

**HERMETICALLY SEALED PROPORTIONALLY CONTROLLED  
METAL PACKAGE HEATER HYBRID – 52280-101-X**



**Features:**

- Self-contained
- Programmable via a single external resistor

**Applications:**

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

**DESCRIPTION**

The 52280-101 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.

**Typical Electrical Characteristics for 52280-101-X DC Metal Package Heater**

|  |                         |
|--|-------------------------|
| Power Consumption .....                          | 40 Watts @ Vin = 28 Vdc |
| Recommended Operating Voltage (See Note 1) ..... | 28 Vdc                  |
| Voltage Limits .....                             | 28 Vdc Min, 32 Vdc Max  |
| Reverse Voltage Protection .....                 | 50 Vdc Max              |
| Operating Current Range .....                    | 0.006 to 1.480 A        |
| Turn-on Current .....                            | 1.480 A                 |
| Quiescent Current .....                          | Less than 0.006 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) .....              | +115°C          |
| Operating Case Temperature (Tc) with 7.5Kohm pins 3&4 ..... | +75°C+/- 3°C    |

**Environmental Characteristics**

|                             |                     |
|-----------------------------|---------------------|
| Operating Temperature ..... | -55°C to +100°C     |
| Altitude .....              | 70,000 Ft. Max      |
| Shock .....                 | 1500G Max           |
| Vibration .....             | 50G at 2,000 Hz Max |
| Humidity .....              | Greater than 95%    |

**Part Number Ordering Guide**

- 52280-101-1 Heater, with Burn-In Screening
- 52280-101-2 Heater, without Burn-In Screening

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# Hermetically Sealed Proportionally Controlled Metal Package Heater Hybrid 52280-101-X

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## Reliability for 52280-101-X

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

- Precap internal visual Methods 2017 and 2032
- Temperature cycling, Method 1010, Condition B
- Constant acceleration, Method 2001, Condition B, Y axis only
- Optional burn-in per Mii specifications
  - 52280-103 – 1 for Burn-In
  - 52280-103 – 2 for No Burn-In
- Fine and Gross lead test, Method 1014, Conditions A<sub>1</sub> & C<sub>1</sub>
- Final Electrical Test, As Listed on Page 1
- External Visual Inspect, Method 2009

