



Specifications Approval Sheet

CUSTOMER: _____

CUSTOMER P/N: _____

PART NAME: _____ NTC Temperature Sensor _____

PART NUMBER: _____ (OTS-OP-E-482) _____

DATE: _____

Manufacturer:

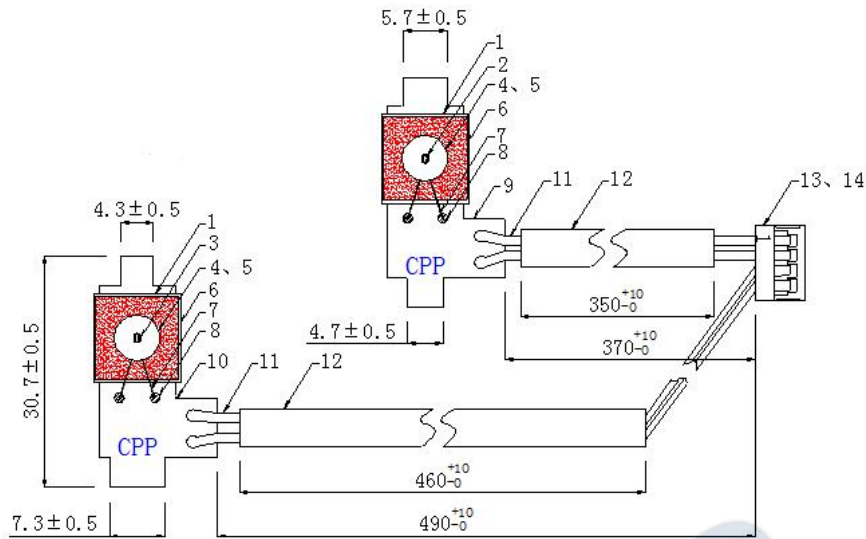
Drawn by	Checked by	Approved by

For Customer Approval:

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1. Structure, Dimensions & Material

Unit: mm



No.	Name	Specification
1	Teflon film	Amber
2	NTC Thermistor Glass Bead 2	R200=3.7KΩ±5% B(100/200)=5108K±3% (THM 3)
3	NTC Thermistor Glass Bead 1	R100=3.3KΩ±5% B(100/200)=4353K±3% (THM 1)
4	Copper foil	Copper foil
5	Silicone	White
6	Sponge foam	Orange Red
7	Sleeve	Brown
8	Silicone	White
9	PCB of Thermistor 1	No.8, with letters "CPP" in Blue on the front, and letters "FM2 9766 1C2" in white on the back
10	PCB of Thermistor 2	No.9, with letters "CPP" in Blue on the front, and letters "FM2 9766 3C2" in white on the back
11	Internal Wire	(THM 3) Thermistor 1: UL1332 #22AWG White, Length 370+10/-0mm
		(THM 1) Thermistor 2: UL1332 #22AWG White, Length 490+10/-0mm
12	Silicone Sleeve	(THM 3) Thermistor 1: Silicon sleeve in White Length 350+10/-0mm
		(THM 1) Thermistor 2: Silicon sleeve in White Length 460+10/-0mm
13	Terminal	179609-1
14	Connector	179228-4 White

2. Part Number Identification

OTS	OP	E	-	482
①	②	③	④	⑤

① Product Series Code		② Product Type		③ Resistance & B-value		④ Length	
OTS	Office Temperature sensor	OP	P type	E	R200=3.7KΩ±5% B(100/200)=5108K±3% R100=3.3KΩ±5% B(100/200)=4353K±3%	482	482mm

3. Electronic Performance

No.	Item	Symbol	Test Condition	Min	Nor	Max	Unit
3-1	Resistance @200℃	R ₂₀₀	T _a =200±0.05℃ P _T ≤0.1mW	3.515	3.7	3.885	KΩ
3-2	Beta Value	B _{100/200}	$B=LN \frac{R_{T1}}{R_{T2}} / \left(\frac{1}{T1} - \frac{1}{T2} \right)$	4954.76	5108	5261.24	K
3-3	Resistance @100℃	R ₁₀₀	T _a =100±0.05℃ P _T ≤0.1mW	3.135	3.3	3.465	KΩ
3-4	Beta Value	B _{100/200}	$B=LN \frac{R_{T1}}{R_{T2}} / \left(\frac{1}{T1} - \frac{1}{T2} \right)$	4222.41	4353	4483.59	K
3-5	Operating Range	/	/	0	/	+230	℃

