

TEST REPORT

**CTK Co., Ltd.**

(Ho-dong), 113, Yejik-ro, Cheoin-gu, Yongin-si,
Gyeonggi-do, 17142, Korea
Tel: +82-31-339-9970
Fax: +82-31-624-9501

Report No.:
CTK-2025-03167
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1. Applicant

- Name : MonstaTek llc
- Address : 99 SOUTH ALMADEN BLVD 600 San Jose US 95113 United States Of America
(Excluding The States Of Alaska)
- Date of Receipt : 2025-10-17

2. Manufacturer

- Name : WILLTRONICS CO.,LTD
- Address : 26L, 601B, Banwolkongdan, 5 Neunggil-ro 115beon-gil, Danwon-gu, Ansan-si,
Gyeonggi-do, 15420, Republic of Korea

3. Use of Report : For FCC Certification, For ISED Certification

4. Test Sample / Model : MonstaTek M1 / M1

5. Date of Test : 2025-11-03 to 2025-11-13

6. Test Standard(method) used : FCC 47 CFR part 15 subpart C 15.231

RSS-Gen Issue 5, RSS-210 Issue 11

7. Testing Environment : refer to 7 page

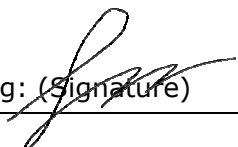
8. Test Results : Compliance

9. Location of Test : ☒ Permanent Testing Lab ☐ On Site Testing

(Address : (Unhak-Dong) 5, Dongbu-ro 221beon-gil, Cheoin-gu, Yongin-si,
Gyeonggi-do, Korea)

The results shown in this test report refer only to the sample(s) tested unless otherwise stated.

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Approval	Tested by  Su-Jun Hwang: (Signature)	Technical Manager  Ji-Hye, Kim: (Signature)
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2025-11-13

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REPORT REVISION HISTORY

Date	Revision	Page No
2025-11-13	Issued (CTK-2025-03167)	All

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1. General Product Description

1.1 Applicant Information

Company	MonstaTek llc
Contact Point	99 SOUTH ALMADEN BLVD 600 San Jose US 95113 United States Of America (Excluding The States Of Alaska)
Contact Person	Name : Ken Wang E-mail : info@monstatek.com Tel : +1-650-713-1559

1.2 Product Information

FCC ID	2BSWU-M1
IC	34778-M1
Product Description	MonstaTek M1
Model name(HVIN)	M1
Variant Model name	-
FVIN	1.0.0.0
Operating Frequency Range	304.50 MHz – 321.95 MHz, 433.075 MHz – 434.775 MHz, 915.0 MHz – 927.95 MHz
Number of Channel	refer to 5 page(Channel List)
Type of Modulation	F1D
RF Output Power	75.20 dBuV/m @ 3 m_Peak
Antenna Type	Helical antenna(Spring Antenna)
Power Source	DC 3.7 V(Lithium Battery)

1.3 Antenna Information

☒	Integral antenna (antenna permanently attached)
☐	Temporary RF connector provided
☒	No temporary RF connector provided Transmit chains bypass antenna and soldered temporary RF connector provided for connected measurement. In case of conducted measurements the transmitter shall be connected to the measuring equipment via a suitable attenuator and correct for all losses in the RF path.
☐	External antenna (dedicated antennas)

1.4 Model Differences

Not applicable

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1.5 Cahnnel List and RF Power setting in Test SW

Channel List					
Range : 304.5 MHz – 321.95 MHz		Range : 433.075 MHz – 434.775 MHz		Range : 915.0 MHz – 927.95 MHz	
Channel Number	Frequency(MHz)	Channel Number	Frequency(MHz)	Channel Number	Frequency(MHz)
1	304.500	1	433.075	1	915.000
2	304.525	2	433.100	2	915.025
3	304.550	3	433.125	3	915.050
4	304.575	4	433.150	4	915.075
5	304.600	5	433.175	5	915.100
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
351	313.250	31	433.825	261	926.500
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
-	-	-	-	-	-
700	321.925	68	434.750	520	927.925
701	321.950	69	434.775	521	927.950

RF Power setting in Test SW		
Range : 304.5 MHz – 321.95 MHz	Range : 433.075 MHz – 434.775 MHz	Range : 915.0 MHz – 927.95 MHz
Power Setting Value : 7	Power Setting Value : 7	Power Setting Value : 17

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2. Accreditations

2.1 Laboratory Accreditations and Listings

Country	Agency	Registration Number
USA	FCC	805871
CANADA	ISED	CN : 8737A CAB ID : KR0025
KOREA	NRRA	KR0025

2.2 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

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3. Test Specifications

3.1 Standards

FCC Part Section(s)	RSS Section(s)	Requirement(s)	Status (Note 1)	Report Clause
15.203	RSS-Gen 6.8	Antenna Requirement	C	1.3
15.231(c)	RSS-210 Annex A.1.4	Bandwidth	C	4.1
15.231(b)	RSS-210 Annex A.1.3	Field strength emissions	C	4.2
15.231(a)	RSS-210 Annex A.1.2(a)	Release Time	C	4.3
15.207	RSS-Gen 8.8	AC Power line Conducted Emissions	C	4.4

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

Note 3: The sample was tested according to the following specification: ANSI C63.10-2020.

3.2 Testing Environment

Test Item		Test Date	Temperature (± 1 °C)	Relative Humidity (± 3 % R.H.)
Bandwidth		2025-11-11	21	40
Release Time		2025-11-13	22	37
Transmitter emission (Radiated)	1) 9 kHz to 30 MHz	2024-11-03	22	58
	2) 30 MHz to 1 GHz	2024-11-03	22	58
AC Power line Conducted Emissions		2025-11-04	24	59



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3.3 Mode of operation during the test

The EUT is operated in a manner representative of the typical of the equipments.

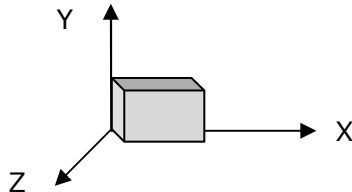
During at testing, system components were manipulated within the confines of typical usage to maximize each emission.

The modulation status for all tests was as shown in the table below.

Test Mode & Worst Case

Test Items	Test Mode	Test Frequency
AC Power line Conducted Emissions	Continuously Transmitting	434.775(Worst Case)
Radiated Emission	Continuously Transmitting	304.5 MHz, 313.25 MHz, 321.95MHz 433.075 MHz, 433.825 MHz, 434.775 MHz 915.0 MHz, 926.5 MHz, 927.95MHz
Bandwidth	Continuously Transmitting	304.5 MHz, 313.25 MHz, 321.95MHz 433.075 MHz, 433.825 MHz, 434.775 MHz 915.0 MHz, 926.5 MHz, 927.95MHz
Release Time	Normal Mode	304.5 MHz, 313.25 MHz, 321.95MHz 433.075 MHz, 433.825 MHz, 434.775 MHz 915.0 MHz, 926.5 MHz, 927.95MHz

