



承 认 书

APPROVAL SHEET

客户名称: _____

CUSTOMER

品 名: 常规厚膜片式固定电阻器 (无铅表面处理)

PARTNAME GENERAL THICK FILM CHIP FIXED RESISTOR(Lead Free Surface Treatment)

- RC01 * * *
- RC02 * * *
- RC03 * * */ RS03 * * *
- RC05 * * */ RS05 * * *
- RC06 * * */ RS06 * * *
- RC1210 * * */ RS1210 * * *
- RC10 * * */ RS10 * * *
- RC12 * * *

规 格:

SPECIFICATION _____

版 本 号: **R-5.16**

VERSION _____

日 期:

DATE _____

制 造			客 户		
APPROVAL			APPROVAL		
拟制	审核	确认	检验	审核	批准



修改记录 REVISION RECORD

VER 版本	MINUTE OF CHANGES 修改内容	CHECKER 修改者	RELEASE DATE 修改日期
R-5.7	1) 修改 3.0 型号规格表示办法 Revised 3.0 2) 修改 4.0 电气性能 Revised 4.0 3) 修改 5.0 可靠性 Revised 5.0 4) 修改 6.2.2 包装数量 Revised 6.2.2	方菲 Yuki Fang	2006-03-01
R-5.8	删除 11.0 附件 SGS 报告 Deleted 11.0	温宇肇 Yuzhao Wen	2006-08-15
R-5.9	1) 修改 2.1 结构 Revised 2.1 2) 修改 3.0 型号规格表示办法的“电阻温度系数代号” Revised 3.0 3) 修改 6.1.2 编带包装标准 (A) 能力 Revised 6.1.2 4) 修改 6.1.4 标签 Revised 6.1.4 5) 修改 7.0 环保情况说明 Revised 7.0	温宇肇 Yuzhao Wen	2007-05-21
R-5.10	1) 删除 1812 规格产品的相关资料 Deleted information of 1812 type chip resistor 2) 修改 9.0 贮存方法 Revised 9.0	吴晓玲 Xiaoling Wu	2009-06-09
R-5.11	1) 修改 2.2 尺寸 Revised 2.2 2) 修改 3.0 型号规格表示方法“电阻值误差精度” Revised 3.0 3) 增加 4.0 电气性能“电阻公差” Revised 4.0 4) 修改 5.0 可靠性的“试验方法”标准 Revised 5.0 5) 修改 6.0 包装 (A) 载带尺寸 Revised 6.0	吴晓玲 Xiaoling Wu	2009-08-12
R-5.12	修改 6.0 包装 (A) 载带尺寸 Revised 6.0	吴晓玲 Xiaoling Wu	2009-09-29
R-5.13	修改 3.0 型号规格表示办法的“电阻值误差精度代号” Revised 3.0	吴晓玲 Xiaoling Wu	2010-03-18
R-5.14	删除 6.0 包装的 6.1.4 标签中 “GP” 环保标识 Deleted 6.1.4 “GP” environmental label.	吴晓玲 Xiaoling Wu	2010-09-15
R-5.15	1) 修改 4.0 电气性能 “负荷下降曲线” 产品使用温度范围。Revised the temperature range of use for chip resistor in 4.0. 2) 5.0 可靠性增加 “上限类别温度试验”。Add High Temperature Exposure test to 5.0 Reliability Data 3) 修改 6.1.1(A) 塑料带编带 2010 及 2512 规格产品的 AO、BO 尺寸。Revised the dimension of AO、BO of 2010 and 2512 chip resistor in 6.1.1(A).	吴晓玲 Xiaoling Wu	2011-01-20
R-5.16	修改 2.2 尺寸中 0201 规格产品尺寸 Revised 2.2 dimension of 0201 type chip resistor.	吴晓玲 Xiaoling Wu	2011-06-29



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RC/RS□□□□

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1.0 概述 Summary

片式电阻器主要生产的型号包括 0201、0402、0603、0805、1206、1210、2010、2512。其特点是：

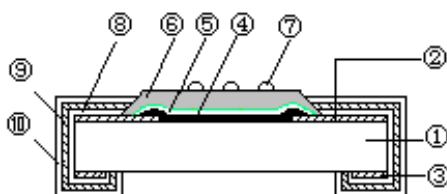
The dimension type for chip resistor including 0201、0402、0603、0805、1206、1210、2010、2512, and the features are as below:

- | | |
|-------------------|---|
| *体积小、重量轻 | miniature and light weight |
| *电性能稳定，可靠性高 | stable electrical capability and high reliability |
| *机械强度高、高频特性优越 | superior mechanical and frequency |
| *装配成本低，并与自动装贴设备匹配 | low assembly cost, suit for automatic SMT |
| *适应再流焊与波峰焊 | suit for re-flow and wave flow soldering . |
| *符合 RoHS 指令要求 | Compliant with RoHS Directive |

产品广泛应用于计算机、通讯、工业自动化、航天航空、军事、数字电视、数字音响及消费类电子等领域。
The applications for the chip resistor are wildly in computer, communication, industry automatization, aviation, military, digital TV, digital acoustics and consume electronics, etc.

2.0 结构及尺寸 Structure And Dimensions

2.1 结构 Structure



结构层 Structure	主要成分 Main Substance
①陶瓷基片 Substrate	三氧化二铝 Al ₂ O ₃
②面电极 Face Electrode	银-钯电极 Ag-Pd,
③背电极 Reverse Electrode	银电极 Ag
④电阻体 Resistive Element	氧化钌、玻璃 Ruthenium oxide , glass
⑤一次保护层 1 st protective coating	玻璃 Glass
⑥二次保护层 2 nd protective coating	玻璃 / 树脂 Glass / Resin
⑦标记 Marking	玻璃 / 树脂 Glass / Resin
⑧端电极 Inner Termination	镍铬合金 Ni-Cr
⑨中间电极 Middle Termination	镍层 Ni Plating
⑩外部电极 Outer Termination	锡层 Sn Plating



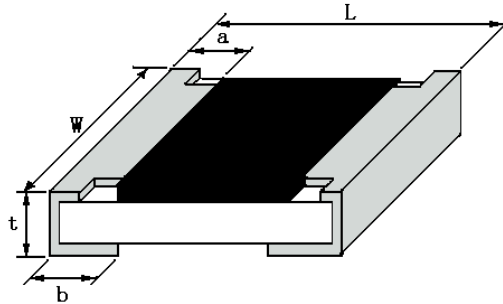
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2.2 尺寸 Dimensions



