

DATA SHEET

AS338-12, AS338-12LF: GaAs IC SPDT Nonreflective Switch 300 kHz–2.5 GHz


Features

- Low DC power consumption
- High isolation (40 dB @ 0.9 GHz)
- Nonreflective
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

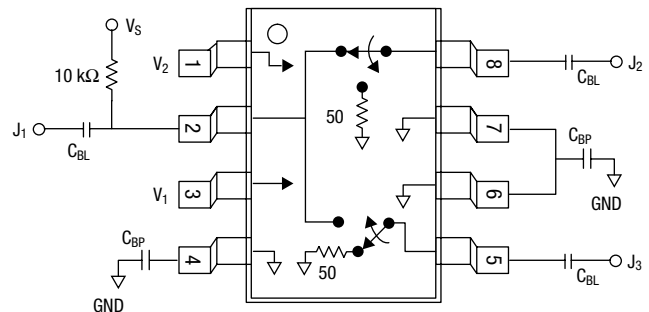
Description

The AS338-12 is a low-cost IC FET SPDT nonreflective switch in a plastic SOIC-8 package for commercial applications. The switch operates with -5, 0 V or 0, +5 V when “floated” as shown on the following page. This general-purpose SPDT switch is used in various telecommunications applications.

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.



Pin Out



External components shown are for positive voltage operation only.
C_{BL} = 100 pF, C_{BP} = 1000 pF for operation >500 MHz.

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

Parameter ⁽¹⁾	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ⁽²⁾	300 kHz–0.5 GHz		0.5	0.7	dB
	300 kHz–1.0 GHz		0.6	0.8	dB
	300 kHz–2.0 GHz		0.7	0.9	dB
	300 kHz–2.5 GHz		1.2	1.4	dB
Isolation	300 kHz–0.5 GHz	43	46		dB
	300 kHz–1.0 GHz	36	39		dB
	300 kHz–2.0 GHz	27	30		dB
	300 kHz–2.5 GHz	23	26		dB
VSWR ⁽³⁾	300 kHz–0.5 GHz		1.2:1	1.3:1	
	300 kHz–1.0 GHz		1.2:1	1.4:1	
	300 kHz–2.5 GHz		1.3:1	1.5:1	

1. All measurements made in a 50 Ω system, unless otherwise specified.

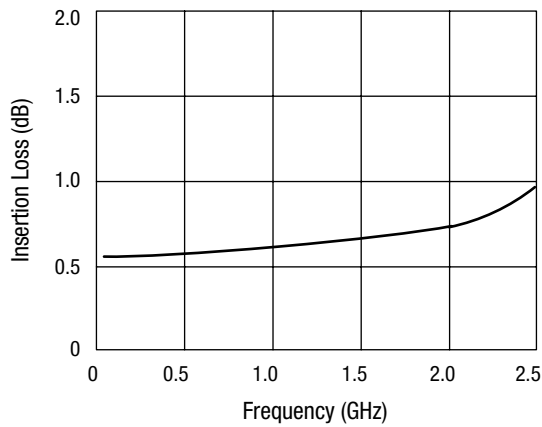
2. Insertion loss changes by 0.003 dB/°C.

3. Input/output.

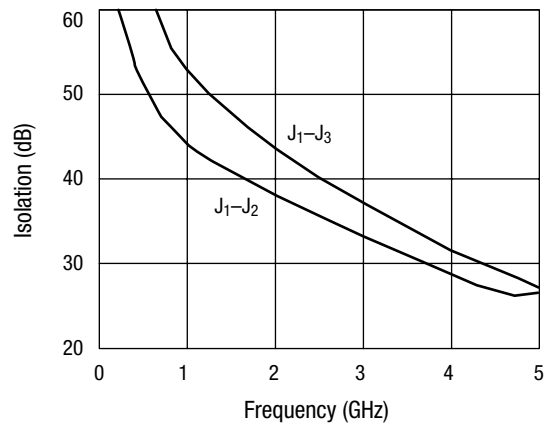
Operating Characteristics at 25 °C (0, -5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall	10/90% or 90/10% RF			8		ns
On, off	50% CTL to 90/10% RF			30		ns
Video feedthru	$T_{RISE} = 1 \text{ ns}$, BW = 500 MHz			25		mV
Input power for 1 dB compression		0.5–2.5 GHz 0.05 GHz		28 23		dBm dBm
Intermodulation intercept point	For two-tone input power 5 dBm	0.5–2.5 GHz 0.05 GHz		46 40		dBm dBm
Thermal resistance				25		°C/W
Control voltages	$V_{LOW} = 0 \text{ to } 0.2 \text{ V @ } 20 \text{ } \mu\text{A max.}$ $V_{HIGH} = -5 \text{ V @ } 50 \text{ } \mu\text{A to } -8 \text{ V @ } 200 \text{ } \mu\text{A max.}$					

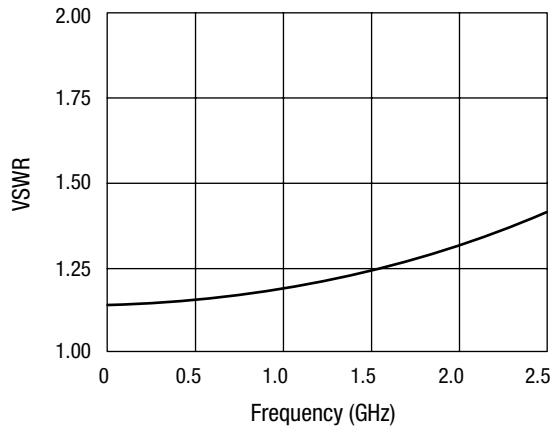
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Negative Operation

V ₁	V ₂	J ₁ -J ₂	J ₁ -J ₃
0	-5	Insertion loss	Isolation
-5	0	Isolation	Insertion loss

All other conditions not recommended.

Positive Operation⁽¹⁾

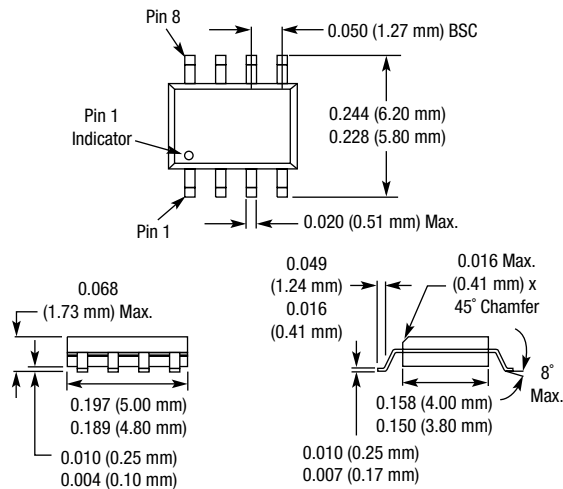
V ₁	V ₂	J ₁ -J ₂	J ₁ -J ₃
V _{HIGH}	0	Insertion loss	Isolation
0	V _{HIGH}	Isolation	Insertion loss

All other conditions not recommended.

V_{HIGH} = 5 to 8 V (V_S = V_{HIGH} ± 0.2 V).

1. Refer to Application Notes for further information.

SOIC-8



Absolute Maximum Ratings

Characteristic	Value
RF input power	2 W > 500 MHz 0/-8 V 0.5 W @ 50 MHz 0/-8 V
Control voltage	+0.2 V, -8 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

Recommended Solder Reflow Profiles

Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

Tape and Reel Information

Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

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