


TEST REPORT


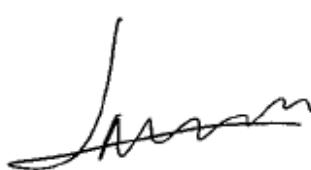
Applicant	Flashbay Electronics
Address	Blgd b & C Xi Feng Cheng IND Zone, No.2 FuYuan Road He Ping, Village, FuYong Town, ShenZhen

Manufacturer or Supplier	Flashbay Electronics	
Address	Blgd b & C Xi Feng Cheng IND Zone, No.2 FuYuan Road He Ping, Village, FuYong Town, ShenZhen	
Product	Bluetooth speaker	
Brand Name	N/A	
Model	Tab	
Additional Model & Model Difference	Ray, Jet, Seed; See items 2.1	
Date of tests	Apr. 12, 2017 ~ Jun. 21, 2017	

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

AS/NZS CISPR 32:2013

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

Tested by Andy Zhu Project Engineer / EMC Department	Approved by Madison Luo Supervisor / EMC Department
	

Date: Jun. 26, 2017

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Test Report No.: CT170412N004

RELEASE CONTROL RECORD

Issue No.	Description	Date Issued
CT170412N004	Original release	Jun. 26, 2017



1 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

Emission			
Standard	Test Item	Result	Remarks
AS/NZS CISPR 32: 2013	Conducted test	PASS	Minimum passing margin is -21.25 dB at 0.97125MHz
	Radiated emission 30-1000 MHz	PASS	Minimum passing Class B margin is -8.02dB at 48.309 MHz

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:

The listed uncertainties are the worst case uncertainty for the entire range of measurement. Please note that the uncertainty values are provided for informational purposes only and are not used in determining the PASS/FAIL results.

MEASUREMENT	FREQUENCY	UNCERTAINTY
Mains Terminal Disturbance Voltage Test	0.15MHz ~ 30MHz	+ /-2.70 dB
Radiated Disturbance Test	30MHz ~ 1000MHz	+ /-4.06 dB

1.2 MODIFICATION RECORD

There were no modifications required for compliance.



2 GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth speaker
TEST MODEL	Tab
ADDITIONAL MODEL	Ray, Jet, Seed
POWER SUPPLY	DC 3.7V from Li-ion Battery or DC 5V from USB Host Unit
DATA CABLE SUPPLIED	USB cable: Unshielded, Detachable, 0.3m
HIGHEST OPERATION FREQUENCY	Below 108MHz

NOTE:

1. For the test results, the EUT had been tested with all conditions. But only the worst case was showed in test report.
2. For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.
3. Please refer to the EUT photo document (Reference No.: 170412N004) for detailed product photo.
4. Additional models Ray, Jet, Seed are identical with the test model Tab except the model number for marketing purpose.



2.2 DESCRIPTION OF TEST MODES

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

FOR CONDUCTED EMISSION TEST

Test Mode	Test Voltage
Charging	DC 5V from adapter

FOR RADIATED EMISSIONS TEST (BELOW 1GHz)

Test Mode	Test Voltage
Charging	DC 5V from adapter



2.3 TEST PROGRAM USED AND OPERATION DESCRIPTIONS

- 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.

2.4 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to the specifications of the manufacturers, the EUT must comply with the requirements of the following standards:

AS/NZS CISPR 32:2013

All applicable tests have been performed and recorded as per the above standards.

2.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an dependent 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	Lenovo	C-P30	N/A	N/A

NO.	DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A



3 CONDUCTED EMISSION FROM THE AC MAINS POWER PORT

3.1 LIMITS

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 linearly with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

3.2 TEST INSTRUMENT

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101494	Apr. 05,17	Apr. 04,18
Artificial Mains Network	Rohde&Schwarz	ENV216	101173	Mar. 06,17	Mar. 05,18
Artificial Mains Network	Rohde&Schwarz	ESH3-Z5	100317	Apr. 05,17	Apr. 04,18
Voltage probe	SCHWARZBECK	TK 9421	TK 9421-176	Jan. 04,17	Jan. 03,18
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 at Shielded Room 553.

