

Chip Inductors

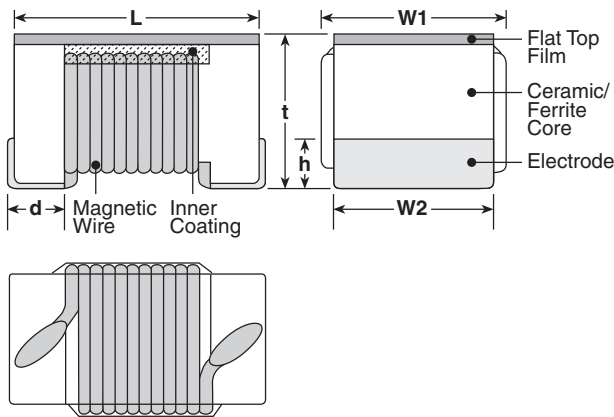
Type KQ 1008

ISO 9001:2000
CERTIFIED
TS-16949
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1. Scope of Application

This specification shall be applied to chip inductors KQ series produced by KOA corporation.

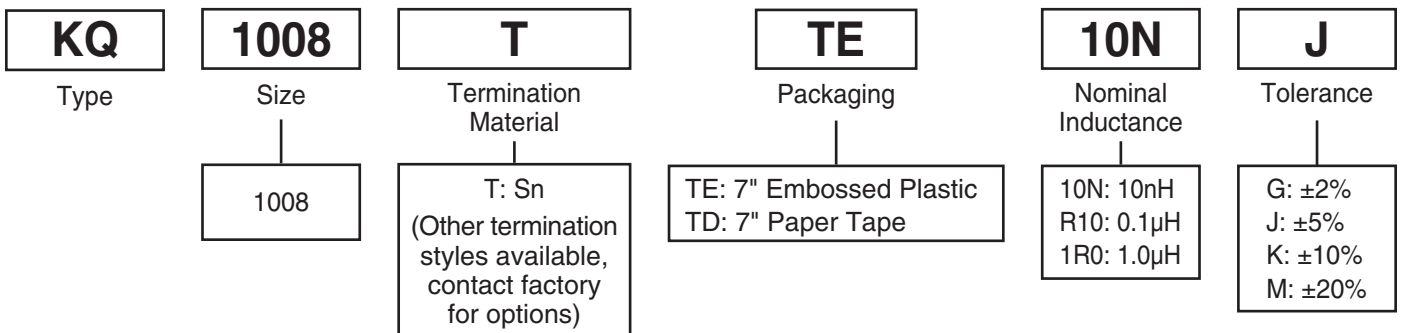
2. Dimensions and Construction



Size Code	L	W1	W2	t	h	d
KQ1008	.098±.008 (2.5±0.2)	.087±.008 (2.2±0.2)	.079±.004 (2.0±0.1)	.071 ^{+0.008} ₋₀ (1.8 ^{+0.2} ₋₀)	.018±.006 (0.45±0.15)	.018±.004 (0.45±0.1)

3. Ordering and Specifying Information

New Type



4. Rating

Item	Specification
Nominal inductance range	10 nH ~ 10 μ H
Nominal inductance tolerance	Measurement Equipment: HP4291A (HP16193A) e7
Q (Quality factor)	Measurement Equipment: HP4291A (HP16193A) e7
Self-resonant frequency (MHz)	Measurement Equipment: HP8720D (A01288831CH)
DC resistance (ohm)	Measurement Equipment: DVM meter
Allowable current (mA)	
Measurement frequency (MHz)	Measurement Equipment: HP4291A (HP16193A)
Storage temperature range	-40°C ~ +100°C
Operating temperature range	-40°C ~ +125°C

