2/F., Garment Centre,
576 Castle Peak Road, Kowloon,
Hong Kong SAR, China.

Telephone: (852) 2173 8888
Facsimile: (852) 2785 5487
www.intertek.com

TEST REPORT

Report No.: 21080012HKG-001

Application For Original Grant of 47 CFR Part 15 Certification
Single New of RSS-210 Issue 10 Equipment Certification

Hush Pro Soothing Sleep Trainer

FCC ID: EW780-2536-00
IC: 1135B-80253600

Prepared and Checked by:	**Approved by:**
Signed On File Wong Cheuk Ho, Herbert Lead Engineer	Intertek Testing Services Hong Kong Ltd. Tang Kwan Mo, Jess Lead Engineer Date: September 02, 2021

TEST REPORT

GENERAL INFORMATION

Grantee:	VTech Telecommunications Ltd.
Grantee Address:	23/F., Tai Ping Industrial Centre, Block 1, 57 Ting Kok Road, Tai Po, Hong Kong.
Manufacturer Name:	VTech (Dongguan) Telecommunications Limited.
Manufacturer Address:	VTech Science Park, Xia Ling Bei Management Zone, Liaobu, Dongguan, Guangdong, China.
FCC Specification Standard:	FCC Part 15, October 1, 2020 Edition
FCC ID:	EW780-2536-00
FCC Model(s):	BC8313
IC Specification Standard:	RSS-210 Issue 10 Amendment 1, April 2020 RSS-Gen Issue 5 Amendment 2, February 2021
IC:	1135B-80253600
HVIN	35-201694
PMN	BC8313
Type of EUT:	Transceiver
Description of EUT:	Hush Pro Soothing Sleep Trainer
Sample Receipt Date:	August 02, 2021
Date of Test:	August 08 - September 02, 2021
Report Date:	September 02, 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 / RSS-210 Issue 10 Certification.

TEST REPORT

TABLE OF CONTENTS

1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE 4

1.1 Summary of Test Results 4
1.2 Statement of Compliance 4

2.0 GENERAL DESCRIPTION 5

2.1 Product Description 5
2.2 Test Methodology 5
2.3 Test Facility 5

3.0 SYSTEM TEST CONFIGURATION 6

3.1 Justification 6
3.2 EUT Exercising Software 7
3.3 Radiated Emission Test Setup 8
3.4 Conducted Emission Test Setup 9
3.5 Details of EUT and Description of Accessories 10
3.6 Measurement Uncertainty 10

4.0 TEST RESULTS 11

4.1 Field Strength Calculation 11
4.2 Radiated Emissions 12
4.2.1 Radiated Emission Configuration Photograph 12
4.2.2 Radiated Emission Data 12
4.2.3 Transmitter Duty Cycle Calculation 20
4.3 Radiated Emission on the Bandedge 21
4.4 AC Power Line Conducted Emission 25
4.4.1 AC Power Line Conducted Emission Configuration Photograph 25
4.4.2 AC Power Line Conducted Emission Data 25

5.0 EQUIPMENT LIST 28

TEST REPORT

1.0 TEST RESULTS SUMMARY & STATEMENT OF COMPLIANCE

1.1 Summary of Test Results

Test Items	FCC Part 15 Section	RSS-210/ RSS-Gen#/ RSS-310^ Section	Results	Details See Section
Antenna Requirement	15.203	6.8#	Pass	2.1
Radiated Emission	15.249(a), 209, & 109	B10(a)	Pass	4.2
Radiated Emission on the Bandedge	15.249(d)	B10(b)	Pass	4.3
Radiated Emission in Restricted Bands	15.205	7.1	Pass	4.2
AC Power Line Conducted Emission	15.207 & 15.107	8.8#	Pass	4.4

Note: Pursuant to FCC Part 15 Section 15.215(c), the 20dB 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 expected variations in temperature and supply voltage were considered.

1.2 Statement of Compliance

The equipment under test is found to be complying with the following standards:

FCC Part 15, October 1, 2020 Edition
RSS-210 Issue 10 Amendment 1, April 2020
RSS-Gen Issue 5 Amendment 2, February 2021

TEST REPORT

2.0 GENERAL DESCRIPTION

2.1 Product Description

The BC8313 (35-201694) is a Hush Pro Soothing Sleep Trainer. It operates at frequency range of 2402MHz to 2480MHz. The EUT is power by a 3.6VDC (1 x 3.6V 2600mAh 9.36Wh Li-ion rechargeable battery) and 100-240VAC 50/60Hz 0.5A adaptor.

The Bluetooth antenna used in base unit is integral, and the test sample is a prototype.

The circuit description is saved with filename: descri.pdf.

2.2 Test Methodology

Both AC power line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.10 (2013). Preliminary radiated scans and all radiated measurements were performed in Radiated Emission Test Sites. All Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "**Justification Section**" of this Application.

