

High Current Ferrite Chip Bead(Lead Free)

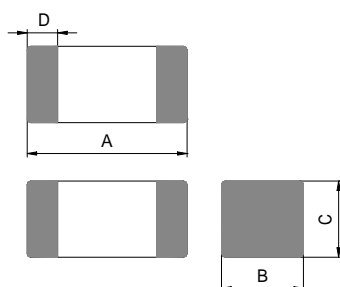
HCB2012KF-101T30

1.Features

1. Monolithic inorganic material construction.
2. Closed magnetic circuit avoids crosstalk.
3. Suitable for reflow soldering.
4. Shapes and dimensions follow E.I.A. spec.
5. Available in various sizes.
6. Excellent solder ability and heat resistance.
7. High reliability.
8. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
9. Low DC resistance structure of electrode to prevent wasteful electric power consumption.



2.Dimensions



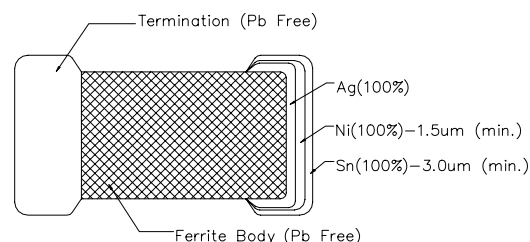
Chip Size	
A	2.00±0.20
B	1.25±0.20
C	0.85±0.20
D	0.50±0.30

Units: mm

3.Part Numbering

HCB	2012	KF	-	101	T	30
A	B	C		D	E	F

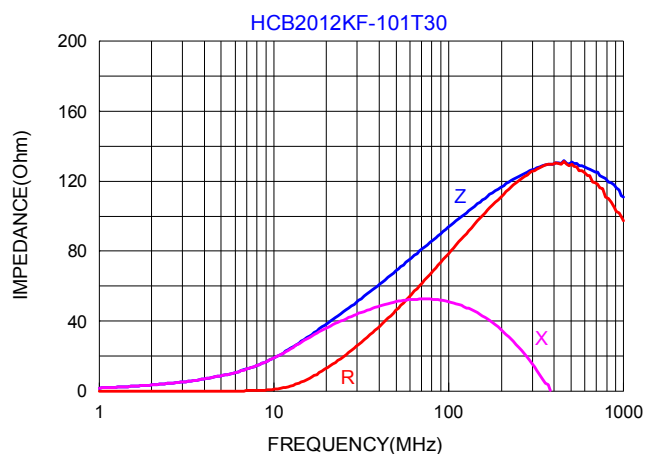
A: Series
 B: Dimension L x W
 C: Material Lead Free Material
 D: Impedance 101=100
 E: Packaging T=Taping and Reel, B=Bulk(Bags)
 F: Rated Current 30=3000mA



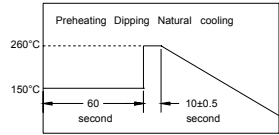
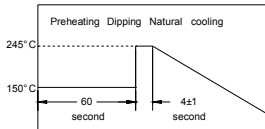
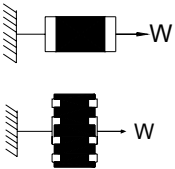
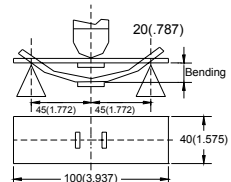
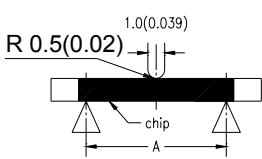
4.Specification

Tai-Tech Part Number	Impedance ()	Test Frequency (Hz)	DC Resistance () max.	Rated Current (mA) max.
HCB2012KF-101T30	100±25%	60mV/100M	0.04	3000

