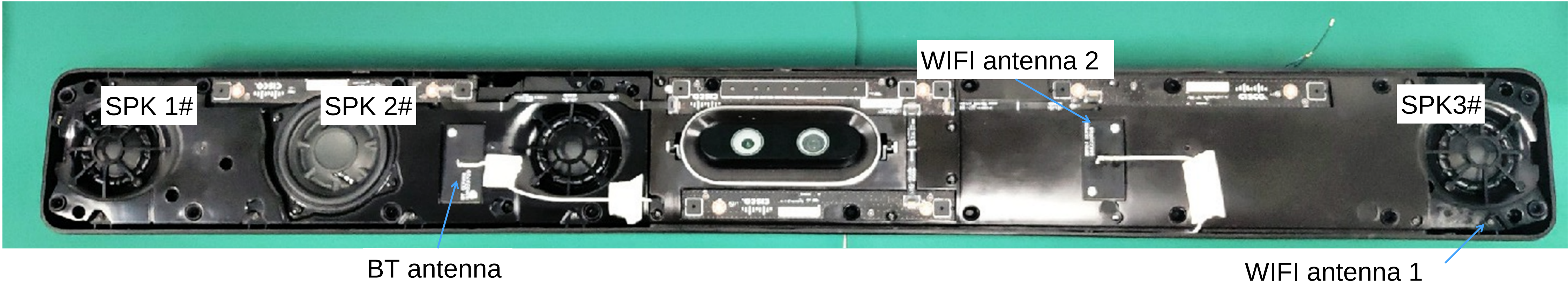


Amphenol | Brooklyn antenna RF report 2022-11-28

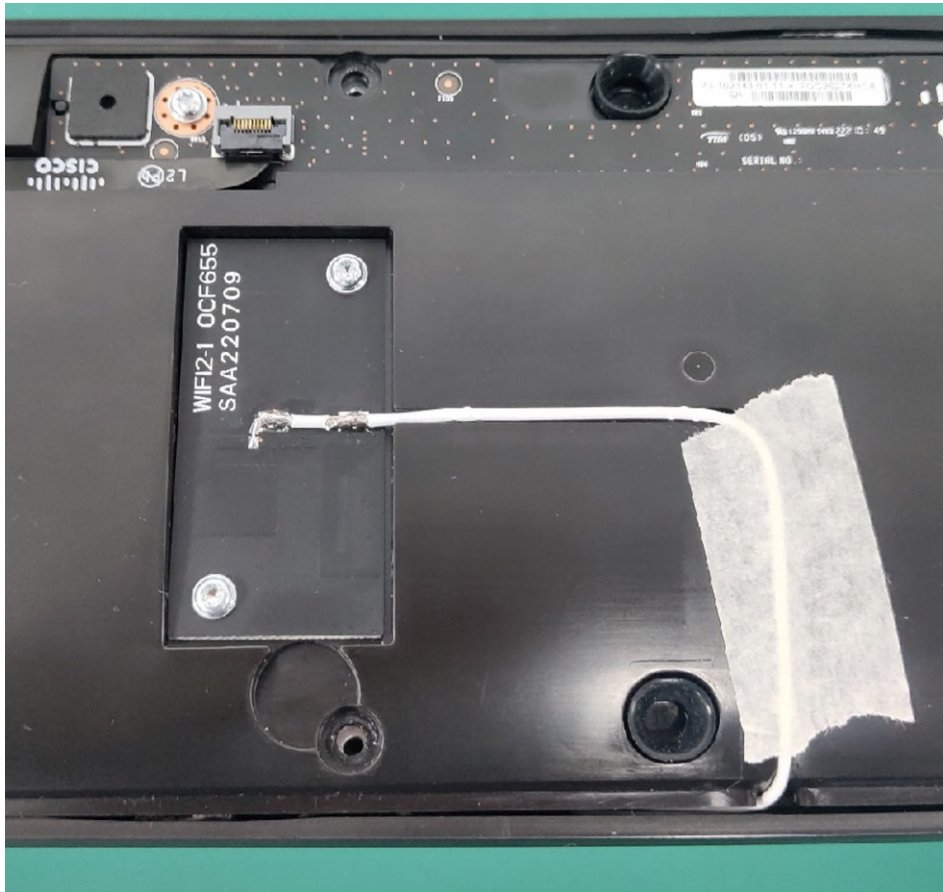
Date	Version	Description
2022.09.22	1.0	Preliminary performance report base on real device.
2022.10.11	1.1	I-PEX receptacle and transmission line impedance Study.
2022.10.21	1.2	Fine-tune antenna performance.
2022.11.28	2.0	Preliminary performance report base on DV unit.

Antenna Information

Antenna	Model Number	Manufacturer	Part Name	Type	Peak Gain (dBi)	Comment
WIFI 1 (Top Left)	CISCO: 07-100659-01 Amphenol: OFC654-15-00-R	Amphenol SAA	Brooklyn WIFI1 Antenna	PCB Antenna + Cable, Connector: (I.Pex / u.FI)	2.4GHz: 6.5dBi 5GHz U-NII-1: 5.7 dBi 5GHz U-NII-2A: 5.7 dBi 5GHz U-NII-2C: 4.4 dBi 5GHz U-NII-3: 4.0 dBi 6GHz U-NII-5: 4.3 dBi	Custom Ordered Antenna from Amphenol DUAL BAND antenna with support for SISO and MIMO operation. Supported WLAN Standards: IEEE802.11b/g/a/n/ac/ax
WIFI 2 (Front Left)	CISCO: 07-100861-01 Amphenol: OFC655-15-000-R	Amphenol SAA	Brooklyn WIFI2 Antenna	PCB Antenna + Cable, Connector: (I.Pex / u.FI)	2.4GHz: 2.8dBi 5GHz U-NII-1: 3.0 dBi 5GHz U-NII-2A: 3.0 dBi 5GHz U-NII-2C: 3.8 dBi 5GHz U-NII-3: 4.2 dBi 6GHz U-NII-5: 4.7 dBi	Custom Ordered Antenna from Amphenol Support for IEEE802.11b/g/a/n/ac/ax DUAL BAND antenna with support for SISO and MIMO operation. Supported WLAN Standards: IEEE802.11b/g/a/n/ac/ax
Bluetooth (Front Right)	07-100660-01 Amphenol: OFC656-15-000-R	Amphenol SAA	Brooklyn BT Antenna	PCB Antenna + Cable, Connector: (I.Pex / u.FI)	Bluetooth 2.4GHz: 2.5dBi	Custom Ordered Antenna from Amphenol BT Support: BT Classic / BT EDR / BLE / BLE Long Range



BT antenna
(50*25*1mm)



WIFI antenna 2
(50*25*1mm)



WIFI antenna 1
(50*25*1mm)

soldered to ground



Antenna	Frequency ranges (MHz)	Return loss in a working range	Efficiency
WIFI antenna 1	2400-2500/5170-5835/5925-7125	≤ -10 dB	$\geq 40\%$ at 5/6GHz, $\geq 50\%$ at 2.4GHz
WIFI antenna 2	2400-2500/5170-5835/5925-7125	≤ -10 dB	$\geq 40\%$ at 5/6GHz, $\geq 50\%$ at 2.4GHz
BT antenna	2400-2500	≤ -10 dB	$\geq 50\%$

Isolation between antennas:

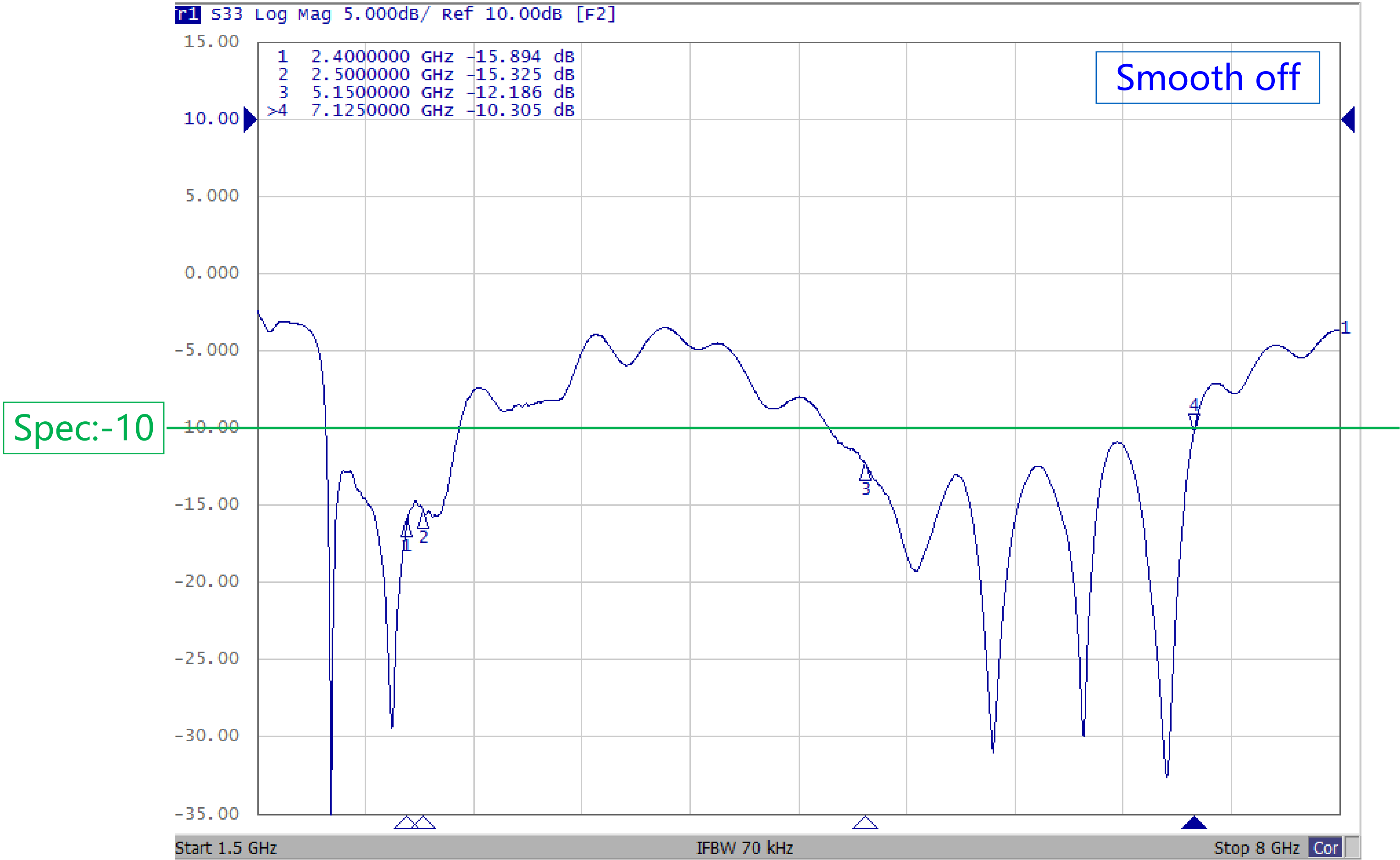
Isolation between WIFI antenna 1 and BT antenna at 2.4GHz band ≥ 35 dB

Isolation between WIFI antenna 2 and BT antenna at 2.4GHz band ≥ 35 dB

Isolation between WIFI antennas at target bands ≥ 20 dB

WIFI antenna 1

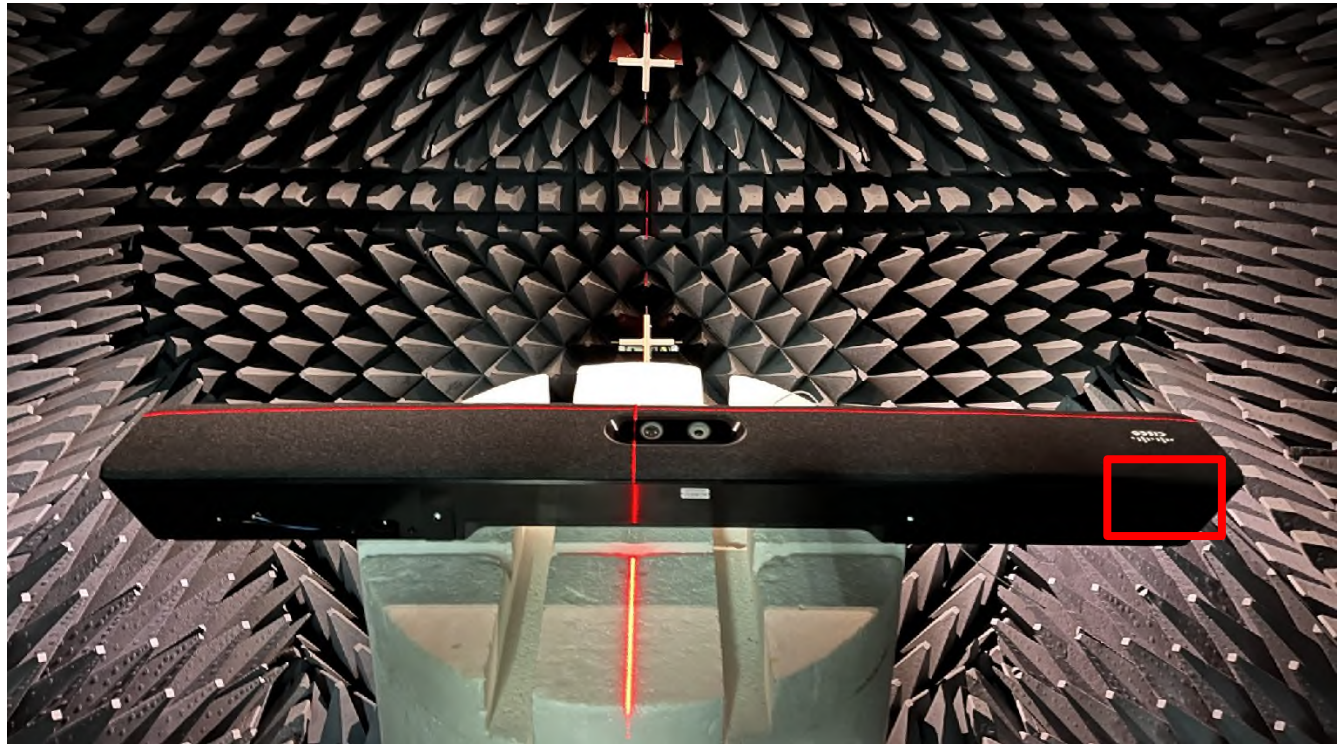
Brooklyn antenna | S-parameter & antenna gain



