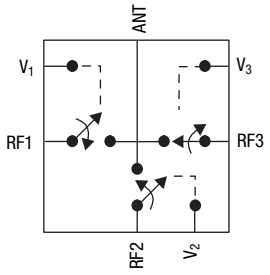
PRELIMINARY DATA SHEET

AS202-321, AS202-321LF: PHEMT GaAs IC High-Power SP3T Switch LF–2 GHz

Features

- Positive low voltage control (0/2.75 V operation)
- Low insertion loss (< 0.8 dB @ 2 GHz)
- High isolation (25 dB at 1 and 2 GHz)
- Excellent harmonics performance (-65 dBc @ 2.75 V 1 GHz, P_{IN} = 34 dBm)
- Miniature QFN-12 plastic package
- PHEMT process
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Functional Block Diagram



Description

The AS202-321 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 (0, 2.75 V)

Z_0 = 50 Ω, unless otherwise noted

Parameter		Frequency	Min.	Typ.	Max.	Unit
Insertion loss	Ant-RF1, RF2, RF3	LF–0.5 GHz LF–1.0 GHz LF–2.0 GHz		0.55 0.60 0.80	0.75 0.80 1.10	dB dB dB
Isolation	Ant-RF1, RF2, RF3	LF–0.5 GHz LF–1.0 GHz LF–2.0 GHz	25 22 22	28 25 25		dB dB dB
Return loss	Ant-RF1, RF2, RF3	LF–0.5 GHz LF–1.0 GHz LF–2.0 GHz		18 18 14		dB dB dB

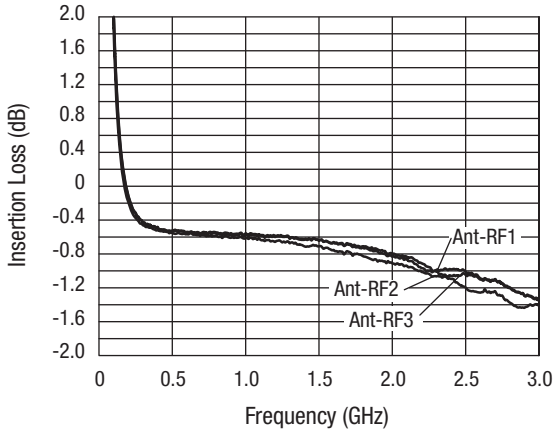
Operating Characteristics at 25 °C (0, 2.75 V)

Z_0 = 50 Ω, unless otherwise noted

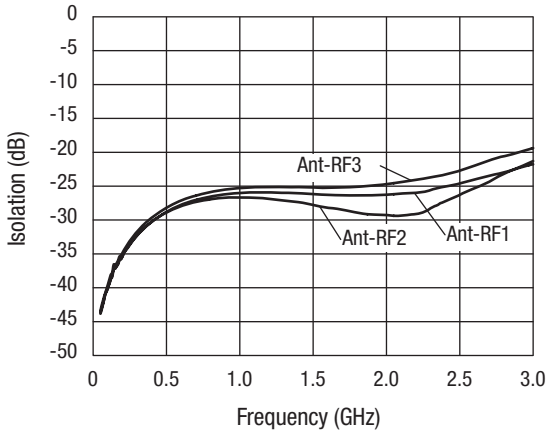
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
2nd harmonic	34 dBm In @ 2.75 V	1 GHz		-72		dBc
3rd harmonic	34 dBm In @ 2.75 V	1 GHz		-65		dBc
2nd harmonic	32 dBm In @ 2.75 V	2 GHz		-70		dBc
3rd harmonic	32 dBm In @ 2.75 V	2 GHz		-65		dBc
Gate leakage current	34 dBm In @ 2.75 V				0.03	mA
Thermal resistance				25		°C/W
Control voltages	V_{HIGH} V_{LOW}		-0.25 2.60	0 2.75	0.25 5.00	V V

Typical Performance Data (0, 2.75 V, C_{BL} = 47 pF)

