



## **STC Test Report**

**Date:** 2013-06-19  
**No.:** DM111332DT

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**Applicant (WHF001):** Whalen Furniture  
4<sup>th</sup> Floor, Jing Lianxuan Building, Lotus Commercial Plaza,  
Chang An Town, Dong Guan City, Guang Dong Province,  
China

**Manufacturer:** Whalen Furniture  
4th Floor, Jing Lianxuan Building, Lotus Commercial Plaza,  
Chang An Town, Dong Guan City, Guang Dong Province,  
China

**Description of Sample(s):** Submitted sample(s) said to be:  
Product: Audio with Bluetooth  
Brand Name: N/A  
Model Number: 225124  
IC ID: 11164A-225124

**Date Sample(s) Received:** 2012-05-27

**Date Tested:** 2013-05-27 to 2013-06-06

**Investigation Requested:** Industry Canada Low Power Licence-Exempt  
Radiocommunication devices (All Frequency Bands) –  
RSS-210

**Conclusion(s):** The submitted product COMPLIED with the requirements  
of Industry Canada Low Power Licence-Exempt  
Radiocommunication devices (All Frequency Bands) – RSS-  
210. The tests were performed in accordance with the  
standards described above and on Section 2.2 in this Test  
Report.

**Remark(s):** ---



LONG Yun Jian, Along  
Authorized Signatory  
ElectroMagnetic Compatibility Department  
For and on behalf of  
STC (Dongguan) Company Limited



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### **1.0 General Details**

#### **1.1 Test Laboratory**

STC (Dongguan) Company Limited  
EMC Laboratory  
68 Fumin Nan Road, Dalang, Dongguan, China

Telephone: (86 769) 81119888  
Fax: (86 769) 81116222

#### **1.2 Equipment Under Test [EUT] Description of Sample(s)**

Submitted Sample(s) said to be:

Product: Audio with Bluetooth  
Manufacturer: Whalen Furniture  
Brand Name: N/A  
Model Number: 225124  
Rating: 9Vd.c. with Jack

The AC/DC adaptor was provided by the applicant with following details:

Brand name: N/A; Model no.: AK06G-0900060UW; Input: 100-240V a.c. 50/60Hz 0.3A;  
Output: 9Vd.c. 0.6A.

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

The Equipment Under Test (EUT) is an Audio with Bluetooth of Whalen Furniture. The transmission transceiver operating in the 2.4GHz ISM frequency band. The EUT continues to transmit while switch bluetooth mode. Modulation by IC; and type is GFSK,  $\pi/4$  DQPSK, 8DPSK modulation.

#### **1.3 Date of Order**

2013-05-27

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**1.4 Submitted Sample(s):**

1 Sample

**1.5 Test Duration**

2013-05-27 to 2013-06-06

**1.6 Country of Origin**

China

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### **2.0 Technical Details**

#### **2.1 Investigations Requested**

Perform ElectroMagnetic Interference measurement in accordance with RSS-210 and ANSI C63.4: 2009 for IC Certification.

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

<b>EMISSION Results Summary</b>					
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result	
				Pass	Fail
Output Power of Fundamental Emissions	RSS-210 issue 8 December 2010	Section A8.4 (2)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Radiated Emissions	RSS-Gen issue 3 December 2010	Section 7.2.5 Table 5 & Table 6	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
AC Mains Conducted Emissions	RSS-Gen issue 3 December 2010	Section 7.2.4 Table 4	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
20dB Bandwidth	RSS-210 issue 8 December 2010	Section A8.1 (b)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
99% Bandwidth	RSS-210 issue 8 December 2010	Section A1.1.3	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Number of Operating Channel	RSS-210 issue 8 December 2010	Section A8.1 (d)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Hopping Frequency Separation	RSS-210 issue 8 December 2010	Section A8.1 (b)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Out-of-band Emission	RSS-210 issue 8 December 2010	Section A8.5	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Occupancy Time (Dwell time)	RSS-210 issue 8 December 2010	Section A8.1 (d)	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>
RF Exposure	RSS-102	N/A	N/A	<input checked="" type="checkbox"/>	<input type="checkbox"/>

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### **2.3 Table for Test Modes**

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate in the table below is the worst case rate with respect to the specific test item.

Investigation has been done on all the possible configurations for searching the worst cases.

The following table is a list of the test modes shown in this test report.

<b>Test Items</b>	<b>Mode</b>	<b>Data Rate</b>
Max. Conducted Output Power	GFSK / $\pi/4$ -DQPSK / 8DPSK	1MBps / 2MBps / 3MBps
Hopping Channel Separation	8DPSK	3MBps
Number of Hopping Frequency	8DPSK	3MBps
Dwell Time	DH1 / DH3 / DH5	3MBps
Radiated Emissions Below 1GHz	GFSK	1MBps
Radiated Emission Above 1GHz	GFSK	1MBps
Band Edge Emissions	GFSK / $\pi/4$ -DQPSK / 8DPSK	1MBps / 2MBps / 3MBps

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### **3.0 Test Results**

#### **3.1 Emission**

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

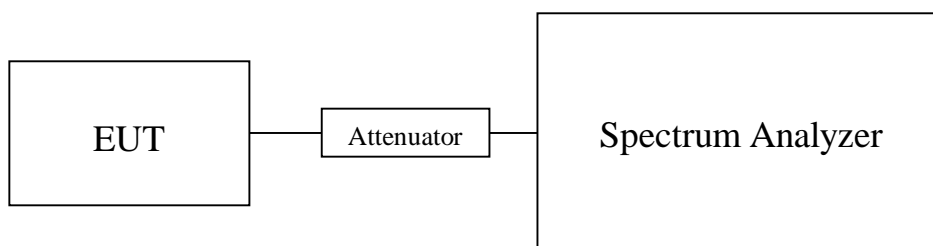
Test Requirement:	RSS-210
Test Method:	RSS-210 A8.4 (2)
Test Date:	2013-06-06
Mode of Operation:	Tx Mode

#### **Test Method:**

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

RBW = 3 MHz, VBW = 3MHz, Sweep = Auto, Span = 10MHz  
Detector = Peak, Trace = Max. hold

#### **Test Setup:**



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### Limits for Peak Output Power of Fundamental:

The maximum peak output power shall not exceed the following limits:  
For frequency hopping systems employing at least 75 hopping channels: 1 Watt  
For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 Watts  
For Digital Transmission systems in 2400-2483.5 MHz Band: 1 Watt

### Results of Tx mode (GFSK) (Fundamental Power): Pass

#### Maximum conducted output power

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2402	0.000619

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2441	0.000644

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2480	0.000630

### Results of Tx mode ( $\pi/4$ -DQPSK) (Fundamental Power): Pass

#### Maximum conducted output power

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2402	0.000462

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2441	0.000440

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2480	0.000432

### Results of Tx mode (8 DPSK) (Fundamental Power): Pass

#### Maximum conducted output power

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2402	0.000495

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2441	0.000485

Transmitter Frequency (MHz)	Maximum conducted output power (Watt)
2480	0.000482

### Limit: 0.125W (20.97dBm)

Calculated measurement uncertainty : 30MHz to 1GHz 1.7dB  
1GHz to 18GHz 1.7dB

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### **3.1.2 Radiated Emissions**

Test Requirement:	RSS-210/ RSS-Gen
Test Method:	RSS-210/ RSS-Gen
Test Date:	2013-06-06
Mode of Operation:	Tx mode / Aux in mode (Connected to iPod) / Bluetooth Communication mode

#### **Test Method:**

The sample was placed 0.8m 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.

\* Semi-anechoic chamber located at DGSTC filed with Industry Canada File Number: IC4789B-1

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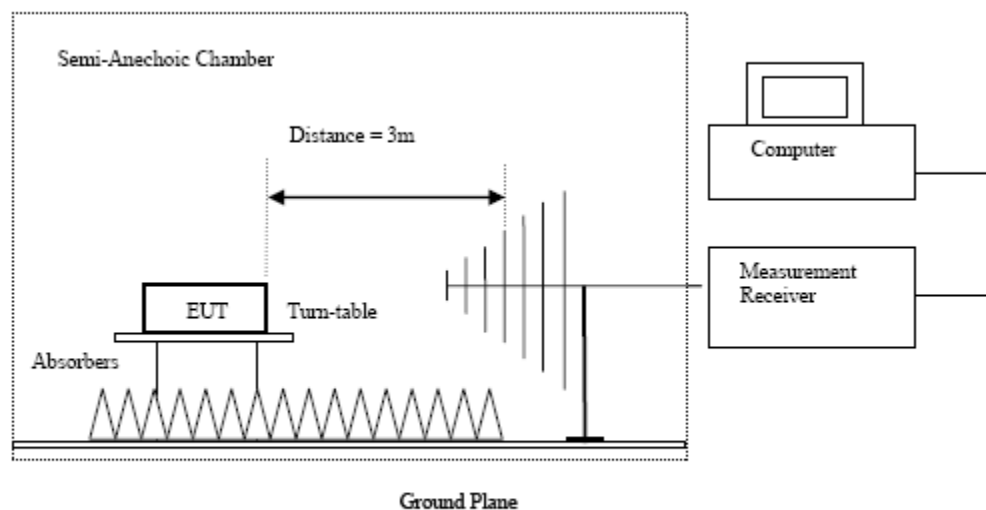
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### **Spectrum Analyzer Setting:**

9KHz – 30MHz (Pk & Av)	RBW: 10kHz VBW: 30kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
30MHz – 1GHz (QP)	RBW: 120kHz VBW: 120kHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold
Above 1GHz (Pk & Av)	RBW: 1MHz VBW: 3MHz Sweep: Auto Span: Fully capture the emissions being measured Trace: Max. hold

### **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.

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**Limits for Radiated Emissions [RSS-Gen Table 5 & Table 6]:**

Frequency Range [MHz]	Quasi-Peak Limits (Transmitter & Receiver) [μV/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
Above 960	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.

**Result of Bluetooth Communication mode (GFSK mode /  $\pi/4$ -DQPSK mode / 8 DPSK mode)  
(9kHz – 30MHz): Pass**

The Low Frequency, which started from 9kHz to 30MHz, was Pre-scan and the result which was more than 20dB lower than the Limit line.

**Result of Tx mode (2402.0 MHz) (GFSK mode) (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
4804.0	13.6	41.5	55.1	74.0	18.9	Vertical
4804.0	12.7	42.4	55.1	74.0	18.9	Horizontal
7206.0	9.1	45.1	54.2	74.0	19.8	Vertical
7206.0	8.1	46.2	54.3	74.0	19.7	Horizontal
9612.0	6.9	48.0	54.9	74.0	19.1	Vertical
9612.0	7.2	48.8	56.0	74.0	18.0	Horizontal
12010.0	4.5	51.5	56.0	74.0	18.0	Vertical
12010.0	3.1	52.4	55.5	74.0	18.5	Horizontal

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

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
4804.0	-0.8	41.5	40.7	54.0	13.3	Vertical
4804.0	-1.2	42.4	41.2	54.0	12.8	Horizontal
7206.0	-5.0	45.1	40.1	54.0	13.9	Vertical
7206.0	-7.0	46.2	39.2	54.0	14.8	Horizontal
9612.0	-7.9	48.0	40.1	54.0	13.9	Vertical
9612.0	-7.2	48.8	41.6	54.0	12.4	Horizontal
12010.0	-9.3	51.5	42.2	54.0	11.8	Vertical
12010.0	-11.5	52.4	40.9	54.0	13.1	Horizontal

**Result of Tx mode (2441.0 MHz) (GFSK mode) (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
4882.0	12.9	41.6	54.5	74.0	19.5	Vertical
4882.0	11.6	42.5	54.1	74.0	19.9	Horizontal
7323.0	9.0	45.2	54.2	74.0	19.8	Vertical
7323.0	7.2	46.3	53.5	74.0	20.5	Horizontal
9764.0	7.3	48.1	55.4	74.0	18.6	Vertical
9764.0	7.8	48.9	56.7	74.0	17.3	Horizontal
12205.0	4.4	51.6	56.0	74.0	18.0	Vertical
12205.0	3.0	52.5	55.5	74.0	18.5	Horizontal

**Result of Tx mode (2441.0 MHz) (GFSK mode) (Above 1GHz): Pass**

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
4882.0	-1.7	41.6	39.9	54.0	14.1	Vertical
4882.0	-1.3	42.5	41.2	54.0	12.8	Horizontal
7323.0	-4.3	45.2	40.9	54.0	13.1	Vertical
7323.0	-7.2	46.3	39.1	54.0	14.9	Horizontal
9764.0	-6.2	48.1	41.9	54.0	12.1	Vertical
9764.0	-7.60	48.9	41.3	54.0	12.7	Horizontal
12205.0	-10.40	51.6	41.2	54.0	12.8	Vertical
12205.0	-12.50	52.5	40	54.0	14.0	Horizontal

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**Result of Tx mode (2480.0 MHz) (GFSK mode) (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	13.8	41.4	55.2	74.0	18.8	Vertical
4960.0	11.9	42.7	54.6	74.0	19.4	Horizontal
7440.0	9.2	45.6	54.8	74.0	19.2	Vertical
7440.0	8.1	46.5	54.6	74.0	19.4	Horizontal
9920.0	6.6	48.6	55.2	74.0	18.8	Vertical
9920.0	5.2	49.7	54.9	74.0	19.1	Horizontal
12400.0	4.0	51.7	55.7	74.0	18.3	Vertical
12400.0	2.9	52.7	55.6	74.0	18.4	Horizontal

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

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	-0.7	41.4	40.7	54.0	13.3	Vertical
4960.0	-3.8	42.7	38.9	54.0	15.1	Horizontal
7440.0	-6.4	45.6	39.2	54.0	14.8	Vertical
7440.0	-6.4	46.5	40.1	54.0	13.9	Horizontal
9920.0	-7.4	48.6	41.2	46.0	4.8	Vertical
9920.0	-9.7	49.7	40.0	47.0	7.0	Horizontal
12400.0	-10.8	51.7	40.9	48.0	7.1	Vertical
12400.0	-11.7	52.7	41.0	49.0	8.0	Horizontal

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**Result of Tx mode (2402.0 MHz) ( $\pi/4$ -DQPSK mode) (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
4804.0	12.7	41.5	54.2	74.0	19.8	Vertical
4804.0	11.7	42.4	54.1	74.0	19.9	Horizontal
7206.0	7.8	45.1	52.9	74.0	21.1	Vertical
7206.0	8.1	46.2	54.3	74.0	19.7	Horizontal
9612.0	7.0	48.0	55.0	74.0	19.0	Vertical
9612.0	6.3	48.8	55.1	74.0	18.9	Horizontal
12010.0	4.2	51.5	55.7	74.0	18.3	Vertical
12010.0	2.0	52.4	54.4	74.0	19.6	Horizontal

**Result of Tx mode (2402.0 MHz) ( $\pi/4$ -DQPSK mode) (Above 1GHz): Pass**

<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
4804.0	-0.5	41.5	41.0	54.0	13.0	Vertical
4804.0	-2.0	42.4	40.4	54.0	13.6	Horizontal
7206.0	-7.1	45.1	38.0	54.0	16.0	Vertical
7206.0	-5.5	46.2	40.7	54.0	13.3	Horizontal
9612.0	-7.9	48.0	40.1	54.0	13.9	Vertical
9612.0	-8.2	48.8	40.6	54.0	13.4	Horizontal
12010.0	-10.6	51.5	40.9	54.0	13.1	Vertical
12010.0	-12.3	52.4	40.1	54.0	13.9	Horizontal

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**Result of Tx mode (2441.0 MHz) ( $\pi/4$ -DQPSK mode) (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
4882.0	12.6	41.6	54.2	74.0	19.8	Vertical
4882.0	11.8	42.5	54.3	74.0	19.7	Horizontal
7323.0	9.4	45.2	54.6	74.0	19.4	Vertical
7323.0	8.0	46.3	54.3	74.0	19.7	Horizontal
9764.0	7.8	48.1	55.9	74.0	18.1	Vertical
9764.0	6.4	48.9	55.3	74.0	18.7	Horizontal
12205.0	3.8	51.6	55.4	74.0	18.6	Vertical
12205.0	2.9	52.5	55.4	74.0	18.6	Horizontal

**Result of Tx mode (2441.0 MHz) ( $\pi/4$ -DQPSK mode) (Above 1GHz): Pass**

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
4882.0	-1.1	41.6	40.5	54.0	13.5	Vertical
4882.0	-2.3	42.5	40.2	54.0	13.8	Horizontal
7323.0	-5.2	45.2	40.0	54.0	14.0	Vertical
7323.0	-5.5	46.3	40.8	54.0	13.2	Horizontal
9764.0	-7.4	48.1	40.7	54.0	13.3	Vertical
9764.0	-7.5	48.9	41.4	54.0	12.6	Horizontal
12205.0	-9.3	51.6	42.3	54.0	11.7	Vertical
12205.0	-11.7	52.5	40.8	54.0	13.2	Horizontal

**Result of Tx mode (2480.0 MHz) ( $\pi/4$ -DQPSK mode) (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	13.7	41.4	55.1	74.0	18.9	Vertical
4960.0	11.5	42.7	54.2	74.0	19.8	Horizontal
7440.0	9.4	45.6	55.0	74.0	19.0	Vertical
7440.0	8.8	46.5	55.3	74.0	18.7	Horizontal
9920.0	6.3	48.6	54.9	74.0	19.1	Vertical
9920.0	4.4	49.7	54.1	74.0	19.9	Horizontal
12400.0	3.0	51.7	54.7	74.0	19.3	Vertical
12400.0	2.9	52.7	55.6	74.0	18.4	Horizontal

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**Result of Tx mode (2480.0 MHz) ( $\pi/4$ -DQPSK mode) (Above 1GHz): Pass**

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	-1.7	41.4	39.7	54.0	14.3	Vertical
4960.0	-3.6	42.7	39.1	54.0	14.9	Horizontal
7440.0	-5.8	45.6	39.8	54.0	14.2	Vertical
7440.0	-6.5	46.5	40.0	54.0	14.0	Horizontal
9920.0	-8.0	48.6	40.6	54.0	13.4	Vertical
9920.0	-10.5	49.7	39.2	54.0	14.8	Horizontal
12400.0	-11.2	51.7	40.5	54.0	13.5	Vertical
12400.0	-11.0	52.7	41.7	54.0	12.3	Horizontal

**Result of Tx mode (2402.0 MHz) (8DPSK) (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
4804.0	12.8	41.5	54.3	74.0	19.7	Vertical
4804.0	12.6	42.4	55.0	74.0	19.0	Horizontal
7206.0	10.0	45.1	55.1	74.0	18.9	Vertical
7206.0	6.5	46.2	52.7	74.0	21.3	Horizontal
9612.0	7.8	48.0	55.8	74.0	18.2	Vertical
9612.0	7.4	48.8	56.2	74.0	17.8	Horizontal
12010.0	4.1	51.8	55.9	74.0	18.1	Vertical
12010.0	3.8	52.4	56.2	74.0	17.8	Horizontal

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**Result of Tx mode (2402.0 MHz) (8DPSK) (Above 1GHz): Pass**

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
4804.0	-1.4	41.5	40.1	54.0	13.9	Vertical
4804.0	-2.2	42.4	40.2	54.0	13.8	Horizontal
7206.0	-4.6	45.1	40.5	54.0	13.5	Vertical
7206.0	-6.8	46.2	39.4	54.0	14.6	Horizontal
9612.0	-6.7	48.0	41.3	54.0	12.7	Vertical
9612.0	-7.0	48.8	41.8	54.0	12.2	Horizontal
12010.0	-10	51.8	41.8	54.0	12.2	Vertical
12010.0	-10.1	52.4	42.3	54.0	11.7	Horizontal

**Result of Tx mode (2441.0 MHz) (8DPSK) (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
4882.0	13.4	41.6	55.0	74.0	19.0	Vertical
4882.0	11.0	42.5	53.5	74.0	20.5	Horizontal
7323.0	8.8	45.2	54.0	74.0	20.0	Vertical
7323.0	7.1	46.3	53.4	74.0	20.6	Horizontal
9764.0	7.5	48.1	55.6	74.0	18.4	Vertical
9764.0	6.2	48.9	55.1	74.0	18.9	Horizontal
12205.0	4.4	51.6	56.0	74.0	18.0	Vertical
12205.0	2.8	52.5	55.3	74.0	18.7	Horizontal

**Result of Tx mode (2441.0 MHz) (8DPSK) (Above 1GHz): Pass**

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
4882.0	-1.8	41.6	39.8	54.0	14.2	Vertical
4882.0	-3.3	42.5	39.2	54.0	14.8	Horizontal
7323.0	-4.6	45.2	40.6	54.0	13.4	Vertical
7323.0	-7.3	46.3	39.0	54.0	15.0	Horizontal
9764.0	-6.4	48.1	41.7	54.0	12.3	Vertical
9764.0	-8.70	48.9	40.2	54.0	13.8	Horizontal
12205.0	-9.80	51.6	41.8	54.0	12.2	Vertical
12205.0	-11.70	52.5	40.8	54.0	13.2	Horizontal

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**Result of Tx mode (2480.0 MHz) (8DPSK) (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
4960.0	13.9	41.4	55.3	74.0	18.7	Vertical
4960.0	11.7	42.7	54.4	74.0	19.6	Horizontal
7440.0	6.6	45.6	52.2	74.0	21.8	Vertical
7440.0	7.3	46.5	53.8	74.0	20.2	Horizontal
9920.0	6.8	48.6	55.4	74.0	18.6	Vertical
9920.0	5.0	49.7	54.7	74.0	19.3	Horizontal
12400.0	3.6	51.7	55.3	74.0	18.7	Vertical
12400.0	2.5	52.7	55.2	74.0	18.8	Horizontal

**Result of Tx mode (2480.0 MHz) (8DPSK) (Above 1GHz): Pass**

<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
4960.0	-0.9	41.4	40.5	54.0	13.5	Vertical
4960.0	-2.8	42.7	39.9	54.0	14.1	Horizontal
7440.0	-5.9	45.6	39.7	54.0	14.3	Vertical
7440.0	-7.9	46.5	38.6	54.0	15.4	Horizontal
9920.0	-7.4	48.6	41.2	54.0	12.8	Vertical
9920.0	-9.1	49.7	40.6	54.0	13.4	Horizontal
12400.0	-11.9	51.7	39.8	54.0	14.2	Vertical
12400.0	-11.6	52.7	41.1	54.0	12.9	Horizontal

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### Limits for Radiated Emissions [RSS-Gen Table 5 & Table 6]:

Frequency Range [MHz]	Quasi-Peak Limits (Transmitter & Receiver) [ $\mu\text{V/m}$ ]
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
Above 960	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.

