

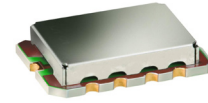
# Low Noise Amplifier

## TAMP-242LN+

50Ω 1710 to 2400 MHz

### The Big Deal

- Ultra Low Noise Figure, 0.65 dB typ.
- High IP3, 33.5dBm typ.
- Low Current, 40mA at +5V
- Integrated Bias Matching and Stabilization Circuits



CASE STYLE: JQ1382

### Product Overview

The TAMP-242LN+ (RoHS compliant) utilizes advanced E-PHEMT technology in a single 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 output IP3 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 0.65 dB NF, the TAMP-242LN+ 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 low system sensitivity in demanding applications.                                      |
| High Output IP3, 33.5dBm typ.    | At +33.5 dBm IP3, in combination with its low noise performance, the TAMP-242LN+ can improve a systems' spur-free dynamic range which is often the critical driver in many receiver applications.                                                                                                   |
| High P1dB: 17dBm typ.            | High P1dB enables the amplifier to operate in linear region in the presence of strong interfering signals.                                                                                                                                                                                          |
| Low Current, 40mA typ.           | At only 40mA, the TAMP-242LN+ is ideal for applications with limited available power or densely packed applications where thermal and power management is critical.                                                                                                                                 |
| Well Matched input/ output ports | With typical input & output VSWR of 1.4:1, the TAMP-242LN+ 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-242LN+ 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 reactive loads at 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.                                                                               |

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Surface Mount

# Low Noise Amplifier

TAMP-242LN+

50Ω

1710 to 2400 MHz

## Features

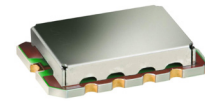
- Ultra low noise figure, 0.65 dB typ.
- Output power, up to +17 dBm typ.
- Good output IP3, 33.5 dBm typ.
- Low current consumption
- Good VSWR, 1.4:1 typ.
- Unconditionally stable

## Applications

- Base station transceiver, tower mounted amplifier, repeater
- WCDMA
- TD SCDMA
- PCS Rx / PCS Tx
- General purpose low noise amplifier

## Electrical Specifications at 25°C

| Parameter                                 | Condition (MHz) | Min. | Typ.  | Max.  | Units |
|-------------------------------------------|-----------------|------|-------|-------|-------|
| Frequency Range                           |                 | 1710 |       | 2400  | MHz   |
| Noise Figure                              | 1710 - 1880     |      | 0.60  | 0.85  | dB    |
|                                           | 1850 - 1990     |      | 0.60  | 0.85  |       |
|                                           | 1990 - 2200     |      | 0.65  | 0.85  |       |
|                                           | 2200 - 2400     |      | 0.65  | 0.90  |       |
| Gain                                      | 1710 - 1880     | 12.0 | 14.0  |       | dB    |
|                                           | 1850 - 1990     | 11.5 | 13.5  |       |       |
|                                           | 1990 - 2200     | 10.5 | 12.5  |       |       |
|                                           | 2200 - 2400     | 10.0 | 11.5  |       |       |
| Gain Flatness                             | 1710 - 1880     |      | ± 0.5 | ± 1.0 | dB    |
|                                           | 1850 - 1990     |      | ± 0.3 | ± 0.7 |       |
|                                           | 1990 - 2200     |      | ± 0.5 | ± 1.0 |       |
|                                           | 2200 - 2400     |      | ± 0.4 | ± 0.8 |       |
| Output Power at 1dB compression           | 1710 - 1880     | 15.5 | 17.0  |       | dBm   |
|                                           | 1850 - 1990     | 15.5 | 17.0  |       |       |
|                                           | 1990 - 2200     | 15.5 | 17.0  |       |       |
|                                           | 2200 - 2400     | 15.5 | 17.0  |       |       |
| Output third order intercept point (OIP3) | 1710 - 1880     |      | 32.5  |       | dBm   |
|                                           | 1850 - 1990     |      | 33.5  |       |       |
|                                           | 1990 - 2200     |      | 34.5  |       |       |
|                                           | 2200 - 2400     |      | 34.5  |       |       |
| Input VSWR                                | 1710 - 1880     |      | 1.4   |       | :1    |
|                                           | 1850 - 1990     |      | 1.5   |       |       |
|                                           | 1990 - 2200     |      | 1.6   |       |       |
|                                           | 2200 - 2400     |      | 1.7   |       |       |
| Output VSWR                               | 1710 - 1880     |      | 1.2   |       | :1    |
|                                           | 1850 - 1990     |      | 1.2   |       |       |
|                                           | 1990 - 2200     |      | 1.2   |       |       |
|                                           | 2200 - 2400     |      | 1.2   |       |       |
| DC Supply Voltage                         |                 |      | 5.0   |       | V     |
| DC Supply Current                         |                 |      | 40    | 46    | mA    |



CASE STYLE: JQ1382

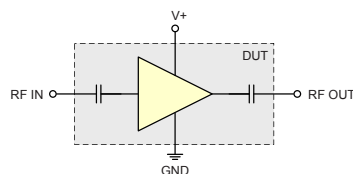
### +RoHS Compliant

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

## Pin Connections

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

## Simplified Schematic



## 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) | +10 dBm        |
| Power Consumption          | 250 mW         |

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

## ESD Rating

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

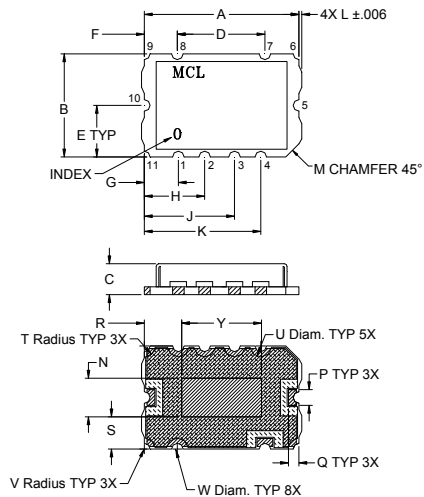
Machine Model (MM): Class M1 (40 V) in accordance with ANSI/ESD STM 5.2 - 1999

