DATA SHEET

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

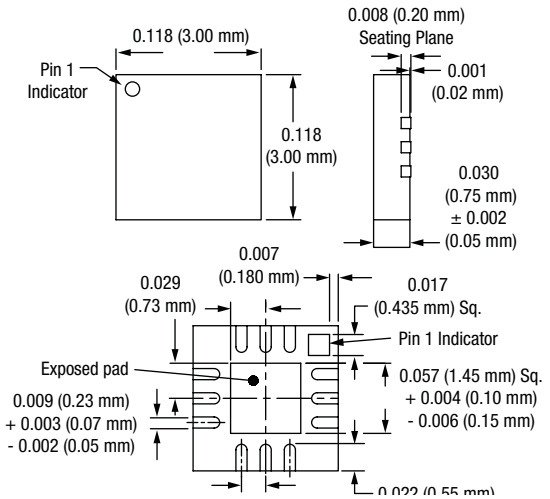
Features

- 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

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.

QFN-12



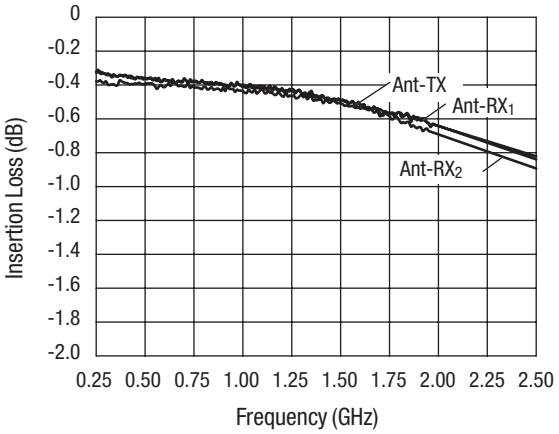
Electrical Specifications at 25 °C (0, +2.75 V)

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

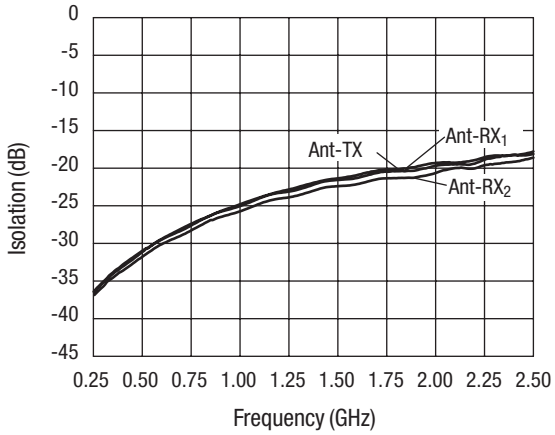
Operating Characteristics at 25 °C (0, +2.75 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
IIP3	27 dBm/tone	824/869 MHz		63		dBm
2nd/3rd harmonic	34.5 dBm	900 MHz		65		dBc
Gate leakage current	34 dBm In @ 2.75 V			50		µA
Control voltages	V_{LOW}		-0.25	0	0.25	V
	V_{HIGH}		2.60	2.75	5.00	V

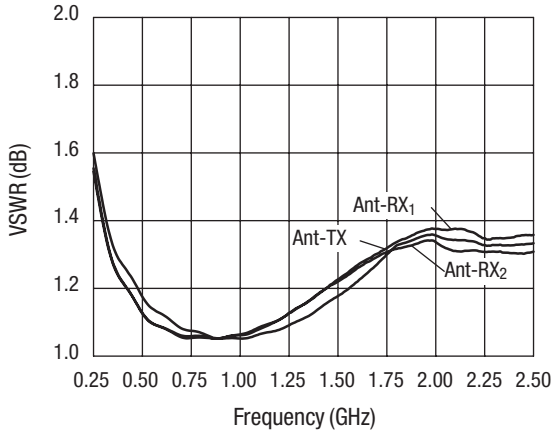
Typical Performance Data



Insertion Loss vs. Frequency



Isolation vs. Frequency



VSWR vs. Frequency

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

V_{LOW} = 0–0.2 V.
V_{HIGH} = 2.75–5 V.

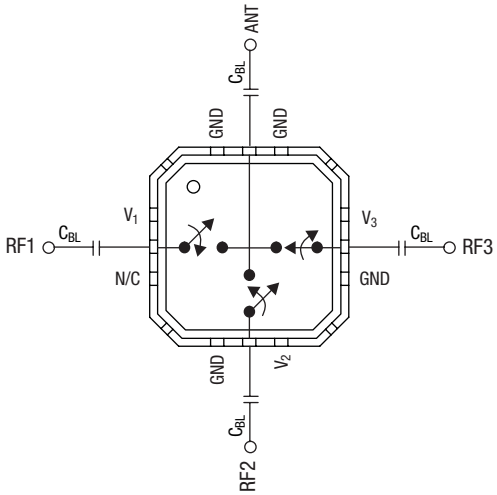
Absolute Maximum Ratings

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
Θ_{JC}	25 °C/W

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, Electrostatic Discharge (ESD) 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.*

Pin Out



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