

DATA SHEET

SKY65206-13: WLAN 802.11b/g Intera™ Front-End Module

Features

- 2.4-2.5 GHz operation
- Advanced InGaP HBT process
- 27 dB small signal gain
- 802.11g linear power at 3.0% EVM: 16 dBm
- 802.11b mask compliant power: 20 dBm
- Temperature compensated directional RF power detector
- GaAs FET 4-control transfer switch
- Low cost 8 x 7 x 1.4 mm plastic package
- Available on tape and reel
- Lead (Pb)-free and RoHS-compliant MSL-3 @ 240 °C per JEDEC J-STD-020

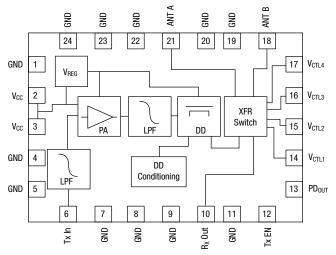
Description

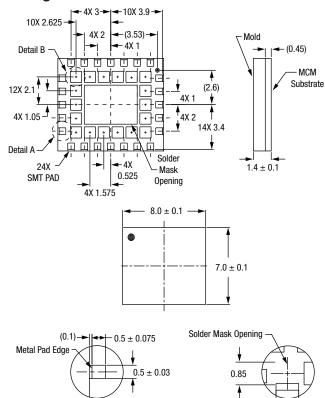
The SKY65206-13 is an integrated Intera RF front-end module for 802.11b/g WLAN applications. A single supply voltage and a positive supply switch control simplifies bias requirements. The PA is manufactured using the Skyworks InGaP HBT process. Modules are 100% RF tested prior to shipment for guaranteed performance. The SKY65206-13 is targeted for high-volume 802.11b/g WLAN access point, PCMCIA, and PC card applications.



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







Package Dimensions

Pin Descriptions

Pin Number	Symbol	Description	
1, 4, 5, 7, 8, 9, 11, 19, 20, 22, 23, 24	GND	Equipotential point. Must be connected to PCB ground via lowest possible impedance.	
2, 3	V _{CC}	DC power supply voltage input to power amplifier and to the internal voltage regulator which biases the internal directional detector. Pins are connected together for current sharing.	
6	Tx IN	Transmitter RF input port. Nominal input impedance = 50 Ω .	
10	Rx OUT	Receiver RF output port. Nominal output impedance = 50 Ω .	
12	Tx EN	High impedance DC control voltage input to enable/disable the power amplifier.	
13	PD _{OUT}	Detected output voltage from directional detector	
14	V _{CTL1}	High impedance DC control voltage input 1 for transfer switch	
15	V _{CTL2}	High impedance DC control voltage input 2 for transfer switch	
16	V _{CTL3}	High impedance DC control voltage input 3 for transfer switch	
17	V _{CTL4}	High impedance DC control voltage input 4 for transfer switch	
18	ANT B	RF antenna I/O port B. Nominal impedance = 50 Ω .	
21	ANT A	RF antenna I/O port A. Nominal impedance = 50 Ω .	

Absolute Maximum Ratings

Detail A

Characteristic	Value		
RF input power	20 dBm		
Supply voltage	4 V		
Supply current	600 mA		
Operating temperature	-40 °C to +85 °C		
Storage temperature	-65 °C to +85 °C		
Moisture sensitivity level	MSL-3 @ 240 °C		
θ _{JC}	55 °C/W		

Detail

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

MODE	V _{CTL1} (V)	V _{CTL2} (V)	V _{CTL3} (V)	V _{CTL4} (V)	V _{CC} (V)	Tx EN (V)
Tx-ANTA	3.3	0	0	0	3.3	3
Rx-ANTA	0	3.3	0	0	3.3	0
Rx-ANTB	0	0	3.3	0	3.3	0
Tx-ANTB	0	0	0	3.3	3.3	3

All other conditions not recommended.

