



# APPROVAL SHEET

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CUSTOMER

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

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

SPECIFICATION \_\_\_\_\_

: **R-5.16**

VERSION \_\_\_\_\_

:

DATE \_\_\_\_\_

APPROVAL			APPROVAL		



<b>REVISION RECORD</b>				
VER	MINUTE OF CHANGES		CHECKER	RELEASE DATE
R-5.7	1) 3.0	Revised 3.0	Yuki Fang	2006-03-01
	2) 4.0	Revised 4.0		
	3) 5.0	Revised 5.0		
	4) 6.2.2	Revised 6.2.2		
R-5.8	11.0	SGS Deleted 11.0	Yuzhao Wen	2006-08-15
R-5.9	1) 2.1	Revised 2.1	Yuzhao Wen	2007-05-21
	2) 3.0	“ ”		
	3) 6.1.2	A Revised		
	4) 6.1.4	Revised 6.1.4		
	5) 7.0	Revised 7.0		
R-5.10	1 1812	Deleted	Xiaoling Wu	2009-06-09
	2 9.0	Revised 9.0		
R-5.11	1 2.2	Revised 2.2	Xiaoling Wu	2009-08-12
	2 3.0	“ ”		
	3 4.0	“ ” Revised 4.0		
	4 5.0	“ ”		
	5 6.0	A Revised 6.0		
R-5.12	6.0	A Revised 6.0	Xiaoling Wu	2009-09-29
R-5.13	3.0	“ ”	Xiaoling Wu	2010-03-18
	”Revised 3.0			
R-5.14	6.0	6.1.4 GP Deleted 6.1.4 “GP” environmental label.	Xiaoling Wu	2010-09-15
R-5.15	1 4.0	Revised the temperature range of use for chip resistor in 4.0.	Xiaoling Wu	2011-01-20
	2 5.0	Add High Temperature Exposure test to 5.0 Reliability Data		
	3 6.1.1(A)	2010 2512 AO BO Revised the dimension of AO BO of 2010 and 2512 chip resistor in 6.1.1(A).		
R-5.16	2.2	0201 Revised 2.2 dimension of 0201type chip resistor.	Xiaoling Wu	2011-06-29



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Approval Sheet for General Chip Resistor	Version of R-5.16
RC/RS	DH11-0629

**1.0 Summary**

0201 0402 0603 0805 1206 1210 2010 2512

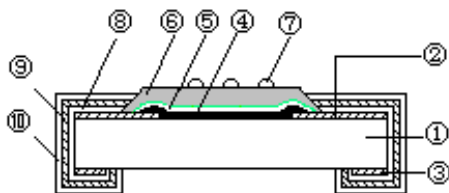
The dimension type for chip resistor including 0201 0402 0603 0805 1206 1210 2010 2512, and the features are as below:

- \* miniature and light weight
- \* stable electrical capability and high reliability
- \* superior mechanical and frequency
- \* low assembly cost, suit for automatic SMT
- \* suit for re-flow and wave flow soldering .
- \* **RoHS** Compliant with RoHS Directive

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 Structure And Dimensions**

**2.1 Structure**



Structure	Main Substance
Substrate	Al <sub>2</sub> O <sub>3</sub>
② Face Electrode	- Ag-Pd ,
③ Reverse Electrode	Ag
④ Resistive Element	Ruthenium oxide glass
⑤ 1 <sup>st</sup> protective coating	Glass
⑥ 2 <sup>nd</sup> protective coating	/ Glass / Resin
⑦ Marking	/ Glass / Resin
⑧ Inner Termination	Ni-Cr
⑨ Middle Termination	Ni Plating
⑩ Outer Termination	Sn Plating

