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TEST REPORT

Report No.: 20090840HKG-002

Binatone Electronics International Ltd.

Application For Certification
(Original Grant)

FCC ID: VLJ-ST700

Transceiver

Prepared and Checked by:	**Approved by:**
Signed On File Wong Cheuk Ho, Herbert Lead Engineer	Digitally signed by Kenneth Wong Location: Intertek Testing Services Hong Kong Limited Wong Kwok Yeung, Kenneth Senior Lead Engineer Date: June 01, 2021

TEST REPORT

GENERAL INFORMATION

Grantee:	Binatone Electronics International Ltd.
Grantee Address:	25/F., Guangdong Investment Tower, 148 Connaught Road, Central, Sheung Wan, Hong Kong, China
Contact Person:	Sam Lee
Tel:	(852) 607880044
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e-mail:	Sam.Lee@binatoneglobal.com
Manufacturer:	Dongguan Guanglei Environmental Protection Technology Co., Ltd.
Manufacturer Address:	1st Building, No.15 Dalingbian Road, Shahu, Tangxia Dongguan City, Guangdong Province, China
Brand Name:	Hubble
Model:	Hubble Pure
Type of EUT:	Transceiver
Description of EUT:	3-in-1 Light & Sound Nursery Air Purifier
Serial Number:	N/A
FCC ID:	VLJ-ST700
Date of Sample Submitted:	September 17, 2020
Date of Test:	September 17, 2020 to March 08, 2021
Report No.:	20090840HKG-002
Report Date:	June 01, 2021
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%
Conclusion:	Test was conducted by client submitted sample. The submitted sample as received complied with the 47 CFR Part 15 Certification.

TEST REPORT

SUMMARY OF TEST RESULT

Test Specification	Reference	Results
Transmitter Power Line Conducted Emissions	15.207	Pass
Radiated Emission Radiated Emission on the Bandedge	15.249, 15.209	Pass
Radiated Emission in Restricted Bands	15.205	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2019 Edition

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

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TEST REPORT

1.0 GENERAL DESCRIPTION

1.1 Product Description

The Equipment Under Test (EUT) Hubble Pure is a 3-in-1 Light & Sound Air Purifier which is a Bluetooth Speaker with Air Purifier and Light feature. The EUT is powered by AC/DC adaptor.

Antenna Type: Internal, Integral

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is a single application for certification of a transceiver.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The 3m Chamber and conducted measurement facility used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong SAR, China. This test facility and site measurement data have been placed on file with the FCC.

TEST REPORT

2.0 SYSTEM TEST CONFIGURATION

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.10 (2013).

The device was powered by 120VAC.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The unit was operated standalone and placed in the rear of the turntable.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

The EUT exercise program (if any) used during radiated testing was designed to exercise the various system components in a manner similar to a typical use.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Measurement Uncertainty

Decision Rule for compliance: For FCC/IC standard, the measured value must be within the limits of applicable standard without accounting for the measurement uncertainty. For EN/IEC/HKTA/HKTC standard, conformity rules will be used as per standard directly excepted EN/IEC 61000-3-2, EN/IEC 61000-3-3, HKTA1004, HKCA1008, HKTA1019, HKTA1020, HKTA1041 and HKTA1044. For these excepted or not mentioned standards, Cl 4.2.2 of ILAC-G8:09/2019 decision rules will be reference and guard band will be equal to our measurement uncertainty with 95% confidence level (k=2). In case, the measured value is within guard band region, undetermined decision will be used.

Uncertainty and Compliance - Unless the standard specifically states that measured values are to be extended by the measurement uncertainty in determining compliance, all compliance determinations are based on the actual measured value.

2.5 Support Equipment List and Description

Adaptor (Provided by Applicant)
Model: BQ12G-0502000-U
Input: 100-240VAC 1A 50/60Hz
Output: 5VDC 2A.

TEST REPORT

3.0 EMISSION RESULTS

Data is included of the worst-case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 27 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

TEST REPORT

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 2480.000 MHz

For electronic filing, the worst-case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 1.4 dB

3.4 Conducted Emission Configuration Photograph

The worst case in line-conducted emission was found at 3.345 MHz

For electronic filing, the worst-case line-conducted configuration photographs are saved with filename: conducted photo.pdf.

