

# Wire Wound Type Common Mode Filter

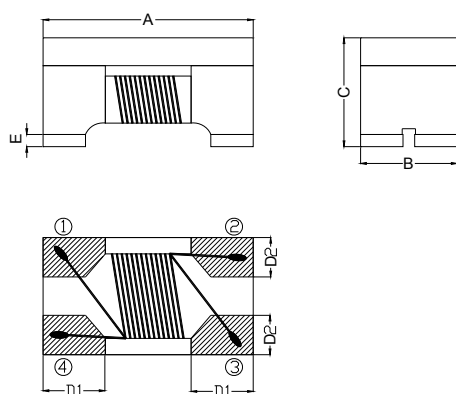
WCM3225F2SF-SERIES

## 1. Features

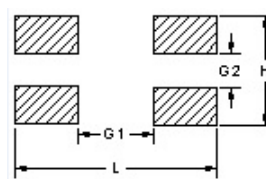
1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM3225F2SF series realizes small size and low profile. 3.2x2.5x2.2 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. Operating temperature-40~+125°C (Including self - temperature rise)



## 2. Dimension



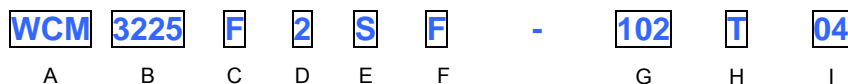
Recommended PC Board Pattern



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)	G1(mm)	G2(mm)	H(mm)	L(mm)
3225F2SF	3.2±0.2	2.5±0.2	2.2±0.2	0.8±0.1	0.9±0.1	0.15±0.1	1.6	0.6	3.5	4.4

