FCC TEST REPORT

Report No: STS1609087F01

Issued for

Outform Ltd.

Room A103 and A105,Nanshan Medical Instrument Industry Park,No.1019,Nanhai Avenue, Nanshan District, Shenzhen, Guangdong Province, China 518000

Product Name:	SECURITY SOLUTION
Brand Name:	OUTFORM
Model Name:	UM100322
Series Model:	UM10xxxx,UC10xxxx,UF10xxxx,UW10xxxx (XXXX representatives product serial number)
FCC ID:	2AC8G-UMSW
Test Standard:	FCC Part 15 Subpart C

Shenzhen STS Test Services Co., Ltd.
1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
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TEST RESULT CERTIFICATION

Applicant's name :	Outform Ltd.
Address :	Room A103 and A105,Nanshan Medical Instrument Industry Park,No.1019,Nanhai Avenue, Nanshan District, Shenzhen, Guangdong Province, China 518000
Manufacture's Name :	Outform Ltd.
Address :	Room A103 and A105,Nanshan Medical Instrument Industry Park,No.1019,Nanhai Avenue, Nanshan District, Shenzhen, Guangdong Province, China 518000

Product description

Product name :	SECURITY SOLUTION
Brand name :	OUTFORM
Model and/or type reference :	UM100322
Standards :	FCC Part 15 Subpart C
Test Procedure :	ANSI C63.10-2013

This device described above has been tested by STS, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.
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Date of performance of tests:	09 Sep. 2016 ~28 Sep. 2016
Date of Issue :	29 Sep. 2016
Test Result :	**Pass**

Testing Engineer : _____
(Tony Liu)

Technical Manager : _____
(Vita Li)

Authorized Signatory : _____
(Bovey Yang)

Table of Contents **Page**

Revision History

Rev.	Issue Date	Report NO.	Effect Page	Contents
00	29 Sep. 2016	STS1609087F01	ALL	Initial Issue

1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15 , Subpart C			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	PASS	
15.209（a）	Radiated emission, Spurious Emission	PASS	
2.1049	20 dB Bandwidth	PASS	

1.1 TEST FACTORY

Shenzhen STS Test Services Co., Ltd.
Add. : 1/F., Building B, Zhuoke Science Park, No.190, Chongqing Road,
Fuyong Street, Bao'an District, Shenzhen, Guangdong, China
CNAS Registration No.: L7649;
FCC Registration No.: 842334; IC Registration No.: 12108A-1

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ±U** , where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2** , providing a level of confidence of approximately **95** %。

No.	Item	Uncertainty
1	Conducted Emission (9KHz-150KHz)	±2.88dB
2	Conducted Emission (150KHz-30MHz)	±2.67 dB
3	All emissions,radiated(<1G) 30MHz-200MHz	±2.83dB
4	All emissions,radiated(<1G) 200MHz-1000MHz	±2.94dB
5	Temperature	±0.5°C
6	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	SECURITY SOLUTION
Trade Name	OUTFORM
Model Name	UM100322
Series Model	UM10xxxx,UC10xxxx,UF10xxxx,UW10xxxx(XX XX representatives product serial number)
Model Difference	Only different in model name
Channel List	Please refer to the Note 2.
Equipemnt Category	Non-ISM frequency
Operating frequency	175KHz
Modulation Type	ASK
Power Adapter	Power supply and ADP(rating): Input: AC 120V, 2000mA Outout: DC 5V,800mA
Hardware version number	N/A
Software version number	N/A
Connecting I/O Port(s)	Please refer to the User's Manual

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
2.

Channel List					
Channel	Frequency (KHz)	Channel	Frequency (KHz)	Channel	Frequency (KHz)
00	175				

3. Table for Filed Antenna

Ant	Brand	Model Name	Antenna Type	Connector	NOTE
1	OUTFORM	UM100322	Coil	NA	Antenna

The EUT antenna is Coil Antenna. No antenna other than that furnished by the responsible party shall be used with the device.

2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base 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.

