

APPROVAL SHEET

RFLPF Series – 2012(0805)

MULTILAYER CERAMIC LOW PASS FILTER

Halogens Free Product

5 GHz ISM Band Working Frequency

RFLPF2012090K0T

*Contents in this sheet are subject to change without prior notice

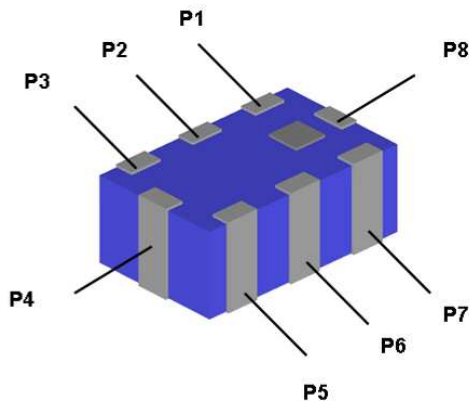
FEATURES

1. Multilayer LTCC (Low Temperature Cofired Ceramics) Technology
2. Reflow solderable
3. Miniature Size $2.0 \times 1.25 \times 0.9 \text{ mm}^3$
4. Low Insertion Loss (Typical -0.3dB)
5. Superior image suppression at $2x_{fo}$

APPLICATIONS

1. Harmonic suppression
2. 5GHz WLAN802.11a, HiperLAN2

CONSTRUCTION



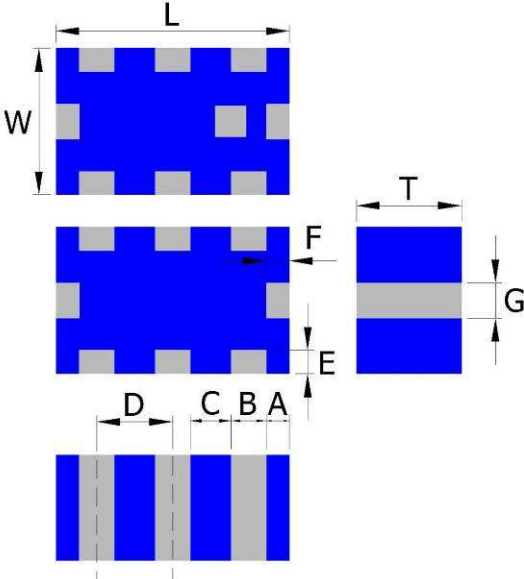
PIN	Definition	PIN	Definition
P1	Ground	P5	Ground
P2	Ground	P6	Ground
P3	Ground	P7	Ground
P4	Output port	P8	Input port

DESCRIPTION

Walsin Technology Corporation develops a new ceramic Low Pass Filter specified for 5GHz ISM Band application, as shown in Fig.1. 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 Walsin's 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 $2.0 \times 1.25 \times 0.9 \text{ mm}^3$ future meet the SMT automation and miniaturization requirements on modern portable devices.

DIMENSIONS

Figure	Symbol	Dimension
	L	$2.00 \pm 0.10 \text{ mm}$
	W	$1.25 \pm 0.10 \text{ mm}$
	T	$0.90 \pm 0.10 \text{ mm}$
	A	$0.20 \pm 0.10 \text{ mm}$
	B	$0.30 \pm 0.10 \text{ mm}$
	C	$0.35 \pm 0.10 \text{ mm}$
	D	$0.65 \pm 0.10 \text{ mm}$
	E	$0.25 \pm 0.10 \text{ mm}$
	F	$0.20 \pm 0.10 \text{ mm}$
	G	$0.30 \pm 0.10 \text{ mm}$

ELECTRICAL CHARACTERISTICS

RFLPF2012090K0T	Specification
Frequency range (MHz)	5400 ± 500 MHz
Insertion Loss (dB)	-0.55dB at 25°C -0.65dB at -40°C ~ +85°C
VSWR	2.0
Attenuation (dB min.)	-30dB @ 9.80 GHz -30dB @ 11.8 GHz -20dB @ 17.55GHz (for reference)

