



COAXIAL

# High Power Amplifier

## ZHL-100W-272+

50Ω 100W 700 to 2700 MHz

### THE BIG DEAL

- High Output Power, 100W typ.
- High Gain, 48 dB typ.
- Excellent Reverse Isolation, 89 dB typ.
- Built-in over-temperature protection with temperature alarm



Generic photo used for illustration purposes only

### APPLICATIONS

- Laboratory Test Instrument
- RF Power Stress Test
- EMI and Antenna Testing
- Reliability Testing

|            |                                       |
|------------|---------------------------------------|
| Model No.  | ZHL-100W-272+                         |
| Case Style | BT2247                                |
| Connectors | IN, SMA-F, OUT, N-TYPE-F, D-SUB, MALE |

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

### PRODUCT OVERVIEW

The ZHL-100W-272+ is a high power amplifier module supply which can be used for a wide variety of laboratory testing applications. This rugged amplifier is capable of amplifying signals up to 100W output power over its entire operating frequency range of 700 – 2700 MHz. Built-in safety features include over-temperature protection. The amplifier's output stage is further protected in the event of a fault condition, allowing high power operation for up to 5 minutes into an OPEN or SHORT load (refer to the maximum input power specifications), preventing amplifier damage and providing excellent reliability.

### KEY FEATURES

| Feature                | Advantages   |
|------------------------|--|
| Wide Frequency Range   | 700 – 2700 MHz frequency range covers popular wireless communications, SATCOM and radar bands in a single instrument, useful for many test applications. |
| 100W Output Power      | Supports high power test applications such as EMI, max power handling, and reliability testing   |
| High Gain              | 48 dB typical gain allows the ZHL-100W-272+ to be driven to full output power with nearly all commercially available signal generators                   |
| High Reverse Isolation | Isolates load reflections to protect sensitive signal sources from potential damage and performance variation due to load pulling                        |
| Built-in Protection    | The unit shuts OFF when the internal amplifier reaches a set temperature of 85±5°C, preventing damage to the amplifier and providing added reliability.  |

REV. B  
 ECO-017949  
 ZHL-100W-272+  
 MCL NY  
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### ELECTRICAL SPECIFICATIONS AT 25°C

| Parameter                          | Condition (MHz) | Min. | Typ.  | Max. | Units |
|------------------------------------|-----------------|------|-------|------|-------|
| Frequency Range                    |                 | 700  | —     | 2700 | MHz   |
| Gain                               | 700 - 2700      | 45   | 48    | —    | dB    |
| Gain Flatness                      | 700 - 2700      | —    | ±1.7  | ±2.1 | dB    |
| Output Power at 1dB compression    | 700 - 2700      | —    | +49   | —    | dBm   |
| Output Power at 3dB compression    | 700 - 2700      | +48  | +50.6 | —    | dBm   |
| Noise Figure                       | 700 - 2700      | —    | 8.2   | 10   | dB    |
| Output third order intercept point | 700 - 2700      | —    | +50   | —    | dBm   |
| Input VSWR                         | 700 - 2700      | —    | 1.5   | —    | :1    |
| Output VSWR                        | 700 - 2700      | —    | 1.5   | —    | :1    |
| DC Supply Voltage                  | DC              | 28   | 30    | 32   | V     |
| Supply Current                     | DC              | —    | 12    | 16   | A     |

### ABSOLUTE MAXIMUM RATINGS<sup>1</sup>

| Parameter                     | Ratings                                    |
|-------------------------------|--|
| Operating Ambient Temperature | 0°C to +40°C                               |
| Storage Temperature           | -20°C to +70°C                             |
| DC Voltage                    | +32V                                       |
| Input RF Power (no damage)    | +7 dBm <sup>2</sup><br>-3 dBm <sup>3</sup> |

- Specifications apply to CW signals only permanent damage may occur if any of these limits are exceeded.
- Into 50 ohm load
- Into open or short load, for up to 5 minutes.

### D-SUB MALE CONNECTOR PIN CONNECTIONS\*

| Pin #     | Description            |
|-----------|------------------------|
| 1,2,5,6,7 | No Connection          |
| 3         | TEMP. Alarm (TTL High) |
| 4         | +5V (max. 100mA)       |
| 8,9       | Ground                 |

\*Each amplifier will come with additional D-sub female connector for mating with amplifier.





