

Xtra Long Life SP6T Switch

MSP6TA-12-12+

50Ω DC to 12 GHz 12 Volt Absorptive

The Big Deal

- Extra long life - 10 million cycles
- Low insertion loss, 0.2 dB
- High isolation, 90 dB typ.
- Absorptive
- Reliable sleep mode switching



CASE STYLE: HJ1143

Product Overview

Mini-Circuits' MSP6TA-12-12+ is an ultra-reliable, rugged-duty reflective fail-safe SP6T switch designed in break-before-make configuration offering an ultra long switching life. Powered by +12VDC, the device has a typical switching speed of 20 milliseconds, insertion loss of 0.2 dB and high isolation of 90 dB. The MSP6TA-12-12+ is suitable for use across a wide range of applications, including switching for automated test equipment and redundancy switching.

Key Features

| Feature | Advantages |
|---|---|
| Extra long service life | Exceptionally long service life improves system reliability and reduces the need to replace switches often, making it ideal for automated test systems. |
| High isolation, 90 dB typ. | Prevents interference from unwanted signals, ensuring signal integrity and accuracy of testing. |
| Reliable sleep-mode switching | Offers dependable performance even after being set at a fixed position for prolonged periods. Highly-reliable sleep mode switching averts failures due to "wake up," making it suitable for automatic testing as well as redundancy switching applications. |
| High repeatability between switching cycles | High repeatability of switching cycles ensures reliable performance critical for automated testing and other measurement applications. |

Xtra Long Life SP6T Switch

50Ω DC to 12 GHz 12 Volt Absorptive

Maximum Ratings

| | |
|---|----------------|
| Operating Temperature | -15°C to +45°C |
| Storage Temperature | -15°C to +85°C |
| RF Power | 20W |
| Control Voltage | 13V |
| Permanent damage may occur if any of these limits are exceeded. | |

Features

- ultra-reliable, 10 million cycles
- low insertion loss, 0.2 dB typ.
- high isolation, 90 dB typ.
- break-before-make configuration
- absorptive fail-safe switch
- reliable "sleep-time" switching
- protected by US Patents 5,272,458; 6,414,577; 7,633,361; 7,843,289 and 6,650,210

Applications

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

MSP6TA-12-12+



front view

back view

CASE STYLE: HJ1143

| | |
|------------|---------------|
| Connectors | Model |
| SMA | MSP6TA-12-12+ |

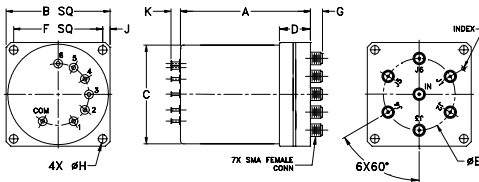


HT-Series
Tight Spot
SMA Wrench
Click Here

+RoHS Compliant

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

Outline Drawing



Outline Dimensions (Inch/mm)

| | | | | | |
|-------|-------|-------|-------|-------|-------|
| A | B | C | D | E | F |
| 2.63 | 2.10 | 2.00 | .63 | 1.45 | 1.800 |
| 66.80 | 53.34 | 50.80 | 16.00 | 36.83 | 45.72 |
| G | H | J | K | wt | |
| .24 | .172 | .15 | .19 | grams | |
| 6.10 | 4.37 | 3.81 | 4.83 | 230 | |

