



STC Test Report



Date: 2015-05-26
No.: DM119503

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Applicant: Creation Electronics Ltd.
Unit 7, 10/F, Corporation Square, 8 Lam Lok Street,
Kowloon Bay, Hong Kong

Manufacturer: Creation Electronics Ltd.
Unit 7, 10/F, Corporation Square, 8 Lam Lok Street,
Kowloon Bay, Hong Kong

Description of Sample(s):

| | |
|---------------|--------------------|
| Product: | Hi-Fi Music Centre |
| Brand Name: | Creatron |
| Model Number: | MIC192U |
| FCC ID: | 2ABPO16042015 |

Date Sample(s) Received: 2015-05-15

Date Tested: 2015-05-20 to 2015-05-25

Investigation Requested: Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2014 and ANSI C63.4: 2009 for FCC Certification.

Conclusion(s): 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.

Remark(s): For additional model(s) details, please page 3.


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



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, Guangdong, China

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

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

Product: Hi-Fi Music Centre
Manufacturer: Creation Electronics Ltd.
Brand Name: Creatron
Additional Brand Name: Jensen
Model Number: MIC192U
Additional Model Number: JBS-350
Rating: Input: 100-240Va.c. 50/60Hz 0.5A;
Output: 12Vd.c. 1.5A.

The AC/DC adaptor was provided by the applicant with following details:
Brand name: Stos; Model no.: QX18W120150FU

1.2.1 Description of EUT Operation

The Equipment Under Test (EUT) is a Hi-Fi Music Centre. The r.f. signal was modulated by IC and type of modulation was frequency hopping spread spectrum Modulation.

1.3 Date of Order

2015-05-15

1.4 Submitted Sample(s):

1 Sample

1.5 Test Duration

2015-05-20 to 2015-05-25

1.6 Country of Origin

China

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1.7 RF Module Details

| | |
|---------------------------|--|
| Module Model Number: | CMD2022C |
| Module FCC ID: | |
| Module Transmission Type: | Bluetooth 2.1+EDR |
| Modulation: | FHSS (GFSK / $\pi/4$ -DQPSK / 8DPSK) |
| Data Rates: | 1Mbps: GFSK 2 Mbps: $\pi/4$ -DQPSK 3 Mbps: 8DPSK |
| 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: | 0dBi |

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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: 2014 Regulations. FCC Pubic Notice DA 00-705 and ANSI C63.4: 2009 for FCC Certification.

2.2 Test Standards and Results Summary Tables

| EMISSION Results Summary | | | | | | |
|-------------------------------------|-----------------------------|----------------------------|---------------------|-------------------------------------|--------------------------|--------------------------|
| Test Condition | Test Requirement | Test Method | Class / Severity | Test Result | | |
| | | | | Pass | Fail | N/A |
| Maximum Peak Conducted Output Power | FCC 47CFR 15.247(b)(1) | FCC Pubic Notice DA 00-705 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Radiated Spurious Emissions | FCC 47CFR 15.209 | ANSI C63.4:2009 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| AC Mains Conducted Emissions | FCC 47CFR 15.207 | ANSI C63.4:2009 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Number of Hopping Frequency | FCC 47CFR 15.247 (b)(1) | FCC Pubic Notice DA 00-705 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 20dB Bandwidth | FCC 47CFR 15.247(a)(2) | FCC Pubic Notice DA 00-705 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Hopping Channel Separation | FCC 47CFR 15.247(a)(1) | FCC Pubic Notice DA 00-705 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Band-edge measurement (Radiated) | FCC 47CFR 15.247(c) | FCC Pubic Notice DA 00-705 | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Pseudorandom Hopping Algorithm | FCC 47CFR 15.247(a)(1) | N/A | N/A | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Time of Occupancy (Dwell Time) | FCC 47CFR 15.247(a)(1)(iii) | FCC Pubic Notice DA 00-705 | 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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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.

| Test Items | Mode | Data Rate |
|--|-------------------------------|-----------------------|
| Maximum Peak Conducted Output Power | GFSK / $\pi/4$ -DQPSK / 8DPSK | 1MBps / 2MBps / 3MBps |
| Hopping Channel Separation | GFSK / $\pi/4$ -DQPSK / 8DPSK | 1MBps / 2MBps / 3MBps |
| Number of Hopping Frequency | GFSK / $\pi/4$ -DQPSK / 8DPSK | 2MBps |
| Time of Occupancy(Dwell Time) | 8DPSK (DH1 / DH3 / DH5) | 2MBps |
| Radiated Spurious Emissions | GFSK / $\pi/4$ -DQPSK / 8DPSK | 1MBps / 2MBps / 3MBps |
| Band-edge compliance of Conducted Emission | GFSK / $\pi/4$ -DQPSK / 8DPSK | 2MBps |

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3.0 Test Results

3.1 Emission

3.1.1 Maximum Peak Conducted Output Power

| | |
|--------------------|----------------------------|
| Test Requirement: | FCC 47CFR 15.247(b)(1) |
| Test Method: | FCC Pubic Notice DA 00-705 |
| Test Date: | 2015-05-16 |
| Mode of Operation: | Tx mode |

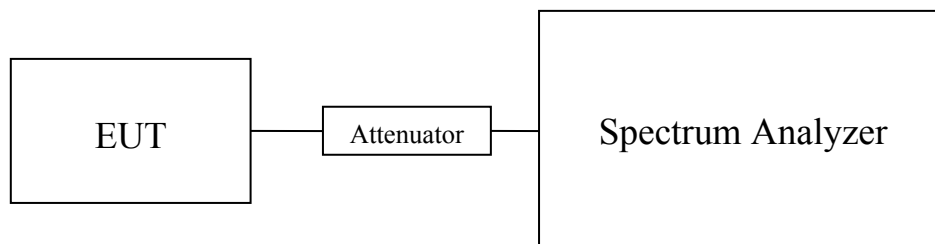
Test Method:

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.

Spectrum Analyzer Setting:

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

Test Setup:



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Limits for Maximum Peak Conducted Output Power [FCC 47CFR 15.247]:

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 Bluetooth Communication mode (GFSK) (Fundamental Power): Pass

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2402 | 0.000441 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2441 | 0.000439 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2480 | 0.000402 |

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

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2402 | 0.000468 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2441 | 0.000454 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2480 | 0.000411 |

Results of Bluetooth Communication mode (8 DPSK) (Fundamental Power): Pass

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2402 | 0.000447 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2441 | 0.000430 |

| Transmitter Frequency (MHz) | Maximum conducted output power (Watt) |
|-----------------------------|---------------------------------------|
| 2480 | 0.000429 |

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

Remark:

1. All test data for each data rate were verified, but only the worst case was reported.
2. The EUT is programmed to transmit signals continuously for all testing.

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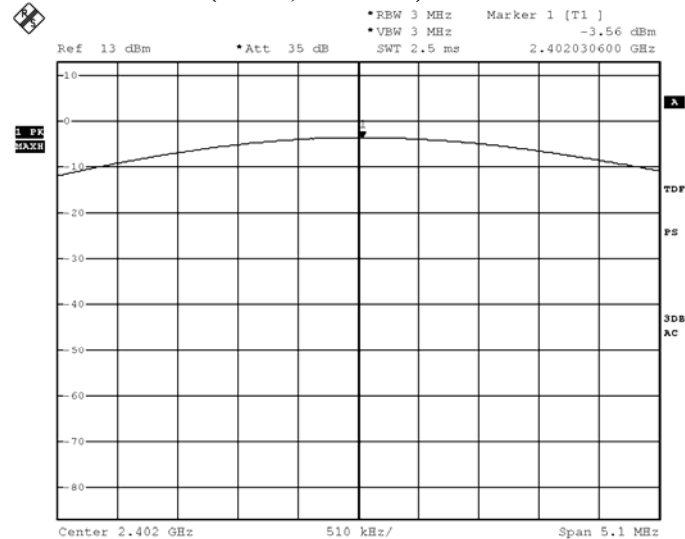
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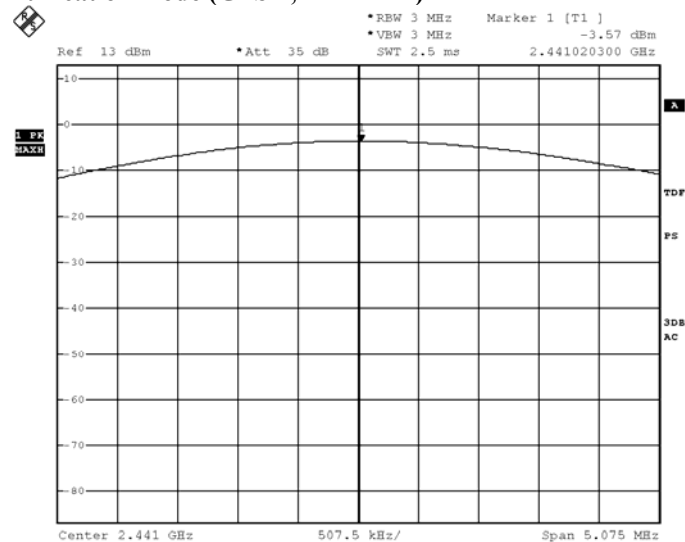
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Test plot of Maximum Peak Conducted Output Power :
Bluetooth Communication mode (GFSK, 2402MHz)



BMP
Date: 16.MAY.2015 16:01:50

Bluetooth Communication mode (GFSK, 2441MHz)



BMP
Date: 16.MAY.2015 16:02:20

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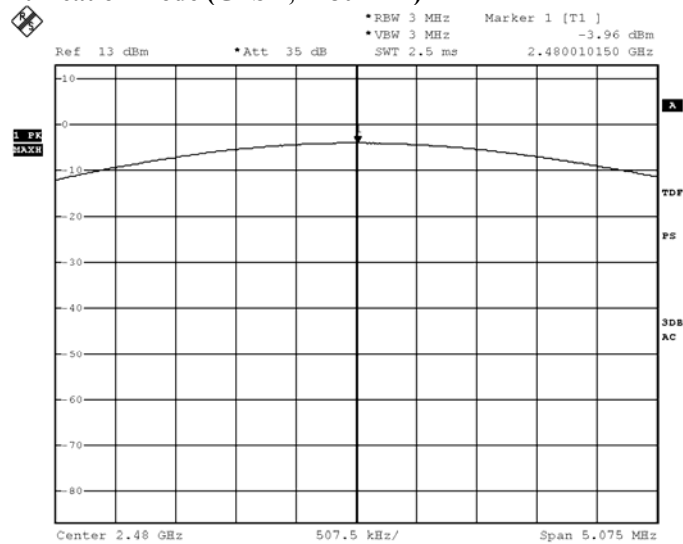
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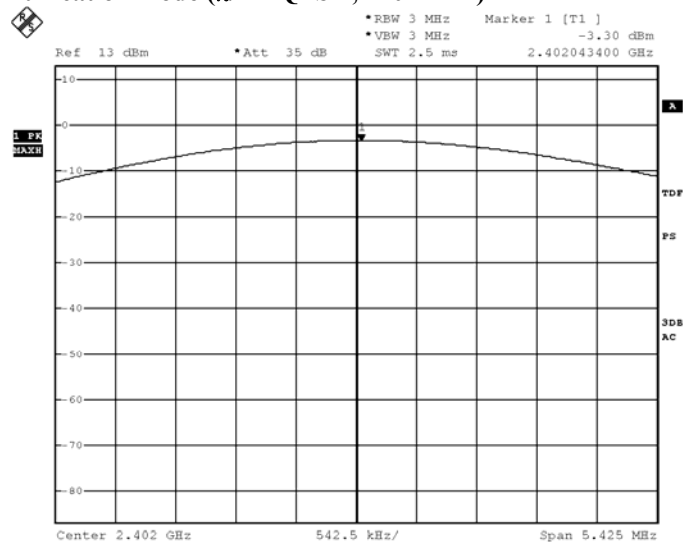
Bluetooth Communication mode (GFSK, 2480MHz)



BMP

Date: 16.MAY.2015 16:02:49

Bluetooth Communication mode ($\pi/4$ -DQPSK, 2402MHz)



BMP

Date: 16.MAY.2015 16:06:23

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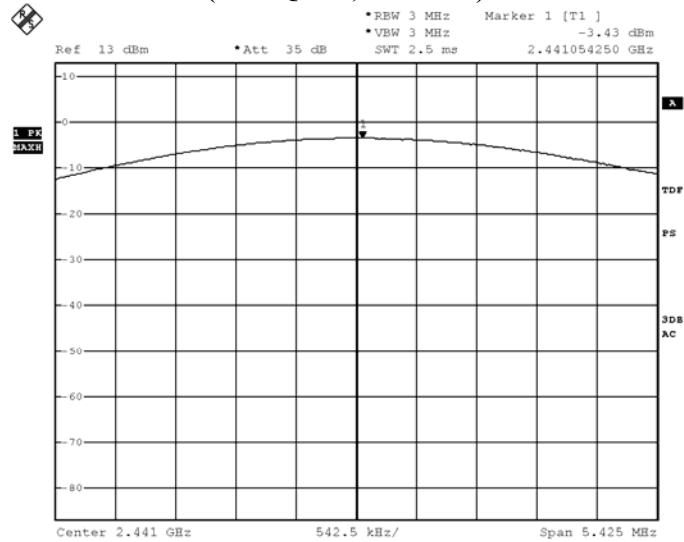
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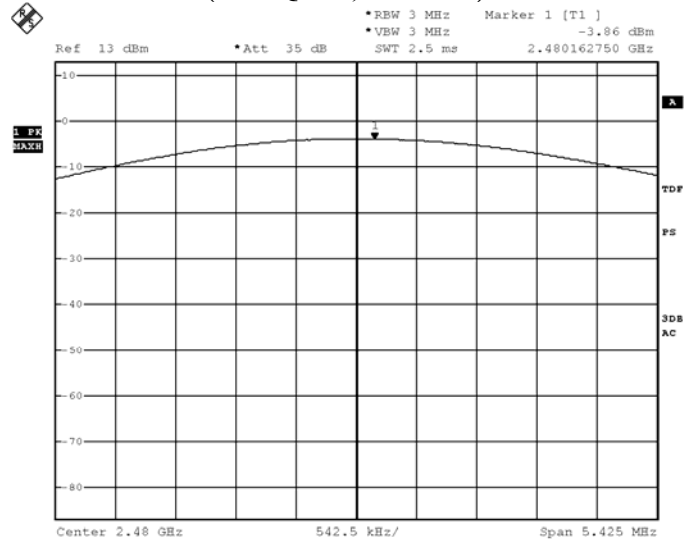
Bluetooth Communication mode ($\pi/4$ -DQPSK, 2441MHz)



BMP

Date: 16.MAY.2015 16:05:04

Bluetooth Communication mode ($\pi/4$ -DQPSK, 2480MHz)



BMP

Date: 16.MAY.2015 16:03:37

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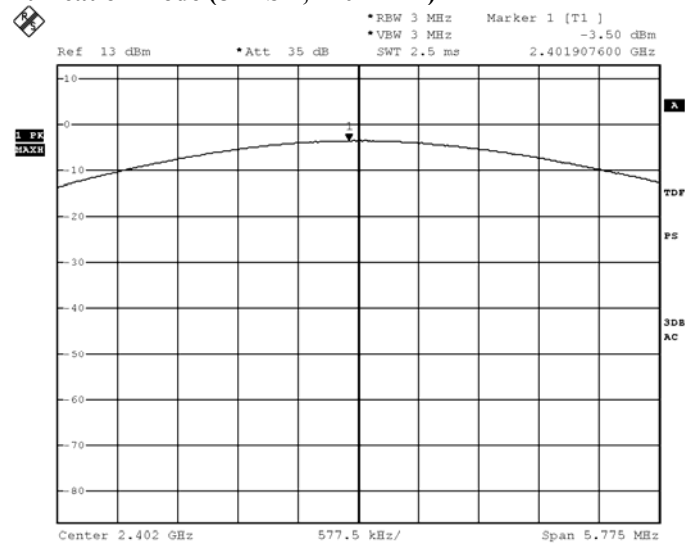
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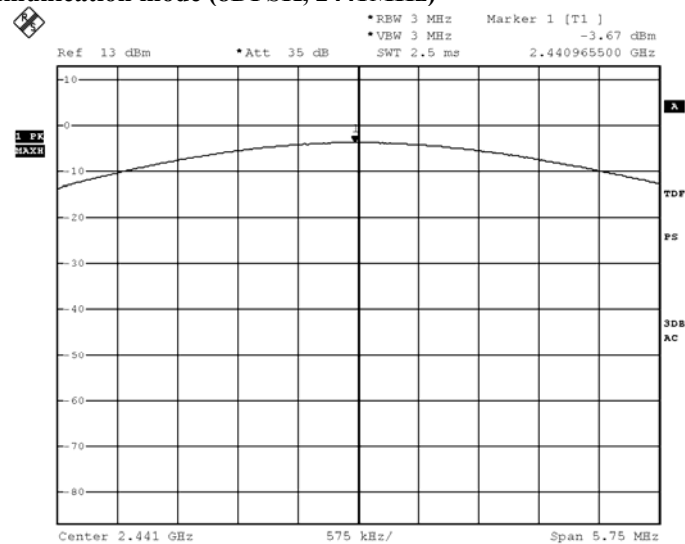
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Bluetooth Communication mode (8DPSK, 2402MHz)



BMP
Date: 16.MAY.2015 16:08:41

Bluetooth Communication mode (8DPSK, 2441MHz)



BMP
Date: 16.MAY.2015 16:09:31

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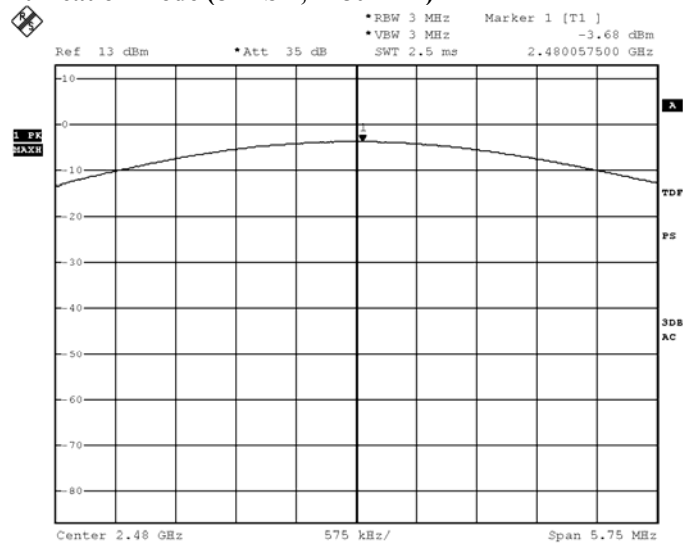
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Bluetooth Communication mode (8DPSK, 2480MHz)



BMP

Date: 16.MAY.2015 16:10:25

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3.1.2 Radiated Spurious Emissions

| | |
|--------------------|--|
| Test Requirement: | FCC 47CFR 15.209 |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2015-05-21 |
| Mode of Operation: | Tx mode/ Bluetooth mode (GFSK / $\pi/4$ -DQPSK/ 8DPSK) |

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, 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 on the STC (Dongguan) Company Ltd. 68 Fumin Nan Road, Dalang, Dongguan, Guangdong, PRC with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 629686.

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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

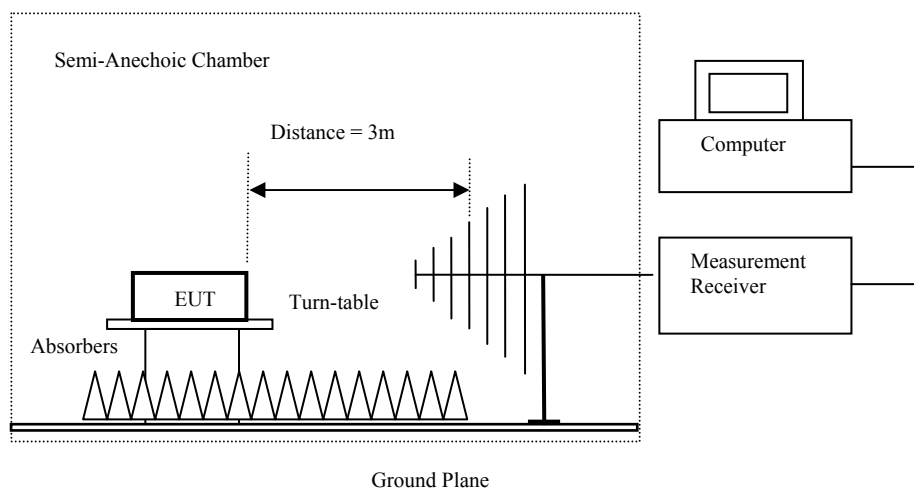
30MHz – 1GHz (QP)

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, 9kHz to 30MHz loop antennas are used.