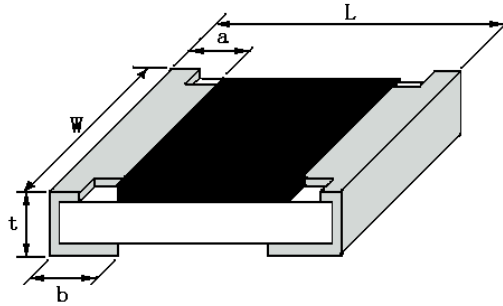


## Approval Sheet for General Chip Resistor

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**2.2 Dimensions**

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 Appearance**

## 2.3.1

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

## 2.3.2

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

## 2.3.3

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



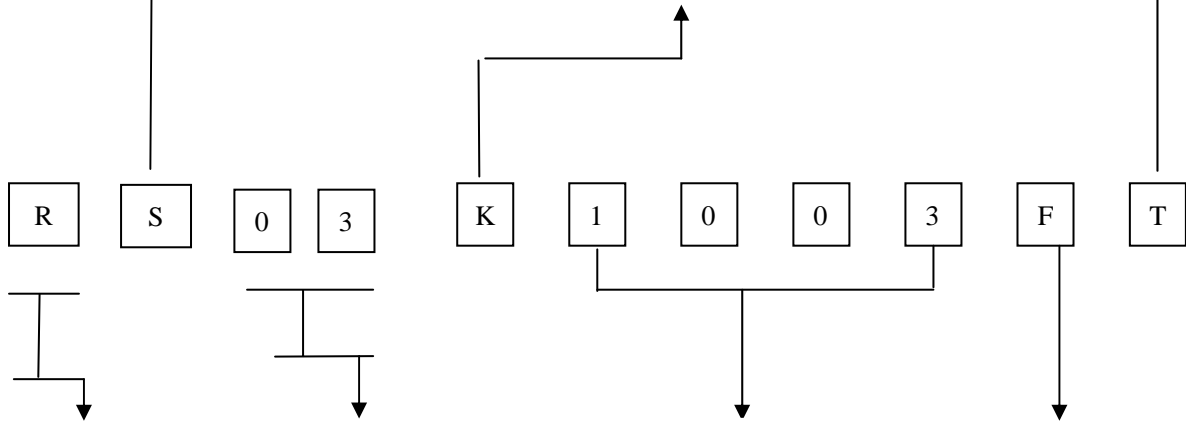
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**3.0 How To Order**

Power Rating Series	
C	Normal Power Series
S	Upgraded Power Series

Resistance Temperature Coefficient Code		
0201 0402	W U	±200ppm/°C ±400ppm/°C
0603 0805 1206 1210 2010 2512	K L	±100ppm/°C ±250ppm/°C
Chip Jumper		No marking

Packing Style Code	
T	Tape & Reel
B	Bulk Case
C	Case



Product Code	
R	Thick Film Chip Resistor

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







Resistance Value Code
<p>三位 (E-24) :</p> <p style="padding-left: 20px;">° Three digits (E-24 series): The first two digits are significant figures and the third one denotes number of zeros.</p> <p>四位 (E-96) :</p> <p style="padding-left: 20px;">° Four digits (E-96 series):The first three digits are significant figures and the four one denotes number of zeros.</p> <p style="padding-left: 20px;">R ° Decimal point should be expressed by "R".</p> <p style="padding-left: 20px;">"000" ° Jumper is expressed by "000"</p> <p>例如 Example :</p> <p style="padding-left: 20px;">103=10K (E-24)</p> <p style="padding-left: 20px;">1003=100K (E-96)</p> <p style="padding-left: 20px;">1R0=1.0</p> <p style="padding-left: 20px;">000=0</p>

Resistance Tolerance Code		
D		±0.5%
F		±1%
G		±2%
J		±5%
K		±10%
M		±20%
Chip Jumper	F	10m
	G	20m
	J	50m



