

GaAs IC SPDT Switch DC–2.5 GHz



AS104-59

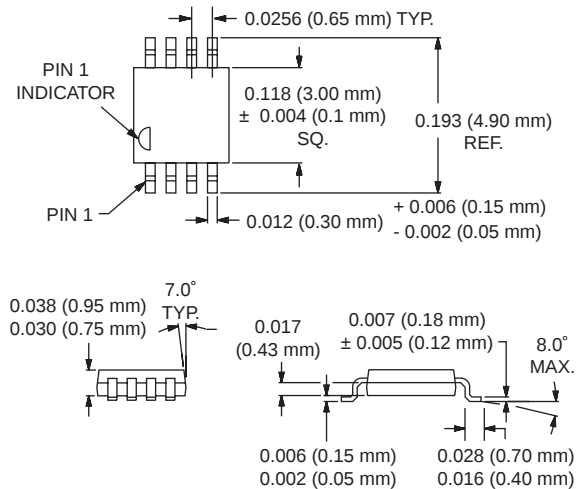
Features

- Miniature MSOP-8 Surface Mount Package
- Low Insertion Loss (0.45 dB @ 0.9 GHz)
- Low DC Power Consumption

Description

The AS104-59 is a low cost IC FET SPDT reflective switch in a plastic MSOP-8 package. It operates with 0 and -5 V, or will operate at +5 and 0 V as shown on the following page. This general purpose SPDT switch is used in various telecommunications applications.

MSOP-8



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

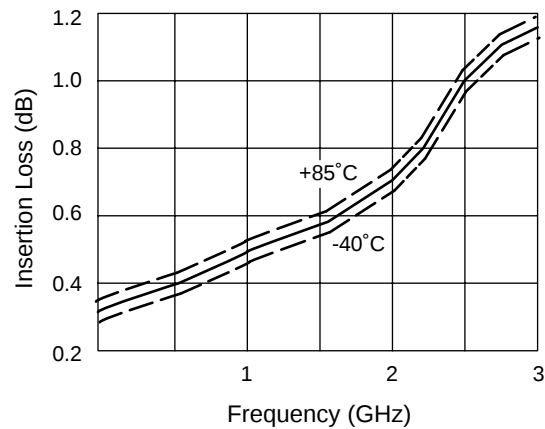
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.1 GHz		0.3	0.5	dB
	DC–0.5 GHz		0.4	0.6	dB
	DC–1.0 GHz		0.5	0.7	dB
	DC–2.0 GHz		0.7	1.0	dB
	DC–2.5 GHz		1.0	1.1	dB
Isolation	DC–0.1 GHz	50	55		dB
	DC–0.5 GHz	37	40		dB
	DC–1.0 GHz	30	32		dB
	DC–2.0 GHz	22	25		dB
	DC–2.5 GHz	20	22		dB
VSWR ⁴	DC–1.0 GHz		1.2:1	1.3:1	
	DC–2.0 GHz		1.5:1	1.6:1	
	DC–2.5 GHz		1.6:1	1.7:1	

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

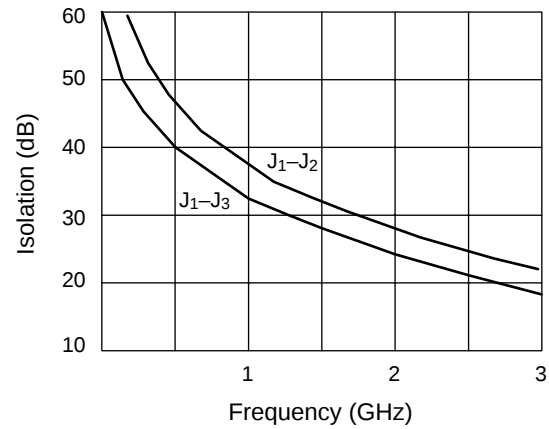
Parameter ¹	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			10		ns
	On, Off (50% CTL to 90/10% RF)			30		ns
	Video Feedthru			15		mV
Input Power for 1 dB Compression		0.50–2.5 GHz		+22		dBm
		0.05 GHz		+14		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.50–2.5 GHz		+40		dBm
Control Voltages	$V_{Low} = 0 \text{ to } -0.2 \text{ V @ } 20 \mu\text{A Max.}$ $V_{High} = -5 \text{ V @ } 20 \mu\text{A to } -8 \text{ V @ } 200 \mu\text{A Max.}$					

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.

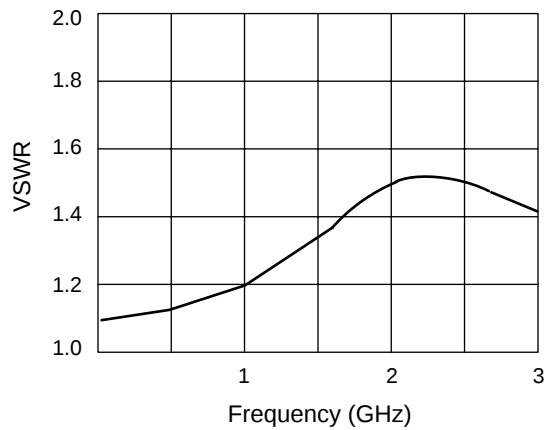
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Negative Voltage Operation

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

Positive Voltage Operation¹

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 to +8 V (V_S = V_{High} ± 0.2 V).
1. Refer to Application Notes for further information.

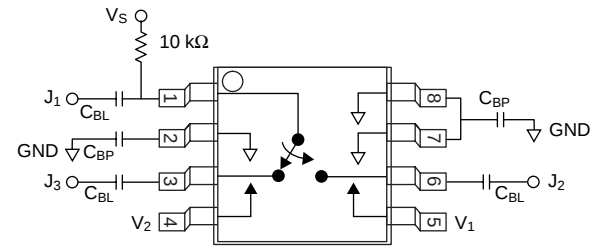
Absolute Maximum Ratings

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
Θ _{JC}	25°C/W

Note: Exceeding these parameters may cause irreversible damage.

Pin Out

Positive Voltage Operation



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