



Specifications Approval Sheet

CUSTOMER: _____

CUSTOMER P/N: _____

PART NAME: _____ NTC Temperature Sensor

PART NUMBER: _____ TS104F25C3950FA-ML130A

DATE: _____

Manufacturer:

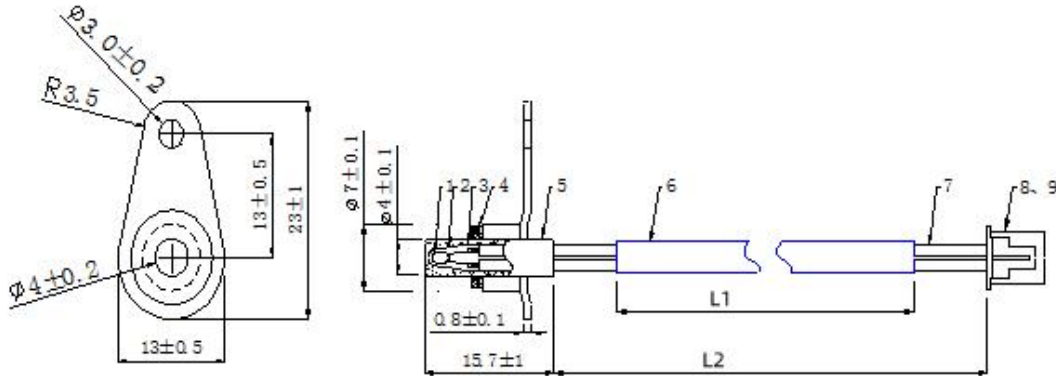
Draft	Check	Approval

For Customer Approval:

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1. Structure, Dimensions & Materials

mm



NO.	Material	Specification
1	Thermistor	R25=100K $\Omega \pm 1\%$ B(25/50)=3950K $\pm 1\%$
2	Epoxy	Black
3	Epoxy	Black
4	Seal ring	Black Silicone Pad
5	Housing	Stainless steel brass assembly
6	Tube	Single-layer fiberglass sleeve is white without print
7	Cable	UL3312 AWG24 black
8	Terminal	XHB-T
9	Connector	XHB-2Y white

2、产品规格型号表示方法

TS	104	F	25C	3950	F	A	-	M	L130	A
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩	

①

②

③

④

⑤

⑥

Product Series Code		Resistance @25°C		R ₂₅ Tolerance		Test Temp. of Resistance		B-value		B-value Tolerance	
TS	TS Series Temperature sensor	104	10×10 ⁴ Ω	F	±1%	25C	25°C	3950	B=3950K	F	±1%

⑦

⑧

⑨

⑩

Test Temp. of B-value		Head Material		Length		Distinguishing Code	
A	25/50°C	M	Metal	L130	130mm	A	First

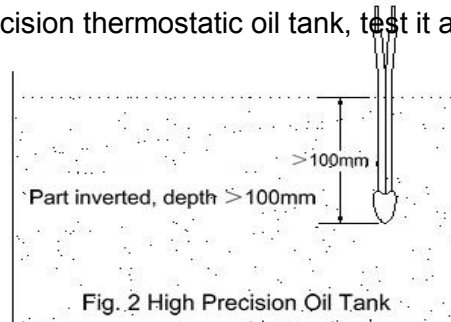
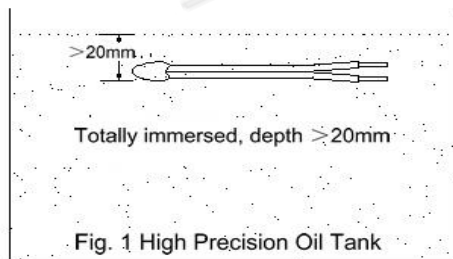
3、Electronic Parameter Specification

No.	Item	Symbol	Test condition	Min.	Nor.	Max.	Unit
3-1	Resistance @25°C	R ₂₅	T _a =25±0.05°C P _T ≤0.1mw	99	100	101	KΩ
3-2	B-value	B _{25/50}	$B=LN \frac{R_{T1}}{R_{T2}} / \left(\frac{1}{T_1} - \frac{1}{T_2} \right)$	3910.5	3950	3989.5	K
3-3	Dissipation factor	δ	T _a =25±0.5°C	2.6	/	/	mW/°C
3-4	Thermal time constant	τ	T _a =25±0.5°C	/	/	16	Sec
3-5	Insulation test	/	500VDC	100	/	/	MΩ
3-6	Withstand voltage test	/	2000V AC, 0.5mA	/	/	5	Sec
3-7	Rated power	/	T _a =25±0.5°C	/	/	10	mW
3-8	Operating temp. range	/	/	-30	/	+200	°C

