

Project No: TM-2401000471P
Report No.: TMTN2401000089NR

FCC ID: KFR-ZP3113US-8

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FCC 47 CFR PART 15 SUBPART C ANSI C63.10: 2013

TEST REPORT

For

4-in-1 Motion Sensor

Model: ZP3113US-8

Data Applies To: N/A

Brand: VISION®

Test Report Number:

TMTN2401000089NR

Issued to:

Vision Automobile Electronics Industrial Co Ltd

No.78, Gongye 3rd Rd., Technology Industrial Park, Tainan , Taiwan , 70955

Issued by:

Compliance Certification Services Inc.

Tainan Lab.

**No. 168, Ln. 523, Sec. 3, Zhongzheng Rd.,
Rende Dist., Tainan City, 717017, Taiwan**

Issued Date: March 05, 2024

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REVISION HISTORY

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	March 05, 2024	Initial Issue	ALL	Polly Wang



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1. TEST RESULT CERTIFICATION

Product: 4-in-1 Motion Sensor**Model:** ZP3113US-8**Data Applies To:** N/A**Brand Name:** **VISION®****Applicant:** Vision Automobile Electronics Industrial Co Ltd

No.78, Gongye 3rd Rd., Technology Industrial Park, Tainan , Taiwan , 70955

Manufacturer: Vision Automobile Electronics Industrial Co Ltd

No.78, Gongye 3rd Rd., Technology Industrial Park, Tainan , Taiwan , 70955

Tested: February 05, 2024 ~ February 16, 2024

APPLICABLE STANDARDS

STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C ANSI C63.10: 2013	No non-compliance noted

Statements of Conformity

Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

FCC Standard Section	Report Section	Test Item	Result
15.215(c)	7.1	20dB BANDWIDTH	Pass
-	7.3	DUTY CYCLE	-
15.249(a)	7.4	SPURIOUS EMISSION	Pass
15.207(a)	7.5	POWERLINE CONDUCTED EMISSIONS	N/A

We hereby certify that:

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10: 2013 and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements emission limits of FCC Rules Part 15.107, 15.109, 15.207, 15.209 and 15.249.

The test results of this report relate only to the tested sample identified in this report.

Approved by:**John Chen**

Supervisor



2. EUT DESCRIPTION

Product	4-in-1 Motion Sensor
Model Number	ZP3113US-8
Data Applies To	N/A
Brand Name	VISION®
Received Date	January 31, 2024
Reported Date	February 20, 2024
Operation Frequency	908.42MHz 908.40MHz 916.00MHz
Transmit Peak Power	94.97 dBuV/m
Transmit Data Rate	908.42MHz/9.6Kbps, 908.40MHz/40Kbps, 916.00MHz/100kbps
Type of Modulation	FSK
Number of Channels	3 Channel
Power Supply	DC 3V (Powered from battery)
Antenna Type	Type: Helical Antenna Model: ZP3113US-8 Manufacturer: N/A Gain: -11 dBi
RF Module Brand /Model	(U4) ZM8202
Hardware Version	Rev.0
Software Version	Rev.0
Temperature Range	-20°C ~ +70°C

Remark:

1. Client consigns only one model sample to test (Model Number: **ZP3113US-8**). Therefore, the testing Lab. just guarantees the unit, which has been tested.
2. This submittal(s) (test report) is intended for FCC ID: **KFR-ZP3113US-8** filing to comply with Section 15.207, 15.209, 15.249.
3. For more details, please refer to the User's manual of the EUT.

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.249.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2.2 of ANSI C63.10 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m and 1.5 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 6.5.4 and Section 6.6.4.2 of ANSI C63.10.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	(²)
13.36 - 13.41	322 - 335.4		

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

- Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT (**Model: ZP3113US-8**) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

Note :

The field strength of spurious emission was measured in the following position:

- The field strength of spurious emission was measured in the following position: EUT stand-up position (Y axis), lie-down position (X, Z axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

4. INSTRUMENT CALIBRATION

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.

4.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

Chamber Room #1166					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Active Loop Antenna	ETS-LINDREN	6502	8905-2356	09/04/2023	09/03/2024
Attenuator	MCL	BW-S15W5	0535	01/17/2024	01/16/2025
Band Reject Filter	MICRO-TRONICS	HPM13525	006	01/17/2024	01/16/2025
Bilog Antenna with 6dB Attenuator	SUNOL SCIENCES & EMCI	JB1 & N-6-06	A021306 & AT-N0682	10/03/2023	10/02/2024
Cable	EMCI	EM102-KMKM	CB1166-01	06/17/2023	06/16/2024
Double Ridged Guide Horn Antenna	ETS-LINDGREN	3116	00078900	03/25/2023	03/24/2024
EMI Test Receiver	R&S	ESCI	101203	10/16/2023	10/15/2024
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY54430216	07/25/2023	07/24/2024
Double Ridged Guide Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-788(98006)	04/18/2023	04/17/2024
Pre-Amplifier	EMCI	EMC012645	980098	01/17/2024	01/16/2025
Pre-Amplifier	Com-Power	PAM-840A	461378	06/07/2023	06/06/2024
Software	Excel(ccs-o6-2020 v1.1) , e3(v6.101222)				

Remark: Each piece of equipment is scheduled for calibration once a year.

4.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
Radiated Emission, 9kHz~30MHz Test Site : CB1166	±2.7dB
Radiated Emission, 30 MHz ~1GHz Test Site : CB1166	±3.76dB
Radiated Emission, 1GHz ~18GHz Test Site : CB1166	±4.43dB
Radiated Emission, 18GH~26.5GHz Test Site : CB1166	±4.79dB
Radiated Emission, 26.5GH~40GHz Test Site : CB1166	±4.72dB
Power Line Conducted Emission, 9kHz~30MHz	±1.83dB
Band Width	0.025%
Peak Output Power MU	±1.9dB
Band Edge MU	±0.264dBuV
Channel Separation MU	±361.69Hz
Duty Cycle MU	±0.2%
Frequency Stability MU	±0.493Hz
Temperature	±0.5
Humidity	±3%

Uncertainty figures are valid to a confidence level of 95%, k=2

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

☐ No.8, Jiucengling, Xinhua Dist., Tainan City 712, Taiwan

☒ No. 168, Ln. 523, Sec. 3, Zhongzheng Rd., Rende Dist., Tainan City 717017, Taiwan

The sites are constructed in conformance with the requirements of ANSI C63.7:1992, ANSI C63.10: 2013 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS LISTING

The test facilities used to perform radiated and conducted emissions tests are accredited by Taiwan Accreditation Foundation for the specific scope of accreditation under Lab Code: 1109 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by TAF or any agency of the Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: TW1109).



5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

Taiwan	TAF
---------------	-----

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

Canada	Industry Canada
Germany	TUV NORD
Taiwan	BSMI
USA	FCC

6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

【RF】

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	N/A	N/A	N/A	N/A	N/A

No.	Signal cable description				
A	N/A	N/A			

【EMC】

No.	Product	Manufacturer	Model No.	Certify No.	Signal cable
1	N/A	N/A	N/A	N/A	N/A

No.	Signal cable description				
A	N/A	N/A			

Remark:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

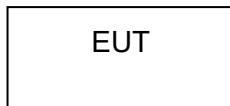


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6.3 CONFIGURATION OF SYSTEM UNDER TEST

【RF】



6.4 EUT OPERATING CONDITION

RF Setup

1. Set up a whole system as the setup diagram.
2. Turn on power.

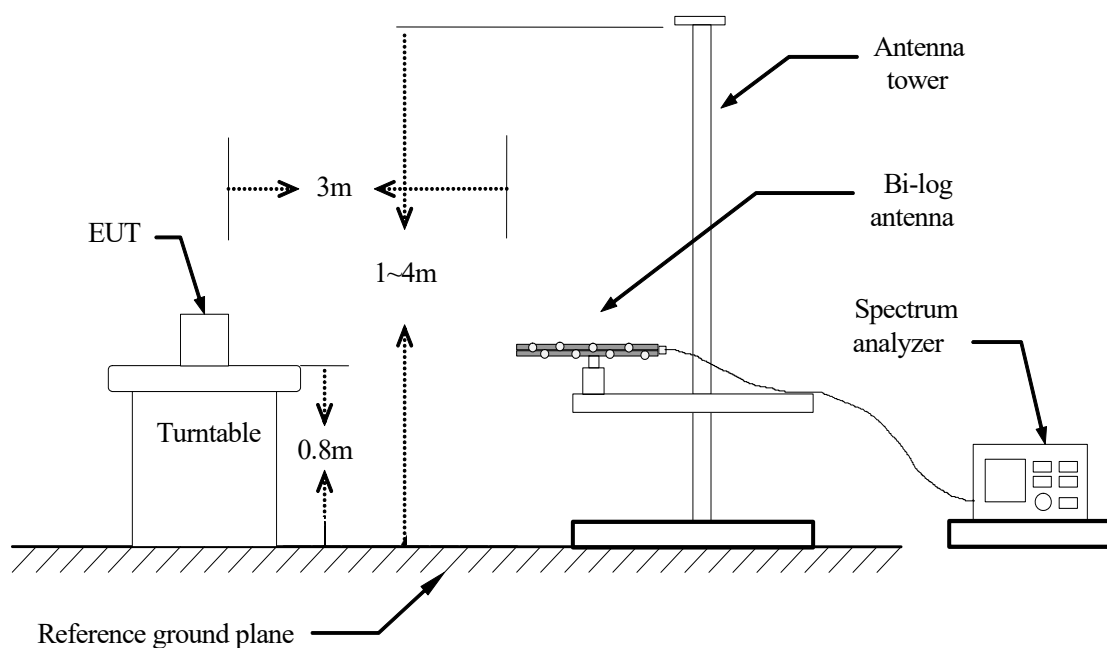
7. FCC PART 15.249 REQUIREMENTS

7.1 20 dB BANDWIDTH

LIMIT

None; for reporting purposes only.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Set the spectrum analyzer in the following setting as:
RBW is set to 3 kHz and VBW is set 10kHz.



