Temperature Measuring NTC Thermistor Datasheet

Features

- MF52 Series Temperature Measuring NTC Thermistor
- Zero Power Resistance at 25°C :5KΩ, tolerance ±1%
- $B_{25/50}$ constant 3950K, tolerance ±1%
- Excellent solder ability
- Operating temperature：-30°C to +125°C
- Lead-Free & Halogen Free

HNTC MF52 Series

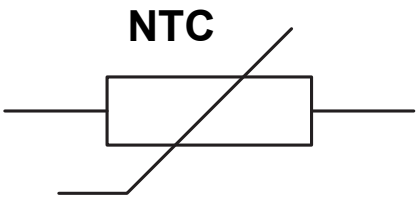
Applications

- Consumer Electronics,Thermal management in smartphones/tablets
- Temperature detection and protection in air conditioners;
- Temperature monitoring in microwaves/ovens
- Temperature monitoring in microwaves/ovens
- Constant temperature control in automated machinery
- Temperature measure and control

Part Number Code

H	NTC	-	103	F	3380	F	B
①	②		③	④	⑤	⑥	⑦

① "HJC" Brand Code
② NTC Thermistor
③ Rated Zero-Power Resistance：10KΩ
④ Resistance Tolerance F: 1% G: 2% H: 3% J:5%
⑤ B Constant
⑥ B Constant Tolerance F: 1% H: 3%
⑦ B Constant calculation method A: 25°C/85°C B: 25°C/50°C



Electrical Characteristics (Ta=25°C Unless otherwise specified)

PARAMETER	Symbol	CONDITION	VALUE	UNIT
Rated Zero-Power Resistance	R_{25}	T_a=25°C ±0.05°C	5.0±1%	KΩ
Resistance At 50°C	R_{50}	T_a=50°C ±0.05°C	1.79（Typ）	KΩ
B Constant (Material Constant)	$B_{25/50}$	25°C /50°C	3950±1%	K
Insulation Resistance	/	T_a=25°C ,100VDC	100 min.	MΩ
Thermal Dissipation Constant	δ	stationary in the air	2.0 min.	mW/°C
Thermal Time Constant	τ	stationary in the air	20 max.	sec
Operating Temperature Range	/	/	-30 to + 125	°C
Max.Dissipation power	P	T_a=25°C	3.5	mW

Electrical Test

Items	Test Methods and Remarks
Nominal Zero-Power Resistance at 25°C	Ambient temperature：25±0.05°C ;
Nominal B Constant	Measure the resistance at the ambient temperature of 25±0.05°C , 50±0.05°C or 85±0.05°C . $B_{(25/50℃)} = \frac{\ln R_{25}-\ln R_{50}}{1/T_{25}-1/T_{50}}$ $B_{(25/85℃)} = \frac{\ln R_{25}-\ln R_{85}}{1/T_{25}-1/T_{85}}$
Thermal Time Constant	The total time for the temperature of the thermistor to change by 63.2% of the difference from ambient temperature T0 (°C) to T1 (°C) by the drastic change of the power applied to thermistor from Non-zero Power to Zero-Power state, normally expressed in second(S)
Dissipation Factor	The required power which makes the NTC thermistor body temperature raise 1 °C through self-heated, normally expressed in milliwatts per degree Celsius (mW/°C). It can be calculated by the following formula:

