



## Specification For Approval

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

**Product name :**                   NTC Thermistor                  

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

**MFG PN :**                   CWFB0104FC-311H1C                  

MFG			Customer Confirmation		
Make	Check	Approval	Test	Check	Approval
HD CHENG	XR LU	DZ LING			

(Company name)

\_\_\_\_\_

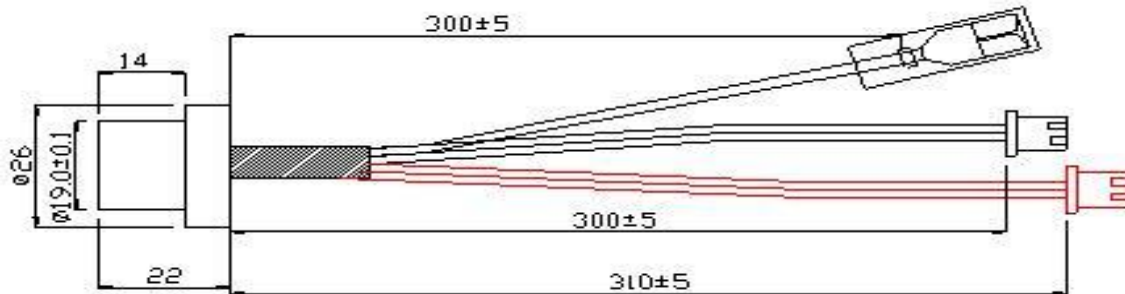
Confirm got the spec and accept as our company's warehouse accept standard.

Version	Revise content	Forwarder	Date
A/1	Just made	Cheng	2017-03-09



### 1、 Overall Dimension

(Unit: mm)



### 2、 Material explanation

NO	COMPONENT	MATERIAL AND SPECIFICATIONS	Q'TY	REMARK
2-1.	Element	R25=100KΩ±1% B25/50=3950±1% DD	1	
		SM182A0 187°C NEC	1	
2-2.	Housing	1060 Aluminium 0.5mm Y-0071	1	
		Material: Dupont PA66	1	Black
2-3.	Coating	Thermal conductive silicone		White
2-4.	Lead Wire	UL 1332# 24AWG 200°C 300V (Red/White), UL 3122# Braided wire 20AWG (28*Φ0.15) Green / yellow	3	
2-5.	Casing	PTFE Casing (Transparent) L=70mm, Heat shrinkable tube (Black) Φ5.5 L=20mm, ø2.4 L=75mm	7	
2-6.	Terminal	XH-2.54 & XH-2Y (Red/White), 187-T0.5 Terminal + transparent sheath, Mounting holes phi 2.6 * 10 ring terminal, (rivet)	3	

### 3、 Part Number :

$\frac{CWF}{1} - \frac{\times \times}{2} \frac{\times \times \times}{3} \frac{\times}{4} \frac{\times}{5} \frac{\times \times \times \times}{6} \frac{\times}{7} \quad 8$

(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 constant sign In general, it is value of 25/50Deg, other conditions will remark and explain;

(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°C	R25	Ta=25±0.05°C P <sub>T</sub> ≤0.1mw	99.0	100.0	101.0	kΩ
4-2.	B Value	B25/50	$B=LN \frac{R_{T1}}{R_{T2}} / \left( \frac{1}{T1} - \frac{1}{T2} \right)$	3871	3950	4029	k
4-3.	Dissipation factor	σ	Ta=25±0.5°C	3	/	/	mw/°C
4-4.	Time constant	τ	Ta=25±0.5°C	/	/	8	sec
4-5.	Insulation resistance	/	500VDC	100	/	/	MΩ
4-6.	Withstand voltage	/	1800V AC	5	/	/	Sec
4-7.	Operating temp.range	/	/	-30	/	+150	°C

#### 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°C, power on 500±24 hrs, DC0.2mA
5-2.	Low temp. tes		-15±5°C, power on 500±24 hrs, DC0.2mA
5-3.	Endure moisture test		Store in environment 55±2°C,90%-95%RH for 500±24 hrs
5-4.	Temp. cycle test		-20°C×30min→Room temp.×10min→ in 100°C 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、Storage Method



- 6.1 In the process of storage and transportation, per stack height is not more than 4 CTN products.
- 6.2 Available with all transport method, but avoid the rain, snow of direct or indirect leaching and mechanical damage.
- 6.3 Products should be stored in the temperature of environment - 10 °C / + 40 °C, relative humidity is not more than 80%, environment should not have acid, alkali and corrosion gas or radioactive source.

