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# IQ Mixer

**ZMIQ-143H-S+**

50Ω Level 18 (LO Power +18 dBm) 5 to 14 GHz SMA Female

## THE BIG DEAL

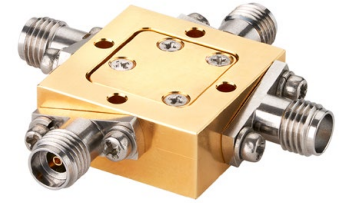
- Wideband RF & LO, 5 to 14 GHz
- Wideband IF, DC to 3 GHz, operational up to 7 GHz
- Excellent Image Rejection, Typ. 28 dB
- Excellent Side Band Suppression, Typ. 30 dB
- High Input IP3, Typ. +25 dBm
- Usable as Image Reject Mixer & SSB Converter
- Small Size with SMA connectors on all Ports

## APPLICATIONS

- Test and Measurement Equipment
- Back Haul Radio
- Satellite Communications
- Radar, EW, and ECM Defense Systems

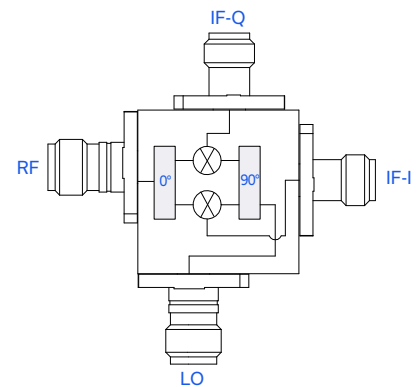
## PRODUCT OVERVIEW

The ZMIQ-143H-S+ is a passive wideband in-phase/quadrature (I/Q) mixer utilizing Mini-Circuits' own GaAs HBT device, the [SMIQ-5143H+](#). This mixer can be used as a single-sideband upconverter for transmission or as an image rejection mixer for receiving applications. It is particularly well-suited for wideband uses that demand inherent image signal rejection and suppression of undesired sidebands. The mixer covers a broad band with an RF and LO frequency range of 5 to 14 GHz and an IF frequency range of DC to 3 GHz (operational up to 7 GHz). As a passive mixer, the ZMIQ-143H-S+ offers a lower noise figure than active mixers, enabling superior dynamic range for high performance applications. The mixer is housed in a compact, rugged package with SMA coaxial connections. This model also serves as an excellent evaluation module for the [SMIQ-5143H+](#).



Generic photo used for illustration purposes only

## FUNCTIONAL DIAGRAM



## KEY FEATURES

| Feature                                                                    | Advantages                                                                                                                                         |
|----------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|
| High Image Rejection, 28 dB typ.<br>High Side Band Suppression, 30 dB typ. | Provides inherent rejection of unwanted image signals and suppression of undesired side band without the need for external filtering.              |
| High Isolation,<br>• LO-RF, 40 dB typ.<br>• LO-IF, 42 dB typ.              | Enables excellent carrier rejection in single-sideband upconverter transmit applications. Minimizes filtering required to ensure signal integrity. |
| Wide Bandwidth, 5 to 14 GHz                                                | Useful in wideband systems or in reconfigurable narrowband systems across multiple bands with minimal component changes.                           |
| Wide IF Bandwidth, DC to 3 GHz                                             | Enables the use of high IF conversion to reduce filtering requirements. IF operation as low as DC enables use in phase detector applications.      |

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PAGE 1 OF 11



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ELECTRICAL SPECIFICATIONS<sup>1</sup> AT +25°C, Z<sub>0</sub> = 50Ω, LO POWER = +18 dBm, UNLESS OTHERWISE NOTED.

| Parameter                                                         | Frequency (GHz) | Min. | Typ.  | Max.           | Unit   |
|-------------------------------------------------------------------|-----------------|------|-------|----------------|--------|
| RF Frequency Range                                                |                 | 5    |       | 14             | GHz    |
| LO Frequency Range                                                |                 | 5    |       | 14             | GHz    |
| IF Frequency Range                                                |                 | DC   |       | 3 <sup>2</sup> | GHz    |
| LO Power                                                          |                 | +17  | +18   | +20            | dBm    |
| Conversion Loss <sup>3</sup>                                      | 5 - 8           |      | 7.2   | 9.0            | dB     |
|                                                                   | 8 - 14          |      | 8.5   | 11.5           |        |
| Amplitude Unbalance                                               | 5 - 8           |      | ±0.1  | ±0.6           | dB     |
|                                                                   | 8 - 14          |      | ±0.2  | ±1.5           |        |
| Phase Unbalance (Relative to 90°)                                 | 5 - 8           |      | 1.5   | 7.5            | Degree |
|                                                                   | 8 - 14          |      | 4.5   | 12.5           |        |
| Image Rejection <sup>4</sup> (Tested as a Downconverter)          | 5 - 8           |      | 22.0  |                | dBc    |
|                                                                   | 8 - 14          |      | 25.0  |                |        |
| Single Sideband Rejection <sup>5</sup> (Tested as an Upconverter) | 5 - 8           |      | 30.0  |                | dBc    |
|                                                                   | 8 - 14          |      | 30.0  |                |        |
| LO-RF Isolation                                                   | 5 - 8           | 33.0 | 40    |                | dB     |
|                                                                   | 8 - 14          | 32.5 | 40    |                |        |
| LO-I Isolation                                                    | 5 - 8           | 30.0 | 40    |                | dB     |
|                                                                   | 8 - 14          | 30.0 | 45    |                |        |
| LO-Q Isolation                                                    | 5 - 8           | 27.5 | 35    |                | dB     |
|                                                                   | 8 - 14          | 30.0 | 45    |                |        |
| RF-I Isolation                                                    | 5 - 8           | 20.0 | 27    |                | dB     |
|                                                                   | 8 - 14          | 25.0 | 26    |                |        |
| RF-Q Isolation                                                    | 5 - 8           | 20.0 | 25    |                | dB     |
|                                                                   | 8 - 14          | 15.0 | 25    |                |        |
| Input Power at 1dB Compression                                    | 5 - 14          |      | +10   |                | dBm    |
| Input IP3 (I) <sup>6</sup><br>Lower Side Band                     | 5 - 8           |      | +24.5 |                | dBm    |
|                                                                   | 8 - 14          |      | +26.5 |                |        |
| Input IP3 (Q) <sup>6</sup><br>Lower Side Band                     | 5 - 8           |      | +21.5 |                | dBm    |
|                                                                   | 8 - 14          |      | +26.5 |                |        |
| Input IP3 (I) <sup>6</sup><br>Upper Side Band                     | 5 - 8           |      | +24.5 |                | dBm    |
|                                                                   | 8 - 14          |      | +25.5 |                |        |
| Input IP3 (Q) <sup>6</sup><br>Upper Side Band                     | 5 - 8           |      | +21.5 |                | dBm    |
|                                                                   | 8 - 14          |      | +26.0 |                |        |

1. Unless otherwise specified, IF = 200 MHz

2. IF is operational up to 7 GHz.

3. Conversion loss (dB) = RF Power (dBm) minus worse of I/Q Port Power (dBm) minus 3 dB theoretical loss of an Ideal External Hybrid, measured as a Downconverter.

4. Level of undesired image signal below desired RF signal.

5. Level of undesired sideband below desired sideband.

6. IIP3 (dBm) = OIP3 (dBm) + Conversion loss (dB), where Conversion loss (dB) = RF Power (dBm) - worse of I/Q Port Power (dBm) measured as a Downconverter.

ABSOLUTE MAXIMUM RATINGS<sup>7</sup>

| Parameter             | Ratings         |
|-----------------------|-----------------|
| Operating Temperature | -40°C to +85°C  |
| Storage Temperature   | -55°C to +100°C |
| RF Power              | +28 dBm         |
| LO Power              | +28 dBm         |
| I/Q Power             | +28 dBm         |
| IF Current            | 49 mA           |

7. Permanent damage may occur if any of these limits are exceeded. Electrical maximum ratings are not intended for continuous operation.





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### TYPICAL PERFORMANCE GRAPHS

IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 200 MHz, IF=RF-LO

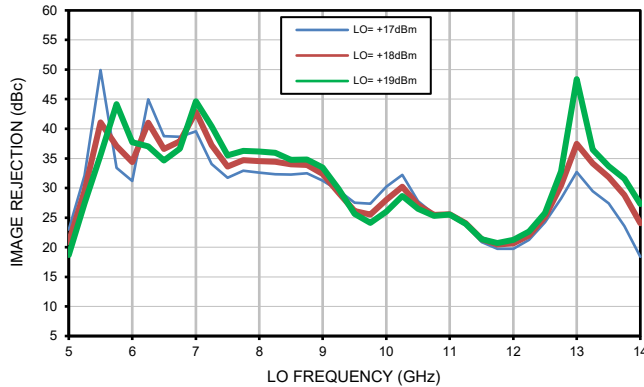


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 200 MHz, IF=LO-RF

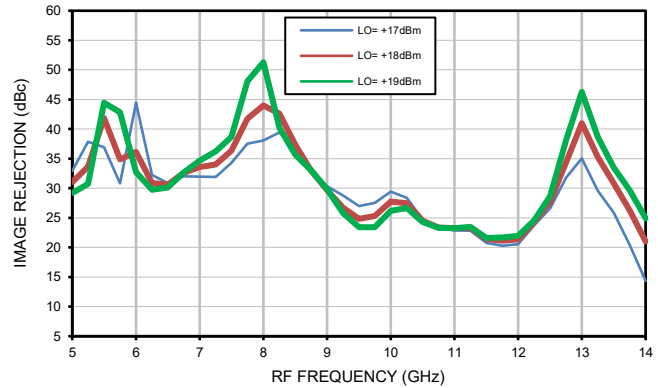


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 1000 MHz, IF=RF-LO

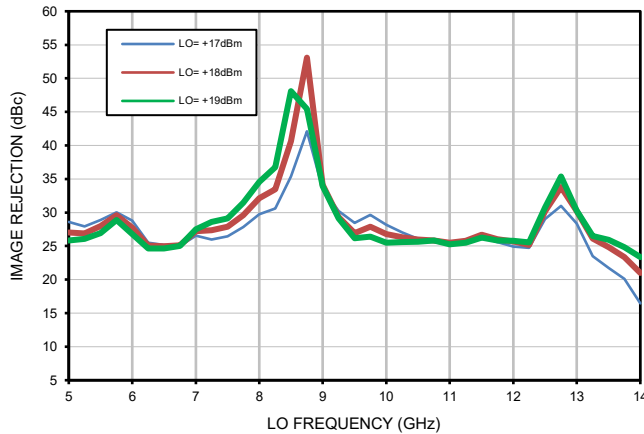


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 1000 MHz, IF=LO-RF

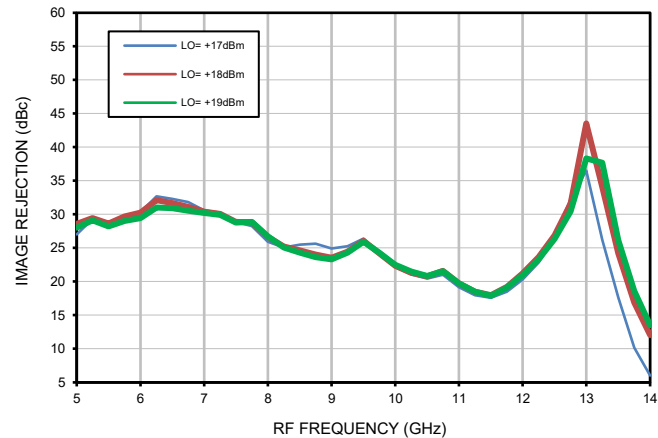


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 3000 MHz, IF=RF-LO

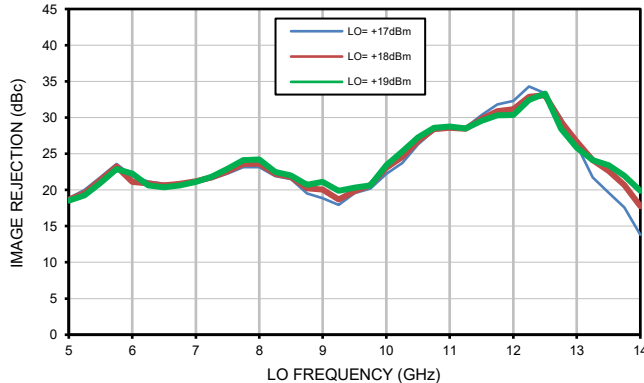
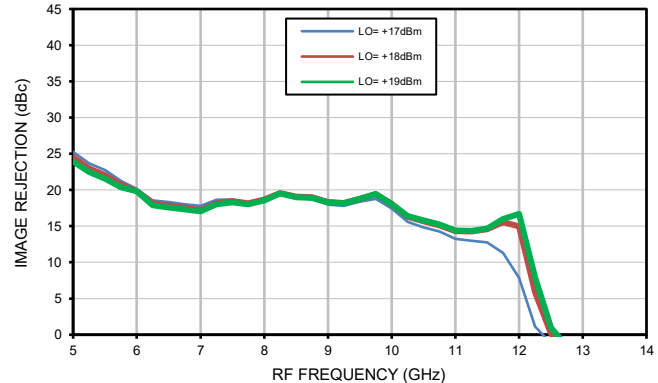


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 3000 MHz, IF=LO-RF





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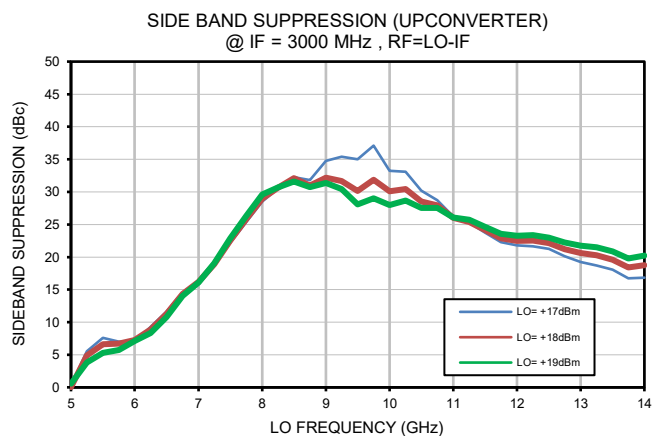
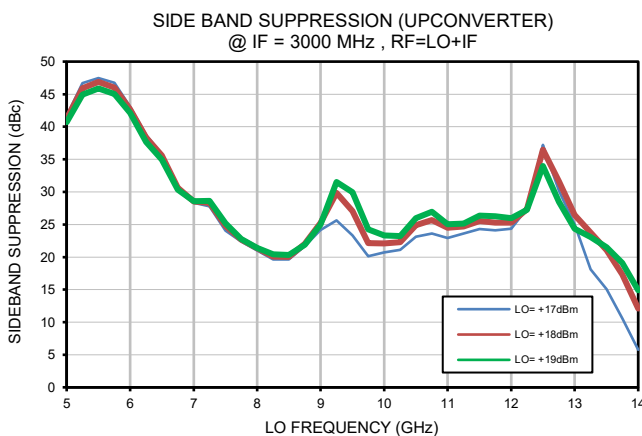
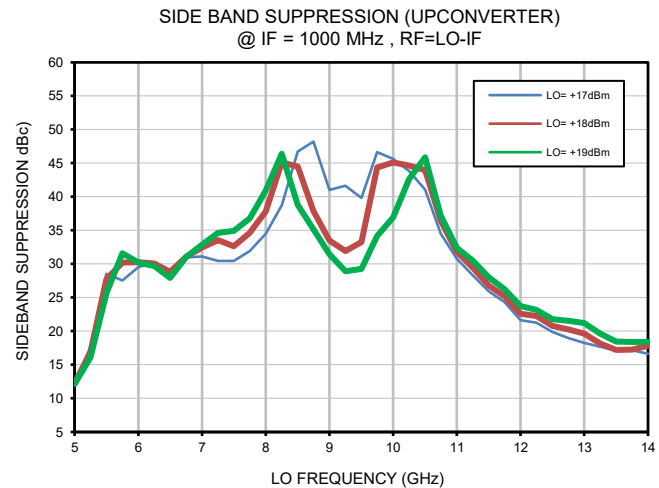
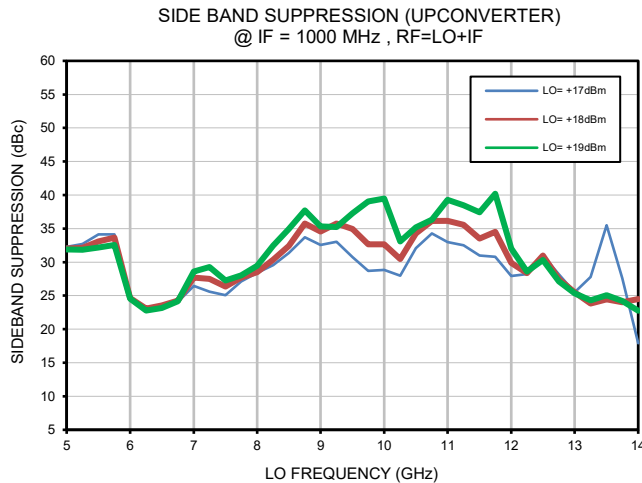
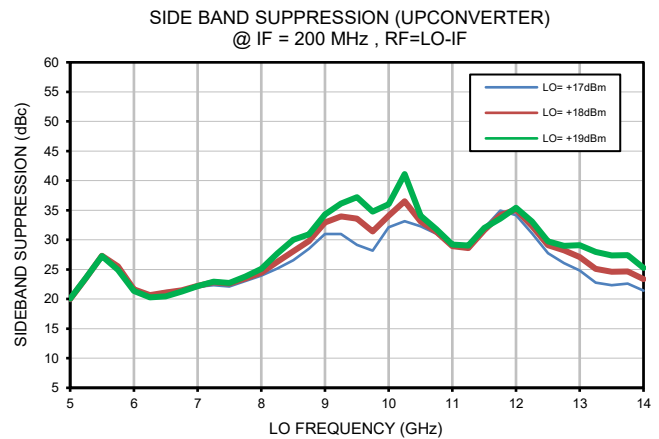
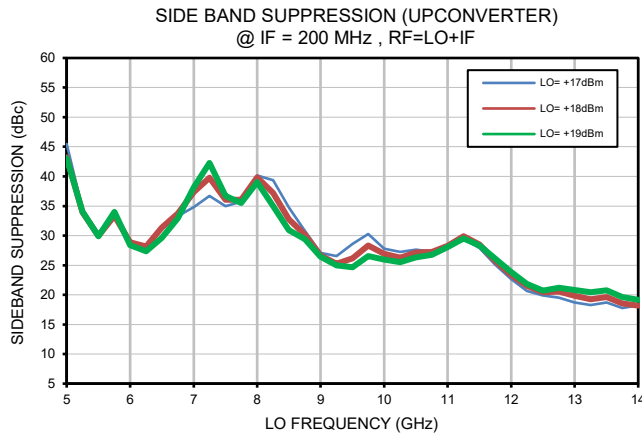
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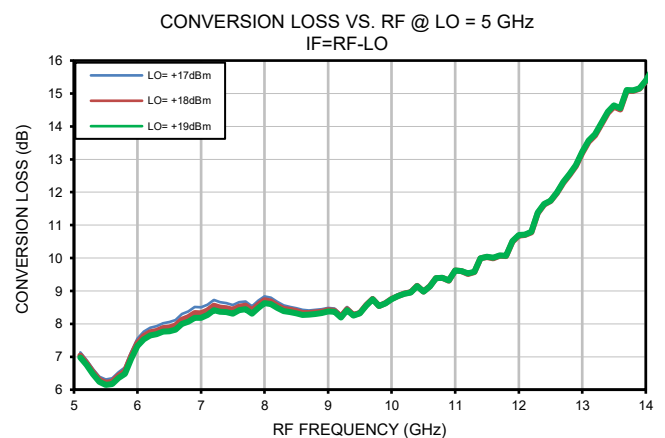
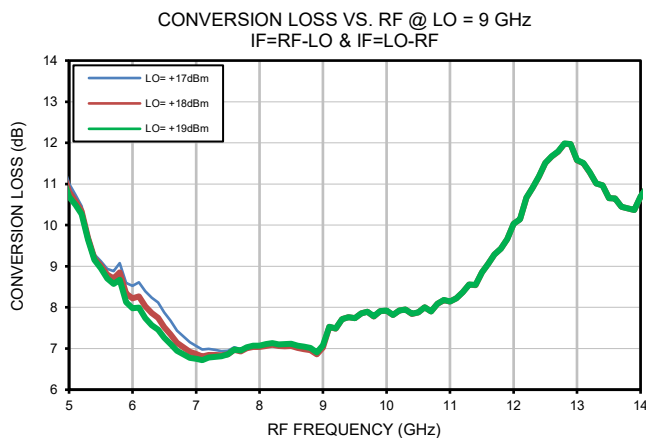
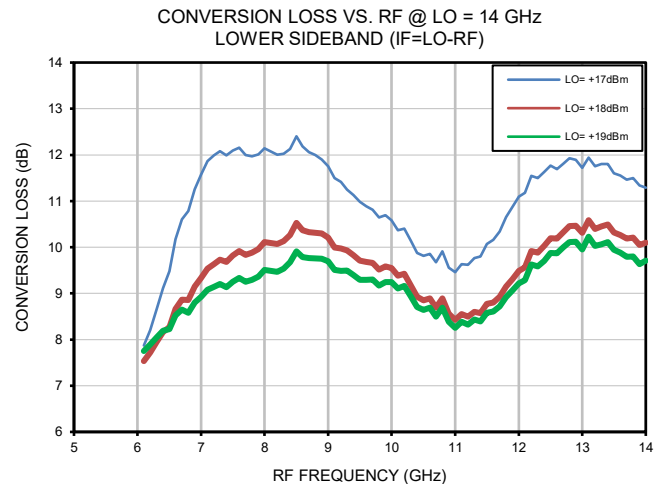
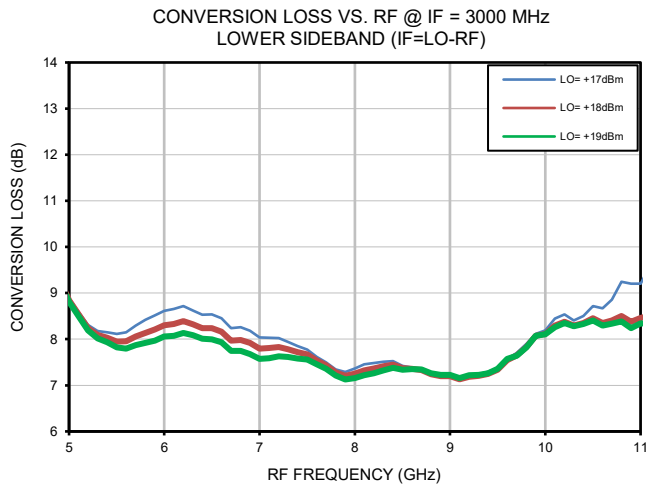
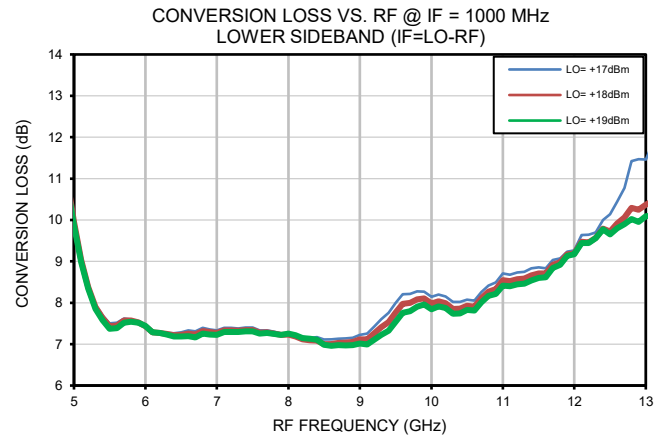
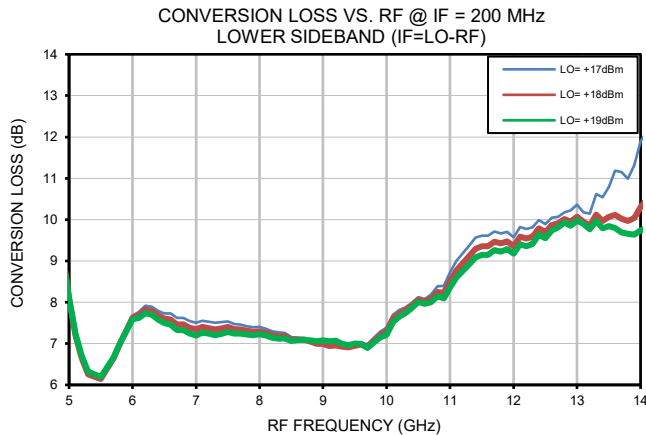
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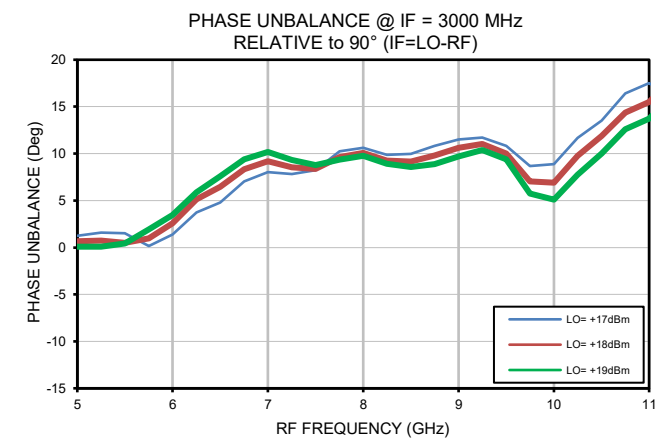
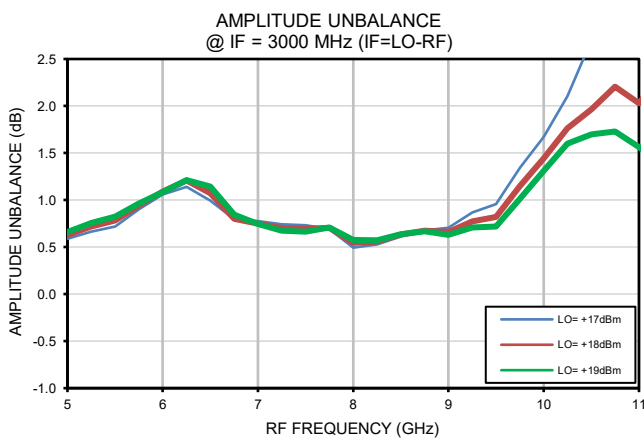
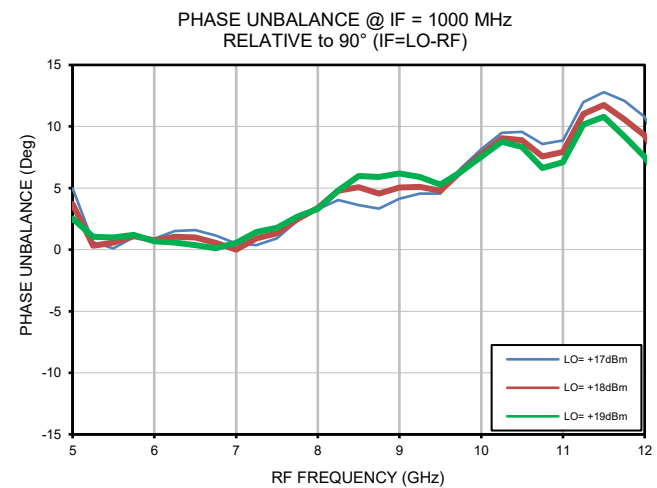
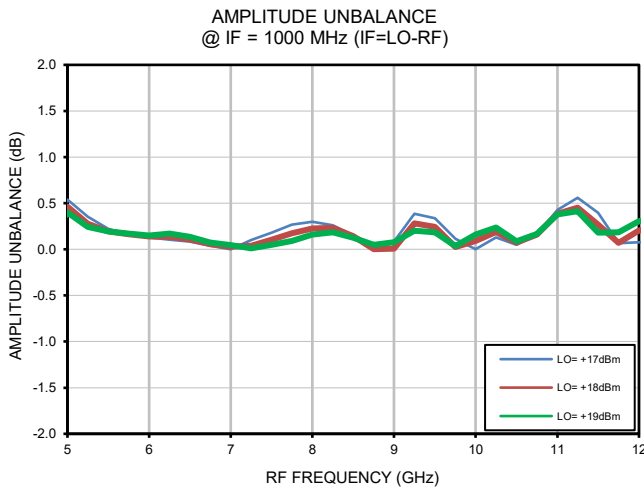
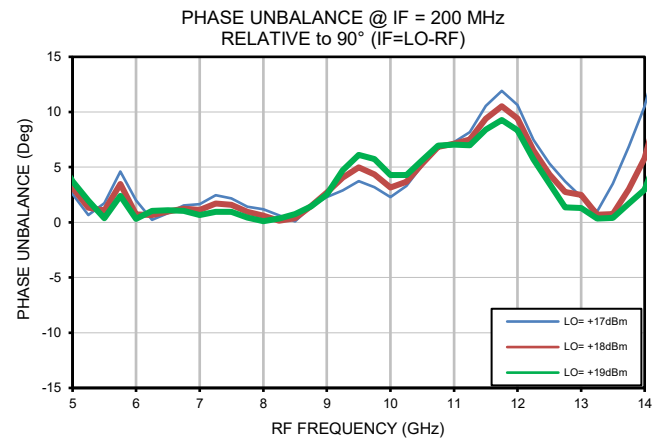
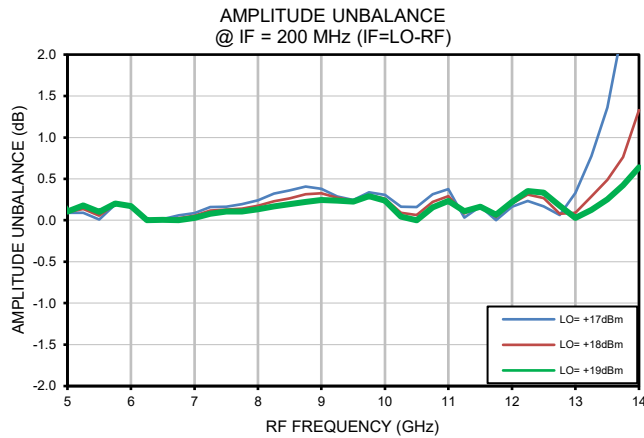
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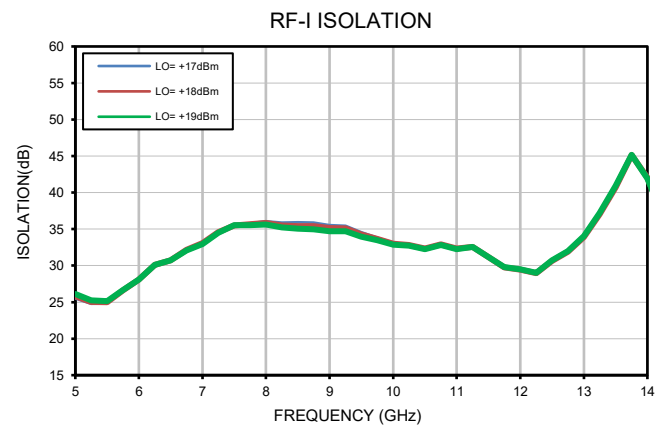
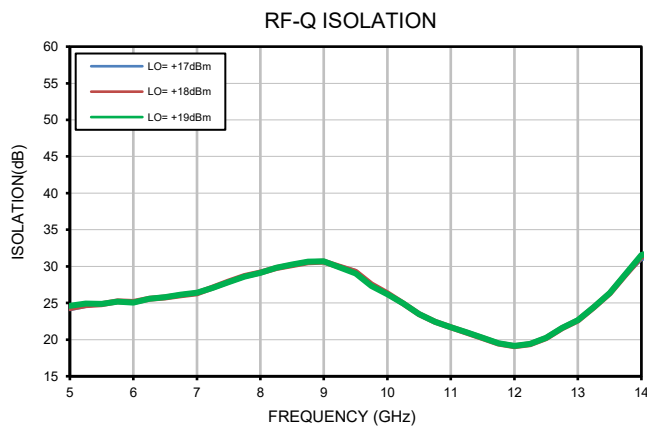
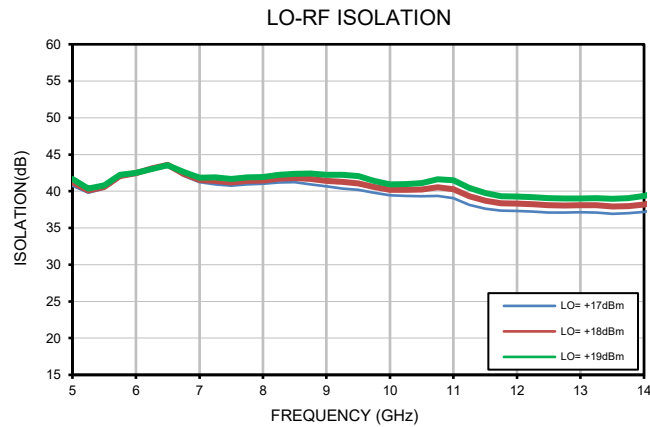
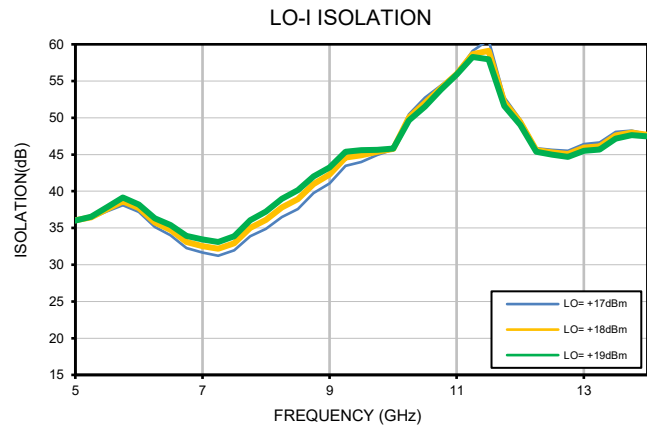
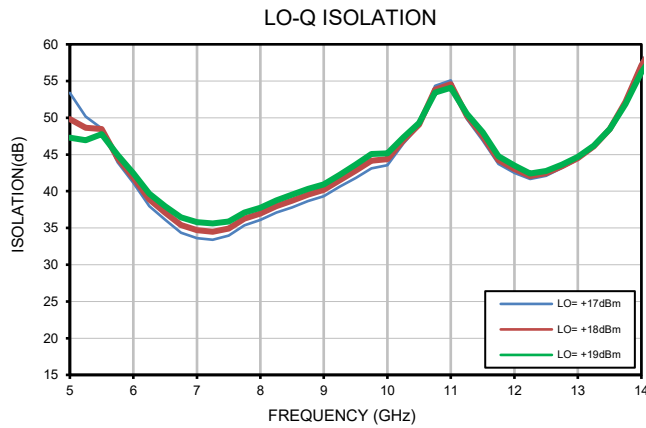
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## TYPICAL PERFORMANCE GRAPHS





