Specification

Non-Magnetic Chip Resistors

◆ Product Features

1. Non-Magnetic chip resistors by copper plating on middle termination.
2. Suited for reflow and flow solder.
3. Suitable for no lead soldering.
4. Lead free, Meet RoHS compliant.

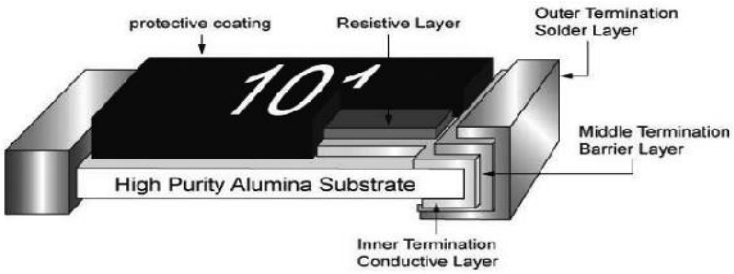
◆ Product Applications

MRI medical equipment, Measurement instrument, other non-magnetic applications.

◆ Part Number

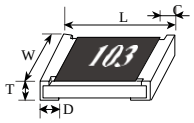
R	0603	RC	103	J	PD	NM
Chip resistor	Size	Temperature Coefficient	Resistance value	Tolerance	Packing	Non-Magnetic

◆ Configuration



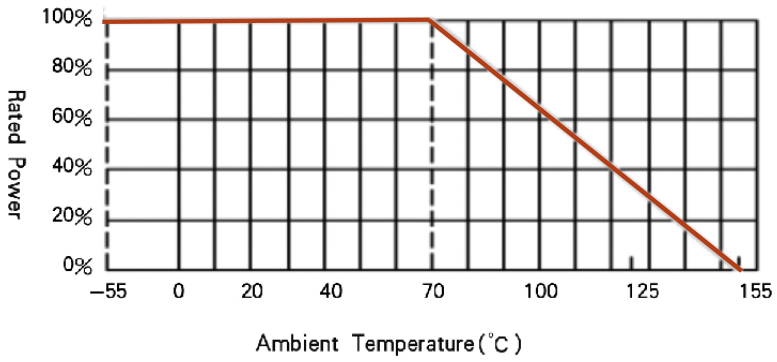
Construction of Chip-Resistor

◆ Dimensions



Size	L	W	C	D	T
0603	1.60±0.10	0.80±0.10	0.30±0.20	0.30±0.20	0.45±0.10
0805	2.00±0.10	1.25±0.10	0.40±0.20	0.40±0.20	0.50±0.10
1206	3.10±0.10	1.60±0.10	0.50±0.20	0.50±0.25	0.55±0.10

