WCM4532L-2 Series

Wire Wound Chip Common Mode Filters

FEATURES

- Winding type realizes small size and low profile
- Prevention of common mode noise at high frequency
- Excellent solderability
- Operating temperature -40~+125℃ (Including self - temperature rise)

APPLICATIONS

- For Automotive
- Common mode noise suppression of automotive LAN for Flex Ray, CANBUS

PRODUCT IDENTIFICATION

WCM 4532 L- 2 - 510 T F

① ② ③④ ⑤ ⑥ ⑦

① Series Name:Wire Wound Chip Common Mode Filters

② Dimensions

③ Feature Type:Ferrite

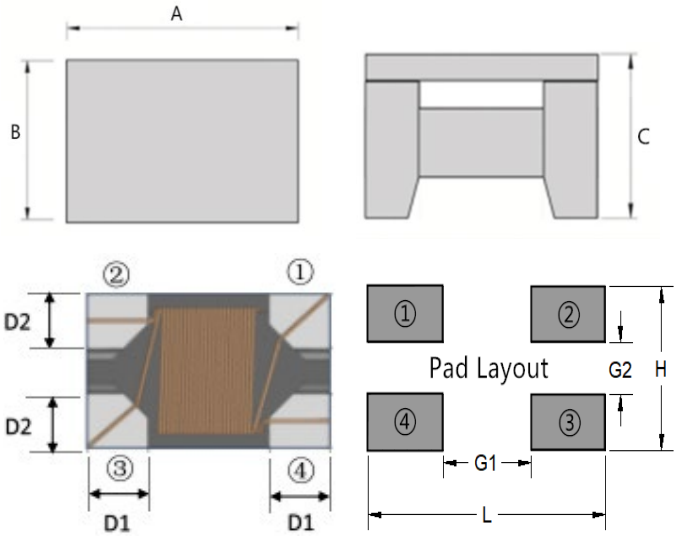
④ Number of Lines 2P=2 lines

⑤ Inductance : 510 = 51uH

⑥ Packing: Tape & Reel

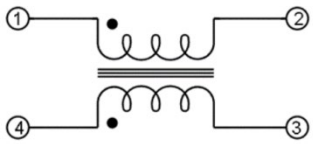
⑦ F:Hazardous Substance Free Products

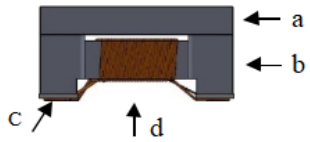
Shapes and Dimensions [Dimensions in mm]



Series:	WCM4532L-2**Series
A(mm)	4.5±0.2
B(mm)	3.2.±0.2
C(mm)	2.8±0.2
D1(mm)	0.90
D2(mm)	1.10
G1(mm)	2.70
G2(mm)	0.70
L(mm)	5.1
H(mm)	3.8

