Form No: T0000X-1-0000-TBM01-140400755

Specification for Approval

Date: 2014/4/21

Customer : 東莞台慶

TAI-TECH P/N: CPI201210UF-Series

CUSTOMER P/N:

DESCRIPTION:

QUANTITY: pcs

REMARK:		
Customer Approval Feedback		

西 北 臺 慶 科 技 股 份 有 限 公 司

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High Current Ferrite Chip Inductor (Lead Free) CPI201210UF-Series

ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	13/06/06	變更可靠度條件	楊祥忠	羅培君	張嘉玲
2.0	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
備註					

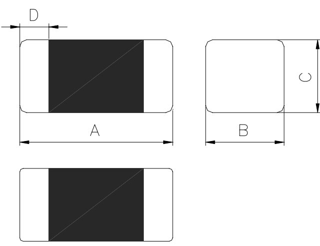
High Current Ferrite Chip Inductor (Lead Free) CPI201210UF-Series

1.Features

1. 2.0x1.25 mm and 1.0 mm in height (very compact size): CAE and fine printing technology made this compact size possible
2. Stable minimum DC resistance in the class.
3. High speed mounting: Using SMT mounter makes less than a second mounting possible.
4. Excellent mounting strength by SMD chip making.
5. Reduced noise over 2/3 of coil inductor by optimal design of CAD

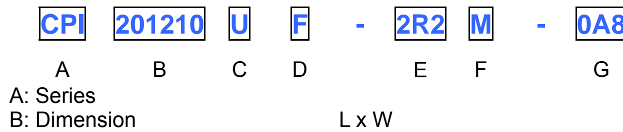
Completely lead-free product and support lead-free solder.

2. Dimensions



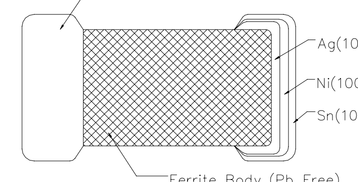
Chip Size				
Series	A(mm)	B(mm)	C(mm)	D(mm)
201210	2.0±0.2	1.25±0.2	1.0 max.	0.5±0.3

3. Part Numbering



A B C D E F G

A: Series
B: Dimension L x W
C: Category Code
D: Material Lead Free Material
E: Inductance 2R2=2.2uH
F: Inductance Tolerance M=±20%
G: Rated Current 0A8=800mA

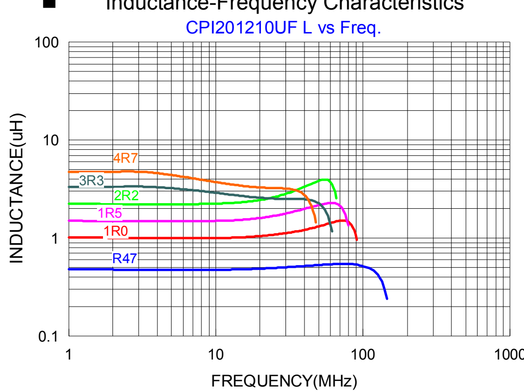


4.Specification

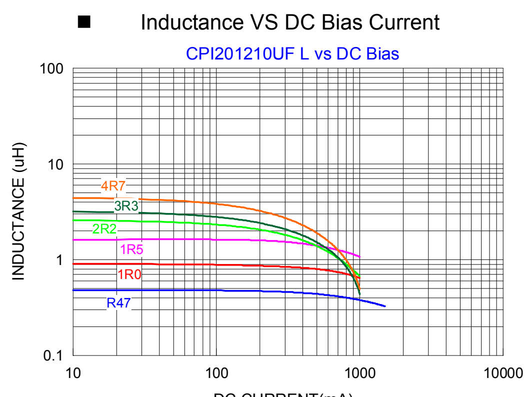
Tai-Tech Part Number	Inductance(uH)	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ω) max.	DCR (Ω) typ.
CPI201210UF-R47M-1A2	0.47±20%	1	1200	0.08	0.06
CPI201210UF-1R0M-1A0	1.0±20%	1	1000	0.14	0.11
CPI201210UF-1R5M-0A8	1.5±20%	1	800	0.20	0.15
CPI201210UF-2R2M-0A8	2.2±20%	1	800	0.20	0.15
CPI201210UF-3R3M-0A7	3.3±20%	1	700	0.24	0.20
CPI201210UF-4R7M-0A7	4.7±20%	1	700	0.28	0.23

