

EMC TEST REPORT

Applicant:	Sonim Technologies, Inc.
Address:	6836 Bee Cave Road, Building 1, Suite 279, Austin, Texas 78746, USA

Manufacturer or Supplier:	Sonim Technologies (Shenzhen) Limited
Address:	2nd Floor, No. 2 Building Phase B, Daqian Industrial park, Longchang Road, 67 District, Baoan, Shenzhen, P. R. China
Product:	Mobile Phone
Brand Name:	Sonim
Model Name:	XP8800
FCC ID:	WYPPG4032
Date of tests:	Jul. 01, 2017 ~ Jul. 20, 2020

The submitted sample of the above equipment has been tested for according to the requirements of the following standards:

- ☐ **FCC Part 15, Subpart B, Class A**
☒ **FCC Part 15, Subpart B, Class B (sDoC)**
☒ **ANSI C63.4:2014**

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

Prepared by Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
	
Date: Jul. 23, 2020	Date: Jul. 23, 2020

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BUREAU
VERITAS

Test Report No.: FV200702W001

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV170730W002	Original release	Nov. 23, 2017
FV171201W001	Based on the original report FV170730W002 disable CDMA function.	Dec. 11, 2017
FV200702W001	Based on the original report FV171201W001 add a new charger, update SW version, change the address and add two type numbers	Jul. 23, 2020



1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Mobile Phone	
BRAND NAME	Sonim	
MODEL NAME	XP8800	
TYPE NUMBER	PG4032/PG4033/PG4034/PG4035/PG4012/PG4041/PG4022/PG4011/P G4061	
BATTERY	Brand Name: Sonim Model Name: BAT-04900-01S Power Rating: DC 3.85V, 4900mAh, Li-ion	
MODULATION TYPE	WLAN	DSSS, OFDM
	BT_LE	GFSK
	Bluetooth	GFSK, $\pi/4$ -DQPSK, 8DPSK
	GPS/ Glonass	BPSK
	GSM	GMSK
	WCDMA	BPSK/QPSK
	LTE	QPSK/16QAM
	NFC	ASK
OPERATING FREQUENCY	WLAN	2412 ~ 2472MHz for 11b/g/n(HT20) 2422 ~ 2462MHz for 11n(HT40) 5150 ~ 5250MHz, 5250 ~ 5350MHz, 5470 ~ 5725MHz, 5725 ~ 5825MHz for 11a/n(HT20)/n(HT40)/ac(HT80)
	Bluetooth/BT_LE	2402MHz ~ 2480MHz
	GPS	1575.42MHz
	GLONASS	1602MHz
	GSM	824.2MHz ~ 848.8MHz (FOR GSM 850) 1850.2MHz ~ 1909.8MHz (FOR GSM 1900)
	WCDMA	1852.4MHz ~ 1907.6MHz (FOR WCDMA Band 2) 1710.7MHz ~ 1754.3MHz (FOR WCDMA Band 4) 826.4MHz ~ 846.6MHz (FOR WCDMA Band 5)
	LTE	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824MHz ~ 849MHz (FOR LTE Band5) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7) 699MHz ~ 716MHz (FOR LTE Band12) 777MHz ~ 787MHz (FOR LTE Band13) 788MHz ~ 798MHz (FOR LTE Band14)



		1850MHz ~ 1915MHz (FOR LTE Band25) 814MHz ~ 849MHz (FOR LTE Band26) 2305MHz ~ 2315MHz (FOR LTE Band30) 2570MHz ~ 2620MHz (FOR LTE Band38) 2305MHz ~ 2315MHz (FOR LTE Band40) 2496MHz ~ 2690MHz (FOR LTE Band41) 1710MHz ~ 1780MHz (FOR LTE Band66)
	NFC	13.56MHz
	FM	98MHz
HW VERSION	A	
SW VERSION	8A.0.0-00-10.0.0-00.34.01	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable 1: With shield, detachable, 1.5meter USB cable 2: non-shielded, detachable, 1.0meter	
ACCESSORY DEVICES	Refer to note as below	

NOTE:

- For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.
- The EUT was powered by the following adapter:

