2400…2500 MHz / 5100…7125 MHz PCB Antenna (ISM, IoT, RFID, Bluetooth, WLAN, Wi-Fi 5/6E/7)

General information

The AN250202-03C is a compact dual-band embedded PCB dipole antenna designed for integration into wireless devices operating in the 2.4 GHz ISM band and the extended 5 GHz / 6 GHz spectrum up to 7.125 GHz. The antenna supports IEEE 802.11 b/g/n in the 2.4 GHz band as well as IEEE 802.11 a/n/ac/ax including Wi-Fi 6, Wi-Fi 6E and Wi-Fi 7 in the 5 GHz and 6 GHz bands.

With omnidirectional radiation characteristics and linear polarization, the antenna ensures stable coverage in compact and space-constrained enclosures. It is optimized for high data throughput applications requiring reliable multi-band performance across WLAN, Bluetooth, and ISM systems. Typical applications include Wi-Fi routers and access points, IoT gateways, smart home devices, industrial controllers, and wireless monitoring systems.

Manufactured on an FR-4 PCB substrate, the antenna is equipped with a micro-coaxial cable terminated with an I-PEX MHF1 / Hirose U.FL (UMCC) compatible connector, enabling easy integration into RF modules and embedded communication platforms.

Electrical data

Antenna type	Embedded / internal PCB antenna	
Frequency band	ISM2400, Wi-Fi 5/6E/7 GHz, ISM5800	
Frequency range [MHz]	2400…2500	5100…7125
Return loss [dB]	-18	-11
Peak gain [dBi]	1.8…2	2.6…4.6
Radiation efficiency [%]	95…97	90…95
Nominal input impedance [Ohm]	50	
Polarization	linear	
Radiation pattern	omnidirectional	
Maximum input power [W]	5	

Mechanical data

Antenna PCB dimensions [mm]	51.5 x 17.5 x 1
Connector type [1)]	IPEX MHF1 / Hirose U.FL (UMCC) compatible [1)]
Cable type and thickness [2)] [mm]	micro coax 1.13 [2)]
Cable length [3)] [mm]	175 [3)]
PCB material	FR4

Additional information

[1)] Other connector types can be offered on request.

[2)] Following cable thicknesses can be used with MHF1 connector: 0.81 mm, 1.13 mm, 1.32 mm, 1.37 mm.

[3)] Other cable lengths can be provided.

Antenna performance was measured using the recommended cable length in free space.

Further customization, electromagnetic simulations and measurements can be offered on request.

The antenna can be additionally equipped with adhesive tape and mounting holes.

