FCC Radio Test Report

FCC ID	:	**2AGBW9290035826X**
Equipment	:	**Philips HUE bridge 3.0**
Brand Name	:	**PHILIPS ; hue ; signify**
Model Name	:	**9290035826**
Applicant	:	**Signify (China) Investment Co., Ltd. Building 9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233 China**
Manufacturer	:	**Signify (China) Investment Co., Ltd. Building 9, Lane 888, Tianlin Road, Minhang District, Shanghai 200233 China**
Standard	:	**47 CFR FCC Part 15.247**

The product was received on Jan. 17, 2024, and testing was started from Feb. 06, 2024 and completed on Mar. 16, 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.)

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History of this test report

Report No.	Version	Description	Issued Date
FR410307AZ	01	Initial issue of report	Jun. 07, 2024
FR410307AZ	02	Update brand name (This report is the latest version replacing for the report issued on Jun. 07, 2024)	Jun. 14, 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: Ann Hou

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	Zigbee	5	1

Note:.
- Zigbee 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
1	LITEON	CO0307AM	Print	N/A	2.4G+5G+BT
2	LITEON	CO0307AM	Print	N/A	Zigbee

Ant.	Port	Gain (dBi)			
		2.4G	5G	BT	Zigbee
1	1	2.7	2.8	2.7	-
2	2	-	-	-	2.8

Note 1: The EUT has two antennas.

For 2.4GHz function:

For IEEE 802.11 b/g/n mode (1TX/1RX)

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

For 5GHz function:

For IEEE 802.11 a/n/ac mode (1TX/1RX)

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

For BT function:

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

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

For Zigbee function:

For IEEE 802.15.4 Zigbee mode (1TX/1RX)

Ant. 2 (port 2) could transmit/receive.

Ant. 1 (port 1) and Ant. 2 (port 2) could transmit/receive simultaneously.

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	1	0	n/a (DC>=0.98)	n/a (DC>=0.98)

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

1.1.5 Table for Multiple Listing

Table for Explanation of SKU and 2nd Source

Object/part or Description (location)	Location	SKU 1	SKU 2	SKU 3	SKU 4
DDR4	U10	Brand: SK HYNIX Model: H5AG36EXNDX017	Brand: Samsung Model: K4A8G165WC-BCTD	Brand: NANYA Model: NT5AD512M16C4-JR	Brand: Micron Model: MT40A512M16TB-062E:R
eMMC	U21	Brand: KIOXIA Model: THGBMUG6C1LBAIL	Brand: KIOXIA Model: THGBMUG6C1LBAIL	Brand: SAMSUNG Model: KLM8G1GETF-B041	Brand: KIOXIA Model: THGBMUG6C1LBAIL
LAN transformer x1	T1	Brand: U-TRON Model: HSC-1607-R	Brand: GLGNET Model: GST16002HF	Brand: GLGNET Model: GST16002HF	Brand: GLGNET Model: GST16002HF
DC-DC buck x2	U4,U6	Brand: DIOO Model: DIO6012BCST5	Brand: DIOO Model: DIO6012BCST5	Brand: SILERGY Model: SY8089A1AAC	Brand: M3TEK Model: MT8152NSBR
DC-DC buck x2	U3,U5	Brand: SILERGY Model: SY8089E1AAC	Brand: JOULWATT Model: JW5262CFSOTA#TR	Brand: M3TEK Model: MT8152ASBR	Brand: RICHTEK Model: RT5752BHGJ5
LDO x3	U1,U11,U2	Brand: FITIPOWER Model: FP6186S5	Brand: ANPEC Model: APL5324ABI-TRG	Brand: FITIPOWER Model: FP6186S5	Brand: FITIPOWER Model: FP6186AS5
Adaptor	-	Brand: Tenpao Model: S005BMM0500100	Brand: PYS Model: PYS-06VY050100	-	-

From the above SKU, The SKU 1 was selected as representative model for the test and its data was recorded in this report. All SKUs were verified and SKU 1 was found to be the worst case.

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**
AC Conduction	CO04-HY	Edward Wang	21.1~21.4°C / 50~52%	15/Mar/2024
RF Conducted	TH07-HY	Xun Hsieh	22.4~23.6°C / 52~56%	07/Feb/2024~14/Mar/2024
Radiated (Co-location)	03CH03-HY	Edward Wang	21.3~22.5°C / 52~55%	16/Mar/2024
☒ Wenhua 3rd. **(TAF:** 3785**)**	**ADD:** No. 58, Aly. 75, Ln. 564, Wenhua 3rd Rd., Guishan Dist. Taoyuan City 333, Taiwan (R.O.C.)			
	TEL: 886-3-327-0868			
Test site Designation No. TW0036 with FCC.				
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**
Radiated	03CH26-HY	Rian Zhong	21.3~22.4°C / 51~54%	06/Feb/2024~14/Mar/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 Release0.62

Mode	Power Setting
Zigbee	-
2405MHz	9
2440MHz	9
2480MHz	10

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	**X Plane**	**Y Plane**	**Z Plane**
			
Worst Planes of EUT		V	

The Worst Case Mode for Following Conformance Tests	
Tests Item	Simultaneous Transmission Analysis
Operating Mode	CTX
1	2.4GHz WLAN + Bluetooth + ZigBee
2	5GHz WLAN + Bluetooth + ZigBee
Refer to Sporton Test Report No.: FA410307 for Co-location RF Exposure Evaluation and Appendix G for Radiated Emission Co-location.	

2.3 Accessories

Accessories				
AC Adapter (Source 1) (EU Plug) (US Plug) (AUS/NZ Plug) (UK Plug)	Brand Name	Tenpao	Model Name	S005BMM0500100
	Manufacturer	Ten Pao Electronics(Hulzhou) Co., Ltd		
	Power Rating	I/P: 100-240Vac, 50/60Hz, 0.3A, O/P: 5Vdc, 1.0A		
	Power Cord	1.5 meter, non-shielded cable, w/o ferrite core		
AC Adapter (Source 2) (EU Plug) (US Plug) (UK Plug) (AUS/NZ Plug)	Brand Name	PYS	Model Name	PYS-06VY050100
	Manufacturer	PYS High-Tech Co.LTD		
	Power Rating	I/P: 100-240Vac, 50/60Hz, 0.3A, O/P: 5Vdc, 1.0A		
	Power Cord	1.5 meter, non-shielded cable, w/o ferrite core		
RJ45 Cable	Signal Line	1.5 meter, non-shielded cable		

2.4 Support Equipment

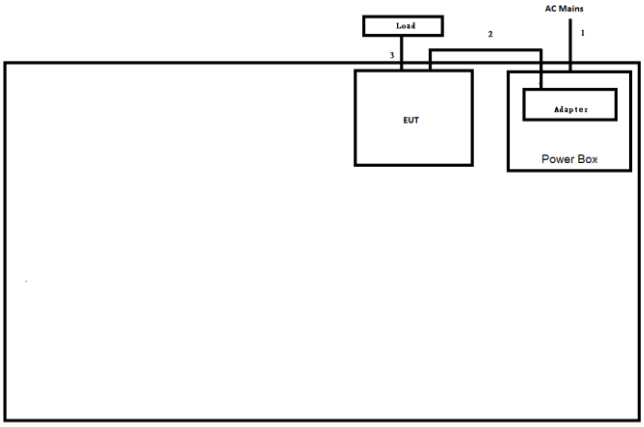
Support Equipment – AC Conduction					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Load	Sporton	Sporton	-	-

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

Support Equipment – Radiated					
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**	**Remark**
1	Load	Sporton	Sporton	-	-
2	Hue Bridge (Remote)	Philips	9290035826	-	Provided by Customer
3	Smart Phone (Remote)	SONY	XPERIA Z	-	-
4	AP Router (Remote)	TP-LINK	Archer AX10	-	-
5	NB *3 (Remote)	DELL	Latitude 7290	-	-
6	RJ-45 Cable (Remote)	Power Sync	CAT-6E-10	-	-
7	RJ-45 Cable (Remote)	Power Sync	CAT-6E-01	-	-

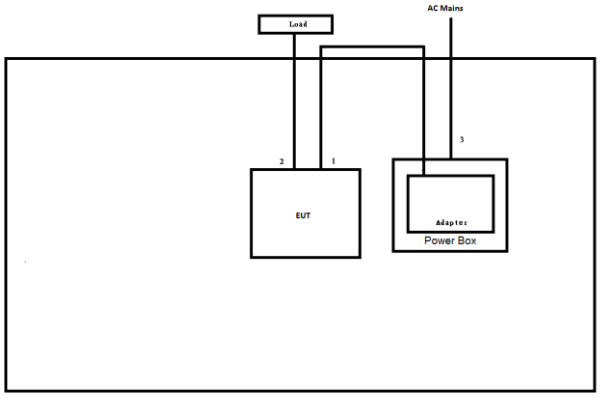
2.5 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test



