

47 CFR PART 15 SUBPART C TEST REPORT

for

TPMS

Model No.: RSI-30

FCC ID: HQXRSI30

of

Applicant: Sysgration Ltd.

Address: 6F, No.1, Sec.1, Tiding Blvd., Neihu Dist. Taipei City Taiwan 114

Tested and Prepared

by

Worldwide Testing Services (Taiwan) Co., Ltd.

**FCC filed test laboratory Reg. No.: TW1072, TW1140, TW1146,
TW1477, TW0037**

Industry Canada filed test laboratory Reg. No.: 20037, 31634



Report No.: W6R22407-23631-C-1

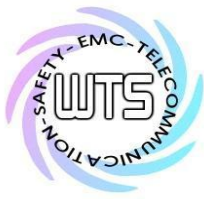
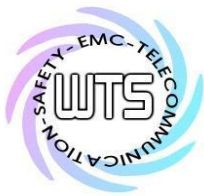


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Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30

1 General Information

1.1 Notes

The purpose of conformity testing is to increase the probability of adherence to the essential requirements or conformity specifications, as appropriate.

The complexity of the technical specifications, however, means that full and thorough testing is impractical for both technical and economic reasons.

Furthermore, there is no guarantee that a test sample which has passed all the relevant tests conforms to a specification.

Neither is there any guarantee that such a test sample will interwork with other genuinely open systems. The existence of the tests nevertheless provides the confidence that the test sample possesses the qualities as maintained and that its performance generally conforms to representative cases of communications equipment.

Laboratory disclaimer-

1. The test results of this test report relate exclusively to the item tested as specified in 1.5.
2. The test report may only be reproduced or published in full.
3. Reproduction or publication of extracts from the report requires the prior written approval of the Worldwide Testing Services(Taiwan) Co., Ltd.

Tester:

August 27, 2024

Ken Kang

Date

WTS-Lab.

Name

Signature

Technical responsibility for area of testing:

August 27, 2024

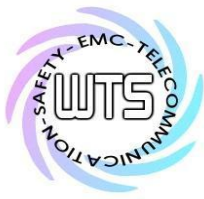
Kevin Wang

Date

WTS

Name

Signature



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

1.2 Testing laboratory

1.2.1 Location

10m OATS

No.5-1, Lishui, Shuang Sing Village, Wanli Dist.,
New Taipei City 207, Taiwan (R.O.C.)

Xizhi Lab

No. 99, Sec. 1, Balian Rd., Xizhi Dist.,
New Taipei City 221032, Taiwan (R.O.C.)

Worldwide Testing Services (Taiwan) Co., Ltd.
6F., No. 58, Ln. 188, Ruiguang Rd., Neihu Dist.,
Taipei City 114 , Taiwan (R.O.C.)
Tel: 886-2-6606-8877

1.2.2 Details of accreditation status

Accredited testing laboratory

FCC filed test laboratory Reg. No.: TW1072, TW1140, TW1146, TW1477, TW0037

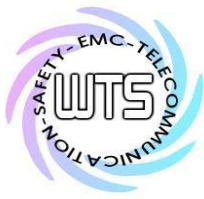
Industry Canada filed test laboratory Reg. No.: 20037, 31634

Test location, where different from Worldwide Testing Services (Taiwan) Co., Ltd.:

Name:	./.
Accredited number:	./.
Street:	./.
Town:	./.
Country:	./.

1.3 Details of approval holder

Name:	Sysgration Ltd.
Street:	6F, No.1, Sec.1, Tiding Blvd., Neihu Dist.
Town:	Taipei City 114
Country:	Taiwan



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

1.4 Application details

Date of receipt of test item: July 24, 2024
Date of test: from July 25, 2024 to August 06, 2024

1.5 Test item

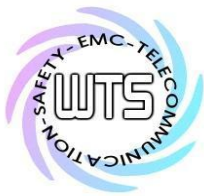
Description of test item: TPMS
Type identification: RSI-30
Brand name: SYSGRATION
Multi-listing model number: RSI-22B, RSI-23, RSI-32, RSI-33
Transmitting frequency: 433.95MHz & 315MHz
Operation mode: Simplex
Voltage supply: Battery 3Vd.c.
Antenna type: Loop antenna
Antenna gain: ./.
Sample no.: #03

Manufacturer (if applicable)

Name: ./.
Street: ./.
Town: ./.
Country: ./.

1.6 Test standards

47 CFR PART 15 SUBPART C § 15.231 (e) (2023-10)



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

2 Technical test

2.1 Summary of test results

No deviations from the technical specification(s) were ascertained in the course of the tests performed. ☒

or

The deviations were ascertained in the course of the tests performed. ☐

2.2 Test environment

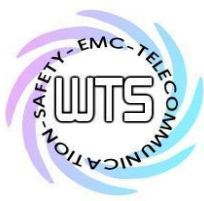
Relative humidity content: 20 ... 75 %

Air pressure: 86 ... 103 kPa

Details of power supply: Battery 3Vd.c.

Test item Name	Uncertainty
Estimation Result of Uncertainty of Conducted Emission (Conducted Measurement at (AC) Power Line)	Expanded Uncertainty : AMN : 0.94 dB Voltage probe : 0.96 dB Include Pulse Limiter : 1.5 dB
Estimation Result of Uncertainty of Radiated Emission(3M-966A) (Output Power (Field Strength), Out of Band Radiated Emissions, Transmitter Radiated Emissions in restricted Bands, Spurious Emission radiated)	Expanded Uncertainty : 0.009-30 MHz : 1.88 dB 30-1000 MHz : 3.20 dB 1-18 GHz : 3.56 dB 18-40 GHz : 2.94 dB
Estimation Result of Uncertainty of Bandwidth Measurement (Channel Bandwidth)	Expanded Uncertainty : 0.45 kHz
Estimation Result of Uncertainty of Frequency Drift Measurement (Frequency Tolerance)	Expanded Uncertainty : 6.11 Hz
Estimation Result of Uncertainty of Duty Cycle Measurement (Active Time)	Expanded Uncertainty : 0.1 ms

The decision rule is: Measurement uncertainty is not included in the calculation of test results.



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

2.3 Test equipment utilized

Output Power (Field Strength)

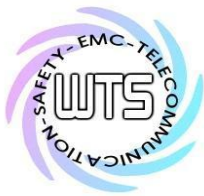
Code No.	Test equipment	Mode No.	Serial No.	Brand	Cal. Date	Next Cal. Date
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2023/9/20	2024/9/19
ETSTW-RE 154	EMI Test Receiver	ESR3	102829	R&S	2024/4/10	2025/4/9
ETSTW-RE 176	Loop Antenna	FMZB 1513-60	39	SCHWARZBECK	2023/8/10	2024/8/9
ETSTW-Cable 090	N type Cable (15m)	EMCCFD400-NM-NM-15000	230732	EMCI	2024/8/3	2025/8/2

Spurious emission

Code No.	Test equipment	Mode No.	Serial No.	Brand	Cal. Date	Next Cal. Date
ETSTW-RE 153	Signal Analyzer	FSV40	101929	R&S	2023/9/20	2024/9/19
ETSTW-RE 154	EMI Test Receiver	ESR3	102829	R&S	2024/4/10	2025/4/9
ETSTW-RE 160	Amplifier Module	CHC 3	None	WTS	2024/7/12	2025/7/11
ETSTW-RE 176	Loop Antenna	FMZB 1513-60	39	SCHWARZBECK	2023/8/10	2024/8/9
ETSTW-RE 177	TRILOG Broadband Antenna	VULB 9168&EMCI-N-6-06	01380&AT-06007	SCHWARZBECK& EMC	2024/3/4	2025/3/3
ETSTW-Cable 077	SMA type cable (10m)	EMC104-SM-SM-10000	230511	EMCI	2024/7/12	2025/7/11
ETSTW-Cable 084	SMA type cable (1m)	SF104-11SMA-1000	816477/4	HONOVA	2024/7/12	2025/7/11
ETSTW-Cable 089	SMA type cable (2m)	SF104-11SMA-2000	SN 811889/4	HUBER+SUHNER	2024/7/12	2025/7/11
ETSTW-Cable 090	N type Cable (15m)	EMCCFD400-NM-NM-15000	230732	EMCI	2024/8/3	2025/8/2

Duration Time & Duty cycle & 20dB Bandwidth

Code No.	Test equipment	Mode No.	Serial No.	Brand	Cal. Date	Next Cal. Date
ETSTW-RE 055	SPECTRUM ANALYZER	FSU 26	200074	R&S	2024/3/7	2025/3/6



Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30

2.5 General Test Procedure

POWER LINE CONDUCTED INTERFERENCE: The procedure used was ANSI STANDARD C63.10-2013 6.2 using a LISN (if necessary). Both lines were observed. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.10-2013 6.3 using a spectrum analyzer. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was the 100 kHz and the video bandwidth was 300 kHz.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB μ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB.

Example:

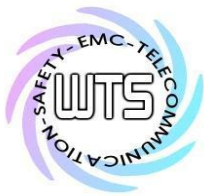
Freq (MHz)	METER READING + ACF + CABLE LOSS (to the receiver) = FS
33	20 dB μ V + 10.36 dB/m + 6 dB = 36.36 dB μ V/m @3m

ANSI STANDARD C63.10-2013 6.2.2 MEASUREMENT PROCEDURES: The EUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m (non metallic table). The EUT was placed in the center of the table. The table used for radiated measurements is capable of continuous rotation. The spectrum was scanned from 30 MHz to 10th harmonic of the fundamental.

Peak readings were taken in three (3) orthogonal planes and the highest readings.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

ANSI STANDARD C63.10-2009 B.2.7: Any measurements that utilize special test software shall be indicated and referenced in the test report. During testing, test software 'EZ EMC' was used for setting up different operation modes.



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FCC ID: HQXRSI30

3 Test results (enclosure)

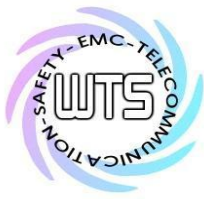
☒ 1st test

☐ test after modification

☐ production test

TEST CASE	Para. Number	Required	Test passed	Test failed
Transmission Requirements	15.231(e)	☒	☒	☐
Radiated Emission	15.231(e)	☒	☒	☐
Bandwidth of Emission	15.231(c)	☒	☒	☐
Frequency Tolerance	15.231(d)	☐	☐	☐
Period Alternate Field Strength Requirements	15.231(e)	☒	☒	☐
Antenna Requirement	15.203	☒	☒	☐
Conducted Measurement at (AC) Power Line	15.207	☐	☐	☐

The following is intentionally left blank.



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

3.1 Transmission Requirements

FCC 15.231(e)

3.1.1 Limit of Transmission Time

Devices operated under the provisions of this paragraph shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

3.1.2 Results for the duration and silent period measurement

Test date: July 24, 2024

Temperature: 25.8°C

Humidity: 51.5%

Tester: Kent

☐ This manually operated transmitter employs software to control the duration of each transmission and silent period between transmissions. The real measured result for the duration of each transmission is _____ ms, and the result for silent period between transmissions is _____ second.

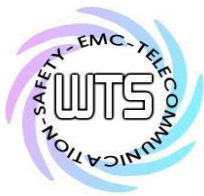
315MHz

☒ This transmitter is operated by automatic activation, and the duration of each transmission and silent period between transmissions will be controlled by software. The real measured result for the duration of each transmission is 13.782051ms, and the result for silent period between transmissions is 29.479167second.

433.95MHz

☒ This transmitter is operated by automatic activation, and the duration of each transmission and silent period between transmissions will be controlled by software. The real measured result for the duration of each transmission is 320.512821ms, and the result for silent period between transmissions is 29.1987718 second.

Explanation: See attached diagrams in appendix.

