FCC Radio Test Report

FCC ID	:	**PPQ-WRB8326**
Equipment	:	**Wi-Fi 7 Tri-Band Mesh Router**
Brand Name	:	**LITEON**
Model Name	:	**WRB8326A, WRB8326B, WRB8326C, WRB8326D**
Applicant	:	**LITE-ON TECHNOLOGY CORP. Bldg. C, 90, Chien 1 Road, Chung Ho,New Taipei City 23585, Taiwan, R.O.C.**
Manufacturer	:	**LITE-ON TECHNOLOGY CORP. Bldg. C, 90, Chien 1 Road, Chung Ho,New Taipei City 23585, Taiwan, R.O.C.**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Aug. 29, 2024, and testing was started from Sep. 03, 2024 and completed on Oct. 10, 2024. 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: Jackson 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

Report No.	Version	Description	Issued Date
FR482702AZ	01	Initial issue of report	Oct. 23, 2024

Summary of Test Result

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

1 General Description

1.1 Information

1.1.1 RF General Information

Frequency Range (MHz)	IEEE Std.	Ch. Frequency (MHz)	Channel Number
2400-2483.5	802.15.4	2405-2480	11-26 [16]

Band	Mode	BWch (MHz)	Nant
2.4-2.4835GHz	802.15.4	5	1TX

Note:.
- 802.15.4 uses a O-QPSK (250kbps) modulation for DSSS.
- BWch is the nominal channel bandwidth.

1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Support	Remark
1	LITEON	20301-002000A000	PIFA	I-Pex	2.4G+5G	-
2	LITEON	20301-002020A000	PIFA	I-Pex	2.4G+5G	-
3	LITEON	20301-002030A000	Monopole	I-Pex	6G	-
4	LITEON	20301-002040A000	Monopole	I-Pex	6G	-
5	LITEON	20301-002010A000	Dipole	I-Pex	BT/Zigbee/Thread	-

Ant.	Port	Gain (dBi)						
		2.4G	UNII-1	UNII-2A	UNII-2C	UNII-3	UNII-5~8	BT/Zigbee/ Thread
1	1	2.35	2.35	2.46	3.44	3.72	-	-
2	2	2.33	2.51	2.18	3.35	3.43	-	-
3	1	-	-	-	-	-	3.19	-
4	2	-	-	-	-	-	3.7	-
5	1	-	-	-	-	-	-	4.67

Composite Gain (dBi)					
	2.4G	UNII-1	UNII-2A	UNII-2C	UNII-3
DG [1SS]	2.69	4.1	4.57	5.27	4.74
DG [2SS]	2.35	2.51	2.46	3.44	3.72

Note 1: The EUT has five antennas.
Note 2: The composite gain is derived as KDB 662911 D03 v01 which was used as directional gain. For more detail information, please refer to the Antenna Pattern Report AP482702.

For 2.4GHz function:
For IEEE 802.11 b/g/n/VHT/ax/be mode (2TX/2RX)
Ant. 1 (port 1) and Ant. 2 (port 2) could receive simultaneously.
For 5GHz function:
For IEEE 802.11 a/n/ac/ax/be mode (2TX/2RX)
Ant. 1 (port 1) and Ant. 2 (port 2) could receive simultaneously.
For 6GHz function:
For IEEE 802.11ax/be mode (2TX/2RX)
Ant. 3 (port 1), Ant. 4 (port 2) could transmit/receive simultaneously.
For BT function:
For IEEE 802.15.1 mode (1TX/1RX)
Ant. 5 could transmit/receive.
For Zigbee/Thread function:
For IEEE 802.15.4 mode (1TX/1RX)
Ant. 5 could transmit/receive.

1.1.3 EUT Information

Operational Condition				
EUT Power Type	From AC Adapter			
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
Zigbee	0.454	3.43	915u	2k

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

1.1.5 Table for Multiple Listing

The brand/model names in the following table are all refer to the identical product.

Brand Name	Model Name	SKU	5GE	2.5GE	USB 2.0	IoT(2.4G)
LITEON	WRB8326A	SKU 1	V	V	V	V
	WRB8326B	SKU 2	V	V	-	V
	WRB8326C	SKU 3	V	-	-	V
	WRB8326D	SKU 4	-	V	-	V

From the above models, model: WRB8326A was selected as representative model for the test and its data was recorded in this report.

Model name	Max TX Power
EFR32MG21B020F512IM32-D	20dBm
FR32MG21B010F512IM32-D	10dBm

There are two kinds of chip for Bluetooth, Zigbee and Thread, EFR32MG21B020F512IM32-D was selected as representative for the test and its data was recorded in this report. For FR32MG21B010F512IM32-D only TX power was verified.

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	**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 site Designation No. TW3785 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
AC Conduction	CO04-HY	Daniel Lin	21.5~22.7°C / 56~59%	10/Oct/2024
☒ Wenhua 3rd..	**ADD:** No. 58, Aly. 75, Ln. 564, Wenhua 3rd Rd., Guishan Dist. Taoyuan City 333, Taiwan (R.O.C.)			
(TAF: 3785**)**	**TEL:** 886-3-327-0868		**TEL:** 886-3-327-0868	
Test site Designation No. TW0036 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
RF Conducted	TH06-HY	Johnny Yu	23.3~23.7°C / 55~57%	19/Sep/2024
Radiated_ below 1GHz	03CH25-HY	Lego Lin	20.5~22.1°C / 55~60%	19/Sep/2024
Radiated_ above 1GHz	03CH26-HY	Rian Chung	22.4~24.1°C / 57~61%	03/Sep/2024~16/Sep/2024
Radiated_ Co-location for Mode 1	03CH25-HY	Ivan Chung	23~25°C / 55~56%	25/Sep/2024
Radiated_ Co-location for Mode 2	03CH24-HY	Ivan Chung	21.3~22.1°C / 56~52%	04/Oct/2024

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
AC Power-line Conducted Emissions	4.53 dB	Confidence levels of 95%
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	PuTTY Release 0.62

Mode	Power Setting
Zigbee	-
2405MHz	200
2440MHz	200
2480MHz	90

2.2 The Worst Case Measurement Configuration

The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Operating Mode	CTX
1	Adapter Mode

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	Adapter Mode
Operating Mode > 1GHz	CTX
Orthogonal Planes of EUT	**Y Plane**
	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis - Radiated measurement Co-location
Operating Mode	CTX
1	WLAN 2.4G + 5G + 6G + Bluetooth
2	WLAN 2.4G + 5G + 6G + 802.15.4
Refer to Sporton Test Report No.: FA482702 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

Accessories				
AC Adapter (US)	Brand Name	RISUNIC	Model Name	R0183-1202500US
	Power Rating	I/P: 100 - 240Vac, 1.5A A, O/P:12Vdc, 2.5A		
	Power Cord	1.5 meter, non-shielded cable, with w/o ferrite core		

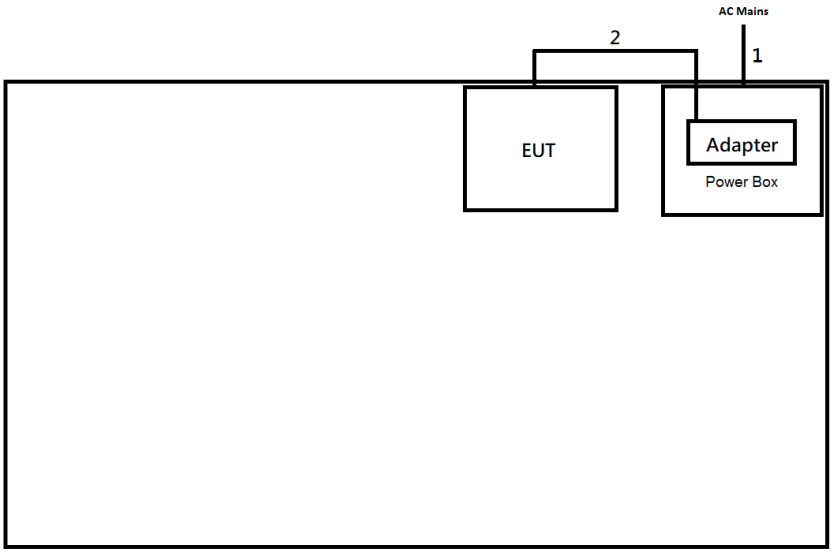
Reminder: Regarding to more detail and other information, please refer to user manual.

