

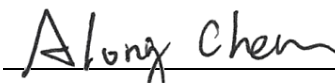
FCC Test Report

FCC ID : JVPER2-80
Equipment : Enhanced Wireless Receiver
Model No. : ER2-80
Brand Name : ZOWIE
Applicant : BENQ CORPORATION
Address : 16 Jihu Road, Neihu, Taipei 114, Taiwan
Standard : 47 CFR FCC Part 15.247
Received Date : Mar. 26, 2024
Tested Date : Jun. 20 ~ Jul. 01, 2024

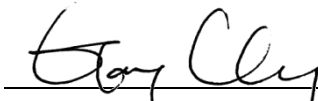
We, International Certification Corporation, would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It shall not be reproduced except in full without the written approval of our laboratory.

Reviewed by:

Approved by:



Along Chen / Assistant Manager



Gary Chang / Manager

Table of Contents

1	GENERAL DESCRIPTION	5
1.1	Information.....	5
1.2	Local Support Equipment List	7
1.3	Test Setup Chart	7
1.4	Test Equipment List and Calibration Data.....	9
1.5	Test Standards	11
1.6	Reference Guidance	11
1.7	Deviation from Test Standard and Measurement Procedure.....	11
1.8	Measurement Uncertainty	11
2	TEST CONFIGURATION.....	12
2.1	Testing Facility	12
2.2	The Worst Test Modes and Channel Details	12
3	TRANSMITTER TEST RESULTS	13
3.1	6dB and Occupied Bandwidth.....	13
3.2	Conducted Output Power	14
3.3	Power Spectral Density	15
3.4	Unwanted Emissions in Restricted Frequency Bands	16
3.5	Emissions in non-restricted Frequency Bands.....	18
3.6	AC Power Line Conducted Emissions	19
4	TEST LABORATORY INFORMATION	20
Appendix A. 6dB and Occupied Bandwidth		
Appendix B. Conducted Output Power		
Appendix C. Power Spectral Density		
Appendix D. Unwanted Emissions into Restricted Frequency Bands		
Appendix E. Emissions in Non-Restricted Frequency Bands		
Appendix F. AC Power Line Conducted Emissions		

Release Record

Report No.	Version	Description	Issued Date
FR432601	Rev. 01	Initial issue	Aug. 20, 2024

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emissions	[dBuV]: 0.521MHz 35.12 (Margin -10.88dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 2.4835G 51.86 (Margin -2.14dB) - AV	Pass
15.247(b)(3)	Conducted Output Power	Power [dBm]: 5.21	Pass
15.247(a)(2)	6dB Bandwidth	Meet the requirement of limit	Pass
15.247(e)	Power Spectral Density	Meet the requirement of limit	Pass
15.203	Antenna Requirement	Meet the requirement of limit	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:

The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

RF General Information				
Frequency Range (MHz)	Modulation	Ch. Freq. (MHz)	Channel Number	Data Rate
2400-2483.5	GFSK	2403-2481	1-79 [79]	2Mbps

1.1.2 Antenna Details

Ant. No.	Brand	Model	Type	Connector	Gain (dBi)
1	BENQ Corporation	ER2-80 ANT	Patch Antenna	N/A	5.64

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Type	5Vdc from host 5Vdc from adapter
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1.1.4 Accessories

Accessories		
No.	Equipment	Description
1	USB cable	Brand: Le Prestique Electronics Manufacturing Model: USB Type-C Cable Line: 2m shielded without core

1.1.5 Channel List

Frequency band (MHz)				2400~2483.5			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2432	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461	79	2481
20	2422	40	2442	60	2462	---	---

1.1.6 Test Tool and Duty Cycle

Test Tool	radio test, Version: 1.0.0.0	
Modulation Mode	Duty Cycle Of Test Signal (%)	Duty Factor (dB)
GFSK	100.00%	0.00

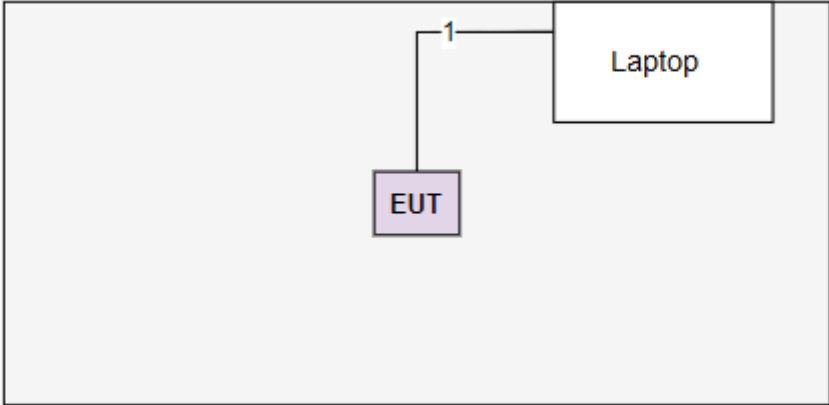
1.1.7 Power Index of Test Tool

Modulation Mode	Test Frequency (MHz)		
	2403	2440	2481
GFSK	4dBm	4dBm	4dBm

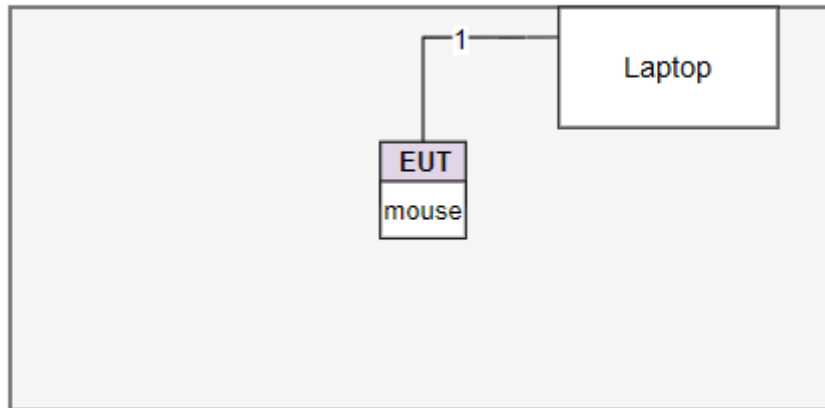
1.2 Local Support Equipment List

Support Equipment List					
No.	Equipment	Brand	Model	FCC ID	Remarks
1	Laptop	DELL	Latitude 5400	DoC	---
2	Mouse for e-Sports	ZOWIE	FK2-DW	---	Provided by applicant.
3	Adapter	Samsung	ETA-U90JWS	---	---

1.3 Test Setup Chart

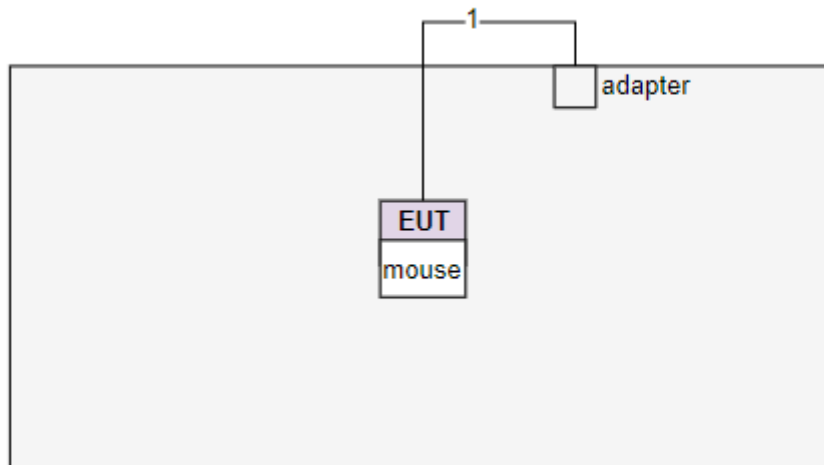
Test Setup Diagram (TX mode with laptop)	
 <pre> graph LR Laptop[Laptop] --- 1 --- EUT[EUT] </pre>	
No.	Signal cable / Length (m)
1	USB, 2m non-shielded.

Test Setup Diagram (charging mode with laptop)



No.	Signal cable / Length (m)
1	USB, 2m non-shielded.

Test Setup Diagram (charging mode with adapter)



No.	Signal cable / Length (m)
1	USB, 2m non-shielded.

1.4 Test Equipment List and Calibration Data

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Jun. 20, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101658	Feb. 23, 2024	Feb. 22, 2025
LISN	R&S	ENV216	101579	May 09, 2024	May 08, 2025
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 11, 2023	Oct. 10, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127666	Mar. 05, 2024	Mar. 04, 2025
50 ohm terminal (Support Unit)	NA	50	03	Aug. 08, 2023	Aug. 07, 2024
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Jul. 01, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Spectrum Analyzer	R&S	FSV3044	101516	Jun. 17, 2024	Jun. 16, 2025
Power Meter	Anritsu	ML2495A	1241002	Nov. 21, 2023	Nov. 20, 2024
Power Sensor	Anritsu	MA2411B	1207366	Nov. 21, 2023	Nov. 20, 2024
Attenuator	Pasternack	PE7005-10	10-2	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	Sporton	SENSE-15247_FS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Jun. 20 ~ Jun. 26, 2024				
Instrument	Brand	Model No.	Serial No.	Calibration Date	Calibration Until
Receiver	R&S	ESR3	101657	Mar. 05, 2024	Mar. 04, 2025
Spectrum Analyzer	R&S	FSV40	101498	Nov. 23, 2023	Nov. 22, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Oct. 31, 2023	Oct. 30, 2024
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 27, 2023	Nov. 26, 2024
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 30, 2023	Oct. 29, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 03, 2023	Oct. 02, 2024
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 03, 2023	Oct. 02, 2024
LF cable 11M	EMC	EMCCFD400-NW-N W-11000	200801	Oct. 03, 2023	Oct. 02, 2024
LF cable 1M	EMC	EMCCFD400-NM-N M-1000	160502	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M- 8000	210920	Oct. 03, 2023	Oct. 02, 2024
RF Cable	EMC	EMC104-35M-35M- 3000	210922	Oct. 03, 2023	Oct. 02, 2024
Attenuator	Pasternack	PE7005-10	10-1	Oct. 05, 2023	Oct. 04, 2024
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 05, 2023	Oct. 04, 2024
Measurement Software	Sporton	SENSE-15247_FS	V5.11	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

47 CFR FCC Part 15.247

ANSI C63.10-2013

1.6 Reference Guidance

FCC KDB 558074 D01 15.247 Meas Guidance v05r02

1.7 Deviation from Test Standard and Measurement Procedure

None

1.8 Measurement Uncertainty

The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor ($k=2$)).

Measurement Uncertainty	
Parameters	Uncertainty
Bandwidth	± 34.130 Hz
Conducted power	± 0.808 dB
Power density	± 0.583 dB
Conducted emission	± 2.715 dB
AC conducted emission	± 2.92 dB
Unwanted Emission ≤ 1 GHz	± 3.41 dB
Unwanted Emission > 1 GHz	± 4.59 dB

2 Test Configuration

2.1 Testing Facility

Test Laboratory	International Certification Corporation
Test Site	CO01-WS, 03CH01-WS, TH01-WS
Address of Test Site	No.3-1, Lane 6, Wen San 3rd St., Kwei Shan Dist., Tao Yuan City 33381, Taiwan (R.O.C.)

