NCC Radio Test Report

Equipment	:	**Wireless Transceiver**
Brand Name	:	**Tile**
Model Name	:	**T1401N**
Applicant	:	**Tile, Inc. 1900 S NORFOLK ST. SUITE 310 SAN MATEO CA 94403**
Manufacturer	:	**Tile, Inc. 1900 S NORFOLK ST. SUITE 310 SAN MATEO CA 94403**
Standard	:	**LP0002 Section 4.10 (2020-07-01)**

The product was received on Jun. 22, 2021, and testing was started from Jul. 02, 2021 and completed on Aug. 09, 2021. We, SPORTON INTERNATIONAL INC. Hsinhua Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2013 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Hsinhua Laboratory, the test report shall not be reproduced except in full.

Approved by: Allen Lin

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)

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PHOTOGRAPHS OF EUT V01

History of this test report

Report No.	Version	Description	Issued Date
TR162229-01AL	01	Initial issue of report	Sep. 04, 2021
TR162229-01AL	02	Revised typo This report is the latest version replacing for the report issued on Sep. 04, 2021	Oct. 04, 2021

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	4.10.1.4	Antenna Requirement	PASS	-
-	3.3	AC Power-line Conducted Emissions	Not Required	Only employ battery power.
3.1	4.10.1.6	DTS Bandwidth	PASS	-
3.2	4.10.1.2	Maximum Conducted Output Power	PASS	-
3.3	4.10.1.6	Power Spectral Density	PASS	-
3.4	4.10.1.5	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	4.10.1.5	Emissions in Restricted Frequency Bands	PASS	-
3.6	3.9	Receiver Radiated Unwanted Emissions	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and explanations:
None

Reviewed by: Ben Tseng

Report Producer: Michelle Tsai

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	Bluetooth Mode	Ch. Frequency (MHz)	Channel Number
2400-2483.5	LE	2402-2480	0-39 [40]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	BT-LE(1Mbps)	1.0	1TX

Note:
- Bluetooth LE uses a GFSK (1Mbps) modulation.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	Tile Inc.	Mate_nRF	PCB	N/A	1.47

For BT function:

For IEEE 802.15.1 Bluetooth mode (1TX/1RX)

Only Ant. 1 (port 1) can be used as transmitting/receiving.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From Battery			
EUT Function	☐	Point-to-multipoint	☒	Point-to-point

Type of EUT		
☒	Stand-alone	
☐	Combined (EUT where the radio part is fully integrated within another device)	
	Combined Equipment - Brand Name / Model No.:	…
☐	Plug-in radio (EUT intended for a variety of host systems)	
	Host System - Brand Name / Model No.:	…
☐	Other:	

1.1.4 Mode Test Duty Cycle

Mode	DC	DCF(dB)	T(s)	VBW(Hz) ≥ 1/T
BT-LE(1Mbps)	0.63	2.01	394.063u	3k

Note. If DC < 0.98, the DCF was added while measuring Output power and PSD.

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- LP0002 (2020-07-01)
- ANSI C63.10-2013
- ANSI C63.4-2014

The following reference test guidance is not within the scope of accreditation of TAF:

- KDB 558074 D01 v05r02
- KDB 414788 D01 v01r01

1.3 Testing Location Information

Test Lab.：Sporton International Inc. Hsinhua Laboratory				
☒ Hsinhua	**ADD:** No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-327-3456		**FAX:** 886-3-327-0973	
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted	TH06-HY	Johnny Yu	20.1~26.9°C / 50~60%	06/Jul/2021
☒ Wen 33rd.St.	**ADD:** No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-318-0787		**FAX:** 886-3-318-0287	
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated	03CH09-HY	Daniel Hsu	23.1~24.0°C / 40~61%	02/Jul/2021~09/Aug/2021

1.4 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Test Items	**Uncertainty**	**Remark**
Conducted Emission (150kHz ~ 30MHz)	0.9 dB	Confidence levels of 95%
Radiated Emission (9kHz ~ 30MHz)	2.4 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.0 dB	Confidence levels of 95%
Temperature	0.41 °C	Confidence levels of 95%
Humidity	3.4 %	Confidence levels of 95%

2 Test Configuration of EUT

2.1 Test Channel Mode

Test Software Version	N/A

Note: The EUT transmits RF signal continuously by itself.

Mode	Power Setting
BT-LE(1Mbps)	-
2402MHz	Default
2440MHz	Default
2480MHz	Default

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	DTS Bandwidth Maximum Conducted Output Power Power Spectral Density Emissions in Non-restricted Frequency Bands
Test Condition	Conducted measurement at transmit chains

The Worst Case Mode for Following Conformance Tests			
Tests Item	Emissions in Restricted Frequency Bands Receiver Radiated Spurious Emissions		
Test Condition	Radiated measurement If EUT consist of multiple antenna assembly (multiple antenna are used in EUT regardless of spatial multiplexing MIMO configuration), the radiated test should be performed with highest antenna gain of each antenna type.		
Operating Mode < 1GHz	CTX/CRX		
1	Battery Mode		
Operating Mode > 1GHz	CTX/CRX		
Orthogonal Planes of EUT	**X Plane**	**Y Plane**	**Z Plane**
Worst Planes of EUT			V

2.3 Accessories

Accessories				
Battery	Brand Name	EVE Energy Co. Ltd. & Maxell and Panasonic	Model Name	CR2032
	Power Rating	3 Vdc, 225 mAh	Type	Coin Cell

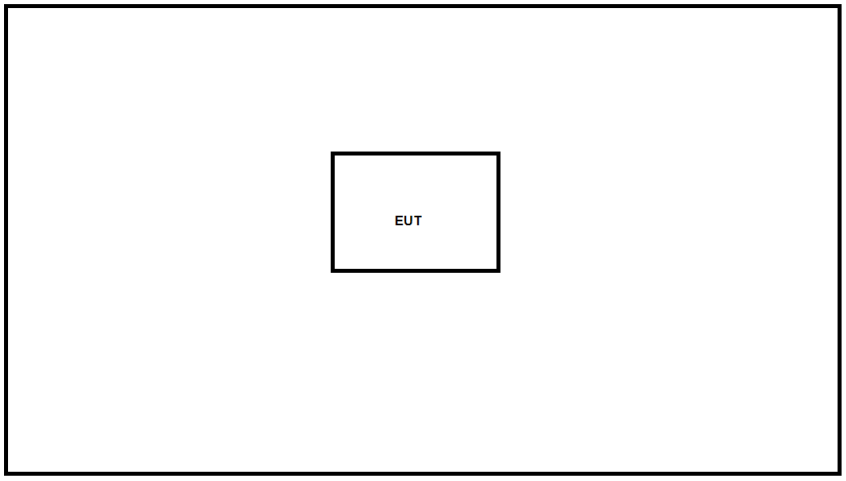
Reminder: Regarding to more detail and other information, please refer to user manual.

2.4 Support Equipment

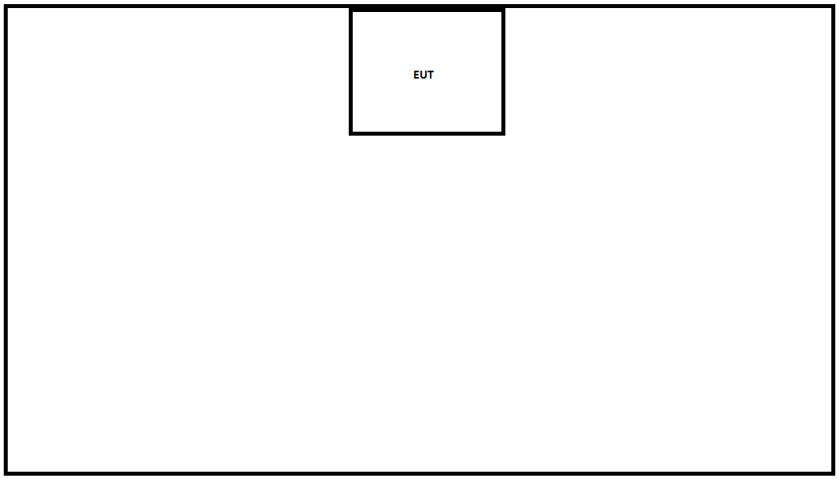
Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	DC Power Supply	GW	GPC-6030D	-	-

2.5 Test Setup Diagram

Test Setup Diagram - Radiated Test (TX)



Test Setup Diagram - Radiated Test (RX)



3 Transmitter Test Result

3.1 DTS Bandwidth

3.1.1 6dB Bandwidth Limit

6dB Bandwidth Limit
Systems using digital modulation techniques:
▪ 6 dB bandwidth ≥ 500 kHz.

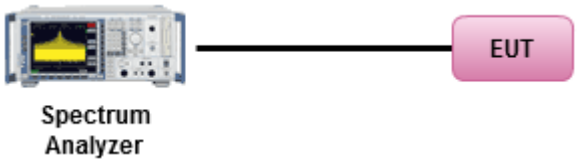
3.1.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method	
▪ For the emission bandwidth shall be measured using one of the options below:	
	☒ Refer as KDB 558074, clause 8.2 (11.8 of ANSI C63.10) DTS bandwidth measurement.
	☐ Refer as RSS-Gen, clause 6.7 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.1.4 Test Setup

Emission Bandwidth


3.1.5 Test Result of Emission Bandwidth

Refer as Appendix A

3.2 Maximum Conducted Output Power

3.2.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit		
	▪ If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	▪ Point-to-multipoint systems (P2M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	▪ Point-to-point systems (P2P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	▪ Smart antenna system (SAS):	
		- Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		- Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
e.i.r.p. Power Limit:		
▪ 2400-2483.5 MHz Band		
	▪ Point-to-multipoint systems (P2M): $P_{eirp} \leq 36$ dBm (4 W)	
	▪ Point-to-point systems (P2P): $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX}])$ dBm	
	▪ Smart antenna system (SAS)	
		- Single beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Overlap beam: $P_{eirp} \leq MAX(36, P_{Out} + G_{TX})$ dBm
		- Aggregate power on all beams: $P_{eirp} \leq MAX(36, [P_{Out} + G_{TX} + 8])$ dBm
P_{Out} = maximum peak conducted output power or maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.		

3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
▪ Maximum Peak Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.1.1 (11.9.1.1 of ANSI C63.10) RBW ≥ EBW method.
	☐ Refer as KDB 558074, clause 8.3.1.2 (11.9.1.2 of ANSI C63.10) integrated band power method.
	☐ Refer as KDB 558074, clause 8.3.1.3 (11.9.1.3 of ANSI C63.10) peak power meter.
▪ Maximum Average Conducted Output Power	
	☐ Refer as KDB 558074, clause 8.3.2.2 (11.9.2.2 of ANSI C63.10) using a spectrum analyzer.
	☒ Refer as KDB 558074, clause 8.3.2.3 (11.9.2.3 of ANSI C63.10) using a power meter.
▪ For conducted measurement.	
	▪ If the EUT supports multiple transmit chains using options given below: Refer as KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.
	▪ If multiple transmit chains, EIRP calculation could be following as methods: $P_{total} = P_1 + P_2 + \ldots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$

3.2.4 Test Setup

Maximum Conducted Output Power (Power Meter)

3.2.5 Test Result of Maximum Conducted Output Power

Refer as Appendix B

3.3 Power Spectral Density

3.3.1 Power Spectral Density Limit

Power Spectral Density Limit
▪ Power Spectral Density (PSD)≤8 dBm/3kHz

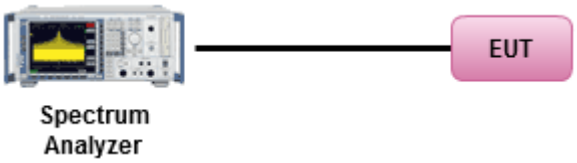
3.3.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.3.3 Test Procedures

Test Method		
▪ Peak power spectral density procedures that the same method as used to determine the conducted output power. If maximum peak conducted output power was measured to demonstrate compliance to the output power limit, then the peak PSD procedure below (Method PKPSD) shall be used. If maximum conducted output power was measured to demonstrate compliance to the output power limit, then one of the average PSD procedures shall be used, as applicable based on the following criteria (the peak PSD procedure is also an acceptable option).		
	☒ Refer as KDB 558074, clause 8.4 (11.10 of ANSI C63.10) Max. PSD.	
▪ For conducted measurement.		
	▪ If The EUT supports multiple transmit chains using options given below:	
		▪ Measure and sum the spectra across the outputs. Refer as KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the NTX output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.

3.3.4 Test Setup

Power Spectral Density


3.3.5 Test Result of Power Spectral Density

Refer as Appendix C

3.4 Emissions in Non-restricted Frequency Bands

3.4.1 Emissions in Non-restricted Frequency Bands Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dB)**
Peak output power procedure	20
Average output power procedure	30
Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak level. Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average level.	

3.4.2 Measuring Instruments

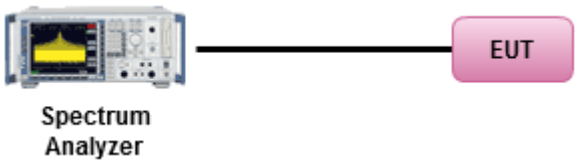
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method
▪ Refer as KDB 558074, clause 8.5 (11.11 of ANSI C63.10) for non-restricted frequency bands.

3.4.4 Test Setup

Emissions in Non-restricted Frequency Bands



3.4.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix D

3.5 Emissions in Restricted Frequency Bands

3.5.1 Emissions in Restricted Frequency Bands Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB / decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

Note 3: Using the distance of 1m during the test for above 18 GHz, and the test value to correct for the distance factor at 3m.

3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method	
▪ The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
▪ Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
▪ For the transmitter unwanted emissions shall be measured using following options below:	
	▪ Refer as KDB 558074, clause 8.6 (11.12 of ANSI C63.10) for restricted frequency bands.
▪ For the transmitter band-edge emissions shall be measured using following options below:	
	▪ Refer as KDB 558074 clause 8.7.1, When the performing peak or average radiated measurements, emissions within 2 MHz of the authorized band edge may be measured using the marker-delta method described below.
	▪ Refer as KDB 558074, clause 8.7.2 (6.10.6 of ANSI C63.10) for marker-delta method for band-edge measurements.
	▪ Refer as KDB 558074, clause 8.7.3 for narrower resolution bandwidth (100kHz) using the band power and summing the spectral levels.
▪ Use the following spectrum analyzer settings:	
	▪ Set RBW=100 kHz for f < 1 GHz; VBW=3 * RBW; Sweep = auto; Detector function = peak; Trace = max hold.
	▪ Set RBW = 1 MHz, VBW= 3MHz for f ≥ 1 GHz for peak measurement. For average measurement, refer as 1.1.4.
▪ KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.	
	▪ Based on LP0002 6.5.2: measurements may be performed at a distance closer than that specified in regulations; however, an attempt should be made to avoid making measurements in the near field.
	▪ Open-field site and chamber correlation testing had been performed and chamber measured test result is the worst case test result.

