

## Wire Wound Type Common Mode Filter

WCM2012F2SF-SERIES

## ECN HISTORY LIST

REV	DATE	DESCRIPTION	APPROVED	CHECKED	DRAWN
1.0	14/07/14	新發行	楊祥忠	林志鴻	林宜蒨
備註					

# Wire Wound Type Common Mode Filter

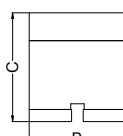
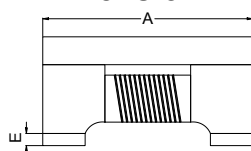
WCM2012F2SF-SERIES

## 1.Features

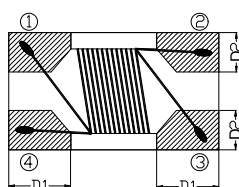
1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM2012F2SF series realizes small size and low profile. 2.0x1.2x1.2 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.



## 2.Dimension

當破損面積 $<0.3\text{mm}^2$ ,產品列入允收品範圍

產品破損寬度



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)
2012F2SF	2.0±0.2	1.2±0.2	1.2±0.2	0.55±0.1	0.46±0.1	0.15±0.1

## 3.Part Numbering

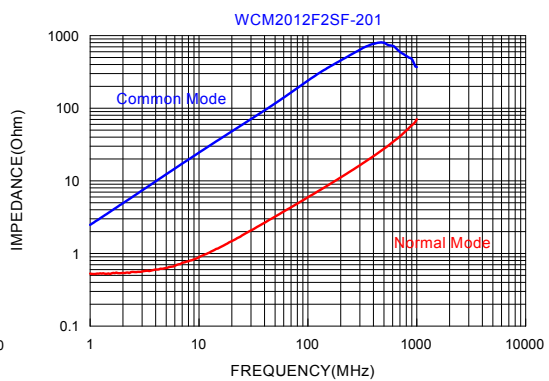
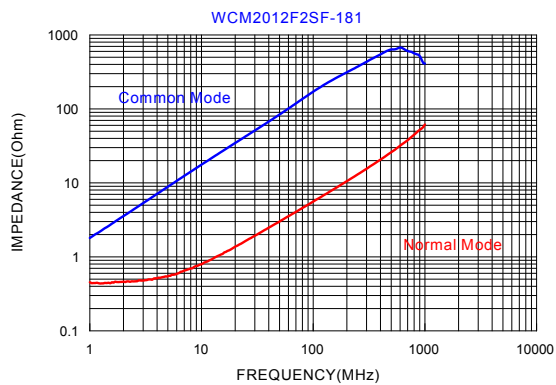
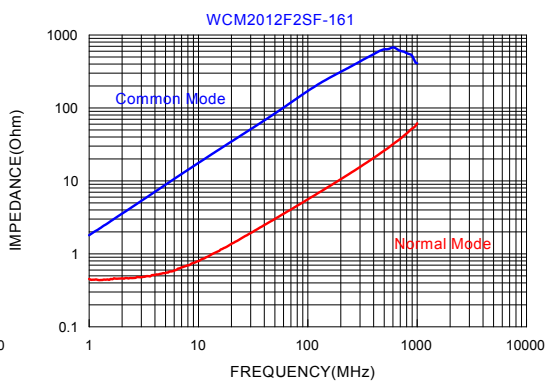
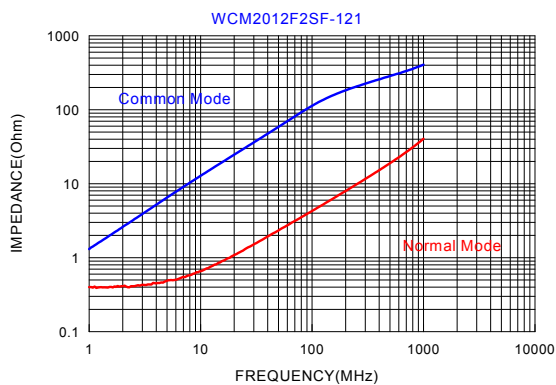
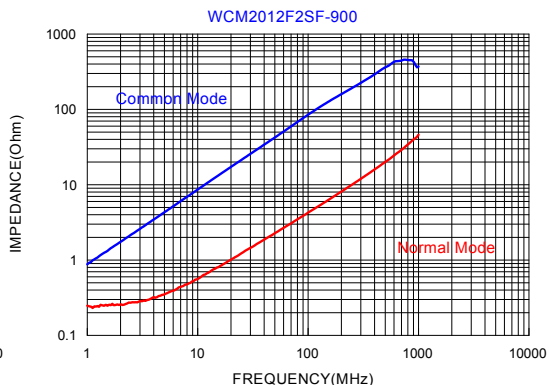
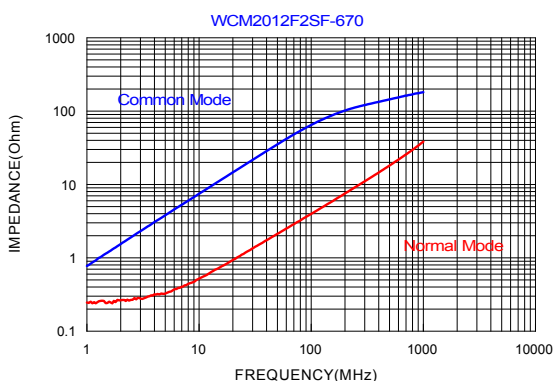