4. Method of the Stockpile

- (1). The height of stacks products cannot be overbalanced four boxes in the stockpile and the course of transport.
- (2). The packing products of inside must be placed desiccant. Allow to use any way to transport, but must prevent the rain and the snow direct or indirect shower bath and damnification of these products.
- (3). The products are stockpiled on condition that the temperature is about 15℃-40℃, the opposite humidity not over 75%, acidic and alkalescent of substance, erode gas or radiant point are not should enclose the products.

6. R-T Table

THM 3: R200=3.7KΩ±5%

B(100/200)=5108K±3%

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
0	4508	5786	7408	41	585.8	730.8	909.5
1	4270	5477	7008	42	559.9	698.0	867.9
2	4046	5187	6632	43	535.2	666.7	828.4
3	3835	4912	6277	44	511.7	637.0	790.9
4	3635	4654	5943	45	489.4	608.7	755.2
5	3447	4409	5627	46	468.1	581.8	721.3
6	3269	4179	5330	47	447.9	556.2	689.0
7	3100	3961	5049	48	428.6	531.8	658.3
8	2942	3756	4784	49	410.2	508.6	629.1
9	2791	3562	4534	50	392.7	486.5	601.3
10	2650	3379	4298	51	376.0	465.5	574.8
11	2515	3205	4075	52	360.1	445.4	549.7
12	2389	3042	3864	53	344.9	426.3	525.7
13	2269	2887	3665	54	330.4	408.1	502.8
14	2155	2741	3477	55	316.6	390.8	481.1
15	2048	2603	3300	56	303.5	374.3	460.4
16	1947	2472	3132	57	290.9	358.5	440.6
17	1850	2348	2973	58	279.0	343.5	421.8
18	1759	2232	2823	59	267.5	329.1	403.9
19	1673	2121	2681	60	256.6	315.4	386.8
20	1592	2016	2547	61	246.2	302.4	370.4
21	1515	1917	2420	62	236.2	289.9	354.9
22	1441	1823	2300	63	226.7	278.0	340.1
23	1372	1734	2186	64	217.6	266.7	325.9
24	1306	1650	2079	65	209.0	255.8	312.4
25	1244	1570	1977	66	200.7	245.4	299.5
26	1185	1494	1880	67	192.7	235.5	287.2
27	1129	1423	1789	68	185.1	226.1	275.4
28	1076	1355	1702	69	177.9	217.1	264.2
29	1025	1290	1620	70	171.0	208.4	253.4
30	977.4	1229	1542	71	164.3	200.2	243.2
31	931.9	1171	1468	72	158.0	192.3	233.4
32	888.8	1116	1398	73	151.9	184.7	224.1
33	847.9	1064	1332	74	146.1	177.5	215.1
34	809.0	1014	1269	75	140.5	170.6	206.6
35	772.0	967.4	1209	76	135.2	164.0	198.4
36	736.9	922.8	1153	77	130.1	157.6	190.6
37	703.6	880.4	1099	78	125.2	151.6	183.1
38	671.9	840.1	1048	79	120.5	145.8	175.9
39	641.7	801.8	999.3	80	116.0	140.2	169.1
40	613.1	765.4	953.2	81	111.7	134.9	162.5

