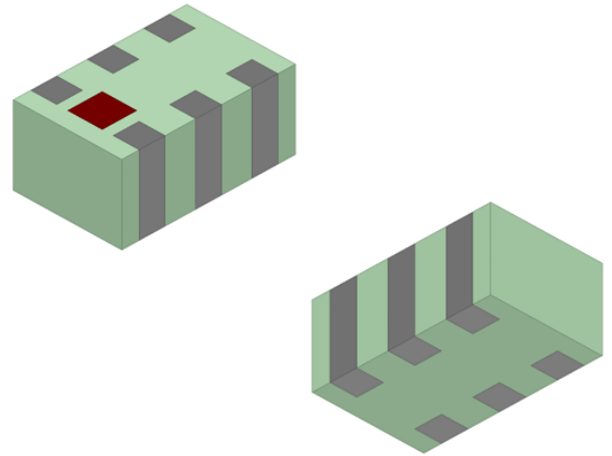


900 MHz RF 1:1 Balun

- 800 - 1000MHz, 50:50 (1:1) Impedance Ratio
- SMD, EIA 0805
- Wireless communication systems using Sub-GHz protocols for smart home, general IoT, security, metering, lighting, cellular, agriculture, city and building automation, etc.
- RoHS compliant



General Specifications^{1 2}

Passband Frequency (MHz)	800 - 1000
Unbalanced Impedance (Ω)	50
Balanced Impedance (Ω)	50
Insertion Loss (dB)	1.2 Max. @ 25°C 1.4 Max. @ -40 to 125°C
Return Loss (dB)	9.5 Max.
Phase Difference (degree)	180 \pm 10
Amplitude Difference (dB)	2 Max.

Maximum Ratings

Power Capacity (W)	1 Max. (CW)
Operating Temperature ($^{\circ}$ C)	-40 to +125 $^{\circ}$ C
Recommended Storage Conditions post-installation ($^{\circ}$ C)	-40 to +85 $^{\circ}$ C
Recommended Storage Conditions and Period for Unused T&R Product	45% - 75% RH +5 to +35 $^{\circ}$ C 18 Months Max.

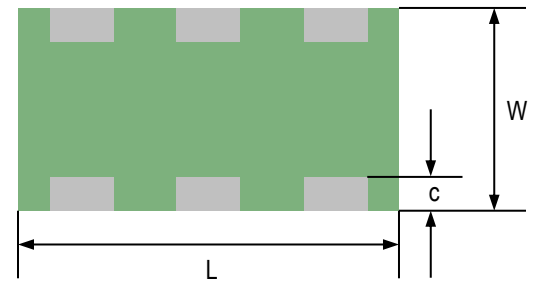
¹ Typical value represents average measurement at 25 $^{\circ}$ C. Min./Max. values represent measurements over specified operating temperature.

² General specifications measured on Johanson's evaluation board PN 0900BL15D0050001CE1.

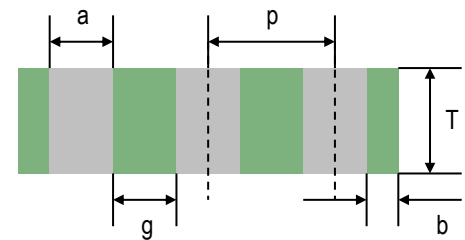
Mechanical Dimensions

	Inches			Millimeters		
L	0.079	±	0.004	2.00	±	0.10
W	0.049	±	0.004	1.25	±	0.10
T	0.028	±	0.004	0.70	±	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/-0.008		0.30	+0.10/-0.20	
g	0.014	±	0.004	0.35	±	0.10
p	0.026	±	0.002	0.65	±	0.05

