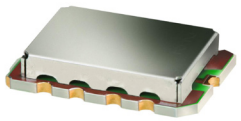
# Low Noise Amplifier TAMP-1521GLN+

## 50Ω 1380 to 1520 MHz

## The Big Deal

- Ultra Low Noise Figure, 0.6 dB typ.
- High IP3, 27.5 dBm typ.
- High Gain, 35 dB typ.
- Integrated Bias Matching and Stability Circuits



CASE STYLE: JQ1382

## Product Overview

The TAMP-1521GLN+ (RoHS compliant) utilizes advanced E-PHEMT technology in a 2-stage low noise amplifier design built into a shielded case (size: .591”x.394”x.118”). The drop-in module offers ultra low noise figure and high gain with good input and output return loss over the entire frequency range and without the need of external matching components.

## Key Features

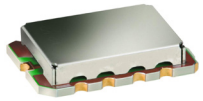
| Feature | Advantages |
|---|---|
| Ultra Low NF | With only 0.6 dB NF, the TAMP-1521GLN+ enables greater sensitivity for receiver applications. It includes all matching and stability circuits making this Drop-in LNA module a turn-key solution for ensuring system sensitivity in demanding applications. |
| High Output IP3 | At +27.5 dBm IP3, in combination with its low noise performance, the TAMP-1521GLN+ can improve a systems’ spur-free dynamic range which is often the critical driver in many receiver applications. |
| Very flat, High Gain | With gain of 35 dB and flatness of ± 0.35 dB, this amplifier can insulate a receiver NF from component losses or NF of the 2nd stage amplifier following the TAMP-1521GLN+. |
| Power In at 1dB Comp.: -20dBm typ.<br>Input no damage, +17dBm | Provides a good safety margin against damage or saturation from unwanted high power RF signals present at the input to a receiver. |
| Well Matched input/ output ports | With typical return loss of 21 dB at the input and output ports, the TAMP-1521GLN+ can be used in cascade with many 50 Ohm components and maintain minimal interaction or reflections. |
| Drop-in Module | Eliminates the need for designers to optimize low noise transistor bias and matching circuitry. The TAMP-1521GLN+ provides the outstanding combined performance and does not require any external elements.<br>The case PCB area is smaller than most LNA transistor designs with external circuitry. |
| Metal Case | Provides a protective enclosure improving handling robustness in addition to shielding the sensitive high gain devices from close by circuitry. |
| Unconditionally stable | No adverse effects due to loading of the input and output ports avoiding potential instability which can be a critical requirement when integrating high gain, high frequency devices on an open PCB assembly. |

*Surface Mount*

# Low Noise Amplifier

## TAMP-1521GLN+

50Ω 1380 to 1520 MHz



CASE STYLE: JQ1382

### Features

- Ultra low noise figure, 0.6 dB typ.
- High gain, 35 dB typ.
- Output power, up to +13.5 dBm typ.
- Good output IP3, 27.5 dBm typ.
- Good VSWR, 1.2:1 typ.
- Unconditionally stable

***+RoHS Compliant***

*The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications*

### Applications

- Military & Avionics
- Base station transceiver, tower mounted amplifier, repeater
- General purpose low noise amplifier

### Electrical Specifications at 25°C

| Parameter | Condition (MHz) | Min. | Typ. | Max. | Units |
|---|---|---|---|---|---|
| Frequency Range | | 1380 | | 1520 | MHz |
| Noise Figure | 1380 - 1520 | | 0.6 | 0.9 | dB |
| Gain | 1380 - 1520 | 33 | 35 | | dB |
| Gain Flatness | 1380 - 1520 | | ± 0.35 | ± 0.65 | dB |
| Output Power at 1dB compression | 1380 - 1520 | 11.5 | 13.5 | | dBm |
| Output third order intercept point (OIP3) | 1380 - 1520 | | 27.5 | | dBm |
| Input VSWR | 1380 - 1520 | | 1.20 | | :1 |
| Output VSWR | 1380 - 1520 | | 1.15 | | :1 |
| DC Supply Voltage | | | 5.0 | | V |
| DC Supply Current | | | 50 | 70 | mA |

### Pin Connections

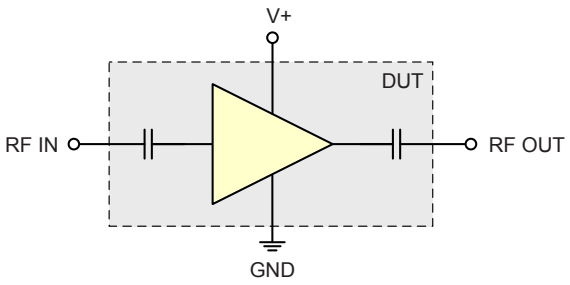
| | |
|---|---|
| RF IN | 10 |
| RF OUT | 5 |
| V+ | 7 |
| GROUND | 1,2,3,4,6,8,9,11 |

### Maximum Ratings

| Parameter | Ratings |
|---|---|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |
| Operating Voltage | 5.5 V |
| Input RF Power (no damage) | +17 dBm |
| Power Consumption | 390 mW |

Permanent damage may occur if any of these limits are exceeded.

### Simplified Schematic




### ESD Rating

Human Body Model (HBM): Class 1A (250 V to < 500 V) in accordance with ANSI/ESD STM 5.1 - 2001
Machine Model (MM): Class M1 (40 V) in accordance with ANSI/ESD STM 5.2 - 1999



