



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.: CTL1905131082-WF

Compiled by: Happy Guo
(position+printed name+signature) (File administrators)

Happy Guo

Tested by: Nice Nong
(position+printed name+signature) (Test Engineer)

Nice Nong

Approved by: Ivan Xie
(position+printed name+signature) (Manager)

Ivan Xie

Product Name.....: WIRELESS MICROPHONE

Model/Type reference.....: TT508

Listed Models.....: See next page

Trade Mark.....: N/A

FCC ID.....: 2ATG4-TT508

Applicant's name.....: ENPING PHONSION ELECTRONIC FACTORY

Address of applicant.....: 2/F, No.C5-1, District 2, Enping Industrial Zone, Enping,
Guangdong, 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.....: May 15, 2019

Date of sampling.....: May 15, 2019

Date of Test Date.....: May 15, 2019–Jun. 10, 2019

Data of Issue.....: Jun. 14, 2019

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. : CTL1905131082-WF	Jun. 14, 2019 ----- Date of issue
---	---

Equipment under Test : WIRELESS MICROPHONE

Model /Type : TT508

Listed Models : TT850, TT550, TT530, TT510, TT515, TT520, TT525,
TT535, TT540, TT550, TT545, TT560, TT565,
TT570, TT575, TT-875, PK-308, PV-2728, PV-2638,
PV-1102, PV-2500, PV-2588, PV-2599, PV-2577,
PV-2928, PV-2011, PV-2878, PV-1156, PV-1157,
PV-2856, PV-2857, PV-1133, PV-2118, PV-4699,
PV-4688

Applicant : **ENPING PHONSION ELECTRONIC FACTORY**

Address : 2/F, No.C5-1, District 2, Enping Industrial Zone,
Enping, Guangdong, China.

Manufacturer : **ENPING PHONSION ELECTRONIC FACTORY**

Address : 2/F ,No.C5-1, District 2, Enping Industrial Zone,
Enping, Guangdong, China.

Test result	Pass *
--------------------	---------------

*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 ****

[illegible]

Table of Contents**Page**

1.	SUMMARY.....	5
1.1.	TEST STANDARDS.....	5
1.2.	TEST DESCRIPTION.....	5
1.3.	TEST FACILITY.....	6
1.4.	STATEMENT OF THE MEASUREMENT UNCERTAINTY.....	6
2.	GENERAL INFORMATION.....	8
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
3.	TEST CONDITIONS AND RESULTS.....	10
3.1.	CONDUCTED EMISSIONS TEST.....	10
3.2.	RADIATED EMISSIONS AND BAND EDGE.....	11
3.3.	MAXIMUM OUTPUT POWER.....	16
3.4.	OCCUPIED BANDWIDTH.....	17
3.5.	NECESSARY BANDWIDTH.....	19
3.6.	TRANSMITTER SPURIOUS EMISSIONS.....	21
3.7.	FREQUENCY STABILITY.....	23
3.8.	ANTENNA REQUIREMENT.....	25
4.	TEST SETUP PHOTOS OF THE EUT.....	26
5.	PHOTOS OF THE EUT.....	27

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

FCC PART 15.247		
FCC Part 15.207	AC Power Conducted Emission	PASS
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.: 9518B

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.: 9518B 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	±0.57 dB	(1)
Transmitter power Radiated	±2.20 dB	(1)
Conducted spurious emission 9KHz-40 GHz	±2.20 dB	(1)
Occupied Bandwidth	±0.01ppm	(1)
Radiated Emission 30~1000MHz	±4.10dB	(1)
Radiated Emission Above 1GHz	±4.32dB	(1)

Conducted Disturbance 0.15~30MHz	$\pm 3.20\text{dB}$	(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:	WIRELESS MICROPHONE
Model/Type reference:	TT508
Power supply:	DC 3.0V from battery
Modulation:	F3E
Operation frequency:	214.2MHz
Antenna type:	Internal antenna
Antenna gain:	1dBi

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 . EUT frequency range is 214.2 Mhz

2.4. Equipments Used during the Test

Test Equipment	Manufacturer	Model No.	Serial No.	Calibration Date	Calibration Due Date
LISN	R&S	ENV216	3560.6550.1 2	2019/05/25	2020/05/24
LISN	R&S	ESH2-Z5	860014/010	2019/05/25	2020/05/24
Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2019/05/25	2020/05/24
EMI Test Receiver	R&S	ESCI	1166.5950.03	2019/05/25	2020/05/24
Spectrum Analyzer	Agilent	E4407B	MY41440676	2019/05/25	2020/05/24
Spectrum Analyzer	Agilent	N9020	US46220290	2019/05/25	2020/05/24
Controller	EM Electronics	EM 1000	060859	2019/05/25	2020/05/24
Horn Antenna	Sunol Sciences Corp.	DRH-118	A062013	2019/05/25	2020/05/24
Active Loop Antenna	Da Ze	ZN30900A	/	2019/05/25	2020/05/24
Amplifier	Agilent	8449B	3008A02306	2019/05/25	2020/05/24
Amplifier	Agilent	8447D	2944A10176	2019/05/25	2020/05/24
Temperature/Humidity Meter	Gangxing	CTH-608	02	2019/05/25	2020/05/24
High-Pass Filter	micro-tranics	HPM50108	G174	2019/05/25	2020/05/24
High-Pass Filter	micro-tranics	HPM50111	G142	2019/05/25	2020/05/24
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M	10m	2019/05/25	2020/05/24
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2019/05/25	2020/05/24
Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M	3m	2019/05/25	2020/05/24
RF Cable	Megalon	RF-A303	N/A	2019/05/25	2020/05/24
Power Sensor	Agilent	U2021XA	MY5365004	2019/05/25	2020/05/24
Power Meter	Agilent	U2531A	TW53323507	2019/05/25	2020/05/24

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

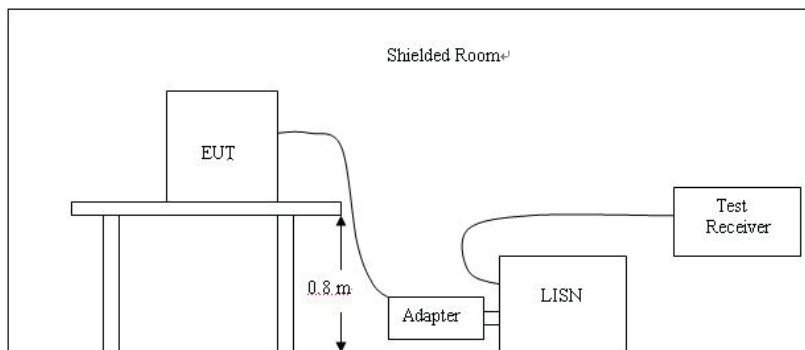
LIMIT

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

N/A

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.

