Form No: T00271-2-0000-KBM01-231100651

Specification for Approval

Date: 2023/11/24

Customer :

TAI-TECH P/N: HCB2012KV-800T30-HD

CUSTOMER P/N:

DESCRIPTION:

QUANTITY: pcs

REMARK:
Customer Approval Feedback

西 北 臺 慶 科 技 股 份 有 限 公 司
TAI-TECH Advanced Electronics Co., Ltd

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High Current Ferrite Chip Bead(Lead Free) HCB2012KV-800T30-HD

ECN HISTORY LIST

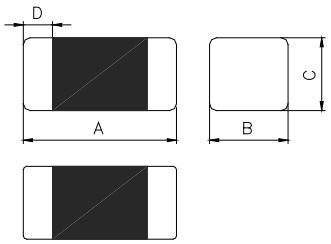
REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	14/01/24	變更電鍍錫層厚度 3.0um min.=>3.5um min.	楊祥忠	羅培君	張嘉玲
2.0	14/08/01	變更 Reflow 圖示	楊祥忠	羅培君	張嘉玲
2.1	14/08/01	修正包裝帶尺寸	楊祥忠	羅培君	張嘉玲
3.0	16/01/26	修訂下列可靠度溫度同 Operating Temperature 1.High Temperature Exposure(Storage) 2.High Temperature Operational Life 3.Thermal shock 4.Temperature Cycling	楊祥忠	詹偉特	張嘉玲
4.0	17/02/16	修訂 Recommended PC Board Pattern	楊祥忠	詹偉特	張嘉玲
5.0	20/08/01	更新 Reflow 依 IPC EDEC J-STD-020E	鄧福興	浦冬生	王俞琴
6.0	22/12/05	更新可靠度及更正 Reflow 敘述	鄧福興	浦冬生	王俞琴
備註					

High Current Ferrite Chip Bead(Lead Free) HCB2012KV-800T30-HD

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. Reliability test meet AEC-Q200.
8. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
9. Low DC resistance structure of electrode to prevent wasteful electric power consumption.
10. Operating Temperature: -55~+150℃(Including self-temperature rise)

2.Dimensions



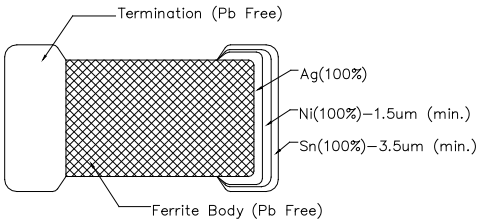
Chip Size	
A	2.00±0.20
B	1.25±0.20
C	0.85±0.20
D	0.50±0.30

Units: mm

3.Part Numbering

HCB	2012	K	V	-	800	T	30	-	HD
A	B	C	D		E	F	G		H

A: Series
B: Dimension L x W
C: Material Lead Free Material
D: Category Code V=Vehicle
E: Impedance 800=80Ω
F: Packaging T=Taping and Reel, B=Bulk(Bags)
G: Rated Current 30=3000mA
H:Category Code



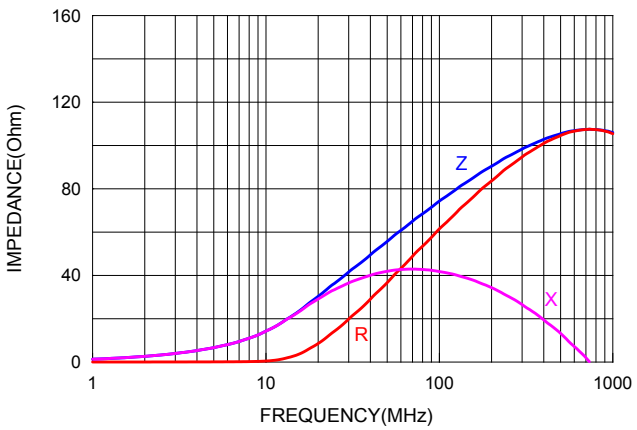
4.Specification

Tai-Tech Part Number	Impedance (Ω)	Test Frequency (Hz)	DC Resistance (Ω) max.	Rated Current (mA) max.
HCB2012KV-800T30-HD	80±25%	60mV/100M	0.04	3000