- FCC Designation No.: TW2732
- FCC site registration No.: 181692
- ISSED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Test Configuration
AC Power Line Conducted Emissions	GFSK	2440	TX
	Charging	-	Charging with laptop
	Charging	-	Charging with adapter
Unwanted Emissions $\leq$ 1GHz	GFSK	2440	TX
	Charging	-	Charging with laptop
	Charging	-	Charging with adapter
Unwanted Emissions > 1GHz	GFSK	2403, 2440, 2481	TX
Conducted Output Power 6dB bandwidth Power spectral density	GFSK	2403, 2440, 2481	TX

3 Transmitter Test Results

3.1 6dB and Occupied Bandwidth

3.1.1 Limit of 6dB Bandwidth

The minimum 6dB bandwidth shall be at least 500 kHz.

3.1.2 Test Procedures

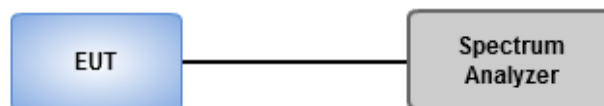
6dB Bandwidth

1. Set resolution bandwidth (RBW) = 100 kHz, Video bandwidth = 300 kHz.
2. Detector = Peak, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6dB relative to the maximum level measured in the fundamental emission.

Occupied Bandwidth

1. Set resolution bandwidth (RBW) = 1% ~ 5 % of OBW, Video bandwidth = 3 x RBW
2. Detector = Sample, Trace mode = max hold.
3. Sweep = auto couple, Allow the trace to stabilize.
4. Use the OBW measurement function of spectrum analyzer to measure the occupied bandwidth.

3.1.3 Test Setup



3.1.4 Test Results

Ambient Condition	25°C / 61%	Tested By	Roger Lu
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Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of Conducted Output Power

Conducted power shall not exceed 1Watt.

Antenna gain $\leq 6\text{dBi}$, no any corresponding reduction is in output power limit.

3.2.2 Test Procedures

A broadband RF power meter is used for output power measurement. The video bandwidth of power meter is greater than DTS bandwidth of EUT. If duty cycle of test signal is not 100 %, trigger and gating function of power meter will be enabled to capture transmission burst for measuring output power.

3.2.3 Test Setup



3.2.4 Test Results

Ambient Condition	25°C / 61%	Tested By	Roger Lu
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Refer to Appendix B.

3.3 Power Spectral Density

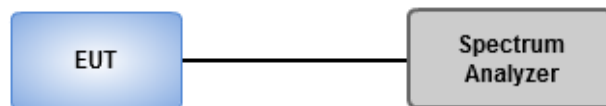
3.3.1 Limit of Power Spectral Density

Power spectral density shall not be greater than 8 dBm in any 3 kHz band.

3.3.2 Test Procedures

1. Set the RBW = 3 kHz, VBW = 10 kHz.
2. Detector = Peak, Sweep time = auto couple.
3. Trace mode = max hold, allow trace to fully stabilize.
4. Use the peak marker function to determine the maximum amplitude level.

3.3.3 Test Setup



3.3.4 Test Results

Ambient Condition	25°C / 61%	Tested By	Roger Lu
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Refer to Appendix C.

3.4 Unwanted Emissions in Restricted Frequency Bands

3.4.1 Limit of Unwanted Emissions in Restricted Frequency Bands

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:
Quasi-Peak value is measured for frequency below 1GHz except for 9~90 kHz, 110~490 kHz frequency band. Peak and average value are measured for frequency above 1GHz. The limit on average radio frequency emission is as above table. The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit

Note 2:
Measurements may be performed at a distance other than what is specified provided. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor as below, Frequency at or above 30 MHz: 20 dB/decade Frequency below 30 MHz: 40 dB/decade.

3.4.2 Test Procedures

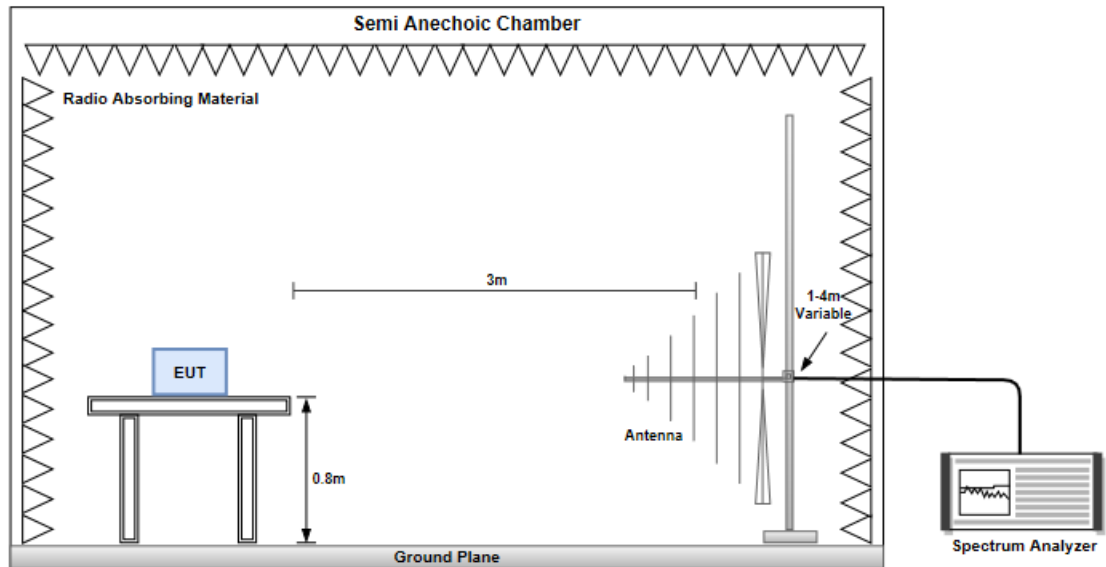
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at test table. For emissions testing at or below 1 GHz, the table height is 80 cm above the reference ground plane. For emission measurements above 1 GHz, the table height is 1.5 m
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.

Note:

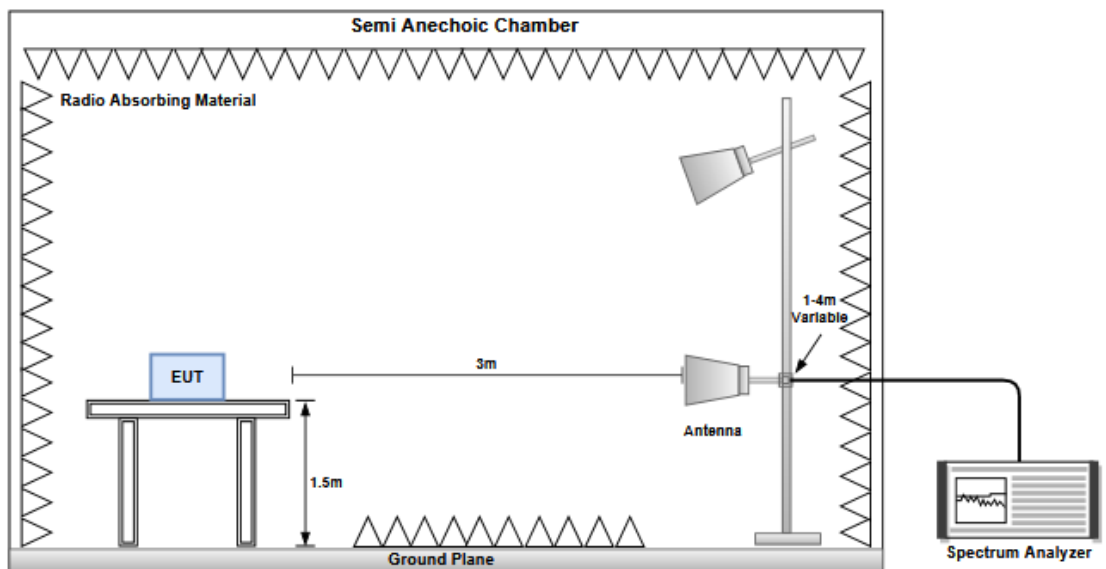
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above 1GHz.

3.4.3 Test Setup

Radiated Emissions below 1 GHz



Radiated Emissions above 1 GHz



3.4.4 Test Results

Refer to Appendix D.

3.5 Emissions in non-restricted Frequency Bands

3.5.1 Emissions in non-restricted frequency bands limit

Peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz.

3.5.2 Test Procedures

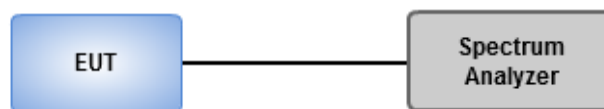
Reference level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Use the peak marker function to determine the maximum PSD level

Emission level measurement

1. Set RBW=100kHz, VBW = 300kHz , Detector = Peak, Sweep time = Auto
2. Trace = max hold , Allow Trace to fully stabilize
3. Scan Frequency range is up to 25GHz
4. Use the peak marker function to determine the maximum amplitude level

3.5.3 Test Setup



3.5.4 Test Results

Ambient Condition	25°C / 61%	Tested By	Roger Lu
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Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

3.6.1 Limit of AC Power Line Conducted Emissions

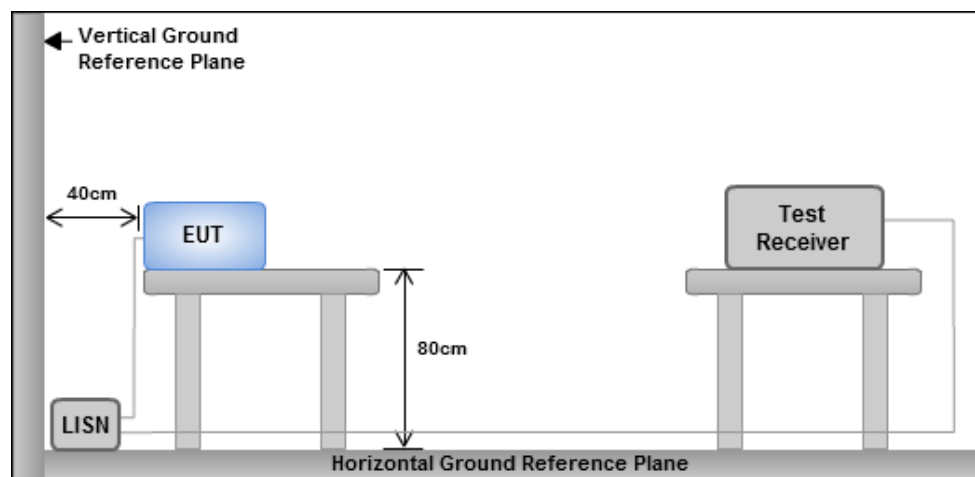
Conducted Emissions Limit		
Frequency Emission (MHz)	Quasi-Peak	Average
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50

Note 1: * Decreases with the logarithm of the frequency.

