

Datasheet

Multilayer Common Mode Filter, For USB 2.0/IEEE 1394 Application, RFCMF 1220(0508) RS Stock number 884-2231

FEATURES

1. Multilayer LTCC (Low Temperature Cofired Ceramics) Technology
2. Reflow solderable SMD Devices
3. Miniatured Size 1.2 x 2.0 x 1.0 mm³
4. Low Differential Mode Insertion Loss maximum 0.6dB @ 240MHz
5. High Common Mode attenuation minimum 9.0dB @ 240MHz ~ 1.0GHz
6. Special 3D layout design to minimize phase shifting

APPLICATIONS

1. USB 2.0/ IEEE 1394 high speed data transmission
2. PC related, DSC, Scanner, Data Storage Devices, CD ROM RW, Printer

CONSTRUCTION and Schematic

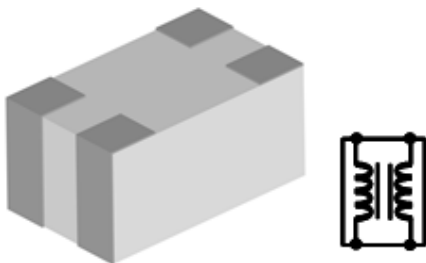
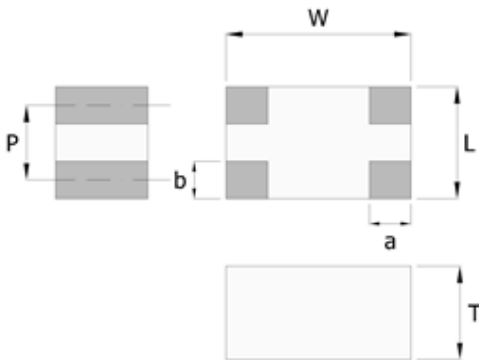


Fig.1. Outline of 1220 size Common Mode Filter and Schematics (No polarity)

DIMENSIONS

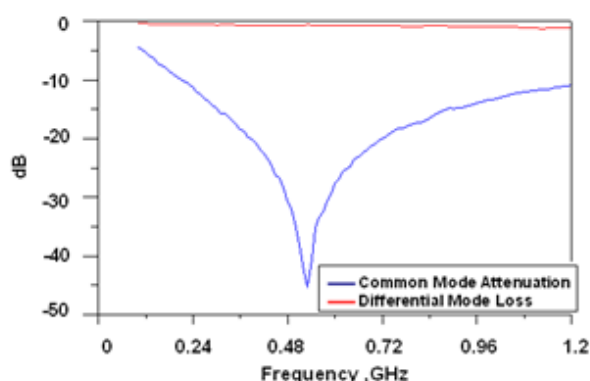
Figure	Symbol	Dimension (mm)
	L	1.20 ± 0.40/ -0.20
	W	2.00 ± 0.40/ -0.20
	T	1.00 ± 0.20
	P	0.80 ± 0.10
	a	0.45 ± 0.20
	b	0.40 ± 0.20

ELECTRICAL CHARACTERISTICS

RFCMF1220100M3T	Specification
Common Mode Impedance	80 ohm \pm 20% @100MHz
Common Mode Attenuation	Min. 9.0dB @ 240MHz ~ 1GHz
Differential Mode Insertion Loss	Max. 0.6 dB @ 240MHz
DC Resistance	Max. 1.5 Ω
Rated Current	300 mA
Characteristic Impedance (Differential)	90 Ω (Typical)
Operating Temperature	- 40 $^{\circ}$ C ~ +85 $^{\circ}$ C

TYPICAL ELECTRICAL CHARACTERISTICS

Insertion Loss vs. Frequency Characteristic:



Impedance vs. Frequency Characteristic:

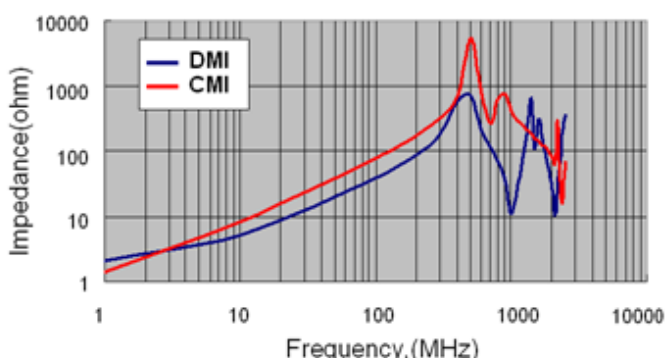
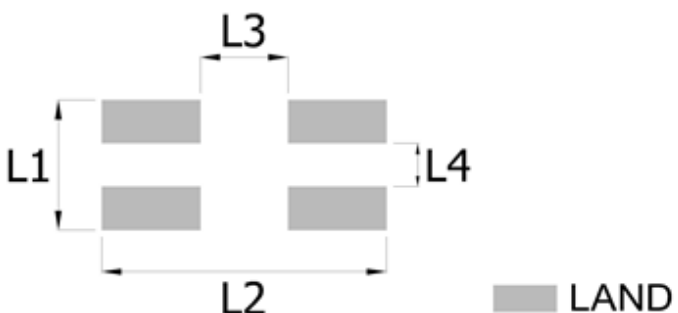

SOLDER LAND PATTERN

Figure	Symbol	Dimension (mm)
	L1	1.20 \pm 0.10
	L2	2.60 \pm 0.05
	L3	0.80 \pm 0.05
	L4	0.40 \pm 0.05

Line width to be designed to match 50 Ω characteristic impedance, depending on PCB material and thickness.

RELIABILITY TEST

Test item	Test condition / Test method	Specification						
Solderability JIS C 0050-4.6 JESD22-B102D	*Solder bath temperature : 235±5°C *Immersion time : 2±0.5 sec *Solder : Sn3Ag0.5Cu for lead-free	At least 95% of a surface of each terminal electrode must be covered by fresh solder.						
Leaching (Resistance to dissolution of metallization) IEC 60068-2-58	*Solder bath temperature : 260±5°C *Leaching immersion time : 30±0.5 sec *Solder: SN63A	Loss of metallization on the edges of each electrode shall not exceed 25%.						
Resistance to soldering heat JIS C 0050-5.4	*Preheating temperature : 120~150℃, 1 minute. *Solder temperature : 270±5°C *Immersion time : 10±1 sec *Solder : Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for 24±2 hrs	Loss of metallization on the edges of each electrode shall not exceed 25%. No mechanical damage. Samples shall satisfy electrical specification after test, meet Table 1. Table 1 <table><tr><td>Appearance</td><td>No damaged</td></tr><tr><td>Common Mode Impedance Change</td><td>Within ± 20%</td></tr><tr><td>DC Resistance Change</td><td>Within ± 30%</td></tr></table>	Appearance	No damaged	Common Mode Impedance Change	Within ± 20%	DC Resistance Change	Within ± 30%
Appearance	No damaged							
Common Mode Impedance Change	Within ± 20%							
DC Resistance Change	Within ± 30%							
Drop Test JIS C 0044	*Height : 75 cm *Test Surface : Rigid surface of concrete or steel. *Times : 6 surfaces for each units ; 2 times for each side.	No mechanical damage. Samples shall satisfy electrical specification after test, meet Table 1.						
Vibration JIS C 0040	*Frequency : 10Hz~55Hz~10Hz(1min) *Total amplitude : 1.5mm *Test times : 6hrs.(Two hrs each in three mutually perpendicular directions)							
Adhesive Strength of Termination JIS C 0051-7.4.3	*Pressurizing force : 5N(≤0603) ; 10N(>0603) *Test time : 10±1 sec	No remarkable damage or removal of the termination.						

