

TEST REPORT



Applicant	PAX Technology Limited
Address	Room 2416, 24/F., Sun Hung Kai Centre, 30 Harbour Hong Kong, China

Manufacturer or Supplier	PAX Computer Technology (Shenzhen) Co., Ltd.
Address	4/F, No.3 Building, Software Park, Second Central Science-Tech Road, High-Tech industrial Park, Shenzhen, Guangdong, P.R.C.
Product	Smart Kiosk
Brand Name	PAX
Model	SK600
Additional model:	SK800
Date of tests	Aug. 05, 2019 ~ Aug. 14, 2019 Dec. 23, 2019 ~ Dec. 30, 2019 Jun. 10, 2020 ~ Jun. 15, 2020

the tests have been carried out according to the requirements of the following standards:

☒ FCC Part 15, Subpart C, Section 15.225

CONCLUSION: The submitted sample was found to COMPLY with the test requirement

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Glyn He Assistant Manager / EMC Department
	
	Date: Jun. 16, 2020

This report is governed by, and incorporates by reference, CPS Conditions of Service as posted at the date of issuance of this report at <http://www.bureauveritas.com/home/about-us/our-business/cps/about-us/terms-conditions/> and is intended for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. Measurement uncertainty is only provided upon request for accredited tests. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence or if you require measurement uncertainty; provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents.

TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1 SUMMARY OF TEST RESULTS.....	5
2 MEASUREMENT UNCERTAINTY	5
3 GENERAL INFORMATION.....	7
3.1 GENERAL DESCRIPTION OF EUT.....	7
3.2 DESCRIPTION OF TEST MODES.....	8
3.2.1. CONFIGURATION OF SYSTEM UNDER TEST	8
3.2.2. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	8
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS.....	10
3.4 DESCRIPTION OF SUPPORT UNITS.....	10
4 TEST TYPES AND RESULTS	11
4.1. CONDUCTED EMISSION MEASUREMENT	11
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	11
4.1.2 TEST INSTRUMENTS.....	11
4.1.3 TEST PROCEDURES.....	12
4.1.4 DEVIATION FROM TEST STANDARD.....	12
4.1.5 TEST SETUP	13
4.1.6 EUT OPERATING CONDITIONS	13
4.1.7 TEST RESULTS.....	14
4.2. RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT	18
4.2.2 TEST INSTRUMENTS.....	19
4.2.3 TEST PROCEDURES.....	20
4.2.4 DEVIATION FROM TEST STANDARD.....	20
4.2.5 TEST SETUP	21
4.2.6 EUT OPERATING CONDITIONS	22
4.2.7 TEST RESULTS.....	22
4.3. FREQUENCY TOLERANCE.....	27
4.3.1. LIMIT OF FREQUENCY TOLERANCE	27
4.3.2. TEST INSTRUMENTS.....	27
4.3.3. TEST PROCEDURES.....	28
4.3.4. DEVIATION FROM TEST STANDARD.....	28
4.3.5. TEST SETUP	28
4.3.6. EUT OPERATING CONDITIONS	29
4.3.7. TEST RESULTS.....	29

4.4.	20dB BANDWIDTH	30
4.4.1	LIMITS OF 20dB BANDWIDTH	30
4.4.2	TEST INSTRUMENTS	30
4.4.3	TEST PROCEDURE	31
4.4.4	DEVIATION FROM TEST STANDARD.....	31
4.4.5	TEST SETUP	31
4.4.6	EUT OPERATING CONDITION.....	32
4.4.7	TEST RESULTS.....	32
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION	33
6.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	34

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF190805N026	Original release	Aug. 15, 2019
RF191223N009	Based on the original product RF190805N026, add one model SK800, changed power module. In this report verify RE(30MHz-1GHz)&CE worst case, other test date is copied from the original test report RF190805N026.	Dec. 30, 2019
RF200602N014-2	Based on the original report RF191223N009 changed the WWAN module, and FCC ID, it needed to be retested radiated spurious emission.(30MHz-1GHz)	Jun. 16, 2020

1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit.
15.225 (a)&(b)&(c)	The field strength of any emissions within the band	PASS	Meet the requirement of limit.
15.225 (d)	The field strength of any emissions appearing outside of the 13.110-14.010 MHz band	PASS	Meet the requirement of limit.
15.225 (e)	Frequency tolerance	PASS	Meet the requirement of limit.
15.215 (c)	20dB Bandwidth	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	No antenna connector is used.

2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.70dB
Radiated emissions	9KHz ~ 30MHz	2.16dB
	30MHz ~ 1GMHz	3.83dB
	1GHz ~ 18GHz	4.66dB
	18GHz ~ 40GHz	4.67dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



Test Report No.: RF200602N014-2

***Test Lab Information Reference**

Lab A:

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Address:

No.B102, Dazhu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen, Guangdong, China

Lab B:

Bureau Veritas Shenzhen Co., Ltd. Dongguan Branch.

Lab Address:

No. 34, Chenwulu Section, Guantai Rd., Houjie Town, Dongguan City, Guangdong 523942, China

Accredited Test Lab Cert 2951.01

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Smart Kiosk
MODEL NO.	SK600
ADDITIONAL MODEL	SK800
FCC ID	V5PSK
POWER SUPPLY	AC 100-240V 50/60Hz 2A
MODULATION TECHNOLOGY	NFC
MODULATION TYPE	ASK
OPERATING FREQUENCY	13.56MHz
NUMBER OF CHANNEL	1
ANTENNA TYPE	PCB Antenna
I/O PORTS	Refer to user's manual
CABLE SUPPLIED	AC Line: Unshielded, Detachable 170cm

NOTES:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
2. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.
3. Additional model SK800 is identical with the test model SK600 except the display screen and model name for trading purpose.

