

Specifications Approval Sheet

CUSTOMER: _____

CUSTOMER P/N: _____

PART NAME: _____ GT-T Series - NTC Thermistor

SPECIFICATION: _____ GT502H3375A-T

DATE: _____

For Customer Approval:

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For Manufacturer Approval:

Formulation	Audit	Approval

EXSENSE Electronics Technology Co., Ltd.

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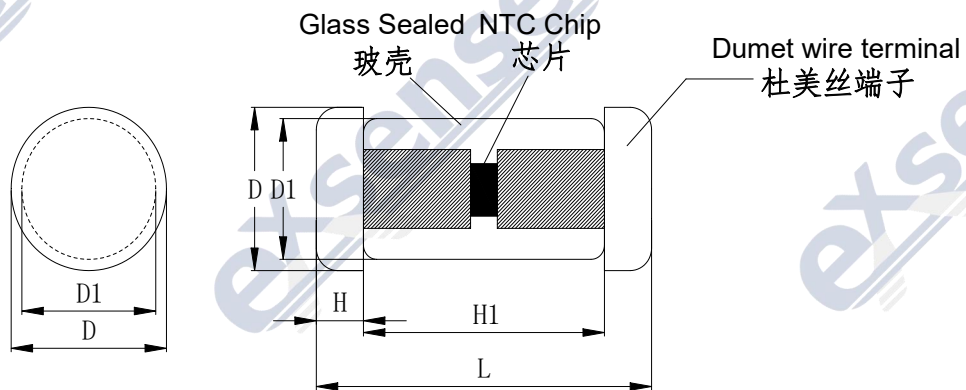
1. Range of Application

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

This product is complied with the EU RoHS Directive.

2. Product Structure and Size

Unit: mm



D	D1	H	H1	L
1.3-1.7	1.5max	0.15-0.35	2.6-2.8	3.1-3.3

3. Part Number

GT	502	H	3375	A	T
①	②	③	④	⑤	⑥
Product Series Code	Resistance @25°C	Tolerance @25°C	Beta	Test temp. of B	Packing
GT-T Series NTC Thermistor	50×102Ω	±3%	3375K	25/50°C	Taping

4. Electrical Performance

No.	Item	Symbol	Test Condition	Range	Unit
1	Resistance @25°C	R ₂₅	T=25±0.01°C	5±3%	KΩ
2	Beta	B _{25/50}	$B = \frac{\ln(R_{T1}) - \ln(R_{T2})}{(1/T_1 - 1/T_2)}$	3375±1%	K
3	Thermal Time Constant	τ	50°C → 25°C, in the oil	≤10	sec
4	Dissipation Factor	δ	T _a =25±0.5°C	≈2.5	mW/°C
5	Max Rated Power	P _r	T _a =25±0.5°C	≤60	mW
6	Operating Temp. Range	/	/	-50~+200	°C

4.1 Resistance Value (R_{25°C})

Requirement: R₂₅ = 5KΩ ± 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} = 3375K ± 1%

Test method: The resistance values of 25±0.01°C and 50±0.01°C are measured in high-precision thermostatic oil tank, then calculate according to the following formula:

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

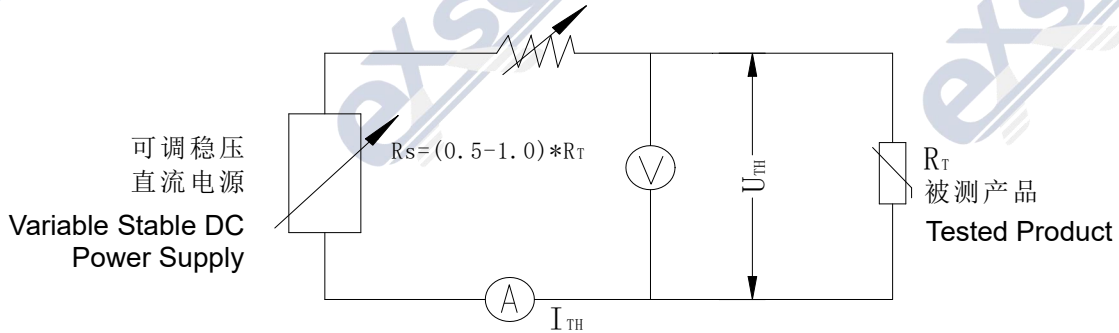
4.3 Thermal Time Constant (τ)

Thermal time constant: T₁ = 50 - (50 - 25) * 63.2% = 34.2°C, max 10 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.

