

FCC Radio Test Report

FCC ID : 2A9LG-P5
Equipment : Cow Collar
Brand Name : Halter
Model Name : P5
Applicant : Halter USA Inc.
2101 Pearl St, Boulder, CO 80302, USA
Manufacturer : Halter USA LLC
2101 Pearl St, Boulder, CO 80302, USA
Standard : 47 CFR FCC Part 15.247

The product was received on Feb. 21, 2025, and testing was started from Feb. 26, 2025 and completed on Mar. 18, 2025. 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: Sam Tsai

SPORTON INTERNATIONAL INC. Hsinhua Laboratory

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



Table of Contents

HISTORY OF THIS TEST REPORT	3
SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Information.....	5
1.2 Testing Applied Standards	6
1.3 Testing Location Information	6
1.4 Measurement Uncertainty	6
2 TEST CONFIGURATION OF EUT.....	7
2.1 Test Channel Mode	7
2.2 The Worst Case Measurement Configuration.....	8
2.3 Accessories	9
2.4 Support Equipment.....	9
2.5 Test Setup Diagram	9
3 TRANSMITTER TEST RESULT	10
3.1 DTS Bandwidth.....	10
3.2 Maximum Conducted Output Power	11
3.3 Power Spectral Density	13
3.4 Emissions in Non-restricted Frequency Bands	14
3.5 Emissions in Restricted Frequency Bands.....	15
4 TEST EQUIPMENT AND CALIBRATION DATA	19
APPENDIX A. TEST RESULTS OF DTS BANDWIDTH	
APPENDIX B. TEST RESULTS OF MAXIMUM CONDUCTED OUTPUT POWER	
APPENDIX C. TEST RESULTS OF POWER SPECTRAL DENSITY	
APPENDIX D. TEST RESULTS OF EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS	
APPENDIX E. TEST RESULTS OF EMISSIONS IN RESTRICTED FREQUENCY BANDS	
APPENDIX F. TEST RESULTS OF RADIATED EMISSION CO-LOCATION	
APPENDIX G. TEST PHOTOS	
PHOTOGRAPHS OF EUT V01	

[illegible]

Summary of Test Result

Report Clause	Ref.Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.1.2	15.203	Antenna Requirement	PASS	-
-	15.207	AC Power-line Conducted Emissions	PASS	-
3.1	15.247(a)	DTS Bandwidth	PASS	-
3.2	15.247(b)	Maximum Conducted Output Power	PASS	-
3.3	15.247(e)	Power Spectral Density	PASS	-
3.4	15.247(d)	Emissions in Non-restricted Frequency Bands	PASS	-
3.5	15.247(d)	Emissions in Restricted Frequency Bands	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: Debby Hung

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	ST	AN5129	PCB-printed antenna	N/A	1.95

Note 1: The EUT has one antenna.

For BT function:

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

Ant. 1 (port 1) could transmit/receive.

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)	1	0	10m	10Hz (DC>=0.98)

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:

- ♦ 47 CFR FCC Part 15
- ♦ ANSI C63.10-2013

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 (TAF: 3785)	ADD: No.52, Huaya 1st Rd., Guishan Dist., Taoyuan City 333411, Taiwan (R.O.C.)			
	TEL: 886-3-327-3456		FAX: 886-3-327-0973	
Test site Designation No. TW3785 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
RF Conducted	TH07-HY	Yulin Chen	22.7~23.5°C / 51~59%	04/Mar/2025
☒ Wen 33rd.St. (TAF: 3785)	ADD: No.14-1, Ln. 19, Wen 33rd St., Guishan Dist., Taoyuan City 333010, Taiwan (R.O.C.)			
	TEL: 886-3-318-0787		FAX: 886-3-318-0287	
Test site Designation No. TW0008 with FCC.				
Test Condition	Test Site No.	Test Engineer	Test Environment	Test Date
Radiated	03CH09-HY	Lego Lin	23.1~24.3°C / 50~52%	26/Feb/2025~28/Feb/2025
Radiated	03CH09-HY	Edward Wang	20.2~23.4°C / 53~55%	18/Mar/2025

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
Bandwidth	3 MHz	Confidence levels of 95%
Maximum Conducted Output Power	2 dB	Confidence levels of 95%
Power Spectral Density	2 dB	Confidence levels of 95%
Emissions in Non-restricted Frequency Bands	0.14 dB	Confidence levels of 95%
Emissions in Restricted Frequency Bands	4.8 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	Halter NFC Diagnostics v1.0.0
------------------------------	-------------------------------

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		
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		
1	Battery Mode		
Operating Mode > 1GHz	CTX		
Orthogonal Planes of EUT	X Plane	Y Plane	Z Plane
			
Worst Planes of EUT	V		

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Test Condition	Radiated measurement
Operating Mode	CTX
1	Bluetooth + LoRa
Refer to Sporton Test Report No.: Appendix F for Radiated Emission Co-location.	

2.3 Accessories

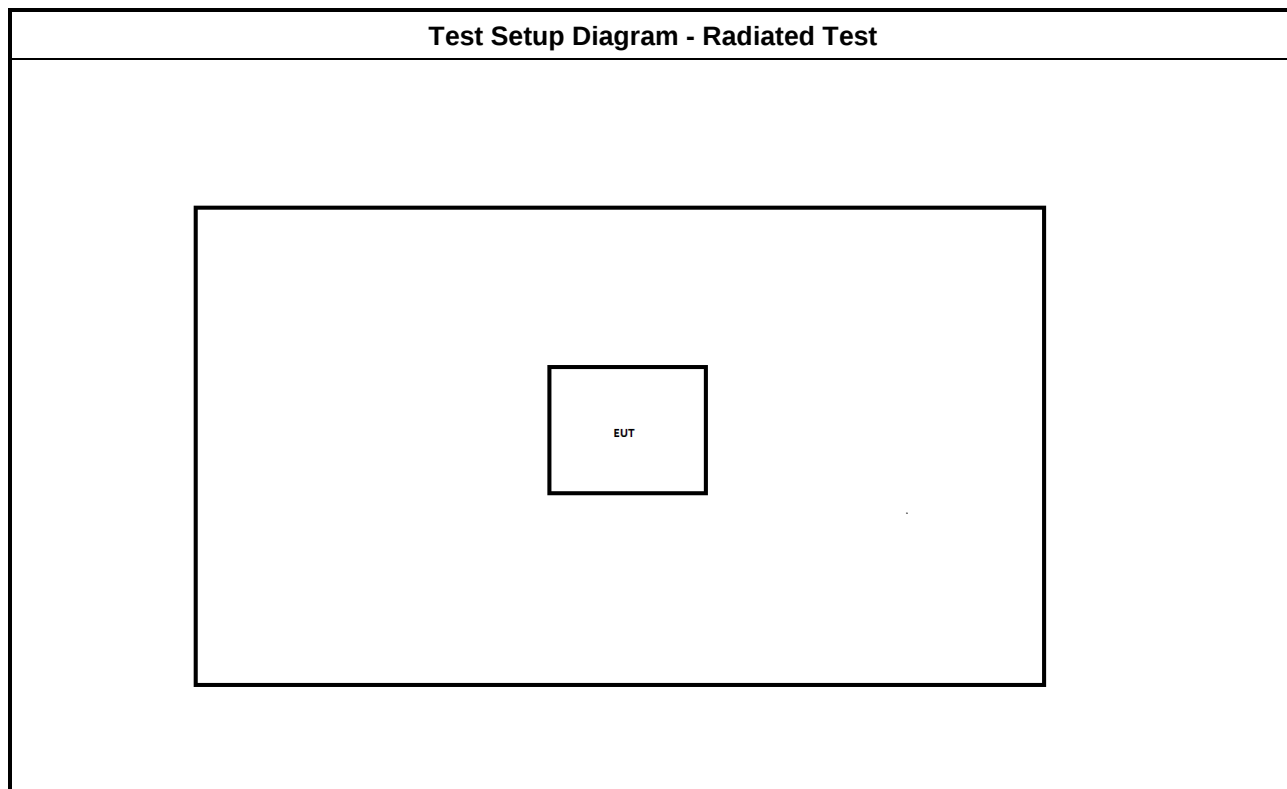
Accessories				
Battery	Brand Name	Sunland Power	Model Name	GSP104060
	Manufacturer	Guangzhou Great Power Energy & Technology Co., Ltd.		
	Power Rating	3.7 Vdc, 11.1 WAh	Type	Li-ion, Yes

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	Phone	ASUS	Z01RD	-	Provided by Customer

2.5 Test Setup Diagram



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 $\geq$ 500 kHz.