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<p><b>3.1 The Explanation For The Resistance Value Marking</b></p> <p>IEC E-24 E-96 IEC E-24 E-96 Series Resistance Cross-reference List</p> <p style="text-align: center;">E-24          E-24 series ×10<sup>n</sup> (    unit   1    10    100    1K    10K    100K    1M    10M   )</p> <p style="text-align: center;">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>								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																																																																								
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<p style="text-align: center;">E-96          E-96 series (×10<sup>n</sup> ) (    1    10    100    1K    10K    100K    1M    10M   )</p> <p style="text-align: center;">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>								1.00	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</p> <p>E-24 series: Express resistance value on the glass side with three digits, the first two digits should be significant and the third one denote number of zeros.</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  <span style="font-size: 2em;">→</span> <span style="margin-left: 20px;">10K</span> </div>	10
<p>E-96</p> <p>0805 1206 1210 2010 2512</p> <p>10</p> <p>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.</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  <span style="font-size: 2em;">→</span> <span style="margin-left: 20px;">100 K</span> </div>	
<p>0603</p> <p style="text-align: center;">E-96</p> <p>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 ).</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  <span style="font-size: 2em;">→</span> <span style="margin-left: 20px;">2M</span> </div>	
<p>“R”</p> <p>The decimal point should be expressed by “R”.</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  <span style="font-size: 2em;">→</span> <span style="margin-left: 20px;">5.6</span> </div>	
<p>“0”</p> <p>The jumper should be expressed by “0”.</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  <span style="font-size: 2em;">→</span> <span style="margin-left: 20px;">0</span> </div>	
<p>0201 0402</p> <p>For the dimension type of 0201 0402, there is no mark on the glass side.</p> <p>For example</p> <div style="display: flex; align-items: center; justify-content: center;">  </div>	
<p>IEC</p> <p style="text-align: center;">IEC E-24</p> <p>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>To get agreement by both party if there special requirement for the marking.</p>	





Approval Sheet for General Chip Resistor						Version of R-5.16		
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Table three								
E-96 E-96 Series Resistance Value Code								
Code	E-96 The resistance of E-96 series	Code	E-96 The resistance of E-96 series	Code	E-96 The resistance of E-96 series	Code	E-96 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	
Table four								
Multiplied Code								
multiplier	$\times 10^{-1}$	$\times 10^{-2}$	$\times 10^0$	$\times 10^1$	$\times 10^2$	$\times 10^3$	$\times 10^4$	$\times 10^5$
code	X	Y	A	B	C	D	E	F



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**4.0 Performance Specification**

Item	Specification								
	Type	0201	0402	0603	0805	1206	1210	2010	2512
	Normal Power Series	1/20W	1/16W	1/16W	1/10W	1/8W	1/4W	1/2W	1W
	Upgraded Power Series	/	/	1/10W	1/8W	1/4W	1/3W	3/4W	/
	70°C “ ”								
	Remark: When used at ambient temperature over 70°C, the load power should be reduced as “Power Derating Curve” shown below.								
Rated Power	Power Derating Curve								
	<p>The graph shows a power derating curve where power is constant at 100% up to 70°C and then decreases linearly. Curve 1 (circled) applies to types 0201, 1206, 1210, 2010, 2512 with a range of -55°C to +125°C. Curve 2 (circled) applies to types 0402, 0603, 0805 with a range of -55°C to +155°C.</p>								
	<p>① 0201 -55°C +125°C ② 0402 0603 0805 1206 1210 2010 2512 -55°C +155°C</p> <p><b>Remark:</b> Curve ① apply for 0201 chip resistor operating temperature range is -55°C +125°C. Curve ② apply for 0402 0603 0805 1206 1210 2010 2512 chip resistor operating temperature range is -55°C +155°C.</p>								

The rated voltage at each resistance should be calculated. From the equation below , and when the rated voltage exceeds the maximum voltage used shown in the table, the rated voltage used should be the maximum voltage.

Rated Voltage & Max. Voltage Used

$$E = \sqrt{P \times R}$$

E Rated Voltage V  
R Normal Resistance  
P Rated Power W

Type	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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Continue								
Item	Specification							
Max. Overload Voltage	2.5 (2.5×E) 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
Rated Current for Chip Jumper	0201	0402	0603	0805	1206	1210	2010	2512
	0.5A	1A	1A	2A	2A	2A	2A	2A
Max. Overload Current for Chip Jumper	0201	0402	0603	0805	1206	1210	2010	2512
	1A	2A	3A	5A	5A	5A	5A	5A
Tolerance for Resistor	0201	±1% ±2% ±3% ±5% ±10% ±20% Chip Jumper: 50 m 20 m 10 m						
	0402 0603 0805 1206 1210 2010 2512	±0.5% ±1% ±2% ±5% ±10% ±20% Chip Jumper: 50 m 20 m 10 m						
Resistance Range	0201 0402 0603 0805 1206 1210 2010 2512	1 10M 0 Chip Jumper						
Temperature Range of Use	0201	-55℃ +125℃						
	0402 0603 0805 1206 1210 2010 2512	-55℃ +155℃						
Rated Temperature	+70℃							