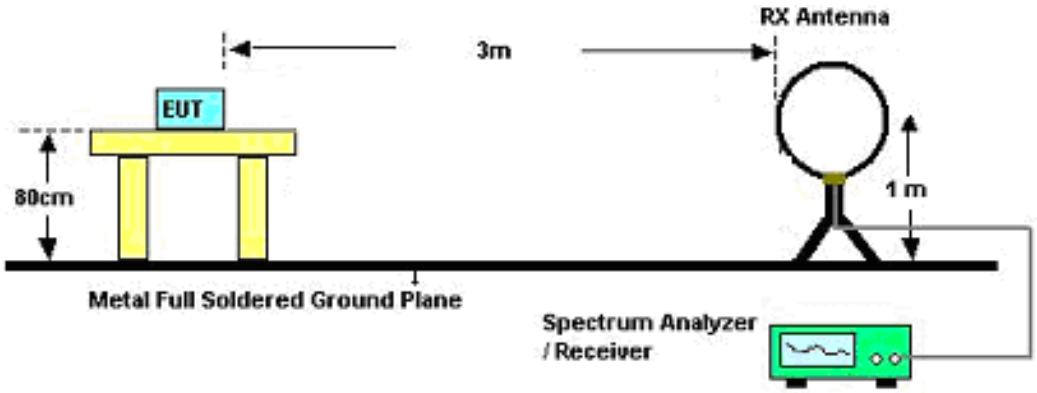
3.5.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

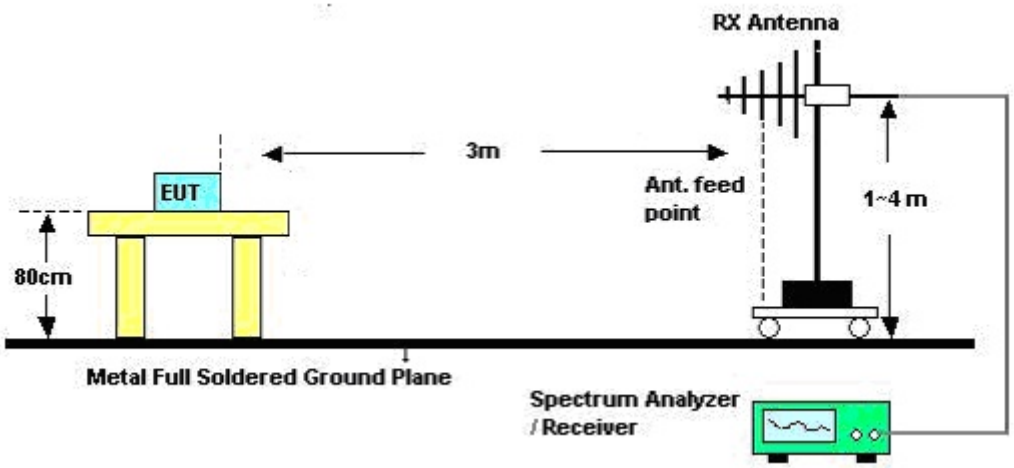
3.5.5 Test Setup

Emissions in Restricted Frequency Bands

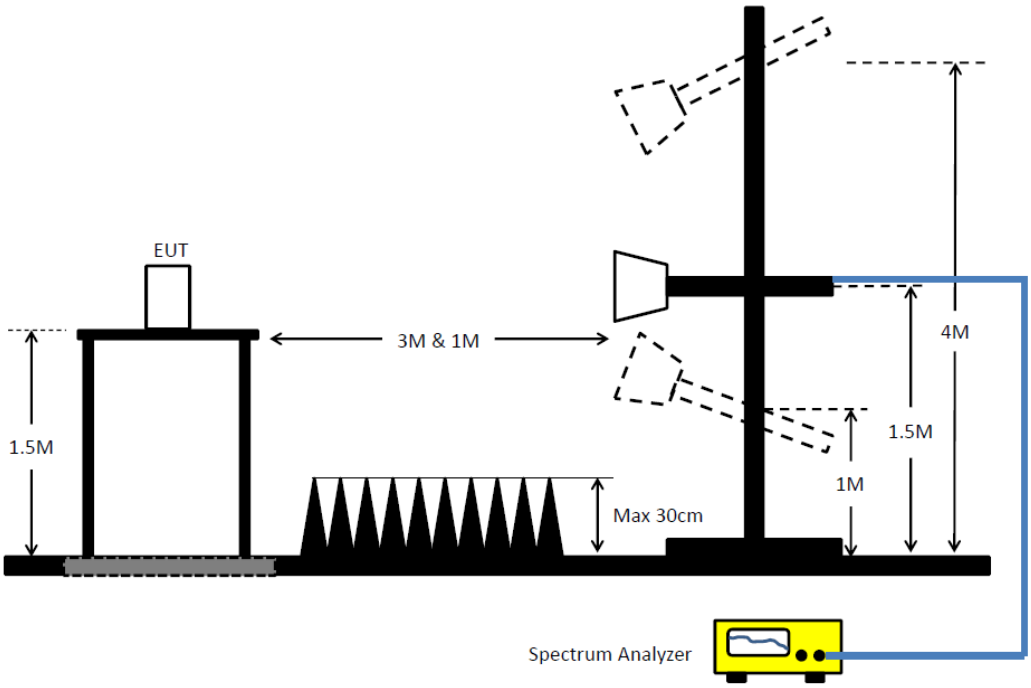
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.5.6 Test Result of Emissions in Restricted Frequency Bands (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.5.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix E

3.6 Receiver Radiated Spurious Emissions

3.6.1 Receiver in Radiated Spurious Emissions Limit

Restricted Spurious Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

3.6.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

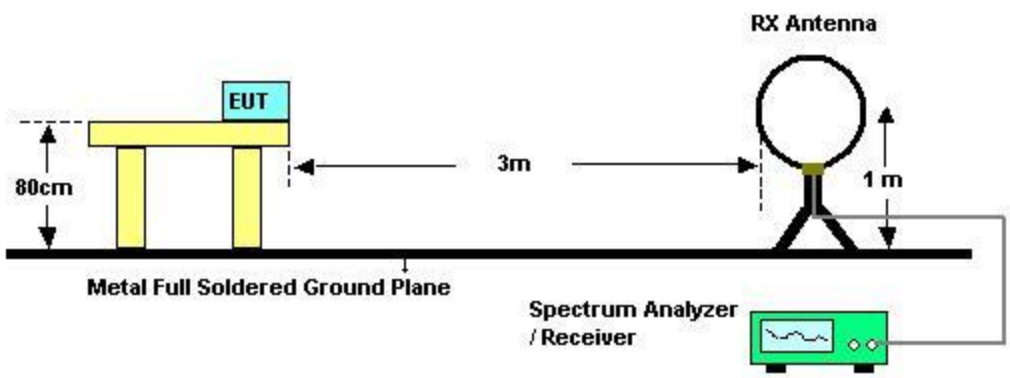
Test Method	
☒	The search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is higher, without exceeding 40 GHz.
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).
☒	For radiated measurement, refer as ANSI C63.4, clause 8.3.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from below 30 MHz.
☒	Refer as ANSI C63.4, clause 8.3.1.1 and 8.3.2.1 for radiated emissions from 30 MHz-1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the QP-Limit so that the QP level does not need to be reported in addition.
☒	Refer as ANSI C63.4, clause 8.3.1.2 and 8.3.2.2 for radiated emissions from above 1 GHz. For the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.
☒	All amplitude of spurious emissions that are attenuated by more than 30 dB below the permissible value has no need to be reported.

3.6.4 Measurement Results Calculation

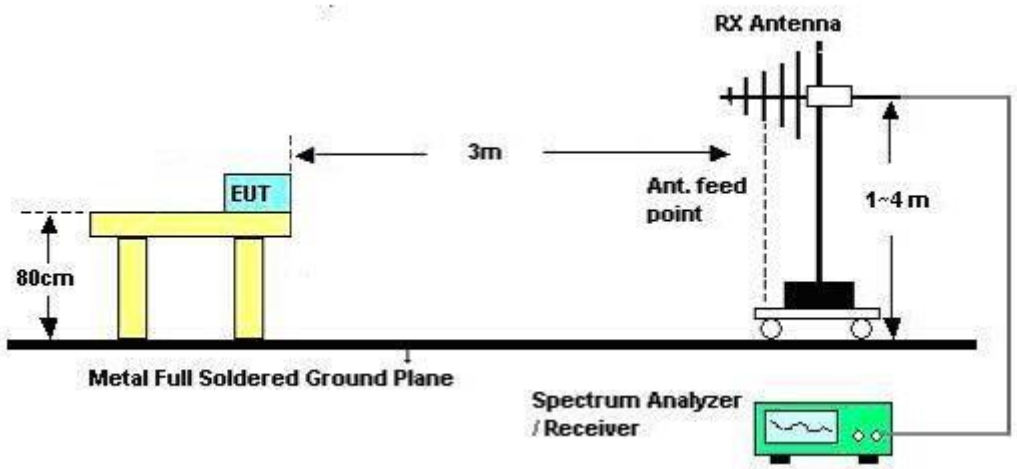
The measured Level is calculated using:
Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamp Factor)

3.6.5 Test Setup

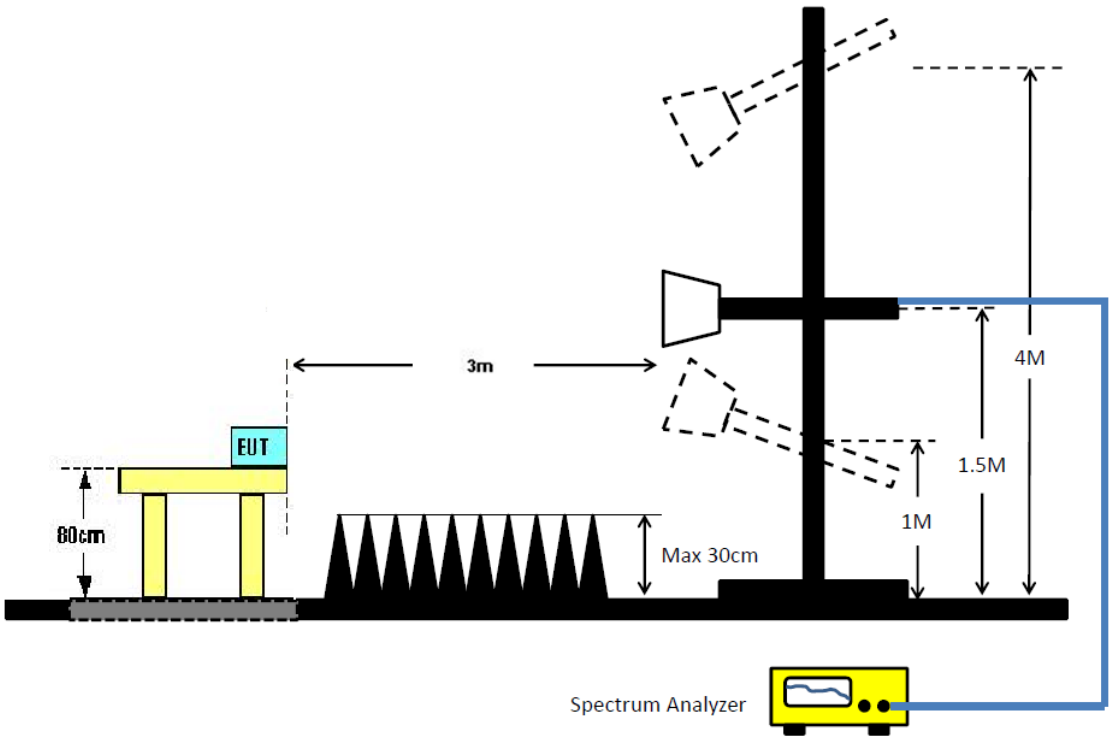
Receiver Spurious and Out of Band Emissions (9 kHz - 30 MHz)



Receiver Radiated Unwanted Emissions (below 1GHz)



Receiver Radiated Unwanted Emissions (above 1GHz)



3.6.6 Receiver Radiated Unwanted Emissions (Below 30MHz)

The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.

3.6.7 Test Result of Receiver Radiated Unwanted Emissions

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
Signal Analyzer	R&S	FSV 40	101029	10Hz~40GHz	19/Oct/2020	18/Oct/2021
SMB100A Signal Generator	R&S	SMB100A03	181147	100kHz~40GHz	20/Oct/2020	19/Oct/2021
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	25/Mar/2021	24/Mar/2022
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	25/Mar/2021	24/Mar/2022

Instrument for Radiated Test

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	30MHz~1GHz 3m	26/Mar/2021	25/Mar/2022
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	18/Mar/2021	17/Mar/2022
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	11/Aug/2020	10/Aug/2021
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	12/Apr/2021	11/Apr/2022
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	24/Jul/2020	23/Jul/2021
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	23/Jul/2021	22/Jul/2022
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	06/Sep/2020	05/Sep/2021
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA9120 D 1534	1GHz~18GHz	18/May/2021	17/May/2022
RF Cable-low	Jye Bao	RG142	CB031+324530/4	9kHz~30MHz	03/Sep/2020	02/Sep/2021
RF Cable-low	Jye Bao	RG142	CB031+324530/4	30MHz~1GHz	09/Feb/2021	08/Feb/2022
RF CABLE 5m+3m+1m	HUBER+SUHNER	SUCOFLEX104	SN MY25918/4+ SN MY39478/4 + SN 324530/4	1GHz~40GHz	15/Aug/2020	14/Aug/2021
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170221	18GHz~40GHz	11/Mar/2021	10/Mar/2022
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060604	18GHz ~ 40GHz	09/Mar/2021	08/Mar/2022
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	16/Mar/2021	15/Mar/2022
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	19/Apr/2021	18/Apr/2022

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
BT-LE(1Mbps)	722.5k	1.047M	1M05F1D	710k	1.046M

Max-N dB = Maximum 6dB down bandwidth; Max-OBW = Maximum 99% occupied bandwidth;
Min-N dB = Minimum 6dB down bandwidth; Min-OBW = Minimum 99% occupied bandwidth

Result

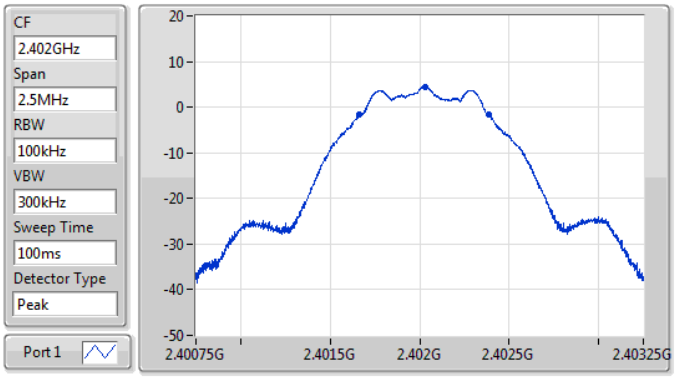
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	722.5k	1.047M
2440MHz	Pass	500k	710k	1.046M
2480MHz	Pass	500k	713.75k	1.047M

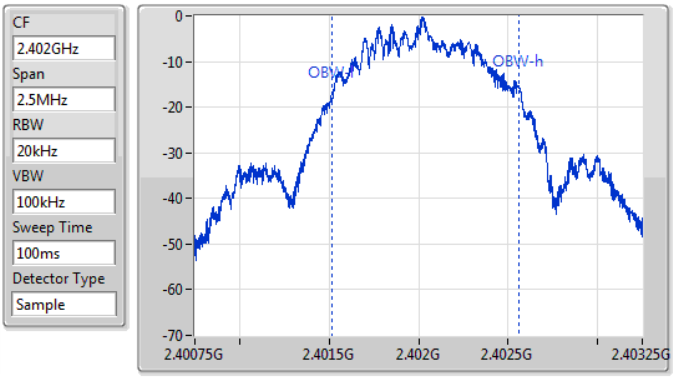
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

