

# Wire Wound Type Common Mode Filter

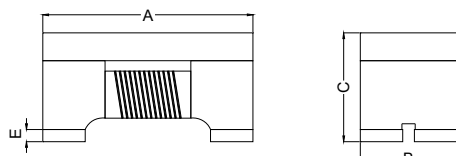
WCM2012F2SV-SERIES

## 1. Features

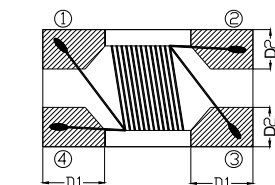
1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM2012F2SV series realizes small size and low profile. 2.0x1.2x1.2 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature-55~+125°C (Including self - temperature rise)



## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)
2012F2SV	2.0±0.2	1.2±0.2	1.2±0.2	0.50±0.1	0.51±0.1	0.15±0.1



## 3. Part Numbering

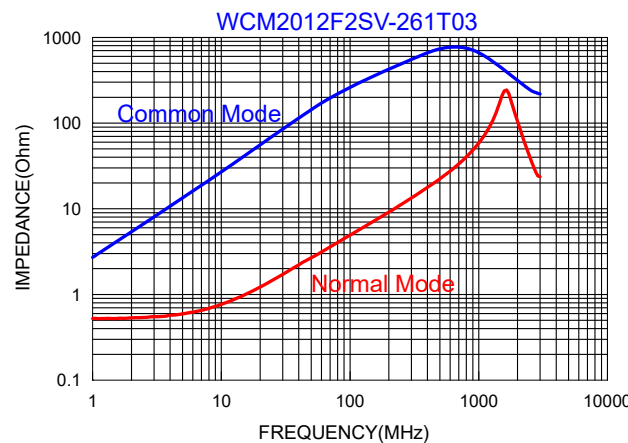
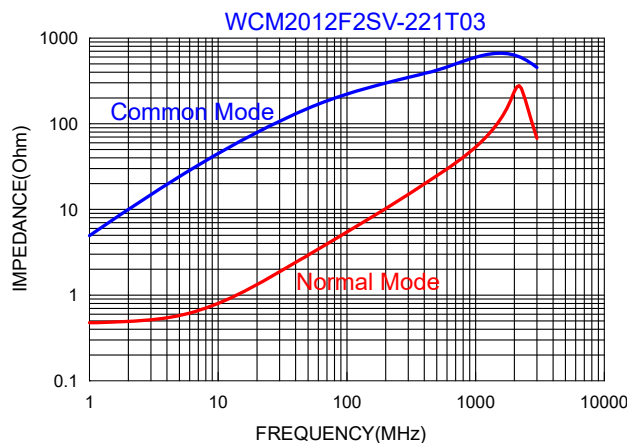
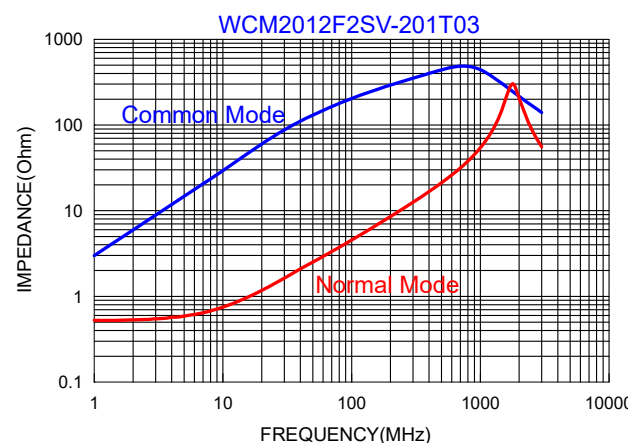
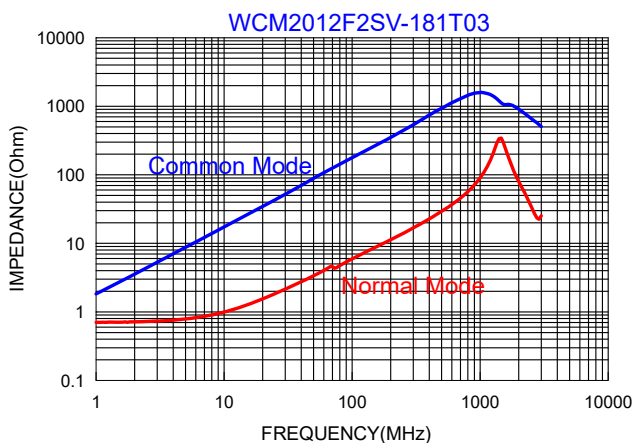
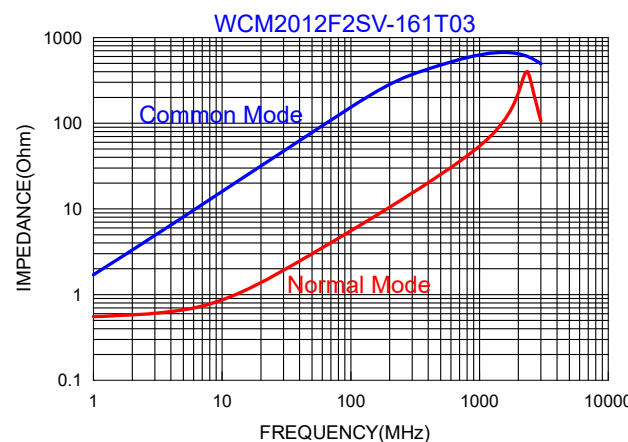
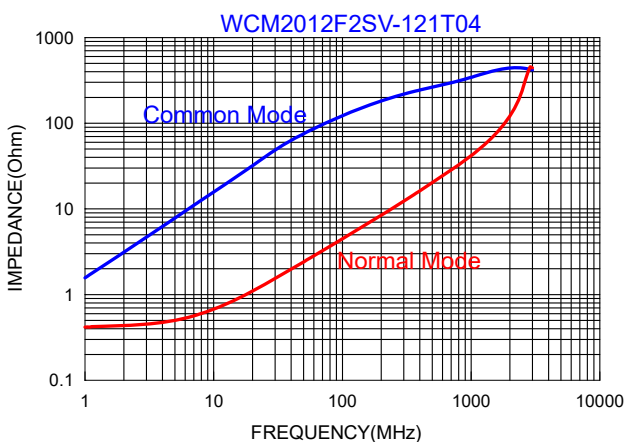
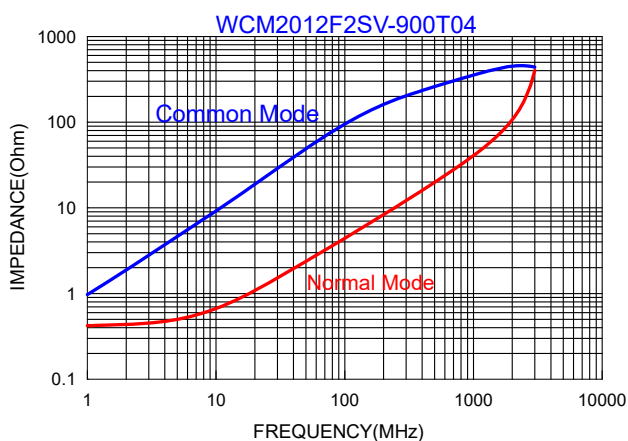
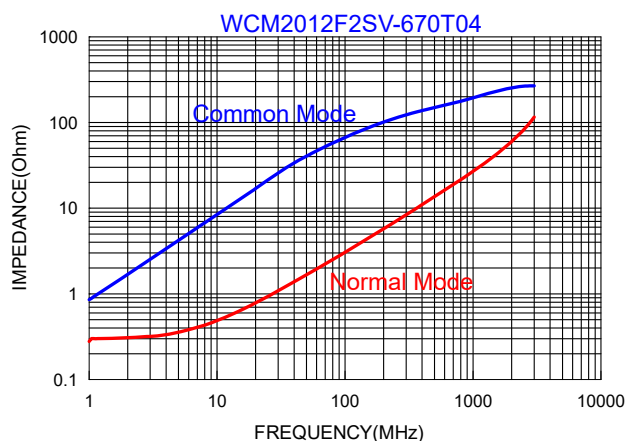


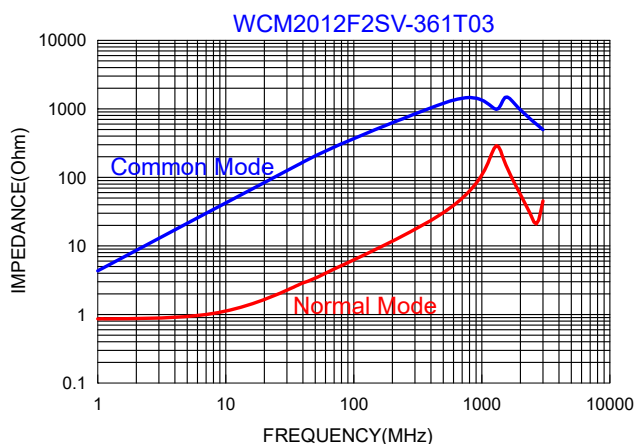
A: Series	
B: Dimension	
C: Material	Ferrite Core
D: Number of Lines	2=2 lines
E: Type	S=Shielded , N=Unshielded
F: Category Code	V=Vehicle
G: Impedance	900=90Ω
H: Packaging	T=Taping and Reel
I: Rated Current	04=400mA

## 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.
WCM2012F2SV-670T04	67±25%	100	0.25	400	50	125	10M
WCM2012F2SV-900T04	90±25%	100	0.30	400	50	125	10M
WCM2012F2SV-121T04	120±25%	100	0.30	400	50	125	10M
WCM2012F2SV-161T03	160±25%	100	0.35	350	50	125	10M
WCM2012F2SV-181T03	180±25%	100	0.35	350	50	125	10M
WCM2012F2SV-201T03	200±25%	100	0.40	300	50	125	10M
WCM2012F2SV-221T03	220±25%	100	0.40	300	50	125	10M
WCM2012F2SV-261T03	260±25%	100	0.40	300	50	125	10M
WCM2012F2SV-361T03	360±25%	100	0.50	300	50	125	10M

### Typical Impedance v.s. Frequency Curve





### 3. Part Numbering

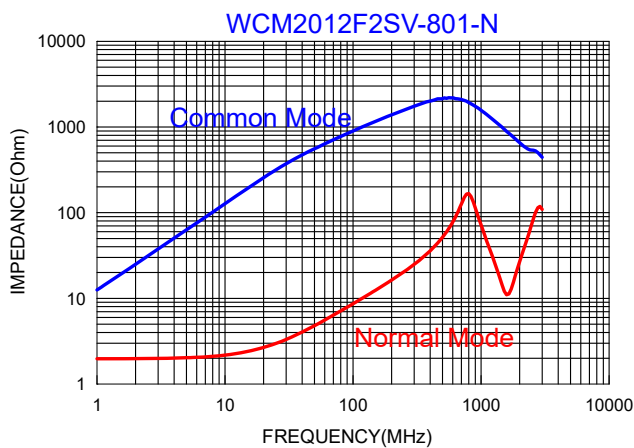
WCM 2012 F 2 S V - 801 - N  
 A            B            C            D            E            F            G            H

- A: Series
- B: Dimension
- C: Material            Ferrite Core
- D: Number of Lines    2=2 lines
- E: Type                S=Shielded , N=Unshielded
- F: Category Code      V=Vehicle
- G: Impedance         801=800Ω
- H: Category Code     N=DR-N45 材&SP-N45 材

### 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.
WCM2012F2SV-801-N	800±25%	100	0.88	300	50	125	10M

### Typical Impedance v.s. Frequency Curve



# Wire Wound Type Common Mode Filter

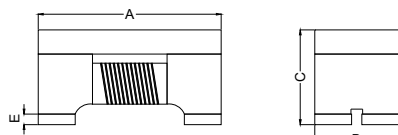
WCM3216F2SV-SERIES

## 1. Features

1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM3216F2SV series realizes small size and low profile. 3.2x1.6x2.0 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature-55~+125°C (Including self - temperature rise)

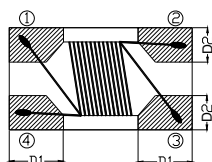


## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)
3216F2SV	3.2±0.2	1.6±0.2	2.0±0.2	0.5±0.1	0.5±0.1	0.15±0.1

