

DATA SHEET

PS196-315: Voltage Controlled Phase Shifter

1.5–3.0 GHz

Features

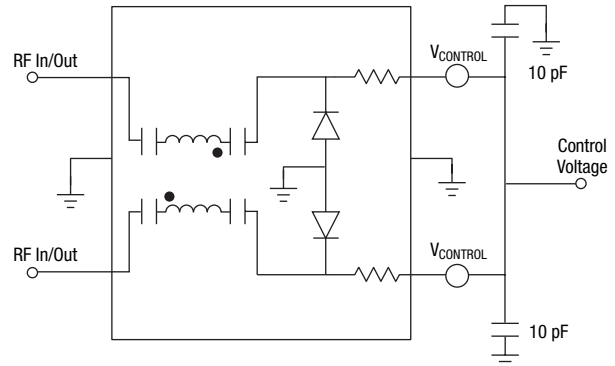
- 1500–3000 MHz frequency band
- 65–100-degree phase shift range
- 2 dB insertion loss variation
- 0–12 V control voltage range
- Specified 33 dBm IP3 @ 1900 MHz
- Small footprint LGA package
- Lead (Pb)-free and RoHS-compliant

Description

The PS196-315 is a voltage controlled phase shifter that employs a monolithic quadrature hybrid and a pair of selected silicon varactor diodes to achieve 100-degree phase shift and low insertion loss. The PS196-315 is packaged in the small outline LGA (Land Grid Array) surface mount package with the internal elements affixed to an organic BT substrate.

NEW

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

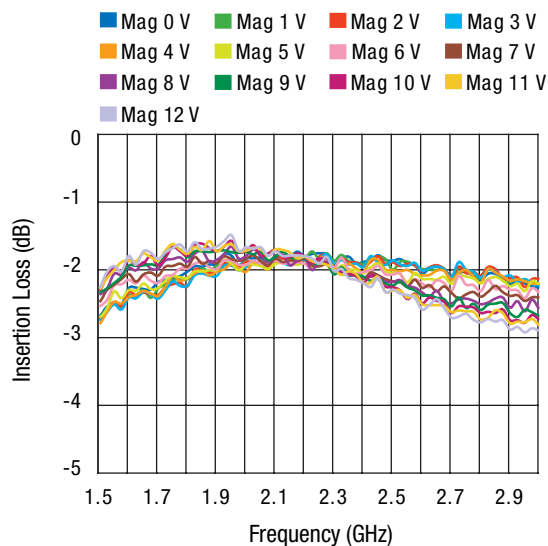

Connection Diagram

Electrical Specifications at 25 °C

Z₀ = 50 Ω, unless otherwise noted

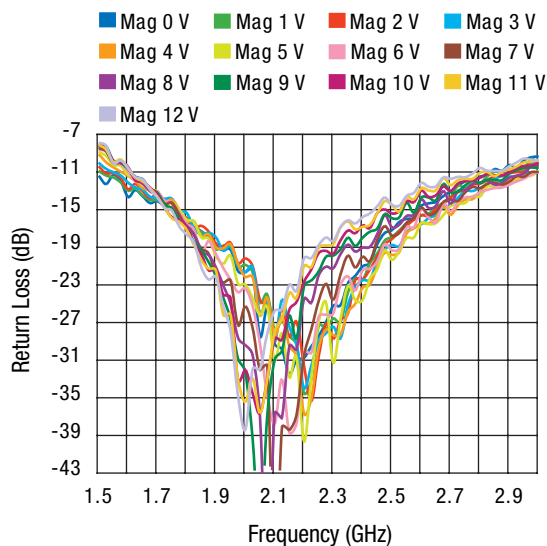
Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
Phase shift	At F ₀ , V _{CONTROL} = 12 V	1930–1990 MHz	65	85	100	Deg.
Control voltage (V _{CONTROL}) range			0		12	V
Control current	V _{CONTROL} = 12 V				1	mA
Insertion loss in BW	V _{CONTROL} = 0–12 V	1930–1990 MHz			3.3	dB
I.L. deviation in BW	V _{CONTROL} = 0–12 V	1930–1990 MHz			2	dB
Return loss in BW		1500–3000 MHz			-7	dB
IM3	P _{IN} = 8 dBm, 1900/1905 MHz, V _{CONTROL} = 0 V				-50	dBc
IP3	Derived from IM3		33			dBm

Typical Performance Data

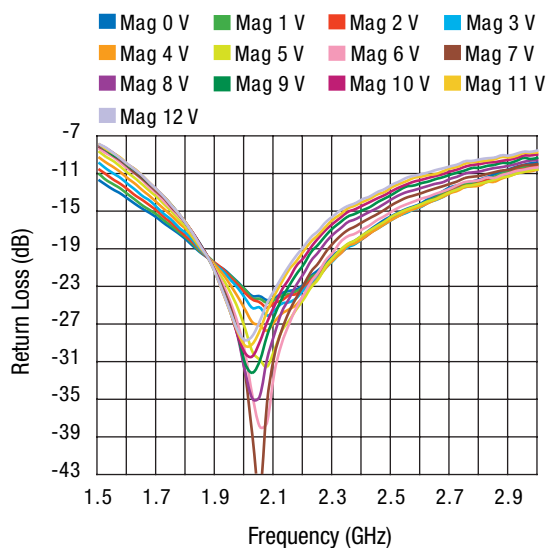
$Z_0 = 50 \Omega$, unless otherwise noted



