E band MMIC
SPDT Schottky Diode

E-SPDT-7681 Previously named CO-E1401506

GaAs Diode SPDT, 76-81 GHz

Overview

E-SPDT-7681 is a SPDT Schottky diode based switch that covers frequencies from 76GHz to 81GHz with very low loss (3.5dB) when closed and high isolation (15dB) when open. By using specialist matching circuitry, this MMIC provides an excellent match to 50 ohms, even when the branch arm is open, which allows ease of integration into complex multipath systems.

All bond pads and the die backside are gold plated. The MMIC is compatible with conventional die attach methods, as well as thermo-compression and thermosonic wire bonding, making it ideal for MCM and hybrid microcircuit applications. All data shown herein is provisional and is measured with the chip in a 50 ohm environment and contacted with RF probes.

Features

- 76 - 81 GHz.
- 3.5 dB insertion loss.
- 15 dB isolation.
- 10 dB return loss. (Open or Closed)

Applications

- Millimeter-wave imaging.
- Automotive radar.
- High resolution radar.
- Sensing.
- P2P communications;short haul/ high capacity/low interference links.
- Medical.
- Automotive radar.

Specification Overview

Parameter	Min.	Typ.	Max.	Units	Notes
Frequency	76		81	GHz	Biased at 0.81V, 8mA closed Biased at -1.2V, 0mA open
Insertion Loss		3.5	4	dB	
Isolation	10	15		dB	
Return Loss (Open)		10		dB	
Return Loss (Closed)		10		dB	
Closed Voltage		0.81		V	
Open Voltage		-1.2		V	
Closed Current		8		mA	
Open Current		0		mA	

Notes
The tests indicated have all been performed with 100pF de-coupling capacitors on all Voltage pads.
All tests are carried out at 25°C.

Absolute Maximum Ratings

Parameter	Rating
Control Voltage	-2 to +1.5V
RF Power	22 dBm
Storage Temperature	−65°C to +175°C
Channel Temperature	+175°C
Operating Temperature	−40°C to +85°C

ESD (electrostatic discharge) sensitive device. Charged devices and circuit boards can discharge without detection. Although this product features proprietary protection circuitry, damage may occur on devices subjected to ESD. Proper ESD precautions should be taken to avoid performance degradation or loss of functionality.

Measured Performance Data

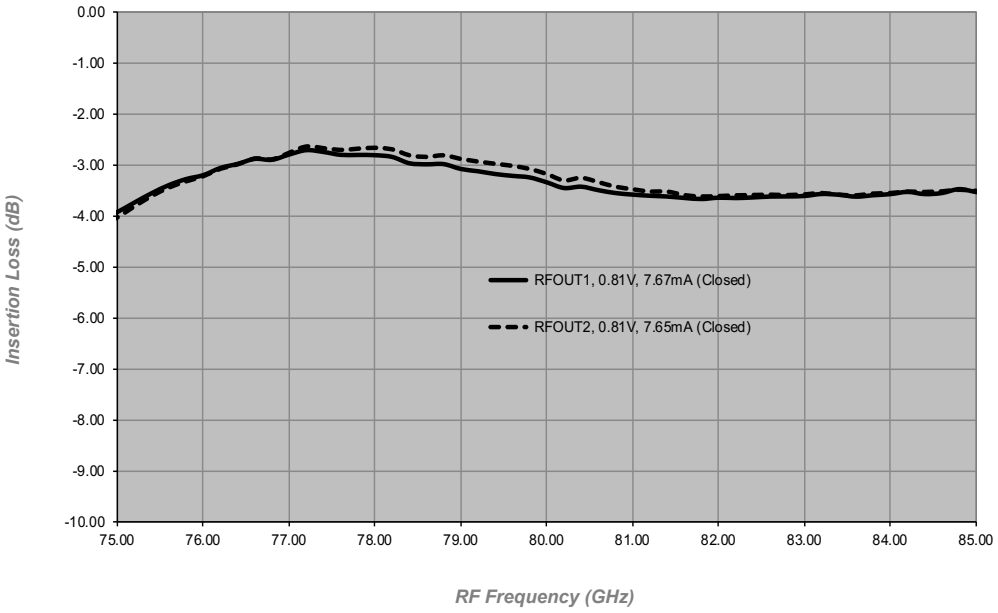


Figure 1
Insertion Loss
(the other branches open)