The Worst Case Measurement Configuration & Duty Cycle

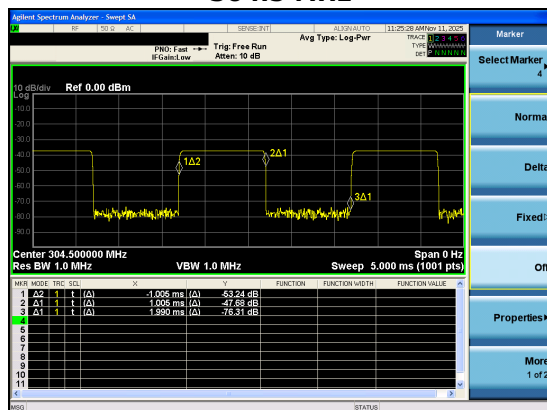
Tests Item	Transmitter Radiated Emissions, Emission Bandwidth
Condition	Radiated measurement
User Position	☐ EUT will be placed in fixed position. ☐ EUT will be placed in mobile position and operating multiple positions. ☒ EUT will be a hand-held or body-worn battery-powered devices and operating multiple positions.
Operating Mode	DC 3.7 V(Lithium Battery)
EUT faces identified relative to view from receiving antenna	

Test mode(Worst Case)	Duty Cycle	Duty Cycle Factor
304.5 MHz	0.505 0	2.97
433.825 MHz	0.507 5	2.95
915.0 MHz	0.506 3	2.96

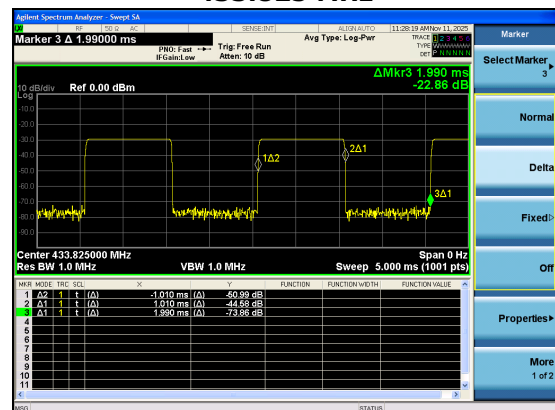
* Duty Cycle : Total time / On Time

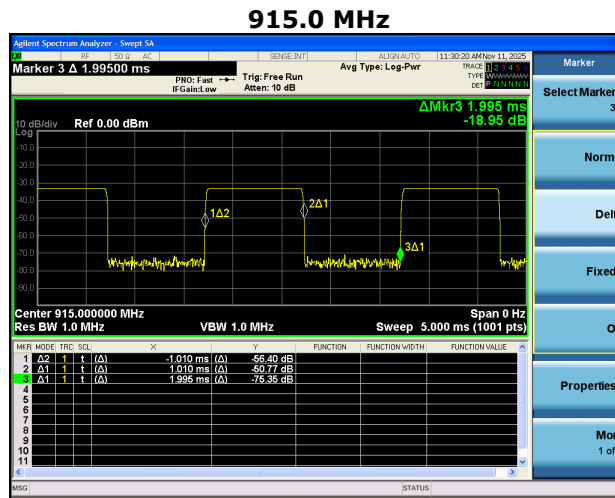
* Duty Cycle Factor : $10\log(1/\text{Duty Cycle})$

304.5 MHz



433.825 MHz





3.4 Peripheral Devices

Not applicable

3.5 Measurement Uncertainty

The value of the measurement uncertainty for the measurement of each parameter.
Coverage factor $k = 2$, Confidence levels of 95 %

Test Item	Uncertainty
Occupied Bandwidth	0.1 MHz (C.L. : Approx. 95%, $k = 2$)
Radiated emissions	4.11 dB(C.L. : Approx. 95%, $k = 2$)
Line Conducted emissions	2.06 dB(C.L. : Approx. 95%, $k = 2$)

3.6 Test Software

Automation program

Conducted Test	-
Radiated Test	EP5RE Ver. 6.0.10, ES10 Ver. 2022.04.000
Line Conducted Test	EMC32 Ver. 10.50.00

Test program

-

4. Technical Characteristic Test

4.1 Bandwidth

Requirement

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.

Test Procedures

For the bandwidth refer ANSI C63.10-2020_clause 6.9(Occupied bandwidth),
 RSS-Gen_Section 6.7

Test Setup



Test results

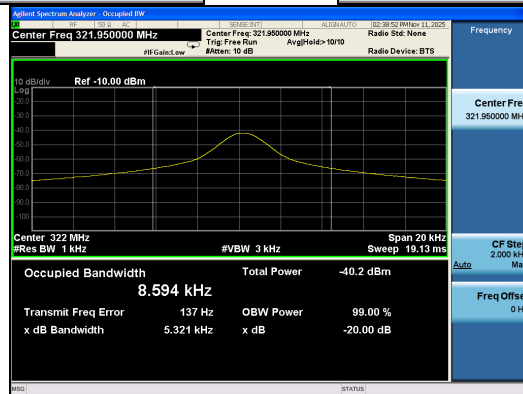
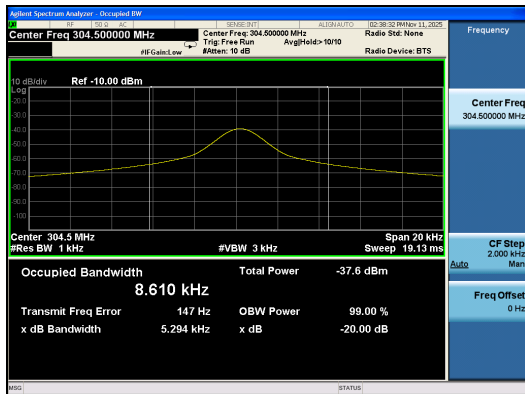
Frequency(MHz)	20 dB Bandwidth(kHz)	99% OBW(kHz)	Limit(kHz)	Result
304.500	5.29	8.61	761.25	PASS
313.250	5.28	8.60	783.13	
321.950	5.32	8.59	804.88	
433.075	5.32	8.63	1082.69	
433.825	5.35	8.63	1084.56	
434.775	5.32	8.62	1086.94	
915.000	5.36	8.76	4575.00	
926.500	5.41	8.79	4632.50	
927.950	5.08	8.70	4639.75	



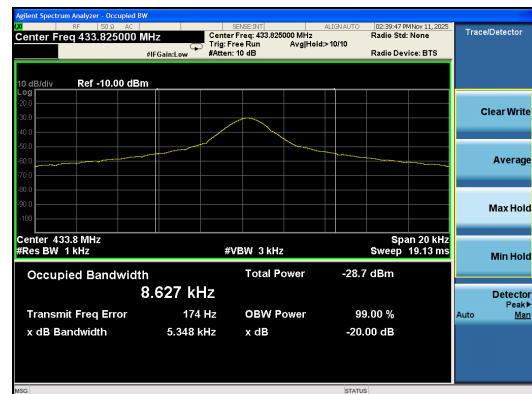
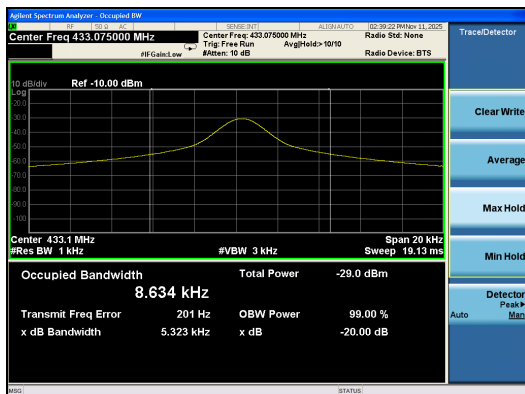
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300 MHz Band