### 7、R—T Table

<b>R—T CONVERSION TABLE</b>							
<b>R<sub>25</sub>=100KΩ±1%</b>				<b>B<sub>25/50</sub>=3950K±1%</b>			
<b>T/°C</b>	<b>Rmin</b>	<b>Rcen</b>	<b>Rmax</b>	<b>T/°C</b>	<b>Rmin</b>	<b>Rcen</b>	<b>Rmax</b>
-40	3095.4092	3238.4826	3385.4731	-2	364.0657	372.6626	381.324
-39	2906.3072	3038.6841	3174.6031	-1	346.1179	354.1083	362.1553
-38	2729.847	2852.3622	2978.0801	0	329.1194	336.5443	344.0188
-37	2565.1117	2678.5312	2794.8464	1	312.3301	319.2056	326.1241
-36	2411.2555	2516.2828	2623.928	2	296.5126	302.8793	309.2832
-35	2267.4987	2364.7801	2464.428	3	281.6046	287.4998	293.427
-34	2133.1218	2223.2513	2315.5197	4	267.548	273.0062	278.4919
-33	2007.4602	2090.9839	2176.4405	5	254.2887	259.3418	264.4185
-32	1889.9006	1967.3209	2046.4875	6	241.7765	246.4541	251.1517
-31	1779.8755	1851.6546	1925.0111	7	229.9647	234.294	238.6403
-30	1676.8611	1743.4245	1811.4125	8	218.8097	222.8159	226.8364
-29	1580.965	1642.7341	1705.7902	9	208.2711	211.9775	215.6959
-28	1491.0528	1548.3833	1606.8762	10	198.3108	201.739	205.1772
-27	1406.7197	1459.9398	1514.2093	11	188.8932	192.0633	195.2415
-26	1327.5907	1377.0032	1427.3627	12	179.9859	182.9163	185.8534
-25	1253.3178	1299.2022	1345.941	13	171.5579	174.2658	176.979
-24	1183.5778	1226.1922	1269.577	14	163.5806	166.0818	168.5873
-23	1118.0711	1157.654	1197.9313	15	156.027	158.3363	160.649
-22	1056.5193	1093.2911	1130.6883	16	148.8721	151.0032	153.1368
-21	998.6634	1032.8277	1067.5551	17	142.0923	144.0578	146.0252
-20	944.2631	976.0082	1008.2599	18	135.6658	137.4775	139.2905
-19	893.4218	922.9362	952.9064	19	129.5721	131.2408	132.9105
-18	845.5528	872.995	900.8471	20	123.7919	125.3278	126.8643
-17	800.4682	825.9851	851.8703	21	118.3071	119.7196	121.1325
-16	757.9931	781.7209	805.7793	22	113.1009	114.3987	115.6967
-15	717.9643	740.0292	762.3905	23	108.1577	109.3489	110.5402
-14	680.2297	700.7487	721.5333	24	103.4624	104.5545	105.6466
-13	644.6471	663.7287	683.048	25	99	100	101



-12	611.0841	628.829	646.7865	26	94.6745	95.6735	96.6726
-11	579.4169	595.9185	612.6099	27	90.5748	91.5711	92.5675
-10	549.5297	564.8747	580.389	28	86.6782	87.6702	88.6623
-9	521.5819	535.8609	550.291	29	82.9732	83.9595	84.946
-8	495.161	508.4469	521.8673	30	79.4496	80.4289	81.4086
-7	470.1777	482.5382	495.0183	31	76.0972	77.0684	78.0401
-6	446.5482	458.0464	469.6507	32	72.9069	73.869	74.8318
-5	424.1938	434.8884	445.677	33	69.87	70.8221	71.7751
-4	403.0405	412.9862	423.0149	34	66.9779	67.9193	68.8617
-3	383.0194	392.267	401.5879	35	64.2231	65.1532	66.0845