3.6.2 Test Procedures

1. The device is placed on a test table, raised 80 cm above the reference ground plane. The vertical conducting plane is located 40 cm to the rear of the device.
2. The device is connected to line impedance stabilization network (LISN) and other accessories are connected to other LISN. Measured levels of AC power line conducted emission are across the 50 Ω LISN port.
3. AC conducted emission measurements is made over frequency range from 150 kHz to 30 MHz.
4. This measurement was performed with AC 120V/60Hz

3.6.3 Test Setup



- Note: 1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.6.4 Test Results

Refer to Appendix F.

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corporation (EMC and Wireless Communication Laboratory), it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan District. Location map can be found on our website <http://www.icertifi.com.tw>.

Linkou

Tel: 886-2-2601-1640

No.30-2, Ding Fwu Tsuen, Lin Kou
District, New Taipei City, Taiwan
(R.O.C.)

Kwei Shan

Tel: 886-3-271-8666

No.3-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)
No.2-1, Lane 6, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

Kwei Shan Site II

Tel: 886-3-271-8640

No.14-1, Lane 19, Wen San 3rd
St., Kwei Shan Dist., Tao Yuan
City 33381, Taiwan (R.O.C.)

If you have any suggestion, please feel free to contact us as below information.

Tel: 886-3-271-8666

Fax: 886-3-318-0155

Email: ICC_Service@icertifi.com.tw

==END==

**Summary**

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
SRD	905k	1.819M	1M82F1D	857.5k	1.782M

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

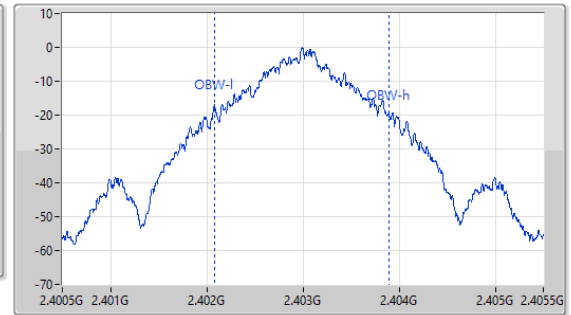
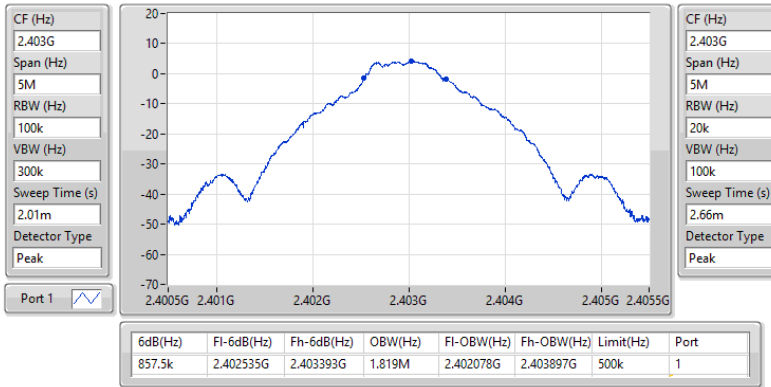
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
SRD	-	-	-	-
2403MHz	Pass	500k	857.5k	1.819M
2440MHz	Pass	500k	905k	1.812M
2481MHz	Pass	500k	890k	1.782M

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

2.4-2.4835GHz_SRD

EBW-DTS

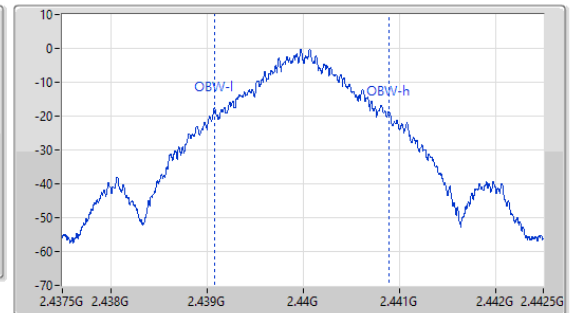
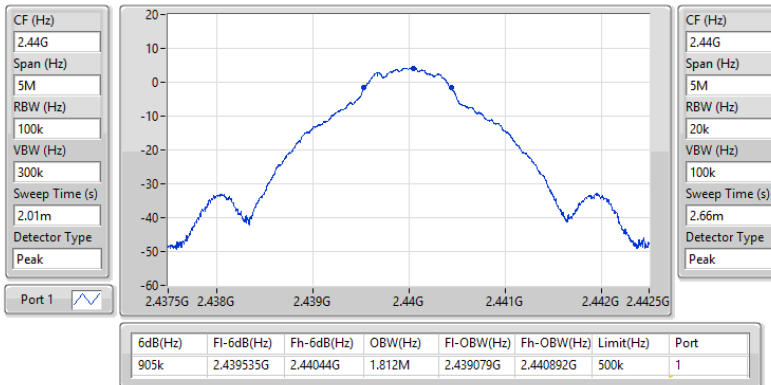
2403MHz



2.4-2.4835GHz_SRD

EBW-DTS

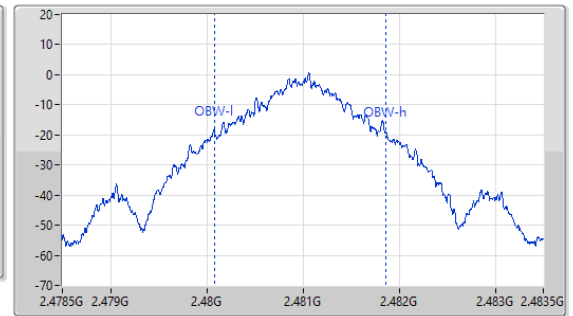
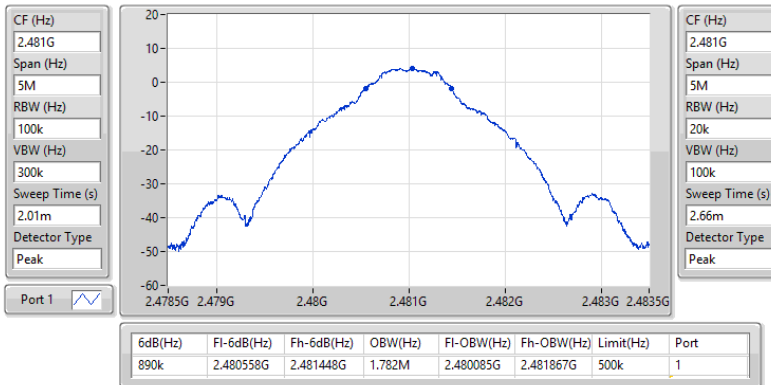
2440MHz



2.4-2.4835GHz_SRD

EBW-DTS

2481MHz





Conducted Output Power (Peak)

Appendix B

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
SRD	5.21	0.00332

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
SRD	-	-	-	-	-	-
2403MHz	Pass	5.64	5.17	30.00	10.81	36.00
2440MHz	Pass	5.64	5.21	30.00	10.85	36.00
2481MHz	Pass	5.64	5.04	30.00	10.68	36.00



Conducted Output Power (Average)

Appendix B

Summary

Mode	Total Power (dBm)	Total Power (W)
2.4-2.4835GHz	-	-
SRD	5.09	0.00323

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
SRD	-	-	-	-	-	-
2403MHz	Pass	5.64	5.05	-	10.69	-
2440MHz	Pass	5.64	5.09	-	10.73	-
2481MHz	Pass	5.64	4.93	-	10.57	-

Note: Average power is for reference only.

**Summary**

Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
SRD	-8.34

Result

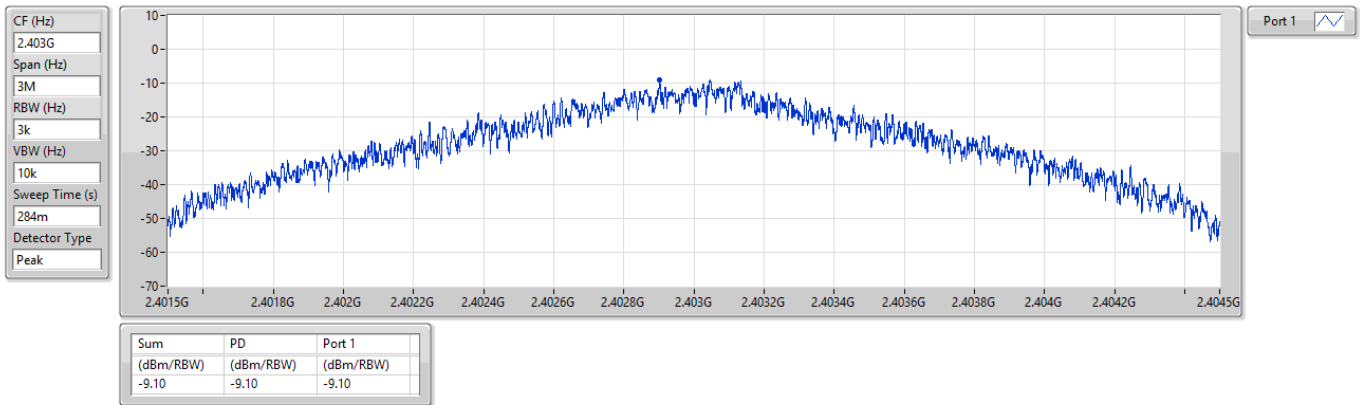
Mode	Result	Antenna Gain (dBi)	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)
SRD	-	-	-	-
2403MHz	Pass	5.64	-9.10	8.00
2440MHz	Pass	5.64	-8.34	8.00
2481MHz	Pass	5.64	-9.11	8.00



