



## Test Report

Date : 2018-06-26  
No. : HM18040017

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**Applicant:** ZERO FOUNDER Co., Ltd  
G-760, 815, Daewanpangyo-ro, Sujeong-gu, Seongnam-Si, Gyeonggi-do, South Korea

**Supplier / Manufacturer:** Shenzhen ShengKang Electronics Technology Co., Lt  
3/F Building F, Xinlong Technology Park, No 49 Xiner Zhuangcun Road, Shajing Town, Baoan, Shenzhen, China

**Description of Sample(s):** Submitted sample(s) said to be  
Product: Eclair Skin Device  
Brand Name: ECLAIR  
Model No.: ZEFA-DV-EC-0001  
FCC ID: 2APRWZFDVEC001

**Date Samples Received:** 2018-04-27

**Date Tested:** 2018-05-22 to 2018-05-31

**Investigation Requested:** Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 and ANSI C63.10:2013 for FCC Certification.

**Conclusions:** The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

**Remarks:** Bluetooth DTS (GFSK)

  
CHEUNG Chi, Kenneth  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
The Hong Kong Standards and Testing Centre Ltd.





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### **1.0**      **General Details**

#### **1.1**      **Test Laboratory**

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EMC Laboratory  
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Telephone:                    852 2666 1888  
Fax:                              852 2664 4353

#### **1.2**      **Equipment Under Test [EUT]**

##### **Description of Sample(s)**

Product:                              Eclair Skin Device  
Manufacturer:                        Shenzhen ShengKang Electronics Technology Co., Lt  
    3/F Building F, Xinlong Technology Park, No 49 Xiner  
    Zhuangcun Road, Shajing Town, Baoan, Shenzhen, China  
  
Brand Name:                            ECLAIR  
Model Number:                        ZEFA-DV-EC-0001  
Rating:                                 5.0Vd.c. Powered by USB port/ 3.7 Vd.c. (1\*3.7Vd.c.  
    Rechargeable battery)

#### **1.2.1**      **Description of EUT Operation**

The Equipment Under Test (EUT) is a Bluetooth Skin Moisture Device. The transmission signal is digital modulated with channel frequency range 2402-2480MHz. The R.F. signal was modulated by IC; the type of modulation used was GFSK.

#### **1.3**      **Date of Order**

2018-04-27

#### **1.4**      **Submitted Sample(s):**

2 Samples

#### **1.5**      **Test Duration**

2018-05-22 to 2018-05-31

#### **1.6**      **Country of Origin**

China

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### 1.7 RF Module Details

Module Model Number: N51922  
Module FCC ID: N/A  
Module Transmission Type: Bluetooth V4.0 BLE  
Modulation: GFSK  
Data Rates: 1Mbps  
Frequency Range: 2400-2483.5MHz  
Carrier Frequencies: 2402MHz – 2480MHz

Module Specification (specification provided by manufacturer)

### 1.8 Antenna Details

Antenna Type: Meander Line Antenna  
Antenna Gain: 0.0dBi

### 1.9 Channel List

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

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### 2.0 Technical Details

#### **2.1 Investigations Requested**

Perform Electromagnetic Interference measurements in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2017 Regulations and ANSI C63.10:2013 for FCC Certification. According FCC KDB 558074 DTS Measurement Guidance, Duty cycle  $\cong$  98%. The device was realized by test software.

#### **2.2 Test Standards and Results Summary Tables**

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Maximum Peak Output Power	FCC 47CFR 15.247(b)(3)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Spurious Emissions	FCC 47CFR 15.209	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	FCC 47CFR 15.207	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Power Spectral Density	FCC 47CFR 15.247(e)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6dB Bandwidth	FCC 47CFR 15.247(a)(2)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Band Edge Emissions (Radiated)	FCC 47CFR 15.247(d)	ANSI C63.10: 2013	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Antenna requirement	FCC 47CFR 15.203	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
RF Exposure	FCC 47CFR 15.247(i)	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

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### 3.0 Test Results

#### **3.1 Emission**

##### **3.1.1 Maximum Peak Output Power**

Ambient temperature 25°C      Relative humidity 51%      Atmospheric Pressure: 101kPa

Test Requirement:      FCC 47CFR 15.247(b)(3)

Test Method:      ANSI C63.10: 2013

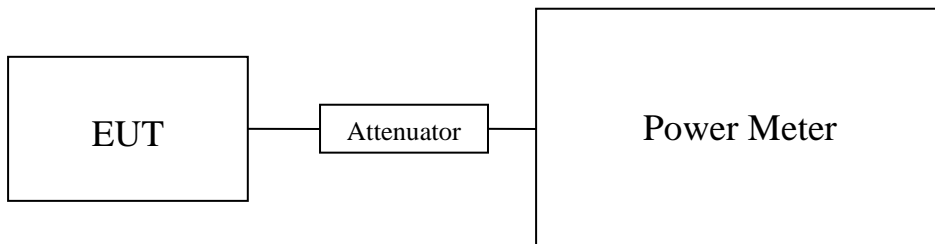
Test Date:      2018-05-29

Mode of Operation:      Bluetooth DTS Tx mode

#### **Test Method:**

The RF output of the EUT was connected to the Power Meter. All the attenuation or cable loss will be added to the measured maximum output power. The results are recorded in Watt.

#### **Test Setup:**



Note: a temporary antenna connector was soldered to the RF output.



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### Limits for Peak Output Power of Fundamental & Harmonics Emissions [FCC 47CFR 15.247]:

For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt (30dBm)

**Results of BT DTS Tx Mode (2402MHz to 2480MHz) : Pass (TX Unit) (GFSK)  
Maximum conducted output power(EIRP)**

Channel	Frequency(MHz)	Output Power(Watt)
0	2402	0.0000043
19	2440	0.0000049
39	2480	0.0000037

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB  
1GHz to 26GHz 1.7dB

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### 3.1.2 Radiated Emissions

Ambient temperature 25°C      Relative humidity 51%      Atmospheric Pressure: 101kPa

Test Requirement:      FCC 47CFR 15.209  
Test Method:      ANSI C63.10:2013  
Test Date:      2018-05-30  
Mode of Operation:      Tx mode / Bluetooth Communication mode (GFSK)

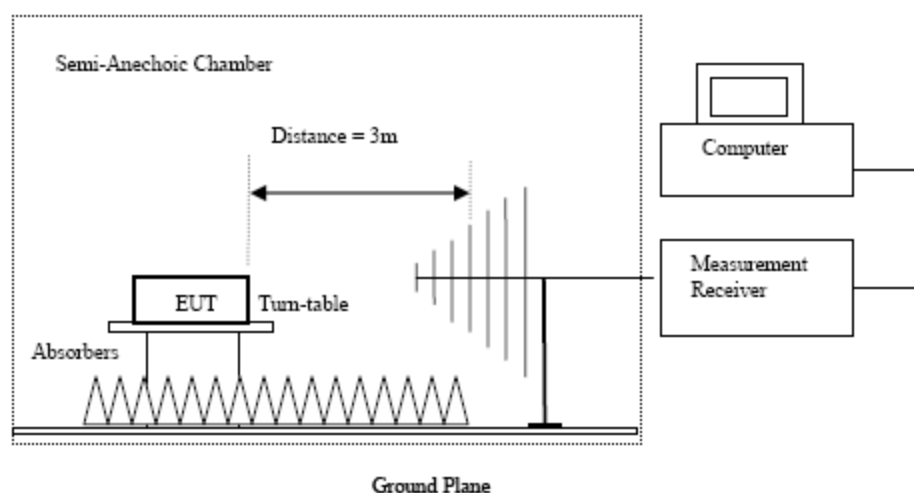
#### Test Method:

For emission measurements at or below 1 GHz, the sample was placed 0.8m above the ground plane of semi-anechoic Chamber\*. For emission measurements above 1 GHz, the sample was placed 1.5m above the ground plane of semi-anechoic Chamber\*. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

\* The Hong Kong Standards and Testing Centre Ltd.

