

Features

- Evaluation board for the OTSW100 DC-40 GHz wideband SPDT switch
- +/- 2.5V control lines brought out to header connector
- High performance 2.4mm compression edgemount connectors utilized for RF I/O
- TRL calibration structures included

Description

The OTSW100-EVAL is designed for the user to evaluate the performance of the OTSW100 DC-40 GHz SPDT switch. Please refer to the OTSW100 datasheet for full details on the switch. This document utilizes the OTSW100-EVAL for the board overview and test setup.

The OTSW101-EVAL evaluation board is functionally equivalent to the OTSW100-EVAL, as the main difference is the switch IC, which has a smaller footprint versus the OTSW100. Please refer to the OTSW101 datasheet for full details on this switch.

Required External Equipment

- Network Analyzer
- Dual Power Supply or Signal Generator

Applications

- Aerospace & Defense
- Wireless Infrastructure
- Satellite Communication
- Instrumentation
- Automotive

OTSW100 Evaluation Board

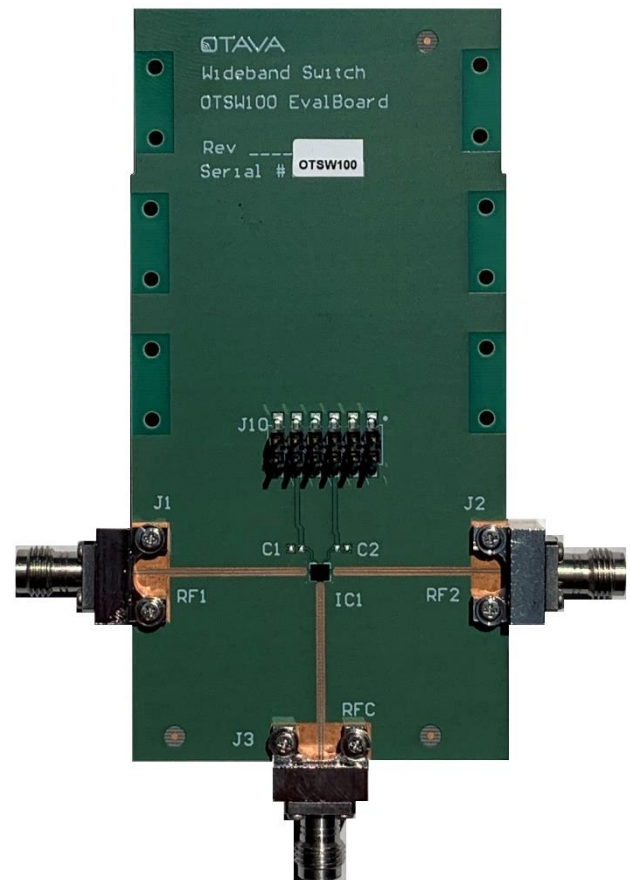


Figure 1 – OTSW100-EVAL Evaluation Board

OTSW100 Block Diagram

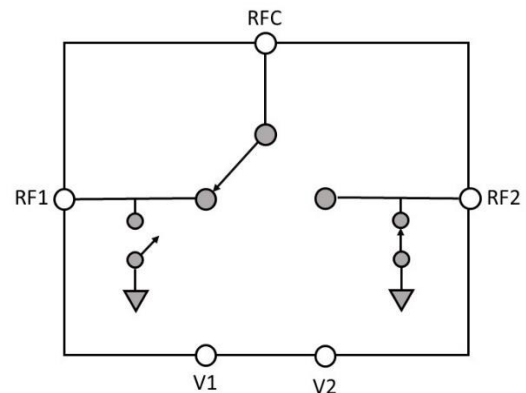


Figure 2 – OTSW100 IC Block Diagram

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Revision History

August 2021, RevA (Initial Release)

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Evaluation Board Overview

The evaluation board is shown above in Figure 1. The board provides a control header to access the two control pins of the switch. TRL calibration structures are provided on the board (Thru, Line, and Short); connectors for these paths are not provided and must be purchased separately. Compression mounted high performance 2.4mm millimeter wave connectors are utilized on the board for the three switch ports.

Unpopulated components, C1 and C2, are available for the addition of bypass capacitors if desired for the switch control lines.

