



TEST REPORT

| | | | |
|--|---|-------------------------|-------------------|
| Report No.: | EM201200331-4 | Application No.: | ZJ00016958 |
| Applicant: | Harman International Industries, Inc. | | |
| Applicant Address: | 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES | | |
| Sample Description: | Soundbar | | |
| Model: | CINEMA SB200 | | |
| FCC ID | APICNMSB200TC | | |
| Test Specification: | FCC PART 15 Subpart C: 2010 | | |
| Test Date: | 2012-07-03 to 2012-07-24 | | |
| Issue Date: | 2012-07-27 | | |
| Test Result: | <i>Pass</i> | | |
| Tested By: | Reviewed By: | Approved By: | |
| David Li / Test Engineer | Jane Cao / Engineer | Gavin Wu / Manager | |
| <i>David Li</i> | <i>Jane Cao</i> | <i>Gavin Wu</i> | |
| Date:2012-07-27 | Date:2012-07-27 | Date:2012-07-27 | |
| Other Aspects: | | | |
| / | | | |
| Abbreviations: <i>ok / P = passed; fail / F = failed; n.a. / N = not applicable</i> | | | |
| The test result in this test report refers exclusively to the presented test sample. This report shall not be reproduced except in full, without the written approval of GRGT. | | | |

DIRECTIONS OF TEST

1. This station carries out test task according to the national regulation of verifications which can be traced to National Primary Standards and BIPM.
2. The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test result without the written permission of the test laboratory.
3. If there is any objection concerning the test, the client should inform the laboratory within 15 days from the date of receiving the test report.

1 TEST SUMMARY

| Test | Test Requirement | Standard Paragraph | Result |
|---|-------------------------|-------------------------------|---------------|
| Antenna Requirement | FCC PART 15 :2010 | Section 15.247 (c) | PASS |
| Occupied Bandwidth | FCC PART 15 :2010 | Section 15.247 (a1) | PASS |
| Carrier Frequencies Separated | FCC PART 15 :2010 | Section 15.247(a)(1) | PASS |
| Hopping Channel Number | FCC PART 15 :2010 | Section 15.247(a)(1)(iii) | PASS |
| Dwell Time | FCC PART 15 :2010 | Section 15.247(a)(1)(iii) | PASS |
| Maximum Peak Output Power | FCC PART 15 :2010 | Section 15.247(b)(1) | PASS |
| Conducted Emission | FCC PART 15 :2010 | Section 15.207 | PASS |
| Conducted Spurious Emission (30MHz to 25GHz) | FCC PART 15 :2010 | Section 15.209 &15.247(d) | PASS |
| Radiated Spurious Emission (30MHz to 25GHz) | FCC PART 15 :2010 | Section 15.209 &15.247(d) | PASS |
| Band Edges Measurement | FCC PART 15 :2010 | Section 15.247 (d) &15.205 | PASS |

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2 GENERAL INFORMATION

2.1 CLIENT INFORMATION

Applicant: Harman International Industries, Inc.
Address of Applicant: 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES

2.2 MANUFACTURER INFORMATION

Manufacturer: Harman International Industries, Inc.
Address of Applicant: 8500 Balboa Blvd, Northridge, CA 91329, UNITED STATES

2.3 GENERAL DESCRIPTION OF E.U.T.

Product Name: Soundbar
Model: CINEMA SB200
Trade Name: Harman
Number of Channels 79 Channels
Channel Separation 1 MHz
Type of Modulation GFSK, 8DPSK, Pi/4 QPSK
Dwell time Per channel is less than 0.4s.
Antenna Type Integral
Adapter: /

2.4 DESCRIPTION OF SUPPORT UNITS

| Name of Equipment | Manufacturer | Model | Serial Number |
|-------------------|--------------|--------|---------------|
| iphone | APPLE | A1303 | / |
| ipad | APPLE | Ipad 2 | / |
| PC | Lenovo | X220i | 42863FC |

2.5 STANDARDS APPLICABLE FOR TESTING

The standard used was FCC PART 15 Subpart C: 2010. ANSI C63.10:2009.

2.6 TEST LOCATION

All tests were performed at:

EMC Laboratory of Guangzhou GRG Metrology and Test Co., Ltd.
No tests were sub-contracted.

2.7 OTHER INFORMATION REQUESTED BY THE CUSTOMER

None.

2.8 TEST FACILITY

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

| | |
|---------------|---------------------------|
| USA | FCC Listed Lab No. 688188 |
| China | CNAS No.L0446 |
| China | DILAC No.DL175 |
| Canada | 8355A-1 |

3 EQUIPMENTS USED DURING TEST

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|------------------------------------|---------------------|---------------|----------------------|------------------------|
| Conducted Emissions | | | | |
| EMI Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| L.I.S.N | SCHWARZBECK | NSLK 8127 | 8127450 | 2012-08-21 |
| Cable | GRGT | GRGT1 | GRGT1 | 2012-08-12 |
| Dwell Time | | | | |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| Restricted Bands | | | | |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| Spurious Emissions | | | | |
| Biconical Log-periodic Antenna | ETS.LINDGREN | 3142C | 00075971 | 2014-05-26 |
| Pre-amplifier | HP | 8447D OPT 010 | 2944A06252 | 2013-03-11 |
| Pre-amplifier | Agilent | 8449B | 3008A01649 | 2013-03-11 |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| Horn antenna | SCHWARZBECK | BBHA9120D | D752 | 2013-10-14 |
| Cable | GRGT | GRGT2 | GRGT2 | 2012-08-12 |
| Number of Hopping Frequency | | | | |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| Maximum Peak Output Power | | | | |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |
| Band Edge | | | | |
| Receiver | R&S | ESU40 | 100106 | 2013-02-04 |

4 TEST RESULTS

4.1 E.U.T. TEST CONDITIONS

Type of antenna: Integral

Operating Environment:

Temperature: 20.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1006 mbar

Test frequencies: According to the 15.31(m) Measurements on intentional radiators or receivers, other than TV broadcast receivers, shall be performed and, if required, reported for each band in which the device can be operated with the device operating at the number of frequencies in each band specified in the following table:

| Frequency range over which device operates | Number of frequencies | Location in the range of operation |
|--|-----------------------|---|
| 1 MHz or less | 1 | Middle |
| 1 to 10 MHz | 2 | 1 near top and 1 near bottom |
| More than 10 MHz | 3 | 1 near top, 1 near middle and 1 near bottom |

bottom

EUT channels and frequencies list:

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|---------|-----------------|---------|-----------------|---------|-----------------|
| 0 | 2402 | 14 | 2416 | 28 | 2430 |
| 1 | 2403 | 15 | 2417 | 29 | 2431 |
| 2 | 2404 | 16 | 2418 | 30 | 2432 |
| 3 | 2405 | 17 | 2419 | 31 | 2433 |
| 4 | 2406 | 18 | 2420 | 32 | 2434 |
| 5 | 2407 | 19 | 2421 | 33 | 2435 |
| 6 | 2408 | 20 | 2422 | 34 | 2436 |
| 7 | 2409 | 21 | 2423 | 35 | 2437 |
| 8 | 2410 | 22 | 2424 | 36 | 2438 |
| 9 | 2411 | 23 | 2425 | 37 | 2439 |
| 10 | 2412 | 24 | 2426 | 38 | 2440 |
| 11 | 2413 | 25 | 2427 | 39 | 2441 |
| 12 | 2414 | 26 | 2428 | 40 | 2442 |
| 13 | 2415 | 27 | 2429 | 41 | 2443 |

| Channel | Frequency (MHz) | Channel | Frequency (MHz) | Channel | Frequency (MHz) |
|----------------|------------------------|----------------|------------------------|----------------|------------------------|
| 42 | 2444 | 55 | 2457 | 68 | 2470 |
| 43 | 2445 | 56 | 2458 | 69 | 2471 |
| 44 | 2446 | 57 | 2459 | 70 | 2472 |
| 45 | 2447 | 58 | 2460 | 71 | 2473 |
| 46 | 2448 | 59 | 2461 | 72 | 2474 |
| 47 | 2449 | 60 | 2462 | 73 | 2475 |
| 48 | 2450 | 61 | 2463 | 74 | 2476 |
| 49 | 2451 | 62 | 2464 | 75 | 2477 |
| 50 | 2452 | 63 | 2465 | 76 | 2478 |
| 51 | 2453 | 64 | 2466 | 77 | 2479 |
| 52 | 2454 | 65 | 2467 | 78 | 2480 |
| 53 | 2455 | 66 | 2468 | | |
| 54 | 2456 | 67 | 2469 | | |

Test frequency is the lowest channel: 0 channel(2402MHz), middle channel: 39 channel(2441MHz) and highest channel: 78 channel(2480MHz)

4.2 ANTENNA REQUIREMENT

4.2.1 STANDARD REQUIREMENT

15.203 requirement:

For intentional device, according to 15.203, 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.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

4.2.2 EUT ANTENNA

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0 dBi.



Test result: The unit does meet the FCC requirements.

4.3 OCCUPIED BANDWIDTH

| | |
|-------------------|--|
| Test Requirement: | FCC Part 15 C |
| Test Method: | Based on FCC Part15 C Section 15.247 & DA 00-705 |
| Test Date: | 2012-07-12 |
| Test Status: | Test in fixing operating frequency at lowest, Middle, highest channel. |
| Power supply: | Connected with convert board powered by PC USB ports, and to fix frequency transmitting. |

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum;
2. Set the spectrum analyzer: Span = approximately 2 to 3 times the 20dB bandwidth, centered on a hopping channel;
3. Set the spectrum analyzer: RBW >= 1% of the 20dB bandwidth (set 100kHz). VBW >= RBW. Sweep = auto; Detector Function = Peak. Trace = Max Hold.
4. Mark the peak frequency and -20dB points or 99% bandwidth.
5. bandwidth value is OBW value.

Remark:

Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

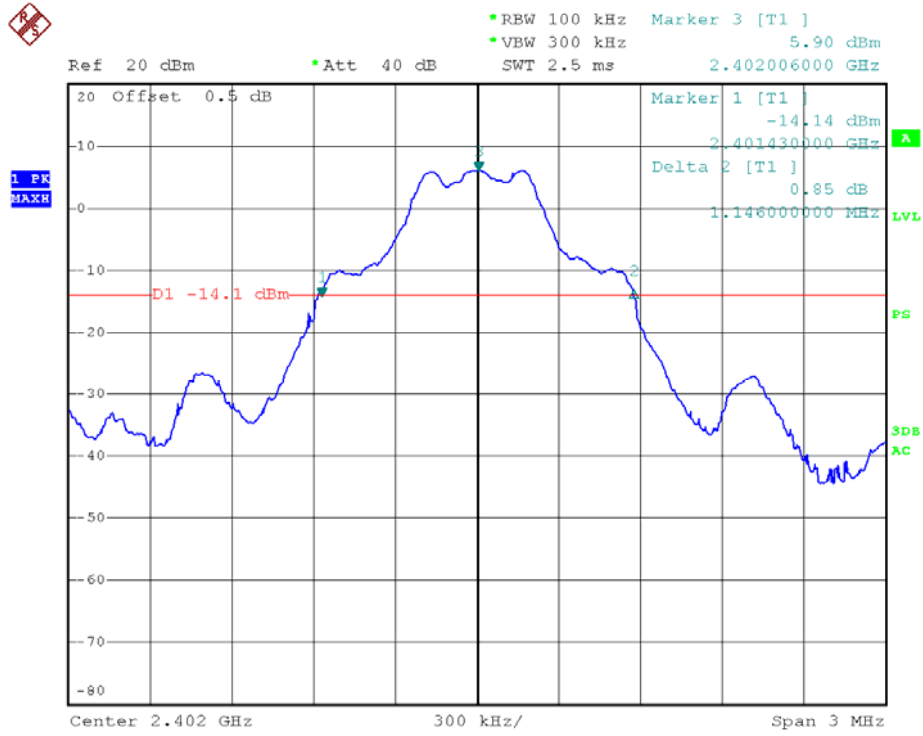
Test result:

For GFSK

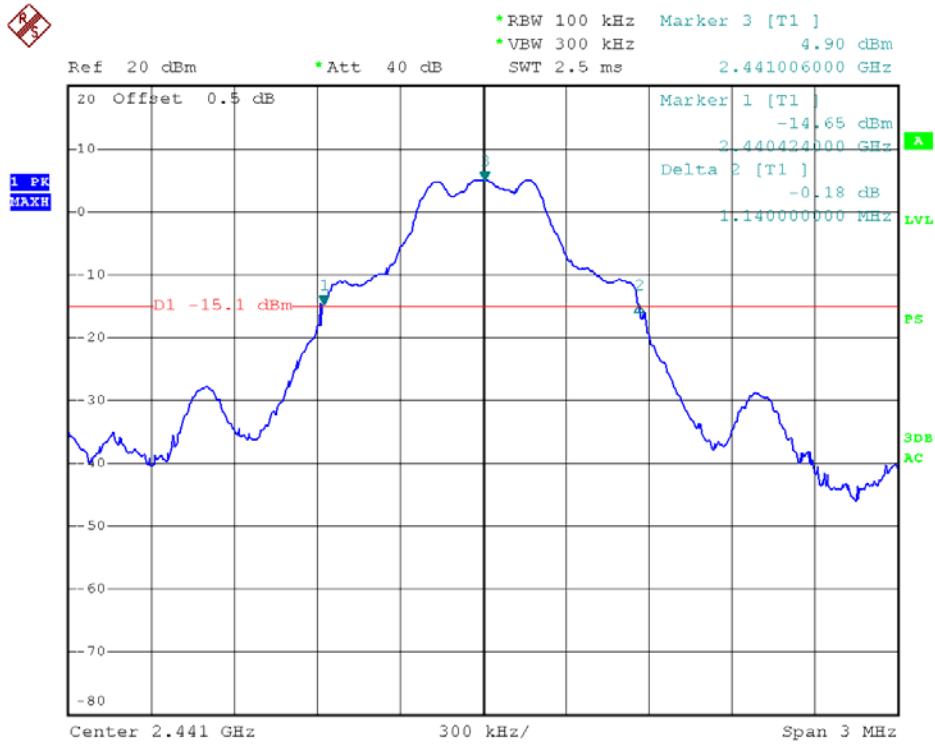
| Frequency (GHz) | Test Channel | bandwidth |
|-----------------|--------------|-----------|
| 2.402 | Lowest | 1.146MHz |
| 2.441 | Middle | 1.140MHz |
| 2.480 | Highest | 1.152MHz |

Result plot as follows:

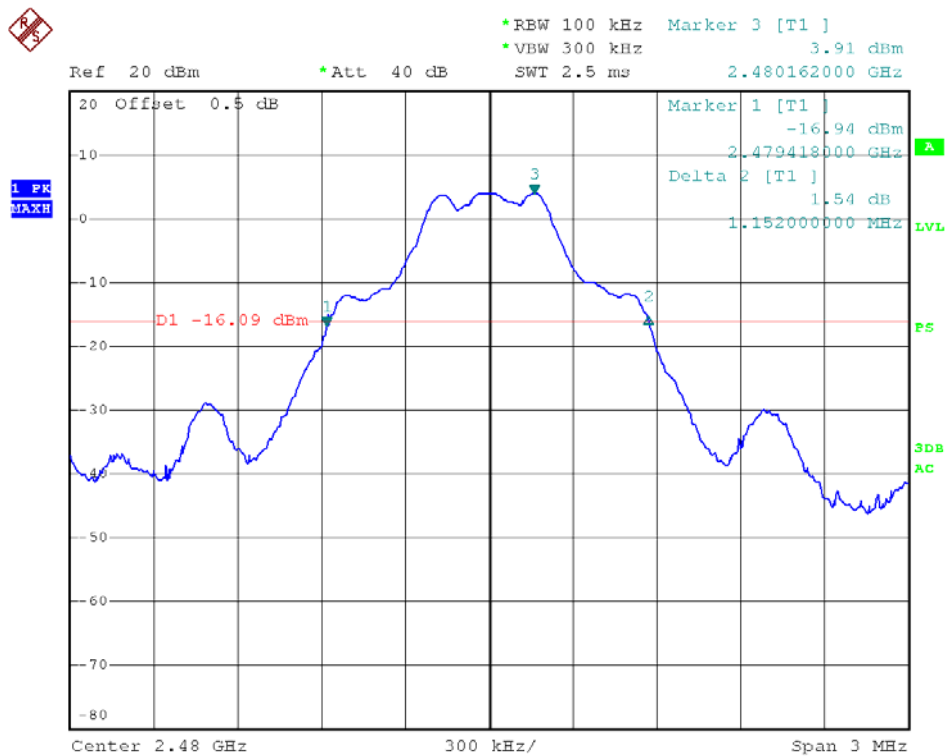
Lowest Channel :



Middle Channel :



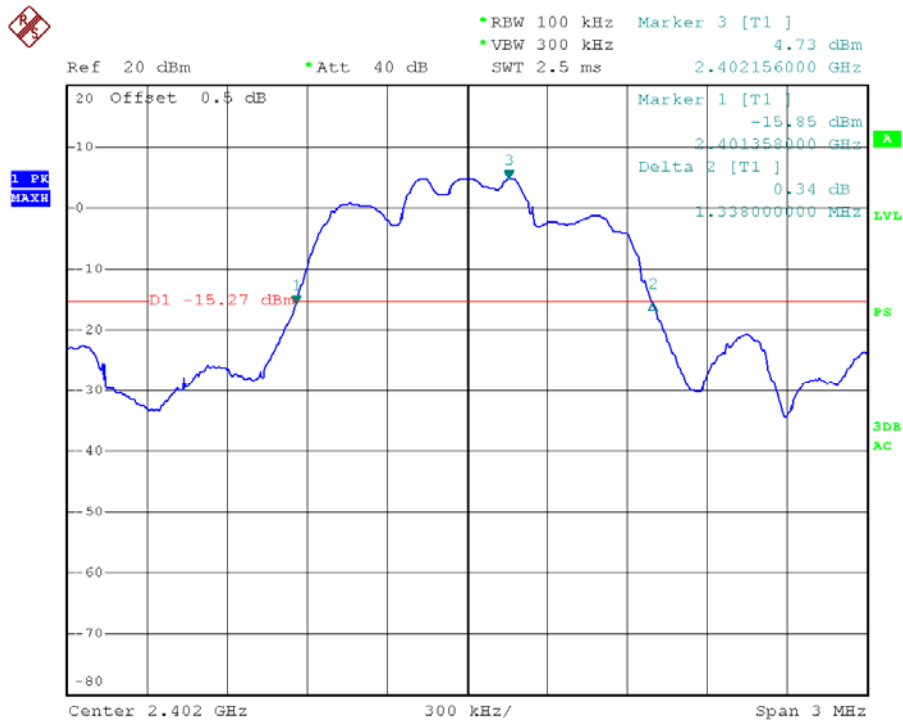
Highest Channel :



