

# Engineering Development Model

## Voltage Controlled Oscillator

## ROS-ED13351/2

### 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 : DV897

| ELECTRICAL SPECIFICATIONS 50Ω      |      |         |      |        |
|------------------------------------|------|---------|------|--------|
| Parameter                          | Min. | Typ.    | Max. | Units  |
| Frequency                          | 763  |         | 870  | MHz    |
| Tuning Voltage                     | .4   |         | 4.6  | V      |
| Power Output                       |      | 0       |      | dBm    |
| Phase Noise                        |      |         |      |        |
| at 1 kHz offset                    |      | -85     |      | dBc/Hz |
| at 10 KHz offset                   |      | -110    |      | dBc/Hz |
| at 100 KHz offset                  |      | -130    |      | dBc/Hz |
| at 1000 kHz offset                 |      | -150    |      | dBc/Hz |
| Pulling at 12 dBm PK-PK all phases |      | .8      |      | MHz    |
| Pushing at Vcc ± 5%                |      | 1.5     |      | MHz/V  |
| Tuning Sensitivity                 |      | 25-42   |      | MHz/V  |
| Harmonic Suppression               |      | -20     |      | dBc    |
| 3 dB Modulation Bandwidth          |      | 100,000 |      | kHz    |
| Supply Voltage                     |      | 5       |      | V      |
| Supply Current                     |      |         | 25   | mA     |

| MAXIMUM RATINGS                 |                |
|---------------------------------|----------------|
| Operating Temperature           | -40°C to 85°C  |
| Storage Temperature             | -55°C to 100°C |
| Absolute Supply Voltage (Vcc)   | +6V            |
| Absolute Tuning Voltage (Vtune) | +6V            |

| PIN CONNECTIONS |                              |
|-----------------|------------------------------|
| RF OUT          | 10                           |
| VCC             | 14                           |
| V-TUNE          | 2                            |
| MODULATION      | 6                            |
| GROUND          | 1,3,4,5,7,8,9,11,12,13,15,16 |