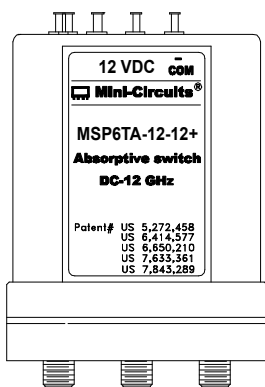
Electrical Specifications at 25°C

| Parameter | Condition | Min. | Typ. (Note 1) | Max. | Unit |
|-------------------------|-------------|------------|---------------|------|--------|
| Frequency Range | | DC | — | 12 | GHz |
| Insertion Loss | DC - 1 GHz | — | 0.10 | 0.15 | dB |
| | 1 - 6 | — | 0.15 | 0.25 | |
| | 6 - 8 | — | 0.20 | 0.30 | |
| | 8 - 12 | — | 0.25 | 0.45 | |
| Isolation | DC - 1 GHz | 85 | 100 | — | dB |
| | 1 - 6 | 80 | 95 | — | |
| | 6 - 8 | 80 | 90 | — | |
| | 8 - 12 | 80 | 90 | — | |
| VSWR (Note 2) | DC - 1 GHz | — | 1.05 | 1.10 | :1 |
| | 1 - 6 | — | 1.20 | 1.25 | |
| | 6 - 8 | — | 1.20 | 1.35 | |
| | 8 - 12 | — | 1.20 | 1.35 | |
| Operating Voltage Range | DC - 12 GHz | | 12±0.5 | | V |
| Control Signal (Note 3) | 12V | — | 170 | 250 | mA |
| RF Power Cold Switching | — | — | — | 20 | W |
| RF Power Hot Switching | 0.1W | 10 million | — | — | Cycles |
| | 1.0W | — | 1 million | — | |
| Switching Time | DC - 12 GHz | — | 20 | — | ms |

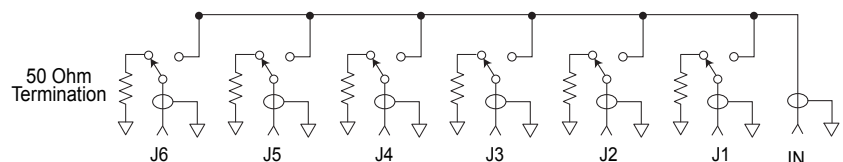
Notes

1. The performance values represents a common value for the frequency range. For typical performance across the frequency band, see performance graphs in the next page.
2. All ports, all states
3. For port IN in Energized state only.
4. +12 Volt applied to energized port, COM is negative.

Marking Drawing



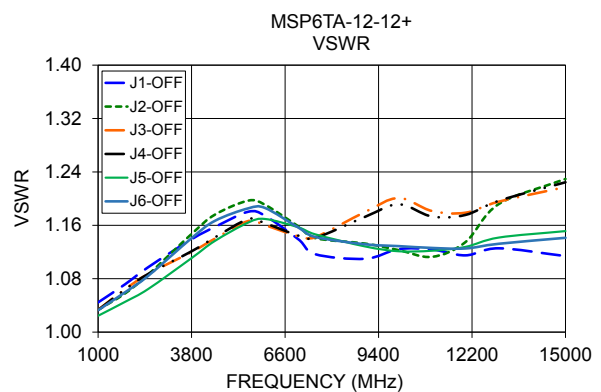
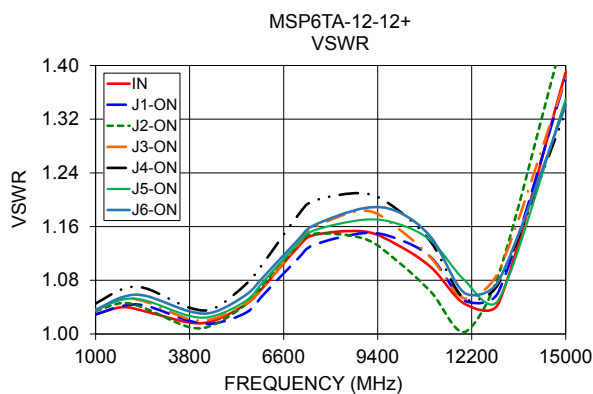
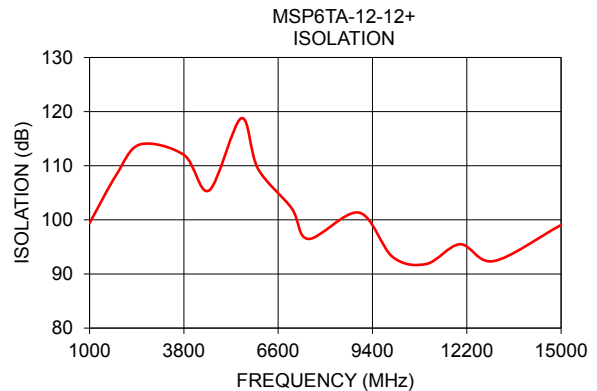
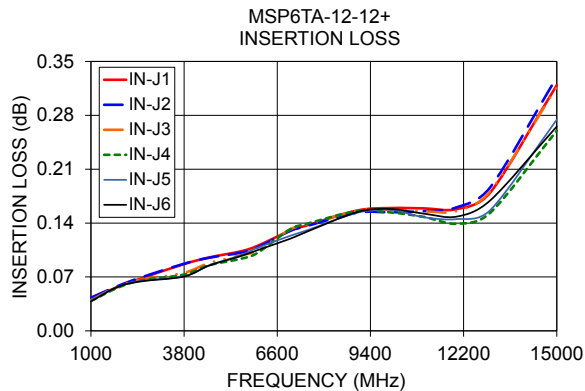
Switching Position (Non-Energized)



