DATA SHEET

AS169-73, AS169-73LF: PHEMT GaAs IC SPDT Switch 300 kHz–2.5 GHz

Applications

- General-purpose medium-power switches in telecommunication applications
- T/R switches in 802.11b, g WLAN Bluetooth™ systems

Features

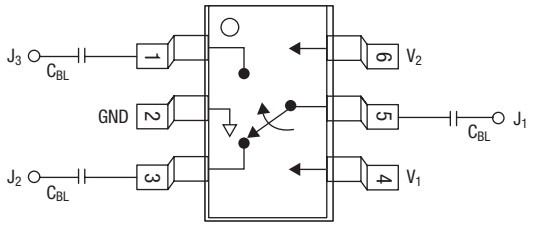
- $P_{1\ dB}$ 30 dBm typical @ 3 V
- IP3 52 dBm typical
- Low insertion loss (0.3 dB @ 0.9 GHz)
- Low DC power consumption
- Ultraminiature low-cost SOT-6 plastic package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The AS169-73 is an IC FET SPDT switch in a low-cost SOT-6 plastic package. The AS169-73 features low insertion loss and positive voltage operation with very low DC power consumption. This general-purpose switch can be used in a variety of telecommunications applications.

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

Pin Out



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

Electrical Specifications at 25 °C

Z_0 = 50 Ω, V_{CTL} = 0/3 V unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit
Insertion loss(1)	300 kHz–1.0 GHz 300 kHz–2.5 GHz		0.3 0.4	0.4 0.5	dB dB
Isolation	300 kHz–1.0 GHz 300 kHz–2.5 GHz	22 21	25 24		dB dB
VSWR(2)	300 kHz–1.0 GHz 300 kHz–2.5 GHz		1.15:1 1.3:1	1.25:1 1.4:1	

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

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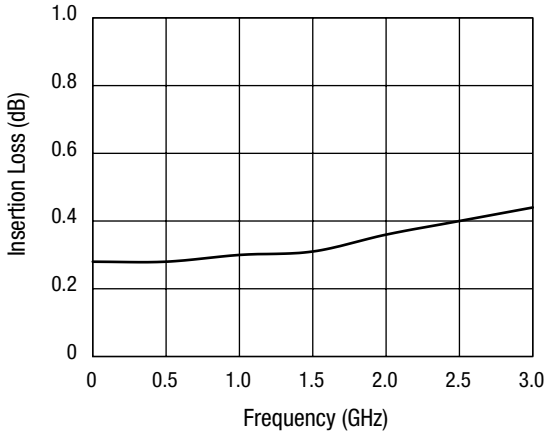
Operating Characteristics at 25 °C (0, 3 V)

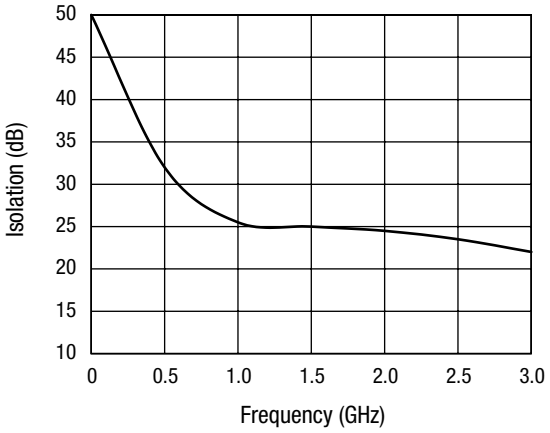
Z_0 = 50 Ω, V_{CTL} = 0/3 V unless otherwise noted

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall time	10/90% or 90/10% RF			25		ns
On, off time	50% CTL to 90/10% RF			35		ns
Video feedthru	T_{RISE} = 1 ns, BW = 500 MHz			10		mV
Input power for 1 dB compression	V_{CTL} = 0/3 V	0.5–2.5 GHz		30		dBm
	V_{CTL} = 0/5 V	0.5–2.5 GHz		34		dBm
Intermodulation intercept point (IP3)	For two-tone input power 5 dBm					
	V_{CTL} = 0/3 V	0.5–2.5 GHz		43		dBm
	V_{CTL} = 0/5 V	0.5–2.5 GHz		50		dBm
Thermal resistance				25		°C/W
ESD rating	Human body model (Class 1A)					
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.					

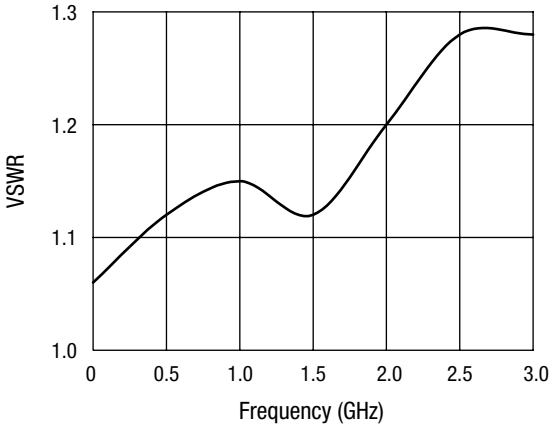
Typical Performance Data (0, 3 V)



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}	V_{LOW}	Isolation	Insertion loss
V_{LOW}	V_{HIGH}	Insertion loss	Isolation

All other conditions not recommended.
$3\ V \le V_{HIGH} \le 5\ V$, $0\ V \le V_{LOW} \le 0.2\ V$.

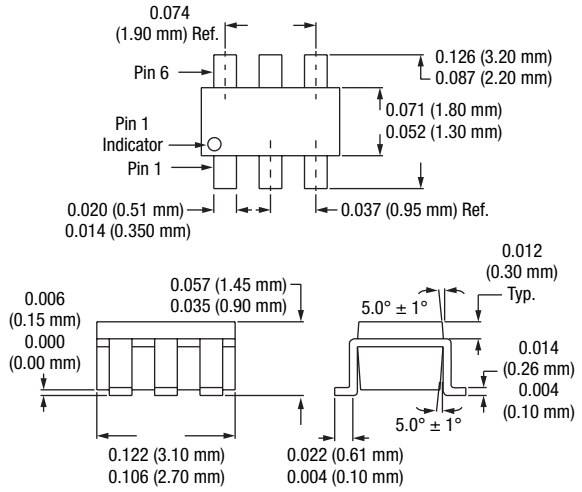
Recommended Solder Reflow Profiles

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.

SOT-6



Absolute Maximum Ratings

Characteristic	Value
RF input power	6 W > 500 MHz 0/7 V control
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.*

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