

ADVANCED DATA SHEET

SKY65214: WLAN 802.11a/b/g Dual-Band Front-End Module

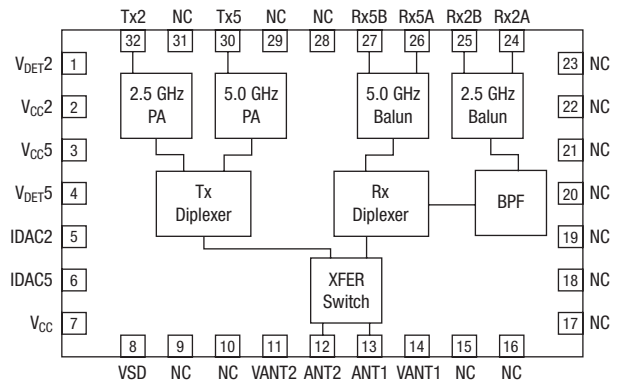
Features

- Fully integrated front-end module.
- Advanced InGaP HBT PAs
- GaAs PHEMT transfer switch
- Includes second harmonic filtering
- P_{OUT}: 19 dBm (11b), 16 dBm (11g), 15 dBm (11a)
- Gain: 25 dB (11b,g), 23 (11a)
- 3.3 V operation
- Built in dual power detection
- Balanced RF receive outputs
- Low cost plastic package
- Available on tape and reel

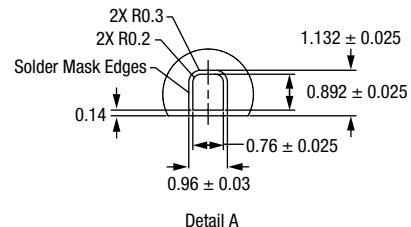
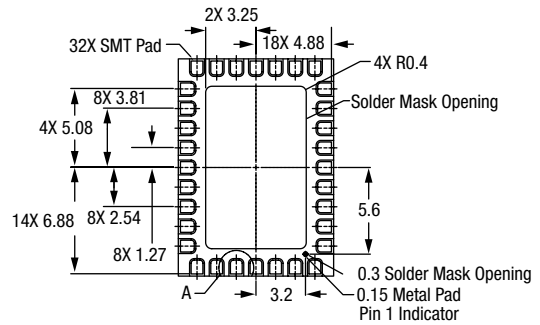
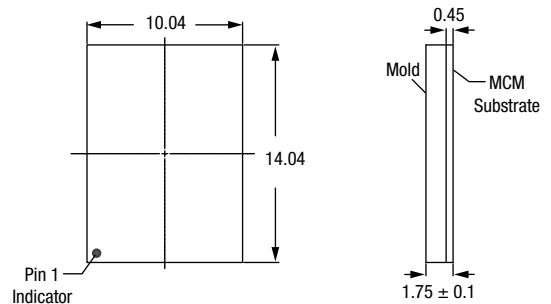
Description

The SKY65214 is a fully integrated RF front-end module for dual-band 802.11a/b/g WLAN applications. The GaAs HBT Power amplifiers provide individual power control as well as power detection functionality. PAs are manufactured on our advanced InGaP HBT process. The GaAs PHEMT broadband switch combines T/R and antenna diversity. No additional filtering is required external to the module. Modules are 100% RF tested prior to shipment for guaranteed performance. SKY65214 is targeted for high-volume WLAN applications.

Block Diagram



Package Dimensions (mm)



DC Voltage Control Table

MODE	VANT1	VANT2	V _{CC 2}	V _{CC 5}	IDAC2	IDAC5	V _{CC}	VSD
Tx2 to ANT1	0.0	3.3	3.3	3.3	1.6	0.0	3.3	3.3
Tx2 to ANT2	3.3	0.0	3.3	3.3	1.6	0.0	3.3	3.3
Rx2 to ANT1	3.3	0.0	3.3	3.3	0.0	0.0	0.0	0.0
Rx2 to ANT2	0.0	3.3	3.3	3.3	0.0	0.0	0.0	0.0
Tx5 to ANT1	0.0	3.3	3.3	3.3	0.0	1.6	3.3	3.3
Tx5 to ANT2	3.3	0.0	3.3	3.3	0.0	1.6	3.3	3.3
Rx5 to ANT1	3.3	0.0	3.3	3.3	0.0	0.0	0.0	0.0
Rx5 to ANT2	0.0	3.3	3.3	3.3	0.0	0.0	0.0	0.0

All data presented within this data sheet uses these bias condition unless otherwise specified.