BT-LE(1Mbps) EBW-DTS

2402MHz

06/07/2021



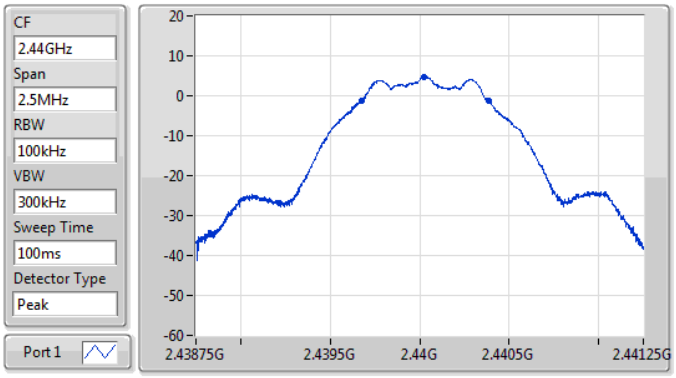


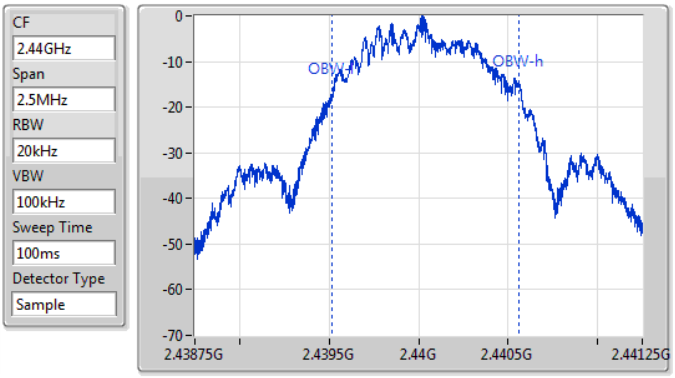
6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
722.5k	2.401665G	2.402388G	1.047M	2.401516G	2.402563G	500k	1

BT-LE(1Mbps) EBW-DTS

2440MHz

06/07/2021



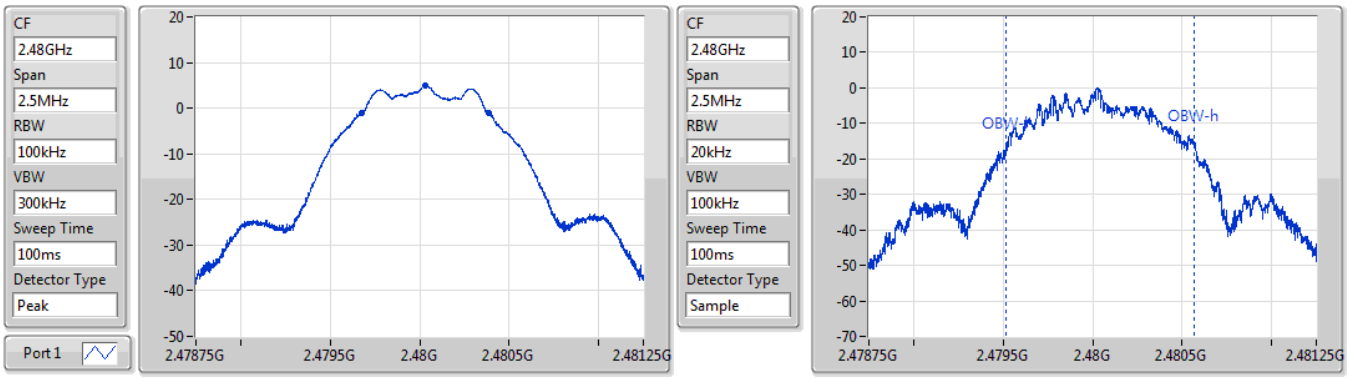


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
710k	2.439676G	2.440386G	1.046M	2.439518G	2.440563G	500k	1

BT-LE(1Mbps) **EBW-DTS**

2480MHz

06/07/2021



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
713.75k	2.479674G	2.480388G	1.047M	2.479518G	2.480565G	500k	1

Summary

Mode	Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	4.94	0.00312

Result

Mode	Result	Gain (dBi)	Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.47	4.54	30.00
2440MHz	Pass	1.47	4.56	30.00
2480MHz	Pass	1.47	4.94	30.00

DG = Directional Gain; Port X = Port X output power

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-10.51

RBW = 3kHz;

Result

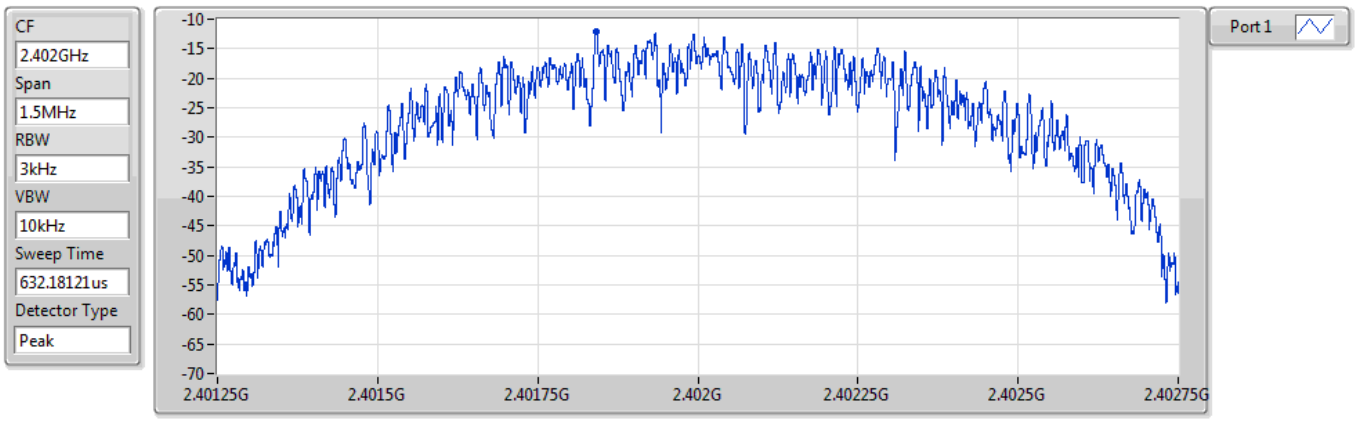
Mode	Result	Gain (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.47	-12.15	8.00
2440MHz	Pass	1.47	-10.84	8.00
2480MHz	Pass	1.47	-10.51	8.00

DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;

BT-LE(1Mbps) PSD

2402MHz

06/07/2021

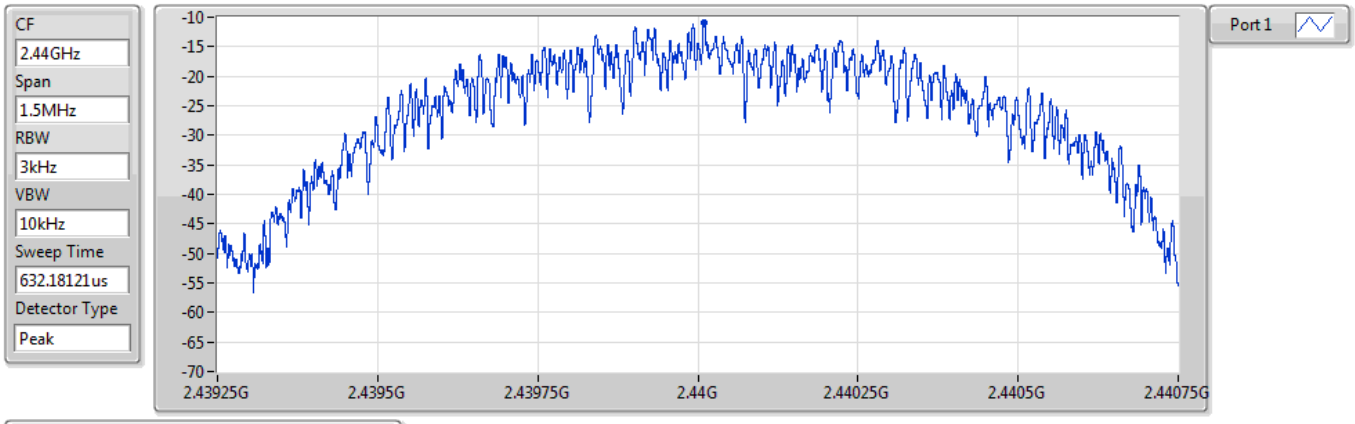


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-12.15	-12.15	-12.15

BT-LE(1Mbps) PSD

2440MHz

06/07/2021

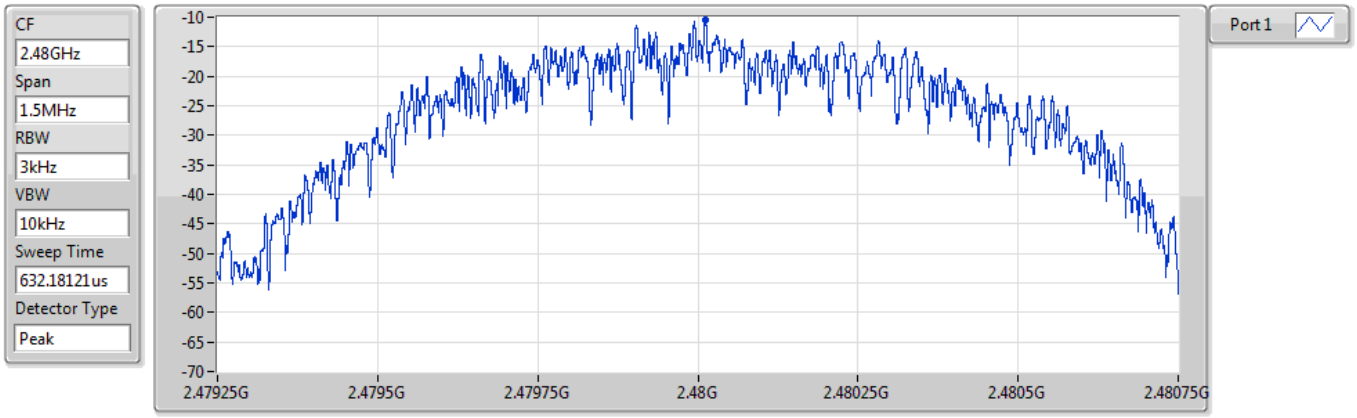


Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.84	-10.84	-10.84

BT-LE(1Mbps) **PSD**

2480MHz

06/07/2021



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-10.51	-10.51	-10.51

Summary

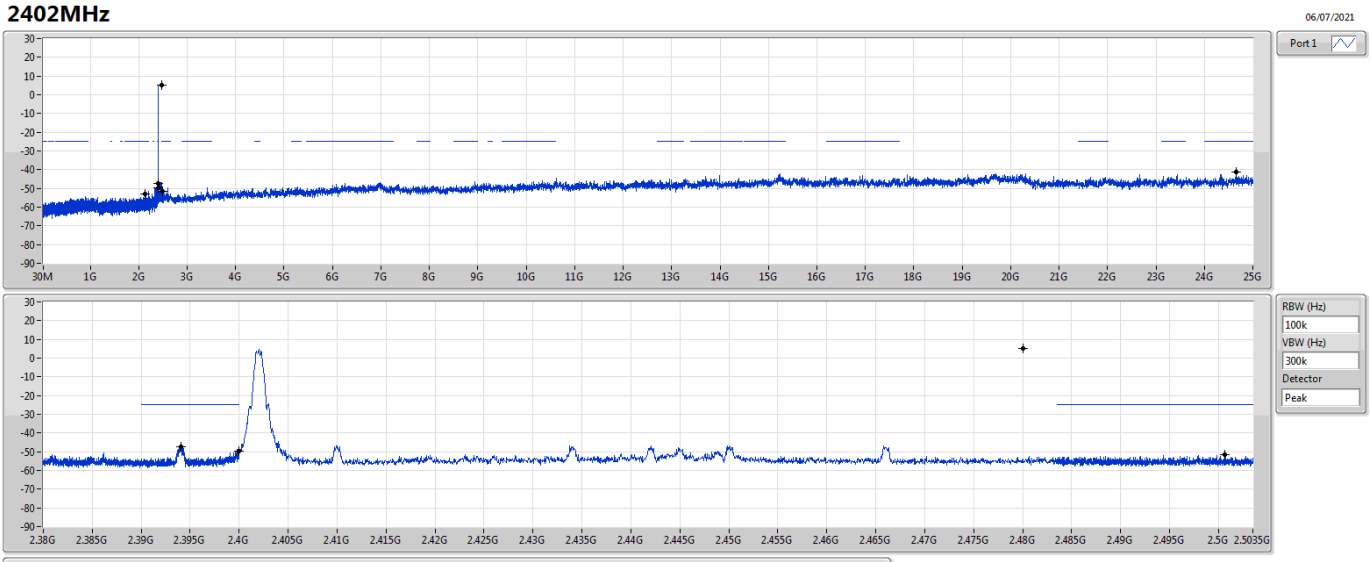
Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	2.48003G	4.93	-25.07	2.30509G	-53.42	2.3921G	-52.39	2.4835G	-54.27	2.48833G	-45.86	15.22527G	-42.54	1

Result

Mode	Result	Ref (Hz)	Ref (dBm)	Limit (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Freq (Hz)	Level (dBm)	Port
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	2.48003G	4.93	-25.07	2.13031G	-53.01	2.39403G	-47.27	2.4G	-49.53	2.5006G	-51.68	24.65693G	-41.23	1
2440MHz	Pass	2.48003G	4.93	-25.07	2.12033G	-53.28	2.39222G	-47.39	2.4G	-47.55	2.48805G	-46.59	23.35776G	-42.75	1
2480MHz	Pass	2.48003G	4.93	-25.07	2.30509G	-53.42	2.3921G	-52.39	2.4835G	-54.27	2.48833G	-45.86	15.22527G	-42.54	1

BT-LE(1Mbps) **CSENdB-DTS**

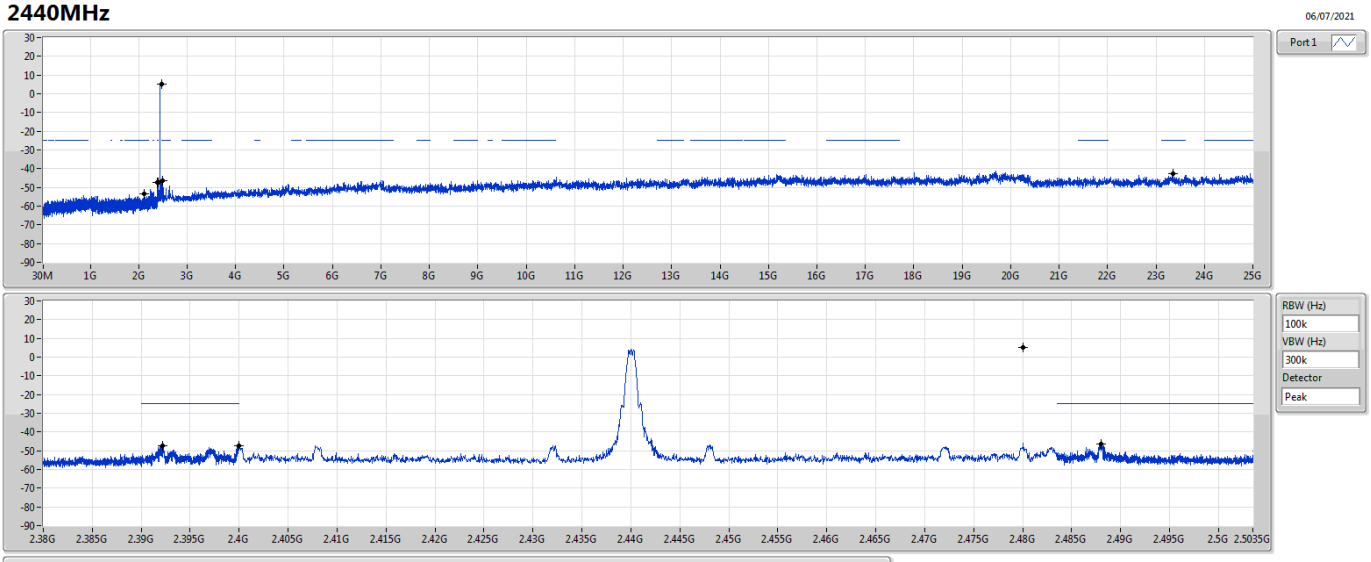
2402MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48003G	4.93	-25.07	2.13031G	-53.01	2.39403G	-47.27	2.4G	-49.53	2.5006G	-51.68	24.65693G	-41.23	1

