

Xtra Long Life Transfer Switch

50Ω DC to 18 GHz

MTS-18XL-B+



CASE STYLE: DS810

Connectors Model
SMA MTS-18XL-B+

+RoHS Compliant

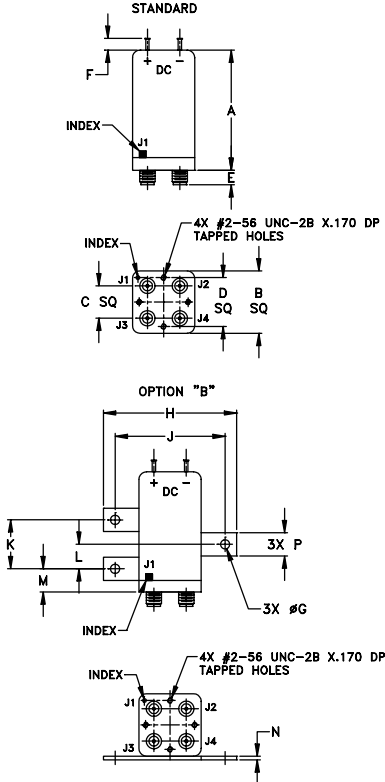
The +Suffix identifies RoHS Compliance. See our web site for RoHS Compliance methodologies and qualifications

Maximum Ratings

| | |
|----------------------------|----------------|
| Operating Temperature | -15°C to +45°C |
| Storage Temperature | -15°C to +85°C |
| RF Power (any single port) | 10W |
| Control Voltage | 26VDC |

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

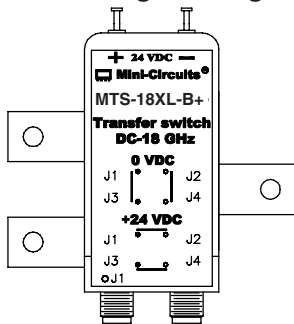
Outline Drawing



Outline Dimensions (inch)

| A | B | C | D | E | F | G | H |
|-------|-------|-------|-------|------|------|-------|-------|
| 1.97 | 1.02 | .53 | .800 | .240 | .19 | .150 | 2.18 |
| 50.04 | 25.91 | 13.46 | 20.32 | 6.10 | 4.83 | 3.81 | 55.37 |
| J | K | L | M | N | P | wt | |
| 1.800 | .800 | .400 | .380 | .06 | .38 | grams | |
| 45.72 | 20.32 | 10.16 | 9.65 | 1.52 | 9.65 | 70 | |

Marking Drawing



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/MCLStore/terms.jsp

Features

- low insertion loss, 0.2 dB typ.
- high isolation, 85 dB typ.
- high power handling, 10W
- ultra reliable
- break-before-make configuration
- failsafe microwave transfer switch
- protected by US Patents 5,272,458; 6,414,577; 6,650,210; 7,633,361; 7,843,289

Applications

- (ATE) automatic test equipment
- reliable "sleeptime" switching
- redundancy switching for microwave radio

Electrical Specifications

| FREQUENCY (GHz) | INSERTION LOSS (dB) | | ISOLATION (dB) | | VSWR (:1) | | DC CURRENT @+24V (mA) | | RF POWER COLD SWITCHING (W) | RF POWER HOT SWITCHING (W) | |
|-----------------|---------------------|------|----------------|------|-----------|------|-----------------------|------|-----------------------------|----------------------------|--------|
| | Typ. | Max. | Typ. | Min. | Typ. | Max. | Typ. | Max. | Max. | Note 1 | Note 2 |
| DC - 1 | 0.10 | 0.15 | 100 | 85 | 1.05 | 1.10 | | | | | |
| 1 - 8 | 0.10 | 0.25 | 90 | 75 | 1.15 | 1.20 | | | | | |
| 8 - 12 | 0.20 | 0.36 | 86 | 70 | 1.15 | 1.30 | 175 | 215 | 10 | 0.1 | 1.0 |
| 12 - 18 | 0.25 | 0.45 | 76 | 60 | 1.15 | 1.30 | | | | | |

Additional Specifications

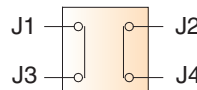
| | |
|--------------------------|--------------------------|
| Operating Voltage Range | 24V (nom) ±1V |
| Switching Time (Typ.) | 20ms |
| Life ³ (Min.) | 10 million switch cycles |

Notes

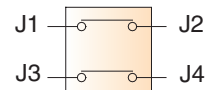
- To achieve specified life, hot switching RF power must not exceed this level.
- Degradation in life (min.) to typically 3 million switch cycles for hot switch at this RF power level.
- Tested at 0 dBm RF power.