Bending test JIS C 0051-7.4.1	<p>The middle part of substrate shall be pressurized by means of the pressurizing rod at a rate of about 1 mm/s per second until the deflection becomes 1mm/s and then pressure shall be maintained for 5±1 sec.</p> <p>Measurement to be made after keeping at room temperature for 24±2 hours</p>	<p>No mechanical damage.</p> <p>Samples shall satisfy electrical specification after test, meet Table 2.</p> <p>Table 2</p> <table><tr><td>Appearance</td><td>No damaged</td></tr><tr><td>DC Resistance Change</td><td>Within ± 30%</td></tr></table>	Appearance	No damaged	DC Resistance Change	Within ± 30%
Appearance	No damaged					
DC Resistance Change	Within ± 30%					
Temperature cycle JIS C 0025	<p>1. 30±3 minutes at -40°C±3°C,</p> <p>2. 10~15 minutes at room temperature,</p> <p>3. 30±3 minutes at +85°C±3°C,</p> <p>4. 10~15 minutes at room temperature,</p> <p>Total 100 continuous cycles</p> <p>Measurement to be made after keeping at room temperature for 24±2 hrs</p>	<p>No mechanical damage.</p> <p>Samples shall satisfy electrical specification after test, meet Table 1.</p>				
High temperature JIS C 0021	<p>*Temperature : 85°C±2°C</p> <p>*Test duration : 1000+24/-0 hours</p> <p>Measurement to be made after keeping at room temperature for 24±2 hrs</p>	<p>No mechanical damage.</p> <p>Samples shall satisfy electrical specification after test, meet Table 1.</p>				
Humidity (steady conditions) JIS C 0022	<p>*Humidity : 90% to 95% R.H.</p> <p>*Temperature : 40±2°C</p> <p>*Time : 1000+24/-0 hrs.</p> <p>Measurement to be made after keeping at room temperature for 24±2 hrs</p> <p>※ 500hrs measuring the first data then 1000hrs data</p>	<p>No mechanical damage.</p> <p>Samples shall satisfy electrical specification after test, meet Table 1.</p>				
Low temperature JIS C 0020	<p>*Temperature : -40°C±2°C</p> <p>*Test duration : 1000+24/-0 hours</p> <p>Measurement to be made after keeping at room temperature for 24±2 hrs</p>	<p>No mechanical damage.</p> <p>Samples shall satisfy electrical specification after test, meet Table 1.</p>				

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig2,

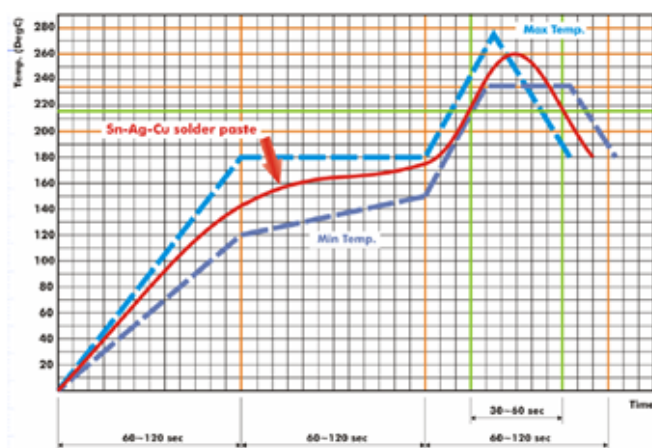
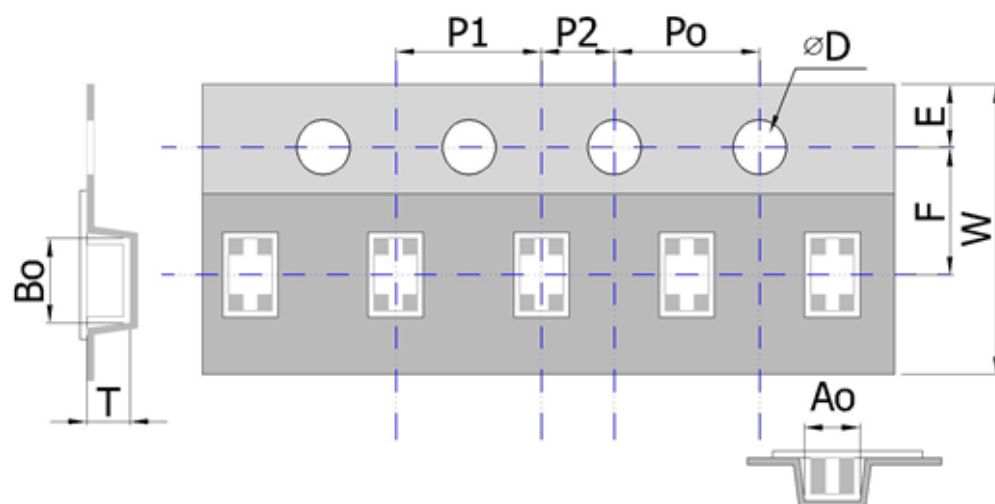