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TEST RESULTS

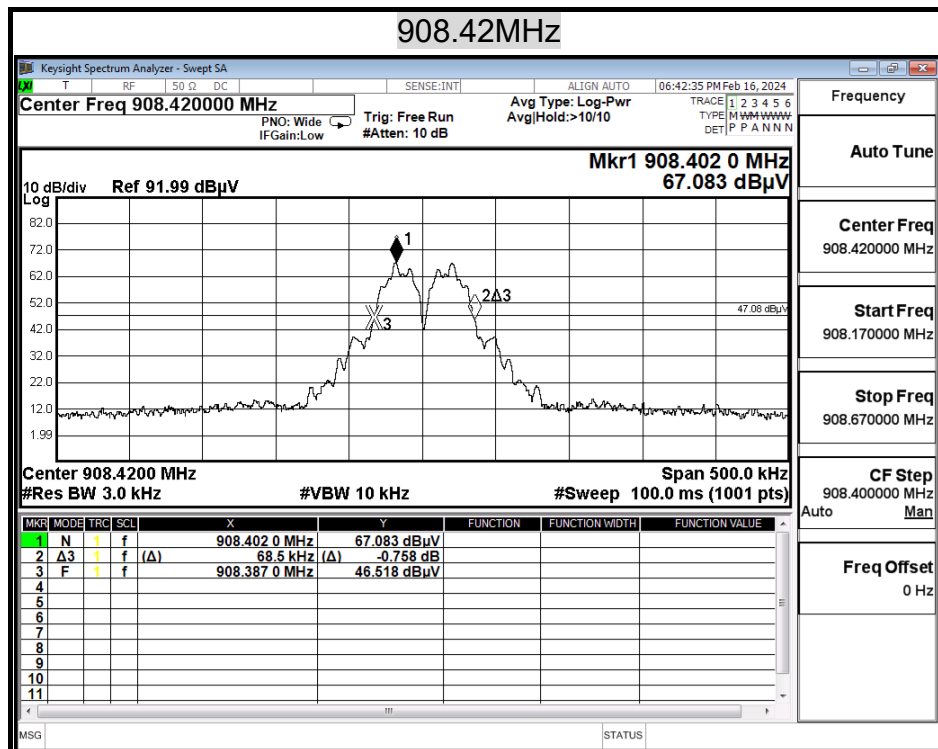
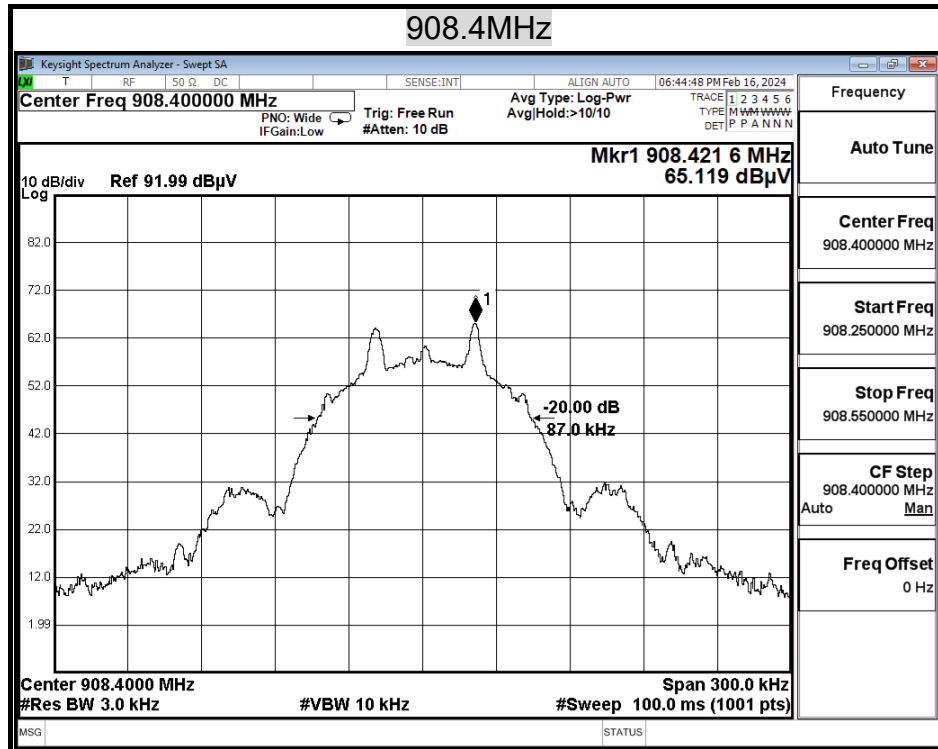
No non-compliance noted.

TEST DATA

Operation Mode:	TX	Test Date:	2024/02/05
Temperature:	24.4°C	Tested by:	Peter Chu
Humidity:	46% RH	Polarity:	Ver. / Hor.

Frequency (MHz)	20 dB Bandwidth (MHz)
908.4	0.09
908.42	0.07
916	0.12

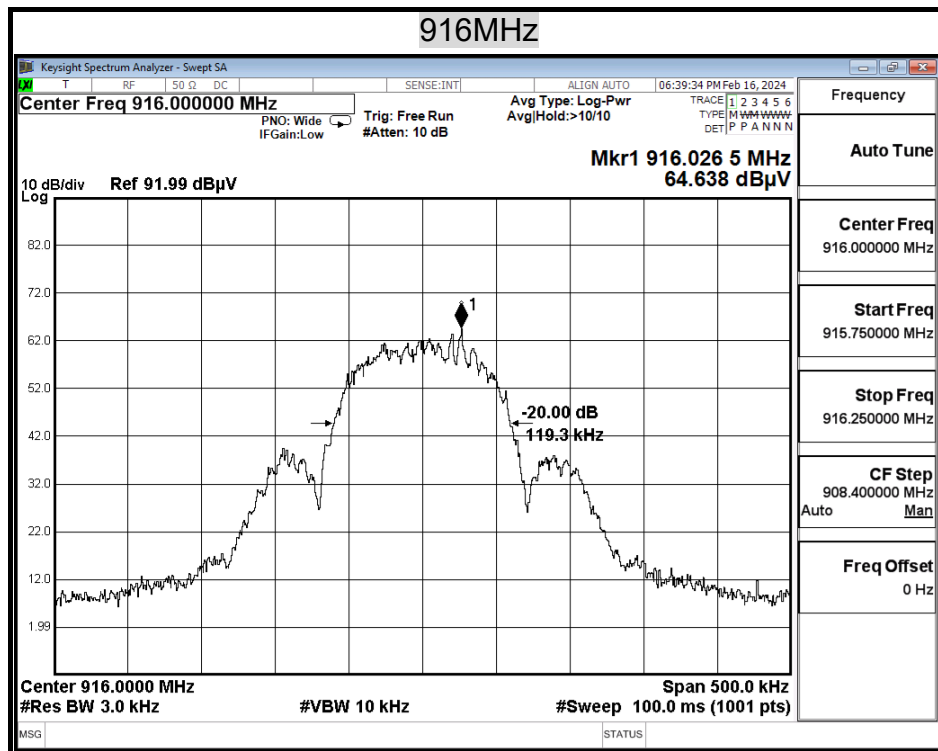
TEST PLOT





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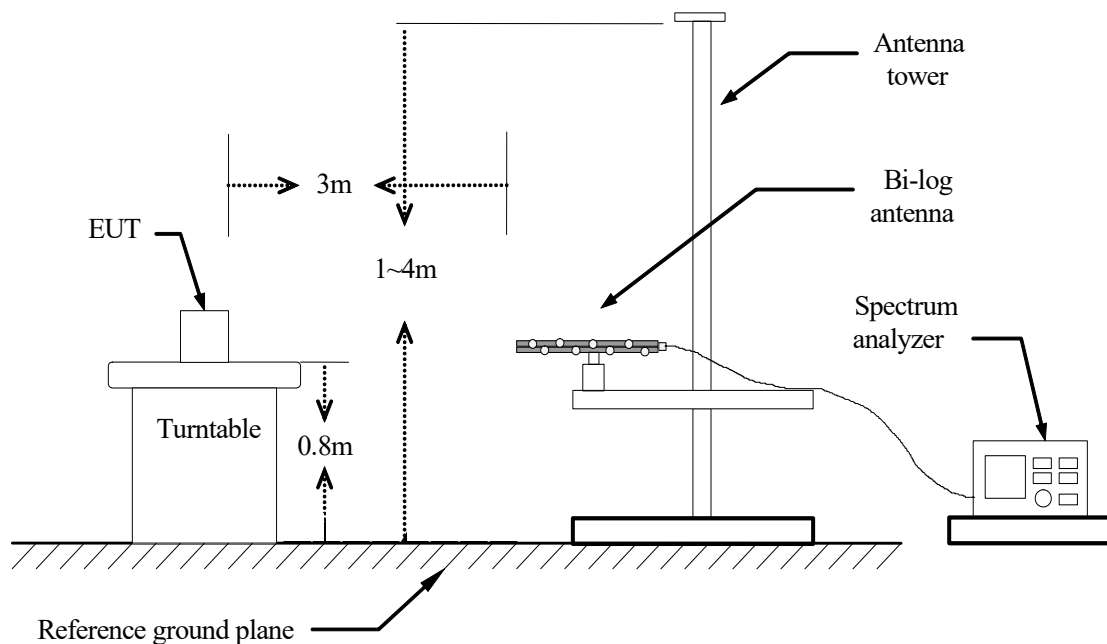


7.2 DUTY CYCLE

LIMIT

Nil (No dedicated limit specified in the Rules)

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in transmitting mode.
2. Set center frequency of spectrum analyzer = operating frequency.
3. Set the spectrum analyzer as RBW=1MHz, VBW=3MHz, Span = 0Hz, a suitable Sweep Time.
4. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

No non-compliance noted.



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TEST DATA

Operation Mode: TX

Temperature: 24.4°C

Humidity: 46% RH

Test Date: 2024/02/05

Tested by: Peter Chu

Polarity: Ver. / Hor.

