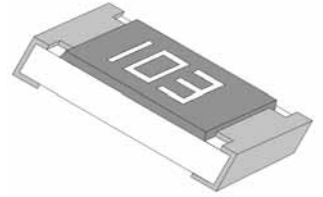


常規厚膜片式固定電阻器 GENERAL CHIP FIXED RESISTOR

■ 常規厚膜片式固定電阻器 GENERAL CHIP FIXED RESISTOR

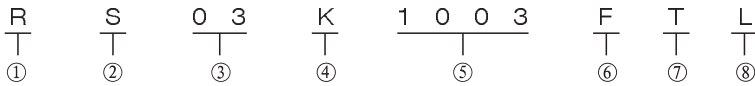
● 特長 FEATURES

- * 體積小、重量輕
Miniature and light weight.
- * 適應再流焊與波峰焊
Suit for reflow and wave flow solder.
- * 電性能穩定，可靠性高
Stable electrical capability, high reliability.
- * 裝配成本低，并與自動裝貼設備匹配
Low assembly cost, suit for automatic SMT equipment.
- * 機械强度高、高頻特性優越
Superior mechanical and frequency characteristics.
- * 符合RoHS指令要求
RoHS compliant



● 品名構成 TYPE DESIGNATION

例 Example



① 產品代號 Product Code
厚膜片式固定電阻器 Thick film chip fixed resistor

② 額定功率系列代號 Power Rating Series Code	
代號 Code	額定功率系列 Power rating series
C	常規功率系列 Normal Power Series
S	提升功率系列 Upgraded Power Series

③ 型號代號 Type Code	
代號 Code	型號 Type
01	0201
02	0402
03	0603
05	0805
06	1206
1210	1210
1812	1812
10	2010
12	2512

④ 電阻溫度系數代號 Resistance Temperature Coefficient Code		
代號 Code	型號 Type	T.C.R
0201 0402	W	±200ppm/°C
	U	±400ppm/°C
0603, 0805 1206, 1210 1812, 2010 2512	K	±100ppm/°C
	L	±250ppm/°C

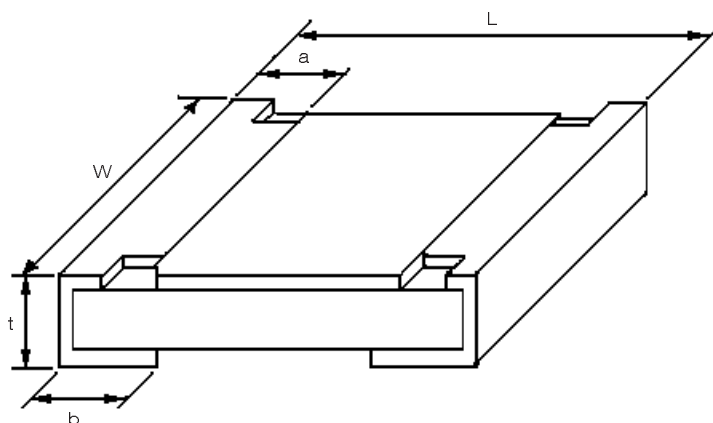
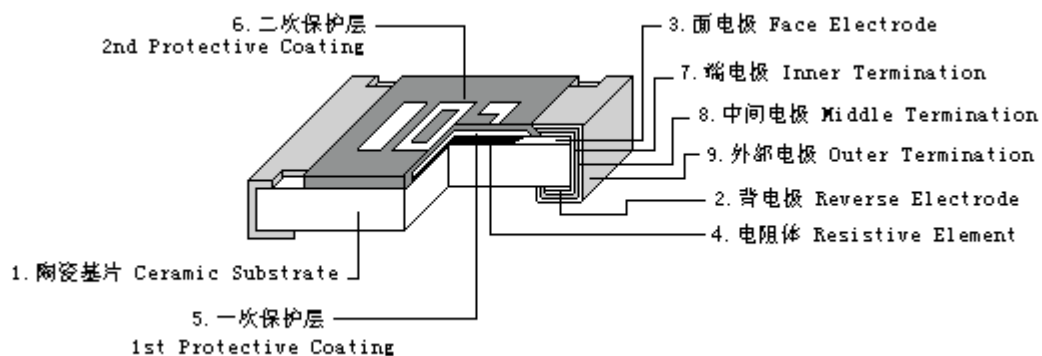
⑤ 電阻值代號 Resistance Value Code
<p>三位數(E-24系列): 前兩位表示有效數字, 第三位表示有效數字后零的個數 Three digits (E-24 series): The first two digits are significant figures and the third one denotes number of zeros.</p> <p>四位數(E-96系列): 前三位表示有效數字, 第四位表示有效數字后零的個數 Four digits (E-96 series): The first three digits are significant figures and the four one denotes number of zeros.</p> <p>“000”表示跨接電阻 Jumper is expressed by “000”.</p> <p>小數點用R表示 Decimal point should be expressed by "R".</p> <p>例如Example: 103=10KΩ (E-24) 1003=100KΩ(E-96) 1R0=1.0Ω</p>

