



Test Report

FCC Part15 Subpart C

Product Name : BASE STATION
Model No. : BASE2.0
FCC ID : 2AVYXBASE20

Applicant : SAIC GM Wuling Automobile Co., Ltd.
Address : No.18 Hexi Road, Liuzhou City, Guangxi
Zhuang Autonomous Region, China

Date of Receipt : Mar. 31 , 2020
Test Date : Apr. 02 , 2020~ Apr. 24, 2020
Issued Date : Jun. 29, 2020
Report No. : 2032200R-RF-US-P06V05
Report Version : V1.1

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 CB Testing Laboratory.

The measurement result is considered in conformance with the requirement if it is within the prescribed limit, It is not necessary to calculate the uncertainty associated with the measurement result.

This report is not used for social proof in China (or Mainland China) market.

Test Report Certification

Issued Date : Jun. 29, 2020
 Report No. : 2032200R-RF-US-P06V05



Product Name : BASE STATION
 Applicant : SAIC GM Wuling Automobile Co., Ltd.
 Address : No.18 Hexi Road, Liuzhou City, Guangxi Zhuang Autonomous Region, China
 Manufacturer : United Automotive Electronic Systems Co., Ltd.
 Address : No. 8, cheyuanheng fifth road yufeng area, Liuzhou City, Guangxi Province, 516006, P.R. China.
 Factory : United Automotive Electronic Systems Co., Ltd.
 Address : No. 8, cheyuanheng fifth road yufeng area, Liuzhou City, Guangxi Province, 516006, P.R. China.
 Model No. : BASE2.0
 FCC ID : 2AVYXBASE20
 EUT Voltage : DC 12V
 Test Voltage : DC 12V
 Brand Name : SGMW
 Applicable Standard : FCC CFR Title 47 Part 15 Subpart C; ANSI C63.10: 2013
 Test Result : Complied
 Performed Location : DEKRA Testing and Certification (Suzhou) Co., Ltd. No.99 Hongye Rd., Suzhou Industrial Park, Suzhou, 215006, Jiangsu, China
 TEL: +86-512-6251-5088 / FAX: +86-512-6251-5098
 FCC Designation Number: CN1199; IC Lab Code: 4075B

Documented By : Kitty Li
 (Adm. Specialist: Kitty Li)

Reviewed By : Frank He
 (Senior Project Manager: Frank He)

Approved By : Jack Zhang
 (Engineering Supervisor: Jack Zhang)

TABLE OF CONTENTS

Description	Page
1. General Information	5
1.1. EUT Description	5
1.2. Antenna information	6
1.3. Mode of Operation	7
1.4. Tested System Details	8
1.5. Configuration of Tested System	9
1.6. EUT Exercise Software	10
2. Technical Test	11
2.1. Summary of Test Result	11
2.2. Test Environment	11
3. Conducted Emission	12
3.1. Test Equipment	12
3.2. Test Setup	12
3.3. Limit	13
3.4. Test Procedure	13
3.5. Uncertainty	13
3.6. Test Result	14
4. Radiated Emission	15
4.1. Test Equipment	15
4.2. Test Setup	16
4.3. Limit	17
4.4. Test Procedure	17
4.5. Uncertainty	18
4.6. Test Result	19
5. 20dB Occupied Bandwidth	23
5.1. Test Equipment	23
5.2. Test Setup	24
5.3. Limit	25
5.4. Test Procedure	25
5.5. Uncertainty	25
5.6. Test Result	26
6. Antenna Requirement	27
6.1. Requirement	27
6.2. Result	27

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
2032200R-RF-US-P06V05	V1.0	Initial Issued Report	Apr. 28, 2020
2032200R-RF-US-P06V05	V1.1	1. Remove unnecessary standards 2. Modify product name	Jun. 29, 2020

1. General Information

1.1. EUT Description

Product Name	BASE STATION
Model No.	BASE2.0
Working Voltage	DC 12V
Carrier Frequency	125KHz
Type of Modulation	ASK

1.2. Antenna information

Model No.	N/A		
Antenna manufacturer	N/A		
Antenna Delivery	<input checked="" type="checkbox"/> 1*TX+1*RX	<input type="checkbox"/> 2*TX+2*RX	<input type="checkbox"/> 3*TX+3*RX
Antenna technology	<input checked="" type="checkbox"/> SISO		
	<input type="checkbox"/> MIMO	<input type="checkbox"/> Basic	
		<input type="checkbox"/> CDD	
		<input type="checkbox"/> Sectorized	
		<input type="checkbox"/> Beam-forming	
Antenna Type	<input type="checkbox"/> External	<input type="checkbox"/> Dipole	
		<input type="checkbox"/> Sectorized	
	<input checked="" type="checkbox"/> Internal	<input type="checkbox"/> PIFA	
		<input type="checkbox"/> PCB	
		<input type="checkbox"/> Ceramic Chip Antenna	
		<input checked="" type="checkbox"/> Coil antenna	
		<input type="checkbox"/> Type F antenna	

1.3. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: Transmit

Note:

1. Regards to the frequency band operation: the lowest, middle and highest frequency of channel were selected to perform the test, then shown on this report.
2. For portable device, radiated spurious emission was verified over X, Y, Z Axis, and shown the worst case on this report.

