



Dongguan Tianrui Electronics Co., Ltd

东莞市天瑞电子有限公司

No.: AFT-CWF06013L

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Specification For Approval

Customer name : _____

Product name : **NTC Thermistor**

Customer PN : **G12/50KOhm**

MFG PN : **CWF503F3950FA151DU12**

MFG			Customer Confirmation		
Make	Check	Approval	Test	Check	Approval

(Company name)

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

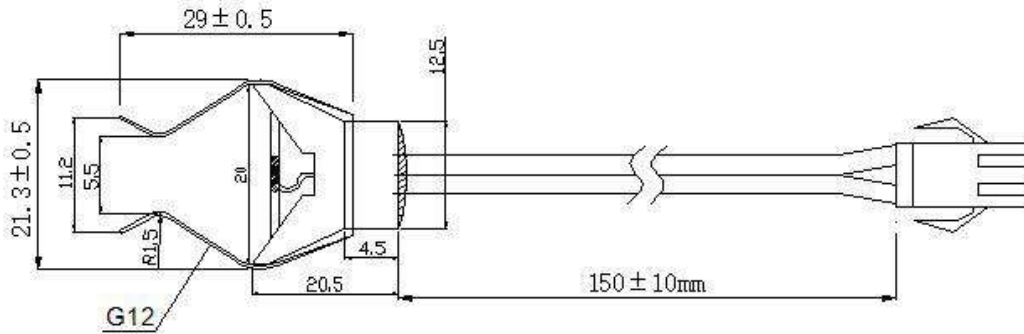
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1、Overall Dimension

(Unit: mm)



2、Material Explanation

NO.	Name	Specification/Model
2-1.	Lead Wire	UL3266-26AWG*2P 125°C 300V (Black) L=150±10mm
2-2.	Thermistor	R25=50KΩ±1% B25/50=3950K±1% MF58R
2-3.	Pipe clamp	G12Pipe clamp Manganese steel nickel plating
2-4.	Molded case	P66 Black Nylon 12#Type
2-5.	Epoxy resin	J105/J106/J-05X G108/GU01/GU-Mz Black
2-6.	Terminal	SM-PT Terminal
2-7.	Glue base	SM-2P Black
2-8.	Silicone	704 One-component silicone
2-9.	Copper sheet	18*12*T0.1 Phosphorus copper sheet
2-10.	Film	Polyimide film
2-11.	Thermal grease	Non-dry thermal grease
2-12.	Sleeve	ø1.0 Black heat shrinkable sleeve 125°C
2-13.	Cable skin	Cable skin 18mm

3、Electrical Performance

NO	Item	Sign	Test Conditions	Min.	Normal value	Max.	Unit
3-1.	Resistance at 25°C	R25	Ta=25±0.05°C P _T ≤ 0.1mw	49.5	50	50.5	KΩ
3-2.	B Value	B25/50	$B=LN \frac{R_{T1}}{R_{T2}} / (\frac{1}{T1} - \frac{1}{T2})$	3910.5	3950	3989.5	k
3-3.	Dissipation factor	σ	Ta=25±0.5°C	3.0	/	/	mw/°C
3-4.	Time constant	τ	Ta=25±0.5°C	/	/	8.0	sec
3-5.	Insulation resistance	/	500VDC	100	/	/	MΩ



3-6	High-voltage Insulation Test	/	1500VAC	5			Sec
3-7	Operating temp.range	/	/	-30	/	+125	°C

4、Reliability Test

NO	Item	Technical requirements	Test conditions and method
4-1.	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
4-2.	Low temp. tes		-10±5°C, power on 500±24 hrs, DC0.2mA
4-3.	Endure moisture test		Store in environment 55±2°C,90%-95%RH for 240±24 hrs
4-4.	Temp. cycle test		-20°C×30min→Room temp.×10min→ in 100°C water×30min→Room temp.×10min 10 cycles
4-5	Load electrify test		Power on DC1mA,500hrs in room temp. and humid.
4-6	Drop test		Free fall into concrete floor from height 1m , 10 cycle.
4-7	Vibration test		Frequency range: 10~55HZ Total amplitude 1.52mm 1 cycle 1 min , direction and time X、 Y、 Z axis 2Hr each.
4-8	Bending test		Bend 180°binding site wire and epoxy resin. Back and forth 10 times