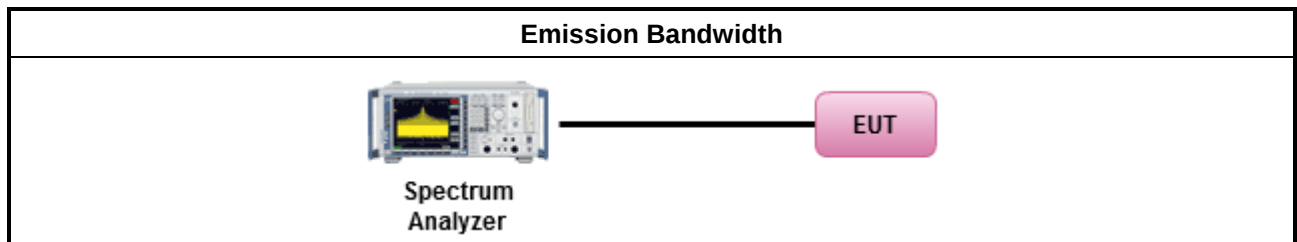
3.1.2 Measuring Instruments

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



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): $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX}])$ dBm
	Smart antenna system (SAS)
	- Single beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Overlap beam: $P_{eirp} \leq \text{MAX}(36, P_{Out} + G_{TX})$ dBm
	- Aggregate power on all beams: $P_{eirp} \leq \text{MAX}(36, [P_{Out} + G_{TX} + 8])$ 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.	

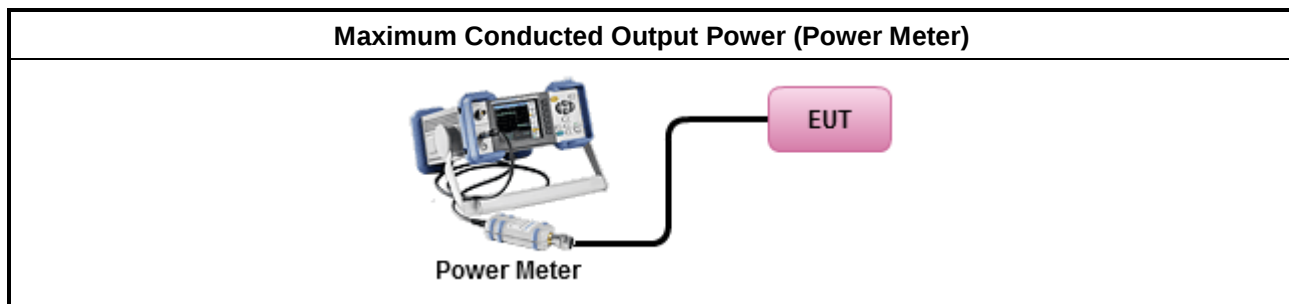
3.2.2 Measuring Instruments

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: $P_{total} = P_1 + P_2 + \dots + P_n$ (calculated in linear unit [mW] and transfer to log unit [dBm]) $EIRP_{total} = P_{total} + DG$	

3.2.4 Test Setup



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

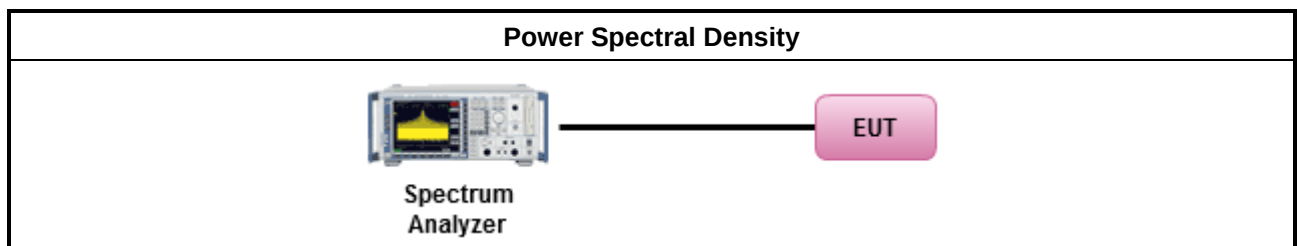
3.3.2 Measuring Instruments

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



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.	

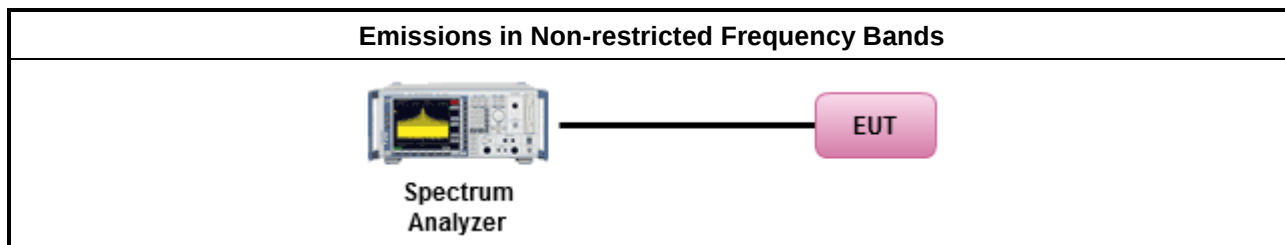
3.4.2 Measuring Instruments

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



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 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.

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

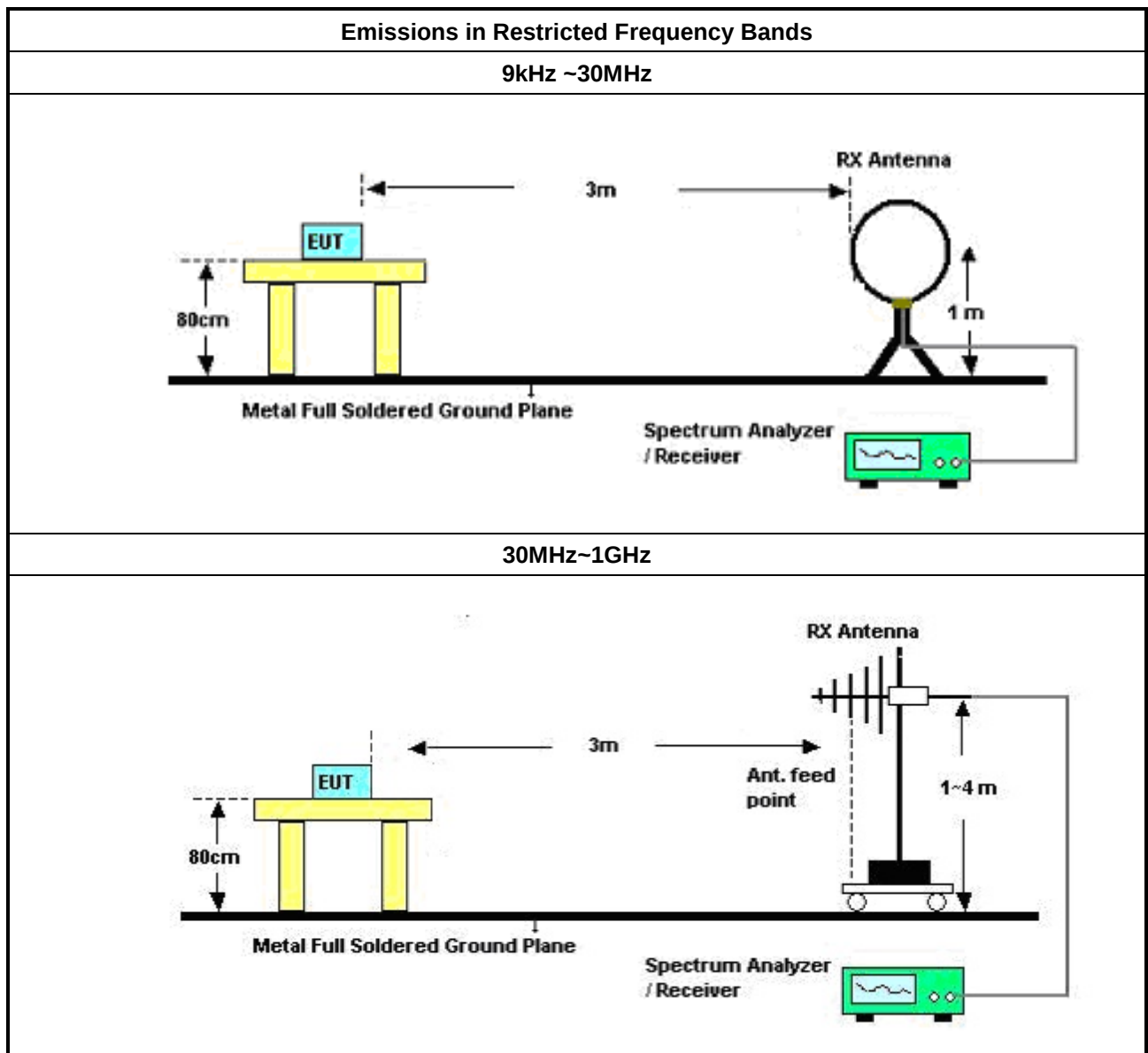
Test Method	
▪	The average emission levels shall be measured in [duty cycle $\geq$ 98 or duty factor].
	Refer as ANSI C63.10, clause 6.10.3 band-edge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.
▪	For the transmitter unwanted 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 $f \geq 1$ GHz for peak measurement. For average measurement, refer as 1.1.4.
	KDB 414788 Open-Field Test Sites and Chamber Correlation Justification.
▪	Based on FCC 15.31(f)(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.

