GaAs IC 2 Watt High Linearity SPDT Switch DC–2 GHz

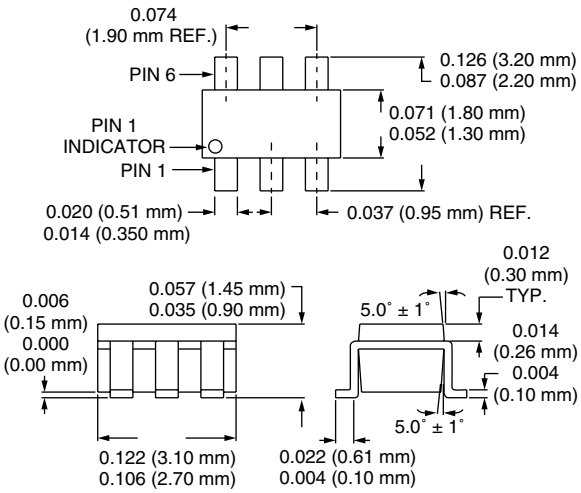
SKYWORKS

AS128-73

Features

- High Linearity (48 dBm IP3 @ 0.9 GHz)
- Low Insertion Loss (0.35 dB @ 0.9 GHz)
- Antenna Changeover and T/R Cellular Switch
- Ultra Miniature SOT-6 Lead Package

SOT-6



Description

The AS128-73 is a FET IC high power SPDT switch in a SOT-6 plastic package. This switch is 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 AS128-73 switch can be used in many analog and digital wireless communication systems including cellular applications.

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

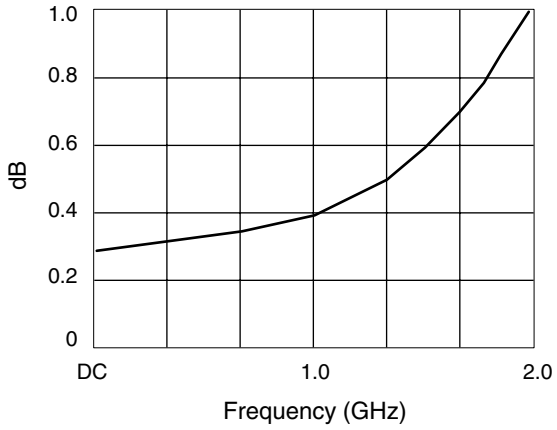
Parameter[1]	Frequency[2]	Min.	Typ.	Max.	Unit
Insertion Loss[3]	DC–0.5 GHz		0.3	0.4	dB
	DC–1.0 GHz		0.4	0.6	dB
	DC–2.0 GHz		1.0	1.2	dB
Isolation	DC–0.5 GHz	20	23		dB
	DC–1.0 GHz	15	17		dB
	DC–2.0 GHz	8	10		dB
VSWR[4]	DC–1.0 GHz		1.4:1	1.5:1	
	DC–2.0 GHz		1.8:1	2.0:1	

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

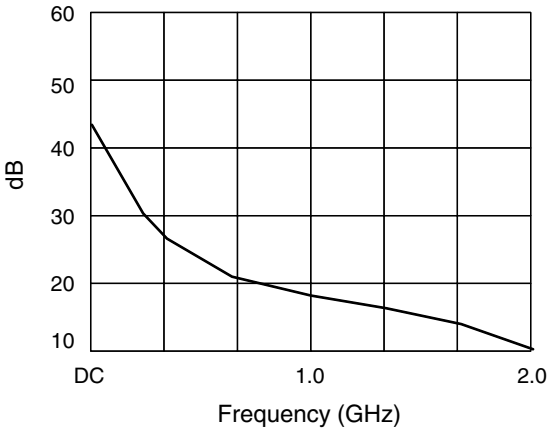
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Input Power for 1 dB Compression		0.9 GHz		+33		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +10 dBm	0.9 GHz		+48		dBm
Control Voltages	V_{Low} = -10.0 V ≤ V_{Low} ≤ 0 V, 500 µA, Max. V_{High} = 0 V ≤ V_{High} ≤ +10.0 V, 500 µA, Max. Differential = 5.0 V ≤ (V_{High} – V_{Low}) < 10.0 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.

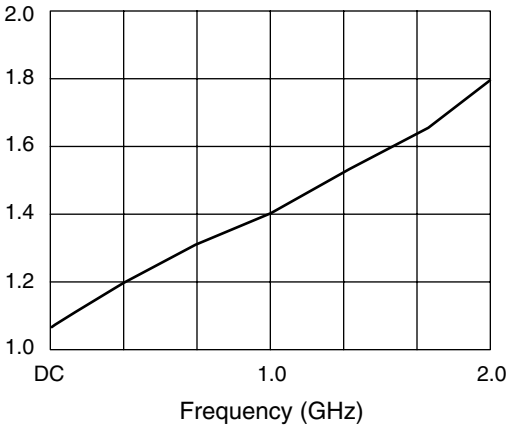
Typical Performance Data (0, -5 V)



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, -10 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ_{JC}	25°C/W

Truth Table

Negative or Differential Voltage Operation[1]

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

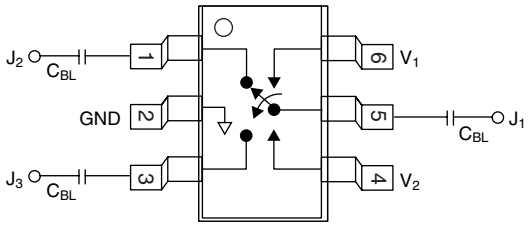
1. Where supply voltage is limited and for improved high power linearity a larger differential voltage can be obtained by using a positive voltage for V_{High} along with a negative voltage for V_{Low}. Refer to application notes for further information.

Positive Voltage Operation

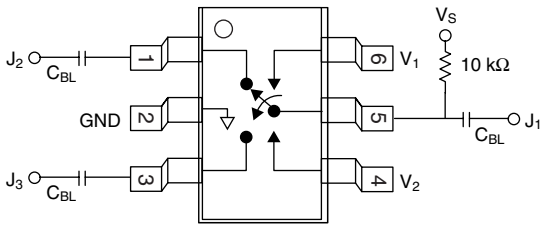
V_1	V_2	J_1–J_2	J_1–J_3
0	V_{High}	Isolation	Insertion Loss
V_{High}	0	Insertion Loss	Isolation

V_{High} = +5 to +10 V (V_S = V_{High} ± 0.2 V).

Pin Out



Negative and Differential Voltages



Positive Operation

DC block components must be supplied externally.
C_{BL} = 100 pF for operation >500 MHz.