



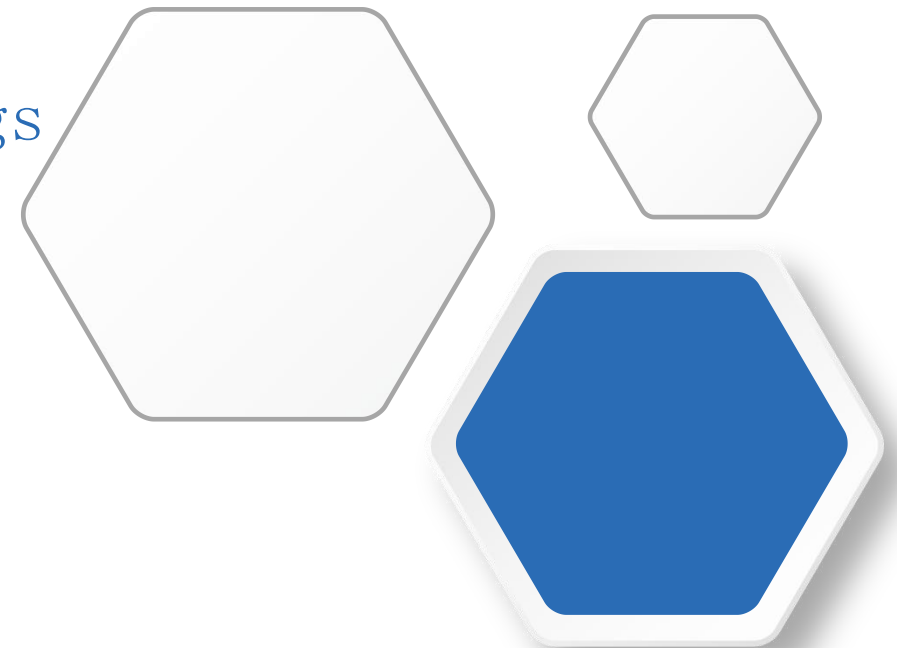
Topfriction Internet of Things

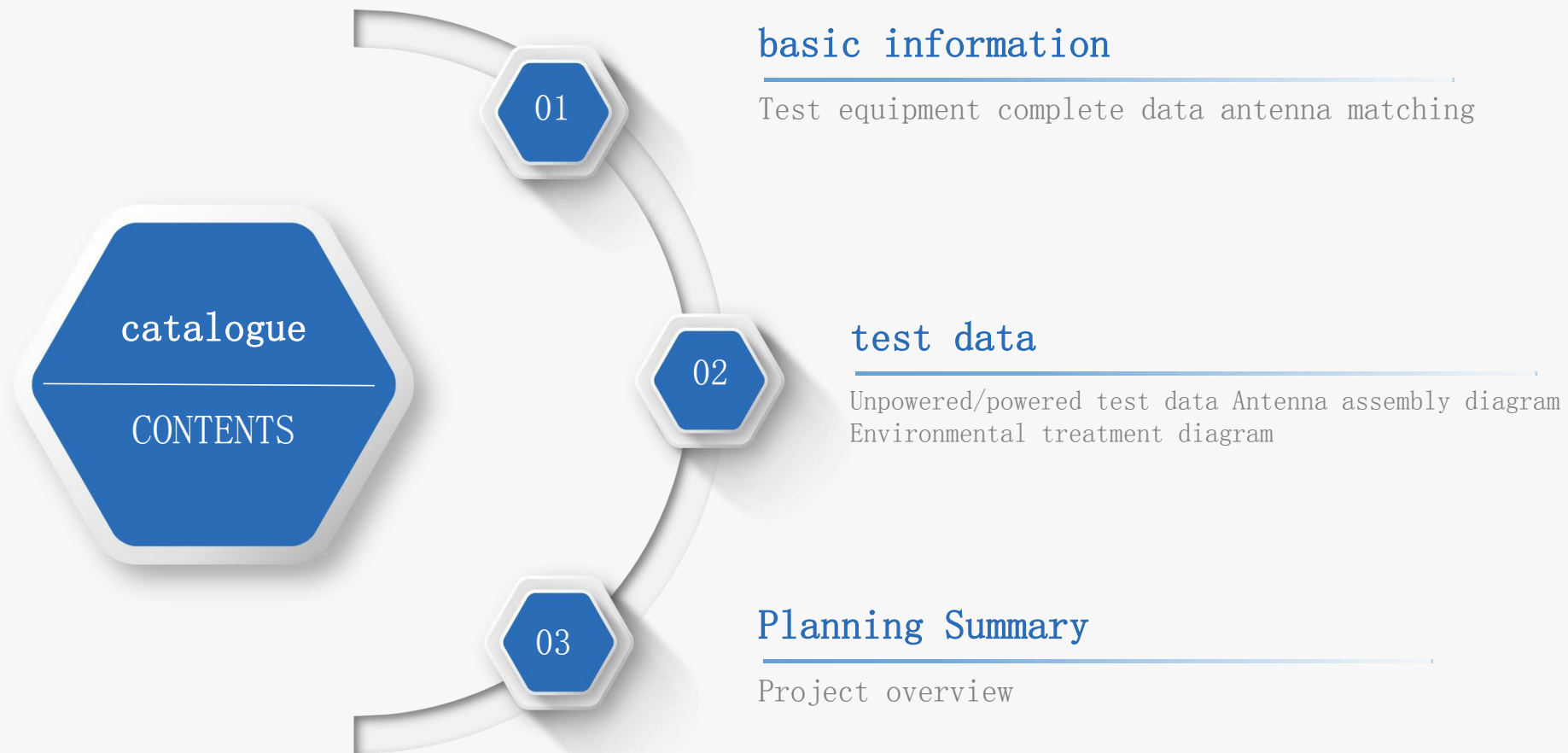
Mower antenna debugging report



Radio: Engineer Li

Time: 2025.10.10



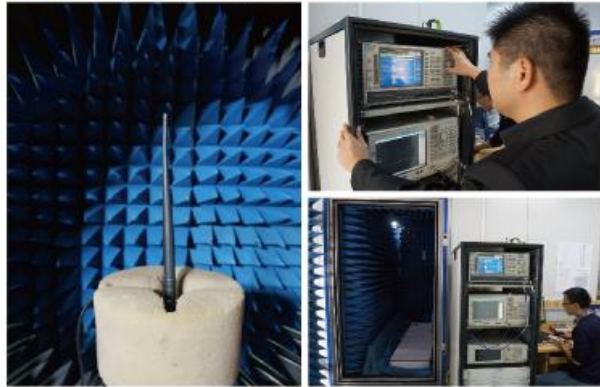
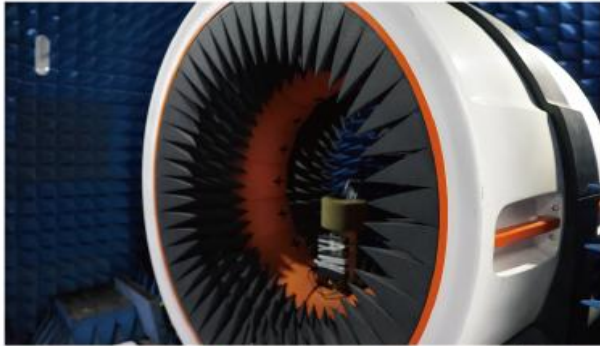




