

## EMC TEST REPORT



Applicant:	TCL Communication Ltd.
Address:	5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park, Pudong Area, Shanghai, 201203, P.R.China

Manufacturer or Supplier	TCL Communication Ltd.
Address	5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park, Pudong Area, Shanghai, 201203, P.R.China
Product	Tablet PC
Brand Name	alcatel
Model Name	9024O
FCC ID	2ACCJBT02
Date of tests	Apr. 29, 2017 ~ May 26, 2017

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 Harry Li Engineer / Mobile Department	Approved by Sam Tung Manager / Mobile Department
	
Date: May 27, 2017	Date: May 27, 2017

This report is 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. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, 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. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification

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Test Report No.: FV170428W003

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FV170428W003	Original release	May 27, 2017



# 1 GENERAL INFORMATION

## 1.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Tablet PC	
<b>BRAND NAME</b>	alcatel	
<b>MODEL NAME</b>	9024O	
<b>NOMINAL VOLTAGE</b>	5.0Vdc (adapter or host equipment) 3.85Vdc (Li-polymer)	
<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</b>	C/A code
	<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) 2422 ~ 2452MHz for 11n(HT40) 5150 ~ 5250MHz, 5260 ~ 5320MHz, 5745 ~ 5825MHz for 11a/n(HT20)/n(HT40)
	<b>Bluetooth/BT_LE</b>	2402MHz ~ 2480MHz
	<b>GPS</b>	1575.42MHz
	<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) 1712.4 MHz ~ 1752.6 MHz (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) 824MHz ~ 849MHz (FOR LTE Band5) 2502.5MHz ~ 2567.5MHz (FOR LTE Band7) 699.7MHz ~ 715.3MHz (FOR LTE Band12)
<b>HW VERSION</b>	05	
<b>SW VERSION</b>	MAB-UDB0	



<b>I/O PORTS</b>	Refer to user's manual
<b>CABLE</b>	USB cable: non-shielded, detachable, 0.8m
<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. The EUT was powered by the following adapter:

<b>ADAPTER</b>	
<b>BRAND:</b>	alcatel
<b>MODEL:</b>	UC13US
<b>INPUT:</b>	AC 100-240V, 400mA
<b>OUTPUT:</b>	DC 5V, 2000mA

3. The EUT matched the following USB cable:

<b>USB CABLE</b>	
<b>BRAND:</b>	N/A
<b>MODEL:</b>	N/A
<b>SIGNAL LINE:</b>	0.8 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 -18.10dB at 9.916000MHz.
	Radiated Emission Test (30MHz ~ 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -3.58dB at 52.31MHz
	Radiated Emission Test (Above 1GHz)	PASS	Meets Class B Limit Minimum passing margin is -13.75dB at 3605MHz

## 1.3 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	150kHz ~ 30MHz	+/-2.70dB
Radiated emissions	30MHz ~ 1GHz	+/-4.06dB
	1GHz ~ 18GHz	+/-4.58dB



## 1.4 DESCRIPTION OF TEST MODES

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

**NOTE:**

- For conducted emission test, test mode 3 was the worst case and only this mode was presented in this report.
- For radiated emission test, test mode 10 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
3	Printer	HP	hp LaserJet 1300	CNSJF75989	N/A
4	Mouse	DELL	M056UOA	01688082	N/A
5	Earphone	N/A	N/A	N/A	N/A

