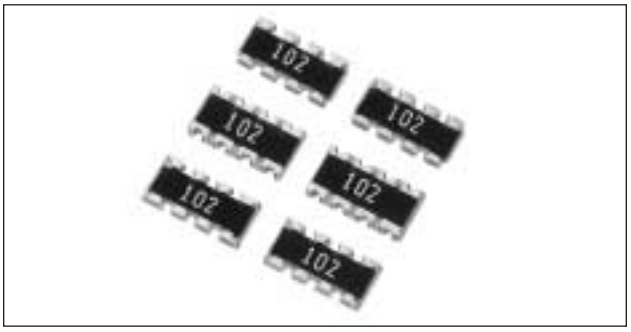
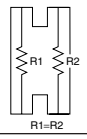
Chip Resistor Arrays

CRC Series (Convex Square Corner Type)

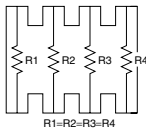


Chip Resistor Arrays have several resistor elements integrated as a single component.

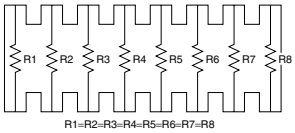
2 Resistors Circuit



4 Resistors Circuit



8 Resistors Circuit



FEATURES

- Reduction in mounting process & costs
- Save PCB space
- Reduction of inventory control costs

APPLICATIONS

- Computer
- Printer
- Hard Disk Drive
- CD-ROM

HOW TO ORDER

CRC 2A 4E 103 J T

Series

Size
- 11A = 0404 size
- 2A = 0804 size
- 3A = 1206 size
- 4A = 1506 size

Number of Elements
- 2E = 2 Elements 8E = 8 Elements
- 4E = 4 Elements

Resistance Value (3 digits)
- Chip Jumper Arrays = 000

Resistance Tolerance
- J = ±5%
- Blank = Chip Jumper Arrays

Packaging
- T = Paper Taping
  - CRC2A 10,000 pcs/7" reel
  - CRC3A 5,000 pcs/7" reel
  - CRC4A 5,000 pcs/7" reel
- H = Paper Taping
  - CRC11A 10,000 pcs/7" reel

RATING

Chip Resistor Arrays	
Item	**Rating**
Rated Power (70°C)*	1/16W Element
Max. Working Voltage	50V (25V CRC4A)
Max. Overload Voltage	100V (50V CRC4A)
Resistance Value	J = 10Ω to 2.2MΩ (CRC4A8E 1MΩ max.)
Tolerance	J±5%
Working Temperature	-55 to +125°C

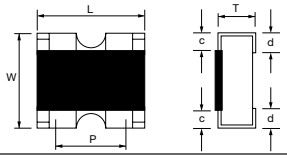
*Rated voltage = 50V or $\sqrt{\text{Rated power x Resistance value}}$, whichever is less

Chip Jumper Arrays	
Item	**Rating**
Rated Current	1A
Conductive Resistance Value	50MΩ max.
Resistance Value	Zero ohms (0 ± .5 ohms)
Working Temperature	-55 to +125°C

DIMENSIONS

millimeters (inches)

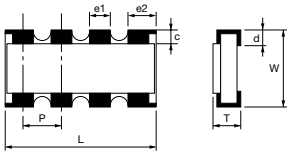
CRC11A



Code	W	L	c	d	t	P
Dim.	1.00±0.10 (0.040±0.004)	1.00±0.10 (0.040±0.004)	0.20±0.15 (0.008±0.006)	0.20±0.15 (0.008±0.006)	0.35±0.06 (0.014±0.002)	0.65 typ (0.026 typ)

No Marking on chips

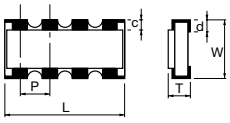
CRC2A4E



Code	L	W	T	P	c	d	e1	e2
Dim.	2.00±0.10 (0.079±0.004)	1.00±0.10 (0.039±0.004)	0.40±0.10 (0.016±0.004)	0.50 typ (0.020 typ)	0.15±0.15 (0.006±0.006)	0.25±0.15 (0.010±0.006)	0.30±0.10 (0.012±0.004)	0.40±0.10 (0.016±0.004)

