

DATA SHEET

SUBMINIATURE PROPORTIONALLY CONTROLLED HEATER

GENERAL DESCRIPTION

The DN515-1228 is a subminiature proportionally controlled heater whose temperature can be programmed with a single external resistor. This device is ideally suited for regulating the temperature of sensitive electronic components such as microwave filters and crystal oscillators. The DN515-1228 is in a ceramic package and can supply up to 28 watts of power from an unregulated 12 Volt power supply.

FEATURES

- BERYLLIA BASE FOR GOOD THERMAL CONDUCTION
- REGULATION TEMPERATURE FROM 5°C ABOVE AMBIENT TO 100°C
- 12 VOLT OPERATION
- ELECTRICALLY ISOLATED FROM THE CASE

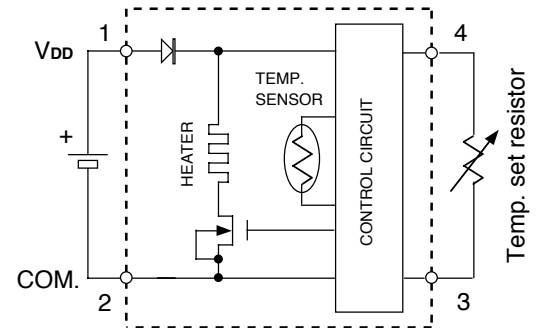
MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|----------------------------------|------------------|-------------|-----------------|
| Supply Voltage | V _{DD} | 16 | V _{DC} |
| Reverse Voltage (Pin 1 to Pin 2) | V _R | -50 | V _{DC} |
| Power Dissipation | P _D | 35 | Watts |
| Operating Temperature | T _{MAX} | 120 | °C |
| Storage Temperature | T _{MIN} | -65 to +150 | °C |

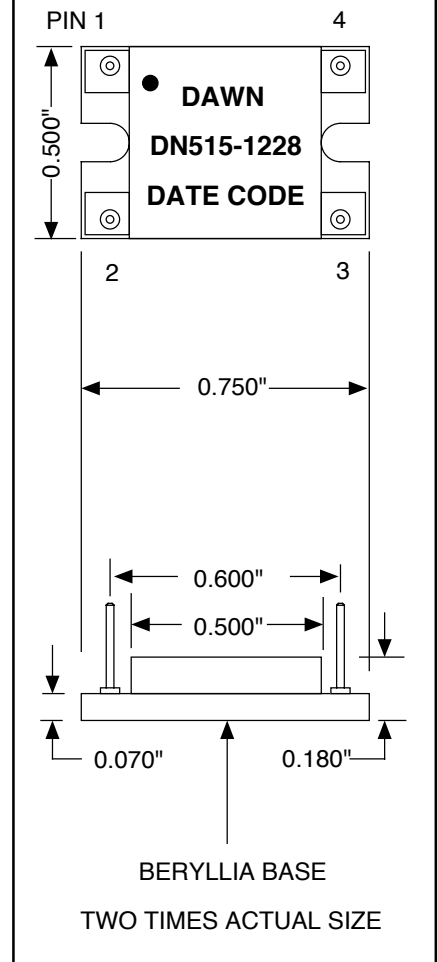
| Characteristic | Symbol | Min | Max | Unit |
|---|------------------|-------------------|-----|-----------------|
| Supply Voltage (Pin 1 to Pin 2) | V _{DD} | +9 | +15 | V _{DC} |
| Steady State Supply Current @ V _{DD} = +28 V _{DC} | I _S | 0.005 | 2.4 | A _{DC} |
| Temperature Variation over Operating Voltage | ΔT _V | | 2 | °C |
| Temperature Variation with Load | ΔT _L | | 10 | °C |
| Control Temperature Range | T _C | T _A +5 | 100 | °C |
| Control Resistor Value Pin 3 to Pin 4 (See Chart) | R _S | 0 | | Ohm |
| Maximum Control Temperature when R _S = 0 Ohms | T _{MAX} | | 120 | °C |
| Turn on power at start-up @ V _{DD} = +28 V _{DC} | P _D | 25 | 30 | Watts |