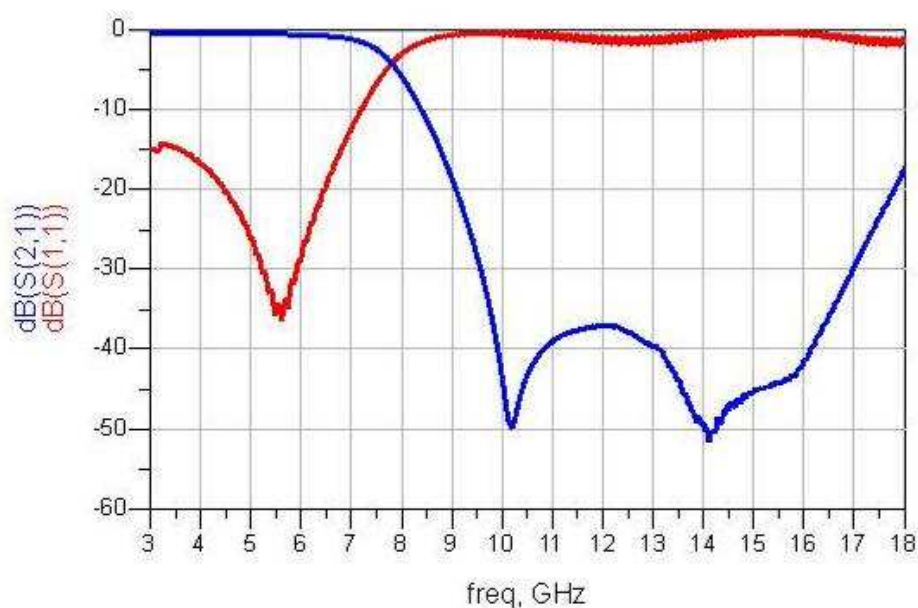
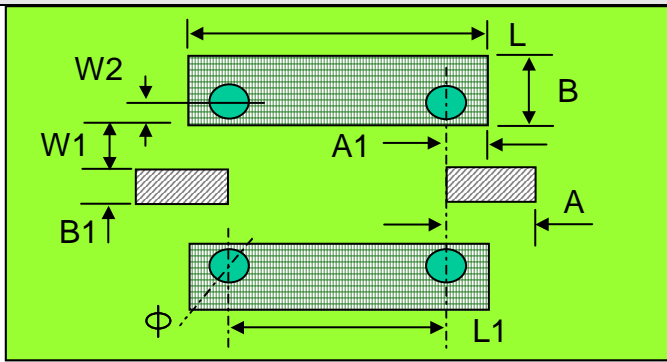



Typical Electrical Performance**SOLDER LAND PATTERN**

Figure	Symbol	Dimension (mm)
 <p>  I/O Solder Pad  Ground Solder Pad  Ground Via </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

Line width to be design to match 50Ω 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 : $235 \pm 5^{\circ}\text{C}$ *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 : $260 \pm 5^{\circ}\text{C}$ *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 : $120 \sim 150^{\circ}\text{C}$, 1 minute. *Solder temperature : $270 \pm 5^{\circ}\text{C}$ *Immersion time : 10 ± 1 sec *Solder : Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for 24 ± 2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test. Loss of metallization on the edges of each electrode shall not exceed 25%.
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.
Adhesive Strength of Termination JIS C 0051- 7.4.3	*Pressurizing force : $5\text{N}(\leq 0603)$; $10\text{N}(> 0603)$ *Test time : 10 ± 1 sec	No remarkable damage or removal of the termination.
Bending test JIS C 0051- 7.4.1	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. Measurement to be made after keeping at room temperature for 24 ± 2 hours	No mechanical damage. Samples shall satisfy electrical specification after test.

Temperature cycle JIS C 0025	1. 30±3 minutes at -40°C±3°C, 2. 10~15 minutes at room temperature, 3. 30±3 minutes at +85°C±3°C, 4. 10~15 minutes at room temperature, Total 100 continuous cycles Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Vibration JIS C 0040	*Frequency : 10Hz~55Hz~10Hz(1min) *Total amplitude : 1.5mm *Test times : 6hrs.(Two hrs each in three mutually perpendicular directions)	No mechanical damage. Samples shall satisfy electrical specification after test.
High temperature JIS C 0021	*Temperature : 85°C±2°C *Test duration : 1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	No mechanical damage. Samples shall satisfy electrical specification after test.
Humidity (steady conditions) JIS C 0022	*Humidity : 90% to 95% R.H. *Temperature : 40±2°C *Time : 1000+24/-0 hrs. Measurement to be made after keeping at room temperature for 24±2 hrs ※ 500hrs measuring the first data then 1000hrs data	No mechanical damage. Samples shall satisfy electrical specification after test.
Low temperature JIS C 0020	*Temperature : -40°C±2°C *Test duration : 1000+24/-0 hours Measurement to be made after keeping at room temperature for 24±2 hrs	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,