3.5 Conducted Emission Data

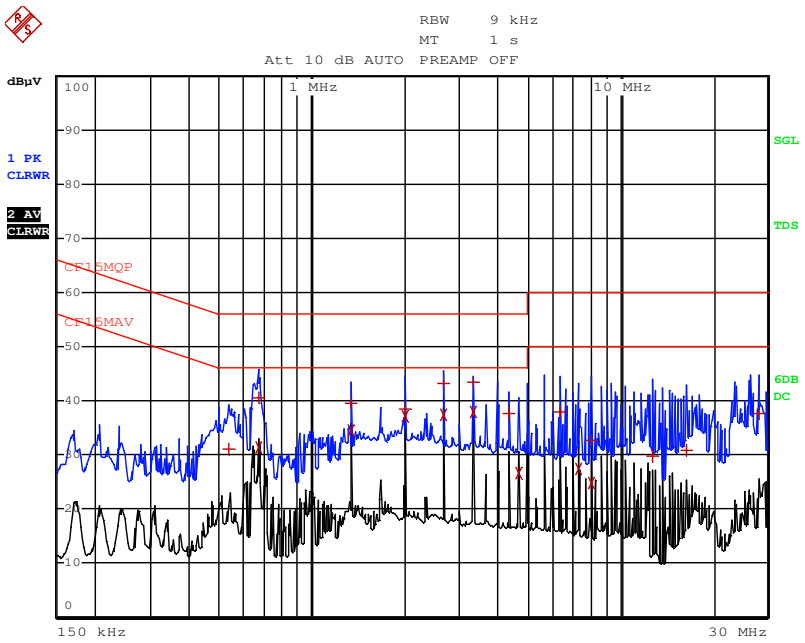
For electronic filing, the graph and data table of conducted emission is saved with filename: conducted.pdf.

Judgment: Pass by 8.0 dB

TEST REPORT

CONDUCTED EMISSION

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Bluetooth + Audio (Live)



EDIT PEAK LIST (Final Measurement Results)

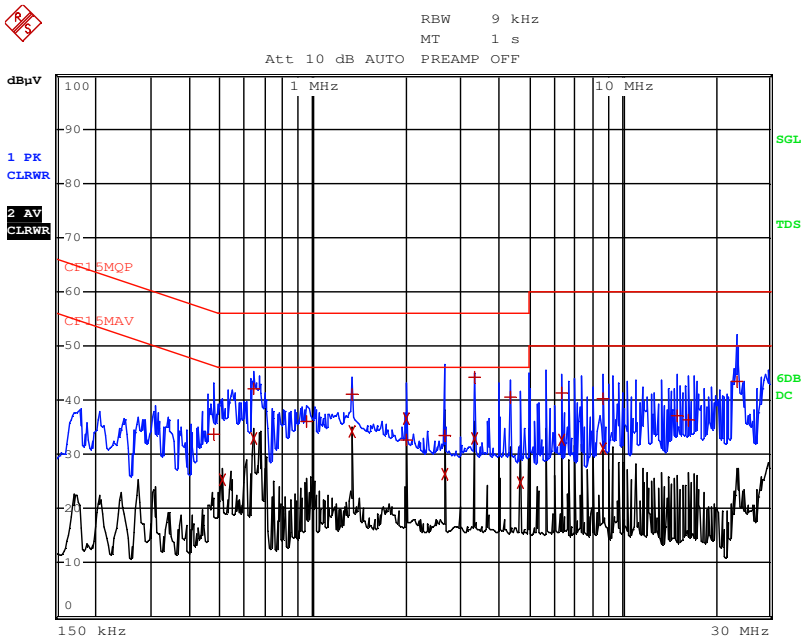
Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	537 kHz	31.11	L1	-24.88
1	Quasi Peak	672 kHz	40.45	L1	-15.54
2	CISPR Average	672 kHz	31.41	L1	-14.59
1	Quasi Peak	1.338 MHz	39.51	L1	-16.48
2	CISPR Average	1.338 MHz	34.52	L1	-11.47
1	Quasi Peak	2.0085 MHz	38.55	L1	-17.44
2	CISPR Average	2.0085 MHz	37.15	L1	-8.84
1	Quasi Peak	2.6745 MHz	43.09	L1	-12.90
2	CISPR Average	2.6745 MHz	37.28	L1	-8.71
1	Quasi Peak	3.345 MHz	43.50	L1	-12.49
2	CISPR Average	3.345 MHz	37.95	L1	-8.04
1	Quasi Peak	4.3485 MHz	37.76	L1	-18.23
2	CISPR Average	4.6815 MHz	26.55	L1	-19.44
1	Quasi Peak	6.3555 MHz	38.05	L1	-21.94
2	CISPR Average	7.359 MHz	27.52	L1	-22.47
1	Quasi Peak	8.025 MHz	32.69	L1	-27.30
2	CISPR Average	8.025 MHz	24.90	L1	-25.09
1	Quasi Peak	12.705 MHz	29.71	L1	-30.28
1	Quasi Peak	16.3905 MHz	30.89	L1	-29.10
1	Quasi Peak	28.2615 MHz	37.77	L1	-22.22