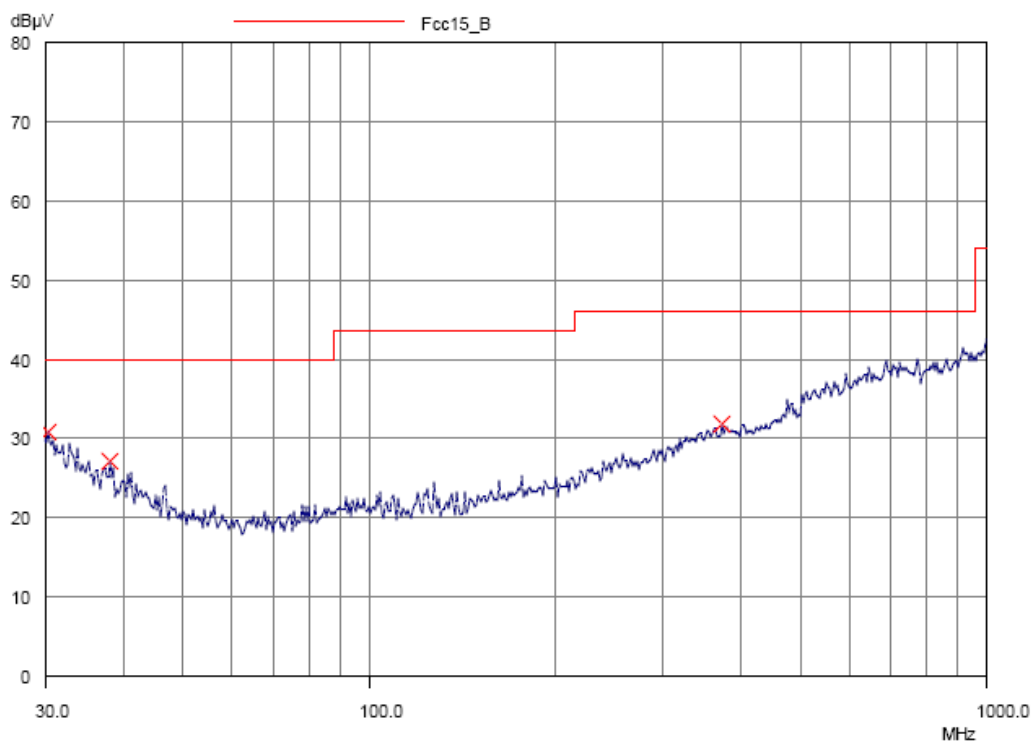
### Results of Aux in mode (Connected to iPod) (9kHz – 30MHz): Pass

Emissions detected are more than 20 dB below the Limits.

### Result of Aux in mode (Connected to iPod) (30MHz – 1GHz): Pass

Please refer to the following table for result details

Horizontal



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**Result of Aux in mode (Connected to iPod) (30MHz – 1GHz): Pass**

<b>Radiated Emissions</b>					
<b>Quasi-Peak</b>					
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
30.2	Horizontal	30.9	40.0	35.1	100
38.1	Horizontal	27.2	40.0	22.9	100
372.8	Horizontal	31.9	46.0	39.4	200

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### Limits for Radiated Emissions [RSS-Gen Table 5 & Table 6]:

Frequency Range [MHz]	Quasi-Peak Limits (Transmitter & Receiver) [ $\mu$ 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
Above 960	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.

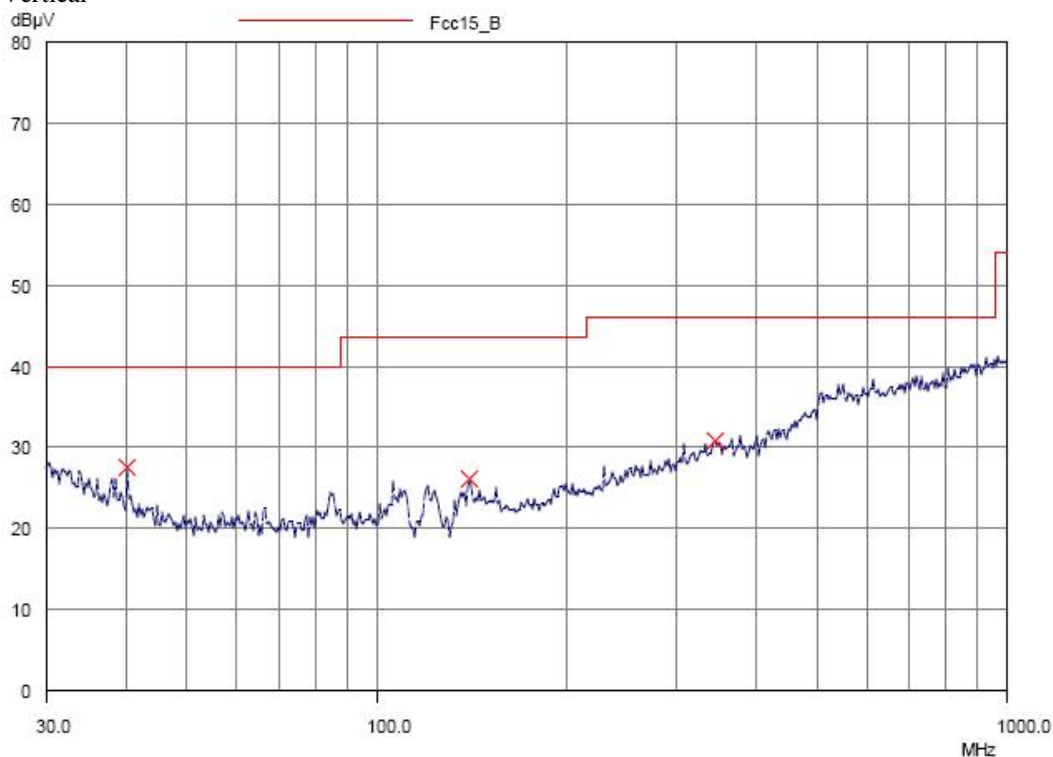
### Results of Aux in mode (Connected to iPod) (9kHz – 30MHz): Pass

Emissions detected are more than 20 dB below the Limits.

### Result of Aux in mode (Connected to iPod) (30MHz – 1GHz): Pass

Please refer to the following table for result details

Vertical



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**Result of Aux in mode (Connected to iPod) (30MHz – 1GHz): Pass**

<b>Radiated Emissions Quasi-Peak</b>					
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
40.4	Vertical	27.5	40.0	23.7	100
141.1	Vertical	26.1	43.5	20.2	150
343.3	Vertical	31.0	46.0	35.5	200

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### Limits for Radiated Emissions [RSS-Gen Table 5 & Table 6]:

Frequency Range [MHz]	Quasi-Peak Limits (Transmitter & Receiver) [ $\mu\text{V/m}$ ]
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
Above 960	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.

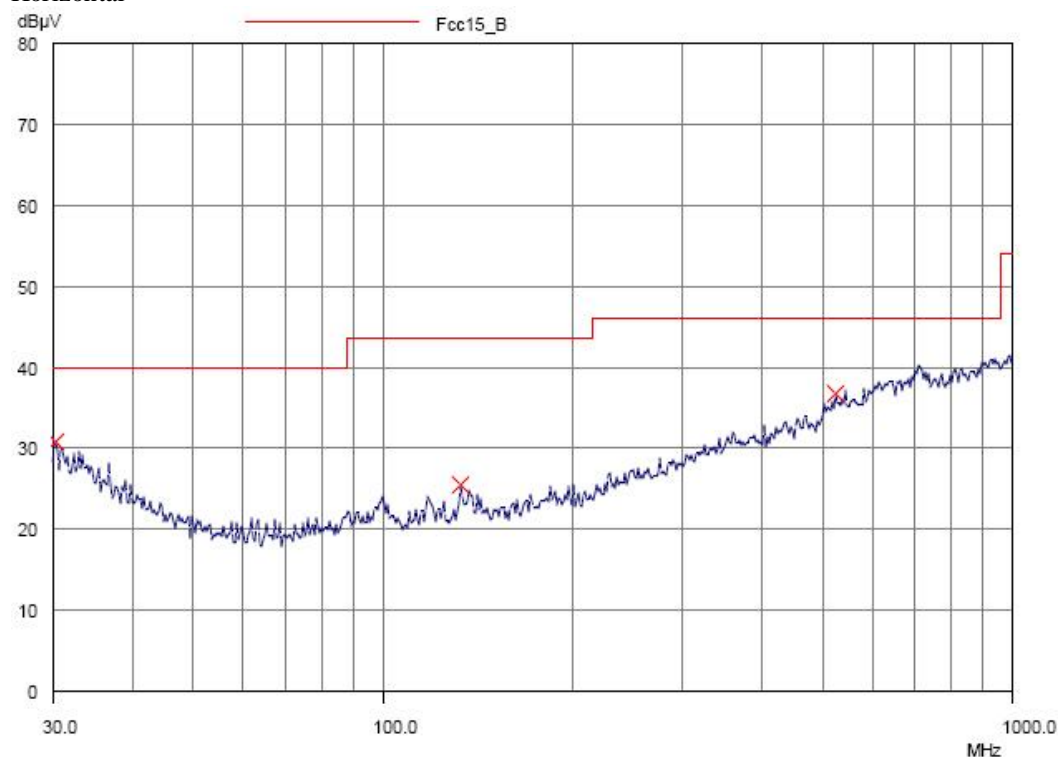
### Results of Bluetooth Communication mode (9kHz – 30MHz): Pass

Emissions detected are more than 20 dB below the Limits.

### Result of Bluetooth Communication mode (GFSK / $\pi/4$ -DQPSK/ 8DPSK) (30MHz – 1GHz): Pass

Please refer to the following table for result details

Horizontal



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**Result of Bluetooth Communication mode (GFSK /  $\pi/4$ -DQPSK/ 8DPSK) (30MHz – 1GHz): Pass**

<b>Radiated Emissions</b>					
<b>Quasi-Peak</b>					
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
30.2	Horizontal	31.0	40.0	35.5	100
133.3	Horizontal	25.6	43.5	19.1	150
525.0	Horizontal	36.8	46.0	69.2	200

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### Limits for Radiated Emissions [RSS-Gen Table 5 & Table 6]:

Frequency Range [MHz]	Quasi-Peak Limits (Transmitter & Receiver) [ $\mu$ 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
Above 960	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.

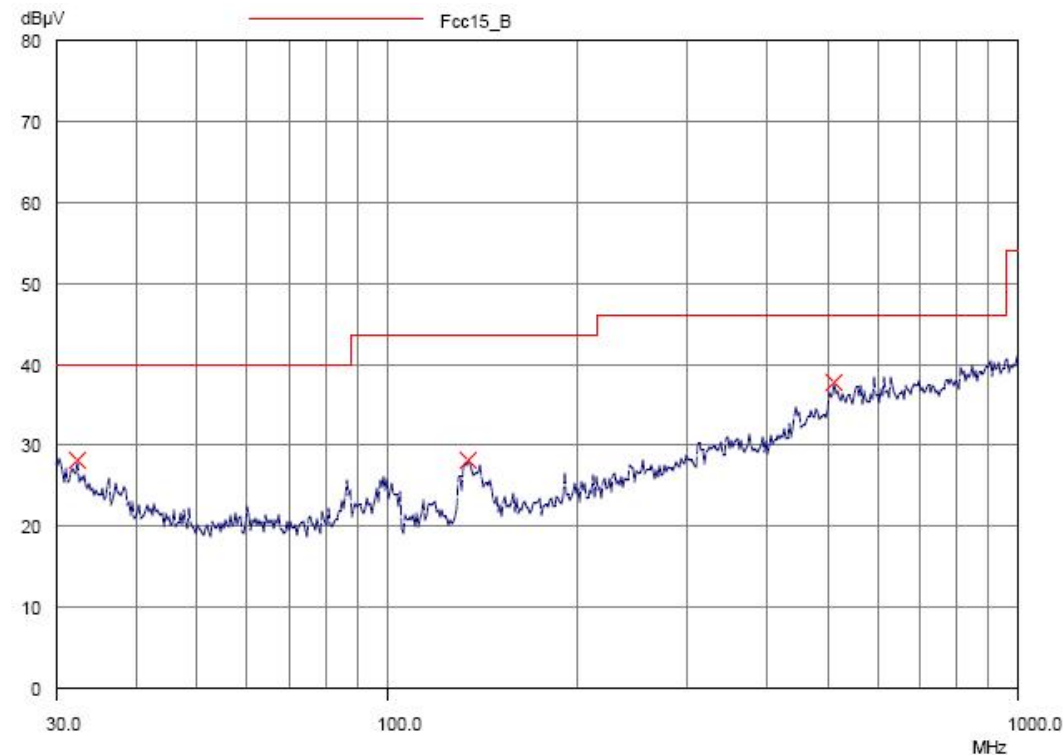
### Results of Bluetooth Communication mode (9kHz – 30MHz): Pass

Emissions detected are more than 20 dB below the Limits.

### Result of Bluetooth Communication mode (GFSK / $\pi$ /4-DQPSK/ 8DPSK) (30MHz – 1GHz): Pass

Please refer to the following table for result details

Vertical



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**Result of Bluetooth Communication mode (GFSK /  $\pi/4$ -DQPSK/ 8DPSK) (30MHz – 1GHz): Pass**

<b>Radiated Emissions Quasi-Peak</b>					
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
32.4	Vertical	28.2	40.0	25.7	100
135.1	Vertical	28.2	43.5	25.7	150
509.6	Vertical	37.8	46.0	77.6	200

Remarks:

\*: Denotes restricted band of operation.

Measurements were made using a peak detector. Any emission less than 1000 MHz and falling within the restricted bands of Section 7.2.5 Table 5 and Table 6 were applied.

Calculated measurement uncertainty (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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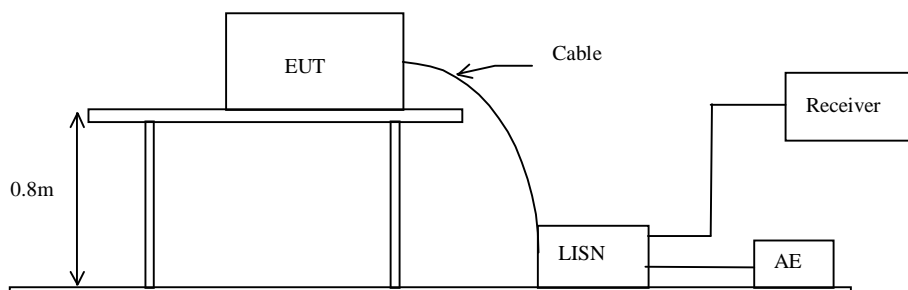
### **3.1.3 Conducted Emissions (0.15MHz to 30MHz)**

Test Requirement:	RSS-Gen
Test Method:	ANSI C63.4:2009
Test Date:	2013-05-27
Mode of Operation:	Aux in mode (Connected to iPod) / Bluetooth Communication mode

#### **Test Method:**

The test was performed in accordance with ANSI C63.4: 2009, 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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## STC Test Report

Date: 2013-06-19  
No.: DM111332DT

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### Limit for Conducted Emissions (FCC 47 CFR 15.207):

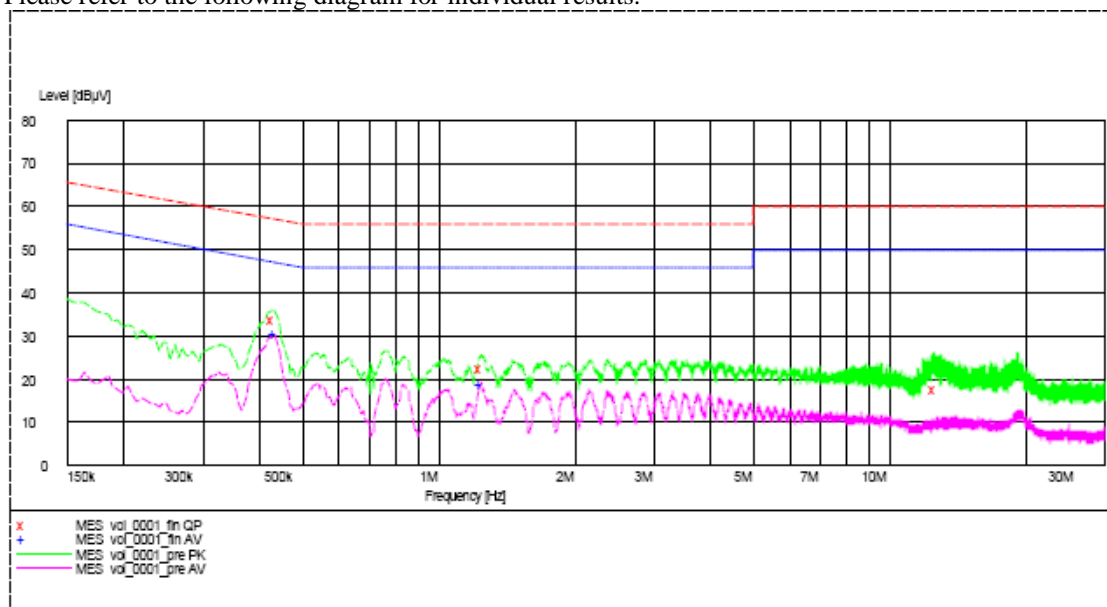
Frequency Range [MHz]	Quasi-Peak Limits [dB $\mu$ V]	Average [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* 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 Aux in mode (Connected to iPod) (L): PASS

Please refer to the following diagram for individual results.



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB $\mu$ V	Limit dB $\mu$ V	Level dB $\mu$ V	Limit dB $\mu$ V
Live	0.435	-*-	-*-	30.8	47.0
Live	1.245	-*-	-*-	18.9	46.0
Live	0.430	33.7	57.0	-*-	-*-
Live	1.245	22.5	56.0	-*-	-*-
Live	12.670	17.9	60.0	-*-	-*-

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### Limit for Conducted Emissions (FCC 47 CFR 15.207):

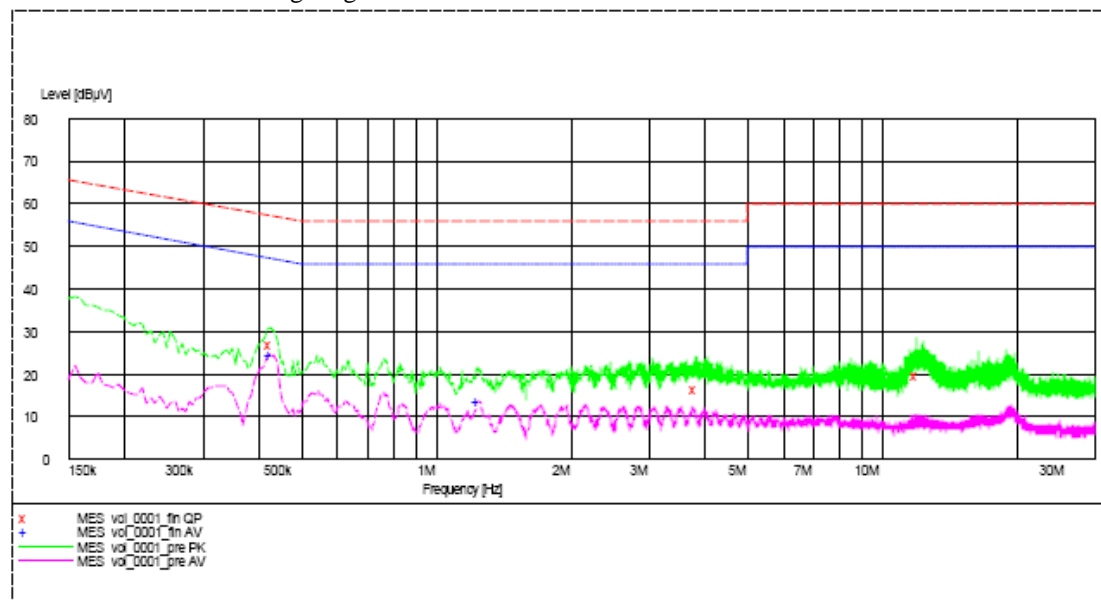
Frequency Range [MHz]	Quasi-Peak Limits [dB $\mu$ V]	Average [dB $\mu$ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* 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 Aux in mode (Connected to iPod) (N): Pass

Please refer to the following diagram for individual results.



