

## Three Termination Capacitor/Resistor EMI Filter for Signal Lines

ISO 9001:2000  
TS-16949

### Type KCR

#### 1. Features

- The KCR Series provides improved reduction of radiated noise and drives it into the ground.
- Capacitor/Resistor filter

#### 2. Applications

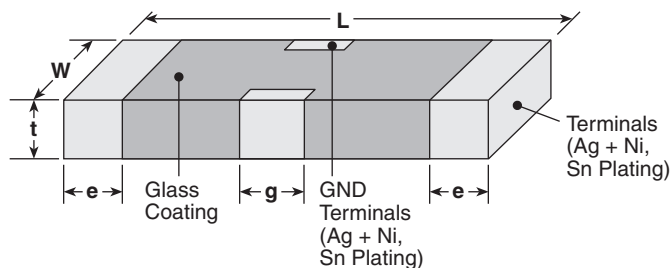
- Noise reduction in a variety of circuits

#### 3. Ordering & Specifying Information

Type designation shall be as the following form.

KCR	1206	T	TE	220/500
Type	Size	Termination Material	Packaging	Capacitance/Resistance
	1206	T: Sn	TE: 7" Embossed Taping 2,000 pcs/reel	2 Significant digits + No. of zeros

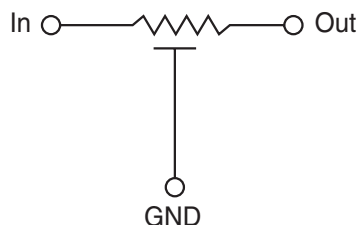
#### 4. Dimension and Structure



Size	L	W	t	g	e
1206	.126±.008 (3.2±0.2)	.063±.008 (1.6±0.2)	.031±.008 (0.8±0.2)*	.039±.012 (1.0±0.3)	.016±.012 (0.4±0.3)

\* KCR1206T221/500: t = .043 ± .008 (1.1 ± 0.2)  
KCR1206T221/101: t = .043 ± .008 (1.1 ± 0.2)

##### 4.1 Circuit



## 5. Ratings

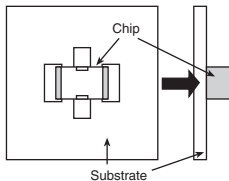
Ordering Code	Capacitance (pF)	Capacitance Tolerance	Resistance ( $\Omega$ )	Resistance Tolerance (%)	Power Rating (W)	Temp. Range ( $^{\circ}\text{C}$ )
KCR1206T220/500	22	+50 ~ -20	50	$\pm 30$	1/16	-40 ~ +85
KCR1206T220/101	22		100			
KCR1206T470/500	47		50			
KCR1206T470/101	47		100			
KCR1206T101/500	100		50			
KCR1206T101/101	100		100			
KCR1206T221/500	220		50			
KCR1206T221/101	220		100			

Customized parts are available upon request.

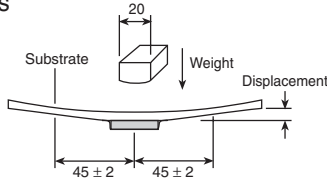
### 5.1 Rating

Item	Specification
Operating temperature range	-40 $^{\circ}\text{C}$ ~ +85 $^{\circ}\text{C}$
Storage temperature range	-40 $^{\circ}\text{C}$ ~ +85 $^{\circ}\text{C}$ (After soldering)
Measuring condition (Standard)	
Temperature	15 ~ 35 $^{\circ}\text{C}$
Relative humidity	20 ~ 90%
Measuring condition (Precision)	
Temperature	20 $^{\circ}\text{C}$ $\pm$ 1 $^{\circ}\text{C}$
Relative humidity	60 ~ 67%

