

## EMC TEST REPORT



Applicant:	FIH International Co., Ltd.
Address:	No.18, Tongji zhonglu, Beijing Economic & Technological Development Area

Manufacturer or Supplier	HMD Global Oy
Address	Karaportti 2 02610 Espoo FINLAND
Product	GSM/WCDMA/LTE Mobile Phone
Brand Name	Nokia
Model Name	TA-1049
FCC ID	2AJOTTA-1049
Date of tests	Mar. 23, 2018 ~ Apr. 17, 2018

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 B**
- ANSI C63.4:2014**

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

Issued by Yuqiang Yin Engineer / Mobile Department	Approved by Sam Tung Manager / Mobile Department
 Date: Apr. 18, 2018	 Date: Apr. 18, 2018

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# TABLE OF CONTENTS

<b>RELEASE CONTROL RECORD .....</b>	<b>3</b>
<b>1 GENERAL INFORMATION .....</b>	<b>4</b>
1.1 GENERAL DESCRIPTION OF EUT .....	4
1.2 SUMMARY OF TEST RESULTS .....	6
1.3 MEASUREMENT UNCERTAINTY .....	6
1.4 DESCRIPTION OF TEST MODES .....	7
1.5 DESCRIPTION OF SUPPORT UNITS .....	8
1.6 CONFIGURATION OF SYSTEM UNDER TEST .....	9
<b>2 EMISSION TEST .....</b>	<b>11</b>
2.1 CONDUCTED EMISSION MEASUREMENT .....	11
2.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	11
2.1.2 TEST INSTRUMENTS .....	11
2.1.3 TEST PROCEDURES .....	12
2.1.4 DEVIATION FROM TEST STANDARD .....	12
2.1.5 TEST SETUP .....	13
2.1.6 EUT OPERATING CONDITIONS .....	13
2.1.7 TEST RESULTS .....	14
2.2 RADIATED EMISSION MEASUREMENT .....	16
2.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT .....	16
2.2.2 TEST INSTRUMENTS .....	17
2.2.3 TEST PROCEDURE .....	18
2.2.4 DEVIATION FROM TEST STANDARD .....	19
2.2.5 TEST SETUP .....	20
2.2.6 EUT OPERATING CONDITIONS .....	20
2.2.7 TEST RESULTS .....	21
<b>3 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>25</b>



**BUREAU  
VERITAS**

Test Report No.: FV180131W003-1

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV180131W003-1	Original release	Apr. 18, 2018



# 1 GENERAL INFORMATION

## 1.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	GSM/WCDMA/LTE Mobile Phone	
<b>BRAND NAME</b>	Nokia	
<b>MODEL NAME</b>	TA-1049	
<b>NOMINAL VOLTAGE</b>	5.0Vdc (adapter or host equipment) 3.9Vdc (Li-ion, ion battery )	
<b>BATTERY</b>	Brand Name: SCUD Model Name: HE336 Power Rating: DC 3.85V, 2900mAh, Li-ion	
<b>MODULATION TYPE</b>	<b>WLAN</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	<b>BT_LE</b>	DTS
	<b>Bluetooth</b>	GFSK, $\pi/4$ -DQPSK, 8DPSK
	<b>GPS/ GLONASS</b>	C/A code
	<b>FM</b>	FSK
	<b>GSM/EDGE</b>	GMSK, 8PSK
	<b>WCDMA</b>	BPSK/QPSK
	<b>LTE</b>	QPSK/16QAM
<b>OPERATING FREQUENCY</b>	<b>WLAN</b>	2412 ~ 2462MHz for 11b/g/n(HT20) 5150 ~ 5250MHz, 5250 ~ 5350MHz, 5470 ~ 5725MHz, 5725 ~ 5825MHz for 11a/n(HT20)/n(HT40)
	<b>Bluetooth/BT_LE</b>	2402MHz ~ 2480MHz
	<b>GPS</b>	1575.42MHz
	<b>GLONASS</b>	1602MHz
	<b>FM</b>	98MHz
	<b>GSM/EDGE</b>	824.2MHz ~ 848.8MHz (FOR GSM 850) 1850.2MHz ~ 1909.8MHz (FOR GSM 1900)
	<b>WCDMA</b>	1852.4MHz ~ 1907.6MHz (FOR WCDMA Band 2) 1712.4MHz ~ 1752.6MHz (FOR WCDMA Band 4) 826.4MHz ~ 846.6MHz (FOR WCDMA Band 5)
	<b>LTE</b>	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824.7MHz ~ 848.3MHz (FOR LTE Band5) 2502.5 ~ 2567.5 MHz (FOR LTE Band7)



		699.7MHz ~ 715.3MHz (FOR LTE Band12) 706.5MHz ~ 713.5MHz (FOR LTE Band17) 2572.5MHz ~ 2617.5MHz (FOR LTE Band38)
<b>HW VERSION</b>	HW0303	
<b>SW VERSION</b>	000C_0_34A	
<b>I/O PORTS</b>	Refer to user's manual	
<b>CABLE</b>	USB cable: non-shielded, detachable, 1.0m Earphone cable: non-shielded, detachable, 1.5m	
<b>ACCESSORY DEVICES</b>	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. For the test results, the EUT had been tested with all conditions. But only the worst case was shown in test report.