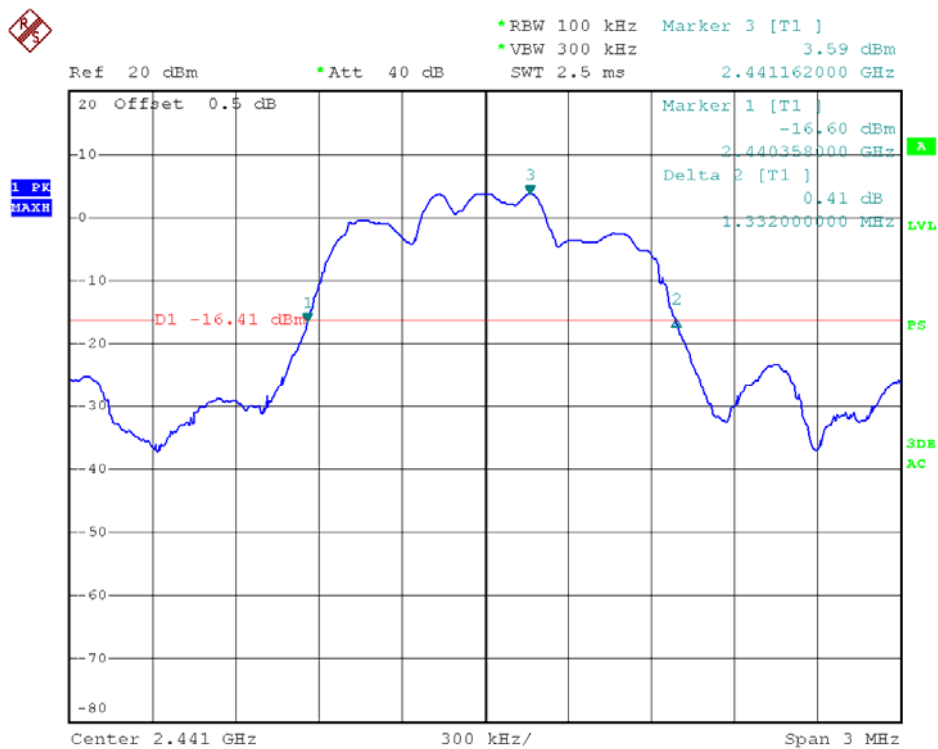
For 8DPSK

| Frequency (GHz) | Test Channel | bandwidth |
|-----------------|--------------|-----------|
| 2.402 | Lowest | 1.338MHz |
| 2.441 | Middle | 1.332MHz |
| 2.480 | Highest | 1.332MHz |

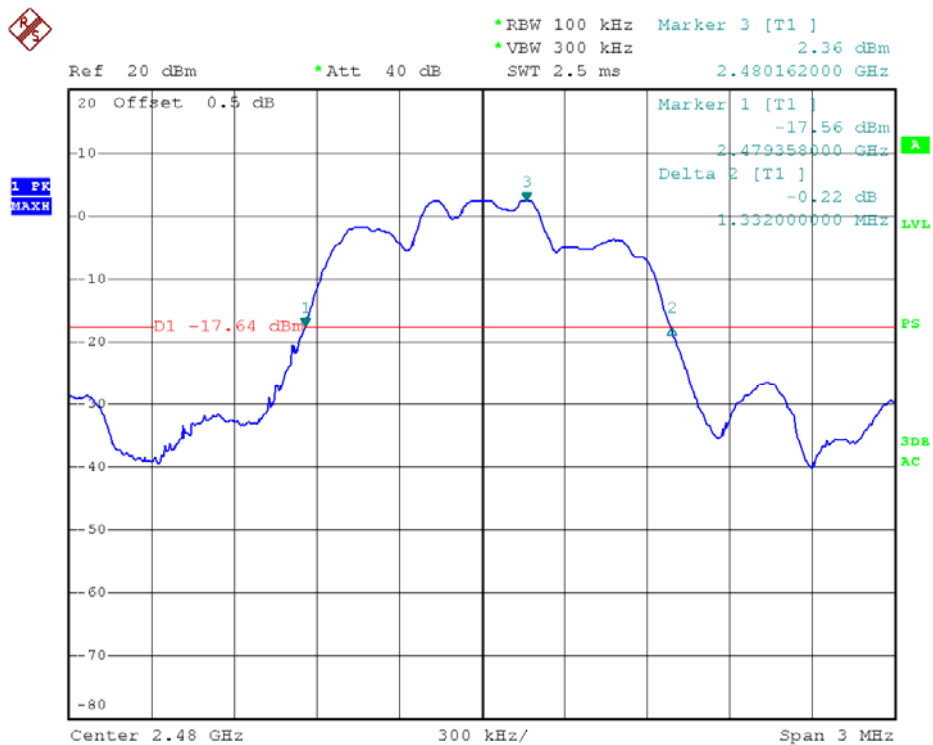
Lowest Channel :



Middle Channel :



Highest Channel :



4.4 CARRIER FREQUENCIES SEPARATED

Test Requirement: FCC Part 15 C

Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705

Test Date: 2012-07-12

Test requirements: Regulation 15.247(a),(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, 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.

Test Status: Test in hopping transmitting operating mode.

Power supply: Connected with convert board powered by PC USB ports, and to fix frequency transmitting.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW \geq 1% of the span (set 100 kHz). VBW \geq RBW , Span = 6MHz. Sweep = auto; Detector Function = Peak. Trace = Max,hold.
3. Allow the trace to stabilize. Use the marker-delta function to determine the separation between the peaks of the adjacent channels. The limit is specified in one of the subparagraphs of this Section. Submit this plot.

Remark :

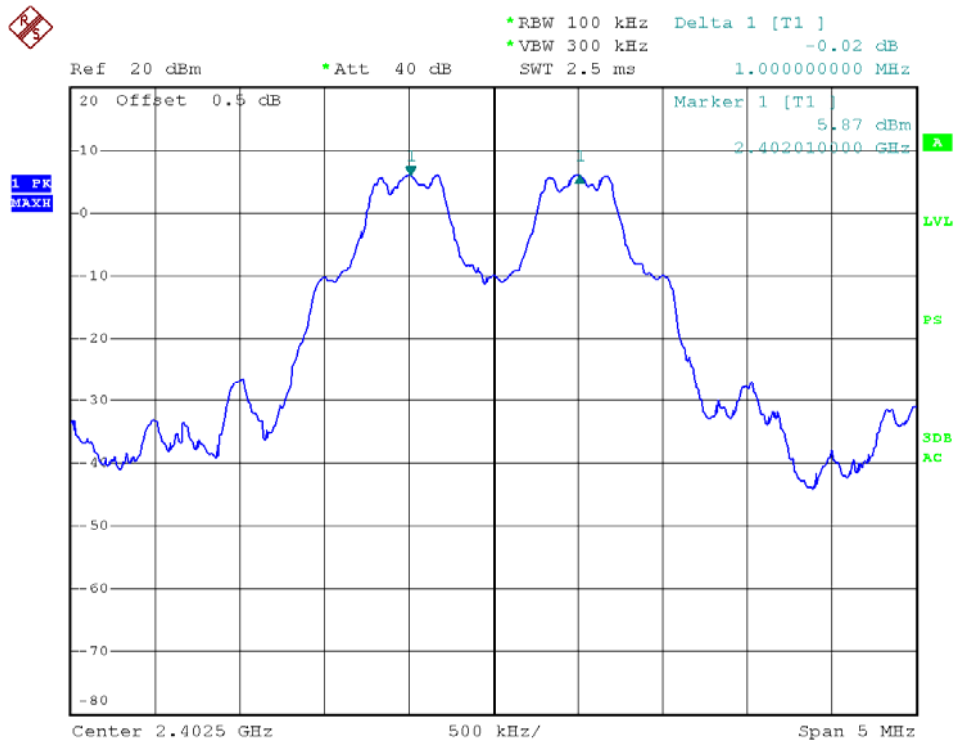
Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

Test result:

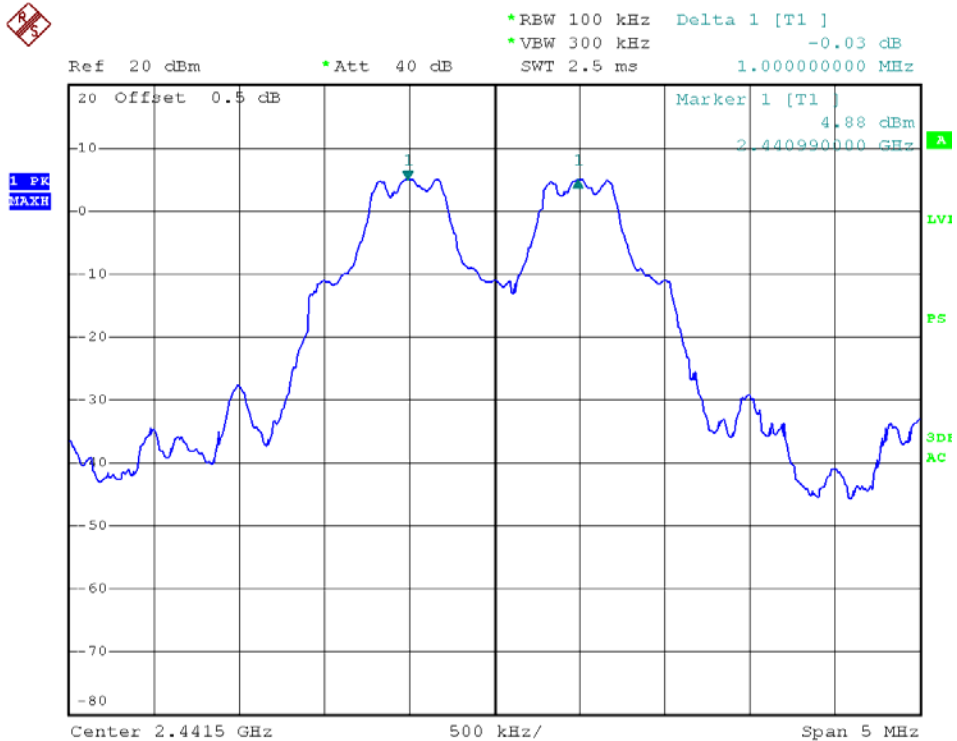
| Mode | Test Channel | Carrier Frequencies Separated | PASS/FAIL |
|-------|--|-------------------------------|-----------|
| GFSK | Lower Channels (channel 0 and channel 1) | 1.000MHz | Pass |
| | Middle Channels (channel 39 and channel 40) | 1.000MHz | Pass |
| | Upper Channels (channel 77 and channel 78) | 1.000MHz | Pass |
| 8DPSK | Lower Channels (channel 0 and channel 1) | 1.010MHz | Pass |
| | Middle Channels (channel 39 and channel 40) | 1.000MHz | Pass |
| | Upper Channels (channel 77 and channel 78) | 1.010MHz | Pass |

For GFSK

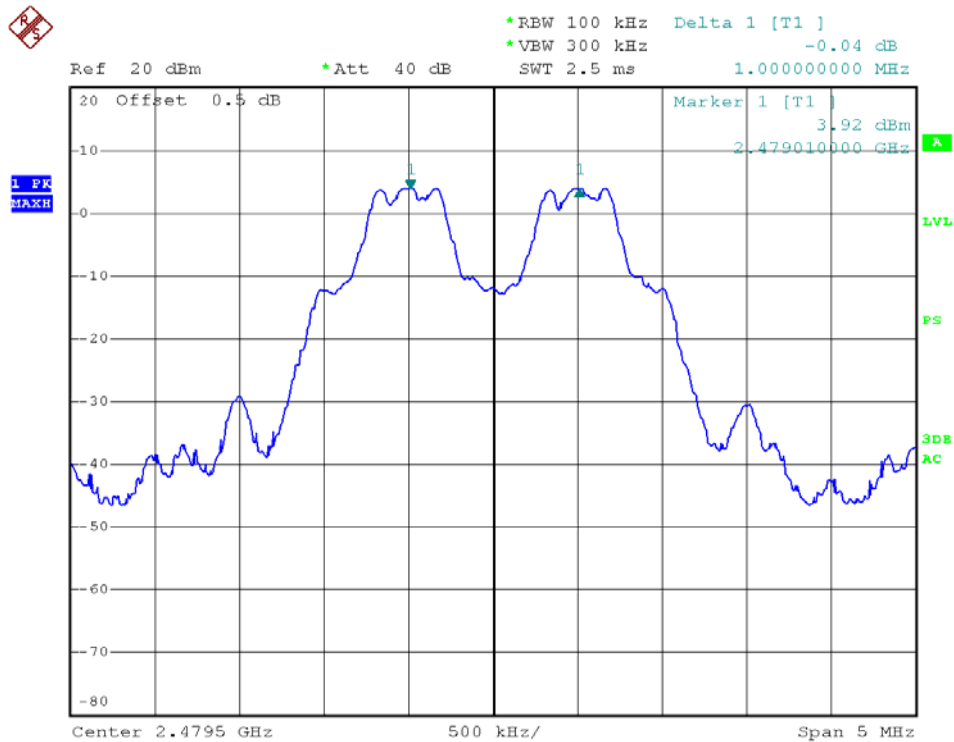
Lowest Channels:



Middle Channels:

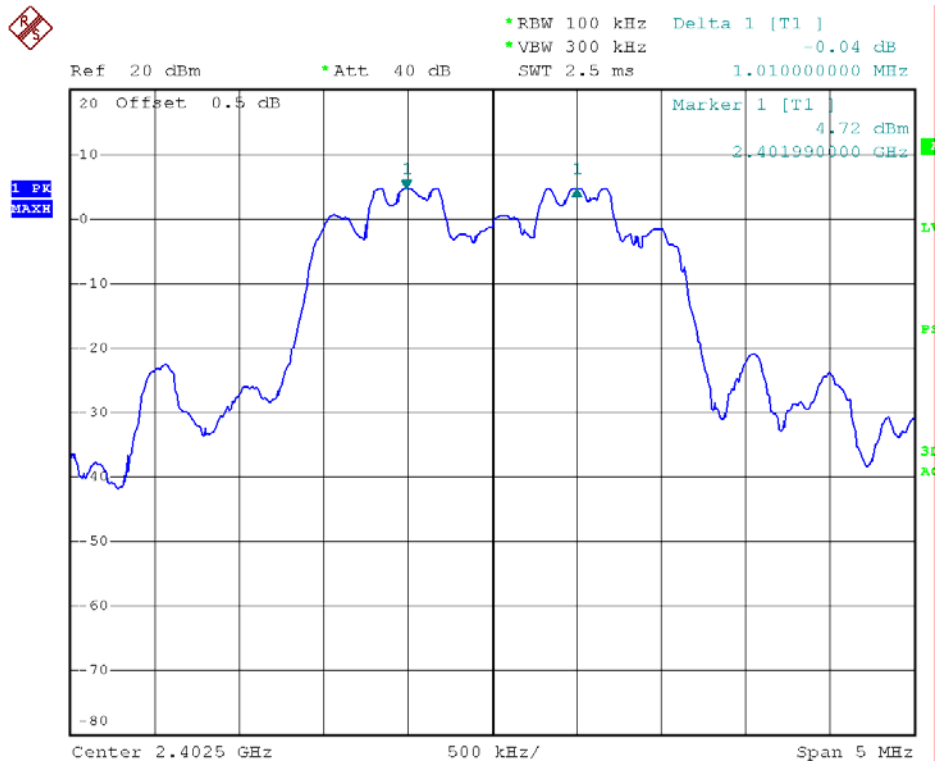


Highest Channels:

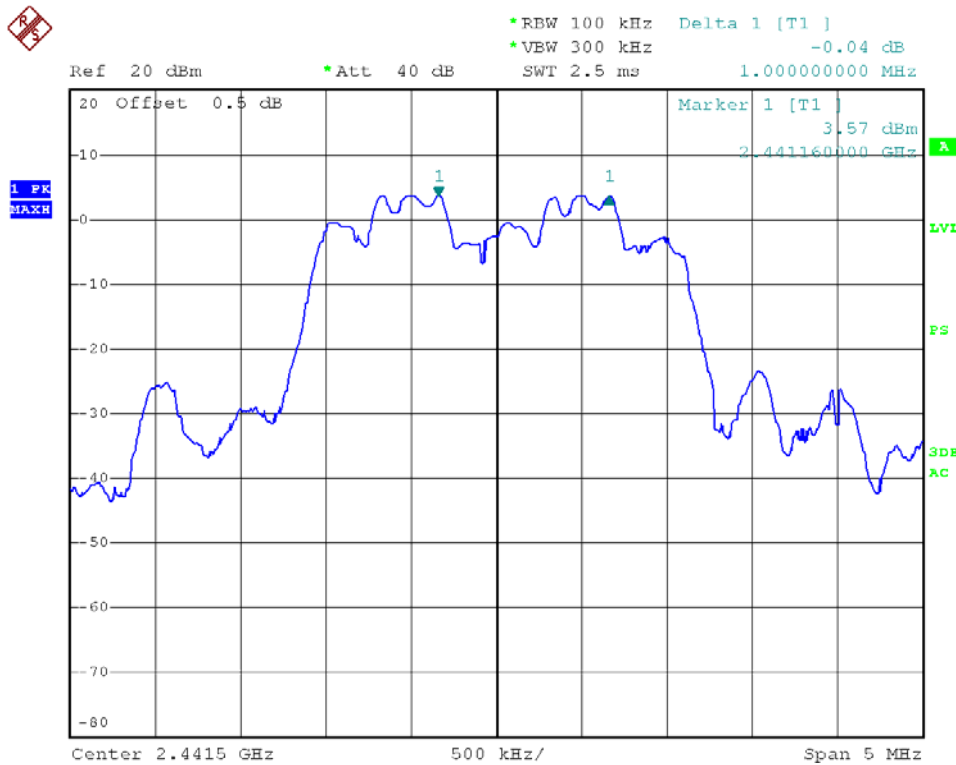


For 8DPSK

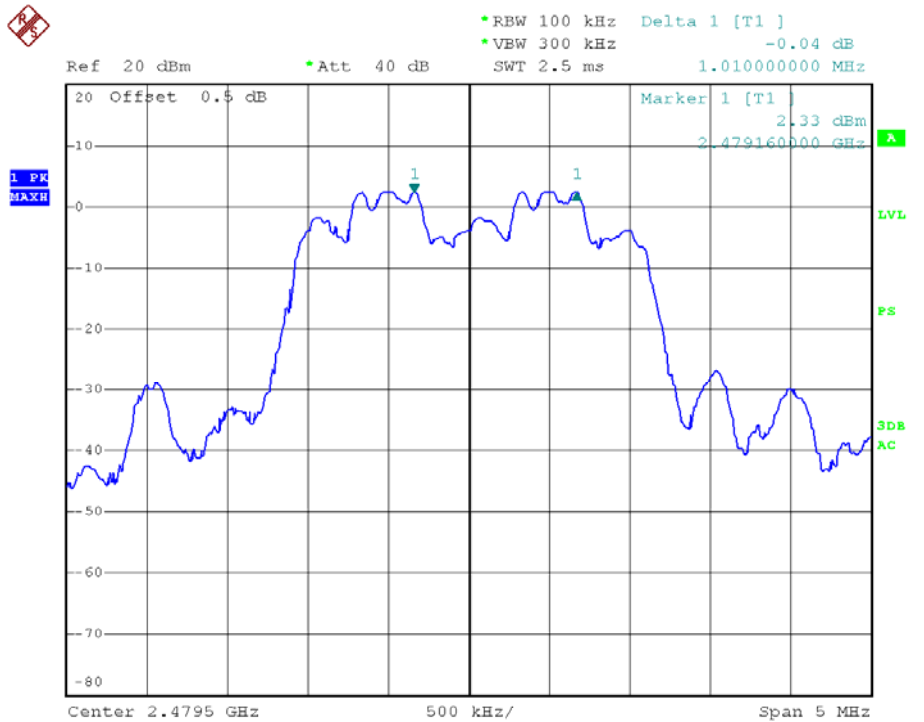
Lowest Channels:



Middle Channels:



Highest Channels:



Test result: The unit does meet the FCC requirements.

