ACCREDITED
Certificate # 3939.01

EMC TEST REPORT

Applicant:	TCL Communication Ltd.
Address:	7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052

Manufacturer or Supplier:	TCL Communication Ltd.
Address:	7/F, Block F4, TCL Communication Technology Building, TCL International E City, Zhong Shan Yuan Road, Nanshan District, Shenzhen, Guangdong, P.R. China 518052
Product:	LTE/UMTS/GSM Smartphone
Brand Name:	Alcatel
Model Name:	5024A
FCC ID:	2ACCJB107
Date of tests:	Jan. 19, 2019 ~ Feb. 17, 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 Sam Tung Manager / Mobile Department
Alex Date: Feb. 18, 2019	 Date: Feb. 18, 2019

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

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV190118W006	Original release	Feb. 18, 2019

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.dg@cn.bureauveritas.com

1 GENERAL INFORMATION

1.1 GENERAL DESCRIPTION OF EUT

PRODUCT	LTE/UMTS/GSM Smartphone	
BRAND NAME	Alcatel	
MODEL NAME	5024A	
NOMINAL VOLTAGE	5.0Vdc (adapter or host equipment) 3.85Vdc (Li-ion, battery)	
MODULATION TYPE	**WLAN**	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
	BT_LE	BT-LE(GFSK) for DTS
	Bluetooth	GFSK, π/4-DQPSK, 8DPSK, LE
	GPS/GLONASS	C/A code
	FM	FSK
	GSM/GPRS/EDGE	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
	GLONASS	1602MHz
	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) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7) 779.5MHz ~ 784.5MHz (FOR LTE Band13) 1710.7MHz ~ 1779.3MHz (FOR LTE Band66)
HW VERSION	PIO	
SW VERSION	V1.0	
I/O PORTS	Refer to user's manual	

CABLE SUPPLIED	USB cable: non-shielded, detachable, 1.5meter Earphone cable: non-shielded, detachable, 1.4meter
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. 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:

ACCESSORIES	BRAND	MODEL	Manufacturer	SPECIFICATION
AC Adapter 1	alcatel	UC11US	PUAN	I/P:100-240Vac, 0.2A O/P: 5Vdc, 1A
AC Adapter 2	alcatel	UC11US	chenyang	I/P:100-240Vac, 0.2A O/P: 5Vdc, 1A
Battery 1	alcatel	TLp030K7	VEKEN	Rating: 3.85Vdc, 3000mAh
Battery 2	alcatel	TLp030KA	Tianmao	Rating: 3.85Vdc, 3000mAh
USB Cable 1	alcatel	-	JUWEI	1.5m shielded cable w/o core
USB Cable 2	alcatel	-	shenghua	1.5m shielded cable w/o core
Earphone	alcatel	-	JUWEI	1.4m 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 -9.33dB at 0.182000MHz.
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -4.74dB at 480.08MHz
	Radiated Emission Test (Above 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -10.18dB at 3120MHz

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	Adapter 1+ USB cable 1+ Battery 1+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
2	Adapter 2+ USB cable 1+ Battery 1+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ Glonass Rx
3	Worst case of(1-2)+ USB cable 2
4	Worst case of(1-3)+ Battery 2
5	Worst case of(1-4)+ GSM 850 Idle
6	Worst case of(1-4)+ GSM 1900 Idle
7	Worst case of(1-4)+ WCDMAB2 Idle
8	Worst case of(1-4)+ WCDMA B4 Idle
9	Worst case of(1-4)+ WCDMA B5 Idle
10	Worst case of(1-4)+ LTE B2 Idle
11	Worst case of(1-4)+ LTE B4 Idle
12	Worst case of(1-4)+ LTE B5 Idle
13	Worst case of(1-4)+ LTE B7 Idle
14	Worst case of(1-4)+ LTE B13 Idle
15	Worst case of(1-4)+ LTE B66 Idle
16	Worst case of(1-4)+ FM RX
17	Worst case of(1-4)+ Camera On
18	Worst case of(1-4)+ MPG4
19	USB link+ USB cable 1+ Data Trasimission(PC to EUT)+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ Battery 1
20	USB link+ USB cable 2+ Data Trasimission(PC to SD)+ Earphone+ BT Idle+ WIFI Idle(2.4G)
21	Worst case of(18-19)+ Battery 2
Conducted emission test	
1	Adapter 1+ USB cable 1+ Battery 1+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ GPS Rx
2	Adapter 2+ USB cable 1+ Battery 1+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ Glonass Rx
3	Worst case of(1-2)+ USB cable 2
4	Worst case of(1-3)+ Battery 2
5	Worst case of(1-4)+ GSM 850 Idle
6	Worst case of(1-4)+ GSM 1900 Idle
7	Worst case of(1-4)+ WCDMAB2 Idle
8	Worst case of(1-4)+ WCDMA B4 Idle
9	Worst case of(1-4)+ WCDMA B5 Idle
10	Worst case of(1-4)+ LTE B2 Idle
11	Worst case of(1-4)+ LTE B4 Idle

12	Worst case of(1-4)+ LTE B5 Idle
13	Worst case of(1-4)+ LTE B7 Idle
14	Worst case of(1-4)+ LTE B13 Idle
15	Worst case of(1-4)+ LTE B66 Idle
16	Worst case of(1-4)+ FM RX
17	Worst case of(1-4)+ Camera On
18	Worst case of(1-4)+ MPG4
19	USB link+ USB cable 1+ Data Trasimission(PC to EUT)+ Earphone+ BT Idle+ WIFI Idle(2.4G)+ Battery 1
20	USB link+ USB cable 2+ Data Trasimission(PC to SD)+ Earphone+ BT Idle+ WIFI Idle(2.4G)
21	Worst case of(18-19)+ Battery 2

NOTE:

1. For conducted emission test, test mode 17, 20 was the worst case and only this mode was presented in this report.
2. For radiated emission test, test mode 17, 20 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	Mar. 15,18	Mar. 14,19
EMC32 test software	Rohde&Schwarz	EMC32	NA	NA	NA
LISN network	Rohde&Schwarz	ENV216	101922	Mar. 15,18	Mar. 14,19

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.

