MMIC DIE

IQ Mixer

SMIQ-6243H-D+

50Ω 6 to 24 GHz Level 18 (LO Power +18 dBm)

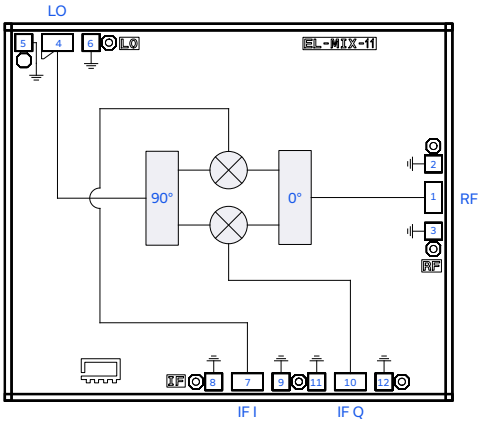
THE BIG DEAL

- Wideband RF & LO, 6 to 24 GHz
- Wideband IF, DC to 6 GHz
- Excellent Image Rejection, Typ. 29 dB
- High LO-RF Isolation, Typ. 40 dB
- High Input IP3, Typ. +25 dBm
- Usable as Image Reject Mixer & SSB Converter

APPLICATIONS

- Test and Measurement Equipment
- 5G mmWave and Back Haul Radio
- Satellite Communications
- Radar, EW and ECM Defense Systems

FUNCTIONAL DIAGRAM



SEE ORDERING INFORMATION ON THE LAST PAGE

PRODUCT OVERVIEW

The SMIQ-6243H-D+ is a passive, wideband in phase/quadrature (I/Q) mixer die fabricated using GaAs HBT technology. The SMIQ-6243H-D+ is usable as a single-sideband upconverter for transmit applications or an image rejection mixer for receiver applications. The SMIQ-6243H-D+ is ideal for wideband frequency translation applications that require inherent rejection of image signals and spurious mixing products. The mixer covers a wide frequency range with RF and LO frequency range of 6 to 24 GHz and an IF frequency range of DC to 6 GHz. As a passive mixer, the SMIQ-6243H-D+ offers lower noise figure than active mixers ensuring superior dynamic range for high performance applications. No DC bias is needed for operation.

KEY FEATURES

Features	Advantages
High Image Rejection, 29 dB typical	Provides inherent rejection of unwanted image signals without the need for external filtering
High LO-RF Isolation, 40 dB typical	Enables excellent carrier rejection in single-sideband upconvert applications
High LO-IF Isolation, 46 dB typical	Minimizes filtering requirements needed to ensure signal integrity
Wide Bandwidth, 6 to 24 GHz	Useful in wideband systems or in several narrowband systems requiring fewer components
Wide IF Bandwidth, DC to 6 GHz	Enables use of high IF conversion to reduce filtering requirements. Also operates as low as DC for use in vector modulation applications.
Unpackaged Die	Enables integration into hybrid chip and wire assemblies

REV. OR
ECO-018346
SMIQ-6243H-D+
MCL NY
230626

IQ Mixer

SMIQ-6243H-D+

50Ω 6 to 24 GHz Level 18 (LO Power +18 dBm)

ELECTRICAL SPECIFICATIONS[1] AT +25°C, LO POWER= +18 dBm, UNLESS NOTED OTHERWISE

Parameter	Frequency (GHz)	Min.	Typ.	Max.	Unit
RF Frequency Range		6		24	GHz
LO Frequency Range		6		24	GHz
IF Frequency Range		DC		6	GHz
LO Power		+17	+18	+20	dBm
Conversion Loss[2]	6 – 20 20 – 24		8.3 9.6		dB
Amplitude Unbalance	6 – 20 20 – 24		±0.2 ±0.2		dB
Phase Unbalance (Relative to 90°)	6 – 20 20 – 24		±4.3 ±1.7		Deg.
Image Rejection[3] (Tested as a Downconverter)	6 – 20 20 – 24		29 27		dBc
Single Sideband Rejection[4] (Tested as an Upconverter)	6 – 20 20 – 24		29 32		dBc
LO-RF Isolation	6 – 20 20 – 24		41 37		dB
LO-I Isolation	6 – 20 20 – 24		50 34		dB
LO-Q Isolation	6 – 20 20 – 24		47 38		dB
RF-I Isolation	6 – 20 20 – 24		29 31		dB
RF-Q Isolation	6 – 20 20 – 24		32 35		dB
Input Power at 1dB Compression	6 – 24		+10		dBm
Input IP3	6 – 20 20 – 24		+20 +25		dBm

1. Electrical specifications are measured on Mini-Circuits Die Characterization Test Board. Board loss is de-embedded to the device. Unless otherwise specified IF = 200 MHz.
2. Conversion loss (dB)= RF Power (dBm) minus worse of I/Q Port Power (dBm) minus 3dB theoretical loss of an Ideal External Hybrid, measured as a Down Converter. See measurement block diagram Figure 2.
3. Level of undesired image signal below desired RF signal. See measurement block diagram Figure 3.
4. Level of undesired sideband below desired sideband. See measurement block diagram Figure 3.

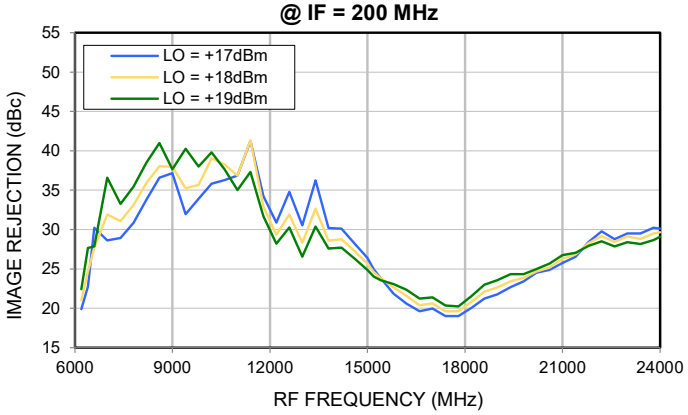
IQ Mixer

SMIQ-6243H-D+

50Ω 6 to 24 GHz Level 18 (LO Power +18 dBm)

TYPICAL PERFORMANCE GRAPHS

IMAGE REJECTION (DOWNCONVERTER)
@ IF = 200 MHz



SSB REJECTION (UPCONVERTER)
@ IF = 200 MHz

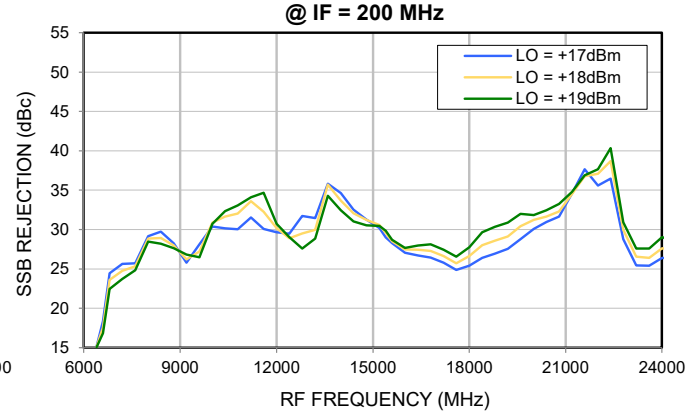
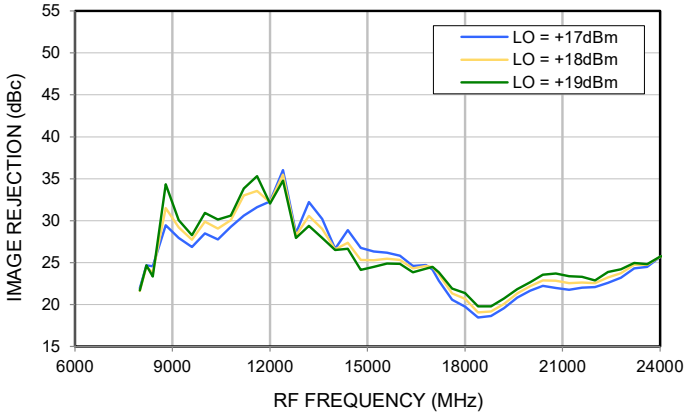


IMAGE REJECTION (DOWNCONVERTER)
@ IF = 2000 MHz



SSB REJECTION (UPCONVERTER)
@ IF = 2000 MHz

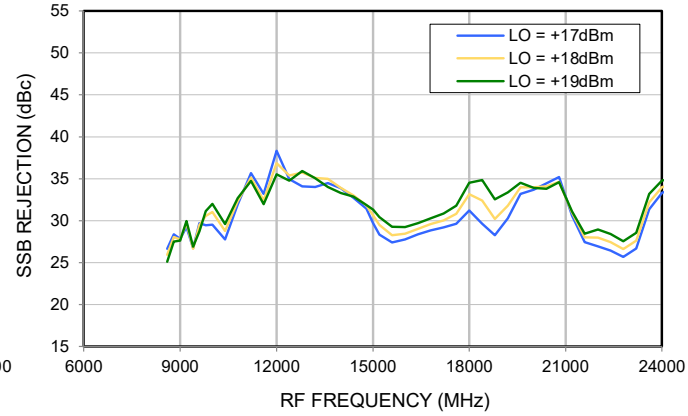
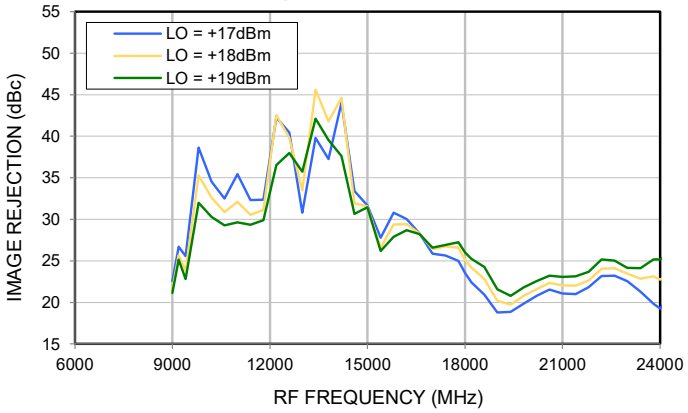
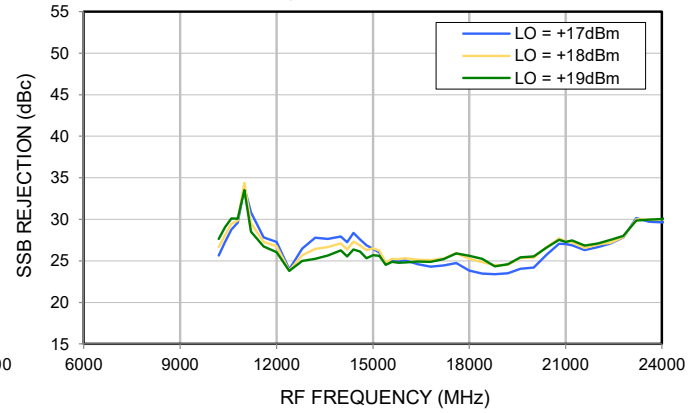


IMAGE REJECTION (DOWNCONVERTER)
@ IF = 3000 MHz

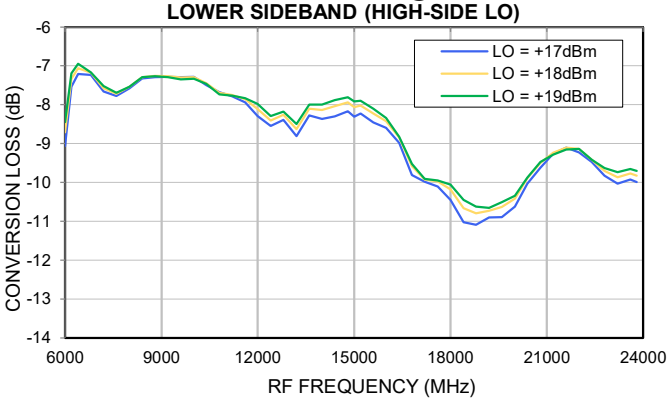


SSB REJECTION (UPCONVERTER)
@ IF = 3000 MHz

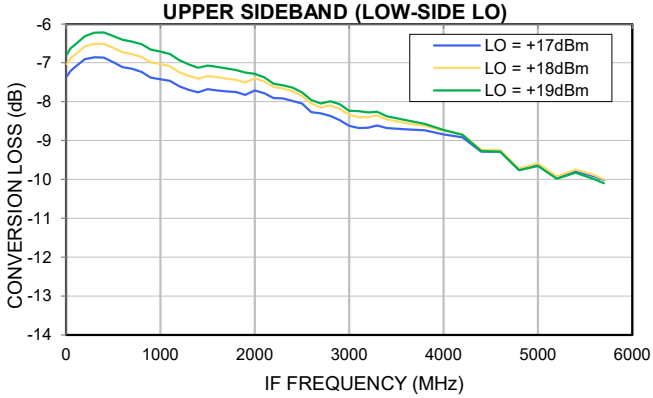


TYPICAL PERFORMANCE GRAPHS

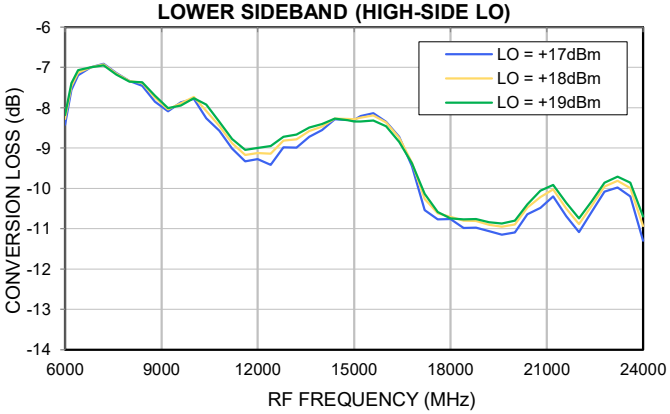
CONVERSION LOSS VS. RF @ IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



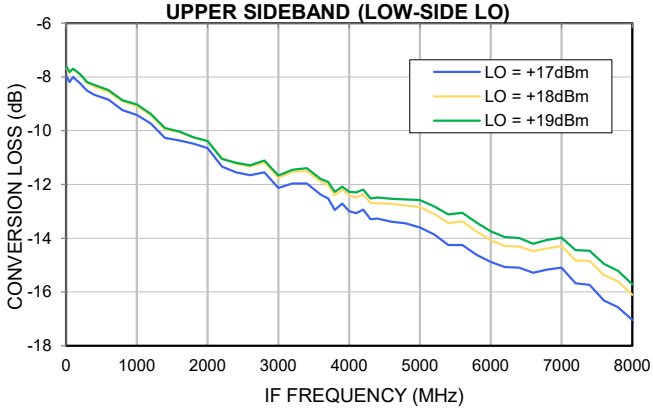
CONVERSION LOSS VS. IF @ FIXED LO = 6.3 GHz
UPPER SIDEBAND (LOW-SIDE LO)



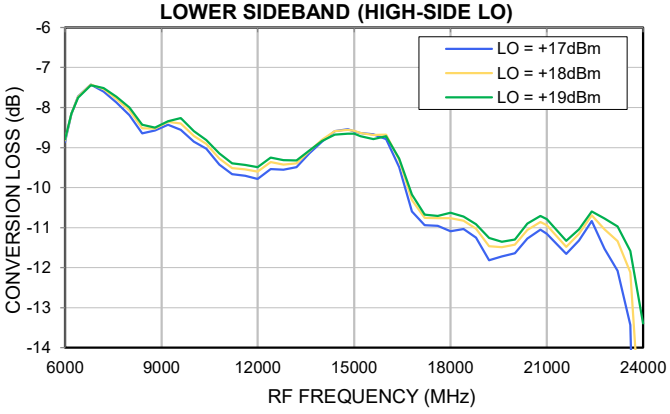
CONVERSION LOSS VS. RF @ IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



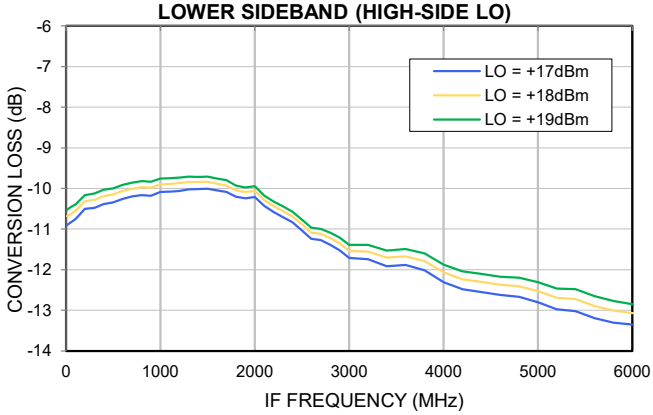
CONVERSION LOSS VS. IF @ FIXED LO = 15.25 GHz
UPPER SIDEBAND (LOW-SIDE LO)



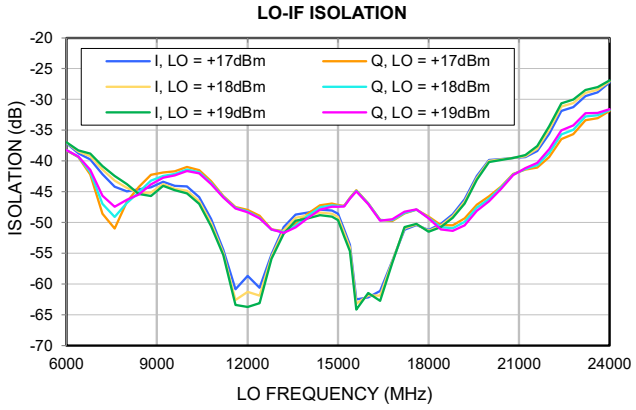
CONVERSION LOSS VS. RF @ IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)

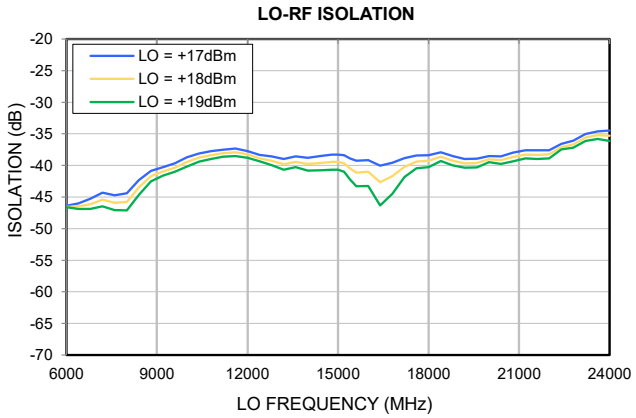


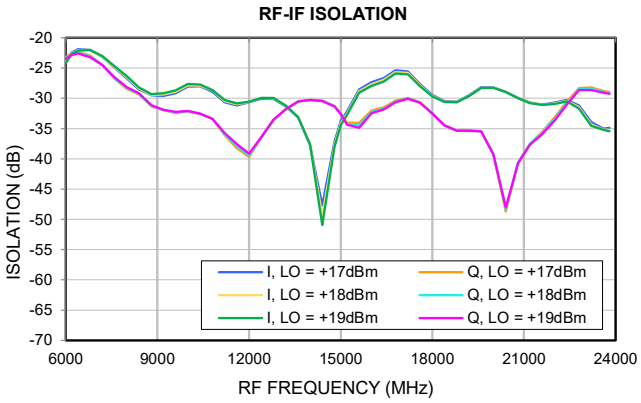
CONVERSION LOSS VS. IF @ FIXED LO = 24.7 GHz
LOWER SIDEBAND (HIGH-SIDE LO)



TYPICAL PERFORMANCE GRAPHS

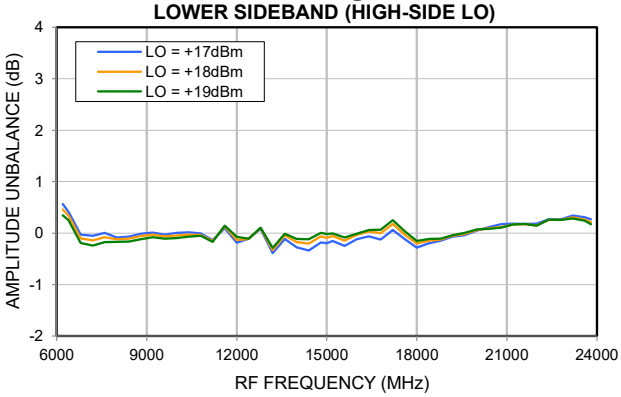




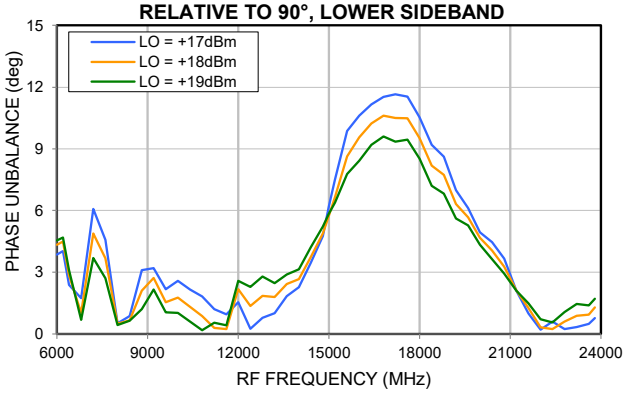


TYPICAL PERFORMANCE GRAPHS

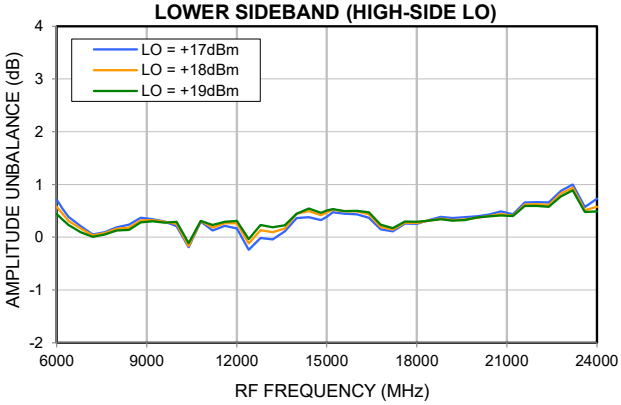
AMPLITUDE UNBALANCE @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