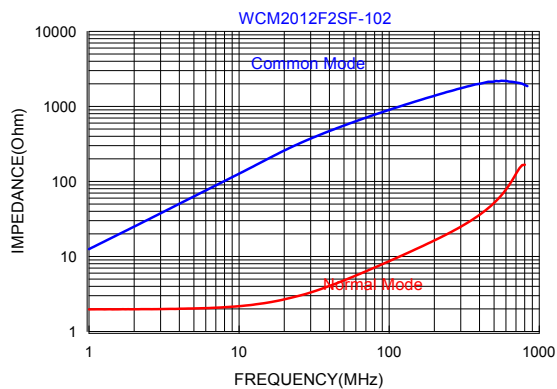
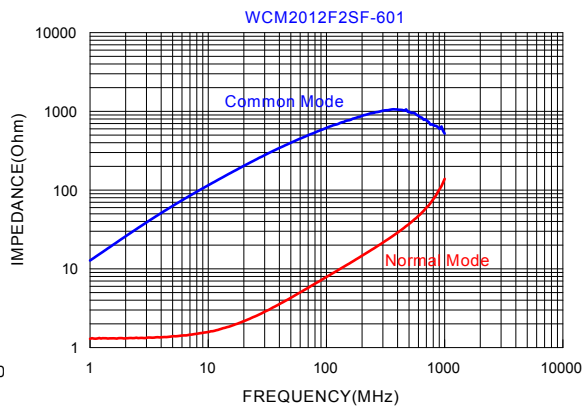
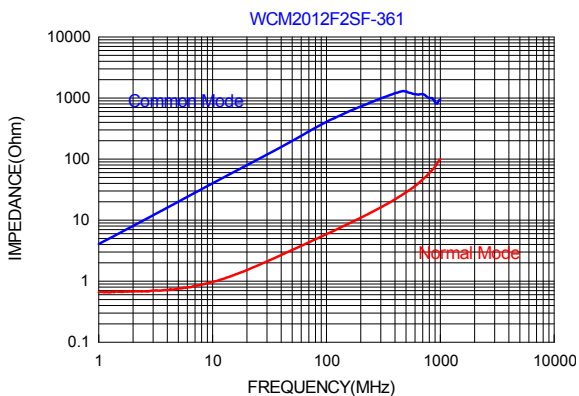
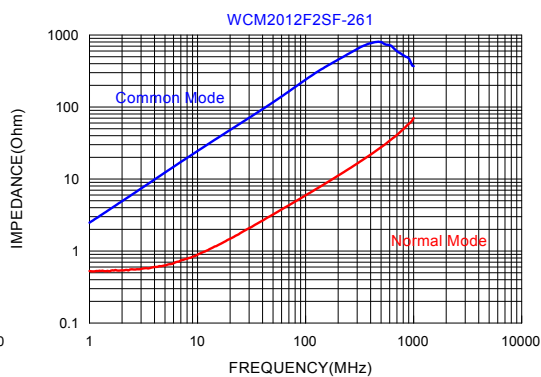
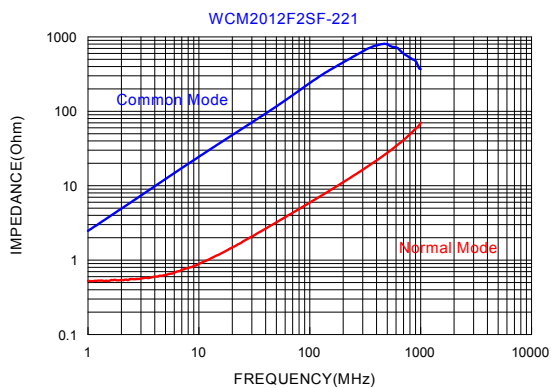
- A: Series  
 B: Dimension  
 C: Material                      Ferrite Core  
 D: Number of Lines          2=2 lines  
 E: Type                            S=Shielded , N=Unshielded  
 F: Lead free  
 G: Impedance                  900=90Ω  
 H: Packaging                      T=Taping and Reel  
 I: Rated Current                04=400mA