5. Standard Applications

Part Designation	Marking	Nominal Inductance (nH)	L Measuring Frequency	Inductance Tolerance	Q Quality Factor Minimum	Q Measuring Frequency (MHz)	Self Resonant Frequency Minimum (MHz)	DC Resistance Maximum (Ω)	Allowable DC Current Maximum (mA)
KQ1008TTE10N*	10N	10	50	J: \pm 5% K: \pm 10% M: \pm 20%	50	500	4100	0.08	1000
KQ1008TTE12N*	12N	12					3300	0.09	
KQ1008TTE15N*	15N	15					3000	0.10	
KQ1008TTE18N*	18N	18			55	350	2500	0.11	
KQ1008TTE22N*	22N	22					2400	0.12	
KQ1008TTE27N*	27N	27					1600	0.13	
KQ1008TTE33N*	33N	33			60	350	1500	0.14	
KQ1008TTE39N*	39N	39						0.15	
KQ1008TTE47N*	47N	47						0.16	
KQ1008TTE56N*	56N	56			65	350	1300	0.18	
KQ1008TTE68N*	68N	68						0.20	
KQ1008TTE82N*	82N	82						0.22	
KQ1008TTER10*	R10	100	25	G: \pm 2% J: \pm 5% K: \pm 10%	60	1000	0.56	650	
KQ1008TTER12*	R12	120					950		0.63
KQ1008TTER15*	R15	150			45	100	850	0.70	580
KQ1008TTER18*	R18	180					750	0.77	620
KQ1008TTER22*	R22	220					700	0.84	500

* Add tolerance character (G, J, K, M)

5. Standard Applications (continued)

Part Designation	Marking	Nominal Inductance (nH)	L Measuring Frequency	Inductance Tolerance	Q Quality Factor Minimum	Q Measuring Frequency (MHz)	Self Resonant Frequency Minimum (MHz)	DC Resistance Maximum (Ω)	Allowable DC Current Maximum (mA)	
KQ1008TTER27*	R27	270	25	G: ±2% J: ±5% K: ±10%	45	100	600	0.91	500	
KQ1008TTER33*	R33	330					570	1.05	450	
KQ1008TTER39*	R39	390					500	1.12	470	
KQ1008TTER47*	R47	470					450	1.19		
KQ1008TTER56*	R56	560					415	1.33	400	
KQ1008TTER62*	R62	620					375	1.40	300	
KQ1008TTER68*	R68	680						1.47	400	
KQ1008TTER75*	R75	750					360	1.54	360	
KQ1008TTER82*	R82	820					350	1.61	400	
KQ1008TTER91*	R91	910					320	1.68	380	
KQ1008TTE1R0*	1R0	1000					7.9	35	50	290
KQ1008TTE1R2*	1R2	1200	28		25	250		1.6		310
KQ1008TTE1R5*	1R5	1500				200		1.7		
KQ1008TTE1R8*	1R8	1800	160		25	140		1.9		270
KQ1008TTE2R2*	2R2	2200						2.2		250
KQ1008TTE2R7*	2R7	2700	22		25	110		2.7		230
KQ1008TTE3R3*	3R3	3300						100		
KQ1008TTE3R9*	3R9	3900	20		25	90		3.1		210
KQ1008TTE4R7*	4R7	4700						80		2.2
KQ1008TTE5R6*	5R6	5600	15		7.9	70		2.5		200
KQ1008TTE6R8*	6R8	6800						65		2.8
KQ1008TTE8R2*	8R2	8200					60	3.2	150	
KQ1008TTE100*	100	10000								

* Add tolerance character (G, J, K, M)

6. Marking of Inductance

The marking of nominal inductance consists of three characters as detailed below:

Value	Code
10nH to 82 nH	10N to 82N
0.1uH to 8.2 μH	R10 to 1R0 "R" indicates the decimal point

No tolerance of inductance shall be indicated.

7. Measurement Method

Nominal Inductance Range	Test Equipment	Fixture	Setup	Measuring Frequency
10 nH to 10 μH	HP 4291A RF Impedance analyzer	HP 16193A Test fixture	E.L = 1.4 cm OSC = 500 mV	Listed Table-1

8. Test Conditions

Unless otherwise specified, the test shall be performed at the temperature of $20\pm 15^{\circ}\text{C}$ and at a relative humidity of $65\pm 20\%$. Revers for

the test conditions shall be performed at the temperature of $20\pm 2^{\circ}\text{C}$ and at a relative humidity of $65\pm 5\%$.

9. Reliability Tests

9-1 Electrical Characteristics

Item	Requirement	Test Methods
Dielectric withstanding voltage	No evidence of flaming, fuming, or breakdown	5 seconds at DC 500 V applied between both terminals and film.
Insulation resistance	1000M Ω and over	1 minute at DC 100 V measured between both terminals and film.
Flammability	IEC 695-2-2	Withstands needle-flame test.