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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

| Frequency Range [MHz] | Quasi-Peak Limits [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 Tx mode (2402.0 MHz) (GFSK mode) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Tx mode (2402.0 MHz) (GFSK mode) (30MHz – 1GHz): Pass

| Field Strength of Spurious Emissions Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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

| Field Strength of Spurious Emissions Peak Value | | | | | | |
|--|-------------------------------|------------------------------|-----------------------------|------------------------|------------------|---------------------|
| Frequency MHz | Measured Level @3m dBμV | Correction Factor dB/m | Field Strength dBμV/m | Limit @3m dBμV/m | Margin dBμV/m | E-Field Polarity |
| 4804.0 | 15.5 | 41.5 | 57.0 | 74.0 | 17.0 | Vertical |
| 4804.0 | 12.8 | 42.4 | 55.2 | 74.0 | 18.8 | Horizontal |
| 7206.0 | 12.4 | 45.1 | 57.5 | 74.0 | 16.5 | Vertical |
| 7206.0 | 10.0 | 46.2 | 56.2 | 74.0 | 17.8 | Horizontal |
| 9608.0 | 8 | 48.0 | 56.0 | 74.0 | 18.0 | Vertical |
| 9608.0 | 4.3 | 48.8 | 53.1 | 74.0 | 20.9 | Horizontal |
| 12010.0 | 4.6 | 51.5 | 56.1 | 74.0 | 17.9 | Vertical |
| 12010.0 | 1.8 | 52.4 | 54.2 | 74.0 | 19.8 | 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 | -0.4 | 41.5 | 41.1 | 54.0 | 12.9 | Vertical |
| 4804.0 | -2.8 | 42.4 | 39.6 | 54.0 | 14.4 | Horizontal |
| 7206.0 | -2.7 | 45.1 | 42.4 | 54.0 | 11.6 | Vertical |
| 7206.0 | -4.5 | 46.2 | 41.7 | 54.0 | 12.3 | Horizontal |
| 9608.0 | -7.5 | 48.0 | 40.5 | 54.0 | 13.5 | Vertical |
| 9608.0 | -8.1 | 48.8 | 40.7 | 54.0 | 13.3 | Horizontal |
| 12010.0 | -6.6 | 51.5 | 44.9 | 54.0 | 9.1 | Vertical |
| 12010.0 | -8.8 | 52.4 | 43.6 | 54.0 | 10.4 | Horizontal |

Result of Tx mode (2441.0 MHz) (GFSK mode) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx mode (2441.0 MHz) (GFSK mode) (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------|------------------------------|-----------------------------|---------------------------|---------------|---------------------|
| Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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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 | 15.9 | 41.6 | 57.5 | 74.0 | 16.5 | Vertical |
| 4882.0 | 13.1 | 42.5 | 55.6 | 74.0 | 18.4 | Horizontal |
| 7323.0 | 2.4 | 45.2 | 47.6 | 74.0 | 26.4 | Vertical |
| 7323.0 | 9.2 | 46.3 | 55.5 | 74.0 | 18.5 | Horizontal |
| 9764.0 | 8.1 | 48.1 | 56.2 | 74.0 | 17.8 | Vertical |
| 9764.0 | 5.2 | 48.9 | 54.1 | 74.0 | 19.9 | Horizontal |
| 12205.0 | 4.4 | 51.6 | 56.0 | 74.0 | 18.0 | Vertical |
| 12205.0 | 4.6 | 52.5 | 57.1 | 74.0 | 16.9 | 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 | 2.4 | 41.6 | 44.0 | 54.0 | 10.0 | Vertical |
| 4882.0 | -2.4 | 42.5 | 40.1 | 54.0 | 13.9 | Horizontal |
| 7323.0 | -2.4 | 45.2 | 42.8 | 54.0 | 11.2 | Vertical |
| 7323.0 | -5.4 | 46.3 | 40.9 | 54.0 | 13.1 | Horizontal |
| 9764.0 | -7.4 | 48.1 | 40.7 | 54.0 | 13.3 | Vertical |
| 9764.0 | -7.7 | 48.9 | 41.2 | 54.0 | 12.8 | Horizontal |
| 12205.0 | -11.2 | 51.6 | 40.4 | 54.0 | 13.6 | Vertical |
| 12205.0 | -9.7 | 52.5 | 42.8 | 54.0 | 11.2 | Horizontal |

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Result of Tx mode (2480.0 MHz) (GFSK mode) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx mode (2480.0 MHz) (GFSK mode) (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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 | 15.1 | 41.4 | 56.5 | 74.0 | 17.5 | Vertical |
| 4960.0 | 12.6 | 42.7 | 55.3 | 74.0 | 18.7 | Horizontal |
| 7440.0 | 11.3 | 45.6 | 56.9 | 74.0 | 17.1 | Vertical |
| 7440.0 | 9.7 | 46.5 | 56.2 | 74.0 | 17.8 | Horizontal |
| 9920.0 | 5.4 | 48.6 | 54.0 | 74.0 | 20.0 | Vertical |
| 9920.0 | 5.0 | 49.7 | 54.7 | 74.0 | 19.3 | Horizontal |
| 12400.0 | 4.7 | 51.7 | 56.4 | 74.0 | 17.6 | Vertical |
| 12400.0 | 3.4 | 52.7 | 56.1 | 74.0 | 17.9 | Horizontal |

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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 | -0.4 | 41.4 | 41.0 | 54.0 | 13.0 | Vertical |
| 4960.0 | -3.0 | 42.7 | 39.7 | 54.0 | 14.3 | Horizontal |
| 7440.0 | -3.1 | 45.6 | 42.5 | 54.0 | 11.5 | Vertical |
| 7440.0 | -4.7 | 46.5 | 41.8 | 54.0 | 12.2 | Horizontal |
| 9920.0 | -8.4 | 48.6 | 40.2 | 54.0 | 13.8 | Vertical |
| 9920.0 | -8.7 | 49.7 | 41.0 | 54.0 | 13.0 | Horizontal |
| 12400.0 | -7.9 | 51.7 | 43.8 | 54.0 | 10.2 | Vertical |
| 12400.0 | -11.2 | 52.7 | 41.5 | 54.0 | 12.5 | Horizontal |

Result of Tx mode (2402.0 MHz) ($\pi/4$ -DQPSK mode) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Tx mode (2402.0 MHz) ($\pi/4$ -DQPSK mode) (30MHz – 1GHz): Pass

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------|------------------------------|-----------------------------|---------------------------|---------------|---------------------|
| Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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Result of Tx mode (2402.0 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 |
| 4804.0 | 16.1 | 41.5 | 57.6 | 74.0 | 16.4 | Vertical |
| 4804.0 | 14.1 | 42.4 | 56.5 | 74.0 | 17.5 | Horizontal |
| 7206.0 | 11.6 | 45.1 | 56.7 | 74.0 | 17.3 | Vertical |
| 7206.0 | 9.3 | 46.2 | 55.5 | 74.0 | 18.5 | Horizontal |
| 9608.0 | 7.1 | 48.0 | 55.1 | 74.0 | 18.9 | Vertical |
| 9608.0 | 7.4 | 48.8 | 56.2 | 74.0 | 17.8 | Horizontal |
| 12010.0 | 4.0 | 51.5 | 55.5 | 74.0 | 18.5 | Vertical |
| 12010.0 | 4.3 | 52.4 | 56.7 | 74.0 | 17.3 | Horizontal |

Result of Tx mode (2402.0 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 |
| 4804.0 | 0.6 | 41.5 | 42.1 | 54.0 | 11.9 | Vertical |
| 4804.0 | -2.0 | 42.4 | 40.4 | 54.0 | 13.6 | Horizontal |
| 7206.0 | -3.9 | 45.1 | 41.2 | 54.0 | 12.8 | Vertical |
| 7206.0 | 5.8 | 46.2 | 52.0 | 54.0 | 2.0 | Horizontal |
| 9608.0 | -7.3 | 48.0 | 40.7 | 54.0 | 13.3 | Vertical |
| 9608.0 | -7.2 | 48.8 | 41.6 | 54.0 | 12.4 | Horizontal |
| 12010.0 | -10.6 | 51.5 | 40.9 | 54.0 | 13.1 | Vertical |
| 12010.0 | -11.4 | 52.4 | 41.0 | 54.0 | 13.0 | Horizontal |

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Result of Tx mode (2441.0 MHz) ($\pi/4$ -DQPSK mode) (9kHz – 30MHz): Pass

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

Results of Tx mode (2441.0 MHz) ($\pi/4$ -DQPSK mode) (30MHz – 1000MHz): PASS

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

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

| Field Strength of Spurious Emissions | | | | | | |
|--------------------------------------|--------------------|-------------------|----------------|-----------|--------|------------------|
| Peak Value | | | | | | |
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dBuV | dB/m | dBuV/m | dBuV/m | dBuV/m | |
| 4882.0 | 14.4 | 41.6 | 56.0 | 74.0 | 18.0 | Vertical |
| 4882.0 | 14.7 | 42.5 | 57.2 | 74.0 | 16.8 | Horizontal |
| 7323.0 | 3.5 | 45.2 | 48.7 | 74.0 | 25.3 | Vertical |
| 7323.0 | 9.8 | 46.3 | 56.1 | 74.0 | 17.9 | Horizontal |
| 9764.0 | 7.4 | 48.1 | 55.5 | 74.0 | 18.5 | Vertical |
| 9764.0 | 3.7 | 48.9 | 52.6 | 74.0 | 21.4 | Horizontal |
| 12205.0 | 3.5 | 51.6 | 55.1 | 74.0 | 18.9 | Vertical |
| 12205.0 | 4.0 | 52.5 | 56.5 | 74.0 | 17.5 | Horizontal |

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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 | -0.5 | 41.6 | 41.1 | 54.0 | 12.9 | Vertical |
| 4882.0 | 1.0 | 42.5 | 43.5 | 54.0 | 10.5 | Horizontal |
| 7323.0 | -3.7 | 45.2 | 41.5 | 54.0 | 12.5 | Vertical |
| 7323.0 | -5.0 | 46.3 | 41.3 | 54.0 | 12.7 | Horizontal |
| 9764.0 | -7.7 | 48.1 | 40.4 | 54.0 | 13.6 | Vertical |
| 9764.0 | -10.0 | 48.9 | 38.9 | 54.0 | 15.1 | Horizontal |
| 12205.0 | -11.0 | 51.6 | 40.6 | 54.0 | 13.4 | Vertical |
| 12205.0 | -10.7 | 52.5 | 41.8 | 54.0 | 12.2 | Horizontal |

Result of Tx mode (2480.0 MHz) ($\pi/4$ -DQPSK mode) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx mode (2480.0 MHz) ($\pi/4$ -DQPSK mode) (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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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 | 13.8 | 41.4 | 55.2 | 74.0 | 18.8 | Vertical |
| 4960.0 | 14.4 | 42.7 | 57.1 | 74.0 | 16.9 | Horizontal |
| 7440.0 | 10.4 | 45.6 | 56.0 | 74.0 | 18.0 | Vertical |
| 7440.0 | 8.1 | 46.5 | 54.6 | 74.0 | 19.4 | Horizontal |
| 9920.0 | 5.5 | 48.6 | 54.1 | 74.0 | 19.9 | Vertical |
| 9920.0 | 6.7 | 49.7 | 56.4 | 74.0 | 17.6 | Horizontal |
| 12400.0 | 4.4 | 51.7 | 56.1 | 74.0 | 17.9 | Vertical |
| 12400.0 | 3.2 | 52.7 | 55.9 | 74.0 | 18.1 | Horizontal |

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 | -0.7 | 41.4 | 40.7 | 54.0 | 13.3 | Vertical |
| 4960.0 | -0.4 | 42.7 | 42.3 | 54.0 | 11.7 | Horizontal |
| 7440.0 | -4.2 | 45.6 | 41.4 | 54.0 | 12.6 | Vertical |
| 7440.0 | -6 | 46.5 | 40.5 | 54.0 | 13.5 | Horizontal |
| 9920.0 | -8.0 | 48.6 | 40.6 | 54.0 | 13.4 | Vertical |
| 9920.0 | -8.9 | 49.7 | 40.8 | 54.0 | 13.2 | Horizontal |
| 12400.0 | -11.4 | 51.7 | 40.3 | 54.0 | 13.7 | Vertical |
| 12400.0 | -10.5 | 52.7 | 42.2 | 54.0 | 11.8 | Horizontal |

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Result of Tx mode (2402.0 MHz) (8DPSK) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Tx mode (2402.0 MHz) (8DPSK) (30MHz – 1GHz): Pass

| Field Strength of Spurious Emissions Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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 | 15.0 | 41.5 | 56.5 | 74.0 | 17.5 | Vertical |
| 4804.0 | 14.6 | 42.4 | 57.0 | 74.0 | 17.0 | Horizontal |
| 7206.0 | 12.0 | 45.1 | 57.1 | 74.0 | 16.9 | Vertical |
| 7206.0 | 9.7 | 46.2 | 55.9 | 74.0 | 18.1 | Horizontal |
| 9608.0 | 7.1 | 48.0 | 55.1 | 74.0 | 18.9 | Vertical |
| 9608.0 | 6.9 | 48.8 | 55.7 | 74.0 | 18.3 | Horizontal |
| 12010.0 | 5 | 51.8 | 56.8 | 74.0 | 17.2 | 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 | -1.3 | 41.5 | 40.2 | 54.0 | 13.8 | Vertical |
| 4804.0 | 0.0 | 42.4 | 42.4 | 54.0 | 11.6 | Horizontal |
| 7206.0 | -1.7 | 45.1 | 43.4 | 54.0 | 10.6 | Vertical |
| 7206.0 | -5.6 | 46.2 | 40.6 | 54.0 | 13.4 | Horizontal |
| 9608.0 | -7.6 | 48.0 | 40.4 | 54.0 | 13.6 | Vertical |
| 9608.0 | -7.3 | 48.8 | 41.5 | 54.0 | 12.5 | Horizontal |
| 12010.0 | -10.0 | 51.8 | 41.8 | 54.0 | 12.2 | Vertical |
| 12010.0 | -12.3 | 52.4 | 40.1 | 54.0 | 13.9 | Horizontal |

Result of Tx mode (2441.0 MHz) (8DPSK) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx mode (2441.0 MHz) (8DPSK) (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions | | | | | | |
|---|---------------------------|------------------------------|-----------------------------|---------------------------|---------------|---------------------|
| Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

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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 | 15.1 | 41.6 | 56.7 | 74.0 | 17.3 | Vertical |
| 4882.0 | 13.3 | 42.5 | 55.8 | 74.0 | 18.2 | Horizontal |
| 7323.0 | 3.7 | 45.2 | 48.9 | 74.0 | 25.1 | Vertical |
| 7323.0 | 9.3 | 46.3 | 55.6 | 74.0 | 18.4 | Horizontal |
| 9764.0 | 5.9 | 48.1 | 54.0 | 74.0 | 20.0 | Vertical |
| 9764.0 | 7.2 | 48.9 | 56.1 | 74.0 | 17.9 | Horizontal |
| 12205.0 | 5.1 | 51.6 | 56.7 | 74.0 | 17.3 | Vertical |
| 12205.0 | 2.9 | 52.5 | 55.4 | 74.0 | 18.6 | 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 | 0.4 | 41.6 | 42.0 | 54.0 | 12.0 | Vertical |
| 4882.0 | -2.1 | 42.5 | 40.4 | 54.0 | 13.6 | Horizontal |
| 7323.0 | -3.1 | 45.2 | 42.1 | 54.0 | 11.9 | Vertical |
| 7323.0 | -5.5 | 46.3 | 40.8 | 54.0 | 13.2 | Horizontal |
| 9764.0 | -7.8 | 48.1 | 40.3 | 54.0 | 13.7 | Vertical |
| 9764.0 | -7.4 | 48.9 | 41.5 | 54.0 | 12.5 | Horizontal |
| 12205.0 | -9.4 | 51.6 | 42.2 | 54.0 | 11.8 | Vertical |
| 12205.0 | -12.0 | 52.5 | 40.5 | 54.0 | 13.5 | Horizontal |

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Result of Tx mode (2480.0 MHz) (8DPSK) (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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Results of Tx mode (2480.0 MHz) (8DPSK) (30MHz – 1000MHz): PASS

| Field Strength of Spurious Emissions Quasi-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 |
| Emissions detected are more than 20 dB below the FCC Limits | | | | | | |

Result of Tx mode (2480.0 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 |
| 4960.0 | 15.7 | 41.4 | 57.1 | 74.0 | 16.9 | Vertical |
| 4960.0 | 14.7 | 42.7 | 57.4 | 74.0 | 16.6 | Horizontal |
| 7440.0 | 10.8 | 45.6 | 56.4 | 74.0 | 17.6 | Vertical |
| 7440.0 | 10.6 | 46.5 | 57.1 | 74.0 | 16.9 | Horizontal |
| 9920.0 | 6.4 | 48.6 | 55.0 | 74.0 | 19.0 | Vertical |
| 9920.0 | 4.0 | 49.7 | 53.7 | 74.0 | 20.3 | Horizontal |
| 12400.0 | 3.4 | 51.7 | 55.1 | 74.0 | 18.9 | Vertical |
| 12400.0 | 3.7 | 52.7 | 56.4 | 74.0 | 17.6 | Horizontal |

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Result of Tx mode (2480.0 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 |
| 4960.0 | 2.2 | 41.4 | 43.6 | 54.0 | 10.4 | Vertical |
| 4960.0 | 0.4 | 42.7 | 43.1 | 54.0 | 10.9 | Horizontal |
| 7440.0 | -4.4 | 45.6 | 41.2 | 54.0 | 12.8 | Vertical |
| 7440.0 | -3.7 | 46.5 | 42.8 | 54.0 | 11.2 | Horizontal |
| 9920.0 | -7.3 | 48.6 | 41.3 | 54.0 | 12.7 | Vertical |
| 9920.0 | -10.1 | 49.7 | 39.6 | 54.0 | 14.4 | Horizontal |
| 12400.0 | -11.1 | 51.7 | 40.6 | 54.0 | 13.4 | Vertical |
| 12400.0 | -10.8 | 52.7 | 41.9 | 54.0 | 12.1 | Horizontal |

Remarks:

- * 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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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

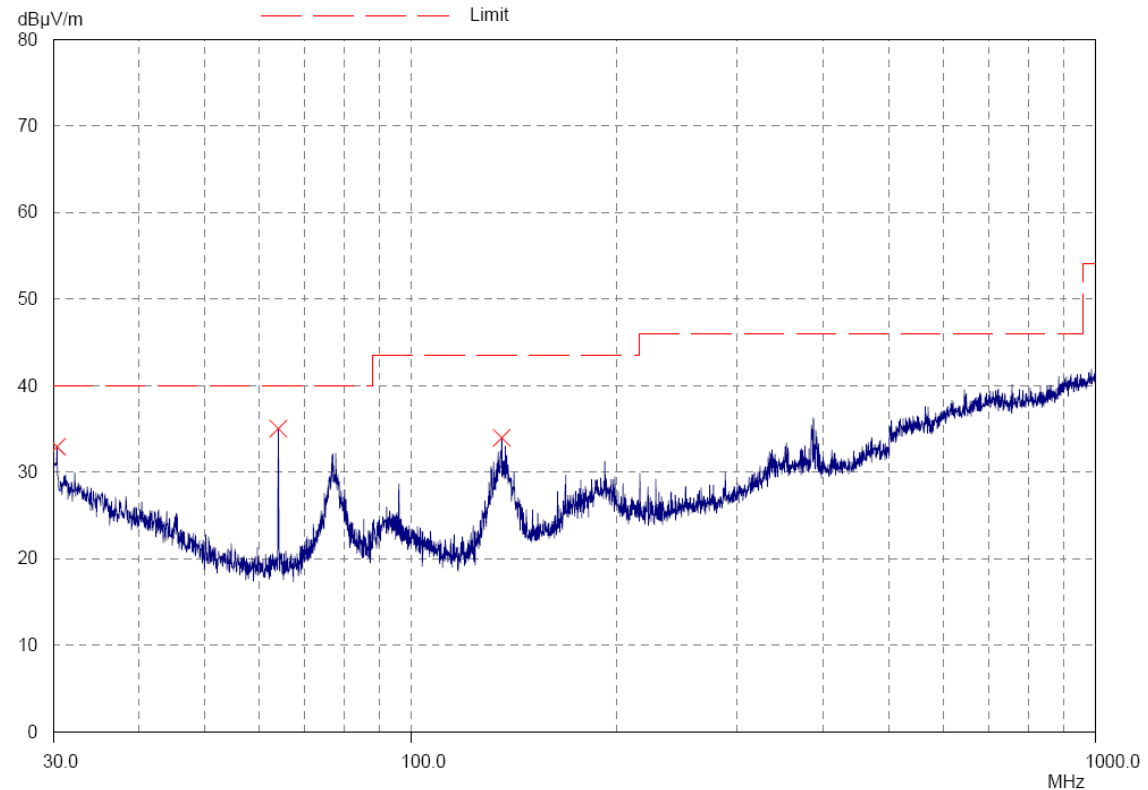
| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz] | [μ V/m] |
| 0.009-0.490 | 2400/F (kHz) |
| 0.490-1.705 | 24000/F (kHz) |
| 1.705-30 | 30 |
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above960 | 500 |

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.