### Notes

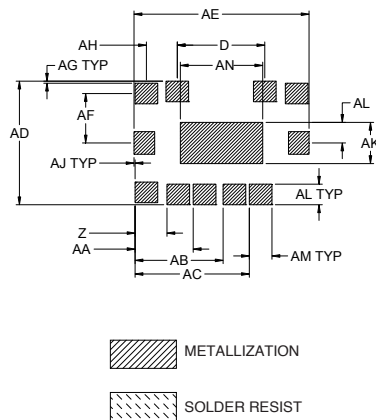
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## Outline Drawing



## PCB Land Pattern



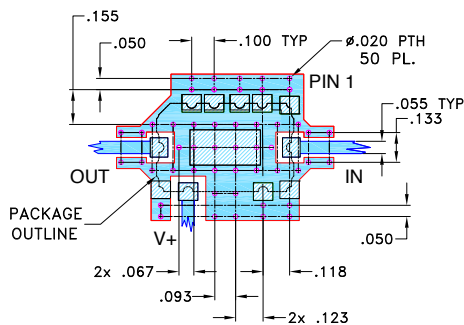
## Outline Dimensions (Inch)

| 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:

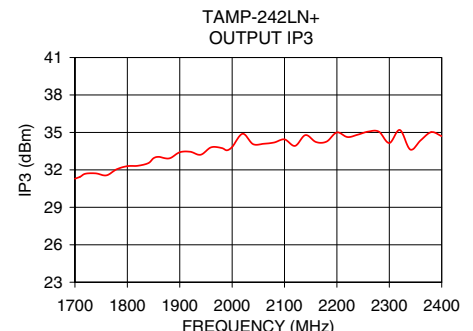
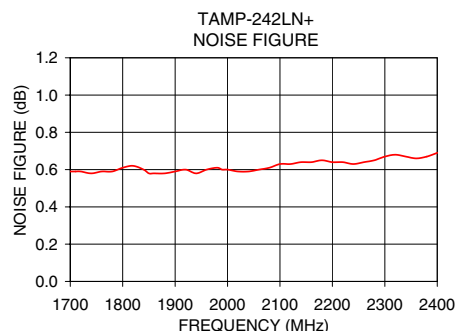
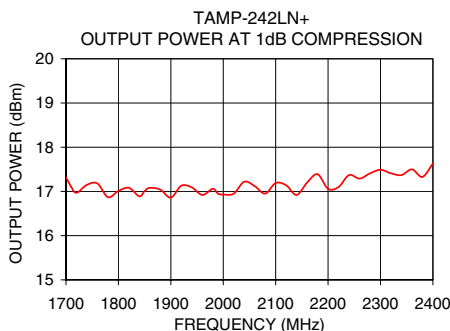
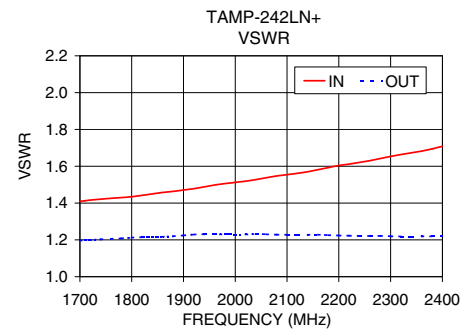
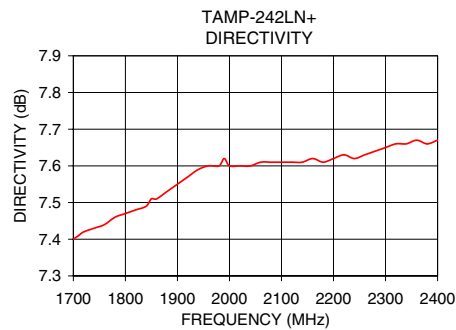
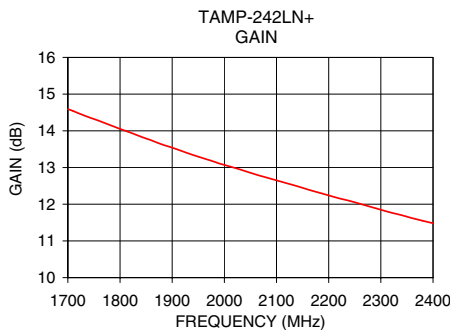
- TRACE WIDTH IS SHOWN FOR ROGERS RO4350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE. FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
  - BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.
- DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

