

EMC TEST REPORT


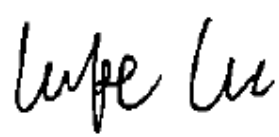
Applicant:	Corporativo Lanix S.A. de C.V.
Address:	Carretera Internacional Hermosillo-Nogales Km 8.5, Hermosillo Sonora, Mexico

Manufacturer or Supplier:	Corporativo Lanix S.A. de C.V.
Address:	Carretera Internacional Hermosillo-Nogales Km 8.5, Hermosillo Sonora, Mexico
Product:	smartphone
Brand Name:	LANIX
Model Name:	Ilium Alpha 1s
FCC ID:	ZC4ALPHA1S
Date of tests:	Mar. 26, 2019 ~ Apr. 16, 2019

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 Alex Chen Engineer / Mobile Department	Approved by Luke Lu Manager / Mobile Department
 Date: Apr. 17, 2019	 Date: Apr. 17, 2019

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	3
1 GENERAL INFORMATION	4
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	9
2 EMISSION TEST	10
2.1 CONDUCTED EMISSION MEASUREMENT	10
2.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	10
2.1.2 TEST INSTRUMENTS	10
2.1.3 TEST PROCEDURES	11
2.1.4 DEVIATION FROM TEST STANDARD	11
2.1.5 TEST SETUP	12
2.1.6 EUT OPERATING CONDITIONS	12
2.1.7 TEST RESULTS	13
2.2 RADIATED EMISSION MEASUREMENT	17
2.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	17
2.2.2 TEST INSTRUMENTS	18
2.2.3 TEST PROCEDURE	19
2.2.4 DEVIATION FROM TEST STANDARD	20
2.2.5 TEST SETUP	21
2.2.6 EUT OPERATING CONDITIONS	21
2.2.7 TEST RESULTS	22
3 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	30



Test Report No.: FV190325W006

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV190325W006	Original release	Apr. 17, 2019

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	smartphone	
BRAND NAME	LANIX	
MODEL NAME	Ilium Alpha 1s	
NOMINAL VOLTAGE	5.0Vdc (adapter or host equipment) 3.85Vdc (Li-ion, battery)	
BATTERY	Brand Name: lanix Model Name: Ilium Alpha 1s-BAT Power Rating: DC 3.85V, 4000mAh, Li-ion	
MODULATION TYPE	WLAN	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	BT_LE	BT-LE(GFSK) for DTS
	Bluetooth	GFSK, $\pi/4$ -DQPSK, 8DPSK, LE
	GPS	C/A code
	FM	FM
	GSM	GMSK/8PSK
	WCDMA	BPSK/QPSK
	LTE	QPSK/16QAM
OPERATING FREQUENCY	WLAN	2412-2462MHz for 11b/g/n(HT20)
	Bluetooth/BT_LE	2402MHz ~ 2480MHz
	GPS	1575.42MHz
	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)
	LTE	1850.7MHz ~ 1909.3MHz (FOR LTE Band2) 1710.7MHz ~ 1754.3MHz (FOR LTE Band4) 824.7MHz ~ 848.3MHz (FOR LTE Band5) 2500MHz ~ 2570MHz (FOR LTE Band7) 699.7MHz ~ 715.3MHz (FOR LTE Band12) 1710.7MHz ~ 1754.3MHz (FOR LTE Band66)
HW VERSION	V1.0	
SW VERSION	Ilium Alpha 1s_SW_01_V01	



**BUREAU
VERITAS**

Test Report No.: FV190325W006

I/O PORTS	Refer to user's manual
CABLE SUPPLIED	USB cable: non-shielded, detachable, 1.0meter Earphone cable: non-shielded, detachable, 1.2meter
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. The EUT was powered by the following adapter:

ADAPTER	
BRAND:	lanix
MODEL:	Alpha 1s-C
INPUT:	AC 100-240V, 250mA
OUTPUT:	DC 5V, 1550mA

3. The EUT matched the following USB cable and Earphone:

USB CABLE	
BRAND:	lanix
MODEL:	Alpha 1s
SIGNAL LINE:	1.0 METER

EARPHONE	
BRAND:	lanix
MODEL:	Alpha 1s
SIGNAL LINE:	1.2 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	Remark
FCC Part 15, Subpart B, Class B ANSI C63.4:2014	Conducted Test	PASS	Meets limits minimum passing margin is -7.94dB at 18.836000MHz.
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -3.56dB at 167.74MHz
	Radiated Emission Test (Above 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -11.73dB at 5146MHz

