SKY12145-315: HIP3™ Variable Attenuator for UMTS Base Stations

Features

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

Description

The SKY12145-315 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 UMTS base station applications centered at 2140 MHz. The SKY12145-315 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 at 1.6 mA typical control current at maximum attenuation. The SKY12145-315 is packaged in a small outline LGA (Land Grid Array) surface mount package with the internal elements affixed to an organic BT substrate.
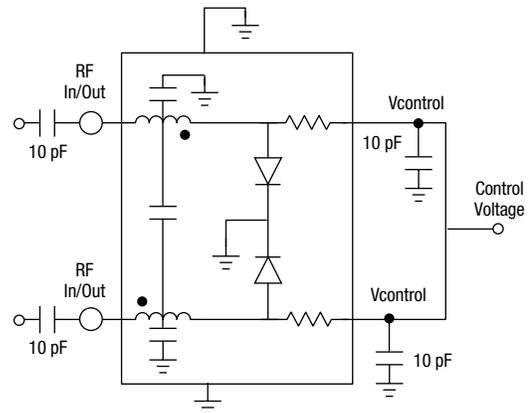
NEW Skyworks offers lead (Pb)-free, RoHS (Restriction of Hazardous Substances)-compliant packaging.

Connection Diagram
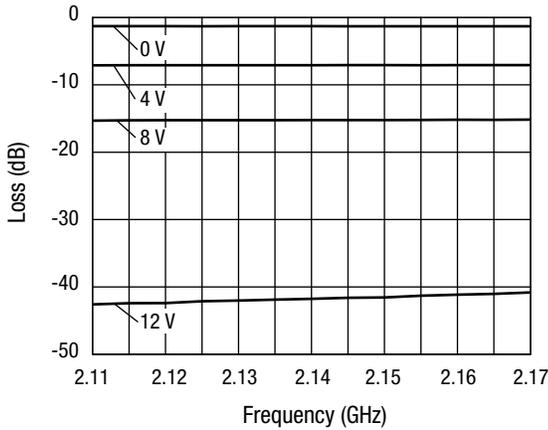

Electrical Specifications at 25 °C

Z_0 = 50 Ω, unless otherwise noted

Parameter	Condition	Min.	Typ.	Max.	Unit
UMTS frequency range (BW)	$F_0 \pm 12.5$ MHz	2110		2170	MHz
Control voltage ($V_{CONTROL}$) range		0		12	V
Insertion loss in BW	$V_{CONTROL} = 0$ V			1.5	dB
Attenuation range	At F_0, $V_{CONTROL} = 10$ V	18		22	dB
	At F_0, $V_{CONTROL} = 12$ V	23		–	dB
VSWR in BW				1.5	
IP3	2140/2145 MHz, $V_{CONTROL} = 0$ V	43			dBm
IM3	8 dBm			-70	dBc

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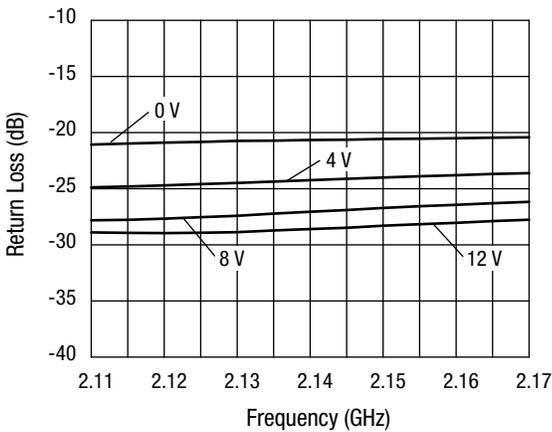
Typical Performance Data

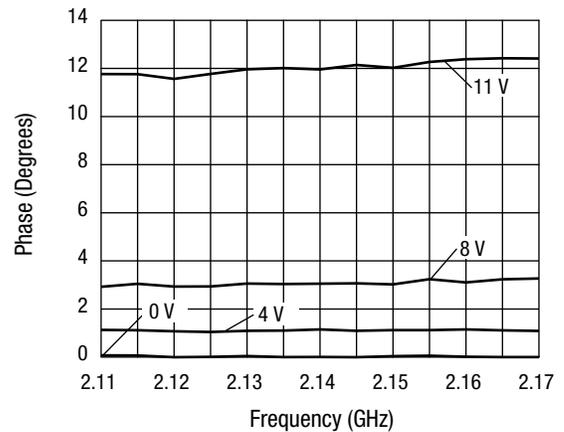**T = 25 °C, Z_0 = 50 Ω, unless otherwise noted**

