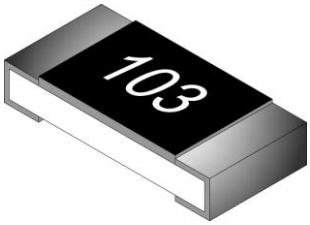
Metal Film Chip Resistor — CF Series



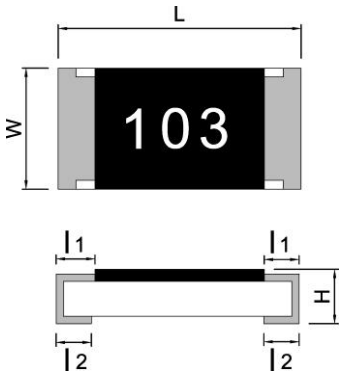
Application

- Consumer electronics
- Computer & relative products: Main board
- Communication equipment: Cell phone, Fax machine
- Measuring instrument: Electric meter, Navigation equipment

Features

- Small size and light weight
- Reliability, high quality
- Low T.C.R
- Anti Sulfur.

Type Dimension



Dimension **Unit: mm**

TYPE	L	W	H	I_1	I_2
0603	1.60 ± 0.20	0.80 ± 0.15	0.40 ± 0.10	0.30 ± 0.20	0.40 ± 0.10
0805	2.00 ± 0.20	1.25 ± 0.15	0.50 ± 0.15	0.30 ± 0.20	0.50 ± 0.15
1206	3.05 ± 0.10	1.60 ± 0.20	0.55 ± 0.15	0.40 ± 0.20	0.80 ± 0.20
1210	3.05 ± 0.10	2.50 ± 0.20	0.55 ± 0.15	0.50 ± 0.20	0.80 ± 0.20
1812	4.50 ± 0.10	3.10 ± 0.20	0.55 ± 0.10	0.45 ± 0.20	1.20 ± 0.20
2010	5.00 ± 0.20	2.50 ± 0.20	0.55 ± 0.10	0.50 ± 0.20	1.40 ± 0.20
2512	6.30 ± 0.20	3.20 ± 0.20	0.55 ± 0.10	0.50 ± 0.20	1.80 ± 0.20

Standard Electrical Specifications

Item / Type	Rated Power at 70℃	Working Voltage Range	Working Current Range	Max Overload Voltage	Max Overload Current	T.C.R. (PPM/℃)	Resistance Range (mΩ) F (±1%)、J (±5%)
CF1206	0.5 W	0.16~0.67V	0.74~3.16A	1.067V	5A	±200	50 ~ 200
						±100	201 ~ 910
CF1210	0.66 W	0.18~0.77V	0.85~3.63A	1.225V	5.745A	±200	50 ~ 200
						±100	201 ~ 910
CF1812	1 W	0.22~0.95V	1.05~4.47A	1.508V	7.071A	±200	50 ~ 200
						±100	201 ~ 910
CF2010	1 W	0.22~0.95V	1.05~4.47A	1.508V	7.071A	±200	50 ~ 200
						±100	201 ~ 910
CF2512	2 W	0.32~1.35V	1.48~6.32A	2.133V	10A	±200	50 ~ 200
						±100	201 ~ 910

- For non-standard parts, please contact our sales dept.
- Operating Temperature Range ：−55℃～＋155℃.