BT-LE(1Mbps) **CSENdB-DTS**

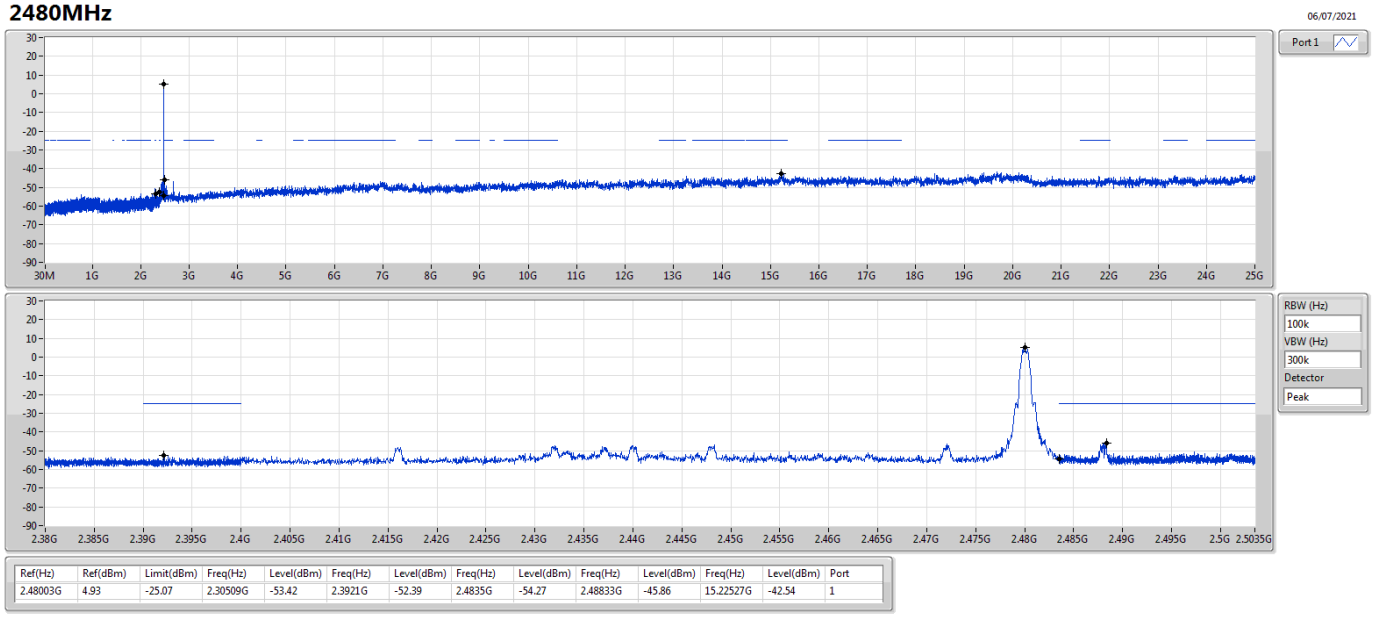
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48003G	4.93	-25.07	2.12033G	-53.28	2.39222G	-47.39	2.4G	-47.55	2.48805G	-46.59	23.35776G	-42.75	1

BT-LE(1Mbps) **CSENdB-DTS**

2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48003G	4.93	-25.07	2.30509G	-53.42	2.3921G	-52.39	2.4835G	-54.27	2.48833G	-45.86	15.22527G	-42.54	1

Summary

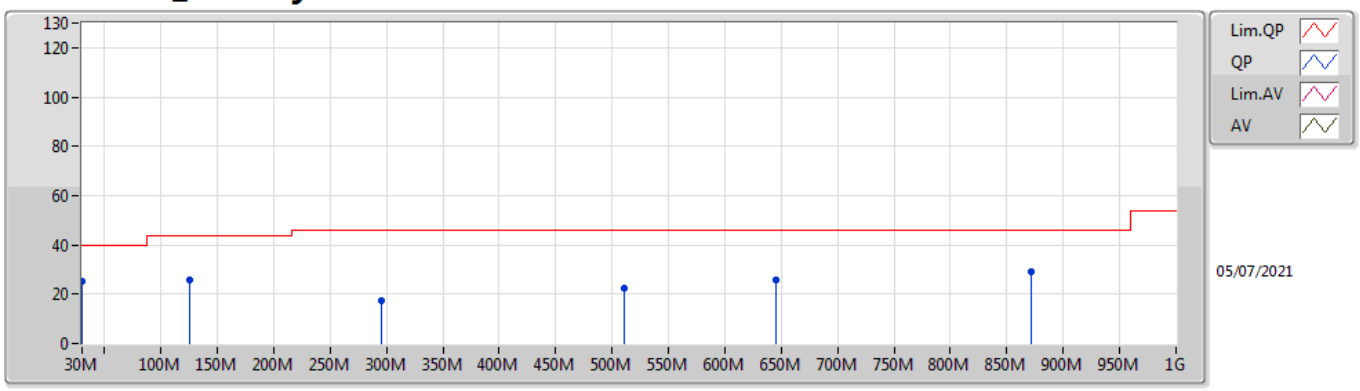
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	30M	25.02	40.00	-14.98	3	Vertical	0	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	25.02	40.00	-14.98	3	Vertical	0	1.00	-
2440MHz	Pass	PK	125.06M	25.69	43.50	-17.81	3	Vertical	0	1.00	-
2440MHz	Pass	PK	295.78M	17.30	46.00	-28.70	3	Vertical	0	1.00	-
2440MHz	Pass	PK	511.12M	22.38	46.00	-23.62	3	Vertical	0	1.00	-
2440MHz	Pass	PK	644.98M	25.51	46.00	-20.49	3	Vertical	0	1.00	-
2440MHz	Pass	PK	871.96M	28.97	46.00	-17.03	3	Vertical	0	1.00	-
2440MHz	Pass	PK	35.82M	19.18	40.00	-20.82	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	125.06M	18.08	43.50	-25.42	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	322.94M	17.45	46.00	-28.55	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	499.48M	22.82	46.00	-23.18	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	774.96M	28.07	46.00	-17.93	3	Horizontal	360	1.00	-
2440MHz	Pass	PK	957.32M	30.82	46.00	-15.18	3	Horizontal	360	1.00	-

BT-LE(1Mbps)

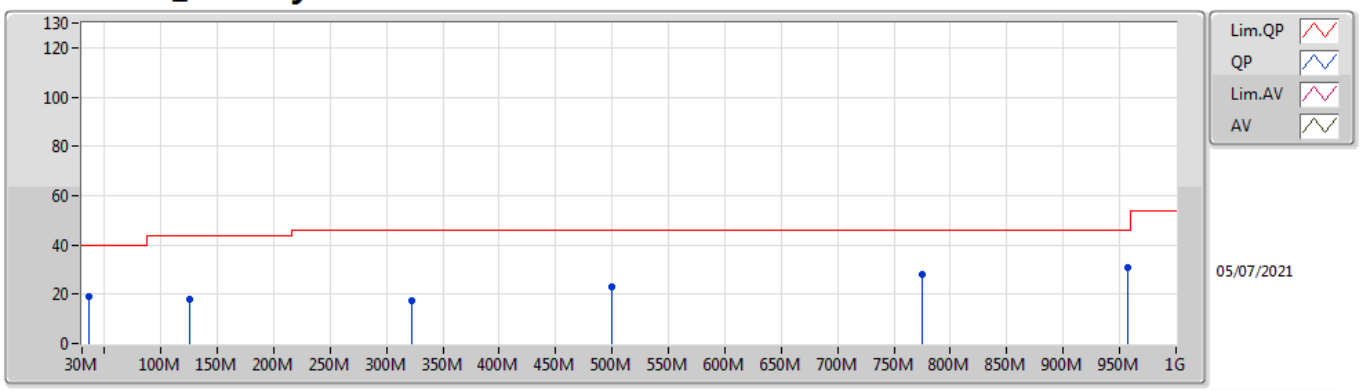
2440MHz_Battery



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	30M	25.02	40.00	-14.98	-13.08	3	Vertical	0	1.00	-	38.10	23.51	0.56	37.15
PK	125.06M	25.69	43.50	-17.81	-18.63	3	Vertical	0	1.00	-	44.32	16.88	1.10	36.61
PK	295.78M	17.30	46.00	-28.70	-16.52	3	Vertical	0	1.00	-	33.82	18.26	1.66	36.44
PK	511.12M	22.38	46.00	-23.62	-11.43	3	Vertical	0	1.00	-	33.81	23.32	2.26	37.01
PK	644.98M	25.51	46.00	-20.49	-9.05	3	Vertical	0	1.00	-	34.56	25.59	2.60	37.24
PK	871.96M	28.97	46.00	-17.03	-6.48	3	Vertical	0	1.00	-	35.45	28.14	2.97	37.59

BT-LE(1Mbps)

2440MHz_Battery



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	35.82M	19.18	40.00	-20.82	-15.77	3	Horizontal	360	1.00	-	34.95	20.63	0.67	37.07
PK	125.06M	18.08	43.50	-25.42	-18.63	3	Horizontal	360	1.00	-	36.71	16.88	1.10	36.61
PK	322.94M	17.45	46.00	-28.55	-16.02	3	Horizontal	360	1.00	-	33.47	18.74	1.72	36.48
PK	499.48M	22.82	46.00	-23.18	-11.51	3	Horizontal	360	1.00	-	34.33	23.25	2.23	36.99
PK	774.96M	28.07	46.00	-17.93	-7.42	3	Horizontal	360	1.00	-	35.49	27.36	2.77	37.55
PK	957.32M	30.82	46.00	-15.18	-4.19	3	Horizontal	360	1.00	-	35.01	30.20	3.11	37.50

Summary

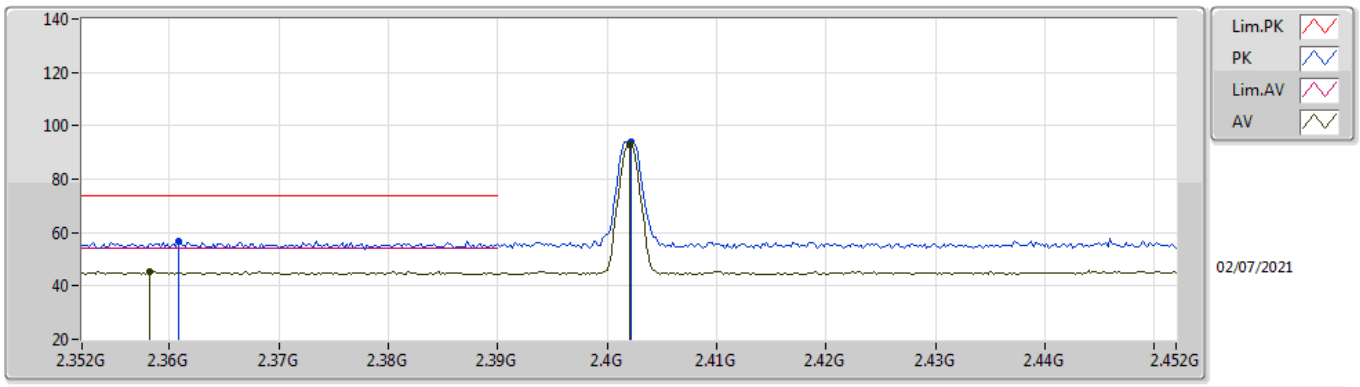
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	7.3194G	50.63	54.00	-3.37	3	Vertical	82	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3582G	45.22	54.00	-8.78	3	Vertical	284	2.79	-
2402MHz	Pass	AV	2.402G	93.03	Inf	-Inf	3	Vertical	284	2.79	-
2402MHz	Pass	PK	2.3608G	56.97	74.00	-17.03	3	Vertical	284	2.79	-
2402MHz	Pass	PK	2.4022G	94.01	Inf	-Inf	3	Vertical	284	2.79	-
2402MHz	Pass	AV	2.3592G	47.17	54.00	-6.83	3	Horizontal	332	1.16	-
2402MHz	Pass	AV	2.402G	101.23	Inf	-Inf	3	Horizontal	332	1.16	-
2402MHz	Pass	PK	2.3798G	57.67	74.00	-16.33	3	Horizontal	332	1.16	-
2402MHz	Pass	PK	2.4022G	102.21	Inf	-Inf	3	Horizontal	332	1.16	-
2402MHz	Pass	AV	4.80378G	34.20	54.00	-19.80	3	Vertical	245	2.66	-
2402MHz	Pass	PK	4.80357G	45.86	74.00	-28.14	3	Vertical	245	2.66	-
2402MHz	Pass	AV	4.80396G	37.97	54.00	-16.03	3	Horizontal	24	1.04	-
2402MHz	Pass	PK	4.80344G	47.67	74.00	-26.33	3	Horizontal	24	1.04	-
2440MHz	Pass	AV	2.3576G	45.38	54.00	-8.62	3	Vertical	296	1.04	-
2440MHz	Pass	AV	2.44G	86.37	Inf	-Inf	3	Vertical	296	1.04	-
2440MHz	Pass	AV	2.52G	45.57	54.00	-8.43	3	Vertical	296	1.04	-
2440MHz	Pass	PK	2.3784G	56.51	74.00	-17.49	3	Vertical	296	1.04	-
2440MHz	Pass	PK	2.4404G	87.48	Inf	-Inf	3	Vertical	296	1.04	-
2440MHz	Pass	PK	2.5316G	57.11	74.00	-16.89	3	Vertical	296	1.04	-
2440MHz	Pass	AV	2.376G	46.75	54.00	-7.25	3	Horizontal	355	1.16	-
2440MHz	Pass	AV	2.44G	101.07	Inf	-Inf	3	Horizontal	355	1.16	-
2440MHz	Pass	AV	2.4884G	47.88	54.00	-6.12	3	Horizontal	355	1.16	-
2440MHz	Pass	PK	2.3764G	57.69	74.00	-16.31	3	Horizontal	355	1.16	-
2440MHz	Pass	PK	2.4404G	102.08	Inf	-Inf	3	Horizontal	355	1.16	-
2440MHz	Pass	PK	2.488G	57.90	74.00	-16.10	3	Horizontal	355	1.16	-
2440MHz	Pass	AV	4.88003G	36.57	54.00	-17.43	3	Vertical	123	1.00	-
2440MHz	Pass	AV	7.3194G	50.63	54.00	-3.37	3	Vertical	82	1.00	-
2440MHz	Pass	PK	4.87969G	46.78	74.00	-27.22	3	Vertical	123	1.00	-
2440MHz	Pass	PK	7.32081G	59.33	74.00	-14.67	3	Vertical	82	1.00	-
2440MHz	Pass	AV	4.87965G	36.59	54.00	-17.41	3	Horizontal	121	1.06	-
2440MHz	Pass	AV	7.31945G	50.43	54.00	-3.57	3	Horizontal	83	1.00	-
2440MHz	Pass	PK	4.88061G	46.30	74.00	-27.70	3	Horizontal	121	1.06	-
2440MHz	Pass	PK	7.31935G	59.05	74.00	-14.95	3	Horizontal	83	1.00	-
2480MHz	Pass	AV	2.48G	92.63	Inf	-Inf	3	Vertical	268	2.63	-
2480MHz	Pass	AV	2.4876G	45.88	54.00	-8.12	3	Vertical	268	2.63	-
2480MHz	Pass	PK	2.4802G	93.66	Inf	-Inf	3	Vertical	268	2.63	-
2480MHz	Pass	PK	2.517G	58.03	74.00	-15.97	3	Vertical	268	2.63	-
2480MHz	Pass	AV	2.4802G	99.72	Inf	-Inf	3	Horizontal	338	1.50	-
2480MHz	Pass	AV	2.5282G	48.32	54.00	-5.68	3	Horizontal	338	1.50	-
2480MHz	Pass	PK	2.4798G	100.72	Inf	-Inf	3	Horizontal	338	1.50	-
2480MHz	Pass	PK	2.4835G	58.87	74.00	-15.13	3	Horizontal	338	1.50	-
2480MHz	Pass	AV	4.95959G	35.45	54.00	-18.55	3	Vertical	54	2.97	-
2480MHz	Pass	AV	7.4394G	41.83	54.00	-12.17	3	Vertical	155	1.04	-
2480MHz	Pass	PK	4.9595G	46.09	74.00	-27.91	3	Vertical	54	2.97	-
2480MHz	Pass	PK	7.44092G	52.80	74.00	-21.20	3	Vertical	155	1.04	-
2480MHz	Pass	AV	4.96009G	41.42	54.00	-12.58	3	Horizontal	121	1.03	-
2480MHz	Pass	AV	7.43946G	49.96	54.00	-4.04	3	Horizontal	82	1.14	-
2480MHz	Pass	PK	4.95961G	49.23	74.00	-24.77	3	Horizontal	121	1.03	-
2480MHz	Pass	PK	7.43932G	58.33	74.00	-15.67	3	Horizontal	82	1.14	-