908 MHz

	us	Times	Ton	Total Ton time(ms)
Ton1	39300.000	1	39300.000	
Ton2		0	0	
Ton3		0	0	39.300
Tp				100.000

Ton	39.300
Tp(Ton+Toff)	100.000
Duty Cycle	0.393
Duty Factor	-8.112

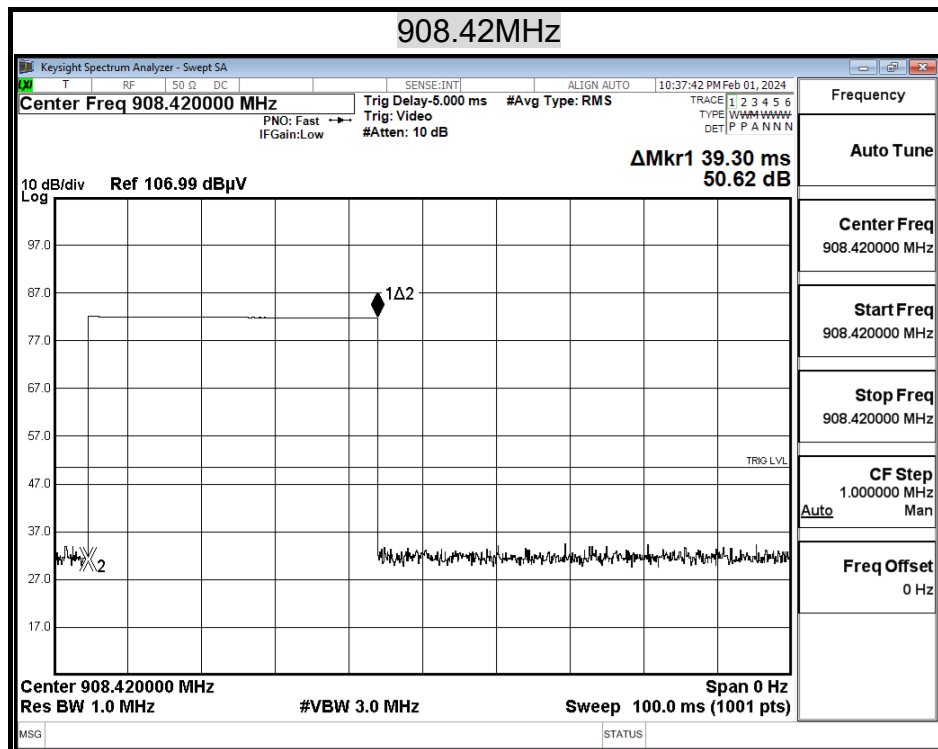
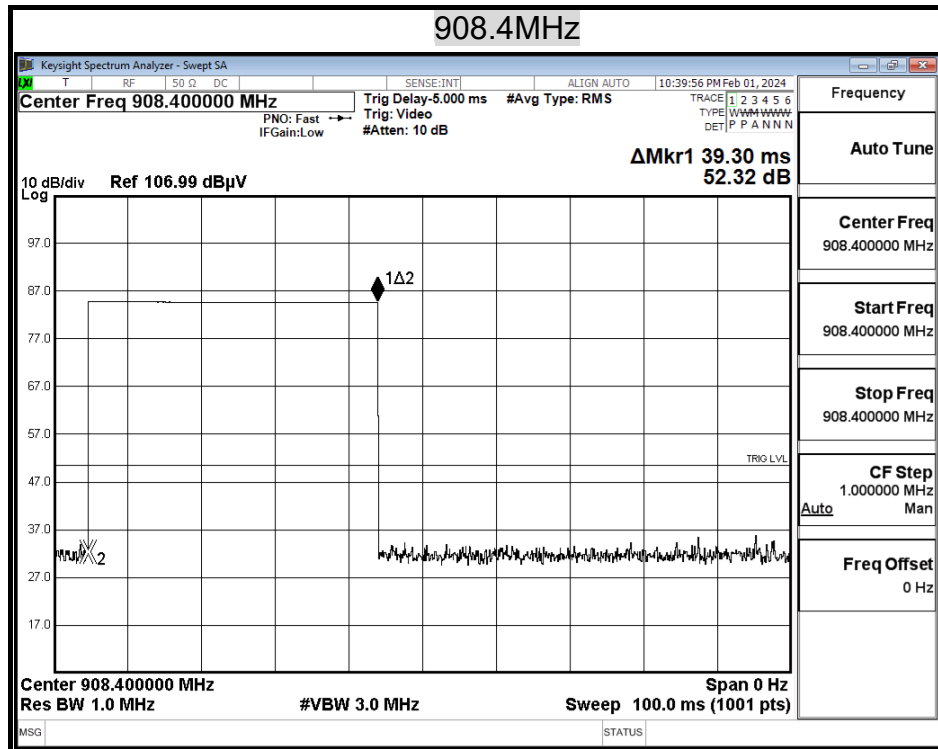
39.3 %



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TEST PLOT



7.3 SPURIOUS EMISSION

LIMIT

1. In the section 15.249(a):

Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (μV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (μV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

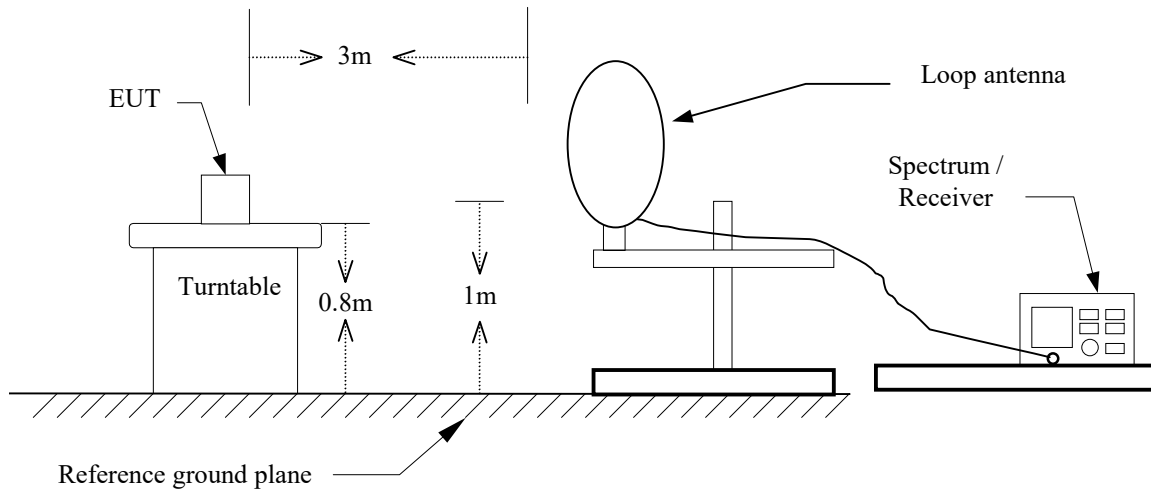
Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

3. In the above emission table, the tighter limit applies at the band edges.

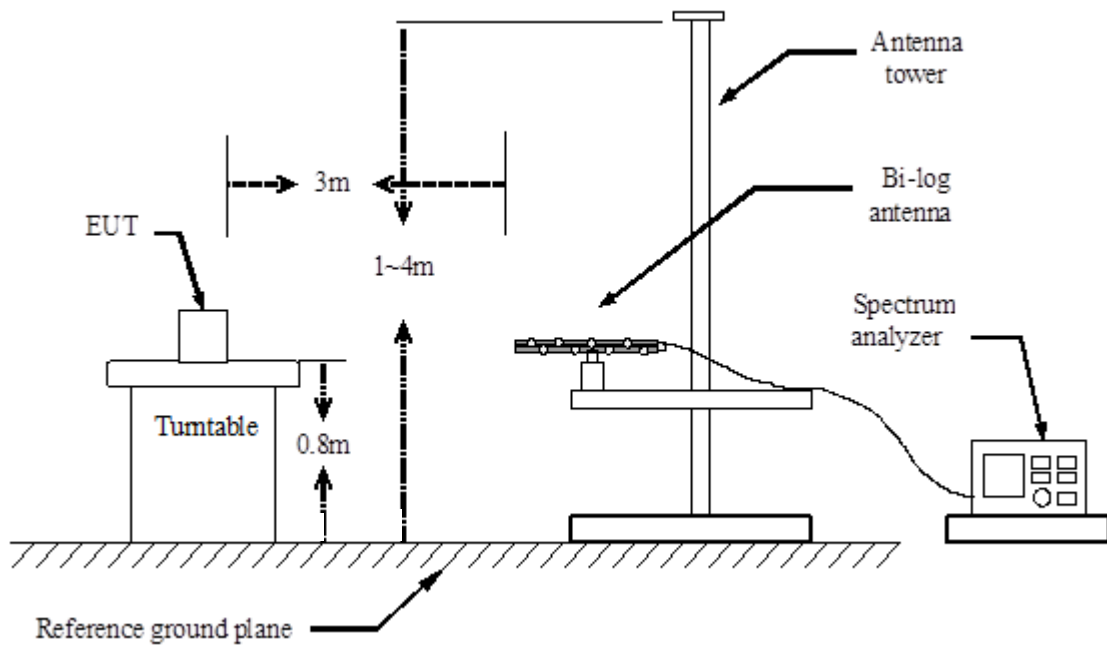
Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBμV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