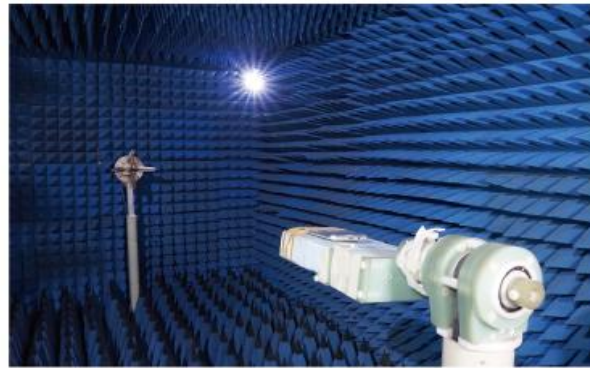
basic information

Basic information

【SATIMO】



【广屏】



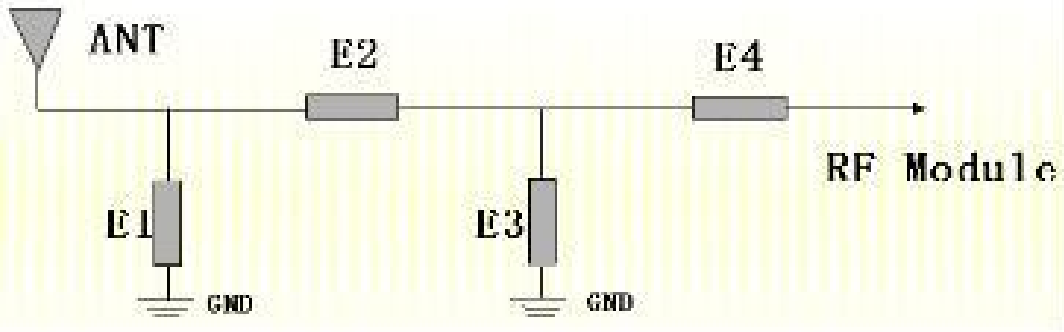
test macro

- SATIMO, Agilent E5071C, Anristu MT8820C, CMW500, StarPointSP9500



basic information

Basic information



antenna loading coil

Antenna circuit matching description

(1) Smart lawn mower 4G-MAIN antenna compatibility:

No changes

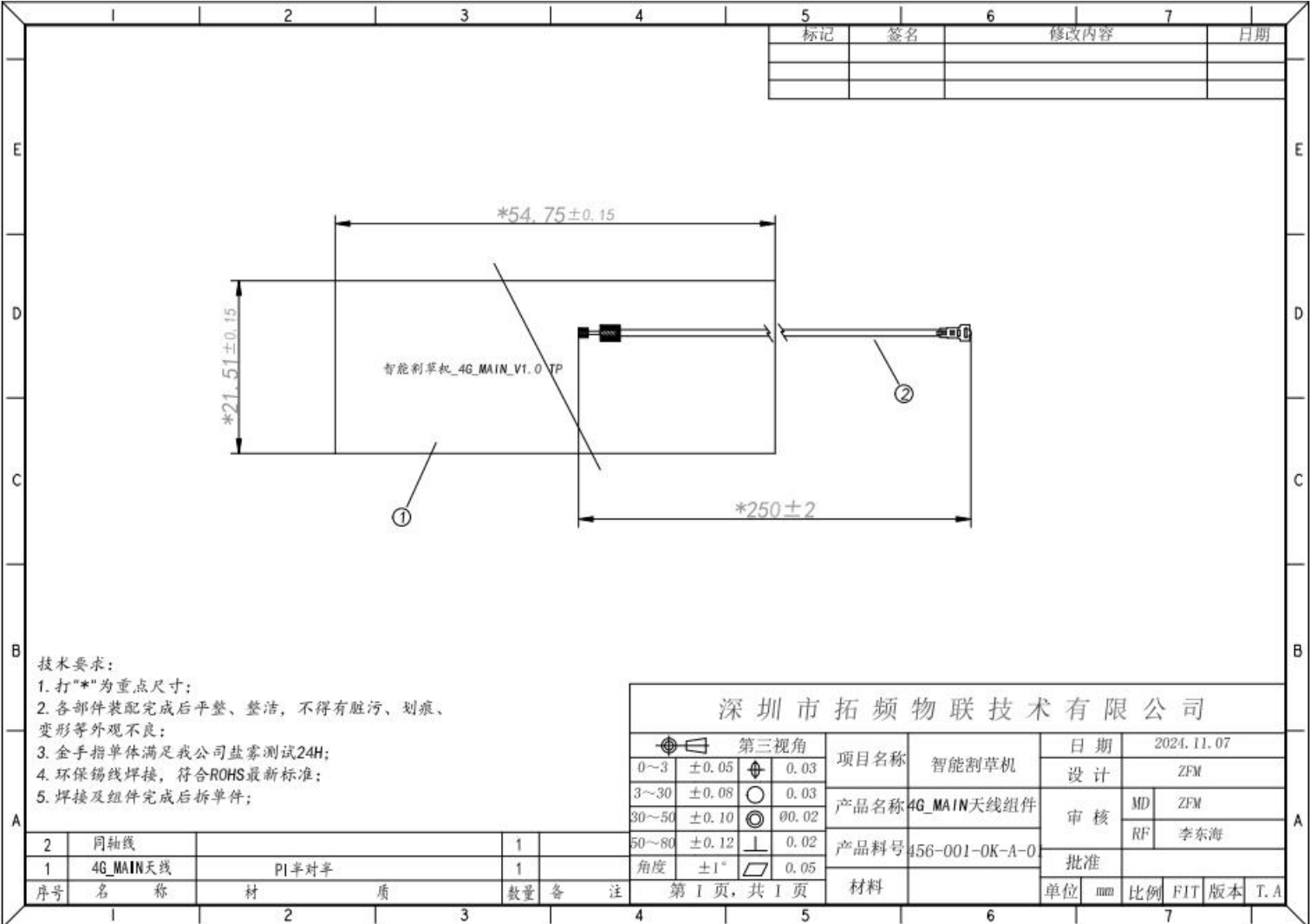
(2) Smart lawn mower 4G-DIV antenna compatibility:

No changes

(3) BT & Wi-Fi antenna compatibility for smart lawn mowers: **No changes**

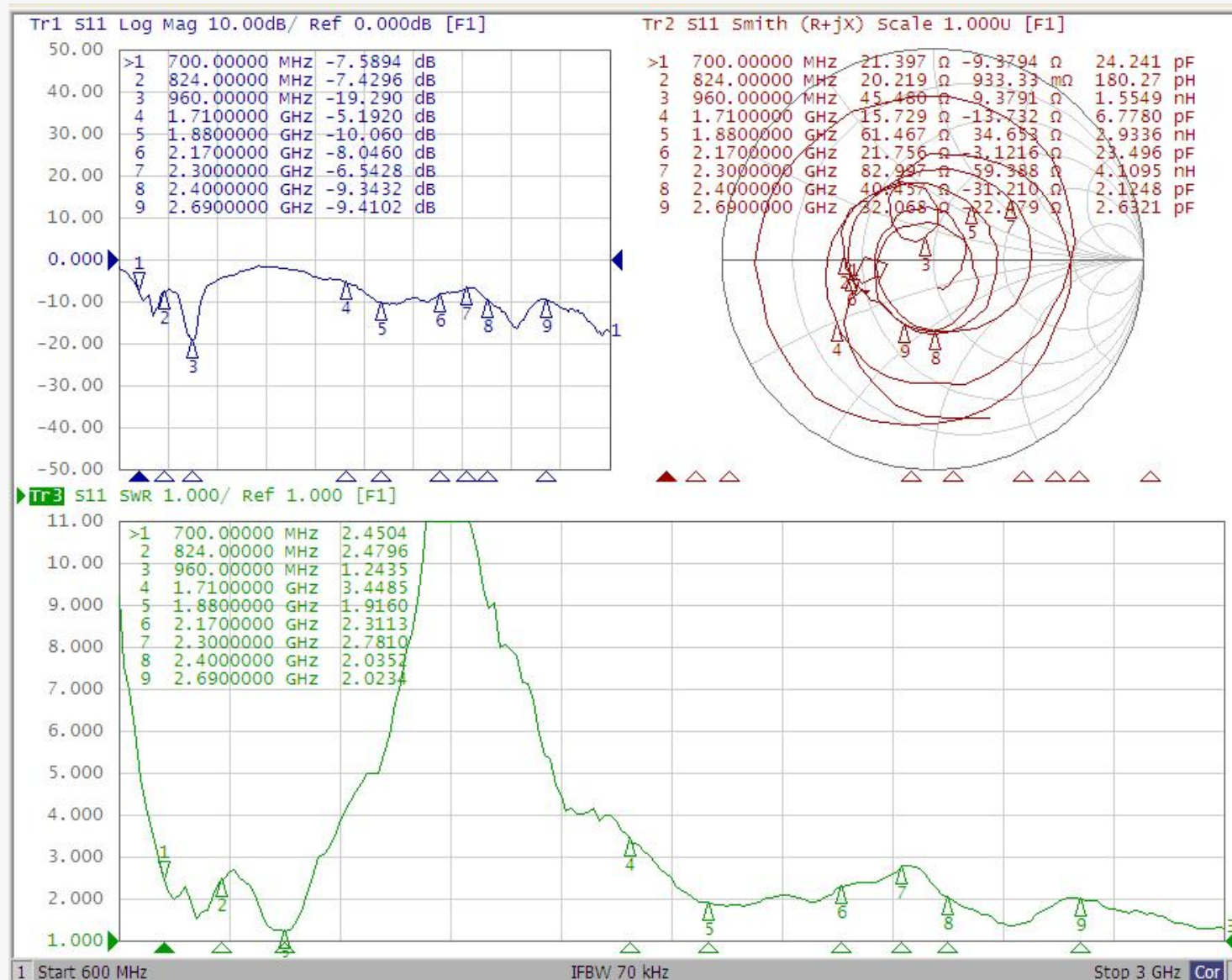


4G-MAIN: Assembly Diagram





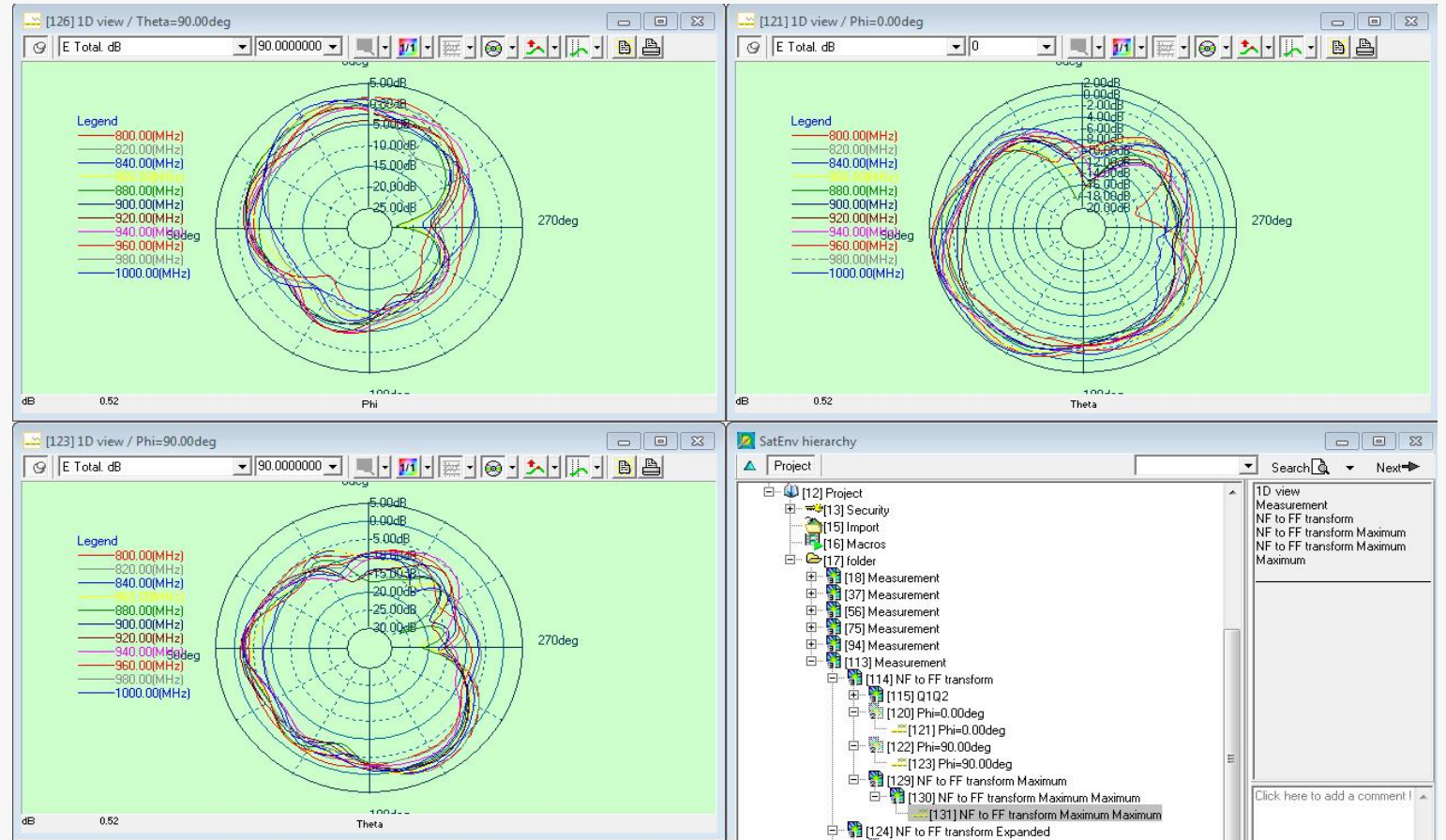
4G-MAIN: Single-antenna passive measurements (echo loss, Smith circle diagram, voltage standing wave ratio)