- Rated current: based on temperature rise test
- In compliance with EIA 595

■ Impedance-Frequency Characteristics

HCB2012KV-800T30-HD



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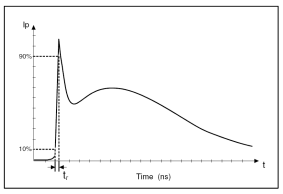
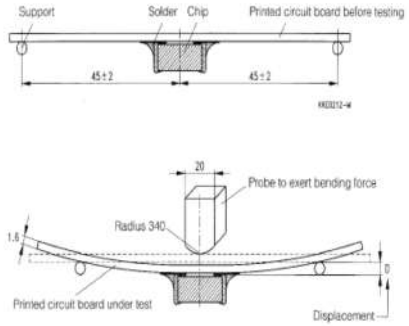
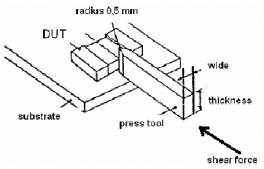
5. Reliability and Test Condition

Item	Performance			Test Condition
Series No.	FCB	FCM	HCB	--
Operating Temperature	-55~+150℃ (Including self-temperature rise)			--
Transportation Storage Temperature	-55~+150℃ (on board)			For long storage conditions, please see the Application Notice
Impedance (Z)	Refer to standard electrical characteristics list			Agilent4291 Agilent E4991 Agilent4287 Agilent16192
DC Resistance				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.
High Temperature Exposure(Storage)	Appearance：No damage. Impedance：within±15% of initial value RDC：Within ±15% of initial value and shall not exceed the specification value			Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature：150±2℃ Duration ：1000hrs Min. Measured at room temperature after placing for 24±2 hrs
Temperature Cycling				Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1：-55±2℃ 30min Min Step2：150±2℃ transition time 1min MAX. Step3：150±2℃30min Min. Step4：Low temp. transition time 1min MAX. Number of cycles：1000 Measured at room temperature after placing for 24±2 hrs
Biased Humidity （AEC-Q200）	Appearance：No damage. Impedance：within±15% of initial value RDC：Within ±15% of initial value and shall not exceed the specification value			Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Humidity :85±3%RH. Temperature :85±2℃. Duration :1000 hrs Min. Measured at room temperature after placing for 24±2 hrs
High Temperature Operational Life				Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature：150±2℃ Duration ：1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±2 hrs
External Visual	Appearance：No damage.			Inspect device construction, marking and workmanship. Electrical Test not required.
Physical Dimension	According to the product specification size measurement			According to the product specification size measurement
Resistance to Solvents	Appearance：No damage.			Add aqueous wash chemical - OKEM clean or equivalent.

<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Mechanical Shock</td><td rowspan="3">Appearance：No damage.
Impedance：within±15% of initial value
RDC：Within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Test condition:
<table>
<tr><th>Type</th><th>Peak alue (g's)</th><th>Normal duration (D) (ms)</th><th>Wave form</th><th>Velocity change (Vi)ft/sec</th></tr>
<tr><td>SMD</td><td>100</td><td>6</td><td>Half-sine</td><td>12.3</td></tr>
<tr><td>Lead</td><td>100</td><td>6</td><td>Half-sine</td><td>12.3</td></tr>
</table>
3 shocks in each direction along 3 perpendicular axes (18 shocks).</td></tr>
<tr><td>Vibration</td><td>Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Oscillation Frequency: 10Hz～2KHz～10Hz for 20 minute
Equipment：Vibration checker
Total Amplitude:5g
Testing Time：12 hours(20 minutes, 12 cycles each of 3 orientations)。</td></tr>
<tr><td>Resistance to Soldering Heat</td><td>Test condition :(MIL-STD-202 Condition B)
Number of heat cycles: 1
<table>
<tr><th>Temperature (°C)</th><th>Time (s)</th><th>Temperature ramp/immersion and emersion rate</th></tr>
<tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s±6mm/s</td></tr>
</table>
Depth: completely cover the termination</td></tr>
<tr><td>Thermal shock</td><td>Appearance：No damage.
Impedance：within±15% of initial value
RDC：Within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles
Condition for 1 cycle
Step1：-55±2℃ 15±1min
Step2：150±2℃ within 20 Sec.
Step3：150±2℃ 15±1min
Number of cycles： 300
Measured at room temperature after placing for 24±2hrs</td></tr>
<tr><td>ESD</td><td>Appearance：No damage.</td><td> 