2.4-2.4835GHz_SRD

PSD

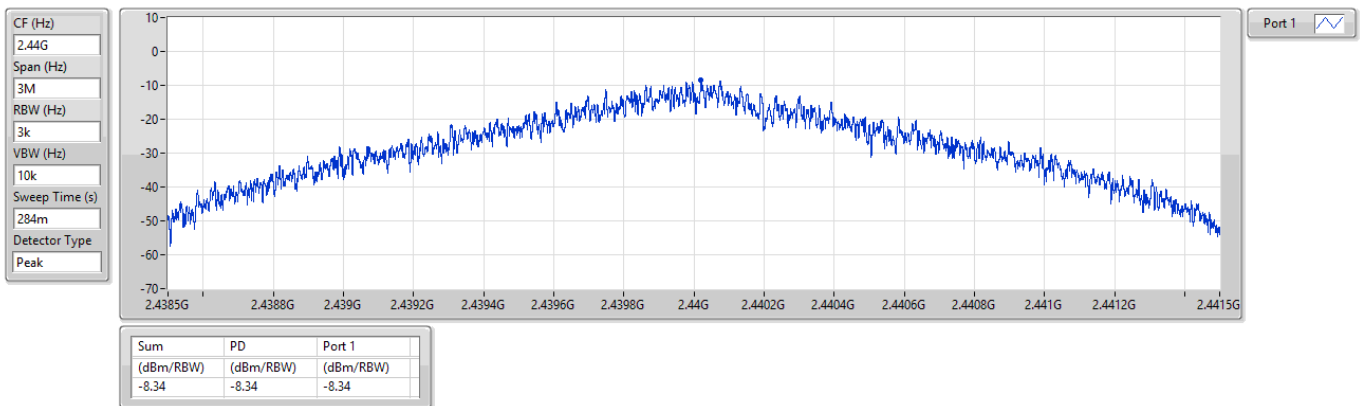
2403MHz



2.4-2.4835GHz_SRD

PSD

2440MHz

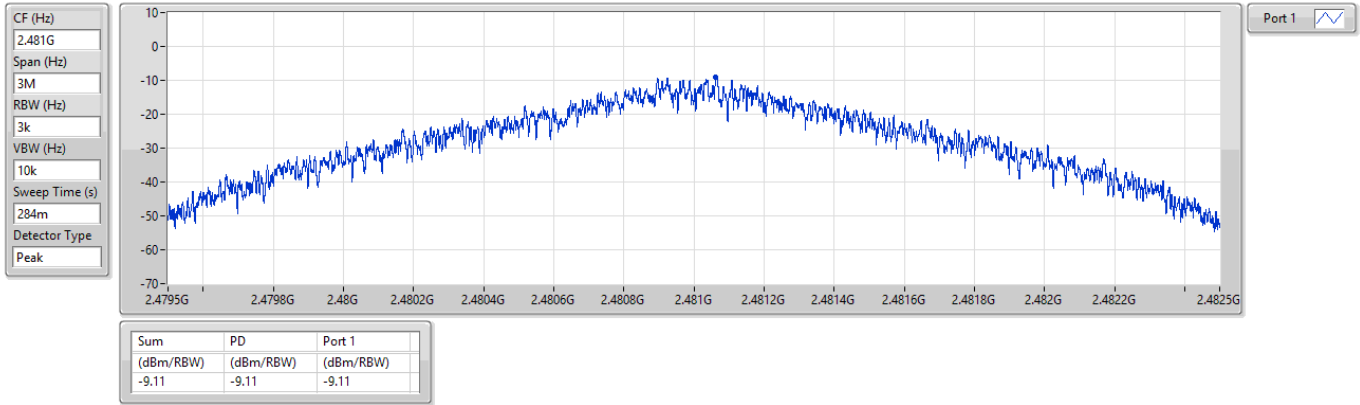




2.4-2.4835GHz_SRD

PSD

2481MHz



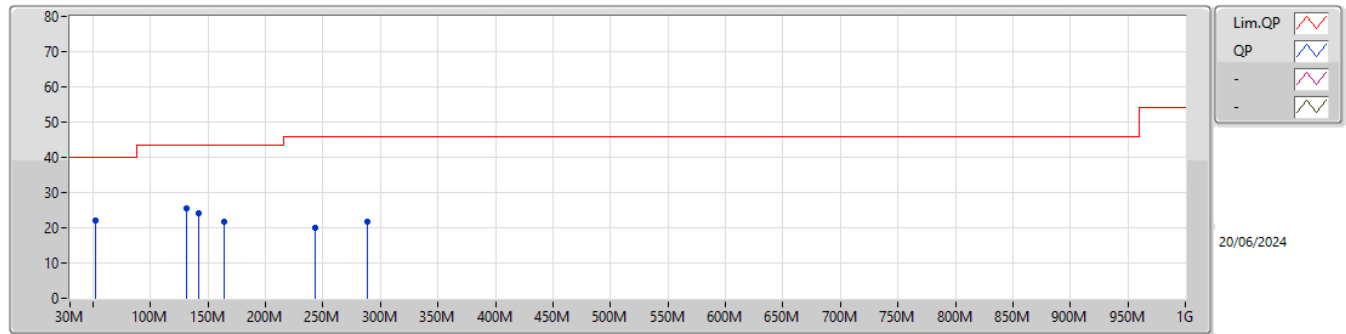


Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Condition
Mode 1	Pass	PK	30.4M	28.71	40.00	-11.29	Vertical
Mode 2	Pass	PK	30.3M	28.14	40.00	-11.86	Vertical
Mode 3	Pass	PK	59.2M	29.36	40.00	-10.64	Vertical



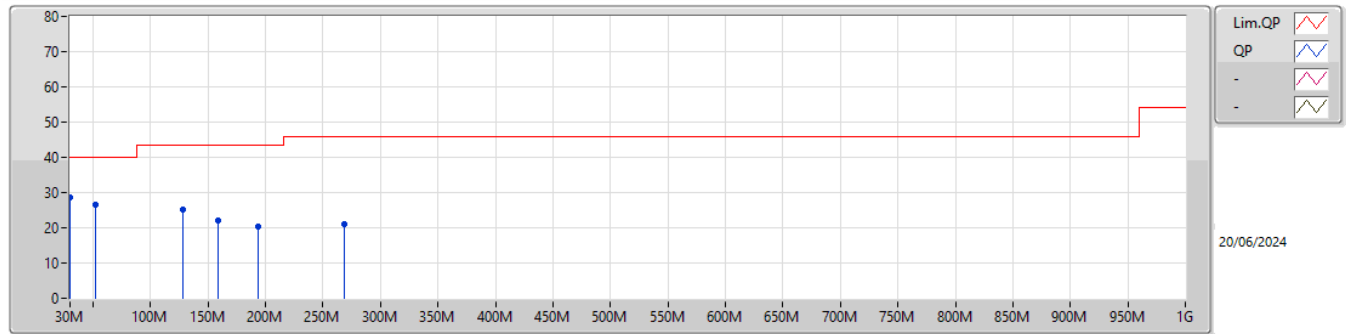
Mode 1



Type	Freq	Level	Limit	Margin	Factor	Dist	Condition	Azimuth	Height	Comment	Raw	AF	CL	PA		
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dB/m)	(m)		(°)	(m)		(dBuV)	(dB/m)	(dB)	(dB)		
PK	51.8M	21.90	40.00	-18.10	-7.92	3	Horizontal	-	-	-	29.82	19.52	0.65	28.09		
PK	131.2M	25.63	43.50	-17.87	-9.95	3	Horizontal	-	-	-	35.58	17.38	1.07	28.40		
PK	141.7M	24.21	43.50	-19.29	-9.12	3	Horizontal	-	-	-	33.33	18.17	1.12	28.41		
PK	163.6M	21.68	43.50	-21.82	-8.88	3	Horizontal	-	-	-	30.56	18.34	1.20	28.42		
PK	243.6M	19.90	46.00	-26.10	-10.13	3	Horizontal	-	-	-	30.03	16.84	1.46	28.43		
PK	288.2M	21.71	46.00	-24.29	-8.30	3	Horizontal	-	-	-	30.01	18.50	1.62	28.42		

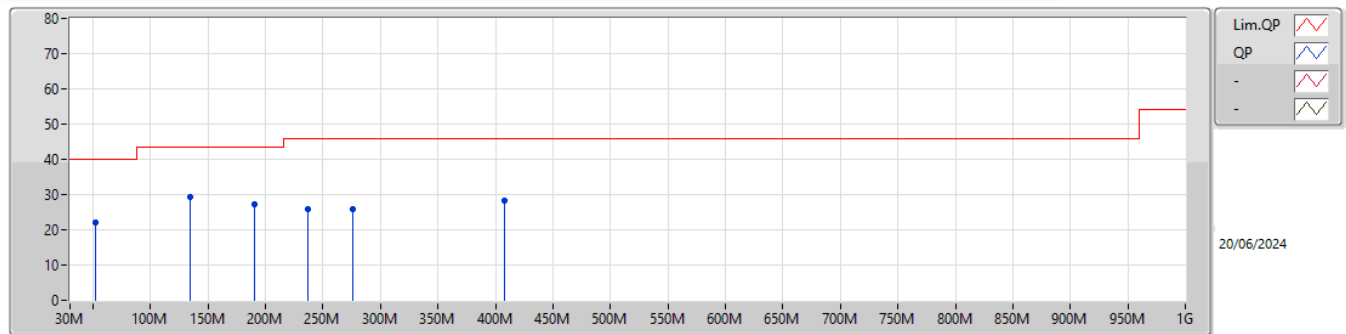


Mode 1



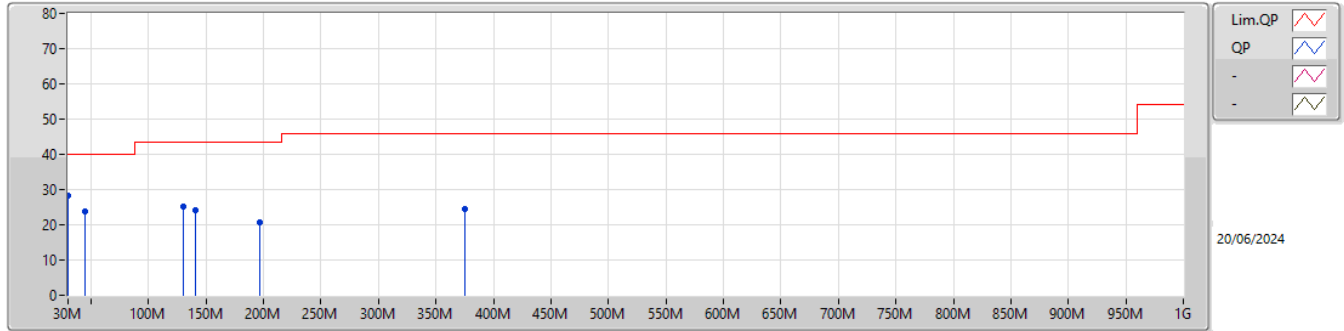
Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	30.4M	28.71	40.00	-11.29	-9.80	3	Vertical	-	-	-	38.51	17.68	0.49	27.97		
PK	51.9M	26.52	40.00	-13.48	-7.93	3	Vertical	-	-	-	34.45	19.51	0.65	28.09		
PK	128.6M	25.10	43.50	-18.40	-10.22	3	Vertical	-	-	-	35.32	17.12	1.06	28.40		
PK	159M	22.05	43.50	-21.45	-8.64	3	Vertical	-	-	-	30.69	18.60	1.18	28.42		
PK	193.8M	20.32	43.50	-23.18	-11.53	3	Vertical	-	-	-	31.85	15.60	1.31	28.44		
PK	268.1M	21.00	46.00	-25.00	-9.16	3	Vertical	-	-	-	30.16	17.72	1.55	28.43		

Mode 2



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	51.7M	21.95	40.00	-18.05	-7.91	3	Horizontal	-	-	-	29.86	19.53	0.65	28.09		
PK	134.6M	29.41	43.50	-14.09	-9.61	3	Horizontal	-	-	-	39.02	17.70	1.09	28.40		
PK	190.1M	27.24	43.50	-16.26	-11.33	3	Horizontal	-	-	-	38.57	15.80	1.30	28.43		
PK	236.8M	25.95	46.00	-20.05	-10.61	3	Horizontal	-	-	-	36.56	16.38	1.44	28.43		
PK	275.5M	25.90	46.00	-20.10	-8.74	3	Horizontal	-	-	-	34.64	18.11	1.57	28.42		
PK	407.7M	28.13	46.00	-17.87	-5.14	3	Horizontal	-	-	-	33.27	21.31	1.87	28.32		