2.3 Test Facility

The radiated emission test sites and conducted measurement facility used to collect the radiated data and conducted data are 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 fully placed on file with the FCC and IC No. 2042H, CABID is “HKAP01”.

TEST REPORT

3.0 SYSTEM TEST CONFIGURATION

3.1 Justification

For radiated emissions testing, the equipment under test (EUT) was setup to transmit continuously mode to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing. During testing, all cables (if any) were manipulated to produce worst case emissions.

The EUT is power by a 3.6VDC (1 x 3.6V 2600mAh 9.36Wh Li-ion rechargeable battery) and 100-240VAC 50/60Hz 0.5A adaptor.

For the measurements, the EUT was attached to a plastic stand if necessary and placed on the 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. If the base unit attached to peripherals, they were connected and operational to simulate typical use.

The signal was maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization were varied during the search for maximum signal level. The antenna height was varied from 1 to 4 meters. Radiated emissions were taken at three meters unless the signal level was too low for measurement at that distance. If necessary, a pre-amplifier was used and/or the test was conducted at a closer distance.

For any intentional radiator powered by AC power line, measurements of the radiated signal level of the fundamental frequency component of the emission was performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

For transmitter radiated measurement, the spectrum analyzer resolution bandwidth was 100 kHz for frequencies below 1000 MHz. The resolution bandwidth was 3 MHz for frequencies above 1000 MHz.

Radiated emission measurement for transmitter was performed 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 to 40 GHz, whichever is lower.

Emission that are directly caused by digital circuits in the transmit path and transmitter portion were measured, and the limit are according to FCC Part 15 Section 15.209. Digital circuitry used to control additional functions other than the operation of the transmitter are subject to FCC Part 15 Section 15.109 Limits.

TEST REPORT

3.1 Justification - Cont'd

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 section 4.2.3.

Determination of pulse desensitization was made according to *Hewlett Packard Application Note 150-2, Spectrum Analysis... Pulsed RF.* The effective period (Teff) was 625µs. With the resolution bandwidth 1MHz and spectrum analyzer IF bandwidth 3dB, the pulse desensitization factor was 0dB.

For AC line conducted emission test, the EUT along with its peripherals were placed on a 1.0m(W)x1.5m(L) and 0.8m in height wooden table and 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 50ohm coupling impedance for measuring instrument. The LISN housing, measuring instrument case, reference ground plane, and vertical ground plane were bounded together. The excess power cable between the EUT and the LISN was bundled.

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

All relevant operation modes have been tested, and the worst case data was included in this report.

3.2 EUT Exercising Software

The EUT exercise program (FCC_assist V1.0.2.2) was used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use.