3.2 DESCRIPTION OF TEST MODES

The EUT only have one channel.

CHANNEL	FREQUENCY (MHz)
1	13.56

3.2.1. CONFIGURATION OF SYSTEM UNDER TEST

Please see section 5 photograph of the test configuration for reference.

3.2.2. TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates, XYZ axis and antenna ports. The worst case was found when positioned on Y axis for radiated emission. Following channel(s) was (were) selected for the final test as listed below:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE	FT	PLC	BW	
A	√	√	√	√	Power by Adapter with NFC

Where RE: Radiated Emission

PLC: Power Line Conducted Emission

FT: Frequency tolerance

BW: 20dB Bandwidth

RADIATED EMISSION TEST:

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, XYZ axis, antenna ports (if EUT with antenna diversity architecture) and packet type.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	Y

FREQUENCY TOLERANCE:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	Y

POWER LINE CONDUCTED EMISSION TEST:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	Y

20dB BANDWIDTH:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, antenna ports (if EUT with antenna diversity architecture), and packet types.
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	TESTED CHANNEL	TESTED FREQUENCY (MHZ)	MODULATION TYPE	AXIS
A	1	13.56	ASK	Y

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	TEST VOLTAGE (SYSTEM)	TESTED BY
RE	21deg. C, 63%RH	AC 230V 50Hz	Tony
FT	25deg. C, 60%RH	AC 230V 50Hz	Robert Cheng
PLC	25deg. C, 55%RH	AC 230V 50Hz	Tony
BW	25deg. C, 60%RH	AC 230V 50Hz	Robert Cheng

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C. Section 15.225
ANSI C63.10-2013**

All test items have been performed and recorded as per the above standards.

NOTE: 1. All test items have been performed and recorded as per the above standards.
2. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (sDOC). The test report has been issued separately.

3.4 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	N/A	N/A	N/A	N/A	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A

4 TEST TYPES AND RESULTS

4.1. CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTES:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 26,19	Feb. 25, 20
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 26,19	Feb. 25, 20

- NOTE:**
1. The test was performed in CE shielded room.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

NOTE: The test was performed in **Lab A**

4.1.3 TEST PROCEDURES

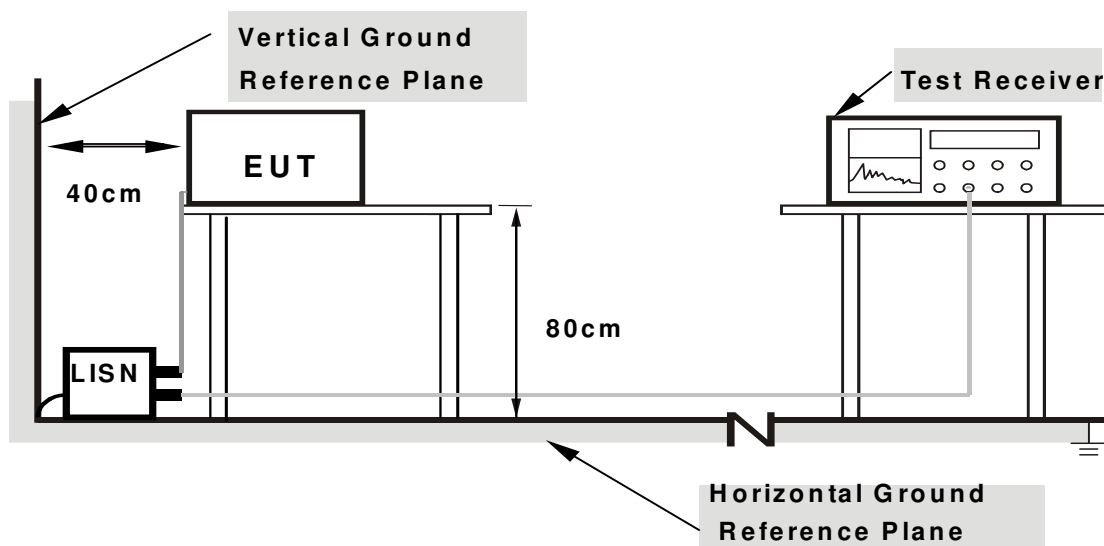
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 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

For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

- Turned on the power and connected of all equipment.
- EUT was operated according to the type used was description in manufacturer's specifications or the User's Manual.

4.1.7 TEST RESULTS

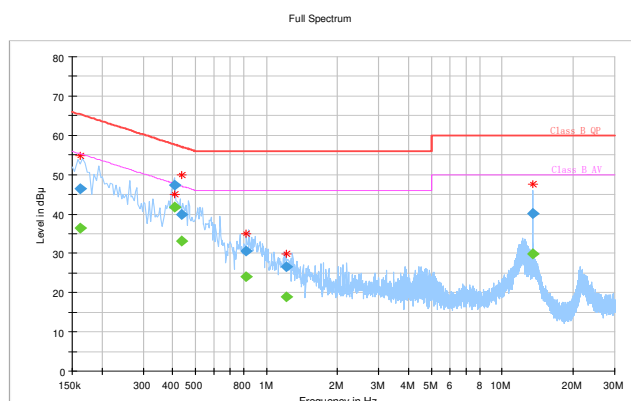
CONDUCTED WORST-CASE DATA:

SK600

TEST VOLTAGE	AC 120V/60Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	Tony

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162000	---	36.40	55.36	-18.96	L	ON	9.9
0.162000	46.35	---	65.36	-19.01	L	ON	9.9
0.408000	---	41.63	47.69	-6.06	L	ON	10.0
0.408000	47.28	---	57.69	-10.41	L	ON	10.0
0.436000	---	33.19	47.14	-13.95	L	ON	10.0
0.436000	39.78	---	57.14	-17.36	L	ON	10.0
0.824000	---	23.98	46.00	-22.02	L	ON	10.1
0.824000	30.50	---	56.00	-25.50	L	ON	10.1
1.220000	---	18.99	46.00	-27.01	L	ON	10.1
1.220000	26.48	---	56.00	-29.52	L	ON	10.1
13.56000	---	29.93	50.00	-20.07	L	ON	10.5
13.56000	40.06	---	60.00	-19.94	L	ON	10.5

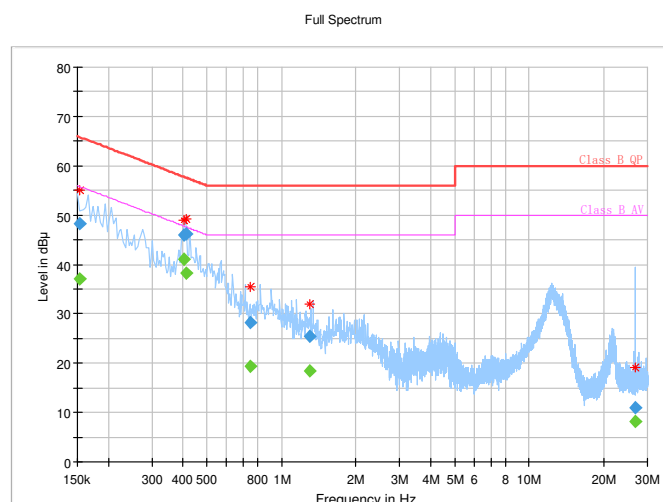
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST VOLTAGE	AC 120V/60Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	Tony

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	---	37.17	55.78	-18.61	N	ON	9.9
0.154000	48.26	---	65.78	-17.52	N	ON	9.9
0.404000	---	41.04	47.77	-6.73	N	ON	9.9
0.404000	45.84	---	57.77	-11.93	N	ON	9.9
0.412000	---	38.26	47.61	-9.34	N	ON	9.9
0.412000	46.17	---	57.61	-11.44	N	ON	9.9
0.752000	---	19.32	46.00	-26.68	N	ON	9.9
0.752000	28.22	---	56.00	-27.78	N	ON	9.9
1.300000	---	18.50	46.00	-27.50	N	ON	10.0
1.300000	25.49	---	56.00	-30.51	N	ON	10.0

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

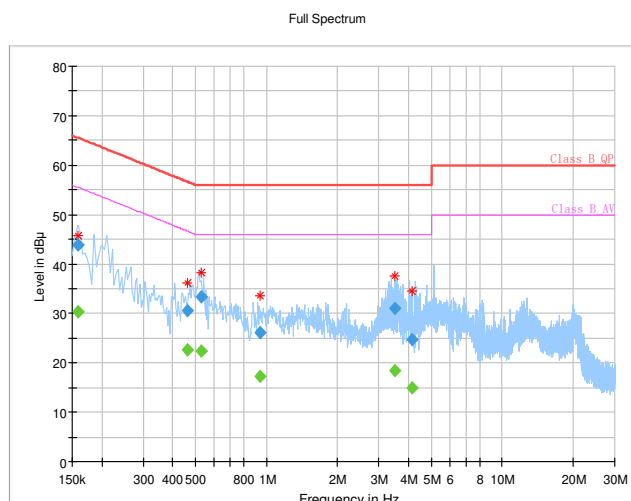


SK800

TEST VOLTAGE	AC 120V/60Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	Tony

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.158000	---	30.40	55.57	-25.17	L	ON	9.9
0.158000	43.94	---	65.57	-21.63	L	ON	9.9
0.460000	---	22.71	46.69	-23.98	L	ON	10.0
0.460000	30.47	---	56.69	-26.22	L	ON	10.0
0.528000	---	22.50	46.00	-23.50	L	ON	10.0
0.528000	33.46	---	56.00	-22.54	L	ON	10.0
0.936000	---	17.23	46.00	-28.77	L	ON	10.1
0.936000	26.02	---	56.00	-29.98	L	ON	10.1
3.480000	---	18.44	46.00	-27.56	L	ON	10.2
3.480000	30.99	---	56.00	-25.01	L	ON	10.2
4.128000	---	14.82	46.00	-31.18	L	ON	10.2
4.128000	24.70	---	56.00	-31.30	L	ON	10.2

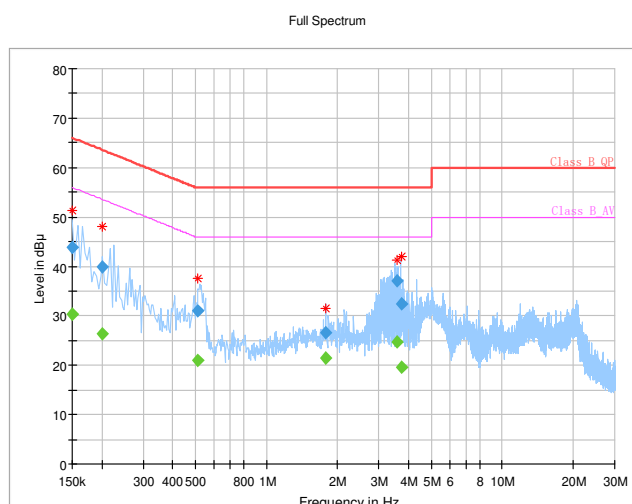
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