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

Test Mode	Test Condition
Radiated emission test	
1	GSM 850 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
2	GSM 1900 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
3	WCDMA B2 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
4	WCDMA B4 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
5	WCDMA B5 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
6	LTE B2 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
7	LTE B4 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
8	LTE B5 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
9	LTE B7 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
10	LTE B12 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
11	LTE B66 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
12	Worst case of(1-11) + FM RX
13	Worst case of(1-11) + Front Camera On
14	Worst case of(1-11) + Back Camera On
15	Worst case of(1-11) + MPG4
16	USB link+ USB cable+ Data Trasimission(PC to EUT) +Earphone + BT Idle + WIFI Idle (2.4G) + GPS Rx
17	USB link + USB cable + Data Trasimission(PC to SD) + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
Conducted emission test	
1	GSM 850 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
2	GSM 1900 Idle+ Adapter + USB cable + Earphone + BT Idle+ WIFI Idle(2.4G) + GPS Rx
3	WCDMA B2 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
4	WCDMA B4 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
5	WCDMA B5 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
6	LTE B2 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
7	LTE B4 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
8	LTE B5 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
9	LTE B7 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
10	LTE B12 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
11	LTE B66 Idle + Adapter + USB cable + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
12	Worst case of(1-11) + FM RX
13	Worst case of(1-11) + Front Camera On
14	Worst case of(1-11) + Back Camera On

**Test Report No.: FV190325W006**

15	Worst case of(1-11) + MPG4
16	USB link+ USB cable +Data Trasimission(PC to EUT) + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx
17	USB link + USB cable + Data Trasimission(PC to SD) + Earphone + BT Idle + WIFI Idle(2.4G) + GPS Rx

NOTE:

1. For conducted emission test, test mode 14, 17 was the worst case and only this mode was presented in this report.
2. For radiated emission test, test mode 14, 17 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	GPS Simulator +Antenna	TOJOIN	GNSS-5000A	E1-010-010119	N/A
2	Wireless AP	ABOCOM	WR224GR	060500749P	N/A
3	FM signal generator	Rohde & Schwarz	SMB100A	109279	N/A
4	Printer	HP	Hp LaserJet 1300	CNSJF75989	N/A
5	Notebook	Lenovo	Thnikpad X520	SL10H14859JS	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)

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

- 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. 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.

2.1.3 TEST PROCEDURES

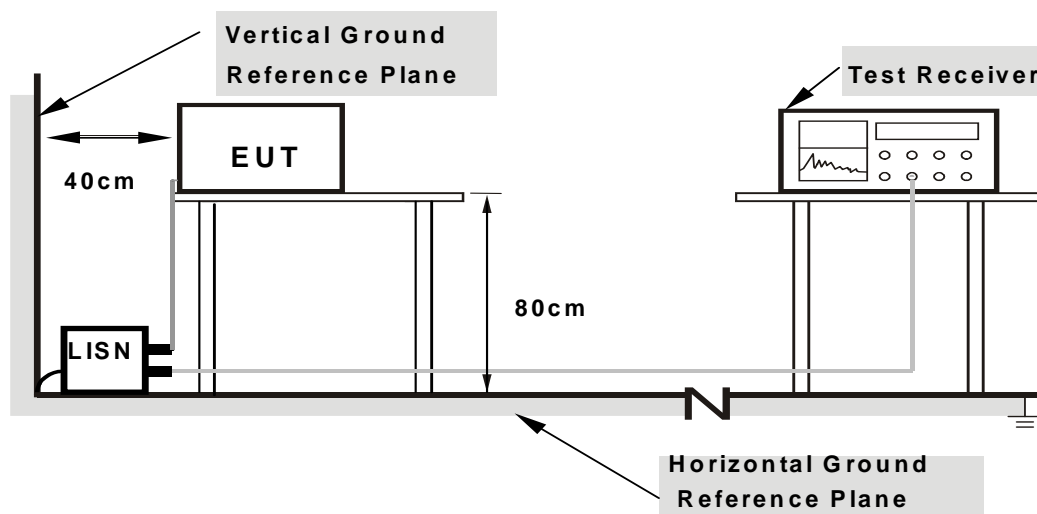
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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 cm 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