TEST REPORT

3.3 Radiated Emission Test Setup

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

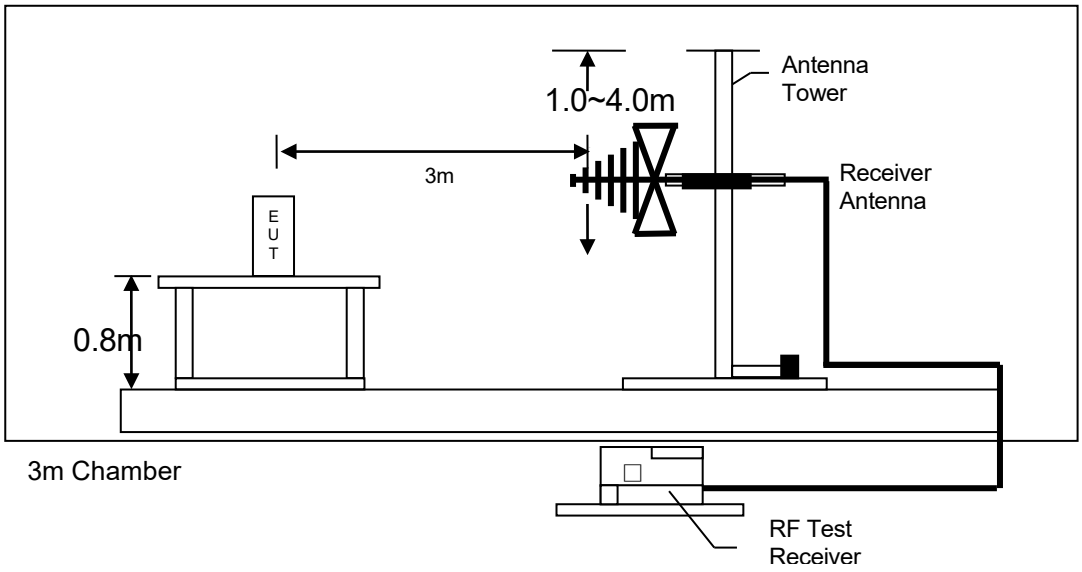


Figure 3.3.1 Test setup of radiated emissions up to 1GHz

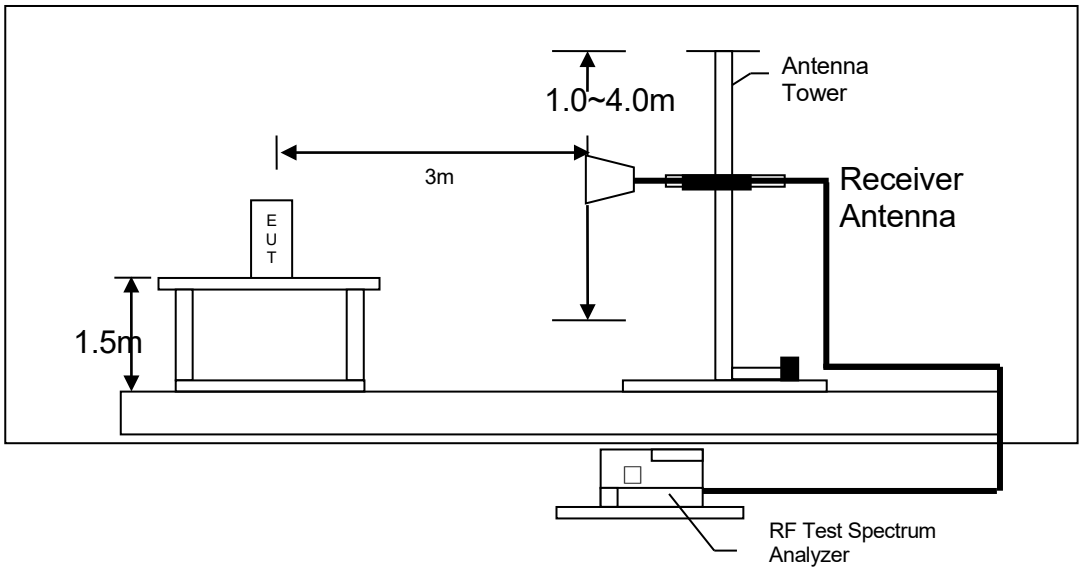


Figure 3.3.2 Test setup of radiated emissions above 1GHz

TEST REPORT

3.4 Conducted Emission Test Setup

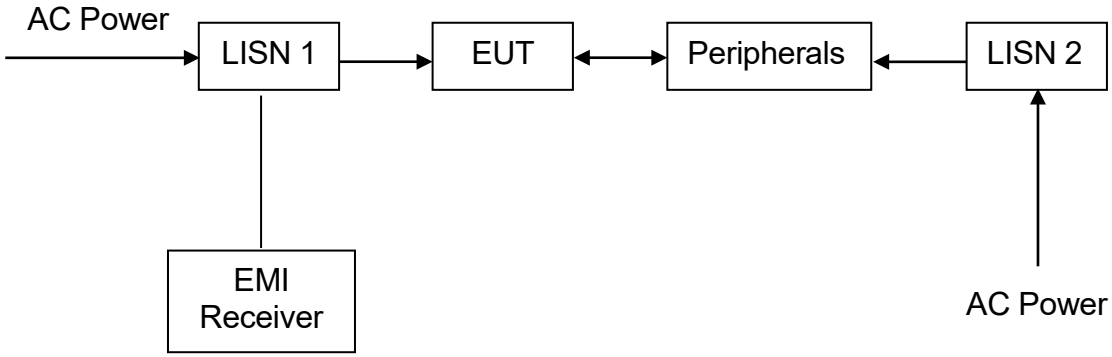


Figure 3.4.1

TEST REPORT

3.5 Details of EUT and Description of Accessories

Details of EUT:

An AC adaptor (provided with the unit) was used to power the device. Their description are listed below.

(1) Internal Li-ion rechargeable battery (3.6V 2600mAh 9.36Wh, Model: ICR18650-2.6Ah-3.6V-1S1P) (Provided by Client)
(2) An AC adaptor (100-240VAC 50/60Hz 0.5A to 5.0VDC 2.0A 10W, Model: VT07EUS05200, Brand VTPL) (Provided by Client)

Description of Accessories:

There are no accessories for compliance of this product.

3.6 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. The values of the Measurement uncertainty for radiated emission test, AC line conducted emission test and RF conducted test, frequency stability and timing jitter are ± 5.3dB, ± 4.2dB, ±1dB, ±23Hz, 0.1μs respectively.

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.

TEST REPORT

4.0 TEST 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.

4.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

FS = RA + AF + CF - AG + PD + 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
PD = Pulse Desensitization in dB
AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflects the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

FS = RA + AF + CF - AG + PD +AV

Example
Assume a receiver reading of 62.0 dBμV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0 dB, and the resultant average factor was -10 dB. The net field strength for comparison to the appropriate emission limit is 32 dBμV/m. This value in dBμV/m was converted to its corresponding level in μV/m.