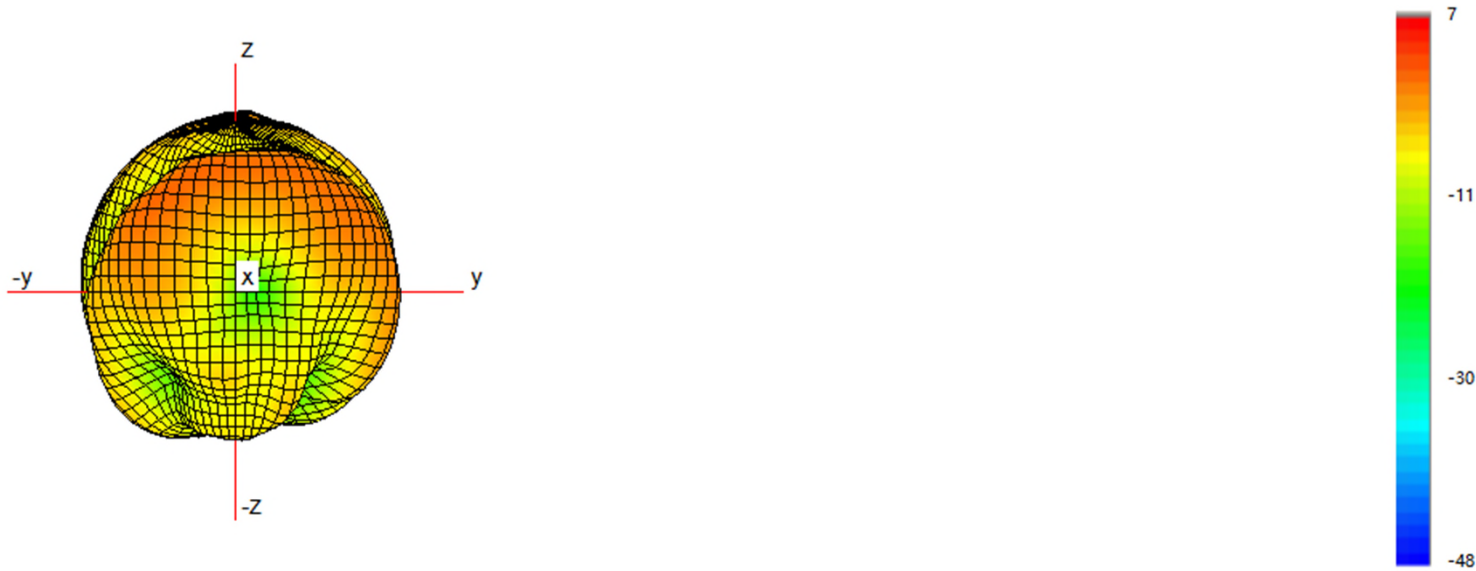
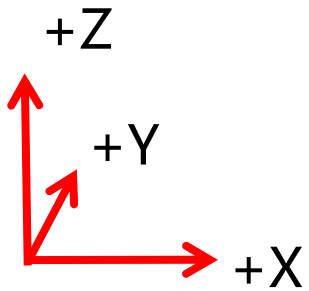
Freq.(MHz)	Effi.(Pcent)	Effi.(dB)	Peak Gain(dBi)
2400	67%	-1.8	5.7
2450	65%	-1.9	6.5
2500	69%	-1.6	6.7
AVG	67%	-1.8	6.3
5150	55%	-2.6	5.7
5250	59%	-2.3	5.7
5350	59%	-2.3	4.6
5450	59%	-2.3	4.0
5550	60%	-2.2	4.4
5650	60%	-2.2	4.4
5750	62%	-2.1	3.5
5850	60%	-2.2	4.0
AVG	59%	-2.3	4.5
5950	58%	-2.4	3.9
6050	59%	-2.3	4.1
6150	62%	-2.0	3.8
6250	60%	-2.2	4.1
6350	54%	-2.7	4.3
6450	54%	-2.7	4.7
6550	55%	-2.6	4.8
6650	55%	-2.6	5.2
6750	52%	-2.8	4.9
6850	49%	-3.1	5.3
6950	45%	-3.5	4.3
7050	40%	-4.0	3.3
7150	41%	-3.8	2.8
AVG	53%	-2.8	4.3

The S-parameter and efficiency can almost meet the spec.