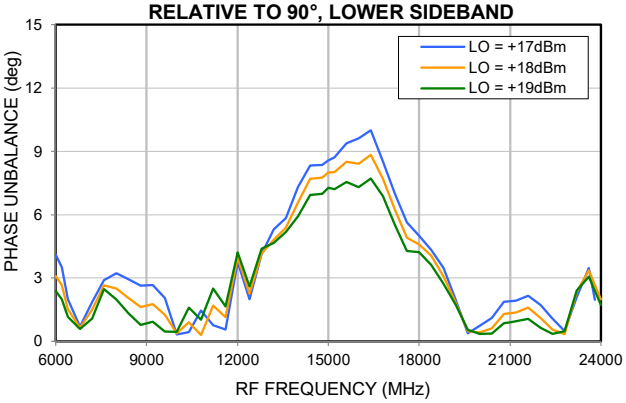
PHASE UNBALANCE @ FIXED IF = 200 MHz
RELATIVE TO 90°, LOWER SIDEBAND



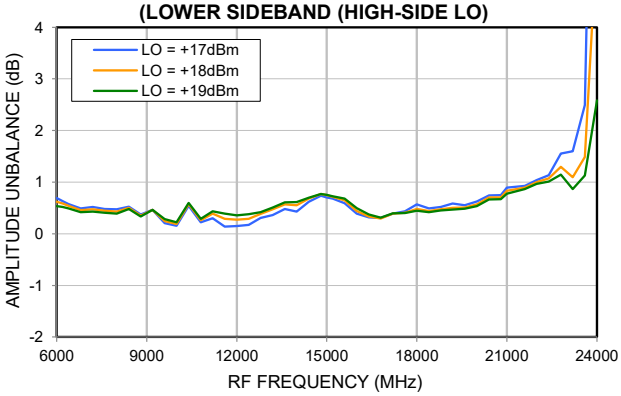
AMPLITUDE UNBALANCE @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



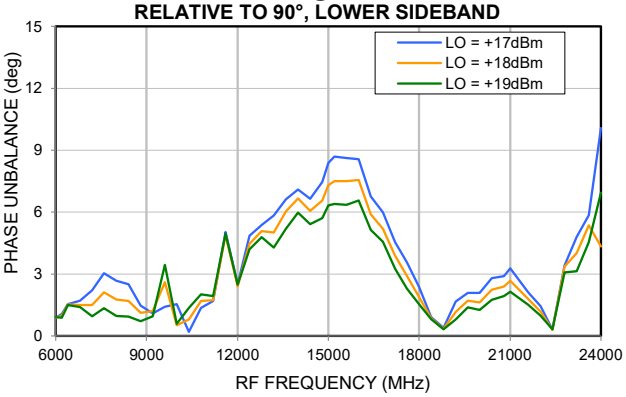
PHASE UNBALANCE @ FIXED IF = 2000 MHz
RELATIVE TO 90°, LOWER SIDEBAND



AMPLITUDE UNBALANCE @ FIXED IF = 3000 MHz
(LOWER SIDEBAND (HIGH-SIDE LO)

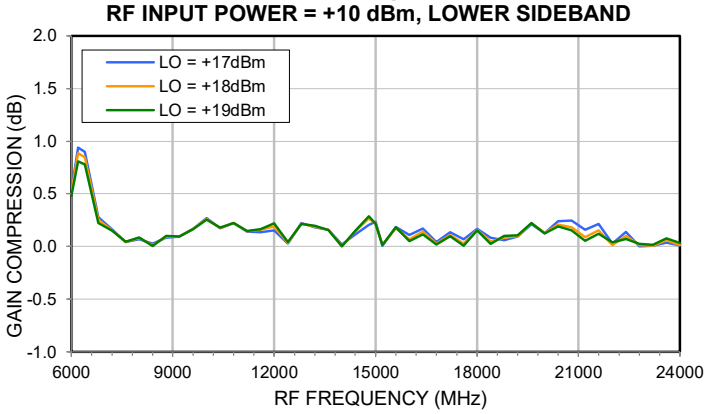


PHASE UNBALANCE @ FIXED IF = 3000 MHz
RELATIVE TO 90°, LOWER SIDEBAND

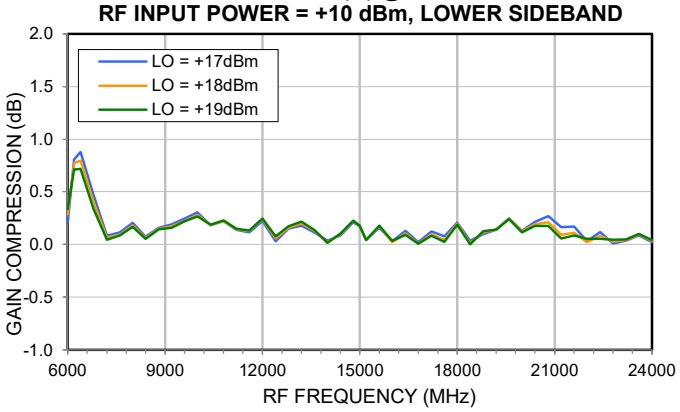


TYPICAL PERFORMANCE GRAPHS

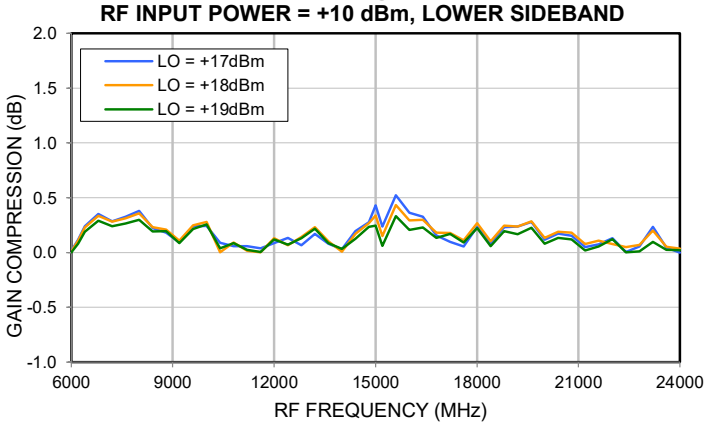
GAIN COMPRESSION (I) @ FIXED IF = 200 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



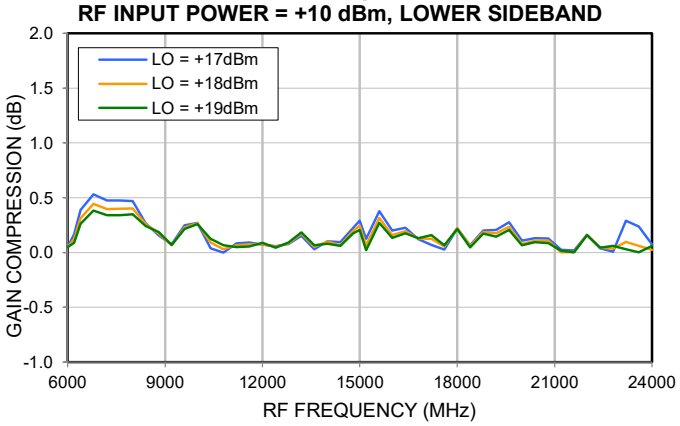
GAIN COMPRESSION (Q) @ FIXED IF = 200 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



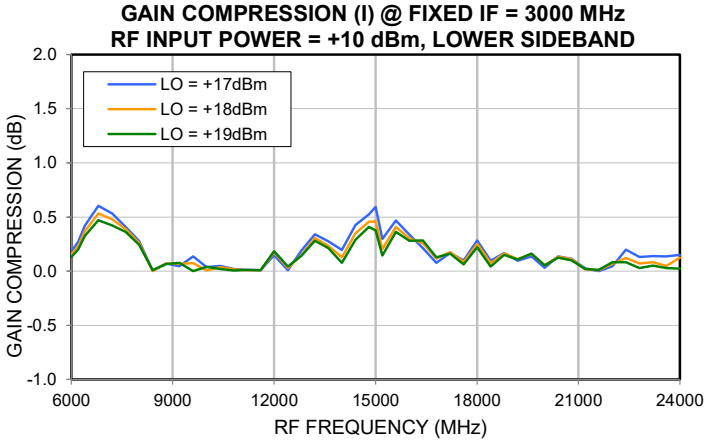
GAIN COMPRESSION (I) @ FIXED IF = 2000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



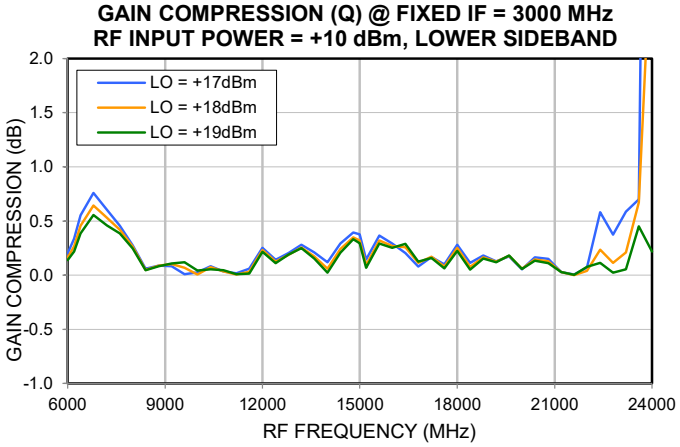
GAIN COMPRESSION (Q) @ FIXED IF = 2000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



GAIN COMPRESSION (I) @ FIXED IF = 3000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND

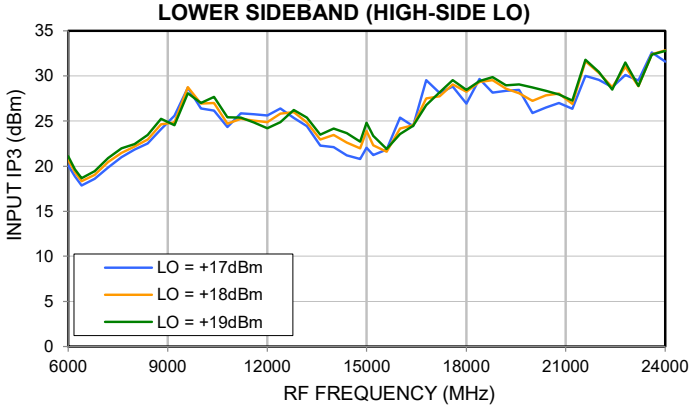


GAIN COMPRESSION (Q) @ FIXED IF = 3000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND

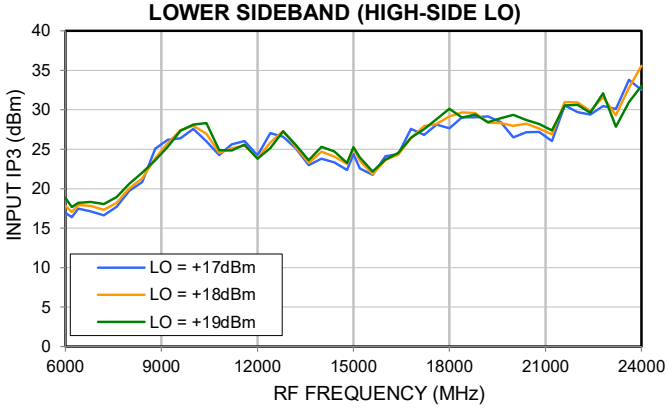


TYPICAL PERFORMANCE GRAPHS

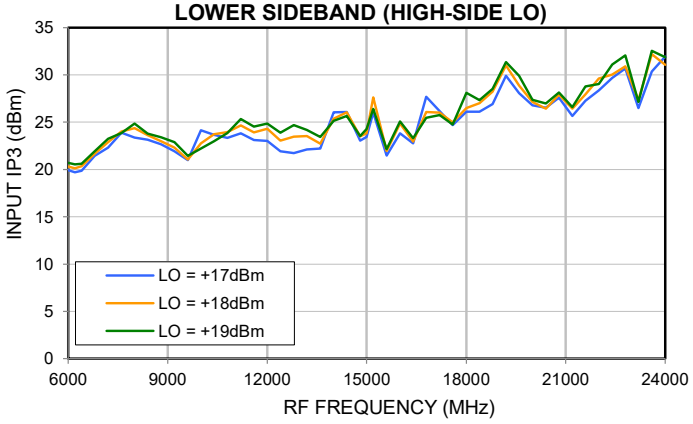
INPUT IP3 (I) @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



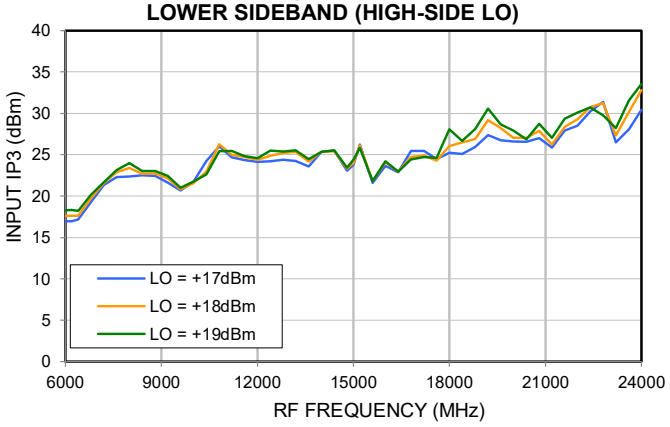
INPUT IP3 (Q) @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



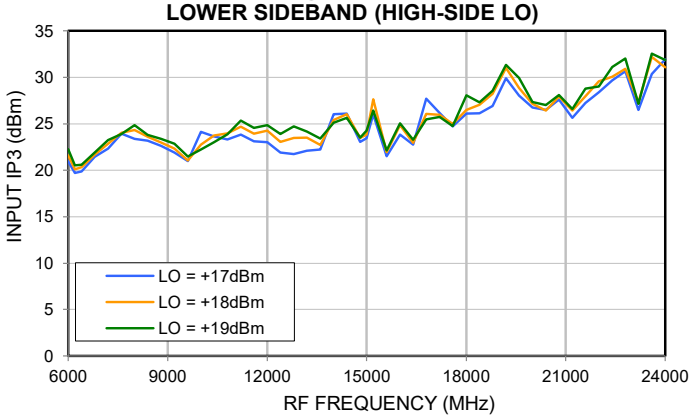
INPUT IP3 (I) @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



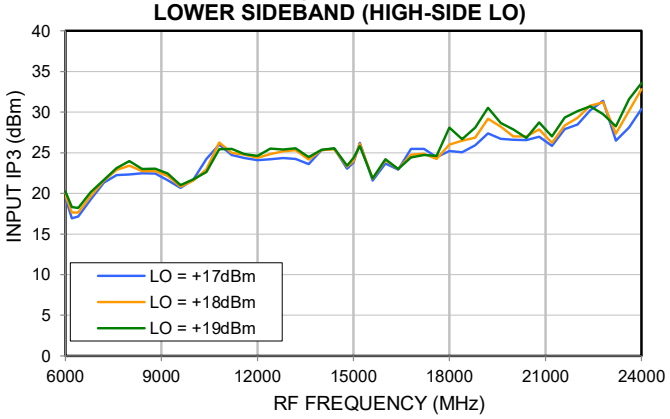
INPUT IP3 (Q) @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



INPUT IP3 (I) @ FIXED IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



INPUT IP3 (Q) @ FIXED IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



ABSOLUTE MAXIMUM RATINGS[5]

Parameter	Ratings
Operating Temperature[6]	-40°C to +85°C
Storage Temperature (for Die)[7]	+20°C to +35°C
LO Power	+25 dBm
RF Power	+25 dBm
DC Current on I & Q Ports	16 mA
Junction Temperature[8]	175°C

5. Permanent damage may occur if any of these limits are exceeded. Maximum ratings are not intended for continuous normal operation.
6. Bottom of Die
7. For die shipped in Gel-Pak see ENV-80 (limited by packaging).
8. Hot spot temperature on die.

ESD RATING[9]

	Class	Voltage Range	Reference Standard
HBM	1A	250 to <500V	ANSI/ESDA/JEDEC JS-001-2017
CDM	C4	500 to <1000V	JESD22-C101F

ESD HANDLING PRECAUTION: This device is designed to be Class 1A for HBM. Static charges may easily produce potentials higher than this with improper handling and can discharge into DUT and damage it. As a preventive measure Industry standard ESD handling precautions should be used at all times to protect the device from ESD damage.

9. ESD tested in 4x4mm 24-Lead MCLP package.

IQ Mixer

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50Ω 6 to 24 GHz Level 18 (LO Power +18 dBm)

FUNCTIONAL DIAGRAM

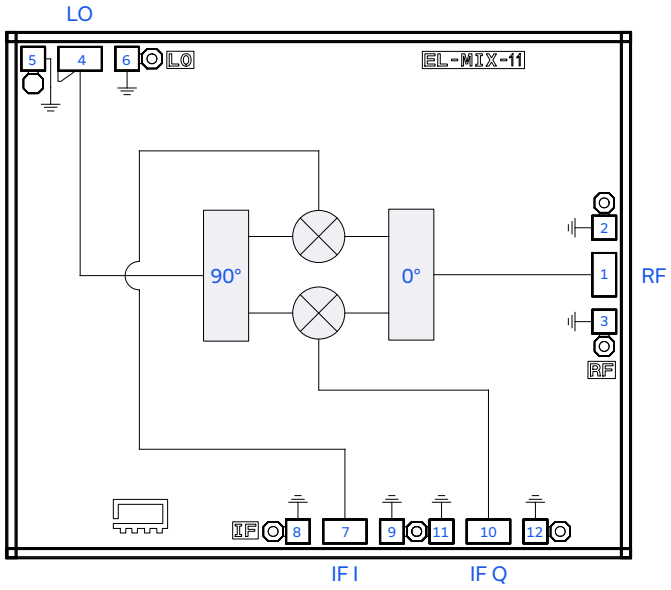
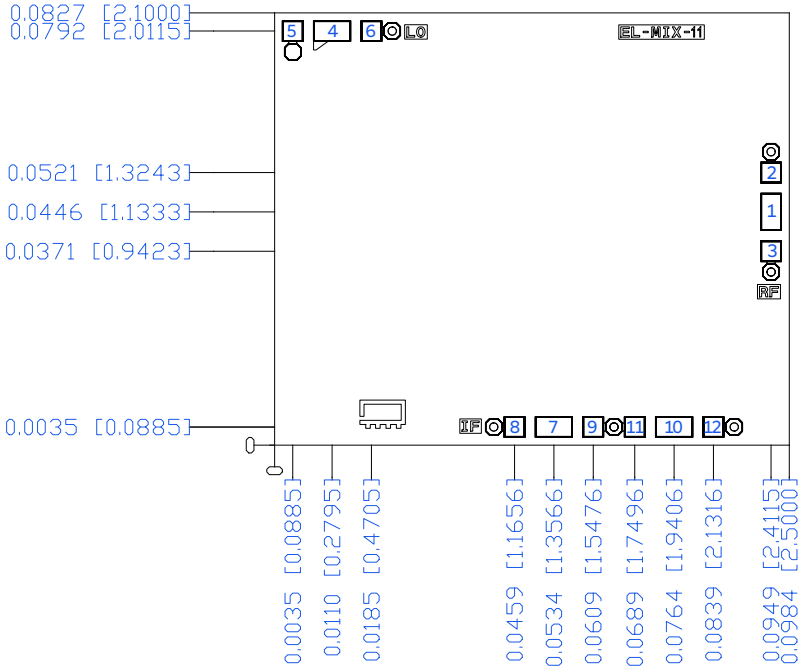


Figure 1. SMIQ-6243H-D+ Functional Diagram

PAD DESCRIPTION

Function	Pad #	Description (Refer to Figure 1)
RF	1	RF Port. Connects to RF Output for Up converters and RF Input for Down converters.
LO	4	LO Port. Connects to LO Input
IF-I	7	IF-I Port. Connects to the IF-I Input for Up converters and IF-I Output for Down converters
IF-Q	10	IF-Q Port. Connects to the IF-Q Input for Up converters and IF-Q Output for Down converters
GND	2, 3, 5, 6, 8, 9, 11, 12	Connected to backside of Die thru vias. Bond wires to ground are optional.