TEST CONFIGURATION

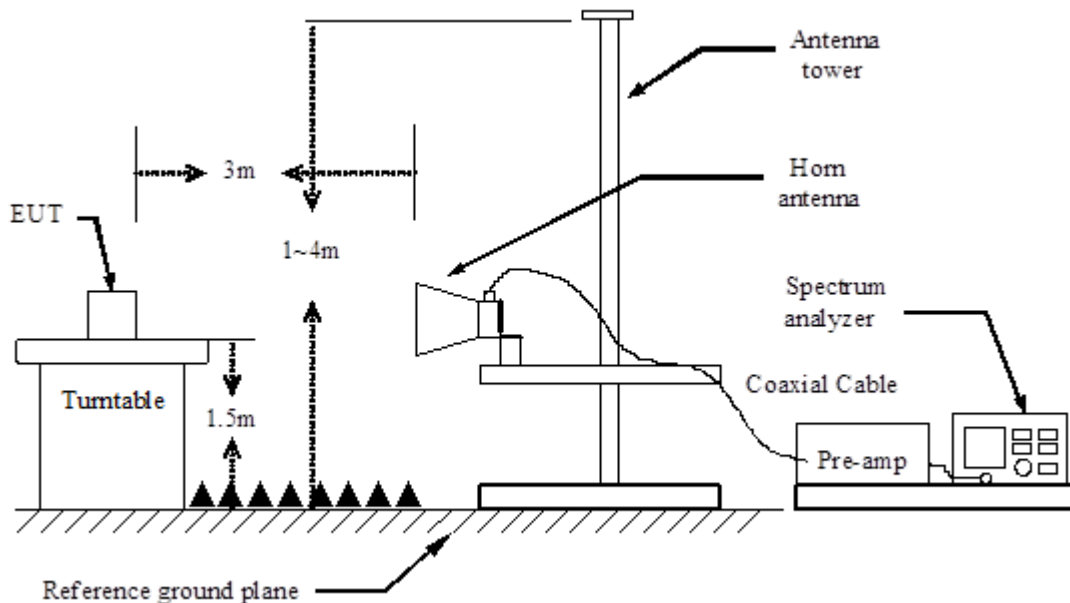
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m/1.5m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Silicon Labs procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. No emission is found between lowest internal used/generated frequency to 30MHz (9kHz~30MHz)

Below 1GHz(9kHz ~ 30MHz)

9kHz~150kHz

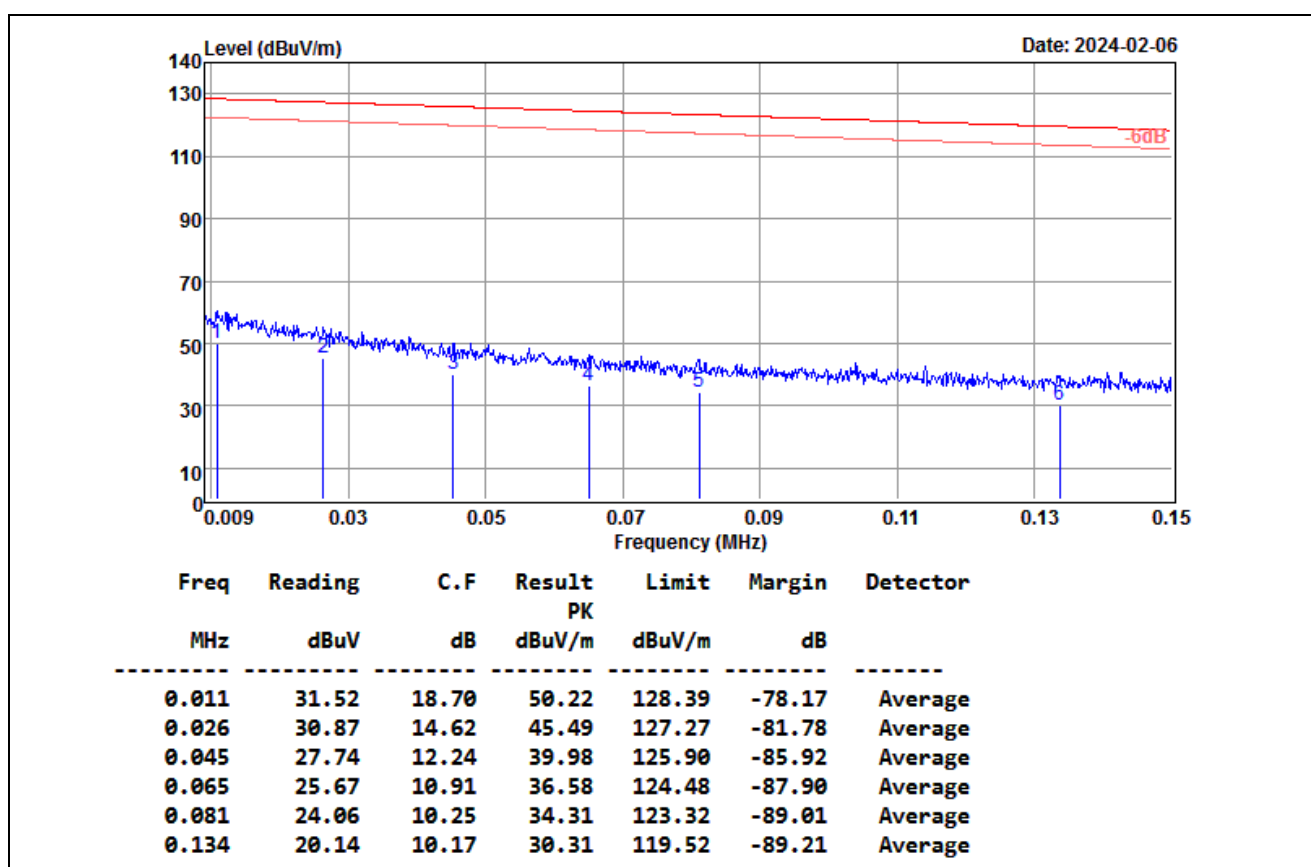
Operation Mode: TX

Test Date: 2024/02/06

Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH



Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Test Receiver setting RBW=200Hz for Quasi-peak detection (QP) and Average detection(AV) at frequency 9~150(kHz).
- 3.Test Receiver setting RBW=9kHz for Quasi-peak detection (QP) and Average detection(AV) at frequency 0.15~30(MHz).
- 4.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 5.The other emission levels were 10dB below the limit
- 6.The test distance is 3m.

15MHz~30MHz

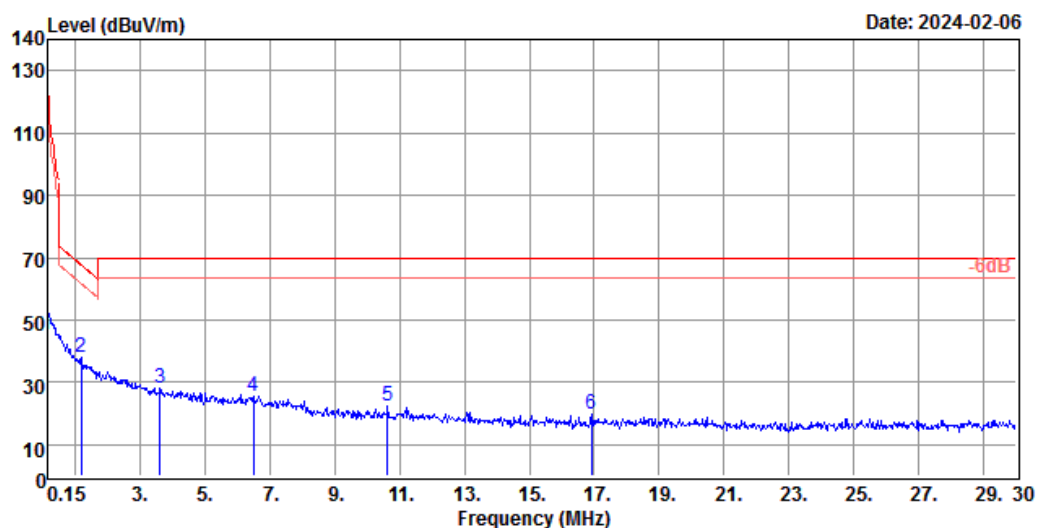
Operation Mode: TX

Test Date: 2024/02/06

Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH



Freq MHz	Reading dBuV	C.F dB	Result PK dBuV/m	Limit dBuV/m	Margin dB	Detector
0.150	35.36	10.17	45.53	118.34	-72.81	Average
1.195	27.85	10.23	38.08	67.52	-29.44	Peak
3.613	17.92	10.32	28.24	69.54	-41.30	Peak
6.508	13.50	11.98	25.48	69.54	-44.06	Peak
10.627	10.04	12.24	22.28	69.54	-47.26	Peak
16.926	7.44	12.33	19.77	69.54	-49.77	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Test Receiver setting RBW=200Hz for Quasi-peak detection (QP) and Average detection(AV) at frequency 9~150(kHz).
- 3.Test Receiver setting RBW=9kHz for Quasi-peak detection (QP) and Average detection(AV) at frequency 0.15~30(MHz).
- 4.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 5.The other emission levels were 10dB below the limit
- 6.The test distance is 3m.

Below 1GHz(30MHz ~ 1GHz)