Pretest Mode	Description
Mode 1	Charging+TX Mode

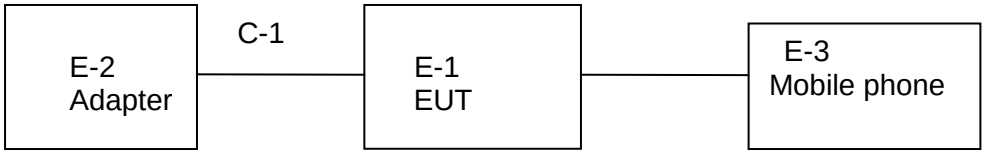
For Conducted Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	Charging+TX Mode

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

During testing channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters

Conducted Emission Test



Radiated EmissionTest

2.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Serial No.	Note
E-1	SECURITY SOLUTION	OUTFORM	UM100322	N/A	EUT
E-2	Adapter	LITEON	PA-1650-86	N/A	N/A
E-3	Mobile phone	SAMSUNG	GALAXY S6	N/A	N/A

Item	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable (FTP)	NO	50cm	/

Note:

(1) FCC DOC approved.
(2) FTP is Foiled Twisted Pair.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
Spectrum Analyzer	Agilent	E4407B	MY50140340	2015.10.25	2016.10.24
Test Receiver	R&S	ESCI	101427	2015.10.25	2016.10.24
Bilog Antenna	TESEQ	CBL6111D	34678	2015.11.25	2016.11.24
50Ω Coaxial Switch	Anritsu	MP59B	6200264416	2016.06.06	2017.06.05
PreAmplifier	Agilent	8449B	60538	2015.10.25	2016.10.24
Loop Antenna	ARA	PLA-1030/B	1029	2016.06.08	2017.06.07
USB RF power sensor	DARE	RPR3006W	15I00041SNO03	2015.10.25	2016.10.24

Conduction Test equipment

Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until
EMI Test Receiver	R&S	ESPI	102086	2015.11.20	2016.11.19
LISN	R&S	ENV216	101242	2015.10.25	2016.10.24
LISN	EMCO	3810/2NM	000-23625	2015.10.25	2016.10.24

3.CONDUCTED EMISSION TEST RESULT(SECTION 15.207)

3.1 POWER LINE CONDUCTED EMISSION LIMITS

Operating frequency band. In case the emission fall within the restricted band specified on Part 15.207 limit in the table below has to be followed.

FREQUENCY (MHz)	Class B (dBuV)	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

(1) The tighter limit applies at the band edges.

(2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

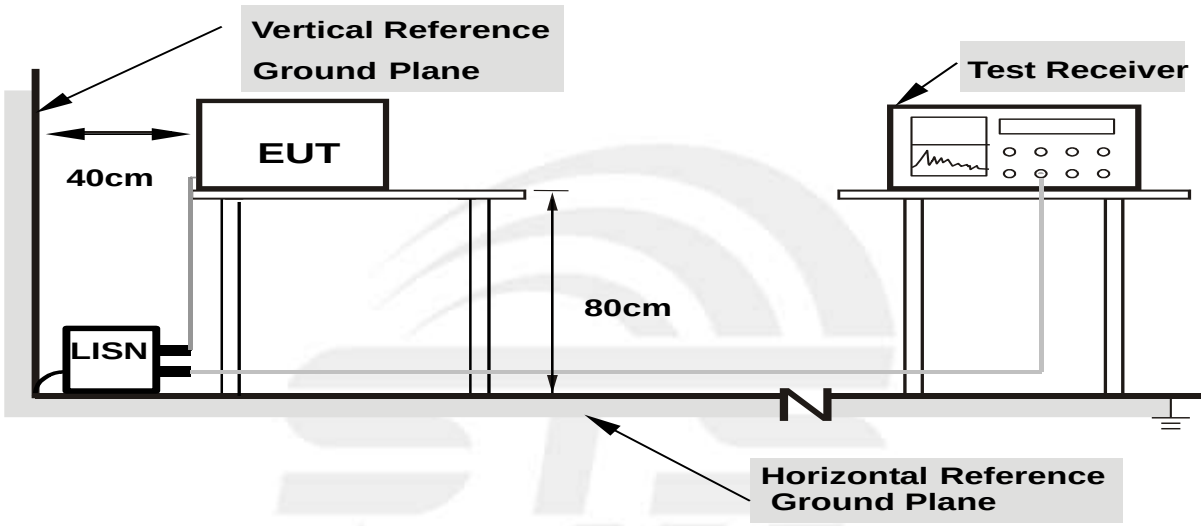
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.2 TEST PROCEDURE