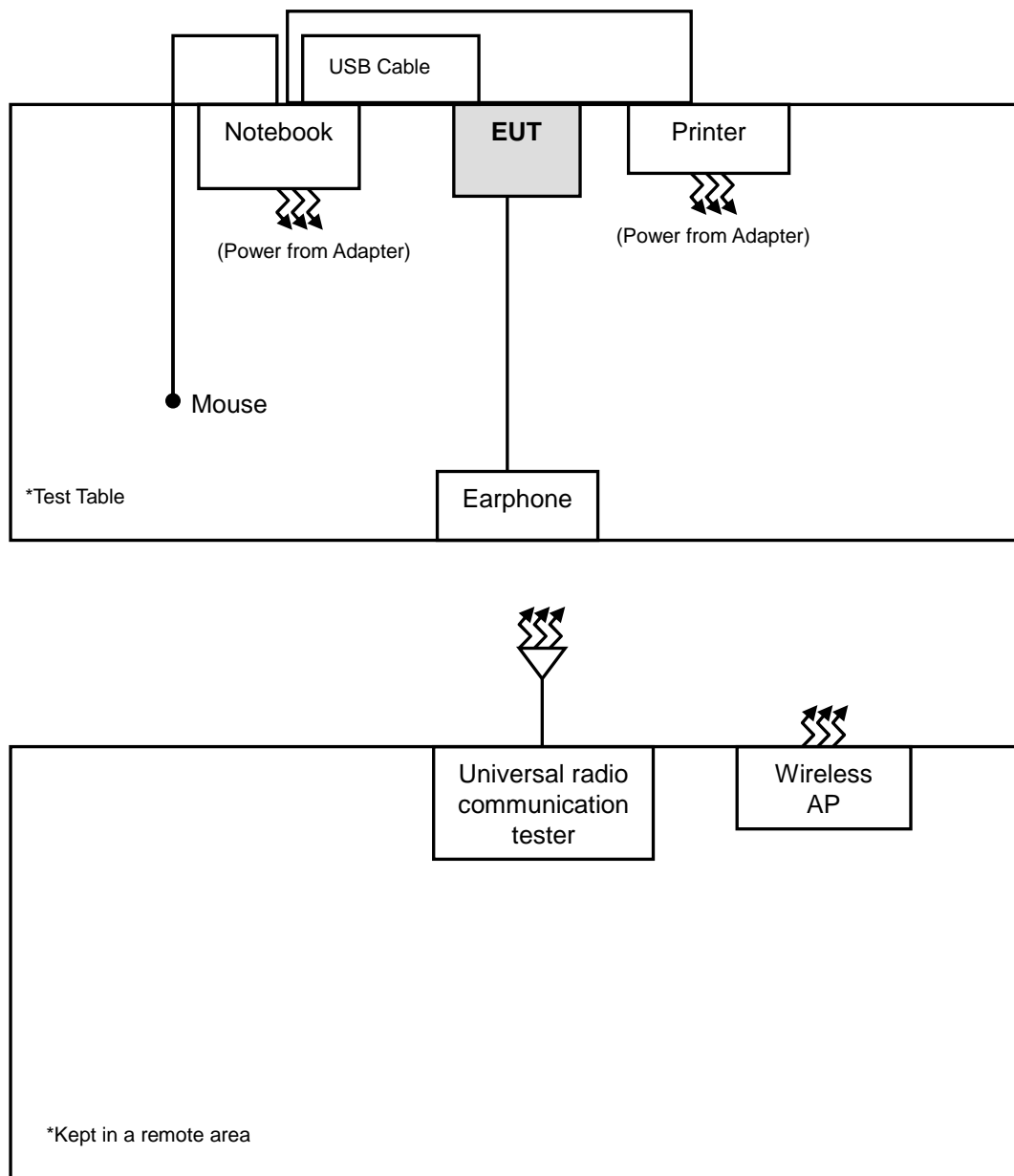
NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	DC Line: Unshielded, Undetachable, 2.0m
3	USB Line: Shielded, Detachable 1.5m;
4	USB Line: Unshielded, Undetachable 1.8m;
5	N/A



