

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

Spec. No.:

EX-AP-SD-22082301

Version:

A/0

Page:

FAX: 0086-758-2698912

1/10

Specifications Approval Sheet

CUSTOMER P/N:		
PART NAME:	DT-A Series - NT	C Thermistor Chip
SPECIFICATION:	DT104F39	950A-A-S-B
DATE:	.69//	16
For Customer App	proval:	
For Customer App	proval:	
For Customer App	oroval:	
For Customer App	oroval:	
For Customer App	oroval:	
For Customer App		

EXSENSE Electronics Technology Co., Ltd.

Address: No. 201, Shunjing Road, Dinghu District, Zhaoqing City, Guangdong Province, China

TEL: 0086-758-2661333

Web: http://www.exsense.com Email: mkb@exsense.com.cn



Spec. No. : EX-AP-SD-22082301

Version: A/0

Page: 2/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

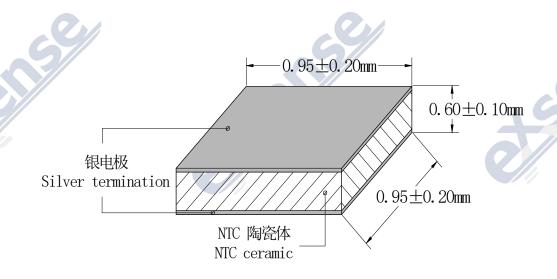
1. Range of Application

The specification approval sheet is applicable to DT-A 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



3. Part Number

DT	104	F	3950	Α	Α	S	В
1	2	3	4	(5)	6	7	8
Product Series Code	Resistance @25℃	Tolerance @25℃	Beta	Test temp. of B	Electrode Material	Welding Method	Packing
DT-A Series NTC Thermistor	10×10 ⁴ Ω	±1%	3950K	25/50℃	Silver Electrode	Solder Welding	Bulk



Spec. No.:

EX-AP-SD-22082301

Version:

A/0

Page:

3/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

4. Electrical Performance

No.	Item	Symbol	Test Condition	Scope	Unit
	Resistance @25℃	R ₂₅	T=25±0.01℃	100±1%	ΚΩ
2	Beta	B _{25/50}	$B = \frac{\ln(R_{T1}) - \ln(R_{T2})}{(1/T1 - 1/T2)}$	3950±1%	К
3	Thermal time constant	Т	50℃→25℃, in oil	≤2.0	sec
4	Dissipation Factor	δ	Ta=25±0.5℃	≈1.2	mW/℃
5	Max. Rated Power	Pr	Ta=25±0.5℃	≤60	mW
6	Operating Temp. Range	1	3//	-40~+125	$^{\circ}$

4.1 Resistance Value (R_{25c})

Requirement: $R_{25}=100K\Omega\pm1\%$

Test method: Measuring in high-precision thermostatic oil tank of 25°C±0.05°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}=3950K±1%

Test method: The resistance values of 25±0.05℃ and 50±0.05℃ are measured in high-precision thermostatic oil tank, then calculate according to the following formula:

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

4.3 Thermal Time Constant (τ)

Thermal time constant: T1=50-(50-25)*63.2%=34.2℃, max 10 seconds (in oil)

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.



Spec. No. :

EX-AP-SD-22082301

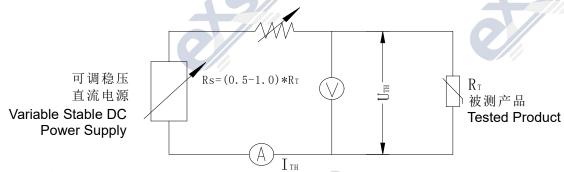
Version: A/0

Page: 4/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

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 $^{\circ}$ C.



Adjust I_{TH} for
$$\frac{U_{TH}}{I_{TH}}$$
 = R₈₅, then calculate by the following formula:
$$\delta = \frac{U_{TH} \bullet I_{TH}}{85 - 25 ^{\circ} \text{C}} \text{ (mw/°C)}$$

4.5 Max. Rated Power (Pr)

Requirement: Ta=25±0.5°C, max 60mW.

