

THINKING ELECTRONIC INDUSTRIAL CO., LTD.

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**SPECIFICATION FOR APPROVAL**

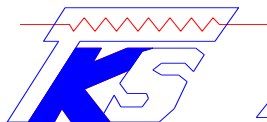
CUSTOMER	立創電子
CERTIFIED MODEL/TYPE	NTSA0103
PART NO.	NTSA0103FP005(RoHS+PHF)
APPLICATION	
CUSTOMER P/N	
ISSUE DATE	JAN.2.2015
REV. NO.	1.4
REV. DATE	JAN.16.2017

FOR CUSTOMER APPROVAL	CHECKED BY
	戶峰
	APPROVED BY
	盧宜睦



THINKING P/N:NTSA0103FP005

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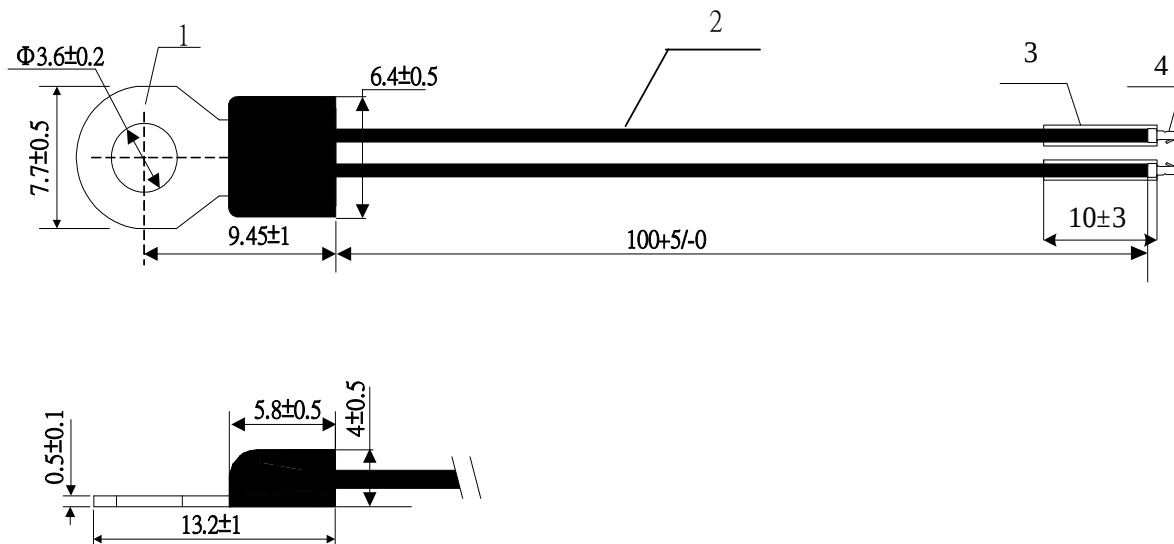


Part Number Code

Example :

NTS **A0** **103** **F** **P005**
(1) **(2)** **(3)** **(4)** **(5)**

No.	Item	Digit	Specification
(1)	Product Type	NTS	Thinking NTC thermistor for temperature sensor
(2)	Type Series	A0	Housing type
(3)	Zero power resistance at 25°C (R ₂₅)	103	$10 \times 10^3 \Omega = 10K \Omega$
(4)	Tolerance of R ₂₅	F	±1%
(5)	Optional Suffix	P005	Special code for customer RoHS+PHF



A. Material List

NO.	ITEM	DESCRIPTION
1	TERMINAL	MA236013BH204P000
2	LEAD WIRE	UL10368#24 TS黑色線
3	TUBE	Φ1.5mm熱縮套管(ZHP)
4	TERMINAL	H11201BS-2 (插Φ1.2mmPCB)
*	ELEMENT	NTC THERMISTOR

