

# Wire Wound Type Common Mode Filter

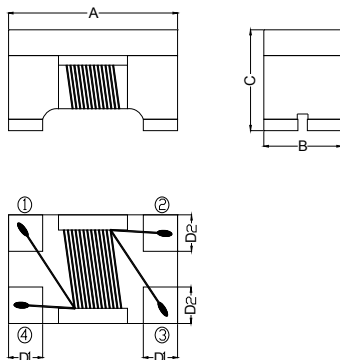
WCM4532F2SF-142T20-HI

## 1. Features

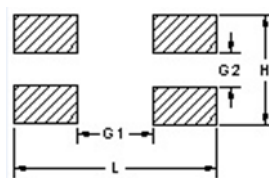
1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM4532F2SF series realizes small size and low profile. 4.5x3.2x2.8 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. Operating temperature-40~+125°C (Including self - temperature rise)



## 2. Dimension



Recommended PC Board Pattern



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	L(mm)	H(mm)	G1(mm)	G2(mm)
4532F2SF	4.5±0.2	3.2±0.2	2.8±0.2	0.90±0.15	1.05±0.15	5.0	3.6	3.0	1.2

Units: mm

## 3. Part Numbering

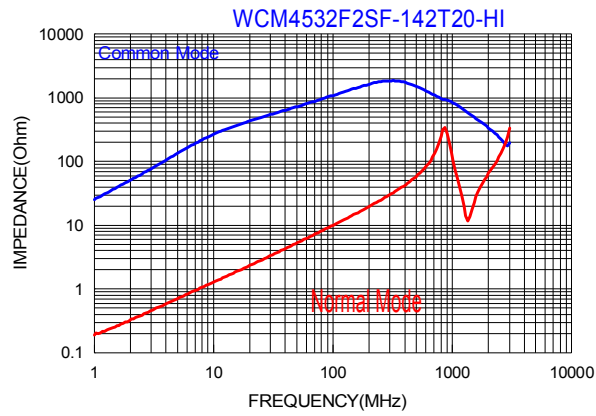


- A: Series  
 B: Dimension  
 C: Material            Ferrite Core  
 D: Number of Lines    2=2 lines  
 E: Type                 S=Shielded , N=Unshielded  
 F: Lead free  
 G: Impedance            142=1400Ω  
 H: Packaging             T=Taping and Reel  
 I: Rated Current        20=2000mA  
 J: Control S/N

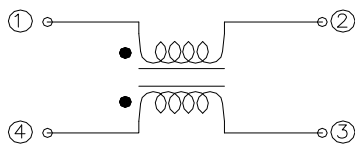
## 4. Specification

TAI-TECH Part Number	Common mode Impedance (Ω)		Test Frequency (MHz)	DC Resistance (Ω) max.	Rated Current (mA) max.	Rated Volt. (Vdc) max.	Withstand Volt. (Vdc) max.	IR (Ω) min.
WCM4532F2SF-142T20-HI	1000 min.	1400 typ.	100	0.100	2000	50	125	10M

Note: When current is applied , the temperature of the part should not exceed 125°C

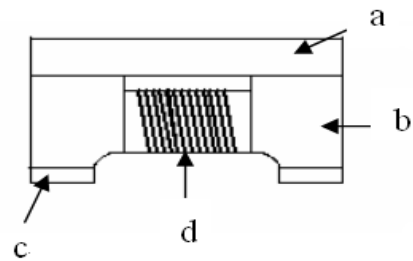


5. Schematic Diagram



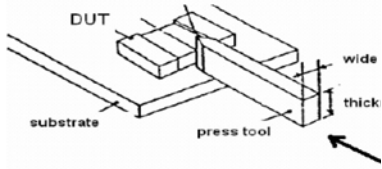
6. Materials

No.	Description	Specification
a.	Upper Plate	Ferrite
b.	Core	Ferrite Core
c.	Termination	Ag/Ni/Sn
d.	Wire	Enameled Copper Wire



## 7. Reliability and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature and Humidity range	-40~+125℃ (on board)	
<b>Electrical Performance Test</b>		
Z(common mode)	Refer to standard electrical characteristics list.	Agilent-4291A+ Agilent -16197A
DCR		Agilent-4338B
I.R.		Agilent4339
Temperature Rise Test	Rated Current , $\Delta T : 40^{\circ}C$ typ.	1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer
<b>Reliability Test</b>		
Life Test	Appearance : No damage. Impedance : within $\pm 15\%$ of initial value 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/JEDECJ-STD-020DClassification Reflow Profiles) Temperature : $125 \pm 2^{\circ}C$ (Inductor) Applied current : rated current Duration : $1000 \pm 12$ hrs Measured at room temperature after placing for $24 \pm 2$ hrs.
Low Temperature Unload Life Test		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DClassification Reflow Profiles) Temperature: $-40 \pm 2^{\circ}C$ Time: $500 \pm 8$ hr. Recovery: 4 to 24hrs of recovery under the standard condition after the removal from test chamber.
Load Humidity		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDECJ-STD-020DClassification Reflow Profiles) Humidity : $85 \pm 2\%$ R.H, Temperature : $85^{\circ}C \pm 2^{\circ}C$ 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/JEDECJ-STD-020DClassification Reflow Profiles) 1. Baked at $50^{\circ}C$ for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to $65 \pm 2^{\circ}C$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}C$ in 2.5hrs. 3. Raise temperature to $65 \pm 2^{\circ}C$ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to $25^{\circ}C$ in 2.5hrs, keep at $25^{\circ}C$ for 2 hrs then keep at $-10^{\circ}C$ for 3 hrs 4. Keep at $25^{\circ}C$ 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/JEDECJ-STD-020DClassification Reflow Profiles) Condition for 1 cycle Step1 : $-40 \pm 2^{\circ}C$ 30 $\pm$ 5min Step2 : $25 \pm 2^{\circ}C$ $\leq$ 0.5min Step3 : $125 \pm 2^{\circ}C$ 30 $\pm$ 5min Number of cycles : 500 Measured at room fempraturc after placing for $24 \pm 2$ hrs.
Vibration		Preconditioning: Run through IR reflow for 2 times.( IPC/JEDECJ-STD-020DClassification Reflow Profiles) Oscillation Frequency: 10~2K~10Hz for 20 minutes Equipment : Vibration checker Total Amplitude: $1.52mm \pm 10\%$ Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)