Equivalent Circuit / Materials



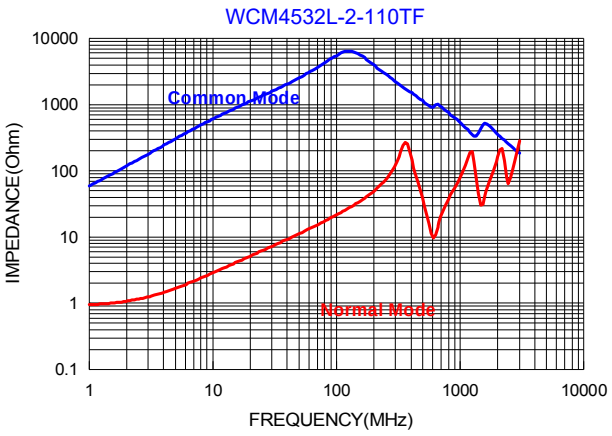


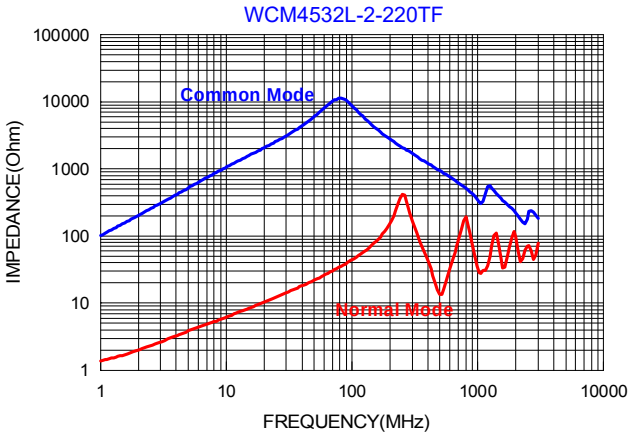
NO.	Description	Specification
a	Upper Plate	Ferrite
b	Core	Ferrite Core
c	Termination	Ag/Ni/Sn
d	Wire	Enameled Copper Wire

Electrical Characterisitics:

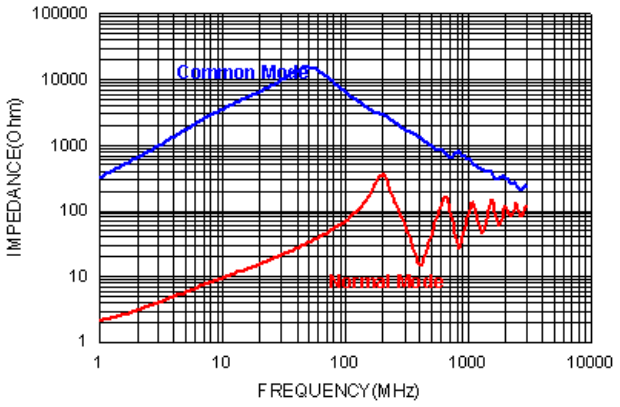
Part Number	Impedance [10MHz]	Inductance [100kHz/0.1V]	DC Resistance	Rated Current	Rated Volt.	IR
Units	**(Ω) Min**	**(uH)**	**(Ω)Max.**	**(mA)Max.**	**(Vdc)**	**(MΩ)min.**
WCM4532L-2-110TF	300	11 +50%/-30%	0.60	360	80	10
WCM4532L-2-220TF	500	22 +50%/-30%	1.00	310	80	10
WCM4532L-2-510TF	1000	51 +50%/-30%	1.00	230	80	10
WCM4532L-2-101TF	2000	100 +50%/-30%	2.00	200	80	10
WCM4532L-2-201TF	5000	200 +50%/-30%	4.50	100	80	10

Curve Frequency (MHz)