Switching States

DE-ENERGIZED DC=0V

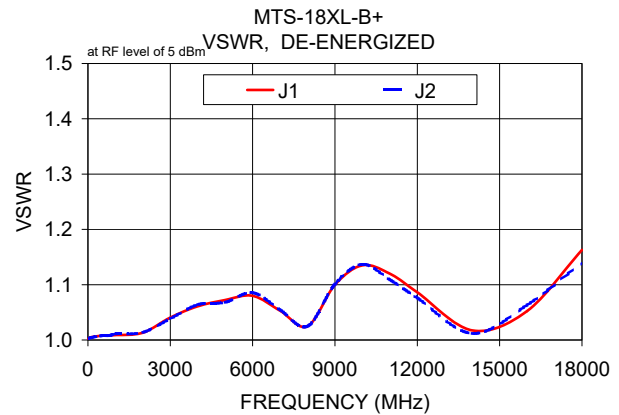
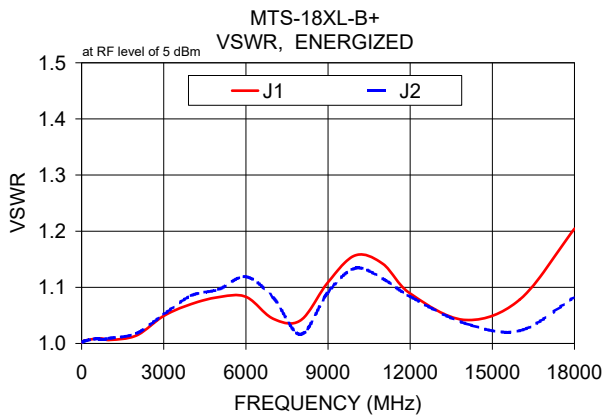
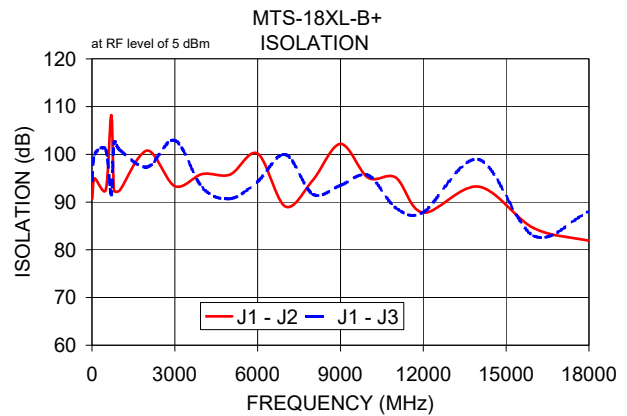
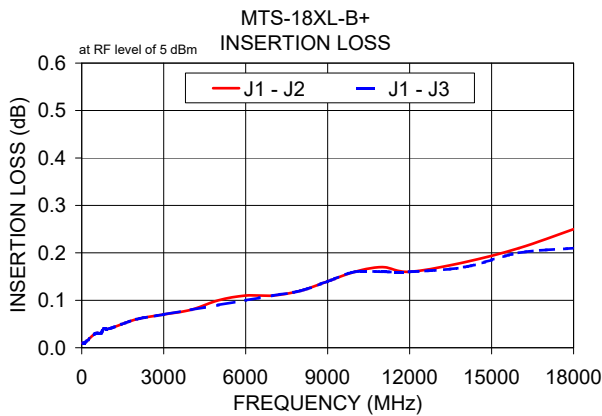