Units: mm

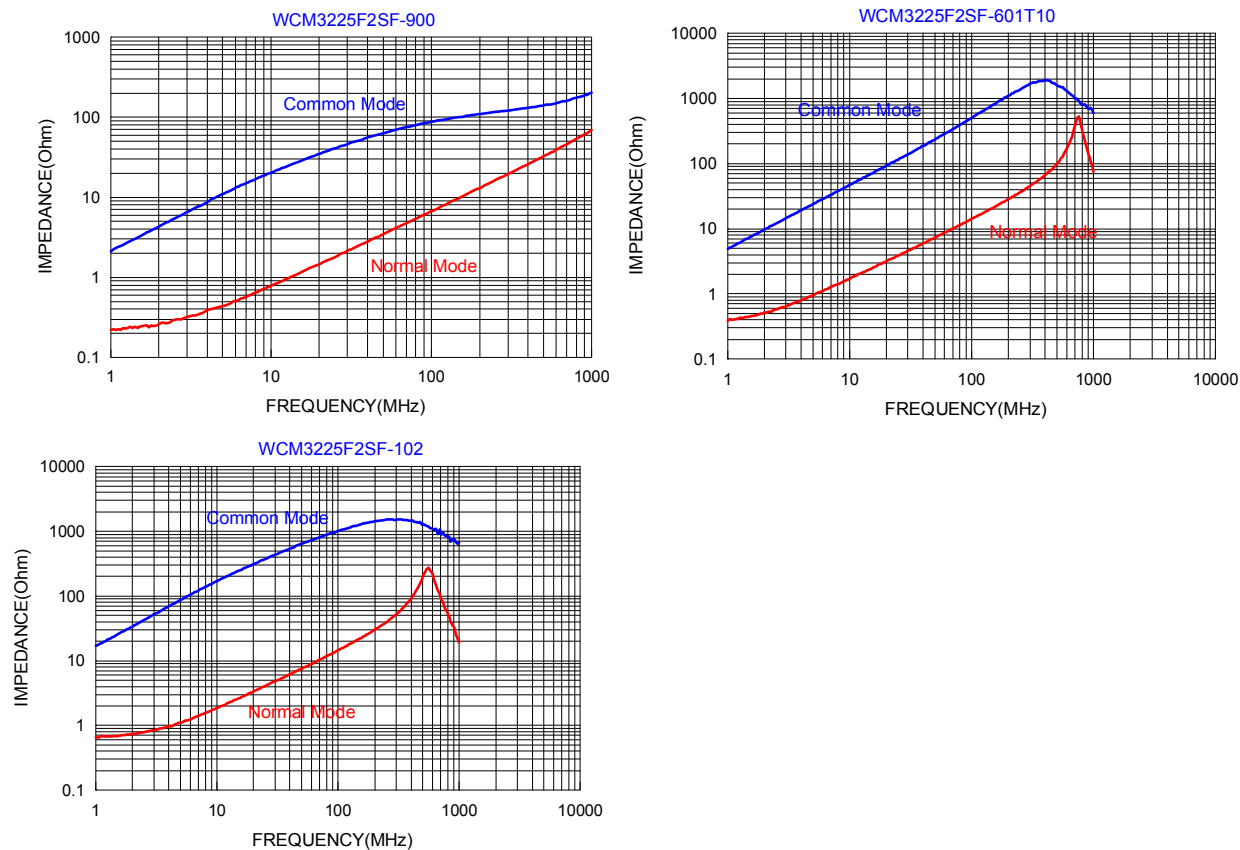
## 3. Part Numbering



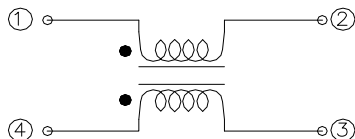
- A: Series  
 B: Dimension  
 C: Material            Ferrite Core  
 D: Number of Lines    2=2 lines  
 E: Type                 S=Shielded , N=Unshielded  
 F: Lead free type  
 G: Impedance            102=1000Ω  
 H: Packaging             T=Taping and Reel  
 I: Rated Current         04=400mA

## 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.
WCM3225F2SF-900T10	90±25%	100	0.050	1000	50	125	10M
WCM3225F2SF-601T10	600±25%	100	0.20	1000	50	125	10M
WCM3225F2SF-102T04	1000±25%	100	0.30	400	50	125	10M

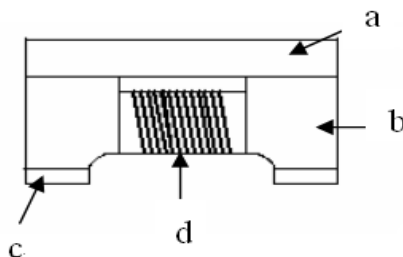


### 5. Schematic Diagram



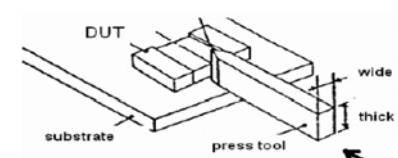
### 6. Materials

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°C (Including self - temperature rise)	
Storage temperature	-40~+125°C (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 < 1A $\Delta T$ 20°C Max Rated Current $\geq$ 1A $\Delta T$ 40°C Max	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°C 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/JEDECJ-STD-020DClassification Reflow Profiles) Humidity : 85 $\pm$ 2% R.H, Temperature : 85°C $\pm$ 2°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 at50°C for 25hrs, measured at room temperature after placing for 4 hrs. 2. Raise temperature to 65 $\pm$ 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs. 3. Raise temperature to 65 $\pm$ 2°C 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25°C in 2.5hrs,keep at 25°C for 2 hrs then keep at -10°C for 3 hrs 4. Keep at 25°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°C 30 $\pm$ 5min Step2 : 25 $\pm$ 2°C $\leq$ 0.5min Step3 : 125 $\pm$ 2°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	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	<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
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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		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 e	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.

