ACCREDITED
Certificate # 3939.01

EMC TEST REPORT

Applicant:	Lenovo (Shanghai) Electronics Technology Co., Ltd.
Address:	Section 304-305, Building No. 4, # 222, Meiyue Road, China (Shanghai) Pilot Free Trade Zone

Manufacturer or Supplier:	Lenovo PC HK Limited
Address:	23/F, Lincoln House, Taikoo Place 979 King's Road, Quarry Bay, Hong Kong, P.R.China
Product:	Portable Tablet Computer
Brand Name:	Lenovo
Model Name:	Lenovo TB-X6C6L
FCC ID:	O57TBX6C6L
Date of tests:	Feb. 23, 2021 ~ Apr. 07, 2021

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

☐ **FCC CFR Title 47-Telecommunication, Part 15, Subpart B, Class A**
☒ **FCC CFR Title 47-Telecommunication, Part 15, Subpart B, Class B**
☒ **ANSI C63.4:2014**

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

Prepared by Simon Wang Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
Simon Date: Apr. 15, 2021	Luke Lu Date: Apr. 15, 2021

TABLE OF CONTENTS

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FVA210222W001	Original release	Apr. 15, 2021

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

No.B102, Dazu Chuangxin Mansion, North of Beihuan Avenue, North Area, Hi-Tech Industrial Park, Nanshan District, Shenzhen51800, China

Tel: +86 755 8869 6566
Fax: +86 755 8869 6577
Email: customerservice.sw@bureauveritas.com

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Portable Tablet Computer	
BRAND NAME	Lenovo	
MODEL NAME	Lenovo TB-X6C6L	
NOMINAL VOLTAGE	5.0Vdc (adapter or host equipment) 3.86Vdc (Li-ion, battery)	
MODULATION TYPE	**BT_LE**	GFSK
	Bluetooth	GFSK, π/4-DQPSK, 8DPSK
	WLAN	DSSS, OFDM
	GPS/GLONASS/BDS/ GALILEO	BPSK
	FM	FM
	GSM	GMSK
	WCDMA	BPSK/QPSK
	LTE	QPSK/16QAM
OPERATING FREQUENCY	**Bluetooth/BT_LE**	2402MHz ~ 2480MHz
	WLAN	2412 ~ 2472MHz for 11b/g/n(HT20/40) 5180 ~ 5240MHz, 5260 ~ 5320 MHz, 5500 ~ 5700MHz, 5745 ~ 5825 MHz for 11a/ n(HT20)/ n(HT40) / ac(VHT20)/ ac(VHT40) / ac(VHT80)
	GPS/ GLONASS /BDS/ GALILEO	1559MHz ~ 1610MHz
	FM	87.5MHz ~ 108MHz
	GSM	824.2MHz ~ 848.8MHz (FOR GSM 850) 1850.2MHz ~ 1909.8MHz (FOR GSM 1900)
	WCDMA	1852.4MHz ~ 1907.6MHz(FOR WCDMA Band 2) 1712.4MHz ~ 1752.6MHz(FOR WCDMA Band 4) 826.4MHz ~ 846.6MHz (FOR WCDMA Band 5)

OPERATING FREQUENCY	**LTE**	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824.7MHz ~ 848.3MHz (FOR LTE Band5) 699.7MHz ~ 715.3MHz (FOR LTE Band12) 779.5MHz ~ 748.5MHz (FOR LTE Band13) 790.5MHz ~ 795.5MHz (FOR LTE Band14) 706.5MHz ~ 713.5MHz (FOR LTE Band17) 2307.5MHz ~ 2312.5MHz (FOR LTE Band30) 1710.7MHz ~ 1779.3MHz (FOR LTE Band66) 1850.7MHz ~ 1914.3MHz (FOR LTE Band25) 665.5MHz ~ 695.5MHz (FOR LTE Band71)
HW VERSION	Lenovo TB-X6C6L	
SW VERSION	TB-X6C6L_RF01_210528	
I/O PORTS	Refer to user's manual	
CABLE SUPPLIED	USB cable: shielded, detachable,1meter	
ACCESSORY DEVICES	Refer to note as below	

NOTE:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. There were Sample 1, 2 for this project, the difference is as below:

SAMPLE	EUT CONFIGURATION INFORMATION
1	LCD Panel 1+Photo Camera 1+Photo Camera 3+CPU1+EMMC1+DDR1+speaker 1+speaker 2+motor1+Main Broad 1+BT/WLAN Module+ Battery 1
2	LCD Panel 2+Photo Camera 2+Photo Camera 4+CPU1+EMMC2+DDR2+speaker 1+speaker 2+motor2+Main Broad 2+BT/WLAN Module+ Battery 2

