



Test Report No.: FS180920N037



# TEST REPORT



Applicant	Particle Industries, Inc
Address	126 Post St,4th floor, San Francisco, CA 94108 USA

Manufacturer or Supplier	Particle Industries, Inc
Address	126 Post St,4th floor, San Francisco, CA 94108 USA
Product	Boron LTE
Brand Name	Particle Industries, Inc
Model	BRN402
Additional Model & Model Difference	N/A
Date of tests	Sep. 03, 2018 ~ Nov. 08, 2018

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

- FCC Part 15, Subpart B, Class B (sDoC)
- ICES-003 Issue 6:2016, Class B

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

Tested by Breeze Jiang Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
	  Date: Nov. 19, 2018

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**BUREAU  
VERITAS**

Test Report No.: FS180920N037

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
FS180920N037	Original release	Nov. 19, 2018

## 1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD			
Standard Section	Test Item	Result	Remark
FCC Part 15 Subpart B, Class B (sDoC) ICES-003 Issue 6: 2016, Class B	Conducted emission test	PASS	Meets limits minimum passing margin is -5.82 dB at 39.749 MHz
	Radiated EmissionTest (9KHz ~ 1GHz)	PASS	Meets limits minimum passing margin is -15.10 dB at 6834.54 MHz
	Radiated Emission Test Above 1GHz	PASS	Meets limits minimum passing margin is -15.10 dB at 6834.54 MHz

Remark: Please refer to FCC part 2 2.1077 for sDoC compliance information requirement

### 1.1 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 emission test	0.15MHz ~ 30MHz	+/- 2.70 dB
Radiated emissions test	9kHz-30MHz	+/- 2.90 dB
	30MHz ~1GHz	+/- 4.04 dB
	1GHz ~ 6GHz	+/- 5.02 dB



## 2 GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Boron LTE
<b>MODEL NO.</b>	BRN402
<b>ADDITIONAL MODEL</b>	N/A
<b>POWER SUPPLY</b>	Li+ PIN: DC 3.7V from Li-ion Battery or VUSB: DC 5V From USB Host Unit
<b>CABLE SUPPLIED</b>	N/A
<b>THE HIGHEST OPERATING FREQUENCY</b>	2480MHz

#### 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 showed in test report.
3. Please refer to the EUT photo document (Reference No.: 180920N037) for detailed product photo.
4. The EUT is wireless module, it no any accessories, the test standard were specified by applicant.



## 2.2 DESCRIPTION OF TEST MODES

The EUT were tested under the following modes, the final worst mode was marked in boldface and recorded in this report

### ◆ FOR CONDUCTED EMISSIONS TEST:

Test Mode	Test Voltage
<b>2.4G Wireless Normal Working</b>	DC5V from Adapter
NFC Normal Working	

### ◆ FOR RADIATED EMISSIONS TEST(Below 30MHz):

Test Mode	Test Voltage
NFC Normal Working	DC 3.7V from Battery
	<b>DC5V from Adapter</b>

### ◆ FOR RADIATED EMISSIONS TEST(Below 1GHz):

Test Mode	Test Voltage
2.4G Wireless Normal Working	DC 3.7V from Battery
NFC Normal Working	
<b>2.4G Wireless Normal Working</b>	<b>DC5V from Adapter</b>

### ◆ FOR RADIATED EMISSIONS TEST(Above 1GHz):

Test Mode	Test Voltage
<b>2.4G Wireless Normal Working</b>	<b>DC5V from Adapter</b>

## 2.3 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.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Adapter	N/A	DC 5V 1.5A	N/A	N/A
2	iPhone 6s	Apple	ML7F2CH/A	C6KQKXLAGRY8	N/A
3	Li-ion Battery	N/A	DC3.7V	N/A	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Line: Unshielded detachable 0.6m.
2, 3	N/A



### 3 EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15, Subpart B (Section: 15.107)

ICES-003 (Class A: section 6.1) (Class B: section 6.1)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

- NOTES:**
- (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 0.50 MHz.
  - (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.

##### 3.1.2 TEST INSTRUMENTS

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,18	Apr. 04,19
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 03,18	Mar. 02,19
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,18	Apr. 04,19
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 17,18	Jan. 16,19
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 shielding room 553.



### 3.1.3 TEST PROCEDURE

The basic test procedure was in accordance with ANSI C63.4:2014 (section 7).

- 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 30 MHz was searched. Emission levels under (Limit – 20dB) were not recorded.

#### NOTE:

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. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

