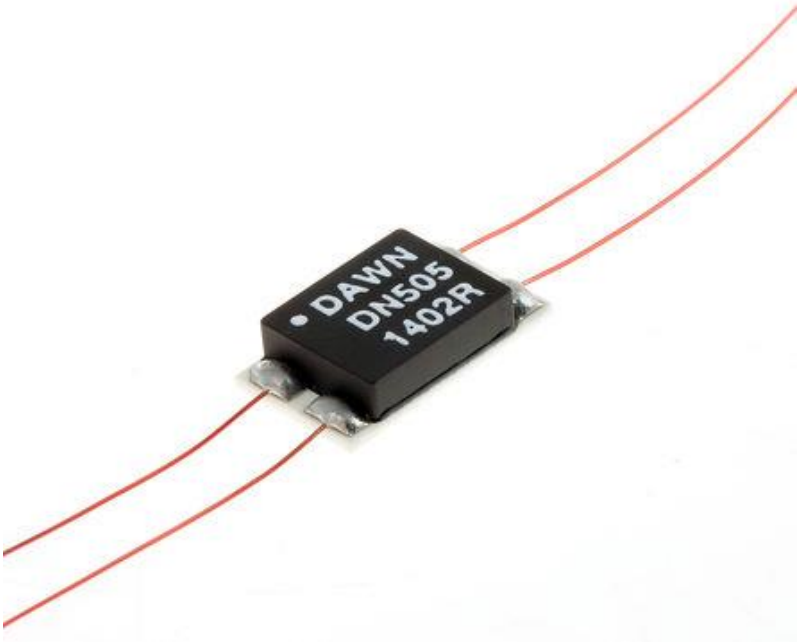
ENGLISH

Datasheet

Stock No: 615-1558

Ceramic Heating Element, 0.48in, 9 W, 18 V ac



Product Details

The DN505 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 DN505 is in a ceramic package and can supply up to 9 watts of power from an unregulated supply.

Features

- BERYLLIA BASE FOR GOOD THERMAL CONDUCTION
- REGULATION TEMPERATURE FROM 5°C ABOVE AMBIENT TO 100°C
- 5 TO 15 VOLT OPERATION
- ELECTRICALLY ISOLATED FROM THE CASE

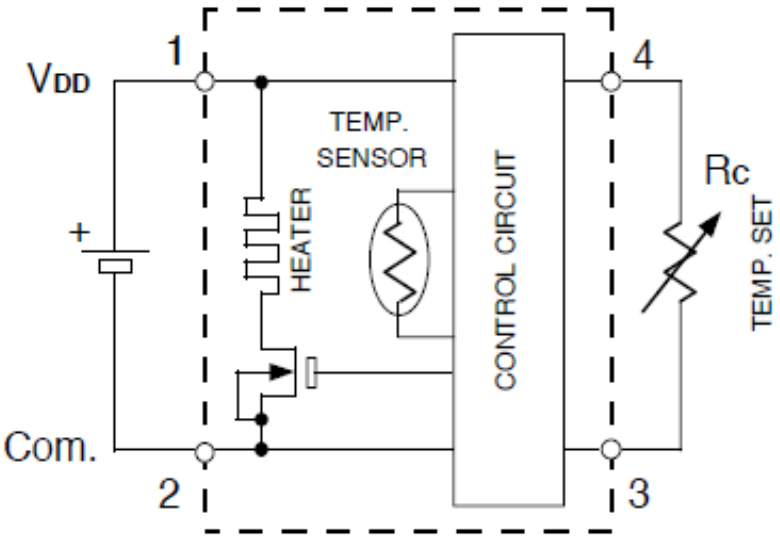
Characteristic	Symbol	Min	Max	Unit
Supply Voltage (Pin 1 to Pin 4)	V_{DD}	+4.5	+16	Vdc
Steady State Supply Current @ V_{DD} = +15 Vdc	I_S	5.0	700	mAdc
Temperature Variation over Operating Voltage	ΔT_V		2	°C
Temperature Variation with Load	ΔT_L		6	°C
Control Temperature Range	T_C	T_A +5	100	°C
Control Resistor Value Pin 3 to Pin 4	R_S	0		Ohm
Maximum Control Temperature when R_S = 0 Ohms	T_{MAX}		120	°C
Turn on power at start-up @ V_{DD} = +15 Vdc	P_D	9.0		Watts

