

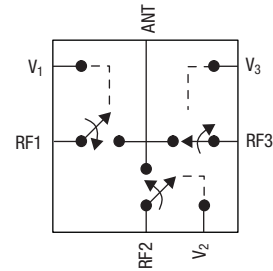
DATA SHEET

AS227-321, AS227-321LF: PHEMT GaAs IC High-Power SP3T Switch DC–2 GHz

Features

- Positive low voltage control (0/2.75 V operation)
- Low insertion loss (< 0.5 dB @ 1 GHz)
- High isolation (> 25 dB @ 1 GHz)
- Excellent IIP3 (63 dBm @ 2.75 V, 27 dBm/tone)
- Miniature QFN-12 plastic package
- PHEMT process
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 250 °C per JEDEC J-STD-020

Functional Block Diagram



Description

The AS227-321 is a PHEMT GaAs IC SP3T antenna switch operating in the 900 MHz and 1800 MHz frequency bands. Switching between the antenna and Tx/Rx ports is accomplished with 3 control inputs. When the control inputs are driven with the appropriate voltages, a low insertion loss path is provided from an antenna port to an Rx or Tx port, while the other ports have high attenuation.

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



Electrical Specifications at 25 °C

V_{CTL} = 0/2.75 V, Z₀ = 50 Ω, unless otherwise noted

Parameter	Frequency	Min.	Typ.	Max.	Unit	
Insertion loss	Ant-RF1, RF2, RF3	DC–0.5 GHz		0.45	0.6	dB
		DC–1.0 GHz		0.50	0.7	dB
		DC–2.0 GHz		0.70	0.9	dB
Isolation	Ant-RF1, RF2, RF3	DC–0.5 GHz	30	32		dB
		DC–1.0 GHz	24	26		dB
		DC–2.0 GHz	18	20		dB
Return loss	Ant-RF1, RF2, RF3	DC–0.5 GHz		18		dB
		DC–1.0 GHz		18		dB
		DC–2.0 GHz		14		dB

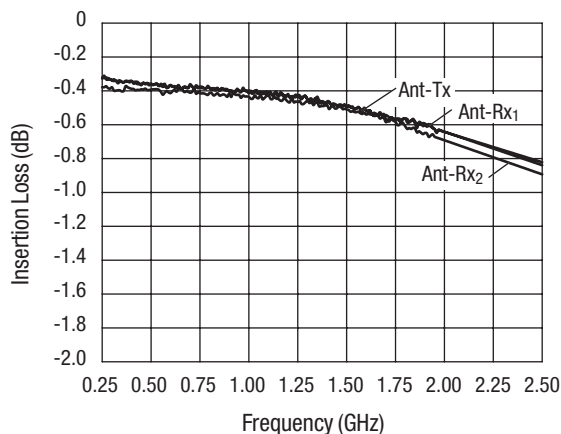
Operating Characteristics at 25 °C

$V_{CTL} = 0/2.75\text{ V}$, $Z_0 = 50\ \Omega$, unless otherwise noted

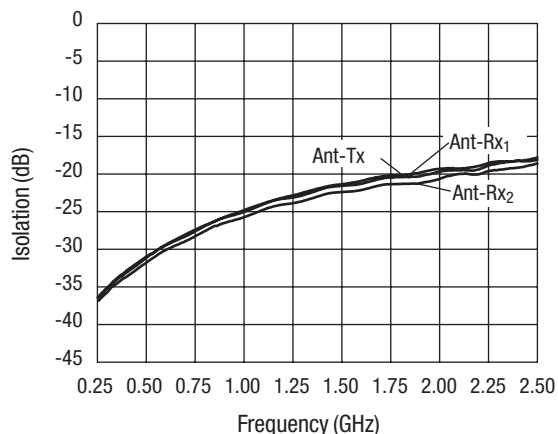
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Input Third Order Intercept (IIP3)	$P_{IN} = 27\text{ dBm}$, each tone	824/869 MHz		63		dBm
2nd/3rd harmonic	$P_{IN} = 34.5\text{ dBm}$	900 MHz		-65		dBc
Gate leakage current	$P_{IN} = 34\text{ dBm}$, $V_{CTL} = 2.75\text{ V}$			50		μA
Thermal resistance				25		$^{\circ}\text{C/W}$
Control voltages	V_{LOW} V_{HIGH}		-0.25 2.60	0 2.75	0.25 5.00	V V

