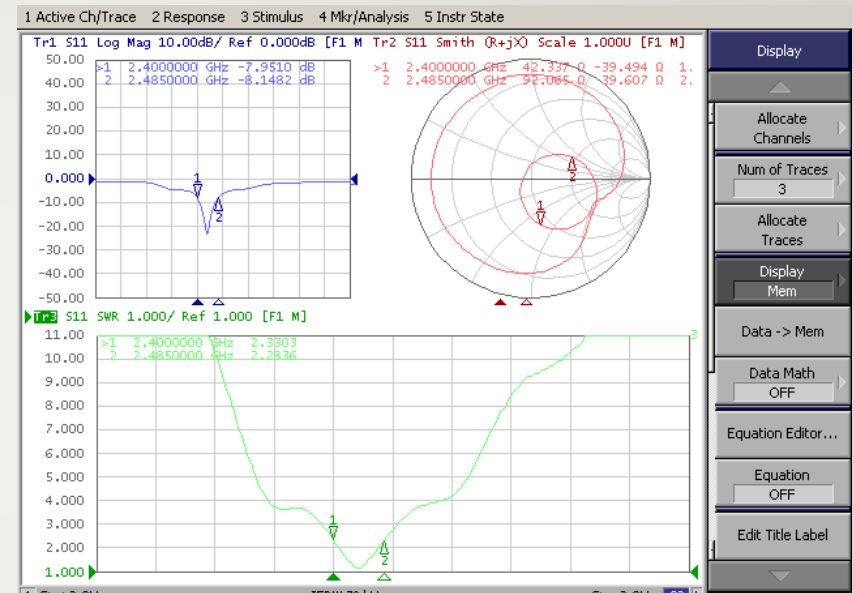


That way 2.4G ANT TEST DATA

Picture



VSWR

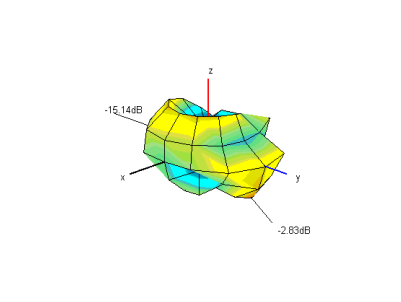
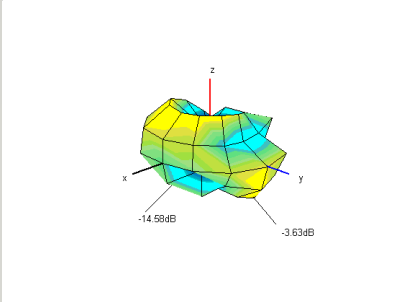
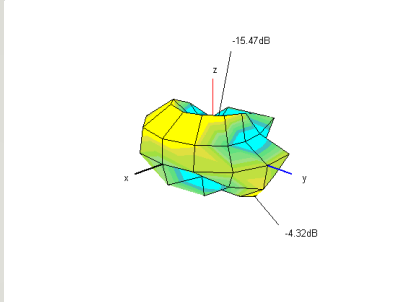
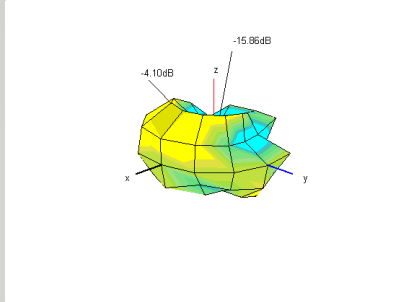
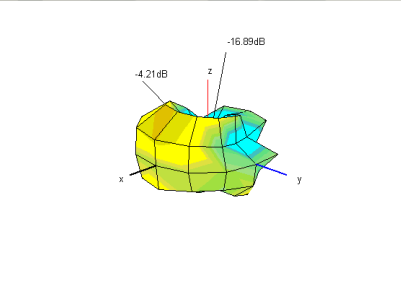


3D gain

	1	2	3	4	5
Frequency [MHz]	2400	2420	2440	2460	2485
Efficiency [dB]	-7.85	-7.94	-7.76	-7.60	-7.92
Efficiency [%]	16.4	16.1	16.8	17.4	16.1
Peak Gain [dB]	-2.83	-3.63	-4.32	-4.10	-4.21
Directivity [dB]	5.03	4.31	3.44	3.50	3.71
Minimum Gain [dB]	-15.14	-14.58	-15.47	-15.86	-16.89

ANT DATA – 3D Radiation Pattern

3D Radiation Pattern

2400	2420	2440	2460
			
2485			
			

Measurement Equipment

Network Analyzer



E5071B (Agilent)



8753ES (Agilent)



**CTIA 3D OTA
Chamber(A+Tech)**

FCC Antenna Specification

1. Antenna Manufacturer Information

- Antenna Manufacturer: JLU Co., Ltd.
- Country of Manufacture: Republic of Korea
- Antenna Implementation: PCB pattern antenna designed and integrated by the device manufacturer
- RF SoC Manufacturer: Nordic Semiconductor ASA
- RF SoC Model: nRF52840

2. Antenna General Description

- Antenna Type: Internal PCB Trace Antenna (Fixed Antenna)
- Wireless Technology: Bluetooth Low Energy (BLE)
- Operating Band: 2.4 GHz ISM Band (2400–2483.5 MHz)
- Installation Method: Permanently integrated on the main PCB
- User Accessibility: Not accessible to the end-user
- Replaceability: Not user replaceable

The antenna is implemented as a PCB trace pattern integrated on the main PCB.

