



# Specification For Approval

**Customer name :** \_\_\_\_\_

**Product name :** NTC Thermistor

**Customer PN :** \_\_\_\_\_

**MFG PN :** CWFD0272FC-35X

MFG			Customer Confirmation		
Make	Check	Approval	Test	Check	Approval

(Company name)

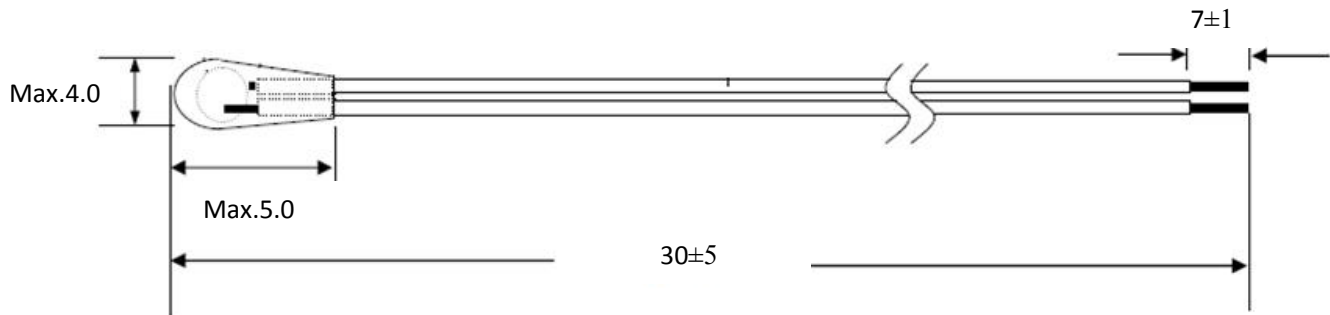
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Confirm got the spec and accept as our company's warehouse accept standard.

Version	Revise content	Forwarder	Date
A/1	Just made	Cheng	2016-04-13

### 1、 Overall Dimension

(Unit: mm)



### 2、 Material explanation

NO	Material Name	Item/PN
a.	Element	R25=2.7KΩ±1% B25/85=3977K±1%
b.	Coating	Epoxy Resin (Black)
c.	Lead Wire	UL1332 AWG28 * 2C (Black)

### 3、 Part Number :

$\frac{\times\times\times}{1}$  -  $\frac{\times\times\times}{2}$   $\frac{\times}{3}$   $\frac{\times}{4}$   $\frac{\times\times\times}{5}$

- (1) NTC Thermistor Mark;
- (2) Head shape sign (B:Housing Type, D:Dip-Coating, M:Molding);
- (3) Series Type (0:Epoxy coating structure, 1:Epoxy coating structure(high temp)) ;
- (4) Nominal Resistance at 25°C (previous two digits are significant figures, The last digit specifies the number of zeros to follow.);
- (5) Resistance tolerance (%);
- (6) B Value (1:25/50; 2:25/85; 3:0/100; 4:0/50; 5:50/85; 6:100/200; 7:Other);
- (7) Length Sign (unit is mm) ;
- (8) Special code ;

#### 4、Electrical Performance:

NO	Item	Sign	Test Conditions	Min.	Normal value	Max.	Unit
4-1.	Resistance at 25℃	R25	Ta=25±0.05℃ P <sub>T</sub> ≤0.1mw	2.673	2.7	2.727	kΩ
4-2.	B Value	B25/85	$B=LN \frac{R_{T1}}{R_{T2}} / \left( \frac{1}{T1} - \frac{1}{T2} \right)$	3937	3977	4016	k
4-3.	Dissipation factor	σ	Ta=25±0.5℃	2.5	/	/	mw/℃
4-4.	Time constant	τ	Ta=25±0.5℃	/	/	20	sec
4-5.	Insulation resistance	/	500VDC	100	/	/	MΩ
4-6.	Withstand voltage	/	1500V AC (3mA)	5	/	/	Sec
4-7.	Operating temp.range	/	/	-40	/	+105	℃