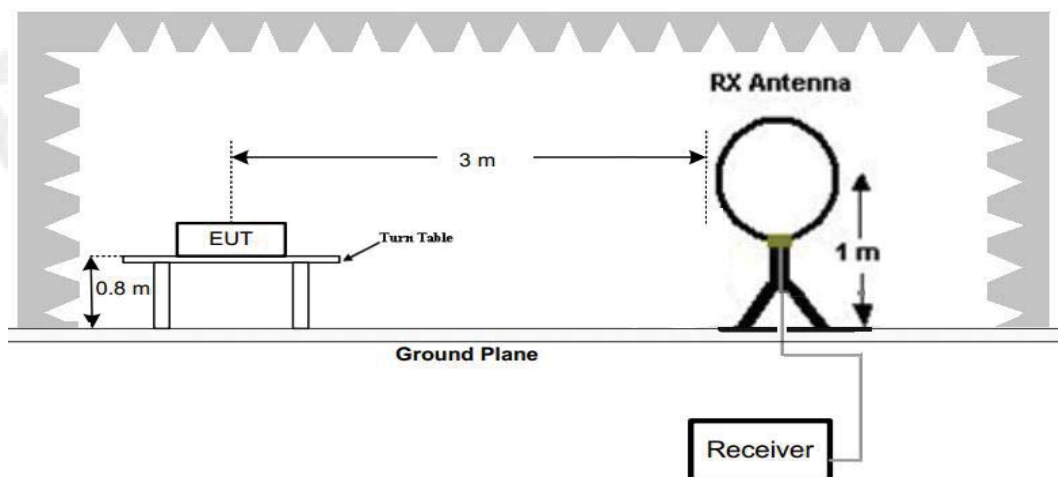
In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a)

Radiated emission limits

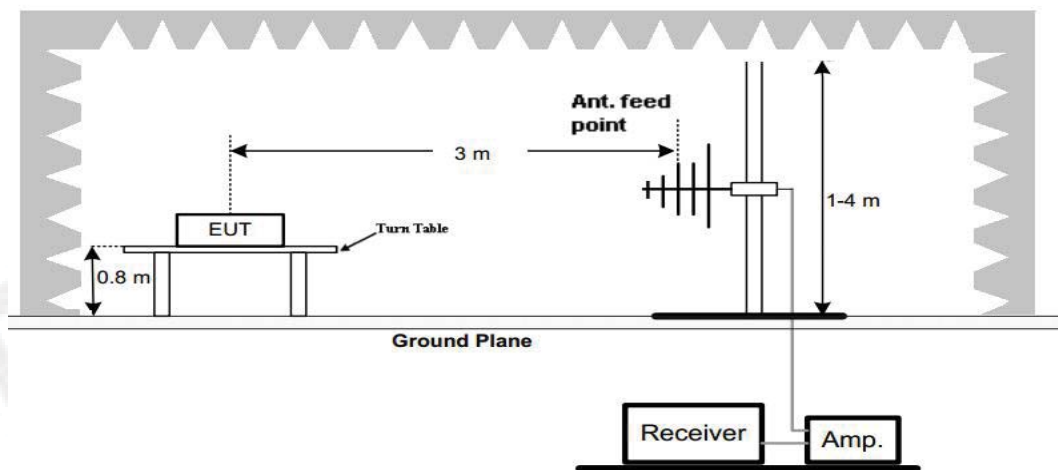
Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
0.009-0.49	3	$20\log(2400/F(\text{KHz}))+40\log(300/3)$	$2400/F(\text{KHz})$
0.49-1.705	3	$20\log(24000/F(\text{KHz}))+40\log(30/3)$	$24000/F(\text{KHz})$
1.705-30	3	$20\log(30)+40\log(30/3)$	30
30-88	3	40.0	100
88-216	3	43.5	150
216-960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

TEST CONFIGURATION

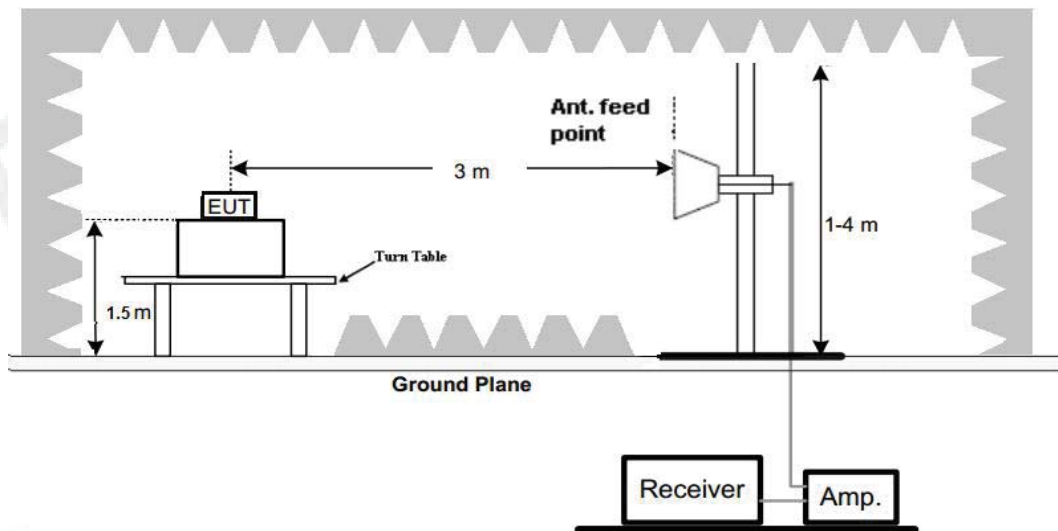
(A) Radiated Emission Test Set-Up, Frequency Below 30MHz



(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° to 360° 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:

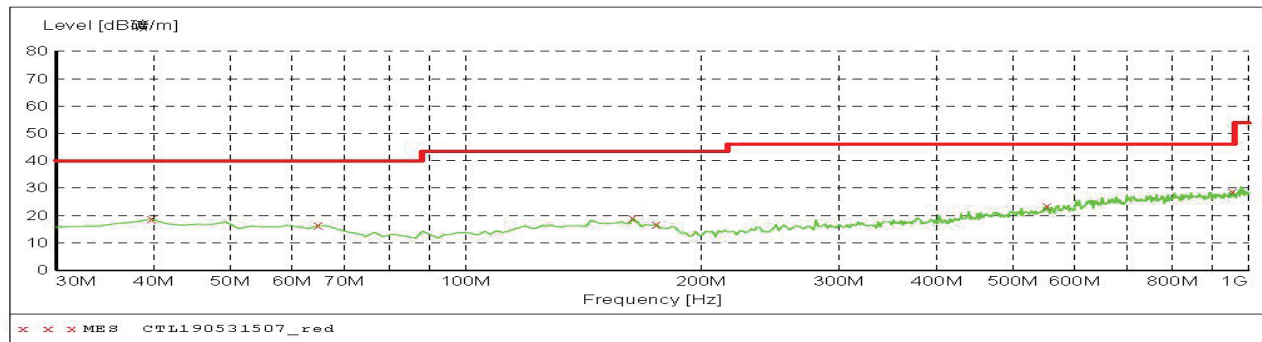
Radiated emission test from 9 KHz to 10th harmonic of fundamental was verified, and no emission found except system noise floor in 9 KHz to 30MHz and not recorded in this report.