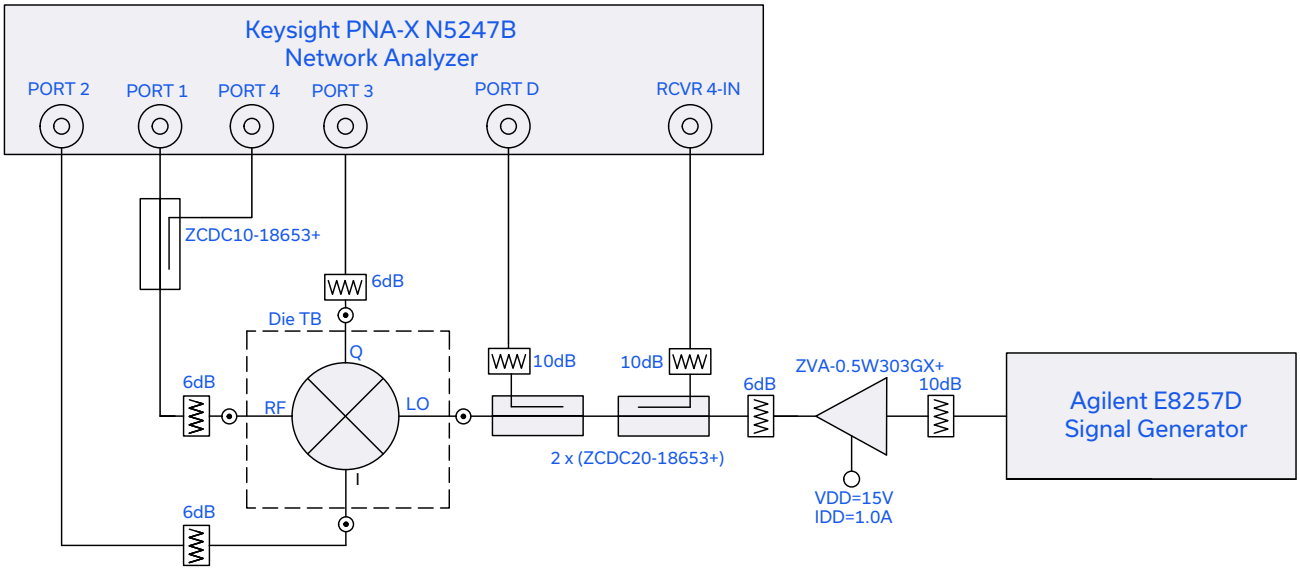
DIE OUTLINE: inches [mm], Typical



DIMENSIONS: inches [mm], Typical

Die Size	0.0827 x 0.0984 [2.1 x 2.5]
Die Thickness	0.040 [0.100]
Bond Pad Sizes:	
Pads 1, 4, 7, & 10	0.0036 x 0.0068 [0.092 x 0.172]
Pads 2, 3, 5, 6, 8, 9, 11, & 12	0.0036 x 0.0036 [0.092 x 0.092]
Plating (Pads & Bottom of Die)	Gold

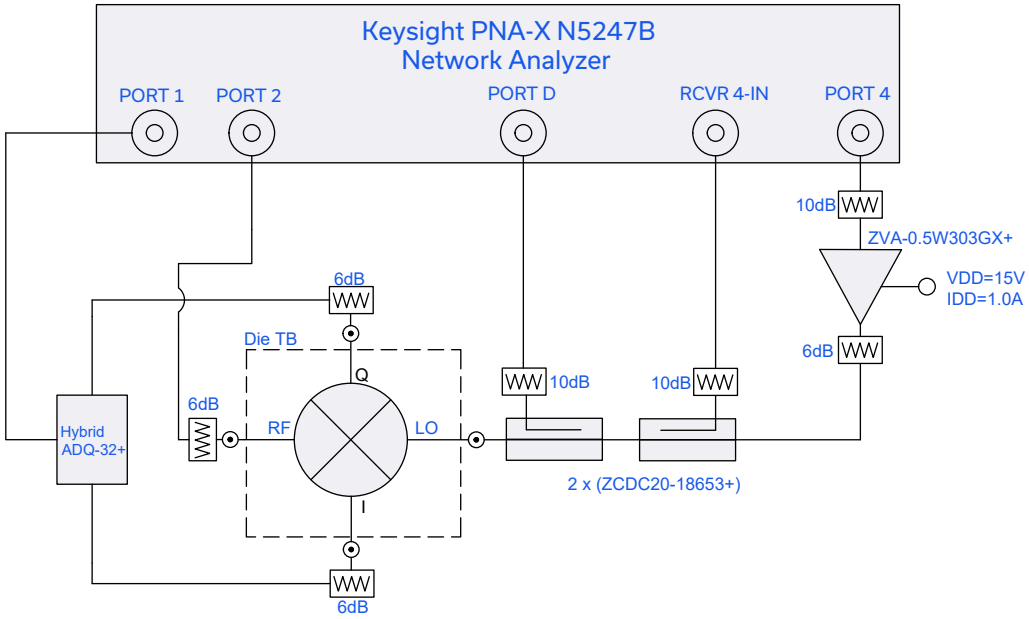
CHARACTERIZATION TEST BLOCK DIAGRAMS



10 dB attenuators P/N BW-E10-1W653+
6 dB attenuators P/N BW-E6-1W653+

Figure 2. Block diagram of test circuit used to characterize: Conversion Loss (CL), Amplitude Unbalance, Phase Unbalance, Isolation, Return Loss (RF, LO, I &Q) & Input IP3

Test conditions:
For CL, Return Loss and Isolation:
RF Input Power = -10 dBm, LO Input Power =+17 to +19 dBm, IF=200 MHz, 2 GHz, 3 GHz
For Input IP3: RF = -10 dBm/Tone, LO Input Power = +17 to +19 dBm. Two tones, spaced 1 MHz apart



10 dB attenuators P/N BW-E10-1W653+
6 dB attenuators P/N BW-E6-1W653+

Figure 3. Block diagram of Test Circuit used for characterization of Image Rejection and Single Side Band Rejection

Test conditions:
RF Input Power = -10 dBm, LO Input Power = +17 to +19 dBm, IF = 200 MHz

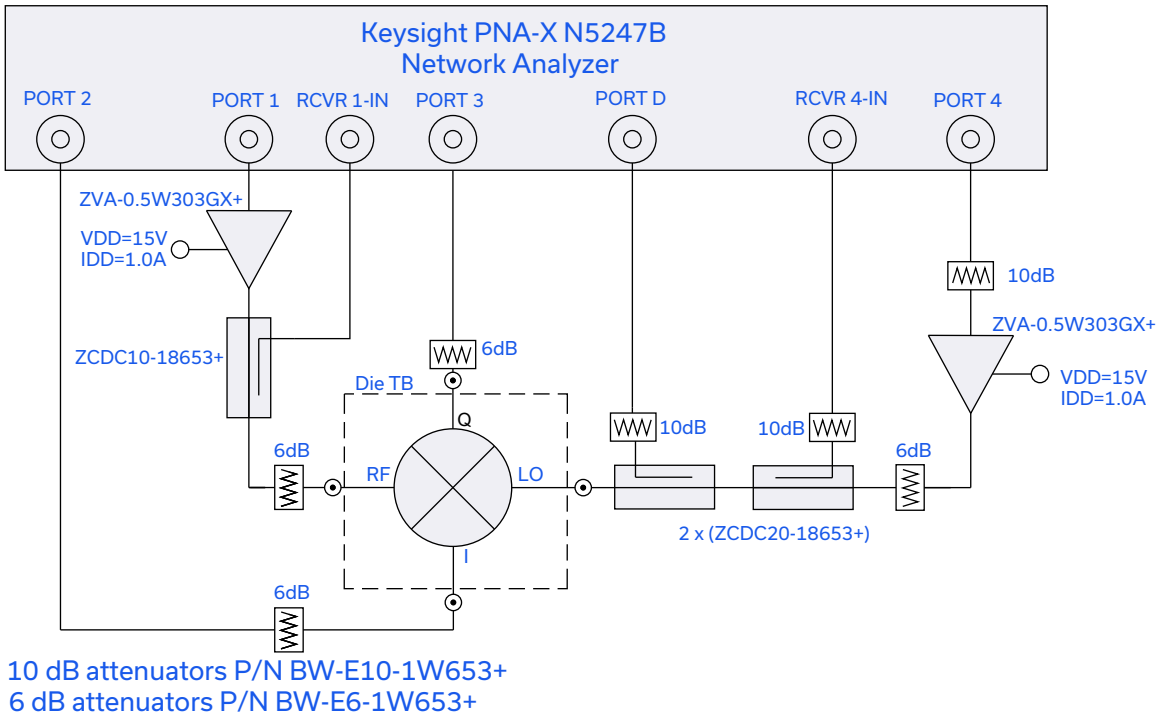


Figure 4. Block diagram of test circuit used to characterize: Compression

Test Conditions:
RF Input Power = -10 dBm to +10 dBm, LO Input Power = +17 to +19 dBm, IF = 200 MHz, 2 GHz, and 3 GHz
Compression = (Conversion Loss @ RF Power = +10 dBm) – (Conversion Loss @ RF Power = -10 dBm)

APPLICATION CONFIGURATION FOR IMAGE REJECT AND SINGLE SIDE BAND MIXER

In Image Reject or Single Sideband Upconverter applications an external 90° Hybrid is needed. Refer to Mini-Circuits extensive portofolio of 90° Hybrids.

IMAGE REJECT MIXER APPLICATION

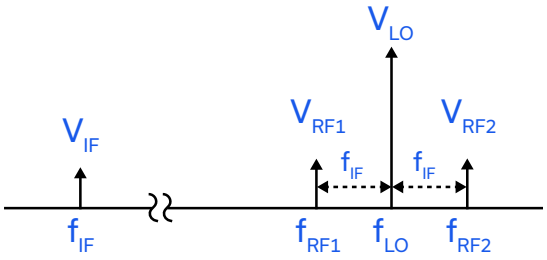


Figure 5. Spectral representation of Signals

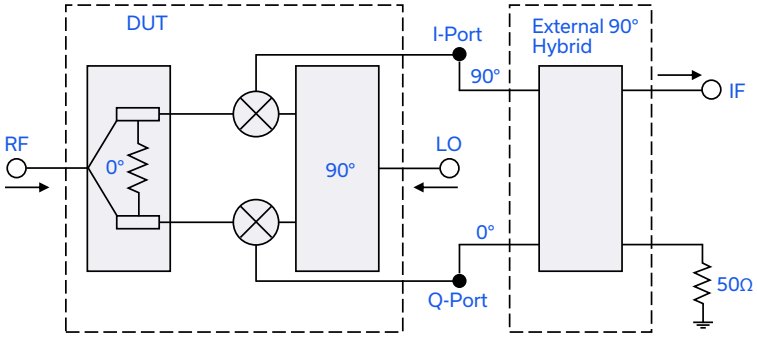


Figure 6. Block Diagram of Image Reject Mixer

If f_{RF1} is the desired signal and f_{RF2} is the image, connect the I port of DUT to the 90° port of the external hybrid and the Q port to the 0° port of the hybrid. This will send the f_{RF2}-f_{LO} IF signal to the terminated output of the external 90° hybrid and desired IF signal f_{LO}- f_{RF1} to IF port.

If f_{RF2} is the desired signal and f_{RF1} is the image signal, connect the I port of DUT to the 0 deg port of the external 90° hybrid and the Q port to the 90° port of the external hybrid. This will send f_{LO}- f_{RF1} IF signal to the terminated output of the external 90° hybrid and desired IF signal f_{RF2}- f_{LO} to IF port.

SINGLE SIDE BAND (SSB) UPCONVERTER APPLICATION

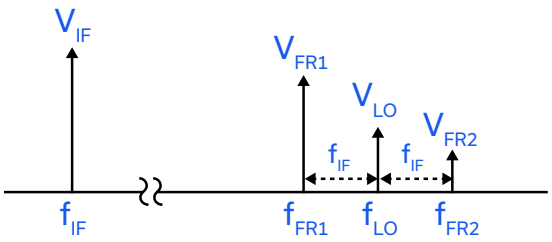


Figure 7. Spectral representation of Signals

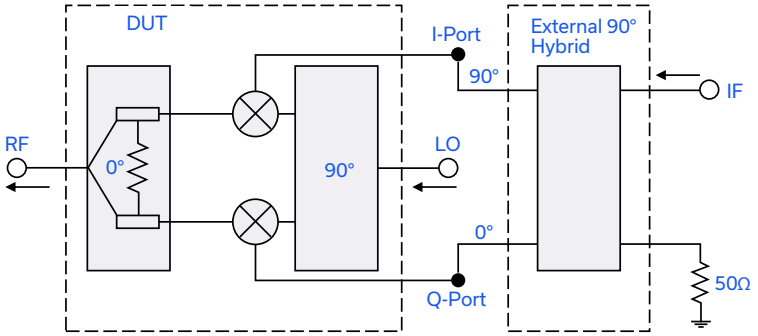


Figure 8. Block Diagram of Single Side Band Mixer

For upper side band selection connect the I port to the 90° port of the external 90° hybrid and the Q port to the 0° port of the external hybrid. This will send the lower sideband band signal to the isolation resistor of the 0° RF splitter in DUT and upper sideband at RF port.

For lower side band selection connect the I port to the 0° port of the external 90° hybrid and the Q port to the 90° port of the hybrid. This will send the upper sideband band signal to the isolation resistor of the 0° RF splitter in DUT and lower sideband out of RF port.

Refer to Mini-Circuits blog, I&Q Mixers, Image Reject Down-Conversion & Single Sideband (SSB) Up-Conversion for a detailed explanation.

ASSEMBLY DIAGRAM

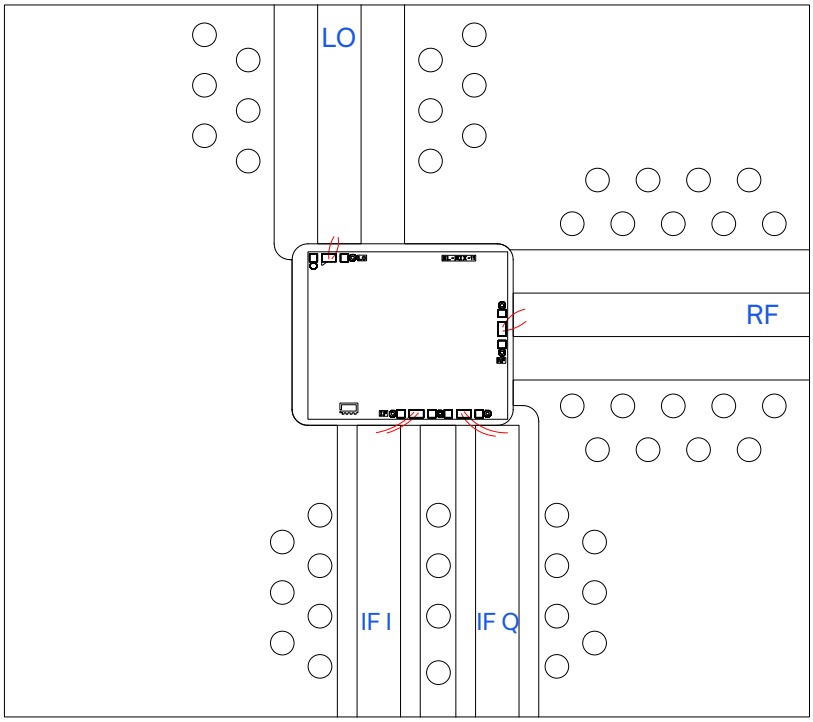


Figure 9. SMIQ-6243H-D+ Assembly Diagram

- Bond wire diameter: 1 mil
- Bond wire lengths from Die Pad to PCB at RF port: 23 ± 2 mils
- Bond wire lengths from Die Pad to PCB at LO port: 27 ± 2 mils
- Bond wire lengths from Die Pad to PCB at IF ports: 41 ± 2 mils
- Typical Gap from Die edge to PCB edge: 3 mils
- PCB thickness and material: 10 mil RO4350B (Thickness: 12.8 mils copper to copper).

ASSEMBLY AND HANDLING PROCEDURE

1. Storage
   Die should be stored in a dry nitrogen purged desiccator or equivalent.
2. ESD Precautions
   MMIC mixer die are susceptible to electrostatic and mechanical damage. Die are supplied in anti-static protected material, which should be opened only in clean room conditions at an appropriately grounded anti-static workstation.
3. Die Handling and Attachment
   Devices require careful handling using tools appropriate for manipulating semiconductor chips. It is recommended to handle the chips along the edges with a custom designed collet. The surface of the chips have exposed air bridges and should not be touched with a vacuum collet, tweezers or fingers.
   The die mounting surface must be clean and flat. Using conductive silver-filled epoxy, apply sufficient adhesive to meet the required bond line thickness, fillet height and coverage around the total periphery of the device. The recommended epoxy is Ablestik 84-1 LMISR4 or equivalent. Parts should be cured in a nitrogen-filled atmosphere per manufacturer's recommended cure profile.
4. Wire Bonding
   Openings in the surface passivation above the gold bond pads are provided to allow wire bonding to the die. Thermosonic bonding is recommended with minimized ultrasonic content. Bond force, time, ultrasonic power and temperature are all critical parameters. The suggested interconnect is pure gold, 1 mil diameter wire. Bonds are recommended to be made from the bond pads on the die to the package or substrate. All bond wire length and bond wire height should be kept as short as possible, unless specified by design, to minimize performance degradation due to undesirable series inductance.

MMIC DIE

IQ Mixer

SMIQ-6243H-D+

50Ω 6 to 24 GHz Level 18 (LO Power +18 dBm)

ADDITIONAL DETAILED INFORMATION IS AVAILABLE ON OUR DASH BOARD CLICK HERE

Performance Data	Table Graphs	
Case Style	Die	
RoHs Status	Compliant	
Die Ordering and Packaging Information	Quantity, Package	Model No.
	Gel - Pak: 5, 10, 50 KGD*	SMIQ-6243H-DG+
	Medium†, Partial wafer: KGD*<460	SMIQ-6243H-DP+
	Full wafer†	SMIQ-6243H-DF+
	†Available upon request contact sales representative. Refer to AN-60-067	
Die Marking	EL-MIX-11	
Environmental Ratings	ENV-80	

* Known Good Die ("KGD") means that the die in question have been subjected to Mini-Circuits DC test performance criteria and measurement instructions and that the parametric data of such die fall within a predefined range. While DC testing is not definitive, it does provide a higher degree of confidence that die are capable of meeting typical RF electrical parameters specified by Mini-Circuits.

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 there in. For a full statement of the standard. Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at www.minicircuits.com/MCLStore/terms.jsp

D. Mini-Circuits does not warrant the accuracy or completeness of the information, text, graphics and other items contained within this document and same are provided as an accommodation and on an As is basis, with all faults.

E. Purchasers of this part are solely responsible for proper storing, handling, assembly and processing of known good die (KGD) (including, without limitation, proper ESD preventative measures, die preparation, die attach, wire bonding and related assembly and test activities), and Mini-Circuits assumes no responsibility therefor or for environmental effects on KGD.

