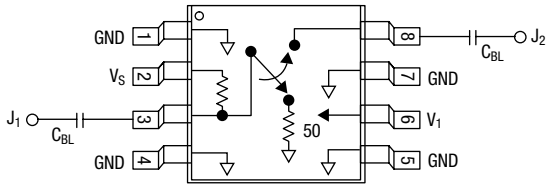
DATA SHEET

AS165-59, AS165-59LF: GaAs IC High-Isolation SPST Switch Positive Control 0.7–2.5 GHz

Features

- Single positive control voltage (0, 5 V)
- Base station synthesizer switch
- High isolation (45 dB @ 0.9, 1.9 GHz)
- J_1 port nonreflective
- Miniature low-cost MSOP-8 plastic package
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Pin Out



DC blocking capacitors must be supplied externally.
C_{BL} = 47 pF for operation >500 MHz.

Description

The AS165-59 SPST IC FET switch is absorptive on the input. The switch features high isolation and low insertion loss. Ideal building block for base station applications where synthesizer isolation is critical. Use in conjunction with the AS164-80 SPDT switch to meet GSM synthesizer switch isolation requirements.

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

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

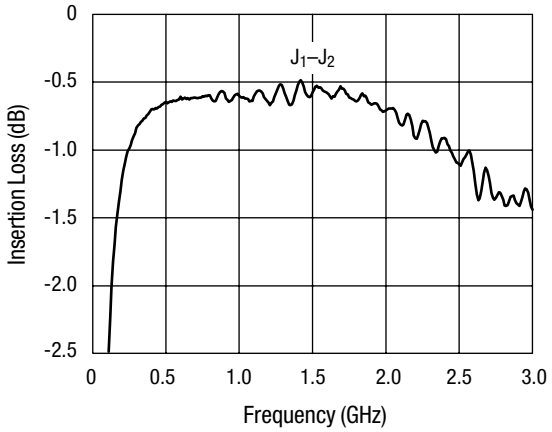
Parameter[1]	Frequency	Min.	Typ.	Max.	Unit
Insertion loss[2]	0.7–1.0 GHz		0.7	0.9	dB
	1.0–2.0 GHz		0.8	1.1	dB
	2.0–2.5 GHz		1.2	1.4	dB
Isolation	0.7–2.0 GHz	39	45		dB
	2.0–2.5 GHz	30	38		dB
VSWR[3]	0.7–1.8 GHz		1.7:1	1.9:1	
	1.8–2.5 GHz		1.5:1	1.8:1	

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Insertion loss state and J_1 port.

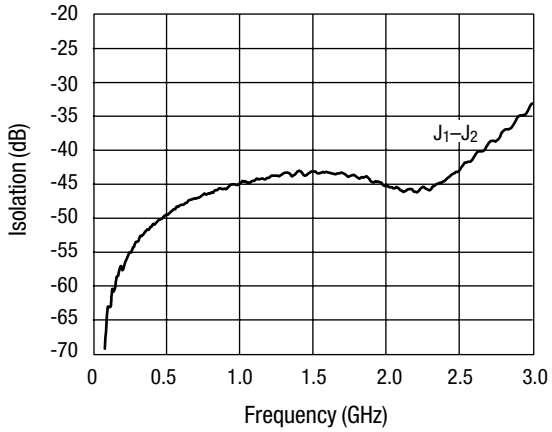
Operating Characteristics at 25 °C (0, 5 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics						
Rise, fall	10/90% or 90/10% RF			25		ns
On, off	50% CTL to 90/10% RF			150		ns
Video feedthru	T_{RISE} = 1 ns, BW = 500 MHz			50		mV
Input power for 1 dB compression		0.7–2.5 GHz		28		dBm
Intermodulation intercept point (IP3)	For two-tone input power 5 dBm	0.7–2.5 GHz		45		dBm
Thermal resistance				25		°C/W
Control voltages	V_{LOW} = 0 to 0.2 V @ 20 µA max. V_{HIGH} = 5 V @ 50 µA max. to 7 V @ 200 µA max. $V_S = V_{HIGH} \pm 0.2$ V					

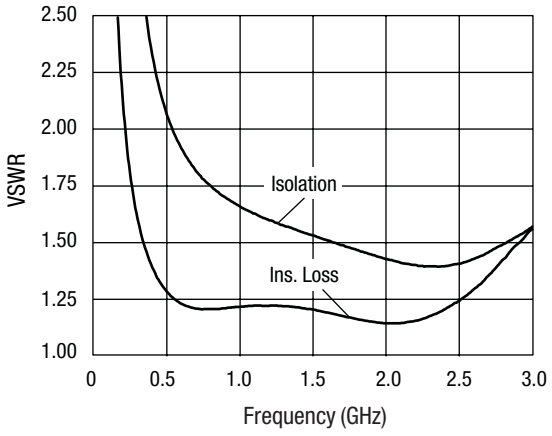
Typical Performance Data (0, 5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

V_1	J_1–J_2
0	Insertion loss
V_{HIGH}	Isolation

V_{HIGH} = 5 to 7 V ($V_S = V_{HIGH} \pm 0.2$ V).

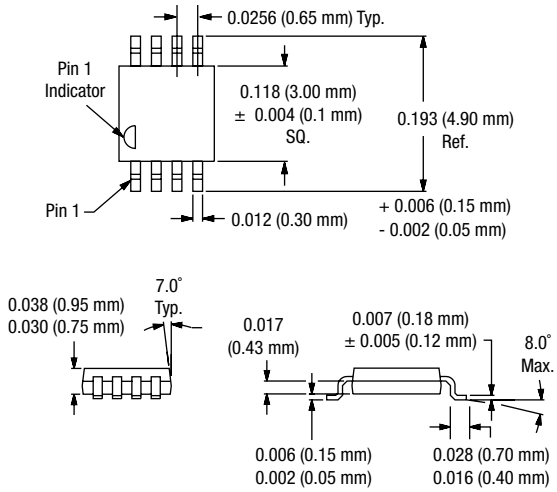
Recommended Solder Reflow Profiles

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.

MSOP-8



Absolute Maximum Ratings

Characteristic	Value
RF input power	2 W max. > 500 MHz, 0/8 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

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.*