Form No: T00117-1-0000-TBM01-121000115

Specification for Approval

Date: 2012/10/3

Customer : Qisda

TAI-TECH P/N: HCB2012KF-600T30

CUSTOMER P/N: 6H.60060.0N3

DESCRIPTION:

QUANTITY: pcs

REMARK:
Customer Approval Feedback

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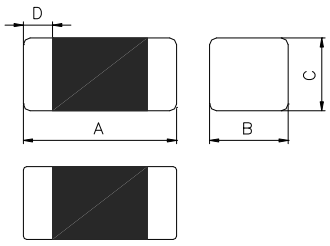
High Current Ferrite Chip Bead(Lead Free) HCB2012KF-600T30

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.

Halogen-free Pb-free Certificate of Green Partner

2.Dimensions



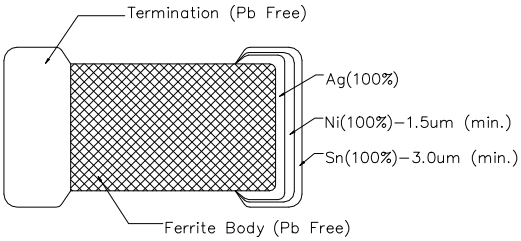
Chip Size	
A	2.00±0.20
B	1.25±0.20
C	0.85±0.20
D	0.50±0.30

Units: mm

3.Part Numbering

HCB	2012	KF	-	600	T	30
A	B	C		D	E	F

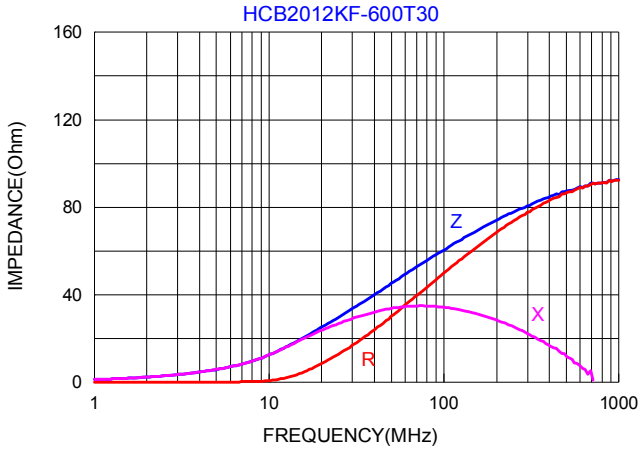
A: Series
B: Dimension L x W
C: Material Lead Free Material
D: Impedance 600=60Ω
E: Packaging T=Taping and Reel, B=Bulk(Bags)
F: Rated Current 30=3000mA



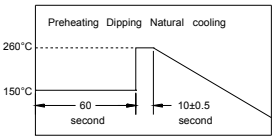
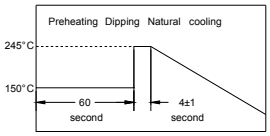
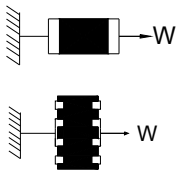
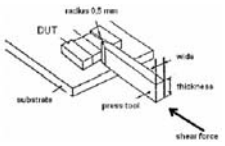
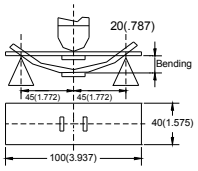
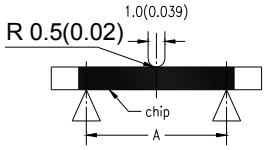
4.Specification

Tai-Tech Part Number	Impedance (Ω)	Test Frequency (Hz)	DC Resistance (Ω) max.	Rated Current (mA) max.
HCB2012KF-600T30	60±25%	60mV/100M	0.04	3000