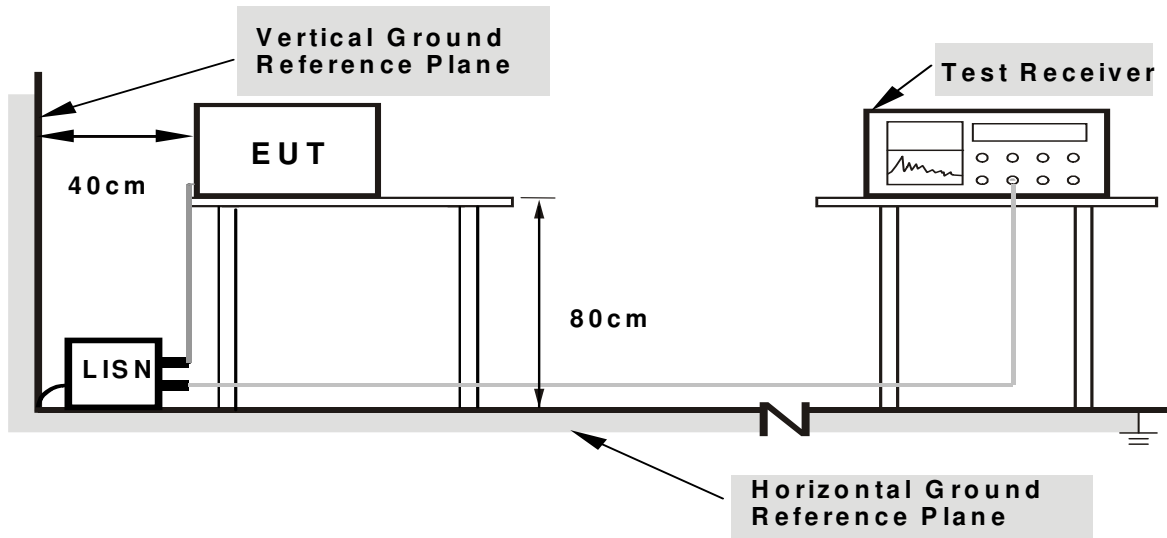
### 3.1.4 DEVIATION FROM TEST STANDARD

No deviation.





### 3.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) are 80cm from EUT and at least 80cm from other units and other metal planes support units.

### 3.1.6 EUT OPERATING CONDITIONS

- a. Turned on the power of all equipment.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

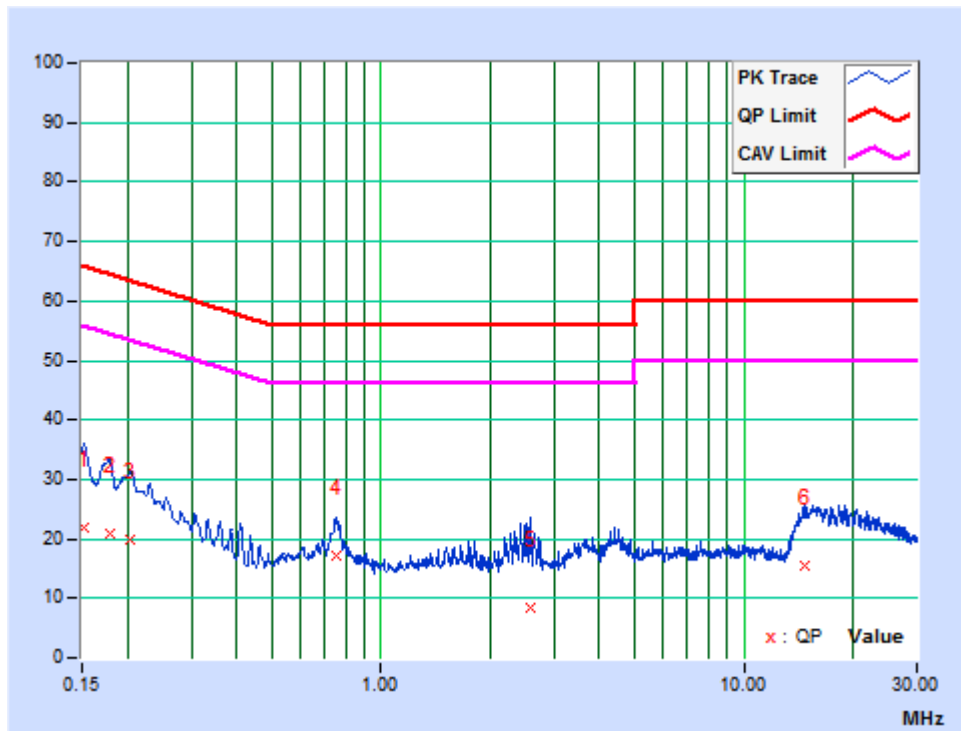


### 3.1.7 TEST RESULTS

<b>TEST MODE</b>	2.4G Wireless Normal Working	<b>6DB BANDWIDTH</b>	9 kHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 46% RH	<b>TESTED BY</b>	Dragon

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15225	9.90	11.95	0.69	21.85	10.59	65.88	55.88	-44.02	-45.28
2	0.17838	9.80	10.97	0.18	20.77	9.98	64.56	54.56	-43.80	-44.59
3	0.20410	10.29	9.72	-0.82	20.01	9.47	63.44	53.44	-43.43	-43.97
<b>4</b>	<b>0.75016</b>	<b>10.16</b>	<b>7.17</b>	<b>2.37</b>	<b>17.33</b>	<b>12.53</b>	<b>56.00</b>	<b>46.00</b>	<b>-38.67</b>	<b>-33.47</b>
5	2.58225	9.94	-1.41	-4.53	8.53	5.41	56.00	46.00	-47.47	-40.59
6	14.68275	9.77	5.82	3.13	15.59	12.90	60.00	50.00	-44.41	-37.10