■ Impedance-Frequency Characteristics



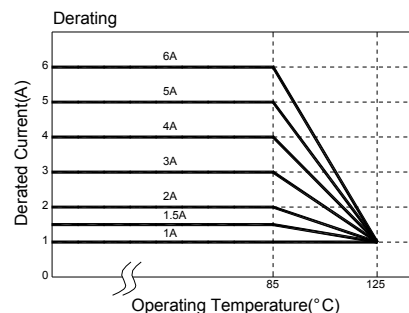
5. Reliability and Test Condition

Item	Performance										Test Condition																							
Series No.	FCB	FCM	HCB	GHB	FCA	FCI	FHI	FCH	HCI	MGI	--																							
Operating Temperature	-40~+125 (Including self-temperature rise)					-40~+105 (Including self-temperature rise)					--																							
Transportation Storage Temperature	-40~+125					-40~+105					Long storage conditions, please see the Application Notice																							
Impedance (Z)	Refer to standard electrical characteristics list										Agilent4291																							
Inductance (Ls)											Agilent E4991																							
Q Factor											Agilent4287																							
DC Resistance											Agilent16192																							
Rated Current											Agilent 4338																							
Temperature Rise Test	Rated Current < 1A ΔT 20 Max										1. Applied the allowed DC current.																							
	Rated Current 1A ΔT 40 Max										2. Temperature measured by digital surface thermometer.																							
Solder heat Resistance	Appearance: No significant abnormality. Impedance change: Within ± 30%. Inductance change: : within±10%					No mechanical damage. Remaining terminal electrode:75% min.					Preheat: 150 ,60sec. Solder: Sn-Cu0.5 Solder temperature: 260±5 Flux for lead free: ROL0 Dip time: 10±0.5sec. 																							
Solderability	More than 95% of the terminal electrode should be covered with solder.										Preheat: 150 ,60sec. Solder: Sn-Cu0.5 Solder temperature: 245±5 Flux for lead free: ROL0 Dip time: 4±1sec.																							
Terminal strength	The terminal electrode and the dielectric must not be damaged by the forces applied on the right conditions.					 <table><tr><td colspan="2">For FCB FCM HCB GHB</td></tr><tr><td>Size</td><td>Force (Kgf) Time(sec)</td></tr><tr><td>1005</td><td>0.2</td></tr><tr><td>1608</td><td>0.5</td></tr><tr><td>2012</td><td>0.6</td></tr><tr><td>3216</td><td>1.0 >30</td></tr><tr><td>3225</td><td>1.0</td></tr><tr><td>4516</td><td>1.0</td></tr><tr><td>4532</td><td>1.5</td></tr></table> <table><tr><td colspan="2">For FCA:</td></tr><tr><td>Size</td><td>Force (Kgf) Time(sec)</td></tr><tr><td>3216</td><td>0.5 >30</td></tr></table>					For FCB FCM HCB GHB		Size	Force (Kgf) Time(sec)	1005	0.2	1608	0.5	2012	0.6	3216	1.0 >30	3225	1.0	4516	1.0	4532	1.5	For FCA:		Size	Force (Kgf) Time(sec)	3216	0.5 >30
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Bending Strength	The ferrite should not be damaged by Forces applied on the right condition.					 <table><tr><th>Size</th><th>mm(inches)</th><th>P-Kgf</th></tr><tr><td>1608</td><td>0.80(0.033)</td><td>0.3</td></tr><tr><td>2012</td><td>1.40(0.055)</td><td>1.0</td></tr><tr><td>FCA3216</td><td>2.00(0.079)</td><td>1.5</td></tr><tr><td>3216</td><td>2.00(0.079)</td><td>2.5</td></tr><tr><td>3225</td><td></td><td></td></tr><tr><td>4516</td><td>2.70(0.106)</td><td>2.5</td></tr><tr><td>4532</td><td></td><td></td></tr></table>					Size	mm(inches)	P-Kgf	1608	0.80(0.033)	0.3	2012	1.40(0.055)	1.0	FCA3216	2.00(0.079)	1.5	3216	2.00(0.079)	2.5	3225			4516	2.70(0.106)	2.5	4532		
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Random Vibration Test	Appearance: Cracking, shipping and any other defects harmful to the characteristics should not be allowed. Impedance: within±30% Inductance change: : within±10%.					Frequency: 10-55-10Hz for 15 min. Amplitude: 1.52mm Directions and times: X, Y, Z directions for 15 min.. This cycle shall be performed 12 times in each of three mutually perpendicular directions (Total 9hours).																												

Item	Performance	Test Condition
Life testing at High Temperature	Appearance: no damage.	Temperature: 125±2 (bead), 105±2 (inductor) Applied current: rated current. Duration: 1008±12hrs. Measured at room temperature after placing for 2 to 3hrs.
Humidity	Impedance: within±30% of initial value. Inductance: within±10% of initial value. Q: within±30% of initial value. (FCI FHI FCH) Q: within±20% of initial value. (HCI MGI)	Humidity: 90~95%RH. Temperature: 40±2 . Temperature: 60±2 .(HCI MGI) Duration: 504±8hrs. Measured at room temperature after placing for 2 to 3hrs.
Thermal shock	Appearance: no damage. Impedance: within±30% of initial value. Inductance: within±10% of initial value. Q: within±30% of initial value. (FCI FHI FCH) Q: within±20% of initial value. (HCI MGI)	Condition for 1 cycle Step1: -40±2 30±5 min. Step2: +105±2 30±5 min. Number of cycles: 500 Measured at room temperature after placing for 2 to 3 hrs.
Low temperature storage test		Temperature: -40±2 . Duration: 500±8hrs. Measured at room temperature after placing for 2 to 3hrs.
Drop	No mechanical damage Impedance change: ±30% Inductance change: : within±10%	Drop 10 times on a concrete floor from a height of 75cm