**List of Accessories:**

<b>ACCESSORIES</b>	<b>BRAND</b>	<b>MANUFACTURER</b>	<b>MODEL</b>	<b>SPECIFICATION</b>
Adapter 1	Salcomp	Salcomp (Shenzhen) Co., Ltd.	FC0202	I/P: 100-240Vac, 150mA O/P: 5Vdc, 1000mA
Adapter 2	Aohai	DONGGUAN AOHAITECHNOLOGY CO., LTD.	AD-5WU	I/P: 100-240Vac, 150mA O/P: 5Vdc, 1000mA
Battery	SCUD	SCUD (Fujian) Electronics CO., Ltd.	HE336	Rating: 3.85Vdc, 2900mAh
Earphone 1	Nokia	FIT	WH-108	1.5m non-shielded cable w/o core
Earphone 2	Nokia	OBO	WH-108	1.5m non-shielded cable w/o core
USB Cable	Nokia	FIH	CA-190CD	1.0m non-shielded cable w/o core

## 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	Remark
FCC Part 15, Subpart B, Class B ANSI C63.4:2014	Conducted Test	PASS	Meets limits minimum passing margin is -9.24dB at 0.476000MHz.
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -4.39dB at 61.04MHz
	Radiated Emission Test (Above 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -15.55dB at 3360MHz

## 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	+/-2.66dB
Radiated emissions	30MHz ~ 1GHz	+/-3.26dB
	1GHz ~ 18GHz	+/-4.48dB

## 1.4 DESCRIPTION OF TEST MODES

For Conducted Emission evaluation, 240Vac/60Hz & 120/60Hz had been covered during the pre-test. The worst data was found at **120Vac/60Hz** and recorded in the applied test report.

Test Mode	Test Condition
<b>Radiated emission test</b>	
1	GSM850 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx + Back camera on
2	GSM1900 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ Front camera on
3	WCDMA B2 Idle + Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
4	WCDMA B4 Idle + Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
5	WCDMA B5 Idle + Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
6	LTE B2 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx + FM RX
7	LTE B4 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
8	LTE B5 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
9	LTE B7 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ MPEG4
10	LTE B12 Idle+ Adapter 2 + Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
11	LTE B17 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
12	LTE B38 Idle+ USB Link+ Earphone 2 + BT Idle+ WIFI Idle(5G)+ Glonass Rx
<b>Conducted emission test</b>	
1	GSM850 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx + Back camera on
2	GSM1900 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx+ Front camera on
3	WCDMA B2 Idle + Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
4	WCDMA B4 Idle + Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
5	WCDMA B5 Idle + Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
6	LTE B2 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx + FM RX
7	LTE B4 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
8	LTE B5 Idle+ Adapter 2+ Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
9	LTE B7 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx+ MPEG4
10	LTE B12 Idle+ Adapter 2 + Earphone 2+ USB cable+ BT Idle+ WIFI Idle(5G)+ Glonass Rx
11	LTE B17 Idle+ Adapter 1+ Earphone 1+ USB cable+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
12	LTE B38 Idle+ USB Link+ Earphone 2 + BT Idle+ WIFI Idle(5G)+ Glonass Rx



**NOTE:**

- 1. For conducted emission test, test mode 1 was the worst case and only this mode was presented in this report.
- 2. For radiated emission test, test mode 12 was the worst 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 EMISSION TESTS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Wireless AP	ABOCOM	WR224GR	060500749P	N/A
2	Notebook	DELL	E6420	9H12FS1	N/A