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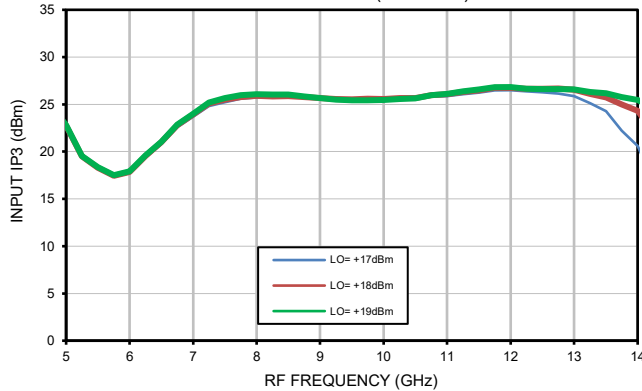
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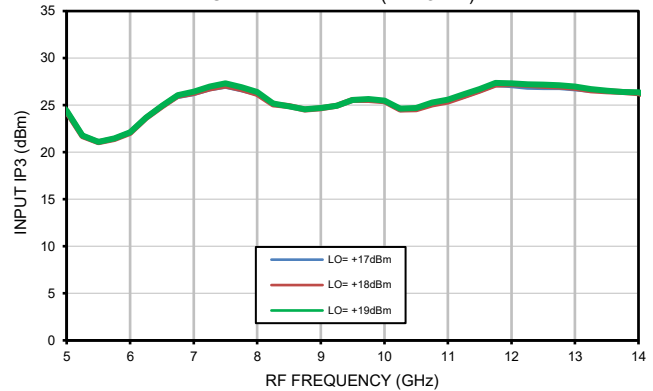
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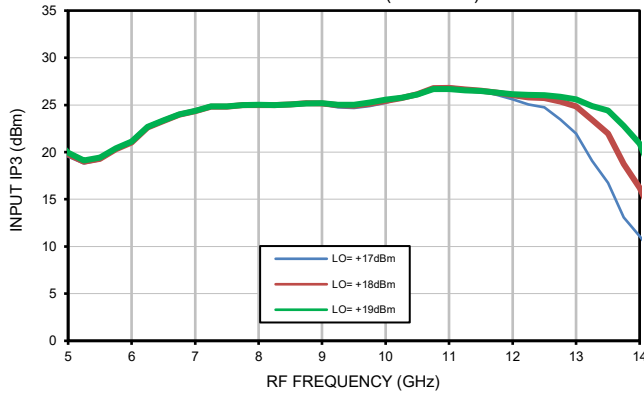
INPUT IP3(I) @ FIXED IF=200MHz  
UPPER SIDEBAND (IF=LO-RF)



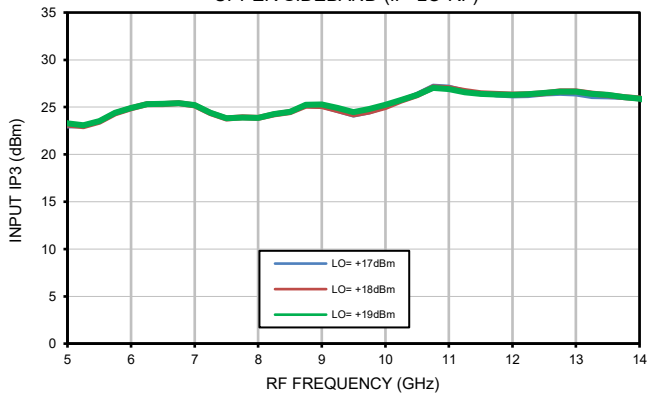
INPUT IP3(Q) @ FIXED IF=200MHz  
UPPER SIDEBAND (IF=LO-RF)



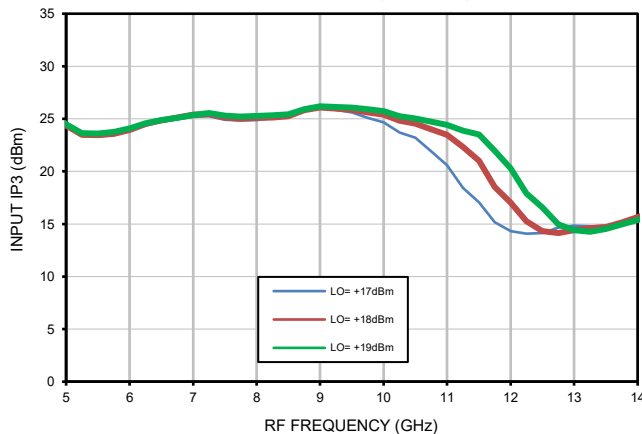
INPUT IP3(I) @ FIXED IF=1000MHz  
UPPER SIDEBAND (IF=LO-RF)



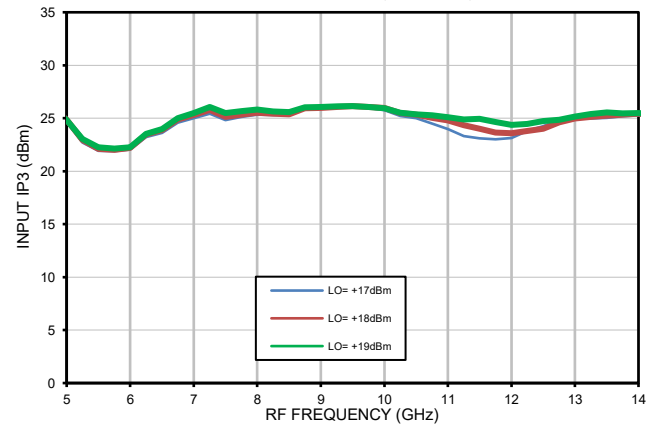
INPUT IP3(Q) @ FIXED IF=1000MHz  
UPPER SIDEBAND (IF=LO-RF)



INPUT IP3(I) @ FIXED IF=3000MHz  
UPPER SIDEBAND (IF=LO-RF)



INPUT IP3(Q) @ FIXED IF=3000MHz  
UPPER SIDEBAND (IF=LO-RF)







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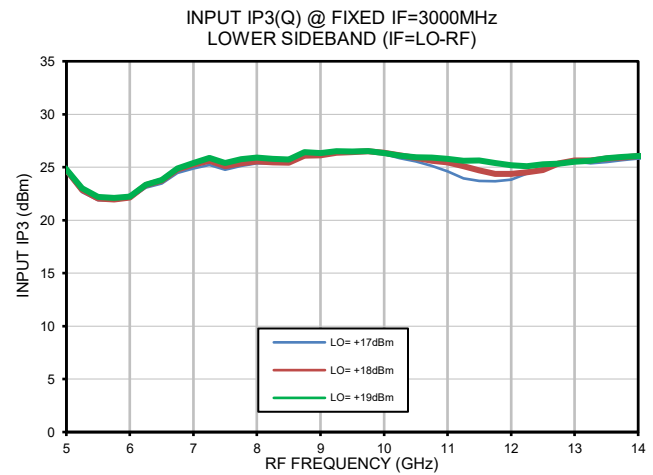
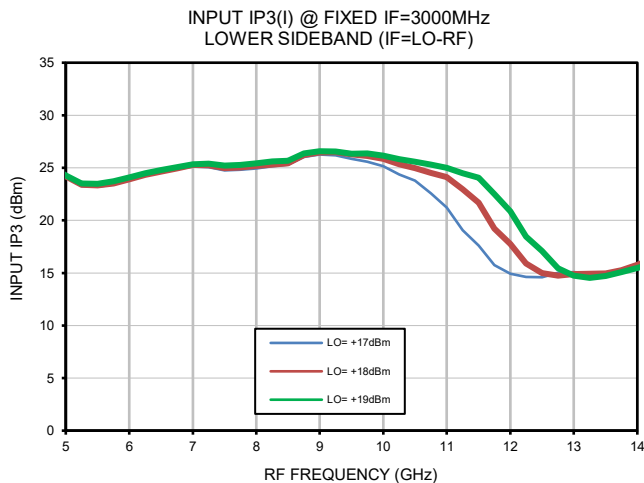
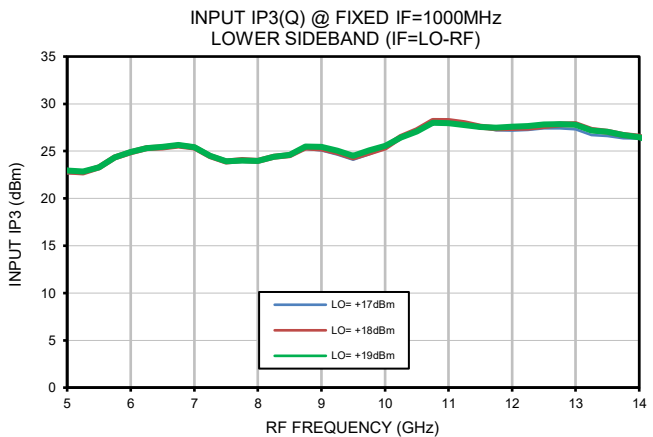
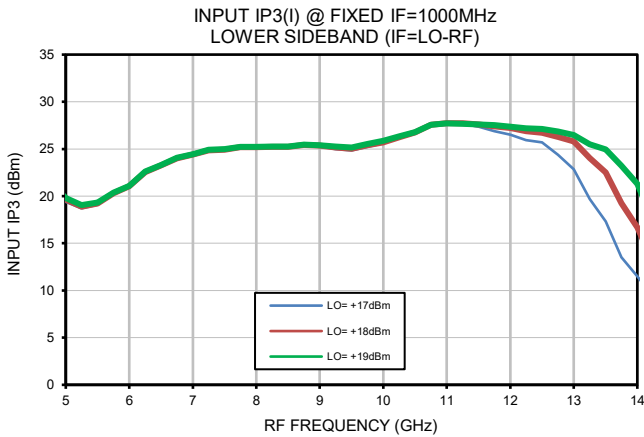
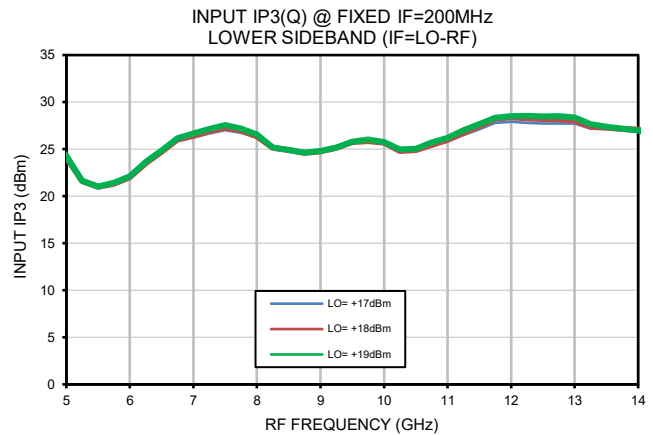
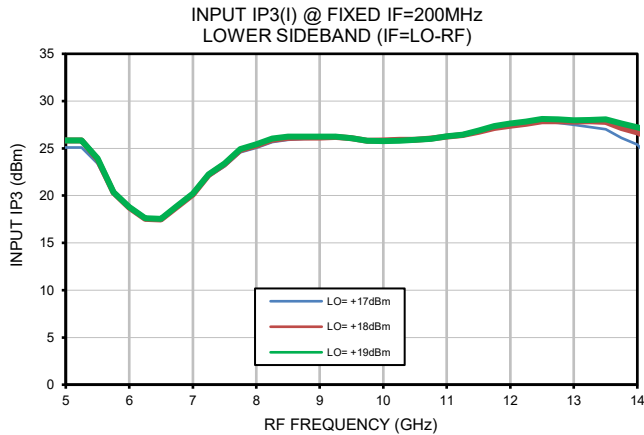
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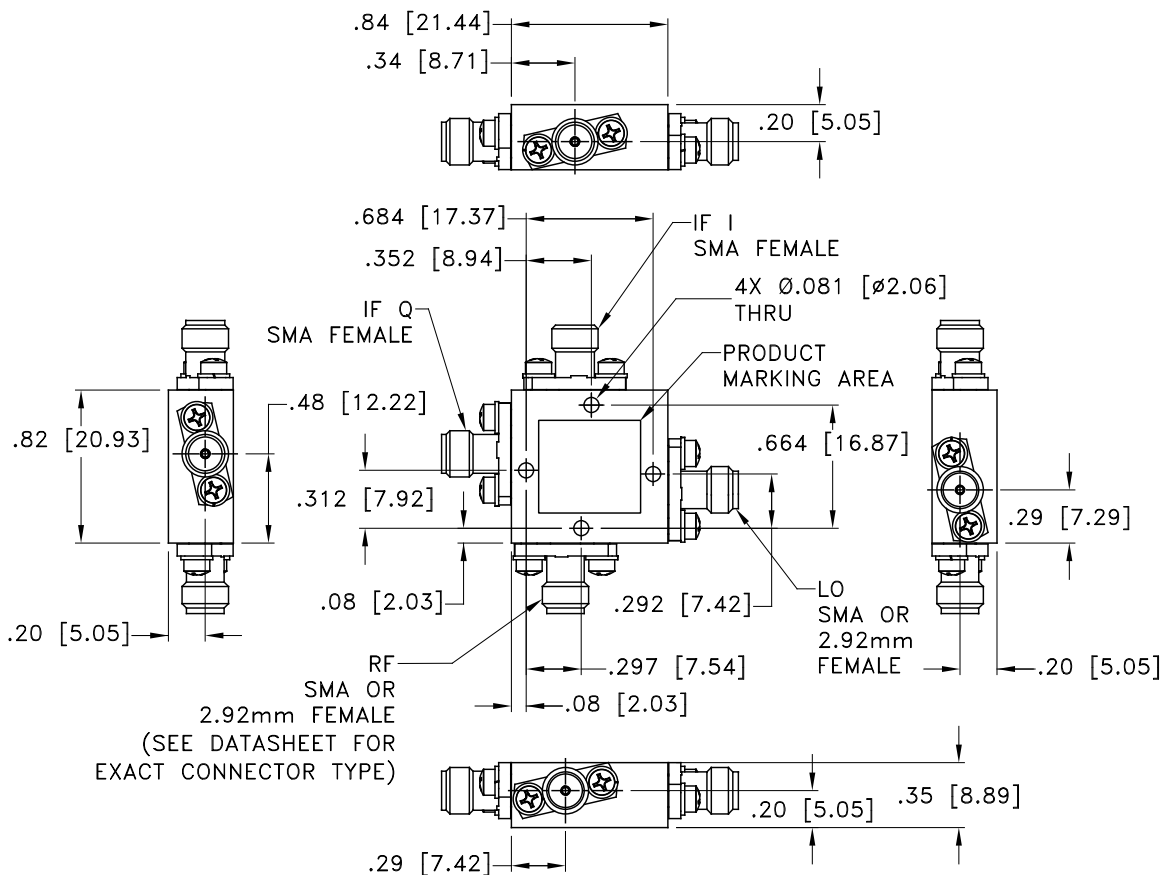
**ZMIQ-143H-S+**

50Ω Level 18 (LO Power +18 dBm) 5 to 14 GHz SMA Female

## COAXIAL CONNECTIONS

| Function  | Connector | Port Marking on Case Style Drawing | Description                                                                               |
|-----------|-----------|------------------------------------|-------------------------------------------------------------------------------------------|
| RF Port   | SMA-F     | RF                                 | RF Port. Connects to RF Output for Upconverters or RF Input for Downconverters.           |
| LO Port   | SMA-F     | LO                                 | LO Port. Connects to LO Input.                                                            |
| IF-I Port | SMA-F     | IF I                               | IF I Port. Connects to the IF I Input for Upconverters or IF I Output for Downconverters. |
| IF-Q Port | SMA-F     | IF Q                               | IF Q Port. Connects to the IF Q Input for Upconverters or IF Q Output for Downconverters. |

## CASE STYLE DRAWING



Weight: 32 grams

Dimensions are in inches [mm]. Tolerances: 2 PL±.03; 3 PL ±.015 inches





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ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASHBOARD [CLICK HERE](#)

|                           |            |
|---------------------------|------------|
| Performance Data & Graphs | Data       |
|                           | Graphs     |
| Case Style                | UK3584     |
| Connectors                | SMA Female |
| RoHS Status               | Compliant  |
| Environmental Ratings     | ENV131     |

## NOTES

- A. Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuits' applicable established test performance criteria and measurement instructions.
- C. The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the standard terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 200 MHz<br>IF = RF-LO |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 1000 MHz<br>IF = RF-LO |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 3000 MHz<br>IF = RF-LO |       |       |
|-------------------------------|--------------------------|---------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|----------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|----------------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                           |       |       |                               |                          | @LO (dBm)                                                            |       |       |                               |                          | @LO (dBm)                                                            |       |       |
|                               |                          | +17                                                                 | +18   | +19   |                               |                          | +17                                                                  | +18   | +19   |                               |                          | +17                                                                  | +18   | +19   |
| 5.20                          | 5.00                     | 22.96                                                               | 20.87 | 18.69 | 6.00                          | 5.00                     | 28.60                                                                | 27.01 | 25.83 | 8.00                          | 5.00                     | 18.88                                                                | 18.65 | 18.53 |
| 5.25                          | 5.05                     | 28.40                                                               | 26.82 | 25.28 | 6.25                          | 5.25                     | 27.92                                                                | 26.90 | 26.08 | 8.25                          | 5.25                     | 20.00                                                                | 19.59 | 19.25 |
| 5.50                          | 5.30                     | 33.33                                                               | 30.46 | 28.21 | 6.50                          | 5.50                     | 28.88                                                                | 27.97 | 26.93 | 8.50                          | 5.50                     | 21.80                                                                | 21.39 | 20.97 |
| 5.75                          | 5.55                     | 54.27                                                               | 44.78 | 37.18 | 6.75                          | 5.75                     | 30.02                                                                | 29.61 | 28.90 | 8.75                          | 5.75                     | 23.58                                                                | 23.26 | 22.88 |
| 6.00                          | 5.80                     | 31.70                                                               | 34.39 | 38.34 | 7.00                          | 6.00                     | 28.80                                                                | 27.73 | 26.80 | 9.00                          | 6.00                     | 21.92                                                                | 21.14 | 22.28 |
| 6.25                          | 6.05                     | 32.13                                                               | 35.67 | 39.00 | 7.25                          | 6.25                     | 25.52                                                                | 25.07 | 24.62 | 9.25                          | 6.25                     | 21.18                                                                | 20.91 | 20.65 |
| 6.50                          | 6.30                     | 45.89                                                               | 40.55 | 36.81 | 7.50                          | 6.50                     | 25.16                                                                | 24.96 | 24.65 | 9.50                          | 6.50                     | 20.85                                                                | 20.65 | 20.36 |
| 6.75                          | 6.55                     | 37.88                                                               | 36.11 | 34.57 | 7.75                          | 6.75                     | 25.03                                                                | 25.10 | 25.02 | 9.75                          | 6.75                     | 20.94                                                                | 20.84 | 20.61 |
| 7.00                          | 6.80                     | 43.19                                                               | 43.59 | 42.11 | 8.00                          | 7.00                     | 26.53                                                                | 27.19 | 27.51 | 10.00                         | 7.00                     | 21.09                                                                | 21.19 | 21.13 |
| 7.25                          | 7.05                     | 38.46                                                               | 41.76 | 44.20 | 8.25                          | 7.25                     | 26.00                                                                | 27.36 | 28.62 | 10.25                         | 7.25                     | 21.52                                                                | 21.73 | 21.84 |
| 7.50                          | 7.30                     | 33.63                                                               | 36.97 | 40.43 | 8.50                          | 7.50                     | 26.45                                                                | 27.88 | 29.12 | 10.50                         | 7.50                     | 22.28                                                                | 22.59 | 22.92 |
| 7.75                          | 7.55                     | 32.51                                                               | 34.21 | 35.77 | 8.75                          | 7.75                     | 27.83                                                                | 29.61 | 31.44 | 10.75                         | 7.75                     | 23.16                                                                | 23.61 | 24.11 |
| 8.00                          | 7.80                     | 32.77                                                               | 34.71 | 36.52 | 9.00                          | 8.00                     | 29.73                                                                | 32.15 | 34.56 | 11.00                         | 8.00                     | 23.17                                                                | 23.65 | 24.20 |
| 8.25                          | 8.05                     | 32.37                                                               | 34.34 | 35.82 | 9.25                          | 8.25                     | 30.58                                                                | 33.48 | 36.74 | 11.25                         | 8.25                     | 21.93                                                                | 22.22 | 22.51 |
| 8.50                          | 8.30                     | 32.00                                                               | 33.85 | 35.05 | 9.50                          | 8.50                     | 35.37                                                                | 40.61 | 48.09 | 11.50                         | 8.50                     | 21.52                                                                | 21.76 | 21.98 |
| 8.75                          | 8.55                     | 32.35                                                               | 34.06 | 34.85 | 9.75                          | 8.75                     | 42.10                                                                | 53.08 | 45.44 | 11.75                         | 8.75                     | 19.54                                                                | 20.21 | 20.73 |
| 9.00                          | 8.80                     | 32.01                                                               | 33.27 | 34.20 | 10.00                         | 9.00                     | 33.58                                                                | 34.13 | 33.94 | 12.00                         | 9.00                     | 18.85                                                                | 20.04 | 21.14 |
| 9.25                          | 9.05                     | 30.43                                                               | 31.32 | 32.53 | 10.25                         | 9.25                     | 30.23                                                                | 29.33 | 29.13 | 12.25                         | 9.25                     | 17.91                                                                | 18.70 | 19.89 |
| 9.50                          | 9.30                     | 28.74                                                               | 28.18 | 28.44 | 10.50                         | 9.50                     | 28.45                                                                | 26.94 | 26.15 | 12.50                         | 9.50                     | 19.57                                                                | 19.85 | 20.31 |
| 9.75                          | 9.55                     | 27.84                                                               | 26.23 | 25.43 | 10.75                         | 9.75                     | 29.63                                                                | 27.86 | 26.41 | 12.75                         | 9.75                     | 20.20                                                                | 20.65 | 20.64 |
| 10.00                         | 9.80                     | 28.41                                                               | 26.46 | 24.77 | 11.00                         | 10.00                    | 28.19                                                                | 26.77 | 25.48 | 13.00                         | 10.00                    | 22.21                                                                | 23.06 | 23.43 |
| 10.25                         | 10.05                    | 31.26                                                               | 29.05 | 27.02 | 11.25                         | 10.25                    | 27.03                                                                | 26.32 | 25.58 | 13.25                         | 10.25                    | 23.72                                                                | 24.58 | 25.32 |
| 10.50                         | 10.30                    | 31.52                                                               | 29.93 | 28.54 | 11.50                         | 10.50                    | 26.09                                                                | 25.95 | 25.64 | 13.50                         | 10.50                    | 26.27                                                                | 26.79 | 27.26 |
| 10.75                         | 10.55                    | 27.22                                                               | 26.76 | 26.27 | 11.75                         | 10.75                    | 25.60                                                                | 25.84 | 25.82 | 13.75                         | 10.75                    | 28.25                                                                | 28.39 | 28.59 |
| 11.00                         | 10.80                    | 25.35                                                               | 25.33 | 25.19 | 12.00                         | 11.00                    | 25.41                                                                | 25.48 | 25.24 | 14.00                         | 11.00                    | 28.42                                                                | 28.60 | 28.75 |
| 11.25                         | 11.05                    | 24.66                                                               | 24.81 | 24.71 | 12.25                         | 11.25                    | 25.67                                                                | 25.77 | 25.52 | 14.25                         | 11.25                    | 28.64                                                                | 28.44 | 28.49 |
| 11.50                         | 11.30                    | 23.03                                                               | 23.37 | 23.31 | 12.50                         | 11.50                    | 26.42                                                                | 26.68 | 26.25 | 14.50                         | 11.50                    | 30.37                                                                | 29.83 | 29.56 |
| 11.75                         | 11.55                    | 20.61                                                               | 21.04 | 20.98 | 12.75                         | 11.75                    | 25.57                                                                | 26.04 | 25.82 | 14.75                         | 11.75                    | 31.80                                                                | 30.88 | 30.31 |
| 12.00                         | 11.80                    | 19.82                                                               | 20.61 | 20.85 | 13.00                         | 12.00                    | 24.94                                                                | 25.69 | 25.77 | 15.00                         | 12.00                    | 32.29                                                                | 31.16 | 30.34 |
| 12.25                         | 12.05                    | 19.93                                                               | 20.89 | 21.39 | 13.25                         | 12.25                    | 24.74                                                                | 25.17 | 25.55 | 15.25                         | 12.25                    | 34.30                                                                | 32.86 | 32.43 |
| 12.50                         | 12.30                    | 21.55                                                               | 22.32 | 22.92 | 13.50                         | 12.50                    | 29.02                                                                | 30.17 | 30.73 | 15.50                         | 12.50                    | 33.35                                                                | 33.08 | 33.31 |
| 12.75                         | 12.55                    | 24.98                                                               | 25.97 | 26.52 | 13.75                         | 12.75                    | 30.98                                                                | 33.78 | 35.36 | 15.75                         | 12.75                    | 29.94                                                                | 29.45 | 28.46 |
| 13.00                         | 12.80                    | 28.91                                                               | 31.63 | 34.92 | 14.00                         | 13.00                    | 28.35                                                                | 30.23 | 30.29 | 16.00                         | 13.00                    | 26.18                                                                | 26.69 | 25.85 |
| 13.25                         | 13.05                    | 31.90                                                               | 36.08 | 44.02 | 14.25                         | 13.25                    | 23.49                                                                | 26.11 | 26.52 | 16.25                         | 13.25                    | 21.76                                                                | 24.12 | 24.13 |
| 13.50                         | 13.30                    | 31.43                                                               | 35.17 | 35.42 | 14.50                         | 13.50                    | 21.75                                                                | 24.85 | 25.92 | 16.50                         | 13.50                    | 19.63                                                                | 22.64 | 23.44 |
| 13.75                         | 13.55                    | 25.44                                                               | 30.17 | 32.47 | 14.75                         | 13.75                    | 20.10                                                                | 23.36 | 24.84 | 16.75                         | 13.75                    | 17.58                                                                | 20.69 | 21.96 |
| 14.00                         | 13.80                    | 22.25                                                               | 27.10 | 29.67 | 15.00                         | 14.00                    | 16.46                                                                | 20.99 | 23.36 | 17.00                         | 14.00                    | 13.82                                                                | 17.76 | 19.90 |

