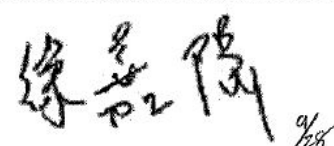



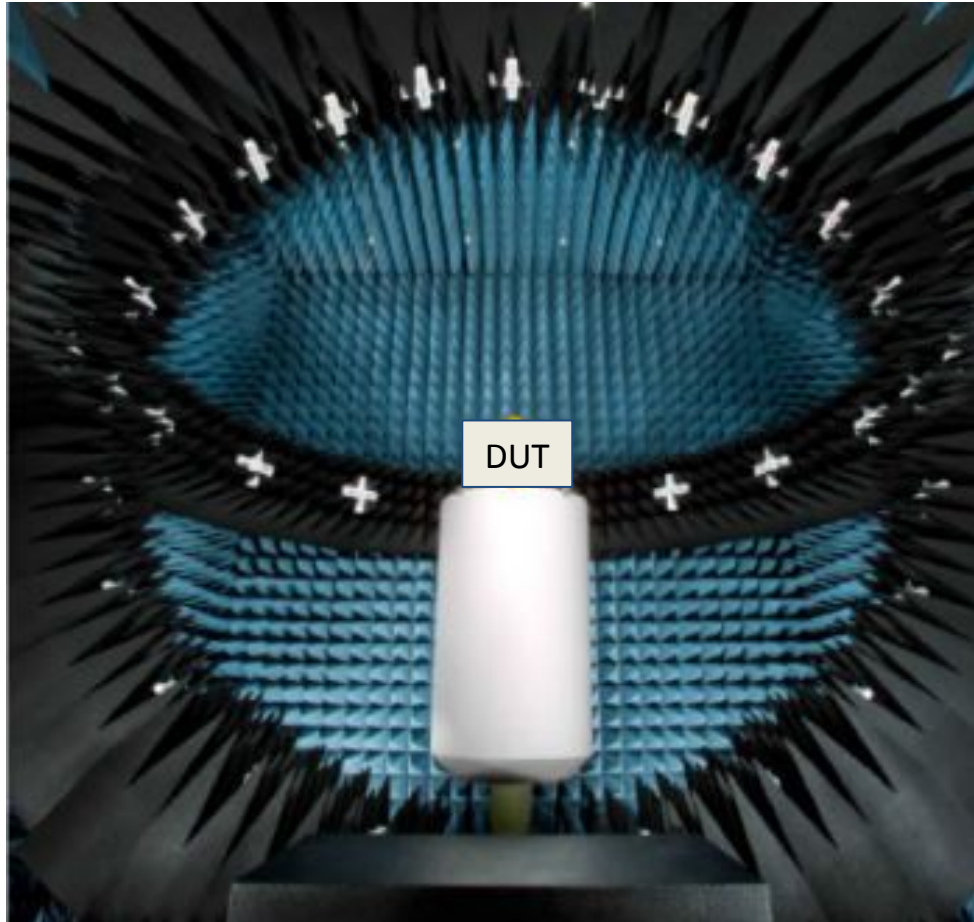
# Antenna Specification and Test Data

	MANUFACTURE
APPROVED BY:	 9/28
TESTED BY:	 9/28

# Revision History

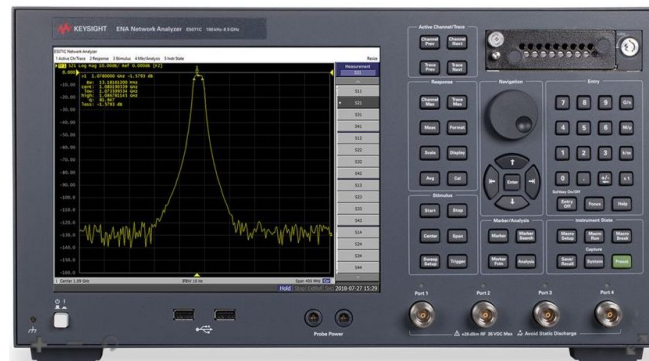
Version	Date	Author	Description
1.00	2023-09-05	Sean Xiao	Initial release
1.01	2023-10-12	Sean Xiao	Initial release