5、Part Number :

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

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 Conversion Table

R—T CONVERSION TABLE							
R25=50KΩ±1%				B25/50=3950K±1%			
T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
-30	848.3	881.8	916.6	8	107.6	109.5	111.5
-29	797.9	828.9	861.1	9	102.6	104.4	106.2
-28	750.8	779.5	809.2	10	97.79	99.46	101.1
-27	706.8	733.4	760.9	11	93.27	94.82	96.38
-26	665.6	690.2	715.7	12	88.99	90.42	91.87
-25	627.1	649.9	673.5	13	84.93	86.25	87.59
-24	591.1	612.2	634.0	14	81.07	82.30	83.54
-23	557.3	576.9	597.1	15	77.41	78.55	79.69
-22	525.7	543.8	562.5	16	73.94	74.99	76.05
-21	496.0	512.9	530.2	17	70.64	71.61	72.59
-20	468.3	483.8	499.9	18	67.51	68.40	69.30
-19	442.2	456.7	471.5	19	64.53	65.36	66.19
-18	417.8	431.2	445.0	20	61.70	62.46	63.23
-17	394.8	407.2	420.0	21	59.01	59.71	60.42
-16	373.3	384.8	396.7	22	56.45	57.10	57.75
-15	353.0	363.7	374.7	23	54.02	54.61	55.21
-14	334.0	343.9	354.1	24	51.70	52.25	52.79
-13	316.1	325.3	334.8	25	49.50	50.00	50.50
-12	299.3	307.8	316.6	26	47.36	47.86	48.36
-11	283.5	291.4	299.6	27	45.32	45.82	46.32
-10	268.6	275.9	283.5	28	43.39	43.88	44.38
-9	254.5	261.4	268.4	29	41.54	42.03	42.53
-8	241.3	247.7	254.2	30	39.79	40.27	40.77
-7	228.9	234.8	240.8	31	38.11	38.60	39.08
-6	217.2	222.7	228.3	32	36.52	37.00	37.48
-5	206.1	211.2	216.4	33	35.00	35.47	35.95
-4	195.7	200.4	205.2	34	33.55	34.02	34.49
-3	185.8	190.2	194.7	35	32.17	32.63	33.10
-2	176.5	180.6	184.8	36	30.85	31.31	31.77
-1	167.8	171.6	175.4	37	29.59	30.05	30.50
0	159.5	163.0	166.6	38	28.40	28.84	29.29
1	151.7	154.9	158.3	39	27.25	27.69	28.13



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2	144.3	147.3	150.4	40	26.16	26.59	27.03
3	137.3	140.1	143.0	41	25.12	25.54	25.97
4	130.7	133.3	136.0	42	24.12	24.54	24.96
5	124.4	126.9	129.3	43	23.17	23.58	23.99
6	118.5	120.8	123.0	44	22.26	22.66	23.07
7	112.9	115.0	117.1	45	21.39	21.79	22.19

