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BH2201 BT Only Module Antenna Return loss & Radiation Pattern Measurement

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15-Dec-2021

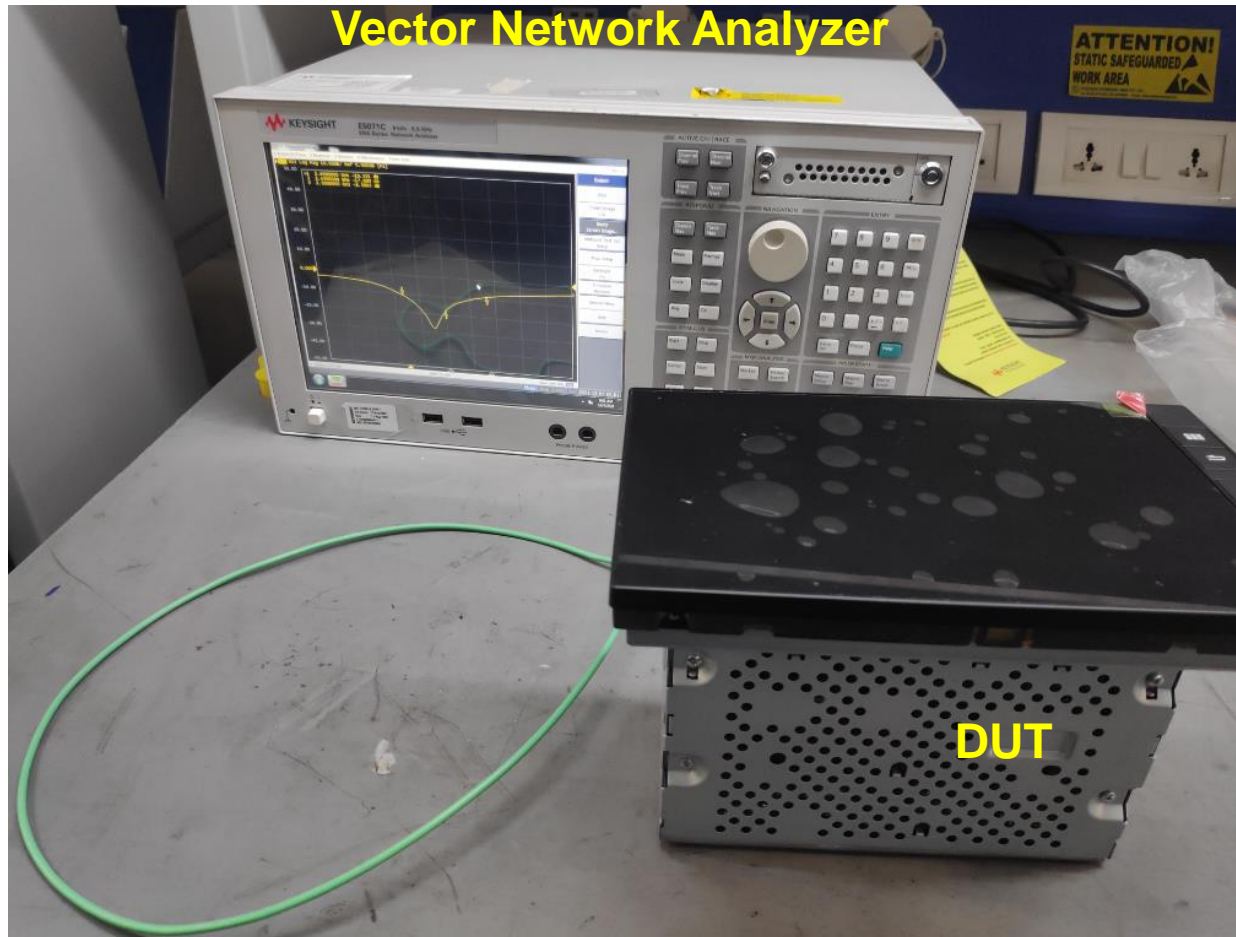


Equipment List and EUT

No.	Equipment	Brand	Model No.
1	Far Field Anechoic Chamber	-	Indoor Lab
2	Transmit Horn Antenna	ETS Lindgren	ETS 3115
3	Reference Antenna	MVG	SH800
4	Signal Generator	Keysight	N5182A
5	Signal Receiver	R&S	ESU 40
6	VNA	Keysight	5071C
7	EUT (Display Audio)	Panasonic	BH2201