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

List of Accessory:

ACCESSORIES	BRAND	MODEL	SPECIFICATION
Battery 1	SCUD	L20D2P32	Capacity：3.86vdc 7500mAh
Battery 2	SUNWODA	L20D2P32	Capacity：3.86vdc 7500mAh
AC Adapter 1	Salom	SC-41	I/P:100-240Vac, 0.3A O/P: 5Vdc, 2A
AC Adapter 2	AcBel	SC-41	I/P:100-240Vac, 0.3A O/P: 5Vdc, 2A
USB Cable 1	BRL	GSZ-209H-A3120	Signal Line, 1.0meter
USB Cable 2	Leagtech	S62B-052000100	Signal Line, 1.0meter

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**	**Test lab***
FCC Part 15, Subpart B, Class B ANSI C63.4:2014	Conducted Test	Compliance	A
	Radiated Emission Test (30MHz ~ 1GHz)	Compliance	B
	Radiated Emission Test (Above 1GHz)	Compliance	A

***Test Lab Information Reference**

Lab A:

BV 7Layers Communications Technology (Shenzhen) Co. Ltd

Lab Address:

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

Accredited Test Lab Cert 3939.01

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

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

1.4 DESCRIPTION OF TEST MODES

Test Mode	Test Condition
Radiated emission test	
1	Sample 1#+GSM850 Idle +Adapter + GPS RX+USB cable +Earphone + BT Idle + WIFI Idle (2.4G)+Front Camera On+SIM1
2	Sample 1#+GSM1900 Idle + Adapter + Glonass RX+USB cable +Earphone +BT Idle + WIFI Idle (5G)+Back Camera On+SIM1
3	Sample 1#+WCDMA B4 Idle + Adapter + Glonass RX+USB cable + Earphone +BT Idle + WIFI Idle (5G)+Back Camera On+SIM1
4	Sample 1#+WCDMA B5 Idle + Adapter + Beidou RX+USB cable + Earphone +BT Idle + WIFI Idle (2.4G)+Back Camera On+SIM1
5	Sample 1#+LTE B2 Idle +Adapter + GPS RX+USB cable + Earphone + BT Idle + WIFI Idle (5G)+Front Camera On+SIM1
6	Sample 1#+LTE B4 Idle + Adapter + Glonass RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+Back Camera On + SIM 1
7	Sample 1#+LTE B5 Idle + Adapter + GALILEO RX+USB cable +Earphone +BT Idle + WIFI Idle (5G)+FM RX+SIM 1
8	Sample 1#+LTE B7 Idle + Adapter + Beidou RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+SIM1
9	Sample 1#+LTE B12 Idle + Adapter + GPS RX+USB cable +Earphone + BT Idle + WIFI Idle (5G)+MPG4+SIM1
10	Sample 1#+LTE B13 Idle + Adapter + GALILEO RX+USB cable +Earphone + BT Idle + WIFI Idle (2.4G)+Front Camera On+SIM1
11	Sample 1#+LTE B14 Idle + Adapter + Glonass RX+USB cable + Earphone + BT Idle + WIFI Idle (5G)+Back Camera On+SIM1
12	Sample 1#+LTE B17 Idle + Adapter + GPS RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+SIM1
13	Sample 1#LTE B25 Idle + Adapter + GALILEO RX+USB cable + Earphone + BT Idle + WIFI Idle (5G)+MPG4+SIM1
14	Sample 1#+LTE B29 Idle + Adapter + Glonass RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+FM RX+SIM1
15	Sample 1#+LTE B30 Idle + Adapter+ GPS RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+Back Camera On+SIM1
16	Sample 1#+LTE66 Idle +USB Link + Data Transmission + Glonass RX+BT Idle + WIFI Idle (5G)+Notebook to SD+Earphone+SIM1
17	Sample 1#+LTE71 Idle + USB Link + Data Transmission + Glonass RX +Earphone + BT Idle + WIFI Idle (5G)+SD to Notebook
18	Sample 2#+ Worst Mode of(1-17)