T_A ---- Ambient Temperature

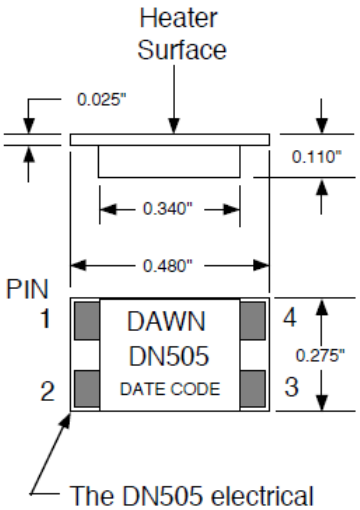
Maximum Ratings

Rating	Symbol	Value	Unit
Supply Voltage	V_{DD}	18	V_{DC}
Power Dissipation	P_D	16	Watts
Operating Temperature	T_{MAX}	120	°C
Storage Temperature	T_{MIN}	-65 to +150	°C

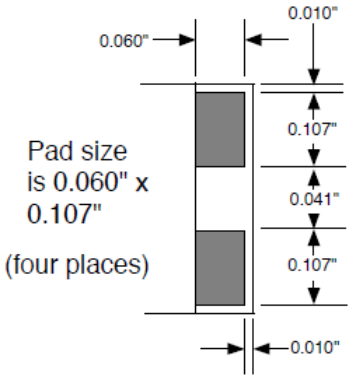
HEATER BLOCK DIAGRAM



OUTLINE DIMENSIONS



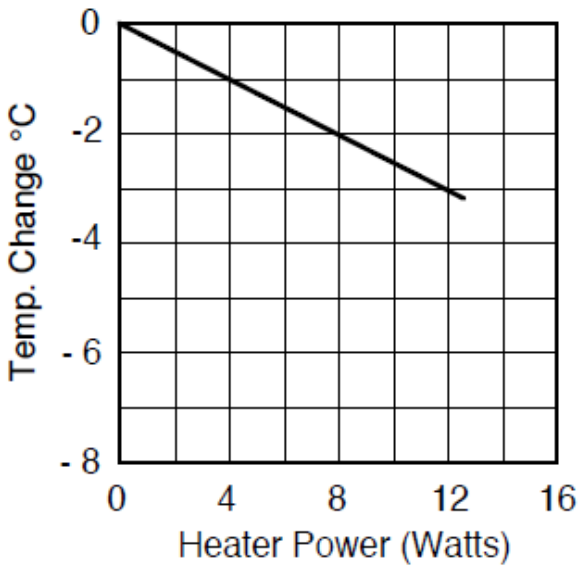
The DN505 electrical output pads are Ag/Pd/Pt and can be soldered. The solder used , such as SN95, should contain silver to prevent leaching of the pads from the substrate.



Heater Temperature (T_C) vs. TemperatureSet Resistor (R_S)

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		

Typical Base Temperature Change vs. Power Dissipation



The base material of the DN505 is Beryllia which provides efficient energy transfer from the heating element located inside the heater and the heating surface of the DN505. The temperature drop across the Beryllia substrate, as a function of heater power, is shown to the left.

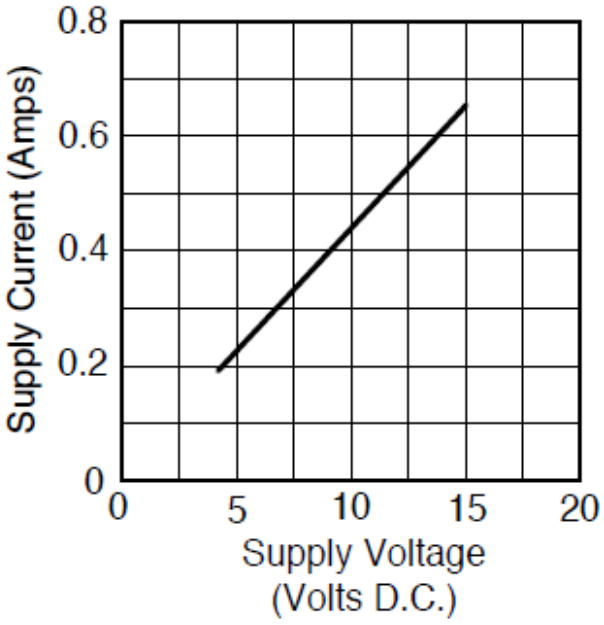
The thermal interface between the DN505 heater and the device being heated causes a temperature drop. Care should be taken to make sure that a good thermal interface exists between the two surfaces.