⑥ 電阻值誤差精度代號 Resistance Tolerance Code	
代號 Code	誤差精度 Tolerance
D	±0.5%
F	±1%
G	±2%
J	±5%
K	±10%
M	±20%

⑦ 包裝方式代號 Packing Style Code	
代號 Code	包裝方法 Packing Style
T	編帶包裝 Tape & Reel
B	塑料盒包裝 Bulk Case
C	塑料袋散裝 Case

⑧ 無鉛化等級代號 Lead-free Level Code	
代號 Code	無鉛化等級 Lead-free Level
無表示 No Marking	端子無鉛(端子鉛含量 ≤100ppm) Terminal Lead-free (pb content in terminal ≤100ppm)
L	整體低鉛(<1000ppm) Low Lead (pb content in resistor body <1000ppm)
G	整體無鉛(<100ppm) Low Lead (pb content in resistor body <100ppm)

• 結構及規格尺寸 CONSTRUCTION AND DIMENSION



單位unit:mm

型號 TYPE	L	W	t	a	b
0201	0.60±0.05	0.30±0.05	0.23±0.05	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
1812	4.50±0.20	3.20±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

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● 產品外觀 APPEARANCE

- * 電阻器表面保護膜覆蓋完好且難以脫落,表面平整。

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

- * 電阻器引出端電極覆蓋均勻、鍍層較難脫落,且平整、無裂痕、針孔、變色。

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

- * 電阻器芯片無裂痕、標志可辨。

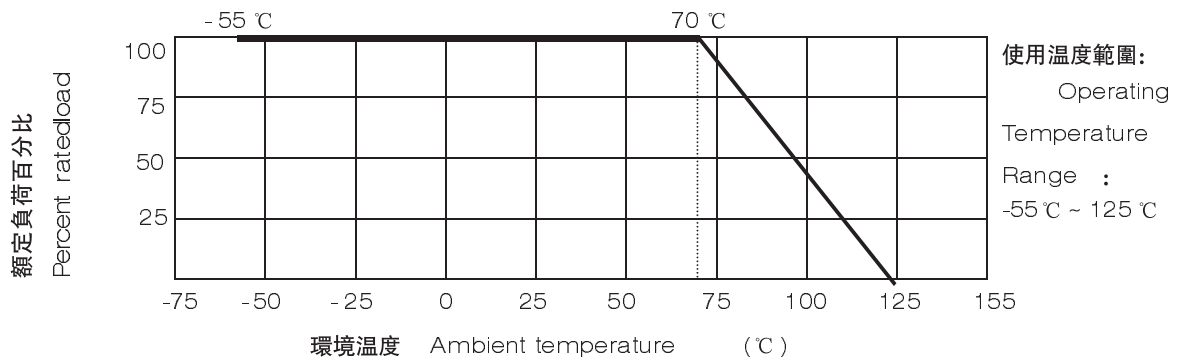
With a clear mark, the resistor body is crack-free.