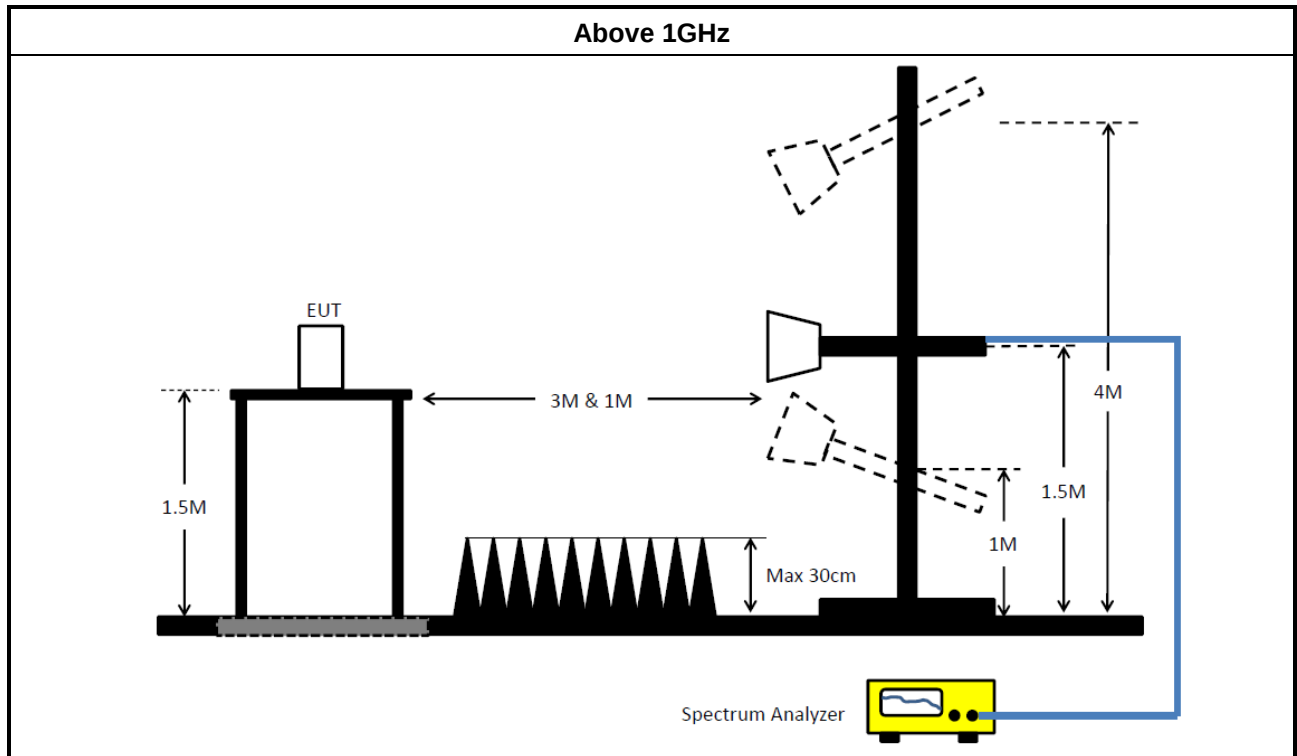
3.5.4 Measurement Results Calculation

The measured Level is calculated using:

Corrected Reading: Raw(Read Level) + AF(Antenna Factor) + CL(Cable Loss) - PA(Preamplifier Factor)

3.5.5 Test Setup





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

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	FSV3044	101439	10Hz~44GHz	23/Dec/2024	22/Dec/2025
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	16/Oct/2024	15/Oct/2025
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	18/Dec/2024	17/Dec/2025
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	18/Dec/2024	17/Dec/2025
SENSE-15247_FS	Sporton	V5.11.23	N/A	N/A	N/A	N/A

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	08/Mar/2024	07/Mar/2025
Site V.S.W.R	TDK	SAC-3M	03CH09-HY	1GHz~18GHz 3m	07/Mar/2024	06/Mar/2025
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	04/Oct/2024	03/Oct/2025
Amplifier	EMC	EMC9135	980232	9kHz~1GHz	08/Apr/2024	07/Apr/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1531	1GHz ~ 18GHz	20/Dec/2024	19/Dec/2025
Microwave Preamplifier	Agilent	8449B	3008A02096	1GHz~26.5GHz	19/Jul/2024	18/Jul/2025
Bilog Antenna & 5dB Attenuator	TESEQ & MTJ	CBL6111D&MT J6102-05	35418 & 3	30MHz~1GHz	26/Aug/2024	25/Aug/2025
RF Cable-R03m	Jye Bao	RG142	03CH09-cable-01	9kHz~1GHz	19/Feb/2025	18/Feb/2026
RF CABLE 5m+3m+1m	HUBER+SUHNE R	SUCOFLEX104	03CH09-cable-02	1GHz~40GHz	07/Oct/2024	06/Oct/2025
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
EMI Test Receiver	R&S	ESR3	102052	9kHz~3.6GHz	03/May/2024	02/May/2025
SENSE-15247_FS	Sporton	V5.11.20	NA	NA	NA	NA



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)	726.25k	1.094M	1M09F1D	680k	1.089M

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

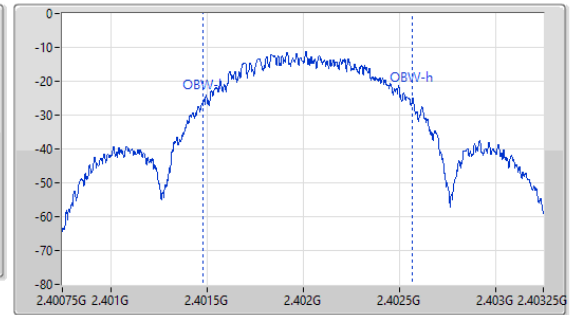
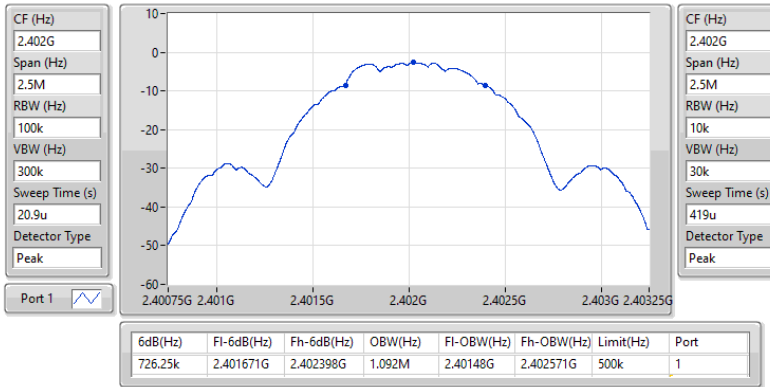
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	500k	726.25k	1.092M
2440MHz	Pass	500k	680k	1.094M
2480MHz	Pass	500k	686.25k	1.089M

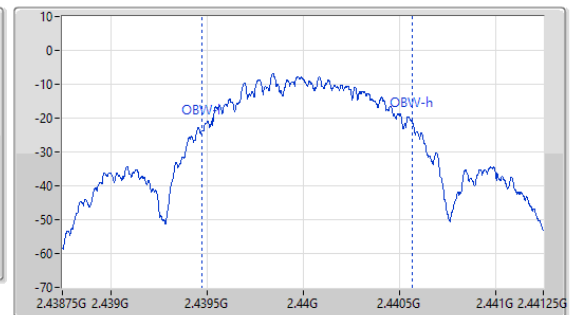
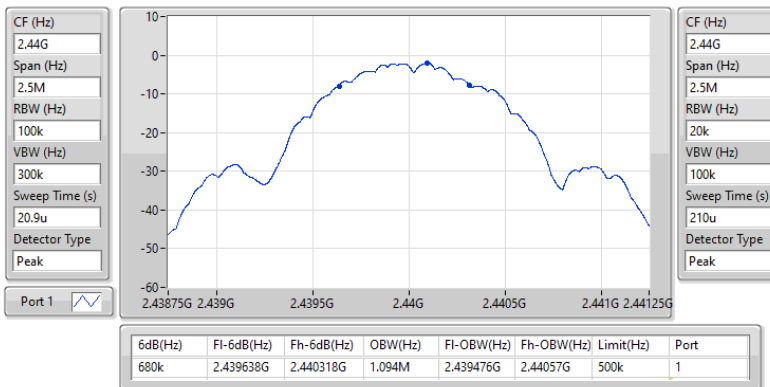
Port X-N dB = Port X 6dB down bandwidth;
Port X-OBW = Port X 99% occupied bandwidth

