TEST REPORT

FOR

Product Type:	**Medical Monitor**
Company Name:	**Future Electronics**
Part Number:	**PCB EQ21008 Rev F**
Report No:	**RL/2022/115**
Issue Date:	**December 21 .2022**
Prepared for:	**Yves Francois**
Prepared By:	**Andy Knowles (Radtenna Ltd)**
Test Date:	**December 20 .2022**

FIGURE 1 UUT

1. Test Description

Conducted and Radiated performance testing of the Future Electronics 2.4GHz antenna fitted to the EQ21008 Rev F PCB.

For all tests, the UUT was mounted in free space

2. Test Equipment

Radiated Tests			
Equipment	**Manufacturer**	**Model**	**Serial No**
VNA	Anritsu	MS2723B	1511303
Ref Antenna	Compower	AH-118	D20-4005901
Positioner	Dimond Engineering	DAMS 6000	N/A
RF Chamber	Radtenna	MOONRAT 1.5 m x 2.5 m	N/A

TABLE 1 RADIATED TEST SITE EQUIPMENT

3. Conducted tests

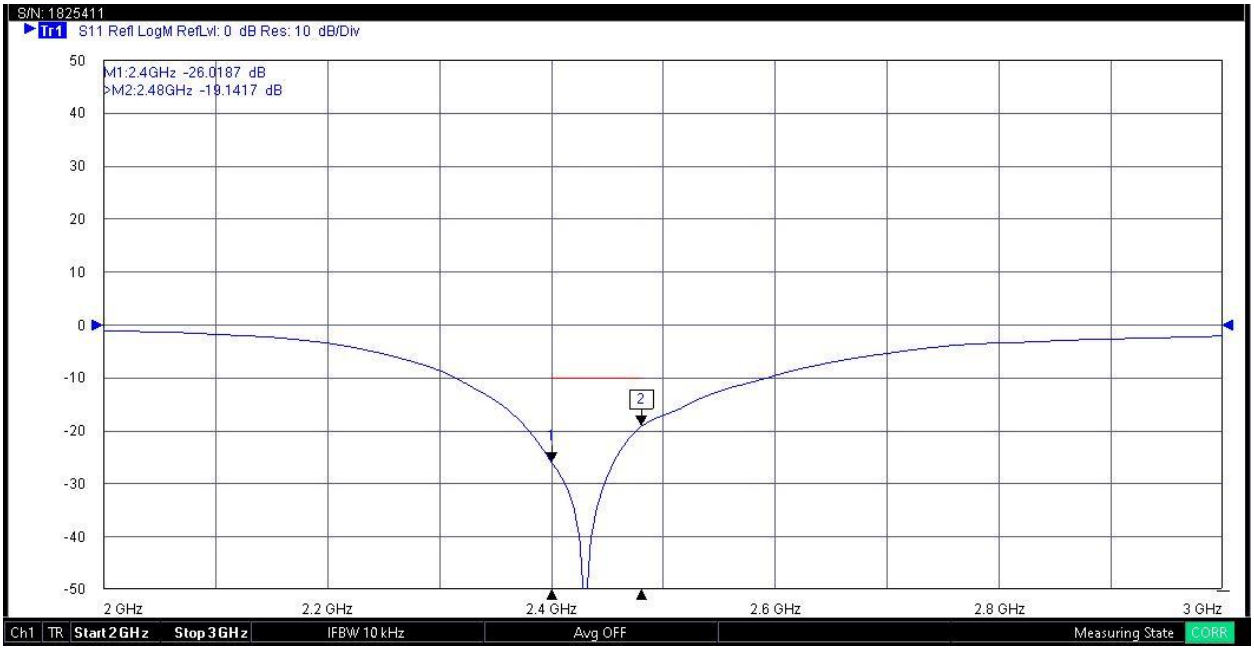


FIGURE 2 RETURN LOSS

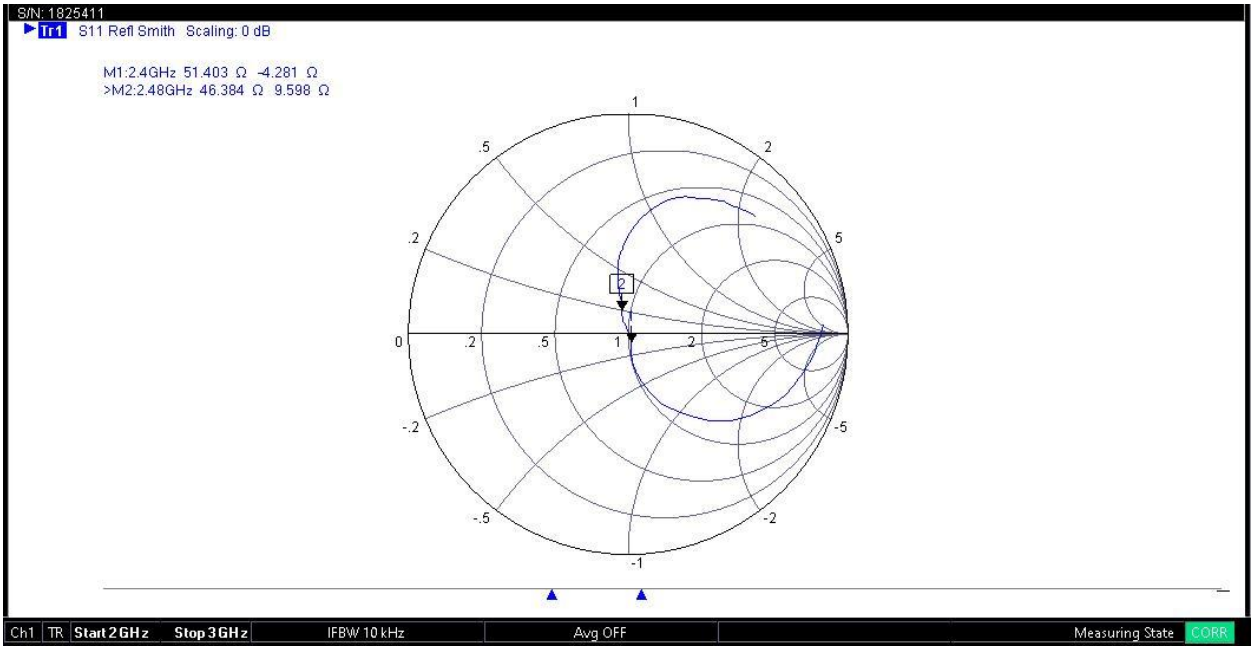
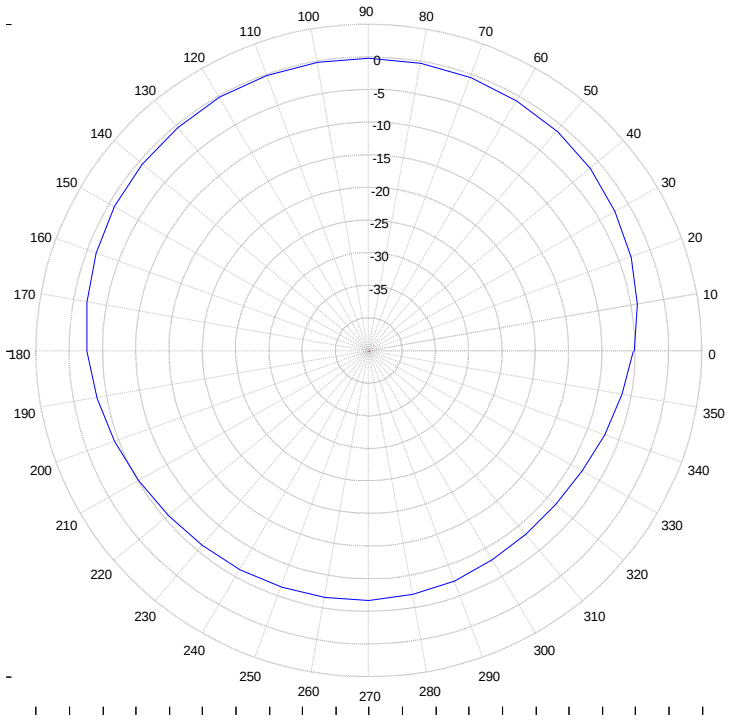