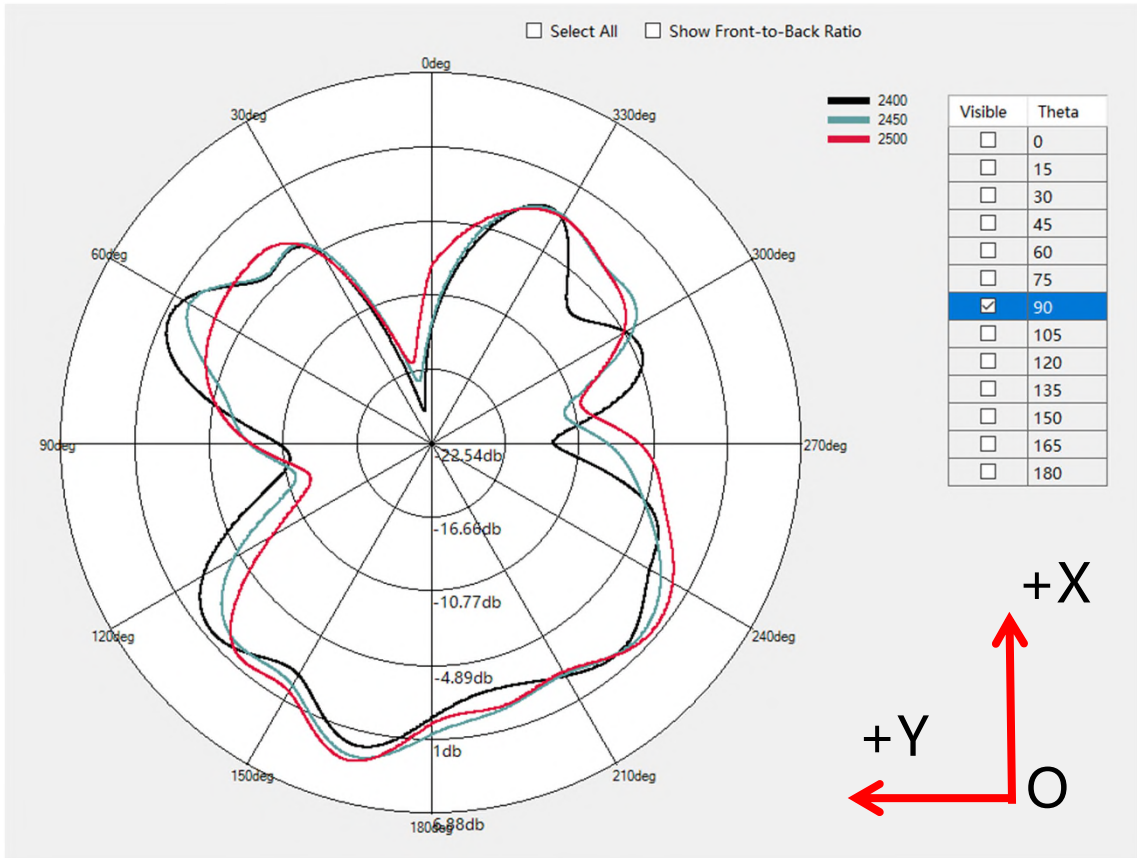
Brooklyn antenna | Radiation Pattern



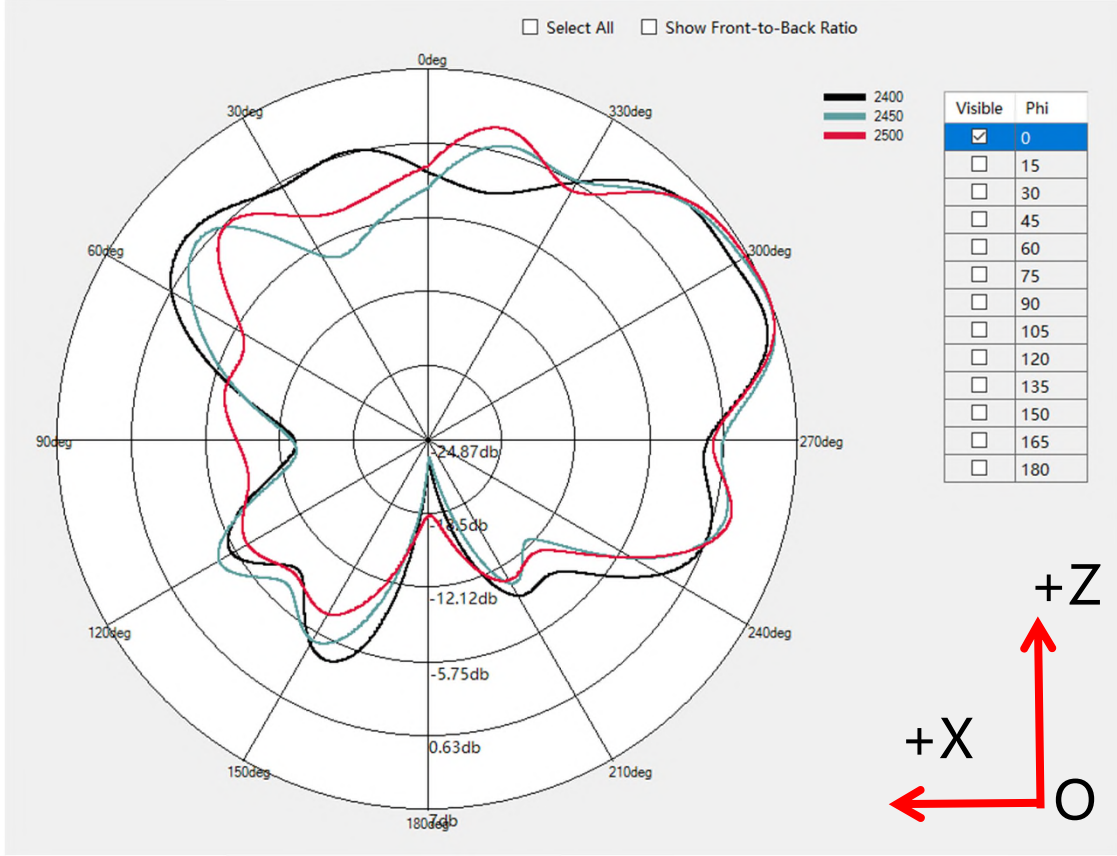
Chamber environment



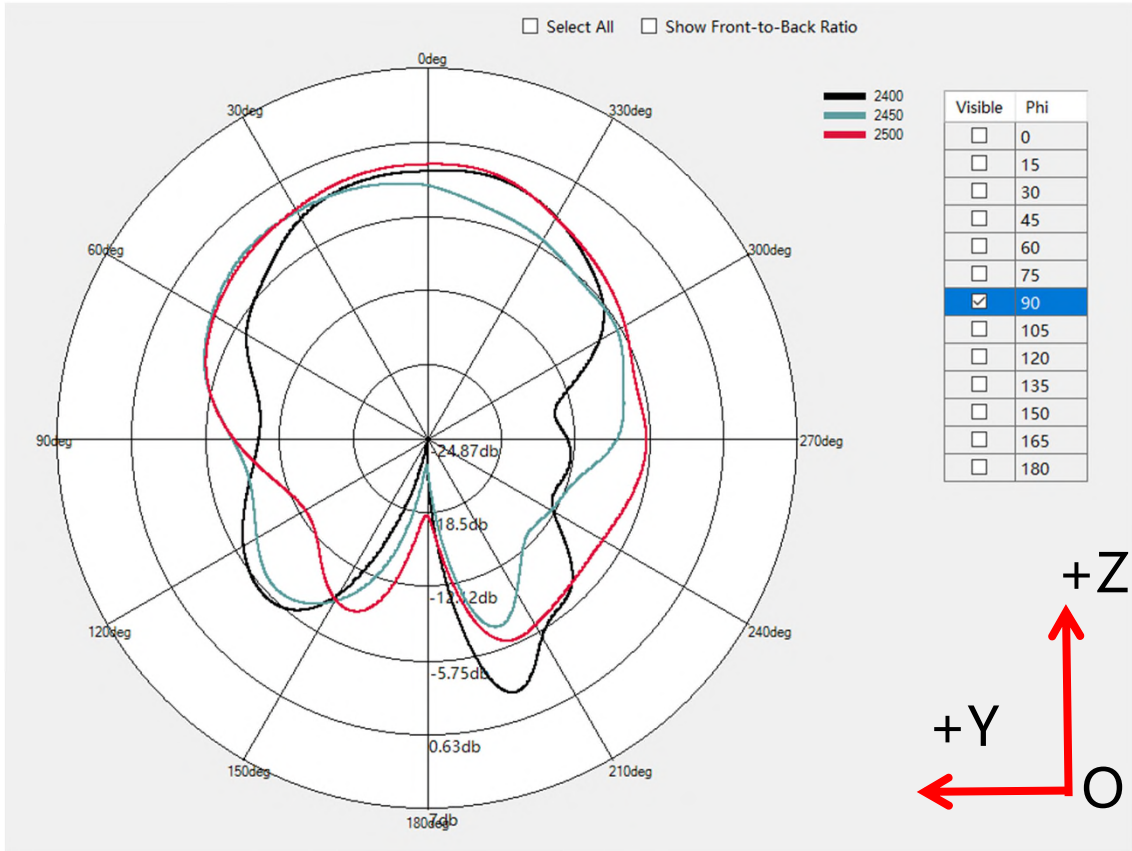
