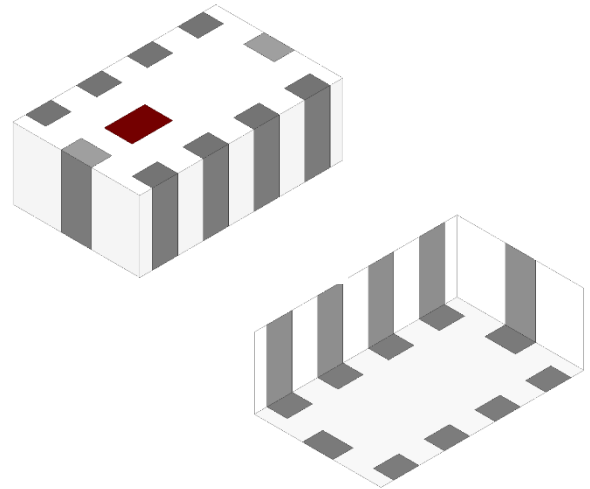


## Impedance-matched Integrated Passive Device (IPD) Balun + Filter for Semtech LR11xx (LR1110, LR1120, LR1121)

- Designed for the Semtech LoRa Connect™ and LoRa Edge™ series chipsets
- Integrates WiFi and GPS/GNSS/BeiDou bands complete front-end
- Provides necessary attenuation for FCC and ETSI requirements
- Replaces complex RF front end with single integrated passive device (IPD)
- SMD, EIA 0805



### General Specifications<sup>1</sup>

GPS/GNSS/BeiDou Rx Frequency	GPS/GNSS/BeiDou
Balanced Impedance, transceiver side ( $\Omega$ )	Impedance-matched to Semtech chipsets LR1110, LR1120, LR1121
Unbalanced Impedance, antenna side ( $\Omega$ )	50
Insertion Loss (dB)	1.4 Typ (2.0 Max.)
Return Loss (dB)	10 Min.
Phase Difference (degree)	180±15
Amplitude Difference (dB)	2.0 Max.
WiFi Passband Frequency (MHz)	2400 - 2500
Balanced Impedance, transceiver side ( $\Omega$ )	Impedance-matched to Semtech chipsets LR1110, LR1120, LR1121
Unbalanced Impedance, antenna side ( $\Omega$ )	50
Insertion Loss (dB)	0.8 Typ. (1.2 Max.)
Return Loss (dB)	10 Min.
Attenuation	
Frequency Range (MHz)	4800 - 5000
Attenuation (dB)	40 Min.
Frequency Range (MHz)	7200 - 7500
Attenuation (dB)	40 Min.

<sup>1</sup> Typical value represents average measurement at 25°C. Min./Max. values represent measurements over specified operating temperature.

**General Specifications (continued)**

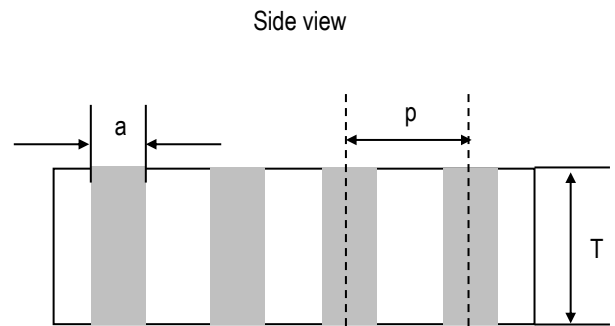
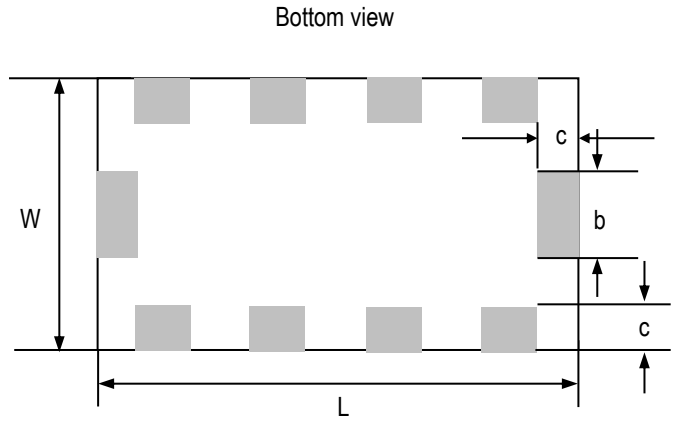
Frequency Range (MHz) Attenuation (dB)	9600 - 10000 30 Min.
Frequency Range (MHz) Attenuation (dB)	12000 - 12500 30 Min.
Frequency Range (MHz) Attenuation (dB)	14400 - 15000 20 Min.
Frequency Range (MHz) Attenuation (dB)	16800 - 17500 5 Min.
Frequency Range (MHz) Attenuation (dB)	19200 - 20000 9 Min.
Frequency Range (MHz) Attenuation (dB)	21600 - 22500 15 Min.
Frequency Range (MHz) Attenuation (dB)	24000 - 25000 4 Min.