● 參考標準 REFERENCE STANDARD

GB/T 5729-2003

GB/T 9546-1995

● 負荷下降曲綫 DERATING CURVE



- * 當電阻使用的環境溫度超過70°C時,其額定負荷(額定功率或額定電流)按上述曲綫下降。

For resistors operated in ambient over 70°C, rated load (power rating or current rating) shall be derated in accordance with the above figure.

● 額定值 RATINGS

項目 Item		0201	0402	0603	0805	1206	1210	1812	2010	2512
額定功率 Power Rating	常規功率系列 Normal Power Series	1/20W	1/16W	1/16W	1/10W	1/8W	1/4W	1/2W	1/2W	1W
	提升功率系列 Upgraded Power Series	/	/	1/10W	1/8W	1/4W	1/3W	/	3/4W	/
最大工作電壓 Max. Working Voltage		25	50	50	RC05:100 RS05:150	200	200	200	200	200
最大過負荷電壓 Max. Overload Voltage		50	100	100	RC05:200 RS05:300	400	400	400	400	400
電阻溫度係數 Resistance Temperature Coefficient		10Ω < R < 1MΩ: ±200ppm/°C 1Ω < R < 10Ω, 1MΩ < R < 10MΩ: ±400ppm/°C			10Ω < R < 1MΩ: ±100ppm/°C 1Ω < R < 10Ω, 1MΩ < R < 10MΩ: ±250ppm/°C					
阻值範圍 Resistance Range		1Ω~10MΩ E-24、E-96系列			1Ω~10MΩ E-24、E-96系列					
阻值誤差精度 Resistance Tolerance		±1%、±2% ±5%、±10% ±20%	1Ω~10MΩ: ±1%、±2%、 ±5%、±10%、±20% (10Ω~1MΩ: ±0.5%)		1Ω~10MΩ: ±1%、 ±2%、±5%、±10%、±20% (10Ω~1MΩ: ±0.5%)			±1% ±2% ±5% ±10% ±20%		
使用溫度範圍 Operating Temperature Range		-55°C ~ +125°C								
額定溫度 Rated Temperature		+70°C								

注：額定電壓 = $\sqrt{\text{額定功率} \times \text{標稱電阻值}}$ 或最大工作電壓兩者中的較小值。

Note: Rated Voltage = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$ or Max. Working Voltage, whichever is lower.

● 特性 CHARACTERISTICS

項目 Item	標準 Specifications	測試方法 (GB/T 5729-2003) Test Methods (GB/T 5729-2003)
端頭強度 Bending Strength	無可見損傷 No mechanical damage $\Delta R \leq \pm (1.0\%R + 0.05\Omega)$	彎曲距離 (Bending Distance): 0201、0402、0603、0805、1206、1210: 3mm; 1812、2010、2512: 1mm 保持時間 (duration): 10S ± 1S
電阻溫度係數 T.C.R	在規定值內 within specified T.C.R	測定範圍: -55°C ~ +125°C Measure between -55°C ~ +125°C
溫度循環 Temperature Cycling	無可見損傷 No mechanical damage $\Delta R \leq \pm (1.0\%R + 0.05\Omega)$	-55°C (30分鐘) ~ 常溫 (2分鐘~3分鐘) ~ 125°C (30分鐘) 5個循環 -55°C (30min) ~ normal temperature (2min~3min) ~ 125°C (30min) 5 cycles
短時間過負載 Short Time Overload	無可見損傷 No mechanical damage $\Delta R \leq \pm (2.0\%R + 0.05\Omega)$	2.5倍額定電壓或最大過負荷電壓 (取最小者) 保持5秒 2.5 × Rated voltage or Max. Overload Voltage whichever is lower for 5 seconds

