

## Engineering Development Model

### Voltage Controlled Oscillator

JCOS-EDR5287

#### Important Note

This model has been designed, built and tested in our engineering department. Performance data represents model capability. At present it is a non-catalog model. On request, we can supply a final specification sheet, part number and price/delivery information.



Please click "Back", and then click "Contact Us" for Applications support.

CASE STYLE : BG291

| ELECTRICAL SPECIFICATIONS 50Ω      |      |         |      |        |
|------------------------------------|------|---------|------|--------|
| Parameter                          | Min. | Typ.    | Max. | Units  |
| Frequency                          | 361  |         | 439  | MHz    |
| Tuning Voltage                     | 0    |         | 6    | V      |
| Power Output                       |      | +4      |      | dBm    |
| Phase Noise                        |      |         |      |        |
| at 1 kHz offset                    |      | -73     |      | dBc/Hz |
| at 10 KHz offset                   |      | -97     |      | dBc/Hz |
| at 100 KHz offset                  |      | -119    |      | dBc/Hz |
| at 1000 kHz offset                 |      | -143    |      | dBc/Hz |
| Pulling at 12 dBm PK-PK all phases |      | 2       |      | MHz    |
| Pushing at Vcc=5V±0.25V            |      | 0.5     |      | MHz/V  |
| Tuning Sensitivity                 |      | 13 - 20 |      | MHz/V  |
| Harmonic Suppression               |      | -31     | -14  | dBc    |
| 3 dB Modulation Bandwidth          |      | 6100    |      | kHz    |
| Supply Voltage                     |      | 5       |      | V      |
| Supply Current                     |      |         | 30   | mA     |

| MAXIMUM RATINGS                 |                |
|---------------------------------|----------------|
| Operating Temperature           | -55°C to 85°C  |
| Storage Temperature             | -55°C to 100°C |
| Absolute Supply Voltage (Vcc)   | +7V            |
| Absolute Tuning Voltage (Vtune) | +8V            |

| PIN CONNECTIONS |                            |
|-----------------|----------------------------|
| RF OUT          | 10                         |
| VCC             | 14                         |
| V-TUNE          | 1                          |
| GROUND          | 2,3,4,5,6,9,10,11,12,13,14 |

