

承认书
APPROVAL SHEET

客户名称

CUSTOMER:

产品名称

PART NAME:

高可靠性片式负温度系数热敏电阻器

High Reliability Chip NTC Thermistors

规格

SPECIFICATION:

CMKA103F3435HANT

版本

VERSION:

A0

日期

DATE OF ISSUE:

2025/10/17

制造 MANUFACTURER			客户 CUSTOMER		
拟制 DESIGN	审核 CHECK	批准 APPROVAL	检验 INSPECTOR	审核 CHECK	批准 APPROVAL
徐雪枫	褚俊华	岑权进			

■高可靠性片式负温度系数热敏电阻器

High Reliability Chip NTC Thermistors

◆特征

Feature

*具有较高的抗弯曲特性。

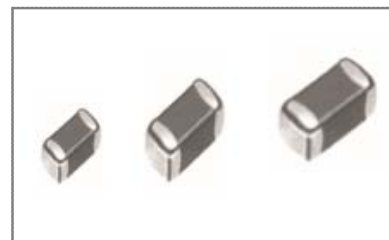
High mechanical performance able to withstand.

* 高的使用温度，最高达 150℃。

Use at temperatures up to 150 °C.

* 采用柔性端电极。

Flexible Termination electrode.



◆应用

Application

* 可充电电池、CPU的温度探测。

Temperature sensing in rechargeable batteries and CPU.

* IC、LCD、石英振荡器的温度补偿。

Temperature compensation in IC、LCD、Crystal oscillator and so on.

* 需温度补偿和探测的各种电路。

Temperature compensation or temperature sensing for various types of circuits.

* 应用于高弯曲的电路板。

High Flexure Stress Circuit Boards.

◆产品规格型号的表示方法

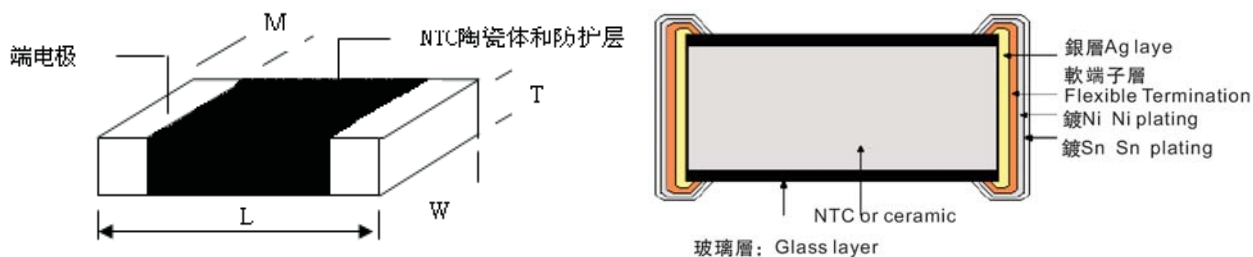
Part number identification

CMK	A	103	F	3435	H	A	N	T
①	②	③	④	⑤	⑥	⑦	⑧	⑨

①		②		③		④		⑤		⑥		⑦		⑧		⑨	
产品代号 Product code		规格尺寸 (L×W×T) (mm) Dimensions		标称阻值 Rated resistance R25 (Ω)		阻值公差 Tolerance (%)		材料常数 B 值 (K) Material constant		B 值精度 Tolerance (%)		B 值温度代码 B value Temperature Code (°C/°C)		端电极 Termina Electrodel		包装方式 Packaging Style	
CMK	高可靠性系列 片式负温度系 数热敏电阻器 Highreliability type ChipNTC Thermistor	D	1.0×0.5	103	10000	F	±1	直接读数 Direct read 3435	F	±1	A	25/50	端电极材料 代号：N 为 三层电镀 Termination Code: NNickelBarr ier		T 卷带盘 装 Tape&Reel		
				A	1.6×0.8												前二位为有效数字，第三位表示有效数字后“0”的个数 The first two are significant figure of resistance and the thir done expresses number of following zeros.
		H	±3			H	±3		C	0/25							
		J	±5						D	0/50							
		K	±10						E	0/100							
		B	2.0×1.2														