The board consists of 4 layers and is detailed below:

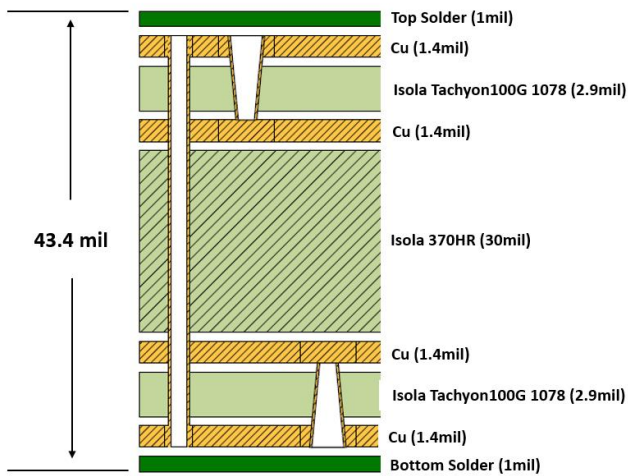


Figure 3 – OTSW100-EVAL PCB Stackup

The gerber files of the evaluation board are provided to assist the user in the implementation of the switch IC.

RF I/O Signals (DC-40 GHz)

The switch RF paths are routed on the top layer of the board. The TRL calibration paths are routed on the bottom layer. All RF lines are designed using a CPWG (coplanar waveguide) structure, with a trace width of 7

mil (tapered to 5mils going into the switch I/O pad) and ground spacing of 9.5 mil. Refer to the gerber files for exact dimensions. All RF I/Os are 50Ω nominal.

Table 1 – RF Connector I/O

Connector	I/O	Description
J1	RF1	Switch RF Port 1
J2	RF2	Switch RF Port 2
J3	RFC	Switch RF Common Port
J4	Short P1	Short Calibration Port1
J5	Short P2	Short Calibration Port2
J6	Line P1	Transmission Line Port1
J7	Line P2	Transmission Line Port2
J8	Thru P1	Thru Line Port1
J9	Thru P2	Thru Line Port2

Testing the Switch

Below is a typical setup to measure the s-parameters of the switch (if using a 2-port network analyzer, terminate the 3rd switch port):

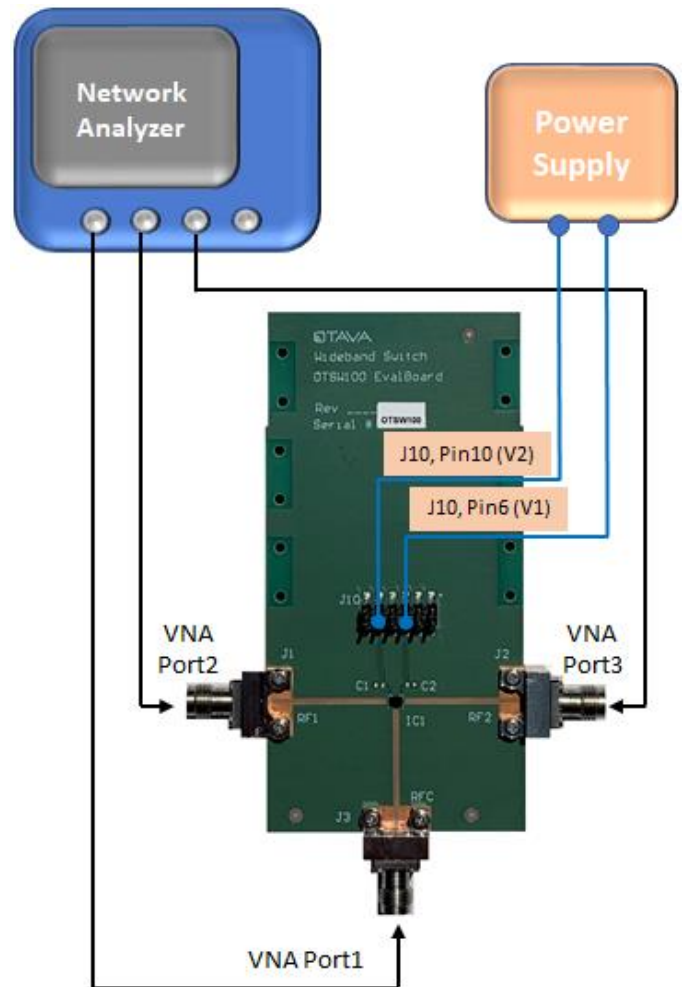


Figure 4 – OTSW100-EVAL Switch Test Setup

OTSW100/101-EVAL Datasheet

A control header is provided on the board to access the two control pins of the switch. The plus and minus 2.5V control for the switch is connected to pin 6 and pin 10 via power supply or signal generator.

