ETSI EN 300 220-1 V3.1.1 (2017-02)

MEASUREMENT AND TEST REPORT

For

Shenzhen Wulian Electronic Co., Limited

Floor 2, Building 3, Masha Industrial Zone, No. 49,
Jiaoyu Road North, Pingdi, Longgang, Shenzhen, China

Model:	CW1，CW2，CW6，CW7，CW8，CW9，CW10，CW12，EW1，EW2，CQ1， CQ3，CQ5，CQ6，CQ7，CQ8，CQ9，CQ10， CR22，CR22A，CR23，CR23A，CR28，CR29，CR30，CT05，CT06，CT07，CT08，CT09，CT10，CT18，CT19，CT20，CT21，CT29，RE01，CK02，CK05，CK06，DB8， DB9，DB10，DB11，DB12，DB15，DT1，DT2，RC1， RC3，RC11，SA1，SA5，WW1，WW2

May 14, 2019

This Report Concerns:	**Equipment Type:**
☒ Original Report	**Calling System**

Test By:	Angell Liu /
Report Number:	CTE19ER-514E-1
Test Date:	May 06-13, 2019
Reviewed By:	Jason Chen /
Prepared By:	**Coffee-T Electronics Technology Co., Ltd.** 4th Floor, Bldg A3, Digital Tech Park, 7th GaoXin South Blvd, Tech Park, NanShan, ShenZhen, China Tel: +86-755-86622903 Fax: +86-755-86622819

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GENERAL INFORMATION

1.1. Client Information

Applicant	:	**Shenzhen Wulian Electronic Co., Limited**
Address	:	Floor 2, Building 3, Masha Industrial Zone, No. 49, Jiaoyu Road North, Pingdi, Longgang, Shenzhen, China
Manufacturer	:	**Shenzhen Wulian Electronic Co., Limited**
Address	:	Floor 2, Building 3, Masha Industrial Zone, No. 49, Jiaoyu Road North, Pingdi, Longgang, Shenzhen, China

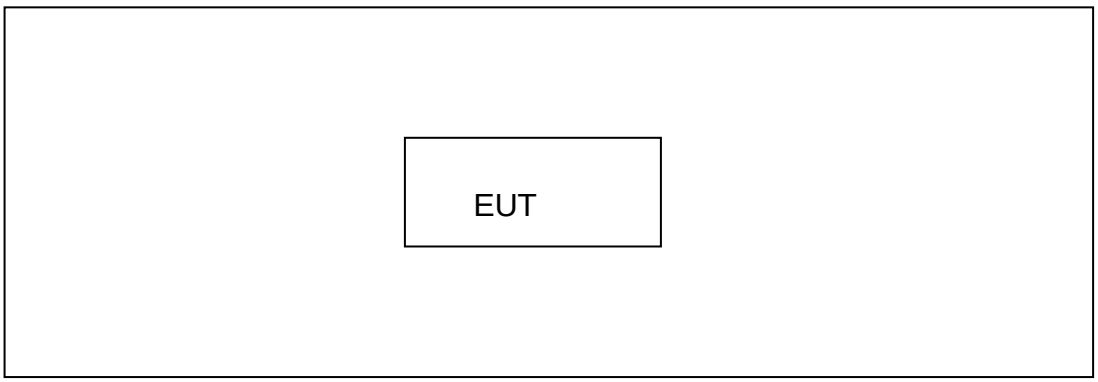
1.2. General Description of EUT (Equipment Under Test)

EUT	: Calling System
Model Number	: CQ5
Operating Frequency Product Description	
Operating Frequency	: 315~433MHz
Modulation Type	: ASK
Communication rate	: 200Kbps
Antenna	: Integral Antenna, 0dBi(Max.)
Power Supply	: DC 3.7V

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

1.3. Block Diagram Showing the Configuration of System Tested



1.4. Description of Support Units

The EUT has been tested as an independent unit.

1.5. Description of Operating Mode

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Test Items	Note
Frequency Error	Continuously transmitting
Effective Radiated Power	Continuously transmitting
Range of Modulation Bandwidth	Continuously transmitting
Transmitter Spurious Emissions	Continuously transmitting
Receiver Spurious Emissions	Standby Mode
Frequency Stability Under Low Voltage Conditions	Continuously transmitting

Note:
(1) The EUT not have receiver function when it is on, so the receiver mode is not test.
The EUT is considered a portable unit, and it was pre-tested on the positioned of each 3 axis: X axis, Y axis and Z axis. The worst case was found positioned on Z-plane. There for only the test data of this X-plane were used for radiated emission measurement test.

1.6. Description of Testing Condition

Normal Temperature(NT):	+15 °C to +30 °C
Relative Humidity:	25% to 75%
Air Pressure:	980-1020 hPa
Extreme Temperature	Low Temperature (LT)= -20°C High Temperature (HT)= +55°C
Normal Voltage of EUT (NV):	DC 9V
Extreme Voltage of the EUT	Low Voltage(LV)= 3.5V High Voltage(HV)= 5V

Mains voltage:

The extreme test voltage for equipment to be connected to DC mains source shall be the nominal mains voltage ±10 %.

Lead-acid battery power sources used on vehicles:
When radio equipment is intended for operation from the usual type of alternator fed lead-acid battery power source used on vehicles, then extreme test voltage shall be 1,3 and 0,9 times the nominal

voltage of the battery (3.7 V).

Power sources using other types of batteries:
The lower extreme test voltages for equipment with power sources using the following types of battery shall be:
• for the Leclanché or lithium type battery: 0,85 times the nominal voltage of the battery;
• for the mercury or nickel-cadmium type of battery: 0,9 times the nominal voltage of the battery. In both cases, the upper extreme test voltage shall be 1,15 times the nominal voltage of the battery.

1. Test Results Summary

ETSI EN 300 220-1 V3.1.1 (2017-02)		
Clause	**Test Item**	**Note**
4.2.1.1	**Frequency Error or frequency drift**	**PASS**
4.2.1.4	**Transient Power**	**PASS** Note(2)
4.2.1.3	**Effective radiated power**	**PASS**
4.2.1.6	**Range of Modulation Bandwidth**	**PASS**
4.2.1.7	**Transmitter Spurious Emissions**	**PASS**
4.2.1.8	**Frequency Stability under Low Voltage**	**PASS**
4.2.1.7	**Receiver Spurious Emissions**	**PASS**

Note:
(1) “N/A” indicates test is not applicable in this Test Report.
(2) No signal is higher than 250nw (-36dBm).

2. Frequency Error

3.1 Test Standard and Limit

3.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1 clause 8.1

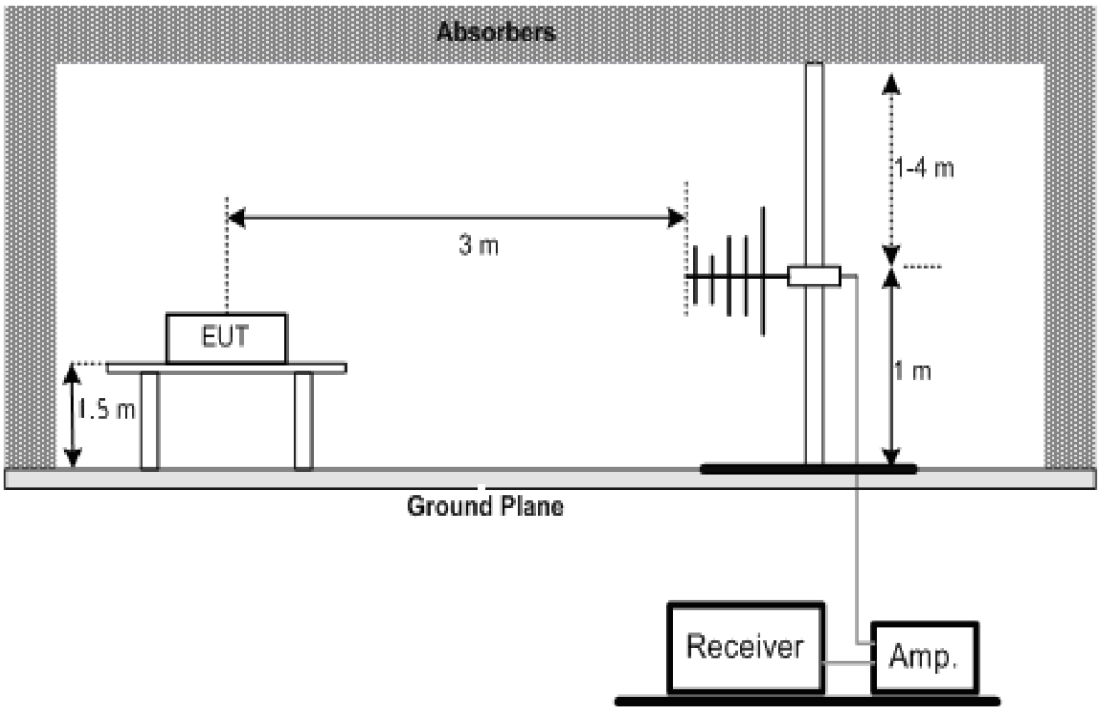
3.1.2 Test Limit

For Wideband

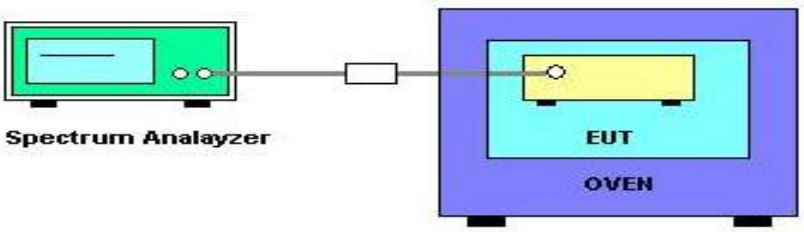
Test Item	Limit
Frequency Error	100ppm

3.2 Test Setup

Normal Condition



Extreme Condition



3.3 Test Procedure

Un-modulation method

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 1 kHz, VBW = 1 kHz with peak detector and max hold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±100ppm.
6. These measurements shall also be performed at normal and extreme test conditions.

Modulation method

1. Under normal conditions, using a spectrum analyzer, a reference point at some level (for example 3 dB point) is selected on the slope of the wanted signal, and the frequency at this point is measured and recorded.
2. Under extreme conditions, for each combination of extreme value of voltage and temperature, the frequency at the same reference point on the slope is measured and recorded. Four values are measured.
3. Maximum frequency drift, the absolute value of fe-f, shall not exceed 100 ppm relative to the maximum frequency of the assigned band.

Where:

f = the frequency measured under normal conditions (1) above).

fe = the maximum frequency drift as measured in (2) above.

3.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2019-3-22	2020-3-22
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2019-3-22	2020-3-22
RF Switch	EM	EMSW18	SW060023	2019-3-22	2020-3-22
Amplifier	Agilent	8447F	3113A06717	2019-3-22	2020-3-22
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

3.5 Test Data

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	TX Mode		

Test Conditions				**Measurement Frequency (MHz)**
T norm (°C)	25.0	V norm (V)	3.7V	433.9100
T min (°C)	-20.0	V max (V)	5V	433.9350
		V min (V)	3.7V	433.9380
T max (°C)	55.0	V max (V)	5V	433.9290
		V min (V)	3.7V	433.9260
Max. Deviation Frequency (MHz)				0.0180
Max. Frequency Error(ppm)				41.48
Limits				100 ppm
Result				**PASS**

3. Effective Radiated Power

4.1 Test Standard and Limit

4.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1 clause 8.3

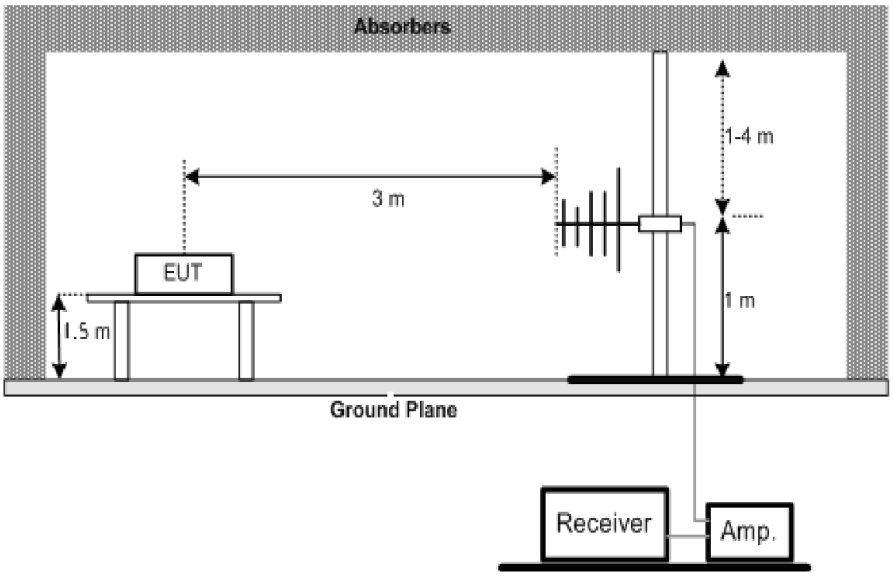
4.1.2 Test Limit

The effective radiated power shall not exceed the power class value given in follow table:

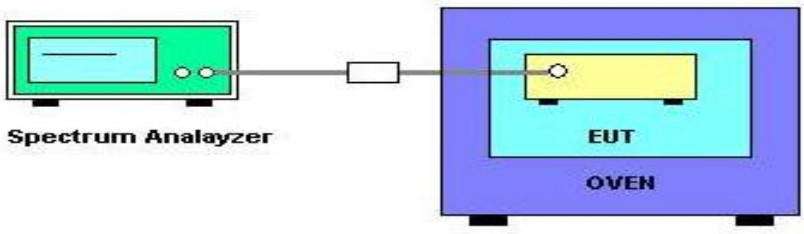
Radiated power limit, e.r.p.

Power class	Power level, e.r.p.(mW)
5a	0.025
7a	5
8	10
9	25
11	100
12	500

4.2 Test Setup



Extreme Condition:



4.3 Test Procedure

1. The EUT was placed on the top of the turntable in chamber.
2. The test shall be made in the transmitting mode. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. This measurement shall be repeated with the transmitter in standby mode where applicable.
4. The receiver shall be set the center frequency equal to the EUT transmit, and the Resolution Bandwidth equal to the Video Bandwidth is set to 1 MHz for the frequency bellow 1 GHz, and the frequency is above 1 GHz the Resolution Bandwidth equal to the Video Bandwidth is set to 3MHz.
5. The broadband receiving antenna was fixed on the same height with the EUT to find each suspected emissions of both horizontal and vertical polarization. Each recorded suspected value is indicated as Read Level (Raw).
6. Replace the EUT by standard antenna and feed the RF port by signal generator.
7. The EIRP=A+G+10*log(1/x), the A is the power measured in the above, and G is the gain of the antenna of the EUT in dBi and x is the duty cycle of the EUT in continuously transmitting mode.
8. The measurement shall be repeated at the lowest, the middle, and the highest channel of the stated frequency range. These measurements shall also be performed at the normal and the extreme test conditions.

4.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2019-3-22	2020-3-22
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2019-3-22	2020-3-22
RF Switch	EM	EMSW18	SW060023	2019-3-22	2020-3-22
Amplifier	Agilent	8447F	3113A06717	2019-3-22	2020-3-22
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

4.5 Test Data

EUT:		Calling System			**Model Name :**	CQ5
Temperature:		26°C			**Relative Humidity:**	60%
Pressure:		1010 hPa			**Test Voltage :**	DC 3.7V
Test Mode :		TX Mode				
Test Conditions					**Peak ERP Power (dBm)**	
T norm (°C)	25.0	V norm	(V)	5V	4.02	
T min (°C)	-20.0	V max	(V)	3.7V	4.24	
		V min	(V)	5V	4.10	
T max (°C)	55.0	V max	(V)	3.7V	4.40	
		V min	(V)	5V	4.32	
Max Peak Power					4.40	
Limits					10	
Result					**PASS**	

4. Range of Modulation Bandwidth

5.1 Test Standard and Limit

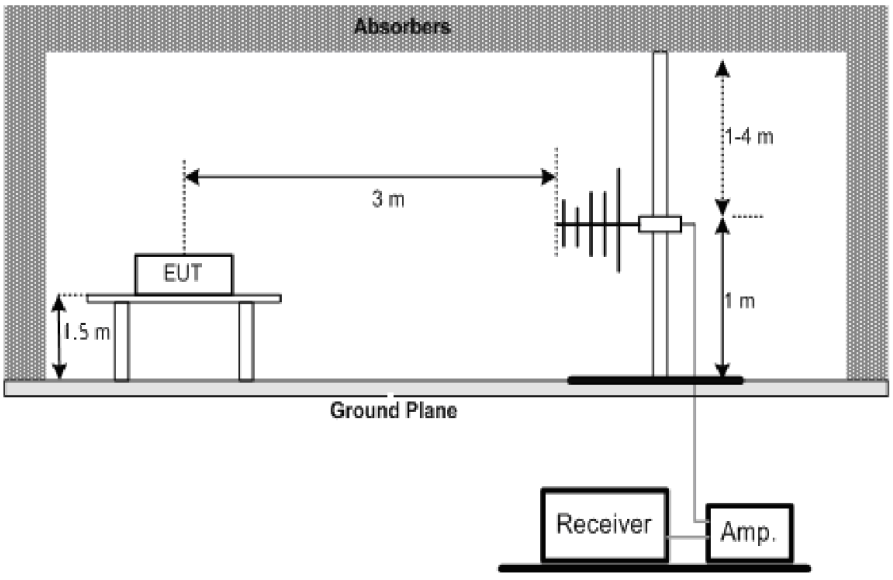
5.1.1 Test Standard

ETSI EN 300 220-1 V2.4.1 clause 8.7
ETSI EN 300 440-2 V2.4.1 clause 4.2.1.6

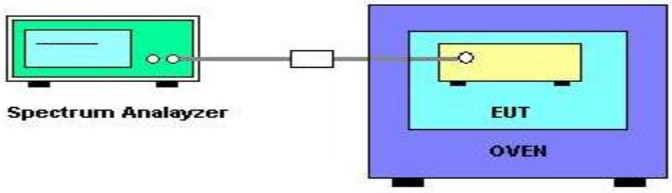
5.1.2 Limits

The frequency range of the equipment is determined by the lowest and highest frequencies occupied by the power envelope. fH is the highest frequency of the power envelope: it is the frequency furthest above the frequency of maximum power where the output power drops below the level of –36 dBm/10kHz e.i.r.p. spectral power density.fL is the lowest frequency of the power envelope; it is the frequency furthest below the frequency of maximum power where the output power drops below the level equivalent to –36 dBm/10kHz e.i.r.p. spectral power density. For a given operating frequency, the width of the power envelope is (fH - fL). In equipment that allows adjustment or selection of different operating frequencies, the power envelope takes up different positions in the allocated band. The frequency range is determined by the lowest value of fL and the highest value of fH resulting from the adjustment of the equipment to the lowest and highest operating frequencies. For all equipment, the frequency range shall lie within the band (fL >433.05MHz and fH <434.79MHz).

5.2 Test Setup



Extreme Condition:



5.3 Test Procedure

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. Added [x] dB to equal than maximum e.i.r.p. power was on the spectrum analyzer.
3. Place the spectrum analyzer in detector averaging mode with a minimum of 50 sweeps selected and activate transmitter with modulation applied.
4. Select lowest operating frequency of the equipment under test.
5. Find lowest frequency below the operating frequency at which spectral power density drops below –36 dBm/10kHz e.i.r.p. This frequency shall be recorded (fL).
6. Select the highest operating frequency of the equipment under test.
7. Find the highest frequency at which the spectral power density drops below-36 dBm/10kHz e.i.r.p. . This frequency shall be recorded (fH).
8. These measurements shall also be performed at normal and extreme test conditions.

5.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2019-3-22	2020-3-22
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2019-3-22	2020-3-22
RF Switch	EM	EMSW18	SW060023	2019-3-22	2020-3-22
Amplifier	Agilent	8447F	3113A06717	2019-3-22	2020-3-22
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

5.5 Test Data

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	TX Mode		

Test Conditions				**Frequency Range(MHz) (fL)**
T norm (°C)	25.0	V norm (V)	5V	433.9010
T min (°C)	-20.0	V max (V)	3.7V	433.8980
		V min (V)	5V	433.8960
T max (°C)	55.0	V max (V)	3.7V	433.8930
		V min (V)	5V	433.8990
Max. fH Band Edges				433.8930
Limit				fL>433.05 MHz
Result				**PASS**

EUT：	Calling System			**Model Name ：**	CQ5
Temperature：	26°C			**Relative Humidity：**	60%
Pressure：	1010 hPa			**Test Voltage ：**	DC 3.7V
Test Mode ：	TX Mode				
Test Conditions				**Frequency Range(MHz) (fH)**	
T norm (°C)	25.0	V norm (V)	5V	433.9390	
T min (°C)	-20.0	V max (V)	3.7V	433.9410	
		V min (V)	5V	433.9420	
T max (°C)	55.0	V max (V)	3.7V	433.9430	
		V min (V)	5V	433.9400	
Max. fH Band Edges				433.9430	
Limit				fH<434.79 MHz	
Result				**PASS**	

5. Transmitter Spurious Emission Measurement

6.1 Test Standard and Limit

8.1.1 Test Standard

ETSI EN 300 220-1 V2.4.1 clause 8.8
ETSI EN 300 440-2 V2.4.1 clause 4.2.1.7

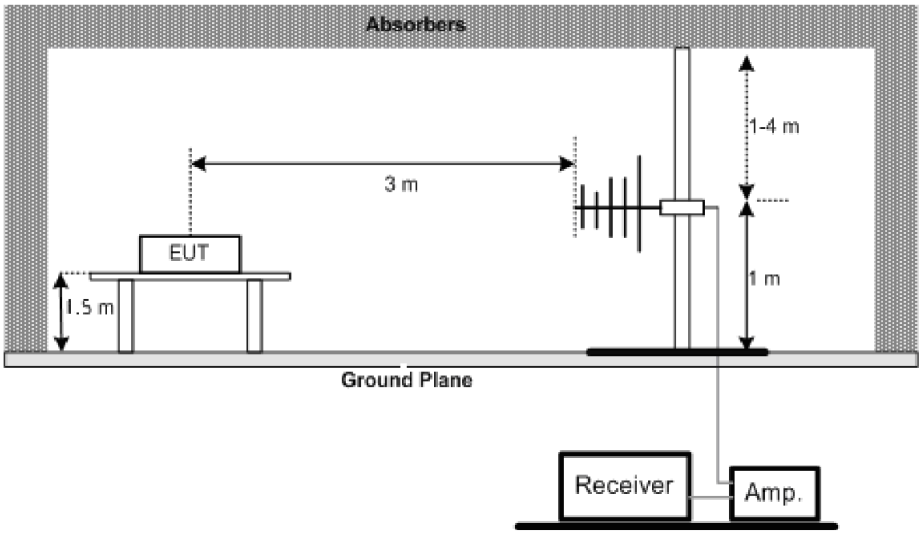
8.1.2 Limits

Transmitter spurious emissions are emissions outside the frequency range(s) of the equipment as defined in 433.05MHz~434.79MHz when the equipment is in Transmit mode. The spurious missions of the transmitter shall not exceed the values in tables 1 in the indicated bands.

Transmitter limits for Spurious Emissions

Frequency Range(MHz)	Transmit Mode (dBm)
47 MHz to 74MHz 87.5 MHz to 118 MHz 174 MHz to 230 MHz 470 MHz to 862 MHz	-54
Other frequencies Below 1GHz	-36
Above 1 GHz	-30

6.2 Test Setup



6.3 Test Procedure

1. The EUT was placed on the top of the turntable in the chamber room.
2. The test shall be made in the transmitting mode. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
3. For 25~1000MHz spurious emissions measurement, the broad band Bi-log receiving antenna was

placed 3 meters far away from the turntable. And the Resolution Bandwidth and the Video Bandwidth was set to 100 kHz to the spectrum analyzer. For 1 GHz~4 GHz carrier frequency measurement, the receiving Horn antenna was placed 3 meter far away from the turn table. And the Resolution Bandwidth and the Video Bandwidth was set to 1 MHz to the Spectrum Analyzer.

6.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2019-3-22	2020-3-22
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2019-3-22	2020-3-22
RF Switch	EM	EMSW18	SW060023	2019-3-22	2020-3-22
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Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

6.5 Test Data

(1) Bellow 1 G

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	TX		

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	60.100	H	-62.41	-4.10	-67.62	-54	13.62	Peak
2	184.900	H	-68.23	-2.51	-70.74	-54	16.74	Peak
3	569.500	H	-69.02	1.42	-67.60	-54	13.60	Peak
4	660.700	H	-73.14	2.34	-70.80	-54	16.80	Peak
5	797.200	H	-72.60	3.26	-69.34	-54	15.34	Peak
6	868.100	H	-44.65	4.48	-40.17	-36	4.17	Peak

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	126.400	V	-63.52	-4.60	-68.12	-36	32.12	Peak
2	181.000	V	-68.02	-4.10	-72.12	-54	18.12	Peak
3	494.800	V	-73.05	0.86	-72.19	-54	18.19	Peak
4	631.400	V	-73.06	2.54	-70.52	-54	16.52	Peak
5	734.800	V	-74.65	3.67	-70.98	-54	16.98	Peak
6	867.900	V	-43.04	4.02	-39.02	-36	18.06	Peak

(2) Above 1G

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	TX		

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1301.900	V	-35.10	1.24	-33.86	-30	3.86	Peak
2	1735.800	V	-36.24	1.86	-34.38	-30	4.38	Peak
3	2169.900	V	-40.25	2.41	-37.84	-30	7.84	Peak
4	2603.800	V	-46.21	2.62	-43.59	-30	13.59	Peak

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1302.000	H	-39.05	2.61	-36.44	-30	6.44	Peak
2	1735.900	H	-40.68	2.80	-37.88	-30	7.88	Peak
3	2169.900	H	-48.27	3.10	-45.17	-30	15.17	Peak
4	2603.900	H	-42.14	3.34	-38.80	-30	8.80	Peak

2 Receiver Spurious Emissions Measurement

7.1 Test Standard and Limit

8.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1 clause 9.7

8.1.2 Limits

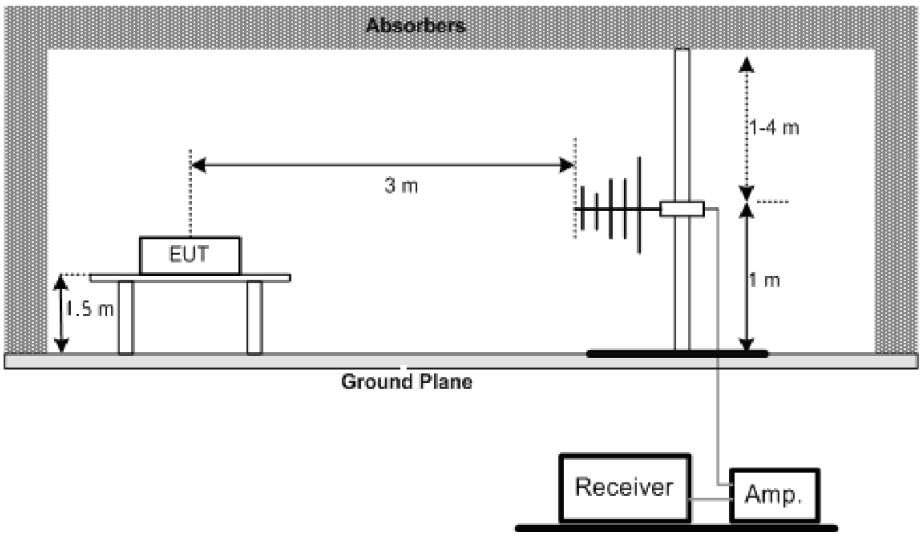
Receiver spurious emissions are emissions at any frequency when the equipment is in received mode. The spurious emissions of the receiver shall not exceed the values as follow table, in the indicated bands.

Receiver Limits for Spurious Emissions

Frequency Range(MHz)	Transmit Mode (dBm)
30 MHz~1000 MHz	-57
Above 1 GHz	-30

The EUT was programmed to be in continuously receiving mode when it is on.

7.2 Test Setup



7.3 Test Procedure

1. The EUT was placed on the top of the turntable in the chamber room.
2. The test shall be made in the transmitting mode. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
3. For 25~1000MHz spurious emissions measurement, the broad band Bi-log receiving antenna was placed 3 meters far away from the turntable. And the Resolution Bandwidth and the Video Bandwidth was set to 100 kHz to the spectrum analyzer. For 1 GHz~4 GHz carrier frequency measurement, the receiving Horn antenna was placed 3 meter far away from the turn table. And the Resolution Bandwidth

and the Video Bandwidth was set to 1 MHz to the Spectrum Anylyzer.

