

Engineering Development Model

Frequency Mixer Level 3 (LO Power +3 dBm)

ADE-ED6975/1

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 : CD542

| ELECTRICAL SPECIFICATIONS 50Ω @ +25°C | | | | | |
|---------------------------------------|---------------|------|------|------|-------|
| Parameter | | Min. | Typ. | Max. | Units |
| Frequency | LO (fL to fU) | 1400 | | 3100 | MHz |
| | RF (fL to fU) | 1400 | | 3100 | MHz |
| | IF | 0.1 | | 1060 | MHz |
| Conversion Loss | | | 5.7 | | dB |
| LO-RF Isolation | | | 32 | | dB |
| LO-IF Isolation | | | 32 | | dB |

| MAXIMUM RATINGS | |
|-----------------------|----------------|
| Operating Temperature | -40°C to 85°C |
| Storage Temperature | -55°C to 100°C |

| PIN CONNECTIONS | |
|-----------------|---------|
| LO | 6 |
| RF | 3 |
| IF | 2 |
| GROUND | 1, 4, 5 |

Frequency Mixer

ADE-ED6975/1

Typical Performance Data

| RF (MHz) | LO (MHz) | CONVERSION LOSS (dB) | | | LO (MHz) | LO-RF ISOLATION (dB) | | | LO-IF ISOLATION (dB) | | |
|-------------|-------------|-------------------------|------|------|-------------|-------------------------|------|------|-------------------------|------|------|
| | | @LO (dBm) | | | | @LO (dBm) | | | @LO (dBm) | | |
| | | 0 | +3 | +6 | | 0 | +3 | +6 | 0 | +3 | +6 |
| 1400.0 | 1430.0 | 5.92 | 5.42 | 5.02 | 1430.0 | 29.0 | 29.7 | 29.4 | 36.1 | 33.1 | 29.8 |
| 1450.0 | 1480.0 | 5.70 | 5.30 | 4.80 | 1480.0 | 29.1 | 29.8 | 29.3 | 35.5 | 32.7 | 29.6 |
| 1500.0 | 1530.0 | 5.59 | 4.89 | 4.59 | 1530.0 | 28.9 | 29.5 | 29.0 | 34.0 | 31.6 | 29.0 |
| 1600.0 | 1630.0 | 5.36 | 4.76 | 4.46 | 1630.0 | 28.5 | 28.6 | 28.0 | 32.4 | 29.9 | 27.9 |
| 1750.0 | 1780.0 | 5.45 | 5.05 | 4.75 | 1780.0 | 28.6 | 27.8 | 26.7 | 29.7 | 28.5 | 27.5 |
| 1800.0 | 1830.0 | 5.53 | 5.13 | 5.13 | 1830.0 | 29.0 | 28.1 | 26.8 | 29.3 | 28.8 | 27.9 |
| 1850.0 | 1880.0 | 5.52 | 5.22 | 5.12 | 1880.0 | 29.6 | 28.9 | 27.8 | 29.2 | 29.2 | 28.5 |
| 1900.0 | 1930.0 | 5.75 | 5.15 | 4.95 | 1930.0 | 29.6 | 28.9 | 28.0 | 29.1 | 29.6 | 29.0 |
| 1970.0 | 2000.0 | 5.91 | 5.21 | 5.01 | 2000.0 | 29.8 | 29.4 | 28.8 | 29.6 | 30.8 | 30.6 |
| 2000.0 | 2030.0 | 5.87 | 5.27 | 5.07 | 2030.0 | 29.9 | 29.7 | 29.3 | 30.3 | 31.6 | 31.5 |
| 2030.0 | 2060.0 | 6.05 | 5.35 | 5.05 | 2060.0 | 30.2 | 30.2 | 29.9 | 30.8 | 32.4 | 32.5 |
| 2050.0 | 2080.0 | 6.07 | 5.27 | 5.17 | 2080.0 | 30.5 | 30.6 | 30.3 | 31.0 | 32.8 | 33.2 |
| 2070.0 | 2100.0 | 5.91 | 5.31 | 5.11 | 2100.0 | 30.5 | 30.7 | 30.6 | 31.5 | 33.3 | 33.5 |
| 2100.0 | 2130.0 | 6.15 | 5.45 | 5.25 | 2130.0 | 31.0 | 31.2 | 31.1 | 32.0 | 33.8 | 34.3 |
| 2150.0 | 2180.0 | 6.47 | 5.67 | 5.27 | 2180.0 | 31.7 | 31.6 | 31.2 | 32.7 | 34.4 | 35.2 |
| 2200.0 | 2230.0 | 7.15 | 6.05 | 5.45 | 2230.0 | 32.4 | 31.6 | 30.8 | 33.5 | 35.0 | 36.0 |
| 2250.0 | 2280.0 | 7.47 | 6.17 | 5.47 | 2280.0 | 32.7 | 31.5 | 30.3 | 33.6 | 34.9 | 35.8 |
| 2300.0 | 2330.0 | 7.60 | 6.40 | 5.60 | 2330.0 | 33.4 | 31.9 | 30.5 | 33.9 | 35.0 | 35.5 |
| 2350.0 | 2380.0 | 7.63 | 6.43 | 5.73 | 2380.0 | 34.3 | 32.5 | 30.8 | 34.2 | 35.0 | 35.4 |
| 2500.0 | 2530.0 | 7.76 | 6.56 | 5.76 | 2530.0 | 38.3 | 35.2 | 32.4 | 34.8 | 35.0 | 34.7 |
| 2650.0 | 2680.0 | 7.95 | 6.45 | 5.65 | 2680.0 | 42.7 | 40.8 | 35.4 | 34.3 | 33.8 | 33.2 |
| 2800.0 | 2830.0 | 7.73 | 6.33 | 5.63 | 2830.0 | 37.3 | 49.2 | 40.7 | 32.3 | 32.0 | 31.0 |
| 2950.0 | 2980.0 | 7.72 | 6.72 | 6.22 | 2980.0 | 31.5 | 36.9 | 42.2 | 31.1 | 30.6 | 29.7 |
| 3100.0 | 3130.0 | 8.20 | 7.60 | 7.20 | 3130.0 | 27.7 | 30.9 | 34.0 | 29.7 | 29.3 | 28.4 |