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dB $\mu$ V	Limit dB $\mu$ V	Level dB $\mu$ V	Limit dB $\mu$ V
Neutral	0.425	27.0	57.0	24.5	47.0
Neutral	1.245	-*-	-*-	13.6	46.0
Neutral	3.825	16.4	56.0	-*-	-*-
Neutral	11.960	19.7	60.0	-*-	-*-

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### Limit for Conducted Emissions (FCC 47 CFR 15.207):

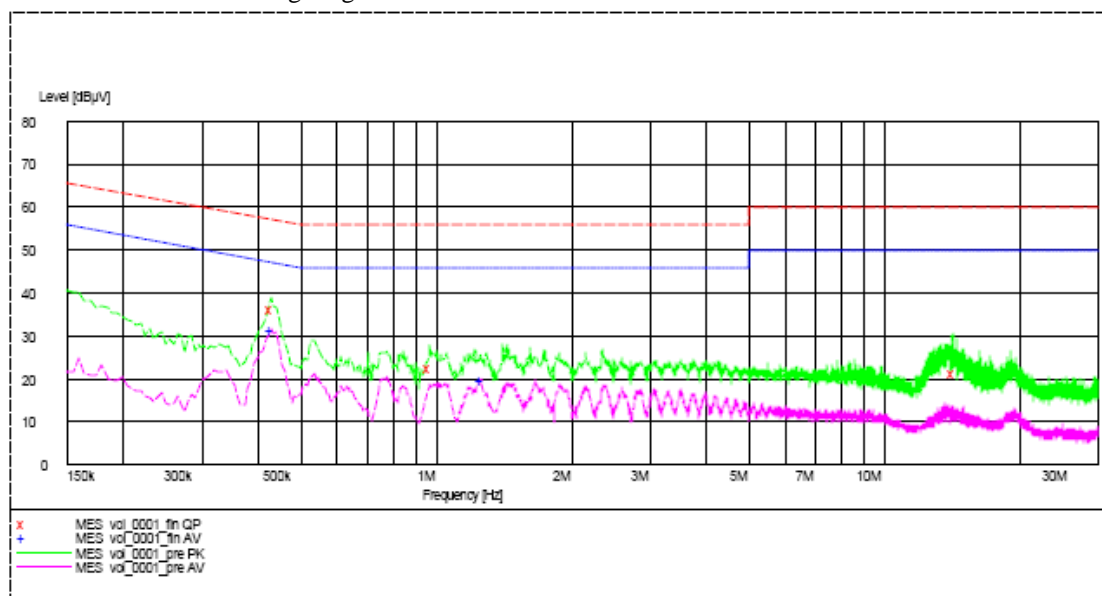
Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* 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 (GFSK / $\pi/4$ -DQPSK/ 8DPSK) (L): PASS

Please refer to the following diagram for individual results.



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Live	0.430	36.3	57.0	31.4	47.0
Live	1.260	-*-	-*-	19.8	46.0
Live	0.970	22.5	56.0	-*-	-*-
Live	14.295	21.3	60.0	-*-	-*-

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### Limit for Conducted Emissions (FCC 47 CFR 15.207):

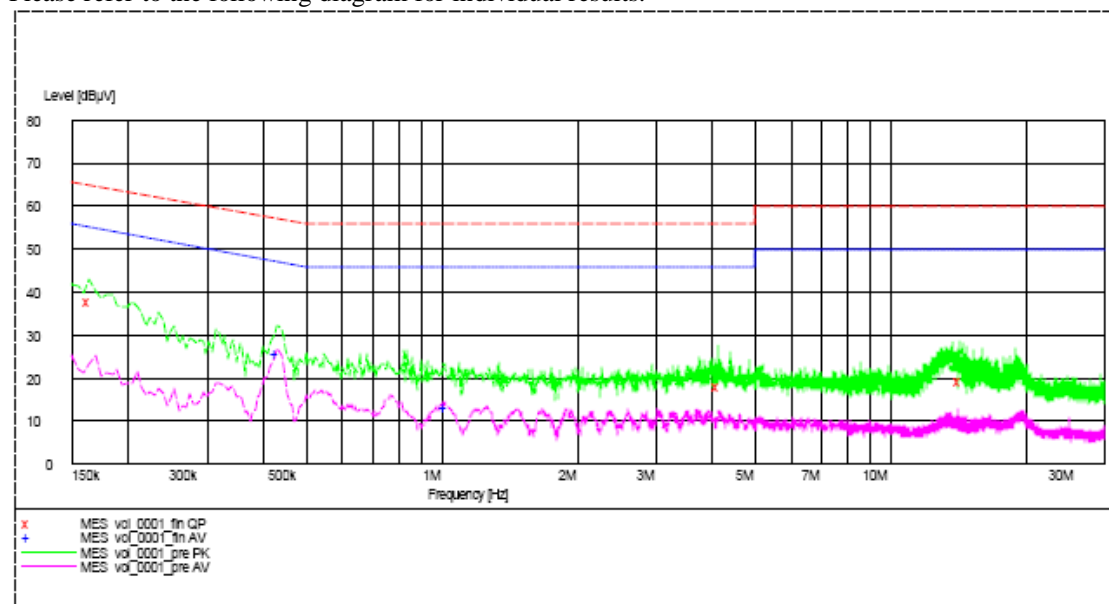
Frequency Range [MHz]	Quasi-Peak Limits [dBμV]	Average [dBμV]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

\* 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 (GFSK / $\pi/4$ -DQPSK/ 8DPSK) (N): PASS

Please refer to the following diagram for individual results.



Conductor Live or Neutral	Frequency MHz	Quasi-peak		Average	
		Level dBμV	Limit dBμV	Level dBμV	Limit dBμV
Neutral	0.430	-*-	-*-	25.9	47.0
Neutral	1.020	-*-	-*-	13.5	46.0
Neutral	0.165	37.8	65.0	-*-	-*-
Neutral	4.135	18.1	56.0	-*-	-*-
Neutral	14.340	19.6	60.0	-*-	-*-

Remarks:

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

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

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### **3.1.4 20dB Bandwidth of Fundamental Emission**

Test Requirement:	RSS-210 issue 8 December 2010
Test Method:	RSS-210 A8.1 (b)
Test Date:	2013-06-06
Mode of Operation:	Bluetooth Communication 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.

The measurement bandwidth settings	RBW = 100 kHz
are	VBW = 300 kHz

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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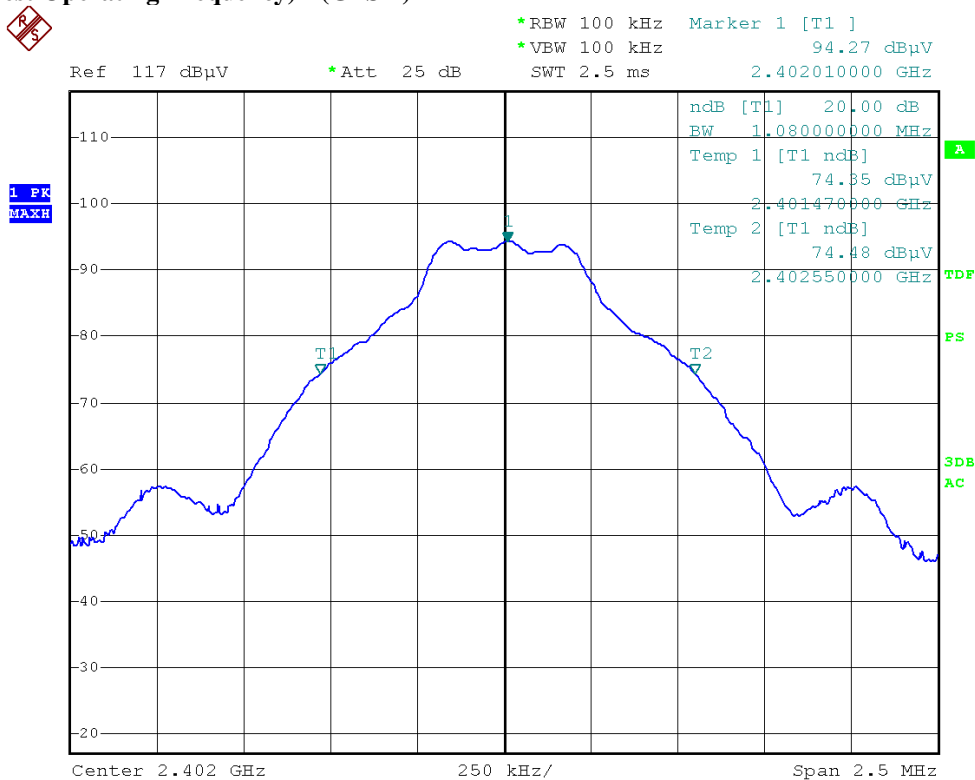
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2402	1.08

### (Lowest Operating Frequency) - (GFSK)



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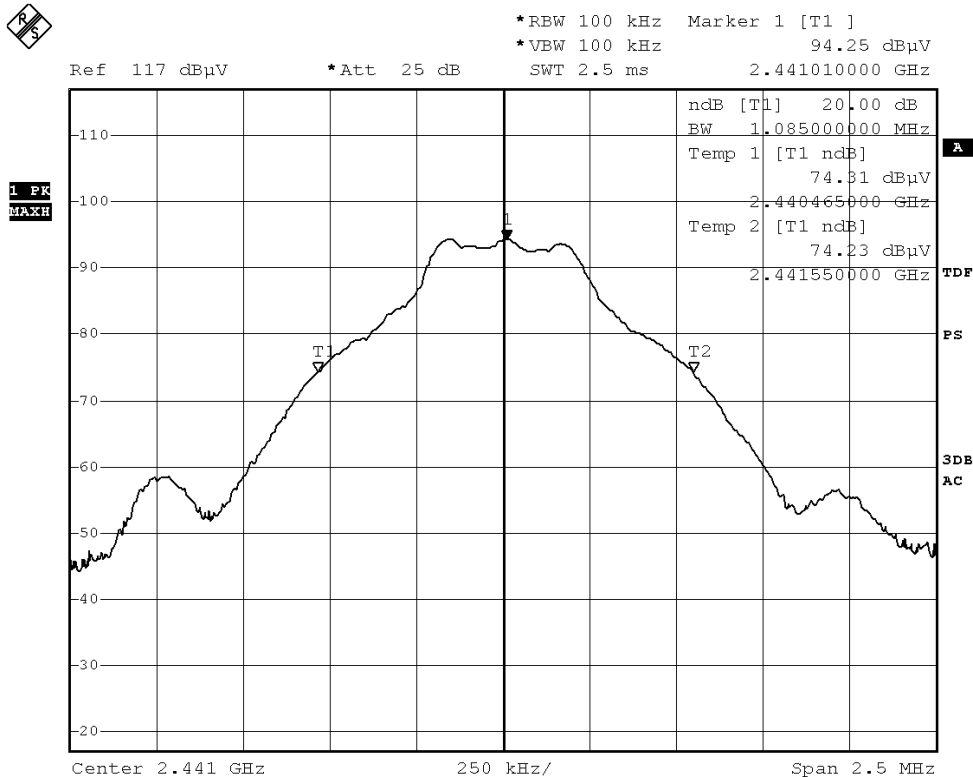
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2441	1.085

### (Middle Operating Frequency) - (GFSK)



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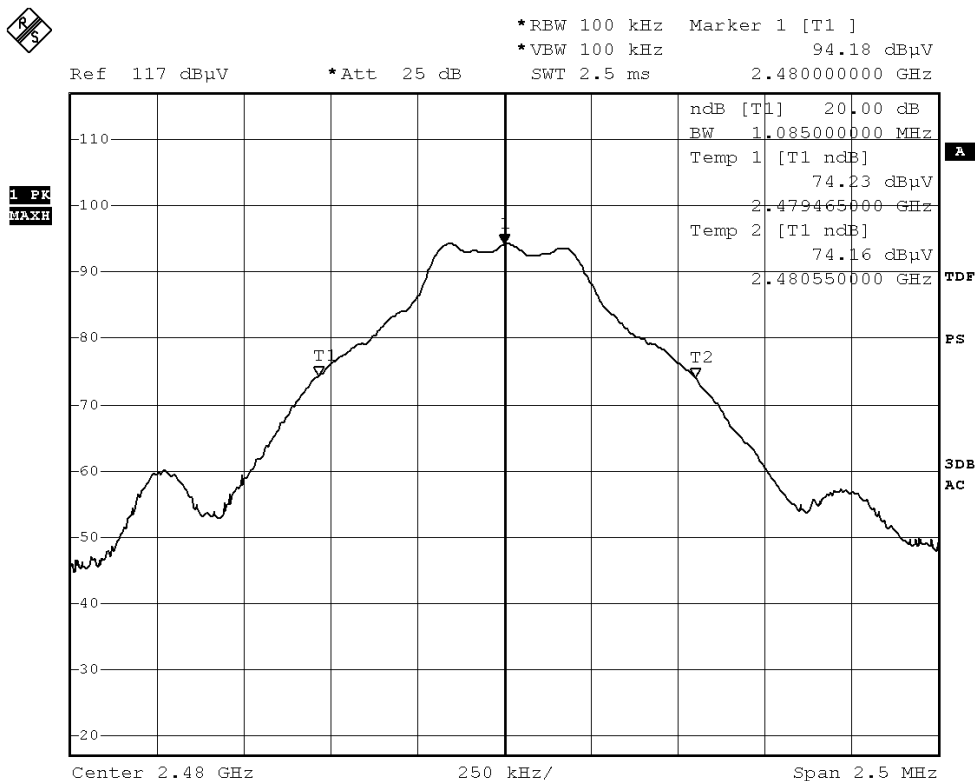
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2480	1.085

### (Highest Operating Frequency) - (GFSK)





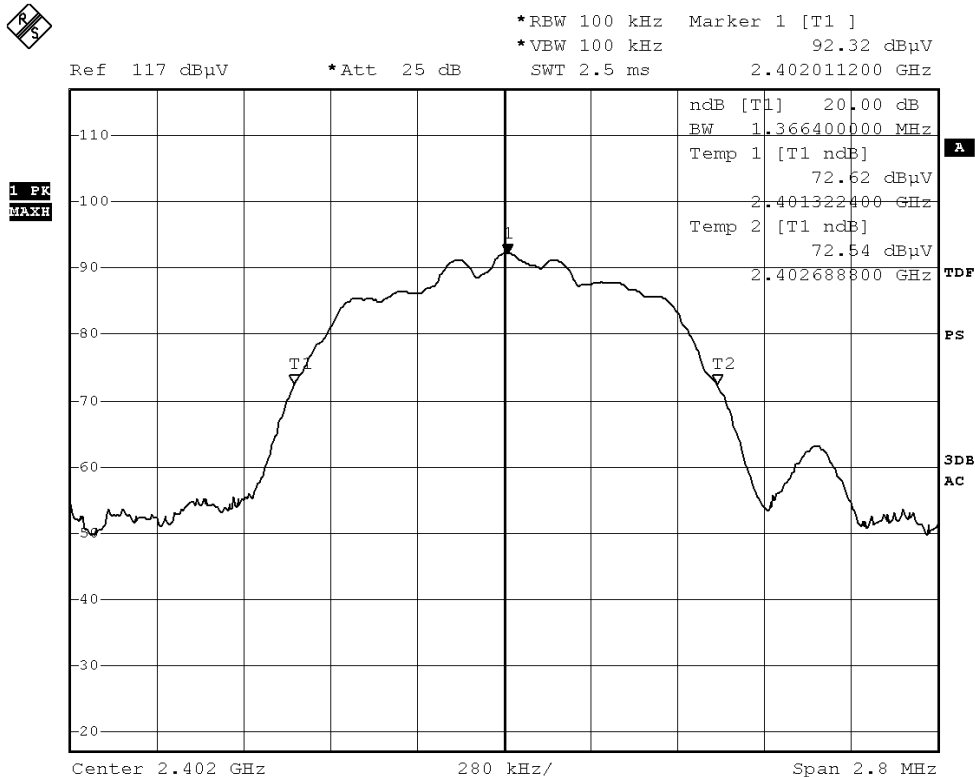
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2402	1.366

(Lowest Operating Frequency) - ( $\pi/4$  DQPSK)



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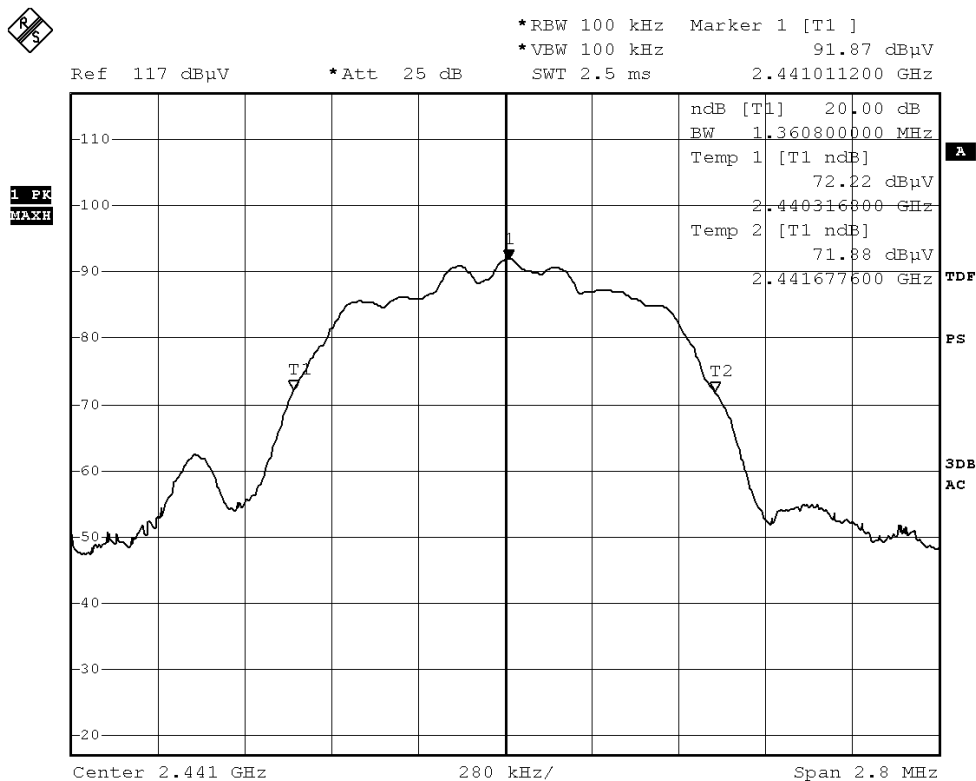
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2441	1.361

(Middle Operating Frequency) - ( $\pi/4$  DQPSK)



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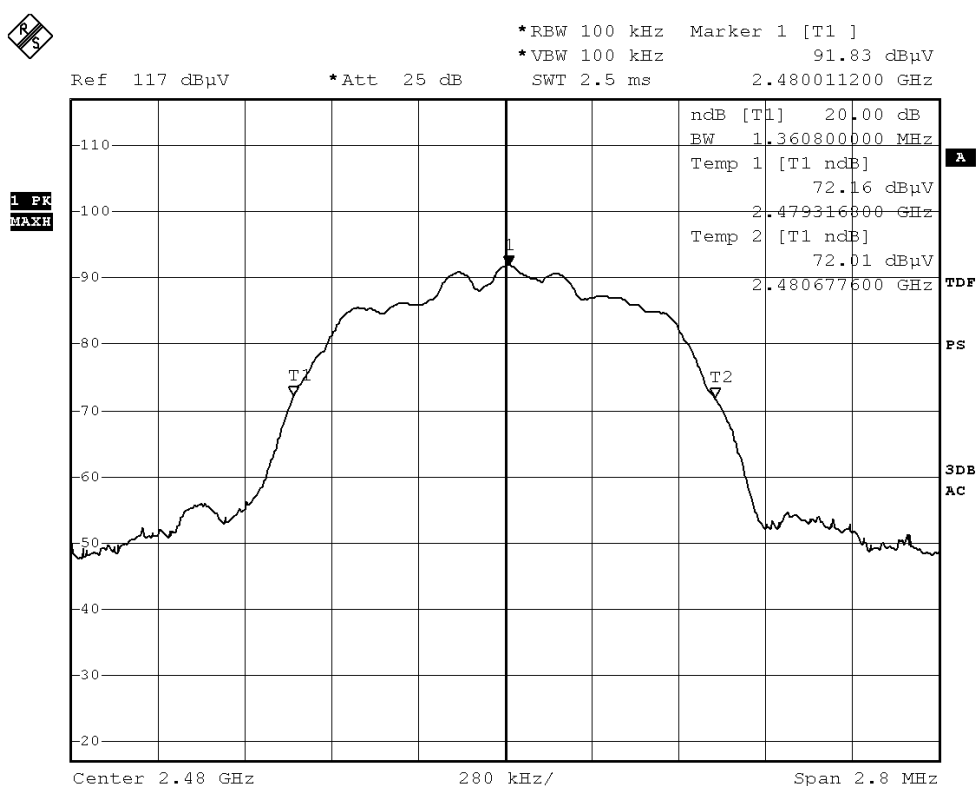
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2480	1.361

(Highest Operating Frequency) - ( $\pi/4$  DQPSK)