- **Antenna type description: PCB printing antenna**
- **PCB printing Antenna manufacture:FII**
- **Antenna model name(foot print name):ANT-U73H038T00D**



## Chamber Information

- Chamber model: ETS AMS-8923-142-G
- Frequency range: 600MHz to 10GHz
- Test instrument:
  - Keysight E5071C ENA
  - Keysight N9020B SA
- Chamber size: 4.8x 4.8x 4.8 m<sup>3</sup>
- Test tool: EMQuest
- Environment loss @2.4GHz: 22-23dB
- Last calibration date:2023/08/31
- Next calibration date:2023/11/31



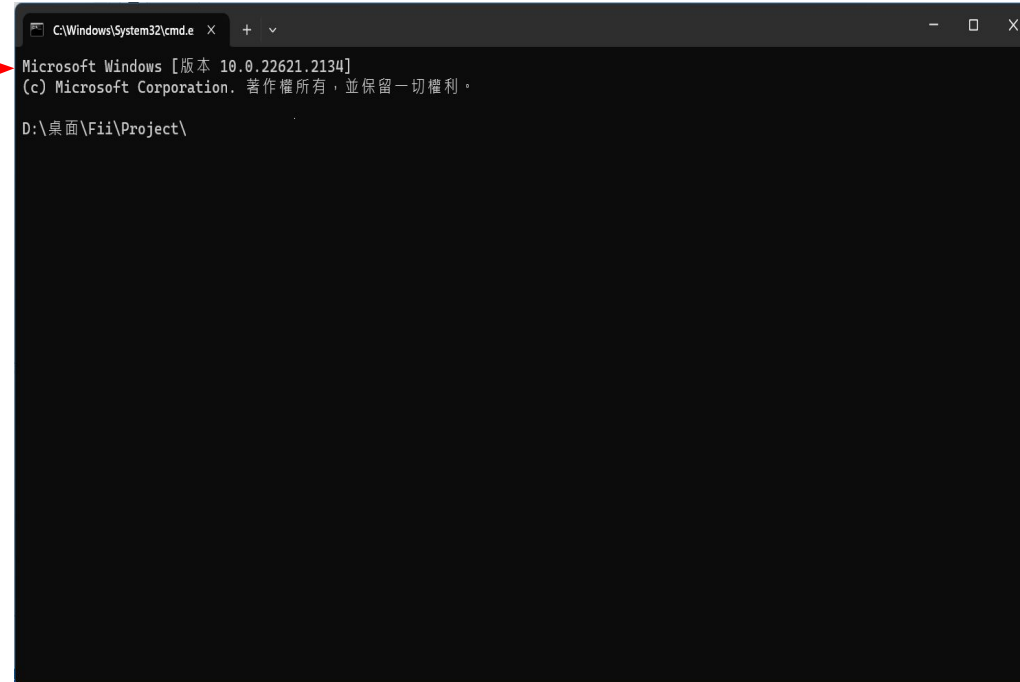
# Measurement SOP(1/2)

1. Key in “cmd” in folder path and press ‘Enter’

1.

Key “cmd” here

名稱	修改日期	類型	大小
beacon_cmd	2023/2/8 下午 04:22	應用程式	8 KB
BLE_Command_Tool	2023/2/8 下午 04:22	應用程式	31 KB
command	2023/4/20 下午 01:37	文字文件	1 KB
DevManView.cfg	2023/3/8 下午 02:13	CFG 檔案	2 KB
DevManView	2023/3/8 下午 02:11	編譯的 HTML 說明...	20 KB
DevManView	2023/3/8 下午 02:11	應用程式	164 KB
DFU_Tool	2023/2/8 下午 04:22	應用程式	56 KB
XQR_1.0.1d1-prodkey-9	2023/3/8 上午 10:50	壓縮的 (zipped) ...	55 KB
nrf52832_xxaa_LQX_1.0.1d1-prodke...	2023/3/8 上午 10:50	壓縮的 (zipped) ...	25 KB
readme	2023/3/8 下午 02:11	文字文件	19 KB



