

DATA SHEET

SKY13306-313LF: GaAs SPDT Switch 100 MHz-6 GHz

Features

• Broadband: 100 MHz - 6 GHz

• Very low insertion loss: 0.5 dB typ. 2.4-2.5 GHz

• High linearity: IIP3 = 53 dBm typ. 3 V

• Low current consumption: <50uA @ 3 V

• Miniature QFN-6 2 x 3 mm package

 Lead (Pb)-free and RoHS-compliant MSL1 @ 260 C per JEDEC J-STD-020

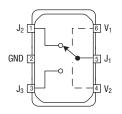
Description

The SKY13306-313LF is an IC FET SPDT switch in a low-cost miniature QFN- 6 plastic package. The SKY13306-313LF features low insertion loss, excellent linearity and positive voltage operation with very low DC power consumption. This general purpose switch can be used in a variety of telecommunications applications, and was designed for use as a transmit-receive switch for WLAN applications such as 802-11a/b/g. The QFN-6 package is lead (Pb)-free and meets all current requirements for RoHS.



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

Functional Block Diagram



Product is in development stages, performance is based on simulation, and pin out and package are advanced and may change.

Electrical Specifications

T = 25 °C, V_{CTL} = 0/3 V, Z_0 = 50 Ω , unless otherwise noted

Parameter	Condition	Frequency	Min.	Тур.	Max.	Unit
Insertion loss	J ₁ -J ₂ , J ₁ -J ₃	0.10 GHz-6.00 GHz		0.6	0.9	dB
		2.40 GHz-2.50 GHz		0.5	0.7	dB
		3.40 GHz-3.60 GHz		0.5	0.7	dB
		5.15 GHz-5.85 GHz		0.6	8.0	dB
Isolation	J ₁ –J ₂ , J ₁ –J ₃	0.10 GHz-6.00 GHz	21	25		dB
		2.40 GHz-2.50 GHz	22	25		dB
		3.40 GHz-3.60 GHz	23	26		dB
		5.15 GHz-5.85 GHz	21	24		dB
Return loss	Insertion loss state	0.10 GHz-6.00 GHz		15		dB
		2.40 GHz-2.50 GHz		25		dB
		3.40 GHz-3.60 GHz		16		dB
		5.15 GHz-5.85 GHz		15		dB
Input power for 0.1 dB compression		2.4 GHz-2.5 GHz		35		dBm
2nd Harmonic	P _{IN} = 22 dBm	2.45 GHz		-70		dBc
3rd Harmonic	P _{IN} = 22 dBm	2.45 GHz		-68		dBc
Input 3rd order intercept point	Two tones, 15 dBm each tone, 5 MHz spacing	5.2 GHz		53		dBm
Control voltage						
V _{HIGH}			2.7		5	V
V_{LOW}			-0.25		0.25	V
Control port current	V _{CTL} = 3 V			10	100	μA
	$V_{CTL} = 5 V$			15	200	μA
	V _{CTL} = 0 V			10	50	μA

Absolute Maximum Ratings

Characteristic	Value		
RF input power @ 0,5 V	36.5 dBm @ 25 °C		
RF input power @ 0,3 V	36 dBm @ 25 °C		
Control voltage	-0.2 V ≤ V _{CTL} ≤ 6 V		
Operating temperature range	-40 °C to +85 °C		
Storage temperature range	-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.

Truth Table

V ₁ ⁽¹⁾	V ₂ ⁽¹⁾	J ₁ -J ₂	J ₁ –J ₃	
0	VHIGH	Isolation	Insertion loss	
VHIGH	0	Insertion loss	Isolation	

All other conditions not recommended. No damage to the switch will occur if a non-recommended combination of control voltages is present. The switch will not provide full isolation or minimum insertion loss under such conditions.

1. $2.7 \text{ V} \le \text{V}_{HIGH} \le 5 \text{ V}.$

Recommended Solder Reflow Profiles

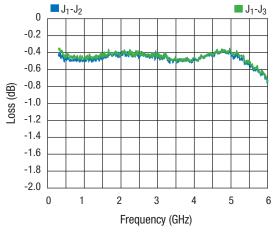
Refer to the "<u>Recommended Solder Reflow Profile</u>" Application Note.

Tape and Reel Information

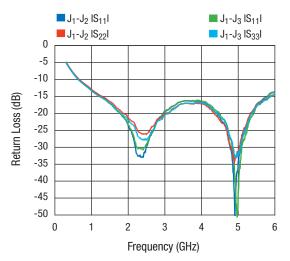
Refer to the "Discrete Devices and IC Switch/Attenuators Tape and Reel Package Orientation" Application Note.