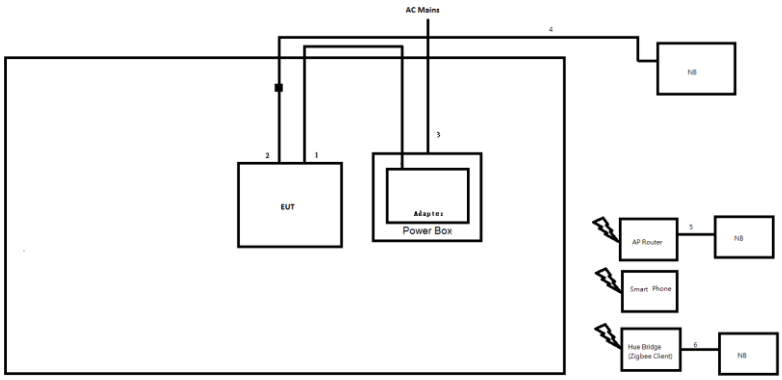
Item	Connection	Shielded	Length(m)	Remark
1	AC Power Cable	No	1.8	-
2	DC Power Cable	No	1.5	-
3	RJ45 Cable	No	1.5	-

Test Setup Diagram - Radiated Test



Item	Connection	Shielded	Length(m)	Remark
1	DC Power Cable	NO	1.5	-
2	RJ45 Cable	NO	1.5	-
3	AC Power Cable	NO	1.8	-

Test Setup Diagram - Radiated Test (Co-location)



Item	Connection	Shielded	Length(m)	Remark
1	DC Power Cable	NO	1.5	-
2	RJ45 Cable	NO	1.5	-
3	AC Power Cable	NO	1.8	-
4	RJ45 Cable	NO	10.0	-
5	RJ45 Cable	NO	1.0	-
6	RJ45 Cable	NO	1.0	-

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

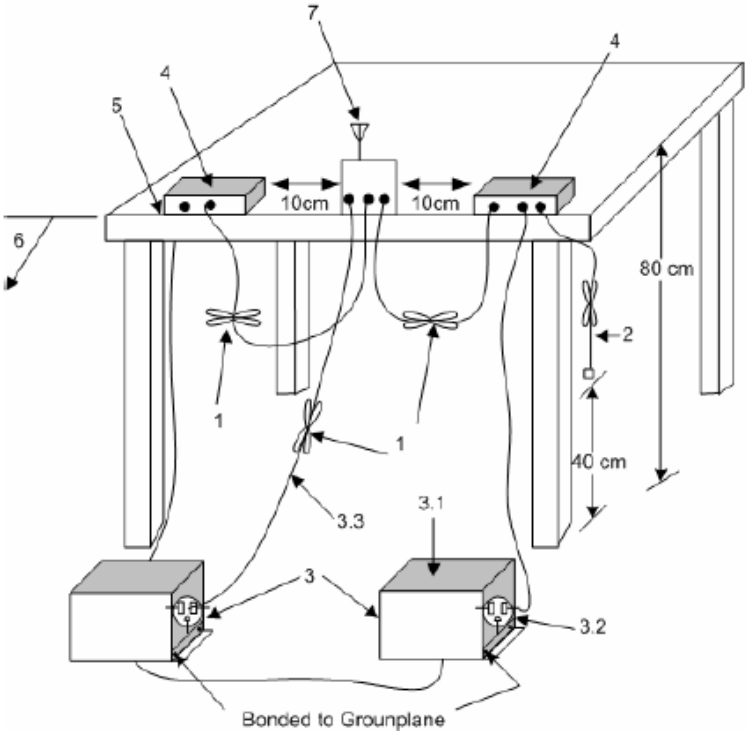
Test Method
☒ Refer as ANSI C63.10-2013, clause 6.2 for AC power-line conducted emissions.

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.

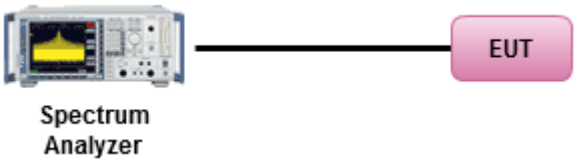
3.2.2 Measuring Instruments

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

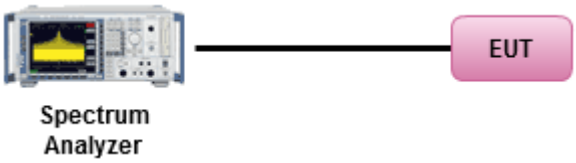
3.4.2 Measuring Instruments

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
 Spectrum Analyzer

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.	

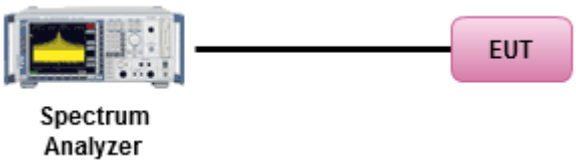
3.5.2 Measuring Instruments

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.

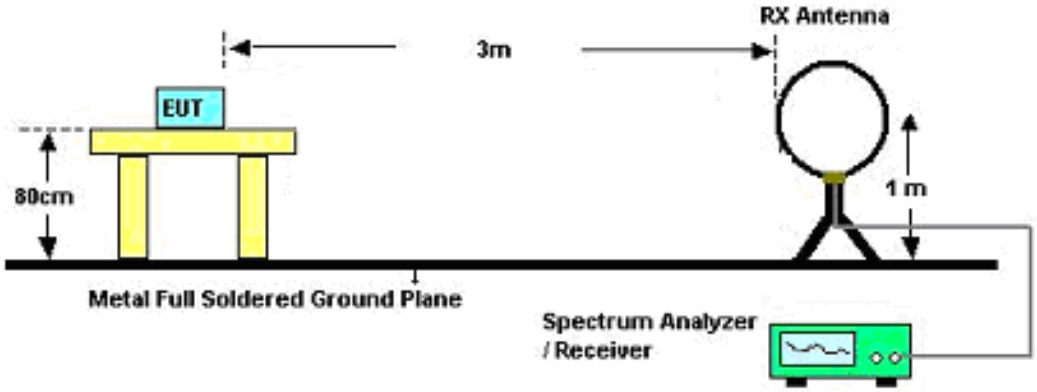
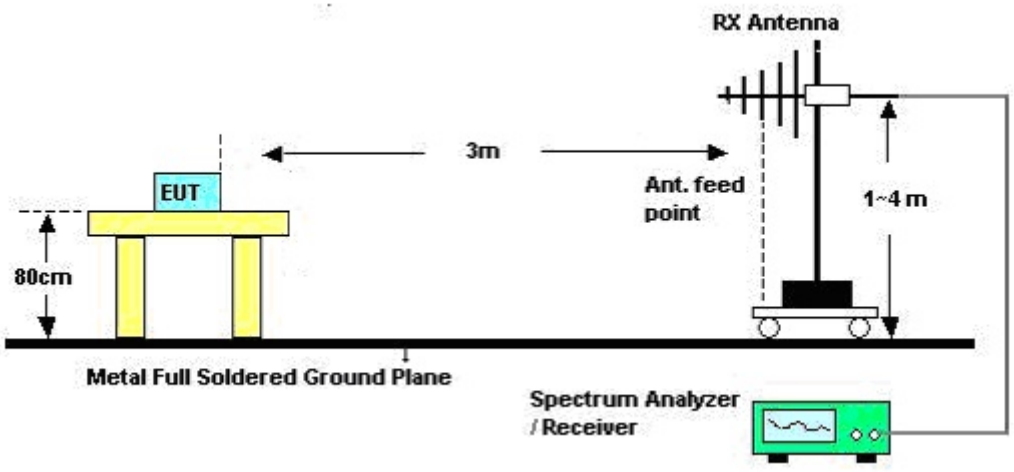
3.6.3 Test Procedures

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.

