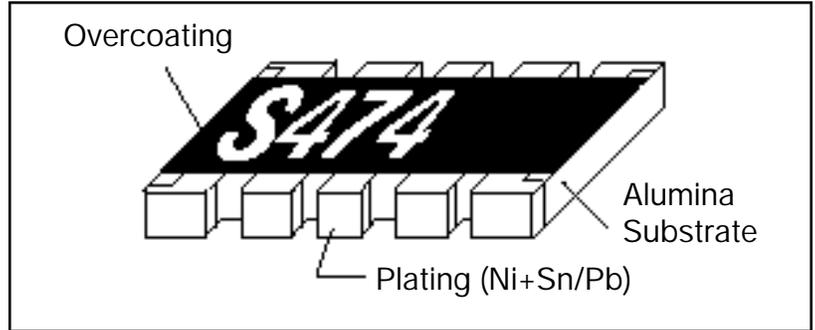
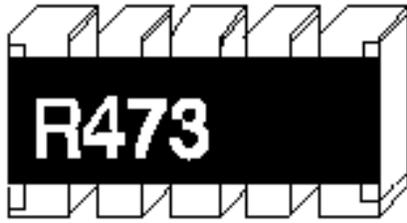


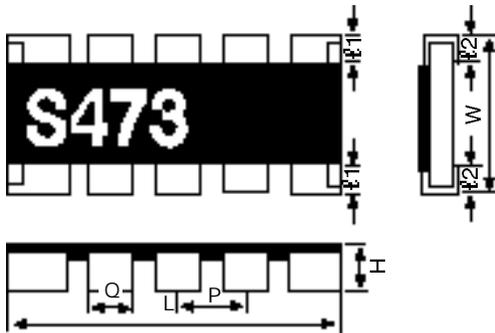


# Thick Film Chip Network Arrays

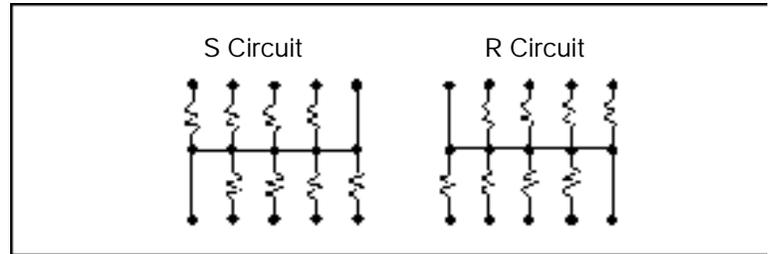
## Construction



## Dimensions



## Circuit



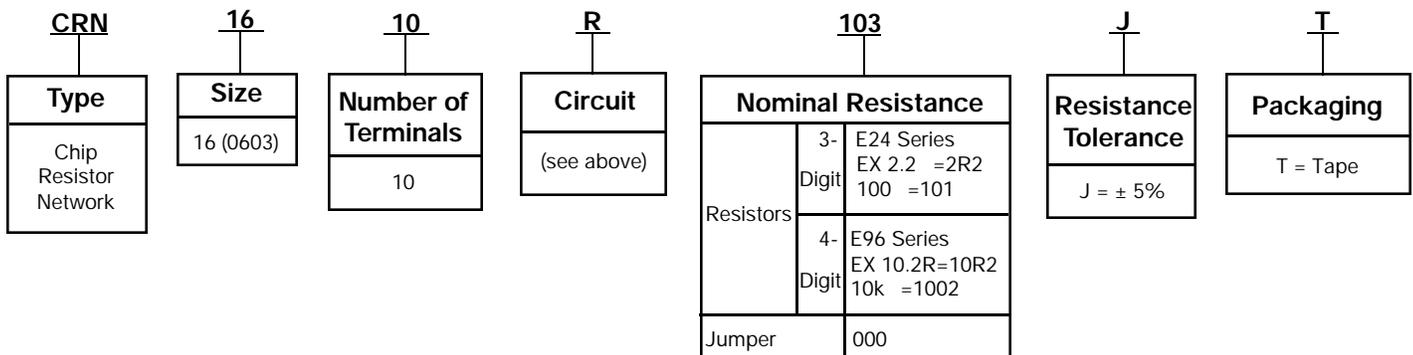
Unit: mm

Dimensions Type	L	W	H	f1	f2	P	Q
	CRN16 10R CRN16 10S	6.4 ± 0.2	3.1 ± 0.2	0.55 ± 0.1	0.5 ± 0.3	0.5 ± 0.2	1.27 ± 0.1