RA = 62.0 dBμV
AF = 7.4 dB
CF = 1.6 dB
AG = 29 dB
PD = 0 dB
AV = -10 dB
FS = 62 + 7.4 +1.6 -29 +0 + (-10) = 32 dBμV/m

Level in μV/m = Common Antilogarithm [(32 dBμV/m)/20] = 39.8 μV/m

TEST REPORT

4.2 Radiated Emissions

4.2.1 Radiated Emission Configuration Photograph

Worst Case Radiated Emission
at

122.5 MHz

The worst case radiated emission configuration photographs are saved with filename: config photos.pdf

4.2.2 Radiated Emission Data

The data in tables 1-7 list the significant emission frequencies, the limit and the margin of compliance. Test setup is shown in section 3.3 Figure 3.3.1 and 3.3.2.

Judgement -

Passed by 7.7 dB margin

TEST REPORT

RADIATED EMISSION DATA

Mode: TX-Channel 00

Table 1, Bluetooth Classic

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	100.4	33	29.4	96.8	24	72.8	94.0	-21.2
V	4804.000	53.4	33	34.9	55.3	24	31.3	54.0	-22.7
V	7206.000	33.1	33	37.9	38.0	24	14.0	54.0	-40.0
V	9608.000	43.2	33	40.4	50.6	24	26.6	54.0	-27.4
H	12010.000	31.5	33	40.5	39.0	24	15.0	54.0	-39.0
H	14412.000	31.5	33	40.0	38.5	24	14.5	54.0	-39.5

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)
V	2402.000	100.4	33	29.4	96.8	114.0	-17.2
V	4804.000	53.4	33	34.9	55.3	74.0	-18.7
V	7206.000	33.1	33	37.9	38.0	74.0	-36.0
V	9608.000	43.2	33	40.4	50.6	74.0	-23.4
H	12010.000	31.5	33	40.5	39.0	74.0	-35.0
H	14412.000	31.5	33	40.0	38.5	74.0	-35.5

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: TX-Channel 39

Table 2, Bluetooth Classic

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2442.000	103.2	33	29.4	99.6	24	75.6	94.0	-18.4
V	4884.000	50.3	33	34.9	52.2	24	28.2	54.0	-25.8
H	7326.000	33.7	33	37.9	38.6	24	14.6	54.0	-39.4
V	9768.000	51.8	33	40.4	59.2	24	35.2	54.0	-18.8
V	12210.000	31.4	33	40.5	38.9	24	14.9	54.0	-39.1
V	14652.000	33.3	33	38.4	38.7	24	14.7	54.0	-39.4

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)
V	2442.000	103.2	33	29.4	99.6	114.0	-14.4
V	4884.000	50.3	33	34.9	52.2	74.0	-21.8
H	7326.000	33.7	33	37.9	38.6	74.0	-35.4
V	9768.000	51.8	33	40.4	59.2	74.0	-14.8
V	12210.000	31.4	33	40.5	38.9	74.0	-35.1
V	14652.000	33.3	33	38.4	38.7	74.0	-35.4

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: TX-Channel 78

Table 3, Bluetooth Classic

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Peak (dBµV/m)	Average Factor (dB)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	102.4	33	29.4	98.8	24	74.8	94.0	-19.2
V	4960.000	59.3	33	34.9	61.2	24	37.2	54.0	-16.8
H	7440.000	33.7	33	37.9	38.6	24	14.6	54.0	-39.4
V	9920.000	44.0	33	40.4	51.4	24	27.4	54.0	-26.6
V	12400.000	31.0	33	40.5	38.5	24	14.5	54.0	-39.5
H	14880.000	33.4	33	38.4	38.8	24	14.8	54.0	-39.2

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)
V	2480.000	102.4	33	29.4	98.8	114.0	-15.2
V	4960.000	59.3	33	34.9	61.2	74.0	-12.8
H	7440.000	33.7	33	37.9	38.6	74.0	-35.4
V	9920.000	44.0	33	40.4	51.4	74.0	-22.6
V	12400.000	31.0	33	40.5	38.5	74.0	-35.5
H	14880.000	33.4	33	38.4	38.8	74.0	-35.2

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: TX-Channel 00

Table 4, Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2402.000	89.3	33	29.4	85.7	85.7	94.0	-8.3
V	4804.000	38.6	33	34.9	40.5	40.5	54.0	-13.5
H	7206.000	25.7	33	37.9	30.6	30.6	54.0	-23.4
V	9608.000	34.9	33	40.4	42.3	42.3	54.0	-11.7
V	12010.000	23.1	33	40.5	30.6	30.6	54.0	-23.4
V	14412.000	23.2	33	40.0	30.2	30.2	54.0	-23.8

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)
V	2402.000	104.6	33	29.4	101.0	114.0	-13.0
V	4804.000	47.9	33	34.9	49.8	74.0	-24.2
H	7206.000	34.0	33	37.9	38.9	74.0	-35.1
V	9608.000	55.2	33	40.4	62.6	74.0	-11.4
V	12010.000	31.0	33	40.5	38.5	74.0	-35.6
V	14412.000	31.6	33	40.0	38.6	74.0	-35.4