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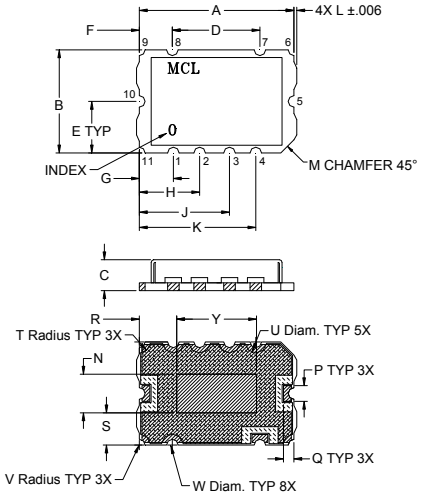
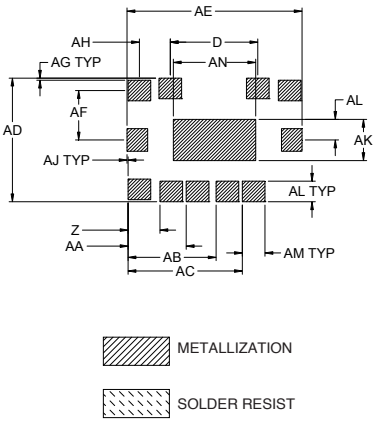
## Outline Drawing




### PCB Land Pattern

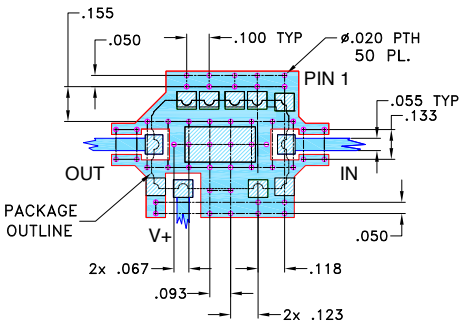



## Outline Dimensions (inch / mm)

| A | B | C | D | E | F | G | H | J | K | L | M | N | P | Q | R | S | T | U |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .591 | .394 | .118 | .335 | .197 | .126 | .130 | .230 | .344 | .445 | .011 | .050 | .148 | .060 | .040 | .143 | .123 | .042 | .084 |
| 15.0 | 10.0 | 3.0 | 8.5 | 5.0 | 3.2 | 3.3 | 5.85 | 8.75 | 11.3 | .28 | 1.27 | 3.75 | 1.52 | 1.02 | 3.63 | 3.13 | 1.07 | 2.13 |

| V | W | Y | Z | AA | AB | AC | AD | AE | AF | AG | AH | AJ | AK | AL | AM | AN | wt. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| .022 | .044 | .305 | .122 | .222 | .337 | .437 | .472 | .669 | .189 | .008 | .118 | .004 | .158 | .079 | .087 | .315 | grams |
| .56 | 1.12 | 7.75 | 3.1 | 5.65 | 8.55 | 11.1 | 12.0 | 17.0 | 4.8 | .20 | 3.0 | .10 | 4.0 | 2.0 | 2.2 | 8.0 | 0.8 |

### *Demo Board MCL P/N: TB-468+*
### *Suggested PCB Layout (PL-293)*

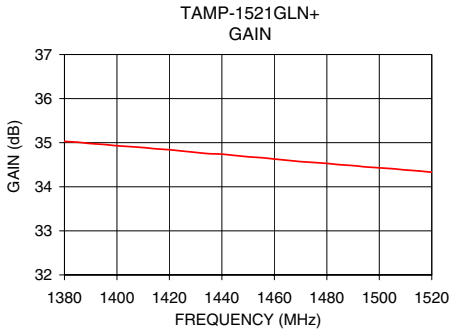


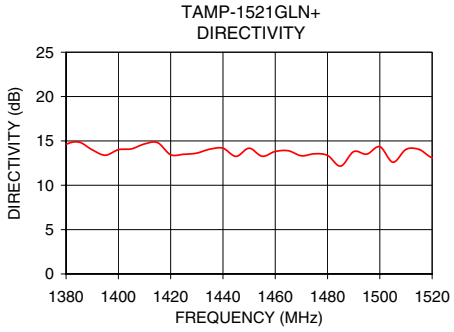

NOTES:
1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

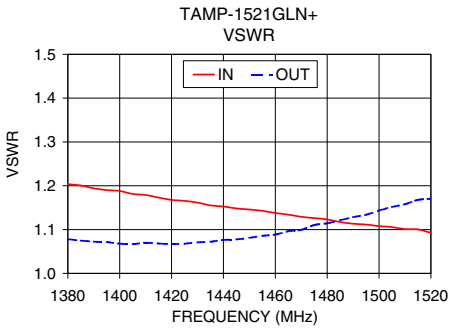
DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

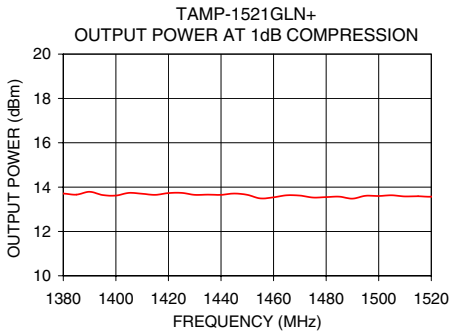
DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