4.6 Operating temp. Range

-40°C~+125°C. (All materials used to assemble must meet the highest operating temperature)









Spec. No. :

EX-AP-SD-22082301

Version: Page: A/0 5/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

5. Reliability

Item	Standard	Test Method
	△ At least 95% of the	Preheating temperature: 100°C~150°C
Oaldanah ilita Taat	termination electrode	Preheating time: 1Min
Solderability Test	surface is covered with	Product soldering temperature: 265±5℃
	solder	Tin immersion time: 1±0.5s
		Vibration frequency range:10~55Hz
Vibration Test		Total amplitude: 1.52mm
5		Time: X, Y, Z direction each 2hrs.
		After the chip is welded to the lead, which
Thornol Chook		is coated into a thermistor with epoxy resin
Thermal Shock Test		and circulated 1000 times in the air
Test	0 //	according to the following temperature
		curve: -40°C×30min→100°C×30min
Lligh		After the chip is welded to the lead, which
High		is coated into a thermistor with epoxy
Temperature	△ Change rate of resistance	resin, placed at 125±5℃ air for
Aging Test	value≤±1%	1000h±24hrs
	△ Change rate of Beta≤±1%	After the chip is welded to the lead, which
Low Temperature	△ Appearance without	is coated into a thermistor with epoxy
Storage Test	damage	resin, placed at -40±5℃ air for
		1000h±24hrs
		After the chip is welded to the lead, which
High		is coated into a thermistor with epoxy
Temperature		resin, under the condition of 100±5℃,
Load Test		1.0mA working current is transmitted,
		working 1000h±24hrs.
High		After the chip is welded to the lead, which
Temperature		is coated into a thermistor with epoxy
High Humidity		resin, placed at 85±2℃, 85±5%RH air for
Test	16//	1000h±24hrs
7/10		



Spec. No.:

EX-AP-SD-22082301

Version:

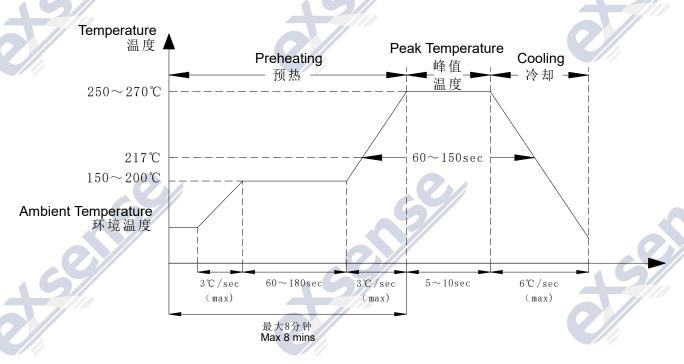
Page:

A/0 6/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

6. Recommended Welding Process Condition

6.1 Reflow soldering



6.2 Recommended working conditions for manual soldered iron soldering

Item	Condition			
Soldering temperature	Soldering when the iron head temperature is 280°C (Max.) and the iron power is 30W			
	(Max.)			
Soldering time	≤2sec			
N. C. D. C. C. L.				

Note: Do not touch the chip with the soldering iron head.

6.3 Technological condition of soldering

Item	Condition
Soldering temperature	265±3 ℃
Soldering time	1±0.5sec

Note: The use of soldering flux helps to obtain better soldering result.



Spec. No.:

EX-AP-SD-22082301

Version:

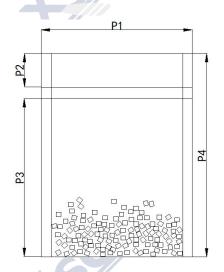
A/0 7/10

Page:

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

7. Packing

Bulk, NTC thermistor chips are vacuumized and packed in anti-static bags, QTY: 5K pcs/bag.



Unit	P1 (P2	P3	P4
mm	90±3	20±3	85±3	120±3

8. Transportation 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°C~+40°C.
- 8.5 Relative humidity: ≤75%RH.

9. Storage Life

9.1 Under the guarantee of the integrity of the sealed package and the above storage conditions, the bulk vacuum-sealed package can be stored for 1 year. (Recommended to store in inert gas.)



Spec. No. :

EX-AP-SD-22082301

Version:

A/0 8/10

Page:

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

9.2 After the packing is opened, please use it within 24 hours under indoor conditions of normal temperature and humidity. If not, please immediately vacuum again and keep according to storage method to avoid the oxidation of product leads.

