



NTC THERMISTORS:

STANDARD DISCS - D140 MATERIAL

DATA:

Resistance range @ 25°C5K Ω to 100K Ω†
 Temperature coefficient of resistance (α) @ 25°C.....-5.08%/°C
 Operating temperature range-50°C to +150°C

Temp. Range (°C)	Resistance Ratio (Nom.)	Beta (°K)
0/50	12.9	4511
37.8/104.4	14.0	4652
25/125	50.3	4651

†This resistance range is based on the diameter/thickness combinations shown in the table below. Other R₀ @ 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	41.22355	8.49383	2129.68
0 to 50	13.46334	4.27220	3243.26
50 to 100	-4.37279	1.64238	4096.60
100 to 150	-8.51923	1.04907	4332.75

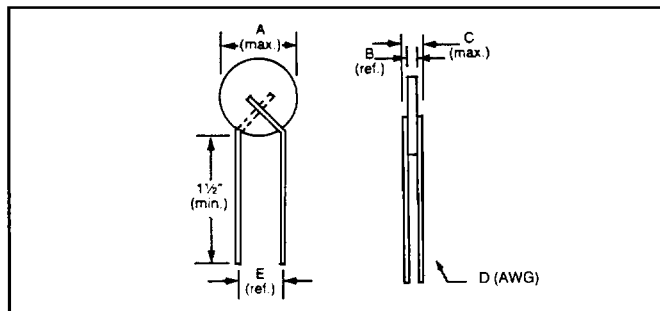
To calculate the actual thermistor temperature as a function of the thermistor resistance, use the following equation:

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

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

$\frac{R_T}{R_{25}}$ Range	a	b	c	d
3.934 to 125.70	3.359980E-03	2.147184E-04	3.723960E-06	-3.231223E-08
.3056 to 3.934	3.354016E-03	2.213807E-04	2.058586E-06	-5.214224E-08
.0441 to .3056	3.352095E-03	2.183216E-04	8.929066E-07	-1.209635E-08
.0098 to .0441	3.345451E-03	2.146500E-04	3.196381E-07	-3.610801E-08

DIMENSIONS:



Temperature (°F)	Temperature (°C)	$\frac{R_T}{R_{25}}$	Temperature Coef. Of Resistance (α) (%/°C)
-58	-50	125.70	-8.08
-49	-45	84.49	-7.81
-40	-40	57.53	-7.56
-31	-35	39.66	-7.32
-22	-30	27.66	-7.10
-13	-25	19.50	-6.88
-4	-20	13.90	-6.68
5	-15	9.999	-6.49
14	-10	7.263	-6.30
23	-5	5.323	-6.13
32	0	3.934	-5.91
41	5	2.941	-5.73
50	10	2.218	-5.55
59	15	1.688	-5.39
68	20	1.294	-5.23
77	25	1.000	-5.08
86	30	0.7784	-4.94
95	35	0.6102	-4.80
104	40	0.4815	-4.67
113	45	0.3824	-4.55
122	50	0.3056	-4.43
131	55	0.2456	-4.30
140	60	0.1987	-4.18
149	65	0.1616	-4.07
158	70	0.1323	-3.96
167	75	0.1088	-3.85
176	80	0.08997	-3.75
185	85	0.07477	-3.65
194	90	0.06244	-3.56
203	95	0.05238	-3.47
212	100	0.04414	-3.38
221	105	0.03733	-3.30
230	110	0.03170	-3.22
239	115	0.02704	-3.14
248	120	0.02315	-3.07
257	125	0.01989	-3.00
266	130	0.01715	-2.93
275	135	0.01484	-2.86
284	140	0.01289	-2.80
293	145	0.01123	-2.74
302	150	0.009809	-2.68

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)		
RL1006-53.4K-140-D1	100K	10	0.110	2.79	0.060	1.52	0.140	3.56	26	0.100	2.54	2.7	10
RL1005-42.7K-140-D1	80K				0.050	1.27	0.130	3.30				2.5	10
RL1004-34.7K-140-D1	65K				0.040	1.02	0.120	3.05				2.5	9
RL1003-26.7K-140-D1	50K				0.030	0.76	0.110	2.79				2.5	9
RL2007-16K-140-D1	30K	10	0.220	5.59	0.070	1.78	0.160	4.06	24	0.156	3.96	6.5	30
RL2006-13.3K-140-D1	25K				0.060	1.52	0.150	3.81				6.5	20
RL2005-10.7K-140-D1	20K				0.050	1.27	0.140	3.56				6.0	18
RL3008-8010-140-D1	15K	10	0.320	8.13	0.080	2.03	0.170	4.32	24	0.250	6.35	8.0	50
RL3006-5340-140-D1	10K				0.060	1.52	0.150	3.81				7.5	45
RL4005-2670-140-D1	5K	10	0.430	10.92	0.050	1.27	0.140	3.56	24	0.250	6.35	9.0	40

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

KEYSTONE THERMOMETRICS