Type	CF0603	CF0805	CF1206	CF1210	CF2010	CF2512
Jumper Resistance Value	≤ 8mΩ	≤ 5mΩ	≤ 5mΩ	≤ 4mΩ	≤ 5mΩ	≤ 5mΩ
Jumper Rated Current	4A	7A	10A	12A	14A	20A

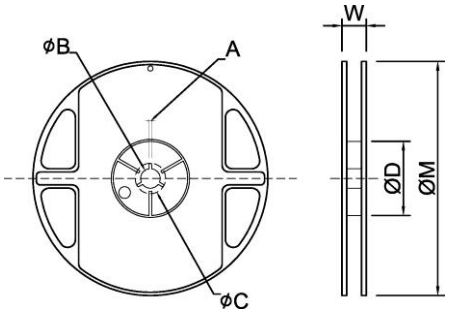
Parts Number Explanation

Example:

CF	2512	20	F	R050	M	
Product Type	Size(Inch)	Rated Power	Tolerance	Resistance	Material	Optional
	0603 0805 1206 1210 1812 2010 2512	05：0.5W 06：0.66W 10：1.00W 20：2.00W	F：±1% J：±5%	R050：50mR R100：100mR R910：910mR	N：NiCu C：Cu	

Appendix For SMD Chip Resistor

Packaging Information

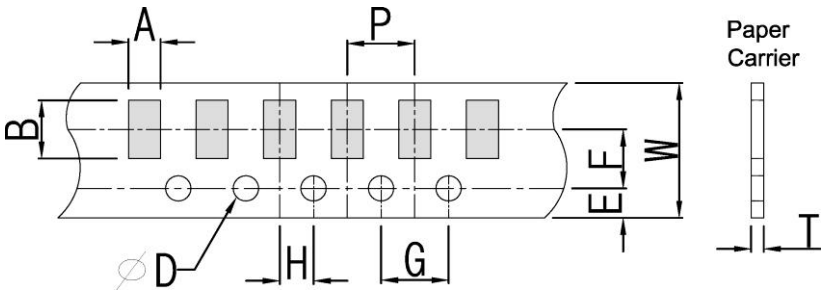


Dimension

Unit: mm

型別 TYPE	尺寸 SIZE		A	øB	øC	øD	W	øM
0603/0805/1206/ 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
0603/0805 /1206	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
2010/2512/1812	7”	4K/Reel	2.0±0.5	13.5±1.0	21±1.0	60±1.0	16.0±2.0	178±2.0

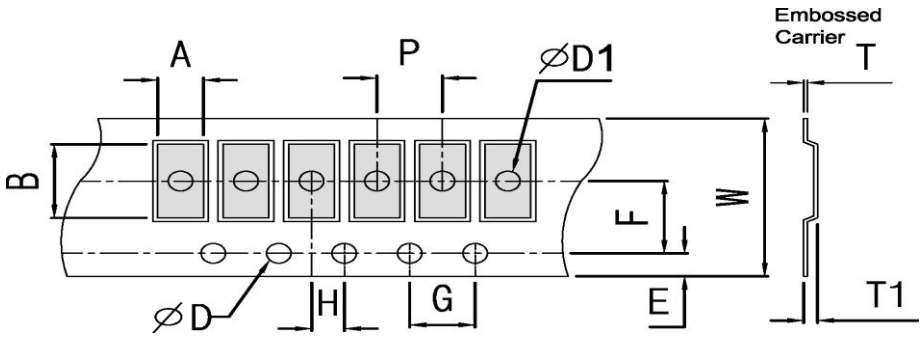
Tapping Specification



Dimension

Unit: mm

Packaging	Type	A	B	W	E	F	G	H	T	øD	P
Paper Type	0603	1.05±0.2	1.80±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.60±0.1	$1.50^{+0.10}_{-0}$	4.0±0.1
	0805	1.55±0.2	2.30±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		
	1206	1.90±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		
	1210	2.85±0.2	3.50±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1		