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
82	107.6	129.8	156.2	125	24.91	28.83	33.28
83	103.6	124.9	150.2	126	24.16	27.93	32.20
84	99.85	120.3	144.5	127	23.43	27.06	31.16
85	96.21	115.8	139.0	128	22.73	26.22	30.17
86	92.72	111.5	133.7	129	22.05	25.41	29.20
87	89.38	107.4	128.6	130	21.40	24.63	28.27
88	86.17	103.4	123.8	131	20.76	23.87	27.38
89	83.09	99.62	119.1	132	20.15	23.14	26.51
90	80.13	95.99	114.7	133	19.56	22.44	25.68
91	77.29	92.50	110.4	134	18.99	21.76	24.88
92	74.57	89.16	106.3	135	18.44	21.11	24.10
93	71.95	85.95	102.4	136	17.91	20.47	23.35
94	69.44	82.87	98.66	137	17.39	19.86	22.63
95	67.02	79.91	95.05	138	16.89	19.27	21.93
96	64.70	77.07	91.58	139	16.41	18.70	21.26
97	62.47	74.35	88.26	140	15.95	18.15	20.61
98	60.33	71.73	85.07	141	15.49	17.62	19.98
99	58.26	69.21	82.01	142	15.06	17.10	19.37
100	56.28	66.79	79.07	143	14.64	16.60	18.79
101	54.38	64.47	76.25	144	14.23	16.12	18.22
102	52.55	62.24	73.54	145	13.83	15.66	17.67
103	50.78	60.09	70.93	146	13.45	15.20	17.15
104	49.09	58.03	68.43	147	13.08	14.77	16.63
105	47.46	56.05	66.03	148	12.72	14.35	16.14
106	45.89	54.14	63.72	149	12.37	13.94	15.66
107	44.37	52.30	61.50	150	12.04	13.55	15.20
108	42.92	50.54	59.36	151	11.71	13.16	14.76
109	41.52	48.84	57.31	152	11.40	12.79	14.32
110	40.17	47.21	55.34	153	11.09	12.44	13.91
111	38.87	45.63	53.44	154	10.80	12.09	13.50
112	37.62	44.12	51.62	155	10.51	11.75	13.11
113	36.41	42.66	49.86	156	10.23	11.43	12.73
114	35.25	41.26	48.17	157	9.962	11.11	12.37
115	34.13	39.91	46.55	158	9.701	10.81	12.01
116	33.05	38.61	44.98	159	9.448	10.51	11.67
117	32.01	37.35	43.48	160	9.203	10.23	11.34
118	31.01	36.14	42.03	161	8.965	9.952	11.02
119	30.04	34.98	40.63	162	8.734	9.683	10.71
120	29.11	33.86	39.29	163	8.510	9.423	10.41
121	28.21	32.78	38.00	164	8.292	9.171	10.12
122	27.34	31.74	36.75	165	8.082	8.927	9.835
123	26.50	30.73	35.55	166	7.877	8.690	9.562
124	25.69	29.76	34.39	167	7.679	8.460	9.297

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
168	7.486	8.237	9.041	200	3.515	3.700	3.885
169	7.299	8.021	8.792	201	3.428	3.614	3.800
170	7.118	7.812	8.552	202	3.344	3.531	3.718
171	6.942	7.608	8.318	203	3.263	3.450	3.638
172	6.771	7.411	8.092	204	3.183	3.371	3.560
173	6.604	7.220	7.873	205	3.106	3.294	3.484
174	6.443	7.034	7.660	206	3.031	3.219	3.410
175	6.286	6.854	7.454	207	2.958	3.146	3.337
176	6.134	6.679	7.254	208	2.887	3.075	3.267
177	5.986	6.509	7.060	209	2.818	3.006	3.198
178	5.843	6.345	6.872	210	2.751	2.938	3.131
179	5.703	6.185	6.690	211	2.686	2.873	3.065
180	5.567	6.029	6.513	212	2.623	2.809	3.001
181	5.435	5.878	6.342	213	2.561	2.747	2.939
182	5.307	5.732	6.175	214	2.501	2.686	2.878
183	5.183	5.590	6.014	215	2.443	2.627	2.819
184	5.061	5.451	5.857	216	2.386	2.570	2.761
185	4.944	5.317	5.705	217	2.331	2.514	2.704
186	4.829	5.187	5.557	218	2.277	2.459	2.649
187	4.718	5.060	5.413	219	2.224	2.406	2.595
188	4.609	4.937	5.274	220	2.174	2.354	2.543
189	4.504	4.817	5.139	221	2.124	2.303	2.492
190	4.401	4.701	5.008	222	2.076	2.254	2.442
191	4.301	4.587	4.880	223	2.029	2.206	2.393
192	4.204	4.477	4.757	224	1.983	2.159	2.345
193	4.110	4.371	4.636	225	1.938	2.113	2.298
194	4.018	4.267	4.519	226	1.895	2.069	2.253
195	3.928	4.165	4.406	227	1.853	2.025	2.208
196	3.841	4.067	4.296	228	1.811	1.983	2.165
197	3.756	3.971	4.189	229	1.771	1.941	2.123
198	3.674	3.878	4.084	230	1.732	1.901	2.081
199	3.593	3.788	3.983				