◆内部结构与外形尺寸

Inner-configuration and dimension



单位(Unit):mm/inch

型号 Size	L	W	T	M
100505 (0402)	1.0±0.15 (0.040±0.006)	0.5±0.15 (0.020±0.006)	0.5±0.15 (0.020±0.006)	0.25±0.10 (0.010±0.004)
160808 (0603)	1.6±0.15 (0.063±0.008)	0.75±0.15 (0.031±0.008)	0.75±0.15 (0.031±0.008)	0.30±0.2 (0.012±0.008)
201209 (0805)	2.0±0.2 (0.079±0.008)	1.25±0.2 (0.047±0.008)	0.9±0.2 (0.035±0.008)	0.5±0.3 (0.020±0.012)

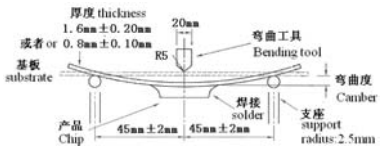
◆性能参数

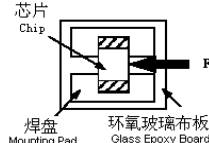
Specification

客户料号 Customers Part No.	型号规格 PartNumber	零功率标称电阻 Zero Power Resistance @ 25°C	B 值 BValue	最大允许工作电 流Maximum Operating Current @ 25°C	热时间常数 Thermal Time Constant	标准耗散常数 Typical Dissipation Constant@ 25°C	额定功率 Rated Electric Power@ 25°C
		R ₂₅ (KΩ)	B _{25/50} (k)	(mA)	sec	(mW/°C)	(mW)
	CMKA103F3435HANT	10	3435	0.31	<7	1.0	100

◆可靠性测试方法
Reliability Test Method

序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks
1	工作温度范围 Operating Temperature Range	-40℃~+150℃	
2	可焊 Solder ability	至少 95%端电极表面被焊锡覆盖。 At least 95% of terminal electrode should be covered with solder	焊锡温度: 245℃±3℃ 浸锡深度:10mm 浸锡时间 : 3±0.3s 浸渍到助焊剂约:3~5 s Solder temperature: 245℃±3℃ Immersion tin depth:10mm Duration : 3±0.3s Dip performance to a flux of about:3~5 s
3	耐焊接热 Resistance to Soldering	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;	方法 1: 焊槽法; 温度 (260±5) °C; 浸渍时间 (10±1) s。 Method 1: Solder bath; Temperature (260±5) °C; Immersion timer (10±1) seconds. 方法 2: 三次回流焊。 Method 2: 3 reflow soldering.
4	高温存储 High Temperature Exposure (Storage)	端电极与瓷体不应受损, 无可见机械损伤。 The termination and body should be no damage.	温度 150℃; 不通电; 持续时间 1000h; 试验结束后 (24±4)h 内进行电性能测量。 Temperature 150℃ Unpowered. Duration 1000h. Measurement at (24±4) hours after test conclusion.
5	温度循环 Temperature Cycling	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;	高温 125℃; 低温-55℃; 每个温度的停留时间 30min; 转换时间≤1min; 循环次数 1000 次。 试验结束后 24±4 小时内进行测试。 High Temperature +125℃; low temperature -40℃: Duration at each temperature 30 min: Transition time ≤ 1 min: Severity 1000 cycles: Measurement at 24±4 hours after test Conclusion.
6	偏高湿度 (高温高湿) Biased Humidity	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;	温度: 85℃ 湿度: 85% 施加工件电流-稳定状态; 持续时间: 1000 h Temperature:85℃: Relative humidity:85%: With Permissive Operating Current. - steady state; Duration:1000 h; Measurement at 24±4 hours after test conclusion.