Operation Mode: TX

Test Date: 2024/02/06

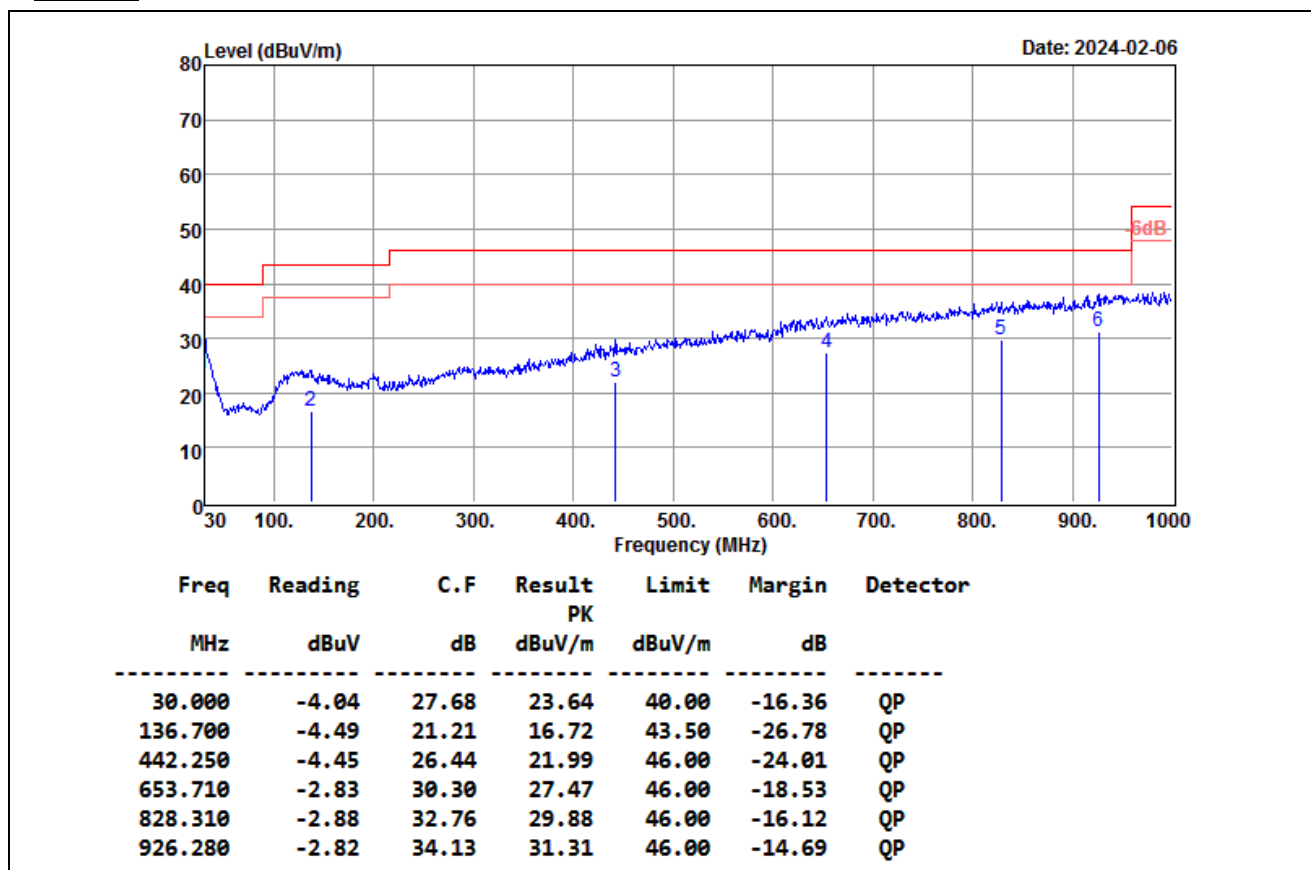
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Test Receiver setting RBW=120kHz for Quasi-peak detection (QP) and at frequency 30~1000(MHz).
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.

Operation Mode: TX

Test Date: 2024/02/06

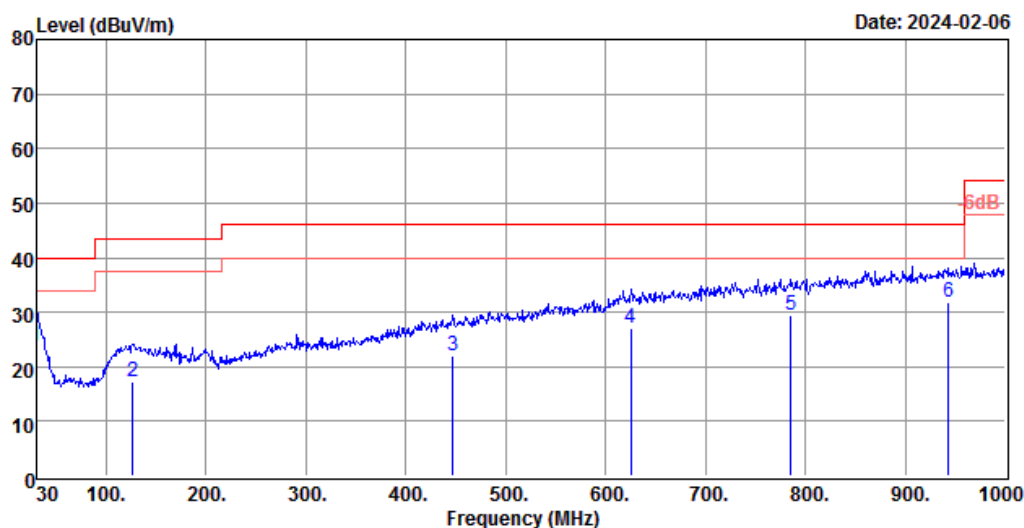
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Hor.

Horizontal



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
30.000	-3.93	27.68	23.75	40.00	-16.25	QP
126.030	-4.58	21.86	17.28	43.50	-26.22	QP
447.100	-4.46	26.50	22.04	46.00	-23.96	QP
625.580	-2.71	29.70	26.99	46.00	-19.01	QP
785.630	-2.90	32.38	29.48	46.00	-16.52	QP
943.740	-2.75	34.64	31.89	46.00	-14.11	QP

Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Test Receiver setting RBW=120kHz for Quasi-peak detection (QP) and at frequency 30~1000(MHz).
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.



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The fundamental signal

Operation Mode: TX 908.4MHz

Test Date: 2024/02/06

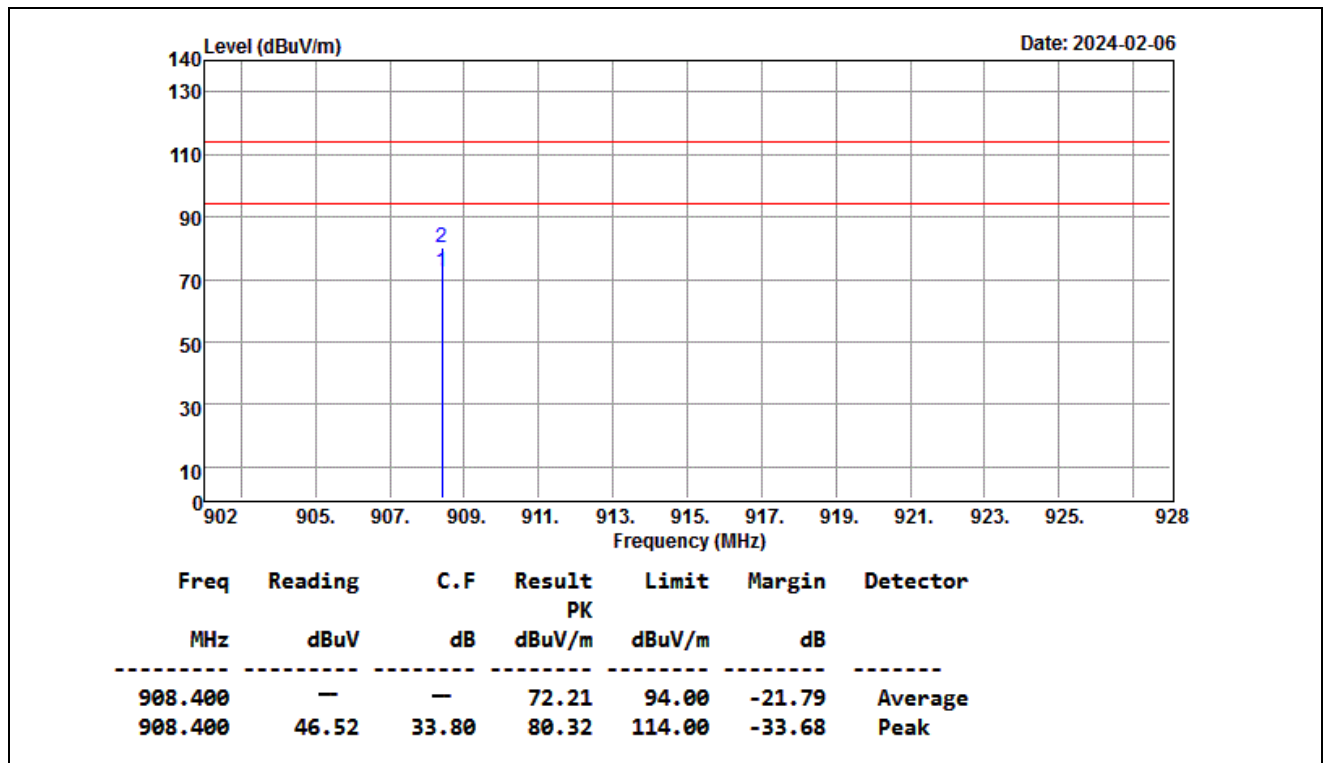
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor



Report No.: TMTN2401000089NR

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Operation Mode: TX 908.4MHz

Temperature: 24.3°C

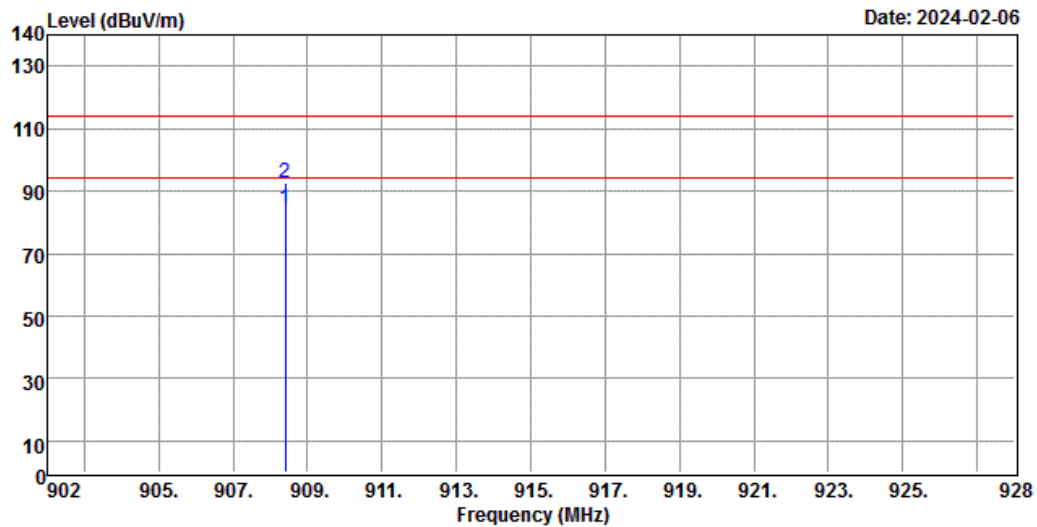
Humidity: 52% RH

Test Date: 2024/02/06

Tested by: Peter Chu

Polarity: Hor.