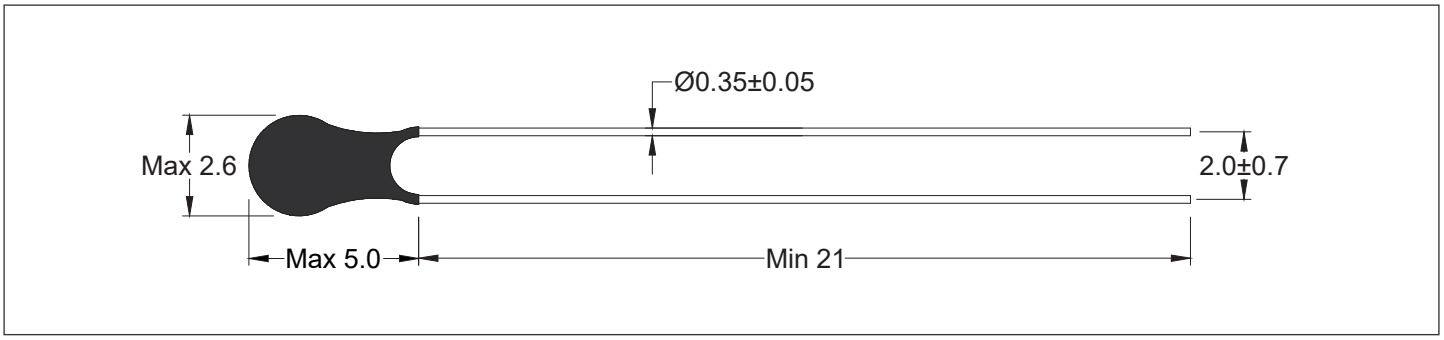
Reliability Test

Items	Standard	Test Conditions & Methods	Requirements
Solderability	IEC 60068-2-20	The leads are immersed in a tin fluid 6mm from the thermistor. The tin fluid temperature is 245±5°C , and the dip soldering time is 2s to 3s.	The solder is evenly coated on the surface of the lead immersed part, and the tin area is over 95%.
Resistance To Welding Heat	IEC 60068-2-20	Leads are immersed in a tin fluid at a distance of 6mm from the thermistor. The tin fluid temperature is 260±5°C , the dip soldering time is 5s±1s.	No visible damage, R25 ΔR/R ⩽ ±3%
Lead Strength	IEC 60068-2-21	Fix resistance, pull is 5±1 N, last 10±1s	No visible damage, R25 ΔR/R ⩽ ±3%
Rapid Temperature Change	IEC 60068-2-14	-30°C 30min → 25°C 5min → 125°C 30min → 25°C 5min, repeat 5 times, recovery time is 4 hours	No visible damage, R25 ΔR/R ⩽ ±3%
High Temperature Storage	IEC 60068-2-2	Temperature:125°C ±5°C , time:1000 hours	No visible damage, R25 ΔR/R ⩽ ±3%
Low Temperature Storage	IEC 60068-2-2	Temperature:-30°C , time:1000 hours	No visible damage, R25 ΔR/R ⩽ ±3%
Steady State Damp Heat	IEC 60068-2-78	Temperature:40 °C ±2 °C , humidity:93%±2%, time:500±12 hours	No visible damage, R25 ΔR/R ⩽ ±3%

Environmental Specification

Storage temperature:	-10°C to +40°C
Storage Conditions:	Light-proof, Hermetically Sealed, Moisture-proof; The components should be left in their original packing to avoid soldering problems due to oxidized contacts.
Relative humidity:	< 75 % RH
Storage period	The components should be employed within 12 months after delivery,the components should be resealed after opening the packing.

Physical Dimensions



Ordering Information

Part Number	DELIVERY MODE	MPQ(PCS)
HNTC-502F3950FB	Bulk	500

Caution

1.Avoiding the measurement error caused by the current passing through the thermistor chip leads the component to heat itself;
2.When the soldering iron is welded, the distance between the soldering point and the coating layer is at least 2mm, the soldering temperature should be lower than 360 ° C, and the soldering time is <3s;

R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)
-30	86.2123	89.6333	93.1806	17	7.0716	7.1688	7.2666
-29	81.0396	84.2027	87.4804	18	6.7569	6.8467	6.9369
-28	76.2109	79.1363	82.1658	19	6.4580	6.5408	6.6240
-27	71.7011	74.4076	77.2085	20	6.1740	6.2503	6.3269
-26	67.4873	69.9919	72.5821	21	5.9040	5.9742	6.0447
-25	63.5482	65.8666	68.2627	22	5.6473	5.7119	5.7768
-24	59.8643	62.0108	64.2279	23	5.4032	5.4626	5.5221
-23	56.4174	58.4054	60.4573	24	5.1710	5.2255	5.2801
-22	53.1909	55.0324	56.9320	25	4.9500	5.0000	5.0500
-21	50.1694	51.8756	53.6345	26	4.7355	4.7855	4.8354
-20	47.3385	48.9198	50.5488	27	4.5315	4.5813	4.6311
-19	44.6852	46.1510	47.6601	28	4.3374	4.3869	4.4366
-18	42.1973	43.5562	44.9544	29	4.1526	4.2019	4.2513
-17	39.8634	41.1235	42.4193	30	3.9767	4.0256	4.0747
-16	37.6731	38.8418	40.0428	31	3.8092	3.8577	3.9064
-15	35.6168	36.7009	37.8142	32	3.6497	3.6977	3.7459
-14	33.6854	34.6912	35.7234	33	3.4977	3.5452	3.5929
-13	31.8706	32.8038	33.7610	34	3.3528	3.3997	3.4470
-12	30.1647	31.0308	31.9185	35	3.2147	3.2611	3.3078
-11	28.5606	29.3644	30.1878	36	3.0830	3.1288	3.1749
-10	27.0516	27.7976	28.5614	37	2.9574	3.0026	3.0481
-9	25.6314	26.3240	27.0325	38	2.8376	2.8821	2.9270
-8	24.2944	24.9374	25.5947	39	2.7233	2.7671	2.8114
-7	23.0353	23.6322	24.2421	40	2.6141	2.6573	2.7009
-6	21.8489	22.4031	22.9690	41	2.5100	2.5524	2.5953
-5	20.7308	21.2453	21.7705	42	2.4105	2.4522	2.4945
-4	19.6765	20.1543	20.6416	43	2.3155	2.3565	2.3981
-3	18.6822	19.1258	19.5779	44	2.2247	2.2650	2.3059
-2	17.7440	18.1559	18.5754	45	2.1379	2.1776	2.2177
-1	16.8585	17.2408	17.6301	46	2.0550	2.0939	2.1333
0	16.0223	16.3773	16.7385	47	1.9757	2.0139	2.0526
1	15.2326	15.5622	15.8973	48	1.8999	1.9374	1.9754
2	14.4864	14.7923	15.1032	49	1.8274	1.8642	1.9015
3	13.7811	14.0651	14.3534	50	1.7580	1.7941	1.8307
4	13.1143	13.3778	13.6452	51	1.6917	1.7270	1.7629
5	12.4836	12.7281	12.9761	52	1.6281	1.6628	1.6980
6	11.8869	12.1137	12.3436	53	1.5673	1.6012	1.6358
7	11.3222	11.5325	11.7456	54	1.5090	1.5423	1.5762
8	10.7875	10.9825	11.1800	55	1.4532	1.4858	1.5190
9	10.2811	10.4619	10.6448	56	1.3998	1.4317	1.4642
10	9.8014	9.9690	10.1384	57	1.3486	1.3799	1.4117
11	9.3468	9.5021	9.6589	58	1.2995	1.3301	1.3613
12	8.9159	9.0597	9.2048	59	1.2525	1.2824	1.3130
13	8.5073	8.6404	8.7746	60	1.2074	1.2367	1.2666
14	8.1197	8.2428	8.3670	61	1.1641	1.1928	1.2221
15	7.7520	7.8658	7.9806	62	1.1226	1.1507	1.1794
16	7.4030	7.5082	7.6142	63	1.0828	1.1103	1.1384