序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks									
7	工作寿命 Operational Life	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;	测试温度: 150°C; 施加工件电流-稳定状态; 持续时间: 1000 小时; 试验结束后 24±4 小时内进行测试。 Test temp.: 150°C; With Permissive Operating Current. - steady state; Duration:1000 h; Measurement at 24±4 hours after test conclusion;									
8	机械冲击 Mechanical Shock	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;.	正半弦波; 峰值加速度 100g; 脉冲持续时间 6ms; 三轴六向各 3 次, 共 18 次。 Half sine wave. Peak value 100g. Normal duration 6 ms; Three shocks in each direction shall be applied along the three mutually perpendicular axes of the test specimen (18 shocks)									
9	振动 Vibration	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;.	频率 10Hz~2000Hz; 加速度 5g; 一个循环 20 分钟; X、Y、Z 三个方向每个方向 12 个循环,共 36 个循环;. The entire frequency range of 10 to 2000 Hz and return to 10 Hz shall be traversed in 20 minutes. This cycle shall be preformed 12 time in each of three mutually perpendicular directions (total of 36 times), so that the motion shall be applied for a total period of approximately 12 hours. Peak value 5g.									
10	静电放电 ESD	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;.	接触放电; 放电电压: 8000V; 每个样品每个电极承受两次放电, 正、负极性各 1 次 Direct contact discgarge; Indicated voltage: 8000V; Two discharges shall be applied to each PUT within a sample group and at each stress voltage level, one with a positive polarity and one with a negative polarity.									
11	抗弯曲 Board flex	无可见机械损伤; R25 变化率小于±5%; No mechanical damage. R25 change shall be less than±5%;.	条件:测试基板(PCB) 施压速度:0.5mm/s Condition: print circuit board. Pressing speed: 0.5 mm/s  <table><tr><th>规格 Size code</th><th>弯曲度 Camber (mm)</th><th>保持时间 Duration (s)</th></tr><tr><td>0402、0603</td><td>1</td><td>30</td></tr><tr><td>0805</td><td>2.0</td><td>30</td></tr></table>	规格 Size code	弯曲度 Camber (mm)	保持时间 Duration (s)	0402、0603	1	30	0805	2.0	30
规格 Size code	弯曲度 Camber (mm)	保持时间 Duration (s)										
0402、0603	1	30										
0805	2.0	30										

序号 No.	项目 Items	要求 Requirements	试验方法及备注 Test Methods and Remarks												
12	端子强度 Terminal Strength	无可见机械损伤; No mechanical damage.													
			<table><tr><th>类型 Type</th><th>推力(N) Force (N)</th><th>时间(s) Time (s)</th></tr><tr><td>0402</td><td>5</td><td>10±1</td></tr><tr><td>0603</td><td>6</td><td>10±1</td></tr><tr><td>0805</td><td>10</td><td>10±1</td></tr></table>	类型 Type	推力(N) Force (N)	时间(s) Time (s)	0402	5	10±1	0603	6	10±1	0805	10	10±1
			类型 Type	推力(N) Force (N)	时间(s) Time (s)										
			0402	5	10±1										
			0603	6	10±1										
0805	10	10±1													