Note: Test condition:

(1).Resistance @25°C:

Place the product in the 25°C±0.05°C high precision thermostatic oil tank, test it after 10 min

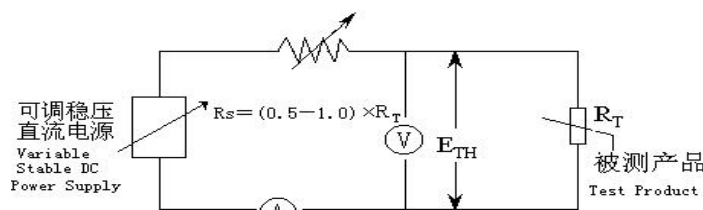


(2).According to the part number, test the resistance at T1 and T2.

In the oil tank, test the resistance value of 25±0.05°C and 50±0.05°C. B-value is an index of the thermal sensitivity expressed by the formula:

$$B_{t1/t2} = \ln(R_{t1}/R_{t2}) / \left(\frac{1}{(t_1+273.15)} - \frac{1}{(t_2+273.15)} \right)$$

(3). The product will be join with the following circuit at 25±0.5°C in still air.



调整 I_{TH} 使 $\frac{E_{TH}}{I_{TH}} = R_{25°C}$, 然后按下式计算:

Adjust I_{TH} for then:

$$\delta = \frac{E_{TH} \cdot I_{TH}}{85°C - 25°C} \text{ (mw/°C)}$$

(4). Test equipment: 25±0.5°C thermostatic water tank & 85±0.5°C thermostatic water tank

Connect the product to the resistance meter, place it in the 25°C water until the resistance become stable, and then move it to 85°C water from 25°C water, in the meanwhile, set off the timer when the product be take out of the 25°C water tank, once the product rise to the temperature which is 63.2% of the temperature difference, timer should be stopped, this time period represents the thermal time constant.

(5). Set the tester to DC 500V, connect the 2 lead wires as an electrode and put the head into the steel balls as another electrode, then start the testing. Insulation resistance: $R \geq 100M\Omega$.

(6). Set the tester to AC 2000V ,0.5mA, 5sec, connect the 2 lead wires as an electrode and put the head into the steel balls as another electrode, then start the testing; There should not be breakdown and flashover.

4、Reliability Characteristics

NO	Description	Requirement	Testing method and condition
4-1	High temp test	After the above performance test, the withstand voltage and insulation performance have no change	200±5°C in air for 1000hrs.
4-2	Low temp test		-30±5°C in air for 1000hrs
4-3	Temperature cycle		0°C×30min→room temp.×10min→100°C×30min10 cycles
4-4	Electric charge test		Charged DC0.2mA, 1000 hours in normal temp. and humidity.
4-5	Rocking test		After 20 consecutive swings on the dedicated swing test stand, the swing test stand shows a constant conduction state
4-6	Lead wire strength tensile		Apply force of 20N to the lead wire for 1 min
4-7	Terminal and lead tension		Apply 20N longitudinal tension to the core riveting position
4-8	Drop test		Drop it onto concrete floor from 1 meter height, 3 times

5、Storage & Packing method

5-1.The height of each pile should be no more than 4 levels during storage and transportation.

5-2. Put desiccant in each packing bag; Protect it from the rain, snow and mechanical damage.

5-3. Should not close to the acidoid, alkali and corrosion gas or radioactive source.

Storage temperature: 15°C~40°C, relative humidity: ≤75%.