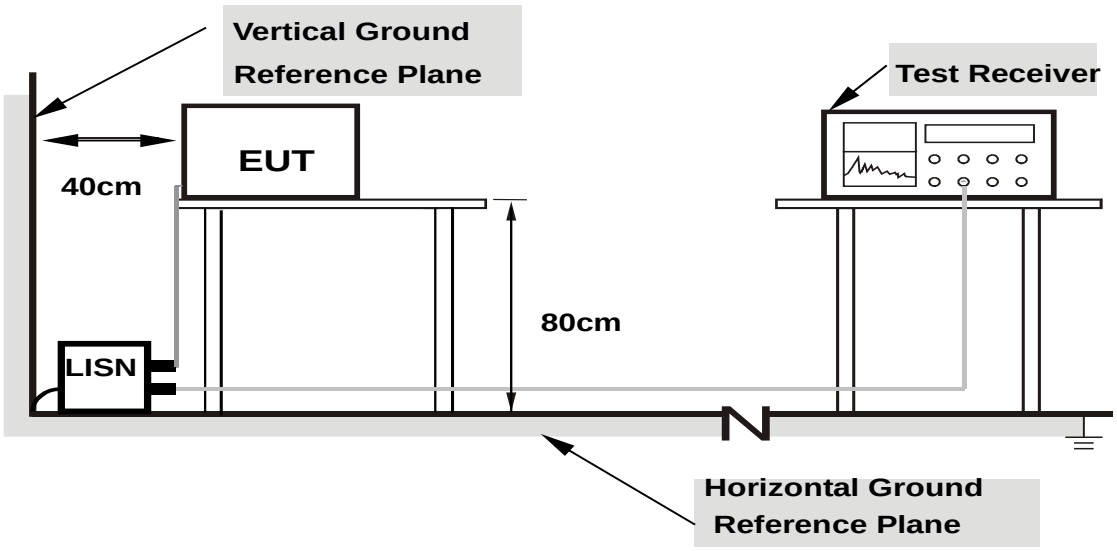
c. The frequency range from 150 kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

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.

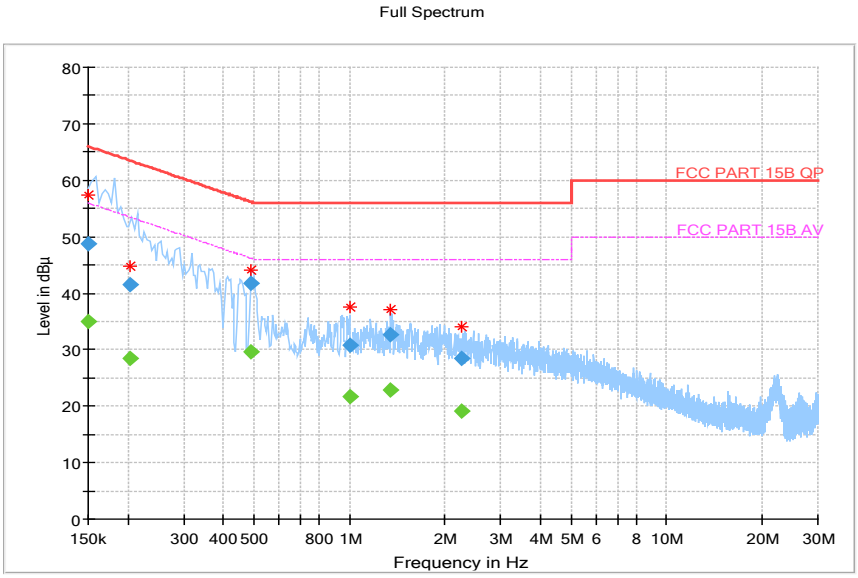
2.1.7 TEST RESULTS

Mode 17

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, 50RH	TESTED BY	Star Le

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	34.94	56.00	-21.06	L1	ON	9.6
0.150000	48.68	---	66.00	-17.32	L1	ON	9.6
0.204000	---	28.50	53.45	-24.95	L1	ON	9.7
0.204000	41.55	---	63.45	-21.90	L1	ON	9.7
0.488000	---	29.65	46.20	-16.55	L1	ON	9.7
0.488000	41.78	---	56.20	-14.42	L1	ON	9.7
1.000000	---	21.79	46.00	-24.21	L1	ON	9.7
1.000000	30.82	---	56.00	-25.18	L1	ON	9.7
1.344000	---	22.92	46.00	-23.08	L1	ON	9.7
1.344000	32.69	---	56.00	-23.31	L1	ON	9.7
2.252000	---	19.16	46.00	-26.84	L1	ON	9.7
2.252000	28.51	---	56.00	-27.49	L1	ON	9.7