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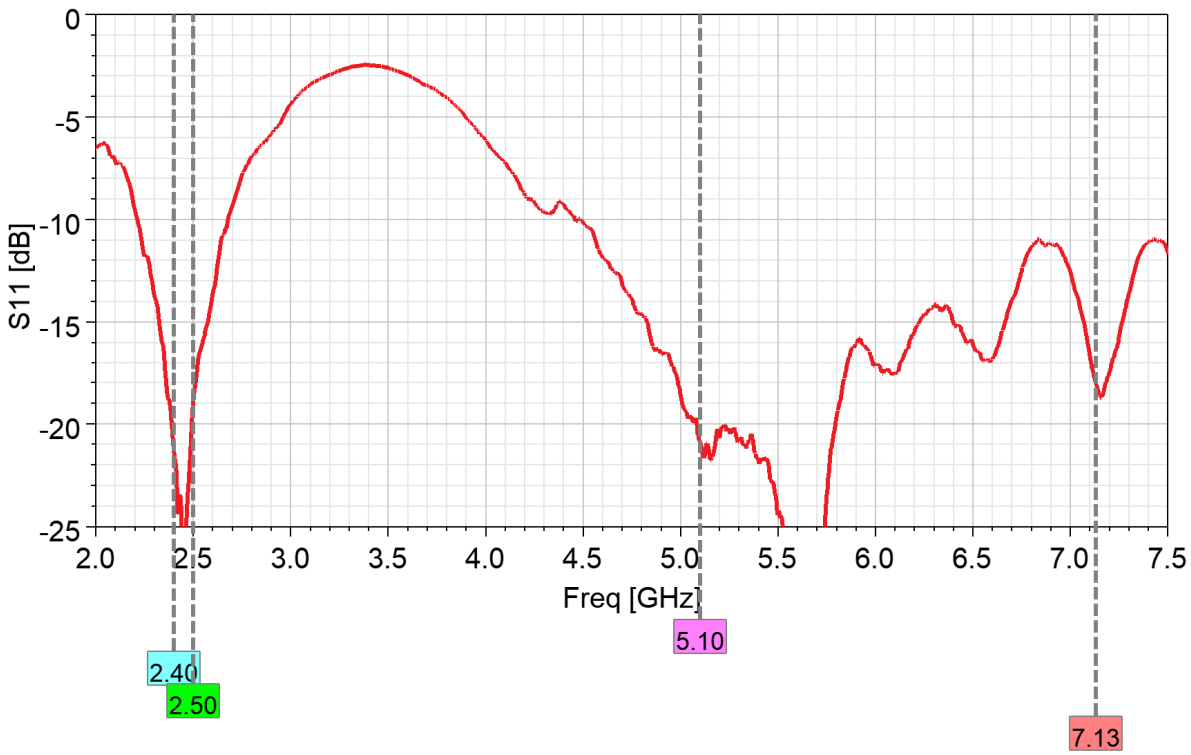
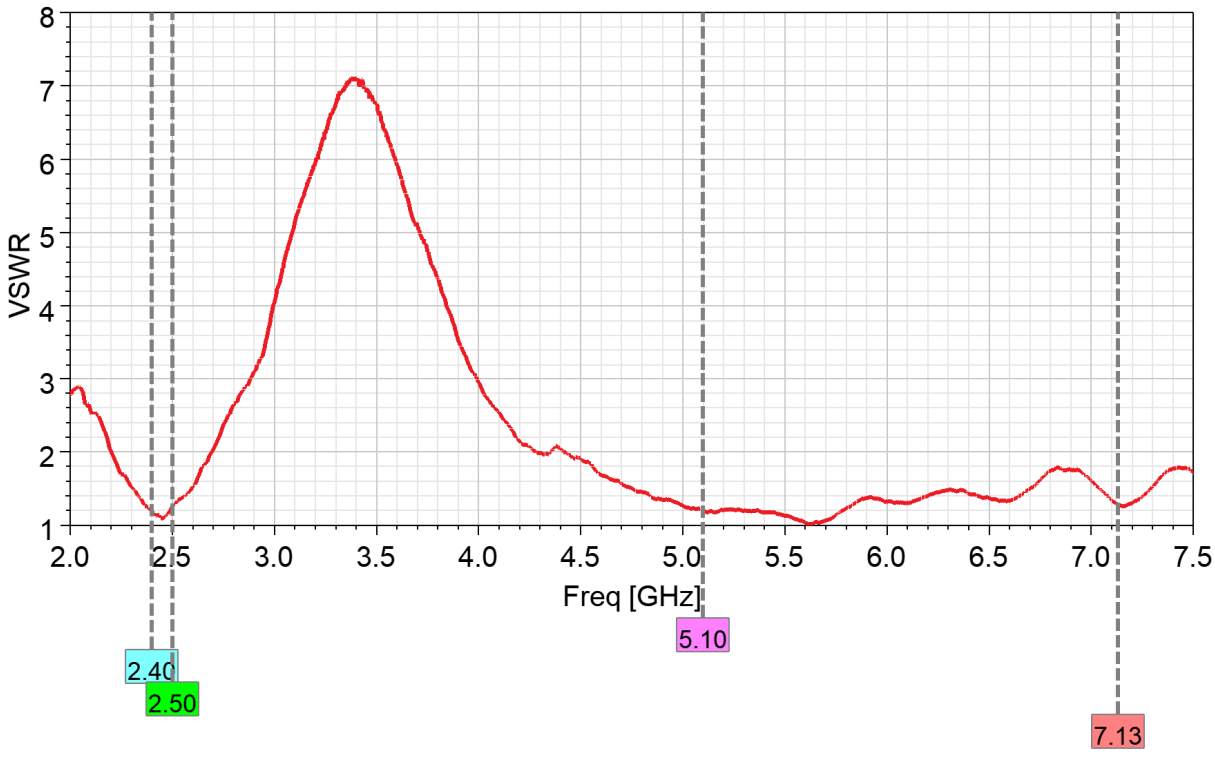
Measured input impedance matching