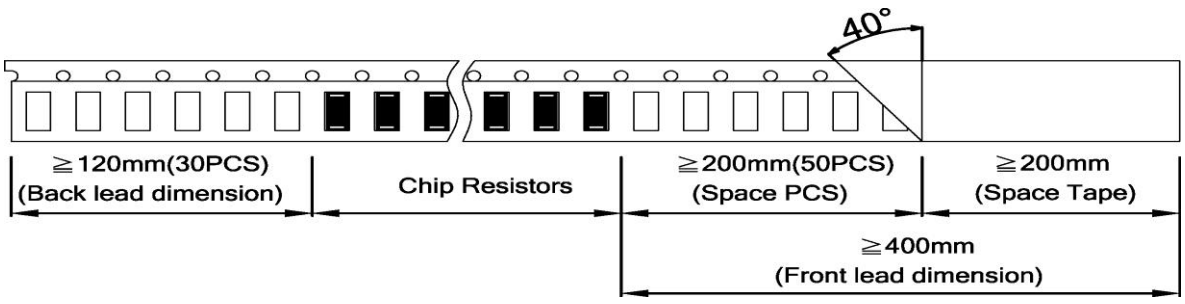
Dimension

Unit: mm

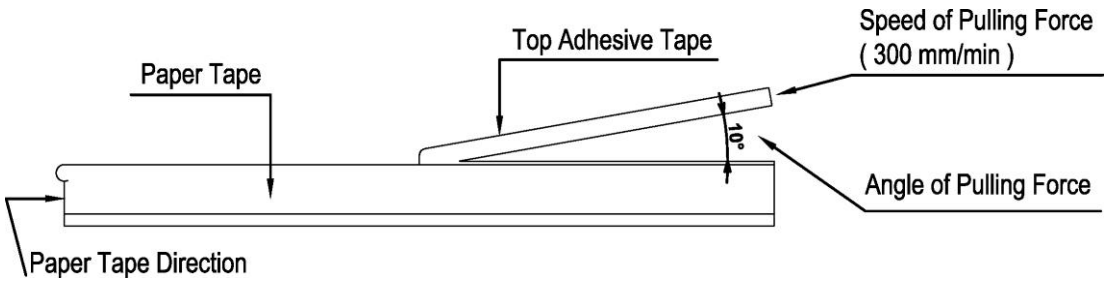
Packaging	Type	A	B	W	E	F	G	H	T	ØD	ØD1	T1	P
Embossed Type	1812	3.30±0.2	4.60±0.2	12±0.1	1.75±0.1	5.5±0.05	4.0±0.1	2.0±0.05	0.23±0.1	$1.50^{+0.10}_{-0}$	1.50±0.1	0.85±0.15	4.0±0.1
	2010	2.80±0.2	5.60±0.2	12±0.1	1.75±0.1	5.5±0.05	4.0±0.1	2.0±0.05	0.23±0.1		1.50±0.1	0.85±0.15	
	2512	3.40±0.2	6.70±0.2	12±0.1	1.75±0.1	5.5±0.05	4.0±0.1	2.0±0.05	0.23±0.1		1.50±0.1	0.85±0.15	

Packing Material Data / Storage Data

Front & Back Lead Dimension

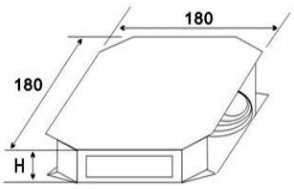


Top Adhesive Peel Off Strength：10~70g

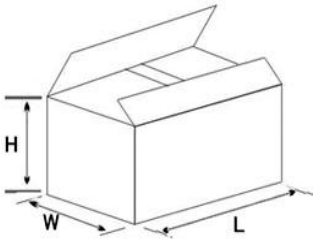


Package

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



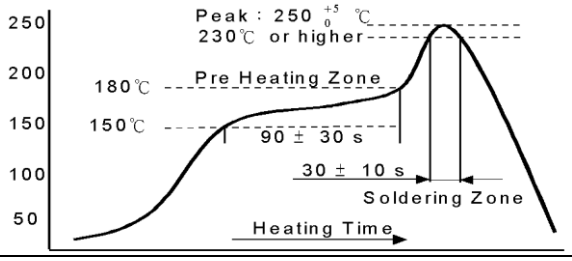
External Box Size			
Contain (Kpcs)	Length (mm)	Width (mm)	Height (mm)
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200



Storage Data：

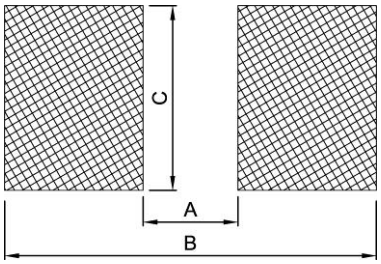
Storage time at the environment temp: 25±5℃& humidity: 60±20% is valid for one year from the date of delivery.