FCC Test Firm Registration Number 723883 Designation Number HK0001

#### Test Setup:



- Absorbers placed on top of the ground plane are for measurements above 1000MHz only.
- Measurements between 30MHz to 1000MHz made with Bi-log antennas, above 1000MHz horn antennas are used, 9kHz to 30MHz loop antennas are used.

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### Limits for Radiated Emissions FCC 47 CFR 15.247 Class B]:

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

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**Result of Tx mode (2402.0 MHz) (GFSK) (9kHz – 30MHz): Pass**

<b>Field Strength of Spurious Emissions Peak Value</b>						
Frequency MHz	Measured Level dBuV	Correction Factor dB/m	Field Strength dBuV/m	Field Strength uV/m	Limit uV/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the Limits</b>						

**Result of Tx mode (2402.0 MHz) (GFSK) (Above 1GHz): Pass**

<b>Field Strength of Spurious Emissions Peak Value</b>						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4804.0	3.7	32.1	35.8	74.0	38.2	Horizontal
7206.0	2.9	38.6	41.5	74.0	32.5	Horizontal
9608.0	-1.1	41.3	40.2	74.0	33.8	Horizontal
12010.0	-3.2	43.5	40.3	74.0	33.7	Horizontal

<b>Field Strength of Spurious Emissions Average Value</b>						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4804.0	-5.1	32.1	27.0	54.0	27.0	Horizontal
7206.0	-4.3	38.6	34.3	54.0	19.7	Horizontal
9608.0	-8.7	41.3	32.6	54.0	21.4	Horizontal
12010.0	-9.1	43.5	34.4	54.0	19.6	Horizontal



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**Result of Tx mode (2440.0 MHz) (GFSK) (9kHz – 30MHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Peak Value</b>						
Frequency MHz	Measured Level dBuV	Correction Factor dB/m	Field Strength dBuV/m	Field Strength uV/m	Limit uV/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the Limits</b>						

**Result of Tx mode (2440.0 MHz) (GFSK) (Above 1GHz): Pass**

<b>Field Strength of Spurious Emissions</b>						
<b>Peak Value</b>						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4880.0	3.3	32.1	35.4	74.0	38.6	Horizontal
7320.0	2.7	38.6	41.3	74.0	32.7	Horizontal
9760.0	-1.3	41.3	40.0	74.0	34.0	Horizontal
12200.0	-4.1	43.5	39.4	74.0	34.6	Horizontal

<b>Field Strength of Spurious Emissions</b>						
<b>Average Value</b>						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4880.0	-3.7	32.1	28.4	54.0	25.6	Horizontal
7320.0	-4.2	38.6	34.4	54.0	19.6	Horizontal
9760.0	-4.3	41.3	37.0	54.0	17.0	Horizontal
12200.0	-3.6	43.5	39.9	54.0	14.1	Horizontal

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**Result of Tx mode (2480.0 MHz) (GFSK) (9kHz – 30MHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level dBuV	Correction Factor dB/m	Field Strength dBuV/m	Field Strength uV/m	Limit uV/m	E-Field Polarity
<b>Emissions detected are more than 20 dB below the Limits</b>						

**Result of Tx mode (2480.0 MHz) (GFSK) (Above 1GHz): Pass**

Field Strength of Spurious Emissions Peak Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4960.0	3.3	32.2	35.5	74.0	38.5	Horizontal
7440.0	2.9	38.6	41.5	74.0	32.5	Horizontal
9920.0	-1.3	42.1	40.8	74.0	33.2	Horizontal
12400.0	-4.5	44.1	39.6	74.0	34.4	Horizontal

Field Strength of Spurious Emissions Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
4960.0	-3.3	32.2	28.9	54.0	25.1	Horizontal
7440.0	-3.8	38.6	34.8	54.0	19.2	Horizontal
9920.0	-4.1	42.1	38.0	54.0	16.0	Horizontal
12400.0	-5.1	44.1	39.0	54.0	15.0	Horizontal

**Remarks:**

No additional spurious emissions found between lowest internal used/generated frequency and 30 MHz

\* Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000MHz and falling within the restricted bands of FCC Rules Part 15 Section 15.205 and the limits of FCC Rules Part 15 Section 15.209 were applied.

Correction Factor included Antenna Factor and Cable Attenuation.

Calculated measurement uncertainty : 9kHz-30MHz 3.3dB  
 30MHz -1GHz 4.6dB  
 1GHz -26GHz 4.4dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.



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**Band edge Emissions Measurement:**

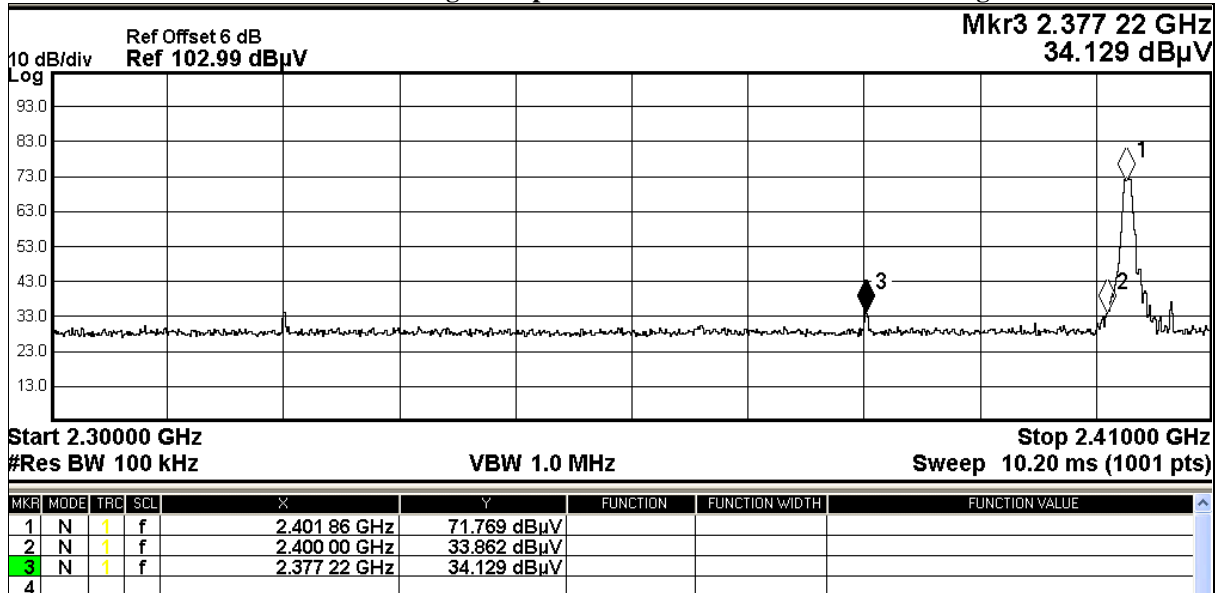
Ambient temperature 25°C                      Relative humidity 51%                      Atmospheric Pressure: 101kPa