4G-MAIN: Passive data with single antenna (efficiency, gain, pattern)

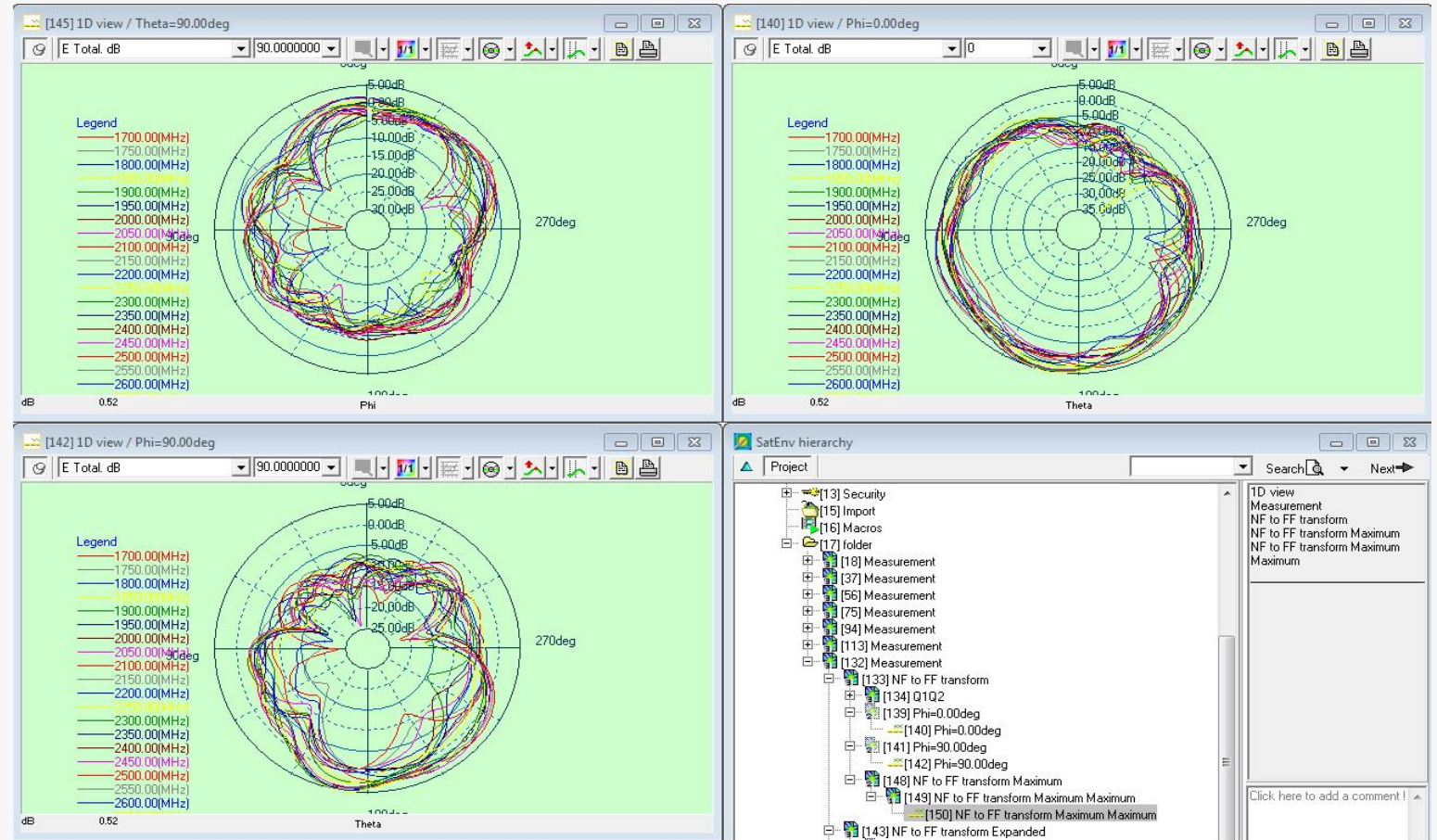
Frequency	Efficiency	Gain . dBi
800MHz	47%	1. 90
820MHz	46%	2. 22
840MHz	42%	2. 07
860MHz	40%	1. 39
880MHz	44%	1. 41
900MHz	42%	1. 70
920MHz	42%	1. 28
940MHz	36%	1. 52
960MHz	35%	1. 73
980MHz	34%	2. 25
1000MHz	40%	3. 49





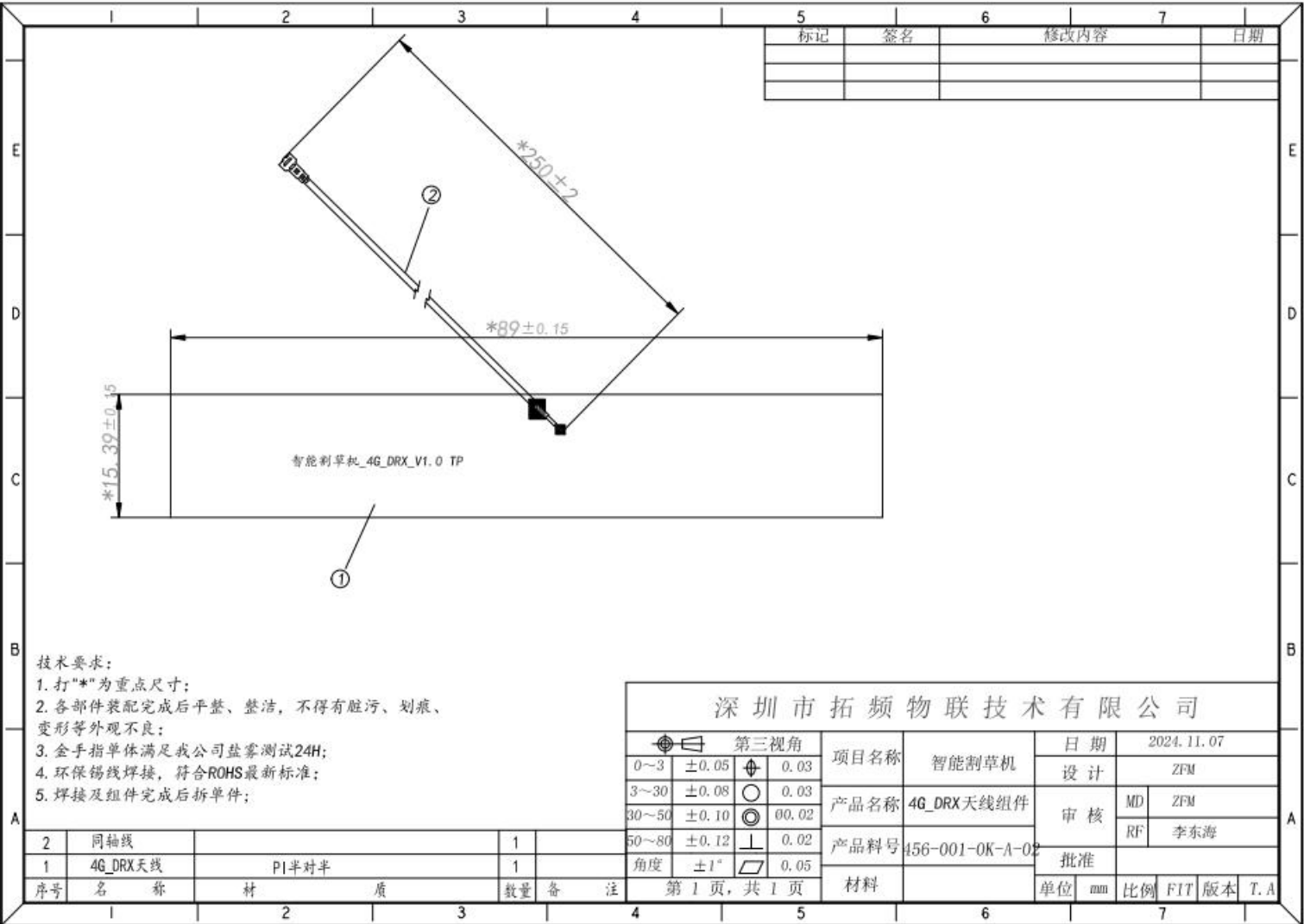
4G-MAIN: single antenna passive data (efficiency, gain, directionality)