BT-LE(1Mbps)

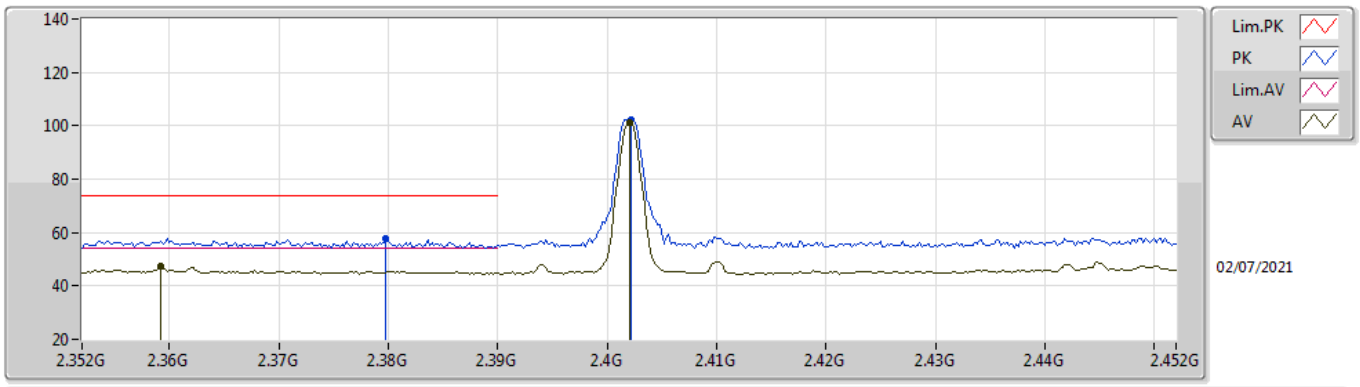
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3582G	45.22	54.00	-8.78	31.61	3	Vertical	284	2.79	-	13.61	27.77	3.84	-
AV	2.402G	93.03	Inf	-Inf	31.50	3	Vertical	284	2.79	-	61.53	27.60	3.90	-
PK	2.3608G	56.97	74.00	-17.03	31.60	3	Vertical	284	2.79	-	25.37	27.76	3.84	-
PK	2.4022G	94.01	Inf	-Inf	31.50	3	Vertical	284	2.79	-	62.51	27.60	3.90	-

BT-LE(1Mbps)

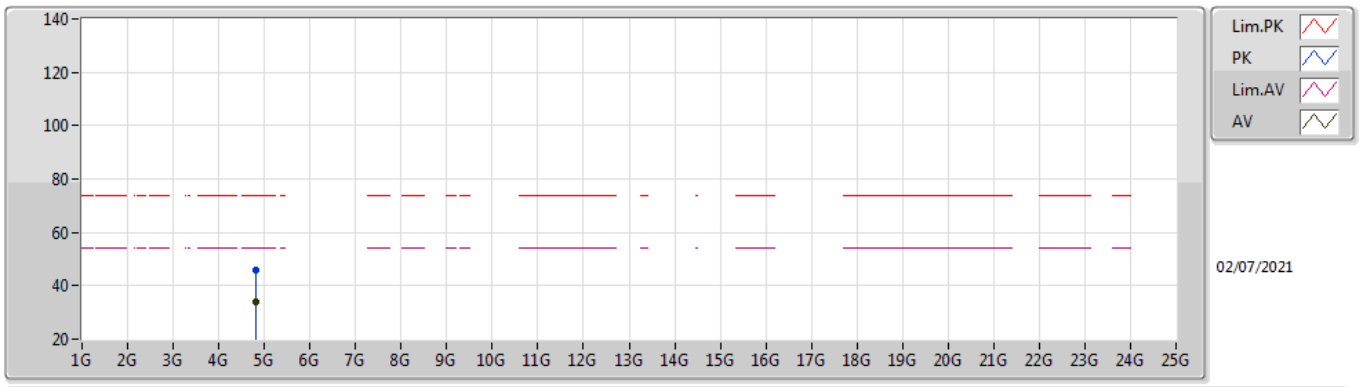
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3592G	47.17	54.00	-6.83	31.60	3	Horizontal	332	1.16	-	15.57	27.76	3.84	-
AV	2.402G	101.23	Inf	-Inf	31.50	3	Horizontal	332	1.16	-	69.73	27.60	3.90	-
PK	2.3798G	57.67	74.00	-16.33	31.55	3	Horizontal	332	1.16	-	26.12	27.68	3.87	-
PK	2.4022G	102.21	Inf	-Inf	31.50	3	Horizontal	332	1.16	-	70.71	27.60	3.90	-

BT-LE(1Mbps)

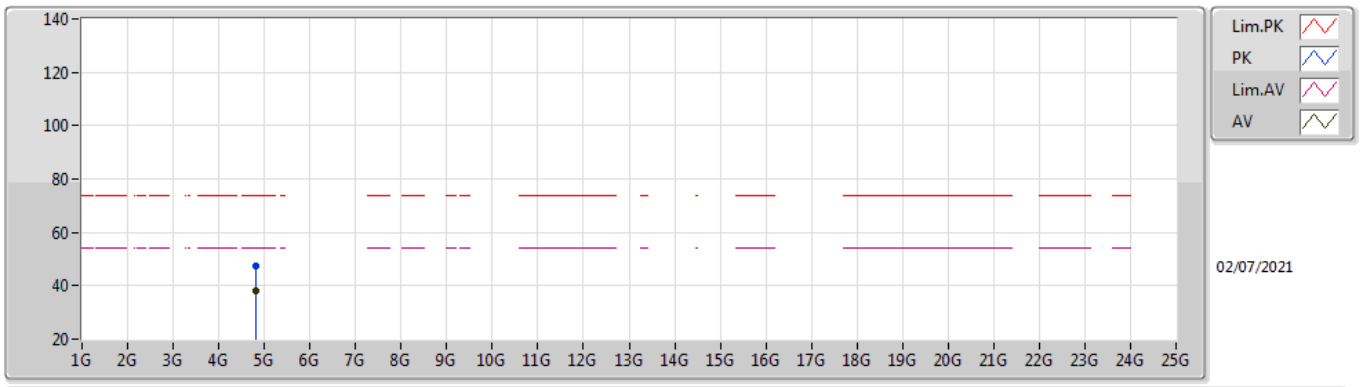
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80378G	34.20	54.00	-19.80	1.47	3	Vertical	245	2.66	-	32.73	31.10	5.30	34.93
PK	4.80357G	45.86	74.00	-28.14	1.47	3	Vertical	245	2.66	-	44.39	31.10	5.30	34.93

BT-LE(1Mbps)

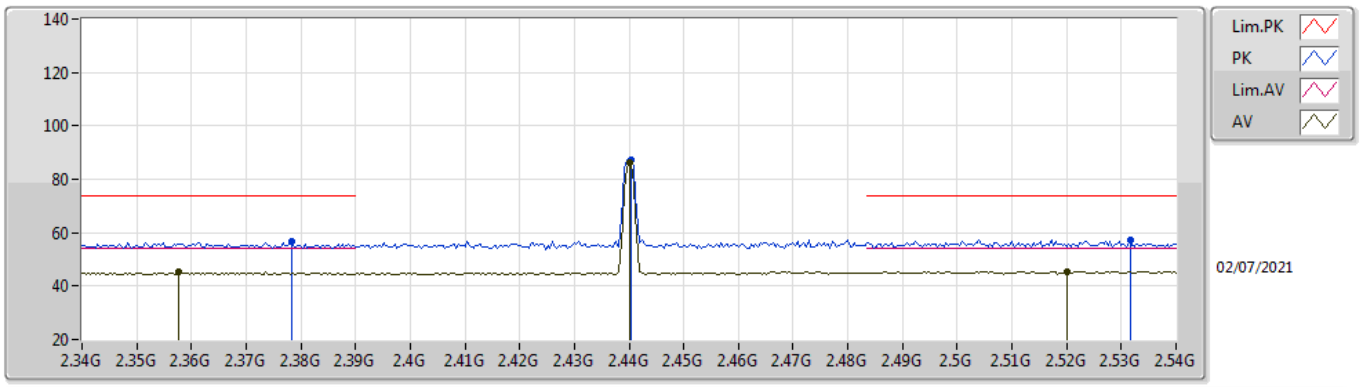
2402MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.80396G	37.97	54.00	-16.03	1.47	3	Horizontal	24	1.04	-	36.50	31.10	5.30	34.93
PK	4.80344G	47.67	74.00	-26.33	1.47	3	Horizontal	24	1.04	-	46.20	31.10	5.30	34.93

BT-LE(1Mbps)

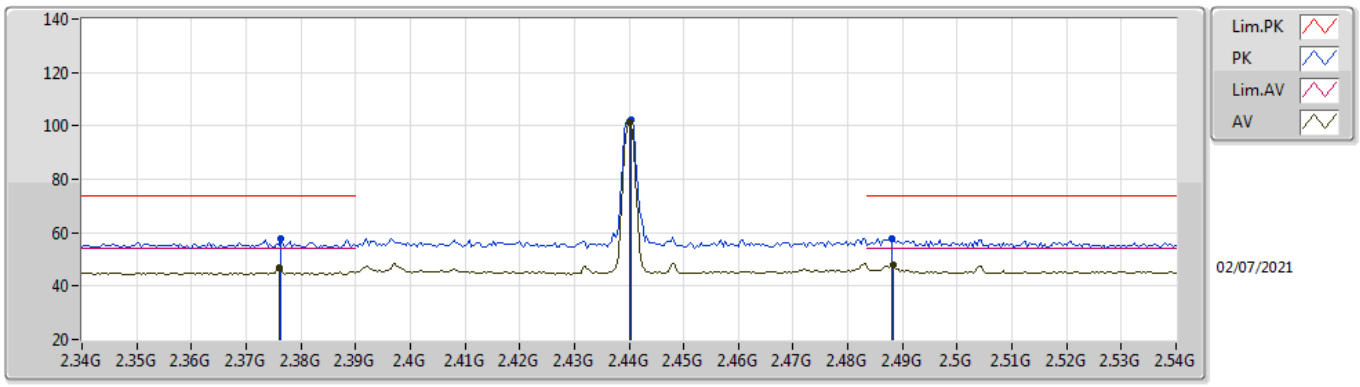
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.3576G	45.38	54.00	-8.62	31.61	3	Vertical	296	1.04	-	13.77	27.77	3.84	-
AV	2.44G	86.37	Inf	-Inf	31.48	3	Vertical	296	1.04	-	54.89	27.52	3.96	-
AV	2.52G	45.57	54.00	-8.43	31.54	3	Vertical	296	1.04	-	14.03	27.46	4.08	-
PK	2.3784G	56.51	74.00	-17.49	31.56	3	Vertical	296	1.04	-	24.95	27.69	3.87	-
PK	2.4404G	87.48	Inf	-Inf	31.48	3	Vertical	296	1.04	-	56.00	27.52	3.96	-
PK	2.5316G	57.11	74.00	-16.89	31.54	3	Vertical	296	1.04	-	25.57	27.44	4.10	-

BT-LE(1Mbps)

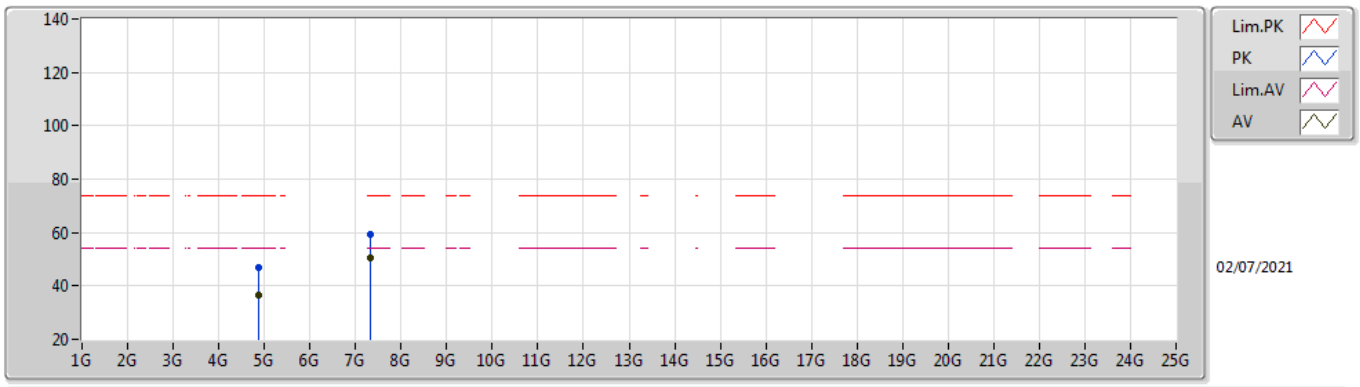
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.376G	46.75	54.00	-7.25	31.56	3	Horizontal	355	1.16	-	15.19	27.70	3.86	-
AV	2.44G	101.07	Inf	-Inf	31.48	3	Horizontal	355	1.16	-	69.59	27.52	3.96	-
AV	2.4884G	47.88	54.00	-6.12	31.53	3	Horizontal	355	1.16	-	16.35	27.50	4.03	-
PK	2.3764G	57.69	74.00	-16.31	31.55	3	Horizontal	355	1.16	-	26.14	27.69	3.86	-
PK	2.4404G	102.08	Inf	-Inf	31.48	3	Horizontal	355	1.16	-	70.60	27.52	3.96	-
PK	2.488G	57.90	74.00	-16.10	31.53	3	Horizontal	355	1.16	-	26.37	27.50	4.03	-

