SKYWORKS®

DATA SHEET

SKY12144-315: HIP3™ Variable Attenuator for DCS and PCS Base Stations

Features

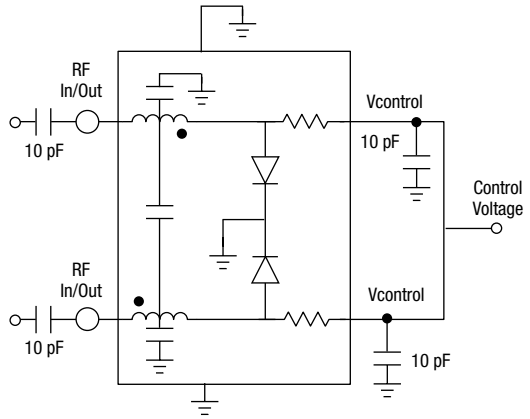
- 23 dB attenuation range
- 1.5 dB insertion loss, 2:1 SWR
- 0–12 V control voltage
- 43 dBm IP3
- Small footprint LGA package
- Designed for DCS/PCS base stations
- Lead (Pb)-free and RoHS-compliant

Description

The SKY12144-315 is a voltage controlled, variable attenuator from Skyworks series of HIP3™ components. It is specifically designed and specified for use as a wide dynamic range, low-distortion attenuator for DCS and PCS base station applications centered at 1837.5 MHz and 1960 MHz. The SKY12144-315 employs a monolithic quadrature hybrid and a pair of silicon PIN diodes to achieve the specified low-distortion performance. It operates from 0–12 V with 1.6 mA typical control current at maximum attenuation. The SKY12144-315 is packaged in a 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



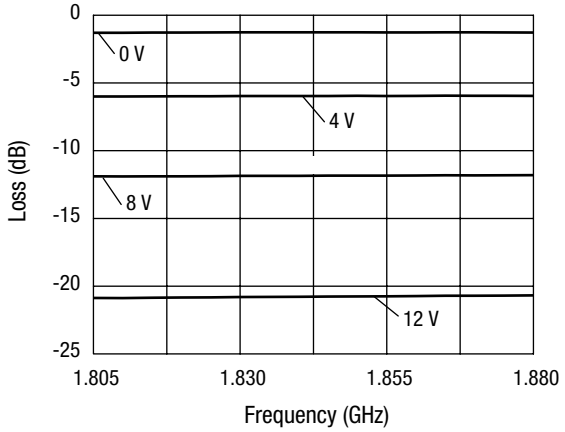
Electrical Specifications at 25 °C

Z_0 = 50 Ω, unless otherwise noted

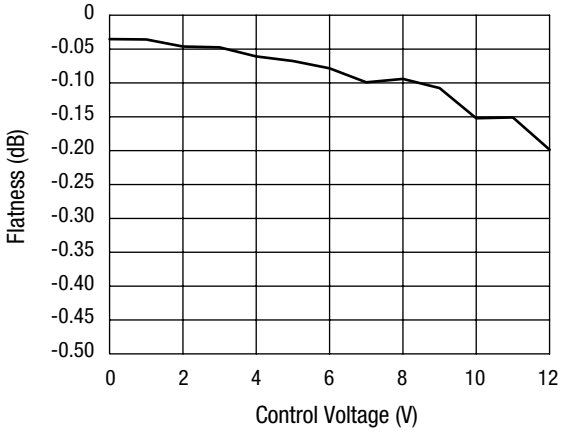
Parameter	Condition	Min.	Typ.	Max.	Unit
DCS frequency range (BW)		1805		1870	MHz
PCS frequency range (BW)	F_0 ± 30 MHz	1930		1990	MHz
Control voltage ($V_{CONTROL}$) range		0		12	V
Insertion loss in BW	$V_{CONTROL}$ = 0 V			2	dB
Attenuation range	At F_0, $V_{CONTROL}$ = 10 V At F_0, $V_{CONTROL}$ = 12 V	18 23		22 –	dB dB
VSWR in BW				1.5	
IP3	1900/1905 MHz, $V_{CONTROL}$ = 0 V	43			dBm
IM3	8 dBm			-70	dBc

Typical Performance Data

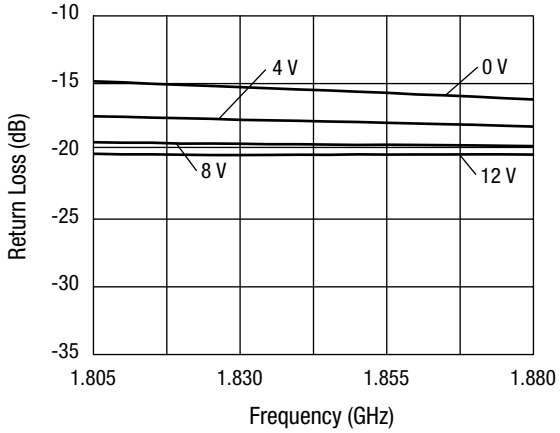
T = 25 °C, Z_0 = 50 Ω, unless otherwise noted