型号 Type	L (mm)	W (mm)	t (mm)	a (mm)	b (mm)
0201	0.60±0.05	0.30±0.05	0.23±0.03	0.10±0.05	0.15±0.05
0402	1.00±0.10	0.50±0.10	0.30±0.10	0.20±0.10	0.25±0.10
0603	1.60±0.15	0.80±0.15	0.40±0.10	0.30±0.20	0.30±0.20
0805	2.00±0.20	1.25±0.15	0.50±0.10	0.30±0.20	0.40±0.20
1206	3.20±0.20	1.60±0.15	0.55±0.10	0.50±0.20	0.50±0.20
1210	3.20±0.20	2.50±0.20	0.55±0.10	0.50±0.20	0.50±0.20
2010	5.00±0.20	2.50±0.20	0.55±0.10	0.60±0.20	0.60±0.20
2512	6.40±0.20	3.20±0.20	0.55±0.10	0.60±0.20	0.60±0.20

2.3 产品外观 Appearance

2.3.1 电阻器表面二次保护层保护膜覆盖完好且难以脱落,表面平整;

The surface of resistor is covered with Protecting Coating which hard to fade, and the surface of coating should avoid unevenness.

2.3.2 电阻器端电极覆盖均匀、镀层较难脱落、而且平整、无开裂、针孔、变色;

The terminal part is covered equable, the plating is hard to fade, and should avoid unevenness, flaw, pinhole and discoloration.

2.3.3 电阻器芯片无裂痕、标记可辨。

With a clear mark, the resistor body is crack-free.



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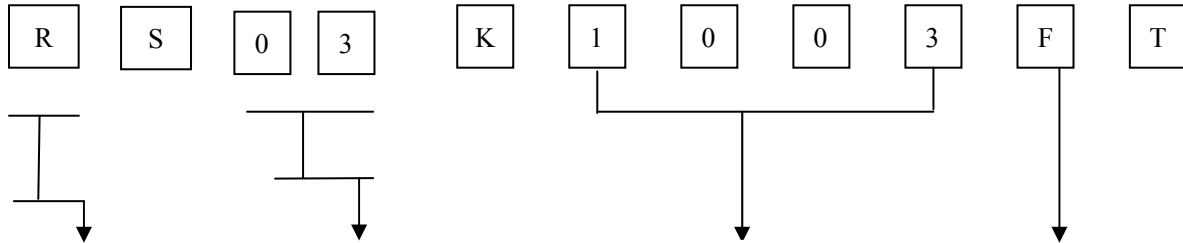
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3.0 型号规格表示办法 How To Order

额定功率系列代号 Power Rating Series	
C	常规功率系列 Normal Power Series
S	提升功率系列 Upgraded Power Series

电阻温度系数代号 Resistance Temperature Coefficient Code		
0201 0402	W	±200ppm/°C
	U	±400ppm/°C
0603 0805 1206 1210 2010 2512	K	±100ppm/°C
	L	±250ppm/°C
跨接电阻 Chip Jumper		无表示 No marking

包装方式代号 Packing Style Code	
T	编带包装 Tape & Reel
B	塑料盒包装 Bulk Case
C	塑料袋散装 Case



产品代号 Product Code	
R	厚膜片式电阻器 Thick Film Chip Resistor

代号 Code	型号 Type
01	0201
02	0402
03	0603
05	0805
06	1206
1210	1210
10	2010
12	2512







电阻值代号 Resistance Value Code	
三位数 (E-24 系列): 前两位表示有效数字, 第三位表示有效数字后零的个数。Three digits (E-24 series): The first two digits are significant figures and the third one denotes number of zeros.	
四位数 (E-96 系列): 前三位表示有效数字, 第四位表示有效数字后零的个数。Four digits (E-96 series): The first three digits are significant figures and the four one denotes number of zeros.	
小数点用 R 表示。Decimal point should be expressed by "R".	
"000" 表示跨接电阻。Jumper is expressed by "000"	
例如 Example:	
103=10KΩ (E-24)	
1003=100KΩ (E-96)	
1R0=1.0Ω	
000=0Ω	

电阻值误差精度代号 Resistance Tolerance Code		
D	±0.5%	
F	±1%	
G	±2%	
J	±5%	
K	±10%	
M	±20%	
跨接电阻 Chip Jumper	F	≤10mΩ
	G	≤20mΩ
	J	≤50mΩ