◆ Power Derating Curve

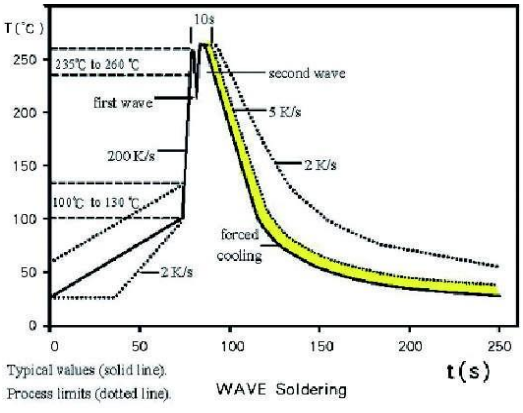


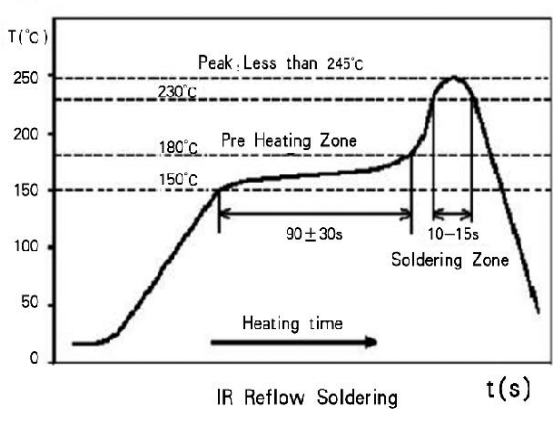
◆ Rated Value

Size	Rated Power At 70℃	RCWV Max.	Overload Voltage Max.	Tolerance	Temperature Coefficient ppm/℃	Resistance Range		Standard Resistance Value
						Min.	Max.	
0603	1/10W	50V	100V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
0805	1/8W	150V	300V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24
1206	1/4W	200V	400V	±1%(F)	±100	1Ω	10MΩ	E-96
				±5%(J)	±200	0Ω&1Ω	10MΩ	E-24

Jumper: 0603 size maximum resistance ≤50mΩ and rated current≤1A.
0805, 1206 size maximum resistance ≤50mΩ and rated current ≤2A.
1Ω～10Ω: Temperature Coefficient of Resistance for 0603, 0805, 1206 = -300～+500ppm/℃.

◆ Soldering Temperature Curve





◆ Resistance Marking

R100

4 digit marking for ± 1%.
For example: 1R00 = 1Ω; R100 = 100mΩ; R047 = 47mΩ;

R10

3 digit marking for 0603 ± 1%.
For example: 1R0 = 1Ω; R10 = 100mΩ; R50 = 500mΩ;

E-24 Series

473

3 digit marking for ± 5% E24.
For example: 473 = 47kΩ; 1R5 = 1.5Ω; 0 = 0Ω;

E-96 Series

1542

4 digit marking for E96.
For example: 1542 = 15k4Ω; 22R1 = 22.1Ω;

02C

3 digit marking for E96-0603.
For example: 02C = 102 × 100 = 10.2kΩ;

◆ 0603 1% Marking Table

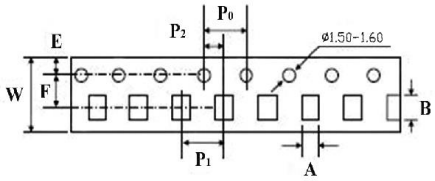
Code	E48	E96	Code	E48	E96	Code	E48	E96	Code	E48	E96
01	100	100	25	178	178	49	316	316	73	562	562
02		102	26		182	50		324	74		576
03	105	105	27	187	187	51	332	332	75	590	590
04		107	28		191	52		340	76		604
05	110	110	29	196	196	53	348	348	77	619	619
06		113	30		200	54		357	78		634
07	115	115	31	205	205	55	365	365	79	649	649
08		118	32		210	56		374	80		665
09	121	121	33	215	215	57	383	383	81	681	681
10		124	34		221	58		392	82		698
11	127	127	35	226	226	59	402	402	83	715	715
12		130	36		232	60		412	84		732
13	133	133	37	237	237	61	422	422	85	750	750
14		137	38		243	62		432	86		768
15	140	140	39	249	249	63	442	442	87	787	787
16		143	40		255	64		453	88		806
17	147	147	41	261	261	65	464	464	89	825	825
18		150	42		267	66		475	90		845
19	154	154	43	274	274	67	487	487	91	866	866
20		158	44		280	68		499	92		887
21	162	162	45	287	287	69	511	511	93	909	909
22		165	46		294	70		523	94		931
23	169	169	47	301	301	71	536	536	95	953	953
24		174	48		309	72		549	96		976

Code	A	B	C	D	E	F	G	H	X	Y	Z
Mulitiplier	10^0	10^1	10^2	10^3	10^4	10^5	10^6	10^7	10^{-1}	10^{-2}	10^{-3}