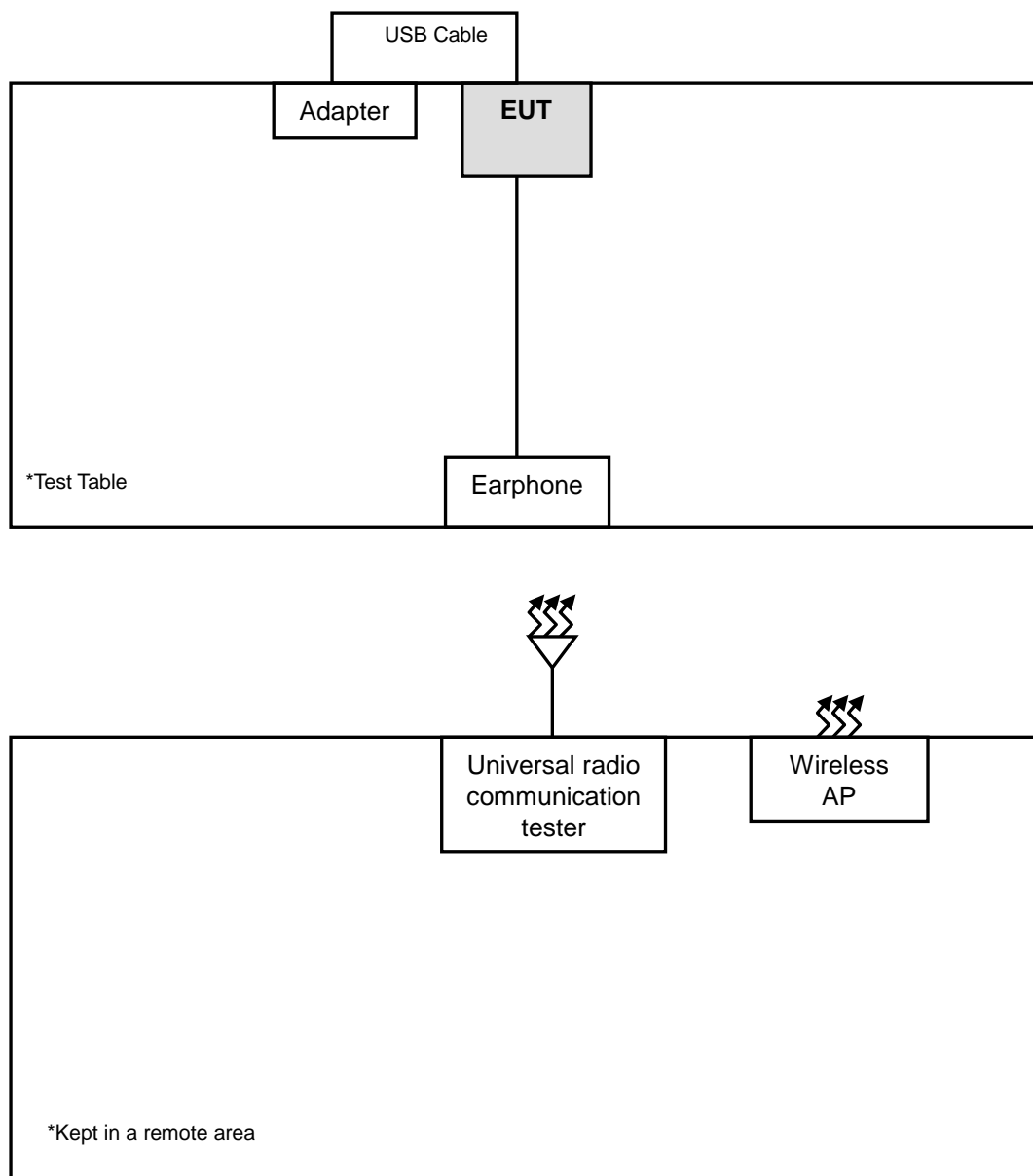


## 1.6 CONFIGURATION OF SYSTEM UNDER TEST

### 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 (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	ESR7	101494	Apr. 01,17	Mar. 31,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 03,17	Mar. 02,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 01,17	Mar. 31,18
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Nov. 25,16	Nov. 24,17
Test software	ADT	ADT_Cond_V7.3.7	N/A	N/A	N/A

**NOTE:** 1. 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. The test was performed in Dongguan Shielded Room 553.

3. The FCC Site Registration No. is 502831.



### 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.

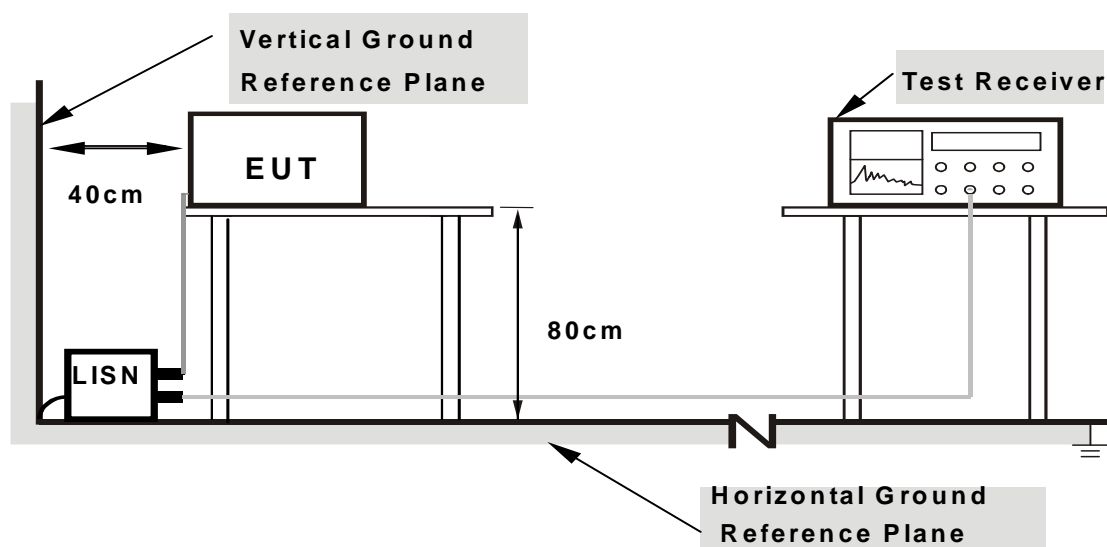
**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