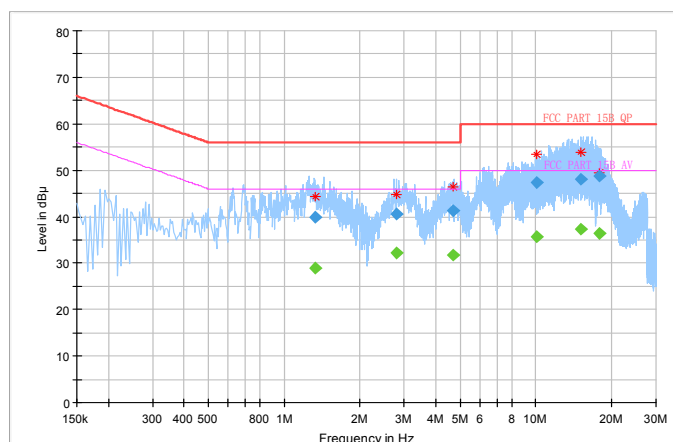
Mode 14

TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
1.332000	---	28.83	46.00	-17.17	L	ON	10.1
1.332000	39.83	---	56.00	-16.17	L	ON	10.1
2.792000	---	32.27	46.00	-13.73	L	ON	10.2
2.792000	40.66	---	56.00	-15.34	L	ON	10.2
4.664000	---	31.61	46.00	-14.39	L	ON	10.2
4.664000	41.24	---	56.00	-14.76	L	ON	10.2
10.104000	---	35.74	50.00	-14.26	L	ON	10.5
10.104000	47.45	---	60.00	-12.55	L	ON	10.5
15.144000	---	37.42	50.00	-12.58	L	ON	10.5
15.144000	48.16	---	60.00	-11.84	L	ON	10.5
17.922000	---	36.47	50.00	-13.53	L	ON	10.5
17.922000	48.73	---	60.00	-11.27	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.

Full Spectrum

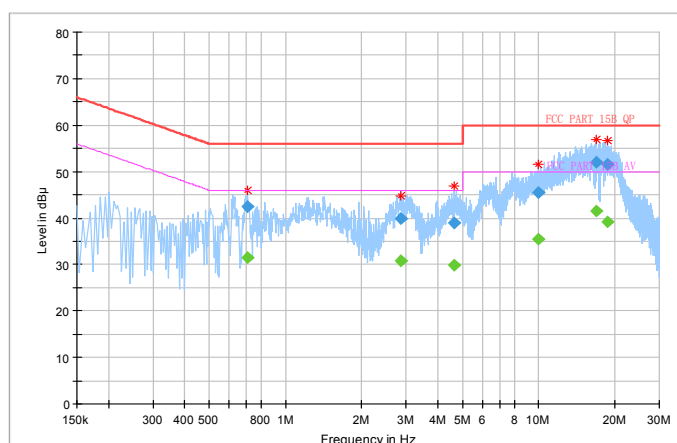


TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.708000	---	31.55	46.00	-14.45	N	ON	9.9
0.708000	42.56	---	56.00	-13.44	N	ON	9.9
2.856000	---	30.76	46.00	-15.24	N	ON	10.1
2.856000	39.77	---	56.00	-16.23	N	ON	10.1
4.648000	---	29.87	46.00	-16.13	N	ON	10.1
4.648000	39.04	---	56.00	-16.96	N	ON	10.1
10.000000	---	35.39	50.00	-14.61	N	ON	10.3
10.000000	45.51	---	60.00	-14.49	N	ON	10.3
16.836000	---	41.46	50.00	-8.54	N	ON	10.4
16.836000	52.06	---	60.00	-7.94	N	ON	10.4
18.624000	---	39.19	50.00	-10.81	N	ON	10.4
18.624000	51.44	---	60.00	-8.56	N	ON	10.4

- 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



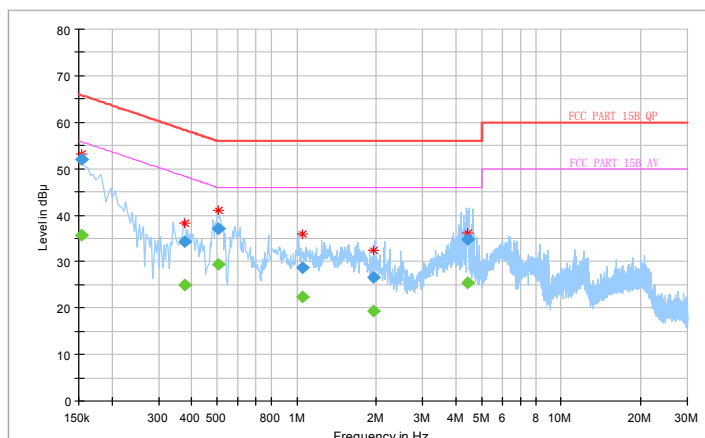
Mode 17

TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.154000	---	35.80	55.78	-19.98	L	ON	9.9
0.154000	51.95	---	65.78	-13.83	L	ON	9.9
0.376000	---	24.99	48.37	-23.38	L	ON	10.0
0.376000	34.22	---	58.37	-24.14	L	ON	10.0
0.508000	---	29.42	46.00	-16.58	L	ON	10.0
0.508000	37.17	---	56.00	-18.83	L	ON	10.0
1.056000	---	22.38	46.00	-23.62	L	ON	10.1
1.056000	28.57	---	56.00	-27.43	L	ON	10.1
1.952000	---	19.36	46.00	-26.64	L	ON	10.1
1.952000	26.62	---	56.00	-29.38	L	ON	10.1
4.436000	---	25.34	46.00	-20.66	L	ON	10.2
4.436000	34.67	---	56.00	-21.33	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.