Typical Performance Data

| FREQ. (MHz) | ON INSERTION LOSS (dB) | | | | | | ISOLATION (dB) | | VSWR* | | | | | |
|----------------|---------------------------|-------|-------|-------|-------|-------|-------------------|-------|-------|-------|-------|-------|-------|------|
| | IN-J1 | IN-J2 | IN-J3 | IN-J4 | IN-J5 | IN-J6 | IN | J1-ON | J2-ON | J3-ON | J4-ON | J5-ON | J6-ON | |
| 1000 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 99.41 | 1.03 | 1.03 | 1.03 | 1.04 | 1.05 | 1.04 | 1.04 |
| 1800 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 108.37 | 1.04 | 1.04 | 1.05 | 1.05 | 1.07 | 1.05 | 1.05 |
| 2500 | 0.07 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 113.94 | 1.03 | 1.04 | 1.04 | 1.05 | 1.07 | 1.05 | 1.06 |
| 3800 | 0.09 | 0.09 | 0.08 | 0.07 | 0.07 | 0.07 | 112.01 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4550 | 0.10 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 105.44 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 5500 | 0.10 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 118.76 | 1.05 | 1.03 | 1.05 | 1.05 | 1.08 | 1.05 | 1.06 |
| 6000 | 0.11 | 0.11 | 0.10 | 0.10 | 0.11 | 0.10 | 109.45 | 1.07 | 1.06 | 1.07 | 1.07 | 1.11 | 1.08 | 1.09 |
| 7000 | 0.13 | 0.13 | 0.13 | 0.13 | 0.12 | 0.12 | 102.15 | 1.13 | 1.11 | 1.13 | 1.13 | 1.18 | 1.13 | 1.14 |
| 7500 | 0.14 | 0.14 | 0.14 | 0.14 | 0.13 | 0.13 | 96.47 | 1.15 | 1.13 | 1.15 | 1.16 | 1.20 | 1.15 | 1.16 |
| 9000 | 0.16 | 0.15 | 0.16 | 0.16 | 0.15 | 0.15 | 101.34 | 1.15 | 1.15 | 1.14 | 1.18 | 1.21 | 1.17 | 1.19 |
| 10000 | 0.16 | 0.15 | 0.16 | 0.15 | 0.16 | 0.16 | 93.14 | 1.13 | 1.14 | 1.11 | 1.16 | 1.18 | 1.16 | 1.18 |
| 11000 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 | 91.84 | 1.10 | 1.11 | 1.06 | 1.11 | 1.14 | 1.14 | 1.14 |
| 12000 | 0.16 | 0.16 | 0.16 | 0.14 | 0.15 | 0.15 | 95.49 | 1.04 | 1.05 | 1.00 | 1.05 | 1.05 | 1.08 | 1.06 |
| 13005 | 0.18 | 0.19 | 0.18 | 0.15 | 0.16 | 0.17 | 92.38 | 1.05 | 1.06 | 1.09 | 1.09 | 1.08 | 1.05 | 1.08 |
| 15000 | 0.32 | 0.33 | 0.32 | 0.26 | 0.27 | 0.27 | 99.05 | 1.39 | 1.38 | 1.46 | 1.38 | 1.33 | 1.35 | 1.34 |

*See graph below for VSWR OFF state.