For 30MHz-1GHz

Horizontal

SWEEP 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	120 kHz	VULB9168



MEASUREMENT RESULT: "CTL190531507_red"

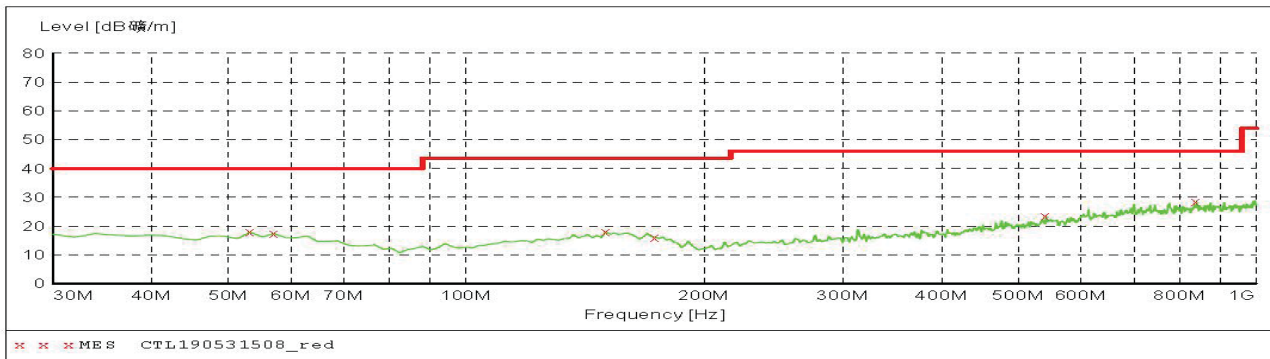
2019-5-31 9:26

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
39.700000	18.70	14.8	40.0	21.3	---	0.0	0.00	HORIZONTAL
64.920000	16.40	12.4	40.0	23.6	---	0.0	0.00	HORIZONTAL
163.860000	18.90	14.8	43.5	24.6	---	0.0	0.00	HORIZONTAL
175.500000	16.70	13.4	43.5	26.8	---	0.0	0.00	HORIZONTAL
553.800000	23.40	19.2	46.0	22.6	---	0.0	0.00	HORIZONTAL
955.380000	28.70	24.3	46.0	17.3	---	0.0	0.00	HORIZONTAL

Vertical

SWEEP 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	120 kHz	VULB9168



MEASUREMENT RESULT: "CTL190531508_red"

2019-5-31 9:27

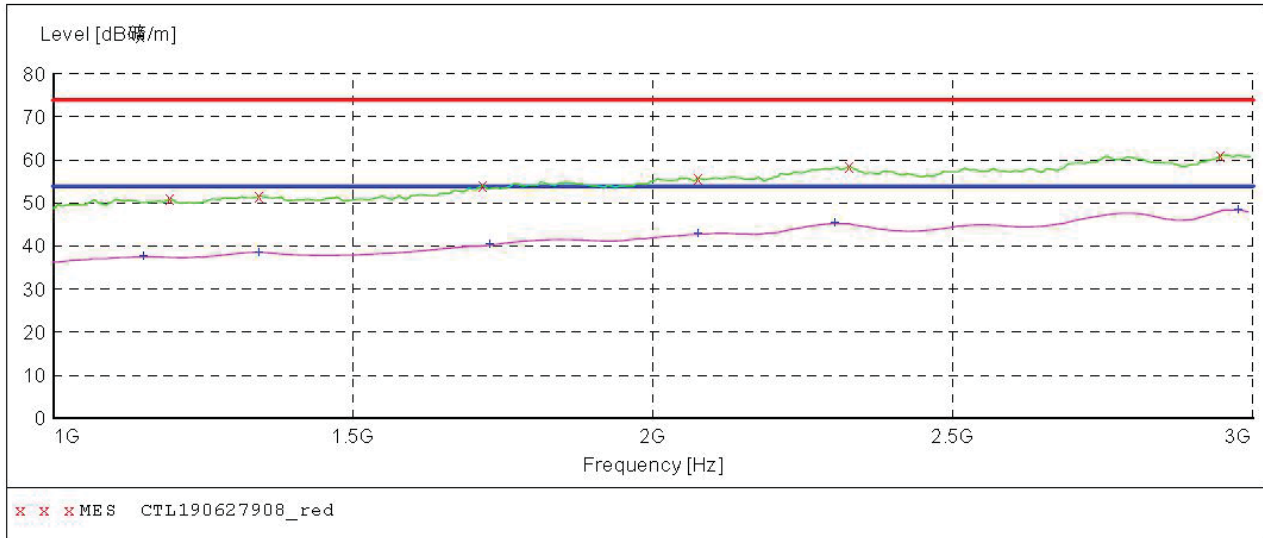
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
53.280000	17.90	13.9	40.0	22.1	---	0.0	0.00	VERTICAL
57.160000	17.40	13.6	40.0	22.6	---	0.0	0.00	VERTICAL
150.280000	18.10	15.2	43.5	25.4	---	0.0	0.00	VERTICAL
173.560000	16.20	13.7	43.5	27.3	---	0.0	0.00	VERTICAL
542.160000	23.70	19.0	46.0	22.3	---	0.0	0.00	VERTICAL
840.920000	28.50	23.0	46.0	17.5	---	0.0	0.00	VERTICAL

. For 1GHz-3GHz

Horizontal

SWEEP TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
Start Stop Detector Meas. IF Transducer
Frequency Frequency Time Bandw.
1.0 GHz 6.0 GHz MaxPeak 5.0 s 1 MHz DRH-118 Horizontal
Average

***MEASUREMENT RESULT: "CTL190627908_red"***

2019-6-27 21:38

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1196.000000	51.10	25.0	73.9	22.8	---	0.0	0.00	HORIZONTAL
1344.000000	51.60	25.4	73.9	22.3	---	0.0	0.00	HORIZONTAL
1716.000000	54.30	27.2	73.9	19.6	---	0.0	0.00	HORIZONTAL
2076.000000	55.80	29.1	73.9	18.1	---	0.0	0.00	HORIZONTAL
2328.000000	58.50	30.0	73.9	15.4	---	0.0	0.00	HORIZONTAL
2948.000000	61.20	31.1	73.9	12.7	---	0.0	0.00	HORIZONTAL

MEASUREMENT RESULT: "CTL190627908_red2"