All data presented within this data sheet is taken at a temperature of: TA = 25 °C, unless otherwise specified.

Pin Assignments

Pin	Symbol	Description
1	V _{DET2}	Detector output voltage for the 2.0 GHz path.
2	V _{CC2}	DC voltage supply to the 2.0 GHz PA.
3	V _{CC5}	DC voltage supply to the 5.0 GHz PA.
4	V _{DET5}	Detector output voltage for the 5.0 GHz path.
5	IDAC2	DC control voltage to regulate the 2.0 GHz PA output power.
6	IDAC5	DC control voltage to regulate the 5.0 GHz PA output power.
7	V _{CC}	DC supply voltage to the bias controller.
8	VSD	DC control voltage to enable/disable the bias controller.
9	GND	There in no connection to this pin, therefore it is grounded.
10	GND	There in no connection to this pin, therefore it is grounded.
11	VANT2	DC control voltage to the diversity antenna switch.
12	ANT2	RF antenna output port 2.
13	ANT1	RF antenna output port 2.
14	VANT1	DC control voltage to the diversity antenna switch.
15	GND	There in no connection to this pin, therefore it is grounded.
16	GND	There in no connection to this pin, therefore it is grounded.
17	GND	There in no connection to this pin, therefore it is grounded.
18	GND	There in no connection to this pin, therefore it is grounded.
19	GND	There in no connection to this pin, therefore it is grounded.
20	GND	There in no connection to this pin, therefore it is grounded.
21	GND	There in no connection to this pin, therefore it is grounded.
22	GND	There in no connection to this pin, therefore it is grounded.
23	GND	There in no connection to this pin, therefore it is grounded.
24	Rx2A	Single-ended 2.0 GHz receive output port.
25	Rx2B	Single-ended 2.0 GHz receive output port.
26	Rx5A	Single-ended 5.0 GHz receive output port.
27	Rx5B	Single-ended 5.0 GHz receive output port.
28	GND	There in no connection to this pin, therefore it is grounded.
29	GND	There in no connection to this pin, therefore it is grounded.
30	Tx5	RF 5.0 GHz transmit input port.
31	GND	There in no connection to this pin, therefore it is grounded.
32	Tx2	RF 2.0 GHz transmit input port.

General Receive Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency band	F		2.4		2.500	GHz
Insertion loss	S_{21} IL	Small signal		3.5		dB
In-band ripple	ΔS_{21} IL	Small signal		0.3		dB
Rejection loss	S_{21} RL	DC–1.8 GHz		20.0		dB
Rejection loss	S_{21} RL	5.0–8.0 GHz		20.0		dB
Input return loss	S_{11}	Small signal		12.0		dB
Output return loss	S_{22}	Small signal		12.0		dB
Tx-Rx isolation	S_{21} ISO	Small signal		20.0		dB
ANT1 to ANT2 diversity isolation	S_{21} DIV	Small signal		17.0		dB
Frequency band	F		4.9		5.925	GHz
Insertion loss	S_{21} IL	Small signal		4.0		dB
In-band ripple	ΔS_{21} IL	Small signal		0.3		dB
Rejection loss	S_{21} RL	DC–2.5 GHz		20.0		dB
Rejection loss	S_{21} RL	7.0–11.0 GHz		20.0		dB
Input return loss	S_{11}	Small signal		12.0		dB
Output return loss	S_{22}	Small signal		12.0		dB
Tx-Rx isolation	S_{21} ISO	Small signal		20.0		dB
ANT1 to ANT2 diversity isolation	S_{21} DIV	Small signal		17.0		dB