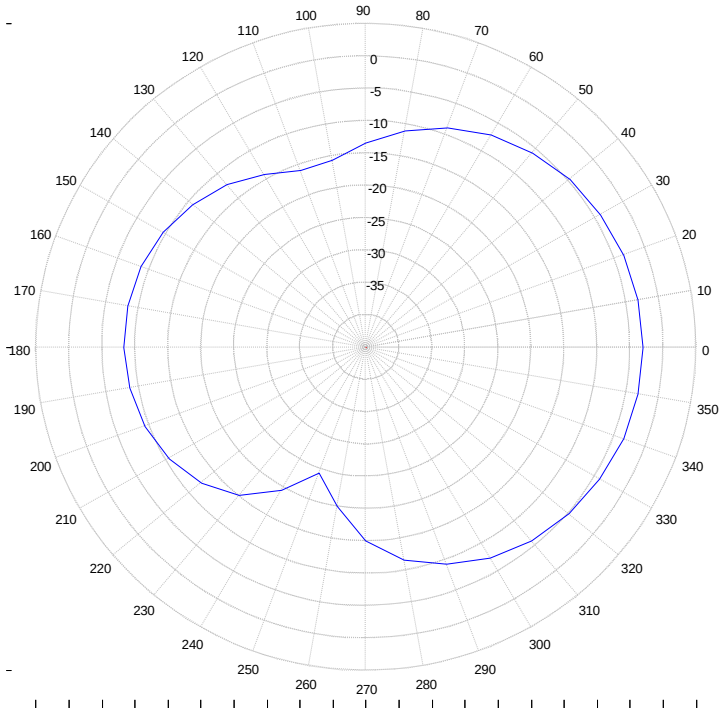
FIGURE 3 SMITH CHART

4. Radiated Tests



Name: .
Date/Time = 21/12/2022 14:14:06
Plot Scale: 5 dB/Div
Beamwidth: 162.8 Degrees

Frequency: 2439.718592964824 MHz
MAX dB= -0.046 @ 100 Deg.
MIN dB= -8.435 @ 320 Deg.
dB Min/Max Delta = 8.3892 dB

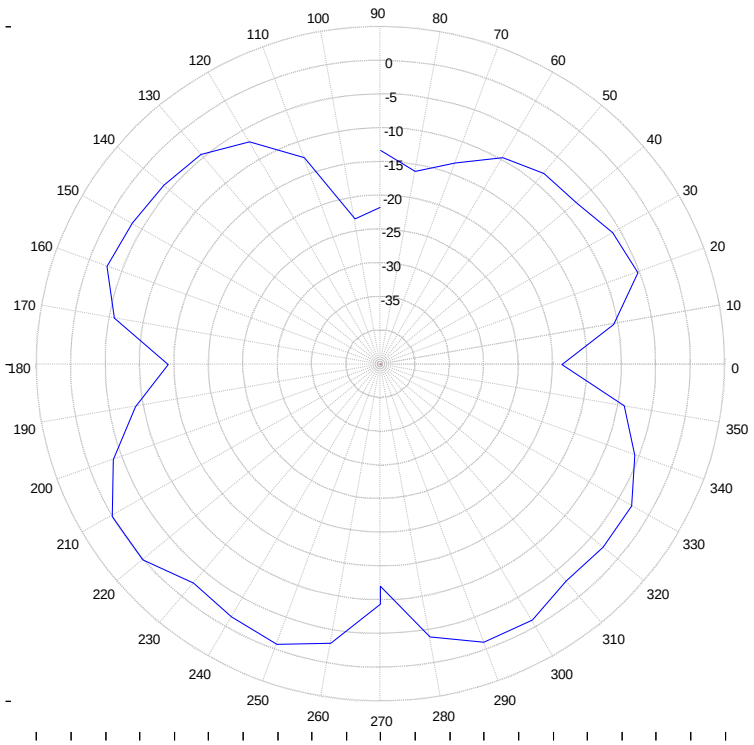


Name: .
Date/Time = 21/12/2022 13:54:00
Plot Scale: 5 dB/Div
Beamwidth: 102.2 Degrees

Frequency: 2439.718592964824 MHz
MAX dB= -3.067 @ 360 Deg.
MIN dB= -24.38 @ 250 Deg.
dB Min/Max Delta = 21.317 dB