B. Electrical Characteristic

ITEM	VALUE
R25	10KΩ±1%
B25/85	3435K±1%

						Customer	立創電子		
						Customer P/N			
1.4	2017/1/16	端子由H11601PS-2#變更為H11201BS-2 (插Φ1.2mmPCB)	曹建暉	戶鋒	盧宜睦	Thinking P/N	NTSA0103FP005		
1.3	2016/9/22	端子由H11201BS-2 (插Φ1.2mmPCB) 變更為H11601PS-2#	曹建暉	戶鋒	盧宜睦	Drawing NO.	SA1501006		
1.2	2016/5/9	線材UL3266#24 TS黑色線變更為UL10368#24 TS黑色線	蘭英	戶鋒	盧宜睦	Date	2017/1/16		
1.1	2016/2/24	線材UL4413#24 *2C TS黑色線變更為UL3266#24 TS黑色線	林淑迎	戶鋒	盧宜睦	Tol:	±0.3mm	Unit:	mm Scale: mm
1.0	2015/1/2	新圖制作	劉威	戶峰	朱鳳美	THINKING ELECTRONIC INDUSTRIAL CO.,LTD.			
Rev.	Date	Subjects of Change	Designed by	Checked by	Approved by				

興勤電子工業股份有限公司
THINKING ELECTRONIC INDUSTRIAL CO.,LTD
SUBJECT: CERTIFICATION OF MATERIALS

CUSTOMER: 立創電子

THINKING P/N: N TSA0103FP005

NO	Part name	DESCRIPTION	Supplier	Supplier P/n	UL file NO.	Q'T Y	Remark
1	THERMISTOR	BRASS		MA236013BH204P000			
3	LEAD WIRE	VW-1 105℃, 300VAC TS Black WIRE	REI HSING (DONG GUAN)ELECTRIC WIRE AND CABLE CO.,LTD	UL10368#24	E108485	2	
3	TUBE	Φ1.5mm black heat-shrink tube VW-1, 125℃, 600VAC	CHANGYUAN ELECTRONICS GROUP CO LTD	CYG-ZHP	E180908	1	
			DONGGUAN SALIPT CO LTD	SALIPT S-901-600	E209436		
			WELL ONE CO LTD	GT-2	E257529		
4	TERMINAL	PHOS BRONZE	WELI SHENG TERMINAL INDUSTRIAL CO LTD	H11201BS-2		2	

Approved By: 盧宜睦

Checked By: 戶峰

Designed By: 曹建暉



Specification of NTC Thermistor for Temperature Compensation

PART NO . NTSA0103FP005

CUSTOMER P/N .

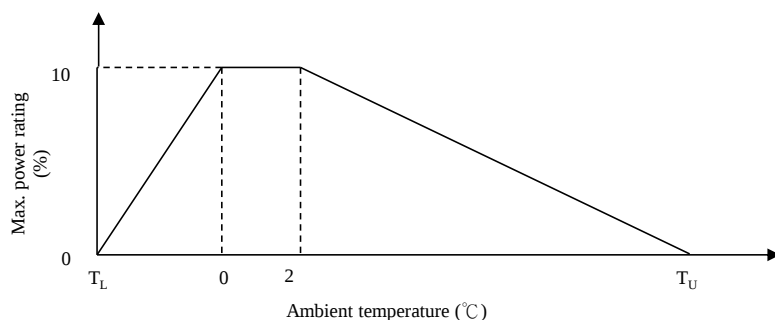
1. Electrical characteristics

	Parameter	Symbol	Test Conditions	Min.	Nor.	Max.	Unit.
a.	Resistance At 25°C	R ₂₅	Ta=25°C±0.05°C I<0.5mA	9.900	10.000	10.100	KΩ
b.	Resistance At 85°C	R ₈₅	Ta=85°C±0.05°C I<0.5mA	-----	1.451	-----	KΩ
c.	R ₂₅ / R ₈₅	K	-----	-----	6.890	-----	-----
d.	B Constant	B25/85	(1779.707 Ln K)	3401	3435	3469	K
e.	Thermal Dissipation Constant	δ	Ta=25°C (in air)	-----	Approx.5	-----	mW/°C
f.	Thermal Time Constant	τ	25°C→85°C T1=25+(85-25)*63.2%=62.9°C	-----	Approx30	-----	Sec
g.	Hi-Pot Test	-----	1500V AC 1 sec	-----	-----	10	mA