Bottom view



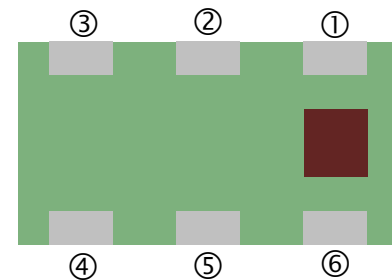
Side view



Terminal Configuration³

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

Top view



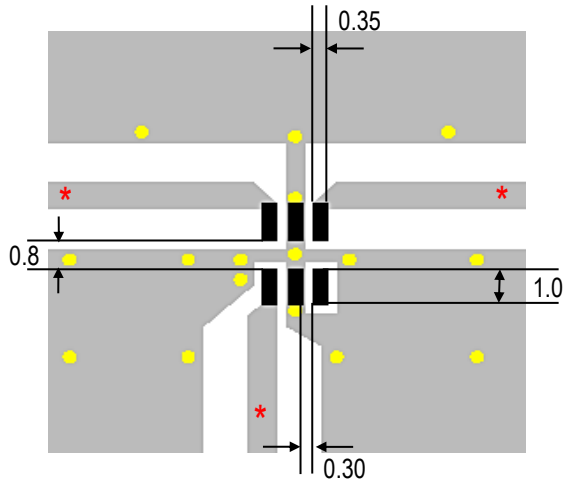
³ The termination type is Nickel Tin. Go to: <https://www.johansontechnology.com/tech-notes/typical-soldering-profile-ipc/> for Typical Soldering Profile.

⁴ Use 56pF RF GND cap when using DC-Feed option.




Recommended PCB Layout (P/N 0900BL15D0050001CE1)

Note: Mount device with colored mark facing up.

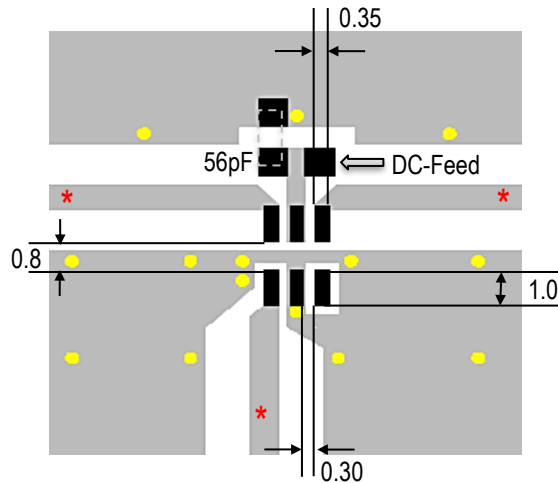
Without DC feed






Units: mm

-  Solder Resist
-  Land
-  Through-hole (ϕ0.3)

With DC feed⁵



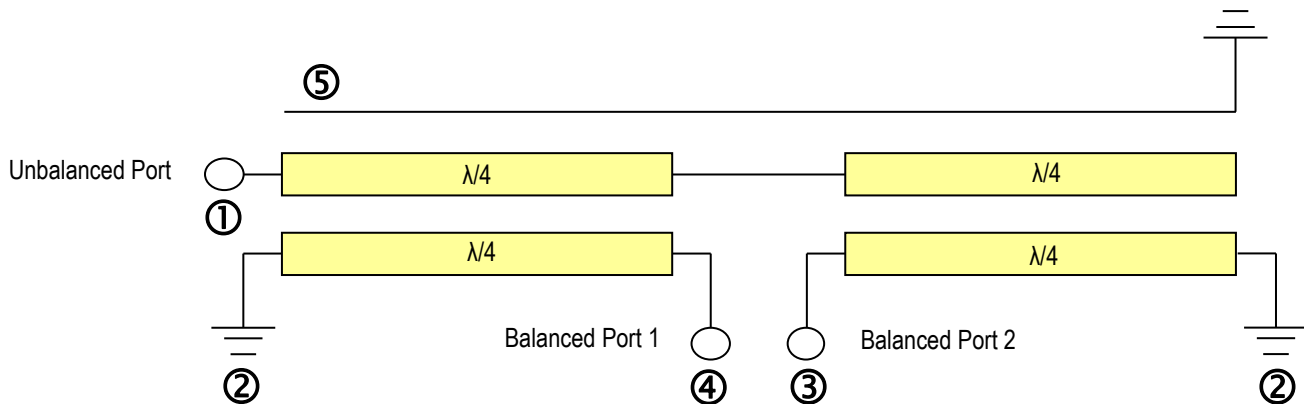
-  Solder Resist
-  Land
-  Through-hole (ϕ0.3)

