Logitech
Antenna Under Test (AUT)
Report

Model Name: Krull

Equipment Type: Headset

Manufacturer: Logitech Far East LTD.

Test Location: B2, No. 215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 23143, Taiwan (R.O.C.), 23143

Teste personnel: _____**Frankie Chang**_____

Report Date: _____**2023.10.06**_____

Report Release History

Report version	Description	Date Issued
Krull AUT Report	Original release	2023/10/06

Table of Contents

1. EUT Antenna Information

1) Antenna Material : PCB on board
2) Antenna Type : Monopole
3) Antenna Dimension: 16 x 12 mm
4) Operating Frequency : 2.4 GHz - 2.4835 GHz
5) Input Impedance : 50 Ω
6) Standing-Wave Ratio : 2:1

2. Measured Values and Calculation of Antenna Gains

Measure peak Theta/Phi EIRP on 3D plane. The highest measured values will be used to calculate the antenna peak gain.

Antenna Peak Gain (dBi) = Max EIRP(dBm) - Conducted Power (dBm)

2402MHz

Polarization	Theta	Phi
Tot. Rad. Pwr. (dBm)	-1.74	-2.03
Peak EIRP (dBm)	5.85	3.70
Directivity (dBi)	7.58	5.7
Efficiency (dB)	-1.74	-2.03

2441MHz

Polarization	Theta	Phi
Tot. Rad. Pwr. (dBm)	-0.50	-1.25
Peak EIRP (dBm)	6.50	3.97
Directivity (dBi)	6.99	5.22
Efficiency (dB)	-0.49	-1.25

2480MHz

Polarization	Theta	Phi
Tot. Rad. Pwr. (dBm)	0.89	0.12
Peak EIRP (dBm)	7.60	5.78

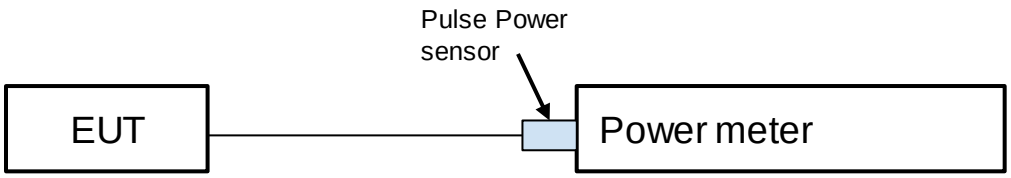
Directivity (dBi)	6.72	5.65
Efficiency (dB)	0.89	0.12

Frequency	3D Plane		Max Peak EIRP (dBm)	Conducted Power (dBm)	Antenna Peak Gain (dBi)
	Theta Peak EIRP (dBm)	Phi Peak EIRP (dBm)			
2402	5.85	3.7	5.85	5.08	0.77
2441	6.5	3.97	6.5	4.99	1.51
2480	7.6	5.78	7.6	4.81	2.79

Test Date: _____2023.10.03_____

3. Conducted Power Measurement

3.1 Test Setup



3.2 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Power Meter- Anritsu	ML2495A	1529002	Jun. 17, 2023
Pulse Power Sensor- Anritsu	MA2411B	1726434	Jun. 19, 2023

Note: The calibration interval of the above test instruments is _12_ months

3.3 Test Procedure

A Power meter was used to perform output power measurement, setting the detector to average and configuring EUT continuously transmitting power(100% duty cycle).