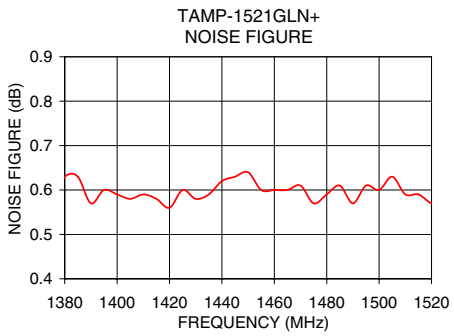
| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR IN (:1) | VSWR OUT (:1) | NOISE FIGURE (dB) | P. OUT @ 1dB COMPR. (dBm) | OUTPUT IP3 (dBm) |
|---|---|---|---|---|---|---|---|
| 1380.00 | 35.03 | 14.61 | 1.20 | 1.08 | 0.63 | 13.71 | 27.79 |
| 1390.00 | 34.98 | 14.00 | 1.19 | 1.07 | 0.57 | 13.79 | 27.57 |
| 1400.00 | 34.93 | 14.01 | 1.19 | 1.07 | 0.59 | 13.62 | 27.68 |
| 1410.00 | 34.89 | 14.66 | 1.18 | 1.07 | 0.59 | 13.70 | 27.78 |
| 1420.00 | 34.84 | 13.44 | 1.17 | 1.07 | 0.56 | 13.73 | 27.61 |
| 1430.00 | 34.78 | 13.62 | 1.16 | 1.07 | 0.58 | 13.65 | 27.49 |
| 1435.00 | 34.75 | 14.07 | 1.16 | 1.07 | 0.59 | 13.66 | 27.60 |
| 1440.00 | 34.74 | 14.18 | 1.15 | 1.08 | 0.62 | 13.65 | 27.55 |
| 1445.00 | 34.71 | 13.26 | 1.15 | 1.08 | 0.63 | 13.71 | 27.53 |
| 1450.00 | 34.68 | 14.18 | 1.15 | 1.08 | 0.64 | 13.65 | 27.55 |
| 1455.00 | 34.66 | 13.27 | 1.14 | 1.09 | 0.60 | 13.49 | 27.50 |
| 1460.00 | 34.63 | 13.81 | 1.14 | 1.09 | 0.60 | 13.54 | 27.62 |
| 1470.00 | 34.57 | 13.32 | 1.13 | 1.10 | 0.61 | 13.62 | 27.53 |
| 1480.00 | 34.53 | 13.36 | 1.12 | 1.11 | 0.59 | 13.55 | 27.62 |
| 1485.00 | 34.50 | 12.16 | 1.12 | 1.12 | 0.61 | 13.57 | 27.54 |
| 1490.00 | 34.48 | 13.79 | 1.11 | 1.13 | 0.57 | 13.48 | 27.62 |
| 1495.00 | 34.45 | 13.51 | 1.11 | 1.13 | 0.61 | 13.61 | 27.55 |
| 1500.00 | 34.43 | 14.35 | 1.11 | 1.14 | 0.60 | 13.60 | 27.54 |
| 1510.00 | 34.38 | 14.05 | 1.10 | 1.16 | 0.59 | 13.58 | 27.67 |
| 1520.00 | 34.33 | 13.11 | 1.09 | 1.17 | 0.57 | 13.57 | 27.69 |

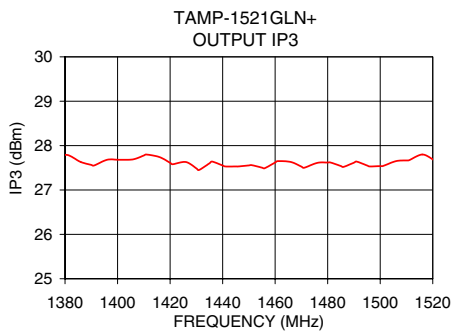


# Amplifier TAMP-1521GLN+

## *Typical Performance Data*

**NOTE: Use PDF Bookmarks to view DATA at required conditions or to view GRAPHS.**

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 48mA, Vd = 5V @Temperature = +25degC

| FREQ | Gain | Isolation | Input Return Loss | Output Return Loss | Stability | | IP3 Output | 1dB Comp. Output | Noise Figure |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dB) | (dB) | (dB) | (dB) | K | Delta | (dBm) | (dBm) | (dB) |
| 1380 | 35.03 | 49.64 | 20.68 | 28.51 | 2.76 | 0.19 | 27.50 | 13.71 | 0.63 |
| 1385 | 35.01 | 49.87 | 20.81 | 28.86 | 2.83 | 0.18 | 27.90 | 13.66 | 0.63 |
| 1390 | 34.98 | 48.98 | 21.06 | 29.13 | 2.59 | 0.20 | 27.80 | 13.79 | 0.57 |
| 1395 | 34.96 | 48.35 | 21.23 | 29.26 | 2.43 | 0.22 | 27.59 | 13.64 | 0.60 |
| 1400 | 34.93 | 48.94 | 21.31 | 29.68 | 2.59 | 0.20 | 27.55 | 13.62 | 0.59 |
| 1405 | 34.91 | 49.01 | 21.61 | 29.80 | 2.62 | 0.20 | 27.91 | 13.74 | 0.58 |
| 1410 | 34.89 | 49.55 | 21.71 | 29.42 | 2.78 | 0.19 | 27.75 | 13.70 | 0.59 |
| 1415 | 34.86 | 49.66 | 21.98 | 29.64 | 2.82 | 0.18 | 27.82 | 13.65 | 0.58 |
| 1420 | 34.84 | 48.28 | 22.23 | 29.79 | 2.44 | 0.21 | 27.66 | 13.73 | 0.56 |
| 1425 | 34.81 | 48.30 | 22.34 | 29.69 | 2.45 | 0.21 | 27.45 | 13.74 | 0.60 |
| 1430 | 34.78 | 48.40 | 22.53 | 29.33 | 2.49 | 0.21 | 27.68 | 13.65 | 0.58 |
| 1435 | 34.75 | 48.82 | 22.85 | 29.16 | 2.61 | 0.20 | 27.57 | 13.66 | 0.59 |
| 1440 | 34.74 | 48.92 | 22.99 | 28.70 | 2.64 | 0.20 | 27.77 | 13.65 | 0.62 |
| 1445 | 34.71 | 47.97 | 23.22 | 28.56 | 2.40 | 0.22 | 27.77 | 13.71 | 0.63 |
| 1450 | 34.68 | 48.86 | 23.36 | 28.20 | 2.64 | 0.19 | 27.54 | 13.65 | 0.64 |
| 1455 | 34.66 | 47.93 | 23.52 | 27.72 | 2.40 | 0.22 | 27.44 | 13.49 | 0.60 |
| 1460 | 34.63 | 48.44 | 23.81 | 27.45 | 2.54 | 0.20 | 27.87 | 13.54 | 0.60 |
| 1465 | 34.60 | 48.49 | 24.04 | 26.77 | 2.56 | 0.20 | 27.70 | 13.63 | 0.60 |
| 1470 | 34.57 | 47.89 | 24.34 | 26.49 | 2.41 | 0.22 | 27.52 | 13.62 | 0.61 |
| 1475 | 34.55 | 48.10 | 24.53 | 25.63 | 2.47 | 0.21 | 27.48 | 13.53 | 0.57 |
| 1480 | 34.53 | 47.89 | 24.74 | 25.34 | 2.42 | 0.21 | 27.50 | 13.55 | 0.59 |
| 1485 | 34.50 | 46.66 | 25.14 | 24.85 | 2.14 | 0.25 | 27.82 | 13.57 | 0.61 |
| 1490 | 34.48 | 48.27 | 25.42 | 24.40 | 2.53 | 0.20 | 27.60 | 13.48 | 0.57 |
| 1495 | 34.45 | 47.96 | 25.55 | 24.05 | 2.46 | 0.21 | 27.30 | 13.61 | 0.61 |
| 1500 | 34.43 | 48.78 | 25.82 | 23.49 | 2.69 | 0.19 | 27.54 | 13.60 | 0.60 |
| 1505 | 34.41 | 47.01 | 25.99 | 23.05 | 2.23 | 0.23 | 27.58 | 13.63 | 0.63 |
| 1510 | 34.38 | 48.43 | 26.35 | 22.72 | 2.60 | 0.20 | 27.66 | 13.58 | 0.59 |
| 1515 | 34.36 | 48.40 | 26.41 | 22.23 | 2.60 | 0.20 | 27.71 | 13.59 | 0.59 |
| 1520 | 34.33 | 47.44 | 27.04 | 22.08 | 2.35 | 0.22 | 27.63 | 13.57 | 0.57 |