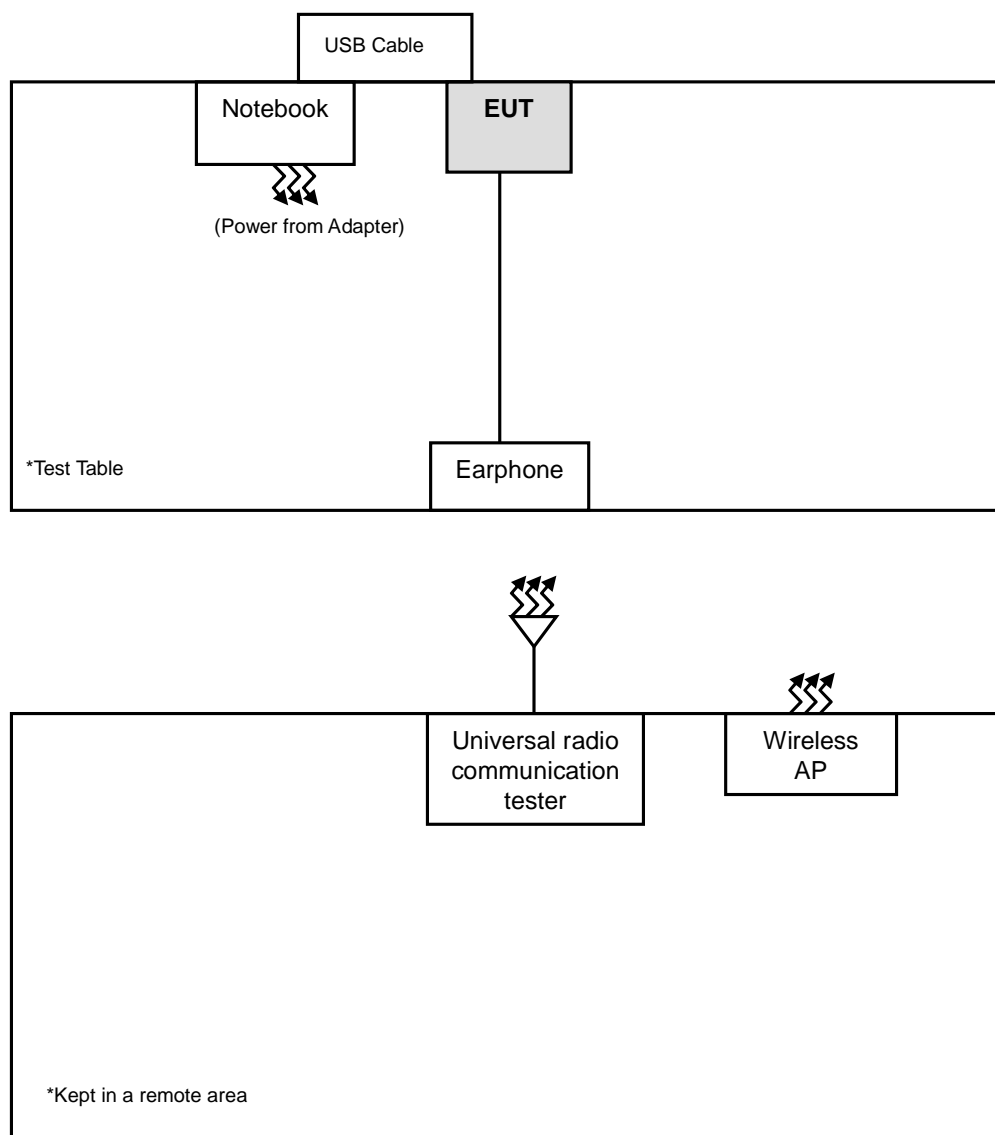
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	DC Line: Unshielded, Undetachable, 2.0m