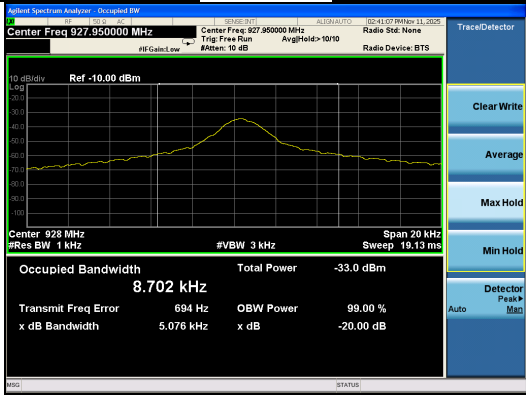
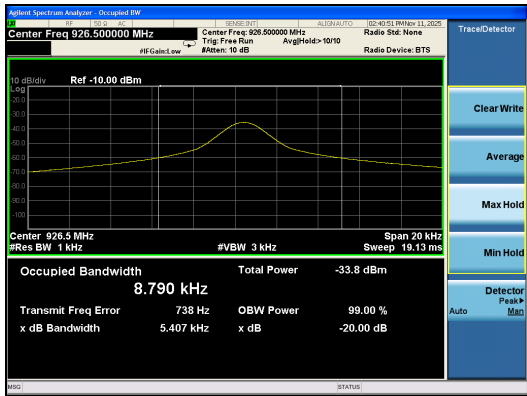
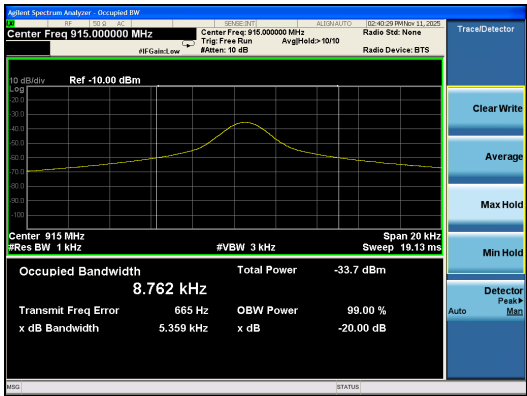


400 MHz Band



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900 MHz Band

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4.2 Field strength emissions

Test Location

- ☒ 10 m SAC (test distance : ☐ 10 m, ☒ 3 m)
☒ 3 m SAC (test distance : 3 m)

Requirement

In addition to the provisions of § 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following:

Fundamental frequency (MHz)	Field strength of fundamental (microvolts/meter)	Field strength of spurious emissions (microvolts/meter)
40.66 - 40.70	2,250	225
70 - 130	1,250	125
130 - 174	¹ 1,250 to 3,750	¹ 125 to 375
174 - 260	3,750	375
260 - 470	¹ 3,750 to 12,500	¹ 375 to 1,250
Adobe 470	12,500	1,250

¹ **Linear interpolations.**

The maximum permitted unwanted emissions level is 20 dB below the maximum permitted fundamental level. In addition field strength of any emissions which appear inside of the restriction band shall not exceed the general radiated emissions limits in FCC Part15.209

Fundamental frequency (MHz)	Field strength of fundamental (dBuV/m)
304.50	74.97
313.25	75.53
321.95	76.02
433.075	80.80
433.825	80.80
434.875	80.86
Adobe 470	81.94

As shown in the table above, the worst value in each band was used and compared with the measured value.

The above field strength limits are specified at a distance of 3 meters. The tighter limits apply at the band edges.

Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emissions, as shown in the above table, based on the average value of the measured emissions. As an alternative, compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector. The specific method of measurement employed shall be specified in the application for equipment authorization. If average emission measurements are employed, the provisions in § 15.35 for averaging pulsed emissions and for limiting peak emissions apply. Further, compliance with the provisions of § 15.205 shall be demonstrated using the measurement instrumentation specified in that section.

The limits on the field strength of the spurious emissions in the above table are based on the fundamental frequency of the intentional radiator. Spurious emissions 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.

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The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency(MHz)	Field Strength uV/m	Field Strength dBuV/m	Measurement Distance (meters)
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	30	29.5	30
30-88	100**	40	3
88-216	150**	43.5	3
216-960	200**	46	3
Above 960	500	54	3

** Except as provided in 15.209(g).fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72MHz, 76-88MHz, 174-216MHz, 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g.15.231 and 15.241.

Note :

- 1) For above 1 GHz, the emission limit in this paragraph is based on measurement instrumentation employing an average detector, measurement using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit.
- 2) For above 1 GHz, limit field strength of harmonics : 54 dBuV/m@3m (AV) and 74 dBuV/m@3m (PK)

Test Method	
☒	In the frequency range of 9 kHz to 30 MHz, magnetic field is measured with Loop Antenna. The Test Antenna is positioned with its plane vertical at 1m distance from the EUT. The center of the Loop Test Antenna is 1m above the ground. During the measurement the Loop Test Antenna rotates about its vertical axis for maximum response at each azimuth about the EUT.
☒	In the frequency range above 30 MHz, Bi-Log Test Antenna(30 MHz to 1 GHz) and Horn Test Antenna(above 1 GHz) are used. Test Antenna is 3m away from the EUT. Test Antenna height is carried from 1m to 4m above the ground to determine the maximum value of the field strength. The emissions levels at both horizontal and vertical polarizations should be tested.
☒	Emissions more than 20 dB below the limit do not need to be reported.

Measuring instrument Settings	
Frequency Range	9 kHz – 1 000 MHz
RBW	200 Hz (9 kHz – 150 kHz) 9 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1 000 MHz)
VBW	≥ RBW
Sweep time	auto couple
Detector function	CISPR quasi-peak(below 1 000 MHz)



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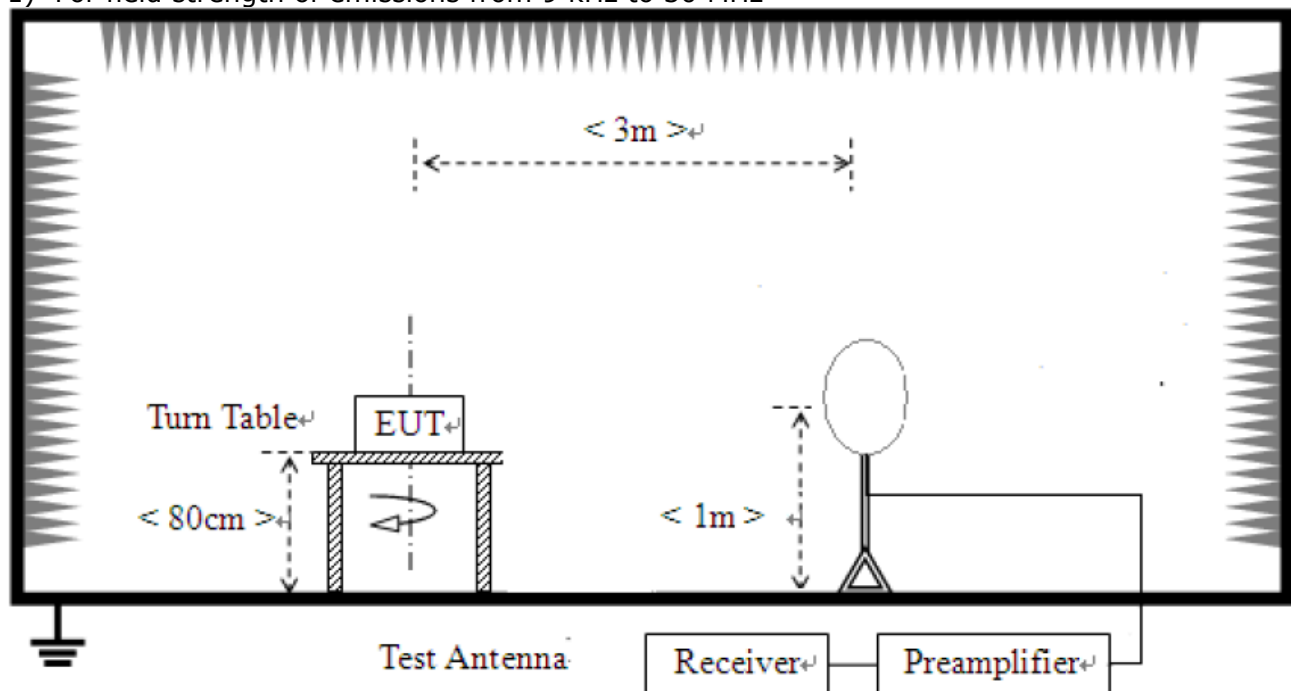
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Measuring instrument Settings