TEST VOLTAGE	AC 120V/60Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	Tony

Frequency (MHz)	QuasiPeak (dBuV)	Average (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	30.23	56.00	-25.77	N	ON	9.9
0.150000	43.92	---	66.00	-22.08	N	ON	9.9
0.200000	---	26.26	53.61	-27.35	N	ON	9.9
0.200000	39.99	---	63.61	-23.62	N	ON	9.9
0.512000	---	20.96	46.00	-25.04	N	ON	9.9
0.512000	31.09	---	56.00	-24.91	N	ON	9.9
1.784000	---	21.48	46.00	-24.52	N	ON	10.0
1.784000	26.70	---	56.00	-29.30	N	ON	10.0
3.560000	---	24.82	46.00	-21.18	N	ON	10.1
3.560000	37.01	---	56.00	-18.99	N	ON	10.1
3.724000	---	19.68	46.00	-26.32	N	ON	10.1
3.724000	32.33	---	56.00	-23.67	N	ON	10.1

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.



4.2. RADIATED EMISSION AND BANDEDGE MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

The field strength of any emissions shall not exceed the following limits:

- (a) 15.848mV/m(84dBuV/m) at 30m, within the band 13.553-13.567 MHz;
- (b) 334uV/m(50.5dBuV/m) at 30m, within the band 13.410-13.553 MHz and 13.567-13.710MHz;
- (c) 106uV/m(40.5dBuV/m) at 30m, within the band 13.110-13.410 MHz and 13.710-14.010MHz;

The field strength of any emissions appearing outside of the 13.110-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTES:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. The measured field strength was extrapolated to distance 30 meters, using the formula that the limit of field strength varies as the inverse distance square (40dB per decade of distance)

Example:

$$\begin{aligned}
 13.56\text{MHz} &= 15848\text{uV/m} & 30\text{m} \\
 &= 84\text{dBuV/m} & 30\text{m} \\
 &= 84+20\log(30/3)^2 & 3\text{m} \\
 &= 124\text{dBuV/m}
 \end{aligned}$$

4.2.2 TEST INSTRUMENTS

9KHz~30MHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Mar. 12,19	Mar. 11,20
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	1519B-045	May 28,19	May 27,20
Amplifier	Burgeon	BPA-530	100210	Apr. 21,19	Apr. 20,20
Test Software	ADT	ADT_Radiated V8.7.07	N/A	N/A	N/A

- NOTES:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
2. The test was performed in 10m Chamber(DG)
3. The FCC Site Registration No. is 749762.

NOTE: The test was performed in **Lab B**

30MHz~1GHz(SZ)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Feb. 26,20	Feb. 25,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,20	Feb. 25,21
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,20	Feb. 25,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 24,19	Jun. 23,20

- NOTES:** 1. The test was performed in 3m chamber(SZ)
2. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
3. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

NOTE: The test was performed in **Lab A**

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3x10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, For battery operated equipment, the equipment tests shall be performed using fresh batteries. The turntable was rotated to maximize the emission level.
- g. For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1m above the ground.

NOTES:

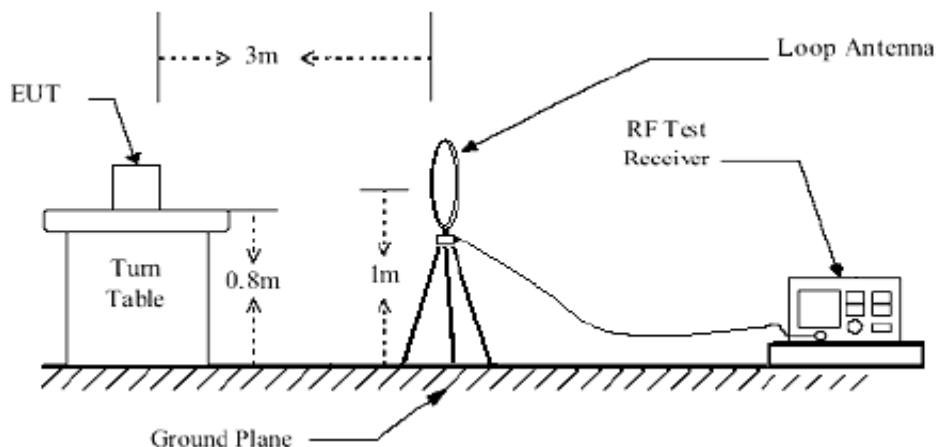
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

