BHWR250F

Production Datasheet

2.4GHz Flex PCB Magnetic Dipole Antenna

Description

Occupying approximately one-third of a penny and implemented in ultra-thin 0.2mm flex PCB, BHWR250F is a complete, self-contained half-wavelength magnetic dipole antenna engineered for 2.4GHz embedded applications with the most stringent space limitations. BHWR250F can be simply connected to the RF port of any 2.4GHz systems using standard IPX/UFL cable assembly, without the need for any additional ground plane or impedance matching. The foldable, patent-pending design has overcome significantly the VSWR sensitivity typical of electrically small antennas (ESAs), and provides reliable, high efficiency radiation for a vast range of wireless solutions such as BLE audio, beacons, wearables, electronic shelf label (ESL), medical as well as Wi-Fi or any other wireless devices in the 2.4-2.5GHz frequency band.

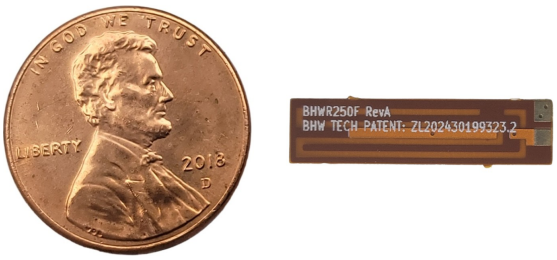
Key Features

- Foldable Flex PCB Design
- Miniature Size: 5x20x0.2mm
- 2.4-2.5GHz Operation Frequency Range
- VSWR < 2:1 over 2.4-2.5GHz
- High Efficiency: 56% at 2.45GHz
- Stable VSWR over Cable Assemblies
- No Need for Ground Plane for Operation

Key Applications

- Bluetooth Embedded Solutions
- LE Audio, Auracast, ESL, Channel Sounding
- Wi-Fi 3/4/5/6/6E/7
- ZigBee/Thread/Matter IoT Devices
- Generic 2.4GHz Radio Designs
- FPC / LDS Antenna Alternatives

Product Information



5x20x0.2mm Flex PCBA for IPX/UFL Cable Assembly

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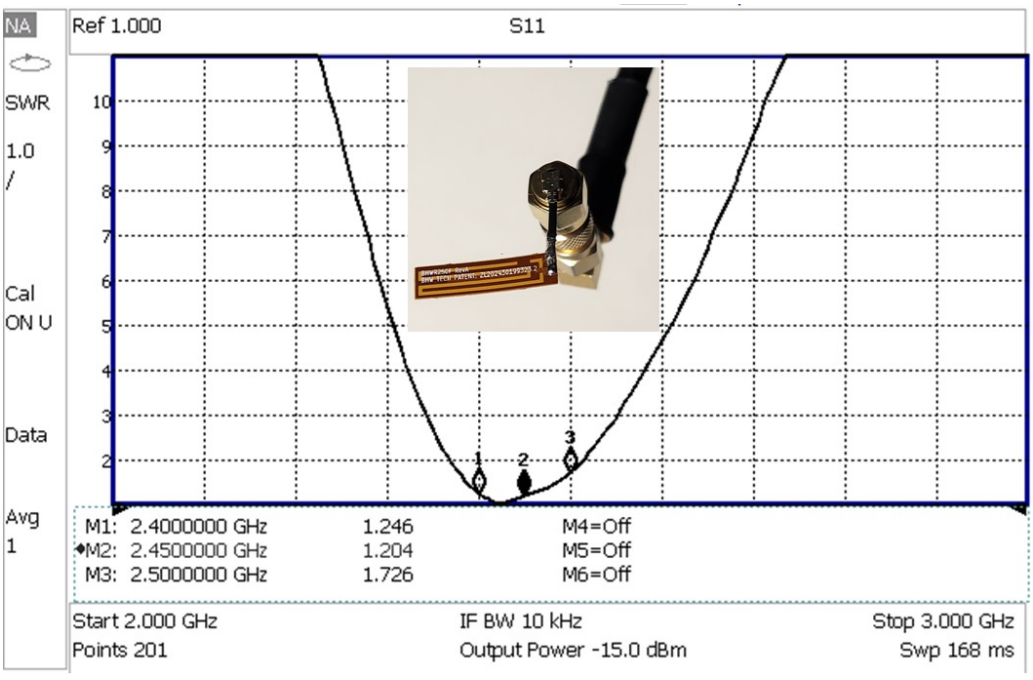
Electrical and Mechanical Specifications*