## Typical Performance Data

**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 46mA, Vd = 5V @Temperature = -40degC

| FREQ | Gain | Isolation | Input Return Loss | Output Return Loss | Stability | | IP3 Output | 1dB Comp. Output | Noise Figure |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dB) | (dB) | (dB) | (dB) | K | Delta | (dBm) | (dBm) | (dB) |
| 1380 | 35.74 | 49.40 | 20.75 | 32.23 | 2.49 | 0.21 | 27.57 | 13.51 | 0.46 |
| 1385 | 35.72 | 48.61 | 20.83 | 33.57 | 2.30 | 0.23 | 27.48 | 13.52 | 0.45 |
| 1390 | 35.68 | 49.40 | 21.00 | 34.42 | 2.51 | 0.21 | 27.01 | 13.86 | 0.40 |
| 1395 | 35.65 | 49.42 | 21.29 | 35.84 | 2.52 | 0.21 | 27.49 | 13.57 | 0.41 |
| 1400 | 35.62 | 48.51 | 21.64 | 36.59 | 2.30 | 0.23 | 27.52 | 13.42 | 0.40 |
| 1405 | 35.60 | 48.76 | 22.02 | 37.69 | 2.37 | 0.22 | 27.39 | 13.65 | 0.40 |
| 1410 | 35.58 | 48.79 | 21.95 | 38.13 | 2.38 | 0.22 | 27.38 | 13.54 | 0.40 |
| 1415 | 35.55 | 48.44 | 22.33 | 37.97 | 2.30 | 0.23 | 27.49 | 13.71 | 0.41 |
| 1420 | 35.53 | 48.27 | 22.48 | 38.51 | 2.27 | 0.23 | 27.48 | 13.98 | 0.38 |
| 1425 | 35.50 | 48.51 | 22.62 | 36.90 | 2.34 | 0.22 | 27.64 | 13.89 | 0.41 |
| 1430 | 35.48 | 48.40 | 22.84 | 35.87 | 2.31 | 0.23 | 27.42 | 13.81 | 0.41 |
| 1435 | 35.44 | 47.70 | 23.00 | 36.12 | 2.16 | 0.24 | 27.53 | 13.84 | 0.40 |
| 1440 | 35.43 | 48.05 | 23.14 | 34.43 | 2.25 | 0.23 | 27.21 | 13.76 | 0.44 |
| 1445 | 35.39 | 48.84 | 23.34 | 34.46 | 2.45 | 0.21 | 27.33 | 13.93 | 0.46 |
| 1450 | 35.36 | 47.67 | 23.45 | 33.95 | 2.17 | 0.24 | 27.41 | 13.85 | 0.44 |
| 1455 | 35.34 | 47.69 | 23.69 | 32.49 | 2.18 | 0.24 | 27.45 | 13.66 | 0.42 |
| 1460 | 35.32 | 48.11 | 23.86 | 31.66 | 2.28 | 0.23 | 27.43 | 13.65 | 0.41 |
| 1465 | 35.28 | 47.94 | 24.00 | 30.68 | 2.25 | 0.23 | 27.50 | 13.81 | 0.40 |
| 1470 | 35.25 | 48.15 | 24.26 | 29.86 | 2.31 | 0.23 | 27.48 | 13.85 | 0.41 |
| 1475 | 35.23 | 47.97 | 24.42 | 28.87 | 2.27 | 0.23 | 27.12 | 13.76 | 0.38 |
| 1480 | 35.22 | 47.51 | 24.64 | 28.21 | 2.17 | 0.24 | 27.69 | 13.81 | 0.42 |
| 1485 | 35.19 | 48.29 | 24.83 | 27.67 | 2.36 | 0.22 | 27.39 | 13.78 | 0.42 |
| 1490 | 35.16 | 47.69 | 25.26 | 26.82 | 2.22 | 0.24 | 27.50 | 13.72 | 0.37 |
| 1495 | 35.14 | 48.05 | 25.25 | 26.27 | 2.31 | 0.23 | 27.42 | 13.82 | 0.40 |
| 1500 | 35.12 | 48.51 | 25.70 | 25.74 | 2.43 | 0.21 | 27.49 | 13.73 | 0.41 |
| 1505 | 35.09 | 48.10 | 25.87 | 25.18 | 2.33 | 0.22 | 27.31 | 13.78 | 0.42 |
| 1510 | 35.07 | 47.19 | 25.44 | 24.75 | 2.13 | 0.25 | 27.44 | 13.67 | 0.40 |
| 1515 | 35.04 | 47.47 | 25.89 | 24.43 | 2.20 | 0.24 | 27.65 | 13.66 | 0.40 |
| 1520 | 35.01 | 47.93 | 25.83 | 23.97 | 2.31 | 0.23 | 27.45 | 13.60 | 0.37 |