Full Spectrum

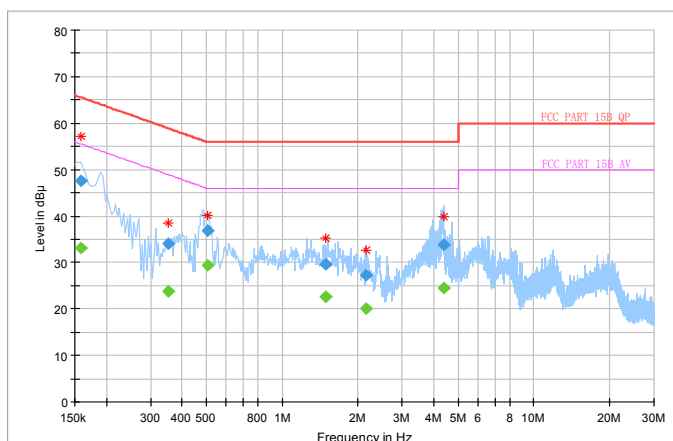


TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 52RH	TESTED BY	John Wen

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.158000	---	33.23	55.57	-22.34	N	ON	9.9
0.158000	47.66	---	65.57	-17.91	N	ON	9.9
0.352000	---	23.90	48.92	-25.02	N	ON	9.9
0.352000	34.16	---	58.92	-24.76	N	ON	9.9
0.508000	---	29.28	46.00	-16.72	N	ON	9.9
0.508000	36.93	---	56.00	-19.07	N	ON	9.9
1.496000	---	22.71	46.00	-23.29	N	ON	10.0
1.496000	29.62	---	56.00	-26.38	N	ON	10.0
2.152000	---	20.00	46.00	-26.00	N	ON	10.0
2.152000	27.29	---	56.00	-28.71	N	ON	10.0
4.396000	---	24.54	46.00	-21.46	N	ON	10.1
4.396000	33.81	---	56.00	-22.19	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



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		
1000-3000	Avg: 49.5	Avg: 43.5	Not defined	Not defined
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		
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74	Avg: 56 Peak: 76	Avg: 50 Peak: 70
3000+			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 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 (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	Feb. 26,19	Feb. 25,20
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Feb. 26,19	Feb. 25,20
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25,20
Signal Pre-Amplifier	EMSI	EMC 9135	980249	Jul. 09,18	Jul. 08,19

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. 26,19	Feb. 25,20
Horn Antenna	ETS-LINDGREN	3117	00168728	Feb. 26,19	Feb. 25,20
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Feb. 26,19	Feb. 25, 20
Signal Pre-Amplifier	EMSI	EMC 012645B	980257	Jul. 09,18	Jul. 08,19

- 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; 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:

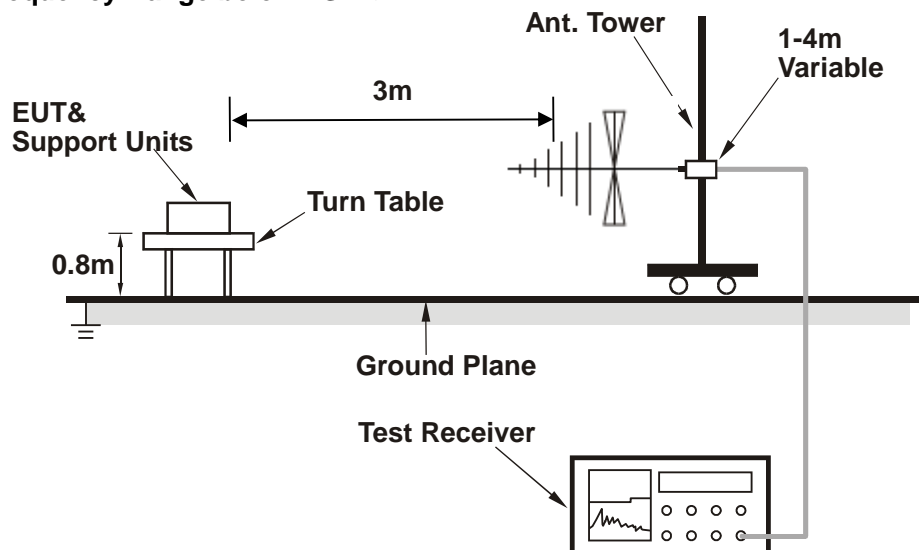
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test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