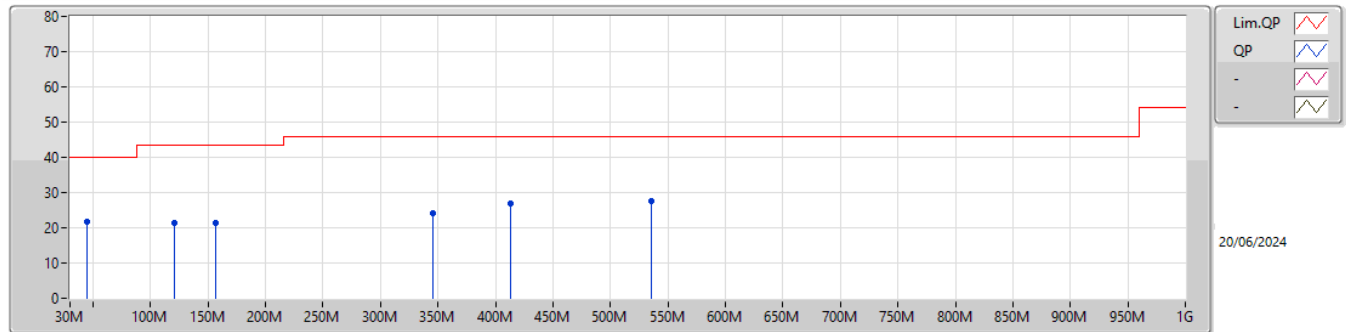
Mode 2



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	30.3M	28.14	40.00	-11.86	-9.82	3	Vertical	-	-	-	37.96	17.66	0.49	27.97		
PK	44.7M	23.87	40.00	-16.13	-8.24	3	Vertical	-	-	-	32.11	19.21	0.60	28.05		
PK	130.7M	25.03	43.50	-18.47	-9.96	3	Vertical	-	-	-	34.99	17.37	1.07	28.40		
PK	140.7M	24.12	43.50	-19.38	-9.22	3	Vertical	-	-	-	33.34	18.07	1.11	28.40		
PK	196.5M	20.63	43.50	-22.87	-11.67	3	Vertical	-	-	-	32.30	15.45	1.32	28.44		
PK	374.8M	24.46	46.00	-21.54	-6.06	3	Vertical	-	-	-	30.52	20.49	1.80	28.35		



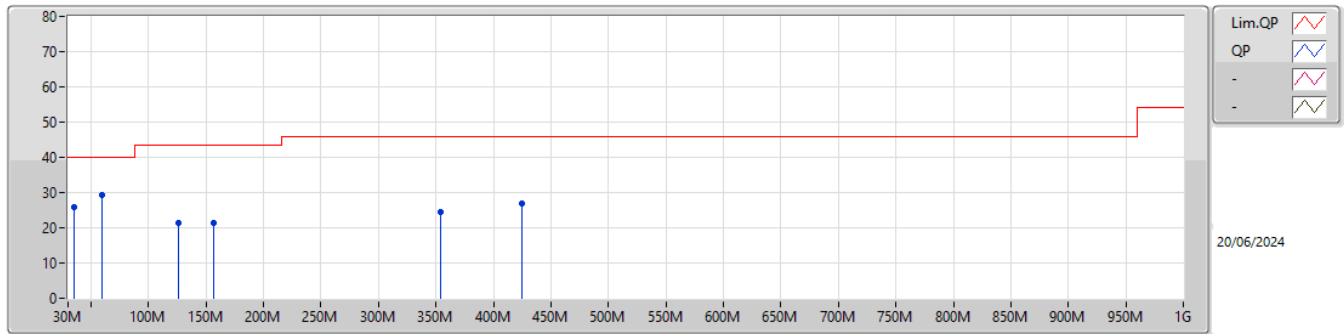
Mode 3



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	45.3M	21.82	40.00	-18.18	-8.09	3	Horizontal	-	-	-	29.91	19.36	0.60	28.05		
PK	120.4M	21.42	43.50	-22.08	-10.96	3	Horizontal	-	-	-	32.38	16.40	1.03	28.39		
PK	156.9M	21.25	43.50	-22.25	-8.73	3	Horizontal	-	-	-	29.98	18.51	1.17	28.41		
PK	345.3M	24.13	46.00	-21.87	-7.04	3	Horizontal	-	-	-	31.17	19.60	1.74	28.38		
PK	413M	26.80	46.00	-19.20	-4.97	3	Horizontal	-	-	-	31.77	21.46	1.89	28.32		
PK	535.7M	27.73	46.00	-18.27	-2.48	3	Horizontal	-	-	-	30.21	23.50	2.26	28.24		



Mode 3



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Factor (dB/m)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	Raw (dBuV)	AF (dB/m)	CL (dB)	PA (dB)		
PK	35.6M	25.98	40.00	-14.02	-9.52	3	Vertical	-	-	-	35.50	17.94	0.54	28.00		
PK	59.2M	29.36	40.00	-10.64	-8.73	3	Vertical	-	-	-	38.09	18.70	0.71	28.14		
PK	125.6M	21.44	43.50	-22.06	-10.49	3	Vertical	-	-	-	31.93	16.86	1.05	28.40		
PK	157M	21.36	43.50	-22.14	-8.74	3	Vertical	-	-	-	30.10	18.50	1.17	28.41		
PK	353.6M	24.40	46.00	-21.60	-6.87	3	Vertical	-	-	-	31.27	19.74	1.76	28.37		
PK	424.6M	26.96	46.00	-19.04	-4.70	3	Vertical	-	-	-	31.66	21.69	1.92	28.31		



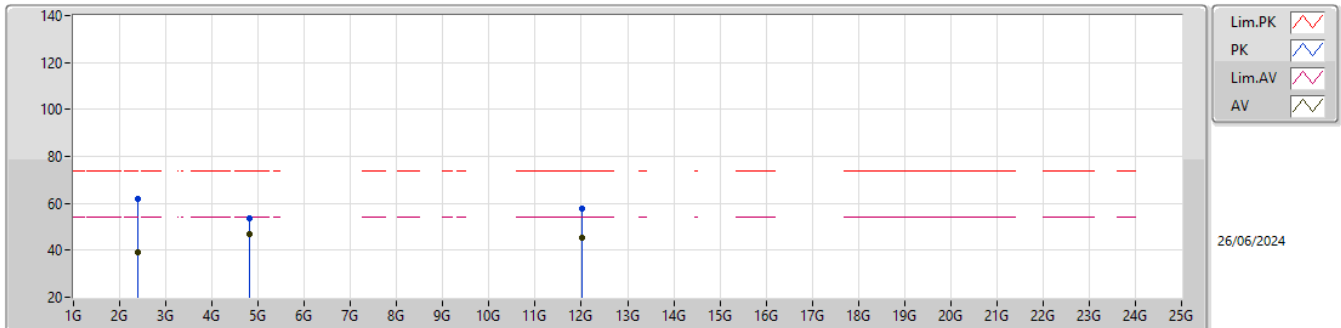
Summary

Mode	Result	Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comments
2.4-2.4835GHz	-	-	-	-	-	-	-	-	-	-	-
SRD	Pass	AV	2.4835G	51.86	54.00	-2.14	3	Horizontal	359	1.16	-



2.4-2.4835GHz_SRD

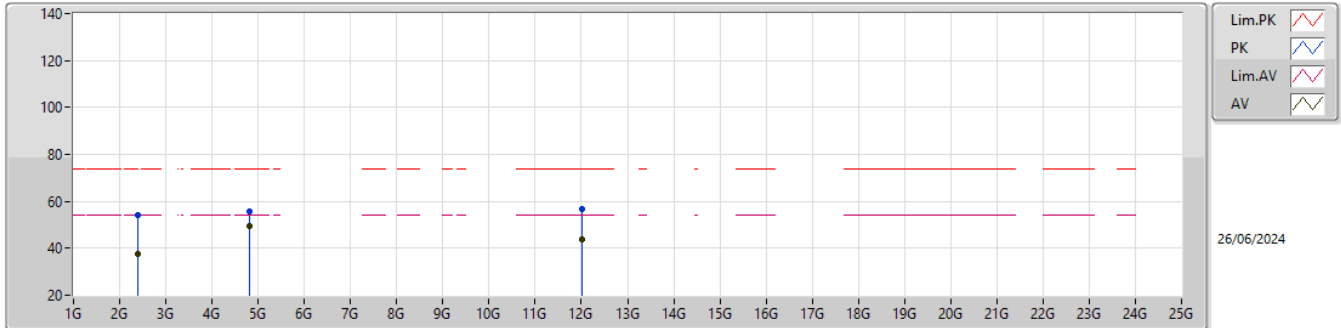
2403MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)				
AV	2.39G	39.31	54.00	-14.69	43.69	3	Horizontal	357	1.18	-	27.60	4.95	36.93				
PK	2.39G	61.86	74.00	-12.14	66.24	3	Horizontal	357	1.18	-	27.60	4.95	36.93				
AV	4.806G	46.77	54.00	-7.23	47.14	3	Horizontal	47	1.44	-	31.29	6.86	38.52				
PK	4.806G	53.45	74.00	-20.55	53.82	3	Horizontal	47	1.44	-	31.29	6.86	38.52				
AV	12.015G	45.28	54.00	-8.72	39.01	3	Horizontal	228	1.00	-	39.20	10.02	42.95				
PK	12.015G	57.98	74.00	-16.02	51.71	3	Horizontal	228	1.00	-	39.20	10.02	42.95				

2.4-2.4835GHz_SRD

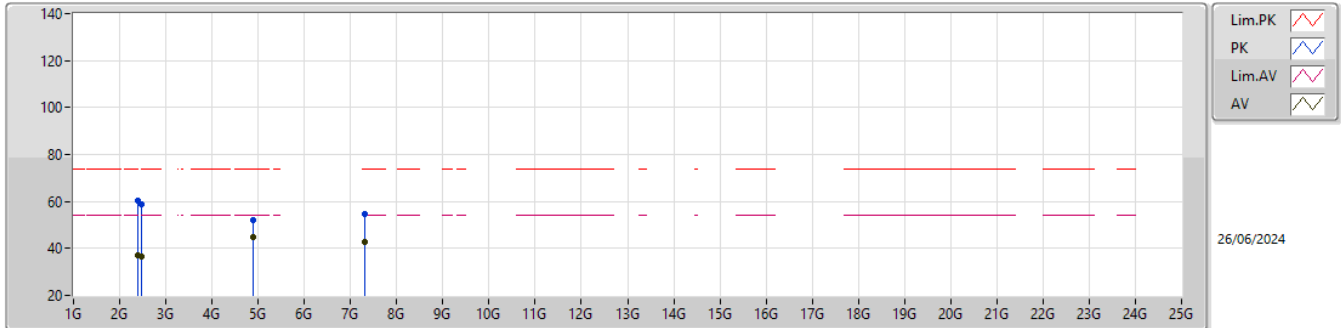
2403MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	2.39G	37.74	54.00	-16.26	42.12	3	Vertical	276	3.51	-	27.60	4.95	36.93			
PK	2.39G	54.18	74.00	-19.82	58.56	3	Vertical	276	3.51	-	27.60	4.95	36.93			
AV	4.806G	49.34	54.00	-4.66	49.71	3	Vertical	42	3.32	-	31.29	6.86	38.52			
PK	4.806G	55.47	74.00	-18.53	55.84	3	Vertical	42	3.32	-	31.29	6.86	38.52			
AV	12.015G	43.96	54.00	-10.04	37.69	3	Vertical	132	1.00	-	39.20	10.02	42.95			
PK	12.015G	56.82	74.00	-17.18	50.55	3	Vertical	132	1.00	-	39.20	10.02	42.95			