Frequency	Efficiency	Gain . dBi
1700MHz	51%	3.44
1750MHz	45%	3.13
1800MHz	41%	2.68
1850MHz	41%	2.90
1900MHz	42%	3.20
1950MHz	43%	1.40
2000MHz	41%	2.45
2050MHz	38%	2.42
2100MHz	36%	1.83
2150MHz	34%	1.60
2200MHz	31%	2.19
2250MHz	35%	3.68
2300MHz	41%	5.14
2350MHz	44%	4.92
2400MHz	46%	4.61
2450MHz	45%	4.32
2500MHz	49%	5.11
2550MHz	51%	5.13
2600MHz	49%	5.15
2650MHz	51%	5.20
2700MHz	50%	4.64



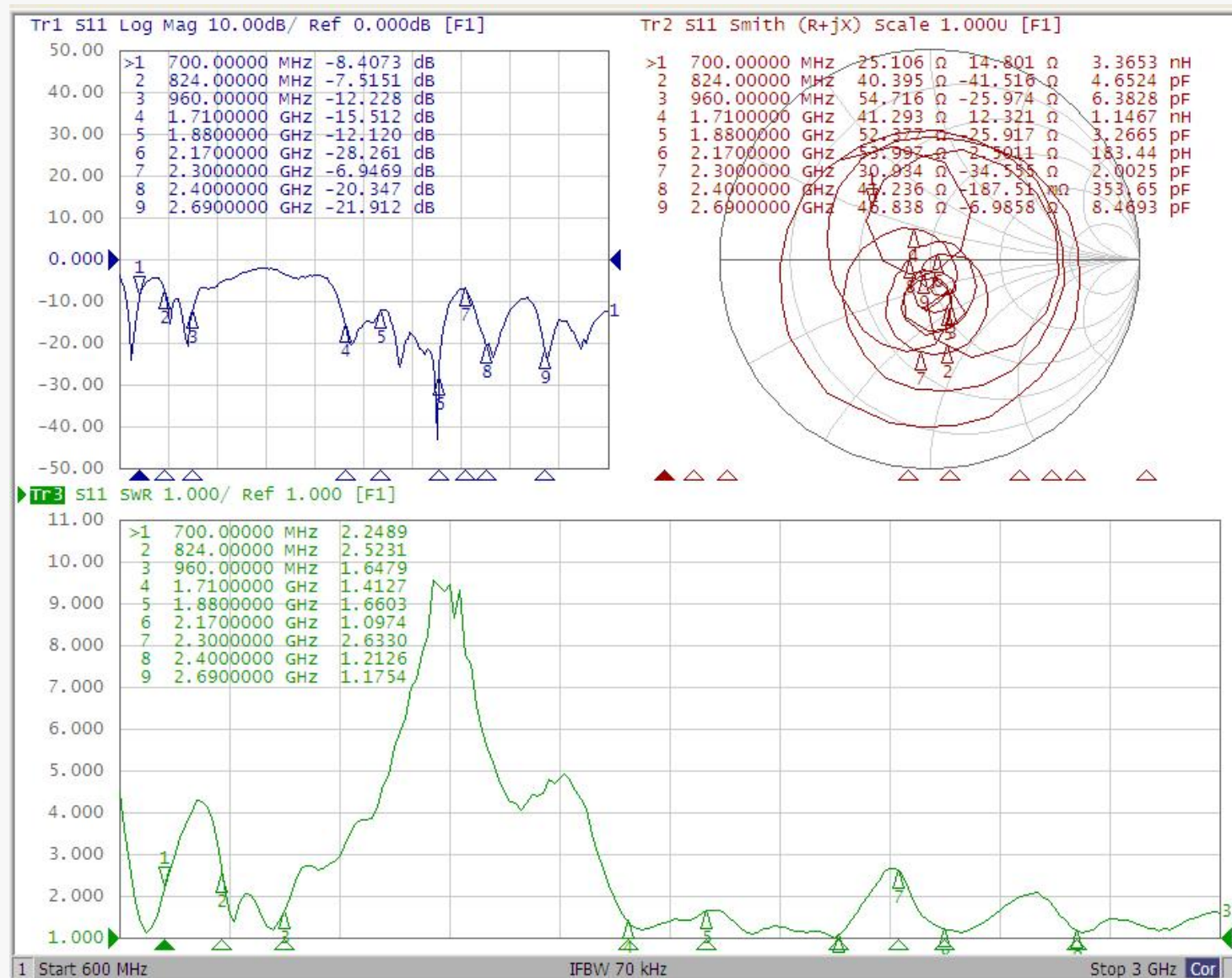


4G-DIV: Assembly diagram