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<p>3.1 标记表示方法 The Explanation For The Resistance Value Marking</p> <p>IEC E-24、E-96 系列电阻值对照表 IEC E-24、E-96 Series Resistance Cross-reference List</p> <p style="text-align: center;">E-24 系列 (E-24 series) ($\times 10^n \Omega$) (单位 unit: 1Ω、10Ω、100Ω、1KΩ、10KΩ、100KΩ、1MΩ、10MΩ)</p> <p style="text-align: center;">表一 Table one</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1.0</td> <td>1.5</td> <td>2.2</td> <td>3.3</td> <td>4.7</td> <td>6.8</td> </tr> <tr> <td>1.1</td> <td>1.6</td> <td>2.4</td> <td>3.6</td> <td>5.1</td> <td>7.5</td> </tr> <tr> <td>1.2</td> <td>1.8</td> <td>2.7</td> <td>3.9</td> <td>5.6</td> <td>8.2</td> </tr> <tr> <td>1.3</td> <td>2.0</td> <td>3.0</td> <td>4.3</td> <td>6.2</td> <td>9.1</td> </tr> </table> <p style="text-align: center;">E-96 系列 (E-96 series) ($\times 10^n \Omega$) (单位: 1Ω、10Ω、100Ω、1KΩ、10KΩ、100KΩ、1MΩ、10MΩ)</p> <p style="text-align: center;">表二 Table two</p> <table border="1" style="width: 100%; text-align: center;"> <tr> <td>1.00</td> <td>1.33</td> <td>1.78</td> <td>2.37</td> <td>3.16</td> <td>4.22</td> <td>5.62</td> <td>7.50</td> </tr> <tr> <td>1.02</td> <td>1.37</td> <td>1.82</td> <td>2.43</td> <td>3.24</td> <td>4.32</td> <td>5.76</td> <td>7.68</td> </tr> <tr> <td>1.05</td> <td>1.40</td> <td>1.87</td> <td>2.49</td> <td>3.32</td> <td>4.42</td> <td>5.90</td> <td>7.87</td> </tr> <tr> <td>1.07</td> <td>1.43</td> <td>1.91</td> <td>2.55</td> <td>3.40</td> <td>4.53</td> <td>6.04</td> <td>8.06</td> </tr> <tr> <td>1.10</td> <td>1.47</td> <td>1.96</td> <td>2.61</td> <td>3.48</td> <td>4.64</td> <td>6.19</td> <td>8.25</td> </tr> <tr> <td>1.13</td> <td>1.50</td> <td>2.00</td> <td>2.67</td> <td>3.57</td> <td>4.75</td> <td>6.34</td> <td>8.45</td> </tr> <tr> <td>1.15</td> <td>1.54</td> <td>2.05</td> <td>2.74</td> <td>3.65</td> <td>4.87</td> <td>6.49</td> <td>8.66</td> </tr> <tr> <td>1.18</td> <td>1.58</td> <td>2.10</td> <td>2.80</td> <td>3.74</td> <td>4.99</td> <td>6.65</td> <td>8.87</td> </tr> <tr> <td>1.21</td> <td>1.62</td> <td>2.15</td> <td>2.87</td> <td>3.83</td> <td>5.11</td> <td>6.81</td> <td>9.09</td> </tr> <tr> <td>1.24</td> <td>1.65</td> <td>2.21</td> <td>2.94</td> <td>3.92</td> <td>5.23</td> <td>6.98</td> <td>9.31</td> </tr> <tr> <td>1.27</td> <td>1.69</td> <td>2.26</td> <td>3.01</td> <td>4.02</td> <td>5.36</td> <td>7.15</td> <td>9.53</td> </tr> <tr> <td>1.30</td> <td>1.74</td> <td>2.32</td> <td>3.09</td> <td>4.12</td> <td>5.49</td> <td>7.32</td> <td>9.76</td> </tr> </table>								1.0	1.5	2.2	3.3	4.7	6.8	1.1	1.6	2.4	3.6	5.1	7.5	1.2	1.8	2.7	3.9	5.6	8.2	1.3	2.0	3.0	4.3	6.2	9.1	1.00	1.33	1.78	2.37	3.16	4.22	5.62	7.50	1.02	1.37	1.82	2.43	3.24	4.32	5.76	7.68	1.05	1.40	1.87	2.49	3.32	4.42	5.90	7.87	1.07	1.43	1.91	2.55	3.40	4.53	6.04	8.06	1.10	1.47	1.96	2.61	3.48	4.64	6.19	8.25	1.13	1.50	2.00	2.67	3.57	4.75	6.34	8.45	1.15	1.54	2.05	2.74	3.65	4.87	6.49	8.66	1.18	1.58	2.10	2.80	3.74	4.99	6.65	8.87	1.21	1.62	2.15	2.87	3.83	5.11	6.81	9.09	1.24	1.65	2.21	2.94	3.92	5.23	6.98	9.31	1.27	1.69	2.26	3.01	4.02	5.36	7.15	9.53	1.30	1.74	2.32	3.09	4.12	5.49	7.32	9.76
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<p>■E-24 系列：采用三位数字表示，前二位表示电阻值有效数字，第三位表示乘以 10 的次方数。 E-24 series: Express resistance value on the glass side with three digits, the first tow digits should be significant and the third one denote number of zeros. 例 For example:</p> <div style="text-align: center;">  → 10KΩ </div> <p>■E-96 系列： ▲0805、1206、1210、2010、2512 采用四位数字表示，前三位表示电阻值有效数字，第四位表示乘以 10 的次方数。 E-96 series: For the dimension type of 0805,1206,2010,2512 express the resistance value with four digits, the first three digits are significant figures and the fourth denotes the number of zeros. 例 For example:</p> <div style="text-align: center;">  → 100 KΩ </div> <p>▲0603 用三位代码表示，前二位表示 E-96 系列阻值代码，后一位字母表示乘数代码（见表三和表四）。 For the dimension type of 0603, express the resistance value with three code, the first two digit code denote the resistance of E-96 series, and the third code of letter denote the multiplier (see the table three and four). 例 For example:</p> <div style="text-align: center;">  → 2MΩ </div> <p>■小数点以“R”表示 The decimal point should be expressed by “R”. 例 For example:</p> <div style="text-align: center;">  → 5.6Ω </div> <p>■跨接电阻以“0”表示 The jumper should be expressed by “0”. 例 For example:</p> <div style="text-align: center;">  → 0Ω </div> <p>■0201、0402：不作标记 For the dimension type of 0201、0402, there is no mark on the glass side. 例 For example:</p> <div style="text-align: center;">  </div> <p>■非 IEC 标准系列的电阻值标记表示方法：一般以最接近 IEC E-24 系列标称阻值的标记表示方法。 For the resistance which does not belong to IEC serial, use the resistance of IEC serial which is most close to the required resistance of non-IEC serial for replacement.</p> <p>■客户对标记有特殊要求时，则按照协商的结果印刷标记 To get agreement by both party if there special requirement for the marking.</p>	



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表三 Table three: E-96 系列阻值代码 E-96 Series Resistance Value Code								
代号 Code	E-96 阻值 The resistance of E-96 series	代号 Code	E-96 阻值 The resistance of E-96 series	代号 Code	E-96 阻值 The resistance of E-96 series	代号 Code	E-96 阻值 The resistance of E-96 series	
01	100	25	178	49	316	73	562	
02	102	26	182	50	324	74	576	
03	105	27	187	51	332	75	590	
04	107	28	191	52	340	76	604	
05	110	29	196	53	348	77	619	
06	113	30	200	54	357	78	634	
07	115	31	205	55	365	79	649	
08	118	32	210	56	374	80	665	
09	121	33	215	57	383	81	681	
10	124	34	221	58	392	82	698	
11	127	35	226	59	402	83	715	
12	130	36	232	60	412	84	732	
13	133	37	237	61	422	85	750	
14	137	38	243	62	432	86	768	
15	140	39	249	63	442	87	787	
16	143	40	255	64	453	88	806	
17	147	41	261	65	464	89	825	
18	150	42	267	66	475	90	845	
19	154	43	274	67	487	91	866	
20	158	44	280	68	499	92	887	
21	162	45	287	69	511	93	909	
22	165	46	294	70	523	94	931	
23	169	47	301	71	536	95	953	
24	174	48	309	72	549	96	976	
表四 Table four: 乘数代码 Multiplied Code								
乘数次方 multiplier	$\times 10^{-1}$	$\times 10^{-2}$	$\times 10^0$	$\times 10^1$	$\times 10^2$	$\times 10^3$	$\times 10^4$	$\times 10^5$
代 码 code	X	Y	A	B	C	D	E	F