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| FREQUENCY<br>(MHz) | GAIN<br>(dB) | DIRECTIVITY<br>(dB) | VSWR<br>IN<br>(:1) | VSWR<br>OUT<br>(:1) | NOISE<br>FIGURE<br>(dB) | P. OUT @ 1dB<br>COMPR.<br>(dBm) | OUTPUT<br>IP3<br>(dBm) |
|--------------------|--------------|---------------------|--------------------|---------------------|-------------------------|---------------------------------|------------------------|
| 1710.00            | 14.54        | 7.41                | 1.41               | 1.19                | 0.59                    | 17.10                           | 31.29                  |
| 1740.00            | 14.37        | 7.43                | 1.42               | 1.19                | 0.58                    | 17.15                           | 31.77                  |
| 1760.00            | 14.27        | 7.44                | 1.42               | 1.20                | 0.59                    | 17.18                           | 31.59                  |
| 1785.00            | 14.13        | 7.47                | 1.43               | 1.20                | 0.60                    | 16.87                           | 32.06                  |
| 1800.00            | 14.05        | 7.47                | 1.43               | 1.20                | 0.61                    | 17.01                           | 32.29                  |
| 1850.00            | 13.79        | 7.51                | 1.45               | 1.21                | 0.58                    | 17.01                           | 32.54                  |
| 1880.00            | 13.63        | 7.53                | 1.46               | 1.21                | 0.58                    | 17.04                           | 32.81                  |
| 1900.00            | 13.54        | 7.55                | 1.46               | 1.21                | 0.59                    | 16.86                           | 33.07                  |
| 1940.00            | 13.34        | 7.59                | 1.48               | 1.22                | 0.58                    | 17.09                           | 33.32                  |
| 1960.00            | 13.25        | 7.60                | 1.49               | 1.22                | 0.60                    | 16.92                           | 33.44                  |
| 1990.00            | 13.11        | 7.62                | 1.50               | 1.22                | 0.60                    | 16.95                           | 33.75                  |
| 2000.00            | 13.07        | 7.60                | 1.51               | 1.22                | 0.60                    | 16.93                           | 33.57                  |
| 2050.00            | 12.86        | 7.60                | 1.53               | 1.22                | 0.59                    | 17.12                           | 34.05                  |
| 2100.00            | 12.65        | 7.61                | 1.55               | 1.22                | 0.63                    | 17.19                           | 34.33                  |
| 2150.00            | 12.46        | 7.62                | 1.56               | 1.22                | 0.64                    | 16.92                           | 34.80                  |
| 2200.00            | 12.24        | 7.62                | 1.59               | 1.22                | 0.64                    | 17.06                           | 34.56                  |
| 2250.00            | 12.05        | 7.62                | 1.61               | 1.21                | 0.63                    | 17.34                           | 34.83                  |
| 2300.00            | 11.85        | 7.65                | 1.64               | 1.21                | 0.67                    | 17.49                           | 34.53                  |
| 2350.00            | 11.68        | 7.66                | 1.66               | 1.21                | 0.67                    | 17.37                           | 33.62                  |
| 2400.00            | 11.48        | 7.67                | 1.69               | 1.21                | 0.69                    | 17.63                           | 34.55                  |



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# Amplifier

# TAMP-242LN+

## 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 = 40mA, Vd = 5V @Temperature = +25degC

| FREQ  | Gain  | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |       | IP3<br>Output | 1dB<br>Comp.<br>Output | Noise*<br>Figure |
|-------|-------|-----------|-------------------------|--------------------------|-----------|-------|---------------|------------------------|------------------|
| (MHz) | (dB)  | (dB)      | (dB)                    | (dB)                     | K         | Delta | (dBm)         | (dBm)                  | (dB)             |
| 1710  | 14.54 | 21.95     | 15.39                   | 21.21                    | 1.34      | 0.42  | 31.43         | 17.10                  | 0.59             |
| 1750  | 14.32 | 21.76     | 15.20                   | 20.98                    | 1.34      | 0.42  | 32.03         | 17.12                  | 0.58             |
| 1760  | 14.27 | 21.71     | 15.17                   | 20.94                    | 1.34      | 0.42  | 31.90         | 17.18                  | 0.59             |
| 1780  | 14.16 | 21.62     | 15.11                   | 20.85                    | 1.34      | 0.42  | 32.34         | 16.87                  | 0.59             |
| 1800  | 14.05 | 21.52     | 15.04                   | 20.68                    | 1.34      | 0.42  | 32.42         | 17.01                  | 0.61             |
| 1810  | 14.00 | 21.48     | 14.98                   | 20.63                    | 1.34      | 0.42  | 32.66         | 17.01                  | 0.61             |
| 1820  | 13.95 | 21.43     | 14.93                   | 20.59                    | 1.34      | 0.41  | 32.56         | 17.08                  | 0.62             |
| 1850  | 13.79 | 21.30     | 14.74                   | 20.53                    | 1.34      | 0.41  | 33.46         | 17.01                  | 0.58             |
| 1860  | 13.74 | 21.25     | 14.68                   | 20.50                    | 1.34      | 0.41  | 33.51         | 17.08                  | 0.58             |
| 1880  | 13.63 | 21.16     | 14.60                   | 20.43                    | 1.34      | 0.41  | 33.56         | 17.04                  | 0.58             |
| 1900  | 13.54 | 21.09     | 14.50                   | 20.31                    | 1.34      | 0.41  | 33.62         | 16.86                  | 0.59             |
| 1910  | 13.49 | 21.05     | 14.44                   | 20.21                    | 1.34      | 0.41  | 34.13         | 16.97                  | 0.59             |
| 1920  | 13.44 | 21.01     | 14.39                   | 20.14                    | 1.34      | 0.41  | 34.08         | 17.13                  | 0.60             |
| 1950  | 13.30 | 20.89     | 14.19                   | 20.07                    | 1.34      | 0.41  | 34.46         | 17.00                  | 0.59             |
| 1960  | 13.25 | 20.85     | 14.11                   | 20.06                    | 1.34      | 0.41  | 34.48         | 16.92                  | 0.60             |
| 1980  | 13.16 | 20.76     | 14.00                   | 20.07                    | 1.34      | 0.41  | 33.88         | 17.06                  | 0.61             |
| 2000  | 13.07 | 20.67     | 13.91                   | 20.06                    | 1.34      | 0.41  | 34.23         | 16.93                  | 0.60             |
| 2010  | 13.03 | 20.64     | 13.87                   | 20.04                    | 1.34      | 0.41  | 33.75         | 16.93                  | 0.60             |
| 2050  | 12.86 | 20.46     | 13.64                   | 19.97                    | 1.34      | 0.41  | 34.03         | 17.12                  | 0.59             |
| 2060  | 12.81 | 20.42     | 13.59                   | 20.01                    | 1.34      | 0.41  | 34.29         | 17.12                  | 0.60             |
| 2080  | 12.73 | 20.34     | 13.48                   | 20.08                    | 1.33      | 0.41  | 34.15         | 16.95                  | 0.61             |
| 2100  | 12.65 | 20.26     | 13.37                   | 20.11                    | 1.33      | 0.41  | 33.59         | 17.19                  | 0.63             |
| 2110  | 12.61 | 20.22     | 13.33                   | 20.10                    | 1.33      | 0.41  | 33.49         | 17.19                  | 0.63             |
| 2120  | 12.57 | 20.18     | 13.29                   | 20.11                    | 1.33      | 0.41  | 34.17         | 17.14                  | 0.63             |
| 2150  | 12.44 | 20.05     | 13.14                   | 20.08                    | 1.33      | 0.41  | 34.80         | 17.05                  | 0.64             |
| 2160  | 12.40 | 20.02     | 13.07                   | 20.09                    | 1.33      | 0.41  | 34.01         | 17.20                  | 0.64             |
| 2180  | 12.32 | 19.93     | 12.93                   | 20.16                    | 1.33      | 0.41  | 33.79         | 17.39                  | 0.65             |
| 2200  | 12.24 | 19.86     | 12.81                   | 20.24                    | 1.33      | 0.41  | 34.96         | 17.06                  | 0.64             |
| 2220  | 12.16 | 19.79     | 12.73                   | 20.26                    | 1.33      | 0.41  | 34.28         | 17.10                  | 0.64             |
| 2250  | 12.05 | 19.67     | 12.59                   | 20.27                    | 1.32      | 0.41  | 34.13         | 17.34                  | 0.63             |
| 2260  | 12.01 | 19.64     | 12.53                   | 20.27                    | 1.32      | 0.41  | 34.84         | 17.29                  | 0.64             |
| 2280  | 11.93 | 19.57     | 12.42                   | 20.27                    | 1.32      | 0.41  | 34.33         | 17.41                  | 0.65             |
| 2300  | 11.85 | 19.50     | 12.29                   | 20.35                    | 1.32      | 0.41  | 33.54         | 17.49                  | 0.67             |
| 2350  | 11.66 | 19.32     | 12.07                   | 20.35                    | 1.32      | 0.40  | 33.96         | 17.44                  | 0.67             |
| 2360  | 11.62 | 19.29     | 12.01                   | 20.31                    | 1.32      | 0.40  | 33.16         | 17.50                  | 0.66             |
| 2380  | 11.55 | 19.21     | 11.91                   | 20.29                    | 1.32      | 0.40  | 33.87         | 17.33                  | 0.67             |
| 2400  | 11.48 | 19.15     | 11.78                   | 20.30                    | 1.32      | 0.40  | 35.05         | 17.63                  | 0.69             |