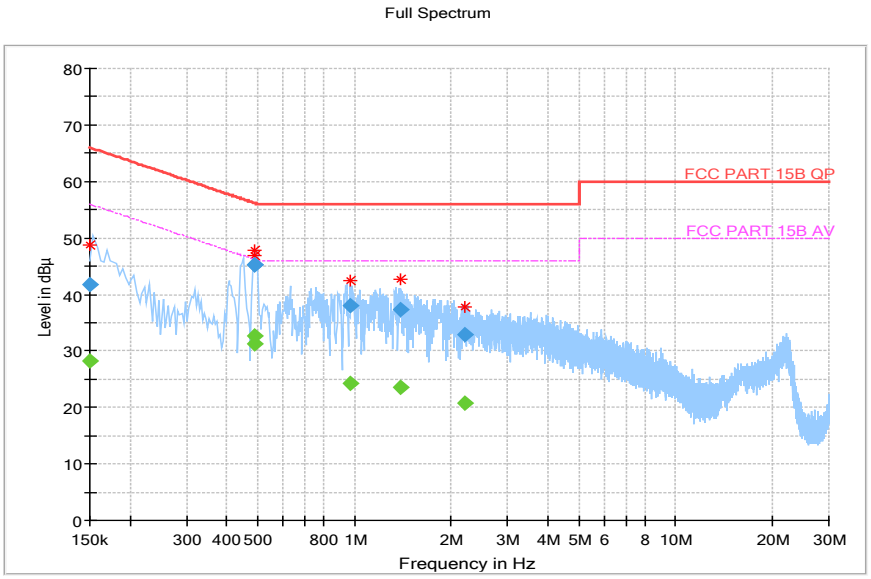
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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	25deg. C, 50RH	**TESTED BY**	Star Le

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	28.33	56.00	-27.67	N	ON	9.8
0.150000	41.73	---	66.00	-24.27	N	ON	9.8
0.486000	---	31.36	46.24	-14.88	N	ON	10.1
0.486000	**45.17**	**---**	**56.24**	**-11.06**	**N**	**ON**	**10.1**
0.488000	---	32.57	46.20	-13.63	N	ON	10.1
0.488000	45.14	---	56.20	-11.06	N	ON	10.1
0.976000	---	24.15	46.00	-21.85	N	ON	9.9
0.976000	38.10	---	56.00	-17.90	N	ON	9.9
1.390000	---	23.61	46.00	-22.39	N	ON	9.9
1.390000	37.35	---	56.00	-18.65	N	ON	9.9
2.196000	---	20.75	46.00	-25.25	N	ON	9.8
2.196000	32.84	---	56.00	-23.16	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.

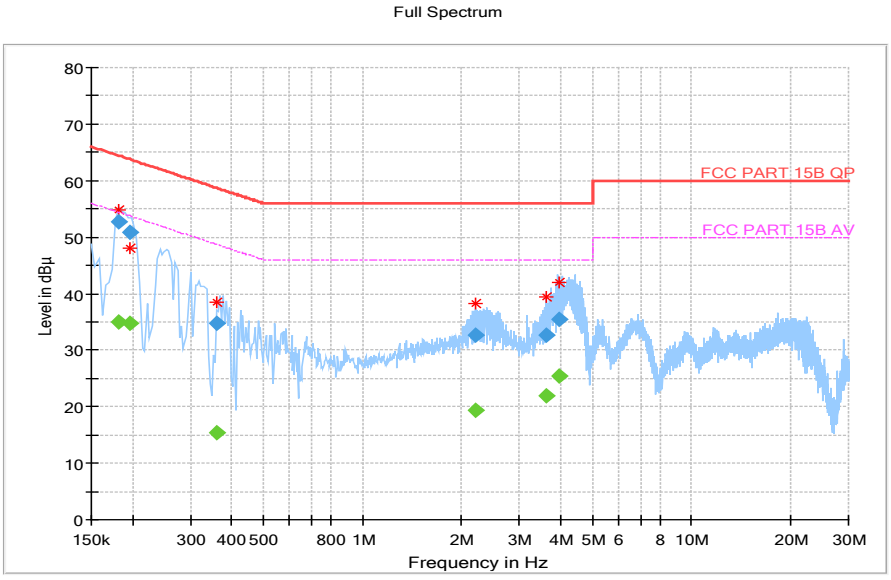


Mode 20

TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 50RH	TESTED BY	Star Le

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.182000	---	34.97	54.39	-19.42	L1	ON	9.7
0.182000	52.76	---	64.39	-11.64	L1	ON	9.7
0.196000	---	34.79	53.78	-18.99	L1	ON	9.7
0.196000	50.80	---	63.78	-12.98	L1	ON	9.7
0.360000	---	15.28	48.73	-33.45	L1	ON	9.7
0.360000	34.84	---	58.73	-23.89	L1	ON	9.7
2.208000	---	19.25	46.00	-26.75	L1	ON	9.7
2.208000	32.54	---	56.00	-23.46	L1	ON	9.7
3.628000	---	21.95	46.00	-24.05	L1	ON	9.7
3.628000	32.66	---	56.00	-23.34	L1	ON	9.7
3.964000	---	25.42	46.00	-20.58	L1	ON	9.7
3.964000	35.55	---	56.00	-20.45	L1	ON	9.7