10. Attention

Thermistor chip may be damaged or misused. Please strictly observe as following:

- 10.1 Thermistor is designed for the specified purpose. Do not use them for other purposes.
- 10.2 Do not use the thermistor exceed the maximum rated power of it.
- 10.3 Please use the thermistor within the applicable temperature range. All materials used to assemble must meet the highest operating temperature.
- 10.4 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.)
- 10.5 Please avoid excessive welding pressure; Avoid the external mechanical force to the thermistor chip caused by crack, edge chipping and other damage. (The causes of thermistor chip damage are: ①using tweezers to pick up the chip; ②welding pressure is too large; ③strong impact) See Picture 1 and Picture 2 below:



Picture 1 Picture 2

- 10.6 Thermistor chip exposed to the air directly will lead to oxidation, yellowing; Do not touch thermistor chip with hands directly.
- 10.7 Do not use in the following environment:
 - A. Corrosive air (C1₂, NH₃, SO_X, N_{OX}, etc.)
 - B. Acid, alkali, organic solvent
 - C. Medium with high electrical conductivity (electrolyte, water, salt water)
 - D. Places with lots of dust

11. 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.



12. R-T Table

廣東愛晟電子科技有限公司

Spec. No. :

EX-AP-SD-22082301

Version:

Page:

A/0 9/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

Part No.:D7	104F3950A-	A-S-B		R ₂₅ =100K Ω ±	1%	B _{25/50} =3950K	B _{25/50} =3950K±1%		
T _{emperature} (℃)	R _{min} (ΚΩ)	R _{nor} (KΩ)	R _{max} (ΚΩ)	T _{emperature} (°C)	R _{min} (KΩ)	R _{nor} (ΚΩ)	R _{max} (ΚΩ)		
-40	3094	3235	3383	2	288.0	294.1	300.3		
-39	2902	3033	3169	3	274.1	279.7	285.4		
-38	2723	2844	2970	4	260.9	266.2	271.5		
-37	2556	2668	2785	5	248.5	253.3	258.2		
-36	2401	2504	2612	6	236.7	241.2	245.7		
-35	2255	2351	2451	7	225.5	229.7	233.9		
-34	2120	2209	2301	8	214.9	218.8	222.7		
-33	1994	2076	2161	9	204.9	208.5	212.1		
-32	1875	1952	2030	10	195.4	198.7	202.1		
-31	1765	1835	1909	11	186.4	189.5	192.6		
-30	1662	1727	1795	12	177.8	180.7	183.6		
-29	1565	1626	1688	13	169.7	172.4	175.0		
-28	1475	1531	1589	14	162.0	164.5	167.0		
-27	1390	1442	1496	15	154.7	157.0	159.3		
-26	1311	1359	1409	16	147.8	149.9	152.0		
-25	1236	1281	1327	17	141.2	143.2	145.1		
-24	1167	1208	1251	18	135.0	136.8	138.6		
-23	1101	1140	1180	19	129.0	130.7	132.3		
-22	1040	1076	1113	20	123.4	124.9	126.4		
-21	982.5	1016	1050	21	118.0	119.4	120.8		
-20	928.4	959.3	991.0	22	112.9	114.2	115.5		
-19	877.1	905.7	935.1	23	108.0	109.2	110.4		
-18	828.9	855.4	882.7	24	103.4	104.5	105.6		
-17	783.7	808.3	833.6	25	99.00	100.0	101.0		
-16	741.2	764.0	787.5	26	94.72	95.72	96.72		
-15	701.2	722.4	744.2	27	90.66	91.65	92.65		
-14	663.7	683.4	703.6	28	86.78	87.77	88.77		
-13	628.4	646.7	665.4	29	83.10	84.08	85.07		
-12	595.1	612.1	629.6	30	79.58	80.56	81.54		
-11	563.9	579.7	595.8	31	76.24	77.21	78.18		
-10	534.4	549.1	564.1	32	73.05	74.01	74.98		
-9	506.7	520.3	534.3	33	70.01	70.96	71.92		
-8	480.6	493.2	506.2	34	67.12	68.06	69.00		
-7	455.9	467.7	479.7	35	64.35	65.28	66.22		
-6	432.7	443.6	454.8	36	61.72	62.64	63.56		
-5	410.8	421.0	431.3	37	59.21	60.11	61.02		
-4	390.1	399.6	409.2	38	56.81	57.70	58.60		
-3	370.6	379.4	388.3	39	54.52	55.40	56.28		
-2	352.2	360.3	368.6	40	52.33	53.20	54.07		
-1	334.8	342.4	350.1	41	50.25	51.10	51.95		
0	318.3	325.4	332.5	42	48.25	49.09	49.93		
1	302.8	309.3	315.9	43	46.35	47.17	48.00		