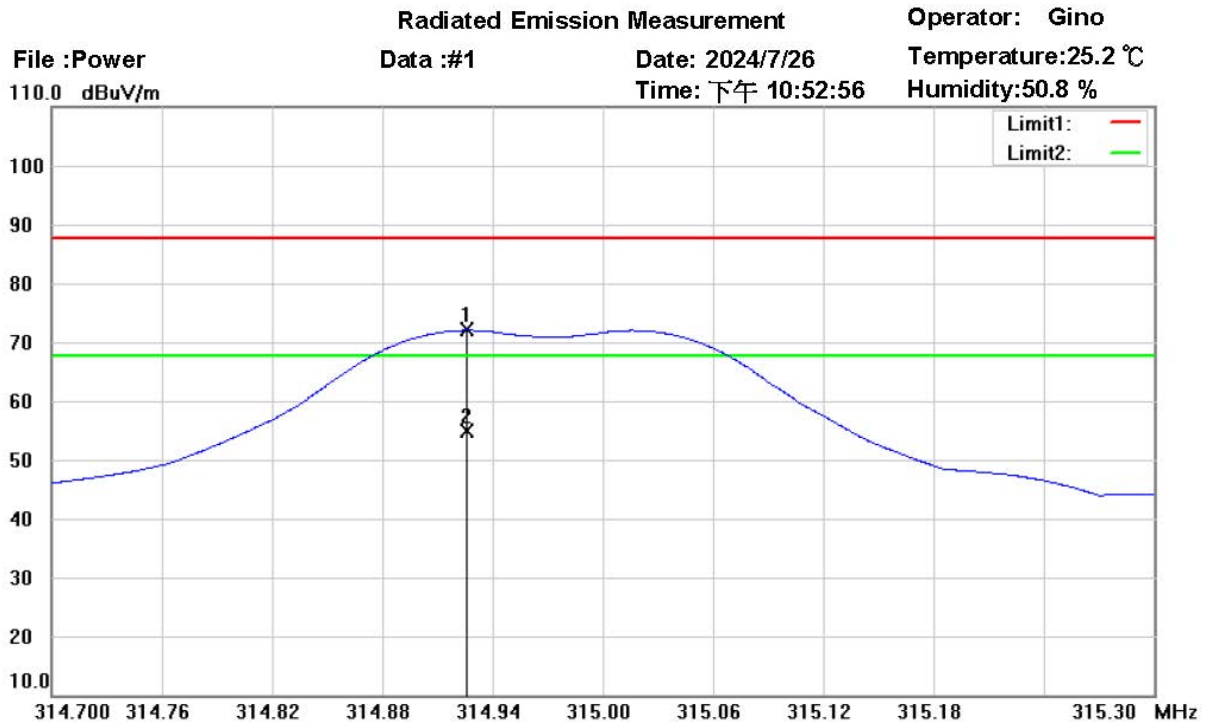


Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

3.2 Output Power (Field Strength)

315MHz



Site : 966A Chamber

Condition : FCC 15.231(315MHz)Power(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

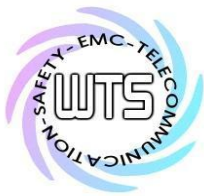
Note :

Polarization: *Horizontal*

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	314.9262	50.32	peak	21.70	72.02	87.66	100	180	-15.64	
*	314.9262	33.11	AVG	21.70	54.81	67.66	100	180	-12.85	



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30

Radiated Emission Measurement

Operator: Gino

File :Power
110.0 dBuV/m

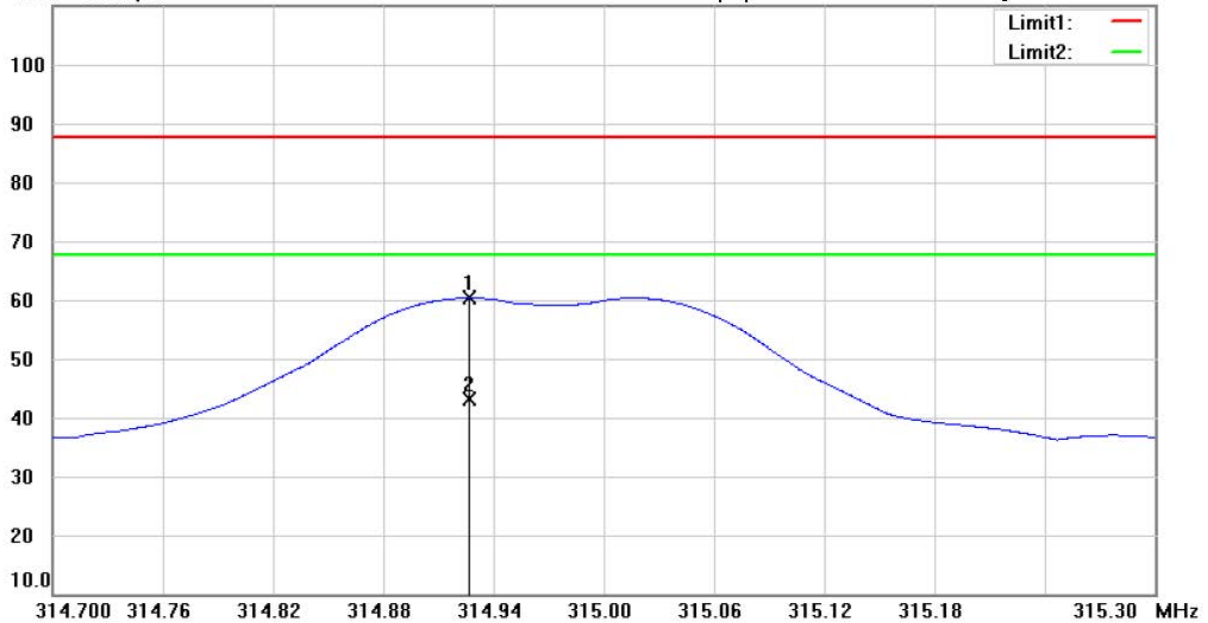
Data :#2

Date: 2024/7/26

Temperature:25.2 °C

Time: 下午 10:55:36

Humidity:50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz)Power(PK)<e>

Polarization: **Vertical**

EUT : W6M22407-23631

Power : 3 Vd.c.

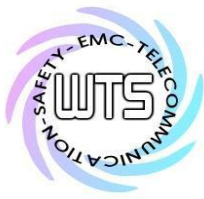
M/N:

Distance: 3m

Test Mode : TX 315MHz

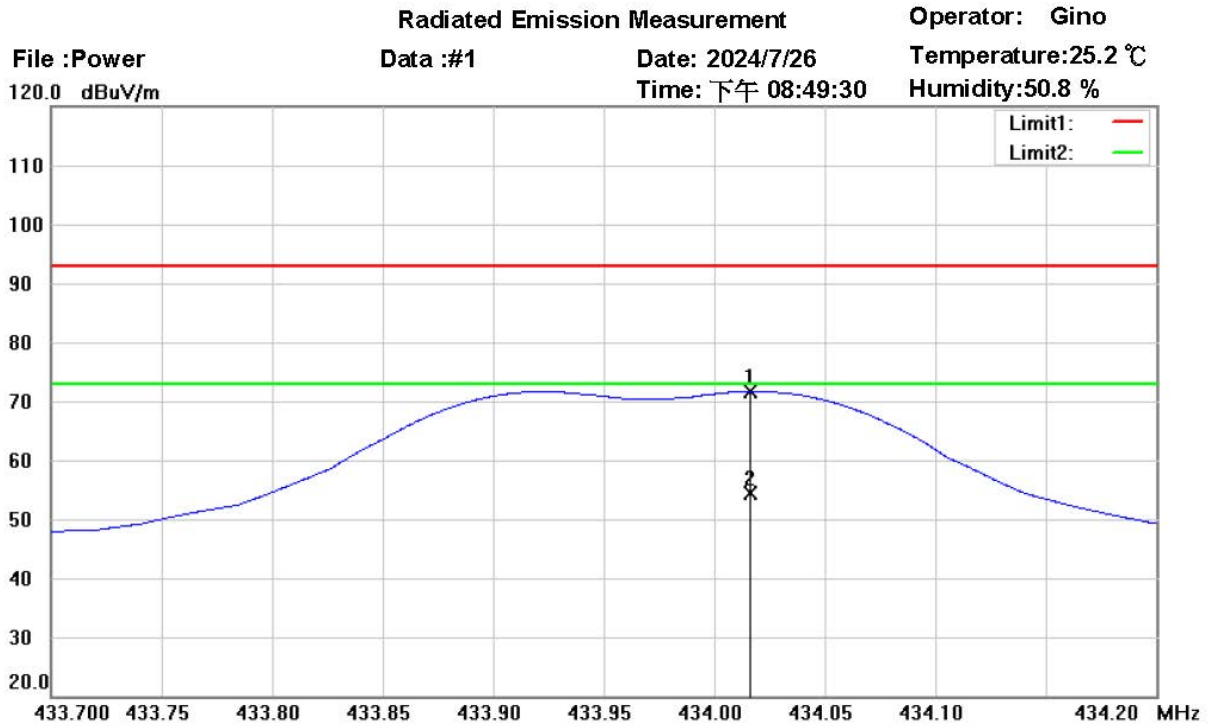
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	314.9268	38.65	peak	21.70	60.35	87.66	100	70	-27.31	
*	314.9268	21.44	AVG	21.70	43.14	67.66	100	70	-24.52	



Worldwide Testing Services(Taiwan) Co., Ltd.

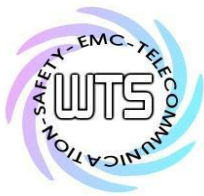
Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30
433.95MHz



Site : 966A Chamber
Condition : FCC 15.231(433.92MHz)Power(PK)<e>
EUT : W6M22407-23631
M/N:
Test Mode : TX 433.95MHz
Note :

Polarization: *Horizontal*
Power : 3 Vd.c.
Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	434.0160	46.93	peak	24.74	71.67	92.80	101	360	-21.13	
*	434.0160	29.72	AVG	24.74	54.46	72.80	101	360	-18.34	



Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30

Radiated Emission Measurement

Operator: Gino

File :Power
120.0 dBuV/m

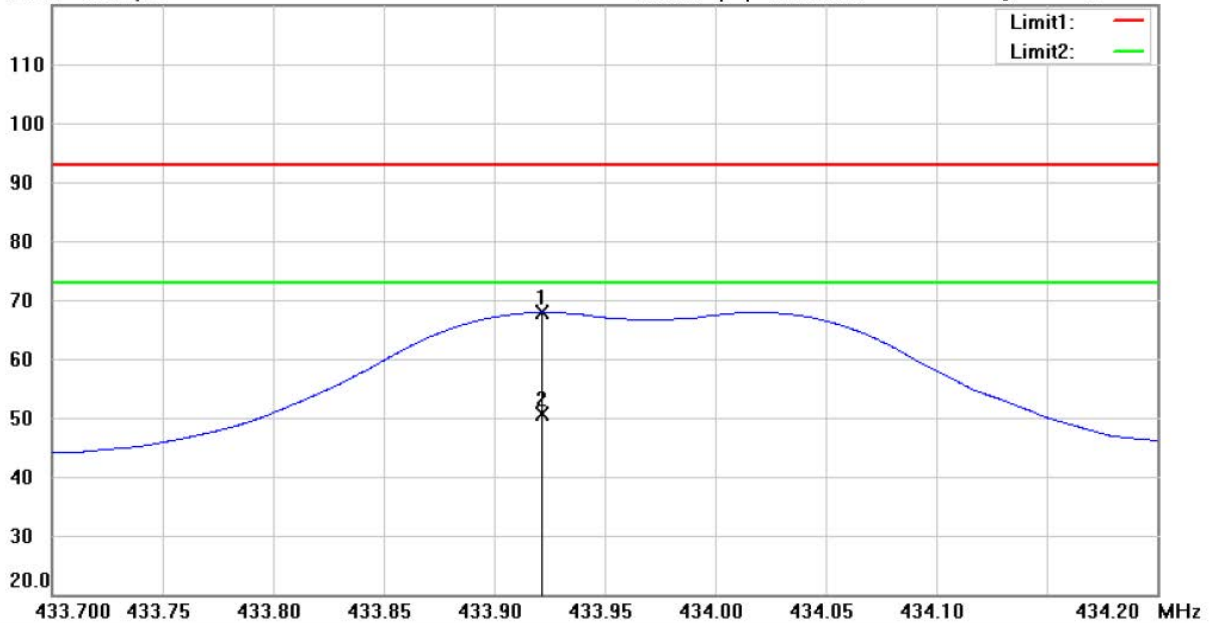
Data :#2

Date: 2024/7/26

Temperature:25.2 °C

Time: 下午 08:54:55

Humidity:50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433.92MHz)Power(PK)<e>

Polarization: **Vertical**

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

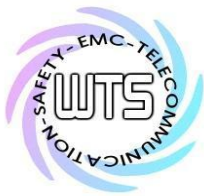
Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	433.9212	43.17	peak	24.73	67.90	92.80	116	326	-24.90	
*	433.9212	25.96	AVG	24.73	50.69	72.80	116	326	-22.11	

Limit 15.231(e)

Fundamental Frequency (MHz)	Field strength of fundamental, limit $\mu\text{V/m}$
40.66 – 40.70	1,000
70 – 130	500
130 – 174	500 to 1,500
174 – 260	1,500
260 – 470	1,500 to 5,000** (315 MHz: 67.66 dB $\mu\text{V/m}$ = 2416.677 $\mu\text{V/m}$) (433.95 MHz: 72.87 dB $\mu\text{V/m}$ = 4399.181 $\mu\text{V/m}$)
Above 470	5,000

** linear interpolation



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3.3 Out of Band Radiated Emissions

FCC Rule: 15.231(e) , 15.35

For out of band emissions that are close to or that exceed the 20 dB attenuation requirement described in the specification, radiated measurements were performed at a 3 m separation distance to determine whether these emissions complied with the general radiated emission requirement.

Guidance on Measurement of pulsed emission: 15.35(c)

“the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.”