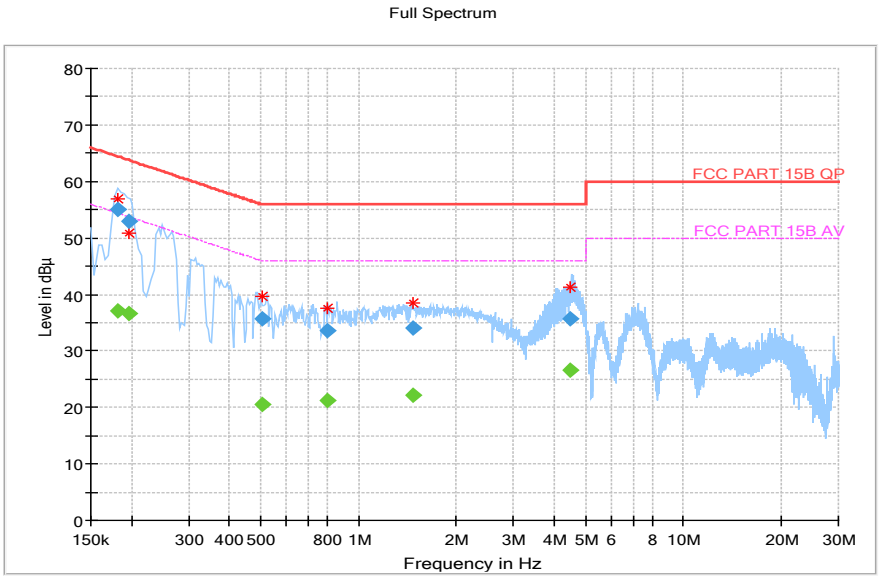
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



TEST VOLTAGE	Data trasmission Input 120 Vac, 60 Hz	**Detector Function & Resolution Bandwidth**	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	25deg. C, 50RH	**TESTED BY**	Star Le

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.182000	---	37.06	54.39	-17.33	N	ON	9.7
0.182000	**55.06**	**---**	**64.39**	**-9.33**	**N**	**ON**	**9.7**
0.196000	---	36.71	53.78	-17.07	N	ON	9.7
0.196000	53.03	---	63.78	-10.75	N	ON	9.7
0.504000	---	20.59	46.00	-25.41	N	ON	9.7
0.504000	35.77	---	56.00	-20.23	N	ON	9.7
0.800000	---	21.23	46.00	-24.77	N	ON	9.7
0.800000	33.63	---	56.00	-22.37	N	ON	9.7
1.464000	---	22.05	46.00	-23.95	N	ON	9.7
1.464000	33.97	---	56.00	-22.03	N	ON	9.7
4.480000	---	26.63	46.00	-19.37	N	ON	9.7
4.480000	35.66	---	56.00	-20.34	N	ON	9.7

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**	**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 Peak: 69.5	Avg: 43.5 Peak: 63.5	Not defined	Not defined
3000+			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	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.
3m Semi-anechoic Chamber	ETS-LINDGREN	9m*6m*6m	Euroshieldpn-CT0001143-1216	Apr. 21,18	Apr. 20,19
Bilog Antenna	ETS-LINDGREN	3143B	00161965	Mar. 15,18	Mar. 14,19
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 16,18	Mar. 15,19
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	Apr. 21,18	Apr. 20,19
Horn Antenna	ETS-LINDGREN	3117	00168728	Mar. 15,18	Mar. 14,19
MXE EMI Receiver	KEYSIGHT	N9038A-544	MY54450026	Mar. 16,18	Mar. 15,19
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. 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:

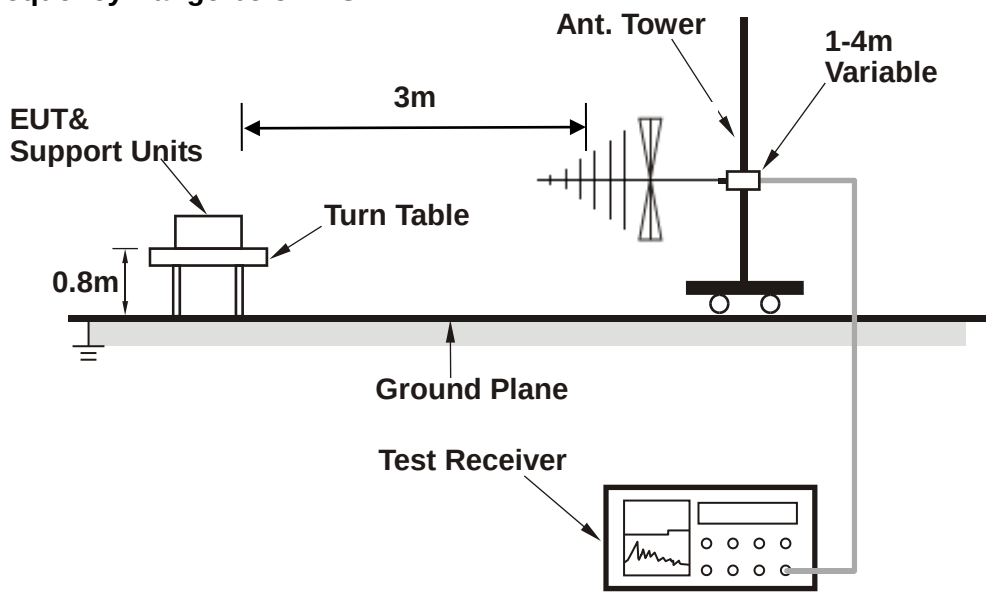
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test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