Conducted emission test	
1	Sample 1#+GSM850 Idle + Adapter + GPS RX +USB cable+ Earphone + BT Idle + WIFI Idle (2.4G)+Front Camera On+SIM1
2	Sample 1#+GSM1900 Idle + Adapter + Glonass RX+USB cable + Earphone + BT Idle + WIFI Idle (5G)+Back Camera On+SIM1
3	Sample 1#+WCDMA B4 Idle + Adapter + Glonass RX+USB cable + Earphone + BT Idle +WIFI Idle (5G)+Back Camera On+SIM1
4	Sample 1#+WCDMA B5 Idle + Adapter + Beidou RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+Back Camera On+SIM1
5	Sample 1#+LTE B2 Idle + Adapter + GPS RX+USB cable + Earphone + BT Idle + WIFI Idle (5G)+Front Camera On+SIM1
6	Sample 1#+LTE B4 Idle + Adapter + Glonass RX+USB cable + Earphone +BT Idle +WIFI Idle (2.4G)+Back Camera On + SIM 1
7	Sample 1#+LTE B5 Idle+ Adapter+ GALILEO RX+USB cable +Earphone +BT Idle+ WIFI Idle (5G)+FM RX+SIM 1
8	Sample 1#+LTE B7 Idle + Adapter + Beidou RX+USB cable + Earphone + BT Idle + WIFI Idle (2.4G)+SIM1
9	Sample 1#+LTE B12 Idle + Adapter+ GPS RX+USB cable + Earphone + BT Idle +WIFI Idle (5G)+MPG4+SIM1
10	Sample 1#+LTE B13 Idle+ Adapter+ GALILEO RX+USB cable + Earphone+ BT Idle +WIFI Idle (2.4G)+Front Camera On+SIM1
11	Sample 1#+LTE B14 Idle + Adapter +Glonass RX+USB cable+ Earphone+ BT Idle+ WIFI Idle (5G)+Back Camera On+SIM1
12	Sample 1#+LTE B17 Idle+ Adapter+ GPS RX+USB cable +Earphone+ BT Idle+ WIFI Idle (2.4G)+SIM1
13	Sample 1#LTE B25 Idle+ Adapter+ GALILEO RX+USB cable+ Earphone +BT Idle+ WIFI Idle (5G)+MPG4+SIM1
14	Sample 1#+LTE B29 Idle+ Adapter+ Glonass RX+USB cable +Earphone +BT Idle +WIFI Idle (2.4G)+FM RX+SIM1
15	Sample 1#+LTE B30 Idle+ Adapter+ GPS RX+USB cable+ Earphone+ BT Idle+ WIFI Idle (2.4G)+Back Camera On+SIM1
16	Sample 1#+LTE66 Idle+ USB Link+ Data Transmission+ Glonass RX+BT Idle +WIFI Idle (5G)+Notebook to SD+Earphone+SIM1
17	Sample 1#+LTE71 Idle+ USB Link+ Data Transmission+ Glonass RX+ Earphone+ BT Idle+ WIFI Idle (5G)+SD to Notebook
18	Sample 2#+ Worst Mode of(1-17)

NOTE:

1. For conducted emission test, test mode 1 was the verification case and only this mode was presented in this report.
2. For radiated emission test, test mode1 was the verification case and only this mode was presented in this report

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 TESTS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Laptop	Lenovo	Thnikpad L440	R90FTFKP	N/A
2	FM signal generator	Rohde & Schwarz	SMB100A	109279	N/A
3	Printer	HP	Hp LaserJet 1300	CNSJF75989	N/A
4	GPS Simulator +Antenna	TOJOIN	GNSS-5000A	E1-010-010119	N/A
5	Universal radio communication tester	Rohde&Schwarz	CMW500	N/A	N/A
6	Earphone	N/A	N/A	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
6	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. 22,21	Feb. 21,22
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Feb. 22,21	Feb. 21,22

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.

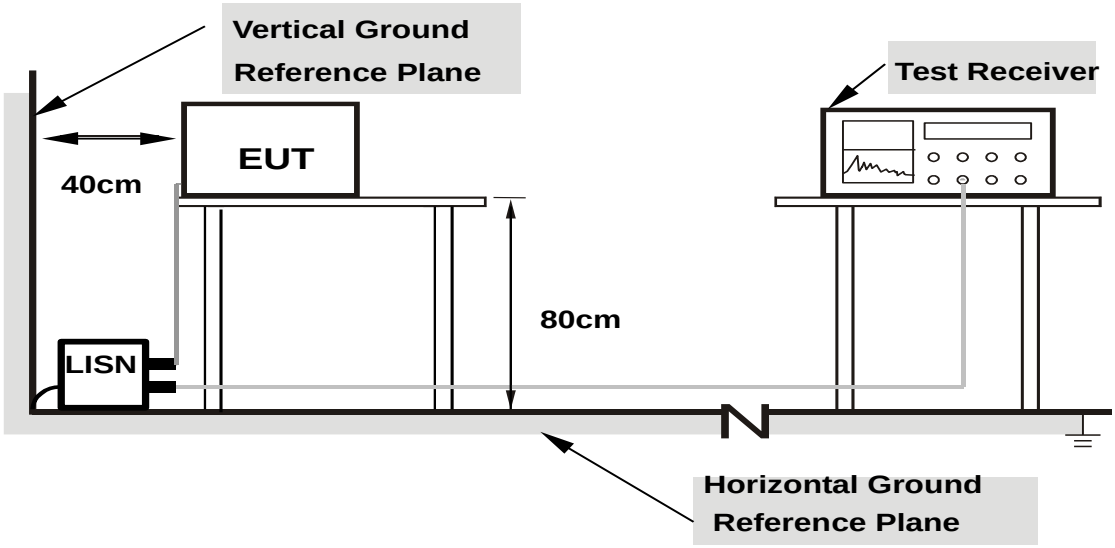
c. The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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