Duty Cycle correction = $20 \log (\text{dwell time}/100\text{ms or one period})$

Limits:

For frequencies (Average measurements)

Correction factor conform 15.35 (c) (Average measurements)

Duty cycle correction :

Max. Peak reading – duty cycle correction

Max permitted average Limits = Max permitted Fundamental limit – 20 dB

For example for 315 fundamental carrier:

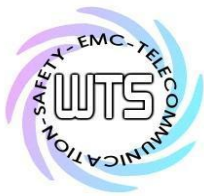
Max permitted average Limit: $67.66\text{dB}\mu\text{V/m} - 20\text{ dB} = 47.66\text{ dB}\mu\text{V/m}$

For example for 433.95 fundamental carrier:

Max permitted average Limit: $72.87\text{ dB}\mu\text{V/m} - 20\text{ dB} = 52.87\text{ dB}\mu\text{V/m}$

For frequencies above 1GHz (Peak measurements).

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)



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3.4 Transmitter Radiated Emissions in restricted Bands

FCC Rules: 15.231 (e), 15.205, 15.209, 15.35

Radiated emission measurements were performed from 30 MHz to 8000 MHz.

For radiated emission tests, the analyzer setting was as followings:

RES BW VID BW

Frequency <1 GHz 100 kHz 100 kHz (Peak measurements)

Frequency >1 GHz 1 MHz 1 MHz (Peak measurements)

1 MHz 1 MHz (Average measurements)

Limits:

For frequencies below 1GHz :

Frequency of Emission (MHz)	Field strength (microvolts/meter)	Field Strength (dB microvolts/meter)
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

For frequencies above 1GHz (Average measurements).

Guidance on Measurement of pulsed emission:

“If the emission is pulsed, modify the unit for continues operation , use the settings shown above, then correct the reading by subtracting the peak-average correction factor, derived from the appropriate duty cycle calculation.

For frequencies above 1GHz (Average measurements).

The correction factor, based on the channel dwell time in a 100 ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the value.

Duty cycle correction = $20 \log (\text{dwell time}/100\text{ms})$

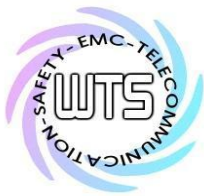
No duty cycle correction was added to the reading

Modified Limits for peak conform 15.35 (b) = Max Permitted average Limits + 20dB (because Peak detector is used)

Above 960 MHz

For mode DSSS CW: $54 \text{ dB}\mu\text{V/m} + 20 \text{ dB} = 74 \text{ dB}\mu\text{V/m}$

Explanation: See attached diagrams in appendix.



Registration number: W6R22407-23631-C-1

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3.5 Spurious Emission radiated, Transmitter

Spurious emission was measured with modulation (declared by manufacturer).

The limits on the field strength of the spurious emission in the table § 15.231(e) are based on the fundamental frequency of the intentional radiator. Spurious emission shall be attenuated to the average (or alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in § 15.209, whichever limit permits a higher field strength.

In addition, radiated emission which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a) (see § 15.205(c)).

SAMPLE CALCULATION OF LIMIT. All results will be updated by an automatic measuring system in accordance to point 2.3.

Calculation of test results:

Such factors like antenna correction, cable loss, external attenuation etc. are already included in the provided measurement results. This is done by using validated test software and calibrated test system according the accreditation requirements.

The peak and average spurious emission plots was measured with the average limits.

In the Table being listed the critical peak and average value an exhibit the compliance with the above calculated Limits.

Summary table with radiated data of the test plots

Model: RSI-30 Date: --
Mode: -- Temperature: -- °C Engineer: --
Polarization: Horizontal Humidity: -- %

Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Polarization: Vertical

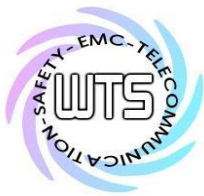
Frequency (MHz)	Reading (dBuV)	Detector	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Table Degree (Deg.)	Ant. High (cm)
--	--	--	--	--	--	--	--	--
--	--	--	--	--	--	--	--	--

Note

1. **Correction Factor = Antenna factor + Cable loss - Preamplifier**
2. **The formula of measured value as: Test Result = Reading + Correction Factor**
3. **Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
4. **All not in the table noted test results are more than 20 dB below the relevant limits.**
5. **See attached diagrams in appendix.**

All other not noted test plots do not contain significant test results in relation to the limits

Test results: The unit meet the FCC requirements.



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

3.6 Channel Bandwidth

Measurement of Necessary Bandwidth (BN)

Test date: July 24, 2024

Temperature: 25.8°C

Humidity: 51.5%

Tester: Kent

Used frequency	Bandwidth	Limit
315 MHz	142.628205128 kHz	0.7875 MHz

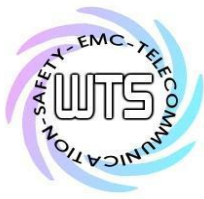
Used frequency	Bandwidth	Limit
433.95 MHz	144.230769231 kHz	1.0848 MHz

Explanation: The bandwidth fulfills the requirements of FCC § 15.231, see attached diagrams.

Limits:

The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Explanation: See attached diagrams in appendix.



Registration number: W6R22407-23631-C-1

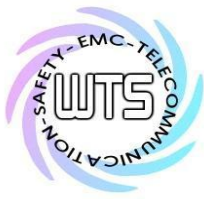
FCC ID: HQXRSI30

3.7 Antenna requirement

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

Explanation: This Loop antenna is integral antenna which passes antenna requirement.

The equipment meets the requirements	yes ☒	no ☐
--------------------------------------	--	--------------------------------



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

3.8 Duty Cycle

The correction factor, based on the channel dwell time in a 100ms period, may be mathematically applied to a measurement made with an average detector, to further reduce the measured value.

Average Reading = Peak Reading (dBuV/m) + Duty Cycle Correction

Test date: July 23, 2024

Temperature: 26.4°C

Humidity: 50.2%

Tester: Kent

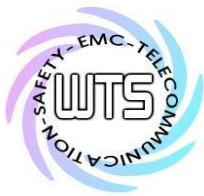
Duty Cycle Correction = $20 \log (\text{Cycle})$

In order to determine the Duty Cycle, the EUT is measured as:

315MHz&433.95MHz

Testing Mode	T period (ms)	T on (ms)	Duty Cycle	Duty Cycle Correction $20*\log(\text{Duty Cycle})$
Transmitting mode	100	13.78205	0.13782051	-17.21

Explanation: See attached diagrams in appendix.



Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

3.9 Conducted Measurement at (AC) Power Line

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the table bellows with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

This measurement was transact first with instrumentation using an average and peak detector and a 10 kHz bandwidth. If the peak detector achieves a calculated level, the measurement is repeated by an instrumentation using a quasi-peak detector.

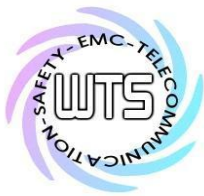
Frequency	Level	
	quasi-peak (dB μ V/m)	average (dB μ V/m)
-- kHz	--	--

Note

- 1. The formula of measured value as: Test Result = Reading + Correction Factor**
- 2. The Correction Factor = Cable Loss + LISN Insertion Loss + Pulse Limit Loss**
- 3. Detector function in the form : PK = Peak, QP = Quasi Peak, AV = Average**
- 4. All not in the table noted test results are more than 20 dB below the relevant limits.**
- 5. Up Line: QP Limit Line, Down Line: Ave Limit Line.**
- 6. This test is not required because the EUT is battery-used.**

Limits:

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi Peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

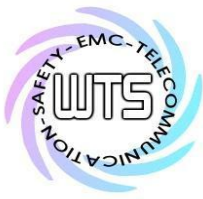


Registration number: W6R22407-23631-C-1
FCC ID: HQXRSI30

Appendix

Measurement diagrams

1. Active Time
2. Bandwidth
3. Spurious Emissions radiated



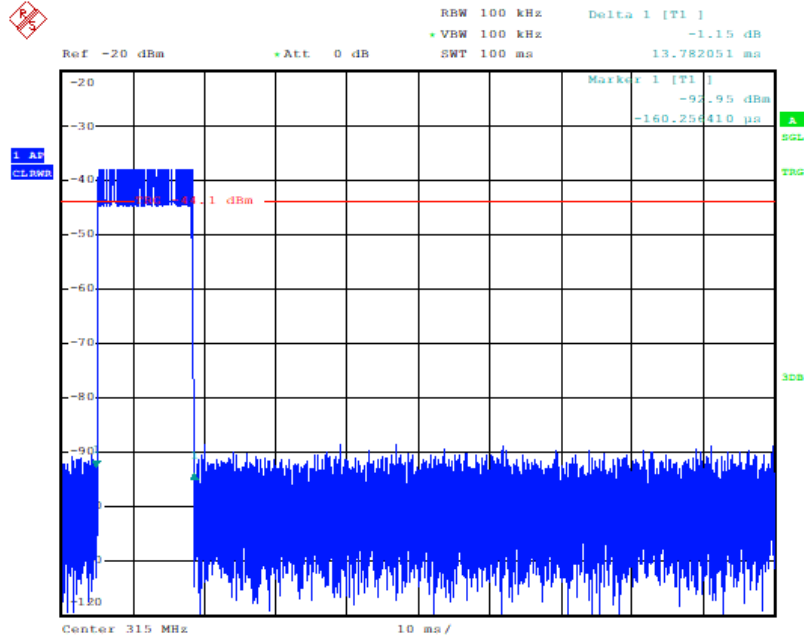
Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6R22407-23631-C-1

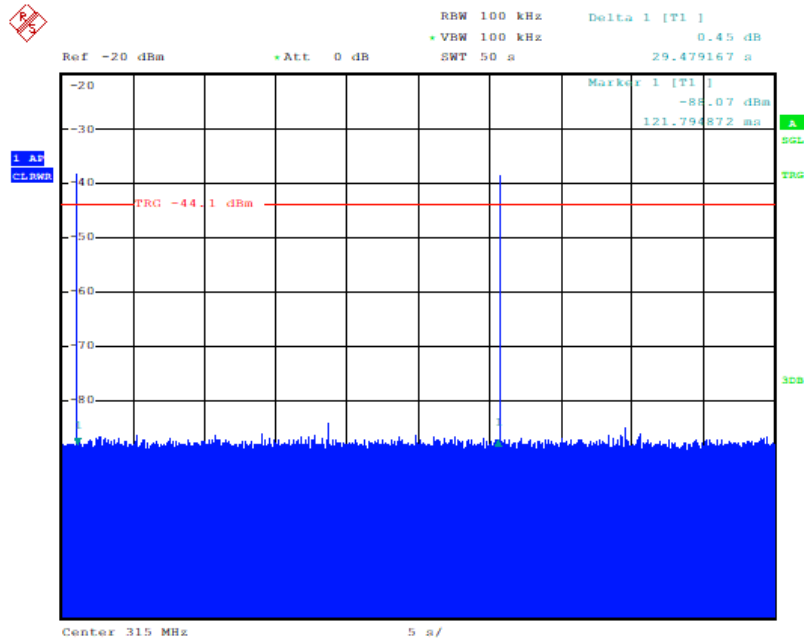
FCC ID: HQXRSI30

Active Time

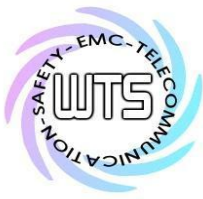
315MHz



Date: 24. JUL. 2024 20:49:08



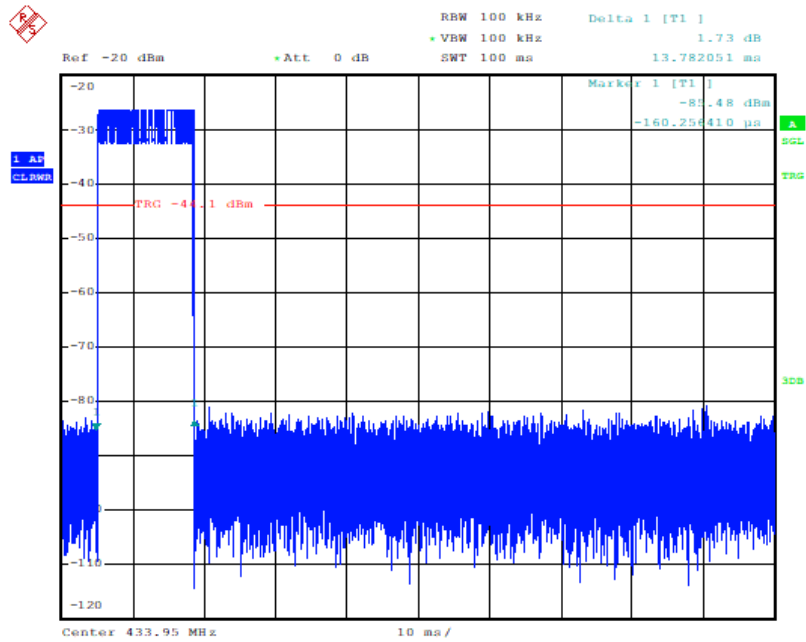
Date: 24. JUL. 2024 20:48:23



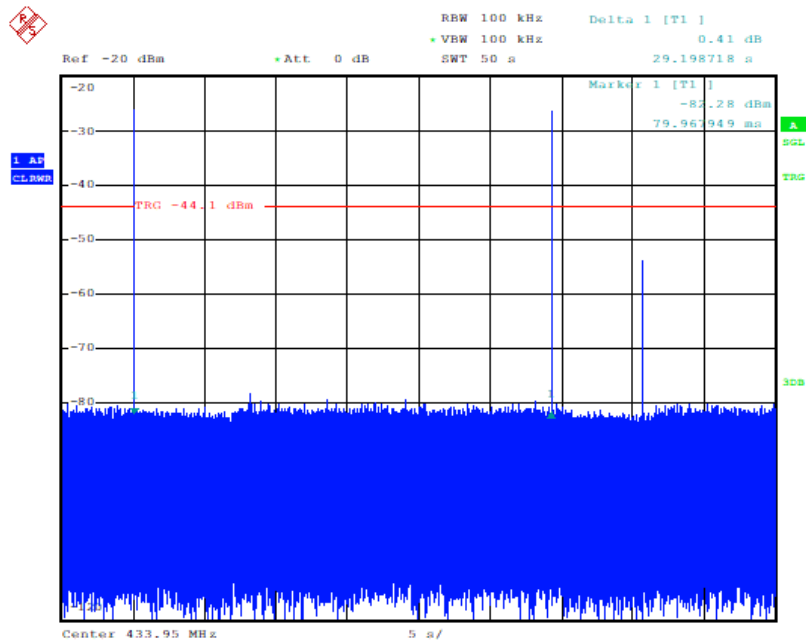
Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

