FCC Test Report

FCC ID	:	**MXF-W1700K**
Equipment	:	**Wi-Fi 7 Router**
Model No.	:	**W1700K**
Brand Name	:	**Q Fiber**
Applicant	:	**Gemtek Technology Co., Ltd.**
Address	:	**No. 15-1 Zhonghua Road, Hsinchu Industrial Park, Hukou, Hsinchu, Taiwan, 30352.**
Standard	:	**47 CFR FCC Part 15.247**
Received Date	:	**Jun. 27, 2023**
Tested Date	:	**Jul. 21 ~ Aug. 10, 2023**

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 The Equipment List 8
1.5 Test Standards 9
1.6 Reference Guidance 9
1.7 Deviation from Test Standard and Measurement Procedure 10
1.8 Measurement Uncertainty 10

2 TEST CONFIGURATION 11

2.1 Testing Facility 11
2.2 The Worst Test Modes and Channel Details 11

3 TRANSMITTER TEST RESULTS 12

3.1 6dB and Occupied Bandwidth 12
3.2 Conducted Output Power 13
3.3 Power Spectral Density 14
3.4 Unwanted Emissions into Restricted Frequency Bands 15
3.5 Emissions in Non-Restricted Frequency Bands 17
3.6 AC Power Line Conducted Emissions 18

4 TEST LABORATORY INFORMATION 19

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
FR362704	Rev. 01	Initial issue	Sep. 19, 2023

Summary of Test Results

FCC Rules	Test Items	Measured	Result
15.207	AC Power Line Conducted Emission	[dBuV]: 0.270MHz 40.96 (Margin -10.16dB) - AV	Pass
15.247(d) 15.209	Unwanted Emissions	[dBuV/m at 3m]: 31.86MHz 36.71 (Margin -3.29dB) - PK	Pass
15.247(b)(3)	Conducted Output Power	Max Power [dBm]: 9.77	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)	**Mode**	**Ch. Frequency (MHz)**	**Channel Number**	**Data Rate**
2400~2483.5	Thread	2405~2480	11-26 [16]	250kbps
Note 1: Thread uses DSSS-OQPSK modulation.				

1.1.2 Antenna Details

Ant. No.	Type	Connector	Gain (dBi)	Remarks
1	PIFA	NA	2.94	---

1.1.3 Power Supply Type of Equipment under Test (EUT)

Power Supply Type	12Vdc from adapter

1.1.4 Accessories

Accessories		
No.	**Equipment**	**Description**
1	AC adapter	Brand: LUCENT TRANS ELECTRONICS CO., LTD. Model: 1A98-LJHL I/P: 100-120V~1.6A, 50-60Hz O/P: 12V⎓5.0A, 60.0W Power Line: 1.8m non-shielded without core
2	AC adapter	Brand: LEI Model: ML60-4120500-A1 I/P: 120V~60Hz, 1.5A O/P: 12V⎓5.0A Power Line: 1.8m non-shielded without core
3	RJ45	Brand: Tung Li Line: 1.8m non-shielded without core
4	RJ45	Brand: RAPID CONN Line: 1.8m non-shielded without core
5	Fan	Brand: SUNONWEALTH ELECTRIC MACHINE INDUSTRY CO LTD Model: MF70151V1-1C010-S99
6	Fan	Brand: Yingfan Model: DB701512HMS4B01F25

1.1.5 Channel List

Channel No.	Frequency (MHz)
11	2405
12	2410
13	2415
14	2420
15	2425
16	2430
17	2435
18	2440
19	2445
20	2450
21	2455
22	2460
23	2465
24	2470
25	2475
26	2480

1.1.6 Test Tool and Duty Cycle

Test Tool	Terminal, Version: v1.93b	
Duty Cycle and Duty Factor	**Duty Cycle (%)**	**Duty Factor (dB)**
	100	0

1.1.7 Power Index of Test Tool

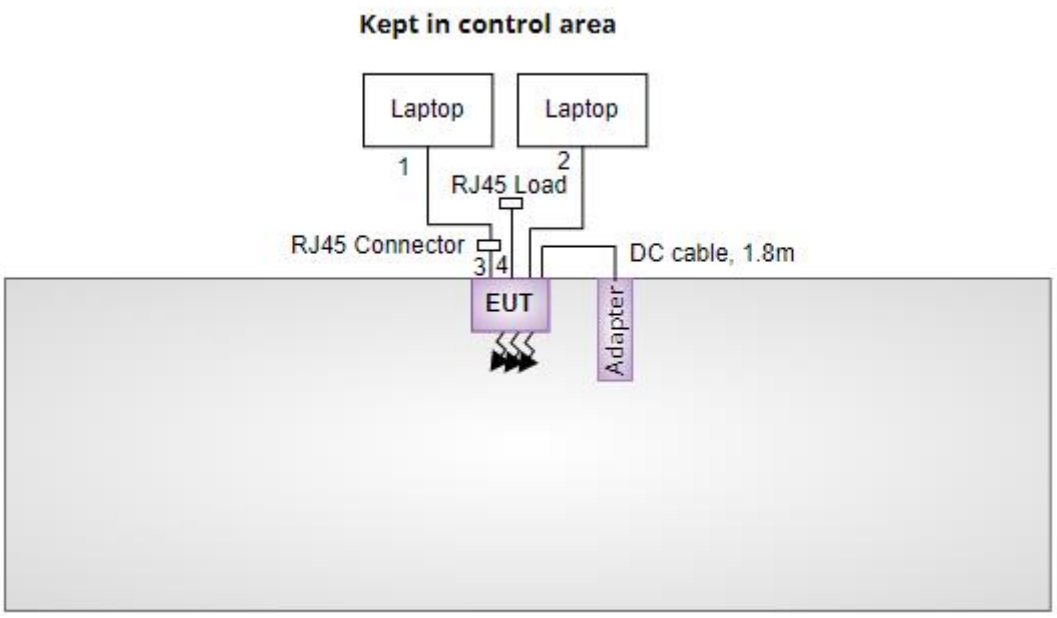
Modulation Mode	Test Frequency (MHz)	Power Index
OQPSK	2405	100
OQPSK	2440	100
OQPSK	2480	100

1.2 Local Support Equipment List

Support Equipment List					
No.	**Equipment**	**Brand**	**Model**	**FCC ID**	**Remarks**
1	RJ45 Load	ICC	--	--	---
2	RJ45 Connector	ICC	RJ45 Connector	--	---
3	Laptop	DELL	Latitude 5400	DoC	---
4	Laptop	DELL	Latitude E5470	DoC	---

1.3 Test Setup Chart

Test Setup Diagram



No.	Signal cable / Length (m)
1-2	RJ45, 10m non-shielded.
3	RJ45, 1.8m non-shielded.
4	RJ45, 1.3m(x2) non-shielded with load.

1.4 The Equipment List

Test Item	Conducted Emission				
Test Site	Conduction room 1 / (CO01-WS)				
Tested Date	Aug. 10, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101658	Feb. 17, 2023	Feb. 16, 2024
LISN	R&S	ENV216	101579	May 09, 2023	May 08, 2024
LISN (Support Unit)	SCHWARZBECK	Schwarzbeck 8127	8127667	Jan .03, 2023	Jan .02, 2024
RF Cable-CON	Woken	CFD200-NL	CFD200-NL-001	Oct. 17, 2022	Oct. 16, 2023
50 ohm terminal (Support Unit)	NA	50	01	Jun. 14, 2023	Jun. 13, 2024
Measurement Software	AUDIX	e3	6.120210k	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission below 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Aug. 02, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Receiver	R&S	ESR3	101657	Mar. 03, 2023	Mar. 02, 2024
Loop Antenna	R&S	HFH2-Z2	100330	Nov. 01, 2022	Oct. 31, 2023
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jul. 31, 2023	Jul. 30, 2024
Preamplifier	EMC	EMC02325	980225	Jun. 28, 2023	Jun. 27, 2024
Loop Antenna Cable	KOAX KABEL	101354-BW	101354-BW	Oct. 04, 2022	Oct. 03, 2023
LF cable 3M	Woken	CFD400NL-LW	CFD400NL-001	Oct. 04, 2022	Oct. 03, 2023
LF cable 11M	EMC	EMCCFD400-NW-NW-11000	200801	Oct. 04, 2022	Oct. 03, 2023
LF cable 1M	EMC	EMCCFD400-NM-NM-1000	160502	Oct. 04, 2022	Oct. 03, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Tested Date	Jul. 21, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101498	Nov. 21, 2022	Nov. 20, 2023
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Nov. 25, 2022	Nov. 24, 2023
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Oct. 27, 2022	Oct. 26, 2023
Preamplifier	EMC	EMC118A45SE	980898	Jul. 14, 2023	Jul. 13, 2024
Preamplifier	EMC	EMC184045SE	980903	Jul. 17, 2023	Jul. 16, 2024
RF Cable	EMC	EMC104-35M-35M-8000	210920	Oct. 04, 2022	Oct. 03, 2023
RF Cable	EMC	EMC104-35M-35M-3000	210922	Oct. 04, 2022	Oct. 03, 2023
HIGHPASS FILTER 3.1-18G	WHK	WHK3.1/18G-10SS	39	Oct. 06, 2022	Oct. 05, 2023
Attenuator	Pasternack	PE7005-10	10-1	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	AUDIX	e3	6.120210g	NA	NA
Note: Calibration Interval of instruments listed above is one year.					