#### 5、Reliability Test

NO	Item	Technical requirements	Test conditions and method
5-1.	High temp. Test	$\Delta R/R25 \leq \pm 3\%$ $\Delta B/B \leq \pm 3\%$ No change with withstand voltage、 Insulation performance。 Appearance without damage.	100±5℃, power on 500±24 hrs, DC0.2mA
5-2.	Low temp. tes		-15±5℃, power on 500±24 hrs, DC0.2mA
5-3.	Endure moisture test		Store in environment 55±2℃,90%-95%RH for 240±24 hrs
5-4.	Temp. cycle test		-20℃×30min→Room temp.×10min→ in 100℃ water×30min→Room temp.×10min 10 cycles
5-5.	Load electrify test		Power on DC1mA, 500hrs in room temp. and humid.
5-6.	Tensile tests		Applying 2 kg force lasts 1 min.
5-7.	Drop test		Free fall into concrete floor from height 1M , 10 cycle.
5-8.	Vibration test		Frequency range: 10~55HZ Total amplitude 1.52mm 1 cycle 1 min , direction and time X、Y、Z axis 2Hr each.
5-9.	Bending test		Bend 180°binding site wire and epoxy resin。 Back and forth 10 times

#### 6、Using the matters needing attention

6.1 Application: temperature measurement and control.

6.2 Avoid self-heat and measuring error caused by current is too high go through thermistor chip.

6.3 When soldering by soldering iron, soldering point should be min 2mm distance away from coated layer,soldering temperature should be less than 300℃, soldering time should be less than 3sec.

6.4 Products should be stored in the temperature of environment - 10℃ / + 40℃, relative humidity is not more than 75%, environment should not have acid, alkali and corrosion gas or radioactive source.

#### 7、R—T TABLE

**R—T CONVERSION TABLE**R<sub>25</sub>=2.7KΩ±1%B<sub>25/85</sub>=3977K±1%

T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>	T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>
-55	211.966	223.777	236.223	-18	21.618	22.303	23.006
-54	197.640	208.505	219.946	-17	20.470	21.106	21.760
-53	184.388	194.389	204.911	-16	19.389	19.981	20.588
-52	172.123	181.332	191.014	-15	18.371	18.921	19.486
-51	160.761	169.246	178.160	-14	17.411	17.923	18.448
-50	150.230	158.051	166.262	-13	16.507	16.983	17.471
-49	140.463	147.675	155.242	-12	15.654	16.097	16.551
-48	131.398	138.052	145.027	-11	14.850	15.262	15.684
-47	122.980	129.121	135.555	-10	14.092	14.475	14.867
-46	115.158	120.828	126.764	-9	13.376	13.732	14.097
-45	107.885	113.122	118.602	-8	12.700	13.032	13.371
-44	101.119	105.958	111.018	-7	12.062	12.371	12.686
-43	94.821	99.294	103.968	-6	11.459	11.746	12.040
-42	88.955	93.092	97.411	-5	10.890	11.157	11.429
-41	83.489	87.316	91.309	-4	10.351	10.600	10.853
-40	78.393	81.934	85.626	-3	9.843	10.074	10.309
-39	73.640	76.918	80.333	-2	9.361	9.576	9.795
-38	69.204	72.239	75.399	-1	8.906	9.106	9.310
-37	65.062	67.873	70.798	0	8.475	8.662	8.851
-36	61.193	63.797	66.505	1	8.068	8.241	8.417
-35	57.577	59.990	62.498	2	7.682	7.843	8.006
-34	54.195	56.433	58.756	3	7.316	7.466	7.618
-33	51.033	53.107	55.260	4	6.970	7.109	7.250
-32	48.073	49.996	51.992	5	6.642	6.771	6.902
-31	45.301	47.086	48.936	6	6.331	6.451	6.573
-30	42.706	44.362	46.077	7	6.036	6.148	6.261
-29	40.274	41.810	43.402	8	5.757	5.860	5.965
-28	37.994	39.420	40.896	9	5.492	5.588	5.685
-27	35.855	37.180	38.550	10	5.243	5.333	5.423
-26	33.850	35.080	36.351	11	5.001	5.084	5.167
-25	31.967	33.110	34.289	12	4.775	4.851	4.928
-24	30.199	31.261	32.356	13	4.559	4.630	4.702
-23	28.539	29.526	30.543	14	4.355	4.421	4.487
-22	26.980	27.896	28.841	15	4.161	4.222	4.283
-21	25.513	26.365	27.243	16	3.976	4.032	4.089
-20	24.135	24.927	25.742	17	3.801	3.853	3.905
-19	22.838	23.574	24.332	18	3.634	3.682	3.730