● Rated Current： based on temperature rise test

■ Inductance-Frequency Characteristics



■ Inductance VS DC Bias Current



5. Reliability and Test Condition

Item	Performance	Test Condition
Operating Temperature	-40~+85℃ (Including self-temperature rise)	--
Transportation Storage Temperature	-40~+85℃	For long storage conditions, please see the Application Notice
Inductance (Ls)	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.
Resistance to Soldering Heat	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Preheat: 150℃,60sec. Solder: Sn99.5%-Cu0.5% Solder tamperature: 260±5℃ Flux for lead free: Rosin. 9.5% Temperature ramp/immersion and immersion rate: 25±6 mm/s Dip time: 10±1sec. Depth: completely cover the termination.
Solderability	More than 95% of the terminal electrode should be covered with solder.	Preheat: 150℃,60sec. Solder: Sn99.5%-Cu0.5% Solder tamperature: 245±5℃ Flux for lead free: Rosin. 9.5% Depth: completely cover the termination. Dip time: 4±1sec.
Terminal strength	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles) Component mounted on a PCB apply a force (>0805:1kg <=0805:0.5kg)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 shock the component being tested.
Bending	Appearance：No damage. Impedance：within±10% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions:>=0805:40x100x1.2mm <0805:40x100x0.8mm Bending depth:>=0805:1.2mm <0805:0.8mm Duration of 10 sec for a min.
Vibration Test	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles) Oscillation Frequency: 10 2K 10Hz for 20 minutes Equipment： Vibration checker Total Amplitude:1.52mm±10% Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)。
Shock	Appearance：No damage. Impedance：within±15% of initial value Inductance：within±10% of initial value Q：Shall not exceed the specification value. RDC：within ±15% of initial value and shall not exceed the specification value	Test condition:

Type	Peak Value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec
SMD	1,500	0.5	Half-sine	15.4
Lead	100	6	Half-sine	12.3

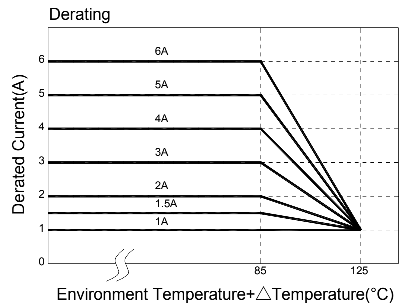
<table>
<tr><th>Item</th><th>Performance</th><th>Test Condition</th></tr>
<tr><td>Life test</td><td rowspan="2">Appearance: no damage.

Impedance: within±15%of initial value.
Inductance: within±10%of initial value.
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Temperature: 125±2℃(bead),
85±2℃(inductor)
Applied current: rated current.
Duration: 1000±12hrs.
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Load Humidity</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Humidity: 85±2%R.H.
Temperature: 85±2℃.
Duration: 1000hrs Min. with 100% rated current.
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Thermal shock</td><td>Appearance: no damage.

Impedance: within±15%of initial value.
Inductance: within±10%of initial value.
Q：Shall not exceed the specification value.
RDC：within ±15% of initial value and shall not exceed the specification value</td><td>Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020D Classification Reflow Profiles)
Condition for 1 cycle
Step1: -40±2℃ 30±5 min.
Step2: 25±2℃ ≦0.5min
Step3: +105±2℃ 30±5min.
Number of cycles: 500
Measured at room temperature after placing for 24±2 hrs.</td></tr>
<tr><td>Insulation Resistance</td><td>IR>1GΩ</td><td>Chip Inductor Only
Test Voltage:100±10%V for 30Sec.</td></tr>
</table>

Derating Curve

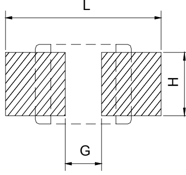
For the ferrite chip bead which withstanding current over 1.5A, as the operating temperature over 85℃, the derating current information is necessary to consider with. For the detail derating of current, please refer to the Derated Current vs. Operating Temperature curve.



