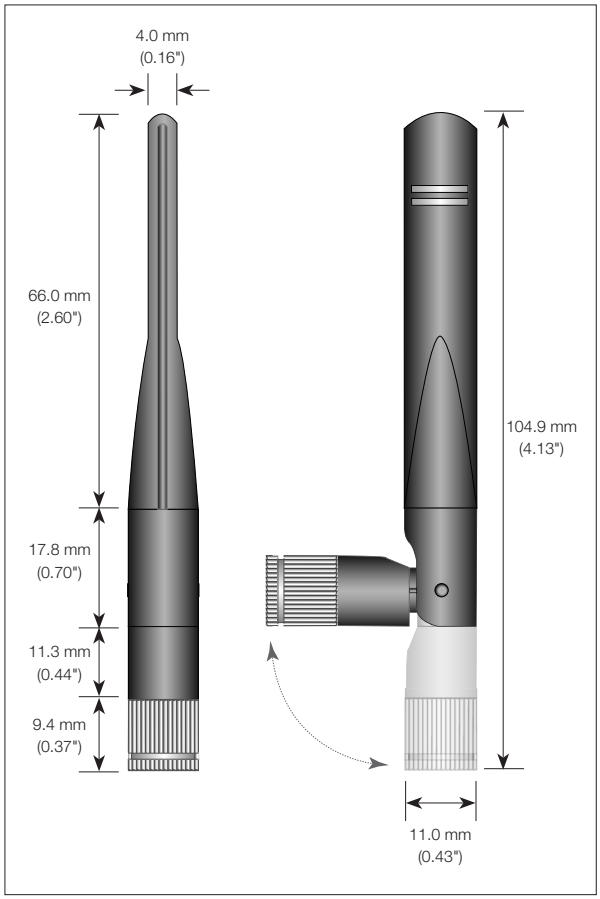
ANT-DB1-RAF-xxx

Data Sheet

Product Description

The RAF is a compact, cosmetically attractive, dual-band, ½-wave antenna covering the popular 2.45 and emerging 5GHz bands. The antenna features a tilt and swivel joint which allows it to be oriented at straight or right angle to the product or conveniently folded for storage and shipment. It attaches using an SMA or Part 15 compliant RP-SMA connector.



Features

- Tilts and rotates
- Dual-band
- Excellent performance
- Omni-directional pattern
- Very low VSWR
- Rugged & damage-resistant
- Standard SMA or Part 15 compliant RP-SMA connector

Electrical Specifications

Recom. Freq. Range:	Band 1: 2.40–2.483GHz
	Band 2: 5.15–5.825GHz
Peak Gain:	Band 1: 2.5dBi
	Band 2: 4.6dBi
Wavelength:	½-wave
VSWR:	≤ 1.9 typical at center
Impedance:	50-ohms
Connection:	RP-SMA or SMA
Oper. Temp. Range:	–40°C to +80°C

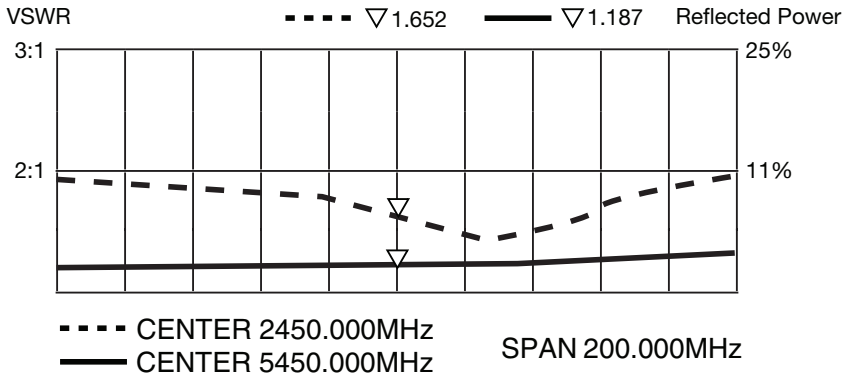
Electrical specifications and plots measured on 10.16 cm x 10.16 cm (4.00" x 4.00") reference ground plane

Ordering Information

ANT-DB1-RAF-RPS (with RP-SMA connector)
ANT-DB1-RAF-SMA (with SMA connector)

Revised 12/10/13

VSWR Graph



What is VSWR?