3.4 Test Result of RF conducted Power

Frequency	Conducted Power (dBm)
2402	5.08
2441	4.99
2480	4.81

Test Date: _____2023.09.21_____

4. 3D Radiation Pattern Measurement

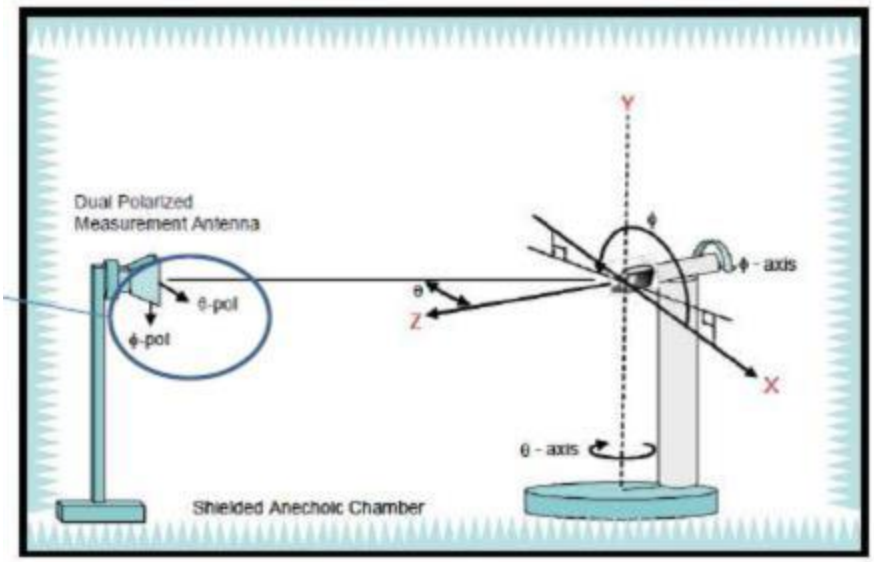
4.1 Test Location

3D radiation pattern measurement in the anechoic chamber

4.2 Description of the anechoic chamber

The anechoic chamber is a standard AMS-8500 rectangular anechoic chamber designed and built by ETS-Lindgren with the following nominal dimensions

Length: 7.32m (24 ft)
Width: 3.66m (12 ft)
Height: 3.66m (12 ft)
Turntable height: 1.45m
Measurement antenna height: 1.75m
Measurement distance: 4.86m



4.3 Test Instruments

Description	Model No.	Serial No.	Last Calibration
Measurement Software	EM-Quest 1.16- ETS-Lindgren	N/A	N/A
Signal Analyzer	EXA (N9010A)	102538	2023/7/18
Measurement Antenna	ETS Lindgren (3164-06)	133105	N/A
Bluetooth Tester	CBT- R&S	100980	2023/08/01
Chamber	ETS-lindgren_AMS-8500 Antenna Measurement System	N/A	N/A

Note: The calibration interval of the above test instruments is _12___ months

4.4 Test Procedure