2. Maximum Ratings

	Parameter	Specification	Unit
a.	Operation Temperature Range	-30 ----- +105	°C
b.	Max' power rating at 25°C	240	mW

Maximum power rating (Pmax)



Note: T_L = Minimum Temp. of Operating Temp. Range (°C)

T_U = Maximum Temp. of Operating Temp. Range (°C)

3. Mechanical Characteristics

Wire pullout force for copper lug terminal

TEST CONDITION	AWG#	REQUIREMENT
Mount the crimped terminal ,apply axial pull out force on the wire at the speed rate of 25+/- 3mm/Min	24	3.0kgf min

Wire pullout force for connector terminal

TEST CONDITION	AWG#	REQUIREMENT
Mount the crimped terminal ,apply axial pull out force on the wire at the speed rate of 25+/- 3mm/Min	24	3.63kgf min

3-1 Leads Terminal Tensile Strength

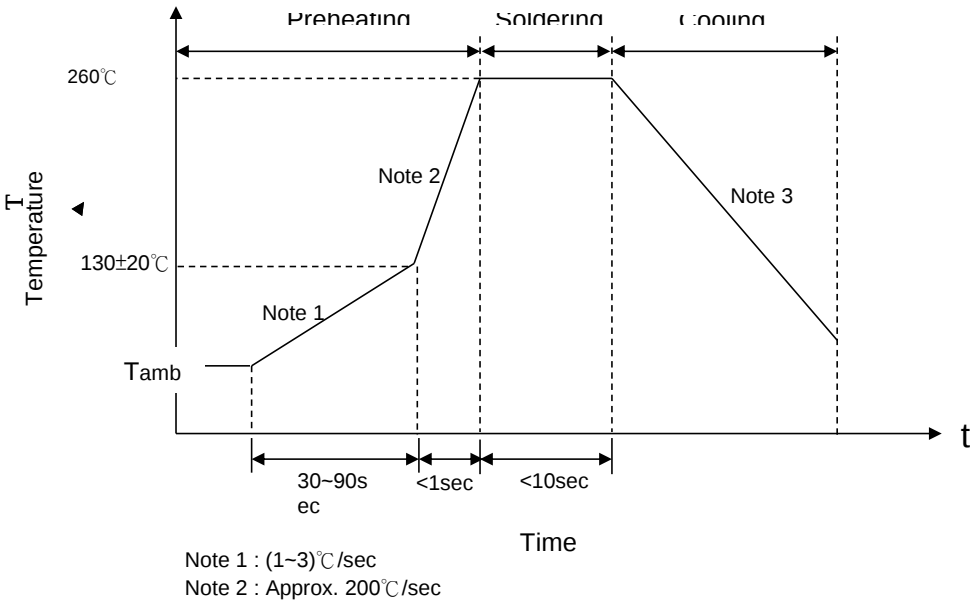
4. Reliability Test

Item	Test Conditions	Variable
Temp. cycle test	-40℃ X 30min → +25 ℃ X 5min X 10Cycles +125℃ X 30min → +25 ℃ X 5min	Within ± 3 %
High Temperature Storage	125± 5 ℃ , 1000 ± 24 hrs	No visible damage R25/R25 ≤3 %
low Temperature Storage	-40 ℃± 5 ℃ , 1000 ± 24 hrs	No visible damage R25/R25 ≤3 %
Humidity test	40 ℃ 95 % RH X 1000 HRS	Within ± 3 %

5. Solderability Test (TERMINAL)

Item	Standard	Conditions
Soldering Temperature	IEC60068-2-20	245±3℃
Soldering Time		3 ±0.5sec
Immersed Degree		95% of Immersed

6. Wave Flow Soldering Profile



7. Recommended Reworking Conditions With Soldering Iron

Item	Conditions
Temperature of Soldering Iron-tip	360℃ (max.)
Soldering Time	3 sec (max.)
Distance from Thermistor	10 mm (max.)