Note: Measurement Uncertainty is ±4.2dB at a level of confidence of 95%.

TEST REPORT

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Bluetooth + Audio (Neutral)



EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	478.5 kHz	33.71	N	-22.65
2	CISPR Average	510 kHz	25.31	N	-20.68
1	Quasi Peak	645 kHz	42.13	N	-13.87
2	CISPR Average	645 kHz	32.98	N	-13.01
1	Quasi Peak	951 kHz	36.14	N	-19.85
1	Quasi Peak	1.338 MHz	41.14	N	-14.85
2	CISPR Average	1.338 MHz	34.18	N	-11.81
1	Quasi Peak	2.004 MHz	32.58	N	-23.41
2	CISPR Average	2.0085 MHz	36.52	N	-9.47
1	Quasi Peak	2.6745 MHz	33.43	N	-22.56
2	CISPR Average	2.6745 MHz	26.39	N	-19.60
1	Quasi Peak	3.3495 MHz	44.31	N	-11.68
2	CISPR Average	3.3495 MHz	32.81	N	-13.18
1	Quasi Peak	4.353 MHz	40.44	N	-15.55
2	CISPR Average	4.686 MHz	24.72	N	-21.27
1	Quasi Peak	6.3645 MHz	41.43	N	-18.56
2	CISPR Average	6.3645 MHz	32.61	N	-17.38
1	Quasi Peak	8.709 MHz	40.20	N	-19.79
2	CISPR Average	8.709 MHz	31.10	N	-18.89
1	Quasi Peak	15.0765 MHz	37.04	N	-22.95

Note: Measurement Uncertainty is ±4.2dB at a level of confidence of 95%.

TEST REPORT

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Bluetooth + Audio (Neutral)

EDIT PEAK LIST (Final Measurement Results)

Trace1:	CF15MQP
Trace2:	CF15MAV
Trace3:	---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	16.413 MHz	36.29	N	-23.70
1	Quasi Peak	23.4465 MHz	43.39	N	-16.60

Note: Measurement Uncertainty is ±4.2dB at a level of confidence of 95%.

TEST REPORT

RADIATED EMISSIONS

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Transmitting (Bluetooth 3.0)

Table 1
Pursuant to FCC Part 15 Section 15.249 Requirement

Lowest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	94.2	33	29.4	90.6	94.0	-3.4
H	4804.000	40.7	33	34.9	42.6	54.0	-11.4
H	7206.000	34.9	33	37.9	39.8	54.0	-14.2
H	9608.000	29.8	33	40.4	37.2	54.0	-16.8
H	12010.000	29.3	33	40.5	36.8	54.0	-17.2
H	14412.000	29.5	33	40.0	36.5	54.0	-17.5

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2402.000	102.2	33	29.4	98.6	114.0	-15.4
H	4804.000	51.7	33	34.9	53.6	74.0	-20.4
H	7206.000	47.3	33	37.9	52.2	74.0	-21.8
H	9608.000	41.4	33	40.4	48.8	74.0	-25.2
H	12010.000	40.7	33	40.5	48.2	74.0	-25.8
H	14412.000	41.2	33	40.0	48.2	74.0	-25.8

NOTES:
1. Peak Detector Data unless otherwise stated. Average detector is applied according to ANSI C63.10.
2. All measurements were made at 3 meters.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Transmitting (Bluetooth 3.0)

Table 2
Pursuant to FCC Part 15 Section 15.249 Requirement

Middle Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2440.000	95.4	33	29.4	91.8	94.0	-2.2
H	4880.000	41.7	33	34.9	43.6	54.0	-10.4
H	7320.000	35.9	33	37.9	40.8	54.0	-13.2
H	9760.000	30.1	33	40.4	37.5	54.0	-16.5
H	12200.000	29.3	33	40.5	36.8	54.0	-17.2
H	14640.000	31.2	33	38.4	36.6	54.0	-17.4