**R-T CONVERSION TABLE**R<sub>25</sub>=100KΩ±1%B<sub>25/50</sub>=3950K±1%

T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
36	61.5986	62.5167	63.4362	74	14.7426	15.1778	15.6184
37	59.097	60.0027	60.91	75	14.2465	14.6721	15.1031
38	56.712	57.6049	58.4996	76	13.7693	14.1855	14.6071
39	54.4379	55.3176	56.1993	77	13.3101	13.7171	14.1295
40	52.2684	53.1347	54.0031	78	12.8684	13.2663	13.6697
41	50.1985	51.0511	51.906	79	12.4433	12.8324	13.2269
42	48.2228	49.0615	49.9027	80	12.0338	12.4143	12.8002
43	46.3367	47.1614	47.9888	81	11.6398	12.0118	12.3892
44	44.5355	45.3462	46.1597	82	11.2603	11.624	11.9931
45	42.815	43.6115	44.411	83	10.8947	11.2503	11.6113
46	41.171	41.9534	42.7389	84	10.5427	10.8904	11.2435
47	39.6	40.3682	41.1397	85	10.2034	10.5434	10.8887
48	38.098	38.8521	39.6097	86	9.8668	10.199	10.5365
49	36.6619	37.4019	38.1456	87	9.5422	9.8668	10.1966
50	35.2882	36.0143	36.7441	88	9.2295	9.5466	9.869
51	33.9561	34.6681	35.384	89	8.928	9.2378	9.5529
52	32.6807	33.3787	34.0808	90	8.6374	8.9401	9.248
53	31.4592	32.1434	32.8317	91	8.3572	8.6529	8.9538
54	30.2893	30.9598	31.6345	92	8.087	8.3759	8.67
55	29.1686	29.8255	30.4868	93	7.8263	8.1086	8.396
56	28.0945	28.738	29.386	94	7.5749	7.8507	8.1315
57	27.065	27.6953	28.3301	95	7.3325	7.6019	7.8763
58	26.0782	26.6954	27.3173	96	7.0985	7.3617	7.6299
59	25.132	25.7363	26.3454	97	6.8727	7.1298	7.3919
60	24.2244	24.816	25.4124	98	6.6549	6.9061	7.1622
61	23.3539	23.933	24.517	99	6.4446	6.69	6.9403



62	22.5187	23.0855	23.6573	100	6.2416	6.4814	6.726
63	21.7172	22.2719	22.8316	101	6.0457	6.2799	6.5189
64	20.948	21.4908	22.0387	102	5.8565	6.0853	6.3189
65	20.2095	20.7406	21.2769	103	5.6737	5.8973	6.1256
66	19.5004	20.02	20.5448	104	5.4974	5.7158	5.9389
67	18.8194	19.3278	19.8414	105	5.327	5.5404	5.7584
68	18.1653	18.6626	19.1651	106	5.1624	5.3709	5.584
69	17.5369	18.0233	18.515	107	5.0119	5.2159	5.4244
70	16.9329	17.4087	17.8898	108	4.8667	5.0662	5.2702
71	16.3527	16.818	17.2887	109	4.726	4.9212	5.1209
72	15.7947	16.2498	16.7103	110	4.5902	4.7812	4.9766
73	15.2583	15.7034	16.1539	111	4.4588	4.6457	4.837

**R-T CONVERSION TABLE**R<sub>25</sub>=100KΩ±1%B<sub>25/50</sub>=3950K±1%

T/°C	R <sub>min</sub>	R <sub>cen</sub>	R <sub>max</sub>	T/°C	R <sub>min</sub>	R <sub>cen</sub>	R <sub>max</sub>
112	4.3317	4.5146	4.7018	150	1.5346	1.6161	1.7003
113	4.2088	4.3877	4.5709	151	1.4962	1.576	1.6585
114	4.0899	4.265	4.4443	152	1.4587	1.5369	1.6178
115	3.9727	4.144	4.3195	153	1.4223	1.4989	1.5782
116	3.8593	4.0269	4.1986	154	1.3869	1.462	1.5397
117	3.7496	3.9135	4.0815	155	1.3525	1.4261	1.5023
118	3.6434	3.8038	3.9682	156	1.3192	1.3913	1.466
119	3.5407	3.6976	3.8585	157	1.2867	1.3574	1.4306
120	3.4411	3.5946	3.7521	158	1.255	1.3243	1.3961
121	3.3447	3.4949	3.6491	159	1.2244	1.2923	1.3627
122	3.2514	3.3984	3.5493	160	1.1946	1.2612	1.3302
123	3.1612	3.305	3.4527	161	1.1655	1.2308	1.2984
124	3.0735	3.2143	3.3589	162	1.1372	1.2012	1.2675
125	2.9888	3.1266	3.2681	163	1.1099	1.1726	1.2376
126	2.9068	3.0416	3.1801	164	1.0831	1.1446	1.2084
127	2.8272	2.9591	3.0947	165	1.0571	1.1174	1.1799
128	2.7501	2.8792	3.012	166	1.032	1.0911	1.1524
129	2.6753	2.8017	2.9317	167	1.0073	1.0653	1.1255
130	2.6029	2.7266	2.8539	168	0.9835	1.0403	1.0993
131	2.5327	2.6538	2.7784	169	0.9602	1.0159	1.0738
132	2.4646	2.5832	2.7052	170	0.9375	0.9922	1.049
133	2.3987	2.5148	2.6343	171	0.9155	0.9691	1.0248
134	2.3347	2.4483	2.5653	172	0.8939	0.9465	1.0011
135	2.2727	2.384	2.4986	173	0.873	0.9246	0.9782



