

Noise Filters

KC Series

ISO 9001:2000
TS-16949

1. Features

- Compact physical dimensions
- Excellent wave reflection control
- Exceptional EMI attenuation
- Excellent as impedance matching for signal lines
- Marking: Brown and black body color with no marking (1J & 2AF)
White and black body color with no marking (2A)

2. Applications

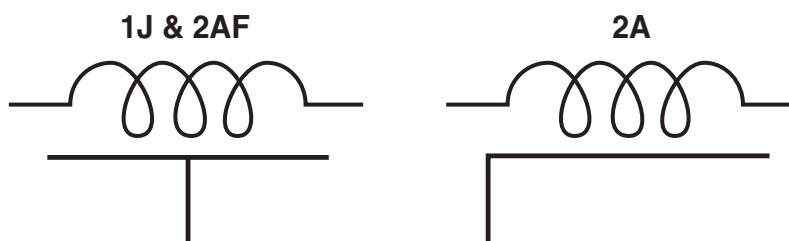
- Clock output signal line
- In/out video signal line for super high resolution
- High speed signal line
- Noise reduction for various signal circuits

3. Ordering & Specifying Information

Type designation shall be as the following form.

KC	2AF	T	TE	120	N	6N5	L
Type	Size	Termination Material	Packaging	Capacitance Value (pF)	Capacitance Tolerance	Inductance Value (nH)	Inductance Tolerance
	1J 2AF 2A	T: Sn L: SnPb	TD: 7" paper tape (1J & 2AF only - 4,000 pieces/reel) TE: 7" embossed plastic (2A only - 2,000 pcs/reel)	2 significant digits + num. of zeros	N: ±30% P: ±25%	6.5nH	L: ±15%

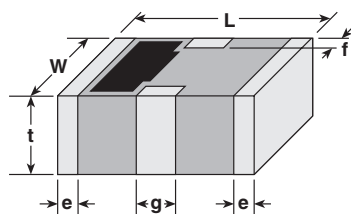
4. Circuit Schematic



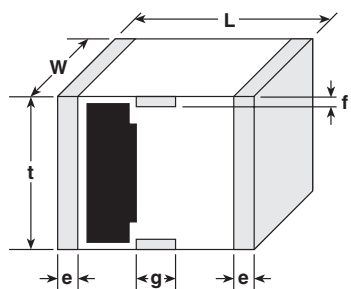
5. Rating

Item	Specification
Operating temperature range	-25°C ~ +85°C (1J & 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



1J & 2AF

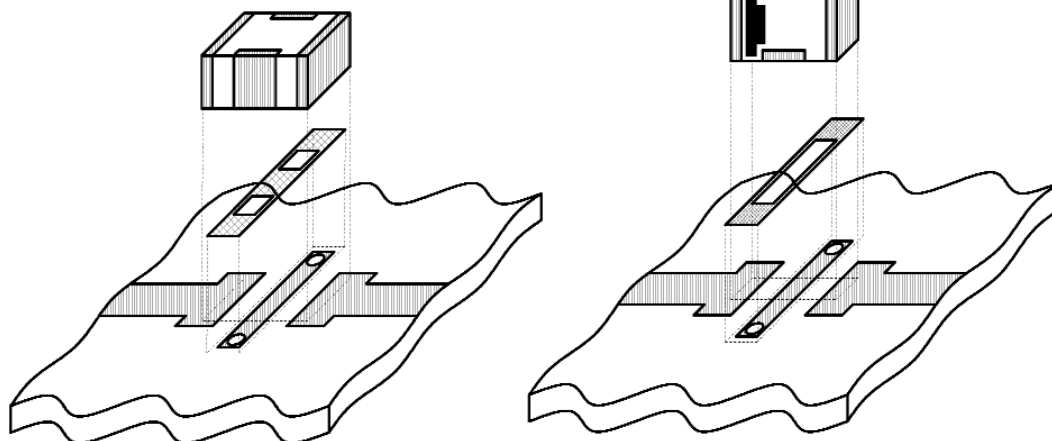


2A

Size	Dimensions inches (mm)					
	L	W	t	g	e	f
1J	.062±.008 (1.6±0.2)	.031±.008 (0.8±0.2)	.024±.008 (0.6±0.2)	.016±.012 (0.4±0.3)	.008±.006 (0.2±0.15)	N/A
2AF	.079±.008 (2.0±0.2)	.049±.008 (1.25±0.2)	.031±.008 (0.8±0.2)	.016±.012 (0.4±0.3)	.012±.008 (0.3±0.2)	N/A
2A	.079±.008 (2.0±0.2)	.049±.008 (1.25±0.2)	.063±.008 (1.6±0.2)	.016±.008 (0.4±0.2)	.004 Min. (0.1 Min.)	.02±.006 (0.25±0.15)

