

NEW

Noise Filters

ISO 9002
CERTIFIED

KC Series

1. Features

- Compact physical dimensions
- Excellent wave reflection control
- Exceptional EMI attenuation
- Excellent as impedance matching for signal lines

2. Applications

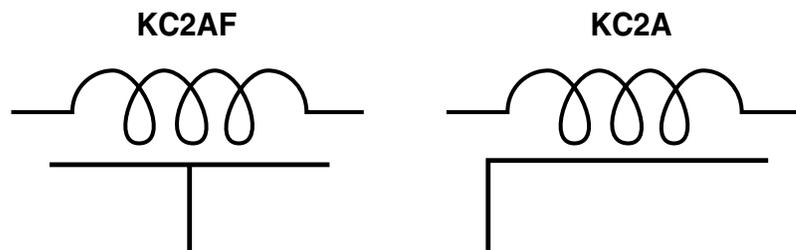
- Clock output signal line
- In/out video signal line for super high resolution
- High speed signal line
- Noise reduction for various signal circuits

3. Ordering & Specifying Information

Type designation shall be as the following form.

KC	2AF	L	TE	220	N	100	L
Type	Size	Termination Material	Packaging	Capacitance Value (pF)	Capacitance Tolerance	Inductance Value (nH)	Inductance Tolerance
	2AF 2A	L= 90% Tin 10% Lead	T: 7" Paper Tape (2AF only) TE: 7" Embossed Taping (2A only) 2AF: 4,000 pcs/reel 2A: 2,000 pcs/reel	Two Significant digits + No. of zeros	N: ± 30%	10nH	L: ± 15%