\*The Noise Figure measurement performed in shielded box.

REV. X1  
TAMP-242LN+  
090317  
Page 1 of 3



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# Amplifier

# TAMP-242LN+

## 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 = 40mA, Vd = 5V @Temperature = -45degC

| FREQ  | Gain  | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |       | IP3<br>Output | 1dB<br>Comp.<br>Output |
|-------|-------|-----------|-------------------------|--------------------------|-----------|-------|---------------|------------------------|
| (MHz) | (dB)  | (dB)      | (dB)                    | (dB)                     | K         | Delta | (dBm)         | (dBm)                  |
| 1710  | 14.80 | 21.78     | 15.99                   | 21.64                    | 1.30      | 0.44  | 31.28         | 16.81                  |
| 1750  | 14.59 | 21.61     | 15.89                   | 21.25                    | 1.30      | 0.44  | 31.53         | 16.90                  |
| 1760  | 14.53 | 21.56     | 15.84                   | 21.25                    | 1.30      | 0.44  | 31.41         | 16.93                  |
| 1780  | 14.42 | 21.47     | 15.69                   | 21.15                    | 1.30      | 0.44  | 31.99         | 16.62                  |
| 1800  | 14.31 | 21.37     | 15.51                   | 21.09                    | 1.30      | 0.44  | 31.96         | 16.76                  |
| 1810  | 14.25 | 21.34     | 15.42                   | 21.08                    | 1.30      | 0.44  | 32.22         | 16.79                  |
| 1820  | 14.20 | 21.29     | 15.34                   | 21.05                    | 1.30      | 0.43  | 32.21         | 16.83                  |
| 1850  | 14.04 | 21.18     | 15.30                   | 20.70                    | 1.31      | 0.43  | 33.08         | 16.78                  |
| 1860  | 13.98 | 21.13     | 15.24                   | 20.63                    | 1.31      | 0.43  | 33.07         | 16.83                  |
| 1880  | 13.89 | 21.03     | 15.16                   | 20.48                    | 1.31      | 0.43  | 32.62         | 16.76                  |
| 1900  | 13.79 | 20.96     | 14.97                   | 20.41                    | 1.31      | 0.43  | 32.99         | 16.63                  |
| 1910  | 13.75 | 20.91     | 14.88                   | 20.39                    | 1.30      | 0.43  | 33.32         | 16.76                  |
| 1920  | 13.70 | 20.86     | 14.81                   | 20.39                    | 1.30      | 0.43  | 33.34         | 16.91                  |
| 1950  | 13.56 | 20.71     | 14.68                   | 20.43                    | 1.30      | 0.43  | 33.57         | 16.73                  |
| 1960  | 13.52 | 20.67     | 14.64                   | 20.35                    | 1.30      | 0.43  | 33.44         | 16.66                  |
| 1980  | 13.43 | 20.61     | 14.55                   | 20.43                    | 1.30      | 0.43  | 33.84         | 16.79                  |
| 2000  | 13.34 | 20.50     | 14.44                   | 20.43                    | 1.30      | 0.43  | 33.82         | 16.70                  |
| 2010  | 13.30 | 20.46     | 14.35                   | 20.43                    | 1.30      | 0.43  | 33.16         | 16.69                  |
| 2050  | 13.11 | 20.29     | 14.05                   | 20.39                    | 1.30      | 0.43  | 33.69         | 16.85                  |
| 2060  | 13.07 | 20.24     | 14.06                   | 20.37                    | 1.30      | 0.43  | 33.81         | 16.86                  |
| 2080  | 12.99 | 20.15     | 14.04                   | 20.39                    | 1.30      | 0.43  | 33.86         | 16.71                  |
| 2100  | 12.91 | 20.08     | 13.91                   | 20.48                    | 1.30      | 0.43  | 33.26         | 16.98                  |
| 2110  | 12.86 | 20.05     | 13.85                   | 20.57                    | 1.30      | 0.43  | 33.31         | 16.95                  |
| 2120  | 12.82 | 20.02     | 13.79                   | 20.52                    | 1.30      | 0.43  | 33.98         | 16.88                  |
| 2150  | 12.70 | 19.87     | 13.56                   | 20.41                    | 1.29      | 0.43  | 34.05         | 16.86                  |
| 2160  | 12.67 | 19.84     | 13.49                   | 20.42                    | 1.29      | 0.43  | 33.69         | 17.00                  |
| 2180  | 12.59 | 19.75     | 13.39                   | 20.45                    | 1.29      | 0.43  | 33.62         | 17.18                  |
| 2200  | 12.51 | 19.67     | 13.33                   | 20.49                    | 1.29      | 0.43  | 34.44         | 16.77                  |
| 2220  | 12.42 | 19.62     | 13.22                   | 20.59                    | 1.29      | 0.43  | 33.69         | 16.92                  |
| 2250  | 12.31 | 19.49     | 12.95                   | 20.59                    | 1.29      | 0.43  | 34.01         | 17.14                  |
| 2260  | 12.27 | 19.44     | 12.88                   | 20.55                    | 1.28      | 0.43  | 34.16         | 17.07                  |
| 2280  | 12.19 | 19.37     | 12.80                   | 20.48                    | 1.28      | 0.43  | 33.72         | 17.18                  |
| 2300  | 12.12 | 19.30     | 12.75                   | 20.52                    | 1.28      | 0.43  | 33.25         | 17.30                  |
| 2350  | 11.93 | 19.14     | 12.41                   | 20.68                    | 1.28      | 0.43  | 33.73         | 17.25                  |
| 2360  | 11.89 | 19.11     | 12.32                   | 20.71                    | 1.28      | 0.43  | 32.89         | 17.30                  |
| 2380  | 11.82 | 19.03     | 12.20                   | 20.56                    | 1.28      | 0.43  | 33.32         | 17.19                  |
| 2400  | 11.75 | 18.95     | 12.12                   | 20.42                    | 1.27      | 0.43  | 34.88         | 17.43                  |