@2.45GHz



XOY plane

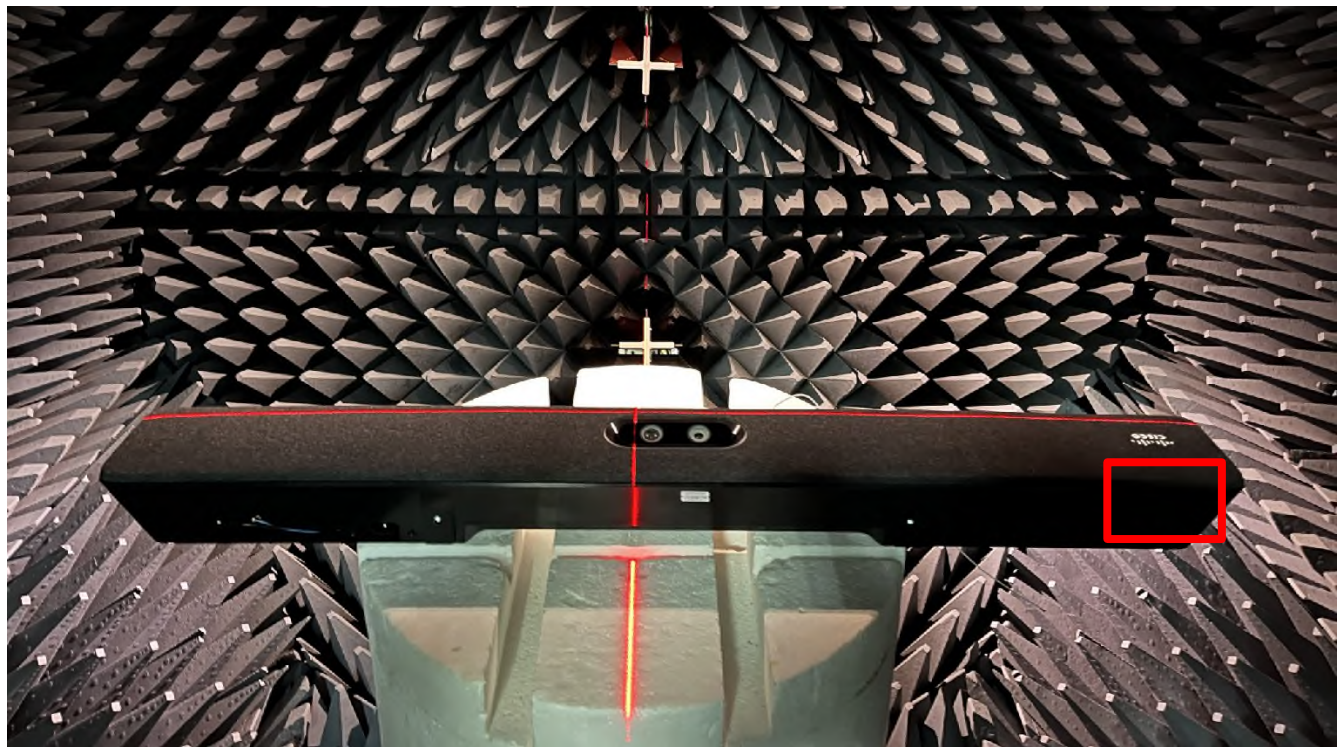


XOZ plane

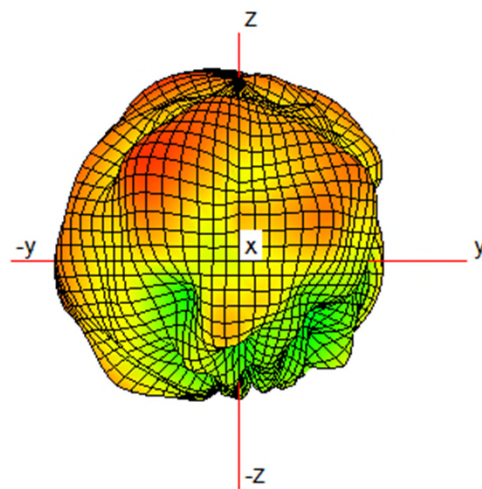
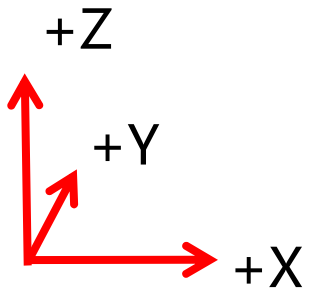