Units: mm



## 3. Part Numbering

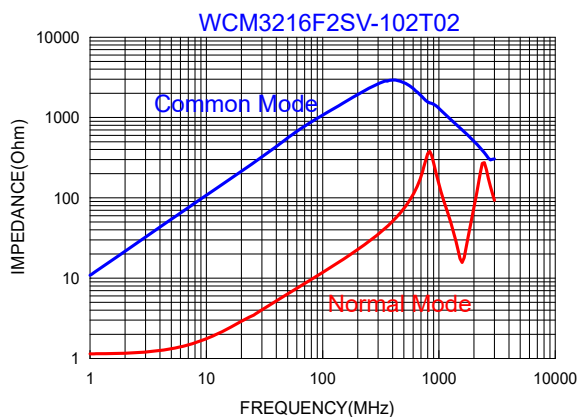
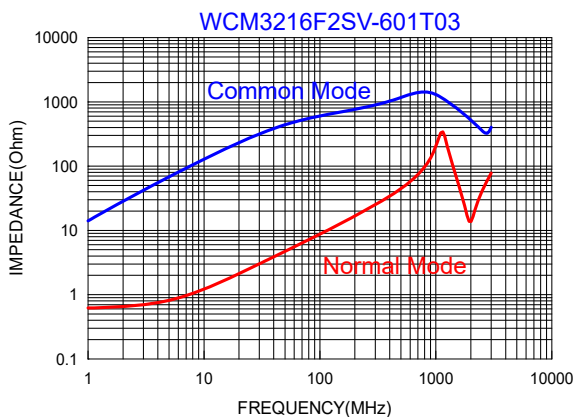
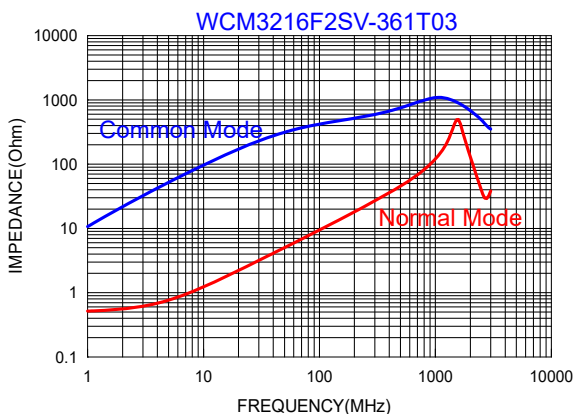
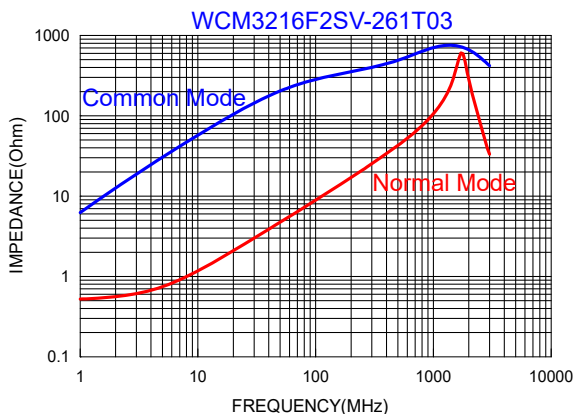
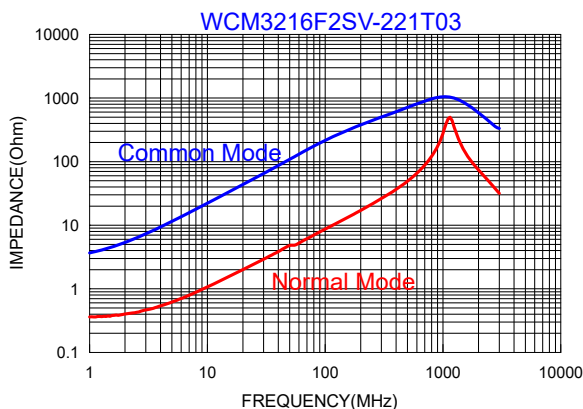
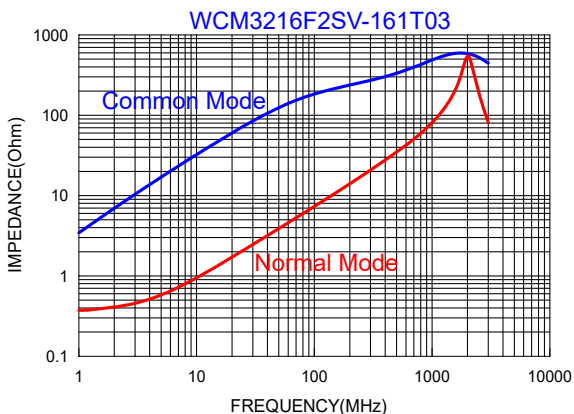
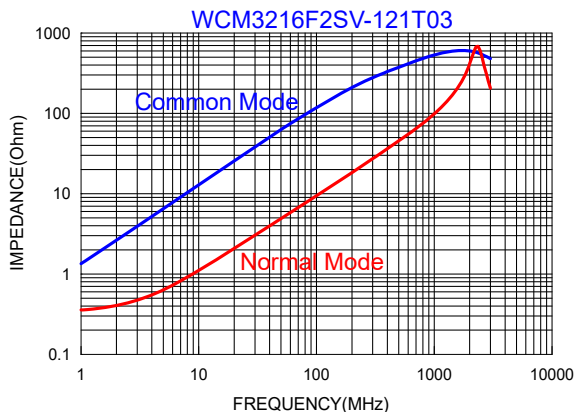
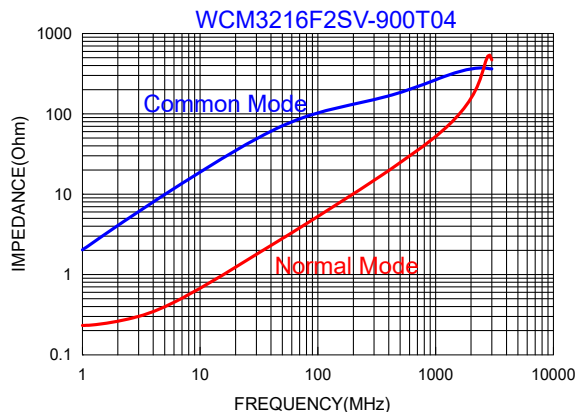
WCM	3216	F	2	S	V	-	900	T	04
A	B	C	D	E	F	G	H	I	

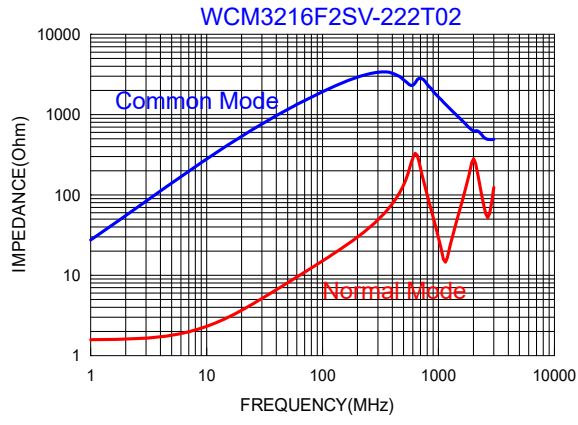
- A: Series  
 B: Dimension  
 C: Material                      Ferrite Core  
 D: Number of Lines          2=2 lines  
 E: Type                            S=Shielded , N=Unshielded  
 F: Category Code                V=Vehicle  
 G: Impedance                    900=90Ω  
 H: Packaging                      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.
WCM3216F2SV-900T04	90±25%	100	0.30	400	50	125	10M
WCM3216F2SV-121T03	120±25%	100	0.30	350	50	125	10M
WCM3216F2SV-161T03	160±25%	100	0.40	350	50	125	10M
WCM3216F2SV-221T03	220±25%	100	0.45	300	50	125	10M
WCM3216F2SV-261T03	260±25%	100	0.50	300	50	125	10M
WCM3216F2SV-361T03	360±25%	100	0.60	300	50	125	10M
WCM3216F2SV-601T03	600±25%	100	0.80	300	50	125	10M
WCM3216F2SV-102T02	1000±25%	100	1.00	200	50	125	10M
WCM3216F2SV-222T02	2200±25%	100	1.20	200	50	125	10M

### Typical Impedance v.s. Frequency Curve





# Wire Wound Type Common Mode Filter

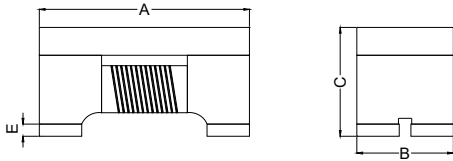
WCM3225F2SV-SERIES

## 1. Features

1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM3225F2SV series realizes small size and low profile. 3.2x2.5x2.2 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature-55~+125°C (Including self - temperature rise)

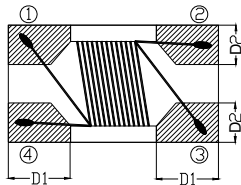


## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)	E(mm)
3225F2SV	3.2±0.2	2.5±0.2	2.2±0.2	0.8±0.1	0.9±0.1	0.15±0.1

Units: mm



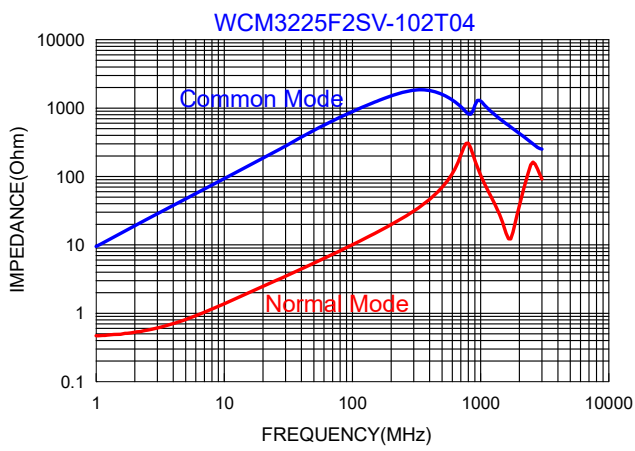
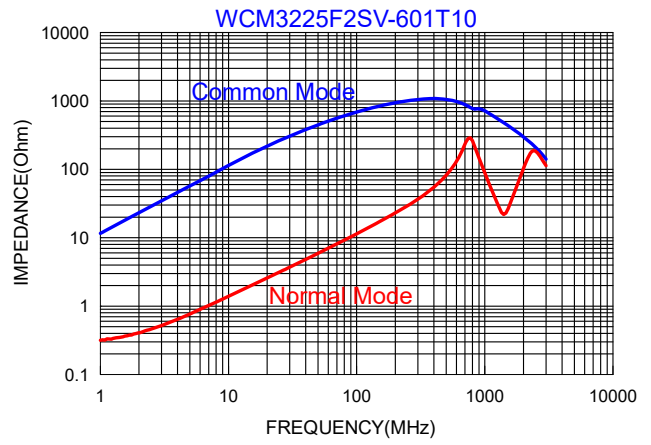
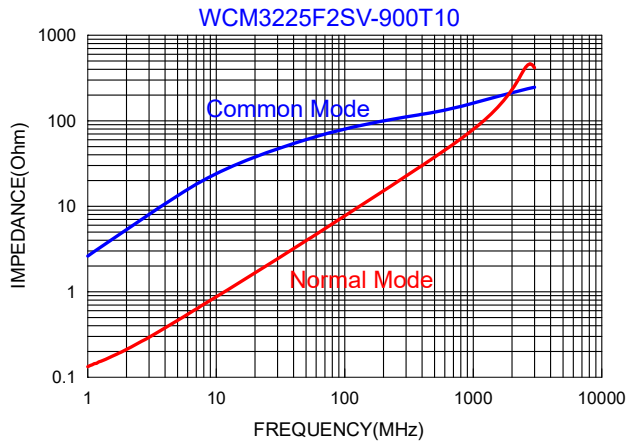
## 3. Part Numbering



- A: Series
- B: Dimension
- C: Material                      Ferrite Core
- D: Number of Lines            2=2 lines
- E: Type                            S=Shielded , N=Unshielded
- F: Category Code                V=Vehicle
- 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.
WCM3225F2SV-900T10	90±25%	100	0.050	1000	50	125	10M
WCM3225F2SV-601T10	600±25%	100	0.20	1000	50	125	10M
WCM3225F2SV-102T04	1000±25%	100	0.30	400	50	125	10M





# Wire Wound Type Common Mode Filter

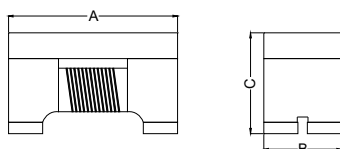
WCM4532F2SV-SERIES

## 1. Features

1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM4532F2SV series realizes small size and low profile. 4.5x3.2x2.8 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature-55~+125°C (Including self - temperature rise)

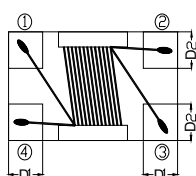


## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)
4532F2SV	4.5±0.2	3.2±0.2	2.8±0.2	1.0±0.1	1.2±0.1

Units: mm



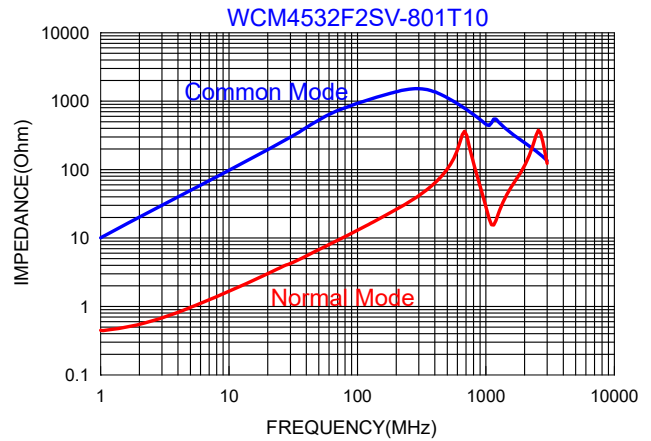
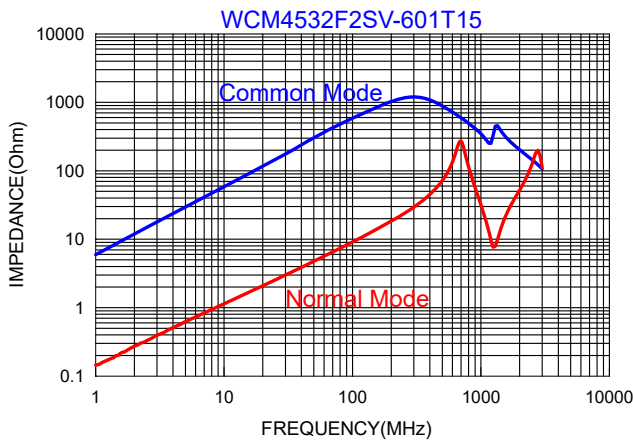
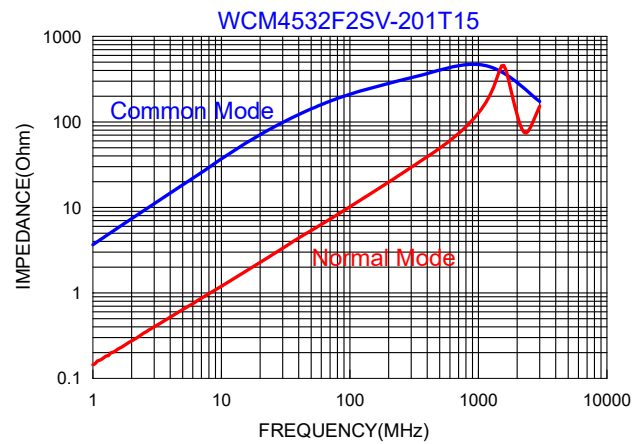
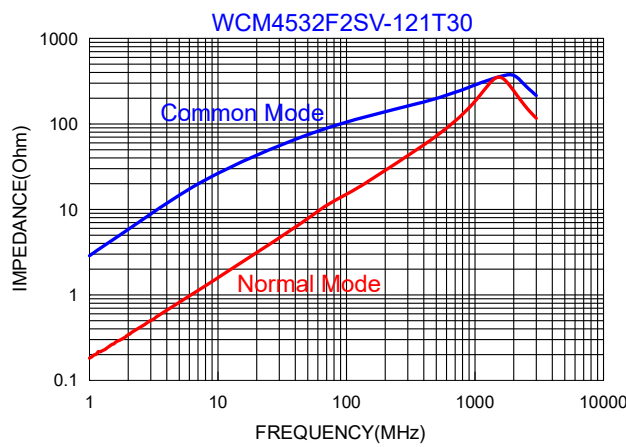
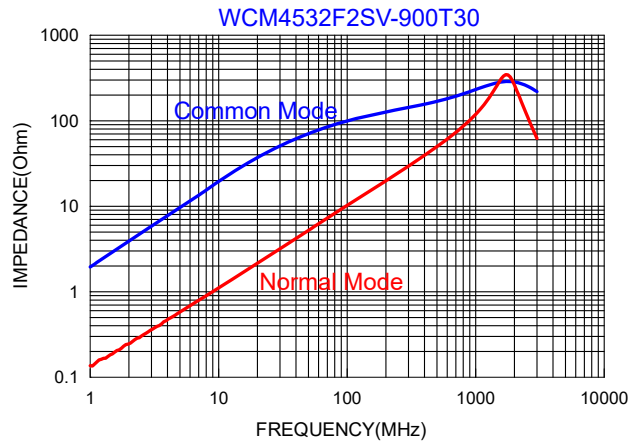
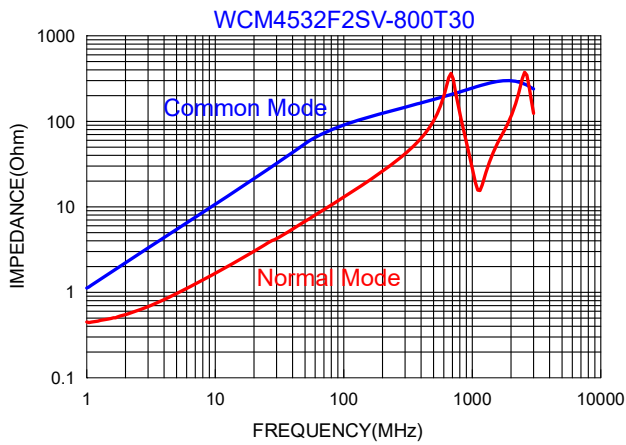
## 3. Part Numbering