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RF/MICROWAVE COMPONENTS

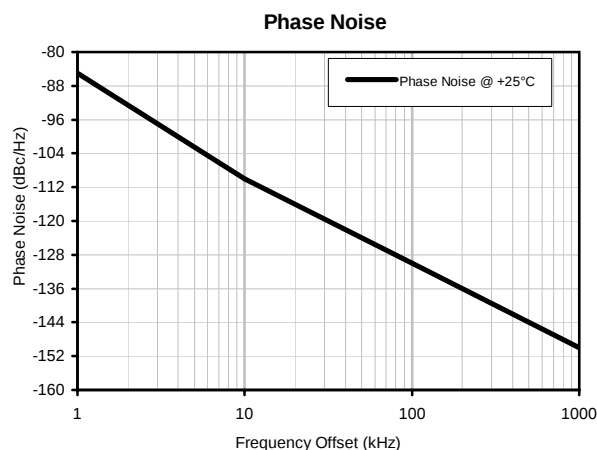
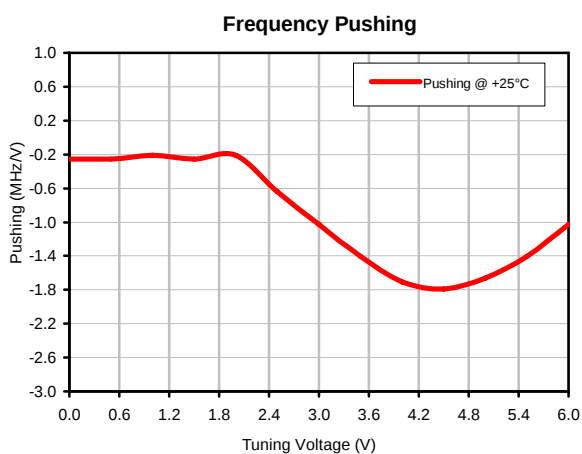
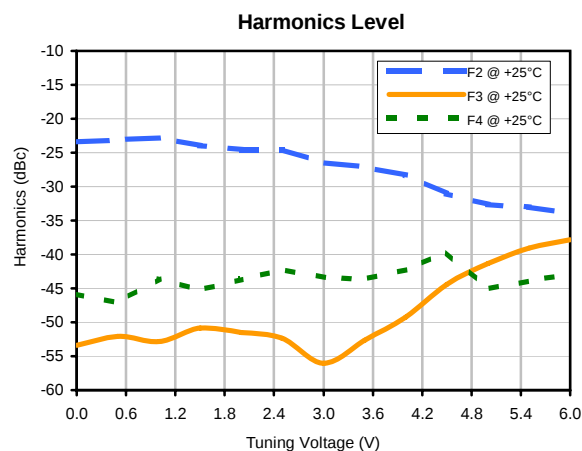
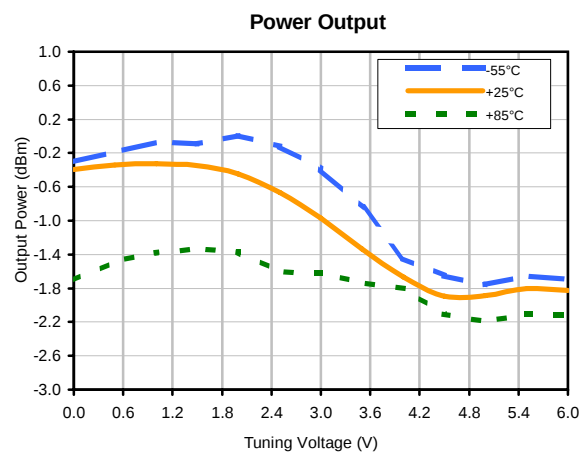
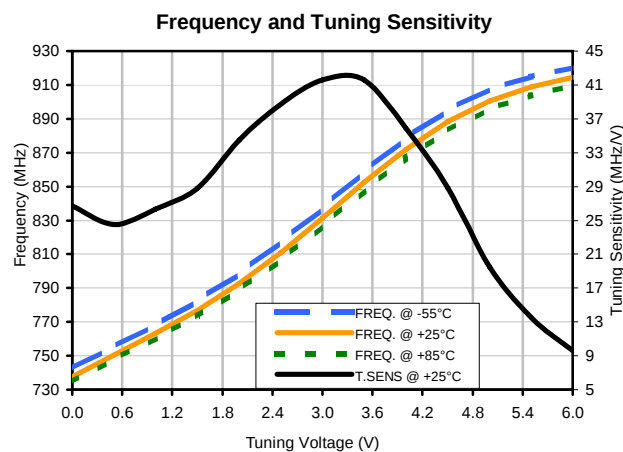


REV. X1  
ROS-ED13351/2  
12/18/2008  
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*Typical Performance Data*