VSWR



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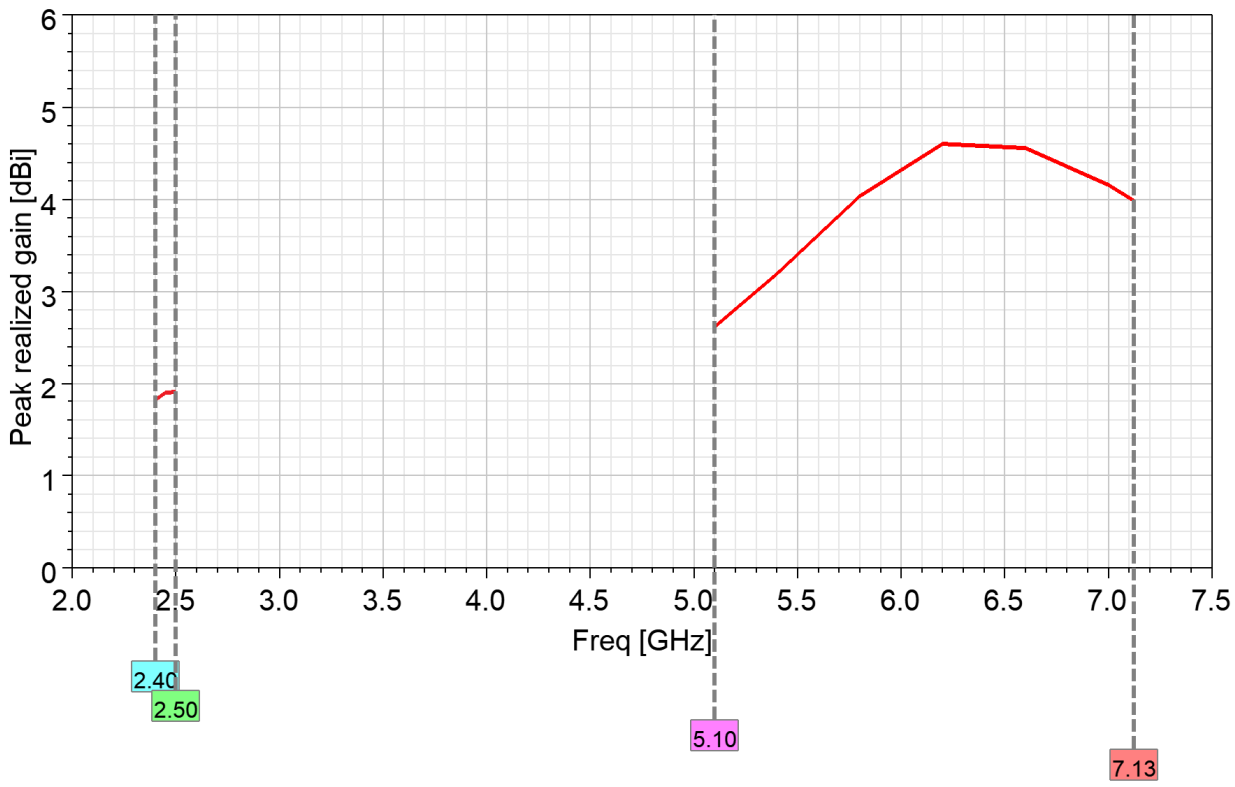