2.4-2.4835GHz_SRD

2440MHz_TX

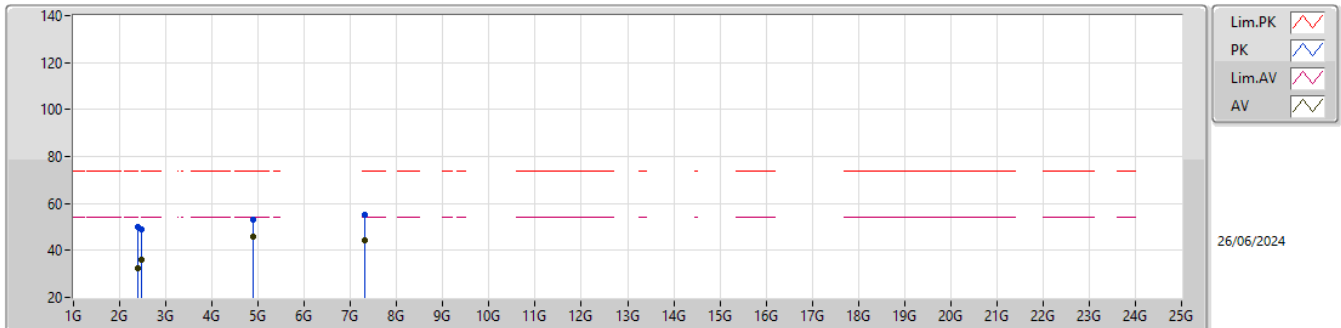


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	2.39G	37.04	54.00	-16.96	41.42	3	Horizontal	354	1.21	-	27.60	4.95	36.93			
PK	2.39G	60.56	74.00	-13.44	64.94	3	Horizontal	354	1.21	-	27.60	4.95	36.93			
AV	2.4835G	36.69	54.00	-17.31	41.44	3	Horizontal	354	1.21	-	27.20	5.06	37.01			
PK	2.4835G	58.86	74.00	-15.14	63.61	3	Horizontal	354	1.21	-	27.20	5.06	37.01			
AV	4.88G	45.07	54.00	-8.93	45.58	3	Horizontal	53	1.00	-	31.14	6.92	38.57			
PK	4.88G	52.08	74.00	-21.92	52.59	3	Horizontal	53	1.00	-	31.14	6.92	38.57			
AV	7.32G	42.66	54.00	-11.34	37.53	3	Horizontal	192	1.00	-	36.16	8.43	39.46			
PK	7.32G	54.73	74.00	-19.27	49.60	3	Horizontal	192	1.00	-	36.16	8.43	39.46			



2.4-2.4835GHz_SRD

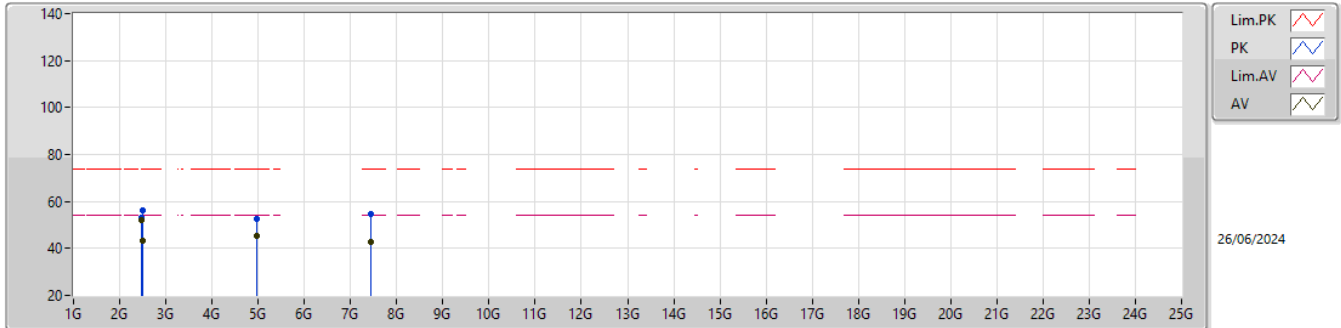
2440MHz_TX



Type	Freq	Level	Limit	Margin	Raw	Dist	Condition	Azimuth	Height	Comment	AF	CL	PA			
	(Hz)	(dBuV/m)	(dBuV/m)	(dB)	(dBuV)	(m)		(°)	(m)		(dB/m)	(dB)	(dB)			
AV	2.39G	32.47	54.00	-21.53	36.85	3	Vertical	251	2.96	-	27.60	4.95	36.93			
PK	2.39G	49.80	74.00	-24.20	54.18	3	Vertical	251	2.96	-	27.60	4.95	36.93			
AV	2.4835G	36.09	54.00	-17.91	40.84	3	Vertical	251	2.96	-	27.20	5.06	37.01			
PK	2.4835G	48.77	74.00	-25.23	53.52	3	Vertical	251	2.96	-	27.20	5.06	37.01			
AV	4.88G	45.67	54.00	-8.33	46.18	3	Vertical	43	3.21	-	31.14	6.92	38.57			
PK	4.88G	53.35	74.00	-20.65	53.86	3	Vertical	43	3.21	-	31.14	6.92	38.57			
AV	7.32G	44.11	54.00	-9.89	38.98	3	Vertical	167	1.00	-	36.16	8.43	39.46			
PK	7.32G	55.13	74.00	-18.87	50.00	3	Vertical	167	1.00	-	36.16	8.43	39.46			

2.4-2.4835GHz_SRD

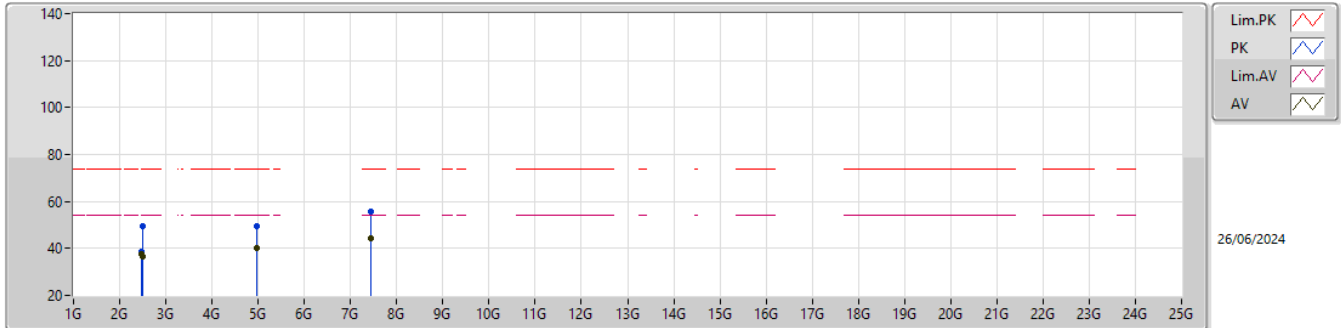
2481MHz_TX



Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	2.4835G	51.86	54.00	-2.14	-	3	Horizontal	359	1.16	-	-	-	-			
PK	2.4835G	53.11	74.00	-20.89	-	3	Horizontal	359	1.16	-	-	-	-			
AV	2.4855G	43.53	54.00	-10.47	48.28	3	Horizontal	359	1.16	-	27.20	5.06	37.01			
PK	2.4855G	56.25	74.00	-17.75	61.00	3	Horizontal	359	1.16	-	27.20	5.06	37.01			
AV	4.962G	45.41	54.00	-8.59	45.66	3	Horizontal	27	2.61	-	31.37	7.00	38.62			
PK	4.962G	52.49	74.00	-21.51	52.74	3	Horizontal	27	2.61	-	31.37	7.00	38.62			
AV	7.443G	43.01	54.00	-10.99	37.76	3	Horizontal	183	1.00	-	36.36	8.50	39.61			
PK	7.443G	54.49	74.00	-19.51	49.24	3	Horizontal	183	1.00	-	36.36	8.50	39.61			

2.4-2.4835GHz_SRD

2481MHz_TX

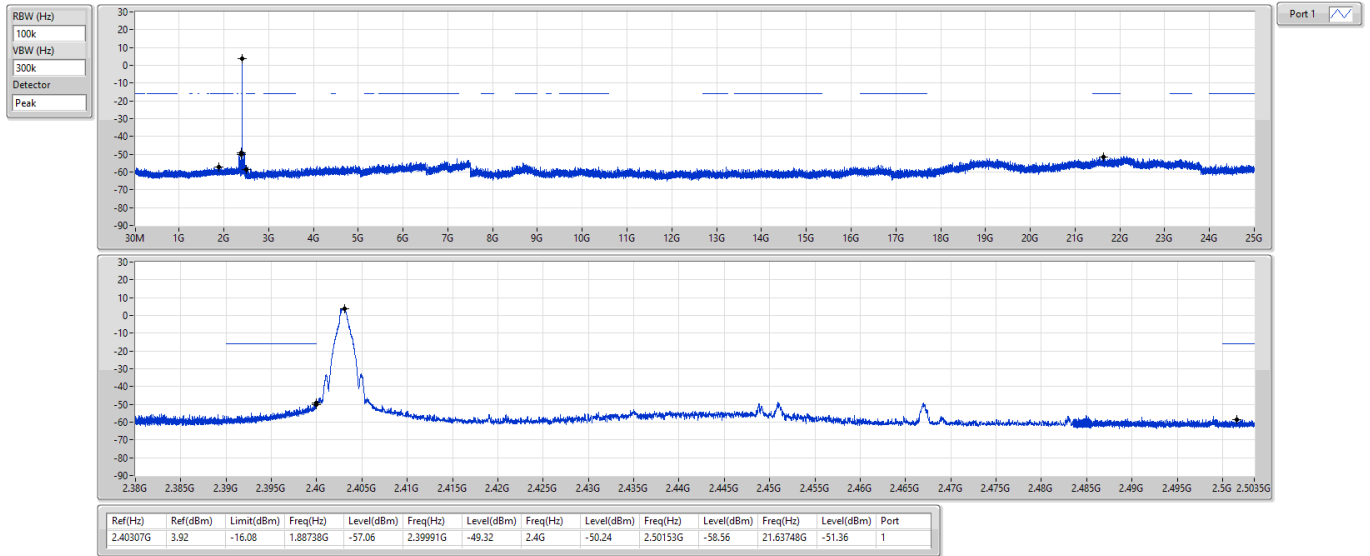


Type	Freq (Hz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw (dBuV)	Dist (m)	Condition	Azimuth (°)	Height (m)	Comment	AF (dB/m)	CL (dB)	PA (dB)			
AV	2.4835G	37.38	54.00	-16.62	-	3	Vertical	295	3.21	-	-	-	-			
PK	2.4835G	38.64	74.00	-35.36	-	3	Vertical	295	3.21	-	-	-	-			
AV	2.4855G	36.67	54.00	-17.33	41.42	3	Vertical	295	3.21	-	27.20	5.06	37.01			
PK	2.4855G	49.63	74.00	-24.37	54.38	3	Vertical	295	3.21	-	27.20	5.06	37.01			
AV	4.962G	40.26	54.00	-13.74	40.51	3	Vertical	47	2.62	-	31.37	7.00	38.62			
PK	4.962G	49.31	74.00	-24.69	49.56	3	Vertical	47	2.62	-	31.37	7.00	38.62			
AV	7.443G	44.09	54.00	-9.91	38.84	3	Vertical	166	1.00	-	36.36	8.50	39.61			
PK	7.443G	55.60	74.00	-18.40	50.35	3	Vertical	166	1.00	-	36.36	8.50	39.61			