*Transmission line width should be designed to match 50Ω characteristic impedance, depending on PCB material and thickness. If 50Ω characteristic impedance cannot be achieved, make sure the balanced feeding transmission lines are shorter than 1.2mm.

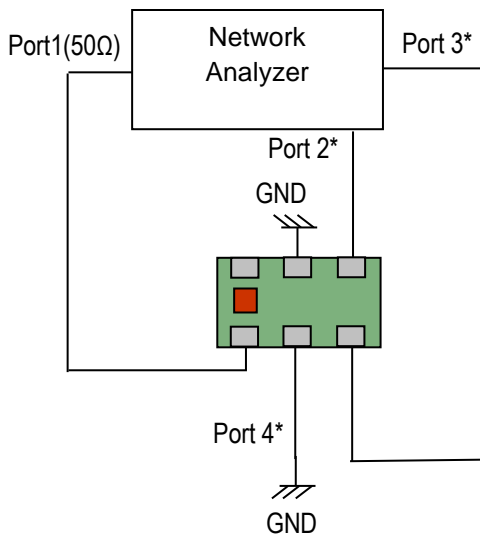
If you would like the full reference design package or have any questions, contact our application engineers at <https://www.johansontechnology.com/ask-a-question>

⁵ Use 56pF RF GND cap when using DC-Feed option.

Equivalent Internal Circuit^{6 7 8}



Measuring Diagram



Port 1: Unbalanced Port

Ports 2 and 3: Balanced Port

Port 4: GND or DC feed + RF GND

$$IL = S_{ds21}$$

$$RL = S_{ss11}$$

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

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

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

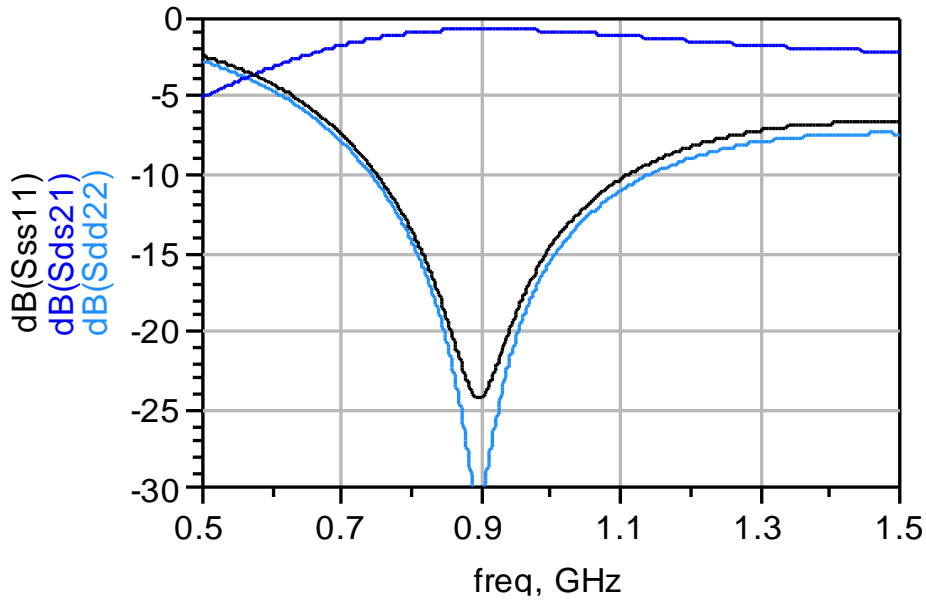
⁶ Pin3 and Pin4 are DC connected to Pin2 (GND or DC feed) in the device but not DC connected to Pin5 (GND). Therefore, by-pass capacitors should be connected when feeding DC power from Pin2.