Parameter	Condition	Specification			Unit
		Min.	Typ.	Max.	
Operating Frequency		2.4		2.5	GHz
Peak Gain			2.2	2.7	dBi
Radiation Efficiency			50	56	%
Input VSWR	Typical Cable & PCB Assembly		2:1	3:1	
Height	H		20		mm
Width	W		5		mm
Thickness	T		0.2		mm

Typical In-Band Input VSWR



Typical measured standalone VSWR with short (15mm) IPX cable and IPX-to-SMA adapter

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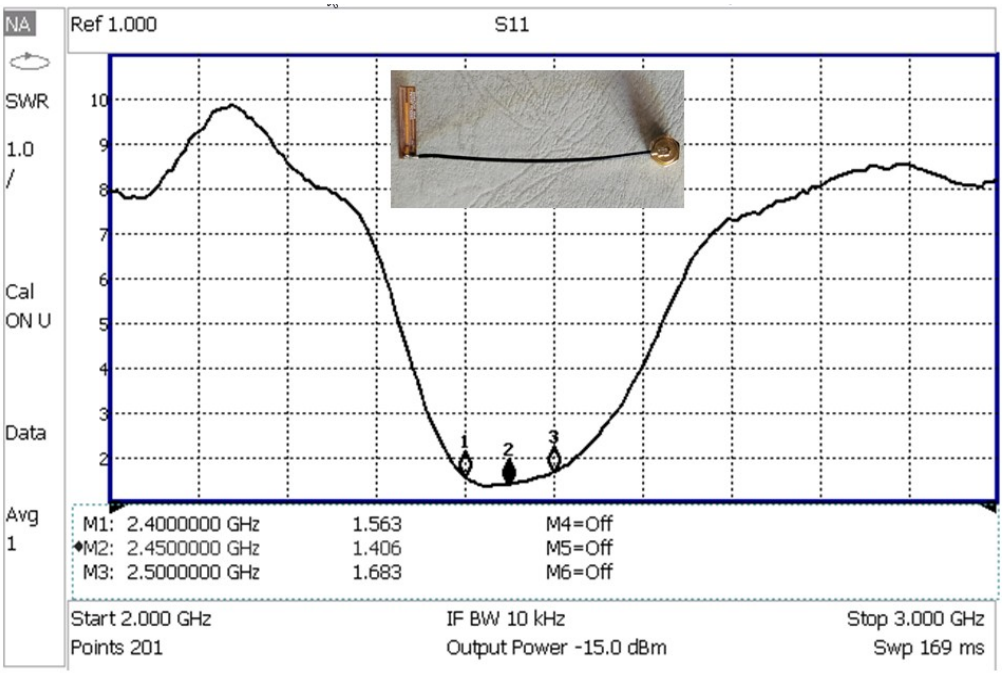
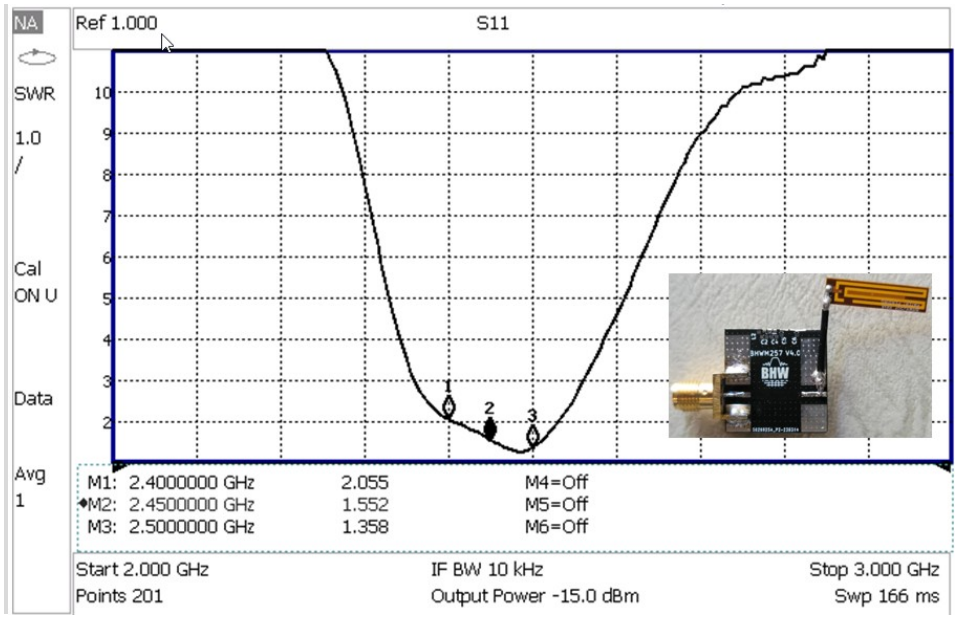