2.4 Support Equipment

Support Equipment – Conducted					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Notebook	DELL	E5410	-	-
2	Adapter for NB	DELL	HA65NM130	-	-

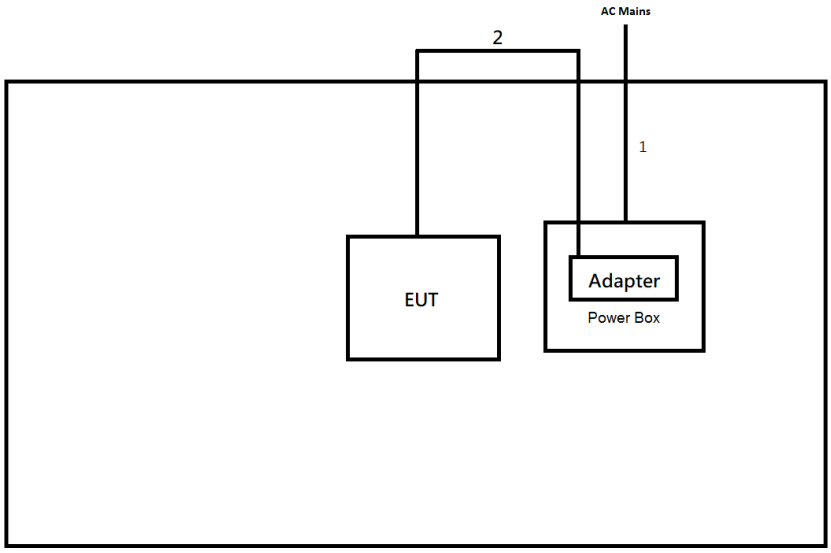
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.5	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	AC Power cable	No	1.8	-
2	DC Power cable	No	1.5	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

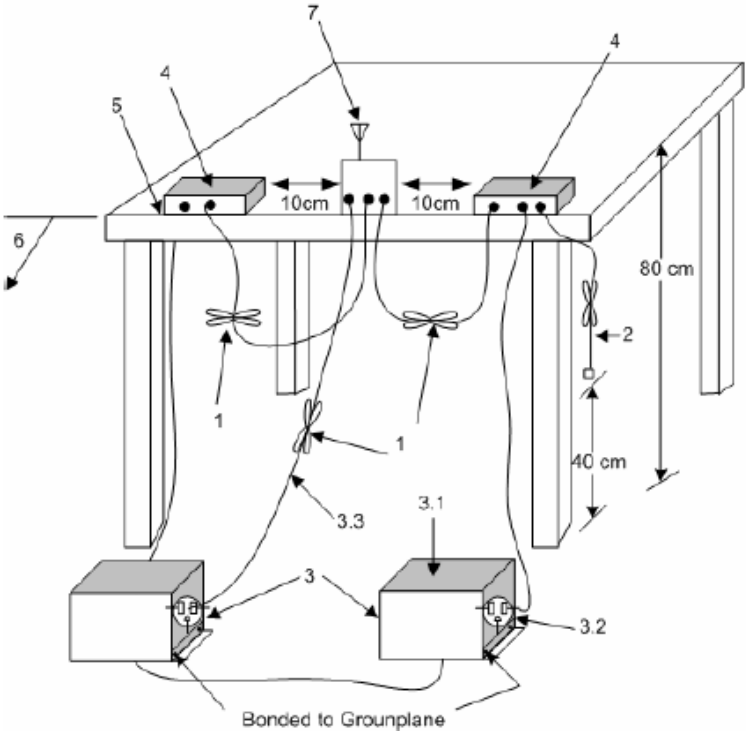
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

3.1.4 Measurement Results Calculation

The measured Level is calculated using:
Corrected Reading: Raw(Read Level) +LISN(LISN Factor) + CL(Cable Loss) + AT(Attenuator).

3.1.5 Test Setup

AC Power-line Conducted Emissions



1—Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 cm to 40 cm long.
2—The I/O cables that are not connected to an accessory shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
3—EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50Ω loads. LISN may be placed on top of, or immediately beneath, reference ground plane.
3.1—All other equipment powered from additional LISN(s).
3.2—A multiple-outlet strip may be used for multiple power cords of non-EUT equipment.
3.3—LISN at least 80 cm from nearest part of EUT chassis.
4—Non-EUT components of EUT system being tested.
5—Rear of EUT, including peripherals, shall all be aligned and flush with edge of tabletop.
6—Edge of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.
7—Antenna can be integral or detachable. If detachable, then the antenna shall be attached for this test.

3.1.6 Test Result of AC Power-line Conducted Emissions

Refer as Appendix A

3.2 DTS Bandwidth

3.2.1 6dB Bandwidth Limit

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

3.2.2 Measuring Instruments

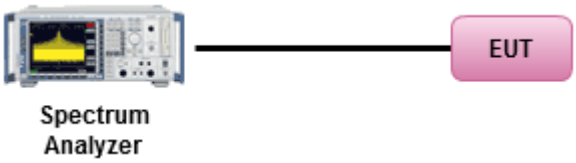
Refer a test equipment and calibration data table in this test report.

3.2.3 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 for occupied bandwidth testing.
	☐ Refer as ANSI C63.10, clause 6.9.3 for occupied bandwidth testing.

3.2.4 Test Setup

Emission Bandwidth



3.2.5 Test Result of Emission Bandwidth

Refer as Appendix B

3.3 Maximum Conducted Output Power

3.3.1 Maximum Conducted Output Power Limit

Maximum Conducted Output Power Limit			
	▪ If G_{TX} ≤ 6 dBi, then P_{Out} ≤ 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 + 8dB dBm	
e.i.r.p. Power Limit:			
▪ 2400-2483.5 MHz Band			
	▪ Point-to-multipoint systems (P2M): P_{eirp} ≤ 36 dBm (4 W)		
	▪ Point-to-point systems (P2P): P_{eirp} ≤ MAX(36, [P_{Out} + G_{TX}]) dBm		
	▪ Smart antenna system (SAS)		
		- Single beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm	
		- Overlap beam: P_{eirp} ≤ MAX(36, P_{Out} + G_{TX}) dBm	
		- Aggregate power on all beams: P_{eirp} ≤ 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.			

3.3.2 Measuring Instruments

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

3.3.3 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]) $EIRP_{total} = P_{total} + DG$

3.3.4 Test Setup

Maximum Conducted Output Power (Power Meter)


3.3.5 Test Result of Maximum Conducted Output Power

Refer as Appendix C

3.4 Power Spectral Density

3.4.1 Power Spectral Density Limit

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

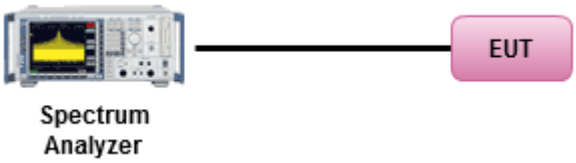
3.4.2 Measuring Instruments

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

3.4.3 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.

3.4.4 Test Setup

Power Spectral Density


3.4.5 Test Result of Power Spectral Density

Refer as Appendix D

3.5 Emissions in Non-restricted Frequency Bands

3.5.1 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.	

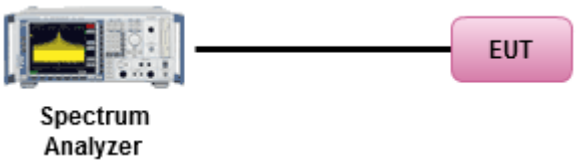
3.5.2 Measuring Instruments

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

3.5.3 Test Procedures

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

3.5.4 Test Setup

Emissions in Non-restricted Frequency Bands


3.5.5 Test Result of Emissions in Non-restricted Frequency Bands

Refer as Appendix E

3.6 Emissions in Restricted Frequency Bands

3.6.1 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.

3.6.2 Measuring Instruments

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

3.6.3 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 (i.e., 1 MHz).
▪ 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 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.

3.6.4 Measurement Results Calculation

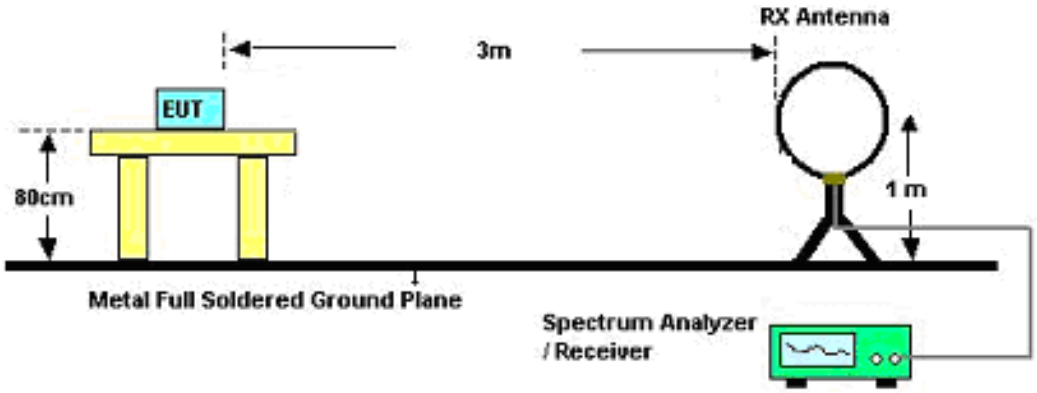
The measured Level is calculated using:

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

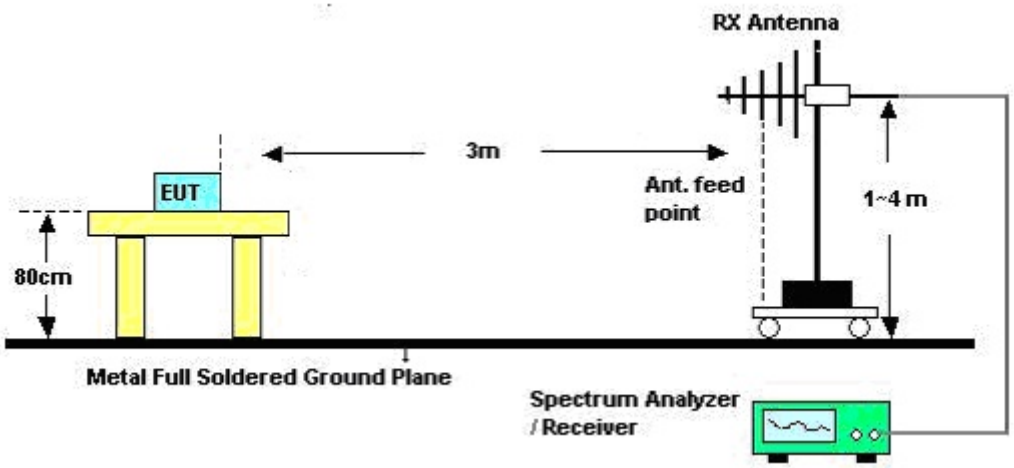
3.6.5 Test Setup

Emissions in Restricted Frequency Bands

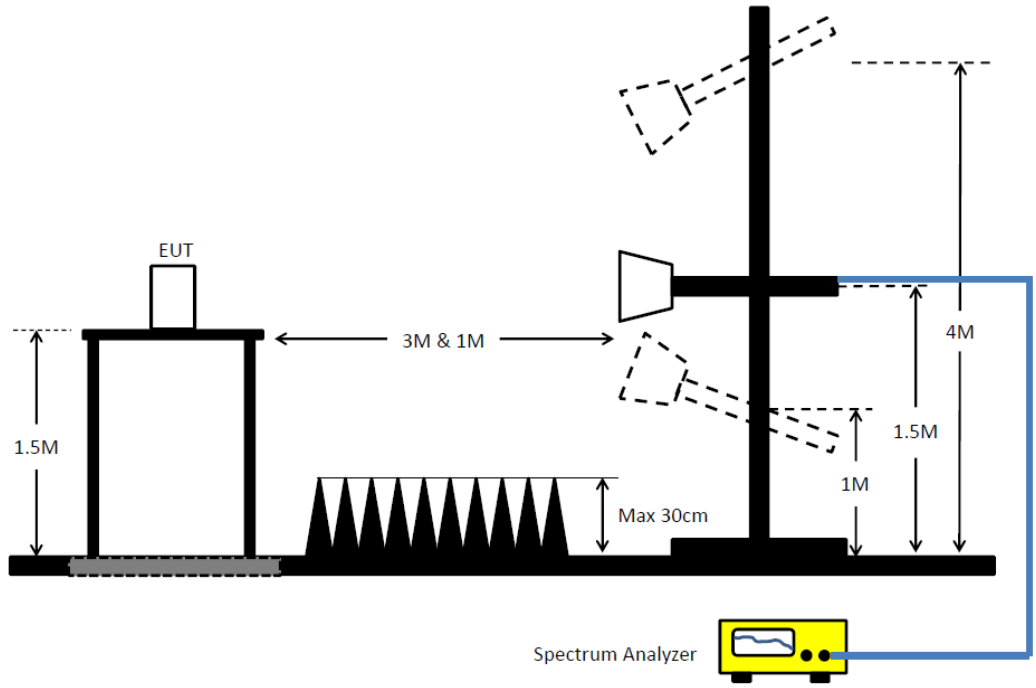
9kHz ~30MHz



30MHz~1GHz



Above 1GHz



3.6.6 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.

3.6.7 Test Result of Emissions in Restricted Frequency Bands

Refer as Appendix F

4 Test Equipment and Calibration Data

Instrument for AC Conduction

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
EMI Test Receiver	ROHDE & SCHWARZ	ESR3	102051	9kHz ~ 3.6GHz	17/May/2024	16/May/2025
Two-Line V-Network	ROHDE & SCHWARZ	ENV 216	101274	9kHz ~ 30MHz	18/Jun/2024	17/Jun/2025
RF Cable 5m	TITAN	TITAN	CO04-cable-01	9 kHz~200MHz	27/Feb/2024	26/Feb/2025
Impuls Begrenzer Pulse Limiter	SCHWARZBECK	VTSD 9561-F	9561-F041	9kHz ~ 30MHz	18/Oct/2023	17/Oct/2024
Software	Sporton	SENSE-EMI	V5.11.3	-	NCR	NCR

NCR: No Calibration Required

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	30/Oct/2023	29/Oct/2024
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	20/Oct/2023	19/Oct/2024
Power Meter	Anritsu	ML2495A	1124009	300MHz~40GHz	01/Apr/2024	31/Mar/2025
Pulse Sensor	Anritsu	MA2411B	1027452	300MHz~40GHz	02/Apr/2024	01/Apr/2025
SENSE-15247_DTS	Sporton	V5.11.20	N/A	N/A	N/A	N/A

Instrument for Radiated Test (03CH26-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH26-HY	1GHz~18GHz 3m	07/Aug/2024	06/Aug/2025
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101411	10Hz~44GHz	06/Oct/2023	05/Oct/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02877	1GHz~18GHz	11/Jul/2024	10/Jul/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	04/Jun/2024	03/Jun/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB009	1GHz~40GHz	18/Oct/2023	17/Oct/2024
Preamplifier	SGH	PRAMP 118-H	20230515-4	1GHz ~18GHz	24/May/2024	23/May/2025
Amplifier	EM	EM18G40G	060874	18GHz ~ 40GHz	15/Apr/2024	14/Apr/2025
SENSE-15247-FS	Sporton	V5.11.18	NA	NA	NA	NA

Instrument for Radiated Test (03CH25-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	30MHz~1GHz 3m	08/Aug/2024	07/Aug/2025
EMI Test Receiver	ROHDE & SCHWARZ	ESR	102318	9kHz~3.6GHz	27/Dec/2023	26/Dec/2024
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101410	10Hz~44GHz	17/Nov/2023	16/Nov/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	19/Mar/2024	18/Mar/2025
Bilog Antenna & 6dB Attenuator	TESEQ & VGT	CBL 6111D & VFA 04002-06	63537/001	30MHz~1GHz	30/May/2024	29/May/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	9kHz~1GHz	24/Apr/2024	23/Apr/2025
Preamplifier	SGH	PRAMP 903	20230515-1	25MHz~3GHz	24/May/2024	23/May/2025
SENSE-15247-FS	Sporton	V5.11.18	NA	NA	NA	NA

Instrument for Radiated Test Co-location for Mode 1 (03CH25-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH25-HY	1GHz~18GHz 3m	08/Aug/2024	07/Aug/2025
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101410	10Hz~44GHz	17/Nov/2023	16/Nov/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02876	1GHz~18GHz	11/Jul/2024	10/Jul/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	01248	18GHz~40GHz	20/Aug/2024	19/Aug/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB007	1GHz~40GHz	23/Apr/2024	22/Apr/2025
Preamplifier	SGH	PRAMP 118-H	20230515-3	1GHz ~18GHz	24/May/2024	23/May/2025
Amplifier	EM	EM18G40GA	060874	18GHz ~ 40GHz	15/Apr/2024	14/Apr/2025
SENSE-EMI	Sporton	V5.11.8	NA	NA	NA	NA

Instrument for Radiated Test Co-location for Mode 2 (03CH24-HY)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH24-HY	1GHz~18GHz 3m	30/Jul/2024	29/Jul/2025
EXA Signal Analyzer	KEYSIGHT	N9010A	MY54200885	10Hz~44GHz	15/Aug/2024	14/Aug/2025
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02744	1GHz~18GHz	15/Aug/2024	14/Aug/2025
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA 9170154	18GHz~40GHz	04/Jun/2024	05/Jun/2025
RF Cable	HUBER+SUHNER	SUOFLEX 104	03CH24-CABLE-01	1GHz~40GHz	01/Oct/2024	30/Sep/2025
Amplifier	EM	EM01G18G	060870	1GHz ~18GHz	12/Aug/2024	11/Aug/2025
SENSE-EMI	Sporton	V5.11.8	NA	NA	NA	NA

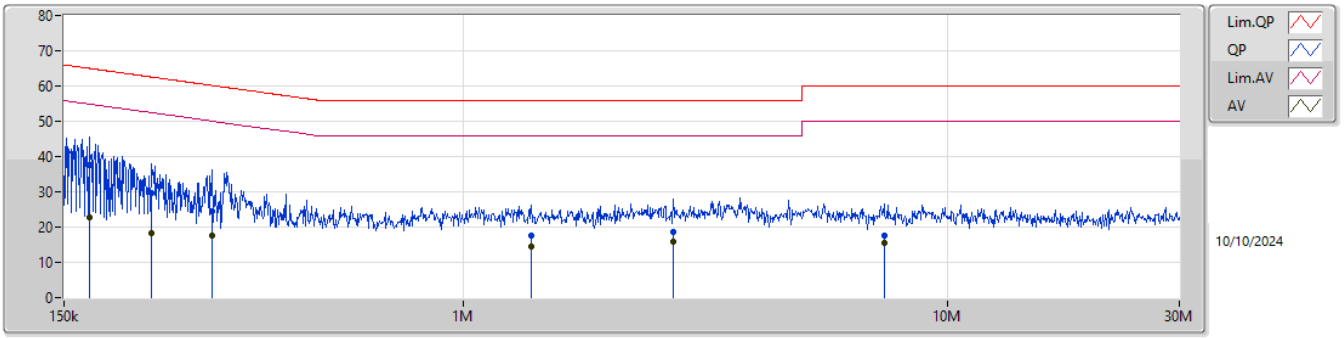
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	324.114k	29.28	49.59	-20.31	Neutral

