



FCC ID: KR5HFM401
Report No.: T190618W04-RP

ISED: 7812D-HFM401

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**FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS-210**

TEST REPORT

For

Radio Frequency Transmitter-Receiver

Model: HFM401

Trade Name: Continental

Issued to

FCC	Continental Automotive GmbH Siemensstrasse 12 SV C TS RBG EMC-Laboratory Regensburg, 93055 Germany
IC	Continental Automotive GmbH Siemensstrasse 12 Regensburg 93055 Germany

Issued by

**Compliance Certification Services Inc.
Wugu Laboratory
No.11, Wugong 6th Rd., Wugu Dist.,
New Taipei City 24891, Taiwan. (R.O.C.)
Issued Date: August 19, 2019**

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only.

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	August 7, 2019	Initial Issue	ALL	Allison Chen
01	August 19, 2019	See the follow note Rev.(01)	P.21-24	Allison Chen

Rev.(01)

1. Revised limit below 30MHz in section 8.2.



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1. TEST RESULT CERTIFICATION

FCC Applicant: Continental Automotive GmbH
Siemensstrasse 12 SV C TS RBG EMC-Laboratory
Regensburg, 93055 Germany

FCC Manufacturer: Continental Automotive GmbH
Siemensstrasse 12 SV C TS RBG EMC-Laboratory
Regensburg, 93055 Germany

IC Applicant: Continental Automotive GmbH
Siemensstrasse 12 Regensburg 93055 Germany

IC Manufacturer: Continental Automotive GmbH
Siemensstrasse 12 Regensburg 93055 Germany

Factory:

1. Continental Automotive Guadalajara Mexico, S.A. de C.V.
Plant Tijera Camino a la Tijera No. 3, km 3.5 Carretera
Guadalajara-Morelia 45640 Tlajomulco de Zuniga, Jalisco,
Mexico
2. Continental Automotive Changchun Co., Ltd.
Jingyue Branch No. 5800 Shengtai Street, Jingyue Zone,
Changchun City, Jilin Province, P. R. China 130000
3. Continental Automotive France S.A.S.
1 Avenue Paul Ourliac, 31100 Toulouse, France

Equipment Under Test: Radio Frequency Transmitter-Receiver

Trade Name: Continental

Model: HFM401

Date of Test: June 25 ~ July 1, 2019



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APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C INDUSTRY CANADA RSS-210	No non-compliance noted

Statements of Conformity
Determination of compliance is based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

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 tested as described in this report is in compliance with the requirements of FCC Rules Part 15.207, 15.209 and Industry Canada RSS-210.

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

Approved by:

Tested by:

Kevin Tsai
Deputy Manager
Compliance Certification Services Inc.

Dally Hong
Engineer
Compliance Certification Services Inc.



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2. EUT DESCRIPTION

Product	Radio Frequency Transmitter-Receiver
Trade Name	Continental
Model Number	HFM401
Model Difference	N/A
Received Date	June 18, 2019
Power Supply	Power from power supply. (DC 12V)
Frequency Range	TX: 125kHz, RX: 433.92MHz
Number of Channels	1 Channel
Antenna Requirement	TX: Type: Winded wire coil Gain: 0 dBi RX: Type: PCB printed antenna Gain: -2 dBi
S.W Version	N/A
H.W Version	N/A

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for **FCC ID: KR5HFM401** & **ISED: 7812D-HFM401** filing to comply with Section 15.209 of the FCC Part 15, Subpart C Rules.



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3. TEST SUMMARY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	RSS-GEN Sec. 8.3	2	Antenna Requirement	Pass
15.209	RSS-210 A.1.3	8.1	Emission Bandwidth	Pass
15.209(a)	RSS-210 4.4 RSS-GEN 8.9	8.2	Fundamental Emission	Pass
15.209(a)	RSS-210 4.4 RSS-GEN 8.9	8.2	Transmitter Radiated Emission	Pass
15.207(a)	RSS-GEN Sec. 8.8	8.3	AC Power-line Conducted Emission	Not applicable

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC CFR 47 Part 2, 15.207, 15.209, RSS-210 and RSS-Gen.

4.1 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.

4.2 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) 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

- (b) 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.

4.3 RSS-GEN 8.10 RESTRICTED BANDS

- (a) Except as shown in other rules, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	13.36 - 13.41	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.42 - 16.423	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.69475 - 16.69525	960 - 1240	7.25 - 7.75
3.020 - 3.026	16.80425 - 16.80475	1300 - 1427	8.025 - 8.5
4.125 - 4.128	25.5 - 25.67	1435 - 1626.5	9.0 - 9.2
4.17725 - 4.17775	37.5 - 38.25	1645.5 - 1646.5	9.3 - 9.5
4.20725 - 4.20775	73 - 74.6	1660 - 1710	10.6 - 12.7
5.677 - 5.683	74.8 - 75.2	1718.8 - 1722.2	13.25 - 13.4
6.215 - 6.218	108 - 121.94	2200 - 2300	14.47 - 14.5
6.26775 - 6.26825	123 - 138	2310 - 2390	15.35 - 16.2
6.31175 - 6.31225	149.9 - 150.05	2483.5 - 2500	17.7 - 21.4
8.291 - 8.294	156.52475 -	2655 - 2900	22.01 - 23.12
8.362 - 8.366	156.52525	3260 - 3267	23.6 - 24.0
8.37625 - 8.38675	156.7 - 156.9	3332 - 3339	31.2 - 31.8
8.41425 - 8.41475	162.0125 - 167.17	3345.8 - 3358	36.43 - 36.5
12.29 - 12.293	167.72 - 173.2	3500 - 4400	(²)
12.51975 - 12.52025	240 - 285		
12.57675 - 12.57725	322 - 335.4		

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

² Above 38.6

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.

- (b) Except when the requirements applicable to a given device state otherwise, emissions from licence-exempt transmitters shall comply with the field strength limits shown in RSS-GEN clause 8.9. Unless otherwise specified, for all frequencies greater than 1 GHz, the radiated emission limits for licence-exempt radio apparatus stated in applicable RSSs (including RSS-Gen) are based on measurements using a linear average detector function having a minimum resolution bandwidth of 1 MHz. If an average limit is specified for the EUT, then the peak emission shall also be measured with instrumentation properly adjusted for such factors as pulse desensitization to ensure the peak emission is less than 20 dB above the average limit.

4.4 DESCRIPTION OF TEST MODES

The EUT (model: HFM401) had been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.

4.4.1 The worst mode of measurement

Radiated Emission Measurement Above 1G	
Test Condition	Radiated Emission Above 1G
Power supply Mode	Mode 1: EUT power by Battery (DC 12V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4
Worst Position	☐ Placed in fixed position. ☐ Placed in fixed position at X-Plane (E2-Plane) ☐ Placed in fixed position at Y-Plane (E1-Plane) ☒ Placed in fixed position at Z-Plane (H-Plane)
Worst Polarity	☒ Horizontal ☐ Vertical

Radiated Emission Measurement Below 1G	
Test Condition	Radiated Emission Below 1G
Power supply Mode	Mode 1: EUT power by Power supply (DC 12V)
Worst Mode	☒ Mode 1 ☐ Mode 2 ☐ Mode 3 ☐ Mode 4

Remark:

1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(Z-Plane and Horizontal) were recorded in this report
3. For below 1G, radiation emission were performed the EUT transmit at the highest output power channel as worse case.

5. INSTRUMENT CALIBRATION

5.1 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.

5.2 MEASUREMENT EQUIPMENT USED

Equipment Used for Emissions Measurement

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

Conducted Emissions Test Site					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Signal Analyzer	R&S	FSV 40	101073	09/27/2018	09/26/2019
Software	N/A				

Wugu 966 Chamber A					
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Date	Calibration Due
Bilog Antenna	Sunol Sciences	JB3	A030105	07/13/2018	07/12/2019
Cable	HUBER SUHNER	SUCOFLEX 104PEA	25157	02/26/2019	02/25/2020
Cable	HUBER SUHNER	SUCOFLEX 104PEA	20995	02/26/2019	02/25/2020
Digital Thermo-Hygro Meter	WISEWIND	1206	D07	01/30/2019	01/29/2020
double Ridged Guide Horn Antenna	ETC	MCTD 1209	DRH13M02003	08/20/2018	08/19/2019
High Pass Filter	SOLVANG TECHNOLOGY INC.	STI15	9923	02/26/2019	02/25/2020
Loop Ant	COM-POWER	AL-130	121051	03/22/2019	03/21/2020
Pre-Amplifier	EMEC	EM330	060609	02/26/2019	02/25/2020
Pre-Amplifier	HP	8449B	3008A00965	02/26/2019	02/25/2020
PSA Series Spectrum Analyzer	Agilent	E4446A	MY46180323	05/29/2019	05/28/2020
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R	N.C.R
Software	e3 6.11-20180419c				

Remark:

- Each piece of equipment is scheduled for calibration once a year..
- N.C.R. = No Calibration Request.



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5.3 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 0.0014
RF output power, conducted	+/- 1.14
Power density, conducted	+/- 1.40
3M Semi Anechoic Chamber / 30M~200M	+/- 4.12
3M Semi Anechoic Chamber / 200M~1000M	+/- 4.68
3M Semi Anechoic Chamber / 1G~8G	+/- 5.18
3M Semi Anechoic Chamber / 8G~18G	+/- 5.47
3M Semi Anechoic Chamber / 18G~26G	+/- 3.81
3M Semi Anechoic Chamber / 26G~40G	+/- 3.87

Remark: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

6. FACILITIES AND ACCREDITATIONS

6.1 FACILITIES

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

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

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

6.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, ridged waveguide, horn and/or Loop. 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."



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7. SETUP OF EQUIPMENT UNDER TEST

7.1 SETUP CONFIGURATION OF EUT

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

7.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
	N/A						

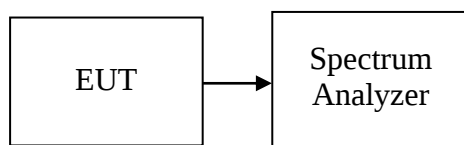
Remark:

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.

8. FCC PART 15.209 & RSS-210 REQUIREMENTS

8.1 OCCUPIED BANDWIDTH(99%) AND 20 dB BANDWIDTH

TEST CONFIGURATION



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10KHz, VBW=30KHz, Span=100KHz, Sweep = auto.
4. Record the max. reading.

TEST RESULTS

No non-compliance noted

Test Condition	Frequency(kHz)	Occupied Bandwidth 99% (kHz)	20 dB Bandwidth (kHz)
125kHz	125kHz	12.0694	11.404

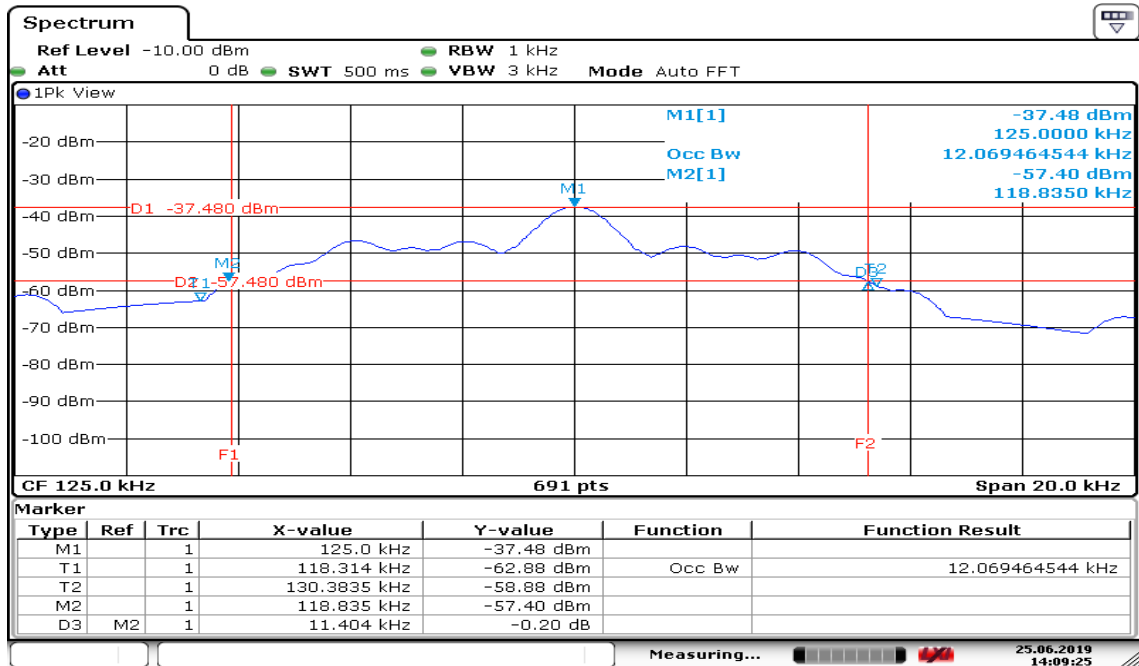


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Test Plot



Date: 25.JUN.2019 14:09:26

8.2 RADIATED EMISSIONS

LIMIT

FCC according to §15.209(a)

IC according to RSS-Gen, section 8.9 and 8.10.

FCC:

According to FCC PART 15.209(a), 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)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

Remark: Except as provided in other rules, 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.

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

Below 30MHz

Frequency (MHz)	Field Strength		Measurement Distance (meter)	Field Strength (dBμV/m)	Measurement Distance (meter)
	(μV/m)	(dBμV/m)			
0.009 - 0.490	2400/F(kHz)	48.52 – 13.80	300	128.52–93.80	3
0.490 - 1.705	24000/F(kHz)	33.80 – 22.97	30	73.80– 62.97	3
1.705 – 30.0	30	29.54	30	69.54	3

Remark: According to Part 15.31(f)(2), the transfer formula as below:

$Limit@3m = 20\log(Limit@300m) + 40\log (Limit\ define\ distance(300m)/ (Measurement\ distance(3m)))$

Above 30MHz

Frequency (MHz)	Field Strength		Measurement Distance (meter)
	(μV/m)	(dBμV/m)	
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

IC:

RSS-Gen Table 3 and Table 5 – General Field Strength Limits for Transmitters and Receivers at Frequencies Above 30 MHz ^(Note)

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Measurements for compliance with the limits in table 3 may be performed at distances other than 3 metres, in accordance with Section 6.6.

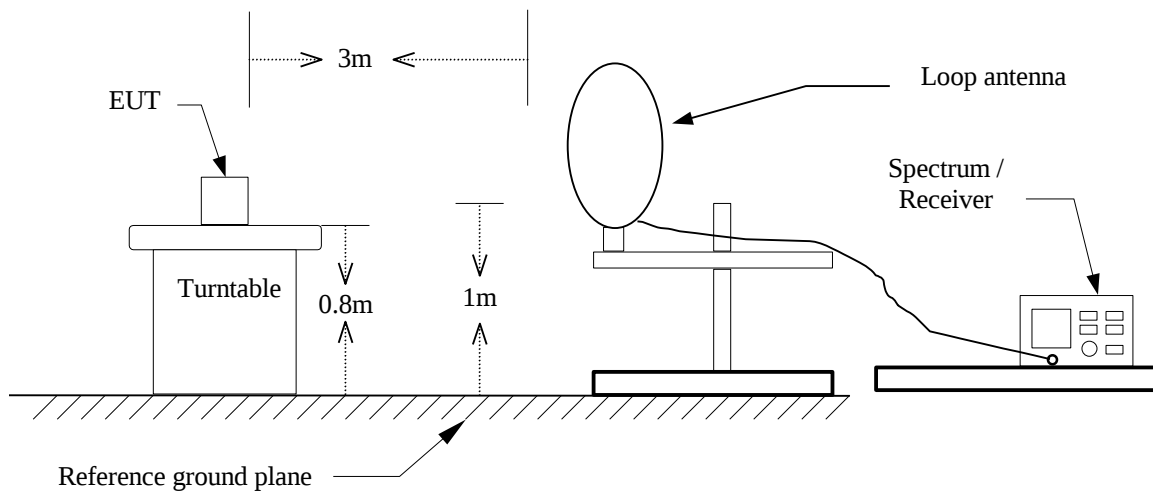
RSS-Gen Table 6: General Field Strength Limits for Transmitters at Frequencies Below 30 MHz (Transmit)

Frequency	Magnetic field strength (H-Field) (μA/m)	Measurement Distance (m)
9-490 kHz ^{Note}	6.37/F (F in kHz)	300
490-1,705 kHz	63.7/F (F in kHz)	30
1.705-30 MHz	0.08	30

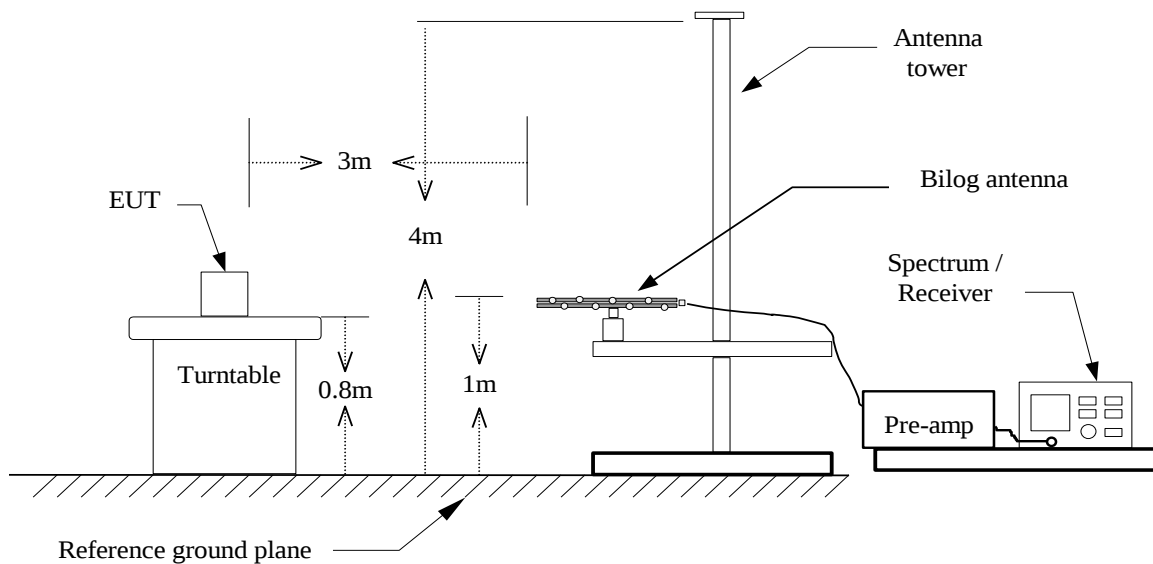
Note: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector..

Test Configuration

9kHz ~ 30MHz



30MHz ~ 1GHz



TEST PROCEDURE

For 9KHz ~ 30MHz

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 face off.
6. Set the spectrum analyzer in the following setting as:
9KHz-490KHz : RBW=200Hz / VBW=1kHz / Sweep=AUTO
490KHz-30MHz : RBW=10kHz / VBW=30kHz / Sweep=AUTO

For 30MHz ~ 1GHz

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 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=100kHz / VBW=300kHz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.

Remark:

Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30 m open area test site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788, and RSS-Gen Clause 6.5.

- 1) *Limit @ 3m(dBuV/m) = limit @ 300m or 30m (dBuV/m) + 40 log (Specific distance/measurement distance)*
- 2) *Correction factor= Antenna factor + cable loss - Amp Gain*



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100kHz ~ 150kHz

Operation Mode: TX mode

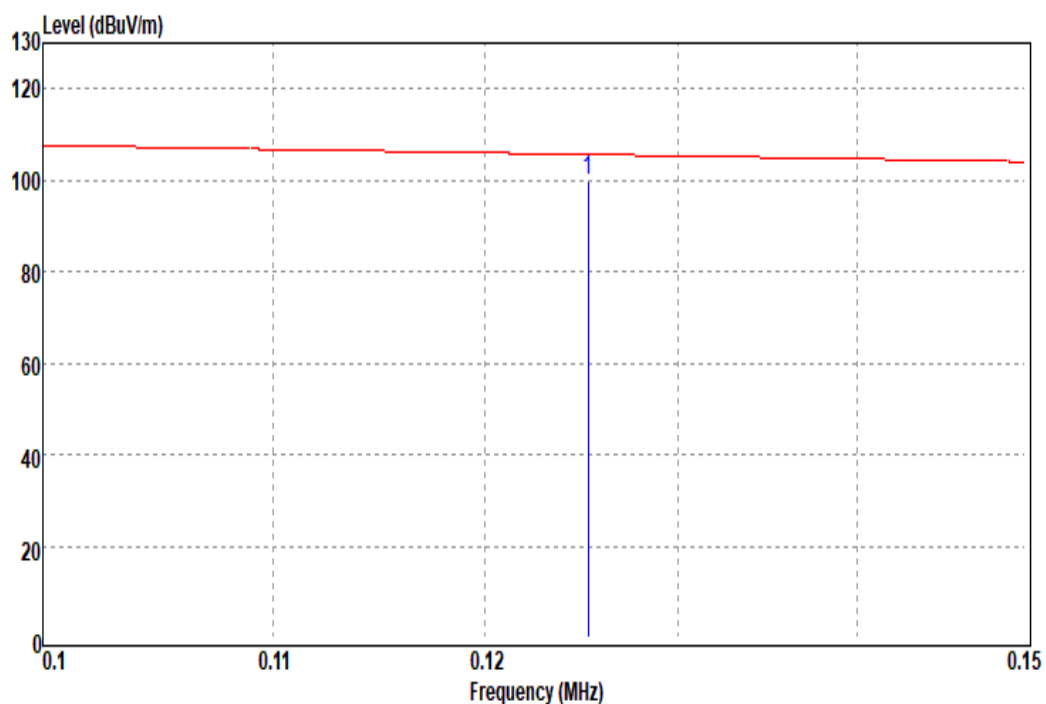
Test Date: July 01, 2019

Temperature: 25°C

Tested by: Dally Hong

Humidity: 55 % RH

Polarity: Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.13	86.35	13.51	99.86	105.65	-5.79	Average

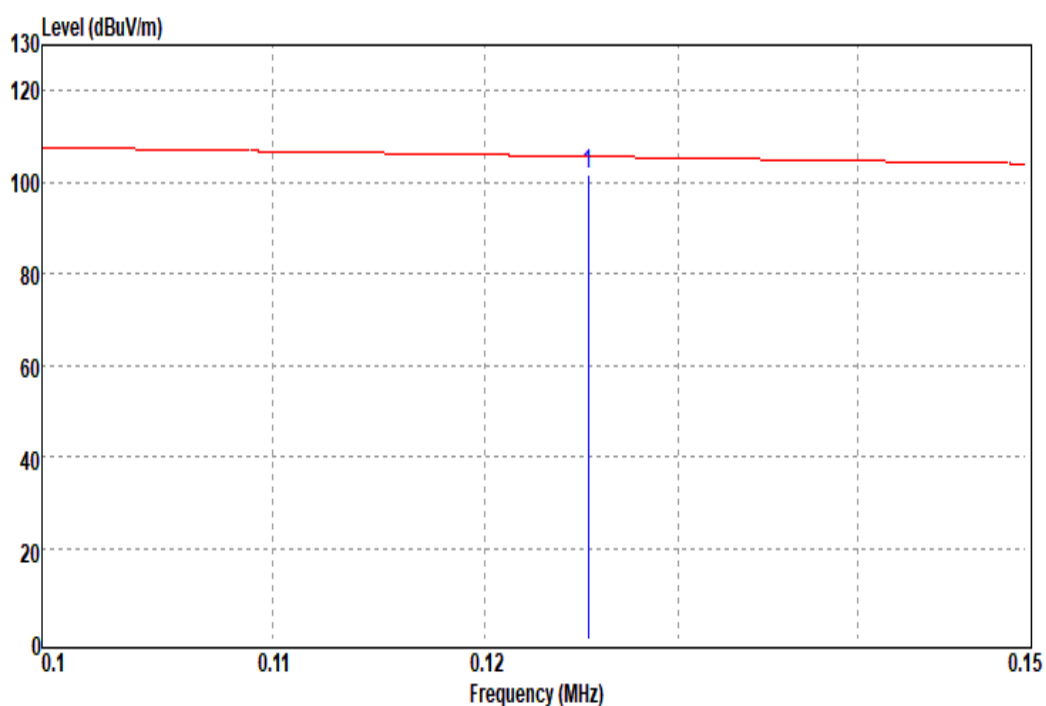


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Operation Mode: TX mode
Temperature: 25°C
Humidity: 55 % RH

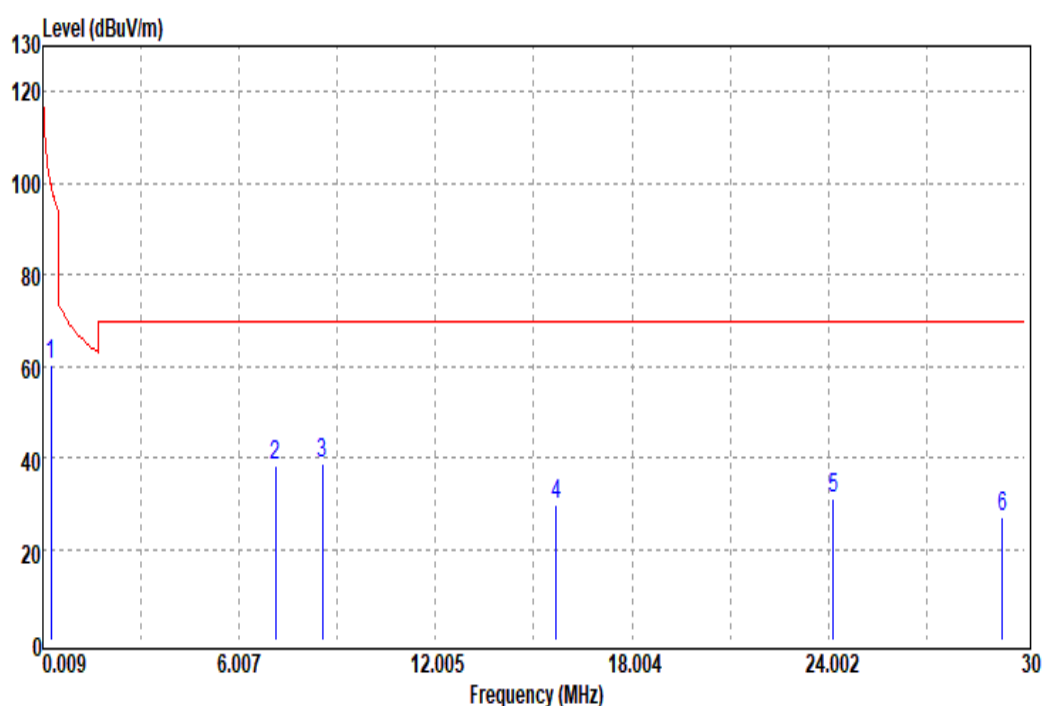
Test Date: July 01, 2019
Tested by: Dally Hong
Polarity: Horizontal



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.13	88.12	13.51	101.63	105.65	-4.02	Average

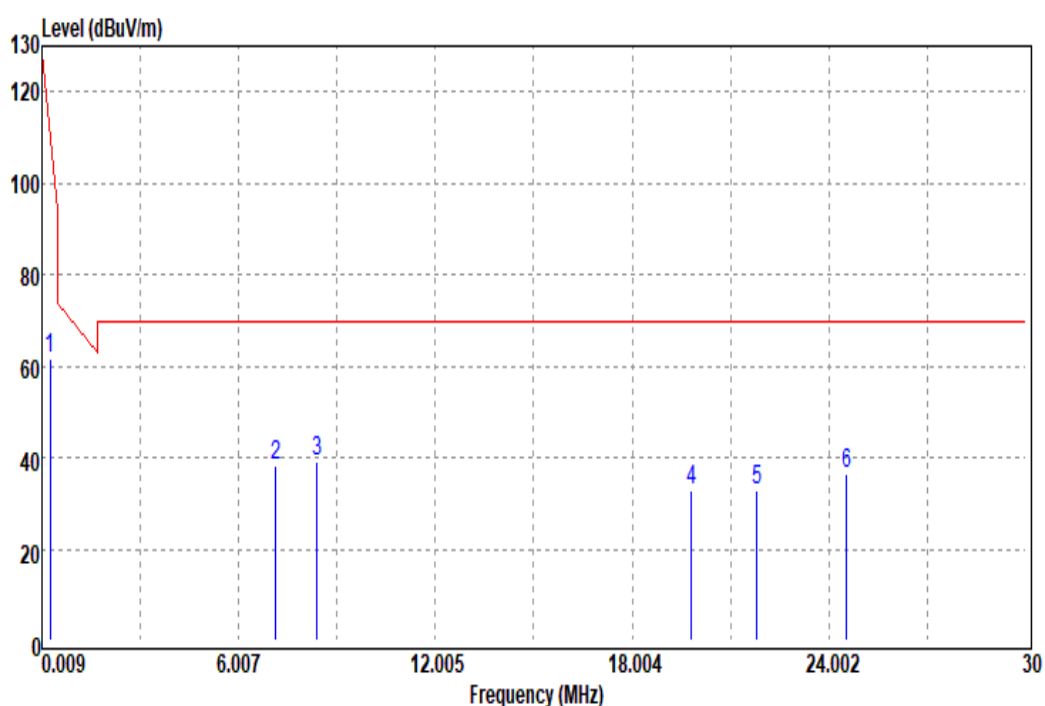
9kHz ~ 30MHz

Operation Mode:	TX mode	Test Date:	July 01, 2019
Temperature:	25°C	Tested by:	Dally Hong
Humidity:	55 % RH	Polarity:	Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.25	46.22	14.13	60.35	99.65	-39.30	peak
7.12	22.29	15.77	38.06	69.54	-31.48	peak
8.56	22.80	15.98	38.78	69.54	-30.76	peak
15.69	13.81	15.78	29.59	69.54	-39.95	peak
24.15	16.54	14.70	31.24	69.54	-38.30	peak
29.31	13.23	13.79	27.02	69.54	-42.52	peak

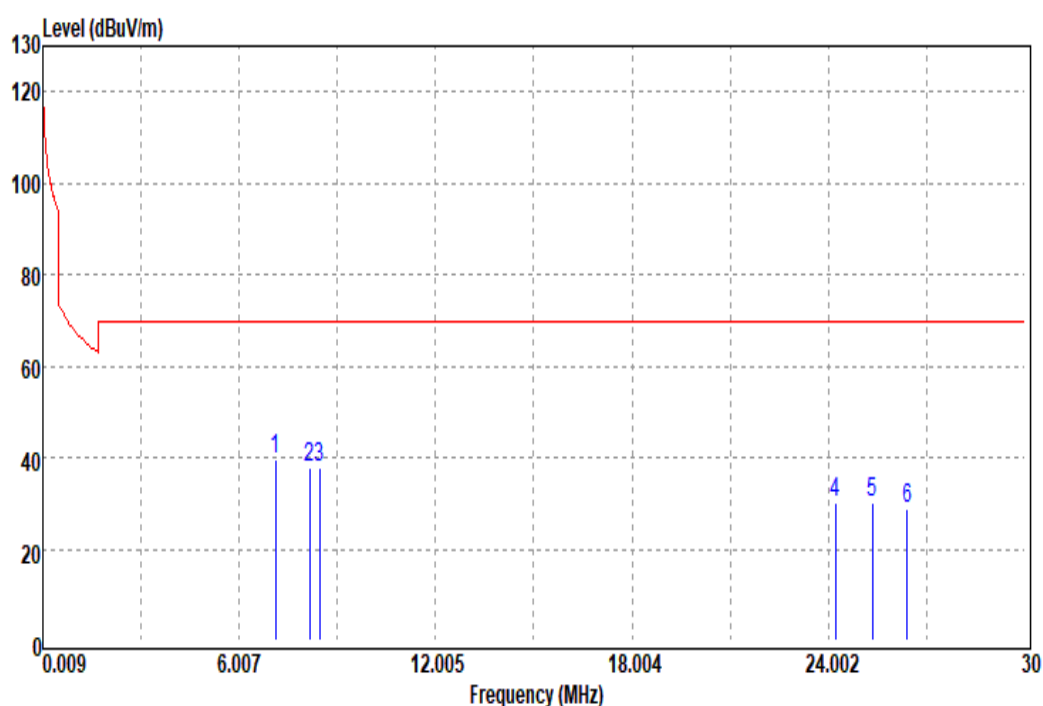
Operation Mode:	TX mode	Test Date:	July 01, 2019
Temperature:	25°C	Tested by:	Dally Hong
Humidity:	55 % RH	Polarity:	Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.25	47.56	14.13	61.69	99.65	-37.96	peak
7.15	22.67	15.77	38.44	69.54	-31.10	peak
8.41	23.02	15.96	38.98	69.54	-30.56	peak
19.80	17.21	15.59	32.80	69.54	-36.74	peak
21.81	17.64	15.17	32.81	69.54	-36.73	peak
24.54	21.62	14.62	36.24	69.54	-33.30	peak

Operation Mode: RX mode
Temperature: 25°C
Humidity: 55 % RH

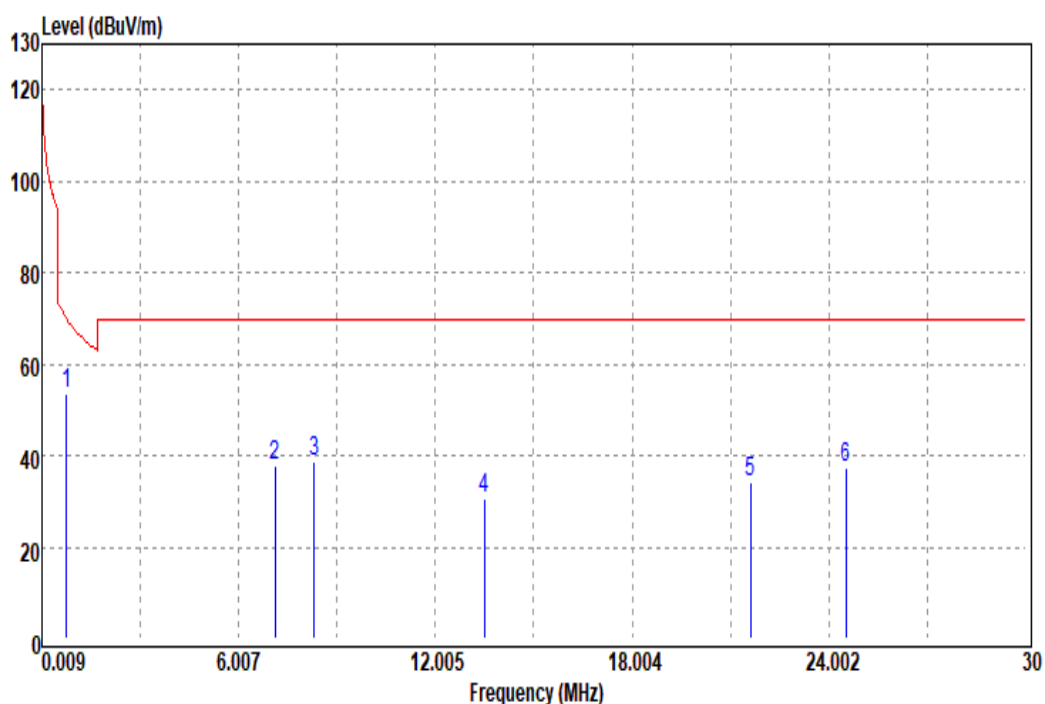
Test Date: July 01, 2019
Tested by: Dally Hong
Polarity: Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
7.12	23.92	15.77	39.69	69.54	-29.85	peak
8.17	21.95	15.93	37.88	69.54	-31.66	peak
8.47	21.89	15.97	37.86	69.54	-31.68	peak
24.21	15.60	14.69	30.29	69.54	-39.25	peak
25.35	15.52	14.47	29.99	69.54	-39.55	peak
26.40	14.56	14.28	28.84	69.54	-40.70	peak

Operation Mode: RX mode
Temperature: 25°C
Humidity: 55 % RH

Test Date: July 01, 2019
Tested by: Dally Hong
Polarity: Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
0.76	38.78	14.56	53.34	70.00	-16.66	peak
7.12	22.17	15.77	37.94	69.54	-31.60	peak
8.32	22.62	15.95	38.57	69.54	-30.97	peak
13.51	14.90	15.91	30.81	69.54	-38.73	peak
21.60	19.02	15.22	34.24	69.54	-35.30	peak
24.51	22.85	14.63	37.48	69.54	-32.06	peak



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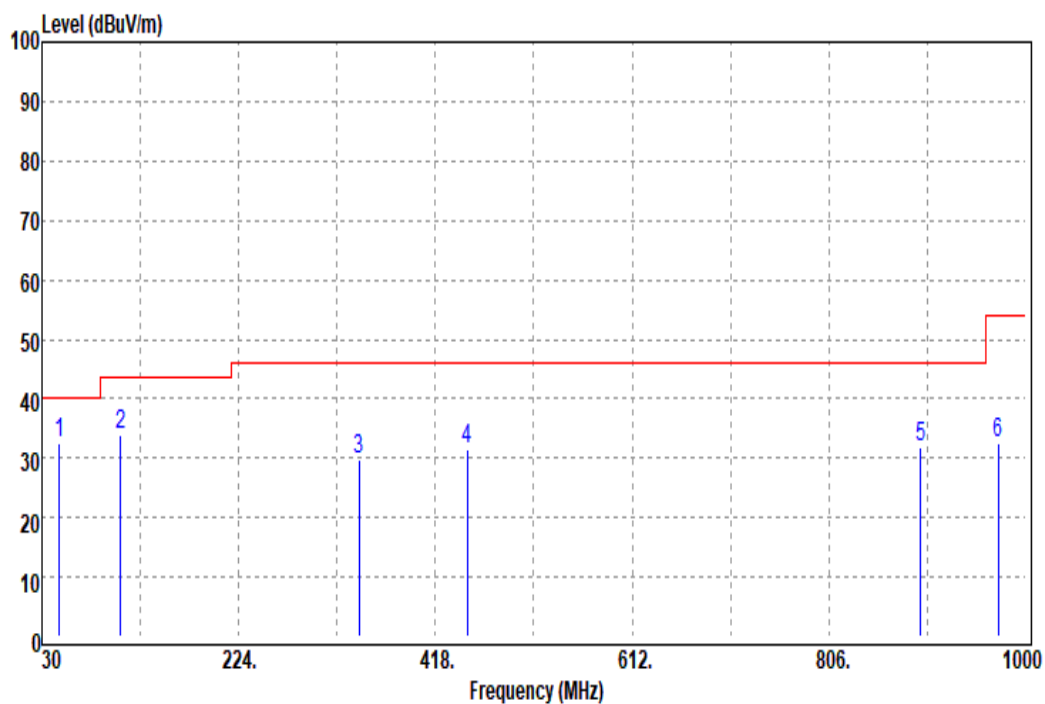
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30MHz ~ 1000MHz

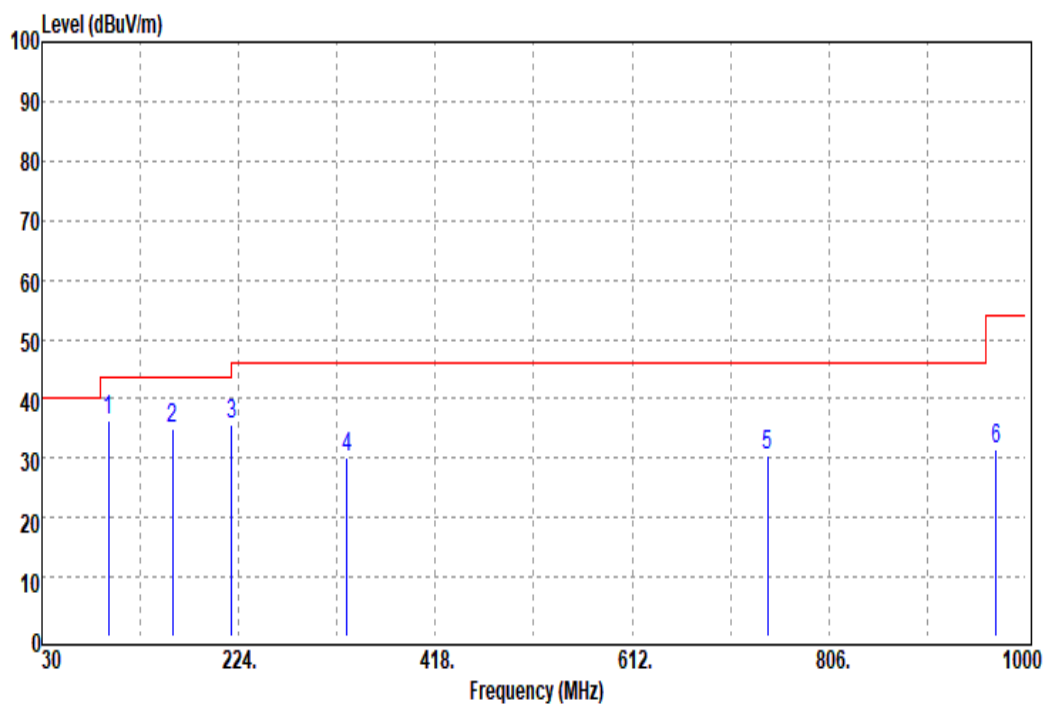
Operation Mode:	TX mode	Test Date:	July 01, 2019
Temperature:	25°C	Tested by:	Dally Hong
Humidity:	55 % RH	Polarity:	Vertical / Horizontal

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
47.46	46.77	-14.26	32.51	40.00	-7.49	peak
107.60	44.69	-10.67	34.02	43.50	-9.48	peak
342.34	36.88	-7.19	29.69	46.00	-16.31	peak
449.04	35.45	-3.88	31.57	46.00	-14.43	peak
896.21	27.63	4.05	31.68	46.00	-14.32	peak
972.84	26.96	5.56	32.52	54.00	-21.48	peak
95.96	50.35	-13.95	36.40	43.50	-7.10	peak
159.01	44.82	-9.95	34.87	43.50	-8.63	peak
217.21	47.22	-11.43	35.79	46.00	-10.21	peak
330.70	37.19	-7.08	30.11	46.00	-15.89	peak
745.86	28.50	1.96	30.46	46.00	-15.54	peak
970.90	26.00	5.37	31.37	54.00	-22.63	peak

Vertical



Horizontal





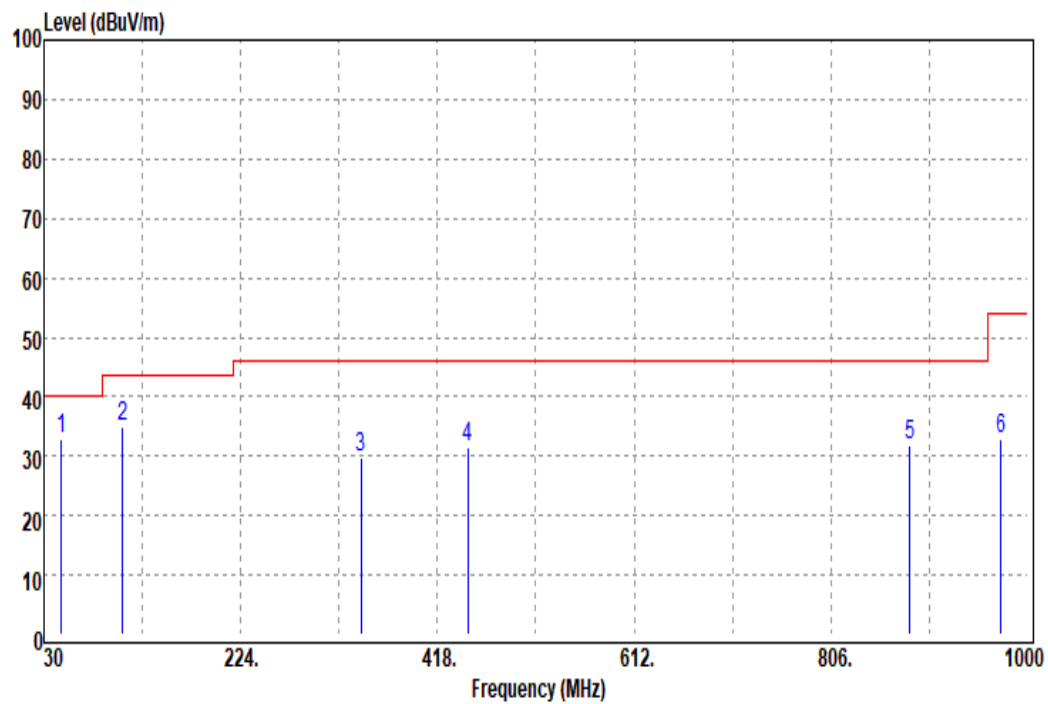
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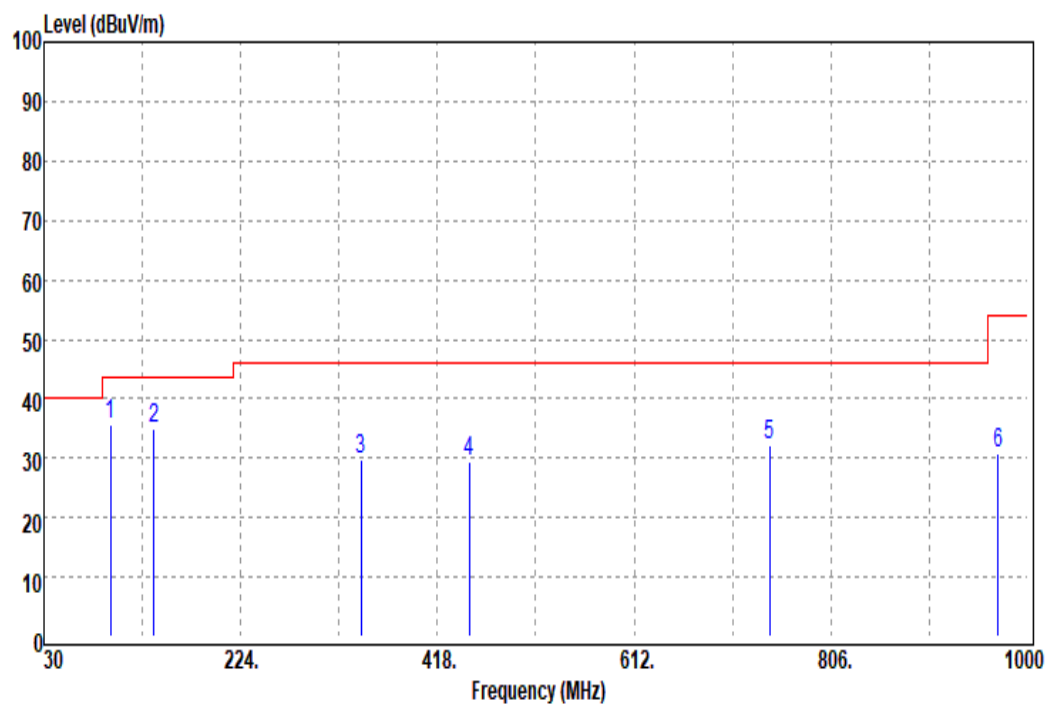
Operation Mode: RX mode **Test Date:** July 01, 2019
Temperature: 25°C **Tested by:** Dally Hong
Humidity: 55 % RH **Polarity:** Vertical / Horizontal

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit 3m (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
47.46	46.97	-14.26	32.71	40.00	-7.29	peak
107.60	45.51	-10.67	34.84	43.50	-8.66	peak
342.34	37.11	-7.19	29.92	46.00	-16.08	peak
448.07	35.40	-3.86	31.54	46.00	-14.46	peak
883.60	28.31	3.65	31.96	46.00	-14.04	peak
973.81	27.13	5.63	32.76	54.00	-21.24	peak
95.96	49.54	-13.95	35.59	43.50	-7.91	peak
138.64	44.70	-9.70	35.00	43.50	-8.50	peak
342.34	37.01	-7.19	29.82	46.00	-16.18	peak
449.04	33.40	-3.88	29.52	46.00	-16.48	peak
745.86	30.21	1.96	32.17	46.00	-13.83	peak
970.90	25.59	5.37	30.96	54.00	-23.04	peak

Vertical



Horizontal





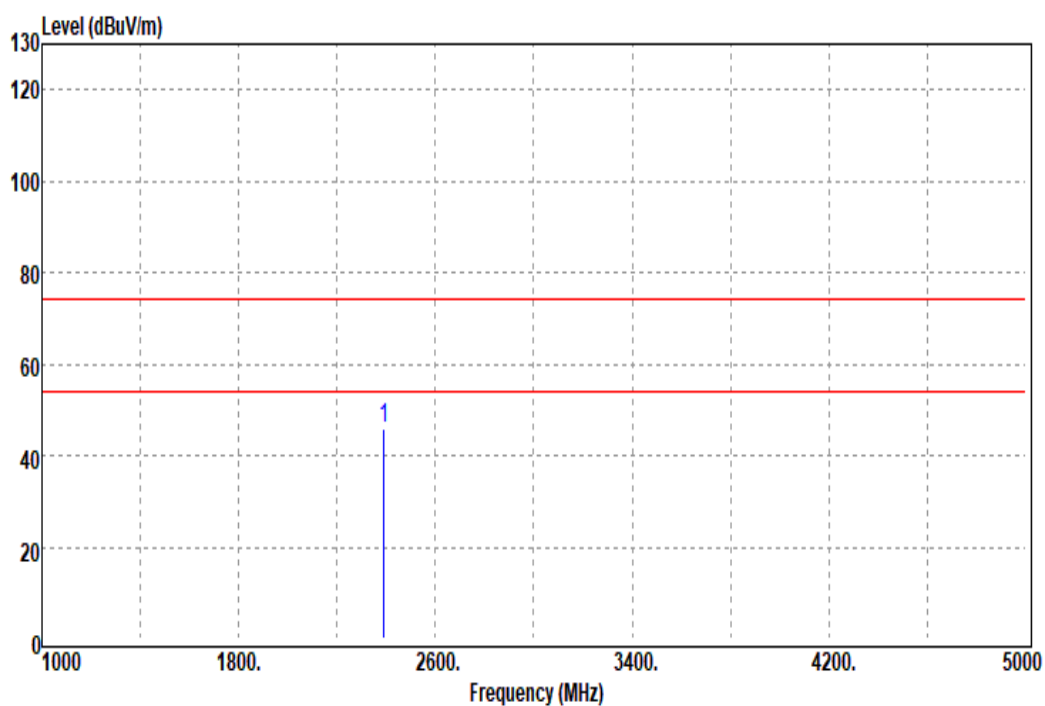
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Above 1GHz

Operation Mode: RX mode
Temperature: 25°C
Humidity: 55 % RH

Test Date: July 01, 2019
Tested by: Dally Hong
Polarity: Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
2392.00	49.08	-3.39	45.69	74.00	-28.31	peak



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Operation Mode: RX mode

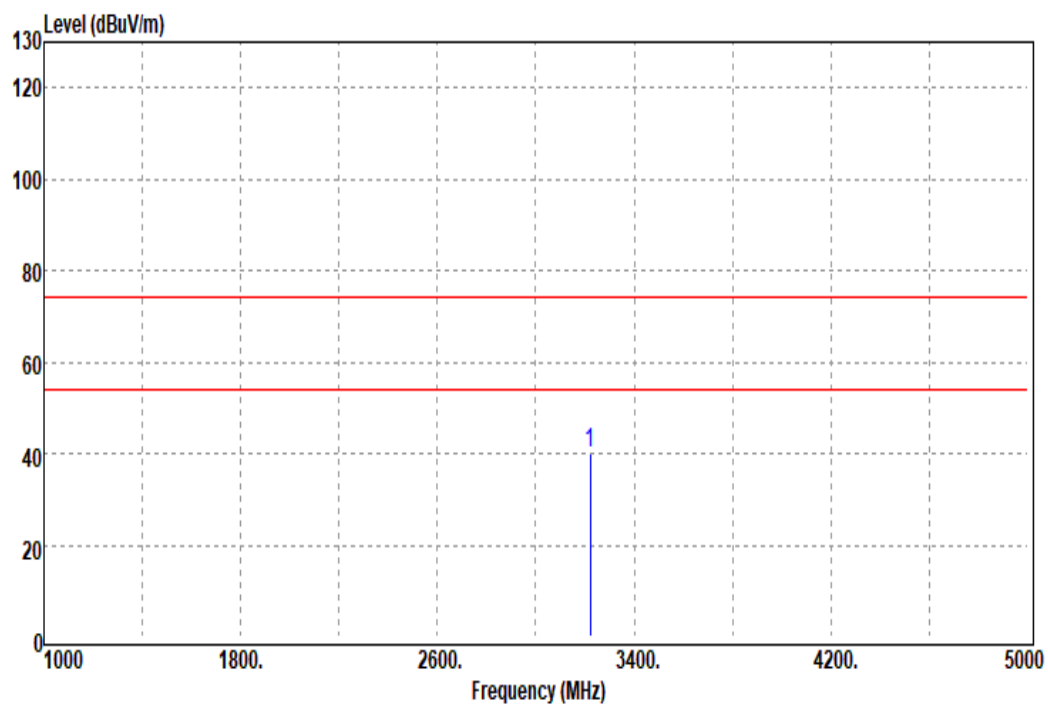
Test Date: July 01, 2019

Temperature: 25°C

Tested by: Dally Hong

Humidity: 55 % RH

Polarity: Vertical



Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode (PK/QP/AVG)
3220.00	41.29	-1.09	40.20	74.00	-33.80	peak

8.3 POWERLINE CONDUCTED EMISSIONS

LIMIT

According to §15.207(a) & RSS-Gen §8.8, 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

* Decreases with the logarithm of the frequency.

TEST PROCEDURE

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

Not applicable, because EUT not connect to AC Main Source direct.

- End of Test Report -