T_A ---- Ambient Temperature

HEATER BLOCK DIAGRAM



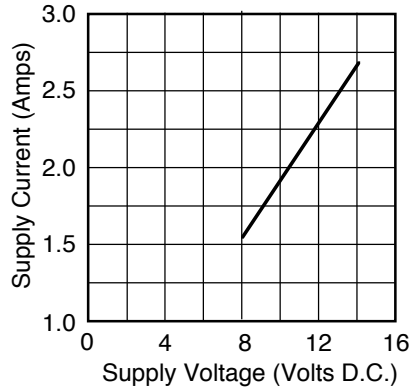
OUTLINE DIMENSIONS



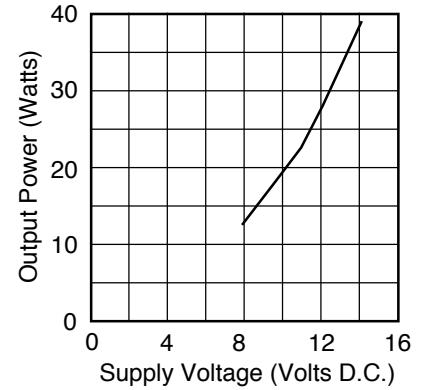
Heater Temperature (Tc) vs. TemperatureSet Resistor (Rs)

| T °C | RS KΩ | T °C | RS KΩ | T °C | RS KΩ | T °C | RS KΩ |
|------|-------|------|-------|------|-------|------|-------|
| 0 | 360.1 | 29 | 79.6 | 58 | 20.2 | 87 | 4.6 |
| 1 | 340.6 | 30 | 75.8 | 59 | 19.3 | 88 | 4.4 |
| 2 | 322.3 | 31 | 72.2 | 60 | 18.4 | 89 | 4.1 |
| 3 | 305.0 | 32 | 68.8 | 61 | 17.5 | 90 | 3.9 |
| 4 | 288.7 | 33 | 65.5 | 62 | 16.7 | 91 | 3.6 |
| 5 | 273.4 | 34 | 62.5 | 63 | 15.9 | 92 | 3.4 |
| 6 | 259.0 | 35 | 59.5 | 64 | 15.2 | 93 | 3.2 |
| 7 | 245.4 | 36 | 56.8 | 65 | 14.5 | 94 | 3.0 |
| 8 | 232.5 | 37 | 54.1 | 66 | 13.8 | 95 | 2.8 |
| 9 | 220.4 | 38 | 51.6 | 67 | 13.2 | 96 | 2.6 |
| 10 | 209.0 | 39 | 49.2 | 68 | 12.5 | 97 | 2.4 |
| 11 | 198.3 | 40 | 46.9 | 69 | 11.9 | 98 | 2.2 |
| 12 | 188.1 | 41 | 44.8 | 70 | 11.4 | 99 | 2.0 |
| 13 | 178.5 | 42 | 42.7 | 71 | 10.8 | 100 | 1.80 |
| 14 | 169.4 | 43 | 40.7 | 72 | 10.3 | 101 | 1.68 |
| 15 | 160.8 | 44 | 38.9 | 73 | 9.8 | 102 | 1.52 |
| 16 | 152.7 | 45 | 37.1 | 74 | 9.3 | 103 | 1.37 |
| 17 | 145.1 | 46 | 35.4 | 75 | 8.9 | 104 | 1.23 |
| 18 | 137.8 | 47 | 33.8 | 76 | 8.4 | 105 | 1.09 |
| 19 | 131.0 | 48 | 32.3 | 77 | 8.0 | 106 | 0.95 |
| 20 | 124.5 | 49 | 30.8 | 78 | 7.6 | 107 | 0.82 |
| 21 | 118.3 | 50 | 29.4 | 79 | 7.2 | 108 | 0.70 |
| 22 | 112.5 | 51 | 28.1 | 80 | 6.8 | 109 | 0.58 |
| 23 | 107.0 | 52 | 26.8 | 81 | 6.5 | 110 | 0.46 |
| 24 | 101.8 | 53 | 25.5 | 82 | 6.1 | 111 | 0.35 |
| 25 | 96.9 | 54 | 24.4 | 83 | 5.8 | 112 | 0.25 |
| 26 | 92.2 | 55 | 23.2 | 84 | 5.5 | 113 | 0.14 |
| 27 | 87.8 | 56 | 22.2 | 85 | 5.2 | 114 | 0.04 |
| 28 | 83.6 | 57 | 21.2 | 86 | 4.9 | | |

