



# 5% Thick Film Chip Resistors (RoHS Compliant)

# CR5-RC Series

## FEATURES

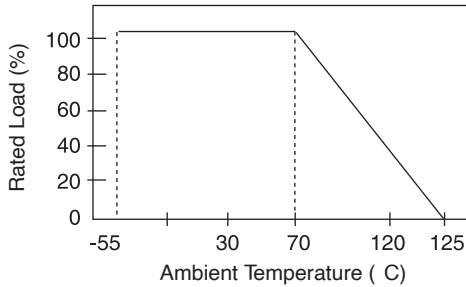
- Temperature Range: -55°C ~ +125°C
- High purity alumina substrate
- Wave or flow solderable
- Excellent high frequency characteristics
- Wrap around termination
- Inner electrode protection
- Value range 0Ω ~ 10MΩ



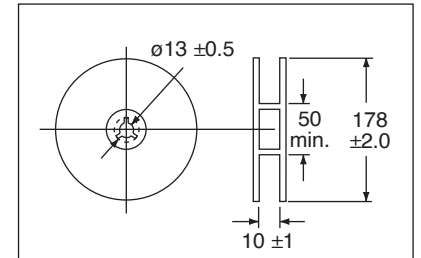
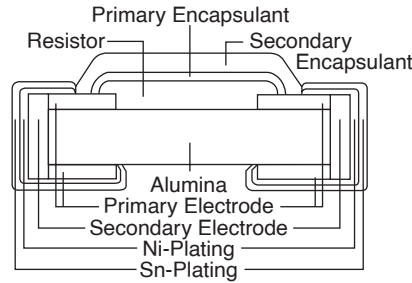
RoHS Compliant



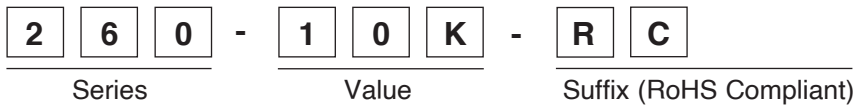
## DERATING CURVE



## REEL DIMENSIONS (mm)

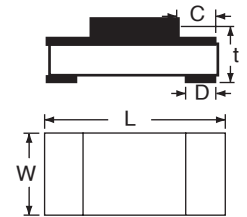


## PART NUMBERING SYSTEM



## SERIES, SIZE, WATTAGE, VOLTAGE, AND DIMENSIONS

Series	Case Size	Watts	Voltage (V) (max.)		Dimensions (mm)				
			W.V.	O.V.	L	W	C	D	t
301	0603	1/10	50	100	1.60 ± .10	0.8 ± .15	0.3 ± .20	0.30 ± .20	.45 ± .10
260	0805	1/8	150	300	2.0 ± 0.15	1.25 ± .15	0.4 ± 0.2	0.4 ± 0.2	.55 ± .10
263	1206	1/4	200	400	3.1 ± 0.15	1.55 ± .15	0.45 ± 0.2	0.45 ± 0.2	.55 ± .10



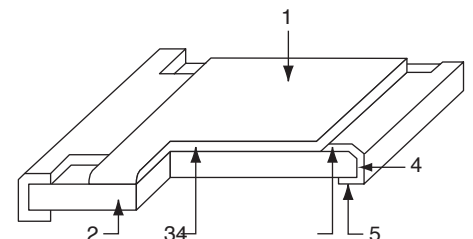
## STANDARD STOCKED VALUES (Ω)

0	2.0	4.3	9.1	20	43	91	200	430	910	2K	4.3K	9.1K	20K	43K	91K	200K	430K	820K	1.8M	3.9M	8.2M
1.0	2.2	4.7	10	22	47	100	220	470	1K	2.2K	4.7K	10K	22K	47K	100K	220K	470K	910K	2M	4.3M	9.1M
1.1	2.4	5.1	11	24	51	110	240	510	1.1K	2.4K	5.1K	11K	24K	51K	110K	240K	510K	1M	2.2M	4.7M	10M
1.2	2.7	5.6	12	27	56	120	270	560	1.2K	2.7K	5.6K	12K	27K	56K	120K	270K	560K	1.1M	2.4M	5.1M	
1.3	3.0	6.2	13	30	62	130	300	620	1.3K	3K	6.2K	13K	30K	62K	130K	300K	620K	1.2M	2.7M	5.6M	
1.5	3.3	6.8	15	33	68	150	330	680	1.5K	3.3K	6.8K	15K	33K	68K	150K	330K	660K	1.3M	3M	6.2M	
1.6	3.6	7.5	16	36	75	160	360	750	1.6K	3.6K	7.5K	16K	36K	75K	160K	360K	680K	1.5M	3.3M	6.8M	
1.8	3.9	8.2	18	39	82	180	390	820	1.8K	3.9K	8.2K	18K	39K	82K	180K	390K	750K	1.6M	3.6M	7.5M	