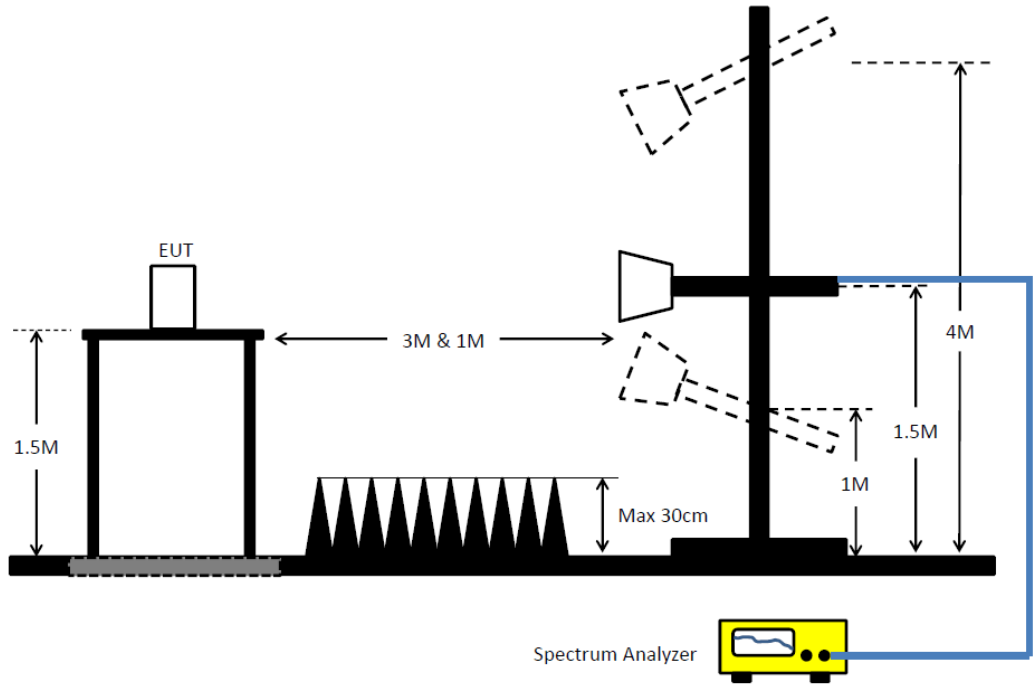
3.6.4 Measurement Results Calculation

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	R&S	ESR	102051	9kHz ~ 3.6GHz	16/May/2023	15/May/2024
Two-Line V-Network	R&S	ENV 216	101295	9kHz ~ 30MHz	05/Feb/2024	04/Feb/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	101515	9kHz~40GHz	02/Feb/2024	01/Feb/2025
SMB100A Signal Generator	R&S	SMB100A	181147	100kHz~40GHz	20/Oct/2023	19/Oct/2024
Power Meter	Anritsu	ML2495A	1517010	300MHz~40GHz	15/Dec/2023	14/Dec/2024
Pulse Sensor	Anritsu	MA2411B	1339407	300MHz~40GHz	15/Dec/2023	14/Dec/2024
SENSE-15247_DTS	Sporton	V5.11.16	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	03CH26-HY	30MHz~1GHz 3m	08/Aug/2023	07/Aug/2024
3m Semi Anechoic Chamber	TDK	SAC-3M	03CH26-HY	1GHz~18GHz 3m	08/Aug/2023	07/Aug/2024
EMI Test Receiver	ROHDE & SCHWARZ	ESR	102318	9kHz~3.6GHz	27/Dec/2023	26/Dec/2024
Signal Analyzer	ROHDE&SCHWARZ	FSV3044	101411	10Hz~44GHz	06/Oct/2023	05/Oct/2024
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	23/Mar/2023	22/Mar/2024
Bilog Antenna & 6dB Attenuator	TESEQ & VGT	CBL 6111D & VFA 04002-06	63540/002	30MHz~1GHz	06/Jun/2023	05/Jun/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	02877	1GHz~18GHz	12/Jul/2023	11/Jul/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	01248	18GHz~40GHz	21/Aug/2023	20/Aug/2024
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB009	9kHz~1GHz	18/Oct/2023	17/Oct/2024
RF Cable	HUBER+SUHNER	SUOFLEX 104	CB009	1GHz~40GHz	18/Oct/2023	17/Oct/2024
Preamplifier	SGH	PRAMP 903	20230515-2	25MHz~3GHz	25/May/2023	24/May/2024
Preamplifier	SGH	PRAMP 118-H	20230515-4	1GHz ~18GHz	25/May/2023	24/May/2024
Microwave Premplifier	EMC INSTRUMENTS	EM18G40G	060874	18GHz ~ 40GHz	18/AUG/2023	17/Aug/2024
SENSE-15.247-DTS	Sporton	V5.11.16	NA	NA	NA	NA

Instrument for Radiated Test (Co-location)

Instrument	Manufacturer /Brand	Model No.	Serial No.	Spec.	Calibration Date	Calibration Due Date
3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	1GHz~18GHz 3m	28/Jul/2023	27/Jul/2024
Signal Analyzer	R&S	FSV40	101500	10Hz~40GHz	26/Oct/2023	25/Oct/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120 D	2267	1GHz~18GHz	04/Oct/2023	03/Oct/2024
Broadband Horn Antenna	SCHWARZBECK	BBHA 9170	1248	18GHz ~ 40GHz	21/Aug/2023	20/Aug/2024
RF CABLE 5+8 m	HUBER+SUHNER	SUOFLEX 104	03CH03-cable-03	1GHz~40GHz	20/Feb/2024	19/Feb/2025
Microwave Preamplifier	Agilent	8449B	3008A02326	1GHz~26.5GHz	26/Jul/2023	25/Jul/2024
Microwave Preamplifier	EMC INSTRUMENTS	EM18G40G	060874	18GHz ~ 40GHz	18/Aug/2023	17/Aug /2024
SENSE-EMI	Sporton	V5.11.6	N/A	N/A	N/A	N/A

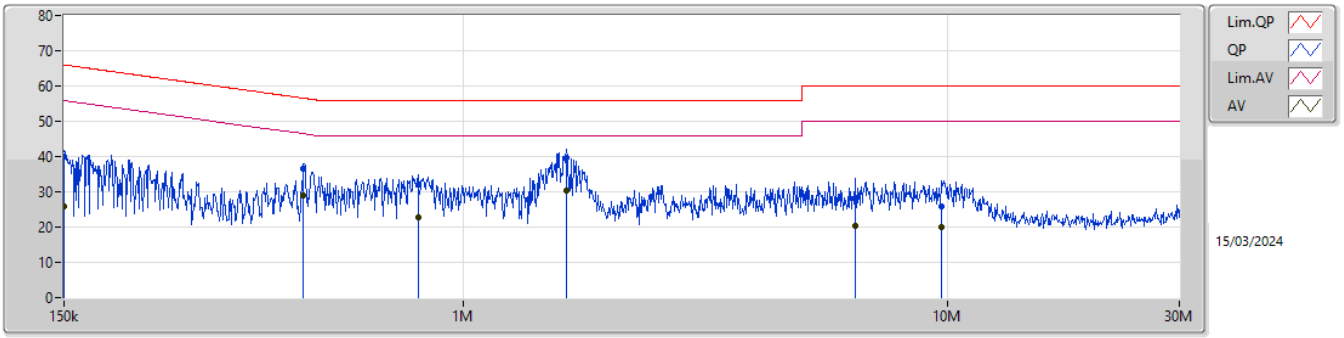
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	AV	469.822k	32.86	46.52	-13.66	Neutral