ENERGIZED DC=24V



Typical Performance Data

| FREQ. (MHz) | ON INSERTION LOSS (dB) | | OFF ISOLATION (dB) | | VSWR energized (:1) | | VSWR de-energized (:1) | |
|----------------|------------------------------|-------|-----------------------|--------|------------------------|------|---------------------------|------|
| | J1-J2 | J1-J3 | J1-J2 | J1-J3 | J1 | J2 | J1 | J2 |
| 10.00 | 0.01 | 0.01 | 90.66 | 94.50 | 1.00 | 1.00 | 1.00 | 1.00 |
| 100.00 | 0.01 | 0.01 | 94.93 | 100.05 | 1.00 | 1.00 | 1.00 | 1.00 |
| 500.00 | 0.03 | 0.03 | 92.59 | 100.93 | 1.01 | 1.01 | 1.01 | 1.01 |
| 700.00 | 0.03 | 0.03 | 108.21 | 91.48 | 1.01 | 1.01 | 1.01 | 1.01 |
| 800.00 | 0.04 | 0.04 | 92.52 | 102.45 | 1.01 | 1.01 | 1.01 | 1.01 |
| 1000.00 | 0.04 | 0.04 | 92.45 | 100.96 | 1.01 | 1.01 | 1.01 | 1.01 |
| 2000.00 | 0.06 | 0.06 | 100.79 | 97.34 | 1.01 | 1.02 | 1.01 | 1.01 |
| 3000.00 | 0.07 | 0.07 | 93.32 | 102.92 | 1.05 | 1.05 | 1.04 | 1.04 |
| 4000.00 | 0.08 | 0.08 | 95.89 | 93.03 | 1.07 | 1.09 | 1.06 | 1.06 |
| 5000.00 | 0.10 | 0.09 | 95.75 | 90.70 | 1.08 | 1.10 | 1.07 | 1.07 |
| 6000.00 | 0.11 | 0.10 | 100.15 | 94.32 | 1.08 | 1.12 | 1.08 | 1.09 |
| 7000.00 | 0.11 | 0.11 | 89.08 | 99.96 | 1.04 | 1.08 | 1.05 | 1.05 |
| 8000.00 | 0.12 | 0.12 | 94.59 | 91.64 | 1.04 | 1.02 | 1.02 | 1.02 |
| 9000.00 | 0.14 | 0.14 | 102.19 | 93.50 | 1.11 | 1.09 | 1.10 | 1.10 |
| 10000.00 | 0.16 | 0.16 | 95.10 | 95.63 | 1.16 | 1.13 | 1.14 | 1.14 |
| 11000.00 | 0.17 | 0.16 | 95.14 | 88.79 | 1.14 | 1.12 | 1.12 | 1.11 |
| 12000.00 | 0.16 | 0.16 | 87.77 | 87.85 | 1.09 | 1.08 | 1.09 | 1.08 |
| 14000.00 | 0.18 | 0.17 | 93.24 | 98.95 | 1.04 | 1.04 | 1.02 | 1.01 |
| 16000.00 | 0.21 | 0.20 | 84.54 | 82.94 | 1.08 | 1.02 | 1.05 | 1.06 |
| 18000.00 | 0.25 | 0.21 | 81.87 | 88.03 | 1.20 | 1.08 | 1.16 | 1.14 |



Notes

- A. 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.
- B. Electrical specifications and performance data contained in this specification document are based on Mini-Circuit's applicable established test performance criteria and measurement instructions.
- C. 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/MCLStore/terms.jsp