Test Item	RF Conducted				
Test Site	(TH01-WS)				
Tested Date	Aug. 01, 2023				
Instrument	**Brand**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV40	101910	Apr. 14, 2023	Apr. 13, 2024
Power Meter	Anritsu	ML2495A	1241002	Nov. 23, 2022	Nov. 22, 2023
Power Sensor	Anritsu	MA2411B	1207366	Nov. 23, 2022	Nov. 22, 2023
Attenuator	Pasternack	PE7005-10	10-2	Oct. 06, 2022	Oct. 05, 2023
Measurement Software	Sporton	SENSE-15247_DTS	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
Radiated emission ≤ 1GHz	±3.41 dB
Radiated emission > 1GHz	±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
- ISED#: 10807A
- CAB identifier: TW2732

2.2 The Worst Test Modes and Channel Details

Test item	Modulation Mode	Test Frequency (MHz)	Data Rate	Test Configuration
Conducted Emissions	OQPSK	2480	250kbps	---
Radiated Emissions ≤1GHz	OQPSK	2480	250kbps	---
Radiated Emissions >1GHz Maximum Output Power 6dB bandwidth Power spectral density	OQPSK	2405 / 2440 / 2480	250kbps	---

NOTE:

1. The EUT was pretested with 3 orientations placed on the table for the radiated emission measurement – X, Y, and Z-plane. The **Z-plane** results were found as the worst case and were shown in this report.
2. Two adapters (LUCENT TRANS ELECTRONICS CO., LTD and LEI) had been covered during the pretest, and found that **LEI adapter** was the worst case of AC Power line conducted emission test item and **LUCENT TRANS ELECTRONICS CO., LTD adapter** was the worst case of Unwanted Emission test item.
3. Two RJ45 cable (Tung Li and RAPID CONN) had been covered during the pretest, and found that **Tung Li adapter** was the worst case and was selected for final test.
4. Two Fan (SUNONWEALTH ELECTRIC MACHINE INDUSTRY CO LTD and Yingfan) had been covered during the pretest, and found that **Yingfan** was the worst case and was selected for final test.

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

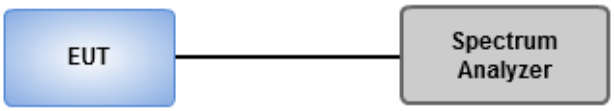
6dB Bandwidth

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 Result of 6dB and Occupied Bandwidth

Ambient Condition	23°C / 66%	**Tested By**	Akun Chung

Refer to Appendix A.

3.2 Conducted Output Power

3.2.1 Limit of RF Output Power

Conducted power shall not exceed 1Watt.

Antenna gain <= 6dBi, no any corresponding reduction is in output power limit.

Antenna gain > 6dBi

Non Fixed, point to point operations.
The conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dB

Fixed, point to point operations
Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point Operations, maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

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 Result of Maximum Output Power

Ambient Condition	23°C / 66%	**Tested By**	Akun Chung

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

Peak PSD

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.

Average PSD, duty cycle ≥ 98%

1. Set the RBW = 30 kHz, VBW = 100 kHz.
2. Detector = RMS, Sweep time = auto couple.
3. Sweep time = auto couple.
4. Employ trace averaging (RMS) mode over a minimum of 100 traces.
5. Use the peak marker function to determine the maximum amplitude level.

Average PSD, duty cycle < 98%

1 Set the RBW = 30 kHz, VBW = 100 kHz. Detector = RMS.

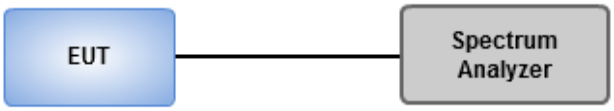
2 Set the sweep time to: ≥ 10 (number of measurement points in sweep) x (total on/off period of the transmitted signal).

3 Perform the measurement over a single sweep.

4 Use the peak marker function to determine the maximum amplitude level.

5 Add 10 log (1/x), where x is the duty cycle.

3.3.3 Test Setup



3.3.4 Test Result of Power Spectral Density

Ambient Condition	23°C / 66%	**Tested By**	Akun Chung

Refer to Appendix C.

3.4 Unwanted Emissions into Restricted Frequency Bands

3.4.1 Limit of Unwanted Emissions into 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:
Qusai-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

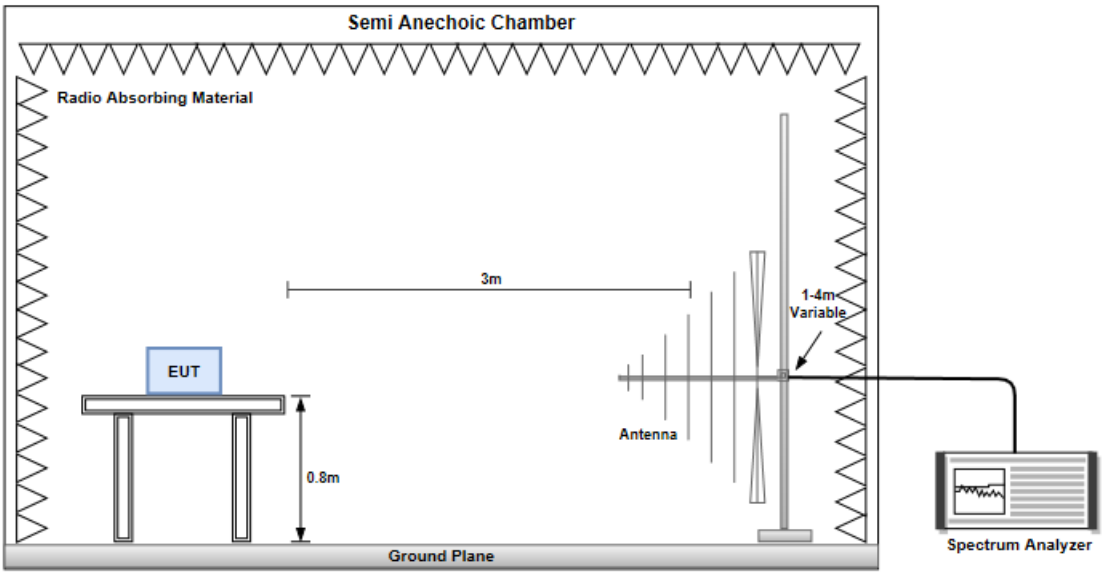
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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:

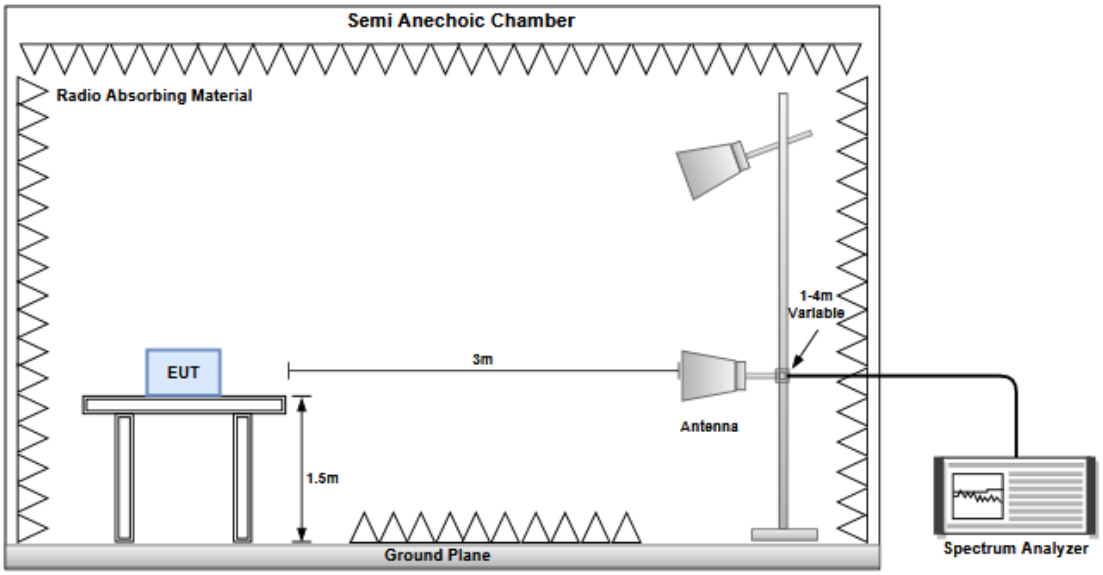
1. 120kHz measurement bandwidth of test receiver and Quasi-peak detector is for radiated emission below 1GHz.
2. RBW=1MHz, VBW=3MHz and Peak detector is for peak measured value of radiated emission above 1GHz.
3. RBW=1MHz, VBW=1/T and Peak detector is for average measured value of radiated emission above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

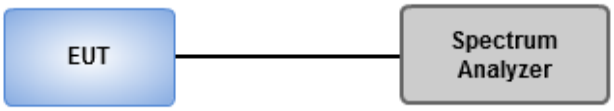
Reference level measurement

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 Unwanted Emissions into Non-Restricted Frequency Bands

Ambient Condition	23°C / 66%	**Tested By**	Akun Chung

Refer to Appendix E.

3.6 AC Power Line Conducted Emissions

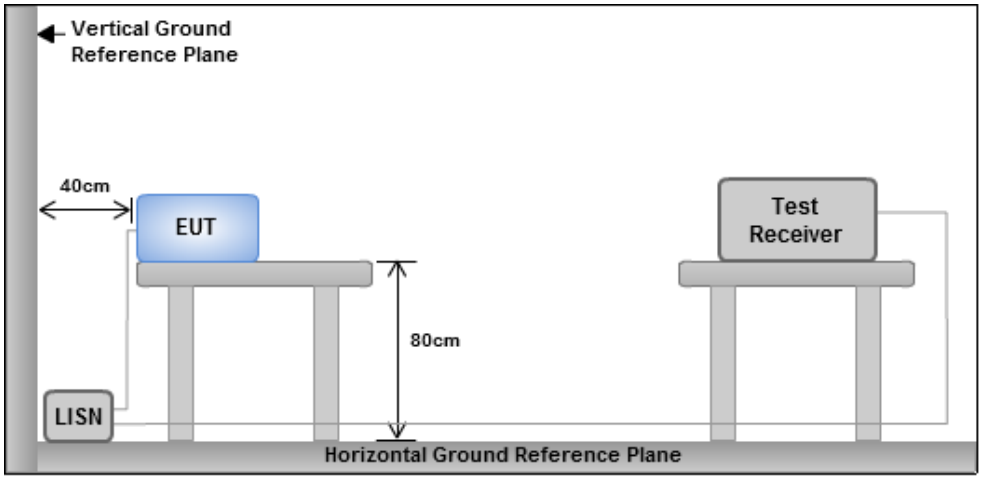
3.6.1 Limit of Conducted Emissions

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: 886-3-318-0345
Email: ICC_Service@icertifi.com.tw

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Summary

Mode	Max-N dB (Hz)	Max-OBW (Hz)	ITU-Code	Min-N dB (Hz)	Min-OBW (Hz)
2.4-2.4835GHz	-	-	-	-	-
Thread_5MHz_Nss1_1TX	1.644M	2.261M	2M26D1D	1.625M	2.255M

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

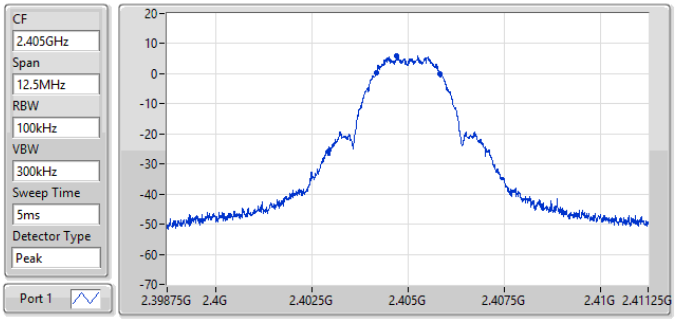
Result

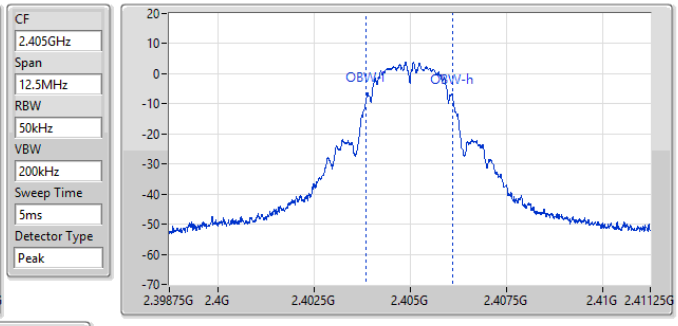
Mode	Result	Limit (Hz)	Port 1-N dB (Hz)	Port 1-OBW (Hz)
Thread_5MHz_Nss1_1TX	-	-	-	-
2405MHz	Pass	500k	1.638M	2.255M
2440MHz	Pass	500k	1.644M	2.255M
2480MHz	Pass	500k	1.625M	2.261M

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

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **EBW-DTS**

2405MHz

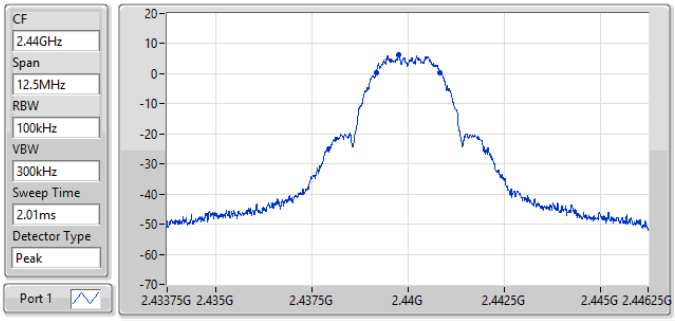


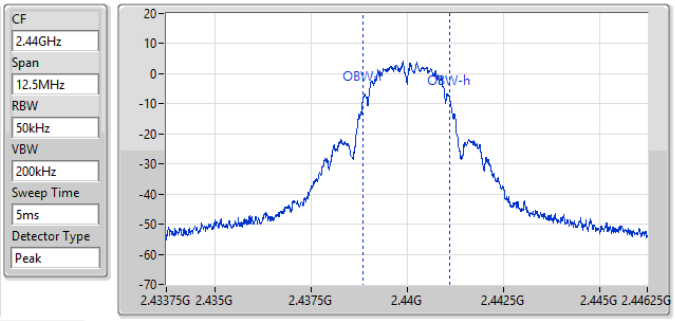


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.638M	2.404188G	2.405825G	2.255M	2.403869G	2.406124G	500k	1

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **EBW-DTS**

2440MHz

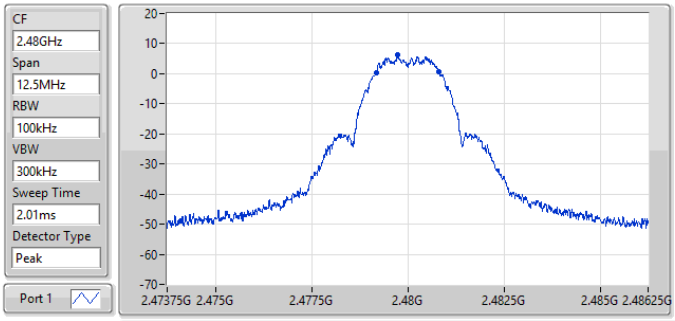


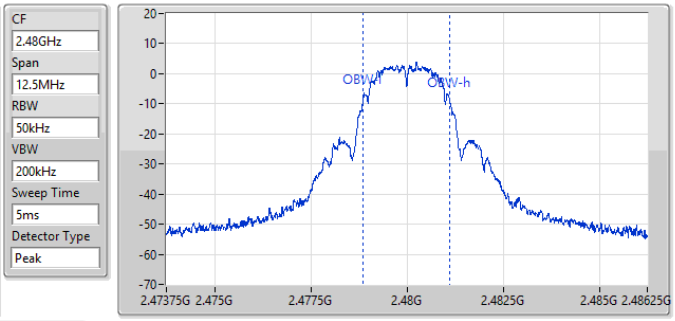


6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.644M	2.439181G	2.440825G	2.255M	2.438869G	2.441124G	500k	1

