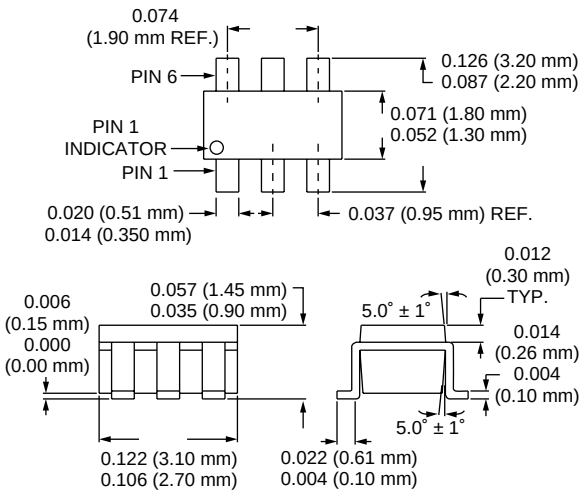
GaAs IC High Linearity Positive Control SPDT Switch DC–2 GHz

AS139-73

Features

- High Linearity (55 dBm IP3 @ 0.9 GHz)
- Low Insertion Loss (0.35 dB @ 0.9 GHz)
- Low DC Power Consumption
- +3 V to +5 V Operation
- Ultra Miniature SOT-6 Package

SOT-6



Description

The AS139-73 is a GaAs FET IC high linearity SPDT switch in a SOT-6 plastic package. This switch has been designed for use where extremely high linearity, low insertion loss and ultraminiature package size are required. It can be controlled with positive, negative or a combination of both voltages. Some standard implementations include antenna changeover, T/R and diversity switching over 2 W. The AS139-73 switch can be used in many analog and digital wireless communication systems including cellular, GSM and DECT applications.

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

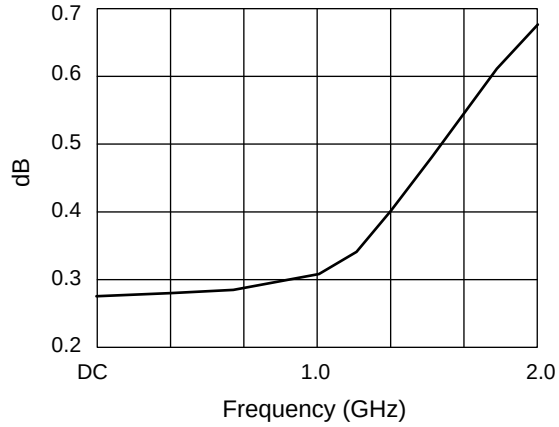
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz DC–1.0 GHz DC–2.0 GHz		0.3 0.4 1.0	0.4 0.6 1.2	dB dB dB
Isolation	DC–0.5 GHz DC–1.0 GHz DC–2.0 GHz	20 15 8	23 17 10		dB dB dB
VSWR[4]	DC–1.0 GHz DC–2.0 GHz		1.3:1 1.3:1	1.4:1 1.8:1	dB dB

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

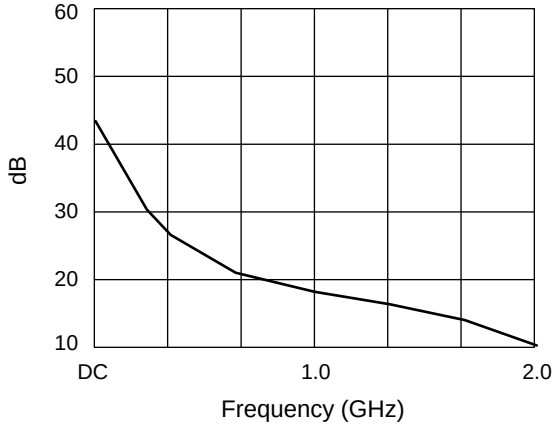
Parameter[1]	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF) On, Off (50% CTL to 90/10% RF) Video Feedthru			60 100 50		ns ns mV
Input Power for 1 dB Compression		0.9 GHz		+38		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	0.9 GHz		+55		dBm
Control Voltages	V_{Low} = 0 to 0.2 V @ 20 µA Max. V_{High} = +3 V @100 µA Max. to +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.

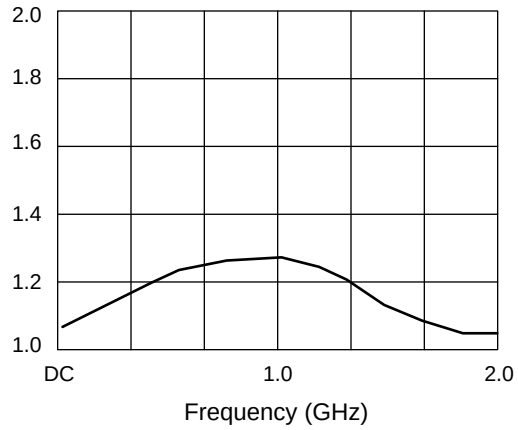
Typical Performance Data (0, +5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

Absolute Maximum Ratings

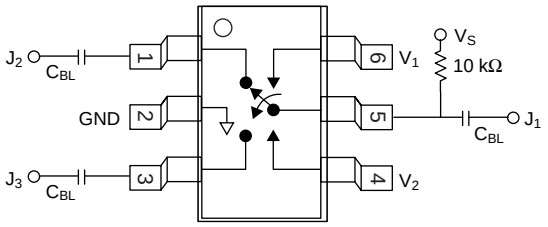
Characteristic	Value
RF Input Power	6 W Max. > 900 MHz, 0/-5 V Control
Control Voltage	-0.2 V, +8 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25°C/W

Truth Table

V_1	V_2	J_1–J_2	J_1–J_3
0	V_{High}	Isolation	Insertion Loss
V_{High}	0	Insertion Loss	Isolation

V_{High} = +3 to +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 operating frequency >500 MHz.

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