CR THICK FILM CHIP RESISTOR SERIES

INTRODUCTION

The most popular type of chip resistor developed for surface mount technology. Ideal for general purpose applications. Unique construction and special termination techniques ensure high quality and reliability. Extremely compact size for miniaturization.

FEATURES

- Excellent Long Term stability
- Available in Bulk and Tape & Reel packing.
- Available in Tolerances of ±5% & ±1%
- Uniform body size ensures compatibility with High Speed automatic handling machines
- Compatible with flow and re-flow soldering methods

SPECIFICATIONS

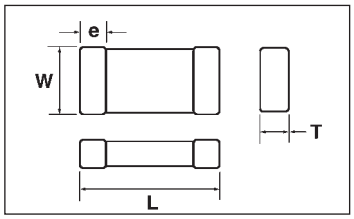
Resistance Range: 1 Ohm to 10 M Ohms for E24 values(5%)
1 Ohm to 1 M Ohms for E96 values(1%)
Rated Power: 1/16 to 1W at 70°C (Please see Power Derating Curve)
Rated Voltage: √ Rated Power x Nominal Resistance.
Overload Voltage: Please refer to Power Ratings Table.
Temperature Coefficient: ± 100 ppm or ± 200 ppm per °C.
Temperature Range: -55°C to +125°C with derating above 70°C
Tolerance: ± 5% or ±1% (Special tolerance upon request.).

Load Life:

The component will be subjected to 1000 hours of testing at rated voltage and 70° C, with duty cycles of 1.5 hours "on" and 0.5 hours "off". After the test the Resistance change will remain within ±3% of the initial value + 0.1 Ohm for values above 1 M Ohm and 5% for values less than 1 M Ohm.

Resistance to Soldering Heat:

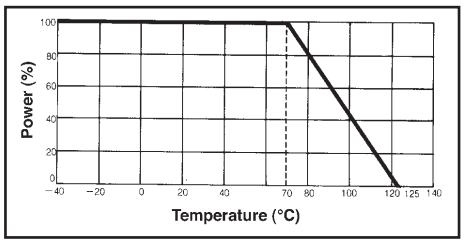
The component can be subjected to a soldering temperature of 270 °C for 10 seconds. After the test the Resistance change will remain within ±3% + 0.1 Ohms.



Case Dimensions Table

Dimensions in mm				
Case Code	L	W	T Max	e
0402	1.0 ± 0.05	0.5 ± 0.05	0.35 ± 0.05	0.25 ± 0.15
0603	1.6 ± 0.1	0.8 ± 0.15	0.45 ± 0.10	0.30 ± 0.1
0805	2.0 ± 0.1	1.25 ± 0.10	0.55 ± 0.10	0.40 ± 0.2
1206	3.2 ± 0.15	1.6 ± 0.15	0.55 ± 0.10	0.50 ± 0.25
2010	5.0 ± 0.15	2.5 ± 0.15	0.55 ± 0.15	0.60 ± 0.2
2512	6.4 ± 0.15	3.2 ± 0.15	0.55 ± 0.15	0.60 ± 0.2

Power Derating Curve



Tape, Reel and Packing Specifications

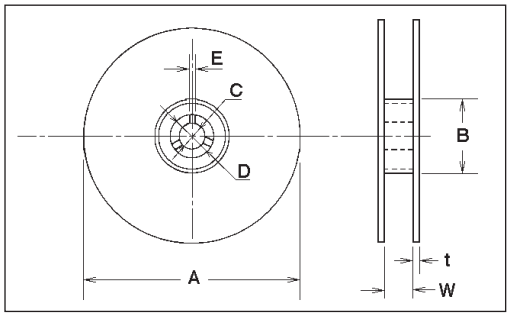
Reel Dimensions;

Reel Dimensions in Millimeters

A	B	C	D	E	W	t
ø178 ±2.0	ø50 min.	13.0 ±0.5	21.0 ±0.8	2.0 ±0.8	8.8/12.8 ±1.5	2.0 ±0.5
ø330 ±2.0	ø100 min.	13.0 ±0.5	21.0 ±0.8	2.0 ±0.8	8.8/12.8 ±1.5	2.0 ±0.6

Reel Dimensions in Inches

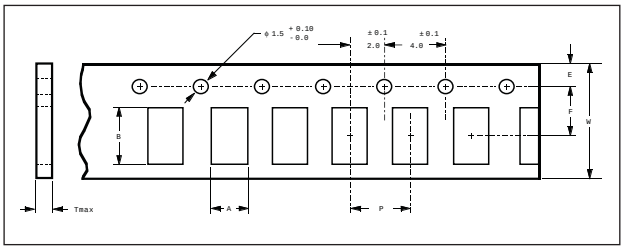
A	B	C	D	E	W	t
ø7 ±0.08	ø2.0 min.	5.0 ±0.02	0.83 ±0.03	0.08 ±0.3	0.35/0.50 ±0.06	0.08 ±0.02
ø13 ±0.08	ø4.0 min.	5.0 ±0.3	0.83 ±0.03	0.08 ±0.3	0.35/0.50 ±0.06	0.08 ±0.02



Power Ratings Table (Values above 10 M Ohms are available upon request)