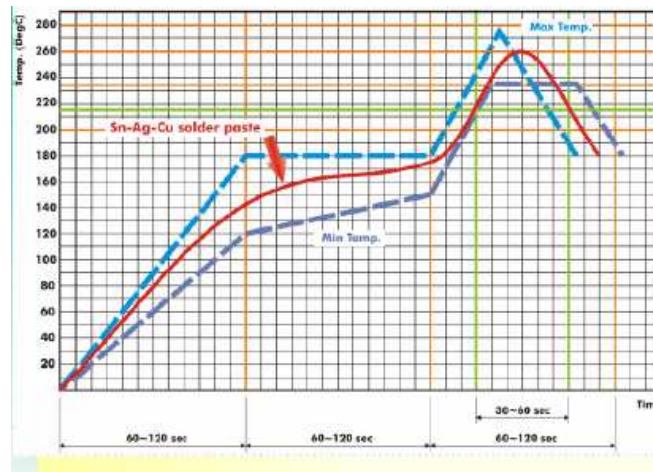
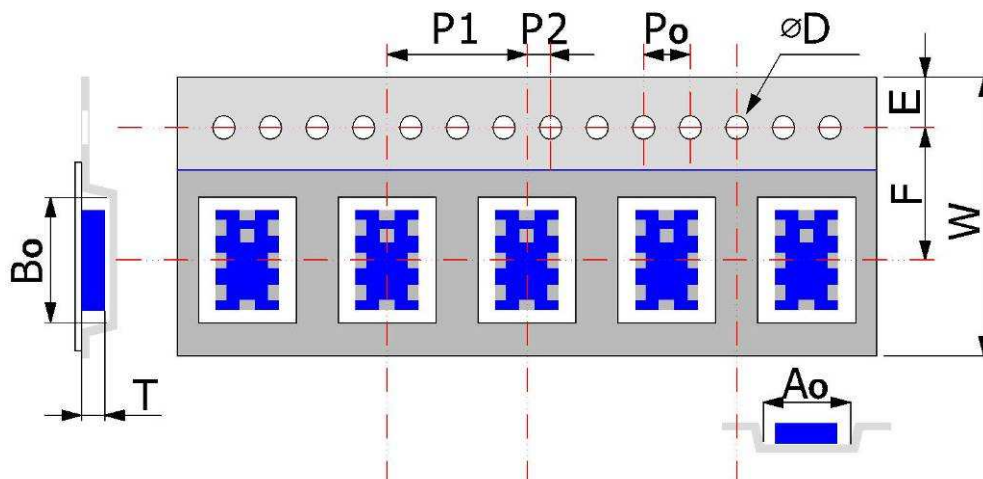


Fig 2. Infrared soldering profile

ORDERING CODE

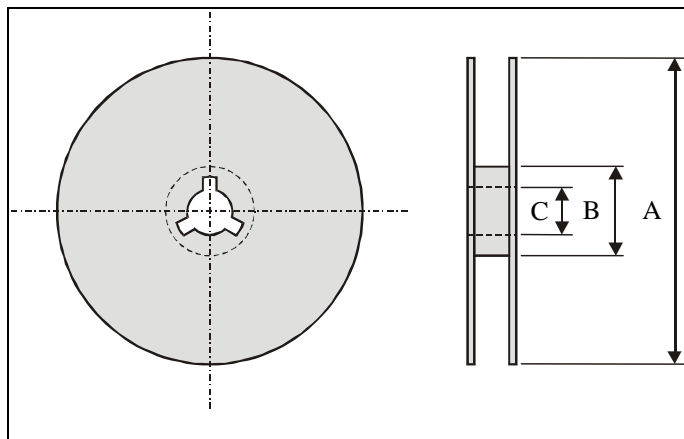
RF	LPF	201209	0	K	0	T
Walsin RF device	Product Code LPF : Low Pass Filter	Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 201209 = Length 20, Width 12, Thickness 09	Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	Application K: ISM 5.2/5.8 Dual Band	Specification Code from 0 ~ 9 dependent on different electrical specification	Packing T : 7" Reeled

Minimum Ordering Quantity: 2000 pcs per reel.

PACKAGING

Plastic Tape specifications (unit :mm)

Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.45 ± 0.10	2.25 ± 0.10	1.55 ± 0.10	1.10 ± 0.10	8.0 ± 0.30
Index	E	F	Po	P1	P2
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
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.