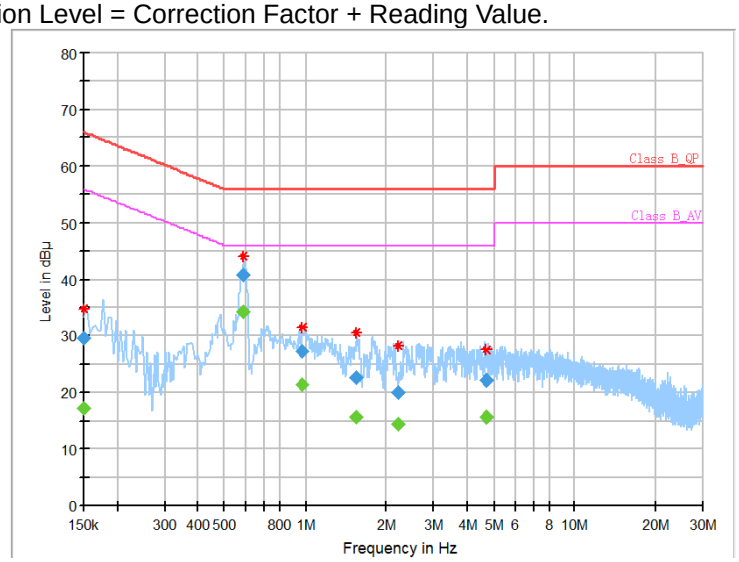
a. Turned on the power and connected of all equipment.
b. EUT was operated according to the use type described in the manufacturer's specifications or the user's manual.

2.1.7 TEST RESULTS

TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	24deg. C, 55%RH	**TESTED BY**	Carl Xie

Frequency (MHz)	QuasiPeak (dB¦ìV)	CAverage (dB¦ìV)	Limit (dB¦ìV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	17.28	56.00	38.72	L	ON	9.7
0.150000	29.58	---	66.00	36.42	L	ON	9.7
0.588000	---	34.30	46.00	11.70	L	ON	9.7
0.588000	40.86	---	56.00	15.14	L	ON	9.7
0.968000	---	21.51	46.00	24.49	L	ON	9.7
0.968000	27.19	---	56.00	28.81	L	ON	9.7
1.544000	---	15.56	46.00	30.44	L	ON	9.8
1.544000	22.67	---	56.00	33.33	L	ON	9.8
2.216000	---	14.48	46.00	31.52	L	ON	9.8
2.216000	20.04	---	56.00	35.96	L	ON	9.8
4.696000	---	15.55	46.00	30.45	L	ON	9.8
4.696000	22.25	---	56.00	33.75	L	ON	9.8

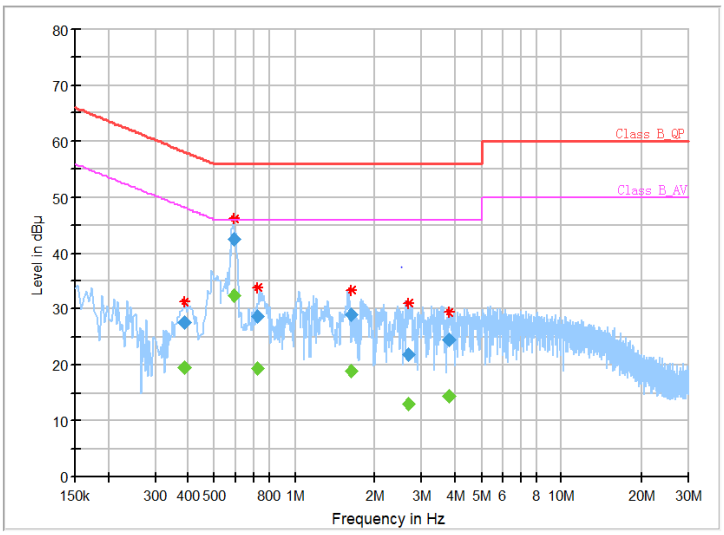
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	24deg. C, 55%RH	TESTED BY	Carl Xie