4. Internal Connection of the Parts



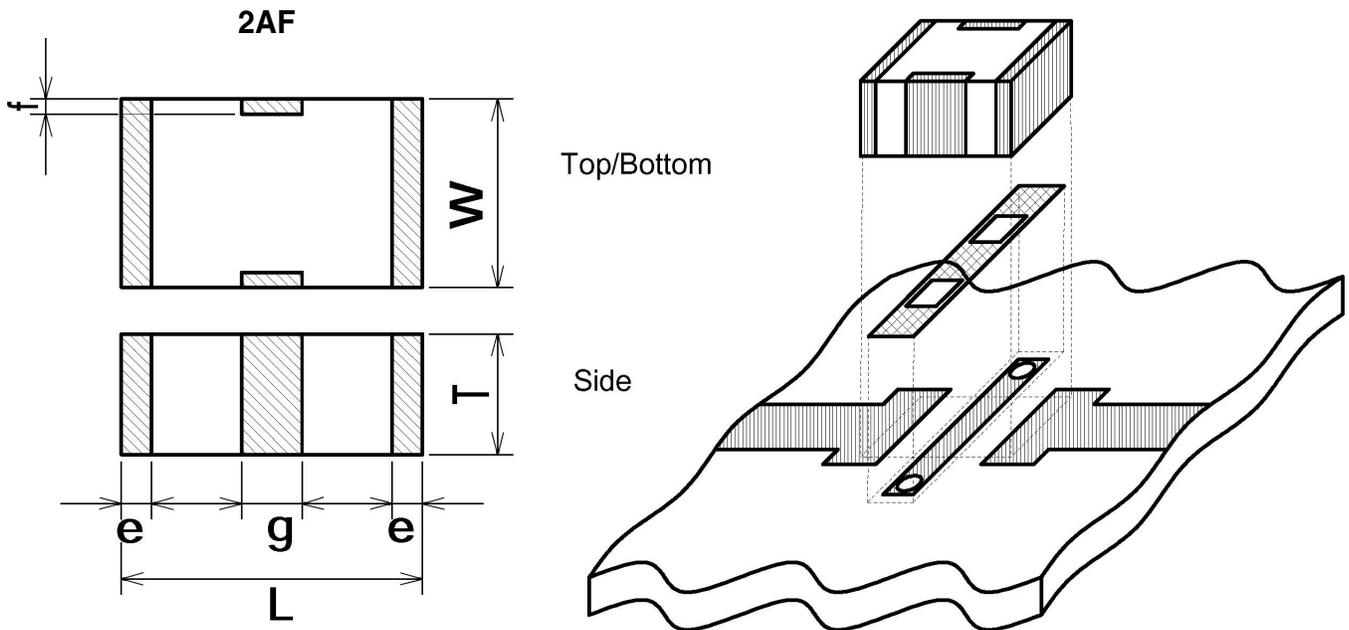
5. Rating

Item	Specification
Operating temperature range	-25°C ~ +85°C (2AF) -40°C ~ +85°C (2A)
Storage temperature range	-40°C ~ +85°C (After soldering)
Measuring condition (Standard)	
Temperature	15 ~ 35°C
Relative humidity	20 ~ 90%
Measuring condition (Precision)	
Temperature	20°C ±1°C
Relative humidity	60 ~ 67%

6. Dimension

Dimensions in inches (mm)

Size	L	W	T	g	e	f
2AF	0.078 ± 0.0078 (2.0 ± 0.2)	0.049 ± 0.0078 (1.25 ± 0.2)	0.031 ± 0.0078 (0.8 ± 0.2)	0.0157 ± 0.0118 (0.4 ± 0.3)	0.0118 ± 0.0078 (0.3 ± 0.2)	N/A



6. Dimension Cont.

Dimensions in inches (mm)

Size	L	W	T	g	e	f
2A	0.078 ± 0.0078 (2.0 ± 0.2)	0.049 ± 0.0078 (1.25 ± 0.2)	0.062 ± 0.0078 (1.6 ± 0.2)	0.0157 ± 0.0078 (0.4 ± 0.2)	0.0039 (min 0.1)	0.0098 ± 0.0059 (0.25 ± 0.15)