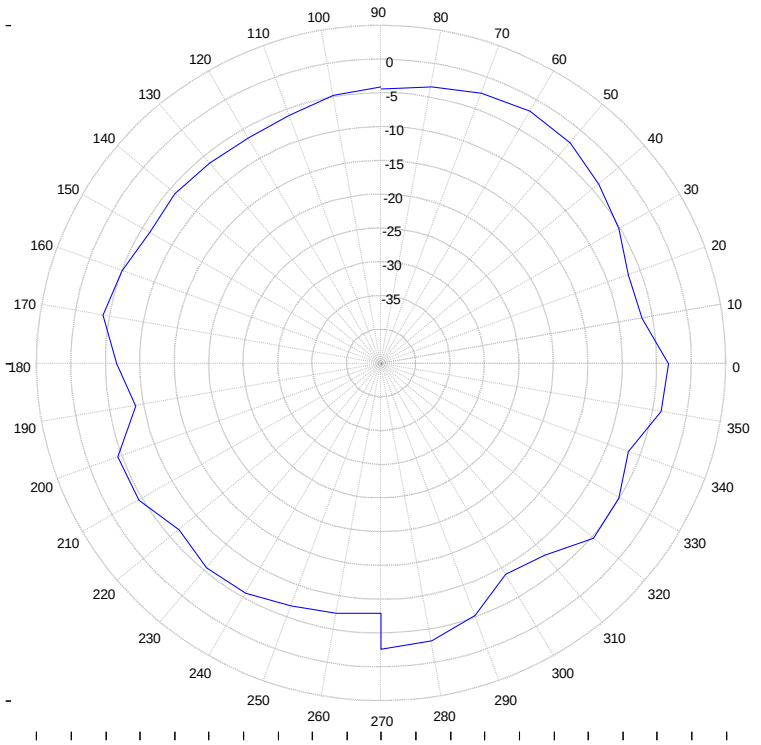
FIGURE 4 , 2440 MHZ AZIMUTH CUT

(HORIZONTAL AND VERTICAL POLARIZATION)



Name: .
Date/Time = 21/12/2022 14:14:50
Plot Scale: 5 dB/Div
Beamwidth: 58.04 Degrees

Frequency: 2439.718592964824 MHz
MAX dB= 0.0581 @ -140 Deg.
MIN dB= -23.14 @ -260 Deg.
dB Min/Max Delta = 23.207 dB



Name: .
Date/Time = 21/12/2022 14:10:16
Plot Scale: 5 dB/Div
Beamwidth: 70.51 Degrees

Frequency: 2439.718592964824 MHz
MAX dB= -1.990 @ 60 Deg.
MIN dB= -9.038 @ -60 Deg.
dB Min/Max Delta = 7.0488 dB

FIGURE 5 2440 MHZ ELEVATION CUT

(HORIZONTAL AND VERTICAL POLARIZATION)