a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

3.4 EUT OPERATING CONDITIONS

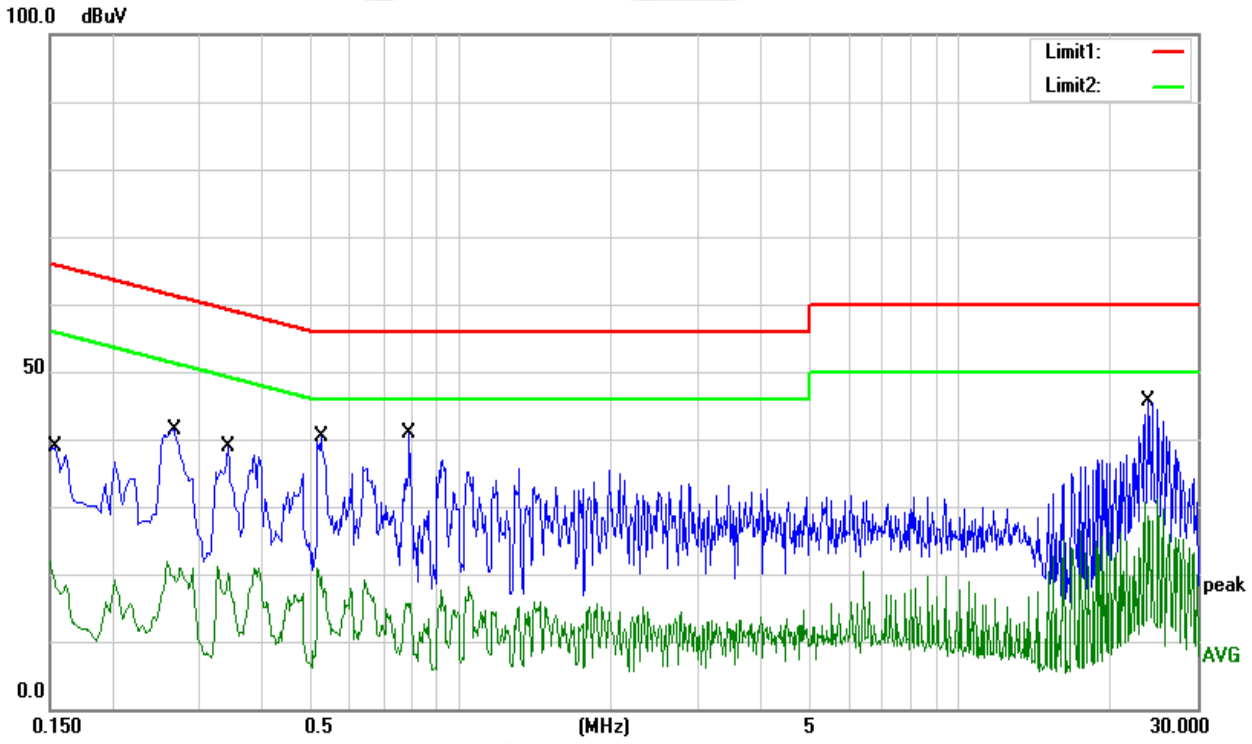
The EUT was configured for testing in a typical fashion (as a customer would normally use it). The EUT has been programmed to continuously transmit during test. This operating condition was tested and used to collect the included data.

3.5TEST RESULTS

Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	L
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.1540	29.53	9.23	38.76	65.78	-27.02	QP
2	0.1540	8.38	9.23	17.61	55.78	-38.17	AVG
3	0.2660	32.29	9.16	41.45	61.24	-19.79	QP
4	0.2660	9.87	9.16	19.03	51.24	-32.21	AVG
5	0.3420	29.58	9.26	38.84	59.15	-20.31	QP
6	0.3420	8.40	9.26	17.66	49.15	-31.49	AVG
7	0.5260	31.25	9.15	40.40	56.00	-15.60	QP
8	0.5260	8.81	9.15	17.96	46.00	-28.04	AVG
9	0.7900	31.75	9.22	40.97	56.00	-15.03	QP
10	0.7900	3.76	9.22	12.98	46.00	-33.02	AVG
11	23.9580	35.82	9.75	45.57	60.00	-14.43	QP
12	23.9580	18.78	9.75	28.53	50.00	-21.47	AVG