2.2.4. DEVIATION FROM TEST STANDARD

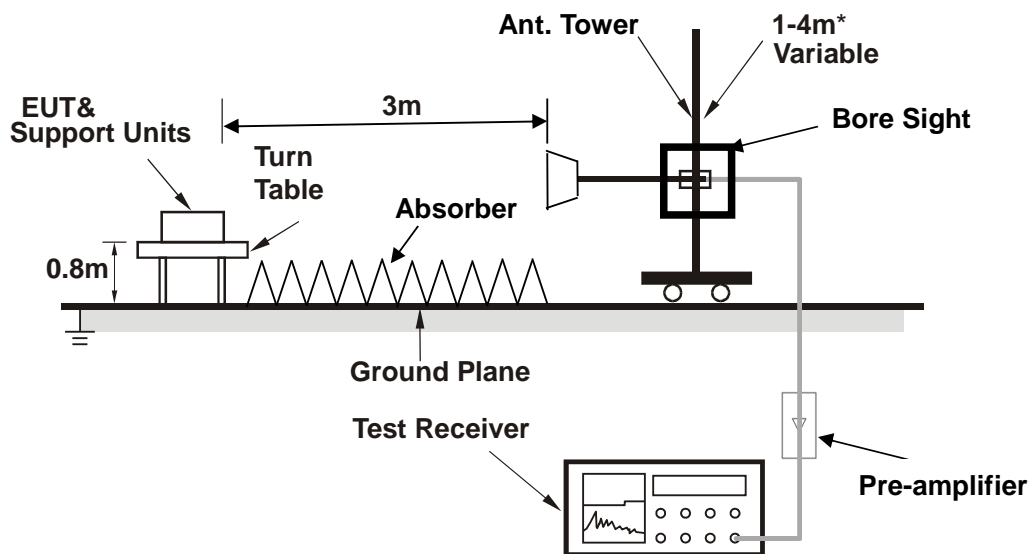
No deviation.

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.

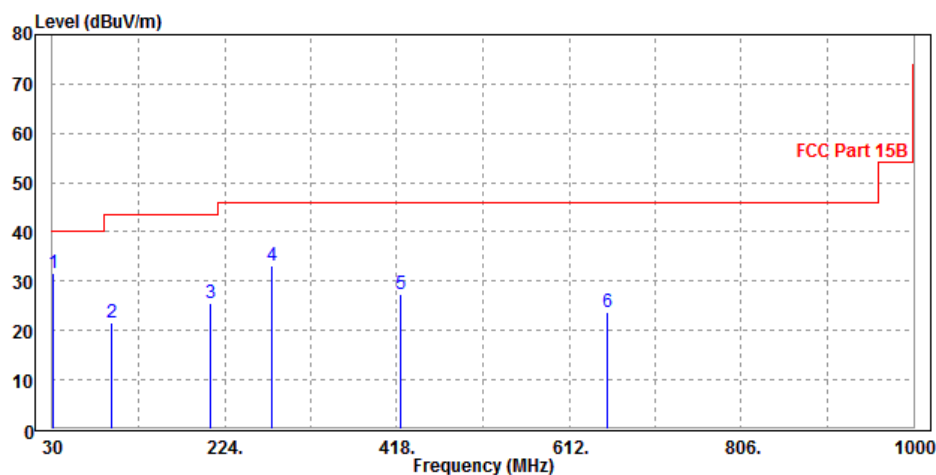
2.2.7. TEST RESULTS

Mode 14

TEST VOLTAGE	DC 5V 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	Rose Ma		

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
30.97	31.62	51.58	40	-8.38	16.8	0.79	37.55	100	217	QP
95.96	21.45	47.94	43.5	-22.05	9.22	1.3	37.01	100	134	QP
207.51	25.53	49.11	43.5	-17.97	11.13	1.83	36.54	100	269	QP
276.38	33.22	54.02	46	-12.78	13.58	2.13	36.51	100	107	QP
422.85	27.23	43.8	46	-18.77	17.5	2.7	36.77	100	239	QP
655.65	23.7	35.93	46	-22.3	21.71	3.37	37.31	100	321	QP

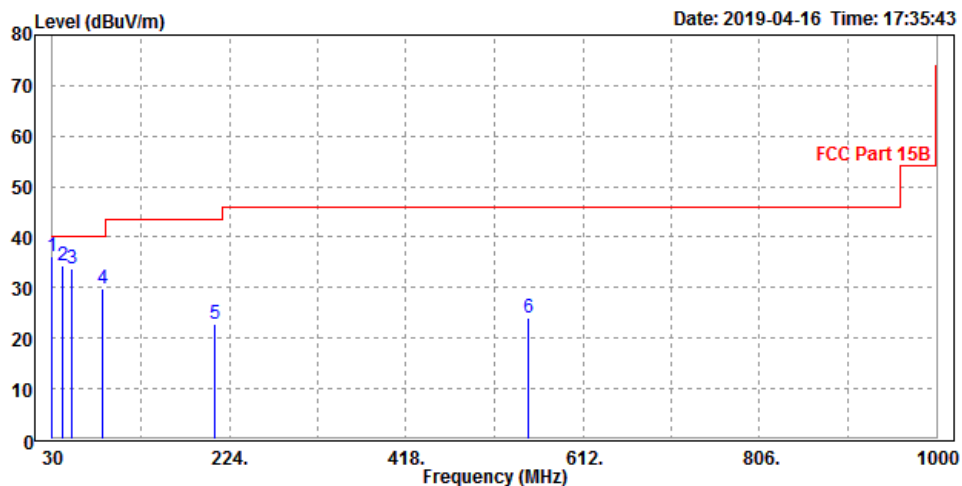
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4.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



