



# 自贡兴川光电有限公司

Zigong Xingchuan Energy Storage Technology Co.,Ltd.

## 样品承认书

物料编码	01.01.4063	
样品名称	贴片电阻	
规格型号	1/8W 1.5K ohm 0805 ±1% RoHS	
生产厂家	厚声	
生产厂家规格型号	0805W8F1501T5E	
结论	测试合格	
确认部门	研发部	质量部
确认人	廖永春	胡磊
备注		

注：可附带另外的测试报告



表单编号：ZONERGY-GD-R-YF-015 版本：A/1

## 1. Scope

- 1.1 This specification for approve relates to the Thick Film Chip Resistors manufactured by UNI-ROYAL.  
 1.2 There no lead exists terminal of resistors, and lead which exist in glass of resistor layer meets ROHS exemption.  
 1.3 Small size& light weight; Suitable for both wave & re-flow soldering.

## 2. Explanation of Part No. System

Part No. includes 14 codes shown as below:

2.1 1<sup>st</sup>~4<sup>th</sup> codes: Part name. E.g.: 01005, 0201, 0402, 0603, **0805**, 1206, 1210, 2010, 1812, 2512.

2.2 5<sup>th</sup>~6<sup>th</sup> codes: Power rating.

E.g.: W=Normal Size "1~G" = "1~16"

Wattage	1/32	3/4	1/2	1/3	1/4	<b>1/8</b>	1/10	1/16	1/20	1
Normal Size	WH	07	W2	W3	W4	W8	WA	WG	WM	1W

If power rating is lower or equal than 1 watt, 5<sup>th</sup> code would be "W" and 6<sup>th</sup> code would be a number or letter.

E.g.: WA=1/10W W4=1/4W

2.3 7<sup>th</sup> code: Tolerance. E.g.: D=±0.5% **F=±1%** G=±2% J=±5% K= ±10%

2.4 8<sup>th</sup>~11<sup>th</sup> codes: Resistance Value.

2.4.1 If value belongs to standard value of ≥5% series, 8<sup>th</sup> code would be zero, 9<sup>th</sup>~10<sup>th</sup> codes are significant figures of the resistance and 11<sup>th</sup> code is the power of ten.

2.4.2 If value belongs to standard value of ≤2% series, 8<sup>th</sup>~10<sup>th</sup> codes are significant figures of the resistance, and 11<sup>th</sup> code is the power of ten.

2.4.3 11<sup>th</sup> codes listed as following:

0=10<sup>0</sup> 1=10<sup>1</sup> 2=10<sup>2</sup> 3=10<sup>3</sup> 4=10<sup>4</sup> 5=10<sup>5</sup> 6=10<sup>6</sup> J=10<sup>-1</sup> K=10<sup>-2</sup> L=10<sup>-3</sup> M=10<sup>-4</sup> N=10<sup>-5</sup> P=10<sup>-6</sup>

2.5 12<sup>th</sup>~14<sup>th</sup> codes.

2.5.1 12<sup>th</sup> code: Packaging Type. E.g.: C=Bulk T=Tape/Reel

2.5.2 13<sup>th</sup> code: Standard Packing Quantity.