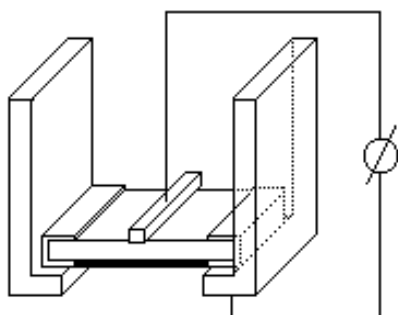


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RC/RS□□□□							DH11-0629																			
4.0 电气性能 Performance Specification																										
项 目 Item		规 格 Specification																								
型 号 Type		0201	0402	0603	0805	1206	1210	2010	2512																	
常规功率系列 Normal Power Series		1/20W	1/16W	1/16W	1/10W	1/8W	1/4W	1/2W	1W																	
提升功率系列 Upgraded Power Series		/	/	1/10W	1/8W	1/4W	1/3W	3/4W	/																	
注：当使用环境温度超过 70℃时应按“负荷下降曲线”（见下图）降负荷。 Remark: When used at ambient temperature over 70℃, the load power should be reduced as “Power Derating Curve” shown below.																										
<p>负荷下降曲线 Power Derating Curve</p> <p>额定功率 Rated Power</p> <p>环境温度 Ambient Temperature (°C)</p> <p>注： 曲线①适用于 0201 规格产品，使用温度范围为-55℃~+125℃。曲线②适用于 0402、0603、0805、1206、1210、2010、2512 规格产品，使用温度范围为-55℃~+155℃。</p> <p>Remark: Curve ① apply for 0201 chip resistor, operating temperature range is -55℃~+125℃. Curve ② apply for 0402、0603、0805、1206、1210、2010、2512 chip resistor, operating temperature range is -55℃~+155℃.</p>																										
额定电压及使用 最大工作电压 Rated Voltage & Max. Voltage Used		$E = \sqrt{P \times R}$ <p>E: 额定电压 Rated Voltage (V) R: 标称阻值 Normal Resistance (Ω) P: 额定功耗 Rated Power (W)</p>					<table border="1"> <thead> <tr> <th>型号 Type</th> <th>使用最大工作电压 Max Voltage Used</th> </tr> </thead> <tbody> <tr> <td>0201</td> <td>25V</td> </tr> <tr> <td>0402</td> <td>50V</td> </tr> <tr> <td>0603</td> <td>50V</td> </tr> <tr> <td>0805</td> <td>RC05:100V RS05:150V</td> </tr> <tr> <td>1206</td> <td>200V</td> </tr> <tr> <td>1210</td> <td>200V</td> </tr> <tr> <td>2010</td> <td>200V</td> </tr> <tr> <td>2512</td> <td>200V</td> </tr> </tbody> </table>		型号 Type	使用最大工作电压 Max Voltage Used	0201	25V	0402	50V	0603	50V	0805	RC05:100V RS05:150V	1206	200V	1210	200V	2010	200V	2512	200V
型号 Type	使用最大工作电压 Max Voltage Used																									
0201	25V																									
0402	50V																									
0603	50V																									
0805	RC05:100V RS05:150V																									
1206	200V																									
1210	200V																									
2010	200V																									
2512	200V																									

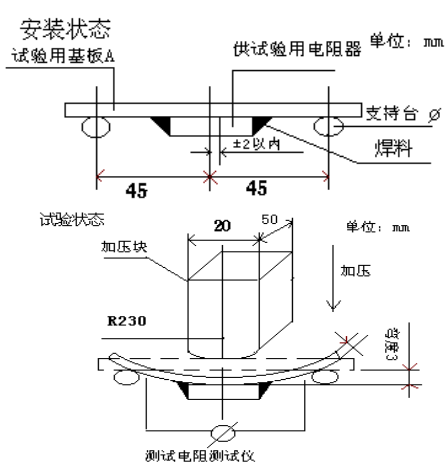


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RC/RS□□□□					DH11-0629			
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项 目 Item	标 准 Specification							
最大过负载电压 Max. Overload Voltage	最大过负荷电压为：2.5 倍额定电压(2.5×E) 当计算出的电压值超过下表中最大过负荷电压时,按下表： The Max. Overload Voltage should be 2.5×E, When the Voltage exceeds the maximum overload voltage in the table below. The value shown in the table should be the maximum one.							
	0201	0402	0603	0805	1206	1210	2010	2512
	50V	100V	100V	RC05:200V RS05:300V	400V	400V	400V	400V
跨接电阻额定电流 Rated Current for Chip Jumper	0201	0402	0603	0805	1206	1210	2010	2512
	0.5A	1A	1A	2A	2A	2A	2A	2A
跨接电阻最大过负 载电流 Max. Overload Current for Chip Jumper	0201	0402	0603	0805	1206	1210	2010	2512
	1A	2A	3A	5A	5A	5A	5A	5A
电阻公差 Tolerance for Resistor	0201	±1%、±2%、±3%、±5%、±10%、±20% 跨接电阻 Chip Jumper:≤50 mΩ、≤20 mΩ、≤10 mΩ						
	0402 0603 0805 1206 1210 2010 2512	±0.5%、±1%、±2%、±5%、±10%、±20% 跨接电阻 Chip Jumper:≤50 mΩ、≤20 mΩ、≤10 mΩ						
阻值范围 Resistance Range	0201 0402 0603 0805 1206 1210 2010 2512	1Ω~10MΩ 0Ω（跨接电阻 Chip Jumper）						
	0201	-55℃~+125℃						
使用温度范围 Temperature Range of Use	0402 0603 0805 1206 1210 2010 2512	-55℃~+155℃						
	额定温度 Rated Temperature	+70℃						