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2440.000	102.8	33	29.4	99.2	114.0	-14.8
H	4880.000	51.9	33	34.9	53.8	74.0	-20.2
H	7320.000	47.9	33	37.9	52.8	74.0	-21.2
H	9760.000	41.2	33	40.4	48.6	74.0	-25.4
H	12200.000	41.0	33	40.5	48.5	74.0	-25.5
H	14640.000	43.0	33	38.4	48.4	74.0	-25.6

NOTES:
1. Peak Detector Data unless otherwise stated. Average detector is applied according to ANSI C63.10.
2. All measurements were made at 3 meters.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Transmitting (Bluetooth 3.0)

Table 3
Pursuant to FCC Part 15 Section 15.249 Requirement

Highest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	96.2	33	29.4	92.6	94.0	-1.4
H	4960.000	43.7	33	34.9	45.6	54.0	-8.4
H	7440.000	37.9	33	37.9	42.8	54.0	-11.2
H	9920.000	30.2	33	40.4	37.6	54.0	-16.4
H	12400.000	29.3	33	40.5	36.8	54.0	-17.2
H	14880.000	31.1	33	38.4	36.5	54.0	-17.5

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Peak Limit at 3m (dBµV/m)	Margin (dB)
H	2480.000	104.2	33	29.4	100.6	114.0	-13.4
H	4960.000	52.9	33	34.9	54.8	74.0	-19.2
H	7440.000	48.9	33	37.9	53.8	74.0	-20.2
H	9920.000	41.4	33	40.4	48.8	74.0	-25.2
H	12400.000	41.3	33	40.5	48.8	74.0	-25.2
H	14880.000	43.2	33	38.4	48.6	74.0	-25.4

NOTES:
1. Peak Detector Data unless otherwise stated. Average detector is applied according to ANSI C63.10.
2. All measurements were made at 3 meters.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

Model: Hubble Pure
Date of Test: March 08, 2021
Worst-Case Operating Mode: Bluetooth + Audio

Table 4
Pursuant to FCC Part 15 Section 15.209 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	34.018	32.8	16	10.0	26.8	40.0	-13.2
V	64.710	42.5	16	9.0	35.5	40.0	-4.5
H	125.792	37.4	16	14.0	35.4	43.5	-8.1
H	139.842	38.8	16	14.0	36.8	43.5	-6.7
V	166.742	35.2	16	17.0	36.2	43.5	-7.3
V	332.368	17.5	16	24.0	25.5	46.0	-20.5

NOTES:
1. Quasi-Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

TEST REPORT

4.0 EQUIPMENT PHOTOGRAPHS

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 PRODUCT LABELLING

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 TECHNICAL SPECIFICATIONS

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 INSTRUCTION MANUAL

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States.

TEST REPORT

8.0 MISCELLANEOUS INFORMATION

The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor (calculation and timing diagram).