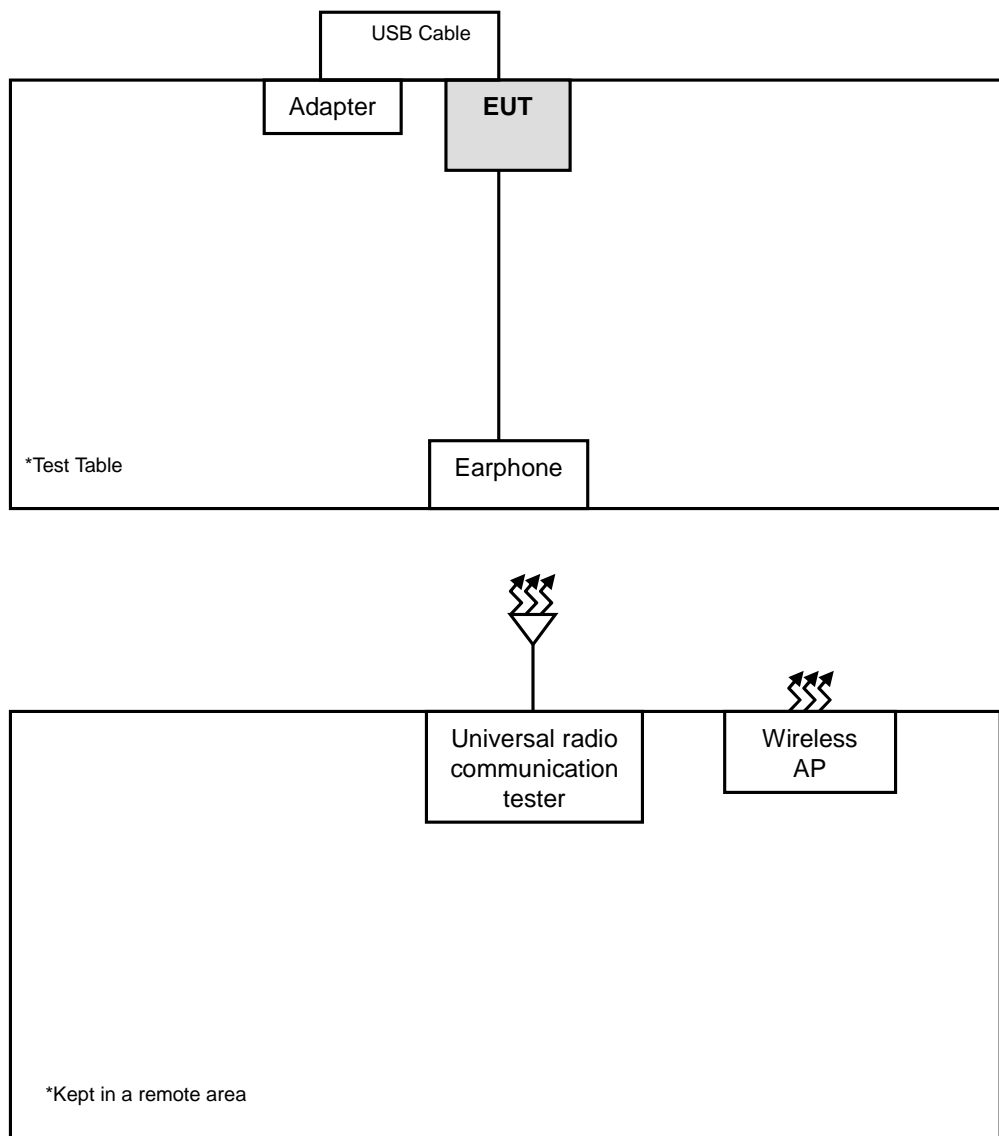


## 1.6 CONFIGURATION OF SYSTEM UNDER TEST

### Test configuration 1



## Test configuration 2



## 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)

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

- 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	Jun. 28,17	Jun. 27,18
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Sep. 18,17	Sep. 17,18

- 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.

### 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.

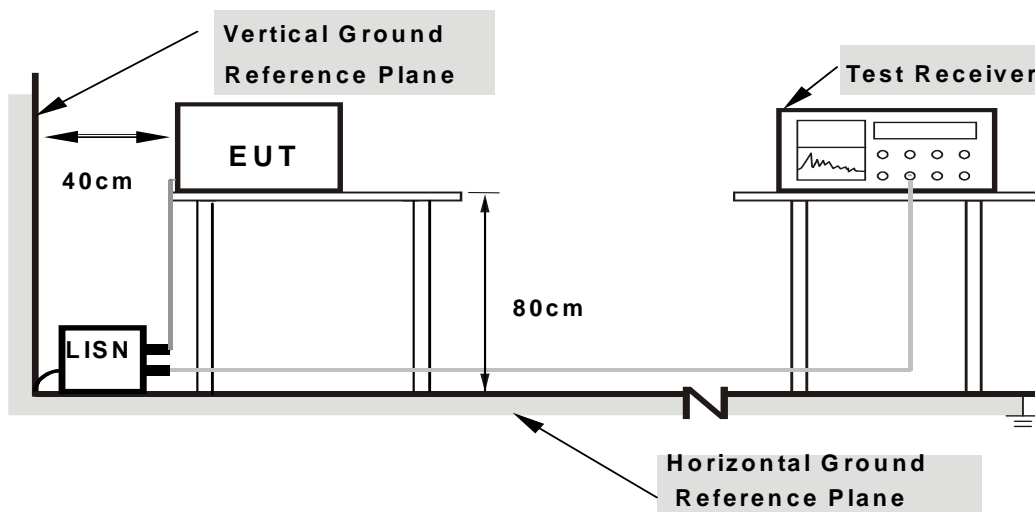
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 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.



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Test Report No.: FV180131W003-1

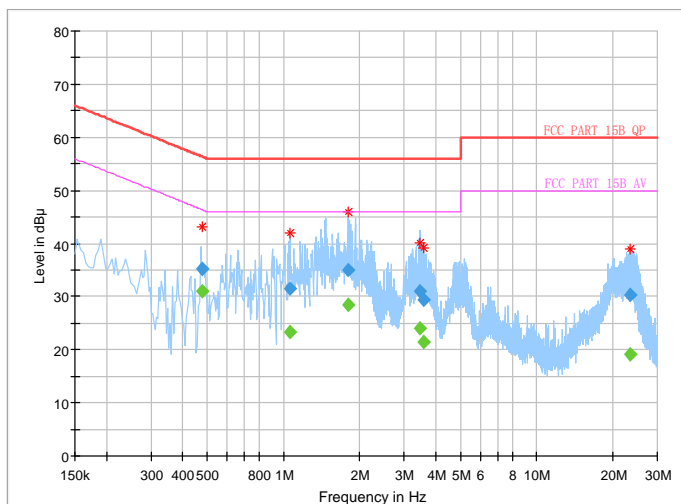
## 2.1.7 TEST RESULTS

<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 52RH	<b>TESTED BY</b>	Alex Chen

