
APPROVAL SHEET

RFLPF Series – 2012(0805)

MULTILAYER CERAMIC LOW PASS FILTER

2.4 GHz ISM Band Working Frequency

RFLPF2012110A0x series

Customer : _____

Approval No : _____

Issue Date : _____

Customer Approval :

FEATURES

1. Multilayer LTCC (Low Temperature Cofired Ceramics) Technology
2. Reflow solderable
3. Miniatured Size 2.00 x 1.25 x 1.05 mm³
4. Low Insertion Loss (Typical -0.3dB@2.4GHz)
5. High attenuation on 2nd and 3rd harmonic suppressed
6. Suitable for 2.45 GHz Working Frequency Operation

APPLICATIONS

1. 2.4GHz ISM Band RF Application
2. Bluetooth, Wireless LAN, Home RF

CONSTRUCTION

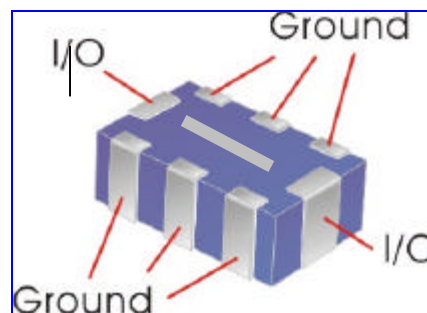


Fig 1. Outline of 2.4GHz Low Pass Filter

DESCRIPTION

Our new ceramic Low Pass Filter specified for 2.4 GHz ISM Band application, as shown in fig-1. Both of Wireless LAN IEEE 802.11b, and Bluetooth™ typically located on this unlicensed frequency band which range covers from 2.4GHz to 2.4835GHz. To fulfil the in-band and out-band frequency requirements, this Low Pass Filter has been designed to a high suppression on 2nd and 3rd harmonic as well as low insertion loss characteristics through our advanced LTCC (Low Temperature Co-fired Ceramic) technology and superior product design via 3D EM Simulation Skill.

This Low Pass Filter has a rectangular ceramic body with a tiny dimension of 2.00 x 1.25 x 1.05 mm³ future meet the SMT automation and miniaturization requirements on modern portable devices.

DIMENSIONS

Figure	Symbol	Dimension
	L	2.00 ± 0.15 mm
	W	1.25 ± 0.10 mm
	T	1.05 ± 0.10 mm
	A	0.30 ± 0.10 mm
	B	0.30 ± 0.10 mm
	C	0.30 ± 0.10 mm
	D	0.40 ± 0.20 mm
	E	0.30 ± 0.10 mm
	F	0.20 ± 0.10 mm
	P	0.65 ± 0.10 mm

SOLDER LAND PATTERN

Figure	Symbol	Dimension (mm)
<p> I/O Solder Pad Ground Solder Pad Ground Via </p> <p>Line width to be design to match 50W characteristic impedance, depending on PCB material and thickness.</p>	L	2.00 ± 0.10
	A	1.00 ± 0.10
	B	1.30 ± 0.10
	L1	1.40 ± 0.10
	A1	0.30 ± 0.10
	B1	0.35 ± 0.10
	W1	0.20 ± 0.10
	W2	0.30 ± 0.10
	Φ	0.40 ± 0.10