7.4 Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2019-3-22	2020-3-22
Horn Antenna	SCHWARZBECK	BBHX 9120	9120-426	2019-3-22	2020-3-22
RF Switch	EM	EMSW18	SW060023	2019-3-22	2020-3-22
Amplifier	Agilent	8447F	3113A06717	2019-3-22	2020-3-22
Coaxial Cable	SCHWARZBECK	AK9513	9513-10	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESPI	25498514	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

7.5 Test Data

Please see the following pages.

(1) Bellow 1 G

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	RX(Receive)		

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	120.600	H	-68.32	-3.84	-72.16	-57	15.16	Peak
2	204.600	H	-70.24	-3.50	-73.74	-57	16.74	Peak
3	468.200	H	-73.87	1.20	-72.67	-57	15.67	Peak
4	605.300	H	-73.68	2.14	-71.54	-57	14.54	Peak
5	762.800	H	-72.90	3.37	-73.53	-57	16.53	Peak
6	804.500	H	-72.06	3.80	-68.26	-57	11.26	Peak

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	105.400	V	-67.03	-4.60	-71.63	-57	14.63	Peak
2	193.400	V	-70.05	-4.10	-74.15	-57	17.15	Peak
3	358.700	V	-68.05	-0.24	-68.29	-57	11.29	Peak
4	573.400	V	-73.96	2.20	-71.76	-57	14.76	Peak
5	645.800	V	-74.09	3.41	-70.68	-57	13.68	Peak
6	799.700	V	-71.05	3.68	-67.37	-57	10.37	Peak

(2) Above 1G

EUT:	Calling System	**Model Name :**	CQ5
Temperature:	26°C	**Relative Humidity:**	60%
Pressure:	1010 hPa	**Test Voltage :**	DC 3.7V
Test Mode :	RX(Receive)		

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1101.700	V	-59.60	1.10	-58.50	-47	10.37	Peak
2	1335.100	V	-60.37	1.45	-58.92	-47	11.92	Peak

No.	Freq. (MHz)	Ant.Pol. H/V	Reading (dBm)	Factor (dB)	Measure-ment (dBm)	Limit (dBm)	Margin (dB)	Detector
1	1106.300	H	-60.91	2.42	-58.49	-47	10.37	Peak
2	1365.900	H	-62.73	2.70	-60.03	-47	13.03	Peak

3 Frequency Stability Under Low Voltage Condition

8.1Test Standard and Limit

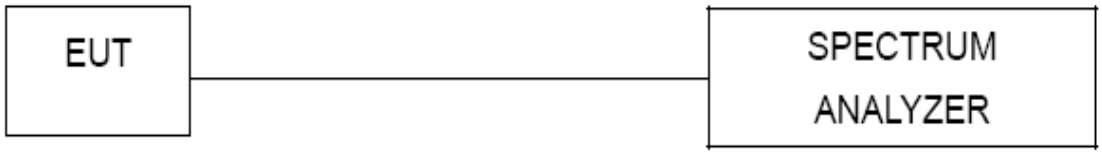
8.1.1 Test Standard

ETSI EN 300 220-1 V3.1.1 clause 8.9

8.1.2 Limits

The equipment ceases to function below the manufacturers declared operating voltage.

8.2Test Setup



8.3Test Procedure

1. The carrier frequency shall be measured, where possible in the absence of modulation, with the transmitter connected to spectrum.
2. The measurement shall be made under normal temperature and humidity conditions
3. The voltage from the test power source shall be reduced below the lower extreme test voltage limit towards zero. Whilst the voltage is reduced the carrier frequency shall be monitored.
4. The lowest voltage of stop function shall be reported.

8.4Test Equipment Used

Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Date
Spectrum Analyzer	ROHDE& SCHWARZ	FSEA20	DE25181	2019-3-22	2020-3-22
EMI Test Receiver	ROHDE& SCHWARZ	ESI26	838786/103	2019-3-22	2020-3-22

8.5Test Data

EUT：	Calling System			**Model Name ：**	CQ5
Temperature：	26°C			**Relative Humidity：**	60%
Pressure：	1010 hPa			**Test Voltage ：**	DC 3.7V
Test Mode ：	TX Mode				
Test Conditions				**Stop Function Voltage(V)**	
T norm (°C)	25.0	V norm (V)	3.7V	90	
Results				PASS	
Remark				Manufacturer declared operating Voltage DC12V	

4 Photographs- Constructional Details

Photo 1

Photo 2

Photo 3

Photo 4