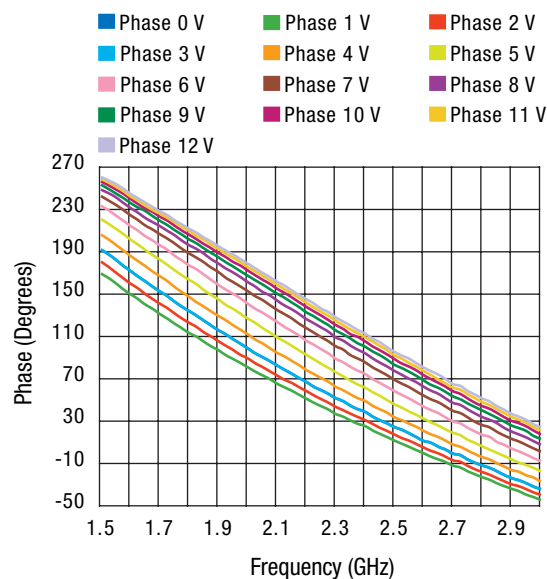
**Magnitude S_{21} vs.
Frequency and Control Voltage**



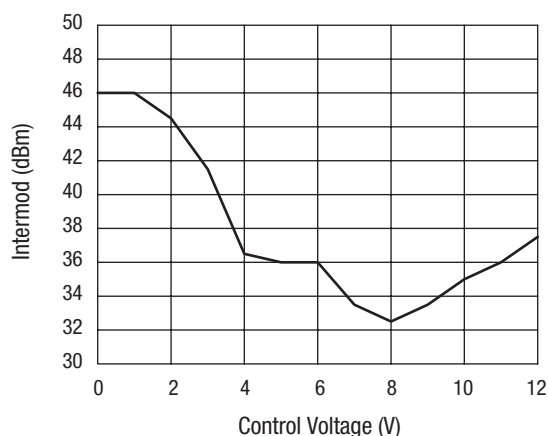
**Magnitude S_{22} vs.
Frequency and Control Voltage**



**Magnitude S_{11} vs.
Frequency and Control Voltage**



**Phase S_{21} vs.
Frequency and Control Voltage**



3rd Order Intermod vs. Control Voltage
 $RF_1 = 1.900 \text{ GHz}$, $RF_2 = 1.905 \text{ GHz}$ @ 8 dBm

Absolute Maximum Ratings

Characteristic	Value
RF input power	20 dBm
Control voltage	15 V
Operating temperature	-40 °C to +85 °C
Storage temperature	-65 °C to +150 °C
Electrostatic discharge	HBM 1 B

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.

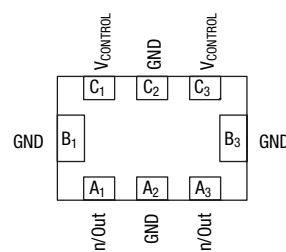
Recommended Solder Reflow Profiles

Refer to the [“Recommended Solder Reflow Profile”](#) Application Note.

Tape and Reel Information

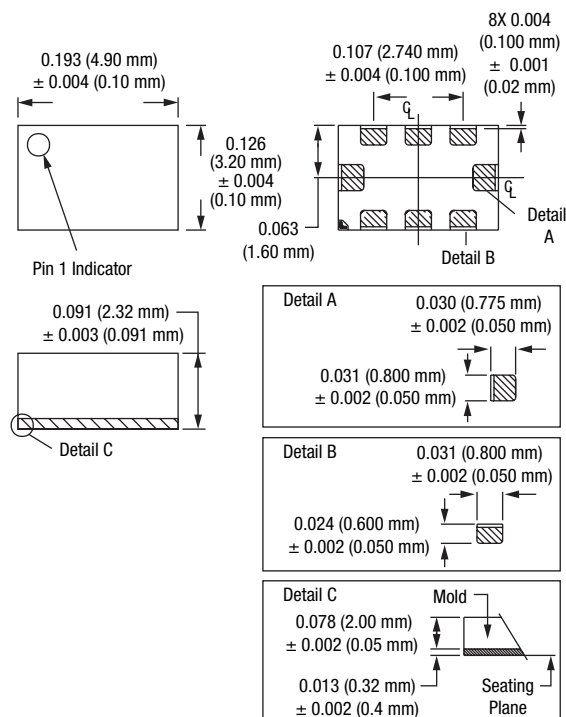
Refer to the [“Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation”](#) Application Note.

Pin Out (Bottom View)



Terminal No.	Terminal Name
A ₁ (Pin 1)	In/Out
A ₂	GND
A ₃	In/Out
B ₁	GND
B ₃	GND
C ₁	V _{CONTROL}
C ₂	GND
C ₃	V _{CONTROL}

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