TEST VOLTAGE	DC 5V 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	Rose Ma		

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
30	36.25	55.54	40	-3.75	17.5	0.77	37.56	100	0	QP
40.67	34.33	57.99	40	-5.67	12.88	0.93	37.47	100	0	QP
50.37	33.84	62.84	40	-6.16	7.38	1	37.38	100	320	QP
85.29	29.92	57.31	40	-10.08	8.46	1.24	37.09	100	108	QP
207.51	22.68	46.23	43.5	-20.82	11.16	1.83	36.54	100	142	QP
551.86	24.01	38.61	46	-21.99	19.43	3.08	37.11	100	304	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.

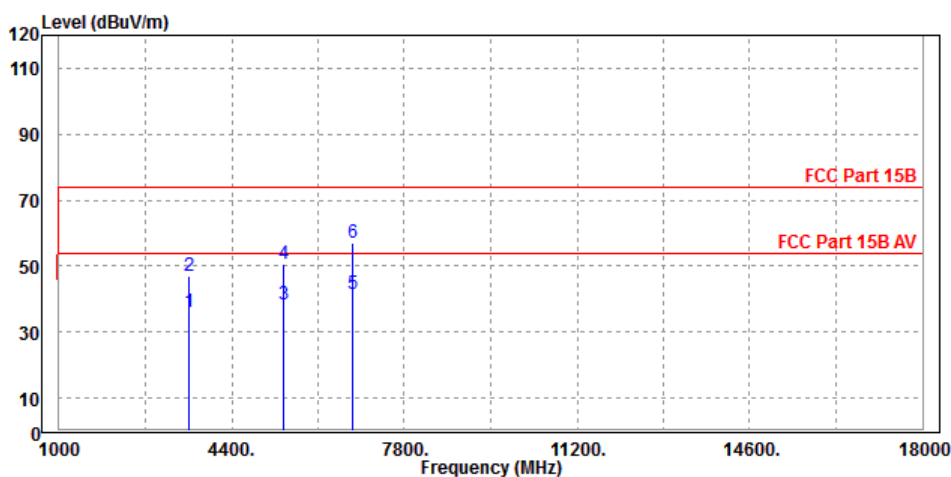


TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

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
3568	36.2	41.52	54	-17.8	35.22	5.84	46.38	100	260	Average
3568	47.15	52.47	74	-26.85	35.22	5.84	46.38	100	260	Peak
5426	38.52	41.08	54	-15.48	36.23	7.48	46.27	100	289	Average
5426	50.61	53.17	74	-23.39	36.23	7.48	46.27	100	289	Peak
6772	41.58	42.59	54	-12.42	37.06	7.82	45.89	100	104	Average
6772	56.85	57.86	74	-17.15	37.06	7.82	45.89	100	104	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.

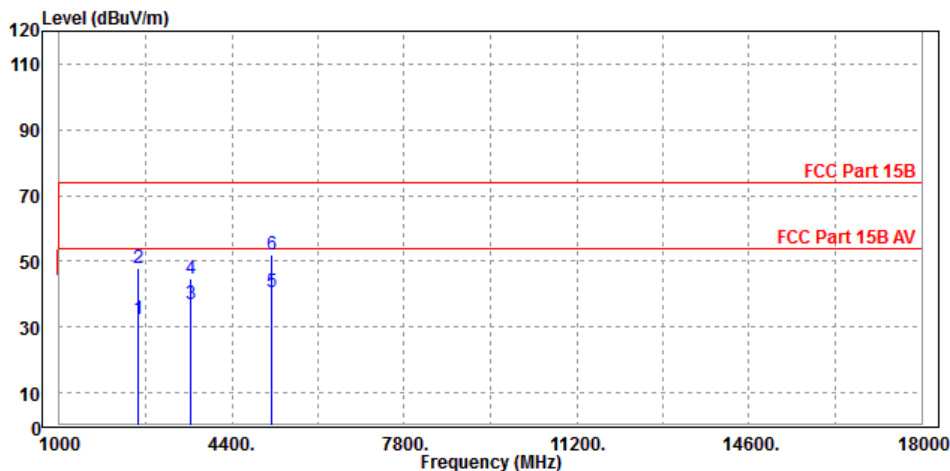


TEST VOLTAGE	DC 5V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

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
2541	32.18	40.99	54	-21.82	32.52	5.04	46.37	100	126	Average
2541	47.99	56.8	74	-26.01	32.52	5.04	46.37	100	126	Peak
3586	36.85	43.51	54	-17.15	33.9	5.82	46.38	100	176	Average
3586	44.57	51.23	74	-29.43	33.9	5.82	46.38	100	176	Peak
5186	40.46	43.06	54	-13.54	36.31	7.43	46.34	100	200	Average
5186	52.18	54.78	74	-21.82	36.31	7.43	46.34	100	200	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.