General Transmit Specifications

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency band	F		2.4		2.500	GHz
Gain	S_{21} G	Small signal		28.0		dB
Gain flatness	ΔS_{21} G	Small signal		0.2		dB
Input return loss	S_{11}	Small signal		12.0		dB
Output return loss	S_{22}	Small signal		12.0		dB
1 dB compression	P_1 dB	CW		23.0		dBm
Tx-Rx isolation	S_{21} ISO	Small signal		20.0		dB
ANT1 to ANT2 diversity isolation	S_{21} DIV	Small signal		17.0		dB
Detector voltage	V_{DET}	$P_{OUT} = 0$ dBm		0.100		V
Frequency band	F		4.9		5.925	GHz
Gain	S_{21} G	Small signal		24.0		dB
Gain flatness	ΔS_{21} G	Small signal		0.2		dB
Input return Loss	S_{11}	Small signal		12.0		dB
Output return Loss	S_{22}	Small signal		12.0		dB
1 dB compression	P_1 dB	CW		21.0		dBm
Tx-Rx isolation	S_{21} ISO	Small signal		20.0		dB
ANT1 to ANT2 diversity isolation	S_{21} DIV	Small signal		17.0		dB
Detector voltage	V_{DET}	$P_{OUT} = 0$ dBm		0.100		V

802.11a Transmit Specifications

OFDM Modulation, Datarate: 54 Mbps

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency band	F		4.9		5.925	GHz
Linear power	P _{OUT}	4.5% EVM		15.00		dBm
Current consumption	I _{CC}	Linear power		190.00		mA
Detector voltage	V _{DET}	Linear power		0.56		V

802.11b Transmit Specifications

CCK Modulation, Datarate: 11 Mbps

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency band	F		2.4		2.5	GHz
Mask compliant power	P _{OUT}	Mask compliant power		19.0		dBm
Current consumption	I _{CC}	Mask compliant power		230.0		mA
Detector voltage	V _{DET}	Mask compliant power		0.80		V

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

802.11g Transmit Specifications

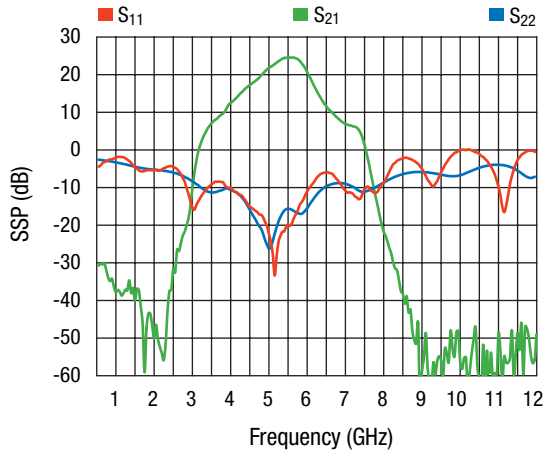
OFDM Modulation, Datarate: 54 Mbps

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Frequency band	F		2.4		2.5	GHz
Linear power	P _{OUT}	4.5% EVM		18.0		dBm
Current consumption	I _{CC}	Linear power		170.0		mA
Detector voltage	V _{DET}	Linear power		0.7		V