Table 2 – J10 Control Header

Pin	I/O	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	V1 Control	Switch V1 Control Signal
7	GND	Ground
8	GND	Ground
9	GND	Ground
10	V2 Control	Switch V2 Control Signal

OTSW100-EVAL Additional Information

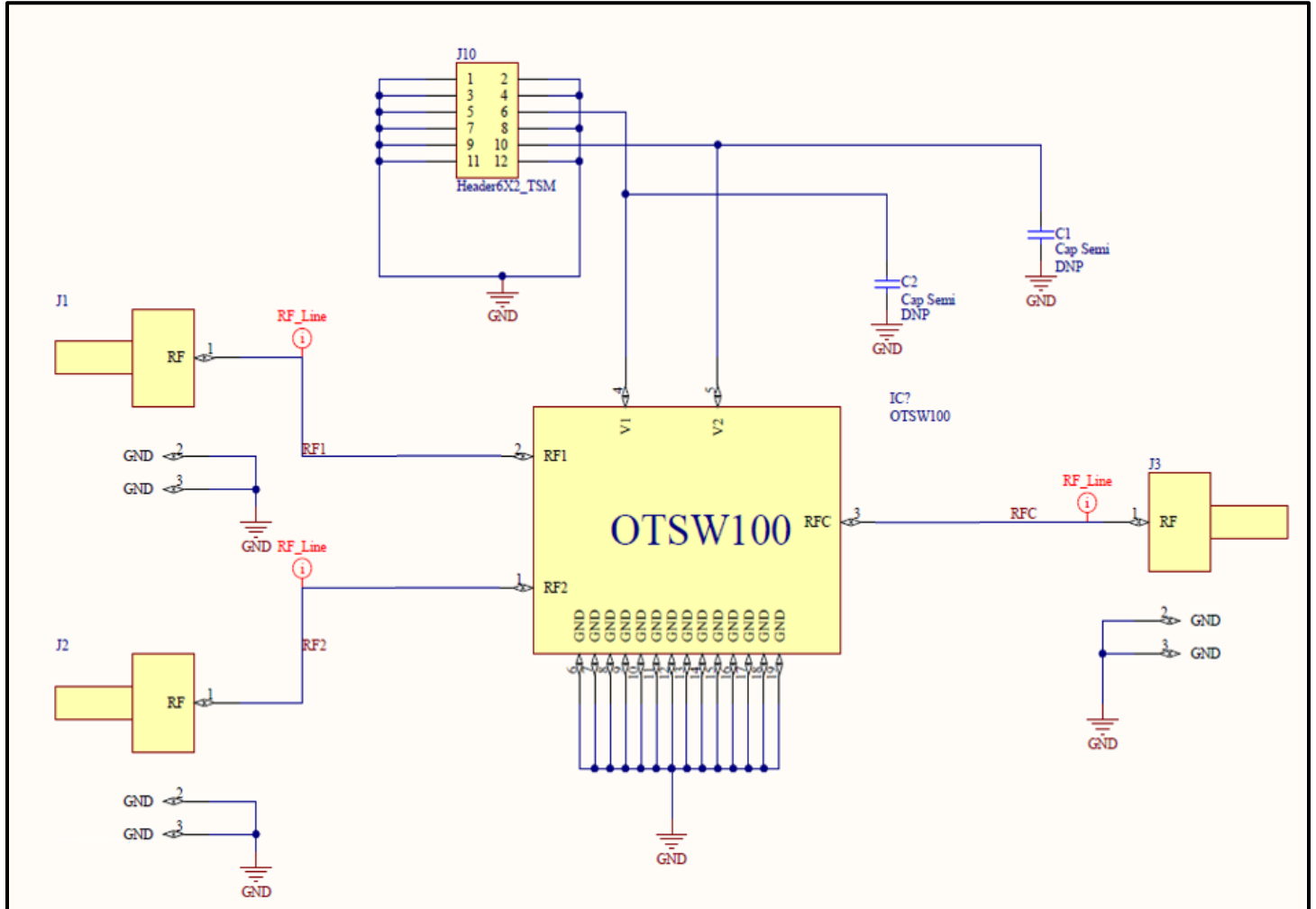


Figure 5 – OTSW100-EVAL Schematic

Table 3 – OTSW100-EVAL Bill of Materials

Reference Designator	Qty	Description	Part Number	Vendor
--	1	Evaluation PCB	OTSW100-PCB	Otava
IC1	1	SPDT Switch, DC to 40GHz	OTSW100	Otava
J1-J3 (J4-J9 not supplied)	3	Compression edgemount 2.4mm RF connector	RSP-220511-01	Samtec
J10	1	Header SMD 12 Pos 2.54mm	TSM-106-01-F-DV	Samtec
C1,C2 (not supplied)	2	Capacitor, 0603 package	n/a	n/a