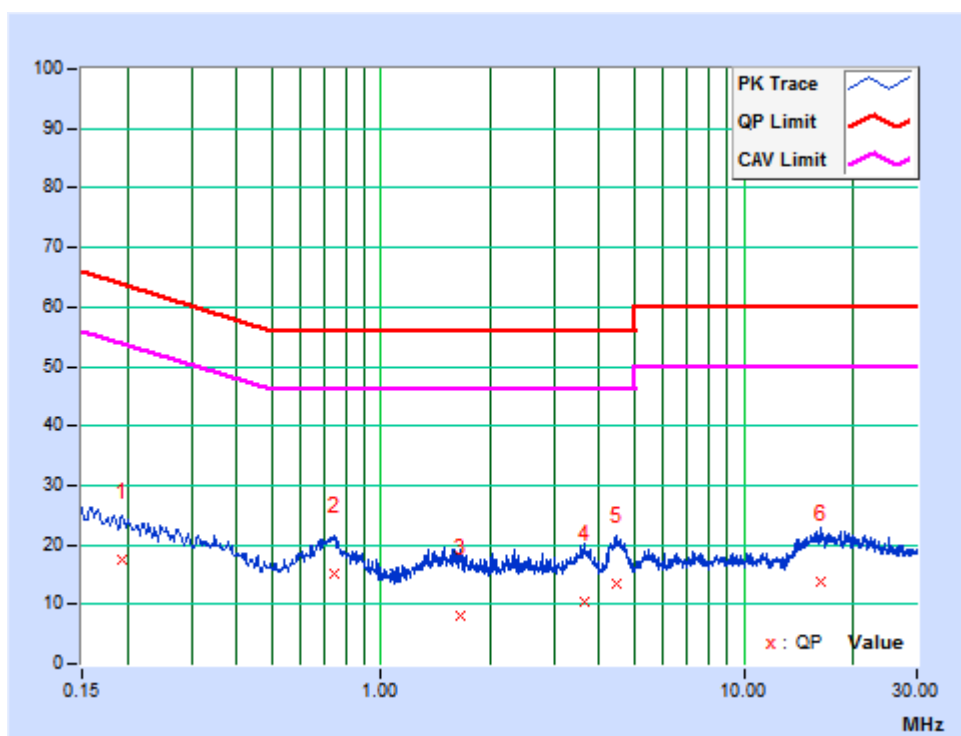
**REMARKS:** The emission levels of other frequencies were very low against the limit.



<b>TEST MODE</b>	2.4G Wireless Normal Working	<b>6DB BANDWIDTH</b>	9 kHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 46% RH	<b>TESTED BY</b>	Dragon

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.19258	9.90	7.68	-2.66	17.58	7.24	63.92	53.92	-46.35	-46.69
2	0.74621	9.99	5.12	-2.40	15.11	7.59	56.00	46.00	-40.89	-38.41
3	1.66514	10.05	-1.92	-5.32	8.13	4.73	56.00	46.00	-47.87	-41.27
4	3.65100	9.87	0.44	-3.47	10.31	6.40	56.00	46.00	-45.69	-39.60
5	4.47900	9.73	3.69	-1.77	13.42	7.96	56.00	46.00	-42.58	-38.04
6	16.4040	9.85	4.00	0.82	13.85	10.67	60.00	50.00	-46.15	-39.33

**REMARKS:** The emission levels of other frequencies were very low against the limit.





### 3.2 RADIATED EMISSION MEASUREMENT

#### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

TEST STANDARD: FCC Part 15 (Section: 15.209)

ICES-003 for below 1GHz (Class A: section 6.2.1 Table 4; Class

B: section 6.2.1 Table 5); for above 1GHz (Class A: section 6.2.2 Table 6; Class B: section 6.2.2 Table 7)

Radiated Emissions Limits at 3 meters (dBµV/m)	
Frequencies (MHz)	FCC 15
0.009-0.490	128.5-93.8
0.490-1.705	73.8-62.97
1.705-30.0	69.50

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	47	37
230-960				
960-1000	49.5	43.5		

Radiated Emissions Limits at 3 meters (dBµV/m)				
Frequencies (MHz)	FCC 15B / ICES-003, Class A	FCC 15B / ICES-003, Class B	CISPR 22, Class A	CISPR 22, Class B
30-88	49.5	40	50	40
88-216	54	43.5		
216-230	56.9	46	57	47
230-960				
960-1000	60	54		
1000-3000	Avg: 60 Peak: 80	Avg: 54 Peak: 74	Avg: 56 Peak: 76	Avg: 50 Peak: 70
Above 3000			Avg: 60 Peak: 80	Avg: 54 Peak: 74



## FREQUENCY RANGE OF RADIATED MEASUREMENT (For unintentional radiators)

Highest frequency generated or Upper frequency of measurement used in the device or on which the device operates or tunes (MHz)	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 40 GHz, 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) All emanation 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.



### 3.2.2 TEST INSTRUMENTS

#### FOR FREQUENCY 9KHz-30MHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Jan. 18,18	Jan. 17,19
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	1519B-045	May 31,18	May 30,19
Amplifier	Burgeon	BPA-530	100210	Apr. 05,18	Apr. 04,19
Test Software	ADT	ADT_Radiated V8.7.07	N/A	N/A	N/A

- NOTES:** 1. The test was performed in 10m Chamber.  
 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.  
 3. The FCC Site Registration No. is 749762.

#### FOR FREQUENCY 30MHz-1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESU26	100005	Jun. 05,18	Jun. 04,19
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Jan. 18,18	Jan. 17,19
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Nov. 10, 18	Nov. 09, 19
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 10, 17	Dec. 09, 18
Preamplifier	EMCI	EMC1135	980378	Mar. 20,18	Mar. 19,19
Preamplifier	EMCI	EMC1135	980423	Mar. 20,18	Mar. 19,19
10m Semi-anechoic Chamber	CHANGLING	21.4m*12.1m*8.8m	NSEMC006	Feb. 10,18	Feb. 09,19
Test Software	ADT	ADT_Radiated V8.7.07	N/A	N/A	N/A

- NOTES:** 1. The test was performed in 10m Chamber.  
 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.  
 3. The FCC Site Registration No. is 749762.

#### FREQUENCY RANGE ABOVE 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	ETS-Lindgren	3117	00085519	Dec. 10, 17	Dec. 09, 18
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170242	May 05,18	May 04,19
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 21,18	Apr. 20,19
Broadband Preamplifier (1~18GHz)	SCHWARZBECK	BBV9718	266	Apr. 18,18	Apr. 18,19
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 08,17	Nov. 07,18
Test Software	ADT	ADT_Radiated V8.7.07	N/A	N/A	N/A

- NOTES:** 1. The test was performed in 10m Chamber.  
 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.  
 3. The FCC Site Registration No. is 749762.



### 3.2.3 TEST PROCEDURE

#### FOR FREQUENCY 9KHZ-30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters 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 fixed of loop antenna
- c. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 30MHz.