**Maximum Ratings**

Power Capacity (W)	2 (CW)
Operating Temperature (°C)	-40 to +85
Recommended Storage Conditions post-installation (°C)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 60% RH +5 to +35°C 18 Months Max.

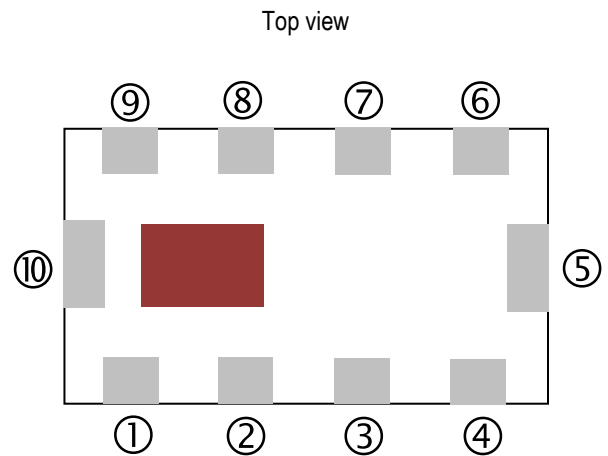
**Mechanical Dimensions**

	Inches			Millimeters		
<b>L</b>	0.079	± 0.008		2.00	± 0.20	
<b>W</b>	0.049	± 0.008		1.25	± 0.20	
<b>T</b>	0.028	± 0.004		0.70	± 0.10	
<b>a</b>	0.010	± 0.004		0.25	± 0.10	
<b>b</b>	0.012	± 0.006		0.30	± 0.15	
<b>c</b>	0.008	+0.004/-0.002		0.20	+0.1/-0.05	
<b>p</b>	0.020	± 0.004		0.50	± 0.10	



