

GaAs IC SPDT Reflective Switch Positive Control DC–2.5 GHz



AS157-73

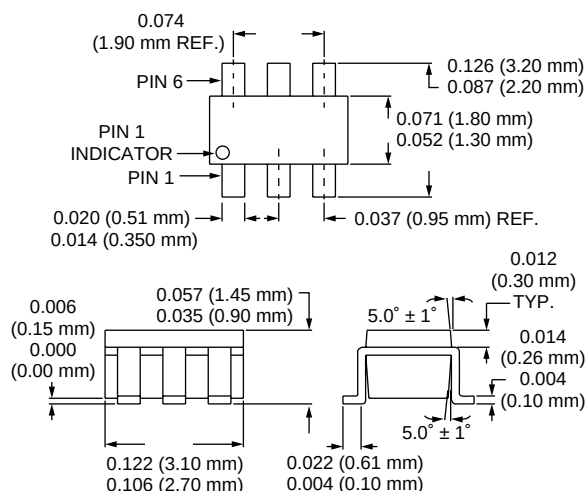
Features

- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- Complementary Positive Control Voltages (0/+3 V to 0/+5 V)
- Positive Voltage Supply (+3 to +5 V)
- Low DC Power Consumption
- Ultra Miniature 6 Lead SOT-6 Package

Description

The AS157-73 is a GaAs IC FET SPDT reflective switch in the SOT-6 plastic package for commercial applications. For positive operation it requires a fixed positive bias (V_S) on the J_1 line and DC blocks on all RF lines. This switch can also be operated with complementary negative voltage (no V_S or blocking caps required). The AS157-73 provides a low cost solution for IF switching requirements in dual-band and dual mode subscribers.

SOT-6



Electrical Specifications at 25°C (0, +3 V)

Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		0.4	0.5	dB
	DC–1.0 GHz		0.45	0.6	dB
	DC–2.0 GHz		0.6	0.8	dB
	DC–2.5 GHz		0.9	1.1	dB
Isolation	DC–0.5 GHz	22	25		dB
	DC–1.0 GHz	17	20		dB
	DC–2.0 GHz	11	14		dB
	DC–2.5 GHz	10	13		dB
VSWR ⁴	DC–1.0 GHz		1.2:1	1.3:1	
	DC–2.5 GHz		1.5:1	1.7:1	

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

Parameter	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)			20		ns
	Video Feedthru			25		mV
Input Power for 1 dB Compression	0/+3 V	0.5–2.0 GHz		+21		dBm
	0/+5 V	0.5–2.0 GHz		+28		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +13 dBm	0.5–2.0 GHz		+45		dBm
Control Voltages	$V_{Low} = 0$ to 0.2 V @ 20 μ A Max. $V_{High} = +3$ V @ 100 μ A Max. to +5 V @ 200 μ A Max. $V_S = V_{High} \pm 0.2$ V					

1. All measurements made in a 50 Ω system, unless otherwise specified.

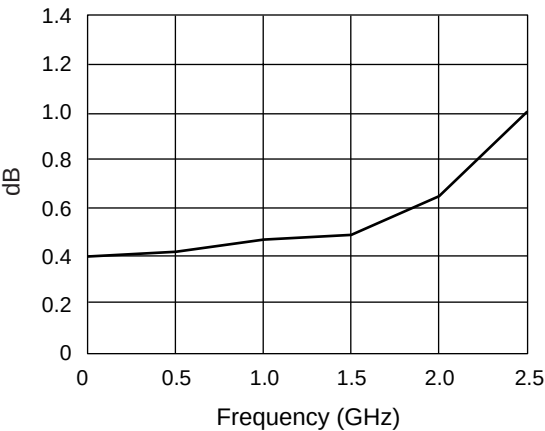
2. DC = 300 kHz.

3. Insertion loss changes by 0.003 dB/°C.

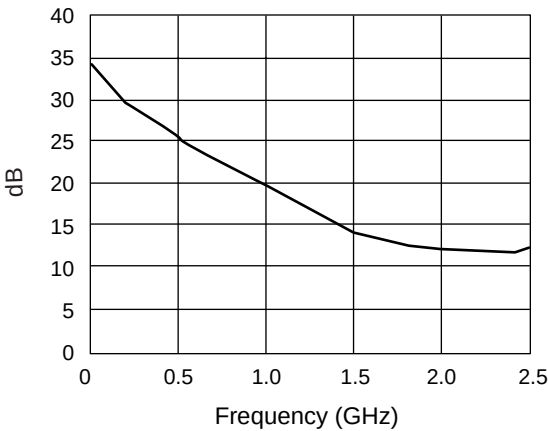
4. Insertion loss state.

5. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

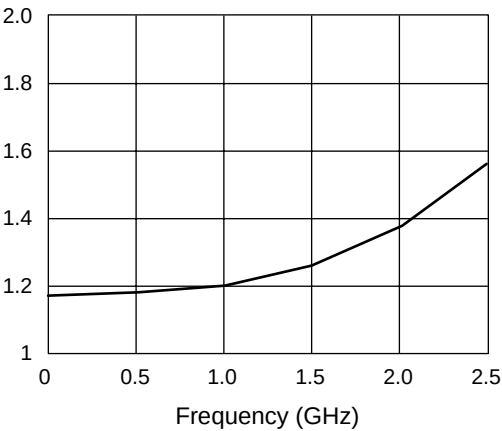
Typical Performance Data (0, +3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Truth Table

Positive Operation

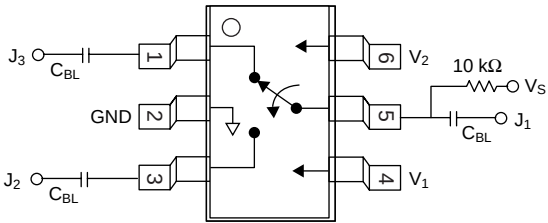
V ₁	V ₂	J ₁ –J ₂	J ₁ –J ₃
V _{High}	0	Isolation	Insertion
0	V _{High}	Insertion	Isolation

V_{High} = +3 to +5 V (V_S = V_{High} ± 0.2 V).

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	2 W > 500 MHz 0/+7 V Control
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-50°C to +150°C
Θ _{JC}	25°C/W

Pin Out



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