

Specifications Approval Sheet

CUSTOMER: _____

CUSTOMER P/N: _____

PART NAME: _____ GT-A Series - NTC Thermistor

SPECIFICATION: _____ GT103H3435B-A

DATE: _____

For Customer Approval:

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For Manufacturer Approval:

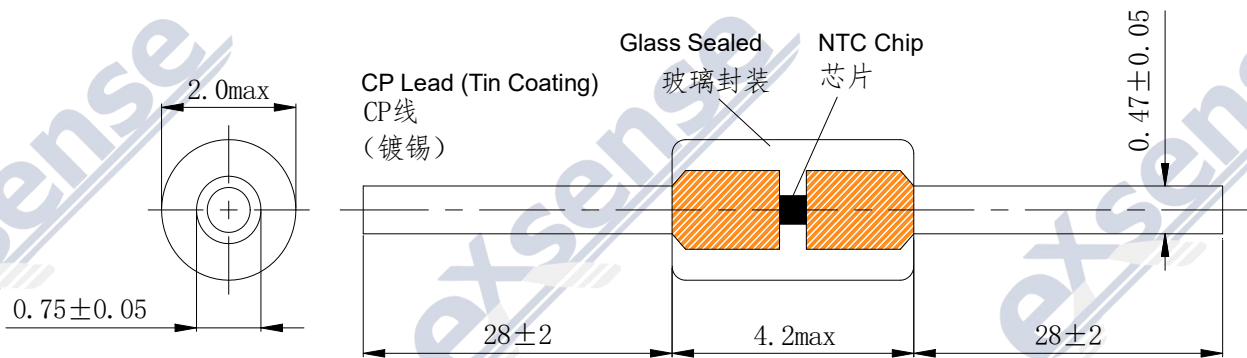
Formulation	Audit	Approval

1. Range of Application

The specification approval sheet is applicable to GT-A series NTC thermistor produced by EXSENSE Electronics Technology Co., Ltd.

2. Product Structure and Size

Unit: mm



3. Part Number

GT	103	H	3435	B	A
①	②	③	④	⑤	⑥
Product Series Code	Resistance @25°C	Tolerance @25°C	Beta	Test temp. of B	Shape
GT Series NTC Thermistor	10×10 ³ Ω	±3%	3435K	25/85°C	Axial Type

4. Electrical Performance

No.	Item	Symbol	Test Condition	Range	Unit
1	Resistance @25°C	R ₂₅	T=25±0.01°C	10±3%	KΩ
2	Beta	B _{25/85}	$B = \frac{\ln(R_{T1}) - \ln(R_{T2})}{(1/T_1 - 1/T_2)}$	3435±1%	K
3	Thermal Time Constant	τ	50°C→25°C, in the oil	≤20	sec
4	Dissipation Factor	δ	Ta=25±0.5°C	≈2.0	mW/°C
5	Operating Temp. Range	/	/	-40~+250	°C

4.1 Resistance Value (R_{25°C})

Requirement: R₂₅=10KΩ±3%

Test method: Measuring in high-precision thermostatic oil tank of 25°C±0.01°C, high precision resistance measuring instrument is used, and the measuring power of the measuring instrument should be zero power. (That is, the self-heat generated by the current flowing through the product can be negligible.)

4.2 Beta

Requirement: B_{25/50}=3435K±1%

Test method: The resistance values of 25±0.01°C and 85±0.01°C are measured in high-precision thermostatic oil tank, then calculate according to the following formula:

$$B_{T1/T2} = \ln(R_{T1}/R_{T2}) / (1/(T1+273.15) - 1/(T2+273.15))$$

4.3 Thermal Time Constant (τ)

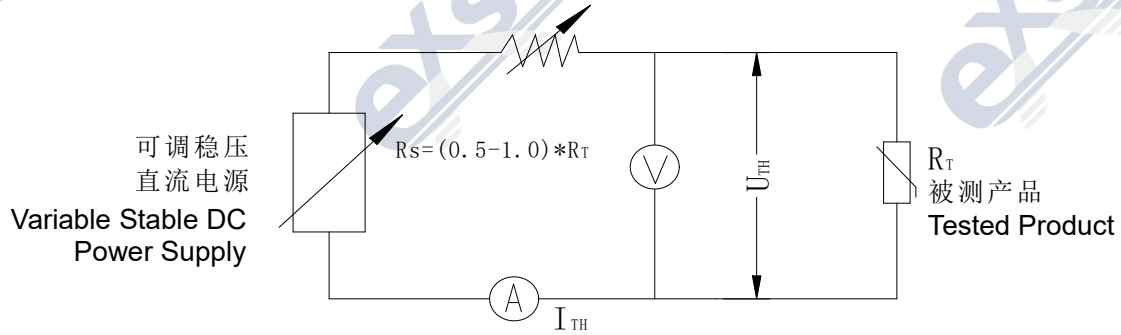
Thermal time constant: T1=50-(50-25)*63.2%=34.2°C, max 20 seconds (in oil tank)

Test method: the time required for the product to quickly convert from the 50°C oil tank to the 25°C oil tank to reach the resistance value corresponding to 34.2°C.

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4.4 Dissipation Factor (δ)

Test method: the product under test is connected to the following circuit in the still air of $25 \pm 0.5^\circ\text{C}$.



Adjust I_{TH} for $\frac{U_{TH}}{I_{TH}} = R_{85}$, then calculate by the following formula:

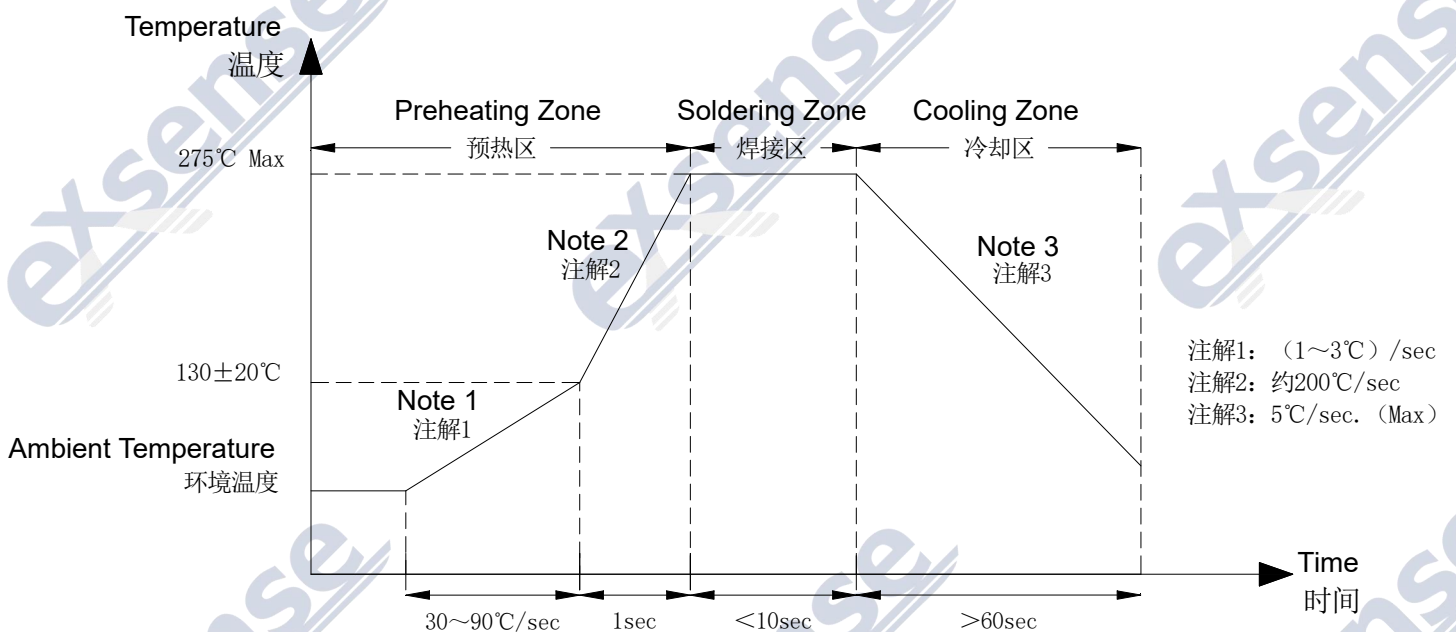
$$\delta = \frac{U_{TH} \cdot I_{TH}}{85 - 25^\circ\text{C}} \quad (\text{mw}/^\circ\text{C})$$