Horizontal



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
908.400	—	—	84.32	94.00	-9.68	Average
908.400	58.63	33.80	92.43	114.00	-21.57	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor



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Operation Mode: TX 908.42MHz

Test Date: 2024/02/06

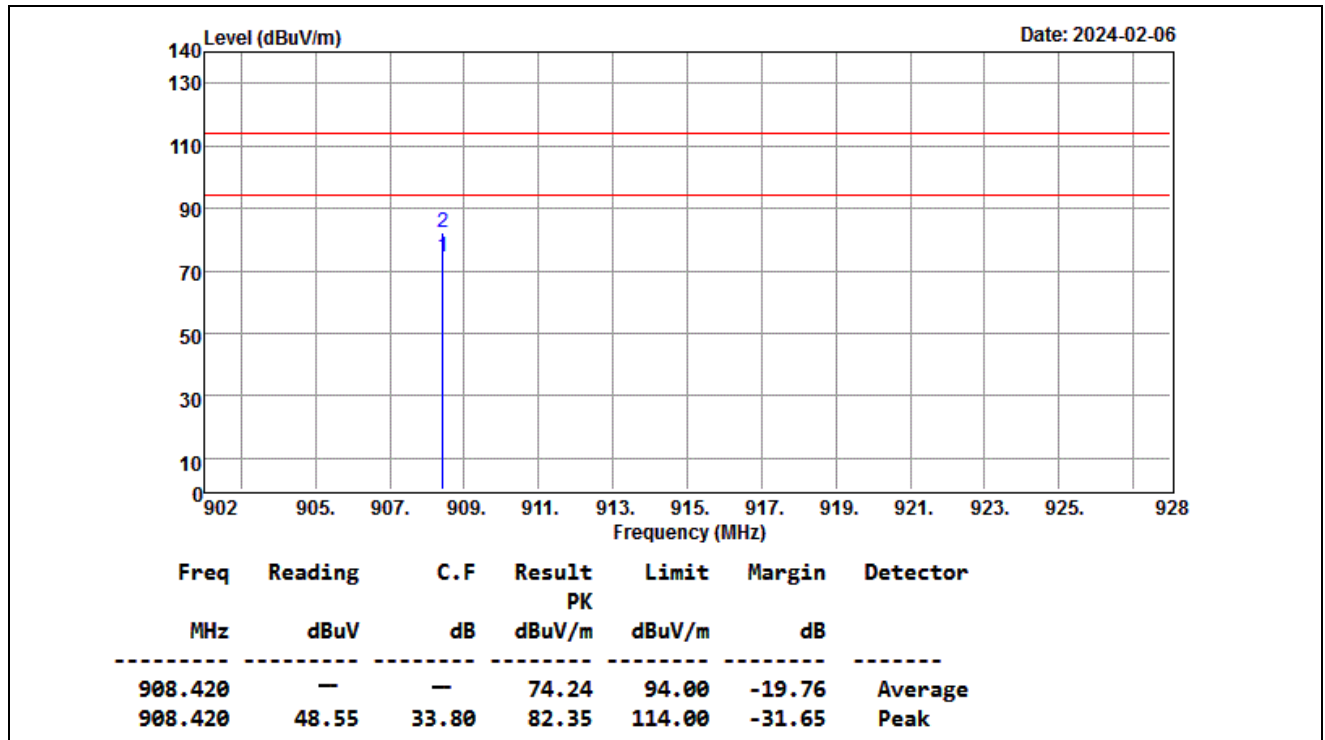
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor



Report No.: TMTN2401000089NR

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Rev.: 00

Operation Mode: TX 908.42MHz

Test Date: 2024/02/06

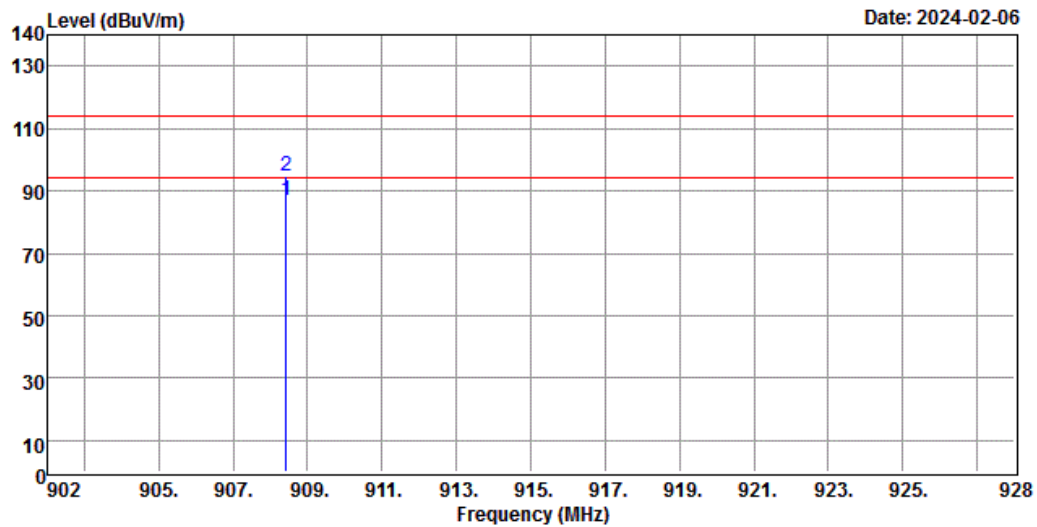
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Hor.

Horizontal



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
908.420	—	—	86.76	94.00	-7.24	Average
908.420	61.07	33.80	94.87	114.00	-19.13	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 916MHz

Test Date: 2024/02/06

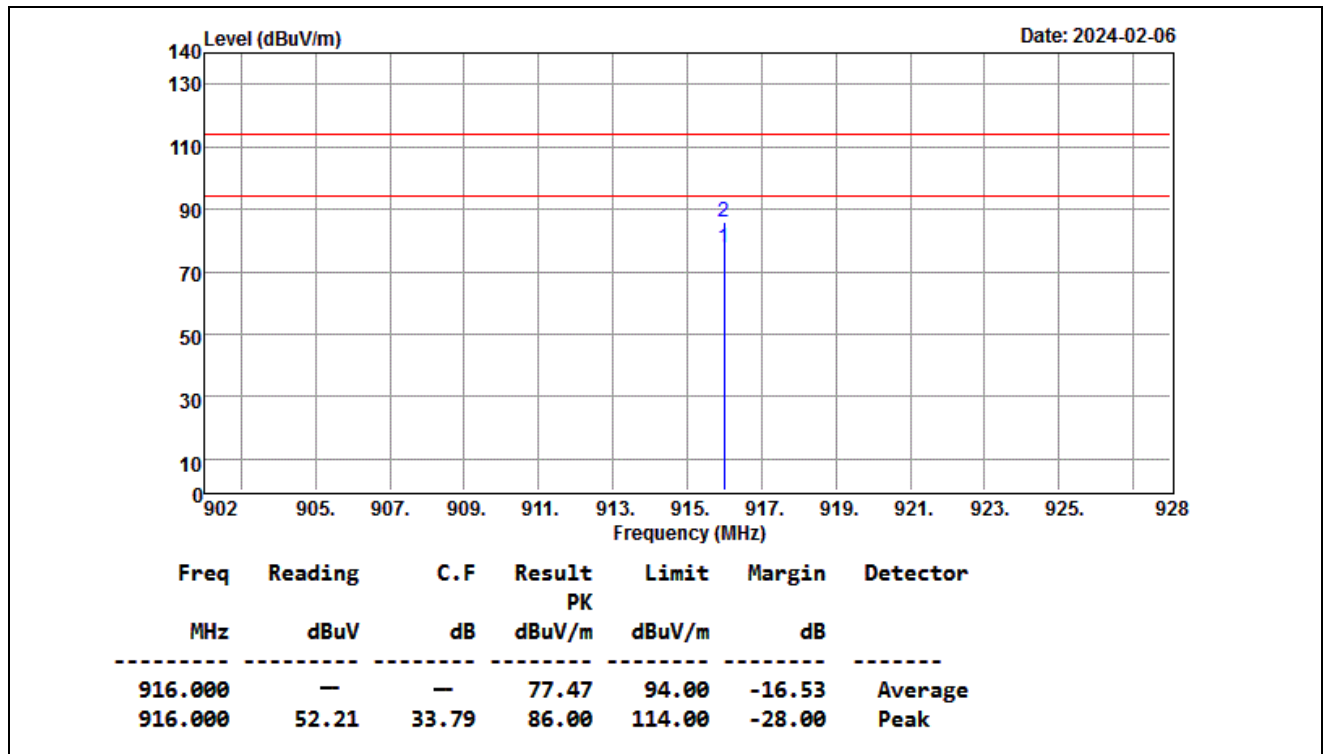
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor



Report No.: TMTN2401000089NR

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Operation Mode: TX 916MHz

Temperature: 24.3°C

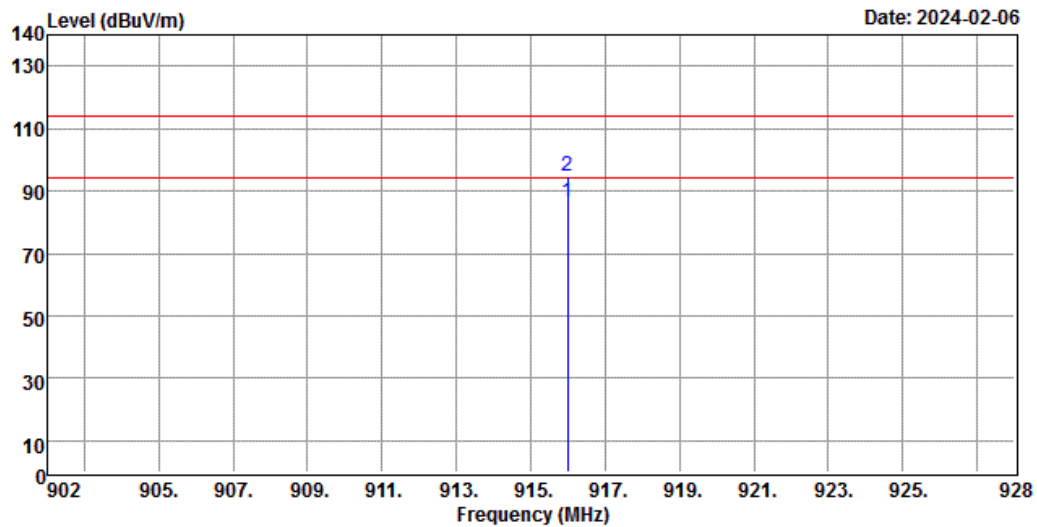
Humidity: 52% RH

Test Date: 2024/02/06

Tested by: Peter Chu

Polarity: Hor.

