True Hermetically Sealed Proportionally Controlled Metal Package Heater Hybrids

Mii

HYBRID MICROELECTRONICS PRODUCTS DIVISION

Features:

- Self-contained
- Programmable via a single external resistor
- Available in 28 watt and 48 watt versions
- Standard products

Applications:

- Ideal for microwave oscillators
- Telecommunications
- Other areas where temperature control is needed

DESCRIPTION

The Mii heater is a self-contained hybrid circuit heater programmable for temperature by a single external resistor. These systems are ideal for microwave oscillators, telecommunications and other areas where temperature control is needed. Metal package heaters are available in 28 watt and 40 watt versions..

Typical Electrical Characteristics for DC Metal Package Heater

Mii P/N 52280-2 ..... 28 VDC Input, 28 Watts
Mii P/N 52280-1 ..... 28 VDC Input, 40 Watts
Operating Voltage Range (See Note 1) ..... 28± 1 VDC
Voltage Limits ..... 24 VDC Min, 32 VDC Max
Reverse Voltage Protection ..... to 50 VDC
Operating Current Range ..... 0.005 to 1.00 A
Turn-on Current ..... to 1.00 A
Quiescent Current ..... Less than .005 A

Typical Temperature Characteristics

Control Range ..... +50°C to +100°C
Variation with Load (See Note 2) ..... 10° C Max
Input Voltage Variation (See Note 3) ..... ±2°C
Maximum Control Temperature (See Note 4) ..... +120°C

Environmental Characteristics

Operating Temperature ..... -55°C to +100°C
Altitude ..... 70,000 Ft. Max
Shock ..... 200G Max
Vibration ..... 50G at 2,000 Hz Max
Humidity ..... Greater than 95%

Reliability

Each hybrid circuit is subjected to the following reliability screening per MIL-PRF-38534:

- Precap internal visual Methods 2017 and 2032
- High Temperature stabilization bake, Method 1008, Condition C (performed at Customer's request only)
- Temperature cycling, Method 1010, Condition B
- Constant acceleration, Method 2001, Condition B, Y axis only
- Optional burn-in per Mii specifications
- Fine and Gross lead test, Method 1014, Conditions A_1 & C_1

Notes:

1. The heater is operational from 24 to 32 VDC; however, for optimum performance 28 VDC is recommended.
2. Maximum temperature variation for current change from 5% over Quiescent to 95% of turn on current.
3. Maximum temperature variation over operating voltage range when ambient temperature is constant and the supply current is between 5% over Quiescent and 95% of turn on current.
4. Maximum temperature with any value of control resistor, including 0 ohms.
   - All metal package hermetically sealed heaters are leak tested to meet MIL-PRF-38534, Method 1014, test conditions A & C, with a maximum leak rate of 1×10^{-7} atm-cc/sec.
   - Optimum heat transfer is obtained by using a thermal joint compound such as Dow Corning 340 on the mounting surface.
   - Operation is possible above 100°C, but electrical performance is not QA guaranteed. Input current decays to ≤20 mA max at = 120°C without damage to the heater.
   - All Mii heaters are protected against reverse voltage up to 50 V.
   - Maximum power rating for control resistor is 1/8 watt. Precise resistor values should be determined by measuring the surface temperature.
   - Micropac Industries, Inc. will work with the potential customer for voltage and wattage ratings not currently available.