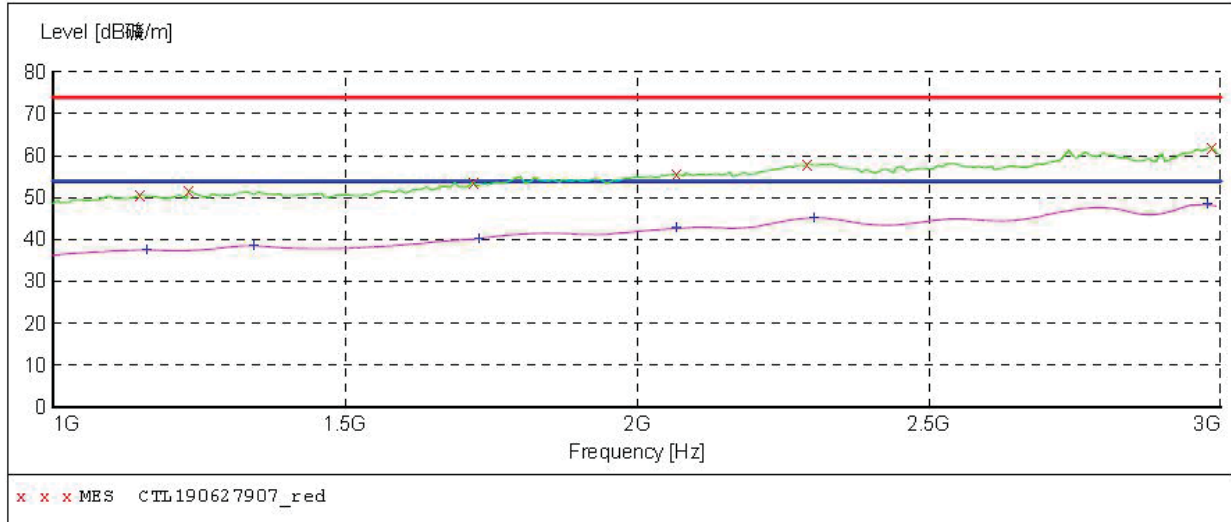
2019-6-27 21:38

Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1152.000000	37.60	24.9	53.9	16.3	---	0.0	0.00	HORIZONTAL
1344.000000	38.50	25.4	53.9	15.4	---	0.0	0.00	HORIZONTAL
1728.000000	40.30	27.3	53.9	13.6	---	0.0	0.00	HORIZONTAL
2076.000000	42.80	29.1	53.9	11.1	---	0.0	0.00	HORIZONTAL
2304.000000	45.30	29.9	53.9	8.6	---	0.0	0.00	HORIZONTAL
2976.000000	48.40	31.1	53.9	5.5	---	0.0	0.00	HORIZONTAL

Vertical

SWEEP TABLE: "test (1G-18G) P"

Short Description: EN 55022 Field Strength
 Start Stop Detector Meas. IF Transducer
 Frequency Frequency Time Bandw.
 1.0 GHz 6.0 GHz MaxPeak 5.0 s 1 MHz DRH-118 Horizontal
 Average

**MEASUREMENT RESULT: "CTL190627907_red"**

2019-6-27 21:33

Frequency MHz	Level dB 磁/m	Transd dB	Limit dB 磁/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1148.000000	50.70	24.9	73.9	23.2	---	0.0	0.00	VERTICAL
1232.000000	51.70	25.1	73.9	22.2	---	0.0	0.00	VERTICAL
1720.000000	53.70	27.2	73.9	20.2	---	0.0	0.00	VERTICAL
2068.000000	55.60	29.1	73.9	18.3	---	0.0	0.00	VERTICAL
2292.000000	58.10	29.9	73.9	15.8	---	0.0	0.00	VERTICAL
2984.000000	62.10	31.1	73.9	11.8	---	0.0	0.00	VERTICAL

MEASUREMENT RESULT: "CTL190627907_red2"

2019-6-27 21:33

Frequency MHz	Level dB 磁/m	Transd dB	Limit dB 磁/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1160.000000	37.50	24.9	53.9	16.4	---	0.0	0.00	VERTICAL
1344.000000	38.50	25.4	53.9	15.4	---	0.0	0.00	VERTICAL
1728.000000	40.20	27.3	53.9	13.7	---	0.0	0.00	VERTICAL
2068.000000	42.60	29.1	53.9	11.3	---	0.0	0.00	VERTICAL
2304.000000	45.20	29.9	53.9	8.7	---	0.0	0.00	VERTICAL
2976.000000	48.40	31.1	53.9	5.5	---	0.0	0.00	VERTICAL

3.3. Maximum Output Power

Limit

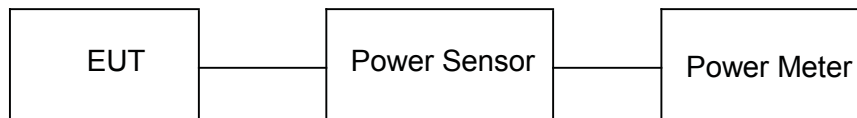
The maximum radiated power shall not exceed the following values:

- (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
F3E	214.2	-4.086	1.00	-3.086	17	Pass

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

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.

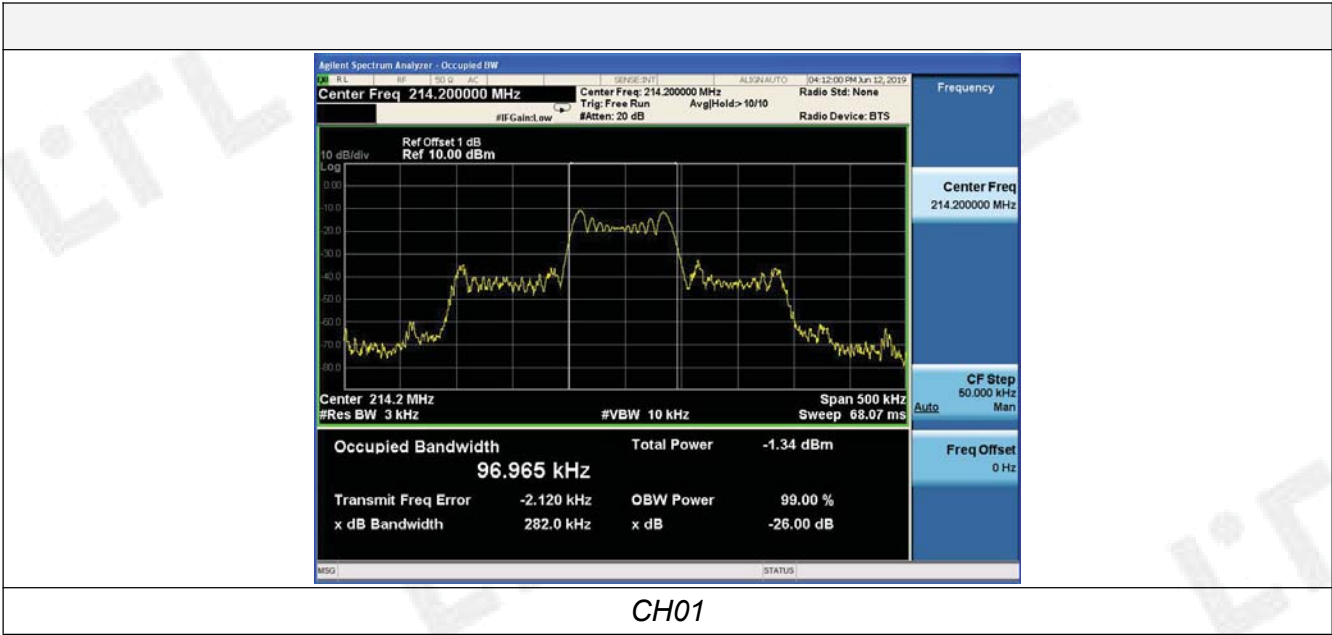
Test Configuration



Test Results

Modulation	Frequency(MHz)	99% OBW (KHz)	Limit (KHz)	Result
F3E	214.2	96.965	200	Pass