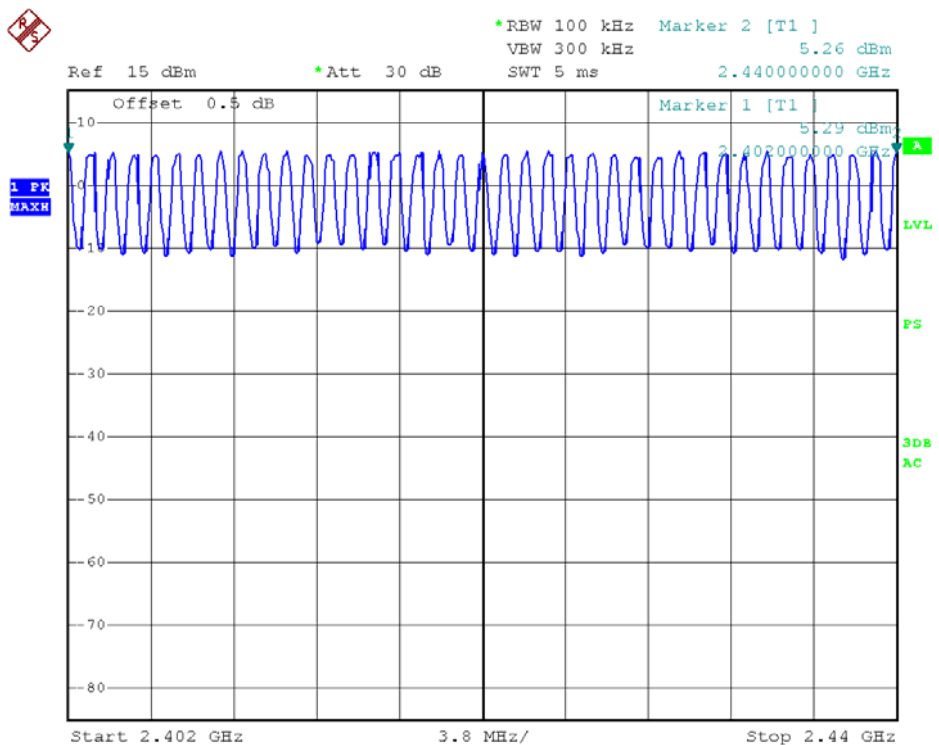
4.5 HOPPING CHANNEL NUMBER

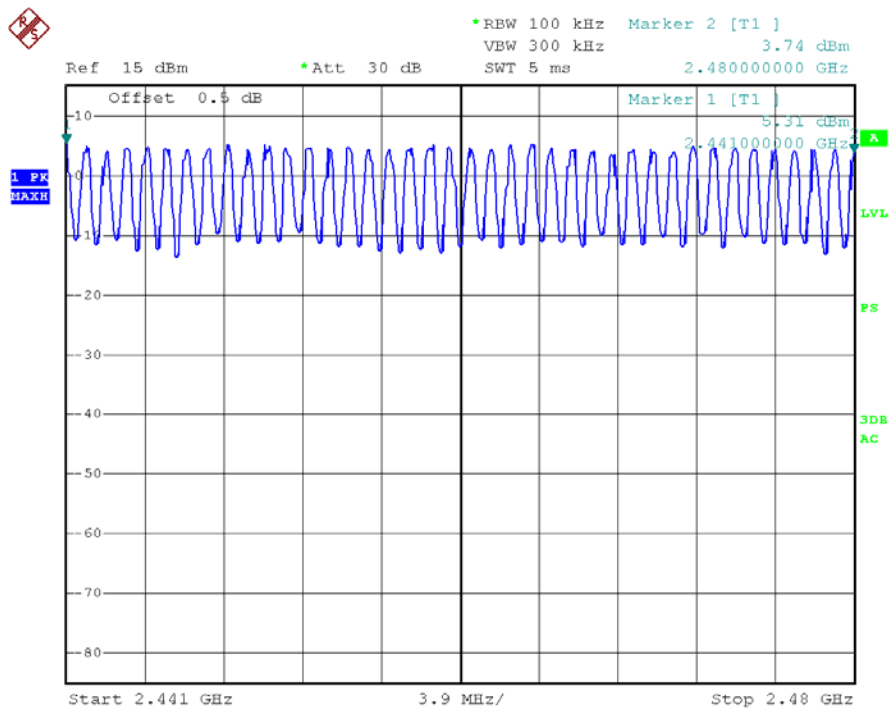
Test Requirement: FCC Part15 C
Test Method: Based on FCC Part15 C Section 15.247 & DA 00-705
Test Date: 2012-07-12
Requirements: Regulation 15.247 (a) (1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels.
Test Status: Test in hopping transmitting operating mode.
Power supply: Connected with convert board powered by PC USB ports, and to fix frequency transmitting.

Test Procedure:

1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
2. Set the spectrum analyzer: RBW = 100 kHz. VBW = 300 kHz. Sweep = auto; Detector Function = Peak. Trace = Max hold.
3. Allow the trace to stabilize. It may prove necessary to break the span up to sections. in order to clearly show all of the hopping frequencies. The limit is specified in one of the subparagraphs of this Section.
4. Set the spectrum analyzer: start frequency = 2402MHz. stop frequency = 2480MHz. Submit the test result graph.

Test result: Total channels are 79 channels.





Test result: The unit does meet the FCC requirements.

4.6 DWELL TIME

| | |
|--------------------|--|
| Test Requirement: | FCC Part 15 C |
| Test Method: | Based on FCC Part15 C Section 15.247 & DA 00-705 |
| Test Date: | 2012-07-12 |
| Test requirements: | Regulation 15.247(a)(1)(iii) Frequency hopping systems in the 2400-2483.5 MHz band shall use at least 15 channels. 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 channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used. |
| Test Status: | Test in hopping transmitting operating mode. |
| Power supply: | Connected with convert board powered by PC USB ports, and to fix frequency transmitting. |

Test Procedure:

- 1.Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2.Set spectrum analyzer span = 0. centered on a hopping channel;
- 3.Set RBW = 1MHz and VBW = 3MHz.Sweep = as necessary to capture the entire dwell time per hopping channel. Detector Function = Peak. Trace = Max hold;
- 4.Use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g.. data rate. modulation format. etc.). repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

Test Results:

The test period: $T = 0.4 \text{ Second/Channel} \times 79 \text{ Channel} = 31.6 \text{ s}$

1. Channel 0: 2.402GHz

- DH1 time slot = $0.387(\text{ms}) * (1600/(2*79)) * 31.6 = 123.840 \text{ ms}$
 DH3 time slot = $1.632(\text{ms}) * (1600/(4*79)) * 31.6 = 261.120 \text{ ms}$
 DH5 time slot = $2.896(\text{ms}) * (1600/(6*79)) * 31.6 = 308.906 \text{ ms}$
 2DH1 time slot = $0.396(\text{ms}) * (1600/(2*79)) * 31.6 = 126.720 \text{ ms}$
 2DH3 time slot = $1.648(\text{ms}) * (1600/(4*79)) * 31.6 = 263.680 \text{ ms}$
 2DH5 time slot = $1.680(\text{ms}) * (1600/(6*79)) * 31.6 = 179.200\text{ms}$
 3DH1 time slot = $0.405(\text{ms}) * (1600/(2*79)) * 31.6 = 129.600 \text{ ms}$
 3DH3 time slot = $1.648(\text{ms}) * (1600/(4*79)) * 31.6 = 263.680 \text{ ms}$
 3DH5 time slot= $2.896(\text{ms}) * (1600/(6*79)) * 31.6 = 308.906 \text{ ms}$

2. Channel 39: 2.441GHz

$$\text{DH1 time slot} = 0.378(\text{ms}) * (1600/(2*79)) * 31.6 = 120.960 \text{ ms}$$

$$\text{DH3 time slot} = 1.632(\text{ms}) * (1600/(4*79)) * 31.6 = 261.120 \text{ ms}$$

$$\text{DH5 time slot} = 2.896(\text{ms}) * (1600/(6*79)) * 31.6 = 308.906 \text{ ms}$$

$$2\text{DH1 time slot} = 0.396(\text{ms}) * (1600/(2*79)) * 31.6 = 126.720 \text{ ms}$$

$$2\text{DH3 time slot} = 1.616(\text{ms}) * (1600/(4*79)) * 31.6 = 258.560 \text{ ms}$$

$$2\text{DH5 time slot} = 1.680(\text{ms}) * (1600/(6*79)) * 31.6 = 179.200 \text{ ms}$$

$$3\text{DH1 time slot} = 0.405(\text{ms}) * (1600/(2*79)) * 31.6 = 129.600 \text{ ms}$$

$$3\text{DH3 time slot} = 1.648(\text{ms}) * (1600/(4*79)) * 31.6 = 263.680 \text{ ms}$$

$$3\text{DH5 time slot} = 2.912(\text{ms}) * (1600/(6*79)) * 31.6 = 310.613 \text{ ms}$$

3. Channel 78: 2.480GHz

$$\text{DH1 time slot} = 0.396(\text{ms}) * (1600/(2*79)) * 31.6 = 126.720 \text{ ms}$$

$$\text{DH3 time slot} = 1.632(\text{ms}) * (1600/(4*79)) * 31.6 = 261.120 \text{ ms}$$

$$\text{DH5 time slot} = 2.896(\text{ms}) * (1600/(6*79)) * 31.6 = 308.906 \text{ ms}$$

$$2\text{DH1 time slot} = 0.405(\text{ms}) * (1600/(2*79)) * 31.6 = 129.600 \text{ ms}$$

$$2\text{DH3 time slot} = 1.648 (\text{ms}) * (1600/(4*79)) * 31.6 = 263.680 \text{ ms}$$

$$2\text{DH5 time slot} = 1.680(\text{ms}) * (1600/(6*79)) * 31.6 = 179.200 \text{ ms}$$

$$3\text{DH1 time slot} = 0.405(\text{ms}) * (1600/(2*79)) * 31.6 = 129.600 \text{ ms}$$

$$3\text{DH3 time slot} = 1.648(\text{ms}) * (1600/(4*79)) * 31.6 = 263.680 \text{ ms}$$

$$3\text{DH5 time slot} = 2.896(\text{ms}) * (1600/(6*79)) * 31.6 = 308.906 \text{ ms}$$

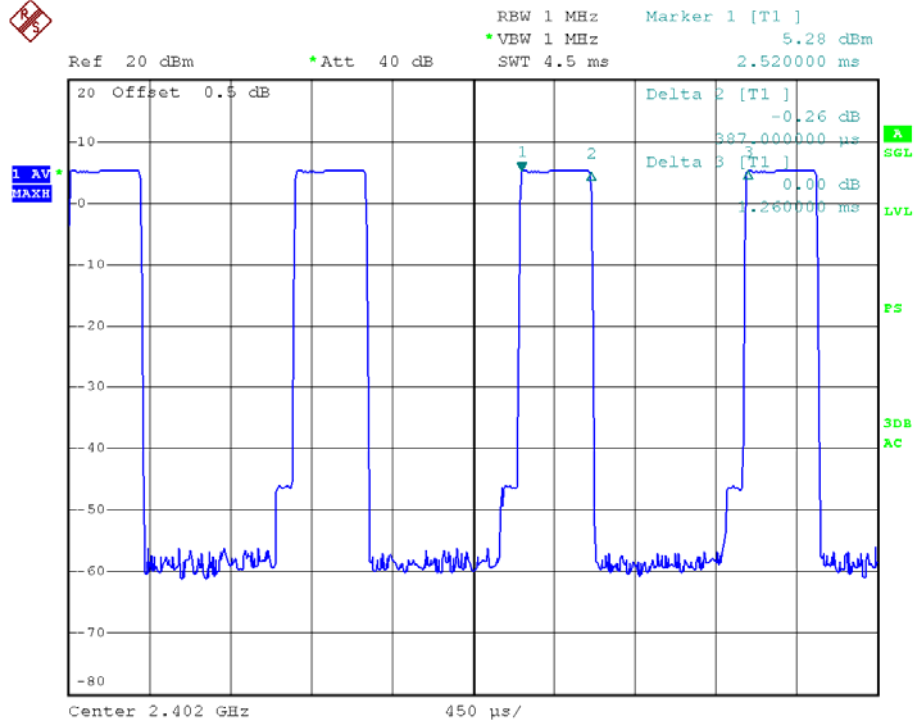
The results are not greater than 0.4 seconds.

The unit does meet the FCC requirements.

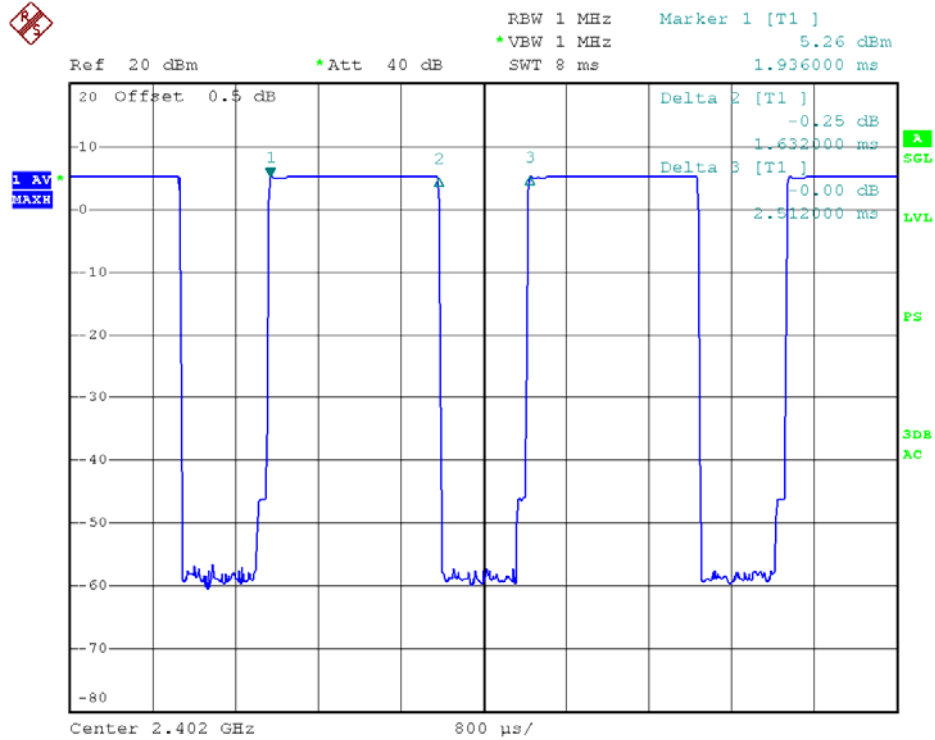
Please refer the graph as below:

1. Lowest channel (2.402 GHz):

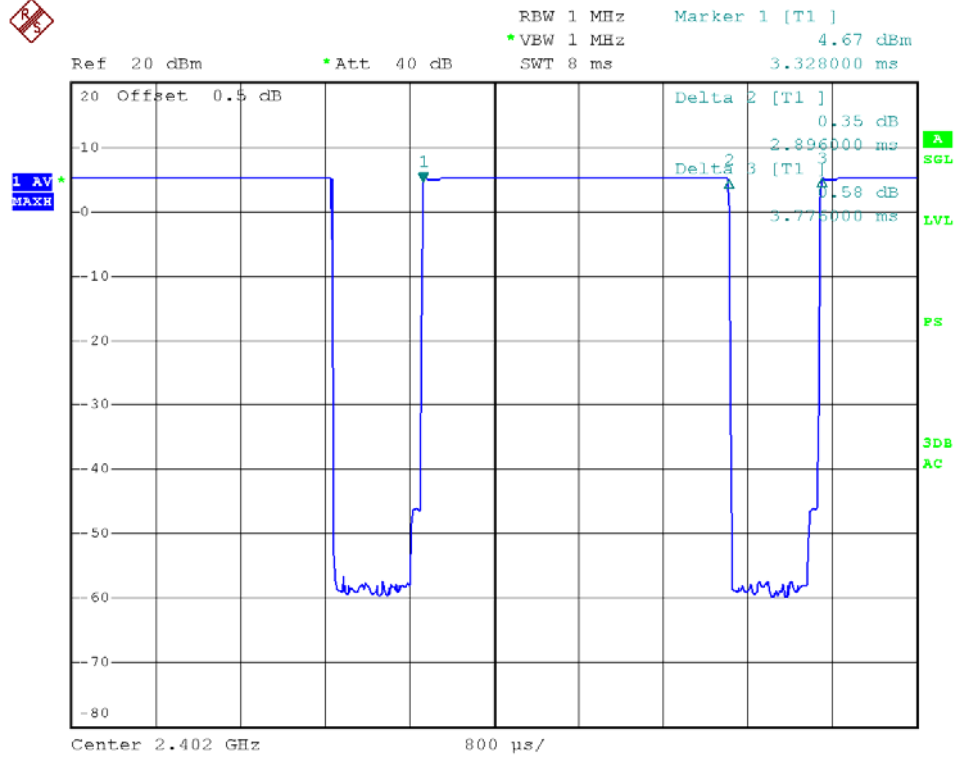
DH1



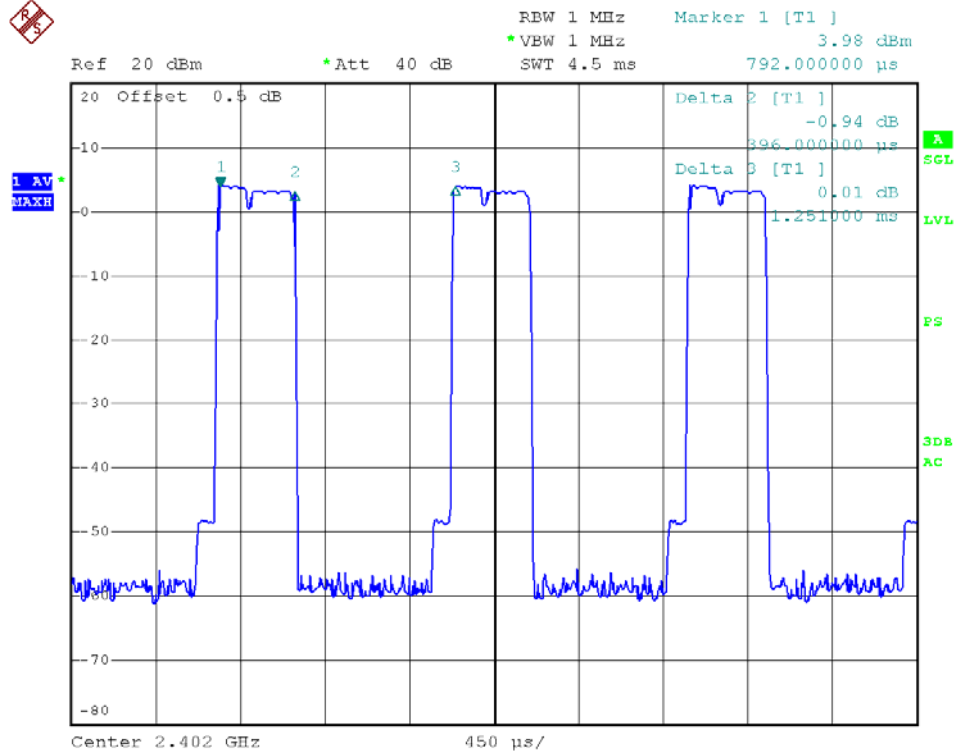
DH3:



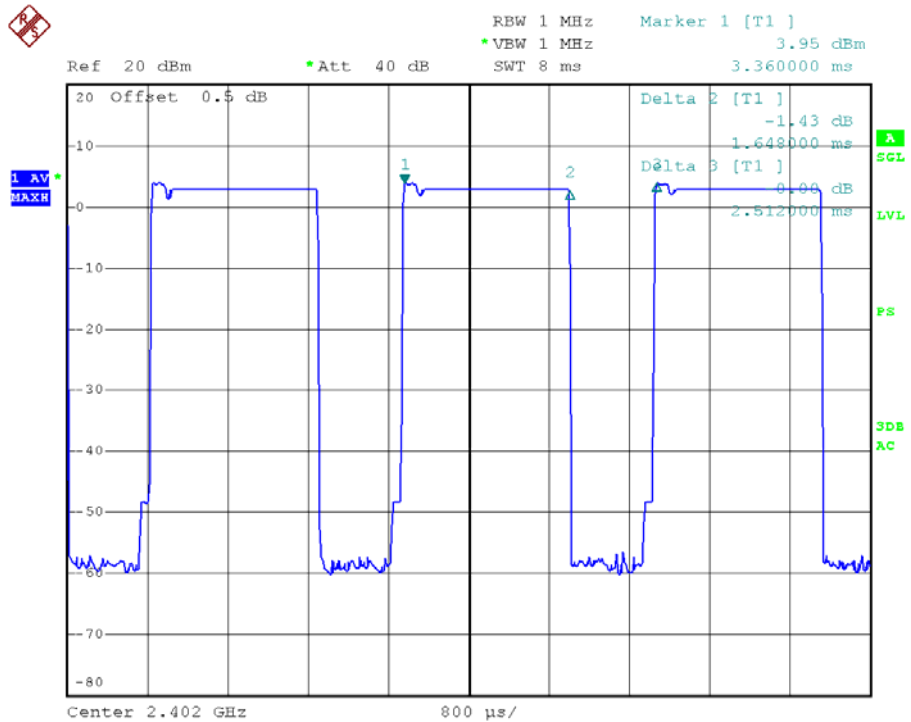
DH5:



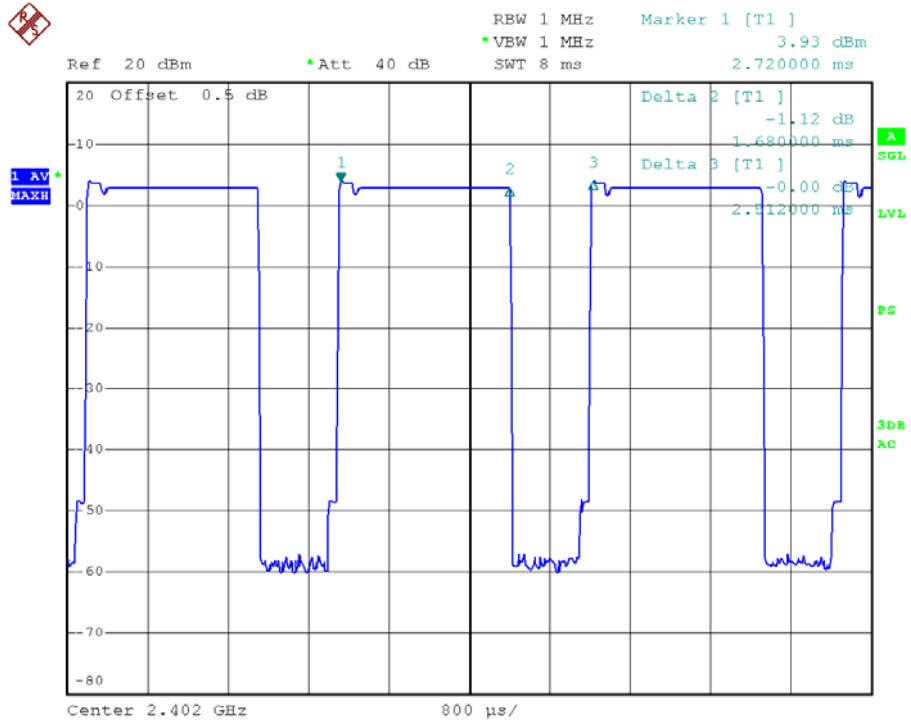
2DH1



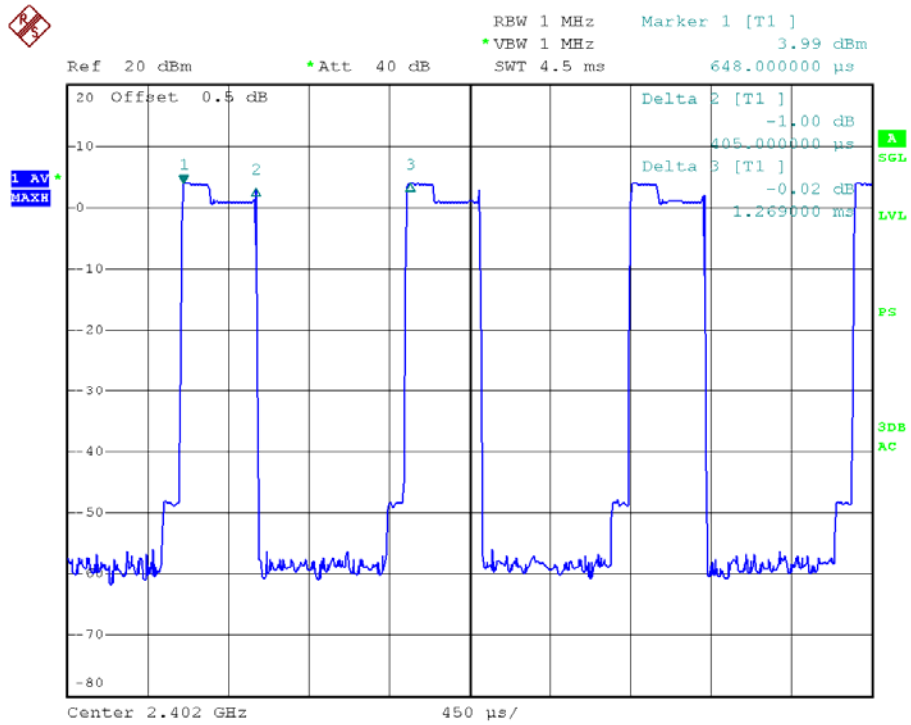
2DH3



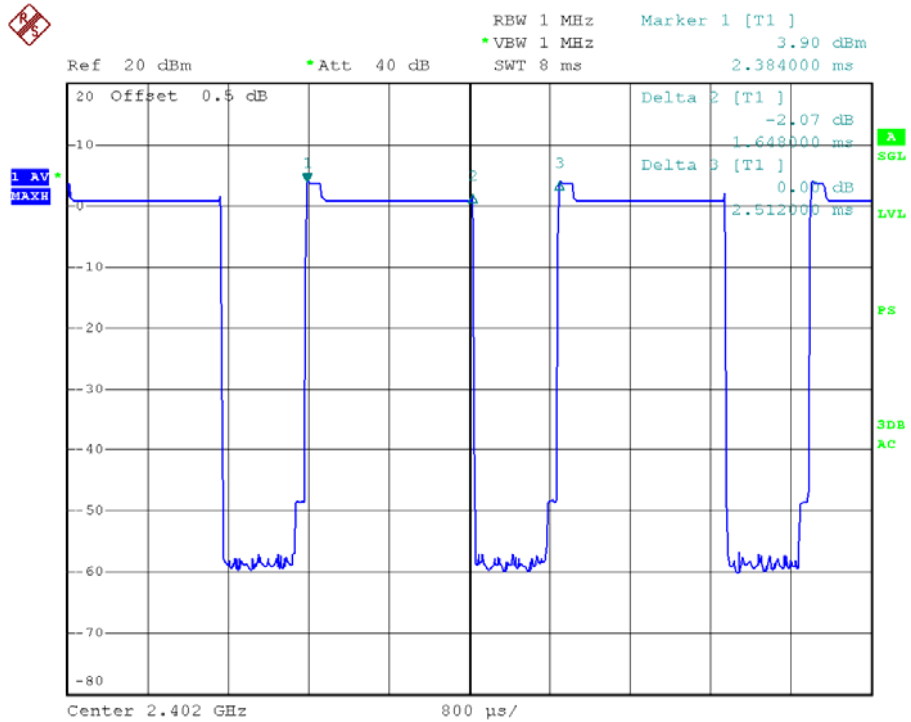
2DH5

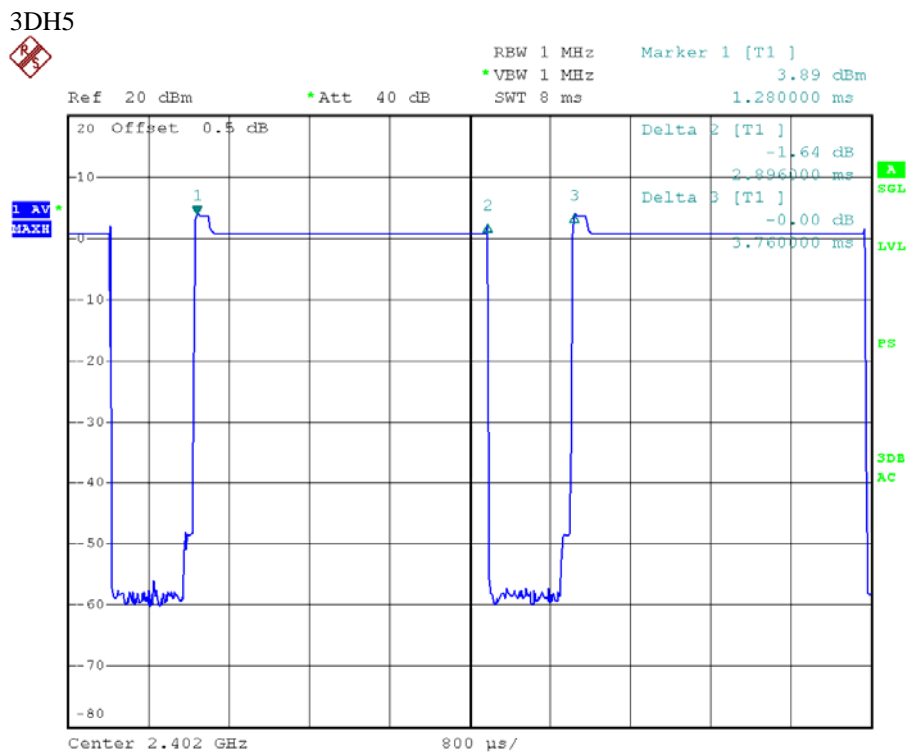


3DH1



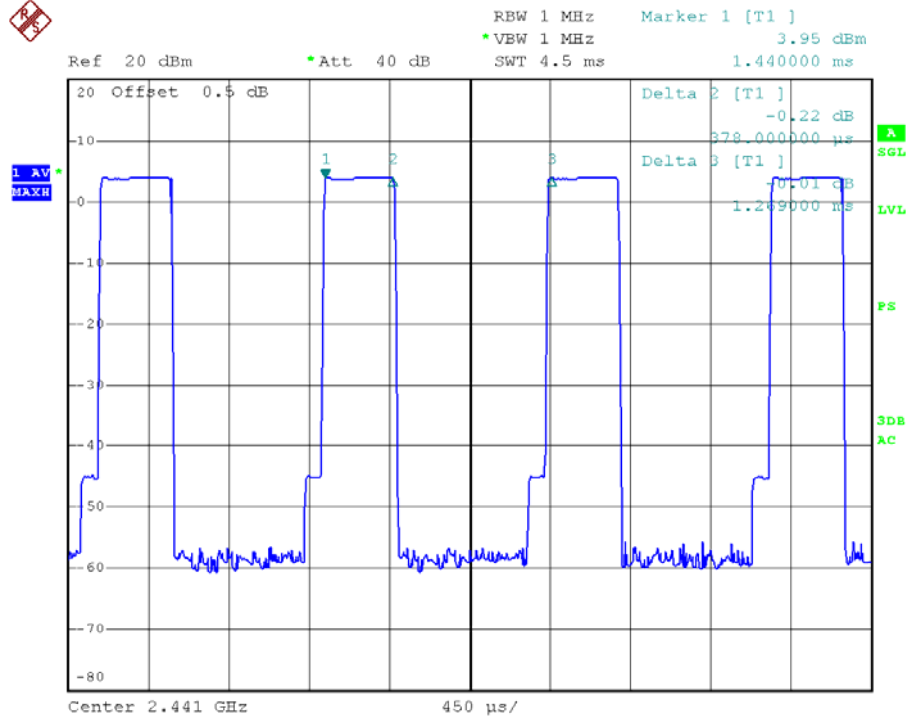
3DH3



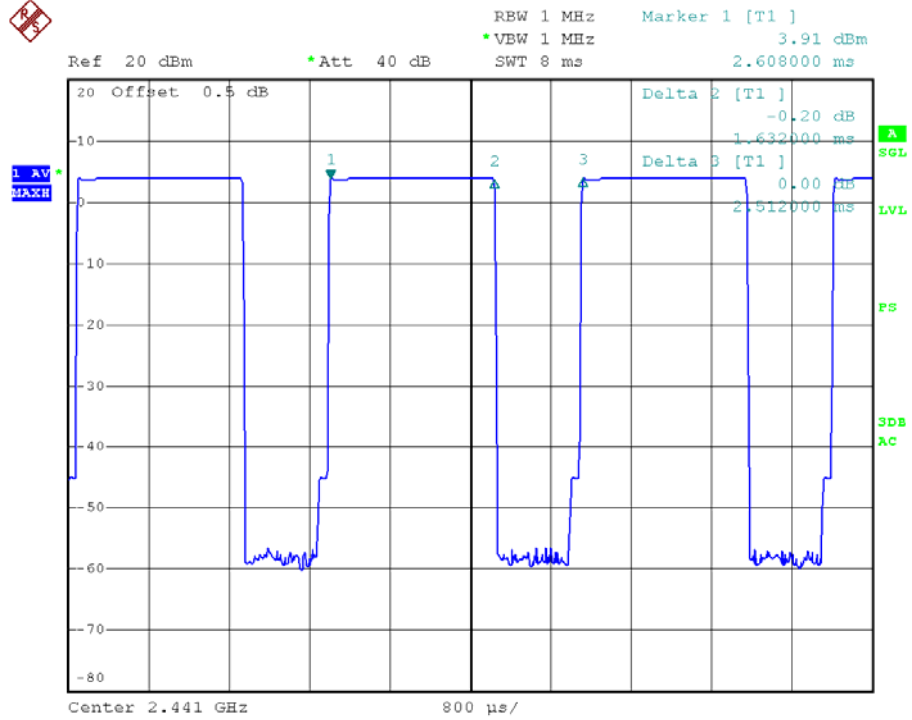


2. Middle Channel (2.441GHz)

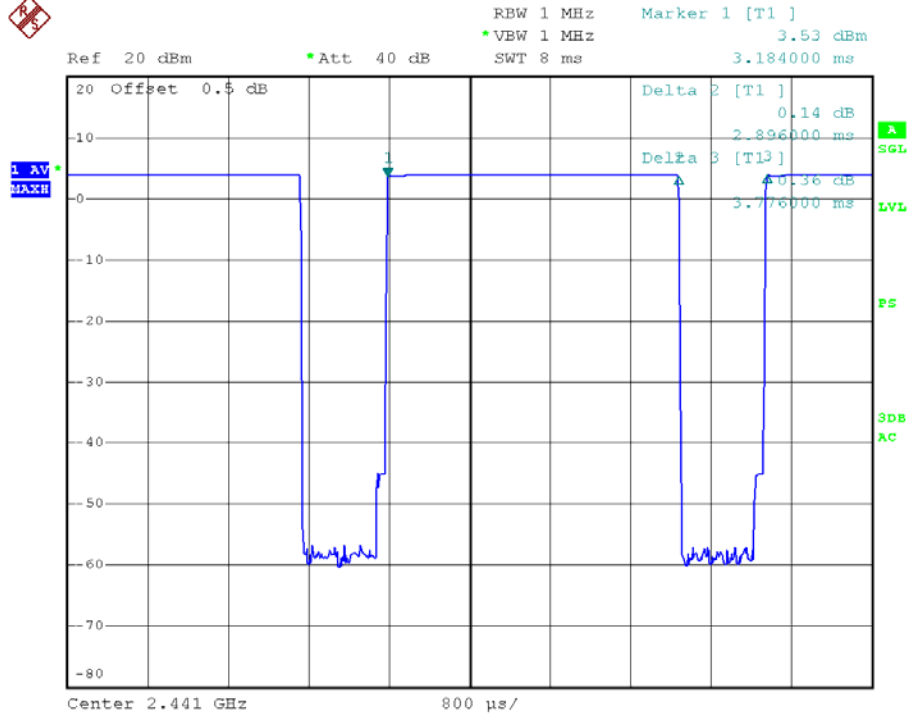
DH1



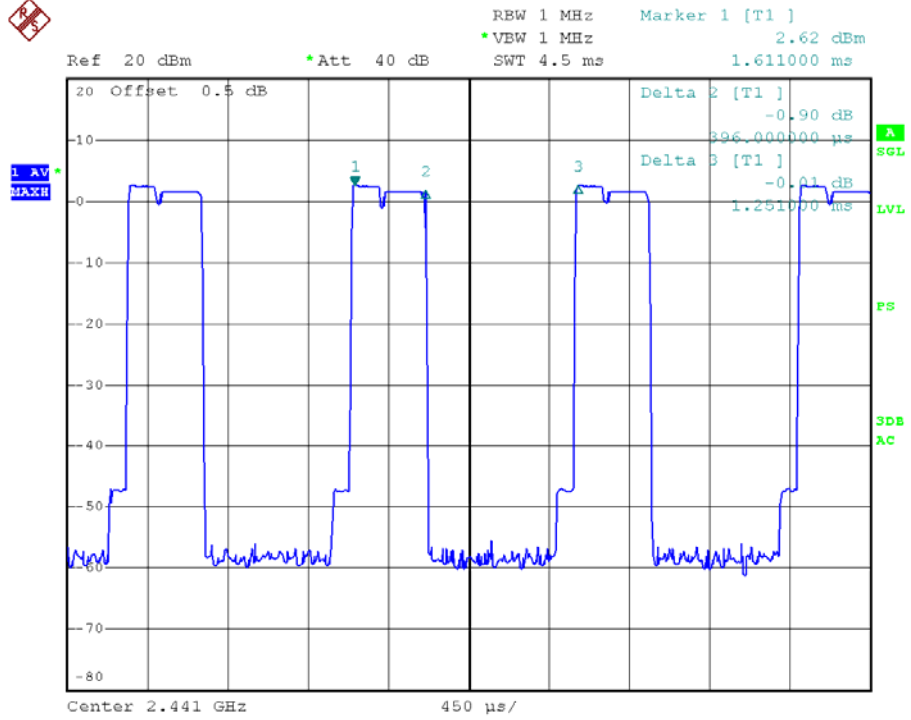
DH3



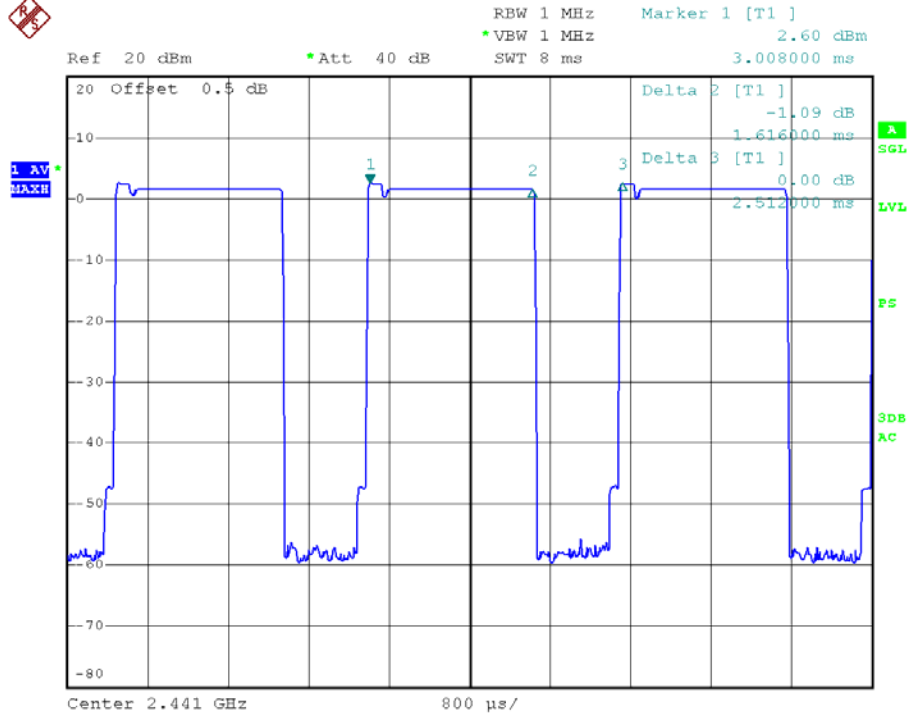
DH5



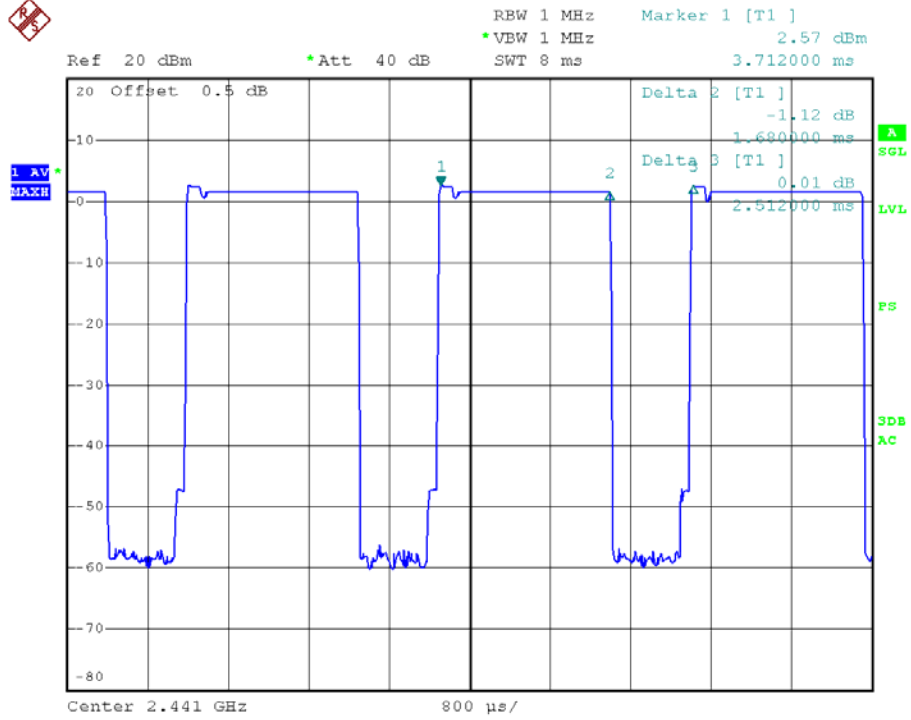
2DH1



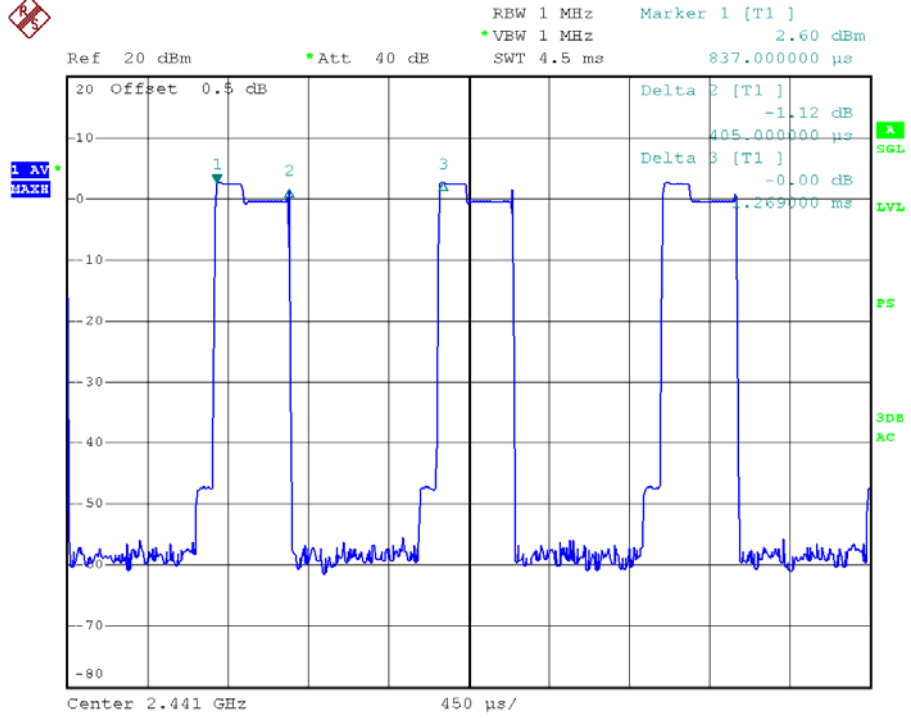
2DH3



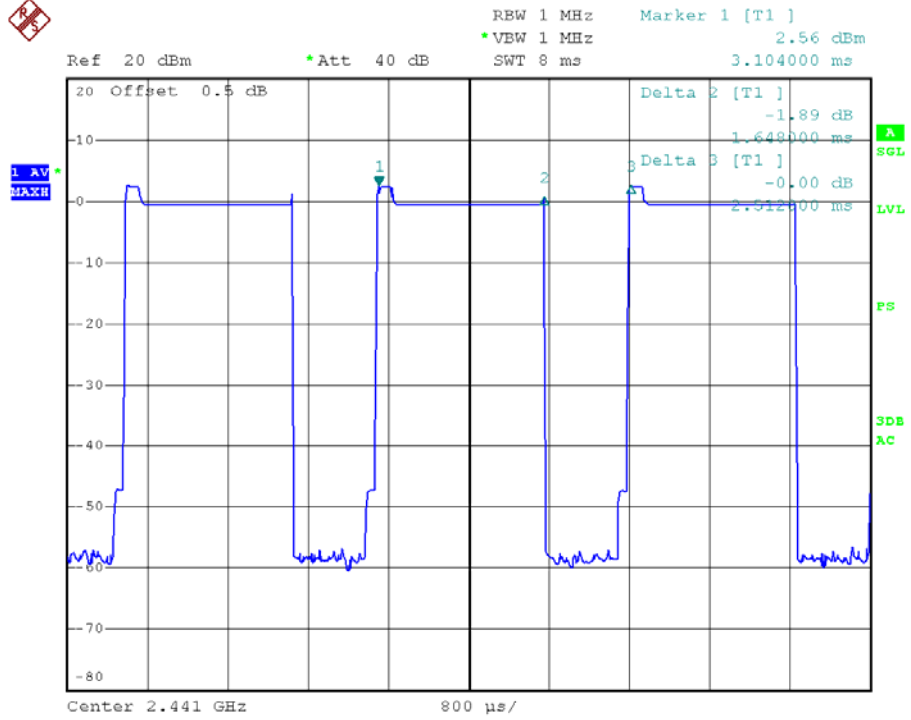
2DH5



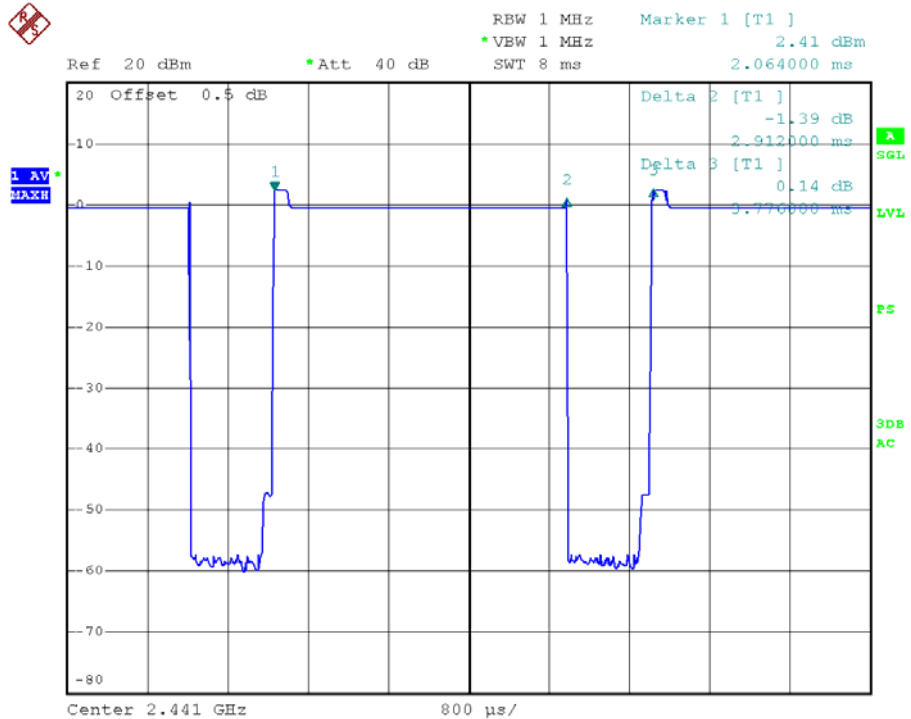
3DH1



3DH3

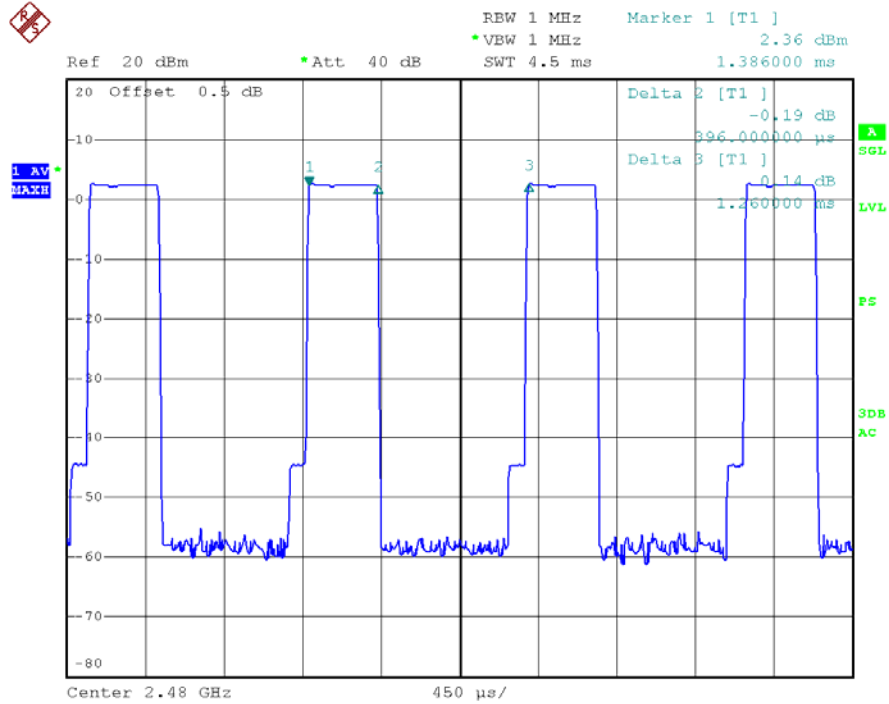


3DH5

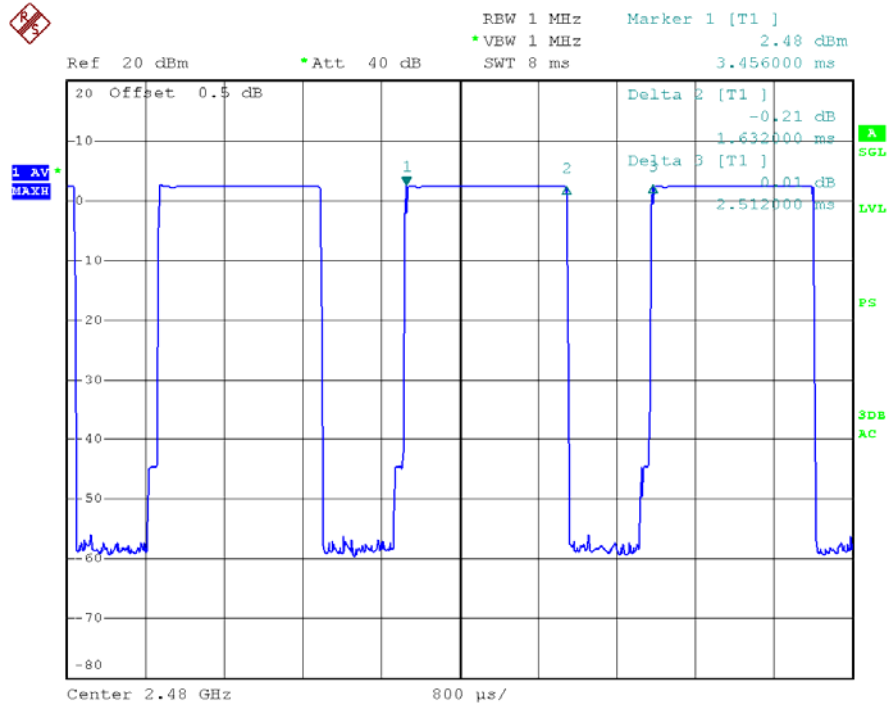


3. Highest channel (2.480GHz)

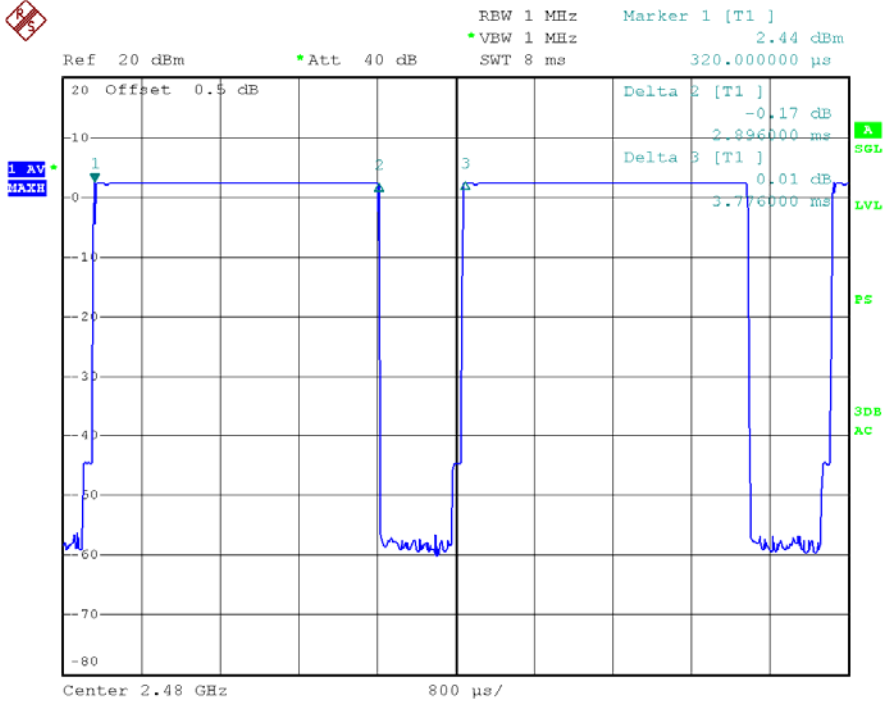
DH1



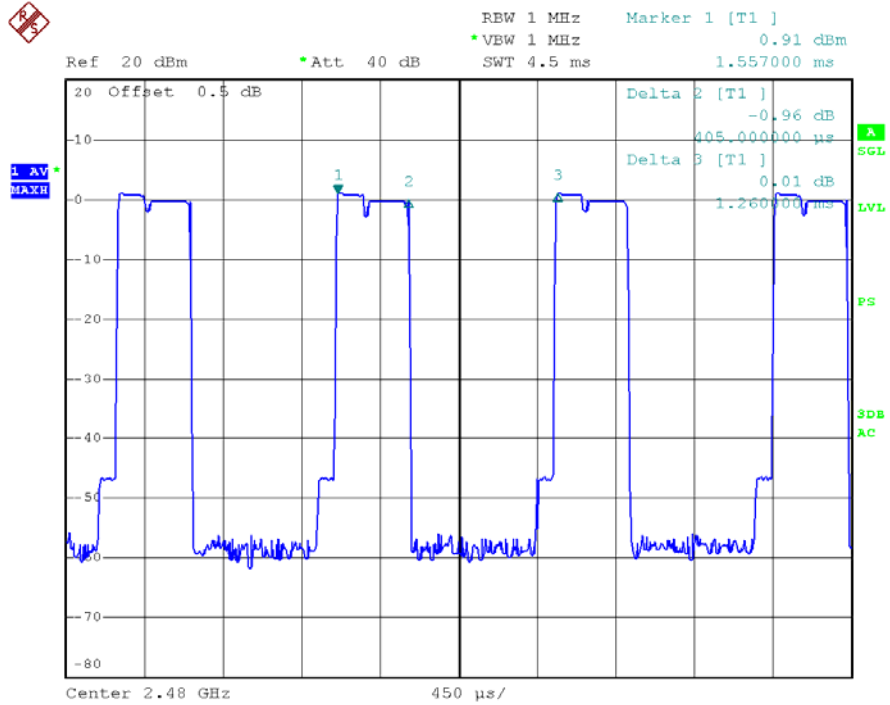