The Voltage Standing Wave Ratio (VSWR) is a measurement of how well an antenna is matched to a source impedance, typically 50-ohms. It is calculated by measuring the voltage wave that is headed toward the load versus the voltage wave that is reflected back from the load. A perfect match will have a VSWR of 1:1. The higher the first number, the worse the match, and the more inefficient the system. Since a perfect match cannot ever be obtained, some benchmark for performance needs to be set. In the case of antenna VSWR, this is usually 2:1. At this point, 88.9% of the energy sent to the antenna by the transmitter is radiated into free space and 11.1% is either reflected back into the source or lost as heat on the structure of the antenna. In the other direction, 88.9% of the energy recovered by the antenna is transferred into the receiver. As a side note, since the ":1" is always implied, many data sheets will remove it and just display the first number.

How to Read a VSWR Graph

VSWR is usually displayed graphically versus frequency. The lowest point on the graph is the antenna's operational center frequency. In most cases, this will be different than the designed center frequency due to fabrication tolerances. The VSWR at that point denotes how close to 50-ohms the antenna gets. Linx specifies the recommended bandwidth as the range where the typical antenna VSWR is less than 2:1.

VSWR

Figure 11 provides the voltage standing wave ratio (VSWR) across the antenna bandwidth. VSWR describes the power reflected from the antenna back to the radio. A lower VSWR value indicates better antenna performance at a given frequency. Reflected power is also shown on the right-side vertical axis as a gauge of the percentage of transmitter power reflected back from the antenna.

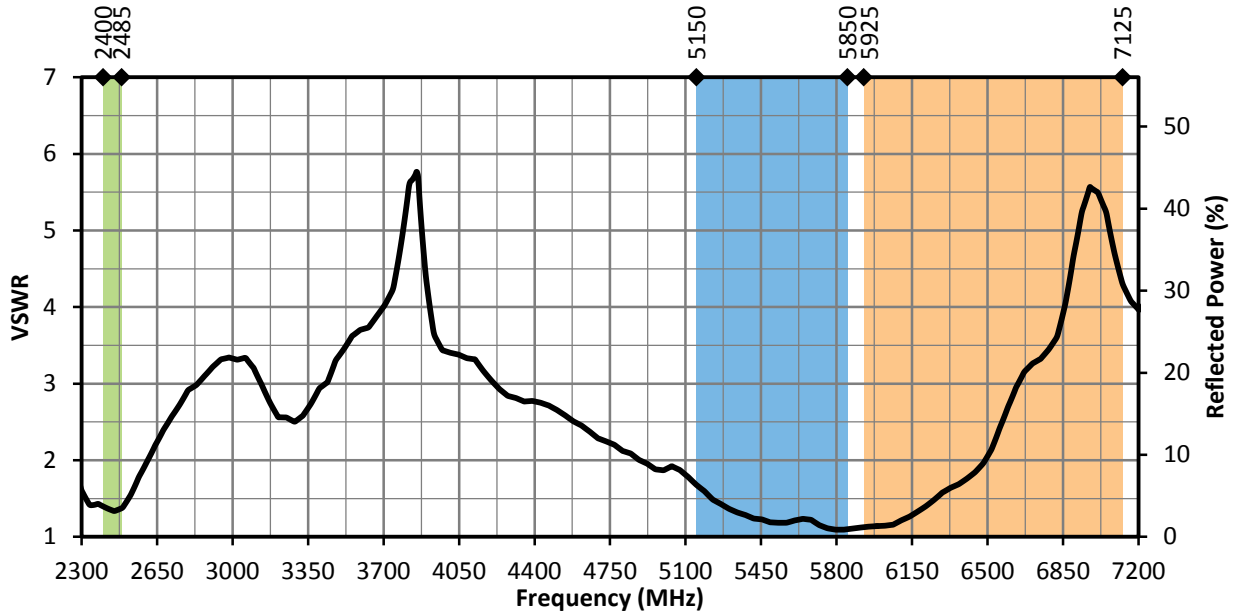


Figure 11. ANT-DB1-RAF Antenna VSWR, Edge-Bent

RETURN LOSS

Return loss (Figure 12), represents the loss in power at the antenna due to reflected signals. Like VSWR, a lower return loss value indicates better antenna performance at a given frequency.