**R—T CONVERSION TABLE**

R<sub>25</sub>=2.7KΩ±1%

B<sub>25/50</sub>=3950K±1%

T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>	T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>
19	3.475	3.520	3.564	56	0.764	0.782	0.799
20	3.324	3.365	3.407	57	0.736	0.753	0.771
21	3.181	3.219	3.257	58	0.710	0.727	0.744
22	3.044	3.079	3.114	59	0.684	0.701	0.717
23	2.914	2.946	2.978	60	0.660	0.676	0.692
24	2.790	2.820	2.849	61	0.637	0.652	0.668
25	2.673	2.700	2.727	62	0.614	0.629	0.645
26	2.558	2.585	2.612	63	0.593	0.608	0.623
27	2.449	2.476	2.503	64	0.572	0.587	0.602
28	2.345	2.372	2.399	65	0.552	0.566	0.581
29	2.246	2.273	2.299	66	0.533	0.547	0.561
30	2.152	2.178	2.205	67	0.515	0.528	0.542
31	2.062	2.088	2.115	68	0.497	0.511	0.524
32	1.977	2.002	2.029	69	0.480	0.493	0.507
33	1.895	1.921	1.946	70	0.464	0.477	0.490
34	1.817	1.843	1.868	71	0.448	0.461	0.474
35	1.743	1.768	1.793	72	0.433	0.446	0.458
36	1.672	1.697	1.722	73	0.419	0.431	0.443
37	1.605	1.629	1.654	74	0.405	0.417	0.429
38	1.540	1.564	1.588	75	0.392	0.403	0.415
39	1.479	1.502	1.526	76	0.379	0.390	0.402
40	1.420	1.443	1.467	77	0.367	0.378	0.389
41	1.364	1.387	1.410	78	0.355	0.366	0.377
42	1.310	1.333	1.356	79	0.343	0.354	0.365
43	1.259	1.281	1.304	80	0.332	0.343	0.353
44	1.210	1.232	1.254	81	0.322	0.332	0.342
45	1.163	1.184	1.206	82	0.312	0.322	0.332
46	1.118	1.139	1.161	83	0.302	0.311	0.321
47	1.075	1.096	1.117	84	0.292	0.302	0.312
48	1.035	1.055	1.075	85	0.283	0.293	0.302
49	0.995	1.015	1.036	86	0.274	0.284	0.293
50	0.956	0.976	0.995	87	0.266	0.275	0.284
51	0.922	0.941	0.961	88	0.258	0.267	0.276
52	0.888	0.906	0.926	89	0.250	0.258	0.267
53	0.855	0.873	0.892	90	0.242	0.251	0.259
54	0.823	0.841	0.860	91	0.235	0.243	0.252
55	0.793	0.811	0.829	92	0.228	0.236	0.244

**R—T CONVERSION TABLE**

R<sub>25</sub>=2.7KΩ±1%

B<sub>25/50</sub>=3950K±1%

T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>	T/°C	R <sub>max</sub>	R <sub>cen</sub>	R <sub>min</sub>
93	0.221	0.229	0.237				
94	0.215	0.222	0.230				
95	0.208	0.216	0.224				
96	0.202	0.210	0.217				
97	0.196	0.203	0.211				
98	0.191	0.198	0.205				
99	0.185	0.192	0.199				
100	0.180	0.187	0.193				
101	0.175	0.181	0.188				
102	0.170	0.176	0.183				
103	0.165	0.171	0.178				
104	0.160	0.166	0.173				
105	0.156	0.162	0.168				
106	0.151	0.157	0.164				
107	0.147	0.153	0.159				
108	0.143	0.149	0.155				
109	0.139	0.145	0.151				
110	0.135	0.141	0.147				
111	0.132	0.137	0.143				
112	0.128	0.133	0.139				
113	0.125	0.130	0.135				
114	0.121	0.127	0.132				
115	0.118	0.123	0.128				
116	0.115	0.120	0.125				
117	0.112	0.117	0.122				
118	0.109	0.114	0.119				
119	0.106	0.111	0.116				
120	0.104	0.108	0.113				
121	0.101	0.105	0.110				
122	0.098	0.103	0.107				
123	0.096	0.100	0.104				
124	0.093	0.098	0.102				
125	0.091	0.095	0.099				