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **EBW-DTS**

2480MHz





6dB(Hz)	Fl-6dB(Hz)	Fh-6dB(Hz)	OBW(Hz)	Fl-OBW(Hz)	Fh-OBW(Hz)	Limit(Hz)	Port
1.625M	2.479194G	2.480819G	2.261M	2.478863G	2.481124G	500k	1

Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
Thread_5MHz_Nss1_1TX	9.77	0.00948

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
Thread_5MHz_Nss1_1TX	-	-	-	-	-	-
2405MHz	Pass	2.94	9.62	30.00	12.56	36.00
2440MHz	Pass	2.94	9.71	30.00	12.65	36.00
2480MHz	Pass	2.94	9.77	30.00	12.71	36.00

Summary

Mode	Total Power (dBm)	Power (W)
2.4-2.4835GHz	-	-
Thread_5MHz_Nss1_1TX	9.72	0.00938

Result

Mode	Result	Antenna Gain (dBi)	Total Power (dBm)	Power Limit (dBm)	EIRP (dBm)	EIRP Limit (dBm)
Thread_5MHz_Nss1_1TX	-	-	-	-	-	-
2405MHz	Pass	2.94	9.56	-	12.50	-
2440MHz	Pass	2.94	9.65	-	12.59	-
2480MHz	Pass	2.94	9.72	-	12.66	-

Note: Average power is for reference only.

Summary

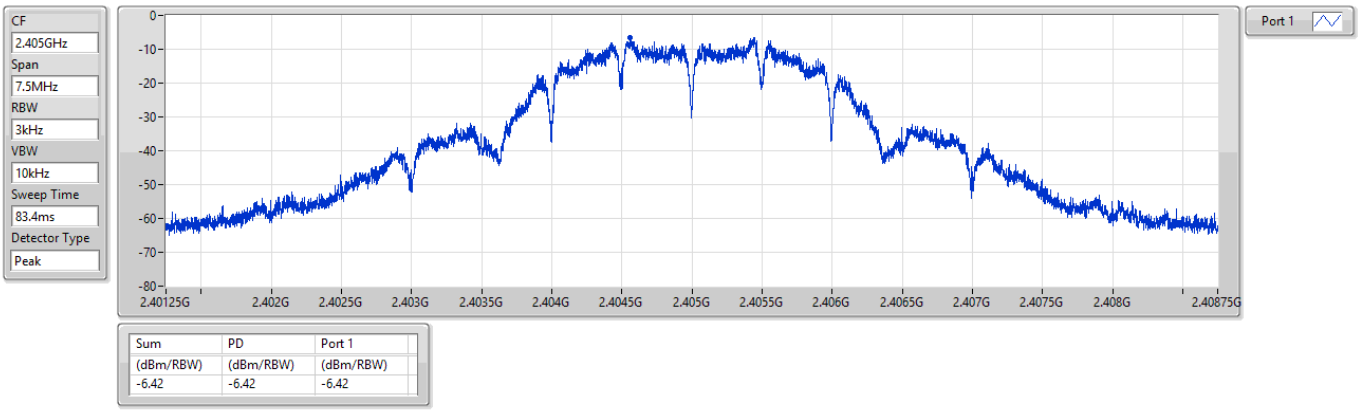
Mode	PD (dBm/3kHz)
2.4-2.4835GHz	-
Thread_5MHz_Nss1_1TX	-5.88

Result

Mode	Result	Antenna Gain (dBi)	Power Density (dBm/3kHz)	Power Density Limit (dBm/3kHz)
Thread_5MHz_Nss1_1TX	-	-	-	-
2405MHz	Pass	2.94	-6.42	8.00
2440MHz	Pass	2.94	-5.88	8.00
2480MHz	Pass	2.94	-6.27	8.00

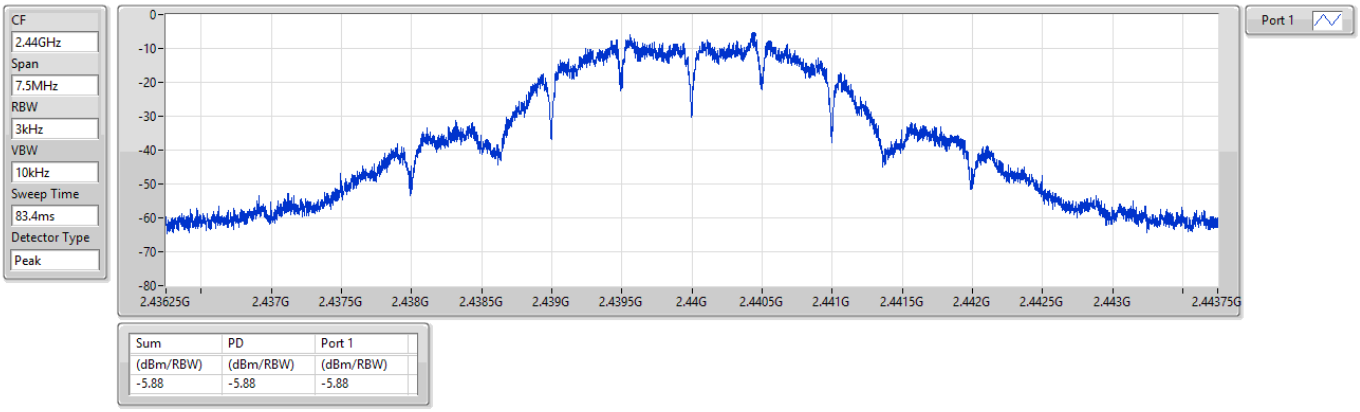
2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **PSD**

2405MHz



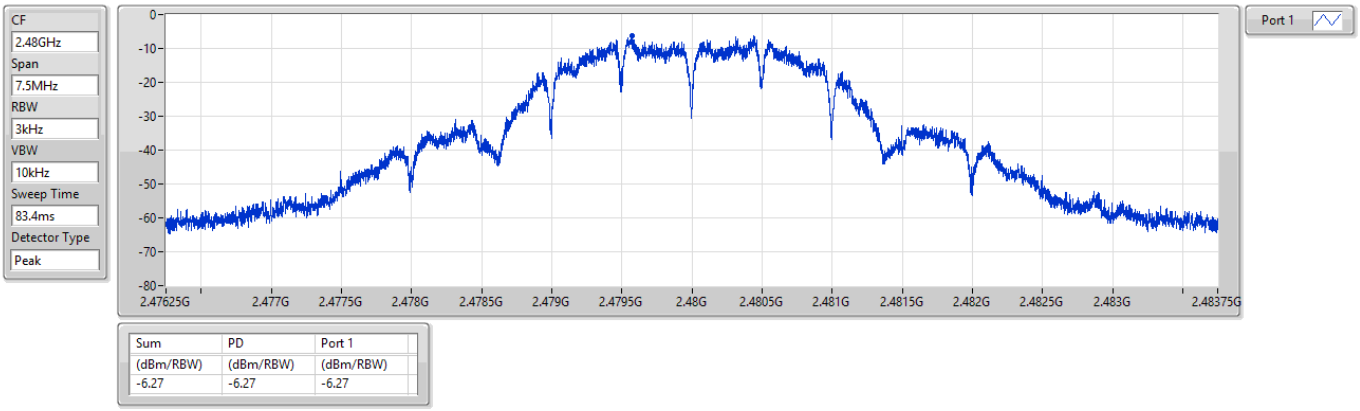
2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **PSD**