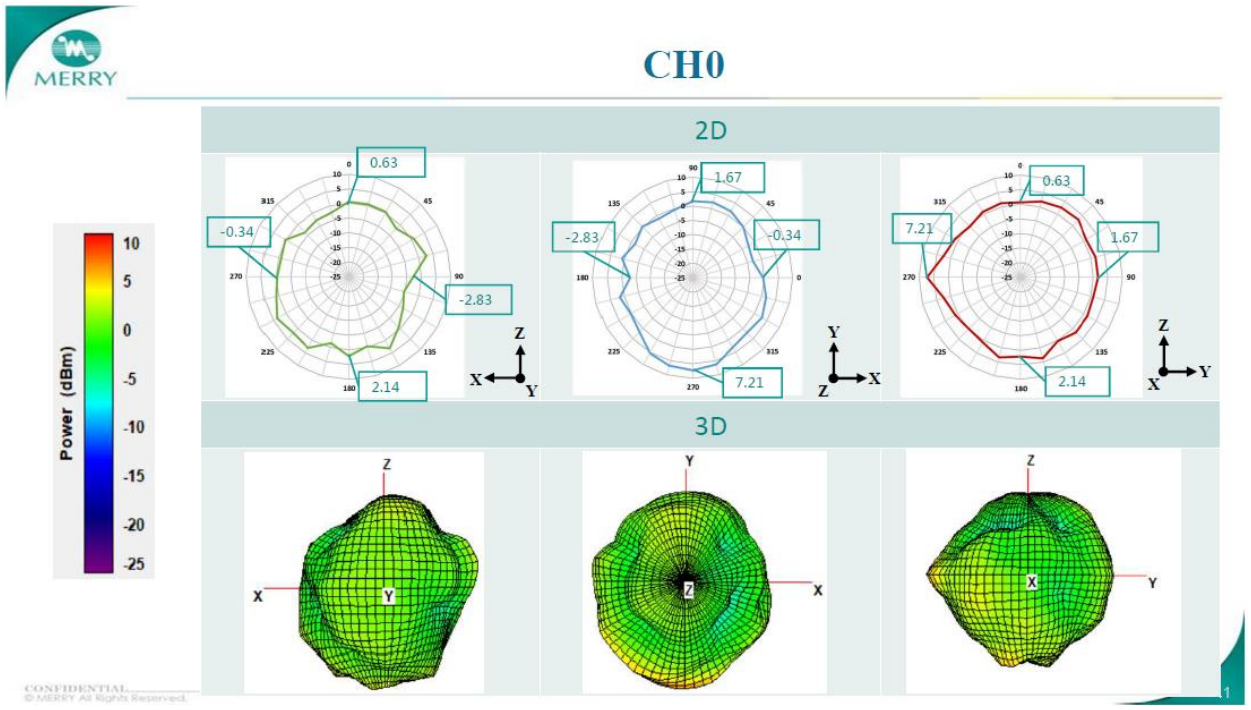
i. Connect the EUT to power meter and record the power setting of EUT and the measured conducted power.
ii. Fasten the EUT in the center of the jig on Multi-Axis Positioning System, record the coordinates and take pictures.
iii. Configuring EUT continuously transmitting power (100% duty cycle).
iv. Make sure the transmit signal is stable and at the maximum RF power level.
v. Read the channel power level on the signal analyzer and record in the following positions.
    1. The EUT is then stepped between 0 to 360 degrees along the horizontal plane in 15-degree increments.
    2. Data is recorded using the signal analyzer for both theta and phi polarizations at each position.
    3. Rotate the EUT with 90 degree and repeat step f.1 and step f.2 until all 3 planes were measured.
vi. Change EUT setup to transmit the RF power on 2402MHz, 2441MHz and 2480MHz respectively.
vii. Find the highest peak EIRP recorded from measurement data for all 3 planes.
viii. Antenna Peak Gain (dBi) = Max EIRP(dBm) - Conducted Power (dBm)