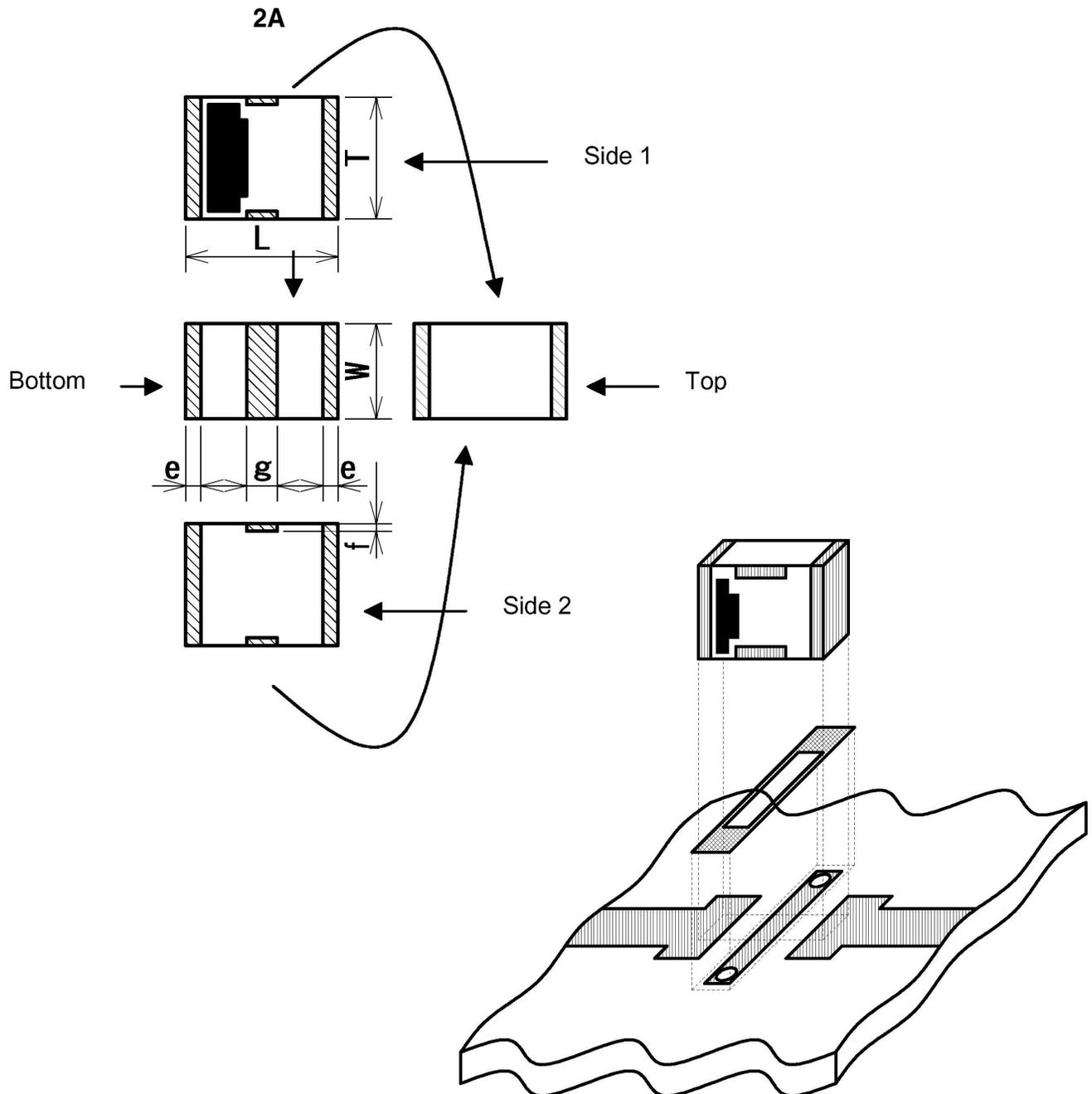


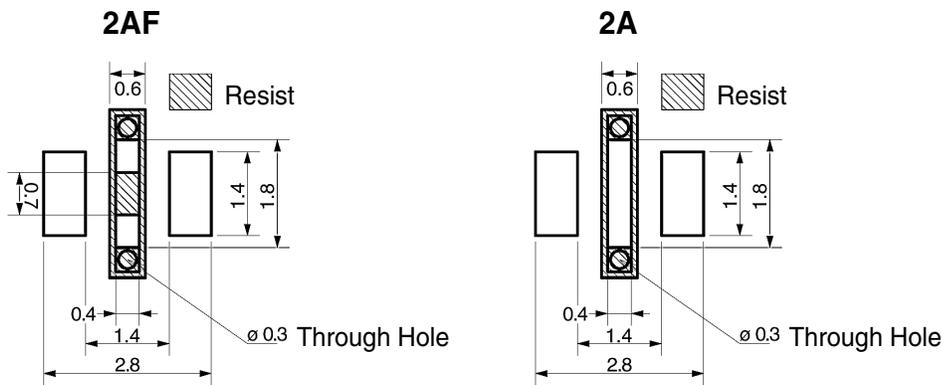
Table-1

Ordering Code	Cap. (pF) %	Induct. (nH) %	Rated Voltage DC (V)	Rated Current DC (mA)	Insulation Resist. (MΩ) min.	Temp. Range (°C)	Typical Cut-off Freq. (Att = 3dB)
KC2AFL151N16N5L	150 ± 30%	16.5 ± 15%	25	200	1000	-25 ~ +85	50 MHz
KC2AFL700N8N50L	70 ± 30%	8.5 ± 15%					
KC2AL120N6NSL	12 ± 30%	6.5 ± 15%	25	200	1000	-40 ~ +85	100 MHz
KC2AL180N13NL	18 ± 30%	13 ± 15%					
KC2AL350N15NL	35 ± 30%	15 ± 15%					

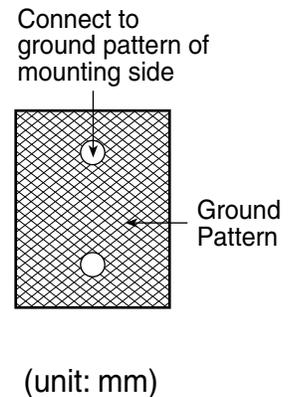
6. Pattern design

The land pattern is recommended as follows.

