



(c) Environment

SS-188 R1

# Flat Chip Capacitor/Resistor **Type CR73**

# 1. Scope of Application

This specification applies to flat combined CR chip CR73 produced by KOA Corporation.

#### 2. Rating

#### (a) Capacitor

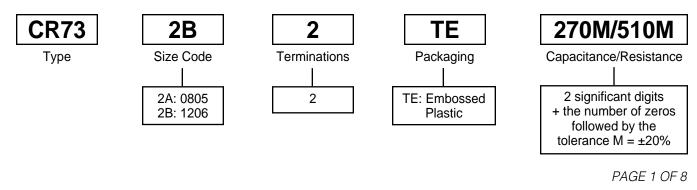
Item	Ratings
Voltage Rating	2A: 25 VDC / 2B: 50 VDC
Temperature Coefficient	+20%/-55% (-25°C ~ +85°C)
Dissipation Factor	5% maximum (at 1 KHz 1.0 vrms)
Insulation Resistance	10,000 Mohms minimum
Dielectric Withstanding Voltage	2A: 62.5 VDC 5 sec. 50mA charge 2B: 125 VDC 5 sec. 50 mA charge

#### (b) Resistor

		_	<b>\</b> /	
ltem	Ratings		ltem	Ratings
Power Rating	2A: 0.1 W / 2B: 0.125 W		Operation	-55°C ~ 125°C
Maximum Working Voltage	2A: 3V / 2B: 5 V		Environment	
Maximum Overload Voltage	2A: 5V / 2B: 10 V		Rating Ambient	70°C
Temperature Coefficient	±200 ppm/C°		Temperature	

# 3. Type Designation

The type designation shall be the following form:



Bolivar Drive 
P.O. Box 547 
Bradford, PA 16701 
USA 
814-362-5536 
Fax 814-362-8883 
www.koaspeer.com





# 4. Capacitance Range and Resistance Range

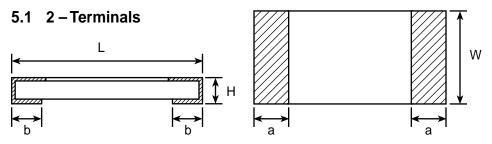
#### (a) Capacitance Range

Capacitance Tolerance	Capacitance Series	Capacitance Range
2A: ± 20%	E – 6	1 pF ~ 200 pF
2B: ± 20%	E – 12	27 pF ~ 100 pF

### (b) Resistance Range

Resistance Tolerance	Resistance Series	Resistance Range
2A: M (± 20%)	E – 12	10 ohms ~ 200 ohms
2B: M (± 20%)	E – 24	51 ohms ~ 200 ohms

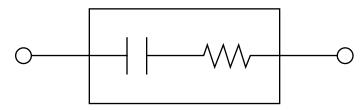
# 5. Dimensions



(unit: mm)

	Dimensions					
	L	W	H	а	b	
2A	2.0 ± 0.2	1.25 ± 0.2	0.7 ± 0.1	0.4 ± 0.3	$0.3 \pm \frac{0.2}{0.1}$	
2B	3.2 ± 0.2	1.6 ± 0.2	0.7 ± 0.1	0.5 ± 0.3	$0.4 \pm \frac{0.2}{0.1}$	

#### 5.2 Circuit Schematic



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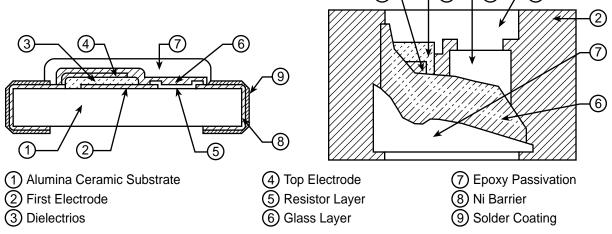




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#### 6. Structure



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#### 7. Outer Coating Color

Outer Coating Color (Capacitor Side) — Dark blue Outer Coating Color (Resistor Side) — Yellow

### 8. Test Conditions

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

If questions arise about the test results, the test shall be performed at the temperature of  $20 \pm 2^{\circ}$ C and at the humidity of  $65 \pm 5^{\circ}$ .

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#### 9. Reliability Test

# 9.1 Electrical Characteristics

Item	Requirement	Test Methods
Insulation Resistance	More than $10^4 M\Omega$	Within 2 minutes at 50 VDC between terminal and another
	More than $10^4 M\Omega$	1 minute at 500 VDC between both terminals and reverse side
	More than $10^3 M\Omega$	1 minute at 500 VDC between both terminals and coating
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
Noise (Resistor)	More less 15dB	Per MIL-STD-202, Method 308





#### 9.2 Mechanical Characteristics

Item	Requirement	Test Methods
Resistance to Soldering Heat	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	Immerse in the solder (H63A) of $260^{\circ}C \pm 5^{\circ}C$ for $10 \pm 1$ sec
Solderability	Approximately 95% of the terminal should be covered with new solder	Immerse in the solder (H63A) of $230^{\circ}C \pm 5^{\circ}C$ for $3 \pm 0.5$ sec
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
Terminal Strength (Pull test)	200g minimum	Per MIL-R-55342 4.7.12.2
Vibration	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	2 hours in each direction of X,Y,Z on PCB at a frequency range of 10-55-10Hz with 1.5mm amplitude