4=4000pcs 5=5000pcs C=10000pcs D=20000pcs E=15000pcs

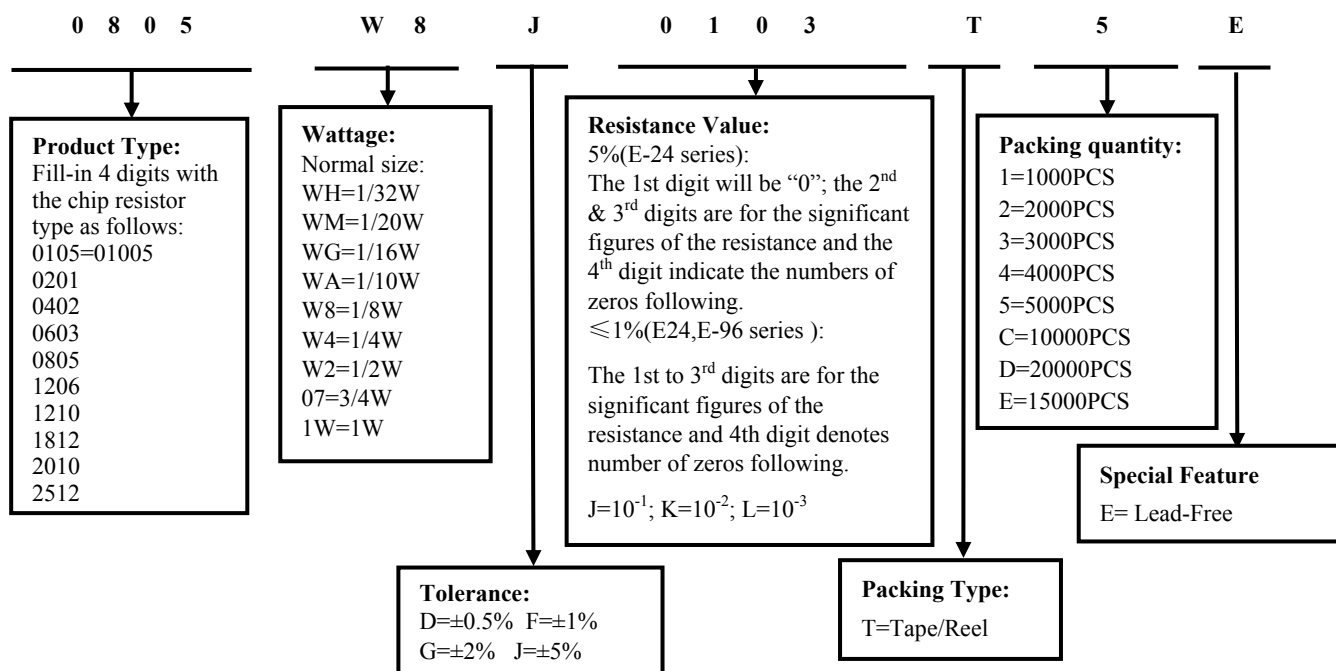
Chip Product: BD=B/B-20000pcs TC=T/R-10000pcs

2.5.3 14<sup>th</sup> code: Special features.

E = Environmental Protection, Lead Free, or Standard type.

## 3. Ordering Procedure

(Example: 0805 1/8W ±5% 10KΩ T/R-5000)



## 4. Marking

(1) For 01005、0201 and 0402 size. Due to the very small size of the resistor's body, there is no marking on the body.

Normally, the making of 0Ω 0603, 0Ω 0805, 0Ω 1206, 0Ω 1210, 0Ω 1812, 0Ω 2010, 0Ω 2512 resistors as following

(2) ±2%,±5%Tolerance:The first two digits are significant figures of resistance and the third denotes number of zeros following

(3) ±0.5%、±1% Tolerance: 4 digits, first three digits are significant; forth digit is number of zeros. Letter r is decimal point.

(4) More than 0805 specifications (including) 4 digits, Product below 1Ω, show as following, the first digit Is "R" which as decimal point.



0 → 0Ω



333 → 33KΩ

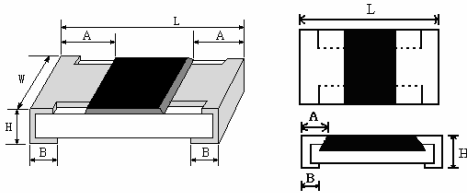


2701 → 2.7KΩ



R300 → 0.3Ω

## 5. Dimension



Type	Dimension(mm)				
	L	W	H	A	B
01005	0.40±0.02	0.20±0.02	0.13±0.02	0.10±0.05	0.10±0.03
0201	0.60±0.03	0.30±0.03	0.23±0.03	0.10±0.05	0.15±0.05
0402	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10
0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20
0805	2.00±0.15	1.25+0.15/-0.10	0.55±0.10	0.40±0.20	0.40±0.20
1206	3.10±0.15	1.55 +0.15/-0.10	0.55±0.10	0.45±0.20	0.45±0.20
1210	3.10±0.10	2.60±0.20	0.55±0.10	0.50±0.25	0.50±0.20
1812	4.50±0.20	3.20±0.20	0.55±0.20	0.50±0.20	0.50±0.20
2010	5.00±0.10	2.50±0.20	0.55±0.10	0.60±0.25	0.50±0.20
2512	6.35±0.10	3.20±0.20	0.55±0.10	0.60±0.25	0.50±0.20