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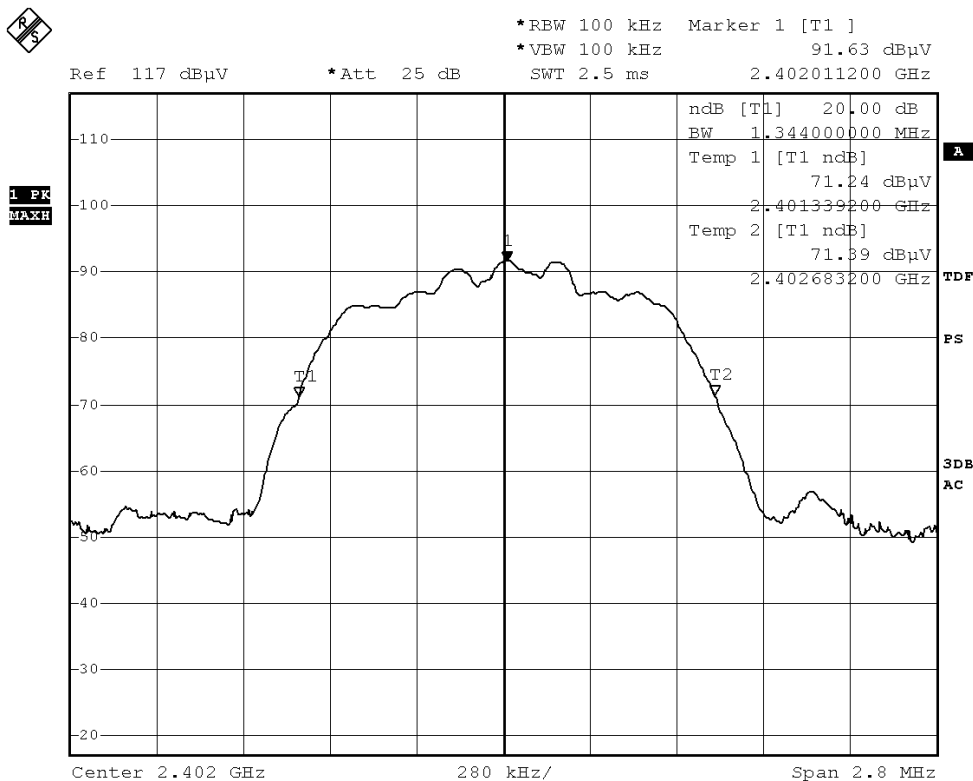
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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2402.0	1.344

### (Lowest Operating Frequency) - (8DPSK)







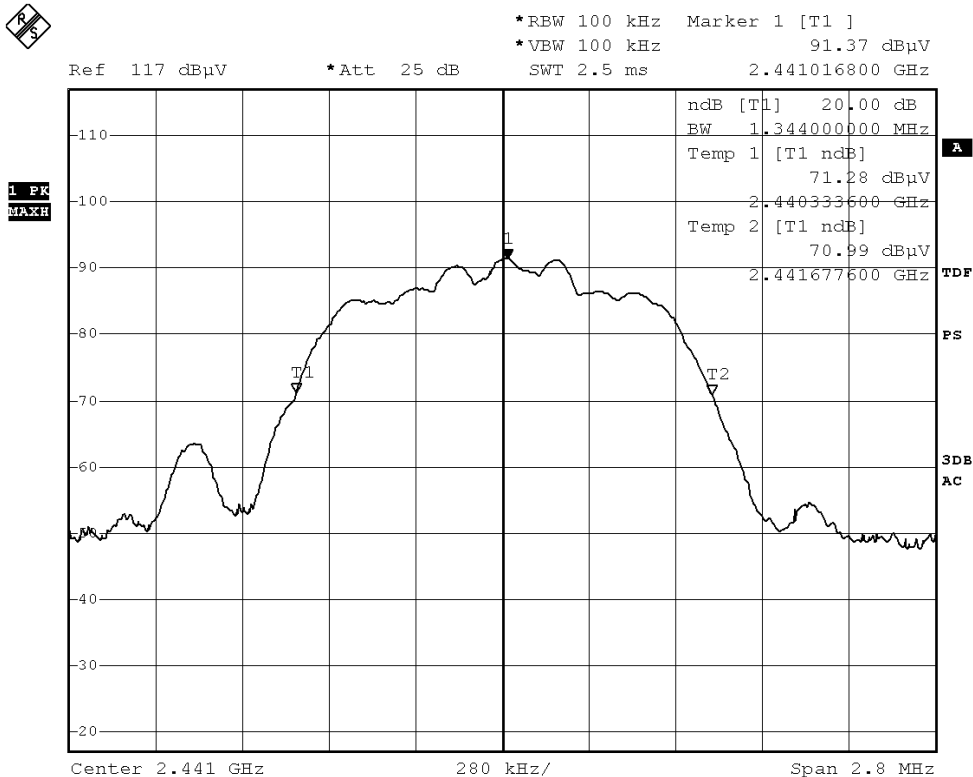
## STC Test Report

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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2441	1.344

(Middle Operating Frequency) - (8DPSK)



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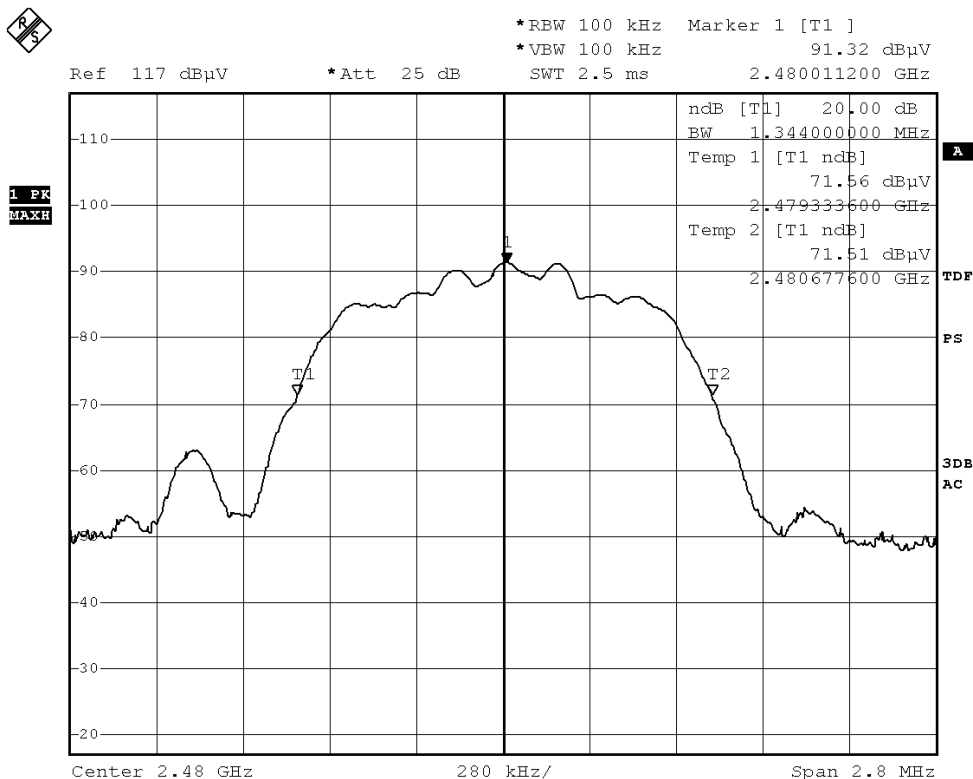
## STC Test Report

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Fundamental Frequency [MHz]	20dB Bandwidth [MHz]
2480	1.344

### (Highest Operating Frequency) - (8DPSK)



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## **STC Test Report**

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### **3.1.5 99% Bandwidth of Fundamental Emission**

Test Requirement:	RSS-210 A1.1.3
Test Method:	ANSI C63.4:2009
Test Date:	2013-06-06
Mode of Operation:	Bluetooth Communication 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.

The measurement bandwidth settings	RBW = 100 kHz
are	VBW = 100 kHz

#### **Test Setup:**

As Test Setup of clause 3.1.1 in this test report.

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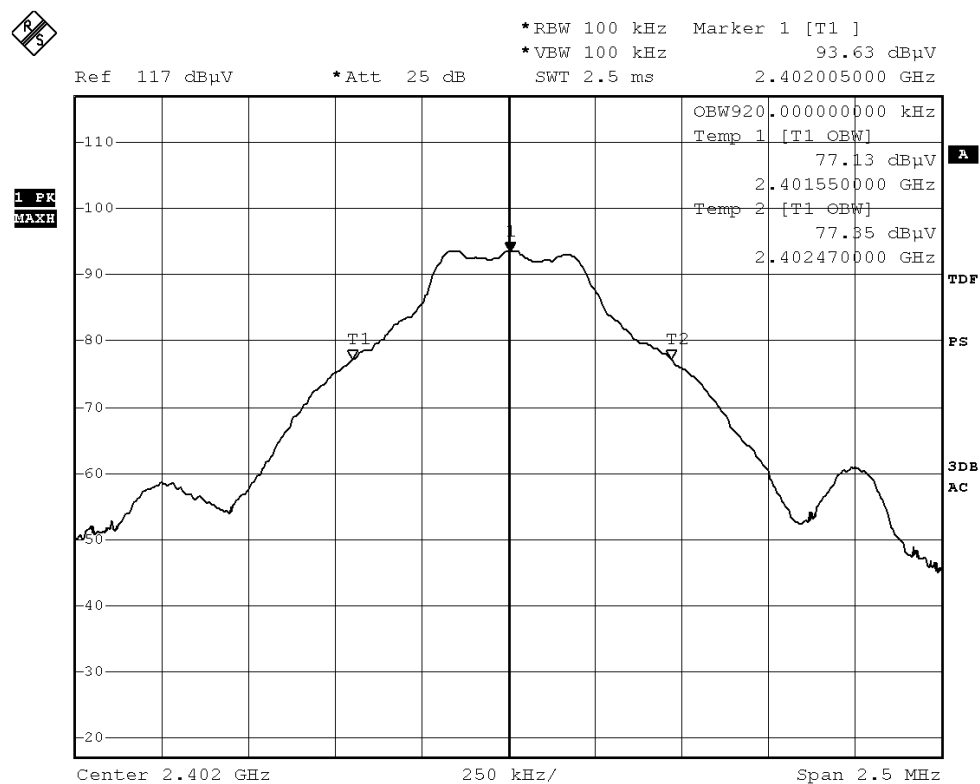
## STC Test Report

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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2402	0.920

### (Lowest Operating Frequency)- (GFSK)



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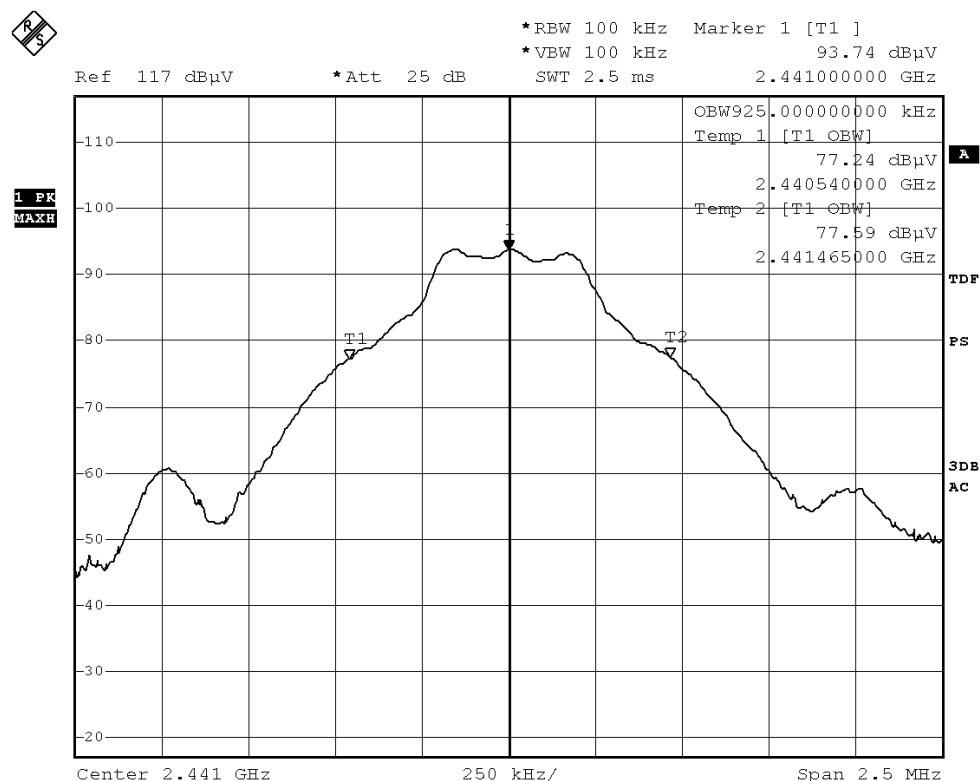
## STC Test Report

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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2441	0.925

### (Middle Operating Frequency)- (GFSK)





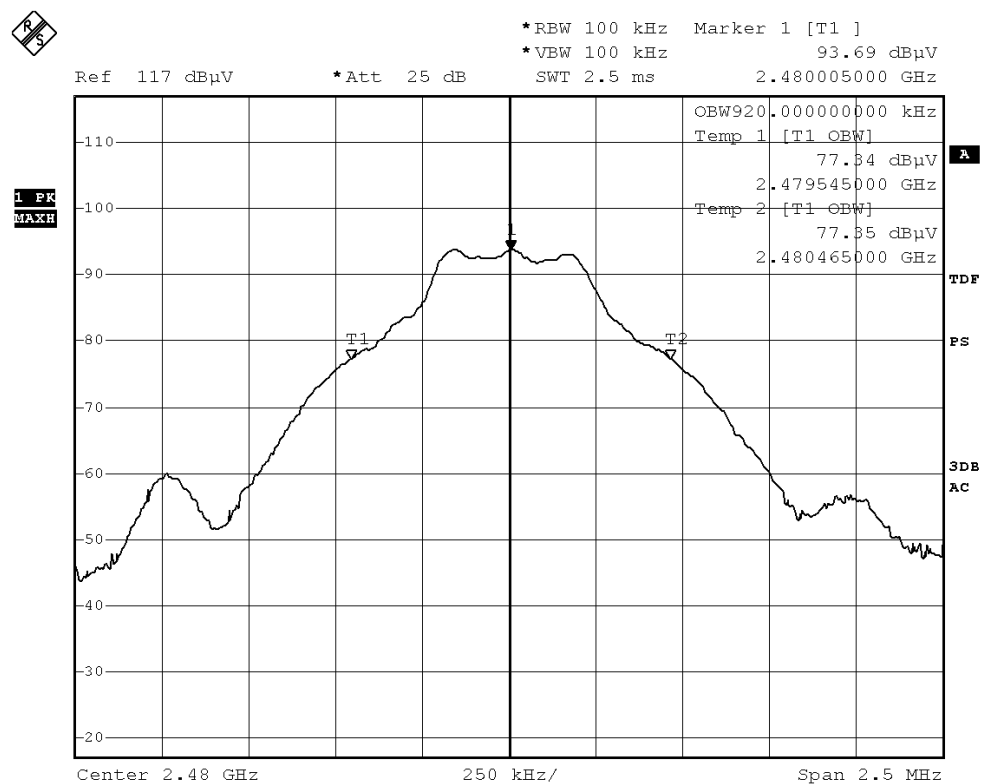
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2480	0.920

### (Highest Operating Frequency)- (GFSK)



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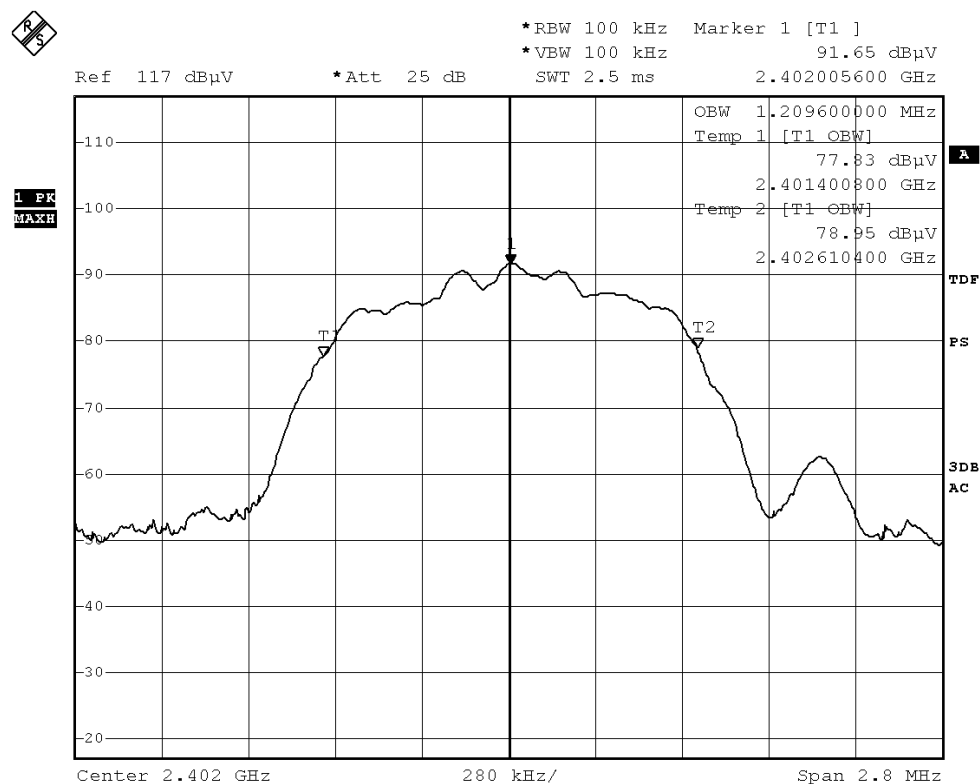
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2402	1.210

(Lowest Operating Frequency)- ( $\pi/4$  DQPSK)





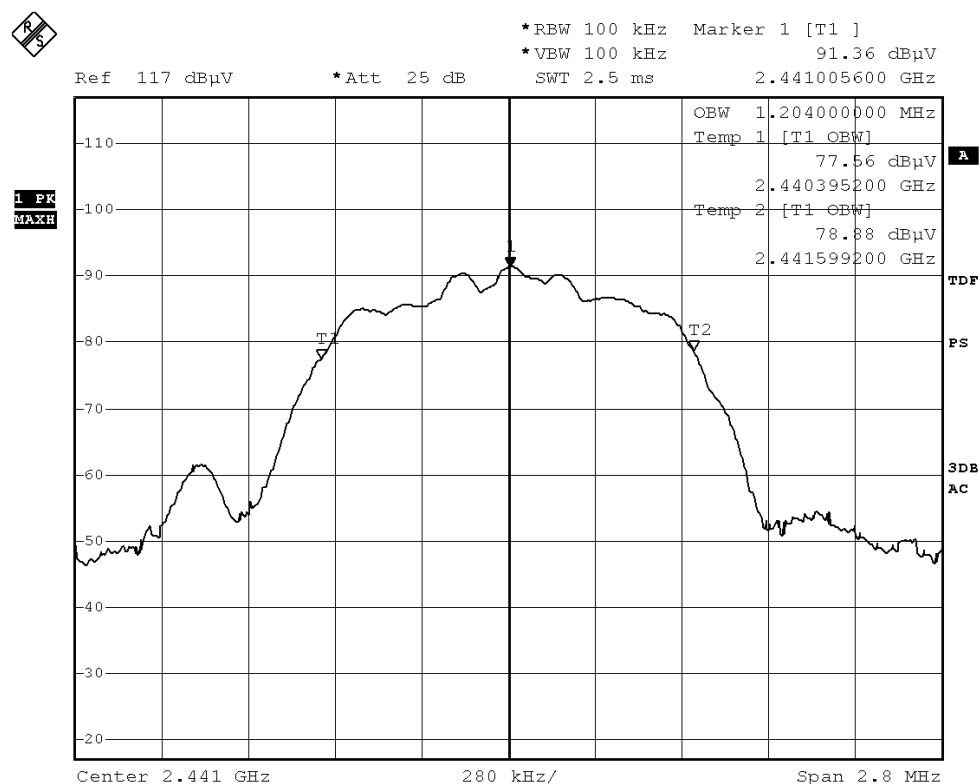
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2441	1.204

(Middle Operating Frequency)- ( $\pi/4$  DQPSK)



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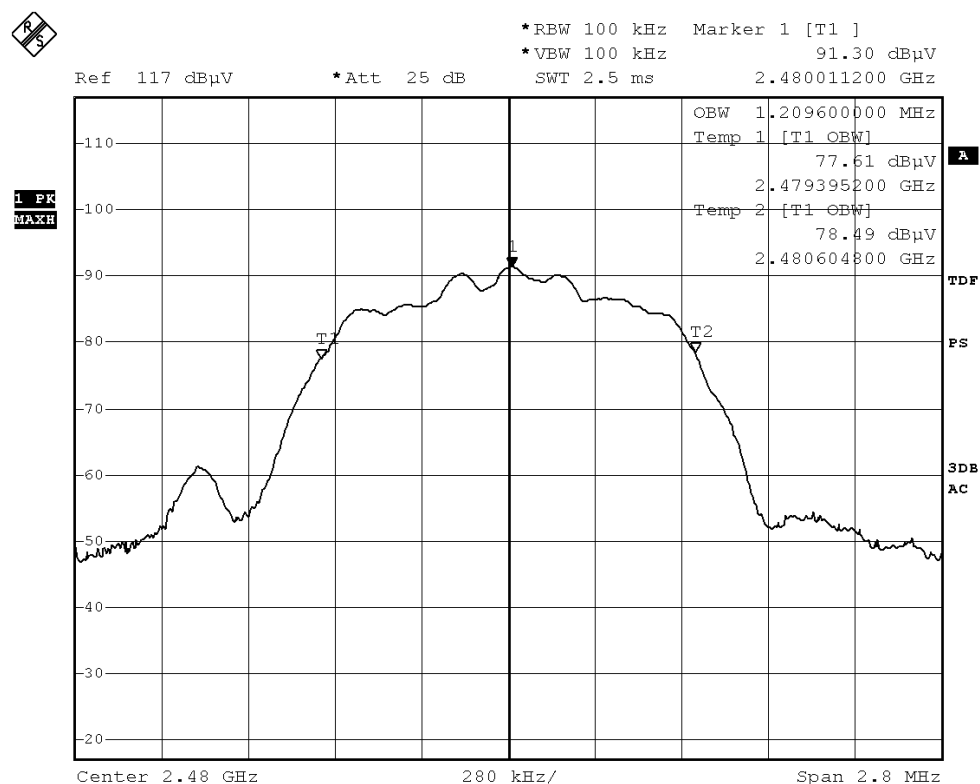
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2480	1.210

