



5.8GHz Active Integrated Antenna with LNA and Switch

Description

BHWR580L is a complete RF Front-End solution from BHW's RF Active integrated Antenna (RFAiA™) product family. It integrates a low noise amplifier with ultra-low 1.7dB total noise figure and 10dB gain, and a pair of antennas for Tx/Rx and very stable VSWR under various PCB size and housing conditions, all into a compact 16x12mm design. The separate Tx/Rx antenna architecture minimizes switch loss and allows the insertion of any power amplifier to further boost the transmit power. BHWR580L 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.

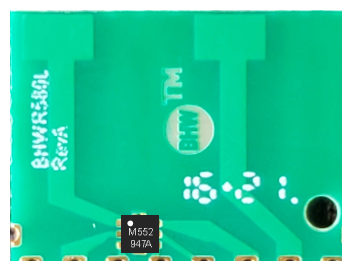
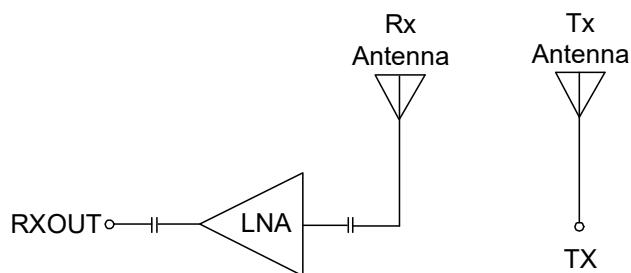
Key Features

- 5.7-5.85GHz Operation Frequency Range
- Rx Noise Figure: 1.7dB; Gain: 10dB
- LNA Current: 12mA (3.3V)
- No External Matching Required
- Separate Tx/Rx Antenna Architecture
- Option for Insertion of Transmit PA
- ESD Protection on All I/O Ports
- Compact 16x12mm footprint for SMT

Key Applications

- 5.8GHz Wireless Audio/Video
- 5.8GHz Data Transmission
- UAV/Drones
- Remote Control
- Generic 5GHz TDD Radio Designs

Functional Block and Product Information

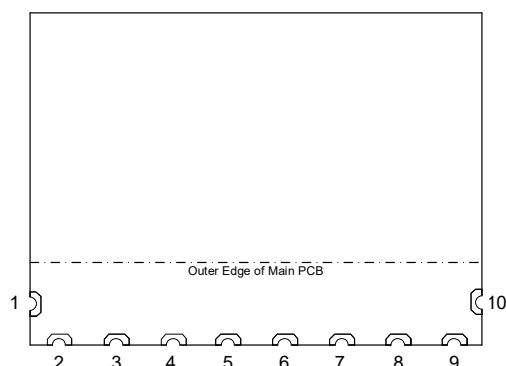


16x12x0.6mm PCB (After BHW552 Assembly)



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Pin Assignment and Pin Description



(Top “See-Through” View)

Pin Number	Pin Name	Description
3	RXOUT	LNA Output Port
4	VDD	DC Supply Voltage
5	CRX	Logic Control Voltage for Rx
8	TX	TX Antenna Port
1,2,6,7,9,10	GND	Connect to GND on Main PCB

Absolute Maximum Ratings

Parameter	Rating	Unit
Maximum VDD Supply Voltage	4.5	V
Maximum Control Voltage	3.6	V
Maximum VDD Supply Current	50	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.



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Electrical Specifications

Receive Mode: VDD=CRX=3.3V

Parameter	Condition	Specification			Unit
		Min.	Typ.	Max.	
Operating Frequency		5.7		5.85	GHz
Operating Voltage	VDD	1.2	3.3	4.5	V
Logic Control Voltage	For CRX=High	1.2	3.3	3.6	V
Quiescent Current*	VDD=CRX=3.3V, No RF Input		12*		mA
Shutdown Current	VDD=3.3V, CRX=0V			1	uA
Small-Signal Gain	Pin=-30dBm		10		dB
Noise Figure			1.7		dB
Input P1dB	VDD=3.3V		+3		dBm
Input VSWR			1.7:1		dB

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

Transmit Antenna:

Parameter	Condition	Specification			Unit
		Min.	Typ.	Max.	
Operating Frequency		5.7		5.85	GHz
Input VSWR			1.7:1	2:1	dB
Average Gain			TBD		dBi
Radiation Efficiency			TBD		%
Max. Input Power			30		dBm