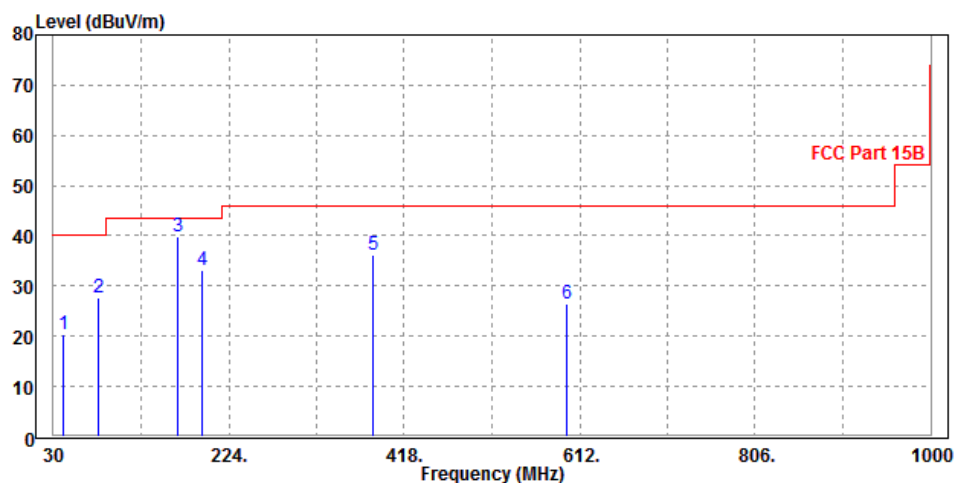


Mode 17

TEST VOLTAGE	Data trasmission 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	Rose Ma		

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	20.35	44.19	40	-19.65	12.7	0.93	37.47	100	218	QP
80.44	27.78	55.61	40	-12.22	8.12	1.2	37.15	100	280	QP
167.74	39.94	64.56	43.5	-3.56	10.42	1.68	36.72	100	264	QP
193.93	33.08	57.26	43.5	-10.42	10.65	1.76	36.59	100	164	QP
383.08	36.21	53.66	46	-9.79	16.68	2.55	36.68	100	207	QP
598.42	26.33	40.35	46	-19.67	20.07	3.16	37.25	100	130	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.

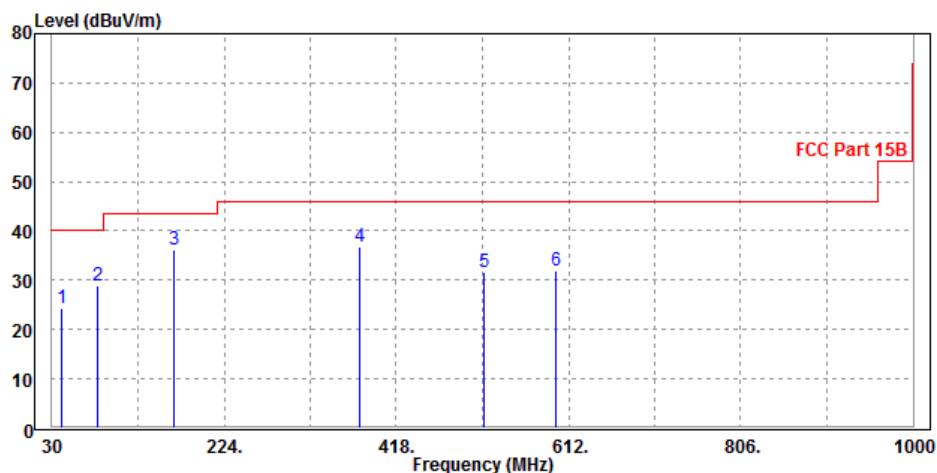


TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Rose Ma		

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	24.48	48.14	40	-15.52	12.88	0.93	37.47	100	137	QP
81.41	28.94	56.52	40	-11.06	8.34	1.21	37.13	100	248	QP
167.74	36.33	60.97	43.5	-7.17	10.4	1.68	36.72	100	216	QP
377.26	36.8	54.34	46	-9.2	16.6	2.53	36.67	100	254	QP
515.97	31.53	46.6	46	-14.47	18.92	3.02	37.01	100	285	QP
597.45	32.02	46.04	46	-13.98	20.06	3.16	37.24	100	128	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.