# Measurement SOP(2/2)

## 2. Command SOP: [env dump values GPIO](#)

- 2-1 BIE\_Command\_tool.exe pair "MAC"
- 2-2 BIE\_Command\_tool.exe write "MAC" env dump
- 2-3 BIE\_Command\_tool.exe write "MAC" gpio set 12 1  
BIE\_Command\_tool.exe write "MAC" gpio set 13 1  
BIE\_Command\_tool.exe write "MAC" gpio set 14 0  
BIE\_Command\_tool.exe write "MAC" gpio set 15 0  
BIE\_Command\_tool.exe write "MAC" gpio set 16 1  
BIE\_Command\_tool.exe write "MAC" gpio set 17 1
- 2-4 BIE\_Command\_tool.exe write "MAC" gpio set 28 1  
BIE\_Command\_tool.exe write "MAC" gpio set 29 1  
BIE\_Command\_tool.exe write "MAC" gpio set 30 1  
BIE\_Command\_tool.exe write "MAC" gpio set 31 1  
BIE\_Command\_tool.exe write "MAC" ble tx 2402 37 0 0 0

//connect DUT  
//Check tx calibration value (GPIO 31,30,29,28) as FEM\_BIAS\_NA = X<sub>31</sub>X<sub>30</sub>X<sub>29</sub>X<sub>28</sub> (example 1111)  
//Set FEM to high power mode

//Write "MAC" env dump & Set frequency

### 2-1

```
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe pair 18:B4:30:CE:EF:1D
/* PEGATRON PROPRIETARY AND CONFIDENTIAL. */
/* Copyright 2017 PEGATRON CORP. */
/* All Rights Reserved. */

Tool Version: V1.17 Unpair Device When Command is "Pair" at the Beginning, Set Flag
Start Time: 2023/9/5 下午 03:25:21
Pairing...
Pair Timeout
Pairing...
Pair Success
```

### 2-2

```
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D env dump
/* PEGATRON PROPRIETARY AND CONFIDENTIAL. */
/* Copyright 2017 PEGATRON CORP. */
/* All Rights Reserved. */

FEM_BIAS_NA=1111
FEM_MODE_NA=1
```

### 2-3

```
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D gpio set 17 1
/* PEGATRON PROPRIETARY AND CONFIDENTIAL. */
/* Copyright 2017 PEGATRON CORP. */
/* All Rights Reserved. */

Search Channel...
Get Command Point
Notification Set Done
Pair Done
Write Command: gpio set 17 1
```

### 2-4

```
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D gpio set 28 1
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D gpio set 29 1
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D gpio set 30 1
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D gpio set 31 1
D:\桌面\Fii\Project\ \tool>BIE_Command_tool.exe write 18:B4:30:CE:EF:1D ble tx 2402 37 0 0 0
Success Send Command
```

# Antenna Specification and Test Data

Parameter	Values
Frequency Band	2.4GHz to 2.480GHz
Antenna in band VSWR	< 2
Antenna Efficiency	> -2dB at band center, > -3dB at band edges in Free space
Antenna peak gain	< 3dBi

## Antenna Specification

Frequency (MHz)	2402	2426	2480	4800	7200
VSWR	< 2.17	< 2.46	< 3		
Active Efficiency (dB)	> -1.62	> -1.54	> -1.5		
Peak gain (dBi)	< 2.46	< 2.19	< 1.33	< -5.4	< -8.81