## NOTE: RoHS Compliant by Exemption

## CONSTRUCTION

No.	Part Name
1	Protective coating: Epoxy
2	Al <sub>2</sub> O <sub>3</sub> high purity alumina substrate: Al 96fi
3	Resistive element: metal film
4	Termination (Inner): Ag/Pd
5	Termination (Between): Ni plating film
6	Termination (Outer): Sn plating film





# 5% Thick Film Chip Resistors (RoHS Compliant)

# CR5-RC Series

## CHARACTERISTICS

Characteristics	Limits	Test Methods ( JIS C 5201-1 )															
Temperature coefficient	$1\Omega \sim 10\Omega \leq \pm 400 \text{ PPM} / ^\circ\text{C}$ $11\Omega \sim 10\text{M}\Omega \leq \pm 200 \text{ PPM} / ^\circ\text{C}$	5.2 Natural resistance change per temp. degree centigrade. $R_2 - R_1$ $\frac{\quad}{\quad} \times 10^6 \text{ (PPM} / ^\circ\text{C)}$ $R_1(t_2 - t_1)$ R1: Resistance value at room temperature (t1) R2: Resistance value at room temp.plus 100°C (t2)															
Short time overload	Resistance change rate is $\pm (2.0 \% + 0.1\Omega)$ Max.	5.5 Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.															
Insulation resistance	1,000M $\Omega$ or more	5.6 Apply 500V DC between protective coating and termination for 1 minute															
Dielectric withstanding voltage	No evidence of flashover mechanical damage, arcing or insulation break down.	5.7 Apply 500V AC between protective coating and termination for 1 minute															
Terminal bending	$\pm (1.0\% + 0.05\Omega)$ Max.	6.1.4 Twist of Test Board: Y/X=5/90mm for 10 seconds															
Temperature cycling	$\pm (1.0\% + 0.05\Omega)$ Max.	7.4 Resistance change after continuous 5 cycles for duty shown below:															
		<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-55°C <math>\pm 3^\circ\text{C}</math></td> <td>30 mins</td> </tr> <tr> <td>2</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> <tr> <td>3</td> <td>+155°C <math>\pm 2^\circ\text{C}</math></td> <td>30 mins</td> </tr> <tr> <td>4</td> <td>Room temp.</td> <td>10~15 mins</td> </tr> </tbody> </table>	Step	Temperature	Time	1	-55°C $\pm 3^\circ\text{C}$	30 mins	2	Room temp.	10~15 mins	3	+155°C $\pm 2^\circ\text{C}$	30 mins	4	Room temp.	10~15 mins
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		1	-55°C $\pm 3^\circ\text{C}$	30 mins													
		2	Room temp.	10~15 mins													
3	+155°C $\pm 2^\circ\text{C}$	30 mins															
4	Room temp.	10~15 mins															
Load life in humidity	Resistance change rate is $\pm (3.0\% + 0.1\Omega)$ Max.	7.9 Resistance change after 1,000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity chamber controlled at 40°C $\pm 2^\circ\text{C}$ and 90 to 95 % relative humidity															
Load life	Resistance change rate is $\pm (3.0\% + 0.1\Omega)$ Max.	7.10 Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of ( 1.5 hours "on", 0.5 hour "off" ) at 70°C $\pm 2^\circ\text{C}$ ambient															
Soldering Heat	Electrical characteristics shall be satisfied. Without distinct deformation in appearance.	<u>Solder bath method</u> Pre-Heat: 100 to 105°C, 30 $\pm 5$ sec. Temperature: 265 $\pm 3^\circ\text{C}$ , 5 +1/-0 sec  <u>Reflow soldering method</u> Peak: 250 +5/-0°C 230°C or higher, 30 $\pm 10$ Sec.  <u>Solder iron method</u> Bit temperature: 350° $\pm 10^\circ\text{C}$ Application time of soldering iron: 3 +1/-0 seconds															
Solderability	95% Coverage min.	6.5 Test temperature of solder: 245° $\pm 3^\circ\text{C}$ Dipping them solder: 2~3 seconds															



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