2440MHz



2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **PSD**

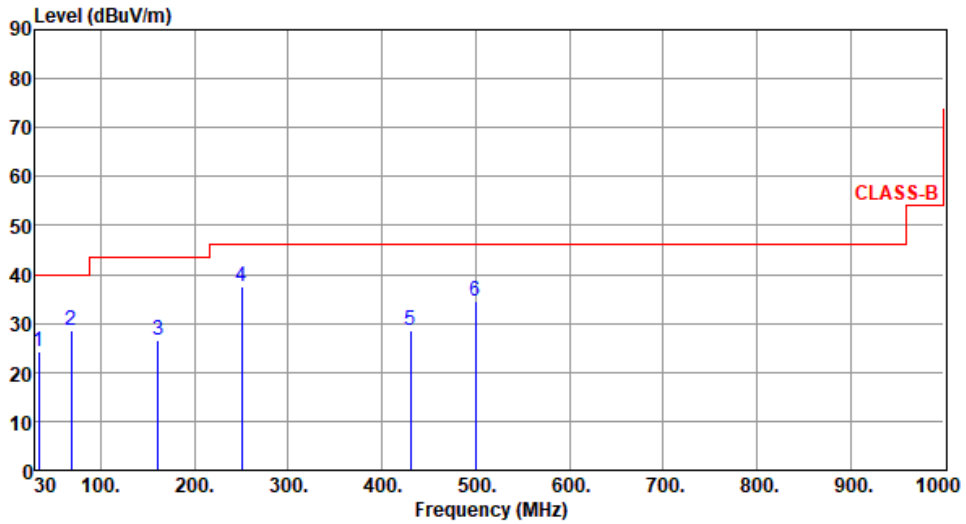
2480MHz



Unwanted Emissions (Below 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2480
Polarization	Horizontal		

Test By :Paul Lin Temperature(℃):24 Humidity(%):62

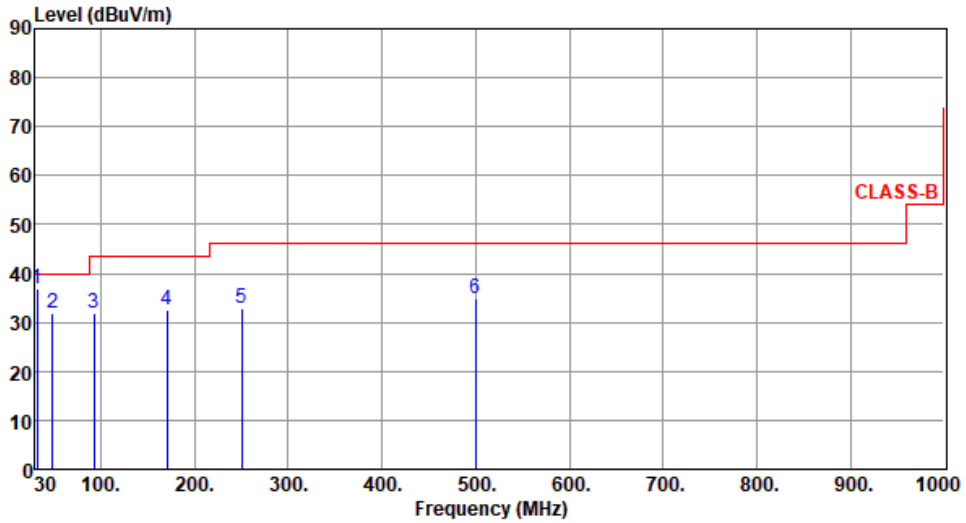


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	33.88	24.34	40.00	-15.66	33.77	-9.43	Peak	---	---
2	68.80	28.67	40.00	-11.33	39.64	-10.97	Peak	---	---
3	160.95	26.69	43.50	-16.81	35.70	-9.01	Peak	---	---
4	250.19	37.56	46.00	-8.44	47.56	-10.00	Peak	---	---
5	430.61	28.59	46.00	-17.41	33.32	-4.73	Peak	---	---
6	499.48	34.53	46.00	-11.47	37.75	-3.22	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Modulation	OQPSK	**Test Freq. (MHz)**	2480
Polarization	Vertical		

Test By :Paul Lin Temperature(℃):24 Humidity(%):62



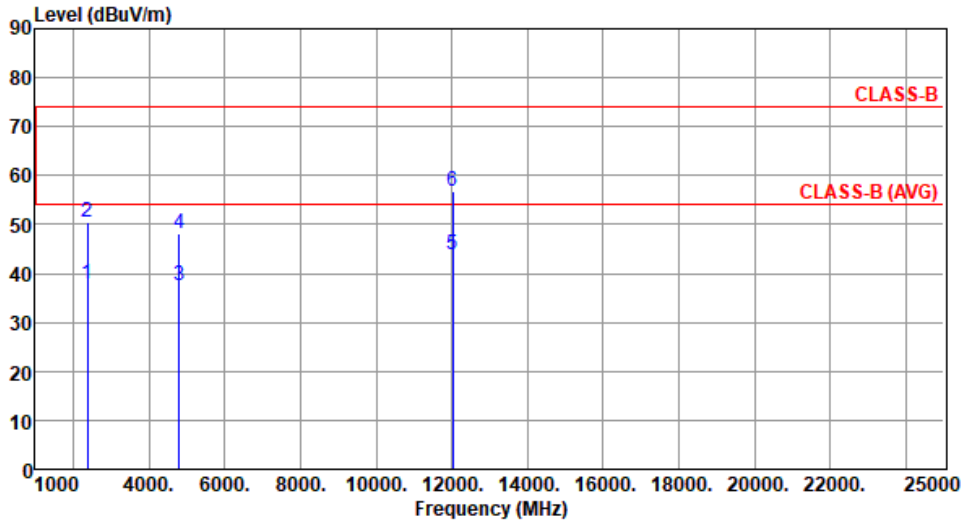
	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	31.86	36.71	40.00	-3.29	46.20	-9.49	Peak	---	---
2	48.52	31.89	40.00	-8.11	40.01	-8.12	QP	100	176
3	93.05	31.81	43.50	-11.69	45.94	-14.13	Peak	---	---
4	170.65	32.48	43.50	-11.02	41.88	-9.40	Peak	---	---
5	250.19	32.86	46.00	-13.14	42.86	-10.00	Peak	---	---
6	499.48	35.00	46.00	-11.00	38.22	-3.22	Peak	---	---

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).
Note 3: All spurious emissions below 30MHz are more than 20 dB below the limit.

Unwanted Emissions (Above 1GHz)

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Horizontal		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

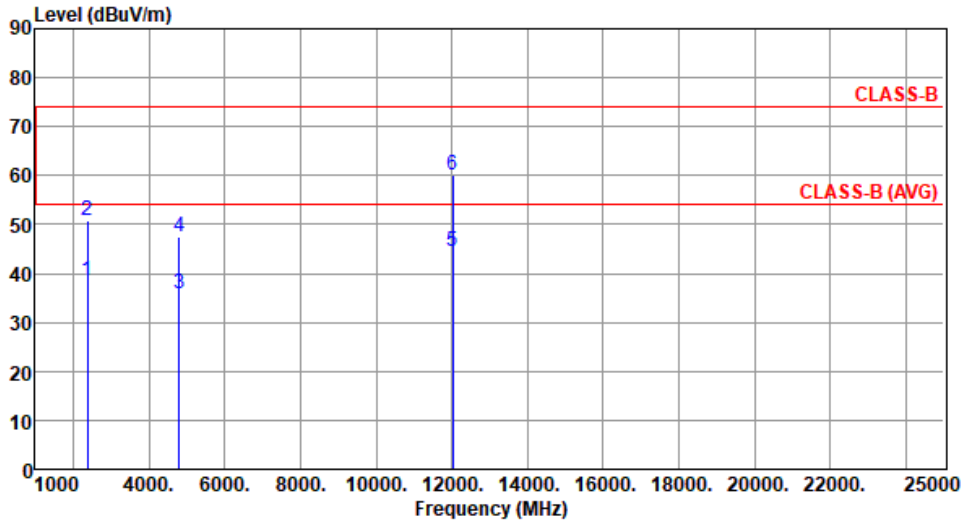


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	38.01	54.00	-15.99	42.55	-4.54	Average	101	315
2	2390.00	50.55	74.00	-23.45	55.09	-4.54	Peak	101	315
3	4810.00	37.50	54.00	-16.50	37.91	-0.41	Average	344	87
4	4810.00	48.04	74.00	-25.96	48.45	-0.41	Peak	344	87
5	12025.00	43.98	54.00	-10.02	37.69	6.29	Average	100	34
6	12025.00	56.95	74.00	-17.05	50.66	6.29	Peak	100	34