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: TX-Channel 20

Table 5, Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2442.000	89.9	33	29.4	86.3	86.3	94.0	-7.7
V	4884.000	46.9	33	34.9	48.8	48.8	54.0	-5.2
V	7326.000	25.4	33	37.9	30.3	30.3	54.0	-23.7
H	9768.000	34.1	33	40.4	41.5	41.5	54.0	-12.5
H	12210.000	23.1	33	40.5	30.6	30.6	54.0	-23.4
H	14652.000	25.1	33	38.4	30.5	30.5	54.0	-23.5

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)
V	2442.000	109.1	33	29.4	105.5	114.0	-8.5
V	4884.000	58.7	33	34.9	60.6	74.0	-13.4
V	7326.000	33.6	33	37.9	38.5	74.0	-35.5
H	9768.000	48.2	33	40.4	55.6	74.0	-18.4
H	12210.000	30.8	33	40.5	38.3	74.0	-35.7
H	14652.000	33.0	33	38.4	38.4	74.0	-35.6

NOTES:

1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: TX-Channel 39

Table 6, Bluetooth BLE

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m - Average (dBµV/m)	Calculated at 3m (dBµV/m)	Average Limit at 3m (dBµV/m)	Margin (dB)
V	2480.000	91.4	33	29.4	87.8	87.8	94.0	-6.2
V	4960.000	46.0	33	34.9	47.9	47.9	54.0	-6.1
H	7440.000	25.5	33	37.9	30.4	30.4	54.0	-23.6
V	9920.000	35.7	33	40.4	43.1	43.1	54.0	-10.9
V	12400.000	23.2	33	40.5	30.7	30.7	54.0	-23.3
H	14880.000	24.9	33	38.4	30.3	30.3	54.0	-23.7

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)
V	2480.000	109.7	33	29.4	106.1	114.0	-7.9
V	4960.000	61.6	33	34.9	63.5	74.0	-10.5
H	7440.000	33.7	33	37.9	38.6	74.0	-35.4
V	9920.000	49.6	33	40.4	57.0	74.0	-17.0
V	12400.000	30.7	33	40.5	38.2	74.0	-35.8
H	14880.000	32.8	33	38.4	38.2	74.0	-35.8

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

Mode: Normal mode with music and LED on

Table 7

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	56.444	35.7	16	11.0	30.7	40.0	-9.3
V	70.338	36.1	16	7.0	27.1	40.0	-12.9
V	122.500	37.8	16	14.0	35.8	43.5	-7.7
V	202.206	27.8	16	16.0	27.8	43.5	-15.7
H	276.794	22.8	16	22.0	28.8	46.0	-17.3
V	395.988	22.5	16	25.0	31.5	46.0	-14.5

NOTES:
1. Peak detector is used for the emission measurement.
2. All measurements were made at 3 meters.
3. Negative value in the margin column shows emission below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 7.1.

TEST REPORT

4.2.3 Transmitter Duty Cycle Calculation

Based on the Bluetooth Classic, the transmitter ON time for each timeslot of Bluetooth is 625µs. DH5 has the maximum duty cycle, which consists of 5 continuous Tx slots and 1 Rx slot. Therefore one hopset take (5+1) x 625µs = 3.75ms. For one period for a pseudo-random hopping through at least 20 RF channels in adaptive mode (worst case), it take: 20 x 3.75ms = 75ms.

The dwell time for DH5 is 5 x 625us = 3.125ms

For the worst case calculation, there are two transmissions might occur in 100ms.

Therefore,

Duty Cycle (DC) = Maximum On time in 100ms/100ms
= 3.125ms x 2 /100ms
= 0.0625

Average Factor (AF) of Bluetooth in dB = $20 \log_{10} (0.0625)$
= -24.0dB

TEST REPORT

4.3 Radiated Emission on the Bandedge

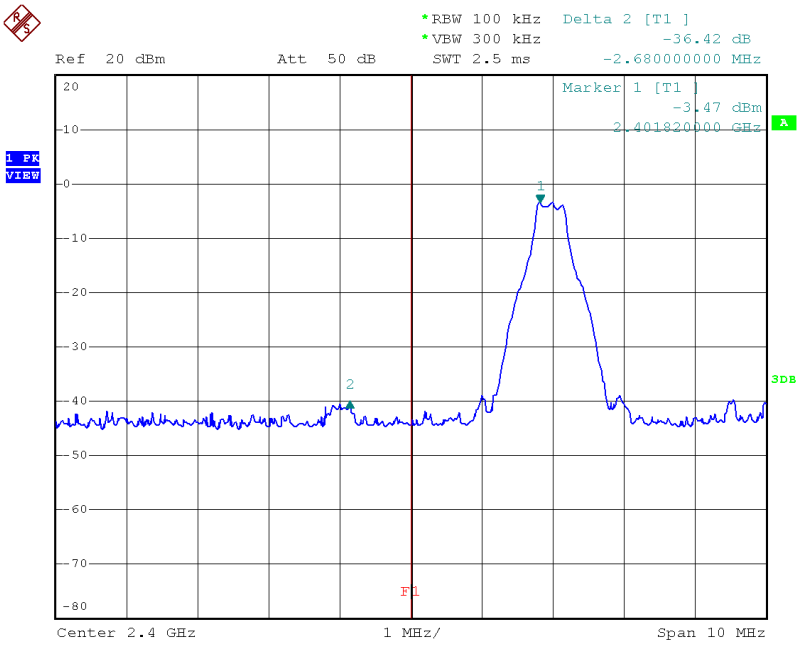
From the following plots, they show that the fundamental emissions are confined in the specified band (2400MHz and 2483.5MHz). In case of emissions up to two standard bandwidths away from the bandedge, the delta measurement technique is used for determining bandedge compliance. Standard bandwidth is the bandwidth specified by ANSI C63.4 (2014) for frequency being measured.