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RC/RS		DH11-0629	
Item	Specification		Test Method (GB/T5729-2003)
	Resistor	Jumper	
Solderability	95%. The termination coverage should be 95% cover min		2S, 10mm, 240°C±5°C, 2s±0.5s, 10 Resistor should be dipped in the melted solder bath at 240°C±5°C for 2s±0.5s. Flux should be removed from the surface of the termination with clean organic solvent.
Resistance to Soldering Heat	No mechanical damage. $\Delta R$ $\pm(1.0\%R+0.05)$	No mechanical damage. R 50 m (J ) R 20 m G R 10 m (F )	10mm, 270°C±5°C, 10s±1s, 1 Resistor should be dipped in the melted solder bath at 270°C±5°C 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.
Bending Strength	No mechanical damage. R $\pm(1.0\%R+0.05)$	No mechanical damage. R 50 m (J ) R 20 m G R 10 m (F )	: Substrate :Glass Epoxy (t=1.6mm) Thickness of Copper foil:0.035mm Span:90mm. Bending Distance: 0201 0402 0603 0805 1206 1210:3mm 2010 2512 : 1 mm (duration):10s±1s  



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Item	Specification		Test Method (GB/T5729-2003)
	Resistor	Jumper	
Rapid Temperature cycle	No mechanical damage. $\Delta R \pm(1.0\%R+0.05)$	No mechanical damage. R 50 m (J ) R 20 m G R 10 m (F )	-55°C±3°C 30 2 3 125°C±3°C 30 5 . 1 , 2 -55°C±3°C for 30mins normal temp. for 2 3 mins 125°C±3°C for 30mins , total 5 cycles.
Steady State Humidity	No mechanical damage. $\Delta R \pm(3.0\%R+0.1)$	No mechanical damage. R 100 m (J ) R 40 m G R 20 m (F )	40°C±2°C, 90% 95% 1000 Resistor should be exposed at 40°C±2°C and 90~95% relative humidity in a humidity test chamber for 1000 hours.
(70°C ) Load Life	No mechanical damage. $\Delta R \pm(3.0\%R+0.1)$	No mechanical damage. R 100 m (J ) R 40 m G R 20 m (F )	70°C±2°C 1.5 ,0.5 ( ) , 1000 Resistor should be exposed at70°C±2°C 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.
Resistance to Solvent	No mechanical damage. $\Delta R \pm(1.0\%R+0.05)$	No mechanical damage. R 50 m (J ) R 20 m G R 10 m (F )	: , 10 ±1 Dipping in solvent solution of Isopropyl alcohol for 10h±1h.
High Temperature Exposure	No mechanical damage. $\Delta R \pm(3.0\%R + 0.1)$	No mechanical damage. R 100 m (J ) R 40 m G R 20 m (F )	0201 125 2 1000 0402 0603 0805 1206-1210 2010 2512 155 2 1000 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.

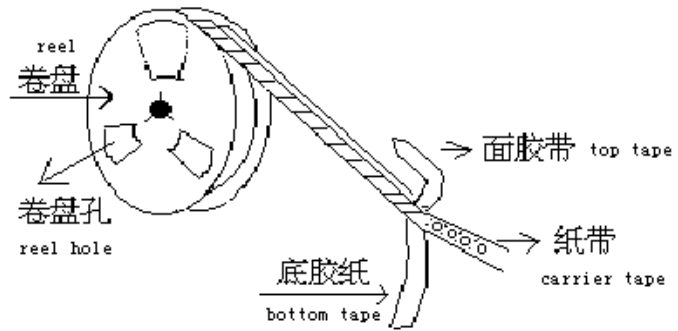


Approval Sheet for General Chip Resistor	Version of R-5.16
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6.0 Package

