

Power Inductor

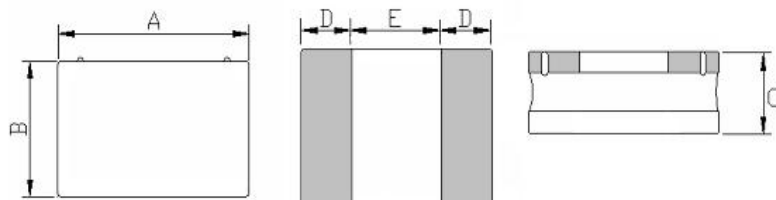
DFP252012TF-100M

1. Features

1. This specification applies Low Profile Power Inductors.
2. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
3. Operating temperature -40~+125°C (Including self - temperature rise)



2. Dimension



| Series | A(mm) | B(mm) | C(mm) | D(mm) | E(mm) |
|-------------|---------------|-----------------|--------|-----------|-----------|
| DFP252012TF | 2.5 -0.1/+0.2 | 2.0 -0.05/+0.35 | 1.2Max | 0.85 ref. | 0.80 ref. |

3. Part Numbering

DFP
252012
TF
-
100
M

A B C D E

- A: Series
 B: Dimension
 C: Lead Free Material
 D: Inductance 100=10.0uH
 E: Inductance Tolerance M=±20%

4. Specification

| TAI-TECH Part Number | Inductance (uH) | Tolerance (%) | Test Frequency (Hz) | DCR (Ω) typ. | DCR (Ω) Max. | I sat (A) typ. | I sat (A) Max. | I rms (A) typ | I rms (A) Max |
|----------------------|-----------------|---------------|---------------------|--------------|--------------|----------------|----------------|---------------|---------------|
| DFP252012TF-100M | 10.0 | ±20% | 0.1V/1M | 0.580 | 0.690 | 1.20 | 1.00 | 1.20 | 1.00 |

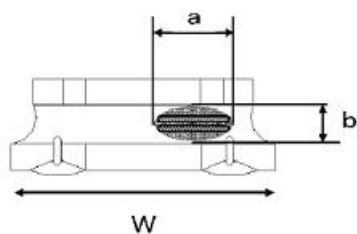
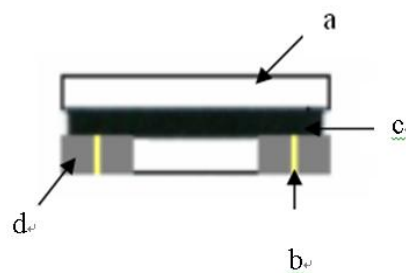
Note:

Isat: Saturation Current (Isat) will cause L0 to drop approximately 30%.

Irms: Heat Rated Current (Irms) will cause the coil temperature rise approximately Δt40°C.

5. Material List

| No. | Description | Specification |
|-----|-------------|----------------------------|
| a. | Core | Ferrite Core |
| b. | Wire | Enameled Copper Wire |
| c. | Glue | Epoxy with magnetic powder |
| d. | Terminal | Ag/Ni/Sn |

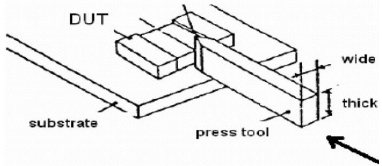


Appearance of exposed wire tolerance limit:

1. Width direction (dimension a) : Acceptable when $a \leq w/2$
Nonconforming when $a > w/2$
2. Length direction (dimension b) : Dimension b is not specified.
3. The total area of exposed wire occurring to each sides is not greater than 50% of coating resin area, and is acceptable.