Coaxial IQ MIXER

ZMIQ-143H-S+

Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | DOWNCONVERTER IMAGE REJECTION<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|---------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|----------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|----------------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                           |       |       |                               |                          | @LO (dBm)                                                            |       |       |                               |                          | @LO (dBm)                                                            |       |       |
|                               |                          | +17                                                                 | +18   | +19   |                               |                          | +17                                                                  | +18   | +19   |                               |                          | +17                                                                  | +18   | +19   |
| 5.00                          | 5.20                     | 32.92                                                               | 31.06 | 29.23 | 5.00                          | 6.00                     | 27.04                                                                | 28.61 | 28.05 | 5.00                          | 8.00                     | 25.27                                                                | 24.52 | 23.93 |
| 5.25                          | 5.45                     | 37.86                                                               | 33.64 | 30.72 | 5.25                          | 6.25                     | 29.32                                                                | 29.45 | 29.10 | 5.25                          | 8.25                     | 23.69                                                                | 22.99 | 22.48 |
| 5.50                          | 5.70                     | 36.93                                                               | 41.87 | 44.44 | 5.50                          | 6.50                     | 28.80                                                                | 28.67 | 28.21 | 5.50                          | 8.50                     | 22.76                                                                | 22.05 | 21.58 |
| 5.75                          | 5.95                     | 30.80                                                               | 34.88 | 42.85 | 5.75                          | 6.75                     | 29.69                                                                | 29.68 | 29.03 | 5.75                          | 8.75                     | 21.24                                                                | 20.73 | 20.35 |
| 6.00                          | 6.20                     | 44.44                                                               | 36.12 | 32.71 | 6.00                          | 7.00                     | 30.30                                                                | 30.28 | 29.45 | 6.00                          | 9.00                     | 20.16                                                                | 19.84 | 19.83 |
| 6.25                          | 6.45                     | 32.22                                                               | 30.89 | 29.74 | 6.25                          | 7.25                     | 32.69                                                                | 32.10 | 31.02 | 6.25                          | 9.25                     | 18.55                                                                | 18.18 | 17.91 |
| 6.50                          | 6.70                     | 30.89                                                               | 30.64 | 30.13 | 6.50                          | 7.50                     | 32.29                                                                | 31.70 | 30.91 | 6.50                          | 9.50                     | 18.32                                                                | 17.84 | 17.56 |
| 6.75                          | 6.95                     | 32.02                                                               | 32.61 | 32.65 | 6.75                          | 7.75                     | 31.85                                                                | 31.11 | 30.53 | 6.75                          | 9.75                     | 18.04                                                                | 17.54 | 17.32 |
| 7.00                          | 7.20                     | 31.95                                                               | 33.59 | 34.67 | 7.00                          | 8.00                     | 30.59                                                                | 30.41 | 30.21 | 7.00                          | 10.00                    | 17.79                                                                | 17.22 | 17.05 |
| 7.25                          | 7.45                     | 31.88                                                               | 34.02 | 36.25 | 7.25                          | 8.25                     | 30.25                                                                | 30.07 | 29.94 | 7.25                          | 10.25                    | 18.63                                                                | 18.17 | 18.03 |
| 7.50                          | 7.70                     | 34.31                                                               | 36.33 | 38.66 | 7.50                          | 8.50                     | 28.89                                                                | 28.89 | 28.80 | 7.50                          | 10.50                    | 18.68                                                                | 18.44 | 18.30 |
| 7.75                          | 7.95                     | 37.51                                                               | 41.76 | 48.09 | 7.75                          | 8.75                     | 28.28                                                                | 28.84 | 28.89 | 7.75                          | 10.75                    | 18.19                                                                | 18.16 | 18.04 |
| 8.00                          | 8.20                     | 38.06                                                               | 43.99 | 51.29 | 8.00                          | 9.00                     | 25.95                                                                | 26.66 | 26.73 | 8.00                          | 11.00                    | 18.75                                                                | 18.67 | 18.55 |
| 8.25                          | 8.45                     | 39.44                                                               | 42.61 | 40.21 | 8.25                          | 9.25                     | 25.08                                                                | 25.20 | 25.07 | 8.25                          | 11.25                    | 19.47                                                                | 19.57 | 19.53 |
| 8.50                          | 8.70                     | 36.79                                                               | 37.30 | 35.67 | 8.50                          | 9.50                     | 25.48                                                                | 24.63 | 24.32 | 8.50                          | 11.50                    | 18.94                                                                | 19.06 | 18.98 |
| 8.75                          | 8.95                     | 32.74                                                               | 32.97 | 33.03 | 8.75                          | 9.75                     | 25.66                                                                | 24.02 | 23.66 | 8.75                          | 11.75                    | 18.71                                                                | 18.98 | 18.90 |
| 9.00                          | 9.20                     | 30.35                                                               | 29.69 | 29.85 | 9.00                          | 10.00                    | 24.94                                                                | 23.56 | 23.33 | 9.00                          | 12.00                    | 18.00                                                                | 18.34 | 18.29 |
| 9.25                          | 9.45                     | 28.79                                                               | 26.74 | 25.82 | 9.25                          | 10.25                    | 25.28                                                                | 24.47 | 24.30 | 9.25                          | 12.25                    | 17.80                                                                | 18.18 | 18.16 |
| 9.50                          | 9.70                     | 27.01                                                               | 24.83 | 23.40 | 9.50                          | 10.50                    | 26.42                                                                | 26.08 | 25.95 | 9.50                          | 12.50                    | 18.39                                                                | 18.76 | 18.78 |
| 9.75                          | 9.95                     | 27.53                                                               | 25.34 | 23.40 | 9.75                          | 10.75                    | 24.01                                                                | 24.21 | 24.31 | 9.75                          | 12.75                    | 18.78                                                                | 19.43 | 19.43 |
| 10.00                         | 10.20                    | 29.42                                                               | 27.73 | 26.16 | 10.00                         | 11.00                    | 22.19                                                                | 22.34 | 22.50 | 10.00                         | 13.00                    | 17.44                                                                | 18.05 | 18.05 |
| 10.25                         | 10.45                    | 28.39                                                               | 27.46 | 26.64 | 10.25                         | 11.25                    | 21.07                                                                | 21.30 | 21.51 | 10.25                         | 13.25                    | 15.60                                                                | 16.30 | 16.40 |
| 10.50                         | 10.70                    | 24.66                                                               | 24.48 | 24.27 | 10.50                         | 11.50                    | 20.44                                                                | 20.77 | 20.81 | 10.50                         | 13.50                    | 14.84                                                                | 15.66 | 15.81 |
| 10.75                         | 10.95                    | 23.31                                                               | 23.36 | 23.33 | 10.75                         | 11.75                    | 21.01                                                                | 21.59 | 21.56 | 10.75                         | 13.75                    | 14.27                                                                | 15.10 | 15.22 |
| 11.00                         | 11.20                    | 22.90                                                               | 23.24 | 23.28 | 11.00                         | 12.00                    | 19.17                                                                | 19.75 | 19.74 | 11.00                         | 14.00                    | 13.27                                                                | 14.29 | 14.40 |
| 11.25                         | 11.45                    | 22.84                                                               | 23.31 | 23.46 | 11.25                         | 12.25                    | 17.96                                                                | 18.50 | 18.49 | 11.25                         | 14.25                    | 12.99                                                                | 14.25 | 14.34 |
| 11.50                         | 11.70                    | 20.76                                                               | 21.42 | 21.60 | 11.50                         | 12.50                    | 17.58                                                                | 17.98 | 17.89 | 11.50                         | 14.50                    | 12.78                                                                | 14.59 | 14.67 |
| 11.75                         | 11.95                    | 20.28                                                               | 21.16 | 21.71 | 11.75                         | 12.75                    | 18.51                                                                | 19.23 | 19.12 | 11.75                         | 14.75                    | 11.32                                                                | 15.53 | 15.99 |
| 12.00                         | 12.20                    | 20.56                                                               | 21.39 | 21.95 | 12.00                         | 13.00                    | 20.30                                                                | 21.21 | 20.95 | 12.00                         | 15.00                    | 7.86                                                                 | 14.95 | 16.68 |
| 12.25                         | 12.45                    | 23.72                                                               | 24.29 | 24.56 | 12.25                         | 13.25                    | 22.82                                                                | 23.63 | 23.32 |                               |                          |                                                                      |       |       |
| 12.50                         | 12.70                    | 26.62                                                               | 27.76 | 28.66 | 12.50                         | 13.50                    | 26.44                                                                | 26.88 | 26.37 |                               |                          |                                                                      |       |       |
| 12.75                         | 12.95                    | 31.78                                                               | 34.42 | 38.11 | 12.75                         | 13.75                    | 32.30                                                                | 31.59 | 30.44 |                               |                          |                                                                      |       |       |
| 13.00                         | 13.20                    | 35.03                                                               | 41.01 | 46.28 | 13.00                         | 14.00                    | 36.51                                                                | 43.53 | 38.33 |                               |                          |                                                                      |       |       |
| 13.25                         | 13.45                    | 29.58                                                               | 35.27 | 38.68 | 13.25                         | 14.25                    | 26.23                                                                | 34.05 | 37.69 |                               |                          |                                                                      |       |       |
| 13.50                         | 13.70                    | 25.88                                                               | 30.84 | 33.48 | 13.50                         | 14.50                    | 17.65                                                                | 24.23 | 26.14 |                               |                          |                                                                      |       |       |
| 13.75                         | 13.95                    | 20.37                                                               | 26.25 | 29.63 | 13.75                         | 14.75                    | 10.15                                                                | 16.90 | 18.59 |                               |                          |                                                                      |       |       |
| 14.00                         | 14.20                    | 14.35                                                               | 21.02 | 24.93 | 14.00                         | 15.00                    | 6.02                                                                 | 12.05 | 13.52 |                               |                          |                                                                      |       |       |

Typical Performance Data

| RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER USB SUPPRESSION<br>@ FIXED IF = 200 MHz<br>RF = LO+IF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER USB SUPPRESSION<br>@ FIXED IF = 1000 MHz<br>RF = LO+IF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER USB SUPPRESSION<br>@ FIXED IF = 3000 MHz<br>RF = LO+IF |       |       |
|--------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                                |                          | @LO (dBm)                                                         |       |       |                                |                          | @LO (dBm)                                                          |       |       |                                |                          | @LO (dBm)                                                          |       |       |
|                                |                          | +17                                                               | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |
| 5.20                           | 5.00                     | 45.48                                                             | 43.23 | 43.07 | 6.00                           | 5.00                     | 32.29                                                              | 32.01 | 31.88 | 8.00                           | 5.00                     | 41.66                                                              | 41.22 | 40.72 |
| 5.45                           | 5.25                     | 34.47                                                             | 33.95 | 34.06 | 6.25                           | 5.25                     | 32.68                                                              | 32.13 | 31.83 | 8.25                           | 5.25                     | 46.70                                                              | 45.91 | 44.95 |
| 5.70                           | 5.50                     | 30.32                                                             | 29.96 | 29.91 | 6.50                           | 5.50                     | 34.13                                                              | 33.07 | 32.19 | 8.50                           | 5.50                     | 47.47                                                              | 46.89 | 45.88 |
| 5.95                           | 5.75                     | 33.79                                                             | 33.38 | 34.02 | 6.75                           | 5.75                     | 34.15                                                              | 33.63 | 32.57 | 8.75                           | 5.75                     | 46.76                                                              | 46.02 | 45.03 |
| 6.20                           | 6.00                     | 28.76                                                             | 28.88 | 28.39 | 7.00                           | 6.00                     | 24.67                                                              | 24.62 | 24.53 | 9.00                           | 6.00                     | 43.06                                                              | 42.65 | 42.13 |
| 6.45                           | 6.25                     | 27.85                                                             | 28.15 | 27.34 | 7.25                           | 6.25                     | 23.14                                                              | 23.07 | 22.78 | 9.25                           | 6.25                     | 38.75                                                              | 38.33 | 37.64 |
| 6.70                           | 6.50                     | 31.40                                                             | 31.33 | 29.61 | 7.50                           | 6.50                     | 23.45                                                              | 23.52 | 23.17 | 9.50                           | 6.50                     | 35.76                                                              | 35.58 | 34.98 |
| 6.95                           | 6.75                     | 33.29                                                             | 33.76 | 32.92 | 7.75                           | 6.75                     | 24.06                                                              | 24.25 | 24.14 | 9.75                           | 6.75                     | 30.67                                                              | 30.65 | 30.34 |
| 7.20                           | 7.00                     | 34.84                                                             | 37.33 | 38.19 | 8.00                           | 7.00                     | 26.47                                                              | 27.70 | 28.62 | 10.00                          | 7.00                     | 28.31                                                              | 28.53 | 28.59 |
| 7.45                           | 7.25                     | 36.68                                                             | 39.78 | 42.25 | 8.25                           | 7.25                     | 25.61                                                              | 27.52 | 29.25 | 10.25                          | 7.25                     | 27.79                                                              | 28.31 | 28.64 |
| 7.70                           | 7.50                     | 35.00                                                             | 36.07 | 36.68 | 8.50                           | 7.50                     | 25.09                                                              | 26.35 | 27.26 | 10.50                          | 7.50                     | 24.04                                                              | 24.80 | 25.17 |
| 7.95                           | 7.75                     | 35.75                                                             | 36.06 | 35.52 | 8.75                           | 7.75                     | 27.12                                                              | 27.67 | 28.02 | 10.75                          | 7.75                     | 22.36                                                              | 22.66 | 22.79 |
| 8.20                           | 8.00                     | 40.18                                                             | 39.86 | 39.05 | 9.00                           | 8.00                     | 28.42                                                              | 28.52 | 29.44 | 11.00                          | 8.00                     | 21.02                                                              | 21.33 | 21.42 |
| 8.45                           | 8.25                     | 39.35                                                             | 37.20 | 34.96 | 9.25                           | 8.25                     | 29.55                                                              | 30.38 | 32.45 | 11.25                          | 8.25                     | 19.64                                                              | 20.10 | 20.39 |
| 8.70                           | 8.50                     | 34.75                                                             | 32.74 | 30.93 | 9.50                           | 8.50                     | 31.37                                                              | 32.39 | 34.94 | 11.50                          | 8.50                     | 19.61                                                              | 20.02 | 20.32 |
| 8.95                           | 8.75                     | 30.83                                                             | 30.18 | 29.40 | 9.75                           | 8.75                     | 33.70                                                              | 35.77 | 37.73 | 11.75                          | 8.75                     | 21.67                                                              | 22.05 | 21.87 |
| 9.20                           | 9.00                     | 27.09                                                             | 26.62 | 26.42 | 10.00                          | 9.00                     | 32.57                                                              | 34.55 | 35.31 | 12.00                          | 9.00                     | 24.18                                                              | 25.24 | 24.99 |
| 9.45                           | 9.25                     | 26.53                                                             | 25.26 | 24.97 | 10.25                          | 9.25                     | 33.02                                                              | 35.75 | 35.20 | 12.25                          | 9.25                     | 25.61                                                              | 29.87 | 31.50 |
| 9.70                           | 9.50                     | 28.58                                                             | 26.18 | 24.66 | 10.50                          | 9.50                     | 30.73                                                              | 34.92 | 37.26 | 12.50                          | 9.50                     | 23.31                                                              | 27.07 | 29.94 |
| 9.95                           | 9.75                     | 30.28                                                             | 28.32 | 26.53 | 10.75                          | 9.75                     | 28.71                                                              | 32.63 | 39.06 | 12.75                          | 9.75                     | 20.10                                                              | 22.14 | 24.23 |
| 10.20                          | 10.00                    | 27.79                                                             | 26.92 | 25.92 | 11.00                          | 10.00                    | 28.82                                                              | 32.68 | 39.45 | 13.00                          | 10.00                    | 20.70                                                              | 22.07 | 23.32 |
| 10.45                          | 10.25                    | 27.22                                                             | 26.27 | 25.53 | 11.25                          | 10.25                    | 27.97                                                              | 30.46 | 33.08 | 13.25                          | 10.25                    | 21.11                                                              | 22.30 | 23.22 |
| 10.70                          | 10.50                    | 27.61                                                             | 27.11 | 26.31 | 11.50                          | 10.50                    | 32.06                                                              | 34.25 | 35.18 | 13.50                          | 10.50                    | 23.14                                                              | 24.87 | 25.95 |
| 10.95                          | 10.75                    | 27.30                                                             | 27.25 | 26.78 | 11.75                          | 10.75                    | 34.27                                                              | 36.14 | 36.31 | 13.75                          | 10.75                    | 23.61                                                              | 25.65 | 26.93 |
| 11.20                          | 11.00                    | 28.10                                                             | 28.26 | 28.05 | 12.00                          | 11.00                    | 32.98                                                              | 36.15 | 39.27 | 14.00                          | 11.00                    | 22.92                                                              | 24.48 | 25.06 |
| 11.45                          | 11.25                    | 29.45                                                             | 29.89 | 29.54 | 12.25                          | 11.25                    | 32.52                                                              | 35.58 | 38.47 | 14.25                          | 11.25                    | 23.63                                                              | 24.68 | 25.13 |
| 11.70                          | 11.50                    | 27.89                                                             | 28.50 | 28.30 | 12.50                          | 11.50                    | 30.98                                                              | 33.51 | 37.42 | 14.50                          | 11.50                    | 24.29                                                              | 25.53 | 26.34 |
| 11.95                          | 11.75                    | 25.10                                                             | 25.73 | 26.09 | 12.75                          | 11.75                    | 30.81                                                              | 34.53 | 40.19 | 14.75                          | 11.75                    | 24.08                                                              | 25.29 | 26.28 |
| 12.20                          | 12.00                    | 22.66                                                             | 23.37 | 23.86 | 13.00                          | 12.00                    | 27.92                                                              | 29.88 | 32.03 | 15.00                          | 12.00                    | 24.35                                                              | 25.27 | 25.98 |
| 12.45                          | 12.25                    | 20.65                                                             | 21.52 | 21.86 | 13.25                          | 12.25                    | 28.22                                                              | 28.36 | 28.59 | 15.25                          | 12.25                    | 27.43                                                              | 27.34 | 27.25 |
| 12.70                          | 12.50                    | 19.92                                                             | 20.44 | 20.70 | 13.50                          | 12.50                    | 31.00                                                              | 30.99 | 30.29 | 15.50                          | 12.50                    | 37.21                                                              | 36.46 | 33.97 |
| 12.95                          | 12.75                    | 19.51                                                             | 20.53 | 21.18 | 13.75                          | 12.75                    | 28.17                                                              | 27.44 | 27.10 | 15.75                          | 12.75                    | 30.21                                                              | 31.62 | 28.49 |
| 13.20                          | 13.00                    | 18.69                                                             | 19.83 | 20.81 | 14.00                          | 13.00                    | 25.51                                                              | 25.51 | 25.36 | 16.00                          | 13.00                    | 25.04                                                              | 26.44 | 24.36 |
| 13.45                          | 13.25                    | 18.26                                                             | 19.23 | 20.44 | 14.25                          | 13.25                    | 27.80                                                              | 23.85 | 24.29 | 16.25                          | 13.25                    | 18.13                                                              | 23.74 | 23.08 |
| 13.70                          | 13.50                    | 18.71                                                             | 19.62 | 20.74 | 14.50                          | 13.50                    | 35.49                                                              | 24.46 | 25.08 | 16.50                          | 13.50                    | 15.05                                                              | 21.08 | 21.48 |
| 13.95                          | 13.75                    | 17.77                                                             | 18.56 | 19.61 | 14.75                          | 13.75                    | 27.58                                                              | 24.02 | 24.20 | 16.75                          | 13.75                    | 10.59                                                              | 17.34 | 19.11 |
| 14.20                          | 14.00                    | 18.22                                                             | 18.17 | 19.16 | 15.00                          | 14.00                    | 17.91                                                              | 24.47 | 22.75 | 17.00                          | 14.00                    | 5.77                                                               | 12.09 | 14.90 |