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	**Test Freq. (MHz)**	2405
Polarization	Vertical		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

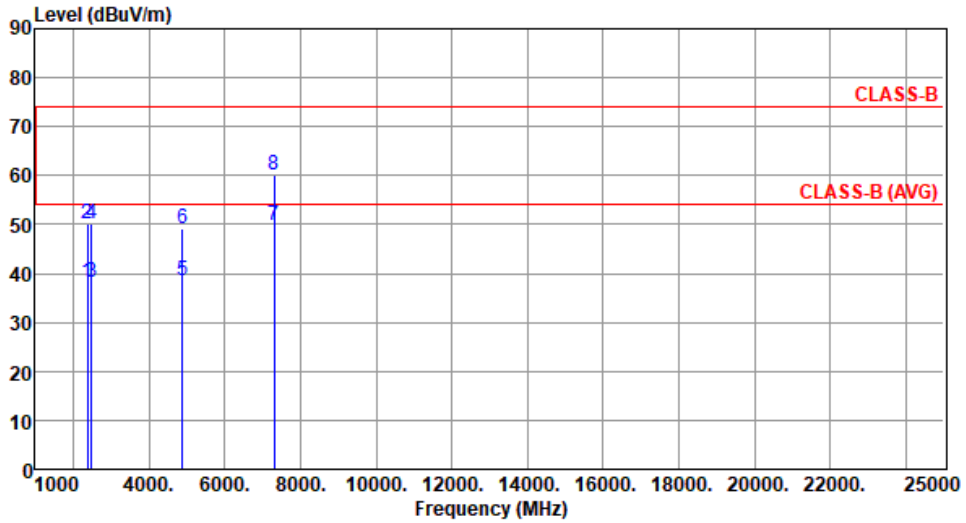


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	38.44	54.00	-15.56	42.98	-4.54	Average	186	175
2	2390.00	50.69	74.00	-23.31	55.23	-4.54	Peak	186	175
3	4810.00	35.88	54.00	-18.12	36.29	-0.41	Average	100	359
4	4810.00	47.53	74.00	-26.47	47.94	-0.41	Peak	100	359
5	12025.00	44.41	54.00	-9.59	38.12	6.29	Average	100	65
6	12025.00	59.96	74.00	-14.04	53.67	6.29	Peak	100	65

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	**Test Freq. (MHz)**	2440
Polarization	Horizontal		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

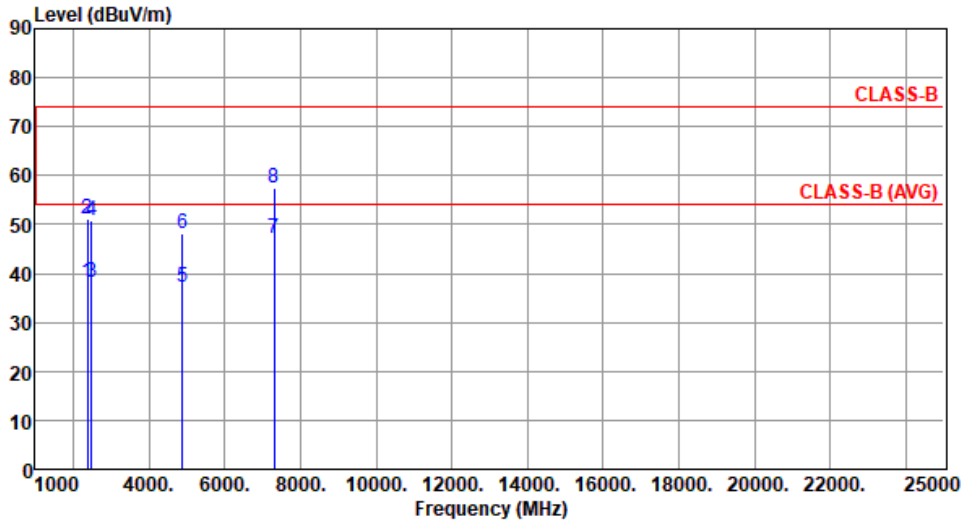


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	38.05	54.00	-15.95	42.59	-4.54	Average	100	276
2	2390.00	50.08	74.00	-23.92	54.62	-4.54	Peak	100	276
3	2483.50	38.13	54.00	-15.87	42.91	-4.78	Average	100	276
4	2483.50	50.17	74.00	-23.83	54.95	-4.78	Peak	100	276
5	4880.00	38.64	54.00	-15.36	39.07	-0.43	Average	135	195
6	4880.00	49.16	74.00	-24.84	49.59	-0.43	Peak	135	195
7	7320.00	49.66	54.00	-4.34	44.43	5.23	Average	242	128
8	7320.00	60.03	74.00	-13.97	54.80	5.23	Peak	242	128

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	**Test Freq. (MHz)**	2440
Polarization	Vertical		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

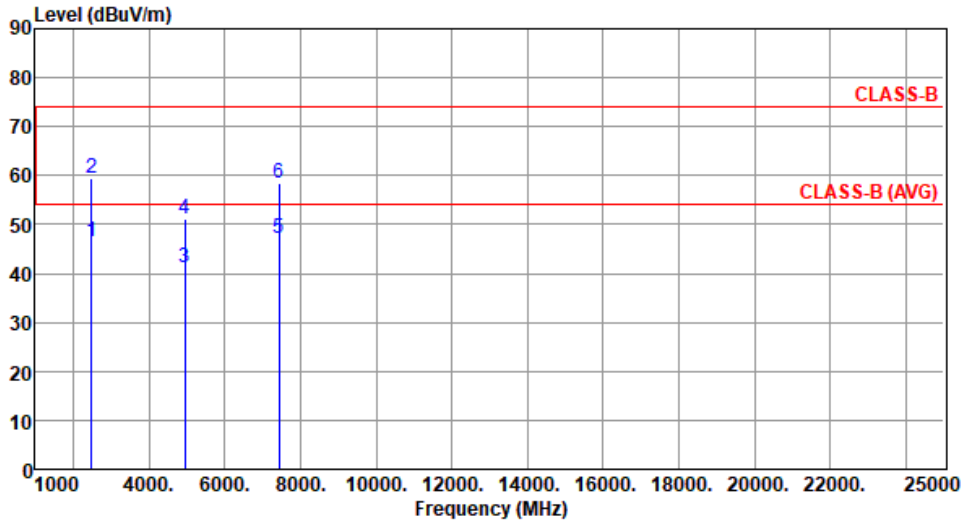


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2390.00	38.27	54.00	-15.73	42.81	-4.54	Average	161	174
2	2390.00	51.08	74.00	-22.92	55.62	-4.54	Peak	161	174
3	2483.50	38.25	54.00	-15.75	43.03	-4.78	Average	161	174
4	2483.50	50.77	74.00	-23.23	55.55	-4.78	Peak	161	174
5	4880.00	37.19	54.00	-16.81	37.62	-0.43	Average	100	12
6	4880.00	48.05	74.00	-25.95	48.48	-0.43	Peak	100	12
7	7320.00	47.21	54.00	-6.79	41.98	5.23	Average	103	102
8	7320.00	57.39	74.00	-16.61	52.16	5.23	Peak	103	102

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	**Test Freq. (MHz)**	2480
Polarization	Horizontal		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