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5.0 可靠性 Reliability Data					
项目 Item	标准 Specification			试验方法 Test Method (GB/T5729-2003)	
	片状电阻器 Resistor		跨接电阻 Jumper		
电阻温度系数 Resistance Temperature Coefficient	型号 type	电阻值 Resistance	电阻温度系数 Resistance Temperature Coefficient	测定范围 Measured Between -55℃~+125℃	
	0201 0402	1Ω≤R<10Ω 1MΩ<R≤10MΩ	±400PPM/℃		U
		10Ω≤R≤1MΩ	±200PPM/℃		W
	0603 0805 1206 1210 2010 2512	1Ω≤R<10Ω 1MΩ<R≤10MΩ	±250PPM/℃		L
		10Ω≤R≤1MΩ	±100PPM/℃		K
短时间 过负载 Short Time Overload	无可见损伤 No mechanical damage. ΔR≤±(2.0%R+0.05Ω)	无可见损伤 No mechanical damage. R≤50 mΩ (J 级) 或 R≤20 mΩ (G 级) 或 R≤10 mΩ (F 级)	对非跨接电阻器施加 2.5 倍额定电压, 或最大过负载电压(取最小值),持续 5 秒。 Apply 2.5 times rated voltage or the max.overload voltage (choose the small one) for 5 seconds.	对跨接电阻器施加最大过负载电流, 持续 5 秒。 Apply the max. overload current for 5 seconds.	
绝缘电阻 Insulation Resistance	1000MΩ Min	在电极与基片间施加 100V 直流电压,保持 1 分钟,然后测绝缘电阻 值。 Apply DC 100V between substrate and termination for 1 minute, then check insulation resistance.			
					



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项目 Item	标准 Specification		试验方法 Test Method (GB/T5729-2003)
	片状电阻器 Resistor	跨接电阻 Jumper	
可焊性 Solderability	可焊面积≥95%. The termination coverage should be 95% cover min		将片状电阻器浸入非活性焊剂中浸渍大约 2S,然后去除多余焊剂,将片状电阻器浸入到焊料槽内深达 10mm,焊料槽温度为 240℃±5℃,浸入时间为 2s±0.5s,用溶剂清洗掉电阻器上的焊剂残余物,后在 10 倍放大镜下观察。Resistor should be dipped in the melted solder bath at 240℃±5℃ for 2s±0.5s. Flux should be removed from the surface of the termination with clean organic solvent.
耐焊接热 Resistance to Soldering Heat	无可见损伤 No mechanical damage. $\Delta R \leq \pm(1.0\%R+0.05\Omega)$	无可见损伤 No mechanical damage. $R \leq 50 \text{ m}\Omega$ (J 级) 或 $R \leq 20 \text{ m}\Omega$ (G 级) 或 $R \leq 10 \text{ m}\Omega$ (F 级)	将片状电阻器浸入焊料槽内深达 10mm,焊料槽内温度为 270℃±5℃,浸入时间 10s±1s,在室温放置 1~2 小时。用溶剂将多余的焊剂清洗掉,然后测量电阻值。Resistor should be dipped in the melted solder bath at 270℃±5℃ for 10 s±1s, Flux should be removed from the surface of the termination with clean organic solvent., resistor should be exposed at room condition for one or two hours, then check the resistance value.
端头强度 Bending Strength	无可见损伤 No mechanical damage. $R \leq \pm(1.0\%R+0.05\Omega)$	无可见损伤 No mechanical damage. $R \leq 50 \text{ m}\Omega$ (J 级) 或 $R \leq 20 \text{ m}\Omega$ (G 级) 或 $R \leq 10 \text{ m}\Omega$ (F 级)	基板:环氧玻璃层压印制线路板,厚度:1.6mm Substrate :Glass Epoxy (t=1.6mm) 铜箔厚度 Thickness of Copper foil:0.035mm 支持台距离 Span:90mm. 弯曲距离 Bending Distance: 0201、0402、0603、0805、1206、1210:3mm 2010、2512 : 1 mm 保持时间(duration):10s±1s 



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项目 Item	标准 Specification		试验方法 Test Method (GB/T5729-2003)
	片状电阻器 Resistor	跨接电阻 Jumper	
温度快速变化 Rapid Temperature cycle	无可见损伤 No mechanical damage. $\Delta R \leq \pm(1.0\%R+0.05\Omega)$	无可见损伤 No mechanical damage. $R \leq 50 \text{ m}\Omega$ (J级) 或 $R \leq 20 \text{ m}\Omega$ (G级) 或 $R \leq 10 \text{ m}\Omega$ (F级)	-55℃±3℃ 30 分钟←常温 (2~3) 分钟 →125℃±3℃ 30 分钟连续 5 个循环.电阻器在标准大气条件下恢复不少于 1 小时,也不多于 2 小时。 -55℃±3℃ for 30mins←normal temp. for (2~3) mins →125℃±3℃ for 30mins , total 5 cycles.
稳态湿热 Steady State Humidity	无可见损伤 No mechanical damage. $\Delta R \leq \pm(3.0\%R+0.1\Omega)$	无可见损伤 No mechanical damage. $R \leq 100 \text{ m}\Omega$ (J级) 或 $R \leq 40 \text{ m}\Omega$ (G级) 或 $R \leq 20 \text{ m}\Omega$ (F级)	电阻器在温度为 40℃±2℃,湿度 90%~95% 湿热试验箱内维持 1000 小时。 Resistor should be exposed at 40℃±2℃ and 90~95% relative humidity in a humidity test chamber for 1000 hours.
负载寿命 (70℃耐久性) Load Life	无可见损伤 No mechanical damage. $\Delta R \leq \pm(3.0\%R+0.1\Omega)$	无可见损伤 No mechanical damage. $R \leq 100 \text{ m}\Omega$ (J级) 或 $R \leq 40 \text{ m}\Omega$ (G级) 或 $R \leq 20 \text{ m}\Omega$ (F级)	在温度在 70℃±2℃ 环境状态下以 1.5 小时通,0.5 小时断周期地施加电压(额定电压或最大工作电压两者较小者),持续进行 1000 小时。 Resistor should be exposed at 70℃±2℃ for 1000hours,during this time the rated voltage or the max working voltage (choose the small one)shall be applied intermittently for 1.5 hours ON,0.5 hours OFF.
耐溶剂性 Resistance to Solvent	无可见损伤 No mechanical damage. $\Delta R \leq \pm(1.0\%R+0.05\Omega)$	无可见损伤 No mechanical damage. $R \leq 50 \text{ m}\Omega$ (J级)或 $R \leq 20 \text{ m}\Omega$ (G级) 或 $R \leq 10 \text{ m}\Omega$ (F级)	溶解溶液:三氯乙烯,浸 10 小时±1 小时。 Dipping in solvent solution of Isopropyl alcohol for 10h±1h.
上限类别温度 耐久性 High Temperature Exposure	无外观损伤 No mechanical damage. $\Delta R \leq \pm(3.0\%R + 0.1\Omega)$	无可见损伤 No mechanical damage. $R \leq 100 \text{ m}\Omega$ (J级) 或 $R \leq 40 \text{ m}\Omega$ (G级) 或 $R \leq 20 \text{ m}\Omega$ (F级)	0201 规格电阻器在温度为 125±2℃ 试验箱内,持续 1000 小时。0402、0603、0805、1206-1210、2010、2512 规格电阻器在温度为 155±2℃ 试验箱内,持续 1000 小时。 0201 type chip resistor should be exposed at 125±2℃ in the test chamber for 1000 hours. 0402、0603、0805、1206-1210、2010、2512 type chip resistor should be exposed at 155±2℃ in the test chamber for 1000 hours.