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

| Radiated Emissions Quasi-Peak | | | | | |
|--|-----------------------------|--|--|--|--|
| Emission Frequency MHz | E-Field Polarity | Level @3m dBμV/m | Limit @3m dBμV/m | Level @3m μV/m | Limit @3m μV/m |
| 30.4 | Horizontal | 30.8 | 40.0 | 34.7 | 100 |
| 64.0 | Horizontal | 36.7 | 40.0 | 68.4 | 100 |
| 135.8 | Horizontal | 32.4 | 43.5 | 41.7 | 150 |

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Limits for Radiated Emissions [FCC 47 CFR 15.209 Class B]:

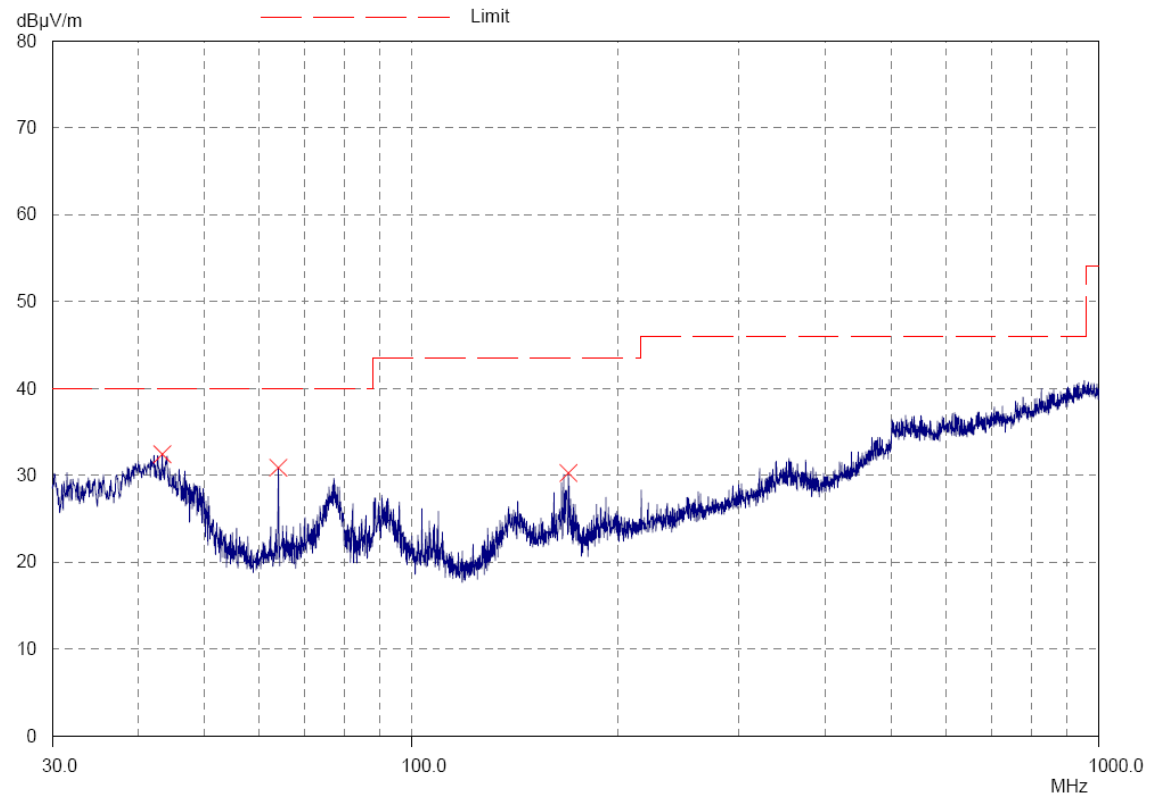
| Frequency Range | Quasi-Peak Limits |
|-----------------|-------------------|
| [MHz] | [μ V/m] |
| 0.009-0.490 | 2400/F (kHz) |
| 0.490-1.705 | 24000/F (kHz) |
| 1.705-30 | 30 |
| 30-88 | 100 |
| 88-216 | 150 |
| 216-960 | 200 |
| Above960 | 500 |

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.

Result of Bluetooth Communication mode (GFSK / π /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

| Radiated Emissions | | | | | |
|---------------------------|------------------|------------------------------|------------------------------|---------------------------|---------------------------|
| Quasi-Peak | | | | | |
| Emission Frequency MHz | E-Field Polarity | Level @3m dB μ V/m | Limit @3m dB μ V/m | Level @3m μ V/m | Limit @3m μ V/m |
| 43.4 | Vertical | 30.5 | 40.0 | 33.5 | 100 |
| 64.0 | Vertical | 30.2 | 40.0 | 32.4 | 100 |
| 169.3 | Vertical | 28.7 | 43.5 | 27.2 | 150 |

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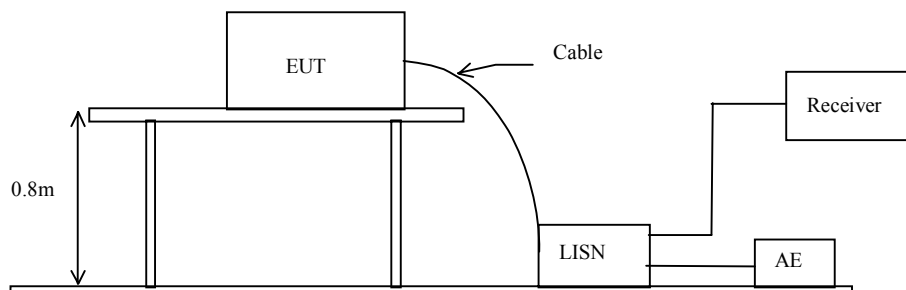
3.1.3 AC Mains Conducted Emissions (0.15MHz to 30MHz)

| | |
|--------------------|------------------------------|
| Test Requirement: | FCC 47CFR 15.207 |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2015-05-20 |
| Mode of Operation: | Bluetooth Communication mode |
| Test Voltage: | 120Va.c. 60Hz |

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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Limit for Conducted Emissions (FCC 47 CFR 15.207):

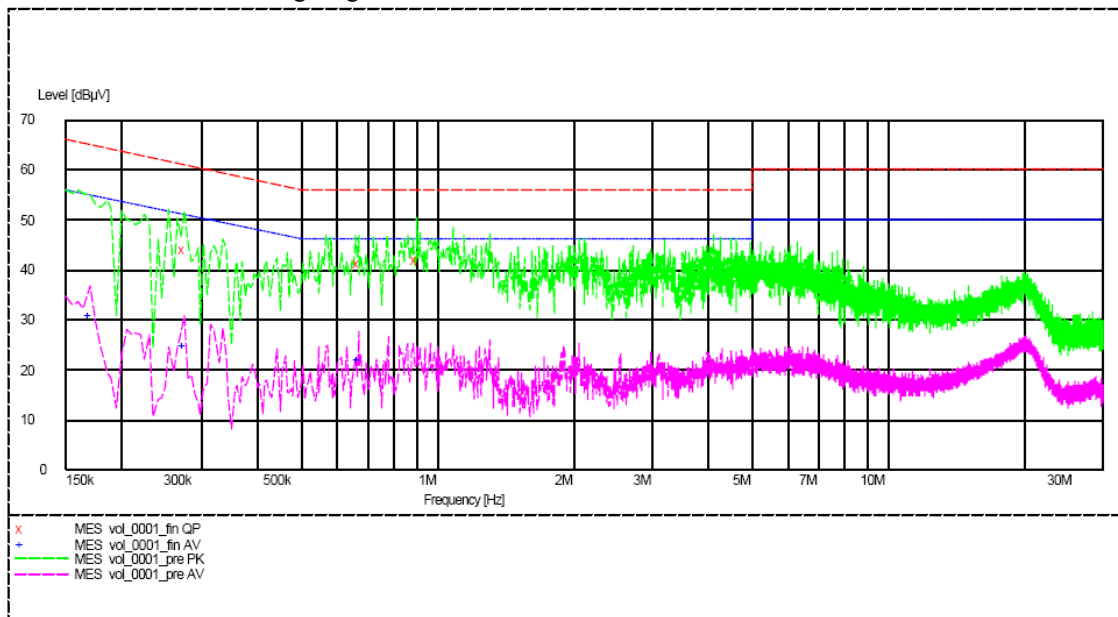
| Frequency Range [MHz] | Quasi-Peak Limits [dB μ V] | Average [dB μ V] |
|--------------------------|-----------------------------------|-------------------------|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

* 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.

Result of Bluetooth Communication mode (L): PASS

Please refer to the following diagram for individual results.



| Conductor Live or Neutral | Frequency MHz | Quasi-peak | | Average | |
|------------------------------|------------------|---------------------|---------------------|---------------------|---------------------|
| | | Level dB μ V | Limit dB μ V | Level dB μ V | Limit dB μ V |
| Live | 0.275 | 44.0 | 61.0 | -*- | -*- |
| Live | 0.670 | 41.1 | 56.0 | -*- | -*- |
| Live | 0.905 | 41.7 | 56.0 | -*- | -*- |
| Live | 0.170 | -*- | -*- | 30.8 | 55.0 |
| Live | 0.275 | -*- | -*- | 24.7 | 51.0 |
| Live | 0.670 | -*- | -*- | 21.8 | 46.0 |

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Limit for Conducted Emissions (FCC 47 CFR 15.207):

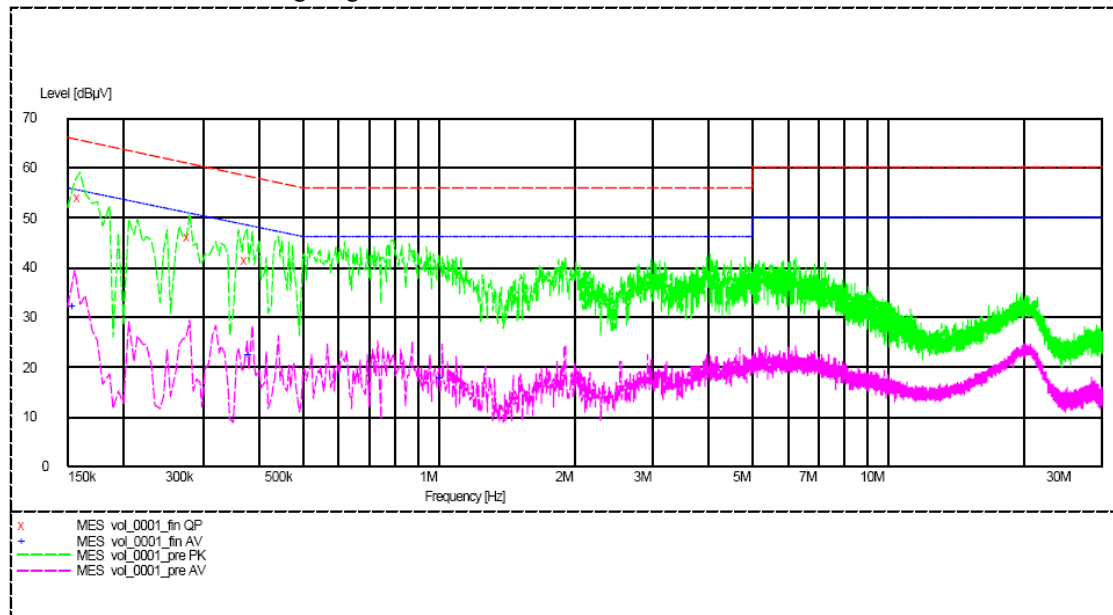
| Frequency Range [MHz] | Quasi-Peak Limits [dBμV] | Average [dBμV] |
|--------------------------|-----------------------------|-------------------|
| 0.15-0.5 | 66 to 56* | 56 to 46* |
| 0.5-5.0 | 56 | 46 |
| 5.0-30.0 | 60 | 50 |

* 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.

Result of Bluetooth Communication mode (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 | 0.160 | 54.1 | 66.0 | -*- | -*- |
| Neutral | 0.280 | 46.1 | 61.0 | -*- | -*- |
| Neutral | 0.375 | 41.6 | 58.0 | -*- | -*- |
| Neutral | 0.155 | -*- | -*- | 32.3 | 56.0 |
| Neutral | 0.385 | -*- | -*- | 22.3 | 48.0 |
| Neutral | 1.025 | -*- | -*- | 17.7 | 46.0 |

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 Number of Hopping Frequency

Limit of Number of Hopping Frequency

Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels

Test Method:

The RF output of the EUT was connected to the spectrum analyzer by a low loss cable.

Spectrum Analyzer Setting:

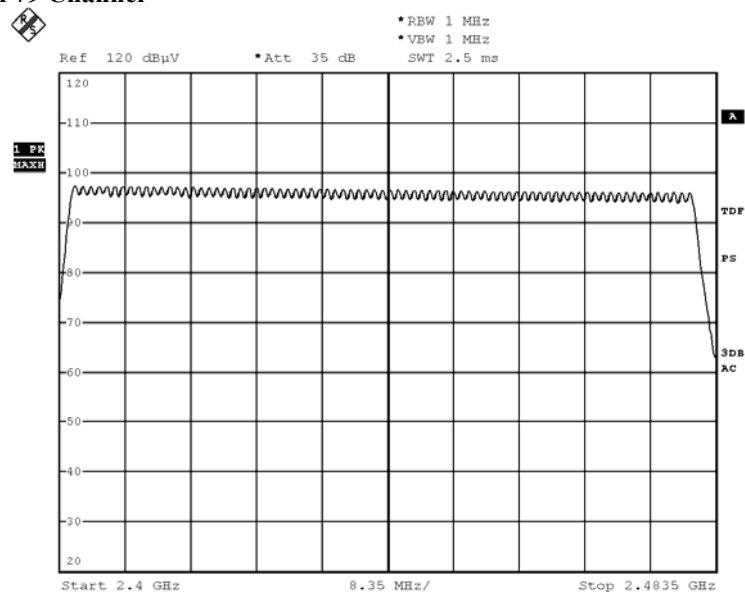
RBW = 1MHz, VBW \geq RBW, Sweep = Auto, Span = the frequency band of operation
Detector = Peak, Trace = Max. hold

Test Setup:

As Test Setup of clause 3.1.1 in this test report.

Measurement Data:

GFSK: 79 of 79 Channel



BMP

Date: 16.MAY.2015 15:25:38

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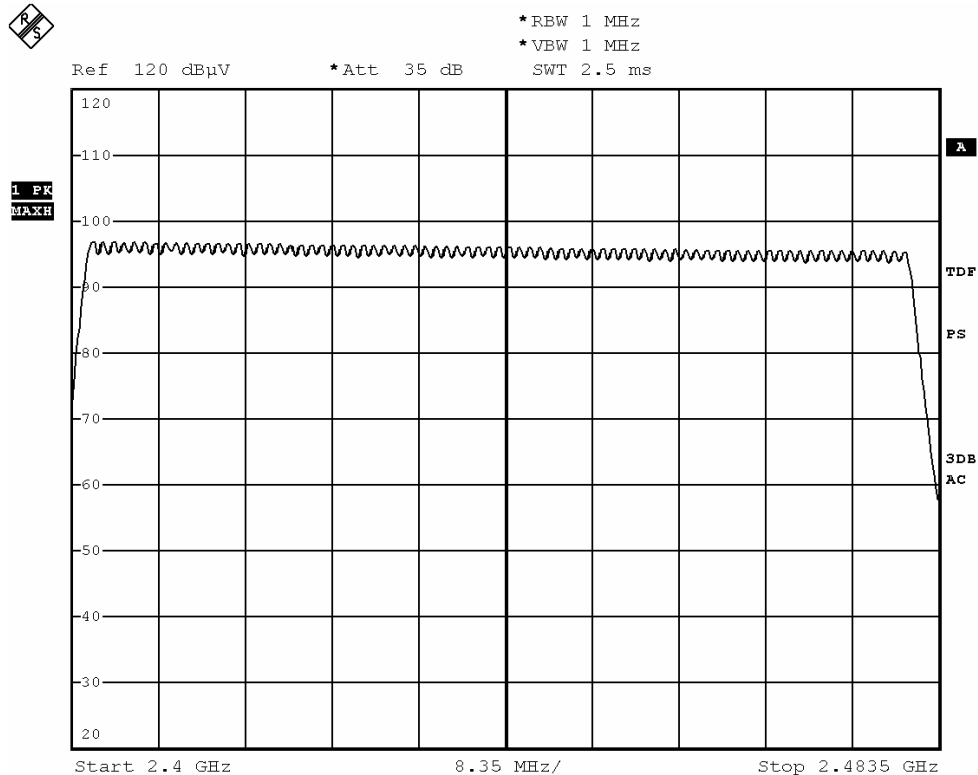
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Pi/4 DQPSK: 79 of 79 Channel



BMP

Date: 16.MAY.2015 15:19:37

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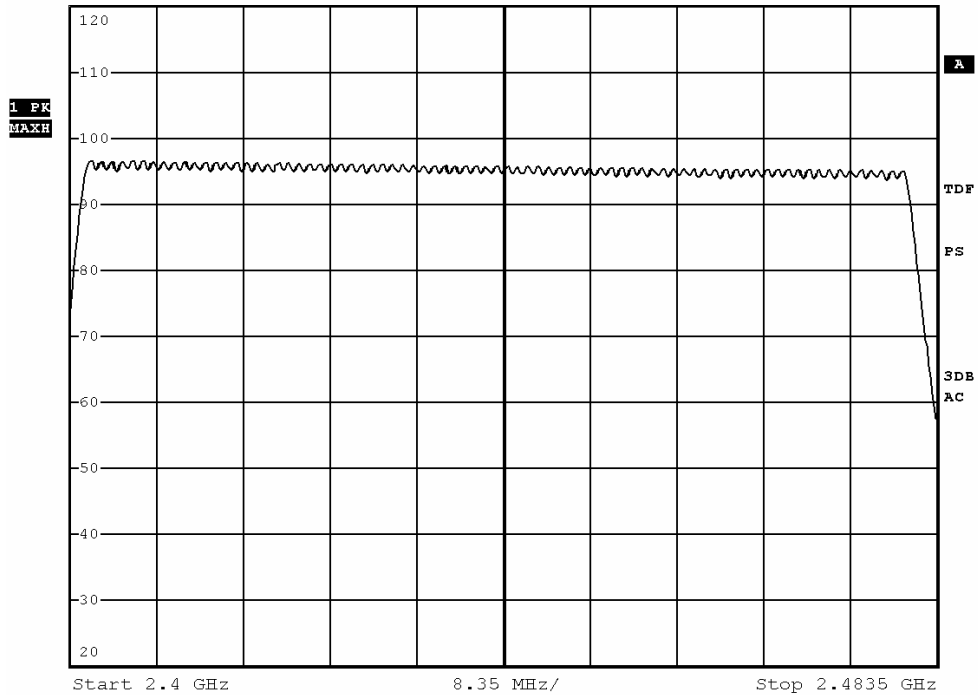
8DPSK: 79 of 79 Channel



*RBW 1 MHz
*VBW 1 MHz
SWT 2.5 ms

Ref 120 dBμV

*Att 35 dB



BMP

Date: 16.MAY.2015 15:14:05

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3.1.5 20dB Bandwidth

| | |
|--------------------|------------------------|
| Test Requirement: | FCC 47CFR 15.247(a)(1) |
| Test Method: | ANSI C63.4:2009 |
| Test Date: | 2015-05-16 |
| Mode of Operation: | Communication mode |

Remark:

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

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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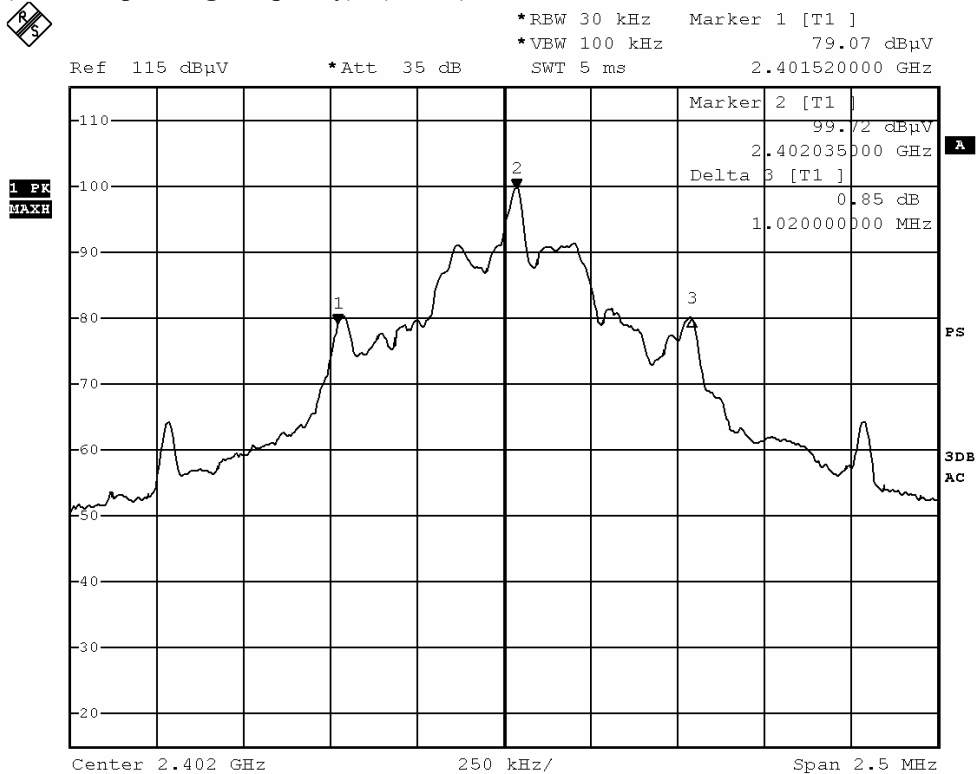
Date: 2015-05-26

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| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2402 | 1.020 | Within 2400-2483.5 |

(Lowest Operating Frequency) - (GFSK)



BMP

Date: 16.MAY.2015 11:15:11

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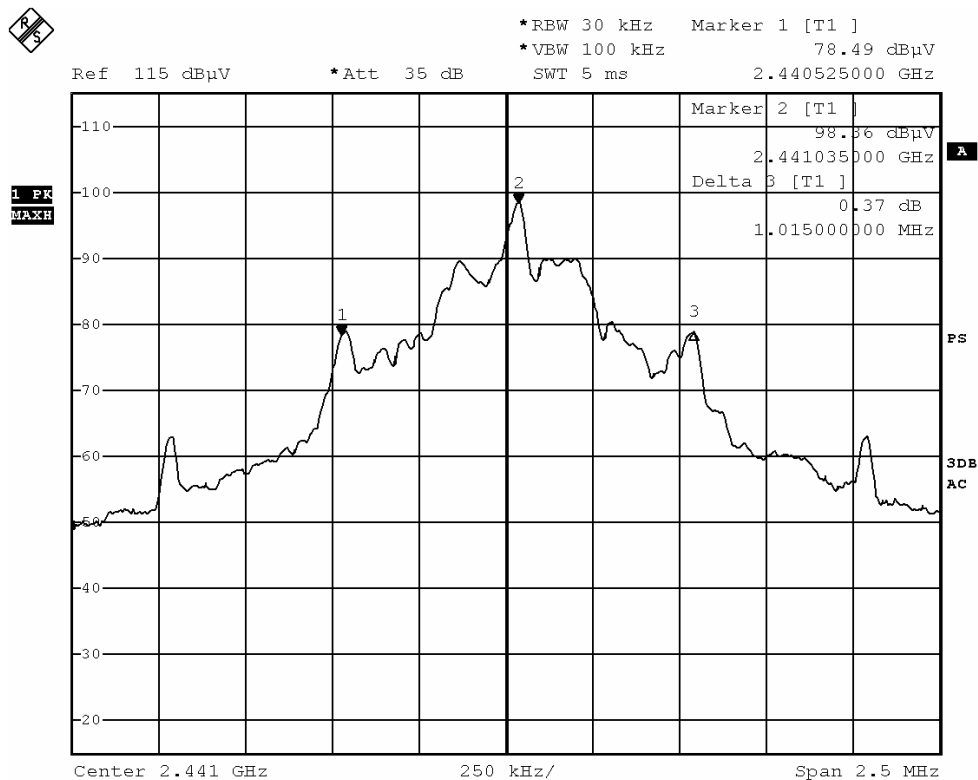
Date: 2015-05-26

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| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2441 | 1.015 | Within 2400-2483.5 |

(Middle Operating Frequency) - (GFSK)



BMP

Date: 16.MAY.2015 11:16:21

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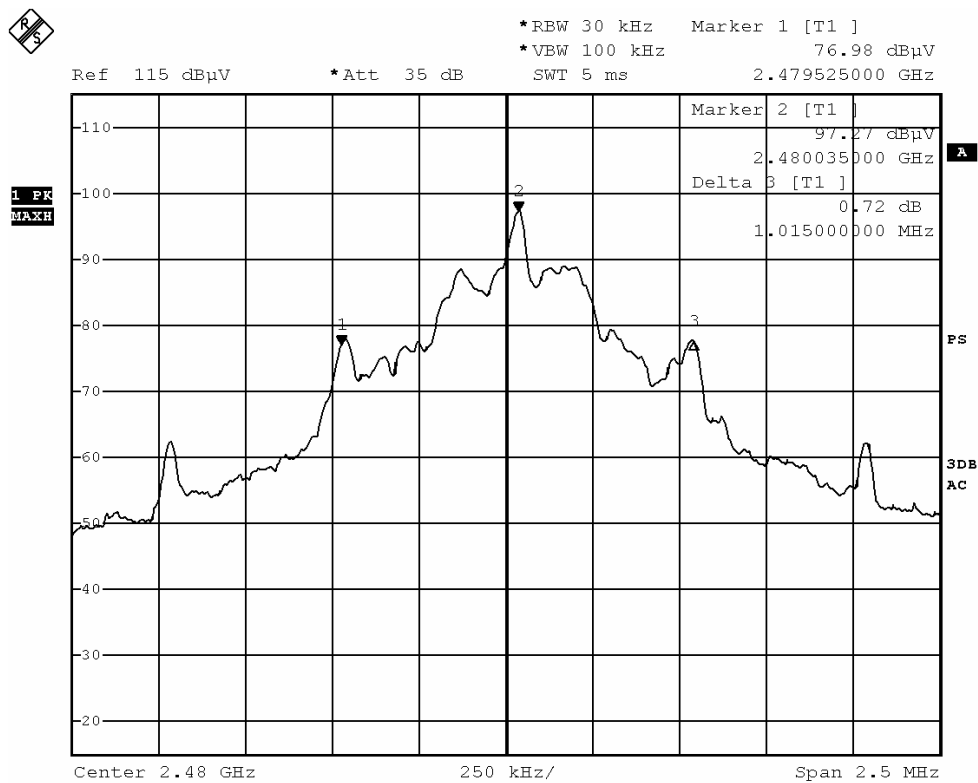
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2480 | 1.015 | Within 2400-2483.5 |

(Highest Operating Frequency) - (GFSK)



BMP

Date: 16.MAY.2015 11:18:15

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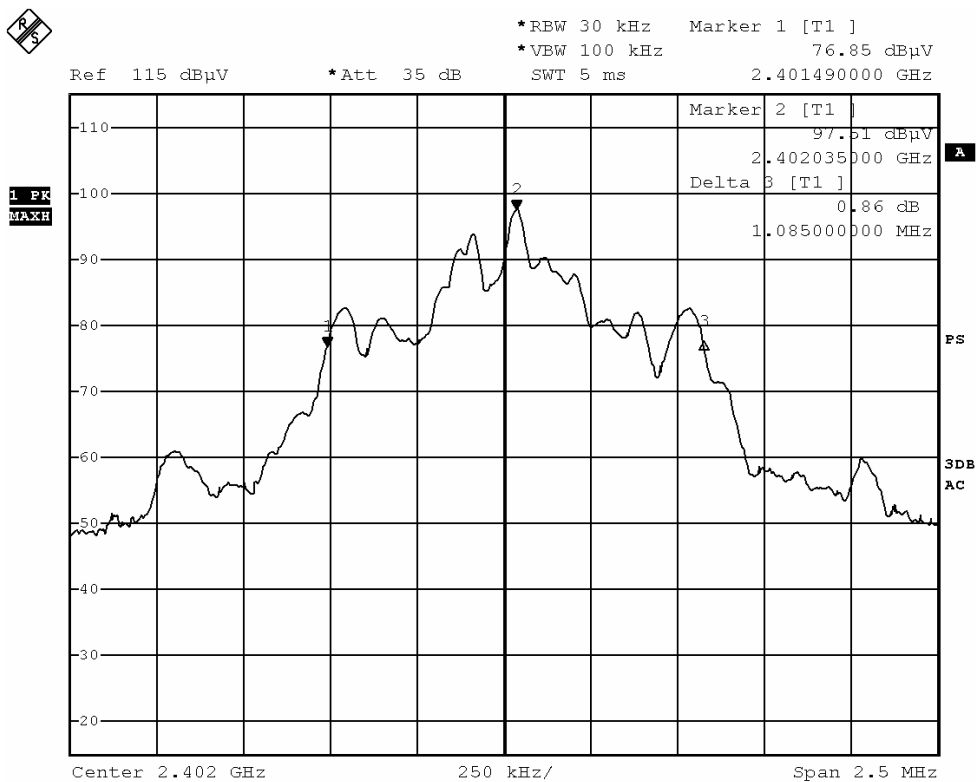
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2402 | 1.085 | Within 2400-2483.5 |

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



BMP

Date: 16.MAY.2015 11:28:03

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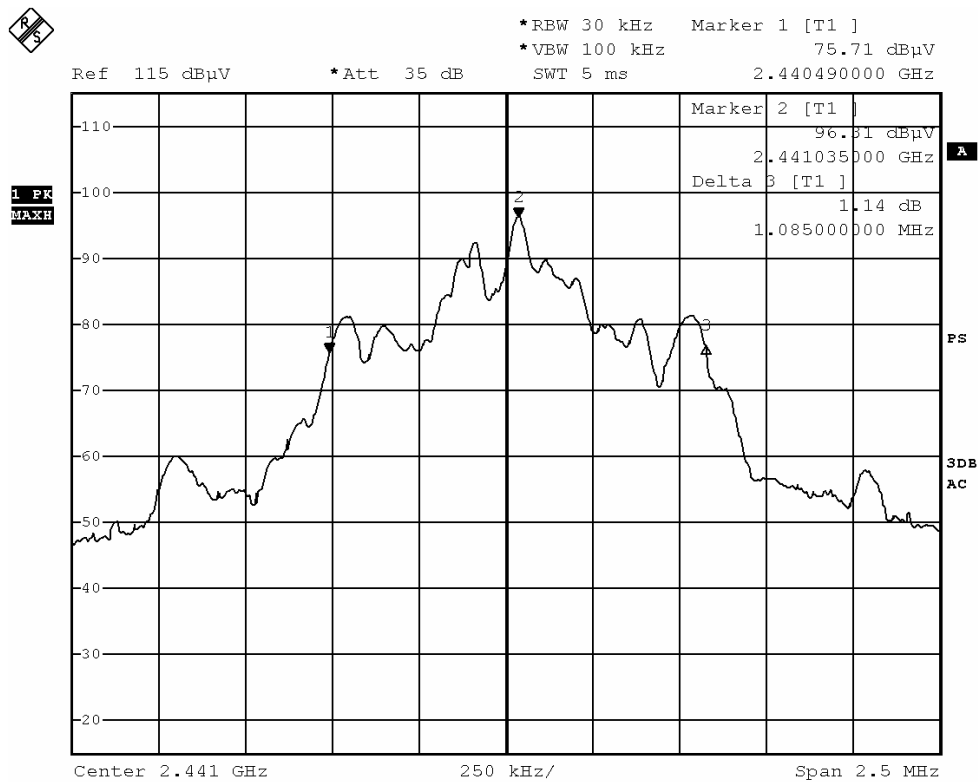
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2441 | 1.085 | Within 2400-2483.5 |

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



BMP

Date: 16.MAY.2015 11:26:03

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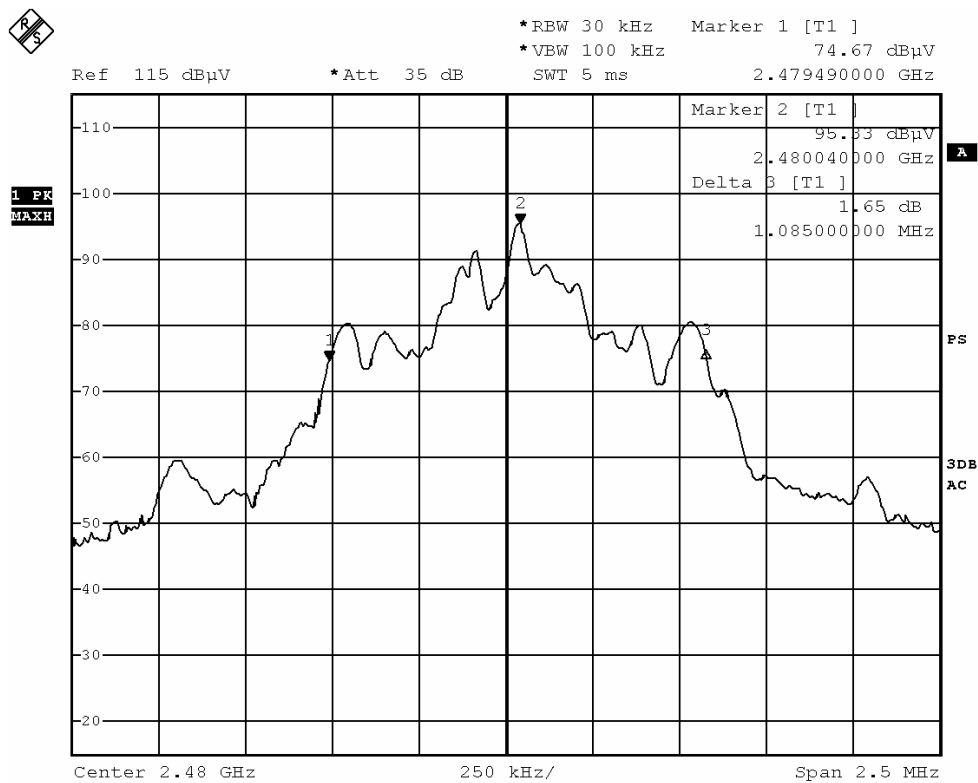
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2480 | 1.085 | Within 2400-2483.5 |

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



BMP

Date: 16.MAY.2015 11:24:58

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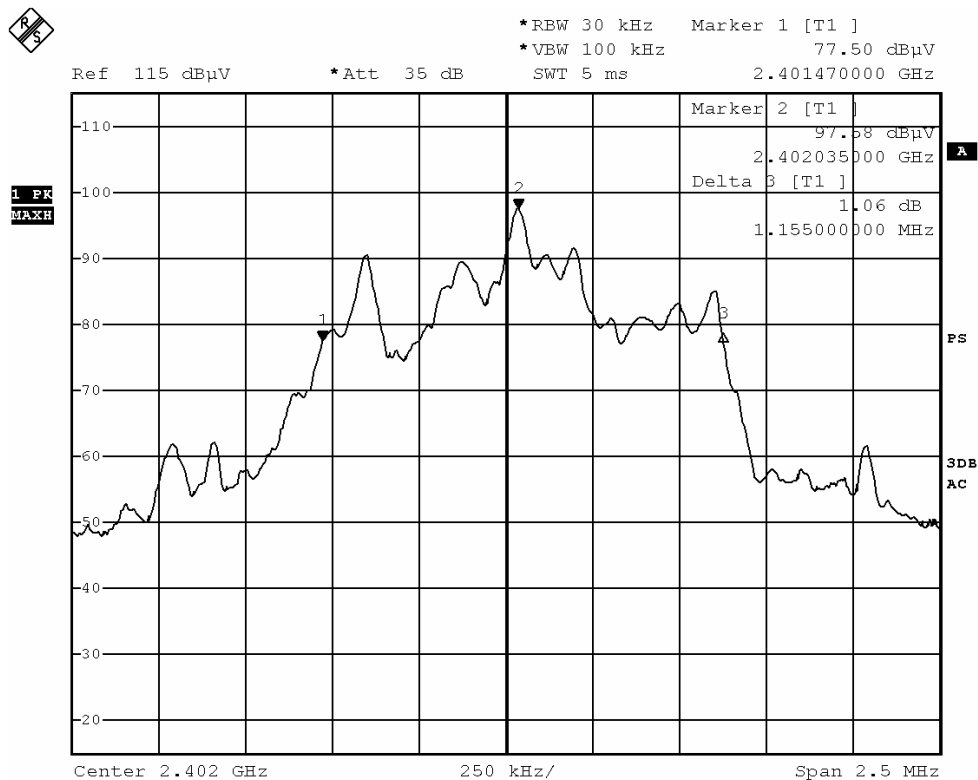
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2402 | 1.155 | Within 2400-2483.5 |

(Lowest Operating Frequency) - (8DPSK)



BMP

Date: 16.MAY.2015 11:29:26

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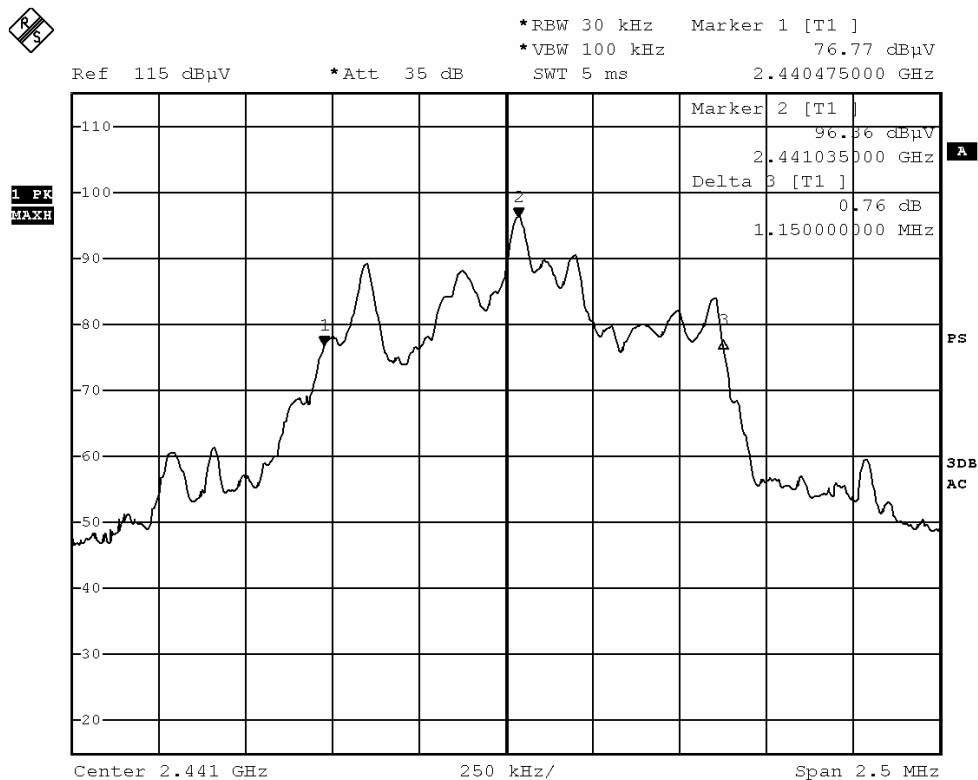
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2441 | 1.150 | Within 2400-2483.5 |

(Middle Operating Frequency) - (8DPSK)



BMP

Date: 16.MAY.2015 11:30:21

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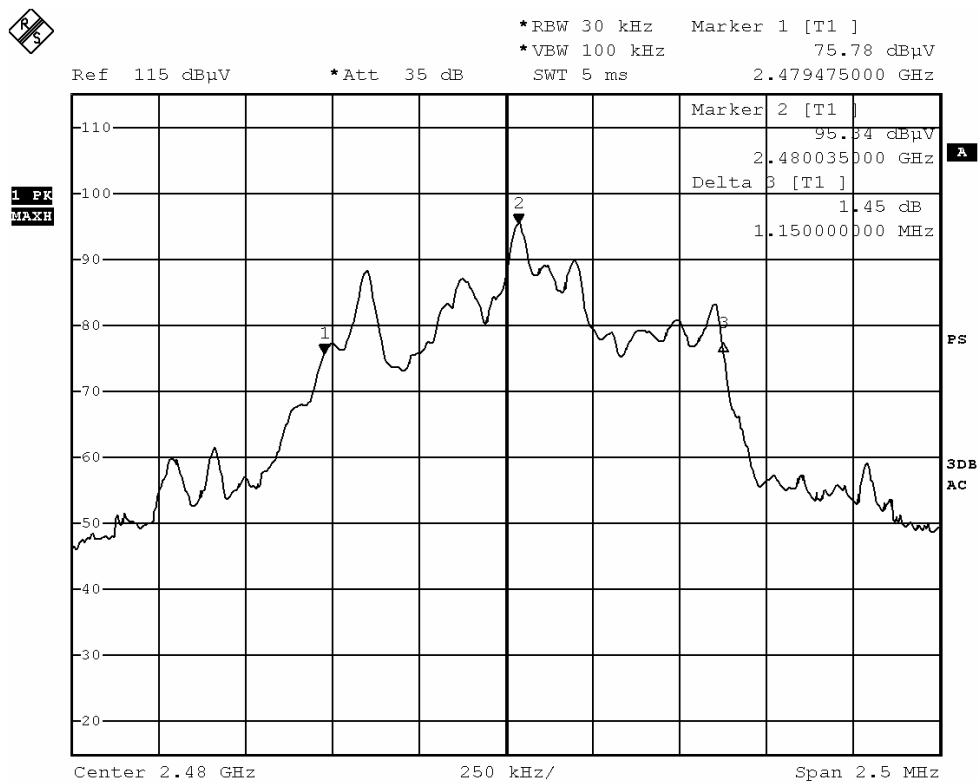
Date: 2015-05-26