**Limit :**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 5.205(c)).

Frequency Range [MHz]	Conducted Emission Attenuated below the Fundamental [dB]
2400 – Lowest Fundamental (2402)	37.9

**Conducted Band-edge Compliance Measurement – Lower band edge**





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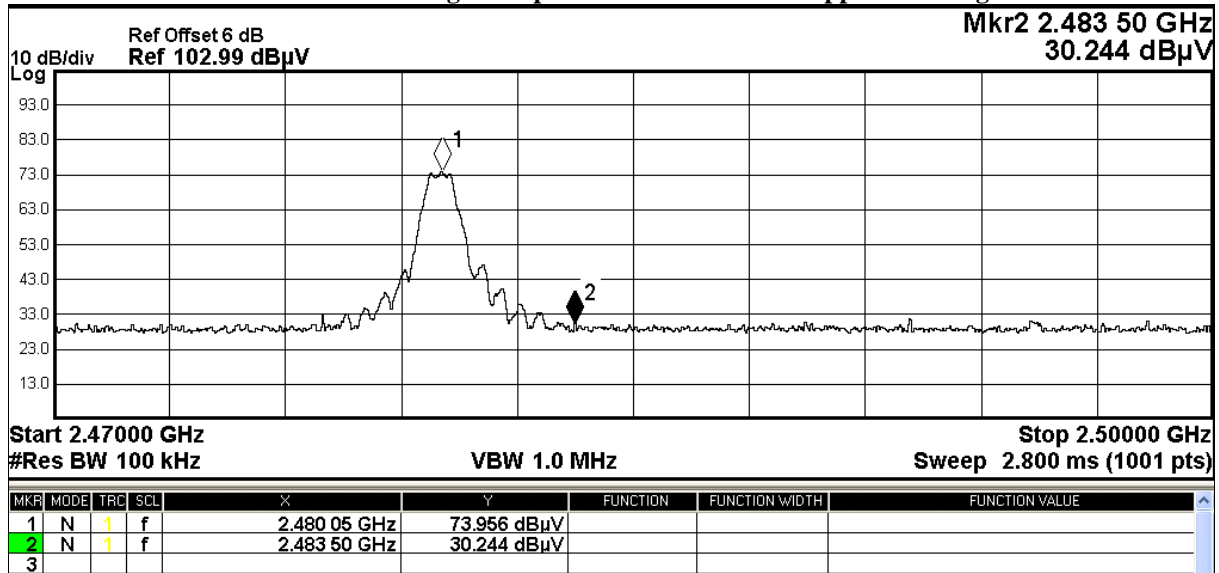
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**Band-edge Compliance of RF Conducted Emissions Measurement:**

Frequency Range	Conducted Emission Attenuated below the
[MHz]	Fundamental
2483.5 - Highest Fundamental (2480)	[dB]
	43.7

**Conducted Band-edge Compliance Measurement – Upper band edge**



**Radiated Emissions Band-edge and Restricted Band Result:**

Field Strength of Band-edge Compliance Peak Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
2377.2	7.6	27.9	35.5	74.0	38.5	Horizontal
2484.0	4.7	27.9	32.6	74.0	41.4	Horizontal

Field Strength of Band-edge Compliance Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
2377.2	2.4	27.9	30.3	54.0	23.7	Horizontal
2484.0	0.5	27.9	28.4	54.0	25.6	Horizontal

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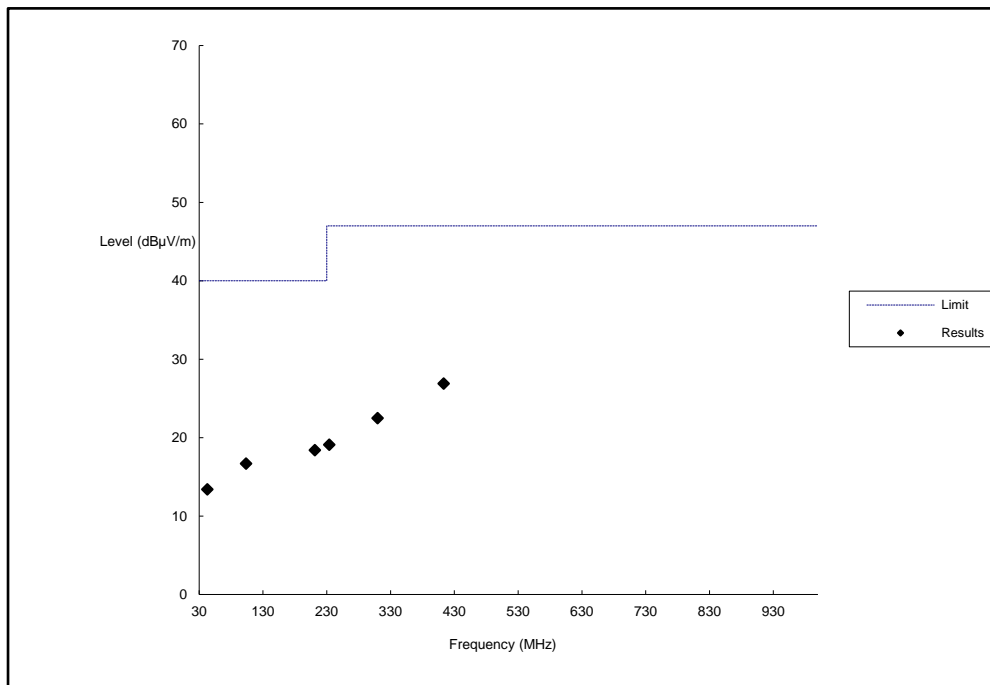
**Limits for Radiated Emissions FCC 47 CFR 15.247 Class B]:**

Frequency Range [MHz]	Quasi-Peak Limits [ $\mu$ V/m]
0.009-0.490	2400/F (kHz)
0.490-1.705	24000/F (kHz)
1.705-30	30
30-88	100
88-216	150
216-960	200
Above960	500

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

**Results of Bluetooth Communication mode (30MHz – 1GHz): Pass**

Please refer to the following table for result details(The data is the worst cases)



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Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Level @3m dB $\mu$ V/m	Limit @3m dB $\mu$ V/m	Level @3m $\mu$ V/m	Limit @3m $\mu$ V/m
42.7	Vertical	13.4	40.0	4.7	150
103.4	Vertical	16.7	43.5	6.8	150
211.4	Horizontal	18.4	43.5	8.3	150
234.0	Horizontal	19.1	43.5	9.0	200
309.7	Horizontal	22.5	46.0	13.3	200
413.2	Horizontal	26.9	46.0	22.1	200

Remarks:

Calculated measurement uncertainty (30MHz – 1GHz): 4.6dB

Emissions in the vertical and horizontal polarizations have been investigated and the worst-case test results are recorded in this report.