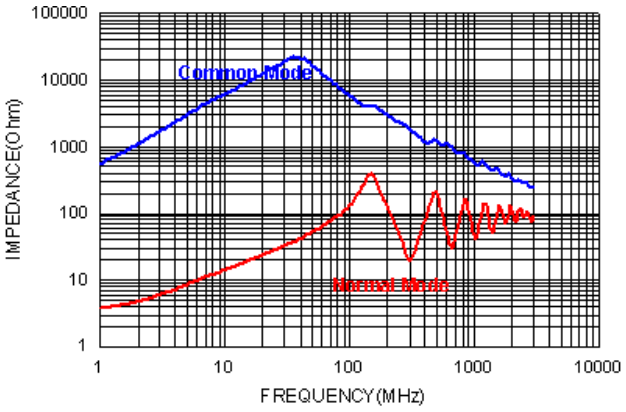




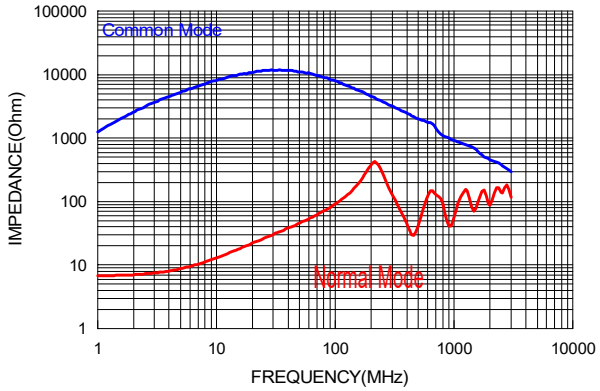
WCM4532L-2-510TF



WCM4532L-2-101TF



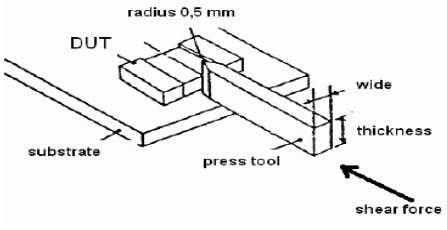
WCM4532L-2-201TF



Reliabily and Test Condition

Item	Performance	Test Condition
Operating temperature	-40~+125℃ (Including self - temperature rise)	
Storage temperature	-40~+125℃ (on board)	
Electrical Performance Test		
Impedance	Refer to standard electrical characteristics list.	Keysight E4991B + Keysight 16197A
DCR		Agilent-34420A Agilent-4338B
Insulation Resistance	Test Voltage : Rated Voltage Time : 1 minute max.	Chroma 19073
Withstand Volt	Test Voltage : Rated Voltage*2.5 times. Time : 1 ~ 5 s. Charge Current : 1 mA max.	Chroma 19073
Temperature Rise Test	Rated Current ΔT 40℃Max	1.Applied the allowed DC current. 2.Temperature measured by digital surface thermometer

Reliability Test

Life Test	Appearance：No damage. Impedance：within±15% of initial value DCR：within±15% of initial value and shall not exceed the specification value	Preconditioning: Run through reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Temperature：125±2℃ Applied current：rated current Duration：1000±12hrs Measured at room temperature after placing for 24 hrs.
Load Humidity		Preconditioning: Run through reflow for 3 times. (IPC/JEDECJ-STD-020F Classification Reflow Profiles) Humidity：85±3% RH Temperature：85℃±2℃ Duration：1000hrs Min. Bead：with 100% rated current Inductance：with 10% rated current Measured at room temperature after placing for 24 hrs.
Moisture Resistance		Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) 1. . Ba d at 50℃ for 25hrs, measured at room temperature after placing for 4 hrs. 2. . aise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs. 3. . aise temperature to 65±2℃ 90-100%RH in 2.5hrs, and keep 3 hours, cool down to 25℃ in 2.5hrs, keep at 25℃ for 2hrs then keep at -10℃ for 3hrs. 4. . eep at 25℃ 80-100%RH for 15min and vibrate at the frequency of 10 to 55 Hz to 10 Hz, measured at room temperature after placing for 1~2 hrs.
Thermal Shock		Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) Condition for 1 cycle Step1：-40±2℃ 30±5min Step2：125±2℃ ≦0.5min Step3：125±2℃ 30±5min Number of cycles：500 Measured at room temperature after placing for 24 hrs.
Vibration		Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) Oscillation Frequency : 10Hz～2kHz～10Hz for 20 minutes Equipment : Vibration checker Total Amplitude : 10g Testing Time : 12 hours (20 minutes, 12 cycles each of 3 orientations)
Bending	Appearance：No damage. Impedance：within±15% of initial value DCR：within±15% of initial value and shall not exceed the specification value	Shall be mounted on a FR4 substrate of the following dimensions: >=0805 inch(2012mm):40x100x1.2mm <0805 inch(2012mm):40x100x0.8mm Bending depth: >=0805 inch(2012mm):1.2mm <0805 inch(2012mm):0.8mm duration of 10 sec.
Shock		<table><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><tr><td>SMD</td><td>0</td><td>11</td><td>Half-sine</td><td>11.3</td></tr><tr><td>Lead</td><td>0</td><td>11</td><td>Half-sine</td><td>11.3</td></tr></table> 3 shocks in each direction along 3 perpendicular axes. (18 shocks).
Solderability	More than 95% of the terminal electrode should be covered with solder	a. Method B, 4hrs @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
Resistance to Soldering Heat	Appearance：No damage. Impedance：within±15% of initial value DCR：within±15% of initial value and shall not exceed the specification value	Depth: completely cover the termination <table><tr><th>Temperature(°C)</th><th>Time(s)</th><th>Temperature ramp/immersion and emersion rate</th><th>Number of heat cycles</th></tr><tr><td>260 ±5 (solder temp)</td><td>10 ±1</td><td>25mm/s ±6 mm/s</td><td>1</td></tr></table>
Terminal Strength		Preconditioning: Run through reflow for 3 times. (IPC/JEDEC J-STD-020F Classification Reflow Profiles) With the component mounted on a PCB with the device to be tested, apply a force (>0805:1kg, <=0805:0.5kg) to the side of a device being tested. This force shall be applied for 60 +1 seconds. Also the force shall be applied gradually as not to apply a shock to the component being tested. 