ADAPTER 1	
BRAND:	Sonim
MODEL:	S42A02
INPUT:	AC 100-240V, 500mA
OUTPUT:	DC 5V, 1500mA DC 9V, 1500mA DC 12V, 1100mA

ADAPTER 2	
BRAND:	Sonim
MODEL:	S84A02
INPUT:	AC 100-240V, 750mA
OUTPUT:	DC 5V, 3000mA DC 9V, 2220mA DC 12V, 1670mA

3. The EUT matched the following USB cables:

USB CABLE 1	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.5 METER

USB CABLE 2	
BRAND:	N/A
MODEL:	N/A
SIGNAL LINE:	1.0 METER

4. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

1.2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart B		
Standard Section	Test Item	Result
FCC Part 15, Subpart B, Class B (sDoC) ANSI C63.4:2014	Conducted Test	Compliance
	Radiated Emission Test (30MHz ~ 1GHz)	Compliance
	Radiated Emission Test (Above 1GHz)	N/A

1.3 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:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz ~ 30MHz	±2.70dB
Radiated emissions	30MHz~1GMHz	±4.98dB
	1GMHz ~6GMHz	±4.70dB
	6GMHz ~18GMHz	±4.60dB
	18GMHz ~40GMHz	±4.12dB



1.4 DESCRIPTION OF TEST MODES

Test Mode	Test Condition
Radiated emission test	
1	GSM850 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
2	GSM1900 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
3	WCDMA B2 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
4	WCDMA B4 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
5	WCDMA B5 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
6	LTE B2 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
7	LTE B4 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
8	LTE B5 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
9	LTE B7 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
10	LTE B12 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
11	LTE B13 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
12	LTE B14 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ NFC Idle
13	LTE B25 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ MPEG4
14	LTE B26 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ FM Rx
15	LTE B30 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ Front camera on
16	LTE B38 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ Back camera on
17	LTE B40 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
18	LTE B41 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
19	LTE B66 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
20	LTE B41 Idle + Adapter2 + Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx

Conducted emission test	
1	GSM850 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
2	GSM1900 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
3	WCDMA B2 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
4	WCDMA B4 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
5	WCDMA B5 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
6	LTE B2 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
7	LTE B4 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
8	LTE B5 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
9	LTE B7 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
10	LTE B12 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
11	LTE B13 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
12	LTE B14 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ NFC Idle
13	LTE B25 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ MPEG4
14	LTE B26 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ FM Rx
15	LTE B30 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ Front camera on
16	LTE B38 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ Back camera on
17	LTE B40 Idle+ Adapter 1+ Earphone+ USB cable 2+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
18	LTE B41 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
19	LTE B66 Idle+ Adapter 1+ Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
20	GSM850 Idle+ Adapter2 + Earphone+ USB cable 1+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx

NOTE:

1. For the conducted emission test verify the mode 20, and only the verification result was presented in this report.
2. For the radiation emission test verify the mode 20, and only the verification result was presented in this report.
3. The original case data refer to FV170730W002 and FV171201W001

1.5 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.

FOR ALL TEST

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Wireless AP	ABOCOM	WR224GR	060500749P	N/A
2	Bluetooth Earphone	FAP00	H6080	12098	N/A
3	GPS Simulator +Antenna	GPS Simulator	Spetctracom/USA	GSG-5	200782
4	Earphone	N/A	N/A	N/A	N/A
5	Universal radio communication tester	Rohde&Schwarz	CMW500	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	N/A
3	N/A
4	N/A
5	N/A

2 EMISSION TEST

2.1 CONDUCTED EMISSION MEASUREMENT

2.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107 a CLASS B)

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

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107 b CLASS A)

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60

NOTE: 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.

2.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR3	101900	Feb. 28,20	Feb. 27, 21
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 28,20	Feb. 27, 21

NOTE: 1. The test was performed in CE shielded room.