## Test Data

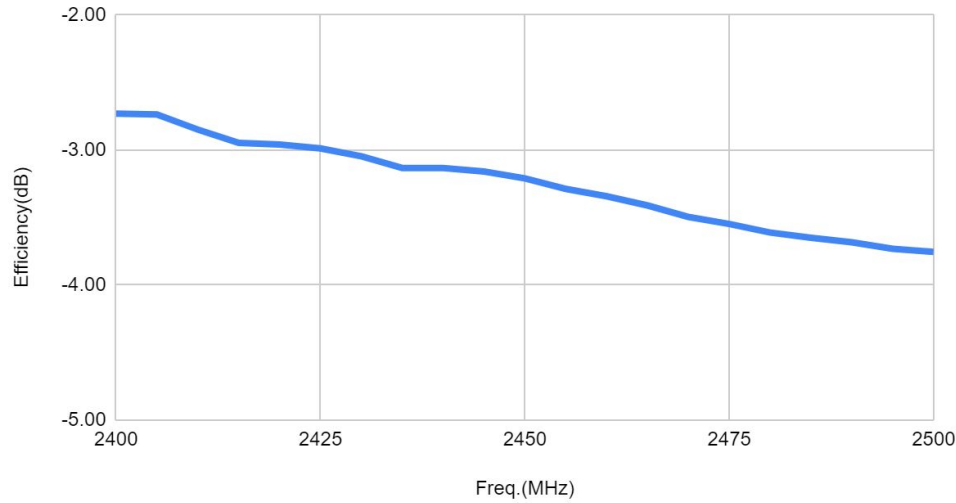


# *Appendix*

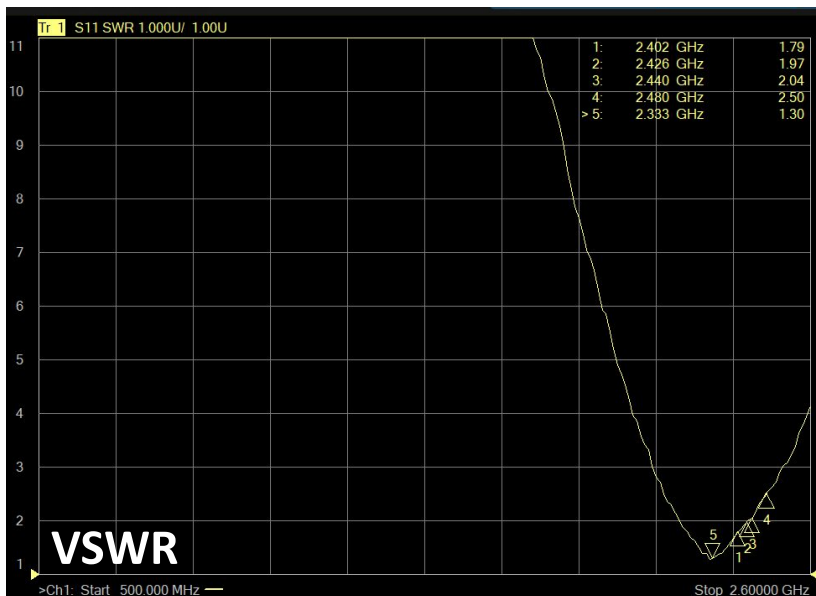
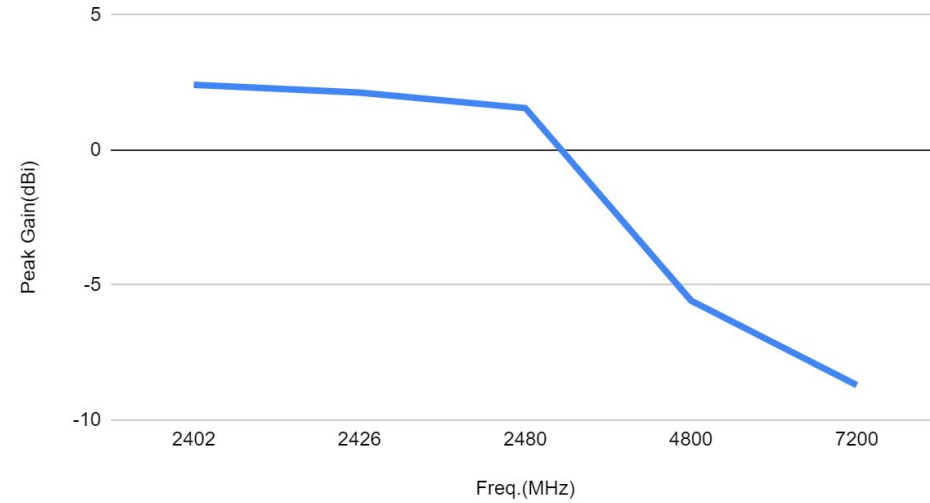