No Marking on chips

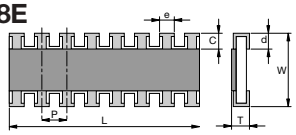
CRC3A4E



Code	W	L	c	d	T	P
Dim.	1.60±0.15 (0.063±0.006)	3.20±0.15 (0.126±0.006)	0.30±0.20 (0.012±0.008)	0.20±0.15 (0.008±0.006)	0.50±0.10 (0.020±0.004)	0.80 typ (0.031 typ)

No Marking on chips

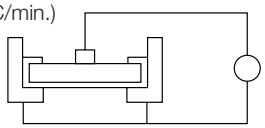
CRC4A8E



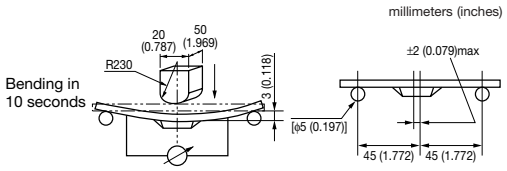
Code	L	W	T	P	c	d	e
Dim.	3.80±0.10 (0.150±0.004)	1.60±0.10 (0.063±0.004)	0.45±0.10 (0.018±0.004)	0.50 typ (0.020 typ)	0.30±0.20 (0.012±0.008)	0.30±0.15 (0.012±0.006)	0.30±0.10 (0.012±0.004)

No Marking on chips

ELECTRICAL CHARACTERISTICS

Item		Standard		Test Conditions	
		Resistor	Jumper	Resistor	Jumper
DC Resistance		Within Initial Tolerance	50mΩ max.	Power Condition A (20°C, 65% RH)	
Temperature Characteristics		Resistance (Ω) / TCR (ppm/°C) *D, F 10≤ R ≤1M: –100 to +100 J, CR05 = F R <10: –100 to +600 10≤ R ≤1M: –250 to +250 1M< R: –500 to +300		Test Temperature: 25, 125(°C) $\Delta R/R = R_2 - R_1/R_1 x 1/T_2 - T_1 x 10^6$ ΔR/R = Temp. Coefficient (ppm/°C) T_1 = 25(°C) T_2 = 125(°C) R_1 = T_1 Resistance at (Ω) R_2 = T_2 Resistance at (Ω)	
Short-time Overload	**ΔR/R**	±(2.0%+0.10Ω) max. of the initial value	50mΩ max.	(1) Apply 2.0 x rated voltage for 5 sec. (2.5 x rated voltage for Arrays) (2) Wait 30 minutes (3) Measure resistance CR03 = 30V max. CR05 = 50V max CR10 = 100V max. CR21 = 200V max. CR32 = 400V max. CRA3A, CRB3A, CRC3A = 100V max.	(1) 2A for 5 sec. (CJ03 = 1A) (2) Wait 30 minutes (3) Measure resistance
	Visual	No evidence of mechanical damage intermittent overload			
Intermittent Overload	**ΔR/R**	±(5%+0.1Ω) max. of the initial value	50mΩ max.	(1) Perform 10,000 voltage cycles as follows: ON (2.0 x rated voltage, 2.5 x for Arrays) 1 sec. OFF 25 sec. (2) Stabilization time 30 min. without loading (3) Measure resistance CR03 = 30V max. CR05 = 50V max. CR10 = 150V max. CR21 = 200V max. CR32 = 400V max. CRA, CRB, CRC = 100V max.	(1) Perform 10,000 current cycles as follows: ON (2A) 1 sec. OFF 25 sec. (2) Wait 30 minutes (3) Measure resistance CJ03 = 1A max.
	Visual	No evidence of mechanical damage			
Dielectric Withstanding Voltage		No evidence of mechanical damage		Apply 500 VAC for 1 min. (CR10 300 VAC) (CR05, CRA3A, CRB3A, CRC3A 300 VAC/1 sec. CR03 50 VAC/min.)  Apply 500V DC (CR05, CRA3A, CRB3A, CRC3A 100V DC CR03 50 VDC)	
Insulation Resistance		• CR03, CJ03 = 10^8Ω min. • CR05, CJ05 = 10^8Ω min. • CR10, CJ10 = 10^9Ω min. • CR21, CJ21 = 10^{10}Ω min. • CR32, CJ32 = 10^{12}Ω min. • CRA3A, CRB3A, CRC3A = 10^9Ω min.			