Frequency (MHz)	QuasiPeak (dB¦ÌV)	CAverage (dB¦ÌV)	Limit (dB¦ÌV)	Margin (dB)	Line	Filter	Corr. (dB)
0.384000	---	19.67	48.19	28.52	N	ON	9.8
0.384000	27.52	---	58.19	30.67	N	ON	9.8
0.592000	---	32.47	46.00	13.53	N	ON	9.8
0.592000	42.56	---	56.00	13.44	N	ON	9.8
0.728000	---	19.47	46.00	26.53	N	ON	9.8
0.728000	28.65	---	56.00	27.35	N	ON	9.8
1.624000	---	18.98	46.00	27.02	N	ON	9.8
1.624000	28.94	---	56.00	27.06	N	ON	9.8
2.686000	---	13.03	46.00	32.97	N	ON	9.9
2.686000	22.03	---	56.00	33.97	N	ON	9.9
3.768000	---	14.41	46.00	31.59	N	ON	9.9
3.768000	24.52	---	56.00	31.48	N	ON	9.9

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.



2.2 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 10 meters (dBμV/m)		
Frequencies (MHz)	**FCC 15B/ ICES-003, Class A**	**FCC 15B / ICES-003, Class B**
30-88	39	29.5
88-216	43.5	33.1
216-230	46.4	35.6
230-960		
960-1000	49.5	43.5

Radiated Emissions Limits at 3 meters (dBμV/m)		
Frequencies (MHz)	**FCC 15B / ICES-003, Class A**	**FCC 15B / ICES-003, Class B**
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74
3000+		

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	5th harmonic of the highest frequency or 40GHz, whichever is lower

NOTE: 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. QP detector shall be applied if not specified.

2.2.2 TEST INSTRUMENTS

Frequency range below1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI 3	101418	May. 14,20	May 13, 21
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Mar. 18,21	Mar. 17,22
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Mar. 19,20	Mar. 18,21
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Dec. 27,20	Dec. 26,21
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 27,20	Dec. 26,21
Preamplifier	EMCI	EMC1135	980378	Mar. 15,21	Mar. 14,22
Preamplifier	EMCI	EMC1135	980378	Mar. 16,20	Mar. 15,21
Preamplifier	EMCI	EMC1135	980423	Mar. 15,21	Mar. 14,22
Preamplifier	EMCI	EMC1135	980423	Mar. 16,20	Mar. 15,21
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Feb. 22,21	Feb. 21,22
Test Software	ADT	ADT_Radiated_V8.7.07	N/A	N/A	N/A

NOTE: 1. 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.
2. The test was performed in Dongguan 10m Semi-anechoic Chamber

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	May. 20,20	May. 19,21
Horn Antenna	ETS-LINDGREN	3117	00168728	Aug. 21,20	Aug. 20,21
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Apr. 27,20	Apr. 26, 21
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jun. 02,20	Jun. 01,21

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 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 10 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. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier).
5. Margin value = Emission level – 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:

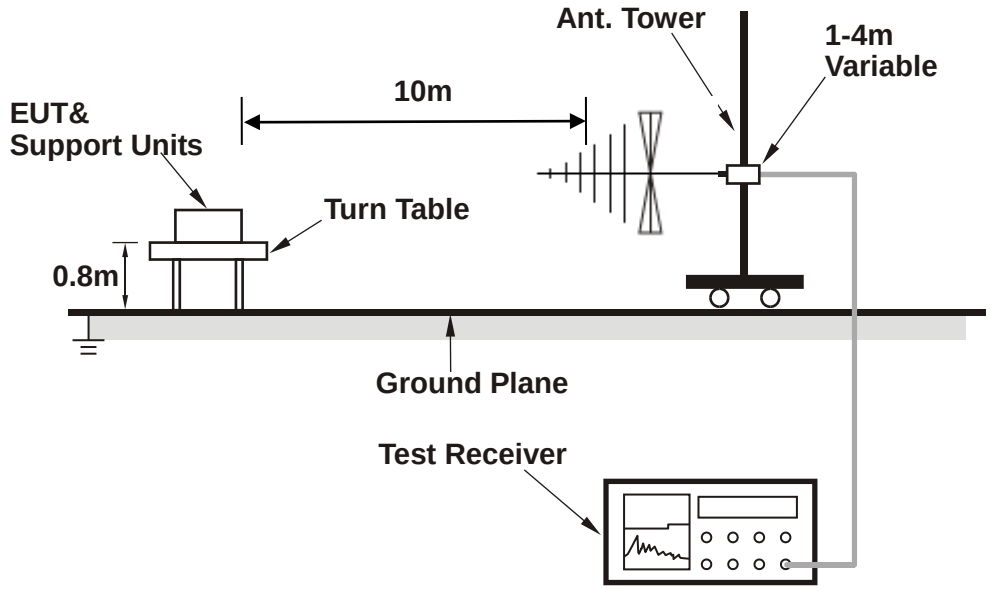
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test 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