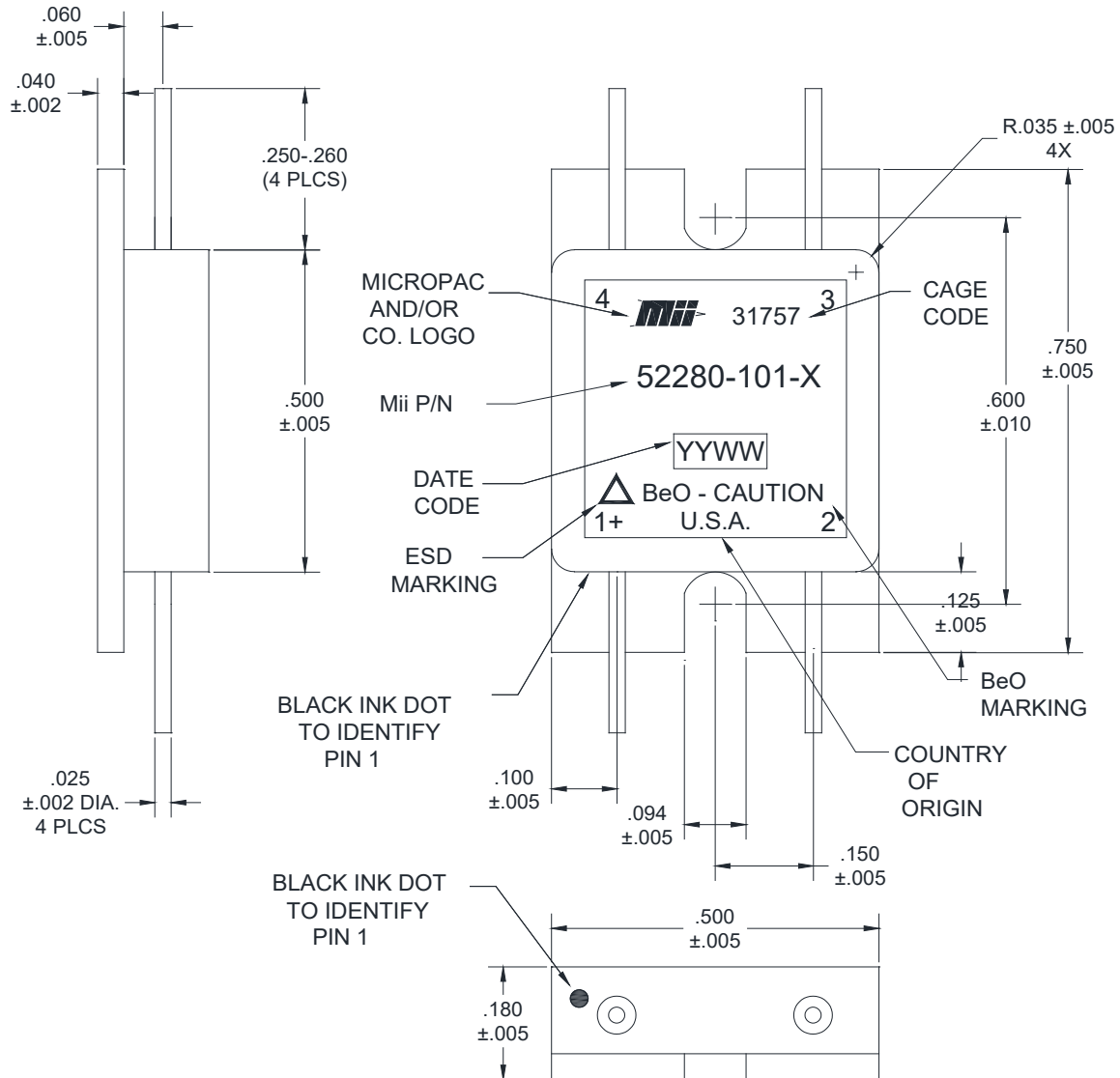
## Notes

1. The heater is operational from 28 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  $5 \times 10^{-8}$  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 guaranteed. Input current decays to  $\leq 8$  mA max at 115°C without damage to the heater.
  - All Micropac heaters are protected against reverse voltage up to 50 V.
  - Minimum 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.
5. Pin 1 is positive input  
Pin 2 is negative input  
Pin 3 and Pin 4 are control resistor, reference Table 1
6. The maximum Metal Package Heater weight is 4 grams
7. The operating case temperature and tolerance of +75°C +/- 3°C shall be verified during 100% acceptance testing using a 7.5K Ohm control resistor. Acceptance testing shall be performed as part of 100% device screening.

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## 52280-101-X



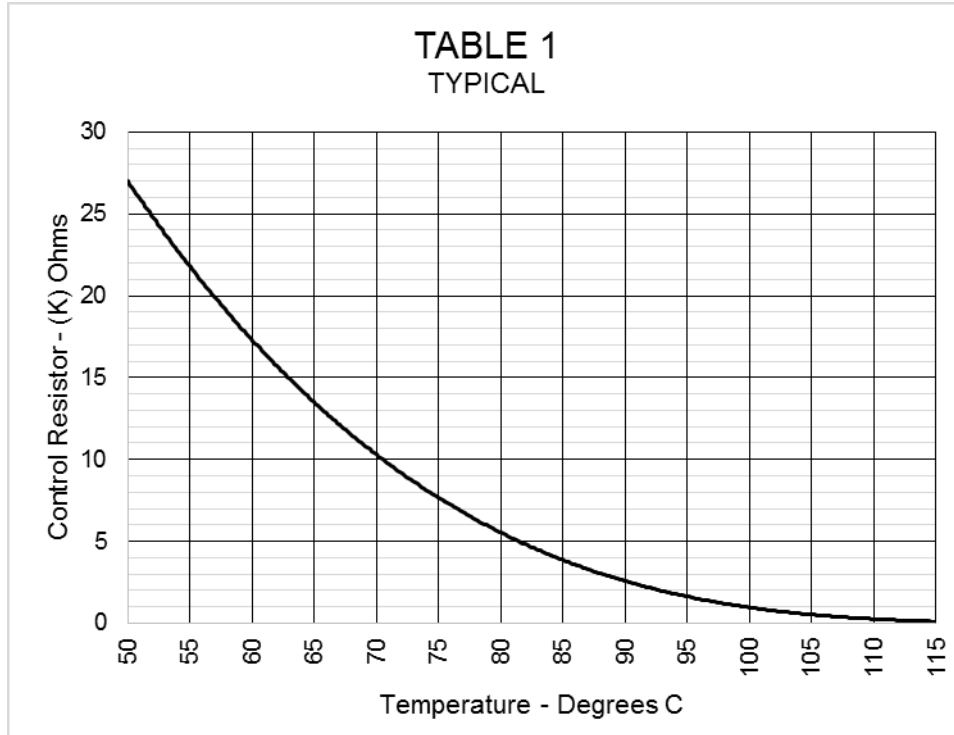
**NOTES:**

1. MATERIAL: FRAME: COLD ROLLED STEEL TYPE C1010 OR C1020 OR C12L14.  
BASE: CDA 101 TYPE COPPER.  
PINS: 52 ALLOY, COPPER CORED.
2. PLATING: BODY: ELECTROLESS NICKEL 150-350 MICROINCHES THICK PER MIL-C-26074.  
LEADS: GOLD PLATE 30-100 MICROINCHES THICK OVER ELECTROLESS NICKEL  
PLATE 150-350 MICROINCHES THICK.
3. SEAL: SEAM WELD

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## METAL PACKAGE HEATER TYPICAL HEATER CURRENT



### NOTES:

1. LOAD EQUAL TO 2.30oz.
2. MATERIAL: COPPER
3. SIZE 1.5" X 1.7" X 1/2"

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