Soldering and Mounting

1. Soldering

Mildly activated rosin fluxes are preferred. Magnetsyc 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.

1.1 Soldering Reflow:

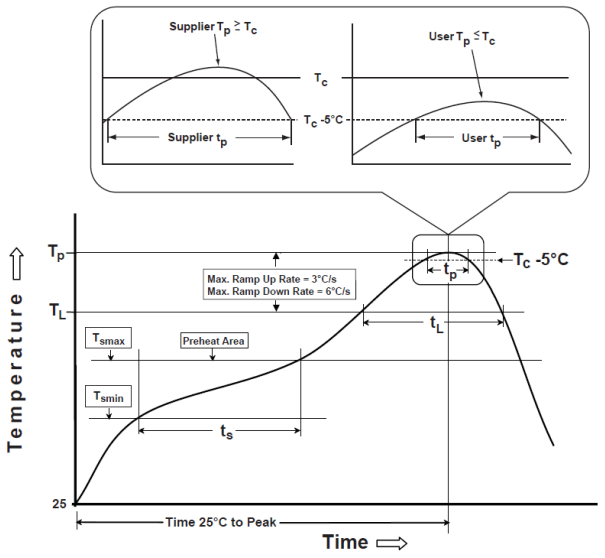
Recommended temperature profiles for lead free re-flow soldering in Figure 1. Table 1.1&1.2 (J-STD-020F)

1.2 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.)

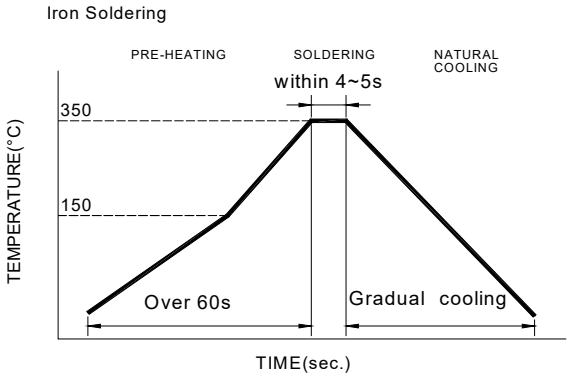
- Preheat circuit and products to 150℃
- 350℃ tip temperature (max)
- Never contact the ceramic with the iron tip
- 1.0mm tip diameter (max)
- Use a 20 watt soldering iron with tip diameter of 1.0mm
- Limit soldering time to 4~5sec.

Fig.1 Soldering Reflow



Reflow times: 3 times max

Fig.2 Iron soldering temperature profiles



Iron Soldering times：1 times max

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℃ 200℃ 60-120seconds
Ramp-up rate($T_L$to T_p)	℃/second max.
Liquidus temperature(T_L) Time(t_L)maintained above T_L	217℃ 60-150 seconds
Classification temperature(T_c)	See Table (1.2)
Time(t_p) at Tc- 5℃ (Tp should be equal to or less than Tc.)	< 30 seconds
Ramp-down rate(T_p to T_L)	6℃ /second max.
Time 25℃ to peak temperature	8 minutes max.