Typical Performance Data

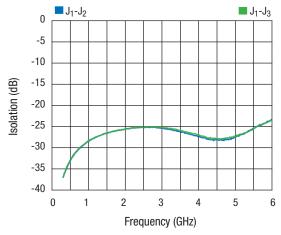
T = 25 °C, V_{CTL} = 0/3 V, Z_0 = 50 Ω , unless otherwise noted



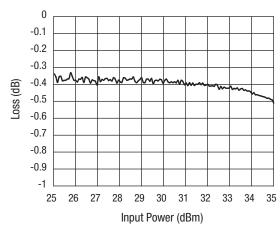
Typical Insertion Loss



Typical Return Loss Insertion Loss State

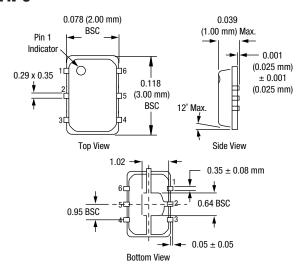


Typical Isolation

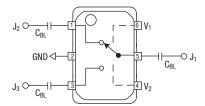


Typical Compression at 2.4 GHz

QFN-6



Pin Out and Suggested Circuit



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

Copyright © 2007, 2008, Skyworks Solutions, Inc. All Rights Reserved.

Information in this document is provided in connection with Skyworks Solutions, Inc. ("Skyworks") products or services. These materials, including the information contained herein, are provided by Skyworks as a service to its customers and may be used for informational purposes only by the customer. Skyworks assumes no responsibility for errors or omissions in these materials or the information contained herein. Skyworks may change its documentation, products, services, specifications or product descriptions at any time, without notice. Skyworks makes no commitment to update the materials or information and shall have no responsibility whatsoever for conflicts, incompatibilities, or other difficulties arising from any future changes.

No license, whether express, implied, by estoppel or otherwise, is granted to any intellectual property rights by this document. Skyworks assumes no liability for any materials, products or information provided hereunder, including the sale, distribution, reproduction or use of Skyworks products, information or materials, except as may be provided in Skyworks Terms and Conditions of Sale

THE MATERIALS, PRODUCTS AND INFORMATION ARE PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, WHETHER EXPRESS, IMPLIED, STATUTORY, OR OTHERWISE, INCLUDING FITNESS FOR A PARTICULAR PURPOSE OR USE, MERCHANTABILITY, PERFORMANCE, QUALITY OR NON-INFRINGEMENT OF ANY INTELLECTUAL PROPERTY RIGHT; ALL SUCH WARRANTIES ARE HEREBY EXPRESSLY DISCLAIMED. SKYWORKS DOES NOT WARRANT THE ACCURACY OR COMPLETENESS OF THE INFORMATION, TEXT, GRAPHICS OR OTHER ITEMS CONTAINED WITHIN THESE MATERIALS. SKYWORKS SHALL NOT BE LIABLE FOR ANY DAMAGES, INCLUDING BUT NOT LIMITED TO ANY SPECIAL, INDIRECT, INCIDENTAL, STATUTORY, OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LOST REVENUES OR LOST PROFITS THAT MAY RESULT FROM THE USE OF THE MATERIALS OR INFORMATION, WHETHER OR NOT THE RECIPIENT OF MATERIALS HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

Skyworks products are not intended for use in medical, lifesaving or life-sustaining applications, or other equipment in which the failure of the Skyworks products could lead to personal injury, death, physical or environmental damage. Skyworks customers using or selling Skyworks products for use in such applications do so at their own risk and agree to fully indemnify Skyworks for any damages resulting from such improper use or sale.

Customers are responsible for their products and applications using Skyworks products, which may deviate from published specifications as a result of design defects, errors, or operation of products outside of published parameters or design specifications. Customers should include design and operating safeguards to minimize these and other risks. Skyworks assumes no liability for applications assistance, customer product design, or damage to any equipment resulting from the use of Skyworks products outside of stated published specifications or parameters.

Skyworks, the Skyworks symbol, and "Breakthrough Simplicity" are trademarks or registered trademarks of Skyworks Solutions, inc., in the United States and other countries. Third-party brands and names are for identification purposes only, and are the property of their respective owners. Additional information, including relevant terms and conditions, posted at www.skyworksinc.com, are incorporated by reference.