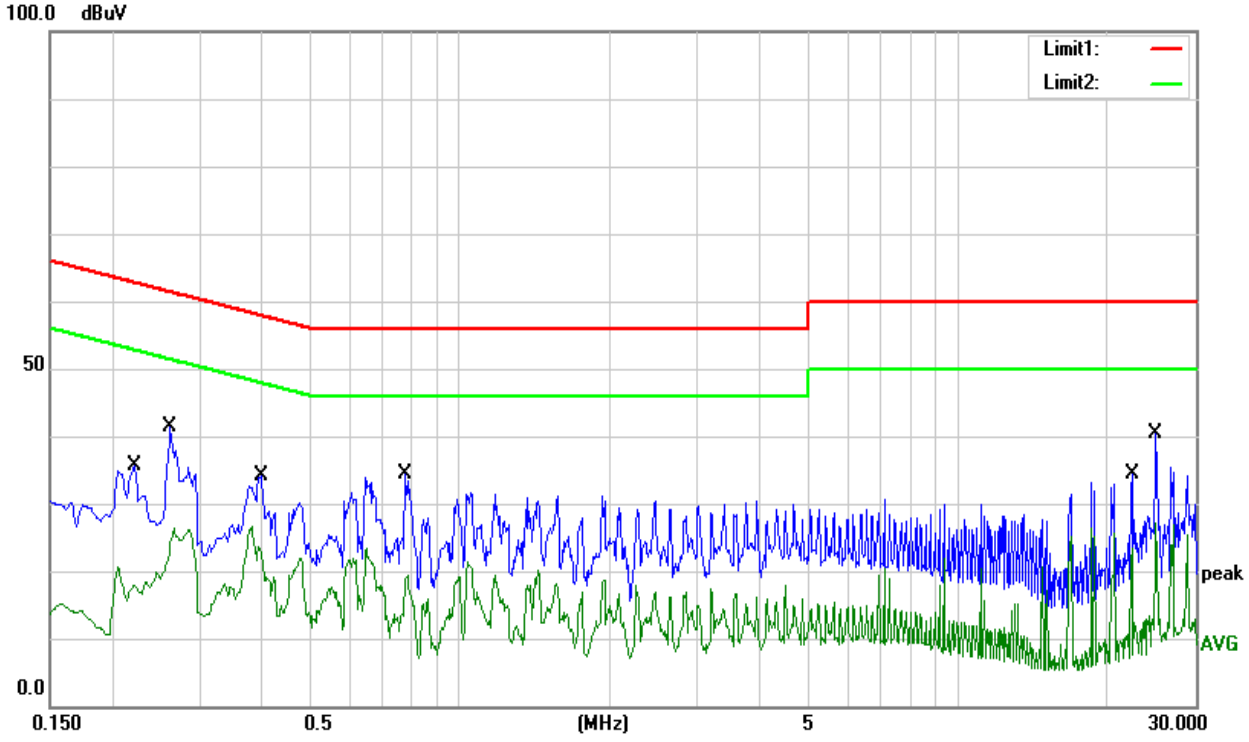
Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



Temperature:	26 ℃	Relative Humidity:	54%
Pressure:	1010hPa	Phase:	N
Test Voltage:	AC 120V/60Hz	Test Mode:	Mode 1

No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Result (dBuV)	Limit (dBuV/m)	Margin (dB)	Detector
1	0.2220	26.45	9.21	35.66	62.74	-27.08	QP
2	0.2220	8.49	9.21	17.70	52.74	-35.04	AVG
3	0.2620	32.30	9.17	41.47	61.37	-19.90	QP
4	0.2620	16.22	9.17	25.39	51.37	-25.98	AVG
5	0.3980	24.95	9.24	34.19	57.90	-23.71	QP
6	0.3980	12.14	9.24	21.38	47.90	-26.52	AVG
7	0.7780	25.18	9.24	34.42	56.00	-21.58	QP
8	0.7780	7.64	9.24	16.88	46.00	-29.12	AVG
9	22.3900	24.51	9.83	34.34	60.00	-25.66	QP
10	22.3900	13.64	9.83	23.47	50.00	-26.53	AVG
11	24.9980	30.46	9.89	40.35	60.00	-19.65	QP
12	24.9980	17.22	9.89	27.11	50.00	-22.89	AVG

Remark:
1. All readings are Quasi-Peak and Average values.
2. Margin = Result (Result =Reading + Factor)–Limit



4. RADIATED& FIELD EMISSION TEST RESULT(SECTIOU 15.209)

4.1 Limit

Frequency [MHz]	Field Strength [uV/m]	Measurement Distance [Meters]
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

(1) The limit for radiated test was performed according to FCC PART 15C.

(2) The tighter limit applies at the band edges.

(3) Emission level (dBuV/m)=20log Emission level (uV/m).