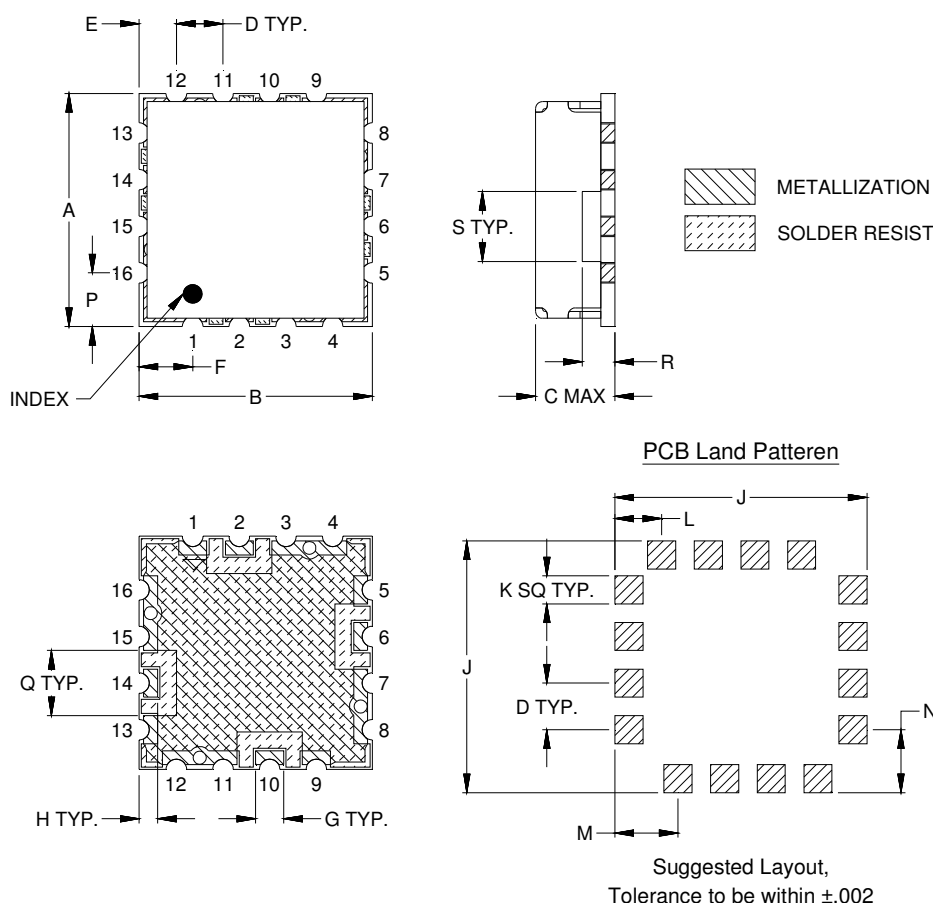
| V<br>TUNE | TUNE<br>SENS<br>(MHz/V) | FREQUENCY<br>(MHz) |        |        | POWER OUTPUT<br>(dBm) |       |       | HARMONICS (dBc) |        |        | FREQ.<br>PUSH<br>(MHz/V) | FREQ<br>OFFSET<br>(kHz) | PHASE<br>NOISE<br>(dBc/Hz) |
|-----------|-------------------------|--------------------|--------|--------|-----------------------|-------|-------|-----------------|--------|--------|--------------------------|-------------------------|----------------------------|
|           |                         | -55°C              | +25°C  | +85°C  | -55°C                 | +25°C | +85°C | F2              | F3     | F4     |                          |                         |                            |
| 0.00      | 26.67                   | 742.40             | 737.54 | 734.72 | -0.31                 | -0.39 | -1.71 | -23.41          | -53.42 | -45.84 | -0.26                    | 1                       | -85                        |
| 0.50      | 24.53                   | 755.31             | 750.42 | 747.67 | -0.19                 | -0.34 | -1.49 | -23.15          | -52.08 | -47.20 | -0.26                    | 10                      | -110                       |
| 1.00      | 26.31                   | 768.19             | 763.14 | 760.19 | -0.07                 | -0.32 | -1.38 | -22.84          | -52.85 | -43.63 | -0.21                    | 100                     | -130                       |
| 1.50      | 28.80                   | 782.40             | 776.90 | 773.63 | -0.09                 | -0.35 | -1.33 | -24.00          | -50.86 | -45.24 | -0.26                    | 1000                    | -150                       |
| 2.00      | 34.49                   | 798.70             | 792.62 | 788.99 | 0.01                  | -0.45 | -1.37 | -24.54          | -51.53 | -43.70 | -0.21                    |                         |                            |
| 2.50      | 38.76                   | 817.24             | 811.01 | 806.91 | -0.12                 | -0.67 | -1.60 | -24.57          | -52.40 | -42.23 | -0.64                    |                         |                            |
| 3.00      | 41.60                   | 837.50             | 831.42 | 826.88 | -0.39                 | -0.97 | -1.62 | -26.47          | -56.06 | -43.35 | -1.02                    |                         |                            |
| 3.50      | 41.60                   | 858.60             | 852.37 | 847.57 | -0.84                 | -1.34 | -1.73 | -27.10          | -52.64 | -43.72 | -1.41                    |                         |                            |
| 4.00      | 35.91                   | 878.53             | 871.91 | 866.94 | -1.44                 | -1.66 | -1.81 | -28.29          | -49.22 | -42.29 | -1.71                    |                         |                            |
| 4.50      | 28.80                   | 895.17             | 888.38 | 883.26 | -1.65                 | -1.89 | -2.11 | -31.06          | -44.41 | -39.67 | -1.79                    |                         |                            |
| 5.00      | 19.56                   | 907.20             | 900.61 | 895.62 | -1.76                 | -1.89 | -2.20 | -32.64          | -41.31 | -45.07 | -1.66                    |                         |                            |
| 5.50      | 13.51                   | 915.01             | 908.86 | 904.06 | -1.66                 | -1.80 | -2.11 | -33.05          | -39.04 | -43.91 | -1.41                    |                         |                            |
| 6.00      | 9.60                    | 920.26             | 914.37 | 909.70 | -1.69                 | -1.82 | -2.12 | -33.82          | -37.78 | -42.95 | -1.02                    |                         |                            |