## Ratings

Type	Rated Power at 70°C	Max. Working Voltage	Max. Overload Voltage	T.C.R. (ppm/°C)	Resistance	Number of Terminals	Number of Resistors	Operating Temperature Range
					J (±5%) E -12			
CRN16 10R CRN16 10S	1/16W	50V	100V	± 200	10 ~1M	10	8	-55°C~+125°C

## Part Numbering System



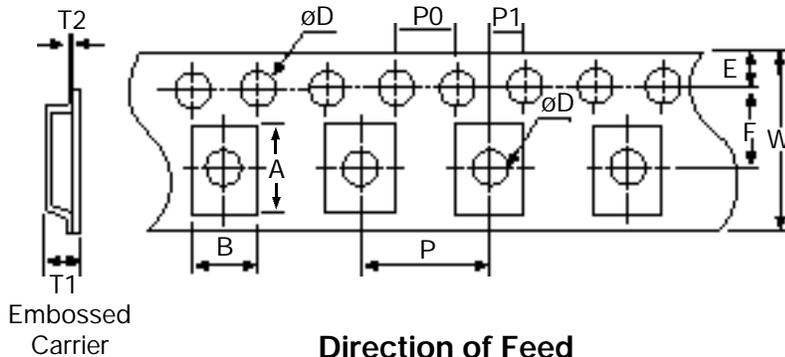
# Thick Film Chip Network Arrays



Item	5%	Test Method
Temperature Cycling	$\pm (2\% + 0.1)$	JIS C5202 7.4 Cycle between -55°C and +125°C for 5 cycles
Low Temperature Operation	$\pm (2\% + 0.1)$	1.5Hr at -55°C followed by 45 Minutes of RCWV
Short Time Overload	$\pm (2\% + 0.1)$	JIS C5202 5.5 Apply rated voltage 2.5 times for 5 seconds
Resistance to Soldering Heat	$\pm (1\% + 0.1)$	JIS C5202 6.10 260°C for 10 seconds
Loading Life in Moisture	$\pm (2\% + 0.1)$	JIS C5202 7.9 40°C 1000Hr at RCWV, 1.5Hr ON, 0.5Hr Off.
Exposure	$\pm (2\% + 0.1)$	JIS C5202 7.2 1000Hr Exposure at 125°C
Load Life	$\pm (3\% + 0.1)$	JIS C5202 7.10 70°C 1000Hr at RCWV, 1.5Hr ON 0.5Hr Off.
Solderability	Coverage 95%	JIS C5202 6.11 Immerse for 5 sec in solder at 230°C

## Taping Specifications

### Carrier Tape



Embossed Carrier

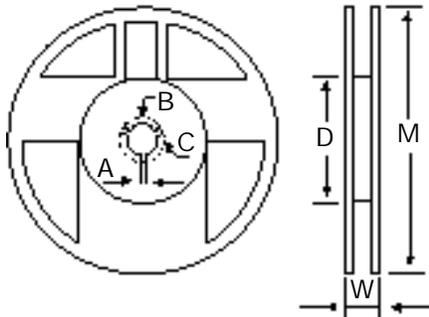
Direction of Feed

Unit: mm

Packaging	Type	A	B	W	E	F	P0	P	P1	T1	T2	øD
Tape	CRN16 10R CRN16 10S	6.7 ± 0.2	3.6 ± 0.2	12 ± 0.2	1.75 ± 0.1	5.5 ± 0.1	4.0 ± 0.1	8.0 ± 0.1	2.0 ± 0.1	0.85 ± 0.15	0.23 ± 0.15	1.5 <sup>+0.1</sup> <sub>-0</sub>