6. Reliability and Test Condition

| Item | Performance | Test Condition |
|------------------------------------|--|--|
| Operating temperature | -40~+125℃ (Including self - temperature rise) | |
| Storage temperature | 1. -10~+40℃,50~60%RH (Product with taping) 2. -40~+125℃ (on board) | |
| Electrical Performance Test | | |
| Inductance | Refer to standard electrical characteristics list. | HP4284A,CH11025,CH3302,CH1320,CH1320S LCR Meter. |
| DCR | | CH16502,Agilent33420A Micro-Ohm Meter. |
| Saturation Current (Isat) | Approximately Δ L30% | Saturation DC Current (Isat) will cause L0 to drop Δ L(%) (keep quickly). |
| Heat Rated Current (Irms) | Approximately Δ T40℃ | Heat Rated Current (Irms) will cause the coil temperature rise Δ T(℃) without core loss. 1.Applied the allowed DC current(keep 1 min.). 2.Temperature measured by digital surface thermometer |
| Reliability Test | | |
| Life Test | Appearance: No damage. Inductance: within \pm 10% of initial value Q: Shall not exceed the specification value. RDC: within \pm 15% of initial value and shall not exceed the specification value | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles) Temperature: 125 \pm 2℃ Applied current: rated current Duration: 1000 \pm 12hrs Measured at room temperature after placing for 24 \pm 2 hrs |
| Load Humidity | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles) Humidity: 85 \pm 2% R.H. Temperature: 85℃ \pm 2℃ Duration: 1000hrs Min. with 100% rated current Measured at room temperature after placing for 24 \pm 2 hrs |
| Moisture Resistance | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles 1. Baked at50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65 \pm 2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3. Raise temperature to 65 \pm 2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs,keep at 25℃ for 2 hrs then keep at -10℃ for 3 hrs 4. Keep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measure at room temperature after placing for 1~2 hrs. |
| Thermal shock | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020DClassification Reflow Profiles Condition for 1 cycle Step1: -40 \pm 2℃ 30 \pm 5min Step2: 25 \pm 2℃ \cong 0.5min Step3: 125 \pm 2℃ 30 \pm 5min Number of cycles: 500 Measured at room temperature after placing for 24 \pm 2 hrs |
| Vibration | | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDECJ-STD-020DClassification Reflow Profiles) Oscillation Frequency: 10Hz~2KHz~10Hz for 20 minutes Equipment: Vibration checker Total Amplitude:10g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations). |

| Item | Performance | Test Condition | | | | | | | | | | | | | | | |
|------------------------------|---|--|-----------------------|---------------------------|--|-----------------------|---------------------------|-------|----------------|----|-----------|------|------|----|----|-----------|------|
| Bending | Appearance: No damage. | Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec. | | | | | | | | | | | | | | | |
| Shock | 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 | <table border="1"> <thead> <tr> <th>Type</th> <th>Peak value (g's)</th> <th>Normal duration (D) (ms)</th> <th>Wave form</th> <th>Velocity change (V)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> <tr> <td>Lead</td> <td>50</td> <td>11</td> <td>Half-sine</td> <td>11.3</td> </tr> </tbody> </table> | Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (V)ft/sec | SMD | 50 | 11 | Half-sine | 11.3 | Lead | 50 | 11 | Half-sine | 11.3 |
| Type | Peak value (g's) | Normal duration (D) (ms) | Wave form | Velocity change (V)ft/sec | | | | | | | | | | | | | |
| SMD | 50 | 11 | Half-sine | 11.3 | | | | | | | | | | | | | |
| Lead | 50 | 11 | Half-sine | 11.3 | | | | | | | | | | | | | |
| Solder ability | More than 95% of the terminal electrode should be covered with solder. | Preheat: 150℃,60sec. Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245±5℃. Flux for lead free: Rosin. 9.5%. Dip time: 4±1sec. Depth: completely cover the termination | | | | | | | | | | | | | | | |
| Resistance to Soldering Heat | | Depth: completely cover the termination <table border="1"> <thead> <tr> <th>Temperature(℃)</th> <th>Time(s)</th> <th>Temperature ramp/immersion and emersion rate</th> <th>Number of heat cycles</th> </tr> </thead> <tbody> <tr> <td>260 ±5 (solder temp)</td> <td>10 ±1</td> <td>25mm/s ±6 mm/s</td> <td>1</td> </tr> </tbody> </table> | Temperature(℃) | Time(s) | Temperature ramp/immersion and emersion rate | Number of heat cycles | 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | | | | | | | |
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| 260 ±5 (solder temp) | 10 ±1 | 25mm/s ±6 mm/s | 1 | | | | | | | | | | | | | | |
| 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 e | Preconditioning: Run through IR reflow for 2 times.(IPC/JEDEC J-STD-020Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, 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 apply a shock to the component being tested.  | | | | | | | | | | | | | | | |

Note : When there are questions concerning measurement result : measurement shall be made after 48 ± 2 hours of recovery under the standard condition

7. Soldering and Mounting

7-1. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH terminations are suitable for all wave and re-flow soldering systems. If hand soldering cannot be avoided, the preferred technique is the utilization of hot air soldering tools.