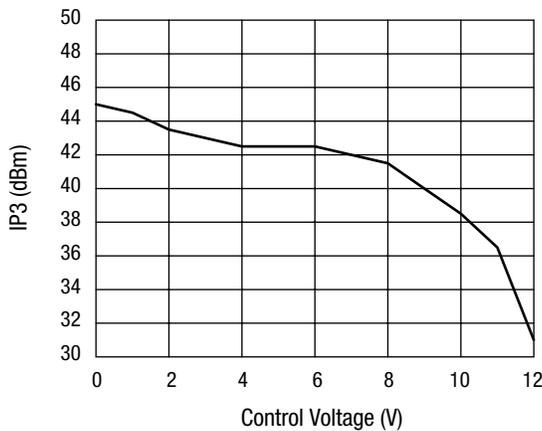**Insertion Loss vs. Frequency and
Control Voltage — UMTS Band**
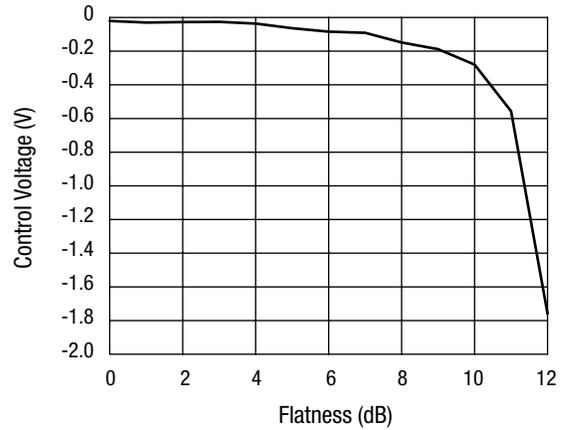
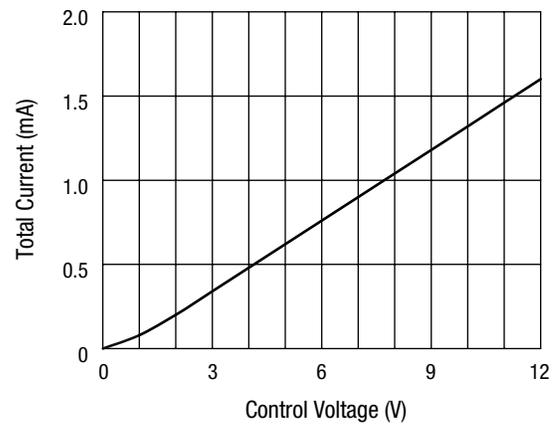**Insertion Loss Flatness vs.
Control Voltage — UMTS Band**

**Input/Output Return Loss vs. Frequency
and Control Voltage — UMTS Band**
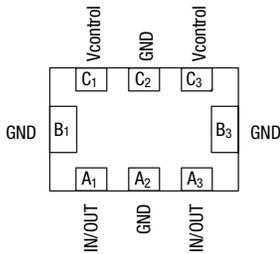
**Phase vs. Frequency and
Control Voltage — UMTS Band**

**3rd Order Intermod
Intercept vs. Control Voltage
RF_1 = 2.140 GHz, RF_2 = 2.145 GHz @ 8 dBm**

Total Current vs. Control Voltage

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Pin Out (Bottom View)

Terminal No.	Terminal Name
A₁ (Pin 1)	IN/OUT
A₂	GND
A₃	IN/OUT
B₁	GND
B₃	GND
C₁	Vcontrol
C₂	GND
C₃	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.*
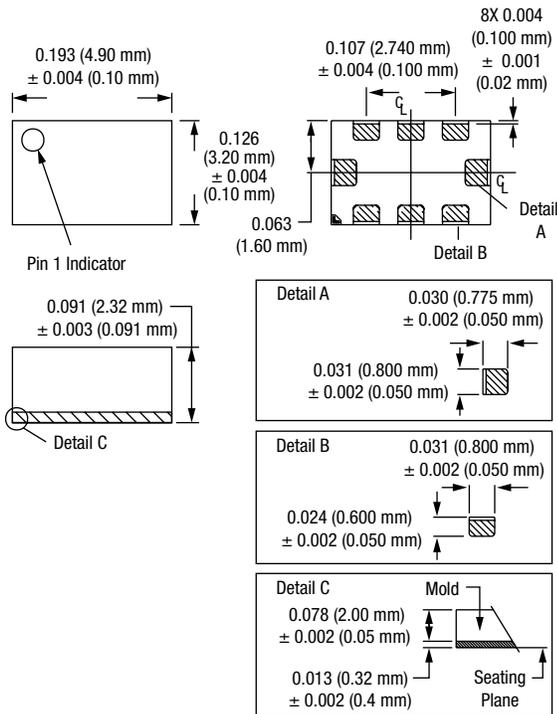
Recommended Solder Reflow Profiles

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.

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