Unit: mm

## Reel Specifications



Type	W	M	A	B	C	D
CRN16 10R CRN16 10S	16.5 ±1.5	17.8 ±2.0	2.0 ±0.5	13.5 ±0.5	21 ±0.5	8.0 ±2.0

## Quantities

Unit: mm

Type	T (pcs/reel)
CRN16 10R CRN16 10S	2,000



# Thick Film Chip Network and Resistor Arrays

## Performance Specifications

Characteristics	Test Methods	Limits															
Temperature coefficient JIS - C - 5202 5.2	Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1 (t_2 - t_1)} \times 10^6 \text{ (PPM / } ^\circ\text{C)}$	$\pm 5\%$ 1 - 10 $\pm 400\text{PPM}/^\circ\text{C}$ 11 - 10M $\pm 200\text{PPM}/^\circ\text{C}$															
	$R_1$ : Resistance value at room temperature ( $t_1$ ) $R_2$ : Resistance value at room temp. plus 100 °C ( $t_2$ )	$\pm 1\%$ 10 - 100 $\pm 200\text{PPM}/^\circ\text{C}$ 101 - 1M $\pm 100\text{PPM}/^\circ\text{C}$															
Short - time overload JIS - C - 5202 5.5	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.	$\pm 5\%$ Tolerance $\pm(2.0\% + 0.1 \text{ } )$ $\pm 1\%$ Tolerance $\pm(1.0\% + 0.1 \text{ } )$															
Insulation resistance JIS - C - 5202 5.6	Apply 500V DC between protective coating and termination for 1 minute, then measure.	1,000 Meg ohm or more															
Dielectric withstanding voltage JIS - C - 5202 6.1.4	Apply 500V AC between protective coating and termination for 1 minute.	No evidence of flashover mechanical damage, arcing or insulation breakdown															
Terminal bending JIS - C - 5202 6.1.4	Twist of Test Board: Y/X=5/90mm for 10 seconds.	$\pm (1.0\% + 0.05 \text{ } )$															
Soldering Heat JIS - C - 5202 6.4	Dip the resistor into a solder bath having a temperature of $260^\circ\text{C} \pm 5^\circ\text{C}$ and hold it for $10 \pm 1$ seconds.	Resistance change rate is $\pm (1.0\% + 0.05 \text{ } )$															
Solderability JIS - C - 5202 6.5	Test temperature of solder $235^\circ\text{C} \pm 5^\circ\text{C}$ . Dipping them in solder: $3 \pm 0.5$ seconds.	95% coverage Min.															
Temperature cycling JIS - C - 5202 7.4	Resistance change after continuous five cycles for duty cycle specified below:	$\pm 5\%$ Tolerance $\pm(1.0\% + 0.05 \text{ } )$ $\pm 1\%$ Tolerance $\pm(0.5\% + 0.05 \text{ } )$															
	<table border="1"> <thead> <tr> <th>Step</th> <th>Temperature</th> <th>Time</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><math>-55^\circ\text{C} \pm 3^\circ\text{C}</math></td> <td>30 minutes</td> </tr> <tr> <td>2</td> <td>Room temp</td> <td>10-15 minutes</td> </tr> <tr> <td>3</td> <td><math>+ 125^\circ\text{C} \pm 2^\circ\text{C}</math></td> <td>30 minutes</td> </tr> <tr> <td>4</td> <td>Room temp</td> <td>10-15 minutes</td> </tr> </tbody> </table>		Step	Temperature	Time	1	$-55^\circ\text{C} \pm 3^\circ\text{C}$	30 minutes	2	Room temp	10-15 minutes	3	$+ 125^\circ\text{C} \pm 2^\circ\text{C}$	30 minutes	4	Room temp	10-15 minutes
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3	$+ 125^\circ\text{C} \pm 2^\circ\text{C}$	30 minutes															
4	Room temp	10-15 minutes															
Load life in humidity JIS - C - 5202 7.9	Resistance change after 1,000 hours (1.5 hours "on" 0.5 hour "off") at RCWV in a humidity chamber controlled at $40^\circ\text{C} \pm 2^\circ\text{C}$ and 90 to 95% relative humidity.	$\pm 5\%$ Tolerance $\pm(3.0\% + 0.1 \text{ } )$ $\pm 1\%$ Tolerance $\pm(1.0\% + 0.1 \text{ } )$															
Load Life JIS - C - 5202 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 $70^\circ\text{C} \pm 2^\circ\text{C}$ ambient.	$\pm 5\%$ Tolerance $\pm(3.0\% + 0.1 \text{ } )$ $\pm 1\%$ Tolerance $\pm(1.0\% + 0.1 \text{ } )$															

\*RCWV = Rated Continuous Working Voltage =  $\sqrt{\text{Rated Power} \times \text{Resistance Value}}$

## Marking

- $\pm 5\%$  Tolerance: The first two digits are significant of resistance and the third one denotes number of zeros following  
Example: 273 → 27000 → 27K
- Below 10 shown as following: Example: 4R7 → 4.7
- $\pm 1\%$  Tolerance: 4 digits, the first three are significant, the fourth digit is number of zeroes. Letter R is decimal point.  
Example: 3901 → 3900 → 3.9K  
4R99 → 4.99
- For E-96 Series ( $\pm 1\%$ -F Tolerance) in 0603, please refer to page C5.
- 0402 has no marking.