### (Highest Operating Frequency)- ( $\pi/4$ DQPSK)



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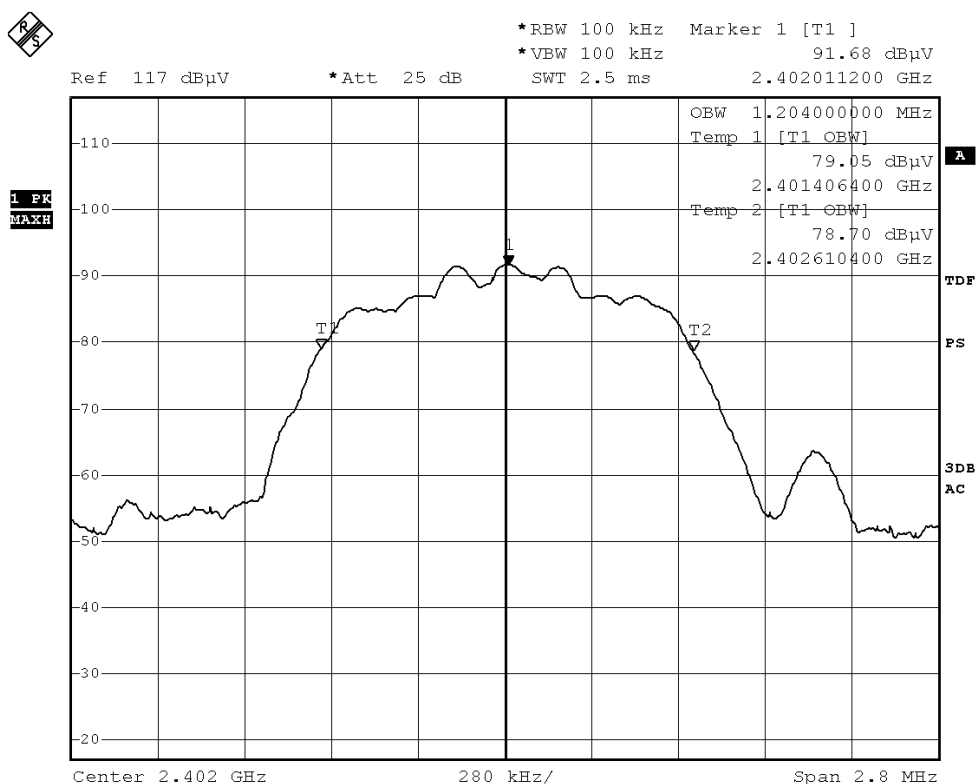
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2402	1.204

(Lowest Operating Frequency)- (8DPSK)



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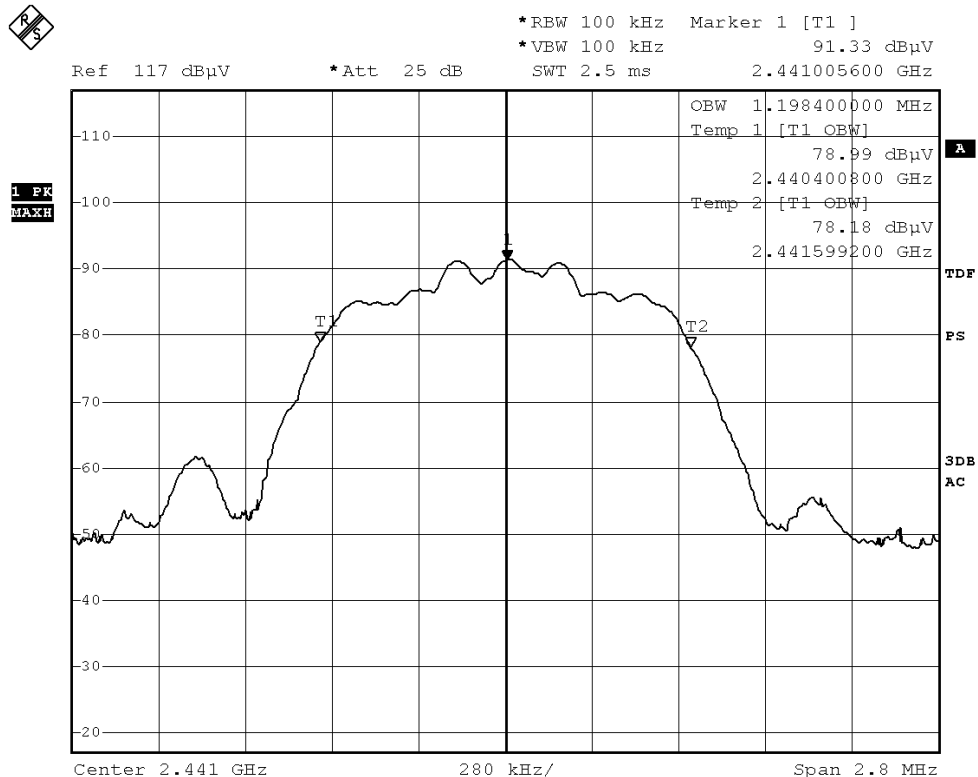
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2441	1.198

(Middle Operating Frequency)- (8DPSK)



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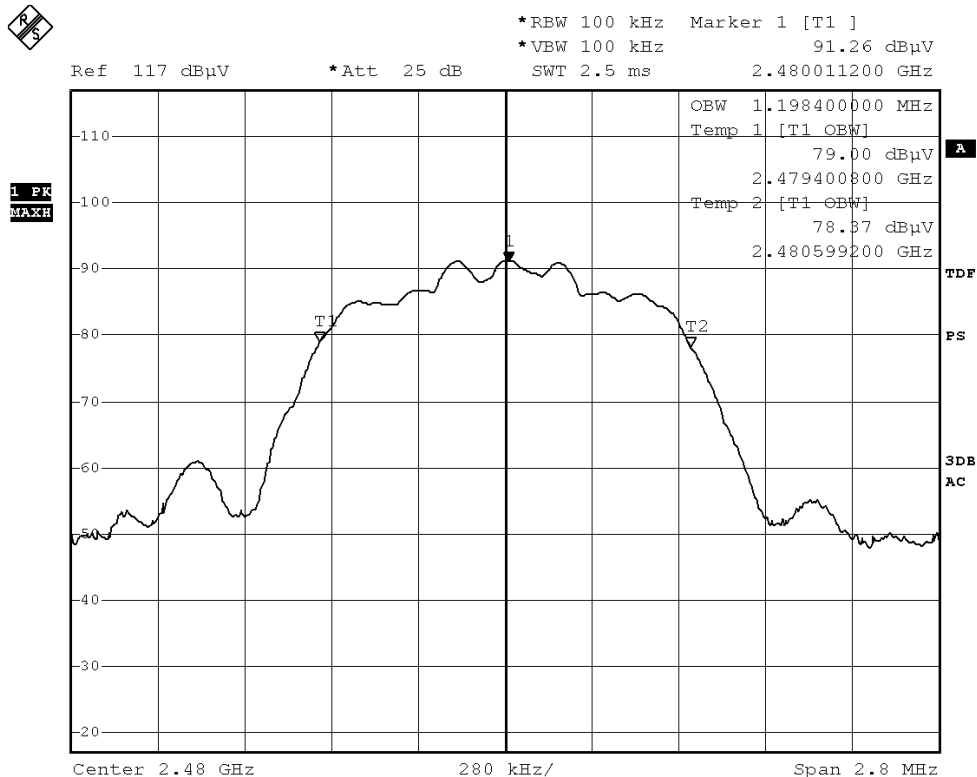
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Fundamental Frequency [MHz]	99% Bandwidth [MHz]
2480	1.198

### (Highest Operating Frequency)- (8DPSK)



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### 3.1.6 Number of Operating Channel

#### Requirements:

Frequency hopping system in the 2400-2483.5MHz band shall use at least 15 non-overlapping channels.

Item	Frequency (MHz)	Item	Frequency (MHz)	Item	Frequency (MHz)
1	2402	31	2432	61	2462
2	2403	32	2433	62	2463
3	2404	33	2434	63	2464
4	2405	34	2435	64	2465
5	2406	35	2436	65	2466
6	2407	36	2437	66	2467
7	2408	37	2438	67	2468
8	2409	38	2439	68	2469
9	2410	39	2440	69	2470
10	2411	40	2441	70	2471
11	2412	41	2442	71	2472
12	2413	42	2443	72	2473
13	2414	43	2444	73	2474
14	2415	44	2445	74	2475
15	2416	45	2446	75	2476
16	2417	46	2447	76	2477
17	2418	47	2448	77	2478
18	2419	48	2449	78	2479
19	2420	49	2450	79	2480
20	2421	50	2451		
21	2422	51	2452		
22	2423	52	2453		
23	2424	53	2454		
24	2425	54	2455		
25	2426	55	2456		
26	2427	56	2457		
27	2428	57	2458		
28	2429	58	2459		
29	2430	59	2460		
30	2431	60	2461		

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### **3.1.7 Channel Centre Frequency**

**Requirements:**

Frequency hopping system in the 2400-2483.5MHz band shall use at least 79 (Channel 0 to 78) non-overlapping channels.

The EUT operates in according with the Bluetooth system specification within the 2400 - 2483.5 MHz frequency band.

RF channels for Bluetooth systems are spaced 1 MHz and are ordered in channel number k. In order to comply with out-of-band regulations, a lower frequency guard band of 2.0 MHz and a higher frequency guard band of 3.5MHz is used.

The operating frequencies of each channel are as follows:

First RF channel start from 2400MHz + 2MHz guard band = 2402MHz

Frequency of RF Channel = 2402+k MHz, k = 0,...,78 (Channel separation = 1MHz)

### **3.1.8 Hopping Channel Separation**

**Requirements:**

Frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

**Limit:**

The measured Maximum bandwidth \* 2/3 = 1.3664MHz \* 2/3 = 910.9kHz

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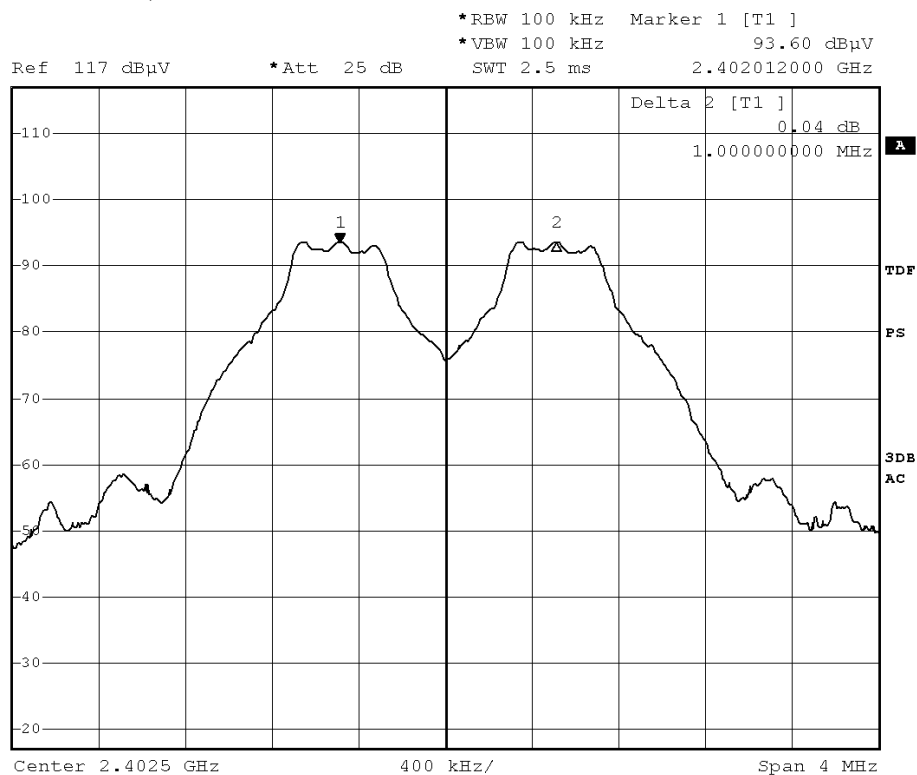
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Channel separation = 1MHz (>910.9kHz) (GFSK)

Channel 0 – Channel 1, Pass



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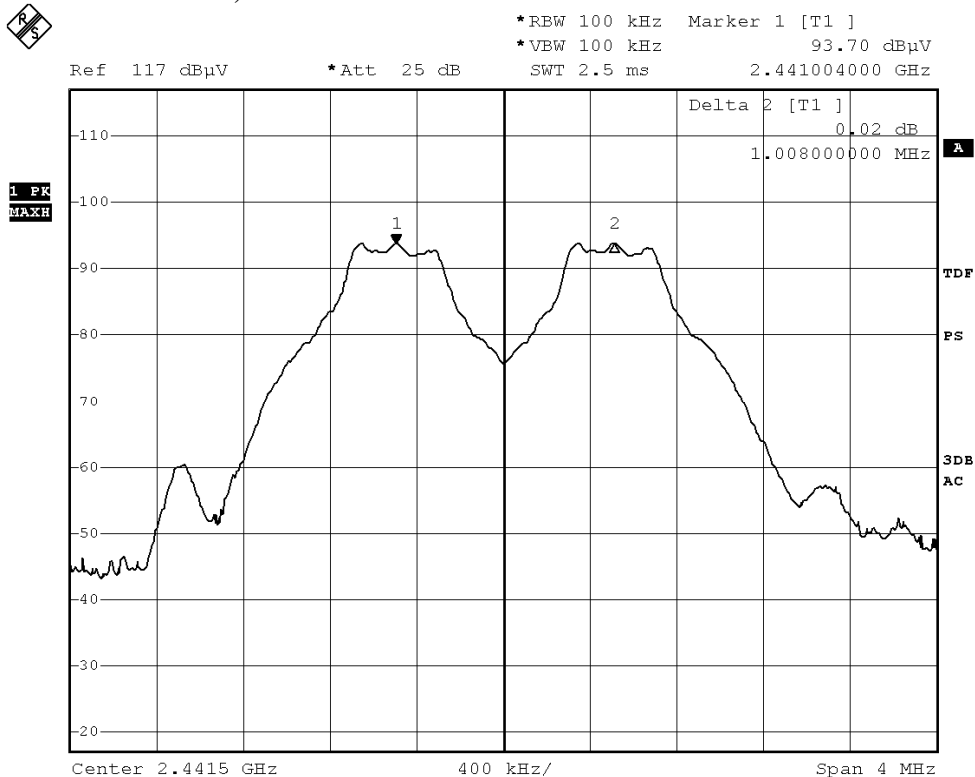


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### Channel 39 – Channel 40, Pass



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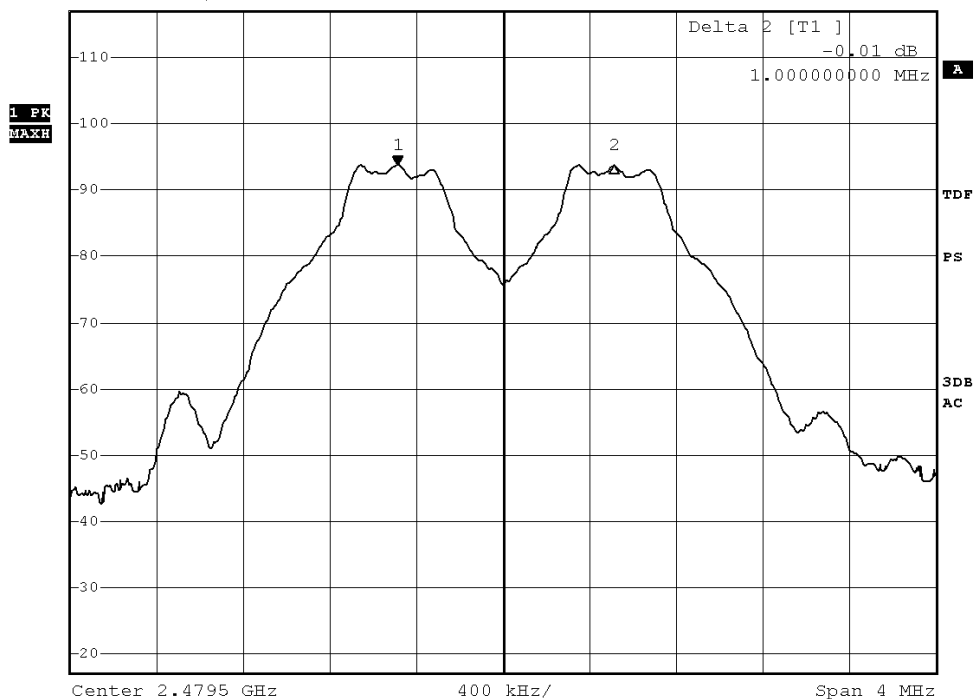
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### Channel 78 – Channel 79, Pass



Ref 117 dB $\mu$ V \*Att 25 dB \*RBW 100 kHz Marker 1 [T1]  
\*VBW 100 kHz 93.66 dB $\mu$ V  
SWT 2.5 ms 2.479012000 GHz



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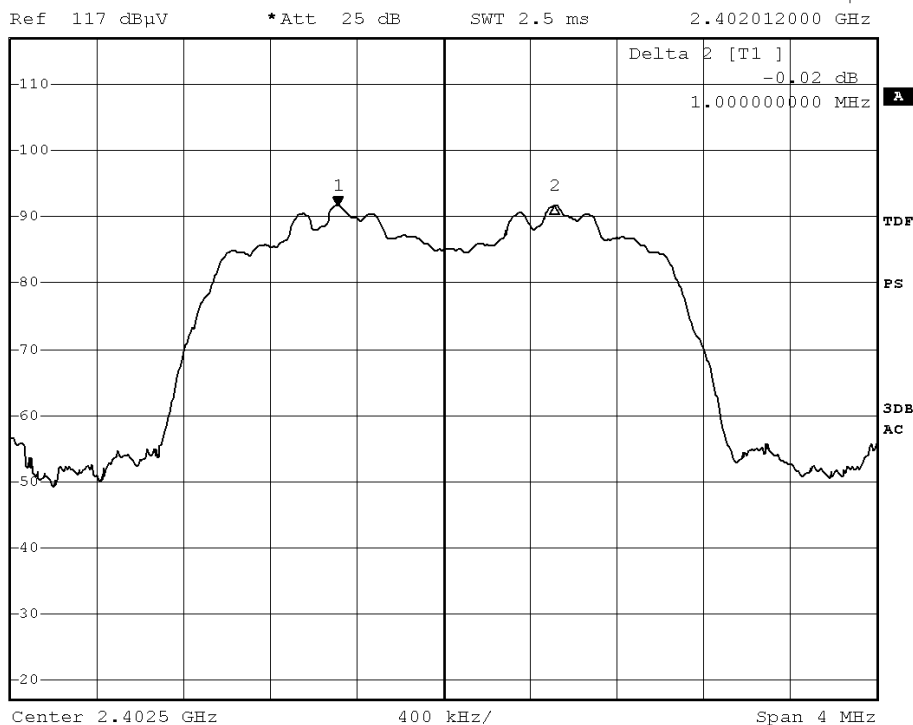
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Channel separation = 1MHz (>910.9kHz) ( $\pi/4$  DQPSK)

Channel 0 – Channel 1, Pass



\*RBW 100 kHz Marker 1 [T1]  
\*VBW 100 kHz 91.64 dBμV  
SWT 2.5 ms 2.402012000 GHz



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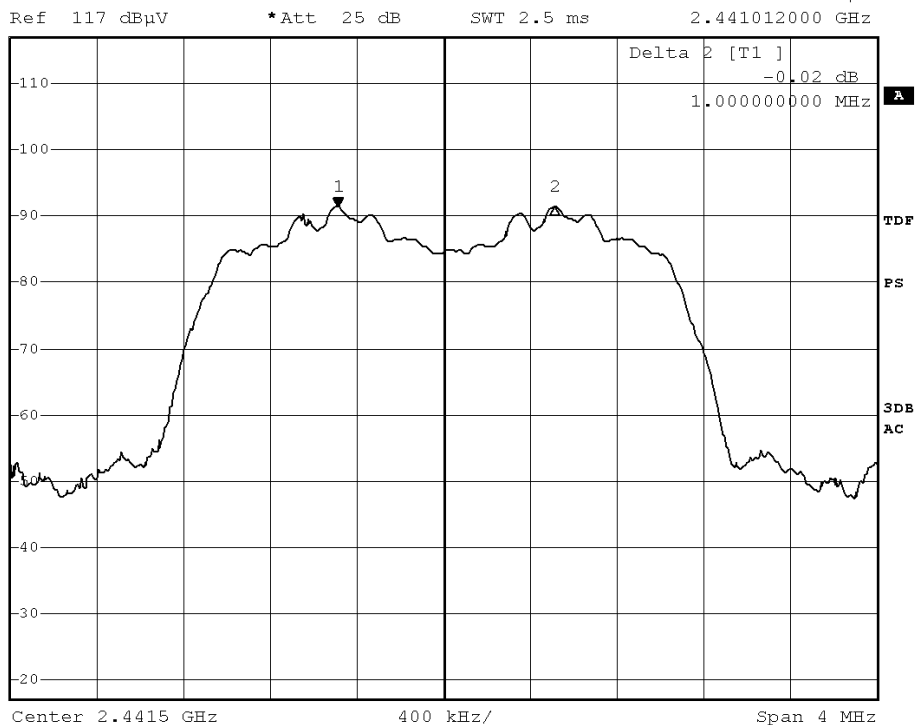
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### Channel 39 – Channel 40, Pass