<b>WCM</b>	<b>4532</b>	<b>F</b>	<b>2</b>	<b>S</b>	<b>V</b>	-	<b>900</b>	<b>T</b>	<b>30</b>
A	B	C	D	E	F		G	H	I

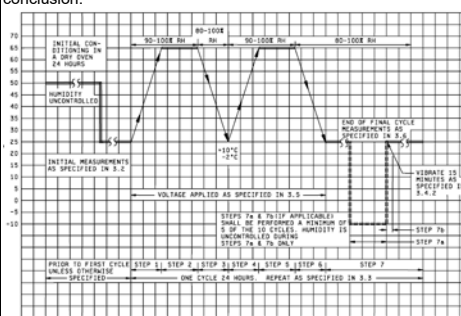
- A: Series  
 B: Dimension  
 C: Material                      Ferrite Core  
 D: Number of Lines          2=2 lines  
 E: Type                            S=Shielded , N=Unshielded  
 F: Category Code                V=Vehicle  
 G: Impedance                    900=90Ω  
 H: Packaging                        T=Taping and Reel  
 I: Rated Current                 30=3000mA

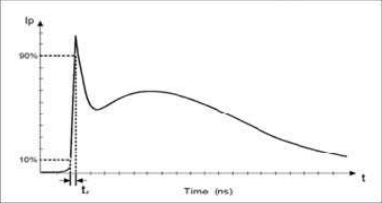
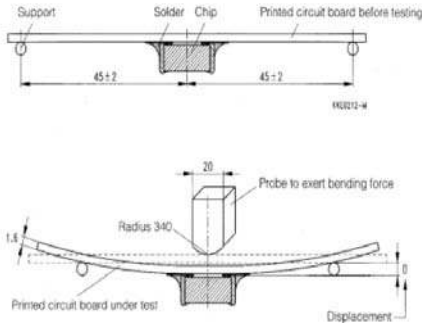
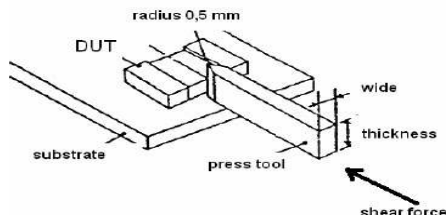
## 4. Specification

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.
WCM4532F2SV-800T30	80±25%	100	0.05	3000	50	125	10M
WCM4532F2SV-900T30	90±25%	100	0.05	3000	50	125	10M
WCM4532F2SV-121T30	120±25%	100	0.05	3000	50	125	10M
WCM4532F2SV-201T15	200±25%	100	0.10	1500	50	125	10M
WCM4532F2SV-601T15	600±25%	100	0.24	1500	50	125	10M
WCM4532F2SV-801T10	800±25%	100	0.24	1000	50	125	10M

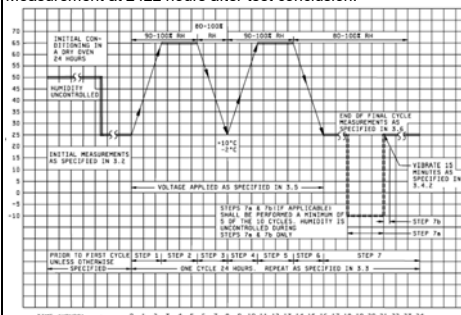


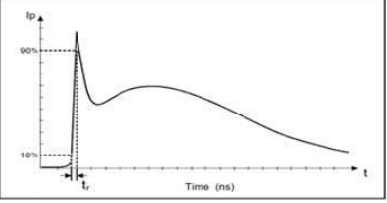
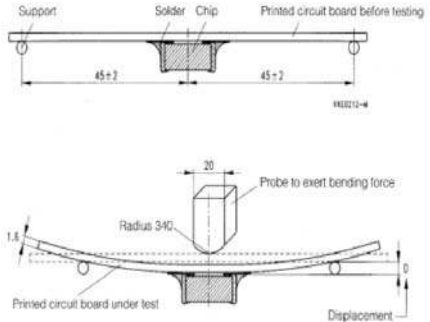
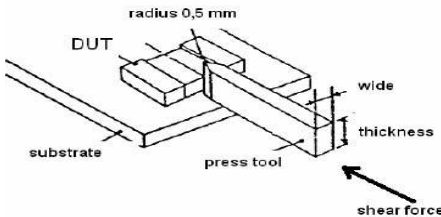
Reliability and Test Condition (WCM2012, 3216)

Item	Performance	Test Condition															
Operating temperature	-55~+125°C(Including self - temperature rise)																
Storage temperature	-55~+125°C(on board)																
<b>Electrical Performance Test</b>																	
Z(common mode)	Refer to standard electrical characteristics list.	Keysight E4991B + Keysight 16197A															
DCR		Agilent-34420A Agilent-4338B															
I.R.		Chroma 19073															
Temperature Rise Test	Rated Current ΔT 40°C Max	1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer															
<b>Reliability Test</b>																	
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125±2°C Duration : 1000hrs Min. Measured at room temperature after placing for 24±4 hrs.															
Temperature Cycling AEC-Q200		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 30min Min. Step2 : 125±2°C transition time 1min MAX. Step3 : 125±2°C 30min Min. Step4 : Low temp. Transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24±4 hrs.															
Moisture Resistance (AEC-Q200)		t=24 hours/cycle. Note: Steps 7a & 7b not required. Unpowered. Measurement at 24±2 hours after test conclusion.															
Biased Humidity (AEC-Q200)																	
High Temperature Operational Life (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Humidity : 85±3%R.H, Temperature : 85°C ±2°C Duration: 1000hrs Min. Measured at room temperature after placing for24±4hrs															
External Visual	Appearance : No damage.	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Impedance : within±15% of initial 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 (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> 3 shocks in each direction along 3 perpendicular axes. (18 shocks).	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													

Item	Performance	Test Condition								
Vibration		IPC/JEDEC J-STD-020E Classification Reflow Profiles Oscillation Frequency:10Hz~2KHz~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:5g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) ◦								
Resistance to Soldering Heat	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition : <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
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							
Thermal shock (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing fo24±4hrs								
ESD	Appearance : No damage.	 <p>Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target Test method: AEC-Q200-002 Test mode : Contact Discharge Discharge level : 4 KV (Level: 2 )</p>								
Solderability	More than 95% of the terminal electrode should be covered with solder ◦	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3. (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds								
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation.								
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.								
Board Flex	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 								
Terminal Strength(SMD)	Appearance : No damage	AEC-Q200,TQI-TECH SPEC V10N 30 SECONDS 								

Reliability and Test Condition (WCM3225, 4532)

Item	Performance	Test Condition															
Operating temperature	-55~+125°C (Including self - temperature rise)																
Storage temperature	-55~+125°C (on board)																
<b>Electrical Performance Test</b>																	
Z(common mode)	Refer to standard electrical characteristics list.	Keysight E4991B + Keysight 16197A															
DCR		Agilent-34420A Agilent-4338B															
I.R.		Chroma 19073															
Temperature Rise Test	Rated Current ΔT 40°C Max	1. Applied the allowed DC current. 2. Temperature measured by digital surface thermometer															
<b>Reliability Test</b>																	
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125±2°C Duration : 1000hrs Min. Measured at room temperature after placing for 24±4 hrs.															
Temperature Cycling AEC-Q200		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 30min Min. Step2 : 125±2°C transition time 1min MAX. Step3 : 125±2°C 30min Min. Step4 : Low temp. Transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24±4 hrs.															
Moisture Resistance (AEC-Q200)		t=24 hours/cycle. Note: Steps 7a & 7b not required. Unpowered. Measurement at 24±2 hours after test conclusion. 															
Biased Humidity (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Humidity : 85±3% R.H, Temperature : 85°C±2°C Duration: 1000hrs Min. Measured at room temperature after placing for 24±4hrs															
High Temperature Operational Life (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125±2°C Duration : 1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24±4hrs															
External Visual	Appearance : No damage.	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Impedance : within±15% of initial 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 (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> <p>3 shocks in each direction along 3 perpendicular axes. (18 shocks).</p>	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													

Item	Performance	Test Condition								
Vibration		IPC/JEDEC J-STD-020E Classification Reflow Profiles Oscillation Frequency:10Hz~2KHz~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:5g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) °								
Resistance to Soldering Heat	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition : <table border="1" data-bbox="914 387 1393 501"> <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
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							
Thermal shock (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing fo24±4hrs								
ESD	Appearance : No damage.	 <p>Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target Test method: AEC-Q200-002 Test mode : Contact Discharge Discharge level : 4 KV (Level: 2 )</p>								
Solderability	More than 95% of the terminal electrode should be covered with solder °	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3. (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds								
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation.								
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.								
Board Flex	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 								
Terminal Strength(SMD)	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force 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. 								

# Wire Wound Type Common Mode Filter

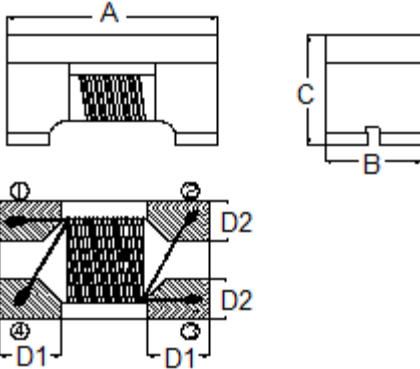
WCM4532F2SV-SERIES-HI

## 1. Features

1. High common mode impedance at high frequency cause excellent noise suppression performance.
2. WCM4532F2SV series realizes small size and low profile. 4.5x3.2x2.8 mm.
3. 100% Lead(Pb) & Halogen-Free and RoHS compliant.
4. High reliability -Reliability tests comply with AEC-Q200
5. Operating temperature -55~+125°C (Including self - temperature rise)



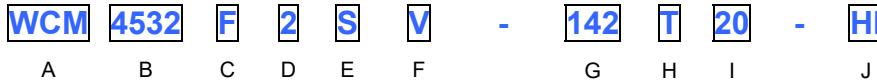
## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D1(mm)	D2(mm)
4532F2SV	4.5±0.2	3.2±0.2	2.8±0.2	0.90±0.15	1.05±0.15

Units: mm

## 3. Part Numbering

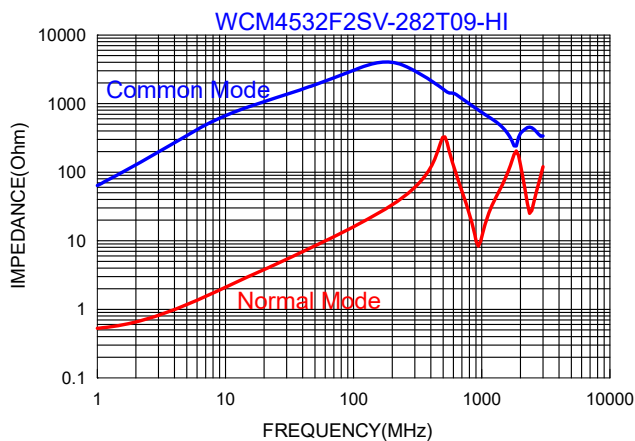
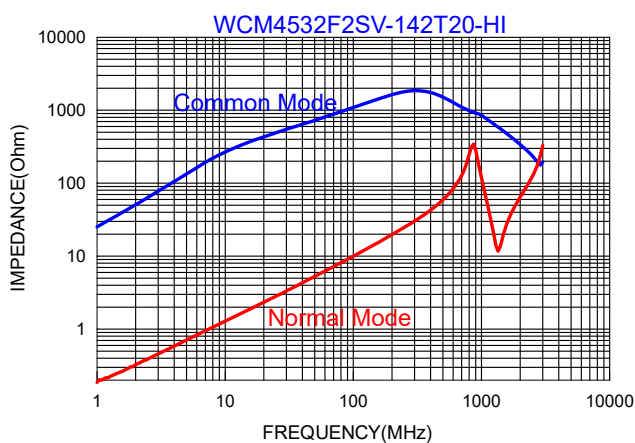
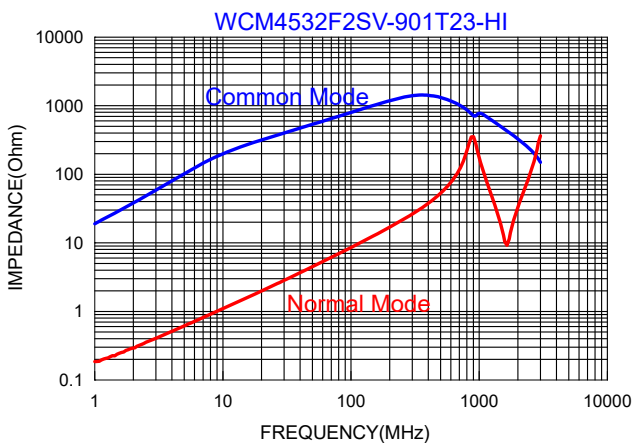
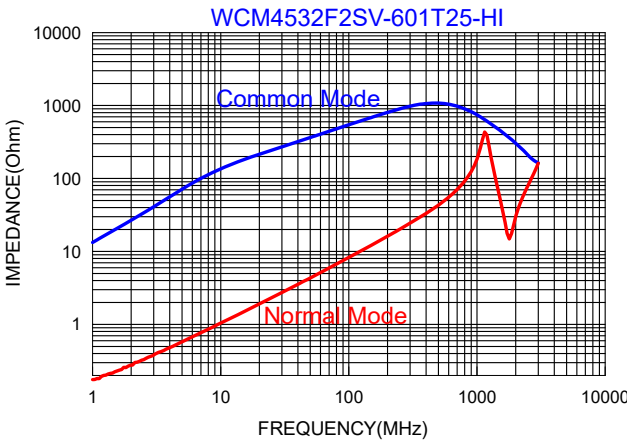
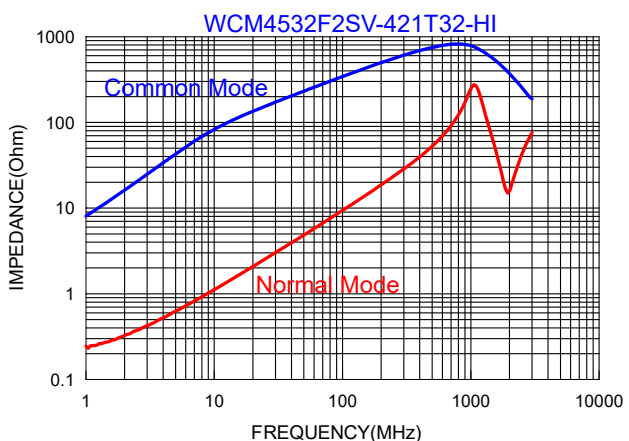
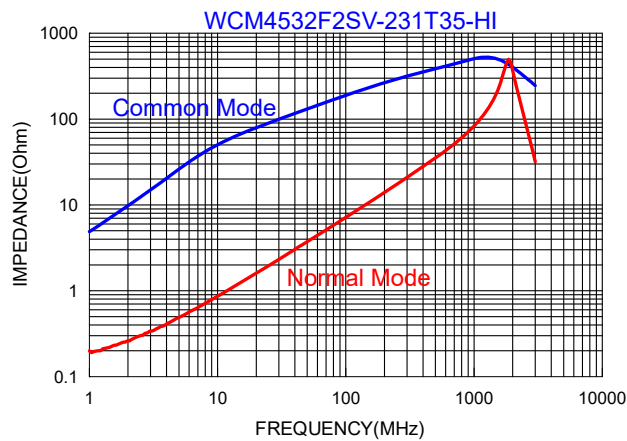
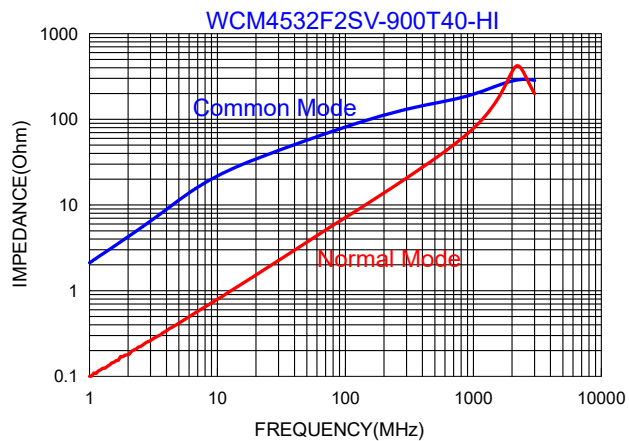