2.1.3 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 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

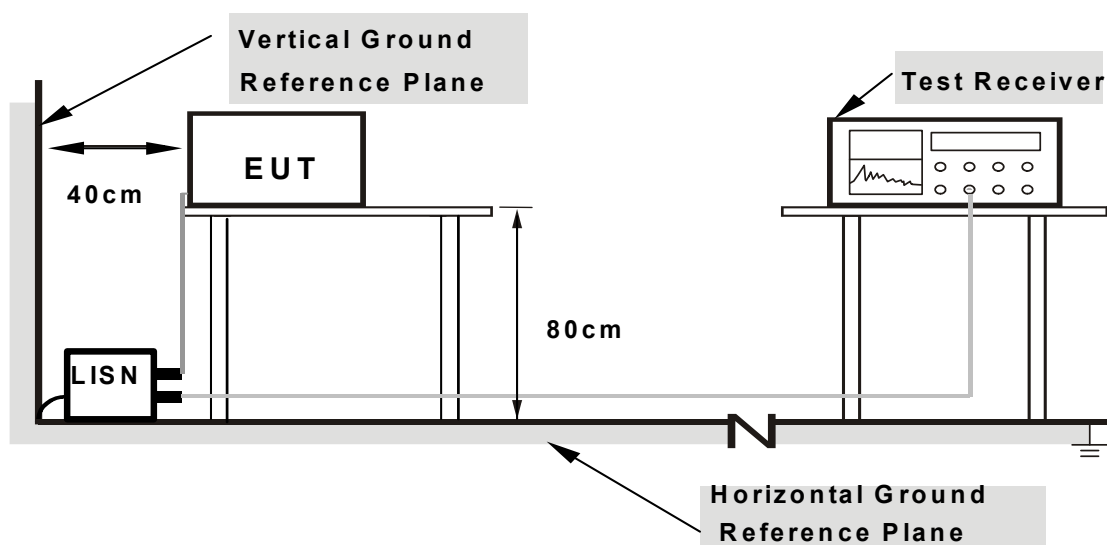
NOTE: All modes of operation were investigated and the worst-case emissions are reported.

2.1.4 DEVIATION FROM TEST STANDARD

No deviation.



2.1.5 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).

2.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power and connected of all equipment.
- b. EUT was operated according to the use type described in the manufacturer's specifications or the user's manual.



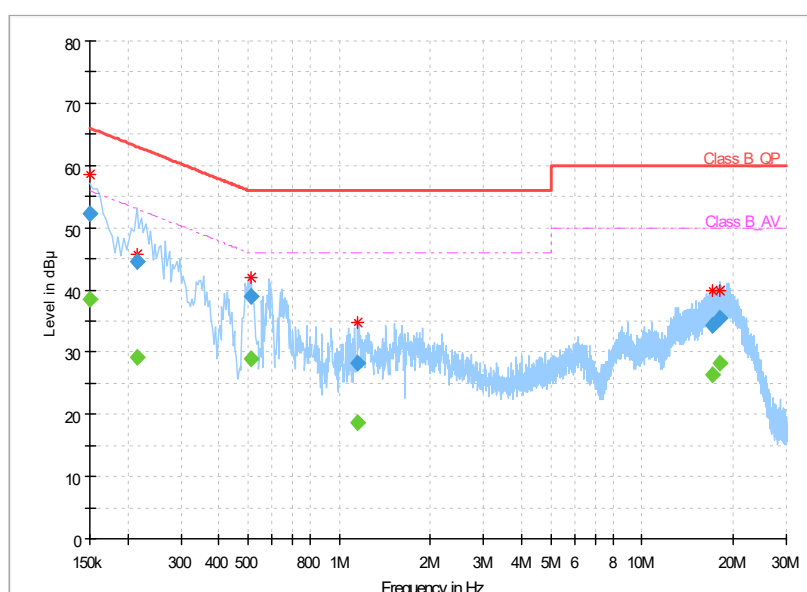
2.1.7 TEST RESULTS

TEST VOLTAGE	DC 5/9V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	23deg. C, 52RH	TESTED BY	Chase zhou

Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	38.43	56.00	-17.57	L1	ON	9.7
0.150000	52.22	---	66.00	-13.78	L1	ON	9.7
0.216000	---	29.16	52.97	-23.81	L1	ON	9.7
0.216000	44.57	---	62.97	-18.40	L1	ON	9.7
0.512000	---	28.92	46.00	-17.08	L1	ON	9.7
0.512000	38.94	---	56.00	-17.06	L1	ON	9.7
1.152000	---	18.67	46.00	-27.33	L1	ON	9.7
1.152000	28.23	---	56.00	-27.77	L1	ON	9.7
17.136000	---	26.42	50.00	-23.58	L1	ON	10.0
17.136000	34.28	---	60.00	-25.72	L1	ON	10.0
18.024000	---	28.16	50.00	-21.84	L1	ON	10.0
18.024000	35.48	---	60.00	-24.52	L1	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.

Full Spectrum

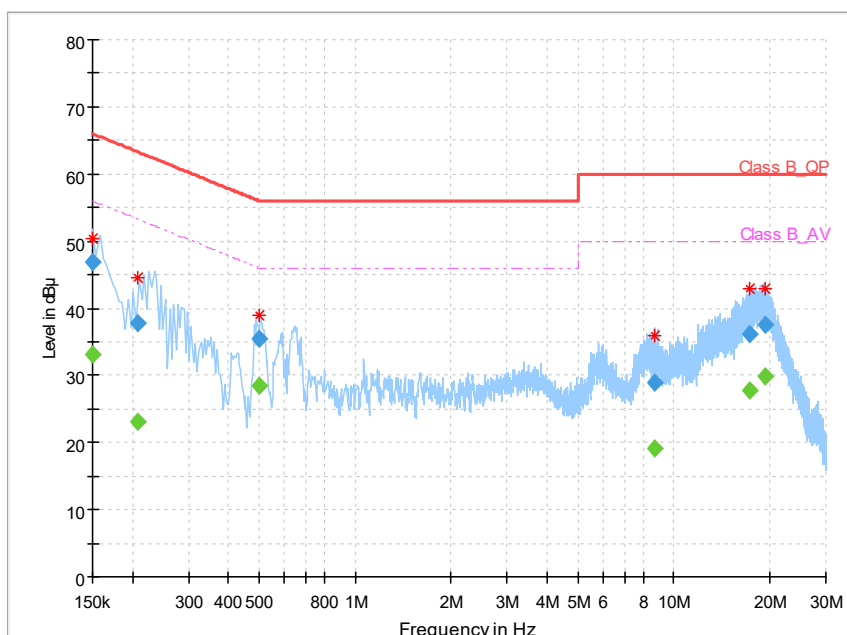


TEST VOLTAGE	DC 5/9V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	23deg. C, 52RH	TESTED BY	Chase zhou

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	33.07	56.00	-22.93	N	ON	9.8
0.150000	46.86	---	66.00	-19.14	N	ON	9.8
0.208000	---	23.18	53.28	-30.11	N	ON	9.8
0.208000	37.75	---	63.28	-25.53	N	ON	9.8
0.500000	---	28.48	46.00	-17.52	N	ON	9.8
0.500000	35.55	---	56.00	-20.45	N	ON	9.8
8.722000	---	19.11	50.00	-30.89	N	ON	10.0
8.722000	29.02	---	60.00	-30.98	N	ON	10.0
17.380000	---	27.76	50.00	-22.24	N	ON	10.1
17.380000	36.26	---	60.00	-23.74	N	ON	10.1
19.256000	---	29.76	50.00	-20.24	N	ON	10.1
19.256000	37.65	---	60.00	-22.35	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.

Full Spectrum



3.2 RADIATED EMISSION MEASUREMENT

2.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.109)

Emissions radiated outside of the specified bands, shall be according to the general radiated limits as following:

Radiated Emissions Limits at 3 meters (dB μ V/m)		
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B
30-88	49	40
88-216	53.5	43.5
216-960	56	46
960-1000	59.5	54
Above 1000	Avg: 59.5 Peak: 79.5	Avg: 54 Peak: 74

Frequency Range (For unintentional radiators)

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705-108	1000
108-500	2000
500-1000	5000
Above 1000	5 th harmonic of the highest frequency or 40GHz, whichever is lower

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. Emission level (dB μ V/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. QP detector shall be applied if not specified.

