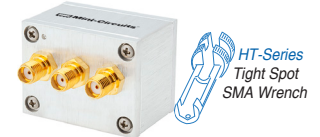


# Coaxial Power Splitter/Combiner

## ZMSCQ-2-90

2 Way-90° 50Ω 55 to 90 MHz



Generic photo used for illustration purposes only

CASE STYLE: M21  
 Connectors Model  
**SMA** ZMSCQ-2-90  
**BRACKET (OPTION "B")**  
**BRACKET (OPTION "BR")**

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

### Maximum Ratings

|   |                |
|---|----------------|
| Operating Temperature   | -55°C to 100°C |
| Storage Temperature   | -55°C to 100°C |
| Power Input (as a splitter)                                     | 1W max.        |
| Internal Dissipation  | 0.125W max.    |
| Permanent damage may occur if any of these limits are exceeded. |                |

### Coaxial Connections

|               |   |
|---------------|---|
| SUM PORT      | 2 |
| PORT 1 (0°)   | 1 |
| PORT 2 (+90°) | 3 |

### Features

- low insertion loss, 0.3 dB typ.
- high isolation, 30 dB typ.
- rugged shielded case

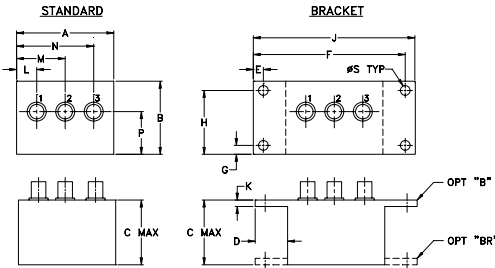
### Applications

- VHF
- modulators
- test set-ups

### Electrical Specifications

| FREQ. RANGE (MHz)              | ISOLATION (dB) |      | INSERTION LOSS (dB)<br>Avg. of Coupled Outputs ABOVE 3 dB |      | PHASE UNBALANCE (Degrees) | AMPLITUDE UNBALANCE (dB) |
|--------------------------------|----------------|------|---|------|---------------------------|--------------------------|
|                                | Typ.           | Min. | Typ.  | Max. |                           |                          |
| f <sub>L</sub> -f <sub>U</sub> |                |      |   |      | Max.                      | Max.                     |
| 55-90                          | 30             | 20   | 0.3   | 0.7  | 3.0                       | 1.2                      |

### Outline Drawing



### Outline Dimensions (inch/mm)

| A     | B     | C     | D     | E    | F     | G    | H     |
|-------|-------|-------|-------|------|-------|------|-------|
| 1.50  | 1.13  | 1.00  | .50   | .155 | 2.345 | .138 | .987  |
| 38.10 | 28.70 | 25.40 | 12.70 | 3.94 | 59.56 | 3.51 | 25.07 |

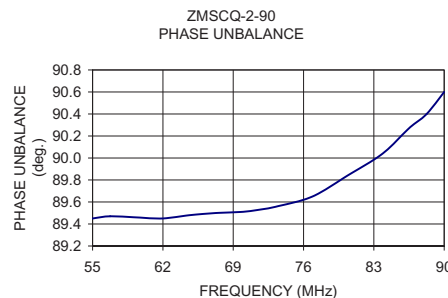
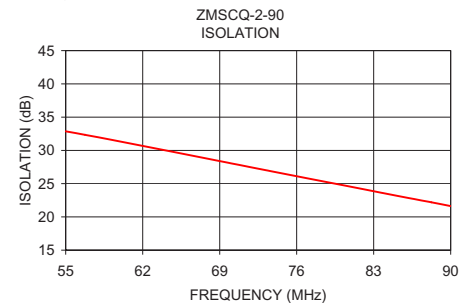
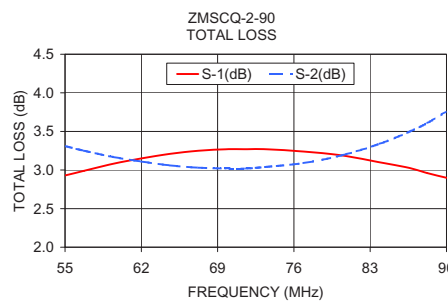
  

| J     | K    | L    | M     | N     | P     | S    | wt    |
|-------|------|------|-------|-------|-------|------|-------|
| 2.50  | .10  | .31  | .75   | 1.19  | .66   | .150 | grams |
| 63.50 | 2.54 | 7.87 | 19.05 | 30.23 | 16.76 | 3.81 | 40.0  |