◆电阻-温度特性

Resistance-Temperature Characteristics

片式 NTC热敏电阻器温度阻值对照表							
R-T CONVERSION TABLE							
R25=10k Ω $\pm$ 1%				B25/50= 3435 $\pm$ 3%			
T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
-40	179.5	198.4	219.1	0	26.69	27.80	28.96
-39	170.2	187.7	207.0	1	25.59	26.61	27.68
-38	161.4	177.7	195.7	2	24.53	25.48	26.47
-37	153.1	168.3	185.0	3	23.52	24.41	25.32
-36	145.2	159.4	174.9	4	22.56	23.38	24.22
-35	137.9	151.1	165.5	5	21.65	22.40	23.18
-34	130.9	143.2	156.6	6	20.78	21.47	22.19
-33	124.3	135.8	148.3	7	19.94	20.58	21.24
-32	118.1	128.8	140.5	8	19.15	19.74	20.35
-31	112.2	122.2	133.1	9	18.39	18.93	19.49
-30	106.7	116.0	126.1	10	17.66	18.16	18.67
-29	101.5	110.1	119.5	11	16.97	17.42	17.89
-28	096.5	104.6	113.4	12	16.30	16.72	17.15
-27	091.8	099.4	107.5	13	15.67	16.05	16.45
-26	087.4	094.4	102.0	14	15.06	15.41	15.77
-25	083.2	089.8	096.9	15	14.48	14.80	15.13
-24	079.3	085.4	092.0	16	13.93	14.22	14.52
-23	075.5	081.2	087.3	17	13.40	13.66	13.93
-22	072.0	077.3	083.0	18	12.89	13.13	13.37
-21	068.6	073.5	078.9	19	12.41	12.62	12.84
-20	65.39	70.02	74.98	20	11.94	12.14	12.33
-19	62.37	66.69	71.31	21	11.50	11.67	11.84
-18	59.51	63.54	67.84	22	11.07	11.22	11.38
-17	56.79	60.55	64.55	23	10.67	10.80	10.93
-16	54.21	57.72	61.44	24	10.27	10.39	10.51
-15	51.77	55.03	58.50	25	9.900	10.000	10.100
-14	49.44	52.49	55.72	26	9.517	9.625	9.732
-13	47.23	50.07	53.08	27	9.152	9.266	9.380
-12	45.14	47.78	50.58	28	8.802	8.922	9.042
-11	43.15	45.61	48.21	29	8.468	8.593	8.718
-10	41.25	43.55	45.97	30	8.149	8.278	8.408
-9	39.45	41.59	43.84	31	7.843	7.976	8.111
-8	37.74	39.73	41.82	32	7.551	7.687	7.826
-7	36.11	37.96	39.91	33	7.271	7.411	7.552
-6	34.56	36.28	38.09	34	7.003	7.145	7.290
-5	33.08	34.69	36.37	35	6.746	6.891	7.038
-4	31.68	33.17	34.73	36	6.501	6.647	6.796
-3	30.34	31.73	33.17	37	6.265	6.413	6.564
-2	29.06	30.35	31.69	38	6.039	6.189	6.341
-1	27.85	29.05	30.29	39	5.823	5.974	6.127

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Inductor Branch of Guangdong Fenghua Advanced Technology Holding Co., Ltd.

R—T CONVERSION TABLE							
R25=10k Ω $\pm$ 1%				B25/50= 3435 $\pm$ 3%			
T/℃	Rmin	Rcen	Rmax	T/℃	Rmin	Rcen	Rmax
40	5.616	5.767	5.922	83	1.435	1.533	1.638
41	5.417	5.569	5.724	84	1.395	1.492	1.595
42	5.227	5.379	5.534	85	1.356	1.451	1.553
43	5.044	5.196	5.352	86	1.3173	1.4111	1.5114
44	4.868	5.020	5.176	87	1.2798	1.3721	1.4709
45	4.700	4.851	5.007	88	1.2436	1.3344	1.4317
46	4.538	4.689	4.845	89	1.2086	1.2979	1.3937
47	4.383	4.534	4.689	90	1.1747	1.2626	1.3569
48	4.234	4.384	4.538	91	1.1419	1.2283	1.3212
49	4.091	4.240	4.394	92	1.1102	1.1952	1.2866
50	3.953	4.101	4.254	93	1.0795	1.1631	1.2530
51	3.824	3.972	4.124	94	1.0498	1.1320	1.2205
52	3.701	3.847	3.998	95	1.0210	1.1019	1.1890
53	3.581	3.726	3.877	96	0.9931	1.0727	1.1584
54	3.467	3.610	3.760	97	0.9662	1.0444	1.1288
55	3.356	3.498	3.646	98	0.9401	1.0170	1.1000
56	3.249	3.390	3.537	99	0.9148	0.9904	1.0721
57	3.147	3.286	3.432	100	0.8903	0.9646	1.0451
58	3.048	3.186	3.330	101	0.8667	0.9398	1.0190
59	2.952	3.089	3.232	102	0.8440	0.9159	0.9938
60	2.860	2.995	3.137	103	0.8219	0.8926	0.9693
61	2.771	2.905	3.045	104	0.8006	0.8701	0.9456
62	2.686	2.818	2.956	105	0.7799	0.8483	0.9226
63	2.603	2.734	2.870	106	0.7598	0.8271	0.9002
64	2.523	2.652	2.788	107	0.7404	0.8066	0.8786
65	2.446	2.574	2.708	108	0.7216	0.7867	0.8575
66	2.372	2.498	2.630	109	0.7034	0.7674	0.8371
67	2.301	2.425	2.555	110	0.6857	0.7486	0.8173
68	2.231	2.354	2.483	111	0.6686	0.7305	0.7980
69	2.165	2.285	2.413	112	0.6519	0.7128	0.7793
70	2.100	2.219	2.345	113	0.6358	0.6957	0.7612
71	2.038	2.155	2.279	114	0.6202	0.6791	0.7435
72	1.978	2.094	2.216	115	0.6050	0.6630	0.7264
73	1.920	2.034	2.155	116	0.5903	0.6473	0.7097
74	1.863	1.976	2.095	117	0.5760	0.6321	0.6936
75	1.809	1.920	2.038	118	0.5622	0.6173	0.6778
76	1.757	1.866	1.982	119	0.5487	0.6030	0.6625
77	1.706	1.814	1.928	120	0.5357	0.5890	0.6477
78	1.657	1.763	1.876	121	0.5230	0.5755	0.6332
79	1.610	1.714	1.825	122	0.5106	0.5623	0.6192
80	1.564	1.667	1.776	123	0.4987	0.5495	0.6055
81	1.519	1.621	1.729	124	0.4871	0.5371	0.5922
82	1.476	1.576	1.683	125	0.4758	0.5250	0.5793