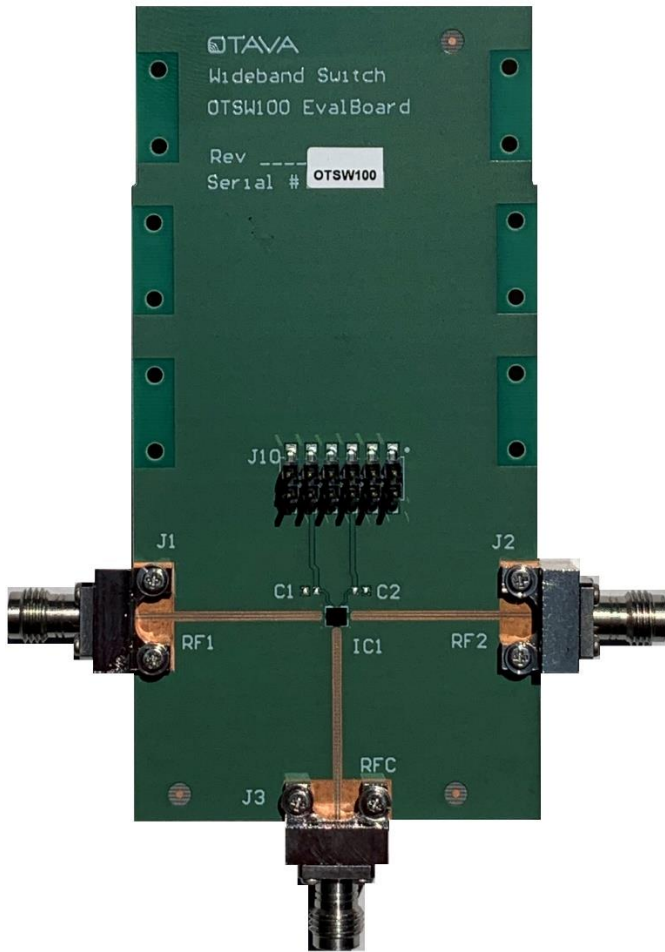


Figure 6 – OTSW100-EVAL PCB (Top)

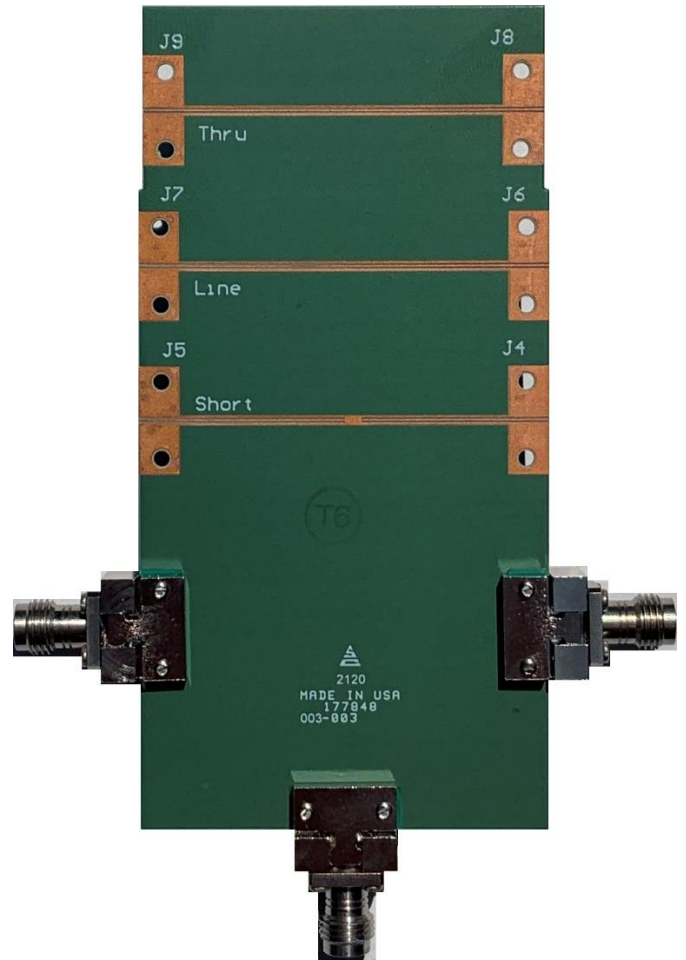


Figure 7 – OTSW100-EVAL PCB (Bottom)

