

Coaxial High Power Amplifier

LZY-22+

50Ω 30W 0.1 to 200 MHz

The Big Deal

- High Power Output, 30W typ., from 100 KHz to 200 MHz
- Digitally controlled blanking, isolation 70 dB typ.
- Designed to withstand open or short output load at full rated power



LZY-22+



LZY-22X+

Product Overview

This ruggedized High Power Amplifier is capable of delivering 30W output signals across its entire operating bandwidth, from 0.1-200 MHz. Extensive safety features to prevent amplifier damage include over-temperature protection and the ability to handle short and open loads. The LZY-22+, including heat-sink and cooling fan, is designed for a 24V/5.5A DC power supply.

Key Features

| Feature | Advantages |
|---|---|
| 30 W Output Power @ 3 dB compression across 0.1-200 MHz bandwidth | High power output across broad frequency range supports a wide array of applications, from avionics, broadcasting, medical, and high-power lab testing to marine band, public safety, and aircraft communications |
| High Gain, 43 dB typ. | High, consistent gain across entire operating range (flatness ± 1.36 dB) for predictable performance and signal level strength |
| Blanking Isolation 70dB | Manual or TTL-controlled signal blanking (OFF 0.4 ms; ON 64 ms) |
| Internal open/short Protection Circuitry | Antenna mismatches or damaged output cables will not cause amplifier damage |
| Overheat Protection | Automatic shutdown at baseplate temperature of $+85 \pm 5^\circ\text{C}$ prevents thermal runaway, even during remote, unmonitored operation in difficult thermal environments. |
| Unconditionally Stable | No risk of damage to other components from impedance mismatch or internal oscillations |

Notes

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LZY-22+

50Ω 30W 0.1 to 200 MHz

Features

- Saturated Output Power, 30 W typ.
- High Gain, 43 dB typ.
- Excellent IP3, +52 dBm typ.
- Blanking isolation, 70 dB typ.
- Unconditionally stable
- Overheat-protection automatic shuts off when base plate temperature exceeds 85±5°C

Applications

- Avionics
- Broadcast radio and TV
- Medical-MRI
- Lab Use - High Power Test



| | | |
|------------|------------|-----------|
| Model No. | LZY-22+ | LZY-22X+▲ |
| Case Style | BT1598 | |
| Connectors | SMA Female | |

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

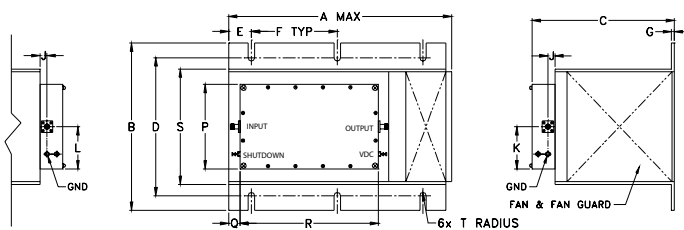
Electrical Specifications¹ at 25°C

| Parameter | Frequency (MHz) | LZY-22+ LZY-22X+ ▲ | | | Units |
|---|-----------------|-----------------------|-------|------|-------|
| | | Min | Typ. | Max. | |
| Frequency Range | | 0.1 | — | 200 | MHz |
| Gain | 0.1 - 200 | 40 | 43 | — | dB |
| Gain Flatness | | | ±1.36 | ±1.6 | dB |
| Output Power at 1dB compression | 0.1 | 40 | 42 | — | dBm |
| | 100 | 40 | 42 | — | |
| | 200 | 40 | 41.5 | — | |
| Saturated Output Power at 3dB compression (Pin=8 dBm) | 0.1 | 42 | 44 | — | dBm |
| | 100 | 44 | 45 | — | |
| | 200 | 44 | 45 | — | |
| Noise Figure | 10 - 200 | — | 8.9 | 10 | dB |
| Output third order intercept point ² | 0.1 - 200 | — | +52 | — | dBm |
| Input VSWR | 0.1 - 200 | — | 1.4 | 2.0 | :1 |
| Output VSWR | 0.1 - 200 | — | 4.0 | — | :1 |
| Blanking Isolation | 0.1 - 50 | — | 60 | — | dB |
| | 50 - 200 | — | 70 | — | |
| DC Supply Voltage | | | 24 | 25 | V |
| Supply Current ³ | | — | 5.3 | 6.0 | A |