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Frequency Mixer Die

SMIQ-6243H-D+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	Image Rejection (Upconverter Mode) IF Fixed @IF(OUT)=200MHz (dB) @LO (dBm)			RF (IN) (MHz)	LO (MHz)	Image Rejection (Upconverter Mode) IF Fixed @IF(OUT)=2000MHz (dB) @LO (dBm)			RF (IN) (MHz)	LO (MHz)	Image Rejection (Upconverter Mode) IF Fixed @IF(OUT)=3000MHz (dB) @LO (dBm)		
		+17	+18	+19			+17	+18	+19			+17	+18	+19
6400.1	6200.1	15.17	15.14	15.07	8600.1	6600.1	26.66	25.94	25.12	10200.1	7200.1	25.68	26.67	27.64
6600.1	6400.1	18.34	17.59	16.86	8800.1	6800.1	28.37	28.05	27.49	10400.1	7400.1	27.26	28.08	29.08
6800.1	6600.1	24.45	23.62	22.48	9000.1	7000.1	27.86	27.80	27.62	10600.1	7600.1	28.76	29.46	30.11
7200.1	7000.1	25.63	24.75	23.71	9200.1	7200.1	29.23	29.71	29.95	10800.1	7800.1	29.61	29.84	30.10
7600.1	7400.1	25.71	25.34	24.83	9400.1	7400.1	26.71	26.64	26.87	11000.1	8000.1	33.87	34.38	33.51
8000.1	7800.1	29.16	28.86	28.47	9600.1	7600.1	29.71	29.52	28.74	11200.1	8200.1	30.86	29.53	28.52
8400.1	8200.1	29.75	28.95	28.21	9800.1	7800.1	29.44	30.57	31.12	11600.1	8600.1	27.81	27.28	26.76
8800.1	8600.1	28.25	27.97	27.61	10000.1	8000.1	29.54	31.04	31.98	12000.1	9000.1	27.31	26.79	26.03
9200.1	9000.1	25.78	26.22	26.83	10400.1	8400.1	27.76	28.80	29.61	12400.1	9400.1	23.99	23.83	23.80
9600.1	9400.1	28.14	27.22	26.48	10800.1	8800.1	31.91	32.35	32.68	12800.1	9800.1	26.49	25.69	25.01
10000.1	9800.1	30.36	30.89	30.73	11200.1	9200.1	35.67	35.14	34.74	13200.1	10200.1	27.77	26.47	25.24
10400.1	10200.1	30.15	31.64	32.36	11600.1	9600.1	33.19	32.43	31.96	13600.1	10600.1	27.64	26.66	25.68
10800.1	10600.1	30.02	32.01	33.04	12000.1	10000.1	38.32	36.84	35.52	14000.1	11000.1	27.93	27.08	26.24
11200.1	11000.1	31.56	33.61	34.07	12400.1	10400.1	34.96	35.37	34.78	14200.1	11200.1	27.23	26.36	25.54
11600.1	11400.1	30.07	32.26	34.65	12800.1	10800.1	34.11	35.75	35.93	14400.1	11400.1	28.37	27.34	26.34
12000.1	11800.1	29.66	30.20	30.73	13200.1	11200.1	34.03	35.10	35.07	14600.1	11600.1	27.58	26.85	26.11
12400.1	12200.1	29.46	28.90	29.03	13600.1	11600.1	34.47	34.99	34.03	14800.1	11800.1	26.89	26.29	25.33
12800.1	12600.1	31.73	29.52	27.56	14000.1	12000.1	33.88	33.94	33.30	15000.1	12000.1	26.48	26.55	25.70
13200.1	13000.1	31.48	29.98	28.88	14400.1	12400.1	32.70	33.04	32.86	15200.1	12200.1	26.00	26.22	25.64
13600.1	13400.1	35.82	35.69	34.30	14800.1	12800.1	31.44	31.83	31.85	15400.1	12400.1	24.62	24.79	24.52
14000.1	13800.1	34.64	33.66	32.47	15000.1	13000.1	29.70	30.66	31.35	15600.1	12600.1	24.98	25.23	24.91
14400.1	14200.1	32.52	32.06	31.04	15200.1	13200.1	28.33	29.49	30.45	15800.1	12800.1	24.98	25.22	24.78
14800.1	14600.1	31.25	31.23	30.55	15600.1	13600.1	27.40	28.26	29.28	16000.1	13000.1	25.07	25.32	24.81
15200.1	15000.1	30.19	30.58	30.47	16000.1	14000.1	27.79	28.44	29.22	16400.1	13400.1	24.58	25.14	24.94
15400.1	15200.1	29.01	29.58	29.85	16400.1	14400.1	28.38	29.03	29.71	16800.1	13800.1	24.32	25.10	24.90
15600.1	15400.1	28.27	28.50	28.72	16800.1	14800.1	28.85	29.60	30.26	17200.1	14200.1	24.44	25.29	25.20
16000.1	15800.1	27.06	27.47	27.66	17200.1	15200.1	29.18	30.02	30.85	17600.1	14600.1	24.75	25.93	25.90
16400.1	16200.1	26.68	27.43	27.99	17600.1	15600.1	29.64	30.81	31.79	18000.1	15000.1	23.84	25.23	25.63
16800.1	16600.1	26.43	27.27	28.12	18000.1	16000.1	31.23	33.17	34.52	18400.1	15400.1	23.46	24.85	25.24
17200.1	17000.1	25.76	26.62	27.43	18400.1	16400.1	29.65	32.39	34.86	18800.1	15800.1	23.40	24.49	24.32
17600.1	17400.1	24.87	25.71	26.55	18800.1	16800.1	28.26	30.21	32.53	19200.1	16200.1	23.51	24.52	24.58
18000.1	17800.1	25.42	26.60	27.76	19200.1	17200.1	30.27	31.77	33.36	19600.1	16600.1	24.05	25.34	25.40
18400.1	18200.1	26.41	28.02	29.68	19600.1	17600.1	33.19	34.01	34.51	20000.1	17000.1	24.20	25.38	25.52
18800.1	18600.1	26.94	28.58	30.33	20000.1	18000.1	33.69	33.98	33.93	20400.1	17400.1	25.73	26.63	26.59
19200.1	19000.1	27.55	29.12	30.89	20400.1	18400.1	34.44	34.10	33.81	20800.1	17800.1	27.07	27.71	27.53
19600.1	19400.1	28.79	30.41	31.98	20800.1	18800.1	35.19	34.61	34.58	21000.1	18000.1	27.03	27.38	27.31
20000.1	19800.1	30.07	31.21	31.83	21200.1	19200.1	30.60	30.94	31.09	21200.1	18200.1	26.87	27.19	27.46
20400.1	20200.1	30.96	31.64	32.46	21600.1	19600.1	27.43	28.03	28.45	21600.1	18600.1	26.29	26.56	26.86
20800.1	20600.1	31.65	32.32	33.28	22000.1	20000.1	26.94	27.99	28.97	22000.1	19000.1	26.68	26.99	27.09
21200.1	21000.1	34.60	34.51	34.77	22400.1	20400.1	26.44	27.45	28.41	22400.1	19400.1	27.07	27.17	27.53
21600.1	21400.1	37.66	36.78	36.89	22800.1	20800.1	25.67	26.62	27.53	22800.1	19800.1	27.82	27.87	28.00
22000.1	21800.1	35.58	37.10	37.64	23200.1	21200.1	26.69	27.62	28.53	23200.1	20200.1	30.17	30.00	29.84
22400.1	22200.1	36.47	38.71	40.33	23600.1	21600.1	31.38	32.19	33.19	23600.1	20600.1	29.70	29.98	29.97
22800.1	22600.1	28.79	29.97	30.91	24000.1	22000.1	33.35	34.04	34.83	24000.1	21000.1	29.62	30.01	30.04
23200.1	23000.1	25.44	26.56	27.57	25000.1	23000.1	34.67	34.84	35.00	25000.1	22000.1	30.31	30.46	31.00
23600.1	23400.1	25.40	26.39	27.57	26000.1	24000.1	37.06	37.76	37.84	26000.1	23000.1	29.33	29.67	30.11
24000.1	23800.1	26.38	27.61	29.03	27000.1	25000.1	37.79	37.85	38.71	27000.1	24000.1	26.08	28.07	28.87
24200.1	24000.1	26.32	27.43	28.73	28000.1	26000.1	33.86	35.30	36.62	28000.1	25000.1	22.78	25.14	27.36

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	Image Rejection (Downconverter Mode) IF Fixed @IF(OUT)=200MHz (dB) @LO (dBm)			RF (IN) (MHz)	LO (MHz)	Image Rejection (Downconverter Mode) IF Fixed @IF(OUT)=2000MHz (dB) @LO (dBm)			RF (IN) (MHz)	LO (MHz)	Image Rejection (Downconverter Mode) IF Fixed @IF(OUT)=3000MHz (dB) @LO (dBm)		
		+17	+18	+19			+17	+18	+19			+17	+18	+19
6200.1	6000.1	19.90	21.00	22.44	8000.1	6000.1	21.97	21.62	21.66	9000.1	6000.1	22.56	21.62	21.14
6400.1	6200.1	22.76	24.69	27.70	8200.1	6200.1	24.67	24.55	24.69	9200.1	6200.1	26.70	25.69	25.13
6600.1	6400.1	30.21	27.66	27.88	8400.1	6400.1	24.57	23.83	23.34	9400.1	6400.1	25.60	23.79	22.81
7000.1	6800.1	28.64	31.92	36.58	8800.1	6800.1	29.44	31.52	34.33	9800.1	6800.1	38.64	35.30	31.99
7400.1	7200.1	28.93	31.07	33.27	9200.1	7200.1	27.96	29.19	30.06	10200.1	7200.1	34.53	32.64	30.29
7800.1	7600.1	30.86	33.10	35.42	9600.1	7600.1	26.84	27.71	28.25	10600.1	7600.1	32.49	30.88	29.27
8200.1	8000.1	33.79	35.91	38.48	10000.1	8000.1	28.46	29.89	30.90	11000.1	8000.1	35.46	32.11	29.62
8600.1	8400.1	36.57	38.03	41.00	10400.1	8400.1	27.76	29.06	30.13	11400.1	8400.1	32.33	30.54	29.36
9000.1	8800.1	37.18	37.99	37.63	10800.1	8800.1	29.28	30.05	30.59	11800.1	8800.1	32.35	31.14	29.92
9400.1	9200.1	31.95	35.24	40.26	11200.1	9200.1	30.61	33.02	33.86	12200.1	9200.1	42.26	42.56	36.53
9800.1	9600.1	33.89	35.67	38.02	11600.1	9600.1	31.60	33.56	35.30	12600.1	9600.1	40.47	39.80	38.01
10200.1	10000.1	35.82	39.06	39.81	12000.1	10000.1	32.31	32.18	32.03	13000.1	10000.1	30.80	33.51	35.74
10600.1	10400.1	36.27	38.27	37.65	12400.1	10400.1	36.04	35.50	34.77	13400.1	10400.1	39.79	45.62	42.11
11000.1	10800.1	36.84	36.83	35.04	12800.1	10800.1	28.51	28.22	27.96	13800.1	10800.1	37.26	41.80	39.56
11400.1	11200.1	41.25	41.32	37.30	13200.1	11200.1	32.22	30.57	29.36	14200.1	11200.1	44.04	44.61	37.62
11800.1	11600.1	34.27	32.91	31.68	13600.1	11600.1	30.18	29.02	27.96	14600.1	11600.1	33.44	31.94	30.65
12200.1	12000.1	30.87	29.33	28.19	14000.1	12000.1	26.65	26.57	26.50	15000.1	12000.1	31.70	31.57	31.45
12600.1	12400.1	34.77	31.91	30.25	14400.1	12400.1	28.89	27.37	26.65	15400.1	12400.1	27.79	26.57	26.18
13000.1	12800.1	30.55	28.32	26.55	14800.1	12800.1	26.76	25.32	24.13	15800.1	12800.1	30.81	29.37	27.90
13400.1	13200.1	36.23	32.65	30.36	15200.1	13200.1	26.32	25.28	24.50	16200.1	13200.1	30.05	29.42	28.70
13800.1	13600.1	30.17	28.60	27.59	15600.1	13600.1	26.20	25.48	24.88	16600.1	13600.1	28.30	28.32	28.25
14200.1	14000.1	30.12	28.78	27.72	16000.1	14000.1	25.82	25.32	24.85	17000.1	14000.1	25.87	26.41	26.61
14600.1	14400.1	28.24	27.27	26.32	16400.1	14400.1	24.61	24.29	23.84	17400.1	14400.1	25.65	26.74	26.90
15000.1	14800.1	26.39	25.66	24.87	16800.1	14800.1	24.73	24.62	24.27	17800.1	14800.1	25.00	26.60	27.21
15200.1	15000.1	24.98	24.61	24.06	17000.1	15000.1	24.14	24.46	24.50	18000.1	15000.1	23.52	25.14	26.01
15400.1	15200.1	23.81	23.82	23.57	17200.1	15200.1	22.86	23.62	23.83	18200.1	15200.1	22.43	24.19	25.25
15800.1	15600.1	21.84	22.64	23.11	17600.1	15600.1	20.59	21.35	21.90	18600.1	15600.1	20.94	22.81	24.26
16200.1	16000.1	20.60	21.59	22.36	18000.1	16000.1	19.75	20.66	21.36	19000.1	16000.1	18.79	20.18	21.57
16600.1	16400.1	19.63	20.40	21.25	18400.1	16400.1	18.45	19.06	19.80	19400.1	16400.1	18.86	19.73	20.77
17000.1	16800.1	19.95	20.64	21.42	18800.1	16800.1	18.66	19.19	19.78	19800.1	16800.1	19.85	20.79	21.79
17400.1	17200.1	19.02	19.64	20.36	19200.1	17200.1	19.56	20.11	20.70	20200.1	17200.1	20.79	21.57	22.55
17800.1	17600.1	19.02	19.65	20.26	19600.1	17600.1	20.83	21.33	21.84	20600.1	17600.1	21.55	22.36	23.24
18200.1	18000.1	20.05	20.82	21.55	20000.1	18000.1	21.65	22.18	22.67	21000.1	18000.1	21.07	22.06	23.08
18600.1	18400.1	21.23	22.10	22.98	20400.1	18400.1	22.22	22.89	23.56	21400.1	18400.1	21.00	22.00	23.14
19000.1	18800.1	21.78	22.63	23.58	20800.1	18800.1	21.99	22.84	23.71	21800.1	18800.1	21.81	22.64	23.67
19400.1	19200.1	22.69	23.42	24.34	21200.1	19200.1	21.79	22.53	23.35	22200.1	19200.1	23.17	24.07	25.19
19800.1	19600.1	23.44	23.86	24.36	21600.1	19600.1	22.01	22.64	23.29	22600.1	19600.1	23.23	24.12	25.02
20200.1	20000.1	24.54	24.66	25.00	22000.1	20000.1	22.07	22.53	22.90	23000.1	20000.1	22.57	23.46	24.15
20600.1	20400.1	24.85	25.20	25.68	22400.1	20400.1	22.56	23.22	23.90	23400.1	20400.1	21.32	22.82	24.12
21000.1	20800.1	25.73	26.28	26.77	22800.1	20800.1	23.19	23.74	24.18	23800.1	20800.1	19.85	23.14	25.16
21400.1	21200.1	26.54	26.88	27.06	23200.1	21200.1	24.32	24.73	24.96	24000.1	21000.1	19.26	22.74	25.19
21800.1	21600.1	28.42	28.25	27.96	23600.1	21600.1	24.50	24.74	24.82	24600.1	21600.1	22.38	24.13	26.63
22200.1	22000.1	29.79	29.15	28.51	24000.1	22000.1	25.66	25.67	25.70	25000.1	22000.1	23.71	25.17	26.10
22600.1	22400.1	28.80	28.44	27.88	24400.1	22400.1	26.11	26.09	25.98	25400.1	22400.1	13.19	16.20	22.25
23000.1	22800.1	29.53	29.11	28.39	24800.1	22800.1	23.86	25.08	25.64	25800.1	22800.1	7.97	8.57	10.35
23400.1	23200.1	29.53	28.84	28.17	25200.1	23200.1	19.84	22.25	24.28	26200.1	23200.1	10.79	12.60	16.30
23800.1	23600.1	30.20	29.51	28.67	25600.1	23600.1	20.99	21.92	23.93	26600.1	23600.1	8.45	12.83	22.30
24000.1	23800.1	30.10	29.66	29.07	26000.1	24000.1	27.31	26.30	25.68	27000.1	24000.1	1.59	5.00	12.51

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	CONVERSION LOSS VS. RF FREQUENCY @IF = 200 MHz @LO (dBm)			RF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. RF FREQUENCY @IF = 2000 MHz @LO (dBm)			RF (OUT) (MHz)	LO (MHz)	CONVERSION LOSS VS. RF FREQUENCY @IF = 3000 MHz @LO (dBm)		
		+17	+18	+19			+17	+18	+19			+17	+18	+19
6000.1	6200.1	9.06	8.71	8.45	6000.1	8000.1	8.42	8.28	8.18	6000.1	9000.1	8.86	8.82	8.80
6200.1	6400.1	7.54	7.33	7.19	6200.1	8200.1	7.55	7.46	7.39	6200.1	9200.1	8.16	8.15	8.16
6400.1	6600.1	7.21	7.06	6.95	6400.1	8400.1	7.19	7.13	7.07	6400.1	9400.1	7.73	7.74	7.75
6800.1	7000.1	7.23	7.18	7.17	6800.1	8800.1	7.00	6.99	7.00	6800.1	9800.1	7.43	7.43	7.44
7200.1	7400.1	7.66	7.57	7.53	7200.1	9200.1	6.91	6.92	6.95	7200.1	10200.1	7.61	7.54	7.52
7600.1	7800.1	7.77	7.72	7.69	7600.1	9600.1	7.14	7.15	7.18	7600.1	10600.1	7.88	7.78	7.73
8000.1	8200.1	7.58	7.54	7.54	8000.1	10000.1	7.33	7.33	7.36	8000.1	11000.1	8.19	8.07	8.00
8400.1	8600.1	7.32	7.29	7.29	8400.1	10400.1	7.45	7.38	7.37	8400.1	11400.1	8.65	8.52	8.43
8800.1	9000.1	7.29	7.26	7.27	8800.1	10800.1	7.85	7.75	7.69	8800.1	11800.1	8.58	8.53	8.51
9200.1	9400.1	7.28	7.27	7.29	9200.1	11200.1	8.08	8.04	8.01	9200.1	12200.1	8.44	8.36	8.34
9600.1	9800.1	7.29	7.30	7.35	9600.1	11600.1	7.87	7.88	7.94	9600.1	12600.1	8.56	8.40	8.27
10000.1	10200.1	7.28	7.29	7.33	10000.1	12000.1	7.77	7.73	7.76	10000.1	13000.1	8.85	8.71	8.59
10400.1	10600.1	7.49	7.45	7.47	10400.1	12400.1	8.26	8.08	7.91	10400.1	13400.1	9.03	8.91	8.81
10800.1	11000.1	7.68	7.69	7.74	10800.1	12800.1	8.57	8.45	8.34	10800.1	13800.1	9.42	9.27	9.15
11200.1	11400.1	7.78	7.75	7.77	11200.1	13200.1	9.01	8.88	8.78	11200.1	14200.1	9.67	9.52	9.40
11600.1	11800.1	7.94	7.86	7.83	11600.1	13600.1	9.33	9.17	9.04	11600.1	14600.1	9.70	9.55	9.44
12000.1	12200.1	8.29	8.11	7.98	12000.1	14000.1	9.27	9.12	9.00	12000.1	15000.1	9.78	9.61	9.49
12400.1	12600.1	8.54	8.41	8.30	12400.1	14400.1	9.42	9.14	8.95	12400.1	15400.1	9.54	9.37	9.25
12800.1	13000.1	8.38	8.26	8.17	12800.1	14800.1	8.97	8.82	8.72	12800.1	15800.1	9.55	9.42	9.32
13200.1	13400.1	8.81	8.63	8.50	13200.1	15200.1	8.99	8.78	8.66	13200.1	16200.1	9.49	9.40	9.33
13600.1	13800.1	8.28	8.11	8.00	13600.1	15600.1	8.72	8.58	8.49	13600.1	16600.1	9.15	9.10	9.07
14000.1	14200.1	8.36	8.14	8.00	14000.1	16000.1	8.55	8.47	8.40	14000.1	17000.1	8.85	8.81	8.84
14400.1	14600.1	8.30	8.04	7.88	14400.1	16400.1	8.29	8.26	8.27	14400.1	17400.1	8.60	8.60	8.68
14800.1	15000.1	8.17	7.94	7.80	14800.1	16800.1	8.30	8.28	8.31	14800.1	17800.1	8.54	8.56	8.66
15000.1	15200.1	8.30	8.06	7.91	15000.1	17000.1	8.30	8.29	8.34	15000.1	18000.1	8.60	8.59	8.66
15200.1	15400.1	8.23	8.02	7.90	15200.1	17200.1	8.20	8.24	8.34	15200.1	18200.1	8.63	8.64	8.72
15600.1	15800.1	8.46	8.23	8.10	15600.1	17600.1	8.13	8.19	8.31	15600.1	18600.1	8.67	8.68	8.80
16000.1	16200.1	8.59	8.43	8.34	16000.1	18000.1	8.35	8.36	8.46	16000.1	19000.1	8.79	8.68	8.72
16400.1	16600.1	8.98	8.85	8.82	16400.1	18400.1	8.72	8.74	8.84	16400.1	19400.1	9.49	9.31	9.27
16800.1	17000.1	9.81	9.58	9.52	16800.1	18800.1	9.45	9.36	9.38	16800.1	19800.1	10.60	10.31	10.18
17200.1	17400.1	9.98	9.92	9.91	17200.1	19200.1	10.54	10.26	10.13	17200.1	20200.1	10.94	10.75	10.68
17600.1	17800.1	10.11	9.97	9.95	17600.1	19600.1	10.76	10.62	10.59	17600.1	20600.1	10.96	10.77	10.71
18000.1	18200.1	10.45	10.18	10.05	18000.1	20000.1	10.76	10.70	10.74	18000.1	21000.1	11.09	10.76	10.63
18400.1	18600.1	11.02	10.66	10.45	18400.1	20400.1	10.98	10.80	10.76	18400.1	21400.1	11.04	10.83	10.73
18800.1	19000.1	11.09	10.80	10.62	18800.1	20800.1	10.97	10.80	10.76	18800.1	21800.1	11.25	11.03	10.91
19200.1	19400.1	10.89	10.73	10.65	19200.1	21200.1	11.06	10.90	10.84	19200.1	22200.1	11.82	11.47	11.26
19600.1	19800.1	10.89	10.63	10.51	19600.1	21600.1	11.15	10.95	10.87	19600.1	22600.1	11.72	11.49	11.36
20000.1	20200.1	10.63	10.42	10.34	20000.1	22000.1	11.09	10.89	10.80	20000.1	23000.1	11.64	11.43	11.30
20400.1	20600.1	10.03	9.90	9.87	20400.1	22400.1	10.64	10.47	10.39	20400.1	23400.1	11.28	11.06	10.90
20800.1	21000.1	9.62	9.49	9.47	20800.1	22800.1	10.48	10.22	10.05	20800.1	23800.1	11.06	10.86	10.71
21200.1	21400.1	9.26	9.24	9.28	21200.1	23200.1	10.20	10.02	9.91	21000.1	24000.1	11.15	10.95	10.78
21600.1	21800.1	9.10	9.10	9.16	21600.1	23600.1	10.68	10.50	10.35	21600.1	24600.1	11.66	11.48	11.33
22000.1	22200.1	9.23	9.14	9.14	22000.1	24000.1	11.08	10.89	10.74	22000.1	25000.1	11.32	11.16	11.04
22400.1	22600.1	9.48	9.41	9.42	22400.1	24400.1	10.58	10.43	10.32	22400.1	25400.1	10.84	10.69	10.60
22800.1	23000.1	9.82	9.70	9.63	22800.1	24800.1	10.08	9.95	9.86	22800.1	25800.1	11.53	11.05	10.77
23200.1	23400.1	10.03	9.86	9.74	23200.1	25200.1	9.97	9.81	9.71	23200.1	26200.1	12.08	11.34	10.97
23600.1	23800.1	9.92	9.77	9.65	23600.1	25600.1	10.20	9.99	9.86	23600.1	26600.1	13.43	12.12	11.58
23800.1	24000.1	9.99	9.83	9.70	24000.1	26000.1	11.30	10.93	10.70	24000.1	27000.1	25.74	16.97	13.39

