DATA SHEET

AS222-92, AS222-92LF: PHEMT GaAs IC SPDT Switch 0.1 to 3 GHz

Applications

- T/R switch for WLAN, Bluetooth® and medium-power telecommunication applications

Features

- Low insertion loss
- Isolation 22 dB @ 2.4 GHz
- Low DC power consumption
- Operates with 1.8 V control voltage
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The AS222-92 is a medium-power IC FET SPDT switch in a low-cost miniature SC-70 6-lead plastic package.

The AS222-92 features low insertion loss and positive voltage operation with very low DC power consumption. This general-purpose switch can be used in a variety of telecommunications applications.

NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

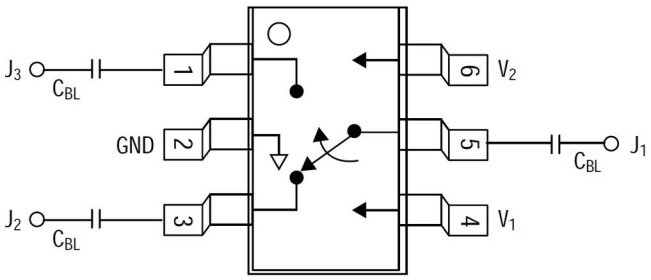


Figure 1. AS222-92, AS222-92LF Block Diagram

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

Table 1. Electrical Specifications at 25 °C (0, 3 V)

Parameter(1)	Frequency	Min.	Typ.	Max.	Unit
Insertion loss(2)	0.1 to 1.0 GHz		0.35	0.5	dB
	1.0 to 2.4 GHz		0.45	0.6	
	2.4 to 3.0 GHz		0.50	0.7	
Isolation	0.1 to 1.0 GHz	24	27		dB
	1.0 to 2.4 GHz	19	22		
	2.4 to 3.0 GHz	16	18		
Return loss(3)	0.1 to 1.0 GHz		19		dB
	1.0 to 2.4 GHz		21		
	2.4 to 3.0 GHz		18		

1. All measurements made in a 50 Ω system, unless otherwise specified.
2. Insertion loss changes by 0.003 dB/°C.
3. Insertion loss state.

Table 2. Operating Characteristics at 25 °C (0, 3 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching characteristics Rise, fall On, off Video feedthru	 10/90% or 90/10% RF 50% CTL to 90/10% RF T_{RISE} = 1 ns, BW = 500 MHz				 20 20 25	 ns ns mV
Input power for 1 dB compression	V_{CTL} = 0/1.8 V V_{CTL} = 0/3 V	0.5 to 3 GHz			20 27	dBm
Intermodulation intercept point (IP3)	For two-tone input power 5 dBm V_{CTL} = 0/3 V	0.5 to 3 GHz			44	dBm
Thermal resistance				25		°C/W
Control voltage	V_{CTL} = High V_{CTL} = Low		1.8 0		5.0 0.2	V
Control port current	V_{CTL} = 5 V V_{CTL} = 2.5 V V_{CTL} = 0.2 V V_{CTL} = 0 V				200 100 20 20	µA

Table 3. Absolute Maximum Ratings[1]

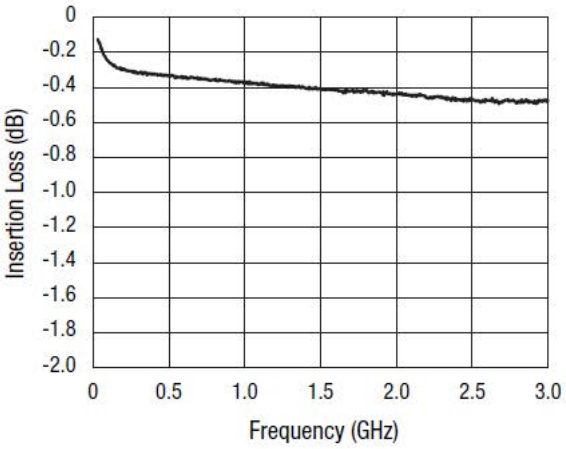
Characteristic	Value
RF input power	2 W max. > 500 MHz 0/8 V control
Supply voltage	8 V
Control voltage	-0.2 V, +8 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C
[1]Exposure to maximum rating conditions for extended periods may reduce device reliability. There is no damage to device with only one parameter set at the limit and all other parameters set at or below their nominal value. Exceeding any of the limits listed here may result in permanent damage to the device.	

***ESD HANDLING**: Industry-standard ESD handling precautions must be adhered to at all times to avoid damage to this device.*

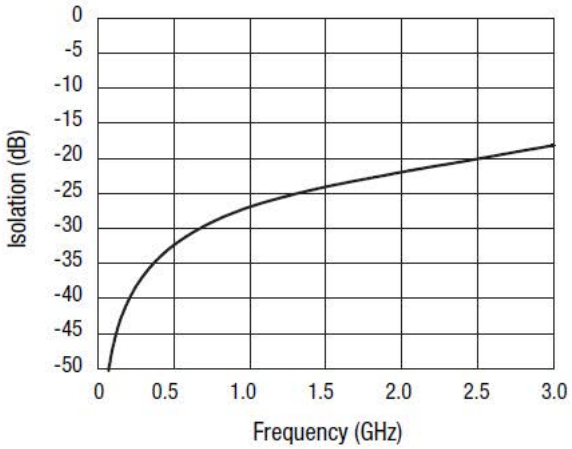
Table 4. Truth Table

V1	V2	J1-J2	J1-J3
V_{HIGH}	0	Isolation	Insertion loss
0	V_{HIGH}	Insertion loss	Isolation
All other conditions not recommended. V_{HIGH} = 1.8 to 5 V.			

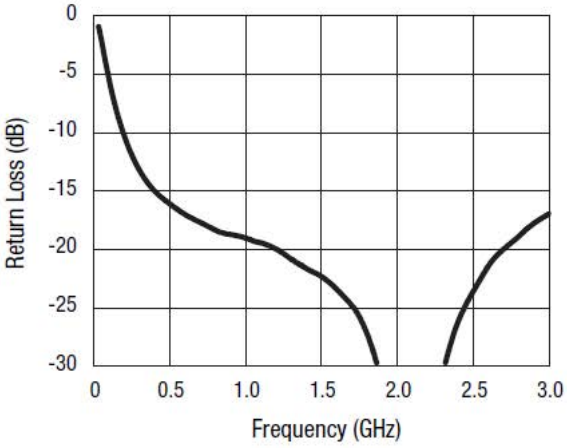
Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency



Return Loss vs. Frequency

Package Dimensions

SC-70 6-Lead