## Typical Performance Data

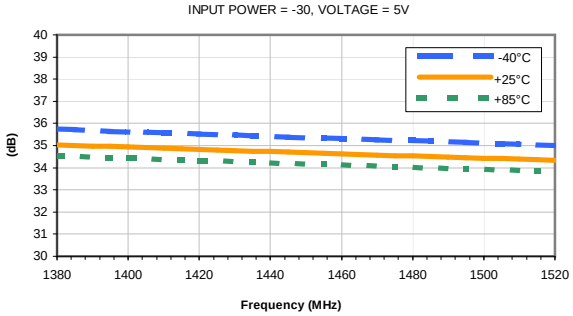
**Definitions:**
Input Return Loss = -S11 (dB)
Gain(Power Gain) = S21 (dB)
Reverse Isolation = -S12 (dB)
Output Return Loss = -S22 (dB)

TEST CONDITIONS: I = 49mA, Vd = 5V @Temperature = +85degC

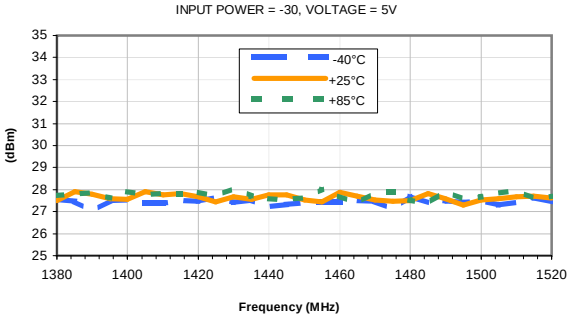
| FREQ | Gain | Isolation | Input Return Loss | Output Return Loss | Stability | | IP3 Output | 1dB Comp. Output | Noise Figure |
|---|---|---|---|---|---|---|---|---|---|
| (MHz) | (dB) | (dB) | (dB) | (dB) | K | Delta | (dBm) | (dBm) | (dB) |
| 1380 | 34.52 | 48.09 | 20.39 | 25.83 | 2.46 | 0.21 | 27.73 | 13.49 | 0.82 |
| 1385 | 34.50 | 48.63 | 20.58 | 25.99 | 2.62 | 0.20 | 27.83 | 13.46 | 0.81 |
| 1390 | 34.47 | 49.20 | 20.84 | 26.06 | 2.79 | 0.19 | 27.85 | 13.52 | 0.77 |
| 1395 | 34.44 | 49.51 | 21.13 | 25.72 | 2.89 | 0.18 | 27.63 | 13.55 | 0.77 |
| 1400 | 34.41 | 49.79 | 21.33 | 25.75 | 2.99 | 0.17 | 27.92 | 13.52 | 0.77 |
| 1405 | 34.39 | 47.85 | 21.56 | 25.57 | 2.44 | 0.21 | 27.78 | 13.45 | 0.78 |
| 1410 | 34.37 | 48.08 | 21.74 | 25.65 | 2.50 | 0.21 | 27.83 | 13.51 | 0.78 |
| 1415 | 34.34 | 48.49 | 21.84 | 25.48 | 2.62 | 0.20 | 27.80 | 13.51 | 0.78 |
| 1420 | 34.32 | 48.44 | 22.08 | 25.39 | 2.62 | 0.20 | 27.88 | 13.52 | 0.75 |
| 1425 | 34.30 | 48.63 | 22.32 | 25.06 | 2.67 | 0.19 | 27.73 | 13.50 | 0.78 |
| 1430 | 34.27 | 48.43 | 22.57 | 25.07 | 2.63 | 0.20 | 28.06 | 13.51 | 0.79 |
| 1435 | 34.24 | 48.50 | 22.85 | 24.97 | 2.66 | 0.19 | 27.70 | 13.48 | 0.78 |
| 1440 | 34.23 | 49.16 | 22.94 | 24.70 | 2.85 | 0.18 | 27.58 | 13.54 | 0.82 |
| 1445 | 34.19 | 48.56 | 23.22 | 24.58 | 2.69 | 0.19 | 27.57 | 13.47 | 0.84 |
| 1450 | 34.17 | 48.11 | 23.41 | 24.37 | 2.57 | 0.20 | 27.63 | 13.40 | 0.82 |
| 1455 | 34.15 | 47.02 | 23.62 | 24.10 | 2.29 | 0.23 | 28.01 | 13.39 | 0.81 |
| 1460 | 34.12 | 47.76 | 23.94 | 23.72 | 2.49 | 0.21 | 27.71 | 13.34 | 0.80 |
| 1465 | 34.10 | 47.80 | 24.14 | 23.44 | 2.50 | 0.20 | 27.38 | 13.41 | 0.79 |
| 1470 | 34.07 | 47.96 | 24.47 | 23.13 | 2.55 | 0.20 | 27.87 | 13.44 | 0.78 |
| 1475 | 34.05 | 48.05 | 24.71 | 22.73 | 2.58 | 0.20 | 27.88 | 13.36 | 0.76 |
| 1480 | 34.03 | 48.87 | 24.95 | 22.47 | 2.82 | 0.18 | 27.54 | 13.33 | 0.78 |
| 1485 | 34.00 | 48.95 | 25.23 | 22.17 | 2.86 | 0.18 | 27.38 | 13.32 | 0.81 |
| 1490 | 33.97 | 48.94 | 25.53 | 21.82 | 2.86 | 0.18 | 27.95 | 13.35 | 0.75 |
| 1495 | 33.95 | 48.79 | 25.93 | 21.31 | 2.82 | 0.18 | 27.55 | 13.35 | 0.80 |
| 1500 | 33.92 | 48.30 | 26.11 | 21.15 | 2.68 | 0.19 | 27.66 | 13.41 | 0.78 |
| 1505 | 33.90 | 47.68 | 26.57 | 20.79 | 2.52 | 0.20 | 27.84 | 13.47 | 0.80 |
| 1510 | 33.88 | 47.63 | 26.83 | 20.59 | 2.51 | 0.20 | 27.95 | 13.38 | 0.79 |
| 1515 | 33.85 | 47.69 | 27.09 | 20.28 | 2.53 | 0.20 | 27.63 | 13.38 | 0.79 |
| 1520 | 33.83 | 48.99 | 27.49 | 19.86 | 2.92 | 0.17 | 27.69 | 13.41 | 0.77 |