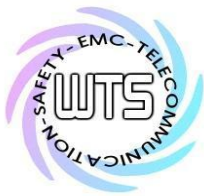
433.95MHz



Date: 24.JUL.2024 21:10:19



Date: 24.JUL.2024 21:09:30



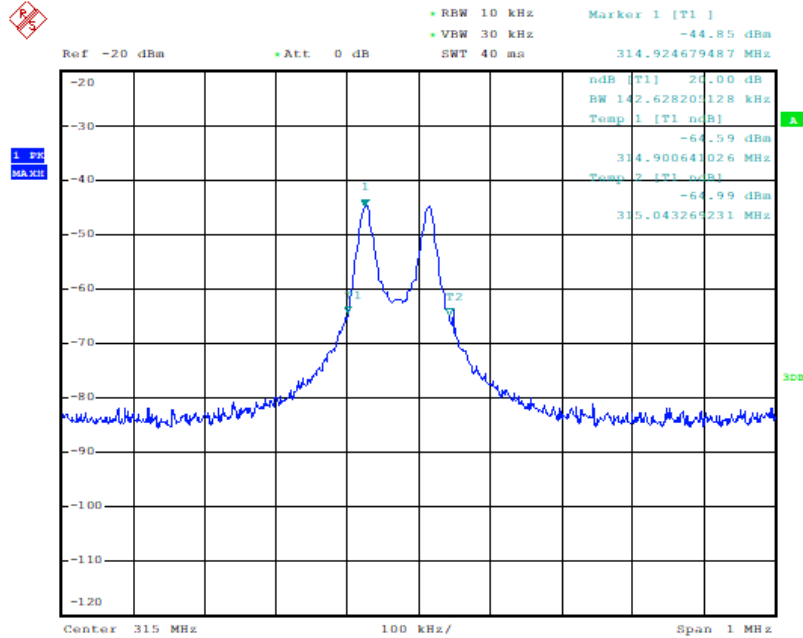
Worldwide Testing Services(Taiwan) Co., Ltd.

Registration number: W6R22407-23631-C-1

FCC ID: HQXRSI30

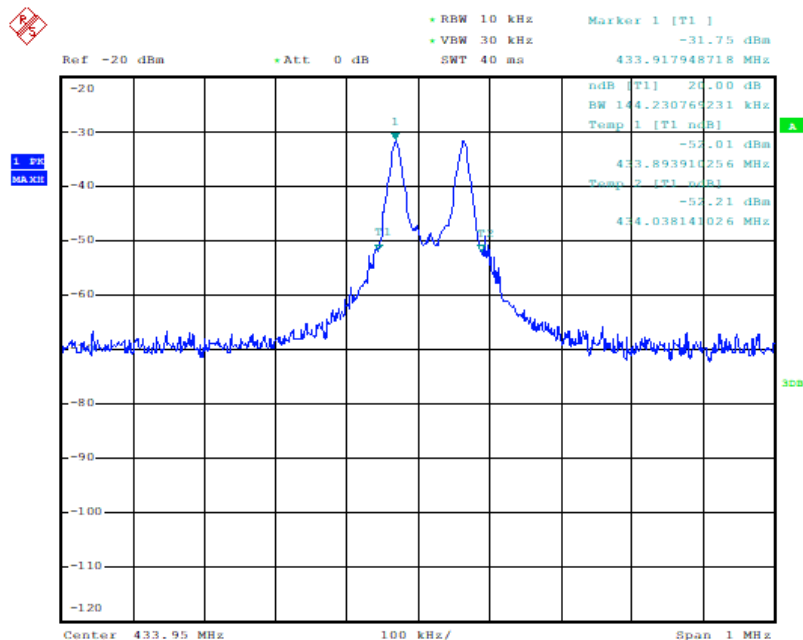
Bandwidth

315MHz



Date: 24. JUL. 2024 20:38:34

433.95MHz



Date: 24. JUL. 2024 21:11:33



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
Tel: +886-2-2646-1508
Fax: +886-2-2646-1533

Radiated Emission Measurement

Operator: Gino

File :1

Data :#1

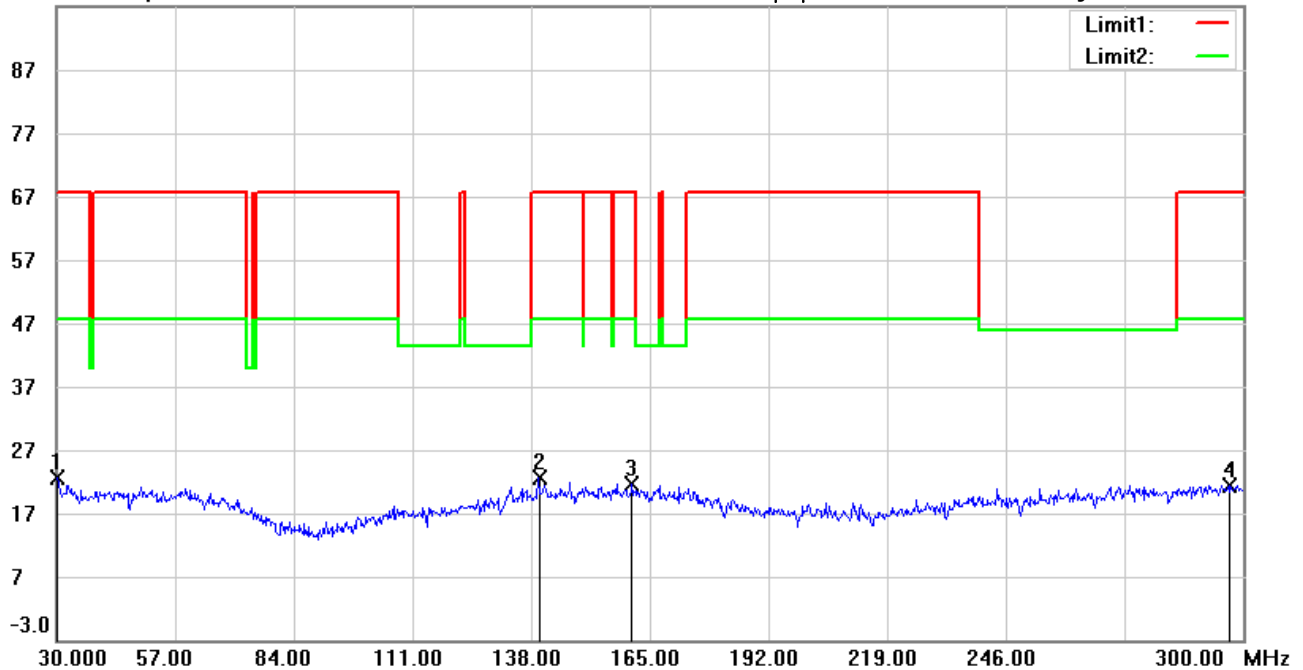
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 11:01:55

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 30-300(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

Note :

Polarization: *Horizontal*

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	30.2700	37.78	peak	-15.12	22.66	67.66	100	104	-45.00	
	139.7550	35.50	peak	-12.86	22.64	67.66	100	277	-45.02	
	160.9500	34.00	peak	-12.25	21.75	67.66	100	156	-45.91	
	296.7600	33.58	peak	-12.22	21.36	67.66	100	32	-46.30	

*:Maximum data x:Over limit !:over margin



Address: No.99, Sec.1, Balian Rd., Xizhi Dist., New Taipei City
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Radiated Emission Measurement

Operator: Gino

File :1

Data :#2

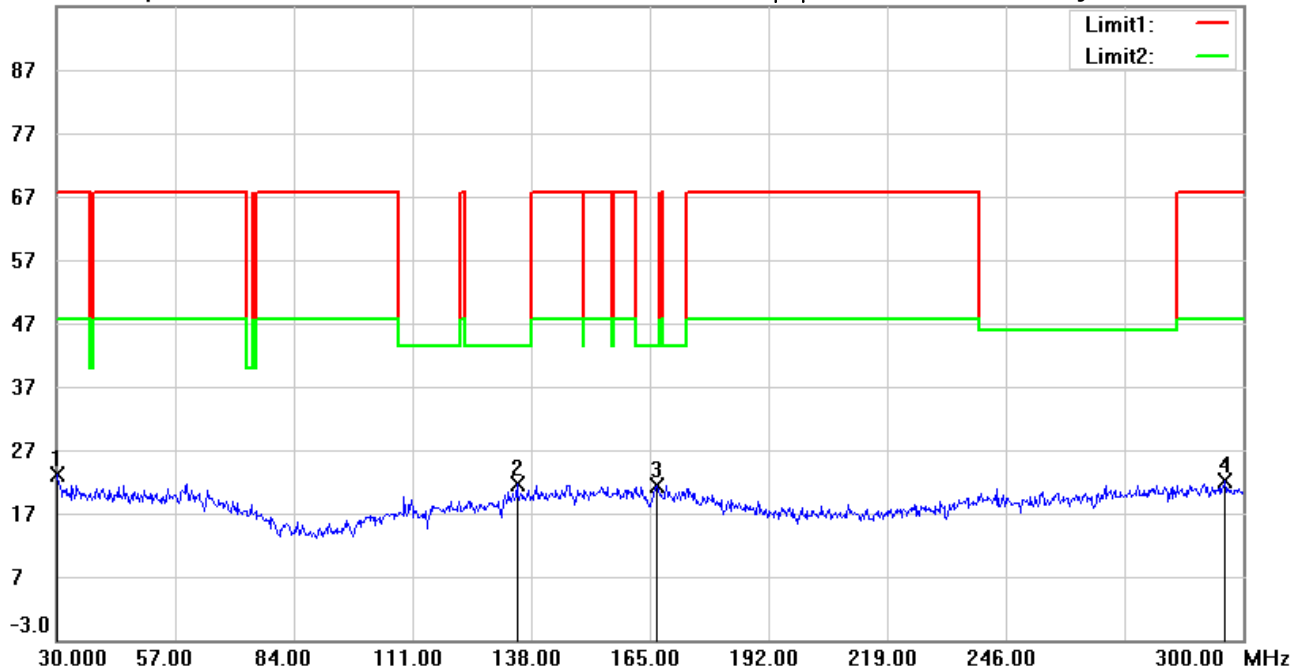
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 11:02:39

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 30-300(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

Note :

Polarization: Vertical

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	30.0000	38.32	peak	-15.16	23.16	67.66	100	314	-44.50	
*	134.7600	34.86	peak	-13.33	21.53	43.50	100	89	-21.97	
	166.6200	33.98	peak	-12.71	21.27	43.50	100	115	-22.23	
	295.9500	34.29	peak	-12.23	22.06	67.66	100	250	-45.60	