- A: Series
- B: Dimension
- C: Material                      Ferrite Core
- D: Number of Lines            2=2 lines
- E: Type                            S=Shielded , N=Unshielded
- F: Category Code                V=Vehicle
- G: Impedance                    142=1400Ω
- H: Packaging                  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

## 4. Specification

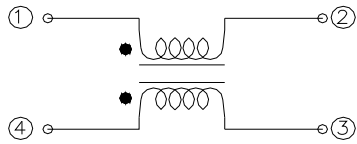
TAI-TECH Part Number	Common mode Impedance (Ω)		Test Frequency (MHz)	DC Resistance (Ω) max.	Rated Current (mA) max.	Rated Volt. (Vdc) max.	Withstand Volt. (Vdc) max.	IR (Ω) min.
	min	typ.						
WCM4532F2SV-900T40-HI	68 min	90 typ.	100	0.050	4000	50	125	10M
WCM4532F2SV-231T35-HI	173 min	230 typ.	100	0.050	3500	50	125	10M
WCM4532F2SV-421T32-HI	300 min	420 typ.	100	0.055	3200	50	125	10M
WCM4532F2SV-601T25-HI	450 min	600 typ.	100	0.060	2500	50	125	10M
WCM4532F2SV-901T23-HI	650 min	900 typ.	100	0.070	2300	50	125	10M
WCM4532F2SV-142T20-HI	1000 min.	1400 typ.	100	0.100	2000	50	125	10M
WCM4532F2SV-282T09-HI	2100 min	2800 typ.	100	0.350	900	50	125	10M

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



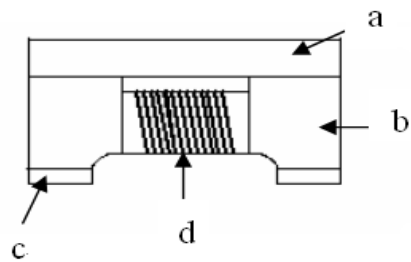


### 5. Schematic Diagram



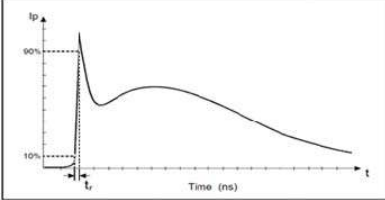
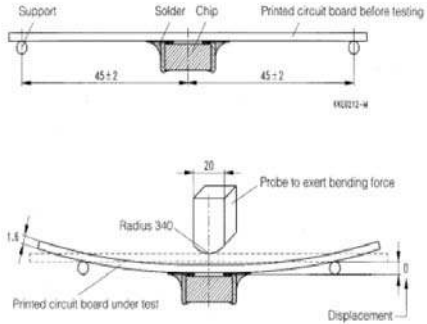
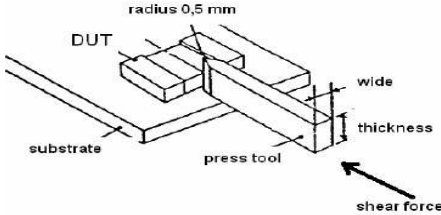
### 6. Materials

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



Reliability and Test Condition (WCM4532-HI)

Item	Performance	Test Condition															
Operating temperature	-55~+125°C (Including self - temperature rise)																
Storage temperature	-55~+125°C (on board)																
<b>Electrical Performance Test</b>																	
Z(common mode)	Refer to standard electrical characteristics list.	Keysight E4991B + Keysight 16197A															
DCR		Agilent-34420A Agilent-4338B															
I.R.		Chroma 19073															
Temperature Rise Test		1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer															
<b>Reliability Test</b>																	
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125±2°C Duration : 1000hrs Min. Measured at room temperature after placing for 24±4 hrs.															
Temperature Cycling AEC-Q200		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 30min Min. Step2 : 125±2°C transition time 1min MAX. Step3 : 125±2°C 30min Min. Step4 : Low temp. Transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24±4 hrs.															
Moisture Resistance (AEC-Q200)		t=24 hours/cycle. Note: Steps 7a & 7b not required. Unpowered. Measurement at 24±2 hours after test conclusion.															
Biased Humidity (AEC-Q200)																	
High Temperature Operational Life (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Humidity : 85±3%R.H. Temperature : 85°C±2°C Duration: 1000hrs Min. Measured at room temperature after placing for 24±4hrs															
External Visual	Appearance : No damage.	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Impedance : within±15% of initial 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 (Vi)ft/sec</th> </tr> </thead> <tbody> <tr> <td>SMD</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> 3 shocks in each direction along 3 perpendicular axes. (18 shocks).	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (Vi)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													

Item	Performance	Test Condition								
Vibration		IPC/JEDEC J-STD-020E Classification Reflow Profiles Oscillation Frequency:10Hz~2KHz~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:5g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations)								
Resistance to Soldering Heat	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition : <table border="1" data-bbox="927 360 1377 477"> <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
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							
Thermal shock (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -55±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing fo24±4hrs								
ESD	Appearance : No damage.	 <p>Direct Contact and Air Discharge PASSIVE COMPONENT HBM                      ESD Discharge Waveform to a Coaxial Target                      Test method: AEC-Q200-002                      Test mode : Contact Discharge                      Discharge level : 4 KV (Level: 2 )</p>								
Solderability	More than 95% of the terminal electrode should be covered with solder .	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3, (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds								
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation.								
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.								
Board Flex	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 								
Terminal Strength(SMD)	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force 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. 								

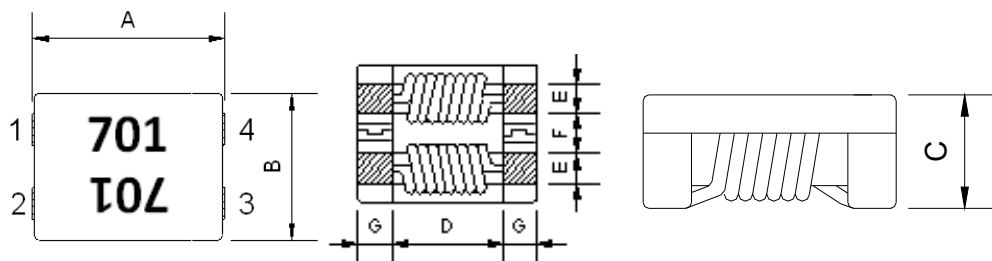
# Wire Wound Power Common Mode Filter WCM7060FASV-SERIES-LM

## 1. Features

1. High reliability -Reliability tests comply with AEC-Q200
2. Operating temperature-40~+125°C (Including self - temperature rise)



## 2. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
WCM7060	7.0±0.5	6.0±0.5	3.8 max.	3.5 typ.	1.5±0.5	1.5±0.5	1.7±0.5

Unit:mm

## 3. Part Numbering



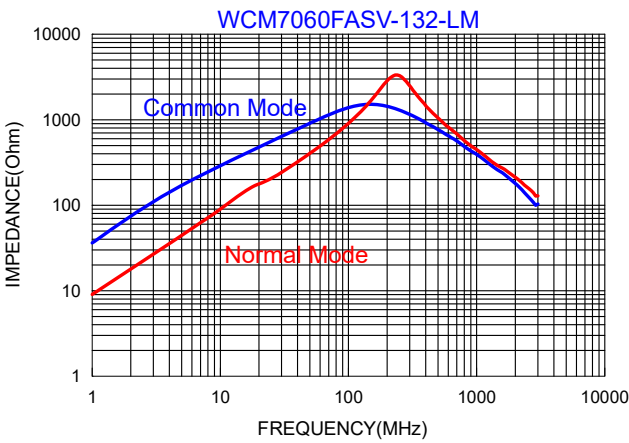
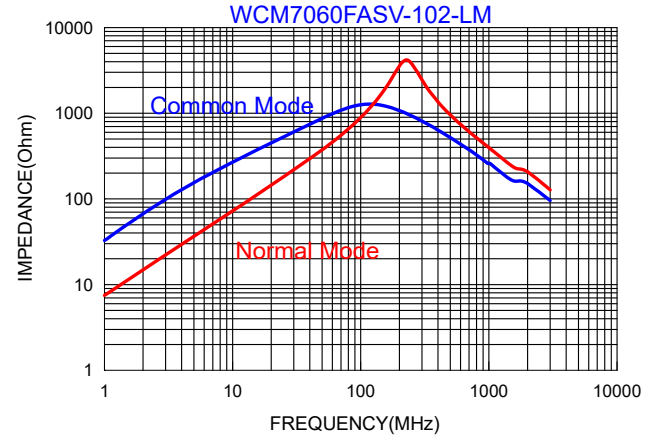
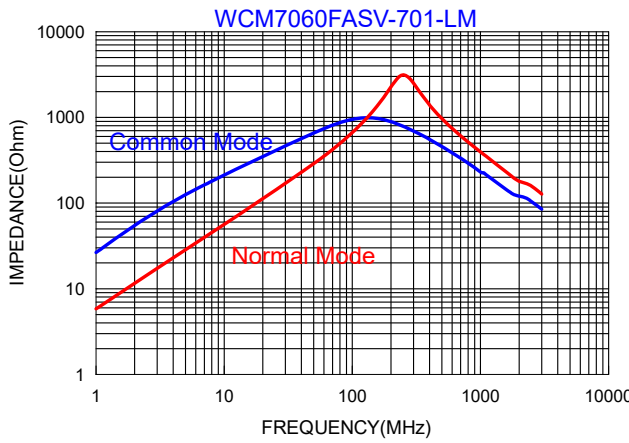
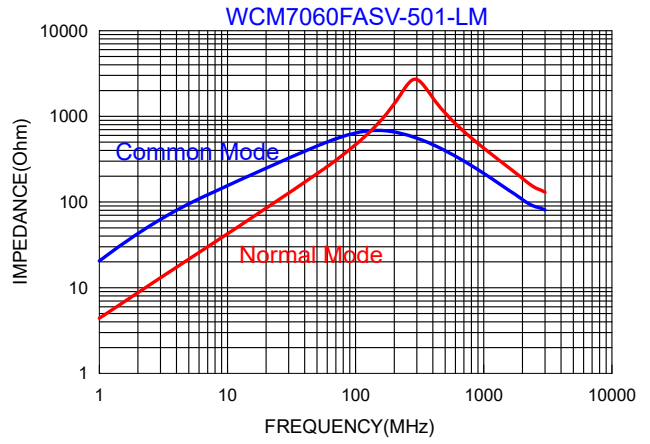
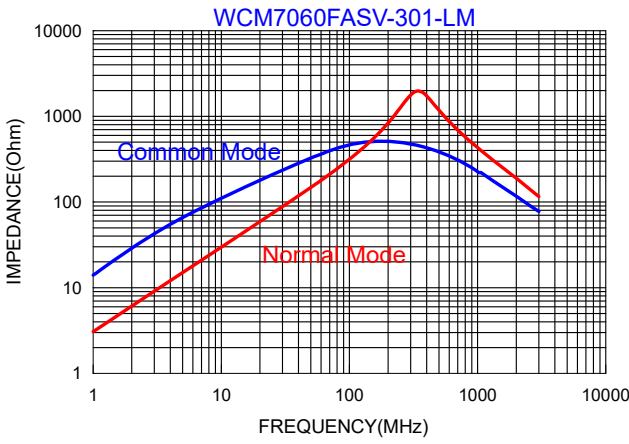
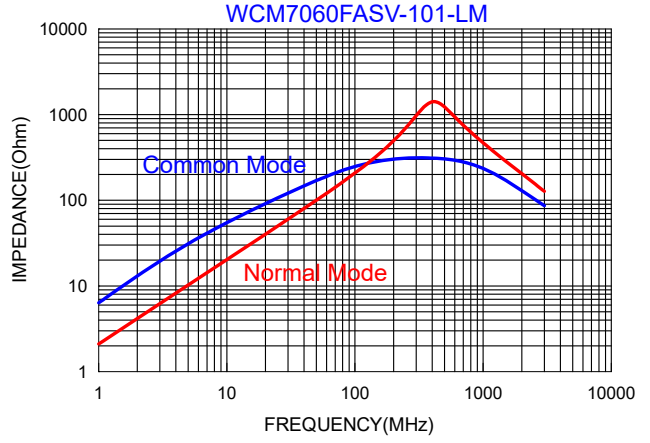
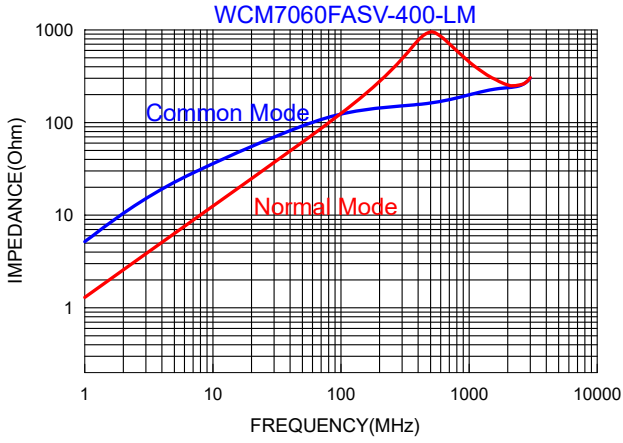
- A: Series  
 B: Dimension  
 C: Material                      Ferrite Core  
 D: Process                        Assembled  
 E: Type                            S=Shielded , N=Unshielded  
 F: Category Code                V=Vehicle  
 G: Impedance                    701=700Ω  
 H: Laser Marking

## 4. Specification

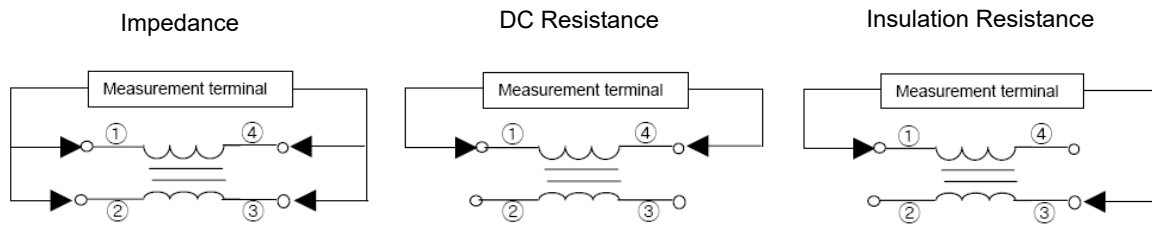
TAI-TECH Part Number	Impedance (Ω)		Test Frequency (MHz)	DC Resistance (mΩ) max. (1 line)	Rated Current (A) max.	Rated Volt. (Vdc) max.	Insulation Resistance (MΩ) min.
	min.	typ.					
WCM7060FASV-400-LM	40	70	100	5	15	80	10
WCM7060FASV-101-LM	100	140	100	10	9	80	10
WCM7060FASV-301-LM	225	300	100	10	5	80	10
WCM7060FASV-501-LM	400	500	100	10	5	80	10
WCM7060FASV-701-LM	500	700	100	15	4	80	10
WCM7060FASV-102-LM	800	1020	100	17	3	80	10
WCM7060FASV-132-LM	910	1300	100	20	3	80	10