YOZ plane

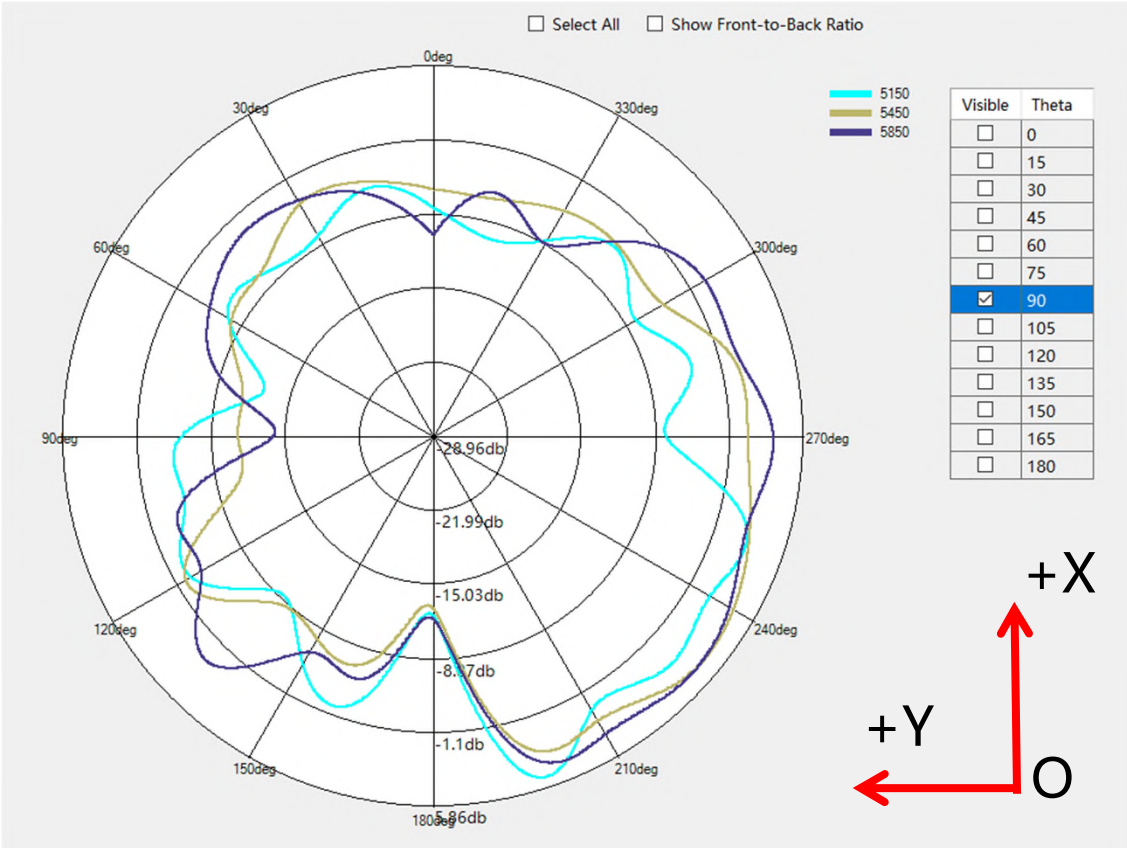
Brooklyn antenna | Radiation Pattern



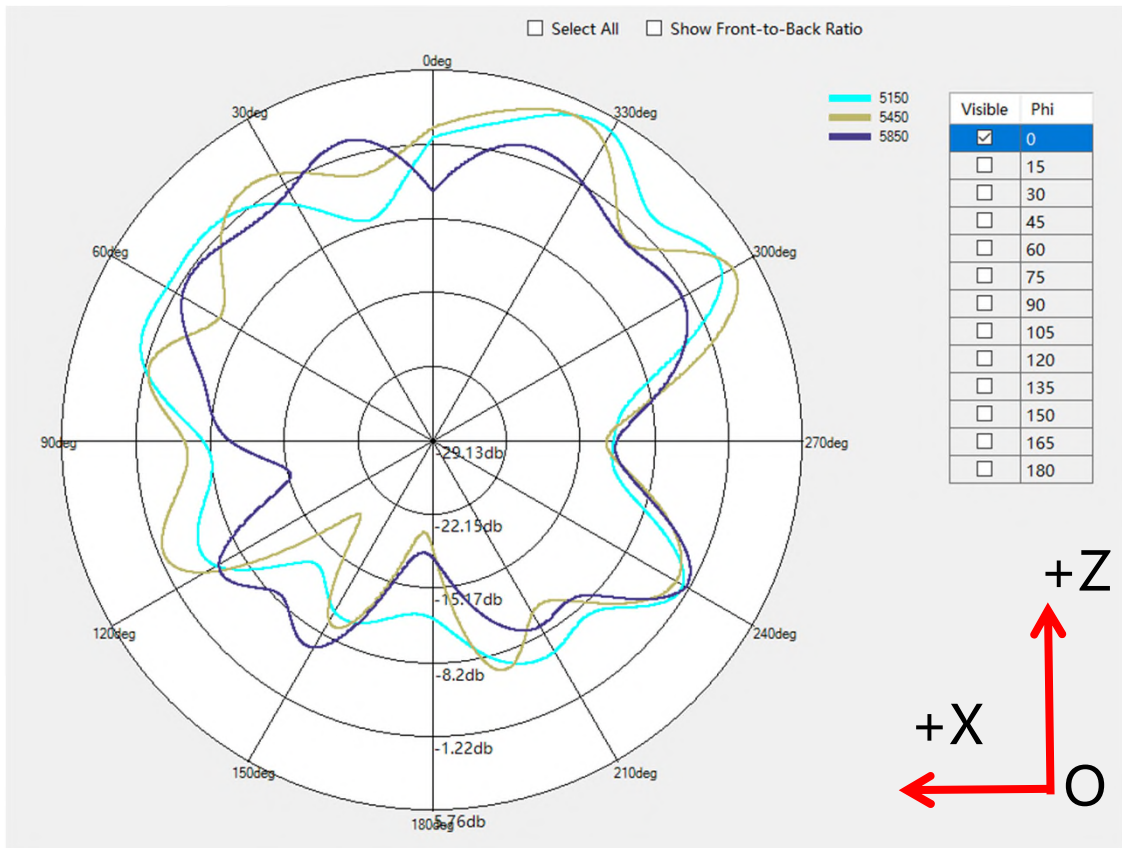
Chamber environment



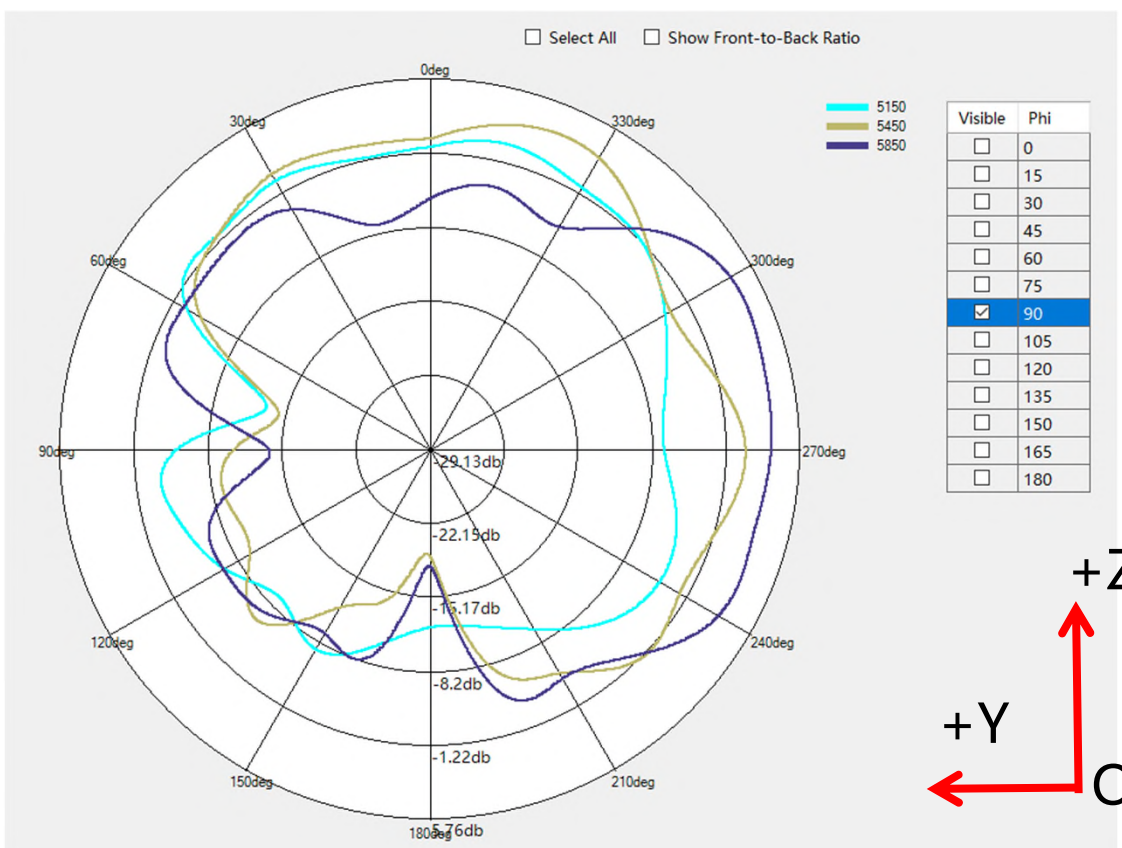