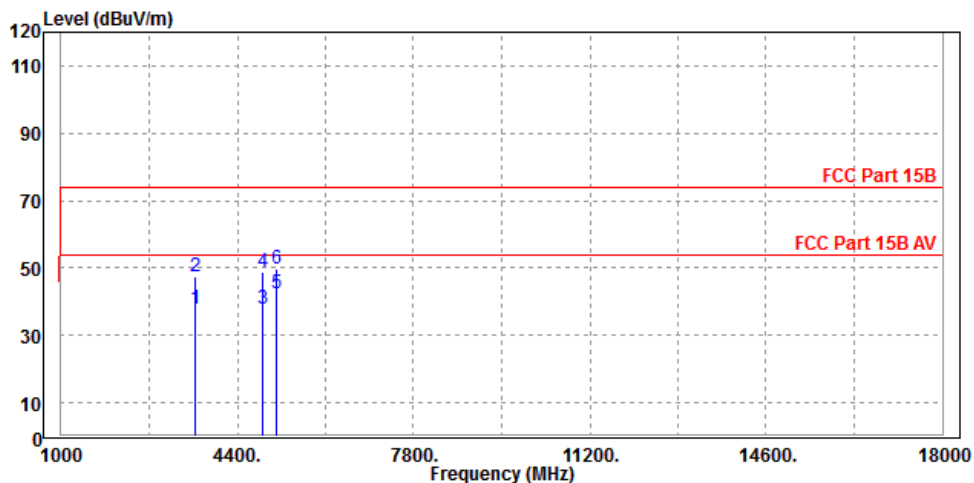


TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	FREQUENCY RANGE	1-18 GHz
ENVIRONMENTAL CONDITIONS	23deg. C, 70 %RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Peak/Average, 1 MHz
TESTED BY	Rose Ma		

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
3586	37.76	42.99	54	-16.24	35.33	5.82	46.38	100	247	Average
3586	47.44	52.67	74	-26.56	35.33	5.82	46.38	100	247	Peak
4879	37.83	41.57	54	-16.17	35.7	6.96	46.4	100	98	Average
4879	48.83	52.57	74	-25.17	35.7	6.96	46.4	100	98	Peak
5146	42.27	45.26	54	-11.73	35.95	7.42	46.36	100	154	Average
5146	49.75	52.74	74	-24.25	35.95	7.42	46.36	100	154	Peak

REMARKS:

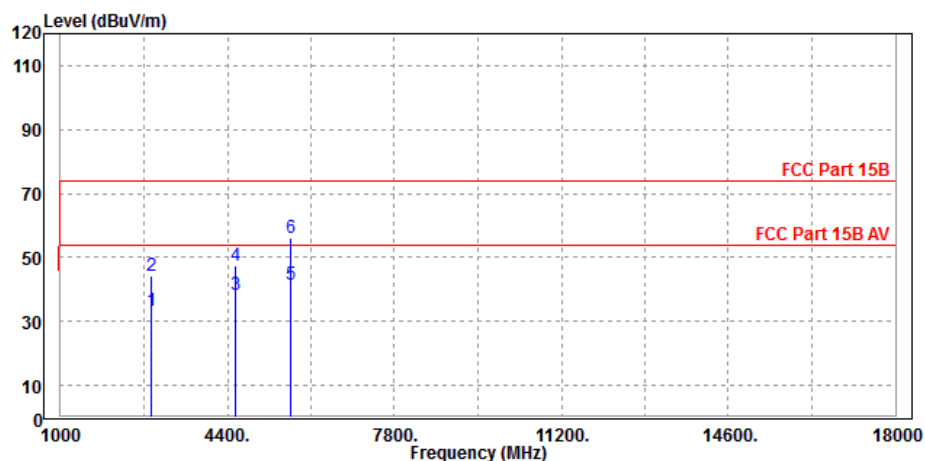
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 1GHz to 18GHz.
4. Only emissions significantly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



TEST VOLTAGE	Data trasmission 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	Rose Ma		

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
2862	33.28	41.55	54	-20.72	32.72	5.38	46.37	100	208	Average
2862	44.03	52.3	74	-29.97	32.72	5.38	46.37	100	208	Peak
4562	38.47	43.08	54	-15.53	35.94	5.84	46.39	100	189	Average
4562	47.42	52.03	74	-26.58	35.94	5.84	46.39	100	189	Peak
5678	41.65	43.56	54	-12.35	36.61	7.68	46.2	100	287	Average
5678	55.93	57.84	74	-18.07	36.61	7.68	46.2	100	287	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.: FV190325W006

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---