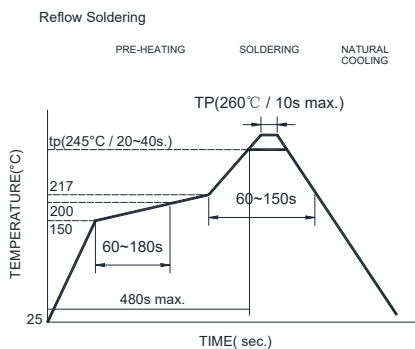
7-1.1 Solder re-flow:

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

7-1.2 Soldering Iron(Figure 2):

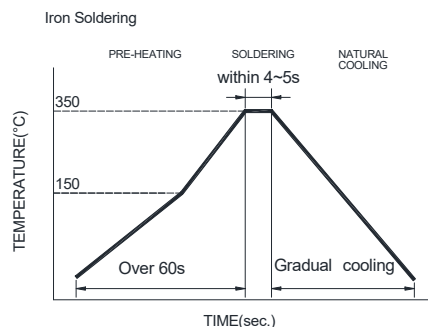
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- Preheat circuit and products to 150°C
- Never contact the ceramic with the iron tip
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- 355°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.



Reflow times: 3 times max.

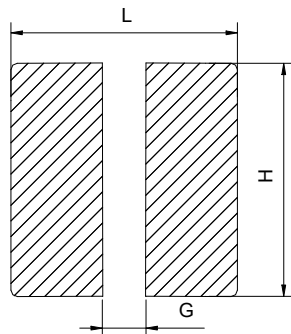
Fig.1



Iron Soldering times: 1 times max.

Fig.2

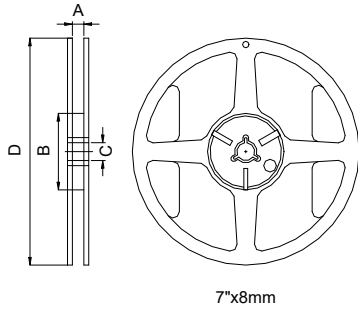
7-2. Recommended PC Board Pattern



| L(mm) | G(mm) | H(mm) |
|-------|-------|-------|
| 2.9 | 0.8 | 2.4 |

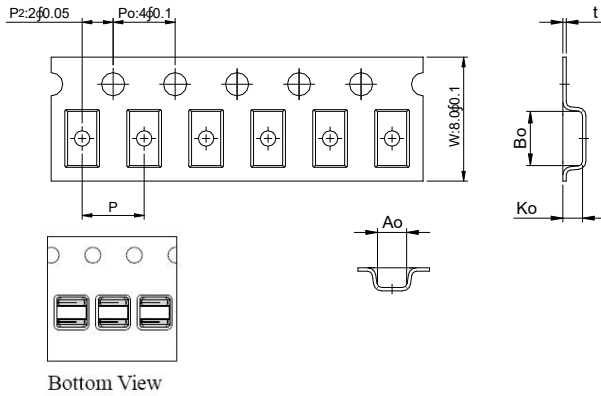
8. Packaging Information

8-1. Reel Dimension



| Type | A(mm) | B(mm) | C(mm) | D(mm) |
|--------|---------|---------|--------|-------|
| 7"x8mm | 8.4±1.0 | 50 min. | 13±0.8 | 178±2 |

8-2. Tape Dimension / 8mm

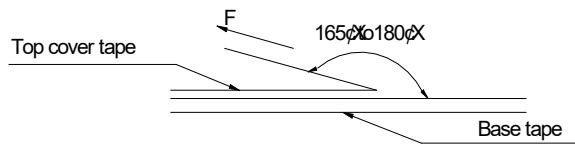


| Series | Size | Bo(mm) | Ao(mm) | Ko(mm) | P(mm) | t(mm) |
|--------|--------|----------|----------|----------|---------|-----------|
| DFP | 252012 | 3.10±0.1 | 2.45±0.1 | 1.40±0.1 | 4.0±0.1 | 0.23±0.05 |

8-3. Packaging Quantity

| | |
|-------------|--------|
| Chip size | 252012 |
| Chip / Reel | 2000 |

8-4. Tearing Off Force



The force for tearing off cover tape is 10 to 100 grams in the arrow direction under the following conditions.

| Room Temp. (°C) | 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-020D standard-MSL, level 1.
 2. Temperature and humidity conditions: Less than 40°C and 60% RH.
 3. Recommended products should be used within 12 months form 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.

9. Typical Performance Curve