# Voltage Controlled Oscillator

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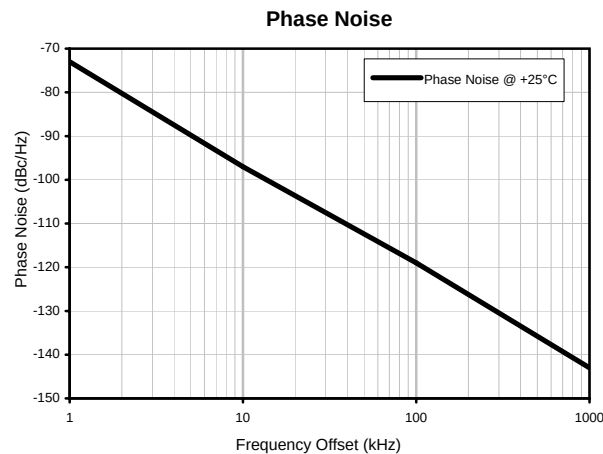
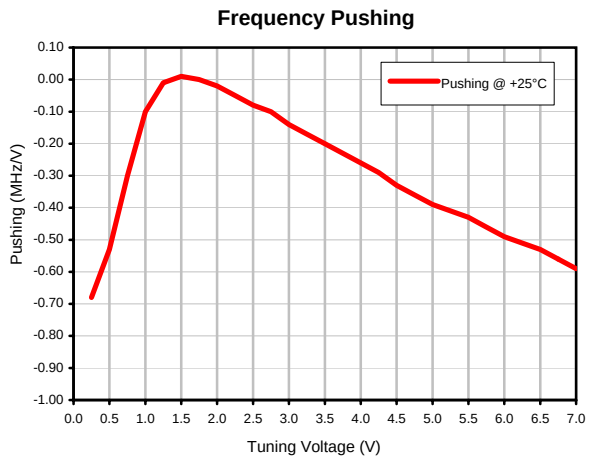
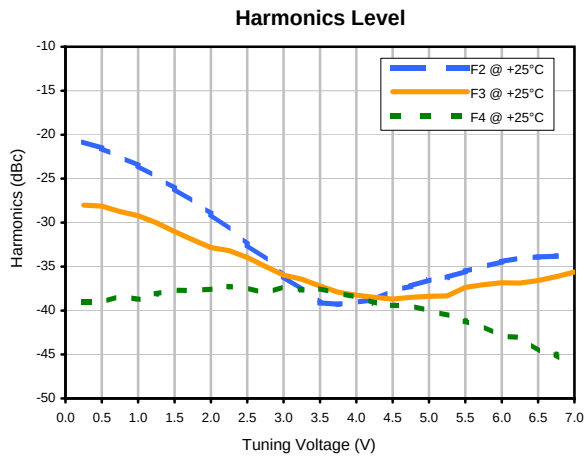
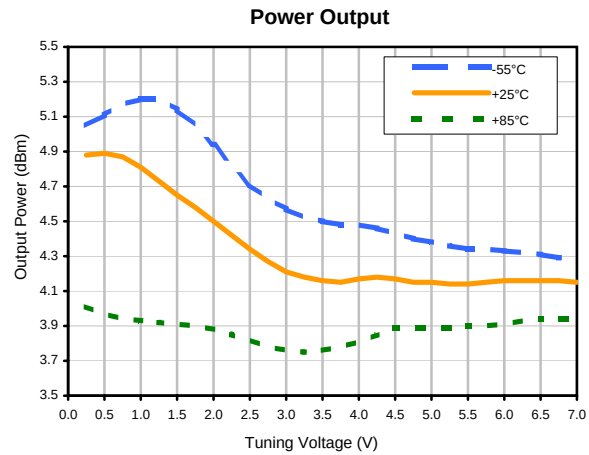
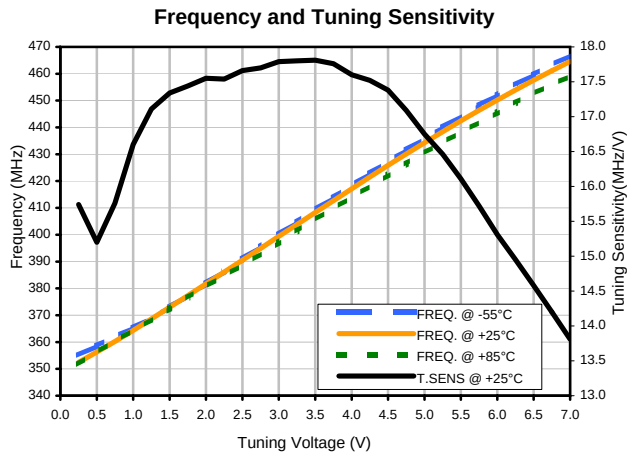
## Typical Performance Data