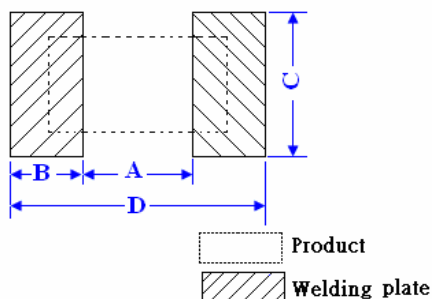
## 6. Resistance Range

Type	Power Rating at 70℃	Resistance Range			
		0.5%	1.0%	2.0%	5.0%
01005	1/32W	---	10 Ω -10M Ω	10 Ω -10M Ω	10 Ω -10M Ω
0201	1/20W	---	1 Ω -10M Ω	1 Ω -10M Ω	1 Ω -10M Ω
0402	1/16W	1Ω-10MΩ	0.1 Ω ~22M Ω	0.1 Ω ~22M Ω	0.1 Ω ~22M Ω
0603	1/10W	1Ω-10MΩ	0.01 Ω ~33M Ω	0.01 Ω ~33M Ω	0.01 Ω ~100M Ω
0805	1/8W	1Ω-10MΩ	0.1 Ω ~33M Ω	0.1 Ω ~33M Ω	0.1 Ω ~100M Ω
	1/4W	---	0.01Ω≤R<0.1Ω	0.01Ω≤R<0.1Ω	0.01Ω≤R<0.1Ω
1206	1/4W	1Ω-10MΩ	0.1 Ω ~33M Ω	0.1 Ω ~33M Ω	0.1 Ω ~100M Ω
	1/3W	---	0.01Ω≤R<0.1Ω	0.01Ω≤R<0.1Ω	0.01Ω≤R<0.1Ω
1210	1/2W	1Ω-10MΩ	0.01 Ω ~10M Ω	0.01 Ω ~22M Ω	0.01 Ω ~100M Ω
1812	3/4W	1Ω-10MΩ	0.01 Ω -10M Ω	0.01 Ω -10M Ω	0.01 Ω -10M Ω
2010	3/4W	1Ω-10MΩ	0.01 Ω ~22M Ω	0.01 Ω ~22M Ω	0.01 Ω ~22M Ω
2512	1W	1Ω-10MΩ	0.01 Ω ~33M Ω	0.01 Ω ~33M Ω	0.01 Ω ~33M Ω

## 7. Ratings

Type	Max. Working Voltage	Max. Overload Voltage	Dielectric withstanding Voltage	Resistance Value of Jumper	Rated Current of Jumper	Max. Overload Current of Jumper	Operating Temperature
01005	15V	30V	--	<50mΩ	0.5A	1A	-55℃~155℃
0201	25V	50V	--	<50mΩ	0.5A	1A	-55℃~155℃
0402	50V	100V	100V	<50mΩ	1A	2A	-55℃~155℃
0603	75V	150V	300V	<50mΩ	1A	2A	-55℃~155℃
0805	150V	300V	500V	<50mΩ	2A	5A	-55℃~155℃
1206	200V	400V	500V	<50mΩ	2A	10A	-55℃~155℃
1210	200V	500V	500V	<50mΩ	2A	10A	-55℃~155℃
1812	200V	500V	500V	<50mΩ	2A	10A	-55℃~155℃
2010	200V	500V	500V	<50mΩ	2A	10A	-55℃~155℃
2512	200V	500V	500V	<50mΩ	2A	10A	-55℃~155℃