### 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.



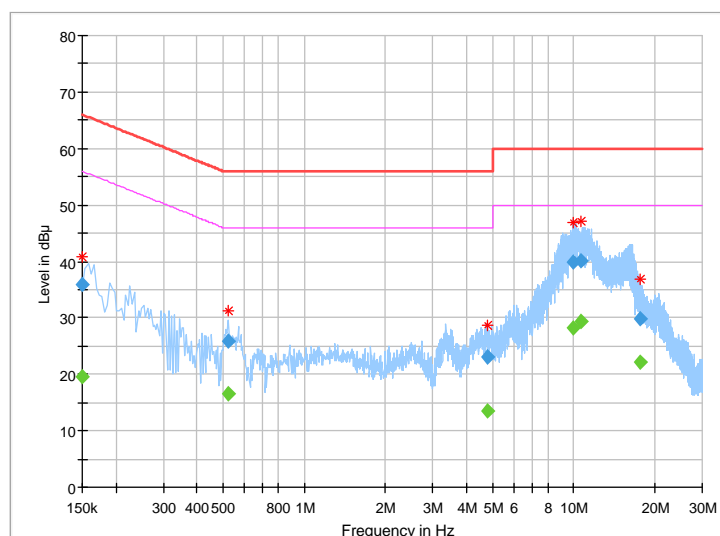
## 2.1.7 TEST RESULTS

<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>	24deg. C, 55RH	<b>TESTED BY</b>	Simon Yang

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	CAverage (dB $\mu$ V)	Limit (dB $\mu$ V)	Margin (dB)	Line	Filter	Corr. (dB)
0.150000	---	19.64	56.00	-36.36	L1	ON	9.6
0.150000	35.99	---	66.00	-30.01	L1	ON	9.6
0.524000	---	16.49	46.00	-29.51	L1	ON	9.7
0.524000	25.87	---	56.00	-30.13	L1	ON	9.7
4.776000	---	13.56	46.00	-32.44	L1	ON	9.7
4.776000	23.05	---	56.00	-32.95	L1	ON	9.7
9.948000	---	28.16	50.00	-21.84	L1	ON	9.9
9.948000	39.80	---	60.00	-20.20	L1	ON	9.9
10.700000	---	29.30	50.00	-20.70	L1	ON	9.9
10.700000	40.13	---	60.00	-19.87	L1	ON	9.9
17.764000	---	22.10	50.00	-27.90	L1	ON	9.9
17.764000	29.89	---	60.00	-30.11	L1	ON	9.9

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

Full Spectrum

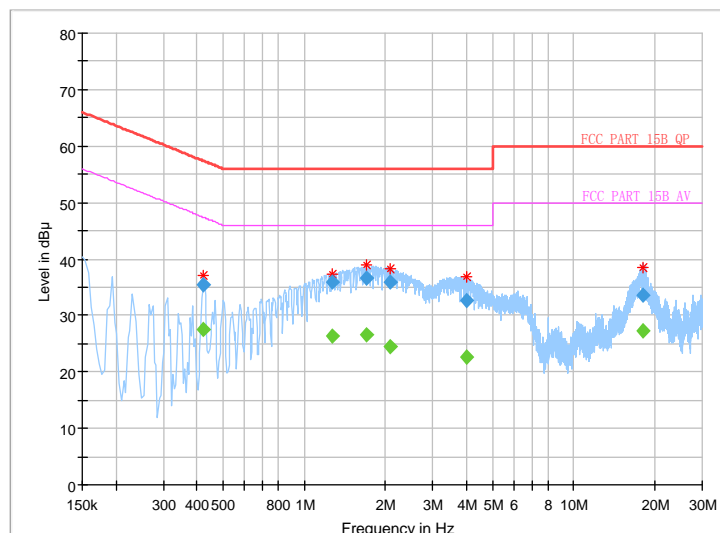


TEST VOLTAGE	DC 5.0V From Adapter Input 120 Vac, 60 Hz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9 kHz
ENVIRONMENTAL CONDITIONS	24deg. C, 55RH	TESTED BY	Simon Yang