## *Typical Performance Curves*

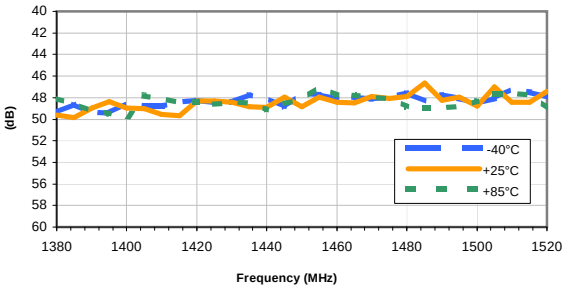
**GAIN vs. FREQUENCY & TEMPERATURE**



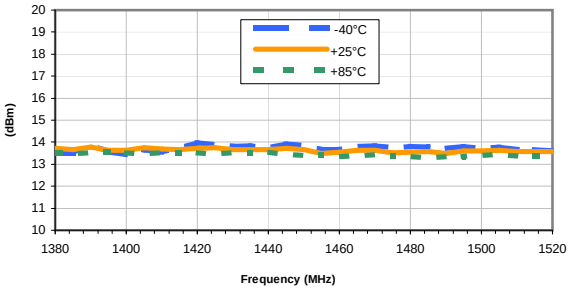

**OUTPUT IP3 vs. FREQUENCY & TEMPERATURE**



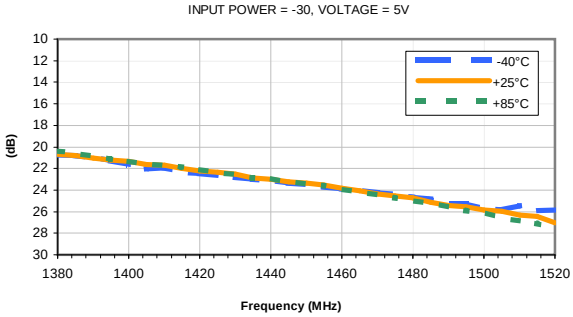

**ISOLATION vs. FREQUENCY & TEMPERATURE**



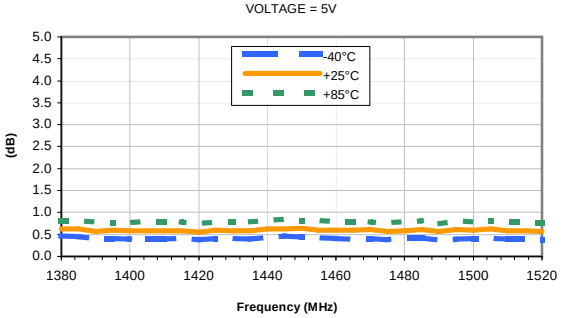

**OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE**



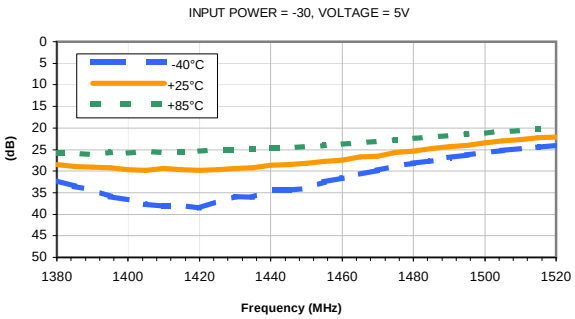

**INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**




**NOISE FIGURE vs. FREQUENCY & TEMPERATURE**



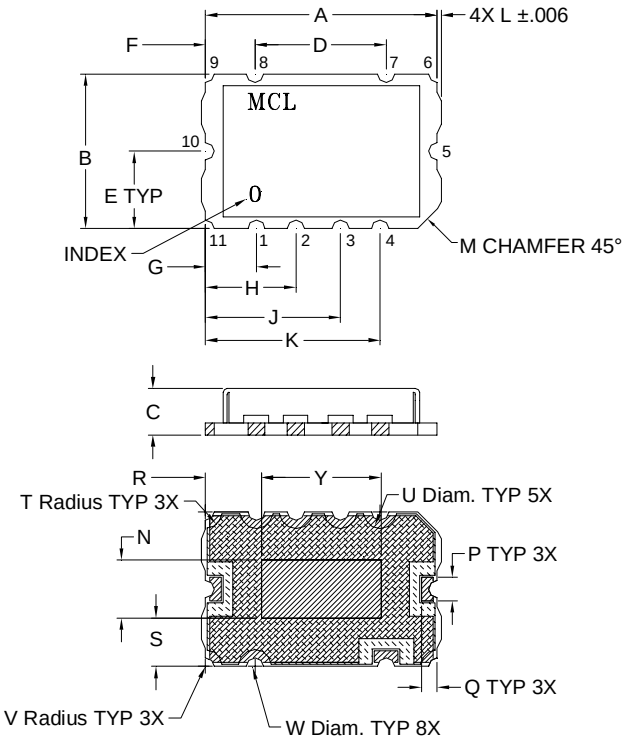

**OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**



# Case Style JQ

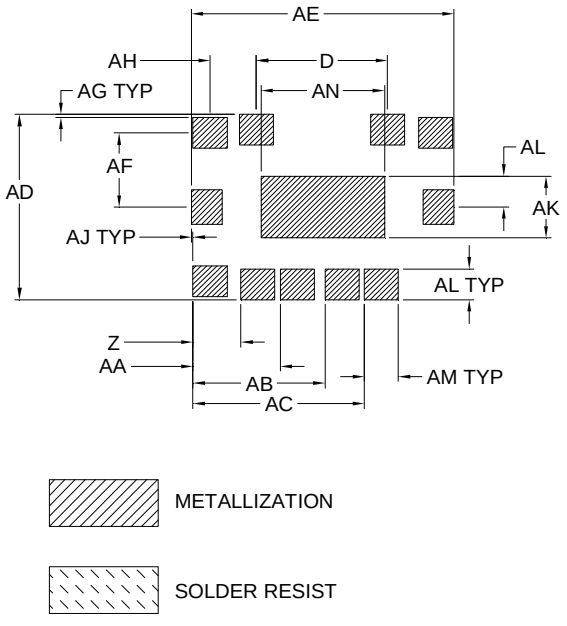
**JQ1382**

## Outline Dimensions




### PCB Land Pattern

Suggested Layout




| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N | P |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JQ1382 | .591 (15.0) | .394 (10.0) | .118 (3.0) | .335 (8.5) | .197 (5.0) | .126 (3.2) | .130 (3.3) | .230 (5.85) | .344 (8.75) | .445 (11.3) | .011 (.28) | .050 (1.27) | .148 (3.75) | .060 (1.52) |