## 8. Recommend the size of welding plate

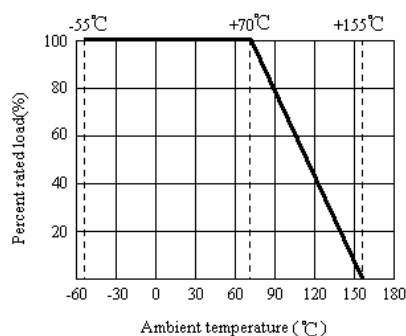


Type	Dimension(mm)			
	A	B	C	D
01005	0.14±0.03	0.2±0.03	0.2±0.03	0.54±0.03
0201	0.25±0.05	0.35±0.05	0.4±0.05	1.0±0.05
0402	0.50±0.05	0.45±0.05	0.5±0.05	1.4±0.05
0603	0.9±0.05	0.65±0.05	0.8±0.05	2.1±0.05
0805	1.0±0.1	1.0±0.1	1.3±0.1	3.0±0.1
1206	2.0±0.1	1.1±0.1	1.6±0.1	4.2±0.1
1210	2.0±0.1	1.1±0.1	2.6±0.1	4.2±0.1
1812	3.2±0.1	1.4±0.1	3.3±0.1	5.8±0.1
2010	3.6±0.1	1.3±0.1	2.6±0.1	6.2±0.1
2512	5.0±0.1	1.6±0.1	3.3±0.1	8.2±0.1

## 9. Derating Curve

Resistors shall have a power rating based on continuous load operation at an ambient temperature from -55℃ to 70℃. For temperature in excess of 70℃, the load shall be derated as shown in figure 1

Figure 1



Voltage rating:

Resistors shall have a rated direct-current (DC) continuous working

Voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial-line frequency and waveform corresponding to the power rating, as determined from the following formula:

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

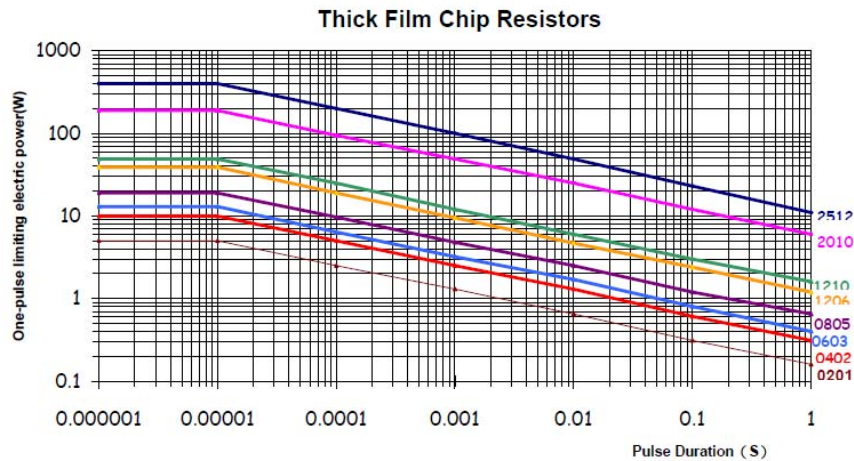
Where: RCWV commercial-line frequency and waveform (Volt.)

P = power rating (WATT.) R = nominal resistance (OHM)

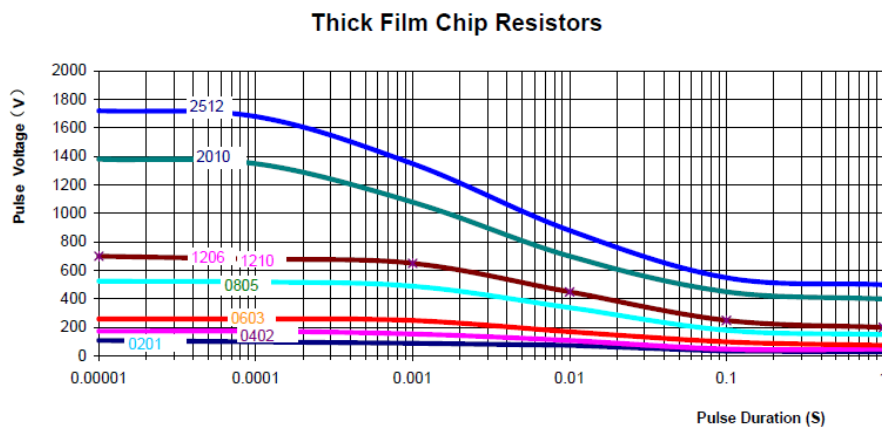
In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.

