

NTC THERMISTORS: STANDARD DISCS – D103 MATERIAL

DATA:

Resistance range @ 25°C.....800 Ω to 12K Ω†
 Temperature coefficient of resistance (α) @ 25°C.....-4.49%/°C
 Operating temperature range-50°C to +150°C

Temp. Range (°C)	Resistance Ratio (Nom.)	Beta (°K)
0/50	9.6	3991
37.8/104.4	10.3	4111
25/125	31.6	4101

†This resistance range is based on the diameter/thickness combinations shown in the table below. Other R₂₅ @ 25°C values are available in this material system.

CALCULATIONS:

To calculate $\frac{R_T}{R_{25}}$ at temperatures other than those listed in the table, use the following equation:

$$\frac{R_T}{R_{25}} = e^{(\ln A - C \ln T + \frac{D}{T})}$$

T = temperature in °K and equation constants are as follows:

Temperature Range (°C)	Ln A	C	D
-50 to 0	27.80891	6.18843	2218.28
0 to 50	9.92949	3.48346	2957.01
50 to 100	-2.29382	1.67619	3532.43
100 to 150	-8.78257	0.73845	3881.51

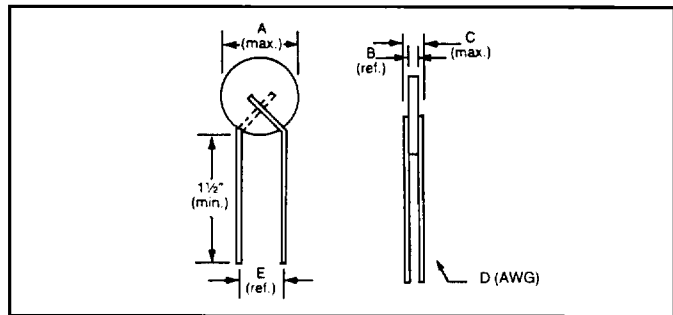
To calculate the actual thermistor temperature as a function of the thermistor resistance, use the following equation:

$$T = \frac{1}{a + b \left(\ln \frac{R_T}{R_{25}}\right) + c \left(\ln \frac{R_T}{R_{25}}\right)^2 + d \left(\ln \frac{R_T}{R_{25}}\right)^3}$$

T = temperature in °K and equation constants are as follows:

$\frac{R_T}{R_{25}}$ Range	a	b	c	d
3.363 to 72.50	3.356463E-03	2.462530E-04	4.065524E-06	-5.880759E-08
.3507 to 3.363	3.354016E-03	2.502706E-04	2.425564E-06	-7.350715E-08
.0637 to .3507	3.352963E-03	2.477688E-04	9.903545E-07	-8.048379E-08
.0169 to .0637	3.346921E-03	2.435247E-04	3.419306E-07	-4.637018E-08

DIMENSIONS:



Temperature (°F)	Temperature (°C)	$\frac{R_T}{R_{25}}$	Temperature Coef. Of Resistance (α) (%/°C)
-58	-50	72.50	-7.23
-49	-45	50.84	-6.97
-40	-40	36.09	-6.74
-31	-35	25.92	-6.51
-22	-30	18.82	-6.30
-13	-25	13.80	-6.10
-4	-20	10.23	-5.91
5	-15	7.646	-5.73
14	-10	5.767	-5.56
23	-5	4.387	-5.39
32	0	3.363	-5.24
41	5	2.599	-5.07
50	10	2.024	-4.92
59	15	1.589	-4.77
68	20	1.256	-4.63
77	25	1.000	-4.49
86	30	0.8013	-4.37
95	35	0.6461	-4.24
104	40	0.5241	-4.13
113	45	0.4276	-4.02
122	50	0.3507	-3.90
131	55	0.2894	-3.79
140	60	0.2400	-3.69
149	65	0.2001	-3.58
158	70	0.1677	-3.49
167	75	0.1412	-3.40
176	80	0.1194	-3.31
185	85	0.1014	-3.22
194	90	0.08652	-3.14
203	95	0.07409	-3.06
212	100	0.06370	-2.99
221	105	0.05497	-2.91
230	110	0.04760	-2.84
239	115	0.04139	-2.78
248	120	0.03610	-2.71
257	125	0.03160	-2.65
266	130	0.02774	-2.59
275	135	0.02443	-2.53
284	140	0.02158	-2.47
293	145	0.01912	-2.42
302	150	0.01698	-2.37

Type Number	R° @ 25°C Ω	Tolerance* ± %	A		B		C		D (AWG)	E		δ (mW/°C)	τ (Sec.)
			(in.)	(mm)	(in.)	(mm)	(in.)	(mm)		(in.)	(mm)		
RL1007-6890-103-D1	12K	10	0.110	2.79	0.070	1.78	0.150	3.81	26	0.100	2.54	2.8	10
RL1005-5744-103-D1	10K				0.050	1.27	0.130	3.30				2.5	10
RL1004-4019-103-D1	7K				0.040	1.02	0.120	3.05				2.5	9
RL1003-2871-103-D1	5K				0.030	0.76	0.110	2.79				2.5	9
RL2008-2010-103-D1	3.5K	10	0.220	5.59	0.080	2.03	0.170	4.32	24	0.156	3.96	6.5	30
RL2006-1600-103-D1	2786				0.060	1.52	0.150	3.81				6.5	20
RL2005-1148-103-D1	2K				0.050	1.27	0.140	3.56				6.5	20
RL3007-861-103-D1	1.5K	10	0.320	8.13	0.070	1.78	0.160	4.06	24	0.250	6.35	7.5	40
RL3005-574-103-D1	1K				0.050	1.27	0.140	3.56				7.0	35
RL3004-459-103-D1	800				0.040	1.02	0.130	3.30				7.0	35

*Consult Keystone Thermometrics Engineering Department for information on other tolerances or tolerances at temperatures other than 25°C.

KEYSTONE THERMOMETRICS