



Explanation of Part Number

WPSMLBLN (1) **00**□ (2) **C** □ (3) □ (4)

- (1) **Product Series** WPSMLBLN: Multilayer Ceramic BALUN Transformer
- (2) **Product No.** Impedance
004: 50Ω Unbalanced /50Ω Balanced
005: 50Ω Unbalanced/100Ω Balanced
- (3) **Revision Code**
- (4) **Packaging Code**
Blank: Bulk
K: 7" Reel, 2000 pieces per reel
G: 13" Reel (Specifications available upon request)
X: SFC Product (Specifications available upon request)

Features

- Multilayer LTCC (Low Temperature Cofired Ceramics) Technology
- Miniatured Size 2.00 x 1.25 x 0.95 mm³
- Low Insertion Loss reduces power consumption
- Low inband Amplitude and Phase imbalance enable high performance wireless system operation.
- Suitable for 5GHz Working Frequency Operation
- Special Balance/ Unbalance impedance is upon requested.

Applications

- IEEE 802.11a Wireless LAN Application
- ETSI/BRAN HiperLan/2 Application

Electrical Characteristics

Part Nr.	Frequency (MHz)	Impedance (Ω)		Return Loss (dB) Min.	Amplitude Balance (dB)	Phase Balance (degree)	Insertion Loss (dB)
		Unbalanced	Balanced				
WPSMLBLN004C	5400 ± 500	50	50	-10	2.0	180°C ± 10°C	-1.1
WPSMLBLN005C	5400 ± 500	50	100	-10	2.0	180°C ± 10°C	-1.2

Dimension

Figure	Symbol	Dimension	Terminals	Connection
	L	2.00 ± 0.15 mm	1	Unbalanced port
	W	1.25 ± 0.15 mm	2	Ground
	T	0.95 ± 0.10 mm	3	Balanced port
	a	0.20 ± 0.20 mm	4	Balanced port
	b	0.30 ± 0.20 mm	5	Ground
	c	0.35 ± 0.20 mm	6	Non Connection
	d	0.65 ± 0.20 mm		
	f	0.3 ± 0.20 mm		

The white block means up-side and unbalanced input

Construction

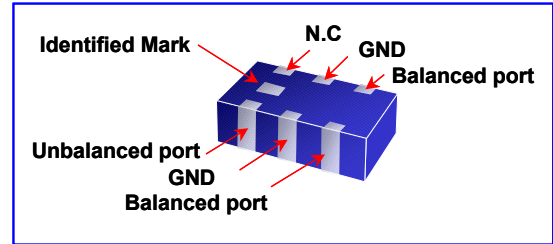


Fig 1. Outline and Pin arrangement of 5GHz Balun

Description

World Products Inc. introduces this new ceramic BALUN transformer specifically designed for 5 GHz ISM band applications, as shown in Fig. 1. Today, the 5GHz ISM band allocations include USA U-NII band (5.150GHz~ 5.825GHz), Europe HiperLan and ISM (5.150GHz~5.875GHz), Japan (4.90GHz~5.10GHz), and IEEE802.11a WLAN (5.150GHz~5.825GHz). Our 5GHz ceramic BALUN is tailored to deliver superior in-band and out-band frequency performance. It has low amplitude imbalance and phase imbalance, wide bandwidth (-10dB), and low insertion loss characteristics. With advanced LTCC (Low Temperature Co-fired Ceramic) manufacturing technology and 3D EM Simulation product design tools, we guarantee the quality of our products. The dimension of our rectangular-shaped ceramic BALUN is 2.00 x 1.25 x 0.95 mm³. This compact size fits the surface mount automation technology and miniaturization trends for modern portable/mobile devices.