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### 3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

Ambient temperature 25°C

Relative humidity 51%

Atmospheric Pressure: 101kPa

Test Requirement:

FCC 47CFR 15.207

Test Method:

ANSI C63.10:2013

Test Date:

2018-05-29

Mode of Operation:

Bluetooth Communication mode with charging function

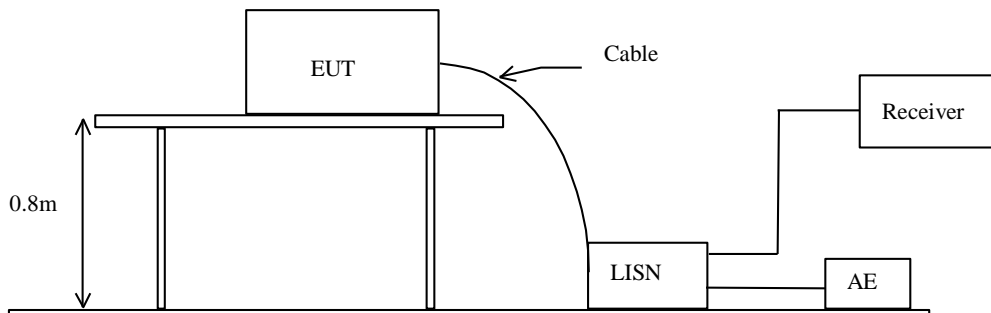
Test Voltage:

120V a.c. 60Hz

#### Test Method:

The test was performed in accordance with ANSI C63.10:2013, with the following: an initial measurement was performed in peak and average detection mode on the live line, any emissions recorded within 30dB of the relevant limit line were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

#### Test Setup:





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**Limits for Conducted Emissions (FCC 47 CFR 15.207):**

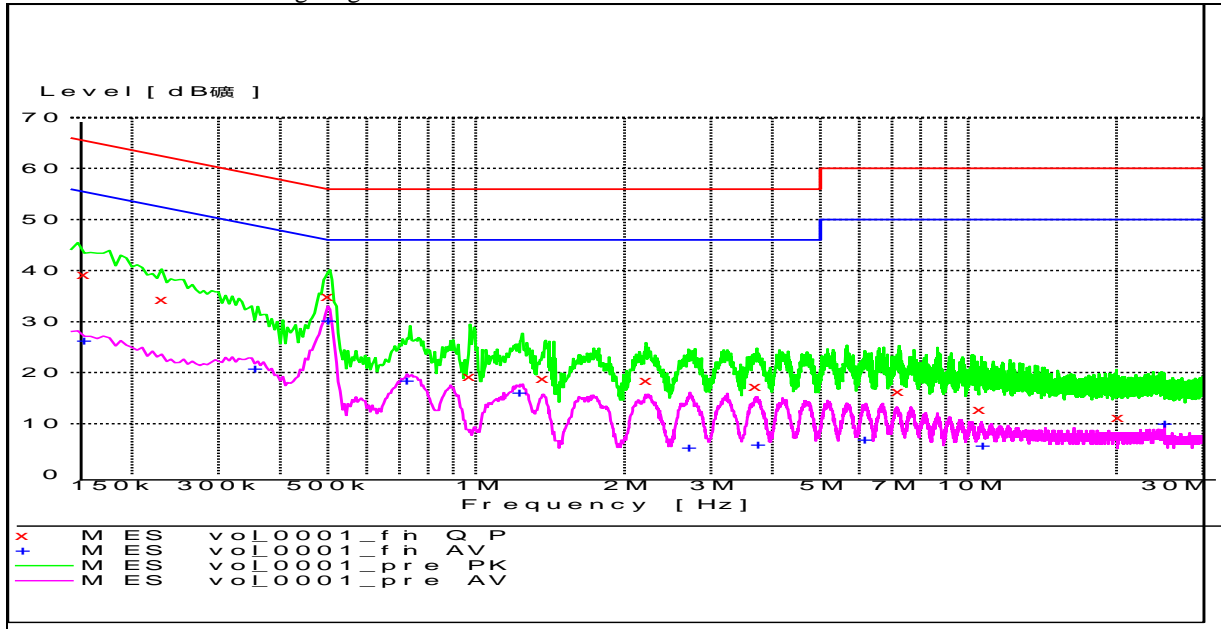
Frequency Range [MHz]	Quasi-Peak Limits [dB $\mu$ V]	Average [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* Decreases with the logarithm of the frequency.

Limits for Conducted Emissions Test, please refer to limit lines (Quasi-Peak and Average) in the following diagram.

**Results of Bluetooth Communication mode with charging function (L & N): PASS**

Please refer to the following diagram for individual results.





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### Results of Bluetooth Communication mode with charging function (L & N): PASS

#### MEASUREMENT RESULT: "vol\_0001\_fin QP"

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.160000	39.20	9.9	66	26.3	L1	GND
0.230000	34.30	9.9	62	28.1	L1	GND
0.500000	34.90	10.0	56	21.1	L1	GND
0.970000	19.20	9.8	56	36.8	N	GND
1.365000	18.80	9.9	56	37.2	L1	GND
2.220000	18.40	10.2	56	37.6	L1	GND
3.700000	17.30	10.4	56	38.7	L1	GND
7.200000	16.30	10.5	60	43.7	L1	GND
10.565000	12.80	10.4	60	47.2	L1	GND
20.205000	11.20	10.8	60	48.8	L1	GND

#### MEASUREMENT RESULT: "vol\_0001\_fin AV"

Frequency MHz	Level dB $\mu$ V	Transd dB	Limit dB $\mu$ V	Margin dB	Line	PE
0.160000	26.20	9.9	56	29.3	L1	GND
0.355000	20.90	10.0	49	27.9	L1	GND
0.500000	30.20	10.0	46	15.8	L1	GND
0.725000	18.50	9.9	46	27.5	L1	GND
1.225000	16.00	9.9	46	30.0	N	GND
2.715000	5.40	10.3	46	40.6	L1	GND
3.740000	6.00	10.4	46	40.0	L1	GND
6.155000	6.90	10.6	50	43.1	L1	GND
10.710000	5.70	10.4	50	44.3	L1	GND
25.060000	10.10	10.8	50	39.9	L1	GND

#### Remarks:

Calculated measurement uncertainty (0.15MHz – 30MHz): 3.2dB

-\*- Emission(s) that is far below the corresponding limit line.