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	CAverage (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.476000	---	31.02	46.41	-15.39	L	ON	9.7
0.476000	35.15	---	56.41	-21.26	L	ON	9.7
1.068000	---	23.37	46.00	-22.63	L	ON	9.7
1.068000	31.42	---	56.00	-24.58	L	ON	9.7
1.804000	---	28.48	46.00	-17.52	L	ON	9.7
1.804000	35.10	---	56.00	-20.90	L	ON	9.7
3.464000	---	23.94	46.00	-22.06	L	ON	9.7
3.464000	31.04	---	56.00	-24.96	L	ON	9.7
3.576000	---	21.49	46.00	-24.51	L	ON	9.7
3.576000	29.28	---	56.00	-26.72	L	ON	9.7
23.516000	---	19.13	50.00	-30.87	L	ON	10.0
23.516000	30.28	---	60.00	-29.72	L	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





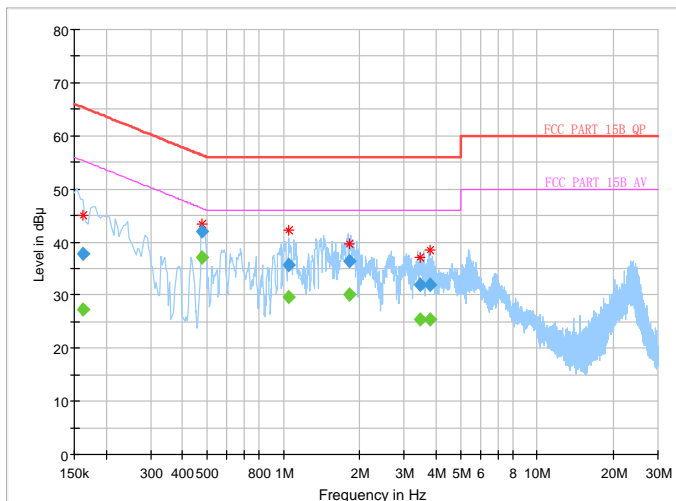
Test Report No.: FV180131W003-1

<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>Detector Function &amp; Resolution Bandwidth</b>	Quasi-Peak (QP) / Average (AV), 9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 52RH	<b>TESTED BY</b>	Alex Chen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.162000	---	27.20	55.36	-28.16	N	ON	10.1
0.162000	37.89	---	65.36	-27.47	N	ON	10.1
<b>0.476000</b>	---	<b>37.17</b>	<b>46.41</b>	<b>-9.24</b>	<b>N</b>	<b>ON</b>	<b>10.1</b>
0.476000	42.05	---	56.41	-14.36	N	ON	10.1
1.056000	---	29.52	46.00	-16.48	N	ON	9.9
1.056000	35.64	---	56.00	-20.36	N	ON	9.9
1.818000	---	30.17	46.00	-15.83	N	ON	9.8
1.818000	36.32	---	56.00	-19.68	N	ON	9.8
3.444000	---	25.43	46.00	-20.57	N	ON	9.8
3.444000	32.01	---	56.00	-23.99	N	ON	9.8
3.792000	---	25.50	46.00	-20.50	N	ON	9.8
3.792000	31.85	---	56.00	-24.15	N	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.

Full Spectrum





## 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	CISPR 22, Class A	CISPR 22, Class B
30-88	39	29.5	40	30
88-216	43.5	33.1		
216-230	46.4	35.6		
230-960			47	37
960-1000	49.5	43.5	Not defined	Not defined
1000-3000	Avg: 49.5	Avg: 43.5		
3000+	Peak: 69.5	Peak: 63.5	Not defined	Not defined

Radiated Emissions Limits at 3 meters (dBµV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50.5	40.5
88-216	54	43.5		
216-230	56.9	46		
230-960			57.5	47.5
960-1000	60	54	Avg: 56 Peak: 76	Avg: 50 Peak: 70
1000-3000	Avg: 60	Avg: 54		
3000+	Peak: 80	Peak: 74	Avg: 60 Peak: 80	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 <sup>th</sup> 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 below 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	May 06,17	May 05,18
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Nov. 26,16	Nov. 25,18
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 16,18	Mar. 15,19
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jul. 24,17	Jul. 23,18

### 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 06,17	May 05,18
Horn Antenna	ETS-LINDGREN	3117	00168728	Nov. 26,16	Nov. 25,18
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 16,18	Mar. 15,19
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jul. 24,17	Jul. 23,18

- NOTE:**
1. The test was performed in 3m chamber.
  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.