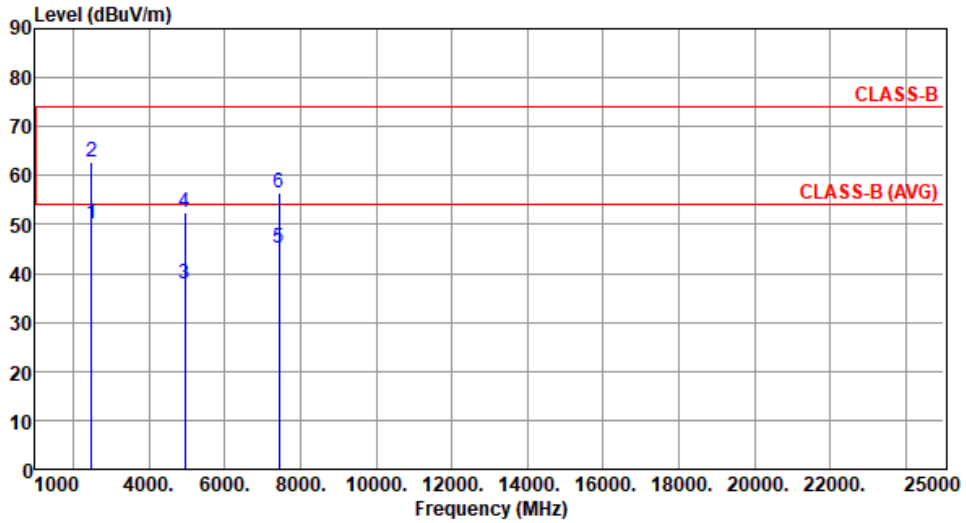


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2483.50	46.36	54.00	-7.64	51.14	-4.78	Average	100	278
2	2483.50	59.56	74.00	-14.44	64.34	-4.78	Peak	100	278
3	4960.00	41.28	54.00	-12.72	41.61	-0.33	Average	150	151
4	4960.00	50.99	74.00	-23.01	51.32	-0.33	Peak	150	151
5	7440.00	47.19	54.00	-6.81	42.04	5.15	Average	252	138
6	7440.00	58.40	74.00	-15.60	53.25	5.15	Peak	252	138

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

Modulation	OQPSK	**Test Freq. (MHz)**	2480
Polarization	Vertical		

Test By :Paul Lin Temperature(℃):26 Humidity(%):61

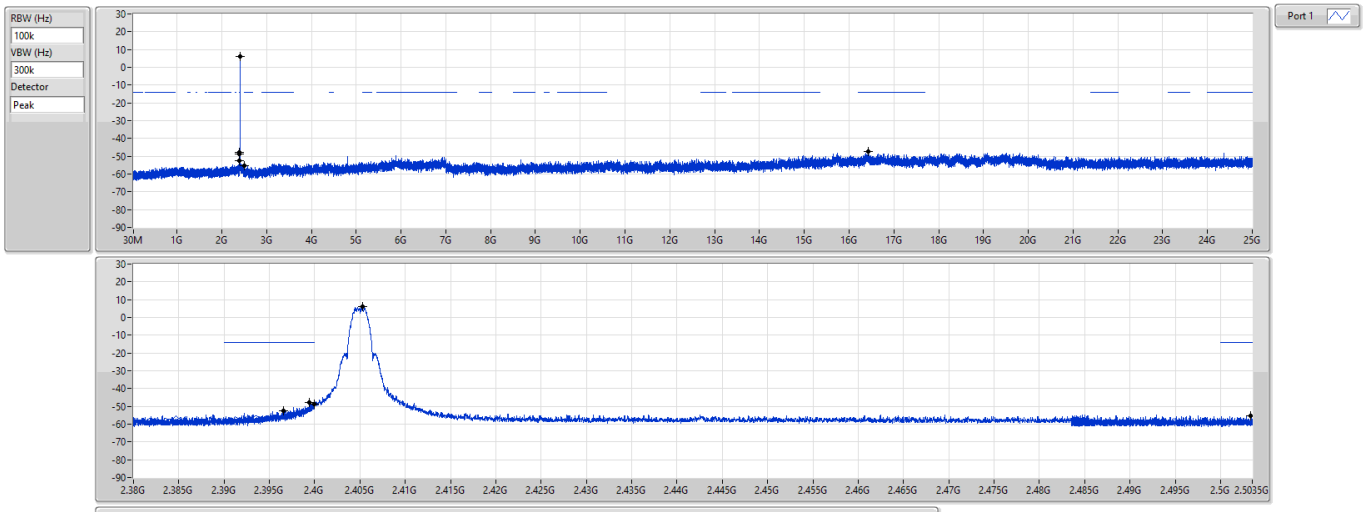


	Freq. MHz	Emission level dBuV/m	Limit dBuV/m	Margin dB	SA reading dBuV	Factor dB/m	Remark	ANT High cm	Turn Table deg
1	2483.50	50.13	54.00	-3.87	54.91	-4.78	Average	159	175
2	2483.50	62.73	74.00	-11.27	67.51	-4.78	Peak	159	175
3	4960.00	37.84	54.00	-16.16	38.17	-0.33	Average	100	7
4	4960.00	52.47	74.00	-21.53	52.80	-0.33	Peak	100	7
5	7440.00	45.12	54.00	-8.88	39.97	5.15	Average	100	45
6	7440.00	56.39	74.00	-17.61	51.24	5.15	Peak	100	45

Note 1: Emission Level (dBuV/m) = SA Reading (dBuV) + Factor* (dB/m)
*Factor includes antenna factor , cable loss and amplifier gain
Note 2: Margin (dB) = Emission level (dBuV/m) – Limit (dBuV/m).

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **CSENdB-DTS**

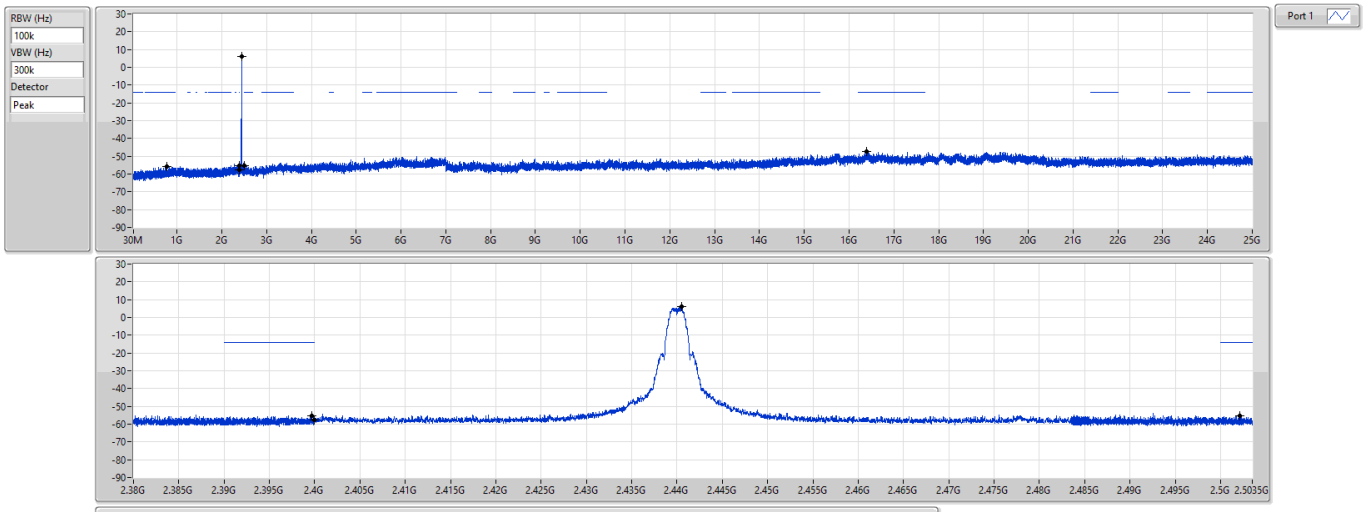
2405MHz



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
2.40525G	5.93	-14.07	2.39652G	-52.29	2.39942G	-47.81	2.4G	-48.78	2.50336G	-55.49	16.42391G	-47.35	1