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續上表

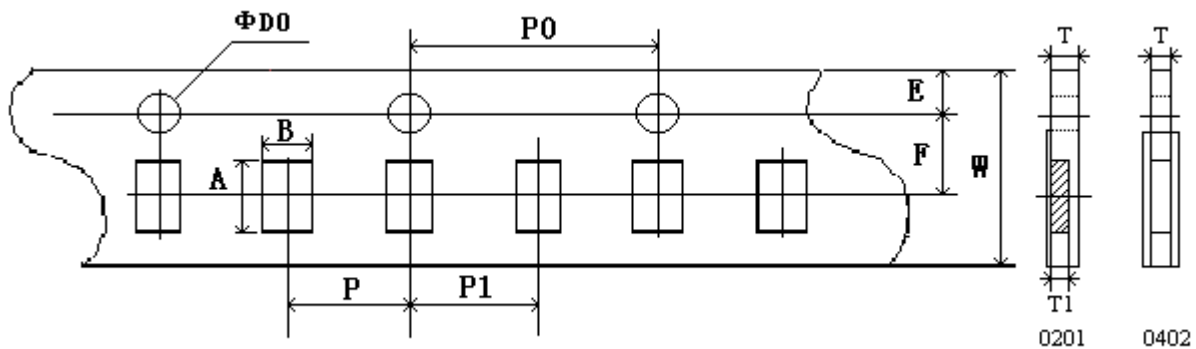
項目 Item	標準 Specifications	測試方法 (GB/T 5729-2003) Test Methods (GB/T 5729-2003)
穩態濕熱 Steady state humidity	無可見損傷 No mechanical damage $\Delta R \leq \pm (3.0\%R + 0.1 \Omega)$	40°C ± 2°C 90%~95%RH 1000小時 40°C ± 2°C 90%~95%RH 1000h
70°C 耐久性 Load Life	無可見損傷 No mechanical damage $\Delta R \leq \pm (3.0\%R + 0.1 \Omega)$	70°C ± 2°C, 1000小時, 額定電壓通1.5小時/斷0.5小時 70°C ± 2°C, 1000h, Rated voltage 1.5h on/0.5h off
上限類別溫度耐久性 Endurance at upper temperature	無可見損傷 No mechanical damage $\Delta R \leq \pm (3.0\%R + 0.1 \Omega)$	125°C ± 2°C 1000h
耐溶劑性 Resistance to Solvent	無可見損傷 No mechanical damage $\Delta R \leq \pm (1.0\%R + 0.05 \Omega)$	浸入三氯乙烯 10h ± 1h Dip in chloroethylene for 10h ± 1h.
絕緣電阻 Insulation Resistance	1000MΩ Min	在電極與基片間施加100V直流電壓, 保持1分鐘, 然後測絕緣電阻值。 Apply DC 100V between substrate and termination for 1 minute, then check insulation resistance .
耐焊接熱 Resistance to Soldering Heat	無可見損傷 No mechanical damage $\Delta R \leq \pm (1.0\%R + 0.05 \Omega)$	270°C ± 5°C 10s ± 1s
可焊性 Solderability	可焊面積 > 95% 95% Cover Min	240°C ± 5°C 2s ± 0.5s
附着力 Adhesion	外觀無可見損傷 No mechanical damage	施加力5N 10s ± 1s Applying 5N 10s ± 1s

• 包裝 PACKAGING

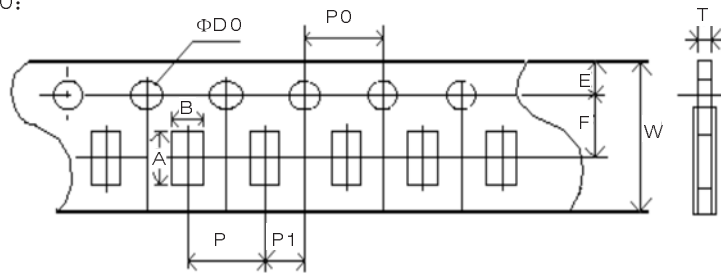
* 編帶包裝 Tape and reel

紙帶編帶 Paper taping

0201、0402;



0603, 0805, 1206, 1210:



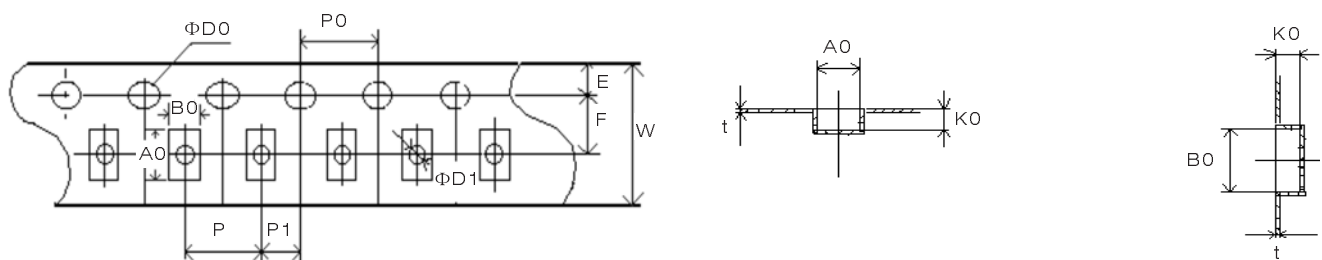
型號 TYPE	A	B	W	F	E
0201	0.70±0.1	0.40±0.1	8.0±0.20	3.5±0.05	1.75±0.1
0402	1.20±0.1	0.70±0.1	8.0±0.20	3.5±0.05	1.75±0.1
0603	1.85±0.1	1.10±0.1	8.0±0.20	3.5±0.05	1.75±0.1
0805	2.35±0.1	1.65±0.1	8.0±0.20	3.5±0.05	1.75±0.1
1206	3.50±0.2	1.90±0.2	8.0±0.20	3.5±0.05	1.75±0.1
1210	3.50±0.2	2.80±0.2	8.0±0.20	3.5±0.05	1.75±0.1

型號 TYPE	P	P0	P1	ΦD0	T
0201	2.0±0.05	4.0±0.1	2.0±0.05	1.5±0.1	T1:0.28 ±0.04 T:0.42 ±0.05
0402	2.0±0.05	4.0±0.1	2.0±0.05	1.5±0.1	0.42±0.05
0603	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	0.60±0.1
0805	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	0.75±0.1
1206	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	0.75±0.1
1210	4.0±0.1	4.0±0.1	2.0±0.05	1.5±0.1	0.75±0.1

備註：0201型號中T1指紙帶方孔槽深，T指紙帶厚度。

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

塑料帶編帶 Embossed taping

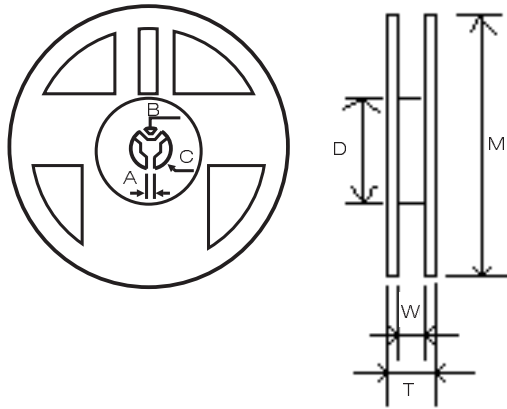


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型號 TYPE	A0	B0	W	F	E	t
1812	4.80±0.10	3.40±0.10	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05
2010	5.45±0.10	2.77±0.10	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05
2512	6.73±0.10	3.40±0.10	12.00±0.10	5.50±0.10	1.75±0.10	0.25±0.05

型號 TYPE	P	P0	P1	ΦD0	ΦD1	K0
1812	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.10	1.50±0.10	0.81±0.05
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