| V<br>TUNE | TUNE<br>SENS<br>(MHz/V) | FREQUENCY<br>(MHz) |       |       | POWER OUTPUT<br>(dBm) |       |       | HARMONICS (dBc) |       |       | FREQ.<br>PUSH<br>(MHz/V) | FREQ<br>OFFSET<br>(KHz) | PHASE<br>NOISE<br>(dBc/Hz) |
|-----------|-------------------------|--------------------|-------|-------|-----------------------|-------|-------|-----------------|-------|-------|--------------------------|-------------------------|----------------------------|
|           |                         | -55°C              | +25°C | +85°C | -55°C                 | +25°C | +85°C | F2              | F3    | F4    |                          |                         |                            |
| 0.3       | 15.74                   | 355.1              | 352.5 | 351.8 | 5.05                  | 4.88  | 4.01  | -20.8           | -28.0 | -39.1 | -0.68                    | 1                       | -73                        |
| 0.5       | 15.20                   | 358.6              | 356.3 | 356.2 | 5.11                  | 4.89  | 3.97  | -21.6           | -28.1 | -39.1 | -0.53                    | 10                      | -97                        |
| 0.8       | 15.76                   | 361.9              | 360.2 | 360.4 | 5.17                  | 4.87  | 3.94  | -22.5           | -28.7 | -38.4 | -0.30                    | 100                     | -119                       |
| 1.0       | 16.60                   | 365.3              | 364.3 | 364.4 | 5.20                  | 4.81  | 3.93  | -23.5           | -29.2 | -38.7 | -0.10                    | 1000                    | -143                       |
| 1.3       | 17.11                   | 368.9              | 368.6 | 368.5 | 5.20                  | 4.73  | 3.92  | -24.8           | -30.0 | -38.1 | -0.01                    |                         |                            |
| 1.5       | 17.34                   | 373.0              | 373.0 | 372.5 | 5.14                  | 4.65  | 3.91  | -26.1           | -31.0 | -37.7 | 0.01                     |                         |                            |
| 1.8       | 17.44                   | 377.4              | 377.3 | 376.5 | 5.05                  | 4.58  | 3.90  | -27.6           | -32.0 | -37.7 | 0.00                     |                         |                            |
| 2.0       | 17.55                   | 381.9              | 381.7 | 380.6 | 4.94                  | 4.50  | 3.88  | -29.0           | -32.8 | -37.6 | -0.02                    |                         |                            |
| 2.3       | 17.54                   | 386.4              | 386.1 | 384.7 | 4.82                  | 4.42  | 3.85  | -30.8           | -33.2 | -37.3 | -0.05                    |                         |                            |
| 2.5       | 17.66                   | 391.0              | 390.5 | 388.8 | 4.71                  | 4.34  | 3.82  | -32.5           | -34.0 | -37.4 | -0.08                    |                         |                            |
| 2.8       | 17.70                   | 395.6              | 394.9 | 392.9 | 4.63                  | 4.27  | 3.78  | -34.2           | -35.0 | -38.1 | -0.10                    |                         |                            |
| 3.0       | 17.79                   | 400.1              | 399.4 | 397.1 | 4.57                  | 4.21  | 3.76  | -36.1           | -36.0 | -37.3 | -0.14                    |                         |                            |
| 3.3       | 17.80                   | 404.7              | 403.8 | 401.3 | 4.52                  | 4.18  | 3.75  | -37.7           | -36.4 | -37.7 | -0.17                    |                         |                            |
| 3.5       | 17.81                   | 409.3              | 408.3 | 405.6 | 4.50                  | 4.16  | 3.76  | -39.1           | -37.2 | -37.5 | -0.20                    |                         |                            |
| 3.8       | 17.76                   | 413.8              | 412.7 | 409.8 | 4.48                  | 4.15  | 3.78  | -39.3           | -37.9 | -38.0 | -0.23                    |                         |                            |
| 4.0       | 17.60                   | 418.3              | 417.1 | 414.0 | 4.48                  | 4.17  | 3.81  | -39.1           | -38.3 | -38.5 | -0.26                    |                         |                            |
| 4.3       | 17.52                   | 422.8              | 421.5 | 418.2 | 4.46                  | 4.18  | 3.85  | -38.8           | -38.5 | -39.2 | -0.29                    |                         |                            |
| 4.5       | 17.38                   | 427.2              | 425.8 | 422.3 | 4.43                  | 4.17  | 3.89  | -37.7           | -38.7 | -39.4 | -0.33                    |                         |                            |
| 4.8       | 17.09                   | 431.6              | 430.1 | 426.4 | 4.40                  | 4.15  | 3.89  | -37.2           | -38.5 | -39.5 | -0.36                    |                         |                            |
| 5.0       | 16.75                   | 435.9              | 434.3 | 430.4 | 4.38                  | 4.15  | 3.89  | -36.5           | -38.4 | -40.0 | -0.39                    |                         |                            |
| 5.3       | 16.46                   | 440.1              | 438.4 | 434.4 | 4.36                  | 4.14  | 3.89  | -36.2           | -38.3 | -40.5 | -0.41                    |                         |                            |
| 5.5       | 16.11                   | 444.2              | 442.4 | 438.2 | 4.34                  | 4.14  | 3.90  | -35.5           | -37.4 | -41.2 | -0.43                    |                         |                            |
| 5.8       | 15.72                   | 448.2              | 446.4 | 442.0 | 4.34                  | 4.15  | 3.90  | -35.0           | -37.1 | -41.8 | -0.46                    |                         |                            |
| 6.0       | 15.31                   | 452.1              | 450.2 | 445.6 | 4.33                  | 4.16  | 3.91  | -34.4           | -36.9 | -42.9 | -0.49                    |                         |                            |
| 6.3       | 14.95                   | 455.9              | 453.9 | 449.1 | 4.32                  | 4.16  | 3.93  | -34.0           | -36.9 | -43.1 | -0.51                    |                         |                            |
| 6.5       | 14.58                   | 459.6              | 457.6 | 452.6 | 4.31                  | 4.16  | 3.94  | -33.9           | -36.6 | -44.6 | -0.53                    |                         |                            |
| 6.8       | 14.20                   | 463.3              | 461.1 | 455.9 | 4.29                  | 4.16  | 3.94  | -33.8           | -36.2 | -45.0 | -0.56                    |                         |                            |
| 7.0       | 13.81                   | 466.8              | 464.6 | 459.1 | 4.30                  | 4.15  | 3.94  | -33.6           | -35.6 | -46.4 | -0.59                    |                         |                            |