Test Method / Standard

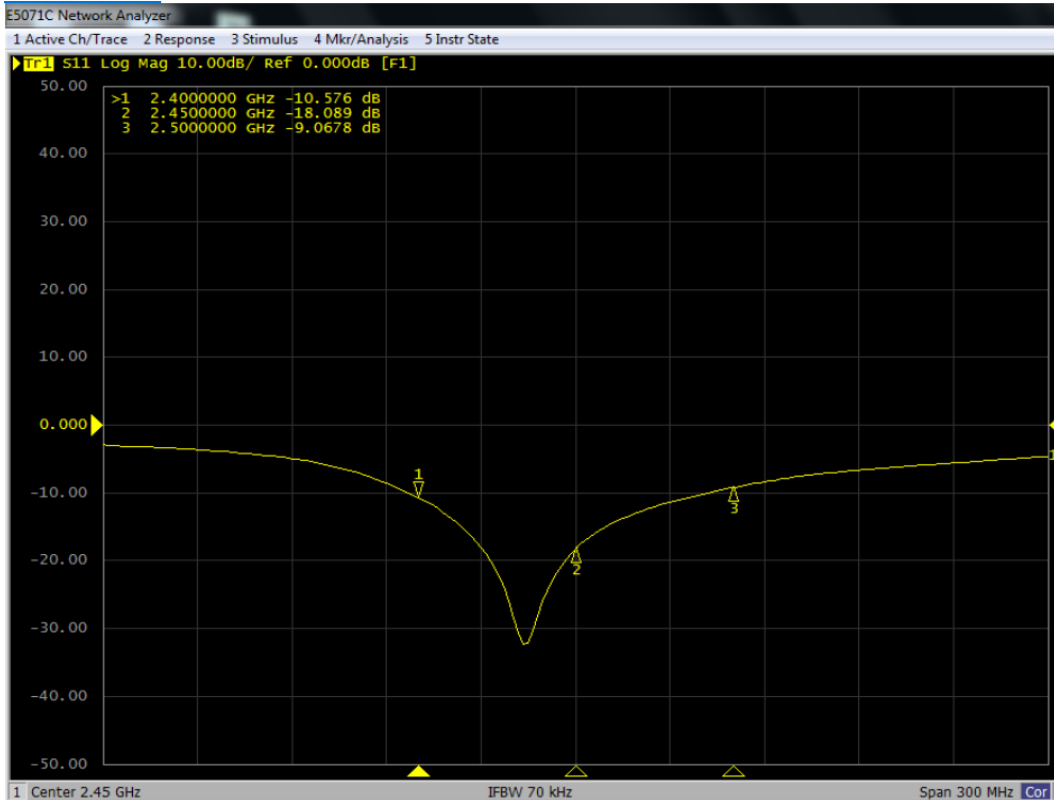
Refer IEEE Recommended Practice for Antenna Measurements
Document No: IEEE Std 149™-2021



Measurement Setup

Return Loss With Enclosure

– Return Loss Measurement



Return Loss S11 Plot

Frequency (GHz)	RL(dB)
2.4	-10.5
2.45	-18.0
2.5	-9.0

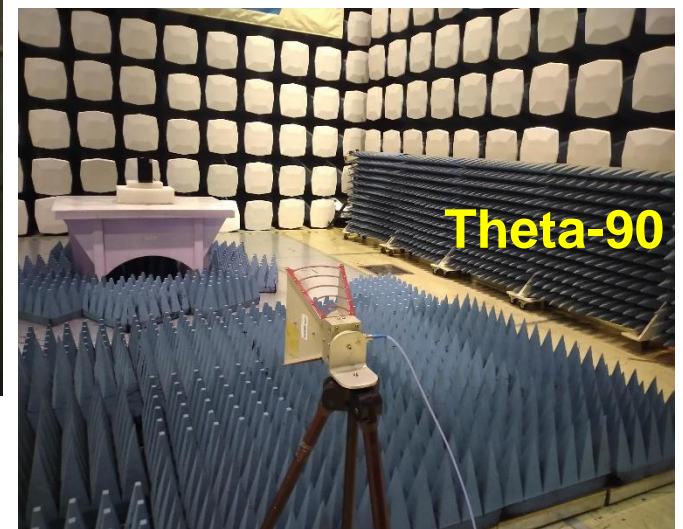
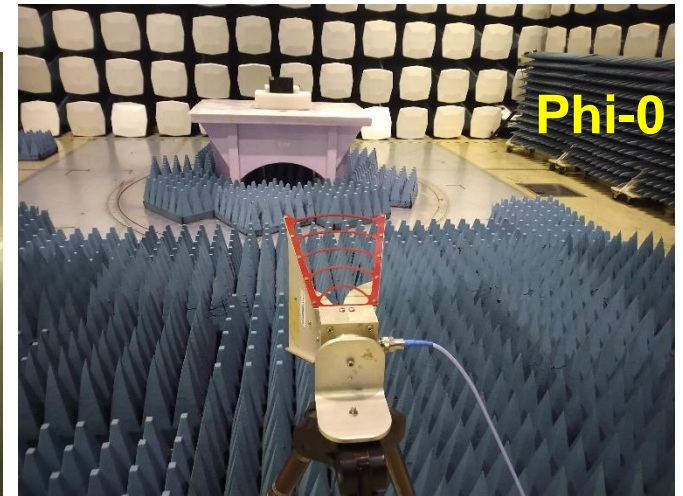
- **Inference:** Antenna is perfectly resonating at 2.4 – 2.5 GHz with RL >9dB over the required bands
- **Meander line Antenna** could not be tuned in this metal case/panel environment and found an alternative antenna topology called **PIFA** which works perfectly on the band of interest. It requires no tuning components.