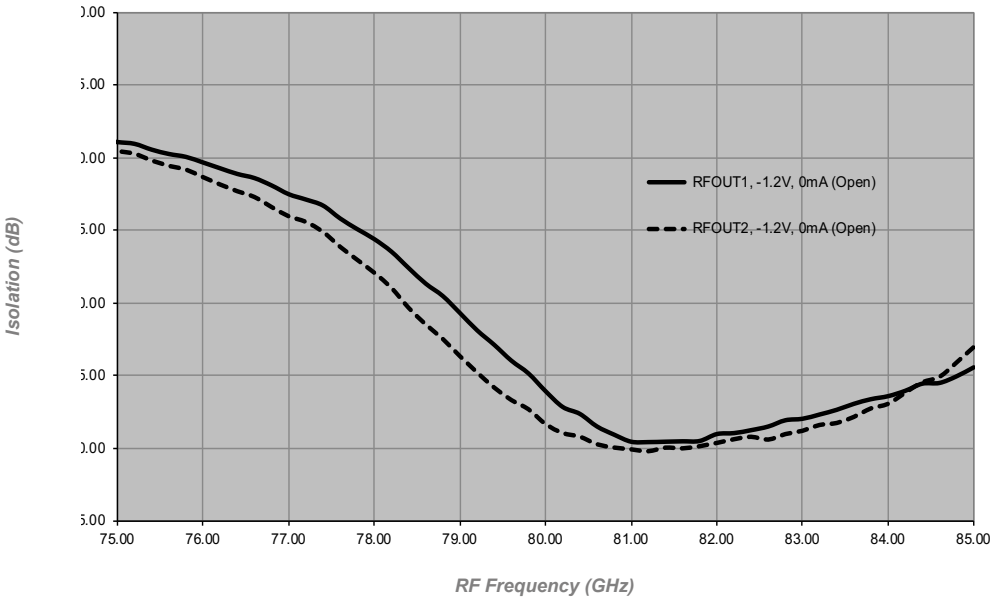


Figure 2
Isolation
(the other branch closed)

Measured Performance Data

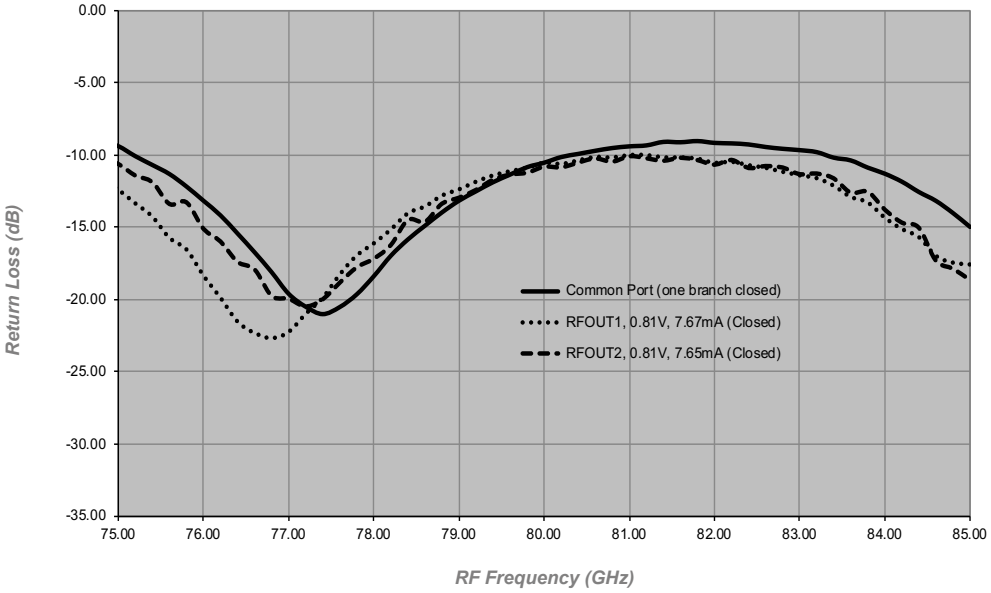


Figure 3
Closed Port Return Loss
(the other branches open)