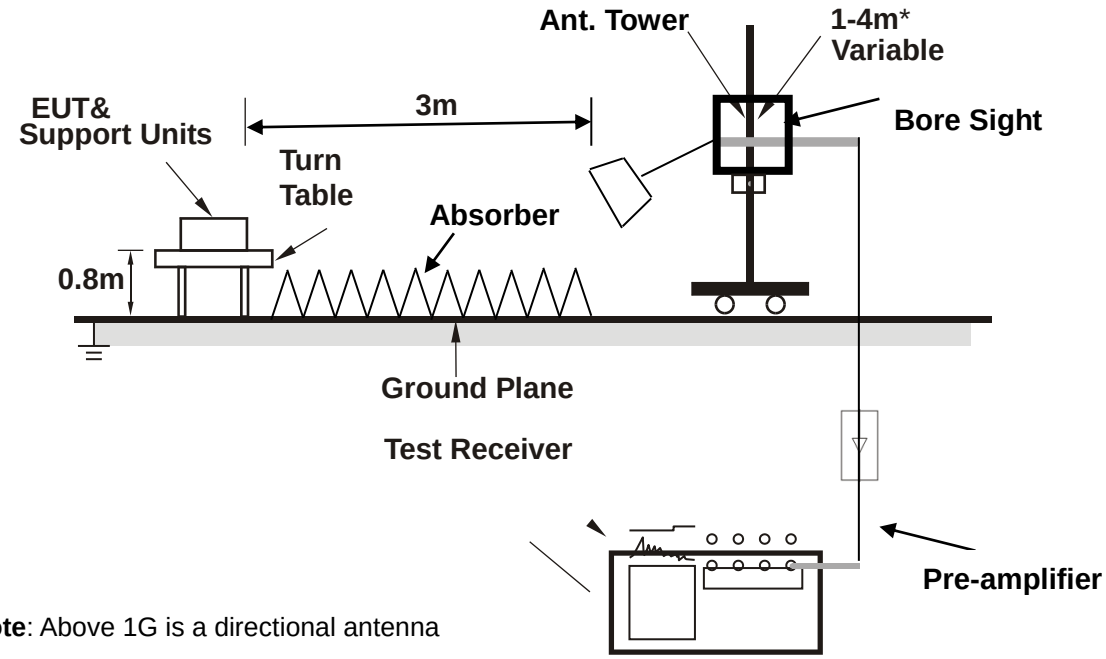
No deviation.

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.

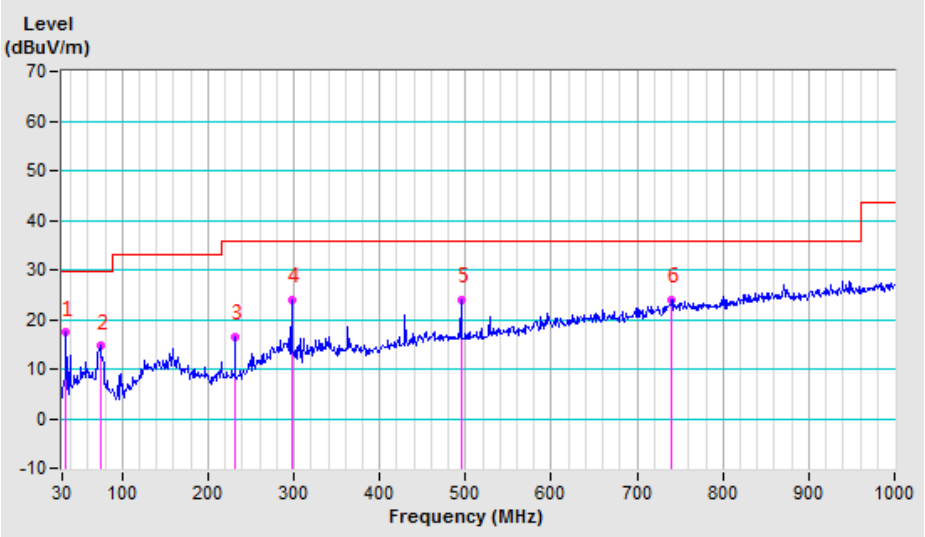
2.2.7 TEST RESULTS

TEST VOLTAGE	Data Transmission Input 120 Vac, 60 Hz	**FREQUENCY RANGE**	30-1000 MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 57 %RH	**DETECTOR FUNCTION & RESOLUTION BANDWIDTH**	Quasi-Peak, 120 kHz
TESTED BY	Albert		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M

