

PCB ON-BOARD ANTENNA SPECIFICATION

Savant Remote B2 | Integral 2.4 GHz Bluetooth Low Energy Antenna

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Product / model	Savant Remote B2 / REM-B2JB-00
Applicant	Savant Systems, Inc.
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1. Scope

This specification defines the integral PCB on-board antenna used in the Savant Remote B2. It records the supplied antenna geometry, radiation patterns, gain, and efficiency data for the 2.4 GHz Bluetooth Low Energy application.

2. Antenna Summary

Antenna type	Integral PCB trace antenna (IFA-type)
Application	Bluetooth Low Energy, 2.4 GHz ISM band
Intended RF band	2400-2500 MHz; product operation 2402-2480 MHz
Mounting	Printed directly on the product main PCB
External connector	None; antenna is not user replaceable
Overall footprint	Approximately 22.5 mm x 5.1 mm, per Figure 1
Maximum measured gain	0.99 dBi at 2490 MHz
Efficiency in 2400-2500 MHz data range	37.11% to 38.82%

3. Mechanical Definition

The antenna is formed by the PCB copper geometry shown below. The red shape represents the antenna conductor. All dimensions are in millimetres; the drawing is not to scale.

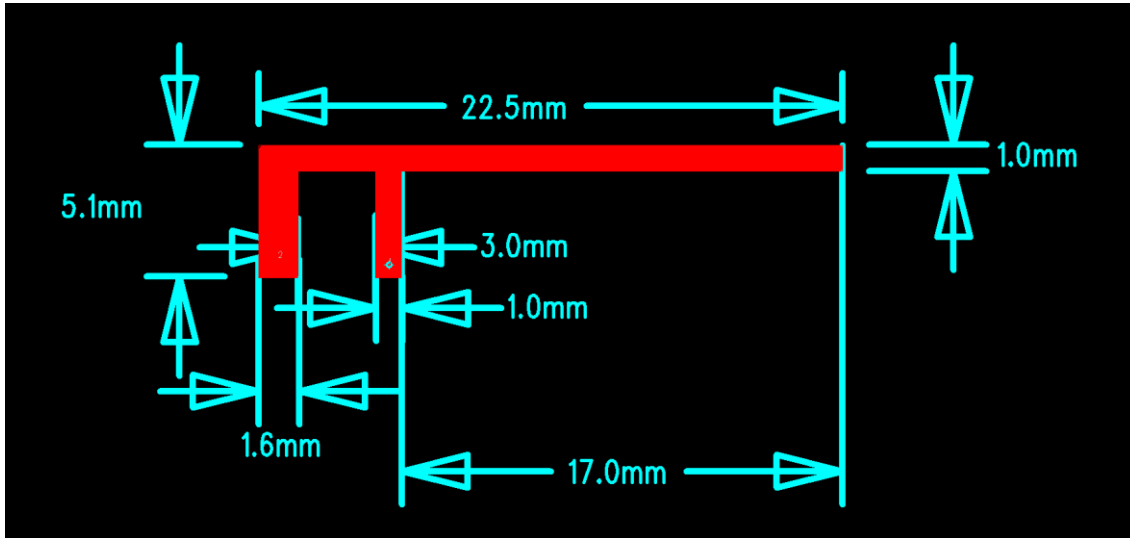


Figure 1. PCB on-board antenna geometry and dimensions.

Dimension	Nominal value	Drawing reference
Overall horizontal length	22.5 mm	Top dimension
Overall vertical extent	5.1 mm	Left-side dimension

4. PCB Implementation Requirements

- The antenna geometry and dimensions shall be maintained without scaling.
- The antenna shall remain integral to the main PCB and shall not use an end-user-accessible RF connector.
- The validated PCB stack-up, ground clearance, enclosure, battery position, and nearby conductive parts shall be controlled because they can affect antenna tuning, gain, and efficiency.
- Any change to antenna geometry, PCB material, matching components, or mechanical surroundings requires RF performance review and, where applicable, regulatory reassessment.

5. Antenna Location on the Main PCB

The antenna is integrated into the upper-right corner of the product main PCB, as shown in Figure 1A. The antenna region and its surrounding clearance shall be maintained in the released PCB layout.

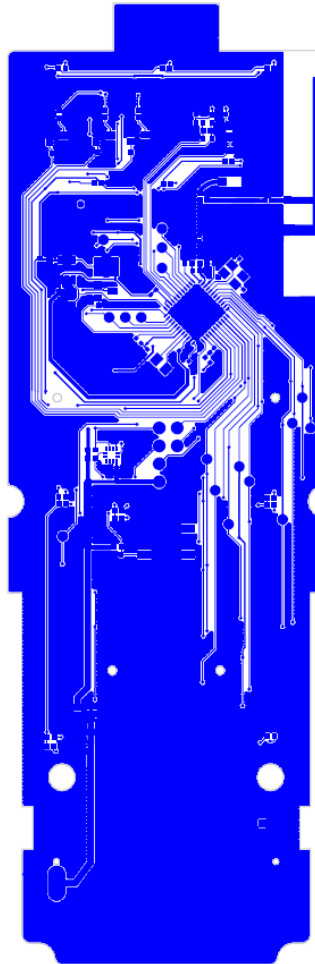


Figure 1A. Overall main PCB layout; the antenna is located at the upper-right corner.

6. Radiation Pattern

Figure 2 contains the supplied E1, E2, and H-plane two-dimensional total field patterns together with the three-dimensional total radiation pattern.