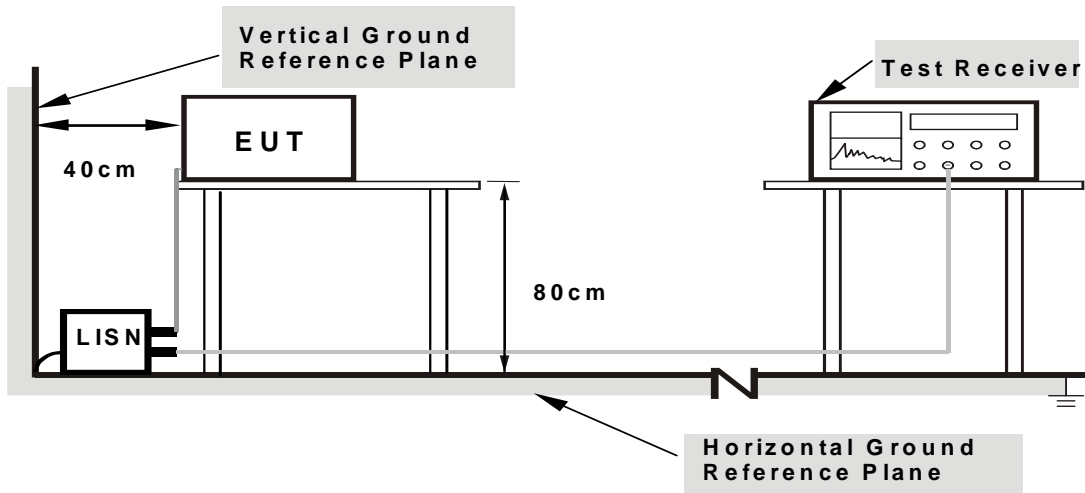
3.3 TEST ARRANGEMENT

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The test results of conducted emissions at mains ports are recorded of six worst margins for quasi-peak (mandatory) [and average (if necessary)] values against the limits at frequencies of interest unless the margin is 20 dB or greater.

Note: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.



3.4 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.

3.5 SUPPLEMENTARY INFORMATION

N/A

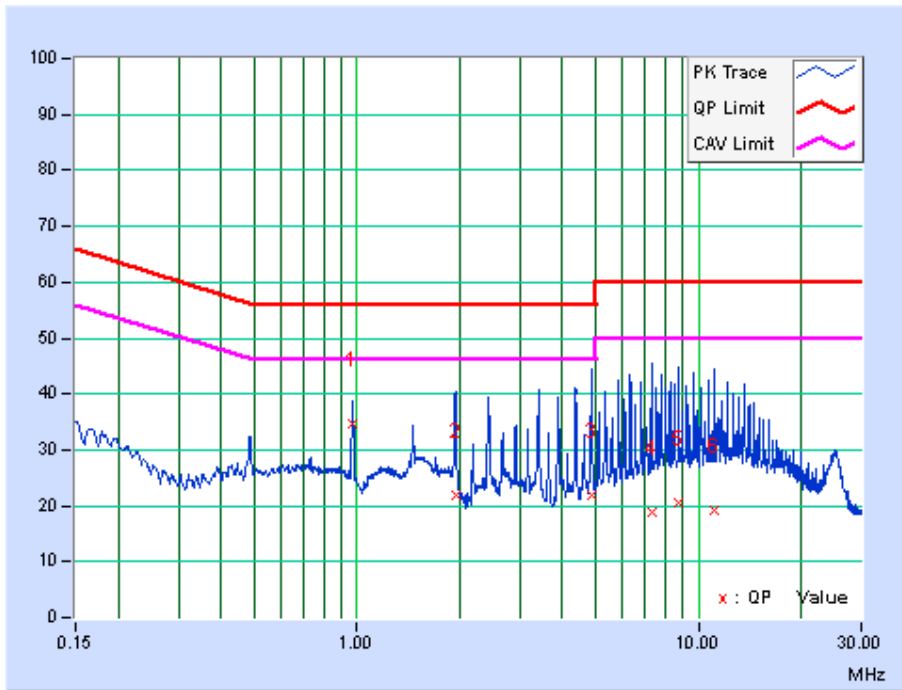


3.6 TEST RESULTS

TEST MODE	Charging	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from adapter	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 46% RH	TESTED BY	Yang

No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.97125	10.23	24.52	12.18	34.75	22.41	56.00	46.00	-21.25	-23.59
2	1.94325	10.22	11.56	3.57	21.78	13.79	56.00	46.00	-34.22	-32.21
3	4.86150	10.22	11.73	2.52	21.95	12.74	56.00	46.00	-34.05	-33.26
4	7.30050	10.22	8.59	0.59	18.81	10.81	60.00	50.00	-41.19	-39.19
5	8.75625	10.23	10.46	1.29	20.69	11.52	60.00	50.00	-39.31	-38.48
6	11.18850	10.24	8.89	1.03	19.13	11.27	60.00	50.00	-40.87	-38.73