# Passive Measurement

Antenna Efficiency

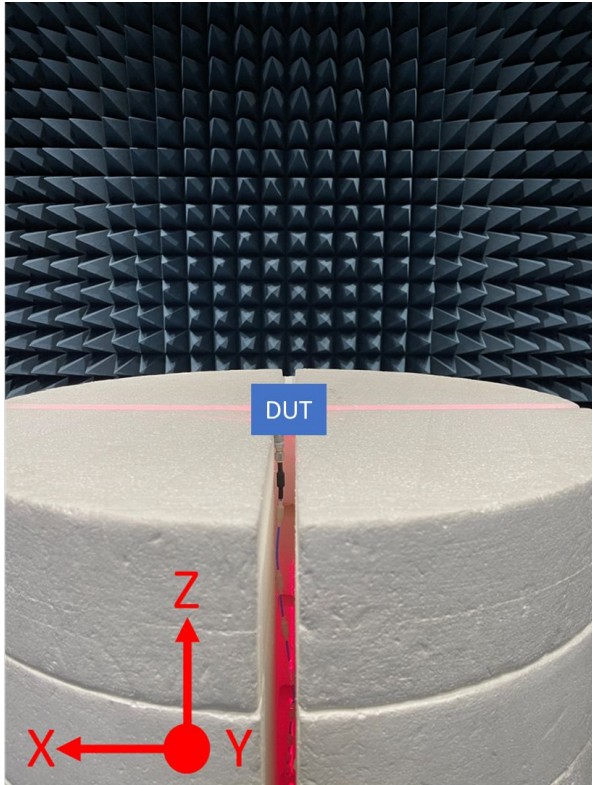


Peak Gain



Ch.	Efficiency	VSWR	Peak gain
2402	-2.73 dB	1.79	2.46 dBi
2426	-2.99 dB	1.97	2.19 dBi
2480	-3.61 dB	2.5	1.6 dBi
4800			-5.57 dBi
7200			-8.71 dBi

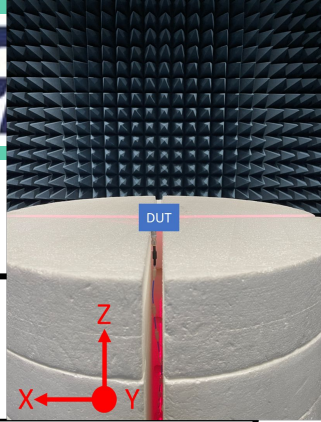
# TRP Measurement



	Config	Main1		
	SN	SKM000360330		
		RFC	TRP	Active efficiency
<a href="#">env dump values GPIO</a>		1011		
Tx setting 19dBm	2402	18.58	16.96	-1.62
	2440	18.85	17.31	-1.54
	2480	18.68	17.18	-1.50
		[dBm]	[dBm]	[dB]