Typical Performance Data

IF (MHz)	RF (IN) (MHz)	CONVERSION LOSS VS. IF FREQUENCY @ Fixed LO = 6.3 GHz @LO (dBm)			IF (MHz)	RF (IN) (MHz)	CONVERSION LOSS VS. IF FREQUENCY @ Fixed LO = 15.25 GHz @LO (dBm)			IF (MHz)	RF (IN) (MHz)	CONVERSION LOSS VS. IF FREQUENCY @ Fixed LO = 24.7GHz @LO (dBm)		
		+17	+18	+19			+17	+18	+19			+17	+18	+19
10	6310.1	7.34	7.03	6.78	10	15260	7.98	7.68	7.63	10	24690.1	10.90	10.68	10.52
50	6350.1	7.20	6.88	6.63	50	15300	8.19	7.86	7.80	50	24650.1	10.84	10.63	10.46
100	6400.1	7.10	6.77	6.52	100	15350	8.00	7.69	7.69	100	24600.1	10.75	10.55	10.39
200	6500.1	6.90	6.58	6.31	200	15450	8.23	7.92	7.89	200	24500.1	10.51	10.31	10.16
300	6600.1	6.86	6.51	6.23	300	15550	8.51	8.22	8.20	300	24400.1	10.48	10.28	10.13
400	6700.1	6.87	6.51	6.22	400	15650	8.66	8.36	8.29	400	24300.1	10.38	10.19	10.03
500	6800.1	6.98	6.61	6.30	600	15850	8.84	8.56	8.49	500	24200.1	10.34	10.14	10.00
600	6900.1	7.11	6.73	6.41	800	16050	9.23	8.91	8.86	600	24100.1	10.25	10.06	9.91
700	7000.1	7.16	6.77	6.45	1000	16250	9.42	9.07	9.02	700	24000.1	10.19	10.00	9.86
800	7100.1	7.23	6.84	6.52	1200	16450	9.74	9.42	9.37	800	23900.1	10.17	9.97	9.82
900	7200.1	7.38	6.99	6.66	1400	16650	10.26	9.94	9.90	900	23800.1	10.18	9.99	9.84
1000	7300.1	7.42	7.03	6.71	1600	16850	10.36	10.05	10.03	1000	23700.1	10.09	9.90	9.75
1100	7400.1	7.46	7.09	6.77	1800	17050	10.49	10.23	10.24	1100	23600.1	10.08	9.89	9.75
1200	7500.1	7.61	7.24	6.93	2000	17250	10.65	10.38	10.39	1200	23500.1	10.06	9.87	9.73
1300	7600.1	7.69	7.33	7.04	2200	17450	11.34	11.03	11.05	1300	23400.1	10.03	9.84	9.71
1400	7700.1	7.76	7.41	7.13	2400	17650	11.55	11.22	11.19	1400	23300.1	10.02	9.84	9.71
1500	7800.1	7.68	7.34	7.07	2600	17850	11.66	11.33	11.29	1500	23200.1	10.01	9.84	9.71
1600	7900.1	7.71	7.37	7.11	2800	18050	11.54	11.18	11.10	1600	23100.1	10.05	9.88	9.75
1700	8000.1	7.73	7.41	7.15	3000	18250	12.13	11.75	11.68	1700	23000.1	10.09	9.92	9.80
1800	8100.1	7.76	7.44	7.19	3200	18450	11.96	11.53	11.46	1800	22900.1	10.20	10.04	9.92
1900	8200.1	7.83	7.50	7.25	3400	18650	11.96	11.50	11.40	1900	22800.1	10.24	10.09	9.97
2000	8300.1	7.71	7.40	7.28	3600	18850	12.38	11.90	11.80	2000	22700.1	10.21	10.06	9.95
2100	8400.1	7.78	7.48	7.37	3700	18950	12.53	12.01	11.90	2100	22600.1	10.43	10.29	10.18
2200	8500.1	7.91	7.62	7.54	3800	19050	12.95	12.39	12.27	2200	22500.1	10.58	10.44	10.32
2300	8600.1	7.91	7.66	7.57	3900	19150	12.70	12.18	12.08	2300	22400.1	10.70	10.56	10.44
2400	8700.1	7.98	7.72	7.64	4000	19250	13.00	12.41	12.27	2400	22300.1	10.83	10.69	10.57
2500	8800.1	8.05	7.85	7.76	4100	19350	13.07	12.48	12.29	2500	22200.1	11.03	10.88	10.76
2600	8900.1	8.27	8.05	7.95	4200	19450	12.95	12.36	12.19	2600	22100.1	11.24	11.09	10.97
2700	9000.1	8.30	8.15	8.05	4300	19550	13.30	12.68	12.52	2700	22000.1	11.27	11.12	10.99
2800	9100.1	8.37	8.09	7.99	4400	19650	13.28	12.69	12.49	2800	21900.1	11.39	11.23	11.09
2900	9200.1	8.47	8.19	8.06	4600	19850	13.39	12.72	12.54	2900	21800.1	11.52	11.35	11.21
3000	9300.1	8.62	8.34	8.24	4800	20050	13.45	12.78	12.55	3000	21700.1	11.72	11.53	11.39
3100	9400.1	8.68	8.39	8.24	5000	20250	13.61	12.85	12.58	3200	21500.1	11.74	11.55	11.39
3200	9500.1	8.67	8.39	8.28	5200	20450	13.86	13.11	12.81	3400	21300.1	11.92	11.70	11.53
3300	9600.1	8.61	8.35	8.26	5400	20650	14.25	13.44	13.11	3600	21100.1	11.88	11.67	11.49
3400	9700.1	8.67	8.46	8.37	5600	20850	14.25	13.38	13.06	3800	20900.1	12.02	11.79	11.60
3600	9900.1	8.71	8.55	8.48	5800	21050	14.61	13.75	13.43	4000	20700.1	12.30	12.07	11.87
3800	10100.1	8.74	8.62	8.57	6000	21250	14.89	14.07	13.74	4200	20500.1	12.47	12.23	12.04
4000	10300.1	8.84	8.75	8.73	6200	21450	15.07	14.28	13.96	4400	20300.1	12.55	12.30	12.10
4200	10500.1	8.92	8.85	8.85	6400	21650	15.10	14.31	13.99	4600	20100.1	12.62	12.37	12.17
4400	10700.1	9.28	9.24	9.26	6600	21850	15.29	14.48	14.20	4800	19900.1	12.67	12.41	12.20
4600	10900.1	9.28	9.24	9.28	6800	22050	15.17	14.39	14.06	5000	19700.1	12.80	12.52	12.31
4800	11100.1	9.76	9.72	9.76	7000	22250	15.10	14.28	13.98	5200	19500.1	12.98	12.69	12.46
5000	11300.1	9.62	9.59	9.65	7200	22450	15.67	14.83	14.45	5400	19300.1	13.02	12.72	12.48
5200	11500.1	9.97	9.92	9.99	7400	22650	15.74	14.84	14.47	5600	19100.1	13.19	12.89	12.66
5400	11700.1	9.78	9.75	9.83	7600	22850	16.31	15.36	14.95	5800	18900.1	13.30	13.01	12.77
5600	11900.1	9.92	9.90	10.00	7800	23050	16.56	15.60	15.21	6000	18700.1	13.35	13.07	12.85
5700	12000.1	10.02	9.99	10.10	8000	23250	17.05	16.11	15.72	6200	18500.1	13.33	13.07	12.87

Frequency Mixer Die SMIQ-6243H-D+

Typical Performance Data

LO (IN) (MHz)	LO-RF ISOLATION (dB)			LO-IF (I) ISOLATION (dB)			LO-IF (Q) ISOLATION (dB)		
	@LO (dBm)			@LO (dBm)			@LO (dBm)		
	+17	+18	+19	+17	+18	+19	+17	+18	+19
6000.1	46.37	46.55	46.63	37.11	37.02	36.99	38.27	38.26	38.26
6400.1	46.00	46.50	46.85	38.80	38.48	38.30	39.37	39.30	39.24
6800.1	45.25	46.14	46.84	39.72	39.20	38.84	42.21	41.82	41.45
7200.1	44.29	45.40	46.49	42.15	41.40	40.83	48.55	46.97	45.66
7600.1	44.74	45.92	47.01	44.18	43.22	42.45	51.00	49.08	47.40
8000.1	44.37	45.74	47.11	44.96	44.39	43.78	46.64	46.83	46.33
8400.1	42.32	43.48	44.70	44.64	45.21	45.38	44.22	45.12	45.43
8800.1	40.86	41.68	42.50	44.26	45.16	45.72	42.25	43.22	43.84
9200.1	40.22	40.92	41.59	43.38	43.78	44.05	41.90	42.47	42.72
9600.1	39.64	40.33	41.00	44.04	44.53	44.77	41.67	42.13	42.34
10000.1	38.72	39.42	40.14	44.14	44.83	45.27	40.99	41.41	41.62
10400.1	38.10	38.74	39.40	45.91	46.56	47.00	41.49	41.82	42.03
10800.1	37.73	38.34	38.97	49.45	50.10	50.57	43.30	43.58	43.77
11200.1	37.51	38.05	38.62	54.45	54.95	55.29	45.72	45.86	45.95
11600.1	37.30	37.87	38.47	60.86	62.63	63.39	47.51	47.66	47.74
12000.1	37.71	38.22	38.81	58.67	61.30	63.69	47.95	48.20	48.35
12400.1	38.34	38.87	39.36	60.58	61.90	63.13	48.92	49.21	49.35
12800.1	38.56	39.25	39.92	55.19	55.55	55.88	51.11	51.16	51.12
13200.1	38.97	39.81	40.65	50.77	51.30	51.82	51.39	51.54	51.69
13600.1	38.59	39.41	40.23	48.75	49.24	49.72	50.20	50.51	50.81
14000.1	38.78	39.77	40.79	48.39	48.87	49.34	48.57	48.93	49.28
14400.1	38.50	39.60	40.77	47.90	48.37	48.85	47.20	47.55	47.90
14800.1	38.29	39.45	40.66	48.02	48.55	49.07	46.92	47.19	47.47
15000.1	38.27	39.44	40.66	48.54	49.08	49.63	47.15	47.30	47.47
15200.1	38.37	39.66	41.00	51.10	51.65	52.24	47.31	47.34	47.39
15400.1	38.85	40.43	42.15	53.63	54.10	54.67	45.99	46.05	46.12
15600.1	39.25	41.12	43.25	62.52	63.22	64.15	44.75	44.82	44.90
16000.1	39.12	41.02	43.22	62.17	61.81	61.48	46.88	46.92	47.02
16400.1	40.02	42.63	46.30	61.12	61.89	62.76	49.60	49.64	49.70
16800.1	39.56	41.68	44.47	56.22	56.36	56.56	49.75	49.61	49.47
17200.1	38.84	40.19	41.81	51.16	50.94	50.74	48.54	48.42	48.28
17600.1	38.41	39.37	40.44	50.41	50.33	50.22	47.90	47.90	47.87
18000.1	38.34	39.25	40.23	51.19	51.36	51.50	49.07	49.20	49.32
18400.1	37.94	38.62	39.31	50.25	50.52	50.75	50.40	50.75	51.10
18800.1	38.50	39.24	40.00	48.64	48.96	49.24	50.44	50.92	51.38
19200.1	38.94	39.64	40.32	46.25	46.61	46.96	49.35	49.90	50.46
19600.1	38.91	39.60	40.30	42.46	42.77	43.06	47.12	47.60	48.09
20000.1	38.50	39.01	39.46	39.81	40.00	40.20	45.76	46.14	46.56
20400.1	38.52	39.12	39.71	39.71	39.76	39.84	44.17	44.34	44.55
20800.1	37.97	38.67	39.35	39.54	39.53	39.52	42.12	42.20	42.30
21200.1	37.58	38.25	38.87	39.39	39.21	39.03	41.41	41.32	41.19
21600.1	37.60	38.30	38.95	38.40	37.98	37.59	41.06	40.70	40.33
22000.1	37.59	38.25	38.85	35.60	34.95	34.40	39.39	38.73	38.10
22400.1	36.56	37.06	37.46	31.87	31.19	30.64	36.46	35.68	35.04
22800.1	36.05	36.64	37.15	31.29	30.61	30.02	35.68	34.90	34.20
23200.1	35.02	35.60	36.12	29.49	28.93	28.44	33.37	32.78	32.26
23600.1	34.58	35.20	35.78	28.87	28.43	28.00	33.01	32.61	32.21
24000.1	34.48	35.30	36.09	27.26	27.06	26.90	31.85	31.72	31.61

Frequency Mixer Die SMIQ-6243H-D+

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	RF-IF (I) ISOLATION (dB) @LO (dBm)			RF-IF (Q) ISOLATION (dB) @LO (dBm)		
		+17	+18	+19	+17	+18	+19
6000.1	6200.1	23.83	24.02	24.13	23.22	23.33	23.46
6200.1	6400.1	22.42	22.57	22.64	22.48	22.64	22.83
6400.1	6600.1	21.89	22.03	22.10	22.32	22.45	22.61
6800.1	7000.1	22.00	22.03	22.00	22.94	23.06	23.22
7200.1	7400.1	23.19	23.15	23.05	24.53	24.51	24.52
7600.1	7800.1	24.94	24.84	24.69	26.77	26.63	26.51
8000.1	8200.1	26.68	26.53	26.32	28.45	28.33	28.19
8400.1	8600.1	28.55	28.42	28.21	29.36	29.24	29.14
8800.1	9000.1	29.53	29.45	29.33	31.36	31.27	31.14
9200.1	9400.1	29.59	29.37	29.15	31.96	31.95	31.92
9600.1	9800.1	29.16	28.94	28.71	32.40	32.33	32.26
10000.1	10200.1	28.10	27.88	27.66	32.14	32.11	32.08
10400.1	10600.1	28.05	27.90	27.75	32.65	32.59	32.54
10800.1	11000.1	28.92	28.73	28.61	33.39	33.37	33.39
11200.1	11400.1	30.66	30.44	30.28	36.05	35.89	35.76
11600.1	11800.1	31.17	30.99	30.83	38.28	37.90	37.57
12000.1	12200.1	30.66	30.61	30.59	39.70	39.41	39.15
12400.1	12600.1	30.07	29.98	29.91	36.52	36.47	36.44
12800.1	13000.1	30.13	30.03	29.95	33.60	33.57	33.55
13200.1	13400.1	31.33	31.25	31.21	31.85	31.82	31.80
13600.1	13800.1	33.24	33.16	33.10	30.52	30.49	30.49
14000.1	14200.1	37.75	37.69	37.64	30.26	30.27	30.28
14400.1	14600.1	47.69	49.42	50.95	30.37	30.42	30.45
14800.1	15000.1	37.20	37.67	38.03	31.29	31.33	31.36
15000.1	15200.1	33.72	34.11	34.37	32.51	32.58	32.63
15200.1	15400.1	32.20	32.54	32.77	34.02	34.20	34.32
15600.1	15800.1	28.52	28.83	29.06	34.08	34.53	34.86
16000.1	16200.1	27.35	27.68	27.94	32.04	32.28	32.49
16400.1	16600.1	26.65	26.96	27.23	31.52	31.72	31.89
16800.1	17000.1	25.38	25.66	25.90	30.36	30.53	30.67
17200.1	17400.1	25.59	25.81	26.01	29.92	30.02	30.11
17600.1	17800.1	27.70	27.87	28.02	30.67	30.72	30.77
18000.1	18200.1	29.45	29.58	29.71	32.49	32.53	32.56
18400.1	18600.1	30.44	30.53	30.63	34.45	34.49	34.52
18800.1	19000.1	30.52	30.61	30.67	35.33	35.34	35.37
19200.1	19400.1	29.51	29.58	29.65	35.32	35.34	35.35
19600.1	19800.1	28.19	28.25	28.29	35.41	35.43	35.45
20000.1	20200.1	28.21	28.25	28.27	39.26	39.24	39.24
20400.1	20600.1	28.92	28.96	28.96	48.73	48.31	48.01
20800.1	21000.1	29.93	30.00	30.02	40.63	40.65	40.74
21200.1	21400.1	30.74	30.77	30.79	37.50	37.59	37.66
21600.1	21800.1	31.02	31.07	31.09	35.56	35.74	35.92
22000.1	22200.1	30.73	30.85	30.93	33.17	33.44	33.68
22400.1	22600.1	30.26	30.39	30.49	30.60	30.81	31.03
22800.1	23000.1	31.21	31.47	31.72	28.29	28.48	28.68
23200.1	23400.1	33.93	34.27	34.55	28.22	28.40	28.60
23600.1	23800.1	35.01	35.20	35.22	28.79	28.93	29.07
23800.1	24000.1	34.86	35.21	35.46	28.97	29.12	29.27

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	AMP UNBALANCE VS. RF FREQUENCY @IF = 200 MHz			PHASE UNBALANCE VS. RF FREQUENCY @IF = 200 MHz		
		@LO (dBm)			@LO (dBm)		
		+17	+18	+19	+17	+18	+19
6000.1	6200.1	1.21	1.02	0.82	3.87	4.34	4.55
6200.1	6400.1	0.56	0.46	0.35	4.03	4.49	4.69
6400.1	6600.1	0.42	0.34	0.25	2.39	2.86	3.11
6800.1	7000.1	-0.03	-0.10	-0.20	1.75	1.03	0.70
7200.1	7400.1	-0.05	-0.14	-0.24	6.09	4.88	3.70
7600.1	7800.1	0.00	-0.08	-0.17	4.58	3.68	2.71
8000.1	8200.1	-0.08	-0.11	-0.17	0.52	0.51	0.44
8400.1	8600.1	-0.07	-0.11	-0.16	0.88	0.67	0.65
8800.1	9000.1	-0.01	-0.06	-0.12	3.10	2.11	1.21
9200.1	9400.1	0.01	-0.03	-0.08	3.19	2.73	2.17
9600.1	9800.1	-0.03	-0.06	-0.10	2.18	1.55	1.05
10000.1	10200.1	0.01	-0.05	-0.09	2.58	1.77	1.04
10400.1	10600.1	0.02	-0.03	-0.07	2.16	1.32	0.61
10800.1	11000.1	-0.01	-0.03	-0.05	1.82	0.88	0.19
11200.1	11400.1	-0.14	-0.15	-0.17	1.21	0.29	0.55
11600.1	11800.1	0.09	0.13	0.14	0.95	0.25	0.42
12000.1	12200.1	-0.18	-0.13	-0.07	1.56	2.19	2.58
12400.1	12600.1	-0.11	-0.11	-0.10	0.27	1.37	2.30
12800.1	13000.1	0.08	0.10	0.11	0.80	1.85	2.80
13200.1	13400.1	-0.39	-0.33	-0.29	1.01	1.81	2.48
13600.1	13800.1	-0.11	-0.05	-0.01	1.84	2.43	2.90
14000.1	14200.1	-0.28	-0.17	-0.11	2.27	2.68	3.15
14400.1	14600.1	-0.34	-0.20	-0.12	3.46	3.73	4.21
14800.1	15000.1	-0.18	-0.07	0.00	4.76	4.88	5.22
15000.1	15200.1	-0.20	-0.09	-0.02	6.23	5.76	5.86
15200.1	15400.1	-0.15	-0.06	0.00	7.51	6.66	6.39
15600.1	15800.1	-0.25	-0.14	-0.09	9.86	8.64	7.77
16000.1	16200.1	-0.11	-0.03	-0.01	10.61	9.56	8.41
16400.1	16600.1	-0.07	0.03	0.06	11.16	10.23	9.21
16800.1	17000.1	-0.13	0.00	0.07	11.52	10.61	9.60
17200.1	17400.1	0.06	0.18	0.25	11.65	10.51	9.34
17600.1	17800.1	-0.12	-0.03	0.04	11.54	10.49	9.45
18000.1	18200.1	-0.28	-0.20	-0.15	10.53	9.51	8.52
18400.1	18600.1	-0.20	-0.14	-0.11	9.20	8.18	7.21
18800.1	19000.1	-0.15	-0.13	-0.11	8.62	7.74	6.82
19200.1	19400.1	-0.07	-0.05	-0.04	7.00	6.32	5.61
19600.1	19800.1	-0.03	-0.02	0.00	6.12	5.68	5.28
20000.1	20200.1	0.05	0.06	0.07	4.94	4.67	4.35
20400.1	20600.1	0.12	0.09	0.08	4.47	4.05	3.64
20800.1	21000.1	0.17	0.12	0.10	3.67	3.28	2.94
21200.1	21400.1	0.18	0.17	0.17	2.12	2.13	2.12
21600.1	21800.1	0.18	0.17	0.18	1.01	1.27	1.49
22000.1	22200.1	0.18	0.15	0.15	0.21	0.33	0.71
22400.1	22600.1	0.27	0.26	0.26	0.60	0.24	0.56
22800.1	23000.1	0.27	0.26	0.25	0.25	0.60	1.08
23200.1	23400.1	0.34	0.31	0.28	0.34	0.89	1.46
23600.1	23800.1	0.31	0.27	0.24	0.49	0.94	1.40
23800.1	24000.1	0.27	0.22	0.17	0.78	1.29	1.71