R-T Chart

Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)	Temp.(℃)	R_Min(KΩ)	R_Typ(KΩ)	R_Max(KΩ)
64	1.0446	1.0715	1.0990	95	0.3741	0.3877	0.4017
65	1.0079	1.0343	1.0612	96	0.3629	0.3762	0.3899
66	0.9727	0.9985	1.0249	97	0.3520	0.3650	0.3784
67	0.9389	0.9642	0.9900	98	0.3415	0.3543	0.3674
68	0.9065	0.9312	0.9564	99	0.3314	0.3439	0.3567
69	0.8753	0.8995	0.9242	100	0.3216	0.3338	0.3464
70	0.8454	0.8690	0.8932	101	0.3122	0.3241	0.3364
71	0.8166	0.8397	0.8634	102	0.3031	0.3147	0.3268
72	0.7890	0.8115	0.8347	103	0.2943	0.3057	0.3175
73	0.7624	0.7845	0.8071	104	0.2857	0.2969	0.3085
74	0.7368	0.7584	0.7806	105	0.2775	0.2884	0.2997
75	0.7122	0.7334	0.7551	106	0.2696	0.2802	0.2913
76	0.6886	0.7093	0.7305	107	0.2619	0.2723	0.2832
77	0.6659	0.6861	0.7068	108	0.2544	0.2647	0.2753
78	0.6440	0.6638	0.6841	109	0.2472	0.2573	0.2677
79	0.6229	0.6423	0.6621	110	0.2403	0.2501	0.2603
80	0.6027	0.6216	0.6410	111	0.2336	0.2432	0.2531
81	0.5832	0.6016	0.6207	112	0.2271	0.2365	0.2462
82	0.5644	0.5825	0.6011	113	0.2208	0.2300	0.2395
83	0.5463	0.5640	0.5822	114	0.2147	0.2237	0.2330
84	0.5289	0.5462	0.5640	115	0.2088	0.2176	0.2268
85	0.5121	0.5290	0.5464	116	0.2031	0.2117	0.2207
86	0.4959	0.5125	0.5295	117	0.1975	0.2060	0.2148
87	0.4803	0.4965	0.5132	118	0.1922	0.2005	0.2091
88	0.4653	0.4811	0.4975	119	0.1870	0.1951	0.2036
89	0.4508	0.4663	0.4823	120	0.1820	0.1899	0.1982
90	0.4369	0.4520	0.4676	121	0.177	0.185	0.193
91	0.4234	0.4382	0.4535	122	0.173	0.181	0.189
92	0.4104	0.4249	0.4399	123	0.169	0.176	0.184
93	0.3979	0.4121	0.4267	124	0.164	0.172	0.179
94	0.3858	0.3997	0.4140	125	0.160	0.168	0.175