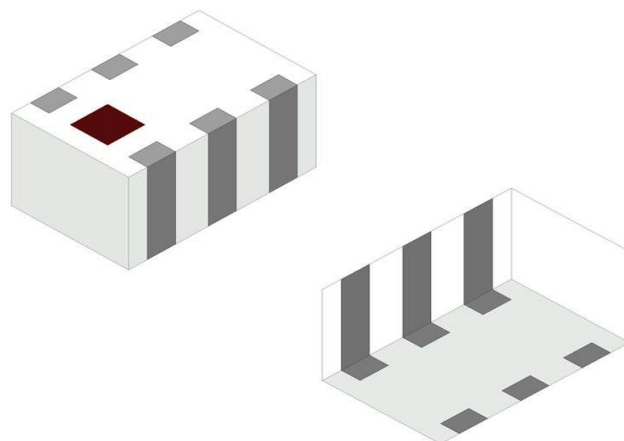




2.4 GHz RF 1:1 Balun

- 2400 - 2500MHz, 50:50 (1:1) Impedance Ratio
- Wireless communication systems including: WiFi, Bluetooth, Zigbee, Thread
- SMD, EIA 0805
- RoHS compliant



General Specifications^{1 2}

Passband Frequency (MHz)	2400 – 2500
Unbalanced Impedance (Ω)	50
Balanced Impedance (Ω)	50
Insertion Loss (dB)	1.0 Max.
Return Loss (dB)	9.5 Min.
Phase Difference (degree)	180 ± 10
Amplitude Difference (dB)	2 Max.

Maximum Ratings

Power Capacity (W)	3 Max. (CW)
Operating Temperature ($^{\circ}\text{C}$)	-40 to +85
Recommended Storage Conditions post-installation ($^{\circ}\text{C}$)	-40 to +85
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 $^{\circ}\text{C}$ 18 Months Max.

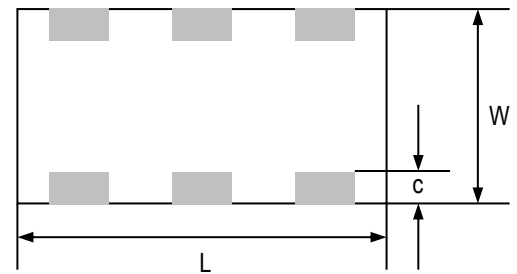
¹ Typical value represents average measurement at 25 $^{\circ}\text{C}$. Min./Max. values represent measurements over specified operating temperature.

² General specifications measured on Johanson's evaluation board P/N 2450BL15B0050001CE1.

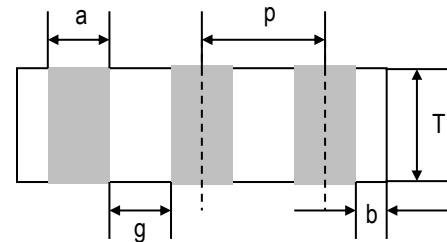
Mechanical Dimensions

	Inches			Millimeters		
L	0.079	±	0.004	2.00	±	0.10
W	0.049	±	0.004	1.25	±	0.10
T	0.037	±	0.004	0.95	±	0.10
a	0.012	±	0.004	0.30	±	0.10
b	0.008	±	0.004	0.20	±	0.10
c	0.012	±	0.004	0.30	±	0.10
g	0.014	±	0.004	0.35	±	0.10
p	0.026	±	0.002	0.65	±	0.05

Bottom view



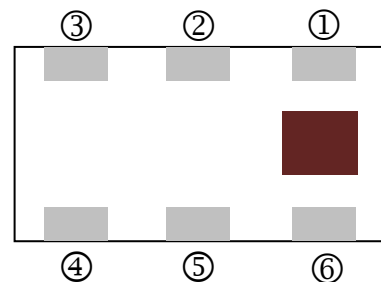
Side view



Terminal Configuration³

Pin Number	Function
1	Unbalanced Port (IN)
2	GND or (DC feed + RF GND)
3	Balanced Port (OUT1)
4	Balanced Port (OUT2)
5	GND
6	NC