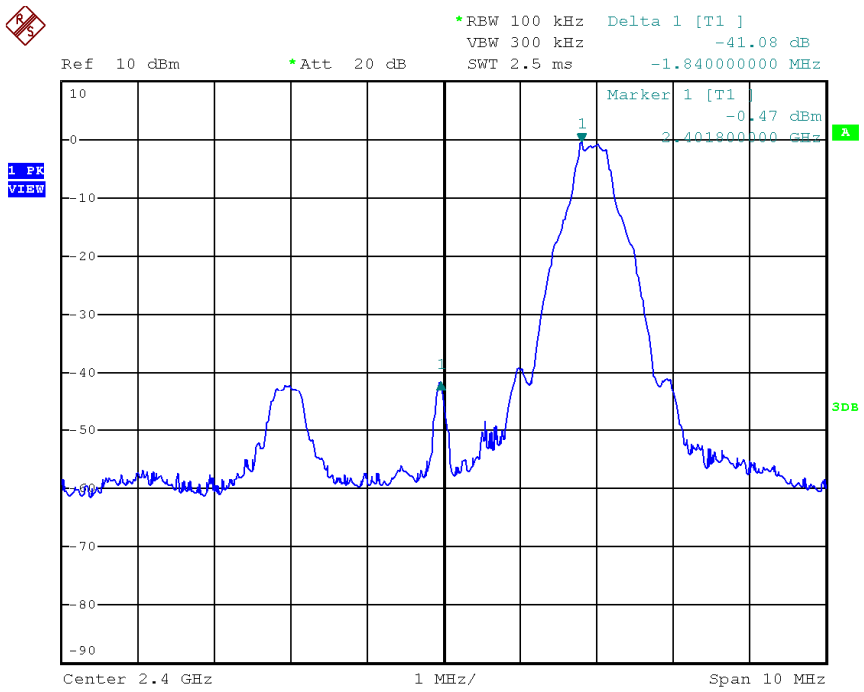
8.1 Radiated Emission on the Bandedge

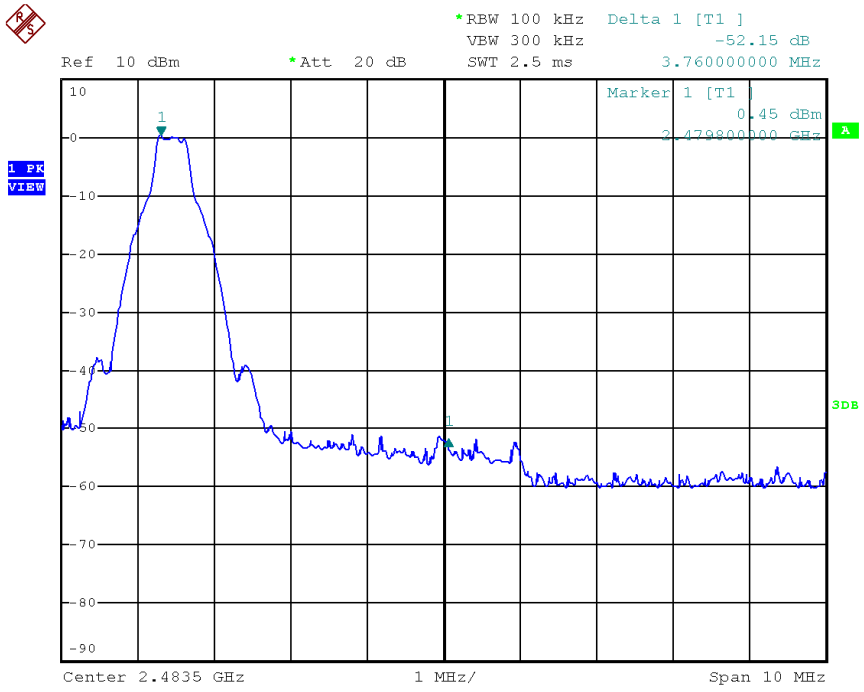
From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz to 2483.5MHz). In case of the fundamental emissions are within two standard bandwidths from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.10 (2013) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50dB below the level of the fundamental or to the general radiated emissions limits in Section 15.209 , whichever is the lesser attenuation, which meet the requirement of part 15.249(d).

TEST REPORT

PEAK MEASUREMENT (Bluetooth 3.0)





TEST REPORT

PEAK MEASUREMENT (Bluetooth 3.0)

Bandedge compliance is determined by applying marker-delta method, i.e. (Bandedge Plot).

Lower bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=98.6 dBµV/m – 41.1 dB
=57.5 dBµV/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=90.6 dBµV/m – 41.1 dB
=49.5 dBµV/m

Upper bandedge

Peak Resultant field strength = Fundamental emissions (peak value) – delta from the plot

=100.6 dBµV/m – 52.2 dB
=48.4 dBµV/m

Average Resultant field strength = Fundamental emissions (average value) – delta from the plot

=92.6 dBµV/m – 52.2 dB
=40.4 dBµV/m

The resultant field strength meets the general radiated emission limit in Section 15.209, which does not exceed 74 dBµV/m (Peak Limit) and 54 dBµV/m (Average Limit).

TEST REPORT

8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. The effective period (Teff) is approximately 625µs for a digital "1" bit which illustrated on technical specification, with a resolution bandwidth (3dB) of 3MHz, so the pulse desensitivity factor is 0dB.

8.3 Calculation of Average Factor

N/A

TEST REPORT

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately 0.8m in height above the ground plane for emission measurement at or below 1GHz and 1.5m in height above the ground plane for emission measurement above 1GHz. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower. For line conducted emissions, the range scanned is 150 kHz to 30 MHz.

TEST REPORT

8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

Conducted measurements were made as described in ANSI C63.10 (2013).