MECHANICAL CHARACTERISTICS

Item		Standard		Test Conditions	
		Resistor	Jumper	Resistor	Jumper
Terminal Strength	ΔR/R	±(1%+0.05Ω) max. of the initial value	50mΩ max.	Apply the load as shown: Measure resistance during load application  PC Board = Glass epoxy t = 1.60 (0.063)	
	Visual	No evidence of mechanical damage after loading			
Soldering Heat Resistance	ΔR/R	±(1%+0.05Ω) max. of the initial value	50mΩ max.	Immerse into molten solder at 260±5°C for 10±1 sec. Stabilize component at room temperature for 1 hr. Measure resistance.	
	Visual	No evidence of leaching			
Solderability		Coverage ≥95% each termination end		Immerse in Rogin Flux for 2±0.5 sec. and in SN62 solder at 235±5°C for 2±0.5 sec.	
Anti-Vibration Test	ΔR/R	±(1%+0.1Ω) max. of the initial value	50mΩ max.	2 hrs. each in X, Y and Z axis. (TTL 6 hrs.) 10 to 55 Hz sweep in 1 min. at 1.5mm amplitude.	
	Visual	No evidence of mechanical damage			
Solvent Resistance	ΔR/R	±(0.5%+0.05Ω) max. of the initial value	50mΩ max.	Immerse in static state butyl acetate at 20°C to 25°C for 30±5 sec. Stabilize component at room temperature for 30 min. then measure value.	
	Visual	No evidence of mechanical damage			

ENVIRONMENTAL CHARACTERISTICS

Item		Standard		Test Conditions	
		Resistor	Jumper	Resistor	Jumper
Temperature Cycle	ΔR/R	±(1%+0.05Ω) max. of the initial value	50mΩ max.	(1) Run 5 cycles as follows: -55±3°C for 30 min. 125±3°C for 30 min. Room temp. for 10-15 min. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			
Low Temperature Storage	ΔR/R	±(2%+0.1Ω) max. of the initial value	50mΩ max.	(1) Dwell in -55°C chamber without loading for 1000^{+48}_{-0} hrs. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			
High Temperature Storage	ΔR/R	±(3%+0.1Ω) max. of the initial value	50mΩ max.	(1) Dwell in 125°C chamber without loading for 1000^{+48}_{-0} hrs. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			
Moisture Resistance	ΔR/R	±(3%+0.1Ω) max. of the initial value	50mΩ max.	(1) Dwell in temp.: 65°C RH90 to 95% RH chamber without loading for 1000^{+48}_{-0} hrs. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			
Life Test	ΔR/R	±(3%+0.1Ω) max. of the initial value	50mΩ max.	(1) Temp.: 70±3°C Voltage: (rated voltage) on 90 min. off 30 min. Duration: 1000^{+48}_{-0} hrs. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			
Loading Life in Moisture	ΔR/R	±(3%+0.1Ω) max. of the initial value	50mΩ max.	(1) Temp.: 40±2°C RH: 90-95% Voltage Cycle: on 90 min. (rated voltage) off 30 min. Duration: 1000^{+48}_{-0} hrs. (2) Stabilize component at room temperature for 1 hr. then measure value.	
	Visual	No evidence of mechanical damage			

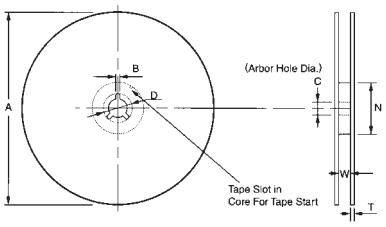
Packaging of Chip Component

Automatic Insertion Packaging

TAPE AND REEL

REEL DIMENSIONS

millimeters (inches)