SIZE	Rate Power at 70C	Rate Current of Jumper A	Maximum Working Voltage Vw	Maximum Overload Voltage Vo	Temperature Coefficient of Resistance ppm/C	Combination of Resistance Range of Tolerance F (+1%) (E96)	J (+ 5%) (E24)	Operating Temperature Range C
0402	1/16		50	100	± 100	10 Ohms-562 K Ohms		
					± 200	1 Ohm-9.76 Ohms	10 Ohms - 1 M Ohms	
0603	1/10	1	50	100	± 100	10 Ohms-1 M Ohms		
					± 200	1 Ohm - 9.76 Ohms	1 Ohm- 10 M Ohms	
0805	1/8		150	300	± 100	10 Ohms - 1 M Ohms		
					± 200	1 Ohm - 9.76 Ohms	1 Ohm - 10 M Ohms	
1206	1/4				± 100	10 Ohms-1 M Ohms		-55 - + 125
		2			± 200	1 Ohm - 9.76 Ohms	1 Ohm - 10 M Ohms	
2010	3/4				± 100	10 Ohms - 1 M Ohms		
			200	400	± 200	1 Ohm - 9.76 Ohms	1 Ohm - 10 M Ohms	
2512	1				± 100	10 Ohms - 1 M Ohms		
					± 200	1 Ohm - 9.76 Ohms	1 Ohm - 10 M Ohms	

Carrier Tape Dimensions;



SIZE CODE	A ±0.2 mm or ±0.008''	B ±0.2 mm or ±0.008''	W ±0.3 mm or ±0.012''	F ±0.1 mm or ±0.004''	E ±0.1 mm or ±0.004''	P ±0.1 mm or ±0.004''	Tmax
0402	0.65 (0.026")	1.15 (0.045")	8.0mm (0.315")	3.5mm (0.138")	1.75mm (0.069")	2mm (0.079")	0.43mm (0.018")
0603	1.1 (0.043")	1.9mm (0.075")	8.0mm (0.315")	3.5mm (0.138")	1.75mm (0.069")	4mm (0.157")	0.60mm (0.024")
0805	1.65 (0.065")	2.4mm (0.094")	8.0mm (0.315")	3.5mm (0.138")	1.75mm (0.069")	4mm (0.157")	0.75mm (0.030")
1206	1.9 (0.075")	3.5mm (0.138")	8.0mm (0.315")	3.5mm (0.138")	1.75mm (0.069")	4mm (0.157")	0.75mm (0.030")
2010	2.8 (0.011")	5.6mm (0.22")	12.0mm (0.472")	5.5mm (0.217")	1.75mm (0.069")	4mm (0.157")	0.20mm (0.080")
2512	3.6 (0.142")	6.7mm (0.264")	12.0mm (0.472")	5.5mm (0.217")	1.75mm (0.069")	8mm (0.315")	0.20mm (0.080")

Packing Methods;

	PACKING				
	Paper Taping Reel (R)			Embossed Taping Reel (K)	Bulk Cassette (K)
Style	7" (178mm)	10" (254mm)	13" (330mm)	7" (178mm)	
CR02 (0402)	10,000	10,000	10,000	-	50,000
CR03 (0603)	5,000	5,000	5,000	-	25,000
CR05 (0805)	5,000	5,000	5,000	-	10,000
CR06 (1206)	5,000	5,000	5,000	-	5,000
CR20 (2010)	-	-	-	4,000	-
CR25 (2512)	-	-	-	4,000	-

PART NUMBERING

CR □□ □□□□□□□□□

Series:
02 = 0402
03 = 0603
05 = 0805
06 = 1206
20 = 2010
25 = 2512

3 or 4 Digit EIA Code.

Tolerance:
F = ± 1%
G = ± 2%
J = ± 5%

Temp. Coefficient:
0 = ± 100 ppm/C
3 = ± 200 ppm/C

Circuits:
0 = NA

Packaging:
1 = 5K Paper Taping
2 = 10K Paper Taping
3 = 20K Paper Taping
4 = 4K Plastic Taping
5 = Loose Packing
A = 5K Cassette
B = 10K Cassette
C = 25K Cassette
D = 50K Cassette

EIA Code-E24 Values

10	33
11	36
12	39
13	43
15	47
16	51
18	56
20	62
22	68
24	75
27	82
30	91

Add 3 digit multipler

Examples:
101= 100 Ohms
472= 4.7K Ohms
684= 680K Ohms
1R0= 1 Ohm
15R= 15 Ohms

Note:
R= decimal point in the EIA code

EIA Code-E96 Values

10.0	14.7	21.5	31.6	46.4	68.1
10.2	15.0	22.1	32.4	47.5	69.8
10.5	15.4	22.6	33.2	48.7	71.5
10.7	15.8	23.2	34.0	49.9	73.2
11.0	16.2	23.7	34.8	51.1	75.0
11.3	16.5	24.3	35.7	52.3	76.8
11.5	16.9	24.9	36.5	53.6	78.7
11.8	17.4	25.5	37.4	54.9	80.6
12.1	17.8	26.1	38.3	56.2	82.5
12.4	18.2	26.7	39.2	57.6	84.5
12.7	18.7	27.4	40.2	59.0	86.6
13.0	19.1	28.0	41.2	60.4	88.7
13.3	19.6	28.7	42.2	61.9	90.9
13.7	20.0	29.4	43.2	63.4	93.1
14.0	20.5	30.1	44.2	64.9	95.3
14.3	21.0	30.9	45.3	66.5	97.6

Add 4 digit multipler

Examples:
1130= 113 Ohms
1871= 1.87K Ohms
6193= 619K Ohms
19R1= 19.1 Ohms
1R21= 1.21 Ohms