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℃ or +155℃, 25℃ is the reference temperature	Refer to Ratings
Short Time Overload	JIS C 5201-1 clause 4.13	2.5 times Rated Power Overload for 5 seconds.	±(2.0%+0.1Ω)
IR Reflow	Sony SS-00254		1%：±(1.0%+0.05Ω) 5%：±(2.0%+0.05Ω)
Leaching	Sony SS-00254-9	260±5℃ for 30 seconds.	>95% Coverage
Soldering Heat	JIS C 5201-1 clause 4.18	260±5℃ for 10 seconds.	±(1.0%+0.05Ω)
Temperature Cycling	JIS C 5201-1 clause 4.19	-55℃ to +155℃,5 cycles	±(1.0%+0.1Ω)
Resistance to Solvent	JIS C 5201-1 clause 4.29	The tested resistor be immersed into isopropyl alcohol of 20~25℃ for 60 secs. Then the resistor is left in the room for 48 hrs.	±(1.0%+0.05Ω)
Load Life in Humidity	JIS C 5201-1 clause 4.24	40±2℃, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs〝ON〞and 0.5 hr〝OFF〞.	±(2.0%+0.05Ω)
Load Life (Endurance)	JIS C 5201-1 clause 4.25	70±2℃, RCWV or for 1000 hrs with 1.5 hrs〝ON〞 and 0.5 hr〝OFF〞.	±(3.0%+0.1Ω)
Insulation Resistance	JIS C 5201-1 clause 4.6	100V for 1 minute.	≧10GΩ
Terminal Bending Strength	JIS C 5201-1 clause 4.33	Bending once for 5 seconds D：0603、0805=5mm 1206、1210、1812 =3mm 2010、2512 =2mm	±(1.0%+0.05Ω)
Sulfur Test	ASTM-B-809-95	60±2℃ no power rating for 1000 hrs	±(1.0%+0.05Ω)

General Information

Recommend Land Pattern Design



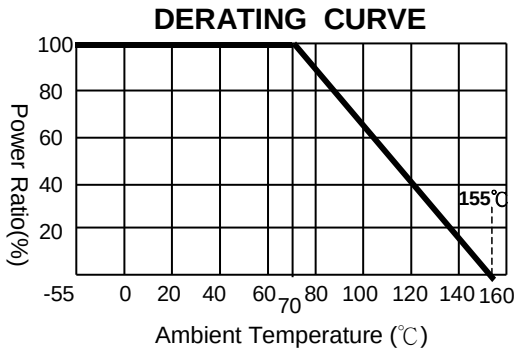
Dimension

Unit: mm

Item \ Type	0603	0805	1206	1210	1812	2010	2512
A	1.20	1.40	1.80	2.00	2.31	2.40	2.70
B	2.40	2.90	4.20	4.40	5.91	6.60	8.10
C	1.00	1.45	1.80	2.70	3.30	2.70	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℃.
For operation at ambient temperature in excess of 70℃, the load should be derated in accordance with figure of derating Curve.

Voltage Rating or Current Rating

Resistance Range: ≧1Ω
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℃	70℃
Storage temperature	20℃	30℃
Storage humidity	40%	80%

Product Testing Method:

Our products are tested with our company's tapping & testing equipments by using four-feet 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.

Marking

mΩ Resistance Codes

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

Revision： April 11, 2018