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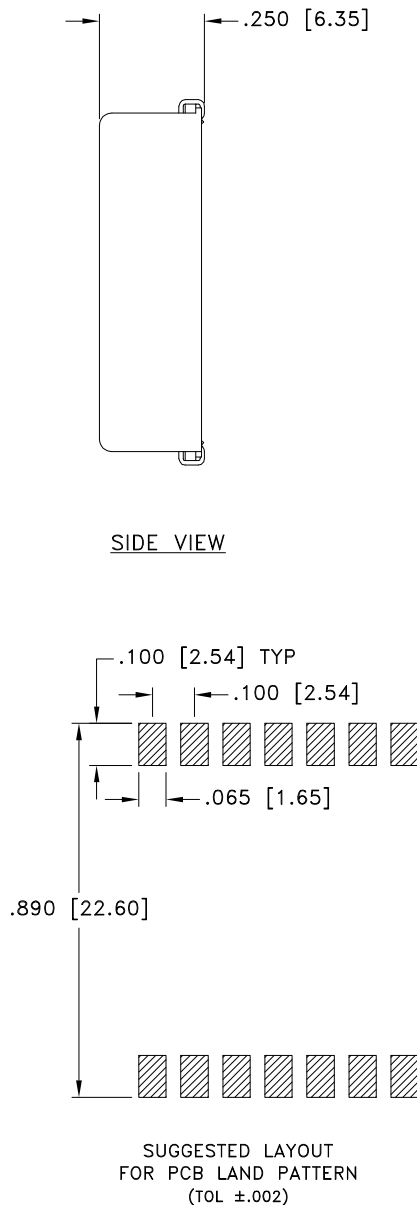
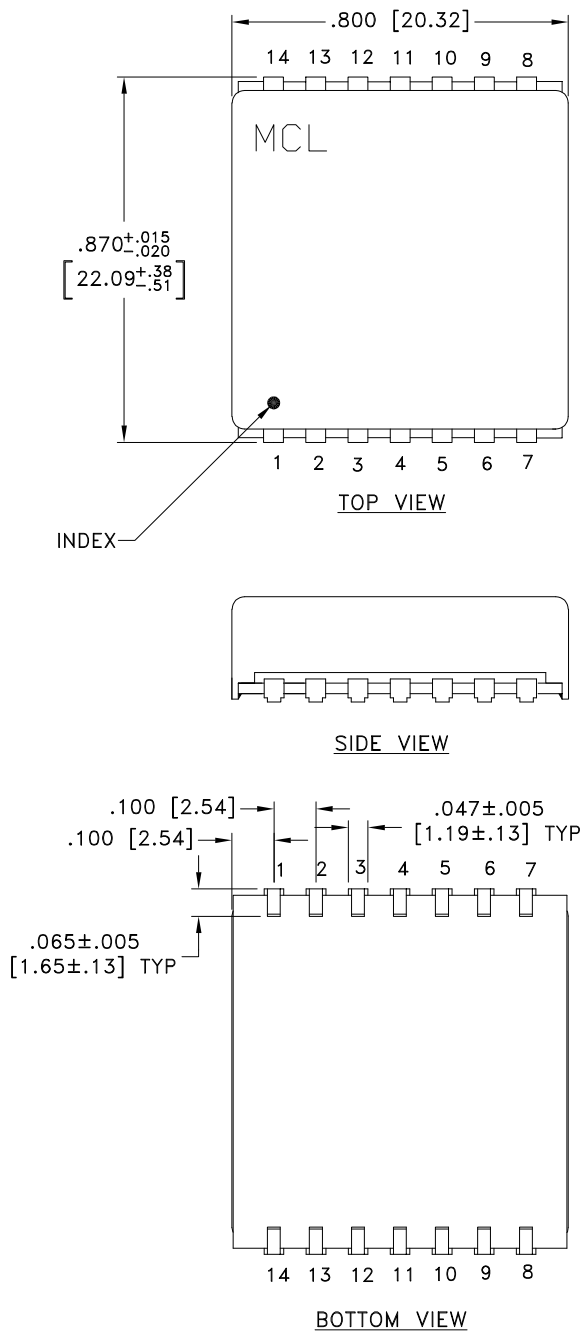
JCOS-EDR5287