Frequency (MHz)	QuasiPeak (dBuV)	CAverage (dBuV)	Limit (dBuV)	Margin (dB)	Line	Filter	Corr. (dB)
0.158000	---	24.54	55.57	-31.03	N	ON	10.1
0.158000	37.16	---	65.57	-28.41	N	ON	10.1
0.228000	---	19.40	52.52	-33.12	N	ON	9.9
0.228000	30.28	---	62.52	-32.24	N	ON	9.9
0.524000	---	26.22	46.00	-19.78	N	ON	10.1
0.524000	33.94	---	56.00	-22.06	N	ON	10.1
4.554000	---	16.87	46.00	-29.13	N	ON	9.8
4.554000	26.53	---	56.00	-29.47	N	ON	9.8
9.916000	---	29.41	50.00	-20.59	N	ON	9.9
<b>9.916000</b>	<b>41.90</b>	---	<b>60.00</b>	<b>-18.10</b>	<b>N</b>	<b>ON</b>	<b>9.9</b>
10.460000	---	29.96	50.00	-20.04	N	ON	9.9
10.460000	40.42	---	60.00	-19.58	N	ON	9.9

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

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				
960-1000	49.5	43.5	47	37
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				
960-1000	60	54	57.5	47.5
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 <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.
EMI Test Receiver	Rohde&Schwarz	ESCI	100962	Feb. 20, 17	Feb. 19, 18
EMI Test Receiver	Rohde&Schwarz	ESCI	101418	Feb. 20, 17	Feb. 19, 18
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 17, 16	Dec. 16, 17
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Nov. 13, 16	Nov. 12, 17
Signal Amplifier	Agilent	8447D	2944A10488	Jun. 25, 16	Jun. 24, 17
Signal Amplifier	Agilent	8447D	2944A11174	Jun. 25, 16	Jun. 24, 17
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Mar. 12, 16	Mar. 11, 18
Test Software	ADT	ADT_Radiated_V8.7.x	N/A	N/A	N/A

### Frequency range above 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Dec. 30, 15	Dec. 29, 17
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	Mar. 12, 17	Mar. 11, 18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 01, 17	Mar. 31, 18
Broadband Preamplifier	SCHWARZBECK	BBV9718	266	Mar. 21, 17	Mar. 20, 18
Pre-Amplifier (100MHz-26.5G Hz)	EMCI	EMC 012645	980077	Apr. 19, 17	Apr. 18, 18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04, 16	Nov. 03, 17

- NOTE:**
1. The calibration interval of the above test instruments is 12 months or 24 months and the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.
  2. The test was performed in 10 Chamber.
  3. The FCC Site Registration No. is 502831.

## 2.2.3 TEST PROCEDURE

### <Frequency Range below 1GHz>

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

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 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 10 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:

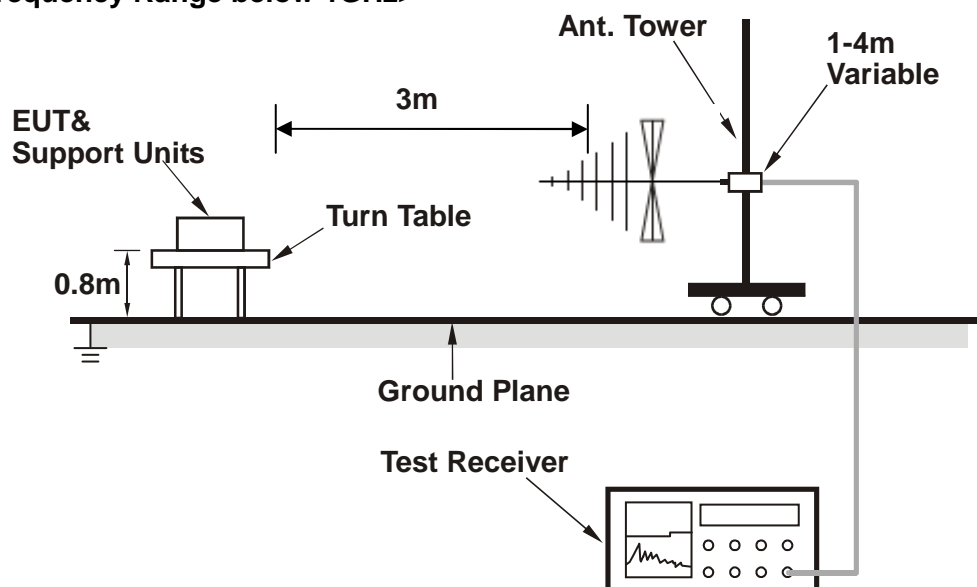
1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test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