THM 1: R100=3.3KΩ±5%

B(100/200)=4353K±3%

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
0	132.0	155.9	183.8	41	22.16	24.78	27.63
1	125.7	148.3	174.5	42	21.32	23.81	26.52
2	119.8	141.1	165.7	43	20.52	22.89	25.46
3	114.1	134.2	157.5	44	19.75	22.00	24.45
4	108.8	127.7	149.6	45	19.01	21.16	23.48
5	103.7	121.6	142.3	46	18.31	20.35	22.56
6	98.927	115.8	135.3	47	17.63	19.57	21.68
7	94.381	110.4	128.7	48	16.99	18.83	20.83
8	90.069	105.2	122.5	49	16.37	18.13	20.03
9	85.979	100.2	116.6	50	15.77	17.45	19.25
10	82.10	95.58	111.0	51	15.20	16.80	18.52
11	78.41	91.16	105.7	52	14.66	16.18	17.81
12	74.91	86.97	100.7	53	14.14	15.59	17.14
13	71.59	82.99	95.97	54	13.63	15.02	16.50
14	68.43	79.22	91.48	55	13.15	14.47	15.88
15	65.43	75.64	87.23	56	12.69	13.95	15.29
16	62.58	72.24	83.19	57	12.25	13.45	14.72
17	59.86	69.02	79.37	58	11.82	12.97	14.18
18	57.28	65.95	75.74	59	11.42	12.50	13.66
19	54.83	63.04	72.30	60	11.02	12.06	13.16
20	52.49	60.27	69.03	61	10.65	11.64	12.69
21	50.27	57.64	65.93	62	10.29	11.23	12.23
22	48.15	55.14	62.98	63	9.938	10.84	11.79
23	46.13	52.76	60.19	64	9.604	10.46	11.37
24	44.21	50.50	57.53	65	9.283	10.10	10.97
25	42.38	48.34	55.00	66	8.974	9.756	10.58
26	40.63	46.28	52.59	67	8.677	9.424	10.21
27	38.96	44.32	50.29	68	8.392	9.104	9.852
28	37.36	42.45	48.11	69	8.117	8.797	9.510
29	35.84	40.67	46.03	70	7.852	8.502	9.181
30	34.39	38.97	44.06	71	7.598	8.218	8.866
31	33.01	37.36	42.18	72	7.353	7.945	8.563
32	31.69	35.82	40.39	73	7.117	7.682	8.271
33	30.42	34.35	38.68	74	6.890	7.429	7.991
34	29.22	32.95	37.06	75	6.671	7.186	7.722
35	28.07	31.61	35.51	76	6.461	6.953	7.463
36	26.97	30.34	34.04	77	6.258	6.727	7.215
37	25.92	29.12	32.63	78	6.062	6.511	6.975
38	24.92	27.96	31.29	79	5.873	6.302	6.745
39	23.96	26.85	30.01	80	5.692	6.101	6.524
40	23.04	25.79	28.80	81	5.518	5.909	6.312