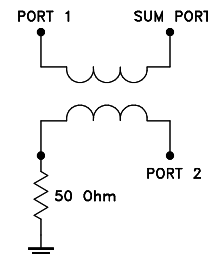
### Typical Performance Data

| Frequency (MHz) | Total Loss <sup>1</sup> (dB) |      | Amplitude Unbalance (dB) | Isolation (dB) | Phase Unbalance (deg.) | VSWR S | VSWR 1 | VSWR 2 |
|-----------------|------------------------------|------|--------------------------|----------------|------------------------|--------|--------|--------|
|                 | S-1                          | S-2  |                          |                |                        |        |        |        |
| 55.00           | 2.93                         | 3.31 | 0.39                     | 32.86          | 89.45                  | 1.07   | 1.09   | 1.05   |
| 56.75           | 2.99                         | 3.25 | 0.26                     | 32.34          | 89.47                  | 1.07   | 1.09   | 1.05   |
| 59.38           | 3.08                         | 3.17 | 0.09                     | 31.52          | 89.46                  | 1.08   | 1.09   | 1.06   |
| 62.00           | 3.15                         | 3.11 | 0.05                     | 30.67          | 89.45                  | 1.08   | 1.10   | 1.06   |
| 64.62           | 3.21                         | 3.06 | 0.15                     | 29.83          | 89.48                  | 1.09   | 1.11   | 1.07   |
| 67.25           | 3.25                         | 3.03 | 0.22                     | 28.96          | 89.50                  | 1.09   | 1.12   | 1.08   |
| 69.88           | 3.27                         | 3.02 | 0.25                     | 28.11          | 89.51                  | 1.10   | 1.12   | 1.09   |
| 71.62           | 3.27                         | 3.02 | 0.25                     | 27.54          | 89.53                  | 1.11   | 1.13   | 1.10   |
| 73.38           | 3.27                         | 3.04 | 0.23                     | 26.97          | 89.56                  | 1.12   | 1.14   | 1.10   |
| 76.88           | 3.24                         | 3.09 | 0.15                     | 25.83          | 89.65                  | 1.13   | 1.15   | 1.12   |
| 80.38           | 3.19                         | 3.19 | 0.00                     | 24.71          | 89.84                  | 1.15   | 1.17   | 1.14   |
| 83.88           | 3.10                         | 3.34 | 0.24                     | 23.58          | 90.04                  | 1.17   | 1.19   | 1.16   |
| 86.50           | 3.03                         | 3.49 | 0.46                     | 22.74          | 90.27                  | 1.18   | 1.21   | 1.18   |
| 88.25           | 2.96                         | 3.61 | 0.65                     | 22.19          | 90.40                  | 1.20   | 1.22   | 1.19   |
| 90.00           | 2.90                         | 3.76 | 0.86                     | 21.62          | 90.60                  | 1.21   | 1.24   | 1.21   |

1. Total Loss = Insertion Loss + 3dB splitter loss.



### electrical schematic



### Notes

- Performance and quality attributes and conditions not expressly stated in this specification document are intended to be excluded and do not form a part of this specification document.
- Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- The parts covered by this specification document are subject to Mini-Circuits standard limited warranty and terms and conditions (collectively, "Standard Terms"); Purchasers of this part are entitled to the rights and benefits contained therein. For a full statement of the Standard Terms and the exclusive rights and remedies thereunder, please visit Mini-Circuits' website at [www.minicircuits.com/WCLStore/terms.jsp](http://www.minicircuits.com/WCLStore/terms.jsp)



