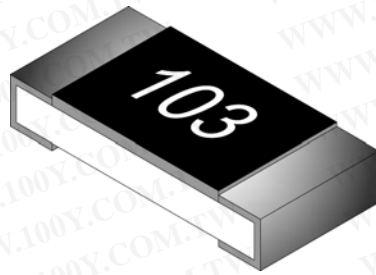


■ Thick Film Chip Resistor — CR Series

勝特力材料 886-3-5753170
勝特力电子(上海) 86-21-34970699
勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)



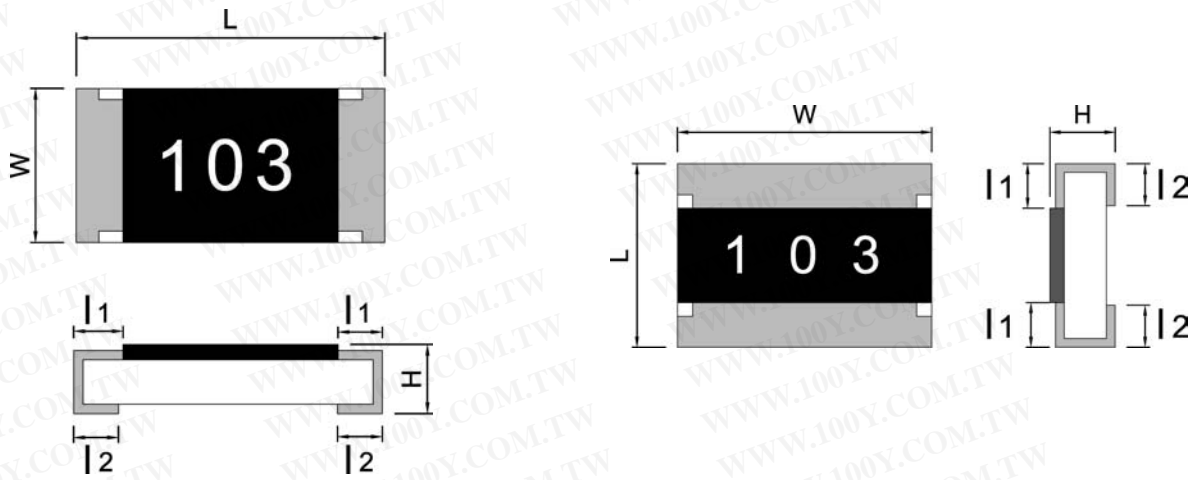
■ Application

- Entertainment: Stereo, TV tuners, Tape recorder
- Appliance: Air conditioner, Refrigerator
- Computer & relative products: Main board, PDA
- Communication equipment: Cell phone, Fax machine
- Power equipment: Power supply, Illumination equipment
- Measuring instrument: Electric meter, Navigation equipment

■ Features

- Small size and light weight
- Reduction of assembly costs and matching with placement machines
- Reliability, high quality and fast delivery

■ Type Dimension



CR0402 / CR0603 / CR0805 / CR1206
CR1210 / CR1812 / CR2010 / CR2512

CR1218

■ Dimension

Unit: mm

TYPE	L	W	H	l_1	l_2
CR0402	1.00 ± 0.10	0.50 ± 0.05	0.30 ± 0.05	0.15 ± 0.10	0.20 ± 0.10
CR0603	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.30 ± 0.10
CR0805	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.30 ± 0.15	0.40 ± 0.15
CR1206	3.05 ± 0.10	1.60 ± 0.20	0.55 ± 0.15	0.40 ± 0.20	0.50 ± 0.20
CR1210	3.05 ± 0.10	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.50 ± 0.20
CR1812	4.50 ± 0.10	3.00 ± 0.10	0.55 ± 0.05	0.55 ± 0.20	0.70 ± 0.20
CR2010	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20
CR1218	3.10 ± 0.10	4.60 ± 0.10	0.55 ± 0.05	0.40 ± 0.20	0.50 ± 0.20
CR2512	6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.60 ± 0.20	0.60 ± 0.20