Result

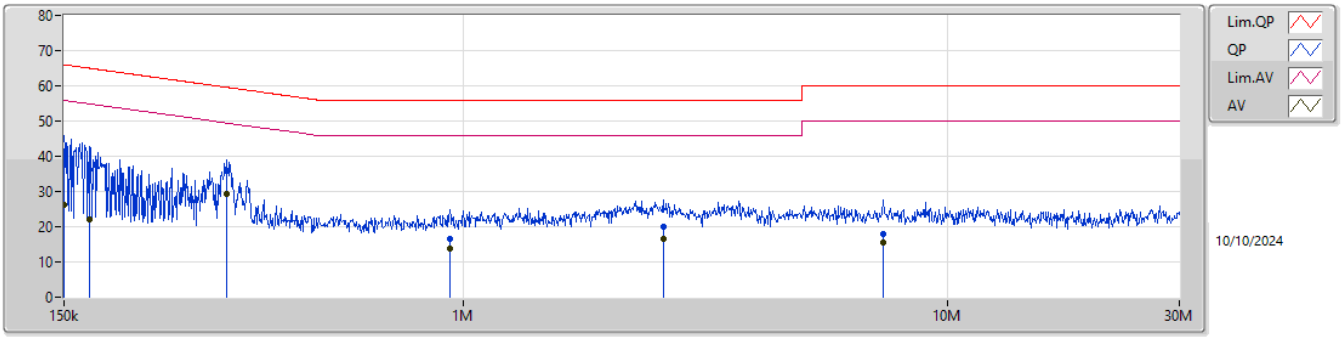
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	169.084k	37.60	65.01	-27.41	Line
Mode 1	Pass	AV	169.084k	22.71	55.01	-32.30	Line
Mode 1	Pass	QP	227.194k	29.78	62.56	-32.78	Line
Mode 1	Pass	AV	227.194k	18.13	52.56	-34.43	Line
Mode 1	Pass	QP	302.848k	24.38	60.17	-35.79	Line
Mode 1	Pass	AV	302.848k	17.50	50.17	-32.67	Line
Mode 1	Pass	QP	1.38M	17.66	56.00	-38.34	Line
Mode 1	Pass	AV	1.38M	14.63	46.00	-31.37	Line
Mode 1	Pass	QP	2.71M	18.78	56.00	-37.22	Line
Mode 1	Pass	AV	2.71M	15.82	46.00	-30.18	Line
Mode 1	Pass	QP	7.382M	17.58	60.00	-42.42	Line
Mode 1	Pass	AV	7.382M	15.51	50.00	-34.49	Line
Mode 1	Pass	QP	150k	41.44	66.00	-24.56	Neutral
Mode 1	Pass	AV	150k	26.26	56.00	-29.74	Neutral
Mode 1	Pass	QP	169.76k	36.34	64.97	-28.63	Neutral
Mode 1	Pass	AV	169.76k	21.95	54.97	-33.02	Neutral
Mode 1	Pass	QP	324.114k	35.96	59.59	-23.63	Neutral
Mode 1	Pass	AV	324.114k	29.28	49.59	-20.31	Neutral
Mode 1	Pass	QP	937.272k	16.46	56.00	-39.54	Neutral
Mode 1	Pass	AV	937.272k	13.63	46.00	-32.37	Neutral
Mode 1	Pass	QP	2.584M	20.13	56.00	-35.87	Neutral
Mode 1	Pass	AV	2.584M	16.62	46.00	-29.38	Neutral
Mode 1	Pass	QP	7.353M	17.81	60.00	-42.19	Neutral
Mode 1	Pass	AV	7.353M	15.57	50.00	-34.43	Neutral

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	169.084k	37.60	65.01	-27.41	19.47	Line	-	18.13	9.66	0.08	9.73
AV	169.084k	22.71	55.01	-32.30	19.47	Line	-	3.24	9.66	0.08	9.73
QP	227.194k	29.78	62.56	-32.78	19.44	Line	-	10.34	9.65	0.10	9.69
AV	227.194k	18.13	52.56	-34.43	19.44	Line	-	-1.31	9.65	0.10	9.69
QP	302.848k	24.38	60.17	-35.79	19.49	Line	-	4.89	9.65	0.11	9.73
AV	302.848k	17.50	50.17	-32.67	19.49	Line	-	-1.99	9.65	0.11	9.73
QP	1.38M	17.66	56.00	-38.34	19.56	Line	-	-1.90	9.66	0.10	9.80
AV	1.38M	14.63	46.00	-31.37	19.56	Line	-	-4.93	9.66	0.10	9.80
QP	2.71M	18.78	56.00	-37.22	19.57	Line	-	-0.79	9.68	0.09	9.80
AV	2.71M	15.82	46.00	-30.18	19.57	Line	-	-3.75	9.68	0.09	9.80
QP	7.382M	17.58	60.00	-42.42	19.55	Line	-	-1.97	9.70	0.06	9.79
AV	7.382M	15.51	50.00	-34.49	19.55	Line	-	-4.04	9.70	0.06	9.79

Conducted Emissions at Powerline_Mode 1



Type	Freq	Level	Limit	Margin	Factor	Condition	Comment	Raw	LISN	CL	AT
	(Hz)	(dBuV)	(dBuV)	(dB)	(dB)			(dBuV)	(dB)	(dB)	(dB)
QP	150k	41.44	66.00	-24.56	19.43	Neutral	-	22.01	9.60	0.07	9.76
AV	150k	26.26	56.00	-29.74	19.43	Neutral	-	6.83	9.60	0.07	9.76
QP	169.76k	36.34	64.97	-28.63	19.40	Neutral	-	16.94	9.60	0.08	9.72
AV	169.76k	21.95	54.97	-33.02	19.40	Neutral	-	2.55	9.60	0.08	9.72
QP	324.114k	35.96	59.59	-23.63	19.45	Neutral	-	16.51	9.60	0.11	9.74
AV	324.114k	29.28	49.59	-20.31	19.45	Neutral	-	9.83	9.60	0.11	9.74
QP	937.272k	16.46	56.00	-39.54	19.50	Neutral	-	-3.04	9.61	0.09	9.80
AV	937.272k	13.63	46.00	-32.37	19.50	Neutral	-	-5.87	9.61	0.09	9.80
QP	2.584M	20.13	56.00	-35.87	19.51	Neutral	-	0.62	9.61	0.10	9.80
AV	2.584M	16.62	46.00	-29.38	19.51	Neutral	-	-2.89	9.61	0.10	9.80
QP	7.353M	17.81	60.00	-42.19	19.50	Neutral	-	-1.69	9.65	0.06	9.79
AV	7.353M	15.57	50.00	-34.43	19.50	Neutral	-	-3.93	9.65	0.06	9.79

Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Zigbee	1.894M	2.293M	2M29G1D	1.744M	2.136M

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

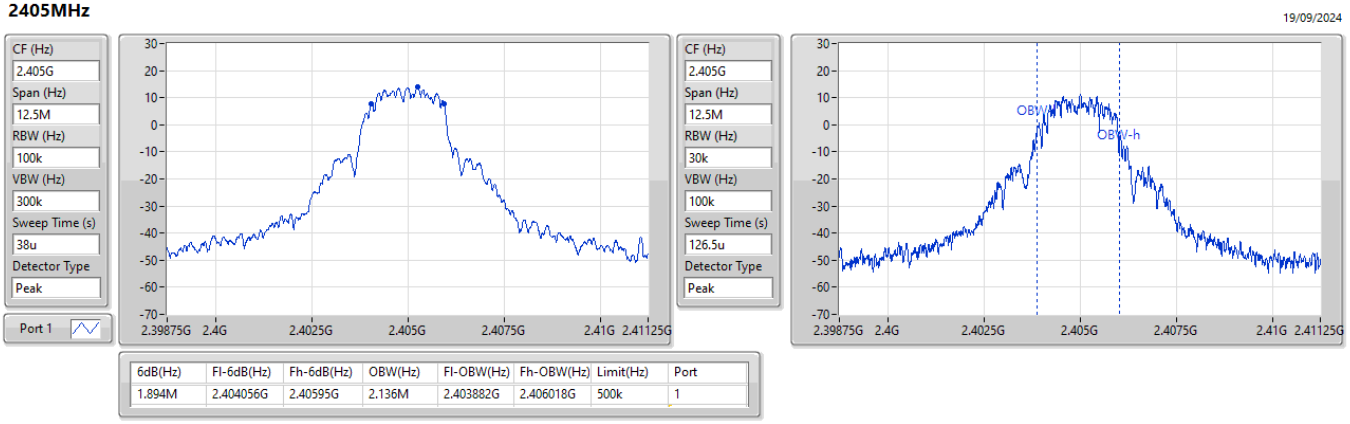
Result

Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.894M	2.136M
2440MHz	Pass	500k	1.888M	2.293M
2480MHz	Pass	500k	1.744M	2.199M

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

2.4-2.4835GHz_Zigbee **EBW**

2405MHz



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.894M	2.404056G	2.40595G	2.136M	2.403882G	2.406018G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	20.19	0.10447

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.67	20.19	20.19	30.00
2440MHz	Pass	4.67	20.00	20.00	30.00
2480MHz	Pass	4.67	8.73	8.73	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	-
Zigbee	5.26

RBW = 3kHz;

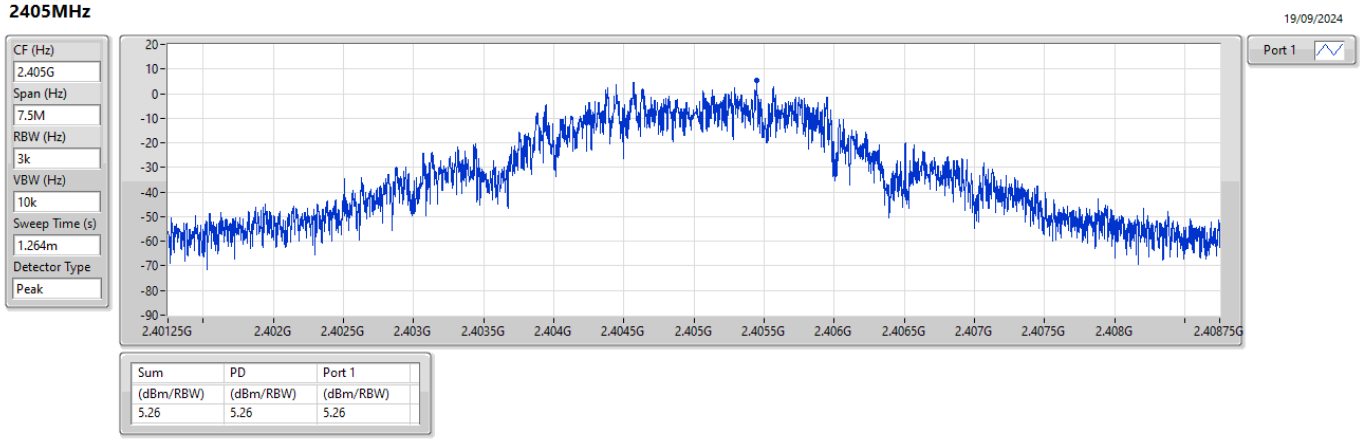
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	4.67	5.26	5.26	8.00
2440MHz	Pass	4.67	4.18	4.18	8.00
2480MHz	Pass	4.67	-5.56	-5.56	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_Zigbee **PSD**