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	AMP UNBALANCE VS. RF FREQUENCY @IF = 2000 MHz			PHASE UNBALANCE VS. RF FREQUENCY @IF = 2000 MHz		
		@LO (dBm)			@LO (dBm)		
		+17	+18	+19	+17	+18	+19
6000.1	8000.1	0.71	0.57	0.44	4.10	3.09	2.39
6200.1	8200.1	0.53	0.44	0.33	3.51	2.66	2.00
6400.1	8400.1	0.39	0.31	0.23	2.00	1.52	1.16
6800.1	8800.1	0.21	0.16	0.10	0.69	0.64	0.58
7200.1	9200.1	0.05	0.04	0.00	1.85	1.50	1.08
7600.1	9600.1	0.10	0.08	0.05	2.89	2.64	2.47
8000.1	10000.1	0.19	0.16	0.13	3.21	2.49	1.97
8400.1	10400.1	0.24	0.19	0.14	2.93	2.05	1.33
8800.1	10800.1	0.37	0.32	0.28	2.64	1.63	0.78
9200.1	11200.1	0.34	0.33	0.30	2.66	1.76	0.93
9600.1	11600.1	0.30	0.29	0.28	2.05	1.24	0.46
10000.1	12000.1	0.21	0.25	0.29	0.32	0.38	0.45
10400.1	12400.1	-0.19	-0.17	-0.11	0.43	0.90	1.59
10800.1	12800.1	0.29	0.31	0.31	1.47	0.30	1.02
11200.1	13200.1	0.13	0.18	0.23	0.76	1.69	2.49
11600.1	13600.1	0.21	0.26	0.29	0.56	1.15	1.65
12000.1	14000.1	0.17	0.26	0.31	3.75	3.96	4.21
12400.1	14400.1	-0.24	-0.12	-0.04	2.00	2.25	2.60
12800.1	14800.1	-0.02	0.14	0.23	4.14	4.15	4.39
13200.1	15200.1	-0.04	0.09	0.19	5.31	4.81	4.66
13600.1	15600.1	0.11	0.17	0.22	5.83	5.38	5.17
14000.1	16000.1	0.36	0.44	0.44	7.32	6.58	5.92
14400.1	16400.1	0.38	0.49	0.54	8.32	7.70	6.93
14800.1	16800.1	0.32	0.42	0.46	8.37	7.75	6.99
15000.1	17000.1	0.39	0.47	0.50	8.58	8.01	7.28
15200.1	17200.1	0.47	0.52	0.54	8.71	8.02	7.20
15600.1	17600.1	0.44	0.49	0.49	9.37	8.50	7.55
16000.1	18000.1	0.43	0.49	0.50	9.60	8.41	7.31
16400.1	18400.1	0.37	0.43	0.47	9.99	8.83	7.72
16800.1	18800.1	0.15	0.19	0.23	8.51	7.70	6.88
17200.1	19200.1	0.11	0.14	0.18	6.97	6.22	5.50
17600.1	19600.1	0.26	0.27	0.30	5.64	4.92	4.27
18000.1	20000.1	0.26	0.27	0.29	5.00	4.60	4.22
18400.1	20400.1	0.33	0.32	0.32	4.32	4.05	3.61
18800.1	20800.1	0.38	0.35	0.34	3.47	3.08	2.71
19200.1	21200.1	0.36	0.33	0.31	1.97	1.83	1.73
19600.1	21600.1	0.38	0.33	0.33	0.38	0.47	0.54
20000.1	22000.1	0.40	0.37	0.37	0.74	0.43	0.35
20400.1	22400.1	0.43	0.40	0.40	1.11	0.60	0.37
20800.1	22800.1	0.49	0.44	0.41	1.87	1.30	0.85
21200.1	23200.1	0.43	0.41	0.40	1.92	1.36	0.90
21600.1	23600.1	0.66	0.62	0.59	2.15	1.59	1.06
22000.1	24000.1	0.66	0.63	0.59	1.71	1.10	0.64
22400.1	24400.1	0.66	0.61	0.57	1.06	0.56	0.36
22800.1	24800.1	0.88	0.83	0.78	0.49	0.33	0.47
23200.1	25200.1	1.00	0.94	0.89	2.09	2.33	2.40
23600.1	25600.1	0.57	0.51	0.48	3.48	3.35	3.05
24000.1	26000.1	0.73	0.57	0.49	1.96	1.97	1.72

Typical Performance Data

RF (IN) (MHz)	LO (MHz)	AMP UNBALANCE VS. RF FREQUENCY @IF = 3000 MHz			PHASE UNBALANCE VS. RF FREQUENCY @IF = 3000 MHz		
		@LO (dBm)			@LO (dBm)		
		+17	+18	+19	+17	+18	+19
6000.1	9000.1	0.69	0.62	0.53	0.89	0.90	0.91
6200.1	9200.1	0.63	0.58	0.52	1.08	0.97	0.89
6400.1	9400.1	0.58	0.54	0.50	1.54	1.53	1.50
6800.1	9800.1	0.49	0.46	0.42	1.71	1.50	1.40
7200.1	10200.1	0.52	0.47	0.43	2.21	1.50	0.95
7600.1	10600.1	0.48	0.44	0.41	3.04	2.12	1.35
8000.1	11000.1	0.47	0.43	0.39	2.69	1.78	0.97
8400.1	11400.1	0.53	0.51	0.48	2.51	1.70	0.94
8800.1	11800.1	0.37	0.35	0.34	1.47	1.13	0.71
9200.1	12200.1	0.46	0.46	0.46	1.09	1.21	0.96
9600.1	12600.1	0.21	0.24	0.29	1.42	2.61	3.44
10000.1	13000.1	0.16	0.19	0.23	1.54	0.52	0.59
10400.1	13400.1	0.54	0.58	0.60	0.20	0.80	1.36
10800.1	13800.1	0.22	0.27	0.29	1.37	1.70	2.02
11200.1	14200.1	0.30	0.39	0.43	1.69	1.75	1.94
11600.1	14600.1	0.14	0.29	0.39	5.04	4.88	4.95
12000.1	15000.1	0.15	0.28	0.36	2.51	2.41	2.49
12400.1	15400.1	0.17	0.29	0.38	4.86	4.46	4.21
12800.1	15800.1	0.31	0.38	0.42	5.38	5.08	4.80
13200.1	16200.1	0.36	0.47	0.51	5.85	5.02	4.28
13600.1	16600.1	0.48	0.57	0.61	6.63	6.04	5.19
14000.1	17000.1	0.43	0.56	0.61	7.10	6.67	5.97
14400.1	17400.1	0.62	0.68	0.69	6.65	6.07	5.41
14800.1	17800.1	0.74	0.77	0.77	7.46	6.58	5.71
15000.1	18000.1	0.70	0.75	0.75	8.38	7.31	6.33
15200.1	18200.1	0.68	0.72	0.73	8.69	7.51	6.40
15600.1	18600.1	0.59	0.65	0.68	8.63	7.49	6.35
16000.1	19000.1	0.39	0.44	0.50	8.56	7.56	6.57
16400.1	19400.1	0.32	0.34	0.37	6.76	5.90	5.14
16800.1	19800.1	0.31	0.29	0.31	5.99	5.19	4.57
17200.1	20200.1	0.39	0.39	0.39	4.56	3.89	3.27
17600.1	20600.1	0.44	0.41	0.40	3.57	2.92	2.31
18000.1	21000.1	0.57	0.48	0.45	2.39	1.89	1.54
18400.1	21400.1	0.50	0.44	0.42	0.92	0.86	0.80
18800.1	21800.1	0.52	0.47	0.45	0.40	0.34	0.33
19200.1	22200.1	0.59	0.50	0.47	1.67	1.17	0.80
19600.1	22600.1	0.55	0.51	0.49	2.09	1.70	1.39
20000.1	23000.1	0.63	0.57	0.53	2.09	1.62	1.27
20400.1	23400.1	0.74	0.70	0.67	2.80	2.24	1.76
20800.1	23800.1	0.75	0.70	0.67	2.90	2.39	1.94
21000.1	24000.1	0.89	0.83	0.78	3.28	2.68	2.14
21600.1	24600.1	0.93	0.90	0.87	2.12	1.79	1.52
22000.1	25000.1	1.04	1.00	0.97	1.45	1.18	0.99
22400.1	25400.1	1.13	1.07	1.02	0.32	0.30	0.32
22800.1	25800.1	1.56	1.30	1.15	3.42	3.37	3.09
23200.1	26200.1	1.60	1.10	0.87	4.80	4.02	3.14
23600.1	26600.1	2.50	1.49	1.13	5.85	5.36	4.55
24000.1	27000.1	13.74	5.75	2.58	10.08	4.34	6.95

Typical Performance Data

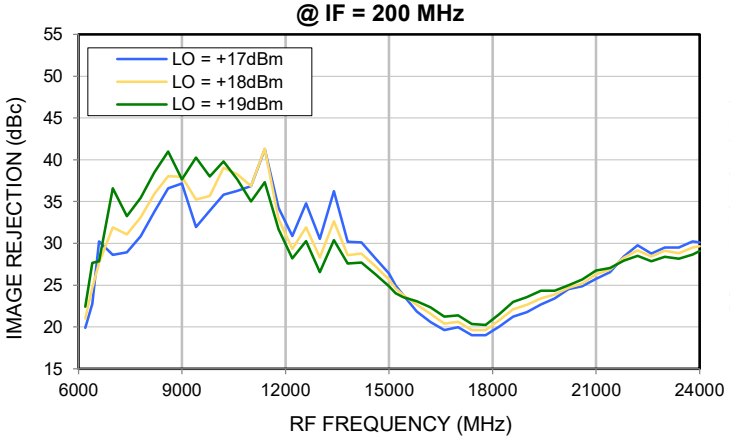
RF (IN) (MHz)	GAIN COMPRESSION (I)			GAIN COMPRESSION (Q)			GAIN COMPRESSION (I)			GAIN COMPRESSION (Q)			GAIN COMPRESSION (I)			GAIN COMPRESSION (Q)		
	IF = LO-RF = 200MHz						IF = LO-RF = 2000MHz						IF = LO-RF = 3000MHz					
	@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)		
	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19
6000.1	0.53	0.51	0.48	0.20	0.29	0.34	0.02	0.01	0.00	0.05	0.05	0.05	0.18	0.15	0.13	0.20	0.16	0.14
6200.1	0.94	0.89	0.81	0.81	0.77	0.71	0.12	0.11	0.08	0.17	0.12	0.09	0.27	0.23	0.20	0.34	0.27	0.22
6400.1	0.90	0.84	0.78	0.88	0.80	0.72	0.24	0.23	0.19	0.39	0.31	0.26	0.42	0.37	0.33	0.55	0.45	0.39
6800.1	0.28	0.25	0.23	0.47	0.40	0.34	0.35	0.34	0.29	0.53	0.44	0.38	0.60	0.53	0.47	0.76	0.64	0.55
7200.1	0.16	0.16	0.15	0.09	0.07	0.05	0.29	0.28	0.24	0.48	0.40	0.34	0.53	0.48	0.42	0.60	0.53	0.46
7600.1	0.04	0.04	0.05	0.12	0.10	0.09	0.33	0.31	0.26	0.48	0.40	0.34	0.41	0.39	0.36	0.46	0.42	0.39
8000.1	0.07	0.08	0.09	0.21	0.18	0.17	0.38	0.36	0.30	0.47	0.40	0.35	0.28	0.26	0.24	0.27	0.26	0.25
8400.1	0.03	0.01	0.00	0.07	0.06	0.05	0.23	0.23	0.19	0.27	0.26	0.24	0.01	0.00	0.01	0.06	0.05	0.04
8800.1	0.08	0.09	0.10	0.16	0.15	0.14	0.18	0.21	0.19	0.16	0.17	0.19	0.07	0.07	0.07	0.09	0.09	0.08
9200.1	0.10	0.10	0.10	0.19	0.17	0.16	0.09	0.11	0.09	0.08	0.07	0.07	0.05	0.07	0.07	0.08	0.10	0.11
9600.1	0.17	0.17	0.17	0.25	0.23	0.22	0.24	0.25	0.22	0.25	0.23	0.22	0.14	0.07	0.00	0.01	0.07	0.12
10000.1	0.27	0.26	0.25	0.30	0.28	0.27	0.24	0.28	0.26	0.27	0.27	0.26	0.04	0.00	0.04	0.03	0.00	0.04
10400.1	0.17	0.18	0.18	0.18	0.19	0.19	0.09	0.00	0.04	0.04	0.09	0.13	0.05	0.04	0.02	0.08	0.07	0.05
10800.1	0.22	0.22	0.23	0.23	0.22	0.23	0.06	0.09	0.09	0.00	0.03	0.07	0.02	0.02	0.01	0.03	0.03	0.05
11200.1	0.14	0.14	0.15	0.14	0.14	0.15	0.06	0.02	0.03	0.08	0.07	0.05	0.01	0.01	0.01	0.02	0.01	0.01
11600.1	0.14	0.16	0.17	0.12	0.13	0.13	0.04	0.00	0.01	0.09	0.08	0.06	0.01	0.01	0.01	0.06	0.03	0.02
12000.1	0.16	0.19	0.22	0.22	0.24	0.25	0.09	0.13	0.12	0.07	0.08	0.09	0.15	0.17	0.18	0.25	0.23	0.22
12400.1	0.03	0.03	0.04	0.03	0.06	0.08	0.13	0.06	0.07	0.06	0.05	0.04	0.01	0.03	0.04	0.14	0.13	0.11
12800.1	0.22	0.22	0.21	0.15	0.16	0.17	0.07	0.14	0.13	0.08	0.09	0.09	0.19	0.15	0.14	0.20	0.19	0.19
13200.1	0.18	0.19	0.20	0.18	0.20	0.22	0.17	0.23	0.22	0.15	0.17	0.18	0.34	0.31	0.28	0.28	0.26	0.25
13600.1	0.16	0.16	0.16	0.12	0.13	0.14	0.08	0.10	0.09	0.03	0.05	0.07	0.27	0.23	0.21	0.21	0.17	0.15
14000.1	0.02	0.00	0.00	0.04	0.02	0.02	0.03	0.01	0.03	0.10	0.10	0.08	0.19	0.13	0.08	0.12	0.06	0.02
14400.1	0.11	0.14	0.15	0.09	0.10	0.10	0.19	0.17	0.12	0.09	0.07	0.06	0.43	0.35	0.29	0.29	0.24	0.21
14800.1	0.21	0.27	0.29	0.21	0.22	0.23	0.28	0.27	0.24	0.23	0.20	0.18	0.52	0.46	0.41	0.39	0.35	0.33
15000.1	0.24	0.22	0.21	0.17	0.18	0.18	0.43	0.34	0.25	0.29	0.24	0.21	0.59	0.46	0.38	0.38	0.32	0.29
15200.1	0.01	0.02	0.02	0.05	0.04	0.04	0.24	0.15	0.06	0.12	0.07	0.02	0.30	0.20	0.14	0.14	0.09	0.07
15600.1	0.19	0.18	0.18	0.16	0.17	0.18	0.52	0.43	0.33	0.38	0.32	0.27	0.47	0.41	0.36	0.37	0.32	0.29
16000.1	0.11	0.07	0.05	0.03	0.02	0.04	0.36	0.29	0.21	0.20	0.16	0.13	0.34	0.30	0.28	0.29	0.27	0.25
16400.1	0.17	0.14	0.12	0.13	0.11	0.09	0.33	0.30	0.23	0.23	0.19	0.18	0.21	0.26	0.28	0.20	0.26	0.29
16800.1	0.04	0.03	0.02	0.02	0.01	0.01	0.16	0.18	0.13	0.12	0.13	0.13	0.08	0.12	0.13	0.08	0.11	0.12
17200.1	0.14	0.11	0.10	0.13	0.10	0.09	0.10	0.18	0.17	0.07	0.12	0.16	0.17	0.18	0.16	0.17	0.17	0.16
17600.1	0.07	0.03	0.01	0.08	0.04	0.02	0.05	0.11	0.09	0.03	0.06	0.07	0.10	0.09	0.06	0.10	0.08	0.06
18000.1	0.17	0.16	0.15	0.21	0.20	0.19	0.24	0.27	0.22	0.22	0.22	0.22	0.28	0.25	0.22	0.28	0.25	0.22
18400.1	0.08	0.05	0.03	0.04	0.01	0.00	0.08	0.10	0.06	0.07	0.06	0.05	0.10	0.07	0.04	0.11	0.08	0.05
18800.1	0.06	0.08	0.10	0.10	0.12	0.13	0.23	0.25	0.19	0.20	0.19	0.17	0.17	0.16	0.15	0.18	0.17	0.15
19200.1	0.10	0.10	0.11	0.14	0.14	0.14	0.24	0.24	0.17	0.21	0.17	0.15	0.10	0.11	0.11	0.13	0.12	0.12
19600.1	0.21	0.22	0.22	0.25	0.25	0.24	0.28	0.28	0.23	0.28	0.23	0.21	0.14	0.16	0.16	0.17	0.18	0.18
20000.1	0.13	0.13	0.12	0.13	0.12	0.12	0.12	0.14	0.08	0.11	0.08	0.06	0.03	0.05	0.05	0.05	0.06	0.06
20400.1	0.24	0.21	0.19	0.21	0.19	0.18	0.17	0.19	0.13	0.13	0.11	0.09	0.14	0.13	0.12	0.16	0.14	0.13
20800.1	0.25	0.18	0.15	0.27	0.21	0.18	0.15	0.18	0.12	0.13	0.11	0.09	0.11	0.11	0.10	0.15	0.13	0.11
21200.1	0.16	0.09	0.05	0.17	0.09	0.06	0.05	0.08	0.02	0.02	0.00	0.02	0.03	0.02	0.02	0.03	0.03	0.03
21600.1	0.21	0.15	0.12	0.17	0.11	0.09	0.08	0.11	0.05	0.02	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.00
22000.1	0.03	0.02	0.04	0.03	0.02	0.05	0.13	0.08	0.12	0.16	0.16	0.16	0.05	0.07	0.08	0.07	0.04	0.07
22400.1	0.14	0.10	0.07	0.12	0.08	0.05	0.01	0.05	0.00	0.04	0.04	0.04	0.20	0.12	0.08	0.58	0.24	0.11
22800.1	0.00	0.02	0.03	0.01	0.03	0.05	0.05	0.07	0.01	0.01	0.04	0.06	0.13	0.07	0.03	0.38	0.11	0.02
23200.1	0.01	0.01	0.02	0.04	0.04	0.05	0.24	0.20	0.10	0.29	0.10	0.03	0.14	0.08	0.05	0.59	0.21	0.05
23600.1	0.04	0.06	0.08	0.09	0.10	0.10	0.04	0.05	0.02	0.24	0.06	0.00	0.13	0.05	0.03	0.70	0.67	0.45
24000.1	0.01	0.02	0.03	0.02	0.03	0.04	0.00	0.04	0.02	0.08	0.03	0.06	0.15	0.12	0.02	11.19	3.25	0.22