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No.: DM119503

| Fundamental Frequency [MHz] | 20dB Bandwidth [MHz] | FCC Limits [MHz] |
|--------------------------------|-------------------------|---------------------|
| 2480 | 1.150 | Within 2400-2483.5 |

(Highest Operating Frequency) - (8DPSK)



BMP

Date: 16.MAY.2015 11:32:36

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No.: DM119503

3.1.6 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 = 1.15MHz * 2/3 = 766.667kHz

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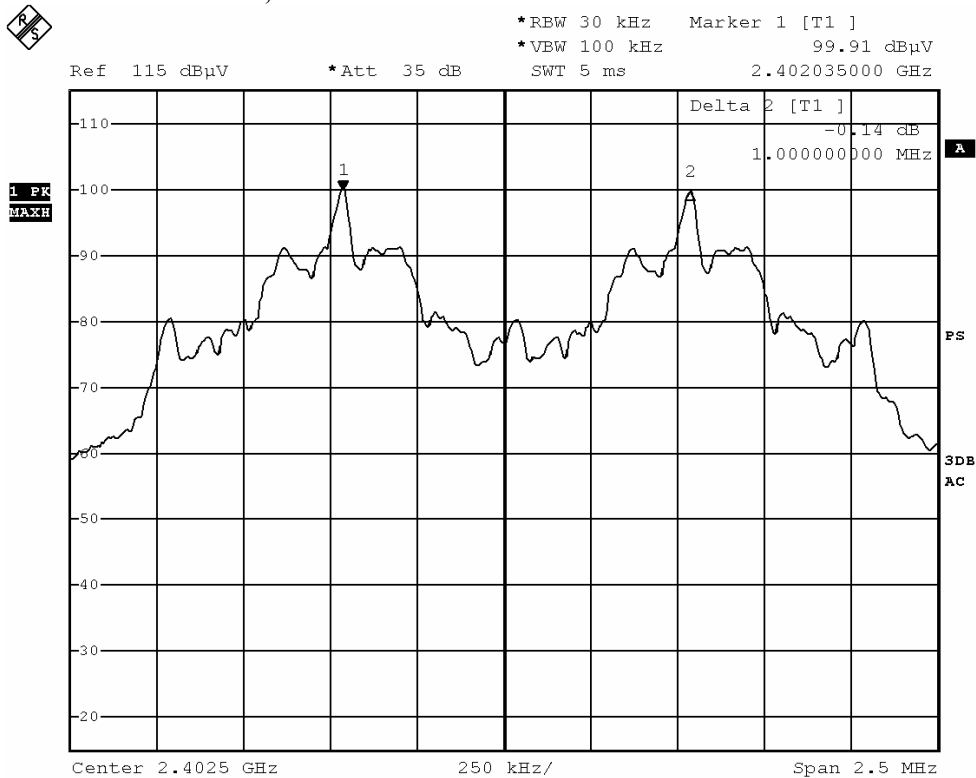
Date: 2015-05-26

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No.: DM119503

Channel separation = 1MHz (>766.667kHz) (GFSK)

Channel 1 – Channel 2, Pass



BMP

Date: 16.MAY.2015 11:37:59

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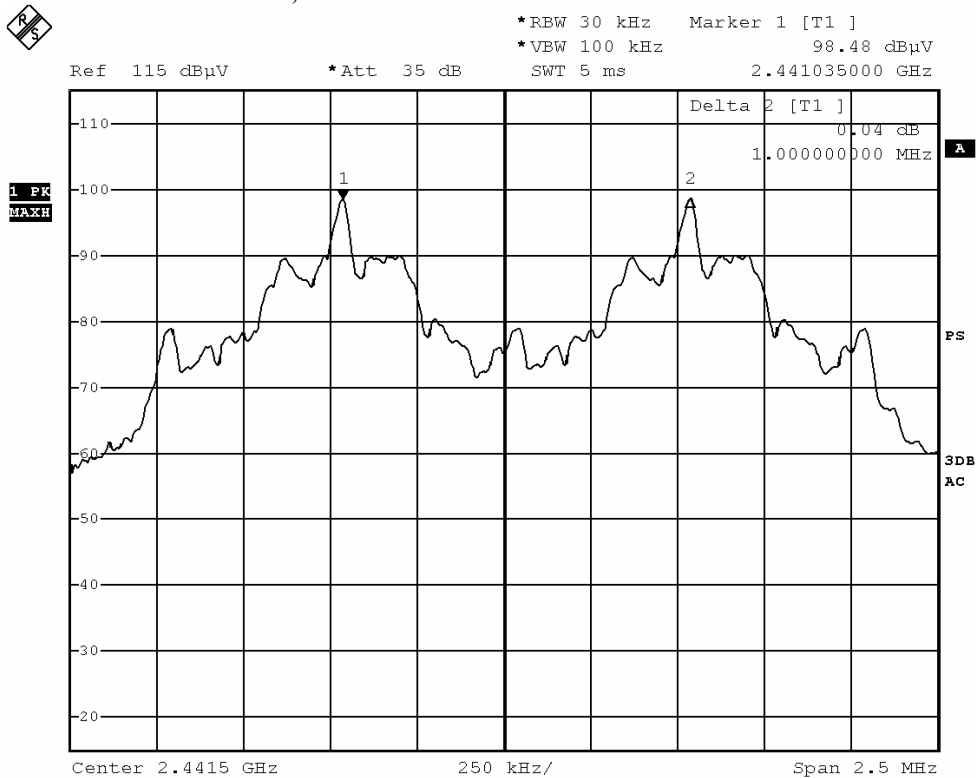
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No.: DM119503

Channel 39 – Channel 40, Pass



BMP

Date: 16.MAY.2015 11:39:51

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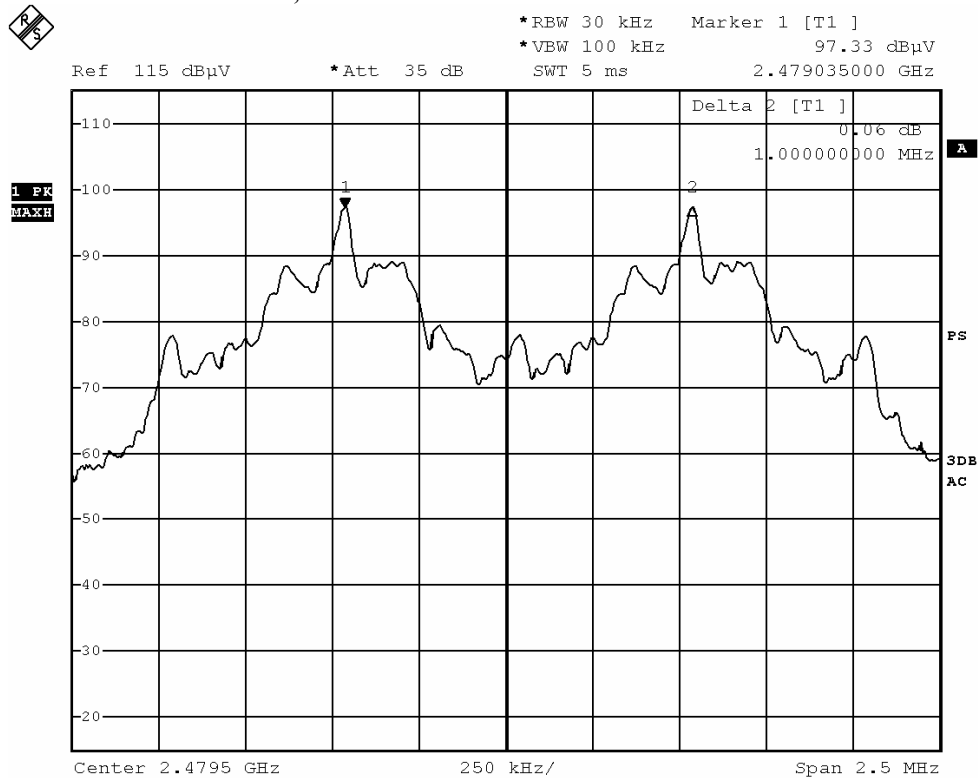
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Date: 2015-05-26

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No.: DM119503

Channel 78 – Channel 79, Pass



BMP

Date: 16.MAY.2015 11:41:14

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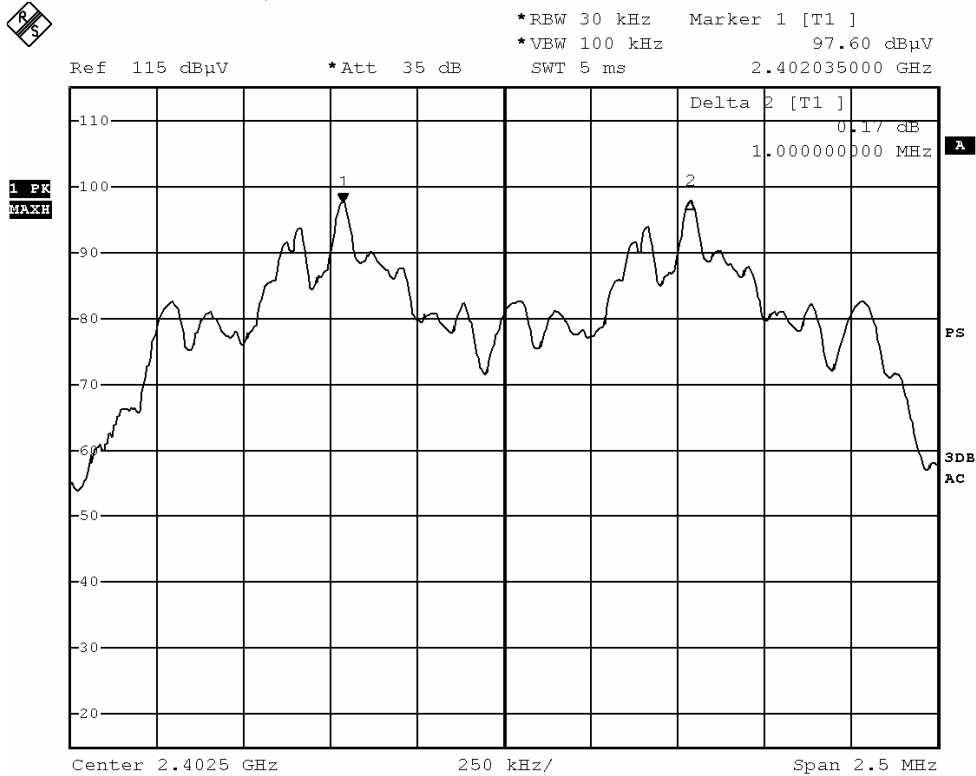
Date: 2015-05-26

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No.: DM119503

Channel separation = 1MHz (>766.667kHz) ($\pi/4$ - DQPSK)

Channel 1 – Channel 2, Pass



BMP

Date: 16.MAY.2015 11:46:53

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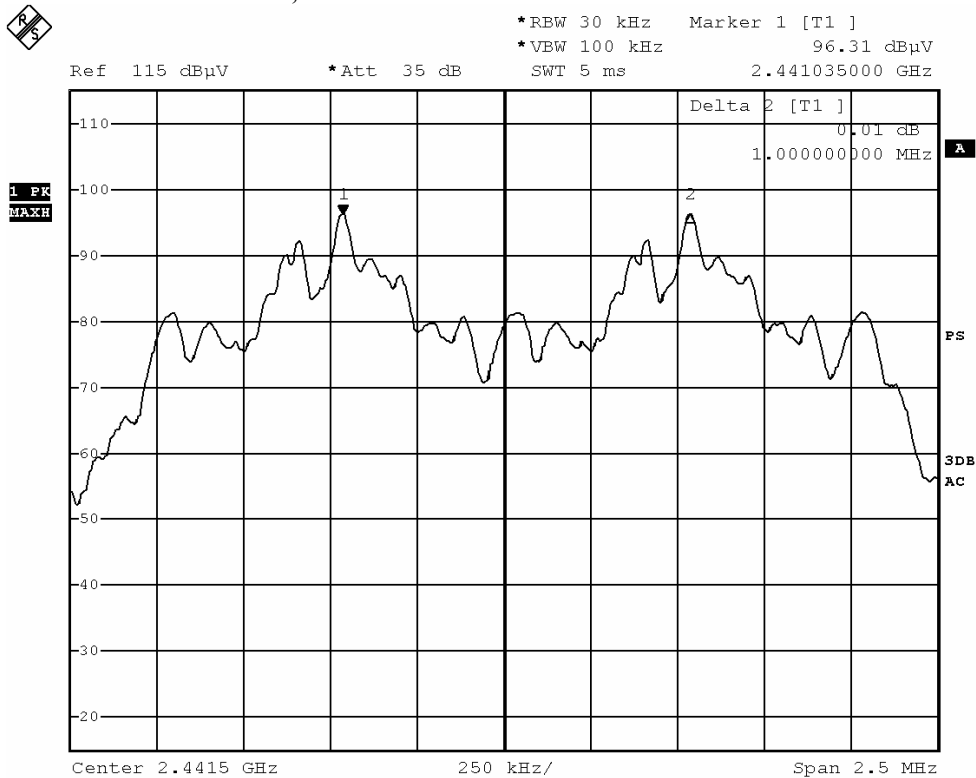
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Date: 2015-05-26

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No.: DM119503

Channel 39 – Channel 40, Pass



BMP

Date: 16.MAY.2015 11:44:39

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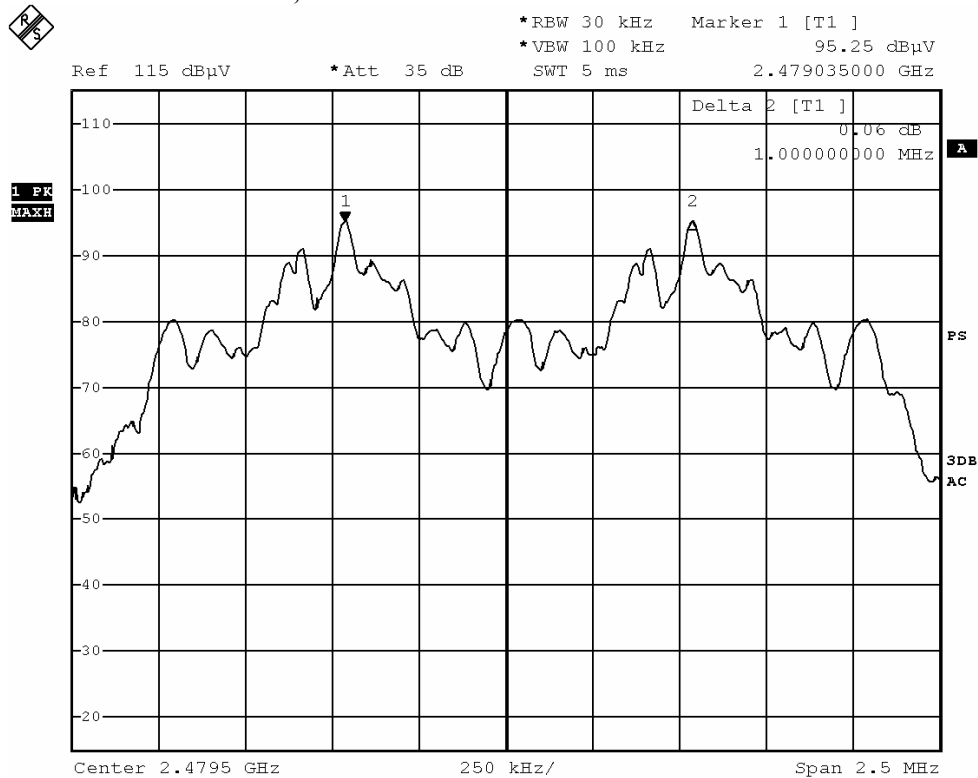
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No.: DM119503

Channel 78 – Channel 79, Pass



BMP

Date: 16.MAY.2015 11:43:00

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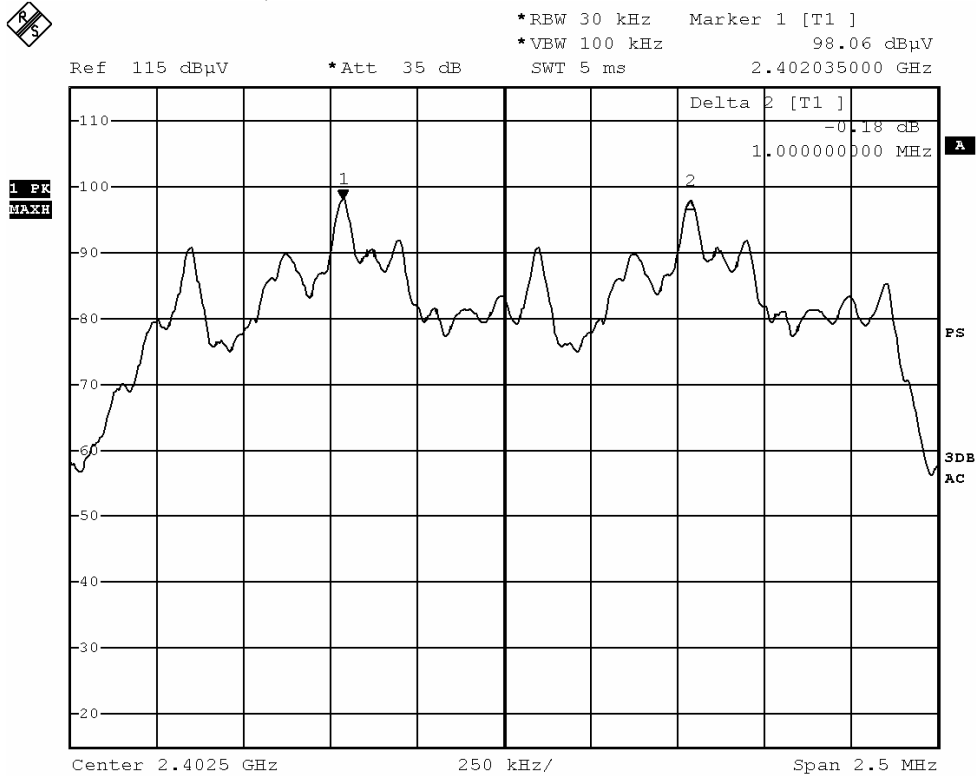
Date: 2015-05-26

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No.: DM119503

Channel separation = 1MHz (>766.667kHz) (8DPSK)