## Typical Performance Data



## Outline Dimensions

BG291



DENOTES METALLIZATION

Weight: 4 gram

Dimensions are in inches[mm]. Tolerances: 2PL $\pm$ 0.03[0.76]; 3 PL $\pm$ 0.015 [0.381] inches[mm], unless otherwise specified

### Notes:

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

For RoHS Case Styles: Tin plate over Nickel plate. All models, (+) suffix.

For RoHS-5 Case Styles: Tin-Lead plate. All models, no (+) suffix.

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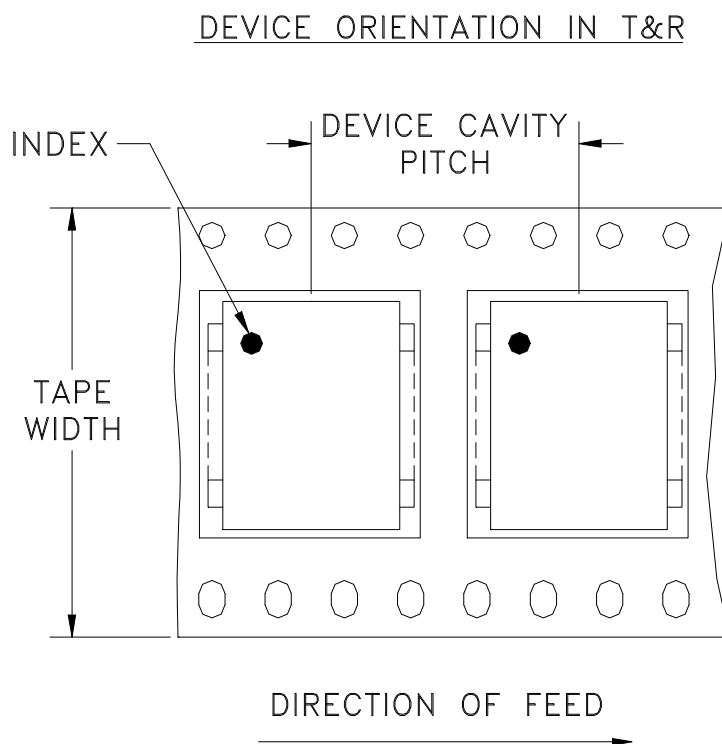
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# Tape & Reel Packaging TR-F21



| Tape Width,<br>mm | Device Cavity<br>Pitch, mm | Reel Size,<br>inches | Devices per Reel |
|-------------------|----------------------------|----------------------|------------------|
| 32                | 32                         | 13                   | 200              |