Top view

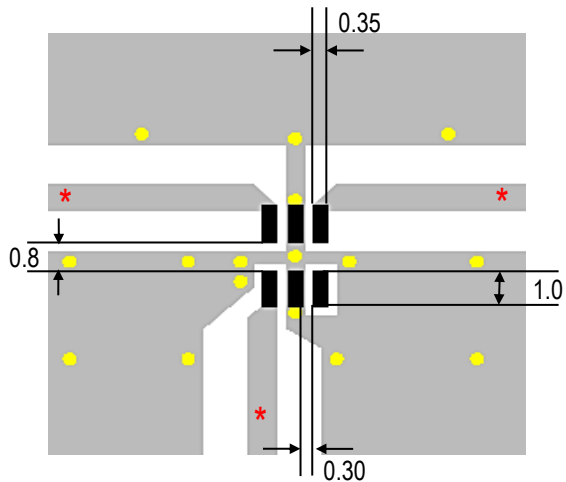


³ The termination type is Nickel Tin. Go to: <https://www.johansontechnology.com/tech-notes/typical-soldering-profile-ipc> for Typical Soldering Profile.

Recommended PCB Layout

Note: Mount device with colored mark facing up.

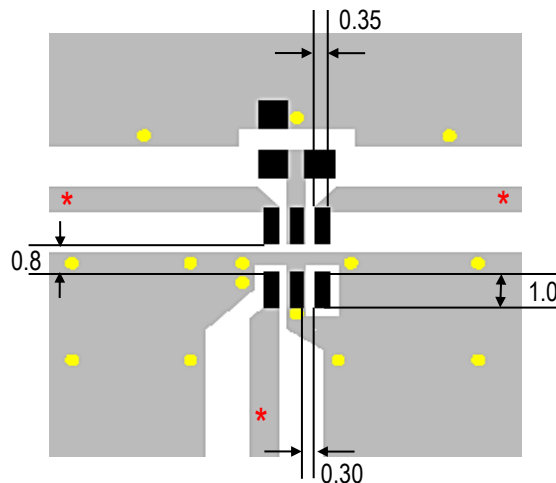
Without DC feed



Units: mm

-  Solder Resist
-  Land
-  Through-hole ($\phi 0.3$)

With DC feed**



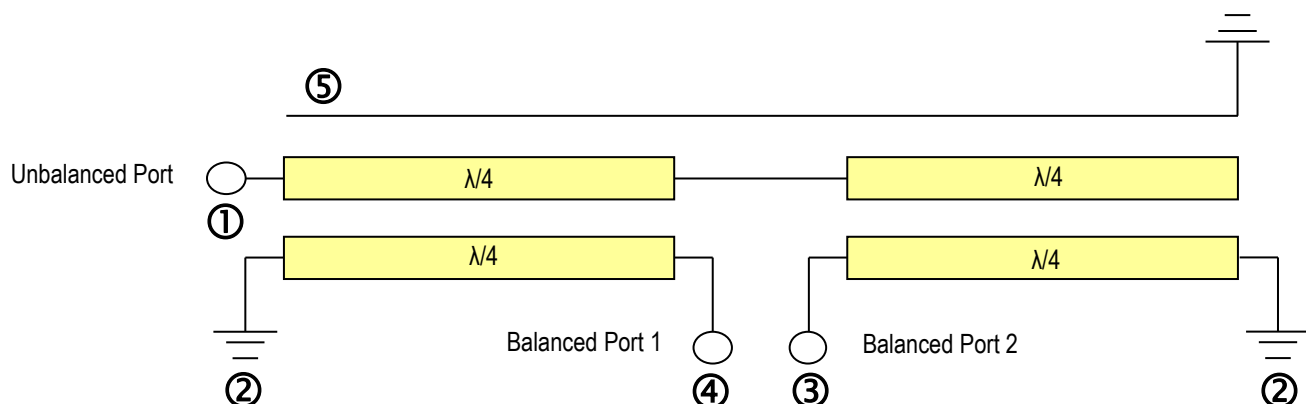
-  Solder Resist
-  Land
-  Through-hole ($\phi 0.3$)

*Transmission line width should be designed to match 50 Ω characteristic impedance, depending on PCB material and thickness.