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### 3.1.3 Power Spectral Density

Ambient temperature 25°C      Relative humidity 51%      Atmospheric Pressure: 101kPa

Test Requirement:      FCC 47CFR 15.247(e)  
Test Method:      ANSI C63.10:2013  
Test Date:      2018-05-31  
Mode of Operation:      Tx mode

#### Test Method:

The RF output of the EUT was connected to the spectrum analyzer. Set the fundamental frequency as the center frequency of the spectral analyzer. Use RBW=3kHz , VBW= 10kHz , Set the span to 1.5 times the DTS channel bandwidth. Detector = peak, Sweep time = auto couple , Trace mode = max hold. Measurement was done at RBW = 10kHz, correction factor of the result =  $10 \text{ Log } (3 \text{ kHz}/10 \text{ kHz}) = -5.2\text{dB}$

#### Test Setup:

As Test Setup of clause 3.1.1 in this test report.

#### Test Limit:

The maximum power spectral density (PSD) shall not exceeded 8dBm in any 3kHz band.

Results of Tx Mode GFSK (Tx:2402MHz to 2480MHz) : Pass (Tx Unit)

Maximum power spectral density

Transmitter Frequency (MHz)	Maximum Power spectral density level / 3kHz band (dBm)	Maximum Power spectral density / 3kHz band limit
2402.0	-42.3	8dBm
2440.0	-41.4	8dBm
2480.0	-44.8	8dBm

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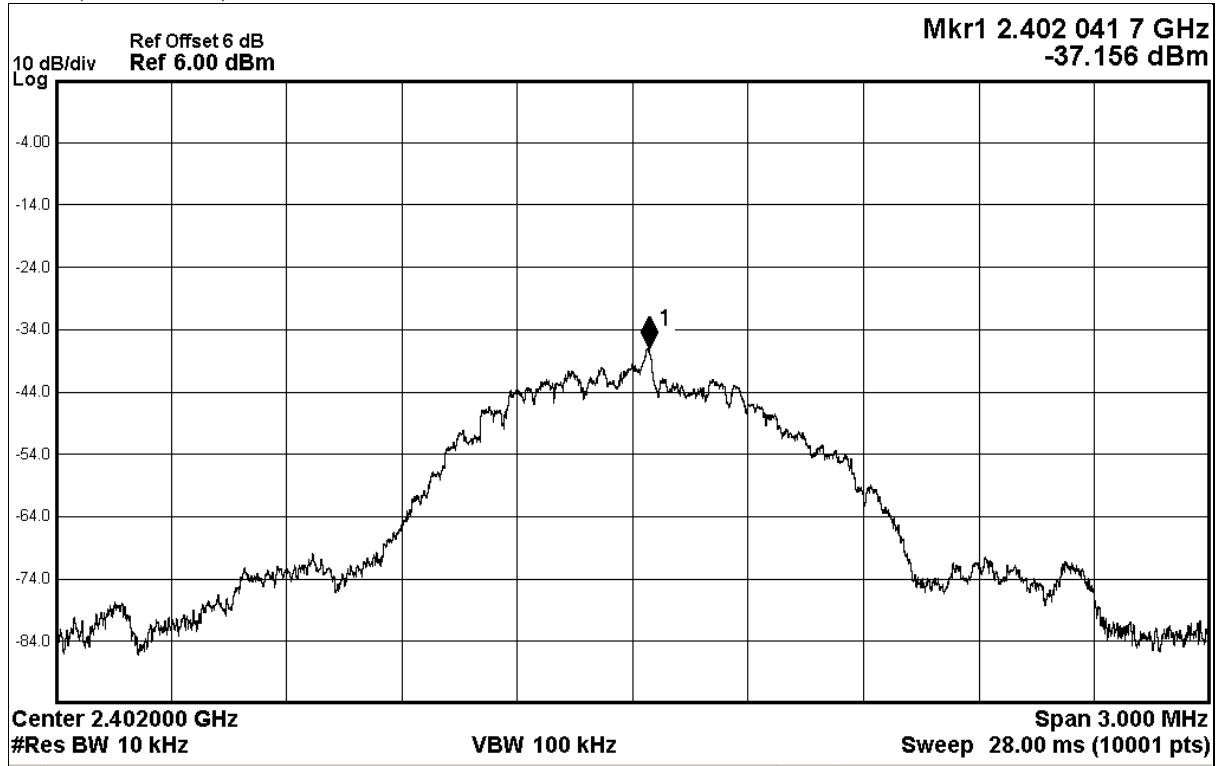


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Tx mode GFSK (Tx: 2402MHz to 2480MHz)  
CH 0 (2402.0 MHz)



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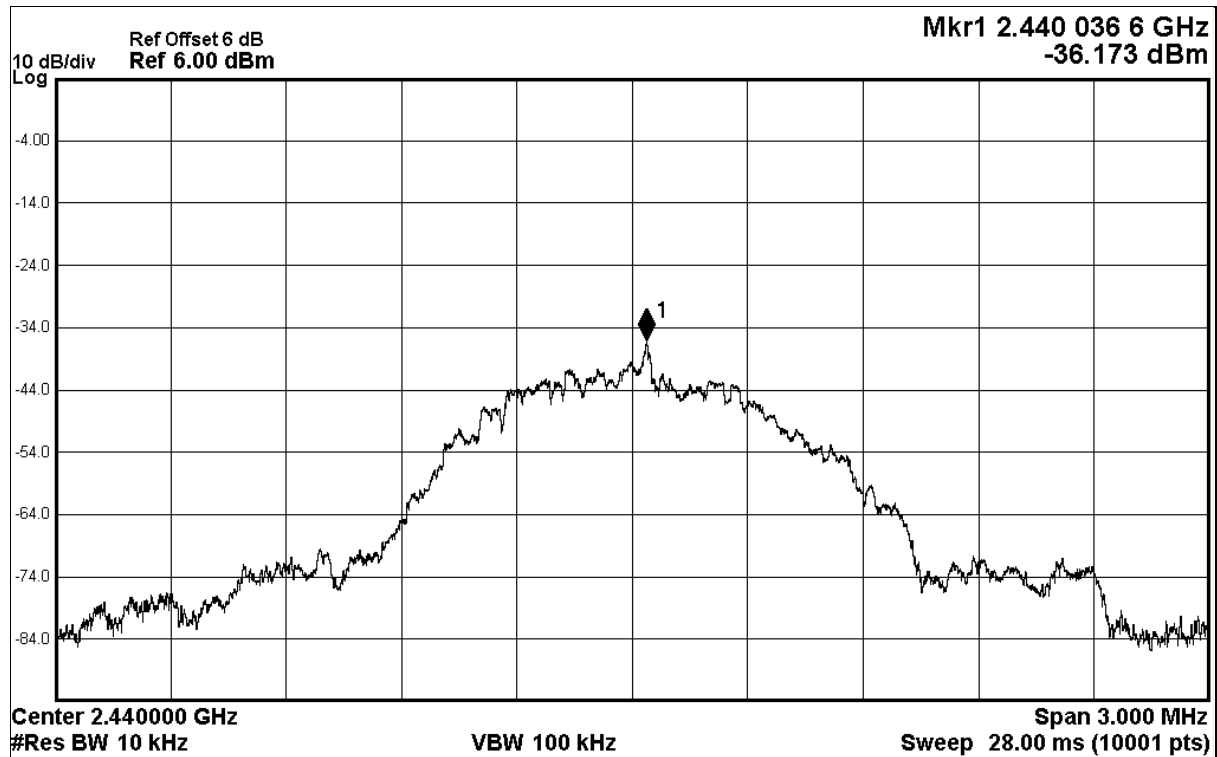


