PHEMT GaAs IC Transfer Switch DC–2 GHz

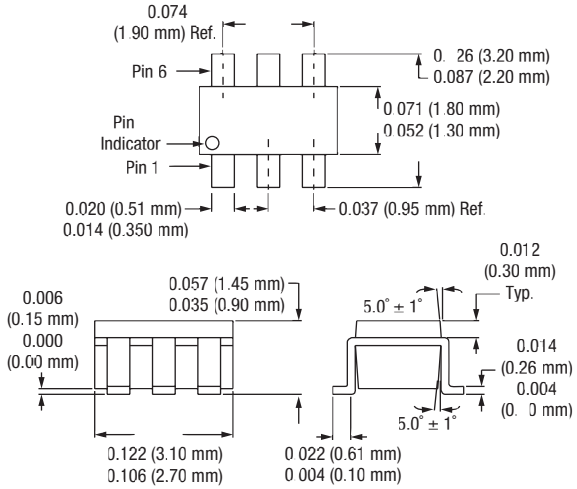
SKYWORKS

AS172-73

Features

- High Linearity (+50 dBm IP3 @ 0.9 GHz) @ 3 V
- Low Insertion Loss (0.4 dB @ 0.9 GHz)
- Isolation (20 dB @ 0.9 GHz)
- Simultaneous T/R Switching

SOT-6



Description

The AS172-73 is a PHEMT GaAs IC 4 port switch designed to combine T/R and antenna changeover switching capability within one device. This switch has two controls and is ideal for applications requiring low power consumption. The AS172-73 has excellent performance to 2 GHz making it suitable for dual-band handset designs.

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

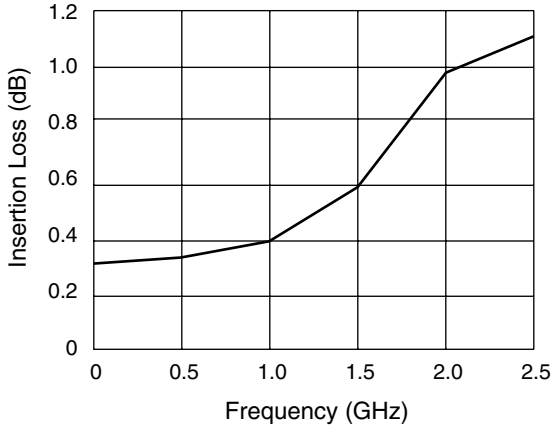
Parameter[1]	Frequency[2]	T_X–J_1 or R_X–J_1			Unit
		Min.	Typ.	Max.	
Insertion Loss[3]	DC–0.5 GHz		0.30	0.40	dB
	DC–1.0 GHz		0.40	0.50	dB
	DC–2.0 GHz		0.95	1.20	dB
Isolation	DC–0.5 GHz	23	25		dB
	DC–1.0 GHz	16	18		dB
	DC–2.0 GHz	11	13		dB
VSWR[4]	DC–1.0 GHz		1.1:1		
	DC–2.0 GHz		1.4:1		

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

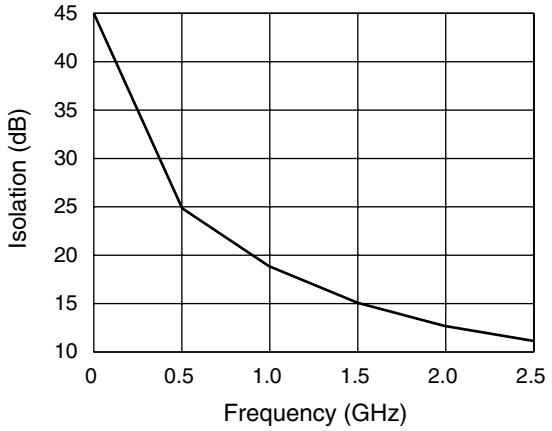
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics[5]	Rise, Fall (10/90% or 90/10% RF)			50		ns
	On, Off (50% CTL to 90/10% RF)			100		ns
	Video Feedthru			50		mV
Input Power for 1 dB Compression	0/+3 V	0.5–2.0 GHz		+34		dBm
Intermodulation Intercept Point (IP3)	For Two-tone Input Power +15 dBm 0/+3 V	0.5–2.0 GHz		+50		dBm
2nd Harmonic	30 dBm	1.0 GHz		+72		dBc
3rd Harmonic	30 dBm	1.0 GHz		+65		dBc
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.

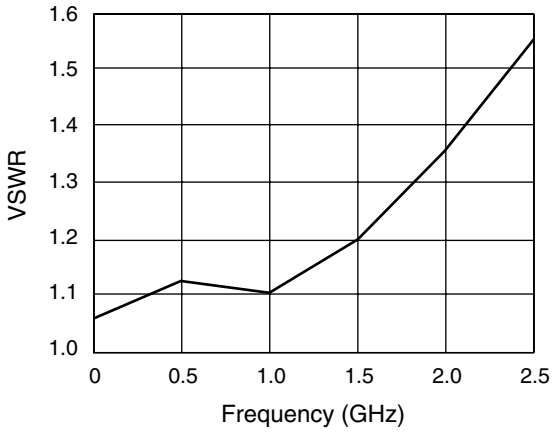
Typical Performance Data (0, +3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

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

Truth Table

Negative Operation

V_1	V_2	T_X–J_2, R_X–J_1	T_X–J_1, R_X–J_2
0	-3	Insertion Loss	Isolation
-3	0	Isolation	Insertion Loss

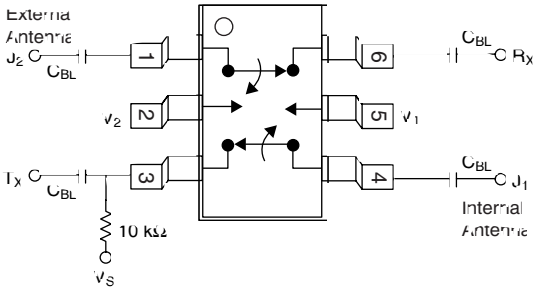
Positive Operation

V_1	V_2	T_X–J_2, R_X–J_1	T_X–J_1, R_X–J_2
V_{High}	0	Insertion Loss	Isolation
0	V_{High}	Isolation	Insertion Loss

V_{High} = +3 to +8 V (V_S = V_{High} ± 0.2 V).

Pin Out

Positive Operation



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