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R—T CONVERSION TABLE							
R25=10k Ω $\pm$ 1%				B25/50= 3435 $\pm$ 3%			
T/°C	Rmin	Rcen	Rmax	T/°C	Rmin	Rcen	Rmax
126	0.4648	0.5132	0.5667	139	0.347	0.386	0.430
127	0.4541	0.5018	0.5544	140	0.340	0.378	0.422
128	0.4438	0.4907	0.5425	141	0.332	0.371	0.413
129	0.4337	0.4799	0.5309	142	0.325	0.363	0.405
130	0.4239	0.4693	0.5196	143	0.318	0.355	0.397
131	0.4144	0.4591	0.5086	144	0.312	0.348	0.389
132	0.4051	0.4491	0.4979	145	0.305	0.341	0.381
133	0.3961	0.4394	0.4875	146	0.299	0.334	0.374
134	0.3874	0.4300	0.4773	147	0.293	0.327	0.366
135	0.3788	0.4208	0.4674	148	0.287	0.321	0.359
136	0.3705	0.4119	0.4578	149	0.281	0.315	0.352
137	0.3625	0.4032	0.4484	150	0.275	0.308	0.346
138	0.3546	0.3947	0.4392				

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Inductor Branch of Guangdong Fenghua Advanced Technology Holding Co.,Ltd.

◆包装

Packaging

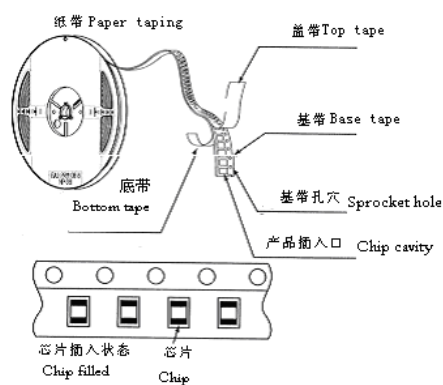
*包装数量

Packaging number

类型 SIZE	201209	160808	100505
每卷数量 REEL	4000	4000	10000
每盒数量 BOX	40000	40000	100000
每箱数量 CASE	240000	240000	600000