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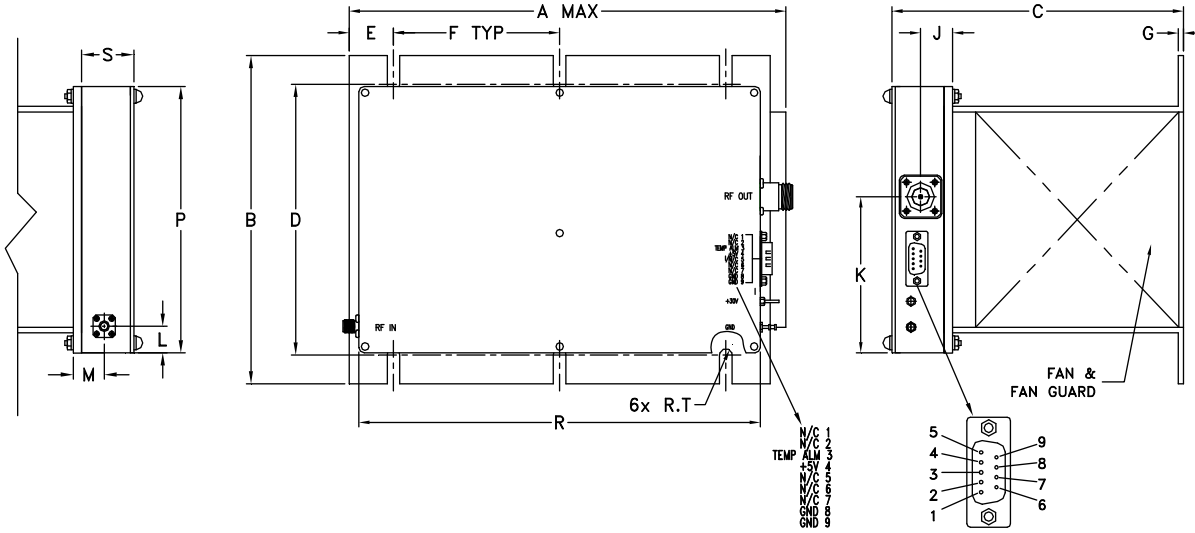
# High Power Amplifier

## ZHL-100W-272+

Mini-Circuits

50Ω 100W 700 to 2700 MHz

### OUTLINE DRAWING



### OUTLINE DIMENSIONS (Inch mm)

| A      | B      | C      | D      | E     | F     | G    | J     | K     | L     | M     | P      | R      | S     | T    | wt    |
|--------|--------|--------|--------|-------|-------|------|-------|-------|-------|-------|--------|--------|-------|------|-------|
| 9.85   | 7.3    | 6.6    | 6.00   | .98   | 3.75  | .13  | .72   | 3.46  | .59   | .70   | 5.91   | 9.06   | 1.18  | .135 | grams |
| 250.19 | 185.42 | 167.64 | 152.40 | 24.89 | 95.25 | 3.30 | 18.29 | 87.88 | 14.99 | 17.78 | 150.11 | 230.12 | 29.97 | 3.43 | 5350  |





