

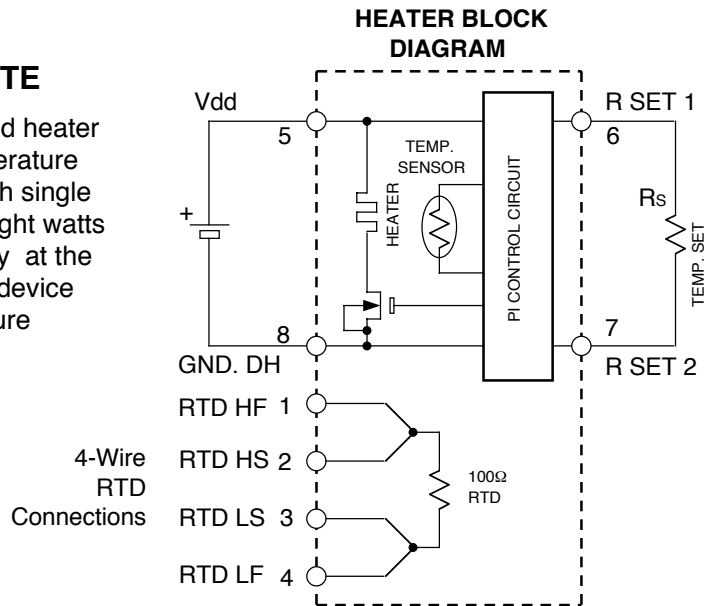
DATA SHEET

FIVE VOLT PI TEMPERATURE CONTROLLED HEATER ON AN ALUMINUM NITRIDE SUBSTRATE

The DN570 is a self contained Proportional-Integral controlled heater on an Aluminum Nitride (AlN) ceramic substrate whose temperature can be programmed from ambient temperature to +100°C with single external resistor. This device is capable of supplying up to eight watts of heating power while maintaining 0.1°C temperature stability at the location of the internal temperature sensing thermistor. This device also contains a 100 ohm platinum RTD for external temperature monitoring of the substrate.

FEATURES

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



MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Supply Voltage	Vdd	6	Vdc
Power Dissipation	P _D	18	Watts
Operating Temperature	T _{MAX}	120	°C
Storage Temperature	T _{STG}	- 55 to +125	°C

OPERATING CHARACTERISTICS

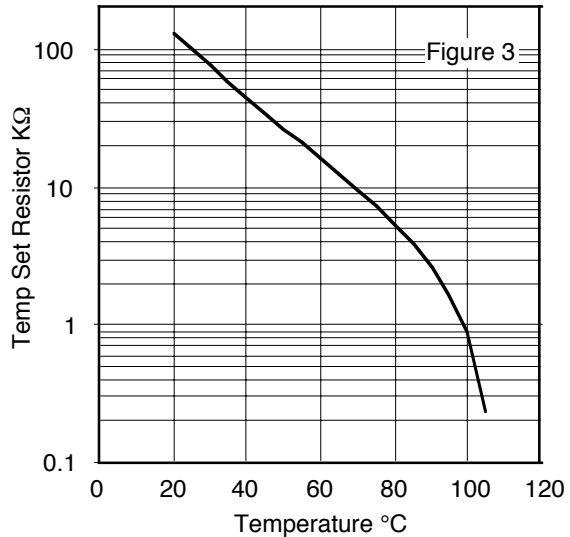
Characteristic	Symbol	Min	Typ	Max	Unit
Supply Voltage (Pin 4 to Pin 8)	Vdd	+4.5		+5.5	Vdc
Turn on Current @ Vdd = 5.0 Vdc	I _s	1.8	2.0	2.2	Adc
Turn on power at start-up @ Vdd = + 5 Vdc			10		Watts
Maximum Control Temperature when R _s = 0 Ω	T _{MAX}	100	110	120	
Temperature Variation over Operating Voltage ¹	ΔT _v	-0.1		+0.1	°C
Temperature Variation with Load ¹	ΔT _L	-0.1		+0.1	°C
Set Temperature	T _s	AMBIENT		+100	°C
Control Resistor Value (See Look-up Table)	R _s	0			Ohms