Result

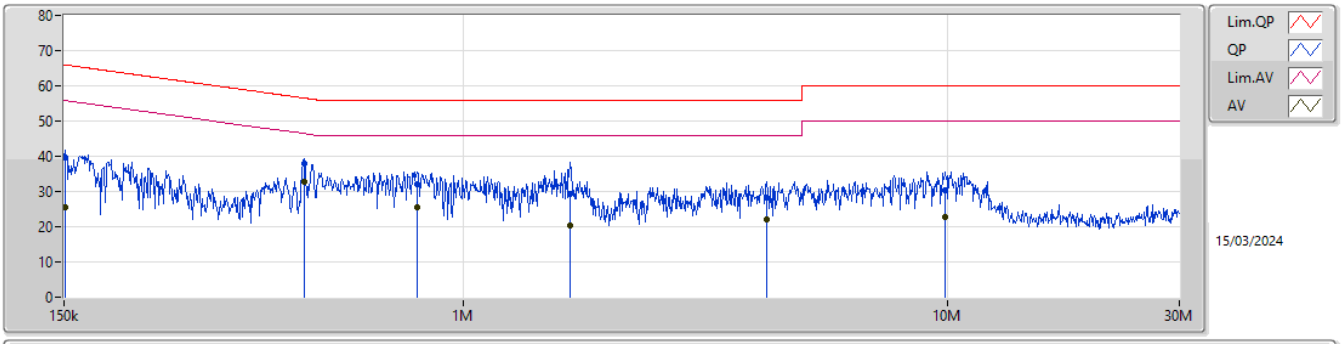
Mode	Result	Type	Freq (Hz)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Condition
Mode 1	Pass	QP	150k	39.88	66.00	-26.12	Line
Mode 1	Pass	AV	150k	25.99	56.00	-30.01	Line
Mode 1	Pass	QP	467.95k	36.45	56.55	-20.10	Line
Mode 1	Pass	AV	467.95k	28.81	46.55	-17.74	Line
Mode 1	Pass	QP	805.349k	32.07	56.00	-23.93	Line
Mode 1	Pass	AV	805.349k	22.61	46.00	-23.39	Line
Mode 1	Pass	QP	1.632M	39.70	56.00	-16.30	Line
Mode 1	Pass	AV	1.632M	30.43	46.00	-15.57	Line
Mode 1	Pass	QP	6.42M	28.11	60.00	-31.89	Line
Mode 1	Pass	AV	6.42M	20.28	50.00	-29.72	Line
Mode 1	Pass	QP	9.685M	25.95	60.00	-34.05	Line
Mode 1	Pass	AV	9.685M	19.85	50.00	-30.15	Line
Mode 1	Pass	QP	150.6k	39.54	65.96	-26.42	Neutral
Mode 1	Pass	AV	150.6k	25.58	55.96	-30.38	Neutral
Mode 1	Pass	QP	469.822k	38.07	56.52	-18.45	Neutral
Mode 1	Pass	AV	469.822k	32.86	46.52	-13.66	Neutral
Mode 1	Pass	QP	802.141k	31.95	56.00	-24.05	Neutral
Mode 1	Pass	AV	802.141k	25.46	46.00	-20.54	Neutral
Mode 1	Pass	QP	1.659M	29.44	56.00	-26.56	Neutral
Mode 1	Pass	AV	1.659M	20.28	46.00	-25.72	Neutral
Mode 1	Pass	QP	4.222M	28.12	56.00	-27.88	Neutral
Mode 1	Pass	AV	4.222M	22.08	46.00	-23.92	Neutral
Mode 1	Pass	QP	9.88M	30.48	60.00	-29.52	Neutral
Mode 1	Pass	AV	9.88M	22.60	50.00	-27.40	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	150k	39.88	66.00	-26.12	19.44	Line	-	20.44	9.61	0.07	9.76
AV	150k	25.99	56.00	-30.01	19.44	Line	-	6.55	9.61	0.07	9.76
QP	467.95k	36.45	56.55	-20.10	19.49	Line	-	16.96	9.61	0.11	9.77
AV	467.95k	28.81	46.55	-17.74	19.49	Line	-	9.32	9.61	0.11	9.77
QP	805.349k	32.07	56.00	-23.93	19.50	Line	-	12.57	9.61	0.10	9.79
AV	805.349k	22.61	46.00	-23.39	19.50	Line	-	3.11	9.61	0.10	9.79
QP	1.632M	39.70	56.00	-16.30	19.52	Line	-	20.18	9.62	0.10	9.80
AV	1.632M	30.43	46.00	-15.57	19.52	Line	-	10.91	9.62	0.10	9.80
QP	6.42M	28.11	60.00	-31.89	19.50	Line	-	8.61	9.65	0.06	9.79
AV	6.42M	20.28	50.00	-29.72	19.50	Line	-	0.78	9.65	0.06	9.79
QP	9.685M	25.95	60.00	-34.05	19.50	Line	-	6.45	9.66	0.05	9.79
AV	9.685M	19.85	50.00	-30.15	19.50	Line	-	0.35	9.66	0.05	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	150.6k	39.54	65.96	-26.42	19.45	Neutral	-	20.09	9.62	0.07	9.76
AV	150.6k	25.58	55.96	-30.38	19.45	Neutral	-	6.13	9.62	0.07	9.76
QP	469.822k	38.07	56.52	-18.45	19.49	Neutral	-	18.58	9.61	0.11	9.77
AV	469.822k	32.86	46.52	-13.66	19.49	Neutral	-	13.37	9.61	0.11	9.77
QP	802.141k	31.95	56.00	-24.05	19.50	Neutral	-	12.45	9.61	0.10	9.79
AV	802.141k	25.46	46.00	-20.54	19.50	Neutral	-	5.96	9.61	0.10	9.79
QP	1.659M	29.44	56.00	-26.56	19.52	Neutral	-	9.92	9.62	0.10	9.80
AV	1.659M	20.28	46.00	-25.72	19.52	Neutral	-	0.76	9.62	0.10	9.80
QP	4.222M	28.12	56.00	-27.88	19.50	Neutral	-	8.62	9.64	0.07	9.79
AV	4.222M	22.08	46.00	-23.92	19.50	Neutral	-	2.58	9.64	0.07	9.79
QP	9.88M	30.48	60.00	-29.52	19.53	Neutral	-	10.95	9.69	0.05	9.79
AV	9.88M	22.60	50.00	-27.40	19.53	Neutral	-	3.07	9.69	0.05	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	1.719M	2.249M	2M25G1D	1.606M	2.224M

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

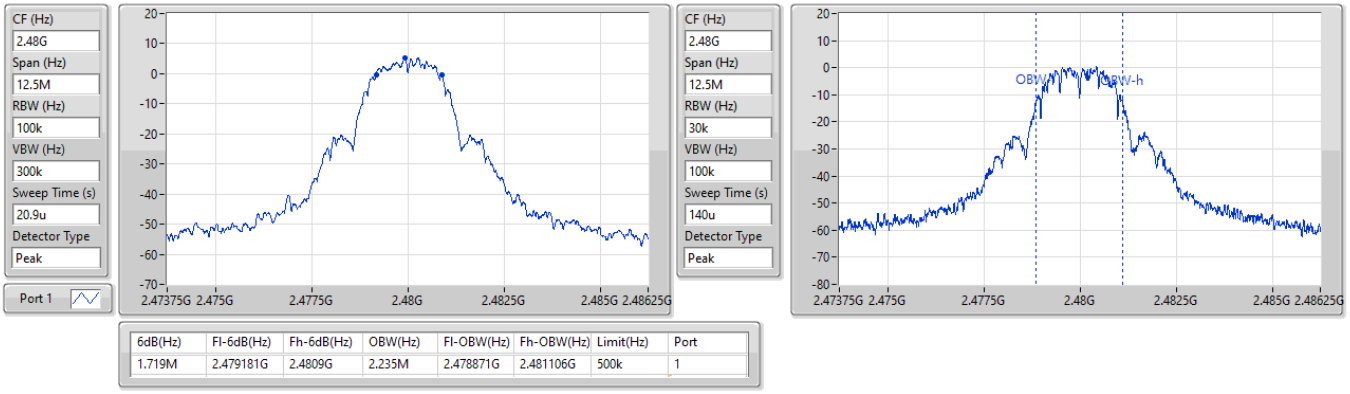
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Zigbee	-	-	-	-
2405MHz	Pass	500k	1.65M	2.249M
2440MHz	Pass	500k	1.606M	2.224M
2480MHz	Pass	500k	1.719M	2.235M

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

2.4-2.4835GHz_Zigbee **EBW**

2480MHz

12/03/2024



6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.719M	2.479181G	2.4809G	2.235M	2.478871G	2.481106G	500k	1

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
Zigbee	9.90	0.00977

Result

Mode	Result	DG (dBi)	Port 1 (dBm)	Total Power (dBm)	Power Limit (dBm)
Zigbee	-	-	-	-	-
2405MHz	Pass	2.80	9.67	9.67	30.00
2440MHz	Pass	2.80	9.47	9.47	30.00
2480MHz	Pass	2.80	9.90	9.90	30.00

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

Summary

Mode	PD (dBm/RBW)
2.4-2.4835GHz	-
Zigbee	-7.41

RBW = 3kHz;

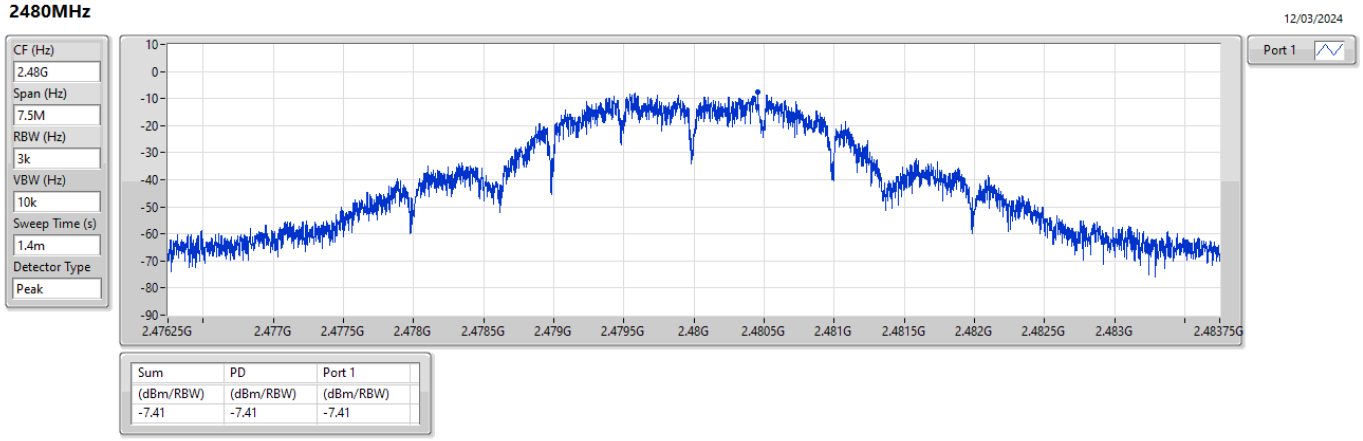
Result

Mode	Result	DG (dBi)	Port 1 (dBm/RBW)	PD (dBm/RBW)	PD Limit (dBm/RBW)
Zigbee	-	-	-	-	-
2405MHz	Pass	2.80	-7.99	-7.99	8.00
2440MHz	Pass	2.80	-7.78	-7.78	8.00
2480MHz	Pass	2.80	-7.41	-7.41	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;

2.4-2.4835GHz_Zigbee **PSD**

2480MHz



Sum	PD	Port 1
(dBm/RBW)	(dBm/RBW)	(dBm/RBW)
-7.41	-7.41	-7.41

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	2.48033G	5.95	-24.05	2.1074G	-55.18	2.39996G	-47.77	2.4G	-47.06	2.50242G	-52.78	21.50461G	-44.24	1

