BHWR250N

Production Datasheet

2.4GHz Active Integrated Antenna with Low Noise Amplifier

Description

BHWR250N is a complete 2.4GHz Receive Front-End solution from BHW's RF Active integrated Antenna (RFAiA™) product family. It integrates a low noise amplifier with ultra-low 1dB total noise figure and 12dB gain and a compact antenna with high efficiency and very stable VSWR under various PCB size and housing conditions, all into a compact 16x12mm design.
BHWR250N can be easily surface-mounted to the main product board without requiring any additional impedance matching, resulting in significantly simplified RF design and shorter product development cycle.

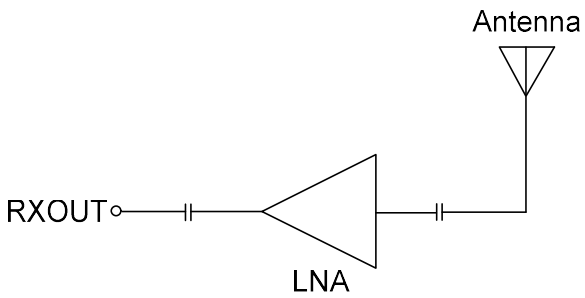
Key Features

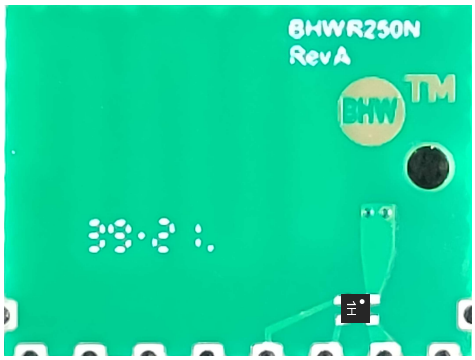
- 2.4-2.5GHz Operation Frequency Range
- Operating Voltage: 1.2~4.2V
- LNA Noise Figure: 1.0dB; Gain: 12dB
- LNA Current: 7mA at Vdd=3.3V (Adjustable)
- Stable VSWR over PCB/Housing Variations
- Excellent Suppression of Cellular Signals
- Robust ESD Protection
- Compact 16x12mm footprint for SMT

Key Applications

- IoT Modules including ZigBee/Thread/Matter
- Remote Control
- Wireless Audio/Video
- Generic 2.4GHz Receiver Designs

Functional Block and Product Information

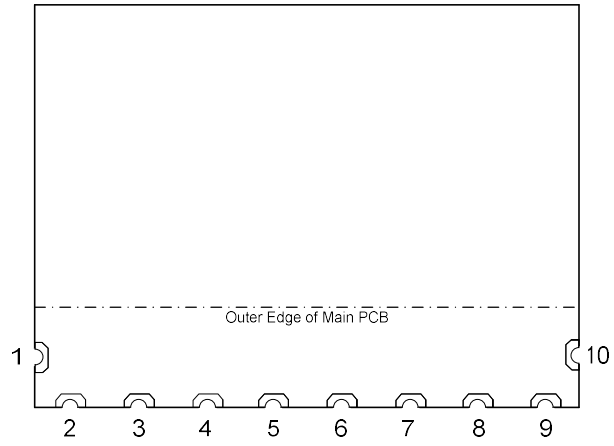




16x12x0.6mm PCB (with BHWL161)

2.4GHz Active Integrated Antenna with Low Noise Amplifier

Pin Assignment and Pin Description



(Top "See-Through" View)

Pin Number	Pin Name	Description
6	VEN	LNA Enable
7	VDD	DC Supply Voltage
8	RF	Rx Output Port
1,2,3,4,5,9,10	GND	Connect to GND on Main PCB

Absolute Maximum Ratings

Parameter		Rating	Unit
Maximum VDD Supply Voltage		5	V
Maximum Control Voltage		3.6	V
Maximum VDD Supply Current		25	mA
Maximum Input Power		+10	dBm
Junction Temperature		+150	°C
Operation Temperature		-40 to +85	°C
Storage Temperature		-40 to +150	°C
Moisture Sensitivity Level		MSL1	

Note: Do not exceed any single or combination of the above parameters. Sustained operation at or above the Absolute Maximum Ratings may result in permanent damage to the device. Maximum Input Power Rating assumes 50-Ohm load impedance.