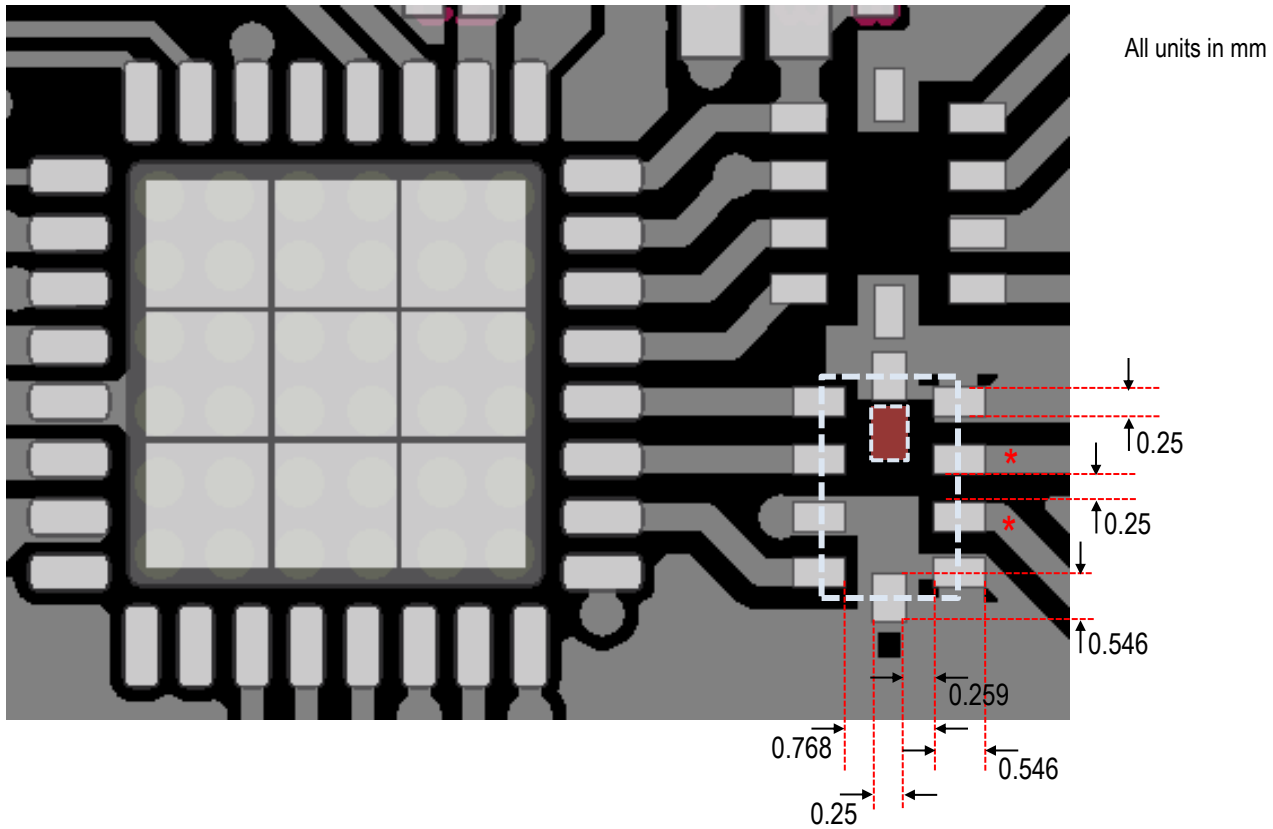
**Terminal Configuration<sup>2</sup>**

Pin Number	Function
1	RFI_P_LF1
2	RFI_N_LF1
3	GND
4	RFIO_HF
5	GND
6	GND
7	WIFI
8	GPS
9	GND
10	GND



<sup>2</sup> The termination type is Nickel Tin. Go to: <https://www.johansontechnology.com/ipcsoldering-profile> for Typical Soldering Profile.