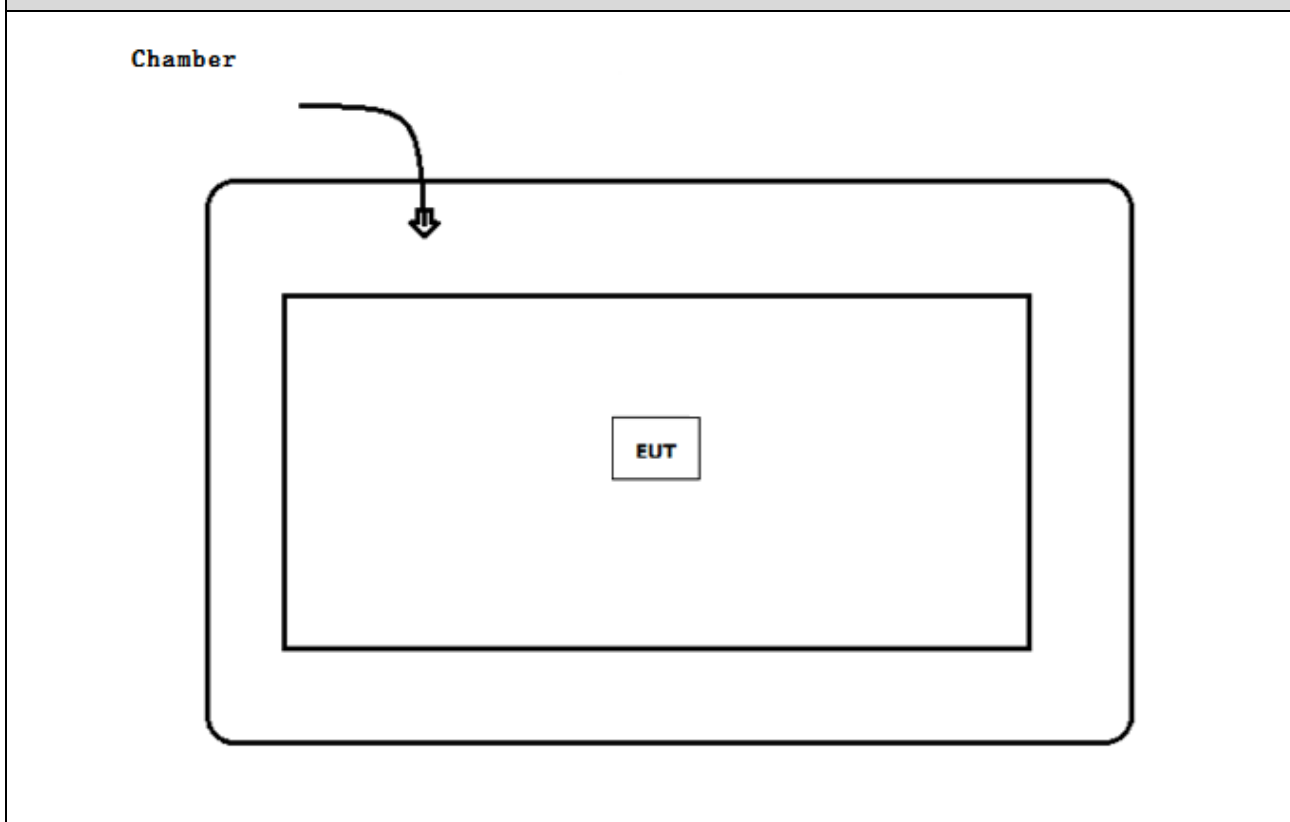
1.4. Tested System Details

The types for all equipments, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 N/A	N/A	N/A	N/A	N/A

1.5. Configuration of Tested System

Test setup Diagram- Radiated Emission



1.6. EUT Exercise Software

1	Setup the EUT and simulators as shown on above.
2	Turn on the power of equipment.
3	Start to continue transmit.

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
- Deviations from the test standards as below description:

Performed Test Item	Normative References	Limit	Result
Conducted Emission	FCC CFR Title 47 Part 15 Subpart C Section 15.207	FCC 15.207	N/A
Field Strength of Spurious	FCC CFR Title 47 Part 15 Subpart C Section 15.209	FCC 15.209	PASS
Channel Bandwidth	FCC CFR Title 47 Part 15 Subpart C Section 15.215(c)	FCC 15.215	PASS
Antenna Requirement	FCC CFR Title 47 Part 15 Subpart C: Section 15.203	FCC 15.203	PASS

2.2. Test Environment

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	21
Humidity (%RH)	25-75	50
Barometric pressure (mbar)	860-1060	950-1000

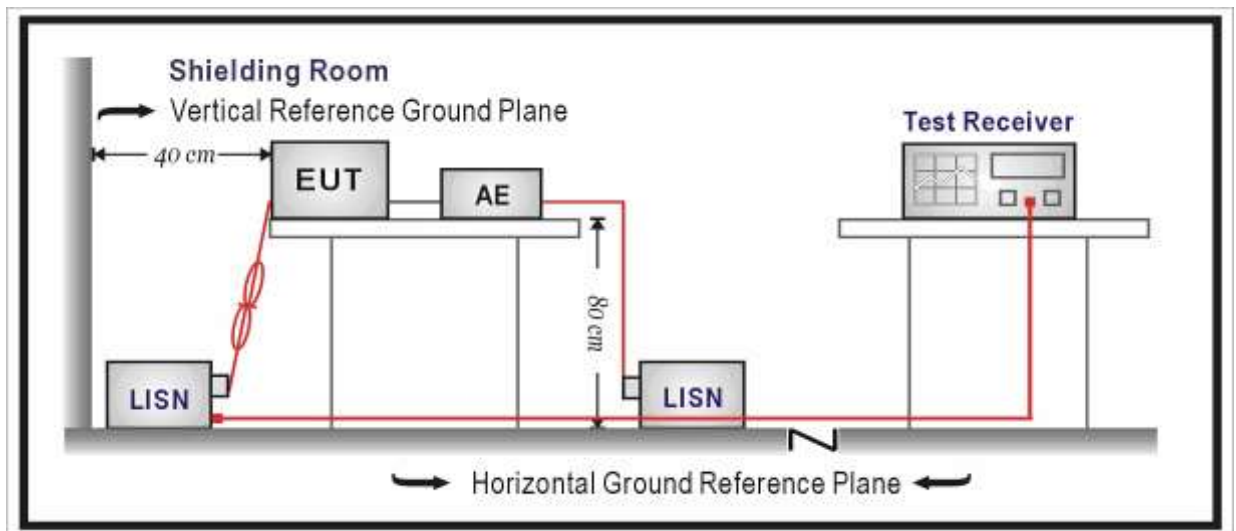
3. Conducted Emission

3.1. Test Equipment

Conducted Emission / TR-1					
Instrument	Manufacturer	Type No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	R&S	ESCI	100726	2020.03.29	2021.03.28
Two-Line V-Network	R&S	ENV216	100043	2020.03.29	2021.03.28
Two-Line V-Network	R&S	ENV216	100044	2019.09.17	2020.09.16
50ohm Coaxial Switch	Anritsu	MP59B	6200464462	2020.03.02	2021.03.01
50ohm Termination	SHX	TF2	07081401	2019.09.17	2020.09.16
Temperature/Humidity Meter	zhicheng	ZC1-2	TR1-TH	2020.01.04	2021.01.03

Note: All equipment are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.

3.2. Test Setup



3.3. Limit

FCC Part 15 Subpart C Paragraph 15.207 Limits		
Frequency (MHz)	QP (dBuV)	AV (dBuV)
0.15 - 0.50	66 - 56	56 – 46
0.50 - 5.0	56	46
5.0 - 30	60	50

Note 1: The lower limit shall apply at the transition frequencies.

Note 2: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

3.4. Test Procedure

The EUT was setup according to ANSI C63.10 requirements. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface. The EUT and simulators are connected to the main power through a line impedance stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs) Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.

The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length. Conducted emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.

3.5. Uncertainty

The measurement uncertainty is defined as ± 2.02 dB

3.6. Test Result

The device was powered by DC source, so this test was not applied.

4. Radiated Emission

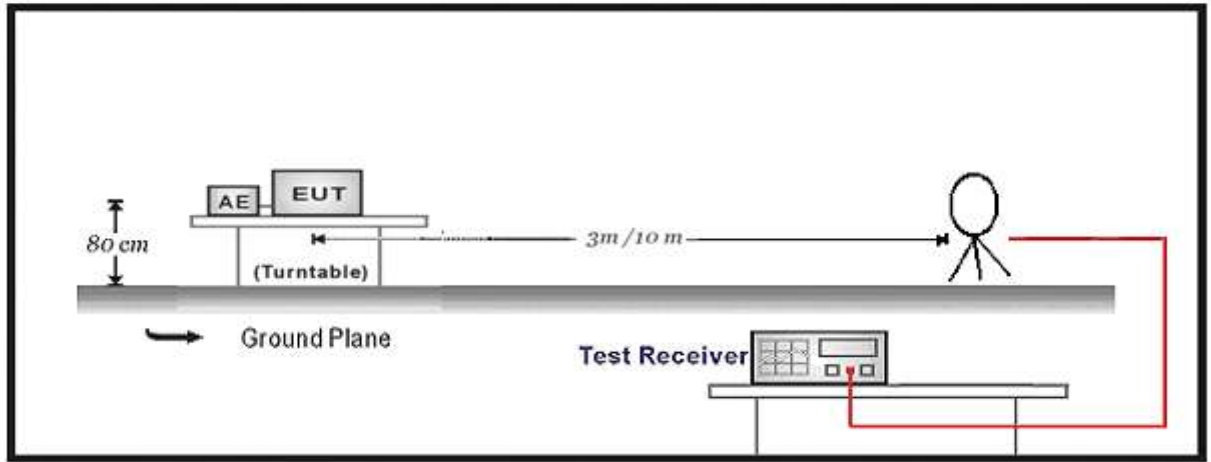
4.1. Test Equipment

AC1

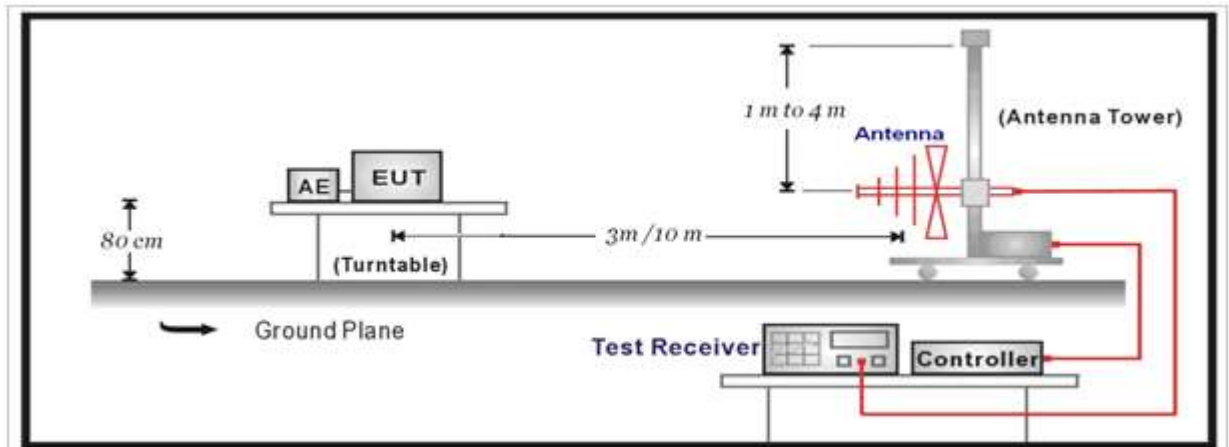
Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2020.05.24
Preamplifier	Quietek	AP-025C	CHM-0602008	2021.04.12
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-R	2021.04.12
Loop Antenna	R&S	HFH2-Z2	833799/003	2021.01.27
Temperature/Humidity Meter	zhichen	ZC1-2	AC1-TH	2020.08.20

4.2. Test Setup

9kHz~30MHz Test Setup:



30MHz~1GHz Test Setup:



4.3. Limit

Field strength of emissions from intentional radiators operated under 15.209(a) shall not exceed the following:

FCC Part 15.209(a)		
Fundamental frequency (MHz)	Field strength of fundamental ($\mu\text{V}/\text{m}$)	Field strength of spurious emissions ($\mu\text{V}/\text{m}$)
0.009-0.490	$2400/F(\text{kHz})$	300
0.490-1.705	$24000/F(\text{kHz})$	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

(1) The tighter limits apply at the band edges.

(2) Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 300m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $40 \log_{10}(300/10) = 59\text{dB}$ for example.

Measurements were performed at 10m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in §15.31(f)(2). Extrapolation Factor = $40 \log_{10}(30/10) = 19\text{dB}$ for example.

(3) All measurements were performed using a loop antenna. The antenna was positioned in three orthogonal positions (X front, Y side, Z top) and the position with the highest emission level was recorded.

4.4. Test Procedure

The EUT was setup according to ANSI C63.10 for compliance to FCC 47CFR 15.209 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 10 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This

is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10 on radiated measurement.

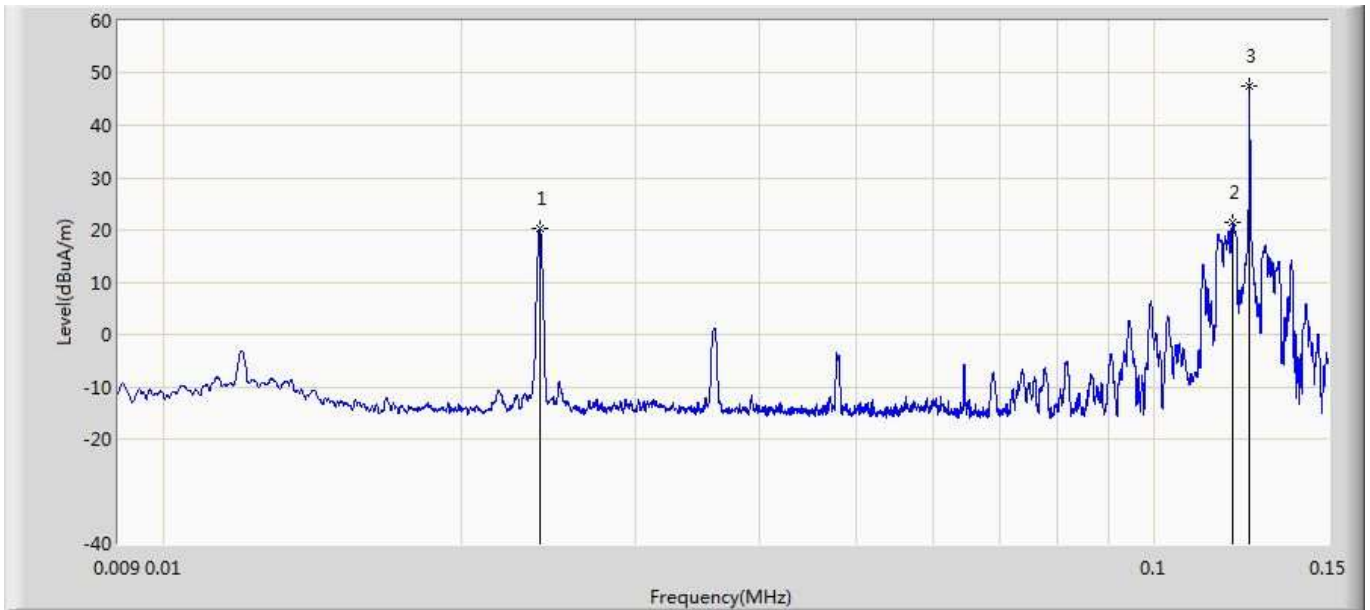
The frequency range from 9kHz to 10th harmonic is checked.

4.5. Uncertainty

The measurement uncertainty is defined as ± 3.80 dB

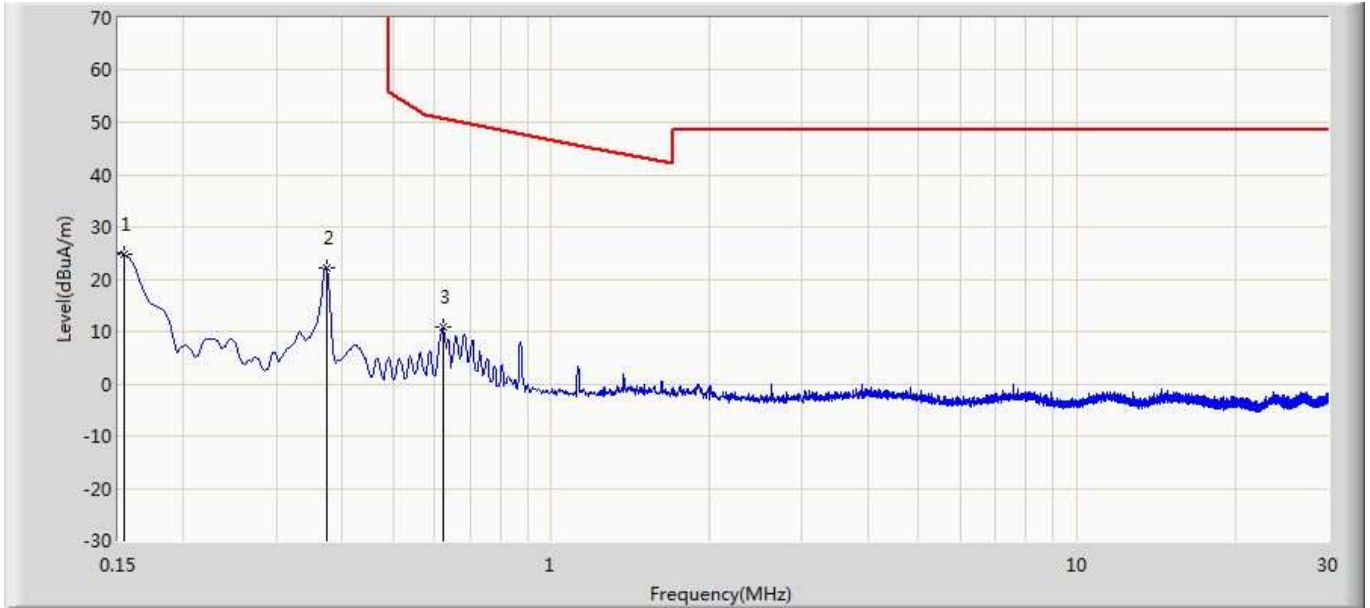
4.6. Test Result

Engineer: Simon	
Site: AC3	Time: 2020/04/12 - 11:44
Limit: FCC-15.209	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Horizontal
EUT: BASE STATION	Power: DC 12V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuA/m)	Reading Level (dBuA)	Over Limit (dB)	Limit (dBuA/m)	Factor (dB)	Type
1		0.024	20.279	9.479	-78.806	99.085	10.800	QP
2		0.120	21.385	10.585	-63.720	85.105	10.800	QP
3	*	0.125	47.441	36.641	-37.310	84.751	10.800	QP

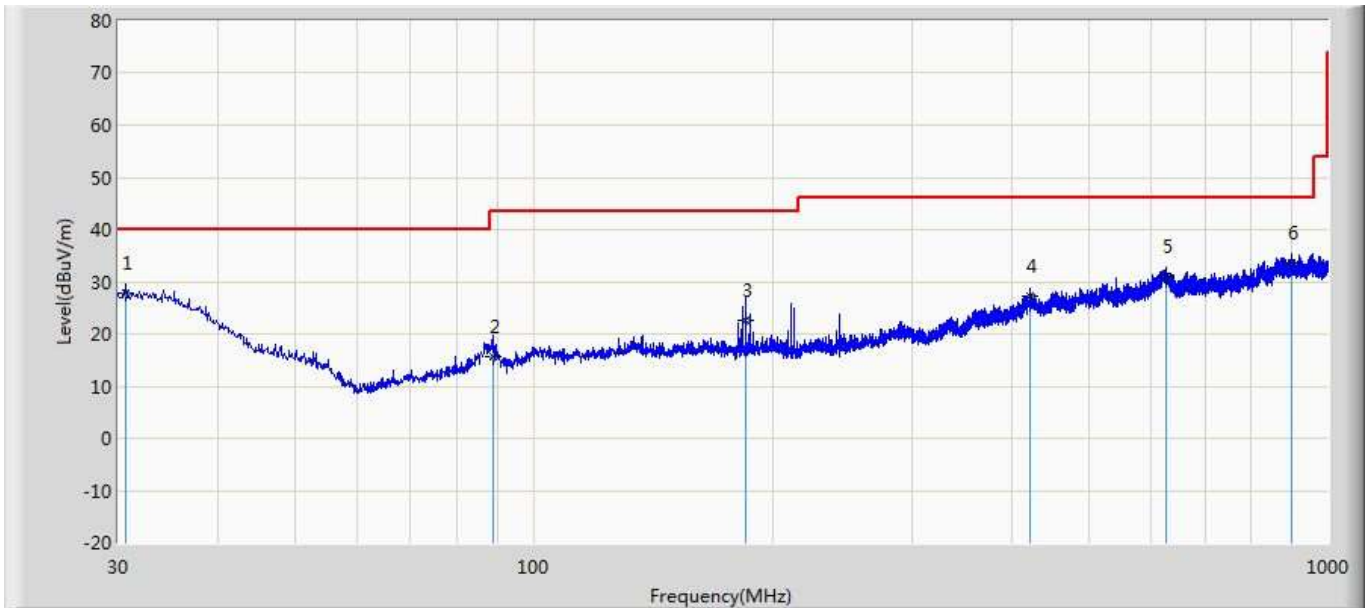
Engineer: Simon	
Site: AC3	Time: 2020/04/12 - 11:59
Limit: FCC-15.209	Margin: 0
Probe: loop antenna(0.009-30MHz)	Polarity: Horizontal
EUT: BASE STATION	Power: DC 12V
Note: Mode 1:	



No	Mark	Frequency (MHz)	Measure Level (dBuA/m)	Reading Level (dBuA)	Over Limit (dB)	Limit (dBuA/m)	Factor (dB)	Type
1		0.154	24.817	14.017	-58.122	82.939	10.800	QP
2		0.374	22.278	11.478	-52.954	75.232	10.800	QP
3	*	0.624	11.010	0.410	-39.775	50.785	10.600	QP

Note: We evaluated the three axes of X, Y and Z, and only the worst axis data is shown in the report

Engineer: Lucas	
Site: AC3	Time: 2020/04/10
Limit: FCC_Part15.209_RE	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Horizontal
EUT: BASE STATION	Power: DC 12V
Note: Mode 1	

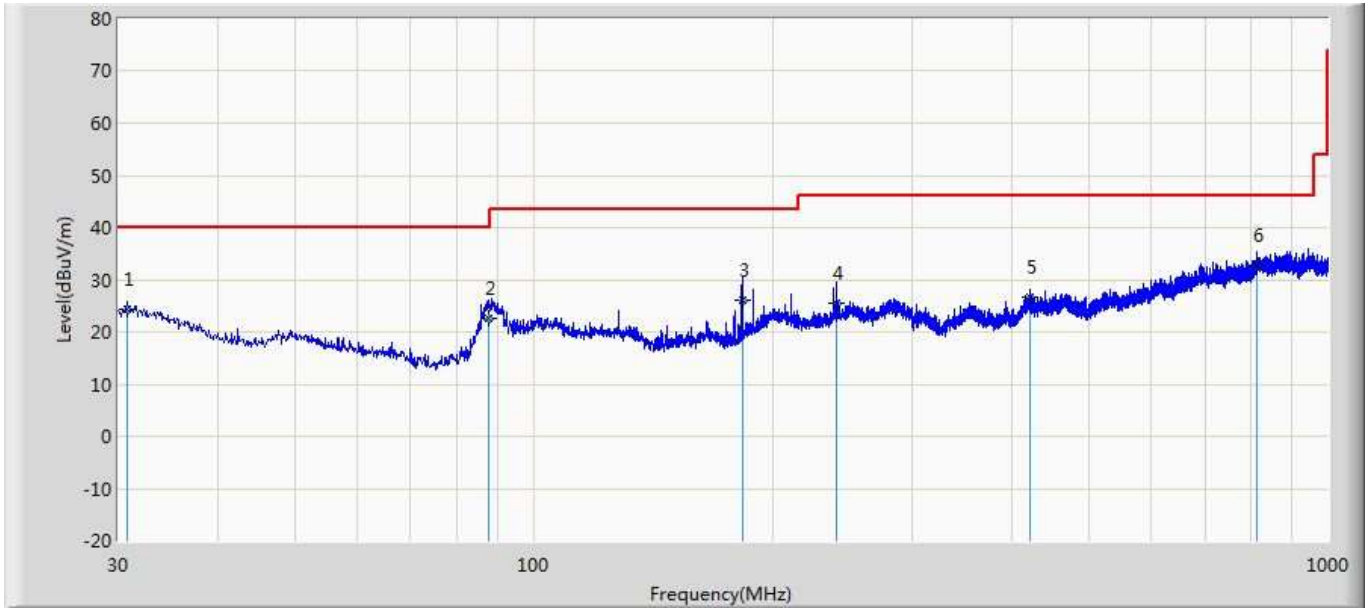


No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1	*	30.728	27.683	0.100	-12.317	40.000	20.956	6.628	0.000	100	30	QP
2		89.049	15.524	1.800	-27.976	43.500	6.985	6.739	0.000	100	50	QP
3		185.079	22.690	5.500	-20.810	43.500	9.880	7.310	0.000	100	111	QP
4		420.910	27.269	0.100	-18.731	46.000	19.201	7.968	0.000	100	150	QP
5		625.338	30.881	0.200	-15.119	46.000	22.111	8.570	0.000	100	45	QP
6		901.540	33.541	0.300	-12.459	46.000	23.988	9.253	0.000	100	200	QP

Note:

- " * ", means this data is the worst emission level.
- Measurement Level = Reading Level + Factor(Probe+Cable-Amp).

Engineer: Lucas	
Site: AC3	Time: 2020/04/10
Limit: FCC_Part15.209_RE	Margin: 0
Probe: AC2_3M(30-1000M)	Polarity: Vertical
EUT: BASE STATION	Power: DC 12V
Note: Mode 1	



No	Mark	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	Probe (dB/m)	Cable (dB)	Amp (dB)	Ant Pos (cm)	Table Pos (deg)	Type
1		30.849	24.265	0.200	-15.735	40.000	17.436	6.629	0.000	100	83	QP
2		87.836	22.679	6.000	-17.321	40.000	9.953	6.726	0.000	100	167	QP
3		183.024	26.149	6.800	-17.351	43.500	12.211	7.138	0.000	100	114	QP
4		240.975	25.651	2.100	-20.349	46.000	16.023	7.528	0.000	100	96	QP
5		421.516	26.701	0.100	-19.299	46.000	18.632	7.969	0.000	100	10	QP
6	*	812.547	32.898	0.200	-13.102	46.000	23.658	9.039	0.000	100	340	QP

5. 20dB Occupied Bandwidth

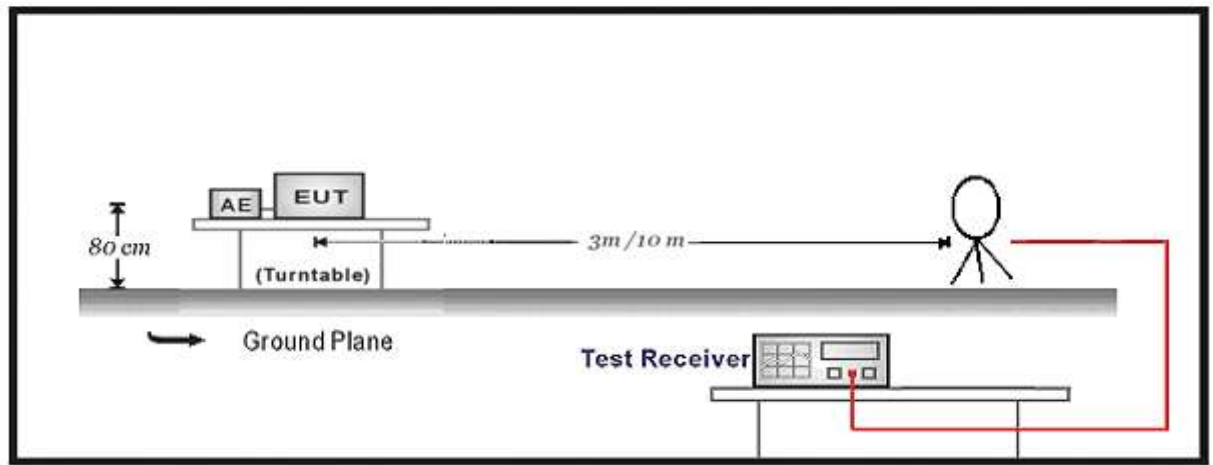
5.1. Test Equipment

AC1

Instrument	Manufacturer	Model No.	Serial No.	Cali. Due Date
EMI Test Receiver	R&S	ESCI	100175	2020.05.24
Preamplifier	Quietek	AP-025C	CHM-0602008	2021.04.12
Coaxial Cable	Huber+Suhner	RG 214_U	AC1-R	2021.04.12
Loop Antenna	R&S	HFH2-Z2	833799/003	2021.01.27
Temperature/Humidity Meter	zhichen	ZC1-2	AC1-TH	2020.08.20

5.2. Test Setup

9kHz~30MHz Test Setup:



5.3. Limit

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.215(c), must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

5.4. Test Procedure

The bandwidth of the fundamental frequency was measured by spectrum analyzer with the RBW 1%~5% of 20dBc bandwidth and the VBW three times of the RBW. The 20dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 20dB.

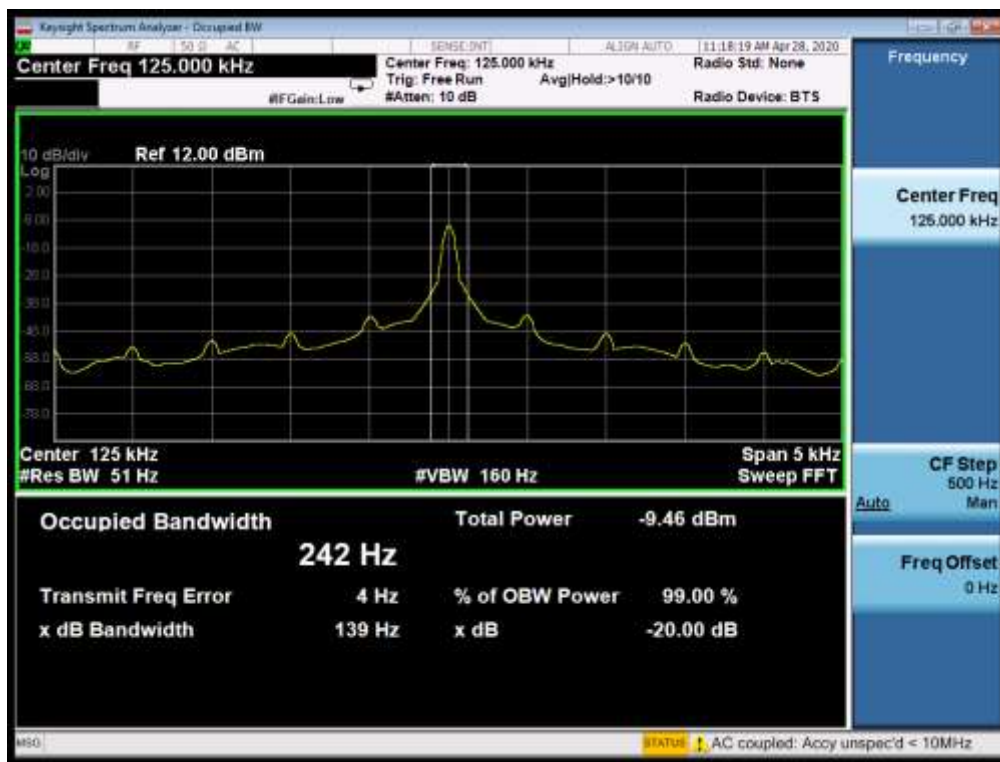
5.5. Uncertainty

The measurement uncertainty is defined as ± 10 Hz

5.6. Test Result

Product	BASE STATION		
Test Item	20dB Occupied Bandwidth		
Test Mode	Mode 1: Transmit		
Date of Test	2020/04/28	Test Site	AC-1

Frequency (kHz)	20dB Bandwidth (kHz)	99% Bandwidth (kHz)
125	0.139	0.242



Test Result	Pass
-------------	------

6. Antenna Requirement

6.1. Requirement

Antenna Requirement Limit
<p>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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.</p>

6.2. Result

Antenna Connector Construction	
<input checked="" type="checkbox"/>	The use of a permanently attached antenna
<input type="checkbox"/>	The antenna use of a unique coupling to the intentional radiator
<input type="checkbox"/>	The use of a nonstandard antenna jack or electrical connector
Please refer to the attached document "Internal Photograph" to show the antenna connector.	

————— The End —————