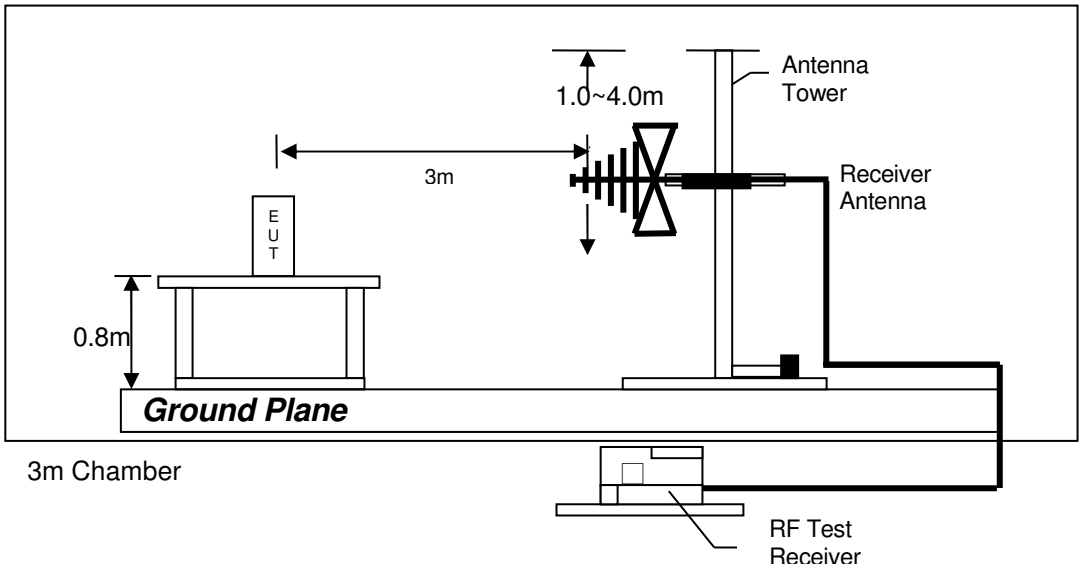
The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 3 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

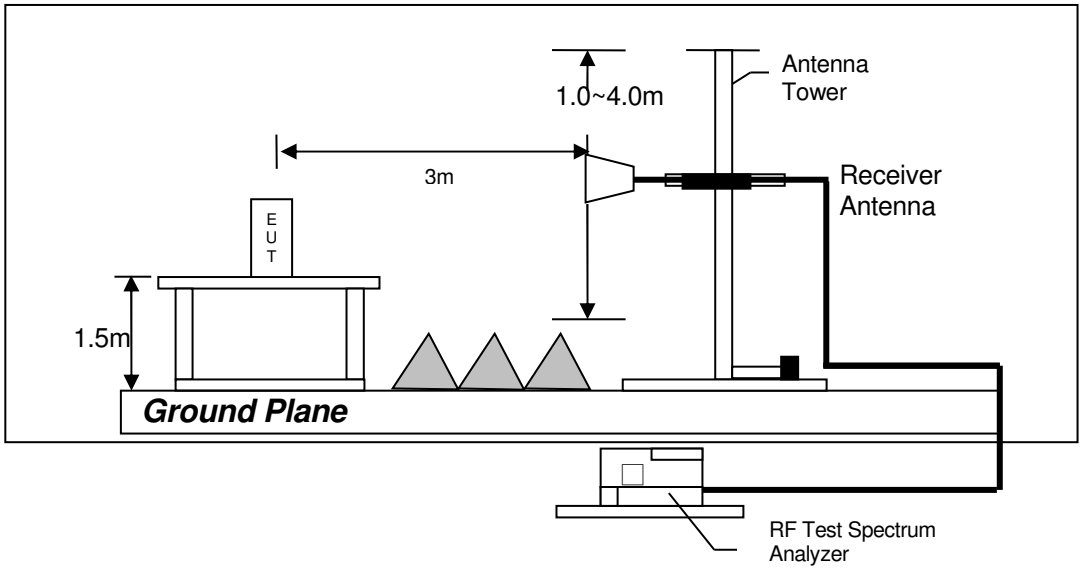
TEST REPORT

8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.