Typical Performance Data

| RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER LSB SUPPRESSION<br>@ FIXED IF = 200 MHz<br>RF = LO-IF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER LSB SUPPRESSION<br>@ FIXED IF = 1000 MHz<br>RF = LO-IF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | UPCONVERTER LSB SUPPRESSION<br>@ FIXED IF = 3000 MHz<br>RF = LO-IF |       |       |
|--------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                                |                          | @LO (dBm)                                                         |       |       |                                |                          | @LO (dBm)                                                          |       |       |                                |                          | @LO (dBm)                                                          |       |       |
|                                |                          | +17                                                               | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |
| 5.00                           | 5.20                     | 19.68                                                             | 19.98 | 20.07 | 5.00                           | 6.00                     | 12.17                                                              | 12.26 | 12.14 | 5.00                           | 8.00                     | 0.28                                                               | 0.03  | 0.56  |
| 5.25                           | 5.05                     | 23.46                                                             | 23.55 | 23.61 | 5.25                           | 4.25                     | 17.63                                                              | 16.86 | 16.05 | 5.25                           | 8.25                     | 5.55                                                               | 4.87  | 3.82  |
| 5.50                           | 5.30                     | 27.43                                                             | 27.34 | 27.28 | 5.50                           | 4.50                     | 28.56                                                              | 27.74 | 25.66 | 5.50                           | 8.50                     | 7.59                                                               | 6.60  | 5.31  |
| 5.75                           | 5.55                     | 25.53                                                             | 25.55 | 24.95 | 5.75                           | 4.75                     | 27.56                                                              | 30.21 | 31.60 | 5.75                           | 8.75                     | 7.01                                                               | 6.70  | 5.72  |
| 6.00                           | 5.80                     | 21.72                                                             | 21.64 | 21.38 | 6.00                           | 5.00                     | 29.56                                                              | 30.28 | 30.24 | 6.00                           | 9.00                     | 6.90                                                               | 7.25  | 7.11  |
| 6.25                           | 6.05                     | 20.73                                                             | 20.69 | 20.29 | 6.25                           | 5.25                     | 30.17                                                              | 30.08 | 29.68 | 6.25                           | 9.25                     | 9.28                                                               | 8.87  | 8.33  |
| 6.50                           | 6.30                     | 21.33                                                             | 21.09 | 20.44 | 6.50                           | 5.50                     | 28.91                                                              | 28.85 | 27.93 | 6.50                           | 9.50                     | 11.63                                                              | 11.28 | 10.78 |
| 6.75                           | 6.55                     | 21.55                                                             | 21.48 | 21.25 | 6.75                           | 5.75                     | 30.96                                                              | 31.05 | 31.02 | 6.75                           | 9.75                     | 14.55                                                              | 14.31 | 14.02 |
| 7.00                           | 6.80                     | 22.08                                                             | 22.26 | 22.16 | 7.00                           | 6.00                     | 31.13                                                              | 32.47 | 32.89 | 7.00                           | 10.00                    | 16.21                                                              | 16.21 | 16.12 |
| 7.25                           | 7.05                     | 22.32                                                             | 22.82 | 22.96 | 7.25                           | 6.25                     | 30.43                                                              | 33.54 | 34.63 | 7.25                           | 10.25                    | 18.69                                                              | 18.90 | 19.04 |
| 7.50                           | 7.30                     | 22.10                                                             | 22.60 | 22.72 | 7.50                           | 6.50                     | 30.46                                                              | 32.64 | 34.94 | 7.50                           | 10.50                    | 22.17                                                              | 22.51 | 22.86 |
| 7.75                           | 7.55                     | 23.06                                                             | 23.50 | 23.78 | 7.75                           | 6.75                     | 31.93                                                              | 34.66 | 36.78 | 7.75                           | 10.75                    | 25.38                                                              | 25.81 | 26.32 |
| 8.00                           | 7.80                     | 23.95                                                             | 24.47 | 25.08 | 8.00                           | 7.00                     | 34.51                                                              | 37.85 | 40.94 | 8.00                           | 11.00                    | 28.50                                                              | 28.98 | 29.60 |
| 8.25                           | 8.05                     | 25.17                                                             | 26.31 | 27.68 | 8.25                           | 7.25                     | 38.76                                                              | 45.11 | 46.40 | 8.25                           | 11.25                    | 30.55                                                              | 30.62 | 30.70 |
| 8.50                           | 8.30                     | 26.57                                                             | 28.06 | 30.04 | 8.50                           | 7.50                     | 46.74                                                              | 44.50 | 38.79 | 8.50                           | 11.50                    | 32.28                                                              | 32.10 | 31.59 |
| 8.75                           | 8.55                     | 28.50                                                             | 29.82 | 30.95 | 8.75                           | 7.75                     | 48.22                                                              | 37.89 | 35.14 | 8.75                           | 11.75                    | 31.80                                                              | 31.00 | 30.73 |
| 9.00                           | 8.80                     | 30.98                                                             | 32.94 | 34.30 | 9.00                           | 8.00                     | 41.01                                                              | 33.49 | 31.43 | 9.00                           | 12.00                    | 34.74                                                              | 32.18 | 31.40 |
| 9.25                           | 9.05                     | 31.01                                                             | 33.94 | 36.13 | 9.25                           | 8.25                     | 41.66                                                              | 31.94 | 28.93 | 9.25                           | 12.25                    | 35.42                                                              | 31.69 | 30.43 |
| 9.50                           | 9.30                     | 29.15                                                             | 33.58 | 37.23 | 9.50                           | 8.50                     | 39.82                                                              | 33.28 | 29.26 | 9.50                           | 12.50                    | 35.03                                                              | 30.13 | 28.07 |
| 9.75                           | 9.55                     | 28.16                                                             | 31.40 | 34.76 | 9.75                           | 8.75                     | 46.65                                                              | 44.38 | 34.16 | 9.75                           | 12.75                    | 37.10                                                              | 31.85 | 29.00 |
| 10.00                          | 9.80                     | 32.11                                                             | 34.10 | 36.01 | 10.00                          | 9.00                     | 45.64                                                              | 45.11 | 36.94 | 10.00                          | 13.00                    | 33.26                                                              | 30.09 | 27.97 |
| 10.25                          | 10.05                    | 33.14                                                             | 36.53 | 41.12 | 10.25                          | 9.25                     | 43.85                                                              | 44.65 | 42.62 | 10.25                          | 13.25                    | 33.07                                                              | 30.44 | 28.65 |
| 10.50                          | 10.30                    | 32.29                                                             | 33.09 | 34.06 | 10.50                          | 9.50                     | 41.05                                                              | 43.99 | 45.89 | 10.50                          | 13.50                    | 30.19                                                              | 28.51 | 27.52 |
| 10.75                          | 10.55                    | 31.07                                                             | 31.37 | 31.83 | 10.75                          | 9.75                     | 34.48                                                              | 36.46 | 37.15 | 10.75                          | 13.75                    | 28.72                                                              | 27.94 | 27.53 |
| 11.00                          | 10.80                    | 29.02                                                             | 28.95 | 29.19 | 11.00                          | 10.00                    | 30.77                                                              | 31.81 | 32.38 | 11.00                          | 14.00                    | 26.22                                                              | 26.00 | 26.08 |
| 11.25                          | 11.05                    | 28.65                                                             | 28.62 | 29.05 | 11.25                          | 10.25                    | 28.29                                                              | 29.47 | 30.51 | 11.25                          | 14.25                    | 25.29                                                              | 25.39 | 25.71 |
| 11.50                          | 11.30                    | 32.02                                                             | 31.64 | 32.04 | 11.50                          | 10.50                    | 25.92                                                              | 26.77 | 28.01 | 11.50                          | 14.50                    | 23.77                                                              | 24.15 | 24.64 |
| 11.75                          | 11.55                    | 34.94                                                             | 34.16 | 33.59 | 11.75                          | 10.75                    | 24.30                                                              | 25.16 | 26.22 | 11.75                          | 14.75                    | 22.30                                                              | 22.88 | 23.56 |
| 12.00                          | 11.80                    | 34.17                                                             | 35.09 | 35.45 | 12.00                          | 11.00                    | 21.63                                                              | 22.60 | 23.71 | 12.00                          | 15.00                    | 21.80                                                              | 22.50 | 23.27 |
| 12.25                          | 12.05                    | 31.13                                                             | 32.35 | 33.10 | 12.25                          | 11.25                    | 21.27                                                              | 22.24 | 23.16 | 12.25                          | 15.25                    | 21.65                                                              | 22.53 | 23.37 |
| 12.50                          | 12.30                    | 27.75                                                             | 29.11 | 29.74 | 12.50                          | 11.50                    | 19.89                                                              | 20.80 | 21.80 | 12.50                          | 15.50                    | 21.24                                                              | 22.16 | 22.98 |
| 12.75                          | 12.55                    | 26.10                                                             | 28.25 | 28.97 | 12.75                          | 11.75                    | 18.96                                                              | 20.28 | 21.54 | 12.75                          | 15.75                    | 20.12                                                              | 21.23 | 22.24 |
| 13.00                          | 12.80                    | 24.82                                                             | 27.11 | 29.12 | 13.00                          | 12.00                    | 18.27                                                              | 19.62 | 21.21 | 13.00                          | 16.00                    | 19.25                                                              | 20.61 | 21.75 |
| 13.25                          | 13.05                    | 22.80                                                             | 25.09 | 27.97 | 13.25                          | 12.25                    | 17.67                                                              | 18.19 | 19.65 | 13.25                          | 16.25                    | 18.71                                                              | 20.26 | 21.51 |
| 13.50                          | 13.30                    | 22.36                                                             | 24.59 | 27.37 | 13.50                          | 12.50                    | 17.13                                                              | 17.20 | 18.47 | 13.50                          | 16.50                    | 18.07                                                              | 19.59 | 20.87 |
| 13.75                          | 13.55                    | 22.59                                                             | 24.69 | 27.42 | 13.75                          | 12.75                    | 17.19                                                              | 17.25 | 18.42 | 13.75                          | 16.75                    | 16.71                                                              | 18.38 | 19.78 |
| 14.00                          | 13.80                    | 21.41                                                             | 23.34 | 25.27 | 14.00                          | 13.00                    | 16.64                                                              | 17.82 | 18.41 | 14.00                          | 17.00                    | 16.82                                                              | 18.72 | 20.22 |



Typical Performance Data

| RF<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |      |
|--------------------------|--------------------------|------------------------------------------------------------|-------|------|
|                          |                          | @LO (dBm)                                                  |       |      |
|                          |                          | +17                                                        | +18   | +19  |
| 5.00                     | 5.20                     | 8.12                                                       | 8.09  | 8.09 |
| 5.25                     | 5.45                     | 6.22                                                       | 6.26  | 6.32 |
| 5.50                     | 5.70                     | 6.11                                                       | 6.15  | 6.19 |
| 5.75                     | 5.95                     | 6.99                                                       | 6.99  | 7.00 |
| 6.00                     | 6.20                     | 7.67                                                       | 7.63  | 7.59 |
| 6.25                     | 6.45                     | 7.90                                                       | 7.79  | 7.70 |
| 6.50                     | 6.70                     | 7.73                                                       | 7.60  | 7.50 |
| 6.75                     | 6.95                     | 7.62                                                       | 7.47  | 7.33 |
| 7.00                     | 7.20                     | 7.50                                                       | 7.34  | 7.20 |
| 7.25                     | 7.45                     | 7.51                                                       | 7.34  | 7.21 |
| 7.50                     | 7.70                     | 7.54                                                       | 7.40  | 7.28 |
| 7.75                     | 7.95                     | 7.42                                                       | 7.31  | 7.22 |
| 8.00                     | 8.20                     | 7.40                                                       | 7.30  | 7.22 |
| 8.25                     | 8.45                     | 7.27                                                       | 7.18  | 7.12 |
| 8.50                     | 8.70                     | 7.16                                                       | 7.10  | 7.07 |
| 8.75                     | 8.95                     | 7.05                                                       | 7.05  | 7.08 |
| 9.00                     | 9.20                     | 6.99                                                       | 6.99  | 7.08 |
| 9.25                     | 9.45                     | 6.95                                                       | 6.93  | 7.00 |
| 9.50                     | 9.70                     | 6.96                                                       | 6.95  | 7.00 |
| 9.75                     | 9.95                     | 7.14                                                       | 7.06  | 7.02 |
| 10.00                    | 10.20                    | 7.39                                                       | 7.29  | 7.21 |
| 10.25                    | 10.45                    | 7.88                                                       | 7.81  | 7.74 |
| 10.50                    | 10.70                    | 8.12                                                       | 8.06  | 8.01 |
| 10.75                    | 10.95                    | 8.39                                                       | 8.25  | 8.15 |
| 11.00                    | 11.20                    | 8.72                                                       | 8.51  | 8.36 |
| 11.25                    | 11.45                    | 9.37                                                       | 9.12  | 8.91 |
| 11.50                    | 11.70                    | 9.61                                                       | 9.35  | 9.14 |
| 11.75                    | 11.95                    | 9.66                                                       | 9.42  | 9.23 |
| 12.00                    | 12.20                    | 9.58                                                       | 9.35  | 9.18 |
| 12.25                    | 12.45                    | 9.81                                                       | 9.59  | 9.41 |
| 12.50                    | 12.70                    | 9.89                                                       | 9.70  | 9.55 |
| 12.75                    | 12.95                    | 10.18                                                      | 10.01 | 9.93 |
| 13.00                    | 13.20                    | 10.36                                                      | 10.07 | 9.97 |
| 13.25                    | 13.45                    | 10.62                                                      | 10.12 | 9.97 |
| 13.50                    | 13.70                    | 10.79                                                      | 10.07 | 9.84 |
| 13.75                    | 13.95                    | 10.99                                                      | 9.97  | 9.66 |
| 14.00                    | 14.20                    | 11.91                                                      | 10.31 | 9.74 |

| RF<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       |
|--------------------------|--------------------------|-------------------------------------------------------------|-------|-------|
|                          |                          | @LO (dBm)                                                   |       |       |
|                          |                          | +17                                                         | +18   | +19   |
| 5.00                     | 6.00                     | 10.06                                                       | 9.94  | 9.86  |
| 5.25                     | 6.25                     | 7.95                                                        | 7.89  | 7.85  |
| 5.50                     | 6.50                     | 7.50                                                        | 7.43  | 7.37  |
| 5.75                     | 6.75                     | 7.59                                                        | 7.57  | 7.54  |
| 6.00                     | 7.00                     | 7.43                                                        | 7.43  | 7.44  |
| 6.25                     | 7.25                     | 7.27                                                        | 7.24  | 7.23  |
| 6.50                     | 7.50                     | 7.29                                                        | 7.23  | 7.18  |
| 6.75                     | 7.75                     | 7.39                                                        | 7.32  | 7.25  |
| 7.00                     | 8.00                     | 7.33                                                        | 7.27  | 7.22  |
| 7.25                     | 8.25                     | 7.38                                                        | 7.32  | 7.29  |
| 7.50                     | 8.50                     | 7.40                                                        | 7.34  | 7.31  |
| 7.75                     | 8.75                     | 7.30                                                        | 7.26  | 7.25  |
| 8.00                     | 9.00                     | 7.25                                                        | 7.23  | 7.25  |
| 8.25                     | 9.25                     | 7.14                                                        | 7.09  | 7.13  |
| 8.50                     | 9.50                     | 7.11                                                        | 7.00  | 6.98  |
| 8.75                     | 9.75                     | 7.14                                                        | 7.04  | 6.97  |
| 9.00                     | 10.00                    | 7.22                                                        | 7.11  | 7.02  |
| 9.25                     | 10.25                    | 7.60                                                        | 7.41  | 7.22  |
| 9.50                     | 10.50                    | 8.00                                                        | 7.76  | 7.54  |
| 9.75                     | 10.75                    | 8.27                                                        | 8.08  | 7.90  |
| 10.00                    | 11.00                    | 8.15                                                        | 7.98  | 7.84  |
| 10.25                    | 11.25                    | 8.02                                                        | 7.85  | 7.73  |
| 10.50                    | 11.50                    | 8.07                                                        | 7.93  | 7.83  |
| 10.75                    | 11.75                    | 8.42                                                        | 8.27  | 8.17  |
| 11.00                    | 12.00                    | 8.71                                                        | 8.54  | 8.41  |
| 11.25                    | 12.25                    | 8.75                                                        | 8.59  | 8.46  |
| 11.50                    | 12.50                    | 8.85                                                        | 8.71  | 8.60  |
| 11.75                    | 12.75                    | 9.07                                                        | 8.98  | 8.92  |
| 12.00                    | 13.00                    | 9.26                                                        | 9.19  | 9.17  |
| 12.25                    | 13.25                    | 9.70                                                        | 9.56  | 9.56  |
| 12.50                    | 13.50                    | 10.13                                                       | 9.72  | 9.65  |
| 12.75                    | 13.75                    | 11.42                                                       | 10.29 | 10.02 |
| 13.00                    | 14.00                    | 11.46                                                       | 10.37 | 10.09 |
| 13.25                    | 14.25                    | 13.03                                                       | 11.03 | 10.32 |
| 13.50                    | 14.50                    | 13.28                                                       | 11.82 | 10.50 |
| 13.75                    | 14.75                    | 12.85                                                       | 12.35 | 10.75 |
| 14.00                    | 15.00                    | 12.63                                                       | 12.80 | 11.65 |

| RF<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|--------------------------|--------------------------|-------------------------------------------------------------|-------|-------|
|                          |                          | @LO (dBm)                                                   |       |       |
|                          |                          | +17                                                         | +18   | +19   |
| 5.00                     | 8.00                     | 8.89                                                        | 8.84  | 8.81  |
| 5.25                     | 8.25                     | 8.18                                                        | 8.09  | 8.02  |
| 5.50                     | 8.50                     | 8.11                                                        | 7.95  | 7.82  |
| 5.75                     | 8.75                     | 8.42                                                        | 8.14  | 7.92  |
| 6.00                     | 9.00                     | 8.61                                                        | 8.30  | 8.06  |
| 6.25                     | 9.25                     | 8.62                                                        | 8.32  | 8.08  |
| 6.50                     | 9.50                     | 8.54                                                        | 8.24  | 7.99  |
| 6.75                     | 9.75                     | 8.26                                                        | 7.98  | 7.74  |
| 7.00                     | 10.00                    | 8.04                                                        | 7.80  | 7.57  |
| 7.25                     | 10.25                    | 7.94                                                        | 7.78  | 7.61  |
| 7.50                     | 10.50                    | 7.77                                                        | 7.67  | 7.56  |
| 7.75                     | 10.75                    | 7.35                                                        | 7.28  | 7.21  |
| 8.00                     | 11.00                    | 7.37                                                        | 7.25  | 7.16  |
| 8.25                     | 11.25                    | 7.51                                                        | 7.41  | 7.33  |
| 8.50                     | 11.50                    | 7.42                                                        | 7.37  | 7.33  |
| 8.75                     | 11.75                    | 7.26                                                        | 7.24  | 7.26  |
| 9.00                     | 12.00                    | 7.23                                                        | 7.20  | 7.22  |
| 9.25                     | 12.25                    | 7.24                                                        | 7.21  | 7.23  |
| 9.50                     | 12.50                    | 7.36                                                        | 7.34  | 7.36  |
| 9.75                     | 12.75                    | 7.90                                                        | 7.83  | 7.82  |
| 10.00                    | 13.00                    | 8.19                                                        | 8.11  | 8.11  |
| 10.25                    | 13.25                    | 8.41                                                        | 8.29  | 8.28  |
| 10.50                    | 13.50                    | 8.72                                                        | 8.45  | 8.40  |
| 10.75                    | 13.75                    | 9.25                                                        | 8.50  | 8.38  |
| 11.00                    | 14.00                    | 9.20                                                        | 8.46  | 8.34  |
| 11.25                    | 14.25                    | 11.09                                                       | 8.86  | 8.39  |
| 11.50                    | 14.50                    | 13.47                                                       | 10.05 | 8.73  |
| 11.75                    | 14.75                    | 15.79                                                       | 12.09 | 9.45  |
| 12.00                    | 15.00                    | 16.54                                                       | 14.95 | 11.00 |
| 12.25                    | 15.25                    | 15.96                                                       | 16.15 | 14.79 |
| 12.50                    | 15.50                    | 15.27                                                       | 15.47 | 15.62 |
| 12.75                    | 15.75                    | 14.66                                                       | 14.78 | 14.93 |
| 13.00                    | 16.00                    | 14.22                                                       | 14.32 | 14.44 |
| 13.25                    | 16.25                    | 13.63                                                       | 13.71 | 13.80 |
| 13.50                    | 16.50                    | 13.09                                                       | 13.15 | 13.24 |
| 13.75                    | 16.75                    | 12.37                                                       | 12.40 | 12.47 |
| 14.00                    | 17.00                    | 12.09                                                       | 12.09 | 12.12 |

| RF<br>FREQUENCY<br>(GHz) | IF<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED LO = 14 GHz<br>IF = LO-RF |       |       |
|--------------------------|--------------------------|-----------------------------------------------------------|-------|-------|
|                          |                          | @LO (dBm)                                                 |       |       |
|                          |                          | +17                                                       | +18   | +19   |
| -                        | -                        | -                                                         | -     | -     |
| -                        | -                        | -                                                         | -     | -     |
| -                        | -                        | -                                                         | -     | -     |
| -                        | -                        | -                                                         | -     | -     |
| -                        | -                        | -                                                         | -     | -     |
| 6.25                     | 7.75                     | 8.43                                                      | 7.84  | 7.97  |
| 6.50                     | 7.50                     | 9.48                                                      | 8.27  | 8.22  |
| 6.75                     | 7.25                     | 10.72                                                     | 8.87  | 8.63  |
| 7.00                     | 7.00                     | 11.57                                                     | 9.33  | 8.93  |
| 7.25                     | 6.75                     | 11.87                                                     | 9.54  | 9.04  |
| 7.50                     | 6.50                     | 12.09                                                     | 9.82  | 9.25  |
| 7.75                     | 6.25                     | 11.98                                                     | 9.85  | 9.26  |
| 8.00                     | 6.00                     | 12.14                                                     | 10.11 | 9.51  |
| 8.25                     | 5.75                     | 12.13                                                     | 10.21 | 9.60  |
| 8.50                     | 5.50                     | 12.40                                                     | 10.53 | 9.91  |
| 8.75                     | 5.25                     | 12.08                                                     | 10.35 | 9.79  |
| 9.00                     | 5.00                     | 11.75                                                     | 10.21 | 9.70  |
| 9.25                     | 4.75                     | 11.21                                                     | 9.83  | 9.38  |
| 9.50                     | 4.50                     | 10.98                                                     | 9.71  | 9.29  |
| 9.75                     | 4.25                     | 10.71                                                     | 9.56  | 9.20  |
| 10.00                    | 4.00                     | 10.59                                                     | 9.55  | 9.24  |
| 10.25                    | 3.75                     | 10.08                                                     | 9.11  | 8.86  |
| 10.50                    | 3.50                     | 9.81                                                      | 8.85  | 8.64  |
| 10.75                    | 3.25                     | 9.81                                                      | 8.85  | 8.67  |
| 11.00                    | 3.00                     | 9.46                                                      | 8.43  | 8.26  |
| 11.25                    | 2.75                     | 9.67                                                      | 8.54  | 8.38  |
| 11.50                    | 2.50                     | 10.07                                                     | 8.77  | 8.58  |
| 11.75                    | 2.25                     | 10.48                                                     | 9.00  | 8.78  |
| 12.00                    | 2.00                     | 11.10                                                     | 9.48  | 9.22  |
| 12.25                    | 1.75                     | 11.45                                                     | 9.83  | 9.53  |
| 12.50                    | 1.50                     | 11.77                                                     | 10.20 | 9.87  |
| 12.75                    | 1.25                     | 11.91                                                     | 10.43 | 10.08 |
| 13.00                    | 1.00                     | 11.72                                                     | 10.31 | 9.95  |
| 13.25                    | 0.75                     | 11.91                                                     | 10.59 | 10.23 |
| 13.50                    | 0.50                     | 11.60                                                     | 10.32 | 9.94  |
| 13.75                    | 0.25                     | 11.52                                                     | 10.21 | 9.81  |
| 14.00                    | 0.00                     | 11.29                                                     | 10.10 | 9.71  |

| RF<br>FREQUENCY<br>(GHz) | IF<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED LO = 9 GHz<br>IF = LO-RF & IF = RF-LO |       |       |
|--------------------------|--------------------------|-----------------------------------------------------------------------|-------|-------|
|                          |                          | @LO (dBm)                                                             |       |       |
|                          |                          | +17                                                                   | +18   | +19   |
| 5.00                     | 4.00                     | 11.00                                                                 | 10.81 | 10.68 |
| 5.25                     | 3.75                     | 9.84                                                                  | 9.73  | 9.68  |
| 5.50                     | 3.50                     | 9.12                                                                  | 9.01  | 8.95  |
| 5.75                     | 3.25                     | 8.86                                                                  | 8.67  | 8.52  |
| 6.00                     | 3.00                     | 8.53                                                                  | 8.22  | 7.98  |
| 6.25                     | 2.75                     | 8.38                                                                  | 8.01  | 7.71  |
| 6.50                     | 2.50                     | 7.88                                                                  | 7.52  | 7.26  |
| 6.75                     | 2.25                     | 7.43                                                                  | 7.15  | 6.95  |
| 7.00                     | 2.00                     | 7.07                                                                  | 6.87  | 6.75  |
| 7.25                     | 1.75                     | 6.93                                                                  | 6.80  | 6.75  |
| 7.50                     | 1.50                     | 6.95                                                                  | 6.86  | 6.86  |
| 7.75                     | 1.25                     | 7.06                                                                  | 7.01  | 7.02  |
| 8.00                     | 1.00                     | 7.07                                                                  | 7.04  | 7.07  |
| 8.25                     | 0.75                     | 7.13                                                                  | 7.12  | 7.17  |
| 8.50                     | 0.50                     | 7.07                                                                  | 7.06  | 7.11  |
| 8.75                     | 0.25                     | 6.95                                                                  | 6.95  | 6.99  |
| 9.00                     | 0.00                     | 7.02                                                                  | 7.03  | 7.08  |
| 9.25                     | 0.25                     | 7.61                                                                  | 7.61  | 7.62  |
| 9.50                     | 0.50                     | 7.73                                                                  | 7.74  | 7.74  |
| 9.75                     | 0.75                     | 7.88                                                                  | 7.88  | 7.88  |
| 10.00                    | 1.00                     | 7.92                                                                  | 7.92  | 7.92  |
| 10.25                    | 1.25                     | 7.90                                                                  | 7.91  | 7.91  |
| 10.50                    | 1.50                     | 7.87                                                                  | 7.88  | 7.88  |
| 10.75                    | 1.75                     | 8.07                                                                  | 8.08  | 8.08  |
| 11.00                    | 2.00                     | 8.14                                                                  | 8.14  | 8.15  |
| 11.25                    | 2.25                     | 8.32                                                                  | 8.32  | 8.32  |
| 11.50                    | 2.50                     | 8.85                                                                  | 8.85  | 8.85  |
| 11.75                    | 2.75                     | 9.35                                                                  | 9.35  | 9.35  |
| 12.00                    | 3.00                     | 10.03                                                                 | 10.03 | 10.03 |
| 12.25                    | 3.25                     | 10.60                                                                 | 10.60 | 10.61 |
| 12.50                    | 3.50                     | 11.51                                                                 | 11.51 | 11.51 |
| 12.75                    | 3.75                     | 12.01                                                                 | 12.01 | 12.02 |
| 13.00                    | 4.00                     | 11.58                                                                 | 11.58 | 11.58 |
| 13.25                    | 4.25                     | 11.31                                                                 | 11.31 | 11.32 |
| 13.50                    | 4.50                     | 10.65                                                                 | 10.66 | 10.66 |
| 13.75                    | 4.75                     | 10.50                                                                 | 10.50 | 10.50 |
| 14.00                    | 5.00                     | 10.70                                                                 | 10.70 | 10.70 |

| RF<br>FREQUENCY<br>(GHz) | IF<br>FREQUENCY<br>(GHz) | CONVERSION LOSS (dB)<br>@ FIXED LO = 5 GHz<br>IF = RF-LO |       |       |
|--------------------------|--------------------------|----------------------------------------------------------|-------|-------|
|                          |                          | @LO (dBm)                                                |       |       |
|                          |                          | +17                                                      | +18   | +19   |
| 5.00                     | 0.00                     | 7.13                                                     | 7.03  | 6.98  |
| 5.25                     | 0.25                     | 6.77                                                     | 6.67  | 6.62  |
| 5.50                     | 0.50                     | 6.31                                                     | 6.21  | 6.15  |
| 5.75                     | 0.75                     | 6.73                                                     | 6.61  | 6.53  |
| 6.00                     | 1.00                     | 7.55                                                     | 7.42  | 7.33  |
| 6.25                     | 1.25                     | 8.02                                                     | 7.88  | 7.78  |
| 6.50                     | 1.50                     | 8.06                                                     | 7.89  | 7.77  |
| 6.75                     | 1.75                     | 8.42                                                     | 8.25  | 8.11  |
| 7.00                     | 2.00                     | 8.50                                                     | 8.32  | 8.19  |
| 7.25                     | 2.25                     | 8.76                                                     | 8.58  | 8.45  |
| 7.50                     | 2.50                     | 8.57                                                     | 8.42  | 8.31  |
| 7.75                     | 2.75                     | 8.61                                                     | 8.48  | 8.38  |
| 8.00                     | 3.00                     | 8.84                                                     | 8.72  | 8.63  |
| 8.25                     | 3.25                     | 8.51                                                     | 8.41  | 8.34  |
| 8.50                     | 3.50                     | 8.48                                                     | 8.39  | 8.32  |
| 8.75                     | 3.75                     | 8.42                                                     | 8.34  | 8.30  |
| 9.00                     | 4.00                     | 8.49                                                     | 8.41  | 8.37  |
| 9.25                     | 4.25                     | 8.42                                                     | 8.36  | 8.33  |
| 9.50                     | 4.50                     | 8.38                                                     | 8.33  | 8.32  |
| 9.75                     | 4.75                     | 8.60                                                     | 8.55  | 8.55  |
| 10.00                    | 5.00                     | 8.80                                                     | 8.75  | 8.75  |
| 10.25                    | 5.25                     | 8.65                                                     | 8.60  | 8.60  |
| 10.50                    | 5.50                     | 9.02                                                     | 8.98  | 8.98  |
| 10.75                    | 5.75                     | 9.43                                                     | 9.39  | 9.39  |
| 11.00                    | 6.00                     | 9.65                                                     | 9.62  | 9.63  |
| 11.25                    | 6.25                     | 9.67                                                     | 9.65  | 9.67  |
| 11.50                    | 6.50                     | 10.04                                                    | 10.03 | 10.04 |
| 11.75                    | 6.75                     | 10.33                                                    | 10.32 | 10.33 |
| 12.00                    | 7.00                     | 10.69                                                    | 10.68 | 10.70 |
| 12.25                    | 7.25                     | 11.22                                                    | 11.22 | 11.23 |
| 12.50                    | 7.50                     | 11.73                                                    | 11.73 | 11.74 |
| 12.75                    | 7.75                     | 12.58                                                    | 12.59 | 12.61 |
| 13.00                    | 8.00                     | 13.16                                                    | 13.19 | 13.23 |
| 13.25                    | 8.25                     | 13.92                                                    | 13.95 | 14.00 |
| 13.50                    | 8.50                     | 14.57                                                    | 14.60 | 14.64 |
| 13.75                    | 8.75                     | 14.86                                                    | 14.87 | 14.90 |
| 14.00                    | 9.00                     | 15.37                                                    | 15.37 | 15.39 |