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# High Power Amplifier

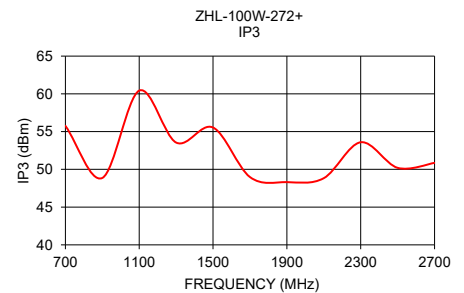
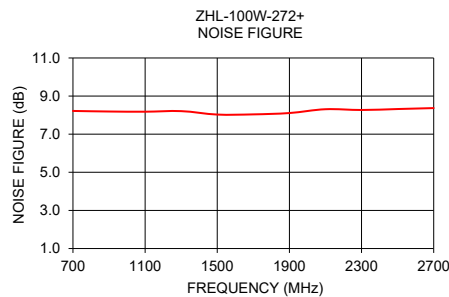
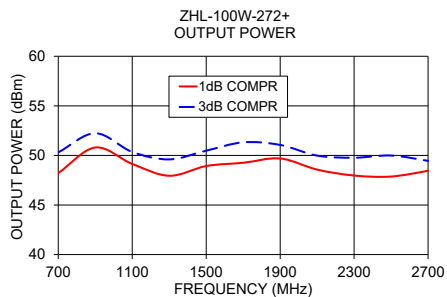
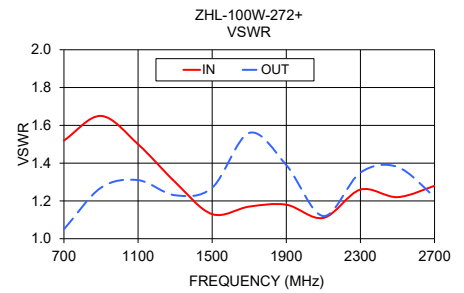
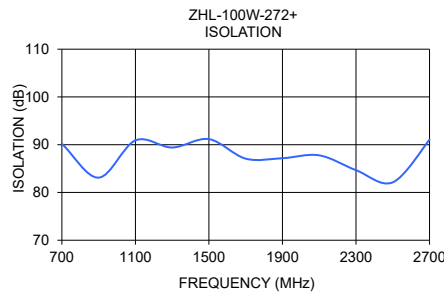
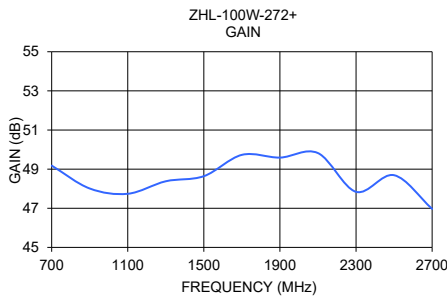
## ZHL-100W-272+

Mini-Circuits

50Ω 100W 700 to 2700 MHz

### TYPICAL PERFORMANCE DATA

| FREQUENCY (MHz) | GAIN (dB) | ISOLATION (dB) | VSWR (:1) |     | POUT at 1 dB COMPR. (dBm) | POUT at 3 dB COMPR. (dBm) | NOISE FIGURE (dB) | IP3 (dBm) |
|-----------------|-----------|----------------|-----------|-----|---------------------------|---------------------------|-------------------|-----------|
|                 |           |                | IN        | OUT |                           |                           |                   |           |
| 700             | 49.2      | 90.2           | 1.5       | 1.1 | 48.2                      | 50.3                      | 8.2               | 55.8      |
| 900             | 48.0      | 83.1           | 1.7       | 1.3 | 50.8                      | 52.2                      | 8.2               | 48.9      |
| 1100            | 47.7      | 90.9           | 1.5       | 1.3 | 49.1                      | 50.4                      | 8.2               | 60.4      |
| 1300            | 48.4      | 89.4           | 1.3       | 1.2 | 48.0                      | 49.6                      | 8.2               | 53.6      |
| 1500            | 48.6      | 91.2           | 1.1       | 1.3 | 48.9                      | 50.5                      | 8.0               | 55.5      |
| 1700            | 49.7      | 87.1           | 1.2       | 1.6 | 49.3                      | 51.3                      | 8.0               | 49.0      |
| 1900            | 49.6      | 87.2           | 1.2       | 1.4 | 49.7                      | 51.1                      | 8.1               | 48.3      |
| 2100            | 49.8      | 87.8           | 1.1       | 1.1 | 48.6                      | 50.0                      | 8.3               | 48.8      |
| 2300            | 47.8      | 84.7           | 1.3       | 1.4 | 48.0                      | 49.8                      | 8.3               | 53.6      |
| 2500            | 48.7      | 82.1           | 1.2       | 1.4 | 47.9                      | 50.0                      | 8.3               | 50.2      |
| 2700            | 47.0      | 91.1           | 1.3       | 1.2 | 48.5                      | 49.5                      | 8.4               | 50.9      |



#### 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/terms/viewterm.html](http://www.minicircuits.com/terms/viewterm.html)