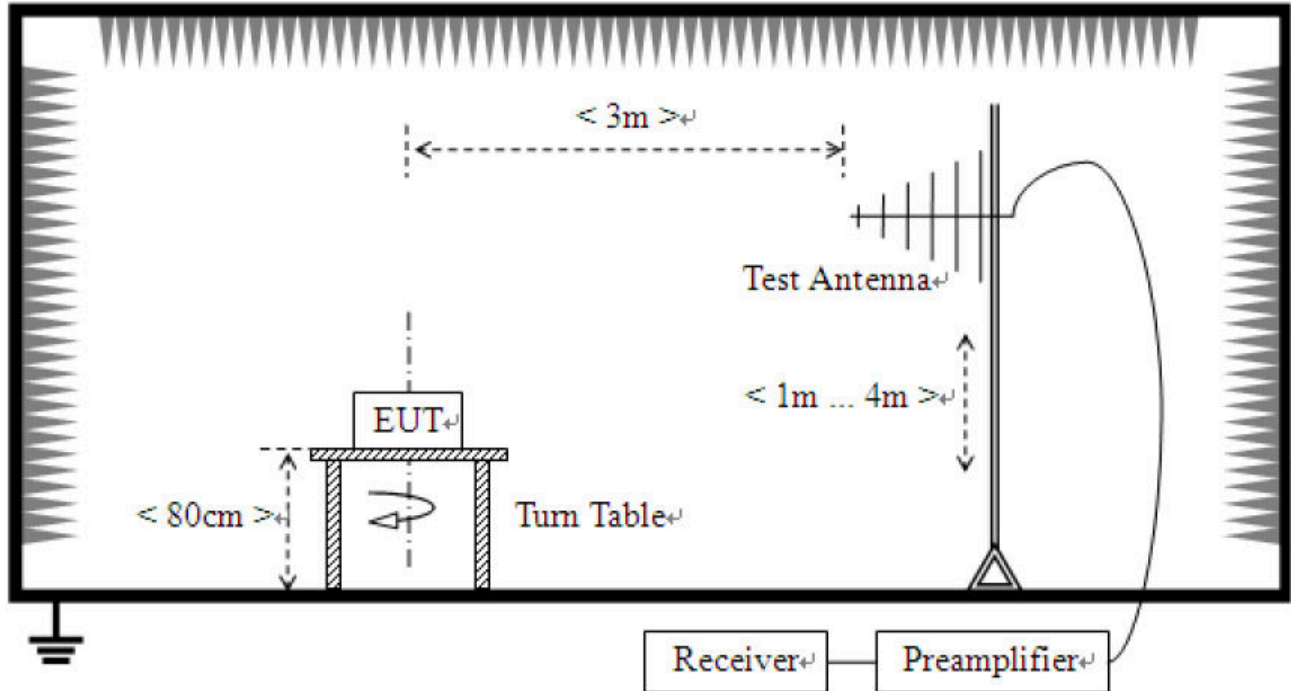
Frequency Range	1 GHz – 10 GHz
RBW	1 MHz
VBW	3 x RBW
Sweep time	auto couple
Detector function	Peak_Peak Averager_RMS
Trace Mode	Peak_Max Hold Average_Average(at least 100 traces)

Test Setup

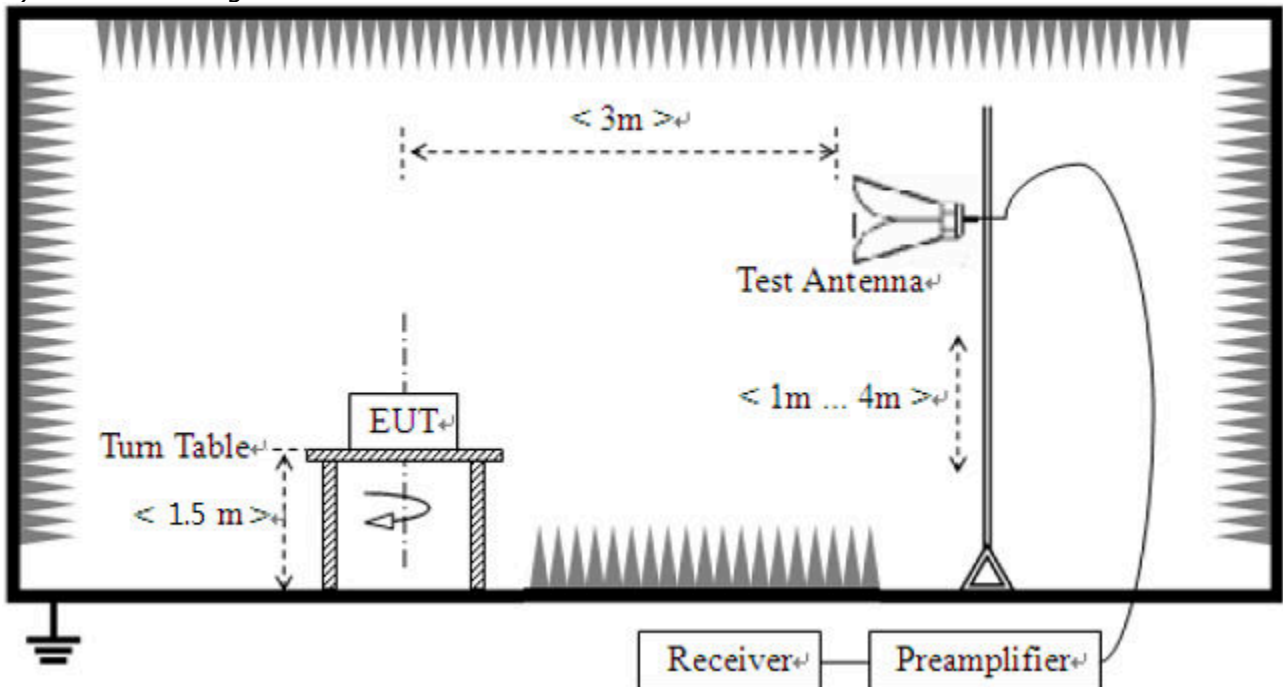
- 1) For field strength of emissions from 9 kHz to 30 MHz