Coaxial IQ MIXER

ZMIQ-143H-S+

Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | AMP UNBALANCE VS. RF<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |      |      | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | AMP UNBALANCE VS. RF<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |      | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | AMP UNBALANCE VS. RF<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|------------------------------------------------------------|------|------|-------------------------------|--------------------------|-------------------------------------------------------------|-------|------|-------------------------------|--------------------------|-------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                  |      |      |                               |                          | @LO (dBm)                                                   |       |      |                               |                          | @LO (dBm)                                                   |       |       |
|                               |                          | +17                                                        | +18  | +19  |                               |                          | +17                                                         | +18   | +19  |                               |                          | +17                                                         | +18   | +19   |
| 5.00                          | 5.20                     | 0.09                                                       | 0.10 | 0.11 | 5.00                          | 6.00                     | 0.54                                                        | 0.46  | 0.39 | 5.00                          | 8.00                     | 0.59                                                        | 0.63  | 0.66  |
| 5.25                          | 5.45                     | 0.09                                                       | 0.14 | 0.18 | 5.25                          | 6.25                     | 0.35                                                        | 0.28  | 0.22 | 5.25                          | 8.25                     | 0.66                                                        | 0.72  | 0.75  |
| 5.50                          | 5.70                     | 0.01                                                       | 0.05 | 0.10 | 5.50                          | 6.50                     | 0.22                                                        | 0.19  | 0.18 | 5.50                          | 8.50                     | 0.72                                                        | 0.78  | 0.82  |
| 5.75                          | 5.95                     | 0.19                                                       | 0.20 | 0.20 | 5.75                          | 6.75                     | 0.16                                                        | 0.16  | 0.17 | 5.75                          | 8.75                     | 0.90                                                        | 0.94  | 0.97  |
| 6.00                          | 6.20                     | 0.19                                                       | 0.18 | 0.17 | 6.00                          | 7.00                     | 0.13                                                        | 0.14  | 0.15 | 6.00                          | 9.00                     | 1.06                                                        | 1.09  | 1.08  |
| 6.25                          | 6.45                     | 0.00                                                       | 0.00 | 0.00 | 6.25                          | 7.25                     | 0.10                                                        | 0.13  | 0.17 | 6.25                          | 9.25                     | 1.14                                                        | 1.21  | 1.21  |
| 6.50                          | 6.70                     | 0.01                                                       | 0.01 | 0.01 | 6.50                          | 7.50                     | 0.08                                                        | 0.11  | 0.13 | 6.50                          | 9.50                     | 0.99                                                        | 1.07  | 1.14  |
| 6.75                          | 6.95                     | 0.06                                                       | 0.03 | 0.00 | 6.75                          | 7.75                     | 0.04                                                        | 0.05  | 0.07 | 6.75                          | 9.75                     | 0.80                                                        | 0.80  | 0.84  |
| 7.00                          | 7.20                     | 0.09                                                       | 0.05 | 0.03 | 7.00                          | 8.00                     | 0.00                                                        | 0.03  | 0.04 | 7.00                          | 10.00                    | 0.78                                                        | 0.75  | 0.75  |
| 7.25                          | 7.45                     | 0.16                                                       | 0.12 | 0.08 | 7.25                          | 8.25                     | 0.10                                                        | 0.04  | 0.01 | 7.25                          | 10.25                    | 0.74                                                        | 0.70  | 0.68  |
| 7.50                          | 7.70                     | 0.16                                                       | 0.13 | 0.10 | 7.50                          | 8.50                     | 0.18                                                        | 0.10  | 0.05 | 7.50                          | 10.50                    | 0.73                                                        | 0.70  | 0.66  |
| 7.75                          | 7.95                     | 0.19                                                       | 0.14 | 0.11 | 7.75                          | 8.75                     | 0.27                                                        | 0.17  | 0.09 | 7.75                          | 10.75                    | 0.69                                                        | 0.71  | 0.71  |
| 8.00                          | 8.20                     | 0.24                                                       | 0.18 | 0.13 | 8.00                          | 9.00                     | 0.30                                                        | 0.23  | 0.15 | 8.00                          | 11.00                    | 0.49                                                        | 0.54  | 0.57  |
| 8.25                          | 8.45                     | 0.32                                                       | 0.23 | 0.17 | 8.25                          | 9.25                     | 0.26                                                        | 0.23  | 0.17 | 8.25                          | 11.25                    | 0.53                                                        | 0.56  | 0.57  |
| 8.50                          | 8.70                     | 0.36                                                       | 0.27 | 0.20 | 8.50                          | 9.50                     | 0.15                                                        | 0.14  | 0.12 | 8.50                          | 11.50                    | 0.61                                                        | 0.63  | 0.64  |
| 8.75                          | 8.95                     | 0.41                                                       | 0.31 | 0.22 | 8.75                          | 9.75                     | 0.04                                                        | 0.00  | 0.04 | 8.75                          | 11.75                    | 0.68                                                        | 0.67  | 0.67  |
| 9.00                          | 9.20                     | 0.38                                                       | 0.33 | 0.24 | 9.00                          | 10.00                    | 0.09                                                        | 0.01  | 0.07 | 9.00                          | 12.00                    | 0.71                                                        | 0.66  | 0.63  |
| 9.25                          | 9.45                     | 0.29                                                       | 0.27 | 0.24 | 9.25                          | 10.25                    | 0.39                                                        | 0.28  | 0.19 | 9.25                          | 12.25                    | 0.87                                                        | 0.77  | 0.71  |
| 9.50                          | 9.70                     | 0.25                                                       | 0.24 | 0.23 | 9.50                          | 10.50                    | 0.34                                                        | 0.24  | 0.17 | 9.50                          | 12.50                    | 0.96                                                        | 0.82  | 0.72  |
| 9.75                          | 9.95                     | 0.34                                                       | 0.30 | 0.29 | 9.75                          | 10.75                    | 0.11                                                        | 0.02  | 0.03 | 9.75                          | 12.75                    | 1.35                                                        | 1.15  | 1.02  |
| 10.00                         | 10.20                    | 0.31                                                       | 0.26 | 0.24 | 10.00                         | 11.00                    | 0.00                                                        | 0.09  | 0.15 | 10.00                         | 13.00                    | 1.67                                                        | 1.44  | 1.31  |
| 10.25                         | 10.45                    | 0.17                                                       | 0.09 | 0.04 | 10.25                         | 11.25                    | 0.13                                                        | 0.19  | 0.22 | 10.25                         | 13.25                    | 2.10                                                        | 1.76  | 1.60  |
| 10.50                         | 10.70                    | 0.16                                                       | 0.06 | 0.00 | 10.50                         | 11.50                    | 0.05                                                        | 0.07  | 0.08 | 10.50                         | 13.50                    | 2.70                                                        | 1.96  | 1.70  |
| 10.75                         | 10.95                    | 0.32                                                       | 0.22 | 0.16 | 10.75                         | 11.75                    | 0.16                                                        | 0.16  | 0.16 | 10.75                         | 13.75                    | 4.24                                                        | 2.21  | 1.73  |
| 11.00                         | 11.20                    | 0.38                                                       | 0.29 | 0.23 | 11.00                         | 12.00                    | 0.43                                                        | 0.39  | 0.36 | 11.00                         | 14.00                    | 3.91                                                        | 2.03  | 1.56  |
| 11.25                         | 11.45                    | 0.03                                                       | 0.08 | 0.11 | 11.25                         | 12.25                    | 0.56                                                        | 0.45  | 0.38 | 11.25                         | 14.25                    | 7.72                                                        | 2.38  | 1.35  |
| 11.50                         | 11.70                    | 0.17                                                       | 0.17 | 0.17 | 11.50                         | 12.50                    | 0.40                                                        | 0.27  | 0.17 | 11.50                         | 14.50                    | 12.74                                                       | 3.47  | 1.24  |
| 11.75                         | 11.95                    | 0.00                                                       | 0.04 | 0.07 | 11.75                         | 12.75                    | 0.07                                                        | 0.07  | 0.17 | 11.75                         | 14.75                    | 14.97                                                       | 4.84  | 0.96  |
| 12.00                         | 12.20                    | 0.16                                                       | 0.20 | 0.22 | 12.00                         | 13.00                    | 0.08                                                        | 0.21  | 0.30 | 12.00                         | 15.00                    | 16.12                                                       | 9.59  | 2.08  |
| 12.25                         | 12.45                    | 0.23                                                       | 0.31 | 0.35 | 12.25                         | 13.25                    | 0.09                                                        | 0.22  | 0.30 | 12.25                         | 15.25                    | 16.84                                                       | 16.39 | 8.14  |
| 12.50                         | 12.70                    | 0.17                                                       | 0.27 | 0.33 | 12.50                         | 13.50                    | 0.25                                                        | 0.12  | 0.22 | 12.50                         | 15.50                    | 17.70                                                       | 17.02 | 14.22 |
| 12.75                         | 12.95                    | 0.06                                                       | 0.08 | 0.18 | 12.75                         | 13.75                    | 1.75                                                        | 0.20  | 0.04 | 12.75                         | 15.75                    | 18.96                                                       | 18.17 | 17.50 |
| 13.00                         | 13.20                    | 0.33                                                       | 0.09 | 0.03 | 13.00                         | 14.00                    | 1.88                                                        | 0.32  | 0.06 | 13.00                         | 16.00                    | 19.40                                                       | 18.75 | 18.01 |
| 13.25                         | 13.45                    | 0.77                                                       | 0.29 | 0.13 | 13.25                         | 14.25                    | 6.97                                                        | 1.26  | 0.35 | 13.25                         | 16.25                    | 19.40                                                       | 19.01 | 18.51 |
| 13.50                         | 13.70                    | 1.36                                                       | 0.49 | 0.25 | 13.50                         | 14.50                    | 14.16                                                       | 3.29  | 0.73 | 13.50                         | 16.50                    | 19.15                                                       | 18.84 | 18.46 |
| 13.75                         | 13.95                    | 2.34                                                       | 0.76 | 0.42 | 13.75                         | 14.75                    | 20.39                                                       | 6.11  | 1.36 | 13.75                         | 16.75                    | 18.55                                                       | 18.25 | 17.92 |
| 14.00                         | 14.20                    | 5.37                                                       | 1.33 | 0.64 | 14.00                         | 15.00                    | 27.44                                                       | 12.04 | 3.16 | 14.00                         | 17.00                    | 18.23                                                       | 17.94 | 17.64 |

Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | PHASE UNBALANCE VS. RF<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |      | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | PHASE UNBALANCE VS. RF<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | PHASE UNBALANCE VS. RF<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|--------------------------------------------------------------|-------|------|-------------------------------|--------------------------|---------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|---------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                    |       |      |                               |                          | @LO (dBm)                                                     |       |       |                               |                          | @LO (dBm)                                                     |       |       |
|                               |                          | +17                                                          | +18   | +19  |                               |                          | +17                                                           | +18   | +19   |                               |                          | +17                                                           | +18   | +19   |
| 5.00                          | 5.20                     | 2.55                                                         | 3.13  | 3.70 | 5.00                          | 6.00                     | 4.98                                                          | 3.69  | 2.51  | 5.00                          | 8.00                     | 0.59                                                          | 0.63  | 0.66  |
| 5.25                          | 5.45                     | 0.66                                                         | 1.33  | 1.98 | 5.25                          | 6.25                     | 0.61                                                          | 0.30  | 1.03  | 5.25                          | 8.25                     | 0.66                                                          | 0.72  | 0.75  |
| 5.50                          | 5.70                     | 1.74                                                         | 1.07  | 0.38 | 5.50                          | 6.50                     | 0.10                                                          | 0.58  | 0.98  | 5.50                          | 8.50                     | 0.72                                                          | 0.78  | 0.82  |
| 5.75                          | 5.95                     | 4.62                                                         | 3.49  | 2.41 | 5.75                          | 6.75                     | 1.00                                                          | 1.10  | 1.20  | 5.75                          | 8.75                     | 0.90                                                          | 0.94  | 0.97  |
| 6.00                          | 6.20                     | 1.99                                                         | 0.71  | 0.31 | 6.00                          | 7.00                     | 0.88                                                          | 0.76  | 0.67  | 6.00                          | 9.00                     | 1.06                                                          | 1.09  | 1.08  |
| 6.25                          | 6.45                     | 0.24                                                         | 0.67  | 1.03 | 6.25                          | 7.25                     | 1.50                                                          | 1.04  | 0.58  | 6.25                          | 9.25                     | 1.14                                                          | 1.21  | 1.21  |
| 6.50                          | 6.70                     | 0.85                                                         | 0.98  | 1.10 | 6.50                          | 7.50                     | 1.59                                                          | 0.98  | 0.37  | 6.50                          | 9.50                     | 0.99                                                          | 1.07  | 1.14  |
| 6.75                          | 6.95                     | 1.52                                                         | 1.25  | 1.04 | 6.75                          | 7.75                     | 1.14                                                          | 0.54  | 0.12  | 6.75                          | 9.75                     | 0.80                                                          | 0.80  | 0.84  |
| 7.00                          | 7.20                     | 1.66                                                         | 1.12  | 0.66 | 7.00                          | 8.00                     | 0.50                                                          | 0.00  | 0.55  | 7.00                          | 10.00                    | 0.78                                                          | 0.75  | 0.75  |
| 7.25                          | 7.45                     | 2.46                                                         | 1.71  | 0.97 | 7.25                          | 8.25                     | 0.36                                                          | 0.91  | 1.43  | 7.25                          | 10.25                    | 0.74                                                          | 0.70  | 0.68  |
| 7.50                          | 7.70                     | 2.16                                                         | 1.60  | 0.96 | 7.50                          | 8.50                     | 0.91                                                          | 1.33  | 1.77  | 7.50                          | 10.50                    | 0.73                                                          | 0.70  | 0.66  |
| 7.75                          | 7.95                     | 1.42                                                         | 0.95  | 0.43 | 7.75                          | 8.75                     | 2.35                                                          | 2.48  | 2.67  | 7.75                          | 10.75                    | 0.69                                                          | 0.71  | 0.71  |
| 8.00                          | 8.20                     | 1.17                                                         | 0.60  | 0.11 | 8.00                          | 9.00                     | 3.29                                                          | 3.37  | 3.31  | 8.00                          | 11.00                    | 0.49                                                          | 0.54  | 0.57  |
| 8.25                          | 8.45                     | 0.63                                                         | 0.15  | 0.34 | 8.25                          | 9.25                     | 4.03                                                          | 4.80  | 4.81  | 8.25                          | 11.25                    | 0.53                                                          | 0.56  | 0.57  |
| 8.50                          | 8.70                     | 0.09                                                         | 0.37  | 0.74 | 8.50                          | 9.50                     | 3.63                                                          | 5.06  | 5.97  | 8.50                          | 11.50                    | 0.61                                                          | 0.63  | 0.64  |
| 8.75                          | 8.95                     | 1.44                                                         | 1.48  | 1.46 | 8.75                          | 9.75                     | 3.34                                                          | 4.55  | 5.90  | 8.75                          | 11.75                    | 0.68                                                          | 0.67  | 0.67  |
| 9.00                          | 9.20                     | 2.30                                                         | 2.70  | 2.52 | 9.00                          | 10.00                    | 4.13                                                          | 5.05  | 6.18  | 9.00                          | 12.00                    | 0.71                                                          | 0.66  | 0.63  |
| 9.25                          | 9.45                     | 2.90                                                         | 4.06  | 4.72 | 9.25                          | 10.25                    | 4.55                                                          | 5.11  | 5.90  | 9.25                          | 12.25                    | 0.87                                                          | 0.77  | 0.71  |
| 9.50                          | 9.70                     | 3.74                                                         | 5.00  | 6.11 | 9.50                          | 10.50                    | 4.54                                                          | 4.79  | 5.27  | 9.50                          | 12.50                    | 0.96                                                          | 0.82  | 0.72  |
| 9.75                          | 9.95                     | 3.18                                                         | 4.34  | 5.75 | 9.75                          | 10.75                    | 6.61                                                          | 6.34  | 6.31  | 9.75                          | 12.75                    | 1.35                                                          | 1.15  | 1.02  |
| 10.00                         | 10.20                    | 2.30                                                         | 3.16  | 4.28 | 10.00                         | 11.00                    | 8.15                                                          | 7.75  | 7.54  | 10.00                         | 13.00                    | 1.67                                                          | 1.44  | 1.31  |
| 10.25                         | 10.45                    | 3.29                                                         | 3.68  | 4.29 | 10.25                         | 11.25                    | 9.48                                                          | 9.04  | 8.75  | 10.25                         | 13.25                    | 2.10                                                          | 1.76  | 1.60  |
| 10.50                         | 10.70                    | 5.15                                                         | 5.30  | 5.63 | 10.50                         | 11.50                    | 9.57                                                          | 8.89  | 8.34  | 10.50                         | 13.50                    | 2.70                                                          | 1.96  | 1.70  |
| 10.75                         | 10.95                    | 6.77                                                         | 6.83  | 6.95 | 10.75                         | 11.75                    | 8.59                                                          | 7.57  | 6.64  | 10.75                         | 13.75                    | 4.24                                                          | 2.21  | 1.73  |
| 11.00                         | 11.20                    | 7.29                                                         | 7.13  | 7.03 | 11.00                         | 12.00                    | 8.87                                                          | 7.93  | 7.09  | 11.00                         | 14.00                    | 3.91                                                          | 2.03  | 1.56  |
| 11.25                         | 11.45                    | 8.18                                                         | 7.51  | 6.98 | 11.25                         | 12.25                    | 11.99                                                         | 11.03 | 10.17 | 11.25                         | 14.25                    | 7.72                                                          | 2.38  | 1.35  |
| 11.50                         | 11.70                    | 10.55                                                        | 9.39  | 8.39 | 11.50                         | 12.50                    | 12.79                                                         | 11.74 | 10.79 | 11.50                         | 14.50                    | 12.74                                                         | 3.47  | 1.24  |
| 11.75                         | 11.95                    | 11.92                                                        | 10.52 | 9.28 | 11.75                         | 12.75                    | 12.08                                                         | 10.59 | 9.19  | 11.75                         | 14.75                    | 14.97                                                         | 4.84  | 0.96  |
| 12.00                         | 12.20                    | 10.65                                                        | 9.43  | 8.35 | 12.00                         | 13.00                    | 10.79                                                         | 9.28  | 7.55  | 12.00                         | 15.00                    | 16.12                                                         | 9.59  | 2.08  |
| 12.25                         | 12.45                    | 7.47                                                         | 6.51  | 5.72 | 12.25                         | 13.25                    | 7.31                                                          | 6.54  | 4.99  | 12.25                         | 15.25                    | 16.84                                                         | 16.39 | 8.14  |
| 12.50                         | 12.70                    | 5.33                                                         | 4.34  | 3.52 | 12.50                         | 13.50                    | 3.86                                                          | 4.87  | 4.06  | 12.50                         | 15.50                    | 17.70                                                         | 17.02 | 14.22 |
| 12.75                         | 12.95                    | 3.72                                                         | 2.74  | 1.36 | 12.75                         | 13.75                    | 2.31                                                          | 1.21  | 1.88  | 12.75                         | 15.75                    | 18.96                                                         | 18.17 | 17.50 |
| 13.00                         | 13.20                    | 2.32                                                         | 2.50  | 1.30 | 13.00                         | 14.00                    | 3.88                                                          | 0.29  | 0.64  | 13.00                         | 16.00                    | 19.40                                                         | 18.75 | 18.01 |
| 13.25                         | 13.45                    | 0.98                                                         | 0.68  | 0.35 | 13.25                         | 14.25                    | 10.81                                                         | 4.67  | 1.72  | 13.25                         | 16.25                    | 19.40                                                         | 19.01 | 18.51 |
| 13.50                         | 13.70                    | 3.50                                                         | 0.75  | 0.41 | 13.50                         | 14.50                    | 18.81                                                         | 8.59  | 4.41  | 13.50                         | 16.50                    | 19.15                                                         | 18.84 | 18.46 |
| 13.75                         | 13.95                    | 6.86                                                         | 3.00  | 1.72 | 13.75                         | 14.75                    | 30.23                                                         | 12.84 | 7.91  | 13.75                         | 16.75                    | 18.55                                                         | 18.25 | 17.92 |
| 14.00                         | 14.20                    | 10.50                                                        | 5.79  | 2.95 | 14.00                         | 15.00                    | 54.25                                                         | 19.60 | 12.39 | 14.00                         | 17.00                    | 18.23                                                         | 17.94 | 17.64 |

Typical Performance Data

| LO<br>FREQUENCY<br>(GHz) | LO-IF (Q) Isolation (dB) |      |      | LO-IF (I) Isolation (dB) |      |      | LO-RF Isolation (dB) |      |      |
|--------------------------|--------------------------|------|------|--------------------------|------|------|----------------------|------|------|
|                          | @LO (dBm)                |      |      | @LO (dBm)                |      |      | @LO (dBm)            |      |      |
|                          | +17                      | +18  | +19  | +17                      | +18  | +19  | +17                  | +18  | +19  |
| 5.0                      | 53.4                     | 49.8 | 47.3 | 36.1                     | 36.1 | 36.0 | 40.8                 | 41.2 | 41.7 |
| 5.3                      | 50.1                     | 48.6 | 47.0 | 36.3                     | 36.5 | 36.5 | 39.8                 | 40.1 | 40.4 |
| 5.5                      | 48.6                     | 48.5 | 47.8 | 37.3                     | 37.6 | 37.8 | 40.4                 | 40.6 | 40.8 |
| 5.8                      | 43.9                     | 44.5 | 45.0 | 38.1                     | 38.6 | 39.1 | 41.9                 | 42.1 | 42.2 |
| 6.0                      | 41.2                     | 41.9 | 42.5 | 37.2                     | 37.7 | 38.2 | 42.4                 | 42.5 | 42.5 |
| 6.3                      | 38.0                     | 38.9 | 39.7 | 35.1                     | 35.7 | 36.3 | 43.2                 | 43.1 | 43.0 |
| 6.5                      | 36.1                     | 37.1 | 38.0 | 34.0                     | 34.7 | 35.4 | 43.6                 | 43.6 | 43.5 |
| 6.8                      | 34.4                     | 35.4 | 36.5 | 32.3                     | 33.1 | 33.9 | 42.1                 | 42.4 | 42.6 |
| 7.0                      | 33.6                     | 34.7 | 35.8 | 31.6                     | 32.5 | 33.4 | 41.2                 | 41.6 | 41.8 |
| 7.3                      | 33.4                     | 34.5 | 35.6 | 31.2                     | 32.2 | 33.1 | 40.9                 | 41.4 | 41.9 |
| 7.5                      | 34.0                     | 34.9 | 35.9 | 32.0                     | 32.9 | 33.9 | 40.7                 | 41.2 | 41.7 |
| 7.8                      | 35.4                     | 36.3 | 37.1 | 33.9                     | 35.0 | 36.1 | 40.9                 | 41.4 | 41.9 |
| 8.0                      | 36.1                     | 37.0 | 37.7 | 34.9                     | 36.1 | 37.2 | 41.0                 | 41.5 | 42.0 |
| 8.3                      | 37.1                     | 38.0 | 38.7 | 36.5                     | 37.8 | 39.0 | 41.2                 | 41.7 | 42.2 |
| 8.5                      | 37.8                     | 38.7 | 39.5 | 37.6                     | 38.9 | 40.2 | 41.2                 | 41.8 | 42.4 |
| 8.8                      | 38.7                     | 39.5 | 40.3 | 39.7                     | 41.0 | 42.0 | 40.9                 | 41.7 | 42.4 |
| 9.0                      | 39.3                     | 40.2 | 41.0 | 41.1                     | 42.3 | 43.3 | 40.6                 | 41.4 | 42.2 |
| 9.3                      | 40.6                     | 41.5 | 42.2 | 43.5                     | 44.6 | 45.4 | 40.4                 | 41.3 | 42.2 |
| 9.5                      | 41.8                     | 42.8 | 43.6 | 44.0                     | 44.9 | 45.6 | 40.2                 | 41.1 | 42.1 |
| 9.8                      | 43.1                     | 44.2 | 45.1 | 45.0                     | 45.4 | 45.7 | 39.8                 | 40.6 | 41.4 |
| 10.0                     | 43.6                     | 44.4 | 45.2 | 45.7                     | 45.8 | 45.8 | 39.4                 | 40.2 | 40.9 |
| 10.3                     | 46.5                     | 46.9 | 47.4 | 50.5                     | 50.0 | 49.6 | 39.4                 | 40.2 | 41.0 |
| 10.5                     | 48.9                     | 49.1 | 49.3 | 52.7                     | 52.1 | 51.5 | 39.3                 | 40.2 | 41.1 |
| 10.8                     | 54.4                     | 53.8 | 53.4 | 54.4                     | 54.1 | 53.8 | 39.4                 | 40.5 | 41.6 |
| 11.0                     | 55.1                     | 54.6 | 54.1 | 56.1                     | 55.9 | 55.9 | 39.1                 | 40.3 | 41.5 |
| 11.3                     | 49.9                     | 50.3 | 50.6 | 59.1                     | 58.6 | 58.3 | 38.2                 | 39.3 | 40.5 |
| 11.5                     | 46.9                     | 47.5 | 48.0 | 60.6                     | 59.1 | 58.0 | 37.6                 | 38.7 | 39.7 |
| 11.8                     | 43.7                     | 44.3 | 44.8 | 52.8                     | 52.2 | 51.6 | 37.4                 | 38.4 | 39.3 |
| 12.0                     | 42.5                     | 43.0 | 43.5 | 49.8                     | 49.4 | 49.1 | 37.3                 | 38.3 | 39.3 |
| 12.3                     | 41.7                     | 42.1 | 42.4 | 45.8                     | 45.6 | 45.4 | 37.2                 | 38.2 | 39.2 |
| 12.5                     | 42.1                     | 42.4 | 42.8 | 45.6                     | 45.3 | 45.0 | 37.1                 | 38.1 | 39.1 |
| 12.8                     | 43.2                     | 43.4 | 43.6 | 45.5                     | 45.1 | 44.7 | 37.1                 | 38.1 | 39.0 |
| 13.0                     | 44.4                     | 44.5 | 44.7 | 46.4                     | 45.9 | 45.5 | 37.1                 | 38.1 | 39.0 |
| 13.3                     | 46.1                     | 46.1 | 46.2 | 46.6                     | 46.1 | 45.7 | 37.1                 | 38.1 | 39.1 |
| 13.5                     | 48.5                     | 48.5 | 48.5 | 48.1                     | 47.6 | 47.2 | 36.9                 | 37.9 | 38.9 |
| 13.8                     | 52.4                     | 52.2 | 51.9 | 48.3                     | 48.0 | 47.6 | 37.0                 | 38.0 | 39.0 |
| 14.0                     | 57.6                     | 57.1 | 56.2 | 47.8                     | 47.7 | 47.5 | 37.2                 | 38.2 | 39.3 |

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | RF-IF (Q) Isolation (dB) |      |      | RF-IF (I) Isolation (dB) |      |      |
|-------------------------------|--------------------------|--------------------------|------|------|--------------------------|------|------|
|                               |                          | @LO (dBm)                |      |      | @LO (dBm)                |      |      |
|                               |                          | +17                      | +18  | +19  | +17                      | +18  | +19  |
| 5.0                           | 5.2                      | 24.1                     | 24.3 | 24.6 | 25.5                     | 25.8 | 26.1 |
| 5.3                           | 5.5                      | 24.5                     | 24.7 | 24.9 | 24.8                     | 25.0 | 25.2 |
| 5.5                           | 5.7                      | 24.8                     | 24.8 | 24.9 | 24.8                     | 25.0 | 25.1 |
| 5.8                           | 6.0                      | 25.3                     | 25.2 | 25.2 | 26.4                     | 26.6 | 26.7 |
| 6.0                           | 6.2                      | 25.2                     | 25.1 | 25.1 | 28.0                     | 28.1 | 28.1 |
| 6.3                           | 6.5                      | 25.6                     | 25.6 | 25.6 | 30.1                     | 30.1 | 30.1 |
| 6.5                           | 6.7                      | 25.7                     | 25.8 | 25.8 | 30.7                     | 30.7 | 30.7 |
| 6.8                           | 7.0                      | 26.0                     | 26.1 | 26.2 | 32.2                     | 32.2 | 32.1 |
| 7.0                           | 7.2                      | 26.2                     | 26.3 | 26.4 | 33.1                     | 33.1 | 33.0 |
| 7.3                           | 7.5                      | 27.2                     | 27.1 | 27.1 | 34.6                     | 34.6 | 34.5 |
| 7.5                           | 7.7                      | 28.0                     | 27.9 | 27.8 | 35.4                     | 35.5 | 35.5 |
| 7.8                           | 8.0                      | 28.7                     | 28.7 | 28.6 | 35.8                     | 35.7 | 35.5 |
| 8.0                           | 8.2                      | 29.2                     | 29.1 | 29.1 | 36.1                     | 35.9 | 35.6 |
| 8.3                           | 8.5                      | 29.7                     | 29.8 | 29.8 | 35.9                     | 35.5 | 35.2 |
| 8.5                           | 8.7                      | 30.0                     | 30.2 | 30.3 | 35.9                     | 35.4 | 35.0 |
| 8.8                           | 9.0                      | 30.5                     | 30.6 | 30.7 | 35.9                     | 35.4 | 35.0 |
| 9.0                           | 9.2                      | 30.6                     | 30.6 | 30.7 | 35.5                     | 35.1 | 34.7 |
| 9.3                           | 9.5                      | 30.1                     | 30.0 | 29.9 | 35.5                     | 35.1 | 34.7 |
| 9.5                           | 9.7                      | 29.5                     | 29.2 | 29.0 | 34.6                     | 34.3 | 34.0 |
| 9.8                           | 10.0                     | 27.7                     | 27.5 | 27.3 | 33.8                     | 33.7 | 33.5 |
| 10.0                          | 10.2                     | 26.4                     | 26.3 | 26.2 | 33.1                     | 33.0 | 32.9 |
| 10.3                          | 10.5                     | 25.0                     | 24.9 | 24.9 | 32.9                     | 32.8 | 32.8 |
| 10.5                          | 10.7                     | 23.5                     | 23.5 | 23.5 | 32.4                     | 32.3 | 32.2 |
| 10.8                          | 11.0                     | 22.5                     | 22.4 | 22.4 | 33.0                     | 32.9 | 32.8 |
| 11.0                          | 11.2                     | 21.7                     | 21.7 | 21.7 | 32.4                     | 32.3 | 32.2 |
| 11.3                          | 11.5                     | 20.9                     | 21.0 | 21.0 | 32.6                     | 32.6 | 32.5 |
| 11.5                          | 11.7                     | 20.1                     | 20.2 | 20.2 | 31.1                     | 31.1 | 31.1 |
| 11.8                          | 12.0                     | 19.4                     | 19.5 | 19.5 | 29.7                     | 29.7 | 29.8 |
| 12.0                          | 12.2                     | 19.1                     | 19.1 | 19.1 | 29.4                     | 29.5 | 29.5 |
| 12.3                          | 12.5                     | 19.3                     | 19.4 | 19.4 | 28.9                     | 29.0 | 29.0 |
| 12.5                          | 12.7                     | 20.1                     | 20.2 | 20.2 | 30.5                     | 30.6 | 30.7 |
| 12.8                          | 13.0                     | 21.5                     | 21.6 | 21.6 | 31.8                     | 31.9 | 32.0 |
| 13.0                          | 13.2                     | 22.5                     | 22.6 | 22.7 | 33.8                     | 33.9 | 34.1 |
| 13.3                          | 13.5                     | 24.3                     | 24.4 | 24.4 | 36.8                     | 37.0 | 37.2 |
| 13.5                          | 13.7                     | 26.2                     | 26.3 | 26.4 | 40.5                     | 40.7 | 40.9 |
| 13.8                          | 14.0                     | 28.6                     | 28.9 | 28.9 | 45.0                     | 45.1 | 45.2 |
| 14.0                          | 14.2                     | 30.9                     | 31.4 | 31.6 | 42.2                     | 42.0 | 41.9 |

Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) UPPER SIDEBAND<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) UPPER SIDEBAND<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) UPPER SIDEBAND<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                         |       |       |                               |                          | @LO (dBm)                                                          |       |       |                               |                          | @LO (dBm)                                                          |       |       |
|                               |                          | +17                                                               | +18   | +19   |                               |                          | +17                                                                | +18   | +19   |                               |                          | +17                                                                | +18   | +19   |
| 5.00                          | 5.20                     | 22.48                                                             | 22.71 | 22.79 | 5.00                          | 6.00                     | 19.52                                                              | 19.75 | 19.93 | 5.00                          | 8.00                     | 24.31                                                              | 24.36 | 24.49 |
| 5.25                          | 5.45                     | 19.43                                                             | 19.51 | 19.54 | 5.25                          | 6.25                     | 18.81                                                              | 18.99 | 19.13 | 5.25                          | 8.25                     | 23.38                                                              | 23.47 | 23.63 |
| 5.50                          | 5.70                     | 18.22                                                             | 18.30 | 18.34 | 5.50                          | 6.50                     | 19.15                                                              | 19.28 | 19.42 | 5.50                          | 8.50                     | 23.30                                                              | 23.44 | 23.60 |
| 5.75                          | 5.95                     | 17.36                                                             | 17.45 | 17.52 | 5.75                          | 6.75                     | 20.21                                                              | 20.32 | 20.42 | 5.75                          | 8.75                     | 23.47                                                              | 23.58 | 23.76 |
| 6.00                          | 6.20                     | 17.74                                                             | 17.84 | 17.92 | 6.00                          | 7.00                     | 20.94                                                              | 21.03 | 21.11 | 6.00                          | 9.00                     | 23.83                                                              | 23.93 | 24.08 |
| 6.25                          | 6.45                     | 19.41                                                             | 19.56 | 19.60 | 6.25                          | 7.25                     | 22.52                                                              | 22.62 | 22.69 | 6.25                          | 9.25                     | 24.36                                                              | 24.50 | 24.58 |
| 6.50                          | 6.70                     | 20.80                                                             | 20.98 | 21.04 | 6.50                          | 7.50                     | 23.20                                                              | 23.28 | 23.36 | 6.50                          | 9.50                     | 24.71                                                              | 24.85 | 24.88 |
| 6.75                          | 6.95                     | 22.58                                                             | 22.80 | 22.85 | 6.75                          | 7.75                     | 23.87                                                              | 23.95 | 24.01 | 6.75                          | 9.75                     | 24.96                                                              | 25.11 | 25.09 |
| 7.00                          | 7.20                     | 23.69                                                             | 23.95 | 24.02 | 7.00                          | 8.00                     | 24.24                                                              | 24.33 | 24.37 | 7.00                          | 10.00                    | 25.19                                                              | 25.38 | 25.38 |
| 7.25                          | 7.45                     | 24.81                                                             | 25.10 | 25.19 | 7.25                          | 8.25                     | 24.72                                                              | 24.80 | 24.85 | 7.25                          | 10.25                    | 25.23                                                              | 25.47 | 25.54 |
| 7.50                          | 7.70                     | 25.22                                                             | 25.48 | 25.65 | 7.50                          | 8.50                     | 24.75                                                              | 24.80 | 24.85 | 7.50                          | 10.50                    | 24.90                                                              | 25.13 | 25.29 |
| 7.75                          | 7.95                     | 25.61                                                             | 25.78 | 25.98 | 7.75                          | 8.75                     | 24.97                                                              | 24.97 | 24.99 | 7.75                          | 10.75                    | 24.83                                                              | 25.01 | 25.21 |
| 8.00                          | 8.20                     | 25.74                                                             | 25.89 | 26.07 | 8.00                          | 9.00                     | 25.01                                                              | 25.00 | 25.01 | 8.00                          | 11.00                    | 24.88                                                              | 25.08 | 25.27 |
| 8.25                          | 8.45                     | 25.77                                                             | 25.84 | 26.05 | 8.25                          | 9.25                     | 25.03                                                              | 25.00 | 24.99 | 8.25                          | 11.25                    | 25.05                                                              | 25.12 | 25.33 |
| 8.50                          | 8.70                     | 25.85                                                             | 25.87 | 26.03 | 8.50                          | 9.50                     | 25.08                                                              | 25.06 | 25.04 | 8.50                          | 11.50                    | 25.20                                                              | 25.23 | 25.43 |
| 8.75                          | 8.95                     | 25.78                                                             | 25.76 | 25.83 | 8.75                          | 9.75                     | 25.13                                                              | 25.20 | 25.15 | 8.75                          | 11.75                    | 25.75                                                              | 25.81 | 25.93 |
| 9.00                          | 9.20                     | 25.67                                                             | 25.66 | 25.68 | 9.00                          | 10.00                    | 25.05                                                              | 25.17 | 25.18 | 9.00                          | 12.00                    | 26.01                                                              | 26.07 | 26.19 |
| 9.25                          | 9.45                     | 25.62                                                             | 25.56 | 25.49 | 9.25                          | 10.25                    | 24.75                                                              | 24.97 | 25.03 | 9.25                          | 12.25                    | 25.86                                                              | 25.98 | 26.14 |
| 9.50                          | 9.70                     | 25.59                                                             | 25.55 | 25.44 | 9.50                          | 10.50                    | 24.68                                                              | 24.93 | 25.02 | 9.50                          | 12.50                    | 25.59                                                              | 25.85 | 26.08 |
| 9.75                          | 9.95                     | 25.56                                                             | 25.59 | 25.45 | 9.75                          | 10.75                    | 24.89                                                              | 25.11 | 25.25 | 9.75                          | 12.75                    | 25.08                                                              | 25.62 | 25.91 |
| 10.00                         | 10.20                    | 25.52                                                             | 25.55 | 25.45 | 10.00                         | 11.00                    | 25.23                                                              | 25.41 | 25.55 | 10.00                         | 13.00                    | 24.68                                                              | 25.41 | 25.74 |
| 10.25                         | 10.45                    | 25.56                                                             | 25.65 | 25.56 | 10.25                         | 11.25                    | 25.73                                                              | 25.73 | 25.76 | 10.25                         | 13.25                    | 23.70                                                              | 24.80 | 25.23 |
| 10.50                         | 10.70                    | 25.57                                                             | 25.68 | 25.64 | 10.50                         | 11.50                    | 26.21                                                              | 26.14 | 26.11 | 10.50                         | 13.50                    | 23.21                                                              | 24.54 | 25.04 |
| 10.75                         | 10.95                    | 25.83                                                             | 25.98 | 25.96 | 10.75                         | 11.75                    | 26.90                                                              | 26.77 | 26.66 | 10.75                         | 13.75                    | 21.91                                                              | 23.99 | 24.73 |
| 11.00                         | 11.20                    | 25.88                                                             | 26.07 | 26.09 | 11.00                         | 12.00                    | 26.95                                                              | 26.81 | 26.68 | 11.00                         | 14.00                    | 20.58                                                              | 23.49 | 24.41 |
| 11.25                         | 11.45                    | 26.09                                                             | 26.30 | 26.39 | 11.25                         | 12.25                    | 26.75                                                              | 26.66 | 26.54 | 11.00                         | 14.00                    | 18.43                                                              | 22.31 | 23.88 |
| 11.50                         | 11.70                    | 26.24                                                             | 26.47 | 26.58 | 11.50                         | 12.50                    | 26.47                                                              | 26.52 | 26.46 | 11.25                         | 14.25                    | 17.05                                                              | 21.02 | 23.51 |
| 11.75                         | 11.95                    | 26.48                                                             | 26.74 | 26.83 | 11.75                         | 12.75                    | 26.06                                                              | 26.32 | 26.32 | 11.50                         | 14.50                    | 15.15                                                              | 18.53 | 21.96 |
| 12.00                         | 12.20                    | 26.50                                                             | 26.74 | 26.83 | 12.00                         | 13.00                    | 25.61                                                              | 26.03 | 26.15 | 11.75                         | 14.75                    | 14.31                                                              | 17.04 | 20.27 |
| 12.25                         | 12.45                    | 26.39                                                             | 26.64 | 26.65 | 12.25                         | 13.25                    | 25.04                                                              | 25.81 | 26.07 | 12.00                         | 15.00                    | 14.09                                                              | 15.27 | 17.91 |
| 12.50                         | 12.70                    | 26.28                                                             | 26.63 | 26.61 | 12.50                         | 13.50                    | 24.74                                                              | 25.72 | 26.02 | 12.25                         | 15.25                    | 14.14                                                              | 14.33 | 16.58 |
| 12.75                         | 12.95                    | 26.14                                                             | 26.68 | 26.61 | 12.75                         | 13.75                    | 23.46                                                              | 25.35 | 25.88 | 12.50                         | 15.50                    | 14.66                                                              | 14.13 | 14.97 |
| 13.00                         | 13.20                    | 25.86                                                             | 26.54 | 26.58 | 13.00                         | 14.00                    | 21.97                                                              | 24.84 | 25.60 | 12.75                         | 15.75                    | 14.83                                                              | 14.41 | 14.41 |
| 13.25                         | 13.45                    | 25.14                                                             | 26.12 | 26.31 | 13.25                         | 14.25                    | 19.07                                                              | 23.41 | 24.88 | 13.00                         | 16.00                    | 14.78                                                              | 14.59 | 14.27 |
| 13.50                         | 13.70                    | 24.29                                                             | 25.74 | 26.17 | 13.50                         | 14.50                    | 16.73                                                              | 21.98 | 24.40 | 13.25                         | 16.25                    | 14.81                                                              | 14.70 | 14.52 |
| 13.75                         | 13.95                    | 22.23                                                             | 25.00 | 25.78 | 13.75                         | 14.75                    | 13.06                                                              | 18.76 | 22.78 | 13.50                         | 16.50                    | 15.20                                                              | 15.14 | 14.96 |
| 14.00                         | 14.20                    | 20.60                                                             | 24.31 | 25.45 | 14.00                         | 15.00                    | 11.06                                                              | 16.21 | 20.88 | 13.75                         | 16.75                    | 15.71                                                              | 15.65 | 15.38 |
| 14.50                         | 14.70                    | 13.92                                                             | 20.00 | 23.60 | 14.50                         | 15.50                    | 7.87                                                               | 10.62 | 14.53 | 14.00                         | 17.00                    | 16.65                                                              | 16.45 | 16.00 |
| 15.00                         | 15.20                    | 7.78                                                              | 13.07 | 18.45 | 15.00                         | 16.00                    | 8.27                                                               | 8.77  | 10.20 | 14.50                         | 17.50                    | 17.31                                                              | 16.91 | 16.22 |
| 15.50                         | 15.70                    | 3.18                                                              | 6.10  | 10.43 | 15.50                         | 16.50                    | 10.10                                                              | 10.27 | 10.35 | 15.00                         | 18.00                    | 17.22                                                              | 16.75 | 16.08 |
| 16.00                         | 16.20                    | 1.83                                                              | 3.00  | 4.72  | 16.00                         | 17.00                    | 10.91                                                              | 10.87 | 10.76 | 15.50                         | 18.50                    | 17.56                                                              | 17.43 | 16.86 |

Typical Performance Data

| RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) UPPER SIDEBAND<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) UPPER SIDEBAND<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) UPPER SIDEBAND<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|--------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                                |                          | @LO (dBm)                                                         |       |       |                                |                          | @LO (dBm)                                                          |       |       |                                |                          | @LO (dBm)                                                          |       |       |
|                                |                          | +17                                                               | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |
| 5.00                           | 5.20                     | 24.09                                                             | 24.30 | 24.41 | 5.00                           | 6.00                     | 22.90                                                              | 23.14 | 23.28 | 5.00                           | 8.00                     | 24.66                                                              | 24.86 | 24.81 |
| 5.25                           | 5.45                     | 21.60                                                             | 21.71 | 21.77 | 5.25                           | 6.25                     | 22.91                                                              | 22.97 | 23.08 | 5.25                           | 8.25                     | 22.71                                                              | 22.96 | 23.05 |
| 5.50                           | 5.70                     | 20.96                                                             | 21.06 | 21.11 | 5.50                           | 6.50                     | 23.43                                                              | 23.45 | 23.53 | 5.50                           | 8.50                     | 21.92                                                              | 22.11 | 22.24 |
| 5.75                           | 5.95                     | 21.33                                                             | 21.42 | 21.46 | 5.75                           | 6.75                     | 24.33                                                              | 24.34 | 24.39 | 5.75                           | 8.75                     | 21.89                                                              | 22.02 | 22.15 |
| 6.00                           | 6.20                     | 21.98                                                             | 22.05 | 22.11 | 6.00                           | 7.00                     | 24.85                                                              | 24.87 | 24.91 | 6.00                           | 9.00                     | 22.04                                                              | 22.21 | 22.25 |
| 6.25                           | 6.45                     | 23.59                                                             | 23.66 | 23.69 | 6.25                           | 7.25                     | 25.28                                                              | 25.30 | 25.32 | 6.25                           | 9.25                     | 23.22                                                              | 23.47 | 23.51 |
| 6.50                           | 6.70                     | 24.81                                                             | 24.87 | 24.95 | 6.50                           | 7.50                     | 25.28                                                              | 25.32 | 25.34 | 6.50                           | 9.50                     | 23.63                                                              | 23.90 | 23.98 |
| 6.75                           | 6.95                     | 25.80                                                             | 25.98 | 26.07 | 6.75                           | 7.75                     | 25.34                                                              | 25.41 | 25.41 | 6.75                           | 9.75                     | 24.59                                                              | 24.88 | 25.02 |
| 7.00                           | 7.20                     | 26.09                                                             | 26.29 | 26.43 | 7.00                           | 8.00                     | 25.13                                                              | 25.20 | 25.21 | 7.00                           | 10.00                    | 24.99                                                              | 25.32 | 25.49 |
| 7.25                           | 7.45                     | 26.60                                                             | 26.78 | 27.00 | 7.25                           | 8.25                     | 24.35                                                              | 24.37 | 24.41 | 7.25                           | 10.25                    | 25.43                                                              | 25.78 | 26.08 |
| 7.50                           | 7.70                     | 26.88                                                             | 27.07 | 27.30 | 7.50                           | 8.50                     | 23.80                                                              | 23.81 | 23.82 | 7.50                           | 10.50                    | 24.83                                                              | 25.14 | 25.48 |
| 7.75                           | 7.95                     | 26.50                                                             | 26.70 | 26.92 | 7.75                           | 8.75                     | 23.94                                                              | 23.92 | 23.91 | 7.75                           | 10.75                    | 25.12                                                              | 25.35 | 25.68 |
| 8.00                           | 8.20                     | 26.11                                                             | 26.21 | 26.40 | 8.00                           | 9.00                     | 23.87                                                              | 23.85 | 23.87 | 8.00                           | 11.00                    | 25.35                                                              | 25.52 | 25.83 |
| 8.25                           | 8.45                     | 25.10                                                             | 25.07 | 25.16 | 8.25                           | 9.25                     | 24.25                                                              | 24.24 | 24.26 | 8.25                           | 11.25                    | 25.30                                                              | 25.42 | 25.64 |
| 8.50                           | 8.70                     | 24.91                                                             | 24.90 | 24.88 | 8.50                           | 9.50                     | 24.45                                                              | 24.47 | 24.49 | 8.50                           | 11.50                    | 25.33                                                              | 25.38 | 25.57 |
| 8.75                           | 8.95                     | 24.54                                                             | 24.55 | 24.56 | 8.75                           | 9.75                     | 25.06                                                              | 25.15 | 25.25 | 8.75                           | 11.75                    | 25.94                                                              | 25.94 | 26.05 |
| 9.00                           | 9.20                     | 24.76                                                             | 24.68 | 24.71 | 9.00                           | 10.00                    | 24.98                                                              | 25.12 | 25.27 | 9.00                           | 12.00                    | 25.97                                                              | 25.97 | 26.06 |
| 9.25                           | 9.45                     | 24.99                                                             | 24.95 | 24.93 | 9.25                           | 10.25                    | 24.49                                                              | 24.69 | 24.90 | 9.25                           | 12.25                    | 26.10                                                              | 26.06 | 26.11 |
| 9.50                           | 9.70                     | 25.53                                                             | 25.56 | 25.55 | 9.50                           | 10.50                    | 24.03                                                              | 24.25 | 24.46 | 9.50                           | 12.50                    | 26.13                                                              | 26.14 | 26.14 |
| 9.75                           | 9.95                     | 25.49                                                             | 25.56 | 25.65 | 9.75                           | 10.75                    | 24.38                                                              | 24.55 | 24.82 | 9.75                           | 12.75                    | 25.97                                                              | 26.05 | 26.05 |
| 10.00                          | 10.20                    | 25.35                                                             | 25.41 | 25.48 | 10.00                          | 11.00                    | 24.91                                                              | 25.00 | 25.24 | 10.00                          | 13.00                    | 25.77                                                              | 25.96 | 25.94 |
| 10.25                          | 10.45                    | 24.41                                                             | 24.54 | 24.62 | 10.25                          | 11.25                    | 25.76                                                              | 25.67 | 25.76 | 10.25                          | 13.25                    | 25.22                                                              | 25.48 | 25.51 |
| 10.50                          | 10.70                    | 24.47                                                             | 24.58 | 24.71 | 10.50                          | 11.50                    | 26.49                                                              | 26.27 | 26.28 | 10.50                          | 13.50                    | 25.00                                                              | 25.32 | 25.37 |
| 10.75                          | 10.95                    | 24.98                                                             | 25.06 | 25.26 | 10.75                          | 11.75                    | 27.34                                                              | 27.09 | 27.03 | 10.75                          | 13.75                    | 24.50                                                              | 25.03 | 25.27 |
| 11.00                          | 11.20                    | 25.30                                                             | 25.38 | 25.59 | 11.00                          | 12.00                    | 27.24                                                              | 27.00 | 26.92 | 11.00                          | 14.00                    | 23.98                                                              | 24.81 | 25.11 |
| 11.25                          | 11.45                    | 25.84                                                             | 25.97 | 26.17 | 11.25                          | 12.25                    | 26.81                                                              | 26.69 | 26.56 | 11.25                          | 14.25                    | 23.33                                                              | 24.35 | 24.88 |
| 11.50                          | 11.70                    | 26.41                                                             | 26.55 | 26.71 | 11.50                          | 12.50                    | 26.43                                                              | 26.48 | 26.41 | 11.50                          | 14.50                    | 23.09                                                              | 24.02 | 24.94 |
| 11.75                          | 11.95                    | 27.05                                                             | 27.20 | 27.36 | 11.75                          | 12.75                    | 26.17                                                              | 26.40 | 26.34 | 11.75                          | 14.75                    | 23.00                                                              | 23.64 | 24.63 |
| 12.00                          | 12.20                    | 26.96                                                             | 27.23 | 27.31 | 12.00                          | 13.00                    | 26.07                                                              | 26.33 | 26.30 | 12.00                          | 15.00                    | 23.14                                                              | 23.58 | 24.36 |
| 12.25                          | 12.45                    | 26.76                                                             | 27.14 | 27.23 | 12.25                          | 13.25                    | 26.10                                                              | 26.38 | 26.38 | 12.25                          | 15.25                    | 23.79                                                              | 23.79 | 24.47 |
| 12.50                          | 12.70                    | 26.74                                                             | 27.06 | 27.19 | 12.50                          | 13.50                    | 26.26                                                              | 26.48 | 26.49 | 12.50                          | 15.50                    | 24.26                                                              | 24.01 | 24.74 |
| 12.75                          | 12.95                    | 26.74                                                             | 27.00 | 27.11 | 12.75                          | 13.75                    | 26.34                                                              | 26.66 | 26.64 | 12.75                          | 15.75                    | 24.86                                                              | 24.61 | 24.87 |
| 13.00                          | 13.20                    | 26.61                                                             | 26.85 | 26.98 | 13.00                          | 14.00                    | 26.27                                                              | 26.66 | 26.63 | 13.00                          | 16.00                    | 25.06                                                              | 24.99 | 25.15 |
| 13.25                          | 13.45                    | 26.42                                                             | 26.57 | 26.70 | 13.25                          | 14.25                    | 25.98                                                              | 26.42 | 26.39 | 13.25                          | 16.25                    | 24.97                                                              | 25.12 | 25.39 |
| 13.50                          | 13.70                    | 26.44                                                             | 26.46 | 26.54 | 13.50                          | 14.50                    | 25.97                                                              | 26.27 | 26.30 | 13.50                          | 16.50                    | 25.04                                                              | 25.26 | 25.55 |
| 13.75                          | 13.95                    | 26.36                                                             | 26.40 | 26.41 | 13.75                          | 14.75                    | 25.88                                                              | 26.06 | 26.05 | 13.75                          | 16.75                    | 25.19                                                              | 25.34 | 25.47 |
| 14.00                          | 14.20                    | 26.24                                                             | 26.28 | 26.36 | 14.00                          | 15.00                    | 25.83                                                              | 25.93 | 25.91 | 14.00                          | 17.00                    | 25.27                                                              | 25.43 | 25.49 |
| 14.50                          | 14.70                    | 25.79                                                             | 25.75 | 25.78 | 14.50                          | 15.50                    | 25.64                                                              | 25.42 | 25.41 | 14.50                          | 17.50                    | 25.39                                                              | 25.43 | 25.48 |
| 15.00                          | 15.20                    | 25.78                                                             | 25.75 | 25.75 | 15.00                          | 16.00                    | 25.38                                                              | 25.31 | 25.17 | 15.00                          | 18.00                    | 25.78                                                              | 25.69 | 25.71 |
| 15.50                          | 15.70                    | 25.93                                                             | 25.84 | 25.82 | 15.50                          | 16.50                    | 25.34                                                              | 25.37 | 25.26 | 15.50                          | 18.50                    | 26.05                                                              | 25.90 | 25.94 |
| 16.00                          | 16.20                    | 25.95                                                             | 25.91 | 25.95 | 16.00                          | 17.00                    | 25.49                                                              | 25.56 | 25.45 | 16.00                          | 19.00                    | 25.94                                                              | 25.90 | 25.93 |



Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) LOWER SIDEBAND<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) LOWER SIDEBAND<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(I) LOWER SIDEBAND<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|-------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                         |       |       |                               |                          | @LO (dBm)                                                          |       |       |                               |                          | @LO (dBm)                                                          |       |       |
|                               |                          | +17                                                               | +18   | +19   |                               |                          | +17                                                                | +18   | +19   |                               |                          | +17                                                                | +18   | +19   |
| 5.00                          | 5.20                     | 25.08                                                             | 25.83 | 25.83 | 5.00                          | 6.00                     | 19.40                                                              | 19.63 | 19.79 | 5.00                          | 8.00                     | 24.11                                                              | 24.18 | 24.28 |
| 5.25                          | 5.45                     | 25.08                                                             | 25.83 | 25.83 | 5.25                          | 6.25                     | 18.72                                                              | 18.90 | 19.04 | 5.25                          | 8.25                     | 23.27                                                              | 23.38 | 23.51 |
| 5.50                          | 5.70                     | 23.40                                                             | 23.84 | 23.93 | 5.50                          | 6.50                     | 19.07                                                              | 19.21 | 19.33 | 5.50                          | 8.50                     | 23.20                                                              | 23.34 | 23.49 |
| 5.75                          | 5.95                     | 20.22                                                             | 20.31 | 20.37 | 5.75                          | 6.75                     | 20.20                                                              | 20.30 | 20.38 | 5.75                          | 8.75                     | 23.42                                                              | 23.52 | 23.74 |
| 6.00                          | 6.20                     | 18.65                                                             | 18.74 | 18.79 | 6.00                          | 7.00                     | 20.95                                                              | 21.04 | 21.09 | 6.00                          | 9.00                     | 23.80                                                              | 23.90 | 24.09 |
| 6.25                          | 6.45                     | 17.46                                                             | 17.54 | 17.61 | 6.25                          | 7.25                     | 22.49                                                              | 22.55 | 22.60 | 6.25                          | 9.25                     | 24.27                                                              | 24.34 | 24.49 |
| 6.50                          | 6.70                     | 17.36                                                             | 17.46 | 17.54 | 6.50                          | 7.50                     | 23.20                                                              | 23.24 | 23.30 | 6.50                          | 9.50                     | 24.56                                                              | 24.64 | 24.78 |
| 6.75                          | 6.95                     | 18.69                                                             | 18.79 | 18.89 | 6.75                          | 7.75                     | 23.96                                                              | 24.02 | 24.06 | 6.75                          | 9.75                     | 24.87                                                              | 24.95 | 25.07 |
| 7.00                          | 7.20                     | 19.99                                                             | 20.12 | 20.22 | 7.00                          | 8.00                     | 24.35                                                              | 24.40 | 24.45 | 7.00                          | 10.00                    | 25.13                                                              | 25.27 | 25.34 |
| 7.25                          | 7.45                     | 22.00                                                             | 22.17 | 22.25 | 7.25                          | 8.25                     | 24.83                                                              | 24.85 | 24.90 | 7.25                          | 10.25                    | 25.06                                                              | 25.24 | 25.40 |
| 7.50                          | 7.70                     | 23.10                                                             | 23.32 | 23.41 | 7.50                          | 8.50                     | 24.93                                                              | 24.93 | 24.99 | 7.50                          | 10.50                    | 24.76                                                              | 24.98 | 25.21 |
| 7.75                          | 7.95                     | 24.59                                                             | 24.83 | 24.93 | 7.75                          | 8.75                     | 25.22                                                              | 25.18 | 25.22 | 7.75                          | 10.75                    | 24.83                                                              | 25.03 | 25.27 |
| 8.00                          | 8.20                     | 25.05                                                             | 25.30 | 25.44 | 8.00                          | 9.00                     | 25.28                                                              | 25.18 | 25.23 | 8.00                          | 11.00                    | 24.95                                                              | 25.18 | 25.44 |
| 8.25                          | 8.45                     | 25.68                                                             | 25.89 | 26.02 | 8.25                          | 9.25                     | 25.31                                                              | 25.23 | 25.24 | 8.25                          | 11.25                    | 25.16                                                              | 25.31 | 25.60 |
| 8.50                          | 8.70                     | 25.90                                                             | 26.10 | 26.24 | 8.50                          | 9.50                     | 25.31                                                              | 25.24 | 25.26 | 8.50                          | 11.50                    | 25.30                                                              | 25.44 | 25.68 |
| 8.75                          | 8.95                     | 26.01                                                             | 26.13 | 26.26 | 8.75                          | 9.75                     | 25.41                                                              | 25.42 | 25.45 | 8.75                          | 11.75                    | 26.03                                                              | 26.20 | 26.37 |
| 9.00                          | 9.20                     | 26.03                                                             | 26.15 | 26.25 | 9.00                          | 10.00                    | 25.25                                                              | 25.36 | 25.38 | 9.00                          | 12.00                    | 26.27                                                              | 26.46 | 26.58 |
| 9.25                          | 9.45                     | 26.16                                                             | 26.20 | 26.23 | 9.25                          | 10.25                    | 24.99                                                              | 25.16 | 25.26 | 9.25                          | 12.25                    | 26.20                                                              | 26.48 | 26.54 |
| 9.50                          | 9.70                     | 26.05                                                             | 26.07 | 26.07 | 9.50                          | 10.50                    | 24.85                                                              | 25.03 | 25.16 | 9.50                          | 12.50                    | 25.84                                                              | 26.27 | 26.35 |
| 9.75                          | 9.95                     | 25.85                                                             | 25.81 | 25.81 | 9.75                          | 10.75                    | 25.21                                                              | 25.38 | 25.54 | 9.75                          | 12.75                    | 25.59                                                              | 26.14 | 26.36 |
| 10.00                         | 10.20                    | 25.93                                                             | 25.83 | 25.78 | 10.00                         | 11.00                    | 25.61                                                              | 25.71 | 25.86 | 10.00                         | 13.00                    | 25.15                                                              | 25.84 | 26.16 |
| 10.25                         | 10.45                    | 26.01                                                             | 25.89 | 25.81 | 10.25                         | 11.25                    | 26.30                                                              | 26.24 | 26.36 | 10.25                         | 13.25                    | 24.35                                                              | 25.34 | 25.84 |
| 10.50                         | 10.70                    | 26.02                                                             | 25.92 | 25.89 | 10.50                         | 11.50                    | 26.86                                                              | 26.75 | 26.78 | 10.50                         | 13.50                    | 23.78                                                              | 24.98 | 25.58 |
| 10.75                         | 10.95                    | 26.04                                                             | 26.04 | 26.01 | 10.75                         | 11.75                    | 27.70                                                              | 27.55 | 27.57 | 10.75                         | 13.75                    | 22.56                                                              | 24.52 | 25.31 |
| 11.00                         | 11.20                    | 26.25                                                             | 26.26 | 26.26 | 11.00                         | 12.00                    | 27.83                                                              | 27.72 | 27.71 | 11.00                         | 14.00                    | 21.23                                                              | 24.12 | 25.00 |
| 11.25                         | 11.45                    | 26.32                                                             | 26.41 | 26.45 | 11.25                         | 12.25                    | 27.67                                                              | 27.73 | 27.68 | 11.00                         | 14.00                    | 21.23                                                              | 24.12 | 25.00 |
| 11.50                         | 11.70                    | 26.68                                                             | 26.76 | 26.87 | 11.50                         | 12.50                    | 27.37                                                              | 27.60 | 27.60 | 11.25                         | 14.25                    | 19.07                                                              | 22.97 | 24.49 |
| 11.75                         | 11.95                    | 27.07                                                             | 27.15 | 27.35 | 11.75                         | 12.75                    | 26.88                                                              | 27.38 | 27.52 | 11.50                         | 14.50                    | 17.61                                                              | 21.67 | 24.04 |
| 12.00                         | 12.20                    | 27.33                                                             | 27.40 | 27.64 | 12.00                         | 13.00                    | 26.50                                                              | 27.21 | 27.36 | 11.75                         | 14.75                    | 15.74                                                              | 19.21 | 22.51 |
| 12.25                         | 12.45                    | 27.52                                                             | 27.61 | 27.82 | 12.25                         | 13.25                    | 25.94                                                              | 26.88 | 27.17 | 12.00                         | 15.00                    | 14.94                                                              | 17.76 | 20.85 |
| 12.50                         | 12.70                    | 27.81                                                             | 27.86 | 28.11 | 12.50                         | 13.50                    | 25.69                                                              | 26.72 | 27.11 | 12.25                         | 15.25                    | 14.61                                                              | 15.89 | 18.45 |
| 12.75                         | 12.95                    | 27.69                                                             | 27.87 | 28.07 | 12.75                         | 13.75                    | 24.37                                                              | 26.27 | 26.86 | 12.50                         | 15.50                    | 14.59                                                              | 14.98 | 17.08 |
| 13.00                         | 13.20                    | 27.49                                                             | 27.82 | 27.98 | 13.00                         | 14.00                    | 22.85                                                              | 25.78 | 26.48 | 12.75                         | 15.75                    | 15.01                                                              | 14.73 | 15.43 |
| 13.25                         | 13.45                    | 27.27                                                             | 27.85 | 27.99 | 13.25                         | 14.25                    | 19.68                                                              | 24.05 | 25.50 | 13.00                         | 16.00                    | 15.09                                                              | 14.88 | 14.76 |
| 13.50                         | 13.70                    | 27.02                                                             | 27.79 | 28.08 | 13.50                         | 14.50                    | 17.32                                                              | 22.52 | 24.95 | 13.25                         | 16.25                    | 14.98                                                              | 14.94 | 14.53 |
| 13.75                         | 13.95                    | 26.10                                                             | 27.17 | 27.63 | 13.75                         | 14.75                    | 13.52                                                              | 19.25 | 23.23 | 13.50                         | 16.50                    | 14.94                                                              | 14.96 | 14.70 |
| 14.00                         | 14.20                    | 25.38                                                             | 26.70 | 27.21 | 14.00                         | 15.00                    | 11.50                                                              | 16.68 | 21.30 | 13.75                         | 16.75                    | 15.32                                                              | 15.26 | 15.08 |



Typical Performance Data

| RF (IN)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) LOWER SIDEBAND<br>@ FIXED IF = 200 MHz<br>IF = LO-RF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) LOWER SIDEBAND<br>@ FIXED IF = 1000 MHz<br>IF = LO-RF |       |       | RF (OUT)<br>FREQUENCY<br>(GHz) | LO<br>FREQUENCY<br>(GHz) | INPUT IP3(Q) LOWER SIDEBAND<br>@ FIXED IF = 3000 MHz<br>IF = LO-RF |       |       |
|-------------------------------|--------------------------|-------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|--------------------------------|--------------------------|--------------------------------------------------------------------|-------|-------|
|                               |                          | @LO (dBm)                                                         |       |       |                                |                          | @LO (dBm)                                                          |       |       |                                |                          | @LO (dBm)                                                          |       |       |
|                               |                          | +17                                                               | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |                                |                          | +17                                                                | +18   | +19   |
| 5.00                          | 5.20                     | 24.02                                                             | 24.13 | 24.30 | 5.00                           | 6.00                     | 22.69                                                              | 22.85 | 22.96 | 5.00                           | 8.00                     | 24.51                                                              | 24.73 | 24.78 |
| 5.25                          | 5.45                     | 18.72                                                             | 18.90 | 19.04 | 5.25                           | 6.25                     | 22.69                                                              | 22.75 | 22.83 | 5.25                           | 8.25                     | 22.66                                                              | 22.86 | 23.01 |
| 5.50                          | 5.70                     | 19.07                                                             | 19.21 | 19.33 | 5.50                           | 6.50                     | 23.24                                                              | 23.27 | 23.30 | 5.50                           | 8.50                     | 21.89                                                              | 22.04 | 22.18 |
| 5.75                          | 5.95                     | 20.20                                                             | 20.30 | 20.38 | 5.75                           | 6.75                     | 24.32                                                              | 24.34 | 24.34 | 5.75                           | 8.75                     | 21.85                                                              | 21.96 | 22.09 |
| 6.00                          | 6.20                     | 20.95                                                             | 21.04 | 21.09 | 6.00                           | 7.00                     | 24.87                                                              | 24.89 | 24.91 | 6.00                           | 9.00                     | 22.04                                                              | 22.15 | 22.21 |
| 6.25                          | 6.45                     | 22.49                                                             | 22.55 | 22.60 | 6.25                           | 7.25                     | 25.25                                                              | 25.31 | 25.33 | 6.25                           | 9.25                     | 23.07                                                              | 23.30 | 23.35 |
| 6.50                          | 6.70                     | 23.20                                                             | 23.24 | 23.30 | 6.50                           | 7.50                     | 25.35                                                              | 25.40 | 25.45 | 6.50                           | 9.50                     | 23.47                                                              | 23.74 | 23.81 |
| 6.75                          | 6.95                     | 23.96                                                             | 24.02 | 24.06 | 6.75                           | 7.75                     | 25.51                                                              | 25.60 | 25.66 | 6.75                           | 9.75                     | 24.45                                                              | 24.78 | 24.89 |
| 7.00                          | 7.20                     | 24.35                                                             | 24.40 | 24.45 | 7.00                           | 8.00                     | 25.27                                                              | 25.37 | 25.43 | 7.00                           | 10.00                    | 24.87                                                              | 25.25 | 25.39 |
| 7.25                          | 7.45                     | 24.83                                                             | 24.85 | 24.90 | 7.25                           | 8.25                     | 24.39                                                              | 24.45 | 24.49 | 7.25                           | 10.25                    | 25.20                                                              | 25.60 | 25.87 |
| 7.50                          | 7.70                     | 24.93                                                             | 24.93 | 24.99 | 7.50                           | 8.50                     | 23.88                                                              | 23.91 | 23.92 | 7.50                           | 10.50                    | 24.77                                                              | 25.09 | 25.41 |
| 7.75                          | 7.95                     | 25.22                                                             | 25.18 | 25.22 | 7.75                           | 8.75                     | 24.05                                                              | 24.07 | 24.01 | 7.75                           | 10.75                    | 25.12                                                              | 25.35 | 25.76 |
| 8.00                          | 8.20                     | 25.28                                                             | 25.18 | 25.23 | 8.00                           | 9.00                     | 23.94                                                              | 23.96 | 23.95 | 8.00                           | 11.00                    | 25.36                                                              | 25.55 | 25.91 |
| 8.25                          | 8.45                     | 25.31                                                             | 25.23 | 25.24 | 8.25                           | 9.25                     | 24.37                                                              | 24.41 | 24.42 | 8.25                           | 11.25                    | 25.37                                                              | 25.44 | 25.78 |
| 8.50                          | 8.70                     | 25.31                                                             | 25.24 | 25.26 | 8.50                           | 9.50                     | 24.50                                                              | 24.57 | 24.60 | 8.50                           | 11.50                    | 25.39                                                              | 25.43 | 25.74 |
| 8.75                          | 8.95                     | 25.41                                                             | 25.42 | 25.45 | 8.75                           | 9.75                     | 25.23                                                              | 25.39 | 25.47 | 8.75                           | 11.75                    | 26.16                                                              | 26.08 | 26.42 |
| 9.00                          | 9.20                     | 25.25                                                             | 25.36 | 25.38 | 9.00                           | 10.00                    | 25.09                                                              | 25.28 | 25.45 | 9.00                           | 12.00                    | 26.21                                                              | 26.12 | 26.33 |
| 9.25                          | 9.45                     | 24.99                                                             | 25.16 | 25.26 | 9.25                           | 10.25                    | 24.63                                                              | 24.86 | 25.06 | 9.25                           | 12.25                    | 26.46                                                              | 26.37 | 26.50 |
| 9.50                          | 9.70                     | 24.85                                                             | 25.03 | 25.16 | 9.50                           | 10.50                    | 24.09                                                              | 24.32 | 24.52 | 9.50                           | 12.50                    | 26.48                                                              | 26.41 | 26.50 |
| 9.75                          | 9.95                     | 25.21                                                             | 25.38 | 25.54 | 9.75                           | 10.75                    | 24.68                                                              | 24.85 | 25.07 | 9.75                           | 12.75                    | 26.50                                                              | 26.50 | 26.53 |
| 10.00                         | 10.20                    | 25.61                                                             | 25.71 | 25.86 | 10.00                          | 11.00                    | 25.31                                                              | 25.38 | 25.55 | 10.00                          | 13.00                    | 26.25                                                              | 26.35 | 26.34 |
| 10.25                         | 10.45                    | 26.30                                                             | 26.24 | 26.36 | 10.25                          | 11.25                    | 26.32                                                              | 26.49 | 26.44 | 10.25                          | 13.25                    | 25.84                                                              | 26.12 | 26.10 |
| 10.50                         | 10.70                    | 26.86                                                             | 26.75 | 26.78 | 10.50                          | 11.50                    | 27.20                                                              | 27.20 | 27.09 | 10.50                          | 13.50                    | 25.55                                                              | 25.88 | 25.95 |
| 10.75                         | 10.95                    | 27.70                                                             | 27.55 | 27.57 | 10.75                          | 11.75                    | 28.22                                                              | 28.18 | 28.00 | 10.75                          | 13.75                    | 25.12                                                              | 25.62 | 25.90 |
| 11.00                         | 11.20                    | 27.83                                                             | 27.72 | 27.71 | 11.00                          | 12.00                    | 28.20                                                              | 28.18 | 27.95 | 11.00                          | 14.00                    | 24.62                                                              | 25.47 | 25.79 |
| 11.25                         | 11.45                    | 27.67                                                             | 27.73 | 27.68 | 11.25                          | 12.25                    | 27.81                                                              | 27.95 | 27.74 | 11.25                          | 14.25                    | 23.96                                                              | 25.09 | 25.62 |
| 11.50                         | 11.70                    | 27.37                                                             | 27.60 | 27.60 | 11.50                          | 12.50                    | 27.51                                                              | 27.59 | 27.54 | 11.50                          | 14.50                    | 23.72                                                              | 24.70 | 25.64 |
| 11.75                         | 11.95                    | 26.88                                                             | 27.38 | 27.52 | 11.75                          | 12.75                    | 27.23                                                              | 27.42 | 27.48 | 11.75                          | 14.75                    | 23.67                                                              | 24.38 | 25.40 |
| 12.00                         | 12.20                    | 26.50                                                             | 27.21 | 27.36 | 12.00                          | 13.00                    | 27.17                                                              | 27.43 | 27.57 | 12.00                          | 15.00                    | 23.81                                                              | 24.37 | 25.17 |
| 12.25                         | 12.45                    | 25.94                                                             | 26.88 | 27.17 | 12.25                          | 13.25                    | 27.25                                                              | 27.49 | 27.66 | 12.25                          | 15.25                    | 24.40                                                              | 24.51 | 25.08 |
| 12.50                         | 12.70                    | 25.69                                                             | 26.72 | 27.11 | 12.50                          | 13.50                    | 27.41                                                              | 27.66 | 27.81 | 12.50                          | 15.50                    | 24.91                                                              | 24.74 | 25.27 |
| 12.75                         | 12.95                    | 24.37                                                             | 26.27 | 26.86 | 12.75                          | 13.75                    | 27.42                                                              | 27.84 | 27.84 | 12.75                          | 15.75                    | 25.42                                                              | 25.37 | 25.33 |
| 13.00                         | 13.20                    | 22.85                                                             | 25.78 | 26.48 | 13.00                          | 14.00                    | 27.31                                                              | 27.87 | 27.80 | 13.00                          | 16.00                    | 25.54                                                              | 25.65 | 25.51 |
| 13.25                         | 13.45                    | 19.68                                                             | 24.05 | 25.50 | 13.25                          | 14.25                    | 26.72                                                              | 27.26 | 27.17 | 13.25                          | 16.25                    | 25.36                                                              | 25.63 | 25.59 |
| 13.50                         | 13.70                    | 17.32                                                             | 22.52 | 24.95 | 13.50                          | 14.50                    | 26.59                                                              | 27.04 | 27.05 | 13.50                          | 16.50                    | 25.48                                                              | 25.81 | 25.86 |
| 13.75                         | 13.95                    | 13.52                                                             | 19.25 | 23.23 | 13.75                          | 14.75                    | 26.36                                                              | 26.72 | 26.69 | 13.75                          | 16.75                    | 25.68                                                              | 25.92 | 25.97 |
| 14.00                         | 14.20                    | 11.50                                                             | 16.68 | 21.30 | 14.00                          | 15.00                    | 26.33                                                              | 26.52 | 26.48 | 14.00                          | 17.00                    | 25.83                                                              | 26.05 | 26.06 |
| 14.50                         | 14.70                    | 8.31                                                              | 10.89 | 14.84 | 14.50                          | 15.50                    | 26.04                                                              | 25.84 | 25.88 | 14.50                          | 17.50                    | 26.01                                                              | 26.12 | 26.02 |
| 15.00                         | 15.20                    | 8.65                                                              | 9.08  | 10.49 | 15.00                          | 16.00                    | 25.80                                                              | 25.71 | 25.58 | 15.00                          | 18.00                    | 26.26                                                              | 26.42 | 26.16 |
| 15.50                         | 15.70                    | 9.64                                                              | 10.01 | 9.99  | 15.50                          | 16.50                    | 25.08                                                              | 25.03 | 24.99 | 15.50                          | 18.50                    | 25.69                                                              | 25.81 | 25.61 |
| 16.00                         | 16.20                    | 10.45                                                             | 10.58 | 10.38 | 16.00                          | 17.00                    | 25.41                                                              | 25.32 | 25.24 | 16.00                          | 19.00                    | 25.98                                                              | 26.07 | 25.92 |

## Typical Performance Curves

IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 200 MHz, IF=RF-LO

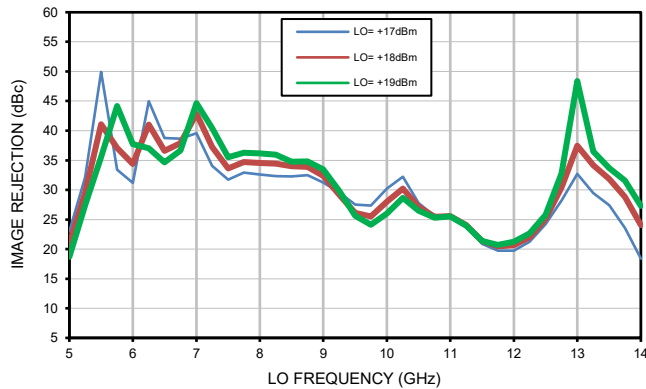


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 200 MHz, IF=LO-RF

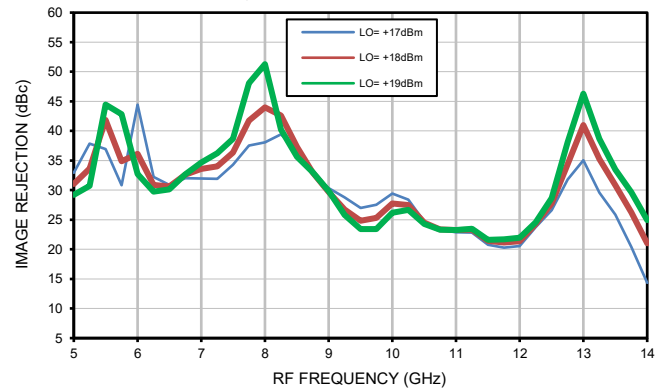


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 1000 MHz, IF=RF-LO

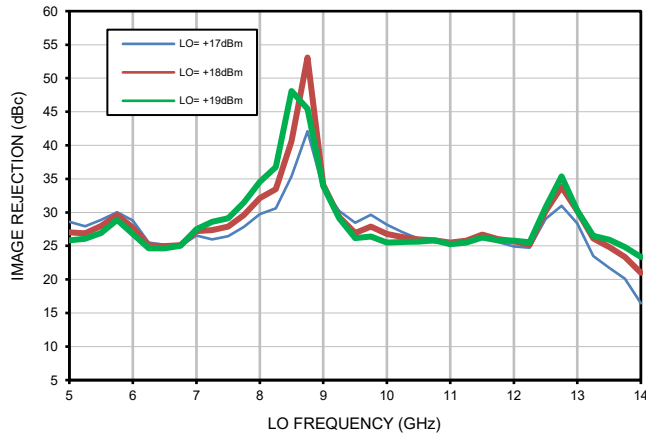


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 1000 MHz, IF=LO-RF

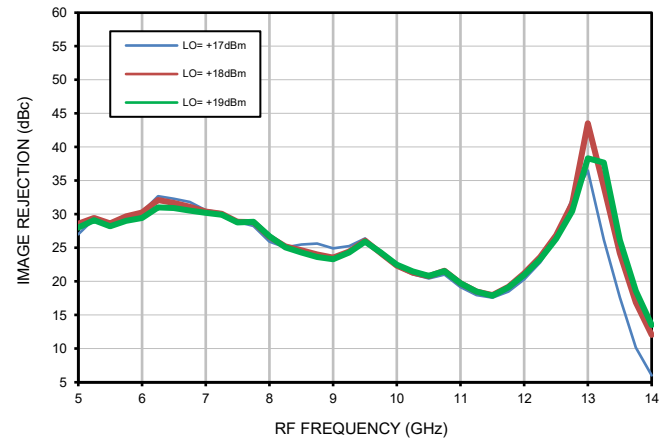


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 3000 MHz, IF=RF-LO

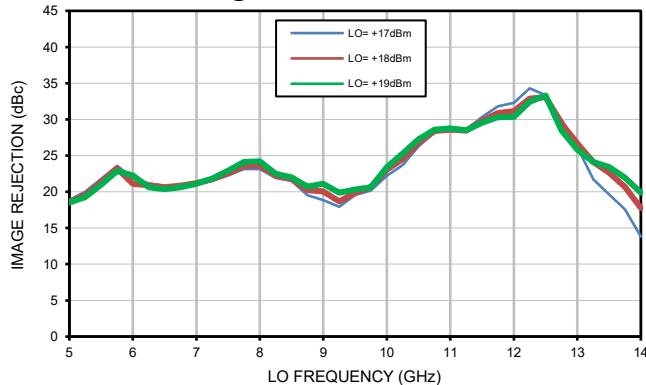
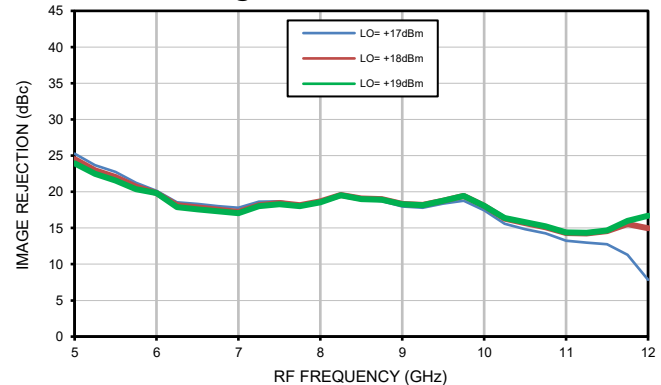
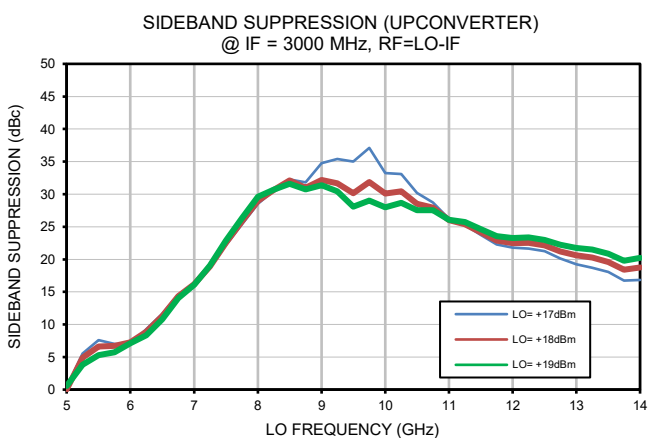
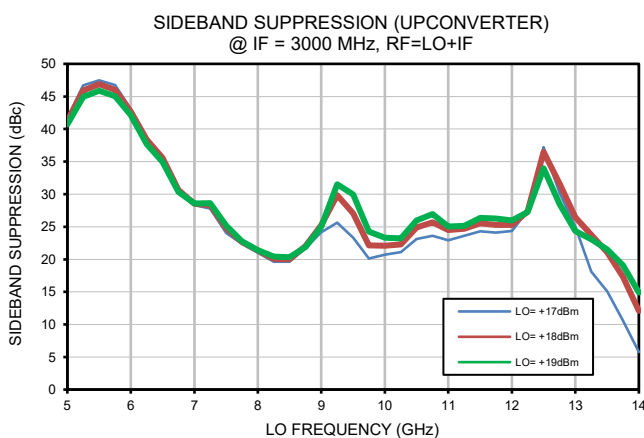
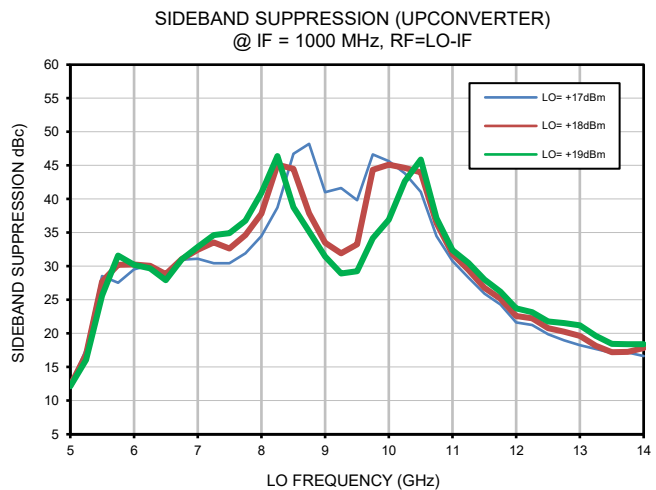
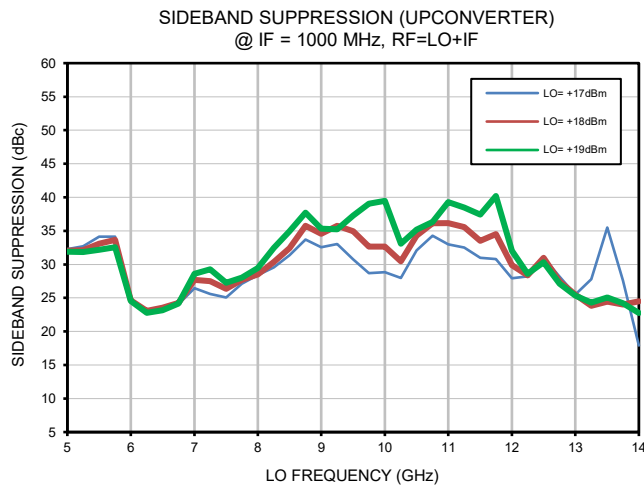
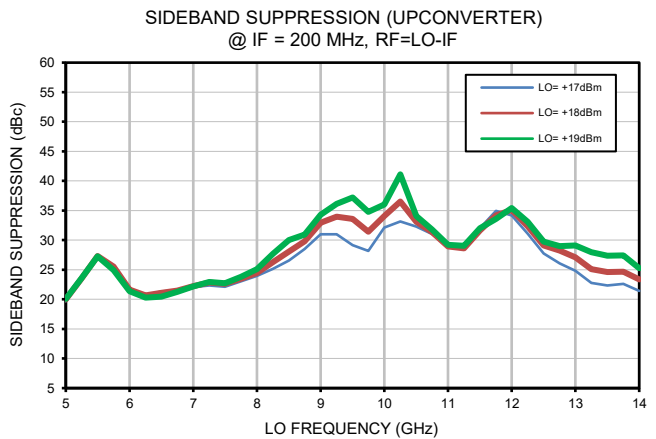
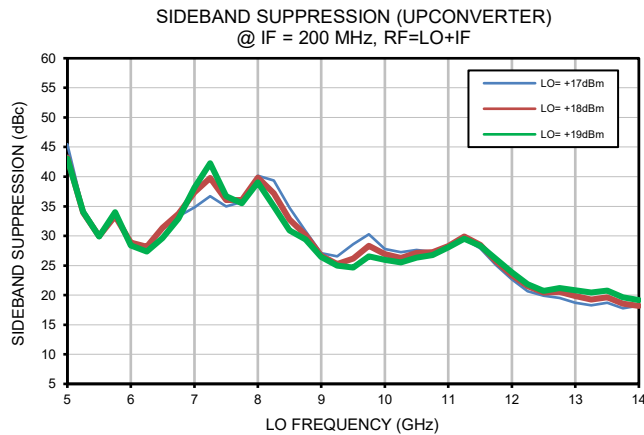