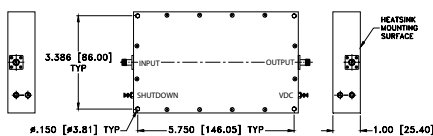
1. All specifications are for a single input CW signal.
At nominal output load, 24V nominal supply voltage.
2. 2 Tones, 0.5W/tone, 1MHz spacing
3. Addition of heat sink and fan to the LZY-22+ results in 0.2A additional current.

▲ Heat sink and fan not included. Alternative heat sinking and heat removal must be provided by the user to limit maximum base-plate temperature to 50°C, in order to ensure proper performance. For reference, this requires thermal resistance of user's external heat sink to be 0.08°C/W max.

Outline Drawing



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.



Outline Dimensions (inch/mm)

| A | B | C | D | E | F | G | J | K | L | P | Q | R | S | T | wt |
|--------|--------|--------|--------|-------|-------|------|------|-------|-------|-------|-------|--------|--------|------|--------|
| 9.85 | 7.3 | 6.3 | 6.00 | .98 | 3.75 | .13 | .31 | 1.84 | 1.84 | 3.68 | .5 | 6.05 | 5.1 | .135 | grams* |
| 250.19 | 185.42 | 160.02 | 152.40 | 24.89 | 95.25 | 3.30 | 7.87 | 46.74 | 46.74 | 93.47 | 12.70 | 153.67 | 129.54 | 3.43 | 4185 |

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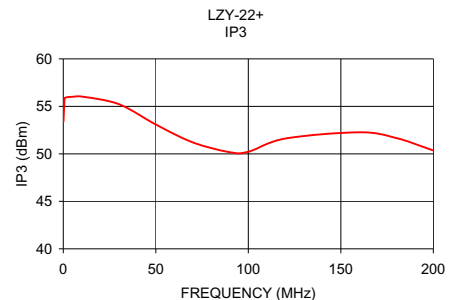
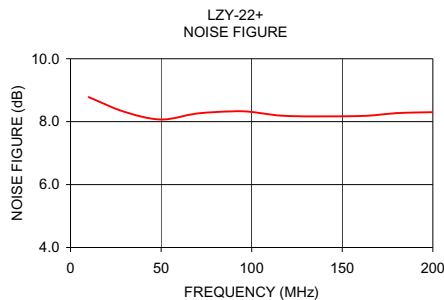
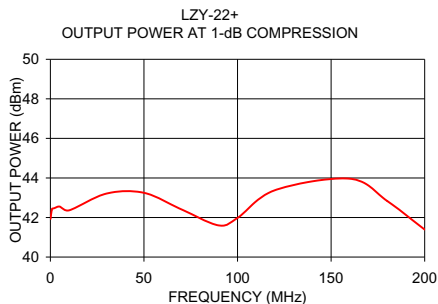
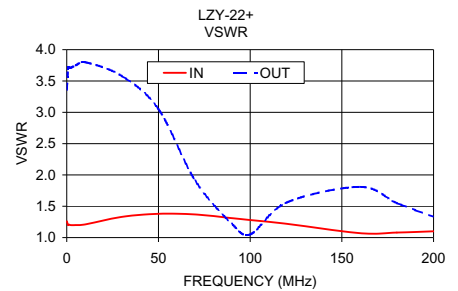
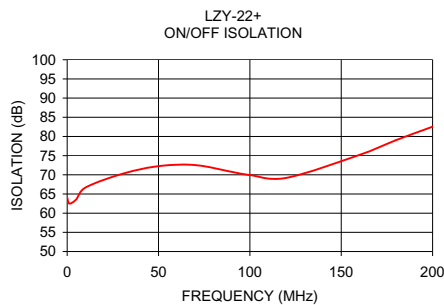
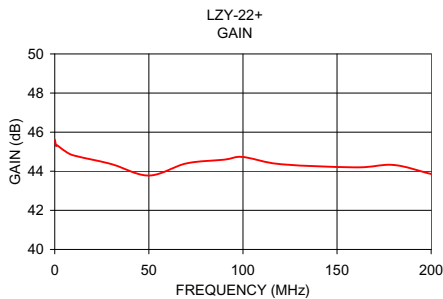
Maximum Ratings

| Parameter | Ratings |
|----------------------------|----------------|
| Operating Temperature | -10°C to 50°C |
| Storage Temperature | -30°C to 100°C |
| Base Plate Temperature | 50°C |
| Input RF Power (no damage) | 20 dBm |
| DC Supply Voltage | 30V |