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~90kHz / RB 200Hz for AV
Start ~ Stop Frequency	90kHz~110kHz / RB 200Hz for QP
Start ~ Stop Frequency	110kHz~490kHz / RB 200Hz for AV
Start ~ Stop Frequency	490kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

§ 15.209(d)The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

4.2 TEST PROCEDURE

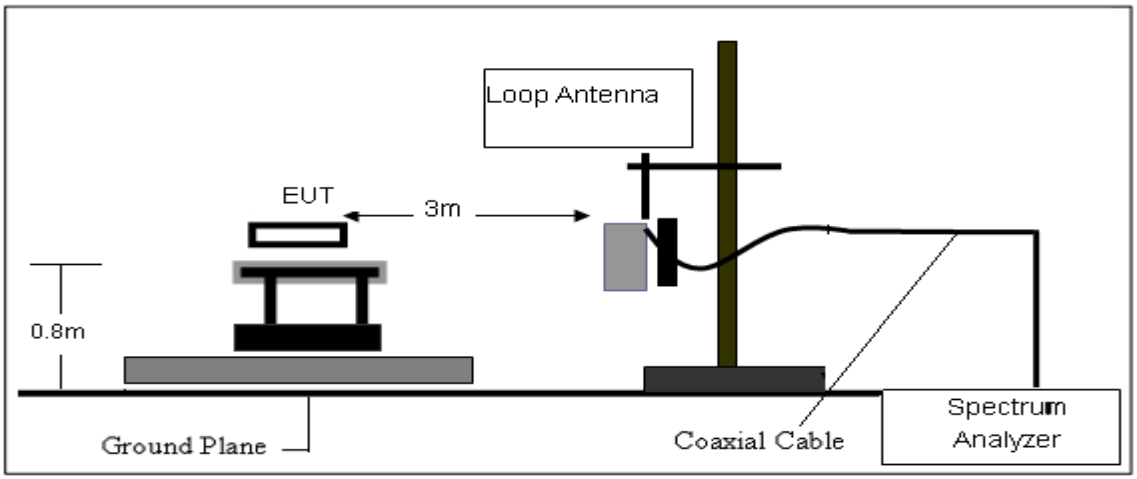
a. The measuring distance of at 3 m shall be used for measurements at frequency 0.009MHz up to 1GHz.
b. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
d. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

Note:

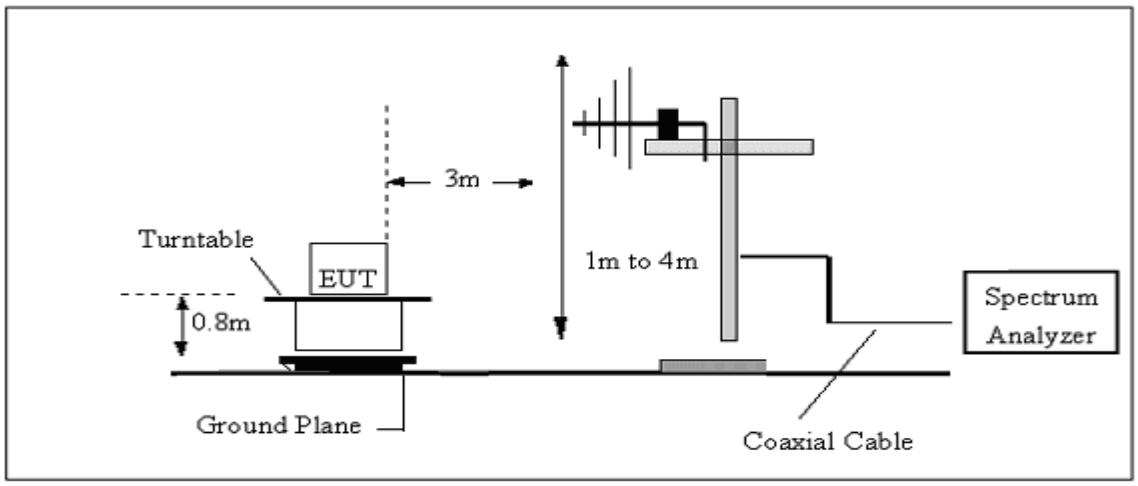
Both horizontal and vertical antenna polarities were tested and performed pretest to three orthogonal axis. The worst case emissions were reported.

4.3 TEST SETUP

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



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



4.4 TEST RESULTS

Temperature：	25 ℃	Relative Humidity：	50%
Pressure：	1012 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	TX Mode		

4.4.1 Spurious Radiated Emission Below 30 MHz

Frequency	Reading	Detector	Ant. Factor	Cable	Emission	Limits	Margin
(KHz)	(dBμV)	(PK/QP/AV)	(dB/m)	Loss	Level (dBμV/m)	(dBμV/m)	(dB)
9	61.21	AV	28.16	0.1	89.47	128.52	-39.05
23	60.22	AV	28.21	0.1	88.53	120.37	-31.84
36	53.32	AV	22.03	0.1	75.45	116.48	-41.03
45	54.13	AV	21.25	0.1	75.48	114.54	-39.06
110	60.21	AV	10.04	0.1	70.35	106.78	-36.43
175	70.31	AV	9.57	0.1	79.98	102.74	-22.76
205	60.32	AV	9.43	0.1	69.85	101.37	-31.52
554	53.13	QP	-16.36	0.1	36.87	72.73	-35.86
23214	41.22	QP	-17.9	0.9	24.22	53.98	-29.76