BT-LE(1Mbps)

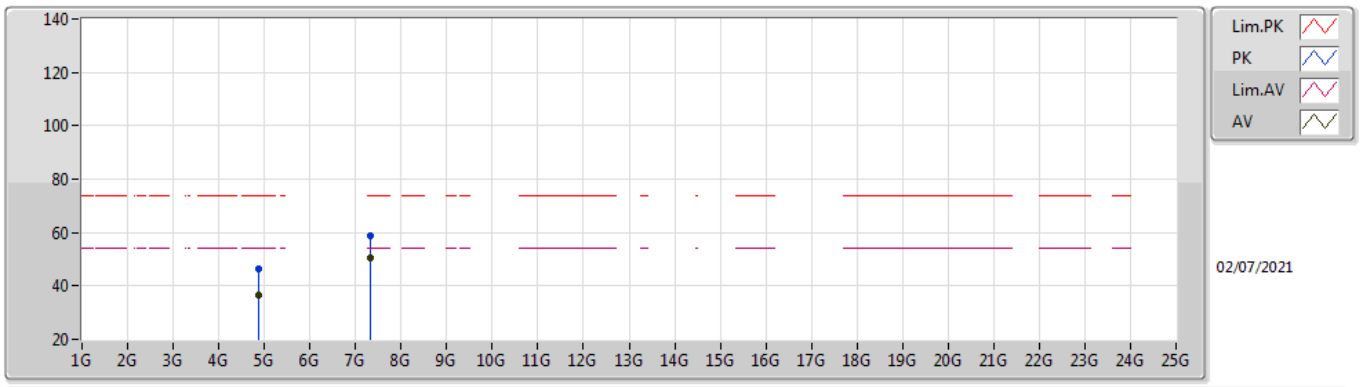
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.88003G	36.57	54.00	-17.43	1.51	3	Vertical	123	1.00	-	35.06	31.10	5.34	34.93
AV	7.3194G	50.63	54.00	-3.37	7.98	3	Vertical	82	1.00	-	42.65	36.36	6.80	35.18
PK	4.87969G	46.78	74.00	-27.22	1.51	3	Vertical	123	1.00	-	45.27	31.10	5.34	34.93
PK	7.32081G	59.33	74.00	-14.67	7.98	3	Vertical	82	1.00	-	51.35	36.36	6.80	35.18

BT-LE(1Mbps)

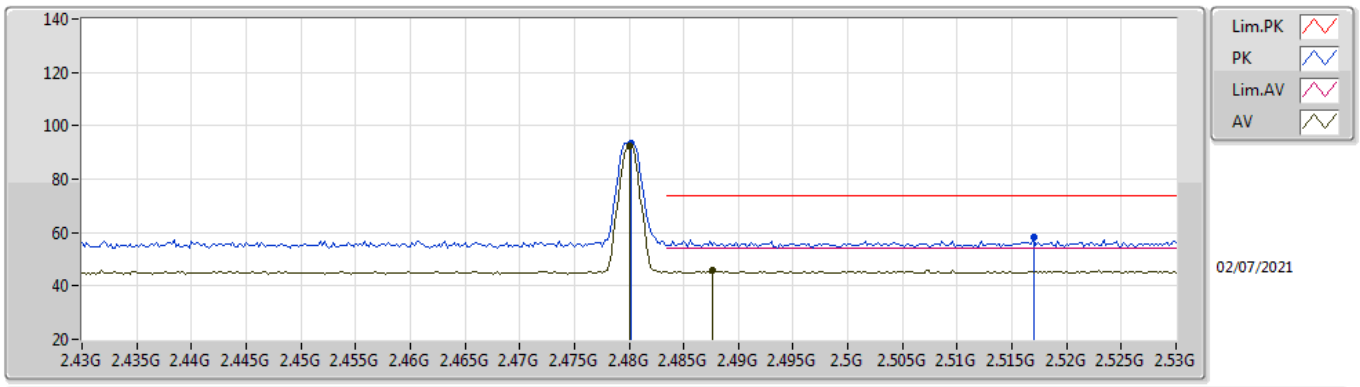
2440MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.87965G	36.59	54.00	-17.41	1.51	3	Horizontal	121	1.06	-	35.08	31.10	5.34	34.93
AV	7.31945G	50.43	54.00	-3.57	7.98	3	Horizontal	83	1.00	-	42.45	36.36	6.80	35.18
PK	4.88061G	46.30	74.00	-27.70	1.51	3	Horizontal	121	1.06	-	44.79	31.10	5.34	34.93
PK	7.31935G	59.05	74.00	-14.95	7.98	3	Horizontal	83	1.00	-	51.07	36.36	6.80	35.18

BT-LE(1Mbps)

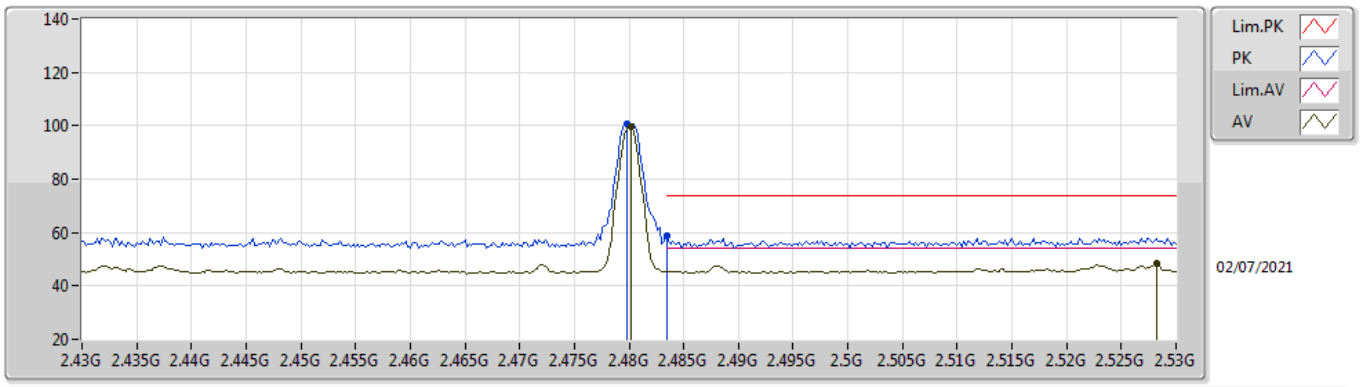
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	92.63	Inf	-Inf	31.52	3	Vertical	268	2.63	-	61.11	27.50	4.02	-
AV	2.4876G	45.88	54.00	-8.12	31.53	3	Vertical	268	2.63	-	14.35	27.50	4.03	-
PK	2.4802G	93.66	Inf	-Inf	31.52	3	Vertical	268	2.63	-	62.14	27.50	4.02	-
PK	2.517G	58.03	74.00	-15.97	31.55	3	Vertical	268	2.63	-	26.48	27.47	4.08	-

BT-LE(1Mbps)

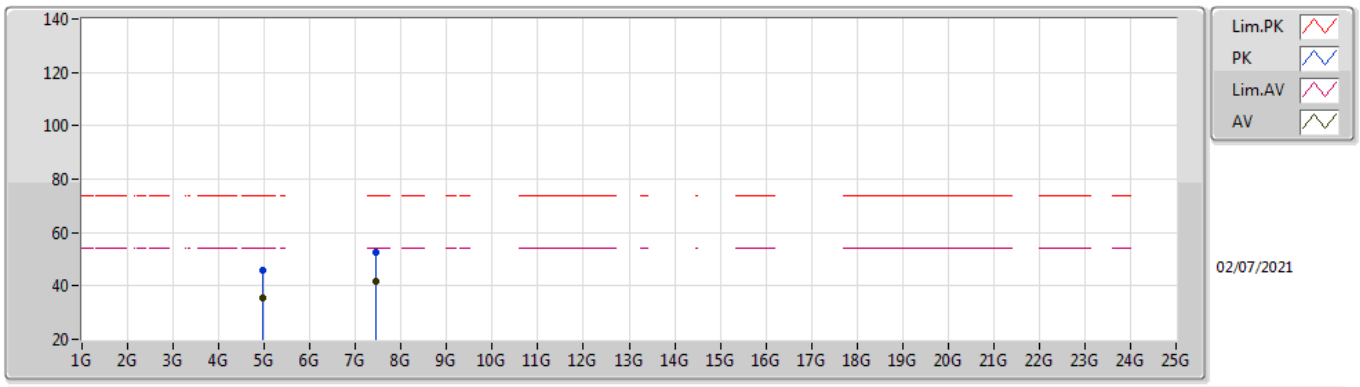
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	2.4802G	99.72	Inf	-Inf	31.52	3	Horizontal	338	1.50	-	68.20	27.50	4.02	-
AV	2.5282G	48.32	54.00	-5.68	31.53	3	Horizontal	338	1.50	-	16.79	27.44	4.09	-
PK	2.4798G	100.72	Inf	-Inf	31.52	3	Horizontal	338	1.50	-	69.20	27.50	4.02	-
PK	2.4835G	58.87	74.00	-15.13	31.53	3	Horizontal	338	1.50	-	27.34	27.50	4.03	-

BT-LE(1Mbps)

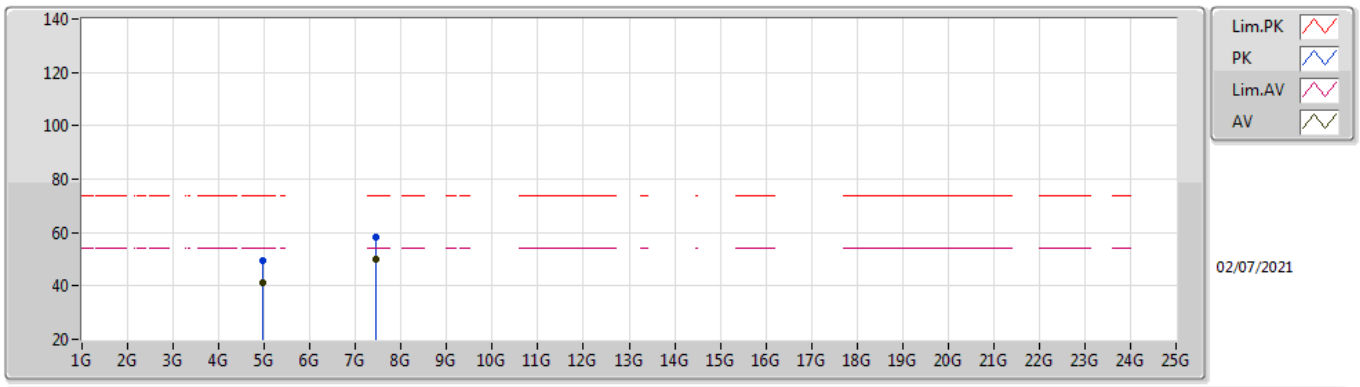
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.95959G	35.45	54.00	-18.55	1.78	3	Vertical	54	2.97	-	33.67	31.34	5.38	34.94
AV	7.4394G	41.83	54.00	-12.17	7.93	3	Vertical	155	1.04	-	33.90	36.28	6.82	35.17
PK	4.9595G	46.09	74.00	-27.91	1.78	3	Vertical	54	2.97	-	44.31	31.34	5.38	34.94
PK	7.44092G	52.80	74.00	-21.20	7.93	3	Vertical	155	1.04	-	44.87	36.28	6.82	35.17

BT-LE(1Mbps)

2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	4.96009G	41.42	54.00	-12.58	1.78	3	Horizontal	121	1.03	-	39.64	31.34	5.38	34.94
AV	7.43946G	49.96	54.00	-4.04	7.93	3	Horizontal	82	1.14	-	42.03	36.28	6.82	35.17
PK	4.95961G	49.23	74.00	-24.77	1.78	3	Horizontal	121	1.03	-	47.45	31.34	5.38	34.94
PK	7.43932G	58.33	74.00	-15.67	7.93	3	Horizontal	82	1.14	-	50.40	36.28	6.82	35.17

Summary

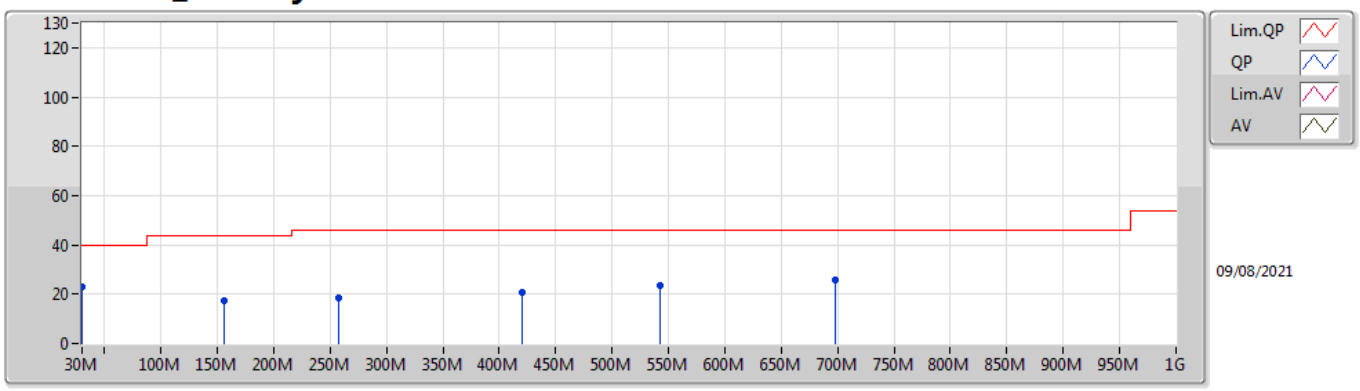
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	30M	23.19	40.00	-16.81	3	Vertical	360	1.00	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	30M	23.19	40.00	-16.81	3	Vertical	360	1.00	-
2440MHz	Pass	PK	156.1M	17.59	43.50	-25.91	3	Vertical	360	1.00	-
2440MHz	Pass	PK	256.98M	18.50	46.00	-27.50	3	Vertical	360	1.00	-
2440MHz	Pass	PK	419.94M	20.59	46.00	-25.41	3	Vertical	360	1.00	-
2440MHz	Pass	PK	542.16M	23.56	46.00	-22.44	3	Vertical	360	1.00	-
2440MHz	Pass	PK	697.36M	25.78	46.00	-20.22	3	Vertical	360	1.00	-
2440MHz	Pass	PK	30M	19.83	40.00	-20.17	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	144.46M	14.63	43.50	-28.87	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	260.86M	17.11	46.00	-28.89	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	400.54M	19.55	46.00	-26.45	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	557.68M	25.01	46.00	-20.99	3	Horizontal	0	1.00	-
2440MHz	Pass	PK	641.1M	25.35	46.00	-20.65	3	Horizontal	0	1.00	-