● Low Ohm Chip Resistor

■ Standard Electrical Specifications

Item Type	Rated Power at 70 °C	Rated Voltage	Max Working Voltage	Max Overload Voltage	T.C.R. (PPM/°C)	Resistance Range (mΩ)	Operating Temperature Range
						F(±1%) J±(5%)	
CR0402	0.063 W	0.17~0.25V	0.25 V	0.624 V	±800	470~990	-55°C ~ +155°C
CR0603	0.1 W	0.1~0.31V	0.31 V	0.775 V	±800	100~330	
					±600	331~510	
					±400	511~990	
CR0805	0.125 W	0.04~0.35V	0.35 V	0.875 V	±1000	10~50	
					±800	51~100	
					±600	101~330	
					±400	331~990	
CR1206	0.25 W	0.05~0.5V	0.5 V	1.25 V	±800	10~50	
					±600	51~100	
					±500	101~330	
					±400	331~990	
CR1210	0.33 W	0.06~0.57V	0.57 V	1.425 V	±800	10~50	
					±600	51~100	
					±500	101~330	
					±400	331~990	
CR1812	0.5 W	0.07~0.7V	0.7 V	1.75 V	±800	10~50	
					±600	51~100	
					±500	101~330	
					±400	331~990	
CR2010	0.5 W	0.07~0.7V	0.7 V	1.75 V	±800	10~50	
					±800	51~100	
					±600	101~330	
					±400	331~990	
CR1218	1 W	0.1~0.99V	0.99 V	2.475V	±800	10~50	
					±400	51~990	
CR2512	1 W	0.1~0.99V	0.99 V	2.475V	±800	10~50	
					±700	51~100	
					±500	101~330	
					±400	331~990	

● For non-standard parts, please contact our sales dept.

● Operating Temperature Range : -55°C ~ +155°C.

■ High Power Electrical Specifications

Item Type	Rated Power at 70°C	Rated Voltage	Max Overload Voltage	T.C.R. (PPM/°C)	Resistance Range (mΩ)		Operating Temperature Range
					F(±1%) J±(5%)		
CR0603	0.125 W	0.11~0.35V	0.879 V	±800 ±600 ±400	100~330		-55°C ~ +155°C
					331~510		
					511~990		
CR0805	0.25 W	0.05~0.5V	1.244 V	±1000 ±800 ±600 ±400	10~50		
					51~100		
					101~330		
CR1206	0.5 W	0.07~0.7V	1.759 V	±800 ±600 ±500 ±400	10~50		
					51~100		
					101~330		
CR1210	0.66 W	0.08~0.81V	2.021 V	±800 ±600 ±500 ±400	10~50		
					51~100		
					101~330		
CR1812	1 W	0.1~0.99V	2.487 V	±800 ±600 ±500 ±400	10~50		
					51~100		
					101~330		
CR2010	1 W	0.1~0.99V	2.487 V	±800 ±800 ±600 ±400	10~50		
					51~100		
					101~330		
CR2512	2 W	0.14~1.41V	3.518 V	±800 ±700 ±500 ±400	10~50		
					51~100		
					101~330		
				331~990			

● For non-standard parts, please contact our sales dept.

● Operating Temperature Range : -55°C ~ +155°C .