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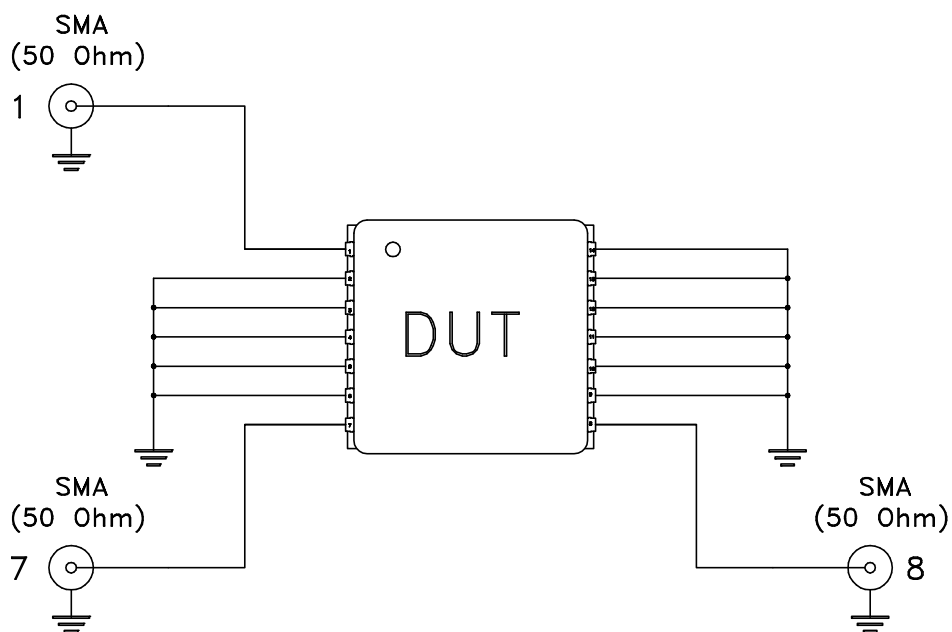
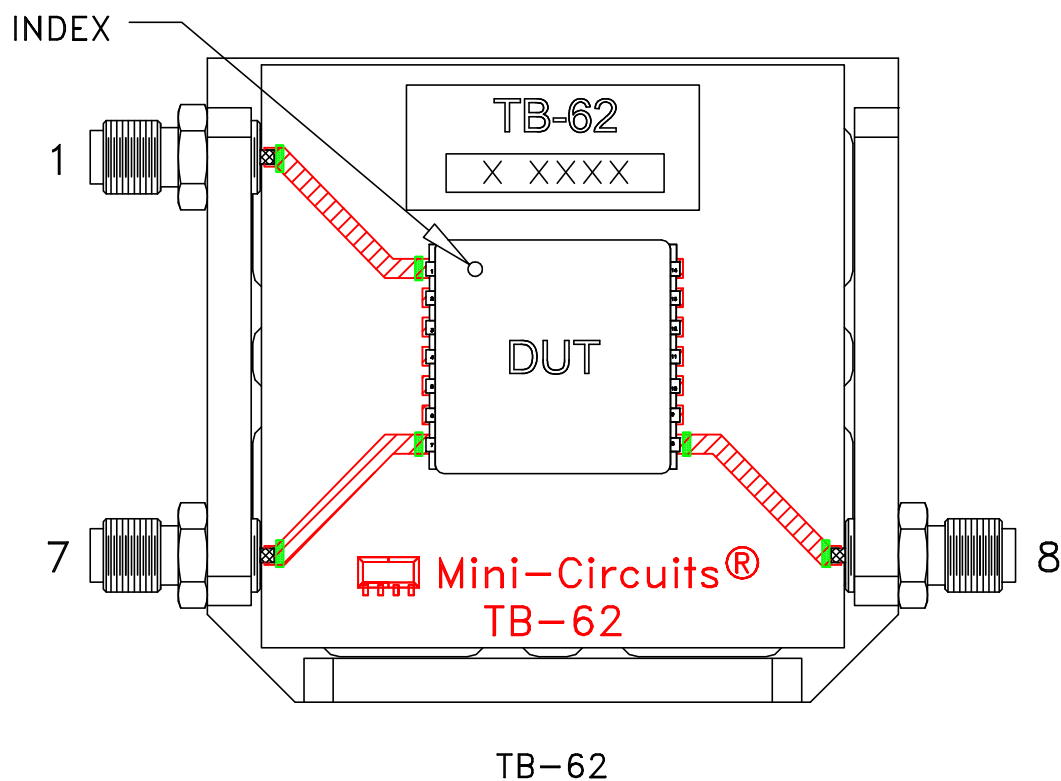
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# Evaluation Board and Circuit

For Pin Connection Refer to  
Data Sheet of the DUT



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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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          | -55° 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                                                                              |