*:Maximum data x:Over limit !:over margin



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Fax: +886-2-2646-1533

Radiated Emission Measurement

Operator: Gino

File :1

Data :#3

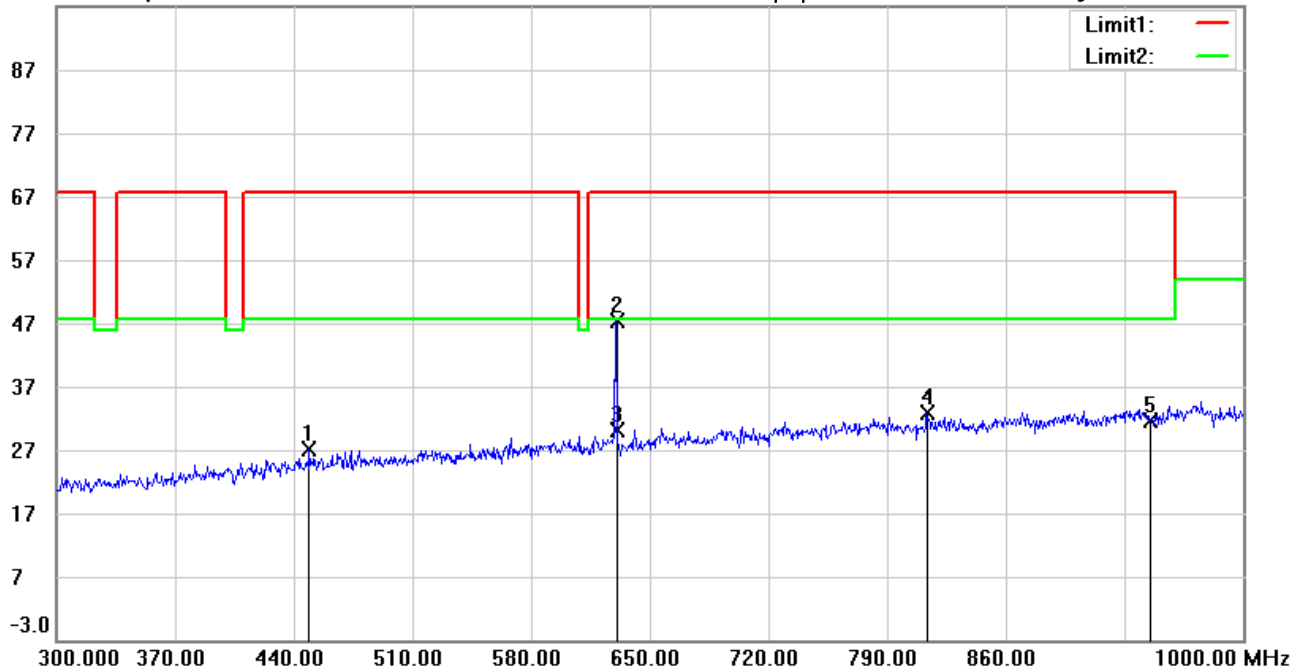
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 11:03:24

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 300-1000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

Note :

Polarization: **Horizontal**

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	449.1000	35.57	peak	-8.32	27.25	67.66	100	270	-40.41	
	630.0500	52.11	peak	-4.69	47.42	67.66	100	276	-20.24	
*	630.0500	34.90	AVG	-4.69	30.21	47.66	100	276	-17.45	
	813.4500	34.66	peak	-1.84	32.82	67.66	100	242	-34.84	
	945.0000	32.05	peak	-0.46	31.59	67.66	100	176	-36.07	

*:Maximum data x:Over limit !:over margin



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
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Radiated Emission Measurement

Operator: Gino

File : 1

Data : #4

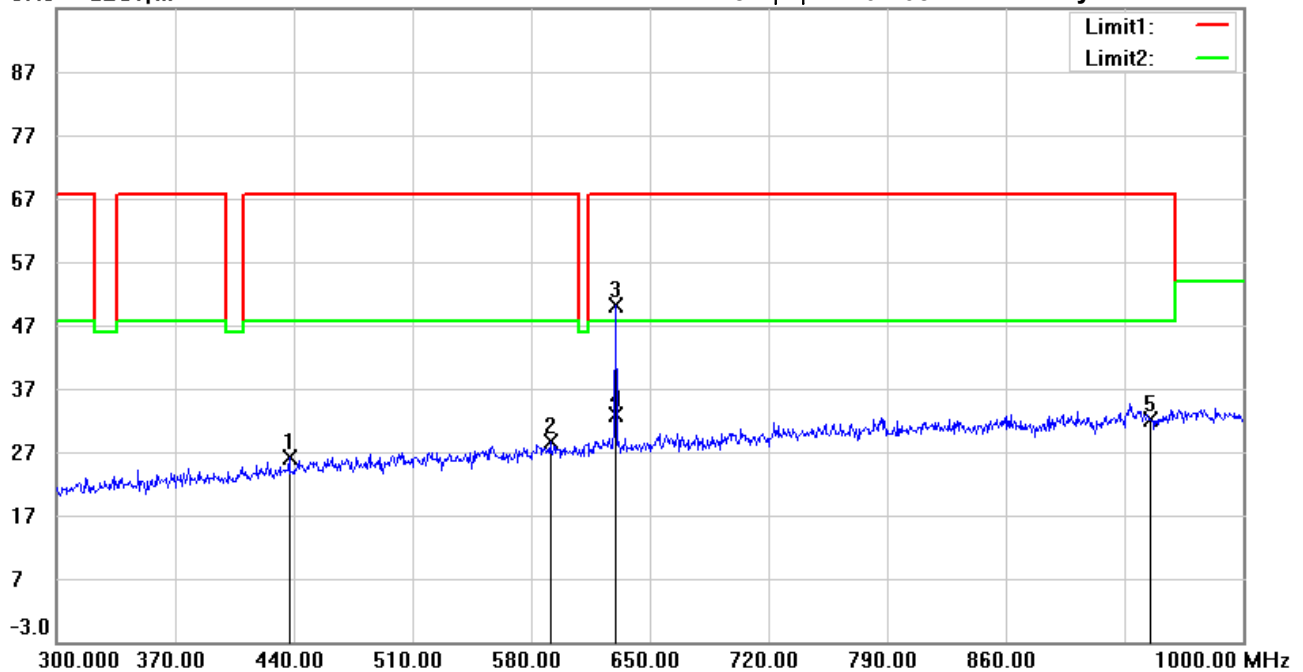
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 11:04:08

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 300-1000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

Note :

Polarization: Vertical

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	437.5500	34.80	peak	-8.71	26.09	67.66	100	123	-41.57	
	591.2000	34.05	peak	-5.51	28.54	67.66	100	25	-39.12	
	629.7000	54.84	peak	-4.70	50.14	67.66	100	359	-17.52	
*	629.7000	37.63	AVG	-4.70	32.93	47.66	100	359	-14.73	
	945.0000	32.70	peak	-0.46	32.24	67.66	100	0	-35.42	

*:Maximum data x:Over limit !:over margin



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #1

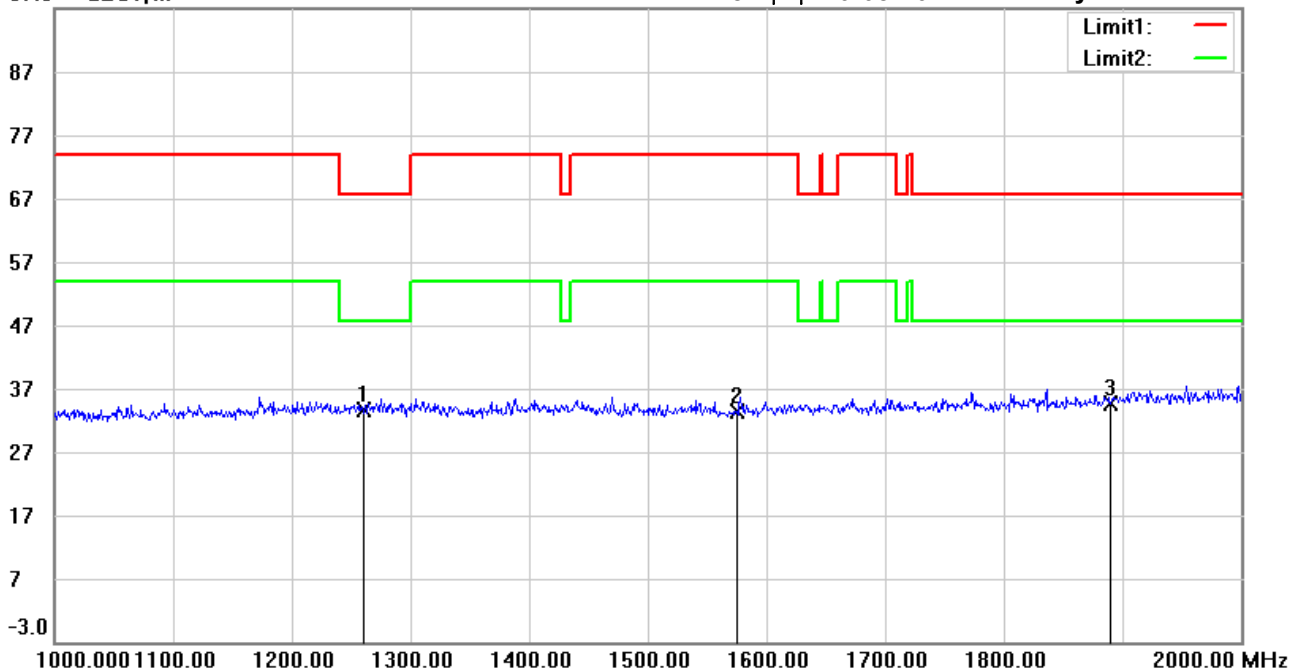
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 10:08:10

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 1000-2000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 315MHz

Note :

Polarization: **Horizontal**

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1260.000	41.76	peak	-8.15	33.61	67.66	150	198	-34.05	
	1575.000	41.31	peak	-7.89	33.42	74.00	150	56	-40.58	
*	1890.000	41.06	peak	-6.44	34.62	67.66	150	274	-33.04	

*:Maximum data x:Over limit !:over margin



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #3

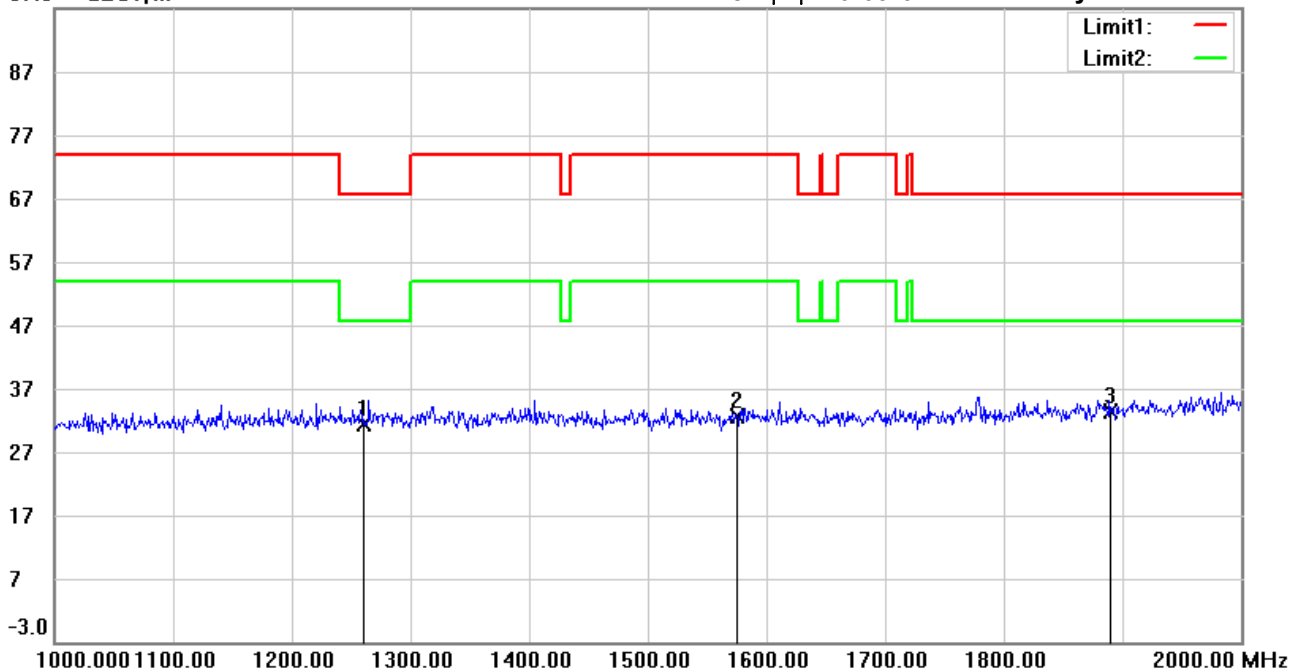
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 10:09:02

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 1000-2000(PK)<e>

Polarization: Vertical

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 315MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1260.000	39.41	peak	-8.15	31.26	67.66	150	347	-36.40	
	1575.000	40.60	peak	-7.89	32.71	74.00	150	111	-41.29	
*	1890.000	39.70	peak	-6.44	33.26	67.66	150	20	-34.40	

