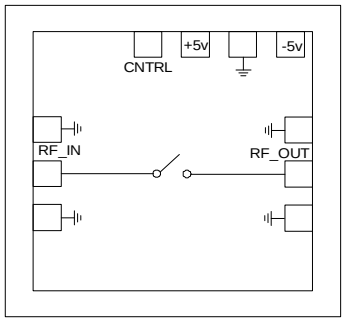
DC–35 GHz SPST Switch

Features

- **Frequency range: DC – 35 GHz**
- **Low Insertion loss ~ 1.3dB @ 18 GHz**
- **High Isolation of 40 dB**
- **I/O Return loss < 15 dB**
- **High Input P_{1dB}: 23 dBm**
- **On-Chip TTL driver for fast switching**
- **0.5µm InGaAs pHEMT technology**
- **Chip Size : 1.73 mm x 1.13 mm x 0.10 mm**

Functional Diagram



Typical Applications

- **Military & space**
- **Test Equipments**
- **Microwave Radio, RADAR**
- **Broadband Telecommunications**
- **Commercial electronic systems**

Description

The AMT2571011 is a wideband reflective Single Pole Single Throw (SPST) switch designed over a frequency range of DC–18GHz. This switch offers high isolation and low insertion loss. It has an on-chip TTL driver for high speed switching. The RF ports are DC coupled to ensure low frequency operation. The MMIC operates on +5 V, -5 V supply voltages with very low DC power consumption. This MMIC is fabricated using highly reliable and high performance InGaAs 0.5µm pHEMT Technology.

Absolute Maximum Ratings (1)

Parameter	Absolute Maximum	Units
RF Input Power	30	dBm
Positive Supply voltage	+6	V
Negative Supply Voltage	-6	V
Control Voltage ON OFF	 5 to +5.5 -0.5 to 0	 V V
Operating Temperature	-55 to +85	oC
Storage Temperature	-65 to +150	oC

1. Operation beyond these limits may cause permanent damage to the component

Electrical Specifications [1] @ T_A = 25 °C, Z_o =50 Ω

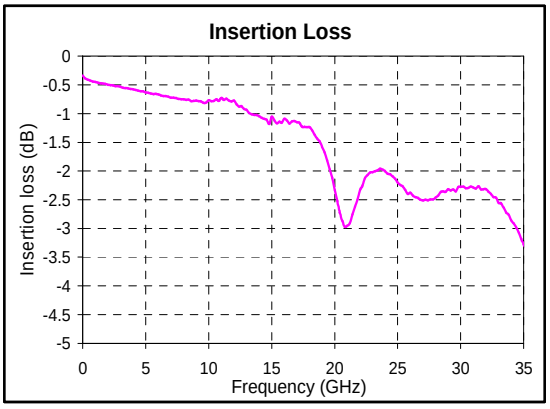
Parameter	Frequency	Typ. Value	Units
Insertion Loss	5 GHz 10 GHz 15 GHz 18 GHz 35GHz	0.6 0.8 1.0 1.2 3.5	dB dB dB dB dB
Isolation	5 GHz 10 GHz 15 GHz 18 GHz 35GHz	46 48 52 57 40	dB dB dB dB dB
Input Return Losses	DC – 18GHz DC – 35GH	15 13	dB dB
Output return Losses	DC – 18GHz DC – 35GHz	15 13	dB dB
Input P1dB	DC-18GHz	23 [2]	dBm
Switching speed		40 [2]	ns
DC Bias Voltages		+5, -5	V
Control Voltage		0/+5	V

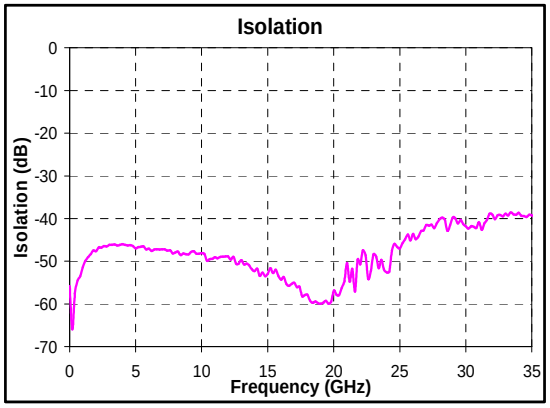
Note:

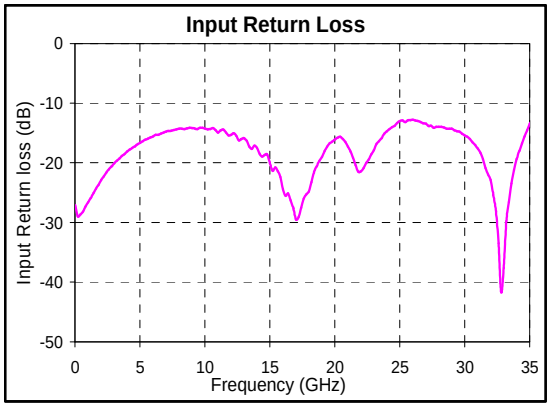
1. Electrical Specifications as measured On-Wafer
2. Measured in a test fixture