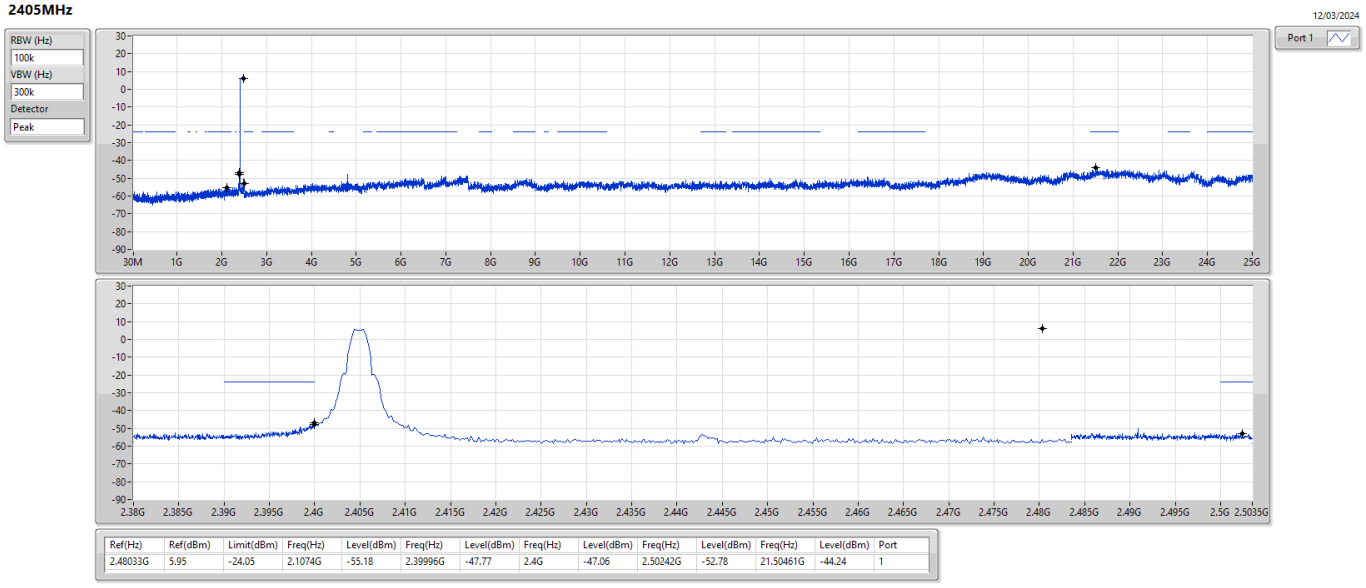
Result

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	2.48033G	5.95	-24.05	2.1074G	-55.18	2.39996G	-47.77	2.4G	-47.06	2.50242G	-52.78	21.50461G	-44.24	1
2440MHz	Pass	2.48033G	5.95	-24.05	2.08743G	-55.24	2.39212G	-53.46	2.4G	-57.13	2.50154G	-53.09	21.47086G	-44.74	1
2480MHz	Pass	2.48033G	5.95	-24.05	2.04395G	-53.98	2.3942G	-52.61	2.4G	-56.10	2.50154G	-51.98	21.56366G	-44.33	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
2.48033G	5.95	-24.05	2.1074G	-55.18	2.39996G	-47.77	2.4G	-47.06	2.50242G	-52.78	21.50461G	-44.24	1

Summary

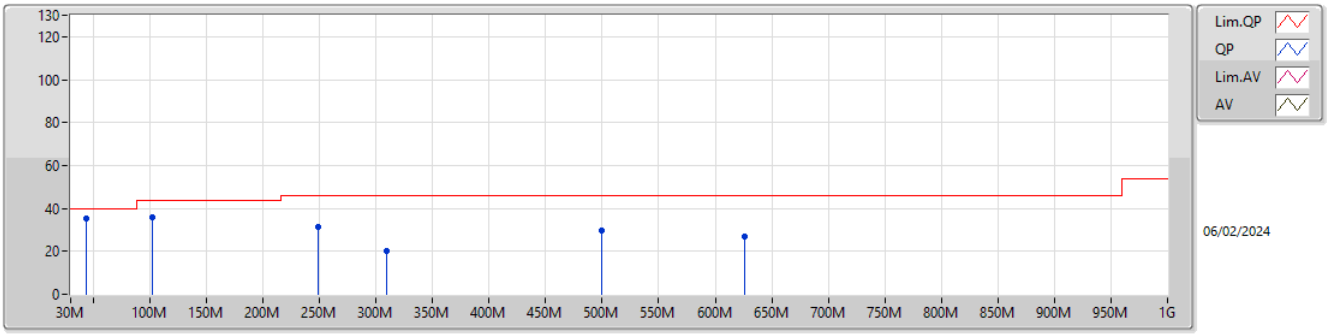
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	QP	43.58M	35.26	40.00	-4.74	3	Vertical	173	1.00

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	PK	101.78M	35.93	43.50	-7.57	3	Vertical	0	1.00
2405MHz	Pass	PK	249.22M	31.31	46.00	-14.69	3	Vertical	0	1.00
2405MHz	Pass	PK	309.36M	20.09	46.00	-25.91	3	Vertical	0	1.00
2405MHz	Pass	PK	499.48M	29.68	46.00	-16.32	3	Vertical	0	1.00
2405MHz	Pass	PK	625.58M	27.14	46.00	-18.86	3	Vertical	0	1.00
2405MHz	Pass	QP	43.58M	35.26	40.00	-4.74	3	Vertical	173	1.00
2405MHz	Pass	PK	101.78M	35.99	43.50	-7.51	3	Horizontal	360	1.00
2405MHz	Pass	PK	163.86M	27.52	43.50	-15.98	3	Horizontal	360	1.00
2405MHz	Pass	PK	249.22M	34.13	46.00	-11.87	3	Horizontal	360	1.00
2405MHz	Pass	PK	375.32M	24.77	46.00	-21.23	3	Horizontal	360	1.00
2405MHz	Pass	PK	499.48M	29.94	46.00	-16.06	3	Horizontal	360	1.00
2405MHz	Pass	PK	633.34M	24.79	46.00	-21.21	3	Horizontal	360	1.00

2.4-2.4835GHz_Zigbee

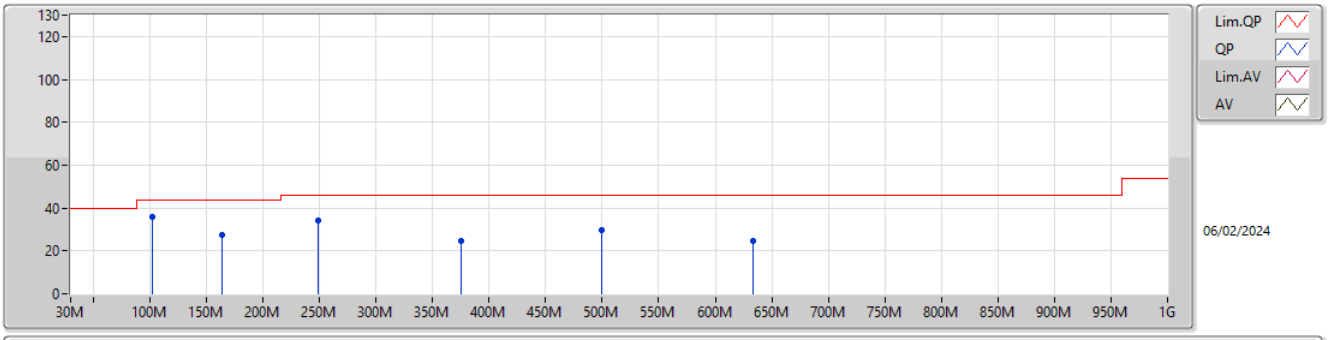
2405MHz_TX



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)
PK	101.78M	35.93	43.50	-7.57	-26.84	3	Vertical	0	1.00	62.77	16.52	0.97	44.33
PK	249.22M	31.31	46.00	-14.69	-23.82	3	Vertical	0	1.00	55.13	18.79	1.48	44.09
PK	309.36M	20.09	46.00	-25.91	-22.86	3	Vertical	0	1.00	42.95	19.49	1.65	44.00
PK	499.48M	29.68	46.00	-16.32	-17.44	3	Vertical	0	1.00	47.12	24.19	2.11	43.74
PK	625.58M	27.14	46.00	-18.86	-14.67	3	Vertical	0	1.00	41.81	26.62	2.27	43.56
QP	43.58M	35.26	40.00	-4.74	-25.45	3	Vertical	173	1.00	60.71	18.16	0.63	44.24

2.4-2.4835GHz_Zigbee

2405MHz_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)
PK	101.78M	35.99	43.50	-7.51	-26.84	3	Horizontal	360	1.00	62.83	16.52	0.97	44.33
PK	163.86M	27.52	43.50	-15.98	-26.77	3	Horizontal	360	1.00	54.29	16.23	1.22	44.22
PK	249.22M	34.13	46.00	-11.87	-23.82	3	Horizontal	360	1.00	57.95	18.79	1.48	44.09
PK	375.32M	24.77	46.00	-21.23	-20.92	3	Horizontal	360	1.00	45.69	21.21	1.77	43.90
PK	499.48M	29.94	46.00	-16.06	-17.44	3	Horizontal	360	1.00	47.38	24.19	2.11	43.74
PK	633.34M	24.79	46.00	-21.21	-14.40	3	Horizontal	360	1.00	39.19	26.87	2.28	43.55