#### FOR FREQUENCY 30MHz-1GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from 1 meter to 4 meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

#### NOTE:

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
3. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier).
5. Margin value = Emission level – Limit value.

### <Frequency Range above 1GHz>

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meters 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 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.
- 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 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 for Average detection (AV) at frequency above 1GHz.
2. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the receiver antenna.
3. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
4. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) (if the raw value not contains the amplifier);
5. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB) – Amplifier Gain(dB) (if the raw value contains the amplifier)
6. Margin value = Emission level – Limit value.

### 3.2.4 DEVIATION FROM TEST STANDARD

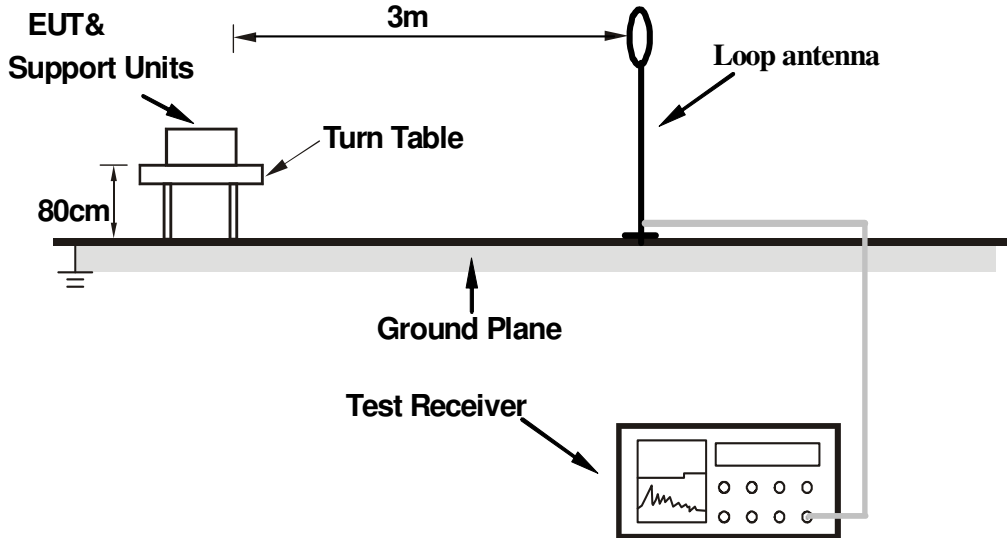
No deviation.