Emissions radiated outside of the specified frequency bands, except harmonics, are attenuated by 50 dB below the level of the fundamental or to the general radiated emission limits in FCC Part 15 Section 15.209 / Table 4 of RSS-Gen, whichever is the lesser attenuation, which meet the requirement of FCC Part 15 Section 15.249(d) / RSS-210 A2.9(b).

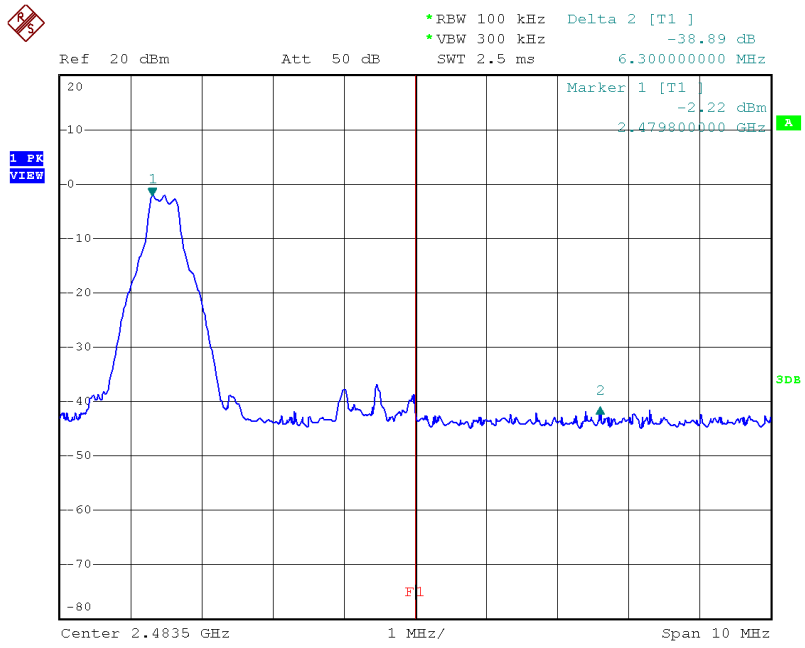
The plots of radiated emission on the bandedge are saved as below.