**Derating Curve

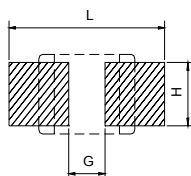
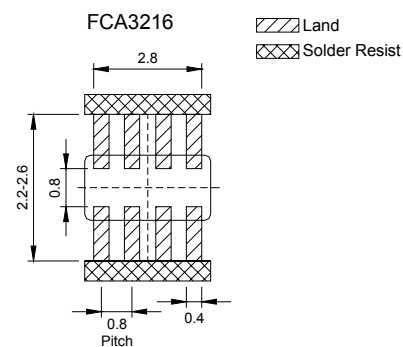
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over 85 , the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.



6.Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip Size						Land Patterns For Reflow Soldering		
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	L(mm)	G(mm)	H(mm)
FCB	0603	0.6±0.03	0.30±0.03	0.30±0.03	0.15±0.05	0.80	0.30	0.30
FCM	1005	1.0±0.10	0.50±0.10	0.50±0.10	0.25±0.10	1.50	0.40	0.55
HCB	1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.20	2.60	0.60	0.80
GHB	2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.30	3.00	1.00	1.00
FCI		2.0±0.20	1.25±0.20	1.25±0.20	0.50±0.30			
FHI	3216	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.30	4.40	2.20	1.40
FCH	3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.30	4.40	2.20	3.40
HCI	4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.30	5.70	2.70	1.40
MGI	4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.30	5.90	2.57	4.22



PC board should be designed so that products are not sufficient under mechanical stress as warping the board.
Products shall be positioned in the sideways direction against the mechanical stress to prevent failure.

6-2. Soldering

Mildly activated rosin fluxes are preferred. The minimum amount of solder can lead to damage from the stresses caused by the difference in coefficients of expansion between solder, chip and substrate. The terminations are suitable for re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

Note.

If Use Wave soldering is there will be some risk.

Re-flow soldering temperatures below 240 degrees, there will be unwitting risk

6-2.1 Lead Free Solder re-flow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1.

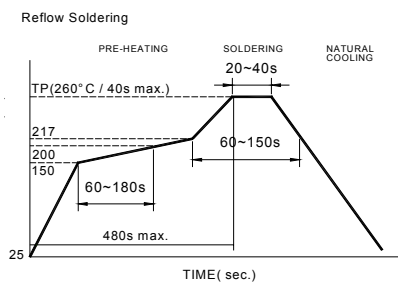
6-2.2 Soldering Iron:

Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. for Iron Soldering in Figure 2.

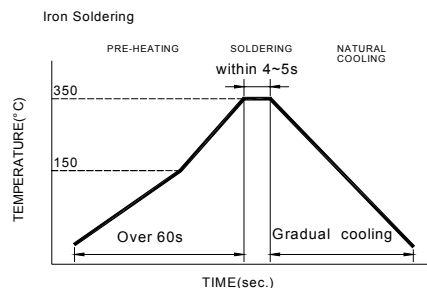
Preheat circuit and products to 150
350 tip temperature (max)

Never contact the ceramic with the iron tip
1.0mm tip diameter (max)

Use a 20 watt soldering iron with tip diameter of 1.0mm
Limit soldering time to 4~5sec.



Reflow times: 3 times max
Fig.1

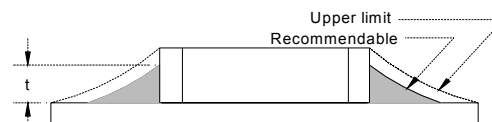


Iron Soldering times : 1 times max
Fig.2

6-2.3 Solder Volume:

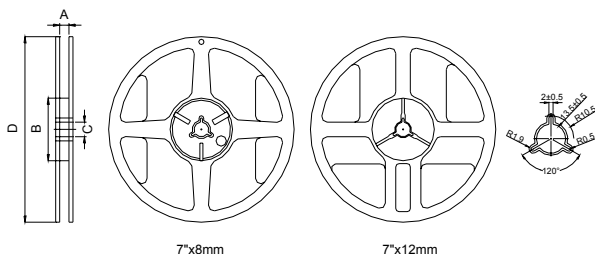
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceeded as shown in right side:

Minimum fillet height = soldering thickness + 25% product height



7. Packaging Information

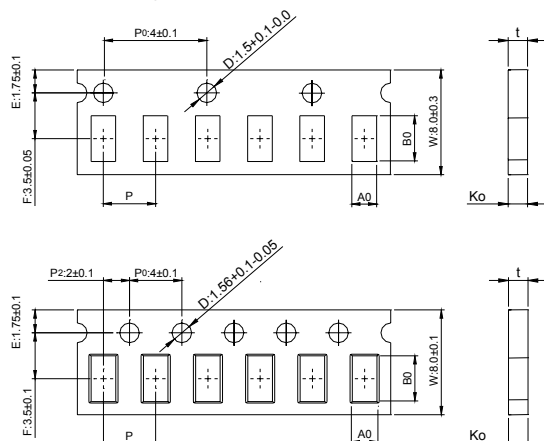
7-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60±2	13.5±0.5	178±2
7"x12mm	13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm

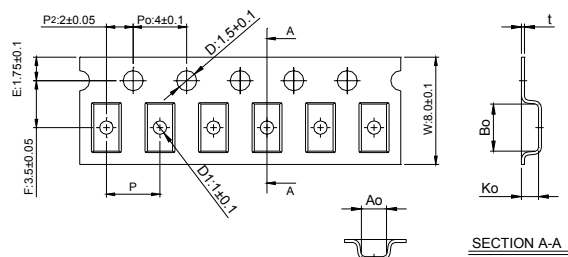
Material of taping is paper



Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
060303	0.68±0.05	0.38±0.05	0.50max	2.0±0.05	0.50max	none

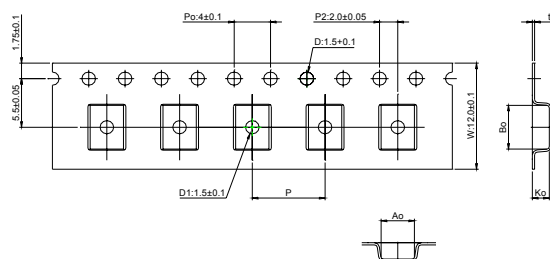
Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
100505	1.12±0.03	0.62±0.03	0.60±0.03	2.0±0.10	0.60±0.03	none
160808	1.85±0.05	1.05±0.05	0.95±0.05	4.0±0.10	0.95±0.05	none
201209	2.30±0.05	1.50±0.05	0.95±0.05	4.0±0.10	0.95±0.05	none

Material of taping is plastic



Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
160808	1.95±0.10	1.05±0.10	1.05±0.10	4.0±0.10	0.23±0.05	none
201209	2.25±0.10	1.42±0.10	1.04±0.10	4.0±0.10	0.22±0.05	1.0±0.10
201212	2.35±0.10	1.50±0.10	1.45±0.10	4.0±0.10	0.22±0.05	1.0±0.10
321611	3.50±0.10	1.88±0.10	1.27±0.10	4.0±0.10	0.22±0.05	1.0±0.10
322513	3.42±0.10	2.77±0.10	1.55±0.10	4.0±0.10	0.22±0.05	1.0±0.10
321609	3.40±0.10	1.77±0.10	1.04±0.10	4.0±0.10	0.22±0.05	1.0±0.10

7-2.2 Tape Dimension / 12mm

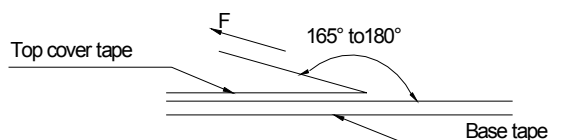


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
451616	4.95±0.1	1.93±0.1	1.93±0.1	4.0±0.1	0.24±0.05	1.5±0.1
453215	4.95±0.1	3.66±0.1	1.85±0.1	8.0±0.1	0.24±0.05	1.5±0.1

7-3. Packaging Quantity

Chip Size	453215	451616	322513	321611	321609	201212	201209	160808	100505	060303
Chip / Reel	1000	2000	2500	3000	3000	2000	4000	4000	10000	15000
Inner box	4000	8000	12500	15000	15000	10000	20000	20000	50000	75000
Middle box	20000	40000	62500	75000	75000	50000	100000	100000	250000	375000
Carton	40000	80000	125000	150000	150000	100000	200000	200000	500000	750000
Bulk (Bags)	12000	20000	30000	50000	50000	100000	150000	200000	300000	--

7-4. Tearing Off Force



The force for tearing off cover tape is 15 to 60 grams in the arrow direction under the following conditions.

Room Temp. ()	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

Application Notice

Storage Conditions

To maintain the solderability of terminal electrodes:

1. TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: -10~ 40 and 30~70% RH.
3. Recommended products should be used within 6 months from the time of delivery.
4. The packaging material should be kept where no chlorine or sulfur exists in the air.

Transportation

1. Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
2. The use of tweezers or vacuum pick up is strongly recommended for individual components.
3. Bulk handling should ensure that abrasion and mechanical shock are minimized.