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 Maximum rated power (P_r)

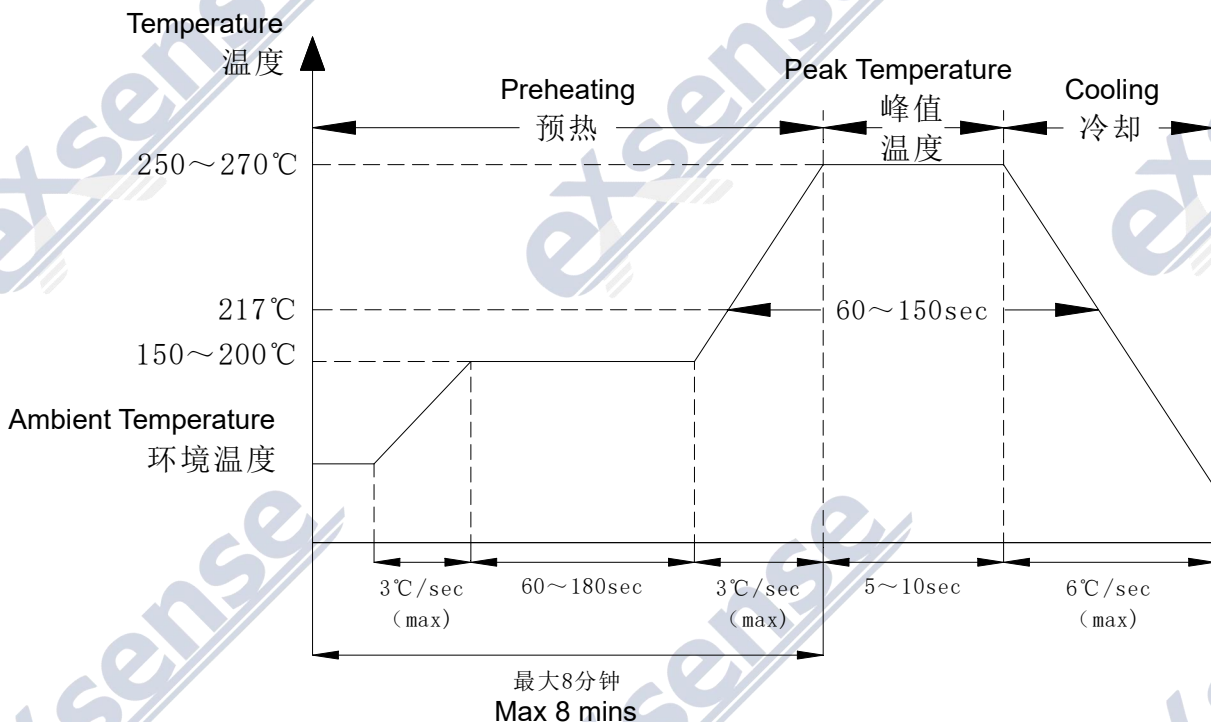
Rated power: $T_a = 25 \pm 0.5^\circ\text{C}$, max 60mW

4.6 Operating temp. Range

$-50^\circ\text{C} \sim 200^\circ\text{C}$. (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

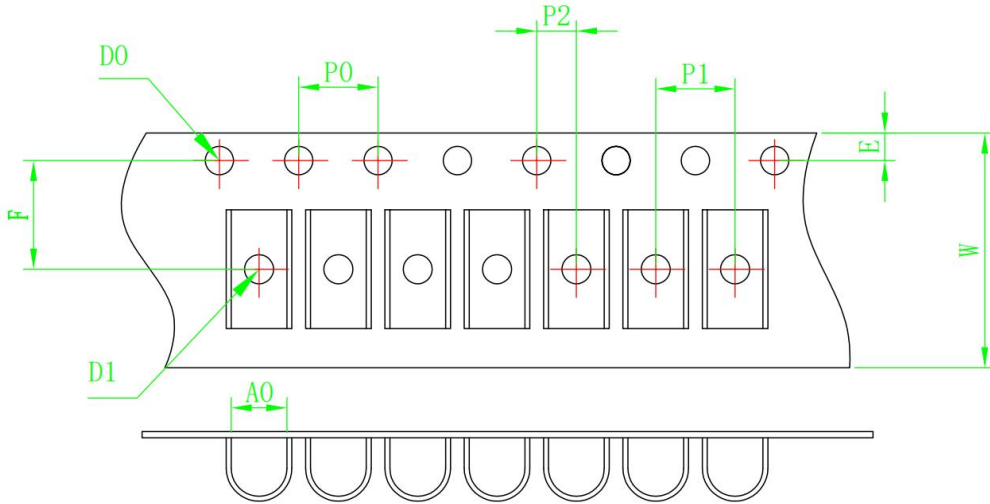
Item	Condition
Temperature of soldering iron head	360°C (max)
Soldering time	3sec (max)
Distance between soldering position and encapsulation layer	2mm (min)