TEST REPORT

BASE UNIT WITH BLUETOOTH CLASSIC PORTION, LOWEST CHANNEL

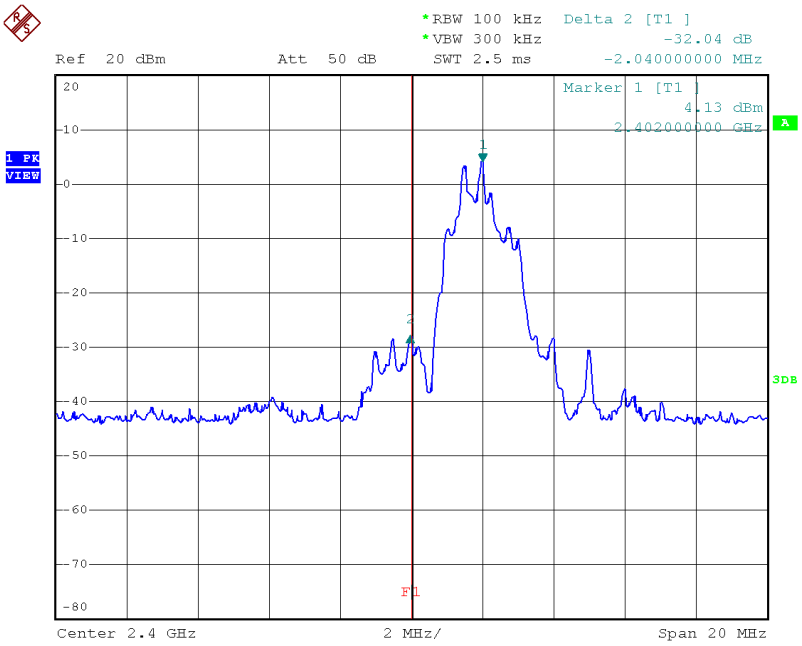


BASE UNIT WITH BLUETOOTH CLASSIC PORTION, HIGHEST CHANNEL

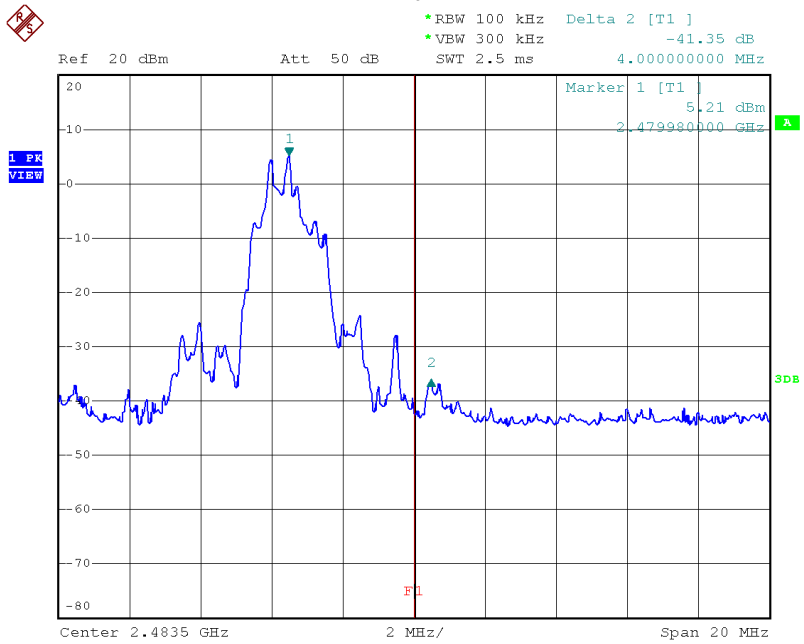


TEST REPORT

BASE UNIT WITH BLUETOOTH BLE PORTION, LOWEST CHANNEL



BASE UNIT WITH BLUETOOTH BLE PORTION, HIGHEST CHANNEL



TEST REPORT

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

Resultant Field Strength = Fundamental Emissions - Delta from the plot

Resultant field strength for the lowest and/or highest channel(s), with corresponding average values are calculated as follows:

Bluetooth Classic

Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
Lowest	72.8	36.42	36.38	54	-17.62
Highest	74.8	38.89	35.91	54	-18.09

Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
Lowest	96.8	36.42	60.38	74	-13.62
Highest	98.8	38.89	59.91	74	-14.09

Bluetooth BLE

Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Average Limit (dBµV/m)	Margin (dB)
Lowest	85.7	32.04	53.66	54	-0.34
Highest	87.8	41.35	46.45	54	-7.55

Channel	Fundamental Emission (dBµV/m)	Delta from the Plot (dB)	Resultant Field Strength (dBµV/m)	Peak Limit (dBµV/m)	Margin (dB)
Lowest	101.0	32.04	68.96	74	-5.04
Highest	106.1	41.35	64.75	74	-9.25

The resultant field strength meets the general radiated emission limit in Table 4 of RSS-Gen, which does not exceed 74dBµV/m for peak limit and also 54dBµV/m for average limit.

TEST REPORT

4.4 AC Power Line Conducted Emission

[ ] Not applicable – EUT is only powered by battery for operation.

[×] EUT connects to AC power line. Emission Data is listed in following pages.

[ ] Base Unit connects to AC power line and has transmission. Handset connects to AC power line but has no transmission. Emission Data of Base Unit is listed in following pages.

Test setup is shown in section 3.4 Figure 3.4.1.

4.4.1 AC Power Line Conducted Emission Configuration Photograph

Worst Case Line-Conducted Configuration
at

433.5 kHz

The worst case line conducted configuration photographs are saved with filename: config photos.pdf.