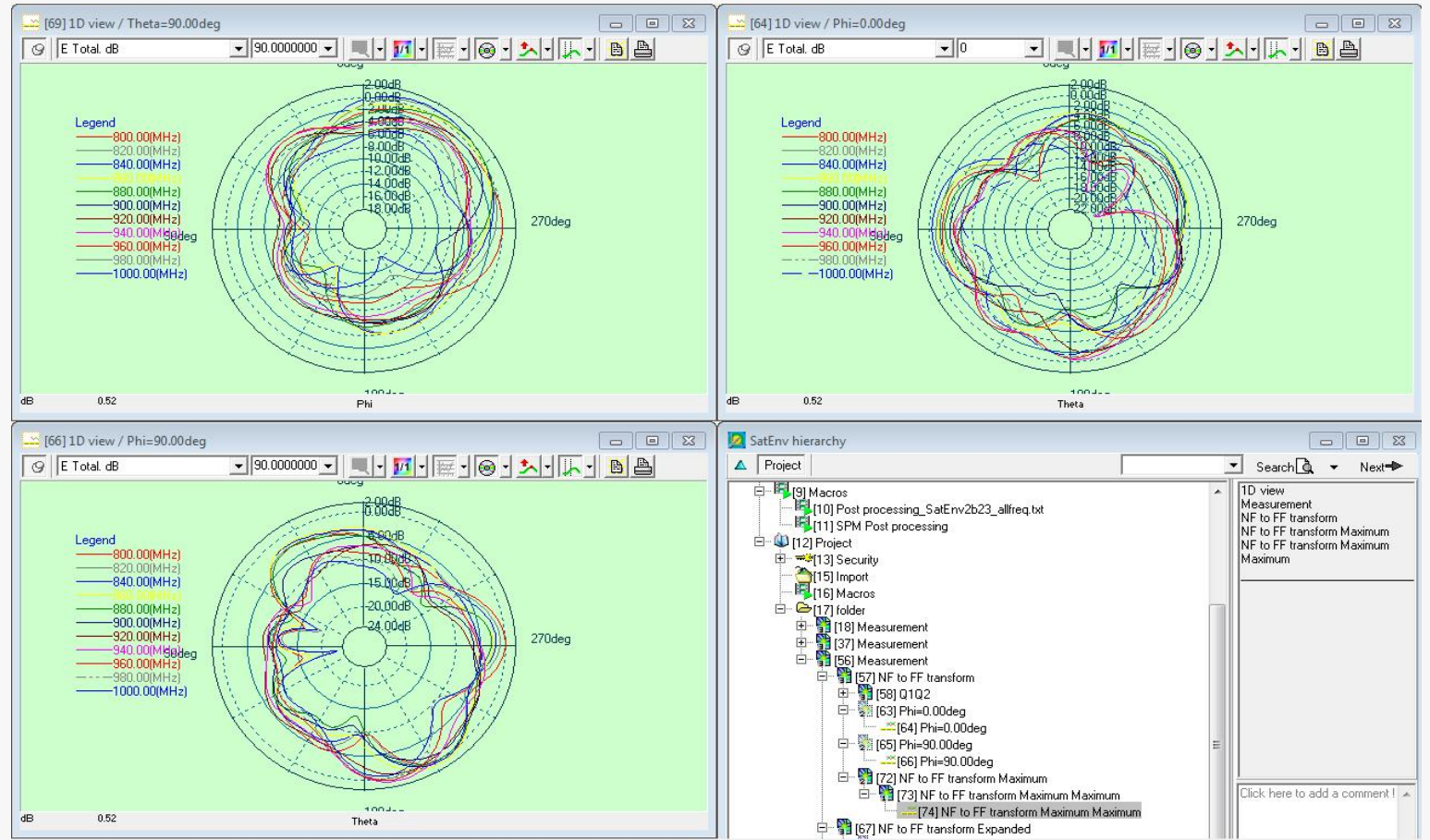
4G-DIV: single antenna passive data (return loss, Smith circle diagram, voltage standing wave ratio)





4G-DIV: single antenna passive data (efficiency, gain, directionality)

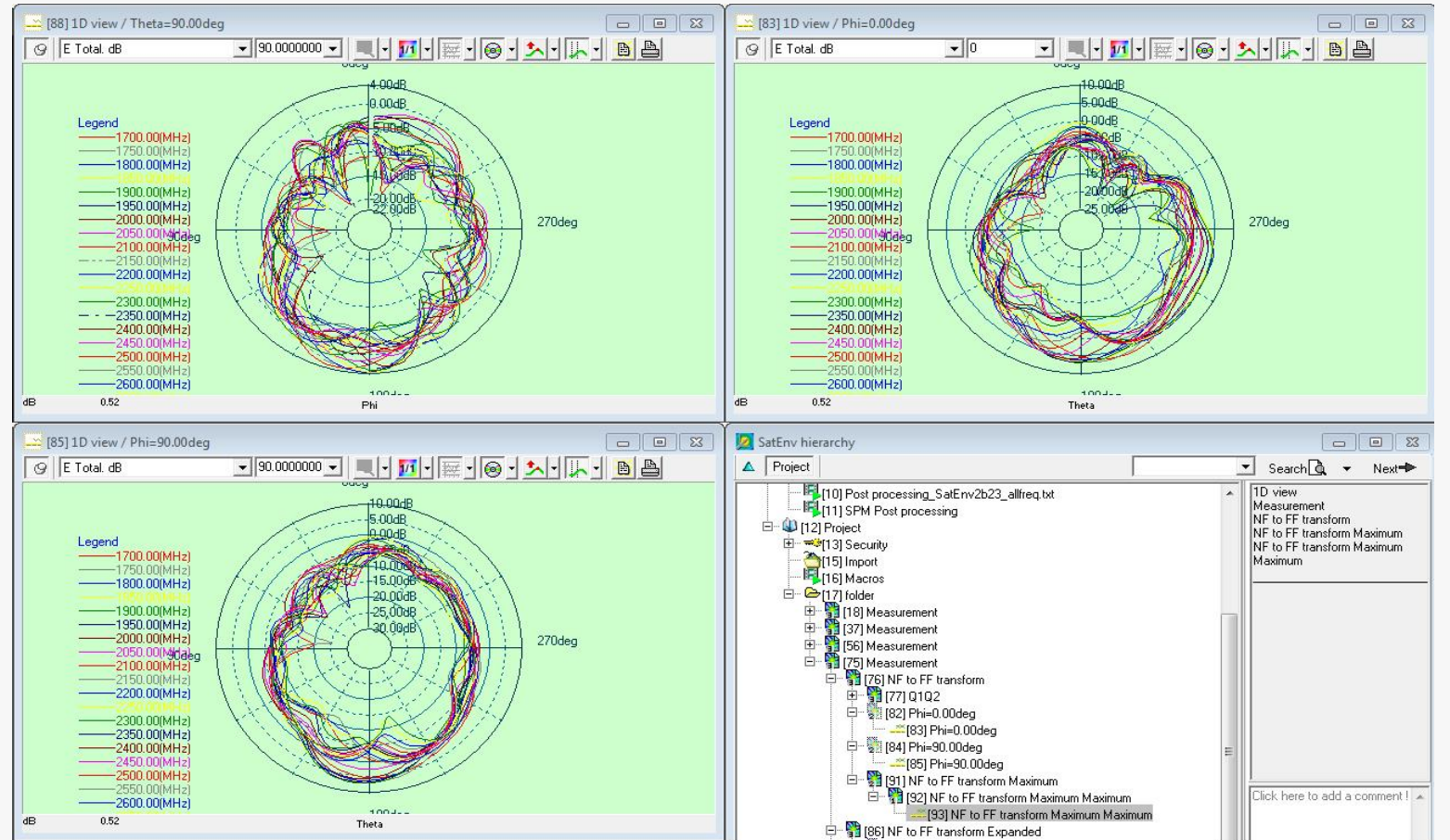
Frequency	Efficiency	Gain . dBi
800MHz	33%	0.99
820MHz	36%	0.72
840MHz	37%	0.85
860MHz	35%	0.86
880MHz	31%	0.51
900MHz	26%	0.34
920MHz	27%	0.10
940MHz	29%	0.75
960MHz	27%	0.47
980MHz	22%	0.06
1000MHz	17%	-0.43