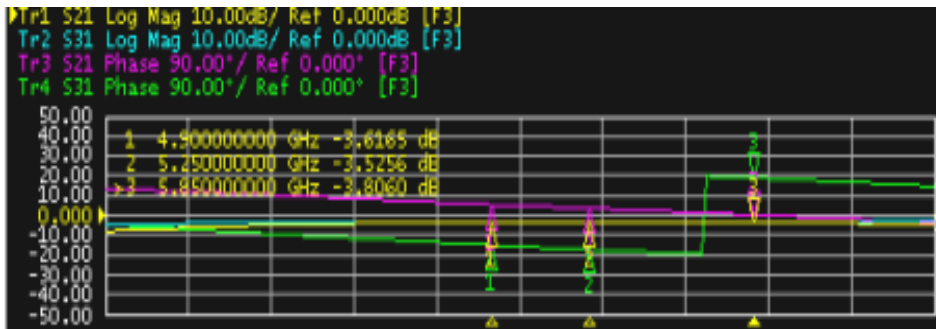
Solder Land Pattern

Figure	Symbol	Dimension (mm)
	a	1.00 ± 0.10
	b	0.35 ± 0.10
	c	0.80 ± 0.10
	d	0.65 ± 0.10

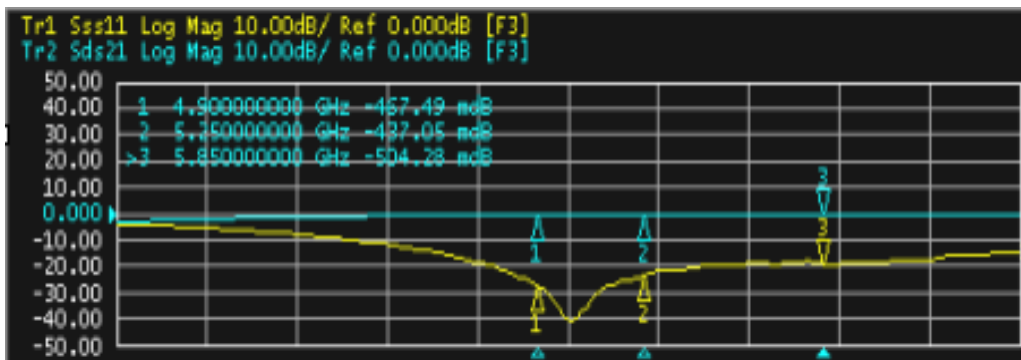
Line width to be design to match 50Ω characteristic impedance, depending on PCB material and thickness

Typical Frequency Characteristics

Amplitude balance and Phase balance (WPSMLBLN004C)

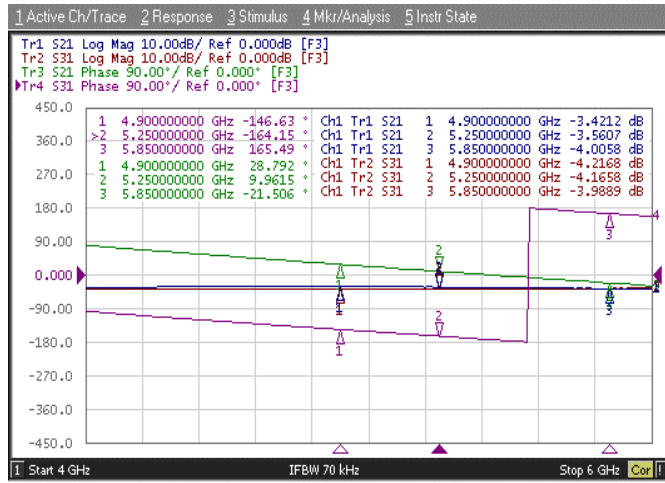


Insertion Loss (WPSMLBLN004C)





Amplitude balance and Phase balance (WPSMLBBLN005C)



Reliability Data

Mechanical performance

Test item	Test condition / Test method	Specification
Solderability	Solder temp.: 235 ± 5°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 ± 10°C Solder Temperature: 260 ± 5°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 Times: 3 times.	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±2°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°C±3°C, 2. 10~15 minutes at room temperature, 3. 30±3 minutes at +85°±3°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°C±2°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°C±3°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.