2.4-2.4835GHz_SRD

CSEndB-DTS

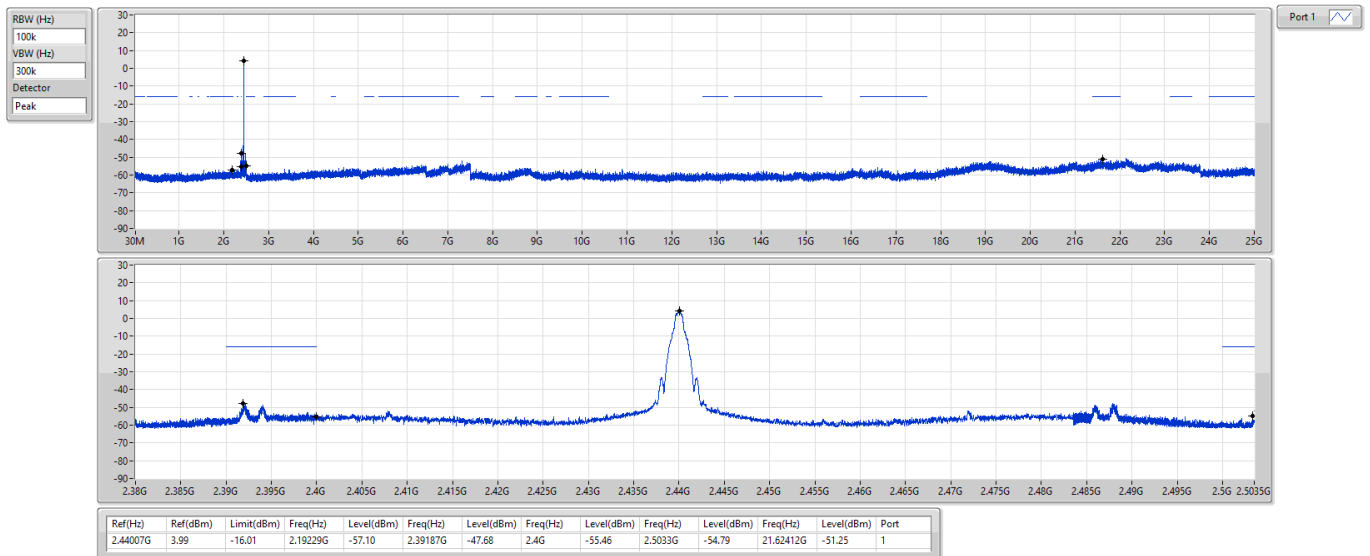
2403MHz

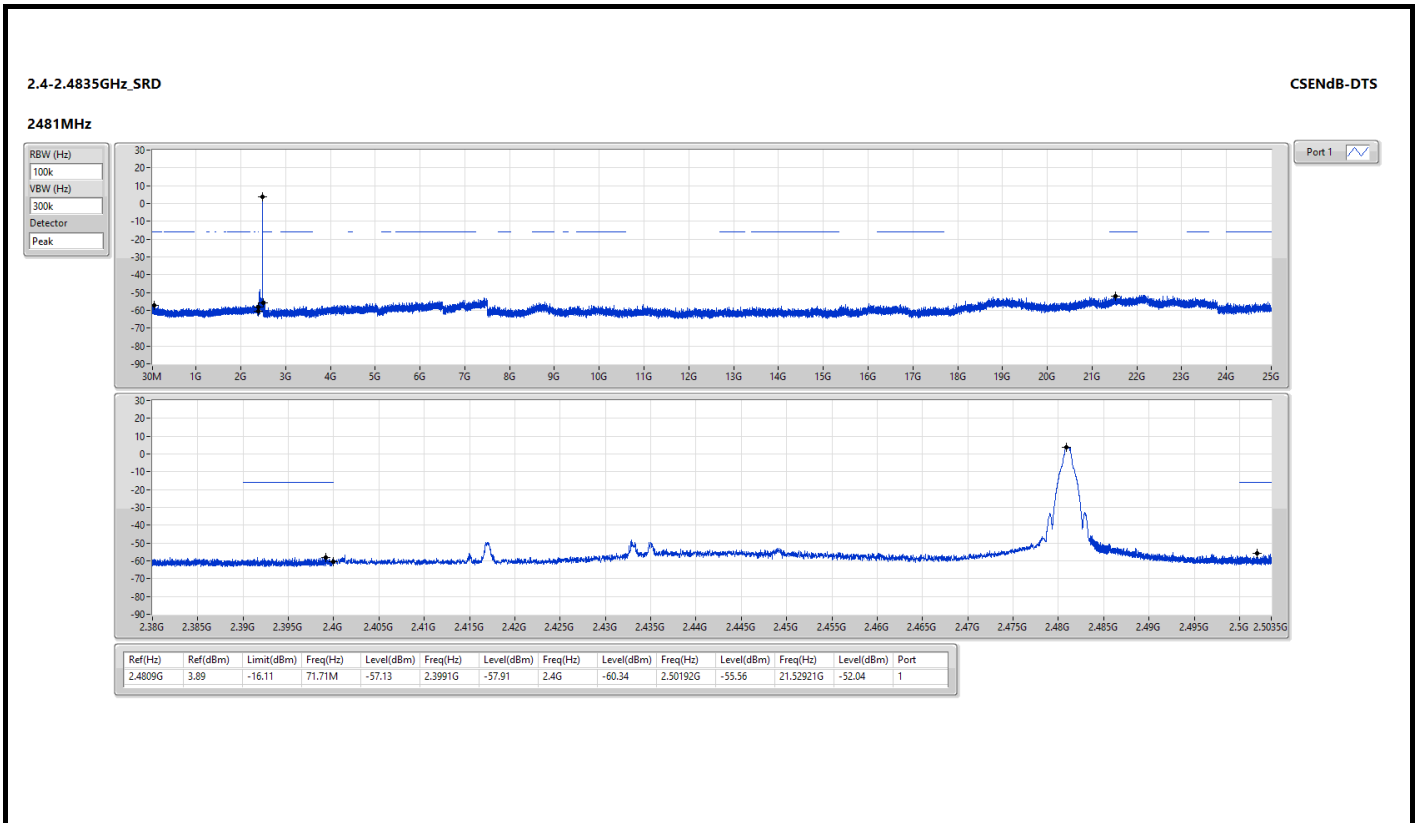


2.4-2.4835GHz_SRD

CSEndB-DTS

2440MHz





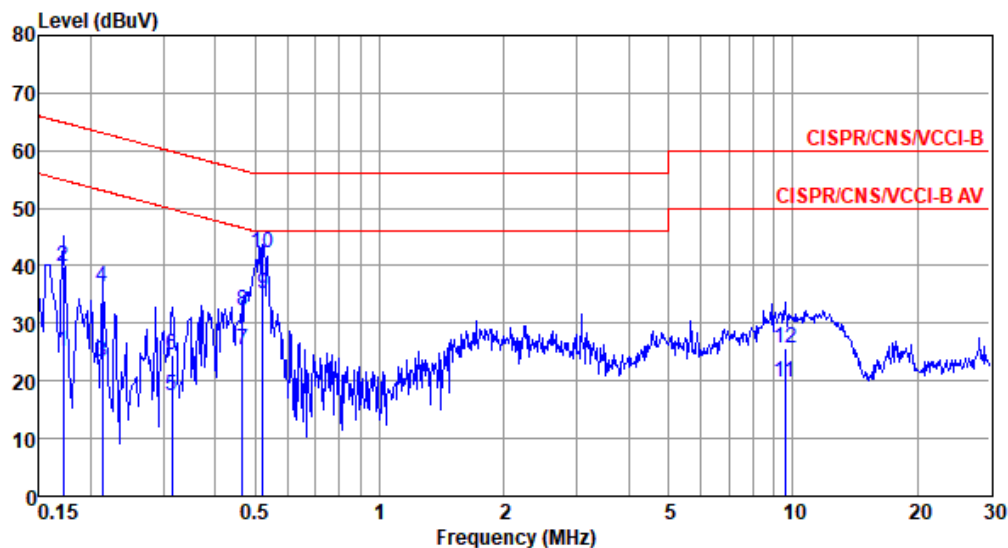


Modulation	GFSK	Test Freq. (MHz)	2440
Power Phase	Line		

Test by : Joe Liao

Temperature: 25°C

Humidity: 62%



	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	
	MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark
			dBuV	dB	dBuV		dB		
1	0.171	25.02	54.90	-29.88	15.08	9.65	0.07	0.22	Average
2	0.171	39.87	64.90	-25.03	29.93	9.65	0.07	0.22	QP
3	0.213	23.37	53.10	-29.73	13.40	9.65	0.06	0.26	Average
4	0.213	36.37	63.10	-26.73	26.40	9.65	0.06	0.26	QP
5	0.315	17.34	49.84	-32.50	7.33	9.64	0.07	0.30	Average
6	0.315	24.47	59.84	-35.37	14.46	9.64	0.07	0.30	QP
7	0.466	25.28	46.58	-21.30	15.22	9.64	0.08	0.34	Average
8	0.466	32.03	56.58	-24.55	21.97	9.64	0.08	0.34	QP
9*	0.521	35.12	46.00	-10.88	25.06	9.64	0.08	0.34	Average
10	0.521	42.25	56.00	-13.75	32.19	9.64	0.08	0.34	QP
11	9.552	19.70	50.00	-30.30	9.20	9.71	0.34	0.45	Average
12	9.552	25.66	60.00	-34.34	15.16	9.71	0.34	0.45	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).