4.4.2 AC Power Line Conducted Emission Data

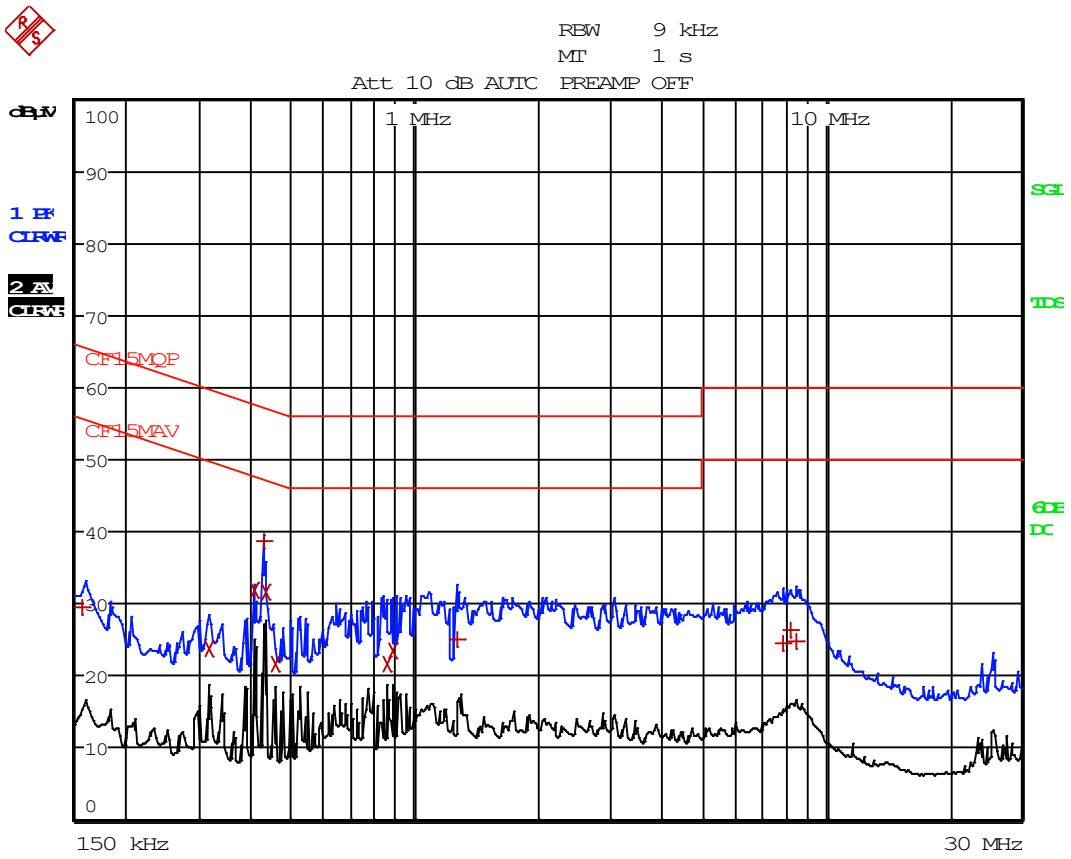
The plot(s) and data in the following pages list the significant emission frequencies, the limit and the margin of compliance.

Passed by 15.44 dB margin compared with CISPR average limit

TEST REPORT

CONDUCTED EMISSION DATA

Worst Case: Normal mode with music and LED on



TEST REPORT

Worst Case: Normal mode with music and LED on

EDIT PEAK LIST (Final Measurement Results)

Trace1: CF15MQP
Trace2: CF15MAV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	159 kHz	29.61	N	-35.90
2	CISPR Average	316.5 kHz	23.85	N	-25.94
2	CISPR Average	406.5 kHz	31.96	N	-15.76
1	Quasi Peak	429 kHz	38.63	N	-18.63
2	CISPR Average	433.5 kHz	31.73	N	-15.44
2	CISPR Average	456 kHz	21.75	N	-25.00
2	CISPR Average	861 kHz	21.76	N	-24.23
2	CISPR Average	883.5 kHz	23.52	N	-22.47
1	Quasi Peak	1.266 MHz	24.95	N	-31.04
1	Quasi Peak	7.98 MHz	24.57	L1	-35.42
1	Quasi Peak	8.1915 MHz	26.25	L1	-33.74
1	Quasi Peak	8.4525 MHz	24.89	L1	-35.10

TEST REPORT

5.0 EQUIPMENT LIST

1) Radiated Emissions Test

Equipment	EMI Test Receiver (9kHz to 26.5GHz)	Spectrum Analyzer	BiConiLog Antenna (30MHz - 6GHz)
Registration No.	EW-3156	EW-2466	EW-3408
Manufacturer	ROHDESCHWARZ	ROHDESCHWARZ	EMCO
Model No.	ESR26	FSP30	
Calibration Date	January 25, 2021	September 05, 2020	October 25, 2020
Calibration Due Date	January 25, 2022	September 05, 2021	October 25, 2021

Equipment	14m Double Shield RF Cable (20MHz to 6GHz)	Double Ridged Guide Antenna	RF Cable 14m (1GHz to 26.5GHz)
Registration No.	EW-2074	EW-1133	EW-2781
Manufacturer	RADIALL	EMCO	GREATBILLION
Model No.	N(m)-RG142-BNC(m) L=14M	3115	SMA m/SHF5MPU /SMA m ra14m,26G
Calibration Date	August 29, 2020	June 03, 2021	November 24, 2020
Calibration Due Date	August 29, 2021	June 03, 2022	November 24, 2021

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-2500
Manufacturer	RADIALL	ROHDESCHWARZ	ROHDESCHWARZ
Model No.	Bnc m st / 142 / bnc mra 240cm	ENV-216	ESCI
Calibration Date	November 10, 2020	September 11, 2020	March 29, 2021
Calibration Due Date	November 10, 2021	September 11, 2021	March 29, 2022

3) Conductive Measurement Test

Equipment	Spectrum Analyzer
Registration No.	EW-2466
Manufacturer	ROHDESCHWARZ
Model No.	FSP30
Calibration Date	September 05, 2020
Calibration Due Date	September 05, 2021

END OF TEST REPORT