2405MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
5.26	5.26	5.26

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	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	2.40484G	19.72	-10.28	2.13325G	-55.07	2.39956G	-40.07	2.4G	-38.82	2.50234G	-52.33	16.24605G	-40.93	1

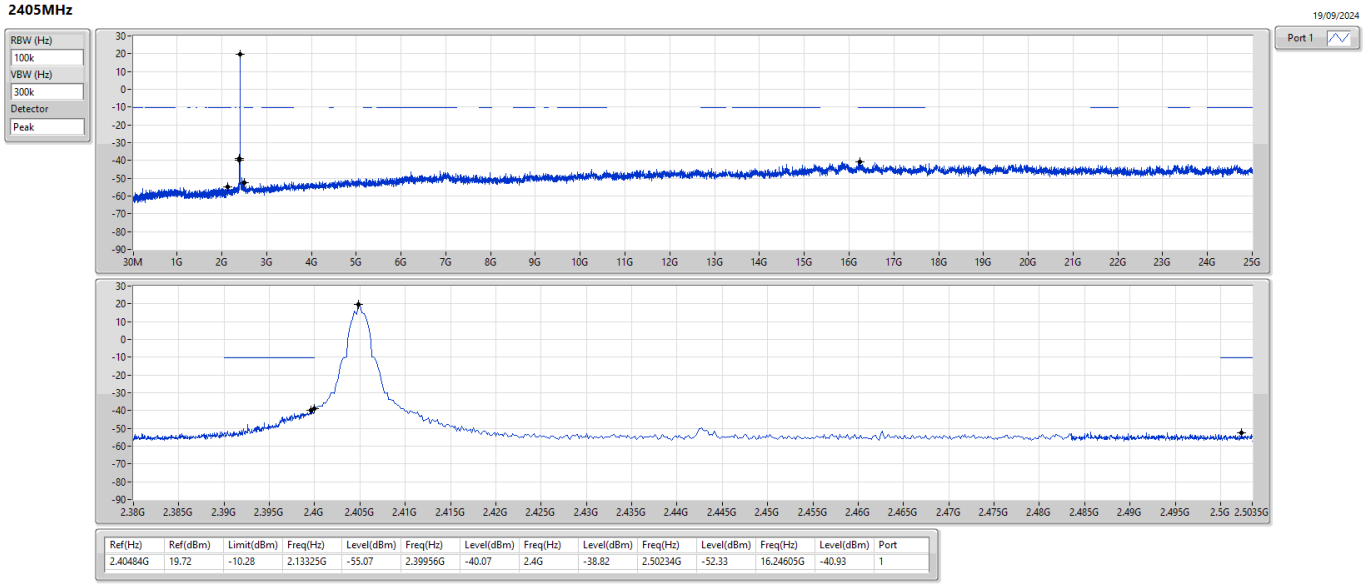
Result

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
Zigbee	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	2.40484G	19.72	-10.28	2.13325G	-55.07	2.39956G	-40.07	2.4G	-38.82	2.50234G	-52.33	16.24605G	-40.93	1
2440MHz	Pass	2.40484G	19.72	-10.28	2.19553G	-54.29	2.4G	-52.95	2.4G	-55.10	2.50286G	-53.72	15.17465G	-41.44	1
2480MHz	Pass	2.40484G	19.72	-10.28	2.11328G	-53.22	2.39468G	-53.14	2.4G	-55.74	2.50154G	-52.93	17.67739G	-41.97	1

2.4-2.4835GHz_Zigbee

CSENdB

2405MHz



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
2.40484G	19.72	-10.28	2.13325G	-55.07	2.39956G	-40.07	2.4G	-38.82	2.50234G	-52.33	16.24605G	-40.93	1

Summary

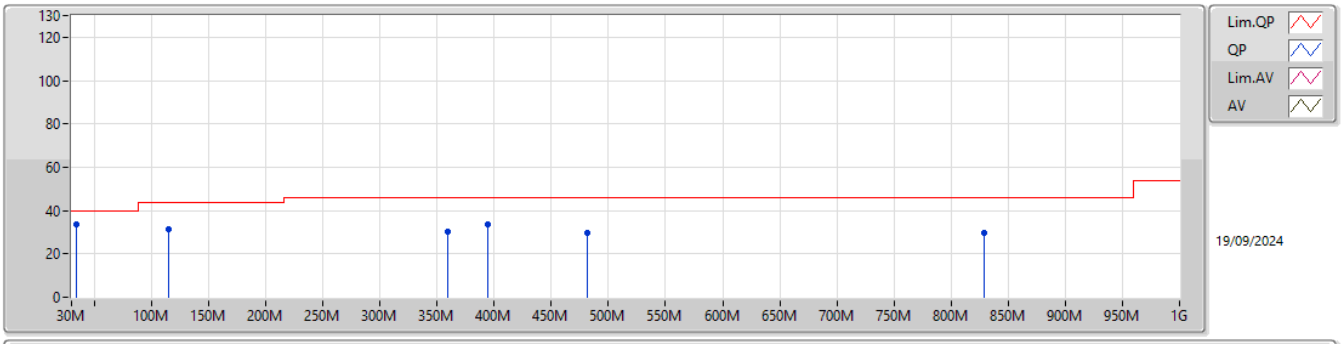
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	PK	33.88M	33.43	40.00	-6.57	3	Vertical	360	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2440MHz	Pass	PK	33.88M	33.43	40.00	-6.57	3	Vertical	360	1.00
2440MHz	Pass	PK	115.36M	31.45	43.50	-12.05	3	Vertical	360	1.00
2440MHz	Pass	PK	359.8M	30.31	46.00	-15.69	3	Vertical	360	1.00
2440MHz	Pass	PK	394.72M	33.65	46.00	-12.35	3	Vertical	360	1.00
2440MHz	Pass	PK	482.02M	29.84	46.00	-16.16	3	Vertical	360	1.00
2440MHz	Pass	PK	829.28M	29.79	46.00	-16.21	3	Vertical	360	1.00
2440MHz	Pass	PK	119.24M	34.78	43.50	-8.72	3	Horizontal	0	1.00
2440MHz	Pass	PK	233.7M	26.48	46.00	-19.52	3	Horizontal	0	1.00
2440MHz	Pass	PK	359.8M	34.66	46.00	-11.34	3	Horizontal	0	1.00
2440MHz	Pass	PK	396.66M	34.84	46.00	-11.16	3	Horizontal	0	1.00
2440MHz	Pass	PK	482.02M	32.15	46.00	-13.85	3	Horizontal	0	1.00
2440MHz	Pass	PK	961.2M	29.17	54.00	-24.83	3	Horizontal	0	1.00

2.4-2.4835GHz_Zigbee

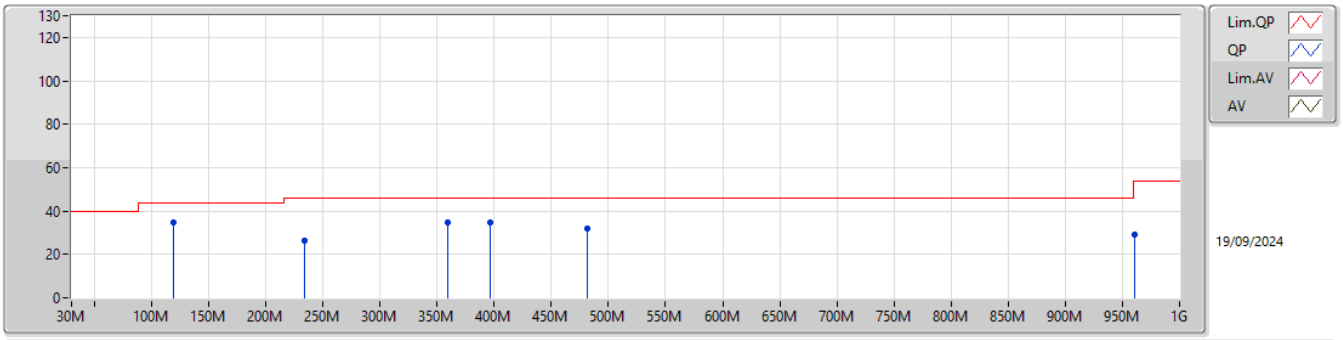
2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	33.88M	33.43	40.00	-6.57	-21.06	3	Vertical	360	1.00	54.49	22.83	0.45	44.34
PK	115.36M	31.45	43.50	-12.05	-26.45	3	Vertical	360	1.00	57.90	17.27	0.83	44.55
PK	359.8M	30.31	46.00	-15.69	-21.90	3	Vertical	360	1.00	52.21	20.89	1.33	44.12
PK	394.72M	33.65	46.00	-12.35	-20.82	3	Vertical	360	1.00	54.47	21.78	1.43	44.03
PK	482.02M	29.84	46.00	-16.16	-18.57	3	Vertical	360	1.00	48.41	23.73	1.60	43.90
PK	829.28M	29.79	46.00	-16.21	-12.64	3	Vertical	360	1.00	42.43	28.99	2.09	43.72

2.4-2.4835GHz_Zigbee

2440MHz_Adapter



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
PK	119.24M	34.78	43.50	-8.72	-26.21	3	Horizontal	0	1.00	60.99	17.51	0.83	44.55
PK	233.7M	26.48	46.00	-19.52	-26.59	3	Horizontal	0	1.00	53.07	16.68	1.14	44.41
PK	359.8M	34.66	46.00	-11.34	-21.90	3	Horizontal	0	1.00	56.56	20.89	1.33	44.12
PK	396.66M	34.84	46.00	-11.16	-20.74	3	Horizontal	0	1.00	55.58	21.85	1.44	44.03
PK	482.02M	32.15	46.00	-13.85	-18.57	3	Horizontal	0	1.00	50.72	23.73	1.60	43.90
PK	961.2M	29.17	54.00	-24.83	-10.34	3	Horizontal	0	1.00	39.51	31.06	2.26	43.66