General RF Receive Electrical Specifications

$\textbf{T}_{\textbf{A}}$ = 25 °C, $\textbf{Z}_{\textbf{0}}$ = 50 $\Omega,$ unless otherwise noted

Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit
Frequency range	F		2400		2500	MHz
Insertion loss	IS ₂₁ I	Small signal		1		dB
In-band ripple	I∆S ₂₁ I	Small signal		0.1		dB
Input return loss	IS ₁₁ I	Small signal		19		dB
Output return loss	IS ₂₂ I	Small signal		17		dB

General RF Transmit Electrical Specifications

T_A = 25 °C, V_{CC} = 3.3 V, Z_0 = 50 Ω , unless otherwise noted

Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit
Frequency range	F		2400		2500	MHz
Gain	IS ₂₁ I	Small signal	25	27	31	dB
Gain variation over frequency	I∆S ₂₁ I	Small signal		1.4		dB
Quiescent current	I _{CQ}	(No RF signal)		0.12		A
Current consumption	I _{CC}	CW at P _{OUT} = 16 dBm		0.17	0.19	A
Input return loss	IS ₁₁ I	Small signal		11		dB
Output return loss	IS ₂₂ I	Small signal		19		dB
Output P1dB	P _{1 dB}	CW		23		dBm
Detector voltage	PD _{OUT}	CW at $P_{OUT} = 4 \text{ dBm}$		0.93		V
Detector voltage	PD _{OUT}	CW at P _{OUT} = 12 dBm		0.826		V
Detector voltage	PD _{OUT}	CW at P _{OUT} = 21 dBm		0.486		V

802.11g Electrical Specifications

OFDM Modulation, 54 Mbps, $T_A = 25 \text{ °C}$, $V_{CC} = 3.3 \text{ V}$

Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit
Linear power at 2.442 GHz	P _{OUT}	54 Mbps at 3% EVM		16.4		dBm
Current consumption	I _{CC}	54 Mbps at linear power		0.17		А

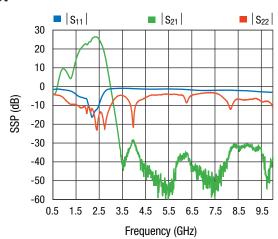
802.11g Electrical Specifications

CCK Modulation, 11 Mbps, $T_A = 25 \text{ °C}$, $V_{CC} = 3.3 \text{ V}$

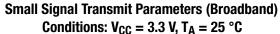
Parameter	Symbol	Condition	Min.	Тур.	Max.	Unit
Linear power at 2.442 GHz	P _{OUT}	11 Mbps		20		dBm
Current consumption	I _{CC}	11 Mbps at compliant power		0.230		А

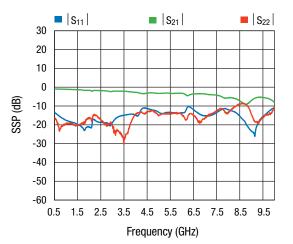
802.11b data is taken with a raised cosine filter and an alpha factor of 0.7.

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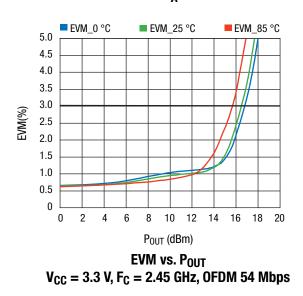