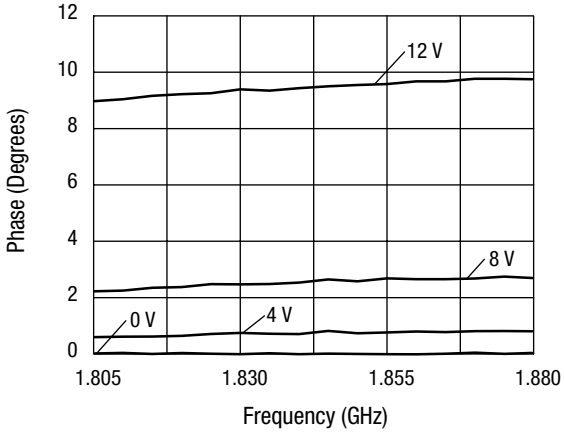
Insertion Loss vs. Frequency and Control Voltage — DCS Band



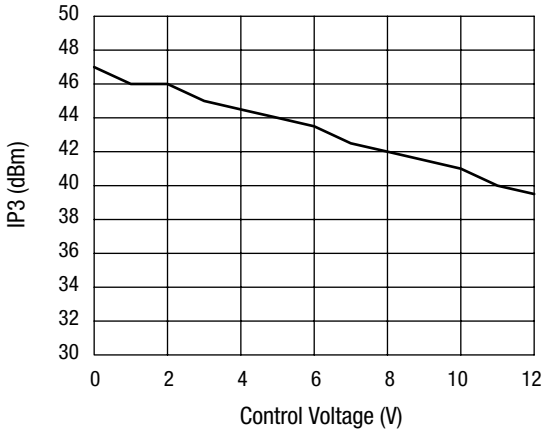
Insertion Loss Flatness vs. Control Voltage — DCS Band



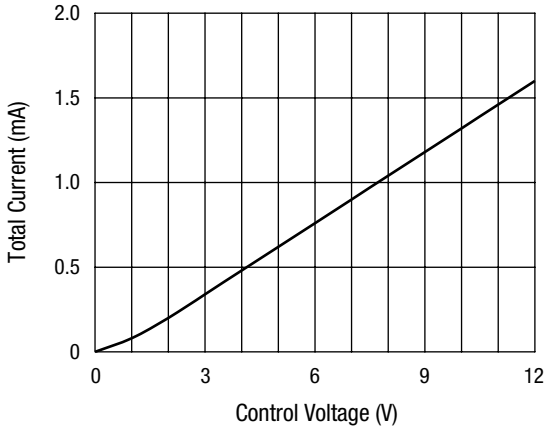
Input/Output Return Loss vs. Frequency and Control Voltage — DCS Band



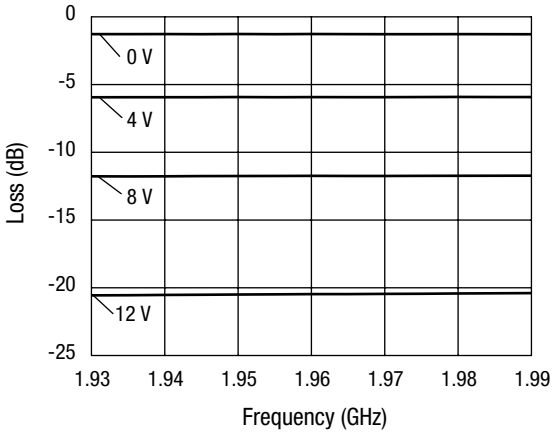
Phase vs. Frequency and Control Voltage — DCS Band



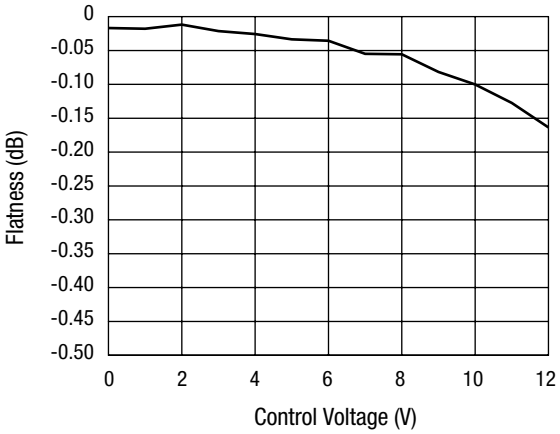
IP3 vs. Control Voltage
RF_1 = 1.900 GHz, RF_2 = 1.905 GHz @ 8 dBm