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CH 19 (2440.0 MHz)



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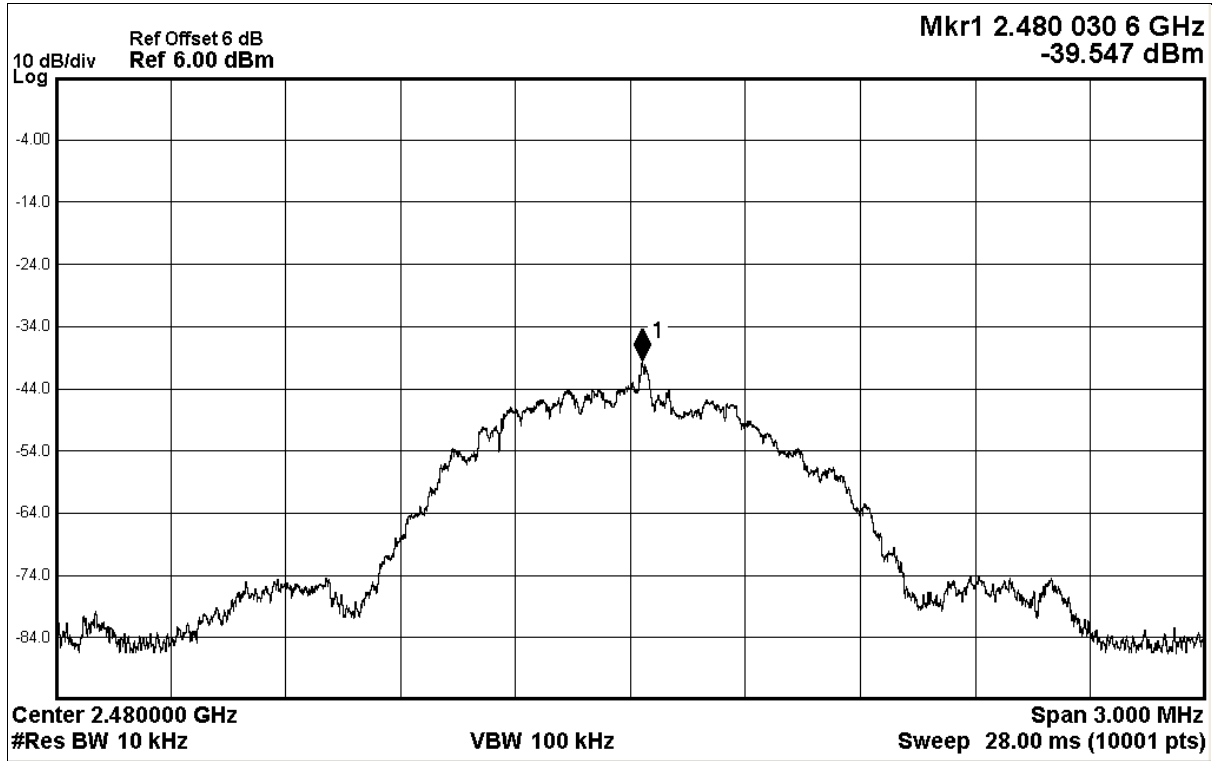


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CH 39 (2480.0 MHz)



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### **3.1.4 6dB Spectrum Bandwidth Measurement**

Ambient temperature 25°C      Relative humidity 51%      Atmospheric Pressure: 101kPa

Test Requirement:      FCC 47CFR 15.247(a)(2)  
Test Method:      ANSI C63.10:2013  
Test Date:      2018-05-29  
Mode of Operation:      Tx mode

#### **Test Method:**

The bandwidth is measured at an amplitude level reduced from the reference level by a specified ratio. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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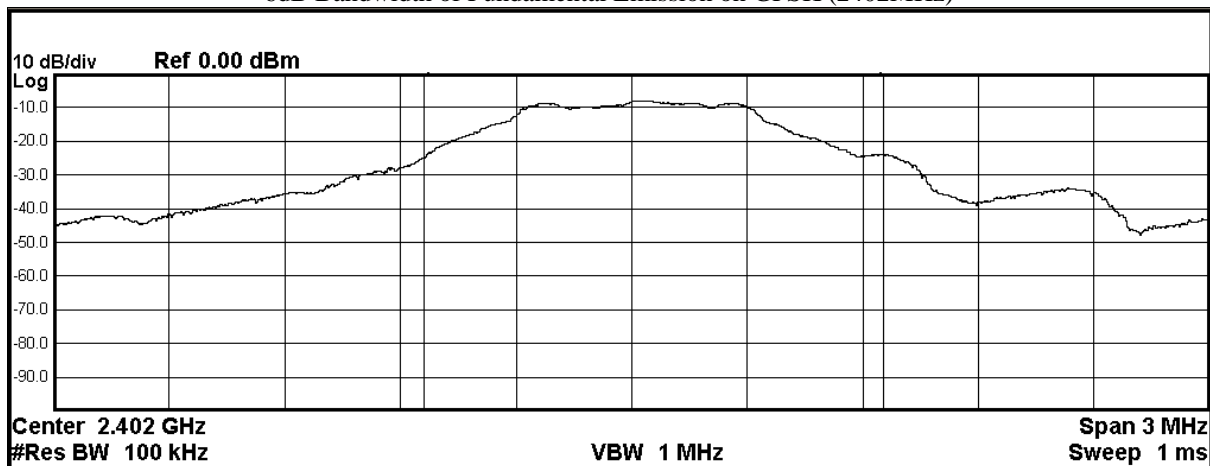
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**Limits for 6dB Spectrum Bandwidth Measurement:**

Center Frequency [MHz]	6dB Bandwidth [kHz]	FCC Limits [kHz]
2402.0	658.9	> 500

6dB Bandwidth of Fundamental Emission on GFSK (2402MHz)



<b>Occupied Bandwidth</b>	<b>Total Power</b>	<b>-0.97 dBm</b>
<b>1.1880 MHz</b>		
<b>Transmit Freq Error</b>	<b>57.526 kHz</b>	<b>OBW Power</b>
		<b>99.00 %</b>
<b>x dB Bandwidth</b>	<b>658.9 kHz</b>	<b>x dB</b>
		<b>-6.00 dB</b>