2) For field strength of emissions from 30 MHz to 1 GHz



3) For field strength of emissions above 1 GHz





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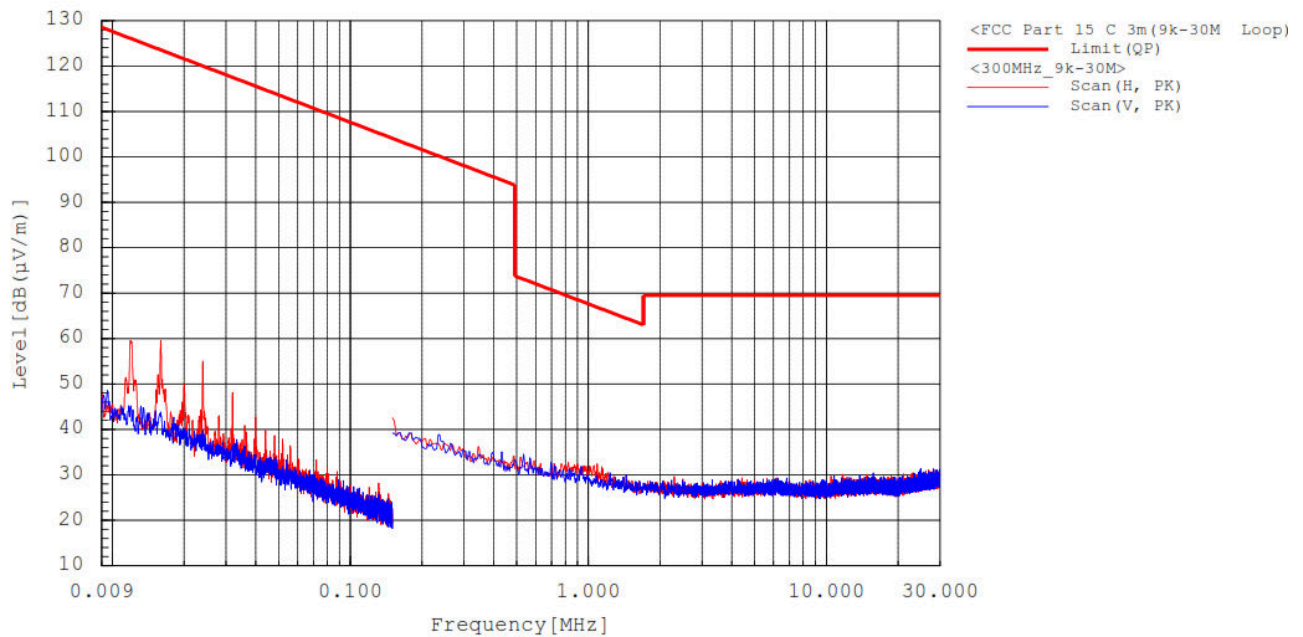
Test results

1) 9 kHz to 30 MHz

Test mode : Transmitter (Worst Case_304.5MHz)

The requirements are:

☒ Complies



Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Level [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]
-----------------	-----	----------------	---------------	------------------	------------------	-------------

The emissions 9 kHz to 30 MHz were 20 dB lower than the limit.

Remark :

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Y axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator
4. This data is the Peak(PK) value.



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2) Radiated emissions in the range of 30 MHz to 1 000 MHz band

The requirements are:

☒ Complies

304.5 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
340.510	H	72.10	-9.50	62.60	74.97	12.37	fundamental
211.972	V	42.20	-14.40	27.80	43.50	15.70	
238.453	V	35.80	-11.80	24.00	46.00	22.00	
317.993	V	33.80	-9.20	24.60	46.00	21.40	
397.533	V	49.20	-6.60	42.60	46.00	3.40	
913.573	H	44.30	4.10	48.40	54.97	6.57	
913.573	V	33.30	4.10	37.40	54.97	17.57	

313.25 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
313.240	H	72.90	-9.10	63.80	74.97	11.17	fundamental
59.231	V	41.00	-18.40	22.60	40.00	17.40	
211.972	V	42.30	-14.40	27.90	43.50	15.60	
238.453	H	35.90	-11.80	24.10	46.00	21.90	
397.533	V	49.30	-6.60	42.70	46.00	3.30	
939.860	H	39.60	-5.50	45.10	54.97	9.87	
939.860	V	30.00	-5.50	35.50	54.97	19.47	

321.95 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
321.970	H	73.70	-9.10	64.60	74.97	10.37	fundamental
211.972	V	42.70	-14.40	28.30	43.50	15.20	
238.453	V	35.60	-11.80	23.80	46.00	22.20	
397.533	H	42.70	-6.60	36.10	46.00	9.90	
397.533	V	49.20	-6.60	42.60	46.00	3.40	
965.953	V	36.00	6.60	42.60	54.97	12.37	
965.953	H	30.00	6.60	36.60	54.97	18.37	

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433.075 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
433.035	H	79.90	-5.00	74.90	80.80	5.90	fundamental
211.972	V	41.90	-14.40	27.50	43.50	16.00	
238.453	H	37.10	-11.80	25.30	46.00	20.70	
317.993	V	33.00	-9.20	23.80	46.00	22.20	
397.533	V	49.30	-6.60	42.70	46.00	3.30	
866.237	H	39.60	3.80	43.40	60.80	17.40	
866.237	V	30.80	3.80	34.60	60.80	26.20	

433.825 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
433.811	H	80.00	-5.00	75.00	80.80	5.80	fundamental
59.973	V	39.20	-18.40	20.80	43.50	22.70	
211.972	V	42.10	-14.40	27.70	46.00	18.30	
317.993	V	33.30	-9.20	24.10	46.00	21.90	
397.533	V	49.30	-6.60	42.70	46.00	3.30	
867.692	H	39.80	3.80	43.60	60.80	17.20	
867.692	V	31.60	3.80	35.40	60.80	25.40	

434.875 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
434.781	H	80.30	-5.10	75.20	80.80	5.60	fundamental
211.972	V	42.40	-14.40	28.00	43.50	15.50	
238.453	H	35.70	-11.80	23.90	46.00	22.10	
317.993	V	32.90	-9.20	23.70	46.00	22.30	
397.533	V	49.40	-6.60	42.80	46.00	3.20	
869.632	H	40.00	3.80	43.80	60.80	17.00	
869.632	V	31.00	3.80	34.80	60.80	26.00	

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915.0 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
915.028	H	67.90	4.30	72.20	81.94	9.74	fundamental
59.391	V	41.90	-18.40	23.50	40.00	16.50	
211.972	V	42.20	-14.40	27.80	43.50	15.70	
238.453	H	36.20	-11.80	24.40	46.00	21.60	
317.993	V	33.50	-9.20	24.30	46.00	21.70	
397.533	H	42.90	-6.60	36.30	46.00	9.70	
397.533	V	49.40	-6.60	42.80	46.00	3.20	

926.50 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
926.571	H	66.90	4.80	71.70	81.94	10.24	fundamental
59.391	V	40.10	-18.40	21.70	40.00	18.30	
211.972	V	42.60	-14.40	28.20	43.50	15.30	
238.453	V	35.60	-11.80	23.80	46.00	22.20	
286.177	V	30.50	-9.70	20.80	46.00	25.20	
317.993	V	33.40	-9.20	24.20	46.00	21.80	
397.533	V	49.60	-6.60	43.00	46.00	3.00	

927.95 MHz

Frequency [MHz]	(P)	Reading [dB(uV/m)]	c.f [dB(1/m)]	Result [dB(uV/m)]	Limit [dB(uV/m)]	Margin [dB]	Note
928.026	H	66.80	4.80	71.60	81.94	10.34	
211.972	V	43.10	-14.40	28.70	43.50	14.80	
238.453	H	35.90	-11.80	24.10	46.00	21.90	
317.993	V	33.30	-9.20	24.10	46.00	21.90	
397.533	H	42.60	-6.60	36.00	46.00	10.00	
397.533	V	49.20	-6.60	42.60	46.00	3.40	
556.516	V	30.90	-1.30	29.60	46.00	16.40	

Remark :

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(Y axis) and the worst case was recorded.
2. Result = Reading + c.f(Correction factor)
3. Correction factor = Antenna factor + Cable loss + 6 dB attenuator - Amp Gain
4. The test result in peak detector is less than quasi-peak(average) limit.
5. The fundamental is to compare the values among Horizontal and Vertical and apply the higher value.