Typical measured standalone VSWR with 3-inch long IPX cable and IPX-to-SMA adapter



Typical measured VSWR when soldered directly to a 2x2cm PCB with a short IPX cable

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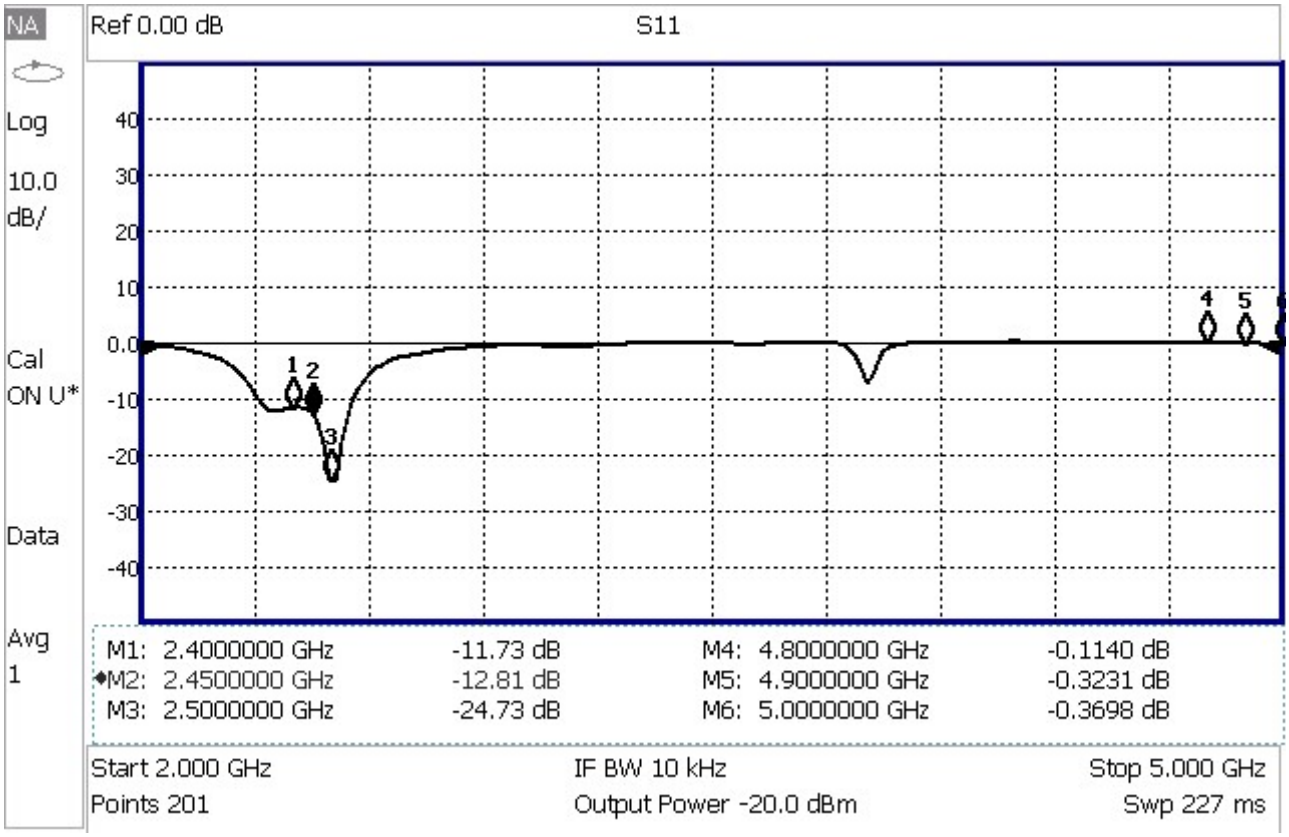
Typical Broadband Return Loss over 2-5GHz



Note: Typical measured S11 for BHWR250F with short (~15mm) IPX cable and IPX-to-SMA adapter, indicating some built-in second harmonic rejection for 2.4GHz applications. S11 in 4800-5000MHz band may be slightly lower for longer IPX cable assembly due to extra cable losses.