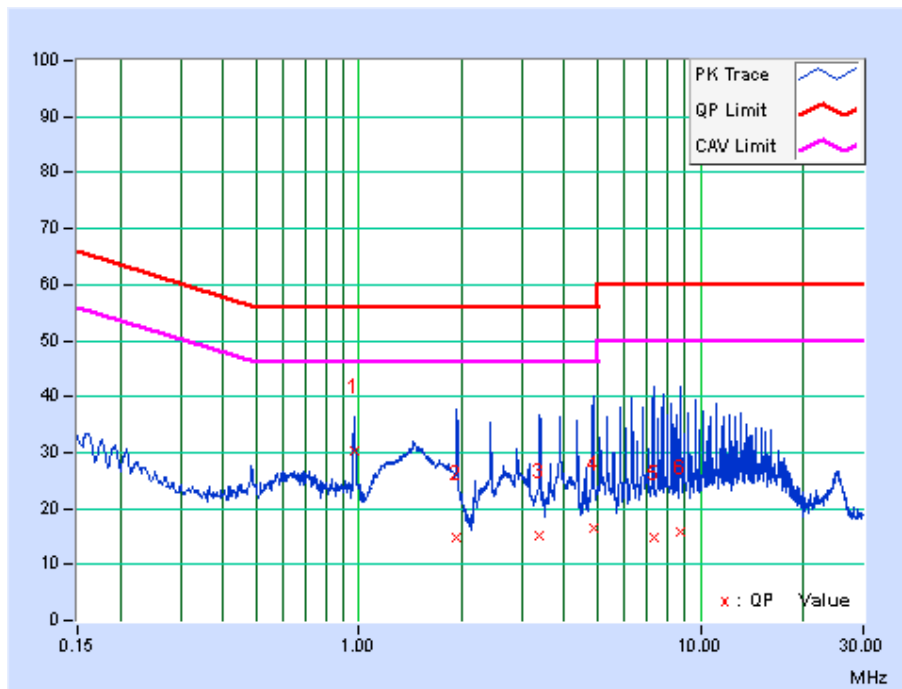
REMARKS: The emission levels of other frequencies were very low against the limit.



TEST MODE	Charging	6DB BANDWIDTH	9 kHz
TEST VOLTAGE	DC 5V from adapter	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 46% RH	TESTED BY	Yang

No.	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.97169	10.02	20.18	7.27	30.20	17.29	56.00	46.00	-25.80	-28.71
2	1.93650	10.01	4.75	3.47	14.76	13.48	56.00	46.00	-41.24	-32.52
3	3.38772	10.03	5.15	1.48	15.18	11.51	56.00	46.00	-40.82	-34.49
4	4.85025	10.02	6.48	3.14	16.50	13.16	56.00	46.00	-39.50	-32.84
5	7.27575	10.03	4.69	2.26	14.72	12.29	60.00	50.00	-45.28	-37.71
6	8.73375	10.08	5.82	2.92	15.90	13.00	60.00	50.00	-44.10	-37.00

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





4 RADIATED EMISSION MEASUREMENT

4.1 LIMITS

4.2 OF RADIATED EMISSION MEASUREMENT

FOR FREQUENCY BELOW 1000 MHz

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 10m)
	Quasi-Peak dBuV/m	Quasi-Peak dBuV/m
30 – 230	40	30
230 – 1000	47	37

FREQUENCY (MHz)	Class A (at 3m)	Class B (at 3m)
	Quasi-Peak dBuV/m	Quasi-Peak dBuV/m
30 – 230	50	40
230 – 1000	57	47

For FM receivers

Distance (m)	Source	Frequency Range (MHz)	Limits dB (uV/m)	
			Quasi-peak	
10	Local oscillator	≤1000	Fundamental	50
		30 to 300	Harmonics	42
		300 to 1000	Harmonics	46
	Other	30 to 230		30
230 to 1000			37	
3	Local oscillator	≤1000	Fundamental	60
		30 to 300	Harmonics	52
		300 to 1000	Harmonics	56
	Other	30 to 230		40
230 to 1000			47	

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 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	Up to 5 times of the highest frequency or 6 GHz, whichever is less

FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (GHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	PEAK	AVERAGE	PEAK	AVERAGE
1 to 3	76	56	70	50
3 to 6	80	60	74	54

- 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.