*:Maximum data x:Over limit !:over margin



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Fax: +886-2-2646-1533

Radiated Emission Measurement

Operator: Gino

File : 3

Data : #2

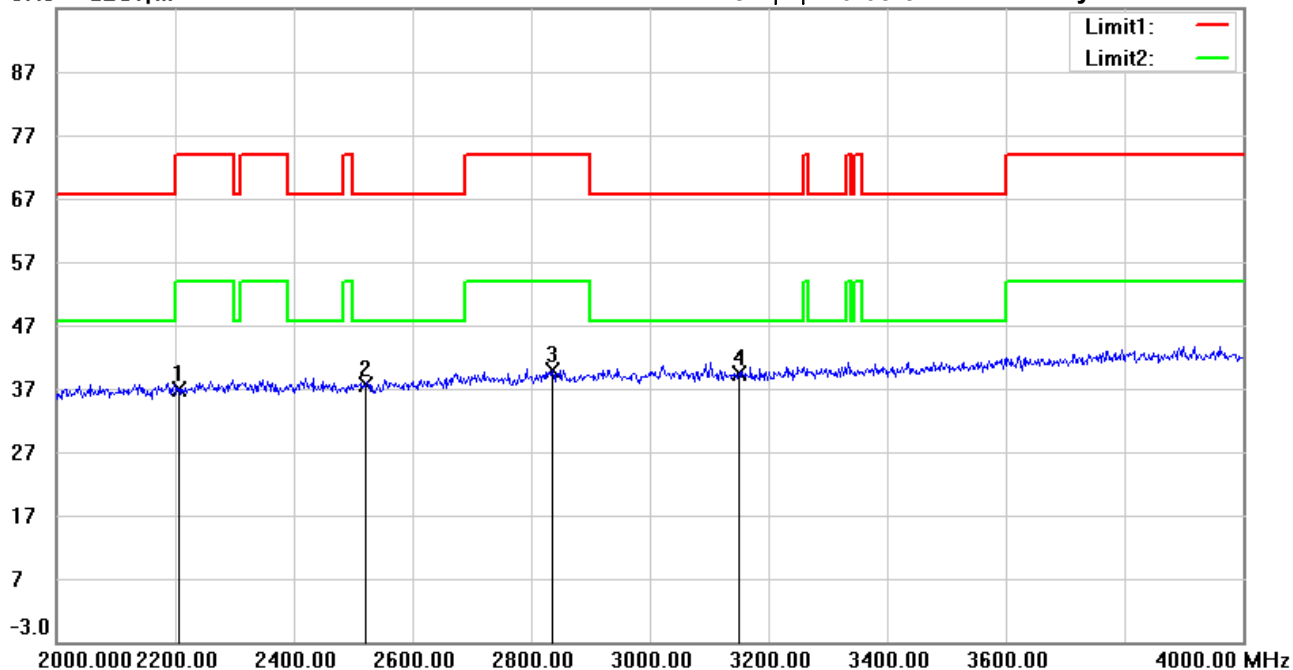
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 10:08:51

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 2000-4000(PK)<e>

Polarization: Horizontal

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 315MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	2205.000	41.46	peak	-4.67	36.79	74.00	150	7	-37.21	
	2520.000	41.71	peak	-4.20	37.51	67.66	150	81	-30.15	
	2835.000	42.59	peak	-2.81	39.78	74.00	150	216	-34.22	
*	3150.000	41.63	peak	-2.37	39.26	67.66	150	264	-28.40	

*:Maximum data x:Over limit !:over margin



Radiated Emission Measurement

Operator: Gino

File :3

Data :#4

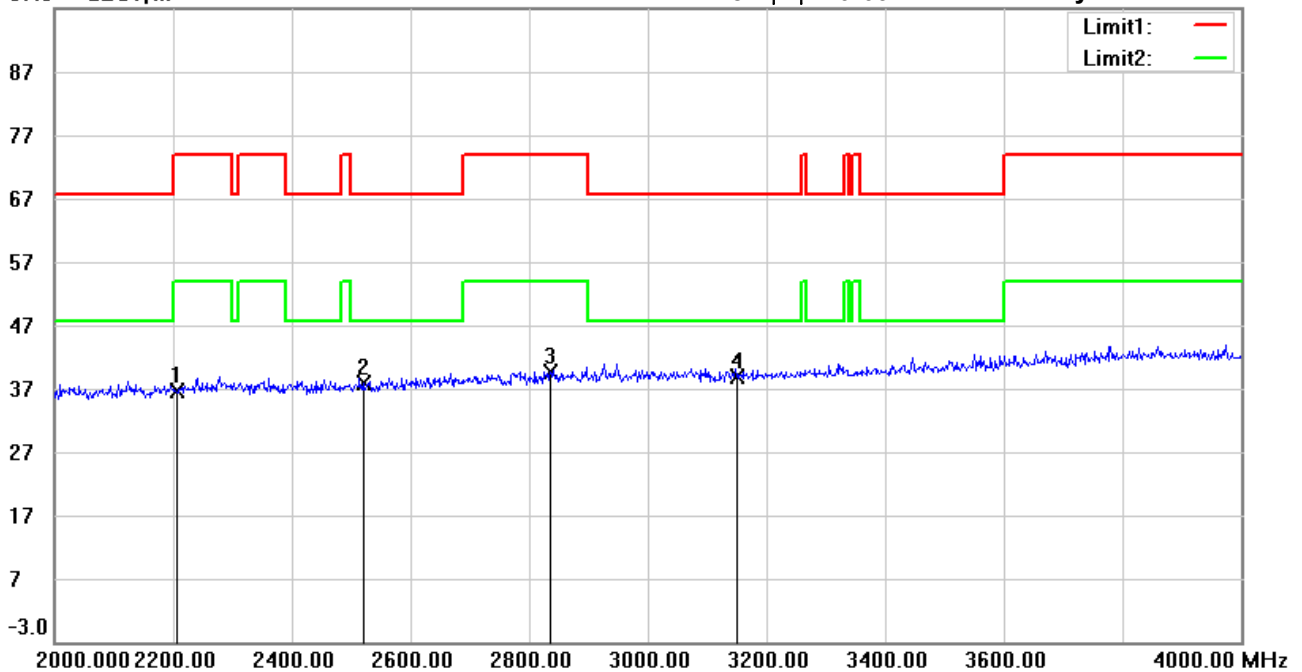
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 10:09:44

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(315MHz) 2000-4000(PK)<e>

Polarization: Vertical

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 315MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	2205.000	41.26	peak	-4.67	36.59	74.00	150	97	-37.41	
	2520.000	42.08	peak	-4.20	37.88	67.66	150	305	-29.78	
	2835.000	42.32	peak	-2.81	39.51	74.00	150	29	-34.49	
*	3150.000	41.15	peak	-2.37	38.78	67.66	150	15	-28.88	



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
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Radiated Emission Measurement

Operator: Gino

File :1

Data :#1

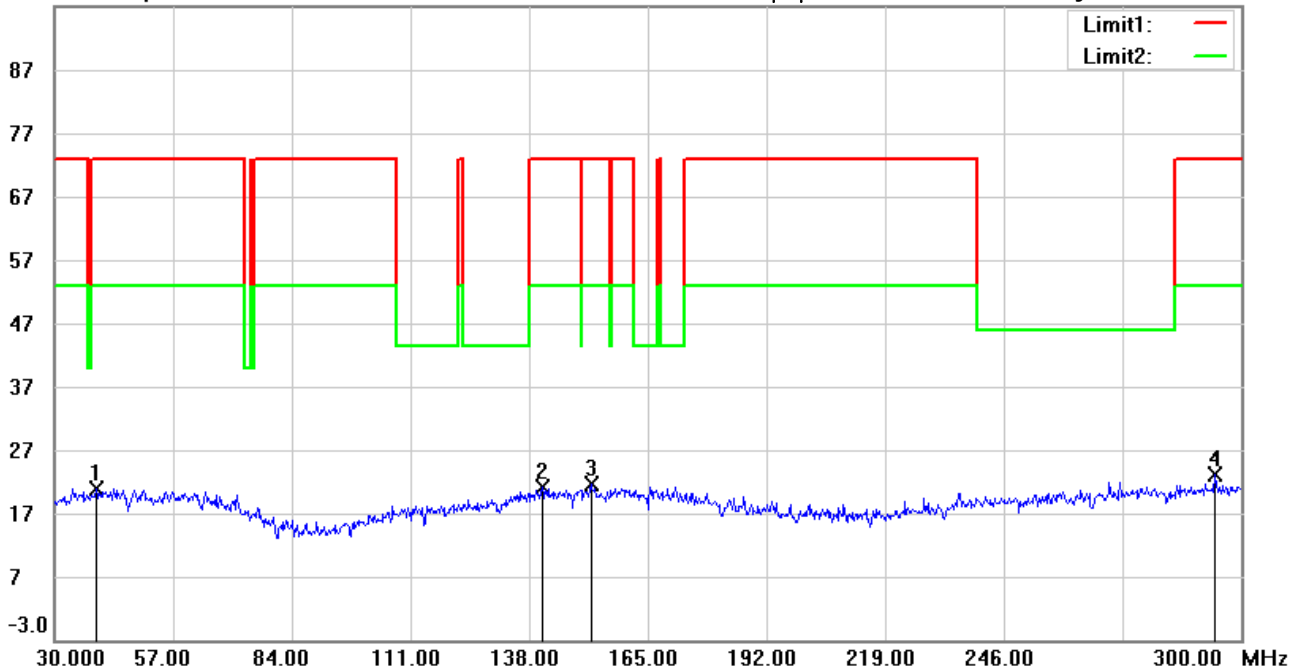
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:02:10

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 30-300(PK)<e>

Polarization: Horizontal

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	39.4500	34.55	peak	-13.74	20.81	72.80	100	103	-51.99	
	140.9700	33.81	peak	-12.78	21.03	72.80	100	258	-51.77	
	152.1750	33.88	peak	-12.20	21.68	72.80	100	125	-51.12	
*	294.0600	35.35	peak	-12.27	23.08	72.80	100	30	-49.72	

*:Maximum data x:Over limit !:over margin



Address: No.99, Sec.1, Balian Rd., Xizhi Dist., New Taipei City
Tel: +886-2-2646-1508
Fax: +886-2-2646-1533

Radiated Emission Measurement

Operator: Gino

File :1

Data :#2

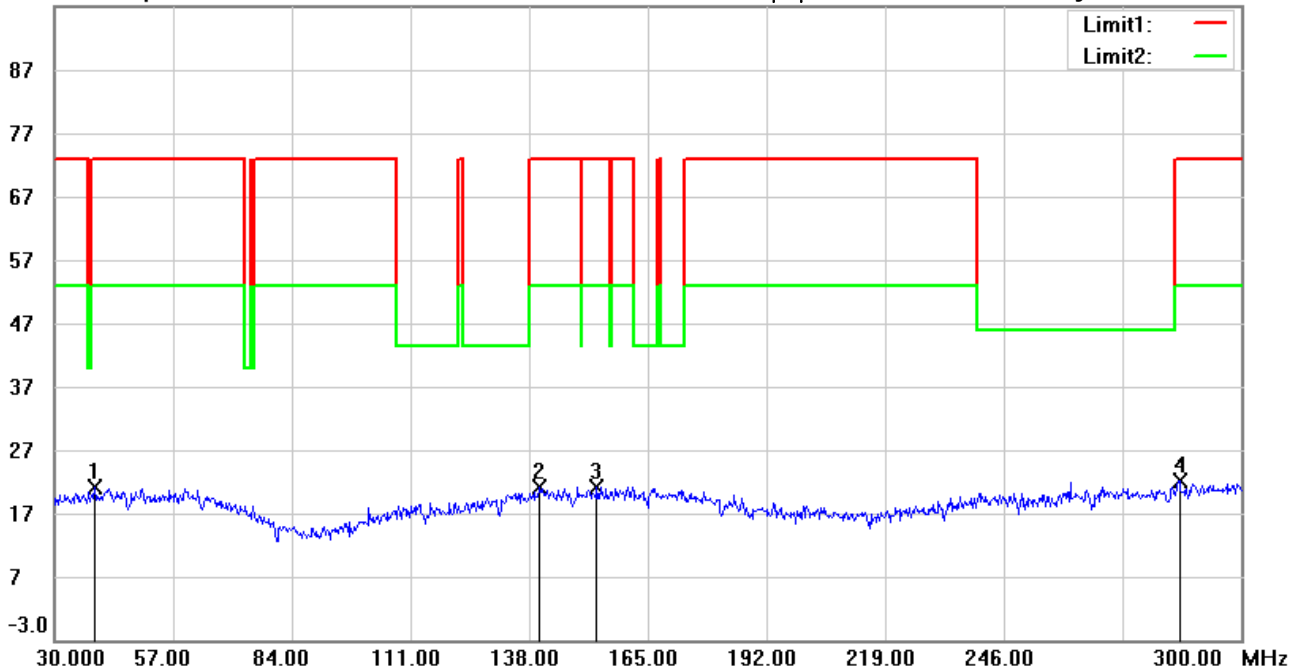
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:02:53

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 30-300(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 433.95MHz

Note :

Polarization: **Vertical**

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	39.1800	35.02	peak	-13.78	21.24	72.80	100	9	-51.56	
	140.4300	34.01	peak	-12.81	21.20	72.80	100	119	-51.60	
	153.3900	33.34	peak	-12.20	21.14	72.80	100	285	-51.66	
*	285.9600	34.66	peak	-12.49	22.17	72.80	100	332	-50.63	

*:Maximum data x:Over limit !:over margin



Address: No. 99, Sec. 1, Balian Rd., Xizhi Dist., New Taipei City
Tel: +886-2-2646-1508
Fax: +886-2-2646-1533