Frequency Mixer

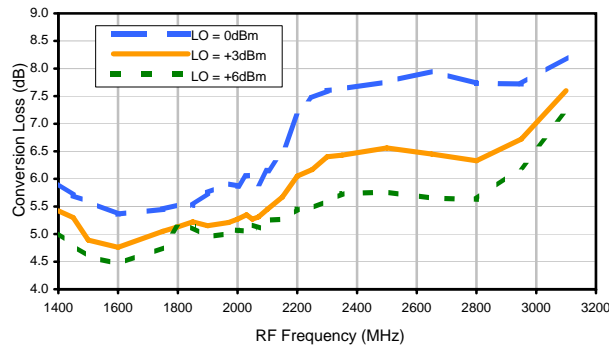
ADE-ED6975/1

Typical Performance Data

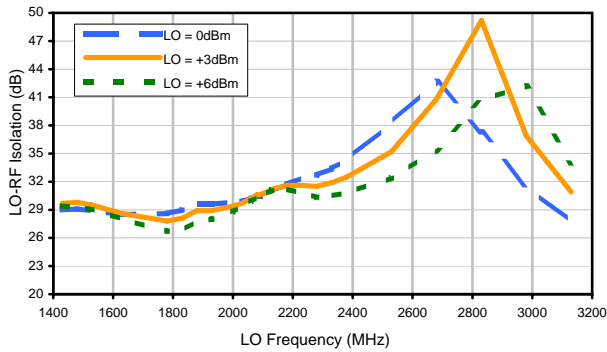
| RF/LO (MHz) | RF VSWR (:1) | | | LO VSWR (:1) | | | IF (MHz) | IF VSWR (:1) | | |
|----------------|-----------------|------|------|-----------------|------|------|-------------|-----------------|------|------|
| | @LO (dBm) | | | @LO (dBm) | | | | @LO (dBm) | | |
| | 0 | +3 | +6 | 0 | +3 | +6 | | 0 | +3 | +6 |
| 1430.0 | 2.23 | 2.04 | 1.88 | 2.08 | 2.23 | 3.06 | 0.5 | 2.16 | 1.70 | 1.43 |
| 1480.0 | 1.91 | 1.73 | 1.60 | 2.16 | 2.27 | 3.06 | 0.8 | 2.20 | 1.74 | 1.46 |
| 1530.0 | 1.64 | 1.48 | 1.39 | 2.18 | 2.20 | 2.80 | 1.0 | 2.27 | 1.76 | 1.46 |
| 1630.0 | 1.27 | 1.12 | 1.08 | 2.40 | 2.25 | 2.72 | 5.0 | 2.20 | 1.73 | 1.44 |
| 1780.0 | 1.11 | 1.27 | 1.40 | 2.92 | 2.58 | 2.96 | 10.0 | 2.23 | 1.73 | 1.44 |
| 1830.0 | 1.16 | 1.39 | 1.59 | 3.06 | 2.68 | 3.11 | 50.0 | 2.12 | 1.68 | 1.42 |
| 1880.0 | 1.14 | 1.38 | 1.63 | 3.44 | 2.80 | 3.16 | 63.3 | 2.20 | 1.70 | 1.43 |
| 1930.0 | 1.21 | 1.36 | 1.60 | 3.95 | 3.11 | 3.57 | 110.0 | 2.14 | 1.68 | 1.41 |
| 2000.0 | 1.39 | 1.43 | 1.66 | 4.22 | 3.26 | 3.64 | 126.4 | 2.04 | 1.63 | 1.39 |
| 2030.0 | 1.44 | 1.47 | 1.68 | 4.64 | 3.57 | 3.71 | 189.6 | 1.99 | 1.59 | 1.37 |
| 2060.0 | 1.48 | 1.48 | 1.68 | 4.64 | 3.50 | 3.50 | 252.7 | 1.85 | 1.51 | 1.31 |
| 2080.0 | 1.49 | 1.48 | 1.66 | 4.77 | 3.57 | 3.64 | 315.9 | 1.77 | 1.46 | 1.29 |
| 2100.0 | 1.48 | 1.46 | 1.62 | 5.33 | 3.79 | 3.71 | 379.0 | 1.70 | 1.40 | 1.27 |
| 2130.0 | 1.51 | 1.39 | 1.48 | 5.17 | 3.79 | 3.71 | 442.2 | 1.63 | 1.37 | 1.29 |
| 2180.0 | 1.68 | 1.42 | 1.32 | 5.66 | 4.03 | 4.03 | 500.0 | 1.55 | 1.36 | 1.34 |
| 2230.0 | 2.14 | 1.81 | 1.59 | 5.66 | 4.03 | 3.86 | 505.3 | 1.54 | 1.36 | 1.34 |
| 2280.0 | 2.52 | 2.18 | 1.92 | 6.73 | 4.42 | 4.03 | 568.5 | 1.48 | 1.39 | 1.44 |
| 2330.0 | 2.76 | 2.46 | 2.14 | 6.49 | 4.22 | 3.86 | 631.6 | 1.44 | 1.44 | 1.54 |
| 2380.0 | 2.88 | 2.58 | 2.30 | 7.00 | 4.64 | 3.95 | 694.8 | 1.46 | 1.54 | 1.68 |
| 2530.0 | 2.96 | 2.68 | 2.43 | 7.94 | 4.64 | 3.79 | 757.9 | 1.54 | 1.66 | 1.84 |
| 2680.0 | 2.72 | 2.40 | 2.23 | 7.60 | 4.32 | 3.44 | 800.0 | 1.63 | 1.81 | 2.04 |
| 2830.0 | 2.32 | 2.10 | 2.03 | 7.00 | 4.42 | 3.32 | 821.1 | 1.69 | 1.89 | 2.14 |
| 2980.0 | 2.18 | 2.18 | 2.25 | 8.31 | 4.32 | 3.21 | 884.2 | 1.89 | 2.16 | 2.49 |
| 3130.0 | 2.68 | 2.84 | 2.96 | 7.00 | 3.86 | 2.72 | 947.4 | 2.23 | 2.58 | 3.06 |