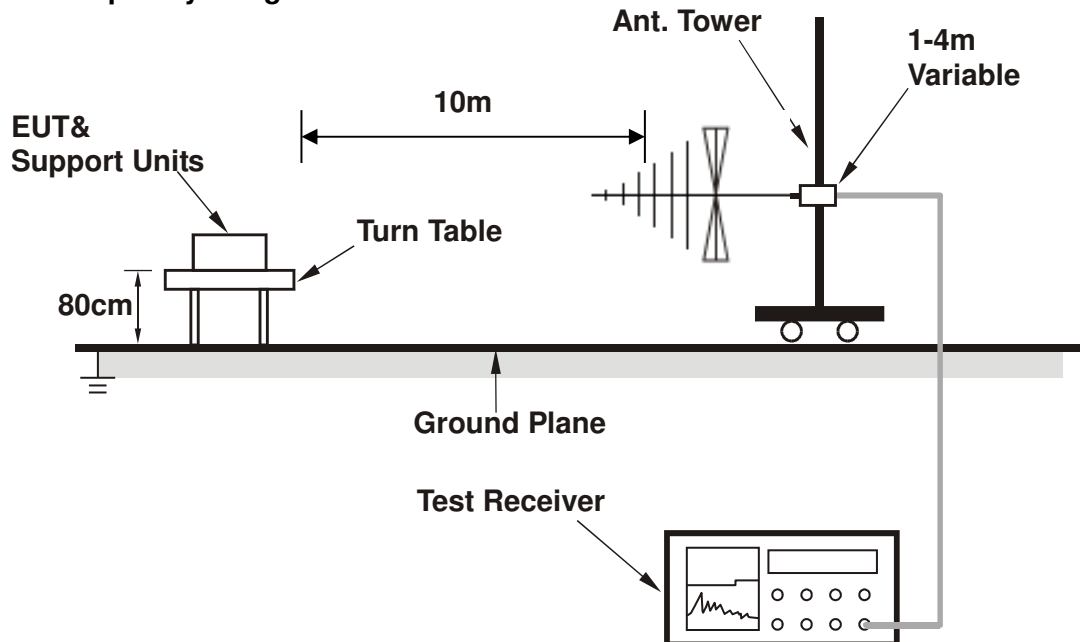


### 3.2.5 TEST SETUP

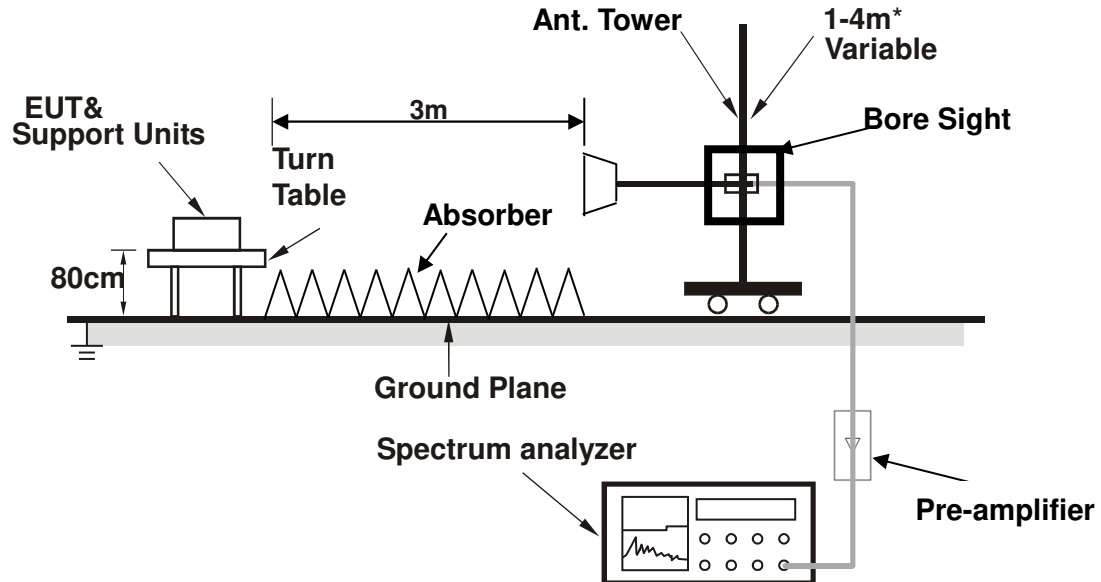
<Frequency Range 9KHz-30MHz>



<Frequency Range 30MHz - 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

### 3.2.6 EUT OPERATING CONDITIONS

- a. Turn on the power supply of the EUT.
- b. EUT was operated according to the type description in manufacturer's specifications or the User's Manual.

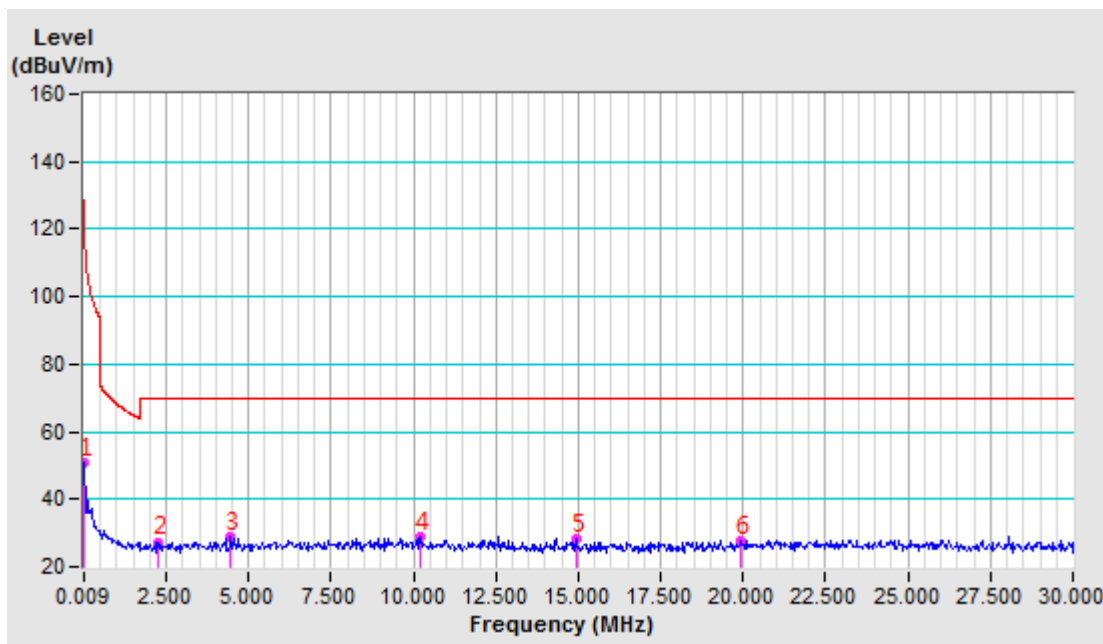


### 3.2.7 TEST RESULTS

<b>TEST MODE</b>	NFC Normal Working	<b>FREQUENCY RANGE</b>	9 -150KHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 200Hz
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 67% RH	<b>TESTED BY:</b> Ming Bai	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M								
No	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.0090	-10.64	61.50	50.86	128.52	-77.66	100	195
2	2.2734	-10.91	38.26	27.35	69.54	-42.19	100	150
3	4.4644	-10.68	39.35	28.67	69.54	-40.87	100	171
4	10.1975	-10.54	39.36	28.82	69.54	-40.72	100	162
5	14.9303	-10.82	38.96	28.14	69.54	-41.40	100	171
6	19.9390	-10.08	37.77	27.69	69.54	-41.85	100	178
7	0.00900	-10.64	61.50	50.86	128.52	-77.66	100	129