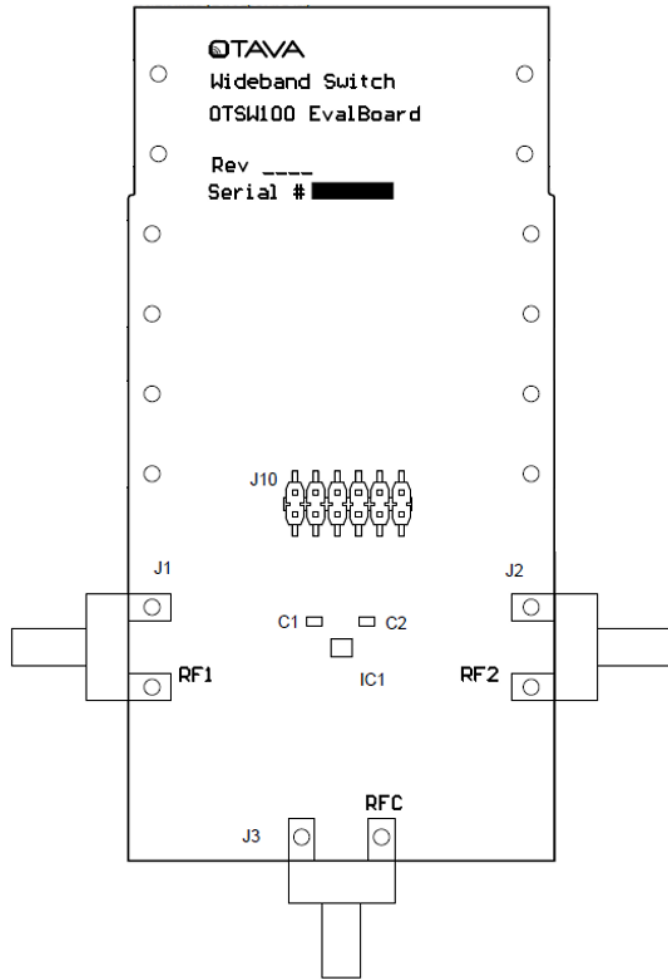


Figure 8 – OTSW100-EVAL Assembly Drawing (Top)

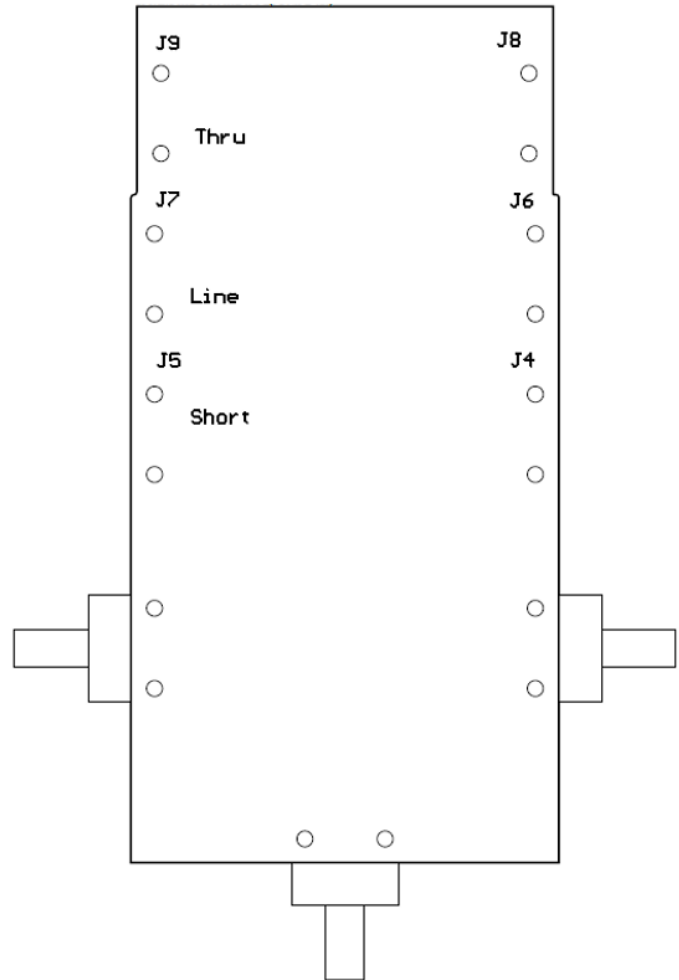


Figure 9 – OTSW100-EVAL Assembly Drawing (Bottom)