1. “*” Means Fundamental frequency

2. Emission Level [dBμV/m] = Reading [dBμV] + Ant. Factor [dB/m] + Cable Loss [dB]

3.Margin [dB] = Emission Level [dBμV/m] – Limit [dBμV/m]

4.Limit calculation: Limit at specified distance + 40log (300/3) = Limit + 80 dB for up to 0.49 MHz

Limit at specified distance + 40log (30/3) = Limit + 40 dB for above 0.49 MHz, Below 30 MHz

4.4.2 Spurious Radiated Emission below 1 GHz

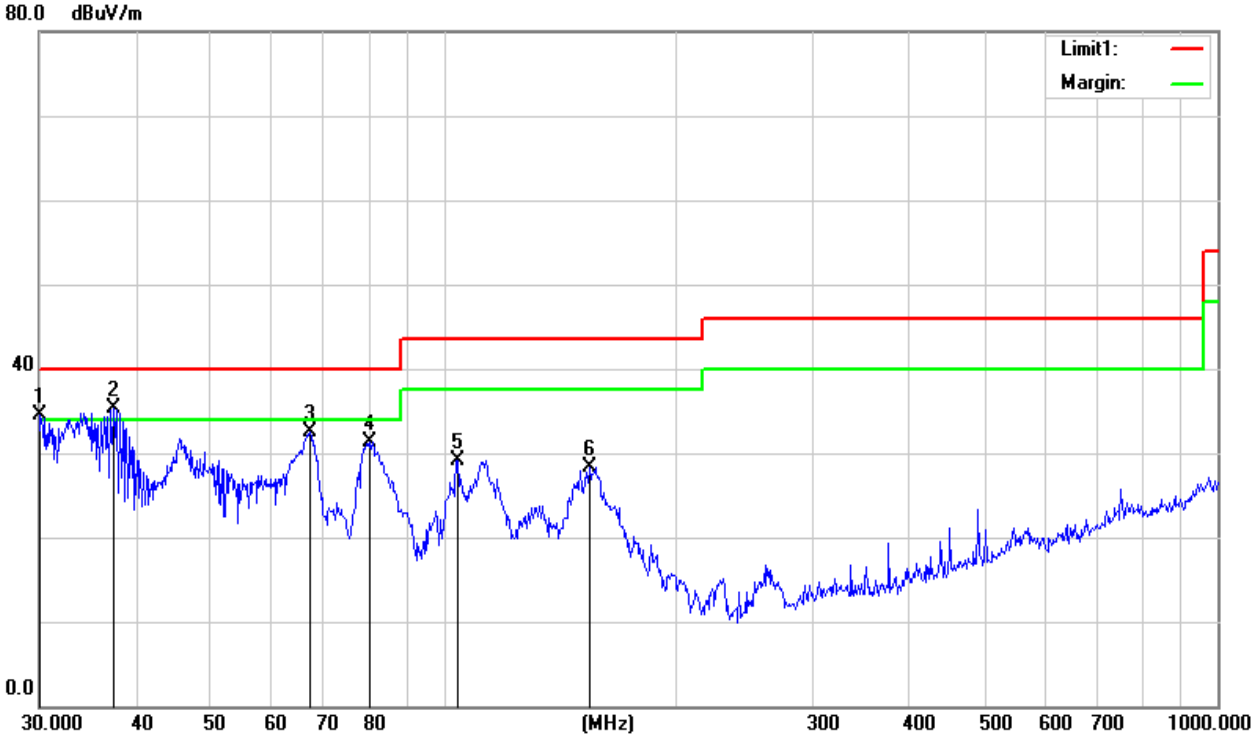
Temperature：	25 ℃	Relative Humidity：	50%
Pressure：	1012 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 1		

The following table shows the highest levels of radiated emissions on polarizations of vertical

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
30.1054	45.75	-11.24	34.51	40.00	-5.49	QP
37.4165	50.38	-15.00	35.38	40.00	-4.62	QP
67.2022	56.69	-24.17	32.52	40.00	-7.48	QP
80.0806	53.98	-22.67	31.31	40.00	-8.69	QP
104.1701	47.95	-18.84	29.11	43.50	-14.39	QP
154.2786	46.45	-18.20	28.25	43.50	-15.25	QP

