SKY14141: GSM Quad-Band Antenna Switch Module

Applications

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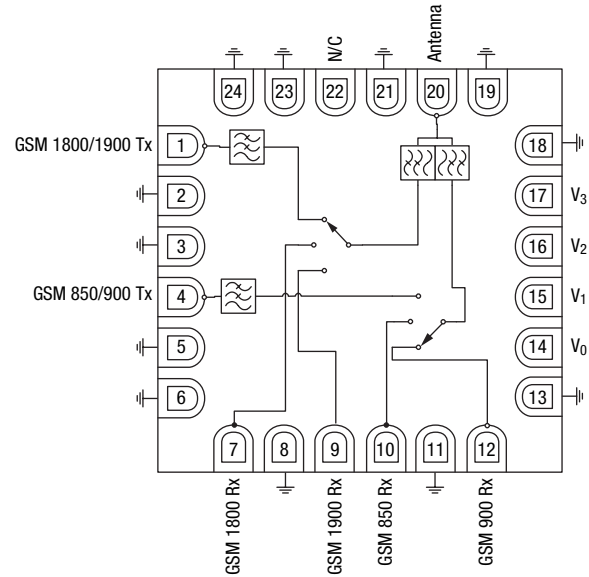
Features

• Excellent harmonic performance: < -75 dBc
• Robust performance into antenna mismatch conditions:
  < -65 dBc harmonics into 5:1 VSWR
• Low current drain: < 10 µA 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_0 = 50 Ω, 0 V ≤ V_{LOW} ≤ +0.2 V, 2.8 V ≤ V_{HIGH} ≤ +5 V) unless otherwise noted

Parameter	Condition	Frequency	Min.	Typ.	Max.	Unit
GSM 850/900 transmit	Insertion loss[1] P_{IN} = +34.5 dBm, 824–915 MHz	824–915 MHz		1.0	1.2	dB
	Isolation to Rx ports P_{IN} = +34.5 dBm, 824–915 MHz	824–915 MHz	25	30		dB
	Input attenuation P_{IN} = +34.5 dBm, 824–915 MHz	1648–1830 MHz 2472–2745 MHz 3296–3660 MHz	26 20 20	30 25 25		dB dB dB
	Harmonics P_{IN} = +34.5 dBm, 824–915 MHz	1648–1830 MHz 2472–2745 MHz	75 75	85 85		dBc dBc
GSM 1800/1900 transmit	Insertion loss[1] P_{IN} = +33 dBm, 1710–1910 MHz	1710–1910 MHz	1.2	1.4		dB
	Isolation to Rx ports P_{IN} = +33 dBm, 1710–1910 MHz	1710–1910 MHz	25	30		dB
	Input attenuation P_{IN} = +33 dBm, 1710–1910 MHz	3420–3820 MHz 5130–5739 MHz	25 20	30 25		dB dB
	Harmonics P_{IN} = +33 dBm, 1710–1910 MHz	3420–3820 MHz 5130–5739 MHz	70 70	80 80		dBc dBc
Receive	ANT to Rx port	869–960 MHz 1805–1990 MHz		0.8 1.0	1.0 1.2	dB 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_0	V_1	V_2	V_3	State
V_{LOW}	V_{LOW}	V_{LOW}	V_{LOW}	Inactive, no current consumed
V_{HIGH}	V_{LOW}	V_{LOW}	V_{LOW}	GSM 1800/1900 Tx
V_{LOW}	V_{HIGH}	V_{LOW}	V_{LOW}	GSM 850/900 Tx
V_{LOW}	V_{LOW}	V_{HIGH}	V_{LOW}	GSM 850/GSM1900 Rx
V_{LOW}	V_{LOW}	V_{Low}	V_{HIGH}	GSM 900/GSM1800 Rx

Where 0 V ≤ V_{LOW} ≤ +0.2 V and +2.8 V ≤ V_{HIGH} ≤ +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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