# 2 Way-90° Power Splitter/Combiner

# ZMSCQ-2-90

## Typical Performance Data

| FREQ.<br>(MHz) | TOTAL LOSS <sup>1</sup><br>(dB) |      |      | AMP.<br>UNBAL.<br>(dB) | ISOLATION<br>(dB) | PHASE<br>UNBAL.<br>(deg.) | FREQ.<br>(MHz) | VSWR<br>(:1) |      |      |
|----------------|---------------------------------|------|------|------------------------|-------------------|---------------------------|----------------|--------------|------|------|
|                | S-1                             | S-2  | AVG. |                        |                   |                           |                | S            | 1    | 2    |
| 55.0           | 2.93                            | 3.31 | 3.12 | 0.39                   | 32.86             | 89.45                     | 55.0           | 1.07         | 1.09 | 1.05 |
| 55.9           | 2.96                            | 3.28 | 3.12 | 0.32                   | 32.60             | 89.49                     | 55.9           | 1.07         | 1.09 | 1.05 |
| 56.8           | 2.99                            | 3.25 | 3.12 | 0.26                   | 32.34             | 89.47                     | 56.8           | 1.07         | 1.09 | 1.05 |
| 57.6           | 3.03                            | 3.22 | 3.13 | 0.20                   | 32.07             | 89.47                     | 57.6           | 1.07         | 1.09 | 1.05 |
| 58.5           | 3.06                            | 3.20 | 3.13 | 0.14                   | 31.79             | 89.45                     | 58.5           | 1.07         | 1.09 | 1.06 |
| 59.4           | 3.08                            | 3.17 | 3.13 | 0.09                   | 31.52             | 89.46                     | 59.4           | 1.08         | 1.09 | 1.06 |
| 60.3           | 3.11                            | 3.15 | 3.13 | 0.04                   | 31.23             | 89.47                     | 60.3           | 1.08         | 1.10 | 1.06 |
| 61.1           | 3.13                            | 3.13 | 3.13 | 0.01                   | 30.95             | 89.46                     | 61.1           | 1.08         | 1.10 | 1.06 |
| 62.0           | 3.15                            | 3.11 | 3.13 | 0.05                   | 30.67             | 89.45                     | 62.0           | 1.08         | 1.10 | 1.06 |
| 62.9           | 3.18                            | 3.09 | 3.14 | 0.09                   | 30.39             | 89.47                     | 62.9           | 1.08         | 1.10 | 1.07 |
| 63.8           | 3.19                            | 3.07 | 3.13 | 0.12                   | 30.11             | 89.47                     | 63.8           | 1.09         | 1.11 | 1.07 |
| 64.6           | 3.21                            | 3.06 | 3.14 | 0.15                   | 29.83             | 89.48                     | 64.6           | 1.09         | 1.11 | 1.07 |
| 65.5           | 3.23                            | 3.05 | 3.14 | 0.18                   | 29.54             | 89.47                     | 65.5           | 1.09         | 1.11 | 1.07 |
| 66.4           | 3.24                            | 3.04 | 3.14 | 0.20                   | 29.25             | 89.49                     | 66.4           | 1.09         | 1.11 | 1.08 |
| 67.3           | 3.25                            | 3.03 | 3.14 | 0.22                   | 28.96             | 89.50                     | 67.3           | 1.09         | 1.12 | 1.08 |
| 68.1           | 3.26                            | 3.02 | 3.14 | 0.23                   | 28.68             | 89.50                     | 68.1           | 1.10         | 1.12 | 1.08 |
| 69.0           | 3.27                            | 3.02 | 3.15 | 0.24                   | 28.40             | 89.51                     | 69.0           | 1.10         | 1.12 | 1.09 |
| 69.9           | 3.27                            | 3.02 | 3.15 | 0.25                   | 28.11             | 89.51                     | 69.9           | 1.10         | 1.12 | 1.09 |
| 70.8           | 3.27                            | 3.02 | 3.15 | 0.25                   | 27.82             | 89.51                     | 70.8           | 1.11         | 1.13 | 1.09 |