2.4-2.4835GHz_BT-LE(1Mbps)
EBW-DTS
2402MHz

04/03/2025


2.4-2.4835GHz_BT-LE(1Mbps)
EBW-DTS
2440MHz

04/03/2025

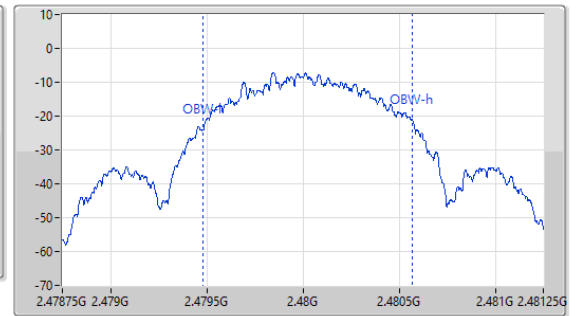
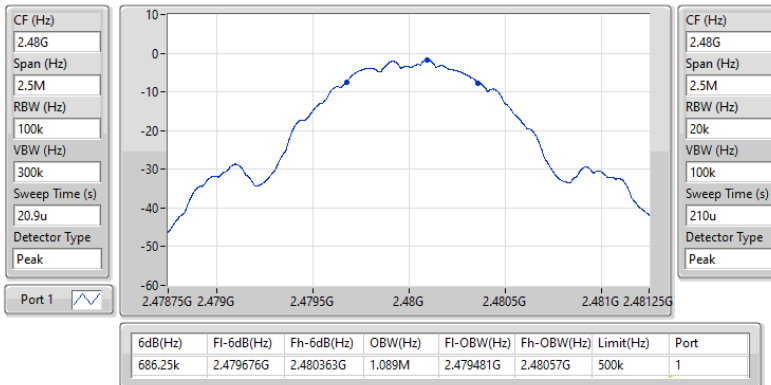


2.4-2.4835GHz_BT-LE(1Mbps)

EBW-DTS

2480MHz

04/03/2025





Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
BT-LE(1Mbps)	0.06	0.00101



Result

Mode	Result	DG (dBi)	Total Power (dBm)	Power Limit (dBm)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.95	-0.74	30.00
2440MHz	Pass	1.95	-0.10	30.00
2480MHz	Pass	1.95	0.06	30.00

DG = Directional Gain; Port X = Port X output power;
Inf = There's no restriction for the limit.



Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
BT-LE(1Mbps)	-17.50

RBW = 3kHz;



Result

Mode	Result	DG (dBi)	PD (dBm/RBW)	PD Limit (dBm/RBW)
BT-LE(1Mbps)	-	-	-	-
2402MHz	Pass	1.95	-18.32	8.00
2440MHz	Pass	1.95	-17.74	8.00
2480MHz	Pass	1.95	-17.50	8.00

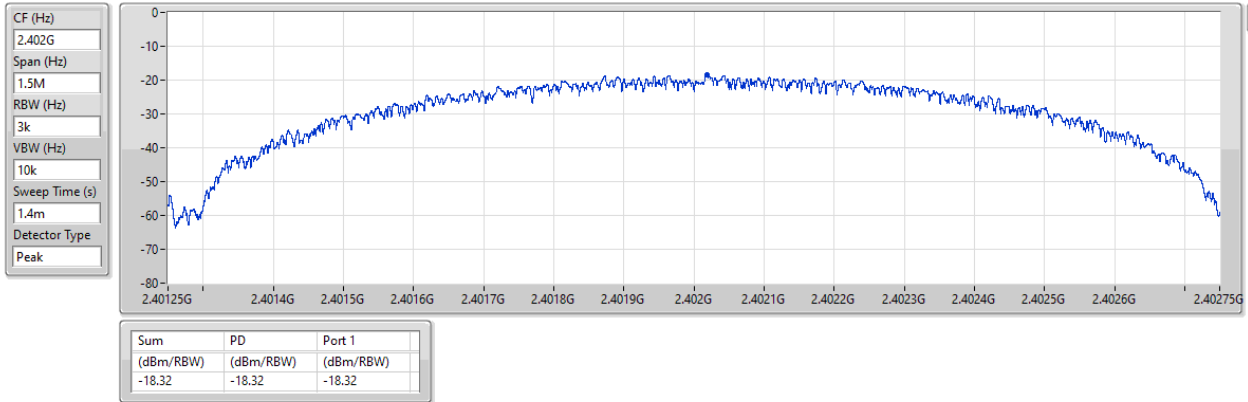
DG = Directional Gain; RBW = 3kHz;
PD = trace bin-by-bin of each transmits port summing can be performed maximum power density; Port X = Port X Power Density;
Inf = There's no restriction for the limit.

2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2402MHz

04/03/2025

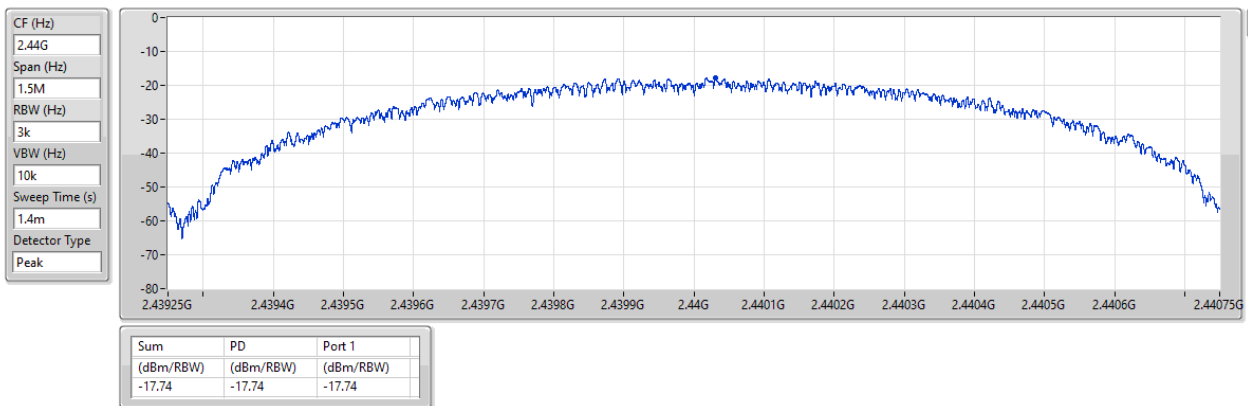


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2440MHz

04/03/2025

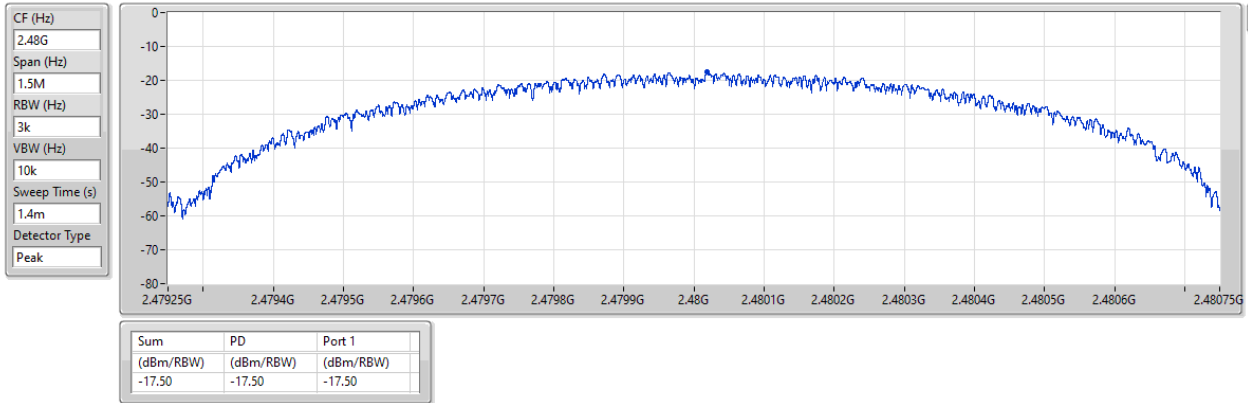


2.4-2.4835GHz_BT-LE(1Mbps)

PSD

2480MHz

04/03/2025





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	2.48033G	-1.09	-31.09	2.0698G	-54.11	2.39996G	-50.42	2.4G	-49.42	2.50338G	-53.01	21.92923G	-41.74	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	2.48033G	-1.09	-31.09	2.0698G	-54.11	2.39996G	-50.42	2.4G	-49.42	2.50338G	-53.01	21.92923G	-41.74	1
2440MHz	Pass	2.48033G	-1.09	-31.09	2.16733G	-55.53	2.3998G	-52.89	2.4G	-58.18	2.50334G	-52.47	22.00515G	-42.43	1
2480MHz	Pass	2.48033G	-1.09	-31.09	2.04748G	-55.15	2.39016G	-53.00	2.4G	-58.27	2.50282G	-53.85	21.99672G	-42.16	1