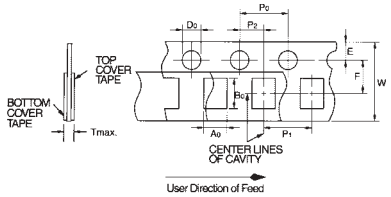
Tape Size	A Max.	B Min.	C	D Min.	N Min.	W	T Max.
8mm	178 (7)	1.50 (0.059)	13.0±0.50 (0.512±0.020)	20.2 (0.795)	50 (1.969)	10.0±1.50 (0.394±0.059)	2.50 (0.098)
	260 (10)						

Metric dimensions will govern.
English measurements rounded and for reference only.

millimeters (inches)

PUNCHED TAPE CONFIGURATION 8MM TAPE ONLY

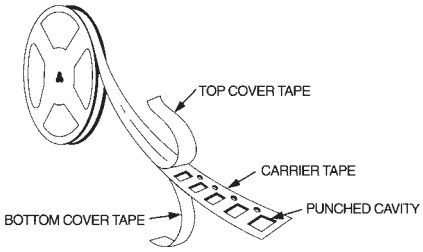
Tape Size	D_0	E	P_0	P_2	W	F
8mm	1.50 $^{+0.10}_{-0.00}$ (0.059 $^{+0.004}_{-0.000}$)	1.75±0.10 (0.069±0.004)	4.0±0.10 (0.157±0.004)	2.00±0.05 (0.079±0.002)	8.00±0.20 (0.135±0.008)	3.50±0.05 (0.138±0.002)



VARIABLE DIMENSIONS

Style	P_1	A_0	B_0	T max.
CR/CJ03 CR/CJ05	2.00±0.10 (0.079±0.004)	0.65±0.10 (0.026±0.004)	1.15±0.10 (0.045±0.004)	0.60 (0.024)
CR/CJ/FR10	4.00±0.10 (0.157±0.004) or 2.00±0.10 (0.079±0.004)	1.10±0.20 (0.043±0.008)	1.90±0.20 (0.075±0.008)	1.10 (0.043)
CR/CJ/FR21	4.00±0.10 (0.157±0.004)	1.65±0.20 (0.065±0.008)	2.40±0.20 (0.094±0.008)	
CR/CJ/FR32		2.00±0.20 (0.079±0.008)	3.60±0.20 (0.142±0.008)	
CRB1A		1.90±0.20 (0.075±0.008)	1.90±0.20 (0.075±0.008)	
CRA3A CRB3A CRC3A		2.00±0.20 (0.079±0.008)	3.60±0.20 (0.142±0.008)	
CRB2A	2.00±0.10 (0.079±0.004)	1.25±0.20 (0.049±0.008)	2.50±0.20 (0.098±0.008)	

PUNCHED CARRIER

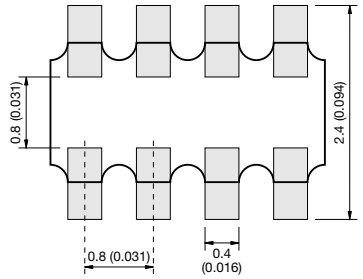


Recommended Land Patterns

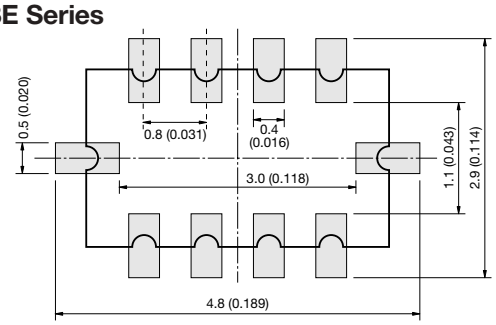
RECOMMENDED LAND PATTERNS IS REFERRED THE FOLLOWING FOR EXAMPLE

millimeters (inches)