\*RBW 100 kHz Marker 1 [T1 ]  
\*VBW 100 kHz 91.35 dBμV  
SWT 2.5 ms 2.441012000 GHz



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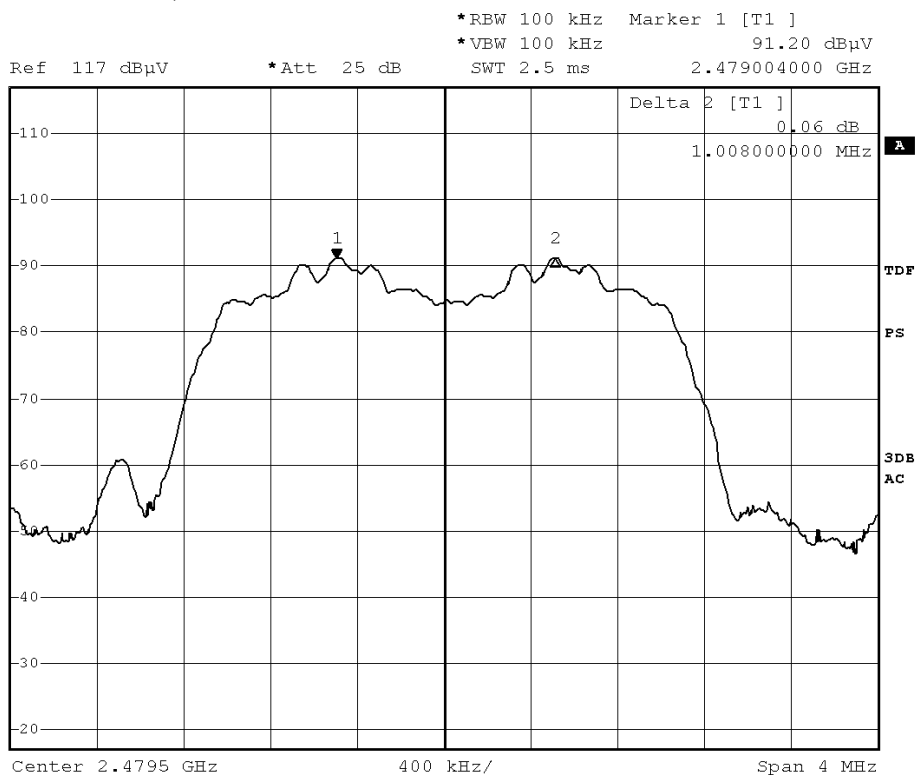


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### Channel 78 – Channel 79, Pass



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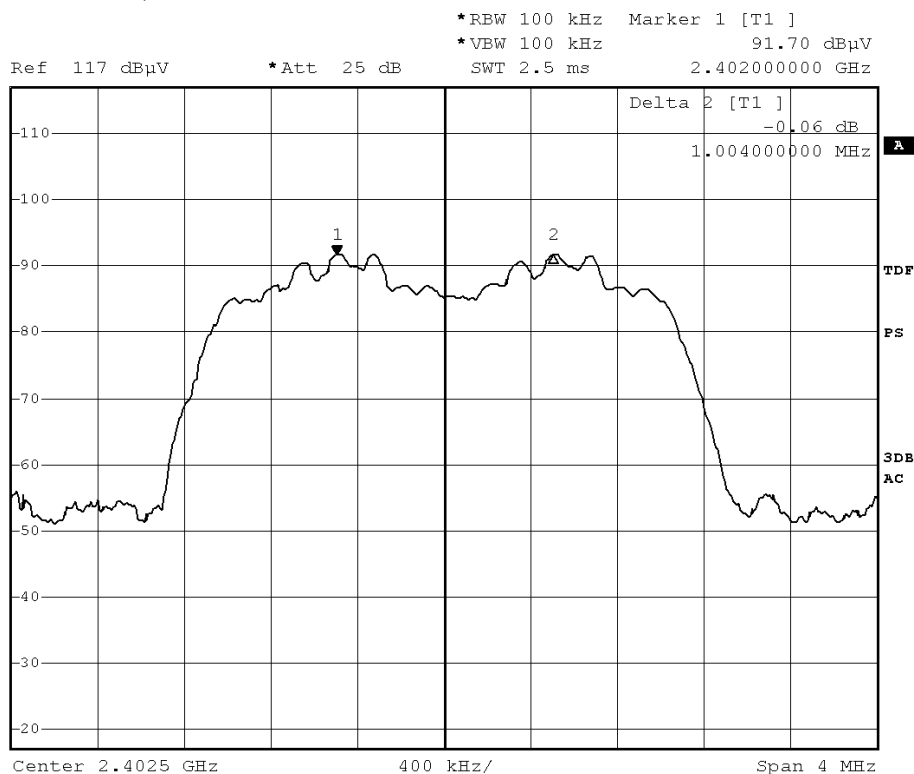
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Channel separation = 1MHz (>910.9kHz) (8DPSK)

Channel 0 – Channel 1, Pass



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### Channel 39 – Channel 40, Pass



\*RBW 100 kHz Marker 1 [T1 ]  
\*VBW 100 kHz 91.34 dBμV  
SWT 2.5 ms 2.441012000 GHz

Ref 117 dBμV

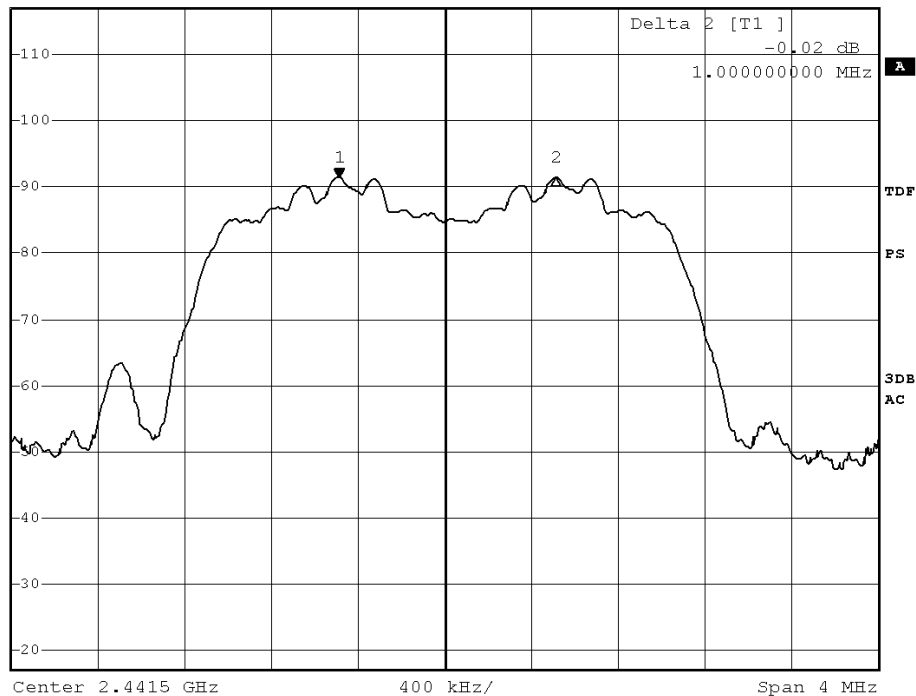
\*Att 25 dB

Delta 2 [T1 ]

-0.02 dB

1.000000000 MHz

1 PK  
MAX



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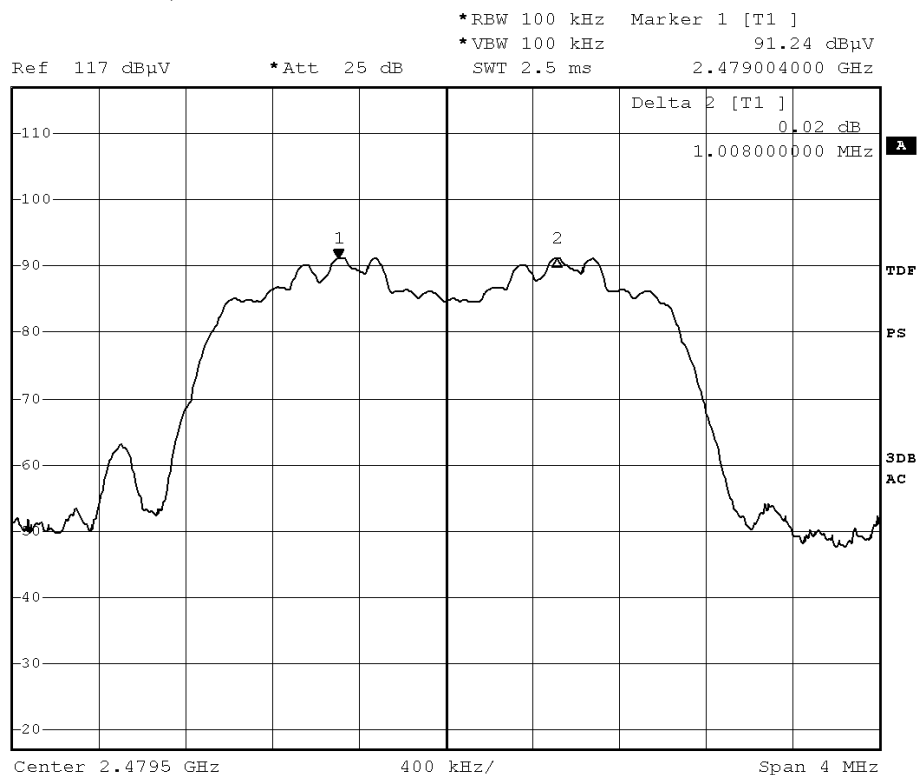


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### Channel 78 – Channel 79, Pass



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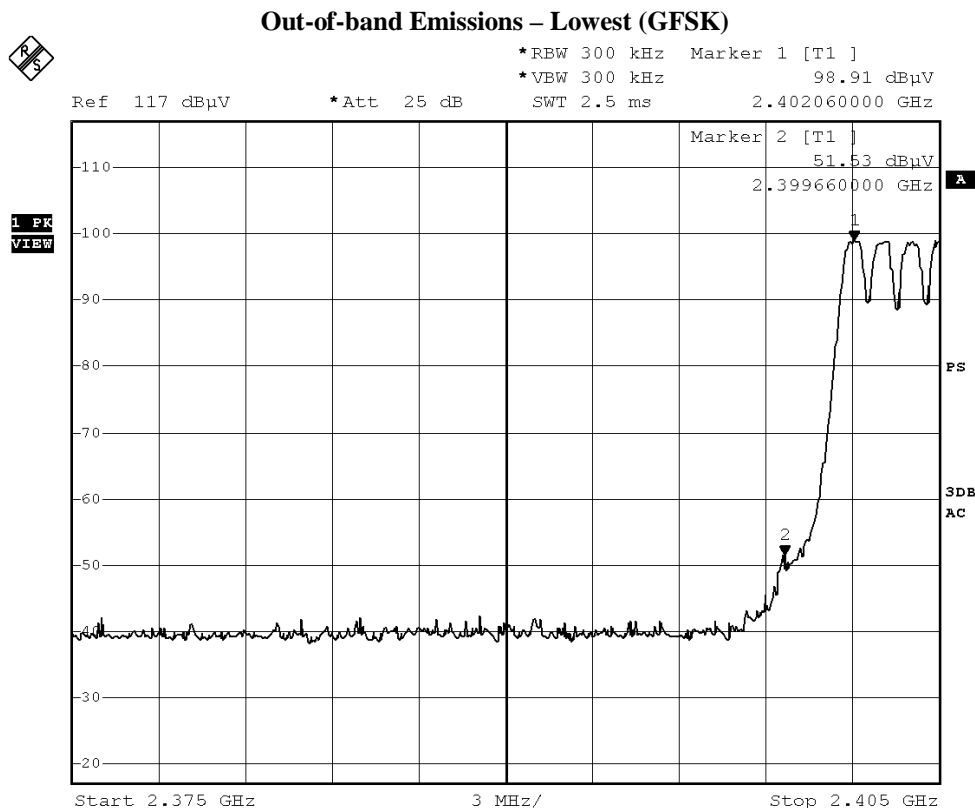


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### 3.1.8 Out-of-band Emissions



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
2400.0	16.3	35.4	51.7	74.0	22.3	Vertical

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
2400.0	4.8	35.4	40.2	54.0	13.8	Vertical

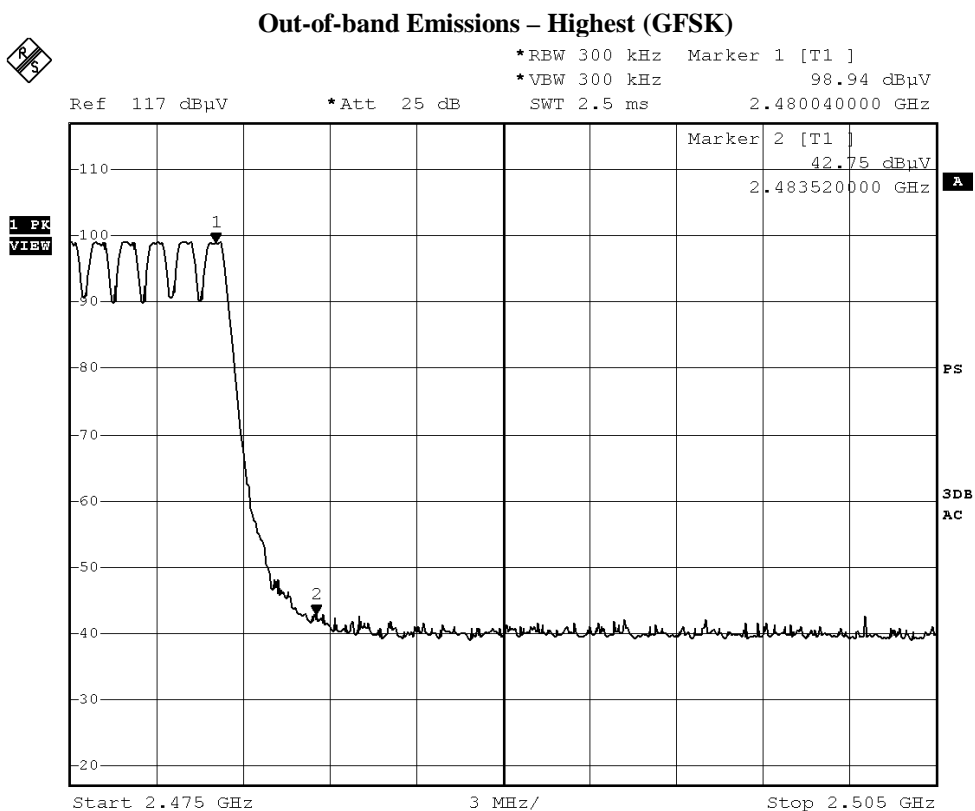




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Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
2483.5	12.4	35.4	47.8	74.0	26.2	Vertical

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
2483.5	1.9	35.4	37.3	54.0	16.7	Vertical

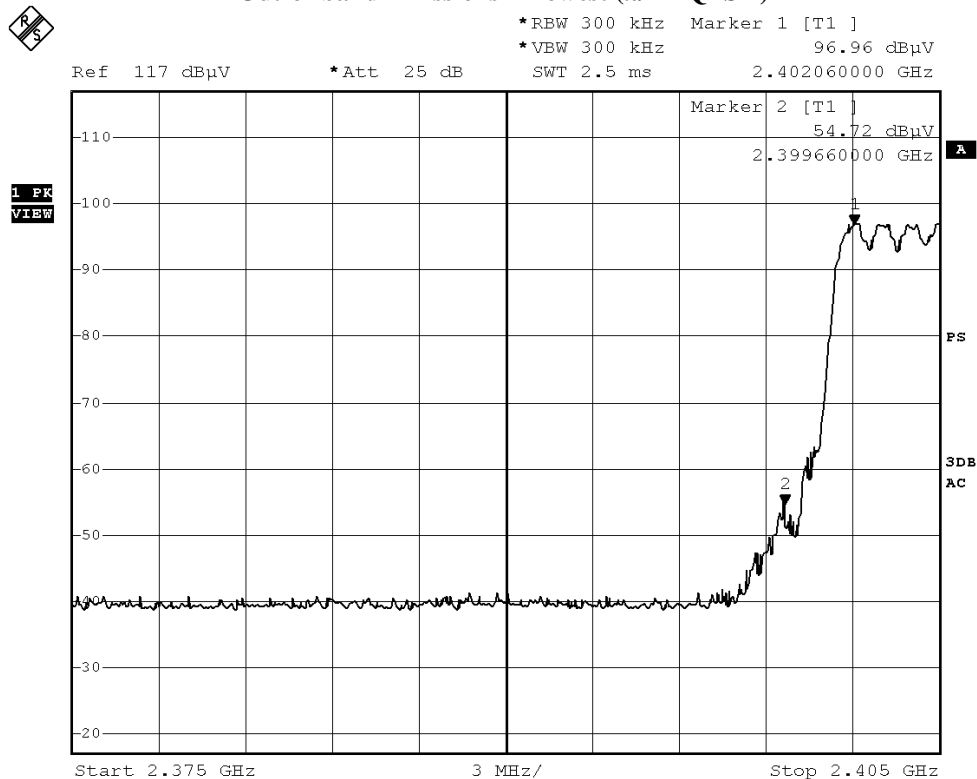


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### Out-of-band Emissions – Lowest ( $\pi/4$ DQPSK)



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
2400.0	19.2	35.4	54.6	74.0	19.4	Vertical

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
2400.0	5.9	35.4	41.3	54.0	12.7	Vertical

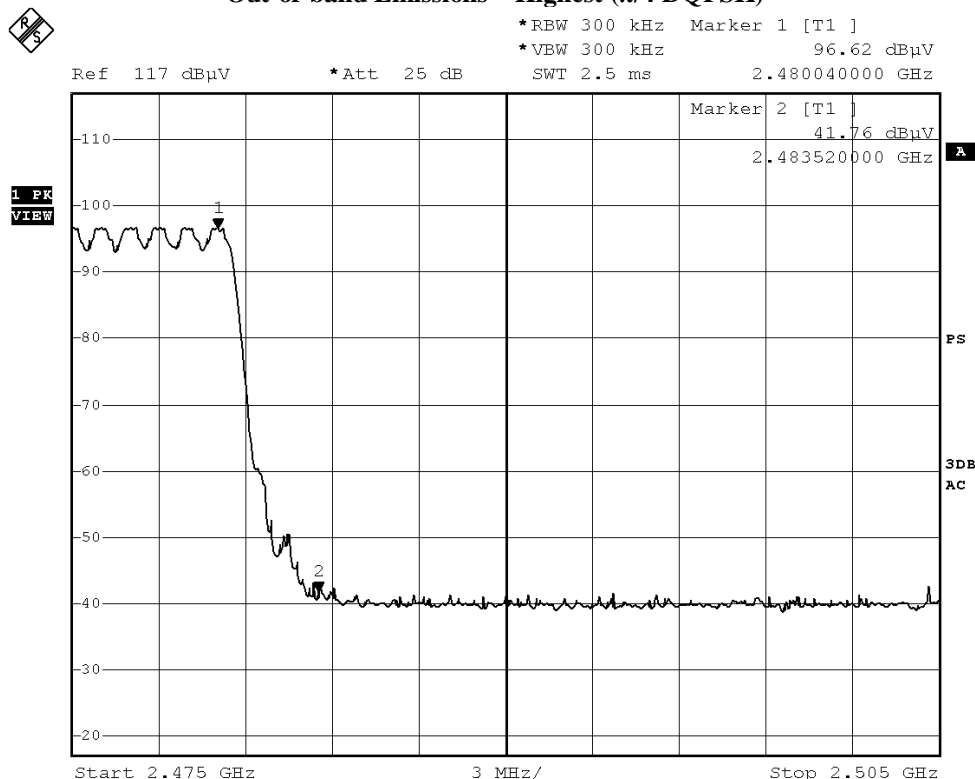


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### Out-of-band Emissions – Highest ( $\pi/4$ DQPSK)