Additional Notes

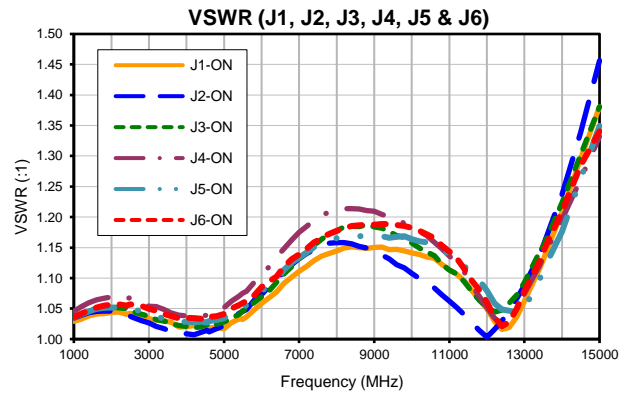
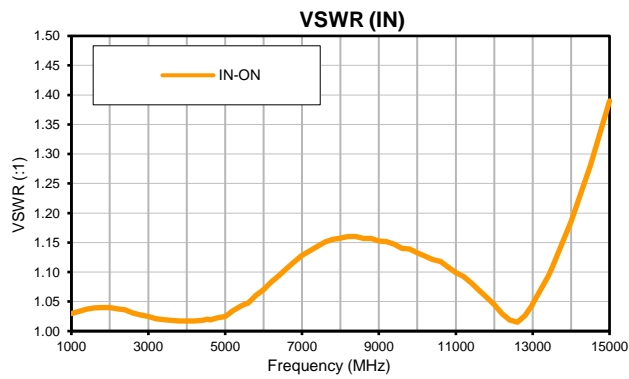
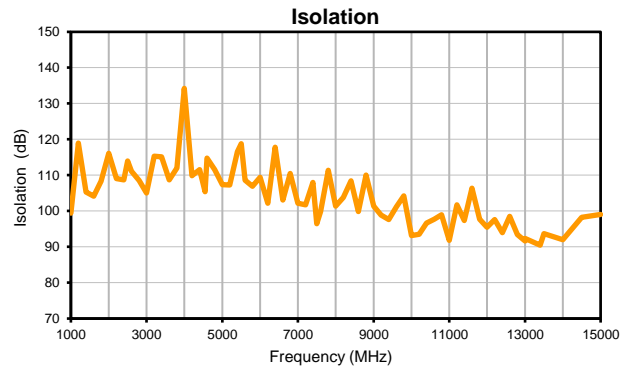
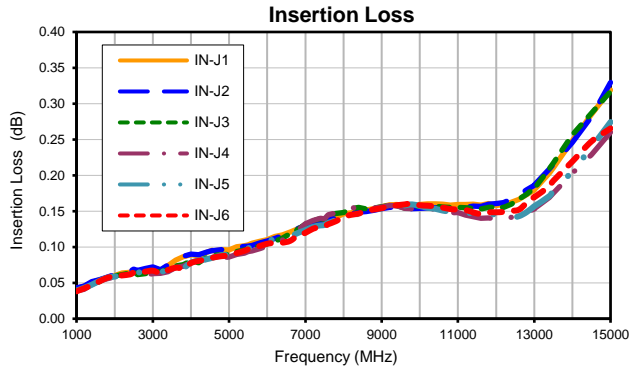
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Typical Performance Data