4.5 Operating temp. Range

$-50^\circ\text{C} \sim +250^\circ\text{C}$. (All materials used to assemble must meet the highest operating temperature)

5. Recommended Soldering Process Condition

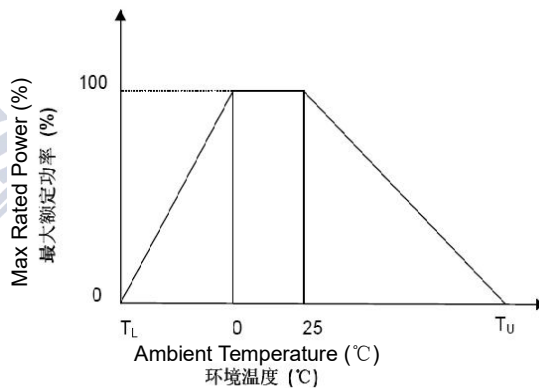
5.1 Reflow soldering



5.2 Soldering conditions of handcrafted soldering iron

Item	Condition
Temperature of soldering iron head	360°C (max)
Soldering time	3sec (max)
Distance between soldering position and encapsulation layer	2mm (min)

5.3 Power attenuation curve



T_U : Upper limit of working humidity
 T_L : Lower limit of working temperature
 T_U : 工作溫度上限
 T_L : 工作溫度下限

例如: 环境温度(T_a)=55°C
 工作溫度上限(T_u)=300°C

$$P_{Ta} = (T_u - T_a) / (T_u - 25) \times P_{max} \cong 89\% P_{max}$$

E.g.: Ambient temperature (T_a)=55°C

Upper limit of working humidity (T_u)=300°C

$$P_{Ta} = (T_u - T_a) / (T_u - 25) \times P_{max} \cong 89\% P_{max}$$

6. Reliability

Item	Standard	Test Method
High-temperature Storage Test	$\Delta R25 : R25 \leq \pm 2\%$	Placed in the air at 250±5°C for 1000±24hrs
Low-temperature Storage Test		Placed in the air at -400±5°C for 1000±24hrs
Steady-state Damp Heat Test		Placed at 60±2°C, 90%~95%RH for 1000±24hrs
Thermal Shock Resistance Test		-40°C×10min→room temperature×5min→200°C×10min, 100 cycle times
Vibration Test	$\Delta R25 : R25 \leq \pm 2\%$ Appearance without damage	Amplitude 1.5mm, frequency 10Hz to 500Hz, components subjected to vibration test X, Y direction each 15 minutes
Leads Strength Test		The leads apply a 9.8N pull along the axial direction for 60 seconds
Drop Test		Free drop 10 times from a height of 1 meter on the specified board

7. Transport and Storage

7.1 The height of each stack shall not exceed 4 boxes during storage and transportation, products must be vacuumed and stored in anti-oxidation packaging.

7.2 Select packing cases according to the quantity of shipment, any method of transportation is allowed; But need to avoid the directly or indirectly drenched hit of dirt, rain, snow and mechanical damage in transport process

7.3 The storage environment of product must be free from acidic and alkaline substances, corrosive gases or radiation sources, avoid storing in environment with light.

7.4 Storage temperature: $-10^{\circ}\text{C}\sim+40^{\circ}\text{C}$.

7.5 Relative humidity: $\leq 75\%RH$.

8. Storage Life

Under the guarantee of the integrity of the sealed package and the above storage conditions, the vacuum-sealed package of bulk can be stored for 1 year.