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# Amplifier

# TAMP-242LN+

## 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 = 40mA, Vd = 5V @Temperature = +85degC

| FREQ  | Gain  | Isolation | Input<br>Return<br>Loss | Output<br>Return<br>Loss | Stability |       | IP3<br>Output | 1dB<br>Comp.<br>Output |
|-------|-------|-----------|-------------------------|--------------------------|-----------|-------|---------------|------------------------|
| (MHz) | (dB)  | (dB)      | (dB)                    | (dB)                     | K         | Delta | (dBm)         | (dBm)                  |
| 1710  | 14.28 | 22.09     | 15.07                   | 21.41                    | 1.38      | 0.40  | 31.62         | 17.31                  |
| 1750  | 14.07 | 21.91     | 15.03                   | 21.09                    | 1.38      | 0.40  | 32.34         | 17.31                  |
| 1760  | 14.02 | 21.87     | 14.98                   | 21.07                    | 1.38      | 0.40  | 32.18         | 17.39                  |
| 1780  | 13.91 | 21.76     | 14.82                   | 21.03                    | 1.38      | 0.40  | 32.79         | 17.09                  |
| 1800  | 13.80 | 21.68     | 14.61                   | 20.94                    | 1.38      | 0.39  | 32.65         | 17.21                  |
| 1810  | 13.74 | 21.64     | 14.52                   | 20.88                    | 1.38      | 0.39  | 33.23         | 17.20                  |
| 1820  | 13.68 | 21.60     | 14.47                   | 20.86                    | 1.38      | 0.39  | 33.26         | 17.27                  |
| 1850  | 13.53 | 21.49     | 14.44                   | 20.69                    | 1.39      | 0.39  | 34.17         | 17.21                  |
| 1860  | 13.48 | 21.45     | 14.41                   | 20.66                    | 1.39      | 0.39  | 34.41         | 17.29                  |
| 1880  | 13.39 | 21.35     | 14.31                   | 20.55                    | 1.38      | 0.39  | 33.96         | 17.26                  |
| 1900  | 13.29 | 21.25     | 14.12                   | 20.54                    | 1.38      | 0.39  | 34.08         | 17.09                  |
| 1910  | 13.24 | 21.22     | 14.03                   | 20.53                    | 1.38      | 0.39  | 34.95         | 17.19                  |
| 1920  | 13.19 | 21.17     | 13.96                   | 20.48                    | 1.38      | 0.39  | 34.16         | 17.34                  |
| 1950  | 13.06 | 21.02     | 13.88                   | 20.52                    | 1.38      | 0.39  | 34.77         | 17.24                  |
| 1960  | 13.01 | 20.99     | 13.86                   | 20.52                    | 1.38      | 0.39  | 34.72         | 17.16                  |
| 1980  | 12.92 | 20.91     | 13.75                   | 20.60                    | 1.38      | 0.39  | 35.35         | 17.30                  |
| 2000  | 12.83 | 20.82     | 13.60                   | 20.52                    | 1.38      | 0.39  | 34.69         | 17.18                  |
| 2010  | 12.79 | 20.79     | 13.50                   | 20.54                    | 1.38      | 0.39  | 33.96         | 17.19                  |
| 2050  | 12.60 | 20.60     | 13.23                   | 20.45                    | 1.37      | 0.39  | 34.75         | 17.39                  |
| 2060  | 12.56 | 20.56     | 13.24                   | 20.47                    | 1.38      | 0.39  | 34.51         | 17.36                  |
| 2080  | 12.48 | 20.50     | 13.24                   | 20.56                    | 1.38      | 0.39  | 34.76         | 17.19                  |
| 2100  | 12.40 | 20.42     | 13.10                   | 20.56                    | 1.38      | 0.39  | 33.92         | 17.41                  |
| 2110  | 12.35 | 20.38     | 13.03                   | 20.61                    | 1.38      | 0.39  | 33.61         | 17.45                  |
| 2120  | 12.31 | 20.34     | 12.96                   | 20.58                    | 1.38      | 0.39  | 34.42         | 17.39                  |
| 2150  | 12.19 | 20.22     | 12.74                   | 20.47                    | 1.37      | 0.39  | 34.83         | 17.27                  |
| 2160  | 12.15 | 20.18     | 12.68                   | 20.44                    | 1.37      | 0.39  | 34.38         | 17.42                  |
| 2180  | 12.08 | 20.10     | 12.63                   | 20.45                    | 1.37      | 0.39  | 34.63         | 17.60                  |
| 2200  | 11.99 | 20.01     | 12.59                   | 20.51                    | 1.37      | 0.39  | 34.83         | 17.33                  |
| 2220  | 11.91 | 19.95     | 12.49                   | 20.56                    | 1.37      | 0.39  | 35.00         | 17.33                  |
| 2250  | 11.79 | 19.84     | 12.26                   | 20.50                    | 1.37      | 0.39  | 34.71         | 17.53                  |
| 2260  | 11.75 | 19.80     | 12.21                   | 20.45                    | 1.36      | 0.39  | 35.81         | 17.49                  |
| 2280  | 11.67 | 19.71     | 12.14                   | 20.37                    | 1.36      | 0.39  | 35.03         | 17.62                  |
| 2300  | 11.60 | 19.66     | 12.12                   | 20.35                    | 1.36      | 0.39  | 34.09         | 17.64                  |
| 2350  | 11.41 | 19.50     | 11.81                   | 20.27                    | 1.36      | 0.38  | 34.01         | 17.65                  |
| 2360  | 11.37 | 19.48     | 11.73                   | 20.29                    | 1.36      | 0.38  | 33.16         | 17.54                  |
| 2380  | 11.30 | 19.40     | 11.64                   | 20.23                    | 1.36      | 0.38  | 34.33         | 17.32                  |
| 2400  | 11.23 | 19.32     | 11.56                   | 20.16                    | 1.36      | 0.39  | 36.18         | 17.66                  |