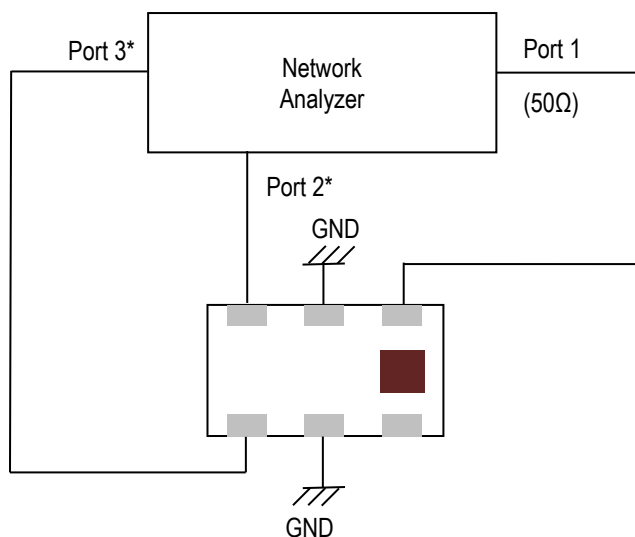
**Bypass capacitor should be connected when feeding DC power.

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>

Equivalent Internal Circuit^{4 5 6}



Measuring Diagram



Port 1: Unbalanced Port

Ports 2 and 3: Balanced Port

Insertion Loss = S_{ds21}

Return Loss = S_{ss11}

Amplitude balance = $\text{dB}(S(2,1)/S(3,1))$

Phase balance = $\text{Phase}(S(2,1)/S(3,1))$

*Impedance for ports 2 and 3 = Balanced Impedance/2

⁴ Pin3 and Pin4 are DC connected to Pin2 (GND or DC feed) in the device but not DC connected to Pin5 (GND). Therefore, by-pass capacitors should be connected when feeding DC power from Pin2.

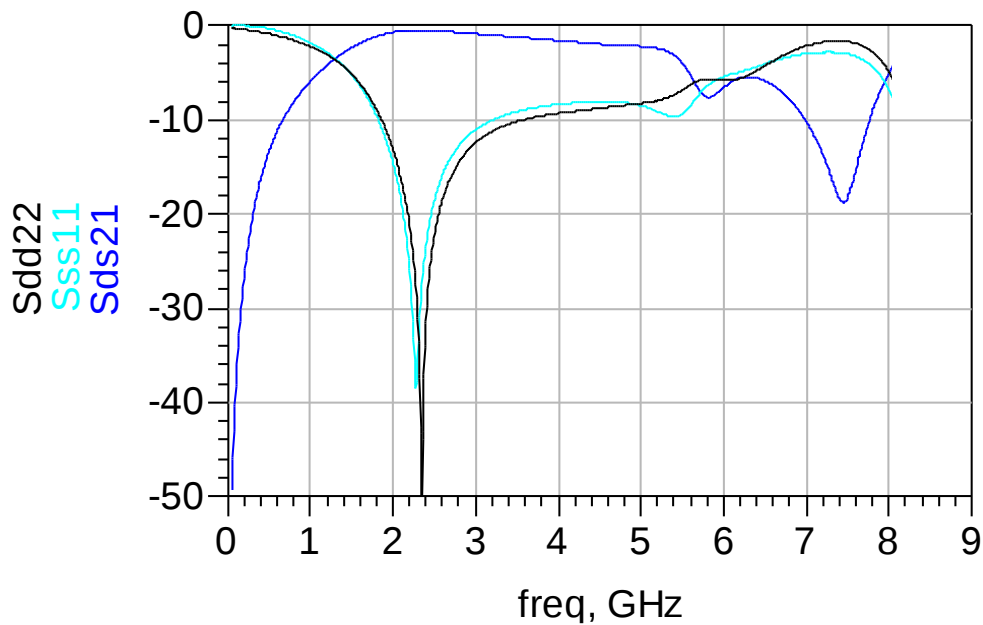
⁵ Unbalanced port does not have a direct current path to GND.