■ Rated Resistance (1%&5%)

Resistance	Code	0603 Code	Resistance	Code	0603 Code	Resistance	Code	0603 Code	Resistance	Code	0603 Code	Resistance	Code	0603 Code
10mΩ	R010	010	65mΩ	R065	065	0.12Ω	R120	R12	0.27Ω	R270	R27	0.56Ω	R560	R56
15mΩ	R015	015	68mΩ	R068	068	0.13Ω	R130	R13	0.30Ω	R300	R30	0.60Ω	R600	R60
20mΩ	R020	020	70mΩ	R070	070	0.15Ω	R150	R15	0.33Ω	R330	R33	0.65Ω	R650	R65
30mΩ	R030	030	75mΩ	R075	075	0.16Ω	R160	R16	0.36Ω	R360	R36	0.68Ω	R680	R68
40mΩ	R040	040	80mΩ	R080	080	0.18Ω	R180	R18	0.40Ω	R400	R40	0.70Ω	R700	R70
50mΩ	R050	050	90mΩ	R090	090	0.20Ω	R200	R20	0.43Ω	R430	R43	0.75Ω	R750	R75
56mΩ	R056	056	0.10Ω	R100	R10	0.22Ω	R220	R22	0.47Ω	R470	R47	0.80Ω	R800	R80
60mΩ	R060	060	0.11Ω	R110	R11	0.25Ω	R250	R25	0.50Ω	R500	R50	0.90Ω	R900	R90

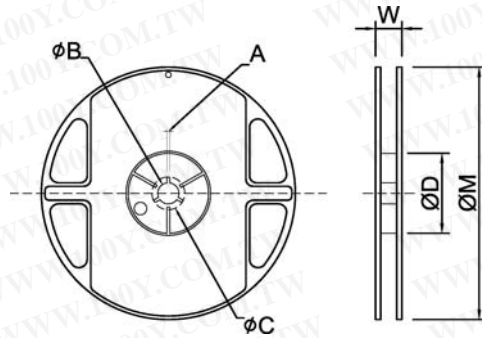
Parts Number Explanation

Example:

CR	0603	J	10R	P	05	
Product Type	Size (Inch)	Resistor Tolerance	Resistors Value	Package	Quantity	Optional
CR: Thick Film	0201 0402 0603 0805 1206 1210 1812 2010 1218 2512	B : $\pm 0.1\%$ C : $\pm 0.25\%$ D : $\pm 0.5\%$ F : $\pm 1\%$ G : $\pm 2\%$ J : $\pm 5\%$ K : $\pm 10\%$ L : $\pm 15\%$ M : $\pm 20\%$ N : $\pm 30\%$		P、Q : Paper Taping E : Embossed Taping D : Packed in a Bag	01 : 1000PCS 02 : 2000PCS 04 : 4000PCS 05 : 5000PCS 10 : 10000PCS 20 : 20000PCS 40 : 40000PCS 50 : 50000PCS	0.125W 0.25W 0.5W 0.66W 1W 2W

■ Appendix For SMD Chip Resistor

● Packaging Information

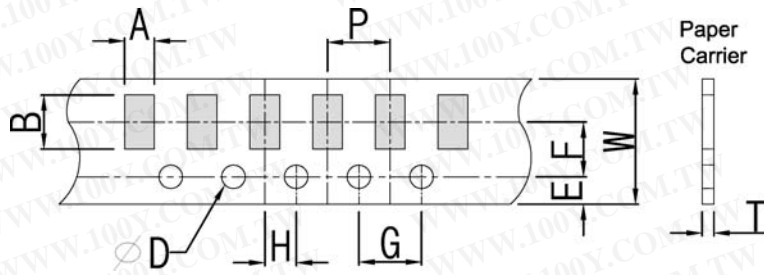


■ Dimension

Unit: mm

TYPE	SIZE		A	φ B	φ C	φ D	W	φ M
0402	7"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
	13"	40K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
	13"	50K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
0603 0805 1206	7"	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
	10"	10K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	254±2.0
	13"	20K/Reel	2.0±0.5	13.5±1.0	21±1.0	100±1.0	11.5±2.0	330±2.0
1210	7"	5K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
2010 2512 1812 1218	7"	4K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	16.0±2.0	178±2.0