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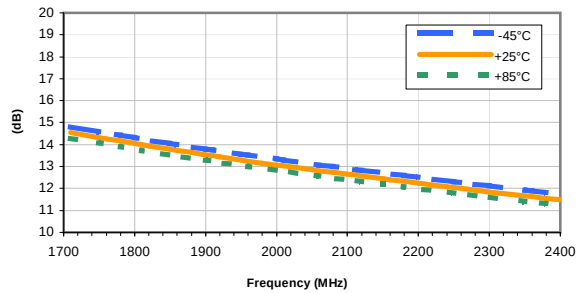
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## Typical Performance Curves

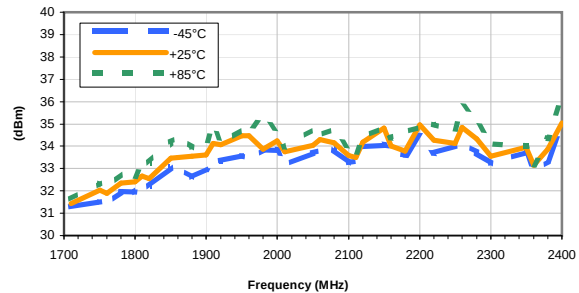
**GAIN vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -15, VOLTAGE = 5V



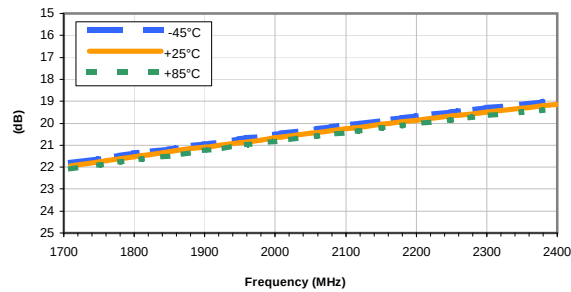
**OUTPUT IP3 vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -15, VOLTAGE = 5V



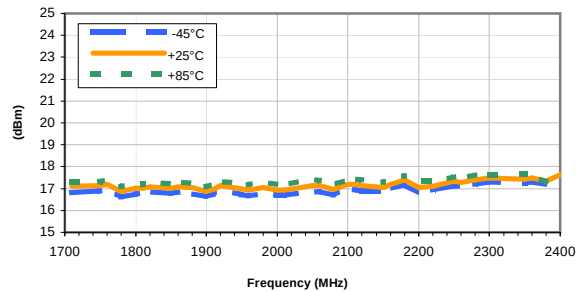
**ISOLATION vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -15, VOLTAGE = 5V



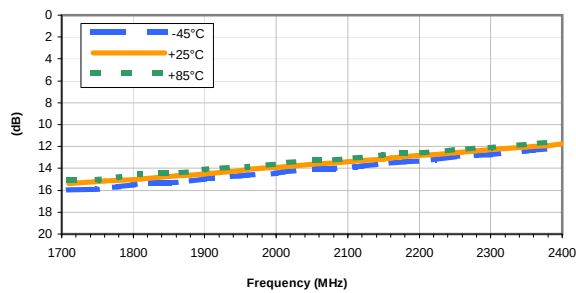
**OUTPUT POWER at 1dB COMPRESSION vs. FREQUENCY & TEMPERATURE**

VOLTAGE = 5V



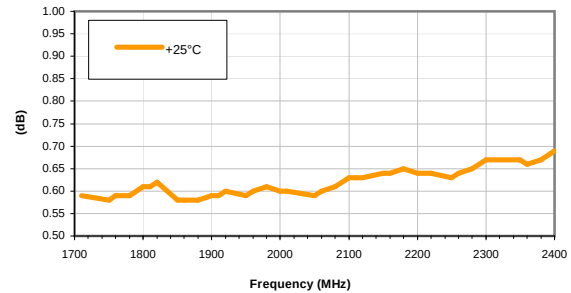
**INPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -15, VOLTAGE = 5V



