GaAs IC High Isolation Positive Control SPDT Switch DC–2.5 GHz

Alpha

AS119-12

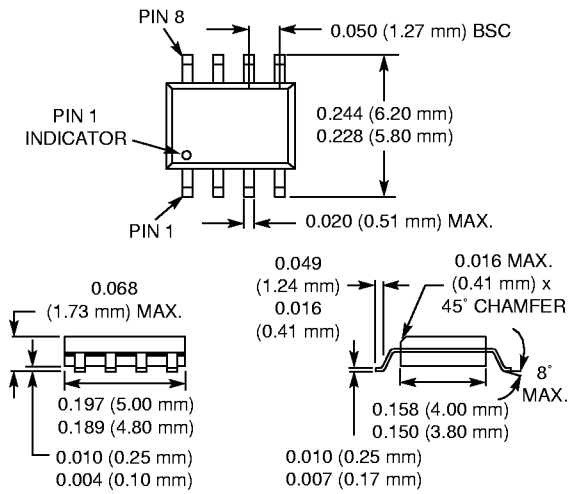
Features

- +3 V to +5 V Operation
- High Isolation (35 dB @ 1.9 GHz)
- Low Cost SOIC-8 Plastic Package

Description

The AS119-12 is a reflective SPDT FET IC switch designed for 1.9 GHz applications requiring high isolation. The switch requires external DC blocking capacitors, positive supply and two positive controls eliminating the need for a negative voltage. The device is mounted in a plastic SOIC-8 package for surface mounting. The AS119-12 can be used in many analog and digital wireless applications.

SOIC-8



Electrical Specifications at 25°C (0, +5 V)

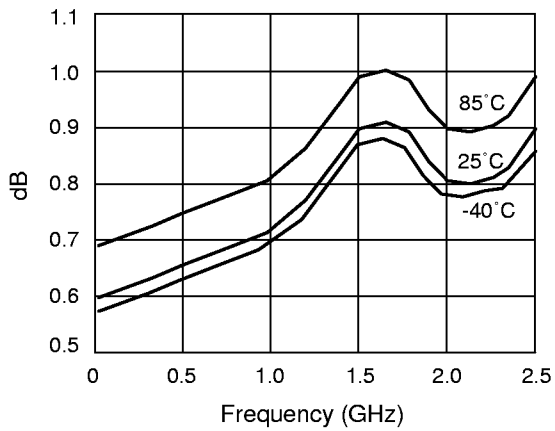
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz		0.7	0.8	dB
	DC–1.0 GHz		0.8	0.9	dB
	DC–2.0 GHz		0.95	1.1	dB
	DC–2.5 GHz		1.0	1.2	dB
Isolation	DC–0.5 GHz	40	42		dB
	DC–1.0 GHz	35	37		dB
	DC–2.0 GHz	33	35		dB
	DC–2.5 GHz	27	29		dB
VSWR[4]	DC–1.0 GHz		1.2:1	1.3:1	
	DC–2.0 GHz		1.5:1	1.8:1	
	DC–2.5 GHz		1.7:1	2.0:1	

Operating Characteristics at 25°C (0, +5 V)

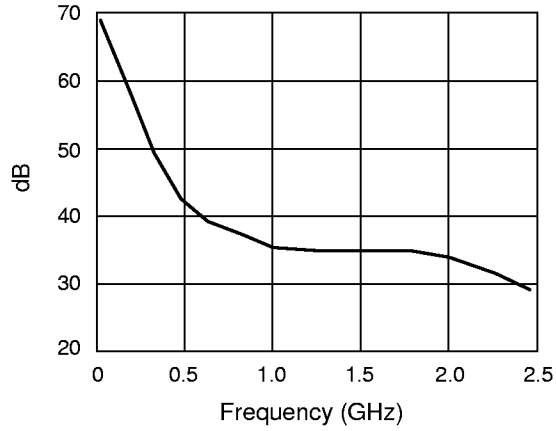
Parameter[1]	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	1.9 GHz		+41		dBm
Input Power for 1 dB Compression		1.9 GHz		+26		dBm
Control Voltages	V_{Low} = 0 to 0.2 V @ 20 µA Max. V_{High} = +3 V @100 µA Max. to +5 V @ 200 µA Max. V_S = V_{High} ± 0.2 V					

1. All measurements made in a 50 ohm system, unless otherwise specified.
2. DC = 300 kHz.
3. Insertion loss changes by 0.003 dB/°C.
4. Insertion loss state.
5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

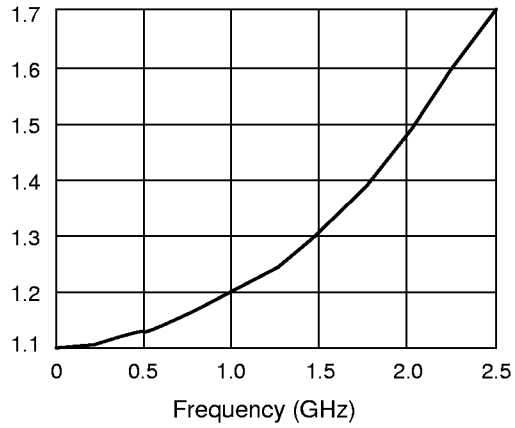
Typical Performance Data (0, +5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

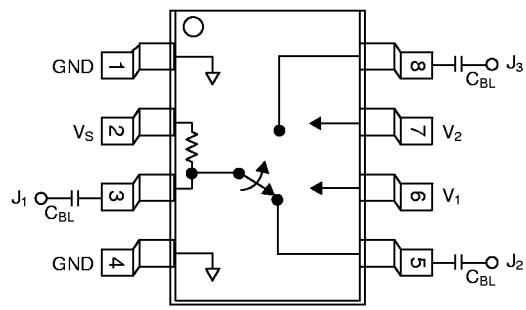
Characteristic	Value
RF Input Power	6 W Max. > 900 MHz 0/+5 V Control
Control Voltage	-0.2 V, +10 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	85°C/W

Truth Table

V_1	V_2	J_1–J_2	J_1–J_3
0	V_{High}	Insertion Loss	Isolation
V_{High}	0	Isolation	Insertion Loss

V_{High} = +3 to +5 V (V_S = V_{High} ± 0.2 V)

Pin Out



DC blocking capacitors C_{BL} must be supplied externally.
C_{BL} = 100 pF for operation >500 MHz.