Summary

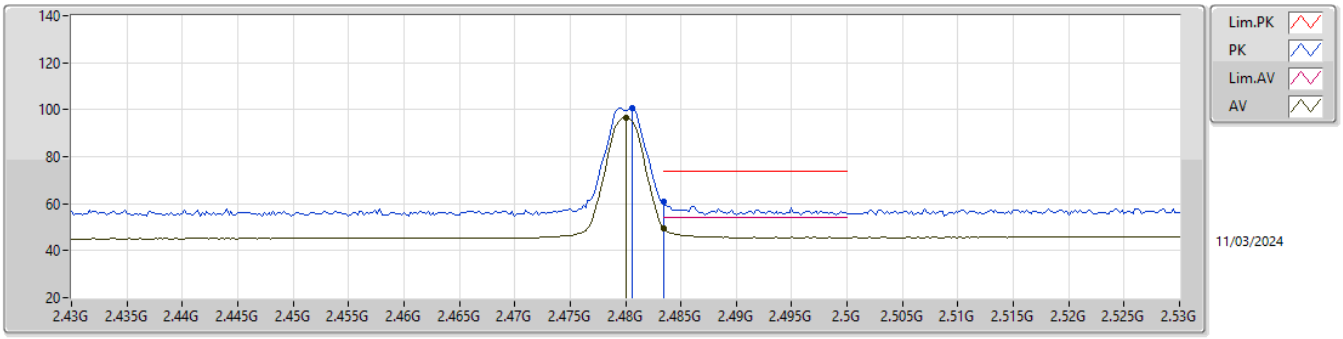
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-
Zigbee	Pass	AV	2.4835G	52.57	54.00	-1.43	3	Horizontal	209	1.50

Result

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Zigbee	-	-	-	-	-	-	-	-	-	-
2405MHz	Pass	AV	2.3664G	46.93	54.00	-7.07	3	Vertical	288	2.23
2405MHz	Pass	AV	2.405G	99.83	Inf	-Inf	3	Vertical	288	2.23
2405MHz	Pass	PK	2.3706G	59.49	74.00	-14.51	3	Vertical	288	2.23
2405MHz	Pass	PK	2.4044G	101.97	Inf	-Inf	3	Vertical	288	2.23
2405MHz	Pass	AV	2.3662G	47.40	54.00	-6.60	3	Horizontal	192	2.26
2405MHz	Pass	AV	2.405G	105.48	Inf	-Inf	3	Horizontal	192	2.26
2405MHz	Pass	PK	2.3666G	59.32	74.00	-14.68	3	Horizontal	192	2.26
2405MHz	Pass	PK	2.4044G	107.62	Inf	-Inf	3	Horizontal	192	2.26
2405MHz	Pass	AV	4.811G	31.99	54.00	-22.01	3	Vertical	24	1.50
2405MHz	Pass	PK	4.81154G	44.22	74.00	-29.78	3	Vertical	24	1.50
2405MHz	Pass	AV	4.81098G	36.26	54.00	-17.74	3	Horizontal	239	1.88
2405MHz	Pass	PK	4.81105G	46.43	74.00	-27.57	3	Horizontal	239	1.88
2440MHz	Pass	AV	2.3644G	44.97	54.00	-9.03	3	Vertical	270	1.20
2440MHz	Pass	AV	2.44G	97.17	Inf	-Inf	3	Vertical	270	1.20
2440MHz	Pass	AV	2.4956G	45.75	54.00	-8.25	3	Vertical	270	1.20
2440MHz	Pass	PK	2.3704G	57.19	74.00	-16.81	3	Vertical	270	1.20
2440MHz	Pass	PK	2.4404G	101.04	Inf	-Inf	3	Vertical	270	1.20
2440MHz	Pass	PK	2.4932G	57.72	74.00	-16.28	3	Vertical	270	1.20
2440MHz	Pass	AV	2.39G	45.04	54.00	-8.96	3	Horizontal	200	1.50
2440MHz	Pass	AV	2.44G	101.42	Inf	-Inf	3	Horizontal	200	1.50
2440MHz	Pass	AV	2.492G	45.77	54.00	-8.23	3	Horizontal	200	1.50
2440MHz	Pass	PK	2.3736G	57.79	74.00	-16.21	3	Horizontal	200	1.50
2440MHz	Pass	PK	2.4404G	105.20	Inf	-Inf	3	Horizontal	200	1.50
2440MHz	Pass	PK	2.4984G	57.87	74.00	-16.13	3	Horizontal	200	1.50
2440MHz	Pass	AV	4.87898G	33.37	54.00	-20.63	3	Vertical	190	1.76
2440MHz	Pass	AV	7.31838G	39.99	54.00	-14.01	3	Vertical	335	1.50
2440MHz	Pass	PK	4.88113G	45.05	74.00	-28.95	3	Vertical	190	1.76
2440MHz	Pass	PK	7.31867G	51.45	74.00	-22.55	3	Vertical	335	1.50
2440MHz	Pass	AV	4.87898G	35.54	54.00	-18.46	3	Horizontal	243	1.62
2440MHz	Pass	AV	7.32155G	42.20	54.00	-11.80	3	Horizontal	43	1.50
2440MHz	Pass	PK	4.8813G	45.82	74.00	-28.18	3	Horizontal	243	1.62
2440MHz	Pass	PK	7.32165G	53.59	74.00	-20.41	3	Horizontal	43	1.50
2480MHz	Pass	AV	2.48G	96.72	Inf	-Inf	3	Vertical	240	1.32
2480MHz	Pass	AV	2.4835G	49.39	54.00	-4.61	3	Vertical	240	1.32
2480MHz	Pass	PK	2.4806G	100.50	Inf	-Inf	3	Vertical	240	1.32
2480MHz	Pass	PK	2.4835G	60.68	74.00	-13.32	3	Vertical	240	1.32
2480MHz	Pass	AV	2.48G	101.50	Inf	-Inf	3	Horizontal	209	1.50
2480MHz	Pass	AV	2.4835G	52.57	54.00	-1.43	3	Horizontal	209	1.50
2480MHz	Pass	PK	2.4794G	105.30	Inf	-Inf	3	Horizontal	209	1.50
2480MHz	Pass	PK	2.4835G	63.08	74.00	-10.92	3	Horizontal	209	1.50
2480MHz	Pass	AV	4.95898G	32.26	54.00	-21.74	3	Vertical	9	1.10
2480MHz	Pass	AV	7.43848G	40.22	54.00	-13.78	3	Vertical	342	1.28
2480MHz	Pass	PK	4.9589G	44.51	74.00	-29.49	3	Vertical	9	1.10
2480MHz	Pass	PK	7.44144G	51.87	74.00	-22.13	3	Vertical	342	1.28
2480MHz	Pass	AV	4.95902G	34.42	54.00	-19.58	3	Horizontal	237	1.79
2480MHz	Pass	AV	7.4384G	41.09	54.00	-12.91	3	Horizontal	37	1.76
2480MHz	Pass	PK	4.95876G	45.81	74.00	-28.19	3	Horizontal	237	1.79
2480MHz	Pass	PK	7.43836G	51.70	74.00	-22.30	3	Horizontal	37	1.76

2.4-2.4835GHz_Zigbee

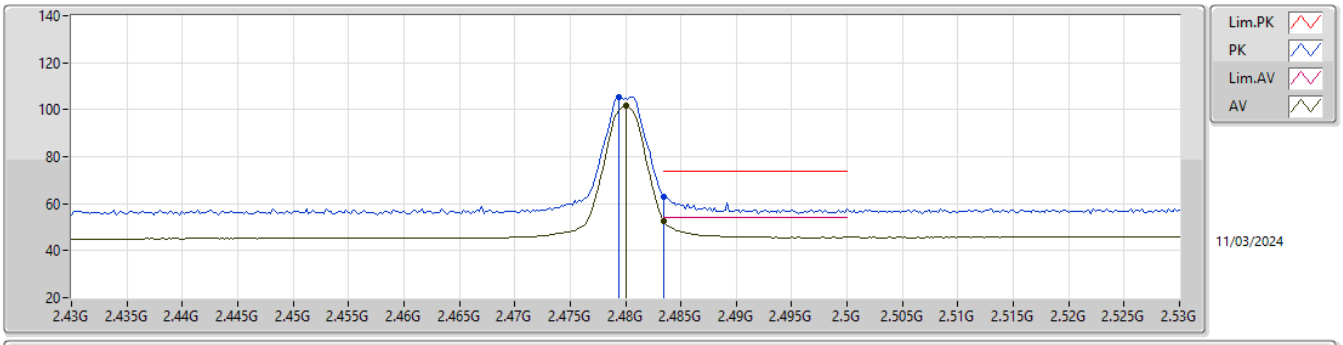
2480MHz_TX



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	96.72	Inf	-Inf	32.56	3	Vertical	240	1.32	64.16	27.90	4.66	-
AV	2.4835G	49.39	54.00	-4.61	32.57	3	Vertical	240	1.32	16.82	27.90	4.67	-
PK	2.4806G	100.50	Inf	-Inf	32.56	3	Vertical	240	1.32	67.94	27.90	4.66	-
PK	2.4835G	60.68	74.00	-13.32	32.57	3	Vertical	240	1.32	28.11	27.90	4.67	-