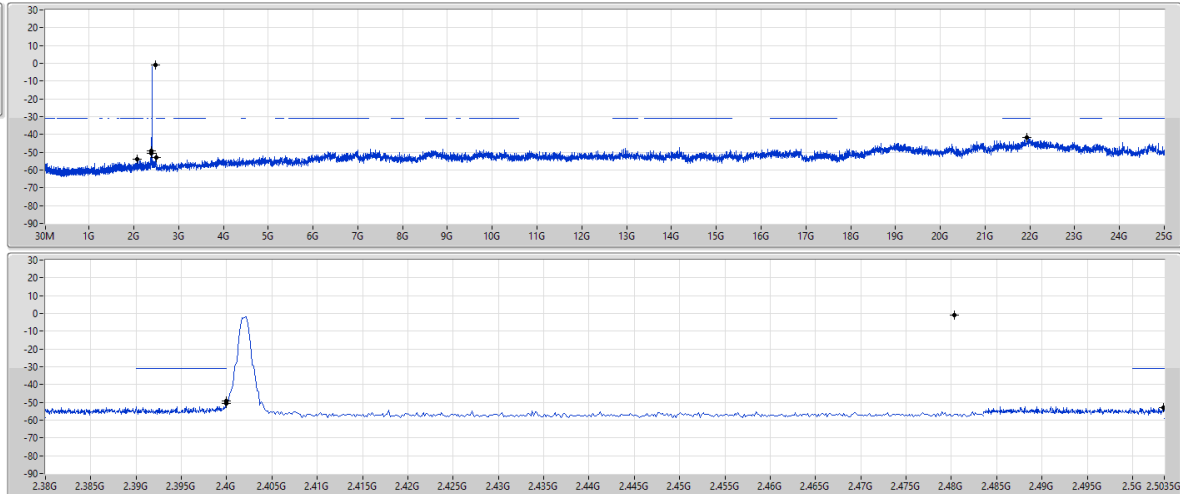
2.4-2.4835GHz_BT-LE(1Mbps)

CSEnDB-DTS

2402MHz

04/03/2025

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



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
2.48033G	-1.09	-31.09	2.0698G	-54.11	2.39996G	-50.42	2.4G	-49.42	2.50338G	-53.01	21.92923G	-41.74	1

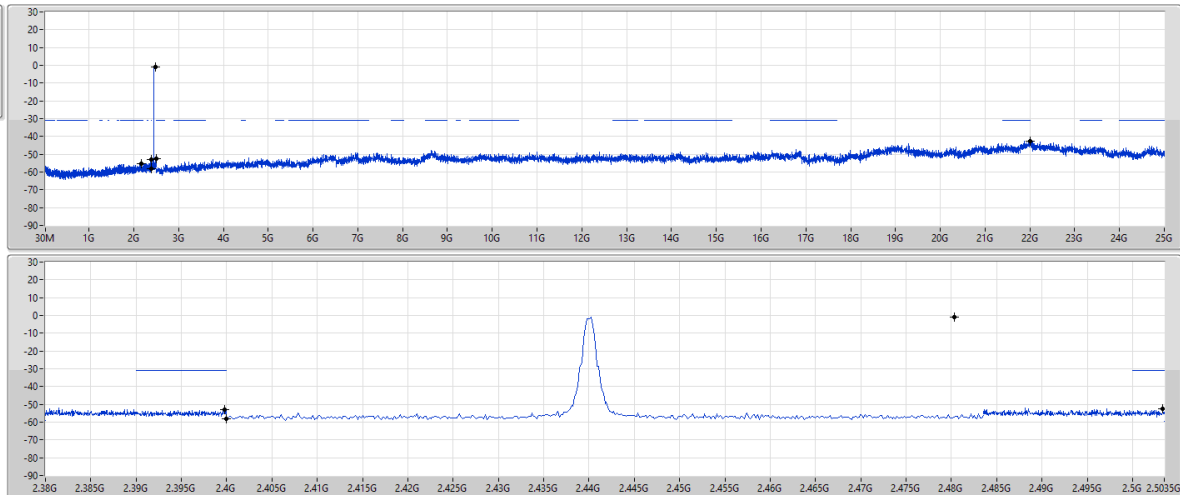
2.4-2.4835GHz_BT-LE(1Mbps)

CSEnDB-DTS

2440MHz

04/03/2025

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak



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
2.48033G	-1.09	-31.09	2.16733G	-55.53	2.3998G	-52.89	2.4G	-58.18	2.50334G	-52.47	22.00515G	-42.43	1

2.4-2.4835GHz_BT-LE(1Mbps)

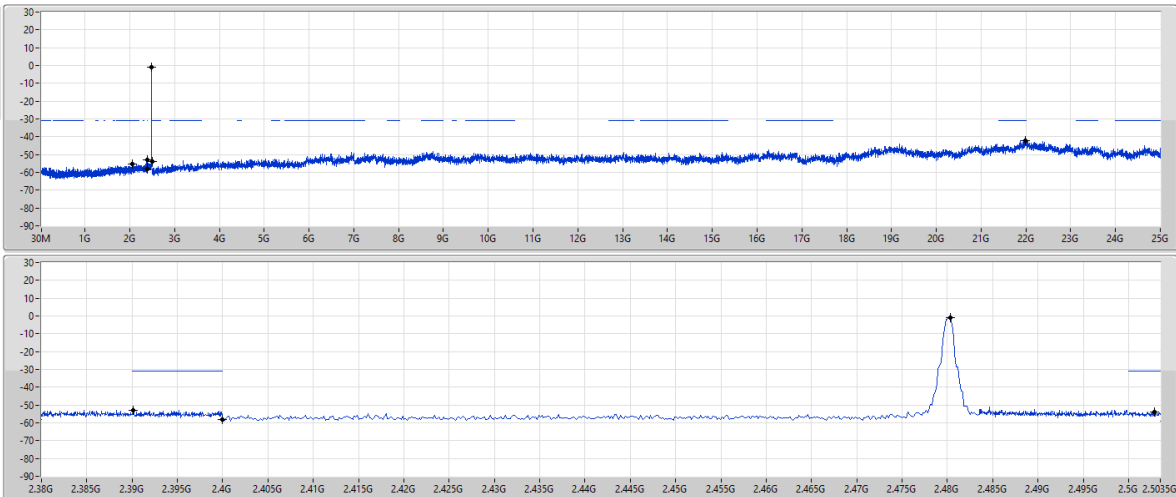
CSEndB-DTS

2480MHz

04/03/2025

RBW (Hz)
100k
VBW (Hz)
300k
Detector
Peak

Port 1



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
2.48033G	-1.09	-31.09	2.04748G	-55.15	2.39016G	-53.00	2.4G	-58.27	2.50282G	-53.85	21.99672G	-42.16	1



Summary

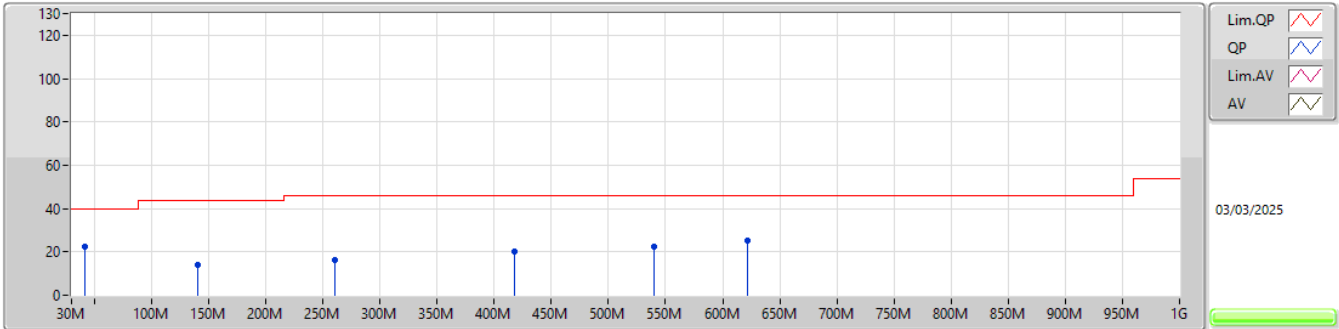
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	PK	41.64M	22.50	40.00	-17.50	3	Vertical	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	41.64M	22.50	40.00	-17.50	3	Vertical	360	1.00
2440MHz	Pass	PK	140.58M	13.97	43.50	-29.53	3	Vertical	360	1.00
2440MHz	Pass	PK	260.86M	16.10	46.00	-29.90	3	Vertical	360	1.00
2440MHz	Pass	PK	418M	20.31	46.00	-25.69	3	Vertical	360	1.00
2440MHz	Pass	PK	540.22M	22.33	46.00	-23.67	3	Vertical	360	1.00
2440MHz	Pass	PK	621.7M	25.11	46.00	-20.89	3	Vertical	360	1.00
2440MHz	Pass	PK	107.6M	13.26	43.50	-30.24	3	Horizontal	0	1.00
2440MHz	Pass	PK	163.86M	13.98	43.50	-29.52	3	Horizontal	0	1.00
2440MHz	Pass	PK	260.86M	16.15	46.00	-29.85	3	Horizontal	0	1.00
2440MHz	Pass	PK	388.9M	19.51	46.00	-26.49	3	Horizontal	0	1.00
2440MHz	Pass	PK	454.86M	21.15	46.00	-24.85	3	Horizontal	0	1.00
2440MHz	Pass	PK	586.78M	25.80	46.00	-20.20	3	Horizontal	0	1.00