Fig2. Infrared soldering profile

ORDERING CODE

RF	CMF	122010	0	M	3	T
Walsin RF device	Product Code CMF : Common Mode Filter	Dimension code 122010= Length 12 , Width 20, Thickness 10	Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	Application M: USB 2.0/ IEEE1394	Specification Design Code	Packing T : 7" Reeled

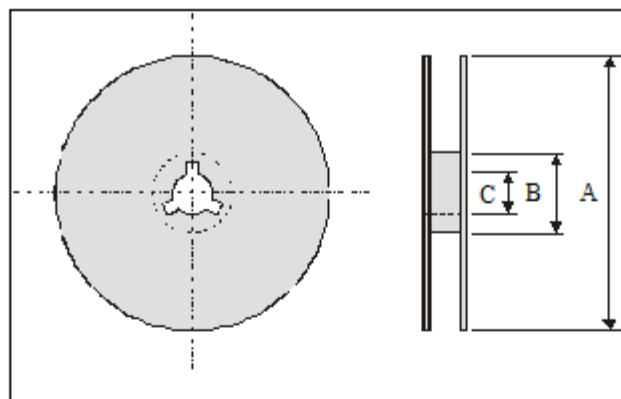
Minimum Ordering Quantity: 2000 pcs per reel.

PACKAGING


Plastic Tape specifications (unit: mm)

Index	Ao	Bo	ØD	T	W
Dimension(mm)	1.52 ± 0.10	2.34 ± 0.10	1.50 ± 0.10	1.22 ± 0.10	8.0 ± 0.20
Index	E	F	Po	P1	P2
Dimension(mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.05	4.00 ± 0.20	2.00 ± 0.05

Reel dimensions



Index	A	B	C
Dimension (mm)	Φ178	Φ60.0	Φ13.5

Typing Quantity: 2000 pieces per 7" reel

CAUTION OF HANDLING

Limitation of Applications

Please contact us before using our products for the applications listed below which require especially high reliability for the prevention of defects, which might directly cause damage to the third party's life, body or property.

- (1) Aircraft equipment
- (2) Aerospace equipment
- (3) Undersea equipment
- (4) Medical equipment
- (5) Disaster prevention / crime prevention equipment
- (6) Traffic signal equipment
- (7) Transportation equipment (vehicles, trains, ships, etc.)
- (8) Applications of similar complexity and/or reliability requirements to the applications listed in the above.

Storage condition

- (1) Products should be used in 6 months from the day of WALSIN outgoing inspection, which can be confirmed.
- (2) Storage environment condition.
 - Products should be storage in the warehouse on the following conditions.
 - Temperature : -10 to +40°C
 - Humidity : 30 to 70% relative humidity
 - Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid or it may cause oxidization of electrode, resulting in poor solderability.
 - Products should be storage on the palette for the prevention of the influence from humidity, dust and son on.
 - Products should be storage in the warehouse without heat shock, vibration, direct sunlight and so on.
 - Products should be storage under the airtight packaged condition.