**PCB Reference Design Layout**

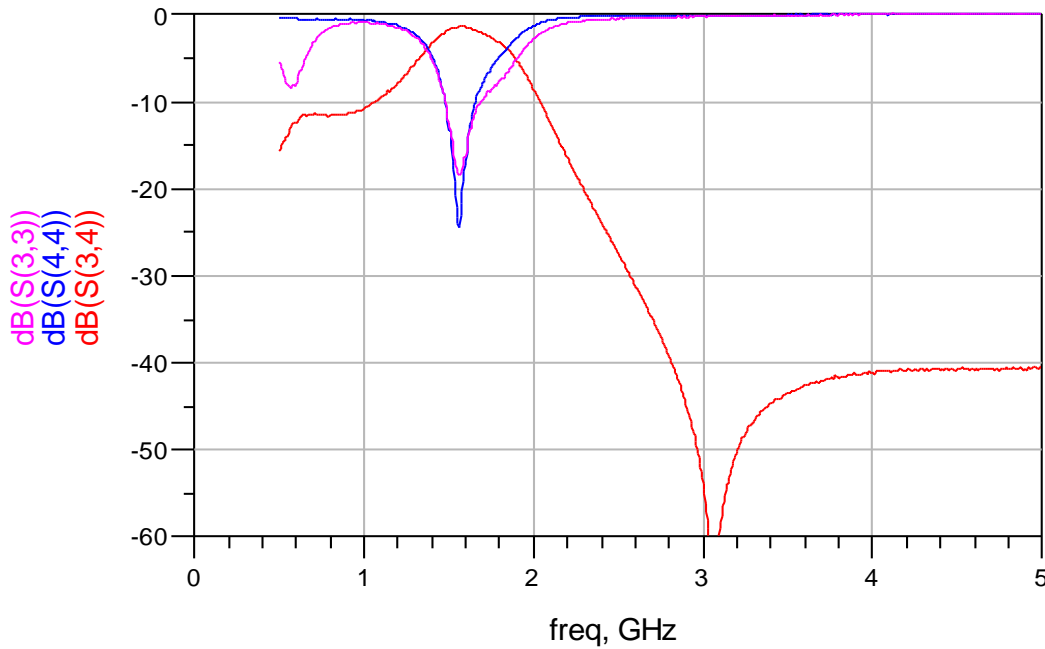


If you would like the full reference design package or have any questions, contact our application engineers at <https://www.johansontechnology.com/ask-a-question>