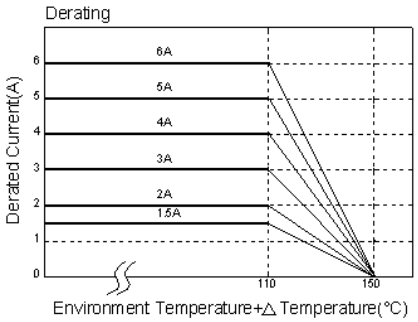
Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target
Test method: AEC-Q200-002
Test mode：Contact Discharge
Discharge level：4 KV (Level: 2)</td></tr>
<tr><td>Solder ability</td><td>More than 95% of the terminal electrode should be covered with solder.</td><td>a.Method B, 4 hrs @155°C dry heat @235°C±5°C Test time:5 +0/-0.5 seconds.

b. Method D category 3. (steam aging 8hours ± 15 min)@ 260°C±5°C
Test time: 30 +0/-0.5 seconds.</td></tr>
<tr><td>Electrical Characterization</td><td>Refer Specification for Approval</td><td>Summary to show Min, Max, Mean and Standard deviation</td></tr>
<tr><td>Flammability</td><td>Electrical Test not required.</td><td>V-0 or V-1 are acceptable.</td></tr>
</table>

Item	Performance		Test Condition
Board Flex	Appearance：No damage.		Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board.
Terminal strength	Appearance：No damage.		Preconditioning:Run through reflow for 3 times.(IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to thecomponent being tested.

**Derating Curve

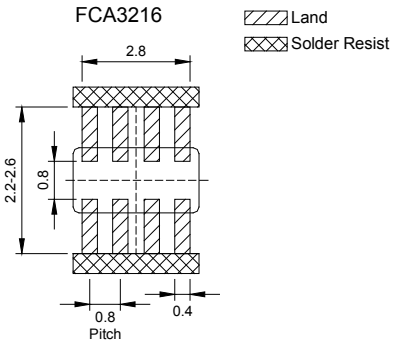
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over 110℃, the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.

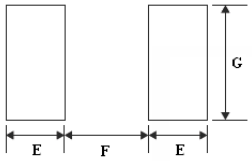


6.Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip Size						Land Patterns For Reflow Soldering		
Series	Type	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
FCB FCM HCB GHB FCI FHI FCH HCI	1005	1.0±0.10	0.50±0.10	0.50±0.10	0.25±0.10	0.50	0.40	0.60
	1606	1.6±0.15	0.80±0.15	0.60±0.15	0.30±0.20	0.80	0.85	0.95
	1608	1.6±0.15	0.80±0.15	0.80±0.15	0.30±0.20	0.80	0.85	0.95
	2012	2.0±0.20	1.25±0.20	0.85±0.20	0.50±0.30	1.05	1.00	1.45
		2.0±0.20	1.25±0.20	1.25±0.20	0.50±0.30			
	3216	3.2±0.20	1.60±0.20	1.10±0.20	0.50±0.30	1.05	2.20	1.80
	3225	3.2±0.20	2.50±0.20	1.30±0.20	0.50±0.30	1.05	2.20	2.70
	4516	4.5±0.20	1.60±0.20	1.60±0.20	0.50±0.30	1.05	3.30	1.80
	4532	4.5±0.20	3.20±0.20	1.50±0.20	0.50±0.30	1.05	3.30	3.40





PC board should be designed so that products can prevent damage from mechanical stress when warping the board.