136	2.2126	2.3215	2.4337	174	0.8527	0.9033	0.9559
137	2.1541	2.2608	2.3707	175	0.833	0.8826	0.9342
138	2.0974	2.2019	2.3096	176	0.8136	0.8623	0.9129
139	2.0425	2.1448	2.2503	177	0.7949	0.8426	0.8922
140	1.9892	2.0894	2.1927	178	0.7766	0.8234	0.8721
141	1.9374	2.0355	2.1367	179	0.7588	0.8047	0.8525
142	1.8872	1.9833	2.0824	180	0.7415	0.7866	0.8335
143	1.8385	1.9326	2.0297	181	0.7246	0.7688	0.8148
144	1.7912	1.8834	1.9786	182	0.708	0.7514	0.7966
145	1.7452	1.8355	1.9287	183	0.6921	0.7347	0.779
146	1.7006	1.789	1.8803	184	0.6764	0.7182	0.7617
147	1.6573	1.7439	1.8334	185	0.6612	0.7022	0.7449
148	1.6152	1.7001	1.7878	186	0.6464	0.6866	0.7285
149	1.5743	1.6575	1.7434	187	0.6319	0.6714	0.7126

**R-T CONVERSION TABLE**

R<sub>25</sub>=100KΩ±1%      B<sub>25/50</sub>=3950K±1%

T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
188	0.6178	0.6565	0.6969	226	0.2747	0.2943	0.3149
189	0.6041	0.6421	0.6818	227	0.2691	0.2884	0.3087
190	0.5907	0.628	0.6669	228	0.2639	0.2828	0.3027
191	0.5777	0.6143	0.6525	229	0.2586	0.2772	0.2968
192	0.5649	0.6009	0.6384	230	0.2535	0.2718	0.2911
193	0.5525	0.5878	0.6247	231	0.2484	0.2664	0.2853
194	0.5403	0.575	0.6112	232	0.2436	0.2613	0.2799
195	0.5286	0.5626	0.5981	233	0.2387	0.2561	0.2744
196	0.517	0.5504	0.5853	234	0.234	0.2511	0.2691
197	0.5058	0.5386	0.5729	235	0.2295	0.2463	0.264
198	0.4949	0.5271	0.5608	236	0.225	0.2415	0.2589
199	0.4842	0.5158	0.5489	237	0.2206	0.2369	0.254
200	0.4737	0.5048	0.5373	238	0.2163	0.2323	0.2491
201	0.4635	0.494	0.5259	239	0.2121	0.2278	0.2444
202	0.4536	0.4835	0.5148	240	0.208	0.2235	0.2398
203	0.4439	0.4733	0.5041	241	0.204	0.2192	0.2352
204	0.4344	0.4633	0.4935	242	0.2	0.215	0.2308
205	0.4252	0.4536	0.4833	243	0.1963	0.211	0.2265
206	0.4162	0.4441	0.4733	244	0.1924	0.2069	0.2222
207	0.4074	0.4348	0.4634	245	0.1888	0.203	0.218
208	0.3988	0.4257	0.4538	246	0.1852	0.1992	0.214
209	0.3905	0.4169	0.4446	247	0.1817	0.1955	0.21



**Dongguan Ampfort Electronics Co., Ltd.**

**东莞市安伏特电子有限公司**

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210	0.3824	0.4083	0.4355	248	0.1782	0.1918	0.2061
211	0.3743	0.3998	0.4265	249	0.1749	0.1882	0.2023
212	0.3666	0.3916	0.4178	250	0.1716	0.1847	0.1985
213	0.359	0.3836	0.4094				
214	0.3514	0.3756	0.4009				
215	0.3443	0.368	0.3929				
216	0.3371	0.3604	0.3849				
217	0.3302	0.3531	0.3771				
218	0.3235	0.346	0.3696				
219	0.3169	0.339	0.3622				
220	0.3104	0.3322	0.355				
221	0.304	0.3254	0.3478				
222	0.298	0.319	0.3411				
223	0.2919	0.3125	0.3342				
224	0.286	0.3063	0.3276				
225	0.2803	0.3002	0.3212				