9-2 Mechanical Characteristics

Item	Requirement	Test Methods
Terminal pull strength	No evidence of damage	Terminals shall withstand a pull of 10 N in a horizontal direction.
Terminal bending strength	No evidence of breakdown	Specimen shall be soldered on bend test board and force applied to the opposite side to cause a 10 mm deflection
Vibration	$\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	2 hours in each direction of X, Y, Z, on PCB at a frequency range of 10-55-10Hz with 1.5 mm amplitude
Dropping	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Dropping 1 m on the ground of concrete 1 time
Resistance to soldering heat	No evidence of outer damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Immerse in the solder at $260\pm 5^{\circ}\text{C}$ for 10 ± 1 seconds
Solderability	95% of the terminal should be covered with new solder	Immerse in the solder at $230\pm 5^{\circ}\text{C}$ for 3 ± 0.5 seconds
Resistance to solvent	No damage and marking must remain legible	Accordance with MIL-STD-202F Method 215

9-3 Environmental Characteristics

Item	Requirement	Test Methods
Low temperature storage	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Store at $-40 \pm 2^\circ\text{C}$, for 1000 hours
High temperature storage	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Store at $+125 \pm 2^\circ\text{C}$, for 1000 hours
Moisture endurance	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Store at $40 \pm 2^\circ\text{C}$, 90~95%RH for 1000 hours
Load life	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Biased to full rated current at $+125^\circ\text{C}$ for 1000 hours
High temperature High Humidity	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	Biased to 10% rated current at $+85^\circ\text{C}$, 85% RH for 1000 hours
Thermal shock	No evidence of damage $\Delta L/L$ within $\pm 5\%$ $\Delta Q/Q$ within $\pm 10\%$	100 cycles between $-40^\circ\text{C}/\text{hour}$ and $+125^\circ\text{C}/\text{hour}$
Temperature characteristics	$\Delta L/L$ within $\pm 5\%$	$\Delta L/L$ to be measured at the temperature of between -40°C and $+125^\circ\text{C}$ as based on the inductance at 20°C

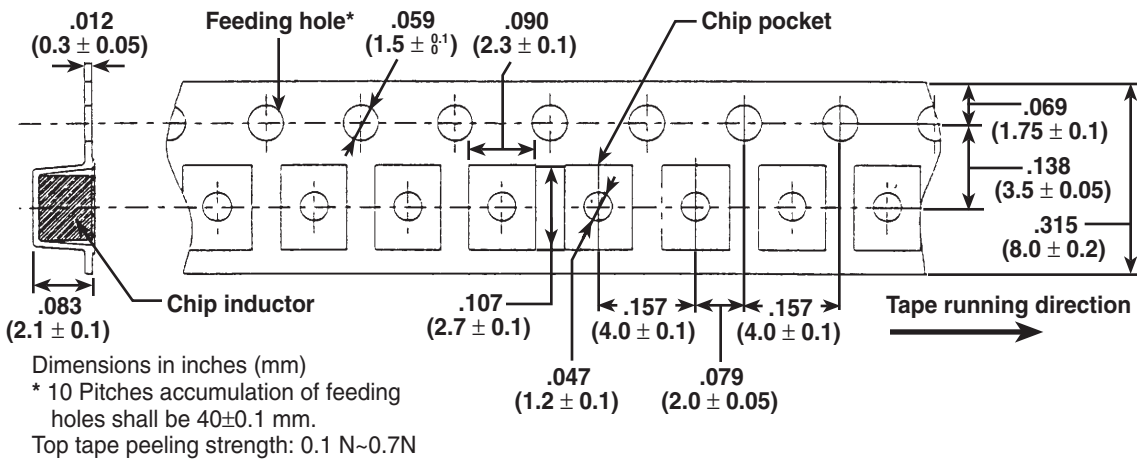
Unless otherwise specified, measurements shall be performed within 2 hours after leaving test samples for more than one hour at the normal temperature and at the normal humidity.

10. Packaging

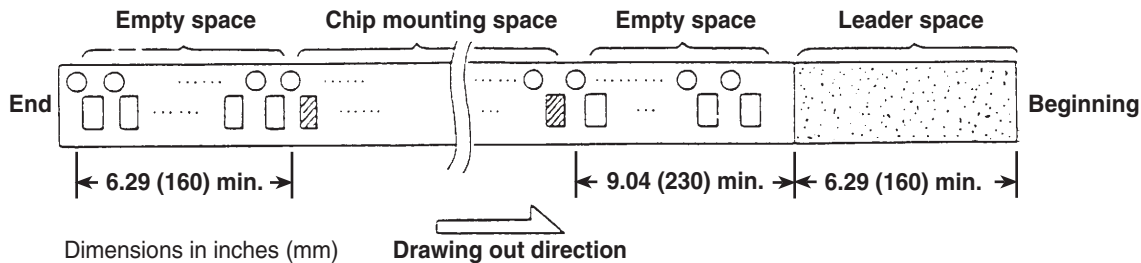
Taping

The tapes for taping shall be embossed carrier tapes of 8 mm width and 4 mm pitches. The standard quantity per reel shall be 2,000 pieces.