1J & 2AF

2A



7. Applications and Ratings

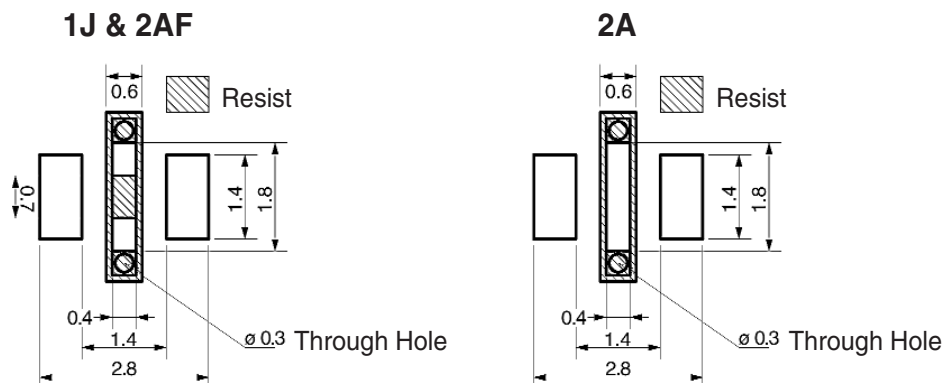
Item	Specification
Operating Temperature Range	-25°C to +85°C (1J & 2AF) -40°C to +85°C (2A)
Storage Temperature Range	-40°C to +85°C (after soldering)
Measuring Condition (Standard) Temperature Relative Humidity	15°C to 35°C 20 - 90%
Measuring Condition (Precision) Temperature Relative Humidity	20°C ± 1°C 60 - 67%

Part Designation	Capacitance (pF) %	Inductance (nH) %	Rated Voltage DC (V)	Rated Current DC (A)	Insulation Resistance Minimum (MΩ)	Operating Temperature Range	Typical Cut-off Frequency (Att = 3dB)
KC1JTTD220P8N0L	22 ± 25%	8.0 ± 15%	16	200	1000	-25°C to +85°C	200 MHz
KC1JTTD350P8N0L	35 ± 25%	8.0 ± 15%					100 MHz
KC1JTTD550P8N0L	55 ± 25%	8.0 ± 15%					50 MHz
KC2AFLTD151N16N5L	150 ± 30%	16.5 ± 15%	25	200	1000	-25°C to +85°C	50 MHz
KC2AFLTD700N8N50L	70 ± 30%	8.5 ± 15%					100 MHz
KC2ALTE120N6N5L	12 ± 30%	6.5 ± 15%					530 MHz
KC2ALTE180N13NL	18 ± 30%	13 ± 15%	25	200	1000	-40°C to +85°C	360 MHz
KC2ALTE350N15NL	35 ± 30%	15 ± 15%					180 MHz

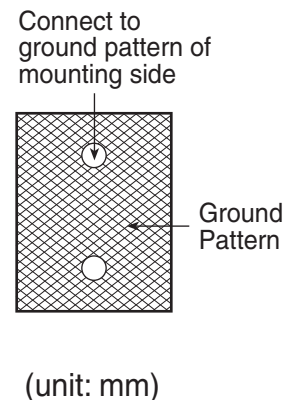
8. Pattern design

The land pattern is recommended as follows.