# High Power Amplifier

# ZHL-100W-272+

## Typical Performance Data

| Frequency<br>(MHz) | Gain<br>(dB)<br>30V | Directivity<br>(dB)<br>30V | VSWR In<br>(:1)<br>30V | VSWR Out<br>(:1)<br>30V | Noise Figure<br>(dB)<br>30V | Pout at 1dB<br>Compression<br>(dBm)<br>30V | Pout at 3dB<br>Compression<br>(dBm)<br>30V | Output IP3<br>(dBm)<br>30V |
|--------------------|---------------------|----------------------------|------------------------|-------------------------|-----------------------------|--|--|----------------------------|
| 700                | 49.18               | 41.02                      | 1.52                   | 1.05                    | 8.22                        | 48.22                                      | 50.31                                      | 55.77                      |
| 900                | 48.01               | 35.09                      | 1.65                   | 1.27                    | 8.19                        | 50.80                                      | 52.24                                      | 48.86                      |
| 1100               | 47.74               | 43.16                      | 1.50                   | 1.31                    | 8.18                        | 49.14                                      | 50.35                                      | 60.43                      |
| 1300               | 48.38               | 41.03                      | 1.30                   | 1.23                    | 8.21                        | 47.95                                      | 49.60                                      | 53.55                      |
| 1500               | 48.64               | 42.52                      | 1.13                   | 1.27                    | 8.03                        | 48.93                                      | 50.48                                      | 55.54                      |
| 1700               | 49.73               | 37.34                      | 1.17                   | 1.56                    | 8.04                        | 49.26                                      | 51.32                                      | 48.98                      |
| 1900               | 49.59               | 37.58                      | 1.18                   | 1.39                    | 8.11                        | 49.69                                      | 51.06                                      | 48.31                      |
| 2100               | 49.82               | 37.95                      | 1.11                   | 1.12                    | 8.31                        | 48.57                                      | 49.98                                      | 48.83                      |
| 2300               | 47.84               | 36.82                      | 1.26                   | 1.35                    | 8.27                        | 47.97                                      | 49.77                                      | 53.59                      |
| 2500               | 48.69               | 33.43                      | 1.22                   | 1.38                    | 8.32                        | 47.87                                      | 49.99                                      | 50.20                      |
| 2700               | 46.97               | 44.09                      | 1.28                   | 1.22                    | 8.37                        | 48.45                                      | 49.45                                      | 50.86                      |