The overload voltage is 2.5 times RCWV or Max. Overload voltage whichever is less

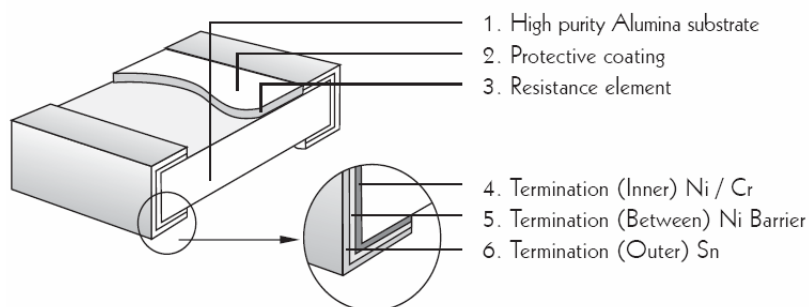
Curve of Pulse Duration :



Pulse Voltage Limit :



## 10. Structure



**11. Performance Specification**

Characteristic	Limits		Test Method (JIS-C-5201& JIS-C-5202)
◎Temperature Coefficient	<b>01005:</b> 1Ω≤R≤10Ω: ±600PPM/°C 10Ω<R≤100Ω: ±400PPM/°C 		

◎ Soldering heat	Resistance change rate must be in $\pm (1\%+0.05\Omega)$		4.18 Dip the resistor into a solder bath having a temperature of $260^{\circ}\text{C}\pm 5^{\circ}\text{C}$ and hold it for $10\pm 1$ seconds.
Terminal bending	$\pm(1\%+0.05\Omega)$ Max		4.33 Twist of test board: $Y/x = 3/90$ mm for 60Seconds
* Insulation resistance	1,000 M $\Omega$ or more		4.6 the measuring voltage shall be ,measured with a direct voltage of $(100\pm 15)\text{V}$ or a voltage equal to the dielectric withstanding voltage., and apply for 1min
◎ Humidity ( steady state )	$\pm 0.5\%, \pm 1\%$	$\pm(0.5\%+0.1\Omega)$ Max.	4.24 Temporary resistance change after 240 hours exposure in a humidity test chamber controlled at $40\pm 2^{\circ}\text{C}$ and 90-95% relative humidity,
	$\pm 2\%, \pm 5\%$	$\pm(3.0\%+0.1\Omega)$ Max.	
	01005	$\pm(3.0\%+0.05\Omega)$ Max.	
◎ *Load life in humidity	$\pm 0.5\%, \pm 1\%$	$\pm(1\%+0.1\Omega)$ max.	7.9 Resistance change after 1,000 hours (1.5 hours “ON”, 0.5 hour “OFF”) at RCWV in a humidity chamber controlled at $40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ and 90 to 95% relative humidity.
	$\pm 2\%, \pm 5\%$	$\pm(3\%+0.1\Omega)$ Max.	
	01005	$\pm(3.0\%+0.05\Omega)$ Max.	
	* <50m $\Omega$		Apply to rated current for 0 $\Omega$
◎ *Load life	$\pm 0.5\%, \pm 1\%$	$\pm(1\%+0.1\Omega)$ Max.	4.25.1 Permanent resistance change after 1,000 hours operating at RCWV with duty cycle 1.5 hours “ON”, 0.5 hour “OFF” at $70^{\circ}\text{C}\pm 2^{\circ}\text{C}$ ambient.
	$\pm 2\%, \pm 5\%$	$\pm(3\%+0.1\Omega)$ Max	
	01005	$\pm(3.0\%+0.05\Omega)$ Max.	
	* <50m $\Omega$		Apply to rated current for 0 $\Omega$
High Temperature Exposure	$\pm(3\%+0.1\Omega)$ Max		4.23.2 Upper limit temperature , for 1000H