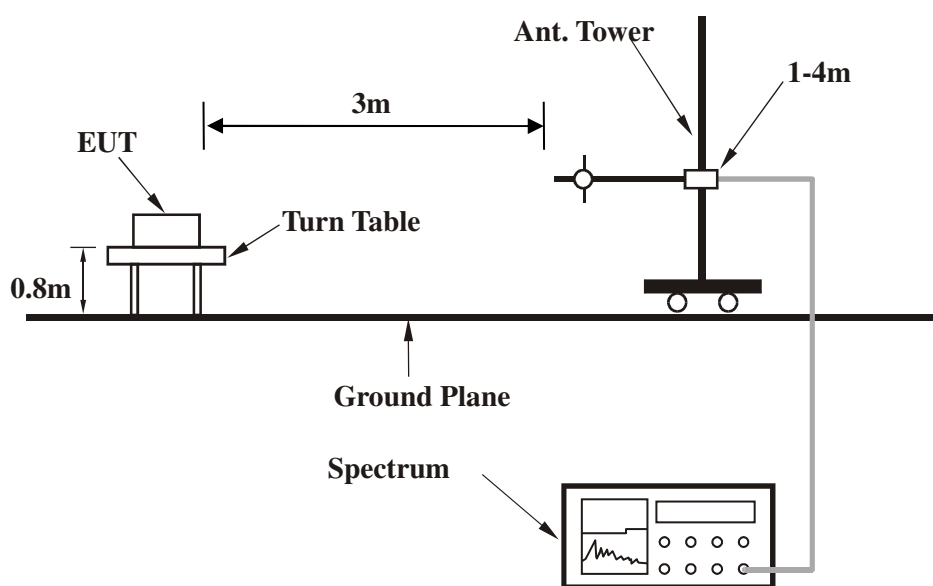
No deviation.

4.2.5 TEST SETUP

Below 30MHz test setup



Below 1GHz test setup



Note: For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.

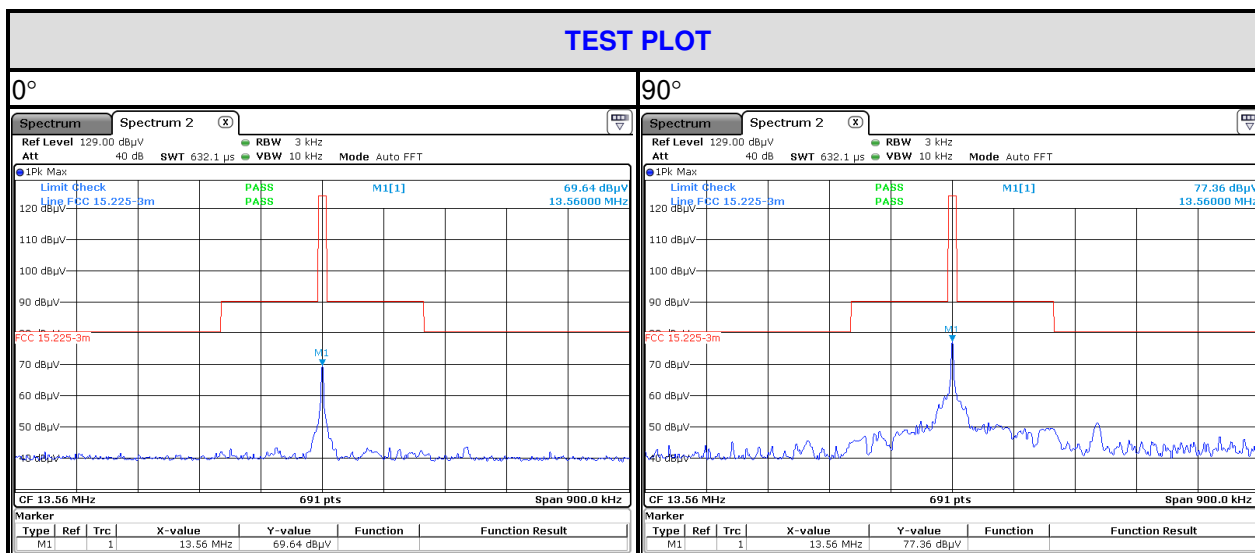
4.2.7 TEST RESULTS

SK600

FIELD STRENGTH (BELOW 30MHZ AT 3M)

No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Polarity (0° / 90°)	Limit (dBuV/m)	Margin (dB)
1	*13.56(QP)	-10.79	80.43	69.64	0°	124.0	-54.36
2	27.12(QP)	-10.62	30.32	19.70	0°	69.5	-49.80
3	*13.56(QP)	-10.79	88.15	77.36	90°	124.0	-46.64
4	27.12(QP)	-10.62	32.83	22.21	90°	69.5	-47.29

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. " * ": Fundamental frequency.
 6. For the test results, both 0° and 90° polarizations of the antenna are set to make the measurement, but only the worst case was shown in test report.



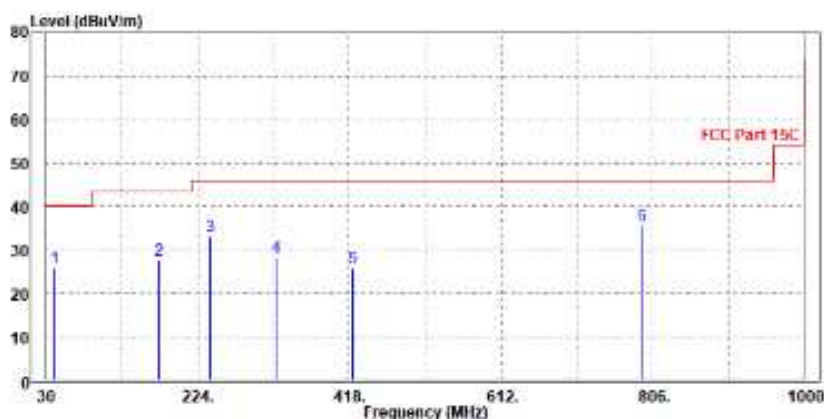
SK600

30MHz~ 1GHz WORST-CASE DATA:

TEST VOLTAGE	AC 120V/60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Tony		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	25.87	49.20	40	-14.13	13.25	0.93	37.51	200	212	QP
173.56	27.75	52.61	43.5	-15.75	10.16	1.69	36.71	200	188	QP
240.49	33.05	54.85	46	-12.95	12.83	1.99	36.62	200	89	QP
324.88	28.39	48.34	46	-17.61	14.40	2.31	36.66	200	134	QP
422.85	25.81	42.62	46	-20.19	17.35	2.70	36.86	200	264	QP
792.42	35.51	45.77	46	-10.49	23.45	3.86	37.57	200	255	QP

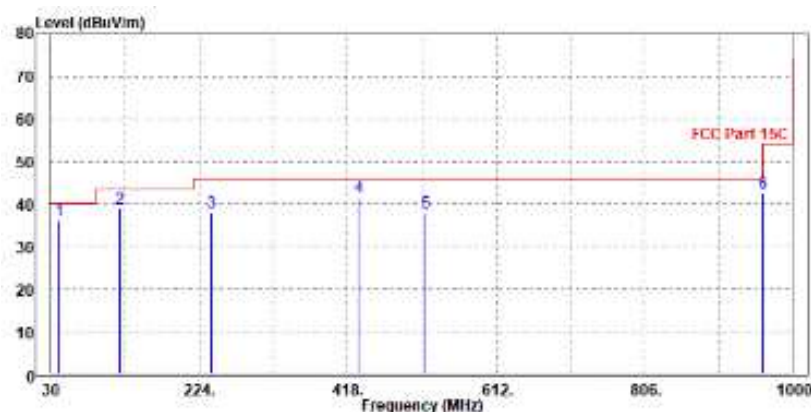
- REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST VOLTAGE	AC 120V/60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Tony		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	36.22	59.55	40	-3.78	13.25	0.93	37.51	100	197	QP
120.21	38.89	66.75	43.5	-4.61	7.59	1.45	36.90	100	236	QP
239.52	37.88	59.74	46	-8.12	12.77	1.99	36.62	100	97	QP
431.58	41.79	58.37	46	-4.21	17.56	2.74	36.88	100	55	QP
519.85	37.91	52.62	46	-8.09	19.34	3.02	37.07	100	0	QP
960.23	42.53	50.92	54	-11.47	24.94	4.30	37.63	100	255	QP

- REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



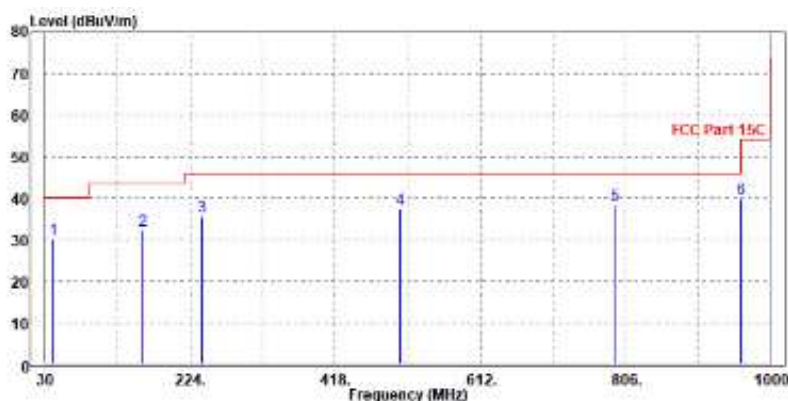
SK800

30MHz~ 1GHz WORST-CASE DATA:

TEST VOLTAGE	AC 120V/60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Tony		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	30.04	53.37	40	-9.96	13.25	0.93	37.51	200	217	QP
159.98	32.29	56.69	43.5	-11.21	10.70	1.66	36.76	200	166	QP
240.49	35.54	57.34	46	-10.46	12.83	1.99	36.62	200	312	QP
504.33	37.50	52.30	46	-8.50	19.23	3.00	37.03	200	233	QP
792.42	38.19	48.45	46	-7.81	23.45	3.86	37.57	200	59	QP
960.23	39.73	48.12	54	-14.27	24.94	4.30	37.63	200	179	QP

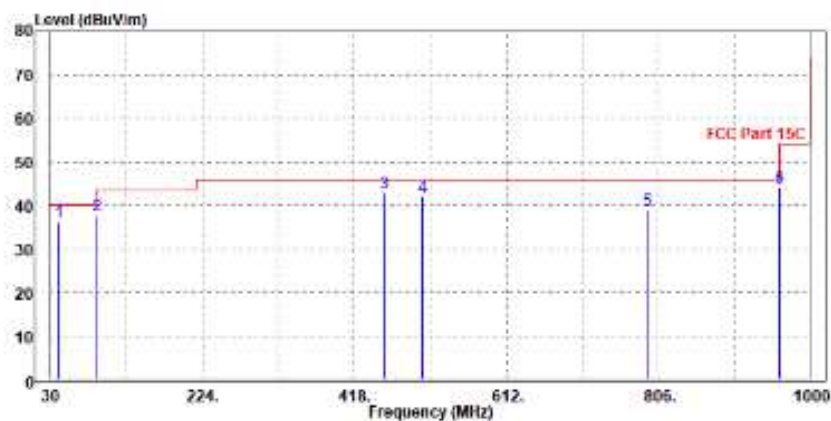
- REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



TEST VOLTAGE	AC 120V/60Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Tony		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB /m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
40.67	36.25	59.58	40	-3.75	13.25	0.93	37.51	100	185	QP
90.14	37.61	65.07	43.5	-5.89	8.31	1.28	37.05	100	231	QP
455.83	42.76	58.72	46	-3.24	18.14	2.83	36.93	100	26	QP
504.33	41.93	56.73	46	-4.07	19.23	3.00	37.03	100	0	QP
792.42	38.84	49.10	46	-7.16	23.45	3.86	37.57	100	113	QP
960.23	44.19	52.58	54	-9.81	24.94	4.30	37.63	100	21	QP

- REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4. Only emissions significantly above equipment noise floor are reported.



