GaAs IC SPST Switch
Reflective DC–18 GHz

Alpha

AS018R1-00

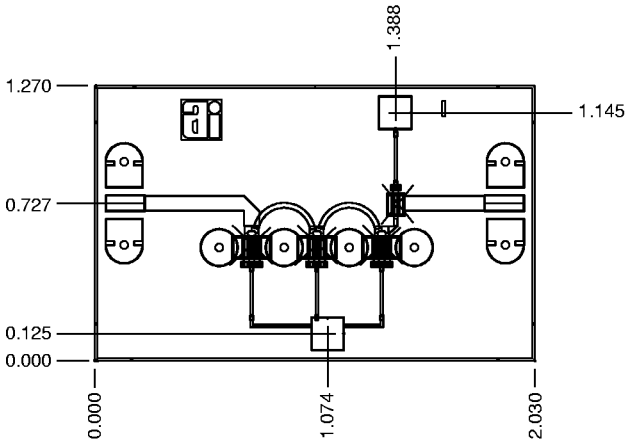
Features

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

Description

The AS018R1-00 GaAs SPST MMIC FET switch chip is ideal for applications requiring low loss, high isolation and/or broadband operation. The GaAs MMIC employs one series and three shunt FETs for low loss, high isolation switching. Each chip is measured on a 100% basis at 2, 10 and 18 GHz for insertion loss, isolation, input and output return losses and gate leakage. Power consumption is very low, typically 75 µA at -5 V. While recommended for operation up to 18 GHz, the switch performs well through 26 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

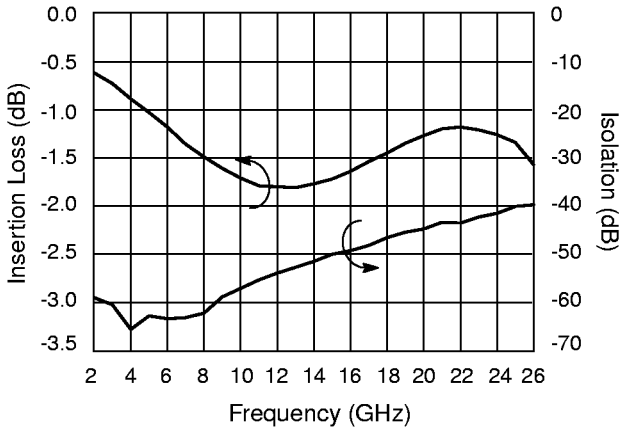
Parameter[1]	2 GHz Typ.	10 GHz Typ.	18 GHz Typ.	2, 10 and 18 GHz		Unit
				Min.	Max.	
Insertion Loss[2]	0.6	1.7	1.5		2.0	dB
Isolation	59	57	47	40		dB
Input Return Loss	17	7	9.5	6		dB
Output Return Loss	18	9	13	6		dB

Operating Characteristics at 25°C

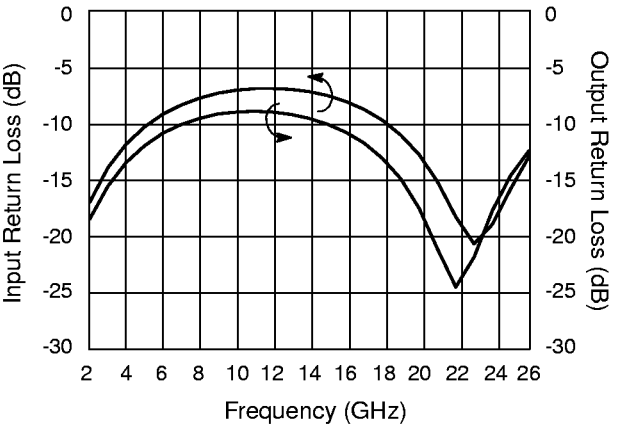
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru[3]			3 6 20		ns ns mV
Input Power for 1 dB Compression	0/-5 V	0.5–18 GHz 0.001 GHz		24 16		dBm dBm
Intermodulation Intercept Point (IP3)	For Two-tone 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 µA Max. V_{High} = -3 V to -6 V @ 250 µA Max.					

1. All measurements made in a 50 Ω 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

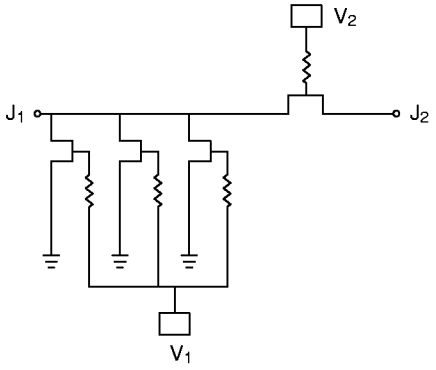
Truth Table

V_1	V_2	J_1–J_2
0	-5	Isolation
-5	0	Low Loss

Absolute Maximum Ratings

Characteristic	Value
RF Input Power (RF In)	1 W
Control Voltage (V_C)	+0.2 V, -7 V
Operating Temperature (T_{OP})	-55°C to +125°C
Storage Temperature (T_{ST})	-65°C to +150°C
Thermal Resistance (Θ_{JC})	83°C/W

Switch Schematic



Chip Layout