6. Reliability

Item	Standard	Test Method
Temperature Cycling Test	$\Delta R_{25} \mid \cong 3\%$ Δ Appearance without damage	-40°C×5min→room temperature×3min→200°C×5min→room temperature×3min, 1000 cycle times
Load Life Test		At 100±5°C, working current is 0.2mA, for 1000±24 hrs
High Temperature Aging Test		Placed in the air at 200±5°C for 1000±24hrs
Low Temperature Storage Test		placed in the air at -40±5°C for 1000±24hrs
Moisture Resistance Test		Placed at 85±5°C, 85%±5RH for 1000±24hrs
Soldering Resistance Test		260±5°C, 10±1sec
Soldering Test		Δ Tin area on circumference of terminal $\cong 90\%$

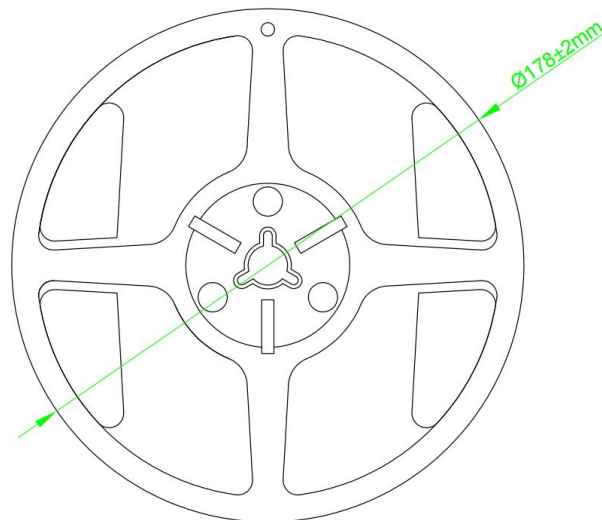
7. Packing

7.1 Taping, 2.5K pcs/Taping, taping size:



Unit	W	E	F	D0	D1
mm	8.0±0.10	1.75±0.10	3.5±0.05	1.5±0.05	1.1±0.05
Unit	P0	P1	P2	A0	
mm	4.0±0.10	4.0±0.10	2.0±0.10	1.6±0.10	

7.2 Taping tray



8. Transport and Storage

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

8.2 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

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

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

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

9. Storage Life

It can be stored for 6 months under the conditions of complete sealed packaging and above storage conditions, vacuum-sealed package can be stored for 1 year.

10. Period of Validity

After being used on the machine, under the conditions specified in the specification approval sheet, the used period can be guaranteed for 10 years.