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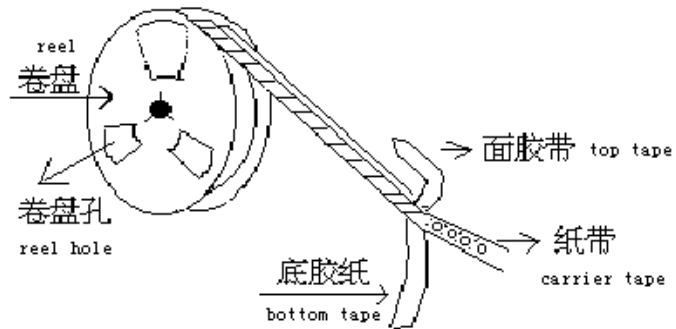
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6.0 包装 Package

6.1 编带包装 Taping

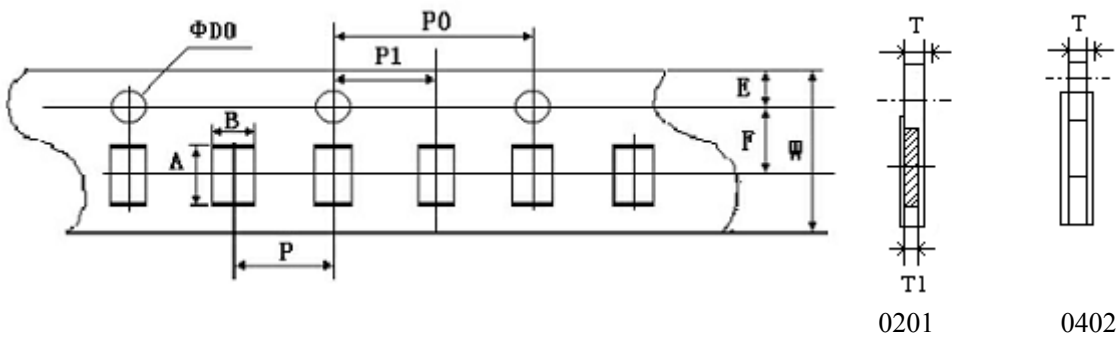
6.1.1 结构尺寸 Dimension And Structure



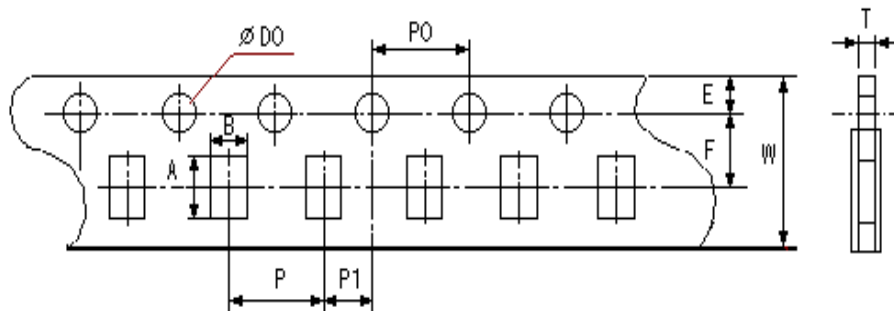
(A) 载带尺寸 Carrier Tape Dimension

■ 纸带编带 Paper Carrier Tape

For 0201、0402 type



For 0603、0805、1206、1210 type





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单位 Unit:mm

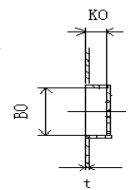
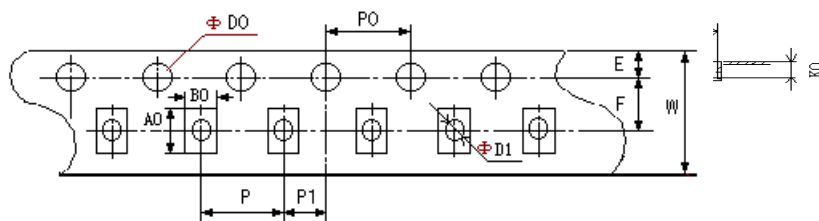
型号 Type	A	B	W	F	E
0201	0.70±0.10	0.40±0.10	8.00±0.20	3.50±0.05	1.75±0.10
0402	1.20±0.10	0.70±0.10	8.00±0.20	3.50±0.05	1.75±0.10
0603	1.85±0.10	1.10±0.10	8.00±0.20	3.50±0.05	1.75±0.10
0805	2.35±0.10	1.65±0.10	8.00±0.20	3.50±0.05	1.75±0.10
1206	3.50±0.20	1.90±0.20	8.00±0.20	3.50±0.05	1.75±0.10
1210	3.50±0.20	2.80±0.20	8.00±0.20	3.50±0.05	1.75±0.10

型号 Type	P	P0	P1	ΦD0	T
0201	2.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	T1: 0.28±0.04 T: 0.42±0.05
0402	2.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	0.42±0.05
0603	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.60±0.10
0805	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
1206	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10
1210	4.00±0.10	4.00±0.10	2.00±0.05	1.50±0.10	0.75±0.10

备注：0201 型号中 T1 指纸带方孔槽深；T 指纸带厚度。

Remark: For 0201type, T1 refers to the whole depth of paper carrier tape; T refers to the thickness of the paper carrier tape.