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3) above 1 GHz

The requirements are:

☒ Complies

304.50 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 218.209	H	51.30	-9.60	-----	41.70	-----	74.00	-----	32.30	-----	Peak
1 218.009	H	45.30	-9.60	2.97	-----	38.67	-----	54.00	-----	15.33	Average
3 044.882	V	48.50	-1.70	-----	46.80	-----	74.00	-----	27.20	-----	Peak
3 045.082	H	39.10	-1.70	2.97	-----	40.37	-----	54.00	-----	13.63	Average
3 654.106	H	49.60	0.10	-----	49.70	-----	74.00	-----	24.30	-----	Peak
3 654.106	V	42.50	0.10	2.97	-----	45.57	-----	54.00	-----	8.43	Average
3 958.518	H	48.00	1.50	-----	49.50	-----	74.00	-----	24.50	-----	Peak
3 958.718	H	38.20	1.50	2.97	-----	42.67	-----	54.00	-----	11.33	Average
4 263.130	H	49.30	2.20	-----	51.50	-----	74.00	-----	22.50	-----	Peak
4 263.130	H	40.70	2.20	2.97	-----	45.87	-----	54.00	-----	8.13	Average

313.25 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 252.810	H	57.40	-9.50	-----	47.90	-----	74.00	-----	26.10	-----	Peak
1 253.010	H	53.60	-9.50	2.97	-----	47.07	-----	54.00	-----	6.93	Average
3 132.485	H	49.60	-1.50	-----	48.10	-----	74.00	-----	25.90	-----	Peak
3 132.485	V	42.00	-1.50	2.97	-----	43.47	-----	54.00	-----	10.53	Average
3 758.910	V	49.60	0.70	-----	50.30	-----	74.00	-----	23.70	-----	Peak
3 759.310	V	41.80	0.70	2.97	-----	45.47	-----	54.00	-----	8.53	Average
4 385.536	V	47.70	2.00	-----	49.70	-----	74.00	-----	24.30	-----	Peak
4 385.735	H	38.20	2.00	2.97	-----	43.17	-----	54.00	-----	10.83	Average

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321.95 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 287.812	H	50.70	-9.30	-----	41.40	-----	74.00	-----	32.60	-----	Peak
1 287.812	H	39.90	-9.30	2.97	-----	33.57	-----	54.00	-----	20.43	Average
2 253.850	V	48.70	-4.80	-----	43.90	-----	74.00	-----	30.10	-----	Peak
2 253.650	V	38.70	-4.80	2.97	-----	36.87	-----	54.00	-----	17.13	Average
3 219.489	V	49.90	-1.20	-----	48.70	-----	74.00	-----	25.30	-----	Peak
3 219.489	V	38.50	-1.20	2.97	-----	40.27	-----	54.00	-----	13.73	Average
3 863.715	H	48.90	1.20	-----	50.10	-----	74.00	-----	23.90	-----	Peak
3 863.715	H	38.20	1.20	2.97	-----	42.37	-----	54.00	-----	11.63	Average

433.075 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 299.212	H	62.50	-9.20	-----	53.30	-----	74.00	-----	20.70	-----	Peak
1 299.212	H	47.40	-9.20	2.95	-----	41.15	-----	54.00	-----	12.85	Average
3 031.481	H	50.90	-1.90	-----	49.00	-----	74.00	-----	25.00	-----	Peak
3 031.481	H	39.80	-1.90	2.95	-----	40.85	-----	54.00	-----	13.15	Average
3 464.698	H	51.30	-0.40	-----	50.90	-----	74.00	-----	23.10	-----	Peak
3 464.698	H	41.60	-0.40	2.95	-----	44.15	-----	54.00	-----	9.85	Average

433.825 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 301.612	H	61.90	-9.10	-----	52.80	-----	74.00	-----	21.20	-----	Peak
1 301.412	H	48.40	-9.10	2.95	-----	42.25	-----	54.00	-----	11.75	Average
2 168.847	H	49.40	-4.20	-----	45.20	-----	74.00	-----	28.80	-----	Peak
2 169.247	H	38.70	-4.20	2.95	-----	37.45	-----	54.00	-----	16.55	Average
3 036.882	H	50.40	-1.80	-----	48.60	-----	74.00	-----	25.40	-----	Peak
3 036.681	H	39.30	-1.80	2.95	-----	40.45	-----	54.00	-----	13.55	Average
3 470.699	H	52.50	-0.40	-----	52.10	-----	74.00	-----	21.90	-----	Peak
3 470.699	H	41.50	-0.40	2.95	-----	44.05	-----	54.00	-----	9.95	Average

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434.875 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
1 304.612	H	62.00	-9.10	-----	52.90	-----	74.00	-----	21.10	-----	Peak
1 304.212	H	47.20	-9.10	2.95	-----	41.05	-----	54.00	-----	12.95	Average
2 173.647	H	49.40	-4.30	-----	45.10	-----	74.00	-----	28.90	-----	Peak
2 173.847	H	39.50	-4.30	2.95	-----	38.15	-----	54.00	-----	15.85	Average
3 043.482	H	50.10	-1.80	-----	48.30	-----	74.00	-----	25.70	-----	Peak
3 043.482	H	40.60	-1.80	2.95	-----	41.75	-----	54.00	-----	12.25	Average
3 478.499	H	51.80	-0.40	-----	51.40	-----	74.00	-----	22.60	-----	Peak
3 478.299	H	42.30	-0.40	2.95	-----	44.85	-----	54.00	-----	9.15	Average

915.0 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
2 744.990	H	51.80	-2.90	-----	48.90	-----	74.00	-----	25.10	-----	Peak
2 744.990	H	41.00	-2.90	2.96	-----	41.06	-----	54.00	-----	12.94	Average
3 660.146	H	60.70	0.10	-----	60.80	-----	74.00	-----	13.20	-----	Peak
3 660.146	H	45.00	0.10	2.96	-----	48.06	-----	54.00	-----	5.94	Average
4 575.303	V	53.10	2.60	-----	55.70	-----	74.00	-----	18.30	-----	Peak
4 574.943	V	41.70	2.50	2.96	-----	47.16	-----	54.00	-----	6.84	Average

926.50 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
2 779.551	H	51.8	-2.90	-----	48.90	-----	74.00	-----	25.10	-----	Peak
2 779.911	H	41.0	-2.90	2.96	-----	41.06	-----	54.00	-----	12.94	Average
3 706.228	H	59.4	0.30	-----	59.70	-----	74.00	-----	14.30	-----	Peak
3 706.228	H	44.4	0.30	2.96	-----	47.66	-----	54.00	-----	6.34	Average
4 632.545	V	52.5	2.80	-----	55.30	-----	74.00	-----	18.70	-----	Peak
4 632.545	V	40.2	2.80	2.96	-----	45.96	-----	54.00	-----	8.04	Average

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927.95 MHz

Frequency [MHz]	(P)	Reading [dBuV]	c.f [dB(1/m)]	Duty Cycle Factor[dB]	Level PK [dB(uV/m)]	Level AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin AV [dB]	Note
2 783.871	H	50.90	-2.90	-----	48.00	-----	74.00	-----	26.00	-----	Peak
2 784.231	H	41.60	-2.90	2.96	-----	41.66	-----	54.00	-----	12.34	Average
3 711.989	H	58.20	0.40	-----	58.60	-----	74.00	-----	15.40	-----	Peak
3 711.989	H	43.30	0.40	2.96	-----	46.66	-----	54.00	-----	7.34	Average
4 640.105	V	52.40	2.80	-----	55.20	-----	74.00	-----	18.80	-----	Peak
4 640.105	V	40.60	2.80	2.96	-----	46.36	-----	54.00	-----	7.64	Average

Remarks

1. The unwanted emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in lie-down position(X axis) and the worst case was recorded.
2. Peak Result = Reading + c.f(Correction factor)
Average Result = Reading + c.f(Correction factor) + Duty Cycle Factor
3. Correction factor = Antenna factor + Cable loss - Amp Gain
4. The measurement results were compared to horizontal and vertical values and the higher value was applied.

4.3 Release Time

Requirement

A manually operated transmitter shall employ a switch that will automatically deactivate the transmitter within not more than 5 seconds of being released.

Test Procedures

For the Release Time refer FCC Part 15.231(a), RSS-210(Annex A)

Test Setup



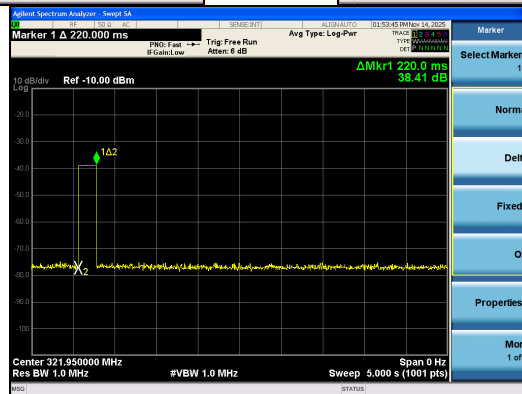
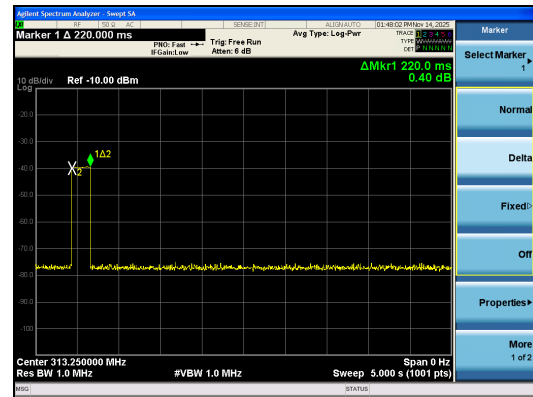
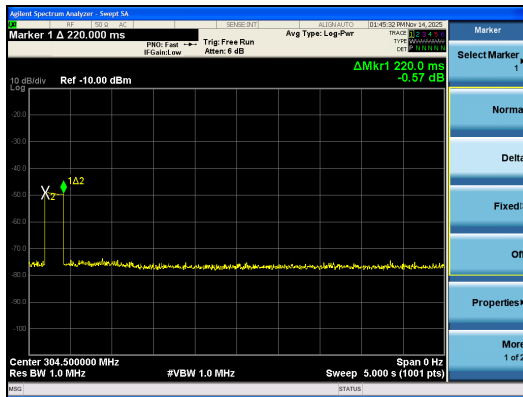
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313.250	0.220		
321.950	0.220		
433.075	0.215		
433.825	0.210		
434.775	0.220		
915.000	0.215		
926.500	0.220		
927.950	0.215		



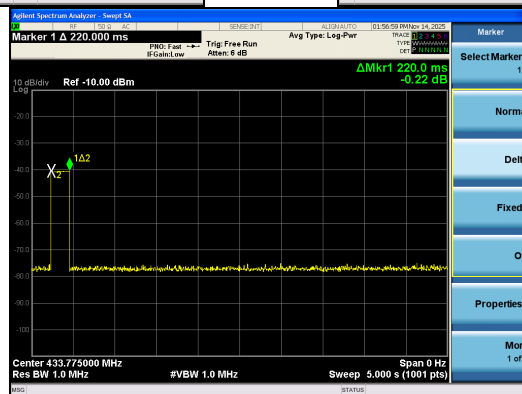
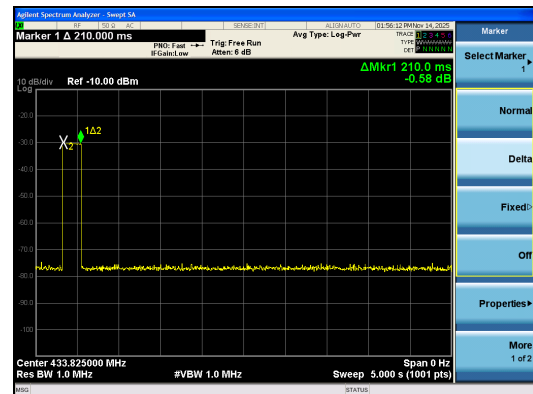
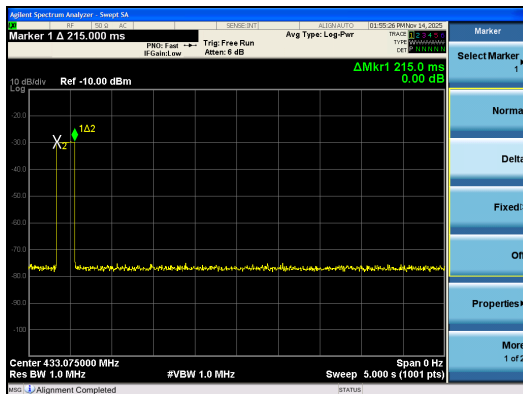
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300 MHz Band



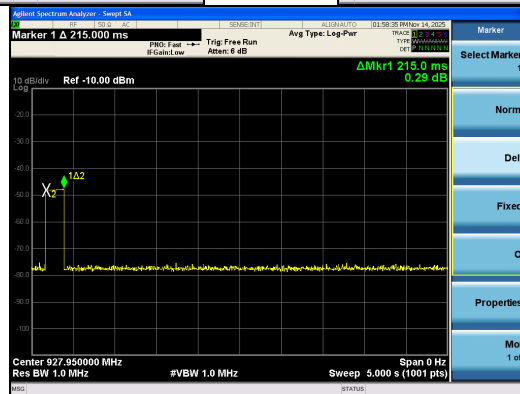
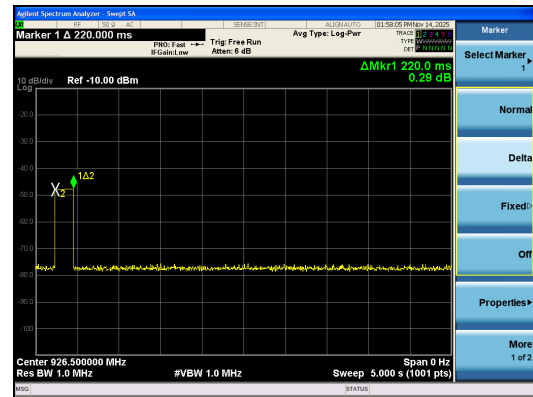
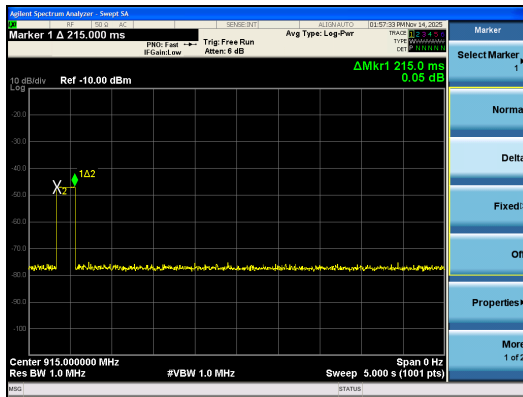
400 MHz Band



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900 MHz Band

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4.4 AC Conducted Emissions

Requirement

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz-30 MHz, shall not exceed the limits.