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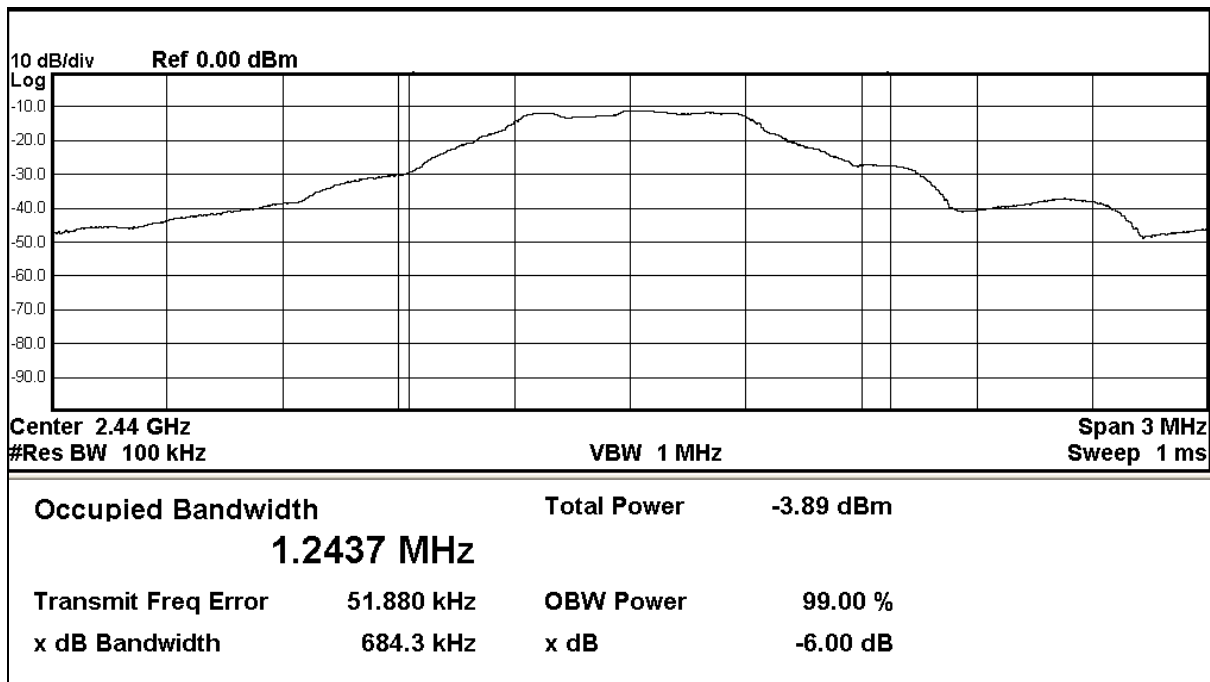
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**Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range [MHz]	6dB Bandwidth [kHz]	FCC Limits [kHz]
2440.0	684.3	> 500

6dB Bandwidth of Fundamental Emission on GFSK (2440MHz)





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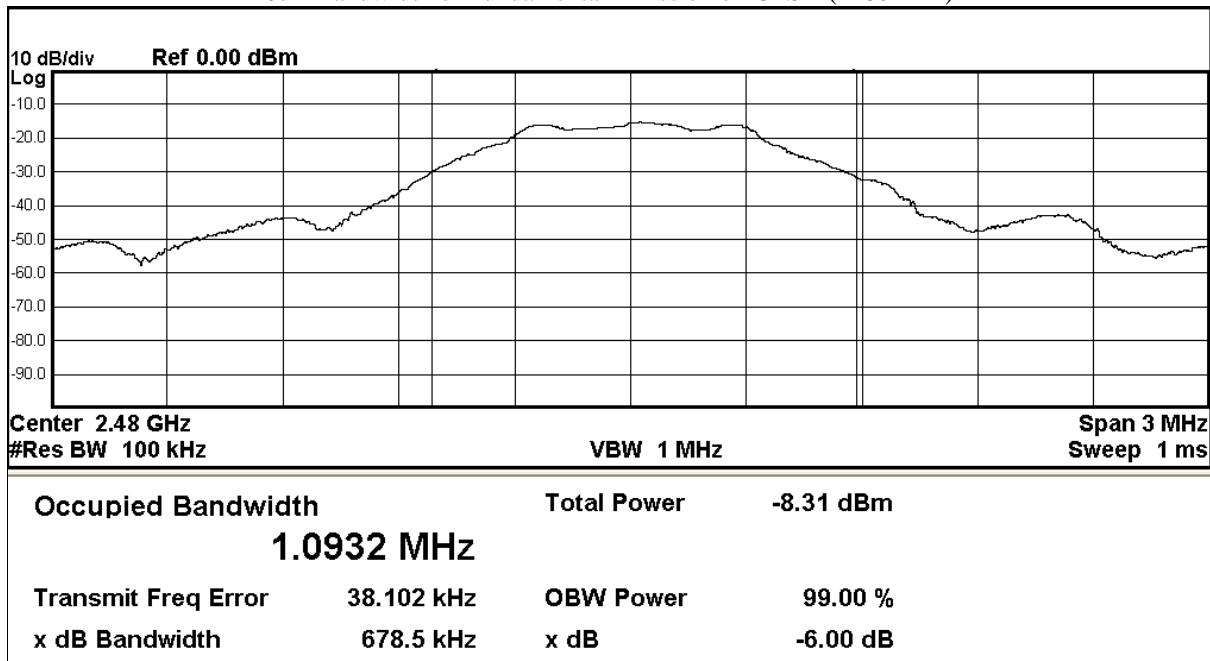
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**Limits for 6dB Spectrum Bandwidth Measurement:**

Frequency Range [MHz]	6dB Bandwidth [kHz]	FCC Limits [kHz]
2480.0	678.5	> 500

6dB Bandwidth of Fundamental Emission on GFSK (2480MHz)





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### **3.1.5 Antenna Requirement**

Ambient temperature 25°C

Relative humidity 51%

Atmospheric Pressure: 101kPa

### **Test Requirements: § 15.203**

#### **Test Specification:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

#### **Test Results:**

This is Meander Line antenna. There is no external antenna, the antenna gain = 0dBi. User is unable to remove or changed the Antenna.

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### Appendix A

#### List of Measurement Equipment

##### Radiated Emission

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM215	MULTIDevice CONTROLLER	EMCO	2090	00024676	N/A	N/A
EM217	ELECTRIC POWERED TURNTABLE	EMCO	2088	00029144	N/A	N/A
EM218	ANECHOIC CHAMBER	ETS-LINDGREN	FACT-3	--	2018/01/24	2019/01/24
EM356	ANTENNA POSITIONING TOWER	ETS-LINDGREN	2171B	00150346	N/A	N/A
EM354	BICONILOG ANTENNA	ETS-LINDGREN	3143B	00142073	2018/03/29	2020/03/29
EM229	EMI TEST RECEIVER	R&S	ESIB40	100248	2018/06/01	2019/06/01
EM276	BROADBAND HORN ANTENNA	A-INFOMW	JTXLB- 10180-SF	J203109090300 7	2018/04/27	2020/04/27
EM300	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-09	00130130	2018/05/13	2019/05/13
EM301	PYRAMIDAL STANDARD GAIN HORN ANTENNA	ETS-LINDGREN	3160-10	00130988	2018/05/13	2019/05/13
EM302	PRECISION OMNIDIRECTIONAL DIPOLE (1 – 6GHZ)	SEIBERSDORF LABORATORIES	POD 16	161806/L	2018/05/11	2020/05/11
EM303	PRECISION OMNIDIRECTIONAL DIPOLE (6 – 18GHZ)	SEIBERSDORF LABORATORIES	POD 618	6181908/L	2018/05/11	2020/05/11
EM353	LOOP ANTENNA	ETS_LINDGREN	6502	00206533	2018/04/16	2020/04/16
EM045	POWER METER	ROHDE & SCHWARZ	NRVD	843246/028	2017/10/14	2018/10/14

##### Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	DUE CAL
EM119	LISN	R & S	ESH3-Z5	0831.5518.52	2017/11/29	2018/11/29
EM145	EMI TEST RECEIVER	R & S	ESCS 30	830245/021	2018/06/01	2019/06/01
EM179	IMPULSE LIMITER	ROHDE & SCHWARZ	ESH3-Z2	357- 8810.52/54	2018/01/11	2019/01/11
EM154	SHIELDING ROOM	SIEMENS MATSUSHITA COMPONENTS	N/A	803-740-057- 99A	2017/02/02	2022/02/02
N/A	MEASUREMENT AND EVALUATION SOFTWARE	ROHDE & SCHWARZ	BSIB-K1	V1.20	N/A	N/A

Remarks:-

CM Corrective Maintenance  
N/A Not Applicable  
TBD To Be Determined

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### Appendix B Photographs of EUT

**Front View of the product**



**Rear View of the product**



**Rear View of the product**



**Rear View of the product**



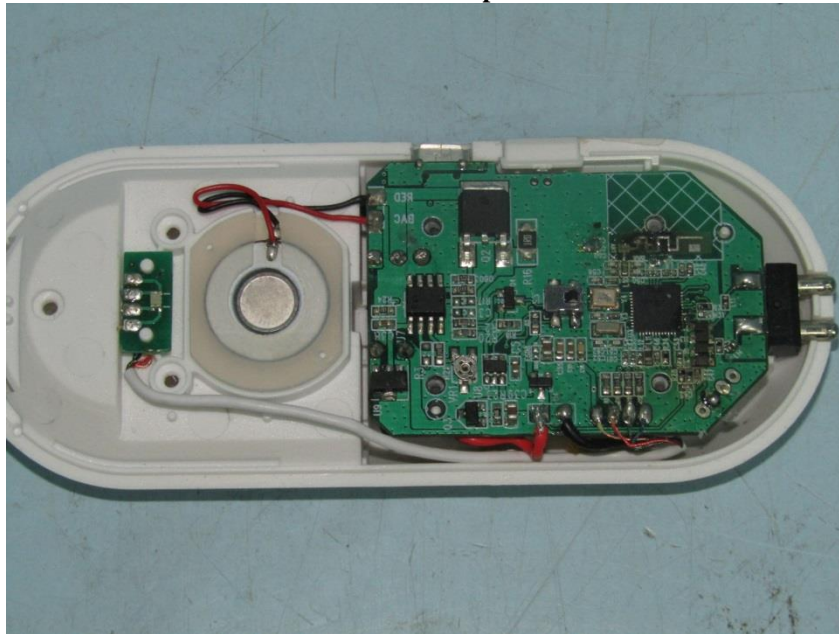
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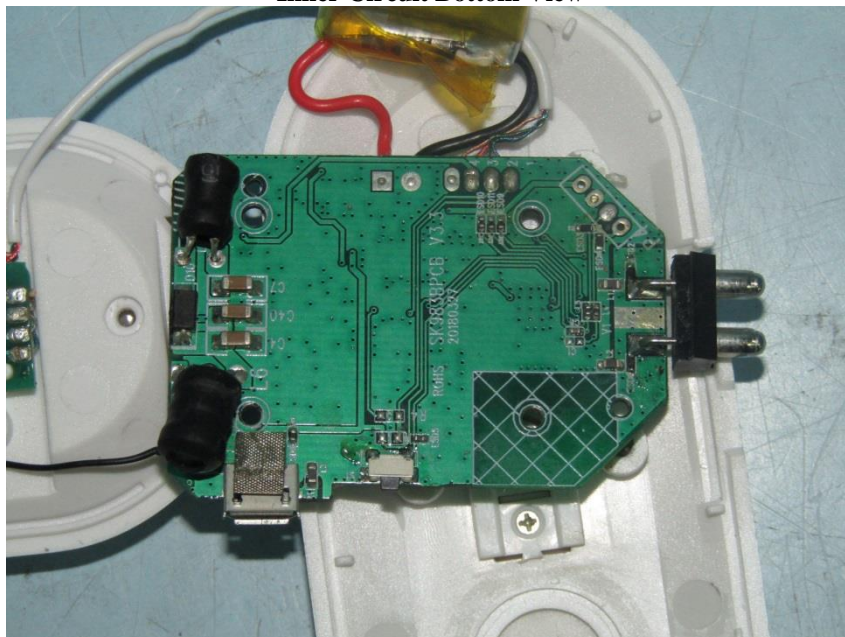
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### Photographs of EUT

**Inner Circuit Top View**



**Inner Circuit Bottom View**



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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



**Measurement of Radiated Emission Test Set Up**





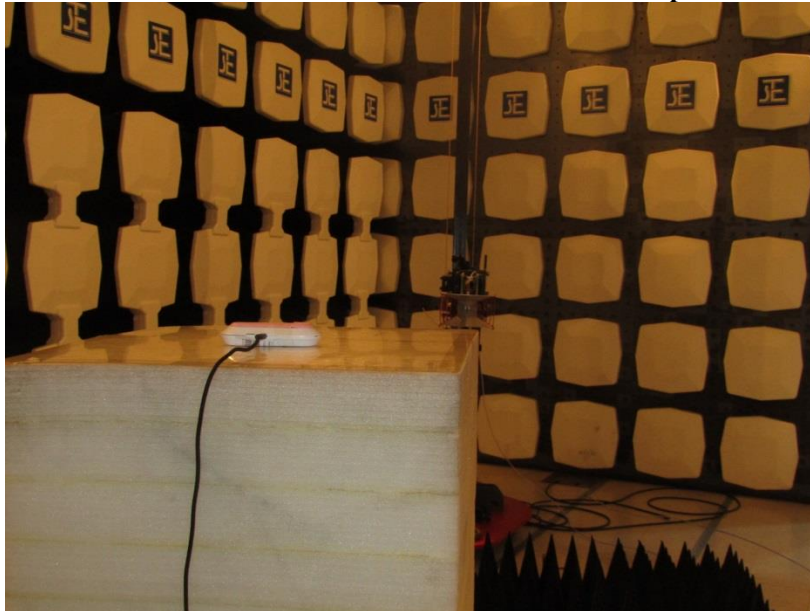
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### Photographs of EUT

**Measurement of Radiated Emission Test Set Up**



**Measurement of Conducted Emission Test Set Up**



**\*\*\*\*\* End of Test Report \*\*\*\*\***

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