8.Storage condition of products

(I)產品使用條件：

- 1.产品使用的最大工作温度，最大功率等，均依照规格书要求作业，不可超出规格书之范围。
- 2.产品移动、安装必须轻拿轻放，不可用力拉动。
- 3.感温端子发生变形、氧化等现象时，不要使用，以免影响感温精度。
- 4.产品外观发现变形、破损时，不可使用，以免影响电性能。

Install and use

1. Use this product within the specified temperature range.
2. Higher temperature may cause deterioration of the characteristics or the material quality of this product.
3. Do not melt the solder in resin head, when you solder this product. If you melt the solder in resin head, it has possibility that the break of wire, short and insulation damage.
4. Do not touch the resin head directly by solder iron. It may cause the melt of solder in resin head.
5. At least away from resin head 10mm above when lead dividing.
6. In case you cut the lead wire of this product less than 10mm from resin head, the heat of melted solder at lead wire edge is propagated easily to the resin head along the lead wire.
7. Radius of lead bending should be more than 1mm when lead bending.
Holding element by side lead wire is recommended when lead wire is bent or cut.
8. Do not apply an excessive force to the lead. Otherwise, it may cause junction between lead and element to break or crack.
9. The ceramic element of this product is fragile, and care must be taken not to load an excessive press-force or not to give a shock at handling. Such forces may cause cracking or chipping.
10. If you mold by resin this product, please evaluate the quality of this product before you use it.

Warehouse Storage Conditions of Products

To keep solderability of product from declining, the following storage condition is recommended.

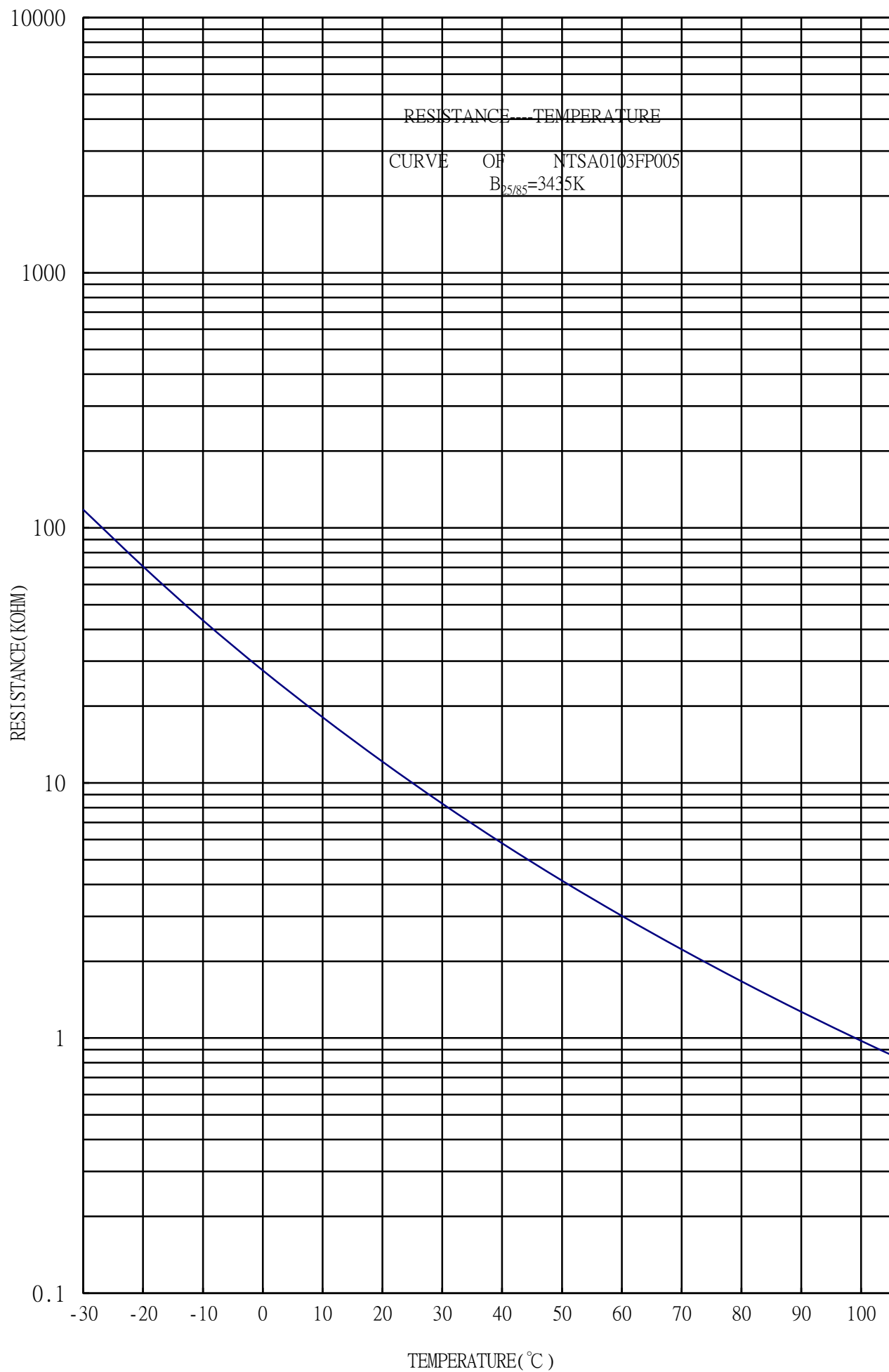
1. Storage condition:
Temperature -10°C to +40°C
Humidity less than 75%RH (not dewing condition)
2. Storage term:
Use this product within 1 year after delivery by first-in and first-out stocking system.
3. Handling after unpacking:
After unpacking, reseal product promptly or store it in a sealed container with a drying agent.
4. Storage place:
Do not store this product in corrosive gas (Sulfuric acid gas, Chlorine gas, etc.) or in direct sunlight.