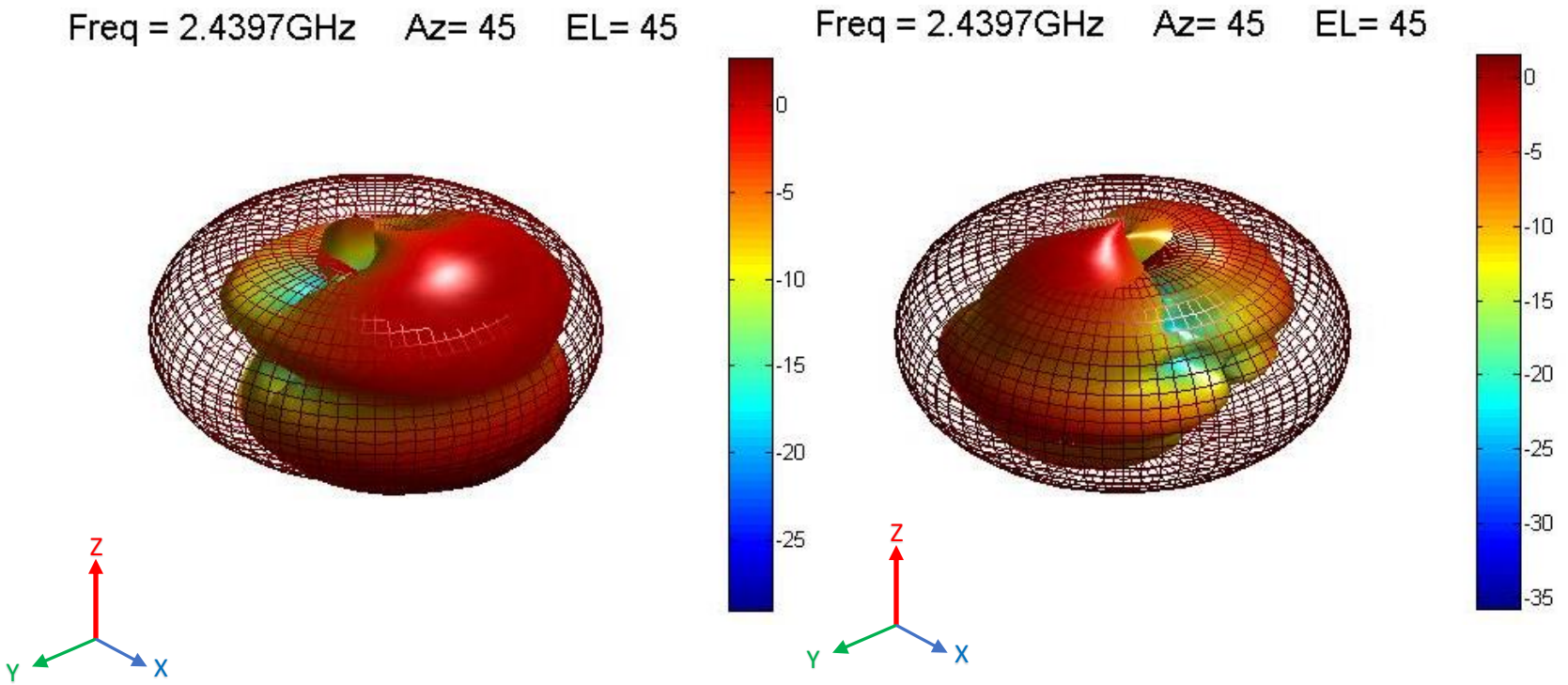


FIGURE 6 3D PLOT HORIZONTAL AND VERTICAL POLARIZATION

5. Radiated efficiency

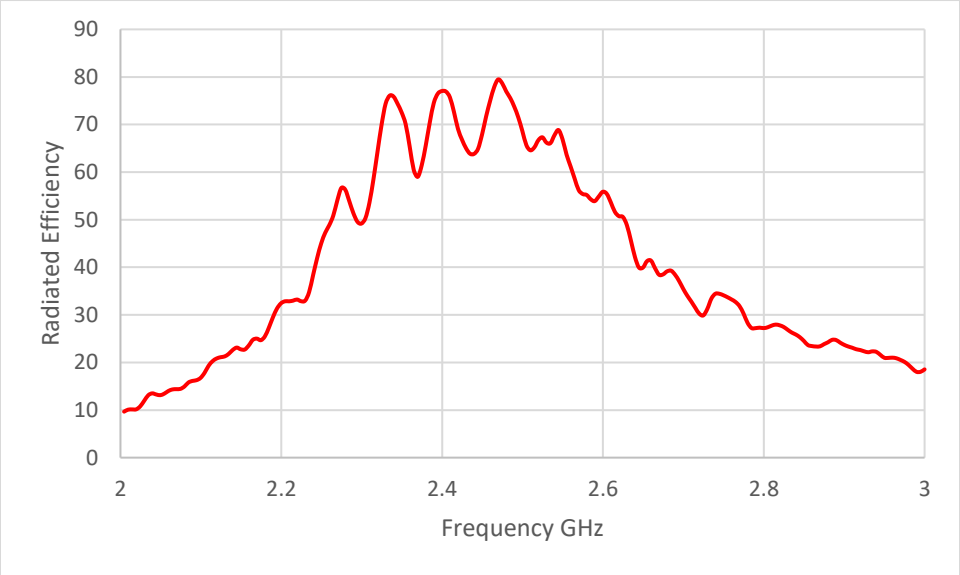


FIGURE 7 RADIATED EFFICIENCY

Test Condition	Peak Gain	Peak Efficiency
2400 - 2480 MHz	3.8 dBi	80%

TABLE 2 RADIATED EFFICIENCY AND GAIN

6. Results observations

The radiation pattens show that the antenna exhibits primary radiation with Horizontal polarization with a peak gain of 3.8dBi. The radiated efficiency is excellent at between 60% and 80%.