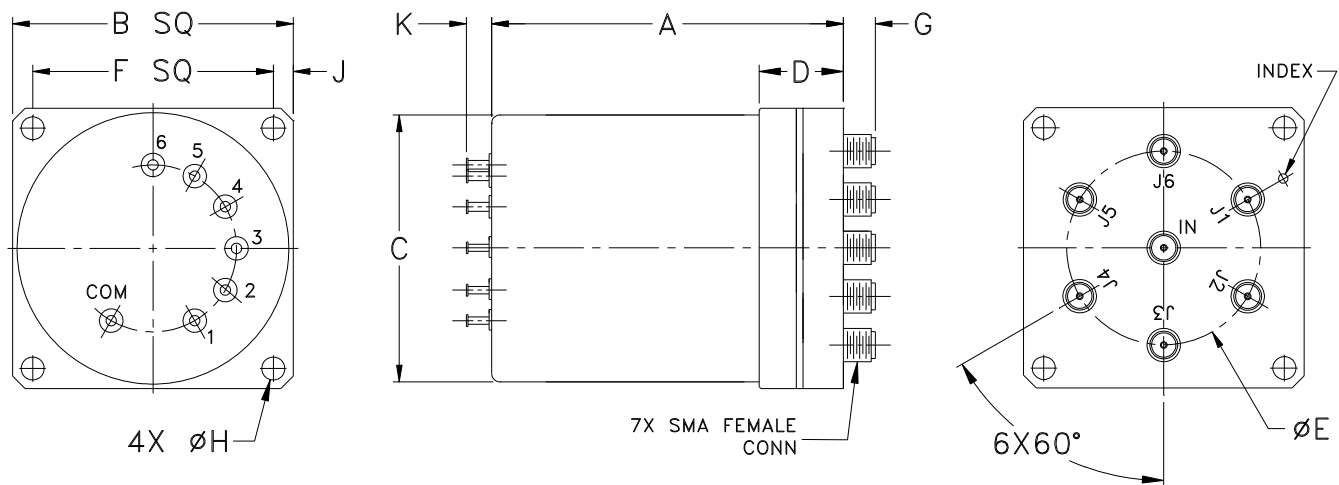
| FREQUENCY (MHz) | INSERTION LOSS (dB) | | | | | | ISOLATION (dB) | VSWR (:1) | | | | | | |
|--------------------|------------------------|-------|-------|-------|-------|-------|-------------------|--------------|-------|-------|-------|-------|-------|-------|
| | IN-J1 | IN-J2 | IN-J3 | IN-J4 | IN-J5 | IN-J6 | | IN | J1-ON | J2-ON | J3-ON | J4-ON | J5-ON | J6-ON |
| 1000 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 99.41 | 1.03 | 1.03 | 1.03 | 1.04 | 1.05 | 1.04 | 1.04 |
| 1200 | 0.05 | 0.05 | 0.04 | 0.04 | 0.04 | 0.04 | 118.97 | 1.03 | 1.03 | 1.04 | 1.04 | 1.05 | 1.04 | 1.04 |
| 1400 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 105.29 | 1.04 | 1.04 | 1.04 | 1.05 | 1.06 | 1.05 | 1.05 |
| 1600 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 104.18 | 1.04 | 1.04 | 1.05 | 1.05 | 1.06 | 1.05 | 1.05 |
| 1800 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 108.37 | 1.04 | 1.04 | 1.05 | 1.05 | 1.07 | 1.05 | 1.05 |
| 2000 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 0.06 | 116.10 | 1.04 | 1.04 | 1.05 | 1.05 | 1.07 | 1.05 | 1.06 |
| 2200 | 0.06 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 | 109.06 | 1.04 | 1.04 | 1.04 | 1.05 | 1.07 | 1.05 | 1.06 |
| 2400 | 0.06 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 | 108.67 | 1.04 | 1.04 | 1.04 | 1.05 | 1.07 | 1.05 | 1.05 |
| 2500 | 0.07 | 0.07 | 0.07 | 0.07 | 0.06 | 0.06 | 113.94 | 1.03 | 1.04 | 1.04 | 1.05 | 1.07 | 1.05 | 1.06 |
| 2600 | 0.07 | 0.07 | 0.06 | 0.06 | 0.06 | 0.06 | 111.12 | 1.03 | 1.04 | 1.04 | 1.04 | 1.06 | 1.05 | 1.06 |
| 2800 | 0.07 | 0.07 | 0.06 | 0.06 | 0.07 | 0.07 | 108.50 | 1.03 | 1.04 | 1.03 | 1.04 | 1.06 | 1.05 | 1.05 |
| 3000 | 0.07 | 0.07 | 0.06 | 0.06 | 0.07 | 0.07 | 105.04 | 1.02 | 1.03 | 1.03 | 1.04 | 1.05 | 1.04 | 1.05 |
| 3200 | 0.07 | 0.07 | 0.07 | 0.06 | 0.07 | 0.06 | 115.33 | 1.02 | 1.03 | 1.02 | 1.03 | 1.05 | 1.04 | 1.05 |
| 3400 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 0.07 | 115.15 | 1.02 | 1.03 | 1.02 | 1.03 | 1.05 | 1.03 | 1.04 |
| 3600 | 0.08 | 0.08 | 0.07 | 0.07 | 0.07 | 0.07 | 108.69 | 1.02 | 1.03 | 1.01 | 1.03 | 1.04 | 1.03 | 1.04 |