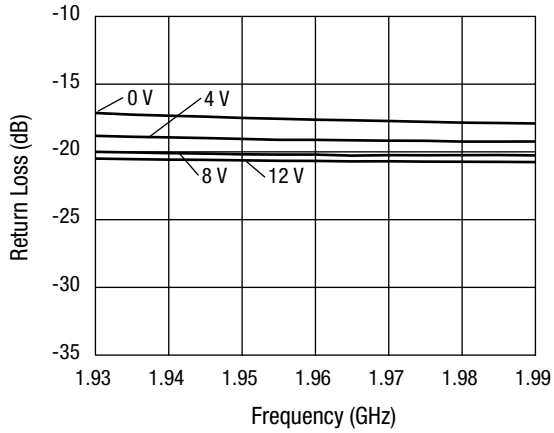
Total Current vs. Control Voltage



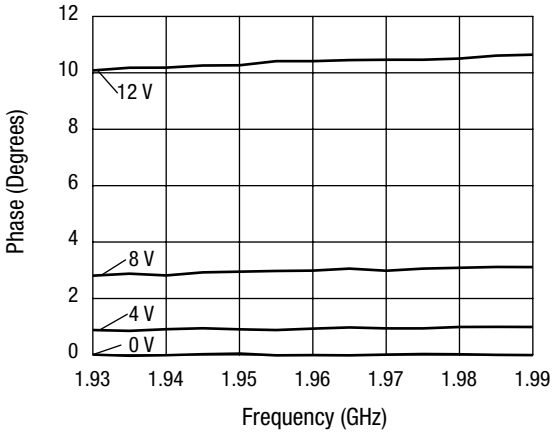
Insertion Loss vs. Frequency and Control Voltage — PCS Band



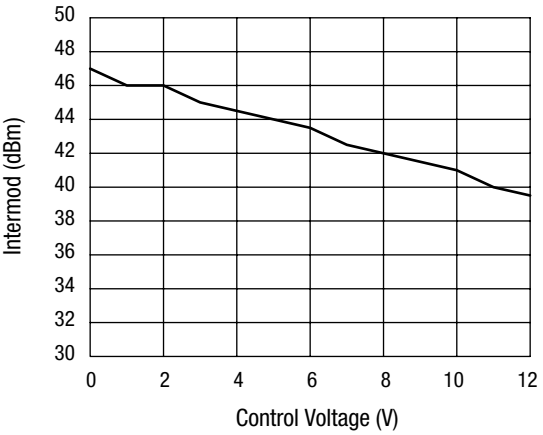
Insertion Loss Flatness vs. Control Voltage — PCS Band



Input/Output Return Loss vs. Frequency and Control Voltage — PCS Band

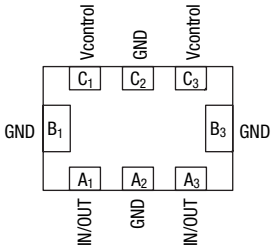


Phase vs. Frequency and Control Voltage — PCS Band



3rd Order Intermod vs. Control Voltage
RF_1 = 1.900 GHz, RF_2 = 1.905 GHz @ 8 dBm

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	Vcontrol
C_2	GND
C_3	Vcontrol

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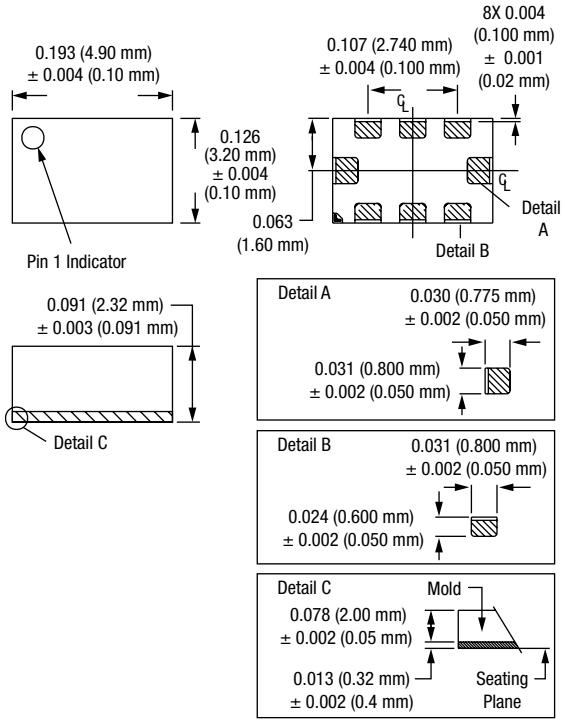

Absolute Maximum Ratings

Characteristic	Value
RF input power	0.5 W CW, 4 W @ 12.5% duty cycle
Control voltage	15 V
Control current	50 mA each diode
Operating temperature	-40 °C to +85 °C
Storage temperature	-40 °C to +85 °C
Maximum reverse diode voltage	-10 V
Electrostatic discharge	Class 1A

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.