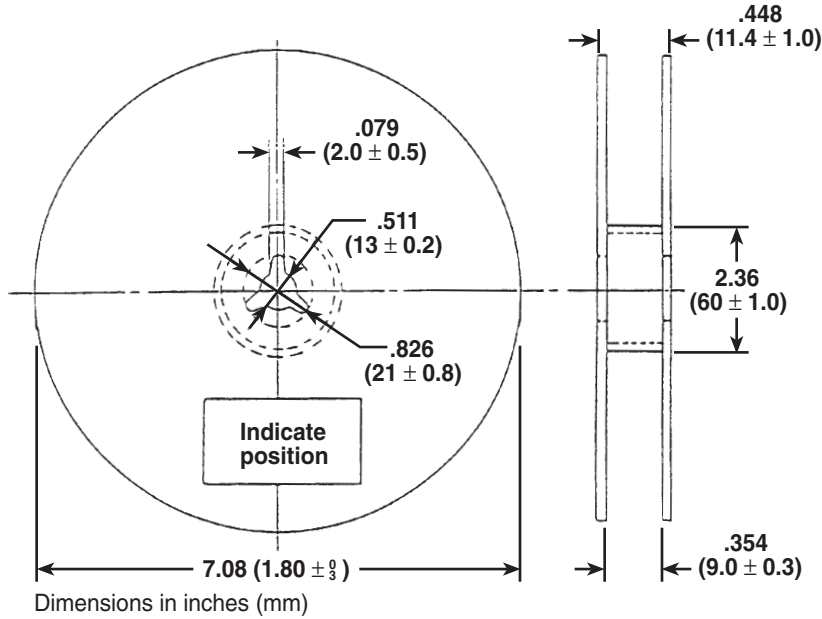
(1) Dimensions of Carrier Tape



(2) Taped Configurations (conforming to EIA-481 standard)



(3) Reel Dimensions and Indication



The following items shall be indicated on the reel.

- Type (KQ 1008 TE)
- Nominal inductance and tolerance
- Quantity
- Production lot number
- Manufacturer's name or trade mark

11. General Information

(1) Storage

Chip inductors shall not be stored under high temperature and high humidity conditions. Especially, do not store taping where they are exposed to heat or direct sunlight. Otherwise, the packing material may be deformed, causing problems during mounting.

(2) Mounting

Placement force should not be excessive.

(3) Soldering

Flow soldering should be done at 260°C for less than 10 seconds. Reflow soldering should be done at 240°C for less than 30 seconds. When using a soldering iron, temperature shall not exceed 350°C and within 3 seconds. Soldering iron time of each electrode shall be allowed only one time. After soldering, chip inductors shall not be stressed excessively.

(4) Cleaning

It is no problem to use organic solvents.

Since this chip inductor is a coil of ultra-fine wire, it is susceptible to vibration. If an ultra-sonic cleaning unit is used for cleaning, check for any possibility of problem generation before practical use since such cleaning units considerably differ in vibration level and mode.

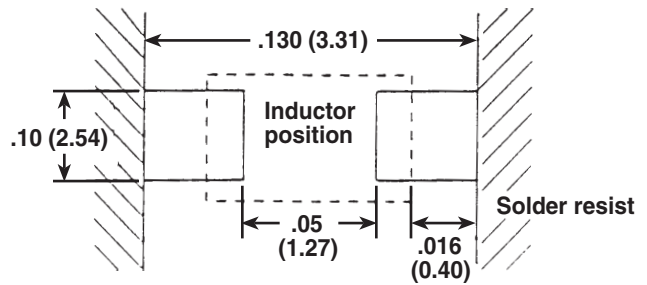
Although the conditions differ depending on the printed board size, ultrasonic cleaning is generally used in the conditions described below as examples.

Power: Within 20 W/L

Cleaning times: Within 5 minutes

(5) Pattern design

The land pattern is recommended as follows.



Dimensions in inches (mm)