Warn and note item

This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).

Do not use under the following conditions because all of these factors can deteriorate the product characteristics or cause failures and burn-out.

1. Corrosive gas or deoxidizing gas (Chlorine gas, Hydrogen sulfide gas, Ammonia gas, Sulfuric acid gas, Nitric oxide gas, etc.)
2. Volatile or flammable gas
3. Dusty conditions
4. Under vacuum, or under high or low pressure
5. Wet or humid locations; soak in the liquid or wash with liquid
6. Places with salt water, oils, chemical liquids or organic solvents and do not use directly with quick-drying glue.
7. Strong vibrations
8. Other places where similar hazardous conditions exist
9. Be sure to provide an appropriate fail-safe function on your product to prevent secondary damages that may be caused by the abnormal function or the failure of our product.



R - T Table

Part No. : NTSA0103FP005

R25 = 10 K Ω $\pm$ 1%

B25/85 = 3435 K $\pm$ 1%

Temperature (°C)	Rmax. (K Ω)	Rnor. (K Ω)	Rmin. (K Ω)	Temperature Tol. (°C)	
-30	122.02	117.87	113.85	-0.65	0.67
-29	115.72	111.84	108.08	-0.64	0.66
-28	109.78	106.15	102.64	-0.64	0.65
-27	104.16	100.78	97.492	-0.63	0.65
-26	98.864	95.699	92.626	-0.62	0.64
-25	93.855	90.897	88.024	-0.62	0.63
-24	89.121	86.356	83.669	-0.61	0.63
-23	84.645	82.061	79.548	-0.60	0.62
-22	80.413	77.998	75.648	-0.59	0.61
-21	76.412	74.155	71.957	-0.59	0.60
-20	72.629	70.519	68.464	-0.58	0.60
-19	69.053	67.080	65.157	-0.57	0.59
-18	65.672	63.827	62.029	-0.57	0.58
-17	62.475	60.750	59.068	-0.56	0.58
-16	59.453	57.840	56.265	-0.55	0.57
-15	56.595	55.087	53.613	-0.55	0.57
-14	53.893	52.482	51.103	-0.54	0.56
-13	51.338	50.018	48.727	-0.54	0.55
-12	48.921	47.686	46.478	-0.53	0.55
-11	46.635	45.479	44.348	-0.52	0.54
-10	44.471	43.389	42.330	-0.52	0.54
-9	42.423	41.410	40.418	-0.51	0.53
-8	40.484	39.536	38.606	-0.51	0.52
-7	38.646	37.759	36.888	-0.50	0.52
-6	36.905	36.074	35.258	-0.49	0.51
-5	35.254	34.476	33.711	-0.49	0.50
-4	33.689	32.960	32.243	-0.48	0.50
-3	32.203	31.520	30.849	-0.47	0.49
-2	30.792	30.153	29.524	-0.47	0.48
-1	29.453	28.854	28.264	-0.46	0.48
0	28.180	27.619	27.066	-0.45	0.47