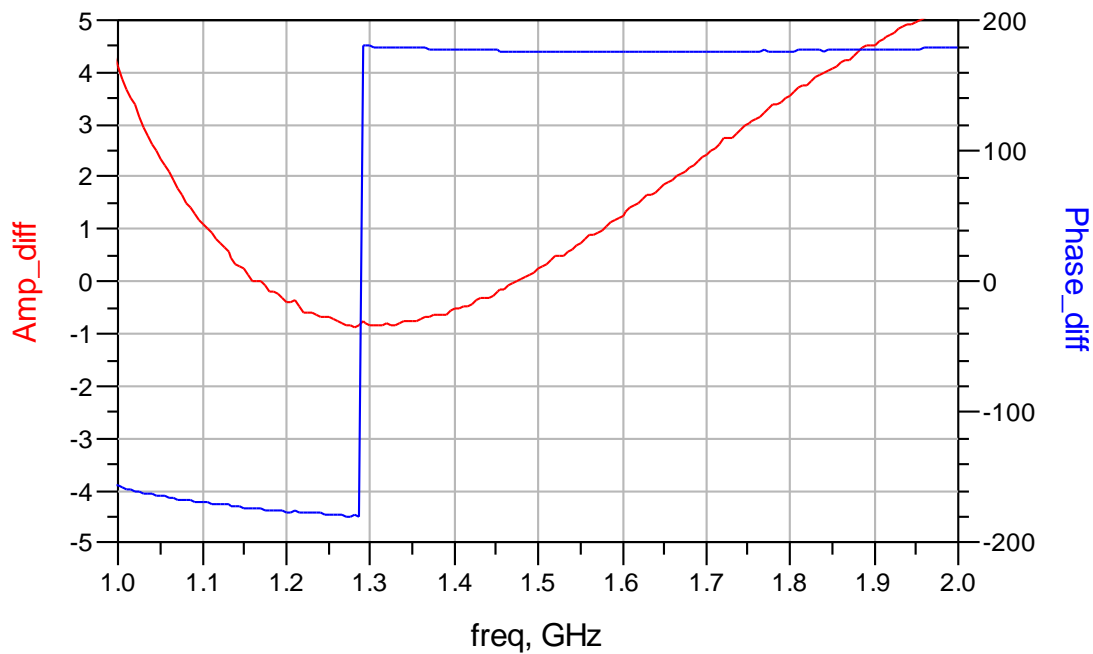
**RF Measurement**

GPS/GNSS/Beidou

**Insertion and Return Loss**

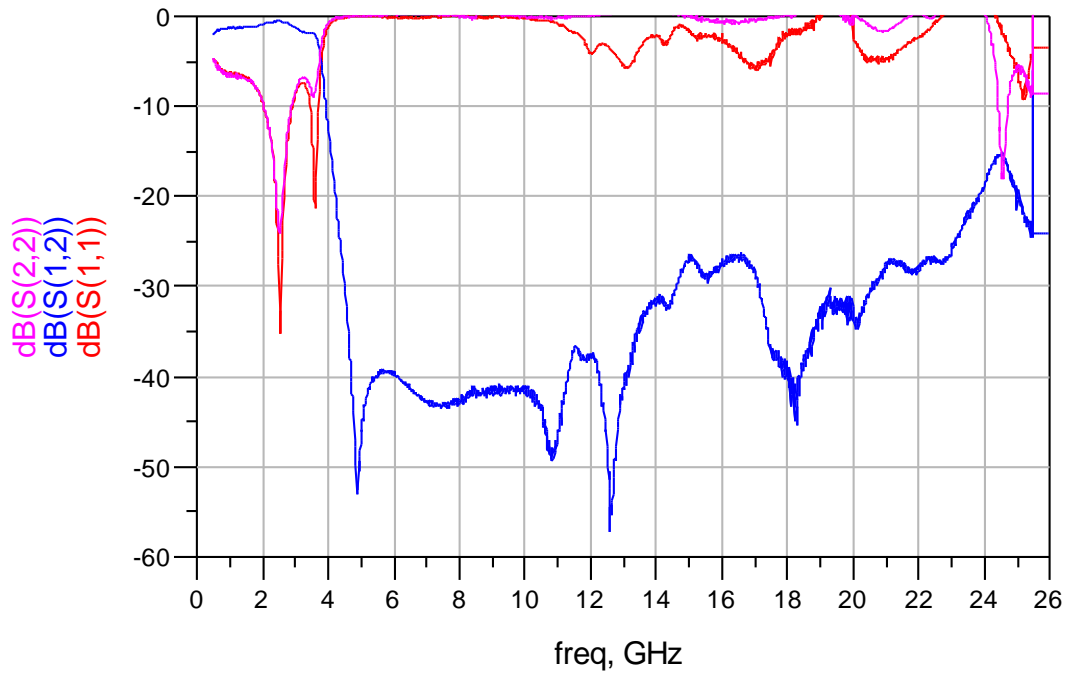


**Amplitude and Phase**



WiFi

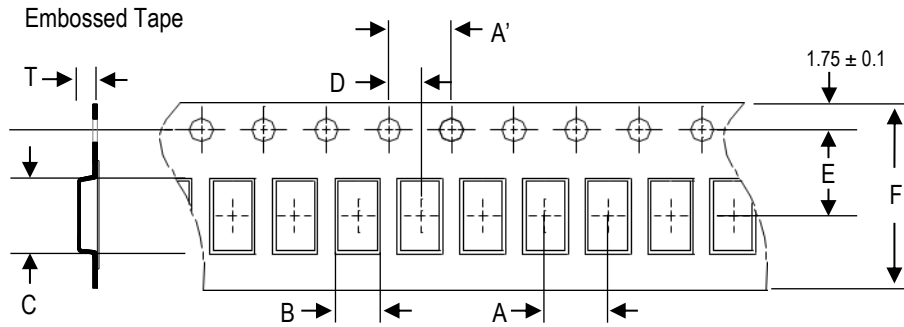
Insertion and Return Loss



S-parameters and layouts file available upon request. Please contact us at <https://www.johansontechnology.com/ask-a-question>