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
82	5.350	5.724	6.109	124	1.549	1.665	1.784
83	5.188	5.545	5.913	125	1.507	1.620	1.738
84	5.032	5.373	5.724	126	1.465	1.577	1.693
85	4.881	5.207	5.541	127	1.425	1.535	1.650
86	4.735	5.046	5.365	128	1.387	1.495	1.607
87	4.594	4.892	5.196	129	1.349	1.456	1.566
88	4.457	4.742	5.032	130	1.313	1.418	1.527
89	4.326	4.598	4.875	131	1.278	1.381	1.488
90	4.199	4.458	4.723	132	1.244	1.345	1.451
91	4.076	4.324	4.576	133	1.210	1.310	1.414
92	3.957	4.194	4.434	134	1.178	1.276	1.379
93	3.842	4.068	4.298	135	1.147	1.244	1.345
94	3.731	3.947	4.166	136	1.117	1.212	1.311
95	3.623	3.830	4.038	137	1.088	1.181	1.279
96	3.519	3.717	3.915	138	1.059	1.151	1.247
97	3.418	3.607	3.797	139	1.032	1.122	1.217
98	3.321	3.501	3.682	140	1.005	1.094	1.187
99	3.227	3.399	3.571	141	0.979	1.066	1.158
100	3.135	3.300	3.465	142	0.954	1.040	1.130
101	3.040	3.203	3.366	143	0.930	1.014	1.103
102	2.949	3.110	3.271	144	0.906	0.989	1.076
103	2.860	3.019	3.178	145	0.883	0.964	1.051
104	2.775	2.931	3.089	146	0.861	0.941	1.026
105	2.692	2.847	3.002	147	0.839	0.918	1.001
106	2.612	2.765	2.918	148	0.818	0.895	0.978
107	2.535	2.685	2.837	149	0.798	0.874	0.955
108	2.461	2.608	2.758	150	0.778	0.853	0.932
109	2.388	2.534	2.682	151	0.758	0.832	0.910
110	2.319	2.462	2.608	152	0.740	0.812	0.889
111	2.251	2.393	2.537	153	0.721	0.793	0.869
112	2.186	2.325	2.467	154	0.704	0.774	0.849
113	2.123	2.260	2.400	155	0.687	0.755	0.829
114	2.062	2.197	2.335	156	0.670	0.738	0.810
115	2.002	2.135	2.272	157	0.654	0.720	0.792
116	1.945	2.076	2.211	158	0.638	0.703	0.774
117	1.890	2.019	2.151	159	0.623	0.687	0.756
118	1.836	1.963	2.094	160	0.608	0.671	0.739
119	1.784	1.909	2.038	161	0.593	0.655	0.722
120	1.734	1.857	1.984	162	0.579	0.640	0.706
121	1.686	1.807	1.932	163	0.565	0.625	0.690
122	1.639	1.758	1.881	164	0.552	0.611	0.675
123	1.593	1.710	1.832	165	0.539	0.597	0.660

T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emp} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
166	0.526	0.584	0.646	199	0.253	0.286	0.323
167	0.514	0.570	0.631	200	0.247	0.280	0.317
168	0.502	0.558	0.617	201	0.242	0.275	0.311
169	0.491	0.545	0.604	202	0.237	0.269	0.305
170	0.479	0.533	0.591	203	0.232	0.264	0.299
171	0.468	0.521	0.578	204	0.228	0.259	0.293
172	0.457	0.509	0.566	205	0.223	0.254	0.288
173	0.447	0.498	0.553	206	0.219	0.249	0.282
174	0.437	0.487	0.542	207	0.214	0.244	0.277
175	0.427	0.476	0.530	208	0.210	0.239	0.272
176	0.417	0.466	0.519	209	0.206	0.234	0.266
177	0.408	0.456	0.508	210	0.202	0.230	0.261
178	0.399	0.446	0.497	211	0.198	0.225	0.257
179	0.390	0.436	0.487	212	0.194	0.221	0.252
180	0.381	0.427	0.476	213	0.190	0.217	0.247
181	0.373	0.418	0.467	214	0.186	0.213	0.242
182	0.365	0.409	0.457	215	0.182	0.209	0.238
183	0.357	0.400	0.447	216	0.179	0.205	0.234
184	0.349	0.391	0.438	217	0.175	0.201	0.229
185	0.341	0.383	0.429	218	0.172	0.197	0.225
186	0.334	0.375	0.420	219	0.169	0.193	0.221
187	0.327	0.367	0.412	220	0.165	0.190	0.217
188	0.319	0.359	0.403	221	0.162	0.186	0.213
189	0.313	0.352	0.395	222	0.159	0.183	0.209
190	0.306	0.345	0.387	223	0.156	0.179	0.206
191	0.299	0.337	0.379	224	0.153	0.176	0.202
192	0.293	0.330	0.372	225	0.150	0.173	0.198
193	0.287	0.324	0.364	226	0.147	0.170	0.195
194	0.281	0.317	0.357	227	0.145	0.167	0.191
195	0.275	0.311	0.350	228	0.142	0.164	0.188
196	0.269	0.304	0.343	229	0.139	0.161	0.185
197	0.263	0.298	0.336	230	0.137	0.158	0.181
198	0.258	0.292	0.330				