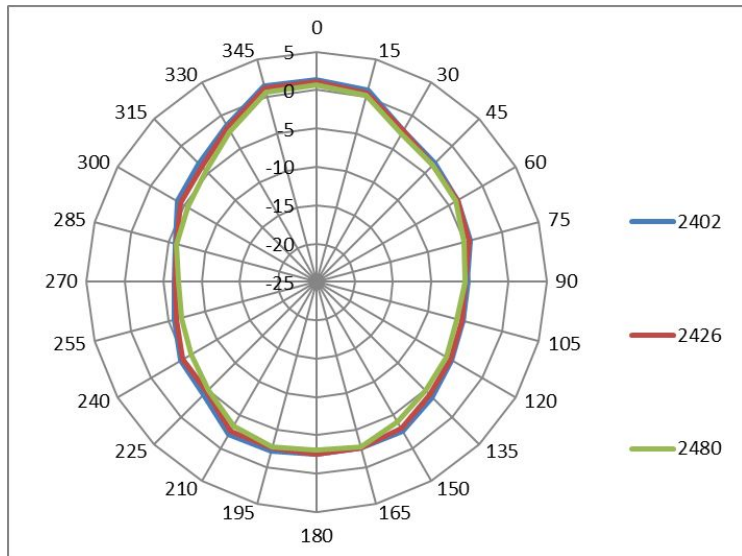
**TRP Measurement**

# 2D Radiation Gain Pattern

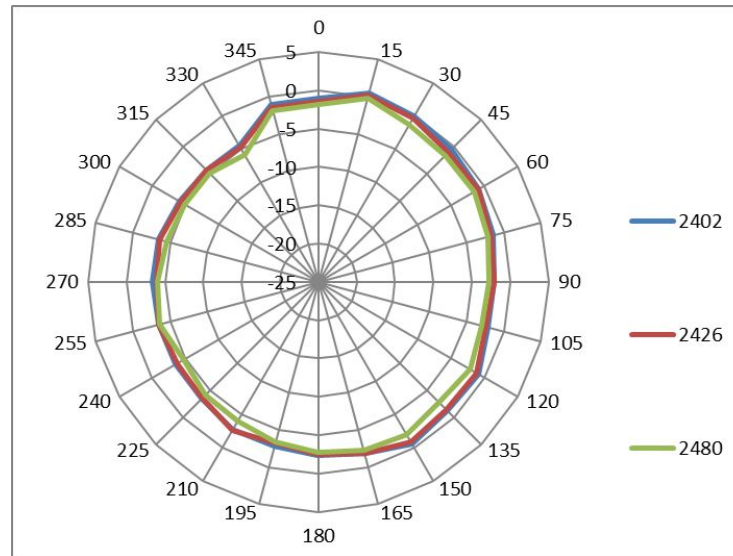


## Main1 Ant.-2402/2426/2480 MHz

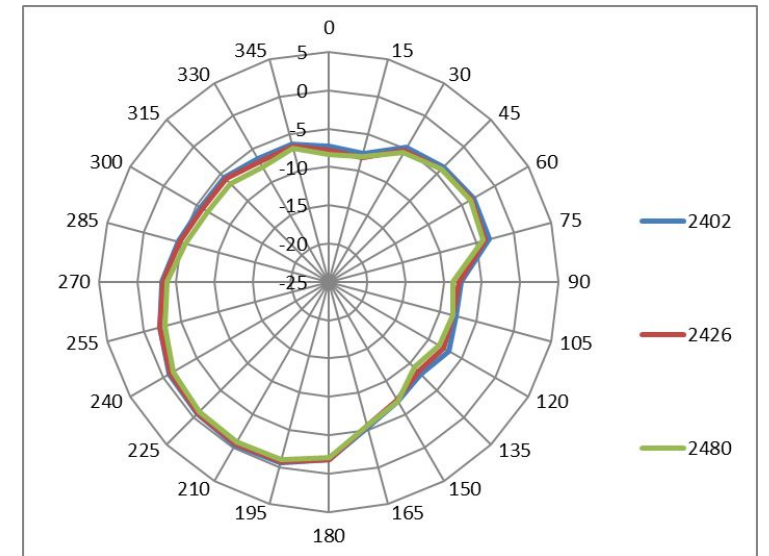
### XZ-Plane



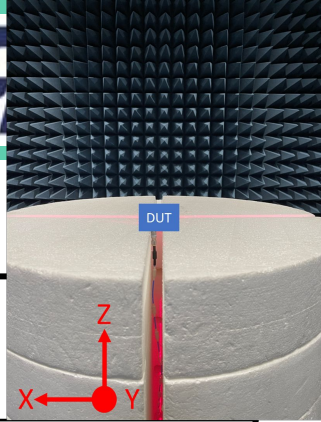
### YZ-Plane



### XY-Plane



# 3D Radiation Gain Pattern



Main1 Ant.-2402/2426/2480 MHz

