



Shenzhen CTL Testing Technology Co., Ltd.  
Tel: +86-755-89486194 E-mail: ctl@ctl-lab.com

# TEST REPORT

## FCC PART 15.236

Report Reference No. ....: **CTL2008081011-WF**

Compiled by: ( position+printed name+signature)	Happy Guo (File administrators)	<u>Happy Guo</u>
Tested by: ( position+printed name+signature)	Nice Nong (Test Engineer)	<u>Nice Nong</u>
Approved by: ( position+printed name+signature)	Ivan Xie (Manager)	<u>Ivan Xie</u>

**Product Name**.....: VHF WIRELESS MICROPHONES

**Model/Type reference** .....: XM-615

**Listed Models** .....: View page 2

**Trade Mark** .....: RITASC

**FCC ID** .....: **2AQ4S-XM615**

**Applicant's name** .....: **RITASC ELECTRONICS CO., LTD.**

**Address of applicant** .....: B3, ZONE2, JIANGMEN CHANYE INDUSTRIAL AREA, ENPING CITY, CHINA

**Test Firm** .....: **Shenzhen CTL Testing Technology Co., Ltd.**

**Address of Test Firm** .....: Floor 1-A, Baisha Technology Park, No.3011, Shahexi Road, Nanshan District, Shenzhen, China 518055

**Test specification** .....:

**Standard** .....: **FCC Part 15.236:** Operation of wireless microphones in the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz

**TRF Originator** .....: Shenzhen CTL Testing Technology Co., Ltd.

**Master TRF** .....: Dated 2011-01

**Date of receipt of test item** .....: Sep. 10, 2020

**Date of sampling** .....: Sep. 11, 2020

**Date of Test Date** .....: Sep. 11, 2020–Sep. 25, 2020

**Date of Issue** .....: Sep. 25, 2020

**Result** .....: **Pass**

**Shenzhen CTL Testing Technology Co., Ltd. All rights reserved.**

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen CTL Testing Technology Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen CTL Testing Technology Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

# TEST REPORT

Test Report No. :	CTL2008081011-WF	Sep. 25, 2020
		Date of issue

Equipment under Test : VHF WIRELESS MICROPHONES

Sample No. : CTL200808101-1-S001

Model /Type : XM-615

Listed Models : XM-625, XM-635, XM-645, XM-655, XM-620, XM-630, XM-640, XM-650, XM-402, XM-403, XM-404, XM-405, XM-406, XM-902U, XM-903U, XM-904U, XM-905U, XM-906U, RV-3100, RV-3110, RV-3120, RV-3130, RV-3150, RV-3160, RV-3180, RV-3190, RV-3220, RV-3250, RV-3260, RU-4230, RU-4250, RU-4260, RU-318, RU-328, RU-330, RU-350, RU-360, RU-380, RU-390, RU-366, RU-368, RU-369

Applicant : RITASC ELECTRONICS CO., LTD.

Address : B3, ZONE2, JIANGMEN CHANYE INDUSTRIAL AREA, ENPING CITY, CHINA

Manufacturer : RITASC ELECTRONICS CO., LTD.

Address : B3, ZONE2, JIANGMEN CHANYE INDUSTRIAL AREA, ENPING CITY, CHINA

<b>Test result</b>	<b>Pass *</b>
--------------------	---------------

\* In the configuration tested, the EUT complied with the standards specified page 5.

The test results presented in this report relate only to the object tested.

This report shall not be reproduced, except in full, without the written approval of the issuing testing laboratory.

## \*\* Modified History \*\*

<b>Table of Contents</b>		<b>Page</b>
<b>1. SUMMARY</b>	.....	<b>5</b>
1.1. TEST STANDARDS .....	.....	5
1.2. TEST DESCRIPTION .....	.....	5
1.3. TEST FACILITY .....	.....	6
1.4. STATEMENT OF THE MEASUREMENT UNCERTAINTY.....	.....	6
<b>2. GENERAL INFORMATION</b> .....	.....	<b>8</b>
2.1. ENVIRONMENTAL CONDITIONS .....	.....	8
2.2. GENERAL DESCRIPTION OF EUT .....	.....	8
2.3. DESCRIPTION OF TEST MODES AND TEST FREQUENCY.....	.....	8
2.4. EQUIPMENTS USED DURING THE TEST .....	.....	9
2.5. RELATED SUBMITTAL(s) / GRANT (s).....	.....	9
2.6. MODIFICATIONS.....	.....	9
<b>3. TEST CONDITIONS AND RESULTS</b> .....	.....	<b>10</b>
3.1. CONDUCTED EMISSIONS TEST .....	.....	10
3.2. RADIATED EMISSIONS AND BAND EDGE .....	.....	12
3.3. MAXIMUM OUTPUT POWER .....	.....	15
3.4. OCCUPIED BANDWIDTH .....	.....	16
3.5. NECESSARY BANDWIDTH.....	.....	18
3.6. TRANSMITTER SPURIOUS EMISSIONS.....	.....	20
3.7. FREQUENCY STABILITY .....	.....	24
3.8. ANTENNA REQUIREMENT.....	.....	27
<b>4. TEST SETUP PHOTOS OF THE EUT</b> .....	.....	<b>28</b>
<b>5. PHOTOS OF THE EUT</b> .....	.....	<b>29</b>

## 1. SUMMARY

### 1.1. TEST STANDARDS

The tests were performed according to following standards:

[FCC Rules Part 15.236](#): Operation of wireless microphones in the bands 54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz and 614-698 MHz

[ANSI C63.10: 2013](#): American National Standard for Testing Unlicensed Wireless Devices

### 1.2. Test Description

<b>FCC PART 15.247</b>		
FCC Part 15.207	AC Power Conducted Emission	N/A
FCC Part 15.236(d)	RF Power Output	PASS
FCC Part 15.236(f)	Occupied Bandwidth	PASS
FCC Part 15.236(g) ETSI EN 300 422-1 v1.4.2	Necessary Bandwidth Spurious emissions	PASS
FCC Part 15.209	Radiated Emissions	PASS
FCC Part 15.236(f)(3)	Frequency Stability	PASS
FCC Part 15.203	Antenna Requirement	PASS

## 1.3. Test Facility

### 1.3.1 Address of the test laboratory

Shenzhen CTL Testing Technology Co., Ltd.

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China

There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 32/EN 55032 requirements.

### 1.3.2 Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-Lab Code: L7497**

Shenzhen CTL Testing Technology Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC 17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No. 4343.01**

Shenzhen CTL Testing Technology Co., Ltd, EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **IC Registration No.: 9618B**

#### **CAB identifier: CN0041**

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Innovation, Science and Economic Development Canada to test to Canadian radio equipment requirements with Registration No.: 9618B on Jan. 22, 2019.

#### **FCC-Registration No.: 399832**

#### **Designation No.: CN1216**

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 399832, December 08, 2017.

## 1.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CTL laboratory is reported:

Test	Measurement Uncertainty	Notes
Transmitter power conducted	$\pm 0.57$ dB	(1)
Transmitter power Radiated	$\pm 2.20$ dB	(1)
Conducted spurious emission 9KHz-40 GHz	$\pm 2.20$ dB	(1)
Occupied Bandwidth	$\pm 0.01$ ppm	(1)
Radiated Emission 30~1000MHz	$\pm 4.10$ dB	(1)
Radiated Emission Above 1GHz	$\pm 4.32$ dB	(1)
Conducted Disturbance 0.15~30MHz	$\pm 3.20$ dB	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

## 2. GENERAL INFORMATION

### 2.1. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Normal Temperature:	25°C
Relative Humidity:	55 %
Air Pressure:	101 kPa

### 2.2. General Description of EUT

Product Name:	VHF WIRELESS MICROPHONES
Model/Type reference:	XM-615
Power supply:	DC 3V from battery
Modulation Type:	FM
Operation frequency:	203MHz, 209MHz, 215MHz
Channel number:	3
Nominal channel bandwidth	200KHz
Antenna type:	Internal antenna
Antenna gain:	0dBi

Note: For more details, please refer to the user's manual of the EUT.

### 2.3. Description of Test Modes and Test Frequency

The Applicant provides software tools to control the EUT for staying in continuous transmitting (Duty Cycle more than 98%) and receiving mode for testing.

#### Operation Frequency :

Channel	Frequency (MHz)
01	203
02	209
03	215

Note: The line display in grey were the channel selected for testing

## 2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.12	2020/05/22	2021/05/21
LISN	R&S	ESH2-Z5	860014/010	2020/05/22	2021/05/21
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2020/05/24	2021/05/23
EMI Test Receiver	R&S	ESCI	1166.5950.03	2019/11/28	2020/11/27
Spectrum Analyzer	Agilent	E4407B	MY41440676	2020/05/22	2021/05/21
Spectrum Analyzer	Agilent	N9020	US46220290	2020/05/21	2021/05/20
Controller	EM Electronics	EM 1000	060859	2020/05/21	2021/05/20
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2020/05/22	2021/05/21
Active Loop Antenna	Da Ze	ZN30900A	/	2020/05/25	2021/05/24
Amplifier	Agilent	8449B	3008A02306	2020/05/24	2021/05/23
Amplifier	Agilent	8447D	2944A10176	2020/05/22	2021/05/21
Temperature/Humidity Meter	Gangxing	CTH-608	02	2020/05/22	2021/05/21
High-Pass Filter	micro-tranics	HPM50108	G174	2020/05/25	2021/05/24
High-Pass Filter	micro-tranics	HPM50111	G142	2020/05/25	2021/05/24
Coaxial Cables	HUBER+SUHN ER	SUCOFLEX 104PEA-10M	10m	2020/05/25	2021/05/24
Coaxial Cables	HUBER+SUHN ER	SUCOFLEX 104PEA-3M	3m	2020/05/25	2021/05/24
Coaxial Cables	HUBER+SUHN ER	SUCOFLEX 104PEA-3M	3m	2020/05/25	2021/05/24
RF Cable	Megalon	RF-A303	N/A	2020/05/25	2021/05/24

The calibration interval was one year

## 2.5. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended to comply with Section 15.236 of the FCC Part 15, Subpart C Rules.

## 2.6. Modifications

No modifications were implemented to meet testing criteria.

### 3. TEST CONDITIONS AND RESULTS

#### 3.1. Conducted Emissions Test

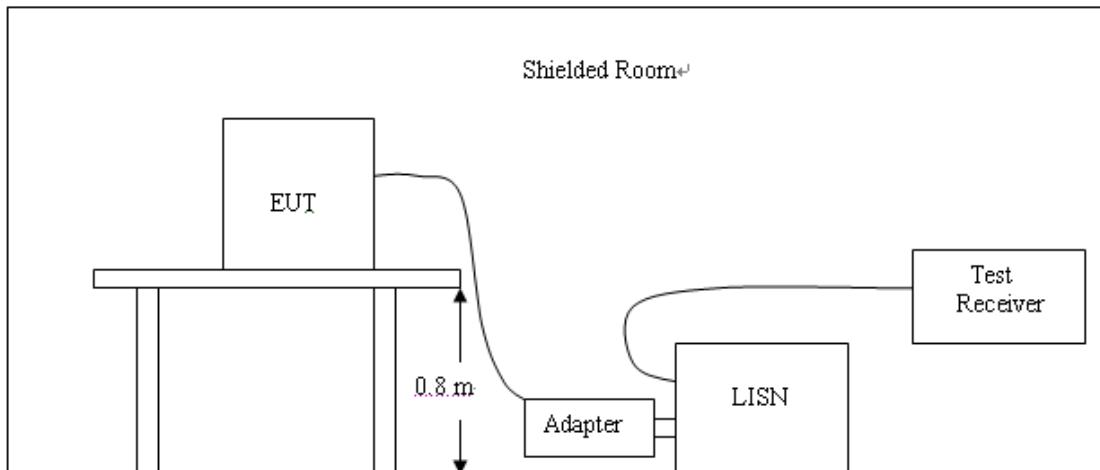
##### LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207

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

\* Decreases with the logarithm of the frequency.

##### TEST CONFIGURATION



##### TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.10:2013.
2. Support equipment, if needed, was placed as per ANSI C63.10:2013.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.10:2013.
4. The adapter received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

**TEST RESULTS**

Not applicable to this device, which is powered by battery.

### 3.2. Radiated Emissions and Band Edge

#### Limit

For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emission out of authorized band shall not exceed the following table at a 3 meters measurement distance.

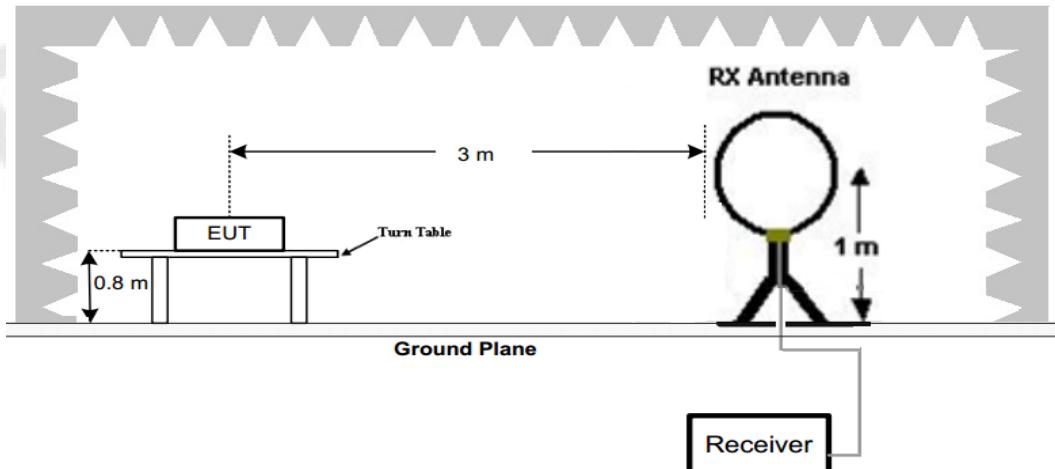
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

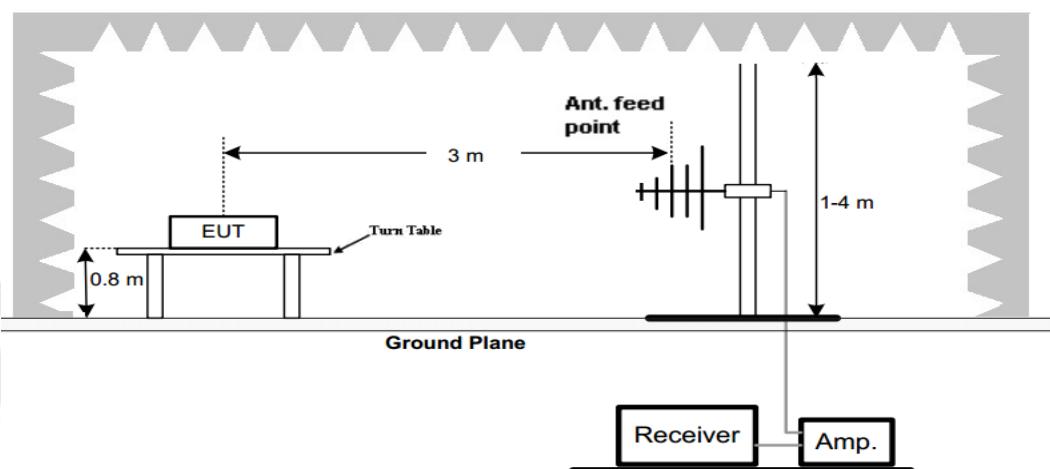
Frequency (MHz)	Distance (Meters)	Radiated (dB $\mu$ V/m)	Radiated ( $\mu$ V/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

#### TEST CONFIGURATION

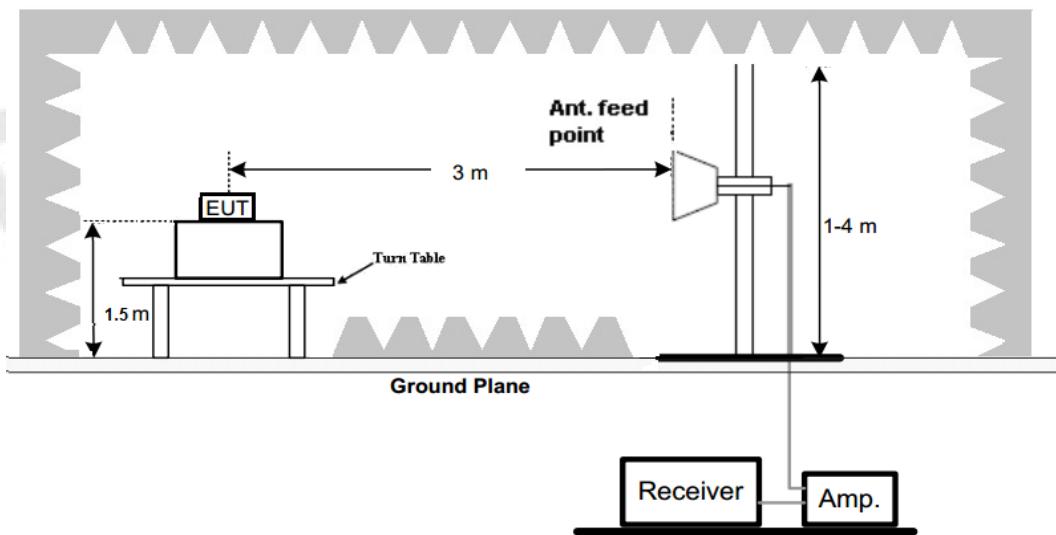
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(B) Radiated Emission Test Set-Up, Frequency below 1000MHz



(C) Radiated Emission Test Set-Up, Frequency above 1000MHz



### Test Procedure

1. Below 1GHz measurement the EUT is placed on a turntable which is 0.8m above ground plane, and above 1GHz measurement EUT was placed on a low permittivity and low loss tangent turn table which is 1.5m above ground plane.
2. Maximum procedure was performed by raising the receiving antenna from 1m to 4m and rotating the turn table from 0°C to 360°C to acquire the highest emissions from EUT
3. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
4. Repeat above procedures until all frequency measurements have been completed.

### TEST RESULTS

#### Remark:

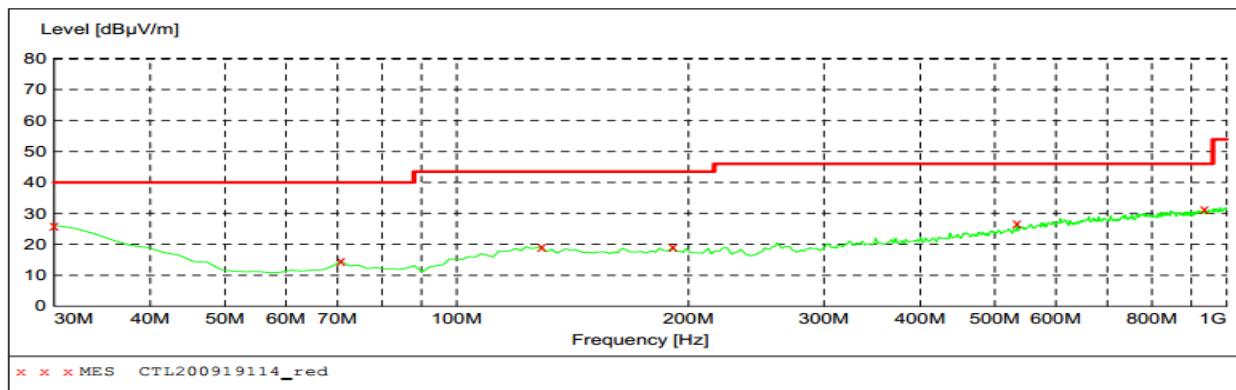
1. We measured Radiated Emission at all mode Low, Middle, and High channel from 9 KHz to 25GHz and recorded worst case at low channel.
2. For below 1GHz testing recorded worst at low channel.
3. Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

## For 30MHz-1GHz

## Horizontal

***SWEET TABLE: "test (30M-1G)"***

Short Description: Field Strength  
 Start Stop Detector Meas. IF Transducer  
 Frequency Frequency Time Bandw.  
 30.0 MHz 1.0 GHz MaxPeak 300.0 ms 100 kHz JB1

***MEASUREMENT RESULT: "CTL200919114\_red"***

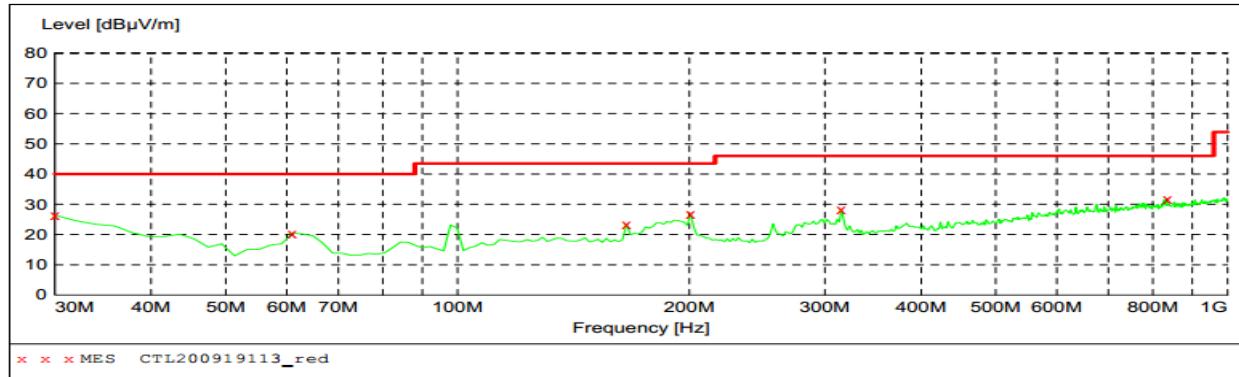
19/09/2020 10:43

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.10	22.2	40.0	13.9	---	0.0	0.00	HORIZONTAL
70.740000	14.60	9.0	40.0	25.4	---	0.0	0.00	HORIZONTAL
128.940000	19.30	15.4	43.5	24.2	---	0.0	0.00	HORIZONTAL
191.020000	19.10	14.6	43.5	24.4	---	0.0	0.00	HORIZONTAL
534.400000	26.80	21.5	46.0	19.2	---	0.0	0.00	HORIZONTAL
935.980000	31.30	27.0	46.0	14.7	---	0.0	0.00	HORIZONTAL

## Vertical

***SWEET TABLE: "test (30M-1G)"***

Short Description: Field Strength  
 Start Stop Detector Meas. IF Transducer  
 Frequency Frequency Time Bandw.  
 30.0 MHz 1.0 GHz MaxPeak 300.0 ms 100 kHz JB1

***MEASUREMENT RESULT: "CTL200919113\_red"***

19/09/2020 10:41

Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
30.000000	26.40	22.2	40.0	13.6	---	0.0	0.00	VERTICAL
61.040000	20.50	7.9	40.0	19.5	---	0.0	0.00	VERTICAL
165.800000	23.50	14.5	43.5	20.0	---	0.0	0.00	VERTICAL
200.720000	26.70	14.6	43.5	16.8	---	0.0	0.00	VERTICAL
315.180000	28.30	16.5	46.0	17.7	---	0.0	0.00	VERTICAL
835.100000	31.70	25.8	46.0	14.3	---	0.0	0.00	VERTICAL

Note: Above 1-6GHz have been tested and found no emission except floor noise.

### 3.3. Maximum Output Power

#### Limit

The maximum radiated power shall not exceed the following values:

- (1) In the bands allocated and assigned for broadcast television and in the 600 MHz service band: 50 mW EIRP
- (2) In the 600 MHz guard band and the 600 MHz duplex gap: 20 mW EIRP.

#### Test Procedure

Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the power sensor.

#### Test Configuration



#### Test Results

Type	Frequency (MHz)	Output power (dBm)	Ant. Gain (dBi)	EIRP (dBm)	Limit (dBm)	Result
FM	203	6.185	0	6.185	17	Pass
FM	209	5.325	0	5.325	17	Pass
FM	215	6.243	0	6.243	17	Pass

Note: 1. The test results including the cable loss.

### 3.4. Occupied Bandwidth

#### Limit

One or more adjacent 25 kHz segments within the assignable frequencies may be combined to form a channel whose maximum bandwidth shall not exceed 200 kHz. The operating bandwidth shall not exceed 200 kHz.

#### Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 3 KHz RBW and 10 KHz VBW.

#### Test Configuration



#### Test Results

Modulation	Frequency (MHz)	99% OBW (KHz)	Limit (KHz)	Result
FM	203	63.762	200	Pass
FM	209	58.994	200	Pass
FM	215	64.285	200	Pass

Test plot as follows:

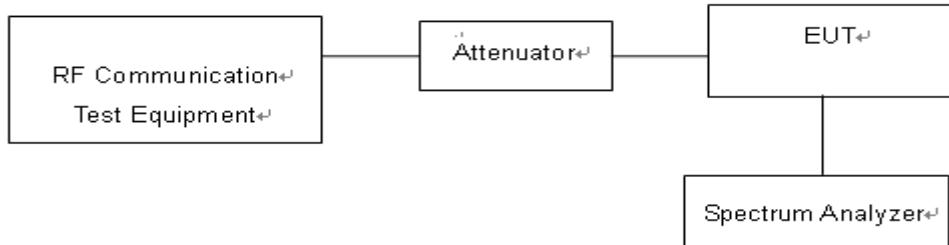


### 3.5. Necessary Bandwidth

#### LIMIT

Analog emissions within the band from one megahertz below to one megahertz above the carrier frequency shall comply with the emission mask in Section 8.3.1.2 of the European Telecommunications Institute Standard ETSI EN 300 422-1 v1.4.2 (2011-08).

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. With the Low Frequency (LF) audio signal generator set to 500 Hz, the audio input level to the EUT shall be Adjusted to 8 dB below the limiting threshold (-8dB limit) as declared by the manufacturer.
2. The corresponding audio output level from the demodulator shall be measured and recorded.
3. The input impedance of the noise meter shall be sufficiently high to avoid more than 0.1 dB changes in input level when the meter is switched between input and output.
4. The audio input level shall be increased by 20 dB, i.e. to 12 dB (lim), and the corresponding change in output level shall be measured.
5. It shall be checked that the audio output level has increased by  $\leq 0$  dB.
6. If the step 5 is not met, the initial audio input level shall be increased from -8 dB (lim) in 1 dB steps until the above condition is fulfilled, and the input level recorded in the test report. This level replaces the value derived from the manufacturer's declaration and is defined as -8dB (lim).
7. Measure the input level at the transmitter required to give +12 dB (lim) and record the EUT output level test plots by the spectrum analyzer.
8. The transmitter RF output spectrum shall be measured, using a spectrum analyser with the following settings:

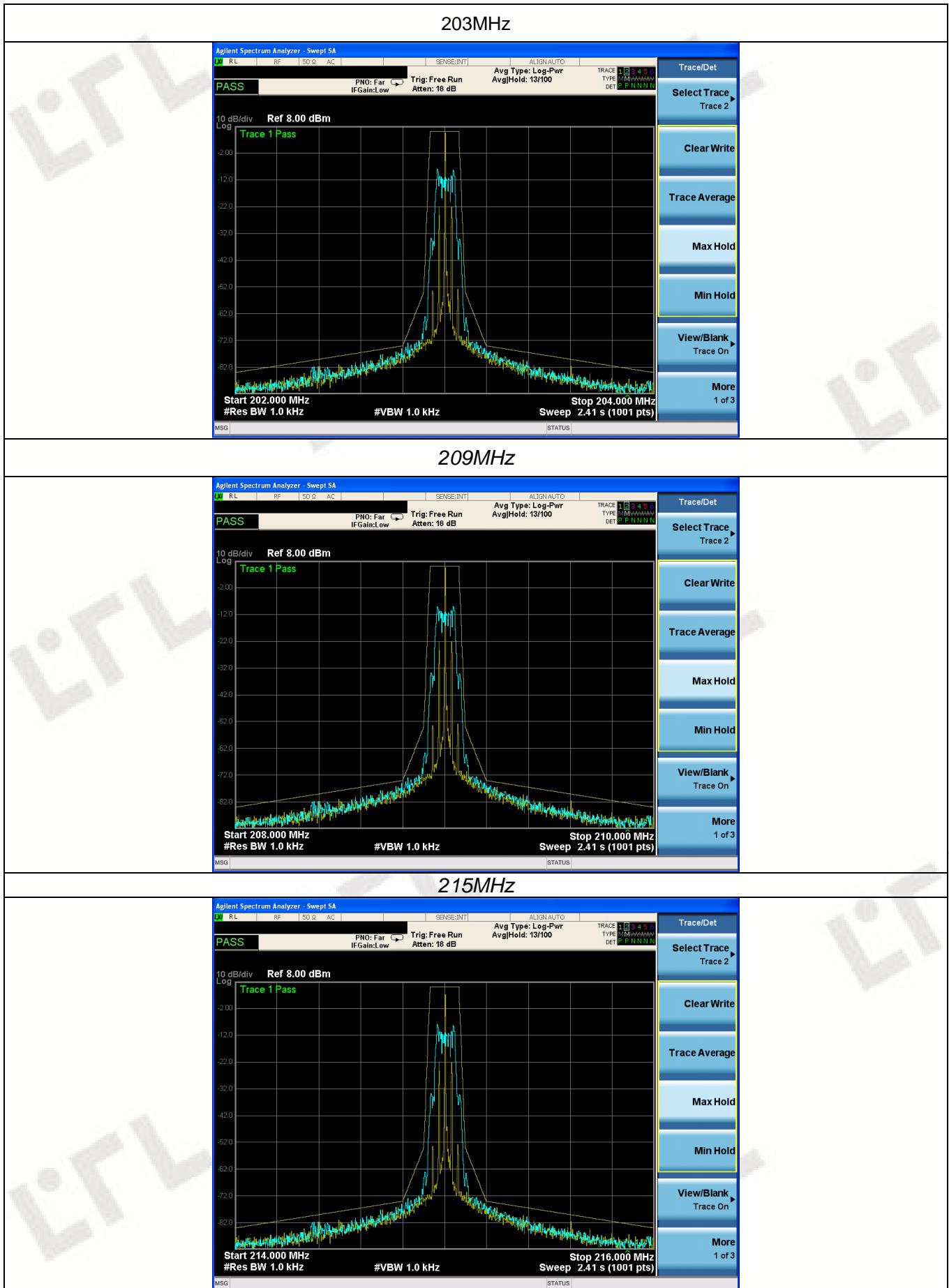
Centre frequency	Transmitter (Tx) nominal frequency
Span	fc - 1 MHz to fc + 1 MHz
Resolution BandWidth (RBW)	1 kHz
Video BandWidth(VBW)	1 kHz
Detector	Peak hold

#### TEST RESULTS

##### **Note:**

	Bandwidth(B)	B/2	0.35B
Manufacturer declare	200 KHz	100 KHz	0.70 KHz

#### TEST RESULTS



### 3.6. Transmitter spurious emissions

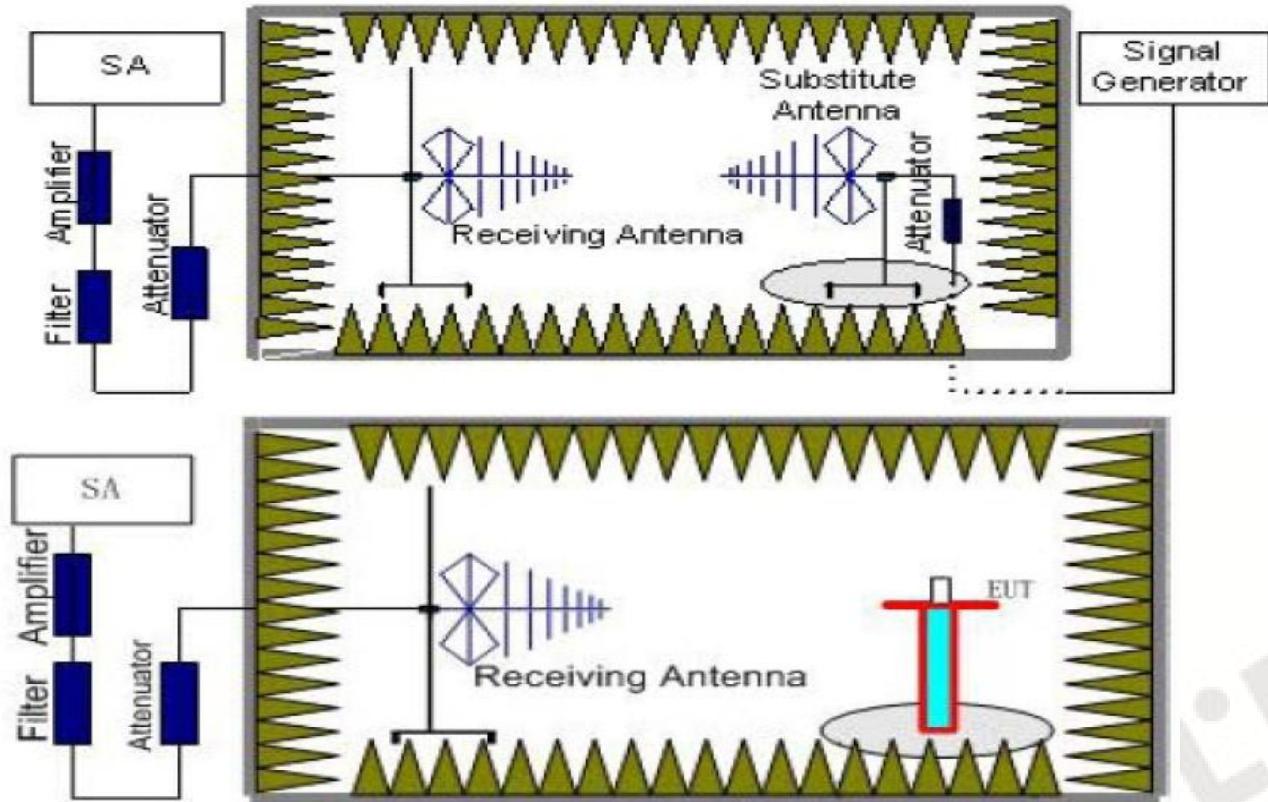
#### Limit

Spurious emissions are emissions outside the frequency range(s) of the equipment. The power of the spurious emissions shall not exceed the limits of table as below:

State	Frequency		
	47 MHz to 74 MHz 87,5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies below 1 000 MHz	Frequencies above 1 000 MHz
Operation	4 nW	250 nW	1 $\mu$ W
Standby	2 nW	2 nW	20 nW

#### Test Configuration

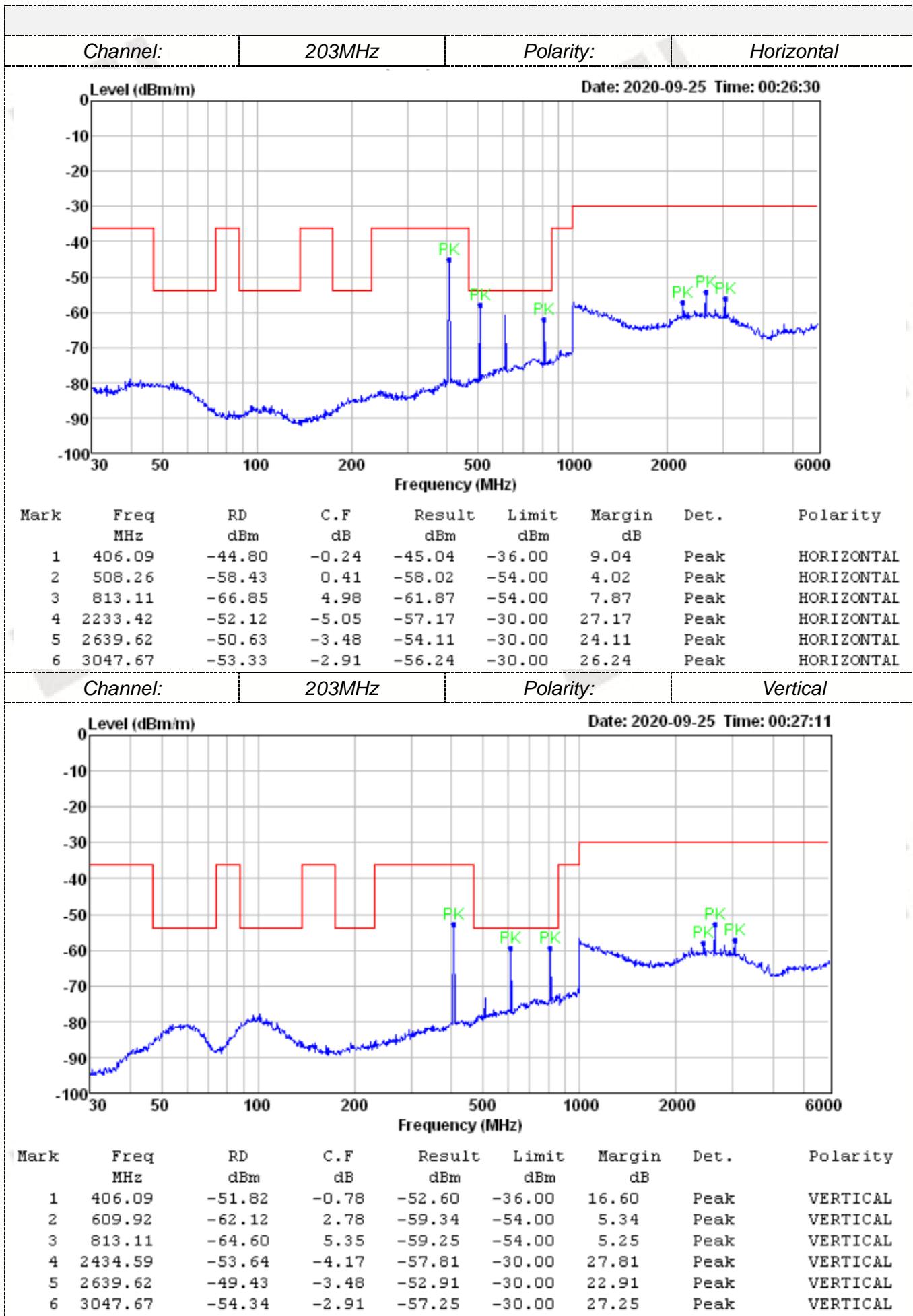
##### Effective Radiated Power measurement (30 MHz to 12.75 GHz)

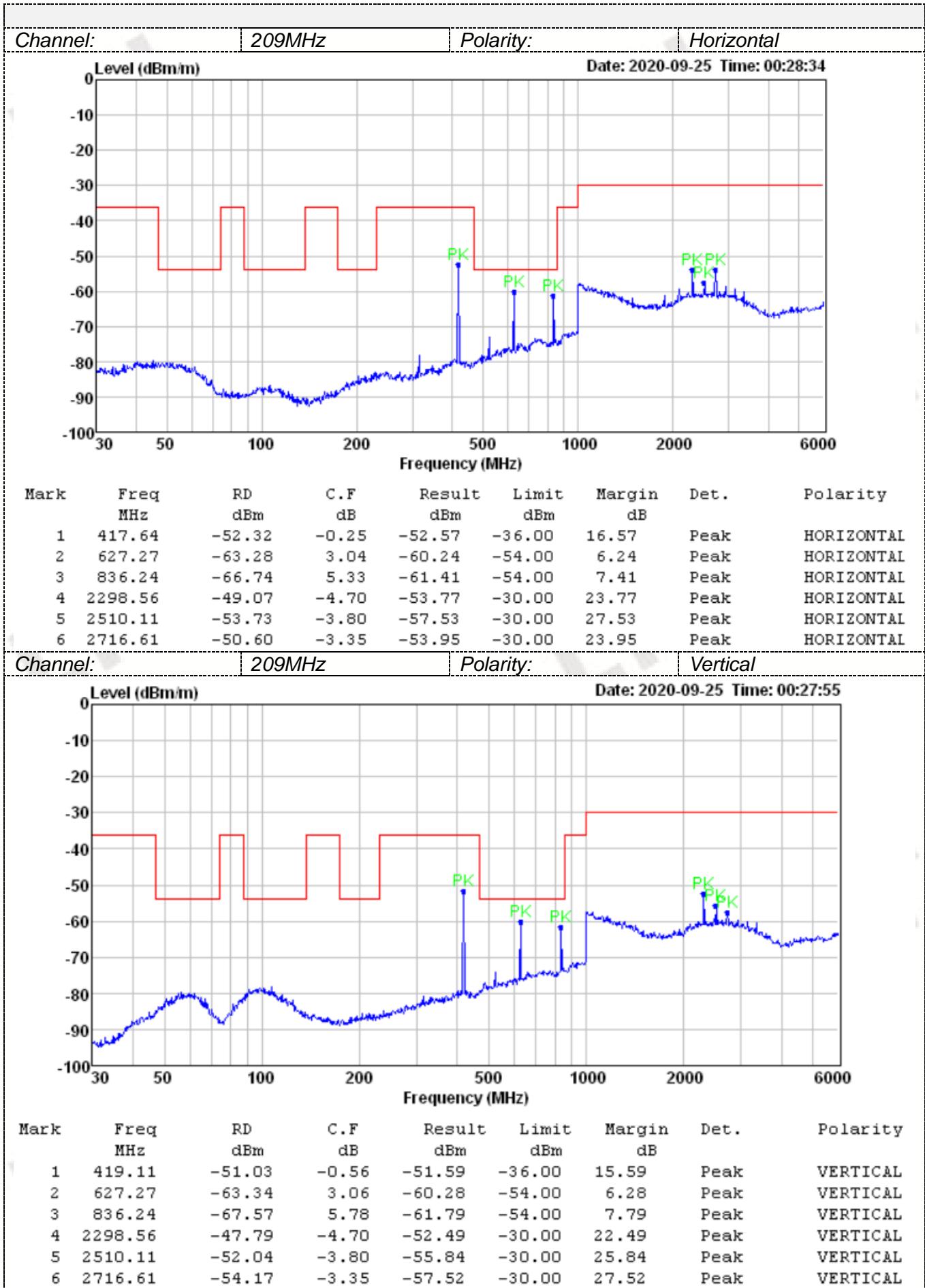


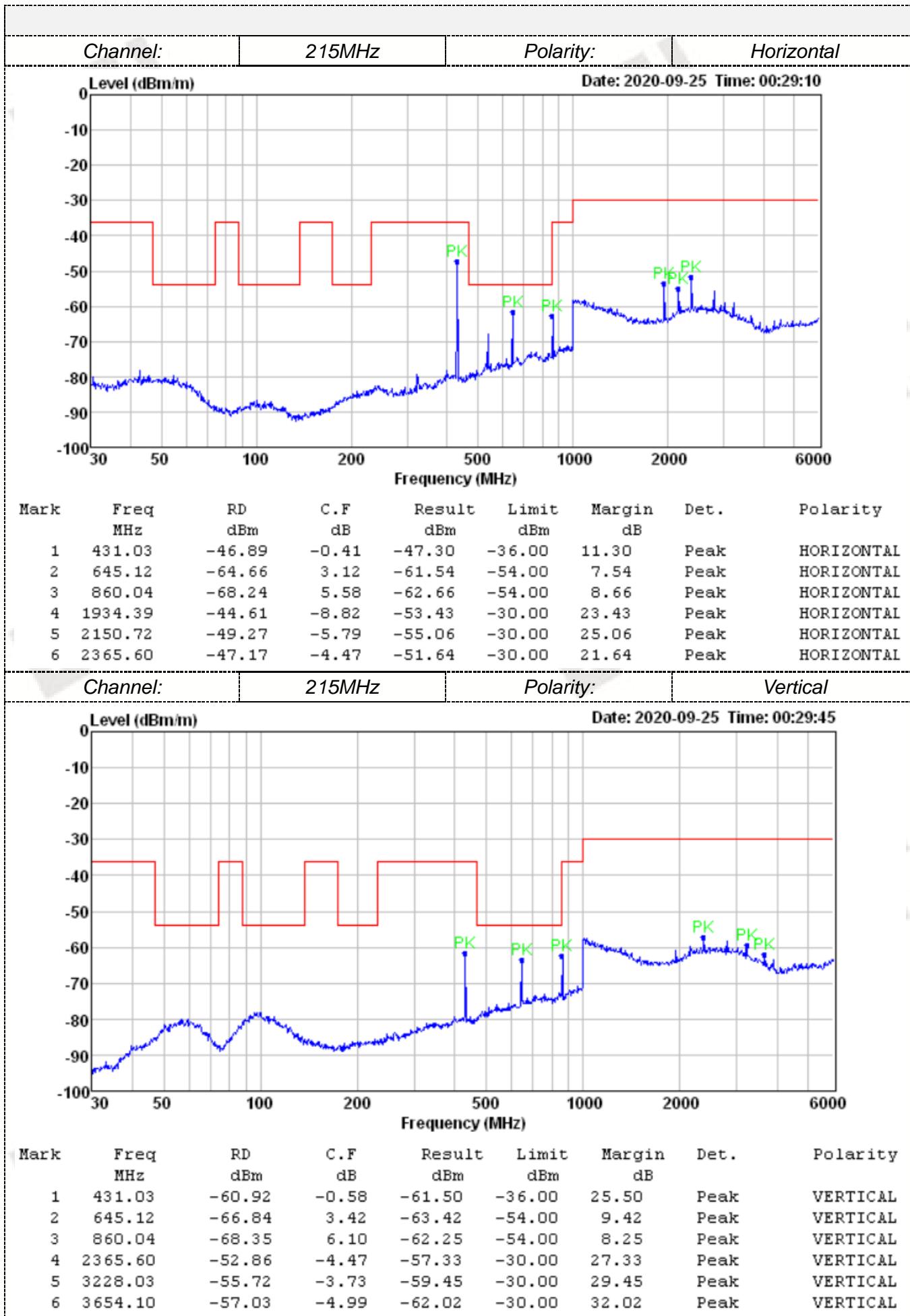
#### TEST PROCEDURE

1. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 6.1 for the test conditions.
2. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 8.4.2 for the measurement method.

#### Test Results







### 3.7. Frequency Stability

#### Limit

The frequency tolerance of the carrier signal shall be maintained within  $\pm 0.005\%$  of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. Battery operated equipment shall be tested using a new battery.

#### Test Procedure

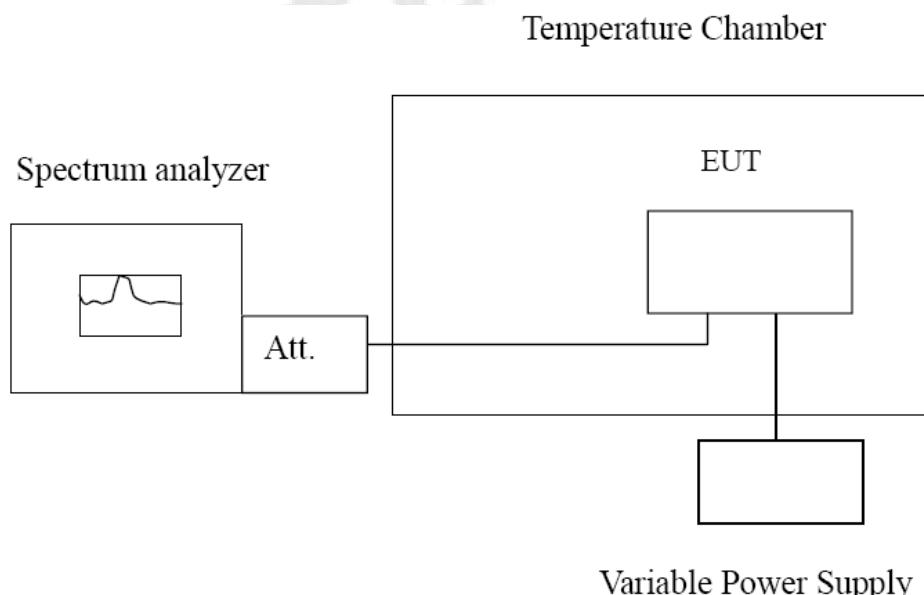
##### **a) Frequency stability versus environmental temperature**

1. Setup as Test Configuration for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used.
2. Turn on EUT and set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 3 kHz, VBW to 10kHz and frequency span to 500 kHz. Record this frequency to be a reference.
3. Set the temperature of chamber to 50°C. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize. While maintaining a constant temperature inside the chamber, turn the EUT on and measure the EUT operating frequency.
4. Repeat step 2 with a 10°C decreased per stage until the lowest temperature -20°C is measured, record all measurement frequencies.

##### **b) Frequency stability versus input voltage**

1. Setup as Test Configuration for frequencies measured at ambient temperature if it is within 15°C to 25°C. Otherwise, an environmental chamber set for a temperature of 20°C shall be used. Install new batteries in the EUT.
2. Set SA center frequency to the right frequency needs to be measured. Then set SA RBW to 3kHz, VBW to 10kHz and frequency span to 500 kHz. Record this frequency to be a reference.
3. For non hand carried, battery operated device, supply the EUT primary voltage with 85 and 115 percent of the nominal value and record the frequency.

#### Test Configuration



**Test Results**

Reference Frequency: 203MHz					
Voltage ( V )	Temperature (°C)	Frequency error (MHz)	Frequency Tolerance (%)	Limit (%)	Result
3.0	-20	-0.00939	-0.00463%	±0.005	PASS
	-10	-0.00961	-0.00473%		
	0	-0.00912	-0.00449%		
	10	-0.00924	-0.00455%		
	20	-0.00982	-0.00484%		
	30	-0.00935	-0.00461%		
	40	-0.00883	-0.00435%		
	50	-0.00824	-0.00406%		
3.45	25	-0.00926	-0.00456%		
2.55	25	-0.00863	-0.00425%		

Reference Frequency: 209MHz					
Voltage ( V )	Temperature (°C)	Frequency error (MHz)	Frequency Tolerance (%)	Limit (%)	Result
3.0	-20	-0.00885	-0.00436%	±0.005	PASS
	-10	-0.00844	-0.00416%		
	0	-0.00889	-0.00438%		
	10	-0.00850	-0.00419%		
	20	-0.00810	-0.00399%		
	30	-0.00879	-0.00433%		
	40	-0.00850	-0.00419%		
	50	-0.00869	-0.00428%		
3.45	25	-0.00817	-0.00402%		
2.55	25	-0.00832	-0.00410%		

Reference Frequency: 215MHz					
Voltage ( V )	Temperature (°C)	Frequency error (MHz)	Frequency Tolerance (%)	Limit (%)	Result
3.0	-20	-0.00872	-0.00430%	±0.005	PASS
	-10	-0.00885	-0.00436%		
	0	-0.00967	-0.00476%		
	10	-0.00938	-0.00462%		
	20	-0.00904	-0.00445%		
	30	-0.00826	-0.00407%		
	40	-0.00870	-0.00429%		
	50	-0.00897	-0.00442%		
3.45	25	-0.00858	-0.00423%		
2.55	25	-0.00990	-0.00488%		

### 3.8. Antenna Requirement

#### Standard Applicable

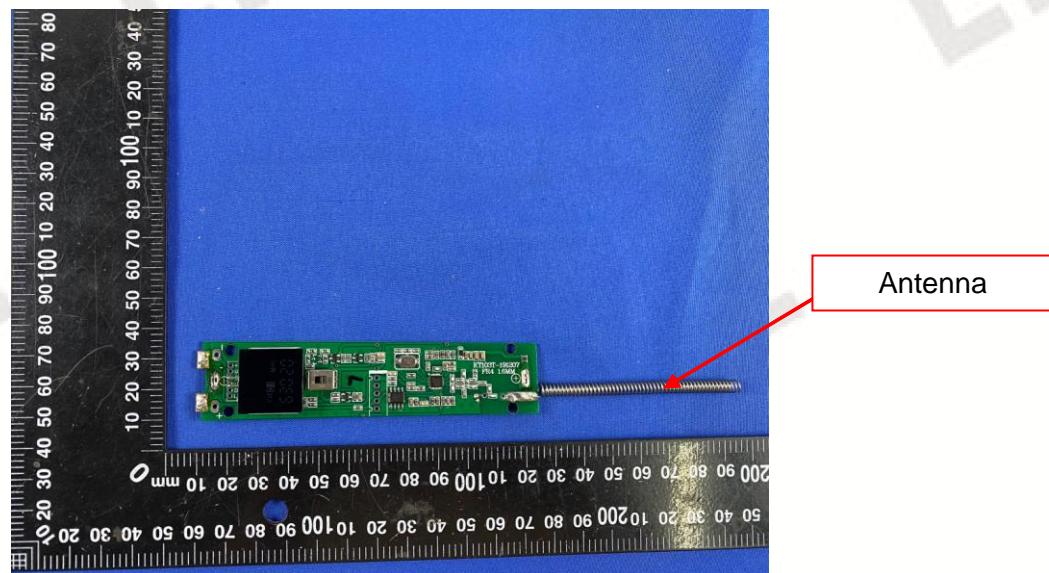
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

#### **Refer to statement below for compliance**

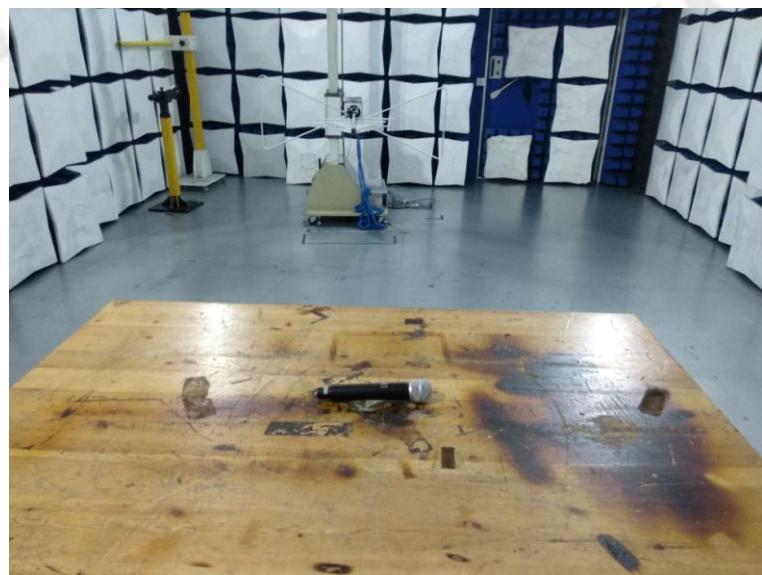
The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

#### Antenna Connected Construction

The maximum gain of antenna was 0dBi.