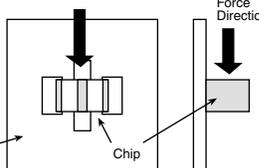
Chip Mounting Side



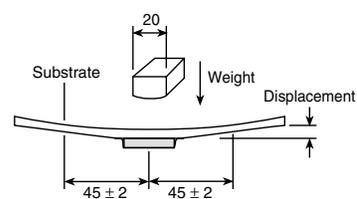
Back Side



8. Characteristics

Item	Requirement	Conditions																		
Insulation Resistance	Within the tolerance	Terminals: Voltage: DC25V Test Time: 60 sec																		
Capacitance	Within the tolerance	Terminals: Frequency: 1MHz Voltage: 1V Equipment: HP4192A Fixture: HP16034E																		
Inductance	Within the tolerance	Terminals: Frequency: 1MHz Current: 10mA Equipment: HP4192A Fixture: HP16034E																		
Resistance (KC2A only)	Within the tolerance	Terminals: Frequency: 1MHz Current: 10mA Equipment: HP4192A Fixture: HP16034E																		
Capacitance vs. Temperature Characteristics	Variation rate of capacitance in operate temperature are shown in below. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Part</th> <th>Rate</th> </tr> </thead> <tbody> <tr> <td>KC2AL120N6NSL</td> <td>± 10%</td> </tr> <tr> <td>KC2AL180N13NL</td> <td>± 10%</td> </tr> <tr> <td>KC2AL350N15NL</td> <td>± 10%</td> </tr> </tbody> </table>	Part	Rate	KC2AL120N6NSL	± 10%	KC2AL180N13NL	± 10%	KC2AL350N15NL	± 10%	The capacitance shall be measured at each stage below. The rate shall be calculated against the capacitance measured at 20°C <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>20°C</td> </tr> <tr> <td>2</td> <td>-40°C ± 3°C</td> </tr> <tr> <td>3</td> <td>20°C</td> </tr> <tr> <td>4</td> <td>85°C ± 3°C</td> </tr> </tbody> </table>	Step	Temperature	1	20°C	2	-40°C ± 3°C	3	20°C	4	85°C ± 3°C
Part	Rate																			
KC2AL120N6NSL	± 10%																			
KC2AL180N13NL	± 10%																			
KC2AL350N15NL	± 10%																			
Step	Temperature																			
1	20°C																			
2	-40°C ± 3°C																			
3	20°C																			
4	85°C ± 3°C																			
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	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance Withstand Voltage: No abnormality	Flux: 25% rosin Pre-heating: 120 ~ 180 sec Pre-heating Temp: 150°C ~ 200°C (KC2AF) Solder: H60A Solder Temp: 260°C ±5°C Dip Time: 5 ±0.5 sec																		