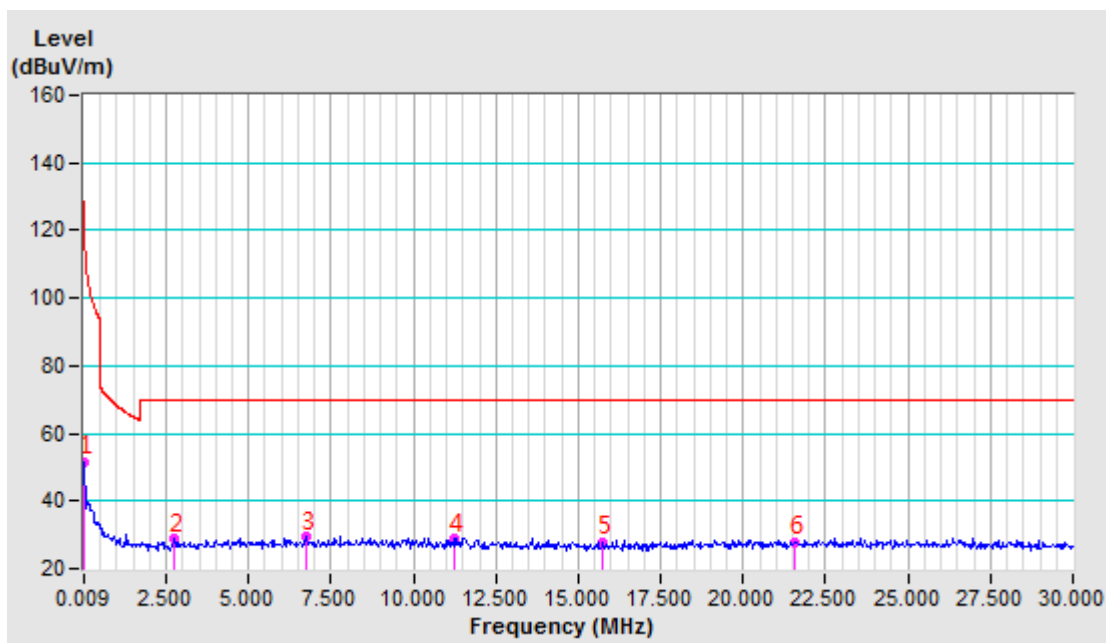
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 0.009-0.15MHz.
  4. Only emissions significantly above equipment noise floor are reported.



<b>TEST MODE</b>	NFC Normal Working	<b>FREQUENCY RANGE</b>	9 -150KHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 200Hz
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 67% RH	<b>TESTED BY:</b> Ming Bai	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M								
No	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	0.0090	-10.64	62.14	51.50	128.52	-77.02	100	239
2	2.7428	-10.80	39.43	28.63	69.54	-40.91	100	246
3	6.7183	-10.69	40.12	29.43	69.54	-40.11	100	110
4	11.2667	-10.61	39.45	28.84	69.54	-40.70	100	112
5	15.7311	-10.71	38.48	27.77	69.54	-41.77	100	110
6	21.5766	-10.10	38.04	27.94	69.54	-41.60	100	115
7	0.0090	-10.64	62.14	51.50	128.52	-77.02	100	171

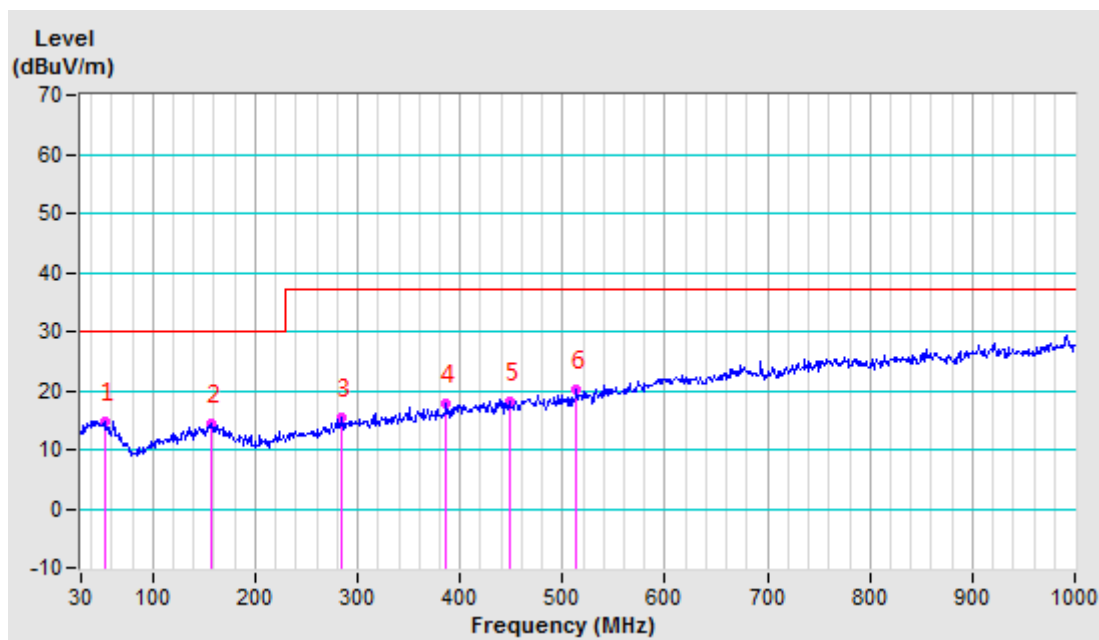
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 0.009-0.15MHz.
  4. Only emissions significantly above equipment noise floor are reported.



<b>TEST MODE</b>	2.4G Wireless Normal Working	<b>FREQUENCY RANGE</b>	30-1000MHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	21.0deg. C, 59.0% RH	<b>TESTED BY:</b> Luke	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	53.0375	-17.67	32.55	14.88	30.00	-15.12	200	102
2	157.9187	-16.73	31.29	14.56	30.00	-15.44	200	201
3	284.2613	-15.93	31.51	15.58	37.00	-21.42	200	284
4	386.5962	-13.57	31.32	17.75	37.00	-19.25	200	43
5	447.9488	-12.57	30.73	18.16	37.00	-18.84	200	60
6	513.4238	-11.02	31.14	20.12	37.00	-16.88	400	310