R-T CONVERSION TABLE

R25=50KΩ±1% B25/50=3950K±1%

T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
46	20.56	20.95	21.34	84	5.242	5.414	5.591
47	19.76	20.15	20.53	85	5.074	5.242	5.415
48	19.00	19.38	19.76	86	4.911	5.076	5.245
49	18.28	18.64	19.02	87	4.755	4.916	5.081
50	17.58	17.94	18.31	88	4.604	4.761	4.923
51	16.92	17.27	17.63	89	4.459	4.612	4.771
52	16.28	16.63	16.98	90	4.319	4.469	4.624
53	15.67	16.01	16.35	91	4.183	4.330	4.482
54	15.08	15.42	15.76	92	4.053	4.197	4.345
55	14.52	14.85	15.18	93	3.927	4.068	4.213
56	13.99	14.31	14.63	94	3.806	3.944	4.085
57	13.47	13.79	14.11	95	3.689	3.824	3.962
58	12.98	13.29	13.60	96	3.576	3.708	3.843
59	12.51	12.81	13.11	97	3.467	3.596	3.729
60	12.06	12.35	12.65	98	3.362	3.488	3.618
61	11.62	11.91	12.20	99	3.261	3.384	3.511
62	11.21	11.49	11.77	100	3.163	3.283	3.407
63	10.81	11.08	11.36	101	3.068	3.186	3.307
64	10.42	10.69	10.97	102	2.977	3.091	3.211
65	10.05	10.32	10.59	103	2.888	3.001	3.117
66	9.700	9.958	10.22	104	2.803	2.913	3.027
67	9.361	9.613	9.870	105	2.720	2.828	2.940
68	9.035	9.281	9.533	106	2.641	2.746	2.855
69	8.722	8.963	9.209	107	2.564	2.667	2.773
70	8.421	8.657	8.898	108	2.489	2.590	2.694
71	8.132	8.362	8.598	109	2.417	2.516	2.618
72	7.854	8.079	8.310	110	2.348	2.444	2.544
73	7.587	7.807	8.033	111	2.280	2.375	2.473
74	7.330	7.546	7.767	112	2.215	2.307	2.403



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75	7.084	7.294	7.510	113	2.152	2.243	2.336
76	6.846	7.052	7.263	114	2.091	2.180	2.271
77	6.618	6.819	7.026	115	2.032	2.119	2.209
78	6.398	6.595	6.797	116	1.975	2.060	2.148
79	6.187	6.379	6.577	117	1.920	2.003	2.089
80	5.983	6.171	6.365	118	1.867	1.948	2.032
81	5.787	5.971	6.161	119	1.815	1.894	1.977
82	5.599	5.779	5.964	120	1.765	1.842	1.923
83	5.417	5.593	5.774	121	1.716	1.792	1.871

R-T CONVERSION TABLE

R25=50KΩ±1%

B25/50=3950K±1%

T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
122	1.669	1.744	1.821	160	0.6293	0.6637	0.6999
123	1.624	1.697	1.772	161	0.6145	0.6483	0.6838
124	1.580	1.651	1.725	162	0.6001	0.6332	0.6681
125	1.537	1.607	1.680	163	0.5861	0.6186	0.6529
126	1.495	1.564	1.635	164	0.5725	0.6044	0.6380
127	1.455	1.522	1.592	165	0.5593	0.5906	0.6236
128	1.416	1.482	1.550	166	0.5464	0.5771	0.6095
129	1.379	1.443	1.510	167	0.5339	0.5640	0.5958
130	1.342	1.405	1.471	168	0.5217	0.5512	0.5824
131	1.307	1.368	1.433	169	0.5098	0.5388	0.5694
132	1.272	1.333	1.396	170	0.4982	0.5267	0.5567
133	1.239	1.298	1.360	171	0.4869	0.5149	0.5444
134	1.207	1.265	1.325	172	0.4760	0.5034	0.5324
135	1.176	1.232	1.291	173	0.4653	0.4922	0.5206
136	1.145	1.201	1.259	174	0.4549	0.4813	0.5092
137	1.116	1.170	1.227	175	0.4448	0.4707	0.4981
138	1.087	1.140	1.196	176	0.4349	0.4604	0.4873
139	1.059	1.111	1.166	177	0.4253	0.4503	0.4767
140	1.032	1.083	1.137	178	0.4159	0.4404	0.4664
141	1.006	1.056	1.109	179	0.4068	0.4309	0.4564
142	0.9806	1.030	1.081	180	0.3979	0.4215	0.4466
143	0.9560	1.004	1.055	181	0.3892	0.4124	0.4370
144	0.9320	0.9792	1.029	182	0.3807	0.4036	0.4277
145	0.9087	0.9550	1.003	183	0.3725	0.3949	0.4186
146	0.8861	0.9315	0.9790	184	0.3645	0.3865	0.4098
147	0.8642	0.9086	0.9552	185	0.3566	0.3783	0.4012



