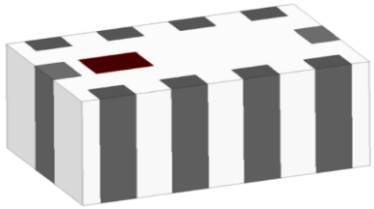
Impedance-matched Integrated Passive Device (IPD) Balun + Filter for Semtech LR11xx (LR1110, LR1120, LR1121)

- 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).



General Specifications[1]

GPS/GNSS/Beidou Rx Frequency	**GPS/GNSS/Beidou**
Balanced Impedance, transceiver side(Ω)	Impedance-matched to Semtech chipsets LR1110, LR1120, LR1121
Unbalanced Impedance, antenna side (Ω)	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 (Ω)	Impedance-matched to Semtech chipsets LR1110, LR1120, LR1121
Unbalanced Impedance, antenna side(Ω)	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.
Frequency Range (MHz)	9600 - 10000
Attenuation (dB)	30 Min.
Frequency Range (MHz)	12000 - 12500
Attenuation (dB)	30 Min.
Frequency Range (MHz)	14400 - 15000
Attenuation (dB)	20 Min.
Frequency Range (MHz)	16800 - 17500
Attenuation (dB)	5 Min.

[1] Typical value represents average measurement at 25°C. Min./Max. values represent measurements from -40°C to +85°C

johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

General Specifications (continued)

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

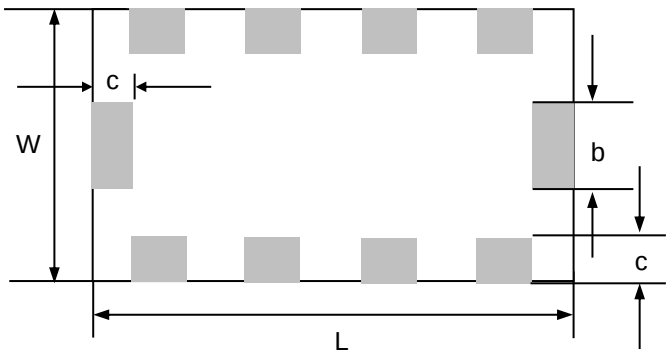
Power Capacity (W)	2 (CW)
Operating Temperature (°C)	-40 to +85
Recommended Storage Conditions post-installation (°C)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 60% RH +5 to +35°C 18 Months Max.

johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

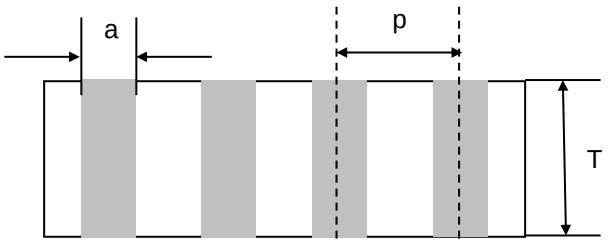
Mechanical Dimensions

L	0.079	±	0.008	2.00	±	0.20
W	0.049	±	0.008	1.25	±	0.20
T	0.028	±	0.004	0.70	±	0.10
a	0.010	±	0.004	0.25	±	0.10
b	0.012	±	0.006	0.30	±	0.15
c	0.008		+.004/-.002	0.20		+0.1/-0.05
p	0.020	±	0.004	0.50	±	0.10