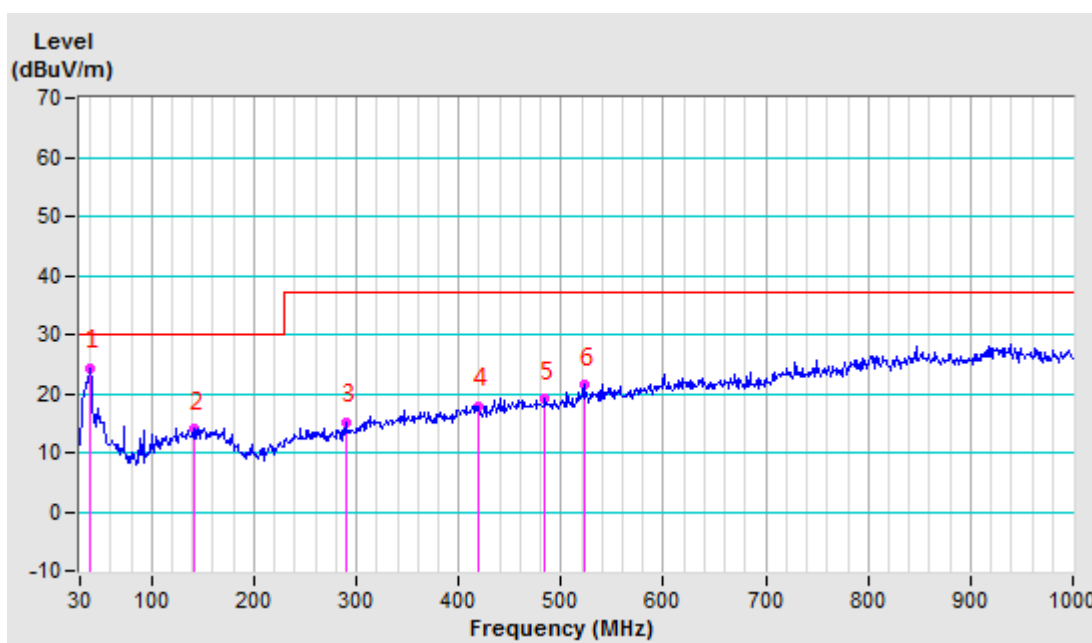
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
  2. Negative sign (-) in the margin column signify levels below the limit.
  3. Frequency range scanned: 30MHz to 1000MHz.
 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



<b>TEST MODE</b>	2.4G Wireless Normal Working	<b>FREQUENCY RANGE</b>	30-1000MHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Quasi-Peak, 120kHz
<b>ENVIRONMENTAL CONDITIONS</b>	21.0deg. C, 59.0% RH	<b>TESTED BY:</b> Luke	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	39.749	-17.76	41.94	24.18	30.00	-5.82	100	65
2	141.0706	-16.76	30.73	13.97	30.00	-16.03	100	314
3	289.6335	-15.33	30.37	15.04	37.00	-21.96	100	251
4	419.7655	-11.76	29.60	17.84	37.00	-19.16	100	94
5	484.0797	-10.41	29.46	19.05	37.00	-17.95	100	128
6	521.8631	-9.46	30.89	21.43	37.00	-15.57	100	165

- 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.





ABOVE 1GHz

<b>TEST MODE</b>	2.4G Wireless Normal Working	<b>FREQUENCY RANGE</b>	Above 1GHz
<b>TEST VOLTAGE</b>	DC 5V from Adapter	<b>DETECTOR FUNCTION &amp; RESOLUTION BANDWIDTH</b>	Peak, Average 1MHz
<b>ENVIRONMENTAL CONDITIONS</b>	21.0deg. C, 59.0% RH	<b>TESTED BY:</b> Daniel	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	6834.54 PK	12.59	45.01	57.60	74.00	-16.40	100	156
2	<b>6834.54 AV</b>	<b>12.59</b>	<b>26.31</b>	<b>38.90</b>	<b>54.00</b>	<b>-15.10</b>	<b>100</b>	<b>156</b>
3	9763.45 PK	16.55	41.75	58.30	74.00	-15.70	100	58
4	9763.45 AV	16.55	22.15	38.70	54.00	-15.30	100	58
5	15167.35 PK	26.12	31.68	57.80	74.00	-16.20	100	254
6	15167.35 AV	26.12	12.28	38.40	54.00	-15.60	100	254
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	6975.35 PK	13.07	45.53	58.60	74.00	-15.40	100	124
2	6975.35 AV	13.07	25.63	38.70	54.00	-15.30	100	124
3	10056.87 PK	16.86	41.04	57.90	74.00	-16.10	100	58
4	10056.87 AV	16.86	21.54	38.40	54.00	-15.60	100	58
5	15673.45 PK	27.04	31.56	58.60	74.00	-15.40	100	97
6	15673.45 AV	27.04	11.76	38.80	54.00	-15.20	100	97

- 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.

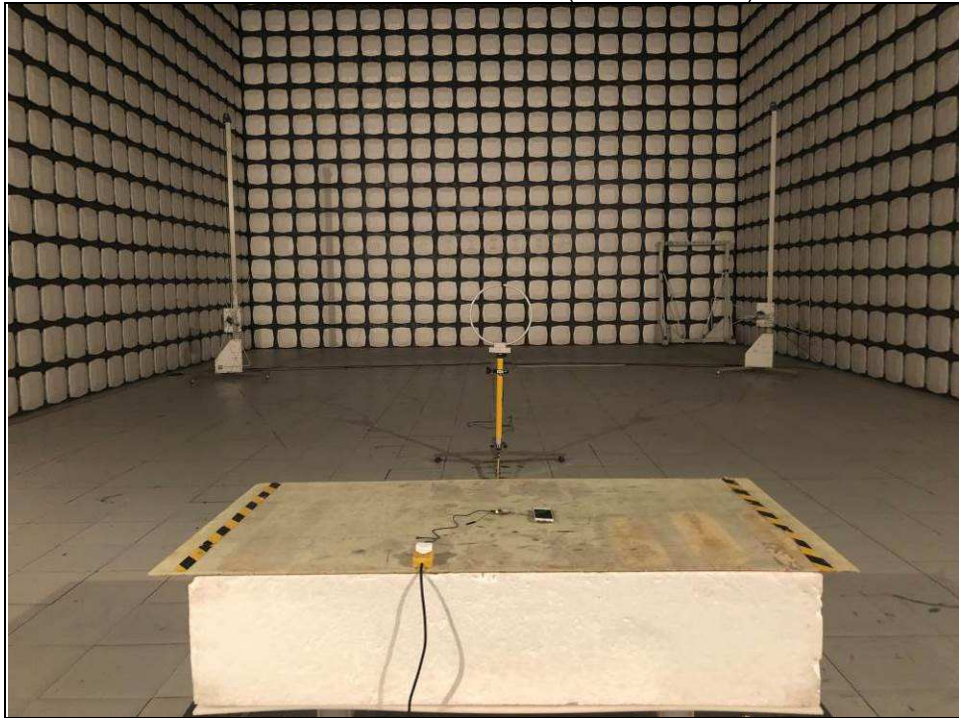
## 4 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