8. Characteristics Cont.

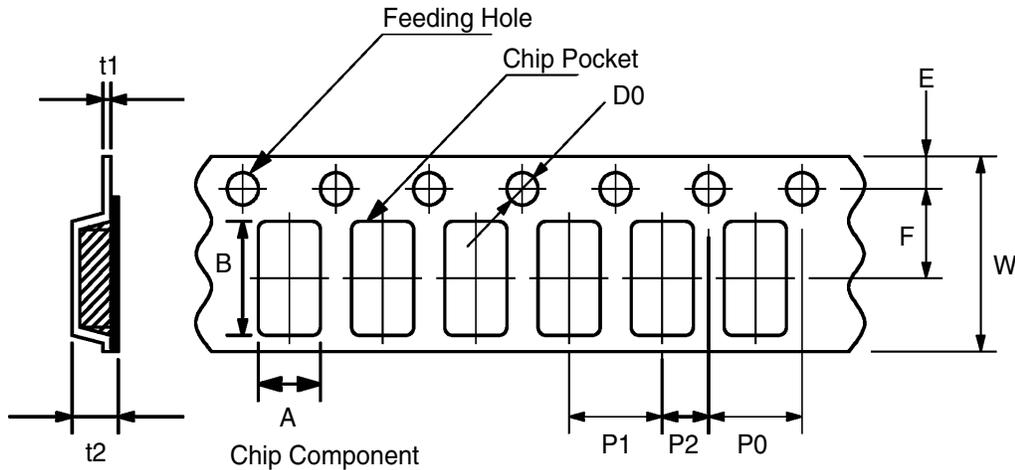
Item	Requirement	Conditions															
Solderability	More than 95% of the terminal electrode shall be covered with new solder.	Flux: 25% rosin Solder: H60A Solder Temp: 235°C ±5°C Dip Time: 2 ±0.5 sec															
Temperature Cycle	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance Withstand Voltage: No abnormality	Repeat the following heat cycle 10 times: <table border="1"> <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	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance Withstand Voltage: No abnormality	Temp: 70°C ±2°C Bias: DC25V Bias: DC200mA Test Time: 500 hour															
Humidity Resistance (unload)	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance	Temp: 85°C ±2°C Humidity: 85% ±5% Test Time: 500 hour															
Vending Substrate	Appearance: No physical damage Capacitance: 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)	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance	Temp: 40°C ±2°C Humidity: 90% ~ 95% Bias: DC25V Bias: DC200mA Test Time: 500 hour															

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 20% to 90% for 24 hours.

9. Packaging Specifications

9.1 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

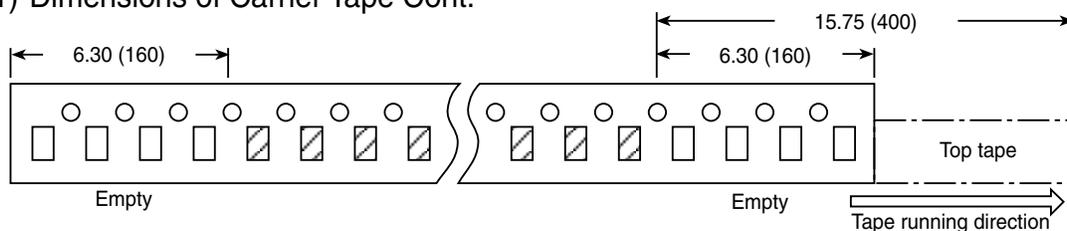
Dimensions in inches (mm)

.Series	A	B	W	F	E	P1
KC2AF Series	0.061 ± 0.003 (1.55 ± 0.1)	0.090 ± 0.003 (2.3 ± 0.1)	0.314 ± 0.0078 (8.0 ± 0.2)	0.137 ± 0.001 (3.5 ± 0.05)	0.068 ± 0.003 (1.75 ± 0.1)	0.157 ± 0.003 (4.0 ± 0.1)
KC2A Series	0.061 ± 0.003 (1.55 ± 0.1)	0.090 ± 0.003 (2.3 ± 0.1)	0.314 ± 0.0078 (8.0 ± 0.2)	0.137 ± 0.001 (3.5 ± 0.05)	0.068 ± 0.003 (1.75 ± 0.1)	0.157 ± 0.003 (4.0 ± 0.1)