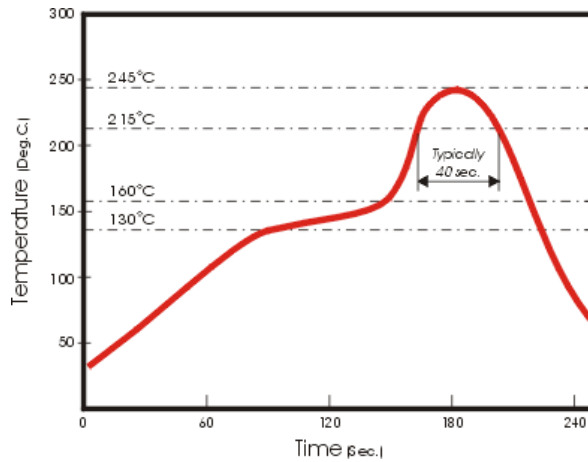
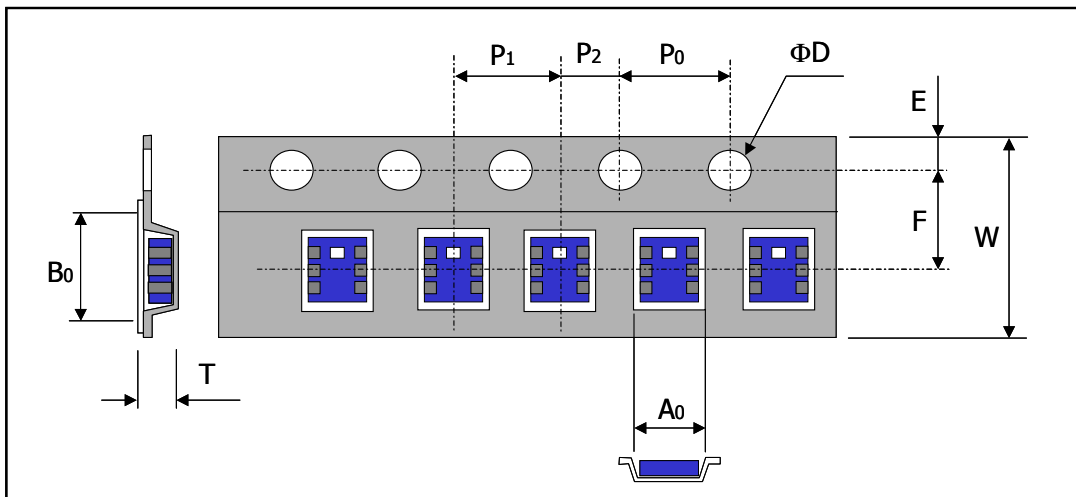


Fig 2. Infrared soldering profile

Packaging

Plastic Tape specifications (unit: mm)



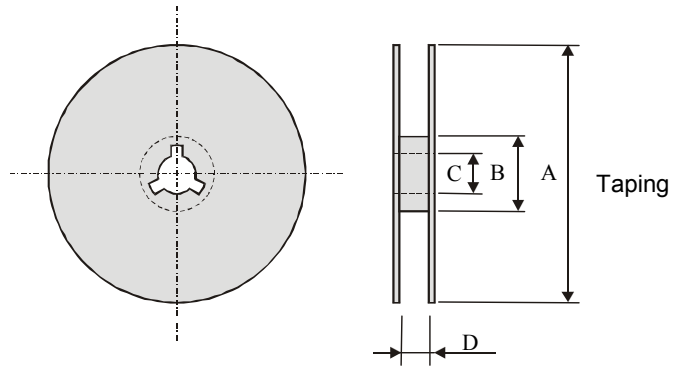
Index	Ao	Bo	ΦD	T	W
Dimension (mm)	1.45 ± 0.10	2.25 ± 0.10	1.55 ± 0.10	1.1 ± 0.10	8.0 ± 0.10
Index	E	F	Po	P1	P2
Dimension (mm)	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05



Reel dimensions

Index	A	B	C	D
7" Reel	Φ178	Φ60.0	Φ13.5	8.0±1.0

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.

Aircraft equipment, Aerospace equipment, Undersea equipment, Medical equipment, Disaster prevention/crime prevention equipment, Traffic signal equipment, Transportation equipment (vehicles, trains, ships, etc.), Applications of similar complexity and/or reliability requirements to the applications listed above.

Storage conditions

Products should be used within 6 months from the day of shipment from our factory location, which can be confirmed. Products should be stored in the warehouse on the following conditions.

Temperature: -10 - +40°C
Humidity: 30 to 70% relative humidity

- Don't keep products in corrosive gases such as sulfur. Chlorine gas or acid may cause oxidation of electrode, resulting in poor solderability.
- Products should be stored on the palette for the prevention of humidity, dust and etc.
- Products should be stored in the warehouse without heat shock, vibration, direct sunlight and so on.
- Products should be stored under the airtight packed conditions.