⁶ Use an RF capacitor to RF GND when using DC-Feed option. Contact us for best cap value for this.

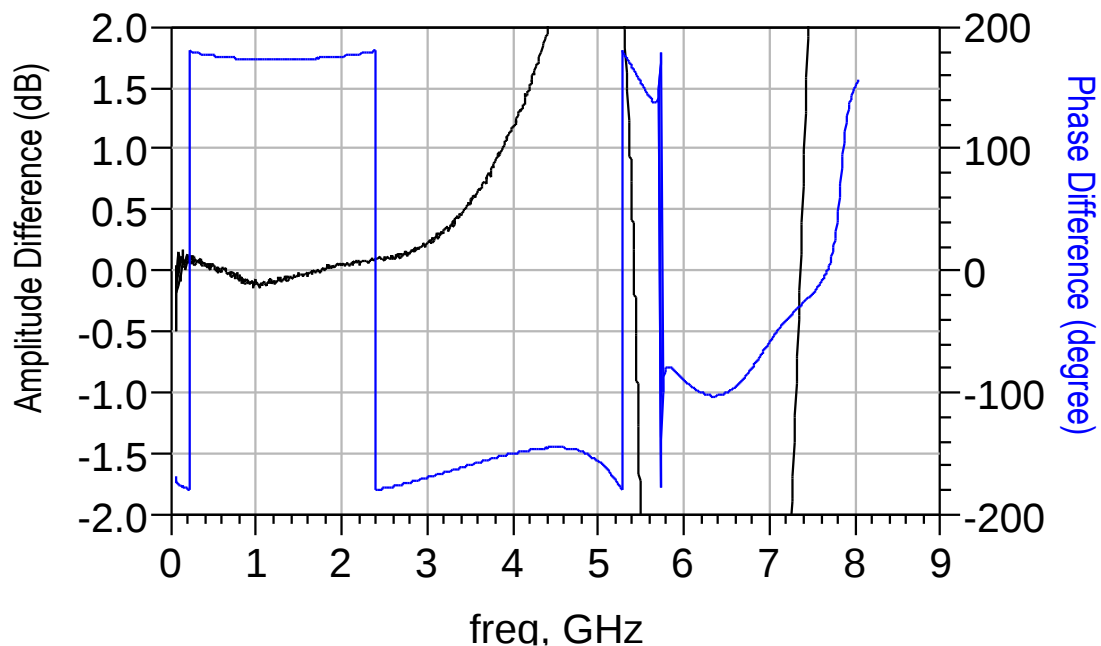


RF Measurement (T=25°C)

Insertion Loss, Return Loss



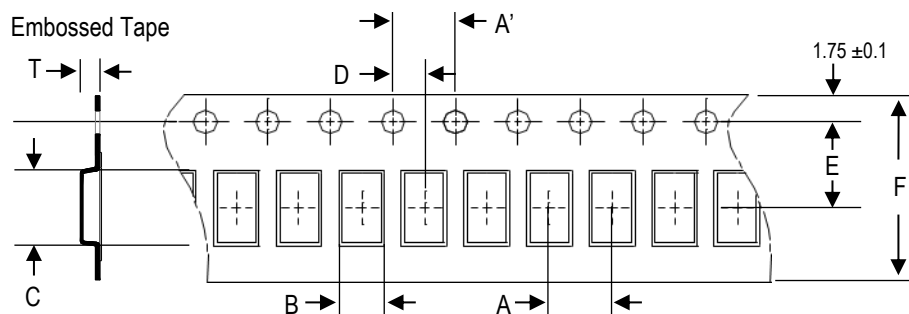
Phase Difference, Amplitude Difference



S-parameter and layout files available upon request. Please contact us at <https://www.johansontechnology.com/ask-a-question>