The antenna has slightly more directional gain than would be desirable, however, due to it's high efficiency, this is likely to be unnoticeable in an indoor environment.

7. Appendix – Test configuration

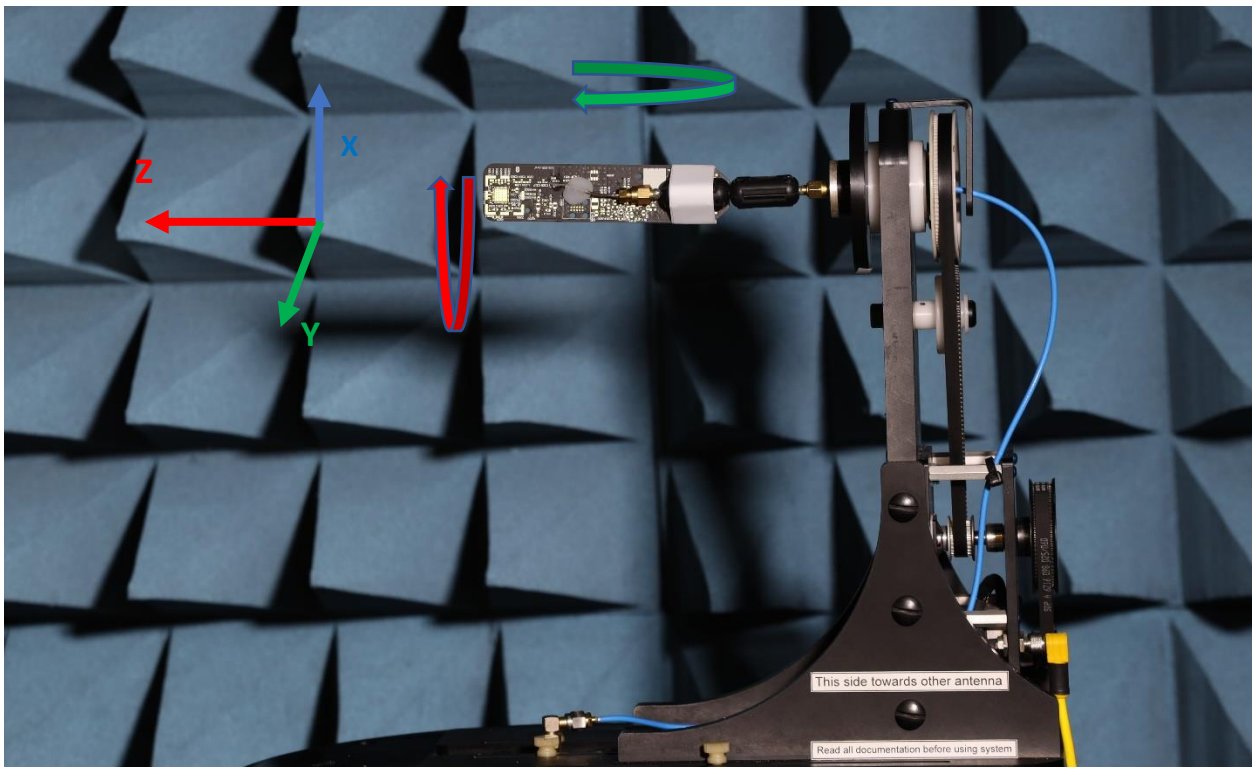


FIGURE 8 CHAMBER TEST CONFIGURATION – UUT SHOWN IN POSITION FOR 0 DEGREES EL, 0 DEGREES AZ

With reference to **FIGURE 8**, the green arrow shows the direction for rotation in the Elevation plane and the Red arrow shows the direction for rotation in the Azimuth plane.

The photograph in **FIGURE 8** was taken from the location of the test antenna.