## Typical Performance Curves



## Outline Dimensions

DV897



| CASE# | A               | B               | C              | D              | E              | F              | G              | H              | J               | K              | L              | M              |
|-------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|----------------|----------------|----------------|
| DV897 | .500<br>(12.70) | .500<br>(12.70) | .115<br>(2.92) | .100<br>(2.54) | .080<br>(2.03) | .115<br>(2.92) | .060<br>(1.52) | .040<br>(1.02) | .540<br>(13.72) | .060<br>(1.52) | .100<br>(2.54) | .135<br>(3.43) |

| CASE# | N              | P              | Q              | R              | S              | WT.GRAM |
|-------|----------------|----------------|----------------|----------------|----------------|---------|
| DV897 | .135<br>(3.43) | .115<br>(2.92) | .140<br>(3.56) | .070<br>(1.78) | .150<br>(3.81) | 1.0     |

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

### Notes:

- Case material: Nickel-Silver alloy.
- Base: Printed wiring laminate.
- 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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RF/IF MICROWAVE COMPONENTS

# Tape & Reel Packaging TR-F37



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel                    |     |
|----------------|-------------------------|-------------------|-------------------------------------|-----|
| 24             | 16                      | 7                 | Small quantity standards (see note) | 10  |
|                |                         |                   |                                     | 20  |
|                |                         |                   |                                     | 50  |
|                |                         |                   |                                     | 100 |
|                |                         | 13                | Standard                            | 200 |
|                |                         |                   |                                     | 500 |

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

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)

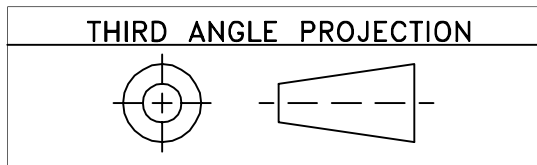


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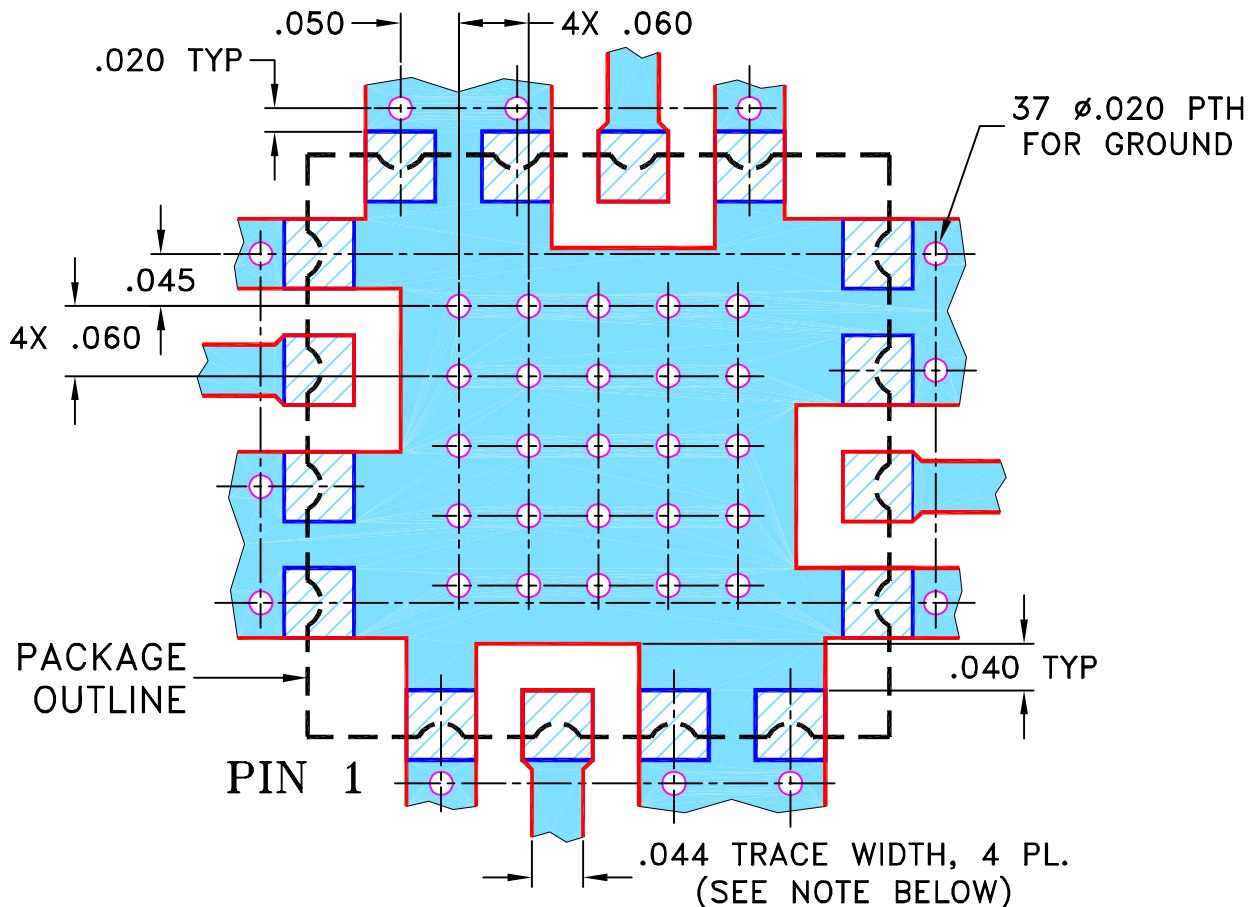
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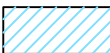