Summary

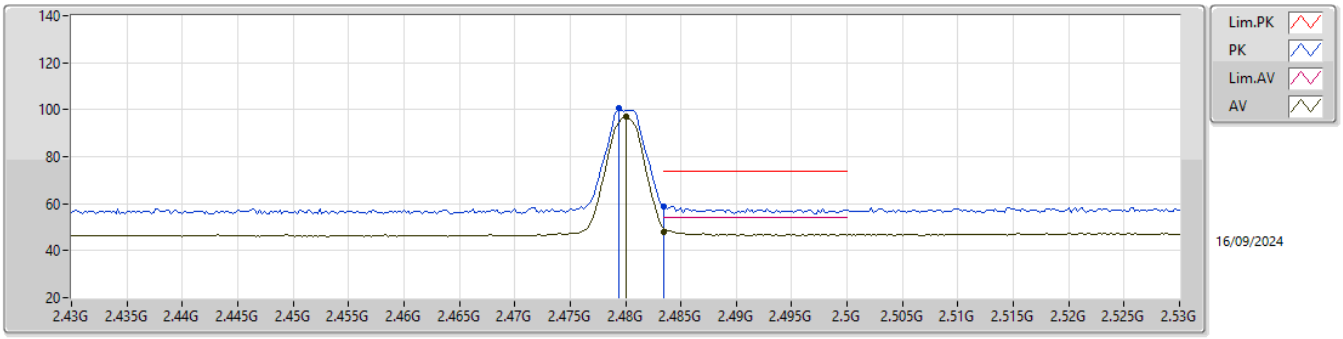
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	52.92	54.00	-1.08	3	Horizontal	97	2.68

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.3662G	46.56	54.00	-7.44	3	Vertical	11	1.31
2405MHz	Pass	AV	2.405G	106.94	Inf	-Inf	3	Vertical	11	1.31
2405MHz	Pass	PK	2.3662G	57.62	74.00	-16.38	3	Vertical	11	1.31
2405MHz	Pass	PK	2.4056G	110.23	Inf	-Inf	3	Vertical	11	1.31
2405MHz	Pass	AV	2.3658G	47.22	54.00	-6.78	3	Horizontal	95	1.50
2405MHz	Pass	AV	2.405G	112.04	Inf	-Inf	3	Horizontal	95	1.50
2405MHz	Pass	PK	2.3858G	57.87	74.00	-16.13	3	Horizontal	95	1.50
2405MHz	Pass	PK	2.4046G	115.26	Inf	-Inf	3	Horizontal	95	1.50
2405MHz	Pass	AV	4.81103G	32.57	54.00	-21.43	3	Vertical	96	2.15
2405MHz	Pass	PK	4.81135G	43.52	74.00	-30.48	3	Vertical	96	2.15
2405MHz	Pass	AV	4.80994G	31.97	54.00	-22.03	3	Horizontal	99	1.50
2405MHz	Pass	PK	4.80811G	43.75	74.00	-30.25	3	Horizontal	99	1.50
2440MHz	Pass	AV	2.3896G	46.11	54.00	-7.89	3	Vertical	34	2.95
2440MHz	Pass	AV	2.44G	107.72	Inf	-Inf	3	Vertical	34	2.95
2440MHz	Pass	AV	2.4868G	46.93	54.00	-7.07	3	Vertical	34	2.95
2440MHz	Pass	PK	2.3528G	57.72	74.00	-16.28	3	Vertical	34	2.95
2440MHz	Pass	PK	2.44G	110.94	Inf	-Inf	3	Vertical	34	2.95
2440MHz	Pass	PK	2.486G	57.37	74.00	-16.63	3	Vertical	34	2.95
2440MHz	Pass	AV	2.3636G	46.17	54.00	-7.83	3	Horizontal	83	2.67
2440MHz	Pass	AV	2.44G	113.60	Inf	-Inf	3	Horizontal	83	2.67
2440MHz	Pass	AV	2.4992G	46.91	54.00	-7.09	3	Horizontal	83	2.67
2440MHz	Pass	PK	2.3852G	57.37	74.00	-16.63	3	Horizontal	83	2.67
2440MHz	Pass	PK	2.4396G	116.85	Inf	-Inf	3	Horizontal	83	2.67
2440MHz	Pass	PK	2.4835G	57.38	74.00	-16.62	3	Horizontal	83	2.67
2440MHz	Pass	AV	4.87764G	32.29	54.00	-21.71	3	Vertical	70	2.64
2440MHz	Pass	PK	4.8823G	42.88	74.00	-31.12	3	Vertical	70	2.64
2440MHz	Pass	AV	4.8828G	32.31	54.00	-21.69	3	Horizontal	89	2.16
2440MHz	Pass	PK	4.88424G	43.67	74.00	-30.33	3	Horizontal	89	2.16
2480MHz	Pass	AV	2.48G	97.08	Inf	-Inf	3	Vertical	198	2.68
2480MHz	Pass	AV	2.4835G	47.92	54.00	-6.08	3	Vertical	198	2.68
2480MHz	Pass	PK	2.4794G	100.92	Inf	-Inf	3	Vertical	198	2.68
2480MHz	Pass	PK	2.4835G	58.94	74.00	-15.06	3	Vertical	198	2.68
2480MHz	Pass	AV	2.48G	103.38	Inf	-Inf	3	Horizontal	97	2.68
2480MHz	Pass	AV	2.4835G	52.92	54.00	-1.08	3	Horizontal	97	2.68
2480MHz	Pass	PK	2.4794G	107.09	Inf	-Inf	3	Horizontal	97	2.68
2480MHz	Pass	PK	2.4836G	62.04	74.00	-11.96	3	Horizontal	97	2.68
2480MHz	Pass	AV	4.95891G	32.89	54.00	-21.11	3	Vertical	96	1.50
2480MHz	Pass	PK	4.96135G	44.01	74.00	-29.99	3	Vertical	96	1.50
2480MHz	Pass	AV	4.96118G	33.16	54.00	-20.84	3	Horizontal	210	3.00
2480MHz	Pass	PK	4.95846G	44.15	74.00	-29.85	3	Horizontal	210	3.00

2.4-2.4835GHz_Zigbee

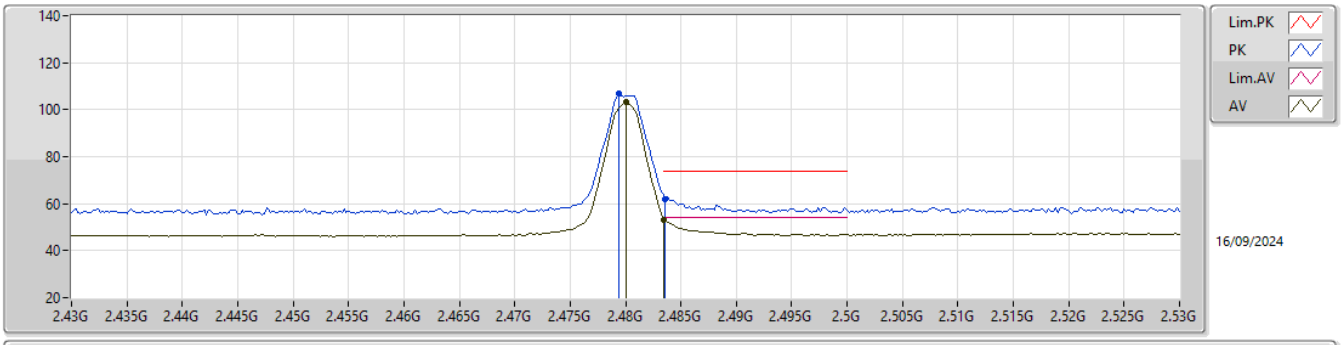
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	97.08	Inf	-Inf	31.10	3	Vertical	198	2.68	65.98	27.90	3.20	-
AV	2.4835G	47.92	54.00	-6.08	31.15	3	Vertical	198	2.68	16.77	27.94	3.21	-
PK	2.4794G	100.92	Inf	-Inf	31.09	3	Vertical	198	2.68	69.83	27.89	3.20	-
PK	2.4835G	58.94	74.00	-15.06	31.15	3	Vertical	198	2.68	27.79	27.94	3.21	-

2.4-2.4835GHz_Zigbee

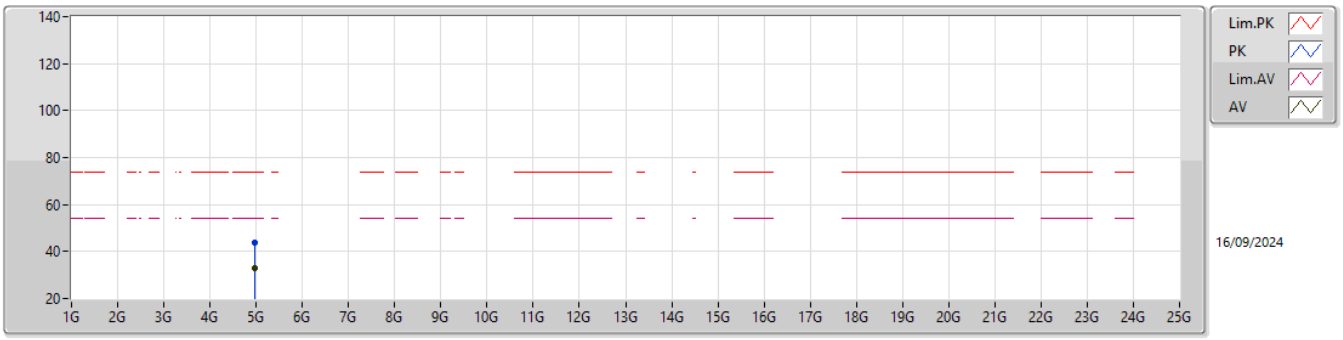
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	2.48G	103.38	Inf	-Inf	31.10	3	Horizontal	97	2.68	72.28	27.90	3.20	-
AV	2.4835G	52.92	54.00	-1.08	31.15	3	Horizontal	97	2.68	21.77	27.94	3.21	-
PK	2.4794G	107.09	Inf	-Inf	31.09	3	Horizontal	97	2.68	76.00	27.89	3.20	-
PK	2.4836G	62.04	74.00	-11.96	31.15	3	Horizontal	97	2.68	30.89	27.94	3.21	-