6.1 Taping

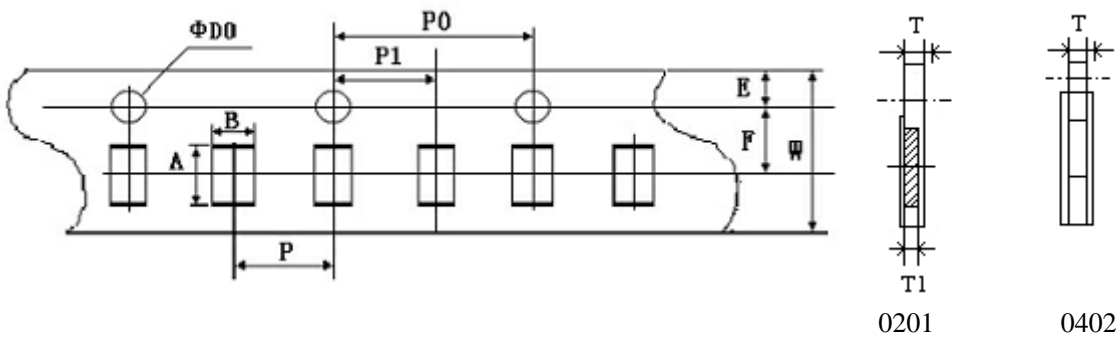
6.1.1 Dimension And Structure



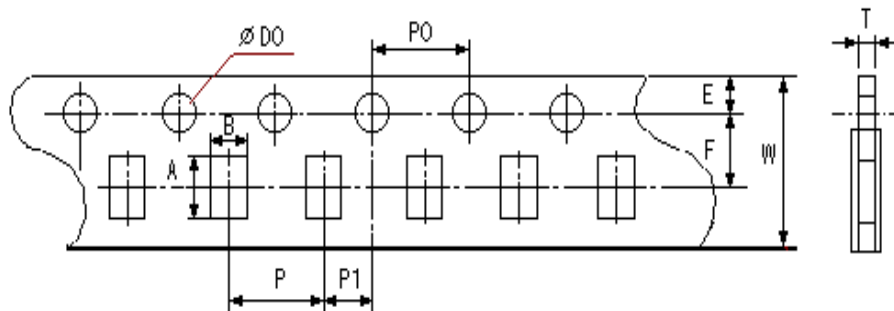
A Carrier Tape Dimension

Paper Carrier Tape

For 0201 0402 type



For 0603 0805 1206 1210 type





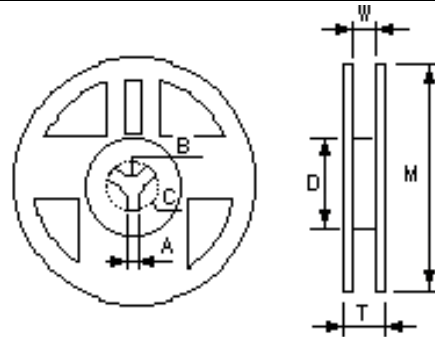
Approval Sheet for General Chip Resistor					Version of R-5.16	
RC/RS					DH11-0629	
Unit:mm						
Type	A	B	W	F	E	
0201	0.70±0.10	0.40±0.10	8.00±0.20	3.50±0.05	1.75±0.10	
0402	1.20±0.10	0.70±0.10	8.00±0.20	3.50±0.05	1.75±0.10	
0603	1.85±0.10	1.10±0.10	8.00±0.20	3.50±0.05	1.75±0.10	
0805	2.35±0.10	1.65±0.10	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	
Type	P	P0	P1	D0	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	
0201	T1	T		Remark: For 0201type, T1 refers to the whole depth of paper carrier tape; T refers to the thickness of the paper carrier tape.		
Embossed taping						
unit mm						
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
Type	P	P0	P1	D0	D1	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





Approval Sheet for General Chip Resistor	Version of R-5.16
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<b>B</b>		<b>Reel Dimension</b>						unit:mm
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 Taping Specification**

