

Capacitor/Resistor Chip Networks

ISO 9002 CERTIFIED

Type CR2A10Y

1. Scope

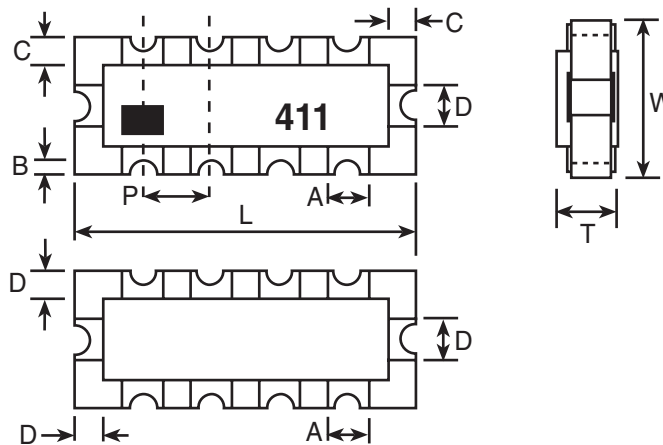
This specification shall be applied to CR chip networks CR2A10Y produced by KOA Corporation.

2. Related Standard

- JIS C 5102 (1994) Test method of fixed capacitors for use in electronic equipment.
- JIS C 5202 (1994) Test method of fixed resistors for use in electronic equipment.
- JIS C 6429 (1991) Fixed Multilayer Ceramic Chip capacitors for use in electronic equipment.
- JIS C 0806 (1990) Packaging of electronic components on continuous tapes (surface mounting devices).

3. Dimensions

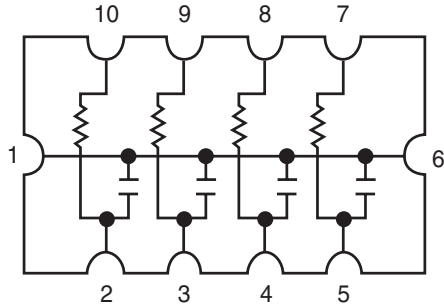
3-1 Dimensions



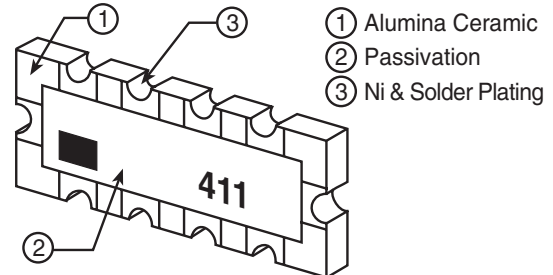
unit: inches (mm)

L	W	C	D	T	A	B	P
.157 ± .008 (4.0 ± 0.2)	.083 ± .008 (2.1 ± 0.2)	.012 ± .008 (0.3 ± 0.2)	.016 ± .006 (0.4 ± 0.15)	.028 ± .004 (0.7 ± 0.1)	.02 (0.5 Ref.)	.006 (0.15 Ref.)	.031 (0.8 Ref.)

3-2. Circuit Schematic

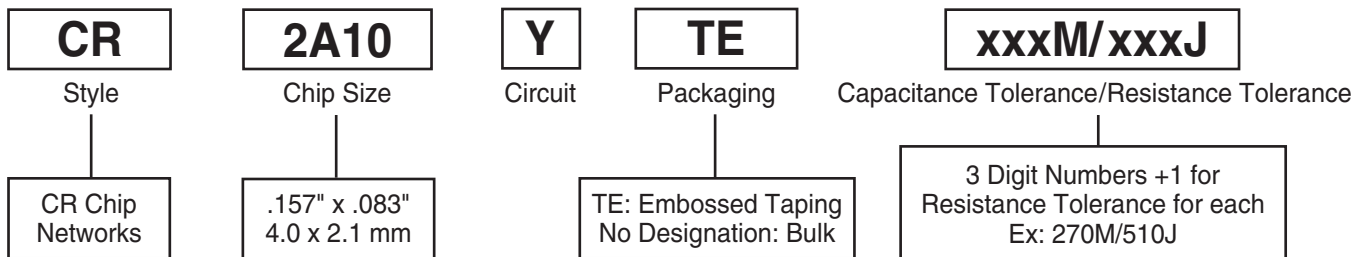


3-3. Structure



4. Type Designation

The type designation shall be the following form:



5. Rating

Operating environment -25°C ~ +85°C

Capacitor Item	Capacitor Rating	Resistor Item	Resistor Rating
Capacitance Measuring Condition	1 KHz ± 10% (1 Vrms ± 0.2V)	Power Rating	0.063 W
Voltage Rating	25V (DC)	Maximum Working Voltage	7.9 V
Capacitance Tolerance	± 20%/± 30%	Maximum Overload Voltage	15.8 V
Temperature Coefficient	+20%/-55%	Temperature Coefficient (-25°C ~ +85°C)	± 200 ppm/°C
Dissipation Factor	3% maximum	Resistor Tolerance (at 1 KHz 1.0 Vrms)	± 5%
Insulation Resistance	1,000 MΩ minimum	Rating Ambient Temperature	+ 70°C
Dielectric Withstanding Voltage	62.5V DC 5 sec. 50 mA charge	Operating Temperature Range	-25°C to +85°C
Operating Temperature Range	-25°C to +85°C	Resistor Range	22Ω, 47Ω, 100Ω, 220Ω, 470Ω, 1KΩ, 47KΩ
Capacitance Range	22pF, 47pF, 100pF		

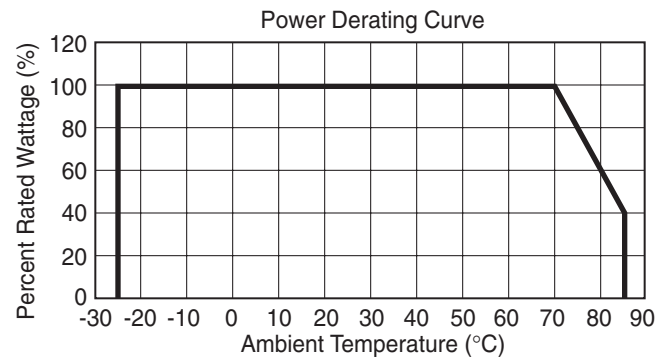
5-2 Rated Voltage

The maximum value DC voltage capable of being applied continuously to a resistor at the rated ambient temperature. Rated voltage shall be calculated from the following formula:

$$E = \sqrt{P \times R}$$

Where:
 E = Rated voltage (V)
 P = Rated power (W)
 R = Nominal resistance (Ω)

The rated voltage is limited to the maximum working voltage.



6. Marking

6-1 Apply a mark of 1st terminal for a position of 1st terminal.

6-2 Marking Code

Type	Capacitance (pF)	Resistance (Ω)	Marking Code
CR2A10YTE220/220J	22	22	120
CR2A10YTE220/470J	22	47	140
CR2A10YTE220/101J	22	100	111
CR2A10YTE220/221J	22	220	121
CR2A10YTE220/471J	22	470	141
CR2A10YTE220/102J	22	1K	112
CR2A10YTE470/220J	47	22	220
CR2A10YTE470/470J	47	47	240
CR2A10YTE470/101J	47	100	211
CR2A10YTE470/221J	47	220	221
CR2A10YTE470/471J	47	470	241
CR2A10YTE470/102J	47	1K	212
CR2A10YTE101/220J	100	22	420
CR2A10YTE101/470J	100	47	440
CR2A10YTE101/101J	100	100	411
CR2A10YTE101/221J	100	220	421
CR2A10YTE101/471J	100	470	441
CR2A10YTE101/102J	100	1K	412
CR2A10YLTE101M/473J	100	47K	443

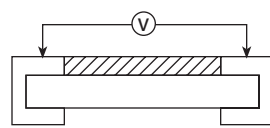
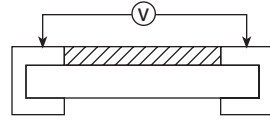
7. Test Condition

Unless otherwise specified, the test shall be performed in accordance with JIS-C-5020 specifying at the temperature of $20\text{ }^{\circ}\text{C} \pm 15\text{ }^{\circ}\text{C}$ and at the humidity of $65\% \pm 20\%$.