| 71.6           | 3.27                            | 3.02 | 3.15 | 0.25                   | 27.54             | 89.53                     | 71.6           | 1.11         | 1.13 | 1.10 |
| 72.5           | 3.27                            | 3.03 | 3.15 | 0.24                   | 27.25             | 89.54                     | 72.5           | 1.11         | 1.13 | 1.10 |
| 73.4           | 3.27                            | 3.04 | 3.16 | 0.23                   | 26.97             | 89.56                     | 73.4           | 1.12         | 1.14 | 1.10 |
| 74.3           | 3.27                            | 3.04 | 3.16 | 0.22                   | 26.69             | 89.59                     | 74.3           | 1.12         | 1.14 | 1.11 |
| 75.1           | 3.26                            | 3.06 | 3.16 | 0.20                   | 26.40             | 89.61                     | 75.1           | 1.12         | 1.14 | 1.11 |
| 76.0           | 3.25                            | 3.07 | 3.16 | 0.18                   | 26.12             | 89.64                     | 76.0           | 1.13         | 1.15 | 1.11 |
| 76.9           | 3.24                            | 3.09 | 3.17 | 0.15                   | 25.83             | 89.65                     | 76.9           | 1.13         | 1.15 | 1.12 |
| 77.8           | 3.23                            | 3.11 | 3.17 | 0.12                   | 25.55             | 89.70                     | 77.8           | 1.13         | 1.15 | 1.12 |
| 78.6           | 3.22                            | 3.13 | 3.18 | 0.08                   | 25.27             | 89.75                     | 78.6           | 1.14         | 1.16 | 1.13 |
| 79.5           | 3.20                            | 3.16 | 3.18 | 0.04                   | 24.98             | 89.80                     | 79.5           | 1.14         | 1.16 | 1.13 |
| 80.4           | 3.19                            | 3.19 | 3.19 | 0.00                   | 24.71             | 89.84                     | 80.4           | 1.15         | 1.17 | 1.14 |
| 81.3           | 3.17                            | 3.22 | 3.20 | 0.05                   | 24.42             | 89.89                     | 81.3           | 1.15         | 1.17 | 1.14 |
| 82.1           | 3.15                            | 3.25 | 3.20 | 0.11                   | 24.14             | 89.93                     | 82.1           | 1.16         | 1.18 | 1.15 |
| 83.0           | 3.13                            | 3.30 | 3.22 | 0.17                   | 23.86             | 90.01                     | 83.0           | 1.16         | 1.18 | 1.15 |
| 83.9           | 3.10                            | 3.34 | 3.22 | 0.24                   | 23.58             | 90.04                     | 83.9           | 1.17         | 1.19 | 1.16 |
| 84.8           | 3.08                            | 3.38 | 3.23 | 0.31                   | 23.30             | 90.11                     | 84.8           | 1.17         | 1.20 | 1.16 |
| 85.6           | 3.05                            | 3.44 | 3.25 | 0.39                   | 23.02             | 90.18                     | 85.6           | 1.18         | 1.20 | 1.17 |
| 86.5           | 3.03                            | 3.49 | 3.26 | 0.46                   | 22.74             | 90.27                     | 86.5           | 1.18         | 1.21 | 1.18 |
| 87.4           | 3.00                            | 3.55 | 3.28 | 0.55                   | 22.47             | 90.32                     | 87.4           | 1.19         | 1.22 | 1.18 |
| 88.3           | 2.96                            | 3.61 | 3.29 | 0.65                   | 22.19             | 90.40                     | 88.3           | 1.20         | 1.22 | 1.19 |
| 89.1           | 2.93                            | 3.69 | 3.31 | 0.75                   | 21.91             | 90.53                     | 89.1           | 1.20         | 1.23 | 1.20 |
| 90.0           | 2.90                            | 3.76 | 3.33 | 0.86                   | 21.62             | 90.60                     | 90.0           | 1.21         | 1.24 | 1.21 |