148	0.8429	0.8864	0.9321	186	0.3490	0.3702	0.3927
149	0.8222	0.8649	0.9097	187	0.3415	0.3624	0.3845
150	0.8020	0.8439	0.8878	188	0.3343	0.3548	0.3765
151	0.7825	0.8235	0.8666	189	0.3272	0.3474	0.3687
152	0.7635	0.8037	0.8460	190	0.3203	0.3401	0.3611
153	0.7450	0.7845	0.8259	191	0.3136	0.3330	0.3536
154	0.7270	0.7657	0.8064	192	0.3070	0.3261	0.3464
155	0.7096	0.7475	0.7874	193	0.3006	0.3194	0.3393
156	0.6926	0.7298	0.7689	194	0.2943	0.3128	0.3324
157	0.6761	0.7126	0.7510	195	0.2882	0.3064	0.3256
158	0.6600	0.6958	0.7335	196	0.2823	0.3001	0.3190
159	0.6444	0.6795	0.7165	197	0.2765	0.2940	0.3126

R-T CONVERSION TABLE

R₂₅=50KΩ±1%

B_{25/50}=3950K±1%

T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
198	0.2708	0.2880	0.3063	235	0.1322	0.1416	0.1516
199	0.2653	0.2822	0.3002	236	0.1298	0.1390	0.1489
200	0.2599	0.2765	0.2942	237	0.1275	0.1366	0.1463
201	0.2546	0.2709	0.2883	238	0.1252	0.1342	0.1438
202	0.2495	0.2655	0.2826	239	0.1230	0.1318	0.1413
203	0.2444	0.2602	0.2770	240	0.1208	0.1295	0.1388
204	0.2395	0.2551	0.2716	241	0.1186	0.1272	0.1364
205	0.2347	0.2500	0.2662	242	0.1165	0.1250	0.1340
206	0.2301	0.2451	0.2610	243	0.1145	0.1228	0.1317
207	0.2255	0.2402	0.2560	244	0.1125	0.1207	0.1295
208	0.2210	0.2355	0.2510	245	0.1105	0.1186	0.1273
209	0.2167	0.2309	0.2461	246	0.1086	0.1166	0.1251
210	0.2124	0.2264	0.2414	247	0.1067	0.1146	0.1230
211	0.2082	0.2221	0.2368	248	0.1049	0.1126	0.1209
212	0.2042	0.2178	0.2322	249	0.1031	0.1107	0.1188
213	0.2002	0.2136	0.2278	250	0.1013	0.1088	0.1168
214	0.1963	0.2095	0.2235				
215	0.1925	0.2055	0.2192				
216	0.1888	0.2015	0.2151				
217	0.1852	0.1977	0.2111				
218	0.1817	0.1940	0.2071				
219	0.1782	0.1903	0.2032				
220	0.1748	0.1867	0.1994				



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221	0.1715	0.1832	0.1957				
222	0.1683	0.1798	0.1921				
223	0.1651	0.1765	0.1886				
224	0.1620	0.1732	0.1851				
225	0.1590	0.1700	0.1817				
226	0.1560	0.1669	0.1784				
227	0.1532	0.1638	0.1752				
228	0.1503	0.1608	0.1720				
229	0.1476	0.1579	0.1689				
230	0.1448	0.1550	0.1659				
231	0.1422	0.1522	0.1629				
232	0.1396	0.1495	0.1600				
233	0.1371	0.1468	0.1571				
234	0.1346	0.1441	0.1543				