

PHEMT GaAs IC 2 W High Linearity 5–6 GHz T/R Switch



AS200-313

Applications

- T/R Switch in WLAN 802.11a Systems

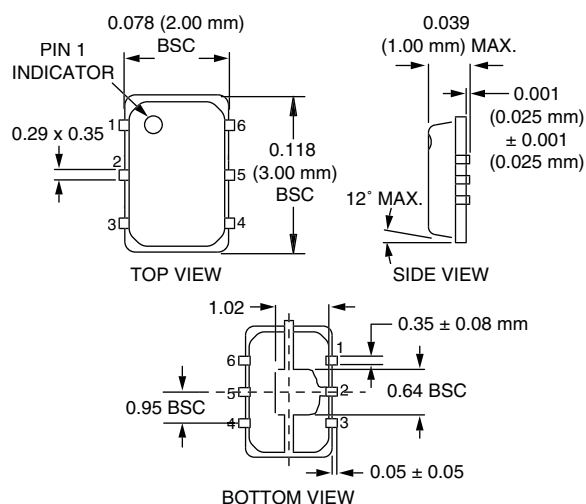
Features

- Operating Frequency 5–6 GHz
- High Linearity 50 dBm IIP3
- High Power $P_{-1\text{ dB}} > 33\text{ dBm}$
- Low Positive Control Voltage 3 V
- Low Cost Ultra Small QFN Package

Description

The AS200-313 is a 5–6 GHz PHEMT GaAs switch. Designed for transmit-receive applications, this device is capable of switching 2 W microwave signals with 3 V control while maintaining high linearity performance. The switch covers the entire 802.11a frequency ranges of 5.15–5.825 GHz. The low loss, high isolation, high linearity and low cost features make it ideal for wireless LAN systems in the 802.11a frequency band.

QFN-6



Electrical Specifications at 25°C (0, +3 V)

Parameter ¹	Frequency	Min.	Typ.	Max.	Unit
Insertion Loss ²	5.0–6.0 GHz		1.3	1.5	dB
	5.0–5.4 GHz		1.3	1.5	dB
	5.5–6.0 GHz		1.3	1.5	dB
Isolation	5.0–6.0 GHz	26	30		dB
	5.0–5.4 GHz	26	30		dB
	5.5–6.0 GHz	26	30		dB
Return Loss ³	5.0–5.4 GHz	10	15		dB
	5.5–6.0 GHz	10	15		dB

Operating Characteristics at 25°C (0, +3 V)

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Switching Characteristics ⁴	Rise, Fall (10/90% or 90/10% RF)			20		ns
	On, Off (50% CTL to 90/10% RF)			50		ns
	Video Feedthru			50		mV
Input Power for -0.1 dB Compression	0/+3 V	5.2 GHz		+33		dBm
Harmonics H ₂ , H ₃	P _{IN} = 30 dBm	5.2 GHz		+65		dBc
Control Voltages	V _{Low} = 0 to 0.2 V @ 20 μA Max. V _{High} = +2.5 V @ 100 μA Max. to +5 V @ 200 μA Max.					

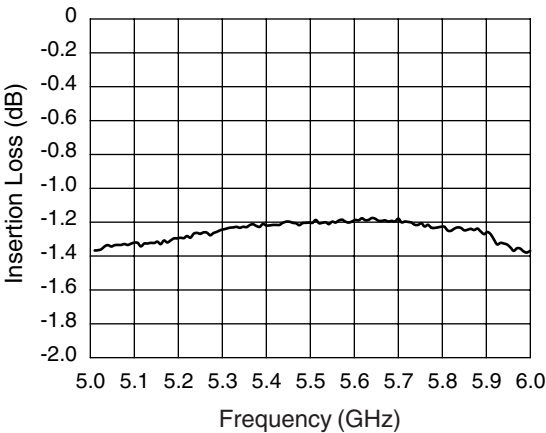
1. All measurements made in a 50 Ω system, unless otherwise specified.

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

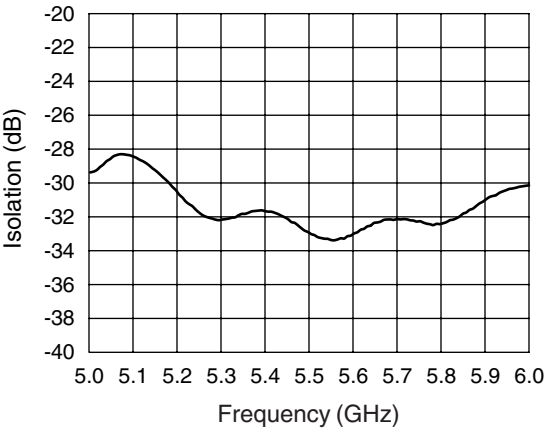
3. Insertion loss state.

4. Video feedthru measured with 1 ns risetime pulse and 500 MHz bandwidth.

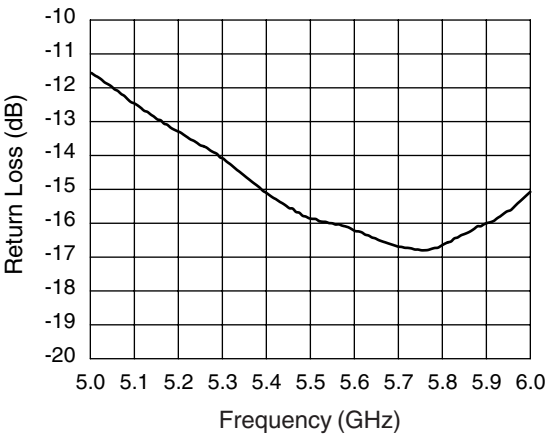
Typical Performance Data (0, +3 V)



Insertion Loss vs. Frequency



Isolation vs. Frequency



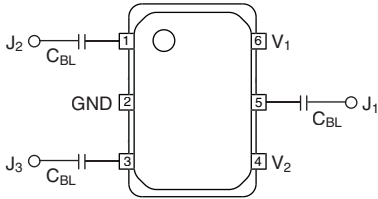
Return Loss vs. Frequency

Truth Table

V ₁	V ₂	J ₁ –J ₂	J ₁ –J ₃
0	V _{High}	Isolation	Insertion Loss
V _{High}	0	Insertion Loss	Isolation

V_{High} = +2.5 to +5 V.

Pin Out (Top View)



DC blocking capacitors (C_{BL}) must be supplied externally.
 C_{BL} = 15 pF.

Absolute Maximum Ratings

Characteristic	Value
RF Input Power	6 W Max. > 900 MHz 0/+7 V Control
Control Voltage	-0.2 V, +7 V
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C
Θ _{JC}	25°C/W