It is permanently attached and has no RF connector or provision for the use of an external antenna.

3. Antenna Design Description

- Antenna Structure: Meandered PCB trace antenna
- Polarization: Linear
- Impedance: 50 Ω system
- RF Connection: Direct PCB feed (no RF connector)
- Matching Network: Integrated on the main PCB

The antenna is designed specifically for BLE operation using the nRF52840 RF transceiver and optimized for internal integration.

4. Antenna Drawing and Mechanical Dimensions

4.1 Antenna Implementation

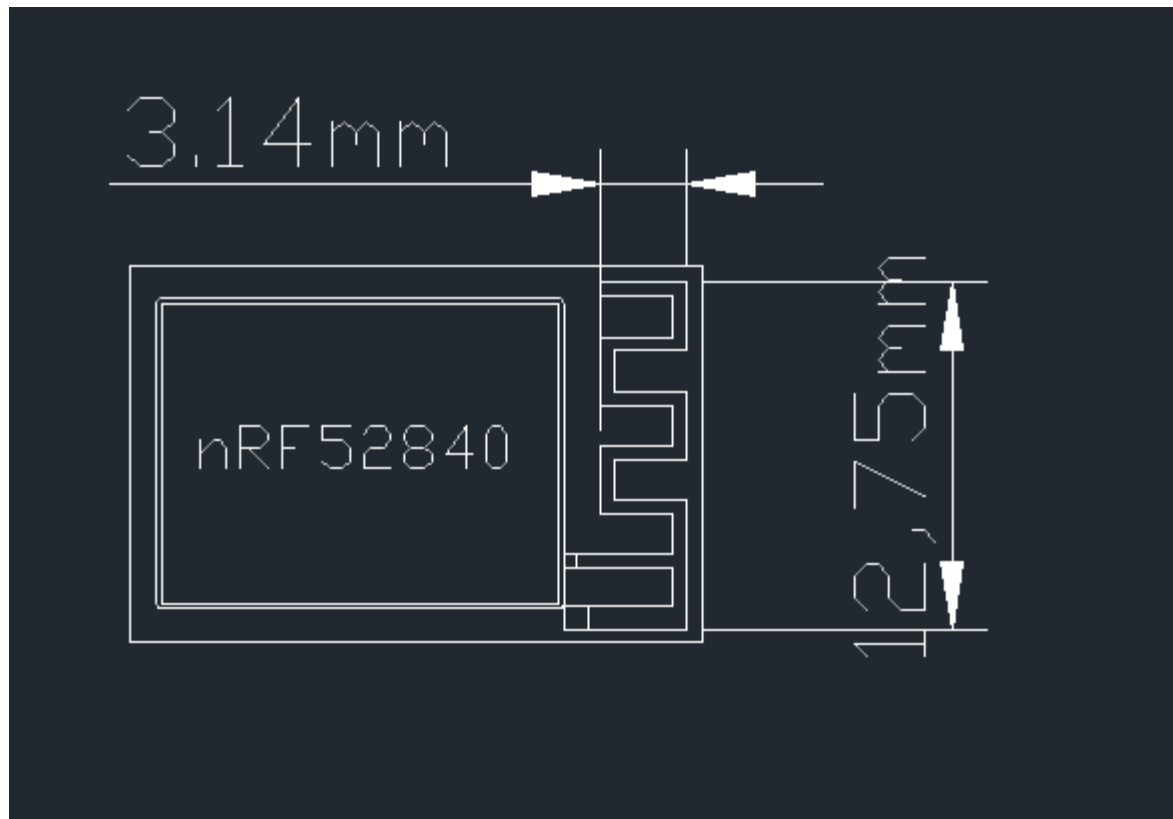
- Integrated PCB pattern antenna etched on the main PCB
- Permanently attached copper trace
- No external antenna connector

4.2 Antenna Dimensions (Top View)

- Based on the antenna layout drawing:
- Antenna Trace Height: 12.75 mm
- Antenna Trace Width: 3.14 mm

4.3. Antenna Drawing Description

- The antenna drawing illustrates the internal PCB trace antenna layout with mechanical dimensions.
- The antenna is implemented as a meandered PCB pattern adjacent to the RF SoC.
- The drawing represents the antenna configuration used in the final product.



[Figure 01] Internal PCB Trace Antenna Layout and Dimensions

5. FCC Fixed Antenna Compliance Statement

- The device employs a permanently attached internal PCB trace antenna.
- The antenna is not user replaceable and has no provision for substitution.
- The device complies with the requirements of FCC §15.203 and §15.204.