In case doubts arise about the test results, the test shall be performed at the temperature of $20\text{ }^{\circ}\text{C} \pm 2\text{ }^{\circ}\text{C}$ and at the humidity of $65\% \pm 5\%$.

8. Reliability Test

8-1 Electrical Characteristics

No.	Item	Requirement	Test Methods
1	Insulation Resistance	More than $10^4\text{ M}\Omega$	Within 2 minutes at DC 25V between terminal and another 
2	Dielectric Withstanding Voltage	No evidence of fuming, flaming or breakdown	2.5 times maximum rated voltage for 5 seconds with 50 mA maximum charging current 

8-2 Mechanical Characteristics

No.	Item	Requirement	Test Methods
1	Resistance to Soldering Heat	No evidence of damage ΔC within $\pm 20\%$ ΔR within $\pm 5\%$ D. F. within 5% I. R. more than 100 M Ω	Immerse in the solder (H63A) of $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 10 ± 1 seconds. Measurement shall be done 24 ± 4 hours at room condition after test.
2	Solderability	Approximately 95% of the terminal should be covered with new solder	Immerse in the solder (H63A) of $235^{\circ}\text{C} \pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds.
3	Terminal Strength (Bend test)	No mechanical damage	Specimen shall be soldered on PCB and support by applying strength so that the bending width becomes 3mm.
4	Resistance to Solvents	No mechanical damage	Immerse in the IPA of $20 \sim 25^{\circ}\text{C}$ for 60 ± 10 seconds.
5	Vibration	No evidence of damage	2 hours in each direction of X,Y,Z on PCB at a frequency range of 10-55-10Hz with 1.5mm amplitude. Measurement shall be done 24 ± 4 hours at room condition after test.

8-3 Environmental Characteristics

No.	Item	Requirement	Test Methods
1	Temperature cycling	No evidence of damage ΔC within $\pm 20\%$ ΔR within $\pm 5\%$ D.F. within 5% I.R. more than 100 M Ω	100 cycles between $-40^{\circ}\text{C}/30$ minutes and $+125^{\circ}\text{C}/30$ minutes. Measurement shall be done 24 ± 4 hours at room condition after test.
2	Humidity (No Load)	No evidence of damage ΔC within $\pm 20\%$ ΔR within $\pm 5\%$ D.F. within 5% I.R. more than 100 M Ω	MIL-STD-202F Method 106 10 cycles Measurement shall be done 24 ± 4 hours at room condition after test.
3	Moisture Resistance	No evidence of damage ΔC within $\pm 20\%$ ΔR within $\pm 5\%$ D.F. within 5% I.R. more than 100 M Ω	Temperature $40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Humidity 90% ~ 95% 1000 hours DC 50V 1.5 hours ON 0.5 hours OFF Measurement shall be done 24 ± 4 hours at room condition after test.
4	Load Life	No evidence of damage ΔC within $\pm 20\%$ ΔR within $\pm 5\%$ D.F. within 5% I.R. more than 100 M Ω	Temperature $70^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 1000 hours DC 50V 1.5 hours ON 0.5 hours OFF Measurement shall be done 24 ± 4 hours at room condition after test.