Note:

- Measurement board data
- Material : FR4
- Board dimensions : 100 X 50 X 1.6t mm
- Pattern dimensions: 45 X 30 mm (Double side board)
- Pattern thickness : 50 μm

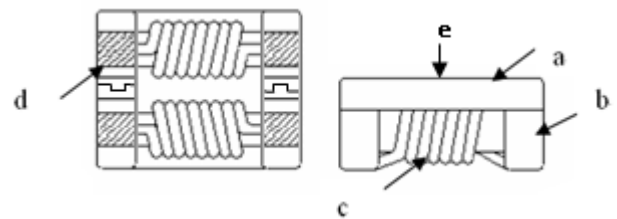


### 5. Schematic Diagram



### 6. Materials (WCM7060)

No.	Description	Specification
a.	Upper Plate	Ceramics Core (Black)
b.	Core	Ferrite Core
c.	Wire	Enameled Copper
d.	Termination	Ag/Ni/Sn + Sn Solder
e.	Mark	Laser Marking



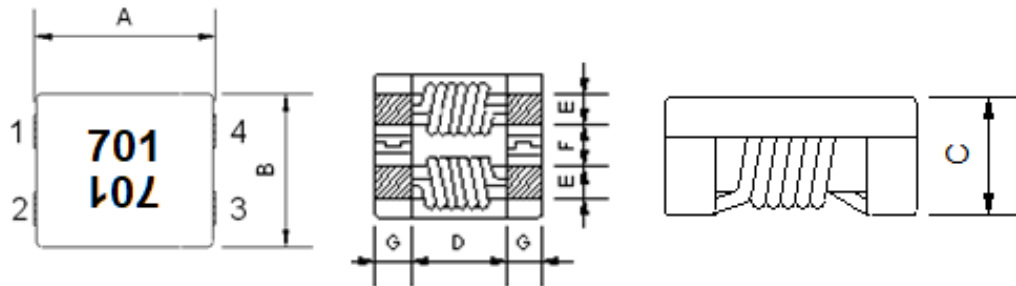
# Wire Wound Power Common Mode Filter WCM5555FASV-SERIES-LM

### 3. Features

1. High reliability -Reliability tests comply with AEC-Q200
2. Operating temperature-40~+125°C (Including self - temperature rise)



### 4. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
WCM5555	5.5±0.5	5.5±0.5	3.5 max.	3.3 typ.	1.2±0.5	1.9±0.5	1.1±0.5

Unit:mm

### 3. Part Numbering



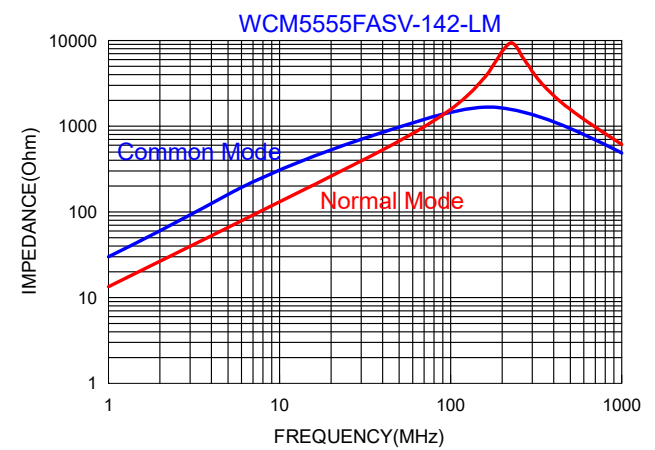
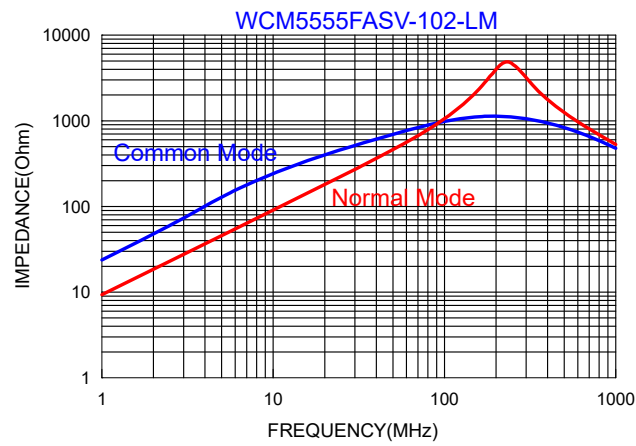
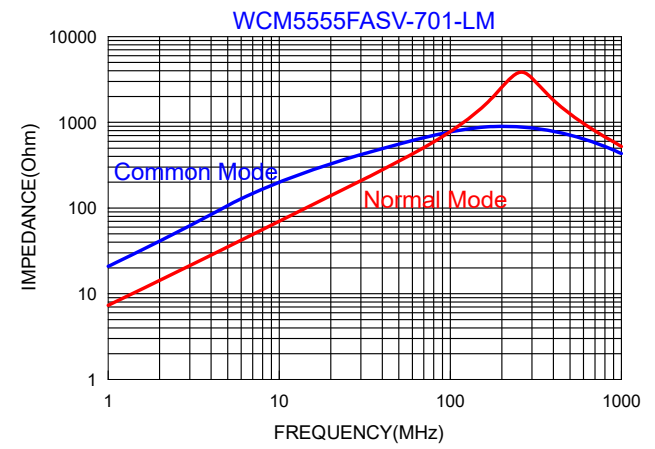
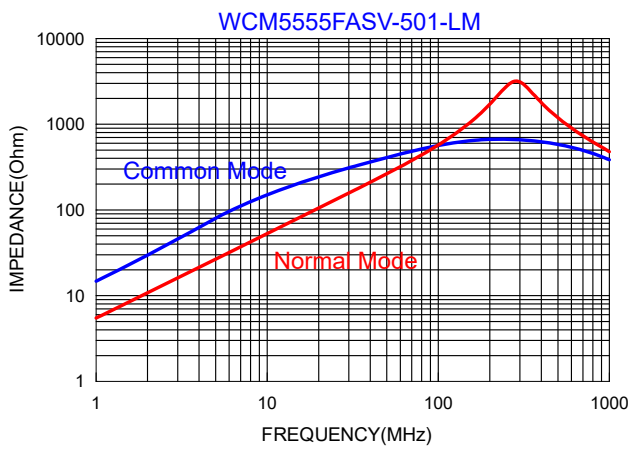
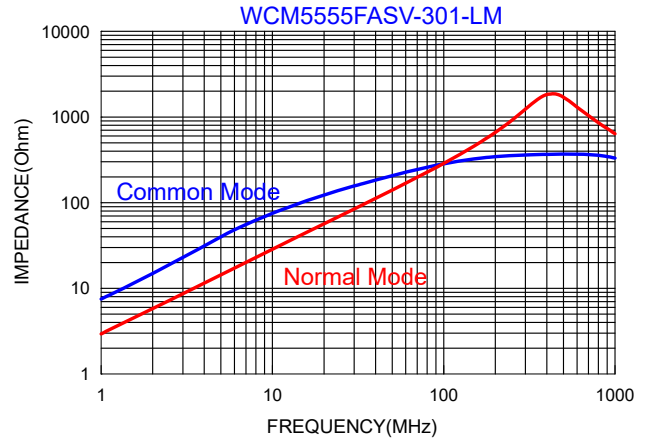
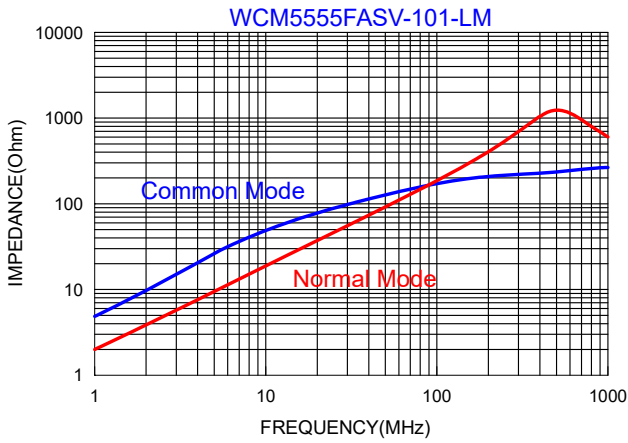
- A: Series
- B: Dimension
- C: Material                      Ferrite Core
- D: Process                        Asembled
- E: Type                            S=Shielded , N=Unshielded
- F: Category Code                V=Vehicle
- G: Impedance                    701=700Ω
- H: Laser Marking

### 4. Specification

TAI-TECH Part Number	Impedance (Ω)		Test Frequency (MHz)	DC Resistance (mΩ) max. (1 line)	Rated Current (A) max.	Rated Volt. (Vdc) max.	Insulation Resistance (MΩ) min.
	min.	typ.					
WCM5555FASV-101-LM	100	140	100	6.0	8.5	80	10
WCM5555FASV-301-LM	150	300	100	7.5	4.8	80	10
WCM5555FASV-501-LM	300	500	100	10.5	4.5	80	10
WCM5555FASV-701-LM	500	700	100	13.0	3.8	80	10
WCM5555FASV-102-LM	750	1000	100	20.0	3.0	80	10
WCM5555FASV-142-LM	1000	1400	100	38.0	2.8	80	10

Note:

- Measurement board data
- Material : FR4
- Board dimensions : 100 X 50 X 1.6t mm
- Pattern dimensions: 45 X 30 mm (Double side board)
- Pattern thickness : 50 μm





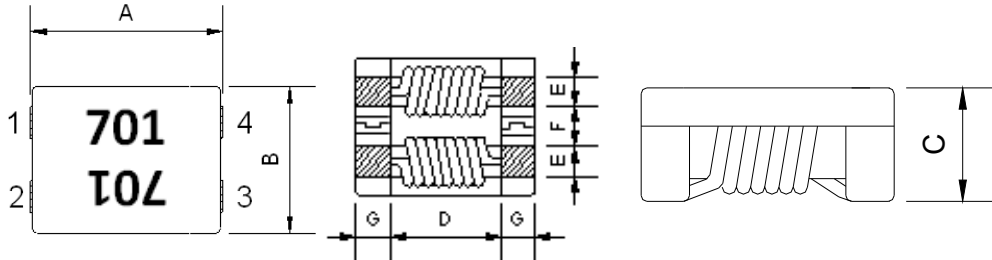
# Wire Wound Power Common Mode Filter WCM9070FASV-SERIES-LM

## 5. Features

1. High reliability -Reliability tests comply with AEC-Q200
2. Operating temperature-40~+125°C (Including self - temperature rise)



## 6. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
WCM9070	9.0±0.5	7.0±0.2	4.5 max.	5.3 typ.	1.5±0.5	2.1±0.5	1.8±0.5

Unit:mm

## 3. Part Numbering



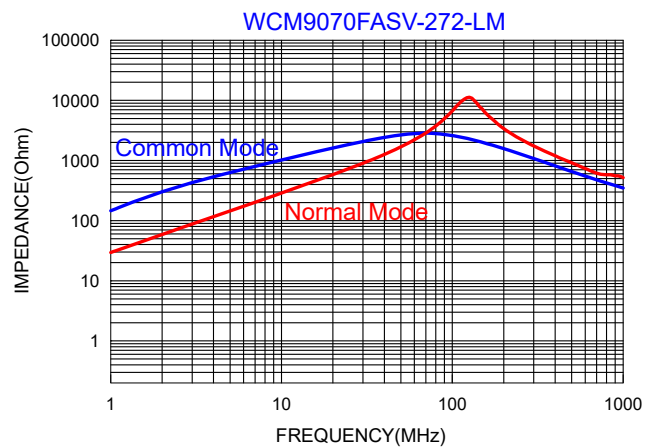
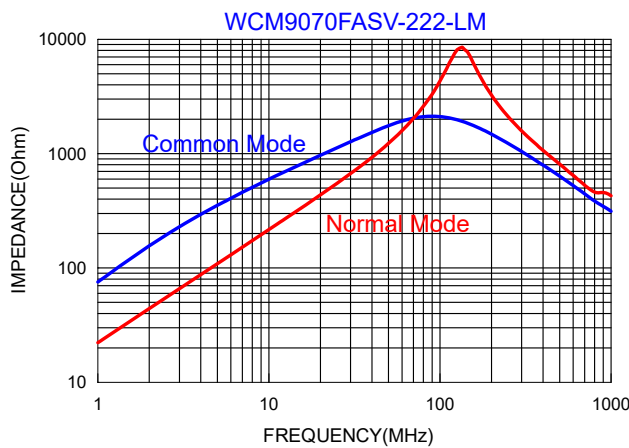
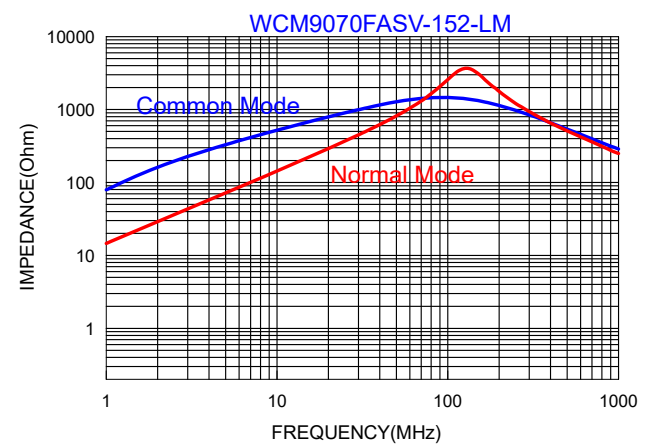
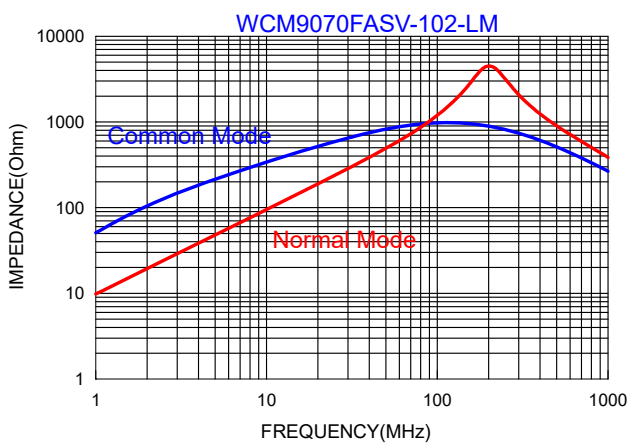
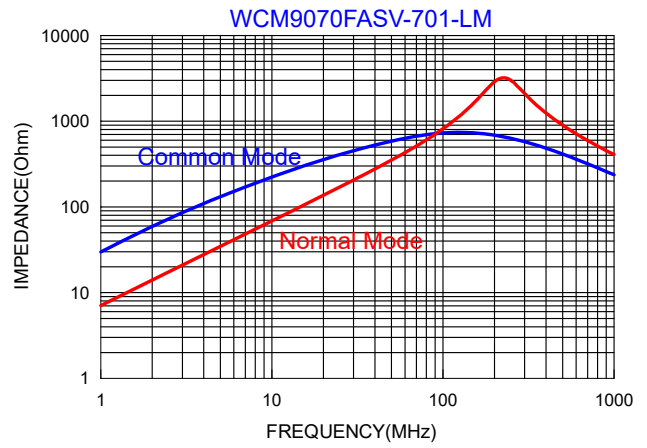
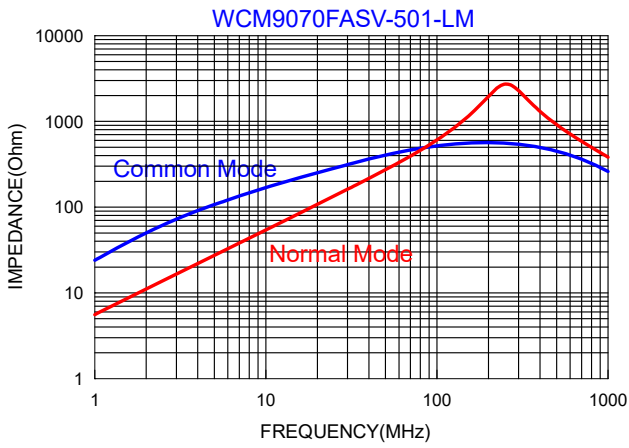
- A: Series
- B: Dimension
- C: Material                      Ferrite Core
- D: Process                        Assembled
- E: Type                            S=Shielded , N=Unshielded
- F: Category Code                V=Vehicle
- G: Impedance                    701=700Ω
- H: Laser Marking

