

DATA SHEET

SKY13286-359LF: GaAs High Isolation SPDT Absorptive Switch 100 MHz–6 GHz

Features

- Single positive voltage control (0/3 to 0/5 V)
- High isolation 64 dB at 1 GHz and 2 GHz
- Integrated silicon CMOS driver
- Absorptive
- Available lead (Pb)-free and RoHS-compliant MSL-1 @ 260 °C per JEDEC J-STD-020

Description

The SKY13286-359LF is a pHEMT GaAs FET IC high isolation absorptive switch packaged in a 16-lead exposed pad plastic package for low-cost commercial applications. It is an ideal building block for base station applications where synthesizer isolation is critical. Typical applications include GSM, PCS, WCDMA, 2.4 and 5.8 GHz ISM and wireless local loop.

An evaluation board is available upon request.



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

Functional Block Diagram



Electrical Specifications

V_{CTL} = 0 V/3V, V_{DD} = 5 V, T = 25 °C, P_{INPUT} = 0 dBm, Z₀ = 50 Ω , unless otherwise noted

Parameter	Frequency	Min.	Тур.	Max.	Unit
Insertion loss	0.1–2.0 GHz		0.8	1.10	dB
	2.0–3.0 GHz		0.8	1.25	dB
	3.0–4.0 GHz		1.0	1.35	dB
	4.0–6.0 GHz		1.5	1.80	dB
Isolation	0.1–2.0 GHz	60	62		dB
	2.0–3.0 GHz	58	62		dB
	3.0–4.0 GHz	55	58		dB
	4.0–6.0 GHz	40	42		dB
Return loss (insertion loss state)	0.1–2.0 GHz	10	22		dB
Lower frequency return loss is dependent on DC blocks	2.0–3.0 GHz	15	22		dB
	3.0–4.0 GHz	13	18		dB
	4.0–6.0 GHz	10	12		dB
Return loss (isolation state)	0.5–2.0 GHz	10	12		dB
Lower frequency return loss is dependent on DC blocks	2.0–3.0 GHz	12	15		dB
	3.0–4.0 GHz	12	15		dB
	4.0–6.0 GHz	11	13		dB

Operating Characteristics

Parameter	Condition	Frequency	Min.	Тур.	Max.	Unit
Switching characteristics						
Rise, fall	10/90% or 90/10% RF			30		ns
On, off	50% CTL to 90/10% RF			50		ns
Video feedthru	$T_{RISE} = 3$ ns, Measurement BW = 500 MHz			25		mV
Input power for 1 dB compression	$V_{DD} = 3 V$	0.7–2.0 GHz		23		dBm
	$V_{DD} = 5 V$	0.7–2.0 GHz	26	30		dBm
Intermodulation intercept point (IP3)	For two-tone input power 8 dBm/tone					
	1 MHz Spacing					
	$V_{DD} = 3.3 V$	0.7–1.0 GHz		49		dBm
	$V_{DD} = 5 V$	0.7–1.0 GHz	45	47		dBm
	$V_{DD} = 3.3 V$	1.0-2.0 GHz		43		dBm
	$V_{DD} = 5 V$	1.0–2.0 GHz	45	46		dBm
Control voltages ^(1,2)	V _{CTL LOW}		0		0.5	V
	V _{CTL HIGH}		2.7		V _{DD}	V
Supply current	$V_{DD} = 5 V$				100	μA
Control current	$V_{CTL} = LOW, V_{CTL} = HIGH$			5		μA
Supply voltage			2.7		5	

V_{CTL} = 0 V/3V, T = 25 °C, P_{INPUT} = 0 dBm, Z₀ = 50 Ω , unless otherwise noted

V_{DD} must be powered on prior to a V_{CTL} high signal. A latch up condition may occur if a logic high signal is applied prior to the V_{DD} voltage.
Control voltages switch the V_{DD} voltage to the GaAs switch.

Typical Performance Data

V_{CTL} = 0 V/3V, V_{DD} = 5 V, T = 25 °C, P_{INPUT} = 0 dBm, Z_0 = 50 Ω , unless otherwise noted











Return Loss vs. Frequency Isolation State



Truth Table

V _{CTL}	RFc–J ₁	RFc-J ₂
0	Insertion loss	Isolation
1	Isolation	Insertion loss

Absolute Maximum Ratings

Characteristic	Value
V _{DD} voltage range	$2.7 \le V_{DD} \le 5.5 \text{ V}$
RF input power	1 W, f > 500 MHz
Operating temperature	-40 °C to +85 °C
Storage temperature	-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.

Part Marking

Pin 1 Indicator <__



Pin Out (Top View)

"X-ray" of pads on bottom of package



DC blocking capacitors required on all RF lines (RFc, J1, J2).

Package Outline



Dimensions in mm.

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