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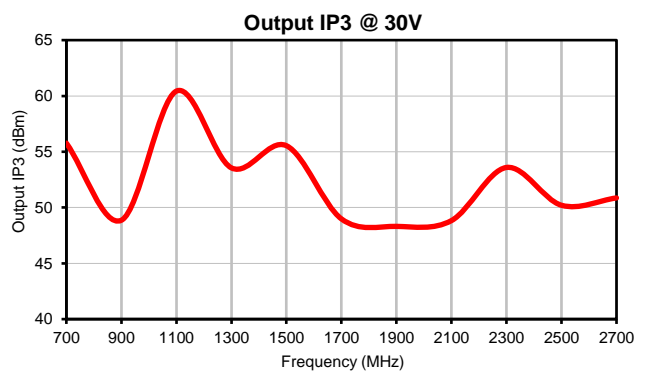
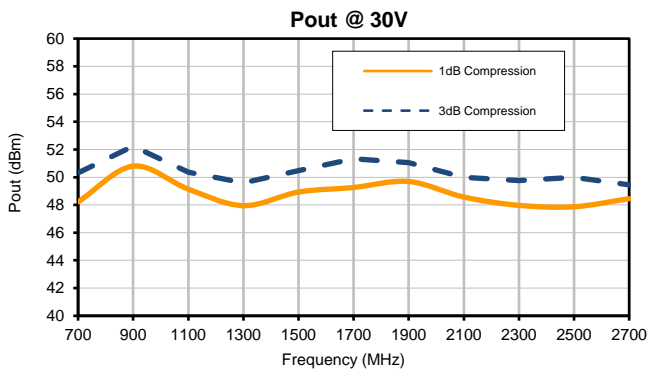
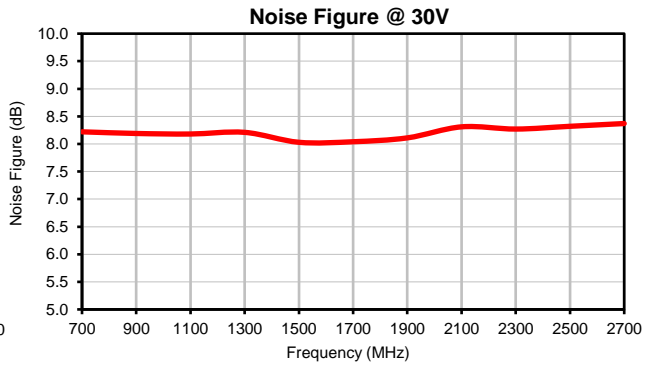
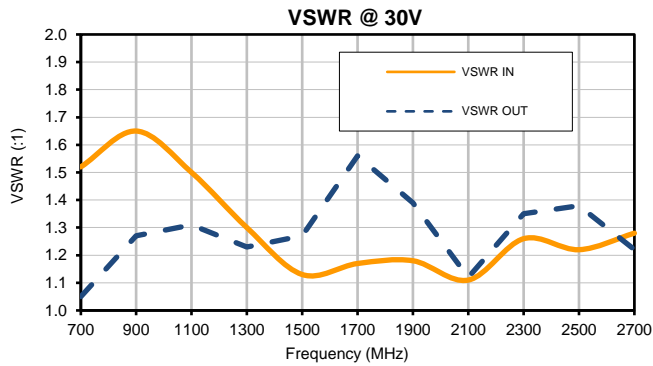
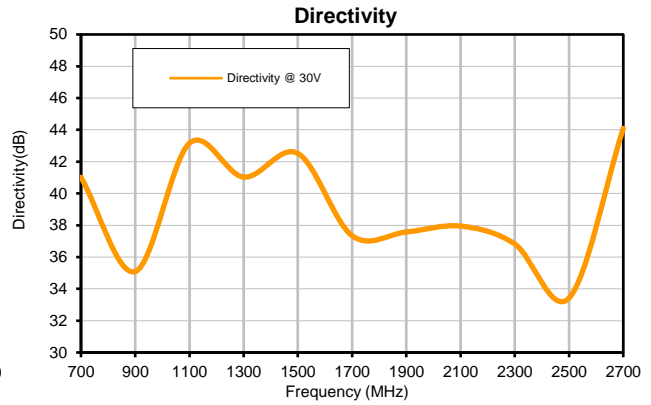
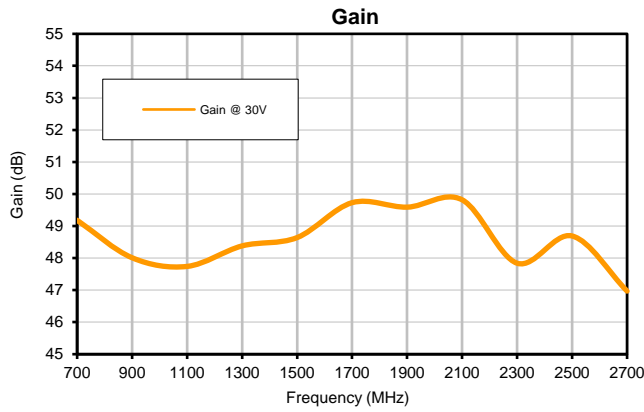
IF/RF MICROWAVE COMPONENTS

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ZHL-100W-272+  
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Page 1 of 1