OTSW101-EVAL Additional Information

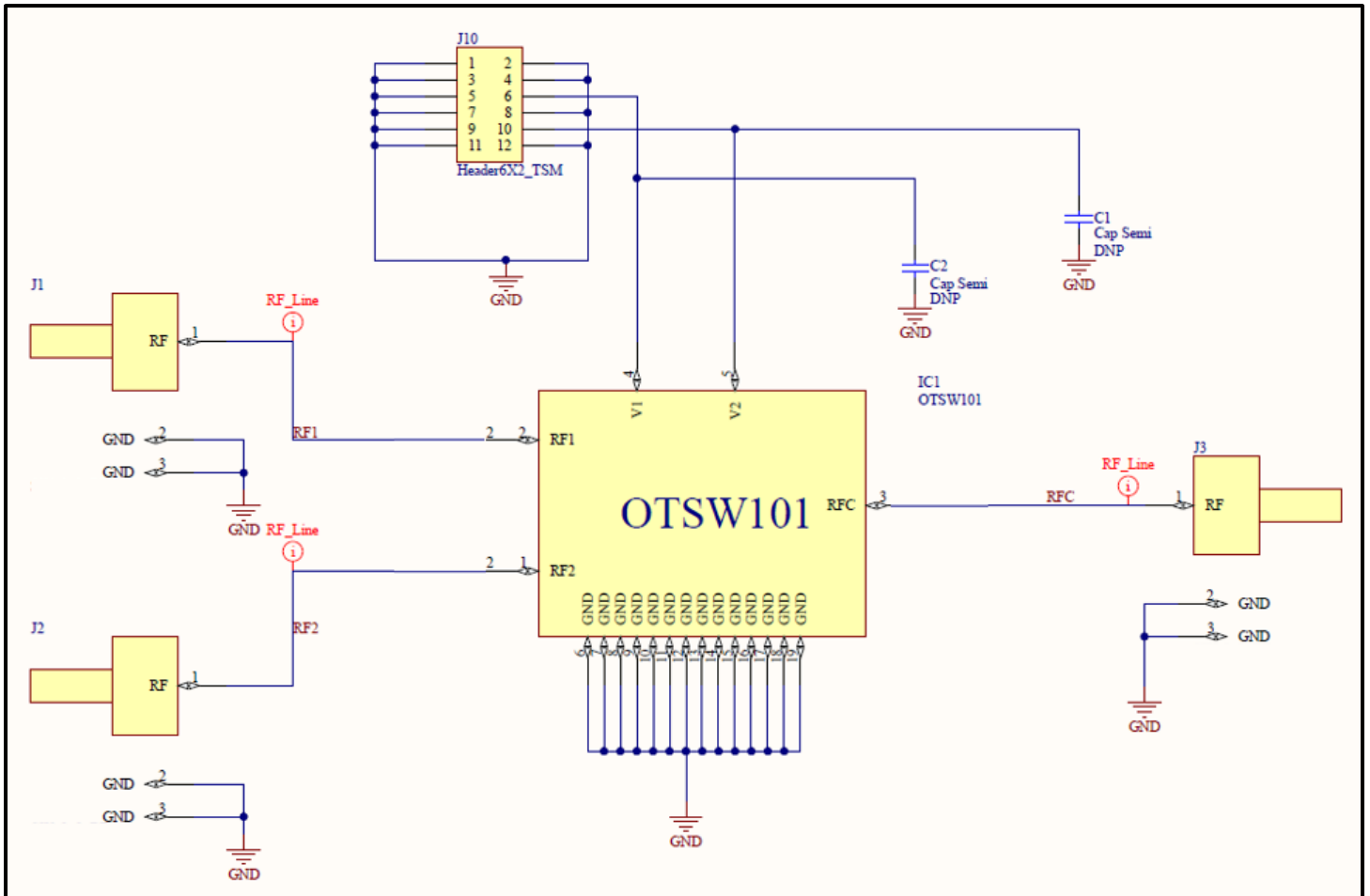


Figure 10 – OTSW101-EVAL Schematic

Table 4 – OTSW101-EVAL Bill of Materials

Reference Designator	Qty	Description	Part Number	Vendor
--	1	Evaluation PCB	OTSW101-PCB	Otava
IC1	1	SPDT Switch, DC to 40GHz	OTSW101	Otava
J1-J3 (J4-J9 not supplied)	3	Compression edgemount 2.4mm RF connector	RSP-220511-01	Samtec
J10	1	Header SMD 12 Pos 2.54mm	TSM-106-01-F-DV	Samtec
C1,C2 (not supplied)	2	Capacitor, 0603 package	n/a	n/a