The resistors of 0 $\Omega$  only can do the characteristic noted of \*

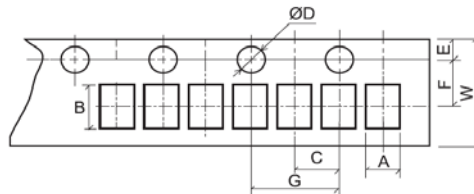
The resistors of 01005 & 0201 only can do the characteristic noted of ◎

The resistors of 0 $\Omega$  only can do the characteristic noted of \*

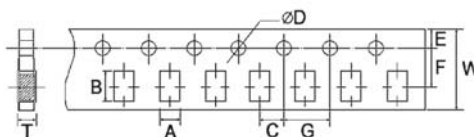
The resistors of 01005 & 0201 only can do the characteristic noted of ◎

## 12. Packing of Surface Mount Resistors

### 12.1 Dimension of Paper Taping :(Unit: mm)

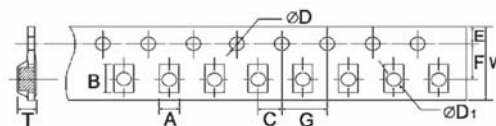


Type	A	B	C $\pm 0.05$	$+0.1$ $\Phi D$ $-0$	E $\pm 0.1$	F $\pm 0.05$	G $\pm 0.1$	W $\pm 0.2$	T
01005	$0.24\pm 0.05$	$0.45\pm 0.05$	2.00	1.50	1.75	3.50	4.00	8.00	$0.40\pm 0.1$
0201	$0.40\pm 0.05$	$0.70\pm 0.05$	2.00	1.50	1.75	3.50	4.00	8.00	$0.42\pm 0.1$
0402	$0.65\pm 0.10$	$1.20\pm 0.10$	2.00	1.50	1.75	3.50	4.00	8.00	$0.42\pm 0.05$



Type	A $\pm 0.2$	B $\pm 0.2$	C $\pm 0.05$	$+0.1$ $\Phi D$ $-0$	E $\pm 0.1$	F $\pm 0.05$	G $\pm 0.1$	W $\pm 0.2$	T $\pm 0.1$
0603	1.10	1.90	2.00	1.50	1.75	3.50	4.00	8.00	0.67
0805	1.65	2.40	2.00	1.50	1.75	3.50	4.00	8.00	0.81
1206	2.00	3.60	2.00	1.50	1.75	3.50	4.00	8.00	0.81
1210	2.80	3.50	2.00	1.50	1.75	3.50	4.00	8.00	0.75

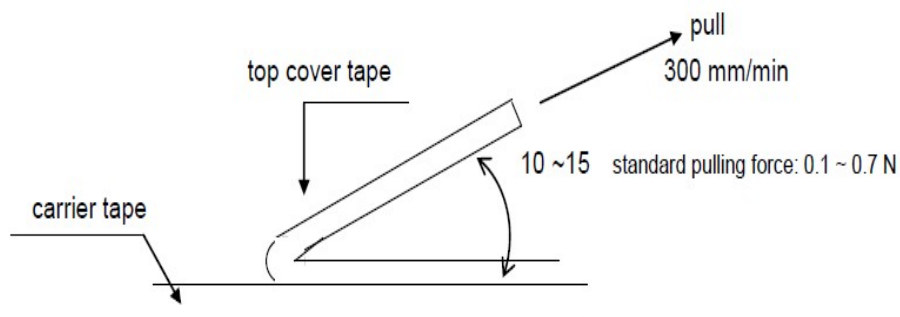
## 12.2 Dimension of Embossed Taping:



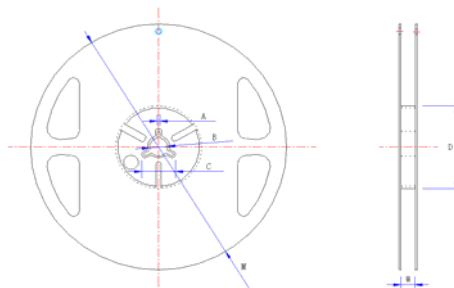
Type	A ±0.2	B ±0.2	C ±0.05	+0.1 φD -0	+0.25 φD1 -0	E ±0.1	F ±0.05	G ±0.1	W ±0.2	T ±0.1
2010	2.90	5.60	2.00	1.50	1.50	1.75	5.50	4.00	12.00	1.00
1812	3.50	4.80	2.00	1.50	1.50	1.75	5.50	4.00	12.00	1.00
2512	3.50	6.70	2.00	1.50	1.50	1.75	5.50	4.00	12.00	1.00

## 12.3 Peeling Strength of Top Cover Tape:

Test Condition: 0.1 to 0.7 N at a peel-off speed of 300 mm / min.



## 12.4 Dimension of Reel : (Unit: mm)



### 12.4.1 normal size:

Type	Taping	Qty/Reel	A ±0.5	B ±0.5	C ±0.5	D ±1	M ±2	W ±1
01005	Paper	20,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
0201	Paper	15,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
0402	Paper	10,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
0603	Paper	5,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
0805	Paper	5,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
1206	Paper	5,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
1210	Paper	5,000pcs	2.0	13.0	21.0	60.0	178.0	10.0
2010	Embossed	4,000pcs	2.0	13.0	21.0	60.0	178.0	13.8
1812	Embossed	4,000pcs	2.0	13.0	21.0	60.0	178.0	13.8
2512	Embossed	4,000pcs	2.0	13.0	21.0	60.0	178.0	13.8



12.5 large size:

Type	Taping	Qty/Reel	A ±0.5	B ±0.5	C ±0.5	D ±1	M ±2	W ±1
0201	Paper	50,000pcs	2.0	13.0	21.0	100.0	330.0	10.0
0402	Paper	50,000pcs	2.0	13.0	21.0	100.0	330.0	10.0
0603	Paper	20,000pcs	2.0	13.0	21.0	100.0	330.0	10.0
0805	Paper	20,000pcs	2.0	13.0	21.0	100.0	330.0	10.0
1206	Paper	20,000pcs	2.0	13.0	21.0	100.0	330.0	10.0

### 13. Note

- 13.1. UNI-ROYAL recommend the storage condition temperature: 15℃~35℃, humidity :25%~75%.  
 (Put condition for individual product).Even under UNI-ROYAL recommended storage condition, solderability of products over 1 year old.  
 (Put condition for each product) may be degraded.
- 13.2. Store / transport cartons in the correct direction, which is indicated on a carton as a symbol.  
 Otherwise bent leads may occur due to excessive stress applied when dropping of a carton.
- 13.3. Product performance and soldered connections may deteriorate if the products are stored in the following places:
- Storage in high Electrostatic.
  - Storage in direct sunshine 、rain and snow or condensation.
  - Where the products are exposed to sea winds or corrosive gases, including Cl<sub>2</sub>, H<sub>2</sub>S<sub>3</sub> NH<sub>3</sub>, SO<sub>2</sub>, NO<sub>2</sub>.
- 13.4. The products are used in circuit board thickness greater than 1.6mm. If customers use less than the thickness of the circuit board that you should confirm with the company, in order to recommend a more suitable product.

### 14. Record

Version	Description of amendment	Page	Date	Amended by	Checked by
1	First issue of this specification	1~14	Mar.21, 2017	Chen Haiyan	Chen Nana
2	1. Extend the resistance range	3	Dec.01, 2018	Chen Haiyan	Chen Nana
	2. Modify 0201 packing quantity	7			
	3. Add pulse curve, voltage curve	5			