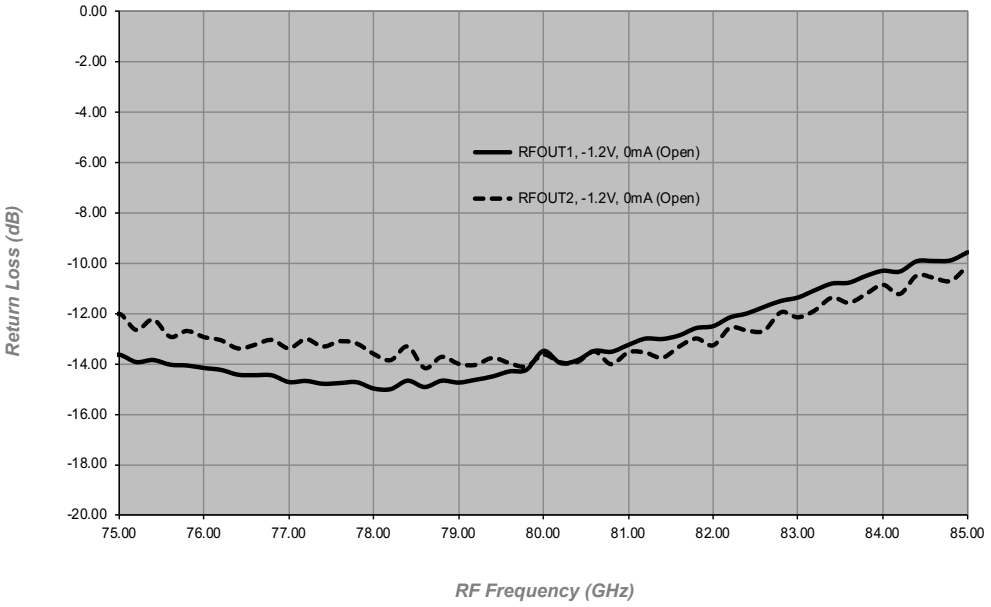
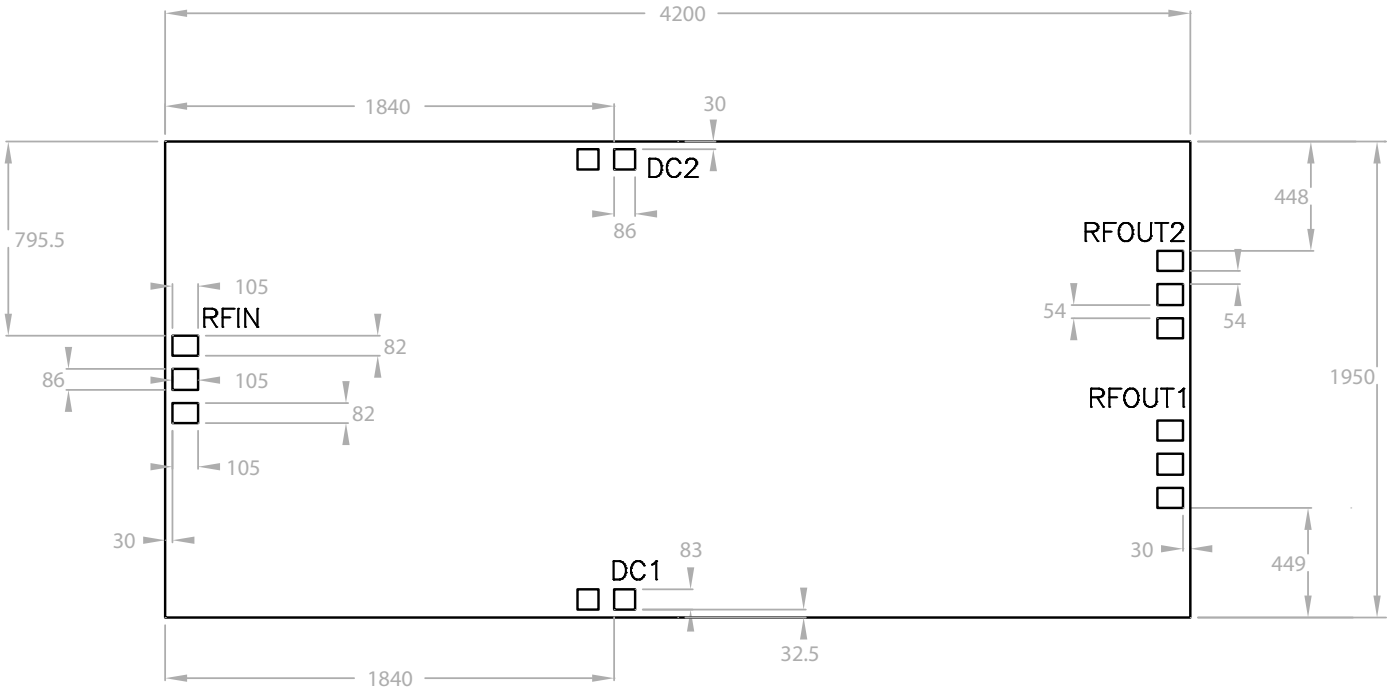


Figure 4
Open Port Return Loss
(the other branch closed)

Outline Drawing

Die Packing Information
All die are delivered using gel-paks unless otherwise requested.