## 4. Specification

TAI-TECH Part Number	Impedance (Ω)		Test Frequency (MHz)	DC Resistance (mΩ) max. (1 line)	Rated Current (A) max.	Rated Volt. (Vdc) max.	Insulation Resistance (MΩ) min.
	min.	typ.					
WCM9070FASV-501-LM	300	500	100	6	8.0	80	10
WCM9070FASV-701-LM	500	700	100	9	6.0	80	10
WCM9070FASV-102-LM	750	1000	100	10	5.0	80	10
WCM9070FASV-152-LM	1000	1500	100	15	4.5	80	10
WCM9070FASV-222-LM	1700	2200	100	25	4.0	80	10
WCM9070FASV-272-LM	2000	2700	100	32	3.5	80	10

Note:

- Measurement board data
- Material : FR4
- Board dimensions : 100 X 50 X 1.6t mm
- Pattern dimensions: 45 X 30 mm (Double side board)
- Pattern thickness : 50 μm



# Wire Wound Power Common Mode Filter

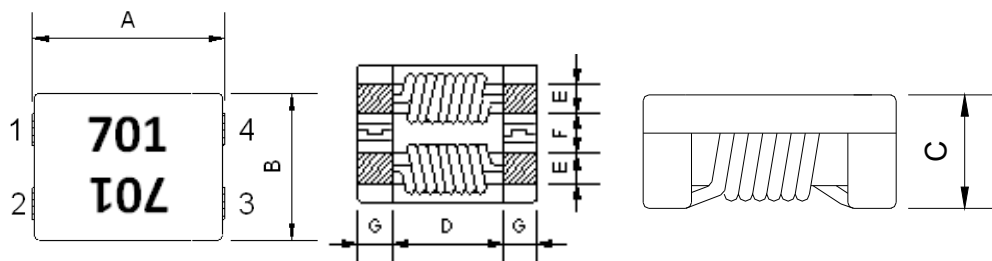
WCM1211FASV-SERIES-LM

## 7. Features

1. High reliability -Reliability tests comply with AEC-Q200
2. Operating temperature-40~+125°C (Including self - temperature rise)



## 8. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
WCM1211	12.0±0.5	11.0±0.3	6.0 max.	6.7 typ.	2.7±0.5	2.6±0.5	2.6±0.5

Unit:mm

## 3. Part Numbering



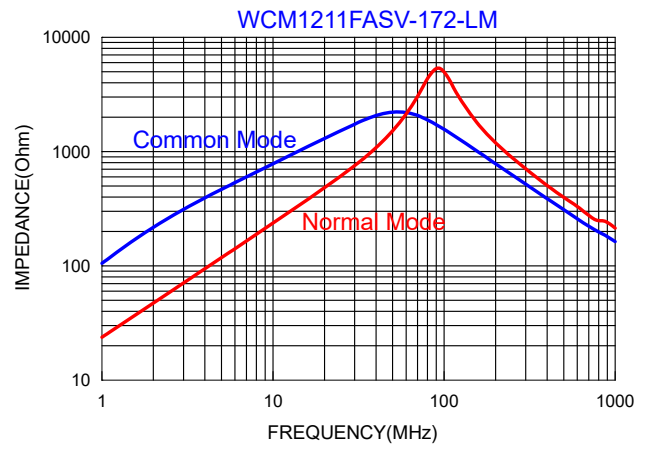
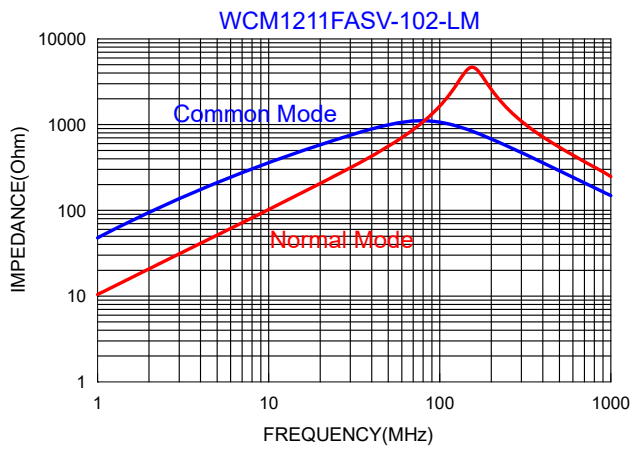
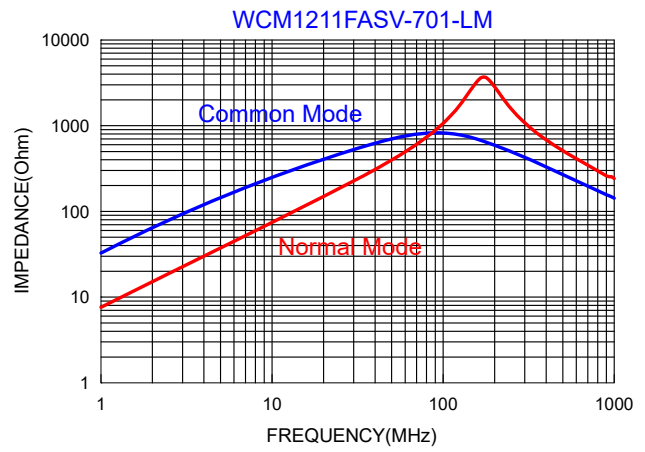
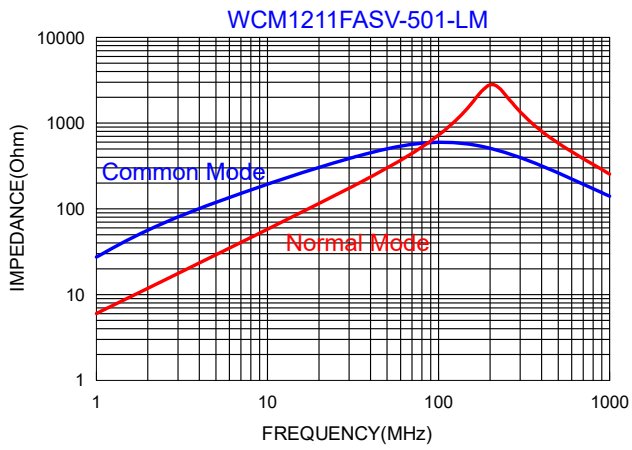
- A: Series  
 B: Dimension  
 C: Material                      Ferrite Core  
 D: Process                        Assembled  
 E: Type                            S=Shielded , N=Unshielded  
 F: Category Code                V=Vehicle  
 G: Impedance                    701=700Ω  
 H: Laser Marking

## 4. Specification

TAI-TECH Part Number	Impedance (Ω)		Test Frequency (MHz)	DC Resistance (mΩ) max. (1 line)	Rated Current (A) max.	Rated Volt. (Vdc) max.	Insulation Resistance (MΩ) min.
	min.	typ.					
WCM1211FASV-501-LM	300	500	100	4	11	80	10
WCM1211FASV-701-LM	500	700	100	5	9	80	10
WCM1211FASV-102-LM	750	1000	100	8	7	80	10
WCM1211FASV-172-LM	1200	1700	100	12	5.5	80	10

Note:

- Measurement board data
- Material : FR4
- Board dimensions : 100 X 50 X 1.6t mm
- Pattern dimensions: 45 X 30 mm (Double side board)
- Pattern thickness : 50 μm



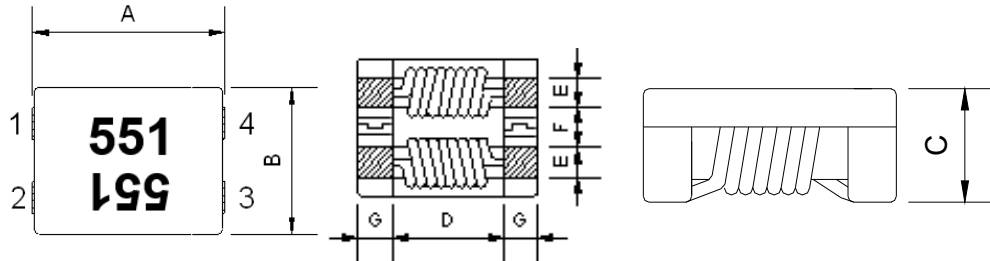
# Wire Wound Power Common Mode Filter WCM1513FASV-SERIES-LM

## 9. Features

1. High reliability -Reliability tests comply with AEC-Q200
2. Operating temperature-40~+125°C (Including self - temperature rise)



## 10. Dimension



Series	A(mm)	B(mm)	C(mm)	D(mm)	E(mm)	F(mm)	G(mm)
WCM1513	15.0±0.5	13.0±0.4	6.0 max.	9.3 Typ.	2.7±0.5	3.6±0.5	2.8±0.5

Unit:mm

## 3. Part Numbering



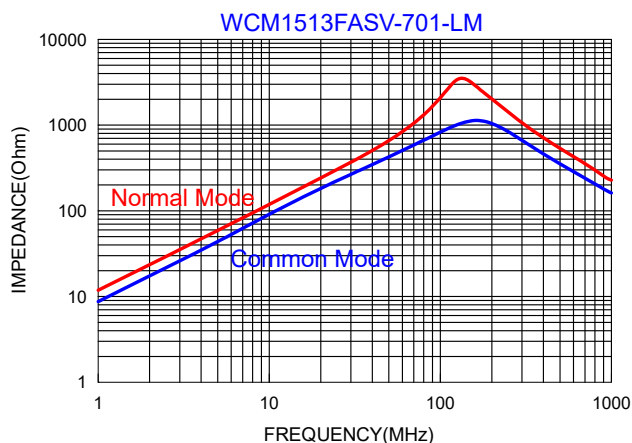
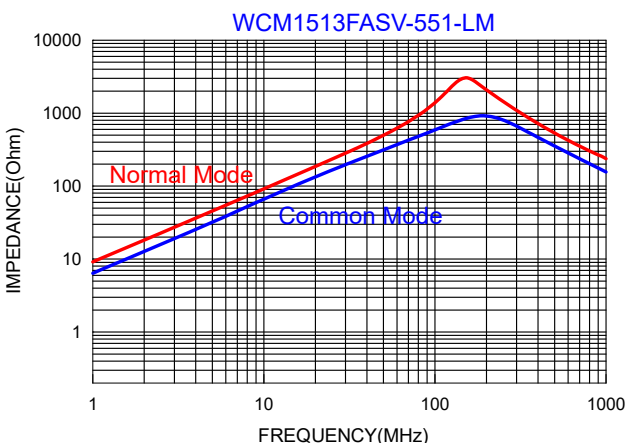
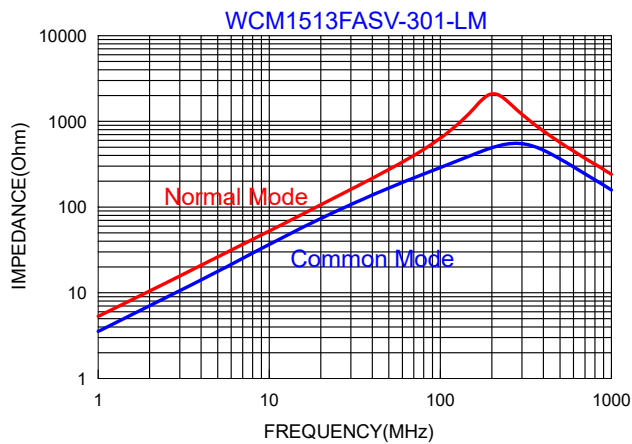
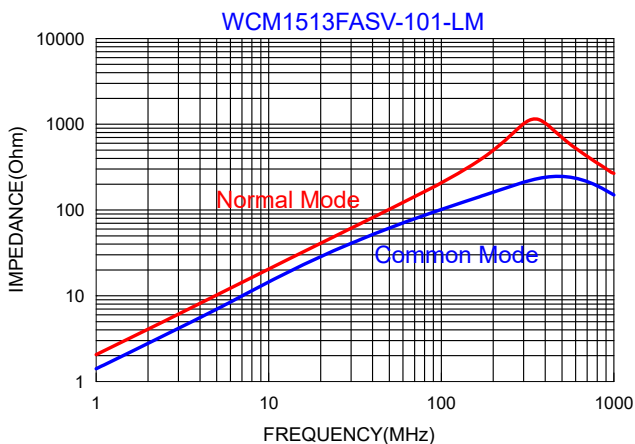
- A: Series
- B: Dimension
- C: Material                      Ferrite Core
- D: Process                        Assembled
- E: Type                            S=Shielded , N=Unshielded
- F: Category Code                V=Vehicle
- G: Impedance                    551=550Ω
- H: Laser Marking

## 4. Specification

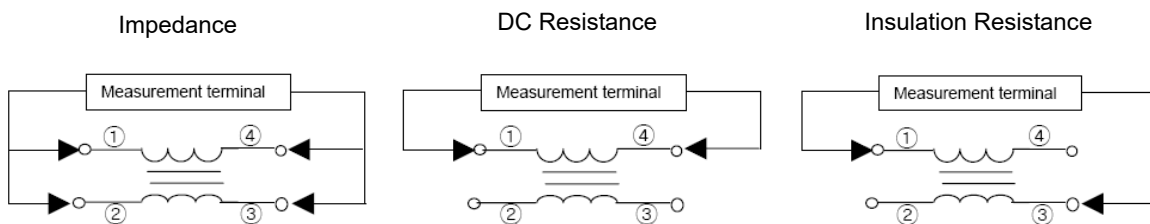
TAI-TECH Part Number	Impedance (Ω)		Test Frequency (MHz)	DC Resistance (mΩ) max. (1 line)	Rated Current (A) max.	Rated Volt. (Vdc) max.	Insulation Resistance (MΩ) min.
	min.	typ.					
WCM1513FASV-101-LM	60	100	100	2.0	20	125	10
WCM1513FASV-301-LM	200	300	100	3.5	14	125	10
WCM1513FASV-551-LM	450	550	100	4.0	10	125	10
WCM1513FASV-701-LM	500	700	100	5.0	10	125	10