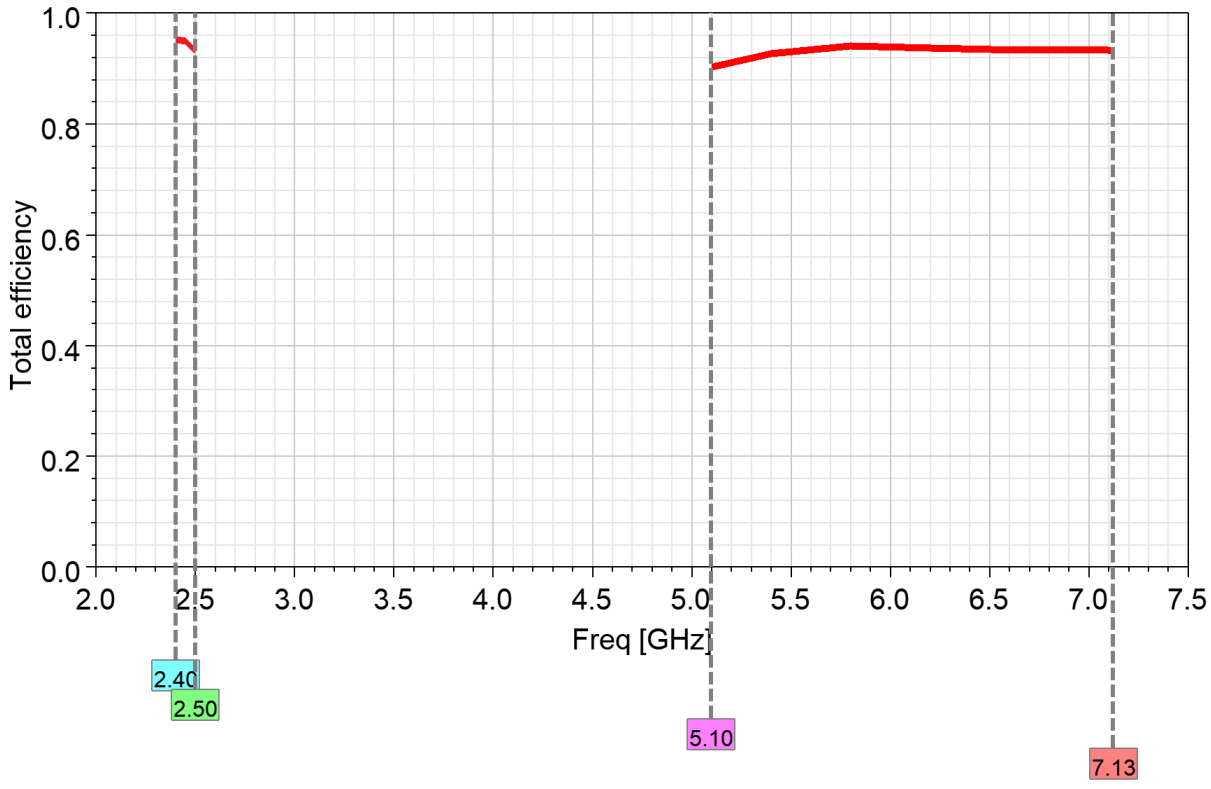
Peak realized gain