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

| Blanking Shutdown / Turn On | Min. | Typ. | Max. | Units |
|-----------------------------|------|------|------|-------|
| ON Voltage | 0 | — | 0.8 | V |
| OFF Voltage | 4 | — | 5 | V |
| Shutdown (90 to 10%) | — | 0.4 | — | ms |
| Turn ON (10 to 90%) | — | 64 | — | ms |

| FREQUENCY (MHz) | GAIN (dB) | DIRECTIVITY (dB) | VSWR (:1) | | ISOLATION (dB) | NOISE FIGURE (dB) | P _{OUT} at 1 dB COMPR. (dBm) | OUTPUT IP ₃ (dBm) |
|-----------------|-----------|------------------|-----------|------|----------------|-------------------|---------------------------------------|------------------------------|
| | | | IN | OUT | | | | |
| 0.10 | 45.61 | 22.22 | 1.26 | 3.36 | 64.0 | -- | 41.93 | 53.37 |
| 0.70 | 45.30 | 21.72 | 1.20 | 3.72 | 62.6 | -- | 42.38 | 55.84 |
| 1.00 | 45.34 | 21.74 | 1.21 | 3.72 | 62.5 | -- | 42.45 | 55.89 |
| 2.00 | 45.28 | 22.68 | 1.20 | 3.71 | 62.5 | -- | 42.47 | 55.96 |
| 5.00 | 45.06 | 25.54 | 1.20 | 3.75 | 63.6 | -- | 42.55 | 56.00 |
| 10.00 | 44.81 | 23.79 | 1.21 | 3.80 | 66.7 | 8.78 | 42.36 | 56.03 |
| 30.00 | 44.37 | 24.74 | 1.33 | 3.58 | 70.2 | 8.31 | 43.21 | 55.23 |
| 50.00 | 43.78 | 25.79 | 1.38 | 3.05 | 72.3 | 8.07 | 43.25 | 53.09 |
| 70.00 | 44.40 | 24.81 | 1.37 | 1.91 | 72.5 | 8.26 | 42.41 | 51.20 |
| 90.00 | 44.59 | 24.14 | 1.31 | 1.22 | 70.8 | 8.33 | 41.60 | 50.17 |
| 100.00 | 44.73 | 24.08 | 1.28 | 1.05 | 69.9 | 8.31 | 41.98 | 50.22 |
| 120.00 | 44.36 | 25.25 | 1.22 | 1.56 | 69.2 | 8.18 | 43.38 | 51.61 |
| 160.00 | 44.20 | 26.43 | 1.07 | 1.81 | 75.2 | 8.18 | 43.96 | 52.27 |
| 180.00 | 44.32 | 26.07 | 1.08 | 1.55 | 79.0 | 8.27 | 42.83 | 51.66 |
| 200.00 | 43.86 | 28.10 | 1.10 | 1.33 | 82.5 | 8.30 | 41.39 | 50.36 |