Remark:

1. Margin = Result (Result =Reading + Factor)–Limit



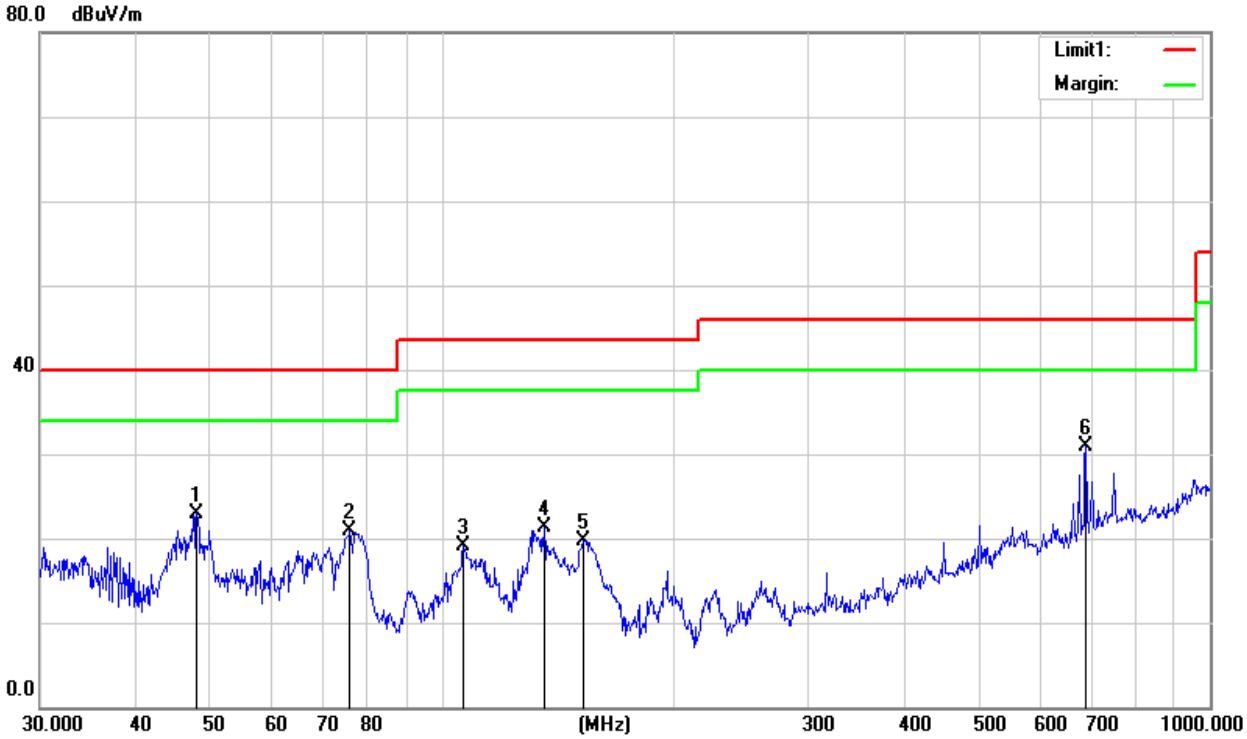
Temperature：	25 ℃	Relative Humidity：	50%
Pressure：	1012 hPa	Test Voltage ：	AC 120V/60Hz
Test Mode ：	Mode 1		

The following table shows the highest levels of radiated emissions on polarizations of horizontal

Frequency	Reading	Correct	Result	Limit	Margin	Remark
(MHz)	(dBuV)	Factor(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
47.9940	43.45	-20.45	23.00	40.00	-17.00	QP
75.9773	44.12	-23.26	20.86	40.00	-19.14	QP
106.7587	37.75	-18.61	19.14	43.50	-24.36	QP
135.9822	38.91	-17.52	21.39	43.50	-22.11	QP
152.6641	37.75	-18.11	19.64	43.50	-23.86	QP
689.5644	36.55	-5.57	30.98	46.00	-15.02	QP

Remark:

1. Margin = Result (Result =Reading + Factor)–Limit



5. 20 DB BANDWIDTH TEST

5.1 Limit

FCC Part 2.1049, Only applicable to report.