2.4-2.4835GHz_BT-LE(1Mbps)

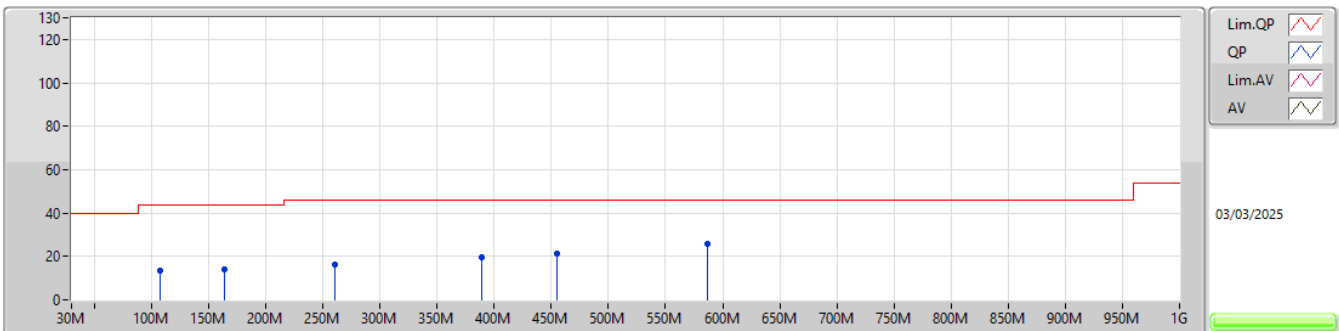
2440MHz_Battery



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	41.64M	22.50	40.00	-17.50	41.54	3	Vertical	360	1.00	-	17.63	0.72	37.39
PK	140.58M	13.97	43.50	-29.53	32.95	3	Vertical	360	1.00	-	16.45	1.36	36.79
PK	260.86M	16.10	46.00	-29.90	31.82	3	Vertical	360	1.00	-	19.08	1.90	36.70
PK	418M	20.31	46.00	-25.69	33.50	3	Vertical	360	1.00	-	21.37	2.47	37.03
PK	540.22M	22.33	46.00	-23.67	33.75	3	Vertical	360	1.00	-	23.13	2.88	37.43
PK	621.7M	25.11	46.00	-20.89	34.43	3	Vertical	360	1.00	-	25.09	3.13	37.54

2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_Battery



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB)	CL (dB)	PA (dB)
PK	107.6M	13.26	43.50	-30.24	33.30	3	Horizontal	0	1.00	-	15.80	1.19	37.03
PK	163.86M	13.98	43.50	-29.52	34.03	3	Horizontal	0	1.00	-	15.22	1.46	36.73
PK	260.86M	16.15	46.00	-29.85	31.87	3	Horizontal	0	1.00	-	19.08	1.90	36.70
PK	388.9M	19.51	46.00	-26.49	33.67	3	Horizontal	0	1.00	-	20.44	2.38	36.98
PK	454.86M	21.15	46.00	-24.85	33.53	3	Horizontal	0	1.00	-	22.13	2.59	37.10
PK	586.78M	25.80	46.00	-20.20	35.53	3	Horizontal	0	1.00	-	24.74	3.03	37.50



Summary

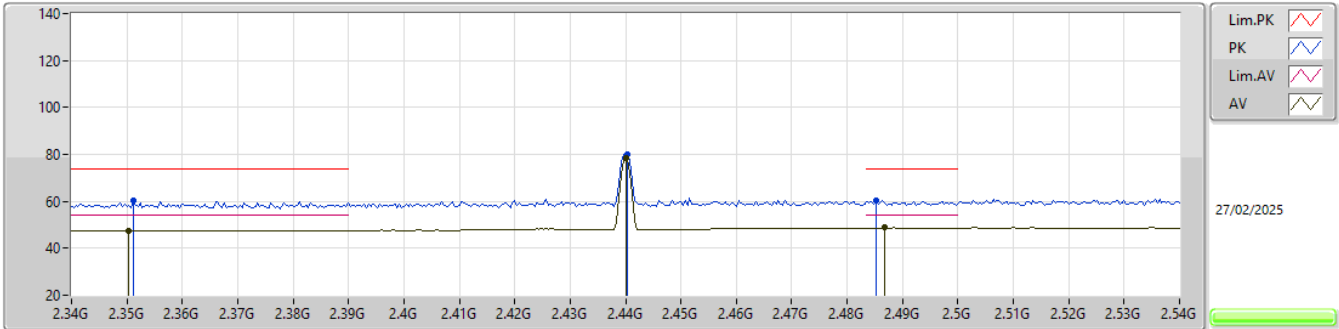
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
BT-LE(1Mbps)	Pass	AV	2.4868G	48.76	54.00	-5.24	3	Vertical	226	1.17

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
BT-LE(1Mbps)	-	-	-	-	-	-	-	-	-	-
2402MHz	Pass	AV	2.3898G	47.47	54.00	-6.53	3	Vertical	144	1.50
2402MHz	Pass	AV	2.402G	75.65	Inf	-Inf	3	Vertical	144	1.50
2402MHz	Pass	PK	2.384G	59.31	74.00	-14.69	3	Vertical	144	1.50
2402MHz	Pass	PK	2.4022G	77.39	Inf	-Inf	3	Vertical	144	1.50
2402MHz	Pass	AV	2.3892G	47.45	54.00	-6.55	3	Horizontal	115	1.14
2402MHz	Pass	AV	2.402G	77.60	Inf	-Inf	3	Horizontal	115	1.14
2402MHz	Pass	PK	2.358G	60.44	74.00	-13.56	3	Horizontal	115	1.14
2402MHz	Pass	PK	2.4018G	79.16	Inf	-Inf	3	Horizontal	115	1.14
2402MHz	Pass	AV	4.80629G	34.41	54.00	-19.59	3	Vertical	307	2.11
2402MHz	Pass	PK	4.80202G	46.94	74.00	-27.06	3	Vertical	307	2.11
2402MHz	Pass	AV	4.80649G	34.41	54.00	-19.59	3	Horizontal	66	2.63
2402MHz	Pass	PK	4.80486G	46.88	74.00	-27.12	3	Horizontal	66	2.63
2440MHz	Pass	AV	2.3504G	47.67	54.00	-6.33	3	Vertical	226	1.17
2440MHz	Pass	AV	2.44G	78.48	Inf	-Inf	3	Vertical	226	1.17
2440MHz	Pass	AV	2.4868G	48.76	54.00	-5.24	3	Vertical	226	1.17
2440MHz	Pass	PK	2.3512G	60.37	74.00	-13.63	3	Vertical	226	1.17
2440MHz	Pass	PK	2.4404G	80.01	Inf	-Inf	3	Vertical	226	1.17
2440MHz	Pass	PK	2.4852G	60.28	74.00	-13.72	3	Vertical	226	1.17
2440MHz	Pass	AV	2.39G	47.79	54.00	-6.21	3	Horizontal	290	1.50
2440MHz	Pass	AV	2.44G	79.38	Inf	-Inf	3	Horizontal	290	1.50
2440MHz	Pass	AV	2.4996G	48.57	54.00	-5.43	3	Horizontal	290	1.50
2440MHz	Pass	PK	2.38G	59.22	74.00	-14.78	3	Horizontal	290	1.50
2440MHz	Pass	PK	2.4404G	80.84	Inf	-Inf	3	Horizontal	290	1.50
2440MHz	Pass	PK	2.484G	61.00	74.00	-13.00	3	Horizontal	290	1.50
2440MHz	Pass	AV	4.87973G	36.46	54.00	-17.54	3	Vertical	4	1.00
2440MHz	Pass	PK	4.87954G	48.08	74.00	-25.92	3	Vertical	4	1.00
2440MHz	Pass	AV	4.88008G	36.51	54.00	-17.49	3	Horizontal	323	1.18
2440MHz	Pass	PK	4.87961G	49.01	74.00	-24.99	3	Horizontal	323	1.18
2480MHz	Pass	AV	2.48G	77.41	Inf	-Inf	3	Vertical	226	1.00
2480MHz	Pass	AV	2.484G	48.74	54.00	-5.26	3	Vertical	226	1.00
2480MHz	Pass	PK	2.4802G	79.05	Inf	-Inf	3	Vertical	226	1.00
2480MHz	Pass	PK	2.4924G	60.52	74.00	-13.48	3	Vertical	226	1.00
2480MHz	Pass	AV	2.48G	77.99	Inf	-Inf	3	Horizontal	291	1.50
2480MHz	Pass	AV	2.4996G	48.57	54.00	-5.43	3	Horizontal	291	1.50
2480MHz	Pass	PK	2.4802G	79.52	Inf	-Inf	3	Horizontal	291	1.50
2480MHz	Pass	PK	2.4988G	61.22	74.00	-12.78	3	Horizontal	291	1.50
2480MHz	Pass	AV	4.96014G	35.42	54.00	-18.58	3	Vertical	275	1.49
2480MHz	Pass	PK	4.95904G	48.08	74.00	-25.92	3	Vertical	275	1.49
2480MHz	Pass	AV	4.96065G	35.42	54.00	-18.58	3	Horizontal	242	2.85
2480MHz	Pass	PK	4.95854G	47.62	74.00	-26.38	3	Horizontal	242	2.85