Channel 1 – Channel 2, Pass



BMP

Date: 16.MAY.2015 11:48:52

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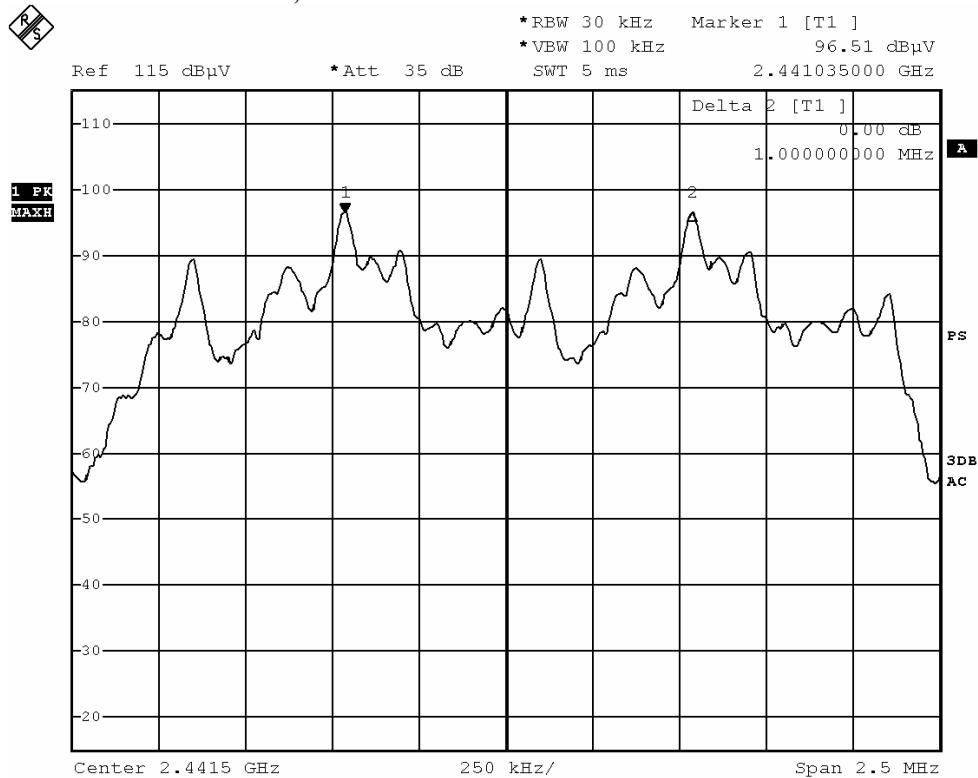
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No.: DM119503

Channel 39 – Channel 40, Pass



BMP

Date: 16.MAY.2015 11:50:46

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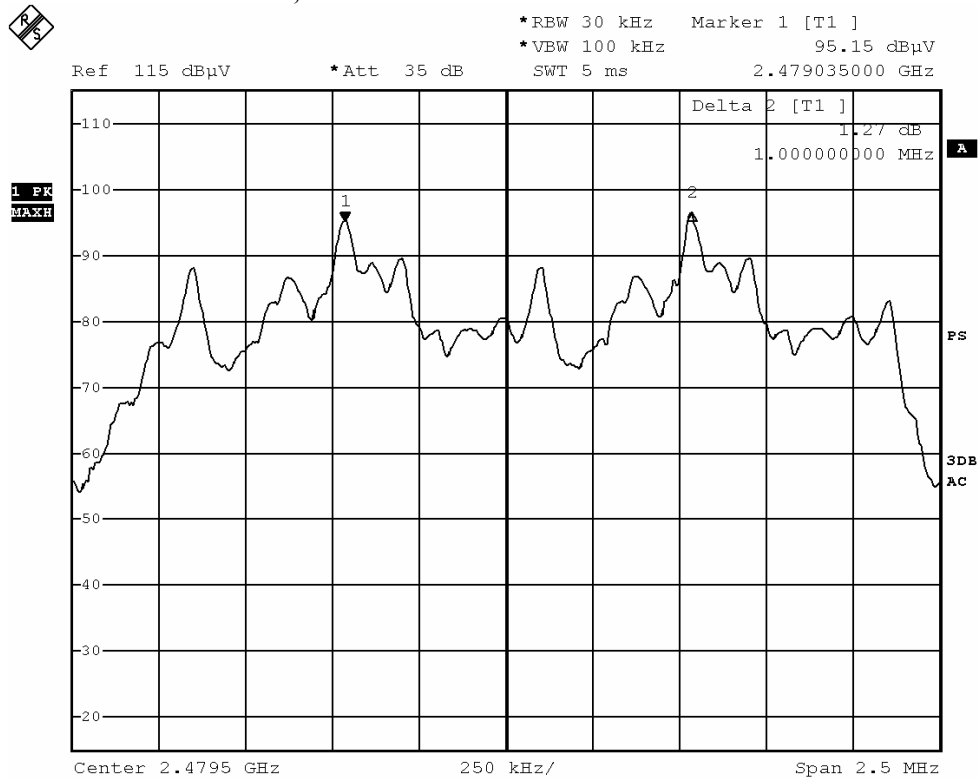
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No.: DM119503

Channel 78 – Channel 79, Pass



BMP

Date: 16.MAY.2015 11:53:35

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No.: DM119503

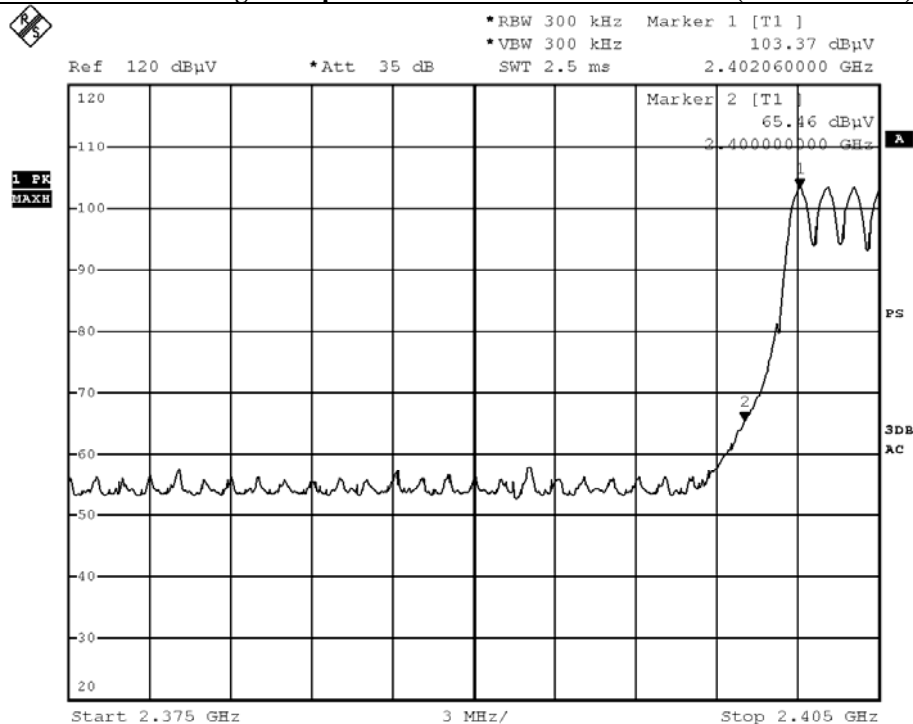
3.1.7 Band-edge Compliance of RF Conducted Emissions Measurement:

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.

| Frequency Range | Radiated Emission Attenuated below the Fundamental |
|----------------------------------|--|
| [MHz] | [dB] |
| 2400 – Lowest Fundamental (2402) | 38.21 |

Band-edge Compliance of RF Conducted Emissions (GFSK Lowest)



BMP

Date: 16.MAY.2015 13:37:21

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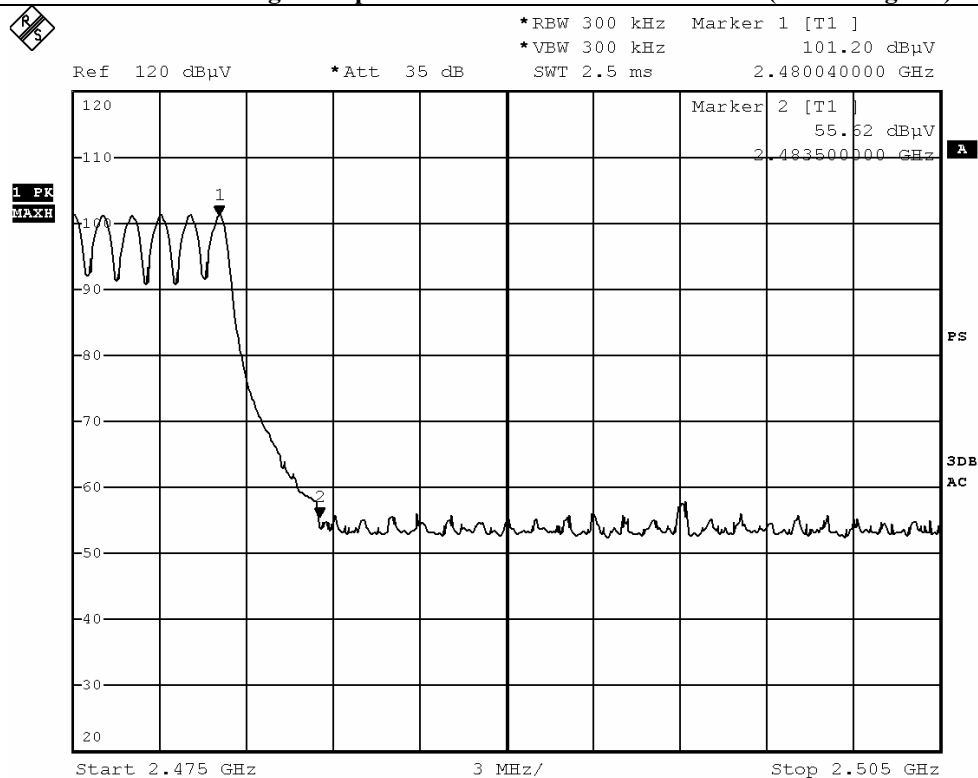
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No.: DM119503

Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range [MHz] | Radiated Emission Attenuated below the Fundamental [dB] |
|-------------------------------------|---|
| Highest Fundamental (2480) - 2483.5 | 45.58 |

Band-edge Compliance of RF Conducted Emissions (GFSK Highest)



BMP

Date: 16.MAY.2015 13:54:59

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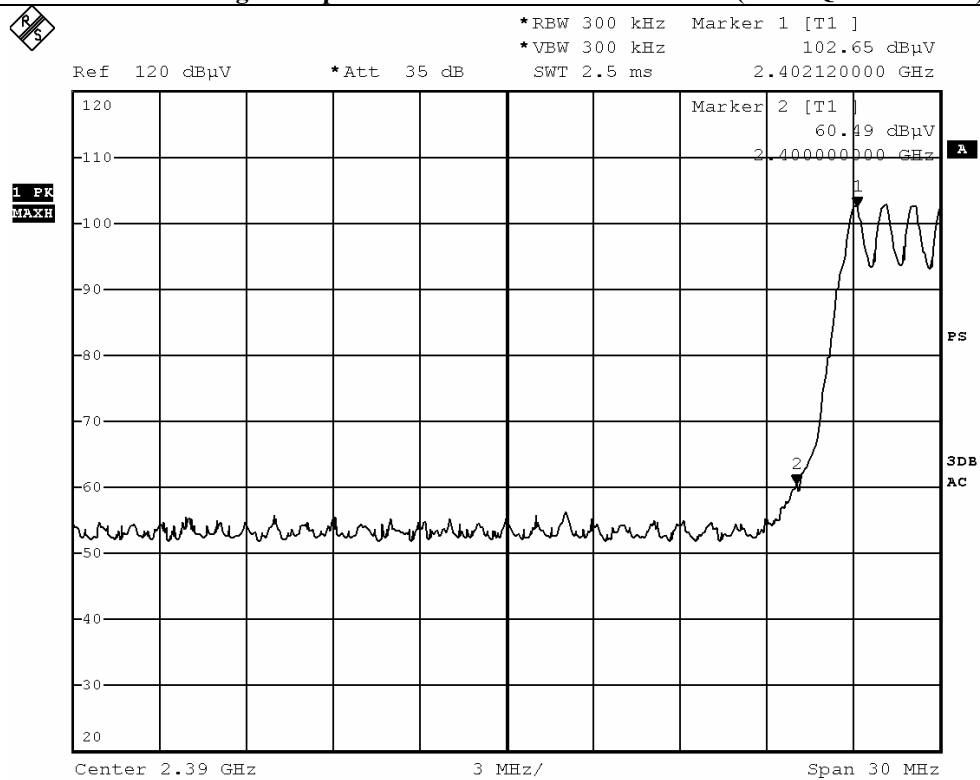
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No.: DM119503

Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range [MHz] | Radiated Emission Attenuated below the Fundamental [dB] |
|----------------------------------|---|
| 2400 - Lowest Fundamental (2402) | 42.16 |

Band-edge Compliance of RF Conducted Emissions ($\pi/4$ -DQPSK Lowest)



BMP

Date: 16.MAY.2015 14:27:17

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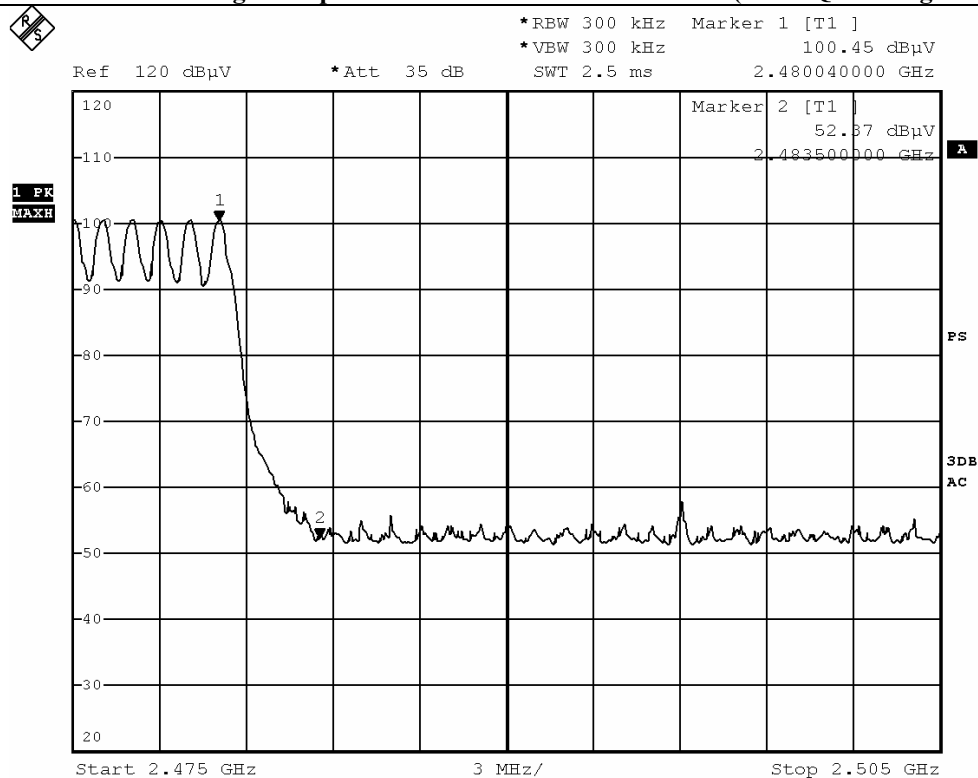
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No.: DM119503

Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range [MHz] | Radiated Emission Attenuated below the Fundamental [dB] |
|-------------------------------------|---|
| Highest Fundamental (2480) - 2483.5 | 48.08 |

Band-edge Compliance of RF Conducted Emissions ($\pi/4$ -DQPSK Highest)



BMP

Date: 16.MAY.2015 14:13:13

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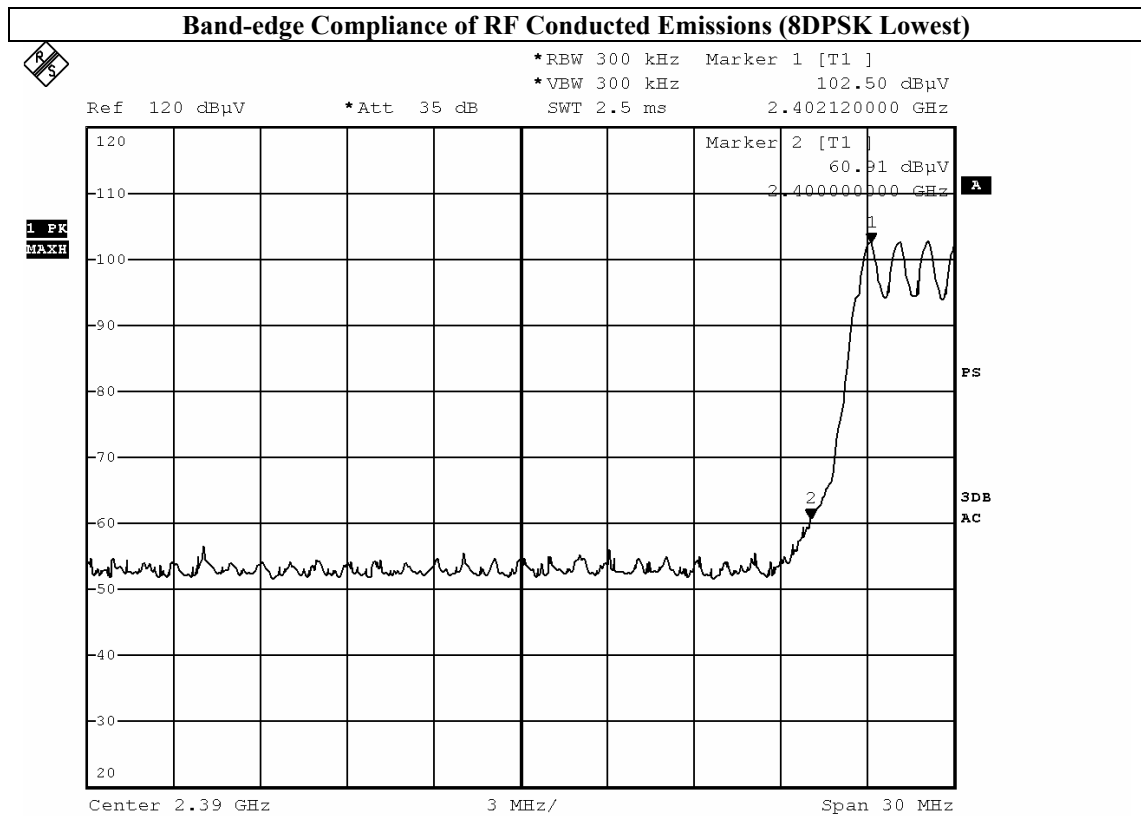
Date: 2015-05-26

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Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range [MHz] | Radiated Emission Attenuated below the Fundamental [dB] |
|----------------------------------|---|
| 2400 - Lowest Fundamental (2402) | 41.59 |



BMP

Date: 16.MAY.2015 14:42:53

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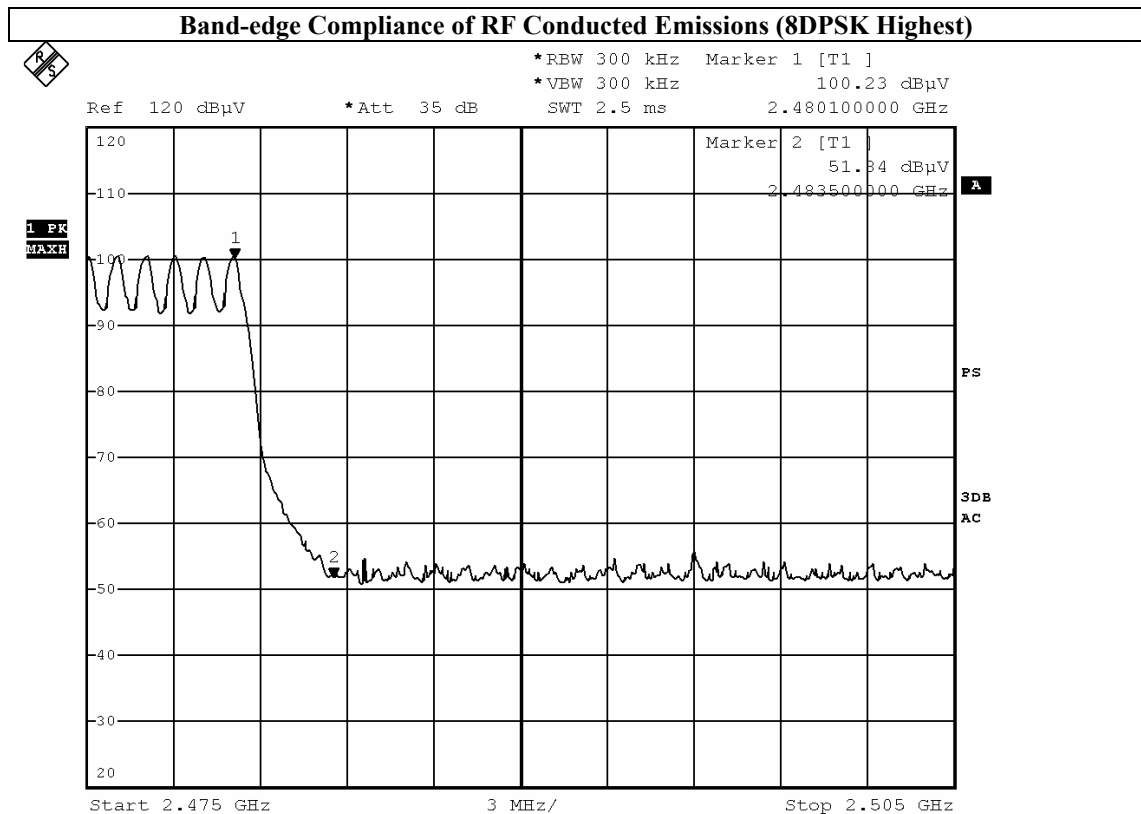
Date: 2015-05-26

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No.: DM119503

Band-edge Compliance of RF Conducted Emissions Measurement:

| Frequency Range [MHz] | Radiated Emission Attenuated below the Fundamental [dB] |
|-------------------------------------|---|
| Highest Fundamental (2480) - 2483.5 | 48.89 |



BMP

Date: 16.MAY.2015 15:04:01

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Band-edge Compliance of RF Radiated Emissions Measurement:

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)).