6.Soldering and Mounting

6-1. Recommended PC Board Pattern

Chip Size						Land Patterns For Reflow Soldering		
Serie	Type	A(mm)	B(mm)	C(mm)	D(mm)	L(mm)	G(mm)	H(mm)
CPI	201210	2.0±0.20	1.25±0.20	1.0 max.	0.5±0.30	3.00	1.00	1.00



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. 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

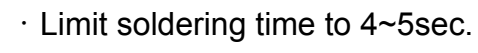
6-2.1 Lead Free Solder re-flow:

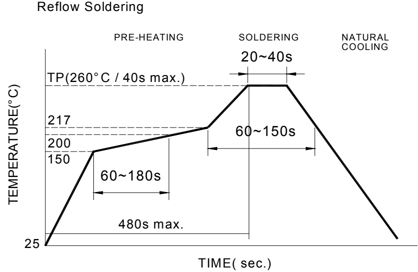
Recommended temperature profiles for lead free re-flow soldering in Figure 1. (Refered to J-STD-020C)

6-2.2 Soldering Iron:

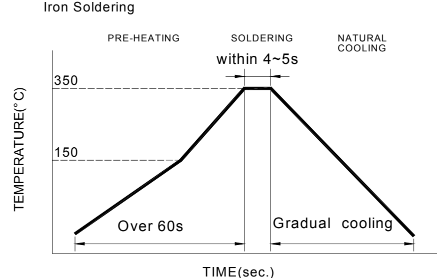
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. If a soldering iron must be employed the following precautions are recommended. for Iron Soldering in Figure 2.

- 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.





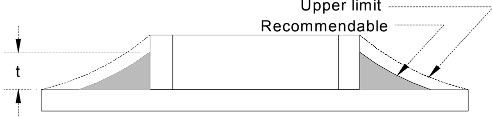
Reflow times: 3 times max
Fig.1



Iron Soldering times：1 times max
Fig.2

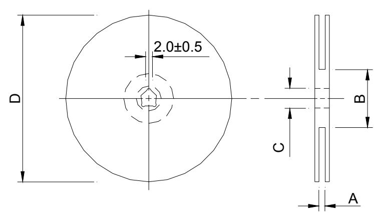
6-2.3 Solder Volume:

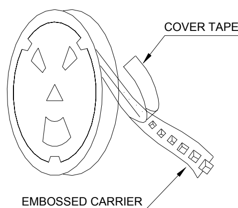
Accordingly increasing the solder volume, the mechanical stress to product is also increased. Exceeding solder volume may cause the failure of mechanical or electrical performance. Solder shall be used not to be exceed as shown in right side:
Minimum fillet height = soldering thickness + 25% product height



7. Packaging Information

7-1. Reel Dimension



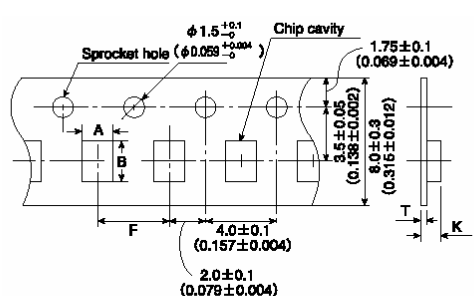


COVER TAPE
EMBOSSED CARRIER

Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	10±1.5	50 or more	13±0.2	178±2.0

7-2 Tape Dimension / 8mm

■Material of taping is plastic

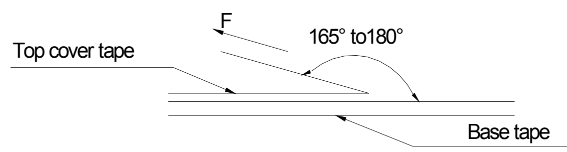


Size	A(mm)	B(mm)	K(mm)	F(mm)	T(mm)
201210	1.55±0.1	2.30±0.1	1.30 max.	4.0±0.1	0.30±0.05

7-3. Packaging Quantity

Chip size	201210
Reel	3000

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.