DH3



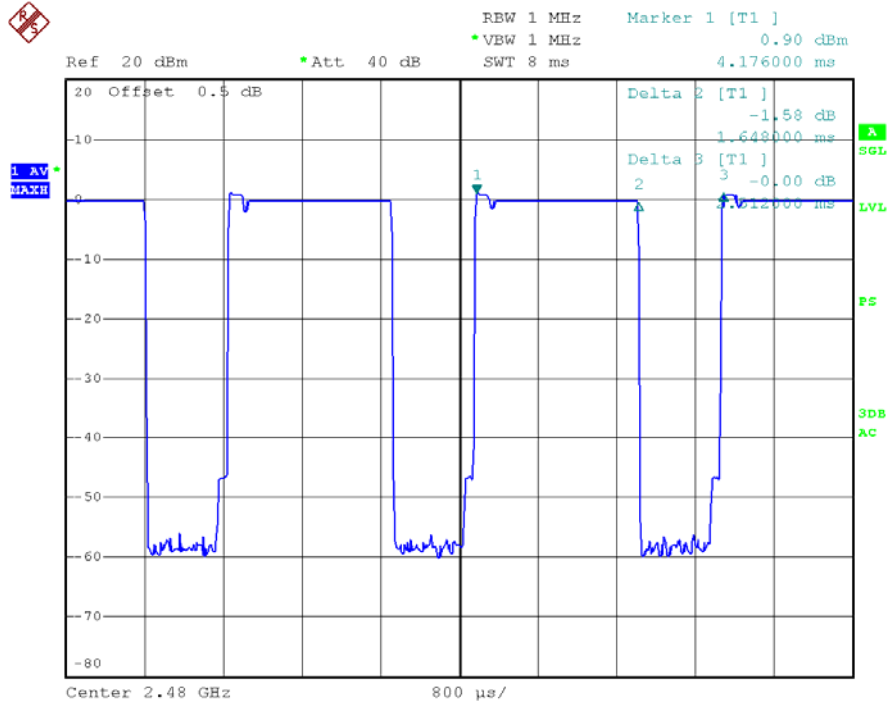
DH5



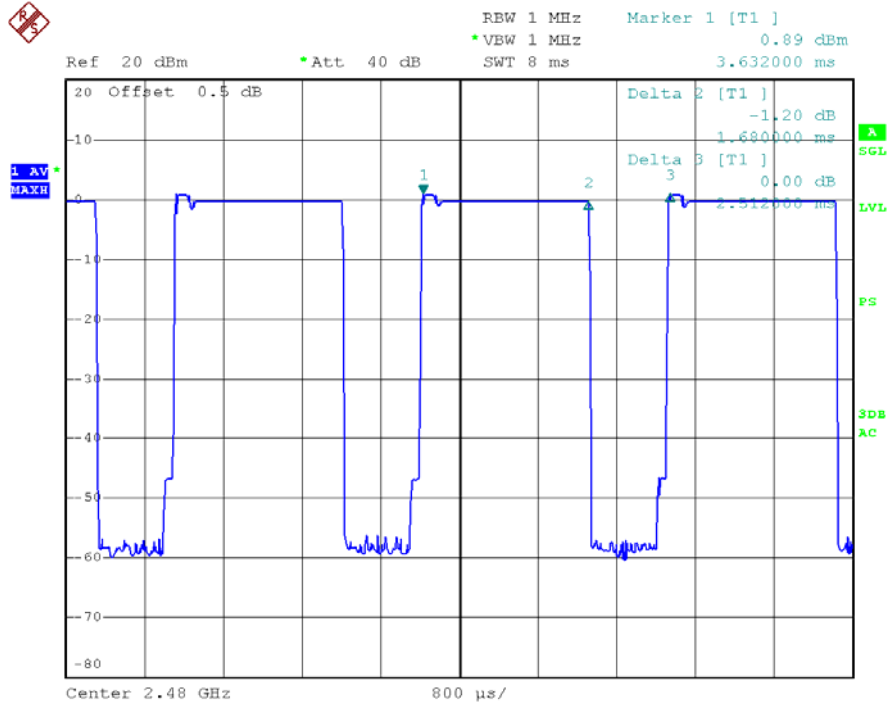
2DH1



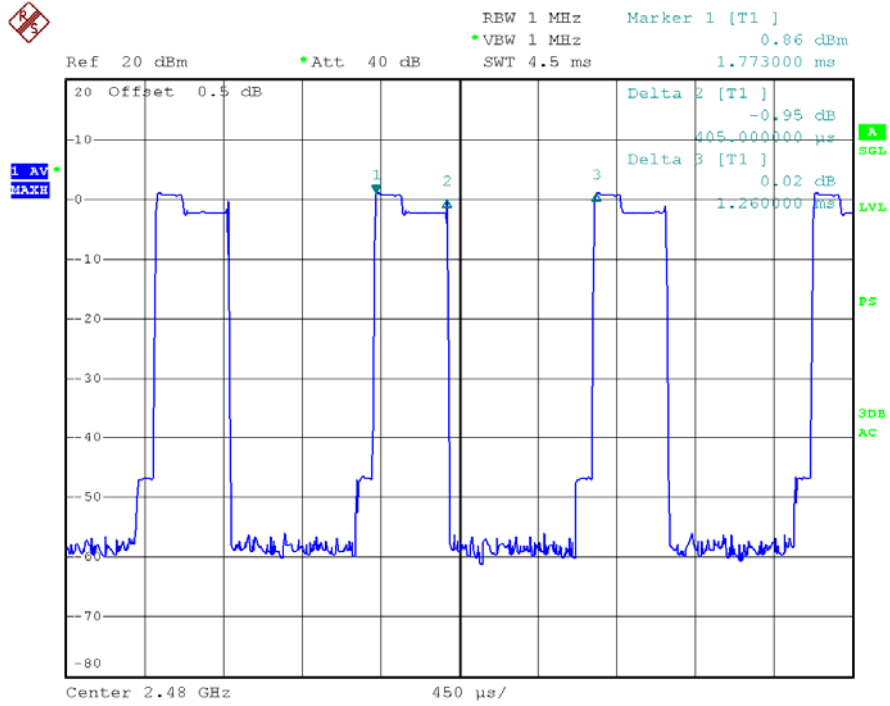
2DH3



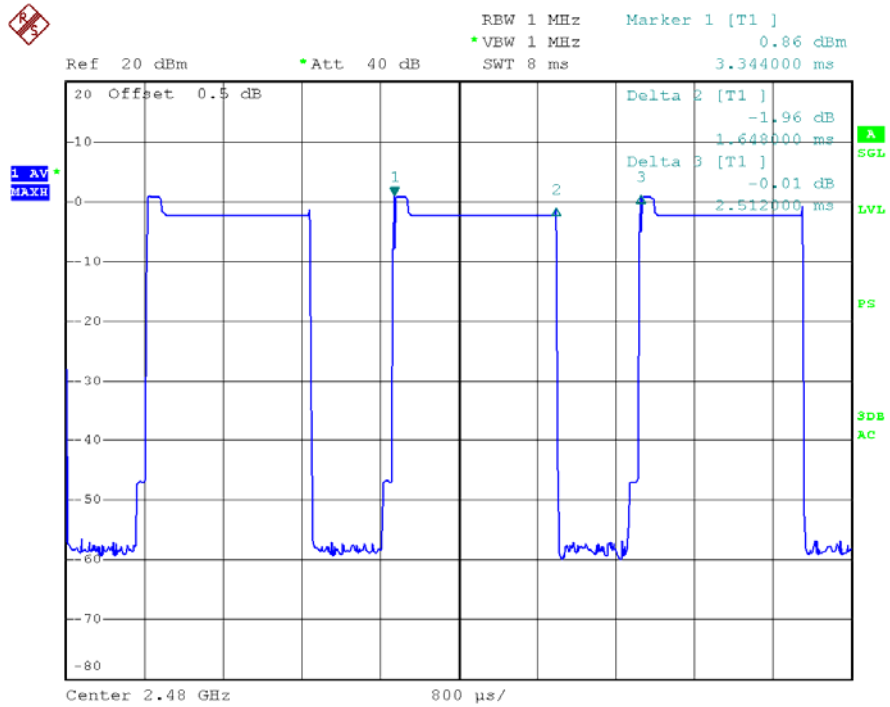
2DH5

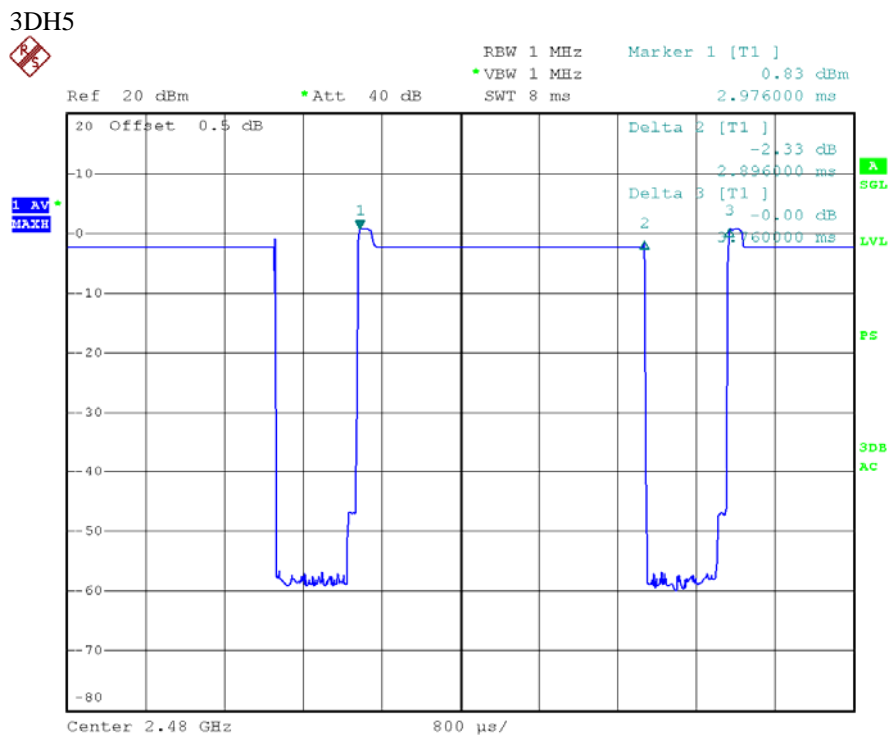


3DH1



3DH3





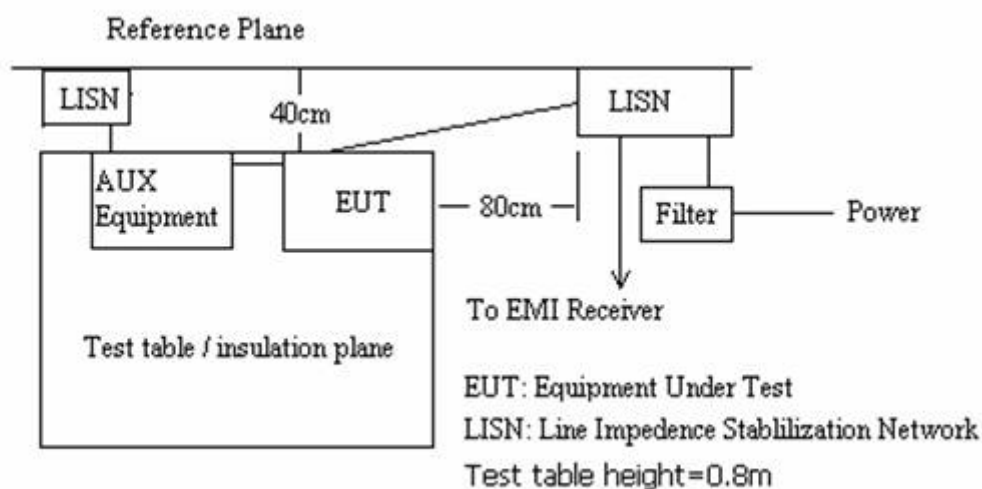
4.7 CONDUCTED EMISSION MEASUREMENT

| | |
|-------------------|--|
| Test Requirement: | FCC Part 15.207 |
| Test Method: | ANSI C63.10 |
| Test Date: | 2012-07-12 |
| Frequency Range: | 150KHz to 30MHz |
| Detector: | Peak for pre-scan (9kHz Resolution Bandwidth) Quasi-Peak if maximised peak within 6dB of Quasi-Peak limit |
| EUT Operation: | Pretest the EUT in 3 modulations to find GFSK and 8DPSK is worse case, so only record 8DPSK test data. |

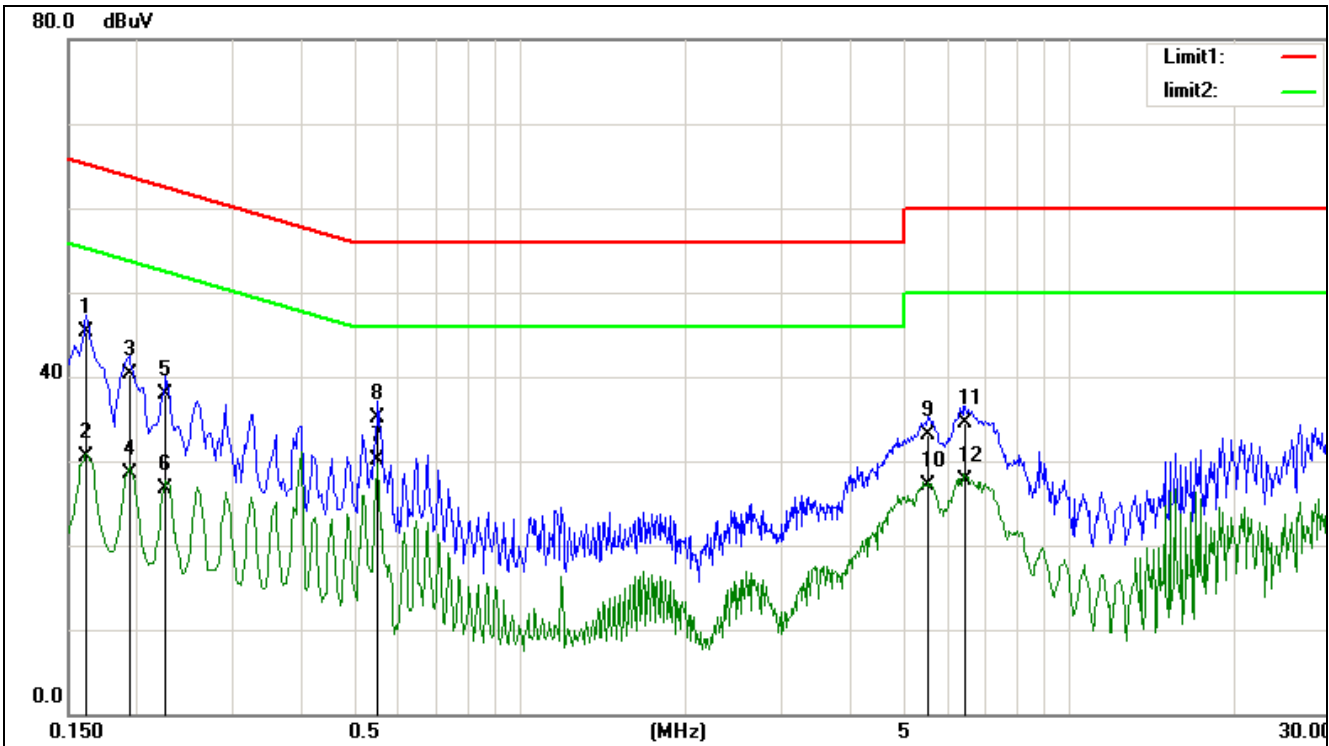
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Plan View of Test Setup