## 6. Characteristics

Item	Requirement	Conditions															
Insulation Resistance	Min 1000M ohms	Applied rated voltage for 60 seconds.															
Capacitance	Within the tolerance	<b>Frequency:</b> 1kHz <b>Voltage:</b> 1Vrms															
DC Resistance	Within the tolerance	<b>DC:</b> 0.3V Max.															
Terminal Adhesion Strength	No physical damage	Solder a chip to a test substrate and then laterally apply a load (5N, 500gF) in the arrow direction. 															
Soldering Heat Resistance	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	<b>Flux:</b> 25% rosin <b>Pre-heating:</b> 60 sec <b>Pre-heating Temp:</b> 150°C <b>Solder:</b> H60A <b>Solder Temp:</b> 260°C ±5°C <b>Dip Time:</b> 5 ±0.5 sec															
Solderability	More than 95% of the terminal electrode shall be covered with new solder.	<b>Flux:</b> 25% rosin <b>Pre-heating:</b> 60 sec <b>Pre-heating Temp:</b> 150°C <b>Solder:</b> H60A <b>Solder Temp:</b> 230°C ±5°C <b>Dip Time:</b> 4 ±1 sec															
Temperature Cycle	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	Repeat the following heat cycle 10 times: <table> <thead> <tr> <th>Step</th><th>Temperature</th><th>Time</th></tr> </thead> <tbody> <tr> <td>1</td><td>-40°C ±3°C</td><td>30 min ±3 min</td></tr> <tr> <td>2</td><td>Room Temp.</td><td>15 min max.</td></tr> <tr> <td>3</td><td>85°C ±2°C</td><td>30 min ±3 min</td></tr> <tr> <td>4</td><td>Room Temp.</td><td>15 min max.</td></tr> </tbody> </table>	Step	Temperature	Time	1	-40°C ±3°C	30 min ±3 min	2	Room Temp.	15 min max.	3	85°C ±2°C	30 min ±3 min	4	Room Temp.	15 min max.
Step	Temperature	Time															
1	-40°C ±3°C	30 min ±3 min															
2	Room Temp.	15 min max.															
3	85°C ±2°C	30 min ±3 min															
4	Room Temp.	15 min max.															
High Temperature Resistance	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	<b>Temp:</b> 70°C ±2°C <b>Bias:</b> 150% of rated voltage <b>Test Time:</b> 1000+48/-0 hour															
Humidity Resistance (unload)	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	<b>Temp:</b> 85°C ±2°C <b>Humidity:</b> 85% ±5% <b>Test Time:</b> 500+24/-0 hour															

## 6. Characteristics Cont.

Item	Requirement	Conditions
Vending Substrate	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance	After soldering a chip to a test substrate, bend the substrate by 1 mm and then measure. The substrate is GE4 or based on GE4. 
Humidity Resistance (load)	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	<b>Temp:</b> 40°C ±2°C <b>Humidity:</b> 90 - 95% <b>Bias:</b> 100% of rated voltage <b>Test Time:</b> 500+24/-0 hour
Low Temperature Resistance (unload)	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	<b>Temp:</b> -40°C ±2°C <b>Test Time:</b> 1000+48/-0 hour
Vibration	<b>Appearance:</b> No physical damage <b>Capacitance:</b> Within tolerance <b>Dielectric Loss:</b> Within tolerance <b>Insulation Resistance:</b> Within tolerance	The frequency of applied vibratoion should be swept from 10 Hz to 55 Hz and return to 10 Hz. This cycle time should be about 1 min and thiscycle should be repeated. <b>Amplitude (total Excursion):</b> 1.5 mm This motion shall be applied for period of 2 hours in each 3 mutually perpendicular axes. (total of 6 hours)

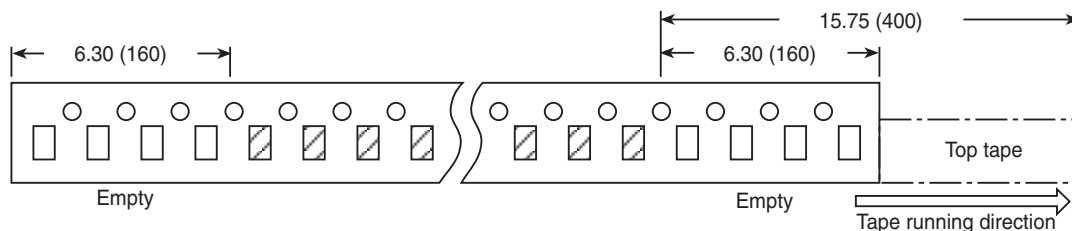
After Temperature cycle test, High temperature resistance test, Humidity resistance test or Low temperature resistance test, the tested sample should be measured after having left in temperature from 15° to 35°C and relative humidity from 45% to 75% for 24 hours.