◆ Standard Resistance Value

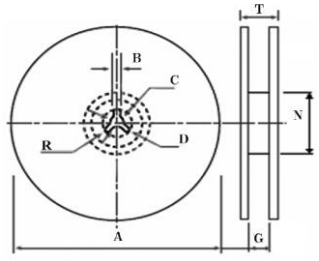
E3	10				22				47								
E6	10		15		22		33		47		68						
E12	10	12	15	18	22	27	33	39	47	56	68	82					
E24	10	11	12	13	15	16	18	20	22	24	27	30	33	36	39	43	47
	51	56	62	68	75	82	91										
E96	100	102	105	107	110	113	115	118	121	124	127	130	133	137	140	143	147
	150	154	158	162	165	169	174	178	182	187	191	196	200	205	210	215	221
	226	232	237	243	249	255	261	267	274	280	287	294	301	309	316	324	332
	340	348	357	365	374	383	392	402	412	422	432	442	453	454	475	487	499
	511	523	536	549	562	576	590	604	619	634	649	665	681	698	715	732	750
	768	787	806	825	845	866	887	909	931	953	975						

◆ Tape and Reel Package



unit:millimeter

Code	A (mm)	B (mm)	W (mm)	F (mm)	E (mm)	P0 (mm)	P1 (mm)	P2 (mm)
0603	1.10±0.20	1.90±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05
0805	1.65±0.20	2.40±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05
1206	2.00±0.20	3.60±0.20	8.00±0.30	3.50±0.05	1.75±0.10	4.00±0.10	4.00±0.10	2.00±0.05



unit:millimeter

Code	A (mm)	N (mm)	C (mm)	D (mm)	B (mm)	G (mm)	T (mm)	Qty/reel
0603	178.0±2.0	60.0±0.5	13.0±0.5	20min	2.0±0.5	10.0±1.5	14.9max	5000
0805	254.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9max	10000
1206	330.0±2.0	100.0±1.0	13.5±0.5	20min	2.0±0.5	10.0±1.5	14.9max	20000

◆ Specification and Test Methods

Item	Specifications	Test Methods
DC Resistance	F：±1%; J：±5%;	IEC 60115-1/JIS C 5201-1, Clause 4.5. Measure the resistance value.
Short time Overload	J：ΔR≤±(2%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.13. 2.5 x Rated voltage or Max. Overload Voltage for 5 second. Measure resistance after 30 minutes.
Solderability	Over 95% of termination must be covered with (Sn+Ag+Cu)	IEC 60115-1/JIS C 5201-1, Clause 4.17. After immersing flux, dip in the 245±2℃ molten solder bath for 3±0.5sec.
Resistance to Solder Heat	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.18. With 260±5℃ for 10±1 sec.
Temperature Coefficient of Resistance(TCR)	Refer to the rating table information.	IEC 60115-1/JIS C 5201-1, Clause 4.8. Test temperature point is -55℃ and +155℃.
Load Life Humidity	J：ΔR≤±(3%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.24. Maintain the temperature of the resistor at 40±2℃ and 90%~95% R.H. with the rated voltage applied. Cycle ON for 1.5 hours and OFF for o.5hour for 1000(-0~+48) hours. After 1-4 hours, measure the resistance value.
Load Life	J：ΔR≤±(3%+0.1Ω) F：ΔR≤±(1%+0.05Ω)	IEC 60115-1/JIS C 5201-1, Clause 4.25. Permanent resistance change after 1000(-0~+48) hours (1.5 hours ON, 0.5 hour OFF) at RCWV or Max. Keep the resistor at 70±2℃.
Temperature Cycle	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.19. Repeat 5 cycles as follows -55℃(30 Min.), 25℃(2-3Min.), +155℃(30Min.).
Insulation Resistance	Between termination and coating must be over 1000MΩ.	IEC 60115-1/JIS C 5201-1, Clause 4.6. Test voltage: 100±15V.
Bending Strength	J：ΔR≤±(1%+0.1Ω) F：ΔR≤±(0.5%+0.05Ω) No mechanical damage.	IEC 60115-1/JIS C 5201-1, Clause 4.33. Resistance change after bended on the 90mm PCB. Bend: 3mm for 0603, 0805. 2mm for 1206.