11. R-T Table

Part No.:GT502H3375A-T				R ₂₅ =5KΩ±3%				B _{25/50} =3375K±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)
-50	160.8	171.8	183.3	-7	17.85	18.65	19.46	0	13.15	13.69	14.24
-49	151.7	161.9	172.7	-6	17.07	17.83	18.60	1	12.59	13.11	13.63
-48	143.1	152.7	162.7	-5	16.34	17.05	17.78	2	12.07	12.56	13.05
-47	135.1	144.0	153.4	-4	15.63	16.31	17.00	3	11.57	12.03	12.50
-46	127.5	135.9	144.7	-3	14.96	15.60	16.26	4	11.09	11.53	11.98
-45	120.5	128.3	136.5	-2	14.33	14.93	15.55	5	10.64	11.06	11.48
-44	113.9	121.2	128.9	-1	13.72	14.30	14.88	6	10.21	10.60	11.00
-43	107.7	114.5	121.7	0	13.15	13.69	14.24	7	9.794	10.17	10.55
-42	101.8	108.2	115.0	1	12.59	13.11	13.63	8	9.400	9.756	10.12
-41	96.33	102.4	108.7	2	12.07	12.56	13.05	9	9.024	9.362	9.704
-40	91.18	96.83	102.7	3	11.57	12.03	12.50	10	8.666	8.987	9.311
-39	86.34	91.63	97.17	4	11.09	11.53	11.98	11	8.324	8.628	8.936
-38	81.78	86.75	91.94	5	10.64	11.06	11.48	12	7.997	8.286	8.578
-37	77.50	82.16	87.03	6	10.21	10.60	11.00	13	7.685	7.959	8.236
-36	73.46	77.84	82.41	7	9.794	10.17	10.55	14	7.386	7.647	7.910
-35	69.66	73.77	78.06	8	9.400	9.756	10.12	15	7.101	7.349	7.599
-34	66.08	69.95	73.97	9	9.024	9.362	9.704	16	6.829	7.065	7.302
-33	62.71	66.34	70.12	10	8.666	8.987	9.311	17	6.568	6.792	7.018
-32	59.53	62.94	66.49	11	8.324	8.628	8.936	18	6.319	6.532	6.746
-31	56.52	59.74	63.07	12	7.997	8.286	8.578	19	6.081	6.283	6.487
-30	53.69	56.72	59.85	13	7.685	7.959	8.236	20	5.853	6.045	6.238
-29	51.02	53.87	56.82	14	7.386	7.647	7.910	21	5.634	5.818	6.001
-28	48.50	51.18	53.95	15	7.101	7.349	7.599	22	5.425	5.600	5.774
-27	46.12	48.64	51.25	16	6.829	7.065	7.302	23	5.225	5.391	5.557
-26	43.86	46.24	48.70	17	6.568	6.792	7.018	24	5.034	5.191	5.349
-25	41.73	43.97	46.29	18	6.319	6.532	6.746	25	4.850	5.000	5.150
-24	39.72	41.83	44.01	19	6.081	6.283	6.487	26	4.671	4.817	4.963
-23	37.82	39.80	41.86	20	5.853	6.045	6.238	27	4.499	4.641	4.784
-22	36.02	37.89	39.82	21	5.634	5.818	6.001	28	4.334	4.473	4.612
-21	34.31	36.08	37.90	22	5.425	5.600	5.774	29	4.176	4.312	4.448
-20	32.70	34.36	36.08	23	5.225	5.391	5.557	30	4.025	4.157	4.290
-19	31.15	32.72	34.34	24	5.034	5.191	5.349	31	3.880	4.009	4.138
-18	29.69	31.17	32.70	25	4.850	5.000	5.150	32	3.741	3.867	3.993
-17	28.31	29.71	31.15	26	4.671	4.817	4.963	33	3.608	3.730	3.853
-16	26.99	28.32	29.68	27	4.499	4.641	4.784	34	3.480	3.599	3.719
-15	25.75	27.00	28.28	28	4.334	4.473	4.612	35	3.357	3.474	3.591
-14	24.57	25.75	26.96	29	4.176	4.312	4.448				
-13	23.46	24.57	25.71	30	4.025	4.157	4.290				
-12	22.40	23.45	24.53	31	3.880	4.009	4.138				
-11	21.39	22.39	23.41	32	3.741	3.867	3.993				
-10	20.44	21.38	22.34	33	3.608	3.730	3.853				
-9	19.53	20.42	21.33	34	3.480	3.599	3.719				
-8	18.67	19.51	20.37	35	3.357	3.474	3.591				