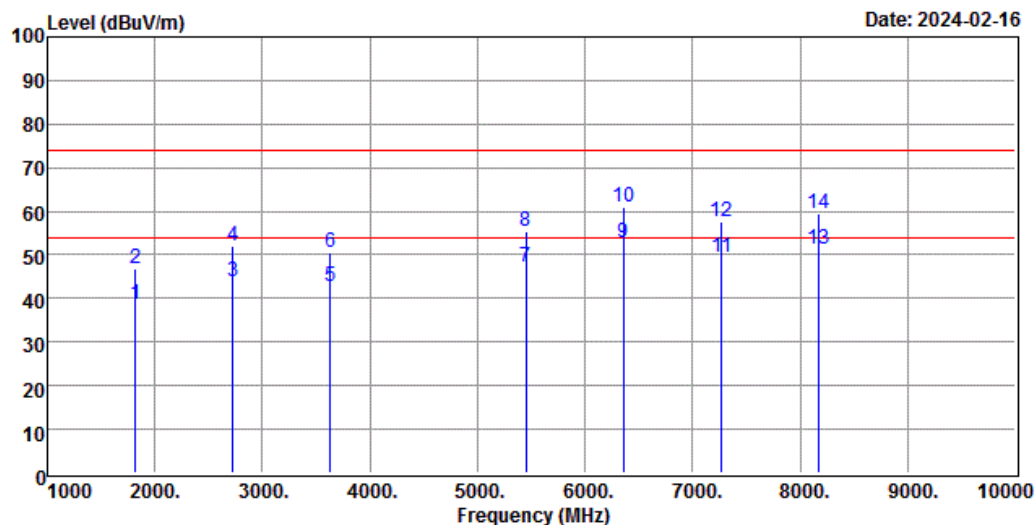
Horizontal



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
916.000	—	—	86.56	94.00	-7.44	Average
916.000	61.18	33.79	94.97	114.00	-19.03	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss
- 2.Spectrum analyzer setting P(Peak): RBW=100kHz, VBW=300kHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Above 1 GHz**Operation Mode:** TX 908.4MHz**Test Date:** 2024/02/16**Temperature:** 24.3°C**Tested by:** Peter Chu**Humidity:** 52% RH**Polarity:** Ver.**Vertical**

Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1816.980	—	—	38.65	54.00	-15.35	Average
1816.980	49.86	-3.10	46.76	74.00	-27.24	Peak
2725.380	—	—	43.95	54.00	-10.05	Average
2725.380	50.28	1.78	52.06	74.00	-21.94	Peak
3633.480	—	—	42.62	54.00	-11.38	Average
3633.480	46.31	4.42	50.73	74.00	-23.27	Peak
5450.210	—	—	47.31	54.00	-6.69	Average
5450.210	45.67	9.75	55.42	74.00	-18.58	Peak
6358.750	—	—	52.92	54.00	-1.08	Average
6358.750	48.22	12.81	61.03	74.00	-12.97	Peak
7267.320	—	—	49.34	54.00	-4.66	Average
7267.320	40.09	17.36	57.45	74.00	-16.55	Peak
8175.935	—	—	51.41	54.00	-2.59	Average
8175.935	39.88	19.64	59.52	74.00	-14.48	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 908.4MHz

Test Date: 2024/02/16

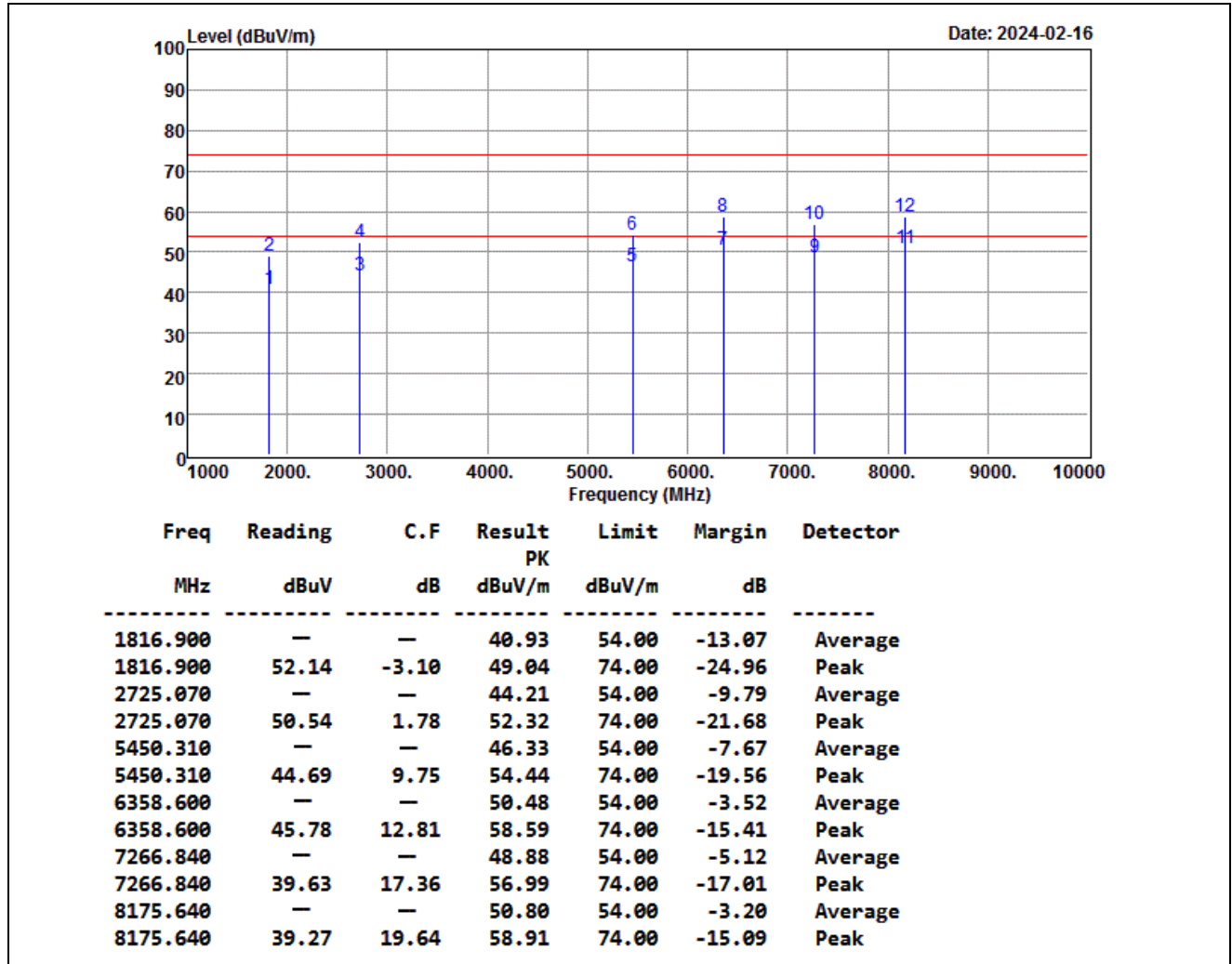
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Hor.

Horizontal



Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 908.42MHz

Test Date: 2024/02/16

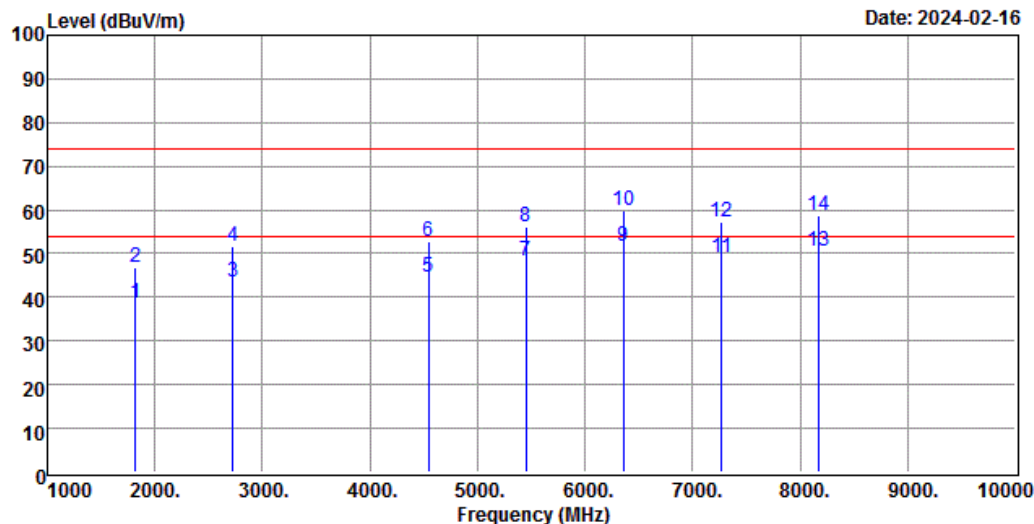
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1816.910	—	—	38.55	54.00	-15.45	Average
1816.910	49.76	-3.10	46.66	74.00	-27.34	Peak
2725.400	—	—	43.47	54.00	-10.53	Average
2725.400	49.80	1.78	51.58	74.00	-22.42	Peak
4542.350	—	—	44.73	54.00	-9.27	Average
4542.350	45.57	7.27	52.84	74.00	-21.16	Peak
5450.500	—	—	48.21	54.00	-5.79	Average
5450.500	46.57	9.75	56.32	74.00	-17.68	Peak
6358.740	—	—	51.66	54.00	-2.34	Average
6358.740	46.96	12.81	59.77	74.00	-14.23	Peak
7266.970	—	—	49.06	54.00	-4.94	Average
7266.970	39.81	17.36	57.17	74.00	-16.83	Peak
8175.820	—	—	50.58	54.00	-3.42	Average
8175.820	39.06	19.64	58.70	74.00	-15.30	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 908.42MHz