2.4-2.4835GHz_Zigbee

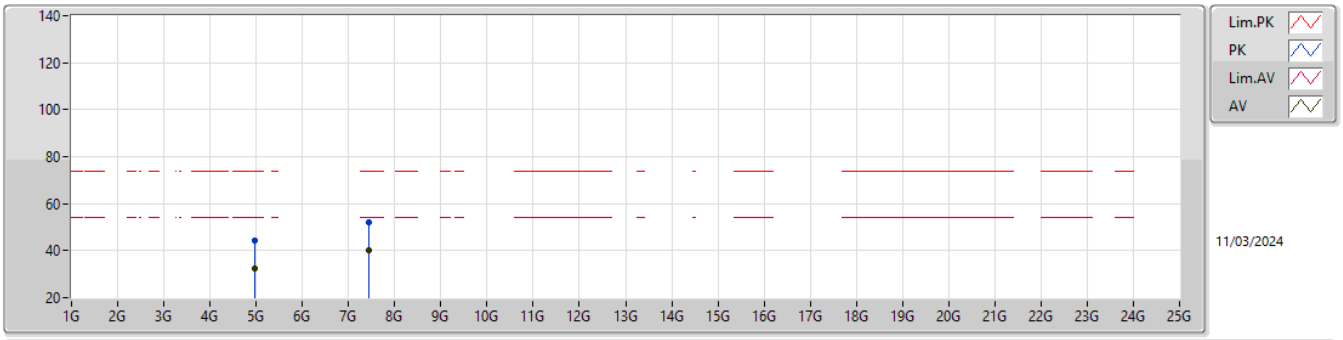
2480MHz_TX



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	101.50	Inf	-Inf	32.56	3	Horizontal	209	1.50	68.94	27.90	4.66	-
AV	2.4835G	52.57	54.00	-1.43	32.57	3	Horizontal	209	1.50	20.00	27.90	4.67	-
PK	2.4794G	105.30	Inf	-Inf	32.55	3	Horizontal	209	1.50	72.75	27.89	4.66	-
PK	2.4835G	63.08	74.00	-10.92	32.57	3	Horizontal	209	1.50	30.51	27.90	4.67	-

2.4-2.4835GHz_Zigbee

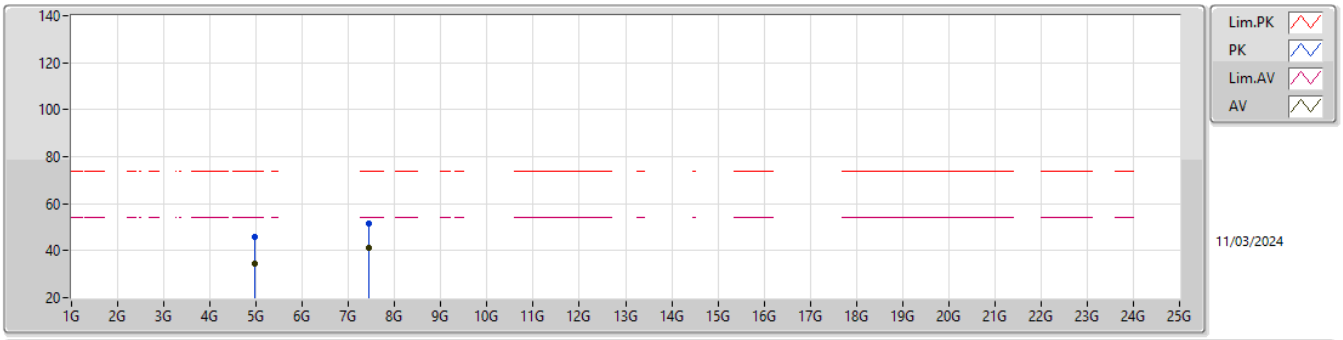
2480MHz_TX



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	4.95898G	32.26	54.00	-21.74	-5.71	3	Vertical	9	1.10	37.97	33.07	7.00	45.78
AV	7.43848G	40.22	54.00	-13.78	-0.75	3	Vertical	342	1.28	40.97	36.45	8.12	45.32
PK	4.9589G	44.51	74.00	-29.49	-5.71	3	Vertical	9	1.10	50.22	33.07	7.00	45.78
PK	7.44144G	51.87	74.00	-22.13	-0.77	3	Vertical	342	1.28	52.64	36.43	8.12	45.32

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	4.95902G	34.42	54.00	-19.58	-5.71	3	Horizontal	237	1.79	40.13	33.07	7.00	45.78
AV	7.4384G	41.09	54.00	-12.91	-0.75	3	Horizontal	37	1.76	41.84	36.45	8.12	45.32
PK	4.95876G	45.81	74.00	-28.19	-5.71	3	Horizontal	237	1.79	51.52	33.07	7.00	45.78
PK	7.43836G	51.70	74.00	-22.30	-0.75	3	Horizontal	37	1.76	52.45	36.45	8.12	45.32

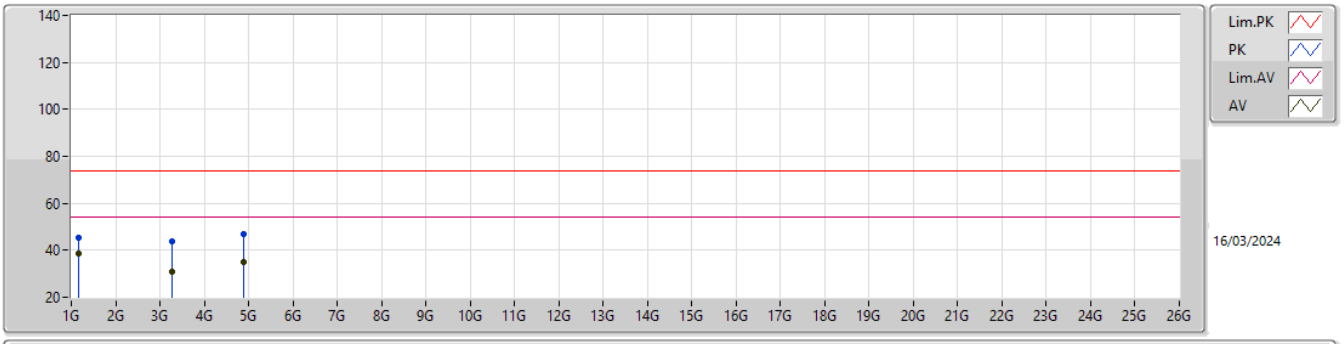
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	AV	1.17615G	39.66	54.00	-14.34	Horizontal
Mode 2	Pass	AV	1.17617G	40.11	54.00	-13.89	Horizontal