## 7. Packaging Specifications

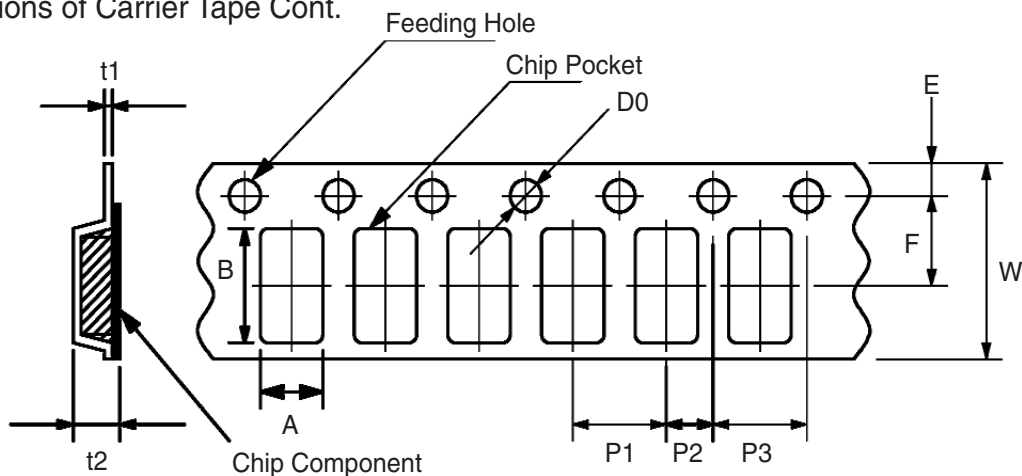
### 7.1 Taping

Packaging of components on continuous tape is complete with carrier tape for putting components and cover tape for sealing.

#### (1) Dimensions of Carrier Tape



(1) Dimensions of Carrier Tape Cont.



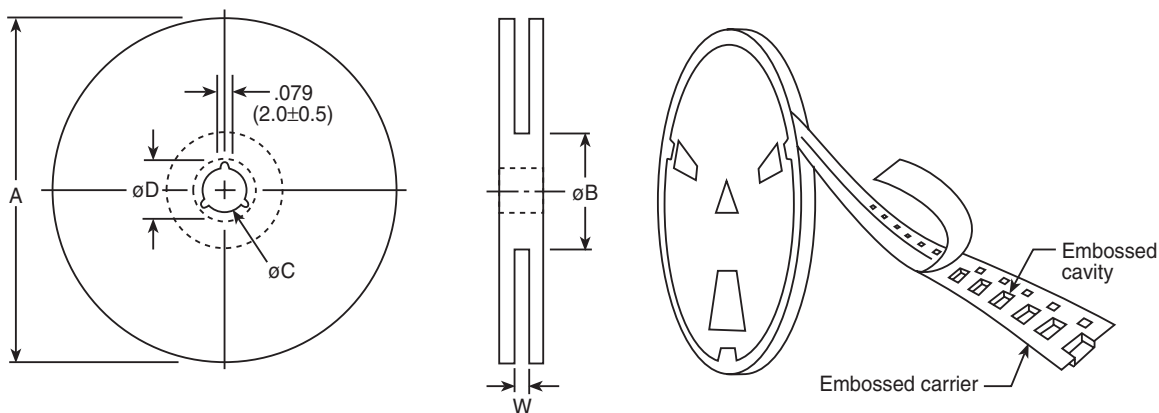
Dimensions in inches (mm)

Series	A	B	W	F	E	P1
KCR1206	0.078 ± 0.003 (2.0 ± 0.1)	0.137 ± 0.003 (3.5 ± 0.1)	0.314 ± 0.011 (8.0 ± 0.3)	0.137 ± 0.02 (3.5 ± 0.05)	0.068 ± 0.003 (1.75 ± 0.1)	0.157 ± 0.003 (4.0 ± 0.1)

Dimensions in inches (mm)

Series	P2	P3	D0	t1	t2
KCR1206	0.078 ± 0.02 (2.0 ± 0.05)	0.157 ± 0.003 (4.0 ± 0.1)	0.059 + <sup>0.003</sup> <sub>-0</sub> (1.5 + <sup>0.1</sup> <sub>-0</sub> )	0.011 ± 0.001 (0.3 ± 0.05)	0.098 (2.5 max)

(2) Reel dimensions



Dimensions in inches (mm)

Series	A	B	C	D	E	W (min)	W (max)
KCR1206	7.00 ± 0.78 (178 ± 2)	2.36 (60 min)	0.511 ± 0.02 (13 ± 0.5)	0.83 ± 0.03 (21 ± 0.8)	0.079 ± 0.02 (2 ± 0.5)	0.311 ± 0.059 (7.9 ± 1.5)	0.429 ± 0.059 (10.9 ± 1.5)

## 8. General Information

### (1) Storage

The products must be stored from 10° to 35°C and from 30% to 70% RH before soldering.