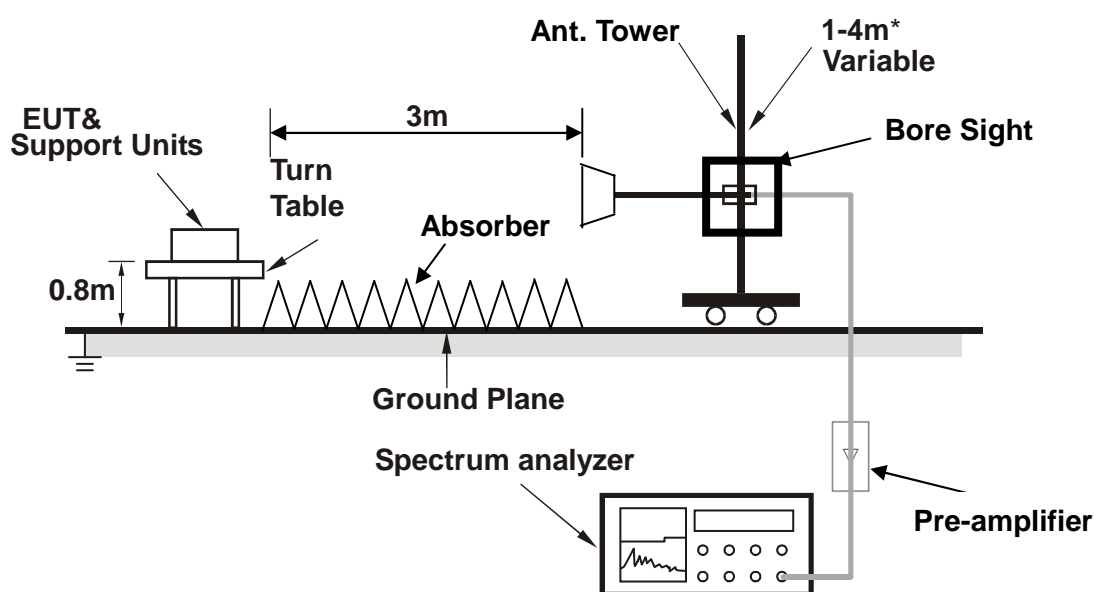
No deviation.

## 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.



**BUREAU  
VERITAS**

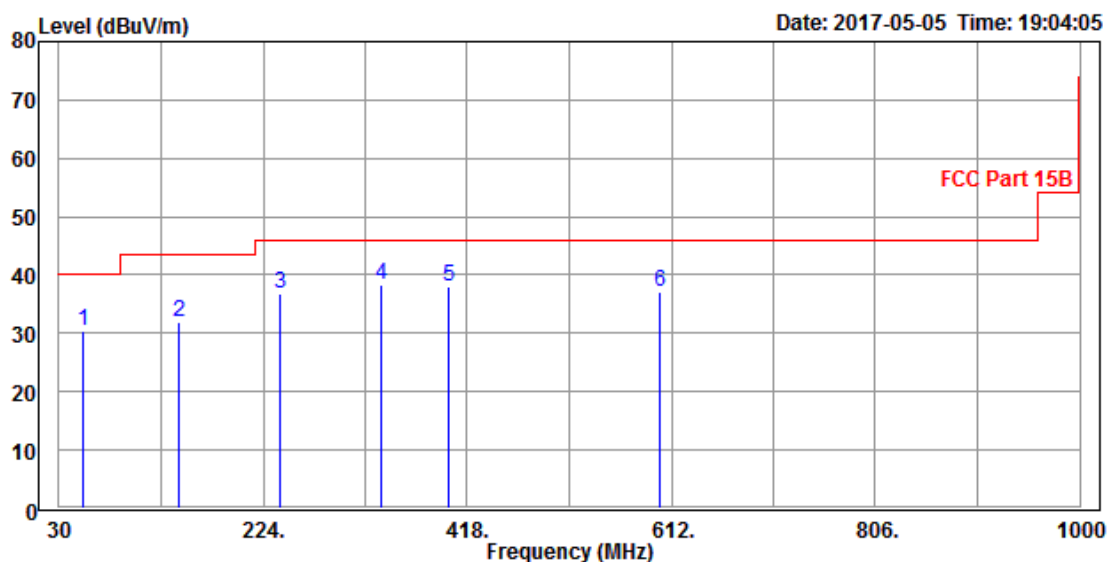
Test Report No.: FV170428W003

## 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>	24deg. C, 58 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 120 kHz
<b>TESTED BY</b>	Tony Zou		