■ Impedance-Frequency Characteristics



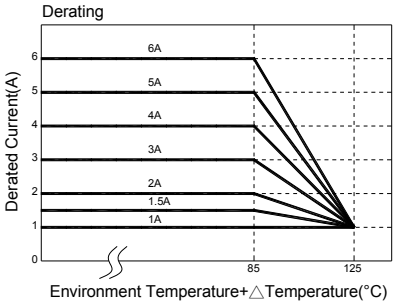
5. Reliability and Test Condition

Item	Performance									Test Condition
Series No.	FCB	FCM	HCB	GHB	FCA	FCI	FHI	FCH	HCI	--
Operating Temperature	-40~+125℃ (Including self-temperature rise)					-40~+105℃ (Including self-temperature rise)				--
Transportation Storage Temperature	-40~+125℃					-40~+105℃				For 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 / Agilent 4338
Rated Current										DC Power Supply Over Rated Current requirements, there will be some risk
Temperature Rise Test	Rated Current < 1A ΔT 20℃Max Rated Current ≧ 1A ΔT 40℃Max									1. Applied the allowed DC current. 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 tamperature: 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 tamperature: 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.									For FCB FCM HCB GHB FCI FHI FCH HCI: 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
Shear Test	The terminal electrode and the part must not be damaged by the forces applied on the right conditions.									Size / Force(Kgf) / Time(sec) 1005, 1608 / >0.5 / 60±5 2012, 3216, 3225 / 1.0 / 60±5
Flexture strength	The terminal electrode and the dielectric must not be damaged by the forces applied on the right conditions.									Solder a chip on a test substrate, bend the substrate by 2mm (0.079in)and return. The duration of the applied forces shall be 60 (+ 5) Sec.
Bending Strength	The ferrite should not be damaged by Forces applied on the right condition.									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, 3225 2.00(0.079) 2.5 4516, 4532 2.70(0.106) 2.5

Item	Performance	Test Condition
Life testing at High Temperature	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)	Temperature: 125±2℃(bead), 85±2℃(inductor) Applied current: rated current. Duration: 1000±12hrs. Measured at room temperature after placing for 2 to 3hrs.
Humidity		Humidity: 90~95%RH. Temperature: 40±2℃. Temperature: 60±2℃.(HCI) 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) Phase / Temperature(℃) / Time(min.) 1 / -40±2℃ / 30±5 2 / room temp. / ≦0.5 3 / +105±2℃ / 30±5 Measured: 500 times	Condition for 1 cycle Step1: -40±2℃ 30±5 min. Step2: +105±2℃ 30±5min. 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
Random Vibration Test	Appearance: Cracking, chipping 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).

****Derating Curve**

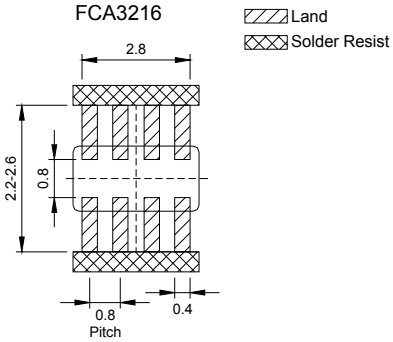
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over 85℃, the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.

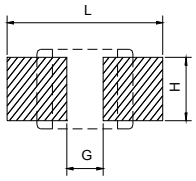


6.Soldering and Mounting

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
	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 can prevent damage from mechanical stress when warping the board.
Products shall be positioned in the sideway direction against the mechanical stress to prevent failure.

6-2. Soldering

Mildly activated rosin fluxes are preferred. 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 wave soldering is used ,there will be some risk.

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

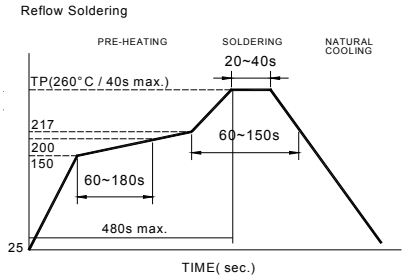
6-2.1 Lead Free Solder re-flow:

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

6-2.2 Soldering Iron:

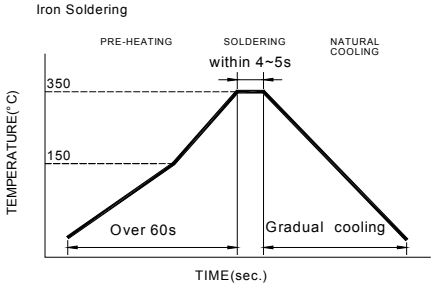
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended. for Iron Soldering in Figure 2.

- Preheat circuit and products to 150℃
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 350℃ tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5sec.