IMAGE REJECTION (DOWNCONVERTER)  
@ IF = 3000 MHz, IF=LO-RF

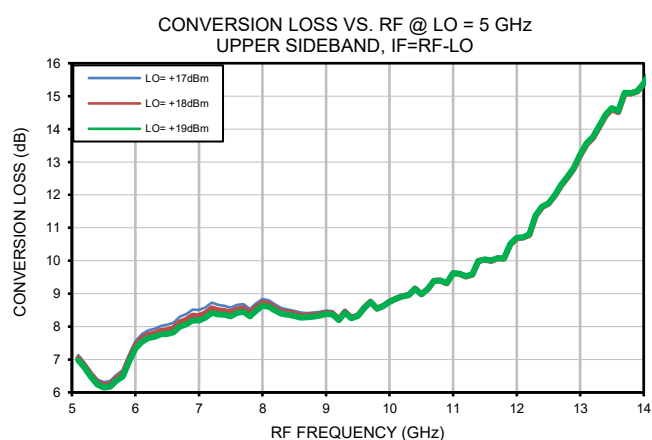
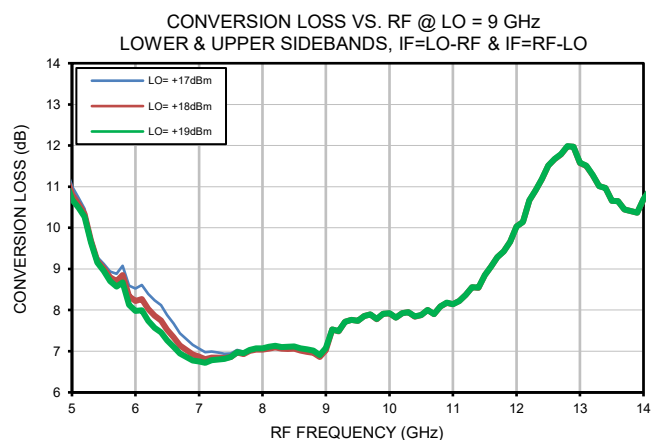
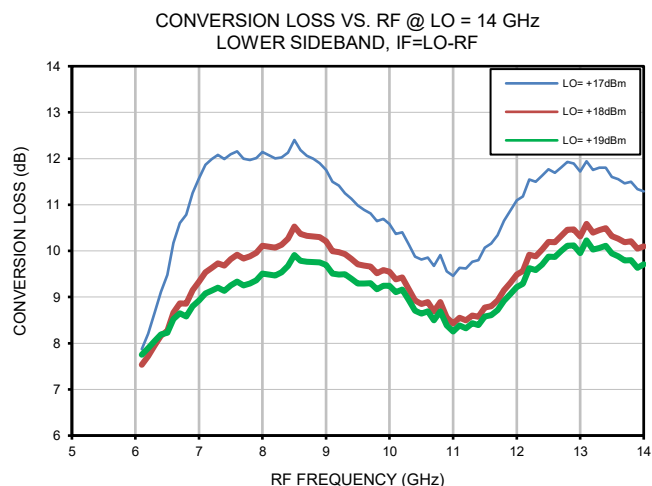
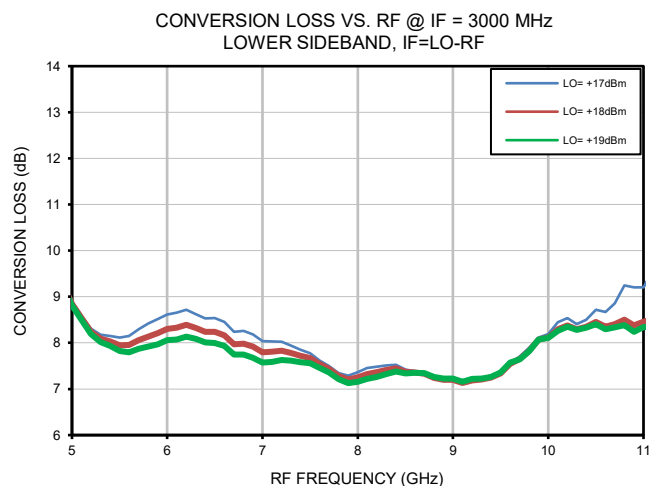
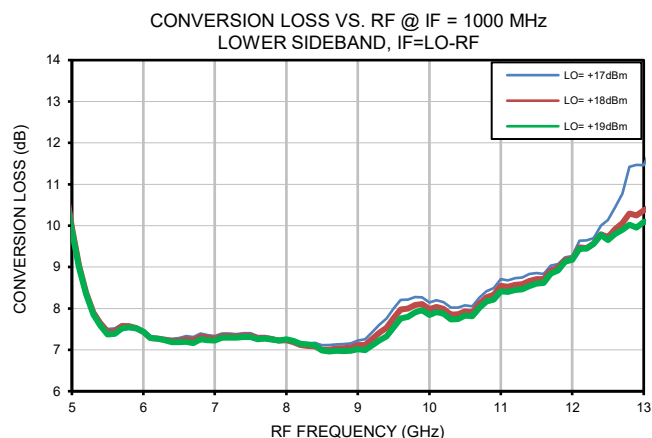
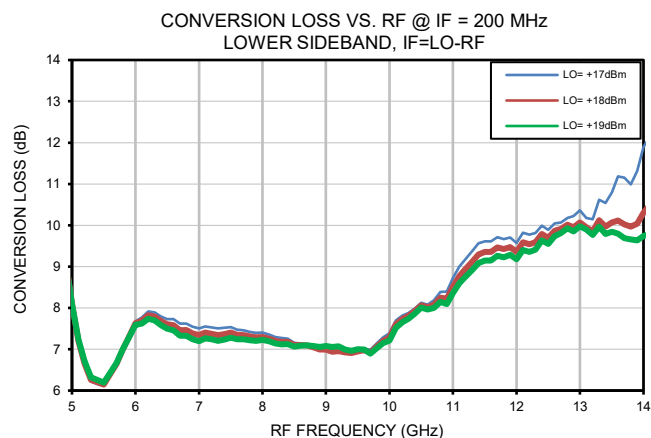




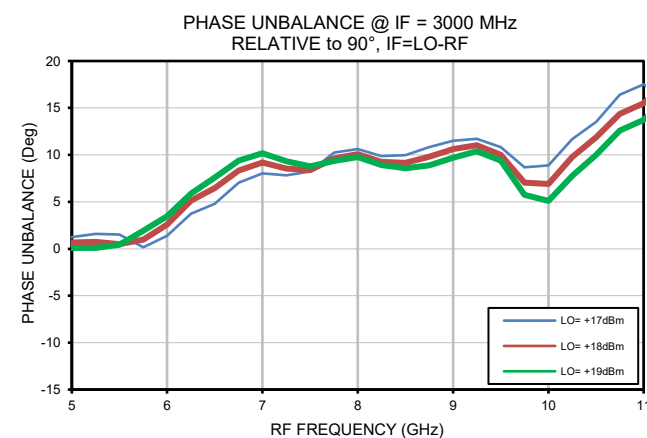
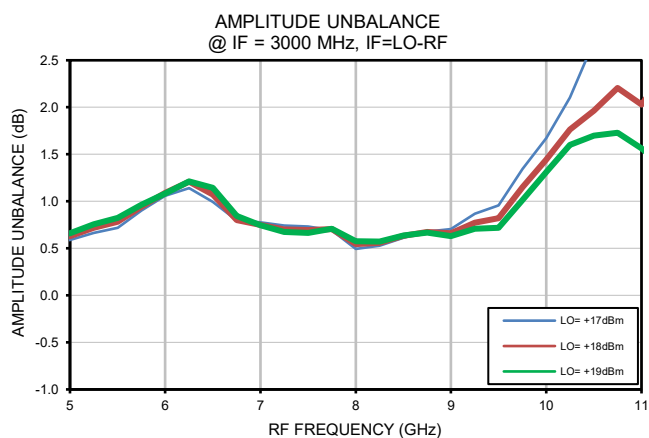
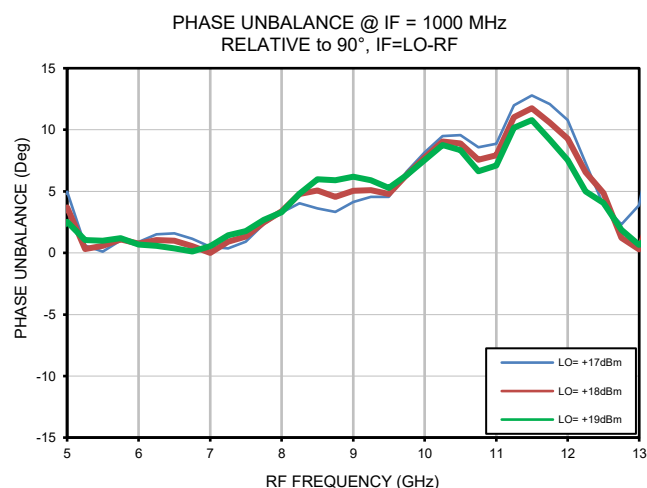
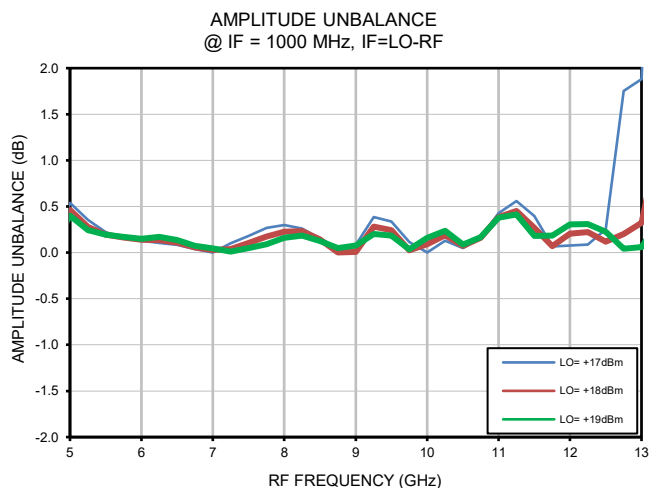
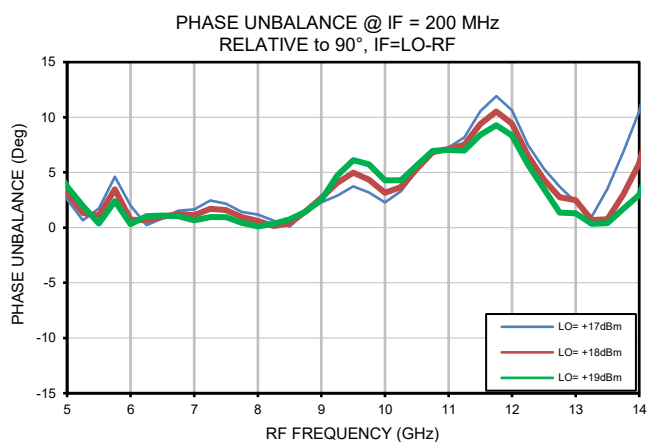
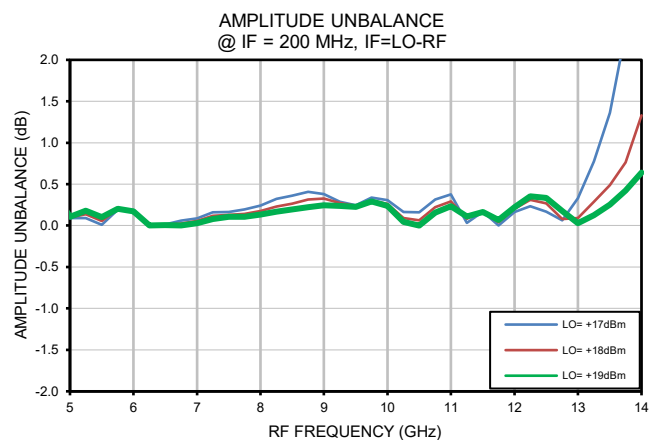
## Typical Performance Curves



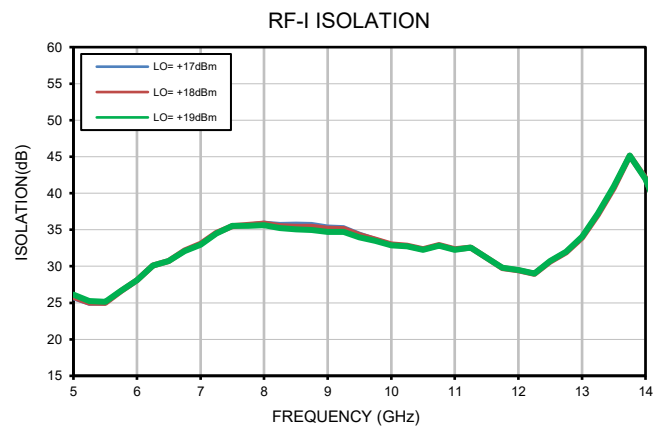
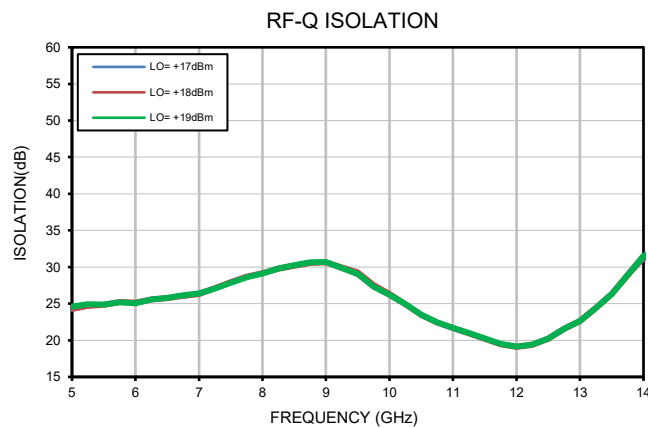
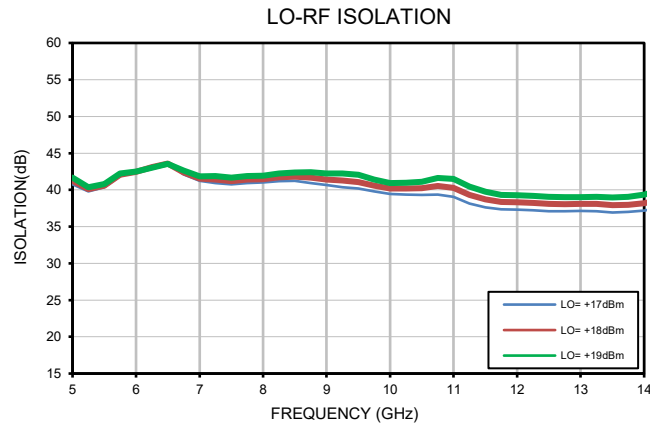
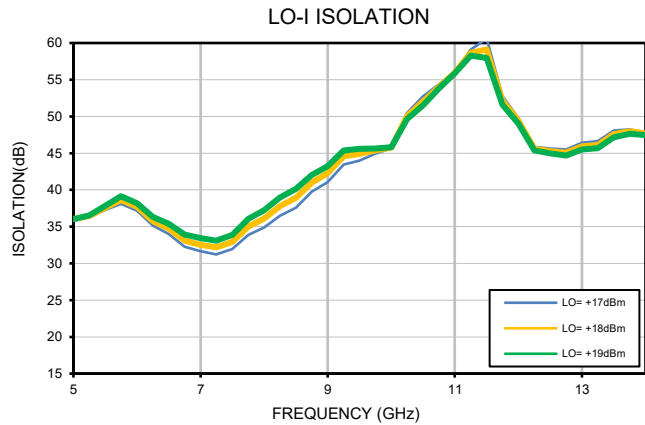
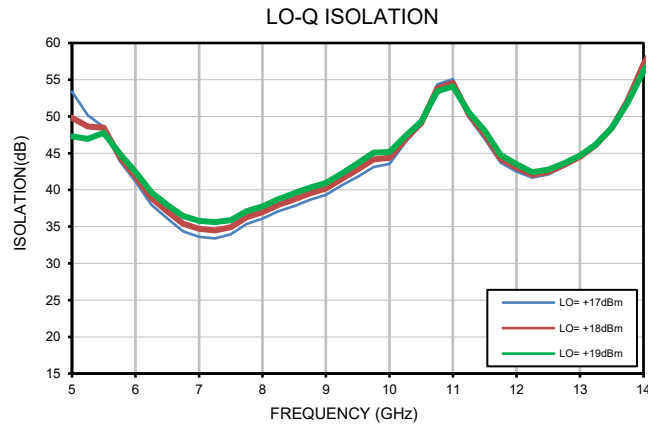
## Typical Performance Curves



## Typical Performance Curves

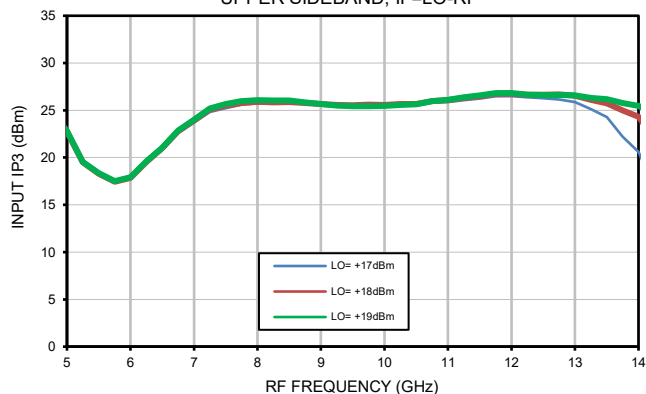


## Typical Performance Curves

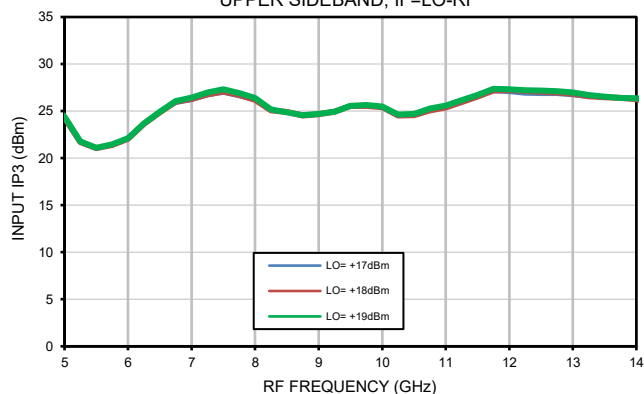


## Typical Performance Curves

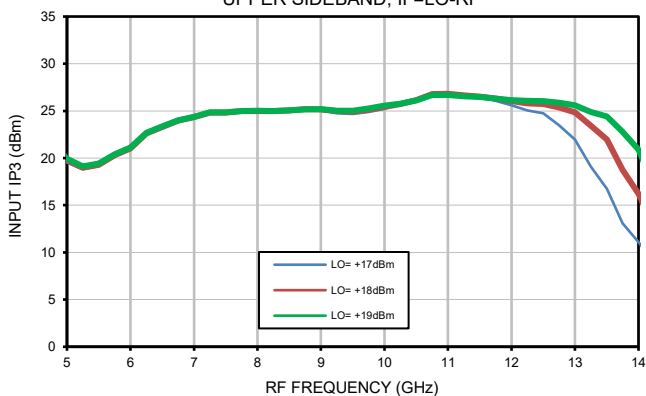
INPUT IP3(I) @ FIXED IF = 200 MHz  
UPPER SIDEBAND, IF=LO-RF



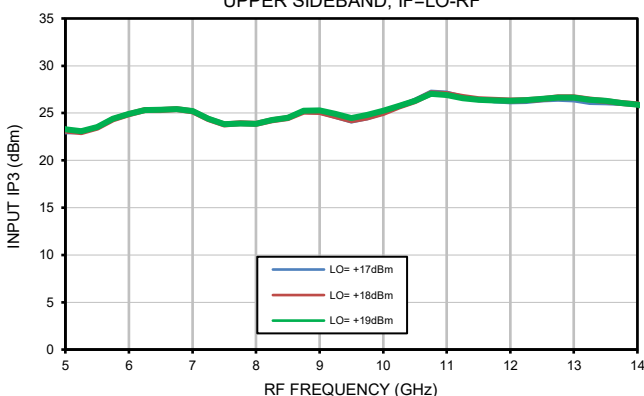
INPUT IP3(Q) @ FIXED IF = 200 MHz  
UPPER SIDEBAND, IF=LO-RF



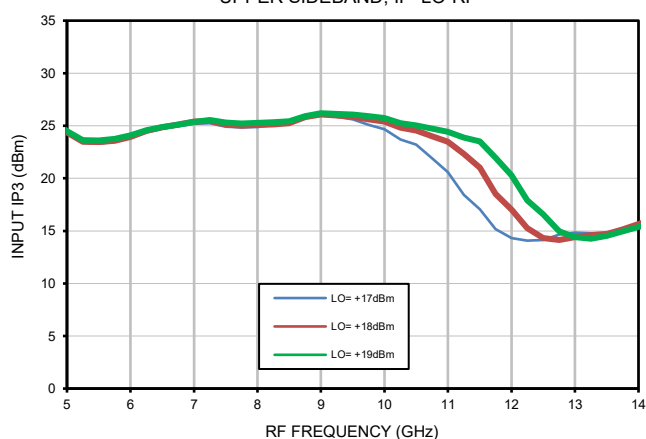
INPUT IP3(I) @ FIXED IF = 1000 MHz  
UPPER SIDEBAND, IF=LO-RF



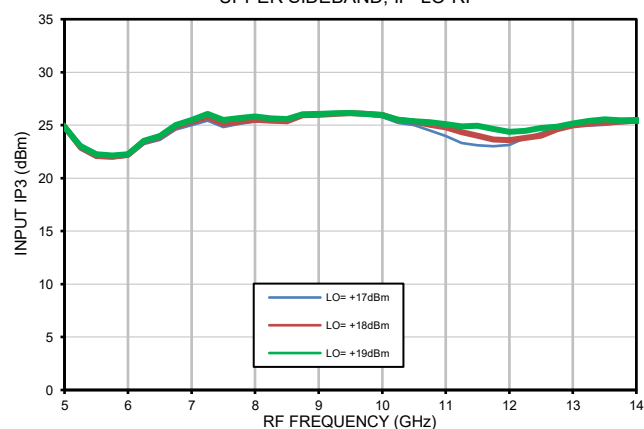
INPUT IP3(Q) @ FIXED IF = 1000 MHz  
UPPER SIDEBAND, IF=LO-RF



INPUT IP3(I) @ FIXED IF = 3000 MHz  
UPPER SIDEBAND, IF=LO-RF

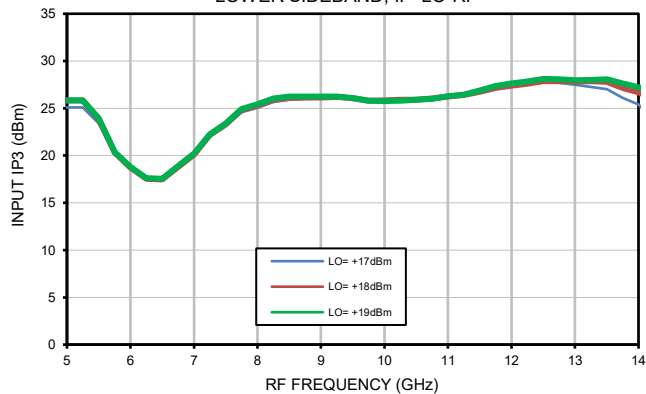


INPUT IP3(Q) @ FIXED IF = 3000 MHz  
UPPER SIDEBAND, IF=LO-RF

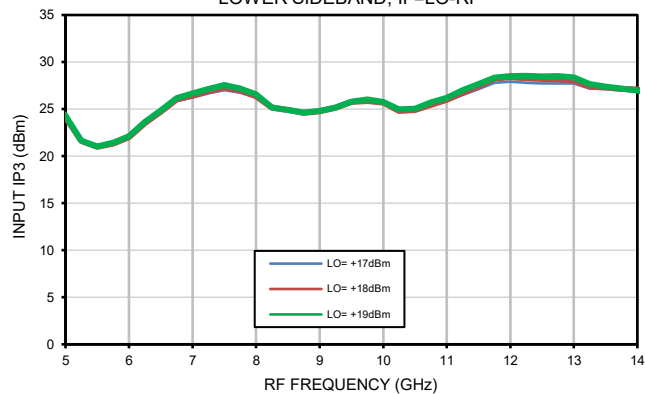


## Typical Performance Curves

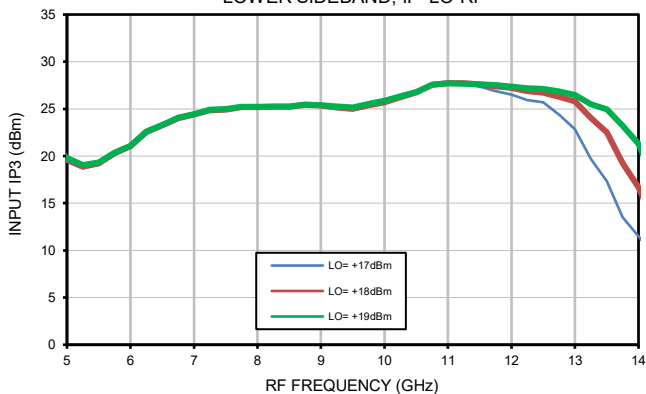
INPUT IP3(I) @ FIXED IF = 200 MHz  
LOWER SIDEBAND, IF=LO-RF



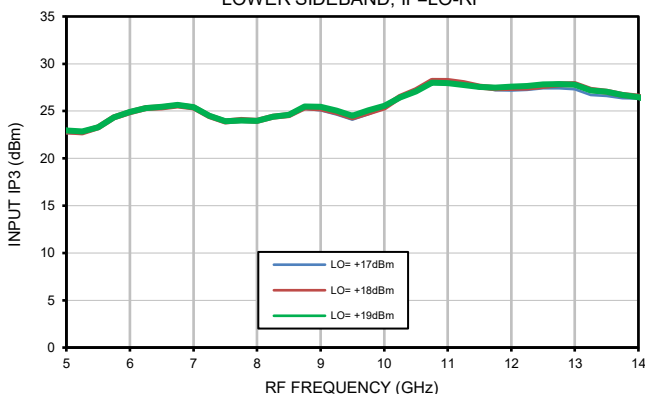
INPUT IP3(Q) @ FIXED IF = 200 MHz  
LOWER SIDEBAND, IF=LO-RF



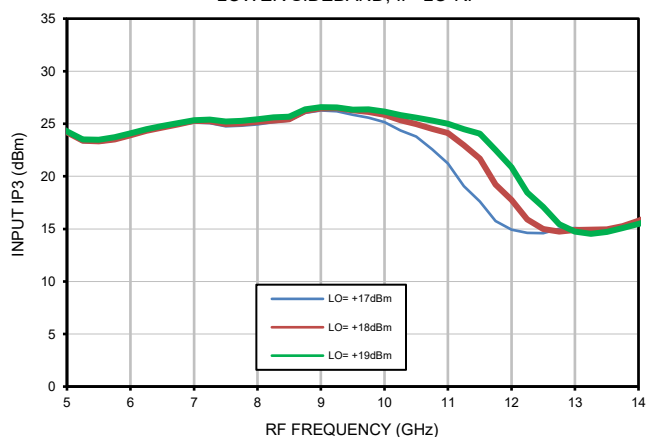
INPUT IP3(I) @ FIXED IF = 1000 MHz  
LOWER SIDEBAND, IF=LO-RF



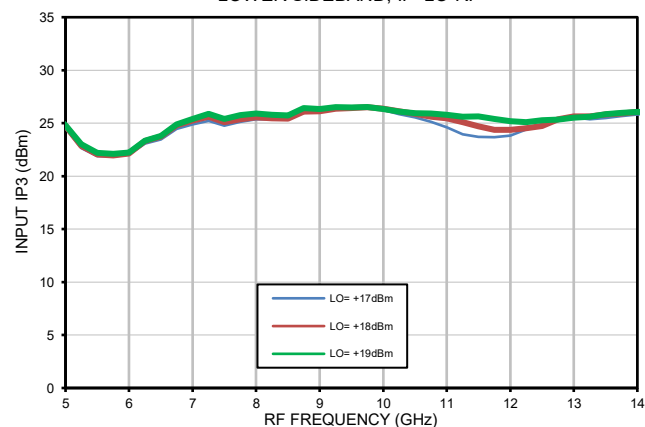
INPUT IP3(Q) @ FIXED IF = 1000 MHz  
LOWER SIDEBAND, IF=LO-RF



INPUT IP3(I) @ FIXED IF = 3000 MHz  
LOWER SIDEBAND, IF=LO-RF



INPUT IP3(Q) @ FIXED IF = 3000 MHz  
LOWER SIDEBAND, IF=LO-RF









All Mini-Circuits products are manufactured under exacting quality assurance and control standards, and are capable of meeting published specifications after being subjected to any or all of the following physical and environmental test.

| Specification         | Test/Inspection Condition             | Reference/Spec                                                 |
|-----------------------|---------------------------------------|----------------------------------------------------------------|
| Operating Temperature | -40° to 85° C<br>Ambient Environment  | Individual Model Data Sheet                                    |
| Storage Temperature   | -55° to 100° C<br>Ambient Environment | Individual Model Data Sheet                                    |
| Thermal Shock         | -55° to 100°C, 5 cycles               | MIL-STD-202, Method 107, Condition B except over -55° to 100°C |