Item	Performance	Test Condition														
Bending	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	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		<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 (Vi)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 (Vi)ft/sec	SMD	50	11	Half-sine	11.3	Lead	50	11	Half-sine
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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°C,60sec.。 Solder: Sn96.5% Ag3% Cu0.5% Temperature: 245±5°C 。 Flux for lead free: Rosin. 9.5% 。 Dip time: 4±1sec 。 Depth: completely cover the termination														
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	Depth: completely cover the termination <table border="1"> <thead> <tr> <th>Temperature(°C)</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(°C)	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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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-020DClassification 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.														
																

## 8. Soldering and Mounting

### 8-1. 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.

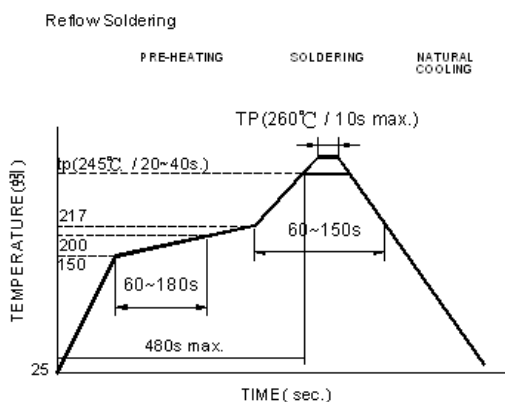
#### 8-1.1 Solder re-flow:

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

#### 8-1.2 Soldering Iron(Figure 2):

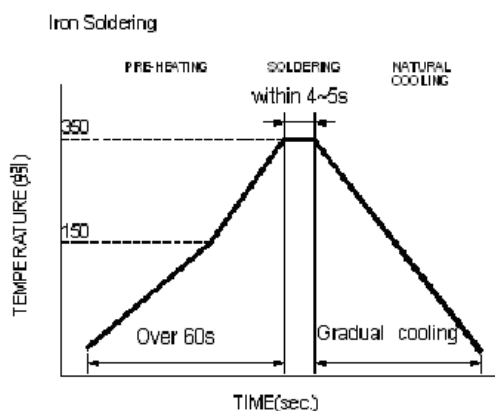
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- 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
- 350°C tip temperature (max)
- 1.0mm tip diameter (max)
- Limit soldering time to 4~5 sec.



Reflow times: 3 times max.

Fig.1

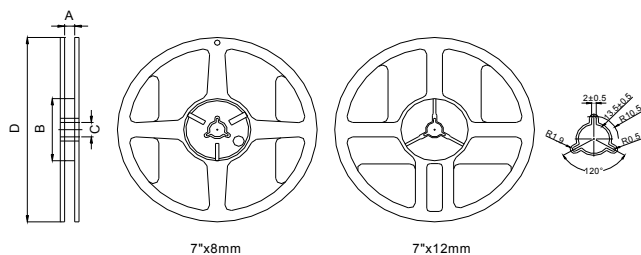


Iron Soldering times: 1 times max.

Fig.2

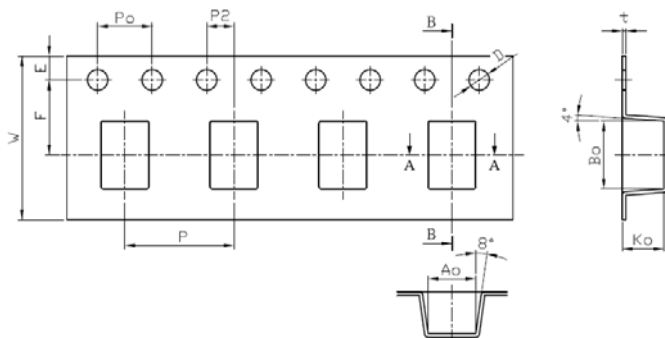
## 9. Packaging Information

### 9-1. Reel Dimension



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

### 9-2. Tape Dimension / 12mm

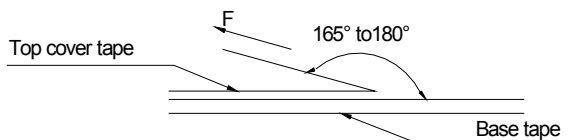


Series	P(mm)	Po(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	E(mm)	F(mm)	W(mm)	t(mm)
WCM4532F2S	8.00±0.10	4.00±0.10	2.00±0.05	4.90±0.10	3.60±0.10	3.00±0.10	1.05+0.10/-0.00	1.75±0.10	5.50±0.05	12.00±0.10	0.26±0.05

### 9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM4532F2S	500	2000	10000	20000

### 9-4. Tearing Off Force



The force for tearing off cover tape is 15 to 80 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.