#### 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
2483.0	9.3	35.4	44.7	74.0	29.3	Vertical

#### 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
2483.5	-1.4	35.4	34.0	54.0	20.0	Vertical

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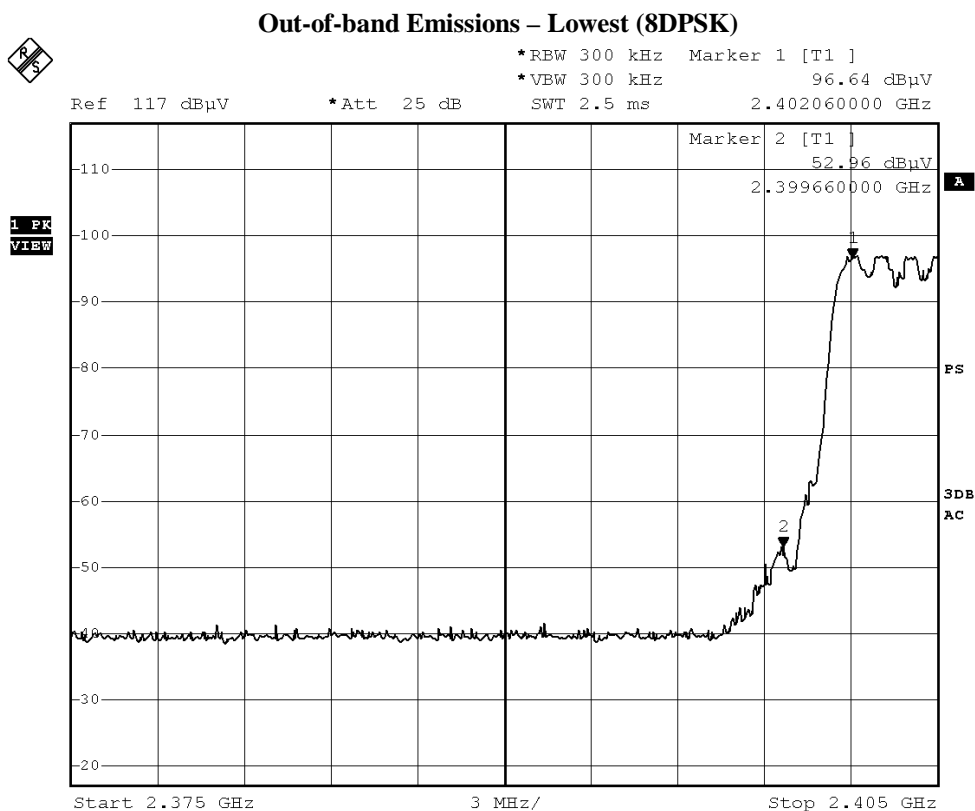
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Field Strength of Spurious Emissions						
Peak Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
2400.0	19.7	35.4	55.1	74.0	18.9	Vertical

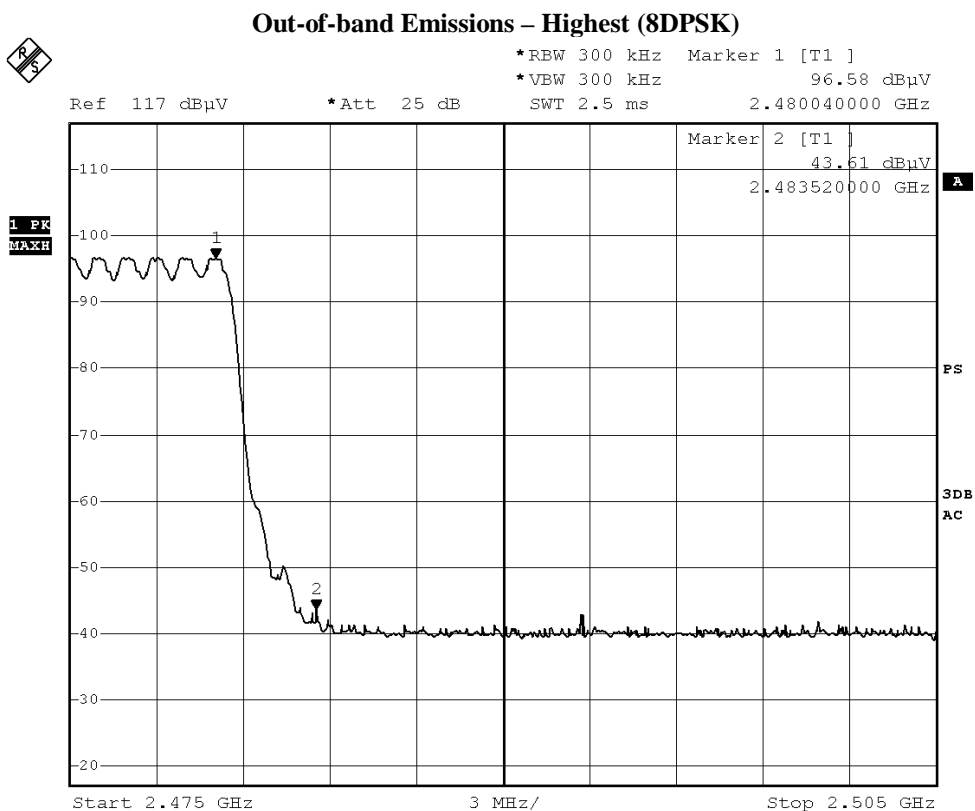
Field Strength of Spurious Emissions						
Average Value						
Frequency MHz	Measured Level @3m dBuV	Correction Factor dB/m	Field Strength dBuV/m	Limit @3m dBuV/m	Margin dBuV/m	E-Field Polarity
2400.0	5.9	35.4	41.3	54.0	12.7	Vertical



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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
2483.0	12.5	35.4	47.9	74.0	26.1	Vertical

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
2483.5	1.8	35.4	37.2	54.0	16.8	Vertical

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### 3.1.9 Occupancy Time (Dwell time)

#### Requirements:

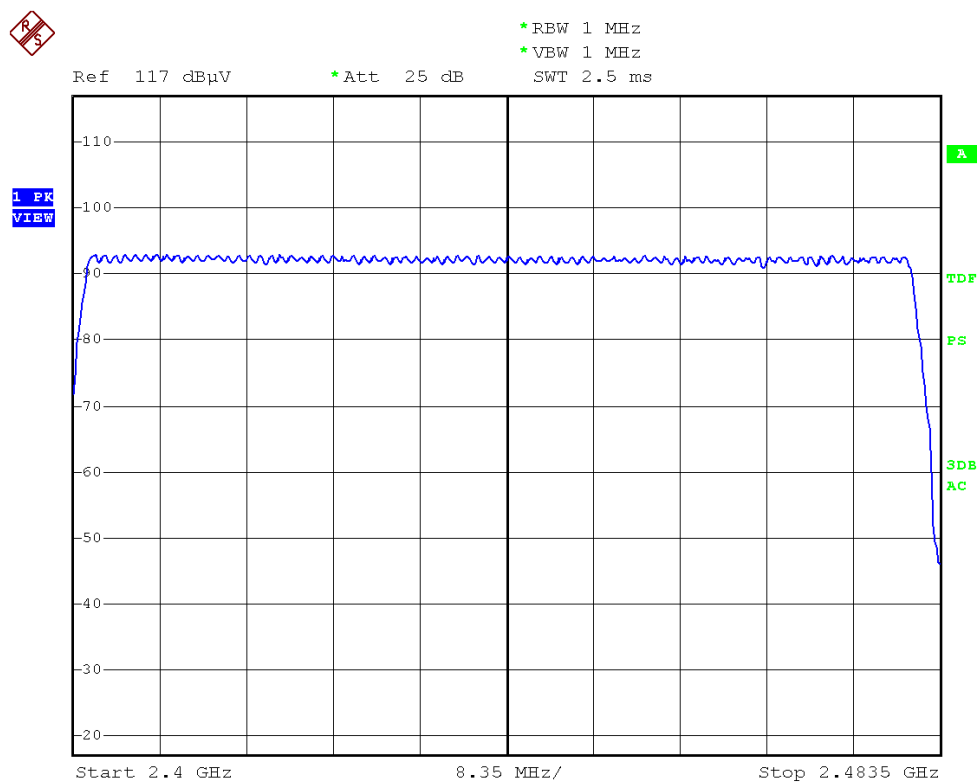
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channel employed.  
No requirements for Digital Transmission System.

**Dwell Time = Pulse Duration \* hop rate / number of channel \* observation duration**

**Observed duration: 0.4s x79 = 31.6s**

#### Measurement Data:

**Channel Occupied in 8DPSK: 79 of 79 Channel**



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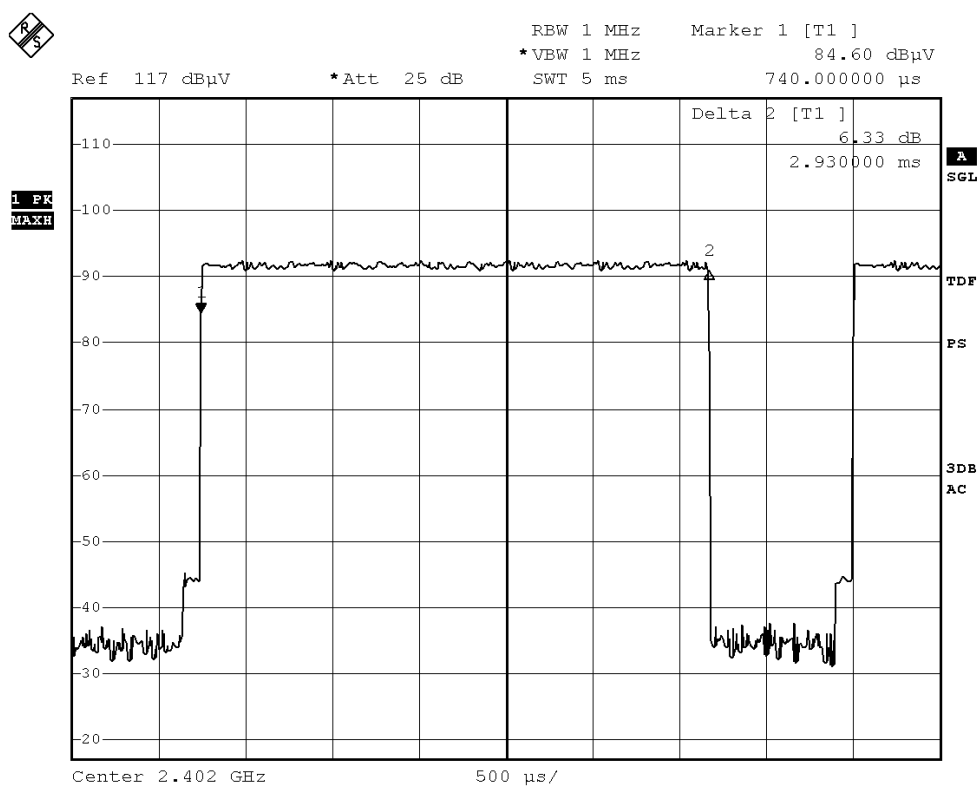
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### DH5 Packet:

DH5 Packet permit maximum  $1600/79/6 = 3.37$  hops per second in each channel (5 time slots RX, 1 time slot TX). The Dwell time is the time duration of the pulse times  $3.37 \times 31.6 = 106.6$  within 31.6 seconds

**Fig. A**  
**[Pulse duration of Lowest Channel]**



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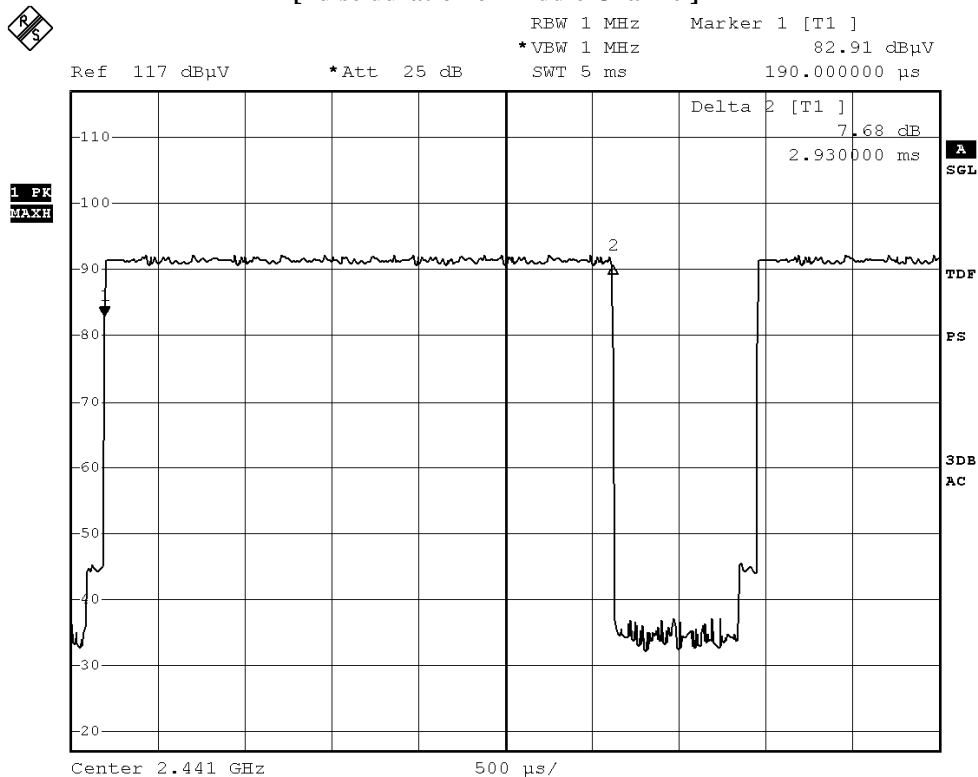


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**Fig. B**  
**[Pulse duration of Middle Channel]**





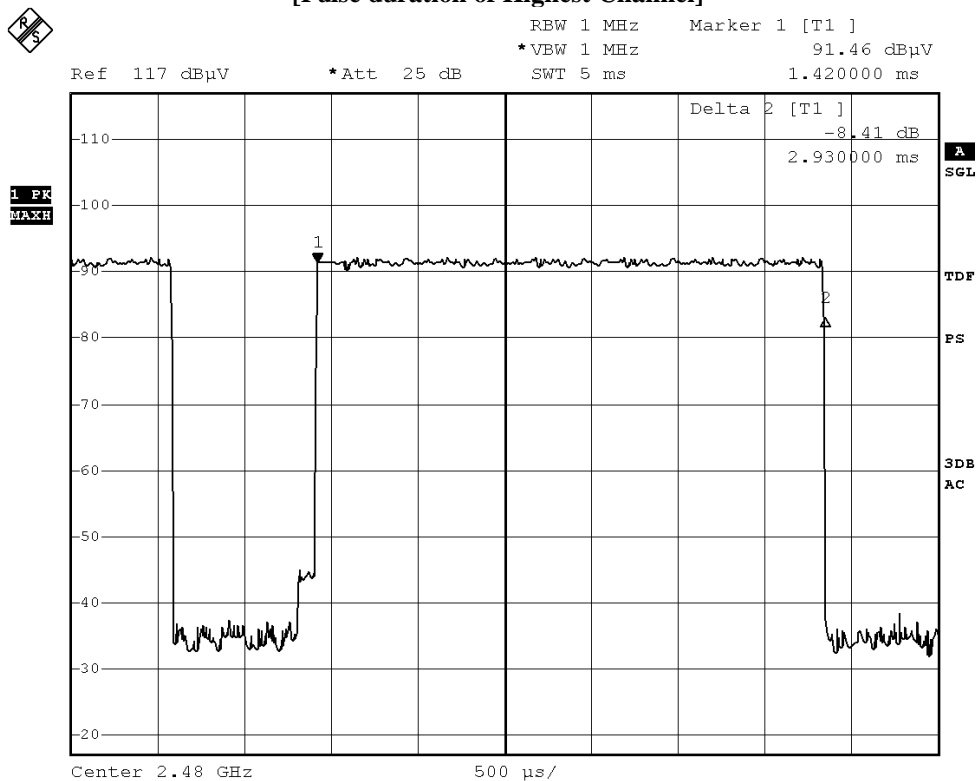


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**Fig. C**  
**[Pulse duration of Highest Channel]**





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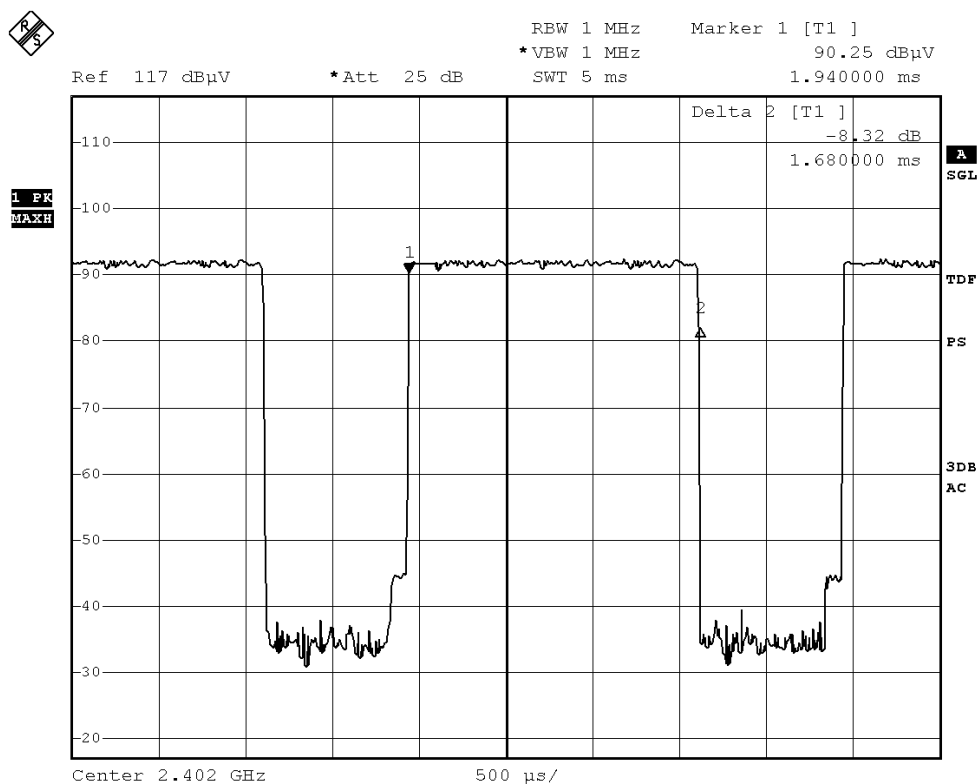
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### DH3 Packet:

DH3 Packet permit maximum  $1600/79/4 = 5.06$  hops per second in each channel (3 time slots RX, 1 time slot TX). The Dwell time is the time duration of the pulse times  $5.06 \times 31.6 = 160$  within 31.6 seconds

**Fig. D**  
**[Pulse duration of Lowest Channel]**



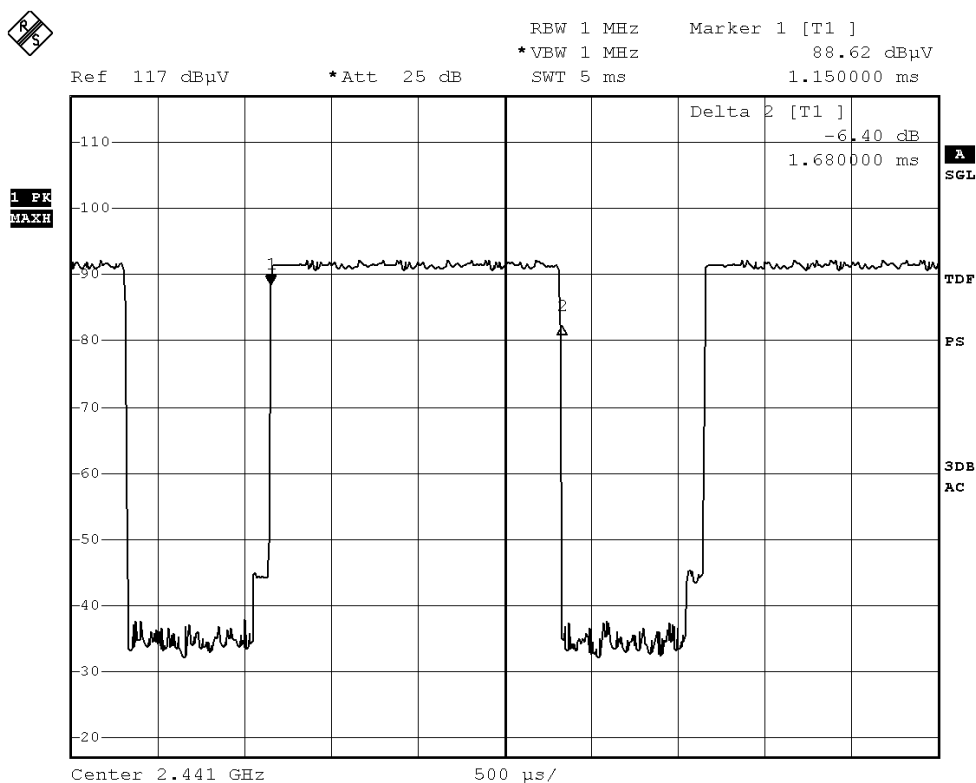


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**Fig. E**  
**[Pulse duration of Middle Channel]**