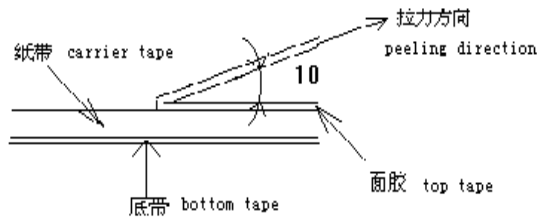
**A Ability**

top tape peel strength

11 70g(0.1N 0.7N) 300mm/min

Peel strength is 11 70g(0.1N 0.7N) with speed of 300mm/min and should not have flash and tear after peeling.

test method



minimum bending radius

50mm

When carrier tape being

bent by minimum bending radius(50mm),no deflection of chip and no break of carrier tape.

resistance to climate (for top tape)

60°C 90% 95% 120

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

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

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

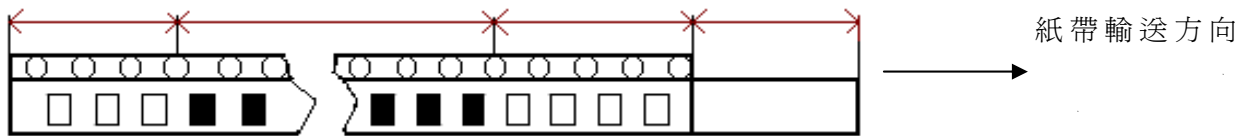


Approval Sheet for General Chip Resistor	Version of R-5.16
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<b>B</b>	<b>Quantity In Taping</b>	unit: PCS / reel
Type	Quantity	
0201 0402	10000	
0603 0805 1206 1210	5000	
2010 2512	4000	

### C Carrier Tape Statement

no components    have components    no components    lead Tape    only top tape



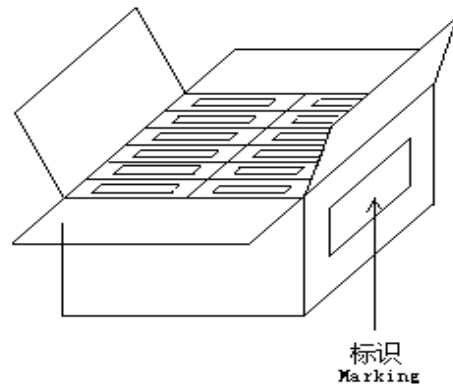
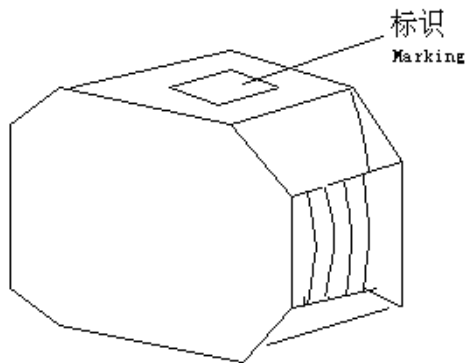
length unit:mm

terminal	front	lead tape
110    140	200-250	300-350

### 6.1.3 Outer Packaging

1    10    8

the first package    1    10 reels    the second package    8 case Max



When quantity shall not reach the max    the remaining empty space shall be buried with buffer material.



Approval Sheet for General Chip Resistor	Version of R-5.16
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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 Label**

- label on the reel
- |                       |                  |                    |
|-----------------------|------------------|--------------------|
| 1. customer part No.  | 2. customer P/O) | 3. fenghua Part No |
| 4. quantity           | 5. resistance    | 6. rated power     |
| 7. tolerance          | 8. delivery date | 9.QC QC marking    |
| 10 GP or RoHS marking |                  |                    |

- label on inner packaging box
- |                       |                  |                    |
|-----------------------|------------------|--------------------|
| (1. customer part No. | 2. customer P/O) | 3. fenghua Part No |
| 4. quantity           | 5. resistance    | 6. rated power     |
| 7. tolerance          | 8. delivery date | 9.QC QC marking    |
| 10 GP or RoHS marking |                  |                    |