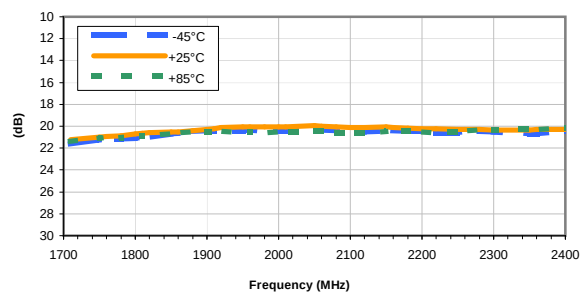
**NOISE FIGURE vs. FREQUENCY**

VOLTAGE = 5V



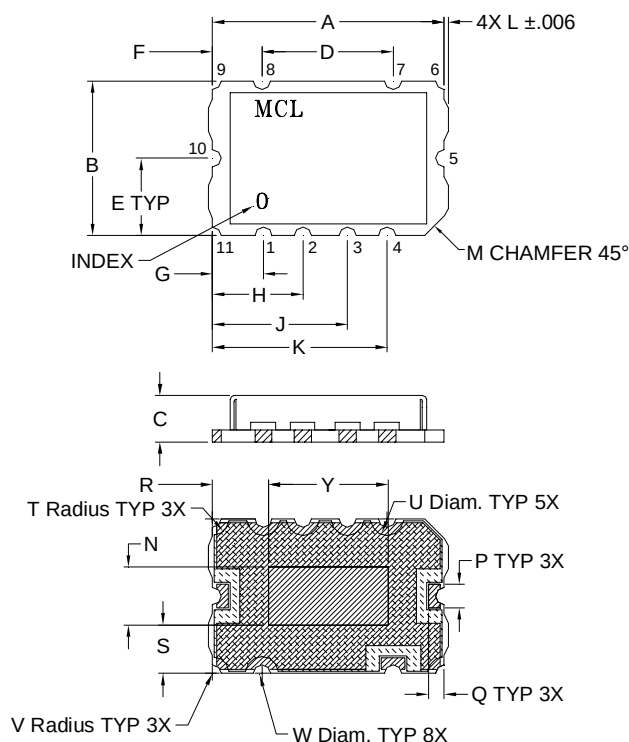
**OUTPUT RETURN LOSS vs. FREQUENCY & TEMPERATURE**

INPUT POWER = -15, VOLTAGE = 5V



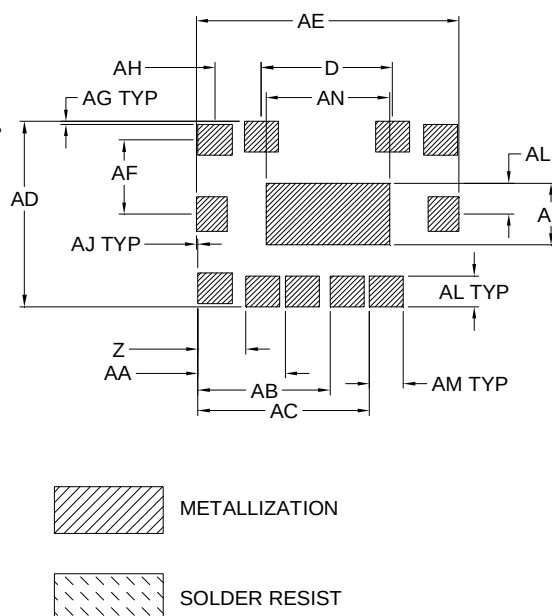


## Outline Dimensions



## PCB Land Pattern

### Suggested Layout



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

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

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

Dimensions are in inches (mm). Tolerances: 2 Pl.  $\pm .03$ ; 3 Pl.  $\pm .015$

### Notes:

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

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

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



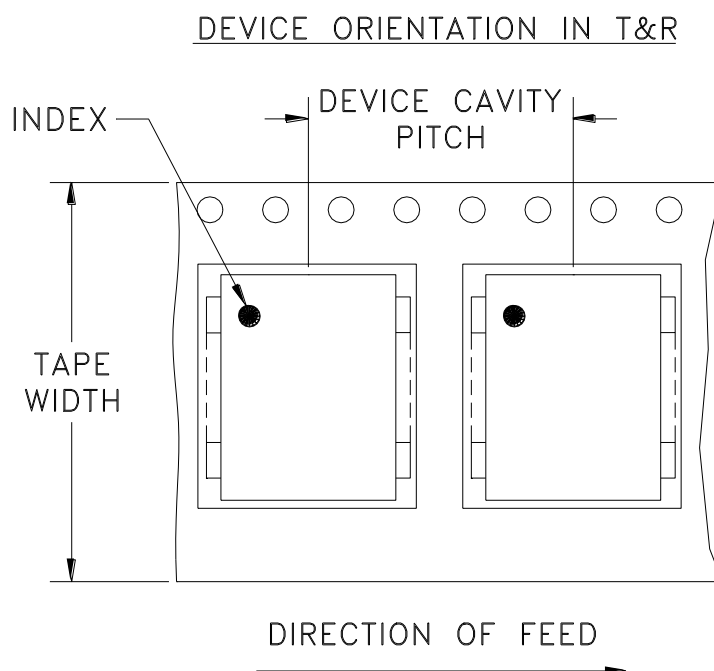
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# Tape & Reel Packaging TR-F10



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>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](http://www.minicircuits.com/pages/pdfs/tape.pdf)

