

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



AS128-73

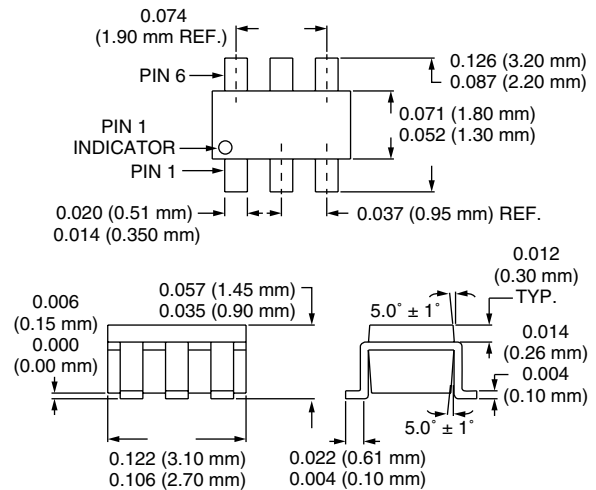
Features

- 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

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.

SOT-6



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

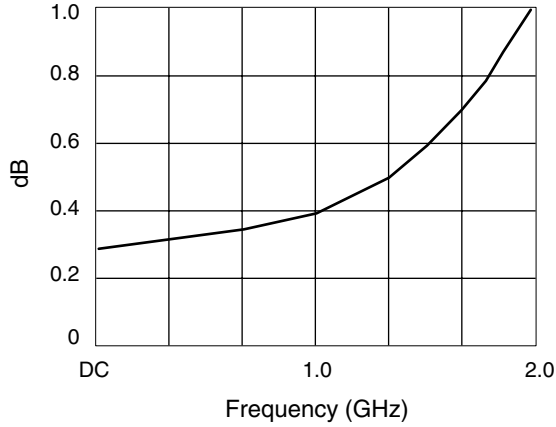
Parameter ¹	Frequency ²	Min.	Typ.	Max.	Unit
Insertion Loss ³	DC–0.5 GHz		0.3	0.4	dB
	DC–1.0 GHz		0.4	0.6	dB
	DC–2.0 GHz		1.0	1.2	dB
Isolation	DC–0.5 GHz	20	23		dB
	DC–1.0 GHz	15	17		dB
	DC–2.0 GHz	8	10		dB
VSWR ⁴	DC–1.0 GHz		1.4:1	1.5:1	
	DC–2.0 GHz		1.8:1	2.0:1	

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

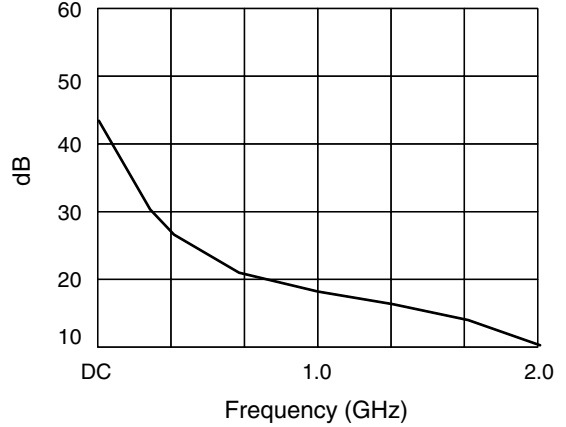
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁵	Rise, Fall (10/90% or 90/10% RF)			60		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Input Power for 1 dB Compression		0.9 GHz		+33		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power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

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.

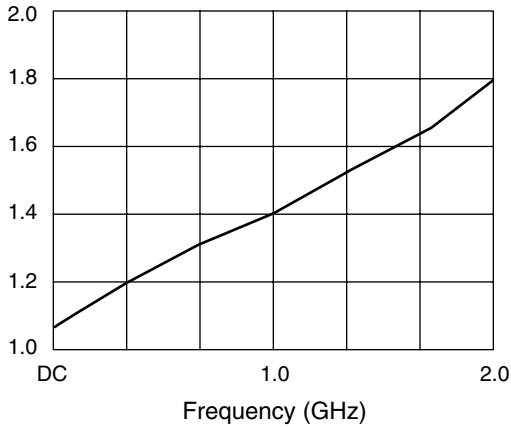
Typical Performance Data (0, -5 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency

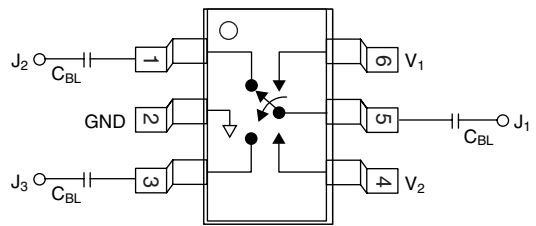


VSWR vs. Frequency

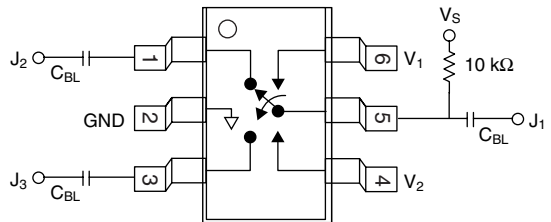
Absolute Maximum Ratings

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

Pin Out



Negative and Differential Voltages



Positive Operation

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

Truth Table

Negative or Differential Voltage Operation¹

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).