| REVISIONS |         |             |          |     |      |
|-----------|---------|-------------|----------|-----|------|
| REV OR    | ECN No. | DESCRIPTION | DATE     | DR  | AUTH |
|           | M108586 | NEW RELEASE | 11/22/06 | MMG | DJ   |
|           |         |             |          |     |      |
|           |         |             |          |     |      |

## SUGGESTED MOUNTING CONFIGURATION FOR DV874 CASE STYLE, "rt" PIN CONNECTION



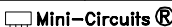
- NOTES: 1. TRACE WIDTH IS SHOWN FOR ROGERS R04350B WITH DIELECTRIC THICKNESS .020"  $\pm$  .0015"; COPPER: 1/2 OZ. EACH SIDE.  
FOR OTHER MATERIALS TRACE WIDTH MAY NEED TO BE MODIFIED.  
2. BOTTOM SIDE OF THE PCB IS CONTINUOUS GROUND PLANE.

-  DENOTES PCB COPPER LAYOUT WITH SMOBC (SOLDER MASK OVER BARE COPPER)  
 DENOTES COPPER LAND PATTERN FREE OF SOLDER MASK

| UNLESS OTHERWISE SPECIFIED                                                                                                       | INITIALS |     | DATE     |
|----------------------------------------------------------------------------------------------------------------------------------|----------|-----|----------|
| DIMENSIONS ARE IN INCHES<br>TOLERANCES ON:<br>2 PL DECIMALS $\pm$<br>3 PL DECIMALS $\pm$ .005<br>ANGLES $\pm$<br>FRACTIONS $\pm$ | DRAWN    | MMG | 11/21/06 |
|                                                                                                                                  | CHECKED  | AY  | 11/22/06 |
|                                                                                                                                  | APPROVED | DJ  | 11/22/06 |
|                                                                                                                                  |          |     |          |