Typical Performance Data

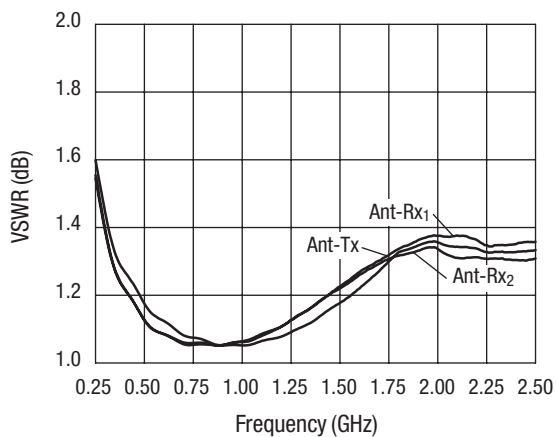
$T_A = 25\text{ }^{\circ}\text{C}$, $V_{CTL} = 0/2.75\text{ V}$, $Z_0 = 50\ \Omega$, unless otherwise noted



Insertion Loss vs. Frequency

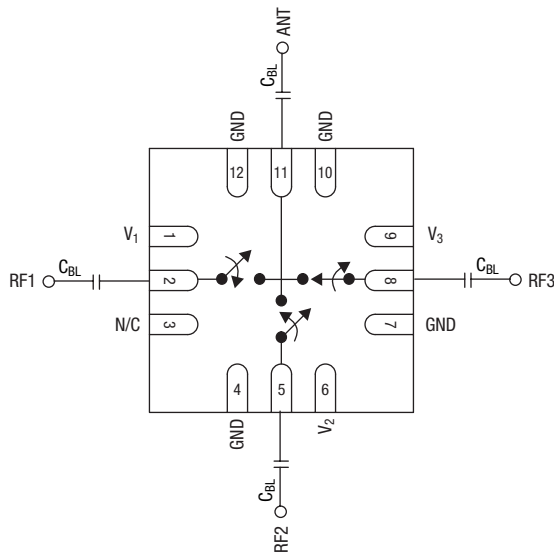


Isolation vs. Frequency



VSWR vs. Frequency

Pin Out (Top View)



DC blocks required. $C_{BL} = 47 \text{ pF}$ for operation $>500 \text{ MHz}$.

Absolute Maximum Ratings

Characteristic	Value
RF input power	4 W > 0.5 GHz 0/6 V control
Control voltage	6 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C

Performance is guaranteed only under the conditions listed in the specifications table and is not guaranteed under the full range(s) described by the Absolute Maximum specifications. Exceeding any of the absolute maximum/minimum specifications may result in permanent damage to the device and will void the warranty.

CAUTION: Although this device is designed to be as robust as possible, ESD (Electrostatic Discharge) can damage this device. This device must be protected at all times from ESD. Static charges may easily produce potentials of several kilovolts on the human body or equipment, which can discharge without detection. Industry-standard ESD precautions must be employed at all times.

Truth Table

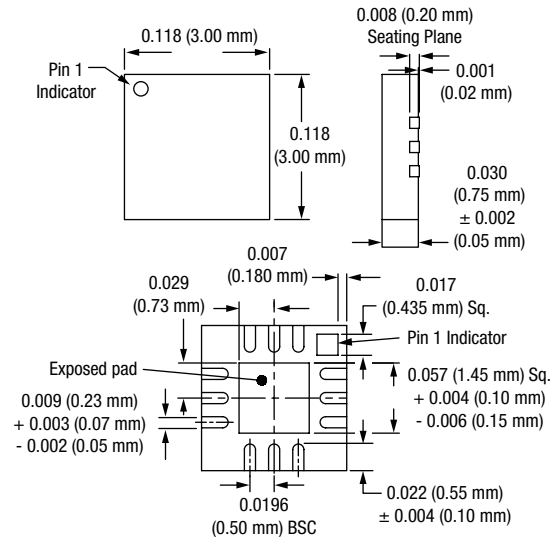
V ₁	V ₂	V ₃	Ant-RF1	Ant-RF2	Ant-RF3
V _{HIGH}	V _{LOW}	V _{LOW}	Ins. loss	Isolation	Isolation
V _{LOW}	V _{HIGH}	V _{LOW}	Isolation	Ins. loss	Isolation
V _{LOW}	V _{LOW}	V _{HIGH}	Isolation	Isolation	Ins. loss

All other conditions not recommended.

V_{LOW} = 0–0.2 V.

V_{HIGH} = 2.75–5 V.

QFN-12



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