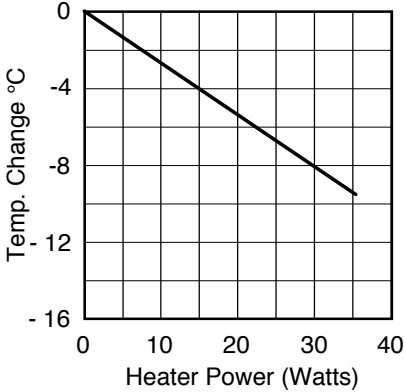
Max. Start-up Current vs. Supply Voltage



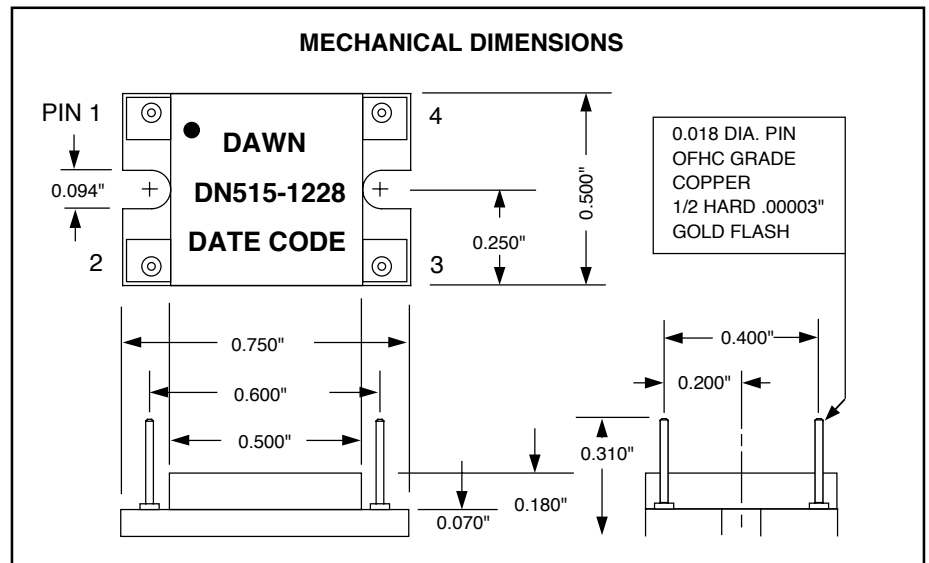
Max. Heater Power Available vs. Supply Voltage



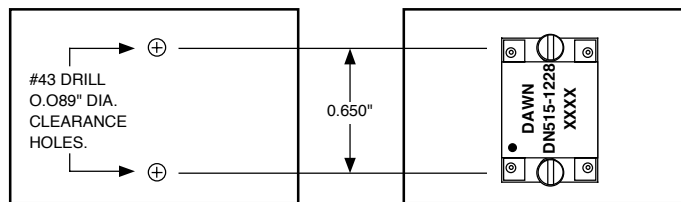
Typical Base Temperature Change vs. Power Dissipation



MECHANICAL DIMENSIONS



Mounting the DN515-1228 Heater



Mounting Tips

1. Optimum heat transfer between the DN515-1228 and the device being heated, occurs when a thermal compound, such as Dow Corning 340, is applied to the mounting surface of the heater.
 2. All DN515-1228 heaters are tested for gross leaks with 3M™ FC-40 Fluorinert™ at 125°C.
 3. Special environmental testing is available on request.
1. Make sure that the surface of the device that the heater is mounted to is flat.
 2. Make sure that the surface of the heater and devices being heated is clean. Any particles between the surfaces will cause poor heat transfer and can cause potential breakage of the heater substrate.
 3. Tighten screws to one inch pound of torque. Alternate tightening of screws to guarantee that the heater is flat.