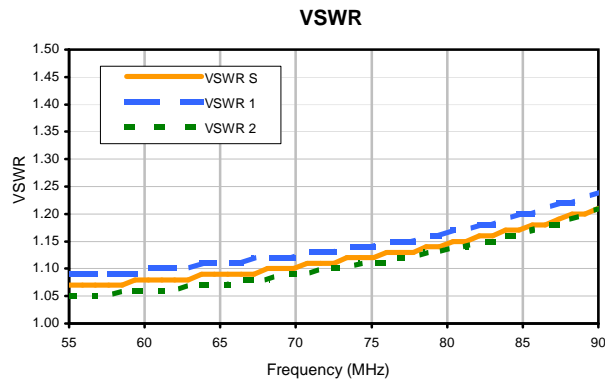
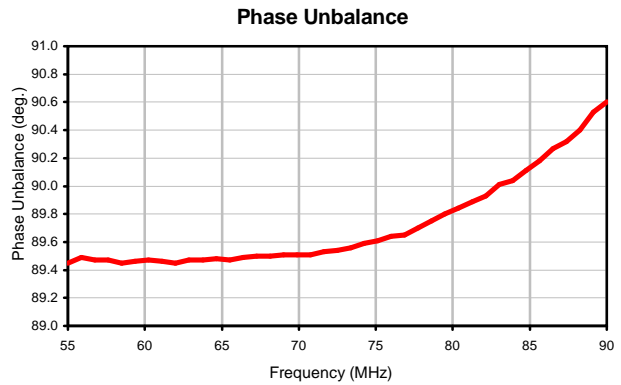
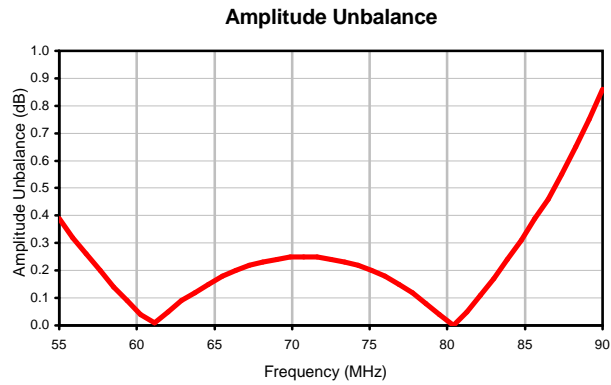
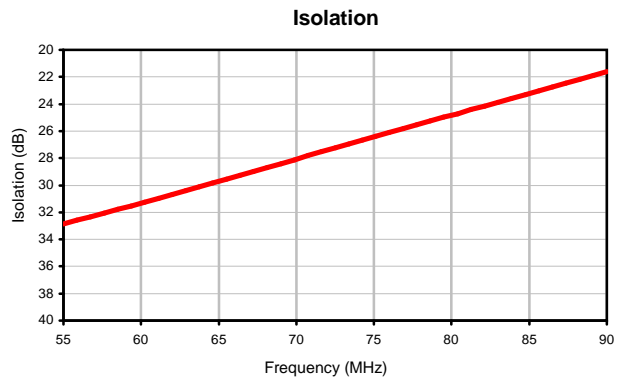
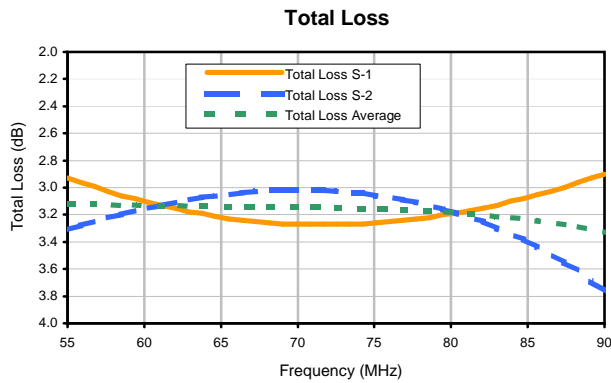
<sup>1</sup> Total Loss = Insertion Loss+ 3dB Splitter Loss