2.4GHz Active Integrated Antenna with Low Noise Amplifier

Electrical Specifications

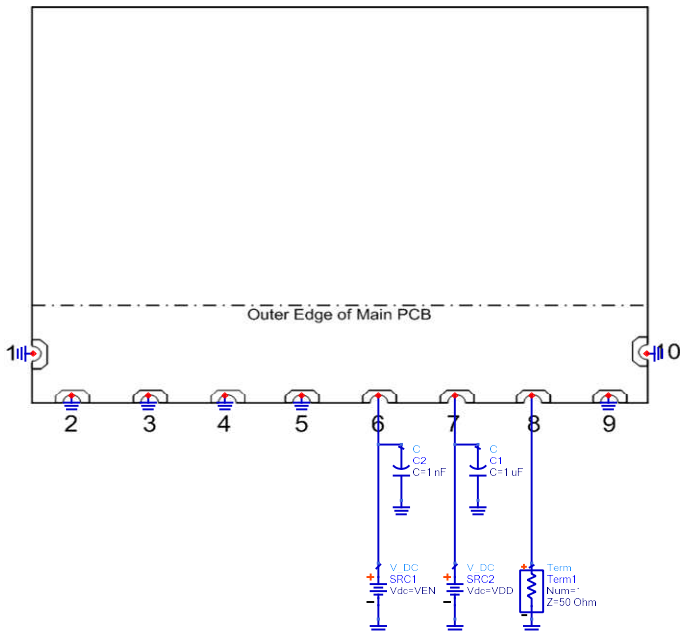
Parameter	Condition	Specification			Unit
		Min.	Typ.	Max.	
Operating Frequency		2.4		2.5	GHz
Operating Voltage	VDD	1.2	3.3	3.6	V
Logic Control Voltage	VEN	1.2	3.3	3.6	V
Quiescent Current*	VDD=VEN=3.3V,No RF Input		7*		mA
Shutdown Current	VDD=3.3V, VEN=0			1	uA
Small-Signal Gain	Pin=-30dBm		12		dB
Noise Figure			1.0		dB
Input P1dB	VDD=3.3V		0		dBm
Input VSWR			1.7:1**		dB

*LNA current can be further reduced with an external resistor on VEN pin.

**VSWR varies slightly with different plastic covers but is much less sensitive than PIFA antennas.

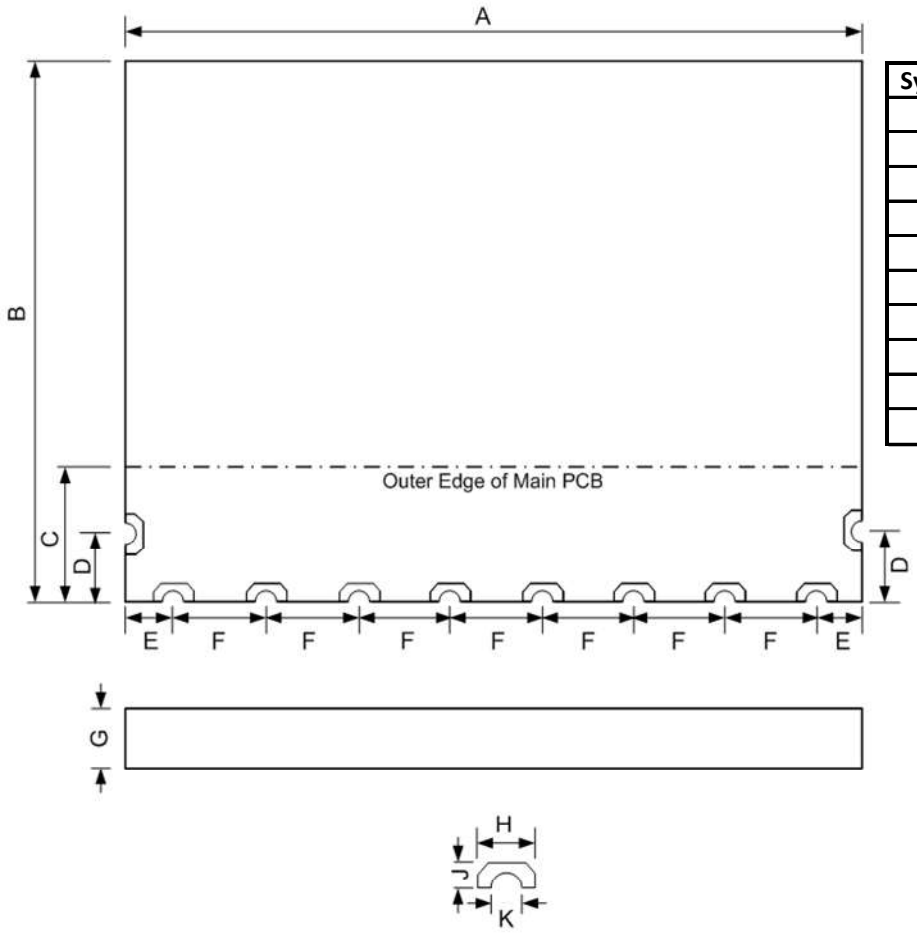
Application Schematic

(Refer to BHW AppNote #022 for Details)



2.4GHz Active Integrated Antenna with Low Noise Amplifier

Mechanical Specifications



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	15.9	16	16.1
B	11.9	12	12.1
C	2.9	3	3.1
D	1.4	1.5	1.6
E	0.9	1	1.1
F	1.9	2	2.1
G	0.65	0.7	0.75
H	0.95	1	1.05
J	0.45	0.5	0.55
K	0.55	0.6	0.65