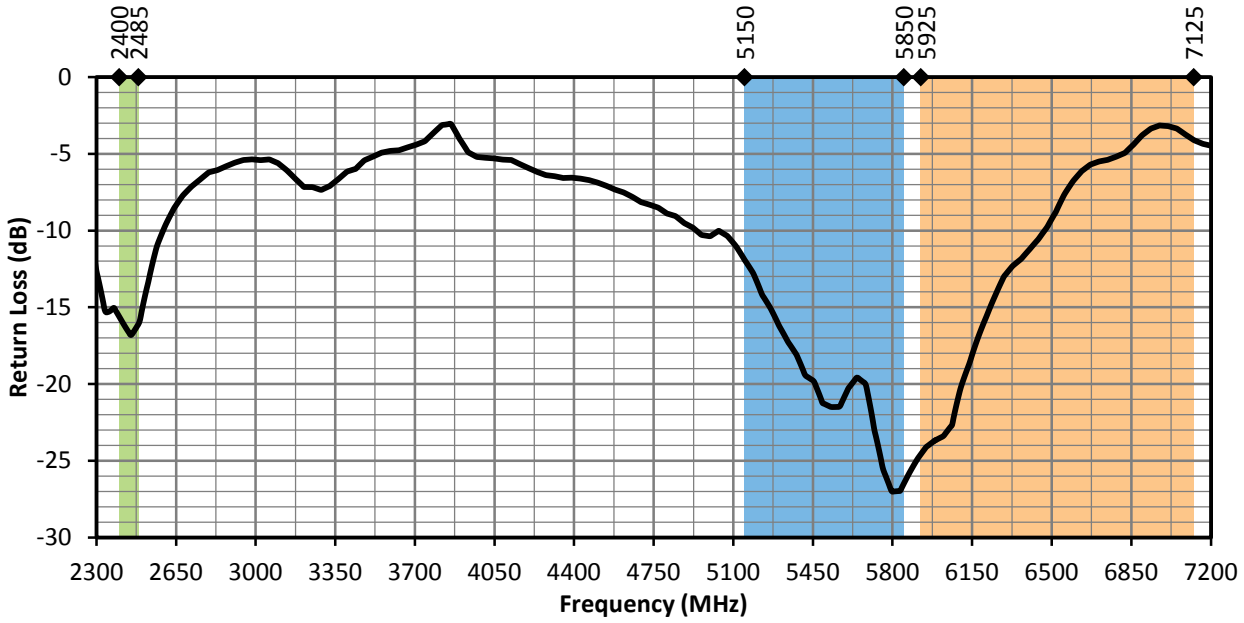


Figure 12. Return Loss for ANT-DB1-RAF, Edge-Bent

PEAK GAIN

The peak gain across the antenna bandwidth is shown in Figure 13. Peak gain represents the maximum antenna input power concentration across 3-dimensional space, and therefore peak performance, at a given frequency, but does not consider any directionality in the gain pattern.