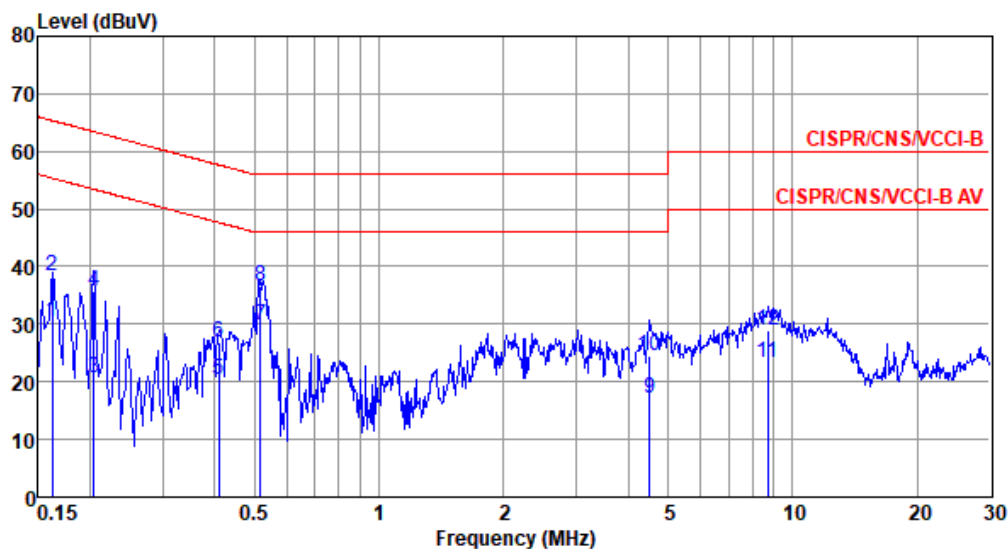


Modulation	GFSK	Test Freq. (MHz)	2440
Power Phase	Neutral		

Test by : Joe Liao

Temperature: 25°C

Humidity: 62%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.162	30.27	55.34	-25.07	20.41	9.66	0.07	0.13	Average
2	0.162	38.32	65.34	-27.02	28.46	9.66	0.07	0.13	QP
3	0.204	20.79	53.45	-32.66	10.91	9.65	0.06	0.17	Average
4	0.204	35.72	63.45	-27.73	25.84	9.65	0.06	0.17	QP
5	0.410	20.31	47.64	-27.33	10.34	9.64	0.08	0.25	Average
6	0.410	26.83	57.64	-30.81	16.86	9.64	0.08	0.25	QP
7*	0.516	29.93	46.00	-16.07	19.95	9.64	0.08	0.26	Average
8	0.516	36.75	56.00	-19.25	26.77	9.64	0.08	0.26	QP
9	4.501	17.15	46.00	-28.85	6.86	9.69	0.20	0.40	Average
10	4.501	24.62	56.00	-31.38	14.33	9.69	0.20	0.40	QP
11	8.729	23.30	50.00	-26.70	12.83	9.73	0.32	0.42	Average
12	8.729	28.92	60.00	-31.08	18.45	9.73	0.32	0.42	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).

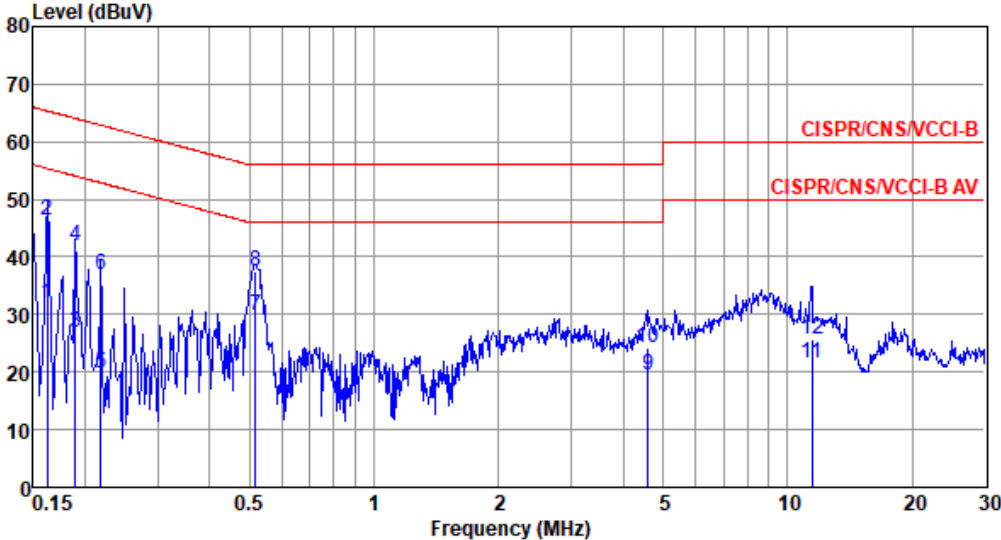
2: Over Limit (dB) = Level (dBuV) - Limit Line (dBuV).



Mode	Charging mode with laptop								
Power Phase	Line								
Test by : Joe Liao Temperature: 25°C Humidity: 62%									
Level (dBuV) Frequency (MHz)									
	Freq	Level	Limit	Over	Read	Factor	Cable	Aux	
	MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark
			dBuV	dB	dBuV		dB		
1	0.150	25.27	56.00	-30.73	15.34	9.65	0.08	0.20	Average
2	0.150	46.29	66.00	-19.71	36.36	9.65	0.08	0.20	QP
3	0.189	27.03	54.06	-27.03	17.08	9.65	0.06	0.24	Average
4	0.189	42.50	64.06	-21.56	32.55	9.65	0.06	0.24	QP
5	0.207	22.80	53.32	-30.52	12.84	9.65	0.06	0.25	Average
6	0.207	38.68	63.32	-24.64	28.72	9.65	0.06	0.25	QP
7*	0.516	34.62	46.00	-11.38	24.56	9.64	0.08	0.34	Average
8	0.516	42.44	56.00	-13.56	32.38	9.64	0.08	0.34	QP
9	2.736	17.54	46.00	-28.46	7.35	9.66	0.14	0.39	Average
10	2.736	23.41	56.00	-32.59	13.22	9.66	0.14	0.39	QP
11	12.060	22.36	50.00	-27.64	11.80	9.70	0.39	0.47	Average
12	12.060	26.67	60.00	-33.33	16.11	9.70	0.39	0.47	QP

Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB).
2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).

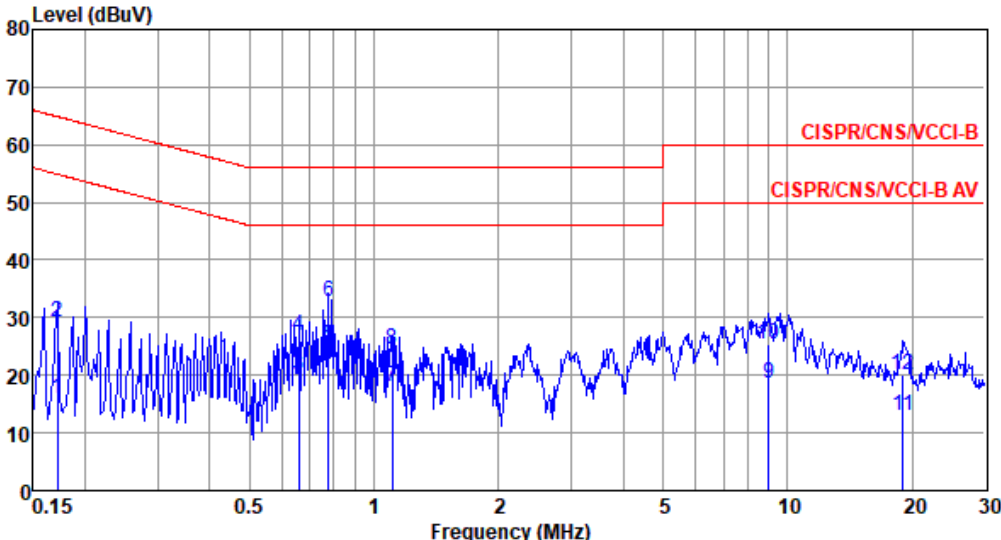


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Level (dBuV)  <table><tr><th></th><th>Freq</th><th>Level</th><th>Limit</th><th>Over</th><th>Read</th><th>Factor</th><th>Cable</th><th>Aux</th><th></th></tr><tr><th></th><th>MHz</th><th>dBuV</th><th>Line</th><th>Limit</th><th>Level</th><th>dB</th><th>loss</th><th>dB</th><th>Remark</th></tr><tr><td>1</td><td>0.171</td><td>15.92</td><td>54.90</td><td>-38.98</td><td>6.05</td><td>9.66</td><td>0.07</td><td>0.14</td><td>Average</td></tr><tr><td>2</td><td>0.171</td><td>29.12</td><td>64.90</td><td>-35.78</td><td>19.25</td><td>9.66</td><td>0.07</td><td>0.14</td><td>QP</td></tr><tr><td>3</td><td>0.658</td><td>20.00</td><td>46.00</td><td>-26.00</td><td>9.98</td><td>9.65</td><td>0.09</td><td>0.28</td><td>Average</td></tr><tr><td>4</td><td>0.658</td><td>26.84</td><td>56.00</td><td>-29.16</td><td>16.82</td><td>9.65</td><td>0.09</td><td>0.28</td><td>QP</td></tr><tr><td>5*</td><td>0.775</td><td>24.97</td><td>46.00</td><td>-21.03</td><td>14.94</td><td>9.65</td><td>0.09</td><td>0.29</td><td>Average</td></tr><tr><td>6</td><td>0.775</td><td>32.88</td><td>56.00</td><td>-23.12</td><td>22.85</td><td>9.65</td><td>0.09</td><td>0.29</td><td>QP</td></tr><tr><td>7</td><td>1.106</td><td>17.95</td><td>46.00</td><td>-28.05</td><td>7.90</td><td>9.65</td><td>0.09</td><td>0.31</td><td>Average</td></tr><tr><td>8</td><td>1.106</td><td>24.49</td><td>56.00</td><td>-31.51</td><td>14.44</td><td>9.65</td><td>0.09</td><td>0.31</td><td>QP</td></tr><tr><td>9</td><td>9.011</td><td>18.60</td><td>50.00</td><td>-31.40</td><td>8.12</td><td>9.73</td><td>0.33</td><td>0.42</td><td>Average</td></tr><tr><td>10</td><td>9.011</td><td>25.43</td><td>60.00</td><td>-34.57</td><td>14.95</td><td>9.73</td><td>0.33</td><td>0.42</td><td>QP</td></tr><tr><td>11</td><td>19.021</td><td>12.90</td><td>50.00</td><td>-37.10</td><td>2.01</td><td>9.82</td><td>0.50</td><td>0.57</td><td>Average</td></tr><tr><td>12</td><td>19.021</td><td>20.19</td><td>60.00</td><td>-39.81</td><td>9.30</td><td>9.82</td><td>0.50</td><td>0.57</td><td>QP</td></tr></table>											Freq	Level	Limit	Over	Read	Factor	Cable	Aux			MHz	dBuV	Line	Limit	Level	dB	loss	dB	Remark	1	0.171	15.92	54.90	-38.98	6.05	9.66	0.07	0.14	Average	2	0.171	29.12	64.90	-35.78	19.25	9.66	0.07	0.14	QP	3	0.658	20.00	46.00	-26.00	9.98	9.65	0.09	0.28	Average	4	0.658	26.84	56.00	-29.16	16.82	9.65	0.09	0.28	QP	5*	0.775	24.97	46.00	-21.03	14.94	9.65	0.09	0.29	Average	6	0.775	32.88	56.00	-23.12	22.85	9.65	0.09	0.29	QP	7	1.106	17.95	46.00	-28.05	7.90	9.65	0.09	0.31	Average	8	1.106	24.49	56.00	-31.51	14.44	9.65	0.09	0.31	QP	9	9.011	18.60	50.00	-31.40	8.12	9.73	0.33	0.42	Average	10	9.011	25.43	60.00	-34.57	14.95	9.73	0.33	0.42	QP	11	19.021	12.90	50.00	-37.10	2.01	9.82	0.50	0.57	Average	12	19.021	20.19	60.00	-39.81	9.30	9.82	0.50	0.57	QP
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Note 1: Level (dBuV) = Read Level (dBuV) + LISN Factor (dB) + Cable Loss (dB) + Aux (dB). 2: Over Limit (dB) = Level (dBuV) – Limit Line (dBuV).																																																																																																																																																					