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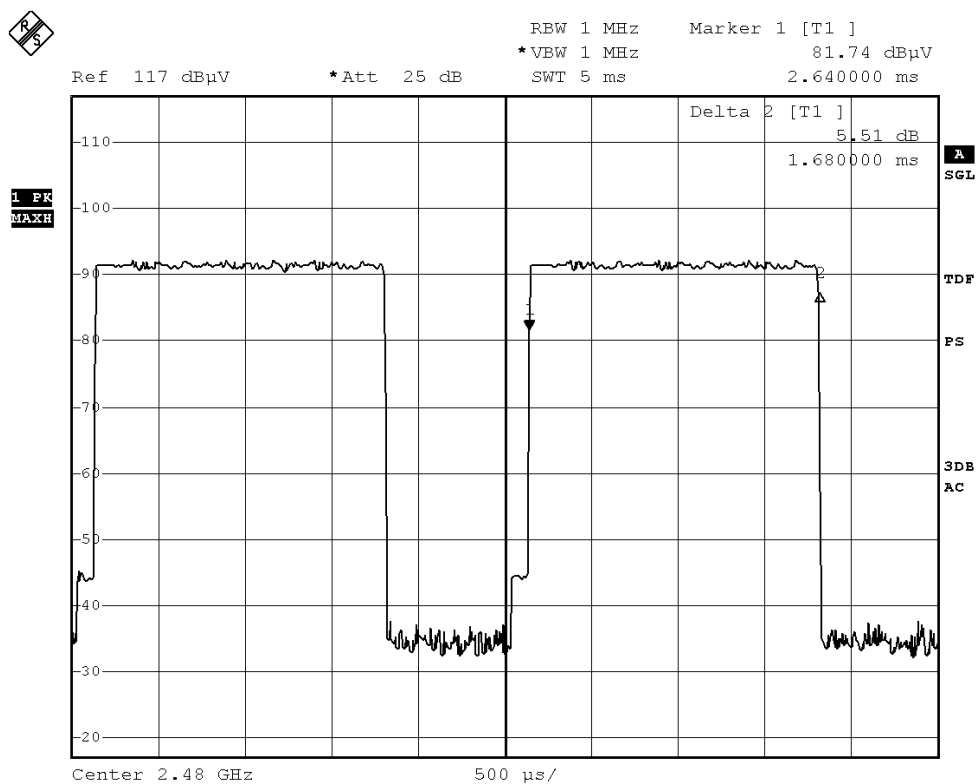


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**Fig. F**  
**[Pulse duration of Highest Channel]**



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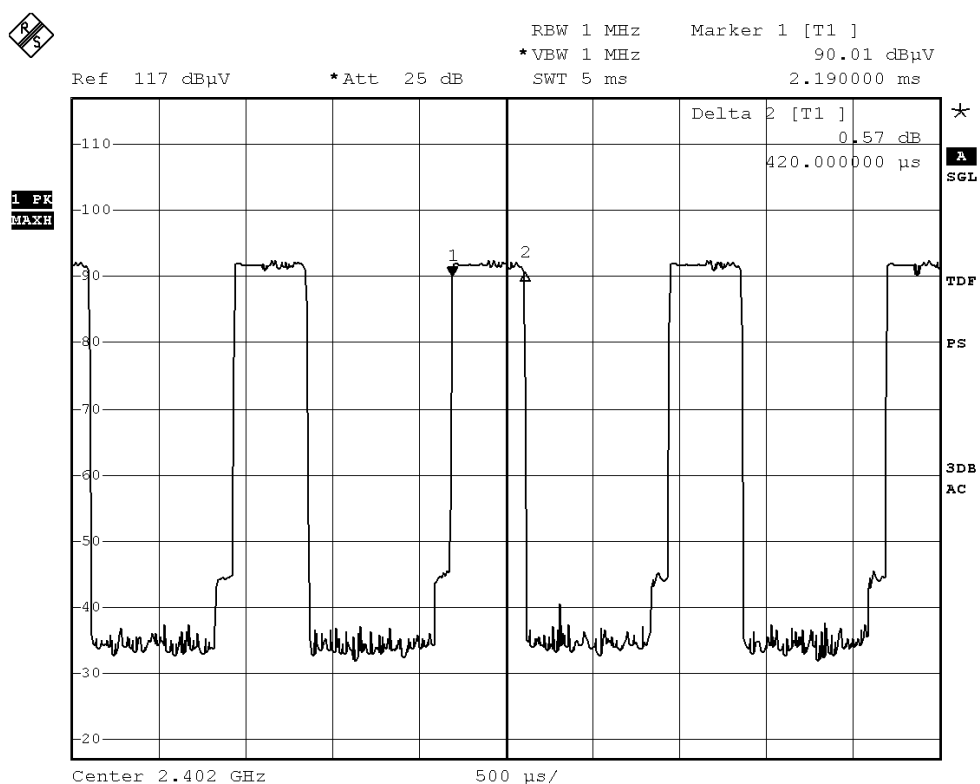
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### DH1 Packet:

DH1 Packet permit maximum  $1600/79/2 = 10.12$  hops per second in each channel (3 time slots RX, 1 time slot TX). The Dwell time is the time duration of the pulse times  $10.12 \times 31.6 = 320$  within 31.6 seconds

**Fig. G**  
**[Pulse duration of Lowest Channel]**



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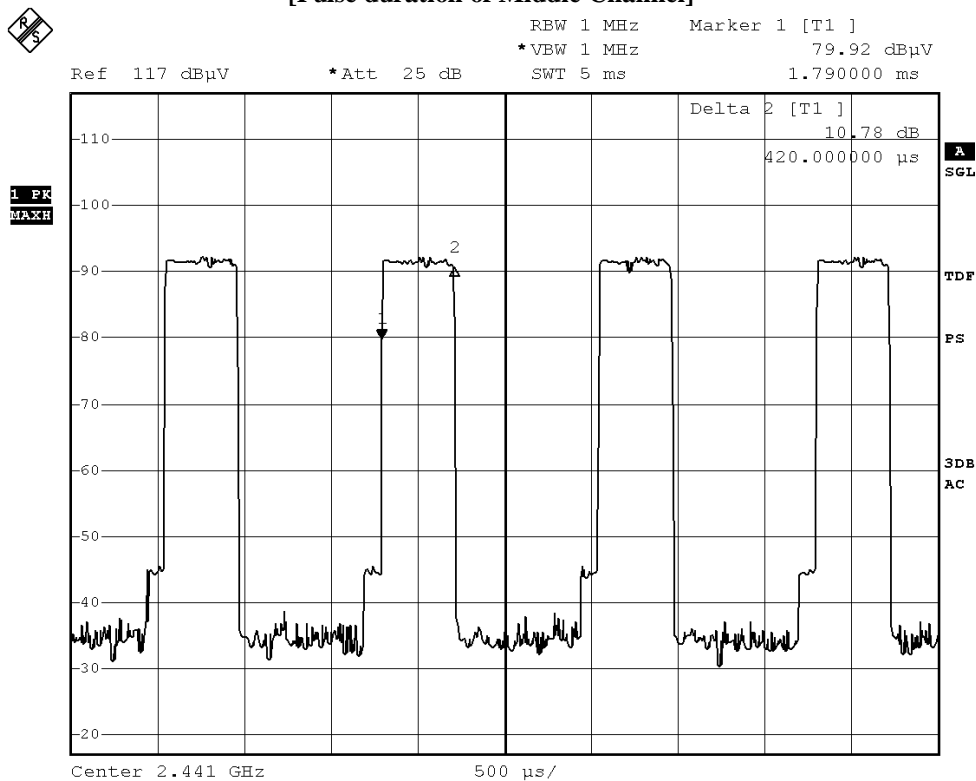


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**Fig. H**  
**[Pulse duration of Middle Channel]**



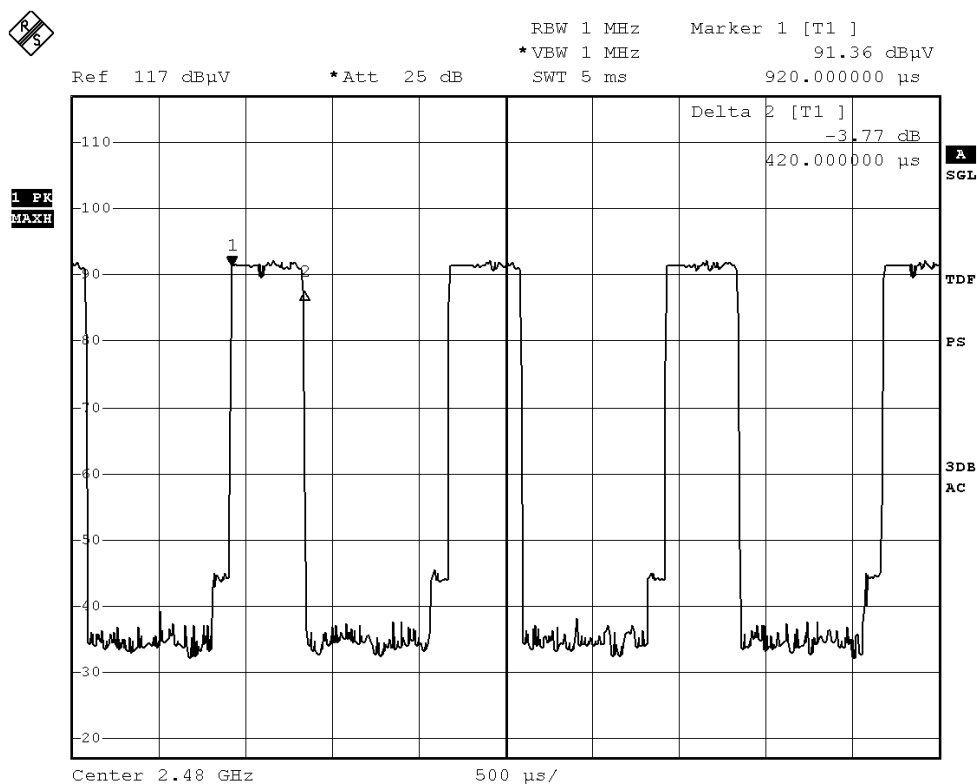


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**Fig. I**  
**[Pulse duration of Highest Channel]**



**Time of occupancy (Dwell Time):**

Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Results
DH5	2402	2.930	0.312	0.400	Complies
DH5	2441	2.930	0.312	0.400	Complies
DH5	2480	2.930	0.312	0.400	Complies
DH3	2402	1.680	0.269	0.400	Complies
DH3	2441	1.680	0.269	0.400	Complies
DH3	2480	1.680	0.269	0.400	Complies
DH1	2402	0.420	0.134	0.400	Complies
DH1	2441	0.420	0.134	0.400	Complies
DH1	2480	0.420	0.134	0.400	Complies

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### **3.1.10 RF Exposure**

Test Requirement:	FCC 47CFR 15.247(i)
Test Date:	2013-7-24
Mode of Operation:	BT mode
Dimension of EUT:	175mm x 92mm x 78mm

#### **Requirements:**

In 15.247(i), an equipment shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the limits in §§ 1.1310 and 2.1093 of this chapter. Applications to the Commission for construction permits, licenses to transmit or renewals thereof, equipment authorizations or modifications in existing facilities must contain a statement confirming compliance with the limits unless the facility, operation, or transmitter is categorically excluded, as discussed below. Technical information showing the basis for this statement must be submitted to the Commission upon request.

According to KDB447498 D01 General RF Exposure Guidance v05, unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and 10-g extremity SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Exclusion Threshold condition.

#### **Test Results:**

##### **RF Exposure Evaluation**

The Maximum conducted output power = 0.644mW (at frequency = 2.441 GHz)

**It's Conducted source-based time-averaging output power = 0.640 mW (at frequency = 2.441 GHz)**

**Since the SAR test exclusion thresholds for 2450MHz at test separation distances  $\leq 5$  mm = 10mW and the Conducted source-based time-averaging output power is less than 10mW.**

**Therefore, the SAR evaluation can be exempted.**

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### **Appendix A**

#### **List of Measurement Equipment**

<b>EQP NO.</b>	<b>DESCRIPTION</b>	<b>MANUFACTURER</b>	<b>MODEL NO.</b>	<b>SERIAL NO.</b>	<b>LAST CAL</b>	<b>DUE CAL</b>
EMD004	LISN	ROHDE & SCHWARZ	ESH3-Z5	100102	2013.03.15	2014.03.14
EMD022	EMI Test Receiver	ROHDE & SCHWARZ	ESCS30	100314	2013.03.15	2014.03.14
EMD035	EMI Test Receiver	ROHDE & SCHWARZ	ESCI	100441	2012.07.06	2013.07.05
EMD036	EMI Test Receiver	ROHDE & SCHWARZ	ESIB 26	100388	2012.07.06	2013.07.05
EMD041	TWO-LINE V-NETWORK	ROHDE & SCHWARZ	ENV216	100261	2012.07.06	2013.07.05
EMD061	Biconilog Antenna	ETS.LINDGREN	3142C	00060439	2012.11.03	2014.11.02
EMD062	Double-Ridged Waveguide (1GHz – 18GHz)	ETS.LINDGREN	3117	00075933	2012.11.28	2014.11.27
EMD084	MULTI-DVICE CONTROLLER	ETS.LINDGREN	2090	00060107	N/A	N/A
EMD088	Video Contol Unit	ETS.LINDGREN	Y21953A	2601073	N/A	N/A
EMD093	Monitor	ViewSonic	VA9036	Q8X064201876	N/A	N/A
EMD102	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707454	N/A	N/A
EMD103	Intelligent Frequency	Ainuo Instrument Co., Ltd	AN97005SS	79707455	N/A	N/A
EMD105	FACT-3 EMC Chamber	ETS.LINDGREN	FACT-3	3803	N/A	N/A
EMD106	Shielding Room #1	ETS.LINDGREN	RFD-100	3802	N/A	N/A
EMD111	Power meter	ROHDE & SCHWARZ	NRVD	102051	2013.03.15	2014.03.14
	100V Insertion Unit	ROHDE & SCHWARZ	URV5-Z4	100464	2013.03.15	2014.03.14
EMD113	Pre-Amplifier	ROHDE & SCHWARZ	N/A	1129588	2013.03.15	2014.03.14
EMD124	Loop Antenna	ETS-Lindgren	6502	00104905	2012.03.26	2014.03.25
EMD131	Standard Gain Horn Antenna (18GHz – 26.5GHz)	Chengdu AINFO Inc.	JXTXLB-42-15-C-KF	J2021100721001	2013.01.25	2015.01.24

Remarks:-

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

### **Appendix B**

#### **Ancillary Equipment**

<b>ITEM NO.</b>	<b>DESCRIPTION</b>	<b>MODEL NO.</b>	<b>FCC ID</b>	<b>REMARK</b>
1	iPod Touch	A1367	BCG-E2407	N/A



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### **Appendix C**

#### **Photographs of EUT**

**Front View of the product**



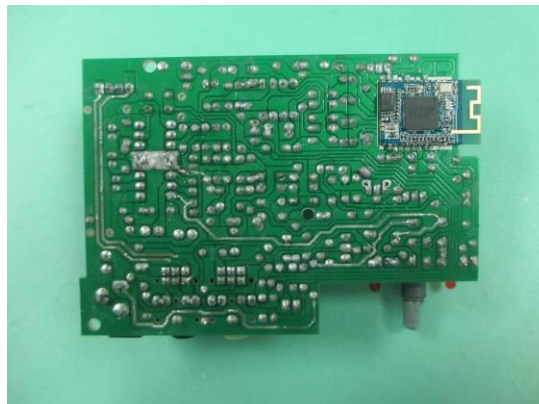
**Rear View of the product**



**Inner Circuit Top View**



**Inner Circuit Bottom View**



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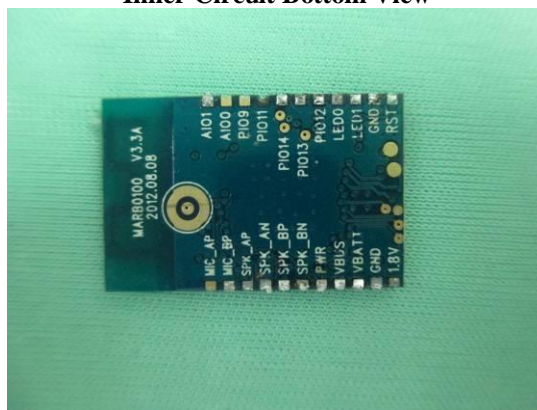
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### **Photographs of EUT**

**Inner Circuit Top View**



**Inner Circuit Bottom View**



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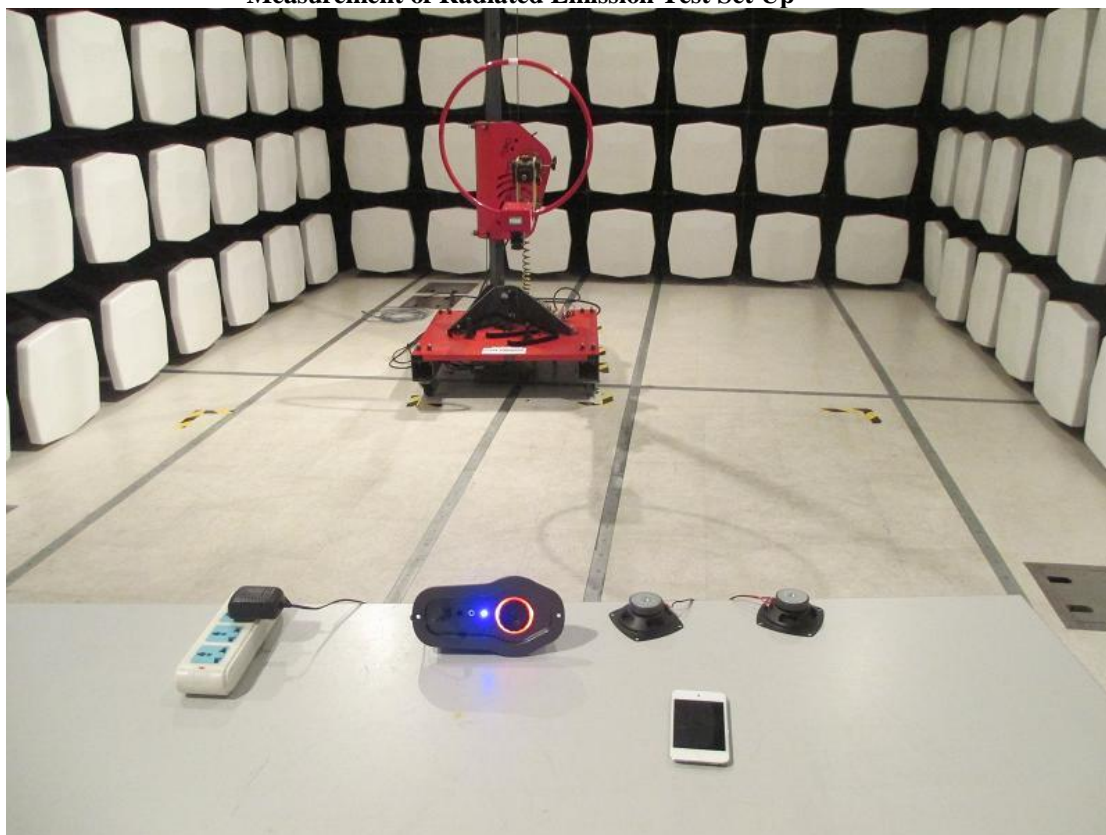
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### **Photographs of EUT**

**Measurement of Radiated Emission Test Set Up**



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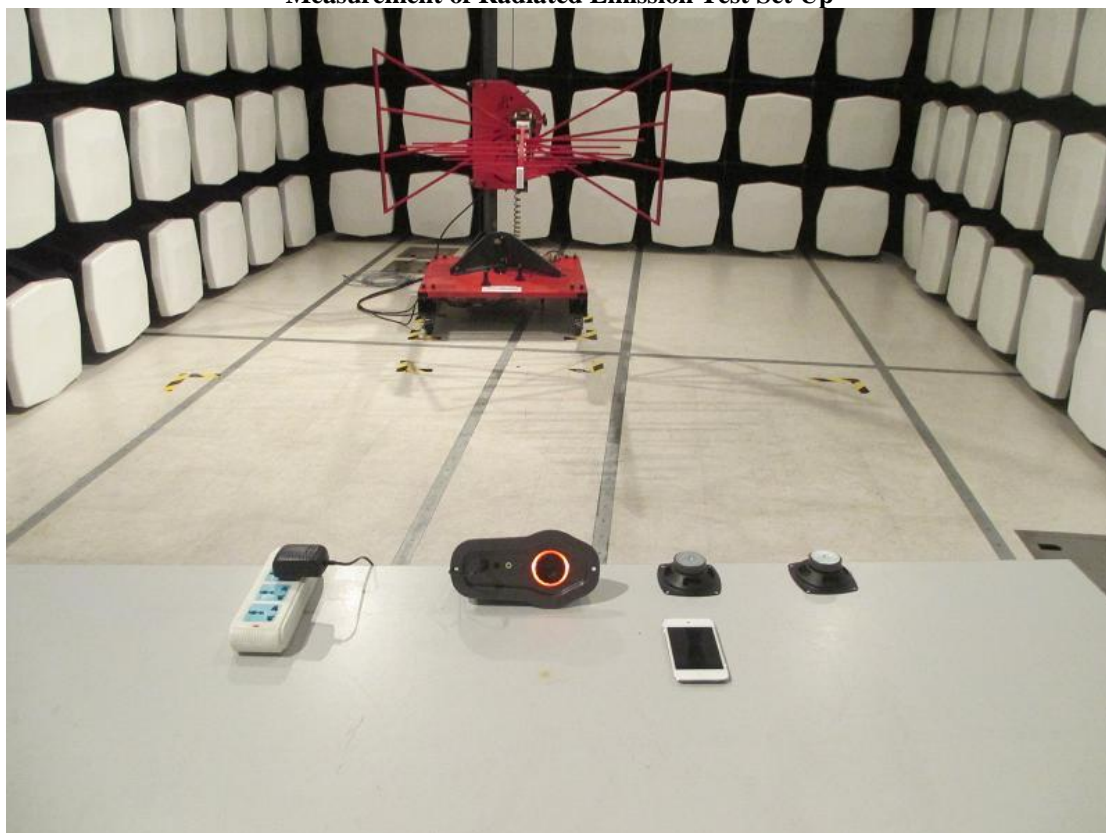
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### **Photographs of EUT**

**Measurement of Radiated Emission Test Set Up**



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### **Photographs of EUT**

**Measurement of Radiated Emission Test Set Up**



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### **Photographs of EUT**

#### **Measurement of Conducted Emission Test Set Up**



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

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