■塑料带编带 Embossed tapping



unit: mm

型号 Type	A0	B0	W	F	E	t
2010	5.50±0.15	2.82±0.15	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05
2512	6.78±0.15	3.45±0.15	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05

型号 Type	P	P0	P1	ΦD0	ΦD1	K0
2010	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.10/-0	1.50±0.10	0.84±0.10
2512	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.10/-0	1.50±0.10	0.81±0.10

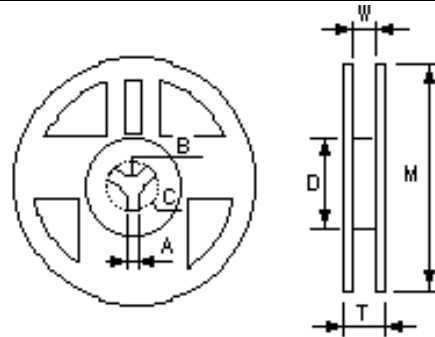


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(B) 卷盘尺寸 Reel Dimension

unit:mm

型号 Type	M	W	T	A	B	C	D
0201 0402 0603 0805 1206 1210	178±2.0	9.5±1.0	12.5±1.5	2.0±0.5	13.0±0.5	21.0±0.5	58.0±2.0
2010 2512	178±2.0	13.0±0.5	15.5±1.5	2.0±0.5	13.0±0.5	21.0±0.5	57.0±2.0



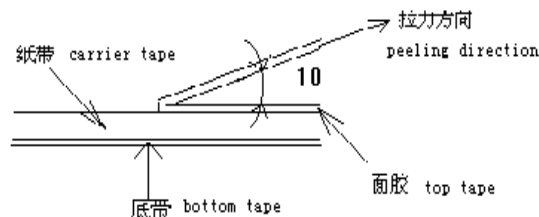
6.1.2 编带包装标准 Taping Specification

(A) 能力 Ability

■面带拉力 top tape peel strength

面带拉力强度为 11~70g(0.1N~0.7N)，速度：300mm/min，经下列试验后不允许有破裂断带现象。
Peel strength is 11~70g(0.1N~0.7N)，with speed of 300mm/min，and should not have flash and tear after peeling.

测试方法 test method:



■最小弯回半径 minimum bending radius:

当载带弯回到胶盘最小盘心半径时（50mm），应无漏片和载带破损现象。When carrier tape being bent by minimum bending radius(50mm),no deflection of chip and no break of carrier tape.

■面胶温度测试 resistance to climate (for top tape)

在温度为 60℃，湿度 90%~95%条件下，维持 120 小时后，面带不会自动剥离。

The top tape don't peel off after exposing at 60℃，90%~95% RH for 120 hours.

■芯片松动自如,无粘面、底胶现象。

Resistor is free, no sticking to top tape and bottom tape.

■芯片易从纸带中取出,且芯片孔无机械损伤。

Resistor is easy to take out from carrier tape and chip hole have no mechanical damage.



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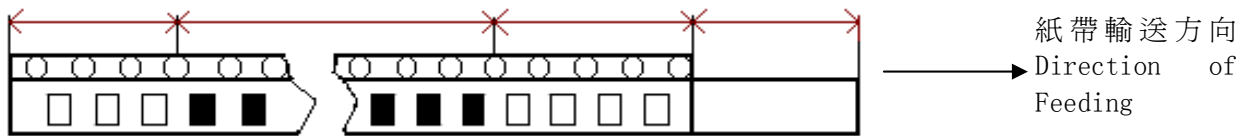
(B) 编带包装数量 Quantity In Taping

unit: PCS / reel

型号规格 Type	数量 Quantity
0201 0402	10000
0603 0805 1206 1210	5000
2010 2512	4000

(C) 载带说明 Carrier Tape Statement

无组件 有组件 无组件 牵引带（仅面胶）
no components have components no components lead Tape（only top tape）
终端部 前端部 牵引带



长度 length unit:mm

终端部 terminal	前端部 front	牵引带 lead tape
110~140	200-250	300-350

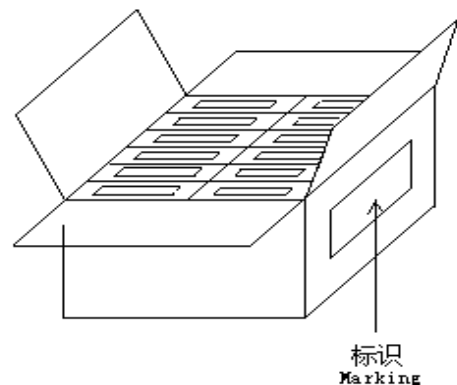
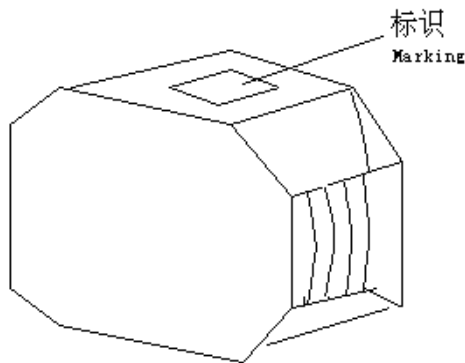
6.1.3 外包装 Outer Packaging

第一次包装：数量：1卷~10卷

第二次包装：数量：最多8盒

the first package : 1~10 reels

the second package: 8 case Max



■当包装数量不能达到最大时,剩余空隙部位采用辅助材料填满。
When quantity shall not reach the max , the remaining empty space shall be buried with buffer material.



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■当数量为最小时,使用别的方法包装,确保运输过程中无问题是至关重要的。

When the quantity is a few, alternative packing methods may be used. It is very important to ensure the safety of the products during transportation.

6.1.4 标签 Label

■卷盘标签 label on the reel

- (1. 客户物料号 customer part No. 2. 客户订单号 customer P/O) 3. 风华型号规格 fenghua Part No
- 4. 数量 quantity 5. 标称阻值 resistance 6. 额定功率 rated power
- 7. 电阻值误差 tolerance 8. 出厂日期 delivery date 9. QC 印章 QC marking
- 10. GP or RoHS marking

■内箱标签 label on inner packaging box

- (1. 客户物料号 customer part No. 2. 客户订单号 customer P/O) 3. 风华型号规格 fenghua Part No
- 4. 数量 quantity 5. 标称阻值 resistance 6. 额定功率 rated power
- 7. 电阻值误差 tolerance 8. 出厂日期 delivery date 9. QC 印章 QC marking
- 10. GP or RoHS marking

■外箱标签 label on outer packaging box

- 1. 客户名称 customer name 2. 合同编号 contract No. 3. 产品名称 product name
- 4. 风华型号规格 fenghua part No. 5. 数量 quantity 6. 箱号 case No.
- 7. 制造者名称 maker name 8. QC 印章 QC marking 9. GP or RoHS marking



备注 Remark:

①()部分可按客户要求而定。

The content with bracket could be designed according to customers' requirement.