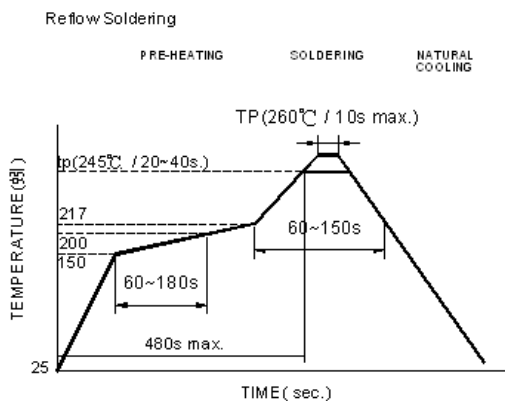
#### 8-1.1 Solder re-flow:

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

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

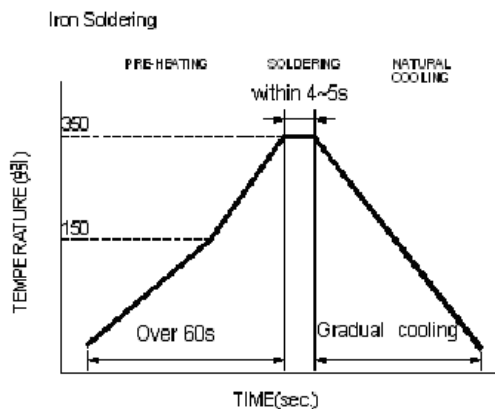
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- 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

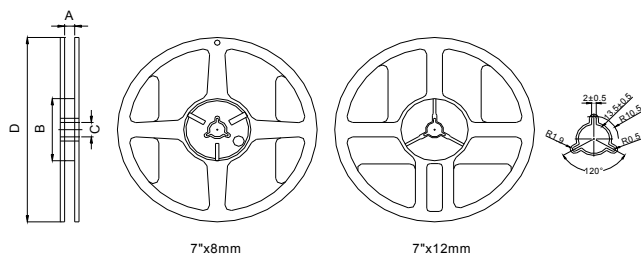


Iron Soldering times: 1 times max.

Fig.2

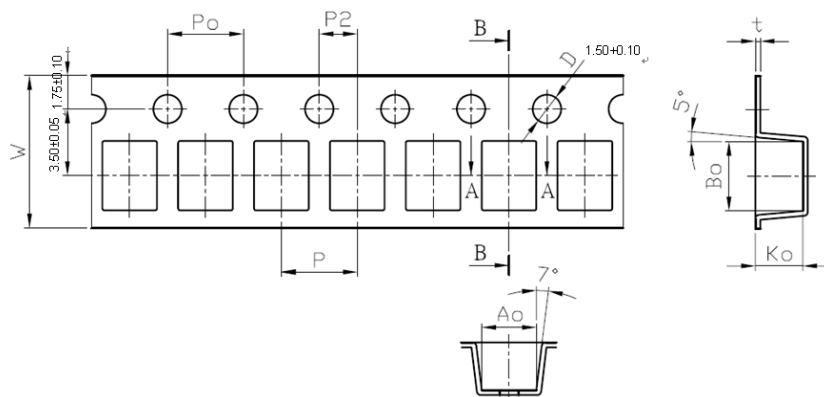
### 9. Packaging Information

#### 9-1. Reel Dimension



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

#### 9-2. Tape Dimension / 8mm

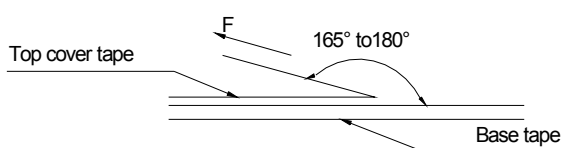


Series	P(mm)	Po(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	W(mm)	t(mm)
WCM3225	4.00±0.10	4.00±0.10	2.00±0.05	3.65±0.10	2.88±0.10	2.50±0.10	8.00±0.10	0.26±0.05

#### 9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM3225F2S	2000	10000	50000	100000

#### 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:
  - TAI-TECH products meet IPC/JEDEC J-STD-020D standard-MSL, level 1.
  - Temperature and humidity conditions: Less than 40°C and 60% RH.
  - Recommended products should be used within 12 months form the time of delivery.
  - The packaging material should be kept where no chlorine or sulfur exists in the air.
- Transportation
  - Products should be handled with care to avoid damage or contamination from perspiration and skin oils.
  - The use of tweezers or vacuum pick up is strongly recommended for individual components.
  - Bulk handling should ensure that abrasion and mechanical shock are minimized.