Typical Performance Curves

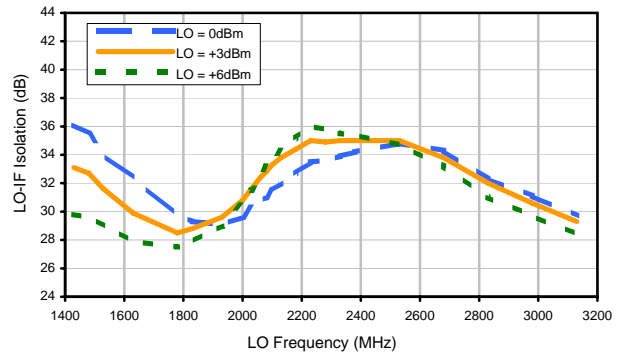
Conversion Loss



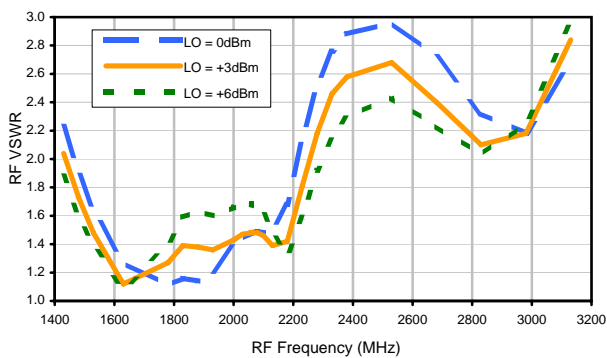
LO-RF Isolation



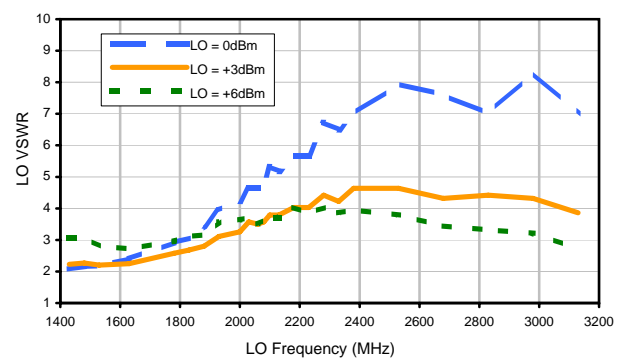
LO-IF Isolation



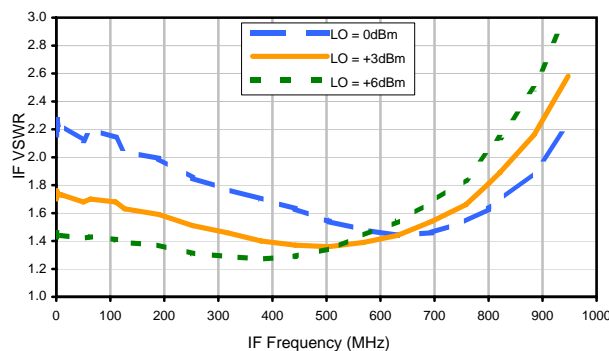
RF VSWR



LO VSWR



IF VSWR

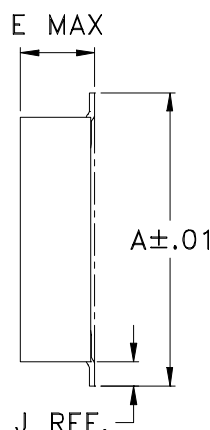
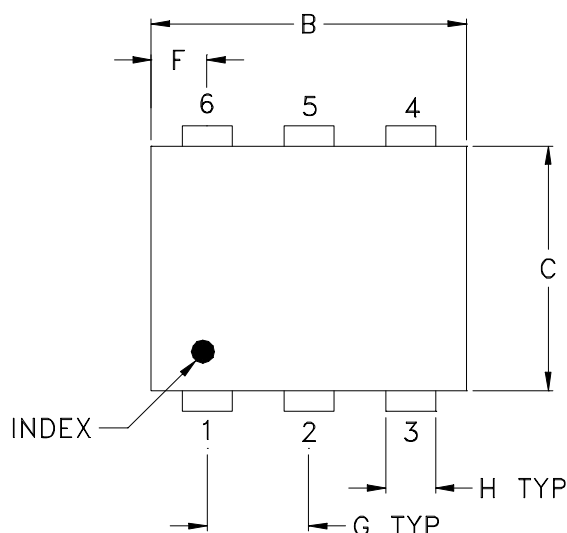


Case Style

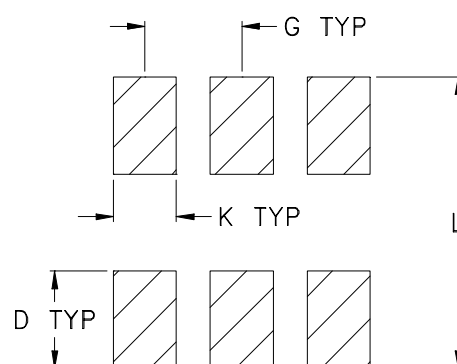
CD

CD541
CD542
CD636
CD637

Outline Dimensions



PCB Land Pattern



Suggested Layout,
Tolerance to be within $\pm .002$

| CASE# | A | B | C | D | E | F | G | H | J | K | L | WT, GRAM |
|-------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------|
| CD541 | | | | | .082 (2.08) | | | | | | | .15 |
| CD542 | .272 (6.91) | .310 (7.87) | .220 (5.58) | .100 (2.54) | .112 (2.84) | .055 (1.40) | .100 (2.54) | .030 (0.76) | .026 (0.66) | .065 (1.65) | .300 (7.62) | .20 |
| CD636 | | | | | .162 (4.11) | | | | | | | .25 |
| CD637 | | | | | .206 (5.23) | | | | | | | .40 |

Dimensions are in inches (mm). Tolerances: 2 Pl. $\pm .01$; 3 Pl. $\pm .005$

Notes:

- Case material: Plastic.
- 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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Tape & Reel Packaging TR-F34



| Tape Width, mm | Device Cavity Pitch, mm | Reel Size, inches | Devices per Reel see note | |
|----------------|-------------------------|-------------------|------------------------------------|------|
| 16 | 12 | 7 | Small quantity standard (see note) | 20 |
| | | | | 50 |
| | | | | 100 |
| | | | | 200 |
| | | 13 | Standard | 500 |
| | | | | 1000 |

Note: Availability of small reel quantity varies by model.
Refer to pricing and availability on individual model dashboard.

