

# APPROVAL SHEET

**RFBLN 2012 (0805) Series – RoHS Compliance**

**MULTILAYER CERAMIC BALUN TRANSFORMER**

**Halogens Free Product**

**GSM 850/ GSM 900/ DCS1800/ PCS1900  
Band Working Frequency**

**P/N: RFBLN2012090BM5T25**

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

**Approval sheet**

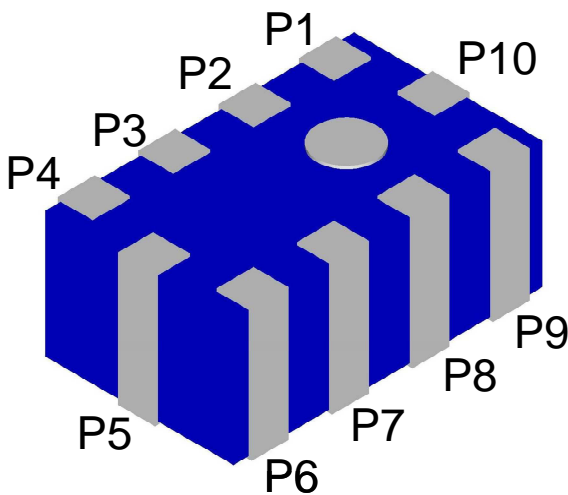
**FEATURES**

1. Miniature footprint: 2.0 X 1.2 X 0.9 mm<sup>3</sup>
2. Integrate 2 different working band devices into one package
3. Low Insertion Loss
4. Low in band Amplitude and Phase imbalance enable high performance wireless system operation
5. LTCC process
6. Second harmonic suppression
7. ISM band suppression

**APPLICATIONS**

1. GSM 850/ GSM 900/ DCS1800/ PCS1900 Band RF application.
2. Unbalance to balance conversion.

**CONSTRUCTION**



PIN	Connection	PIN	Connection
P1	Unbalance Port _LB	P6	Balance Port _HB
P2	GND	P7	Balance Port _HB
P3	GND	P8	Balance Port _LB
P4	Unbalance Port _HB	P9	Balance Port _LB
P5	GND	P10	GND