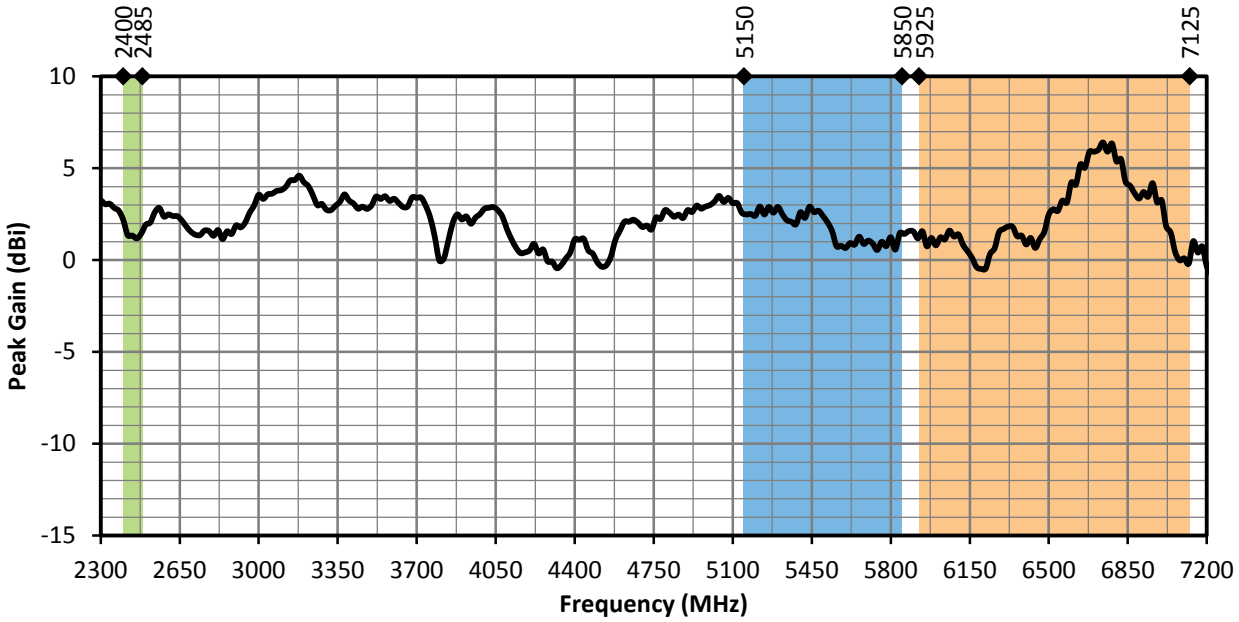


Figure 13. Peak Gain for ANT-DB1-RAF, Edge-Bent

AVERAGE GAIN

Average gain (Figure 14), is the average of all antenna gain in 3-dimensional space at each frequency, providing an indication of overall performance without expressing antenna directionality.

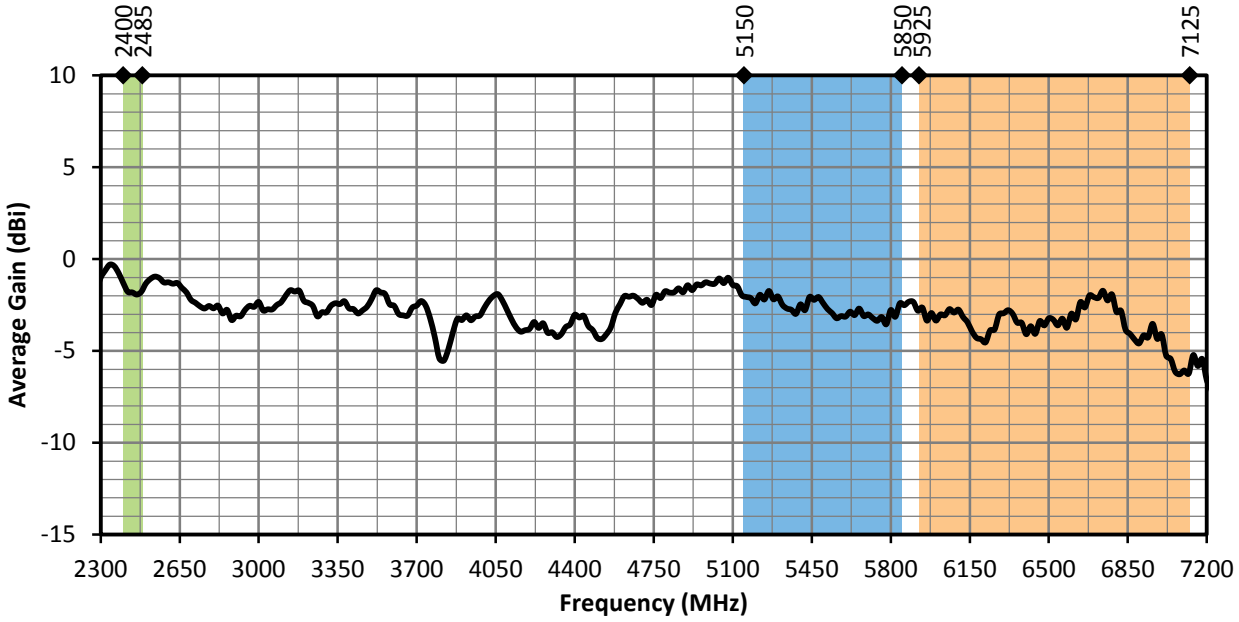


Figure 14. Antenna Average Gain for ANT-DB1-RAF, Edge-Bent

RADIATION EFFICIENCY

Radiation efficiency (Figure 15), shows the ratio of power delivered to the antenna relative to the power radiated at the antenna, expressed as a percentage, where a higher percentage indicates better performance at a given frequency.