| 3800 | 0.09 | 0.09 | 0.08 | 0.07 | 0.07 | 0.07 | 112.01 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4000 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 | 134.23 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4200 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 0.08 | 109.88 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4400 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 0.08 | 111.60 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4550 | 0.10 | 0.09 | 0.09 | 0.09 | 0.08 | 0.08 | 105.44 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.03 |
| 4600 | 0.09 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 114.75 | 1.02 | 1.02 | 1.01 | 1.02 | 1.04 | 1.03 | 1.04 |
| 4800 | 0.10 | 0.10 | 0.09 | 0.08 | 0.09 | 0.09 | 111.59 | 1.02 | 1.02 | 1.02 | 1.02 | 1.05 | 1.03 | 1.04 |
| 5000 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 107.38 | 1.02 | 1.02 | 1.02 | 1.03 | 1.05 | 1.03 | 1.04 |
| 5200 | 0.10 | 0.10 | 0.09 | 0.09 | 0.09 | 0.09 | 107.30 | 1.03 | 1.03 | 1.03 | 1.03 | 1.06 | 1.04 | 1.05 |
| 5400 | 0.10 | 0.10 | 0.10 | 0.09 | 0.10 | 0.09 | 116.56 | 1.04 | 1.03 | 1.04 | 1.04 | 1.07 | 1.05 | 1.06 |
| 5500 | 0.10 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 118.76 | 1.05 | 1.03 | 1.05 | 1.05 | 1.08 | 1.05 | 1.06 |
| 5600 | 0.11 | 0.10 | 0.10 | 0.09 | 0.10 | 0.10 | 108.61 | 1.05 | 1.04 | 1.05 | 1.05 | 1.08 | 1.06 | 1.06 |
| 5800 | 0.11 | 0.11 | 0.10 | 0.10 | 0.10 | 0.10 | 106.91 | 1.06 | 1.05 | 1.06 | 1.06 | 1.09 | 1.07 | 1.07 |
| 6000 | 0.11 | 0.11 | 0.10 | 0.10 | 0.11 | 0.10 | 109.45 | 1.07 | 1.06 | 1.07 | 1.07 | 1.11 | 1.08 | 1.09 |
| 6200 | 0.11 | 0.11 | 0.11 | 0.10 | 0.11 | 0.11 | 102.21 | 1.08 | 1.07 | 1.09 | 1.08 | 1.12 | 1.09 | 1.09 |
| 6400 | 0.12 | 0.12 | 0.11 | 0.11 | 0.11 | 0.11 | 117.85 | 1.09 | 1.08 | 1.10 | 1.09 | 1.13 | 1.10 | 1.10 |
| 6600 | 0.12 | 0.12 | 0.12 | 0.12 | 0.11 | 0.11 | 103.11 | 1.11 | 1.09 | 1.11 | 1.11 | 1.15 | 1.11 | 1.12 |
| 6800 | 0.13 | 0.13 | 0.12 | 0.12 | 0.12 | 0.12 | 110.48 | 1.12 | 1.10 | 1.12 | 1.12 | 1.16 | 1.13 | 1.13 |
| 7000 | 0.13 | 0.13 | 0.13 | 0.13 | 0.12 | 0.12 | 102.15 | 1.13 | 1.11 | 1.13 | 1.13 | 1.18 | 1.13 | 1.14 |
| 7200 | 0.13 | 0.13 | 0.14 | 0.14 | 0.13 | 0.13 | 101.77 | 1.14 | 1.12 | 1.14 | 1.14 | 1.18 | 1.14 | 1.15 |
| 7400 | 0.13 | 0.14 | 0.14 | 0.14 | 0.13 | 0.13 | 107.96 | 1.14 | 1.13 | 1.15 | 1.15 | 1.19 | 1.15 | 1.16 |