6、R-T Table

Part No.: TS104F25C3950FA-ML130A R25=100K Ω \pm 1% B(25/50)=3950K \pm 1%

Temp(°C)	R _{min} (K Ω)	R _{nor} (K Ω)	R _{max} (K Ω)	Temp(°C)	R _{min} (K Ω)	R _{nor} (K Ω)	R _{max} (K Ω)
-30	1681.732	1749.239	1816.74	13	170.166	172.840	175.514
-29	1581.351	1643.767	1706.18	14	162.466	164.941	167.415
-28	1487.709	1545.440	1603.17	15	155.165	157.454	159.743
-27	1400.306	1453.723	1507.14	16	148.172	150.287	152.402
-26	1318.684	1368.127	1417.57	17	141.540	143.493	145.446
-25	1242.421	1288.201	1333.98	18	135.247	137.049	138.851
-24	1171.129	1213.531	1255.93	19	129.274	130.936	132.598
-23	1104.449	1143.736	1183.02	20	123.602	125.134	126.666
-22	1042.051	1078.464	1114.88	21	118.164	119.574	120.983
-21	983.633	1017.391	1051.15	22	113.000	114.296	115.591
-20	928.913	960.220	991.527	23	108.094	109.284	110.474
-19	877.942	906.997	936.053	24	103.432	104.523	105.615
-18	830.136	857.108	884.081	25	99.000	100.000	101.000
-17	785.275	810.322	835.368	26	94.725	95.724	96.723
-16	743.161	766.423	789.686	27	90.662	91.658	92.655
-15	703.605	725.217	746.828	28	86.798	87.790	88.782
-14	666.435	686.518	706.601	29	83.123	84.109	85.096
-13	631.493	650.159	668.824	30	79.626	80.606	81.585
-12	598.630	615.982	633.334	31	76.233	77.205	78.177
-11	567.708	583.843	599.977	32	73.006	73.968	74.931
-10	538.601	553.606	568.610	33	69.935	70.887	71.840
-9	510.356	524.281	538.205	34	67.012	67.954	68.896
-8	483.788	496.713	509.637	35	64.228	65.159	66.090
-7	458.788	470.786	482.784	36	61.604	62.523	63.442
-6	435.253	446.392	457.531	37	59.103	60.009	60.916
-5	413.087	423.430	433.772	38	56.718	57.612	58.506
-4	392.352	401.961	411.570	39	54.444	55.325	56.206
-3	372.800	381.728	390.656	40	52.275	53.143	54.010
-2	354.355	362.651	370.948	41	50.173	51.027	51.880
-1	336.949	344.658	352.368	42	48.168	49.007	49.847
0	320.516	327.680	334.844	43	46.255	47.080	47.906
1	302.312	308.883	315.454	44	44.429	45.240	46.052
2	285.263	291.289	297.315	45	42.686	43.483	44.280
3	269.289	274.814	280.339	46	41.000	41.782	42.565
4	254.315	259.380	264.445	47	39.390	40.158	40.926
5	240.273	244.915	249.557	48	37.853	38.606	39.360
6	230.526	234.880	239.233	49	36.385	37.124	37.863
7	221.240	225.323	229.406	50	35.154	35.881	36.607
8	212.390	216.219	220.048	51	33.645	34.355	35.066
9	203.954	207.544	211.134	52	32.366	33.063	33.759
10	195.908	199.275	202.641	53	31.144	31.826	32.509
11	186.860	189.978	193.097	54	29.975	30.644	31.312
12	178.288	181.176	184.065	55	28.856	29.511	30.167



Temp(°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	Temp(°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
56	27.787	28.429	29.071	102	5.956	6.191	6.425
57	26.764	27.393	28.021	103	5.779	6.008	6.237
58	25.785	26.400	27.016	104	5.607	5.831	6.055
59	24.846	25.449	26.052	105	5.442	5.661	5.880
60	23.948	24.538	25.128	106	5.284	5.498	5.713
61	23.094	23.672	24.250	107	5.131	5.341	5.551
62	22.277	22.842	23.408	108	4.983	5.189	5.394
63	21.492	22.046	22.600	109	4.841	5.042	5.242
64	20.740	21.282	21.824	110	4.703	4.899	5.096
65	20.018	20.549	21.079	111	4.568	4.761	4.953
66	19.316	19.835	20.355	112	4.438	4.627	4.815
67	18.643	19.151	19.659	113	4.313	4.497	4.682
68	17.996	18.493	18.991	114	4.191	4.372	4.552
69	17.376	17.862	18.349	115	4.074	4.251	4.427
70	16.781	17.256	17.732	116	3.960	4.133	4.306
71	16.219	16.685	17.150	117	3.851	4.020	4.189
72	15.680	16.135	16.591	118	3.744	3.910	4.076
73	15.161	15.607	16.053	119	3.642	3.804	3.966
74	14.663	15.099	15.535	120	3.542	3.701	3.860
75	14.183	14.610	15.037	121	3.443	3.598	3.754
76	13.697	14.115	14.532	122	3.347	3.499	3.651
77	13.231	13.639	14.047	123	3.254	3.403	3.552
78	12.783	13.182	13.581	124	3.164	3.309	3.455
79	12.353	12.743	13.133	125	3.077	3.219	3.362
80	11.939	12.321	12.702	126	2.992	3.132	3.272
81	11.548	11.920	12.293	127	2.911	3.048	3.184
82	11.171	11.535	11.900	128	2.832	2.966	3.100
83	10.809	11.165	11.521	129	2.755	2.887	3.018
84	10.460	10.808	11.157	130	2.681	2.810	2.938
85	10.124	10.465	10.806	131	2.615	2.740	2.866
86	9.800	10.134	10.467	132	2.550	2.673	2.797
87	9.489	9.815	10.141	133	2.487	2.608	2.729
88	9.189	9.507	9.826	134	2.426	2.544	2.663
89	8.899	9.211	9.523	135	2.366	2.483	2.599
90	8.621	8.926	9.231	136	2.309	2.423	2.537
91	8.349	8.647	8.946	137	2.253	2.365	2.477
92	8.088	8.379	8.671	138	2.199	2.309	2.419
93	7.836	8.121	8.406	139	2.146	2.254	2.362
94	7.593	7.871	8.150	140	2.095	2.201	2.307
95	7.359	7.631	7.904	141	2.042	2.146	2.250
96	7.138	7.405	7.672	142	1.992	2.094	2.195
97	6.926	7.187	7.448	143	1.942	2.042	2.142
98	6.720	6.976	7.231	144	1.895	1.993	2.090
99	6.522	6.772	7.022	145	1.848	1.944	2.040
100	6.331	6.576	6.821	146	1.803	1.897	1.991
101	6.141	6.380	6.619	147	1.759	1.852	1.944