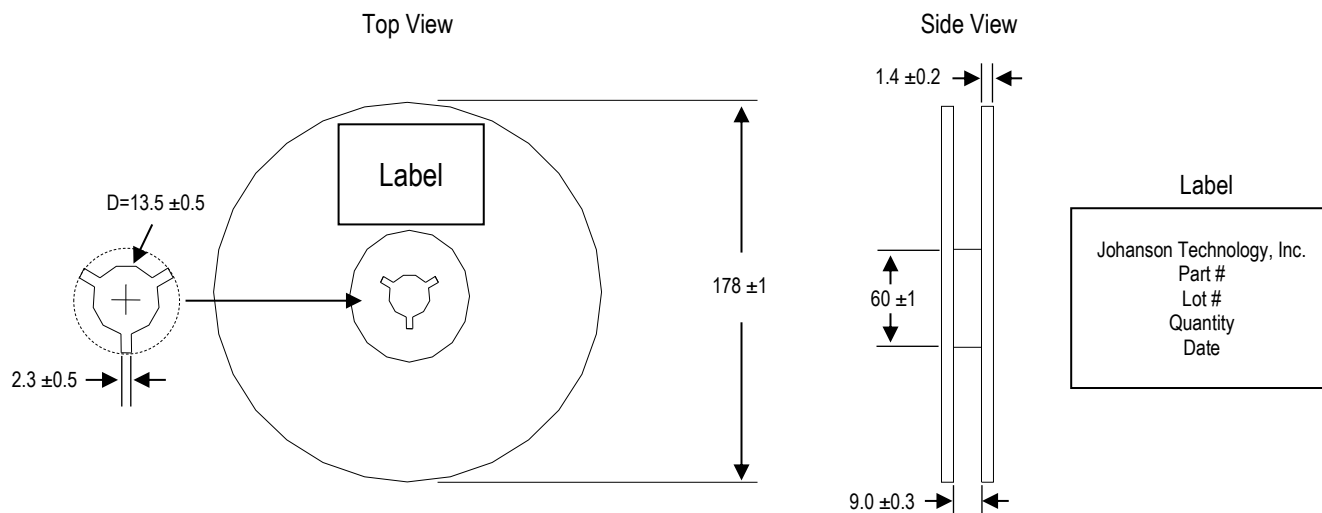
Tape and Reel Specifications (Units in mm)

Tape Dimensions

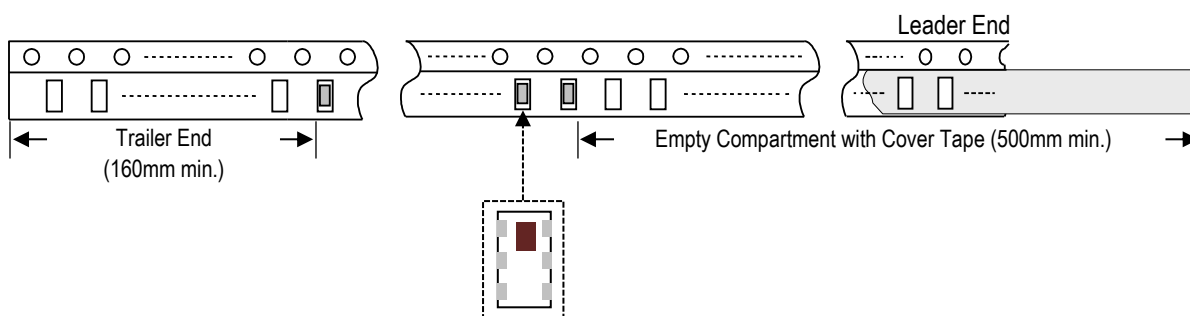


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0 ±0.1	4.0 ±0.1	1.35 ±0.05	2.15 ±0.05	2.0 ±0.05	3.5 ±0.1	8.0 ±0.1	1.08 ±0.05	4,000 pcs.	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



Orderable Part Numbers

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	2450BL15B0050001B	Nickel Tin
T & R (7" Reel Embossed Tape)	2450BL15B0050001E (Qty: 4,000 pcs./reel)	
Evaluation Board with 3 SMA Connector	2450BL15B0050001CE1	

Important Links

[2450BL15B0050001E Product Page](#)

[More RF Baluns](#)

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

[Soldering Information](#)

[MSL Information](#)

[Packaging Information](#)

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

[RoHS Compliance](#)

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