Result: Band-edge Compliance of RF Radiated Emissions (GFSK Lowest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-------------------------------|------------------------------|-----------------------------|------------------------|------------------|---------------------|
| Frequency MHz | Measured Level @3m dBμV | Correction Factor dB/m | Field Strength dBμV/m | Limit @3m dBμV/m | Margin dBμV/m | E-Field Polarity |
| 2390.0 | 18.3 | 36.8 | 55.1 | 74.0 | 18.9 | Vertical |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-------------------------------|------------------------------|-----------------------------|------------------------|------------------|---------------------|
| Frequency MHz | Measured Level @3m dBμV | Correction Factor dB/m | Field Strength dBμV/m | Limit @3m dBμV/m | Margin dBμV/m | E-Field Polarity |
| 2390.0 | 4.6 | 36.8 | 41.4 | 54.0 | 12.6 | Vertical |

Result: Band-edge Compliance of RF Radiated Emissions (GFSK Highest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-------------------------------|------------------------------|-----------------------------|------------------------|------------------|---------------------|
| Frequency MHz | Measured Level @3m dBμV | Correction Factor dB/m | Field Strength dBμV/m | Limit @3m dBμV/m | Margin dBμV/m | E-Field Polarity |
| 2483.5 | 19.2 | 36.8 | 56.0 | 74.0 | 18.0 | Horizontal |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-------------------------------|------------------------------|-----------------------------|------------------------|------------------|---------------------|
| Frequency MHz | Measured Level @3m dBμV | Correction Factor dB/m | Field Strength dBμV/m | Limit @3m dBμV/m | Margin dBμV/m | E-Field Polarity |
| 2483.5 | 5.8 | 36.8 | 42.6 | 54.0 | 11.4 | Horizontal |

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Result: Band-edge Compliance of RF Radiated Emissions ($\pi/4$ -DQPSK Lowest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2390.0 | 18.9 | 36.8 | 55.7 | 74.0 | 18.3 | Vertical |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2390.0 | 5.1 | 36.8 | 41.9 | 54.0 | 12.1 | Vertical |

Result: Band-edge Compliance of RF Radiated Emissions ($\pi/4$ -DQPSK Highest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2483.5 | 21.4 | 36.8 | 58.2 | 74.0 | 15.8 | Horizontal |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2483.5 | 7.9 | 36.8 | 44.7 | 54.0 | 9.3 | Horizontal |

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Result: Band-edge Compliance of RF Radiated Emissions (8DPSK Lowest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2390.0 | 18.1 | 36.8 | 54.9 | 74.0 | 19.1 | Vertical |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2390.0 | 3.8 | 36.8 | 40.6 | 54.0 | 13.4 | Vertical |

Result: Band-edge Compliance of RF Radiated Emissions (8DPSK Highest)

| Field Strength of Band-edge Compliance Peak Value | | | | | | |
|--|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2483.5 | 17.8 | 36.8 | 54.6 | 74.0 | 19.4 | Horizontal |

| Field Strength of Band-edge Compliance Average Value | | | | | | |
|---|-----------------------|----------------------|-------------------|--------------|--------------|---------------------|
| Frequency | Measured Level @3m | Correction Factor | Field Strength | Limit @3m | Margin | E-Field Polarity |
| MHz | dB μ V | dB/m | dB μ V/m | dB μ V/m | dB μ V/m | |
| 2483.5 | 3.3 | 36.8 | 40.1 | 54.0 | 13.9 | Horizontal |

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3.1.8 Time of Occupancy (Dwell Time)

Requirements:

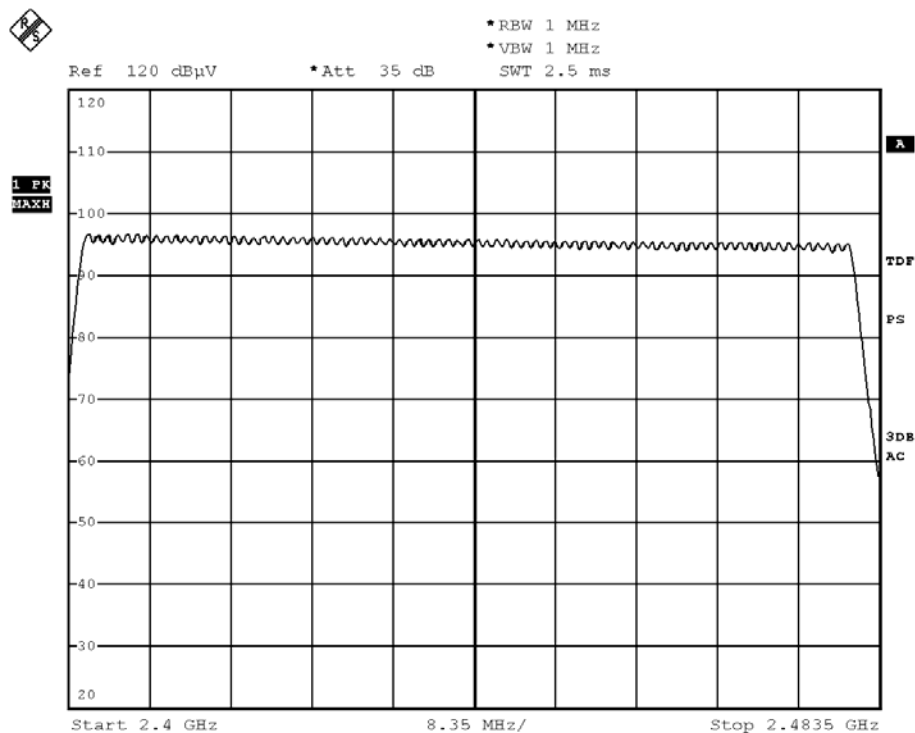
The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channel employed.
No requirements for Digital Transmission System.

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

Observed duration: 0.4s x 79 = 31.6s

Measurement Data:

Channel Occupied in 8DPSK: 79 of 79 Channel



BMP

Date: 16.MAY.2015 15:14:05

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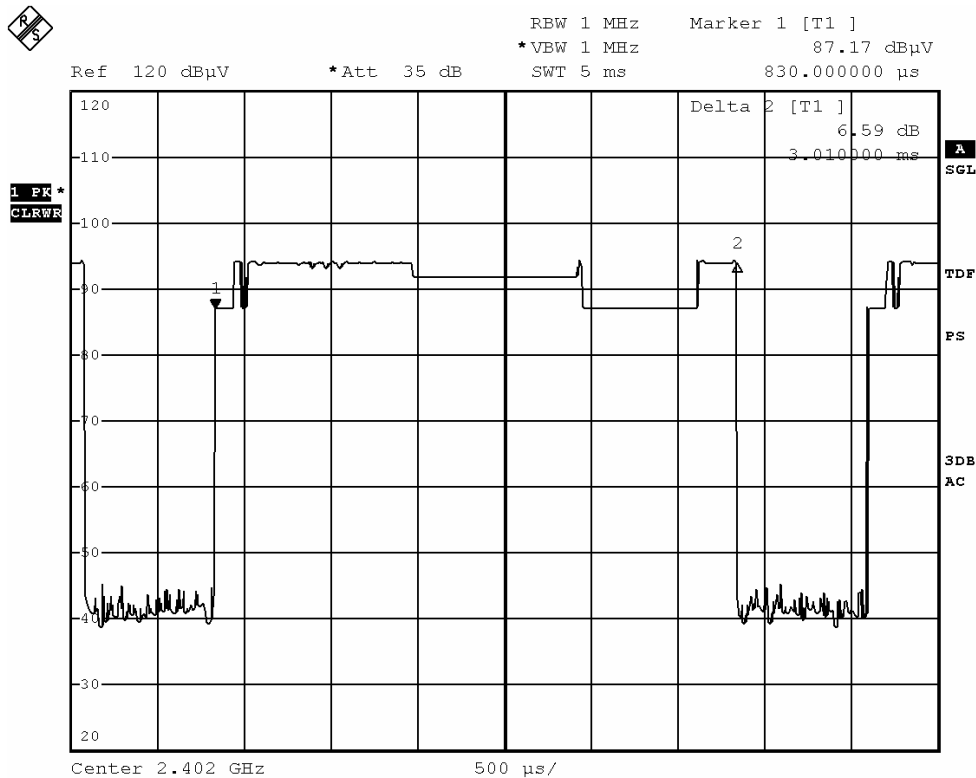
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DH5 Packet:

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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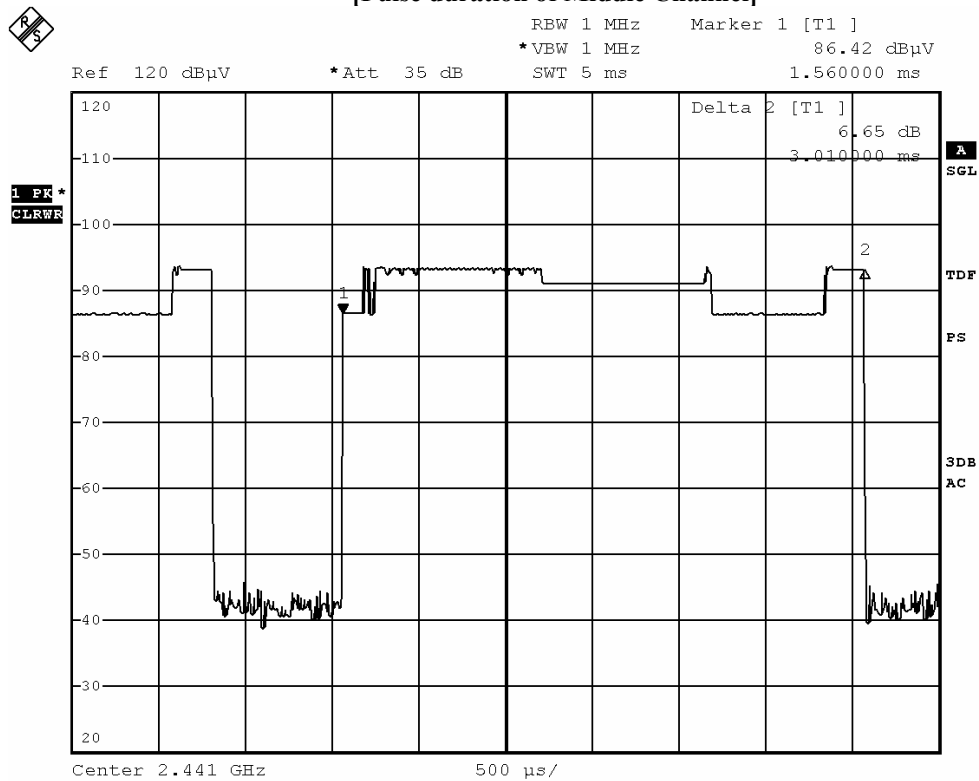
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Fig. B
[Pulse duration of Middle Channel]



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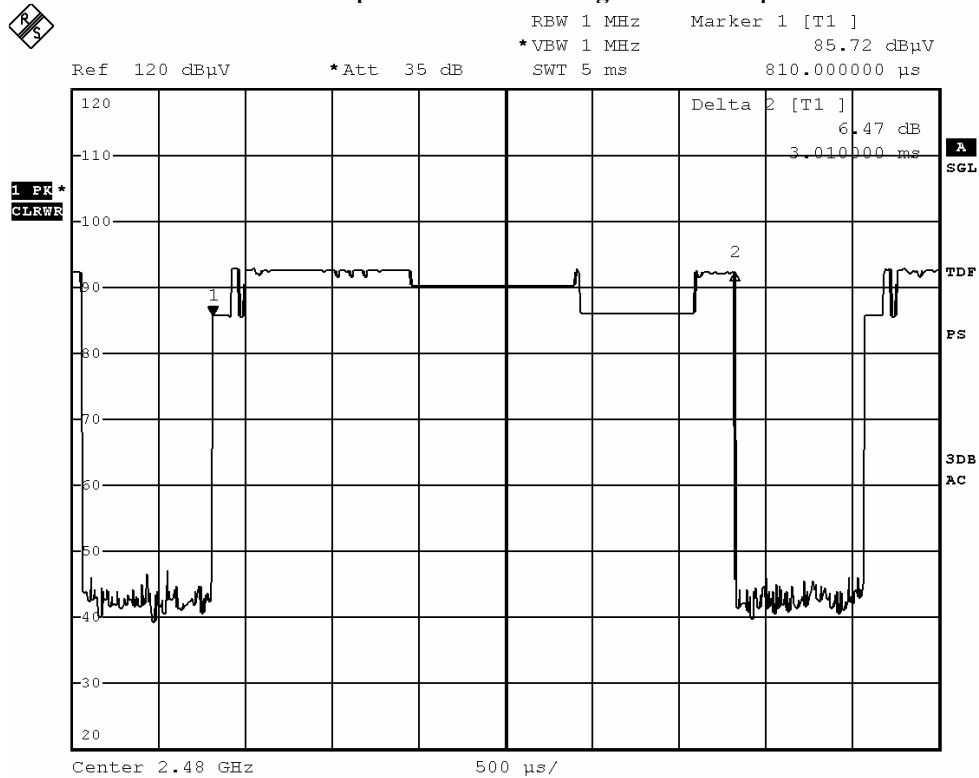
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Fig. C
[Pulse duration of Highest Channel]



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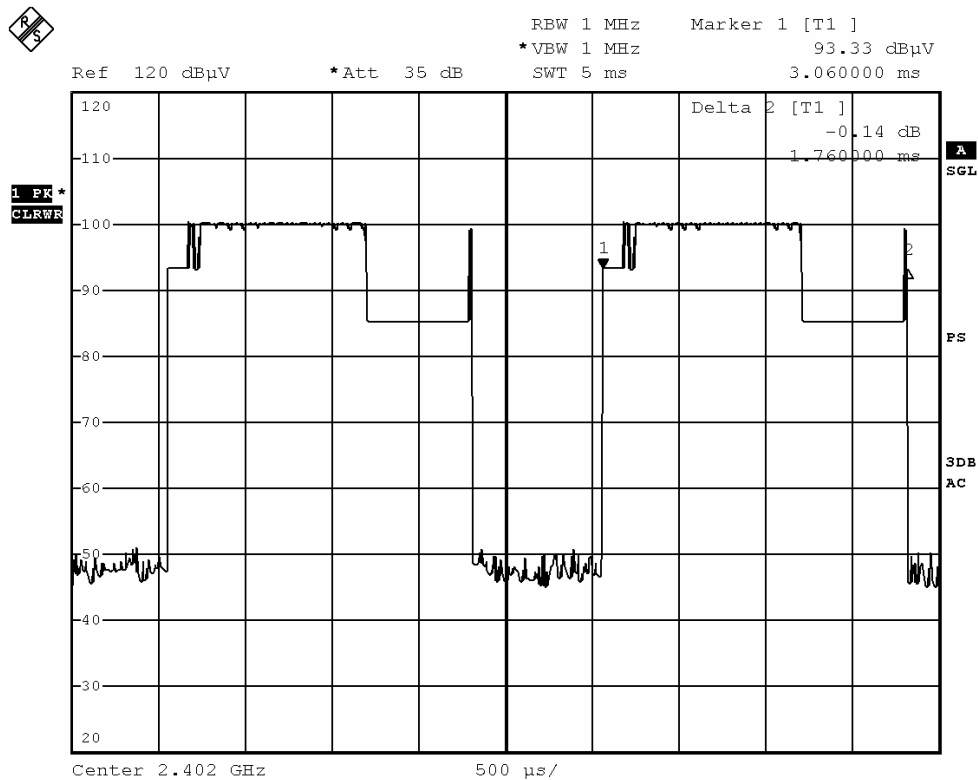
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DH3 Packet:

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]



BMP

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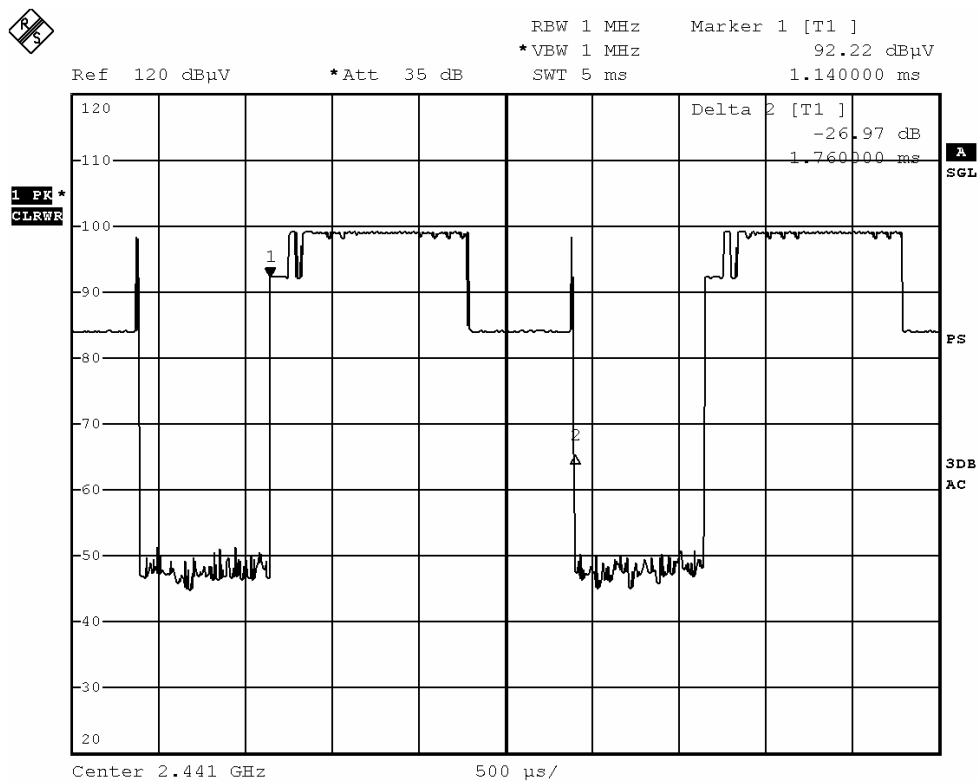
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Fig. E
[Pulse duration of Middle Channel]



BMP

Date: 16.MAY.2015 15:33:30

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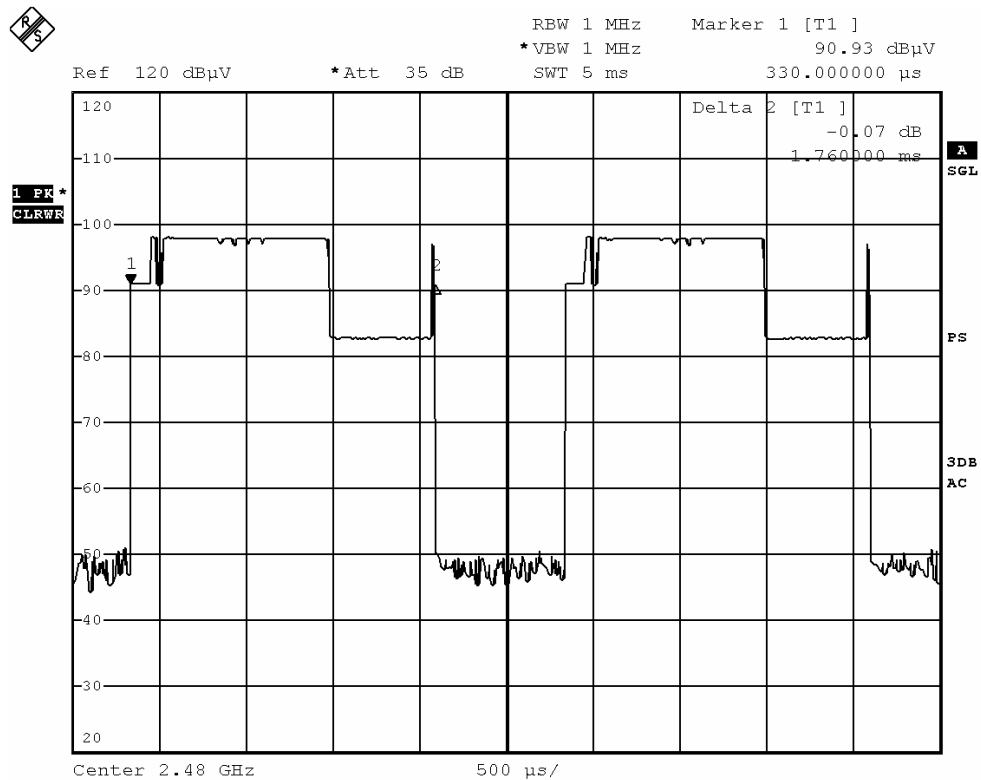
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Fig. F
[Pulse duration of Highest Channel]