Radiated Emission Measurement

Operator: Gino

File :1

Data :#3

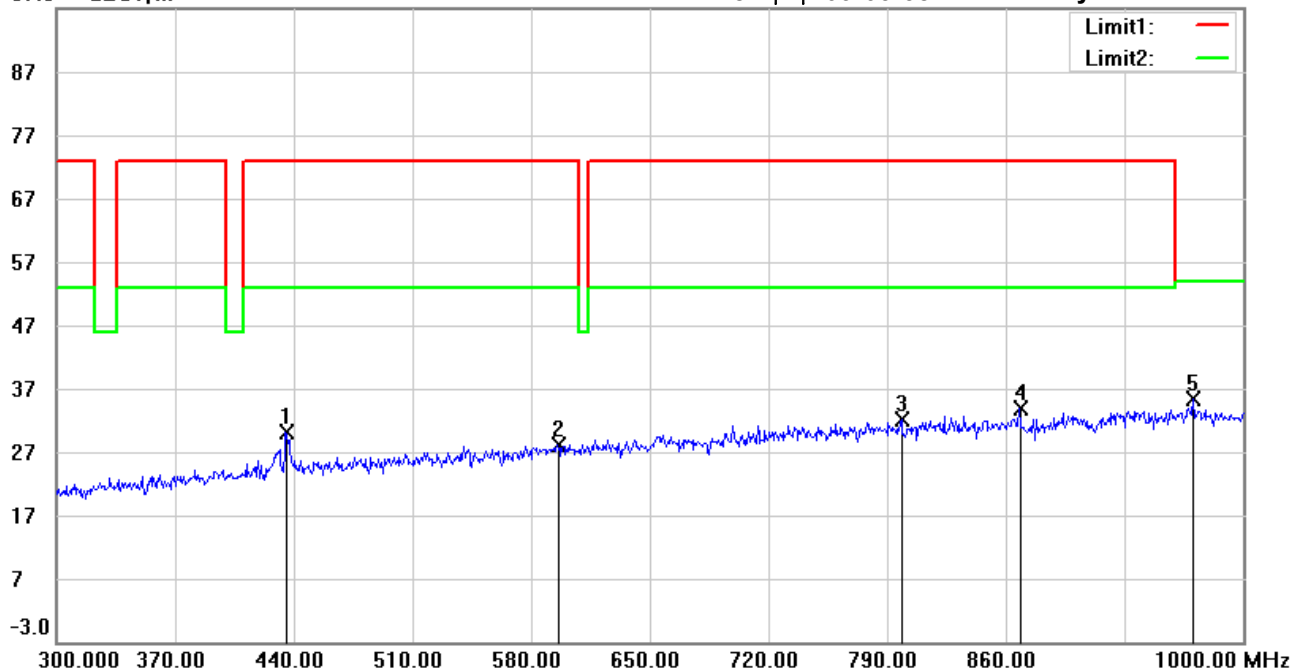
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:03:38

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 300-1000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 433.95MHz

Note :

Polarization: Horizontal

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	435.4500	38.93	peak	-8.77	30.16	72.80	100	177	-42.64	
	595.7500	33.62	peak	-5.46	28.16	72.80	100	246	-44.64	
	798.4000	33.95	peak	-1.93	32.02	72.80	100	200	-40.78	
	868.0500	35.20	peak	-1.44	33.76	72.80	100	235	-39.04	
*	970.6000	35.64	peak	-0.35	35.29	54.00	100	185	-18.71	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File :1

Data :#4

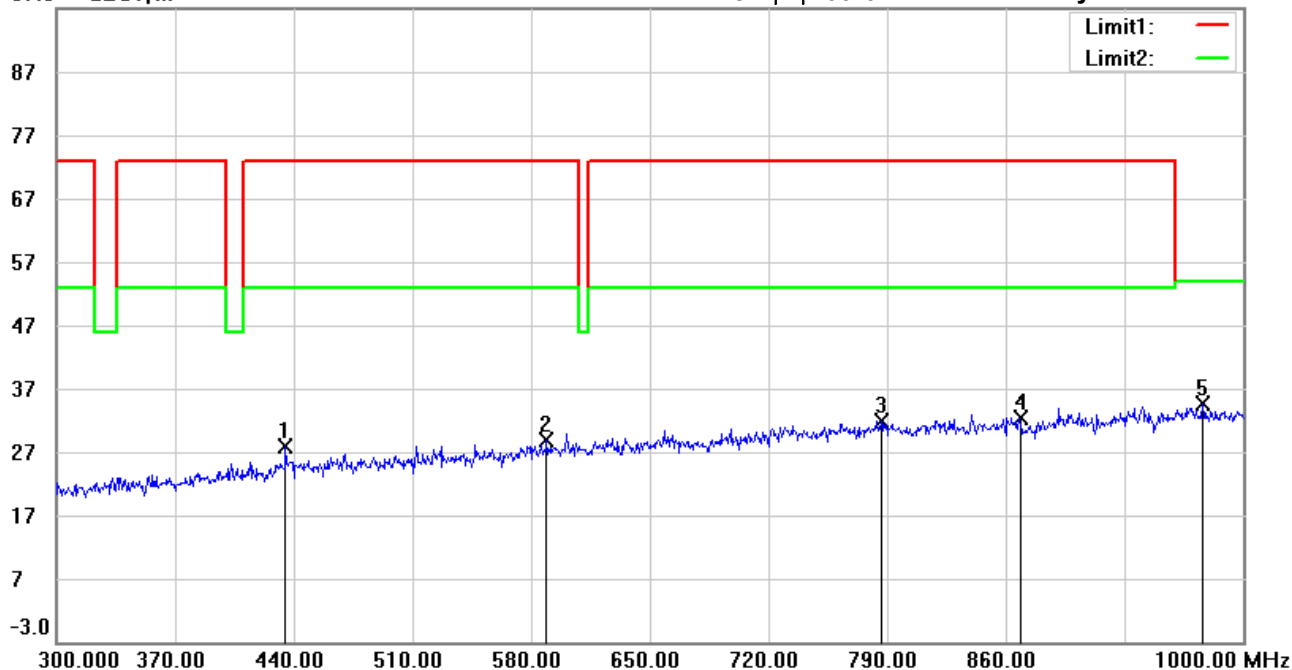
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:04:22

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 300-1000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 433.95MHz

Note :

Polarization: Vertical

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	435.1000	36.57	peak	-8.78	27.79	72.80	100	204	-45.01	
	589.1000	34.49	peak	-5.53	28.96	72.80	100	314	-43.84	
	786.5000	33.86	peak	-2.00	31.86	72.80	100	17	-40.94	
	868.0500	33.83	peak	-1.44	32.39	72.80	100	145	-40.41	
*	976.2000	34.91	peak	-0.34	34.57	54.00	100	296	-19.43	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File :3

Data :#1

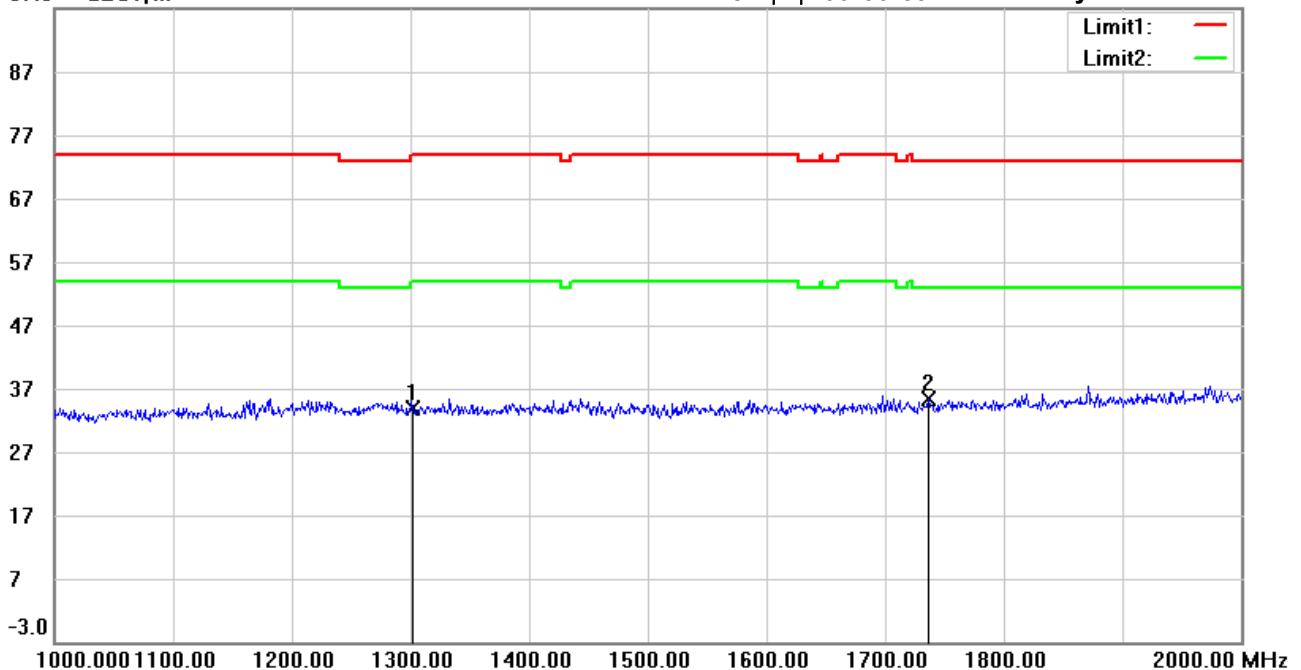
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:30:59

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 1000-2000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 433.95MHz

Note :

Polarization: **Horizontal**

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1301.850	41.87	peak	-8.02	33.85	74.00	150	113	-40.15	
*	1735.800	42.94	peak	-7.49	35.45	72.80	150	258	-37.35	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #4

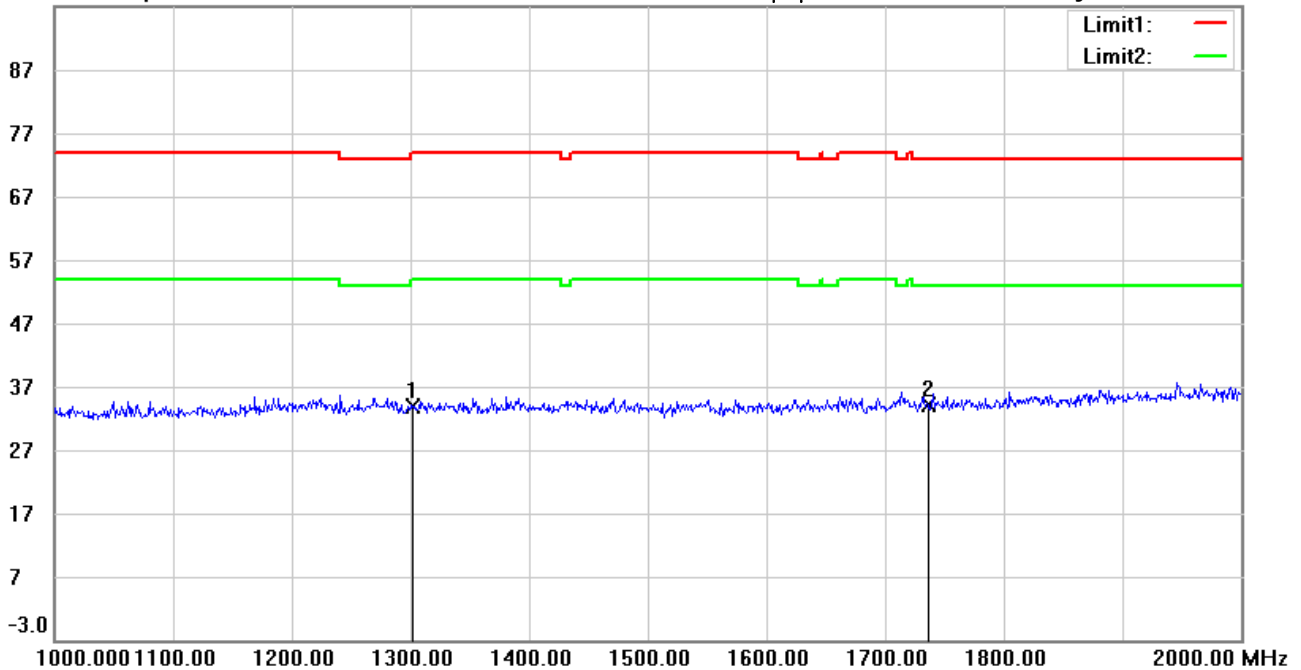
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:33:06

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 1000-2000(PK)<e>

Polarization: **Vertical**

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	1301.850	41.99	peak	-8.02	33.97	74.00	150	198	-40.03	
*	1735.800	41.70	peak	-7.49	34.21	72.80	150	247	-38.59	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #2