MARKING: No marking, the white line means up-side

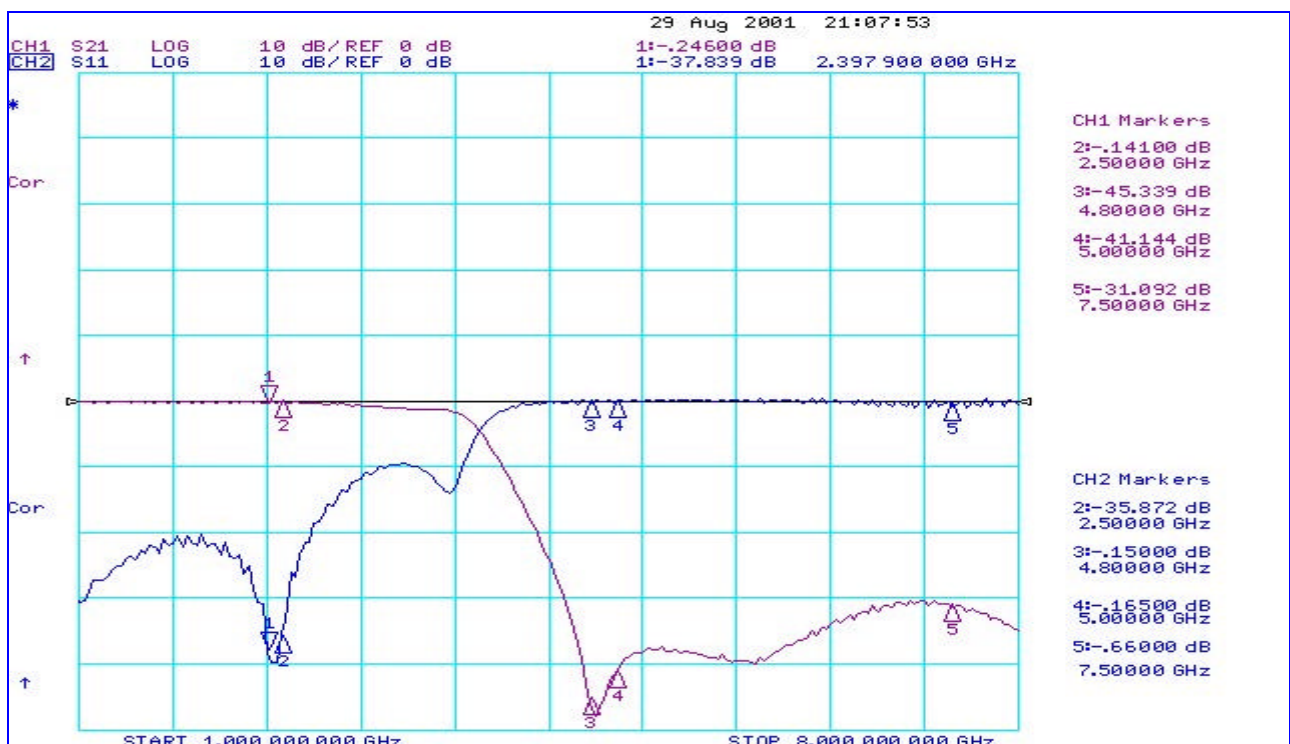
ELECTRICAL CHARACTERISTICS

■ RFLPF2012110A0x Series

Item	Specification
Frequency range (MHz)	2450 ± 50 MHz
Insertion Loss (dB)	0.7 (max)
VSWR	1.5
Attenuation (dB min.)	30 @ 2 x (f ₀ ± BW/2) 25 @ 3 x (f ₀ ± BW/2)

*Note1: Rated power 5W MAX

*Note2: Maximum Input power: 10W for 5 minutes



RELIABILITY TEST

■ Mechanical performance

Test item	Test condition / Test method	Specification
Solderability	Solder temp. : $235 \pm 5^{\circ}\text{C}$ Immersion time: 2 ± 1 sec Solder: SN63	At least 80% of a surface of each terminal electrode must be covered by fresh solder.
Resistance to soldering heat	Solder: Sn63 Preheating temperature: $150 \pm 10^{\circ}\text{C}$ Solder Temperature: $260 \pm 5^{\circ}\text{C}$ Immersion time: 10 ± 1 sec Measurement to be made after keeping at room temp. for 24 ± 2 hrs.	No mechanical damage. Ceramic surface shall not be exposed in the middle of the termination or on the terminated product edge by leaching.
Drop Test	Height : 75 cm Direction : 3 directions Times : 3 times for each direction.	No mechanical damage. Samples shall satisfy electrical specification after test..

■ Environmental characteristics

Test item	Test condition / Test method	Specification
Humidity (steady conditions)	Humidity: 90% to 95% R.H. Temperature: $40 \pm 2^{\circ}\text{C}$ Time: 500 ± 24 hours. Measurement: After placing for 24 hours Minimum.	No mechanical damage. Samples shall satisfy electrical specification after test.
Temperature cycle	1. 30 ± 3 minutes at $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 2. 10~15 minutes at room temperature, 3. 30 ± 3 minutes at $+85^{\circ}\text{C} \pm 3^{\circ}\text{C}$, 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement after placing for 48 ± 2 hrs min.	No mechanical damage. Samples shall satisfy electrical specification after test.
High temperature	Temperature: $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ Test duration: 24 hours Measurement must be taken after subjection to the above conditions, followed by exposure in room environment for 1 to 2 hours.	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature	Temperature: $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ Test duration: 24 hours Measurement must be taken after subjection to the above conditions, followed by exposure in room environment for 1 to 2 hours.	No mechanical damage. Samples shall satisfy electrical specification after test.

SOLDERING CONDITION

Typical examples of soldering processes that provide reliable joints without any damage are given in Fig 2,