@5.5GHz



XOY plane

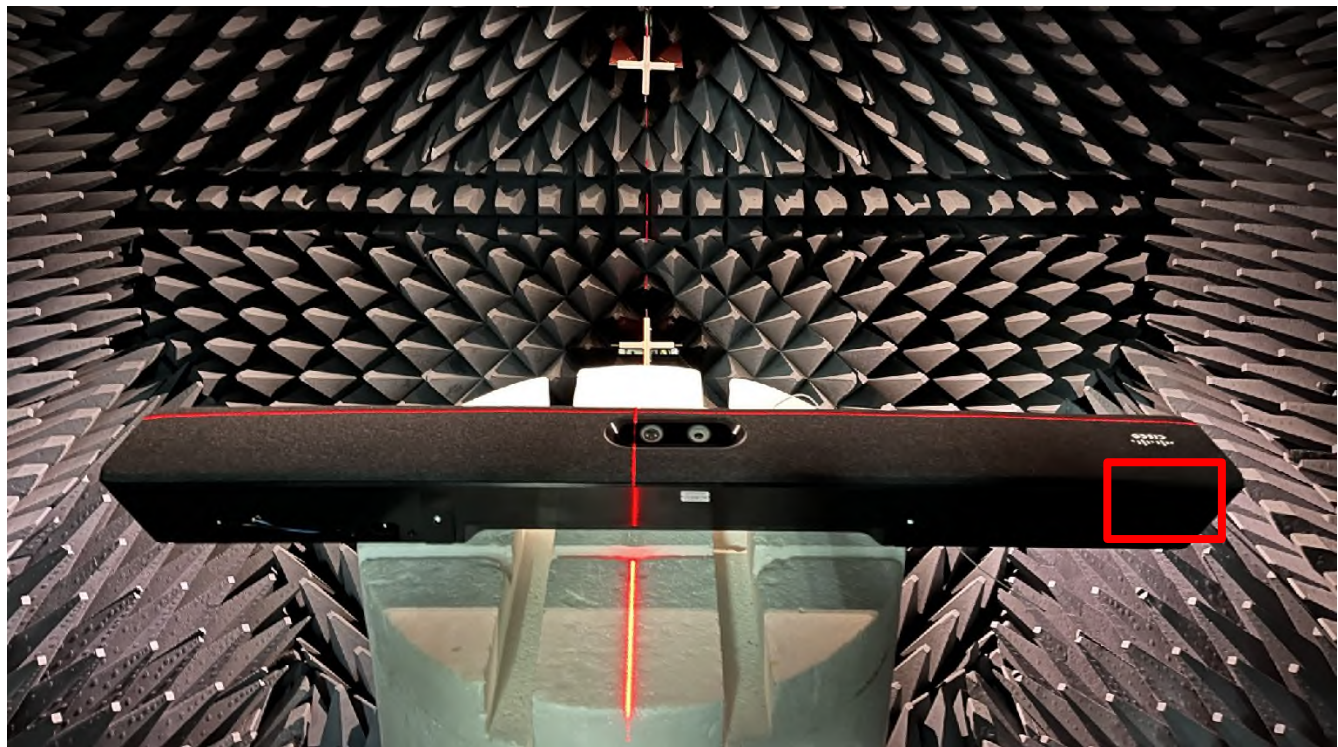


XOZ plane

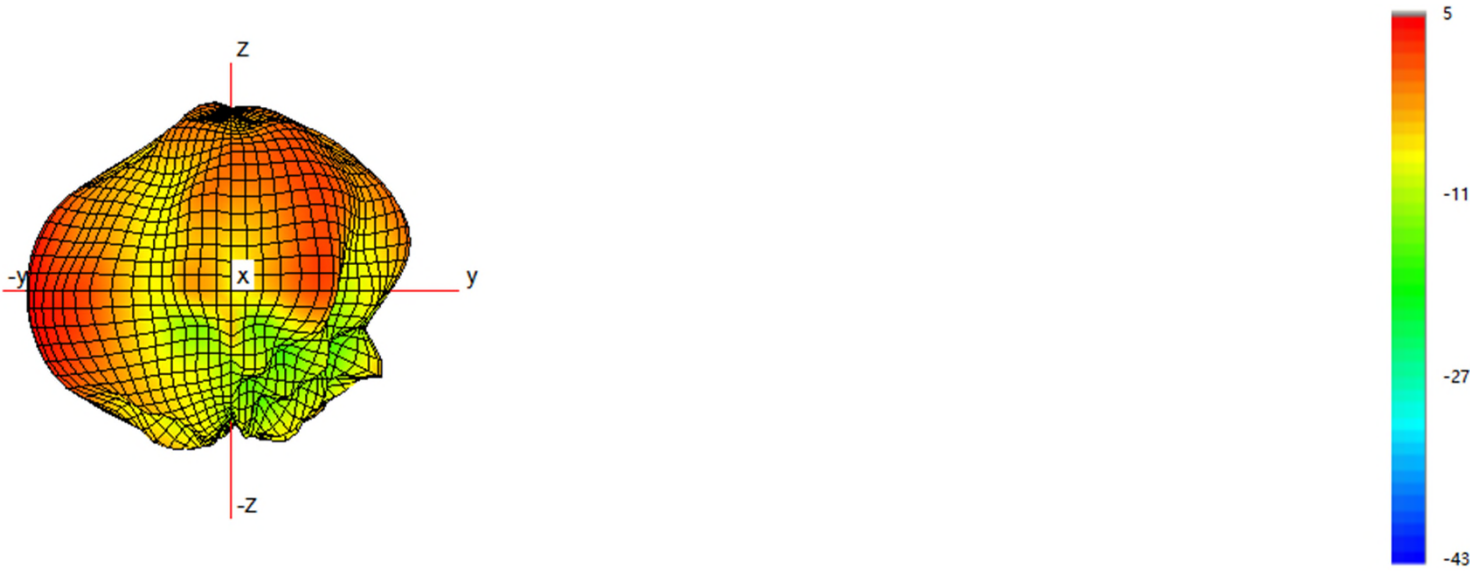
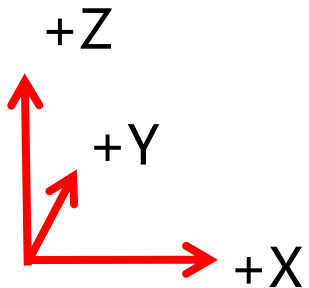