## 4.Specification

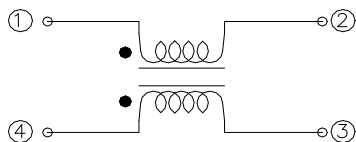
TAI-TECH Part Number	Common mode Impedance (Ω)	Test Frequency (MHz)	DC Resistance (Ω) max.	Rated Current (mA)max.	Rated Volt. (Vdc)max.	Withstand Volt. (Vdc) max.	IR (Ω) min.
WCM2012F2SF-670T04	67±25%	100	0.25	400	50	125	10M
WCM2012F2SF-900T04	90±25%	100	0.30	400	50	125	10M
WCM2012F2SF-121T04	120±25%	100	0.30	400	50	125	10M
WCM2012F2SF-161T03	160±25%	100	0.35	350	50	125	10M
WCM2012F2SF-181T03	180±25%	100	0.35	350	50	125	10M
WCM2012F2SF-201T03	200±25%	100	0.40	300	50	125	10M
WCM2012F2SF-221T03	220±25%	100	0.40	300	50	125	10M
WCM2012F2SF-261T03	260±25%	100	0.40	300	50	125	10M
WCM2012F2SF-361T03	360±25%	100	0.50	300	50	125	10M
WCM2012F2SF-601T03	600±25%	100	0.88	300	50	125	10M
WCM2012F2SF-102T01	1000±25%	100	1.3	100	50	125	10M

### Typical Impedance v.s. Frequency Curve



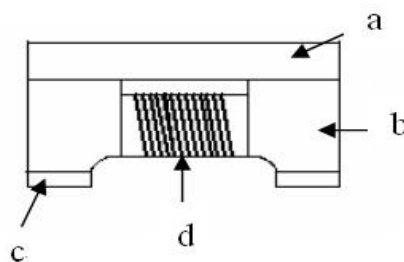


### 5.Schematic Diagram



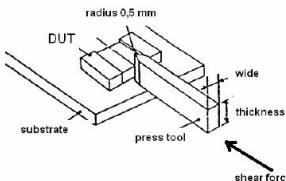
## 6. Materials

No.	Description	Specification
a.	Upper Plate	Ferrite
b.	Core	Ferrite Core
c.	Termination	Tin (Pb Free)
d.	Wire	Enameled Copper Wire



## 7. Reliability and Test Condition

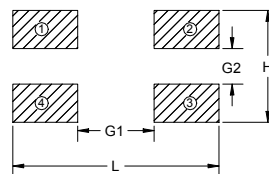
Item	Performance	Test Condition
<b>Electrical Characteristics Test</b>		
Z(common mode)	Refer to standard electrical characteristics list.	Agilent-4291A+ Agilent -16197A
DCR		Agilent-4338B
I.R.		Agilent4339
Operating Temperature	-40°C~+125°C	
Storage Temperature(on board)		
Temperature Rise Test	Rated Current < 1A $\Delta T$ 20°C Max Rated Current $\cong$ 1A $\Delta T$ 40°C Max	1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer
<b>Mechanical Performance Test</b>		
Solderability Test	More than 95% of terminal electrode should be covered with solder.	Preheat: 150°C, 60sec. ° Solder: Sn99.5%-Cu0.5% ° Temperature: 245±5°C ° Flux for lead free: Rosin. 9.5% ° Dip time: 4±1sec ° Depth: completely cover the termination

Item	Performance	Test Condition								
Solder Heat Resistance		<table border="1" data-bbox="1061 320 1425 421"> <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> <p>Depth: completely cover the termination</p>	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
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							
Terminal Strength	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	<p>Preconditioning:Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DCclassification Reflow Profiles</p> <p>With the component mounted on a PCB with the device to be tested, apply a force (&gt;0805:1kg , &lt;=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.</p> 								
<b>Reliability Test</b>										
Life Test		<p>Preconditioning:Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DCclassification Reflow Profiles</p> <p>Temperature : 125±2°C (Bead)</p> <p>Temperature : 85±2°C (Inductor)</p> <p>Applied current : rated current</p> <p>Duration : 1000±12hrs</p> <p>Measured at room temperature after placing for 24±2 hrs</p>								
Thermal shock	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	<p>Preconditioning:Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DCclassification Reflow Profiles</p> <p>Step1 : -40±2°C 30±5min</p> <p>Step2 : 25±2°C ≤0.5min</p> <p>Step3 : 105±2°C 30±5min</p> <p>Number of cycles : 500</p> <p>Measured at room temperature after placing for 24±2 hrs</p>								
Humidity Resistance Test		<p>Preconditioning:Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DCclassification Reflow Profiles</p> <p>Humidity : 85±2% R.H,</p> <p>Temperature : 85°C±2°C</p> <p>Duration : 1000hrs Min. with 100% rated current</p> <p>Measured at room temperature after placing for 24±2 hrs</p>								
Vibration Test		<p>Preconditioning:Run through IR reflow for 2 times.( IPC/JEDEC J-STD-020DCclassification Reflow Profiles</p> <p>Oscillation Frequency: 10~2K~10Hz for 20 minutes</p> <p>Equipment : Vibration checker</p> <p>Total Amplitude:1.52mm±10%</p> <p>Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) °</p>								