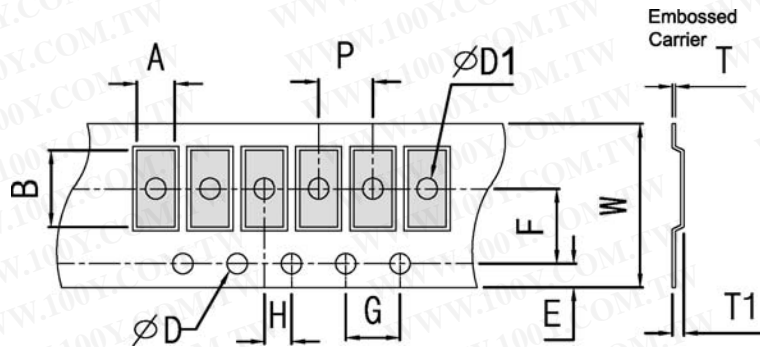
■ Tapping Specification



■ Dimension

Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	φD	P
Paper Type	0402	0.70±0.10	1.20±0.10	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.45±0.10	1.50 +0.10 -0	2.0±0.1
	0603	1.05±0.20	1.80±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.60±0.10		4.0±0.1
	0805	1.55±0.20	2.30±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10		4.0±0.1
	1206	1.90±0.20	3.50±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10		4.0±0.1
	1210	2.85±0.20	3.50±0.20	8.0±0.20	1.75±0.10	3.5±0.05	4.0±0.10	2.0±0.05	0.75±0.10		4.0±0.1



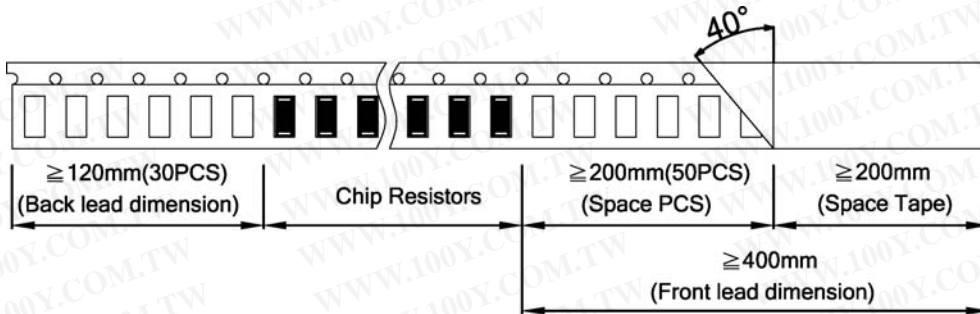
■ Dimension

Unit: mm

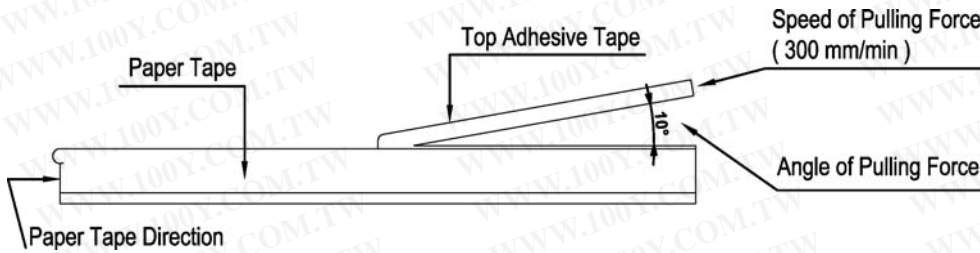
Packaging	Type	A	B	W	E	F	G	H	T	φD	ψD1	T1	P
Embossed Type	2010	2.80±0.20	5.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10	1.50 +0.10 -0	1.50±0.10	0.85±0.15	4.0±0.1
	2512	3.40±0.20	6.70±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10		1.50±0.10	0.85±0.15	
	1812	3.30±0.20	4.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10		1.50±0.10	0.85±0.15	
	1218	3.30±0.20	4.60±0.20	12±0.10	1.75±0.10	5.5±0.05	4.0±0.10	2.0±0.05	0.23±0.10		1.50±0.10	0.85±0.15	