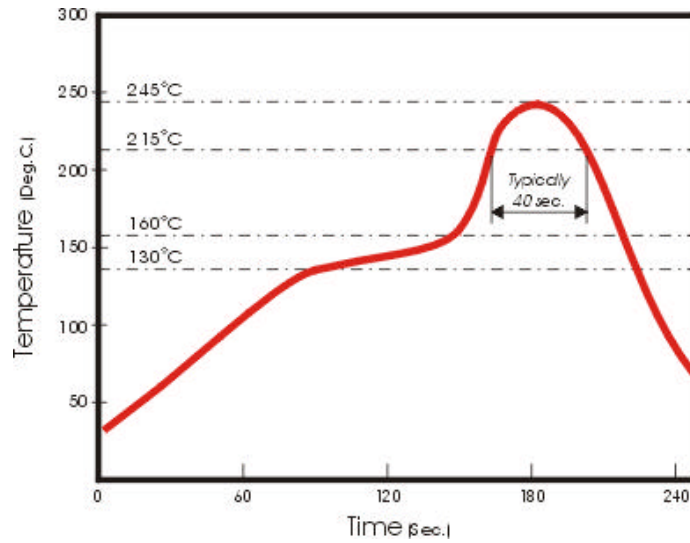


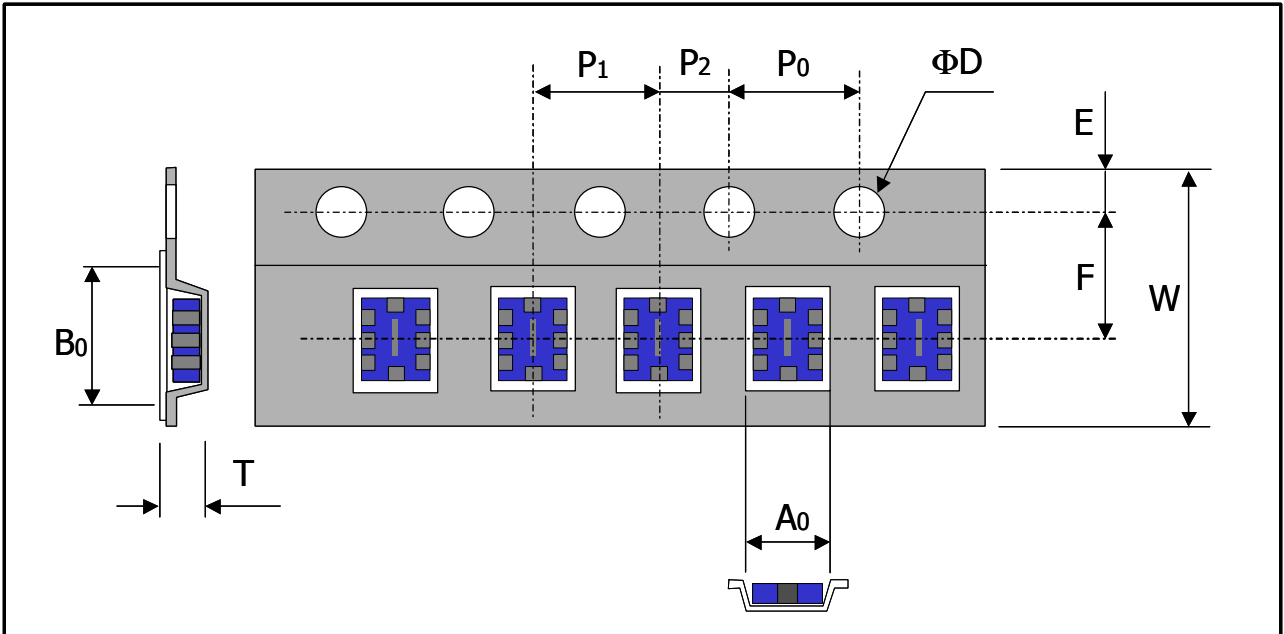
Fig 2. Infrared soldering profile

ORDERING CODE

RF	LPF	201211	0	A	0	T
RF device	Product Code LPF : Low Pass Filter	Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 201211 = Length 20, Width 12, Thickness 11	Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	Application A : 2.4GHZ ISM Band B : GSM 900/1800 Dual Band C : GSM 900 D : GSM 1800 E : GPS F : W-CDMA G : PHS	Specification Code from 0 ~ 9 dependent on different electrical specification	Packing T : 7" Reeled G : 13" Reeled B : Bulk X : SFC product

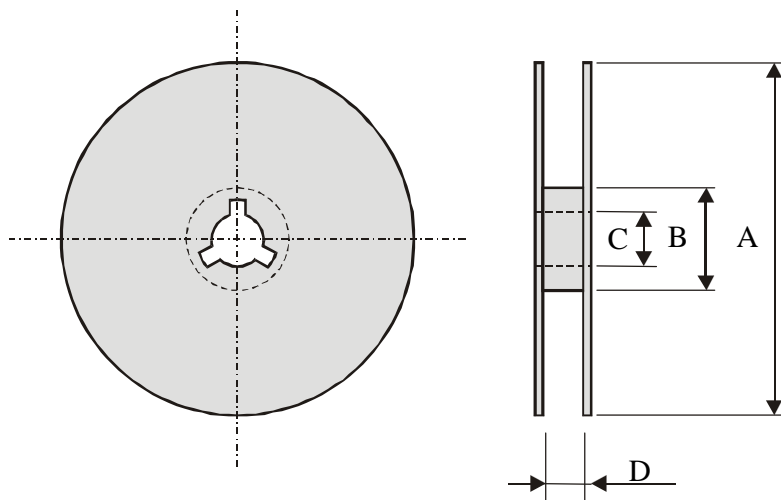
PACKAGING

Plastic Tape specifications (unit :mm)



Index	A ₀	B ₀	ΦD	T	W
Dimension (mm)	1.4 ± 0.10	2.25 ± 0.10	1.55 ± 0.10	1.35 ± 0.10	8.0 ± 0.30
Index	E	F	P ₀	P ₁	P ₂
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	8.00 ± 0.10	2.00 ± 0.10

Reel dimensions



	Index	A	B	C	D
7" Reel	Dimension (mm)	Φ178	Φ60.0	Φ13.5	10.0±1.0

Taping 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 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.