Note:

- Measurement board data
- Material : FR4
- Board dimensions : 100 X 50 X 1.6t mm
- Pattern dimensions: 45 X 30 mm (Double side board)
- Pattern thickness : 50 μm

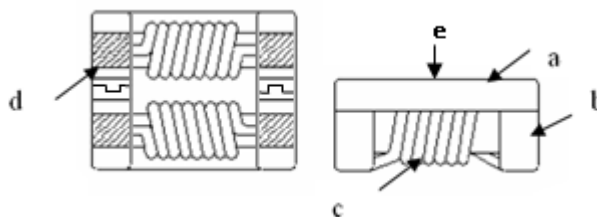


**5. Schematic Diagram**



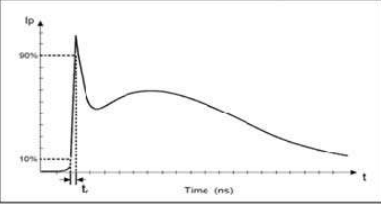
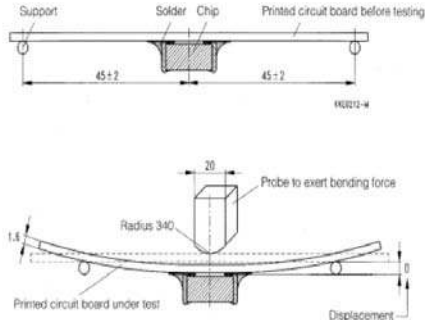
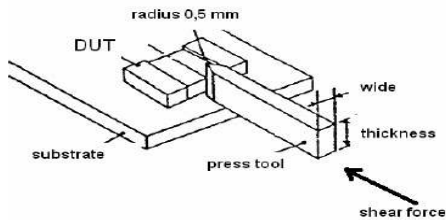
**6. Materials (WCM5555, 7060, 9070, 1211, 1513)**

No.	Description	Specification
a.	Upper Plate	Plastic
b.	Core	Ferrite Core
c.	Wire	Enameled Copper
d.	Termination	Ag/Ni/Sn + Sn Solder
e.	Mark	Laser Marking



### 7. Reliability and Test Condition (WCM5555, 7060, 9070, 1211, 1513)

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 E4991A + Keysight 16092A															
DCR		Agilent-34420A															
I.R.		Chroma 19073															
Temperature Rise Test	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>																	
High Temperature Exposure(Storage) AEC-Q200	Appearance : No damage. Impedance : within $\pm$ 15% of initial value RDC : within $\pm$ 15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125 $\pm$ 2°C Duration : 1000hrs Min. Measured at room temperature after placing for 24 $\pm$ 4 hrs.															
Temperature Cycling AEC-Q200		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -40 $\pm$ 2°C 30min Min. Step2 : 125 $\pm$ 2°C transition time 1min MAX. Step3 : 125 $\pm$ 2°C 30min Min. Step4 : Low temp. Transition time 1min MAX. Number of cycles : 1000 Measured at room temperature after placing for 24 $\pm$ 4 hrs.															
Moisture Resistance (AEC-Q200)		t=24 hours/cycle. Note: Steps 7a & 7b not required. Unpowered. Measurement at 24 $\pm$ 2 hours after test conclusion.															
Biased Humidity (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Humidity : 85 $\pm$ 3% R.H, Temperature : 85°C $\pm$ 2°C Duration: 1000hrs Min. Measured at room temperature after placing for 24 $\pm$ 4hrs															
High Temperature Operational Life (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Temperature : 125 $\pm$ 2°C Duration : 1000hrs Min. with 100% rated current. Measured at room temperature after placing for 24 $\pm$ 4hrs															
External Visual	Appearance : No damage.	Inspect device construction, marking and workmanship. Electrical Test not required.															
Physical Dimension	According to the product specification size measurement	According to the product specification size measurement															
Resistance to Solvents	Appearance : No damage.	Add aqueous wash chemical - OKEM clean or equivalent.															
Mechanical Shock	Appearance : No damage. Impedance : within $\pm$ 15% of initial value RDC : within $\pm$ 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>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> <tr> <td>Lead</td> <td>100</td> <td>6</td> <td>Half-sine</td> <td>12.3</td> </tr> </tbody> </table> 3 shocks in each direction along 3 perpendicular axes. (18 shocks).	Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V)ft/sec	SMD	100	6	Half-sine	12.3	Lead	100	6	Half-sine	12.3
Type	Peak value (g's)	Normal duration (D) (ms)	Wave form	Velocity change (V)ft/sec													
SMD	100	6	Half-sine	12.3													
Lead	100	6	Half-sine	12.3													

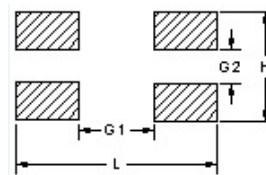
Item	Performance	Test Condition								
Vibration		IPC/JEDEC J-STD-020E Classification Reflow Profiles Oscillation Frequency:10Hz~2KHz~10Hz for 20 minute Equipment : Vibration checker Total Amplitude:5g Testing Time : 12 hours(20 minutes, 12 cycles each of 3 orientations) ◦								
Resistance to Soldering Heat	Appearance : No damage. Impedance : within±15% of initial value RDC : within ±15% of initial value and shall not exceed the specification value	Test condition : <table border="1" data-bbox="943 387 1426 504"> <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
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							
Thermal shock (AEC-Q200)		Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Condition for 1 cycle Step1 : -40±2°C 15±1min Step2 : 125±2°C within 20Sec. Step3 : 125±2°C 15±1min Number of cycles : 300 Measured at room temperature after placing fo24±4hrs								
ESD	Appearance : No damage.	 Direct Contact and Air Discharge PASSIVE COMPONENT HBM ESD Discharge Waveform to a Coaxial Target Test method: AEC-Q200-002 Test mode : Contact Discharge Discharge level : 4 KV (Level: 2 )								
Solderability	More than 95% of the terminal electrode should be covered with solder ◦	a. Method B, 4 hrs @155°C dry heat @235°C±5°C Testing Time :5 +0/-0.5 seconds b. Method D category 3. (8hours ± 15 min)@ 260°C±5°C Testing Time :30 +0/-0.5 seconds								
Electrical Characterization	Refer Specification for Approval	Summary to show Min, Max, Mean and Standard deviation.								
Flammability	Electrical Test not required.	V-0 or V-1 are acceptable.								
Board Flex	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles Place the 100mm X 40mm board into a fixture similar to the one shown in below Figure with the component facing down. The apparatus shall consist of mechanical means to apply a force which will bend the board (D) x = 2 mm minimum. The duration of the applied forces shall be 60 (+ 5) sec. The force is to be applied only once to the board. 								
Terminal Strength(SMD)	Appearance : No damage	Preconditioning: Run through reflow for 3 times.( IPC/JEDEC J-STD-020E Classification Reflow Profiles With the component mounted on a PCB with the device to be tested, apply a 17.7 N (1.8 Kg) force 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. Recommended PC Board Pattern

	WCM2012F2S	WCM3216F2S	WCM3225F2S	WCM4532F2S
L(mm)	2.60	3.70	4.40	4.80
H(mm)	1.40	1.60	3.50	3.80
G1(mm)	1.25	1.90	1.60	2.50
G2(mm)	0.45	0.40	0.60	0.70



	WCM4532F2S-HI	WCM5555 FAS	WCM7060FAS	WCM9070FAS	WCM1211FAS	WCM1513FAS
L(mm)	5.00	5.9	8.0	11.0	14.0	17.0
H(mm)	3.60	4.3	4.5	5.0	7.9	9.2
G1(mm)	3.00	3.3	3.5	6.0	7.4	10.4
G2(mm)	1.20	1.9	1.5	2.0	2.5	3.8

### 8-2. Soldering

Mildly activated rosin fluxes are preferred. TAI-TECH 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.

#### 8-2.1 Soldering Reflow:

Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020E)

#### 8-2.2 Soldering Iron:

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. (Figure 2.)

- 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 4~5sec.

Fig.1 Soldering Reflow

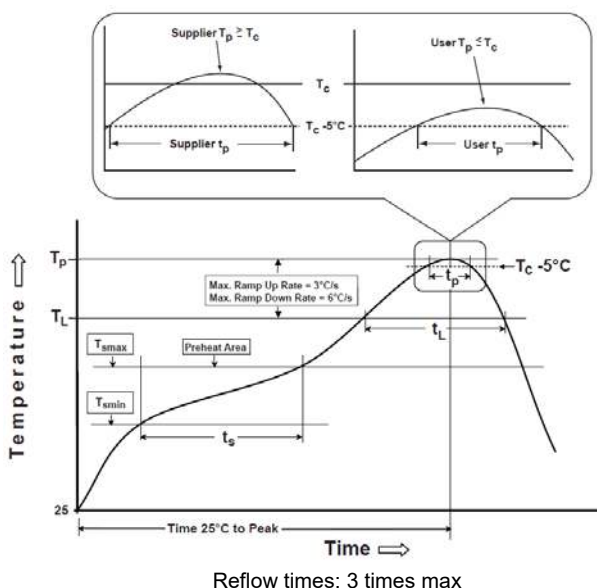
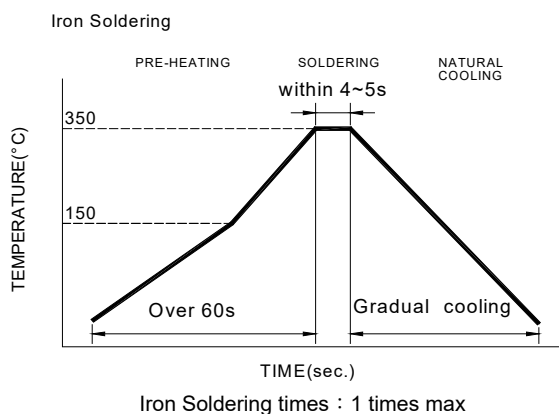


Fig.2 Iron soldering temperature profiles



**Table (1.1): Reflow Profiles**

Profile Type:	Pb-Free Assembly
Preheat -Temperature Min( $T_{smin}$ ) -Temperature Max( $T_{smax}$ ) -Time( $t_s$ )from( $T_{smin}$ to $T_{smax}$ )	150°C 200°C 60-120seconds
Ramp-up rate( $T_L$ to $T_p$ )	3°C/second max.
Liquidus temperature( $T_L$ ) Time( $t_L$ )maintained above $T_L$	217°C 60-150 seconds
Classification temperature( $T_c$ )	See Table (1.2)
Time( $t_p$ ) at $T_c - 5^\circ\text{C}$ ( $T_p$ should be equal to or less than $T_c$ .)	< 30 seconds
Ramp-down rate( $T_p$ to $T_L$ )	6°C /second max.
Time 25°C to peak temperature	8 minutes max.

$T_p$ : maximum peak package body temperature,  $T_c$ : the classification temperature.

For user (customer)  $T_p$  should be equal to or less than  $T_c$ .

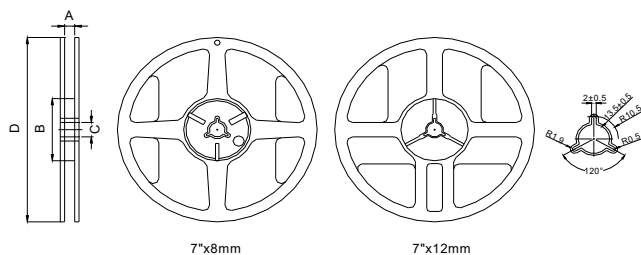
**Table (1.2) Package Thickness/Volume and Classification Temperature ( $T_c$ )**

	Package Thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350-2000	Volume mm <sup>3</sup> >2000
PB-Free Assembly	<1.6mm	260°C	260°C	260°C
	1.6-2.5mm	260°C	250°C	245°C
	≥2.5mm	250°C	245°C	245°C

Reflow is referred to standard IPC/JEDEC J-STD-020E ◦

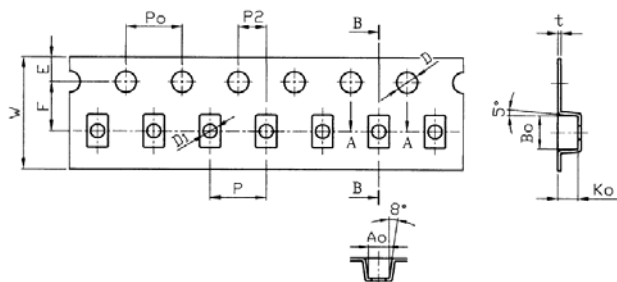
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60.0±2.0	13.5±0.5	178.0±2.0

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

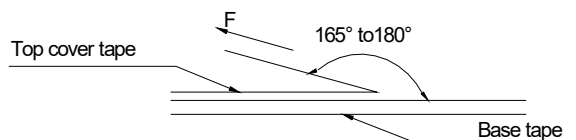


Series	W(mm)	P(mm)	E(mm)	F(mm)	P2(mm)	D(mm)	D1(mm)	P0(mm)	A0(mm)	B0(mm)	K0(mm)	t(mm)
WCM2012F2S	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05	2.00±0.05	1.50+0.10/-0.00	1.00±0.10	4.00±0.10	1.50±0.10	2.35±0.10	1.45±0.10	0.28±0.05

### 9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM2012F2S	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.

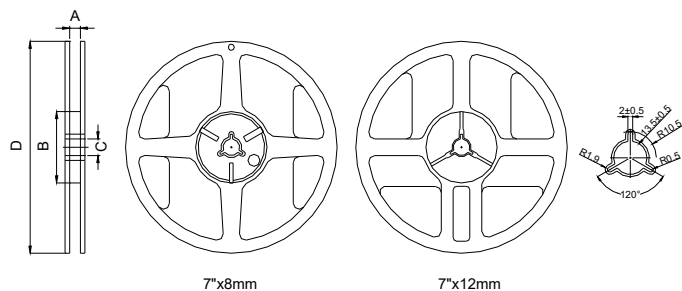
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

#### Application Notice

- Storage Conditions(component level)
  - To maintain the solderability of terminal electrodes:
    1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.