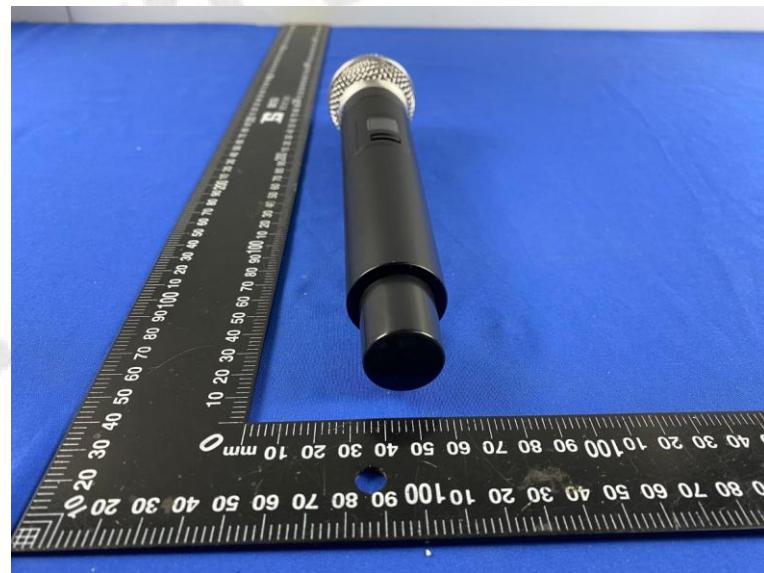
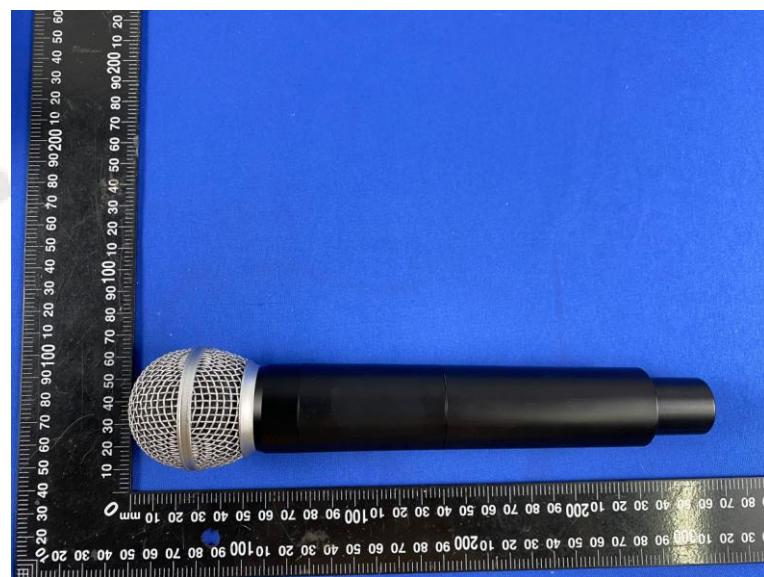
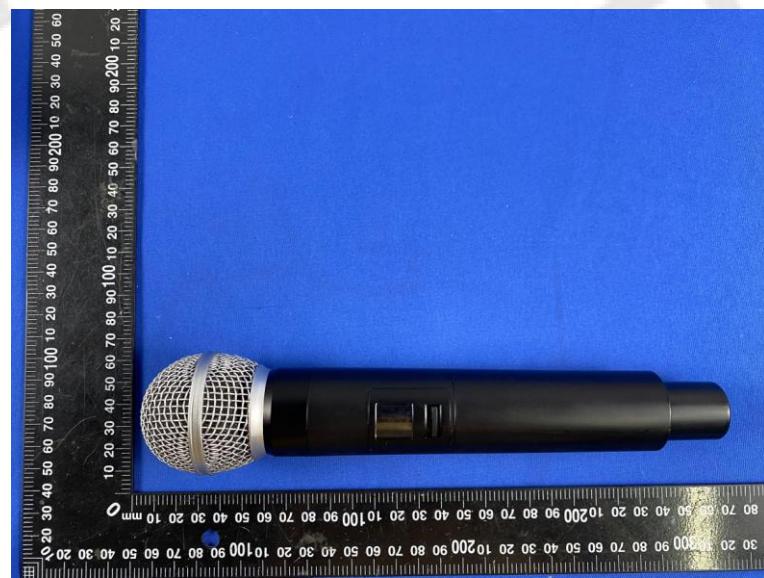


#### 4. Test Setup Photos of the EUT

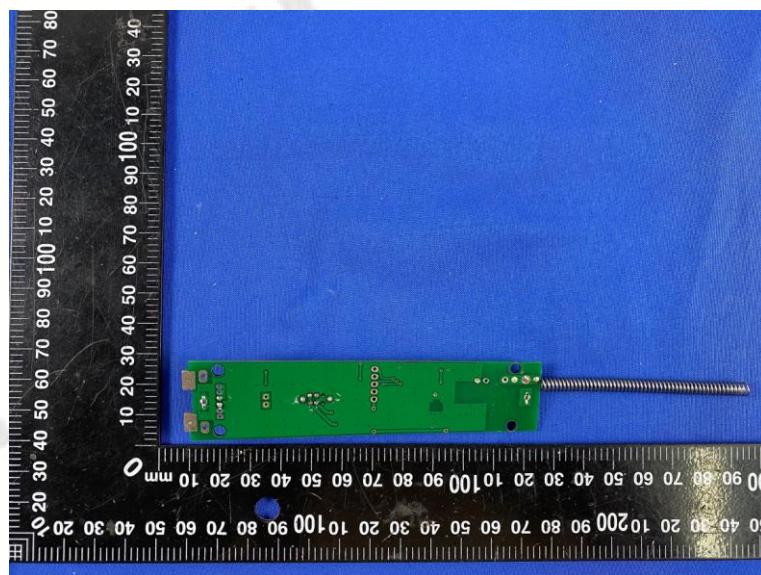
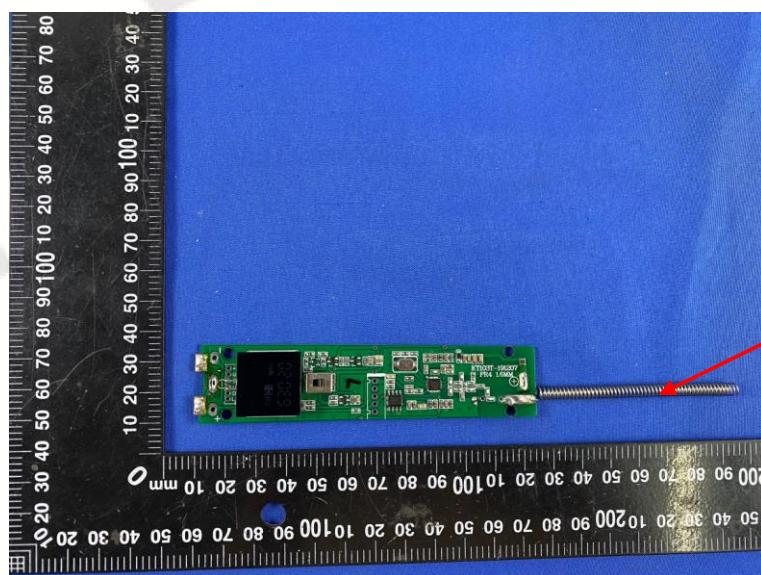


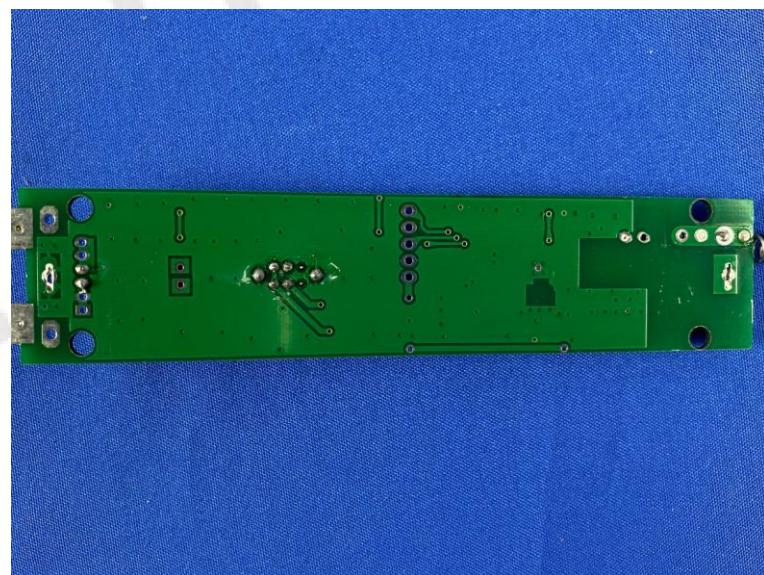
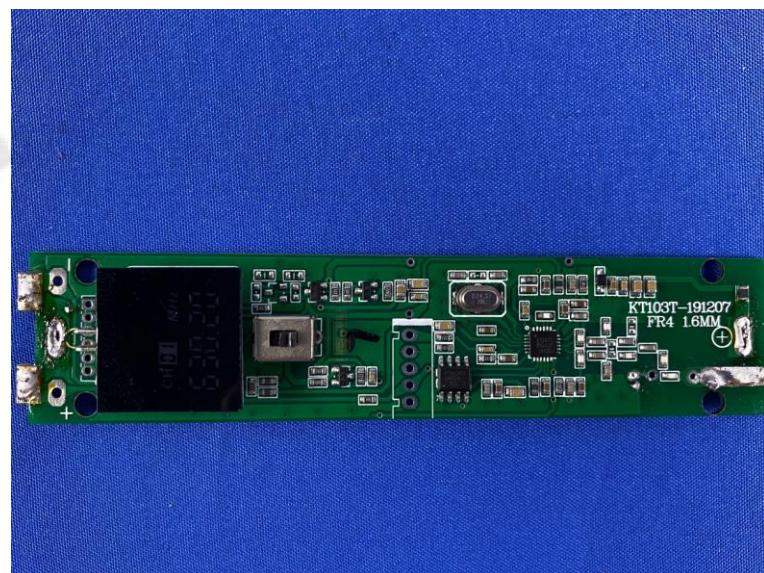
## 5. Photos of the EUT

### External Photos





Internal Photos



\*\*\*\*\* End of Report \*\*\*\*\*