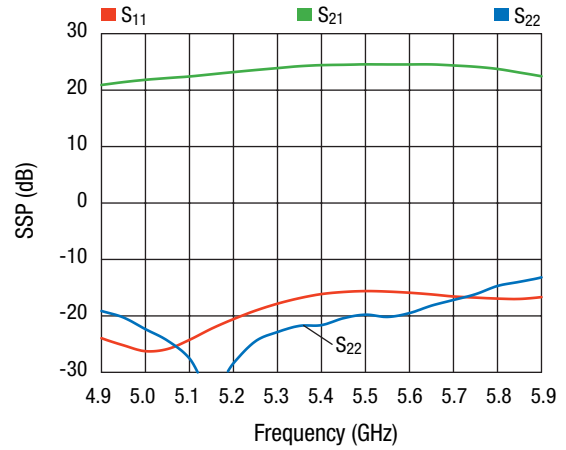
Absolute Maximum Ratings

Characteristic	Value
Supply voltage	5.0 V
Supply current	500 mA
Regulator supply voltage	2.7–3.3 V
Operating temperature	-40 to +85 °C
Storage temperature	-65 to +85 °C
RF input power	+10 dBm
Moisture sensitivity	MSL3/240

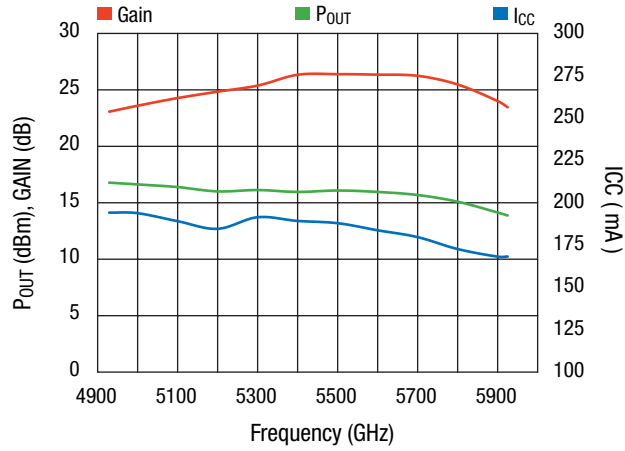
Typical Performance Data



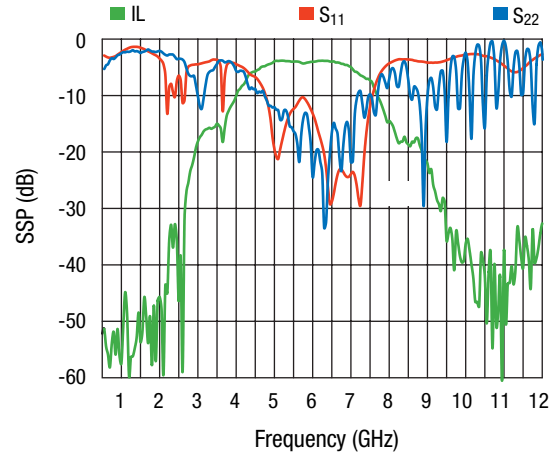
802.11a Transmit Small Signal Parameters



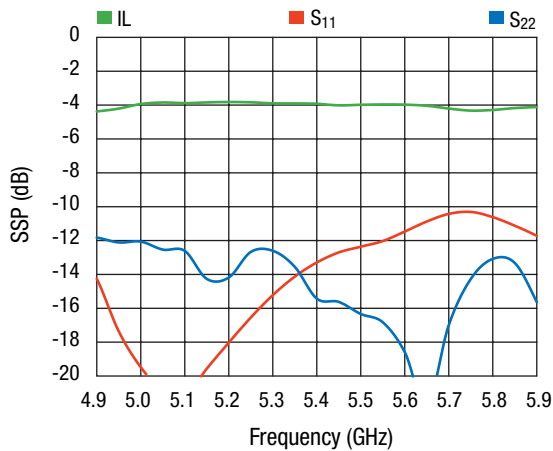
802.11a Transmit Small Signal Parameters