2.2.2 TEST INSTRUMENTS

Frequency range below 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Feb. 28,20	Feb. 27,21
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 28,20	Feb. 27,21
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 28,20	Feb. 27,21
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jun. 2 ,20	Jun. 1 ,21

Frequency range above 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Feb. 28,20	Feb. 27,21
Horn Antenna	ETS-LINDGREN	3117	00168728	Feb. 28,20	Feb. 27,21
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 28,20	Feb. 27,21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 2 ,20	Jun. 1 ,21

NOTE: 1. The test was performed in 3m Chamber.

2. The FCC Site Registration No. is 525120; The Designation No. is CN1171.

2.2.3 TEST PROCEDURE

<Frequency Range below 1GHz>

The basic test procedure was in accordance with ANSI C63.4:2014 (section 12).

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. 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 height of antenna is varied from 1 meter to 4 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 1GHz.

NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. $\text{Emission level(dBuV/m)} = \text{Raw Value(dBuV)} + \text{Correction Factor(dB/m)}$
3. $\text{Correction Factor(dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)}$ (if the raw value not contains the amplifier);
4. $\text{Correction Factor(dB/m)} = \text{Antenna Factor (dB/m)} + \text{Cable Factor (dB)} - \text{Amplifier Gain(dB)}$ (if the raw value contains the amplifier).
5. $\text{Margin value} = \text{Emission level} - \text{Limit value}$.

<Frequency Range above 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter fully-anechoic chamber room. 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 height of antenna 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. The bore sight should be used during the test above 1GHz.
- 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 peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz

NOTE:

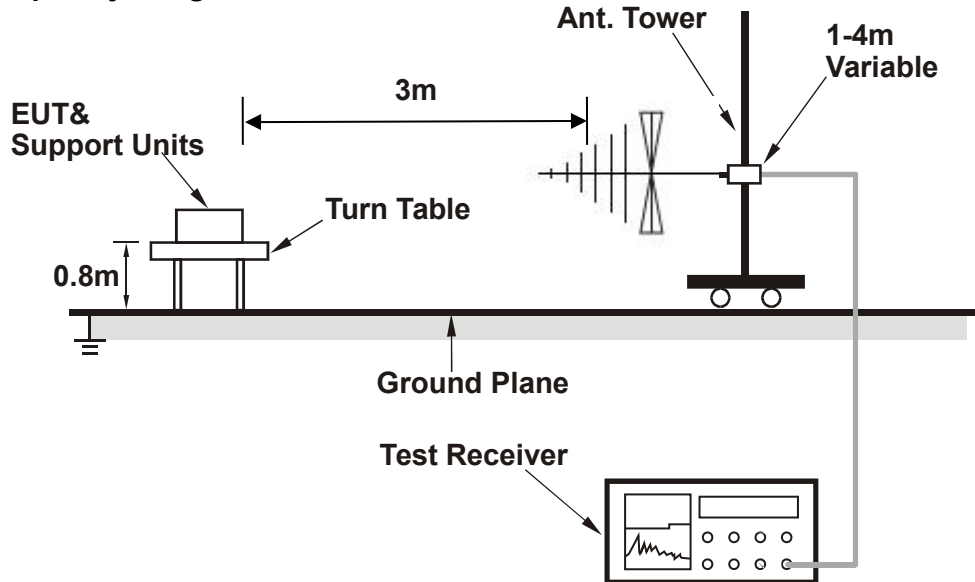
- 1.The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
- 2.The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth of test receiver/spectrum analyzer is 1Hz for Average detection (AV) at frequency above 1GHz.
- 3.For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
- 4.Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
- 5.Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
- 6.Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier)
- 7.Margin value = Emission level – Limit value.