②一般情况下,环保产品采用“RoHS”标示。

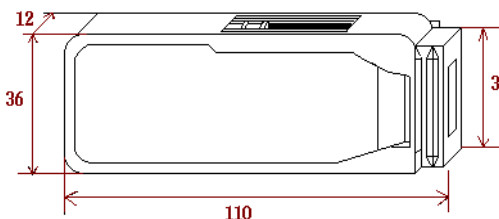
Usually, the environmental product will be used"RoHS" label.

卷盘标签上的环保标识 Environmental Logo on Reel Label	外箱上的环保标识 Environmental Logo on Outer Box
	

常规片式电阻器承认书 Approval Sheet for General Chip Resistor	版本号 Version of: R-5.16
RC/RS□□□□	DH11-0629

6.2 塑料盒包装说明 Bulk Case Packaging

6.2.1 结构尺寸 Dimension And Structure



6.2.2 包装数量 Packaging Quantity

包装方法 Packaging Style	塑料盒 Bulk case						塑料袋散装 Bulk		
型号 Type	0201 0402	0603	0805	1206	1210 2010	2512	0201 0402	0603 0805 1206	1210 2010 2512
数量 Quantity	50,000	25,000	10,000	5,000	1,500	1,000	≤50,000	≤10,000	≤4,000

unit: pcs

7.0 环保情况说明 Environmental Protection Statement

※ 产品符合 RoHS 指令 Compliant with RoHS Directive.

1) 表面处理层（即外部电极）无铅 (Pb≤100ppm)

The termination of the chip resistor is lead-free (Pb≤100ppm).

2) 本体中的铅属于RoHS指令豁免的“玻璃中的铅”

The Pb in the resistor body is belong to the RoHS exemptions of “Pb in glass material”

※ 根据中国《电子信息产品污染控制管理办法》的规定，片式电阻器的有害物质情况如下：

According to the requirement of Administration on the Control of Pollution caused by Electronic Information Products, below are the hazardous substance information for the chip resistor:

部件名称 part name	有毒有害物质或元素 hazardous substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr ⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
片式电阻器 chip resistor	×	○	○	○	○	○

○：表示该有毒有害物质在该部件所有均质材料中的含量均在SJ/T11363-2006标准规定的限量要求以下。

○: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the threshold requirement in ST/J11363-2006.

×：表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T11363-2006 标准规定的限量要求。

×: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the threshold requirement in ST/J11363-2006.

※ 产品的环保使用期限标志如下：

The Environment Friendly Use Period logo as below:



备注：此环保使用期限只适用于产品是在本产品承认书中所规定的条件下工作。

Remarks: Above “Environment Friendly Use Period” only applicable under the condition specified in this approval sheet.



常规片式电阻器承认书 Approval Sheet for General Chip Resistor

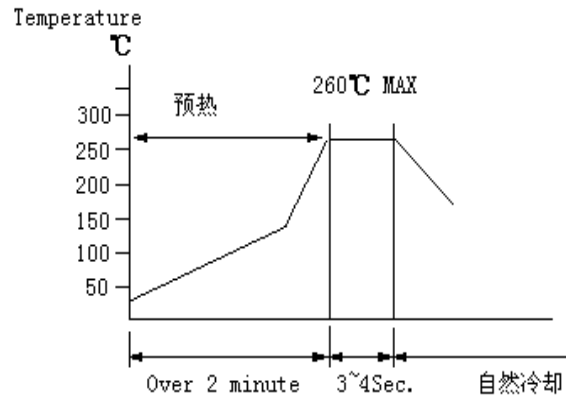
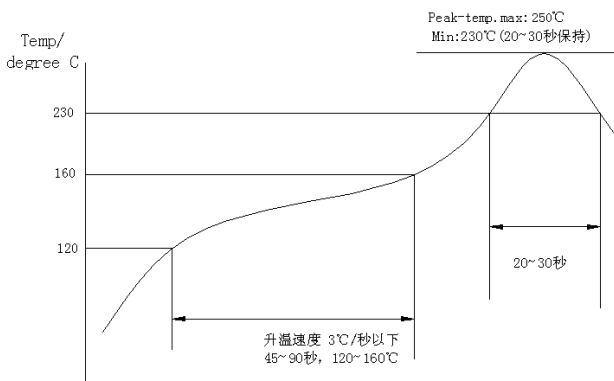
版本号 Version of: R-5.16

RC/RS□□□□

DH11-0629

8.0 表面处理无铅片阻推荐使用的焊接曲线 Recommended Soldering Profile

- 推荐的回流焊曲线 Recommended re-flow profile
 - 推荐的波峰焊曲线 Recommended wave solder profile
- 回流3次 Re-flow 3 times



- 推荐的焊膏类型 Recommended solder alloy: 96.5Sn-3.0Ag-0.5Cu

9.0 贮存方法 Storage Methods

- 贮存条件: 温度 5°C~30°C, 相对湿度 30%~70%.
Storage conditions: T: 5°C~30°C, RH: 30%~70%.
- 避免存放于有腐蚀性气体的环境。
Avoiding storage in place full of corrosive gas.

10.0 使用注意事项 Precautions For Use

- 建议在符合以上贮存条件下 6 个月内使用。
The products are suggested to be used within six months when received, and the storage condition mentioned above should be followed.
- 无铅表面处理的产品既适用于无铅焊接也适用于锡铅焊接。
The lead-free surface treatment products are applicable for lead-free soldering and Pb/Sn soldering also.
- 请您盖章确认后, 将复印件御返我司, 如三个月后未返回我司, 我们将视做默认接受。
Be sure to return a copy to our company after stamping your company acceptance, if no copy returned after three months, we would judge that you shall receive and accept this approval sheet.
- 如承认书有任何变更, 之前的版本自动作废。
If there is any amendment, a former version shall become invalid.