	No.	Frequency	Factor	Reading	Emission	Limit	Margin	Tower	Table
		MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	cm	deg
	1	34.3650	-24.81	42.14	17.33	29.50	-12.17	400	23
	2	74.2562	-24.20	38.82	14.62	29.50	-14.88	400	112
	3	231.0325	-22.17	38.77	16.60	35.60	-19.00	400	162
*	4	296.9925	-19.38	43.37	23.99	35.60	-11.61	400	132
	5	494.9937	-14.54	38.50	23.96	35.60	-11.64	200	228
	6	740.7675	-9.03	32.88	23.85	35.60	-11.75	400	23

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.

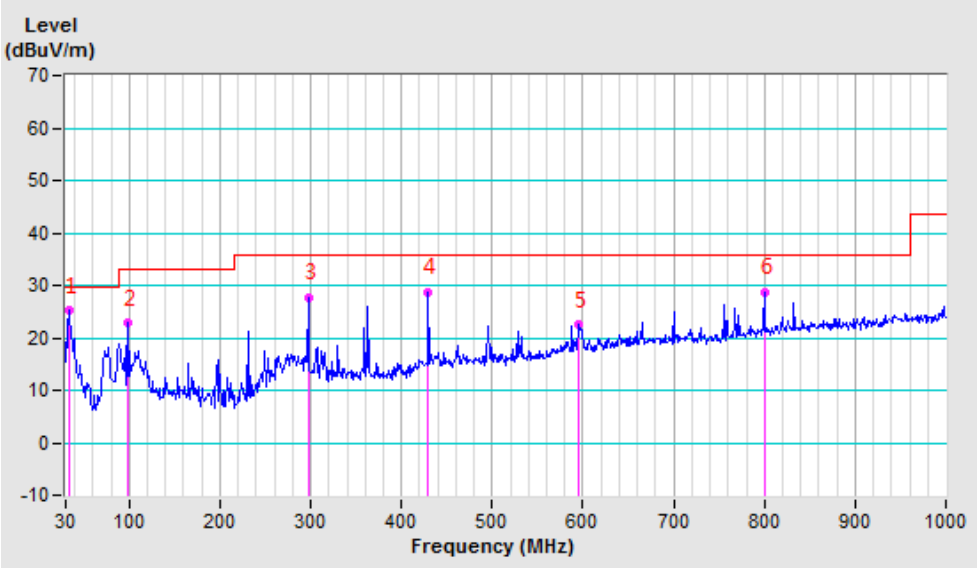


TEST VOLTAGE	Data Transmission Input 120 Vac, 60 Hz	**FREQUENCY RANGE**	30-1000 MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 57 %RH	**DETECTOR FUNCTION & RESOLUTION BANDWIDTH**	Quasi-Peak, 120 kHz
TESTED BY	Albert		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M

	No.	Frequency	Factor	Reading	Emission	Limit	Margin	Tower	Table
		MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	cm	deg
*	1	33.7832	-22.79	47.92	25.13	29.50	-4.37	100	62
	2	98.9704	-24.56	47.32	22.76	33.10	-10.34	300	337
	3	296.9573	-19.13	46.93	27.80	35.60	-7.80	100	172
	4	428.9809	-15.56	44.32	28.76	35.60	-6.84	100	159
	5	595.8778	-11.55	33.96	22.41	35.60	-13.19	300	337
	6	800.0245	-8.63	37.44	28.81	35.60	-6.79	100	107

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.