Typical Performance Data

RF (IN) (MHz)	Input IP3 (I)			Input IP3 (Q)			Input IP3 (I)			Input IP3 (Q)			Input IP3 (I)			Input IP3 (Q)		
	IF = LO-RF = 200MHz						IF = LO-RF = 2000MHz						IF = LO-RF = 3000MHz					
	@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)			@LO (dBm)		
	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19	+17	+18	+19
6000.1	20.09	20.73	21.09	16.91	17.83	18.82	19.95	20.32	20.72	16.97	17.62	18.27	20.98	21.61	22.24	19.51	19.80	20.21
6200.1	18.86	19.35	19.65	16.41	17.04	17.66	19.70	20.11	20.53	16.95	17.64	18.33	19.70	20.11	20.53	16.95	17.64	18.33
6400.1	17.84	18.31	18.66	17.48	17.93	18.20	19.88	20.33	20.60	17.17	17.65	18.22	19.88	20.33	20.60	17.17	17.65	18.22
6800.1	18.60	19.04	19.43	17.09	17.81	18.32	21.45	21.66	21.92	19.27	19.68	20.14	21.45	21.66	21.92	19.27	19.68	20.14
7200.1	19.87	20.44	20.89	16.62	17.34	18.08	22.33	22.86	23.24	21.35	21.56	21.67	22.33	22.86	23.24	21.35	21.56	21.67
7600.1	20.99	21.48	21.96	17.70	18.23	18.93	23.91	24.03	23.88	22.28	22.89	23.13	23.91	24.03	23.88	22.28	22.89	23.13
8000.1	21.82	22.14	22.46	19.73	20.05	20.63	23.38	24.34	24.86	22.36	23.41	23.99	23.38	24.34	24.86	22.36	23.41	23.99
8400.1	22.51	22.93	23.46	20.84	21.30	22.02	23.16	23.61	23.80	22.49	22.73	23.04	23.16	23.61	23.80	22.49	22.73	23.04
8800.1	24.09	24.63	25.23	25.06	23.88	23.64	22.65	22.99	23.40	22.45	22.75	23.05	22.65	22.99	23.40	22.45	22.75	23.05
9200.1	25.60	24.85	24.51	26.17	25.75	25.27	21.92	22.32	22.86	21.64	22.16	22.44	21.92	22.32	22.86	21.64	22.16	22.44
9600.1	28.67	28.74	28.09	26.36	27.44	27.37	21.00	21.07	21.46	20.68	20.82	21.01	21.00	21.07	21.46	20.68	20.82	21.01
10000.1	26.41	26.92	26.97	27.58	27.93	28.09	24.15	22.74	22.24	21.70	21.57	21.72	24.15	22.74	22.24	21.70	21.57	21.72
10400.1	26.15	26.99	27.65	26.00	26.97	28.31	23.65	23.72	23.01	24.25	22.96	22.62	23.65	23.72	23.01	24.25	22.96	22.62
10800.1	24.33	24.71	25.38	24.24	24.56	24.88	23.33	23.97	23.88	26.02	26.27	25.42	23.33	23.97	23.88	26.02	26.27	25.42
11200.1	25.86	25.25	25.35	25.63	25.09	24.86	23.83	24.67	25.35	24.71	24.99	25.48	23.83	24.67	25.35	24.71	24.99	25.48
11600.1	25.75	25.05	24.86	26.03	25.53	25.58	23.11	23.93	24.55	24.35	24.74	24.85	23.11	23.93	24.55	24.35	24.74	24.85
12000.1	25.62	24.87	24.20	24.22	23.87	23.82	23.02	24.28	24.87	24.12	24.39	24.61	23.02	24.28	24.87	24.12	24.39	24.61
12400.1	26.40	25.83	24.87	27.03	25.83	25.14	21.91	23.05	23.90	24.20	24.86	25.50	21.91	23.05	23.90	24.20	24.86	25.50
12800.1	25.34	25.97	26.21	26.59	27.33	27.23	21.74	23.47	24.71	24.37	25.20	25.40	21.74	23.47	24.71	24.37	25.20	25.40
13200.1	24.42	24.84	25.36	25.14	25.28	25.57	22.09	23.52	24.17	24.25	25.34	25.54	22.09	23.52	24.17	24.25	25.34	25.54
13600.1	22.26	22.94	23.47	23.01	23.25	23.58	22.23	22.72	23.43	23.59	24.17	24.45	22.23	22.72	23.43	23.59	24.17	24.45
14000.1	22.11	23.44	24.16	23.79	24.71	25.30	26.02	25.39	25.12	25.34	25.34	25.36	26.02	25.39	25.12	25.34	25.34	25.36
14400.1	21.20	22.62	23.65	23.34	24.08	24.74	26.09	26.02	25.65	25.50	25.45	25.56	26.09	26.02	25.65	25.50	25.45	25.56
14800.1	20.81	21.97	22.71	22.37	23.13	23.26	23.06	23.49	23.52	23.06	23.31	23.42	23.06	23.49	23.52	23.06	23.31	23.42
15000.1	22.04	23.92	24.81	24.35	25.10	25.24	23.44	23.83	24.27	23.80	23.98	24.37	23.44	23.83	24.27	23.80	23.98	24.37
15200.1	21.21	22.33	23.36	22.56	23.55	23.97	26.00	27.62	26.41	26.24	26.11	25.84	26.00	27.62	26.41	26.24	26.11	25.84
15600.1	21.84	21.61	21.90	21.72	21.86	22.19	21.49	21.94	22.14	21.58	21.81	21.84	21.49	21.94	22.14	21.58	21.81	21.84
16000.1	25.38	24.15	23.54	24.11	23.66	23.69	23.83	24.86	25.06	23.67	24.09	24.20	23.83	24.86	25.06	23.67	24.09	24.20
16400.1	24.44	24.54	24.45	24.35	24.30	24.51	22.77	22.93	23.31	22.91	22.98	22.98	22.77	22.93	23.31	22.91	22.98	22.98
16800.1	29.51	27.51	26.77	27.59	26.43	26.47	27.69	26.08	25.46	25.47	24.74	24.42	27.69	26.08	25.46	25.47	24.74	24.42
17200.1	28.10	27.74	28.18	26.82	27.92	27.56	26.17	25.98	25.73	25.48	24.90	24.73	26.17	25.98	25.73	25.48	24.90	24.73
17600.1	28.82	29.04	29.51	28.09	28.16	28.82	24.69	24.99	24.75	24.47	24.26	24.61	24.69	24.99	24.75	24.47	24.26	24.61
18000.1	26.92	28.25	28.45	27.65	29.13	30.14	26.11	26.49	28.08	25.24	26.02	28.09	26.11	26.49	28.08	25.24	26.02	28.09
18400.1	29.69	29.31	29.43	29.04	29.64	29.00	26.13	27.03	27.33	25.07	26.49	26.69	26.13	27.03	27.33	25.07	26.49	26.69
18800.1	28.15	29.51	29.87	29.03	29.59	29.40	26.92	28.23	28.54	25.95	26.88	28.11	26.92	28.23	28.54	25.95	26.88	28.11
19200.1	28.33	28.56	28.97	29.14	28.36	28.43	29.89	31.01	31.35	27.38	29.18	30.56	29.89	31.01	31.35	27.38	29.18	30.56
19600.1	28.43	28.09	29.07	28.42	28.31	28.91	28.06	28.86	29.93	26.74	28.21	28.66	28.06	28.86	29.93	26.74	28.21	28.66
20000.1	25.88	27.26	28.70	26.51	27.96	29.37	26.75	27.14	27.36	26.61	27.02	27.90	26.75	27.14	27.36	26.61	27.02	27.90
20400.1	26.51	27.83	28.34	27.15	28.25	28.71	26.52	26.42	26.99	26.55	27.03	26.85	26.52	26.42	26.99	26.55	27.03	26.85
20800.1	26.98	28.04	27.97	27.18	27.61	28.16	27.60	27.92	28.11	26.98	27.89	28.74	27.60	27.92	28.11	26.98	27.89	28.74
21200.1	26.38	26.89	27.27	26.04	26.86	27.40	25.66	26.42	26.59	25.87	26.21	27.03	25.66	26.42	26.59	25.87	26.21	27.03
21600.1	30.01	31.61	31.77	30.53	30.93	30.54	27.26	27.95	28.77	27.92	28.36	29.37	27.26	27.95	28.77	27.92	28.36	29.37
22000.1	29.55	30.33	30.45	29.71	30.91	30.61	28.38	29.60	29.02	28.49	29.29	30.09	28.38	29.60	29.02	28.49	29.29	30.09
22400.1	28.77	28.74	28.48	29.39	29.85	29.63	29.67	30.05	31.11	30.25	30.78	30.72	29.67	30.05	31.11	30.25	30.78	30.72
22800.1	30.09	30.99	31.49	30.46	31.57	32.10	30.65	30.90	32.03	31.39	31.23	29.76	30.65	30.90	32.03	31.39	31.23	29.76
23200.1	29.47	28.85	28.89	30.08	29.31	27.84	26.50	27.31	27.14	26.48	27.33	28.24	26.50	27.31	27.14	26.48	27.33	28.24
23600.1	32.59	32.40	32.35	33.80	32.75	30.95	30.35	32.18	32.55	28.09	30.16	31.57	30.35	32.18	32.55	28.09	30.16	31.57
24000.1	31.59	32.82	32.76	32.52	35.56	33.01	31.94	31.06	31.85	30.41	32.83	33.56	31.94	31.06	31.85	30.41	32.83	33.56

Typical Performance Curves

IMAGE REJECTION (DOWNCONVERTER)
@ IF = 200 MHz



SSB REJECTION (UPCONVERTER)
@ IF = 200 MHz

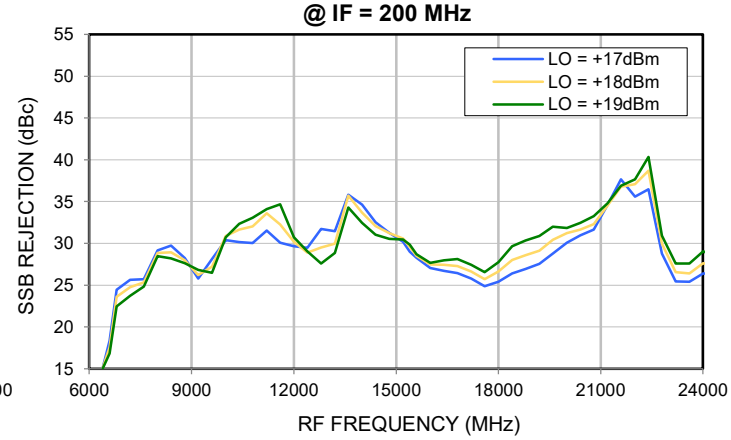
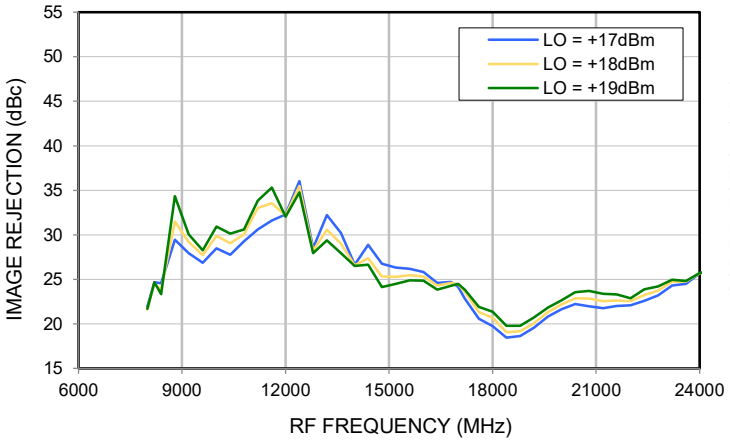


IMAGE REJECTION (DOWNCONVERTER)
@ IF = 2000 MHz



SSB REJECTION (UPCONVERTER)
@ IF = 2000 MHz

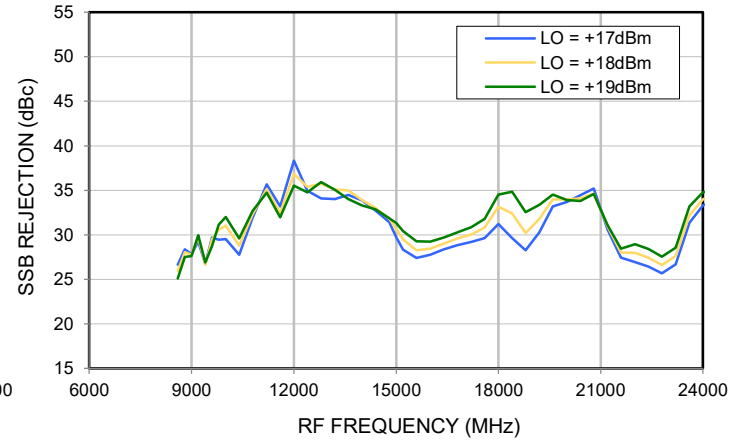
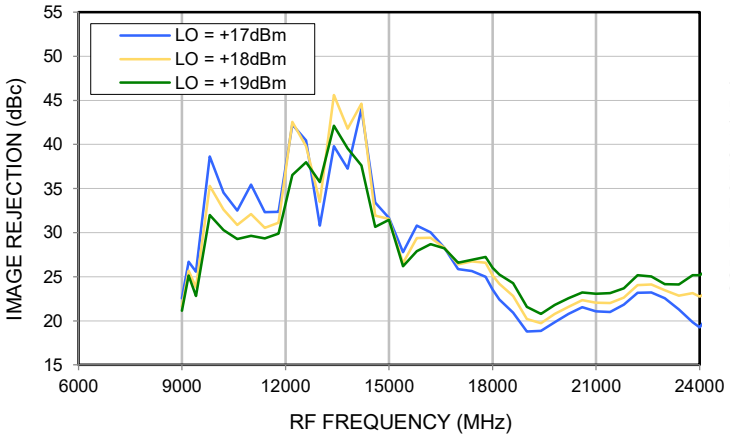
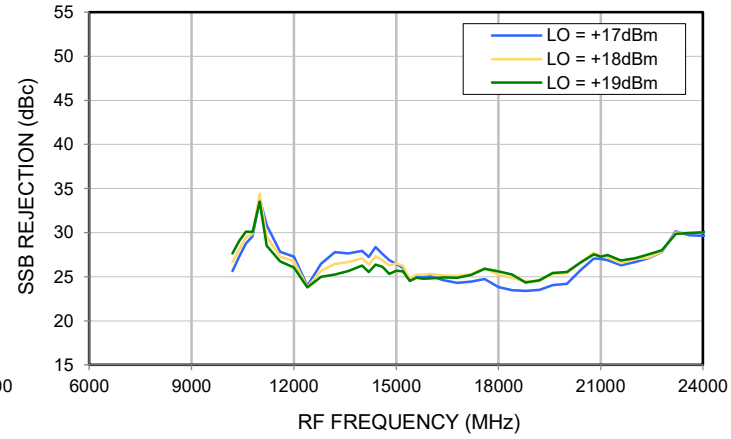


IMAGE REJECTION (DOWNCONVERTER)
@ IF = 3000 MHz

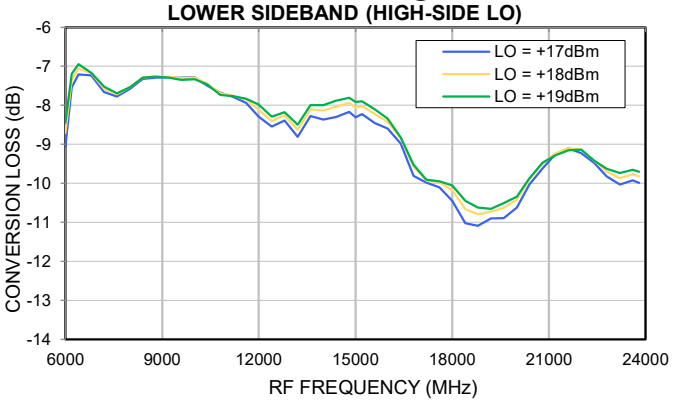


SSB REJECTION (UPCONVERTER)
@ IF = 3000 MHz

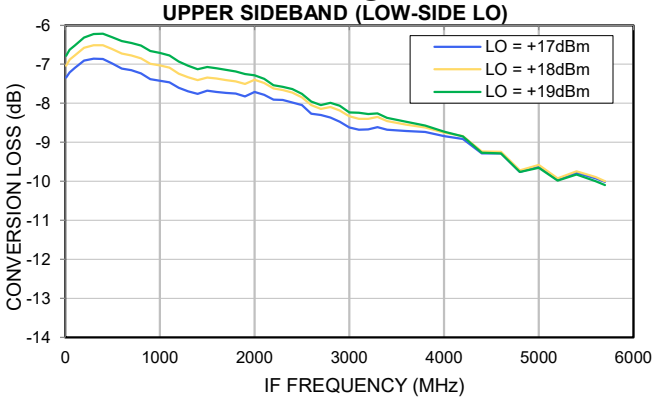


Typical Performance Curves

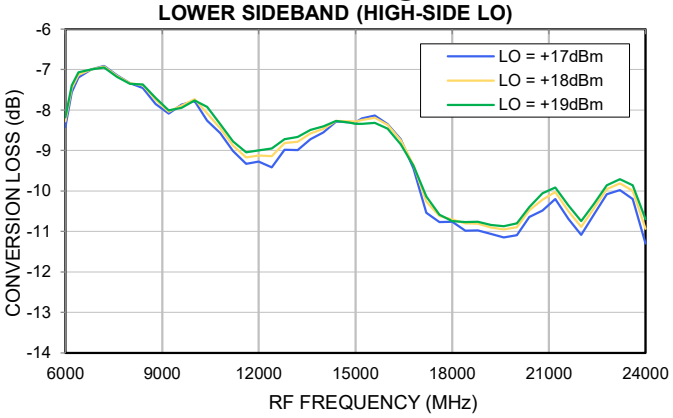
CONVERSION LOSS VS. RF @ IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



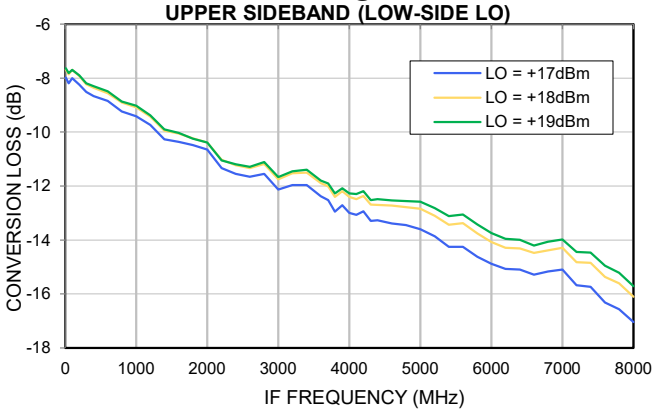
CONVERSION LOSS VS. IF @ FIXED LO = 6.3 GHz
UPPER SIDEBAND (LOW-SIDE LO)



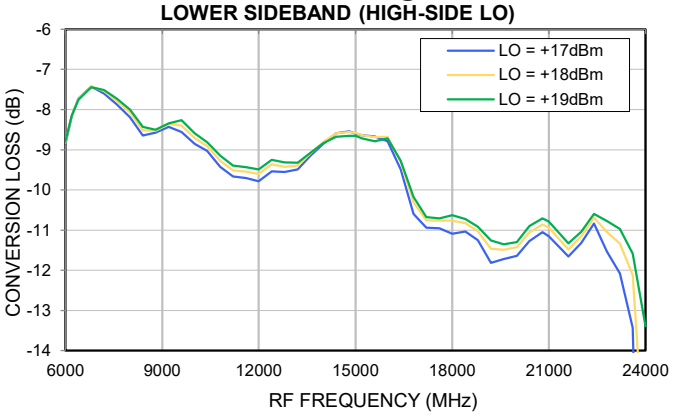
CONVERSION LOSS VS. RF @ IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



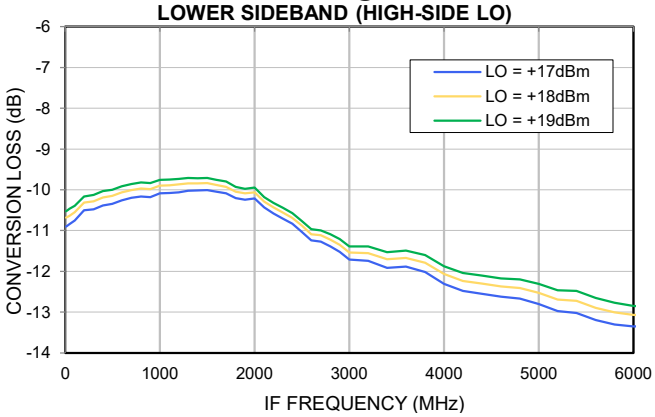
CONVERSION LOSS VS. IF @ FIXED LO = 15.25 GHz
UPPER SIDEBAND (LOW-SIDE LO)



CONVERSION LOSS VS. RF @ IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)

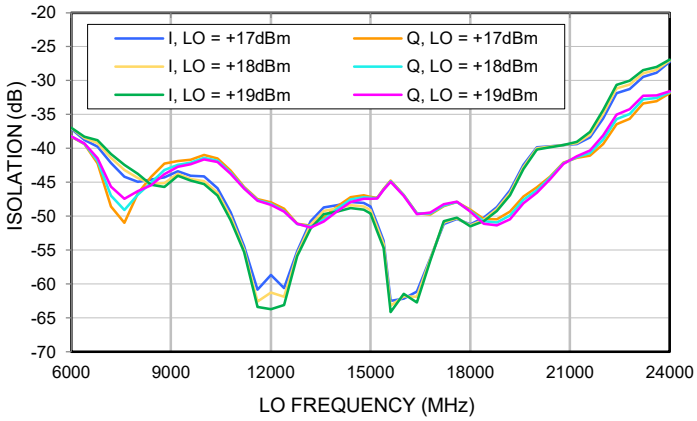


CONVERSION LOSS VS. IF @ FIXED LO = 24.7 GHz
LOWER SIDEBAND (HIGH-SIDE LO)

