DATA SHEET

AS215-92, AS215-92LF: Single Positive Control PHEMT GaAs IC SPDT Switch 0.5 to 3 GHz

Applications

- T/R switch for Bluetooth® and general purpose telecommunication applications

Features

- Single bias control
- Operates with 1.8 V control voltage
- Low DC power consumption
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The AS215-92 is a medium-power IC FET SPDT switch in a low cost, miniature SC-70 6-lead plastic package. The AS215-92 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.

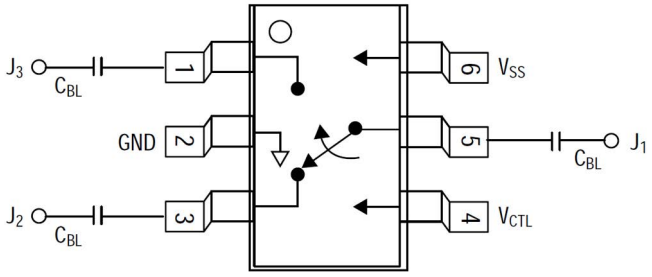


Figure 1. AS215-92 Block Diagram

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 V_S = 3 V, V_{CTL} = 0/3 V, Z_0 = 50 Ω, unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit
Insertion loss(1)	0.5 to 1.0 GHz		0.75	0.5	dB
	1.0 to 2 GHz		0.60	0.6	
	2.0 to 3 GHz		0.50	0.7	
Isolation	0.5 to 1.0 GHz	25	28		dB
	1.0 to 2 GHz	21	24		
	2.0 to 3 GHz	17	20		
VSWR(2)	0.5 to 1.0 GHz		1.1:1		dB
	1.0 to 2 GHz		1.4:1		
	2.0 to 3 GHz		1.2:1		

1. Insertion loss changes by 0.003 dB/°C.
2. Insertion loss state.

Table 2. Operating Characteristics at 25 °C, V_S = 3 V, V_{CTL} = 0/3 V, Z_0 = 50 Ω, unless otherwise noted

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			 10 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		40		dBm
Thermal resistance				25		°C/W
Control voltage	Low High		0 1.8		5.0 0.2	V
Control port current	V_{CTL} = low V_{CTL} = 2.7 V V_{CTL} = 5 V				200 100 20 20	µA
Supply voltage			V_{HIGH} -0.2		V_{HIGH} +0.2	V

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.	

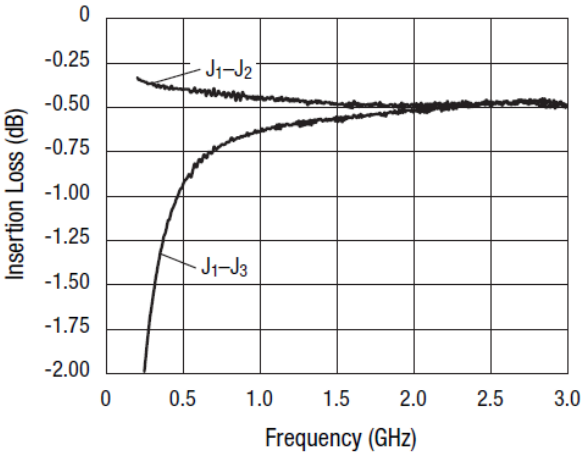
***ESD HANDLING**: Industry-standard ESD handling precautions must be adhered to at all times to avoid damage to this device.*