| CASE# | Q | R | S | T | U | V | W | Y | Z | AA | AB | AC | AD | AE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JQ1382 | .040 (1.02) | .143 (3.63) | .123 (3.13) | .042 (1.07) | .084 (2.13) | .022 (.56) | .044 (1.12) | .305 (7.75) | .122 (3.1) | .222 (5.65) | .337 (8.55) | .437 (11.1) | .472 (12.0) | .669 (17.0) |

| CASE# | AF | AG | AH | AJ | AK | AL | AM | AN | WT. GRAMS |
|---|---|---|---|---|---|---|---|---|---|
| JQ1382 | .189 (4.8) | .008 (.20) | .118 (3.0) | .004 (.10) | .158 (4.0) | .079 (2.0) | .087 (2.2) | .315 (8.0) | .8 |

**Dimensions are in inches (mm). Tolerances: 2 Pl. ± .03; 3 Pl. ± .015**

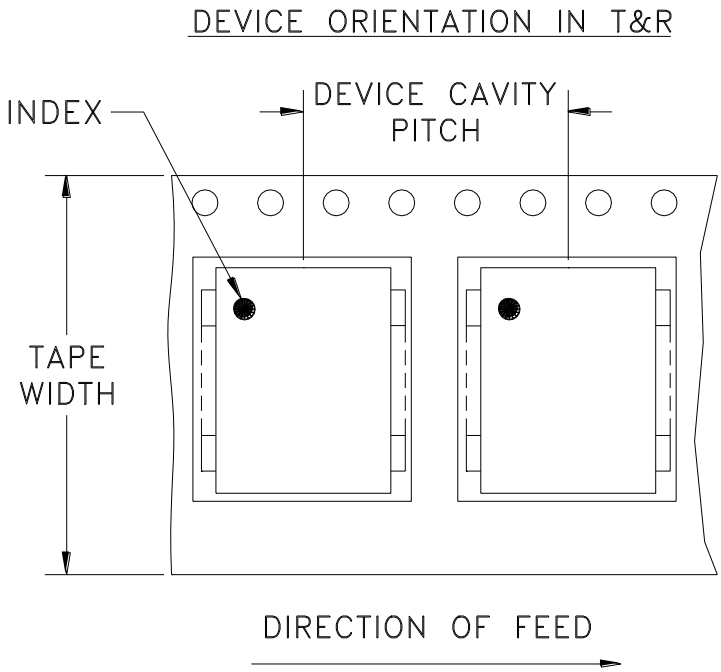
### Notes:

1. Case material: Nickel-Silver alloy.
2. Base: Printed wiring laminate.
3. Termination finish:

   For RoHS Case Styles: 3-5 µ inch (.08-.13 microns) Gold over 120-240 µ inch (3.05-6.10 microns) Nickel plate

   For RoHS-5 Case Styles: Tin-Lead plate.

# Tape & Reel Packaging TR-F10




| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel |
|---|---|---|---|
| 24 | 16 | 7 | 10,20,50,100,200 |
| | | 13 | 500 |

Mini-Circuits carrier tape materials provide protection from ESD (Electro-Static Discharge) during handling and transportation. Tapes are static dissipative and comply with industry standards EIA-481/EIA-541.

Go to: www.minicircuits.com/pages/pdfs/tape.pdf

Note: Please consult individual model data sheet to determine device per reel availability.

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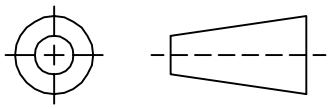
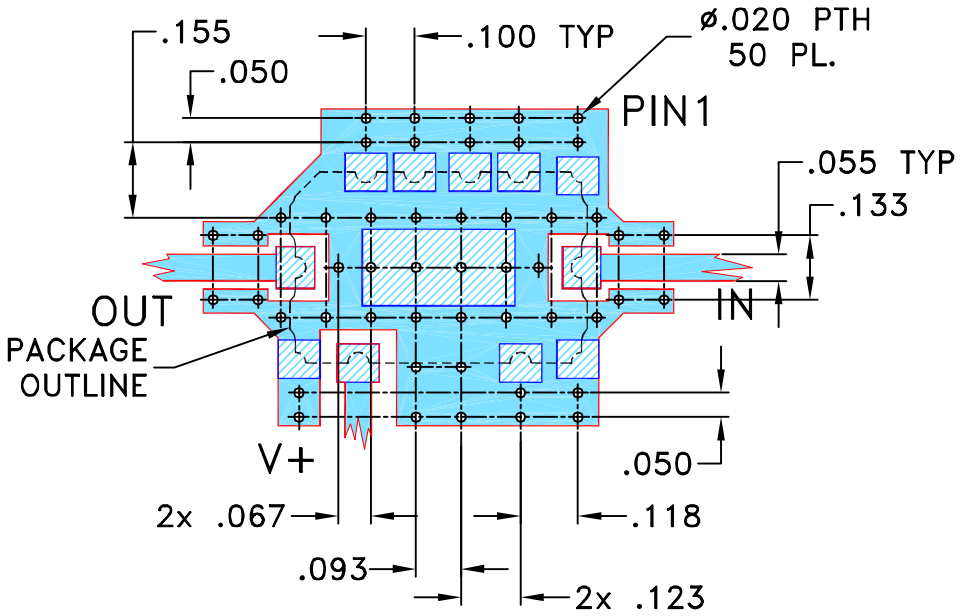
THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|---|---|---|---|---|---|
| OR | M119697 | NEW RELEASE | 10/08 | HB | HH |
| A | M120556 | UPDATE GROUND PLANE DIM. | 12/08 | HB | HH |
| A | R75063 | UPDATE GROUND PLANE DIM. | 12/08 | HB | HH |
| | | | | | |