2.2.4 DEVIATION FROM TEST STANDARD

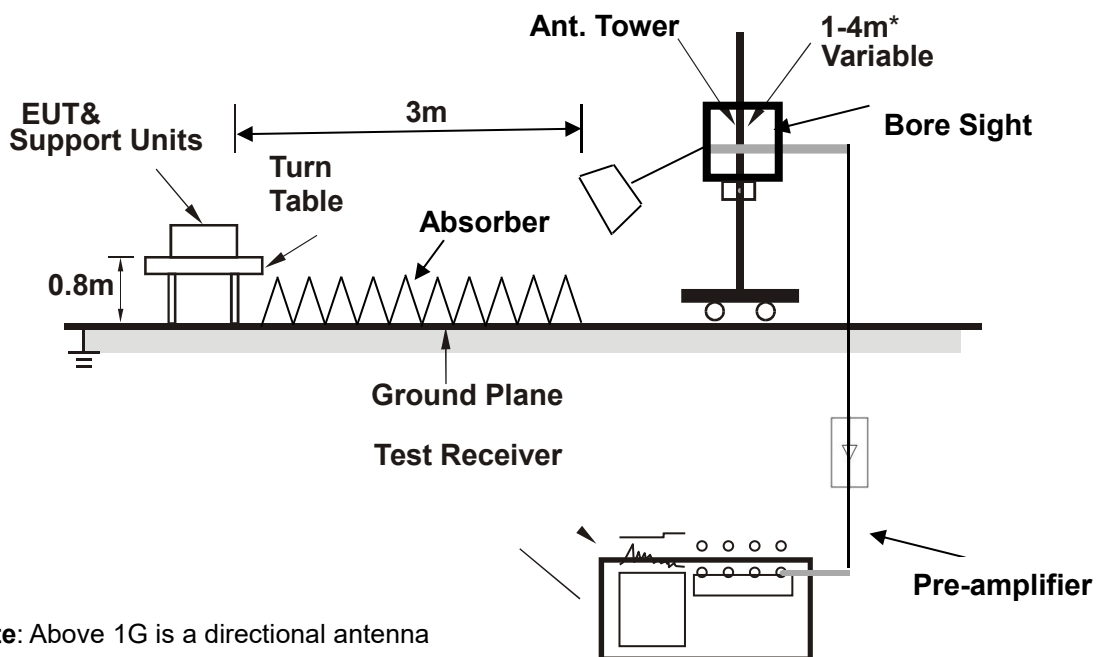
No deviation.

2.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



Note: Above 1G is a directional antenna

depends on the EUT height and the antenna 3dB bandwidth both, refer to section 7.3 of CISPR 16-2-3.

2.2.6 EUT OPERATING CONDITIONS

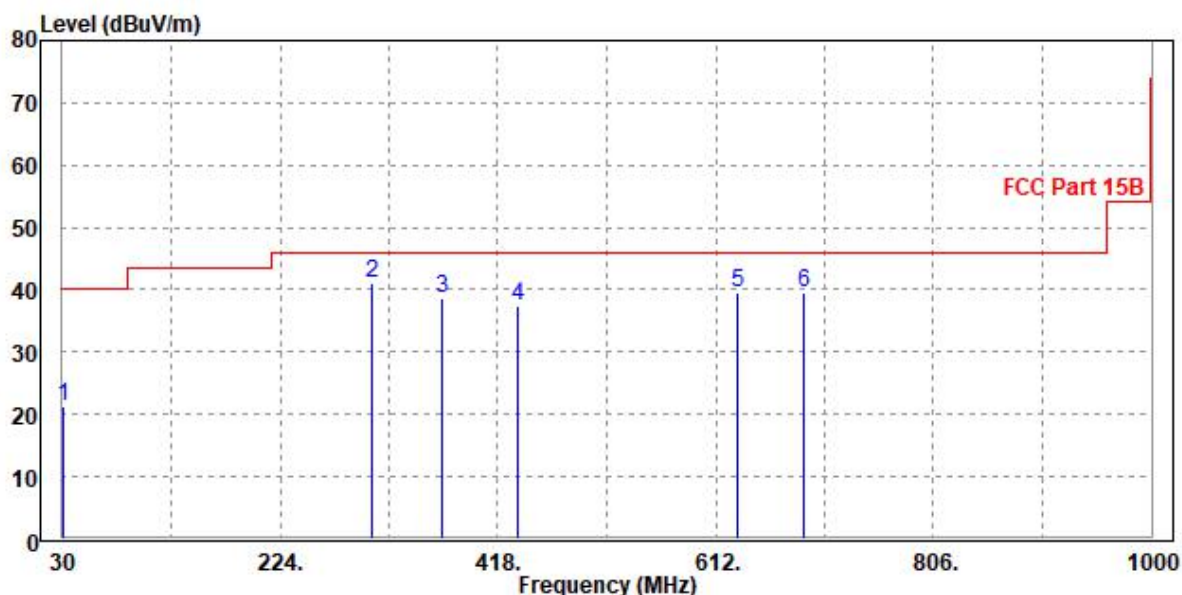
Same as item 2.1.6.