⁷ Unbalanced port does not have a direct current path to GND.

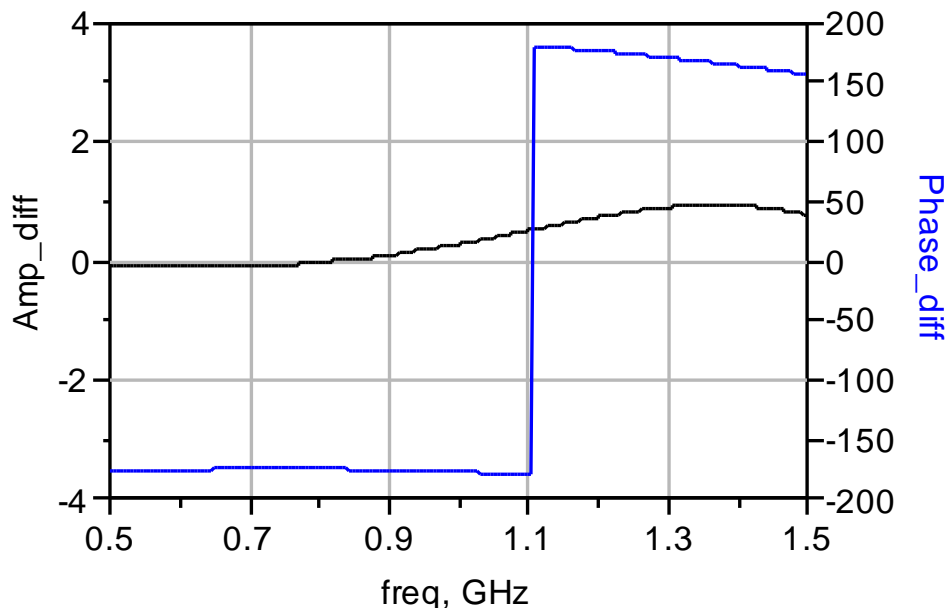
⁸ Use 56pF cap to RF GND when using DC-Feed option.