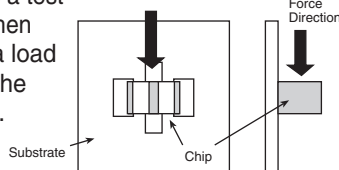
Chip Mounting Side



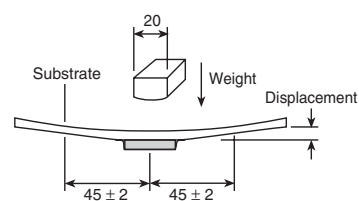
Back Side



9. Characteristics

Item	Requirement	Conditions																		
Insulation Resistance	Within the tolerance	Voltage: DC25V Test Time: 60 sec																		
Capacitance	Within the tolerance	Frequency: 1MHz Voltage: 1V Equipment: HP4192A Fixture: HP16034E																		
Inductance	Within the tolerance	Frequency: 1MHz Current: 10mA Equipment: HP4192A Fixture: HP16034E																		
Resistance (2A only)	Within the tolerance	Frequency: 1MHz Current: 10mA Equipment: HP4192A Fixture: HP16034E																		
Capacitance vs. Temperature Characteristics	Variation rate of capacitance in operate temperature are shown in below. <table><tr><th>Part</th><th>Rate</th></tr><tr><td>KC2AL120N6NSL</td><td>± 10%</td></tr><tr><td>KC2AL180N13NL</td><td>± 10%</td></tr><tr><td>KC2AL350N15NL</td><td>± 10%</td></tr></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><tr><th>Step</th><th>Temperature</th></tr><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></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. 																		
Resistance to Soldering Heat	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 to 180 sec Pre-heating Temp: 150°C to 200°C (1J & 2AF) Solder: H60A Solder Temp: 260°C ±5°C Dip Time: 5 ±0.5 sec																		

9. Characteristics Cont.

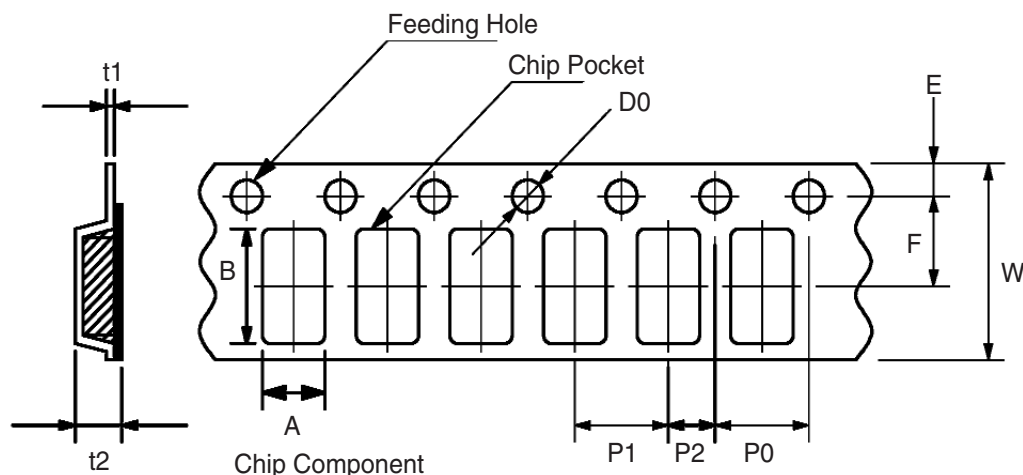
Item	Requirement	Conditions															
Solderability	More than 95% of the terminal electrode shall be covered with new solder.	Flux: 25% rosin Solder: H60A Solder Temp: 235°C $\pm$ 5°C Dip Time: 2 $\pm$ 0.5 sec															
Temperature Cycle*	Appearance: No physical damage Capacitance: Within tolerance 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 $\pm$3°C</td><td>30 min $\pm$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 $\pm$2°C</td><td>30 min $\pm$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 $\pm$ 3°C	30 min $\pm$ 3 min	2	Room Temp.	15 min max.	3	85°C $\pm$ 2°C	30 min $\pm$ 3 min	4	Room Temp.	15 min max.
Step	Temperature	Time															
1	-40°C $\pm$ 3°C	30 min $\pm$ 3 min															
2	Room Temp.	15 min max.															
3	85°C $\pm$ 2°C	30 min $\pm$ 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 $\pm$ 2°C Bias: DC25V Bias: DC200mA Test Time: 500 hours															
Humidity Resistance (unload)*	Appearance: No physical damage Capacitance: Within tolerance Dielectric Loss: Within tolerance Insulation Resistance: Within tolerance	Temp: 85°C $\pm$ 2°C Humidity: 85% $\pm$ 5% Test Time: 500 hours															
Substrate Bending Test	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 $\pm$ 2°C Humidity: 90% ~ 95% Bias: DC25V Bias: DC200mA Test Time: 500 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 20% to 90% for 24 hours.

10. Packaging Specifications

10.1 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

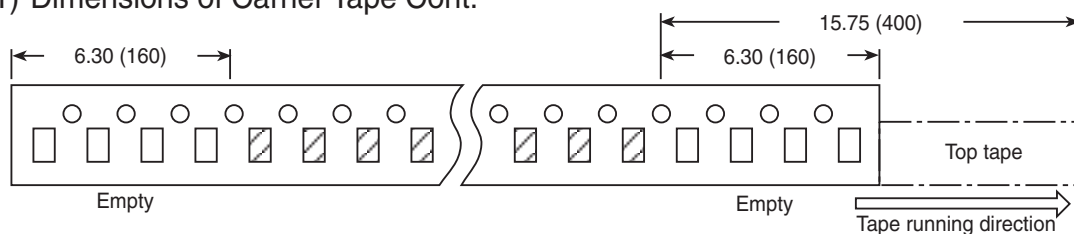
Dimensions in inches (mm)