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
52.31	30.32	60.11	40	-9.68	6.48	1.1	37.37	200	48	QP
144.46	31.91	58.34	43.5	-11.59	8.54	1.85	36.82	200	115	QP
239.52	36.78	58.99	46	-9.22	11.92	2.39	36.52	200	256	QP
335.55	38.37	57.59	46	-7.63	14.49	2.87	36.58	200	75	QP
399.57	38	54.39	46	-8	17.18	3.15	36.72	200	60	QP
601.33	37.13	50.03	46	-8.87	20.34	4.01	37.25	200	290	QP

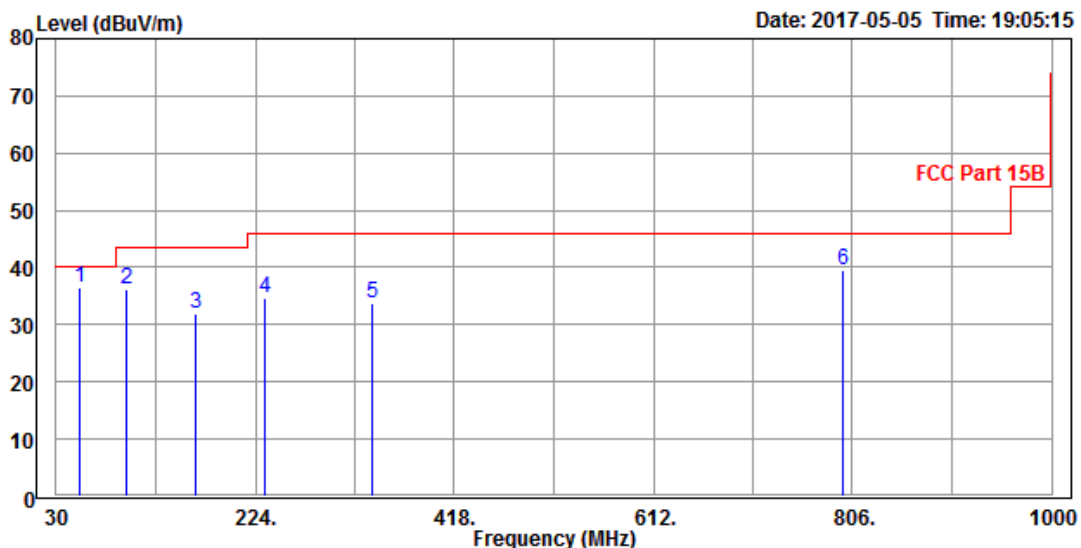
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 30MHz to 1000MHz.
 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



TEST VOLTAGE	DC 5.0V From Adapter Input 120 Vac, 60 Hz	FREQUENCY RANGE	30-1000 MHz
ENVIRONMENTAL CONDITIONS	22deg. C, 57% RH	DETECTOR FUNCTION & RESOLUTION BANDWIDTH	Quasi-Peak, 120 kHz
TESTED BY	Tony Zou		

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
52.31	36.42	66.21	40	-3.58	6.48	1.1	37.37	100	63	QP
97.9	36.18	63.89	43.5	-7.32	7.77	1.52	37	100	84	QP
165.8	31.86	56.51	43.5	-11.64	10.11	1.97	36.73	100	142	QP
232.73	34.56	57.13	46	-11.44	11.61	2.35	36.53	100	215	QP
337.49	33.84	52.97	46	-12.16	14.57	2.88	36.58	100	80	QP
796.3	39.68	49.62	46	-6.32	23	4.67	37.61	100	170	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.