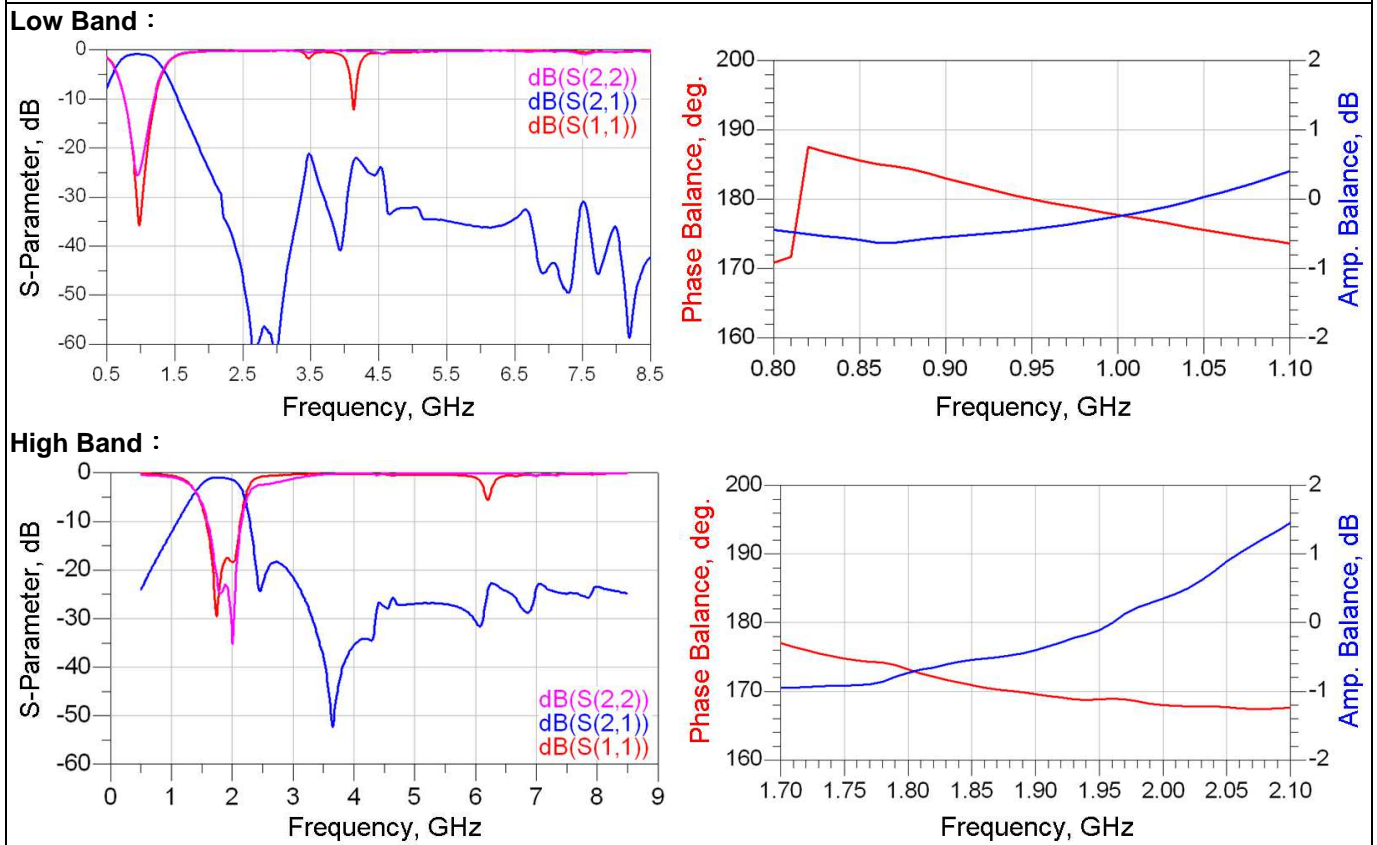
**DIMENSIONS**

Figure	Symbol	Dimension (mm)
	L	2.00 ± 0.10
	W	1.25 ± 0.10
	T	0.90 ± 0.10
	A	0.125 ± 0.10
	B	0.25 ± 0.10
	C	0.25 ± 0.10
	D	0.50 ± 0.10
	E	0.475 ± 0.10
	F	0.30 ± 0.10
	G	0.20 ± 0.10
	H	0.20 ± 0.10