Temperature vs. Temperature Set Resistor

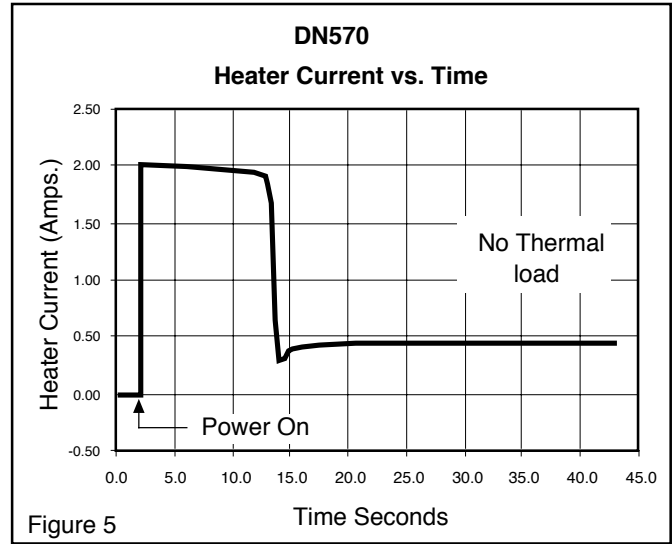
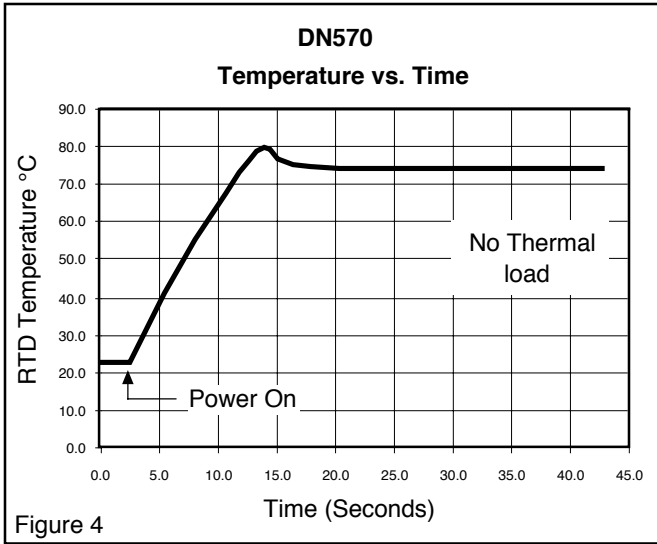
Figure 2

TEMP °C	RS KΩ	TEMP °C	RS KΩ
20	127.1	65	12.2
25	96.9	70	9.3
30	74.2	75	7.1
35	57.1	80	5.2
40	44.1	85	3.8
45	34.1	90	2.6
50	26.5	95	1.6
55	20.5	100	0.9
60	15.9	105	0.2

Temp. Set Resistor vs. Temperature



The turn on characteristics of the DN570 temperature controlled heater are shown in the two graphs below. The temperature of the heater was monitored with the 100Ω platinum RTD that is mounted on the DN570 and is shown in Figure 4. The heater current was also monitored and is shown in Figure 5. The temperature of the DN570 was set with a 7.15KΩ 1% resistor.

