

GaAs IC High Power Positive Control SPDT Switch DC–3 GHz



AS278-12

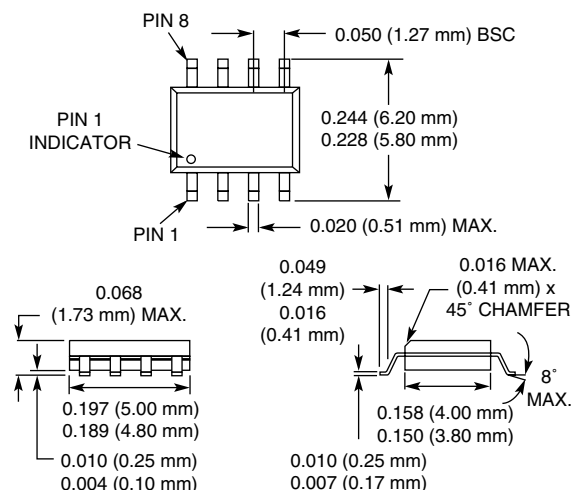
Features

- High Linearity (IP3 55 dBm @ 1.9 GHz)
- High Isolation (30 dB @ 1.9 GHz)
- Low Insertion Loss (0.55 dB @ 1.9 GHz)
- Positive 3 V to 5 V Control Voltage
- Low DC Power Consumption

Description

The AS278-12 is an IC FET SPDT switch in a SOIC-8 plastic package. The AS278-12 has been designed for use where extremely high linearity and low insertion loss are required. It is controlled with positive voltage eliminating the need for negative voltage. Some standard implementations include antenna changeover, T/R and diversity switching over 2 W. The AS278-12 switch can be used in many analog and digital wireless communication systems.

SOIC-8



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

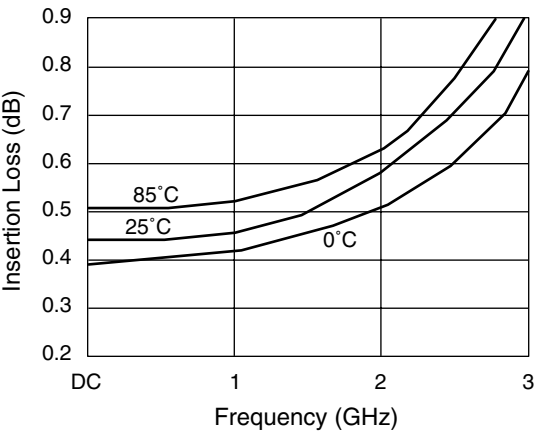
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–1.0 GHz		0.45	0.55	dB
	1.0–2.0 GHz		0.6	0.75	dB
	2.0–3.0 GHz		0.9	1.2	dB
Isolation	DC–1.0 GHz	20	23		dB
	1.0–1.8 GHz	22	25		dB
	1.8–2.1 GHz	27	31		dB
	2.1–3.0 GHz	10	12		dB
VSWR ⁴	DC–1.0 GHz		1.2:1	1.3:1	
	DC–2.0 GHz		1.3:1	1.4:1	
	DC–3.0 GHz		1.7:1	1.8:1	

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

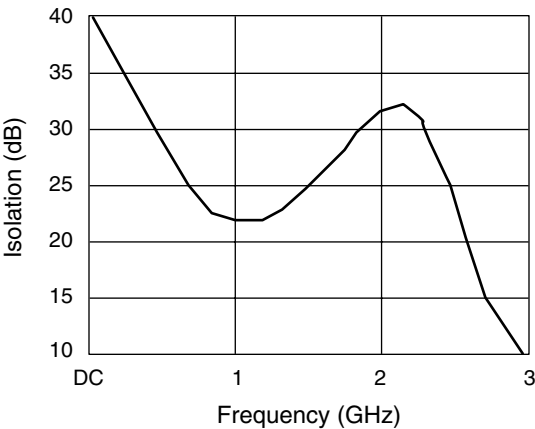
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Input Power for 1 dB Compression	@ +3 V	1.9 GHz		+32		dBm
	@ +5 V	1.9 GHz		+37		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	1.9 GHz		+55		dBm
Control Voltages	$V_{Low} = 0 \text{ to } 0.2 \text{ V @ } 20 \mu\text{A Max.}$ $V_{High} = +3 \text{ V @ } 100 \mu\text{A Max. to } +5 \text{ V @ } 200 \mu\text{A Max.}$ $V_S = V_{High} \pm 0.2 \text{ V}$					

1. All measurements made in a 50 Ω 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.

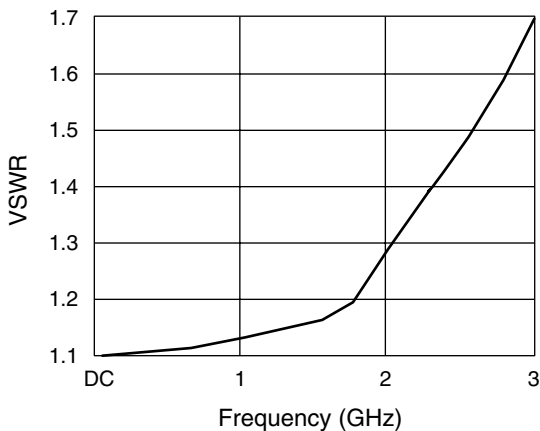
Typical Performance Data (0, +5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

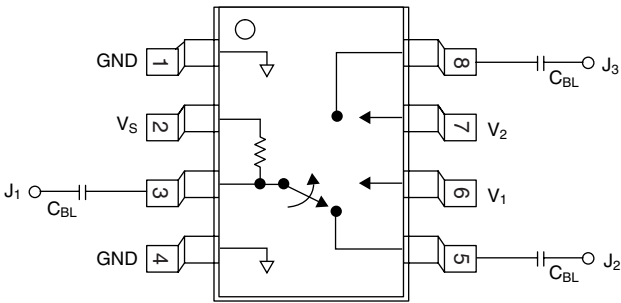
V ₁	V ₂	J ₁ –J ₂	J ₁ –J ₃
V _{High}	0	Isolation	Insertion Loss
0	V _{High}	Insertion Loss	Isolation

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

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	6 W Max. > 900 MHz, 0/+5 V Control
Supply Voltage	+8 V
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ _{JC}	85°C/W

Pin Out



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