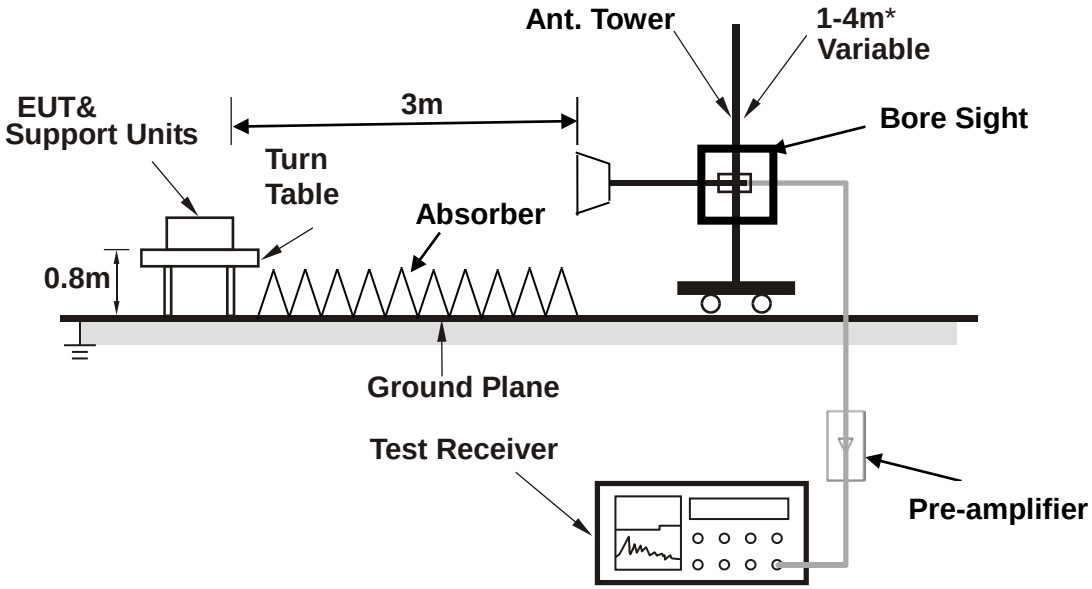
No deviation.

2.2.5. TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



***** : 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.

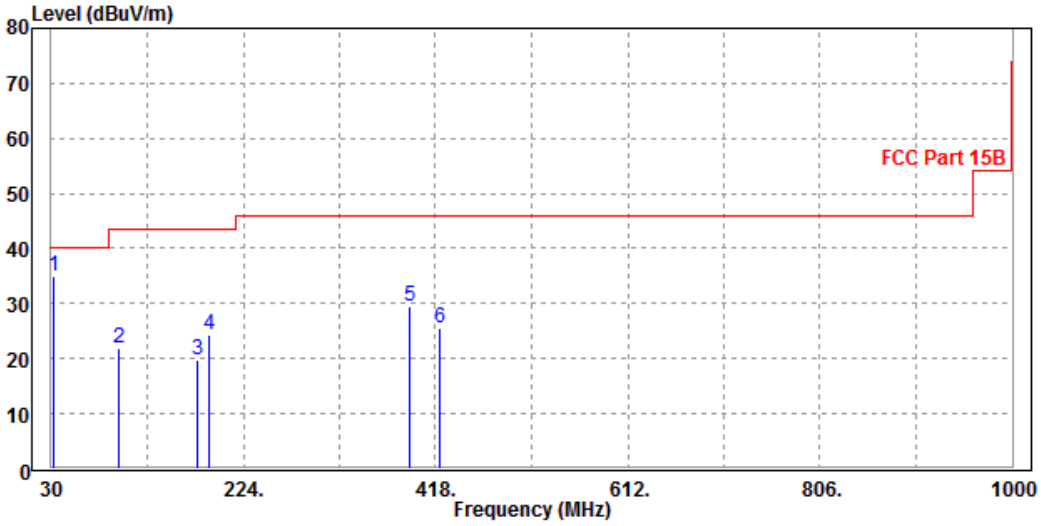
2.2.7. TEST RESULTS

Mode 17

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
31.94	**34.95**	**55.78**	**40**	**-5.05**	**15.91**	**0.8**	**37.54**	**114**	**274**	**QP**
98.87	22.01	48.59	43.5	-21.49	9.11	1.31	37	117	140	QP
178.41	19.8	44.65	43.5	-23.7	10.14	1.7	36.69	117	300	QP
190.05	24.46	48.97	43.5	-19.04	10.35	1.75	36.61	103	118	QP
391.81	29.5	46.78	46	-16.5	16.83	2.59	36.7	100	189	QP
422.85	25.42	42.18	46	-20.58	17.31	2.7	36.77	100	250	QP