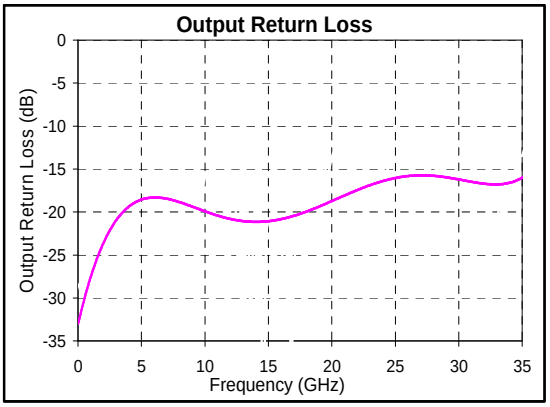
On-Wafer data

T_A = 25 ^oC, Z_o =50Ω



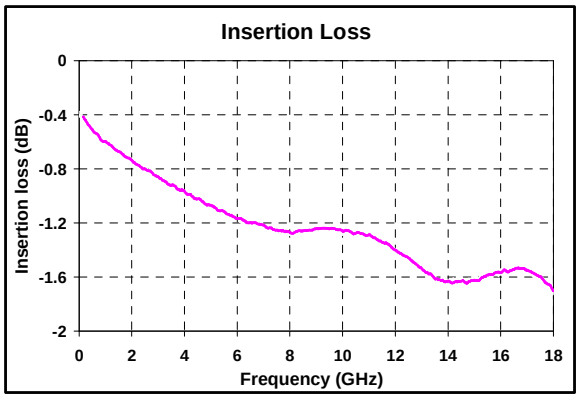


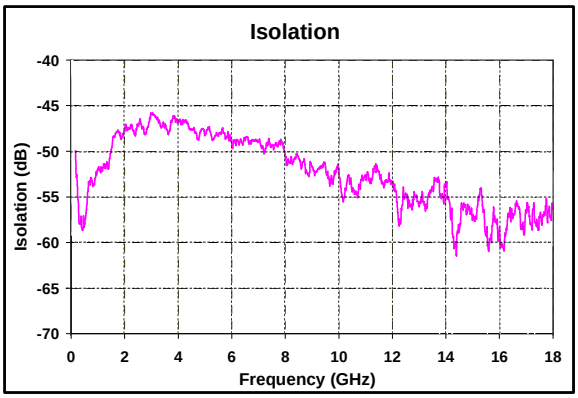


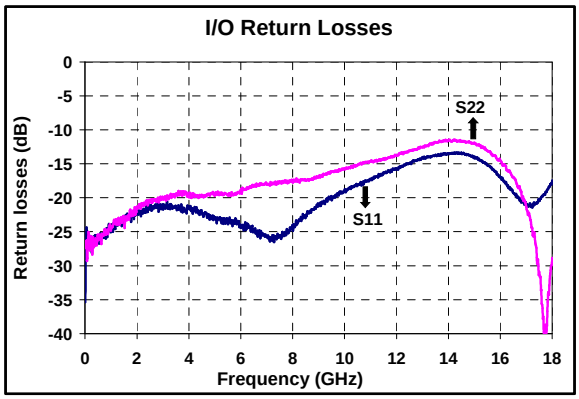


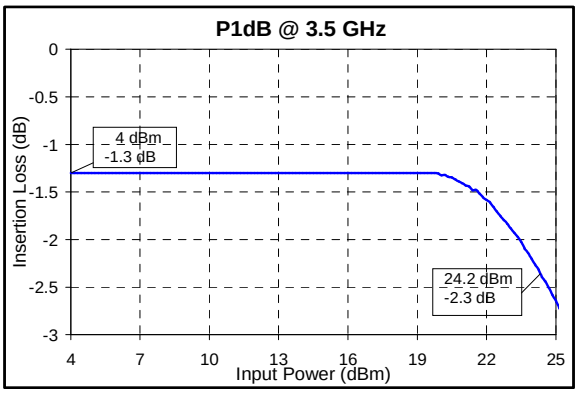
Test fixture data

T_A = 25 °C, Z_o =50Ω









Truth Table

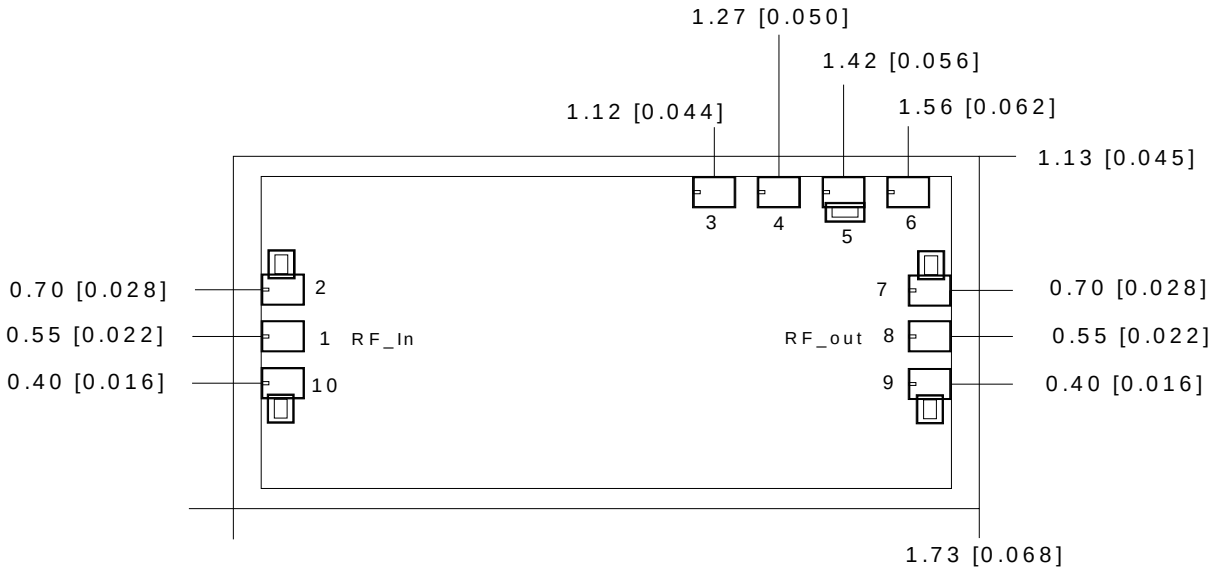
Control Voltage

State	Bias condition
Low “0”	0 - 0.5V
High “1”	3.5 - 5

Truth Table

Ctrl_vol	RF_In to RF_Out
0(Low)	Off (Isolation)
1(High)	On (Low loss)

Mechanical Characteristics



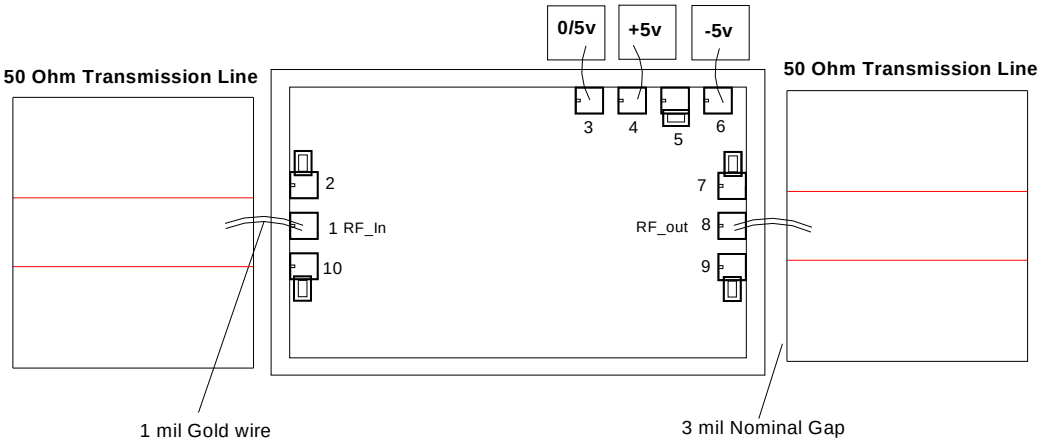
Units: millimeters [inches]

All RF and DC bond pads are 100µm x 100µm

Note:

1. **Pad no. 1 : RF In**
2. **Pad no. 8 : RF Out**
3. **Pad no. 3 : Control Voltage**
4. **Pad no. 4 : +5V**
5. **Pad no. 6 : –5V**

Recommended Assembly Diagram



Note:

1. Both the RF ports are DC Coupled.
2. Two 1 mil (25.4µm) bond wires of minimum length should be used for RF input and output.
3. For reliable operation, 0.1µF capacitors can be used at the voltage supplies

Die attach: For Epoxy attachment, use of a two-component conductive epoxy is recommended. An epoxy fillet should be visible around the total die periphery. If Eutectic attachment is preferred, use of fluxless AuSn (80/20) 1-2 mil thick preform solder is recommended. Use of AuGe preform should be strictly avoided.

Wire bonding: For DC pad connections use either ball or wedge bonds. For best RF performance, use of 150 - 200µm length of wedge bonds is advised. Single Ball bonds of 250-300µm though acceptable, may cause a deviation in RF performance.

GaAs MMIC devices are susceptible to Electrostatic discharge. Proper precautions should be observed during handling, assembly & testing

All information and Specifications are subject to change without prior notice