5.2 TEST SETUP

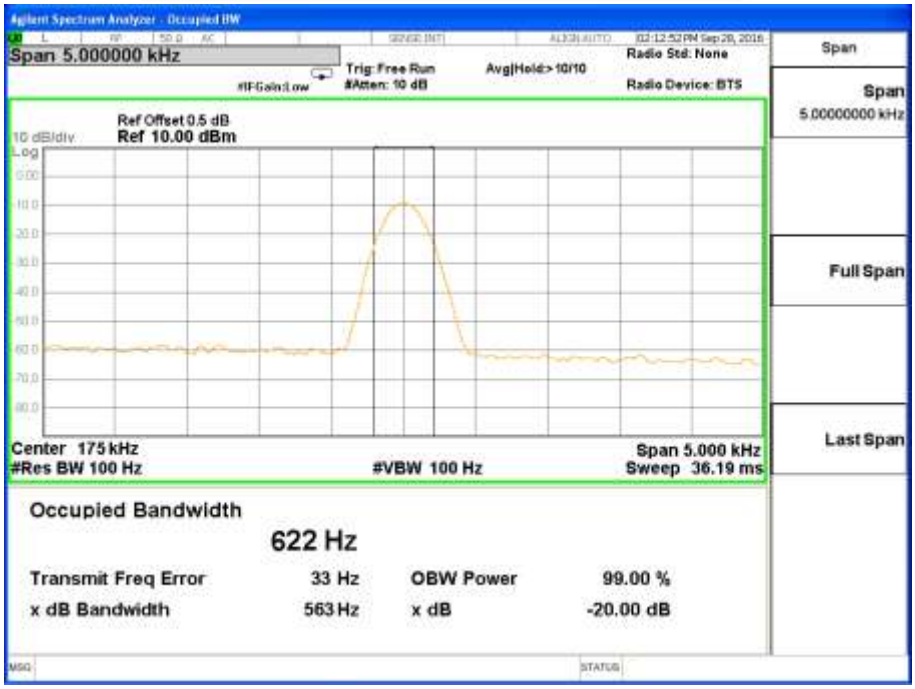
Spectrum Parameter	Setting
Span Frequency	approximately 2 to 3 times the 20 dB bandwidth
RB	greater than 1 % of the 20 dB bandwidth,
VB	equal to the RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

The test program and configuration,Refer to 4.2 and 4.3

5.3 TEST RESULTS

OperatingFrequency（kHz）	20 dB Bandwhidth(Hz)
175	563

CH00

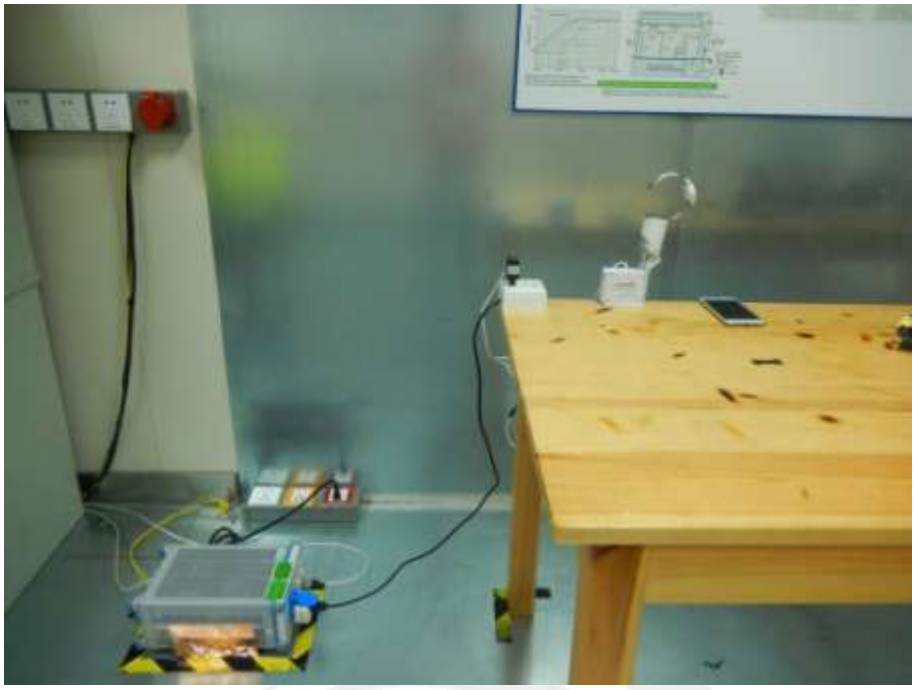


APPENDIX-PHOTOS OF TEST SETUP

Radiated emission Measurement Photos(9KHz-30MHz)

Radiated emission Measurement Photos(30MHz-1000MHz)

ConductionMeasurement Photos



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