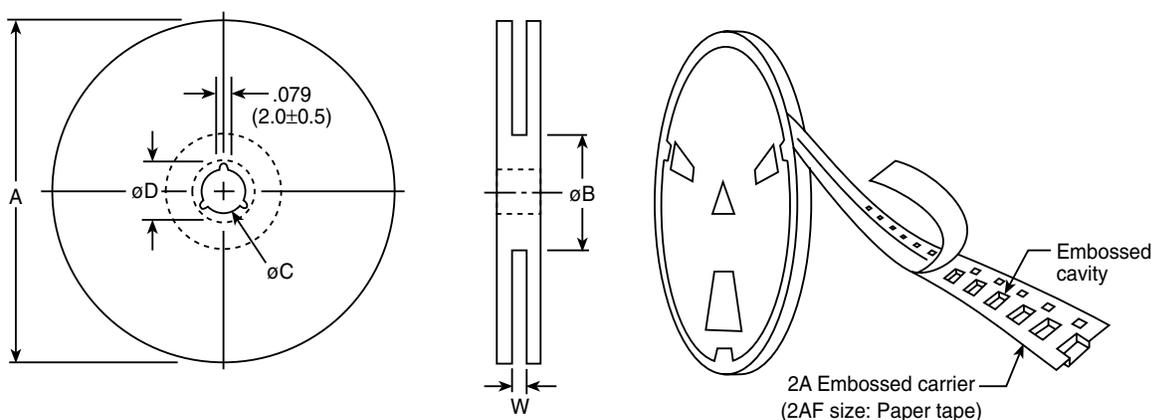
Dimensions in inches (mm)

Series	P2	P0	D0	t1	t2
KC2AF Series	0.078 ± 0.001 (2.0 ± 0.05)	0.157 ± 0.003 (4.0 ± 0.1)	0.059 ^{+0.003} ₋₀ (1.5 ^{+0.1} ₋₀)	0.037 ± 0.001 (0.95 ± 0.05)	N/A
KC2A Series	0.078 ± 0.001 (2.0 ± 0.05)	0.157 ± 0.003 (4.0 ± 0.1)	0.059 ^{+0.003} ₋₀ (1.5 ^{+0.1} ₋₀)	0.009 ± 0.001 (0.25 ± 0.05)	0.074 ± 0.003 (1.9 ± 0.1)

(1) Dimensions of Carrier Tape Cont.



(2) Reel dimensions



Dimensions in inches (mm)

	A	B	C	D	E	W (min)	W (max)
KC Series	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)

9.2 Construction of Packaging on Continuous Tapes (2AF only)

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

Materials

- Reel: Polystyrene
- Carrier Tape: Paper
- Top Cover Tape: Polyester base
- Bottom Cover Tape: Paper

10. 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.

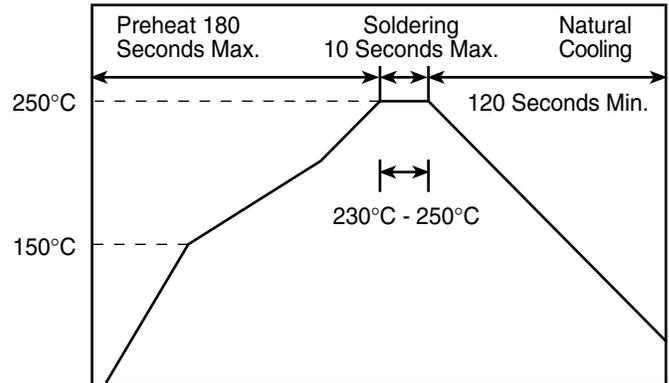
Recommended soldering thermal and time conditions are shown Appendix 2.

(3) Mounting

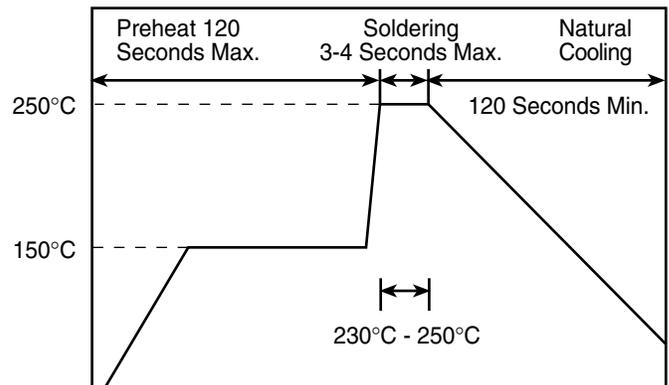
After mounting components on the printed circuit board, do not apply stress through board bending or mishandling.

11. Recommended Soldering Conditions

Recommended Condition for Reflow Soldering



Recommended Condition for Flow Soldering



Recommended Condition for Iron Soldering