Test Date: 2024/02/16

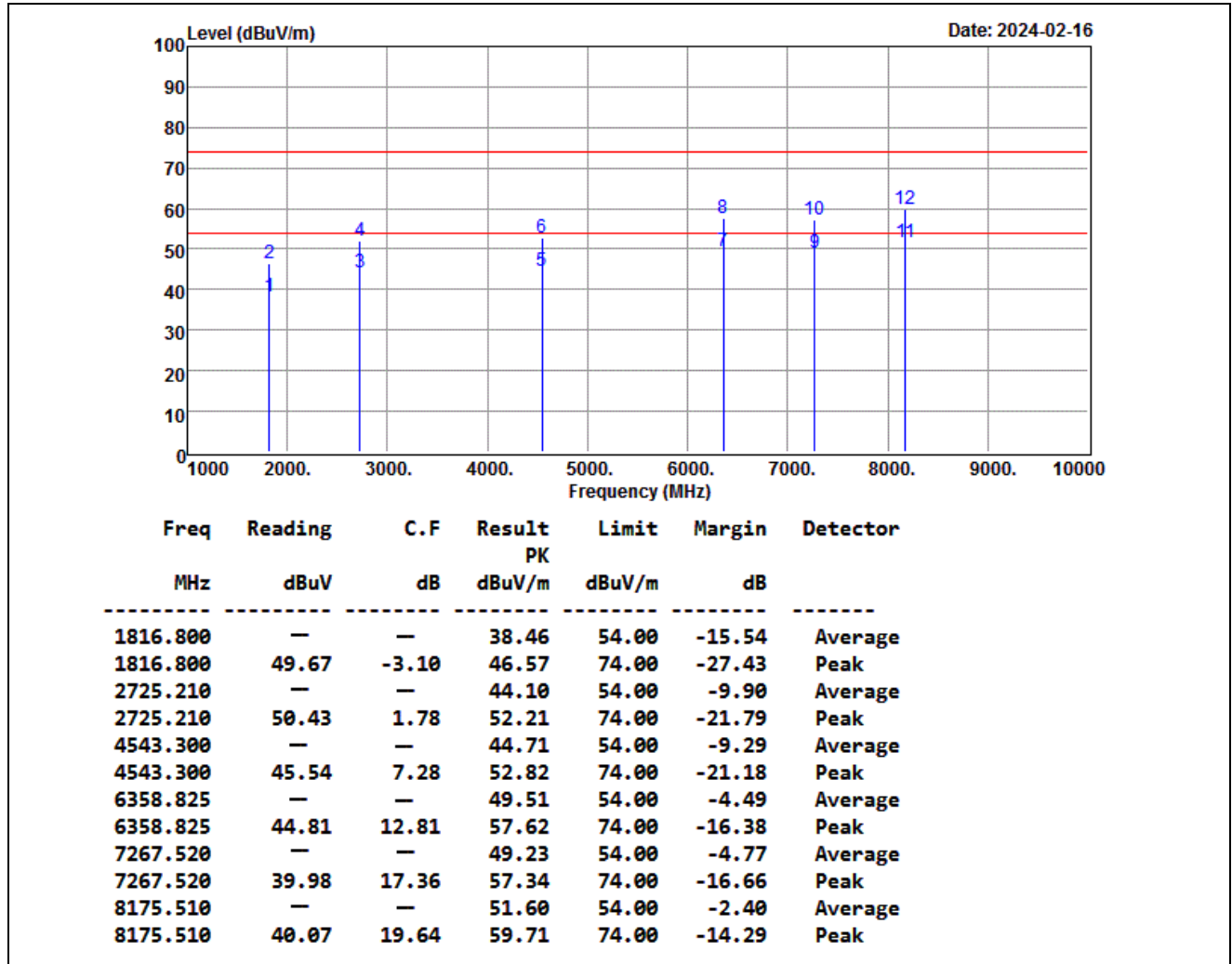
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Hor.

Horizontal



Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 916MHz

Test Date: 2024/02/16

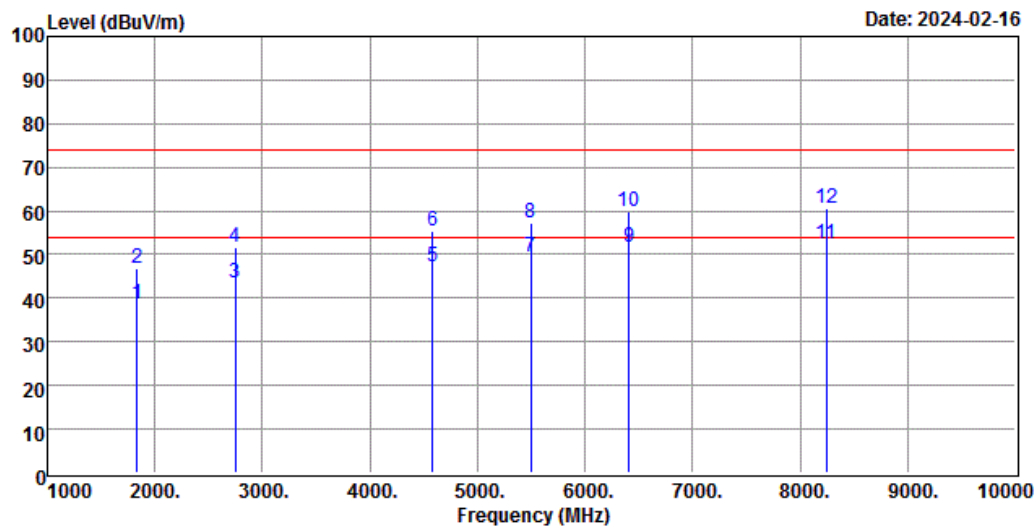
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Ver.

Vertical



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1831.900	—	—	38.78	54.00	-15.22	Average
1831.900	49.82	-2.93	46.89	74.00	-27.11	Peak
2748.040	—	—	43.40	54.00	-10.60	Average
2748.040	49.58	1.93	51.51	74.00	-22.49	Peak
4580.010	—	—	47.23	54.00	-6.77	Average
4580.010	47.94	7.40	55.34	74.00	-18.66	Peak
5496.080	—	—	49.32	54.00	-4.68	Average
5496.080	47.53	9.90	57.43	74.00	-16.57	Peak
6411.865	—	—	51.65	54.00	-2.35	Average
6411.865	46.59	13.17	59.76	74.00	-14.24	Peak
8244.370	—	—	52.51	54.00	-1.49	Average
8244.370	41.04	19.58	60.62	74.00	-13.38	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

Operation Mode: TX 916MHz

Test Date: 2024/02/16

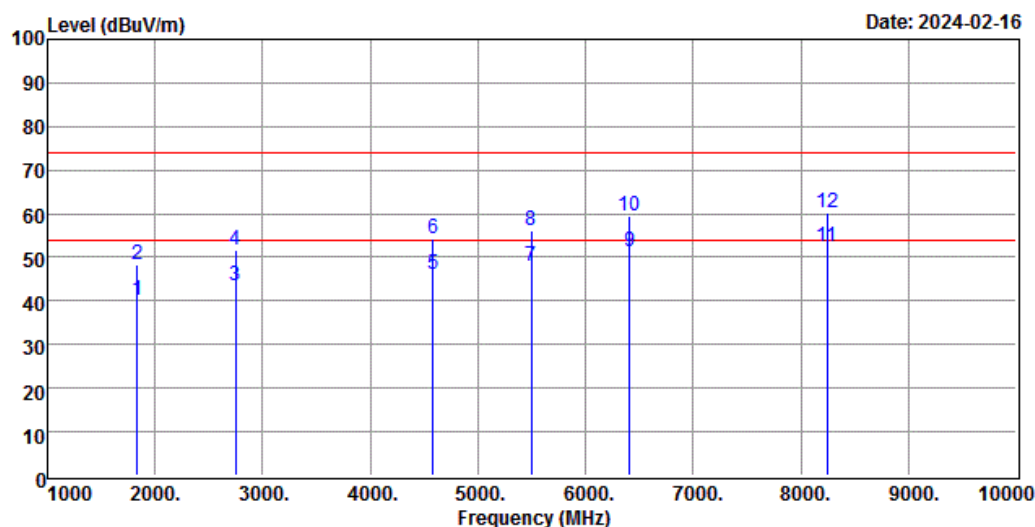
Temperature: 24.3°C

Tested by: Peter Chu

Humidity: 52% RH

Polarity: Hor.

Horizontal



Freq	Reading	C.F	Result	Limit	Margin	Detector
MHz	dBuV	dB	PK dBuV/m	dBuV/m	dB	
1831.830	—	—	40.08	54.00	-13.92	Average
1831.830	51.12	-2.93	48.19	74.00	-25.81	Peak
2747.955	—	—	43.65	54.00	-10.35	Average
2747.955	49.83	1.93	51.76	74.00	-22.24	Peak
4580.090	—	—	46.07	54.00	-7.93	Average
4580.090	46.78	7.40	54.18	74.00	-19.82	Peak
5496.190	—	—	48.06	54.00	-5.94	Average
5496.190	46.27	9.90	56.17	74.00	-17.83	Peak
6412.235	—	—	51.19	54.00	-2.81	Average
6412.235	46.13	13.17	59.30	74.00	-14.70	Peak
8244.110	—	—	52.29	54.00	-1.71	Average
8244.110	40.82	19.58	60.40	74.00	-13.60	Peak

Remark:

- 1.C.F=Antenna Factor+Cable Loss-Preamplifier gain+high pass 1G Filter Insertion Loss
- 2.Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz
- 3.The result basic equation calculation is as follow:
Result = Reading + C.F, Margin = Result-Limit
- 4.The other emission levels were 10dB below the limit
- 5.The test distance is 3m.
- 6.Average Result=Peak Result + Duty factor

7.4 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

Conducted Emission room #1					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
Test S/W	-				

Remark: Each piece of equipment is scheduled for calibration once a year.

TEST RESULTS

✘ This EUT is not connected to AC Source directly. No applicability for this test.

===End of Test Report===