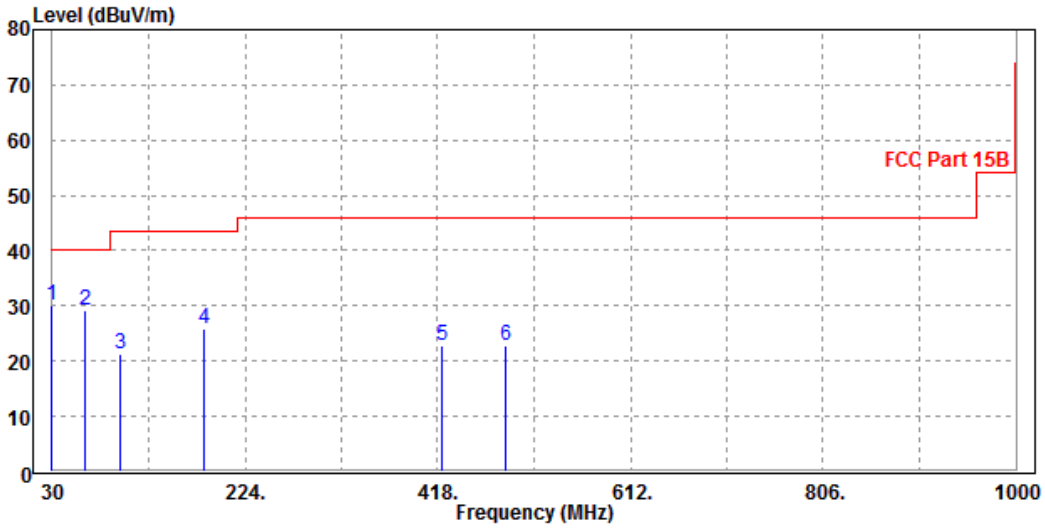
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions 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	30.08	49.87	40	-9.92	17	0.77	37.56	120	150	QP
62.98	29.27	58.42	40	-10.73	7.04	1.11	37.3	113	167	QP
97.9	21.24	47.91	43.5	-22.26	9.03	1.3	37	130	200	QP
183.26	25.77	50.55	43.5	-17.73	10.18	1.71	36.67	115	213	QP
422.85	22.82	39.58	46	-23.18	17.31	2.7	36.77	100	158	QP
486.87	22.7	38.81	46	-23.3	17.88	2.94	36.93	110	147	QP

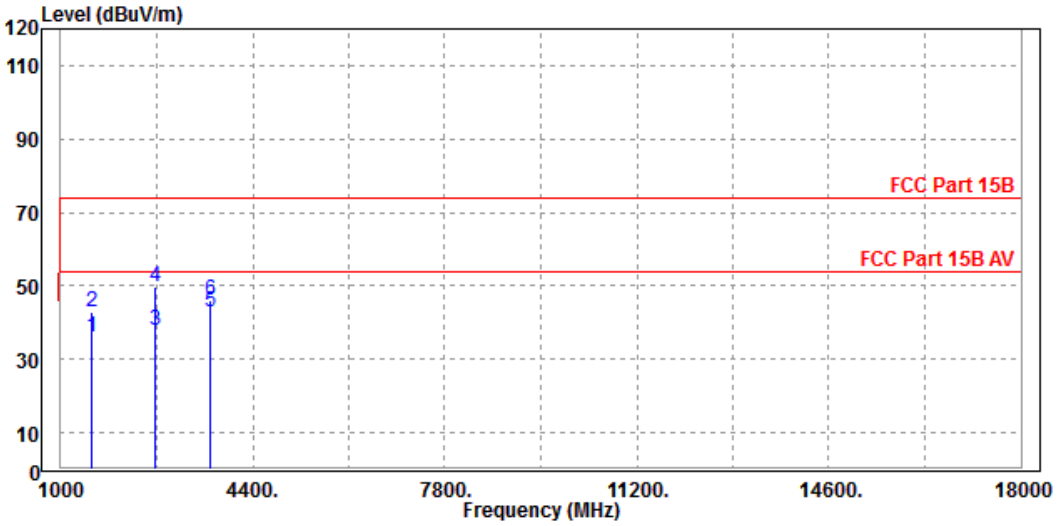
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions 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**
1550	35.83	48.74	54	-18.17	29.02	6.43	48.36	100	149	Average
1550	42.76	55.67	74	-31.24	29.02	6.43	48.36	100	149	Peak
2680	38.01	45.08	54	-15.99	32.58	8.66	48.31	113	300	Average
2680	49.71	56.78	74	-24.29	32.58	8.66	48.31	113	300	Peak
3640	**42.94**	**47.98**	**54**	**-11.06**	**33.22**	**10.19**	**48.45**	**100**	**160**	**Average**
3640	46.18	51.22	74	-27.82	33.22	10.19	48.45	100	160	Peak

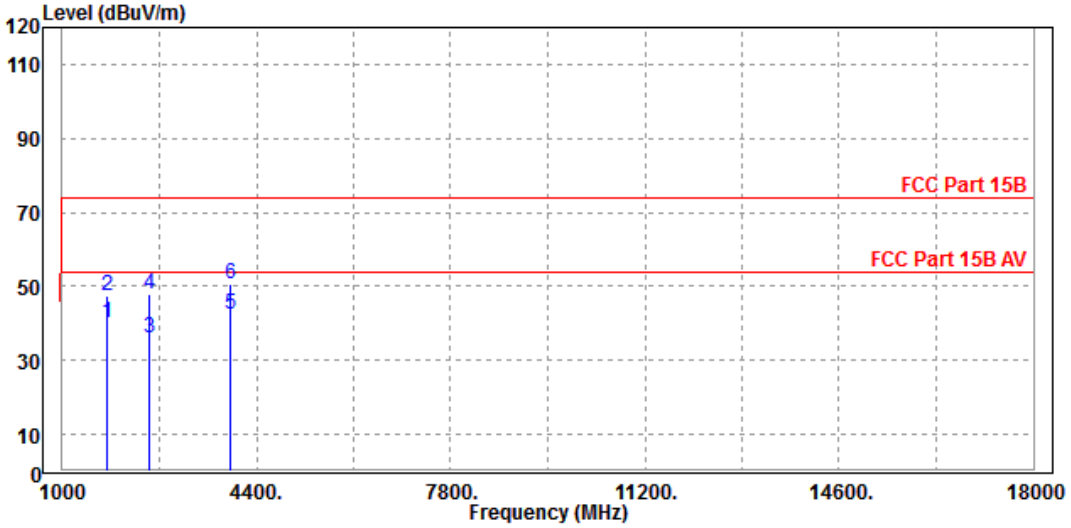
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 1GHz to 18GHz.
4. Only emissions 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**
1780	40.32	51.23	54	-13.68	30.49	6.95	48.35	100	147	Average
1780	47.56	58.47	74	-26.44	30.49	6.95	48.35	100	147	Peak
2520	36.08	43.58	54	-17.92	32.42	8.38	48.3	100	280	Average
2520	47.99	55.49	74	-26.01	32.42	8.38	48.3	100	280	Peak
3950	42.66	46.77	54	-11.34	33.72	10.72	48.55	100	300	Average
3950	50.87	54.98	74	-23.13	33.72	10.72	48.55	100	300	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.