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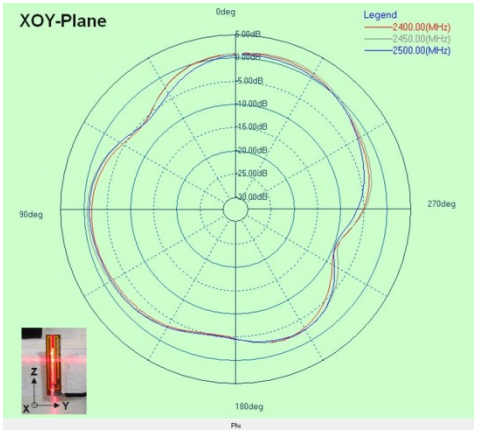
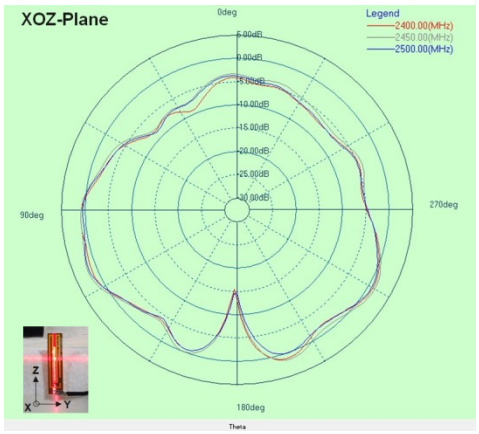
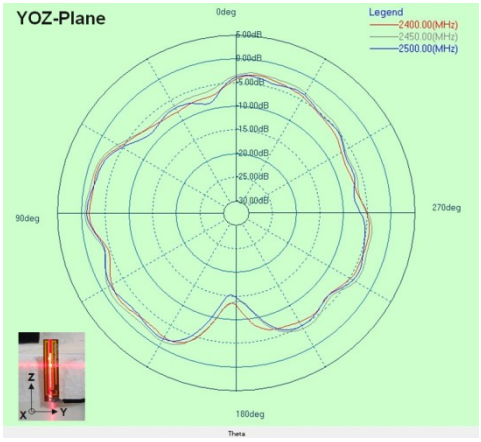
Measured Radiation Patterns







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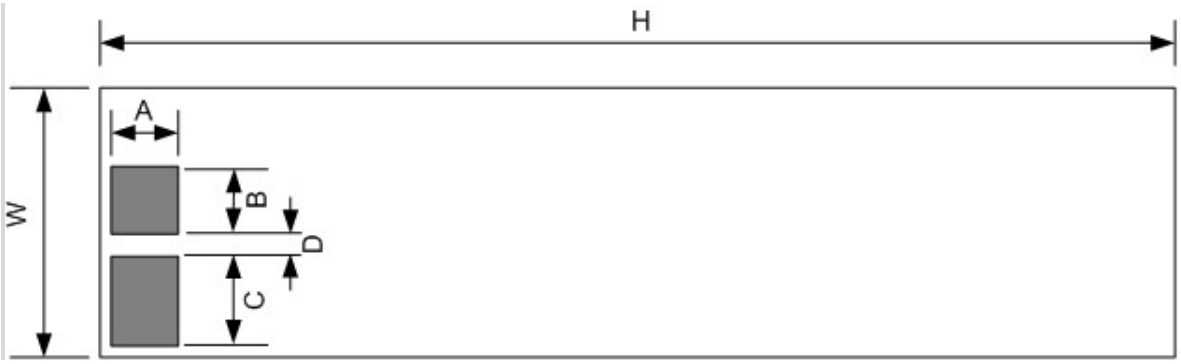
Mechanical Drawings



Symbol	Min. (mm)	Typ. (mm)	Max. (mm)
A	1.2	1.3	1.4
B	1.2	1.3	1.4
C	1.5	1.6	1.7
D	0.5	0.6	0.7
H	19.9	20	20.1
W	4.9	5	5.1

Note: Grey area is solder mask opening for IPX/UFL cable assembly. Square=Signal, Rectangle=GND.