## 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. 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:

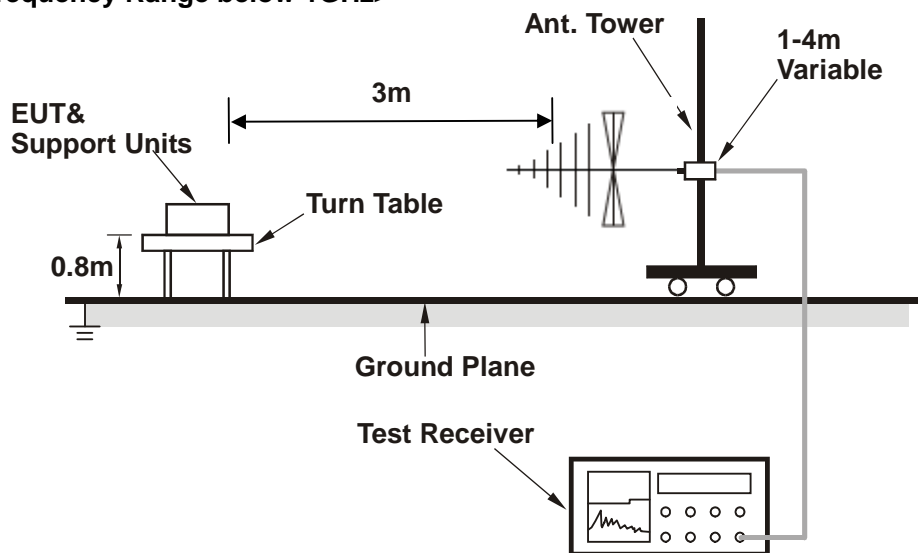
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth of test receiver/spectrum analyzer is 10Hz 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

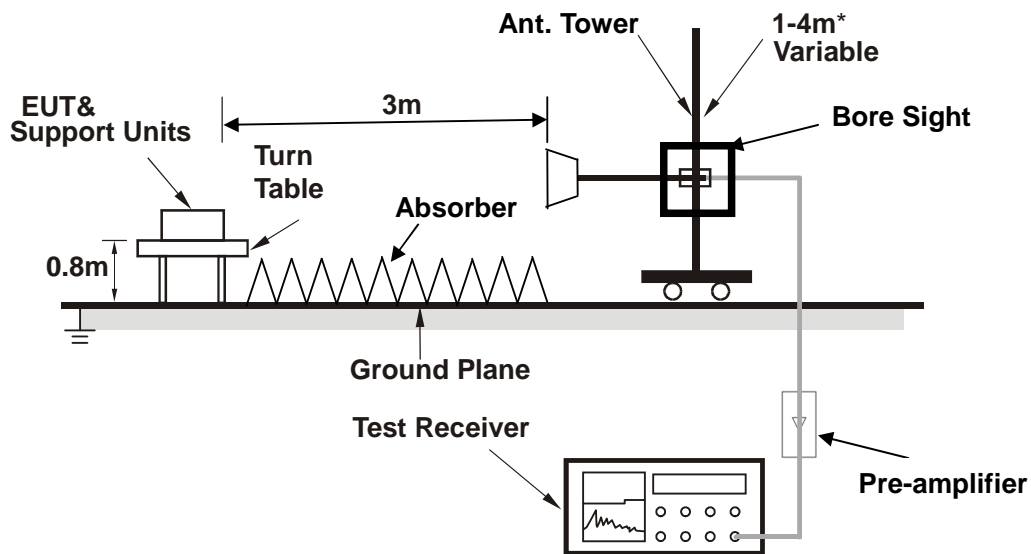
No deviation.