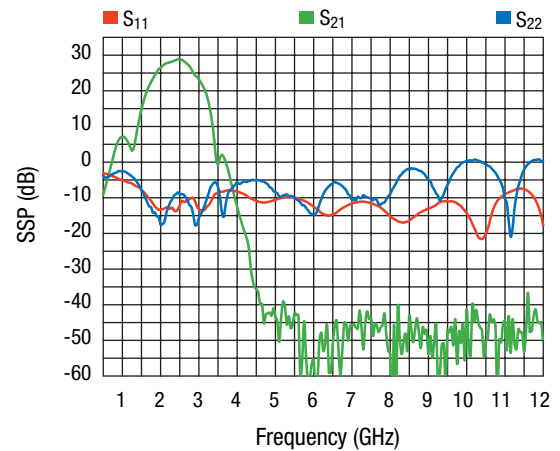
**802.11a Transmit Gain, P_{OUT}, and I_{CC} vs. Frequency
OFDM modulation, 54 Mbps, 4.5% EVM, TA = 25 °C**



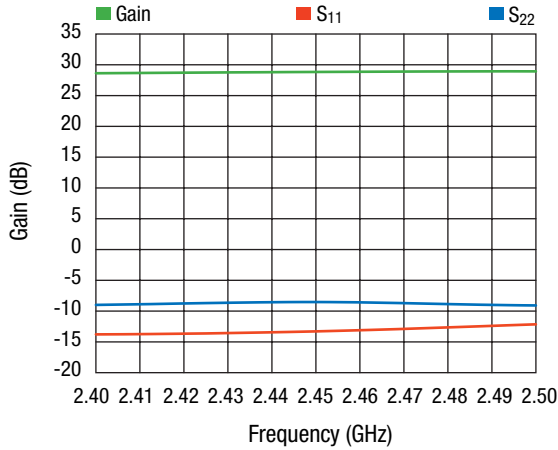
802.11a Receive Small Signal Parameters



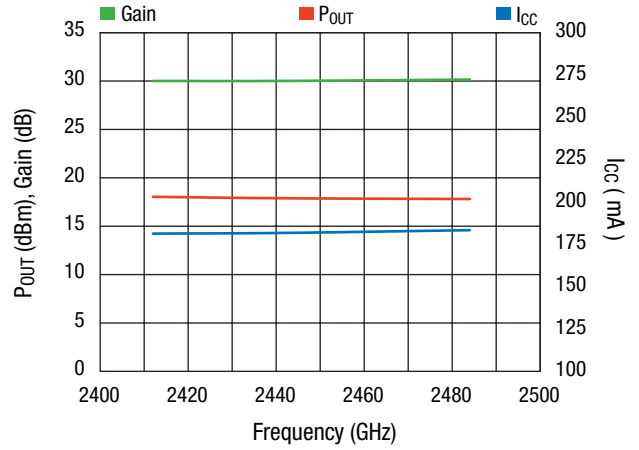
802.11a Receive Small Signal Parameters



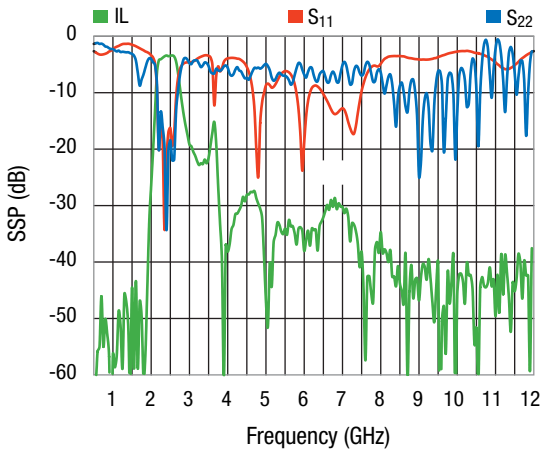
802.11b/g Transmit Small Signal Parameters



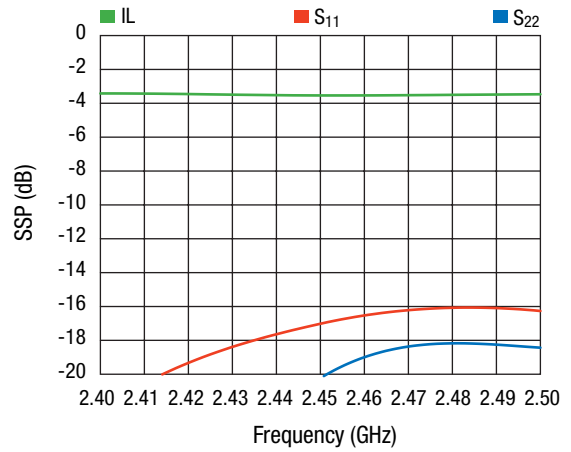
802.11b/g Transmit Small Signal Parameters