2.4-2.4835GHz_Zigbee

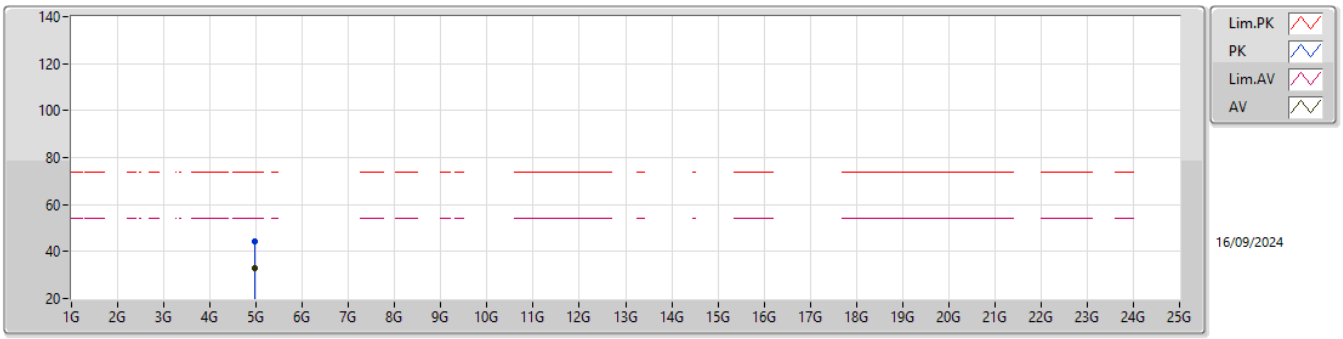
2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.95891G	32.89	54.00	-21.11	-5.60	3	Vertical	96	1.50	38.49	33.15	7.00	45.75
PK	4.96135G	44.01	74.00	-29.99	-5.58	3	Vertical	96	1.50	49.59	33.17	7.00	45.75

2.4-2.4835GHz_Zigbee

2480MHz_TX



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB)	(m)		(°)	(m)	(dBuV)	(dB)	(dB)	(dB)
AV	4.96118G	33.16	54.00	-20.84	-5.58	3	Horizontal	210	3.00	38.74	33.17	7.00	45.75
PK	4.95846G	44.15	74.00	-29.85	-5.60	3	Horizontal	210	3.00	49.75	33.15	7.00	45.75

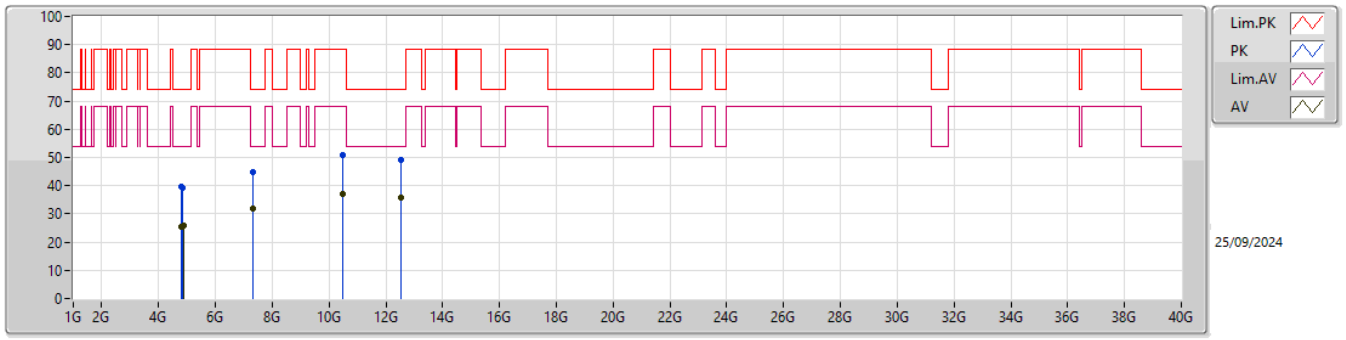
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	12.53192G	35.81	54.00	-18.19	Horizontal
Mode 2	Pass	AV	7.31156G	53.71	54.00	-0.29	Vertical

Result

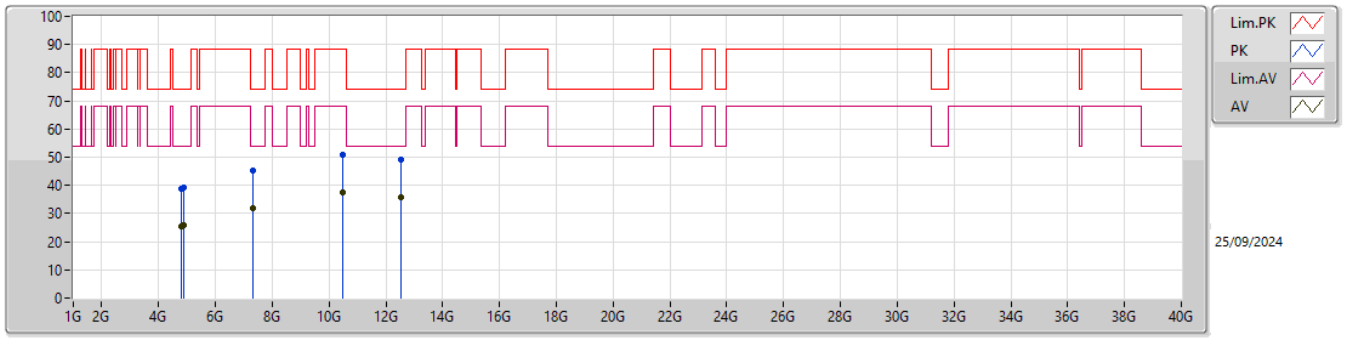
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	4.8132G	25.32	54.00	-28.68	3	Vertical	13	2.46
Mode 1	Pass	AV	4.87948G	26.01	54.00	-27.99	3	Vertical	0	1.63
Mode 1	Pass	AV	7.3108G	31.76	54.00	-22.24	3	Vertical	360	1.50
Mode 1	Pass	AV	10.47564G	37.11	68.20	-31.09	3	Vertical	279	1.52
Mode 1	Pass	AV	12.52192G	35.79	54.00	-18.21	3	Vertical	289	1.97
Mode 1	Pass	PK	4.81356G	39.44	74.00	-34.56	3	Vertical	13	2.46
Mode 1	Pass	PK	4.8642G	39.09	74.00	-34.91	3	Vertical	0	1.63
Mode 1	Pass	PK	7.30644G	44.76	74.00	-29.24	3	Vertical	360	1.50
Mode 1	Pass	PK	10.47528G	50.79	88.20	-37.41	3	Vertical	279	1.52
Mode 1	Pass	PK	12.53844G	48.97	74.00	-25.03	3	Vertical	289	1.97
Mode 1	Pass	AV	4.8134G	25.45	54.00	-28.55	3	Horizontal	217	1.09
Mode 1	Pass	AV	4.86792G	25.88	54.00	-28.12	3	Horizontal	206	1.13
Mode 1	Pass	AV	7.31848G	31.70	54.00	-22.30	3	Horizontal	5	1.39
Mode 1	Pass	AV	10.48024G	37.44	68.20	-30.76	3	Horizontal	127	1.72
Mode 1	Pass	AV	12.53192G	35.81	54.00	-18.19	3	Horizontal	236	1.06
Mode 1	Pass	PK	4.80756G	38.76	74.00	-35.24	3	Horizontal	217	1.09
Mode 1	Pass	PK	4.87272G	39.07	74.00	-34.93	3	Horizontal	206	1.13
Mode 1	Pass	PK	7.31812G	45.11	74.00	-28.89	3	Horizontal	5	1.39
Mode 1	Pass	PK	10.48012G	50.96	88.20	-37.24	3	Horizontal	127	1.72
Mode 1	Pass	PK	12.53652G	49.18	74.00	-24.82	3	Horizontal	236	1.06
Mode 2	Pass	AV	4.81104G	30.60	54.00	-23.40	3	Vertical	262	1.79
Mode 2	Pass	AV	4.87392G	41.93	54.00	-12.07	3	Vertical	98	2.89
Mode 2	Pass	AV	7.31156G	53.71	54.00	-0.29	3	Vertical	272	3.00
Mode 2	Pass	AV	10.482G	40.03	68.20	-28.17	3	Vertical	39	1.61
Mode 2	Pass	AV	12.508G	39.06	54.00	-14.94	3	Vertical	286	2.92
Mode 2	Pass	PK	4.8108G	40.07	74.00	-33.93	3	Vertical	263	1.98
Mode 2	Pass	PK	4.87408G	51.96	74.00	-22.04	3	Vertical	98	2.89
Mode 2	Pass	PK	7.30596G	65.18	74.00	-8.82	3	Vertical	267	3.00
Mode 2	Pass	PK	10.482G	50.32	88.20	-37.88	3	Vertical	39	1.61
Mode 2	Pass	PK	12.5712G	50.11	74.00	-23.89	3	Vertical	286	1.37
Mode 2	Pass	AV	4.81284G	34.30	54.00	-19.70	3	Horizontal	158	2.10
Mode 2	Pass	AV	4.87384G	43.83	54.00	-10.17	3	Horizontal	120	2.18
Mode 2	Pass	AV	7.31028G	52.37	54.00	-1.63	3	Horizontal	205	1.00
Mode 2	Pass	AV	10.4817G	39.46	68.20	-28.74	3	Horizontal	54	1.83
Mode 2	Pass	AV	12.53G	39.71	54.00	-14.29	3	Horizontal	253	1.55
Mode 2	Pass	PK	4.81016G	41.44	74.00	-32.56	3	Horizontal	158	2.02
Mode 2	Pass	PK	4.87424G	54.41	74.00	-19.59	3	Horizontal	120	2.18
Mode 2	Pass	PK	7.30588G	64.26	74.00	-9.74	3	Horizontal	205	1.00
Mode 2	Pass	PK	10.4565G	50.44	88.20	-37.76	3	Horizontal	54	2.43
Mode 2	Pass	PK	12.5288G	51.10	74.00	-22.90	3	Horizontal	253	1.50