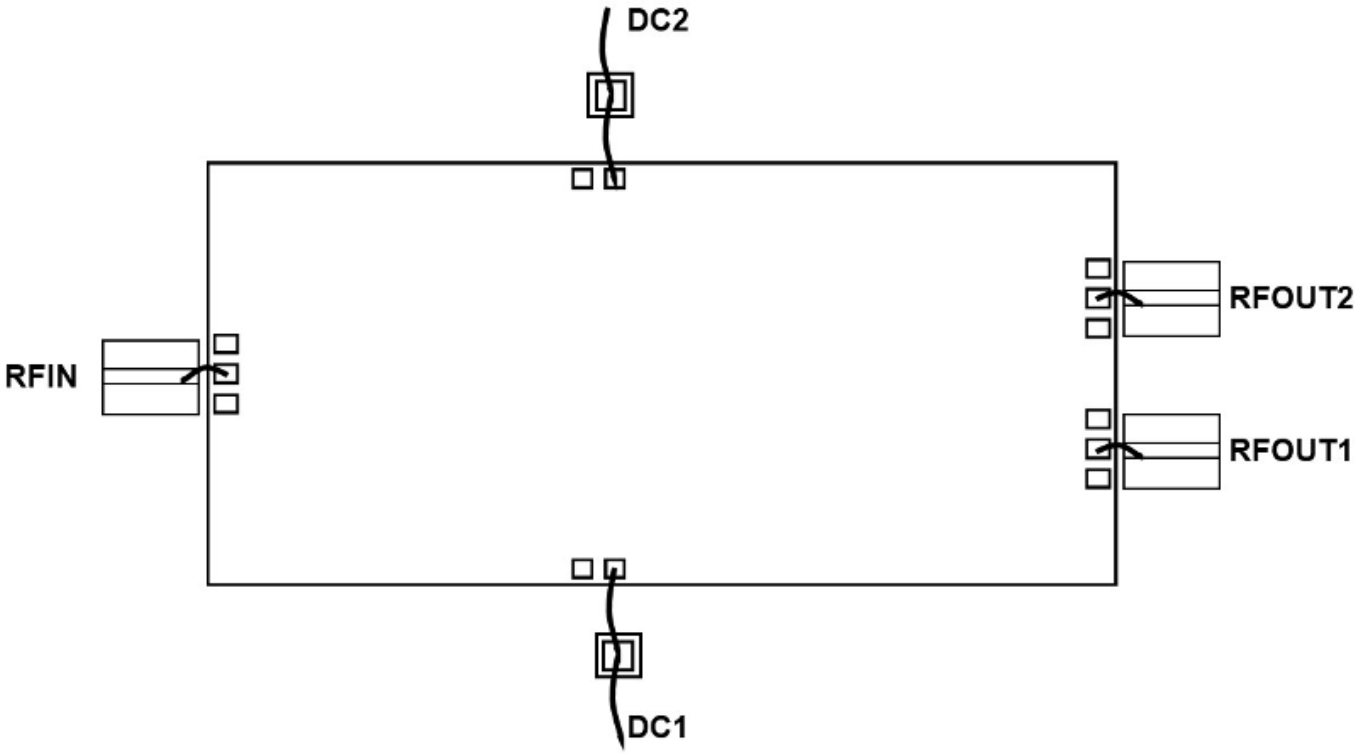
Notes

1. All dimensions are in um.
2. RF bond pads are 86 x 105um.
3. All DC bond pads are 86 x 83um.
4. Gold backside metalisation.
5. Backside metal is ground.
6. Die thickness is 100um

Pad Descriptions

Name	Description
RFIN	Common RF input pad. This pad is ac coupled.
RFOUTX	RF output pad for branch X. This pad is ac coupled.
DCX	This is DC control voltage pad for branch X.
BOTTOM	The die backside must be connected to RF/dc ground.

Connection Configurations



General Notes on Assembly

Die should be mounted on conductive material such as gold-plated metal to provide a good ground and suitable heat sink, if necessary.

1. Attaching the die using Au/Sn preforms is preferable. The Eutectic melt for Au/Sn occurs at approximately 280°C so the die (plus mount and preform) is initially heated up to 180°C and then it is heated for approximately 10 seconds to 280°C using a nitrogen heat gun. The device will survive 10 seconds at this temperature. The static breakdown for GaAs devices is approximately 330°C.
2. Pure, dry nitrogen should be used as the heat source.
3. If the devices cannot be lifted/ placed by a vacuum device, then ESD die-lifting tweezers are preferable.
4. Aluminium wire must not be used.

Arralis European Offices
t: +(44) 1793 239670 (UK)
e: sales@arralis.com

arralis.com

Arralis USA Office
+(1) 386 301 3249 (USA)
e: emilie.wren@arralis.com