1	26.969	26.444	25.926	-0.45	0.46
2	25.818	25.326	24.841	-0.44	0.46
3	24.723	24.262	23.808	-0.43	0.45
4	23.681	23.249	22.823	-0.43	0.44
5	22.688	22.284	21.885	-0.42	0.43
6	21.742	21.364	20.991	-0.41	0.43
7	20.841	20.487	20.137	-0.40	0.42
8	19.982	19.651	19.323	-0.40	0.41
9	19.162	18.853	18.546	-0.39	0.40
10	18.381	18.091	17.804	-0.38	0.39
11	17.635	17.364	17.096	-0.37	0.39

12	16.923	16.670	16.419	-0.36	0.38
13	16.244	16.007	15.773	-0.36	0.37
14	15.595	15.374	15.155	-0.35	0.36
15	14.975	14.769	14.564	-0.34	0.35
16	14.383	14.191	14.000	-0.33	0.35
17	13.817	13.638	13.460	-0.32	0.34
18	13.276	13.109	12.943	-0.32	0.33
19	12.760	12.604	12.449	-0.31	0.32
20	12.265	12.121	11.976	-0.30	0.31
21	11.793	11.658	11.524	-0.29	0.30
22	11.341	11.216	11.091	-0.28	0.30
23	10.909	10.793	10.677	-0.27	0.29
24	10.496	10.388	10.280	-0.27	0.28
25	10.100	10.000	9.9000	-0.26	0.27
26	9.7288	9.6288	9.5289	-0.27	0.28
27	9.3732	9.2734	9.1738	-0.28	0.29
28	9.0326	8.9331	8.8338	-0.29	0.30
29	8.7062	8.6071	8.5083	-0.30	0.32
30	8.3934	8.2948	8.1965	-0.32	0.33
31	8.0936	7.9956	7.8980	-0.33	0.34
32	7.8062	7.7089	7.6119	-0.34	0.35
33	7.5307	7.4340	7.3379	-0.35	0.36
34	7.2664	7.1706	7.0753	-0.36	0.38
35	7.0129	6.9179	6.8236	-0.38	0.39
36	6.7697	6.6756	6.5822	-0.39	0.40
37	6.5363	6.4432	6.3508	-0.40	0.41
38	6.3123	6.2202	6.1289	-0.41	0.43
39	6.0973	6.0062	5.9160	-0.43	0.44
40	5.8908	5.8008	5.7116	-0.44	0.45
41	5.6925	5.6036	5.5156	-0.45	0.47
42	5.5021	5.4143	5.3273	-0.46	0.48
43	5.3190	5.2324	5.1466	-0.48	0.49
44	5.1431	5.0576	4.9730	-0.49	0.50
45	4.9740	4.8896	4.8062	-0.50	0.52
46	4.8114	4.7282	4.6460	-0.52	0.53
47	4.6550	4.5730	4.4920	-0.53	0.54
48	4.5046	4.4238	4.3439	-0.54	0.56
49	4.3598	4.2802	4.2016	-0.55	0.57
50	4.2205	4.1421	4.0646	-0.57	0.58
51	4.0864	4.0091	3.9329	-0.58	0.60
52	3.9572	3.8812	3.8061	-0.59	0.61
53	3.8329	3.7579	3.6841	-0.61	0.62
54	3.7130	3.6393	3.5667	-0.62	0.64
55	3.5976	3.5250	3.4535	-0.63	0.65
56	3.4863	3.4149	3.3446	-0.65	0.66
57	3.3790	3.3087	3.2396	-0.66	0.68
58	3.2755	3.2064	3.1385	-0.68	0.69
59	3.1758	3.1078	3.0410	-0.69	0.70
60	3.0795	3.0127	2.9470	-0.70	0.72
61	2.9867	2.9209	2.8564	-0.72	0.73
62	2.8971	2.8324	2.7689	-0.73	0.74