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High Power Amplifier

LZY-22+

Typical Performance Data

| FREQ. (MHz) | GAIN (dB) 24V | DIRECTIVITY (dB) 24V | VSWR (:1) | | NOISE FIGURE (dB) 24V | POUT @ 1 dB COMPRESSION (dBm) 24V | OUTPUT IP3 (dBm) 24V |
|----------------|---------------------|----------------------------|-----------|------------|--------------------------------|--|----------------------------|
| | | | IN 24V | OUT 24V | | | |
| 0.1 | 45.61 | 22.22 | 1.26 | 3.36 | -- | 41.93 | 53.37 |
| 0.7 | 45.30 | 21.72 | 1.20 | 3.72 | -- | 42.38 | 55.84 |
| 1.0 | 45.34 | 21.74 | 1.21 | 3.72 | -- | 42.45 | 55.89 |
| 2.0 | 45.28 | 22.68 | 1.20 | 3.71 | -- | 42.47 | 55.96 |
| 5.0 | 45.06 | 25.54 | 1.20 | 3.75 | -- | 42.55 | 56.00 |
| 10.0 | 44.81 | 23.79 | 1.21 | 3.80 | 8.78 | 42.36 | 56.03 |
| 30.0 | 44.37 | 24.74 | 1.33 | 3.58 | 8.31 | 43.21 | 55.23 |
| 50.0 | 43.78 | 25.79 | 1.38 | 3.05 | 8.07 | 43.25 | 53.09 |
| 70.0 | 44.40 | 24.81 | 1.37 | 1.91 | 8.26 | 42.41 | 51.20 |
| 90.0 | 44.59 | 24.14 | 1.31 | 1.22 | 8.33 | 41.60 | 50.17 |
| 100.0 | 44.73 | 24.08 | 1.28 | 1.05 | 8.31 | 41.98 | 50.22 |
| 120.0 | 44.36 | 25.25 | 1.22 | 1.56 | 8.18 | 43.38 | 51.61 |
| 160.0 | 44.20 | 26.43 | 1.07 | 1.81 | 8.18 | 43.96 | 52.27 |
| 180.0 | 44.32 | 26.07 | 1.08 | 1.55 | 8.27 | 42.83 | 51.66 |
| 200.0 | 43.86 | 28.10 | 1.10 | 1.33 | 8.30 | 41.39 | 50.36 |