## 2.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

## 2.2.6 EUT OPERATING CONDITIONS

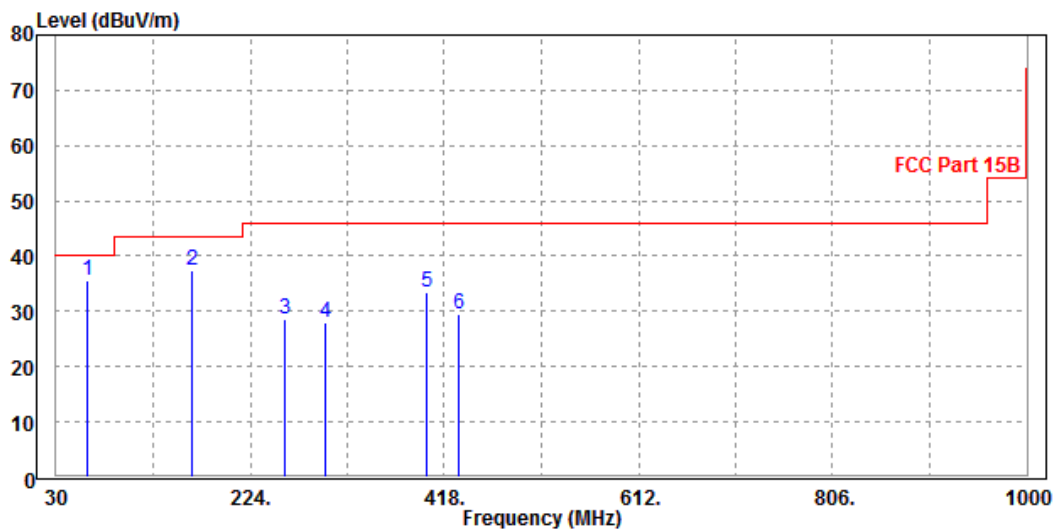
Same as item 2.1.6.

## 2.2.7 TEST RESULTS

<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 120 kHz
<b>TESTED BY</b>	Star Le		

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
62.01	35.58	64.73	40	-4.42	6.96	1.2	37.31	100	125	QP
165.8	37.52	61.83	43.5	-5.98	10.45	1.97	36.73	100	266	QP
257.95	28.71	49.87	46	-17.29	12.87	2.49	36.52	100	75	QP
298.69	28.04	48.06	46	-17.96	13.77	2.71	36.5	100	261	QP
399.57	33.55	50.03	46	-12.45	17.09	3.15	36.72	100	23	QP
431.58	29.49	45.66	46	-16.51	17.38	3.25	36.8	100	321	QP

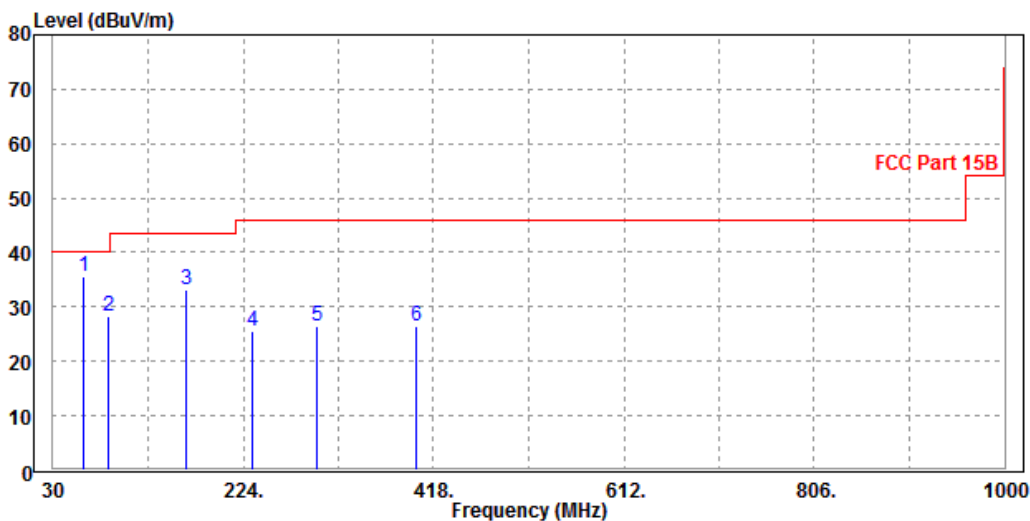
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 30MHz to 1000MHz.
 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



<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 120 kHz
<b>TESTED BY</b>	Star Le		

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
61.04	35.61	64.85	40	-4.39	6.88	1.19	37.31	100	275	QP
87.23	28.43	55.77	40	-11.57	8.29	1.44	37.07	200	125	QP
165.8	33.21	57.52	43.5	-10.29	10.45	1.97	36.73	200	189	QP
232.73	25.43	47.64	46	-20.57	11.97	2.35	36.53	200	257	QP
298.69	26.58	46.6	46	-19.42	13.77	2.71	36.5	200	345	QP
399.57	26.38	42.86	46	-19.62	17.09	3.15	36.72	200	25	QP