2.4-2.4835GHz_BT-LE(1Mbps)

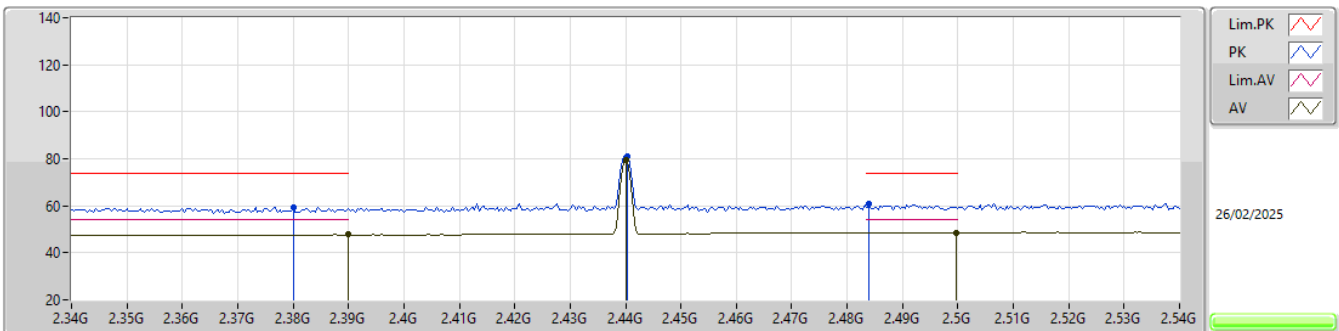
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.3504G	47.67	54.00	-6.33	33.02	3	Vertical	226	1.17	14.65	27.30	5.72	-
AV	2.44G	78.48	Inf	-Inf	33.31	3	Vertical	226	1.17	45.17	27.50	5.81	-
AV	2.4868G	48.76	54.00	-5.24	33.72	3	Vertical	226	1.17	15.04	27.87	5.85	-
PK	2.3512G	60.37	74.00	-13.63	33.02	3	Vertical	226	1.17	27.35	27.30	5.72	-
PK	2.4404G	80.01	Inf	-Inf	33.31	3	Vertical	226	1.17	46.70	27.50	5.81	-
PK	2.4852G	60.28	74.00	-13.72	33.70	3	Vertical	226	1.17	26.58	27.85	5.85	-

2.4-2.4835GHz_BT-LE(1Mbps)

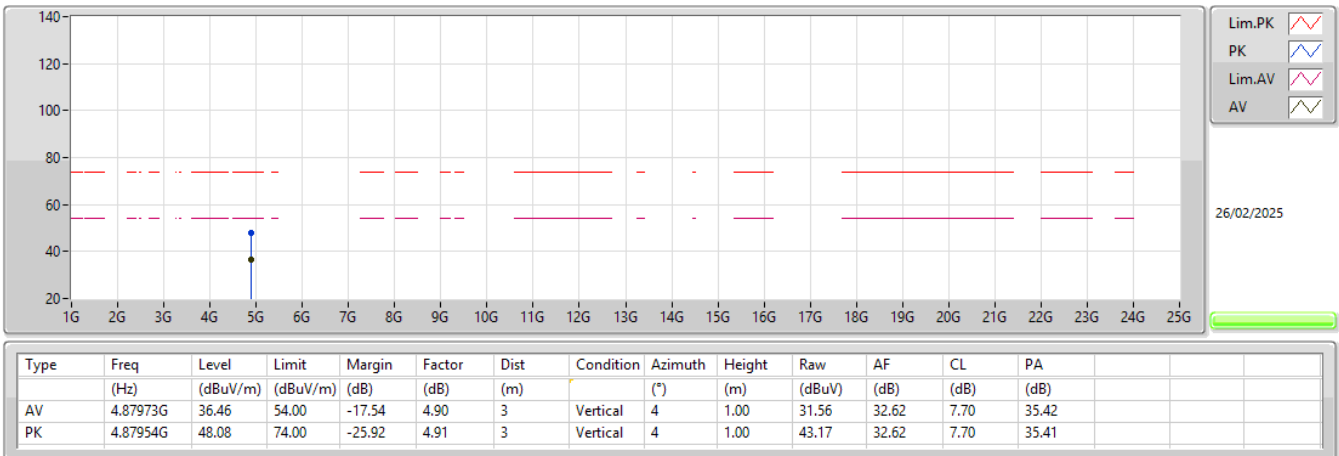
2440MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.39G	47.79	54.00	-6.21	33.17	3	Horizontal	290	1.50	14.62	27.40	5.77	-
AV	2.44G	79.38	Inf	-Inf	33.31	3	Horizontal	290	1.50	46.07	27.50	5.81	-
AV	2.4996G	48.57	54.00	-5.43	33.86	3	Horizontal	290	1.50	14.71	28.00	5.86	-
PK	2.38G	59.22	74.00	-14.78	32.96	3	Horizontal	290	1.50	26.26	27.20	5.76	-
PK	2.4404G	80.84	Inf	-Inf	33.31	3	Horizontal	290	1.50	47.53	27.50	5.81	-
PK	2.484G	61.00	74.00	-13.00	33.69	3	Horizontal	290	1.50	27.31	27.84	5.85	-

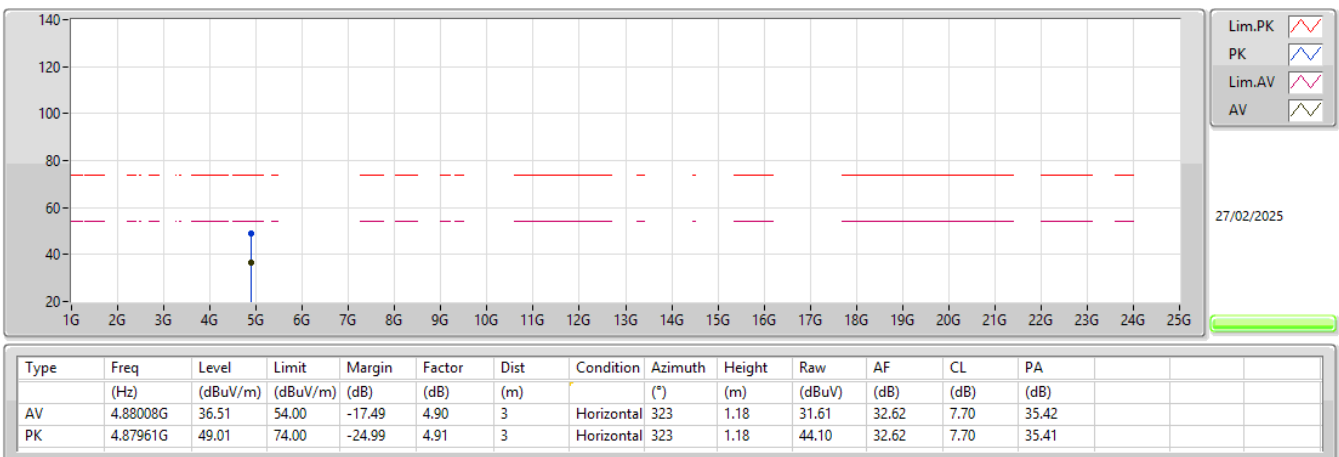
2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX



2.4-2.4835GHz_BT-LE(1Mbps)