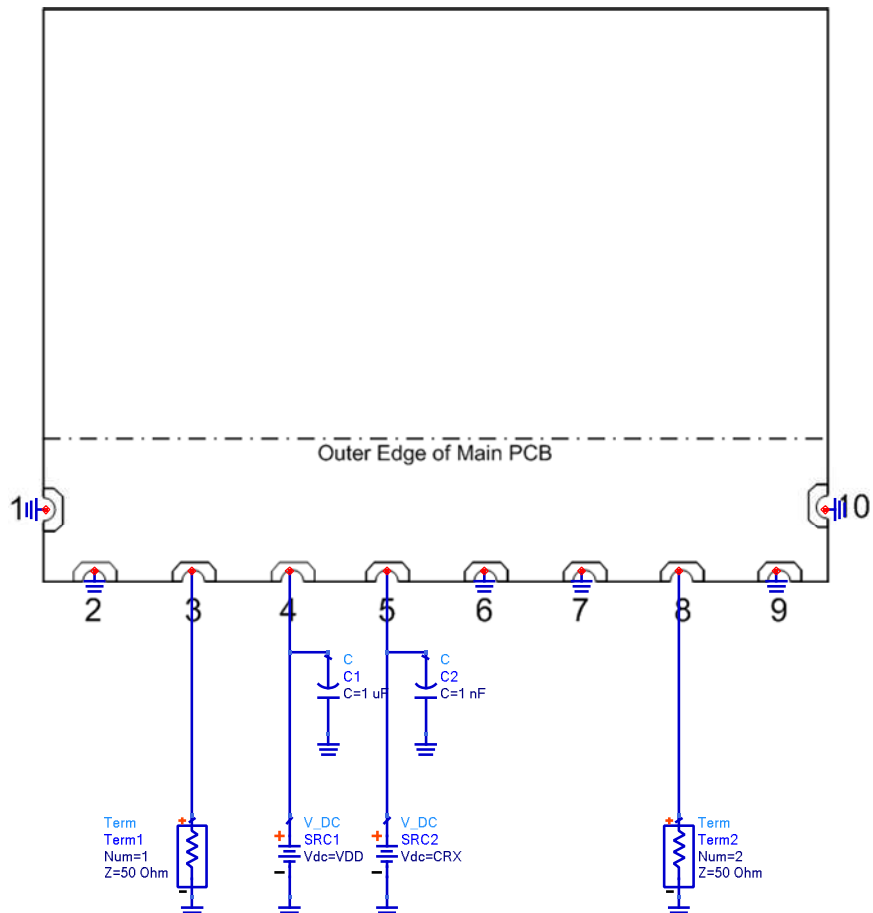
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Transmit/Receive Control

VDD	CRX	Mode of Operation
0	0	All Off
1	0	Transmit
1	1	Receive (LNA On)

Application Schematic

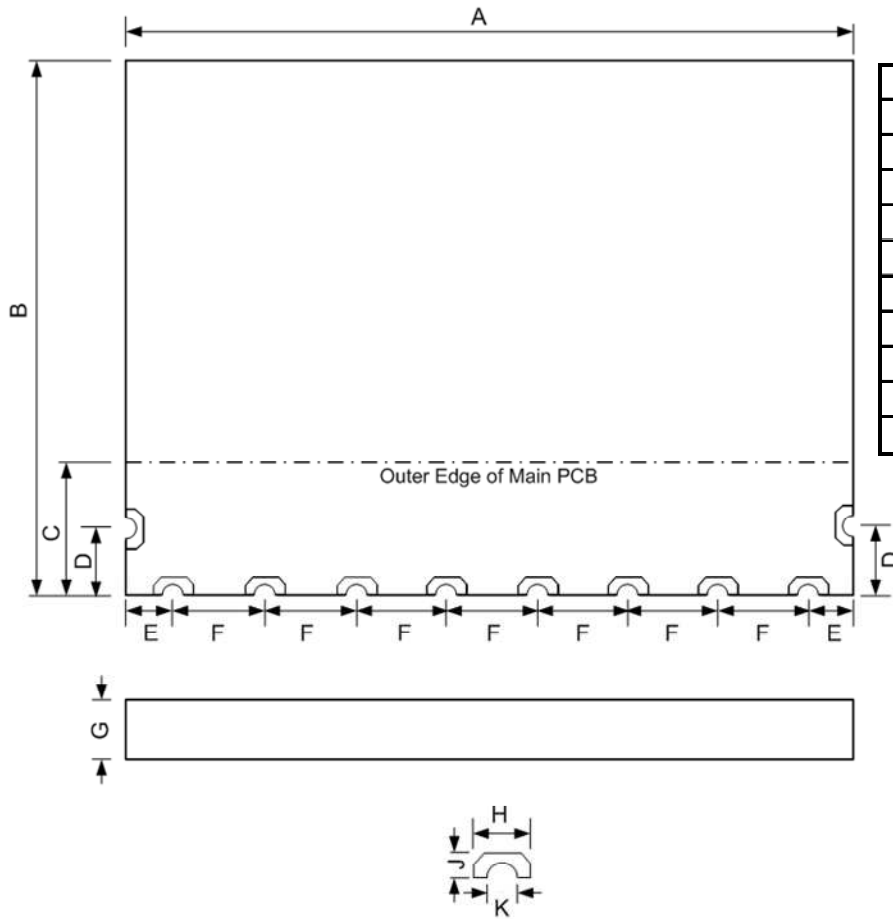
(Refer to BHW AppNote #024 for Details)





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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	0.85	0.9	0.95
J	0.4	0.45	0.5
K	0.55	0.6	0.65