## 8.Soldering and Mounting

### 8-1. Recommended PC Board Pattern

	WCM2012F2S/F2N	WCM3216F2S/F2N
L	2.60	3.70
H	1.25	1.60
G1	1.10	1.90
G2	0.45	0.40



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

Products shall be positioned in the sideways direction to against the mechanical stress to prevent failure.

### 8-2. 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.

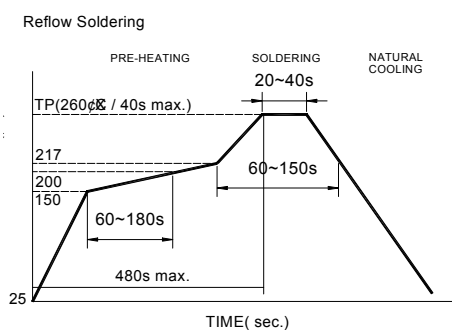
#### 8-2.1 Lead Free Solder re-flow:

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

#### 8-2.2 Soldering Iron(Figure 2):

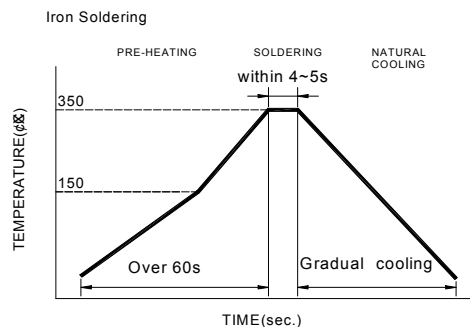
Products attachment with a soldering iron is discouraged due to the inherent process control limitations. In the event that a soldering iron must be employed the following precautions are recommended.

- 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

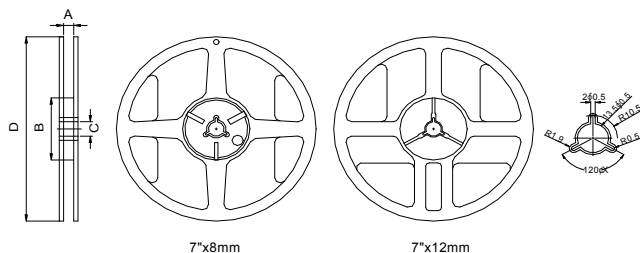


Iron Soldering times: 1 times max.

Fig.2

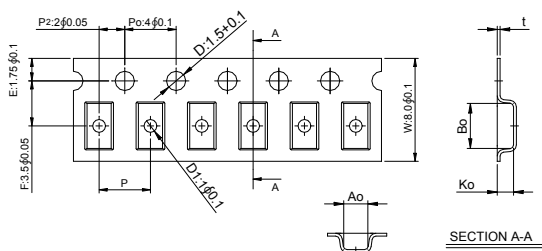
## 9. Packaging Information

### 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

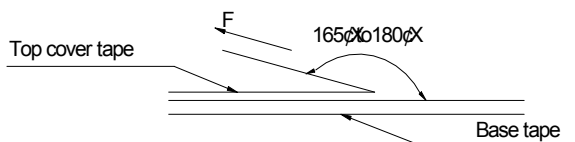


Series	size	Bo(mm)	Ao(mm)	Ko(mm)	P(mm)	t(mm)
WCM2012F2S	201212	2.25±0.1	1.50±0.1	1.45±0.1	4.0±0.1	0.24±0.05
WCM3216F2S	321620	3.50±0.1	1.88±0.1	2.10±0.1	4.0±0.1	0.22±0.05
WCM2012F2N	201209	2.50±0.1	1.60±0.1	1.25±0.1	4.0±0.1	0.22±0.05
WCM3216F2N	321615	3.50±0.1	1.88±0.1	1.80±0.1	4.0±0.1	0.22±0.05

### 9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM2012F2S/F2N	2000	10000	50000	100000
WCM3216F2S/F2N	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:
  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.