9. R-T Table

Part No.:GT103H3435B-A				$R_{25}=10K\Omega\pm3\%$				$B_{25/85}=3435K\pm1\%$			
Temperature (°C)	R_{min} (KΩ)	R_{nor} (KΩ)	R_{max} (KΩ)	Temperature (°C)	R_{min} (KΩ)	R_{nor} (KΩ)	R_{max} (KΩ)	Temperature (°C)	R_{min} (KΩ)	R_{nor} (KΩ)	R_{max} (KΩ)
-30	110.9	117.1	123.6	13	15.41	15.96	16.52	13	15.41	15.96	16.52
-29	105.2	111.1	117.2	14	14.81	15.33	15.86	14	14.81	15.33	15.86
-28	99.82	105.4	111.1	15	14.24	14.73	15.23	15	14.24	14.73	15.23
-27	94.78	99.98	105.4	16	13.69	14.16	14.63	16	13.69	14.16	14.63
-26	90.02	94.91	99.99	17	13.16	13.61	14.06	17	13.16	13.61	14.06
-25	85.53	90.14	94.90	18	12.66	13.08	13.51	18	12.66	13.08	13.51
-24	81.29	85.63	90.11	19	12.18	12.58	12.99	19	12.18	12.58	12.99
-23	77.30	81.37	85.59	20	11.72	12.10	12.49	20	11.72	12.10	12.49
-22	73.52	77.36	81.33	21	11.28	11.65	12.01	21	11.28	11.65	12.01
-21	69.95	73.57	77.30	22	10.86	11.21	11.56	22	10.86	11.21	11.56
-20	66.58	69.98	73.50	23	10.46	10.79	11.12	23	10.46	10.79	11.12
-19	63.39	66.60	69.91	24	10.07	10.38	10.70	24	10.07	10.38	10.70
-18	60.37	63.40	66.52	25	9.700	10.00	10.30	25	9.700	10.00	10.30
-17	57.52	60.37	63.31	26	9.339	9.632	9.924	26	9.339	9.632	9.924
-16	54.82	57.51	60.28	27	8.994	9.279	9.564	27	8.994	9.279	9.564
-15	52.26	54.80	57.41	28	8.663	8.941	9.219	28	8.663	8.941	9.219
-14	49.84	52.23	54.70	29	8.346	8.617	8.889	29	8.346	8.617	8.889
-13	47.54	49.80	52.13	30	8.042	8.306	8.571	30	8.042	8.306	8.571
-12	45.36	47.50	49.70	31	7.751	8.009	8.267	31	7.751	8.009	8.267
-11	43.30	45.32	47.39	32	7.472	7.723	7.976	32	7.472	7.723	7.976
-10	41.34	43.25	45.21	33	7.205	7.450	7.696	33	7.205	7.450	7.696
-9	39.49	41.29	43.14	34	6.948	7.187	7.427	34	6.948	7.187	7.427
-8	37.73	39.43	41.17	35	6.702	6.935	7.169	35	6.702	6.935	7.169
-7	36.05	37.66	39.31	36	6.466	6.693	6.922	36	6.466	6.693	6.922
-6	34.47	35.99	37.55	37	6.240	6.461	6.684	37	6.240	6.461	6.684
-5	32.96	34.40	35.87	38	6.023	6.238	6.456	38	6.023	6.238	6.456
-4	31.52	32.89	34.28	39	5.814	6.024	6.236	39	5.814	6.024	6.236
-3	30.16	31.45	32.77	40	5.613	5.818	6.026	40	5.613	5.818	6.026
-2	28.86	30.08	31.33	41	5.421	5.621	5.823	41	5.421	5.621	5.823
-1	27.63	28.79	29.97	42	5.236	5.431	5.628	42	5.236	5.431	5.628
0	26.46	27.55	28.67	43	5.059	5.249	5.441	43	5.059	5.249	5.441
1	25.34	26.38	27.43	44	4.888	5.073	5.261	44	4.888	5.073	5.261
2	24.28	25.26	26.26	45	4.724	4.905	5.088	45	4.724	4.905	5.088
3	23.27	24.20	25.15	46	4.566	4.743	4.921	46	4.566	4.743	4.921
4	22.30	23.19	24.08	47	4.414	4.587	4.761	47	4.414	4.587	4.761
5	21.38	22.22	23.07	48	4.269	4.436	4.607	48	4.269	4.436	4.607
6	20.51	21.30	22.11	49	4.128	4.292	4.458	49	4.128	4.292	4.458
7	19.67	20.43	21.19	50	3.993	4.153	4.315	50	3.993	4.153	4.315
8	18.88	19.59	20.32	51	3.863	4.019	4.178	51	3.863	4.019	4.178
9	18.12	18.80	19.48	52	3.738	3.890	4.045	52	3.738	3.890	4.045
10	17.39	18.04	18.69	53	3.618	3.766	3.917	53	3.618	3.766	3.917
11	16.70	17.31	17.93	54	3.502	3.647	3.794	54	3.502	3.647	3.794
12	16.04	16.62	17.21	55	3.390	3.532	3.676	55	3.390	3.532	3.676