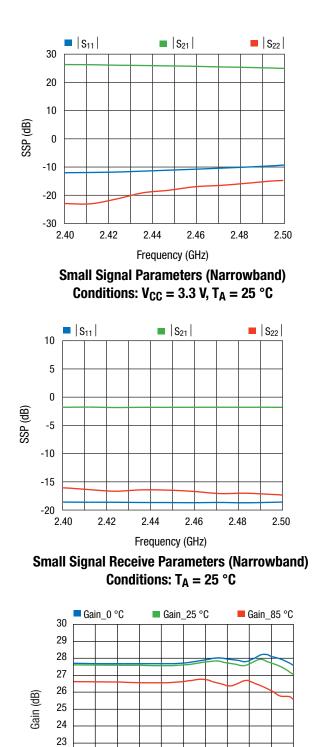
Typical Performance Data





Small Signal Receive Parameters (Broadband) Conditions: $T_A = 25 \ ^{\circ}C$





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22

21 20

0 2 4 6 8

10 12

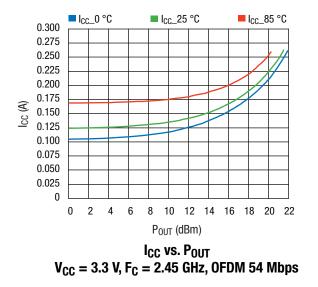
POUT (dBm)

Gain vs. POUT

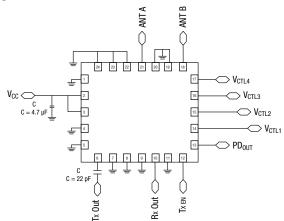
 $V_{CC} = 3.3 V, F_{C} = 2.442 GHz, OFDM 54 Mbps$

14 16

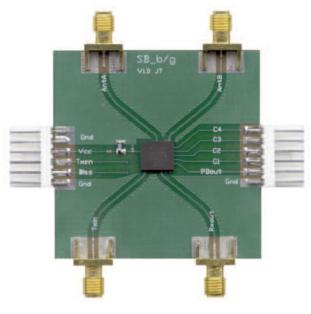
18 20

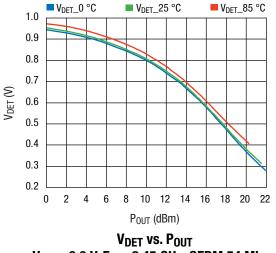


Application Circuit



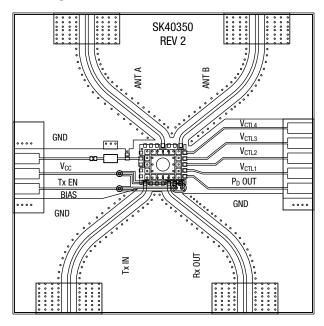
Board Photograph





 $V_{CC} = 3.3 \text{ V}, F_C = 2.45 \text{ GHz}, \text{ OFDM 54 Mbps}$

Board Layout



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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Control Pin Table

Pin Name	Application Board Port Name
V _{CTL1}	C ₁
V _{CTL2}	C ₂
V _{CTL3}	C ₃
V _{CTL4}	C ₄

Test Procedure

Use the following procedure to set up the SKY65206 evaluation board for testing. Refer to the Application Circuit and Board Layout for guidance:

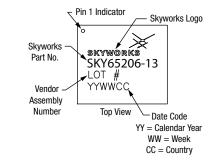
- Connect a 3.3 V supply to V_{CC}. If available, enable the current limiting function of the power supply to 600 mA.
- 2. Connect a 3.3V supply to V_{CTL} 1–4. See Truth Table. Unused V_{CTL} pins must be grounded or set to 0 V. Do not float the connections.
- 3. Connect a 3 V supply to Tx EN. See Truth Table.
- 4. No connection to BIAS pin.
- 5. Connect a DVM to V_{DET}.
- Connect a signal generator to the RF signal input port. Set it to the desired RF frequency at a power level of -15 dBm or less to the evaluation board, but do not enable the RF signal.
- 7. Connect a spectrum analyzer to the RF signal output port.

IMPORTANT: Terminate all unused ports in 50 Ω .

- 8. Enable the power supplies.
- 9. Enable the RF signal.
- 10. Take measurements.

CAUTION: If any of the input signals exceed the rated maximum values, the SKY65206 Evaluation Board can be permanently damaged.

Branding Specifications



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