Spec. No.:

EX-AP-SD-22082301

Version:

Page:

: A/0

10/10

EXSENSE ELECTRONICS TECHNOLOGY CO., LTD.

Part No.:DT	Part No.:DT104F3950A-A-S-B			R ₂₅ =100K Ω ±	1%	B _{25/50} =3950K±1%		
T _{emperature} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	T _{emperature} (°C)	R _{min} (KΩ)	R _{nor} (KΩ)	R _{max} (KΩ)	
44	44.53	45.33	46.15	86	9.850	10.18	10.52	
45	42.79	43.58	44.38	87	9.538	9.860	10.19	
46	41.12	41.90	42.69	88	9.238	9.553	9.878	
47	39.53	40.30	41.07	89	8.949	9.257	9.575	
48	38.01	38.76	39.52	90	8.670	8.971	9.282	
49	36.55	37.29	38.04	91	8.401	8.695	8.999	
50	35.16	35.88	36.61	92	8.141	8.429	8.727	
51	33.83	34.54	35.26	93	7.891	8.173	8.464	
52	32.56	33.25	33.95	94	7.649	7.925	8.210	
53	31.34	32.02	32.71	95	7.416	7.686	7.964	
54	30.17	30.84	31.51	96	7.191	7.455	7.727	
55	29.05	29.70	30.37	97	6.974	7.232	7.499	
56	27.98	28.62	29.27	98	6.764	7.017	7.277	
57	26.95	27.58	28.22	99	6.562	6.809	7.064	
58	25.97	26.58	27.21	100	6.366	6.608	6.858	
59	25.03	25.63	26.24	101	6.177	6.414	6.658	
60	24.12	24.71	25.31	102	5.995	6.226	6.465	
61	23.25	23.83	24.41	103	5.819	6.045	6.279	
62	22.42	22.98	23.56	104	5.648	5.870	6.099	
63	21.62	22.17	22.73	105	5.484	5.700	5.924	
64	20.86	21.39	21.94	106	5.325	5.536	5.756	
65	20.12	20.65	21.19	107	5.171	5.378	5.593	
66	19.41	19.93	20.46	108	5.022	5.225	5.435	
67	18.74	19.24	19.76	109	4.878	5.077	5.282	
68	18.09	18.58	19.08	110	4.739	4.933	5.135	
69	17.46	17.94	18.43	111	4.605	4.794	4.992	
70	16.86	17.33	17.81	112	4.474	4.660	4.853	
71	16.28	16.74	17.21	113	4.348	4.530	4.719	
72	15.73	16.18	16.64	114	4.226	4.405	4.590	
73	15.19	15.63	16.08	115	4.108	4.283	4.464	
74	14.68	15.11	15.55	116	3.994	4.165	4.342	
75	14.18	14.61	15.04	117	3.884	4.051	4.225	
76	13.71	14.12	14.54	118	3.777	3.940	4.110	
77	13.25	13.66	14.07	119	3.673	3.833	4.000	
78	12.81	13.21	13.61	120	3.573	3.729	3.893	
79	12.39	12.78	13.17	121	3.475	3.629	3.789	
80	11.98	12.36	12.75	122	3.381	3.531	3.688	
81	11.59	11.96	12.34	123	3.290	3.437	3.590	
82	11.22	11.58	11.95	124	3.201	3.346	3.496	
83	10.86	11.21	11.57	125	3.116	3.257	3.404	
84	10.51	10.85	11.21					
85	10.17	10.51	10.86					