- label on outer packaging box
- |                     |                 |                       |
|---------------------|-----------------|-----------------------|
| 1. customer name    | 2. contract No. | 3. product name       |
| 4. fenghua part No. | 5. quantity     | 6. case No.           |
| 7. maker name       | 8.QC QC marking | 9. GP or RoHS marking |



Remark

①( )

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

RoHS

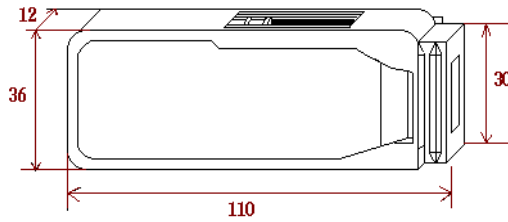
Usually, the environmental product will be used"RoHS" label.

Environmental Logo on Reel Label	Environmental Logo on Outer Box
	



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**6.2 Bulk Case Packaging**  
**6.2.1 Dimension And Structure**



**6.2.2 Packaging Quantity**

unit: pcs

Packaging Style	Bulk case						Bulk		
Type	0201 0402	0603	0805	1206	1210 2010	2512	0201 0402	0603 0805 1206	1210 2010 2512
Quantity	50,000	25,000	10,000	5,000	1,500	1,000	50,000	10,000	4,000

**7.0 Environmental Protection Statement**

※ **RoHS** Compliant with RoHS Directive.

1 Pb 100ppm

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

2 RoHS “ ”

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

※

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

part name	hazardous substance					
	Pb	Hg	Cd	Cr <sup>6+</sup>	PBB	PBDE
chip resistor	×					

SJ/T11363-2006

: 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.

× SJ/T11363-2006

×: 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.

The Environment Friendly Use Period logo as below



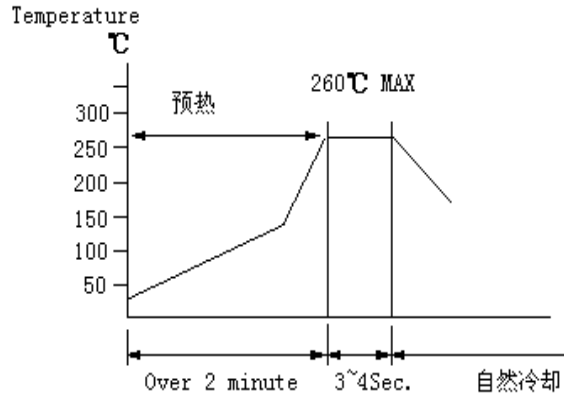
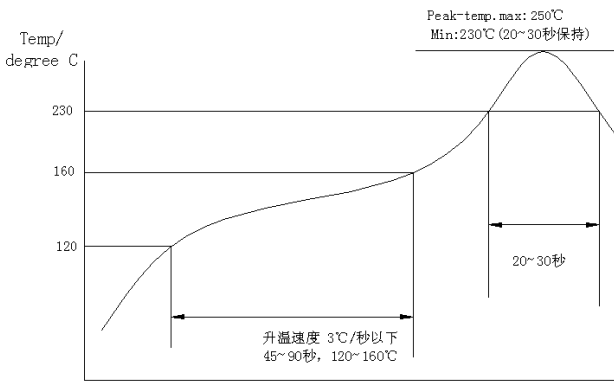
Remarks Above “Environment Friendly Use Period” only applicable under the condition specified in this approval sheet.



Approval Sheet for General Chip Resistor	Version of R-5.16
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**8.0 Recommended Soldering Profile**

Recommended re-flow profile
  Recommended wave solder profile  
 3 Re-flow 3 times



Recommended solder alloy 96.5Sn-3.0Ag-0.5Cu

**9.0 Storage Methods**

: 5°C 30°C, 30% 70%.  
 Storage conditions: T 5°C 30°C, RH 30% 70%.

Avoiding storage in place full of corrosive gas.

**10.0 Precautions For Use**

6

The products are suggested to be used within six months when received, and the storage condition mentioned above should be followed.

The lead-free surface treatment products are applicable for lead-free soldering and Pb/Sn soldering also.

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.

If there is any amendment, a former version shall become invalid.