BT-LE(1Mbps)RX

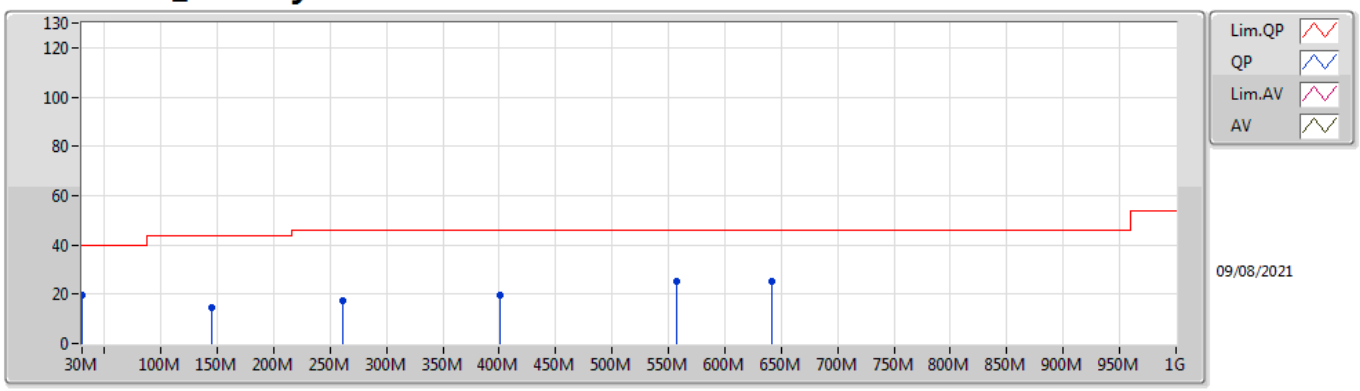
2440MHz_Battery



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	30M	23.19	40.00	-16.81	-13.08	3	Vertical	360	1.00	-	36.27	23.51	0.56	37.15
PK	156.1M	17.59	43.50	-25.91	-19.13	3	Vertical	360	1.00	-	36.72	16.03	1.22	36.38
PK	256.98M	18.50	46.00	-27.50	-16.19	3	Vertical	360	1.00	-	34.69	18.69	1.52	36.40
PK	419.94M	20.59	46.00	-25.41	-12.61	3	Vertical	360	1.00	-	33.20	21.99	1.99	36.59
PK	542.16M	23.56	46.00	-22.44	-11.19	3	Vertical	360	1.00	-	34.75	23.52	2.36	37.07
PK	697.36M	25.78	46.00	-20.22	-8.89	3	Vertical	360	1.00	-	34.67	25.72	2.68	37.29

BT-LE(1Mbps)RX

2440MHz_Battery



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
PK	30M	19.83	40.00	-20.17	-13.08	3	Horizontal	0	1.00	-	32.91	23.51	0.56	37.15
PK	144.46M	14.63	43.50	-28.87	-18.65	3	Horizontal	0	1.00	-	33.28	16.57	1.18	36.40
PK	260.86M	17.11	46.00	-28.89	-15.70	3	Horizontal	0	1.00	-	32.81	19.16	1.54	36.40
PK	400.54M	19.55	46.00	-26.45	-13.53	3	Horizontal	0	1.00	-	33.08	21.13	1.91	36.57
PK	557.68M	25.01	46.00	-20.99	-9.45	3	Horizontal	0	1.00	-	34.46	25.25	2.39	37.09
PK	641.1M	25.35	46.00	-20.65	-9.10	3	Horizontal	0	1.00	-	34.45	25.54	2.59	37.23

Summary

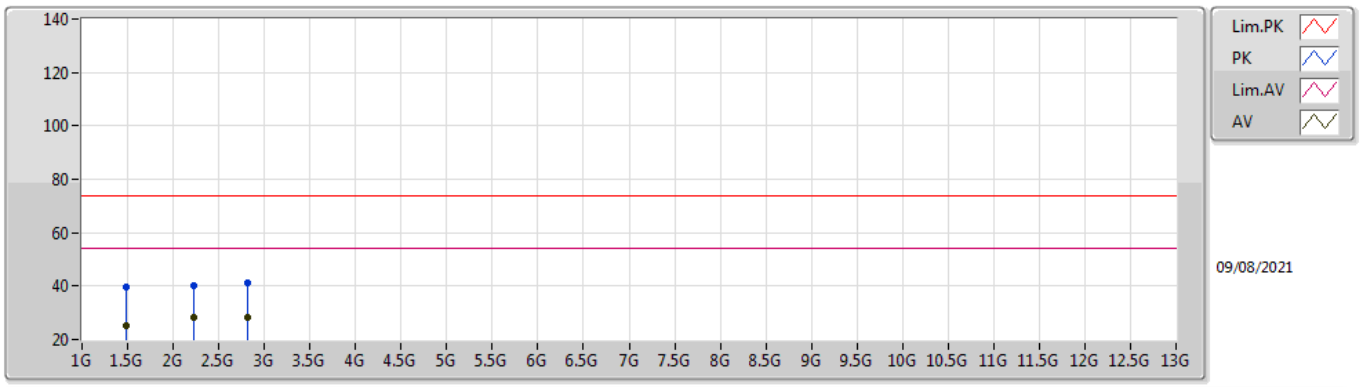
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.81G	28.36	54.00	-25.64	3	Vertical	15	2.39	-

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	AV	1.49G	25.07	54.00	-28.93	3	Vertical	199	1.69	-
2440MHz	Pass	AV	2.23G	28.20	54.00	-25.80	3	Vertical	59	1.29	-
2440MHz	Pass	AV	2.81G	28.36	54.00	-25.64	3	Vertical	15	2.39	-
2440MHz	Pass	PK	1.49G	39.76	74.00	-34.24	3	Vertical	199	1.69	-
2440MHz	Pass	PK	2.23G	40.43	74.00	-33.57	3	Vertical	59	1.29	-
2440MHz	Pass	PK	2.81G	41.07	74.00	-32.93	3	Vertical	15	2.39	-
2440MHz	Pass	AV	1.53G	25.58	54.00	-28.42	3	Horizontal	299	2.06	-
2440MHz	Pass	AV	2.28G	28.15	54.00	-25.85	3	Horizontal	62	1.06	-
2440MHz	Pass	AV	2.84G	28.34	54.00	-25.66	3	Horizontal	40	1.35	-
2440MHz	Pass	PK	1.53G	39.80	74.00	-34.20	3	Horizontal	299	2.06	-
2440MHz	Pass	PK	2.28G	40.88	74.00	-33.12	3	Horizontal	62	1.06	-
2440MHz	Pass	PK	2.84G	41.22	74.00	-32.78	3	Horizontal	40	1.35	-

BT-LE(1Mbps)RX

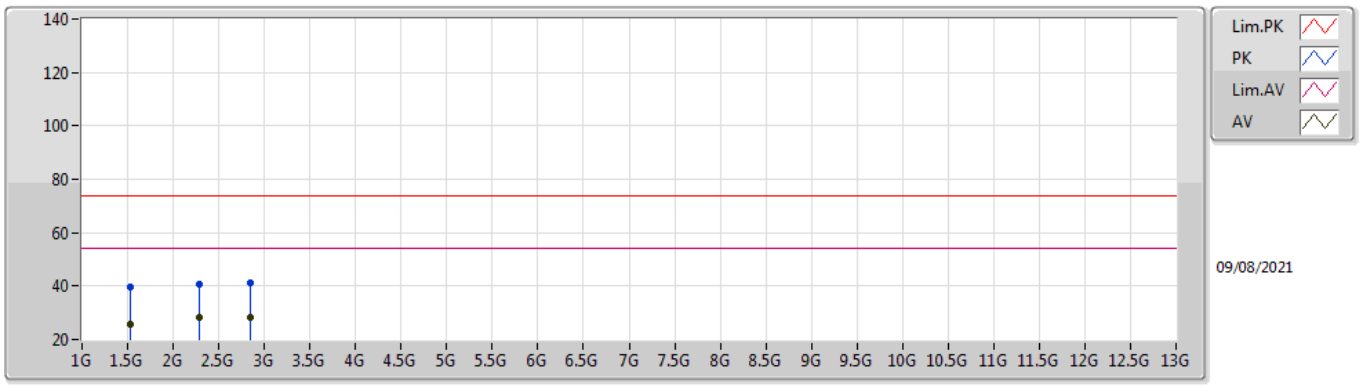
2440MHz_RX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	1.49G	25.07	54.00	-28.93	-6.57	3	Vertical	199	1.69	-	31.64	25.50	2.89	34.96
AV	2.23G	28.20	54.00	-25.80	-3.07	3	Vertical	59	1.29	-	31.27	28.06	3.65	34.78
AV	2.81G	28.36	54.00	-25.64	-2.22	3	Vertical	15	2.39	-	30.58	28.20	4.51	34.93
PK	1.49G	39.76	74.00	-34.24	-6.59	3	Vertical	199	1.69	-	46.35	25.48	2.89	34.96
PK	2.23G	40.43	74.00	-33.57	-3.07	3	Vertical	59	1.29	-	43.50	28.06	3.65	34.78
PK	2.81G	41.07	74.00	-32.93	-2.22	3	Vertical	15	2.39	-	43.29	28.20	4.51	34.93

BT-LE(1Mbps)RX

2440MHz_RX

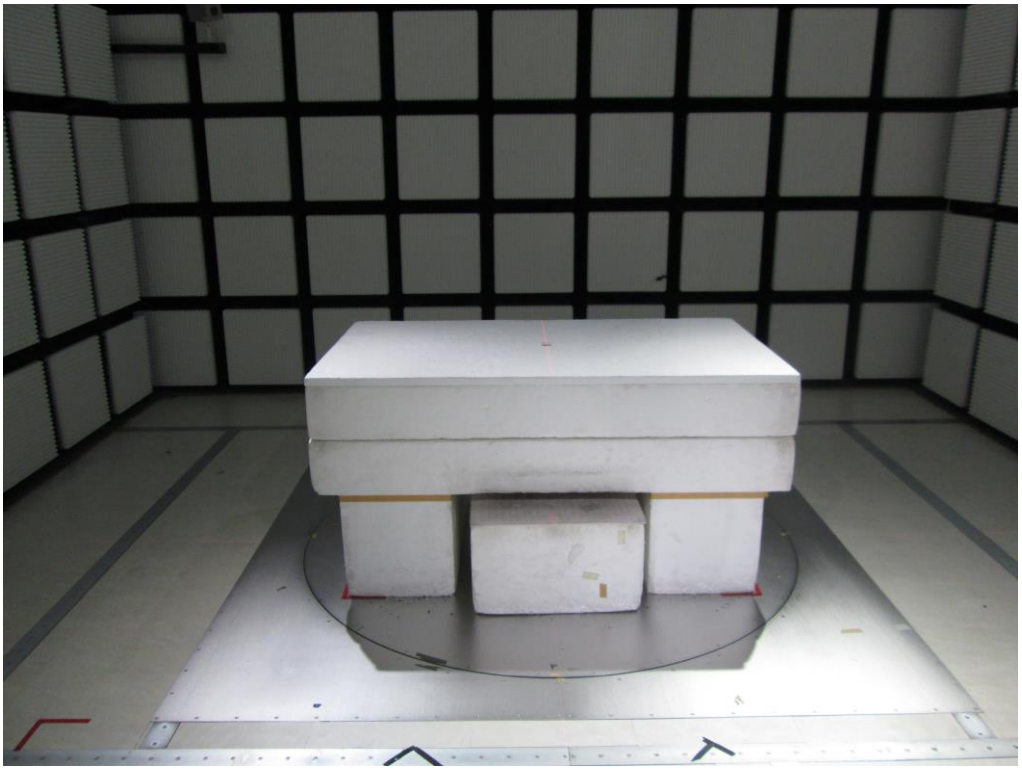


Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)		(dBuV)	(dB)	(dB)	(dB)
AV	1.53G	25.58	54.00	-28.42	-6.71	3	Horizontal	299	2.06	-	32.29	25.28	2.93	34.92
AV	2.28G	28.15	54.00	-25.85	-3.16	3	Horizontal	62	1.06	-	31.31	27.92	3.72	34.80
AV	2.84G	28.34	54.00	-25.66	-2.20	3	Horizontal	40	1.35	-	30.54	28.20	4.54	34.94
PK	1.53G	39.80	74.00	-34.20	-6.71	3	Horizontal	299	2.06	-	46.51	25.28	2.93	34.92
PK	2.28G	40.88	74.00	-33.12	-3.16	3	Horizontal	62	1.06	-	44.04	27.92	3.72	34.80
PK	2.84G	41.22	74.00	-32.78	-2.20	3	Horizontal	40	1.35	-	43.42	28.20	4.54	34.94

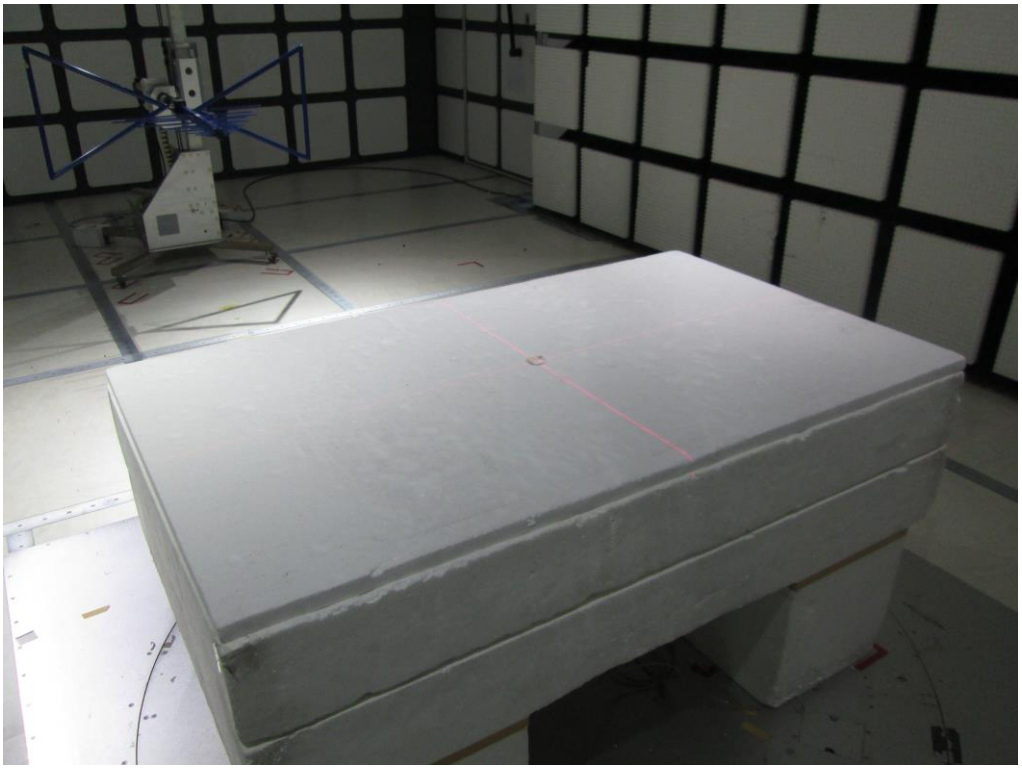
1. Photographs of Radiated Emissions Test Configuration-TX

