

# GaAs IC SPDT Switch Reflective DC–18 GHz



AS018R2-00

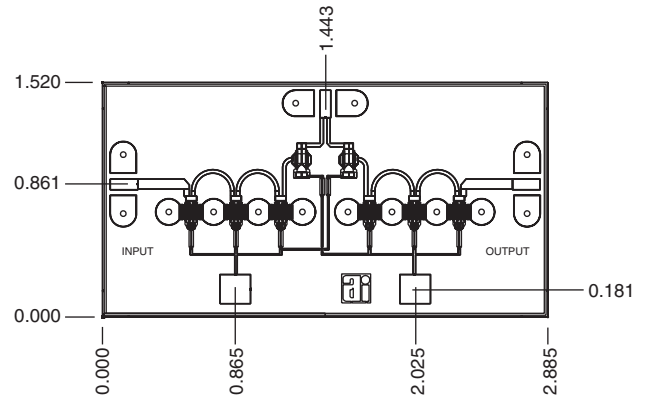
## Features

- Broadband DC–18 GHz
- High Isolation, Low Loss, Fast Switching
- 100% On-Wafer RF and DC Testing
- 100% Visual Inspection to MIL-STD-883 MT 2010

## Description

The AS018R2-00 GaAs SPDT MMIC FET switch chip is ideal for applications requiring low loss, high isolation and/or broadband operation. The GaAs MMIC employs three shunt and two series FETs per arm for low loss, high isolation switching. Power consumption is very low, typically 75  $\mu$ A at -5 V. While recommended for operation up to 18 GHz, the switch performs well through 22 GHz.

## Chip Outline



Dimensions indicated in mm.  
All DC (V) pads are 0.1 x 0.1 mm and RF In, Out pads are 0.07 mm wide.  
Chip thickness = 0.1 mm.

## Electrical Specifications at 25°C

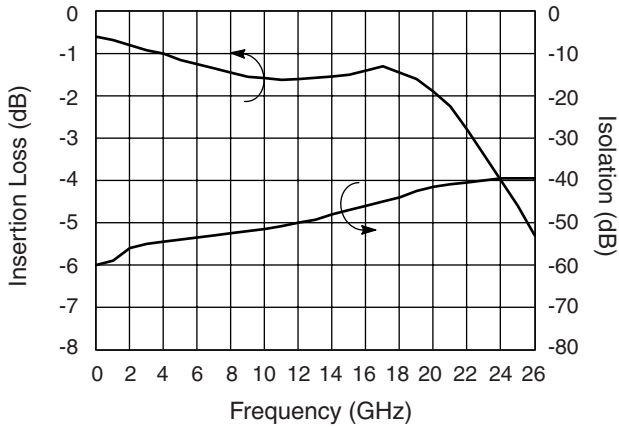
Parameter <sup>1</sup>	2 GHz Typ.	10 GHz Typ.	18 GHz Typ.	2, 10 and 18 GHz		Unit
				Min.	Max.	
Insertion Loss <sup>2</sup>	1.1	2.2	2.2		2.5	dB
Isolation	67	47	42	40		dB
Input Return Loss	15	8.5	10.5	7		dB
Output Return Loss	15	8.5	13	4		dB

## Operating Characteristics at 25°C

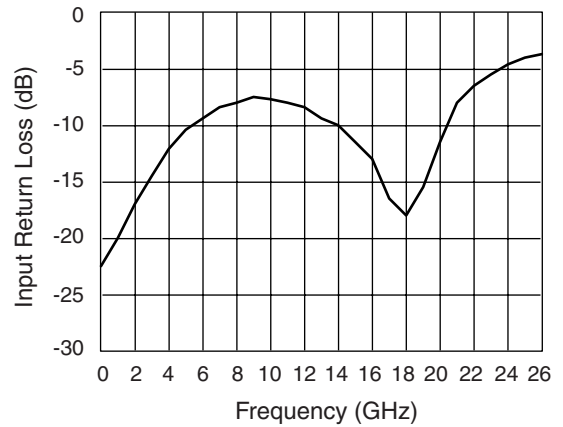
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru <sup>3</sup>			20	1 1	$\mu$ s $\mu$ s mV
Input Power for 1 dB Compression	0/-5 V	0.5–18 GHz 0.001 GHz		24 16		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power 13 dBm	0.5–18 GHz 0.001 GHz		46 35		dBm dBm
Control Voltages	$V_{Low} = 0$ to $-0.2$ V @ 20 $\mu$ A Max. $V_{High} = -3$ V to $-6$ V @ 250 $\mu$ A Max.					

1. All measurements made in a 50  $\Omega$  system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

### Typical Performance Data



Insertion Loss and Isolation vs. Frequency



Return Loss vs. Frequency

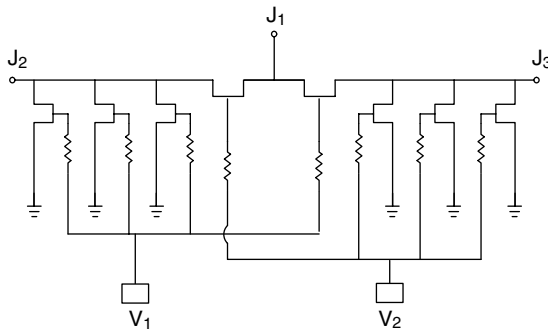
### Truth Table

V <sub>1</sub>	V <sub>2</sub>	J <sub>1</sub> -J <sub>2</sub>	J <sub>1</sub> -J <sub>3</sub>
0	-5	Isolation	Low Loss
-5	0	Low Loss	Isolation

### Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	1 W
Control Voltage (V <sub>C</sub> )	+0.2 V, -7 V
Operating Temperature (T <sub>OP</sub> )	-40°C to +90°C
Storage Temperature (T <sub>ST</sub> )	-65°C to +150°C
Thermal Resistance (θ <sub>JC</sub> )	83°C/W

### Circuit Schematic



### Chip Layout