# 2 Way-90° Power Splitter/Combiner

# ZMSCQ-2-90

## Typical Performance Curves



REV. X2  
ZMSCQ-2-90  
100627  
Page 1 of 1

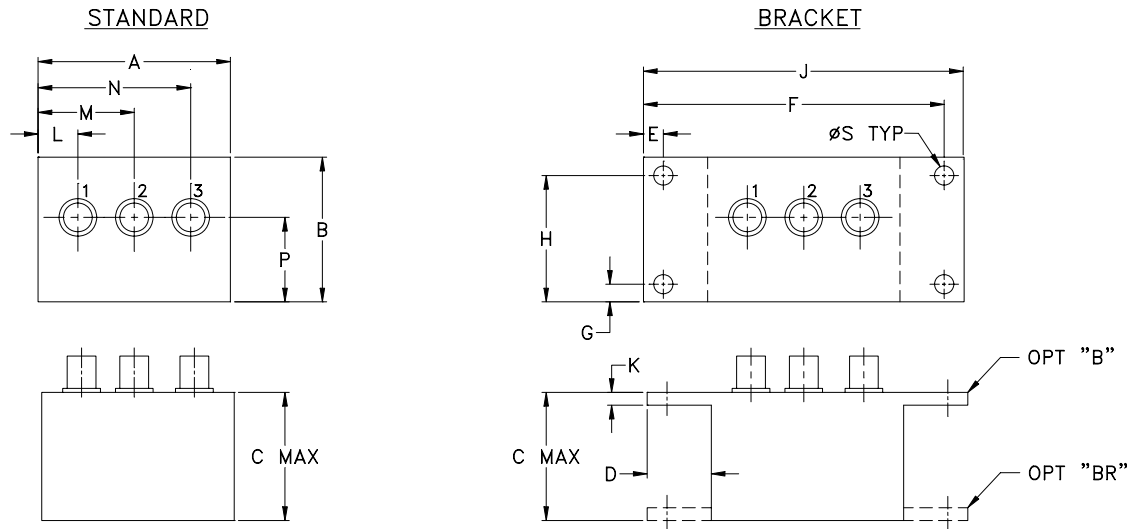


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## Outline Dimensions



| CASE# | A               | B               | C               | D              | E              | F                | G              | H                | J               | K             | L              | M               | N               |
|-------|-----------------|-----------------|-----------------|----------------|----------------|------------------|----------------|------------------|-----------------|---------------|----------------|-----------------|-----------------|
| M21   | 1.50<br>(38.10) | 1.13<br>(28.70) | 1.00<br>(25.40) | .50<br>(12.70) | .155<br>(3.94) | 2.345<br>(59.56) | .138<br>(3.51) | .987<br>(25.07)  | 2.50<br>(63.50) | .10<br>(2.54) | .31<br>(7.87)  | .75<br>(19.05)  | 1.19<br>(30.23) |
| M22   | 2.25<br>(57.15) | 1.38<br>(35.05) | 1.24<br>(31.50) |                | .150<br>(3.81) | 3.100<br>(78.74) |                | 1.238<br>(31.45) | 3.25<br>(82.55) |               | .40<br>(10.16) | 1.15<br>(29.21) | 1.86<br>(47.24) |
| M23   | 2.25<br>(57.15) | 1.38<br>(35.05) | 1.24<br>(31.50) |                | .150<br>(3.81) | 3.100<br>(78.74) |                | 1.238<br>(31.45) | 3.25<br>(82.55) |               | .63<br>(16.00) | 1.06<br>(26.92) | 1.63<br>(41.40) |

| CASE# | P              | Q  | R  | S              | WT. GRAMS |
|-------|----------------|----|----|----------------|-----------|
| M21   | .66<br>(16.76) | -- | -- | .150<br>(3.81) | 40.0      |
| M22   | .64<br>(16.26) | -- | -- |                | 74.0      |
| M23   | .69<br>(17.53) | -- | -- |                | 70.0      |

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

### Notes:

- Case material: Aluminum alloy.
- Case finish:
  - For RoHS Case Styles: Clear chemical conversion coating, non-chrome or trivalent chrome based.
  - For Non-RoHS Case Styles: Yellow hexavalent chrome based conversion coating.

Due to transition from non-RoHS to RoHS, models will be supplied with either case style finish until the non-RoHS case inventory is depleted.
- Mounting bracket available on request. For bracket mounted on connector end add suffix B to part number and add \$5.00 to unit cost. For bracket mounted on the rear, add suffix BR to part number and add \$1.50 to unit cost.



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.

| <b>Specification</b>       | <b>Test/Inspection Condition</b>   | <b>Reference/Spec</b>                |
|----------------------------|--|--------------------------------------|
| Operating Temperature      | -55° to 100°C<br>Ambient Environment   | Individual Model Data Sheet          |
| Storage Temperature        | -55° to 100° C<br>Ambient Environment  | Individual Model Data Sheet          |
| Barometric Pressure        | 100,000 Feet   | MIL-STD-202, Method 105, Condition D |
| Humidity                   | 90% RH, 65°C<br>Units may require bake-out after humidity to restore full performance. | MIL-STD-202, Method 103              |
| Thermal Shock              | -65° to 125°C, 5 cycles  | MIL-STD-202, Method 107, Condition B |
| 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           | 100g, 6ms sawtooth, 3 shocks each direction 3 axes (total 18)                          | MIL-STD-202, Method 213, Condition I |