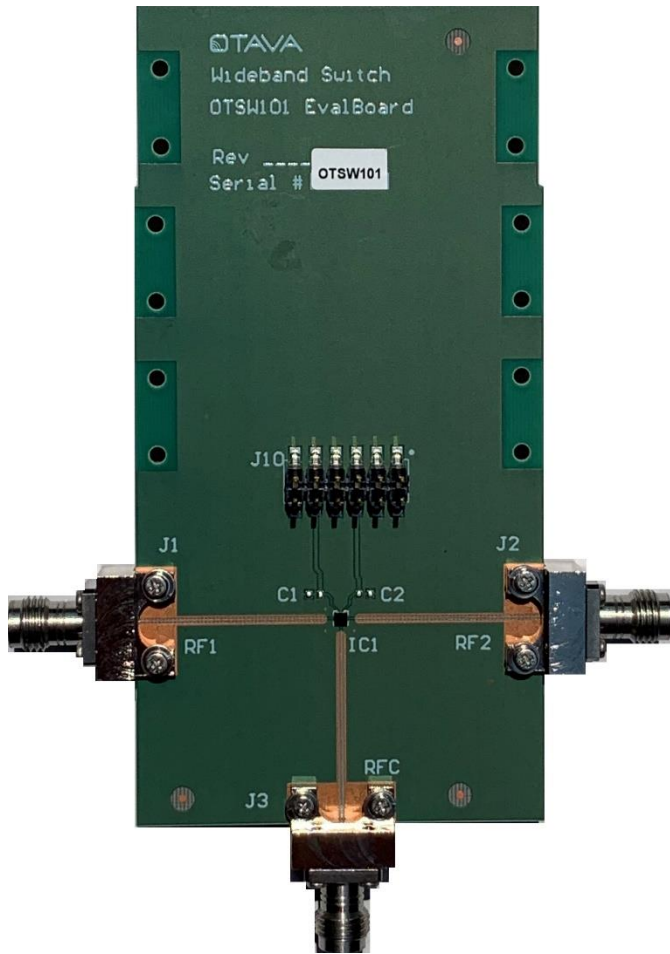


Figure 11 – OTSW101-EVAL PCB (Top)

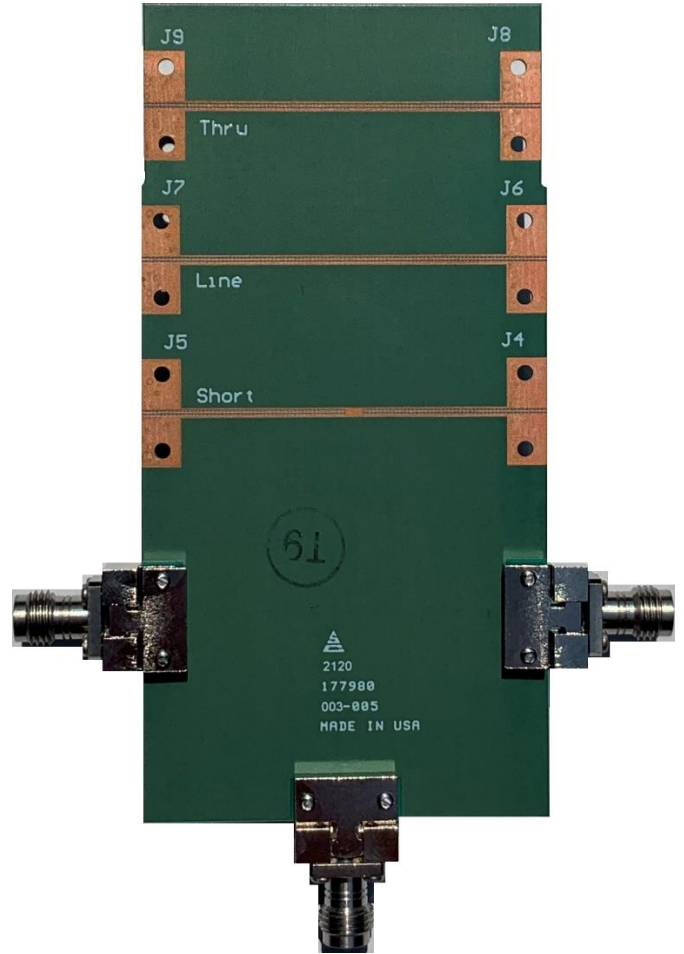


Figure 12 – OTSW101-EVAL PCB (Bottom)