2440MHz_TX





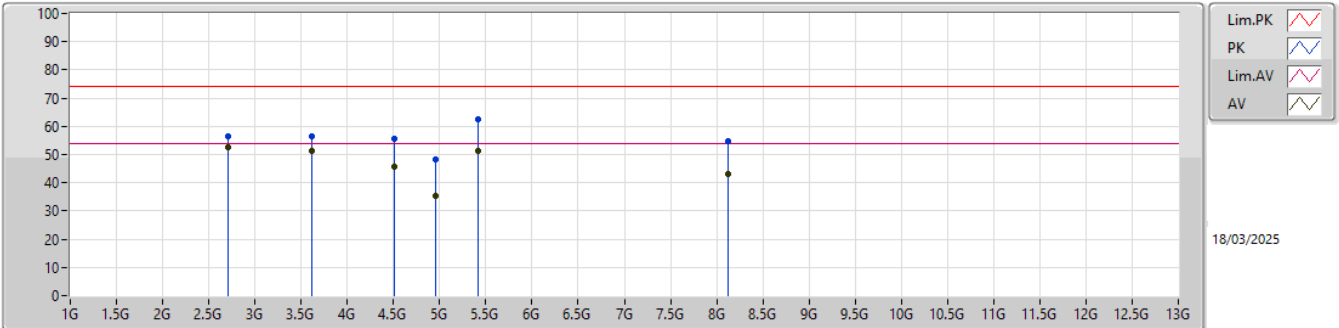
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	2.709G	52.67	54.00	-1.33	Vertical

Result

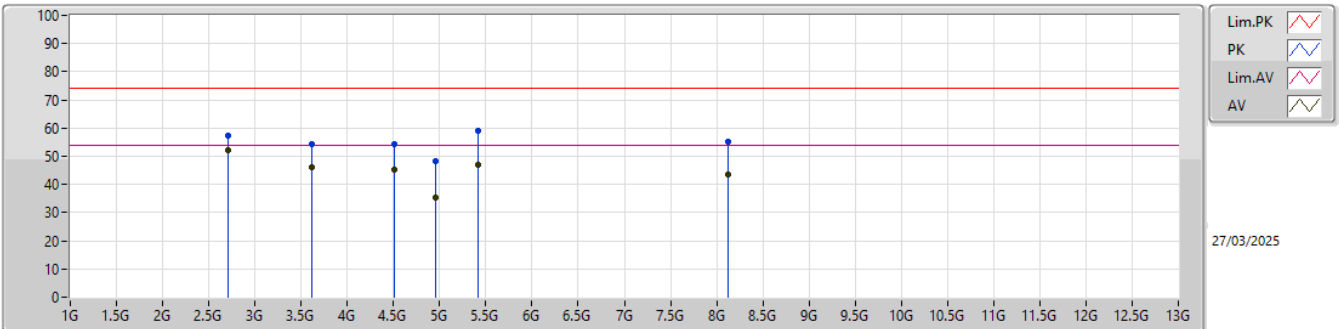
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	2.709G	52.67	54.00	-1.33	3	Vertical	156	1.51
Mode 1	Pass	AV	3.612G	51.36	54.00	-2.64	3	Vertical	312	1.54
Mode 1	Pass	AV	4.51489G	45.55	54.00	-8.45	3	Vertical	261	2.31
Mode 1	Pass	AV	4.96014G	35.42	54.00	-18.58	3	Vertical	275	1.44
Mode 1	Pass	AV	5.41843G	51.11	54.00	-2.89	3	Vertical	267	1.18
Mode 1	Pass	AV	8.12731G	43.22	54.00	-10.78	3	Vertical	114	2.12
Mode 1	Pass	PK	2.70965G	56.46	74.00	-17.54	3	Vertical	156	1.51
Mode 1	Pass	PK	3.6125G	56.59	74.00	-17.41	3	Vertical	312	1.54
Mode 1	Pass	PK	4.5142G	55.54	74.00	-18.46	3	Vertical	261	2.31
Mode 1	Pass	PK	4.95904G	48.09	74.00	-25.91	3	Vertical	275	1.44
Mode 1	Pass	PK	5.41933G	62.38	74.00	-11.62	3	Vertical	267	1.18
Mode 1	Pass	PK	8.12684G	54.71	74.00	-19.29	3	Vertical	114	2.12
Mode 1	Pass	AV	2.70898G	52.01	54.00	-1.99	3	Horizontal	42	1.51
Mode 1	Pass	AV	3.61211G	46.21	54.00	-7.79	3	Horizontal	281	1.01
Mode 1	Pass	AV	4.51479G	45.11	54.00	-8.89	3	Horizontal	274	1.52
Mode 1	Pass	AV	4.96065G	35.14	54.00	-18.86	3	Horizontal	242	2.81
Mode 1	Pass	AV	5.41852G	47.14	54.00	-6.86	3	Horizontal	198	2.24
Mode 1	Pass	AV	8.12762G	43.39	54.00	-10.61	3	Horizontal	15	1.18
Mode 1	Pass	PK	2.7084G	57.44	74.00	-16.56	3	Horizontal	42	1.51
Mode 1	Pass	PK	3.61151G	54.12	74.00	-19.88	3	Horizontal	281	1.01
Mode 1	Pass	PK	4.51521G	54.22	74.00	-19.78	3	Horizontal	274	1.52
Mode 1	Pass	PK	4.95854G	48.11	74.00	-25.89	3	Horizontal	242	2.81
Mode 1	Pass	PK	5.41915G	58.91	74.00	-15.09	3	Horizontal	198	2.24
Mode 1	Pass	PK	8.12894G	54.98	74.00	-19.02	3	Horizontal	15	1.18

Radiated Emissions above 1GHz_Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.709G	52.67	54.00	-1.33	-1.11	3	Vertical	156	1.51	53.78	28.29	6.10	35.50
AV	3.612G	51.36	54.00	-2.64	0.89	3	Vertical	312	1.54	50.47	29.52	6.72	35.35
AV	4.51489G	45.55	54.00	-8.45	3.74	3	Vertical	261	2.31	41.81	31.60	7.36	35.22
AV	4.96014G	35.42	54.00	-18.58	5.24	3	Vertical	275	1.44	30.18	32.94	7.76	35.46
AV	5.41843G	51.11	54.00	-2.89	5.34	3	Vertical	267	1.18	45.77	32.70	8.04	35.40
AV	8.12731G	43.22	54.00	-10.78	10.68	3	Vertical	114	2.12	32.54	36.80	9.33	35.45
PK	2.70965G	56.46	74.00	-17.54	-1.10	3	Vertical	156	1.51	57.56	28.30	6.10	35.50
PK	3.6125G	56.59	74.00	-17.41	0.89	3	Vertical	312	1.54	55.70	29.52	6.72	35.35
PK	4.5142G	55.54	74.00	-18.46	3.74	3	Vertical	261	2.31	51.80	31.60	7.36	35.22
PK	4.95904G	48.09	74.00	-25.91	5.24	3	Vertical	275	1.44	42.85	32.94	7.76	35.46
PK	5.41933G	62.38	74.00	-11.62	5.34	3	Vertical	267	1.18	57.04	32.70	8.04	35.40
PK	8.12684G	54.71	74.00	-19.29	10.68	3	Vertical	114	2.12	44.03	36.80	9.33	35.45

Radiated Emissions above 1GHz_Mode 1



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Raw (dBuV)	AF (dB)	CL (dB)	PA (dB)
AV	2.70898G	52.01	54.00	-1.99	-1.11	3	Horizontal	42	1.51	53.12	28.29	6.10	35.50
AV	3.61211G	46.21	54.00	-7.79	0.89	3	Horizontal	281	1.01	45.32	29.52	6.72	35.35
AV	4.51479G	45.11	54.00	-8.89	3.74	3	Horizontal	274	1.52	41.37	31.60	7.36	35.22
AV	4.96065G	35.14	54.00	-18.86	5.24	3	Horizontal	242	2.81	29.90	32.94	7.76	35.46
AV	5.41852G	47.14	54.00	-6.86	5.34	3	Horizontal	198	2.24	41.80	32.70	8.04	35.40
AV	8.12762G	43.39	54.00	-10.61	10.68	3	Horizontal	15	1.18	32.71	36.80	9.33	35.45
PK	2.7084G	57.44	74.00	-16.56	-1.12	3	Horizontal	42	1.51	58.56	28.28	6.10	35.50
PK	3.61151G	54.12	74.00	-19.88	0.89	3	Horizontal	281	1.01	53.23	29.52	6.72	35.35
PK	4.51521G	54.22	74.00	-19.78	3.74	3	Horizontal	274	1.52	50.48	31.60	7.36	35.22
PK	4.95854G	48.11	74.00	-25.89	5.23	3	Horizontal	242	2.81	42.88	32.93	7.76	35.46
PK	5.41915G	58.91	74.00	-15.09	5.34	3	Horizontal	198	2.24	53.57	32.70	8.04	35.40
PK	8.12894G	54.98	74.00	-19.02	10.68	3	Horizontal	15	1.18	44.30	36.80	9.33	35.45