6-2. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH 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.

6-2.1 Soldering Reflow:

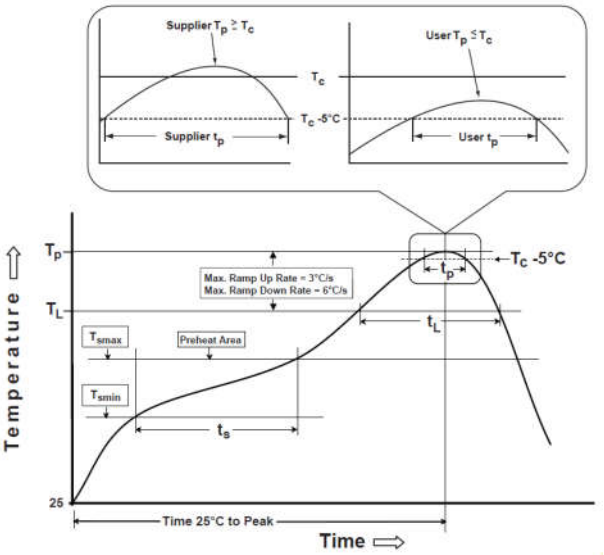
Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

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. (Figure 2.)

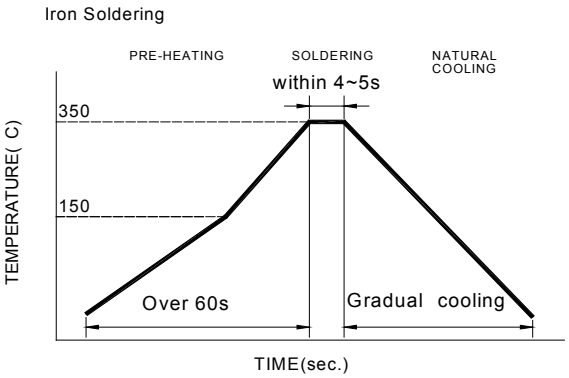
- Preheat circuit and products to 150℃
- 350℃ tip temperature (max)
- Never contact the ceramic with the iron tip
- 1.0mm tip diameter (max)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times：1 times max

Table (1.1): Reflow Profiles

Profile Type:	Pb-Free Assembly
Preheat -Temperature Min(T_{smin}) -Temperature Max(T_{smax}) -Time(t_s)from(T_{smin} to T_{smax})	 150℃ 200℃ 60-120seconds
Ramp-up rate($T_L$to T_p)	3℃/second max.
Liquidus temperature(T_L) Time(t_L)maintained above T_L	217℃ 60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at Tc- 5℃ (Tp should be equal to or less than Tc.)	< 30 seconds
Ramp-down rate(T_p to T_L)	6℃ /second max.
Time 25℃ to peak temperature	8 minutes max.

Tp: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

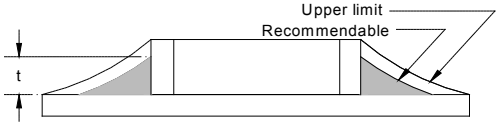
	Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
PB-Free Assembly	<1.6mm	260℃	260℃	260℃
	1.6-2.5mm	260℃	250℃	245℃
	≥2.5mm	250℃	245℃	245℃

Reflow is referred to standard IPC/JEDEC J-STD-020E。

6-2.3 Solder Volume:

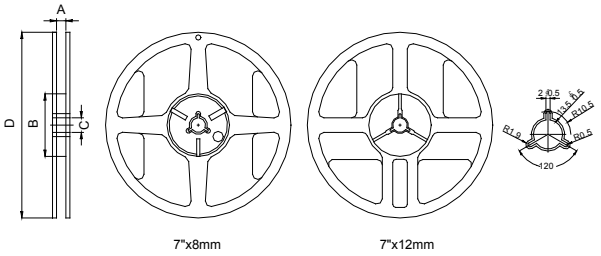
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:

Minimum fillet height = soldering thickness + 25% product height



7. Packaging Information

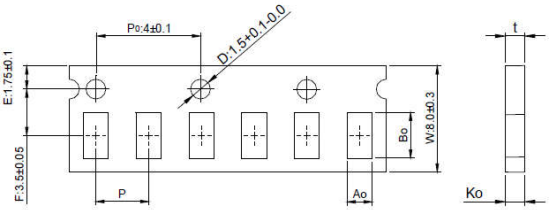
7-1. Reel Dimension



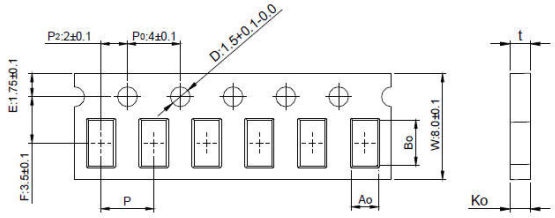
Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60±2	13.5±0.5	178±2
7"x12mm	13.5±0.5	60±2	13.5±0.5	178±2

7-2.1 Tape Dimension / 8mm

■Material of taping is paper

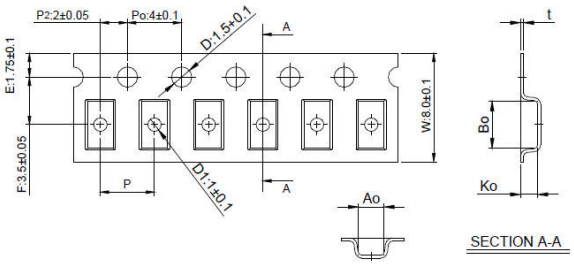


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
100505	1.12±0.03	0.62±0.03	0.60±0.03	2.0±0.05	0.60±0.03



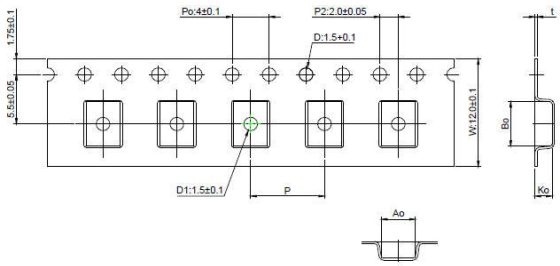
Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
160806	1.78±0.03	0.97±0.03	0.75±0.03	4.0±0.10	0.75±0.03
160808	1.80±0.05	0.96+0.05/-0.03	0.95±0.05	4.0±0.10	0.95±0.05
201209	2.10±0.05	1.30±0.05	0.95±0.05	4.0±0.10	0.95±0.05

■Material of taping is plastic



Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
201212	2.10±0.10	1.28±0.10	1.28±0.10	4.0±0.10	0.22±0.05	1.0±0.10
321611	3.35±0.10	1.75±0.10	1.25±0.10	4.0±0.10	0.23±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

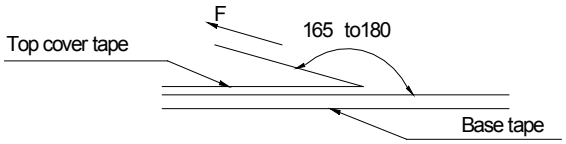


Size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)	D1(mm)
451616	4.70±0.10	1.75±0.10	1.75±0.10	4.0±0.10	0.24±0.05	1.5±0.10
453215	4.70±0.10	3.45±0.10	1.60±0.10	8.0±0.10	0.24±0.05	1.5±0.10

7-3. Packaging Quantity

Chip Size	453215	451616	322513	321611	321609	201212	201209	160808	160806	100505
Chip / Reel	1000	2000	2500	3000	3000	2000	4000	4000	4000	10000
Inner box	4000	8000	12500	15000	15000	10000	20000	20000	20000	50000
Middle box	20000	40000	62500	75000	75000	50000	100000	100000	100000	250000
Carton	40000	80000	125000	150000	150000	100000	200000	200000	200000	500000

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(component level)
To maintain the solderability of terminal electrodes:
1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.

单击下面可查看定价，库存，交付和生命周期等信息

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