Result

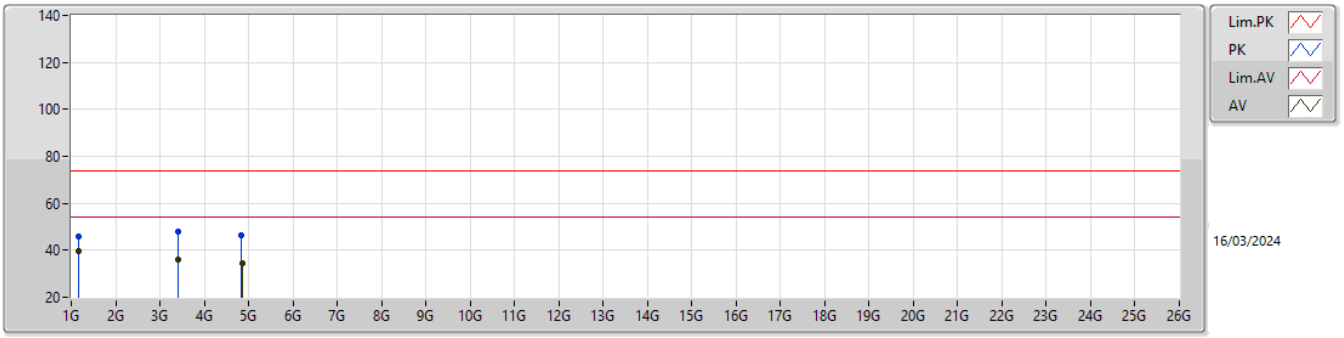
Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)
Mode 1	Pass	AV	1.17614G	38.66	54.00	-15.34	3	Vertical	0	2.54
Mode 1	Pass	AV	3.27042G	31.06	54.00	-22.94	3	Vertical	201	1.03
Mode 1	Pass	AV	4.87756G	34.94	54.00	-19.06	3	Vertical	240	1.50
Mode 1	Pass	PK	1.17572G	45.42	74.00	-28.58	3	Vertical	0	2.54
Mode 1	Pass	PK	3.2607G	43.73	74.00	-30.27	3	Vertical	201	1.03
Mode 1	Pass	PK	4.876G	46.91	74.00	-27.09	3	Vertical	240	1.50
Mode 1	Pass	AV	1.17615G	39.66	54.00	-14.34	3	Horizontal	53	2.12
Mode 1	Pass	AV	3.39636G	35.86	54.00	-18.14	3	Horizontal	290	1.06
Mode 1	Pass	AV	4.8589G	34.39	54.00	-19.61	3	Horizontal	230	1.50
Mode 1	Pass	PK	1.17558G	45.99	74.00	-28.01	3	Horizontal	53	2.12
Mode 1	Pass	PK	3.39617G	48.05	74.00	-25.95	3	Horizontal	290	1.06
Mode 1	Pass	PK	4.84081G	46.35	74.00	-27.65	3	Horizontal	230	1.50
Mode 2	Pass	AV	1.17613G	38.36	54.00	-15.64	3	Vertical	137	2.53
Mode 2	Pass	AV	1.92859G	26.86	68.20	-41.34	3	Vertical	88	1.43
Mode 2	Pass	AV	4.83718G	33.88	54.00	-20.12	3	Vertical	276	1.50
Mode 2	Pass	PK	1.17594G	45.21	74.00	-28.79	3	Vertical	137	2.53
Mode 2	Pass	PK	1.93842G	38.28	68.20	-29.92	3	Vertical	88	1.43
Mode 2	Pass	PK	4.8354G	46.03	74.00	-27.97	3	Vertical	276	1.50
Mode 2	Pass	AV	1.17617G	40.11	54.00	-13.89	3	Horizontal	55	2.14
Mode 2	Pass	AV	1.62508G	25.96	54.00	-28.04	3	Horizontal	16	2.75
Mode 2	Pass	AV	3.47355G	30.16	68.20	-38.04	3	Horizontal	148	2.64
Mode 2	Pass	PK	1.17599G	46.54	74.00	-27.46	3	Horizontal	55	2.14
Mode 2	Pass	PK	1.62508G	37.11	74.00	-36.89	3	Horizontal	16	2.75
Mode 2	Pass	PK	3.47376G	41.83	68.20	-26.37	3	Horizontal	148	2.64

Radiated Emissions above 1GHz_Mode 1



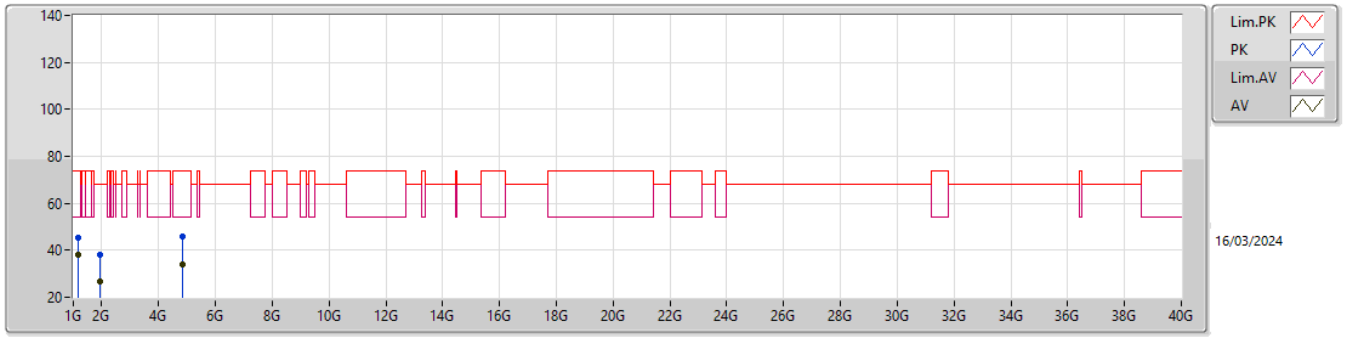
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	1.17614G	38.66	54.00	-15.34	-4.50	3	Vertical	0	2.54	43.16	25.94	3.66	34.10
AV	3.27042G	31.06	54.00	-22.94	2.10	3	Vertical	201	1.03	28.96	29.62	6.54	34.06
AV	4.87756G	34.94	54.00	-19.06	6.44	3	Vertical	240	1.50	28.50	32.47	7.97	34.00
PK	1.17572G	45.42	74.00	-28.58	-4.50	3	Vertical	0	2.54	49.92	25.94	3.66	34.10
PK	3.2607G	43.73	74.00	-30.27	2.14	3	Vertical	201	1.03	41.59	29.66	6.54	34.06
PK	4.876G	46.91	74.00	-27.09	6.43	3	Vertical	240	1.50	40.48	32.46	7.97	34.00

Radiated Emissions above 1GHz_Mode 1



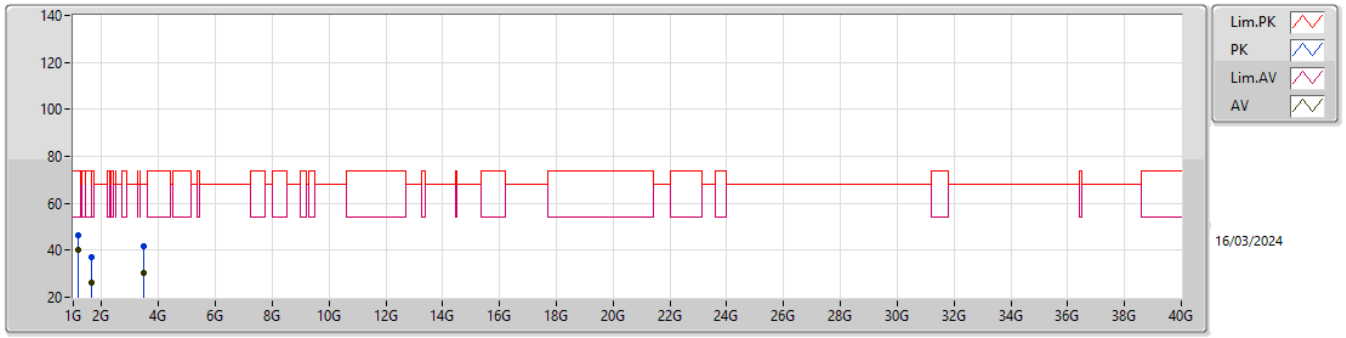
Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Raw	AF	CL	PA
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)	(dBuV/m)	(dB/m)	(dB)	(dB)
AV	1.17615G	39.66	54.00	-14.34	-4.50	3	Horizontal	53	2.12	44.16	25.94	3.66	34.10
AV	3.39636G	35.86	54.00	-18.14	1.97	3	Horizontal	290	1.06	33.89	29.49	6.56	34.08
AV	4.8589G	34.39	54.00	-19.61	6.31	3	Horizontal	230	1.50	28.08	32.35	7.97	34.01
PK	1.17558G	45.99	74.00	-28.01	-4.50	3	Horizontal	53	2.12	50.49	25.94	3.66	34.10
PK	3.39617G	48.05	74.00	-25.95	1.97	3	Horizontal	290	1.06	46.08	29.49	6.56	34.08
PK	4.84081G	46.35	74.00	-27.65	6.19	3	Horizontal	230	1.50	40.16	32.24	7.96	34.01

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/m)	(dB/m)	(dB)	(dB)
AV	1.17613G	38.36	54.00	-15.64	-4.50	3	Vertical	137	2.53	42.86	25.94	3.66	34.10
AV	1.92859G	26.86	68.20	-41.34	-2.95	3	Vertical	88	1.43	29.81	25.97	4.73	33.65
AV	4.83718G	33.88	54.00	-20.12	6.17	3	Vertical	276	1.50	27.71	32.22	7.96	34.01
PK	1.17594G	45.21	74.00	-28.79	-4.50	3	Vertical	137	2.53	49.71	25.94	3.66	34.10
PK	1.93842G	38.28	68.20	-29.92	-2.82	3	Vertical	88	1.43	41.10	26.08	4.75	33.65
PK	4.8354G	46.03	74.00	-27.97	6.16	3	Vertical	276	1.50	39.87	32.21	7.96	34.01

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/m)	(dB/m)	(dB)	(dB)
AV	1.17617G	40.11	54.00	-13.89	-4.50	3	Horizontal	55	2.14	44.61	25.94	3.66	34.10
AV	1.62508G	25.96	54.00	-28.04	-4.04	3	Horizontal	16	2.75	30.00	25.35	4.25	33.64
AV	3.47355G	30.16	68.20	-38.04	1.98	3	Horizontal	148	2.64	28.18	29.40	6.67	34.09
PK	1.17599G	46.54	74.00	-27.46	-4.50	3	Horizontal	55	2.14	51.04	25.94	3.66	34.10
PK	1.62508G	37.11	74.00	-36.89	-4.04	3	Horizontal	16	2.75	41.15	25.35	4.25	33.64
PK	3.47376G	41.83	68.20	-26.37	1.98	3	Horizontal	148	2.64	39.85	29.40	6.67	34.09