YOZ plane

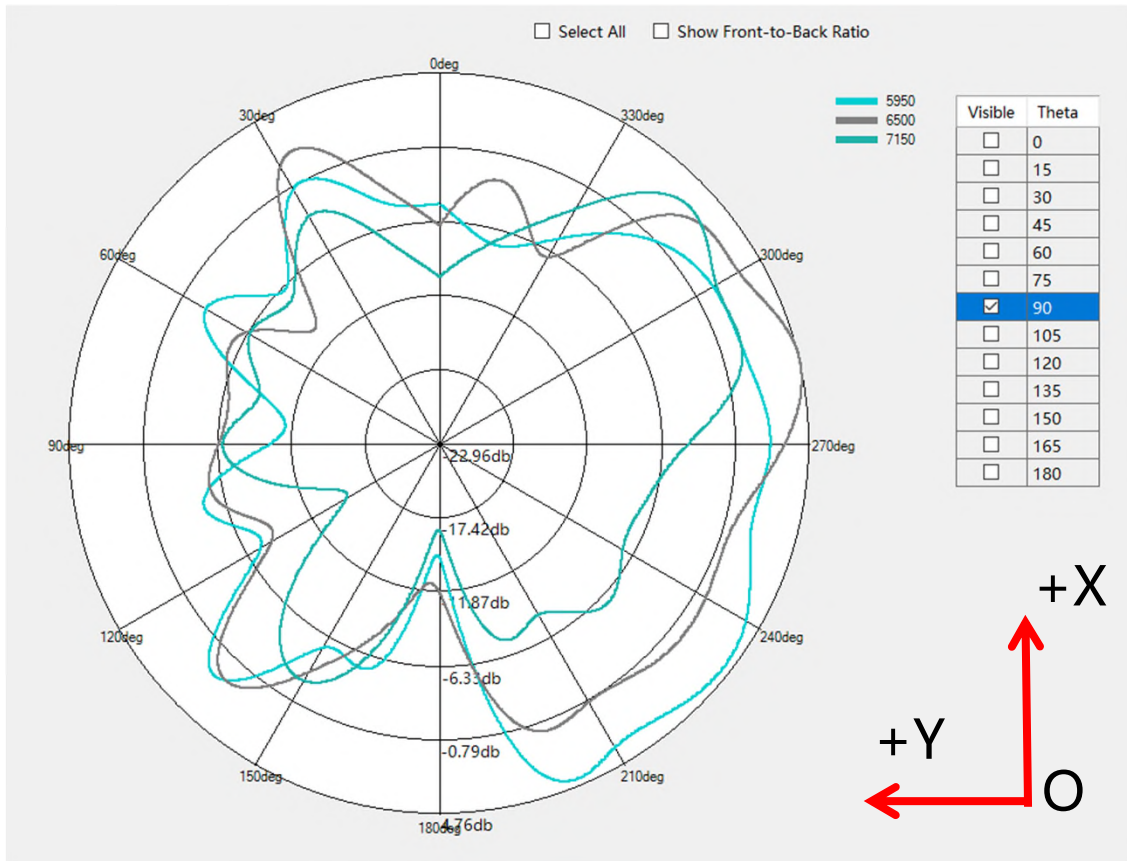
Brooklyn antenna | Radiation Pattern



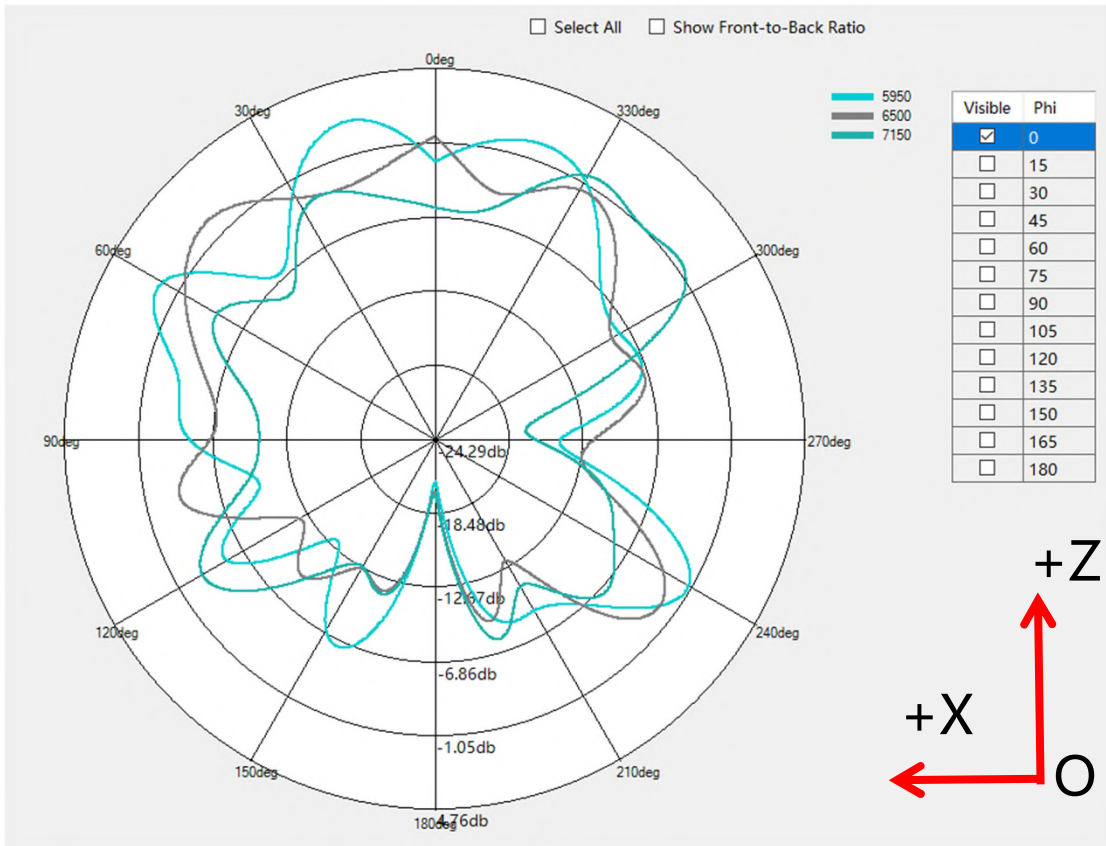
Chamber environment



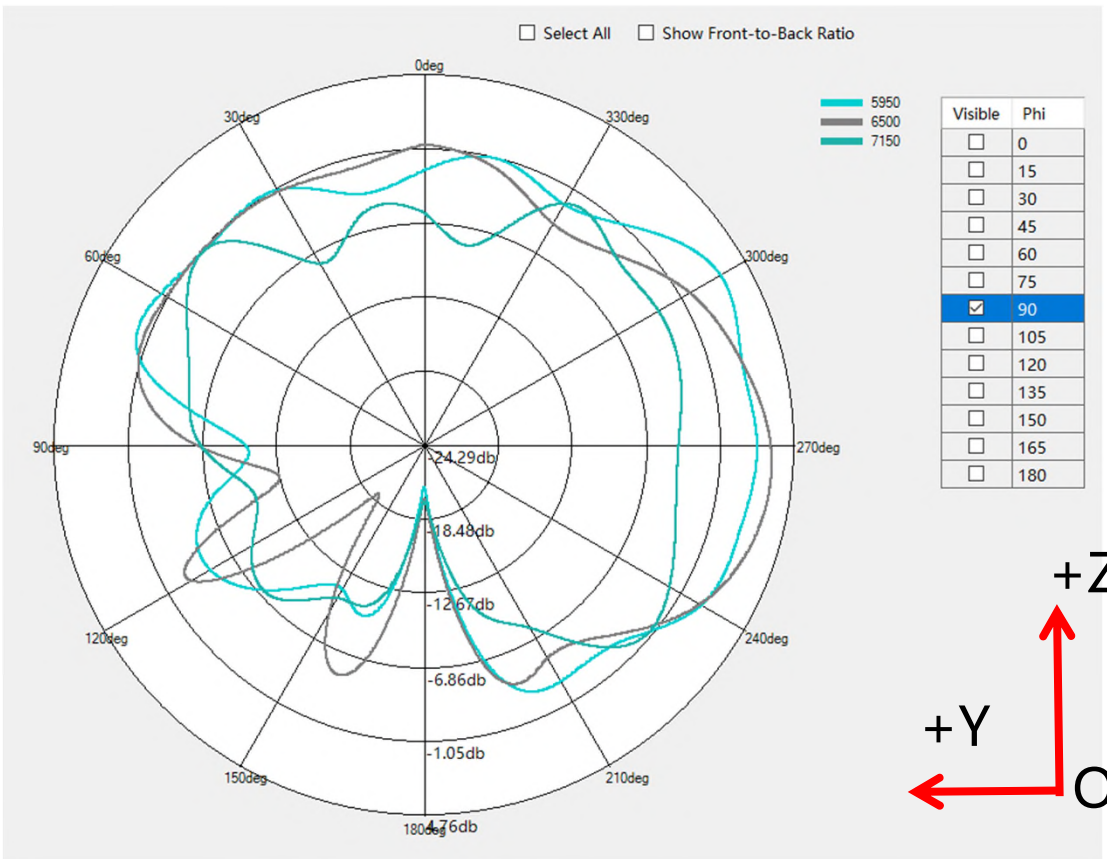
@6.5GHz



XOY plane



XOZ plane



YOZ plane

WIFI antenna 2

Brooklyn antenna | S-parameter & antenna gain



Freq.(MHz)	Effi.(Pcent)	Effi.(dB)	Peak Gain(dBi)
2400	68%	-1.7	2.2
2450	67%	-1.8	2.8
2500	68%	-1.7	2.9
AVG	68%	-1.7	2.6
5150	55%	-2.6	3.0
5250	58%	-2.4	3.0
5350	57%	-2.5	2.9
5450	57%	-2.5	3.3
5550	57%	-2.4	3.4
5650	58%	-2.4	3.4
5750	59%	-2.3	3.8
5850	57%	-2.4	4.2
AVG	57%	-2.4	3.4
5950	57%	-2.4	4.1
6050	60%	-2.2	4.3
6150	61%	-2.1	4.7
6250	57%	-2.4	4.3
6350	53%	-2.7	4.2
6450	53%	-2.7	4.0
6550	52%	-2.8	3.9
6650	48%	-3.2	3.7
6750	46%	-3.4	2.8
6850	48%	-3.2	2.9
6950	43%	-3.7	3.7
7050	40%	-3.9	3.7
7150	40%	-4.0	1.6
AVG	51%	-3.0	3.7

The S-parameter and efficiency can almost meet the spec.