| 7500 | 0.14 | 0.14 | 0.14 | 0.14 | 0.13 | 0.13 | 96.47 | 1.15 | 1.13 | 1.15 | 1.16 | 1.20 | 1.15 | 1.16 |
| 7600 | 0.14 | 0.14 | 0.14 | 0.15 | 0.13 | 0.13 | 99.86 | 1.15 | 1.14 | 1.15 | 1.16 | 1.20 | 1.16 | 1.17 |
| 7800 | 0.14 | 0.14 | 0.15 | 0.15 | 0.14 | 0.14 | 111.36 | 1.16 | 1.14 | 1.16 | 1.17 | 1.21 | 1.16 | 1.17 |
| 8000 | 0.15 | 0.15 | 0.15 | 0.15 | 0.14 | 0.14 | 101.41 | 1.16 | 1.14 | 1.16 | 1.18 | 1.21 | 1.17 | 1.18 |
| 8200 | 0.15 | 0.15 | 0.15 | 0.15 | 0.14 | 0.14 | 103.77 | 1.16 | 1.15 | 1.16 | 1.18 | 1.21 | 1.17 | 1.18 |
| 8400 | 0.15 | 0.15 | 0.16 | 0.16 | 0.15 | 0.15 | 108.45 | 1.16 | 1.15 | 1.16 | 1.18 | 1.21 | 1.17 | 1.19 |
| 8600 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 99.85 | 1.16 | 1.15 | 1.15 | 1.18 | 1.21 | 1.17 | 1.19 |
| 8800 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 0.15 | 110.06 | 1.16 | 1.15 | 1.15 | 1.19 | 1.21 | 1.17 | 1.19 |
| 9000 | 0.16 | 0.15 | 0.16 | 0.16 | 0.15 | 0.15 | 101.34 | 1.15 | 1.15 | 1.14 | 1.18 | 1.21 | 1.17 | 1.19 |
| 9200 | 0.16 | 0.16 | 0.16 | 0.16 | 0.15 | 0.16 | 98.92 | 1.15 | 1.15 | 1.14 | 1.18 | 1.20 | 1.17 | 1.19 |
| 9400 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 0.16 | 97.60 | 1.15 | 1.15 | 1.13 | 1.18 | 1.20 | 1.17 | 1.19 |
| 9600 | 0.16 | 0.15 | 0.15 | 0.15 | 0.16 | 0.16 | 101.23 | 1.14 | 1.15 | 1.12 | 1.17 | 1.20 | 1.17 | 1.19 |
| 9800 | 0.16 | 0.15 | 0.15 | 0.15 | 0.16 | 0.16 | 104.22 | 1.14 | 1.14 | 1.12 | 1.17 | 1.19 | 1.17 | 1.19 |
| 10000 | 0.16 | 0.15 | 0.16 | 0.15 | 0.16 | 0.16 | 93.14 | 1.13 | 1.14 | 1.11 | 1.16 | 1.18 | 1.16 | 1.18 |
| 10200 | 0.16 | 0.15 | 0.16 | 0.15 | 0.15 | 0.16 | 93.55 | 1.13 | 1.14 | 1.10 | 1.15 | 1.18 | 1.16 | 1.18 |
| 10400 | 0.16 | 0.15 | 0.16 | 0.15 | 0.15 | 0.16 | 96.67 | 1.12 | 1.13 | 1.09 | 1.14 | 1.17 | 1.16 | 1.17 |
| 10600 | 0.16 | 0.15 | 0.16 | 0.15 | 0.15 | 0.16 | 97.75 | 1.12 | 1.13 | 1.08 | 1.14 | 1.16 | 1.16 | 1.17 |
| 10800 | 0.16 | 0.15 | 0.16 | 0.15 | 0.15 | 0.15 | 98.95 | 1.11 | 1.12 | 1.07 | 1.12 | 1.15 | 1.15 | 1.15 |
| 11000 | 0.16 | 0.16 | 0.16 | 0.15 | 0.15 | 0.15 | 91.84 | 1.10 | 1.11 | 1.06 | 1.11 | 1.14 | 1.14 | 1.14 |
| 11200 | 0.16 | 0.16 | 0.16 | 0.14 | 0.15 | 0.15 | 101.74 | 1.09 | 1.11 | 1.05 | 1.11 | 1.12 | 1.13 | 1.13 |