Bottom view



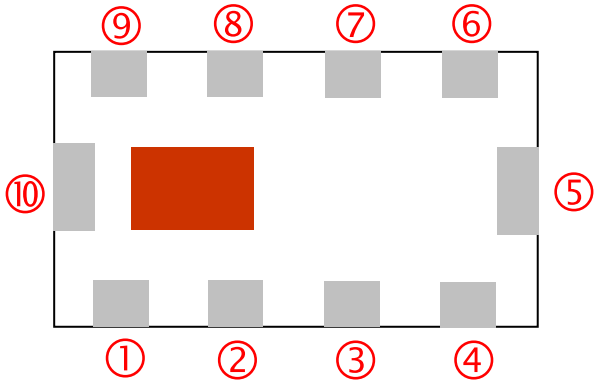
Side view



Terminal Configuration

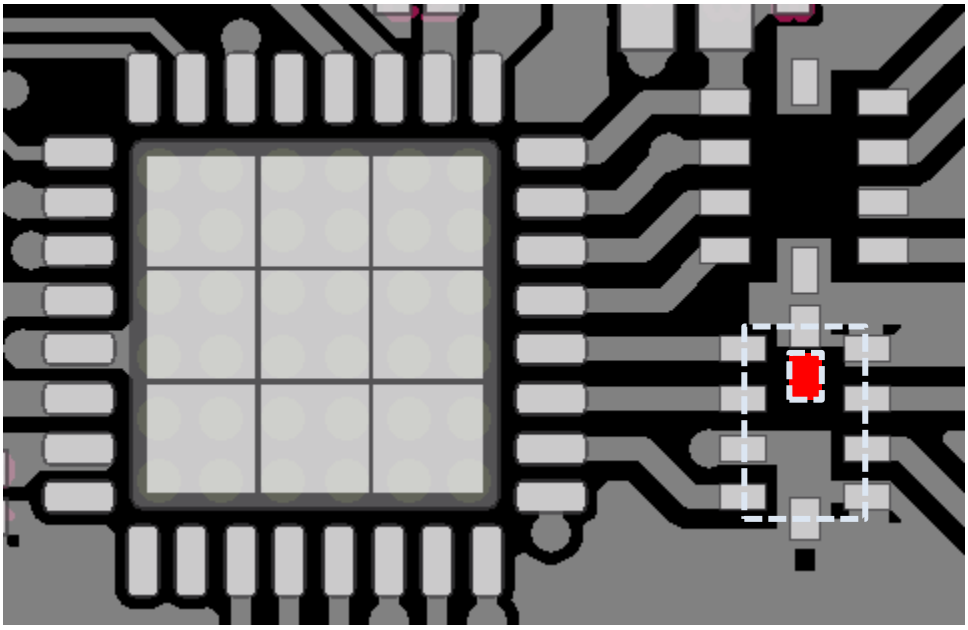
Pin Number	Function
1	RFI_P_LF1
2	RFI_N_LF1
3	GND
4	RFIO_HF
5	GND
6	GND
7	WIFI
8	GPS
9	GND
10	GND

Top view



johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

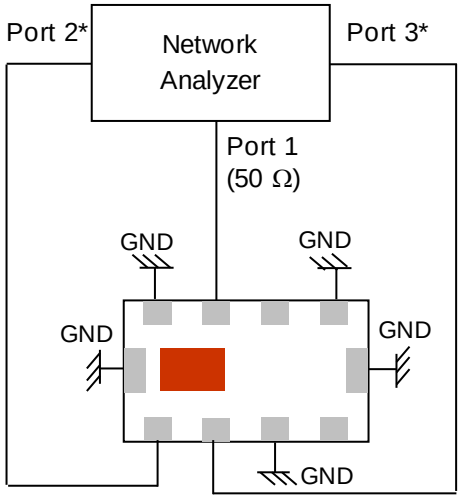
PCB Layout



Please contact us for the full reference design package: https://www.johansontechnology.com/ask-a-question

johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

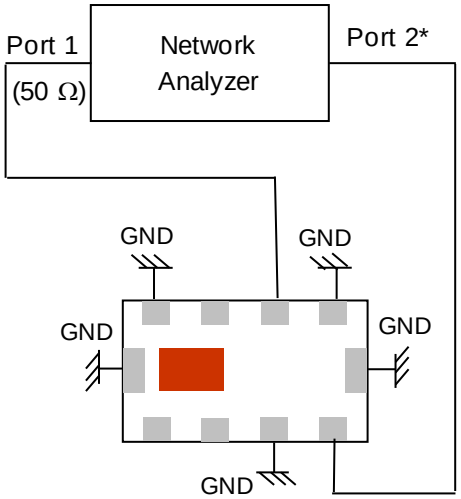
Measurement Diagram



GPS

Port 1: GPS Port, 50Ω

*Ports 2 & 3: RFI_P_LF1 / RFI_N_LF1, Impedance match to Semtech chipset



WiFi

Port 1: WIFI Port, 50Ω

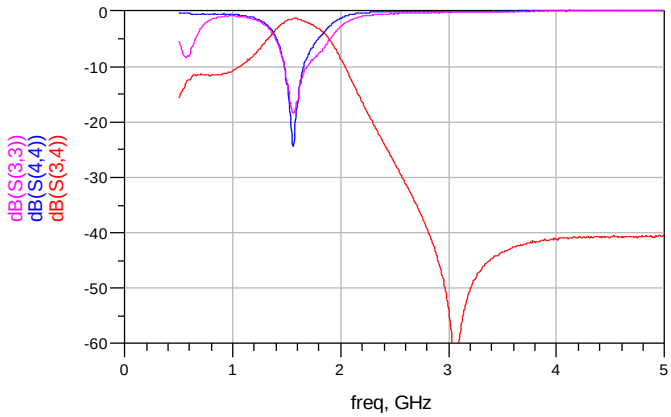
*Port 2: RFIO_HF Port, Impedance match to Semtech chipset

johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

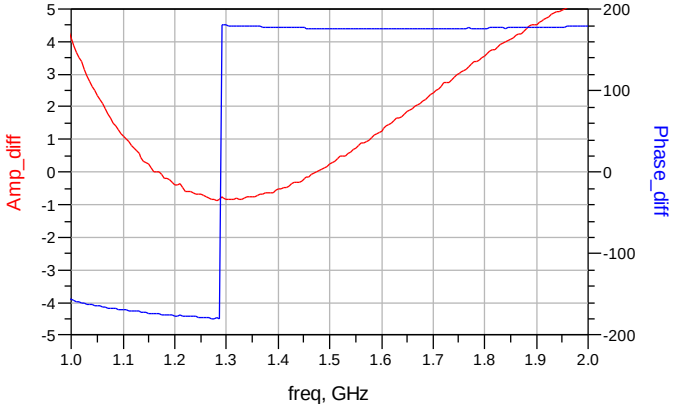
RF Measurement of Component

GPS/GNSS/Beidou

Insertion and Return Loss

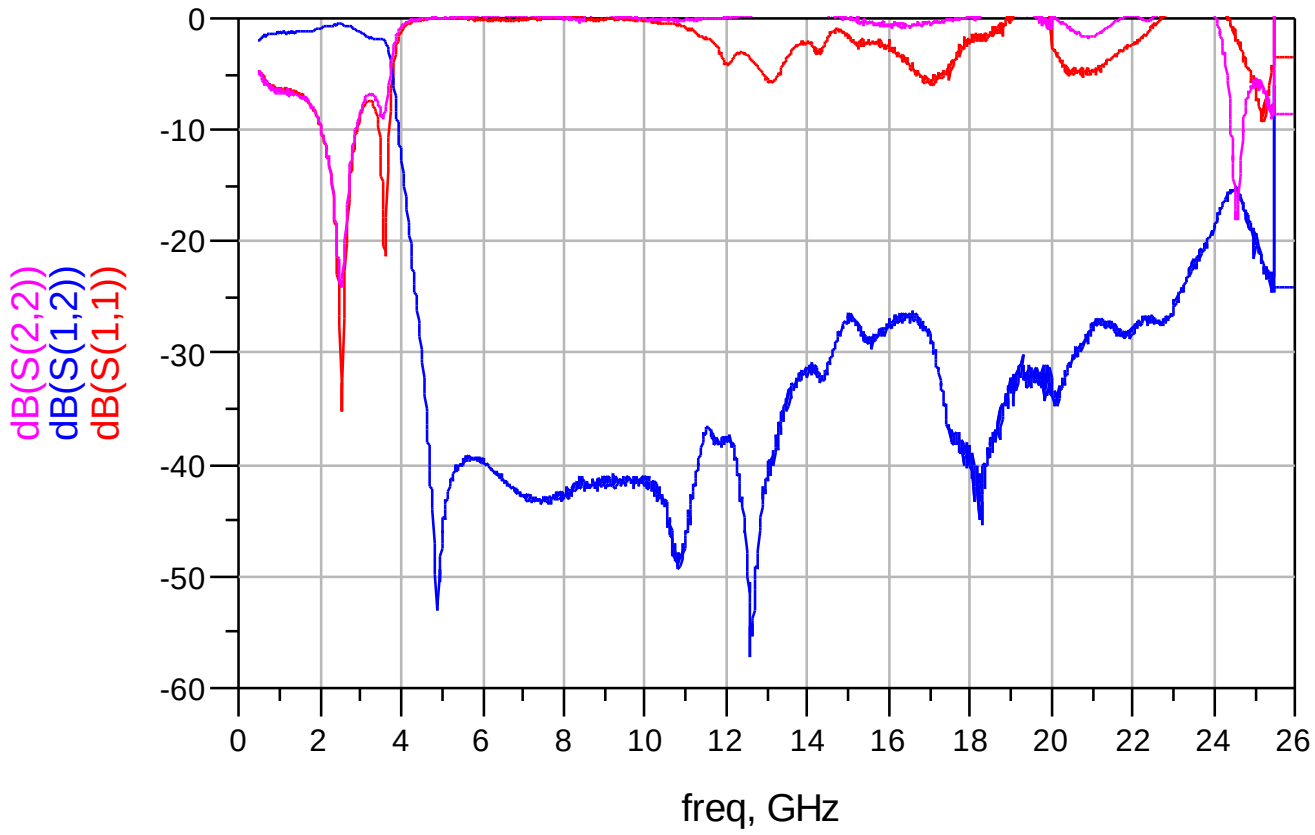


Amplitude and Phase



WiFi

Insertion and Return Loss



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

johansontechnology.com
4001 Calle Tecate • Camarillo, CA 93012, USA • TEL +1.805.389.1166
2023 Johanson Technology, Inc. All Rights Reserved

X-ON Electronics

Largest Supplier of Electrical and Electronic Components

Click to view similar products for Signal Conditioning ***category:***

Click to view products by Johanson ***manufacturer:***

Other Similar products are found below :

PD0409J5050S2HF AFS14A35-1591.50-T3 AFS20A20-1227.60-T3 JP510S LFB322G45SN1A504 SF2159E MAPDCC0005 BD0810N50100AHF DC0710J5005AHF DC2327J5005AHF X3C19F1-20S XC3500P-20S CDBLB455KCAX39-B0 PD0922J5050D2HF 1E1305-3 1F1304-3S BD1222J50200AHF BD1722J50100AHF BD0810J50150AHF BD1722J50200AHF TP-101-PIN T-1000-N XC0900P-10S XC0900B-30S 11305-10 5962-9091202MXA X3C06A4-03S DSS-333-PIN PD2425J5050S2HF B39242B4360P810 B39781B8005P810 B39881B8013P810 B39771B8035P810 B39741B8012P810 B39212B8033P810 B39162B8636P810 SF2225E SF2275E SF2395E SF2188D LFB182G45BG7D948 SF2201E DC1722J5005AHF B39272B8818P810 SF2253E SF2202E SF2182D SF2211E SF2240E SF2307D