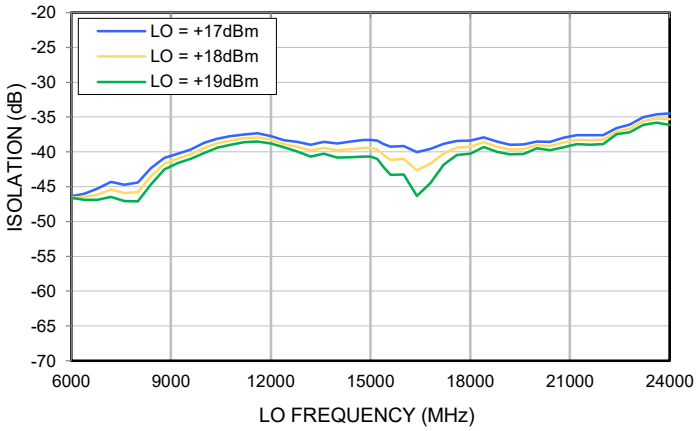


Typical Performance Curves

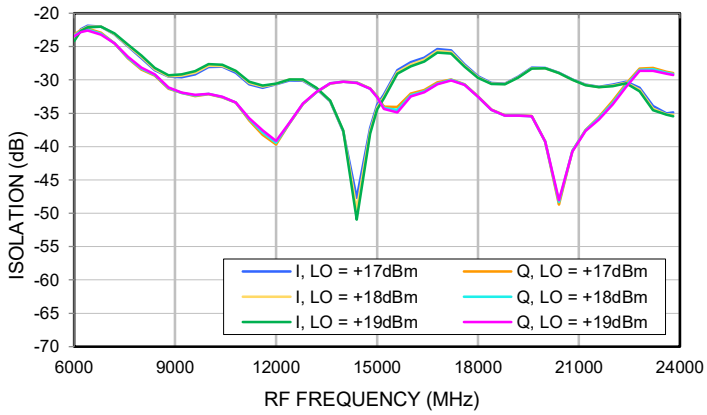
LO-IF ISOLATION



LO-RF ISOLATION

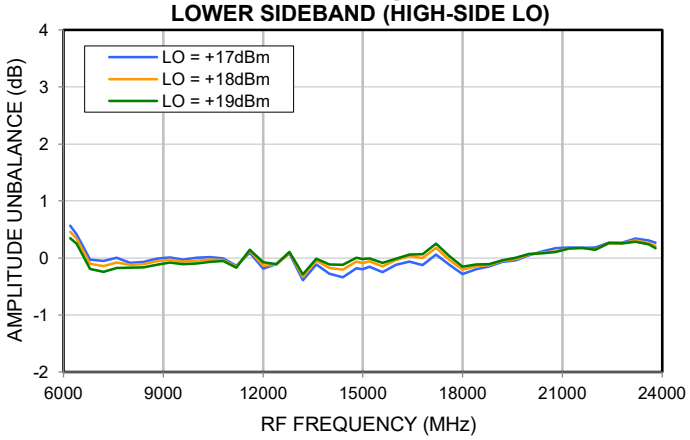


RF-IF ISOLATION

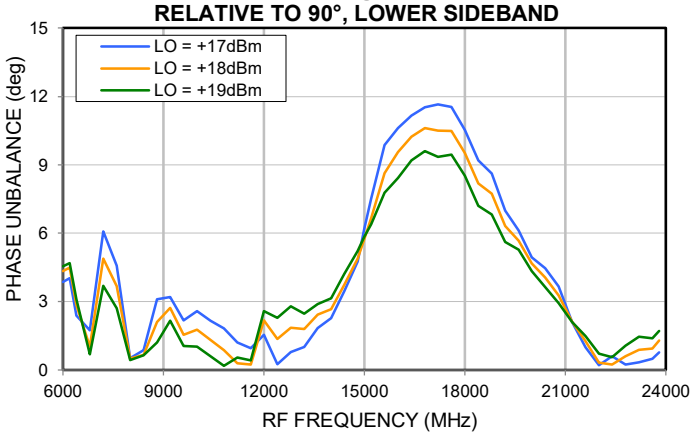


Typical Performance Curves

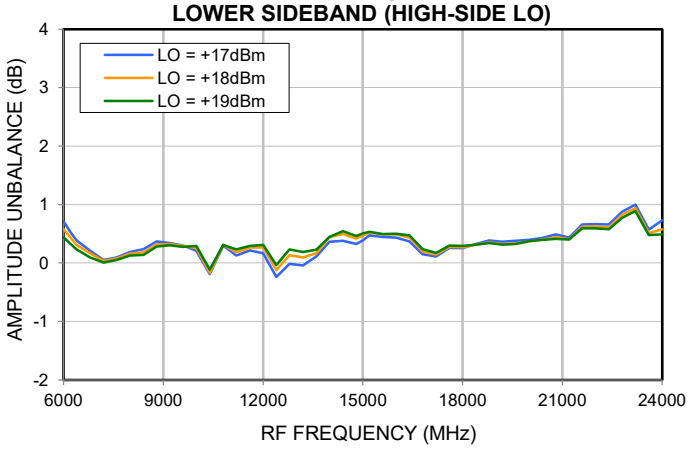
AMPLITUDE UNBALANCE @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



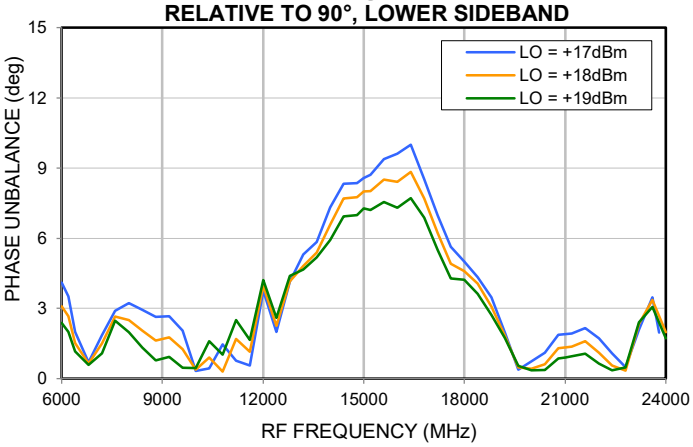
PHASE UNBALANCE @ FIXED IF = 200 MHz
RELATIVE TO 90°, LOWER SIDEBAND



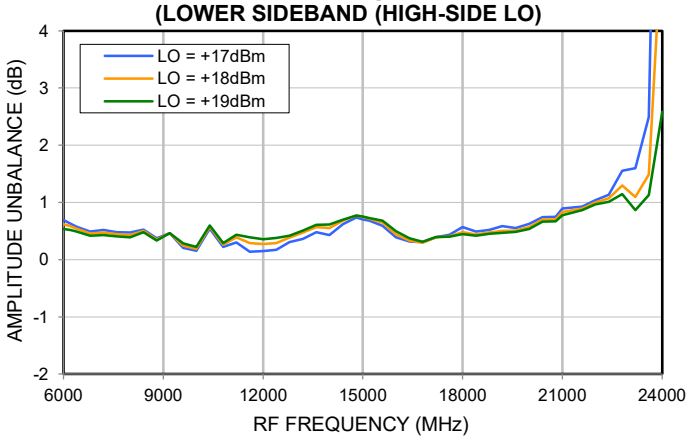
AMPLITUDE UNBALANCE @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



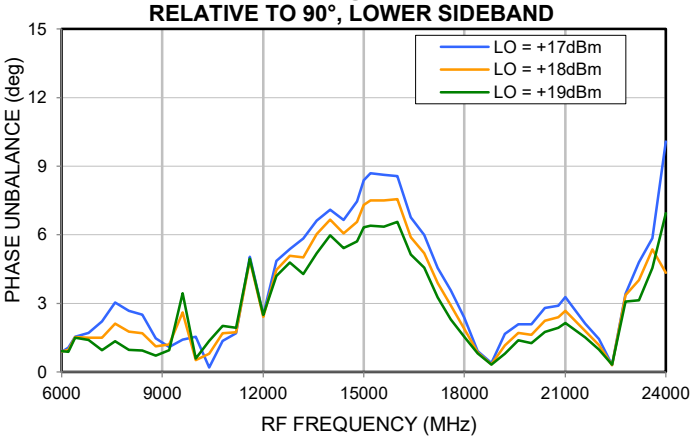
PHASE UNBALANCE @ FIXED IF = 2000 MHz
RELATIVE TO 90°, LOWER SIDEBAND



AMPLITUDE UNBALANCE @ FIXED IF = 3000 MHz
(LOWER SIDEBAND (HIGH-SIDE LO)

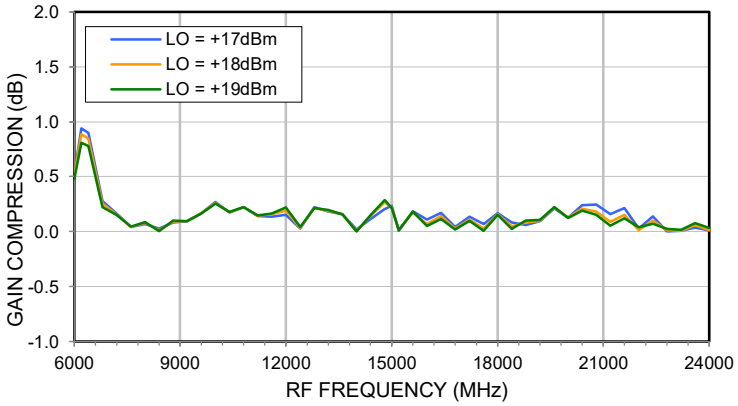


PHASE UNBALANCE @ FIXED IF = 3000 MHz
RELATIVE TO 90°, LOWER SIDEBAND

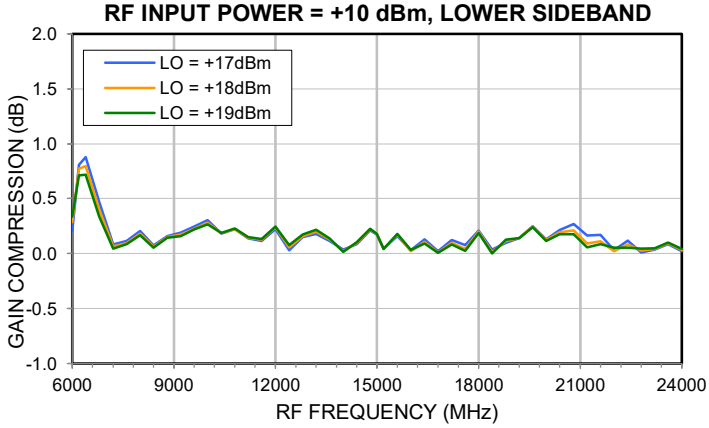


Typical Performance Curves

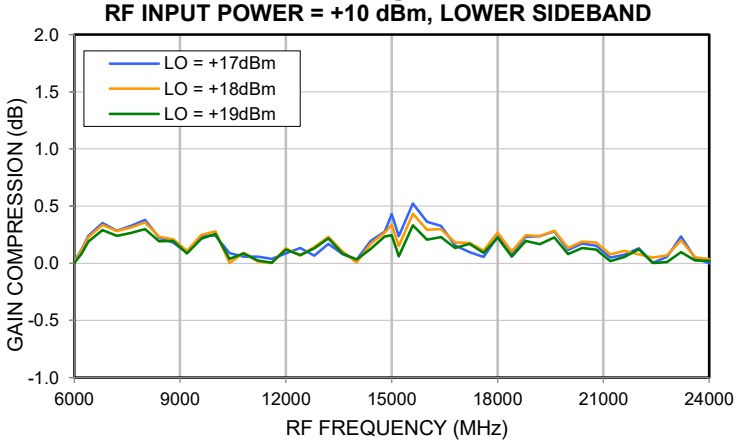
GAIN COMPRESSION (I) @ FIXED IF = 200 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



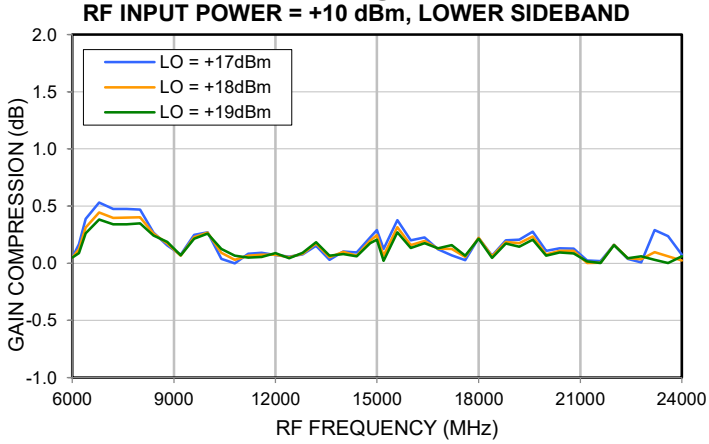
GAIN COMPRESSION (Q) @ FIXED IF = 200 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



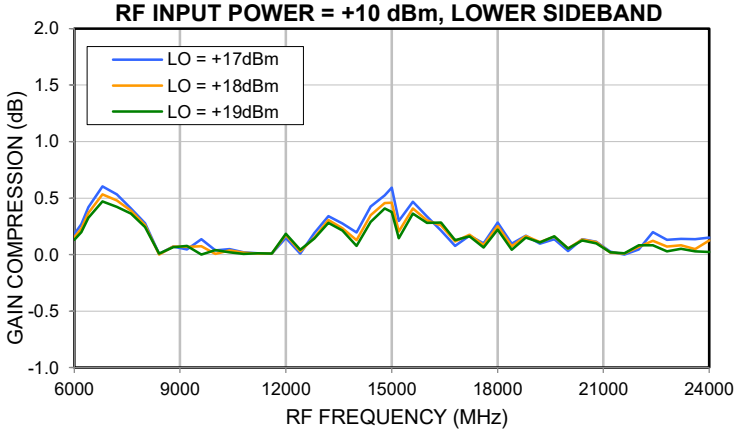
GAIN COMPRESSION (I) @ FIXED IF = 2000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



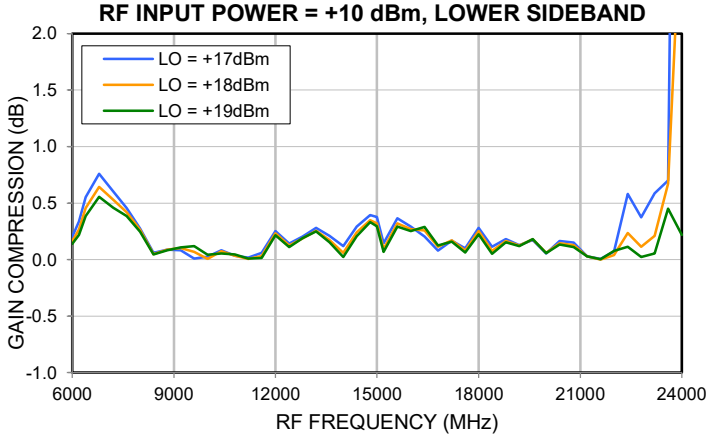
GAIN COMPRESSION (Q) @ FIXED IF = 2000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND



GAIN COMPRESSION (I) @ FIXED IF = 3000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND

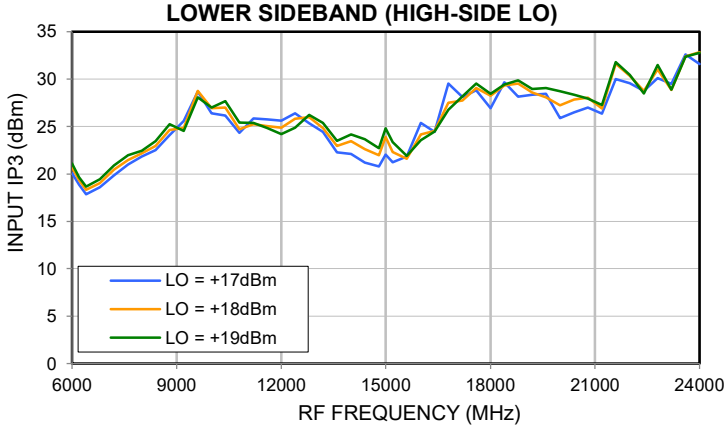


GAIN COMPRESSION (Q) @ FIXED IF = 3000 MHz
RF INPUT POWER = +10 dBm, LOWER SIDEBAND

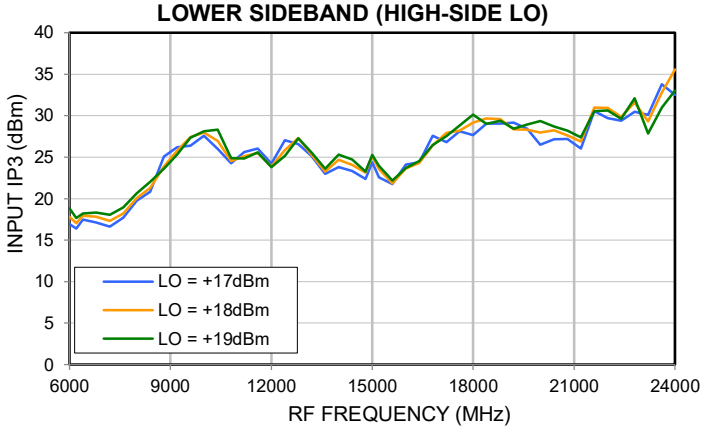


Typical Performance Curves

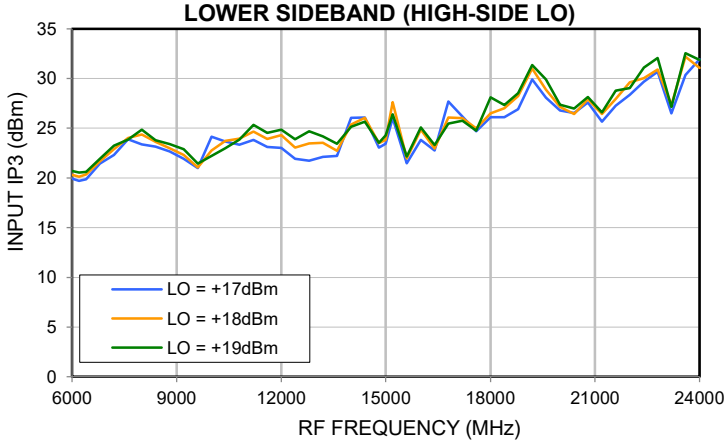
INPUT IP3 (I) @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



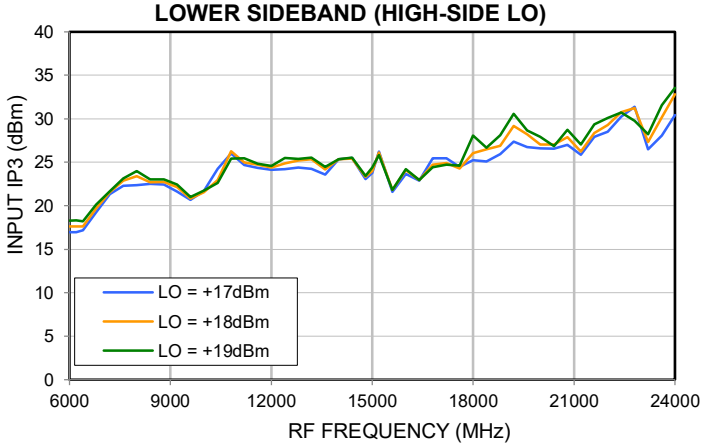
INPUT IP3 (Q) @ FIXED IF = 200 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



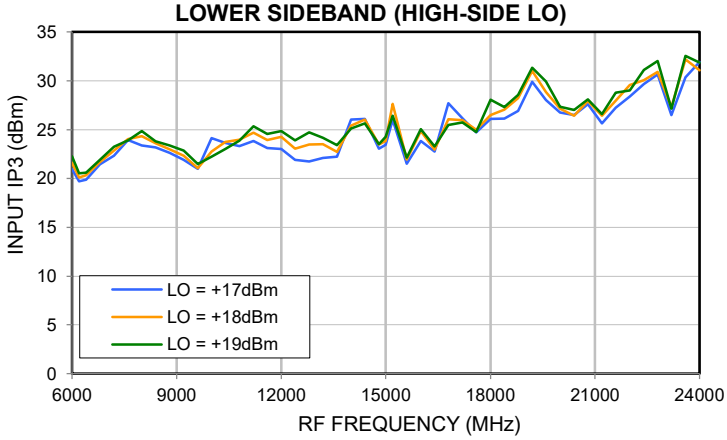
INPUT IP3 (I) @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



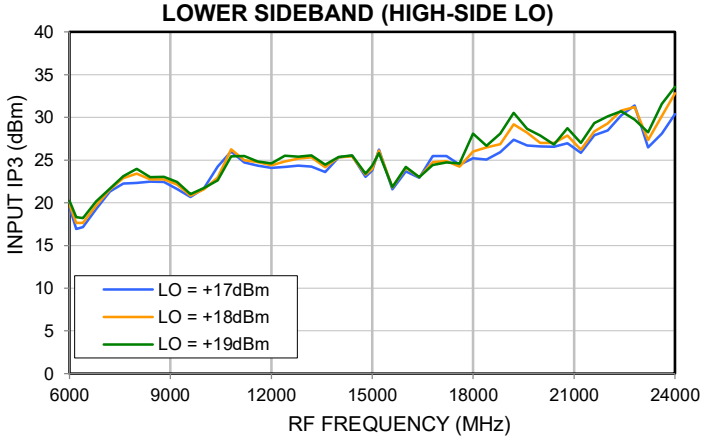
INPUT IP3 (Q) @ FIXED IF = 2000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



INPUT IP3 (I) @ FIXED IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



INPUT IP3 (Q) @ FIXED IF = 3000 MHz
LOWER SIDEBAND (HIGH-SIDE LO)



Mini-Circuits

Environmental Specifications ENV80

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 or -40° to 105° C or -55° to 105° C or -45° to 105° C Ambient Environment	Refer to Individual Model Data Sheet
Storage Environment (Die)	-65° to 150°C	Individual Model Data Sheet
Storage Environment(Packaging)	-40° to 70°C and 40 to 60% humidity (In Factory Shipped Package)	