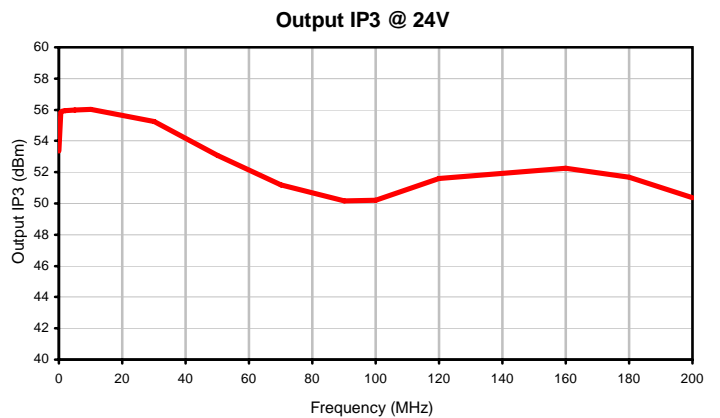
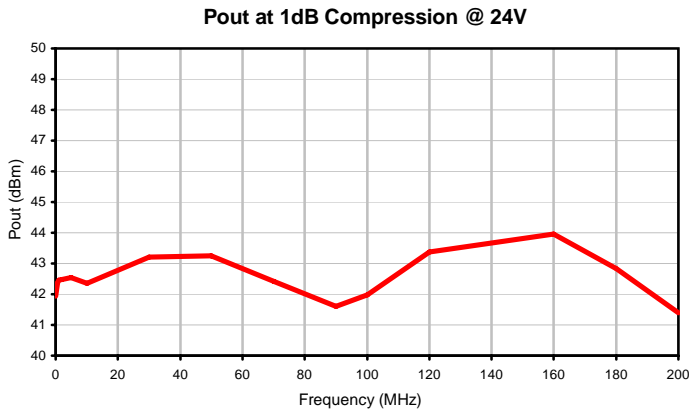
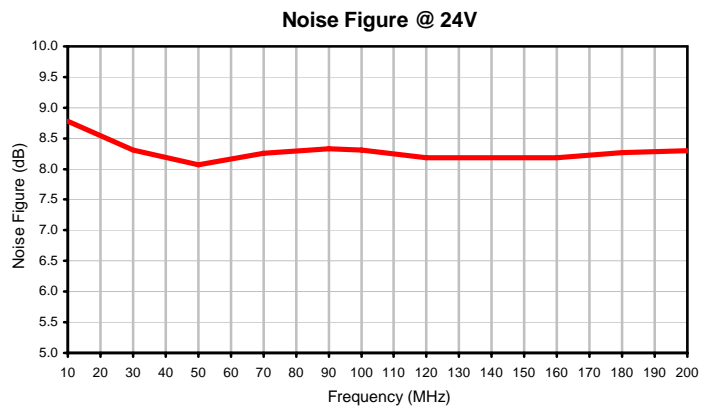
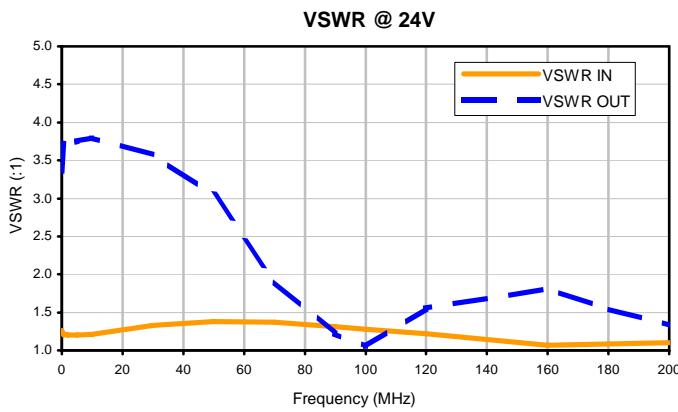
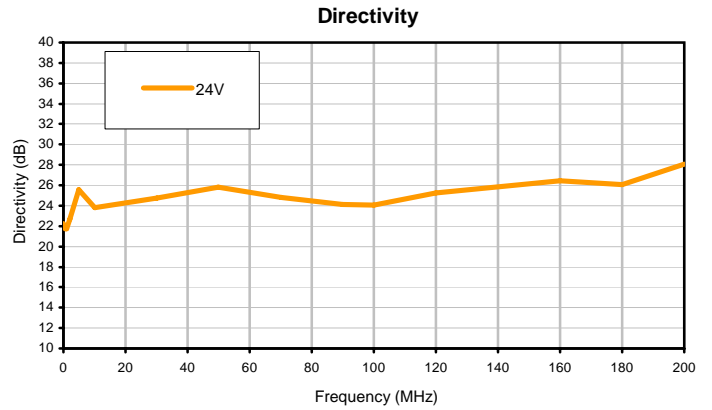
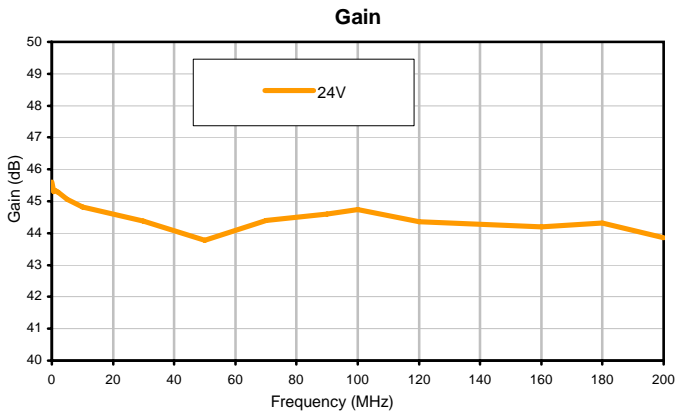
P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 • Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site
The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com