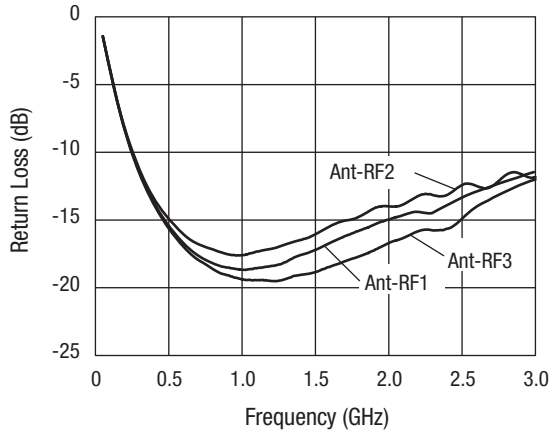
Z_0 = 50 Ω, unless otherwise noted



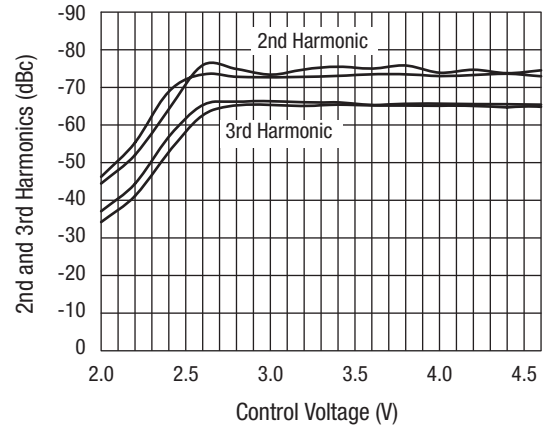
Insertion Loss vs. Frequency



Isolation vs. Frequency

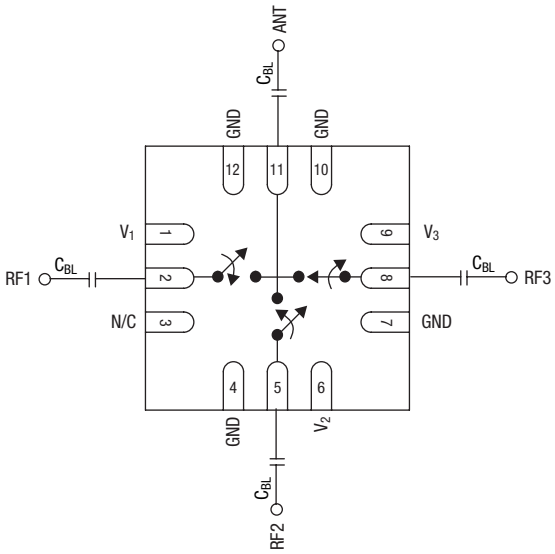


Return Loss vs. Frequency



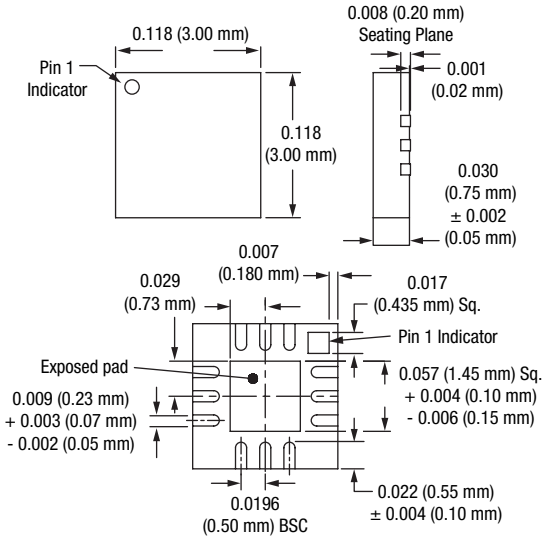
2nd and 3rd Harmonics vs. Control Voltage

Pin Out



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

QFN-12



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.

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.*

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.

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