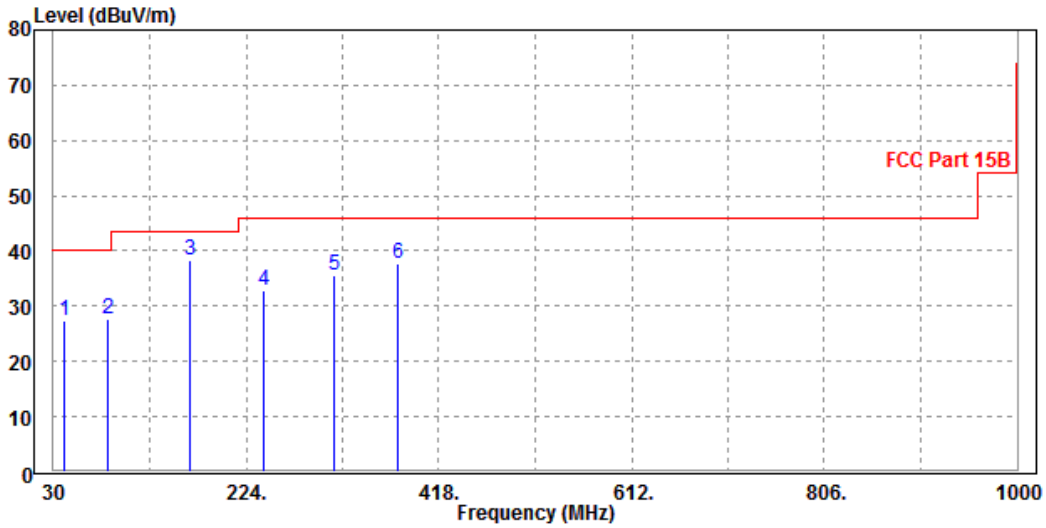


Mode 20

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	27.23	53.35	40	-12.77	10.42	0.93	37.47	200	149	QP
84.32	27.74	55.44	40	-12.26	8.17	1.23	37.1	150	210	QP
167.74	38.41	63.04	43.5	-5.09	10.41	1.68	36.72	200	126	QP
241.46	32.97	55.15	46	-13.03	12.34	2	36.52	108	174	QP
313.24	35.44	55.47	46	-10.56	14.24	2.26	36.53	100	176	QP
376.29	37.84	55.67	46	-8.16	16.32	2.52	36.67	200	140	QP

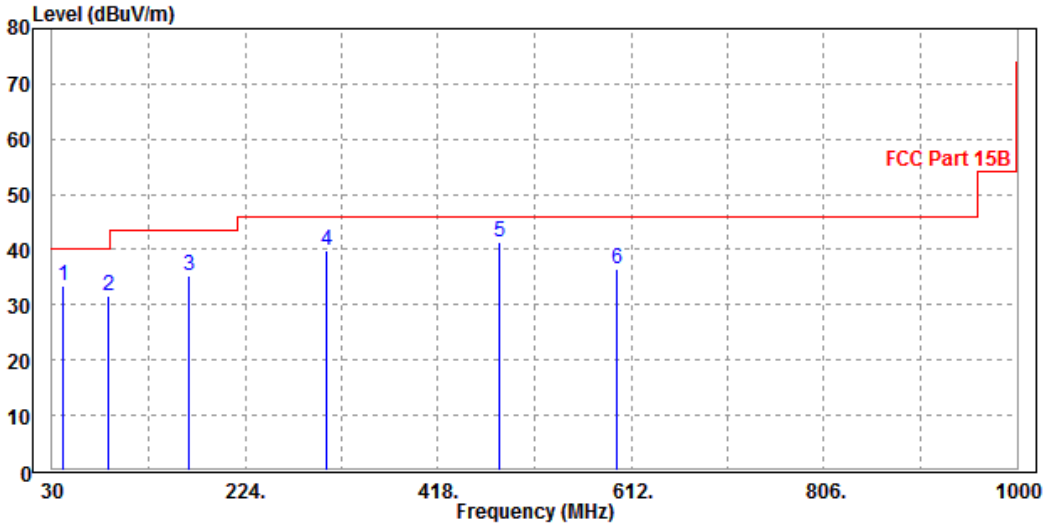
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions 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**
41.64	33.42	60.51	40	-6.58	9.43	0.95	37.47	100	120	QP
87.23	31.64	59.16	40	-8.36	8.29	1.26	37.07	100	215	QP
167.74	35.23	59.86	43.5	-8.27	10.41	1.68	36.72	100	180	QP
305.48	39.92	60.22	46	-6.08	13.98	2.23	36.51	100	148	QP
480.08	**41.26**	**57.43**	**46**	**-4.74**	**17.82**	**2.92**	**36.91**	**100**	**207**	**QP**
598.42	36.37	50.49	46	-9.63	19.97	3.16	37.25	100	156	QP