9. Packaging

9-1 Bulk Packaging

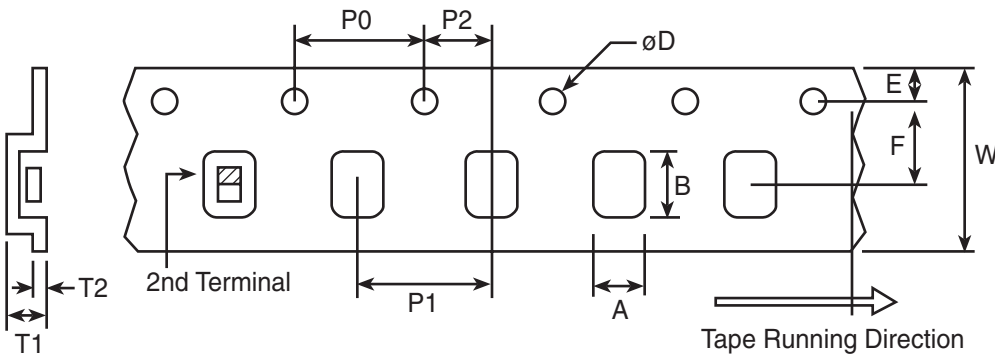
100 pieces chip are packed in a poly bag.
The package shall be marked:

- (1) Type Designation (CR2A10Y)
- (2) Nominal Capacitance/Nominal Resistance
(3 digit/3 digit)
- (3) Quantity
- (4) Production Lot. No.
- (5) Manufacturer's name

9-2 Taping

The taping shall be embossed carrier tapes of 12 mm width and 4 mm pitches.
The standard quantity per reel shall be 4000 pieces.

(1) Carrier Tape



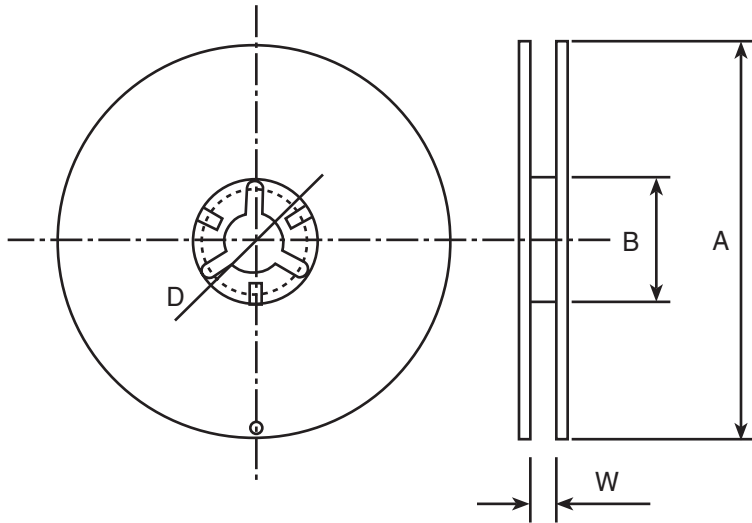
(unit: mm)