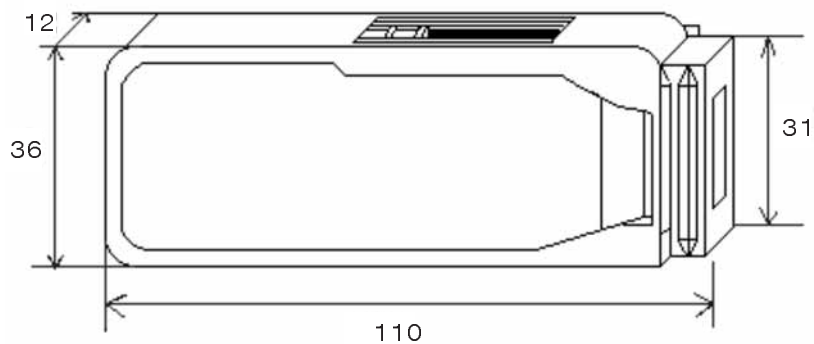
卷盤 Reel



型號 TYPE	M	W	T	A	B	C	D
0201	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
0402							
0603							
0805							
1206							
1210							
1812	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
2010							
2512							

* 塑料盒包裝Bulk case

單位unit:mm



• 包裝數量 PACKAGING QUANTITY

包裝方法 Packaging style	編帶 Tape and reel			塑料盒 Bulk case						塑料袋散裝 Bulk		
型號 Type	0201 0402	0603 0805 1206 1210	1812 2010 2512	0201 0402	0603	0805	1206	1210 2010	1812 2512	0201 0402	0603 0805 1206	1210 1812 2010 2512
數量 (PCS) Quantity	10000	5000	4000	50000	25000	10000	5000	1500	1000	≤50000	≤10000	≤4000

常規厚膜片式固定電阻器
GENERAL CHIP FIXED RESISTOR

• 標記表示方法 The Explanation For The Resistance Value Marking

IEC E-24、E-96系列電阻值對照表

IEC E-24、E-96 Series Resistance Cross-reference List

E-24 系列 (E-24 series)

($\times 10^n \Omega$)

(單位unit: 1 Ω 、10 Ω 、100 Ω 、1K Ω 、10K Ω 、100K Ω 、1M Ω 、10M Ω)

表一 Table one

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

E-96系列 (E-96 series)

($\times 10^n \Omega$)

(單位: 1 Ω 、10 Ω 、100 Ω 、1K Ω 、10K Ω 、100K Ω 、1M Ω 、10M Ω)

表二 Table two

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

- E-24系列：采用三位數字表示，前二位表示電阻值有效數字，第三位表示乘以10的次方數。
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.

例 Example



- E-96系列：

▲0805、1206、1210、1812、2010、2512采用四位數字表示，前三位表示電阻值有效數字，第四位表示乘以10的次方數。
E-96 series: For the dimension type of 0805, 1206, 1210, 1812, 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 Example



▲0603用三位代碼表示，前二位表示E-96系列阻值代碼，后一位字母表示乘數代碼（見表三和表四）。
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 Example



- 小數點以“R”表示 The decimal point should be expressed by “R” .

例 Example



- 跨接電阻以“0”表示 The jumper should be expressed by “0”

例 Example



- 0201、0402：不作標記 For the dimension type of 0201、0402, there is no mark on the glass side.

例 Example



- 非IEC標準系列的電阻值標記表示方法：一般以最接近IEC E-24系列標稱阻值的標記表示方法。
For the resistance which don't belong to IEC serial, use the resistance of IEC serial which is most close to the required resistance of non-IEC serial for replacement.

- 客戶對標記有特殊要求時，則按照協商的結果印刷標記
To get agreement by both party if there special requirement for the marking.

表三 Table three:

E-96系列阻值代碼 E-96 series resistance value code

代號 code	E-96阻值 The resistance of E-96 series	代號 code	E-96阻值 The resistance of E-96 series	代號 code	E-96阻值 The resistance of E-96 series	代號 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:

乘數代碼 Multiplied code

乘數次方 multiplier	$\times 10^{-1}$	$\times 10^{-2}$	$\times 10^{-3}$	$\times 10^1$	$\times 10^2$	$\times 10^3$	$\times 10^4$	$\times 10^5$
代碼 code	X	Y	A	B	C	D	E	F