4.3 TEST INSTRUMENTS

FREQUENCY RANGE BELOW 1GHz

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESR7	101564	Feb. 27,17	Feb. 26,18
EMI Test Receiver	Rohde&Schwarz	ESCI	101418	Feb. 27,17	Feb. 26,18
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-555	Nov. 13, 16	Nov. 12, 17
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-554	Dec. 17, 16	Dec. 16, 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. 06,17	Mar. 05,18
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 and 24 months. And the calibrations are traceable to CEPREI/CHINA, GRGT/CHINA and NIM/CHINA.

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. 15,17	Mar. 14,18
Signal and Spectrum Analyzer	Rohde&Schwarz	FSV40	101003	Apr. 05,17	Apr. 04,18
Broadband Preamplifier	SCHWARZBECK	BBV9718	266	Mar. 21,17	Mar. 20,18
Pre-Amplifier (100MHz-26.5GHz)	EMCI	EMC 012645	980077	May 04,17	May 03,18
Pre-Amplifier (18GHz-40GHz)	EMCI	EMC 184045	980102	Nov. 04,16	Nov. 03,17
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.



4.4 TEST PROCEDURE

<Frequency Range below 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 meter 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 can be varied from one meter-to four meters, the height of adjustment depends on the EUT height and the antenna 3dB beamwidth both, to detect 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test receiver/spectrum was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.

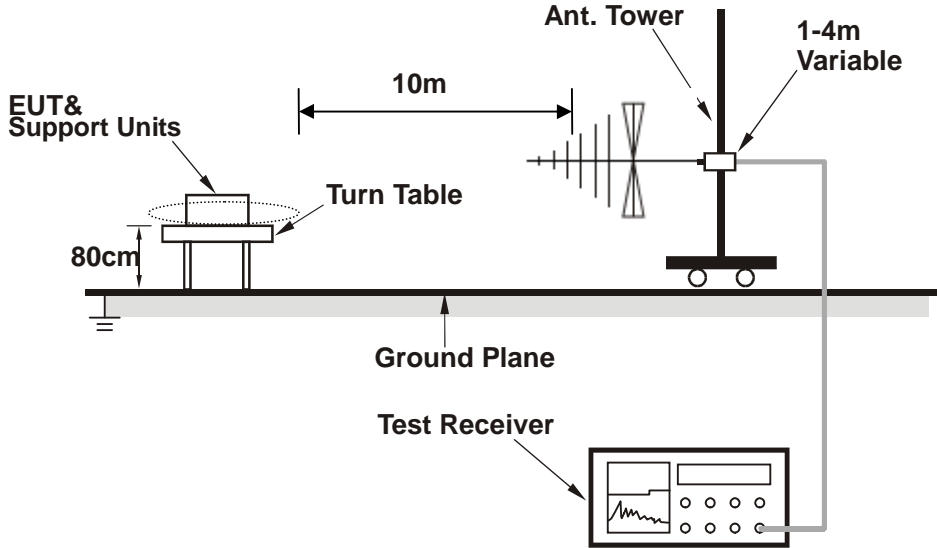
NOTE:

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.