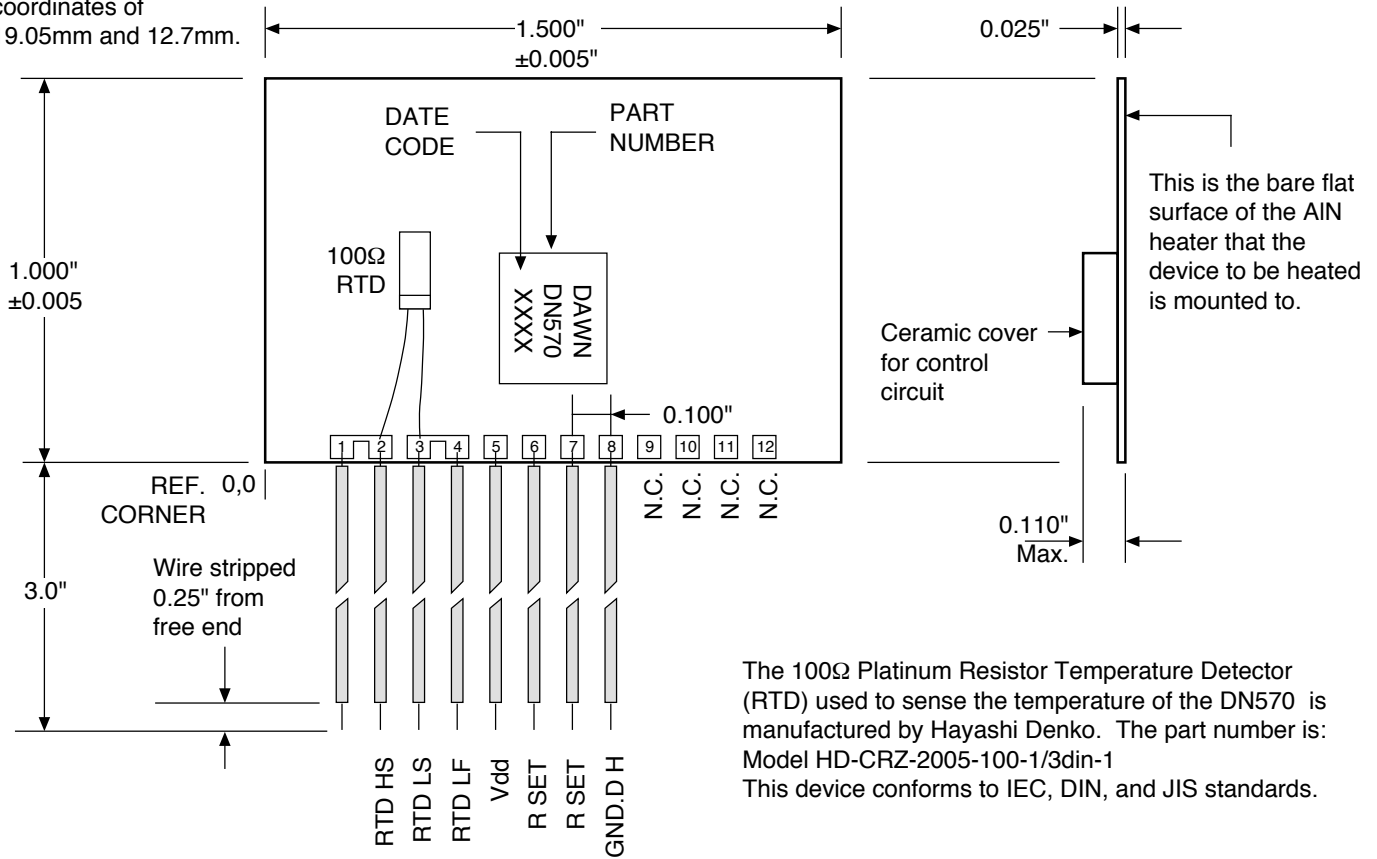


NOTES:

1. The DN570 uses a proportional integral feedback control loop. Temperature is sensed at the physical location of the thermistor internal to the DN570. The exact location of this thermistor is shown on the mechanical drawing. At this point, the temperature will remain within $\pm 0.01^\circ\text{C}$ over the operating environmental extremes of the DN570. The temperature at all other locations on the DN570 is dependent on the thermal gradients between the thermistor and the point at which the temperature is measured. Temperature is measured on the unprinted side of the substrate directly over the spot where the control thermistor is located. The specification of $\pm 0.1^\circ\text{C}$ reflects the thermal resistance of the AlN substrate between the thermistor and the opposite side of the substrate where the temperature is monitored.
2. The DN570 is relatively insensitive to ESD. However, the device should be handled with care like any other electronic component when handling and installing the part.

The temperature control thermistor is located at the X, Y coordinates of 19.05mm and 12.7mm.

MECHANICAL DRAWING



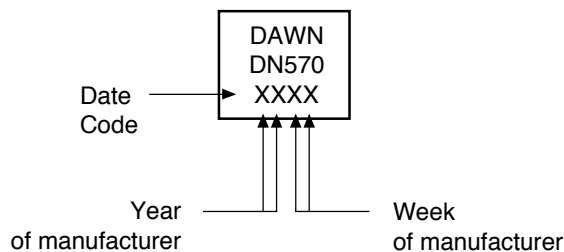
The 100Ω Platinum Resistor Temperature Detector (RTD) used to sense the temperature of the DN570 is manufactured by Hayashi Denko. The part number is: Model HD-CRZ-2005-100-1/3din-1 This device conforms to IEC, DIN, and JIS standards.

Wire type

Number 32 gage solid insulated magnet wire is used for the eight wires to make electrical connections to the DN570 temperature controlled heater .

The wires are attached to the heater with SN96 Solder. This solder is 96% Tin and 4 % Silver.

DATE CODE



Example:
Date code of 0220 indicates the part was manufactured week 20 of the year 2002

NOTES:

1. All DN570 heaters are tested for gross leaks in Fluorocarbon at 125° C.
2. Do not reverse the voltage polarity on the input power leads. This can cause permanent damage to the device.