Series	A	B	W	F	E	P1
KC1J Series	0.043 ± 0.002 (1.1 ± 0.05)	0.075 ± 0.002 (1.9 ± 0.05)	0.314 ± 0.003 (8.0 ± 0.1)	N/A	0.068 ± 0.003 (1.75 ± 0.1)	0.157 ± 0.003 (4.0 ± 0.1)
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)

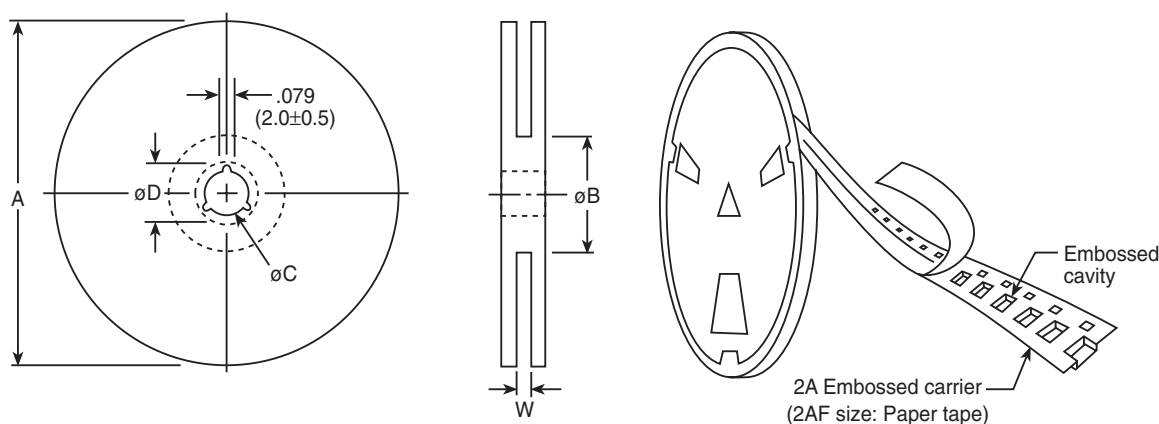
Dimensions in inches (mm)

Series	P2	P0	D0	t1	t2
KC1J 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)	0.030 ± 0.002 (0.75 ± 0.04)
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)

10.2 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

11. 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.

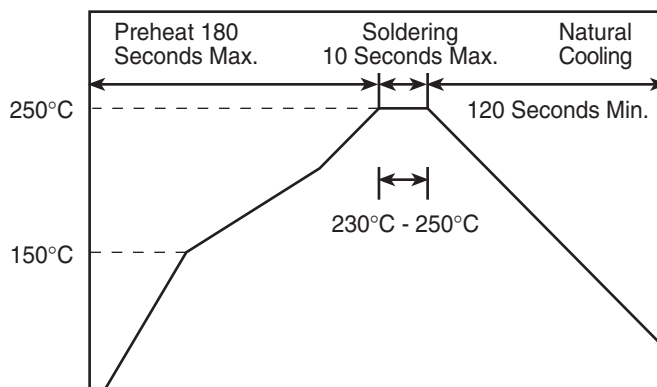
Recommended soldering thermal and time conditions are shown Appendix 2.

(3) Mounting

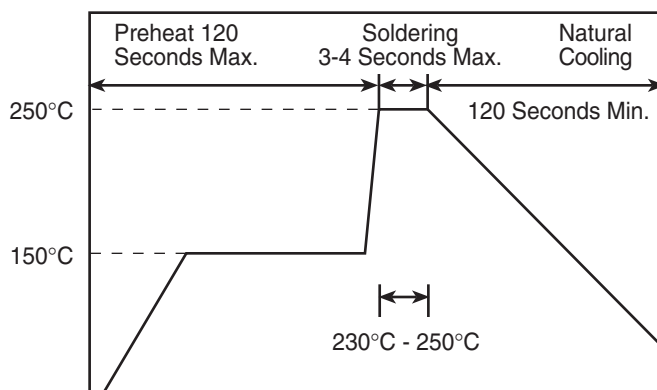
After mounting components on the printed circuit board, do not apply stress through board bending or mishandling.

12. Recommended Soldering Conditions

**Recommended Condition
for Reflow Soldering**



**Recommended Condition
for Flow Soldering**



**Recommended Condition
for Iron Soldering**