63	2.8106	2.7470	2.6846	-0.74	0.76
64	2.7270	2.6646	2.6033	-0.76	0.77
65	2.6464	2.5850	2.5248	-0.77	0.78
66	2.5685	2.5082	2.4490	-0.79	0.80
67	2.4933	2.4340	2.3758	-0.80	0.81
68	2.4206	2.3623	2.3052	-0.81	0.83
69	2.3504	2.2931	2.2370	-0.83	0.84
70	2.2825	2.2262	2.1711	-0.84	0.85
71	2.2169	2.1616	2.1074	-0.86	0.87
72	2.1534	2.0991	2.0459	-0.87	0.88
73	2.0921	2.0387	1.9865	-0.88	0.89
74	2.0328	1.9803	1.9290	-0.90	0.91
75	1.9754	1.9239	1.8735	-0.91	0.92
76	1.9199	1.8693	1.8198	-0.93	0.94
77	1.8662	1.8165	1.7679	-0.94	0.95
78	1.8143	1.7654	1.7177	-0.96	0.97
79	1.7640	1.7160	1.6692	-0.97	0.98
80	1.7154	1.6682	1.6222	-0.99	0.99
81	1.6683	1.6220	1.5768	-1.00	1.01
82	1.6227	1.5772	1.5329	-1.02	1.02
83	1.5785	1.5339	1.4903	-1.03	1.04
84	1.5358	1.4919	1.4492	-1.05	1.05
85	1.4944	1.4513	1.4094	-1.06	1.07
86	1.4544	1.4120	1.3708	-1.08	1.08
87	1.4155	1.3740	1.3335	-1.09	1.10
88	1.3779	1.3371	1.2974	-1.11	1.11
89	1.3415	1.3014	1.2624	-1.12	1.13
90	1.3062	1.2668	1.2285	-1.14	1.14
91	1.2720	1.2333	1.1957	-1.15	1.16
92	1.2389	1.2009	1.1639	-1.17	1.17
93	1.2068	1.1694	1.1332	-1.19	1.19
94	1.1756	1.1390	1.1034	-1.20	1.21
95	1.1455	1.1094	1.0745	-1.22	1.22
96	1.1162	1.0808	1.0465	-1.24	1.24
97	1.0878	1.0531	1.0194	-1.25	1.25
98	1.0603	1.0262	0.99307	-1.27	1.27
99	1.03366	1.0001	0.96759	-1.29	1.29
100	1.0078	0.97485	0.94289	-1.30	1.30
101	0.98270	0.95034	0.91895	-1.32	1.32
102	0.95836	0.92657	0.89574	-1.34	1.34
103	0.93475	0.90351	0.87322	-1.35	1.35
104	0.91183	0.88114	0.85139	-1.37	1.37
105	0.88960	0.85944	0.83022	-1.39	1.39

THINKING ELECTRONIC INDUSTRIAL CO.,LTD

THINKING P/N:NTSA0103FP005

Safety Approvals (Certified Model/Type :NTSA0103)



* UL 1434 recognized→File No. E138827

Certificates

- (1) TS 16949 certificate
- (2) ISO 9001 certificate

Test Report

- (1) RoHS test report