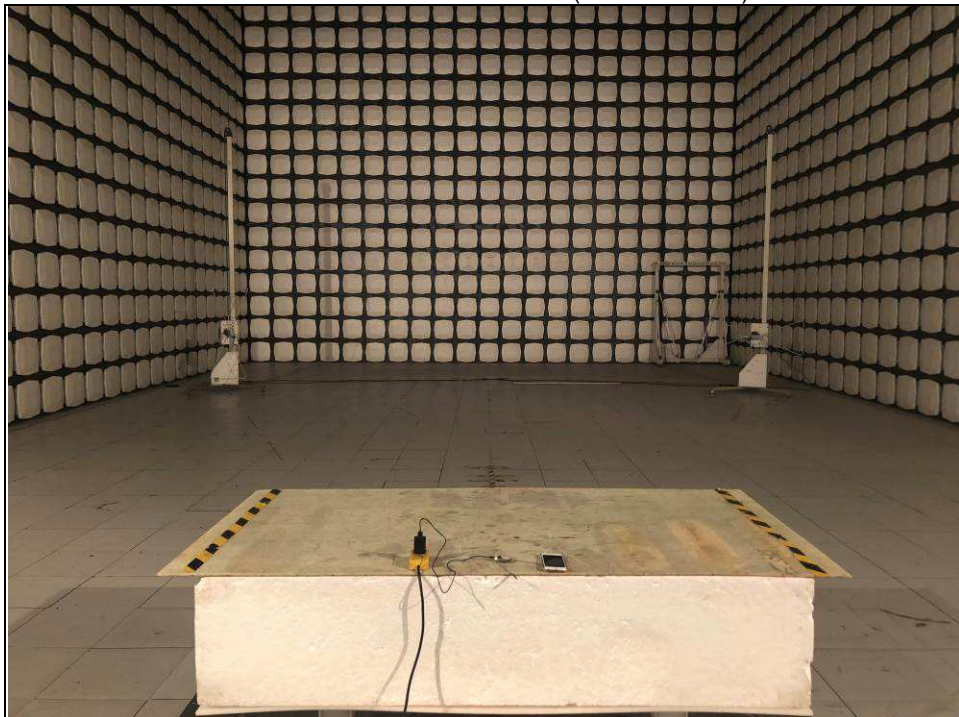




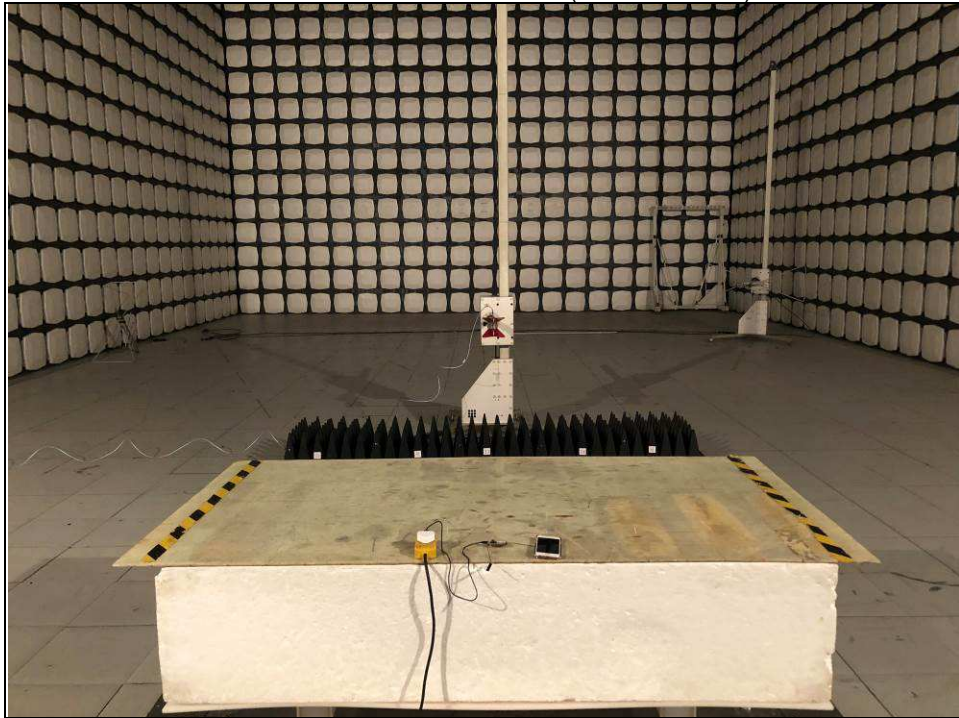
RADIATED EMISSION TEST (9KHz - 30MHz)



RADIATED EMISSION TEST (30MHz-1GHz)



RADIATED EMISSION TEST (ABOVE 1GHz)





**BUREAU  
VERITAS**

Test Report No.: FS180920N037

## **5 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---**