

# SKY14141: GSM Quad-Band Antenna Switch Module

## Applications

- Quad-band 850/900/1800/1900 GSM/GPRS/EDGE

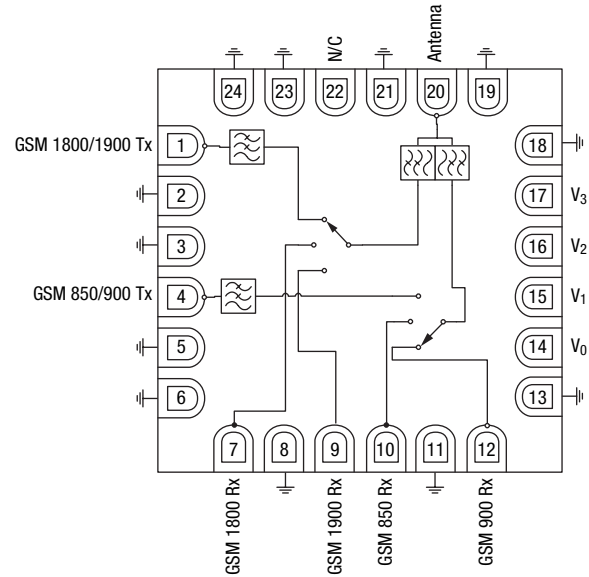
## Features

- Excellent harmonic performance: < -75 dBc
- Robust performance into antenna mismatch conditions: < -65 dBc harmonics into 5:1 VSWR
- Low current drain: < 10  $\mu$ A Rx
- Low Tx insertion loss 1.0 dB typical
- Integrated low pass filters for PA harmonic suppression

## Description

The SKY14141 is a miniature 4 mm x 4 mm antenna switch module for GSM/GPRS/EDGE 850/900/1800/1900 quad-band mobile phone applications. The device is manufactured using Skyworks proven high volume PHEMT and module technology. The low distortion PHEMT and module design provide the excellent harmonic performance with enough margin to meet system level performance under non-ideal antenna mismatch conditions. Port assignments for GSM 1800 Rx and GSM 1900 Rx are interchangeable; similarly the GSM 850 Rx and GSM 900 Rx ports can be swapped as needed.

## Function Block Diagram and Pin Out



**Electrical Specifications**

**TA = 25 °C, Z<sub>0</sub> = 50 Ω, 0 V ≤ V<sub>LOW</sub> ≤ +0.2 V, 2.8 V ≤ V<sub>HIGH</sub> ≤ +5 V) unless otherwise noted**

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
GSM 850/900 transmit	Insertion loss <sup>(1)</sup> P <sub>IN</sub> = +34.5 dBm, 824–915 MHz	824–915 MHz		1.0	1.2	dB
	Isolation to Rx ports P <sub>IN</sub> = +34.5 dBm, 824–915 MHz	824–915 MHz	25	30		dB
	Input attenuation P <sub>IN</sub> = +34.5 dBm, 824–915 MHz	1648–1830 MHz	26	30		dB
		2472–2745 MHz	20	25		dB
3296–3660 MHz		20	25		dB	
Harmonics P <sub>IN</sub> = +34.5 dBm, 824–915 MHz	1648–1830 MHz	75	85		dBc	
	2472–2745 MHz	75	85		dBc	
GSM 1800/1900 transmit	Insertion loss <sup>(1)</sup> P <sub>IN</sub> = +33 dBm, 1710–1910 MHz	1710–1910 MHz	1.2	1.4		dB
	Isolation to Rx ports P <sub>IN</sub> = +33 dBm, 1710–1910 MHz	1710–1910 MHz	25	30		dB
	Input attenuation P <sub>IN</sub> = +33 dBm, 1710–1910 MHz	3420–3820 MHz	25	30		dB
		5130–5739 MHz	20	25		dB
Harmonics P <sub>IN</sub> = +33 dBm, 1710–1910 MHz	3420–3820 MHz	70	80		dBc	
	5130–5739 MHz	70	80		dBc	
Receive	ANT to Rx port	869–960 MHz		0.8	1.0	dB
		1805–1990 MHz		1.0	1.2	dB
VSWR	Insertion loss state	0.1–2.0 GHz		1.3	1.5	

1. Insertion loss changes by 0.003 dB/°C typical.

**Absolute Maximum Ratings**

Characteristic	Value
RF input power	6 W Max > 900 MHz 0/+5 V control
Control voltage	-0.2 V, +8 V
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, Electrostatic Discharge (ESD) 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 <sub>0</sub>	V <sub>1</sub>	V <sub>2</sub>	V <sub>3</sub>	State
V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	Inactive, no current consumed
V <sub>HIGH</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	GSM 1800/1900 Tx
V <sub>LOW</sub>	V <sub>HIGH</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	GSM 850/900 Tx
V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>HIGH</sub>	V <sub>LOW</sub>	GSM 850/GSM1900 Rx
V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>LOW</sub>	V <sub>HIGH</sub>	GSM 900/GSM1800 Rx

Where 0 V ≤ V<sub>LOW</sub> ≤ +0.2 V and +2.8 V ≤ V<sub>HIGH</sub> ≤ +5 V.  
 Assignments for GSM 1800 Rx and GSM 1900 RX can be exchanged as needed. Similarly, GSM 850 Rx and GSM 900 Rx are identical and can be exchanged as needed.  
 All other states not allowed.

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