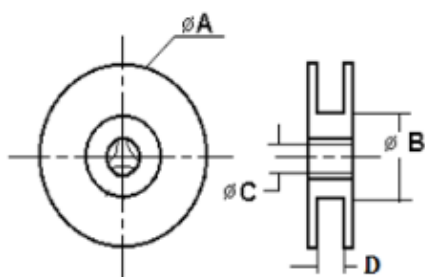
*编带图

Taping drawings



* 卷盘尺寸

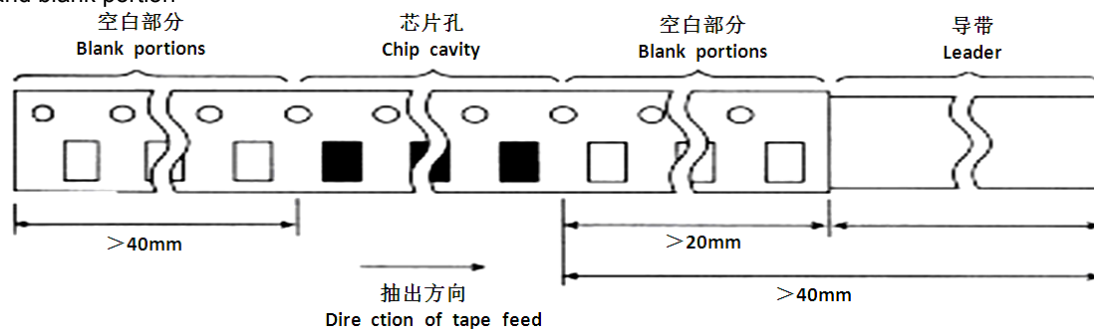
Reel dimensions (Unit: mm)



型号 Size	A	B	C	D
7 inch	178±2.0	60±2.0	13.0±1.0	9.5±2.0

* 导带及空格部分

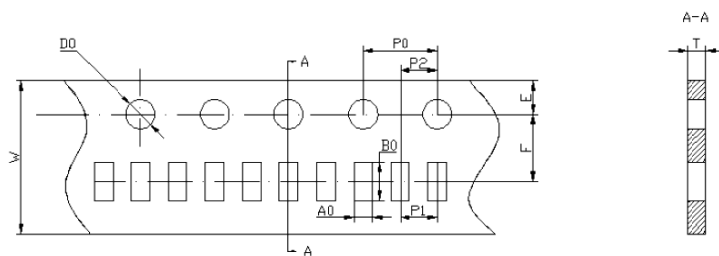
Leader and blank portion



* 编带尺寸

Taping dimensions (Unit: mm)

纸带 Paper tape



Part NO.	A0	B0	W	F	E	P1	P2	P0	D0	T
100505	0.59±0.10	1.12±0.10	8.00±0.20	3.50±0.10	1.75±0.20	2.00±0.10	2.00±0.10	4.00±0.20	1.55±0.10	0.60±0.10
160808	1.05±0.20	1.85±0.20	8.00±0.20	3.50±0.10	1.75±0.20	2.00±0.20	2.00±0.10	4.00±0.20	1.55±0.10	0.95±0.10
201209	1.45±0.20	2.35±0.20	8.00±0.20	3.50±0.10	1.75±0.20	2.00±0.20	2.00±0.10	4.00±0.20	1.55±0.10	0.95±0.10

◆ 使用注意事项 Precautions For Use

*操作注意事项 OPERATING CONSIDERATIONS

本产品的陶瓷元件为易碎材料制成，使用时务必小心不要施加过大压力或引起冲击。此类强力可能会造成产品破裂或破碎。

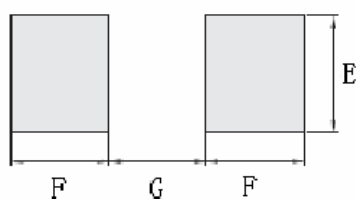
THE CERAMIC OF THIS PRODUCT IS FRAGILE, AND CARE MUSTBE TAKEN NOT TO LOAD AN EXCESSIVE PRESS - FORCE ORTO GIVE A SHOCK AT HANDLING.SUCH FORCES MAY CAUSE CRACKING OR CHIPPING.