Control Room



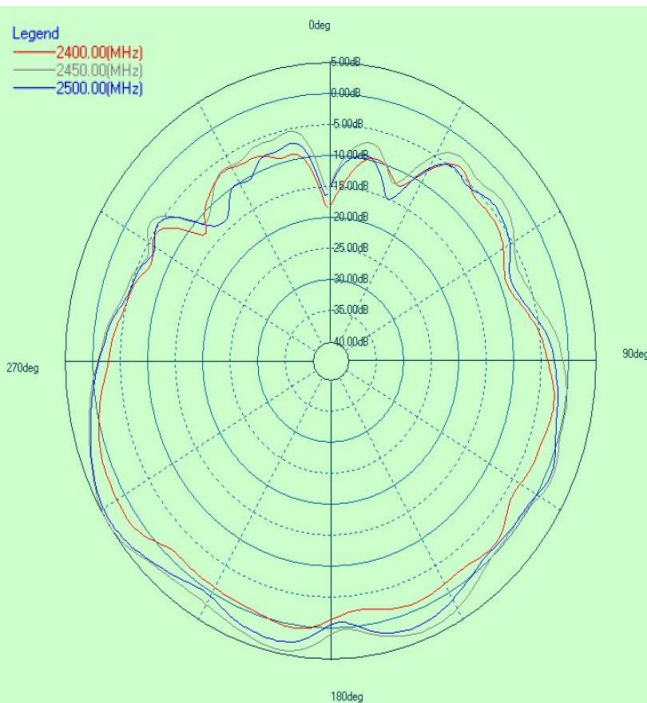
Anechoic Chamber



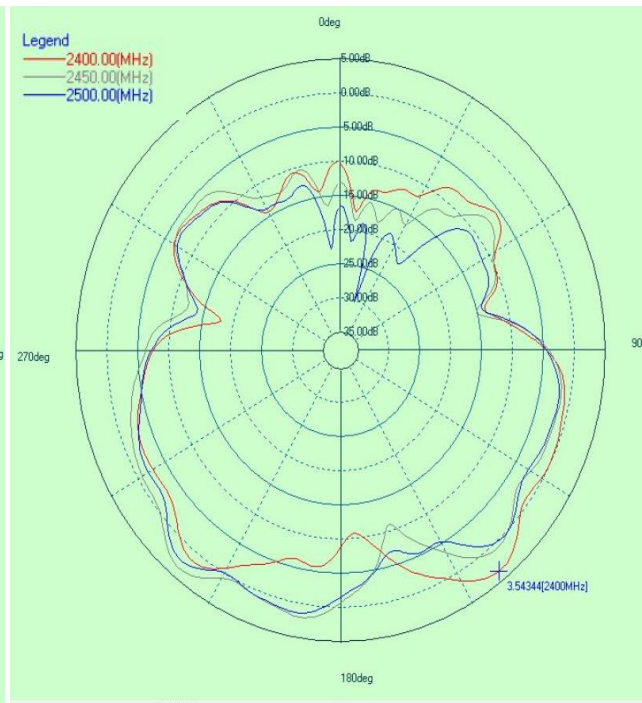
2D Radiation Pattern



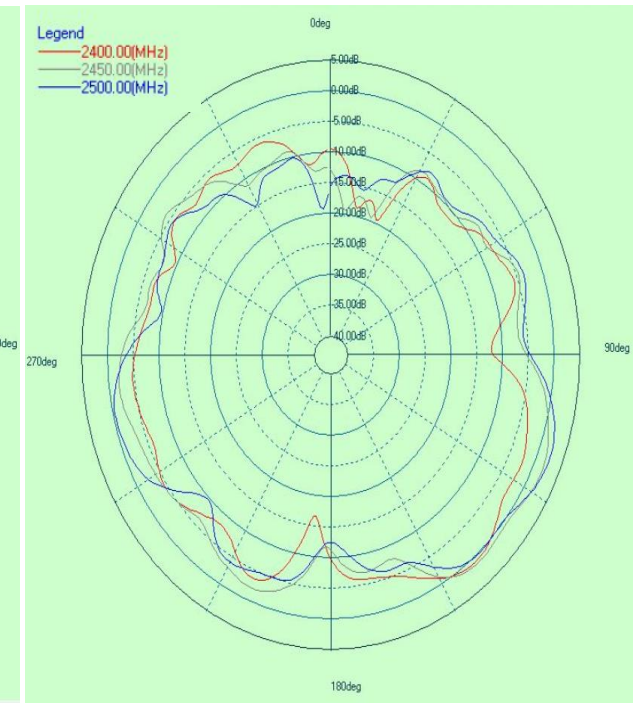
Phi-0



Phi-90



Theta-90



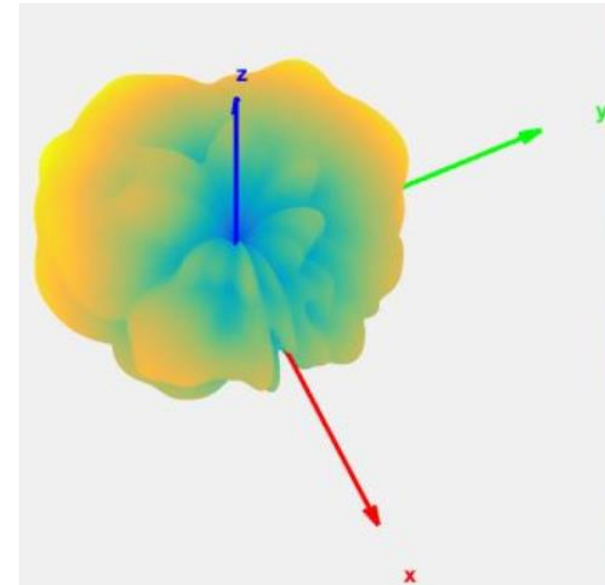
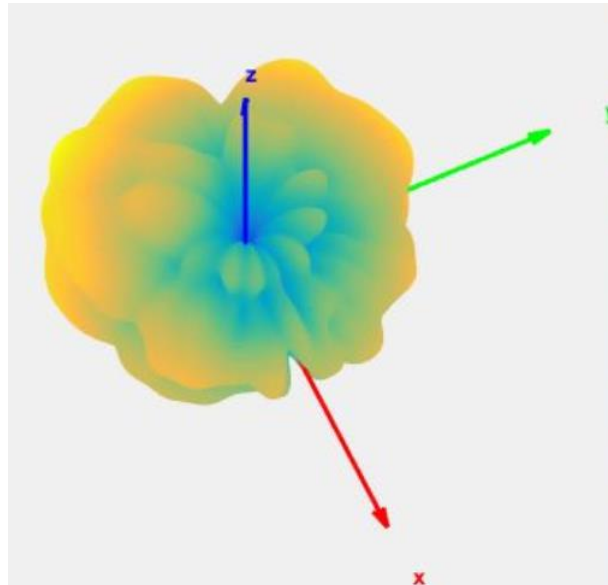
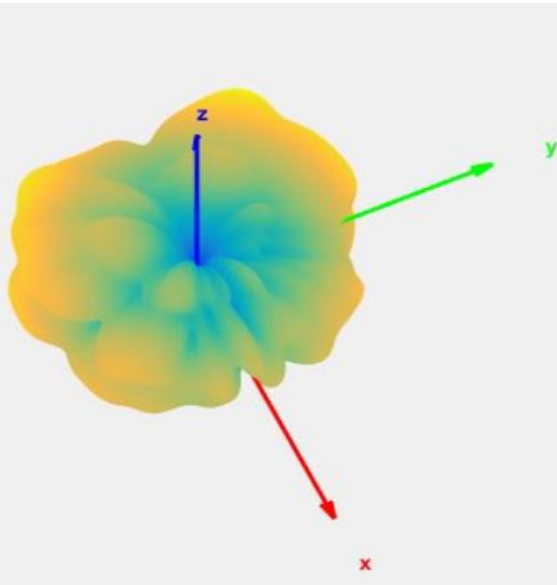
3D Radiation Pattern



2400MHz

2450MHz

2500MHz



Measured Antenna Gain



Frequency (GHz)	Peak Gain (dBi)
2.40 GHz	3.6
2.45 GHz	3.5
2.50 GHz	2.5

- **Inference:** The Radiation pattern with >2.5dBi gain observed in the required BT band.



- Antenna topology (PIFA) is designed, also simulated in CST and implemented on the same 1S PCB and evaluated for Return loss,
 - Return loss met the requirements for the required 2.4G band without need for external matching components
 - Antenna gain, it gives good Radiation pattern with $>2.5\text{dBi}$



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