

**HERMETICALLY SEALED PROPORTIONALLY CONTROLLED  
METAL PACKAGE HEATER - 52280-103-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 52280-103 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 52280-103-X DC Metal Package Heater**

Power Consumption .....	4 Watts @ Vin = 15 Vdc
Recommended Operating Voltage (See Note 1) .....	15 Vdc
Voltage Limits .....	15 Vdc Min, 32 Vdc Max
Reverse Voltage Protection .....	50 Vdc Max
Operating Current Range .....	0.006 to 0.275 A
Turn-on Current .....	0.275 A
Quiescent Current .....	Less than 0.008 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**

- 52280-103-1 Heater, with Burn-In Screening
- 52280-103-2 Heater, without Burn-In Screening

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# Hermetically Sealed Proportionally Controlled Metal Package Heater Hybrid 52280-103-X

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## Reliability for 52280-103-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

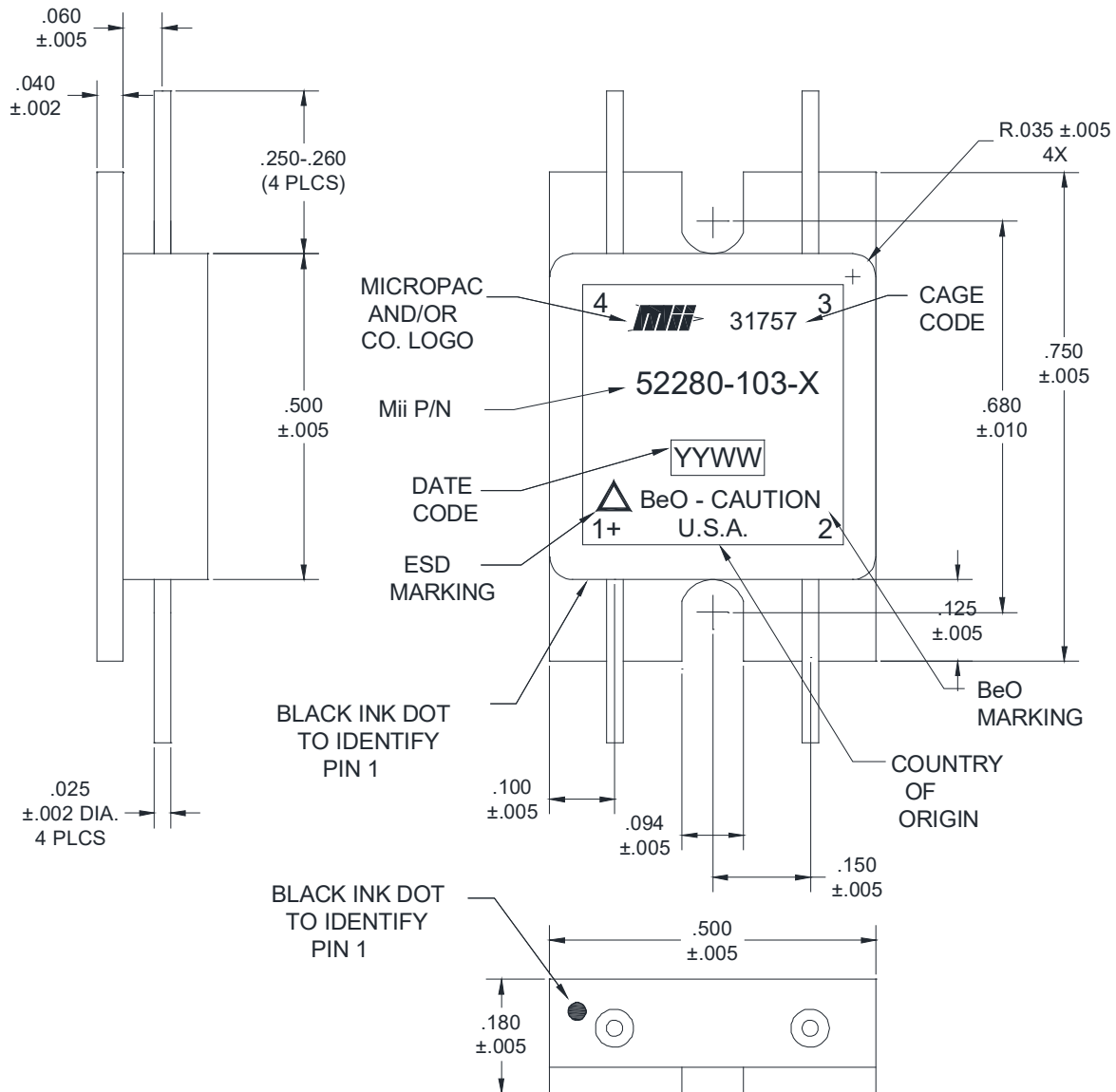
## Notes

1. The heater is operational from 15 to 32 VDC; however, for optimum performance 15 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<sub>1</sub> & C<sub>1</sub>, 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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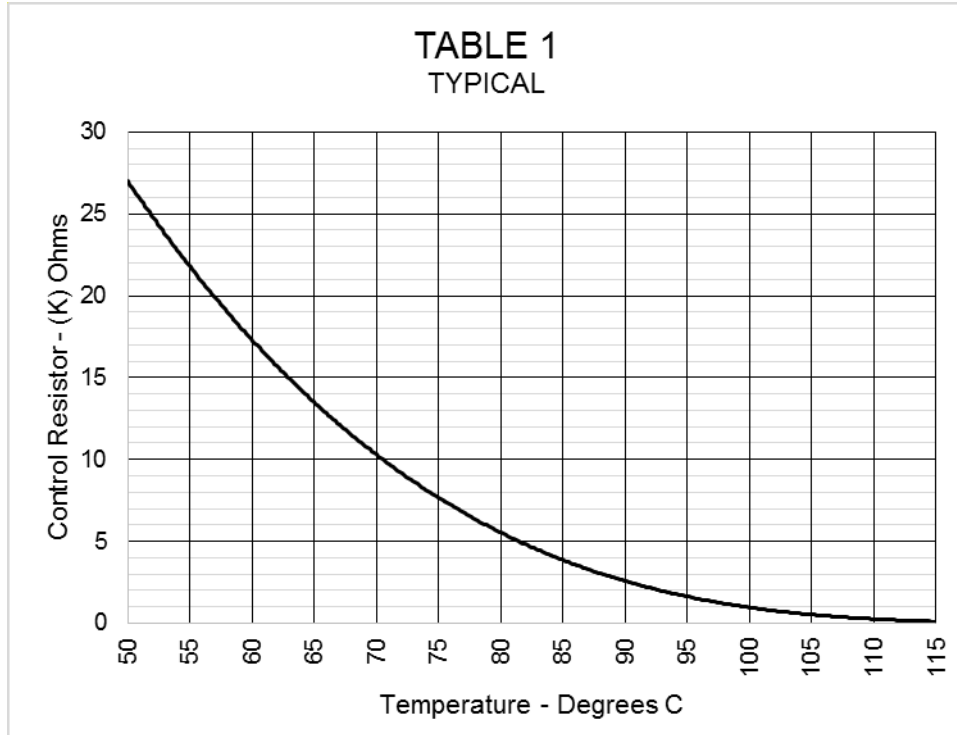
**NOTES:**

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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