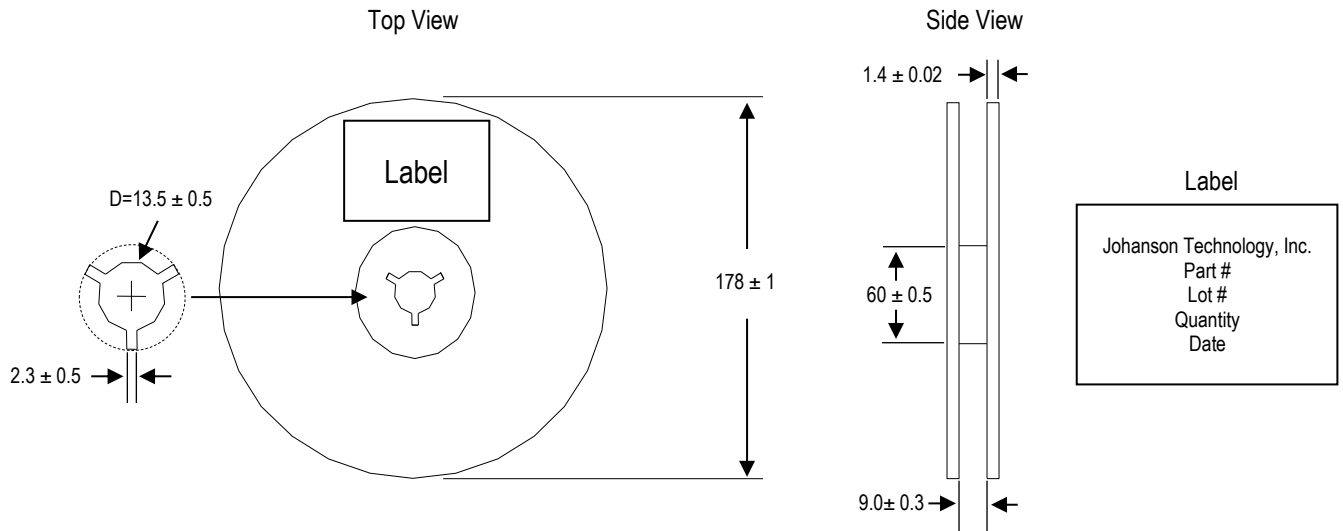
**Tape and Reel Specification (Units in mm)**

**Tape Dimensions**

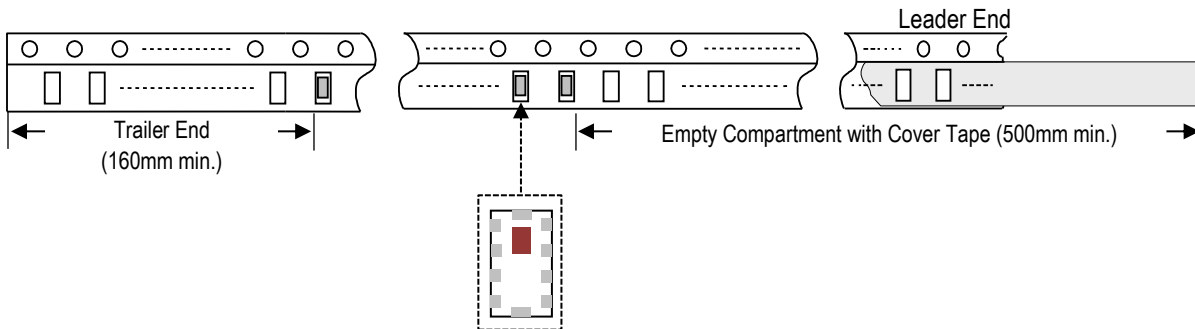


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0±0.1	4.0±0.1	1.35±0.05	2.15±0.05	2.0±0.05	3.5±0.1	8.0±0.1	1.00±0.05	4,000pcs	Plastic (Embossed)

**Reel Dimensions**



**Leader and Trailer Dimensions**



**Orderable Part Number**

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	2000PC15C0040001B	Nickel Tin
T & R (7" Reel Embossed Tape)	2000PC15C0040001E (Qty: 4,000 pcs./reel)	

**Important Links**

[2000PC15C0040001E Product Page](#)

[More Balun Filter Combos](#)

[RF Chip Antennas](#)

[Antenna Tuning, Optimization, and Validation Services](#)

[Soldering Information](#)

[MSL Information](#)

[Packaging Information](#)

[Recommended Storage Condition and Max Shelf Life](#)

[RoHS Compliance](#)

*Contact our application engineers for a PCB layout review.*

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