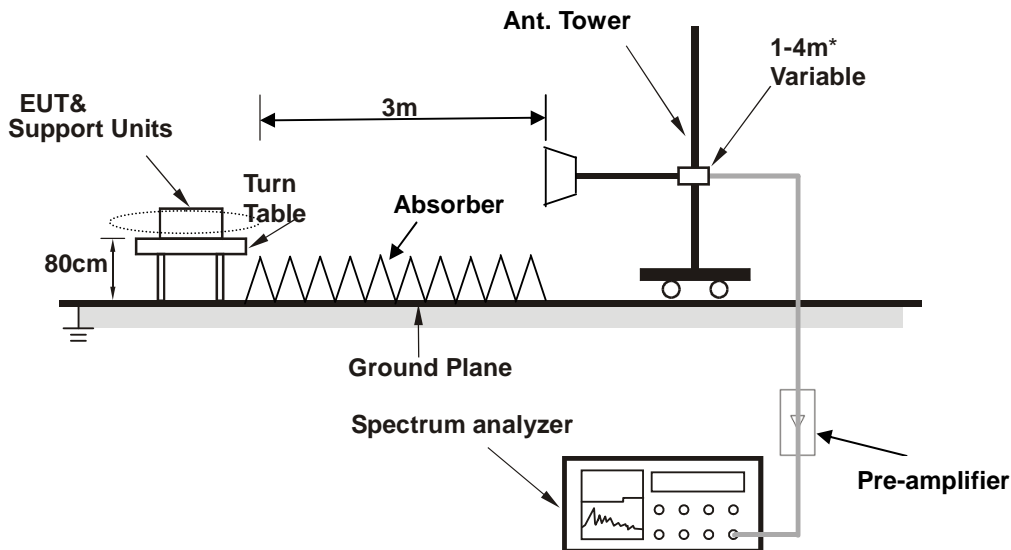


4.5 TEST SETUP

<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

4.6 SUPPLEMENTARY INFORMATION

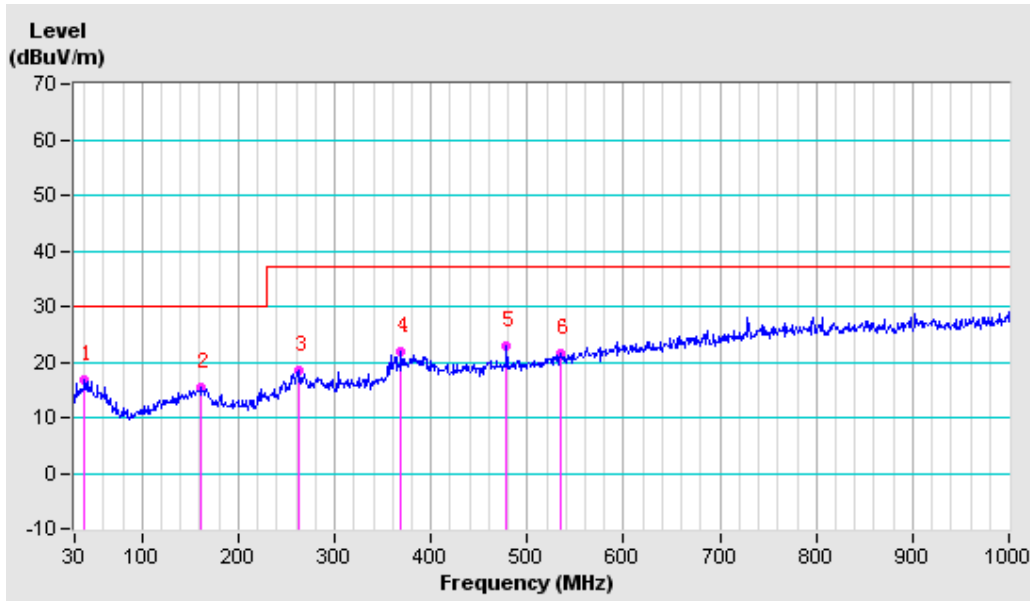
The more stringent measurement method of paragraph 8.3.2.2 in ANSI C63.4:2014 was applied for the test.



4.7 TEST RESULTS (BELOW 1G)

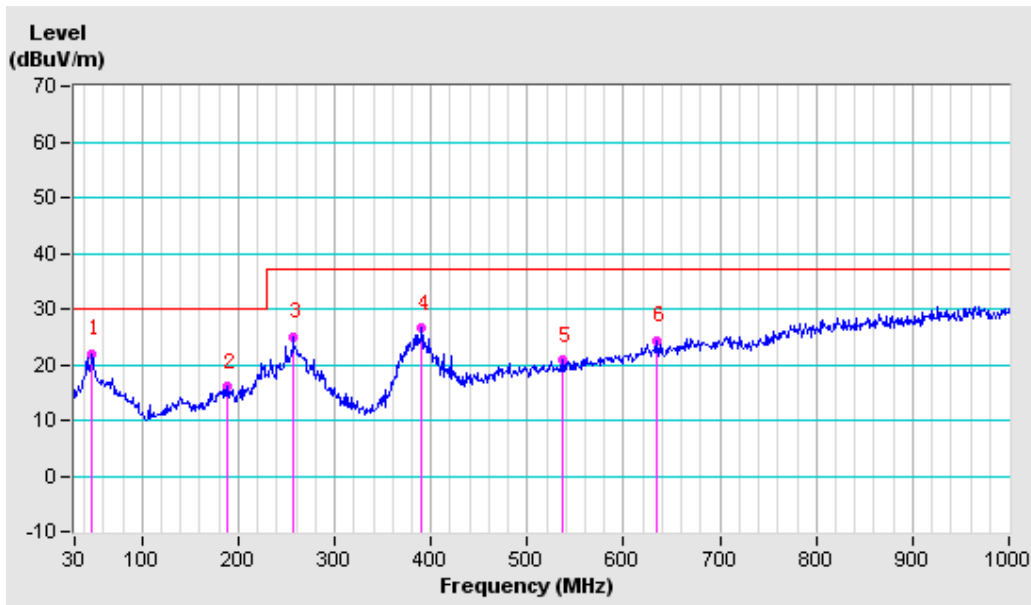
TEST MODE		Charging						
FREQUENCY RANGE		30-1000 MHz		DETECTOR FUNCTION & BANDWIDTH		Quasi-Peak, 120kHz		
ENVIRONMENTAL CONDITIONS		21deg. C, 54% RH		TESTED BY: Clein				
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	39.991	-9.32	26.03	16.71	30.00	-13.29	400	248
2	160.957	-9.05	24.41	15.36	30.00	-14.64	400	104
3	262.909	-9.62	28.05	18.43	37.00	-18.57	400	135
4	368.886	-6.59	28.62	22.03	37.00	-14.97	400	16
5	478.356	-4.40	27.29	22.89	37.00	-14.11	400	31
6	534.231	-3.52	25.07	21.55	37.00	-15.45	400	189