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **CSENdB-DTS**

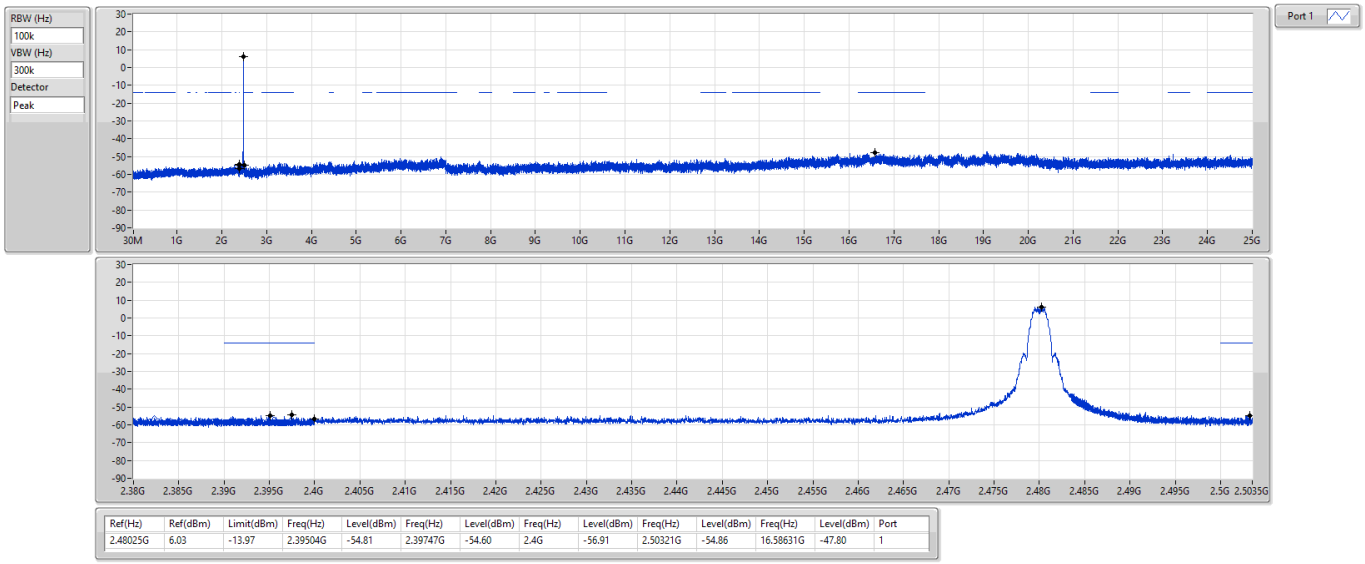
2440MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.4405G	5.89	-14.11	771.48M	-55.96	2.39967G	-55.42	2.4G	-57.79	2.50211G	-55.50	16.39931G	-47.51	1

2.4-2.4835GHz_Thread_5MHz_Nss1_1TX **CSENdB-DTS**

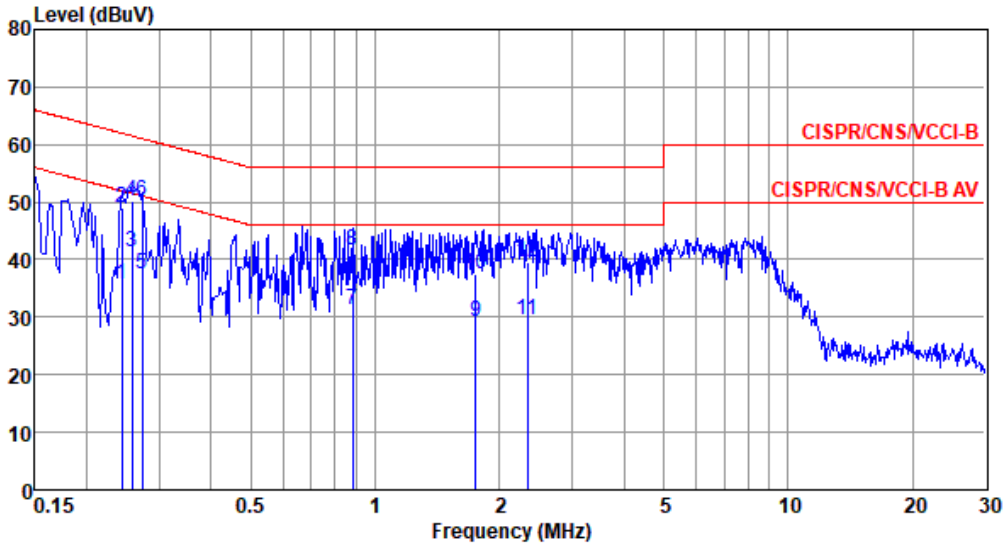
2480MHz



Ref(Hz)	Ref(dBm)	Limit(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Freq(Hz)	Level(dBm)	Port
2.48025G	6.03	-13.97	2.39504G	-54.81	2.39747G	-54.60	2.4G	-56.91	2.50321G	-54.86	16.58631G	-47.80	1

Modulation Mode	OQPSK	**Test Freq. (MHz)**	2480
Power Phase	Line		

Test by : Joe Liao Temperature: 23℃ Humidity: 63%

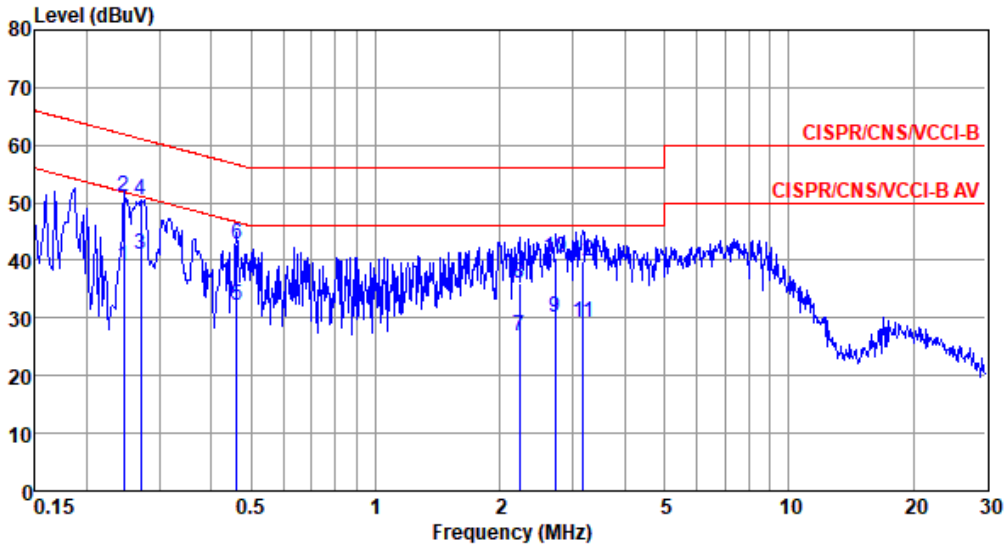


	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.243	35.83	52.00	-16.17	25.93	9.62	0.06	0.22	Average
2	0.243	48.93	62.00	-13.07	39.03	9.62	0.06	0.22	QP
3*	0.258	41.23	51.51	-10.28	31.32	9.62	0.06	0.23	Average
4	0.258	50.10	61.51	-11.41	40.19	9.62	0.06	0.23	QP
5	0.273	37.61	51.03	-13.42	27.69	9.62	0.06	0.24	Average
6	0.273	50.12	61.03	-10.91	40.20	9.62	0.06	0.24	QP
7	0.880	31.17	46.00	-14.83	21.11	9.63	0.10	0.33	Average
8	0.880	41.74	56.00	-14.26	31.68	9.63	0.10	0.33	QP
9	1.753	29.14	46.00	-16.86	19.03	9.63	0.13	0.35	Average
10	1.753	37.48	56.00	-18.52	27.37	9.63	0.13	0.35	QP
11	2.334	29.57	46.00	-16.43	19.43	9.63	0.14	0.37	Average
12	2.334	39.49	56.00	-16.51	29.35	9.63	0.14	0.37	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 Mode	OQPSK	**Test Freq. (MHz)**	2480
Power Phase	Neutral		

Test by : Joe Liao Temperature: 23°C Humidity: 63%



	Freq MHz	Level dBuV	Limit Line dBuV	Over Limit dB	Read Level dBuV	Factor dB	Cable loss dB	Aux dB	Remark
1	0.246	39.03	51.91	-12.88	29.12	9.63	0.06	0.22	Average
2	0.246	51.01	61.91	-10.90	41.10	9.63	0.06	0.22	QP
3*	0.270	40.96	51.12	-10.16	31.03	9.63	0.06	0.24	Average
4	0.270	50.49	61.12	-10.63	40.56	9.63	0.06	0.24	QP
5	0.461	32.27	46.67	-14.40	22.28	9.62	0.07	0.30	Average
6	0.461	42.79	56.67	-13.88	32.80	9.62	0.07	0.30	QP
7	2.225	26.87	46.00	-19.13	16.72	9.64	0.14	0.37	Average
8	2.225	36.16	56.00	-19.84	26.01	9.64	0.14	0.37	QP
9	2.721	30.12	46.00	-15.88	19.94	9.64	0.15	0.39	Average
10	2.721	40.56	56.00	-15.44	30.38	9.64	0.15	0.39	QP
11	3.173	29.33	46.00	-16.67	19.12	9.65	0.16	0.40	Average
12	3.173	39.75	56.00	-16.25	29.54	9.65	0.16	0.40	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).