Xtra Long Life Transfer Switch

MTS-18XL-B+

Typical Performance Data

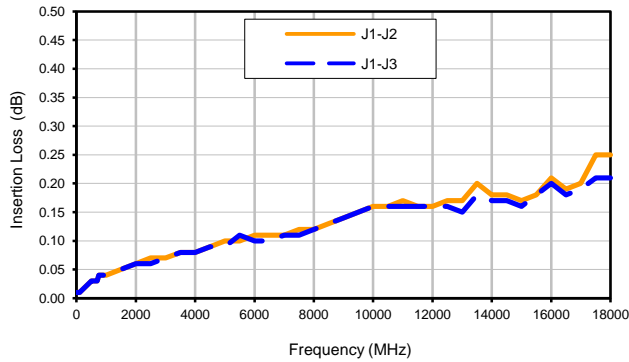
| FREQUENCY (MHz) | INSERTION LOSS ON (dB) | | ISOLATION OFF (dB) | | VSWR ENERGIZED (:1) | | VSWR DE-ENERGIZED (:1) | |
|--------------------|------------------------------|-------|--------------------------|--------|---------------------------|------|------------------------------|------|
| | J1-J2 | J1-J3 | J1-J2 | J1-J3 | J1 | J2 | J1 | J2 |
| | 10.0 | 0.01 | 0.01 | 90.66 | 94.50 | 1.00 | 1.00 | 1.00 |
| 50.0 | 0.01 | 0.01 | 101.14 | 92.25 | 1.00 | 1.00 | 1.00 | 1.00 |
| 100.0 | 0.01 | 0.01 | 94.93 | 100.05 | 1.00 | 1.00 | 1.00 | 1.00 |
| 500.0 | 0.03 | 0.03 | 92.59 | 100.93 | 1.01 | 1.01 | 1.01 | 1.01 |
| 700.0 | 0.03 | 0.03 | 108.21 | 91.48 | 1.01 | 1.01 | 1.01 | 1.01 |
| 750.0 | 0.04 | 0.04 | 94.79 | 108.86 | 1.01 | 1.01 | 1.01 | 1.01 |
| 800.0 | 0.04 | 0.04 | 92.52 | 102.45 | 1.01 | 1.01 | 1.01 | 1.01 |
| 1000.0 | 0.04 | 0.04 | 92.45 | 100.96 | 1.01 | 1.01 | 1.01 | 1.01 |
| 1500.0 | 0.05 | 0.05 | 98.61 | 87.38 | 1.01 | 1.01 | 1.01 | 1.01 |
| 2000.0 | 0.06 | 0.06 | 100.79 | 97.34 | 1.01 | 1.02 | 1.01 | 1.01 |
| 2500.0 | 0.07 | 0.06 | 97.51 | 104.72 | 1.03 | 1.03 | 1.03 | 1.02 |
| 3000.0 | 0.07 | 0.07 | 93.32 | 102.92 | 1.05 | 1.05 | 1.04 | 1.04 |
| 3500.0 | 0.08 | 0.08 | 98.46 | 99.72 | 1.06 | 1.07 | 1.05 | 1.05 |
| 4000.0 | 0.08 | 0.08 | 95.89 | 93.03 | 1.07 | 1.09 | 1.06 | 1.06 |
| 4500.0 | 0.09 | 0.09 | 92.30 | 99.42 | 1.07 | 1.09 | 1.07 | 1.07 |
| 5000.0 | 0.10 | 0.09 | 95.75 | 90.70 | 1.08 | 1.10 | 1.07 | 1.07 |
| 5500.0 | 0.10 | 0.11 | 97.60 | 93.21 | 1.09 | 1.11 | 1.07 | 1.08 |
| 6000.0 | 0.11 | 0.10 | 100.15 | 94.32 | 1.08 | 1.12 | 1.08 | 1.09 |
| 6500.0 | 0.11 | 0.10 | 95.17 | 102.24 | 1.07 | 1.11 | 1.07 | 1.08 |
| 7000.0 | 0.11 | 0.11 | 89.08 | 99.96 | 1.04 | 1.08 | 1.05 | 1.05 |
| 7500.0 | 0.12 | 0.11 | 99.16 | 92.07 | 1.02 | 1.04 | 1.02 | 1.02 |
| 8000.0 | 0.12 | 0.12 | 94.59 | 91.64 | 1.04 | 1.02 | 1.02 | 1.02 |
| 8500.0 | 0.13 | 0.13 | 91.86 | 95.94 | 1.08 | 1.05 | 1.06 | 1.07 |
| 9000.0 | 0.14 | 0.14 | 102.19 | 93.50 | 1.11 | 1.09 | 1.10 | 1.10 |
| 9500.0 | 0.15 | 0.15 | 93.12 | 93.68 | 1.14 | 1.12 | 1.12 | 1.13 |
| 10000.0 | 0.16 | 0.16 | 95.10 | 95.63 | 1.16 | 1.13 | 1.14 | 1.14 |
| 10500.0 | 0.16 | 0.16 | 95.91 | 95.23 | 1.16 | 1.13 | 1.13 | 1.13 |
| 11000.0 | 0.17 | 0.16 | 95.14 | 88.79 | 1.14 | 1.12 | 1.12 | 1.11 |
| 11500.0 | 0.16 | 0.16 | 90.91 | 84.34 | 1.11 | 1.11 | 1.11 | 1.10 |
| 12000.0 | 0.16 | 0.16 | 87.77 | 87.85 | 1.09 | 1.08 | 1.09 | 1.08 |
| 12500.0 | 0.17 | 0.16 | 87.81 | 91.10 | 1.05 | 1.07 | 1.07 | 1.06 |
| 13000.0 | 0.17 | 0.15 | 84.88 | 99.40 | 1.04 | 1.05 | 1.04 | 1.04 |
| 13500.0 | 0.20 | 0.18 | 92.47 | 90.30 | 1.04 | 1.05 | 1.03 | 1.04 |
| 14000.0 | 0.18 | 0.17 | 93.24 | 98.95 | 1.04 | 1.04 | 1.02 | 1.01 |
| 14500.0 | 0.18 | 0.17 | 84.93 | 92.18 | 1.06 | 1.02 | 1.02 | 1.02 |
| 15000.0 | 0.17 | 0.16 | 94.61 | 84.44 | 1.07 | 1.01 | 1.03 | 1.02 |
| 15500.0 | 0.18 | 0.18 | 99.94 | 95.56 | 1.09 | 1.02 | 1.05 | 1.04 |
| 16000.0 | 0.21 | 0.20 | 84.54 | 82.94 | 1.08 | 1.02 | 1.05 | 1.06 |
| 16500.0 | 0.19 | 0.18 | 88.84 | 99.24 | 1.07 | 1.02 | 1.07 | 1.07 |
| 17000.0 | 0.20 | 0.19 | 90.32 | 85.46 | 1.09 | 1.01 | 1.09 | 1.06 |
| 17500.0 | 0.25 | 0.21 | 92.16 | 91.04 | 1.14 | 1.03 | 1.12 | 1.09 |
| 18000.0 | 0.25 | 0.21 | 81.87 | 88.03 | 1.20 | 1.08 | 1.16 | 1.14 |