■ Packing Material Data/Storage Data

■ Front & Back Lead Dimension

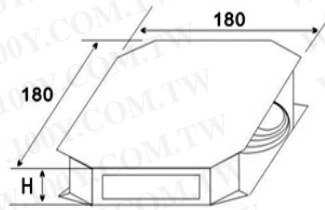


■ Top Adhesive Peel Off Strength : 10~70g

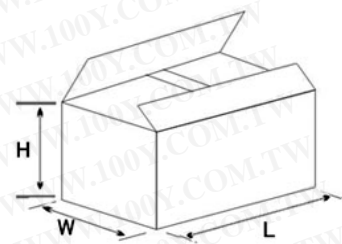


■ Package

Inner Box Size	
Reel	Size H(mm)
1	13
2	24
3	36
5	60
10	113



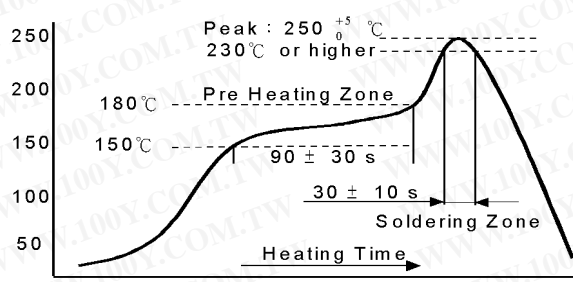
External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



■ Storage Data :

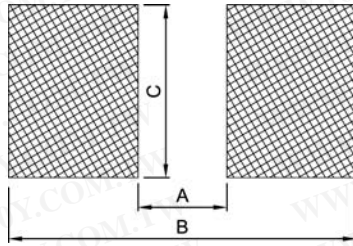
Storage time at the environment temp: 25±5°C & humidity: 60±20% is valid for one year from the date of delivery.

● Reliability Test and Requirement

Test Item	Test Method	Procedure	Requirements
Temperature Coefficient of Resistance (T.C.R)	JIS C 5201-1 clause 4.8	-55°C ~+155°C, 25°C is the reference temperature	Refer to Ratings
Short Time Overload	JIS C 5201-1 clause 4.13	General : 2.5 times RCWV or Max. Overload voltage whichever is less for 5 seconds. High Power : 2.5 times RCWV or Max. Overload voltage whichever is less for 2 seconds.	±1 : ±(1.0%+0.05Ω) ±5 : ±(2.0%+0.1Ω)
IR Reflow	Sony SS-00254		±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Leaching	Sony SS-00254-9	260±5°C for 30 seconds.	>95% Coverage
Soldering Heat	JIS C 5201-1 clause 4.18	260±5°C for 10 seconds.	±1 : ±(0.5%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Temperature Cycling	JIS C 5201-1 clause 4.19	-55°C to +155°C, 5 cycles	0.1%、0.5%、1% : ±(0.5%+0.05Ω) 2%、5% : ±(1.0%+0.10Ω)
Electric Iron	Sony SS-00254-5	Preheating temperature : 350±10°C Electric iron preheating time : 3+1/-0 sec	±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Resistance to Solvent	JIS C 5201-1 clause 4.29	The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secs. Then the resistor is left in the room for 48 hrs.	±1 : ±(0.5%+0.05Ω) ±5 : ±(0.5%+0.05Ω)
Load Life in Humidity	JIS C 5201-1 clause 4.24	40±2°C, 90~95% R.H. RCWV or Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .	0.1%、0.5%、1% : ±(0.5%+0.05Ω) 2%、5% : ±(2.0%+0.05Ω)
Load Life (Endurance)	JIS C 5201-1 clause 4.25	70±2°C, RCWV or Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF" .	0.1%、0.5%、1% : ±(1.0%+0.05Ω) 2%、5% : ±(3.0%+0.10Ω)
Terminal Bending Strength	JIS C 5201-1 clause 4.33	Bending once for 5 seconds D : 0402、0603、0805=5mm 1206、1210、1812=3mm 1218、2010、2512=2mm	±1 : ±(1.0%+0.05Ω) ±5 : ±(1.0%+0.05Ω)
Insulation Resistance	JIS C 5201-1 clause 4.6	100V for 1 minute.	≥10GΩ