Notes:

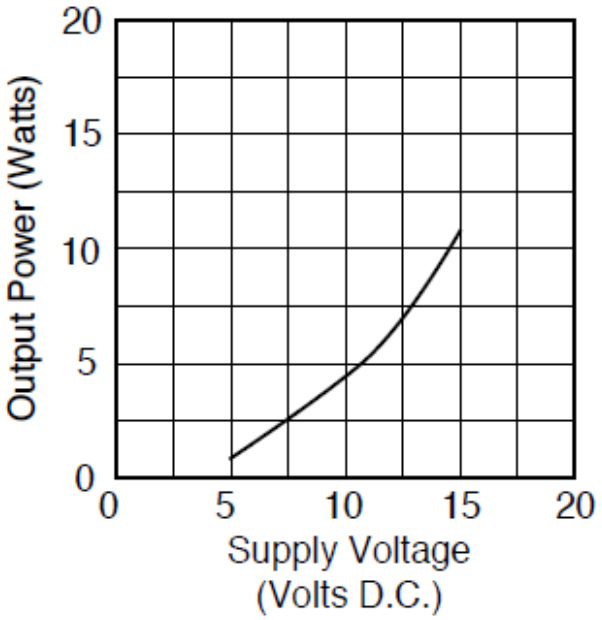
1. All DN505 heaters are tested for gross leaks with 3M™ FC-40 Fluorinert™ at 125° C.

2. Do not reverse the voltage polarity on the input power leads. This can cause permanent damage to the device.

Max. Start-up Current vs. Supply Voltage



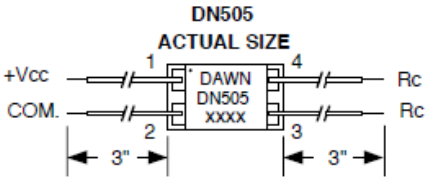
Max. Heater Power Available vs. Supply Voltage

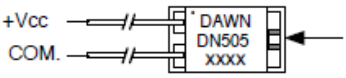


Options

1. The DN505 is normally supplied with leads. However, the heater can be supplied without them. The leaded device has #32 gauge insulated magnet wire attached to the solder pads as shown in the figure to the right.

2. Operating temperature can be set at the factory by soldering a chip resistor between PIns 3 and 4. Consult the factory when specific heater temperatures are required.

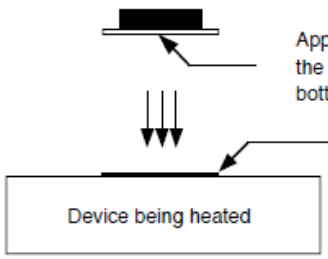




A chip resistor is used to set the temperature of the heater.

Instructions for Mounting the Heater with LOCTITE® 384

LOCTITE® 384 is a two part thermally conductive epoxy that works well for attaching the DN505 heater to the surface of the device being heated. Test data, technical specifications, and destributer locations for LOCTITE® 384 is presented in the applications section of this website..



Apply a **thin** layer of the LOCTITE® 384 to the bottom surface of the heater. Use an E-XATO knife or rasor blade to make sure the bottom is evenly coated.

Apply the activator to surface of the device being heated. Let the solvent evaporate (30 Seconds) and then attach the heater to the activated surface. Use a scrubbing action to make sure the excess Adhesive is moved to the edges of the heater to form a small fillet.

Applications

The DN505 is designed to regulate the temperature of temperature sensitive devices. One such application is using the DN505 to control the temperature of a Voltage Controlled Oscillator.

Care should be taken to thermally insulate the DN505 heater and device being heated from the surrounding environment. This will minimize the amount of power required to heat the package which in turn will reduce the temperature variation of the package over the ambient temperature extremes .

TEMPERATURE STABELIZED VOLTAGE CONTROLLED OSCILLATOR OR SAW FILTER