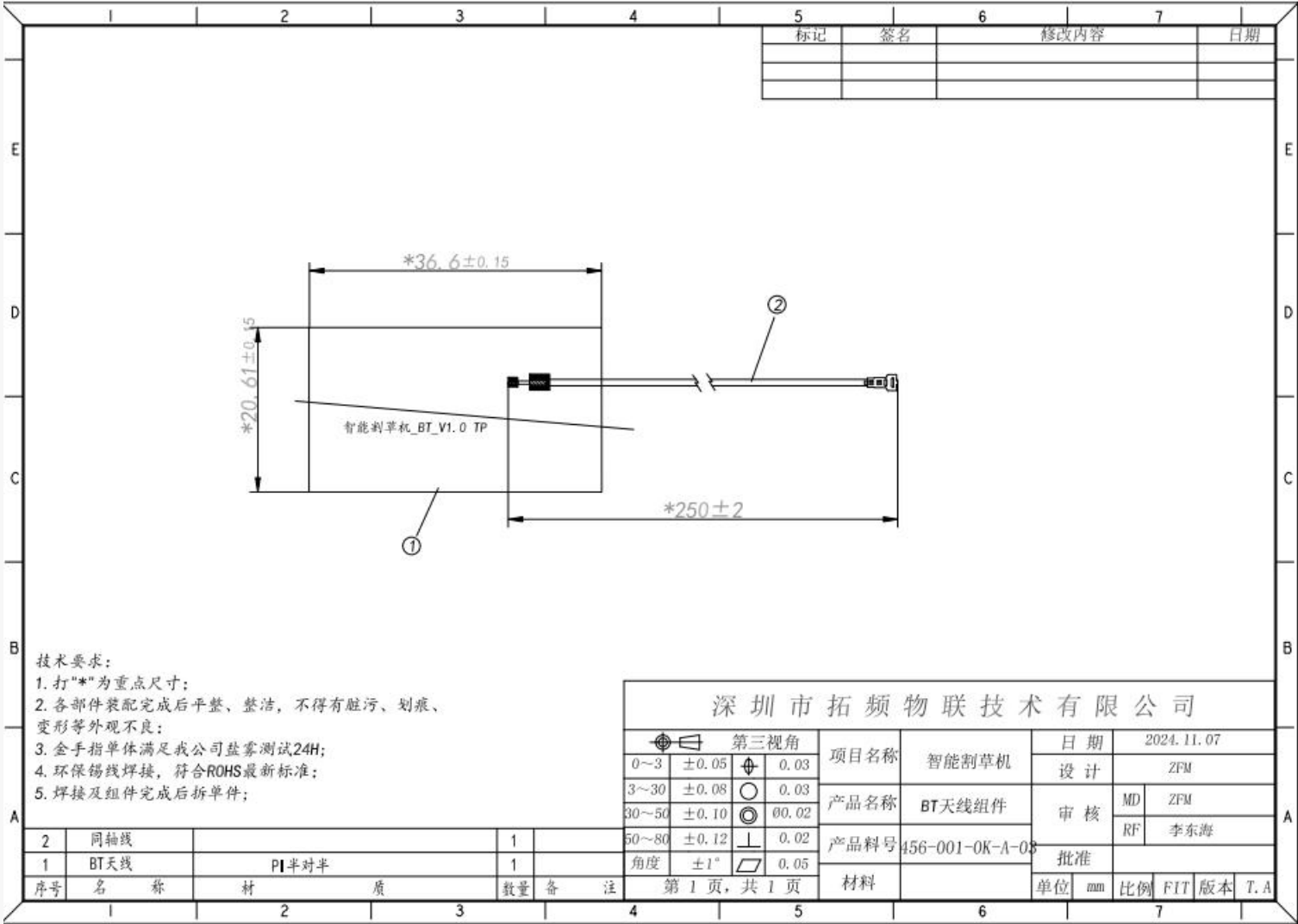
4G-DIV: single antenna passive data (efficiency, gain, directionality)

Frequency	Efficiency	Gain . dBi
1700MHz	57%	6. 51
1750MHz	56%	6. 74
1800MHz	51%	5. 87
1850MHz	57%	6. 36
1900MHz	53%	6. 72
1950MHz	51%	6. 62
2000MHz	50%	6. 01
2050MHz	51%	5. 32
2100MHz	55%	4. 44
2150MHz	57%	5. 17
2200MHz	52%	5. 41
2250MHz	45%	5. 21
2300MHz	41%	5. 52
2350MHz	35%	4. 42
2400MHz	36%	3. 82
2450MHz	34%	3. 50
2500MHz	34%	3. 35
2550MHz	32%	2. 08
2600MHz	30%	1. 34
2650MHz	34%	2. 90
2700MHz	36%	3. 65