- 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 MODE		Charging						
FREQUENCY RANGE		30-1000 MHz		DETECTOR FUNCTION & BANDWIDTH		Quasi-Peak, 120kHz		
ENVIRONMENTAL CONDITIONS		21deg. C, 54% RH		TESTED BY: Clein				
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	48.309	-7.88	29.86	21.98	30.00	-8.02	100	137
2	189.080	-9.82	25.82	16.00	30.00	-14.00	100	77
3	257.586	-6.70	31.57	24.87	37.00	-12.13	100	136
4	390.719	-7.82	34.31	26.49	37.00	-10.51	100	336
5	535.855	-3.99	24.75	20.76	37.00	-16.24	100	178
6	634.553	-0.84	25.05	24.21	37.00	-12.79	100	353

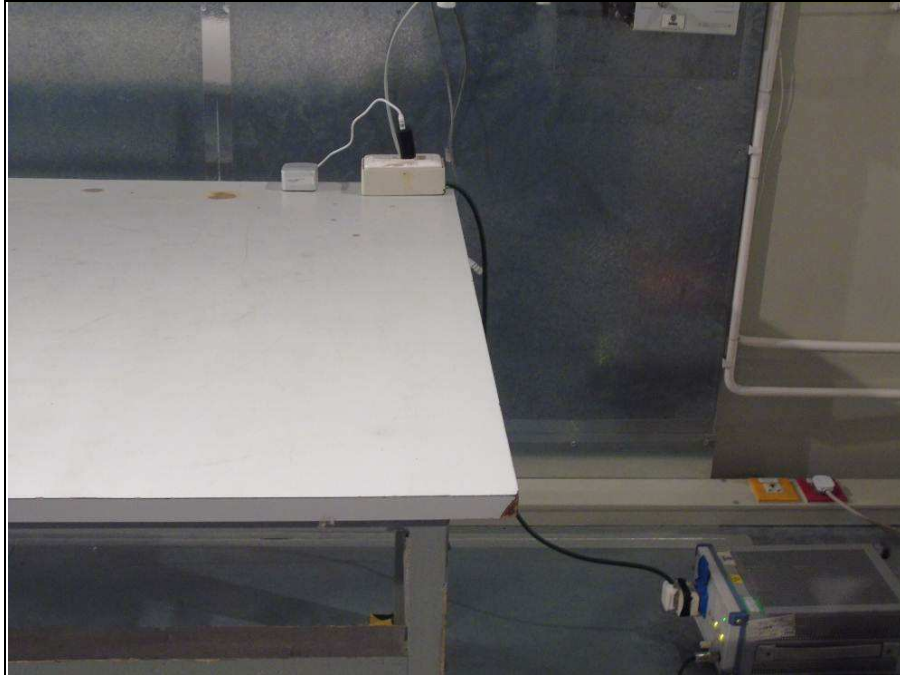
- REMARKS:**
1. Peak detector quick scan is showed on the graph and final quasi-peak detector data is measured corresponding to relevant limit and recorded in the data table.
 2. Negative sign (-) in the margin column signify levels below the limit.
 3. Frequency range scanned: 30MHz to 1000MHz.
 4.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





5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST (<30MHz-1GHz>)





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Test Report No.: CT170412N004

6 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