Xtra Long Life Transfer Switch

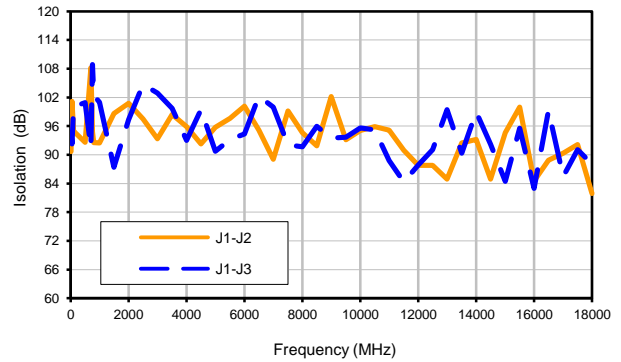
MTS-18XL-B+

Typical Performance Curves

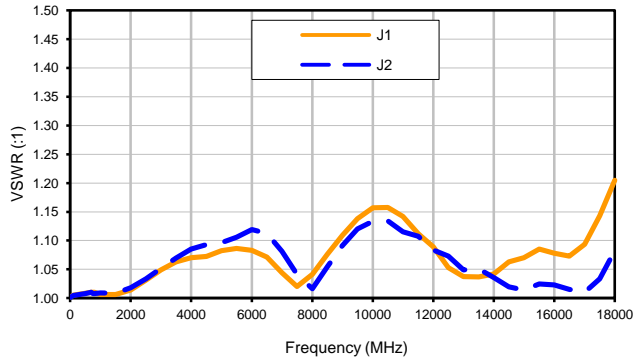
Insertion Loss



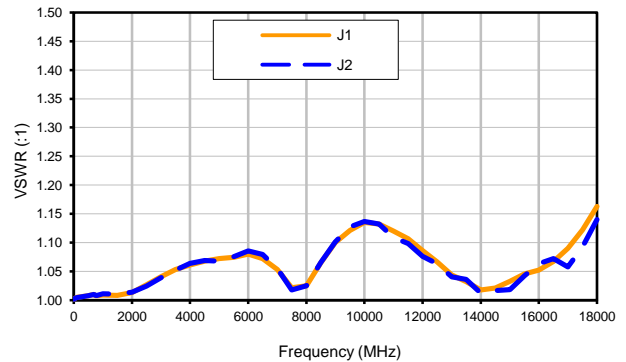
Isolation



VSWR, Energized

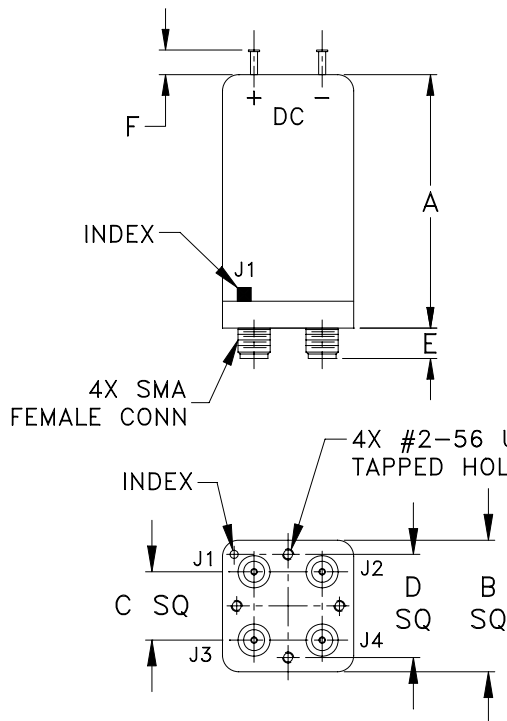


VSWR, De-Energized

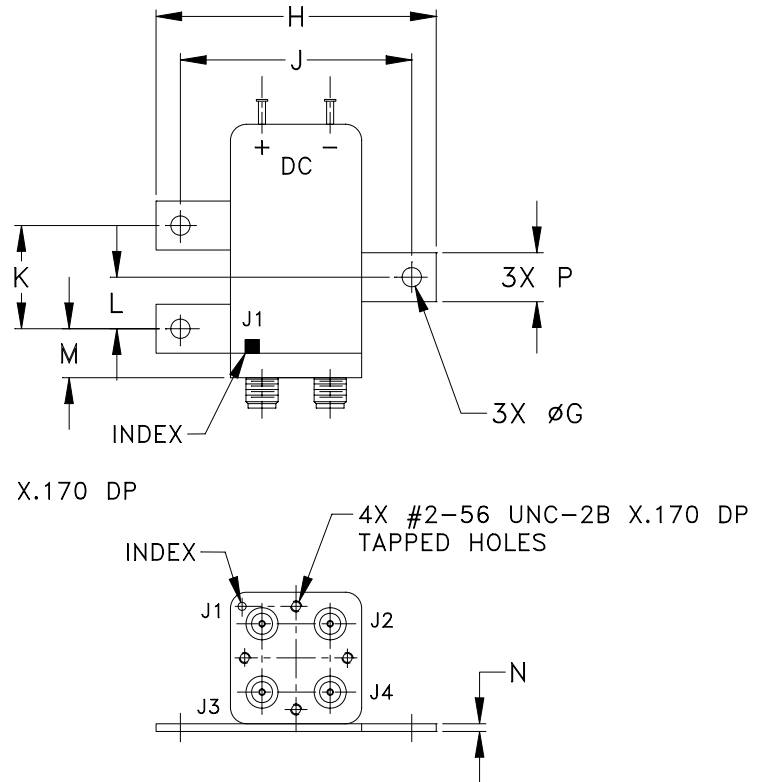


Outline Dimensions

STANDARD



OPTION "B"



| CASE # | A | B | C | D | E | F | G | H | J | K | L |
|--------|-----------------|-----------------|----------------|-----------------|----------------|---------------|----------------|-----------------|------------------|-----------------|-----------------|
| DS810 | 1.97 (50.04) | 1.02 (25.91) | .53 (13.46) | .800 (20.32) | .240 (6.10) | .19 (4.83) | .150 (3.81) | 2.18 (55.37) | 1.800 (45.72) | .800 (20.32) | .400 (10.16) |

| CASE # | M | N | P | WT. GRAM |
|--------|----------------|---------------|---------------|----------|
| DS810 | .380 (9.65) | .06 (1.52) | .38 (9.65) | 70 |

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

Note:

- Case material: Copper-Nickel alloy.

Mini-Circuits[®]

INTERNET <http://www.minicircuits.com>

P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661

Distribution Centers NORTH AMERICA 800-654-7949 • 417-335-5935 • Fax 417-335-5945 • EUROPE 44-1252-832600 • Fax 44-1252-837010

Mini-Circuits ISO 9001 & ISO 14001 Certified

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 | -15° to 45°C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -15° to 85°C Ambient Environment | Individual Model Data Sheet |
| Humidity | 90 to 95% RH, 96 hours, 40°C | MIL-STD-202, Method 103B, Condition B, Except 50°C |
| Thermal Shock | -55° to 100°C, 50 cycles | MIL-STD-202, Method 107, Condition B, except -55° to +100°C and 50 cycles |
| Vibration (High Frequency) | 0.06-inch double amplitude, 10-55 Hz, 2 hours in each of three perpendicular directions (total 6 hours) | MIL-STD-202, Method 204, Condition C, Part 1 |
| Mechanical Shock | 50G, 11 ms sawtooth, 18 shocks: 3 each direction, each of 3 axes | MIL-STD-202, Method 213, Condition G |
| 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 |