# High Power Amplifier

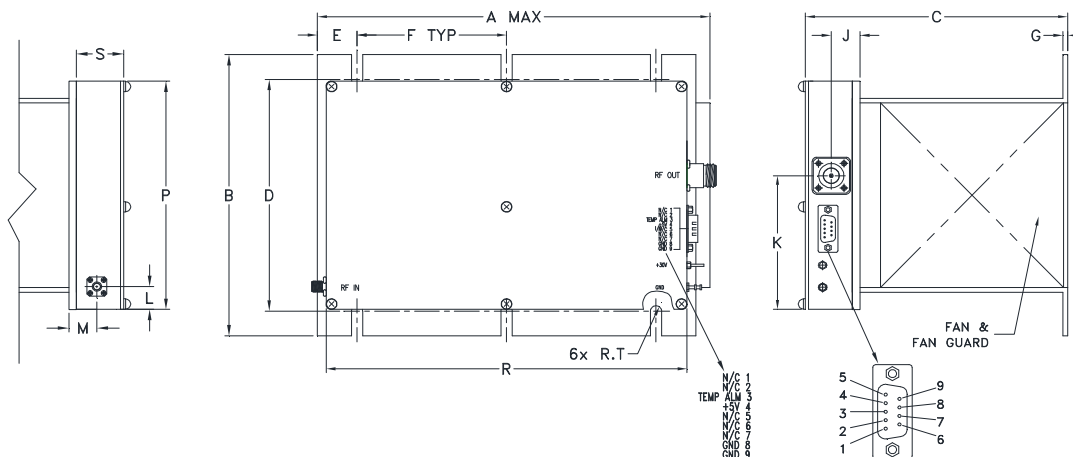
# ZHL-100W-272+

## Typical Performance Curves

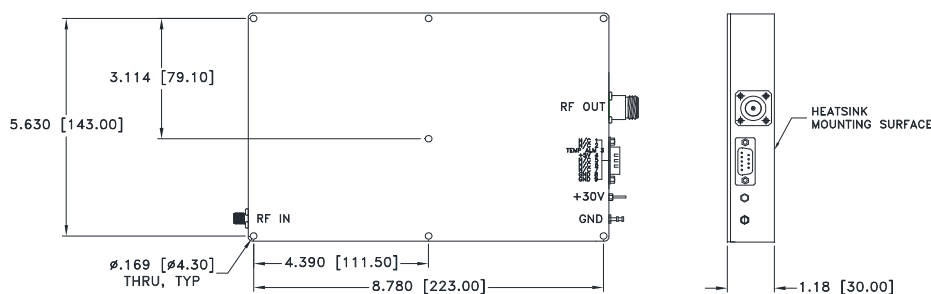


## Outline Dimensions

BT2247



### MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK



| CASE#  | A                | B               | C               | D                | E              | F               | G             | H | J              | K               | L              | M              | N |
|--------|------------------|-----------------|-----------------|------------------|----------------|-----------------|---------------|---|----------------|-----------------|----------------|----------------|---|
| BT2247 | 9.85<br>(250.19) | 7.3<br>(185.42) | 6.6<br>(167.64) | 6.00<br>(152.40) | .98<br>(24.89) | 3.75<br>(95.25) | .13<br>(3.30) | - | .72<br>(18.24) | 3.46<br>(88.00) | .59<br>(15.00) | .70<br>(17.75) | - |

| CASE#  | P                | Q | R                | S               | T              | U | WT, GRAM | WT WITHOUT HEATSINK, GRAM |
|--------|------------------|---|------------------|-----------------|----------------|---|----------|---------------------------|
| BT2247 | 5.91<br>(150.00) | - | 9.06<br>(230.00) | 1.18<br>(30.00) | .135<br>(3.43) | - | 5350     | 1820                      |

Dimensions in inches. Tolerances: 2 Pl. + .03; 3Pl. + .015

### Notes:

- Case material: Aluminum alloy.
- Finish:  
For RoHS Case Styles: Clear Chemical conversion coating, non-chrome or trivalent chrome based.
- Heatsink finish: Black anodize.
- Refer to the individual model data sheet for the type of connectors available.
- Recommended screw for mounting model without heatsink on 3/32" thick sheet: #6-32, 1.50" Length.

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RF/IF MICROWAVE COMPONENTS



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     | -20° to 45°C<br>Ambient Environment                  | Individual Model Data Sheet                        |
| Storage Temperature       | -55° to 100° C<br>Ambient Environment                | Individual Model Data Sheet                        |
| Stabilization Bake        | (non-operating)<br>125°C, 24 hours                   | - - -  |
| Burn-in at Elevated Temp. | (DC on)<br>160 hours at 60° C base plate Temperature | MIL-STD-202, Method 108                            |
| Thermal Shock             | -55° to 100°C, 5 cycles                              | MIL-STD-202, Method 107, Condition A, except 100°C |