| 11400 | 0.16 | 0.16 | 0.15 | 0.14 | 0.15 | 0.15 | 97.34 | 1.08 | 1.10 | 1.04 | 1.09 | 1.11 | 1.12 | 1.11 |
| 11600 | 0.16 | 0.16 | 0.15 | 0.14 | 0.14 | 0.15 | 106.41 | 1.07 | 1.08 | 1.03 | 1.08 | 1.09 | 1.11 | 1.10 |
| 11800 | 0.16 | 0.16 | 0.16 | 0.14 | 0.15 | 0.15 | 97.70 | 1.06 | 1.06 | 1.01 | 1.06 | 1.07 | 1.10 | 1.08 |
| 12000 | 0.16 | 0.16 | 0.16 | 0.14 | 0.15 | 0.15 | 95.49 | 1.04 | 1.05 | 1.00 | 1.05 | 1.05 | 1.08 | 1.06 |
| 12200 | 0.16 | 0.16 | 0.16 | 0.14 | 0.14 | 0.15 | 97.61 | 1.03 | 1.03 | 1.02 | 1.04 | 1.03 | 1.06 | 1.04 |
| 12400 | 0.16 | 0.17 | 0.16 | 0.14 | 0.14 | 0.15 | 93.94 | 1.02 | 1.02 | 1.03 | 1.05 | 1.02 | 1.05 | 1.02 |
| 12600 | 0.17 | 0.17 | 0.17 | 0.14 | 0.14 | 0.15 | 98.49 | 1.02 | 1.02 | 1.05 | 1.06 | 1.03 | 1.05 | 1.03 |
| 12800 | 0.17 | 0.18 | 0.17 | 0.15 | 0.15 | 0.16 | 93.41 | 1.03 | 1.04 | 1.07 | 1.07 | 1.05 | 1.04 | 1.05 |
| 13000 | 0.18 | 0.19 | 0.18 | 0.15 | 0.16 | 0.17 | 91.68 | 1.05 | 1.06 | 1.09 | 1.09 | 1.07 | 1.05 | 1.08 |
| 13005 | 0.18 | 0.19 | 0.18 | 0.15 | 0.16 | 0.17 | 92.38 | 1.05 | 1.06 | 1.09 | 1.09 | 1.08 | 1.05 | 1.08 |
| 13400 | 0.20 | 0.21 | 0.21 | 0.17 | 0.17 | 0.19 | 90.48 | 1.09 | 1.11 | 1.14 | 1.14 | 1.12 | 1.10 | 1.13 |
| 13500 | 0.21 | 0.22 | 0.22 | 0.18 | 0.18 | 0.19 | 93.71 | 1.11 | 1.13 | 1.15 | 1.15 | 1.13 | 1.11 | 1.14 |
| 14000 | 0.25 | 0.25 | 0.26 | 0.20 | 0.21 | 0.22 | 91.98 | 1.19 | 1.21 | 1.24 | 1.22 | 1.20 | 1.18 | 1.21 |
| 14500 | 0.29 | 0.28 | 0.29 | 0.23 | 0.24 | 0.25 | 98.25 | 1.28 | 1.30 | 1.34 | 1.30 | 1.26 | 1.26 | 1.28 |
| 15000 | 0.32 | 0.33 | 0.32 | 0.26 | 0.27 | 0.27 | 99.05 | 1.39 | 1.38 | 1.46 | 1.38 | 1.33 | 1.35 | 1.34 |



Typical Performance Curves



Outline Dimensions



| CASE# | A | B | C | D | E | F | G | H | J | K | WT. GRAM |
|--------|-----------------|-----------------|-----------------|----------------|-----------------|------------------|---------------|----------------|---------------|---------------|----------|
| HJ1143 | 2.63 (66.80) | 2.10 (53.34) | 2.00 (50.80) | .63 (16.00) | 1.45 (36.83) | 1.800 (45.72) | .24 (6.10) | .172 (4.37) | .15 (3.81) | .19 (4.83) | 230 |

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

Note:

1. Case material: Copper-Nickel alloy.

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 |