Test setup of radiated emissions up to 1GHz



Test setup of radiated emissions above 1GHz

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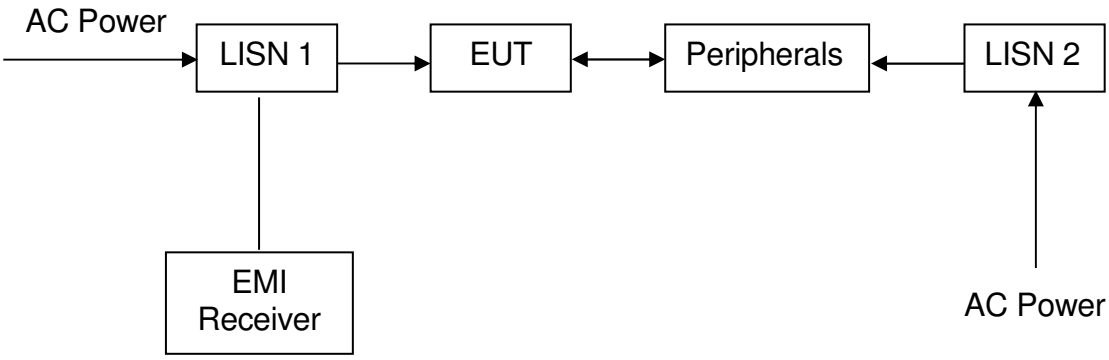
8.4.2 Conducted Emission Test Procedures

For tabletop equipment, the EUT along with its peripherals were placed on a 1.0m(W)×1.5m(L) and 0.8m in height wooden table. For floor-standing equipment, the EUT and all cables were insulated, if required, from the ground plane by up to 12 mm of insulating material. The EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane. The EUT was connected to power mains through a line impedance stabilization network (LISN), which provided 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room. The excess power cable between the EUT and the LISN was bundled.

All connecting cables of EUT and peripherals were moved to find the maximum emission.

8.4.3 Conducted Emission Test Setup



TEST REPORT

9.0 CONFIDENTIALITY REQUEST

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

10.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Spectrum Analyzer	Biconical Antenna (20MHz to 200MHz)
Registration No.	EW-3156	EW-2466	EW-2512
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ	EMCO
Model No.	ESR26	FSP30	3104C
Calibration Date	January 25, 2021	September 05, 2020	June 03, 2020
Calibration Due Date	January 25, 2022	September 05, 2021	December 03, 2021

Equipment	Log Periodic Antenna	Double Ridged Guide Antenna	Active Loop H-field (9kHz to 30MHz)
Registration No.	EW-0447	EW-0194	EW-2313
Manufacturer	EMCO	EMCO	ELECTROMETRI
Model No.	3146	3115	EM-6876
Calibration Date	September 25, 2019	September 26, 2019	December 17, 2019
Calibration Due Date	March 25, 2021	March 26, 2021	June 17, 2021

Equipment	RF Cable 14m (1GHz to 26.5GHz)	14m Double Shield RF Cable (20MHz to 6GHz)	12 metre RF Cable 40GHz
Registration No.	EW-2781	EW-2074	EW-2774
Manufacturer	GREATBILLION	RADIALL	GREATBILLION
Model No.	SMA m/SHF5MPU /SMA m ra14m,26G	N(m)-RG142-BNC(m) L= 14M	SMA m-m ra 12m 40G outdoor
Calibration Date	November 24, 2020	August 29, 2020	September 12, 2020
Calibration Due Date	November 24, 2021	August 29, 2021	September 12, 2021

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2) Conducted Emissions Test

Equipment	RF Cable 240cm (RG142) (9kHz to 30MHz)	Artificial Mains Network	EMI Test Receiver
Registration No.	EW-2454	EW-2501	EW-2251
Manufacturer	RADIALL	ROHDESCHWARZ	ROHDESCHWARZ
Model No.	bnc m st / 142 /bnc m ra 240cm	ENV-216	ESCI
Calibration Date	November 10, 2020	September 11, 2020	January 29, 2021
Calibration Due Date	November 10, 2021	September 11, 2021	January 29, 2022

3) Bandedge & Bandwidth Measurement

Equipment	5m RF Cable (40GHz)	Spectrum Analyzer
Registration No.	EW-2701	EW-2466
Manufacturer	RADIALL	ROHDESCHWARZ
Model No.	sma m-m 5m 40G	FSP30
Calibration Date	November 24, 2020	September 05, 2020
Calibration Due Date	November 24, 2021	September 05, 2021

END OF TEST REPORT