**ELECTRICAL CHARACTERISTICS**

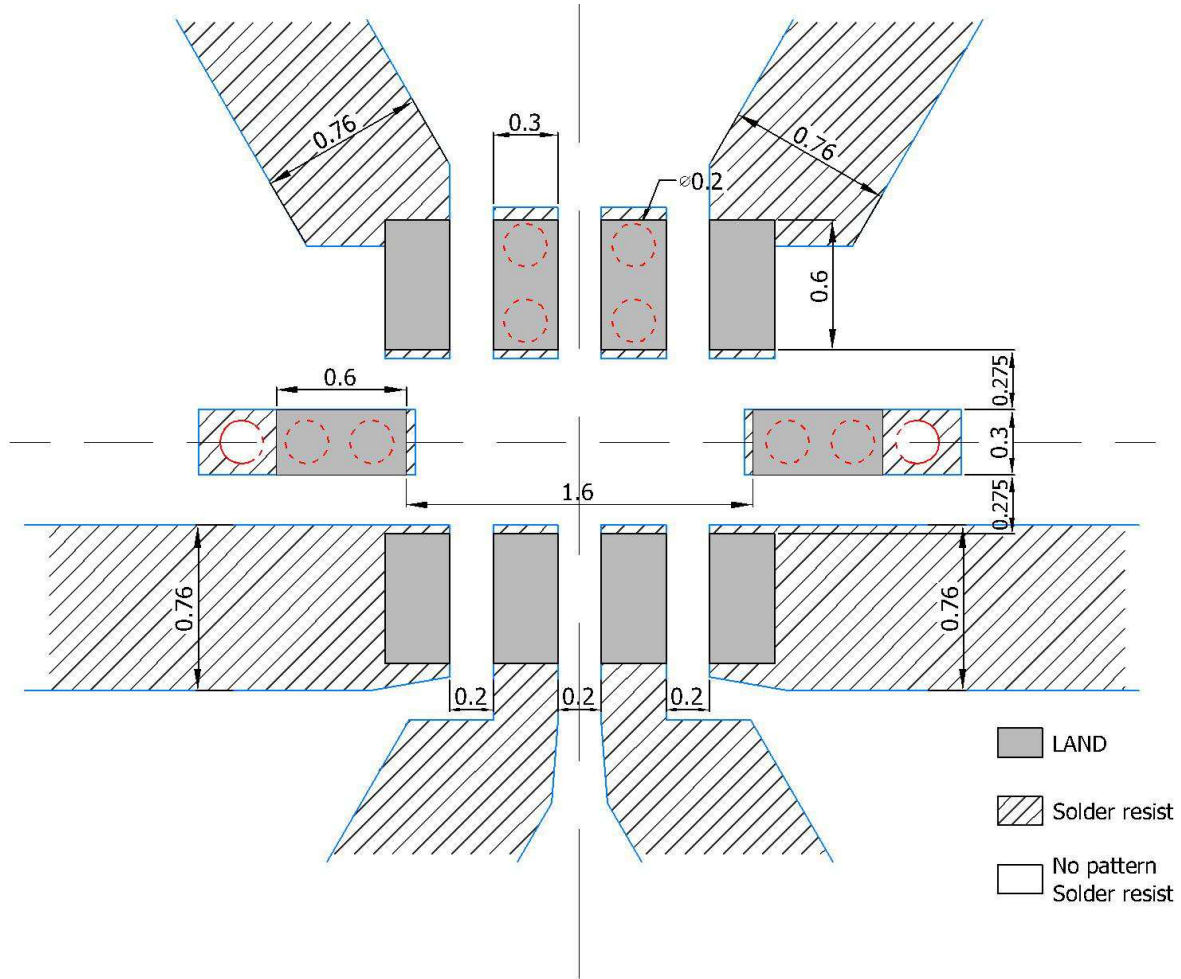
RFBLN2012090BM5T25	Specification L-Band	Specification H-Band
Frequency range (MHz)	869~960	1805~1990
Insertion Loss (dB)	1.1 max	1.6 max
VSWR	2 Max	2 Max
Impedance (Unbalanced)	50 Ω	50 Ω
Impedance (Balanced)	200 Ω	200 Ω
Phase Difference	180° ± 10°	180° ± 15°
Amplitude balance (dB max.)	2 Max	2 Max
Attenuation (dB min.)	10 dB @ 1738 ~ 1920MHz 20 dB @ 2400 ~ 2500MHz 20 dB @ 2607 ~ 2880MHz	15 dB @ 2400 ~ 2500MHz 20 dB @ 3610 ~ 3980MHz 20 dB @ 5415 ~ 5970MHz
Operation Temperature Range	-40°C ~ +85°C	

Typical Electrical Chart



**SOLDER LAND PATTERN**

Figure



Unit : mm

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 : $235 \pm 5^{\circ}\text{C}$ *Immersion time : $2 \pm 0.5$ 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 : $30 \pm 0.5$ 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 : $10\pm 1$ sec *Solder : Sn3Ag0.5Cu for lead-free Measurement to be made after keeping at room temperature for $24\pm 2$ 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 : $10\pm 1$ 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 $5\pm 1$ sec. Measurement to be made after keeping at room temperature for $24\pm 2$ hours	No mechanical damage. Samples shall satisfy electrical specification after test.

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Temperature cycle JIS C 0025	<ol style="list-style-type: none"> <li>1. 30±3 minutes at -40°C±3°C,</li> <li>2. 10~15 minutes at room temperature,</li> <li>3. 30±3 minutes at +85°C±3°C,</li> <li>4. 10~15 minutes at room temperature,</li> </ol> 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,