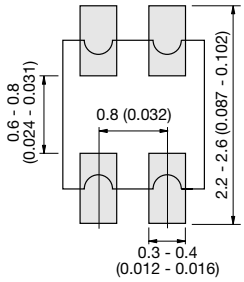
CRA3A4E Series



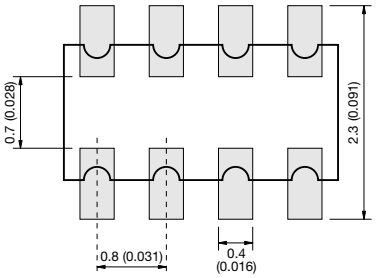
RNA4A8E Series



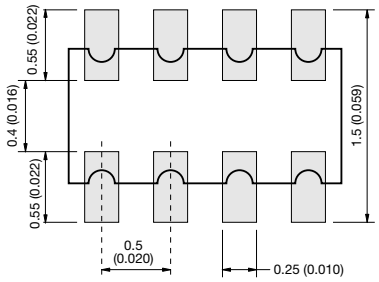
CRB1A2E Series



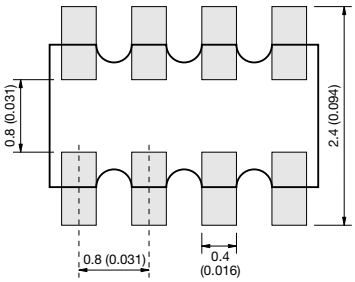
CRB3A4E Series



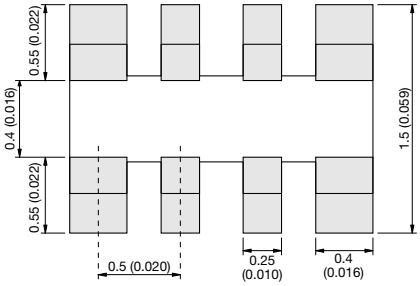
CRB2A4E Series



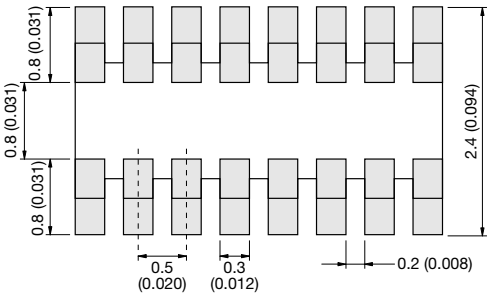
CRC3A4E Series



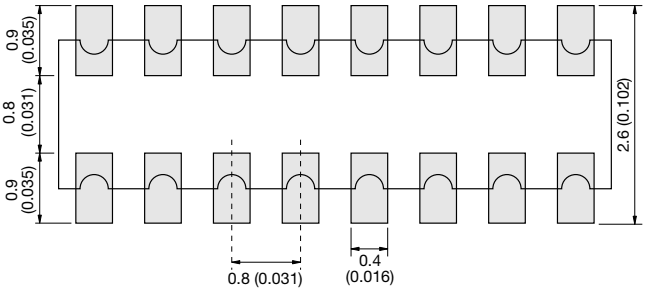
CRC2A4E Series



CRC4A8E Series



CRB6A8E Series



SAMPLE KIT PART NUMBERS

Part Number	Description
CRJ-E6-Kit	Combination 0603, 0805, 1206, 5% parts 21 values per case size 100 pcs. per value (approx.)
CR05-E12-Kit	0402, 5% parts 63 values 100 pcs. per value
CR10J-E12-Kit	0603, 5% parts 63 values 100 pcs. per value (approx.)
CR21J-E12-Kit	0805, 5% parts 63 values 100 pcs. per value (approx.)
CR32J-E12-Kit	1206, 5% parts 63 values 100 pcs. per value (approx.)
CR05F-E24-Kit	0402, 1% parts 63 values 100 pcs. per value
CR10F-E24-Kit	0603, 1% parts 63 values 100 pcs. per value
CR-ARRAY-E6-Kit	Arrays, Various styles, CRA, CRB, CRC, RNA, 5% 13 values per style (approx.) 20 pcs. per value