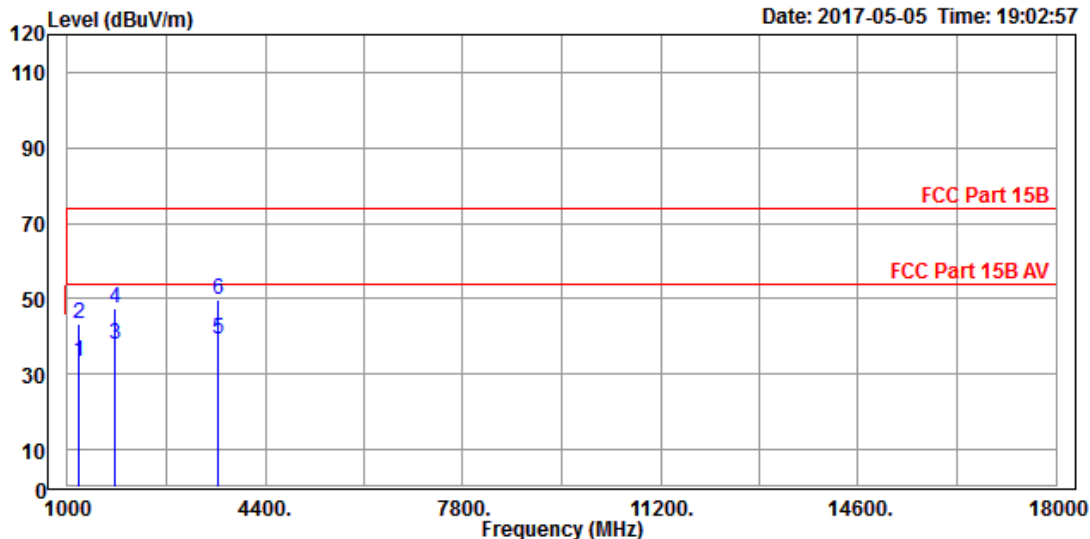


<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1-18 GHz
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 58 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Peak/Average, 1 MHz
<b>TESTED BY</b>	Tony Zou		

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
1200	33.41	47.15	54	-20.59	29	5.62	48.36	100	63	Average
1200	43.25	56.99	74	-30.75	29	5.62	48.36	100	63	Peak
1805	37.96	48.65	54	-16.04	30.65	7.01	48.35	100	138	Average
1805	47.68	58.37	74	-26.32	30.65	7.01	48.35	100	138	Peak
3580	39.46	44.68	54	-14.54	33.13	10.09	48.44	100	210	Average
3580	49.78	55	74	-24.22	33.13	10.09	48.44	100	210	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.



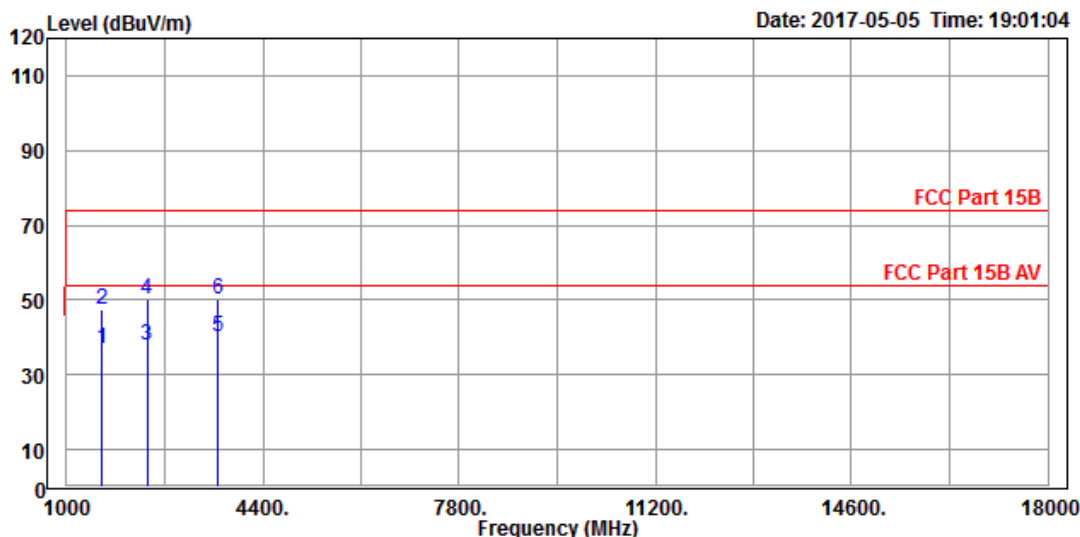


<b>TEST VOLTAGE</b>	DC 5.0V From Adapter Input 120 Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1-18 GHz
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 58 %RH	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Peak/Average, 1 MHz
<b>TESTED BY</b>	Tony Zou		

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
1600	36.78	49.25	54	-17.22	29.34	6.55	48.36	100	140	Average
1600	47.25	59.72	74	-26.75	29.34	6.55	48.36	100	140	Peak
2390	37.82	45.69	54	-16.18	32.29	8.15	48.31	100	242	Average
2390	50.12	57.99	74	-23.88	32.29	8.15	48.31	100	242	Peak
<b>3605</b>	<b>40.25</b>	<b>45.39</b>	<b>54</b>	<b>-13.75</b>	<b>33.17</b>	<b>10.13</b>	<b>48.44</b>	<b>100</b>	<b>276</b>	<b>Average</b>
3605	50.14	55.28	74	-23.86	33.17	10.13	48.44	100	276	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.





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### 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---