2.2.7 TEST RESULTS

TEST VOLTAGE	DC 5/9V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Jacky Liu		

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
31.56	21.22	37.89	40	-18.78	20.12	0.8	37.59	200	50	QP
305.86	40.92	61.52	46	-5.08	13.79	2.23	36.62	200	67	QP
367.89	38.63	57.12	46	-7.37	15.77	2.49	36.75	200	104	QP
435.25	37.38	53.86	46	-8.62	17.65	2.75	36.88	200	111	QP
631.76	39.46	52.67	46	-6.54	20.82	3.28	37.31	200	129	QP
690.88	39.49	50.86	46	-6.51	22.54	3.5	37.41	200	171	QP

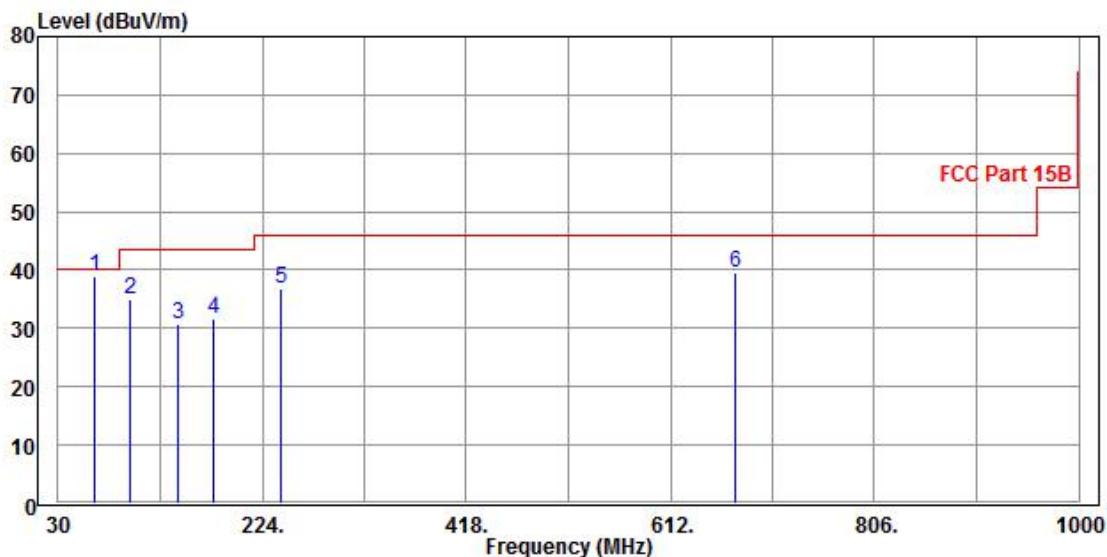
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4.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



TEST VOLTAGE	DC 5/9V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Jacky Liu		

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
32.02	31.13	48.01	40	-8.87	19.89	0.81	37.58	100	90	QP
115.88	31.07	58.65	43.5	-12.43	7.91	1.42	36.91	100	102	QP
170.69	30.25	55.02	43.5	-13.25	10.27	1.68	36.72	100	118	QP
206.75	29.79	54.12	43.5	-13.71	10.47	1.82	36.62	100	110	QP
433.65	37.47	54	46	-8.53	17.61	2.74	36.88	100	138	QP
629.58	40.24	53.52	46	-5.76	20.76	3.27	37.31	100	148	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.



3 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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

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