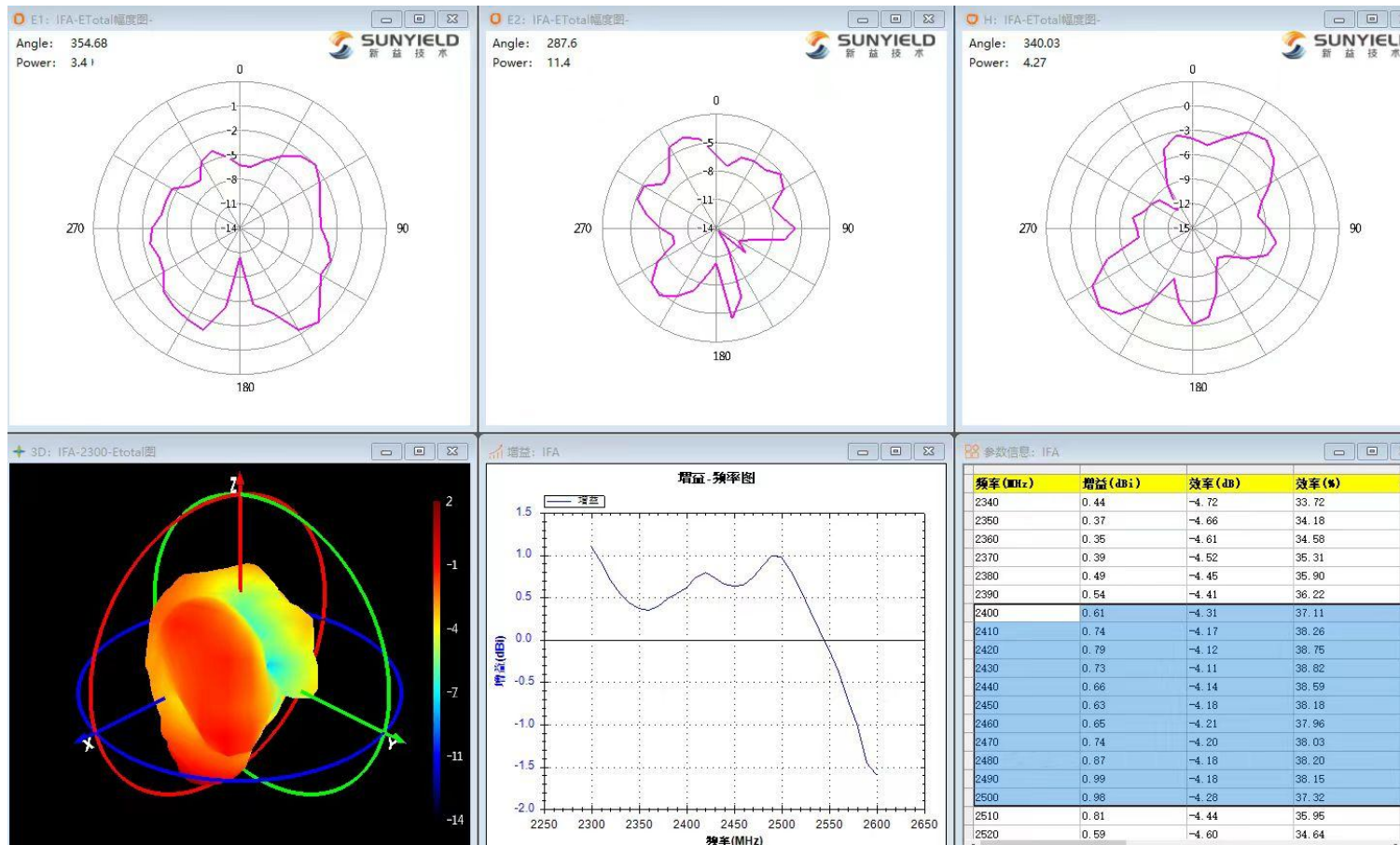


Figure 2. Supplied 2D E1/E2/H-plane patterns and 3D total radiation pattern.

7. Gain and Efficiency

The supplied swept data covers 2300-2600 MHz. Figure 3 reproduces the full dataset.

频率 (MHz)	增益 (dBi)	效率 (dB)	效率 (%)
2300	1.1	-4.72	33.7
2310	0.92	-4.81	33.02
2320	0.7	-4.82	32.93
2330	0.54	-4.81	33.05
2340	0.44	-4.72	33.72
2350	0.37	-4.66	34.18
2360	0.35	-4.61	34.58
2370	0.39	-4.52	35.31
2380	0.49	-4.45	35.9
2390	0.54	-4.41	36.22
2400	0.61	-4.31	37.11
2410	0.74	-4.17	38.26
2420	0.79	-4.12	38.75
2430	0.73	-4.11	38.82
2440	0.66	-4.14	38.59
2450	0.63	-4.18	38.18
2460	0.65	-4.21	37.96
2470	0.74	-4.2	38.03
2480	0.87	-4.18	38.2
2490	0.99	-4.18	38.15
2500	0.98	-4.28	37.32
2510	0.81	-4.44	35.95
2520	0.59	-4.6	34.64
2530	0.34	-4.75	33.48
2540	0.12	-4.84	32.8
2550	-0.11	-4.94	32.1
2560	-0.38	-5.07	31.08
2570	-0.72	-5.26	29.75
2580	-1.03	-5.45	28.52
2590	-1.45	-5.73	26.71
2600	-1.59	-5.81	26.21

Figure 3. Supplied antenna gain and efficiency data.

Table 2. Measured gain and efficiency in the supplied 2400-2500 MHz highlighted range.

Within this range, the maximum measured gain is 0.99 dBi at 2490 MHz. Measured efficiency ranges from 37.11% to 38.82%, with the maximum at 2430 MHz.