802.11g Transmit Gain, P_{OUT}, and I_{CC} vs. Frequency OFDM Modulation, 54 Mbps, 4.5% EVM, TA = 25 °C

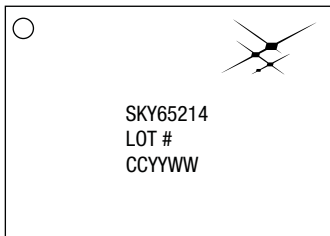


802.11b/g Receive Small Signal Parameters

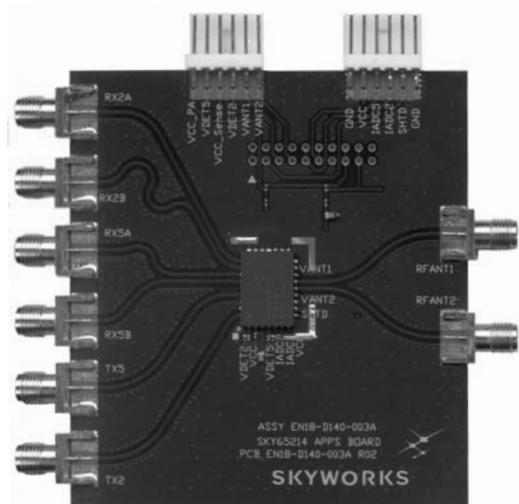


802.11b/g Receive Small Signal Parameters

Device Branding Specifications



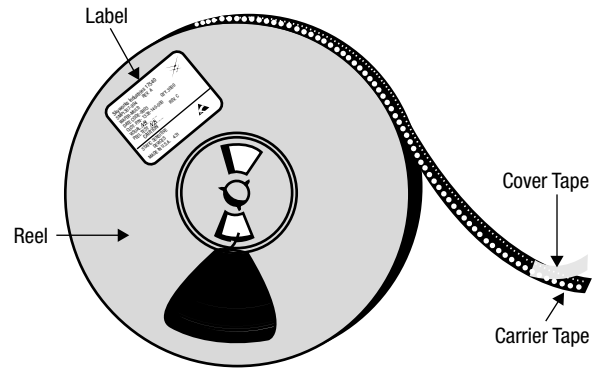
Applications Board



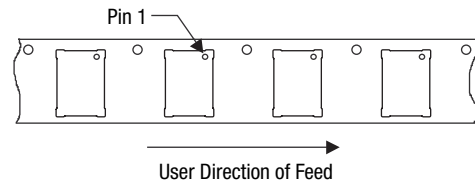
Tape and Reel Specifications

Description	Sym.	QFN 3 x 3
Cavity		
Length	A ₀	10.35 ± 0.1
Width	B ₀	14.35 ± 0.1
Depth	K ₀	2.0 ± 0.1
Pitch	P ₁	12.0 ± 0.1
Bottom hole diameter	D ₁	1.5 ± 0.1
Perforation		
Diameter	D ₀	1.55 ± 0.05
Pitch	P ₀	4.0 ± 0.1
Position	E ₁	1.75 ± 0.1
Carrier Tape		
Width	W	24.0 ± 0.3
Thickness	T	0.3 ± 0.05
Cover Tape		
Width	W ₁	20.35 ± 0.01
Tape thickness	T ₁	0.051 ± 0.01
Distance		
Cavity to perforation (width direction)	F	11.5 ± 0.1
Cavity to perforation (length direction)	P ₂	2.0 ± 0.1

Note: All dimensions are in mm.



Tape Dimensions



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