Reflow times: 3 times max

Fig.1



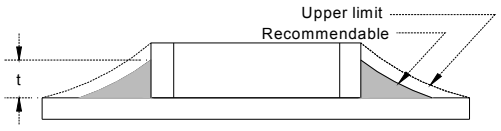
Iron Soldering times：1 times max

Fig.2

6-2.3 Solder Volume:

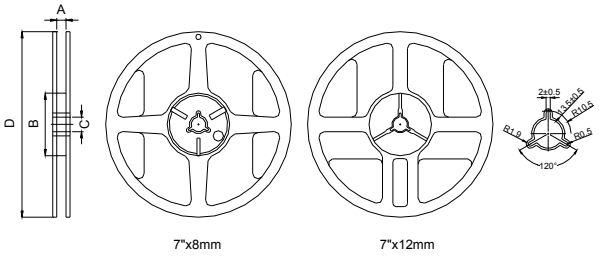
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:

Minimum fillet height = soldering thickness + 25% product height



7.Packaging Information

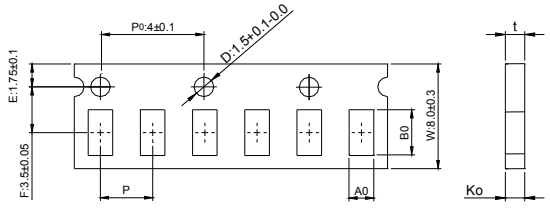
7-1. Reel Dimension



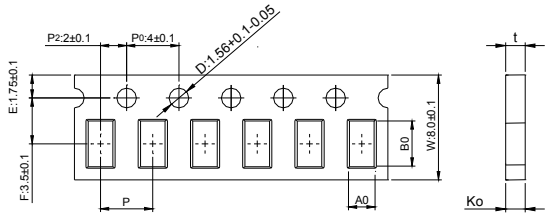
Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60±2	13.5±0.5	178±2
7"x12mm	13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm

■Material of taping is paper

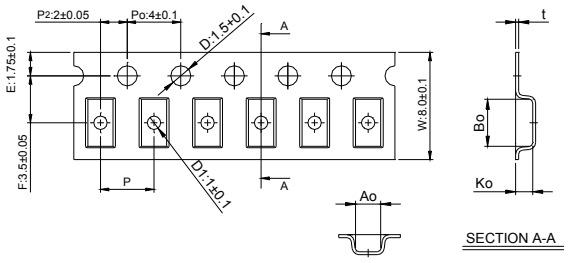


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
060303	0.68±0.05	0.38±0.05	0.50max	2.0±0.05	0.50max	none



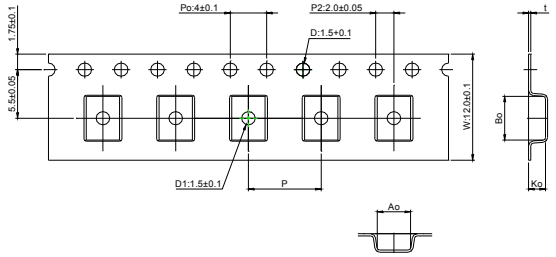
Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
100505	1.12±0.03	0.62±0.03	0.60±0.03	2.0±0.10	0.60±0.03	none
160808	1.85±0.05	1.05±0.05	0.95±0.05	4.0±0.10	0.95±0.05	none
201209	2.30±0.05	1.50±0.05	0.95±0.05	4.0±0.10	0.95±0.05	none

■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

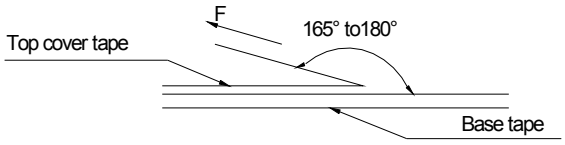


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
451616	4.95±0.1	1.93±0.1	1.93±0.1	4.0±0.1	0.24±0.05	1.5±0.1
453215	4.95±0.1	3.66±0.1	1.85±0.1	8.0±0.1	0.24±0.05	1.5±0.1

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

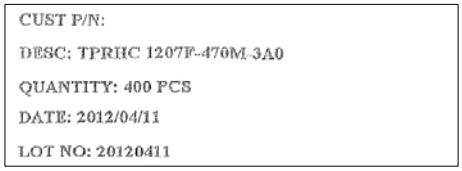
To maintain the solder ability of terminal electrodes:

1. TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
2. Temperature and humidity conditions: Less than 40℃ and 60% RH.
3. Recommended products should be used within 12 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.

標籤格式&條碼格式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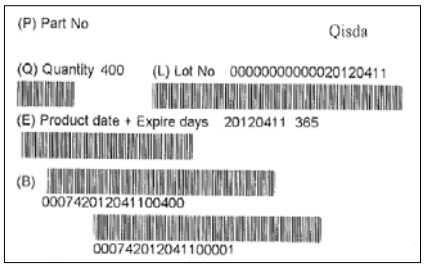
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Qisda
(Q) Quantity 400
(L) Lot No 0000000000020120411
(E) Product date + Expire days 20120411 365
(B)
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