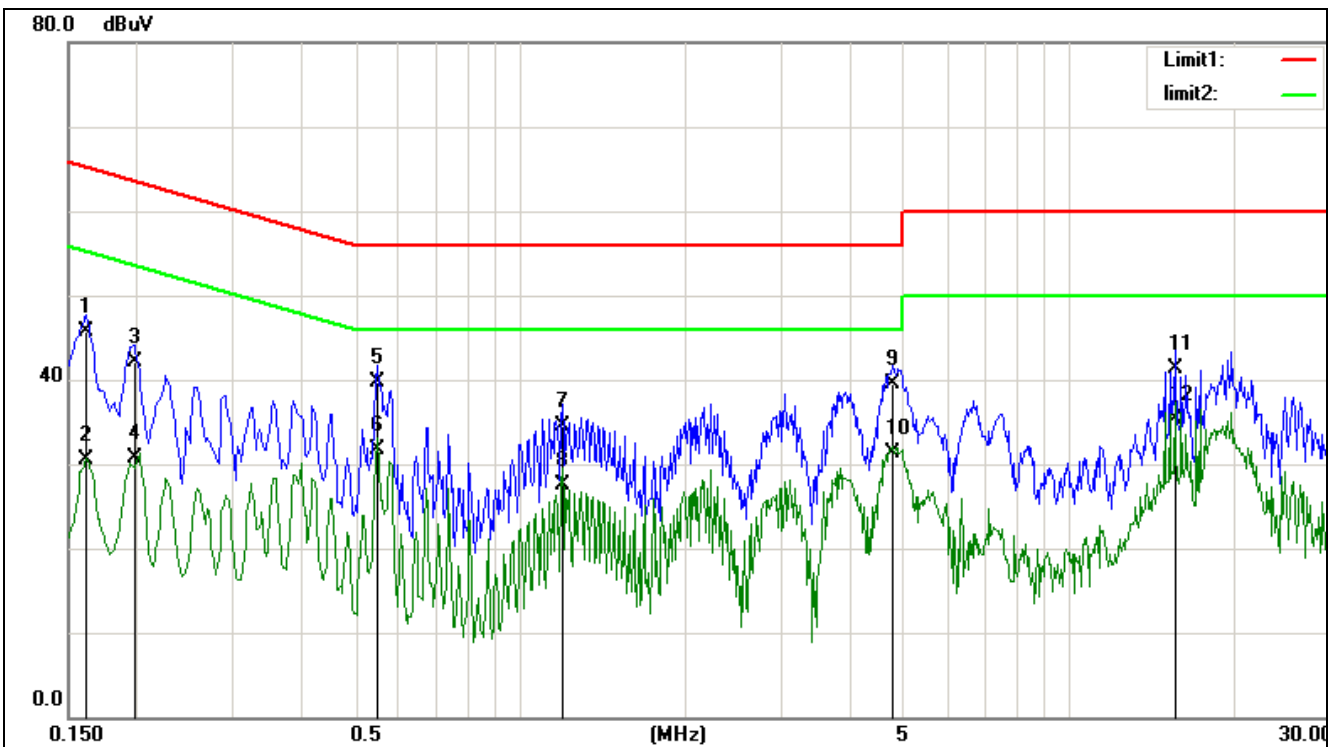


| | | | |
|-------------------------|------------------------------------|----------------------|---------------------|
| Project No.: | ZJ00016958 | Probe: | L1 |
| Standard: | (CE) FCC PART 15 class B_QP | Power Source: | AC 120V/60Hz |
| Test item: | Conduction Test | Date: | 2012-7-12 |
| Temp./Hum.(%RH): | 22/46%RH | Time: | 16:26:51 |
| EUT: | Soundbar | | |
| Model: | CINEMA SB200 | Test Result: | Pass |
| Note: | / | | |



| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor (dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|---------------------|---------------|--------------|-------------|--------|
| 1 | 0.1615 | 33.51 | 11.79 | 45.30 | 65.38 | -20.08 | QP |
| 2 | 0.1615 | 18.81 | 11.79 | 30.60 | 55.38 | -24.78 | AVG |
| 3 | 0.1932 | 29.18 | 11.22 | 40.40 | 63.89 | -23.49 | QP |
| 4 | 0.1932 | 17.38 | 11.22 | 28.60 | 53.89 | -25.29 | AVG |
| 5 | 0.2255 | 27.03 | 10.97 | 38.00 | 62.61 | -24.61 | QP |
| 6 | 0.2255 | 15.73 | 10.97 | 26.70 | 52.61 | -25.91 | AVG |
| 7 | 0.5493 | 19.68 | 10.52 | 30.20 | 56.00 | -25.80 | QP |
| 8 | 0.5493 | 24.58 | 10.52 | 35.10 | 56.00 | -20.90 | QP |
| 9 | 5.5053 | 22.41 | 10.79 | 33.20 | 60.00 | -26.80 | QP |
| 10 | 5.5053 | 16.31 | 10.79 | 27.10 | 50.00 | -22.90 | AVG |
| 11 | 6.4537 | 23.89 | 10.71 | 34.60 | 60.00 | -25.40 | QP |
| 12 | 6.4537 | 17.09 | 10.71 | 27.80 | 50.00 | -22.20 | AVG |

| | | | |
|-------------------------|------------------------------------|----------------------|---------------------|
| Project No.: | ZJ00016958 | Probe: | N |
| Standard: | (CE) FCC PART 15 class B_QP | Power Source: | AC 230V/50Hz |
| Test item: | Conduction Test | Date: | 2012-7-12 |
| Temp./Hum.(%RH): | 22/46%RH | Time: | 16:13:28 |
| EUT: | Soundbar | | |
| Model: | CINEMA SB200 | Test Result: | Pass |
| Note: | / | | |

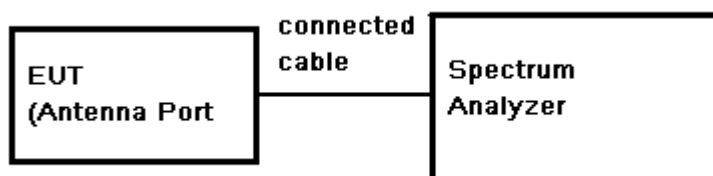


| No. | Frequency (MHz) | Reading (dBuV) | Correct Factor(dB) | Result (dBuV) | Limit (dBuV) | Margin (dB) | Remark |
|-----|-----------------|----------------|--------------------|---------------|--------------|-------------|--------|
| 1 | 0.1615 | 33.91 | 11.79 | 45.70 | 65.38 | -19.68 | QP |
| 2 | 0.1615 | 18.71 | 11.79 | 30.50 | 55.38 | -24.88 | AVG |
| 3 | 0.1975 | 31.06 | 11.14 | 42.20 | 63.71 | -21.51 | QP |
| 4 | 0.1975 | 19.66 | 11.14 | 30.80 | 53.71 | -22.91 | AVG |
| 5 | 0.5493 | 29.18 | 10.52 | 39.70 | 56.00 | -16.30 | QP |
| 6 | 0.5493 | 21.28 | 10.52 | 31.80 | 46.00 | -14.20 | AVG |
| 7 | 1.1907 | 24.15 | 10.45 | 34.60 | 56.00 | -21.40 | QP |
| 8 | 1.1907 | 17.05 | 10.45 | 27.50 | 46.00 | -18.50 | AVG |
| 9 | 4.7716 | 28.89 | 10.71 | 39.60 | 56.00 | -16.40 | QP |
| 10 | 4.7716 | 20.69 | 10.71 | 31.40 | 46.00 | -14.60 | AVG |
| 11 | 15.5523 | 30.43 | 10.97 | 41.40 | 60.00 | -18.60 | QP |
| 12 | 15.5523 | 24.43 | 10.97 | 35.40 | 50.00 | -14.60 | AVG |

4.8 MAXIMUM PEAK OUTPUT POWER

| | |
|-------------------|--|
| Test Requirement: | FCC Part 15.247 & DA 00-705 |
| Test Method: | Base on ANSI 63.10 |
| Test Date: | 2012-07-12 |
| Test Limit: | Regulation 15.247 (b)(1)For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts. Refer to the result “Hopping channel number” of this document. The 1 watt (30.0dBm) limit applies. |
| Test mode: | Test in fixing frequency transmitting mode. |
| Power supply: | Connected with convert board powered by PC USB ports, and to fix frequency transmitting. |

Test Configuration:



Test Procedure:

- 1 . Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
- 2 . Set the spectrum analyzer: RBW = 3 MHz. VBW = 3 MHz. Sweep = auto; Detector Function = Peak.
- 3 . Keep the EUT in transmitting at lowest, medium and highest channel individually. Record the max value.

Remark:

Pre-test the 3 modulation to find GFSK and 8DPSK is worse case, so only record GFSK and 8DPSK test data.

Test Result:

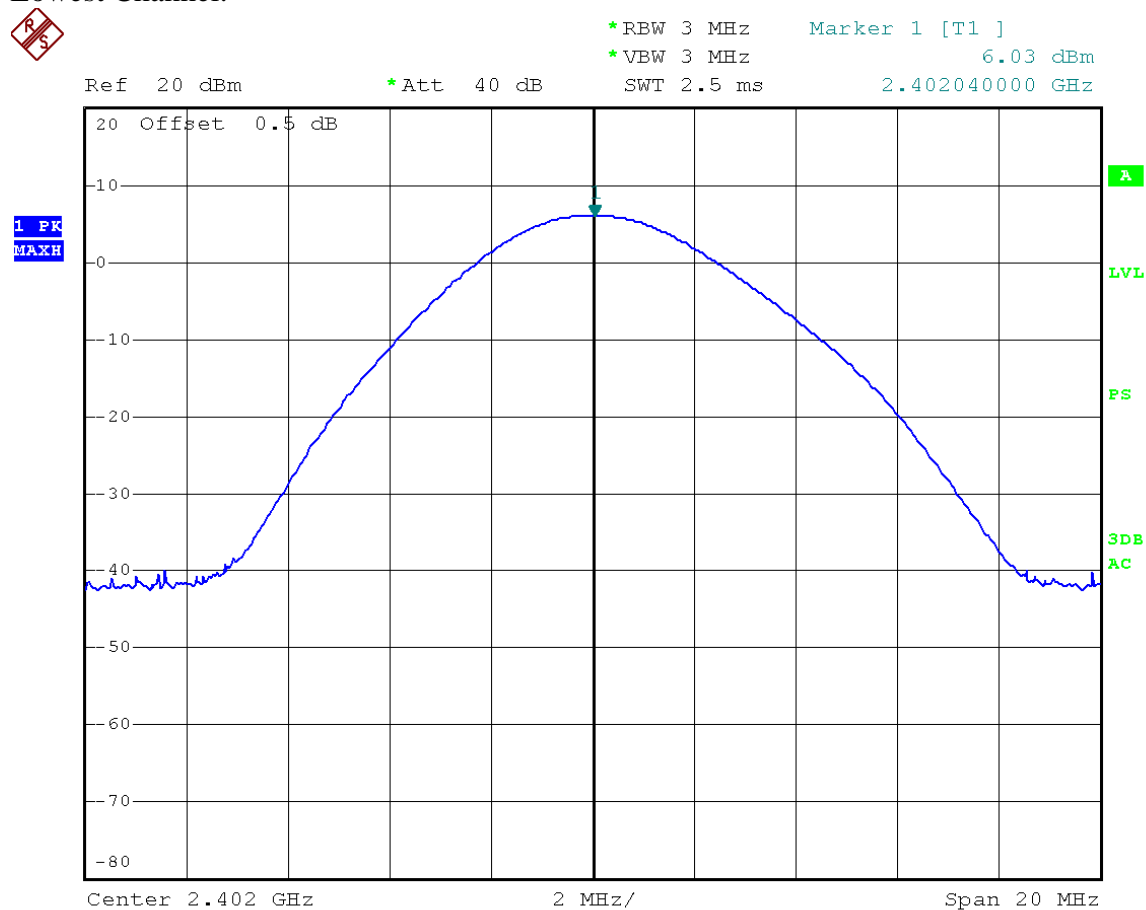
For GFSK:

| Test Channel | Fundamental Frequency (GHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|--------------|-----------------------------|--------------------|-------------|-------------|
| Lowest | 2.402 | 6.03 | 30.0 | 24.05 |
| Middle | 2.441 | 4.97 | 30.0 | 24.81 |
| Highest | 2.480 | 4.09 | 30.0 | 25.5 |

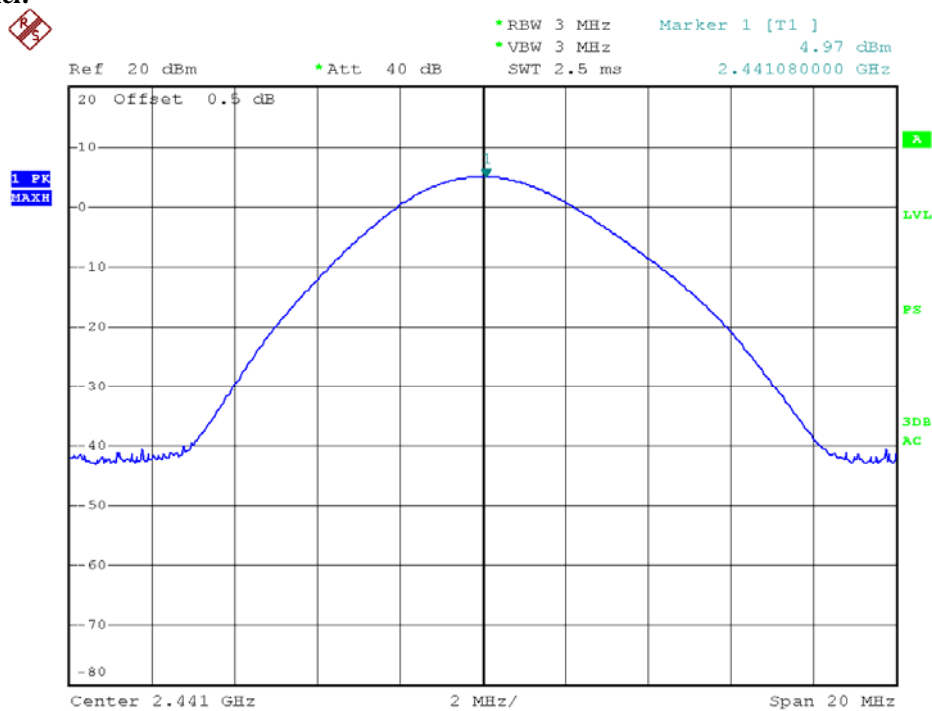
Test result: The unit does meet the FCC requirements.

Test result plot as follows:

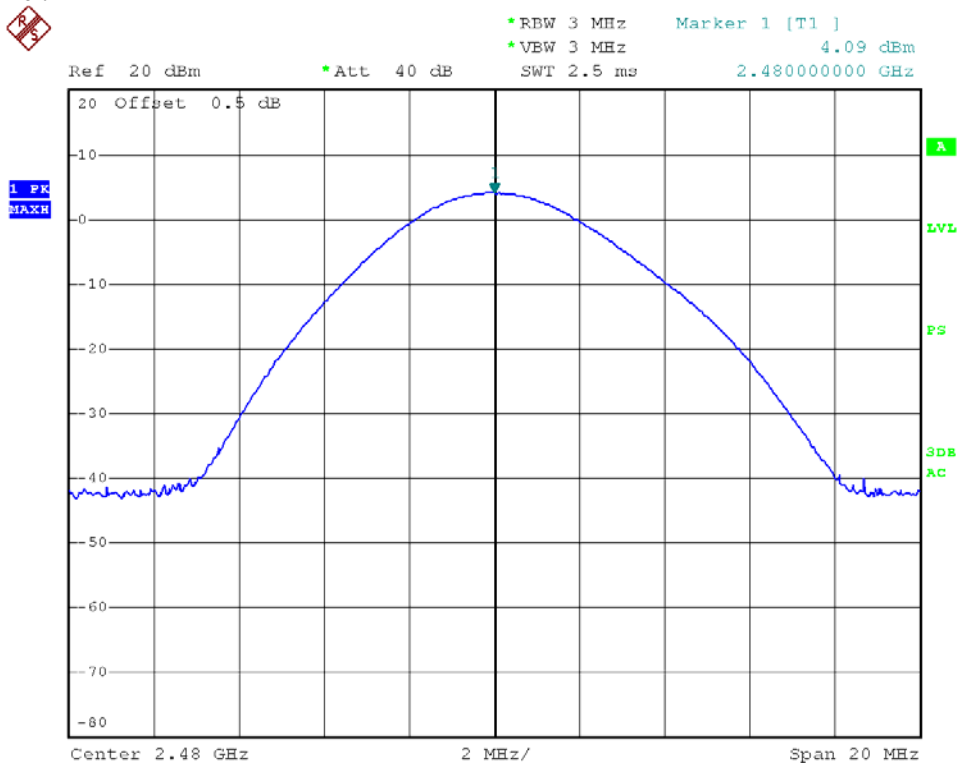
Lowest Channel:



Middle Channel:



Highest Channel:



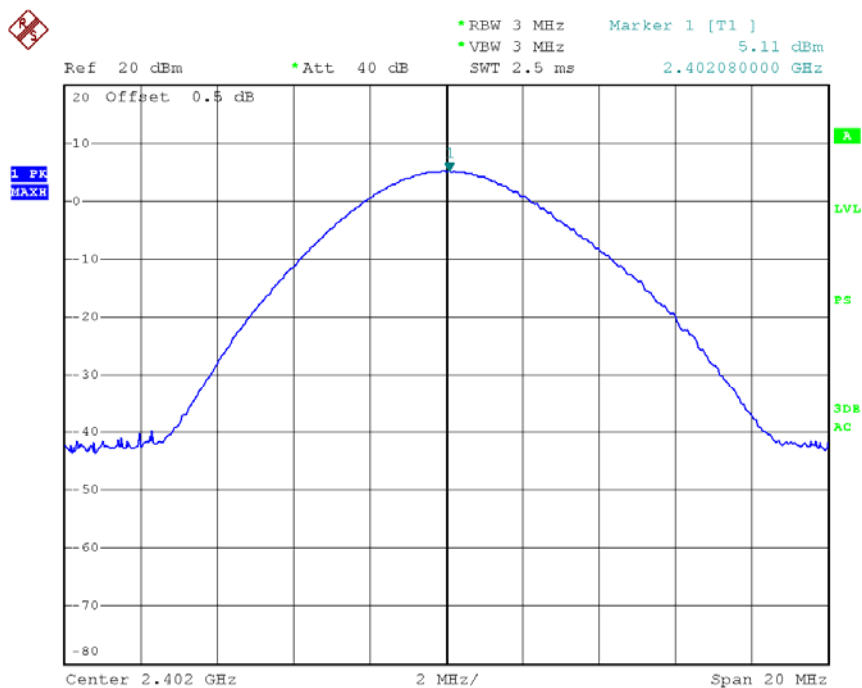
For 8DPSK:

| Test Channel | Fundamental Frequency (GHz) | Output Power (dBm) | Limit (dBm) | Margin (dB) |
|--------------|-----------------------------|--------------------|-------------|-------------|
| Lowest | 2.402 | 5.11 | 30.0 | 25.31 |
| Middle | 2.441 | 3.90 | 30.0 | 26.32 |
| Highest | 2.480 | 2.85 | 30.0 | 27.07 |

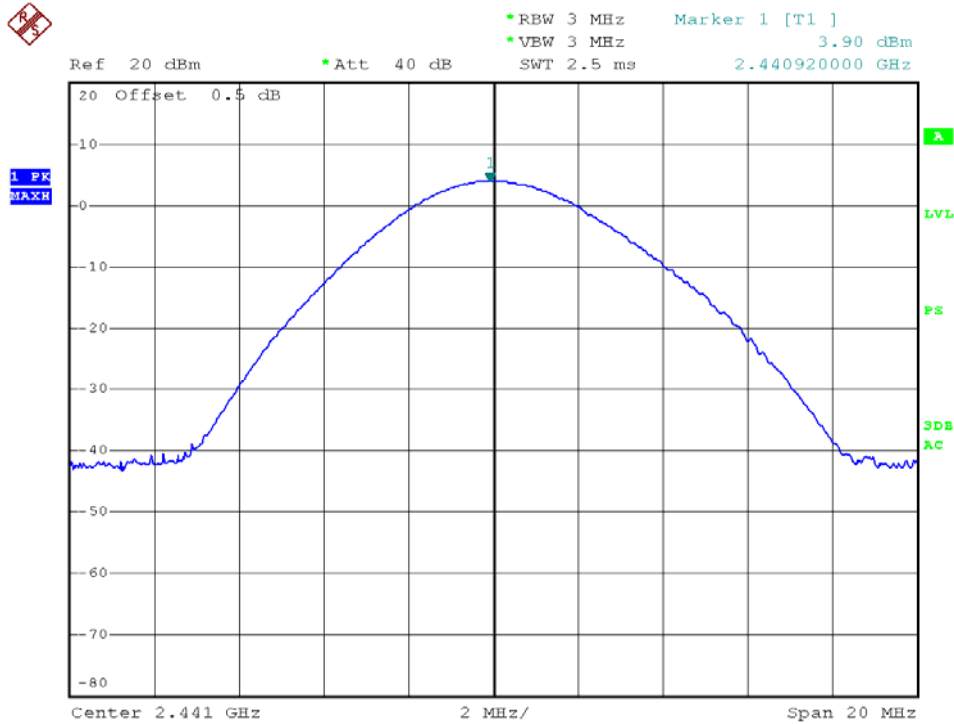
Test result: The unit does meet the FCC requirements.