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Part No.:GT103H3435B-A				R ₂₅ =10KΩ±3%				B _{25/85} =3435K±1%			
Temperature (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	Temperature (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	Temperature (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)
56	3.283	3.421	3.562	100	0.922	0.973	1.026				
57	3.179	3.314	3.451	101	0.898	0.948	1.000				
58	3.079	3.211	3.345	102	0.876	0.924	0.975				
59	2.983	3.112	3.243	103	0.853	0.901	0.951				
60	2.891	3.016	3.144	104	0.832	0.879	0.927				
61	2.801	2.924	3.049	105	0.811	0.857	0.905				
62	2.715	2.835	2.957	106	0.791	0.836	0.882				
63	2.632	2.749	2.868	107	0.771	0.815	0.861				
64	2.552	2.666	2.782	108	0.752	0.795	0.840				
65	2.474	2.586	2.700	109	0.734	0.776	0.820				
66	2.400	2.509	2.620	110	0.716	0.757	0.800				
67	2.328	2.434	2.543	111	0.698	0.739	0.781				
68	2.258	2.362	2.468	112	0.681	0.721	0.762				
69	2.191	2.293	2.396	113	0.665	0.704	0.744				
70	2.126	2.225	2.327	114	0.649	0.687	0.727				
71	2.064	2.161	2.260	115	0.633	0.671	0.710				
72	2.003	2.098	2.195	116	0.618	0.655	0.693				
73	1.945	2.037	2.132	117	0.603	0.639	0.677				
74	1.889	1.979	2.072	118	0.589	0.624	0.661				
75	1.834	1.922	2.013	119	0.575	0.610	0.646				
76	1.782	1.868	1.956	120	0.562	0.596	0.631				
77	1.731	1.815	1.901	121	0.549	0.582	0.617				
78	1.681	1.764	1.848	122	0.536	0.569	0.603				
79	1.634	1.714	1.797	123	0.523	0.555	0.589				
80	1.588	1.666	1.747	124	0.511	0.543	0.576				
81	1.543	1.620	1.699	125	0.500	0.531	0.563				
82	1.500	1.575	1.653	126	0.488	0.519	0.550				
83	1.459	1.532	1.608	127	0.477	0.507	0.538				
84	1.418	1.490	1.564	128	0.466	0.495	0.526				
85	1.379	1.450	1.522	129	0.456	0.484	0.514				
86	1.341	1.410	1.481	130	0.446	0.474	0.503				
87	1.305	1.372	1.442	131	0.436	0.463	0.492				
88	1.270	1.335	1.403	132	0.426	0.453	0.481				
89	1.235	1.300	1.366	133	0.417	0.443	0.471				
90	1.202	1.265	1.330	134	0.407	0.433	0.461				
91	1.170	1.232	1.295	135	0.398	0.424	0.451				
92	1.139	1.199	1.262	136	0.390	0.415	0.441				
93	1.109	1.168	1.229	137	0.381	0.406	0.432				
94	1.079	1.137	1.197	138	0.373	0.397	0.422				
95	1.051	1.108	1.166	139	0.365	0.389	0.414				
96	1.024	1.079	1.136	140	0.357	0.380	0.405				
97	0.997	1.051	1.107	141	0.349	0.372	0.396				
98	0.971	1.024	1.079	142	0.342	0.364	0.388				
99	0.946	0.998	1.052	143	0.335	0.357	0.380				