## SUGGESTED MOUNTING CONFIGURATION FOR JQ1382 CASE STYLE, "11AM01" PIN CODE




NOTES:

1. TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
2. BOTTOM SIDE OF THE PCB IS CONTINOUS GROUND PLANE.

DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)

DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED | | INITIALS | DATE |
|---|---|---|---|
| DIMENSIONS ARE IN INCHES | DRAWN | HB | 05.10.08 |
| TOLERANCES ON: | CHECKED | DH | 28.10.08 |
| 2 PL DECIMALS ± | APPROVED | HH | 29.10.08 |
| 3 PL DECIMALS ± .005 | | | |
| ANGLES ± | | | |
| FRACTIONS ± | | | |



ASHEETA1.DWG REV:A DATE:01/12/95

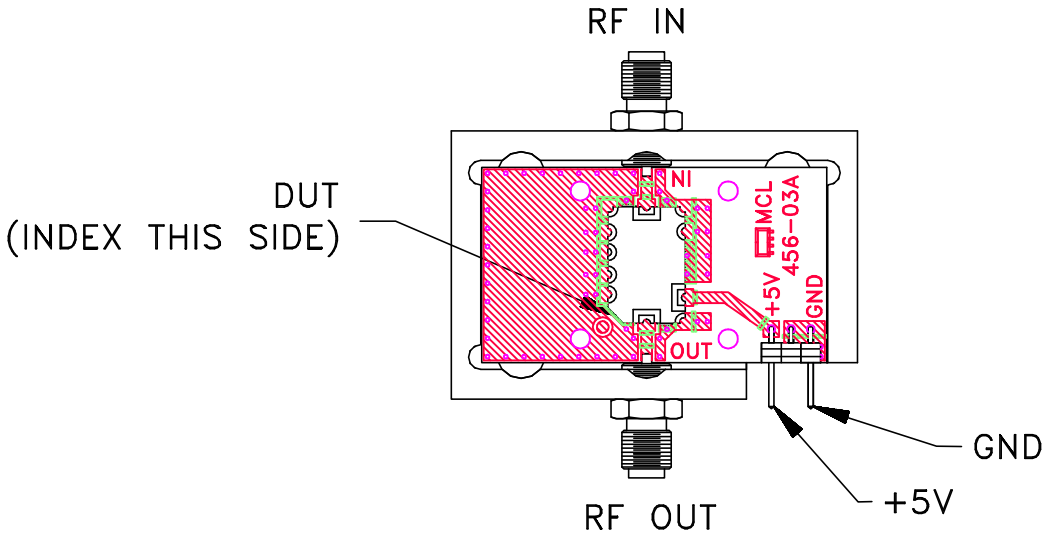
Mini-Circuits® 13 Neptune Avenue Brooklyn NY 11235

# PL, 11AM01, JQ1382, TAMP, TB-468

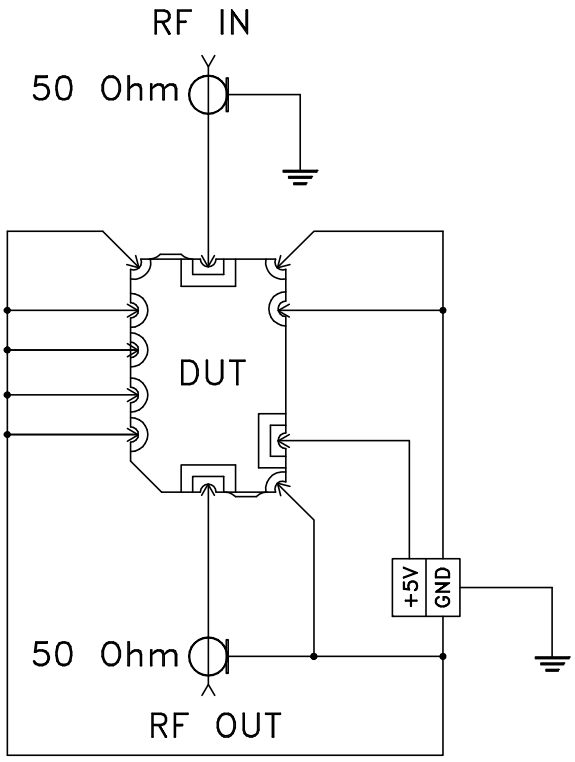
| SIZE | CODE IDENT | DRAWING NO: | REV: |
|---|---|---|---|
| A | 15542 | 98-PL-293 | A |

| FILE: | SCALE: | SHEET: |
|---|---|---|
| 98PL293 | 2.5:1 | 1 OF 1 |

# Evaluation Board and Circuit




TB-468+




Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers RO4350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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# Environmental Specifications ENV44

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 |
| HAST | 130°C, 85% RH, 96 hours | JESD22-A110 |
| Humidity | 90 to 95% RH, 240 hours, 50°C | MIL-STD-202, Method 103, Condition A, Except 50°C and end-point electrical test done within 12 hours |
| Thermal Shock | -55° to 100°C, 100 cycles | MIL-STD-202, Method 107, Condition A-3, except +100°C |
| Solder Reflow Heat | Sn-Pb Eutectic Process: 225°C peak<br>Pb-Free Process, 245°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, Para 4.2.5, Test S, 95% Coverage |
| Vibration (High Frequency) | 20g peak, 20-2000 Hz, 4 times in each of three axes (total 12) | MIL-STD-883, Method 2007.3, Condition A |
| Mechanical Shock | 50g, 11 ms, 1/2-sine, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition A |
| Marking Resistance to Solvents | Isopropyl alcohol + mineral spirits at 25°C; terpene defluxer at 25°C;<br>distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |