FCC Test Report

APPLICANT	:	Locus Solutions,LLC
EQUIPMENT	:	GO Tracker 1.5
BRAND NAME	:	Emerson
MODEL NAME	:	GO Tracker 1.5
FCC ID	:	AMH101011
STANDARD	:	47 CFR Part 15 Subpart B
CLASSIFICATION	:	Certification

The product was received on Nov. 12, 2019 and testing was completed on Nov. 19, 2019. We, Sporton International (ShenZhen) Inc., would like to declare that the tested sample has been evaluated in accordance with the test procedures given in ANSI C63.4-2014 and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International (ShenZhen) Inc., the test report shall not be reproduced except in full.

Reviewed by: Derreck Chen / Supervisor

Approved by: Eric Shih / Manager

Cert #5145.01

Sporton International (ShenZhen) Inc.

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan Shenzhen, 518055

People's Republic of China

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REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FC9N1204	Rev. 01	Initial issue of report	Jan. 08, 2020

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.107	AC Conducted Emission	< 15.107 limits	PASS	Under limit 16.91 dB at 0.600 MHz
3.2	15.109	Radiated Emission	< 15.109 limits	PASS	Under limit 17.17 dB at 31.940 MHz

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.

1. General Description

1.1. Applicant

Locus Solutions,LLC
7121 Fairway Dr. Suite #400 | Palm Beach Gardens, FL 33418 USA

1.2. Manufacturer

Queclink Wireless Solutions Co., Ltd.
3 Floor, Building 2, No.717 Yishan Road, Xuhui District, shanghai, China 200233

1.3. Product Feature of Equipment Under Test

Product Feature	
Equipment	GO Tracker 1.5
Brand Name	Emerson
Model Name	GO Tracker 1.5
FCC ID	AMH101011
EUT supports Radios application	GSM/LTE Category M1/NB-IOT Category NB1
IMEI Code	Conduction: N/A Radiation: 862061041481382 for Sample 1 862061041480590 for Sample 2
HW Version	V1.03
SW Version	R00A01V19
EUT Stage	Production Unit

Remark:

1. The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
2. There are two types of EUT: sample 1 with a battery of 1800mAh capacity and sample 2 with a battery of 4000mAh capacity. According to the difference, we choose sample 1 to perform full test, sample 2 to verify the worst cases.

1.4. Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx Frequency	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8MHz LTE Category M1: LTE Band 2 : 1850.7 MHz ~ 1909.3 MHz LTE Band 4 : 1710.7 MHz ~ 1754.3 MHz LTE Band 5 : 824.7 MHz ~ 848.3 MHz LTE Band 12 : 699.7 MHz ~ 715.3 MHz LTE Band 13 : 779.5 MHz ~ 784.5 MHz LTE Band 26 : 814.7 MHz ~ 848.3 MHz NB-IOT Category NB1 : Band 2 : 1850.1 MHz ~ 1909.9 MHz Band 4 : 1710.1 MHz ~ 1754.9 MHz Band 5 : 824.1 MHz ~ 848.9 MHz Band 12 : 699.1 MHz ~ 715.9 MHz Band 13 : 777.1 MHz ~ 786.9 MHz Band 26 : 814.1 MHz ~ 848.9 MHz
Rx Frequency	GSM850: 869.2 MHz ~ 893.8 MHz GSM1900: 1930.2 MHz ~ 1989.8 MHz LTE Category M1: LTE Band 2 : 1930.7 MHz ~ 1989.3 MHz LTE Band 4 : 2110.7 MHz ~ 2154.3 MHz LTE Band 5 : 869.7 MHz ~ 893.3 MHz LTE Band 12 : 729.7 MHz ~ 745.3 MHz LTE Band 13 : 748.5 MHz ~ 753.5 MHz LTE Band 26 : 859.7 MHz ~ 893.3 MHz NB-IOT Category NB1 : Band 2 : 1930.1 MHz ~ 1989.9 MHz Band 4 : 2110.1 MHz ~ 2154.9 MHz Band 5 : 869.1 MHz ~ 893.9 MHz Band 12 : 729.1 MHz ~ 745.9 MHz Band 13 : 746.1 MHz ~ 755.9 MHz Band 26 : 859.1 MHz ~ 893.9 MHz
Antenna Type	PCB Antenna
Type of Modulation	GPRS: GMSK EGPRS : GMSK for MCS 0 ~ 4 & 8PSK for MCS5 ~9 LTE Category M1: QPSK / 16QAM NB-IOT Category NB1 :BPSK / QPSK

1.5. Modification of EUT

No modifications are made to the EUT during all test items.

1.6. Test Location

Sporton International (Shenzhen) Inc. is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-SZ	CN1256	421272

Test Firm	Sporton International (Shenzhen) Inc.		
Test Site Location	No. 3 Bldg the third floor of south, Shahe River west, Fengzeyuan Warehouse, Nanshan Shenzhen, 518055 People's Republic of China TEL: +86-755-33202398		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	03CH04-SZ	CN1256	421272

1.7. Test Software

Item	Site	Manufacture	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b

1.8. Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 15 Subpart B
- ANSI C63.4-2014

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2. Test Configuration of Equipment Under Test

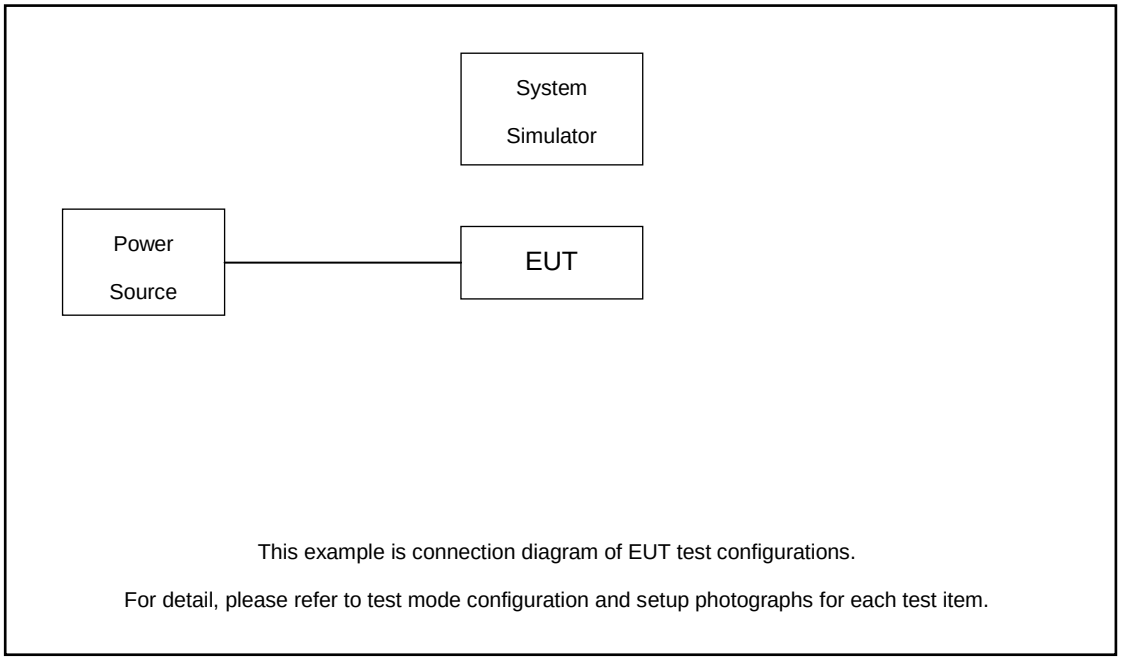
2.1. Test Mode

The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application.

Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (30MHz to the 5th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

Test Items	Function Type
AC Conducted Emission	Mode 1: GPRS 850 Idle(Middle CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 2: LTE Band 5 Idle(Middle CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 3: LTE Band 12 Idle(Low CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 4: LTE Band 13 Idle(Low CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 5: LTE Band 26 Idle(High CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 6: LTE Band 12 Idle(Low CH) + Battery 2 + USB Cable(Charging from Adapter) for Sample 2
Radiated Emissions	Mode 1: GPRS 850 Idle(Middle CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 2: LTE Band 5 Idle(Middle CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 3: LTE Band 12 Idle(Low CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 4: LTE Band 13 Idle(Low CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 5: LTE Band 26 Idle(Middle CH) + Battery 1 + USB Cable(Charging from Adapter) for Sample 1 Mode 6: LTE Band 26 Idle(Middle CH) + Battery 2 + USB Cable(Charging from Adapter) for Sample 2
Remark: **1.** The worst case of AC is mode 3; only the test data of this mode is reported. **2.** The worst case of RE is mode 5; only the test data of this mode is reported. **3.** Pre-scanned Low/Middle/High channel for GPRS850/LTE Band 5/12/13/26, the worst channel was recorded in this report	

2.2. Connection Diagram of Test System



The EUT has been associated with peripherals pursuant to ANSI C63.4-2014 and configuration operated in a manner tended to maximize its emission characteristics in a typical application

2.3. Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	Adapter	N/A	N/A	N/A	N/A	N/A
3.	USB Cable	N/A	N/A	N/A	Unshielded,1.2m	N/A

2.4. EUT Operation Test Setup

The EUT was in GPRS or LTE idle mode during the testing. The EUT was synchronized to the BCCH, and is in continuous receiving mode by setting system simulator's paging reorganization.

3. Test Result

3.1. Test of AC Conducted Emission Measurement

3.1.1 Limits of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

<Class B Limit>

Frequency of emission (MHz)	Conducted 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.

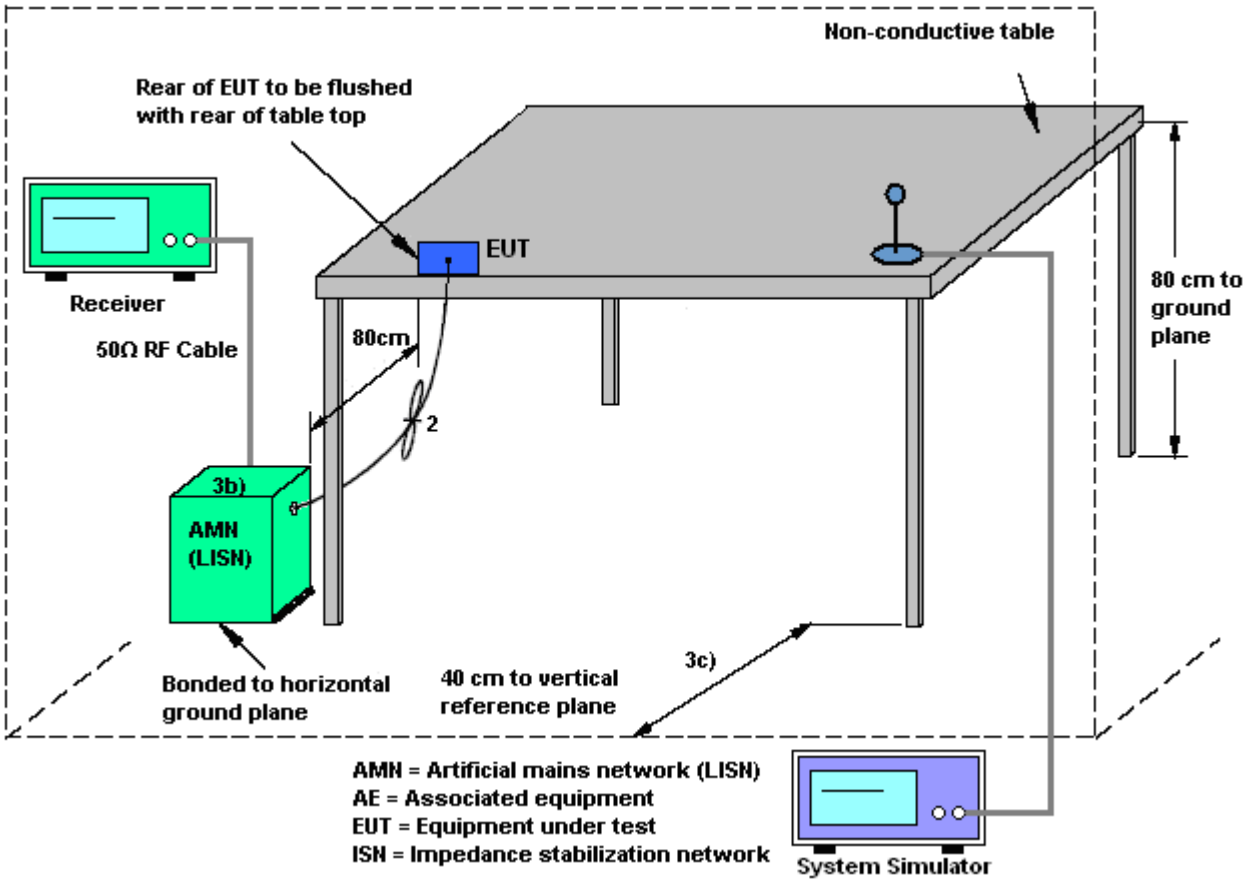
3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedure

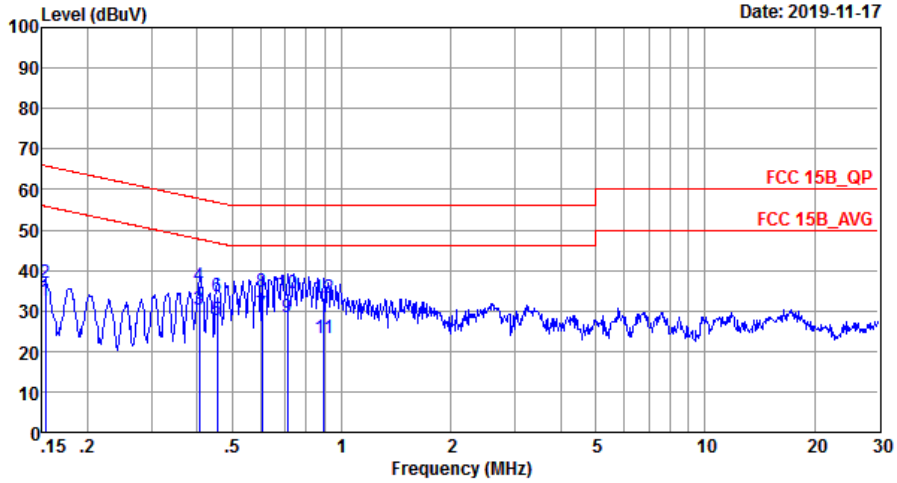
1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF Bandwidth = 9kHz) with Maximum Hold Mode. Then measurement is also conducted by Average Detector and Quasi-Peak Detector Function respectively.

3.1.4 Test Setup



3.1.5 Test Result of AC Conducted Emission

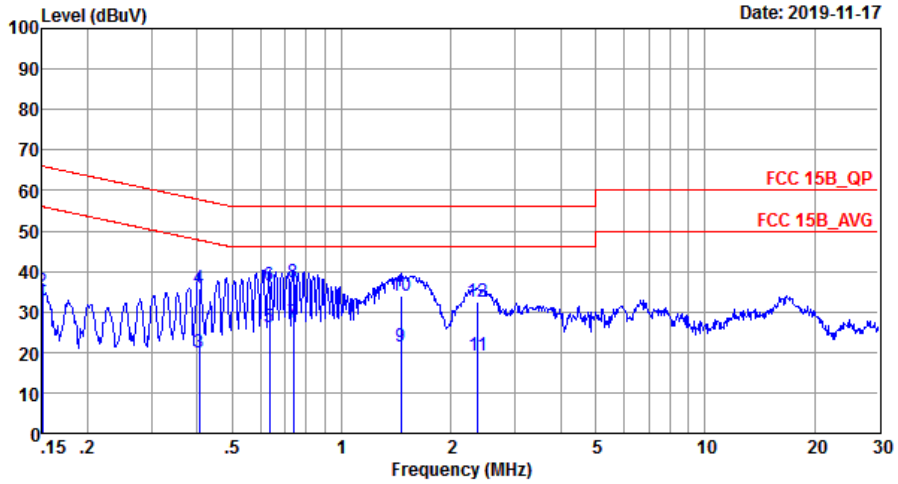
Test Engineer :	Liu Dalin	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Line



Site : CO01-SZ
Condition: FCC 15B_QP LISN_20190719_L LINE

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	32.44	-23.38	55.82	22.40	0.03	10.01	Average
2		0.15	37.04	-28.78	65.82	27.00	0.03	10.01	QP
3		0.41	30.14	-17.59	47.73	20.10	0.03	10.01	Average
4		0.41	36.14	-21.59	57.73	26.10	0.03	10.01	QP
5		0.45	27.66	-19.14	46.80	17.60	0.02	10.04	Average
6		0.45	33.56	-23.24	56.80	23.50	0.02	10.04	QP
7	*	0.60	29.09	-16.91	46.00	19.00	0.02	10.07	Average
8		0.60	34.79	-21.21	56.00	24.70	0.02	10.07	QP
9		0.71	28.49	-17.51	46.00	18.40	0.02	10.07	Average
10		0.71	34.39	-21.61	56.00	24.30	0.02	10.07	QP
11		0.89	23.21	-22.79	46.00	13.10	0.05	10.06	Average
12		0.89	33.11	-22.89	56.00	23.00	0.05	10.06	QP

Test Engineer :	Liu Dalin	Temperature :	22~25℃
		Relative Humidity :	50~55%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral



Site : CO01-SZ
Condition: FCC 15B_QP LISN_20190719_N NEUTRAL

		Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
		MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1		0.15	32.34	-23.66	56.00	22.30	0.03	10.01	Average
2		0.15	35.04	-30.96	66.00	25.00	0.03	10.01	QP
3		0.41	19.83	-27.90	47.73	9.80	0.02	10.01	Average
4		0.41	35.83	-21.90	57.73	25.80	0.02	10.01	QP
5		0.63	26.09	-19.91	46.00	16.00	0.02	10.07	Average
6		0.63	36.69	-19.31	56.00	26.60	0.02	10.07	QP
7	*	0.74	27.29	-18.71	46.00	17.20	0.02	10.07	Average
8		0.74	37.29	-18.71	56.00	27.20	0.02	10.07	QP
9		1.46	21.30	-24.70	46.00	11.20	0.05	10.05	Average
10		1.46	34.10	-21.90	56.00	24.00	0.05	10.05	QP
11		2.37	19.31	-26.69	46.00	9.20	0.04	10.07	Average
12		2.37	32.31	-23.69	56.00	22.20	0.04	10.07	QP

Note:

1. Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
2. Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

3.2. Test of Radiated Emission Measurement

3.2.1. Limit of Radiated Emission

The emissions from an unintentional radiator shall not exceed the field strength levels specified in the following table:

<Class B Limit>

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

3.2.2. Measuring Instruments

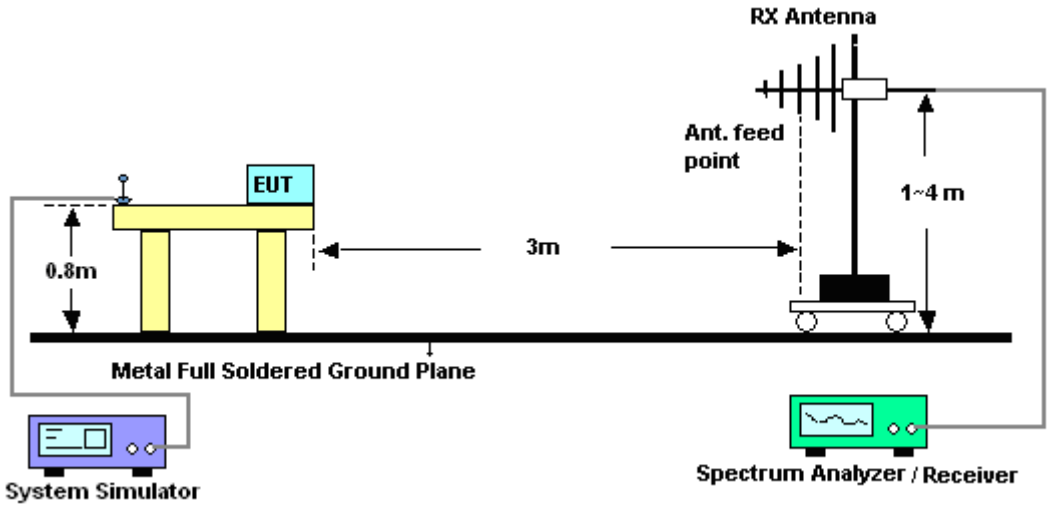
The measuring equipment is listed in the section 4 of this test report.

3.2.3. Test Procedures

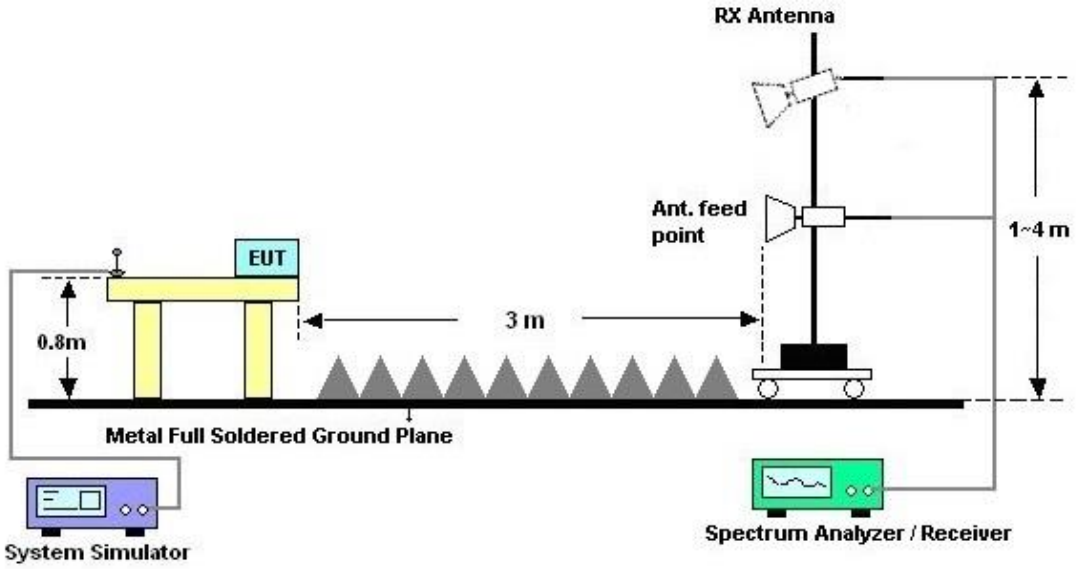
1. The EUT was placed on a turntable with 0.8 meter above ground.
2. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
3. The table was rotated 360 degrees to determine the position of the highest radiation.
4. The antenna is a Bi-Log antenna and its height is adjusted between one to four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode (RBW=120kHz/VBW=300kHz for frequency below 1GHz; RBW=1MHz VBW=3MHz (Peak), RBW=1MHz/VBW=10Hz (Average) for frequency above 1GHz).
7. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, peak values of EUT will be reported. Otherwise, the emission will be repeated by using the quasi-peak method and reported.
8. Emission level (dBμV/m) = 20 log Emission level (μV/m)
9. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

3.2.4. Test Setup of Radiated Emission

For radiated emissions from 30MHz to 1GHz

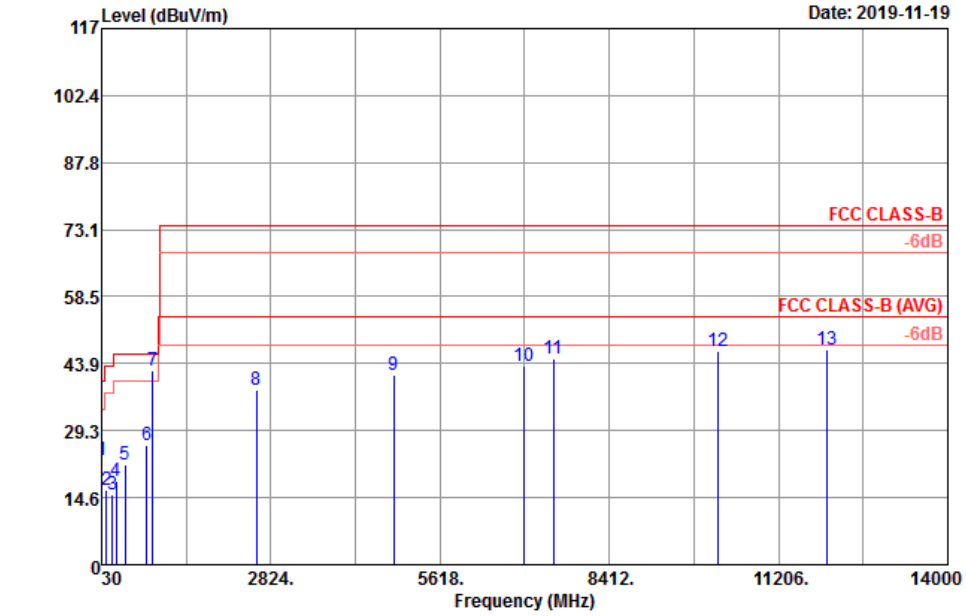


For radiated emissions above 1GHz



3.2.5. Test Result of Radiated Emission

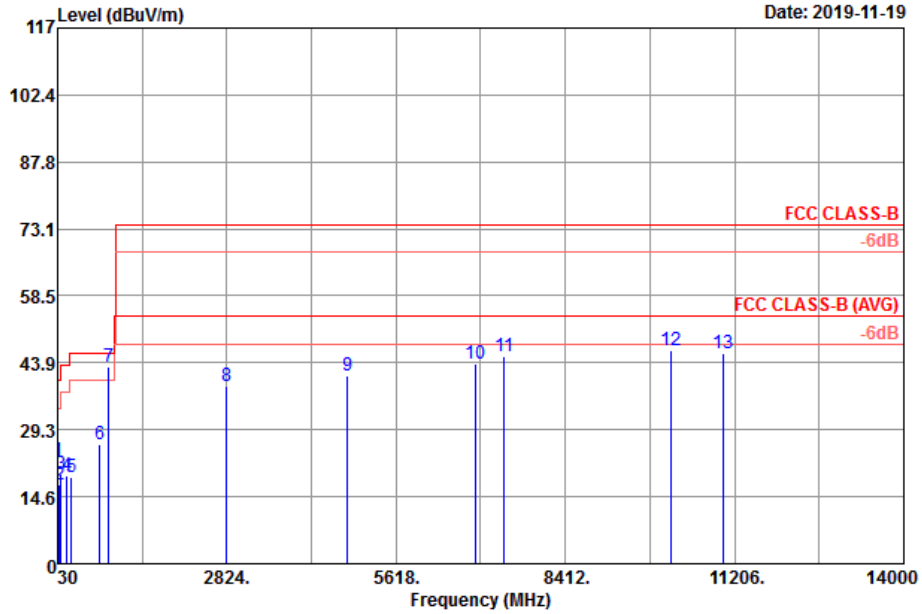
Test Engineer :	Zhang Zhongmin	**Temperature :**	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	**Polarization :**	Horizontal
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH04-SZ
Condition : FCC CLASS-B 3m LF_ANT37879_18 HORIZONTAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.94	22.83	-17.17	40.00	30.36	23.72	0.55	31.80	100	169	Peak
2	104.69	16.22	-27.28	43.50	30.45	17.31	1.04	32.58	---	---	Peak
3	202.66	15.23	-28.27	43.50	30.41	15.57	1.44	32.19	---	---	Peak
4	264.74	18.37	-27.63	46.00	29.07	19.61	1.69	32.00	---	---	Peak
5	414.12	21.71	-24.29	46.00	29.41	22.07	2.13	31.90	---	---	Peak
6	772.05	26.22	-19.78	46.00	29.70	25.89	2.89	32.26	---	---	Peak
7	876.50	42.29			44.85	26.58	3.11	32.25	---	---	Peak
8	2586.00	38.21	-35.79	74.00	63.13	27.72	4.96	57.60	---	---	Peak
9	4850.00	41.30	-32.70	74.00	61.34	31.80	5.65	57.49	---	---	Peak
10	6994.00	43.23	-30.77	74.00	59.11	35.70	7.22	58.80	---	---	Peak
11	7494.00	45.05	-28.95	74.00	59.35	37.60	7.10	59.00	---	---	Peak
12	10204.00	46.72	-27.28	74.00	58.61	38.09	9.20	59.18	---	---	Peak
13	12004.00	46.84	-27.16	74.00	55.12	39.30	9.62	57.20	154	50	Peak