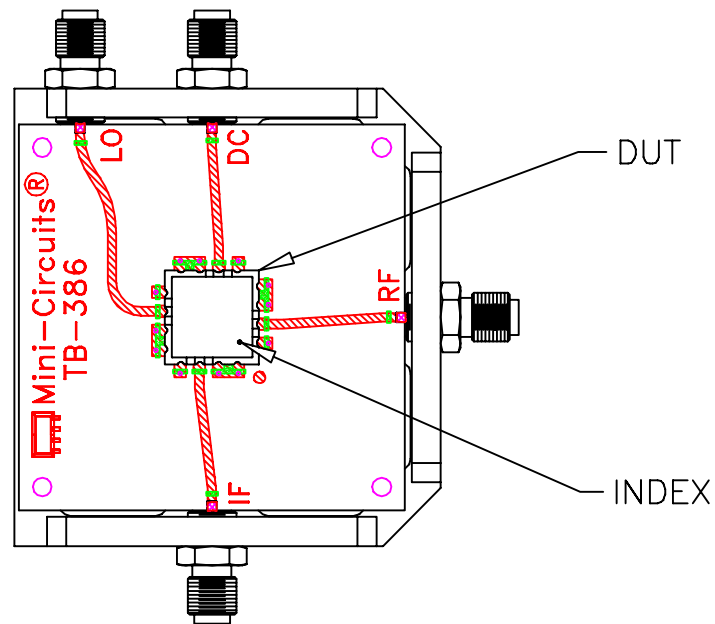
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PL, rt, DV874, DACY, TB-386

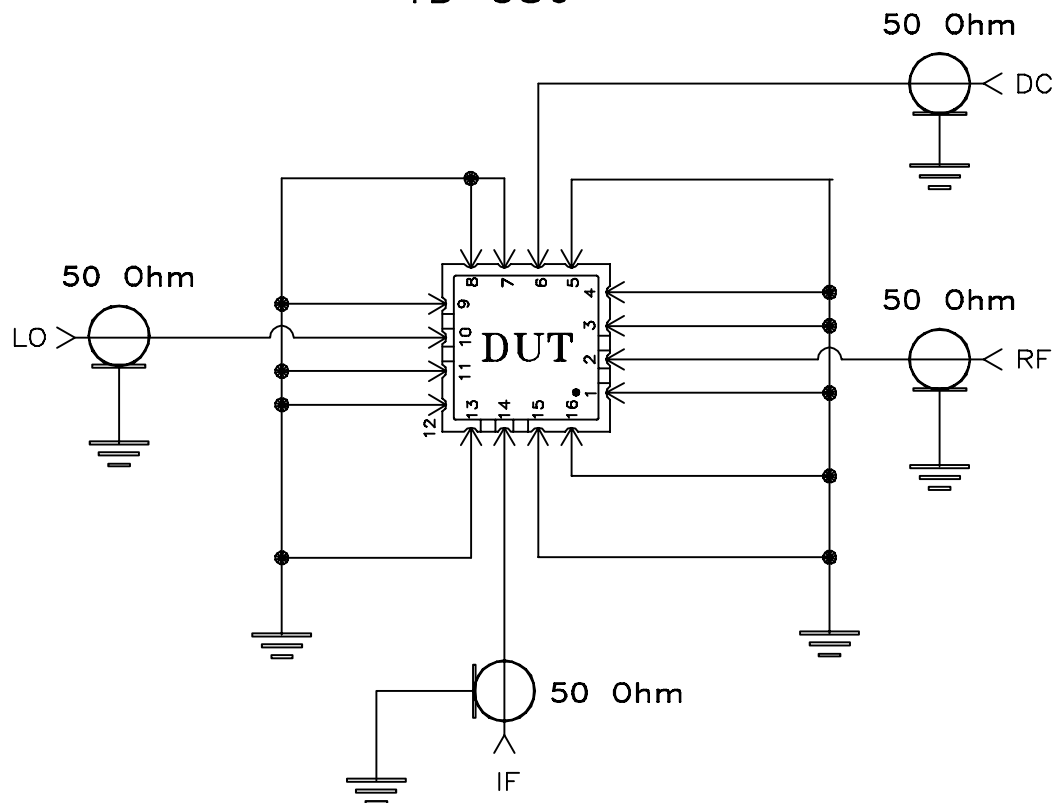
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| ASHEET1.DWG REV:A DATE:01/12/95                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |  |  |  |

| SIZE  | CODE IDENT | DRAWING NO: | REV:   |
|-------|------------|-------------|--------|
| A     | 15542      | 98-PL-256   | OR     |
| FILE: | 98PL256    | SCALE:      | SHEET: |
|       |            | 6:1         | 1 OF 1 |

# Evaluation Board and Circuit



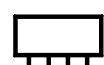
TB-386



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                                                                              |