RF Measurement

Insertion Loss, Return Loss



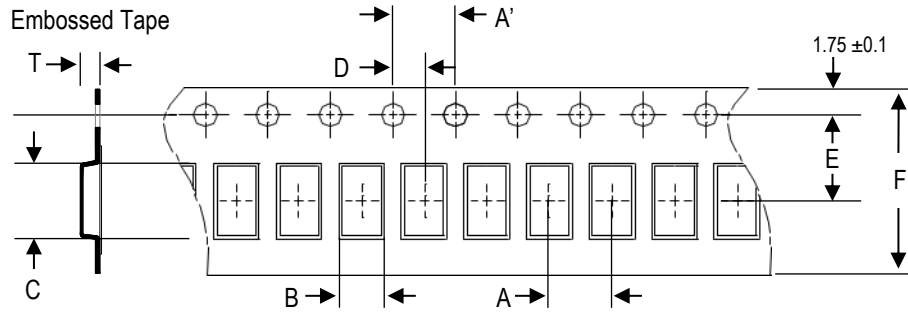
Phase Difference, Amplitude Difference



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

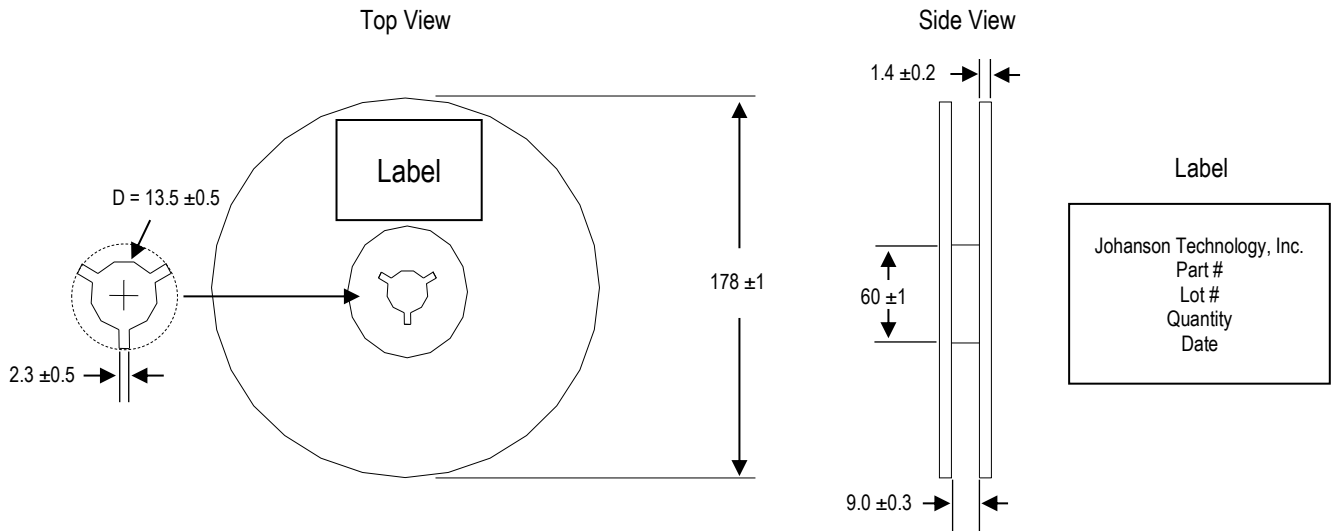
Tape and Reel Specifications (Units in mm)

Tape Dimensions

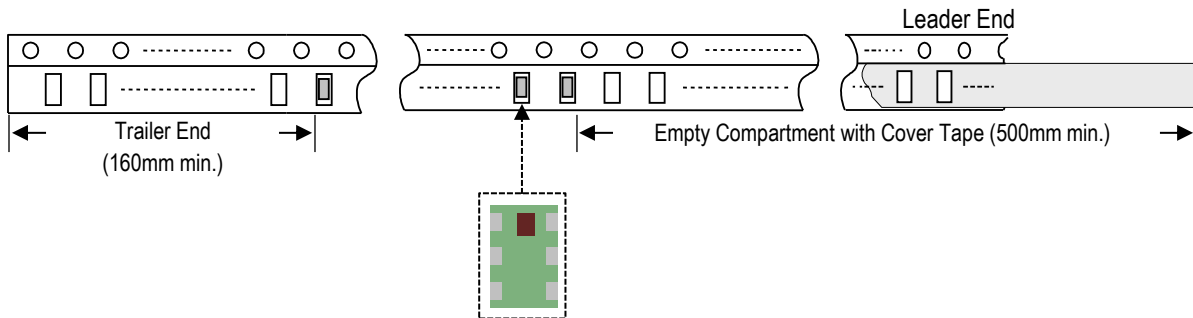


A	A'	B	C	D	E	F	T	Quantity/reel	Tape material
4.0 ±0.1	4.0 ±0.1	1.35 ±0.05	2.15 ±0.05	2.0 ±0.05	3.5 ±0.1	8.0 ±0.1	1.08 ±0.05	4,000 pcs.	Plastic (Embossed)

Reel Dimensions



Leader and Trailer Dimensions



Orderable Part Numbers

Packaging Style	Part Number	Termination
Bulk (loose pcs.)	0900BL15D0050001B	Nickel Tin
T & R (7" Reel Embossed Tape)	0900BL15D0050001E (Qty: 4,000 pcs./reel)	
Evaluation Board with 3 SMA Connector	0900BL15D005001CE1	

Important Links

[0900BL15D0050001E Product Page](#)

[More RF Baluns](#)

[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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