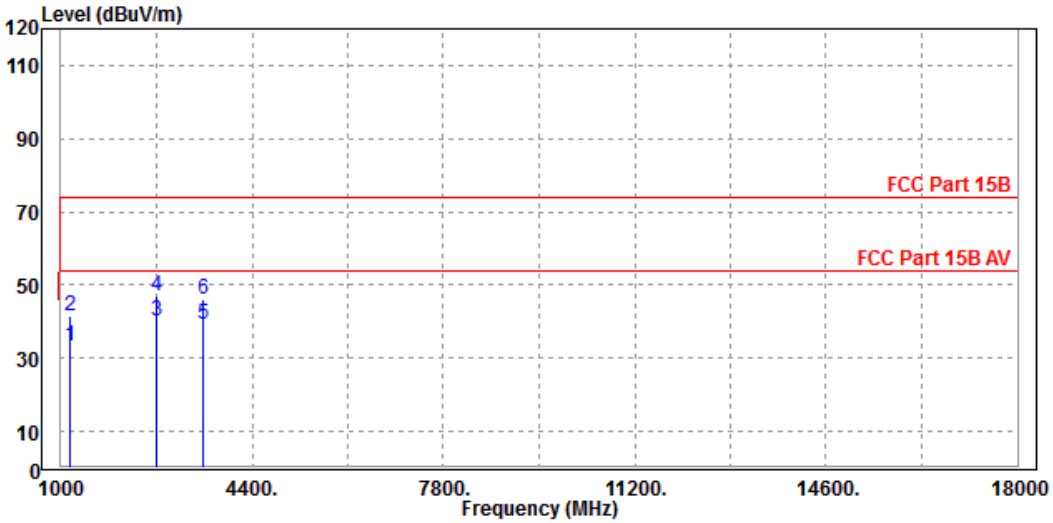
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 30MHz to 1000MHz.
4. Only emissions 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**
1168	33.36	47.15	54	-20.64	29.03	5.54	48.36	100	79	Average
1168	41.53	55.32	74	-32.47	29.03	5.54	48.36	100	79	Peak
2687	40.07	47.12	54	-13.93	32.59	8.67	48.31	100	290	Average
2687	46.96	54.01	74	-27.04	32.59	8.67	48.31	100	290	Peak
3540	39.22	44.56	54	-14.78	33.06	10.02	48.42	200	145	Average
3540	46.15	51.49	74	-27.85	33.06	10.02	48.42	200	145	Peak

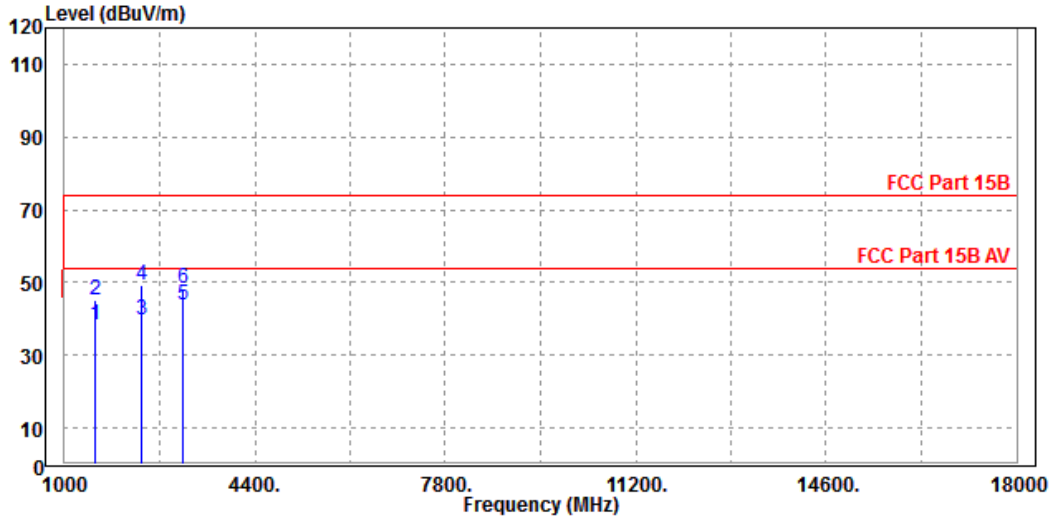
REMARKS:
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
2. Negative sign (-) in the margin column signify levels below the limit.
3. Frequency range scanned: 1GHz to 18GHz.
4. Only emissions 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
1560	38.41	51.23	54	-15.59	29.08	6.46	48.36	100	123	Average
1560	45.25	58.07	74	-28.75	29.08	6.46	48.36	100	123	Peak
2362	39.61	47.56	54	-14.39	32.26	8.1	48.31	100	168	Average
2362	49.07	57.02	74	-24.93	32.26	8.1	48.31	100	168	Peak
3120	**43.82**	**49.86**	**54**	**-10.18**	**32.92**	**9.39**	**48.35**	**100**	**179**	**Average**
3120	48.17	54.21	74	-25.83	32.92	9.39	48.35	100	179	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.



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---