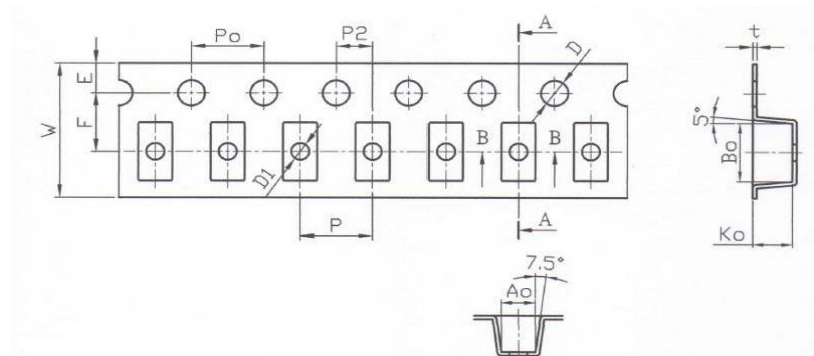
### 9. Packaging Information

#### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60.0±2.0	13.5±0.5	178.0±2.0

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

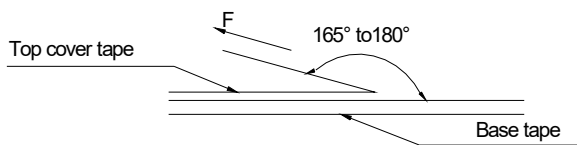


Series	P(mm)	Po(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	W(mm)	t(mm)	E(mm)	F(mm)	D(mm)	D1(mm)
WCM3216F2S	4.00±0.10	4.00±0.10	2.00±0.05	3.50±0.10	1.88±0.10	2.20±0.10	8.00±0.10	0.26±0.05	1.75±0.10	3.50±0.05	1.50+0.10/-0.00	1.0±0.10

#### 9-3. Packaging Quantity

Chip size	Chip/Reel	Inner Box	Middle Box	Carton
WCM3216F2S	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.

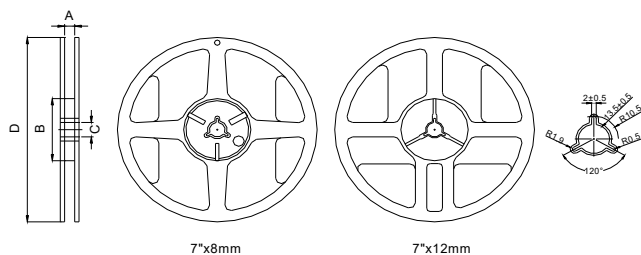
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

**Application Notice**

- Storage Conditions(component level)  
To maintain the solderability of terminal electrodes:
  1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.

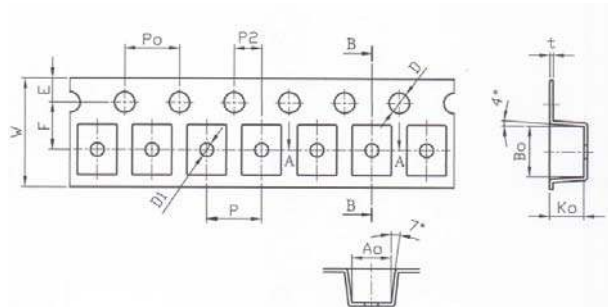
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x8mm	9.0±0.5	60.0±2.0	13.5±0.5	178.0±2.0

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

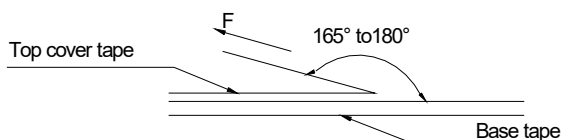


Series	W(mm)	P(mm)	E(mm)	F(mm)	P2(mm)	D(mm)	D1(mm)	P0(mm)	A0(mm)	B0(mm)	K0(mm)	t(mm)
WCM3225F2S	8.00±0.10	4.00±0.10	1.75±0.10	3.50±0.05	2.00±0.05	1.50+0.10/-0.00	1.00±0.10	4.00±0.10	2.88±0.10	3.72±0.10	2.50±0.10	0.26±0.05

### 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

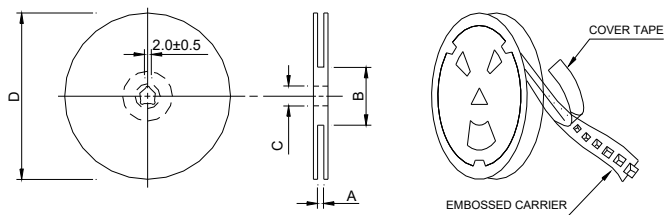
#### Application Notice

- Storage Conditions(component level)
  - To maintain the solderability of terminal electrodes:
    1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.



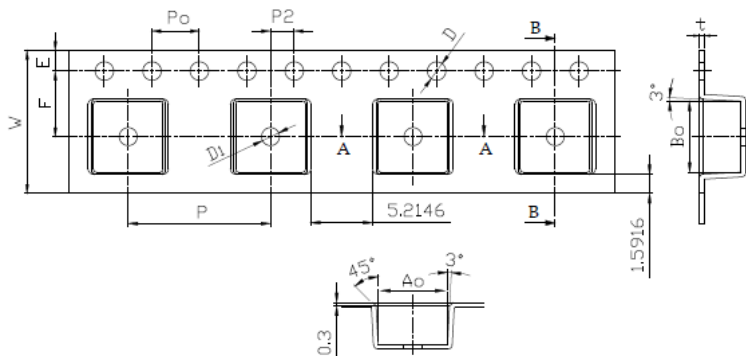
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x12mm	12.5±0.5	100.0±2.0	13.5±0.5	330

### 9-2. Tape Dimension

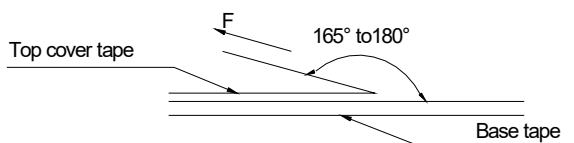


Series	W(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	D1(mm)	P0(mm)	P2(mm)	F(mm)	E(mm)	P(mm)	t(mm)
WCM5555	12.00±0.3	5.95±0.1	5.85±0.1	3.50±0.1	1.50+0.1/-0.00	1.50±0.1	4.00±0.1	2.00±0.1	5.50±0.1	1.75±0.1	12.00±0.1	0.40±0.05

### 9-3. Packaging Quantity

Size	Chip/Reel	Inner Box	Carton
WCM5555	1500	3000	15000

### 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.

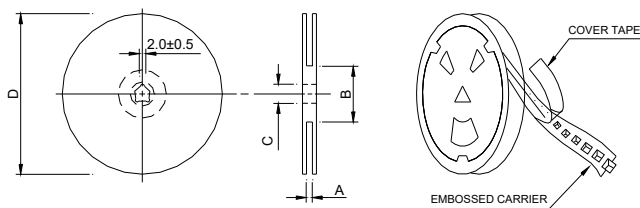
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

#### Application Notice

- Storage Conditions(component level)
  - To maintain the solderability of terminal electrodes:
    1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.

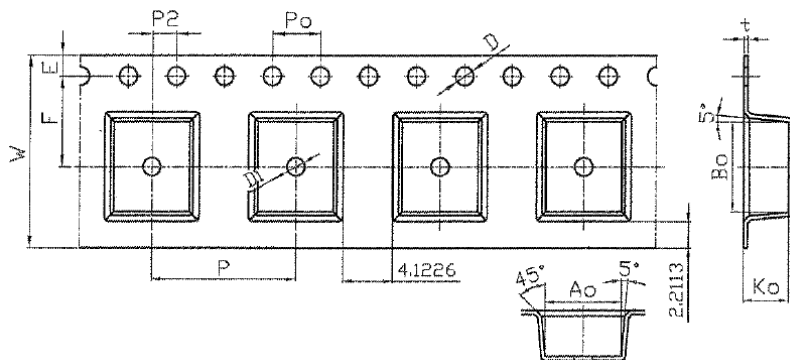
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x16mm	16.0±0.5	100.0±2.0	13.5±0.5	330

### 9-2. Tape Dimension

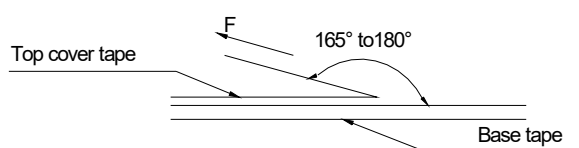


Series	W(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	D1(mm)	Ko(mm)	P0(mm)	P2(mm)	F(mm)	E(mm)	P(mm)	t(mm)
WCM7060	16.00±0.3/-0.1	7.50±0.1	6.3±0.1	3.8±0.1	1.50±0.10/-0.00	1.50±0.1	3.8±0.1	4.0±0.1	2.0±0.1	7.5±0.1	1.75±0.1	12.0±0.1	0.35±0.05

### 9-3. Packaging Quantity

Size	Reel
WCM7060	1500

### 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

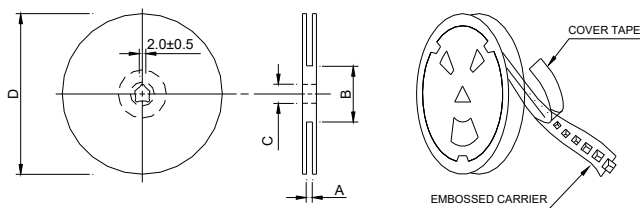
#### Application Notice

- Storage Conditions(component level)  
To maintain the solderability of terminal electrodes:
  1. TAI-TECH products meet IPC/JEDEC J-STD-020E 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.



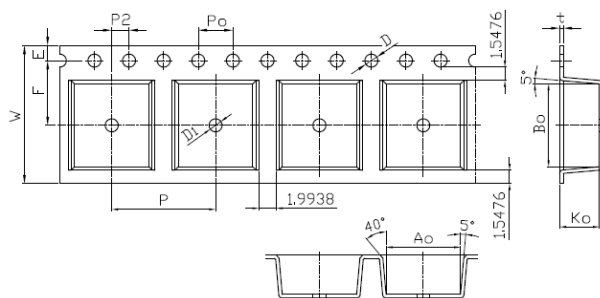
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x16mm	16.0±0.5	100.0±2.0	13.5±0.5	330

### 9-2. Tape Dimension

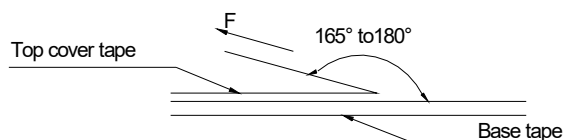


Series	W(mm)	P(mm)	E(mm)	F(mm)	P0(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	D1(mm)	t(mm)
WCM9070	16.00±0.30	12.00±0.10	1.75±0.10	7.50±0.10	4.00±0.10	2.00±0.10	9.60±0.10	8.60±0.10	4.60±0.10	1.50+0.10-0.00	1.50±0.10	0.40±0.05

### 9-3. Packaging Quantity

Size	Chip/Reel	Inner Box	Carton
WCM9070	800	1600	12800

### 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.

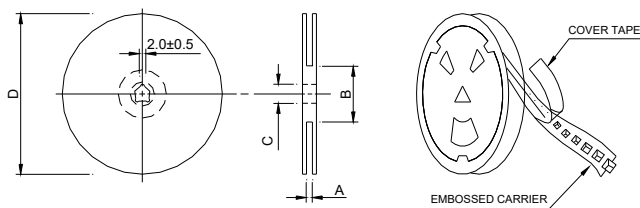
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

#### Application Notice

- Storage Conditions(component level)
  - To maintain the solderability of terminal electrodes:
    - TAI-TECH products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
    - Temperature and humidity conditions: Less than  $40^\circ\text{C}$  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.

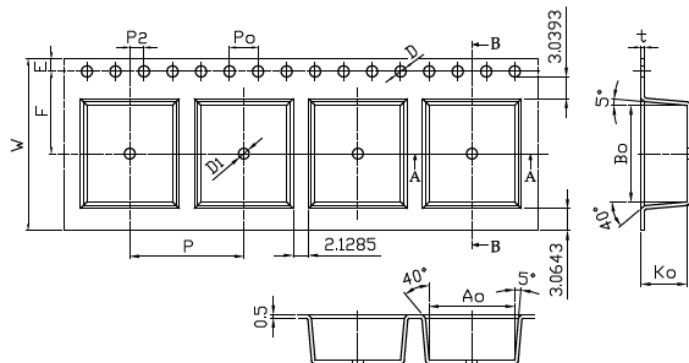
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x24mm	24.0±0.5	100.0±2.0	13.5±0.5	330

### 9-2. Tape Dimension

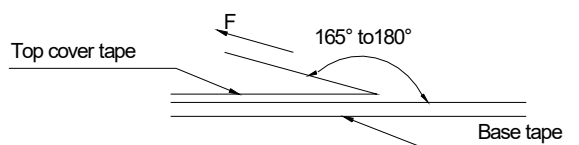


Series	W(mm)	P(mm)	E(mm)	F(mm)	P0(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	D1(mm)	t(mm)
WCM1211	24.00±0.30	16.00±0.10	1.75±0.10	11.50±0.10	4.00±0.10	2.00±0.10	13.50±0.10	12.00±0.10	6.40±0.10	1.50+0.10-0.00	1.50±0.10	0.50±0.05

### 9-3. Packaging Quantity

Size	Chip/Reel	Inner Box	Carton
WCM1211	500	1000	4000

### 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.

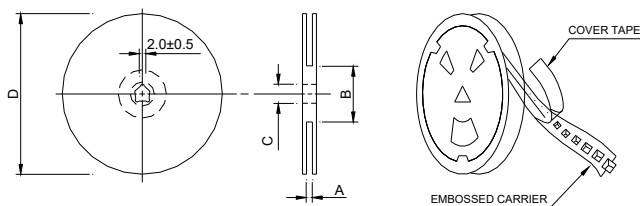
Room Temp. (°C)	Room Humidity (%)	Room atm (hPa)	Tearing Speed mm/min
5~35	45~85	860~1060	300

#### Application Notice

- Storage Conditions(component level)
  - To maintain the solderability of terminal electrodes:
    - TAI-TECH products meet IPC/JEDEC J-STD-020E standard-MSL, level 1.
    - Temperature and humidity conditions: Less than  $40^\circ\text{C}$  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.

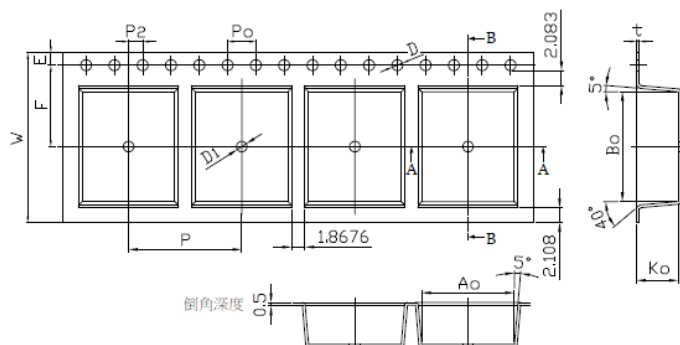
## 9. Packaging Information

### 9-1. Reel Dimension



Type	A(mm)	B(mm)	C(mm)	D(mm)
13"x24mm	24.0±0.5	100.0±2.0	13.5±0.5	330

### 9-2. Tape Dimension

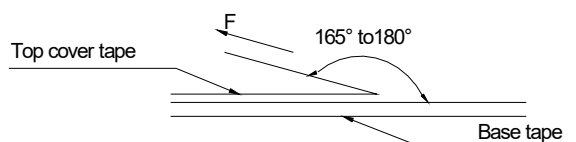


Series	W(mm)	P(mm)	E(mm)	F(mm)	P0(mm)	P2(mm)	Bo(mm)	Ao(mm)	Ko(mm)	D(mm)	D1(mm)	t(mm)
WCM1513	24.00±0.30	16.00±0.10	1.75±0.10	11.50±0.10	4.00±0.10	2.00±0.10	15.50±0.10	13.10±0.10	5.90±0.10	1.50+0.10-0.00	1.50±0.10	0.40±0.05

### 9-3. Packaging Quantity

Size	Chip/Reel	Inner Box	Carton
WCM1513	500	1000	4000

### 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-020E 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.