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

ANSI C63.10-2020 - Section 6.2.2

RSS-Gen – Section 8.8

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average**
0.15 ~ 0.5	66 to 56*	56 to 46*
0.5 ~ 5	56	46
5 ~ 30	60	50

* The level decreases linearly with the logarithm of the frequency.

** A linear average detector is required.

Test Results

The requirements are:

☒ Complies



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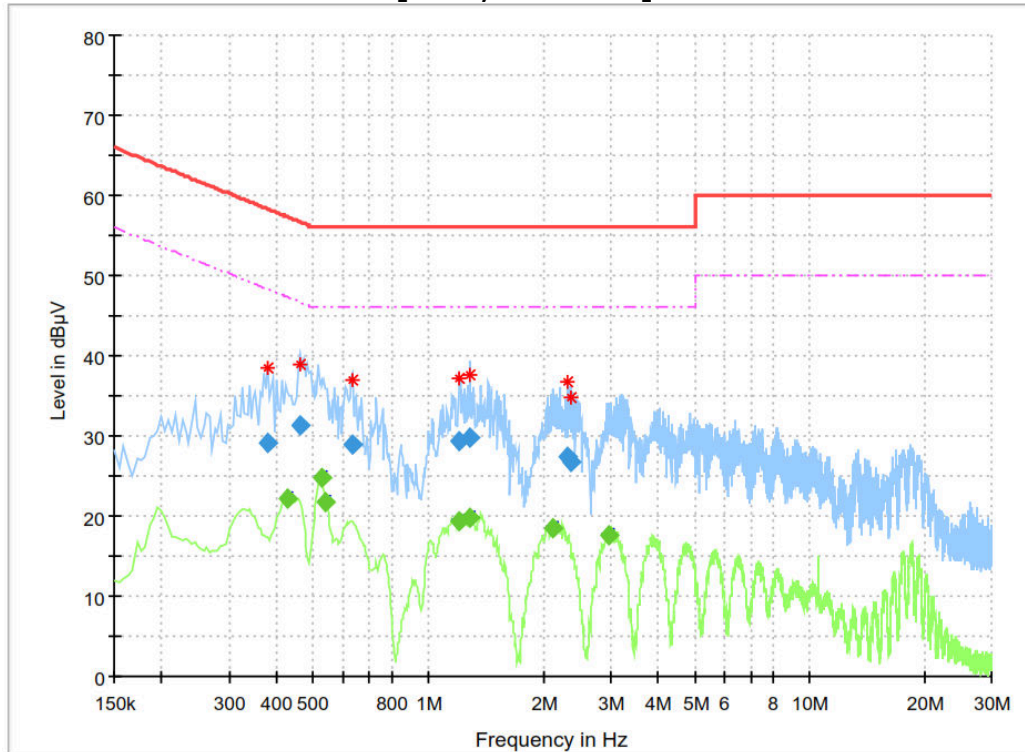
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Test Data

[LINE, NEUTRAL]



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.379500	29.23	---	58.29	29.06	15000.0	9.000	N	ON	9.9
0.429000	---	22.15	47.27	25.12	15000.0	9.000	N	ON	9.9
0.460500	31.26	---	56.68	25.43	15000.0	9.000	N	ON	9.9
0.523500	---	24.69	46.00	21.31	15000.0	9.000	N	ON	10.0
0.537000	---	21.83	46.00	24.17	15000.0	9.000	N	ON	10.0
0.631500	29.00	---	56.00	27.00	15000.0	9.000	N	ON	9.9
1.207500	29.27	---	56.00	26.73	15000.0	9.000	N	ON	9.8
1.207500	---	19.28	46.00	26.72	15000.0	9.000	N	ON	9.8
1.284000	29.79	---	56.00	26.21	15000.0	9.000	N	ON	9.8
1.284000	---	19.82	46.00	26.18	15000.0	9.000	N	ON	9.8
2.125500	---	18.46	46.00	27.54	15000.0	9.000	N	ON	9.7
2.323500	27.40	---	56.00	28.60	15000.0	9.000	N	ON	9.7
2.364000	26.82	---	56.00	29.18	15000.0	9.000	N	ON	9.7
2.985000	---	17.59	46.00	28.41	15000.0	9.000	N	ON	9.7

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Report No.:

CTK-2025-03167

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APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Cal Date	Due Date
1	Signal Analyzer	Agilent	N9020A	MY50510240	2025-07-02	2026-07-02
2	Signal Generator	Rohde & Schwarz	SMB100A	175528	2025-03-21	2026-03-21
3	EMI TEST RECEIVER	Rohde & Schwarz	ESW44	102039	2025-04-28	2026-04-28
4	BILOG ANTENNA	TESEQ	CBL6111D	63162	2024-09-13	2026-09-13
5	Active Loop Antenna	SCHWARZBECK	FMZB 1513	1513-125	2024-04-15	2026-04-15
6	6dB Attenuator	PASTERNAK	PE7AP006-06	L20210504000023	2025-07-28	2026-07-28
7	6dB Attenuator	NONE	6dB	190557	2025-09-18	2026-09-18
8	AMPLIFIER	SONOMA INSTRUMENT	310N	411011	2025-07-28	2026-07-28
9	EMI Test Receiver	R&S	ESR3	102826	2025-04-28	2026-04-28
10	LISN	R&S	ENV216	101236	2025-10-23	2026-10-23
11	Spectrum Analyzer	R&S	FSV40	101574	2025-01-10	2026-01-10
12	PRE AMPLIFIER	HP	9449B	3008A00620	2025-03-11	2026-03-11
13	Double Ridged Guide Antenna	ETS-Lindgren	3115	00078895	2025-03-13	2026-03-13

No.	Cable	Manufacturer	Model No.	Serial No.	Check Date
1	RF Cable (Conducted)	Junkosha Inc.	MWX221	1512S151	2025-11-03
2	RF Cable (9 kHz - 1 GHz Radiated)	HUBER+SUHNER	SUCOFLEX 104	MY27558/4	2025-03-05
3	RF Cable (9 kHz - 30 MHz Radiated)	Canare Corporation	L-5D2W	N/A	2025-03-05
4	RF Cable (30 MHz - 1 GHz Radiated)	Canare Corporation	L-5D2W	N/A	2025-03-05
5	RF Cable (Line Conducted)	Canare Corporation	L-5D2W	N/A	2025-03-05
6	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	2008s246	2025-02-21
7	RF Cable (1 GHz - 18 GHz Radiated)	Junkosha Inc.	MWX221	J09740749	2025-02-21
8	RF Cable (1 GHz - 18 GHz Radiated)	Sensorview Co., LTD	13A26	Tpc2204060007	2025-02-21

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