BMP

Date: 16.MAY.2015 15:32:56

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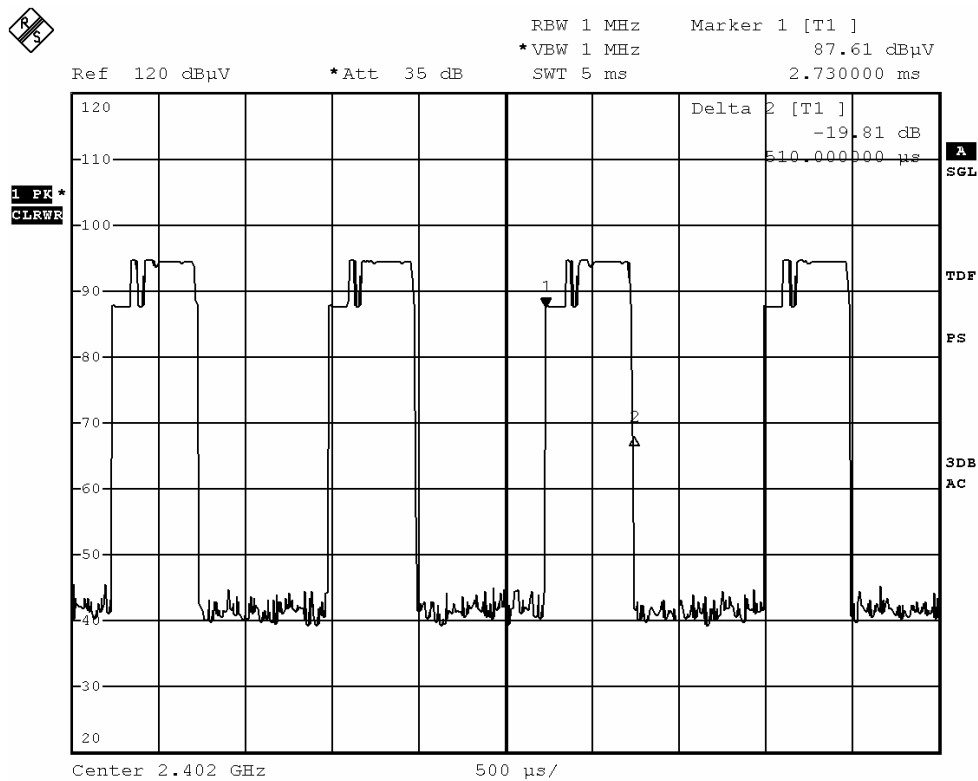
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DH1 Packet:

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]



BMP

Date: 16.MAY.2015 15:29:59

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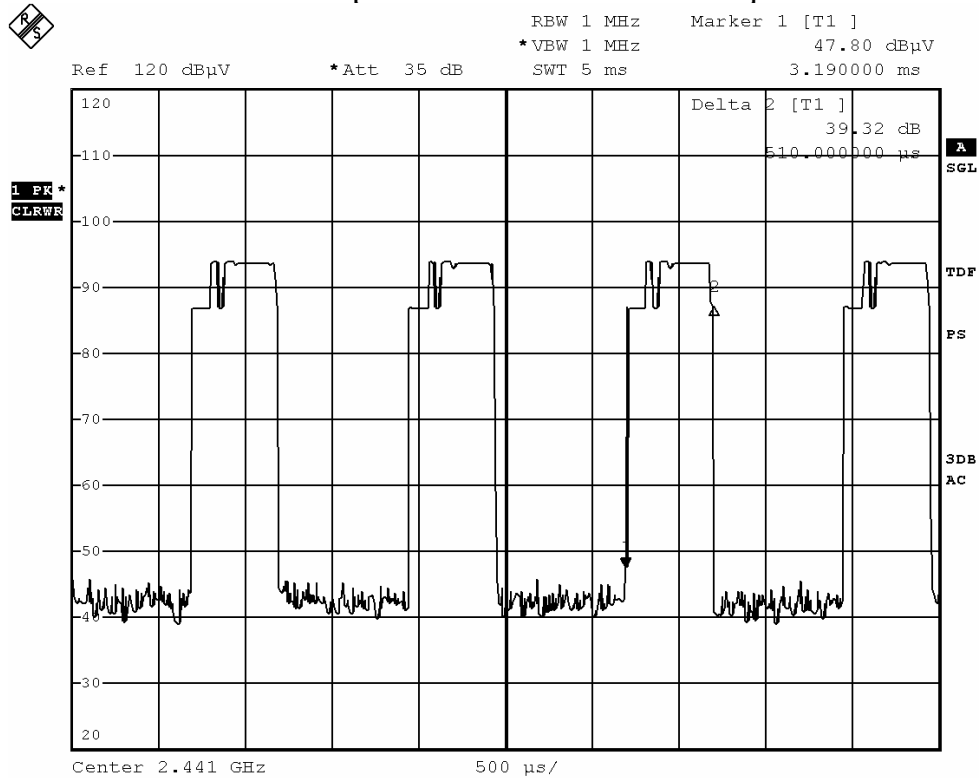
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Fig. H
[Pulse duration of Middle Channel]



BMP

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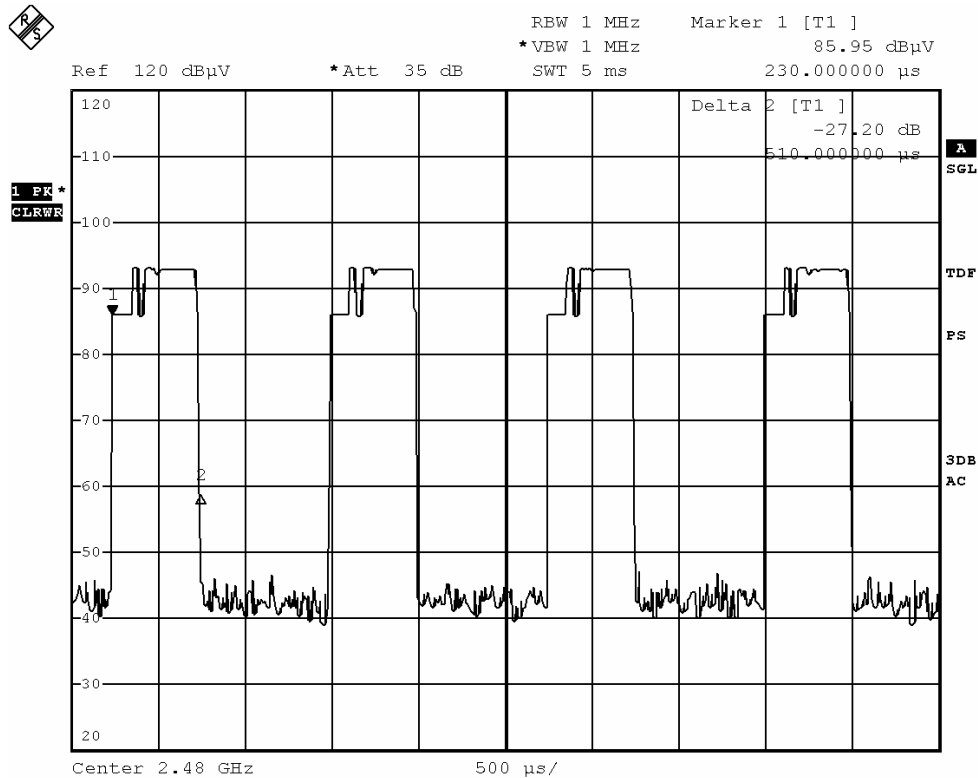
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Fig. I
[Pulse duration of Highest Channel]



BMP

Date: 16.MAY.2015 15:31:35

Time of occupancy (Dwell Time):

| Data Packet | Frequency (MHz) | Pulse Duration (ms) | Dwell Time (s) | Limits (s) | Test Results |
|-------------|-----------------|---------------------|----------------|------------|--------------|
| DH5 | 2402 | 3.01 | 0.321 | 0.400 | Complies |
| DH5 | 2441 | 3.01 | 0.321 | 0.400 | Complies |
| DH5 | 2480 | 3.01 | 0.321 | 0.400 | Complies |
| DH3 | 2402 | 1.76 | 0.281 | 0.400 | Complies |
| DH3 | 2441 | 1.76 | 0.281 | 0.400 | Complies |
| DH3 | 2480 | 0.51 | 0.281 | 0.400 | Complies |
| DH1 | 2402 | 0.51 | 0.163 | 0.400 | Complies |
| DH1 | 2441 | 0.51 | 0.163 | 0.400 | Complies |
| DH1 | 2480 | 0.390 | 0.163 | 0.400 | Complies |

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3.1.9 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)

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3.1.10 Pseudorandom Hopping Algorithm

Requirements:

The channel frequencies shall be selected from a pseudorandom ordered list of hopping frequencies. Each frequency must be used equally by the transmitter.

EUT Pseudorandom Hopping Algorithm

The EUT is a Bluetooth device, the Pseudo-random hopping pattern; hopping characteristics and algorithm are based on the Bluetooth specification.

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3.1.11 Antenna Requirement

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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3.1.12 RF Exposure

Test Requirement: FCC 47CFR 15.247(i)
Test Date: 2015-05-21
Mode of Operation: Tx mode

Test Method:

Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

Test Results:

The EUT complied with the requirement(s) of this section.
EUT meets the requirements of these sections as proven through MPE calculation
The MPE calculation for EUT @ 20cm
Based on the highest P = 0.468 mW

$$\begin{aligned} P_d &= P_G / 4\pi R^2 = (0.468 \times 1) / 12.566 \times (20)^2 \\ &= (0.468) / 12.566 \times 400 = 0.468 / 5026.4 \\ &= 0.0000931 \text{ mW/cm}^2 \end{aligned}$$

where:

- * P_d = power density in mW/cm²
- * G = Antenna numeric gain (1.0); $\text{Log } G = g/10$ ($g = 0\text{dBi}$).
- * P = Conducted RF power to antenna (1.679 mW).
- * R = Minimum allowable distance.(20 cm)

- * The power density $P_d = 0.0000931 \text{ mW/cm}^2$ is less than 1 mW/cm^2 (listed MPE limit)
- * The SAR evaluation is not needed (this is a desk top device, $R > 20 \text{ cm}$)
- * The EUT(antenna) must be 0.2 meters away from the General Population.

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Appendix A

List of Measurement Equipment

| EQP NO. | DESCRIPTION | MANUFACTURER | MODEL NO. | SERIAL NO. | LAST CAL | DUE CAL |
|---------|--|---------------------------|-------------------|----------------|------------|------------|
| EMD004 | LISN | ROHDE & SCHWARZ | ESH3-Z5 | 100102 | 2015.3.24 | 2016.3.24 |
| EMD022 | EMI Test Receiver | ROHDE & SCHWARZ | ESCS30 | 100314 | 2015.3.24 | 2016.3.24 |
| EMD035 | EMI Test Receiver | ROHDE & SCHWARZ | ESCI | 100441 | 2014.06.10 | 2015.06.10 |
| EMD036 | EMI Test Receiver | ROHDE & SCHWARZ | ESIB 26 | 100388 | 2014.06.10 | 2015.06.10 |
| EMD041 | TWO-LINE V-NETWORK | ROHDE & SCHWARZ | ENV216 | 100261 | 2015.3.24 | 2016.3.24 |
| EMD061 | Biconilog Antenna | ETS.LINDGREN | 3142C | 00060439 | 2014.11.29 | 2016.11.29 |
| EMD062 | Double-Ridged Waveguide (1GHz – 18GHz) | ETS.LINDGREN | 3117 | 00075933 | 2014.11.15 | 2015.11.15 |
| 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 |
| | 100V Insertion Unit | ROHDE & SCHWARZ | URV5-Z4 | 100464 | 2015.3.24 | 2016.3.24 |
| EMD113 | Pre-Amplifier | ROHDE & SCHWARZ | N/A | 1129588 | 2015.3.24 | 2016.3.24 |
| EMD124 | Loop Antenna | ETS-Lindgren | 6502 | 00104905 | 2014.04.28 | 2016.04.28 |
| EMD131 | Standard Gain Horn Antenna (18GHz – 26.5GHz) | Chengdu AINFO Inc. | JXTXLB-42-15-C-KF | J2021100721001 | 2013.04.09 | 2016.04.09 |
| EMD147 | Bluetooth Tester | ROHDE & SCHWARZ | CBT-1153.9000.35 | 100745 | 2014.11.21 | 2015.11.21 |
| RE01 | RF cable | N/A | N/A | N/A | 2014-9-28 | 2015-9-27 |
| RE02 | RF cable | N/A | N/A | N/A | 2014-9-28 | 2015-9-27 |

Remarks:-

N/A Not Applicable or Not Available

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Appendix B

Photographs of EUT

Front View of the product



Rear View of the product



Inside View of the product



Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



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Photographs of EUT

Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Bottom View



Inner Circuit Top View



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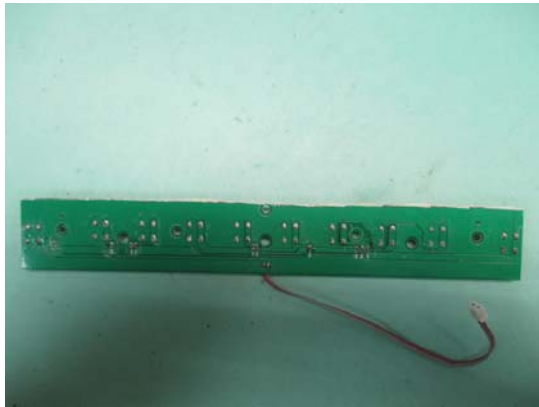
Date: 2015-05-26

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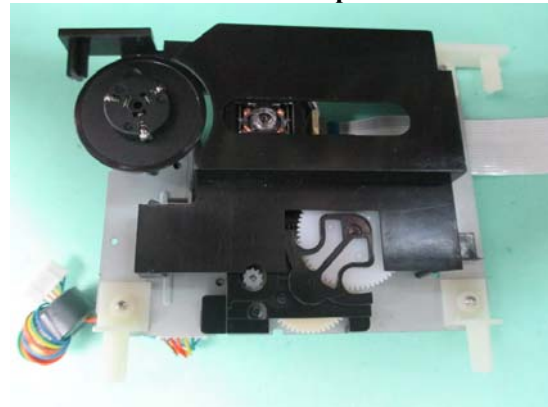
No.: DM119503

Photographs of EUT

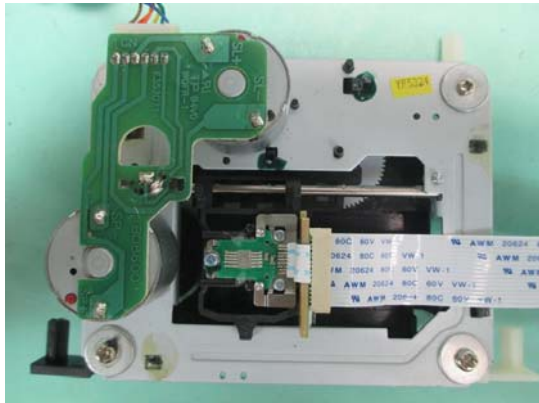
Inner Circuit Bottom View



Inner Circuit Top View



Inner Circuit Bottom View



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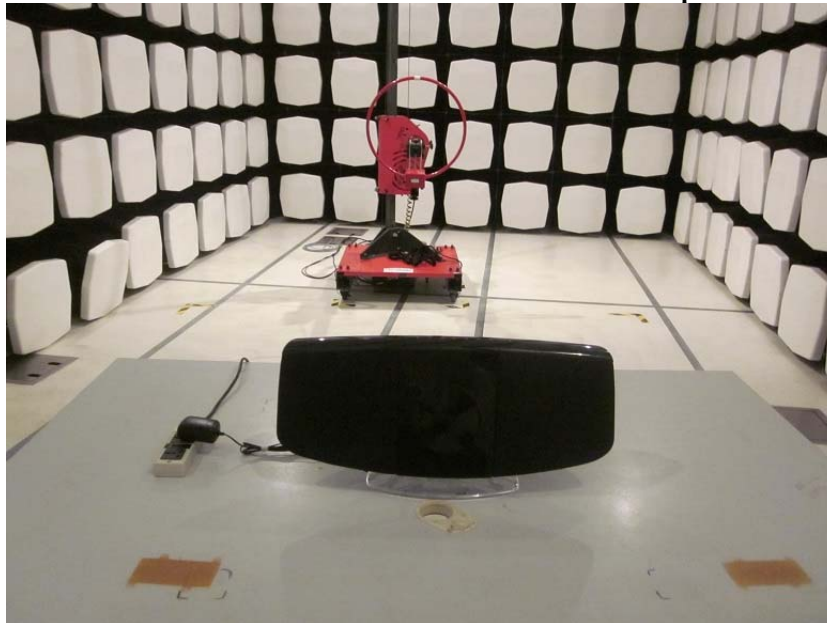
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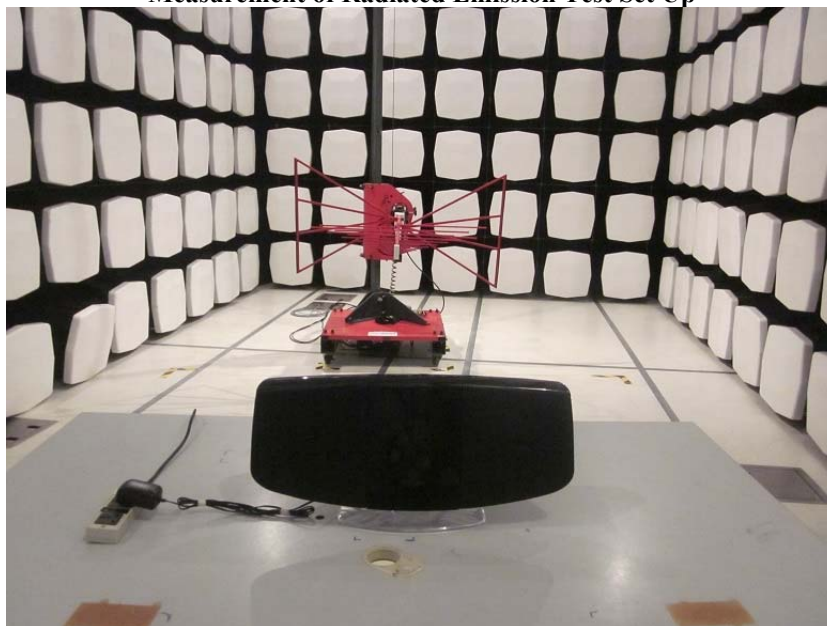
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Radiated Emission Test Set Up



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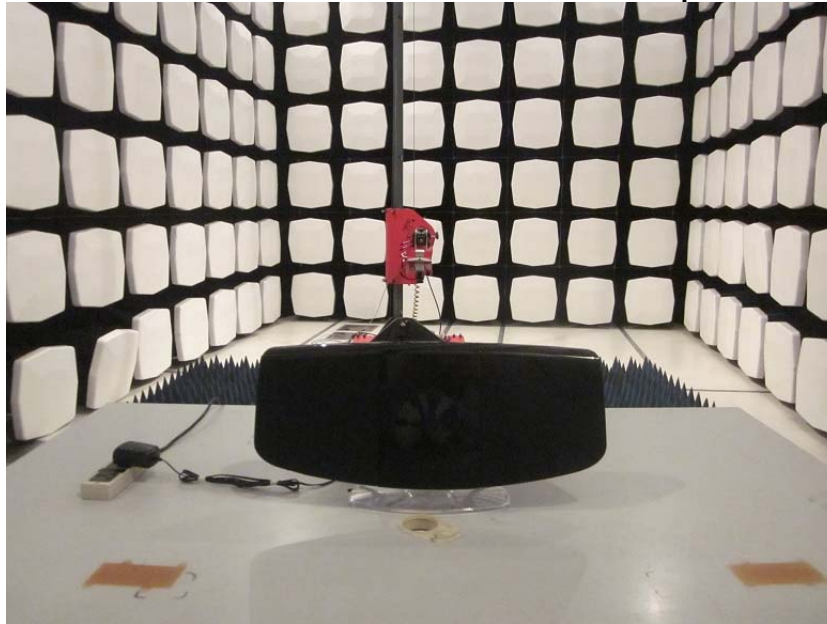
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Photographs of EUT

Measurement of Radiated Emission Test Set Up



Measurement of Conducted Emission Test Set Up



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

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