T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
148	1.717	1.808	1.898	195	0.590	0.628	0.666
149	1.676	1.765	1.853	196	0.577	0.615	0.652
150	1.636	1.723	1.810	197	0.565	0.602	0.639
151	1.596	1.681	1.767	198	0.554	0.590	0.626
152	1.557	1.641	1.725	199	0.543	0.578	0.614
153	1.520	1.602	1.684	200	0.532	0.566	0.601
154	1.484	1.564	1.645	201	0.520	0.555	0.589
155	1.448	1.528	1.607	202	0.510	0.543	0.577
156	1.414	1.492	1.569	203	0.499	0.532	0.565
157	1.381	1.457	1.533	204	0.489	0.521	0.554
158	1.348	1.423	1.498	205	0.479	0.511	0.543
159	1.317	1.390	1.463	206	0.469	0.501	0.532
160	1.286	1.358	1.430	207	0.460	0.491	0.522
161	1.257	1.327	1.398	208	0.450	0.481	0.511
162	1.228	1.297	1.366	209	0.441	0.471	0.501
163	1.199	1.267	1.335	210	0.432	0.462	0.491
164	1.172	1.239	1.305	211	0.424	0.453	0.482
165	1.145	1.211	1.276	212	0.415	0.444	0.472
166	1.119	1.183	1.247	213	0.407	0.435	0.463
167	1.093	1.156	1.219	214	0.399	0.427	0.454
168	1.068	1.130	1.192	215	0.391	0.418	0.445
169	1.044	1.105	1.165	216	0.384	0.410	0.437
170	1.020	1.080	1.139	217	0.376	0.402	0.428
171	0.997	1.056	1.114	218	0.369	0.395	0.420
172	0.975	1.032	1.090	219	0.362	0.387	0.412
173	0.953	1.009	1.066	220	0.355	0.380	0.405
174	0.932	0.987	1.042	221	0.348	0.372	0.397
175	0.911	0.965	1.020	222	0.341	0.365	0.390
176	0.891	0.944	0.998	223	0.335	0.359	0.382
177	0.871	0.924	0.976	224	0.328	0.352	0.375
178	0.852	0.904	0.955	225	0.322	0.345	0.368
179	0.833	0.884	0.935	226	0.316	0.339	0.361
180	0.815	0.865	0.915	227	0.310	0.332	0.355
181	0.797	0.846	0.895	228	0.304	0.326	0.348
182	0.780	0.828	0.876	229	0.299	0.320	0.342
183	0.763	0.810	0.857	230	0.293	0.314	0.335
184	0.746	0.792	0.839	231	0.287	0.308	0.329
185	0.730	0.776	0.821	232	0.282	0.303	0.323
186	0.714	0.759	0.804	233	0.277	0.297	0.317
187	0.699	0.743	0.787	234	0.272	0.292	0.312
188	0.684	0.727	0.770	235	0.267	0.286	0.306
189	0.669	0.712	0.754	236	0.262	0.281	0.300
190	0.655	0.697	0.738	237	0.257	0.276	0.295
191	0.641	0.682	0.723	238	0.252	0.271	0.290
192	0.628	0.668	0.708	239	0.248	0.266	0.285
193	0.615	0.654	0.694	240	0.243	0.261	0.280
194	0.602	0.641	0.679	241	0.239	0.257	0.275



Temp(°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	Temp(°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
242	0.235	0.252	0.270	247	0.215	0.231	0.247
243	0.231	0.248	0.265	248	0.211	0.227	0.243
244	0.226	0.243	0.261	249	0.207	0.223	0.239
245	0.222	0.239	0.256	250	0.204	0.219	0.235
246	0.218	0.235	0.252				