4.3. FREQUENCY TOLERANCE

4.3.1. LIMIT OF FREQUENCY TOLERANCE

The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ 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.

4.3.2. TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 22, 19	May 21, 20
Power Sensor	Keysight	U2021XA	MY55060018	May 22, 19	May 21, 20
Power Meter	Anritsu	ML2495A	1139001	Mar. 12, 19	Mar. 11, 20
Power Sensor	Anritsu	MA2411B	1531155	Mar. 12, 19	Mar. 11, 20
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 17, 18	Oct. 16, 19
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Nov. 15, 18	Nov. 14, 19
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 09, 18	Nov. 08, 19
Signal Analyzer	Rohde & Schwarz	FSV7	102331	May 22, 19	May 21, 20
Signal Generator	Agilent	N5183A	MY50140980	Dec. 07, 18	Dec. 06, 19
Agile Signal Generator	Agilent	8645A	Agilent	Oct. 27, 18	Oct. 26, 19
Spectrum Analyzer	Keysight	N9020A	MY55400499	Mar. 12, 19	Mar. 11, 20
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec. 07, 18	Dec. 06, 19
BLUETOOTH TESTER	Rohde & Schwarz	CBT32	100811	May 20, 19	May 19, 20
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTES:

1. The test was performed in RF Oven room.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.

NOTE: The test was performed in **Lab B**

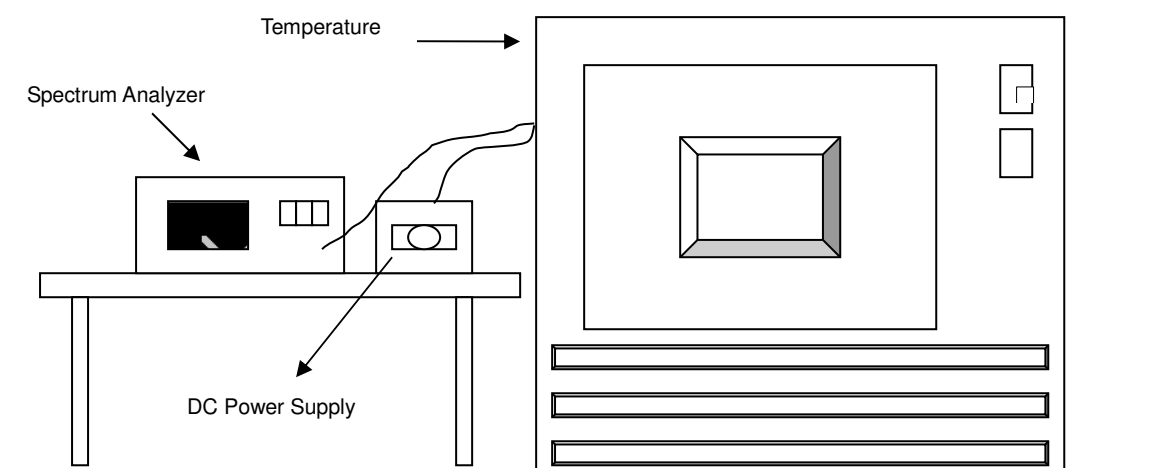
4.3.3. TEST PROCEDURES

- a) The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- b) Turn the EUT on and couple its output to a spectrum analyzer.
- c) Turn the EUT off and set the chamber to the highest temperature specified.
- d) Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e) Repeat step c) and d) with the temperature chamber set to the lowest temperature.
- f) The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.3.4. DEVIATION FROM TEST STANDARD

No deviation.

4.3.5. TEST SETUP



4.3.6. EUT OPERATING CONDITIONS

Set the EUT under transmission condition continuously at specific channel frequency.

4.3.7. TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
TEMP. (°C)	POWER SUPPLY (V)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
50	120V/60Hz	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044	13.56006	0.00044
40	120V/60Hz	13.56002	0.00015	13.56001	0.00007	13.56	0.00000	13.56001	0.00007
30	120V/60Hz	13.56001	0.00007	13.56001	0.00007	13.56002	0.00015	13.56001	0.00007
20	120V/60Hz	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
10	120V/60Hz	13.56000	0.00000	13.56	0.00000	13.56	0.00000	13.56	0.00000
0	120V/60Hz	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022	13.56003	0.00022
-10	120V/60Hz	13.55995	-0.00037	13.55994	-0.00044	13.55994	-0.00044	13.55994	-0.00044
-20	120V/60Hz	13.55996	-0.00029	13.55996	-0.00029	13.55997	-0.00022	13.55996	-0.00029

FREQUENCY STABILITY VERSUS VOLTAGE									
TEMP. (°C)	POWER SUPPLY (V)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift	Measured Frequency	Frequency Drift
		(MHz)	%	(MHz)	%	(MHz)	%	(MHz)	%
20	120V/60Hz	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
	120V/60Hz	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015
	102V/60Hz	13.55998	-0.00015	13.55997	-0.00022	13.55998	-0.00015	13.55998	-0.00015

4.4. 20dB BANDWIDTH

4.4.1 LIMITS OF 20dB BANDWIDTH

The 20dB bandwidth shall be specified in operating frequency band.(13.11MHz – 14.01MHz)