#### 9.3 Environmental Characteristics

Item	Requirement	Test Methods
Temperature cycling	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	100 cycles between - 40°C/30 minutes and +125°C/30 minutes
Humidity (No Load)	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	Per MIL-STD-202F Method 106 10 cycles
Moisture Resistance	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	Temp. 40°C ± 2°C Humidity 90% ~ 95% 1000 hours DC 50V 1.5 hours ON 0.5 hours OFF
Load Life	No evidence of damage $\Delta C$ within ±10% $\Delta R$ within ± 3%	Temp. 70°C ± 2°C 1000 hours DC 50V 1.5 hours ON 0.5 hours OFF

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#### 10. Packaging

#### **10.1 Bulk Packaging**

200 pieces chip are packed in a poly bag. The marking seal shall be marked:

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

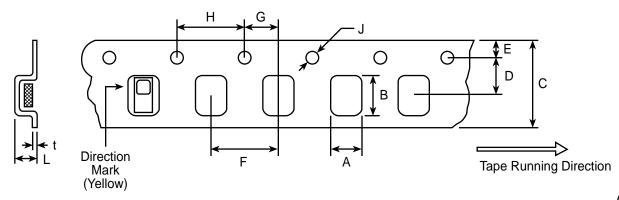
#### 10.2 Taping

The taping shall be embossed carrier tapes

of 8 mm width and 4 mm pitches.

The standard quantity per reel shall be 4000 pieces.

#### (1) Dimensions of Carrier Tape



(unit: mm)

Туре	A	В	С	D	E
CR73 2A	1.6 ± 0.2	2.4 ± 0.2	8.0 ± 0.2	$3.5 \pm 0.05$	1.75 ± 0.1
CR73 2B	1.9 ± 0.2	3.5 ± 0.2	8.0 ± 0.2	$3.5 \pm 0.05$	1.75 ± 0.1

F	G	н	J	L	t
2A: 4.0 ± 0.1	2.0 ± 0.1	4.0 ± 0.1	1.5 ± 0.1	1.0 ± 0.15	0.25 ± 0.1
2B: 4.0 ± 0.1	2.0 ± 0.1	4.0 ± 0.1	1.5 ± 0.1	0.85 ± 0.1	0.25 ± 0.1

Top tape peeling strength: 10 ~ 50g

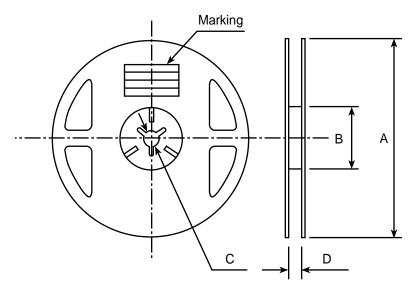
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# spec sheet

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# (2) Reel Dimensions and Marking



Contents on label

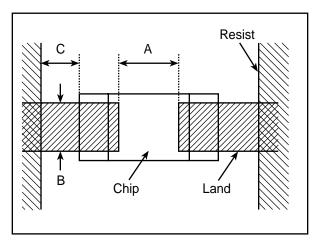
- (1) Article No.
- (2) Quantity
- (3) Nominal capacitance/ Nominal resistance
- (4) Customer's code No. (Subject to change)
- (5) Production lot No.
- (6) Manufacturer's name

(unit: mm)

Туре	Таре		Α	В	С	D
2A / 2B	Embossed Carrier	TE	178 ± 2	60 ± 2	13 ± 0.5	10 ± 1.5

Quan./Reel	Reel
(pieces)	Material
4,000	Plastic

# 11. Pattern Design



(unit: mm)

Туре	Α	В	С
2A	1.3	1.05	0.4 ~ 0.8
2B	2.0 ~ 2.4	1.2 ~ 1.6	0.4 ~ 0.8

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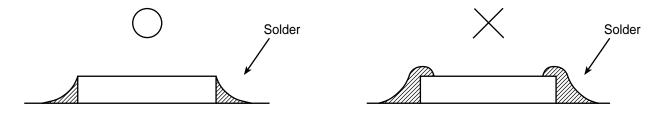
Bolivar Drive = P.O. Box 547 = Bradford, PA 16701 = USA = 814-362-5536 = Fax 814-362-8883 = www.koaspeer.com





#### 12. Soldering

Reflow soldering should be done at 240°C for less than 20 seconds. Flow soldering should be done at 260°C for less than 10 seconds.



#### 13. Measurement Method

#### (1) Measurement Method of C and R

An impedance element connected with a resistor and a capacitor in series shall be considered as a series equivalent circuit element and a C value and R value shall be measured in f = 100MHz with the series equivalent circuit.

#### (2) Measurement Method of D. F.

DISSIPATION FACTOR shall be measured in f = 1KHz as the impedance element connected in series with the resistor and the capacitor.

#### (3) Tolerance

- a) CAPACITANCE TOLERANCE
   The capacitance tolerance is regulated to measure Z (impedance) in f = 1MHz and to compare the C value with a nominal capacitance tolerance at this time.
- b) RESISTANCE TOLERANCE
   The resistance tolerance is regulated to measure Z (impedance) in f = 100MHz and to seek the resistance with the C value and to compare it with the nominal resistance.