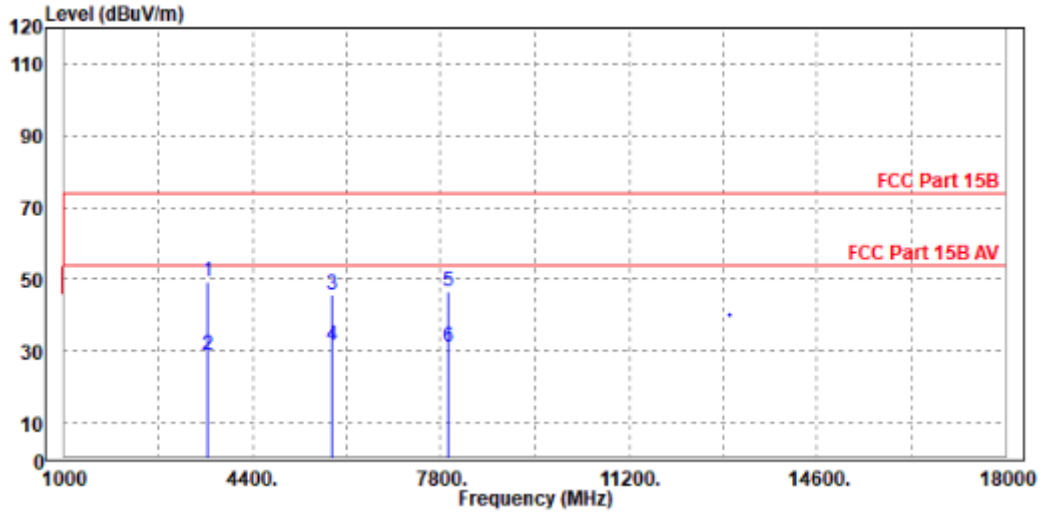


Note: Radiated Emission below 1GHz Test was performed in **Lab B.**

TEST VOLTAGE	Data Transmission Input 120 Vac, 60 Hz	**FREQUENCY RANGE**	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	**DETECTOR FUNCTION & RESOLUTION BANDWIDTH**	Peak/Average, 1 MHz
TESTED BY	Jace Hu		

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**
3601	49.09	57.34	74	-24.91	33.18	4.95	46.38	200	0	Peak
3601	28.88	37.13	54	-25.12	33.18	4.95	46.38	200	0	Average
5845	45.5	49.69	74	-28.5	34.11	7.85	46.15	200	0	Peak
5845	31.48	35.67	54	-22.52	34.11	7.85	46.15	200	0	Average
7936	46.33	47.18	74	-27.67	35.64	9.07	45.56	200	0	Peak
7936	31.25	32.1	54	-22.75	35.64	9.07	45.56	200	0	Average

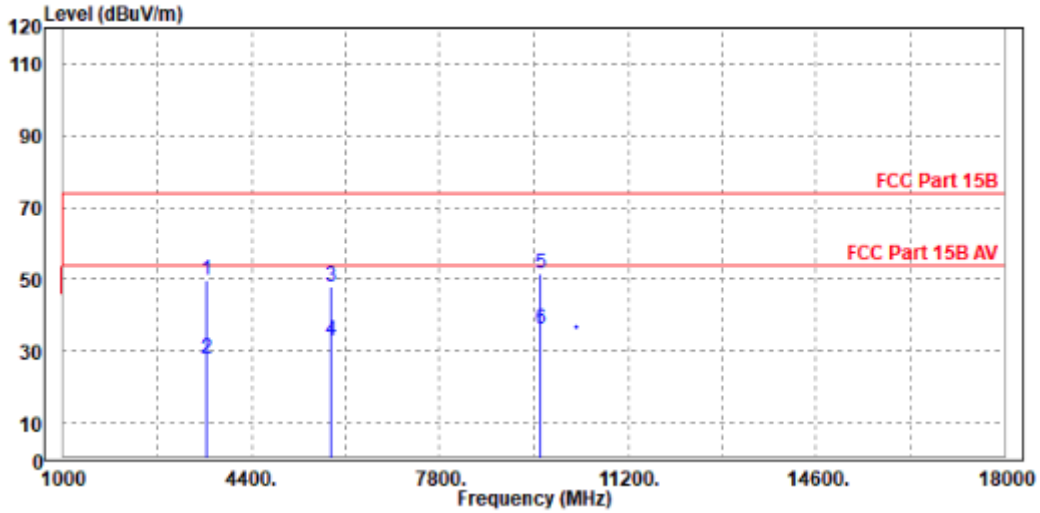
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 1GHz to 18GHz.
4. Only emissions significantly above equipment noise floor are reported.



TEST VOLTAGE	Data Transmission Input 120 Vac, 60 Hz	**FREQUENCY RANGE**	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	**DETECTOR FUNCTION & RESOLUTION BANDWIDTH**	Peak/Average, 1 MHz
TESTED BY	Jace Hu		

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**
3601	49.58	57.02	74	-24.42	33.99	4.95	46.38	100	0	Peak
3601	27.74	35.18	54	-26.26	33.99	4.95	46.38	100	0	Average
5845	47.76	49.35	74	-26.24	36.71	7.85	46.15	100	0	Peak
5845	32.8	34.39	54	-21.2	36.71	7.85	46.15	100	0	Average
9619	51.77	47.33	74	-22.23	38.97	10.71	45.24	100	0	Peak
9619	36.03	31.59	54	-17.97	38.97	10.71	45.24	100	0	Average

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: 1GHz to 18GHz.
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.

---END---