For radiated emissions 30MHz~1GHz

Front view

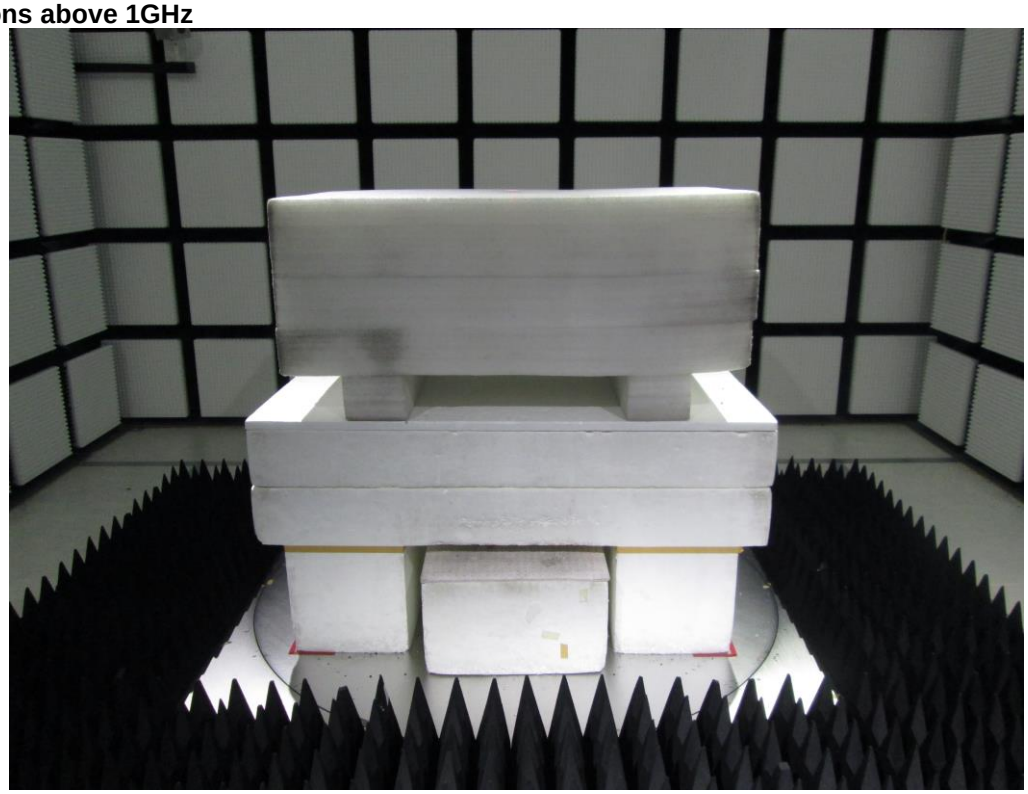


Rear view

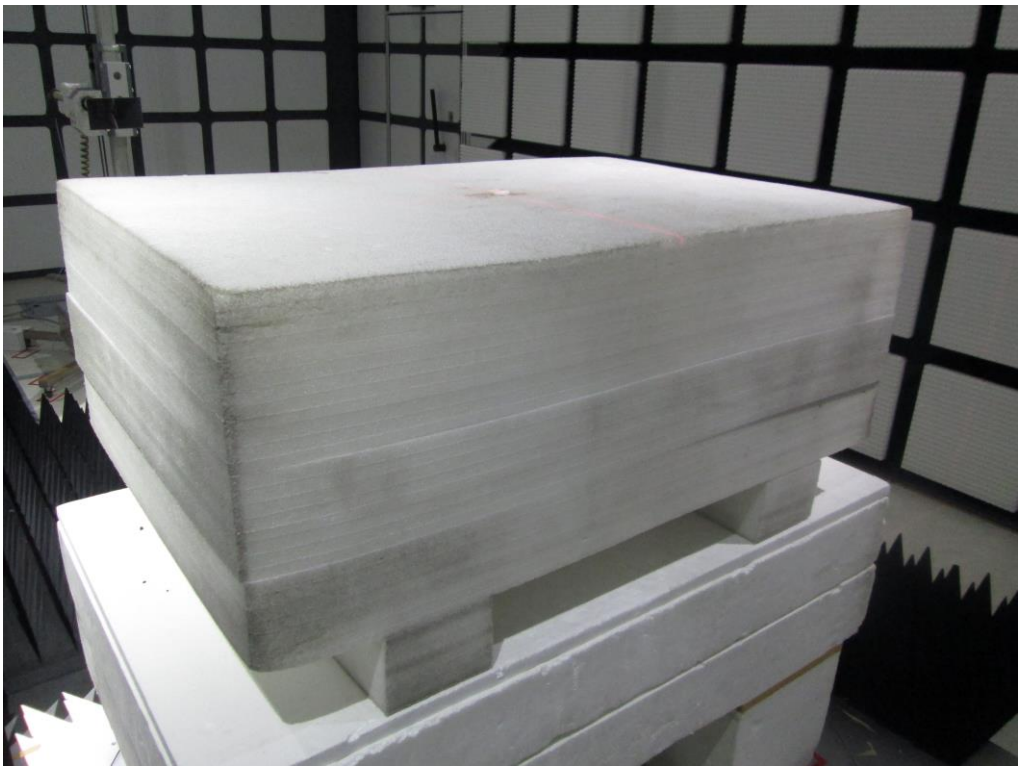


For radiated emissions above 1GHz

Front view



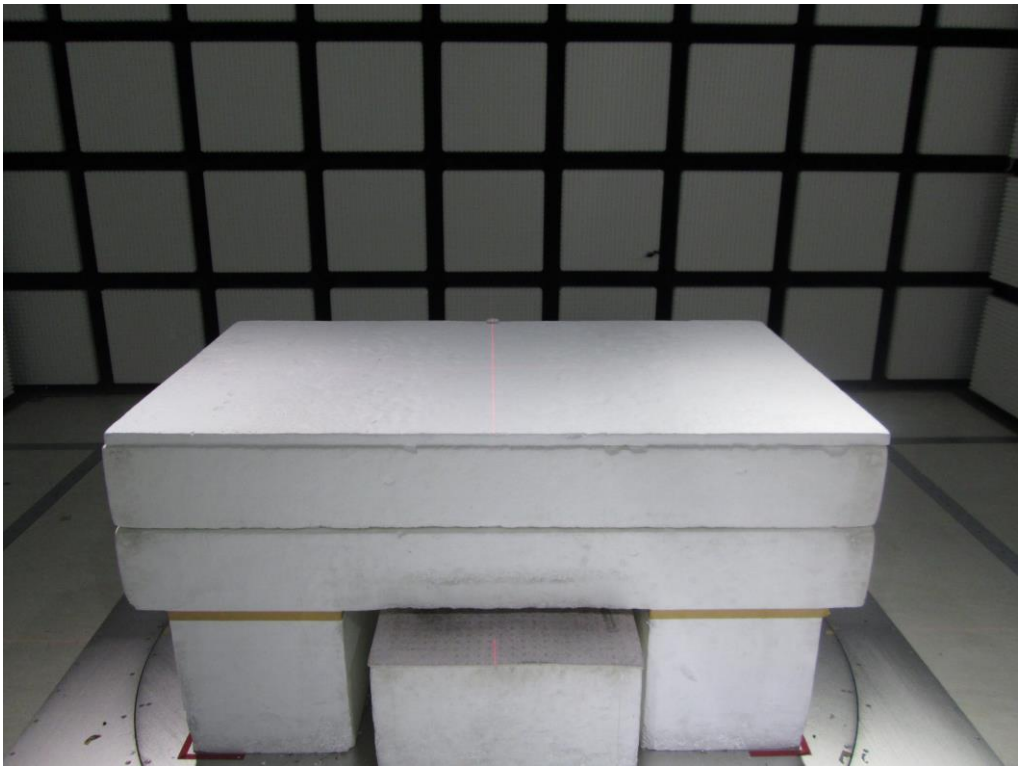
Rear view



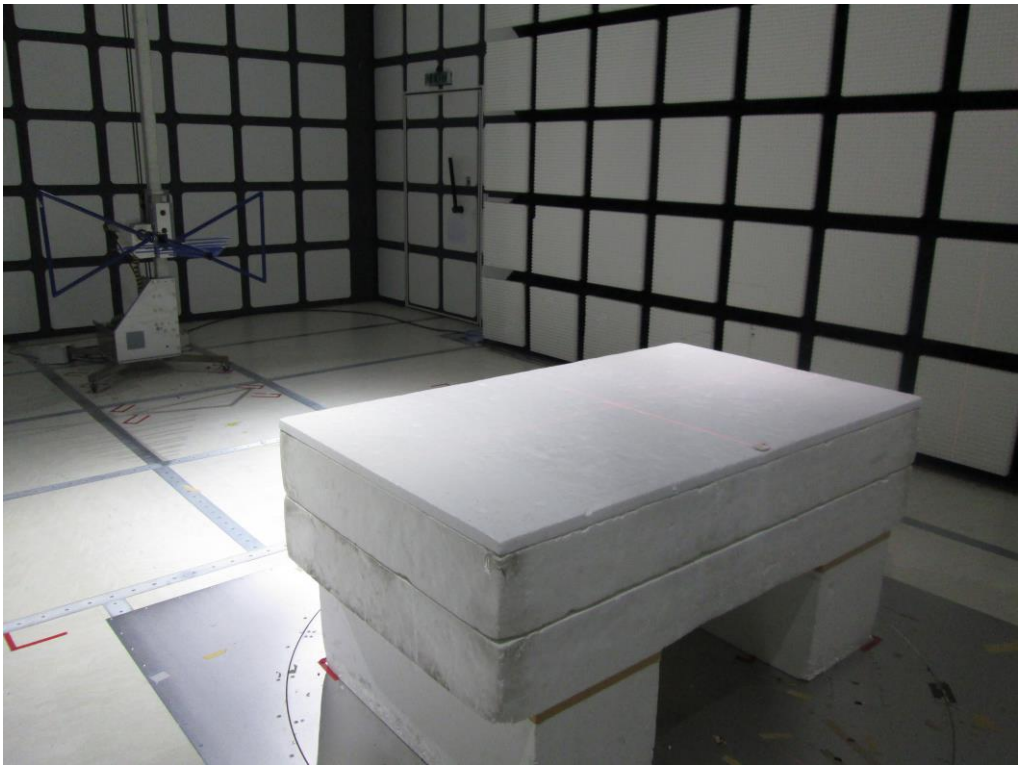
2. Photographs of Radiated Emissions Test Configuration-RX

For radiated emissions 30MHz~1GHz

Front view

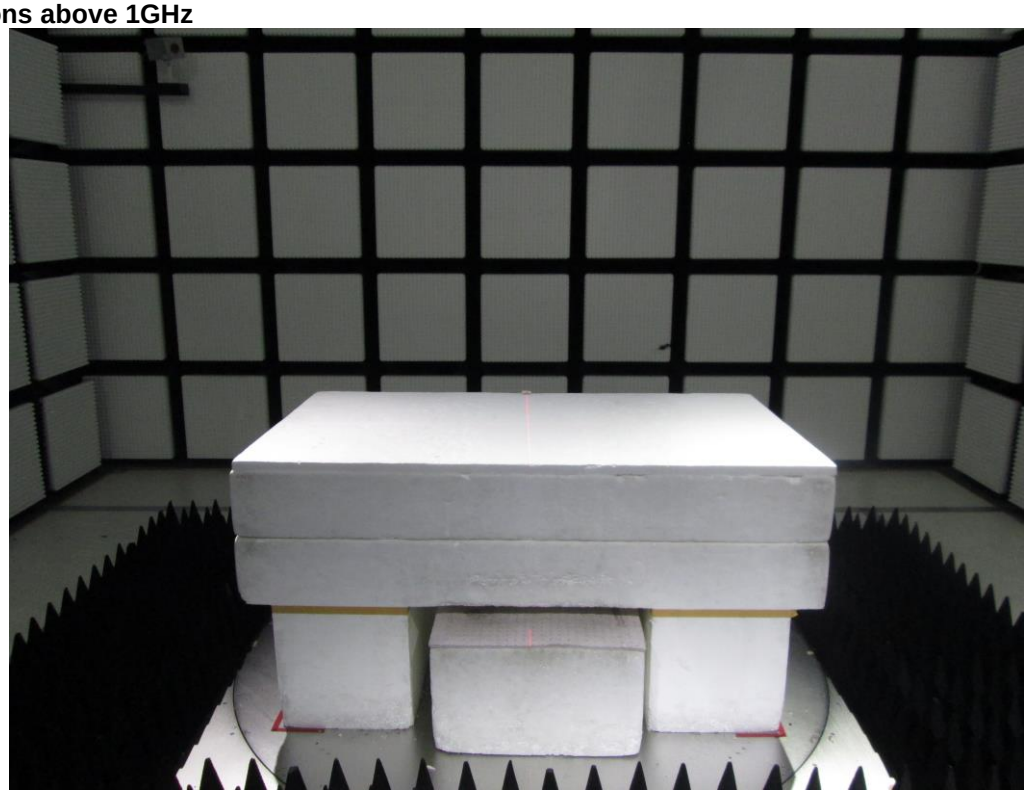


Rear view

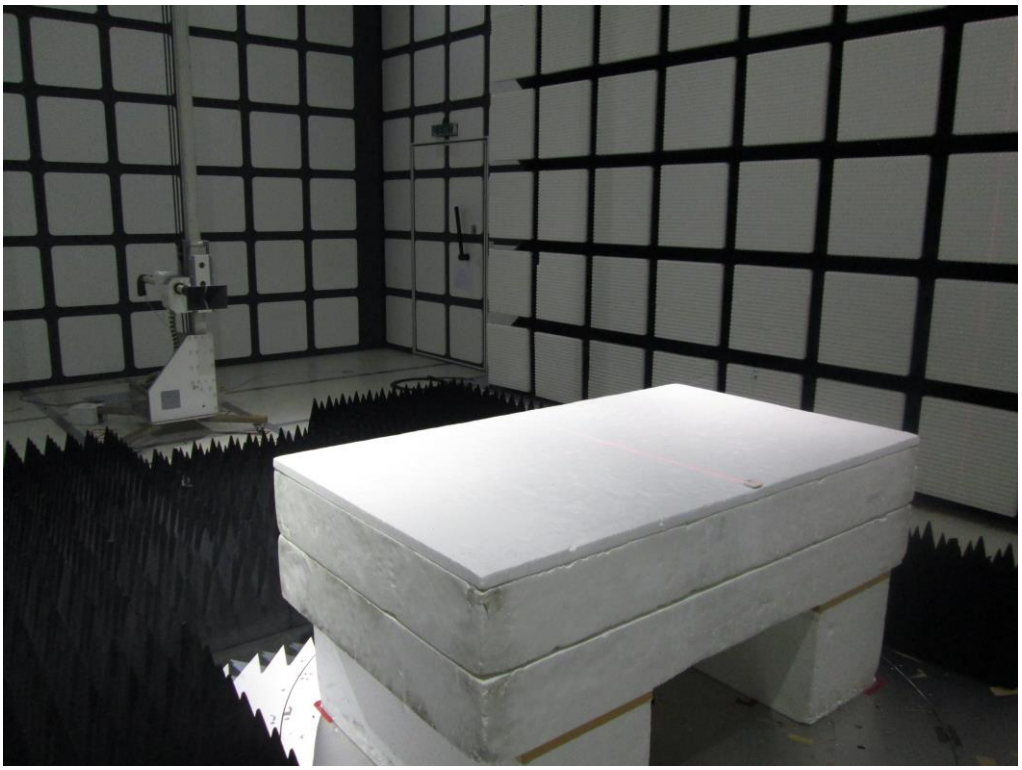


For radiated emissions above 1GHz

Front view



Rear view



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