4.4.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Power Sensor	Keysight	U2021XA	MY55060016	May 22, 19	May 21, 20
Power Sensor	Keysight	U2021XA	MY55060018	May 22, 19	May 21, 20
Power Meter	Anritsu	ML2495A	1139001	Mar. 12, 19	Mar. 11, 20
Power Sensor	Anritsu	MA2411B	1531155	Mar. 12, 19	Mar. 11, 20
Digital Multimeter	FLUKE	15B	A1220010DG	Oct. 17, 18	Oct. 16, 19
Humid & Temp Programmable Tester	Haida	HD-2257	110807201	Nov. 15, 18	Nov. 14, 19
Oscilloscope	Agilent	DSO9254A	MY51260160	Nov. 09, 18	Nov. 08, 19
Signal Analyzer	Rohde & Schwarz	FSV7	102331	May 22, 19	May 21, 20
Signal Generator	Agilent	N5183A	MY50140980	Dec. 07, 18	Dec. 06, 19
Agile Signal Generator	Agilent	8645A	Agilent	Oct. 27, 18	Oct. 26, 19
Spectrum Analyzer	Keysight	N9020A	MY55400499	Mar. 12, 19	Mar. 11, 20
MXG-B RF Vector Signal Generator	Keysight	N5182B	MY56200288	Dec. 07, 18	Dec. 06, 19
BLUETOOTH TESTER	Rohde&Schwarz	CBT32	100811	May 20, 19	May 19, 20
Attenuator	MINI	BW-S10W2+	S130129FGE2	N/A	N/A
DC Source	Keysight	E3642A	MY56146098	N/A	N/A

NOTES:

1. The test was performed in RF Oven room(DG).
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to CEPREI/CHINA, GREGT/CHINA and NIM/CHINA.

NOTE: The test was performed in **Lab B**

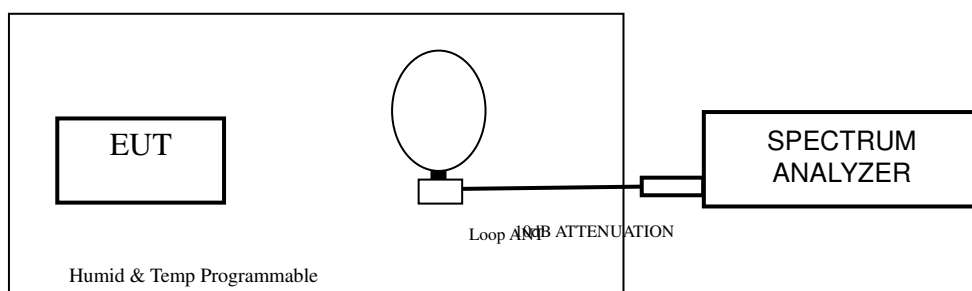
4.4.3 TEST PROCEDURE

- Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
- Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
- Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
- Repeat above procedures until all frequencies measured were complete.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation.

4.4.5 TEST SETUP



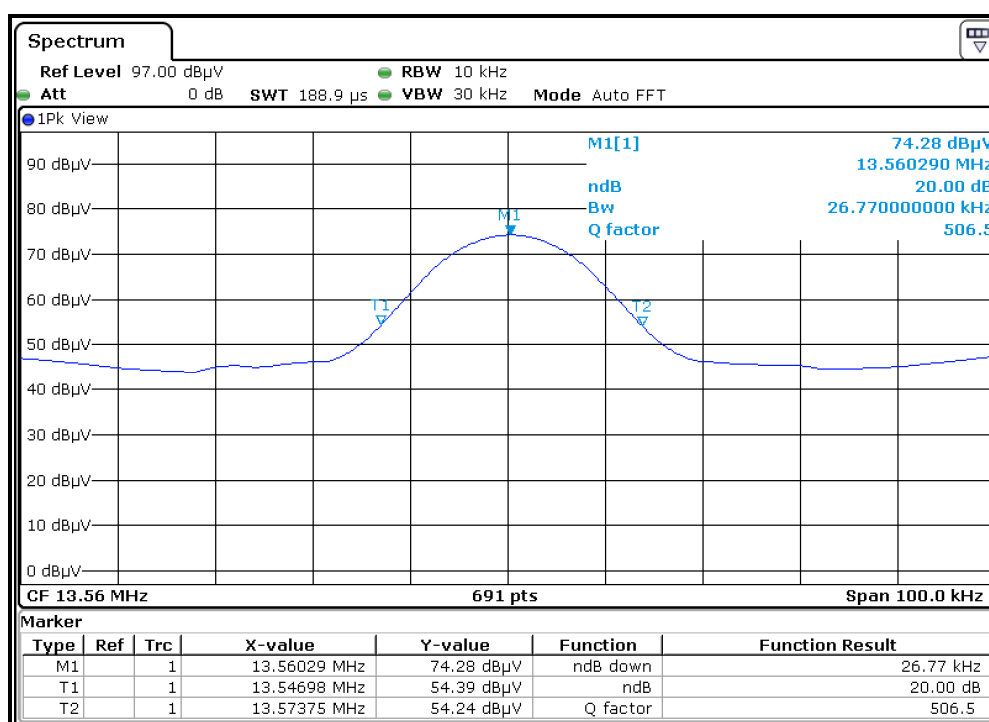
4.4.6 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously.

4.4.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (KHz)
1	13.56	26.77

Lower & Upper Test Frequency Point (MHz)	Test Frequency (MHz)	P/F
Lower	13.54698	PASS
Upper	13.57375	PASS



5. PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---