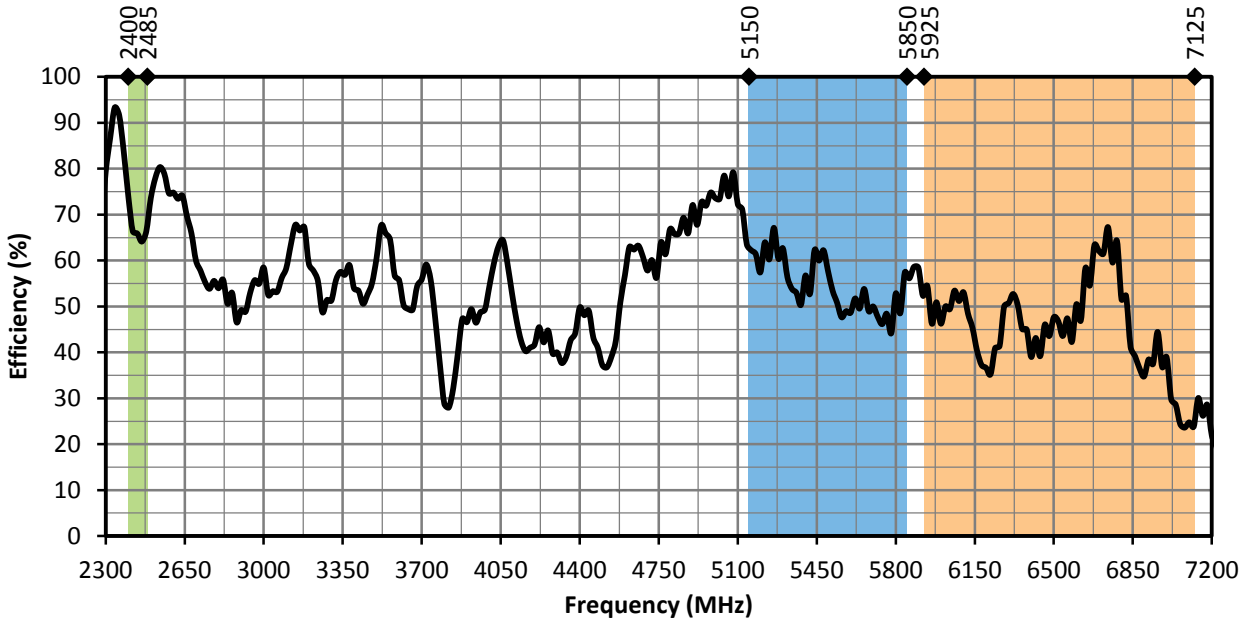


Figure 15. Antenna Radiation Efficiency for ANT-DB1-RAF, Edge-Bent

RADIATION PATTERNS

Radiation patterns provide information about the directionality and 3-dimensional gain performance of the antenna by plotting gain at specific frequencies in three orthogonal planes. Antenna radiation patterns for an “edge-bent” orientation are shown in Figure 16 using polar plots covering 360 degrees. The antenna graphic above the plots provides reference to the plane of the column of plots below it. Note: when viewed with typical PDF viewing software, zooming into radiation patterns is possible to reveal fine detail.