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



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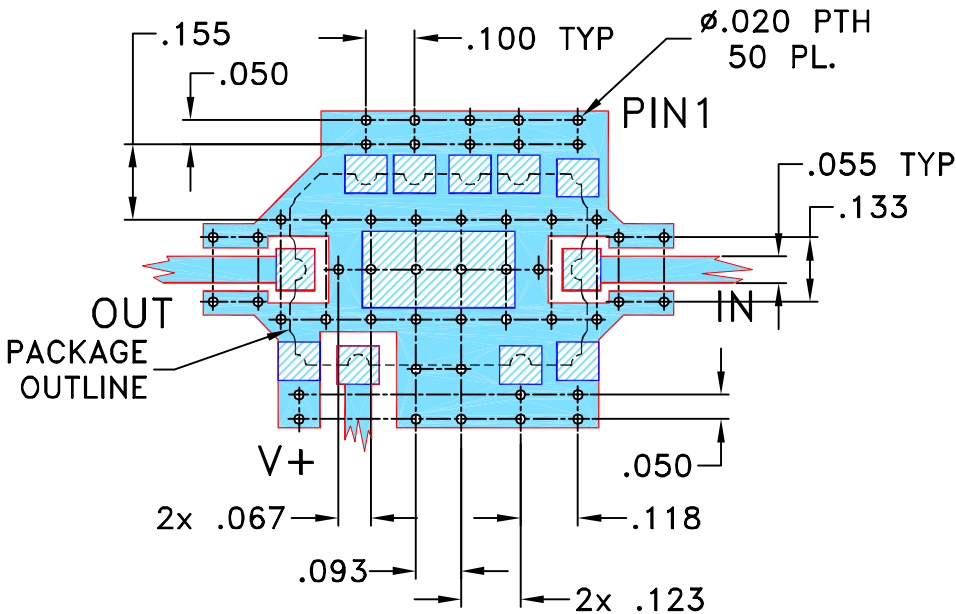
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THIRD ANGLE PROJECTION

| 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:

- TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .030" ± .002; COPPER 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.
- 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

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



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

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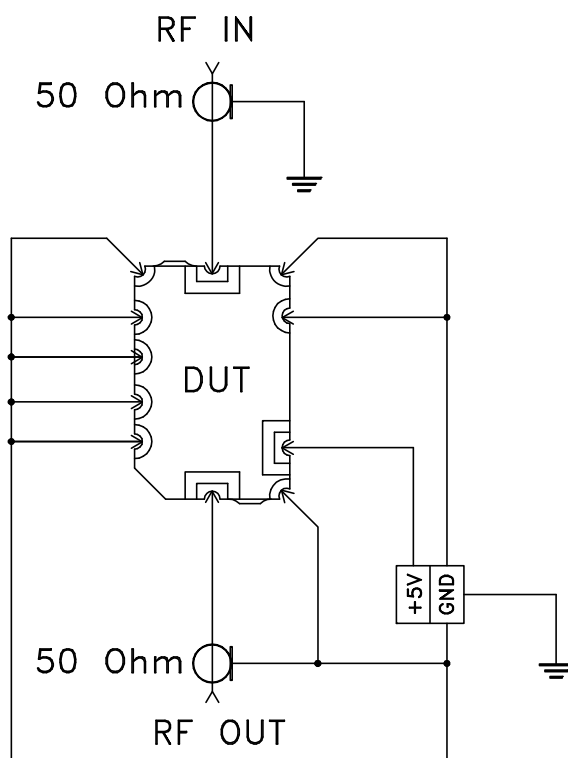
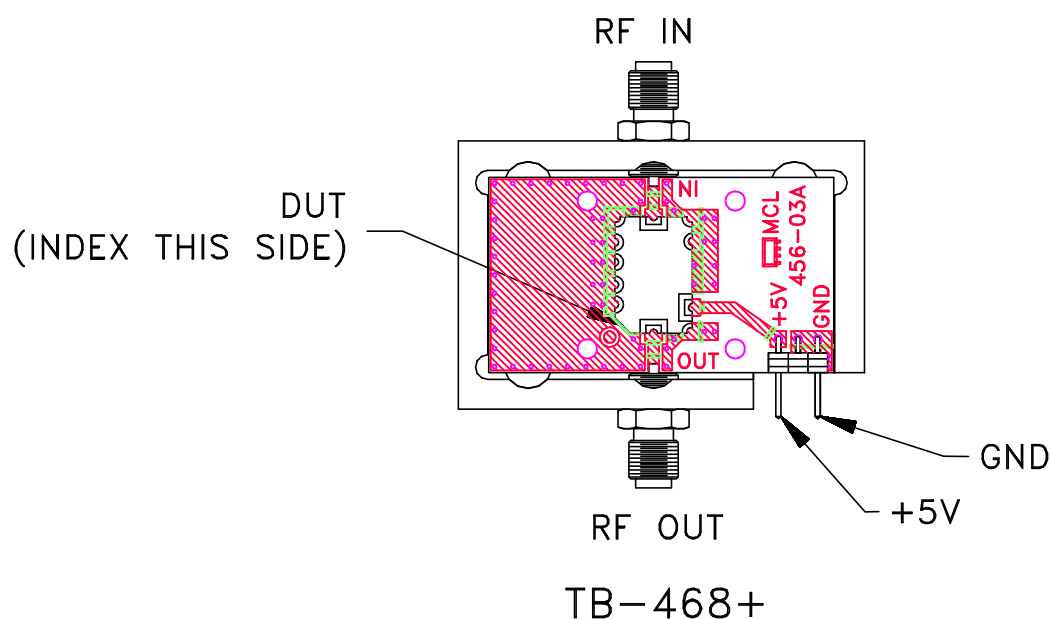
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ASHEETA1.DWG REV:A

DATE:01/12/95

| SIZE   | CODE IDENT | DRAWING NO: | REV:  |
|--------|------------|-------------|-------|
| A      | 15542      | 98-PL-293   | A     |
| FILE:  | 98PL293    | SCALE:      | 2.5:1 |
| SHEET: | 1          | OF          | 1     |

# Evaluation Board and Circuit



Schematic Diagram

## Notes:

1. SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent, Dielectric Constant=3.5, Thickness=.030 inch.

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| 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                                                                              |