Test plot as follows:



3.5. Necessary Bandwidth

LIMIT

Limits

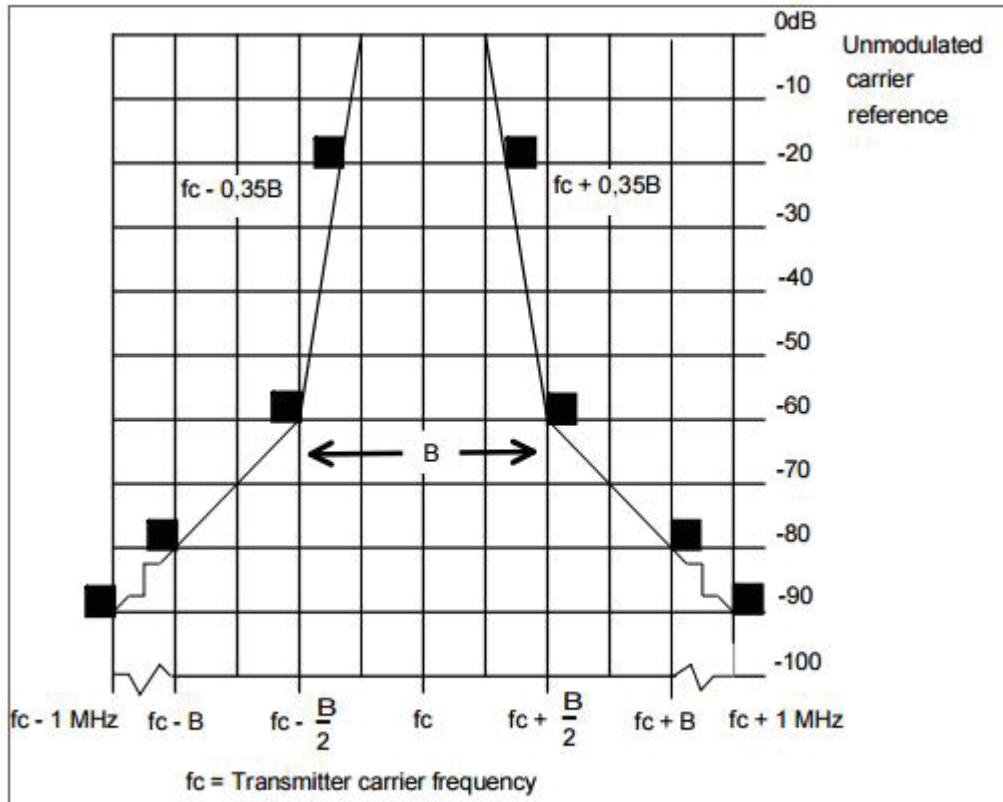


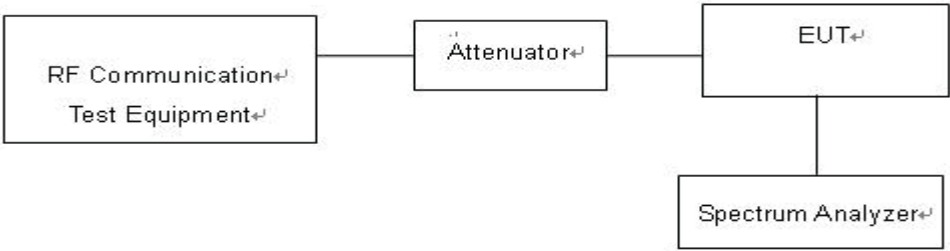
Figure 3: Spectrum mask for analogue systems in all bands

Spectrum mask for analogue systems in all bands

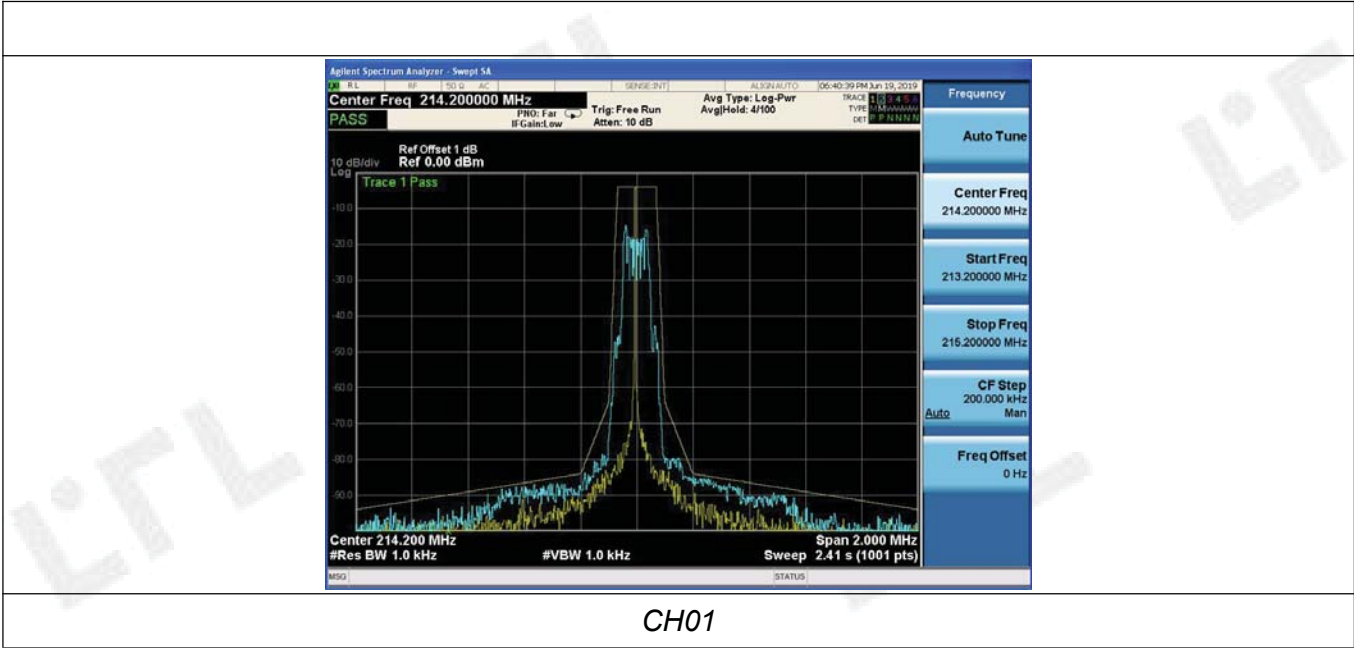
The operating bandwidth shall not exceed 200 kHz.

Test equipment used: ETSTW-RE 055 , ETSTW-RE 072, ETSTW-RE 050(g) 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 of ETSI EN 300 422–1 V1.4.2 (2011–08) (incorporated by reference, see § 15.38). Emissions outside this band shall comply with the limit specified at the edges of the ETSI mask.

TEST CONFIGURATION



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:

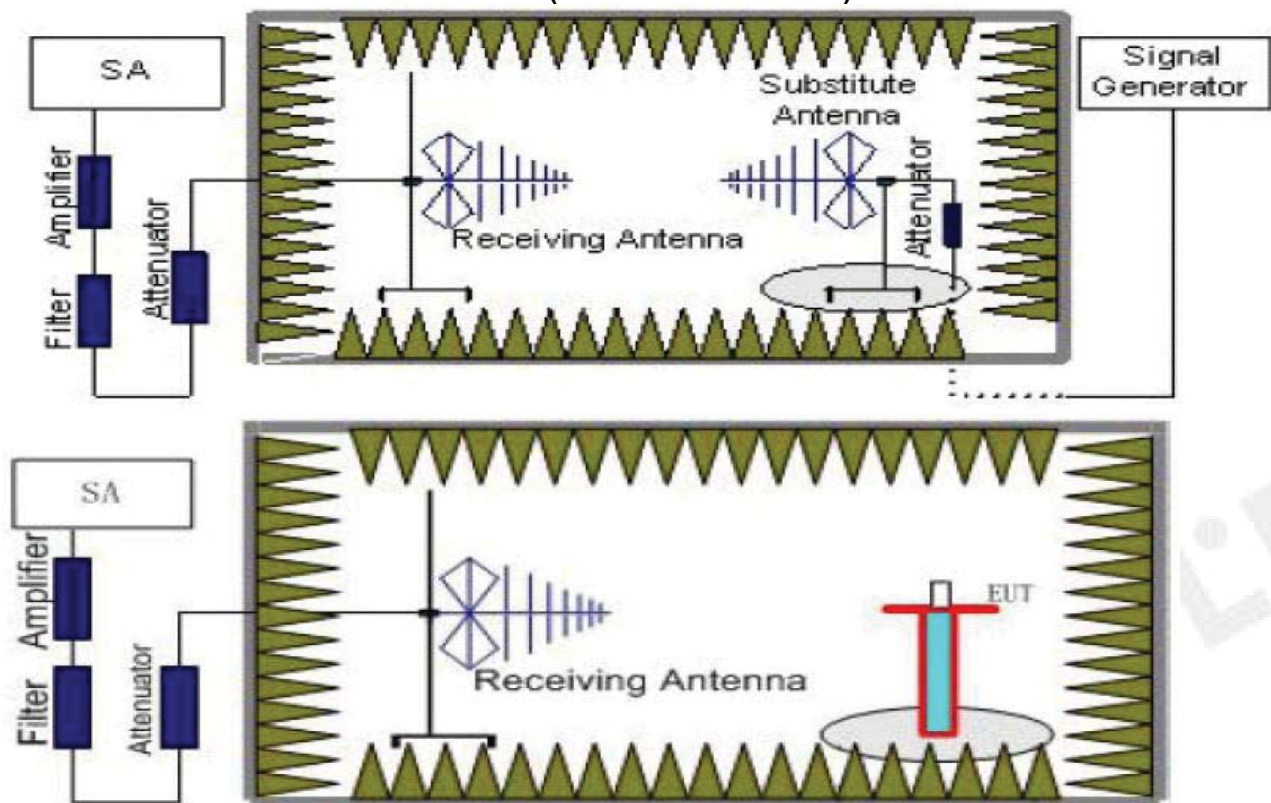
State	Frequency		
	47 MHz to 74 MHz 87.5 MHz to 137 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	Other Frequencies below 1 000 MHz	Frequencies above 1 000 MHz
Operation	4 nW	250 nW	1 μ W
Standby	2 nW	2 nW	20 nW

Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. Set spectrum analyzer start 2400MHz to 2483.5MHz with 100 KHz RBW and 300 KHz VBW.

Test Configuration

Effective Radiated Power measurement (30 MHz to 12.75 GHz)



TEST PROCEDURE

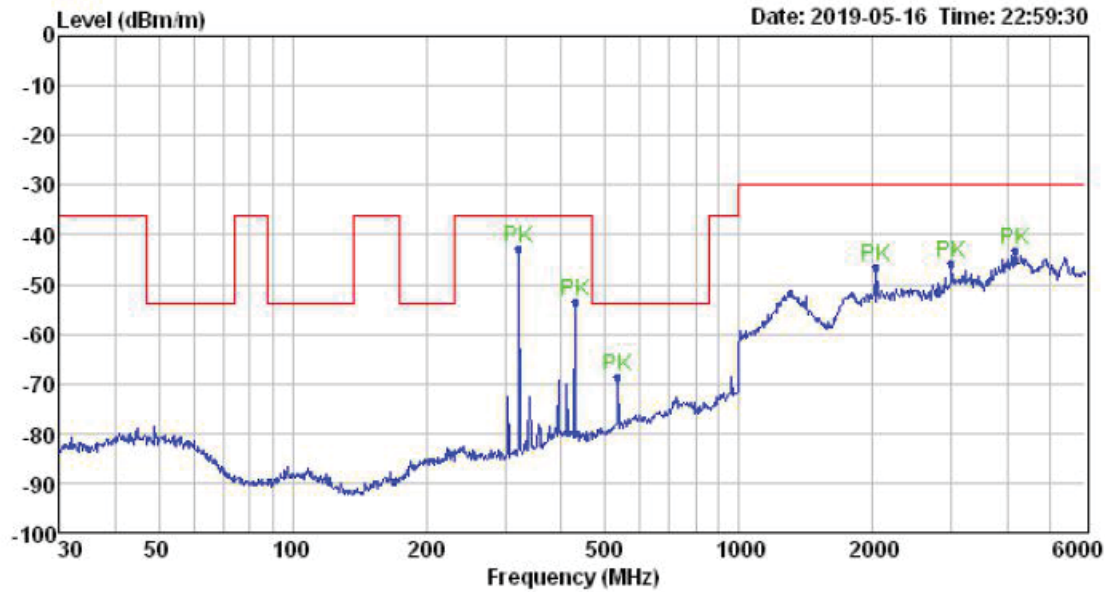
1. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 6.1 for the test conditions.
2. Please refer to ETSI EN 300 422-1 V1.4.2 (2011-08) clause 8.4.2 for the measurement method.

Test Results

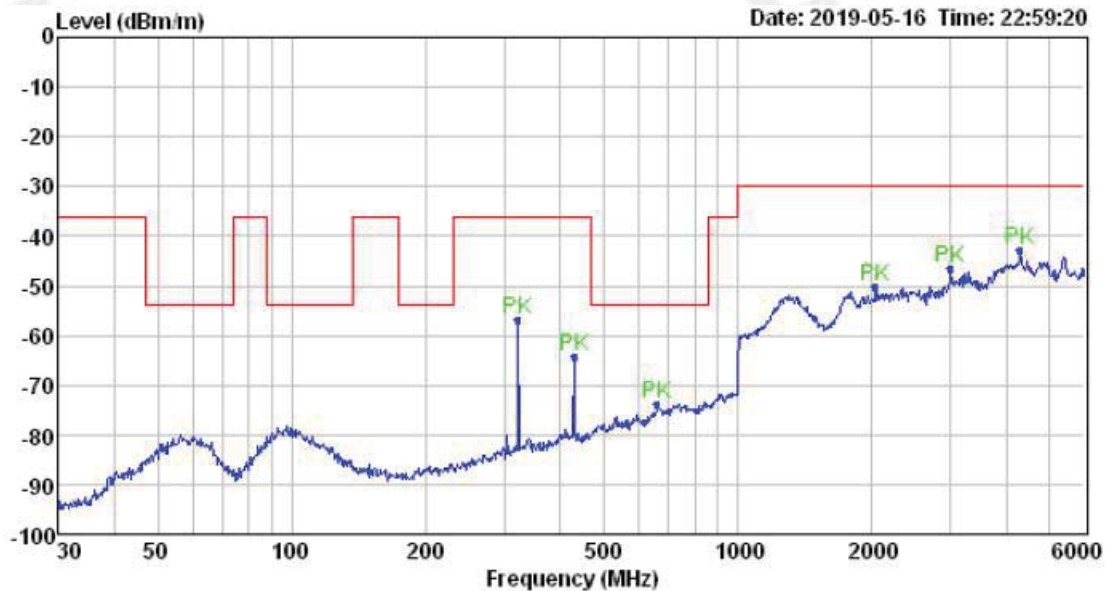
Data: 611

File: E:\E3 TEST DATA\3 tsst 2019.EM6 (612)

Date: 2019-05-16 Time: 22:59:30



Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Det.	Polarization
1	321.06	-42.95	-3.21	-39.74	-35.99	6.96	Peak	HORIZONTAL
2	429.52	-53.57	-0.38	-53.19	-35.99	17.58	Peak	HORIZONTAL
3	535.71	-68.73	0.99	-69.72	-53.99	14.74	Peak	HORIZONTAL
4	2034.20	-46.65	13.08	-59.73	-29.99	16.66	Peak	HORIZONTAL
5	2998.78	-45.81	15.92	-61.73	-29.99	15.82	Peak	HORIZONTAL
6	4181.24	-43.24	21.62	-64.86	-29.99	13.25	Peak	HORIZONTAL



Mark	Frequency MHz	Level dBm	Factor dB	Reading dBm	Limit dB	Margin dB	Det.	Polarization
1	321.06	-56.95	-2.30	-54.65	-35.99	20.96	Peak	VERTICAL
2	429.52	-64.30	-0.57	-63.73	-35.99	28.31	Peak	VERTICAL
3	661.15	-73.68	3.37	-77.05	-53.99	19.69	Peak	VERTICAL
4	2034.20	-50.10	13.08	-63.18	-29.99	20.11	Peak	VERTICAL
5	2998.78	-46.60	15.92	-62.52	-29.99	16.61	Peak	VERTICAL
6	4287.75	-42.90	22.20	-65.10	-29.99	12.91	Peak	VERTICAL

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

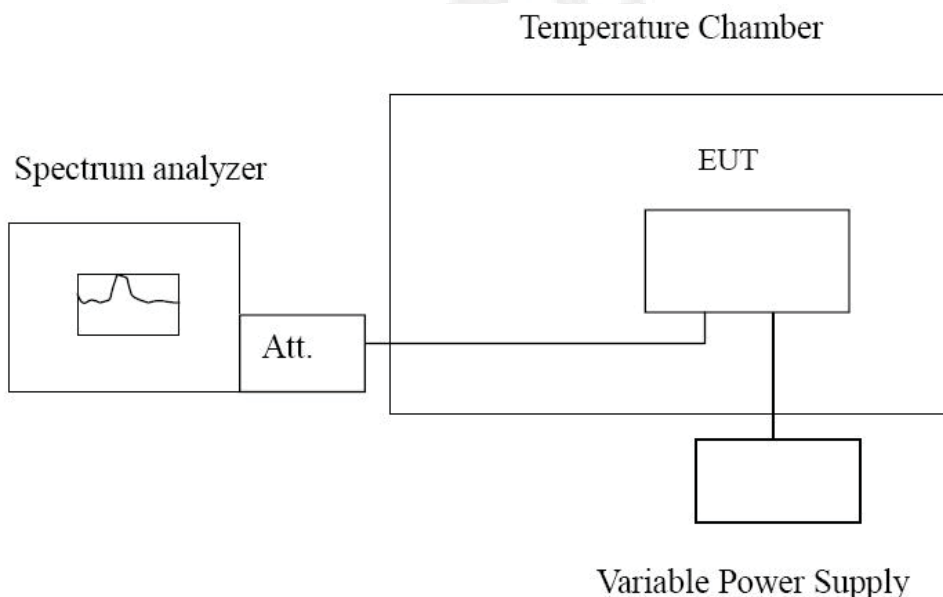
a) Frequency stability versus environmental temperature

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: 214.20MHz					
Voltage (V)	Temperature (°C)	Frequency error (MHz)	Frequency Tolerance (%)	Limit (%)	Result
3.00	-20	0.00826	0.00385	±0.005	PASS
	-10	0.00714	0.00333		
	0	0.00891	0.00416		
	10	0.00742	0.00346		
	20	0.00863	0.00402		
	30	0.00767	0.00358		
	40	0.00793	0.00370		
	50	0.00811	0.00378		
3.45	25	0.00759	0.00354	±0.005	PASS
2.55	25	0.00776	0.00362		

3.8. Antenna Requirement

Standard Applicable

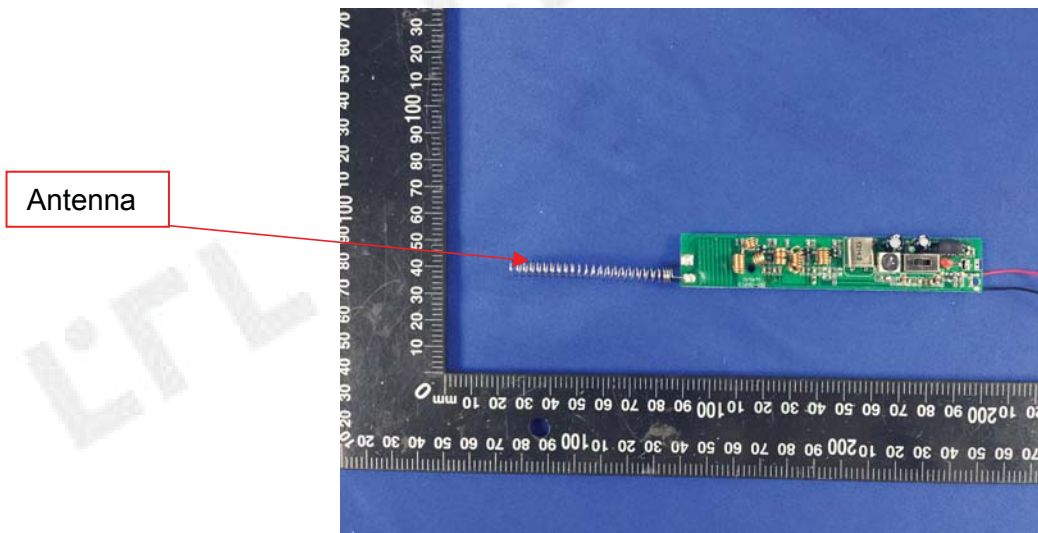
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

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 1.0dBi.



4. Test Setup Photos of the EUT



5. Photos of the EUT

External Photos

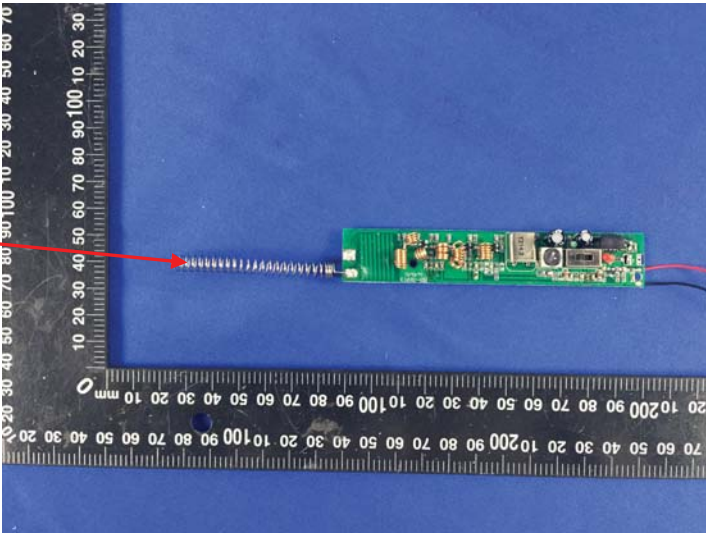


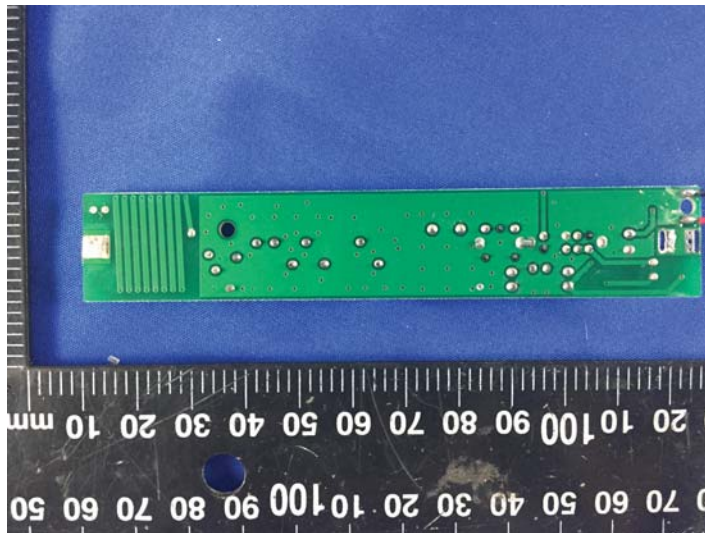
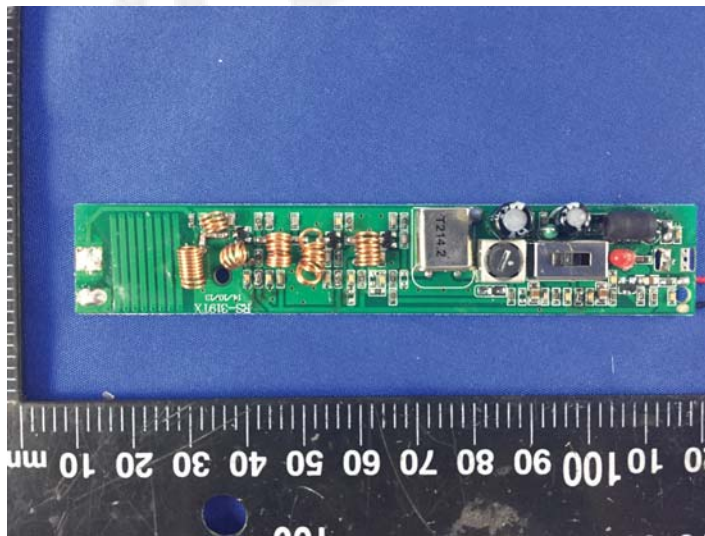
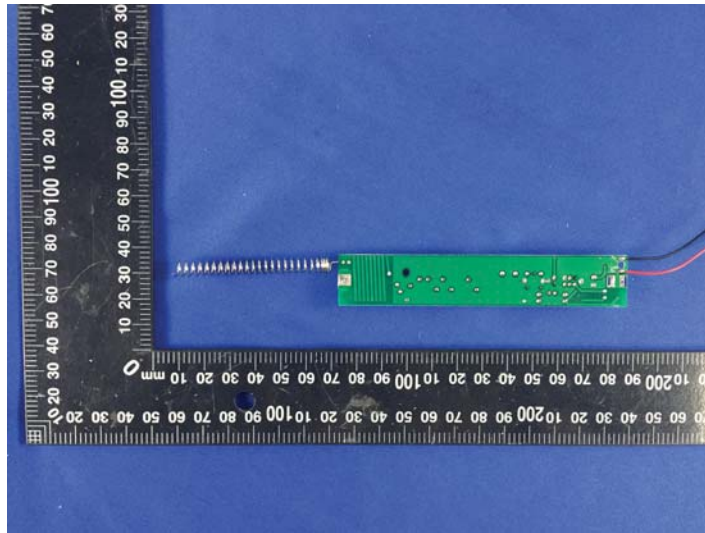


Internal Photos



Antenna





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