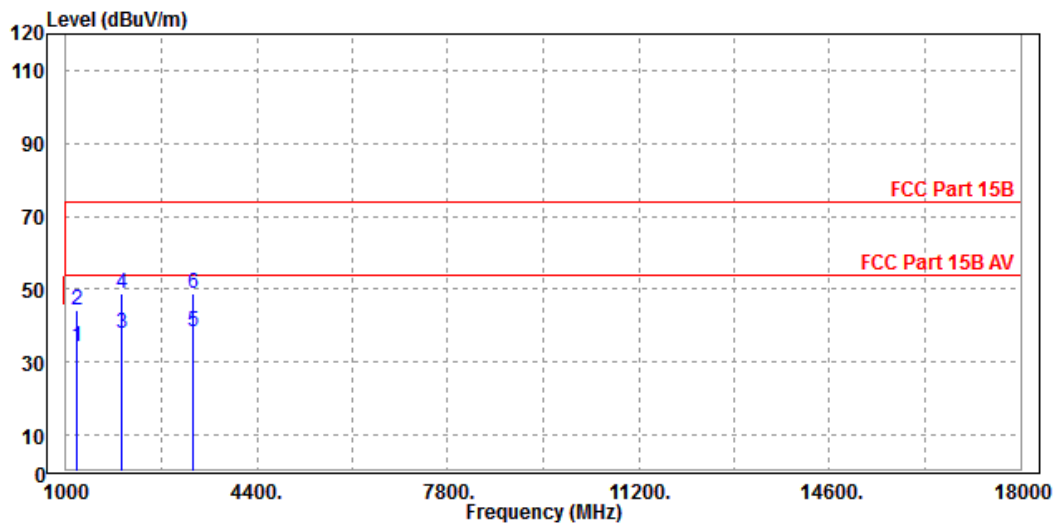
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 30MHz to 1000MHz.
 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



<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1-18 GHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Peak/Average, 1 MHz
<b>TESTED BY</b>	Star Le		

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
1205	34.26	47.99	54	-19.74	29	5.63	48.36	100	96	Average
1205	44.36	58.09	74	-29.64	29	5.63	48.36	100	96	Peak
2000	37.69	46.69	54	-16.31	31.9	7.45	48.35	100	210	Average
2000	48.75	57.75	74	-25.25	31.9	7.45	48.35	100	210	Peak
3250	38.24	44.08	54	-15.76	32.95	9.58	48.37	100	60	Average
3250	48.75	54.59	74	-25.25	32.95	9.58	48.37	100	90	Peak

- 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.

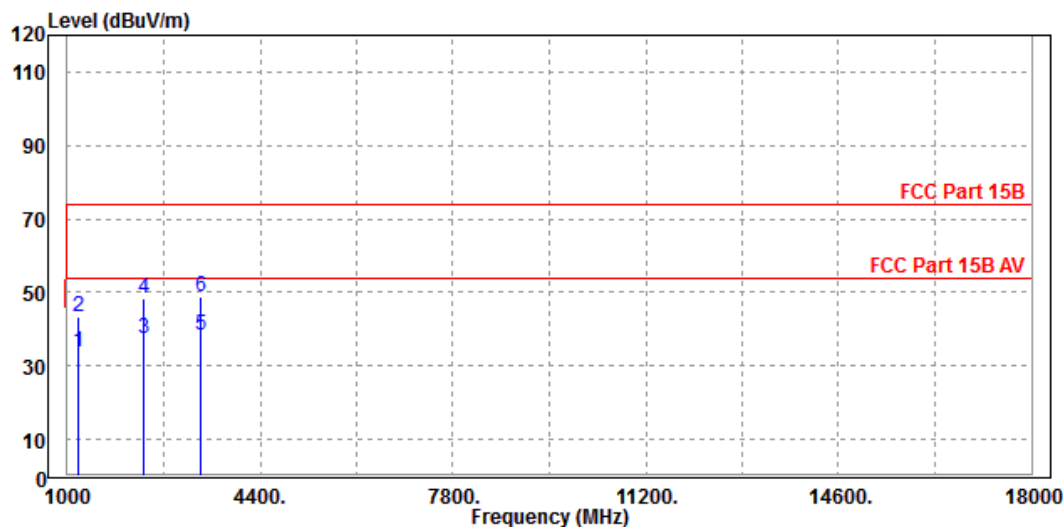




<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1-18 GHz
<b>ENVIRONMENTAL CONDITIONS</b>	23deg. C, 70 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Peak/Average, 1 MHz
<b>TESTED BY</b>	Star Le		

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
1200	33.96	47.7	54	-20.04	29	5.62	48.36	100	63	Average
1200	43.53	57.27	74	-30.47	29	5.62	48.36	100	63	Peak
2350	37.25	45.23	54	-16.75	32.25	8.08	48.31	100	156	Average
2350	48.25	56.23	74	-25.75	32.25	8.08	48.31	100	156	Peak
<b>3360</b>	<b>38.45</b>	<b>44.13</b>	<b>54</b>	<b>-15.55</b>	<b>32.97</b>	<b>9.74</b>	<b>48.39</b>	<b>100</b>	<b>245</b>	<b>Average</b>
3360	48.76	54.44	74	-25.24	32.97	9.74	48.39	100	245	Peak

- 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 Report No.: FV180131W003-1

### 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---