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



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THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|--|----------|-----|------|
| A | M101143 | ADDED "gk" PIN CONNECTION, TT100 CASE STYLE & NOTE 2 | 10/10/05 | MMG | DJ |
| B | M102713 | ADDED "...WITH SMOBC" | 01/17/06 | MMG | IL |
| C | M108637 | REMOVED "PIN 1", ADDED INDEX ON UNIT | 12/01/06 | MYG | FL |

SUGGESTED MOUNTING CONFIGURATION
FOR BH292, CD541/542/636/637, TT100/240 CASE
STYLES, "gk", "ht", "hu", "nd", "w" PIN CONNECTIONS



- NOTES:** 1. 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.
 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 | MMG | 07/17/02 |
| TOLERANCES ON: | WL | 08/02/02 |
| 2 PL DECIMALS ± | DJ | 08/05/02 |
| 3 PL DECIMALS ± .005 | | |
| ANGLES ± | | |
| FRACTIONS ± | | |

Mini-Circuits® 13 Neptune Avenue
 Brooklyn NY 11235

PL, gk/ht/hu/nd/w, BH292,
 CD541/542/636/637, TT100/240, TB-03

| | | | |
|------------------|---------------------|--------------------------|-----------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: 98-PL-052 | REV: C |
| FILE: 98PL052 | SCALE: 8:1 | SHEET: 1 OF 1 | |

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THIRD ANGLE PROJECTION



REVISIONS

| REV | ECN No. | DESCRIPTION | DATE | DR | AUTH |
|-----|---------|---------------------------|-------|----|------|
| E | M119737 | UPDATED PCB | 10.08 | MF | AD |
| F | M127659 | UPDATED CARR | 06.10 | SW | SG |
| G | M127846 | UPDATED SCHEMATIC DIAGRAM | 06.10 | SW | SG |
| H | M131840 | UPDATED DWG | 05.11 | MF | AD |



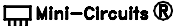
NOTES:

1. REFER TO -09 PAGE FOR ITEM DESCRIPTIONS.
DESIGNATION NUMBERS ON -20 PAGE CORRESPOND TO THE NUMBERS ON -09 PAGE.
2. FOR TEXT HEIGHT & STYLE ON THE LABEL REFER TO: D3-G209.

| UNLESS OTHERWISE SPECIFIED | INITIALS | DATE |
|---|----------|---------------------|
| DIMENSIONS ARE IN INCHES TOLERANCES ON: 2 PL DECIMALS ± 3 PL DECIMALS ± ANGLES ± FRACTIONS ± | DRAWN | S.WOLYNSKI 06.29.99 |
| | CHECKED | SG 07.06.99 |
| | APPROVED | MG 07.10.99 |

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TB,ADE,CD542/636,06MX01,50

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| | | | |
|-----------------|---------------------|-------------------------|-----------|
| SIZE A | CODE IDENT 15542 | DRAWING NO: TB-03-20 | REV: H |
| FILE: WTB-03 | SCALE: 1.5:1 | SHEET: 1 OF 2 | |

Evaluation Board and Circuit

For Pin Connections and DUT Orientation Refer to
Data Sheet of the DUT



TB-03



Schematic Diagram

Notes:

1. 50 Ohm SMA Female connectors.
2. PCB Material: Rogers R04350 or equivalent,
Dielectric Constant=3.5, Thickness=.030 inch.

 **Mini-Circuits®**



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 Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| 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 Eutetic Process: 225°C peak Pb-Free Process 245° - 250°C peak | J-STD-020, Table 4-1, 4-2 and 5-2, Figure 5-1 |
| Solderability | 10X Magnification | J-STD-002, 95% Coverage |
| Vibration (High Frequency) | 20g peak, 10-2000 Hz, 12 times in each of three perpendicular directions (total 36) | MIL-STD-202, Method 204, Condition D |
| 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; distilled water + proylene glycol monomethyl ether + monoethanolamine at 63°C to 70°C | MIL-STD-202, Method 215 |