Part No.:GT502H3375A-T				$R_{25}=5K\Omega\pm 3\%$				$B_{25/50}=3375K\pm 1\%$			
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)
36	3.239	3.353	3.467	80	0.7961	0.8355	0.8761	80	0.7961	0.8355	0.8761
37	3.126	3.237	3.349	81	0.7740	0.8125	0.8523	81	0.7740	0.8125	0.8523
38	3.018	3.126	3.235	82	0.7526	0.7903	0.8292	82	0.7526	0.7903	0.8292
39	2.913	3.019	3.125	83	0.7319	0.7688	0.8068	83	0.7319	0.7688	0.8068
40	2.813	2.916	3.020	84	0.7119	0.7480	0.7852	84	0.7119	0.7480	0.7852
41	2.717	2.817	2.919	85	0.6925	0.7278	0.7643	85	0.6925	0.7278	0.7643
42	2.625	2.722	2.821	86	0.6738	0.7083	0.7440	86	0.6738	0.7083	0.7440
43	2.536	2.631	2.728	87	0.6556	0.6894	0.7243	87	0.6556	0.6894	0.7243
44	2.451	2.544	2.638	88	0.6381	0.6711	0.7053	88	0.6381	0.6711	0.7053
45	2.369	2.459	2.551	89	0.6210	0.6534	0.6868	89	0.6210	0.6534	0.6868
46	2.290	2.378	2.468	90	0.6045	0.6362	0.6690	90	0.6045	0.6362	0.6690
47	2.214	2.300	2.387	91	0.5886	0.6196	0.6516	91	0.5886	0.6196	0.6516
48	2.141	2.225	2.310	92	0.5731	0.6034	0.6348	92	0.5731	0.6034	0.6348
49	2.070	2.152	2.236	93	0.5581	0.5878	0.6185	93	0.5581	0.5878	0.6185
50	2.003	2.083	2.164	94	0.5435	0.5726	0.6027	94	0.5435	0.5726	0.6027
51	1.938	2.016	2.095	95	0.5294	0.5579	0.5874	95	0.5294	0.5579	0.5874
52	1.875	1.951	2.029	96	0.5158	0.5437	0.5725	96	0.5158	0.5437	0.5725
53	1.815	1.889	1.965	97	0.5025	0.5298	0.5581	97	0.5025	0.5298	0.5581
54	1.757	1.829	1.903	98	0.4897	0.5164	0.5441	98	0.4897	0.5164	0.5441
55	1.701	1.772	1.844	99	0.4772	0.5034	0.5306	99	0.4772	0.5034	0.5306
56	1.647	1.716	1.787	100	0.4651	0.4908	0.5174	100	0.4651	0.4908	0.5174
57	1.595	1.663	1.732	101	0.4534	0.4785	0.5046	101	0.4534	0.4785	0.5046
58	1.545	1.611	1.678	102	0.4420	0.4666	0.4921	102	0.4420	0.4666	0.4921
59	1.497	1.561	1.627	103	0.4309	0.4550	0.4800	103	0.4309	0.4550	0.4800
60	1.450	1.513	1.577	104	0.4201	0.4437	0.4683	104	0.4201	0.4437	0.4683
61	1.406	1.467	1.530	105	0.4097	0.4328	0.4568	105	0.4097	0.4328	0.4568
62	1.362	1.422	1.484	106	0.3996	0.4222	0.4458	106	0.3996	0.4222	0.4458
63	1.321	1.379	1.439	107	0.3897	0.4119	0.4350	107	0.3897	0.4119	0.4350
64	1.281	1.338	1.396	108	0.3802	0.4019	0.4245	108	0.3802	0.4019	0.4245
65	1.242	1.298	1.355	109	0.3709	0.3922	0.4144	109	0.3709	0.3922	0.4144
66	1.204	1.259	1.315	110	0.3619	0.3828	0.4045	110	0.3619	0.3828	0.4045
67	1.168	1.221	1.276	111	0.3531	0.3736	0.3949	111	0.3531	0.3736	0.3949
68	1.133	1.185	1.238	112	0.3446	0.3647	0.3856	112	0.3446	0.3647	0.3856
69	1.100	1.150	1.202	113	0.3363	0.3560	0.3765	113	0.3363	0.3560	0.3765
70	1.067	1.117	1.167	114	0.3283	0.3476	0.3677	114	0.3283	0.3476	0.3677
71	1.036	1.084	1.134	115	0.3205	0.3394	0.3591	115	0.3205	0.3394	0.3591
72	1.005	1.053	1.101	116	0.3129	0.3315	0.3508	116	0.3129	0.3315	0.3508
73	0.9758	1.022	1.070	117	0.3055	0.3237	0.3427	117	0.3055	0.3237	0.3427
74	0.9475	0.9927	1.039	118	0.2984	0.3162	0.3348	118	0.2984	0.3162	0.3348
75	0.9200	0.9642	1.010	119	0.2914	0.3089	0.3272	119	0.2914	0.3089	0.3272
76	0.8936	0.9367	0.9811	120	0.2846	0.3018	0.3197	120	0.2846	0.3018	0.3197
77	0.8679	0.9102	0.9536	121	0.2781	0.2949	0.3125	121	0.2781	0.2949	0.3125
78	0.8432	0.8844	0.9269	122	0.2717	0.2882	0.3054	122	0.2717	0.2882	0.3054
79	0.8192	0.8596	0.9011	123	0.2655	0.2817	0.2986	123	0.2655	0.2817	0.2986