### (2) Soldering

In general, ceramics are very sensitive to thermal shocks. Therefore the parts shall not be exposed to a sudden temperature increase, decrease or partial heating.

Products shall be pre-heated prior to soldering. The temperature difference between the solder temperature and product temperature does not exceed 130°C.

It is desirable that the soldering temperature be kept 240° - 250°C and that soldering time be less than 4 seconds.

Flux shall be rosin type. Do not use strong acid type flux.

The tip of the soldering iron shall be 20 W or less, 3f or less, and 220° - 250° C.

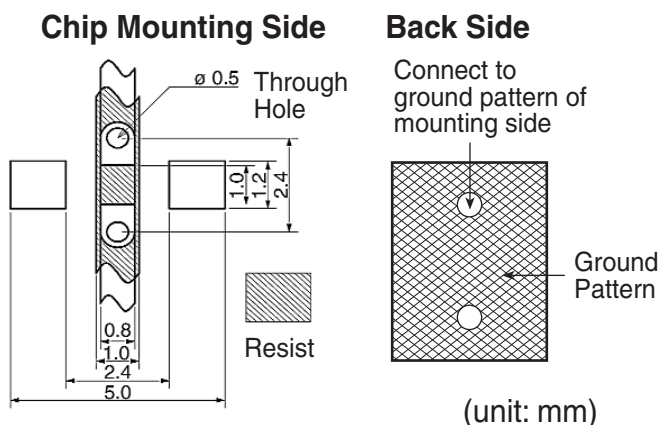
Recommended soldering thermal and time conditions are shown in the Recommend Soldering Conditions.

### (3) Mounting

After mounting components on the printed circuit board, do not apply stress through board bending or mishandling.

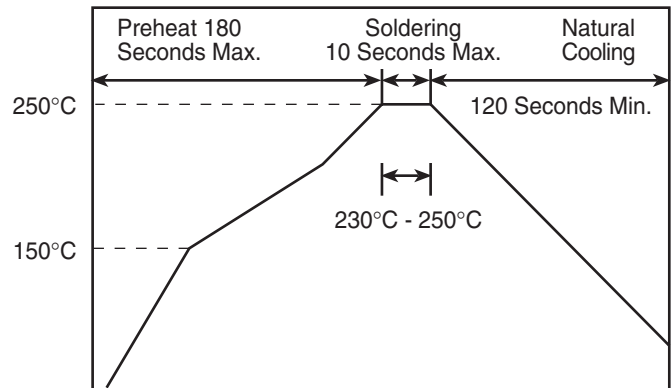
### (4) Pattern design

The land pattern is recommended as follows.

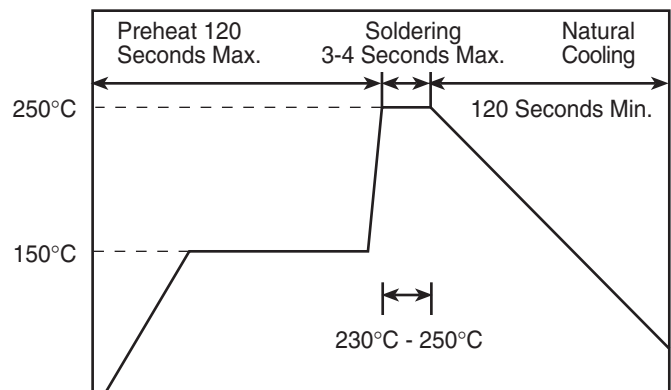


## 9. Recommended Soldering Conditions

### Recommended Condition for Reflow Soldering



### Recommended Condition for Flow Soldering



### Recommended Condition for Iron Soldering