Radiation efficiency



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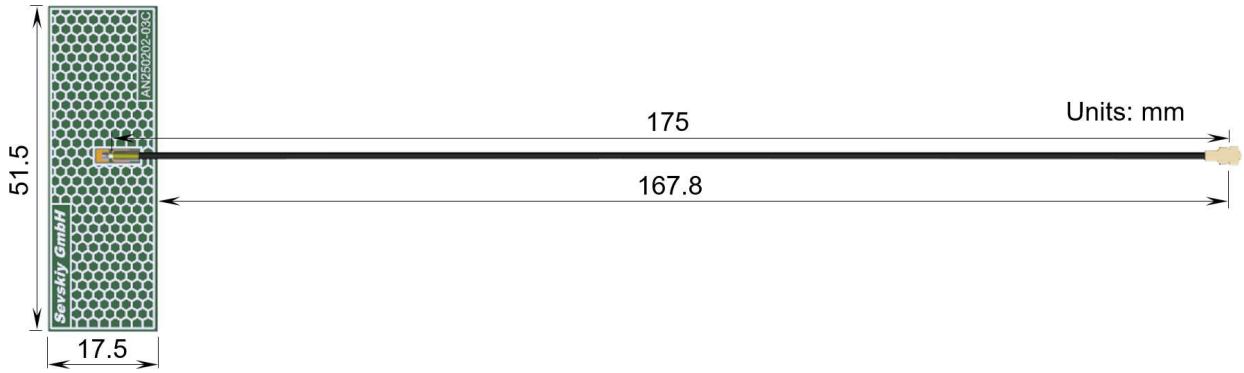
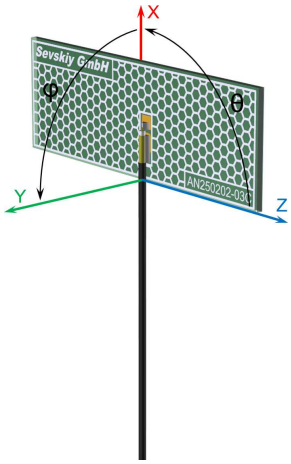
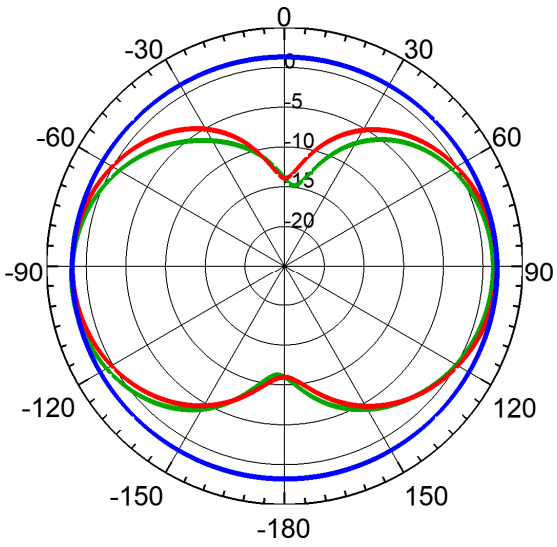
Product dimensions



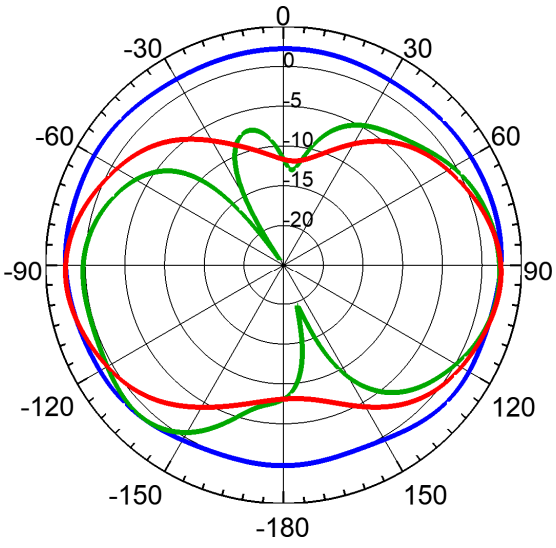
Radiation pattern



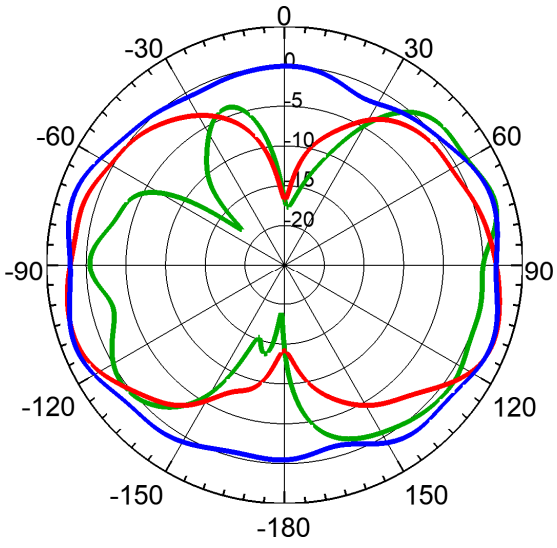
Total realized gain [dBi]
Phi=0°, plane XZ, green curve
Phi=90°, plane YZ, red curve
Theta=90°, plane XY, blue curve



2450 MHz



5100 MHz



7000 MHz

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