4.5 Test Setup photos

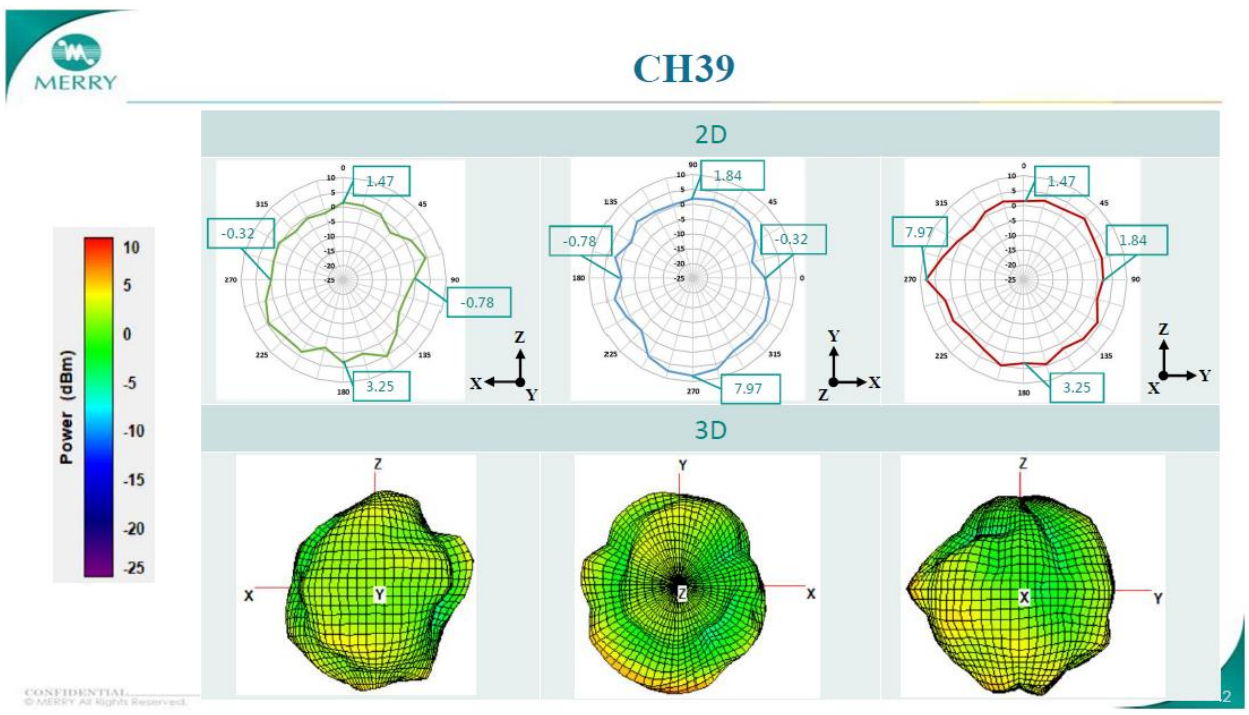
Please see another documents

4.6 2D/3D Patterns

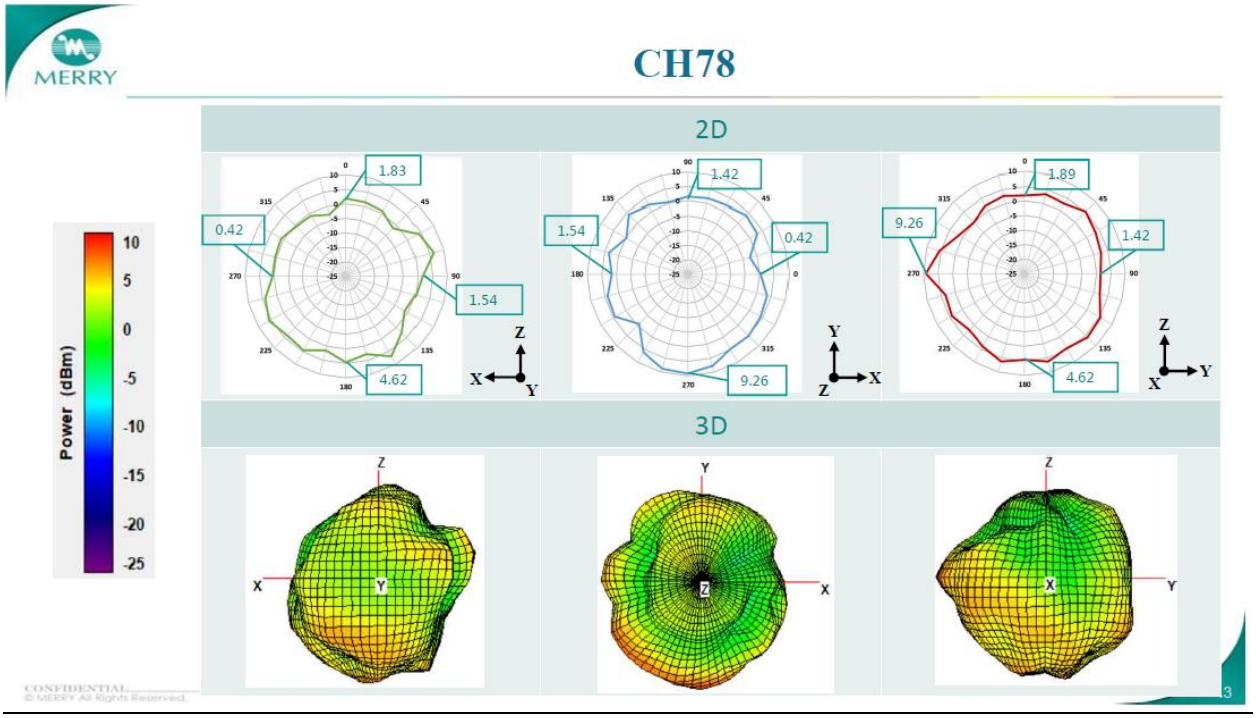
2402MHz



2441MHz


CH39
2D
1.47
-0.32
-0.78
3.25
1.84
-0.78
-0.32
7.97
1.47
7.97
1.84
3.25
3D
Power (dBm)
10
5
0
-5
-10
-15
-20
-25

2480MHz


CH78
2D
1.83
0.42
1.54
4.62
1.42
1.54
0.42
9.26
1.89
9.26
1.42
4.62
3D
Power (dBm)
10
5
0
-5
-10
-15
-20
-25