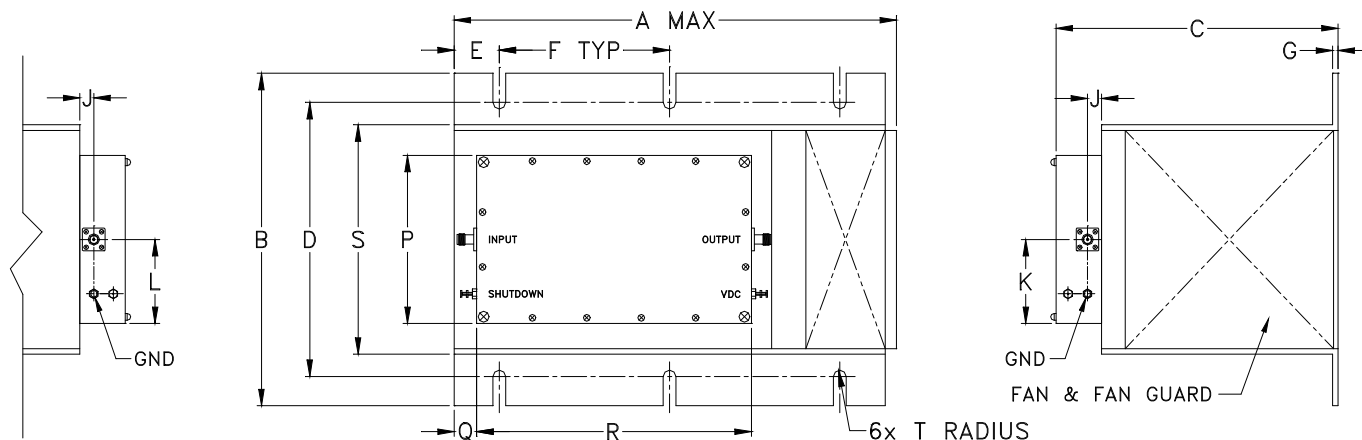
IF/RF MICROWAVE COMPONENTS

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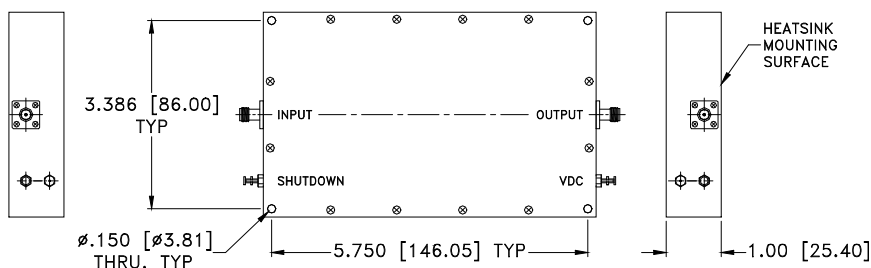
Typical Performance Curves



Outline Dimensions



MOUNTING INFORMATION FOR MODELS WITHOUT HEATSINK.



| CASE# | A | B | C | D | E | F | G | H | J | K | L | M | N |
|--------|------------------|-----------------|-----------------|------------------|----------------|-----------------|---------------|---|---------------|-----------------|-----------------|---|---|
| BT1598 | 9.85 (250.19) | 7.3 (185.42) | 6.3 (160.02) | 6.00 (152.40) | .98 (24.89) | 3.75 (95.25) | .13 (3.30) | - | .31 (7.87) | 1.84 (46.74) | 1.84 (46.74) | - | - |

| CASE# | P | Q | R | S | T | WT, GRAM | WT WITHOUT HEATSINK, GRAM |
|--------|-----------------|---------------|------------------|-----------------|----------------|----------|---------------------------|
| BT1598 | 3.68 (93.47) | .5 (12.70) | 6.05 (153.67) | 5.1 (129.54) | .135 (3.43) | 4185 | 500 |

Dimensions in inches (mm). Tolerances: 1 Pl. $\pm .1$; 2Pl. $\pm .03$; 3 Pl. $\pm .015$

Notes:

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



P.O. Box 350166, Brooklyn, New York 11235-0003 (718) 934-4500 Fax (718) 332-4661 For detailed performance specs & shopping online see Mini-Circuits web site



The Design Engineers Search Engine Provides ACTUAL Data Instantly From MINI-CIRCUITS At: www.minicircuits.com

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 | -10° to 50° C Ambient Environment | Individual Model Data Sheet |
| Storage Temperature | -55° to 100° C Ambient Environment | Individual Model Data Sheet |
| Stabilization Bake | (non-operating) 125°C, 24 hours | - - - |
| Burn-in at Elevated Temp. | (DC on) 160 hours at 85° C | MIL-STD-202, Method 108 |
| Thermal Shock | -55° to 100°C, 5 cycles | MIL-STD-202, Method 107, Condition A, except 100°C |