Test Engineer :	Zhang Zhongmin	Temperature :	24~25°C
		Relative Humidity :	48~49%
Test Distance :	3m	Polarization :	Vertical
Remark :	#7 is system simulator signal which can be ignored.		



Site : 03CH04-SZ
Condition : FCC CLASS-B 3m LF_ANT37879_18 VERTICAL

	Freq	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg	
1	31.94	22.63	-17.37	40.00	30.16	23.72	0.55	31.80	100	137	Peak
2	61.04	17.24	-22.76	40.00	36.62	12.43	0.79	32.60	---	---	Peak
3	90.14	19.45	-24.05	43.50	36.00	15.10	0.95	32.60	---	---	Peak
4	183.26	19.34	-24.16	43.50	34.88	15.35	1.38	32.27	---	---	Peak
5	262.80	19.04	-26.96	46.00	29.66	19.69	1.69	32.00	---	---	Peak
6	722.58	25.98	-20.02	46.00	30.08	25.35	2.80	32.25	---	---	Peak
7	876.50	43.00			45.56	26.58	3.11	32.25	---	---	Peak
8	2816.00	38.72	-35.28	74.00	62.98	28.14	5.03	57.43	---	---	Peak
9	4812.00	41.22	-32.78	74.00	61.42	31.72	5.55	57.47	---	---	Peak
10	6932.00	43.63	-30.37	74.00	59.79	35.46	7.10	58.72	---	---	Peak
11	7398.00	45.23	-28.77	74.00	59.78	37.21	7.20	58.96	---	---	Peak
12	10158.00	46.59	-27.41	74.00	58.55	38.06	9.19	59.21	110	98	Peak
13	11010.00	45.96	-28.04	74.00	56.01	38.84	9.39	58.28	---	---	Peak

Note:

1. Level(dBμV/m) = Read Level(dBμV) + Antenna Factor(dB/m) + Cable Loss(dB) - Preamp Factor(dB)
2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

4. List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Dec. 23, 2018	Nov. 17, 2019	Dec. 22, 2019	Conduction (CO01-SZ)
AC LISN	EMCO	3816/2SH	00103912	9kHz~30MHz	Oct. 17, 2019	Nov. 17, 2019	Oct. 16, 2020	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Dec. 23, 2018	Nov. 17, 2019	Dec. 22, 2019	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Jul. 23, 2019	Nov. 17, 2019	Jul. 22, 2020	Conduction (CO01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Apr. 18, 2019	Nov. 19, 2019	Apr. 17, 2020	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Apr. 18, 2019	Nov. 19, 2019	Apr. 17, 2020	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Aug. 27, 2019	Nov. 19, 2019	Aug. 26, 2020	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	Apr. 01, 2019	Nov. 19, 2019	Mar. 31, 2020	Radiation (03CH04-SZ)
LF Amplifier	Burgeon	BPA-530	102211	0.01~3000Mhz	Oct. 18, 2019	Nov. 19, 2019	Oct. 17, 2020	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-00101800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2019	Nov. 19, 2019	Oct. 17, 2020	Radiation (03CH04-SZ)
AC Power Source	Chroma	61601	N/A	N/A	NCR	Nov. 19, 2019	NCR	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Nov. 19, 2019	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Nov. 19, 2019	NCR	Radiation (03CH04-SZ)

NCR: No Calibration Required

5. Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150 kHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.6dB**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.0dB**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**4.8dB**