Table 4. Truth Table

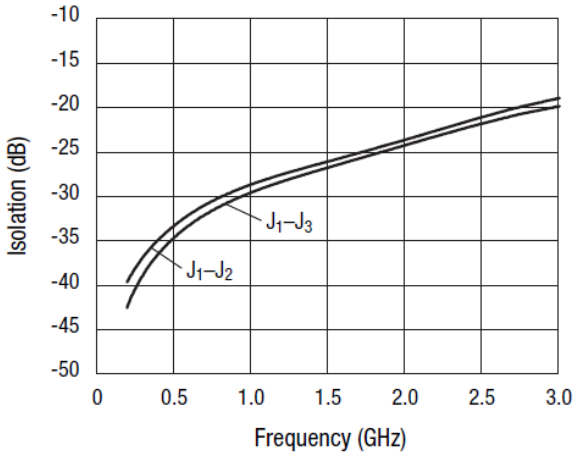
V1	J1-J2	J1-J3
0	Isolation	Insertion loss
V_{HIGH}	Insertion loss	Isolation
$1.8 \leq V_{HIGH} \leq 5$ V VDD = V_{HIGH} ±0.2V		

Typical Performance Data

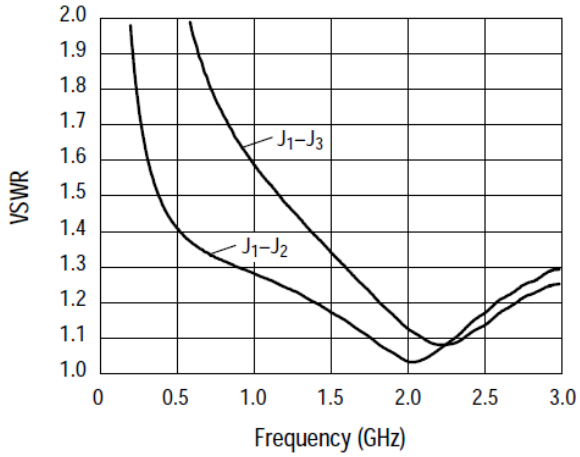
V_S = 3 V, V_{CTL} = 0/3 V, Z_0 = 50 Ω, unless otherwise noted



Insertion Loss vs. Frequency

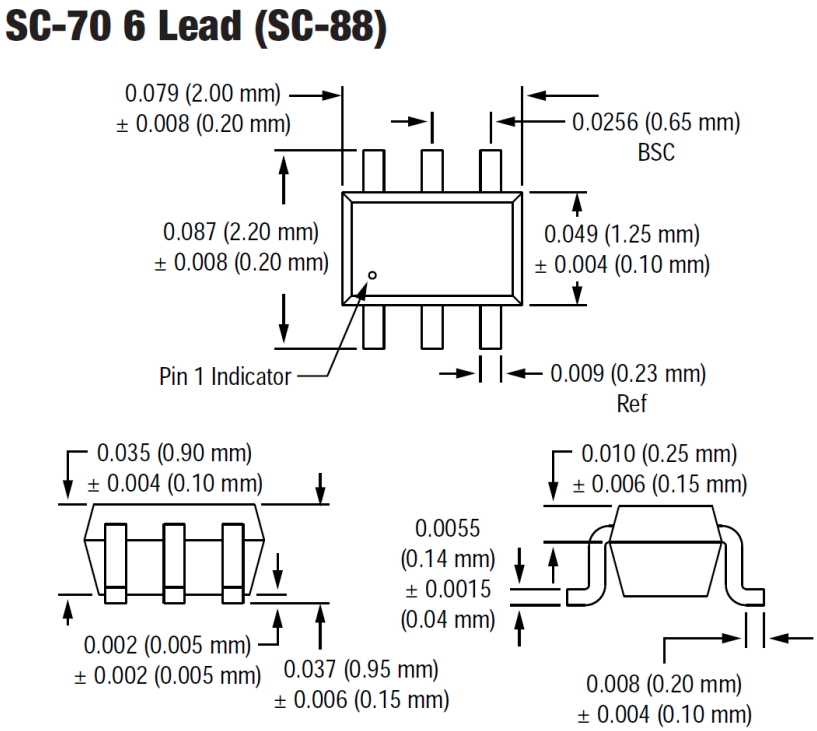


Isolation vs. Frequency



VSWR vs. Frequency

Package Dimensions



Recommended Solder Reflow Profiles

Refer to the "Recommended Solder Reflow Profile" Application Note.

Tape and Reel Information

Refer to the "Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation" Application Note.