● **General Information**

■ **Recommend Land Pattern Design (For Reflow Soldering)**



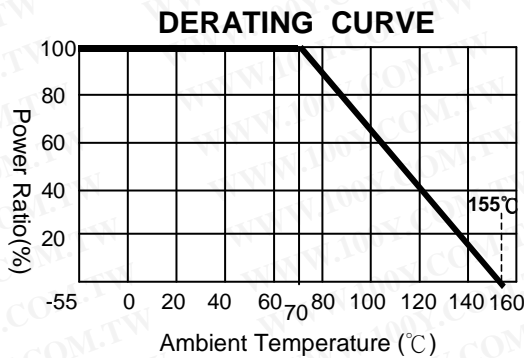
■ **Dimension**

Unit: mm

Type Item	0402	0603	0805	1206	1210	1812	2010	1218	2512
A	0.60	0.80	1.30	2.20	2.00	3.11	3.80	2.04	4.90
B	1.60	2.40	2.90	4.20	4.40	5.91	6.60	4.24	8.10
C	0.70	1.00	1.40	1.70	2.70	3.00	2.70	4.50	3.40

■ **Performance Characteristics**

■ **Power Derating Curve**



Power rating or current rating is in the case based on continuous full-load at ambient temperature of 70°C. For operation at ambient temperature in excess of 70°C, the load should be derated in accordance with figure of derating Curve.

■ **Voltage Rating or Current Rating**

Resistance Range: $\geq 1 \Omega$

Rated Voltage: The resistor shall have a DC continuous working voltage or a RMS AC continuous working voltage at commercial-line frequency and wave form corresponding to the power rating, as determined formula as following:

$$E(RCWV) = \sqrt{P \times R}$$

E=Rated voltage(V)
 P=Power rating(W)
 R=Nominal resistance(Ω)

■ Operation and Storage Temperature

	MIN	MAX
Operation temperature	-55°C	70°C
Storage temperature	20°C	30°C
Storage humidity	40%	80%

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 勝特力电子(上海) 86-21-34970699
 勝特力电子(深圳) 86-755-83298787
[Http://www.100y.com.tw](http://www.100y.com.tw)

■ Equipments Applicable:

Our company's products are produced under low temperature processing applicable to IR reflow surface mounting devices. It is comparatively not applicable to wave soldering which will possibly cause the risk ablating the element protection layer and the front conductor and cause the drift of the resistance value and ablation of the markings.

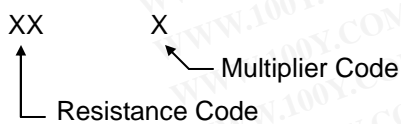
■ Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-foot probe to touch at the back of both electrodes. Supposed different testing points or methods are requested, please advise beforehand and customized-made production is available.

■ 0603 E-96 Multiplier Code

Code	A	B	C	D	E	F	G	H	X	Y	Z
Multiplier	10 ⁰	10 ¹	10 ²	10 ³	10 ⁴	10 ⁵	10 ⁶	10 ⁷	10 ⁻¹	10 ⁻²	10 ⁻³

CODING FORMULA



Example: 10.2KΩ = $\frac{102}{02} \times 10^2 \Omega = 02C$

33.2Ω = $\frac{332}{51} \times 10^{-1} \Omega = 51X$

■ 0603 Standard E-96 Values and 0603 Resistance Codes

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