

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



AS150-59

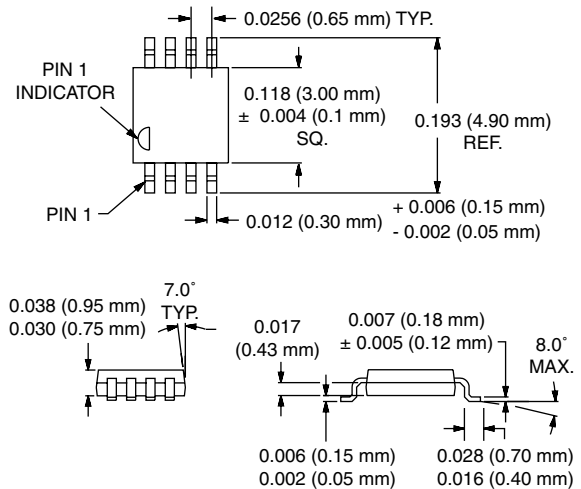
Features

- High Linearity (IP3 55 dBm @ 1.9 GHz)
- High Isolation (22 dB @ 1.9 GHz)
- Low Insertion Loss (0.55 dB @ 1.9 GHz)
- Low DC Power Consumption
- Positive 3 V or 5 V Control Voltage

Description

The AS150-59 is an IC FET SPDT switch in a MSOP-8 plastic package. This switch 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 AS150-59 switch can be used in many analog and digital wireless communication systems.

MSOP-8



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

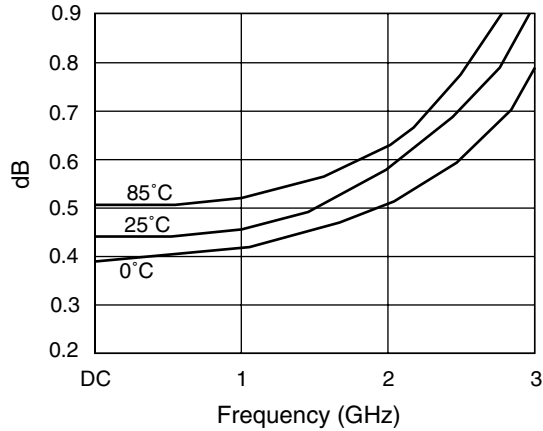
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–1.0 GHz		0.45	0.55	dB
	1.0–2.0 GHz		0.6	0.75	dB
	2.0–3.0 GHz		0.9	1.2	dB
Isolation	DC–1.0 GHz	19	22		dB
	1.0–2.0 GHz	18	20		dB
	2.0–3.0 GHz	20	23		dB
VSWR ⁴	DC–1.0 GHz		1.2:1	1.3:1	
	1.0–2.0 GHz		1.3:1	1.4:1	
	2.0–3.0 GHz		1.7:1	1.8:1	

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

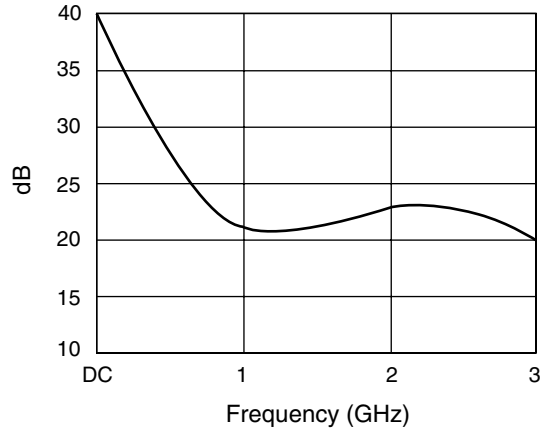
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Input Power for 1 dB Compression	+3 V	1.9 GHz		+32		dBm
	+5 V	1.9 GHz		+37		dBm
Intermodulation Intercept Point (IP3)	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.

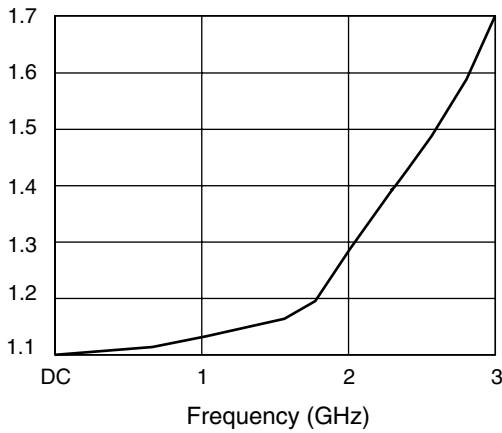
Typical Performance Data (0, +5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency

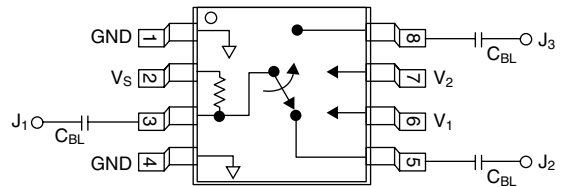


VSWR vs. Frequency

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



External DC blocking capacitors are required on all RF ports.
 $C_{BL} = 100 \text{ pF}$ for operation >500 MHz.

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

$V_{High} = +3 \text{ to } +5 \text{ V}$ ($V_S = V_{High} \pm 0.2 \text{ V}$).