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144	0.328	0.349	0.372	186	0.144	0.155	0.167	210	0.096	0.104	0.112
145	0.321	0.342	0.364	187	0.142	0.153	0.164	211	0.095	0.102	0.110
146	0.314	0.335	0.357	188	0.139	0.150	0.161	212	0.093	0.100	0.108
147	0.308	0.328	0.350	189	0.137	0.147	0.158	213	0.092	0.099	0.107
148	0.301	0.321	0.343	190	0.135	0.145	0.156	214	0.090	0.097	0.105
149	0.295	0.315	0.336	191	0.132	0.142	0.153	215	0.089	0.096	0.103
150	0.289	0.308	0.329	192	0.130	0.140	0.150	216	0.087	0.094	0.102
151	0.283	0.302	0.322	193	0.128	0.137	0.148	217	0.086	0.093	0.100
152	0.277	0.296	0.316	194	0.126	0.135	0.145	218	0.085	0.091	0.099
153	0.272	0.290	0.309	195	0.123	0.133	0.143	219	0.083	0.090	0.097
154	0.266	0.284	0.303	196	0.121	0.131	0.140	220	0.082	0.089	0.096
155	0.261	0.279	0.297	197	0.119	0.128	0.138	221	0.081	0.087	0.094
156	0.255	0.273	0.292	198	0.117	0.126	0.136	222	0.080	0.086	0.093
157	0.250	0.268	0.286	199	0.115	0.124	0.134	223	0.078	0.085	0.092
158	0.245	0.262	0.280	200	0.113	0.122	0.131	224	0.077	0.083	0.090
159	0.241	0.257	0.275	201	0.111	0.120	0.129	225	0.076	0.082	0.089
160	0.236	0.252	0.269	202	0.110	0.118	0.127	226	0.075	0.081	0.088
161	0.231	0.247	0.264	203	0.108	0.116	0.125	227	0.074	0.080	0.086
162	0.227	0.242	0.259	204	0.106	0.114	0.123				
163	0.222	0.238	0.254	205	0.104	0.112	0.121				
164	0.218	0.233	0.249	206	0.103	0.111	0.119				
165	0.214	0.229	0.245	207	0.101	0.109	0.117				
166	0.210	0.224	0.240	208	0.099	0.107	0.115				
167	0.206	0.220	0.236	209	0.098	0.105	0.114				
168	0.202	0.216	0.231	210	0.096	0.104	0.112				
169	0.198	0.212	0.227	211	0.095	0.102	0.110				
170	0.194	0.208	0.223	212	0.093	0.100	0.108				
171	0.190	0.204	0.219	213	0.092	0.099	0.107				
172	0.187	0.200	0.214	214	0.090	0.097	0.105				
173	0.183	0.197	0.211	215	0.089	0.096	0.103				
174	0.180	0.193	0.207	216	0.087	0.094	0.102				
175	0.177	0.189	0.203	217	0.086	0.093	0.100				
176	0.173	0.186	0.199	218	0.085	0.091	0.099				
177	0.170	0.183	0.196	219	0.083	0.090	0.097				
178	0.167	0.179	0.192	220	0.082	0.089	0.096				
179	0.164	0.176	0.189	221	0.081	0.087	0.094				
180	0.161	0.173	0.185	222	0.080	0.086	0.093				
181	0.158	0.170	0.182	223	0.078	0.085	0.092				
182	0.155	0.167	0.179	224	0.077	0.083	0.090				
183	0.152	0.164	0.176	225	0.076	0.082	0.089				
184	0.150	0.161	0.173	226	0.075	0.081	0.088				
185	0.147	0.158	0.170	227	0.074	0.080	0.086				