Radiated Emissions above 1GHz_Mode 1



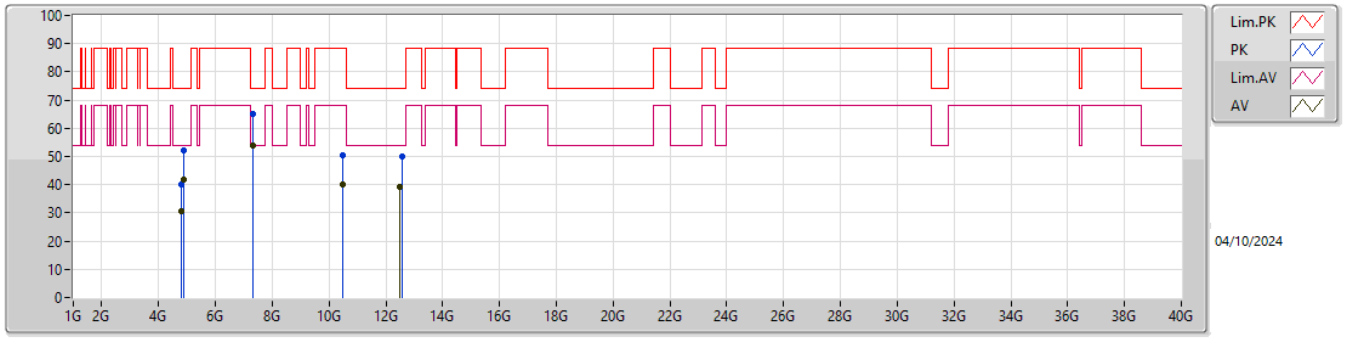
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.8132G	25.32	54.00	-28.68	-6.94	3	Vertical	13	2.46	32.26	32.55	4.57	44.06
AV	4.87948G	26.01	54.00	-27.99	-6.60	3	Vertical	0	1.63	32.61	32.82	4.63	44.05
AV	7.3108G	31.76	54.00	-22.24	-0.60	3	Vertical	360	1.50	32.36	37.16	5.98	43.74
AV	10.47564G	37.11	68.20	-31.09	4.17	3	Vertical	279	1.52	32.94	38.75	7.35	41.93
AV	12.52192G	35.79	54.00	-18.21	5.21	3	Vertical	289	1.97	30.58	39.24	8.27	42.30
PK	4.81356G	39.44	74.00	-34.56	-6.94	3	Vertical	13	2.46	46.38	32.55	4.57	44.06
PK	4.8642G	39.09	74.00	-34.91	-6.68	3	Vertical	0	1.63	45.77	32.76	4.61	44.05
PK	7.30644G	44.76	74.00	-29.24	-0.60	3	Vertical	360	1.50	45.36	37.17	5.98	43.75
PK	10.47528G	50.79	88.20	-37.41	4.17	3	Vertical	279	1.52	46.62	38.75	7.35	41.93
PK	12.53844G	48.97	74.00	-25.03	5.26	3	Vertical	289	1.97	43.71	39.28	8.28	42.30

Radiated Emissions above 1GHz_Mode 1



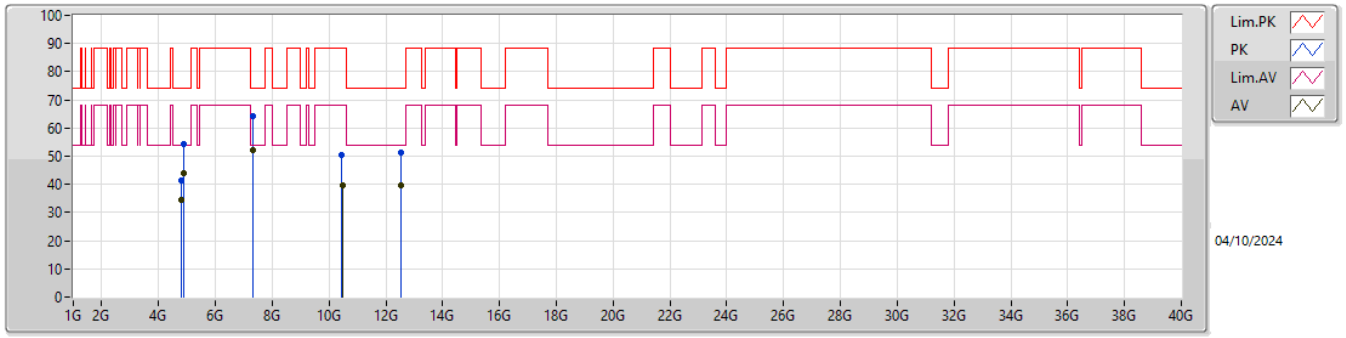
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	4.8134G	25.45	54.00	-28.55	-6.94	3	Horizontal	217	1.09	32.39	32.55	4.57	44.06
AV	4.86792G	25.88	54.00	-28.12	-6.66	3	Horizontal	206	1.13	32.54	32.77	4.62	44.05
AV	7.31848G	31.70	54.00	-22.30	-0.61	3	Horizontal	5	1.39	32.31	37.13	5.99	43.73
AV	10.48024G	37.44	68.20	-30.76	4.16	3	Horizontal	127	1.72	33.28	38.74	7.35	41.93
AV	12.53192G	35.81	54.00	-18.19	5.24	3	Horizontal	236	1.06	30.57	39.26	8.28	42.30
PK	4.80756G	38.76	74.00	-35.24	-6.96	3	Horizontal	217	1.09	45.72	32.53	4.57	44.06
PK	4.87272G	39.07	74.00	-34.93	-6.64	3	Horizontal	206	1.13	45.71	32.79	4.62	44.05
PK	7.31812G	45.11	74.00	-28.89	-0.61	3	Horizontal	5	1.39	45.72	37.13	5.99	43.73
PK	10.48012G	50.96	88.20	-37.24	4.16	3	Horizontal	127	1.72	46.80	38.74	7.35	41.93
PK	12.53652G	49.18	74.00	-24.82	5.25	3	Horizontal	236	1.06	43.93	39.27	8.28	42.30

Radiated Emissions above 1GHz_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV)	(dB/m)	(dB)	(dB)
AV	4.81104G	30.60	54.00	-23.40	-1.45	3	Vertical	262	1.79	32.05	32.57	4.21	38.23
AV	4.87392G	41.93	54.00	-12.07	-1.17	3	Vertical	98	2.89	43.10	32.80	4.24	38.21
AV	7.31156G	53.71	54.00	-0.29	6.28	3	Vertical	272	3.00	47.43	37.25	6.00	36.97
AV	10.482G	40.03	68.20	-28.17	9.11	3	Vertical	39	1.61	30.92	39.04	7.63	37.56
AV	12.508G	39.06	54.00	-14.94	9.70	3	Vertical	286	2.92	29.36	39.22	8.68	38.20
PK	4.8108G	40.07	74.00	-33.93	-1.46	3	Vertical	263	1.98	41.53	32.56	4.21	38.23
PK	4.87408G	51.96	74.00	-22.04	-1.17	3	Vertical	98	2.89	53.13	32.80	4.24	38.21
PK	7.30596G	65.18	74.00	-8.82	6.29	3	Vertical	267	3.00	58.89	37.28	5.99	36.98
PK	10.482G	50.32	88.20	-37.88	9.11	3	Vertical	39	1.61	41.21	39.04	7.63	37.56
PK	12.5712G	50.11	74.00	-23.89	9.81	3	Vertical	286	1.37	40.30	39.34	8.72	38.25

Radiated Emissions above 1GHz_Mode 2



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV)	(dB/m)	(dB)	(dB)
AV	4.81284G	34.30	54.00	-19.70	-1.43	3	Horizontal	158	2.10	35.73	32.58	4.22	38.23
AV	4.87384G	43.83	54.00	-10.17	-1.17	3	Horizontal	120	2.18	45.00	32.80	4.24	38.21
AV	7.31028G	52.37	54.00	-1.63	6.29	3	Horizontal	205	1.00	46.08	37.26	6.00	36.97
AV	10.4817G	39.46	68.20	-28.74	9.11	3	Horizontal	54	1.83	30.35	39.04	7.63	37.56
AV	12.53G	39.71	54.00	-14.29	9.74	3	Horizontal	253	1.55	29.97	39.26	8.70	38.22
PK	4.81016G	41.44	74.00	-32.56	-1.46	3	Horizontal	158	2.02	42.90	32.56	4.21	38.23
PK	4.87424G	54.41	74.00	-19.59	-1.17	3	Horizontal	120	2.18	55.58	32.80	4.24	38.21
PK	7.30588G	64.26	74.00	-9.74	6.29	3	Horizontal	205	1.00	57.97	37.28	5.99	36.98
PK	10.4565G	50.44	88.20	-37.76	9.13	3	Horizontal	54	2.43	41.31	39.09	7.61	37.57
PK	12.5288G	51.10	74.00	-22.90	9.74	3	Horizontal	253	1.50	41.36	39.26	8.70	38.22