Type	A	B	W	E	F
CR2A10Y	2.5 ± 0.2	4.4 ± 0.2	12.0 ± 0.2	1.75 ± 0.1	5.5 ± 0.1

T1	T2	P0	P1	P2	øD
1.15 ± 0.2	0.25 ± 0.05	4.0 ± 0.1	4.0 ± 0.1	2.0 ± 0.1	1.5 ± 0.1 - 0

Top tape peeling strength: 10 ~ 55g

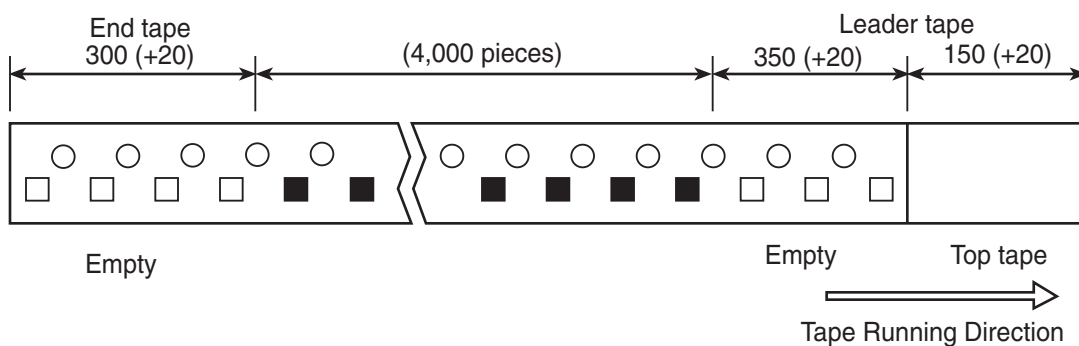
(2) Reel



(unit: mm)

A	B	D	W
178 ± 2.0	60 ± 2.0	21 ± 0.8	10 ± 1.0

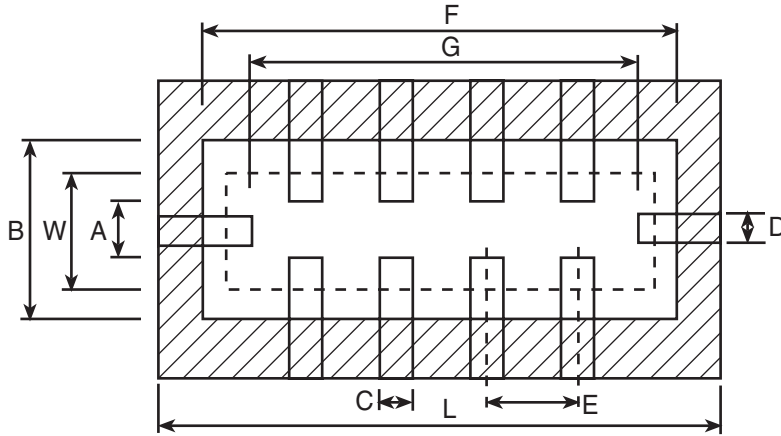
(3) Leader and End Tape



(4) Contents on label

- (1) Type Designation (CR2A10Y)
- (2) Nominal Capacitance/Nominal Resistance (3 digit/3 digit)
- (3) Quantity
- (4) Customer's code No.
- (5) Production lot No. Manufacturer's name
- (6) Manufacturer's name

10. Land Pattern Design



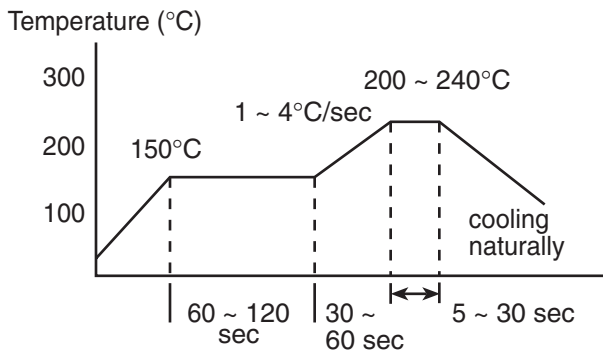
(unit: mm)

L	W	A	B	C	D	E	F	G
4.0	2.1	1.7	3.1	0.4	0.4	0.8	5.1	3.5

11. Soldering

11-1 Reflow Soldering

Reflow soldering should be done at 240°C for less than 20 seconds.



1. The melting time of soldering should be as short as possible.
2. After the soldering, allow products to cool naturally.
3. We do not recommend flow soldering to CR Chip Networks, because of concern that a solder bridge occurs due to narrow 0.8 mm pitch. We therefore recommend reflow soldering.

11-2 Cleaning

1. Residual flux after board washing may cause solder migration. Carefully check the status of board washing.
2. Confirm they will not cause problems when they are not washed.

11-3 Others

1. This product has circuits on both sides. Do not use adhesives, because of concern that characteristics will be impaired by adhesives.
2. Do not use the products in dewy atmosphere.