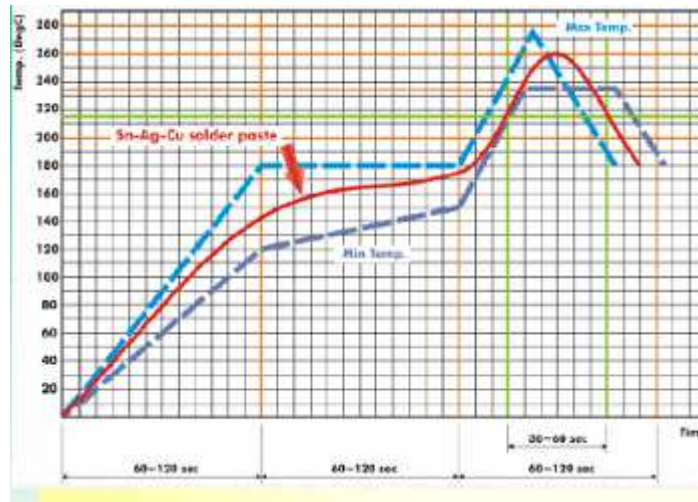


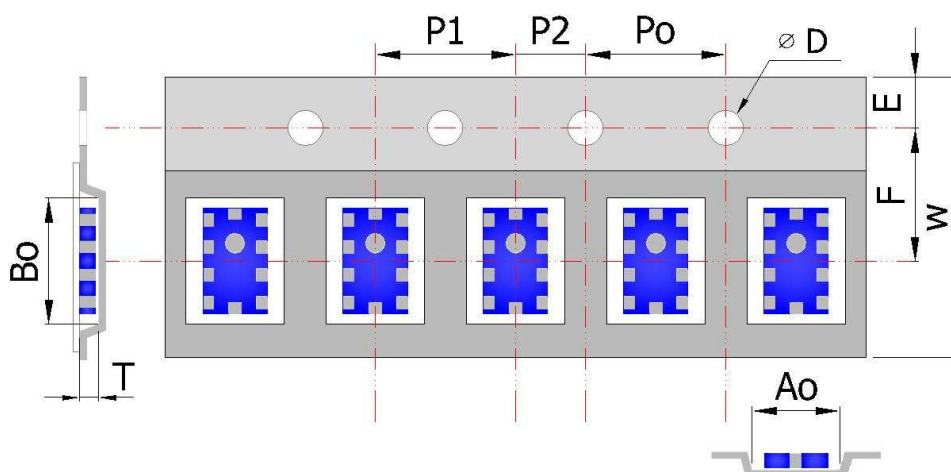
Fig 2. Infrared soldering profile

**ORDERING CODE**

<b>RF</b> Walsin RF device	<b>BLN</b> Product Code BLN : BALUN	<b>201209</b> Dimension code Per 2 digits of Length, Width, Thickness : e.g. : 201209= Length 20, Width 12, Thickness 09	<b>0</b> Unit of dimension 0 : 0.1 mm 1 : 1.0 mm	<b>B</b> Application B: GSM850/ GSM900/ DCS1800/ PCS1900 quad band S: GSM900/ DCS1800/ PCS1900 triple band	<b>M5T25</b> Specification Design Code
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Minimum Ordering Quantity: 2000 pcs per reel.

**PACKAGING**

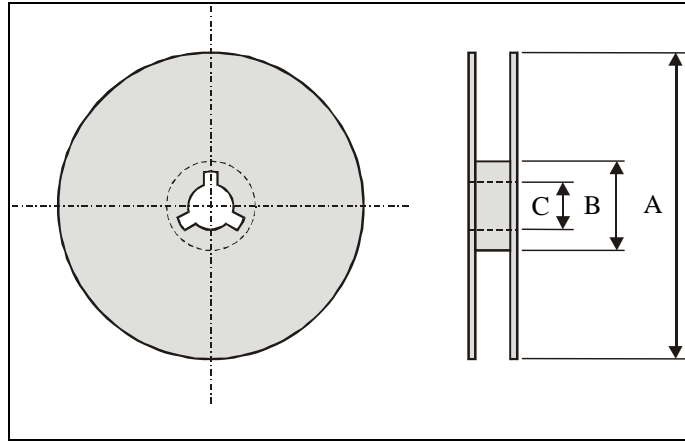


**Plastic Tape specifications (unit :mm)**

Index	Ao	Bo	φD	T	W
Dimension (mm)	1.40 ± 0.10	2.30 ± 0.10	1.55 ± 0.10	1.10 ± 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 ± 0.10



## Reel dimensions



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

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 WAL SIN 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.