GaAs IC High Linearity Positive Control SPDT Switch DC–2.5 GHz

Alpha

AS158-59

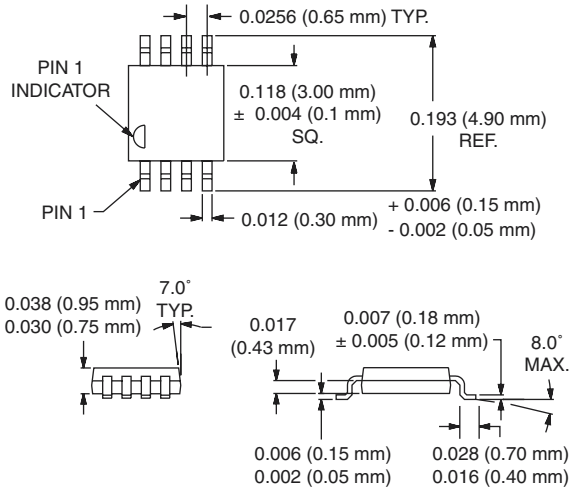
Features

- High Linearity (55 dBm IP3 @ 1.9 GHz)
- High Isolation (28 dB @ 1.9 GHz)
- Complementary Control Voltages (0/+5 V)
- Low DC Power Consumption
- Small Low Cost MSOP-8 Plastic Package

Description

The AS158-59 is an IC FET SPDT switch in a low cost MSOP-8 plastic package. The AS158-59 features extremely high linearity, low insertion loss and positive voltage operation with very low DC power consumption. Some standard implementations include antenna changeover, T/R and diversity switching over 2 W. The AS158-59 switch can be used in many analog and digital wireless communication systems including cellular, GSM and DECT applications.

MSOP-8



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

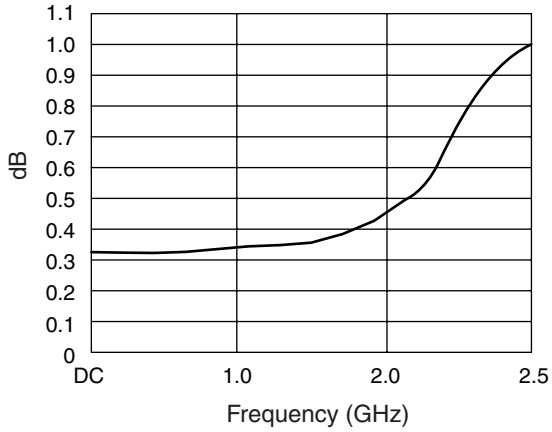
Parameter[1]	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz 0.5–1.0 GHz 1.0–2.0 GHz 2.0–2.5 GHz		0.35 0.40 0.65 0.90	0.4 0.6 0.8 1.1	dB dB dB
Isolation	DC–0.5 GHz 0.5–1.0 GHz 1.0–2.0 GHz 2.0–2.5 GHz	22 20 24 20	25 23 28 22		dB dB dB
VSWR[4]	DC–1.0 GHz 1.0–2.0 GHz 2.0–2.5 GHz			1.6:1 1.9:1 2.0:1	

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

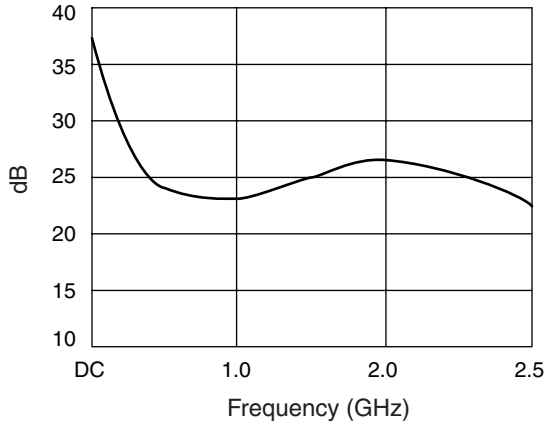
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, On (10/90% or 90/10% RF) Fall, Off (50% CTL to 90/10% RF) Video Feedthru			60 100 50		nS nS mV
Input Power for 1 dB Compression	0/+5 V	0.9–2.5 GHz		35		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +27 dBm	0.9–2.5 GHz		55		dBm
Control Voltages	V_{Low} = 0 to 0.2 V @ 20 µA Max. V_{High} = 5 V @ 200 µA Max. $V_S = V_{High} \pm 0.2$ 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.

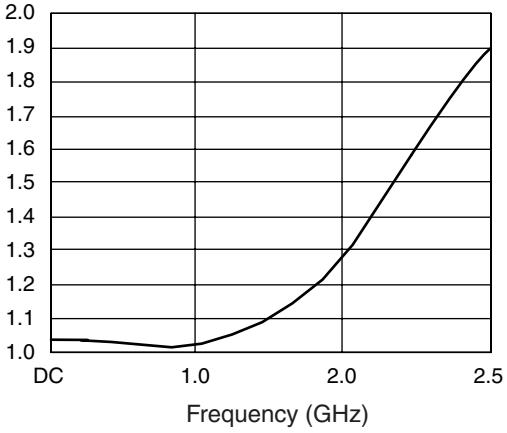
Typical Performance (0, +5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

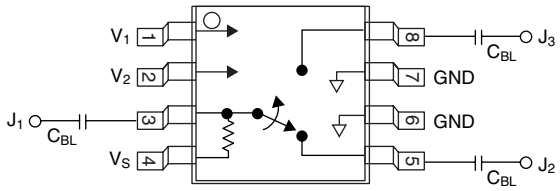
Characteristic	Value
RF Input Power	6 W Max. > 900 MHz, 0/+8 V Control
Supply Voltage	+12 V
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	85°C/W

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} = +5 V (V_S = V_{High} ± 0.2 V).

Pin Out



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

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