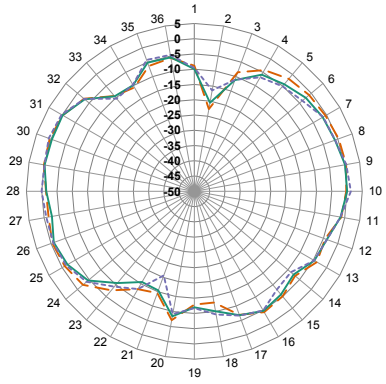
RADIATION PATTERNS - EDGE-BENT

XZ-Plane Gain

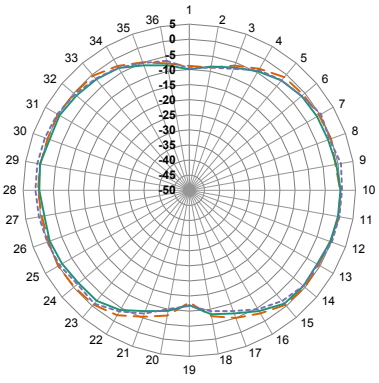
YZ-Plane Gain

XY-Plane Gain

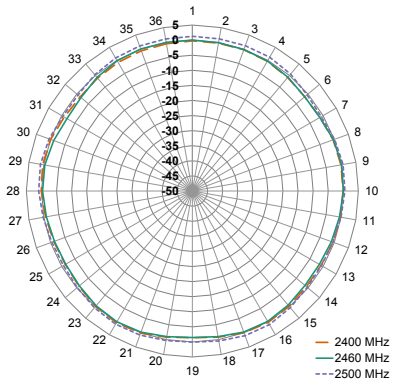
2400 MHZ TO 2485 MHZ (2450 MHZ)



XZ-Plane Gain

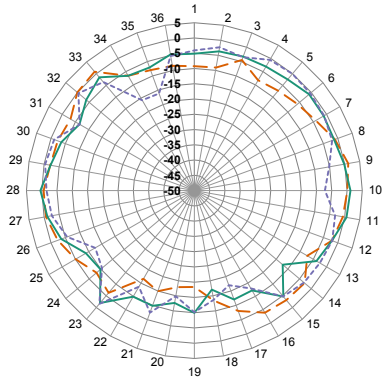


YZ-Plane Gain

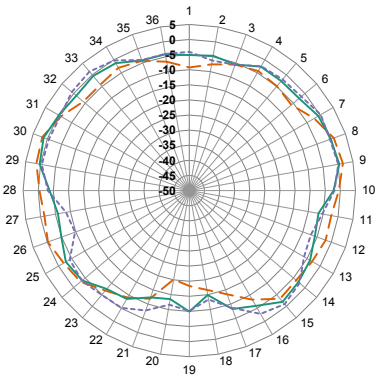


XY-Plane Gain

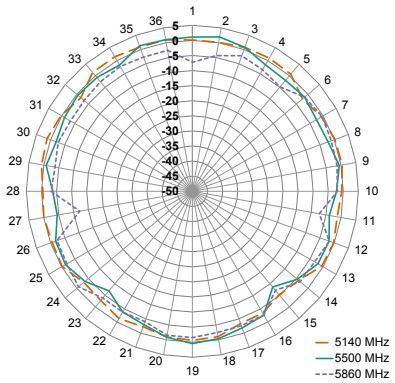
5150 MHZ TO 5850 MHZ (5500 MHZ)



XZ-Plane Gain



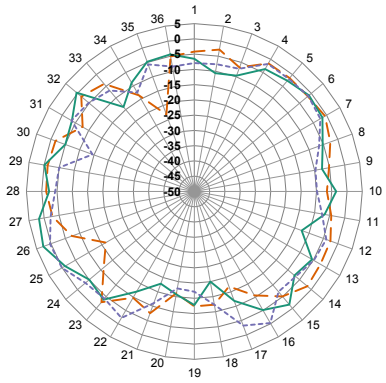
YZ-Plane Gain



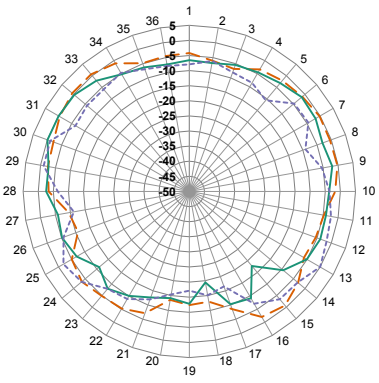
XY-Plane Gain

RADIATION PATTERNS - EDGE-BENT

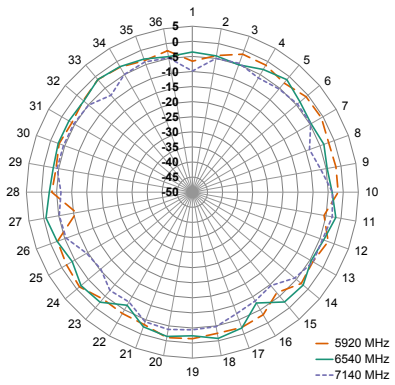
5925 MHZ TO 7125 MHZ (6530 MHZ)



XZ-Plane Gain



YZ-Plane Gain



XY-Plane Gain

Figure 16. Radiation Patterns for ANT-DB1-RAF Antenna, Edge-Bent