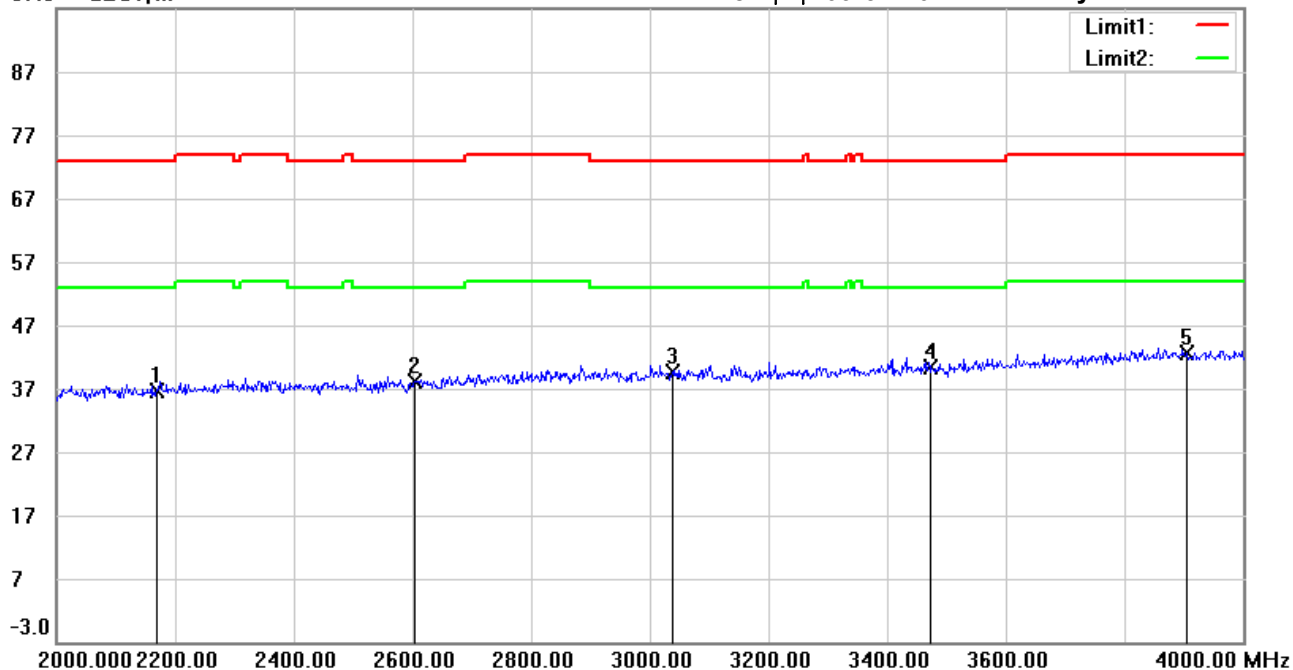
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:31:40

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 2000-4000(PK)<e>

Polarization: *Horizontal*

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	2169.750	41.41	peak	-4.83	36.58	72.80	150	254	-36.22	
	2603.700	41.96	peak	-3.91	38.05	72.80	150	174	-34.75	
	3037.650	42.07	peak	-2.40	39.67	72.80	150	305	-33.13	
	3471.600	41.63	peak	-1.36	40.27	72.80	150	111	-32.53	
*	3905.550	41.30	peak	1.24	42.54	74.00	150	25	-31.46	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #5

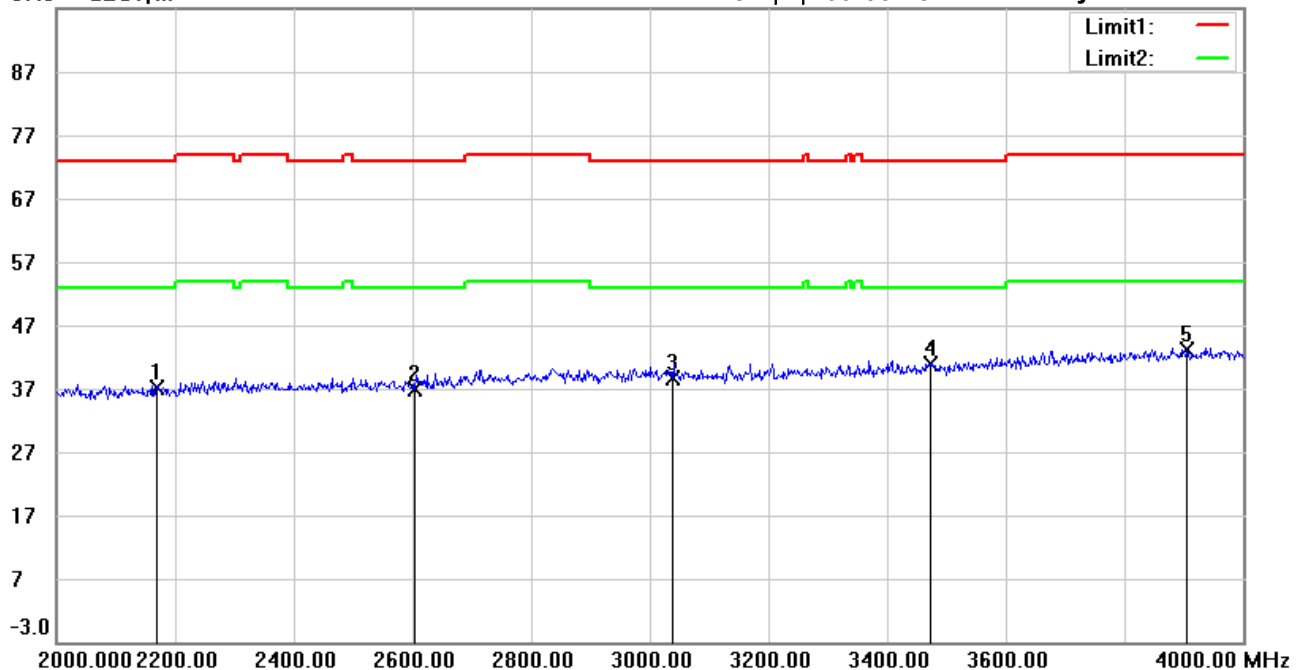
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:33:48

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 2000-4000(PK)<e>

EUT : W6M22407-23631

M/N:

Test Mode : TX 433.95MHz

Note :

Polarization: **Vertical**

Power : 3 Vd.c.

Distance: 3m

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
	2169.750	42.00	peak	-4.83	37.17	72.80	150	108	-35.63	
	2603.700	40.75	peak	-3.91	36.84	72.80	150	274	-35.96	
	3037.650	41.01	peak	-2.40	38.61	72.80	150	5	-34.19	
	3471.600	42.14	peak	-1.36	40.78	72.80	150	196	-32.02	
*	3905.550	41.95	peak	1.24	43.19	74.00	150	337	-30.81	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #3

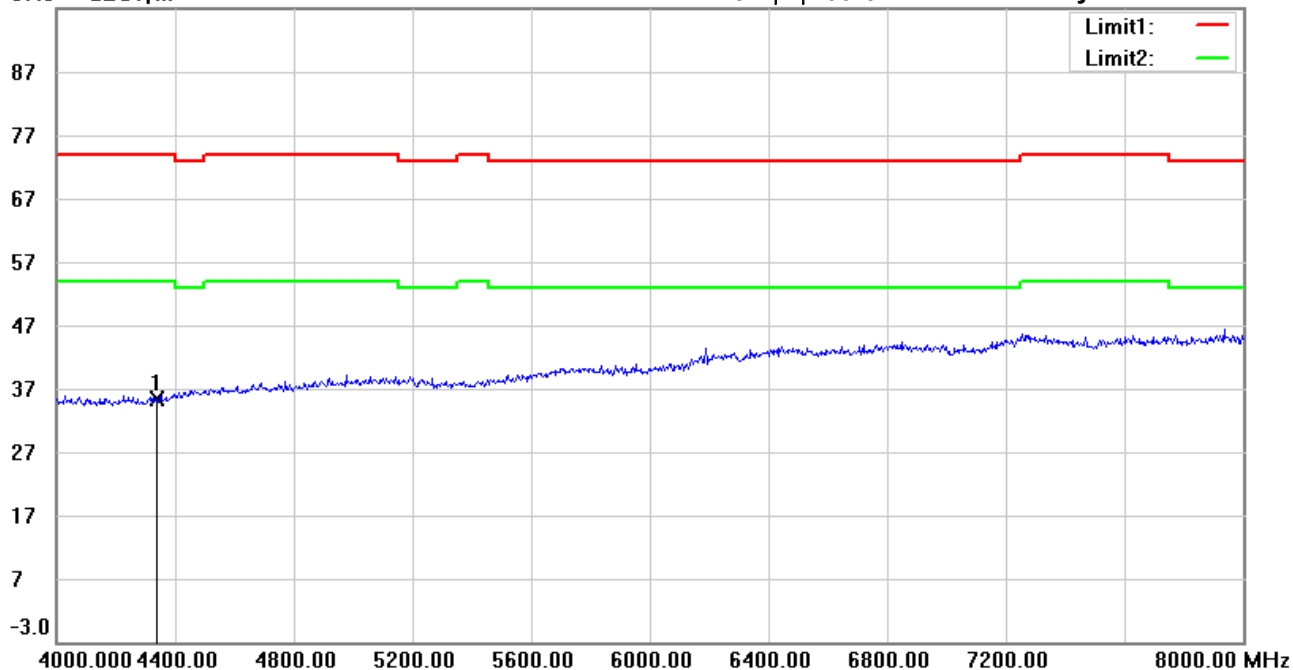
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:32:22

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 4000-8000(PK)<e>

Polarization: *Horizontal*

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	4339.500	33.36	peak	2.01	35.37	74.00	150	55	-38.63	

*:Maximum data x:Over limit !:over margin



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Radiated Emission Measurement

Operator: Gino

File : 3

Data : #6

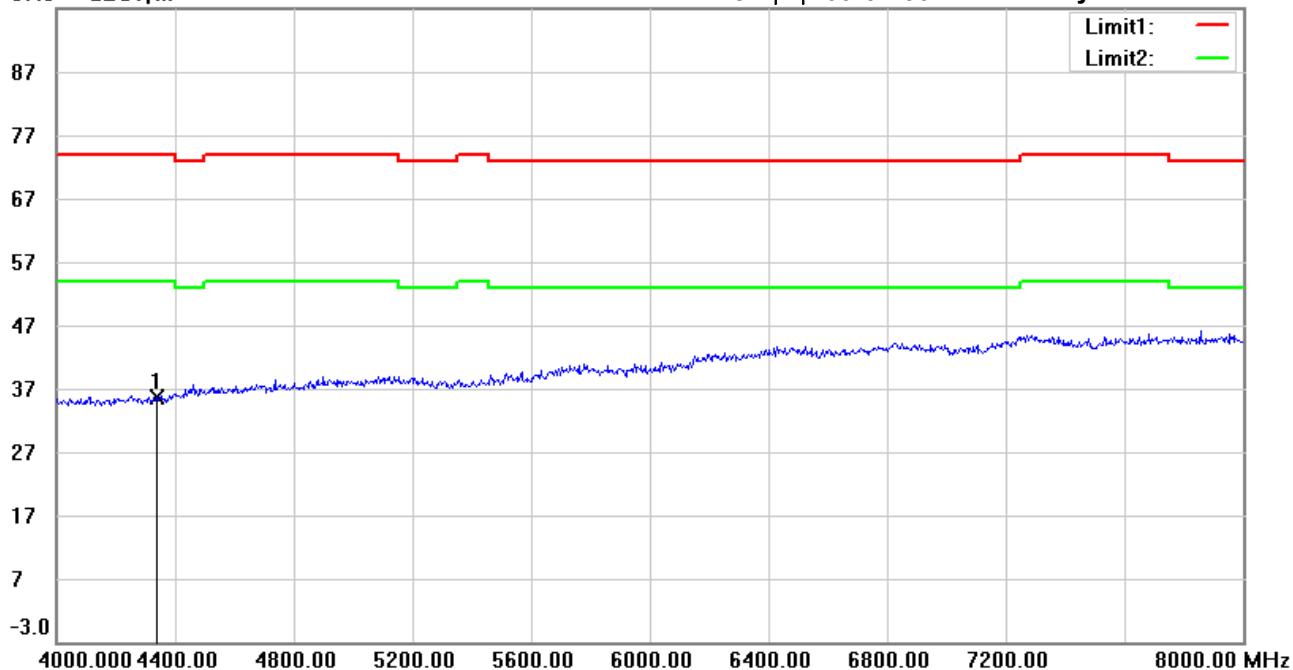
Date: 2024/7/26

Temperature: 25.2 °C

97.0 dBuV/m

Time: 下午 09:34:30

Humidity: 50.8 %



Site : 966A Chamber

Condition : FCC 15.231(433MHz) 4000-8000(PK)<e>

Polarization: **Vertical**

EUT : W6M22407-23631

Power : 3 Vd.c.

M/N:

Distance: 3m

Test Mode : TX 433.95MHz

Note :

Mk.	Frequency (MHz)	Reading (dBuV)	Detector	Corr. factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Ant.Pos (cm)	Tab.Pos (deg.)	Margin (dB)	Comment
*	4339.500	33.67	peak	2.01	35.68	74.00	150	79	-38.32	

*:Maximum data x:Over limit !:over margin