* PC 板的设计 PCB DESIGN

(1) 当片式NTCR被安装在PC板上后，所使用的焊料的量（焊盘的大小）会直接影响到片式NTCR的性能，因此在设计基板时，必须慎重考虑焊盘的大小和配置，这些对组成基板的焊料的量有着决定的作用，过量的焊料会影响到芯片耐机械应力的能力。

WHEN CHIP THERMISTORS ARE MOUNTED ON A PCB, THE AMOUNT OF SOLDER USED(SIZE OF FILLET) CAN DIRECTLY AFFECT THERMISTOR PERFORMANCE THEREFORE, WHEN DESIGN LAND- PATTERNS IT IS NECESSARY TO CONSIDER THE APPROPRIATE SIZE AND CONFIGURATION OF THE SOLDER PADS, WHICH DETERMINES THE AMOUNT OF SOLDER NECESSARY TO FORM THE FILLETS. EXCESS SOLDER CAN AFFECT THE ABILITY OF CHIPS TO WITHSTAND MECHANICAL STRESS.

(2) 推荐最大焊盘尺寸 RECOMMENDED MAXIMUM DIMENSIONS (MM)



型号 SIZE	E	F	G
100505	0.60	0.60	0.50
160808	1.00	1.00	1.00
201209	1.40	1.20	1.00

(3) 基板配置：将片式 NTCR 安装在板上之后，芯片将承受在下一加工过程中产生的机械应力，出于这个原因，在设计焊盘和片式 NTCR 的位置时，应注意考虑将应力减少到最低点。

PATTERN CONFIGURATIONS: AFTER CHIP THERMISTOR HAVE BEEN MOUNTED ON THE BOARD, CHIPS CAN BE SUBJECT TO MECHANICAL

STRESSES IN SUBSEQUENT MANUFACTURING PROCESS , FOR THIS REASON, PLANNING PATTERN CONFIGURATIONS AND THE POSITION OF

SMD THERMISTORS SHOULD BE CAREFULLY PERFORMED TO MINIMIZE STRESS.

*自动安装应考虑到的问题 CONSIDERATIONS FOR AUTOMATIC PLACEMENT.

(1) 在将片式 NTCR 安装在 PC 板上时，不能让其承受过量的冲击力。

EXCESSIVE IMPACT LOAD SHOULD NOT BE IMPOSED ON THE THERMISTOR WHEN MOUNTING ON THE PCB .

(2) 应定期对安装机器进行维护和检查。

THE MAINTENANCE AND INSPECTION OF THE MOUNTING DEVICES SHOULD BE CONDUCTED PERIODICALLY .

(3) 当 PC 板沿着接缝孔切割开时, 片式 NTCR 所受机械应力的的大小因使用的方法不同而不同。以下方法按应力从小到大进行排列: 推板、割裂、V 形凹槽、接缝孔。因此。任何理想的片式 NTCR 的布局必须考虑到 PC 板的分割方法。

WHEN BEATING PCB ALONG THEIR PERFORATIONS, THE AMOUNT OF MECHANICAL STRESS ON THE THERMISTOR CAN VARY ACCORDING TO THE METHOD USED .THE FOLLOWING METHODS ARE LISTED IN ORDER FROM LEAST STRESSFUL TO MOST STRESSFUL: PUSH-BACK, SLIT, V-GROOVING, AND PERFORATION. THUS, ANY IDEAL SMD THERMISTOR LAYOUT MUST ALSO CONSIDER THE PCB SPLITTING PROCEDURE.

*焊膏的印刷 PRINTING SOLDER PASTE

(1) 焊膏的印刷厚度建议在 150MM~200MM。

RECOMMENDABLE THICKNESS OF SOLDER PASTE PRINTING SHOULD FROM 150MM TO 200MM.

(2) 焊接后, 爬锡高度为 0.2MM 至本产品的厚度。

AFTER SOLDERING, THE SOLDER FILLET SHALL BE A HEIGHT FROM 0.2MM TO THE THICKNESS OF CHIP THERMISTOR.

(3) 过多的焊料将给本产品过大的机械应力, 这些应力将导致断裂或机械损伤, 也可能破坏产品的电性能。

TOO MUCH SOLDER GIVES TOO STRONG MECHANICAL STRESS TO CHIP THERMISTOR, SUCH STRESS MAY CAUSE CRACKING OR ANY MECHANICAL DAMAGE. AND ALSO, IT CAN DESTROY THE ELECTRICAL PERFORMANCE OF THIS PRODUCT.

[illegible]

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