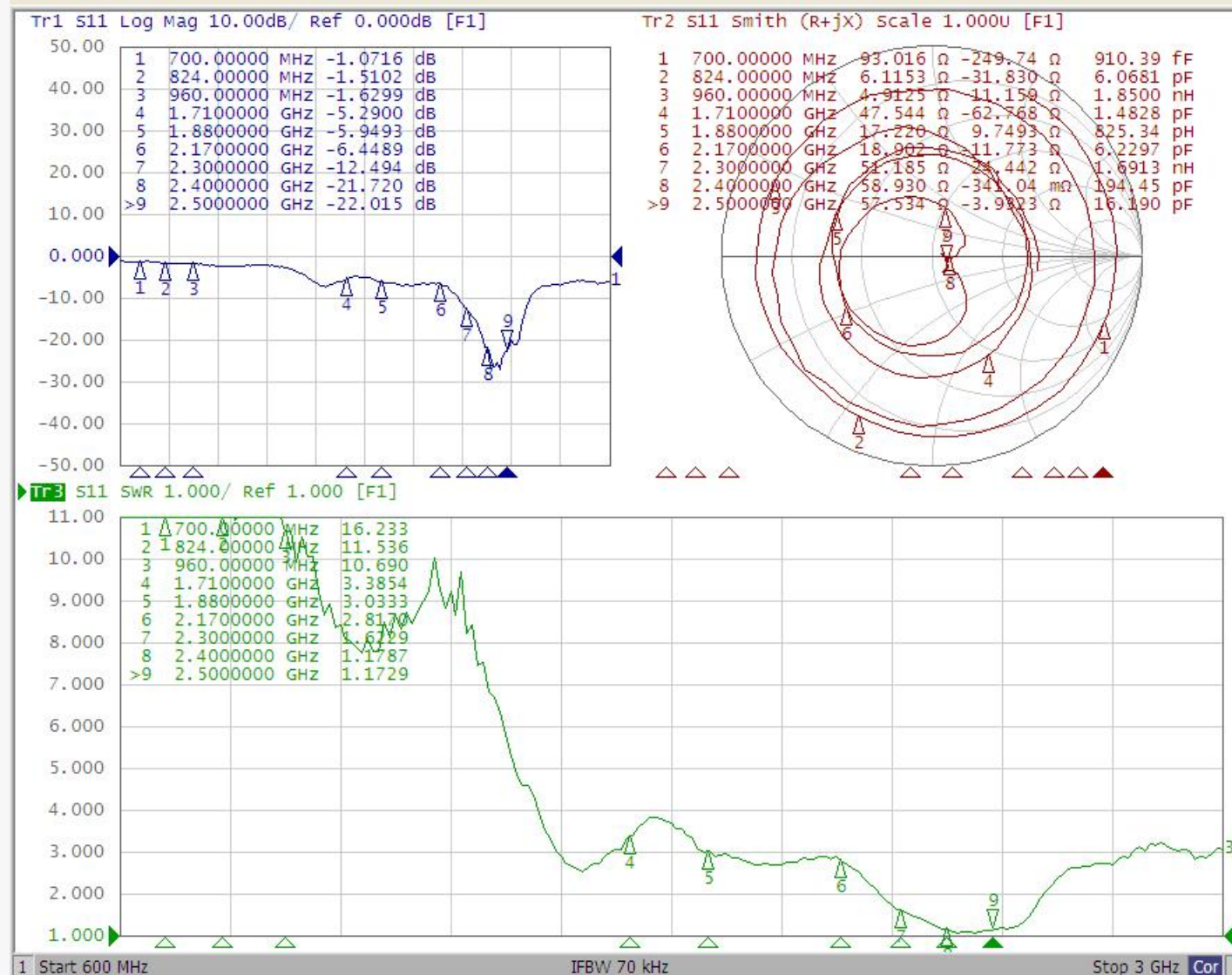


BT: assembly drawing





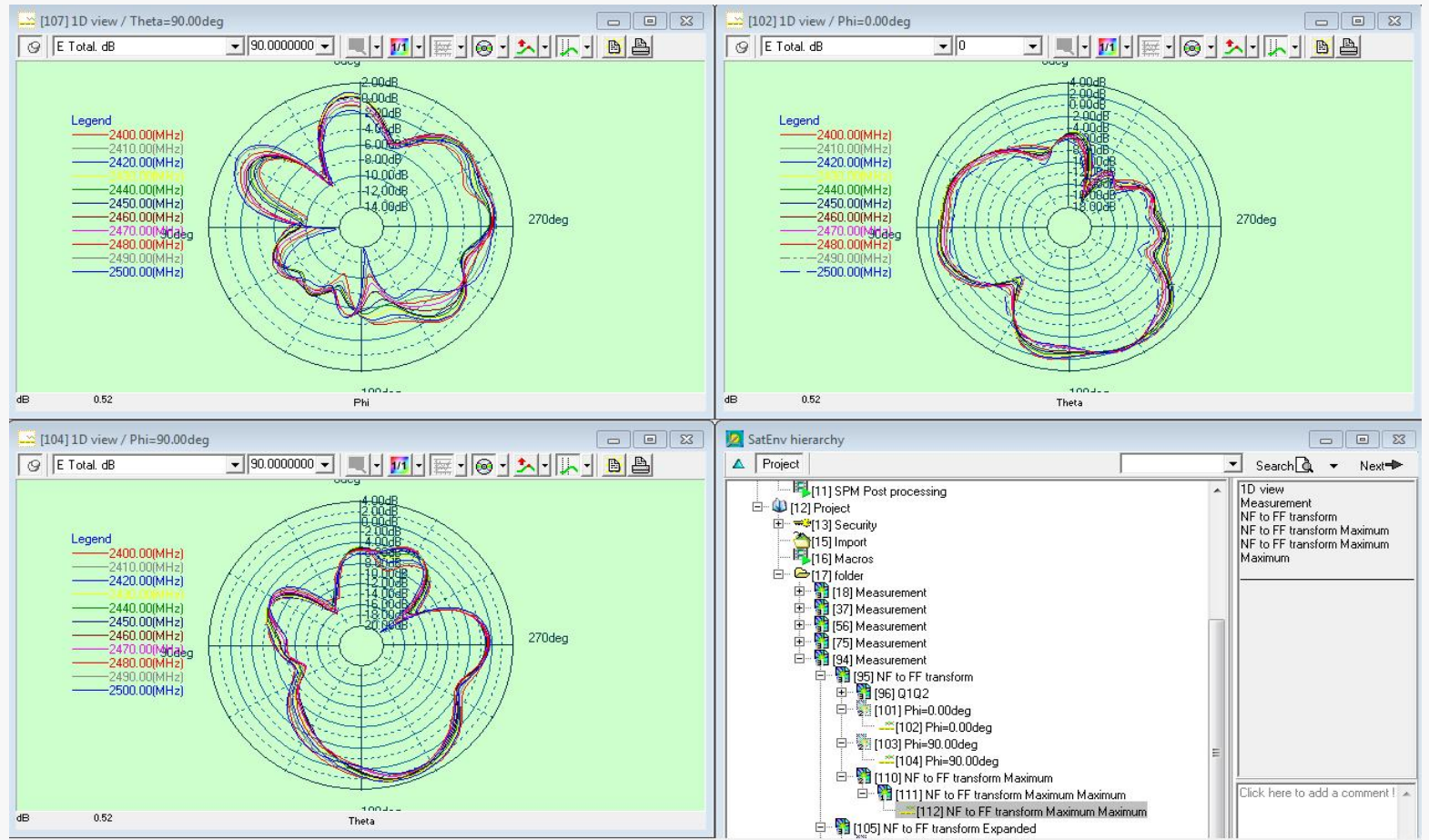
BT & Wi-Fi : single antenna passive data (return loss, Smith circle, voltage standing ratio)





BT & Wi-Fi: Single antenna passive data (efficiency, gain, directivity)

Frequency	Efficiency	Gain . dBi
2400MHz	52%	5.12
2410MHz	51%	4.94
2420MHz	51%	4.67
2430MHz	49%	4.28
2440MHz	48%	3.86
2450MHz	47%	3.66
2460MHz	47%	3.61
2470MHz	45%	3.27
2480MHz	44%	3.04
2490MHz	46%	3.26
2500MHz	45%	3.19





Planning Summary

Planning to summarize

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The above report is for the lawn mower project, using a mass production antenna, and the retest data of a single antenna.

1.No antenna matching changes.

2.The antenna is not grounded, and the motherboard is not treated for environmental conditions.

3.If there are many machine connection lines, it is recommended that all accessory connection lines be twisted into a twisted shape and fixed away from the antenna position.



THANK YOU

May you have a calm mind in a noisy world
—Expand IoT