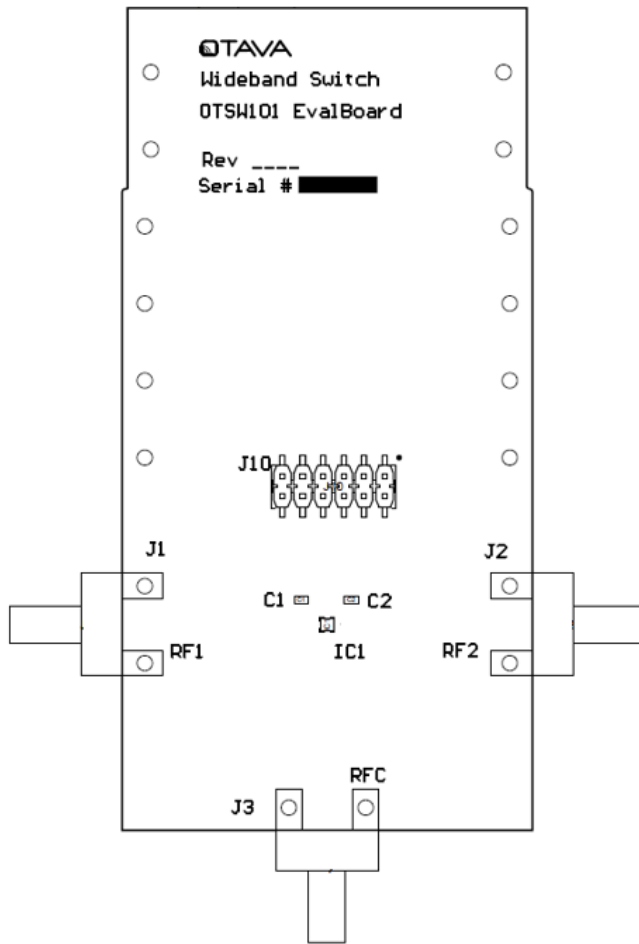


Figure 13 – OTSW101-EVAL Assembly Drawing (Top)

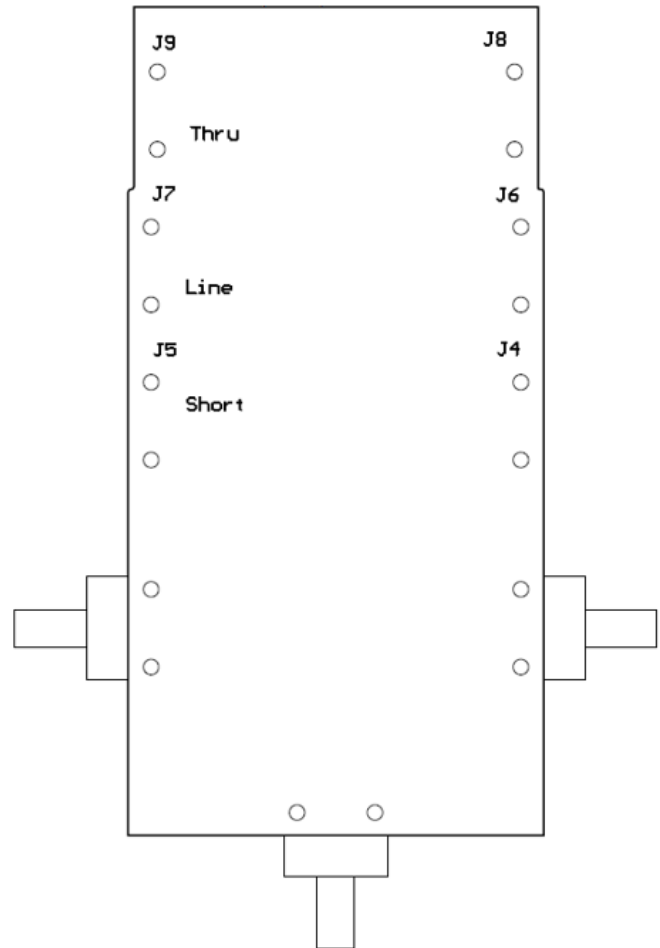


Figure 14 – OTSW101-EVAL Assembly Drawing (Bottom)