Tp: maximum peak package body temperature, **Tc**: the classification temperature.

For user (customer) **Tp** should be equal to or less than **Tc.**

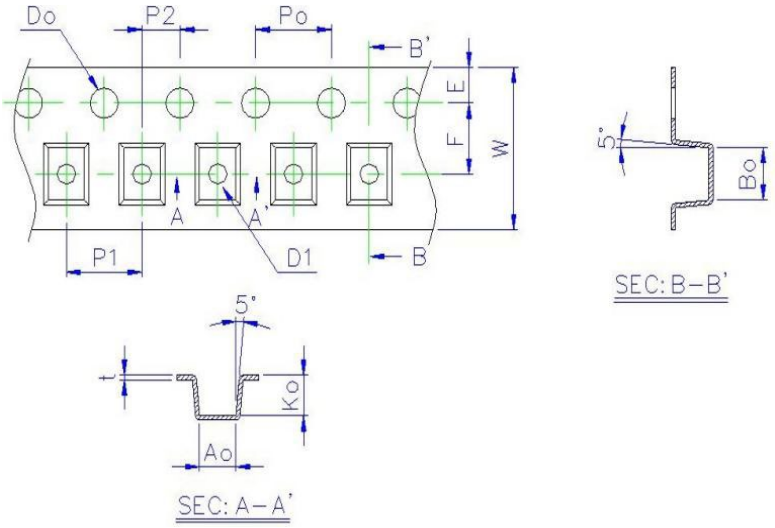
Table (1.2) Package Thickness/Volume and Classification Temperature (T_c)

	Package Thickness	Volume mm^3 <350	Volume mm^3 350-2000	Volume mm^3 >2000
PB-Free Assembly	<1.6mm	℃	260℃	260℃
	1.6-2.5mm	260℃	250℃	245℃
	≥2.5mm	250℃	245℃	245℃

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

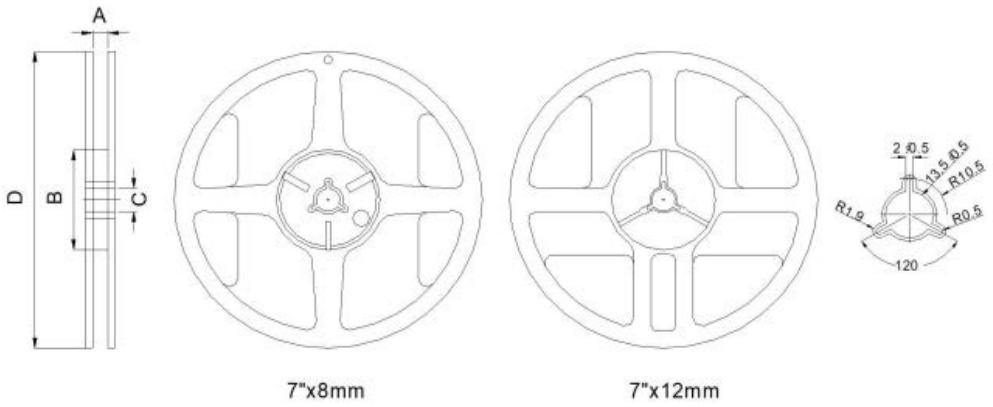
Packaging

(1) Tape Dimensions(Unit:mm)



Size	Ao(mm)	Bo(mm)	Ko(mm)	W(mm)	E(mm)	F(mm)	Po(mm)	P1(mm)	Do(mm)
WCM4532L	3.6±0.10	4.9±0.10	3.0±0.10	12.0±0.10	1.75±0.10	5.50±0.05	4.0±0.05	8.0±0.10	1.5±0.05

(2) Reel



Type	A(mm)	B(mm)	C(mm)	D(mm)
7"x12mm	13.5±0.5	60.0±2	13.5±0.5	178.0±2

Part No.	Tape	MPQ
WCM4532L-2-**	Embossed Tape	500PCS