Test result plot as follows:

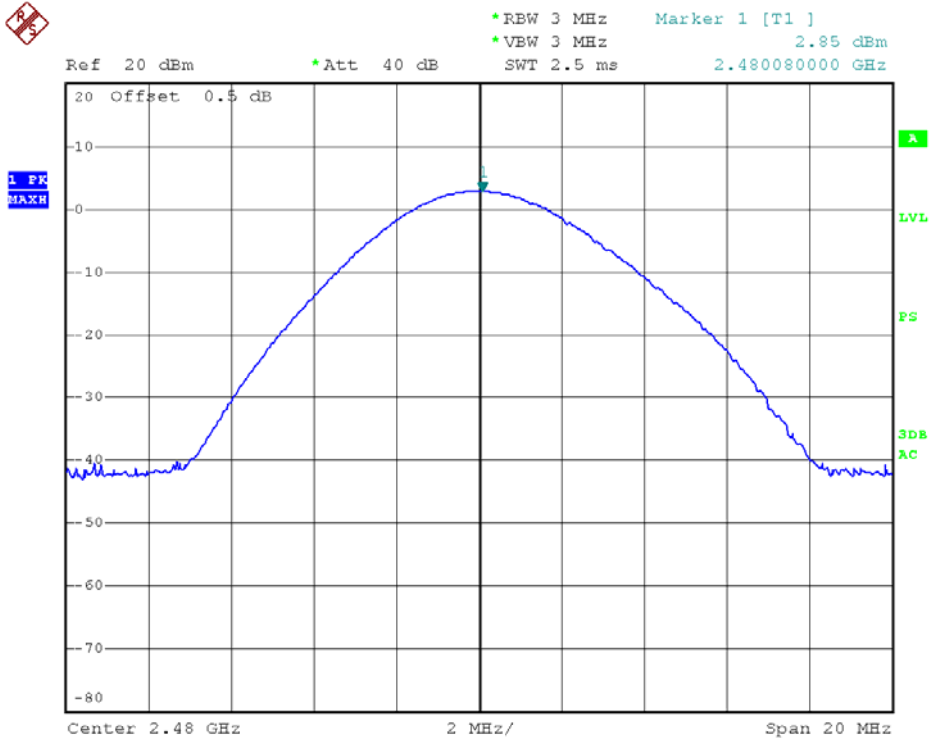
Lowest Channel:



Middle Channel:

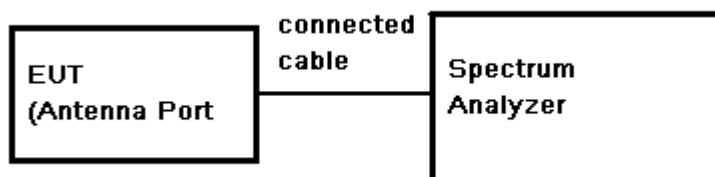


Highest Channel:



4.9 CONDUCTED SPURIOUS EMISSIONS

Test Requirement: FCC Part 15.247
 Test Method: Based on FCC Part 15 C Section 15.247
 Test Date: 2012-07-12
 Power supply: Connected with convert board powered by PC USB ports, and to fix frequency transmitting.
 Test requirements: (d) 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. provided the transmitter demonstrates compliance with the peak conducted power limits.
 Test Status: Test the lowest. Middle, highest channel.
 Test Configuration:



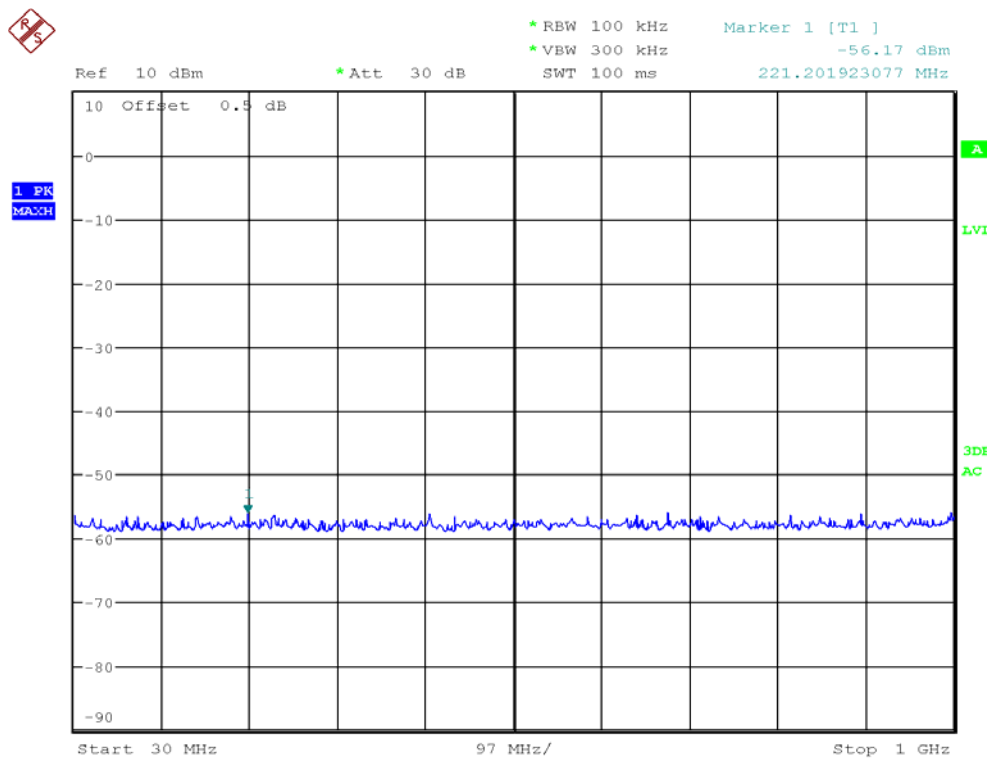
- Test Procedure:
1. Remove the antenna from the EUT and then connect a low RF cable from the antenna port to the spectrum.
 2. Set the spectrum analyzer: Sweep = auto; Detector Function = Peak (Max. hold).

Test result plot as follows:

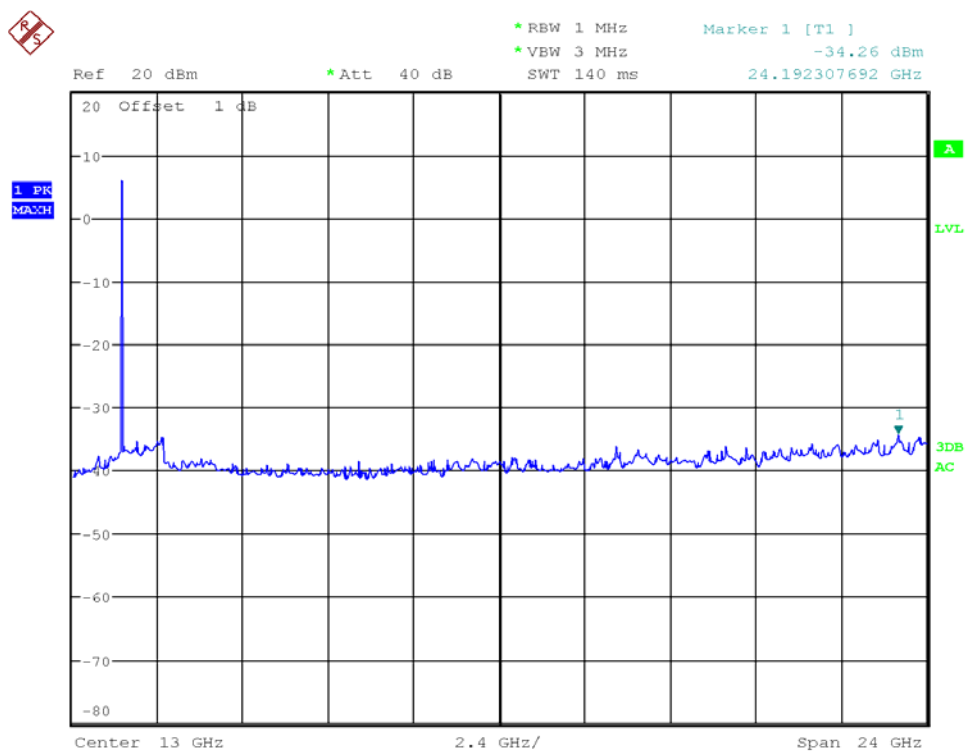
For GFSK

Lowest Channel:

30M to 1GHz

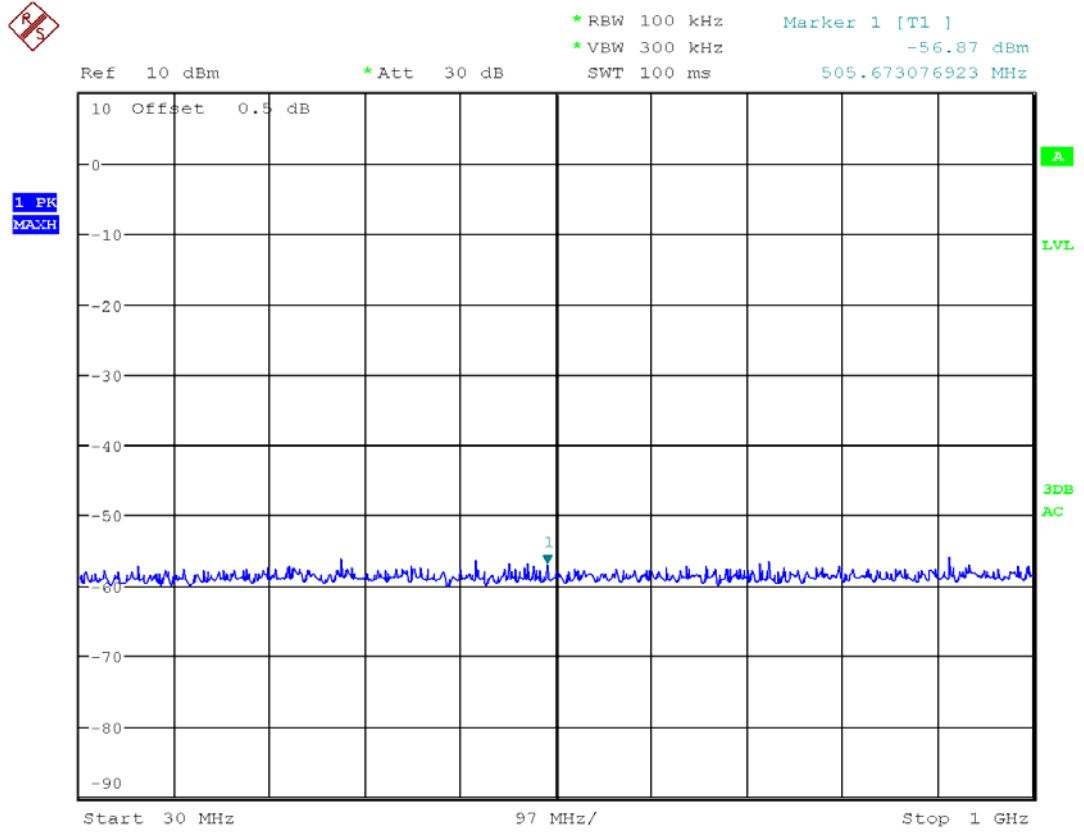


1G to 25GHz

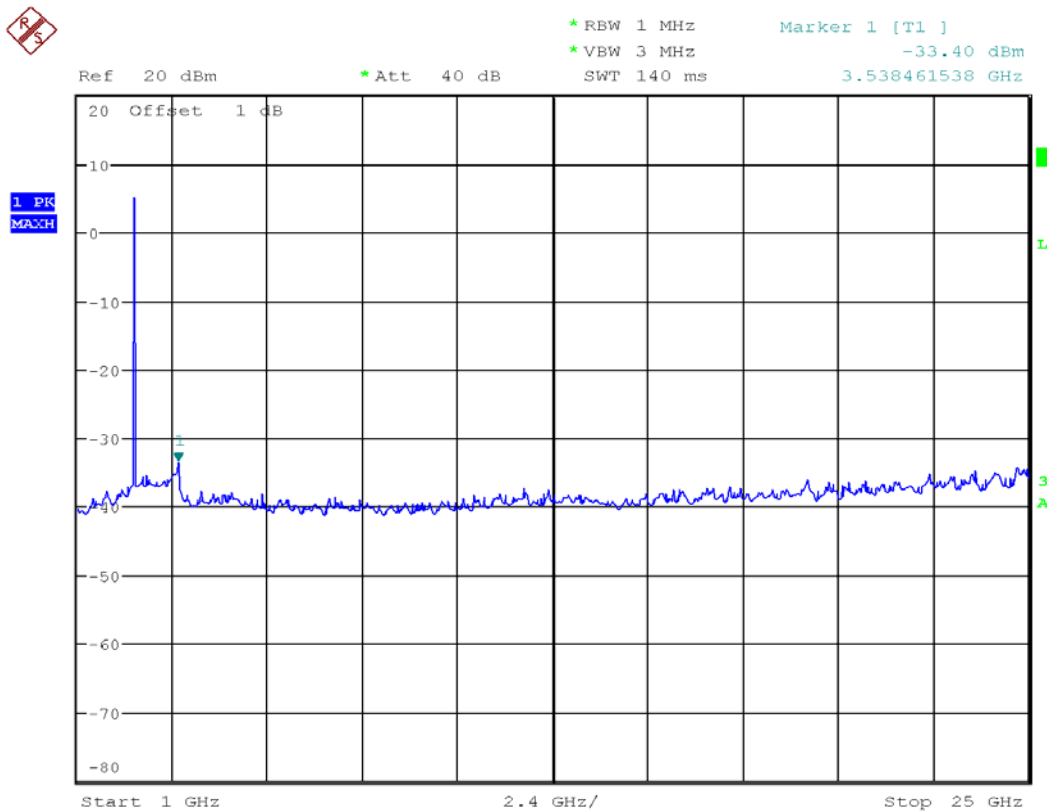


Middle Channel:

30M to 1GHz

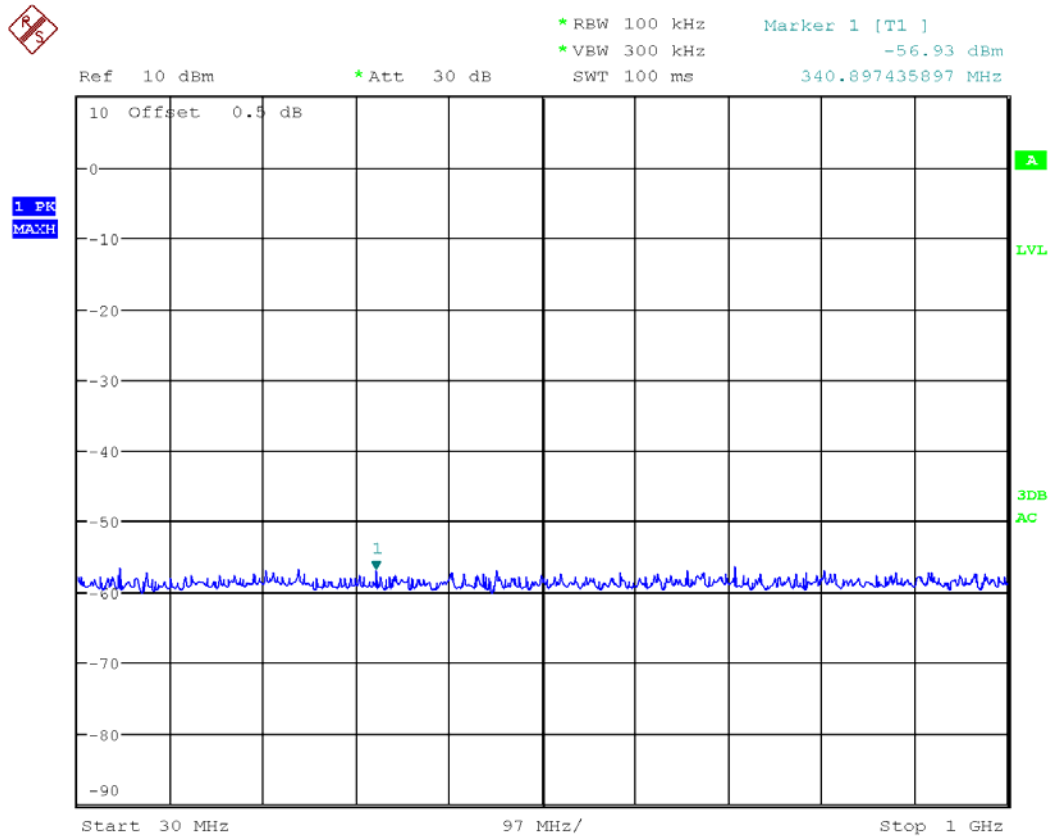


1G to 25GHz

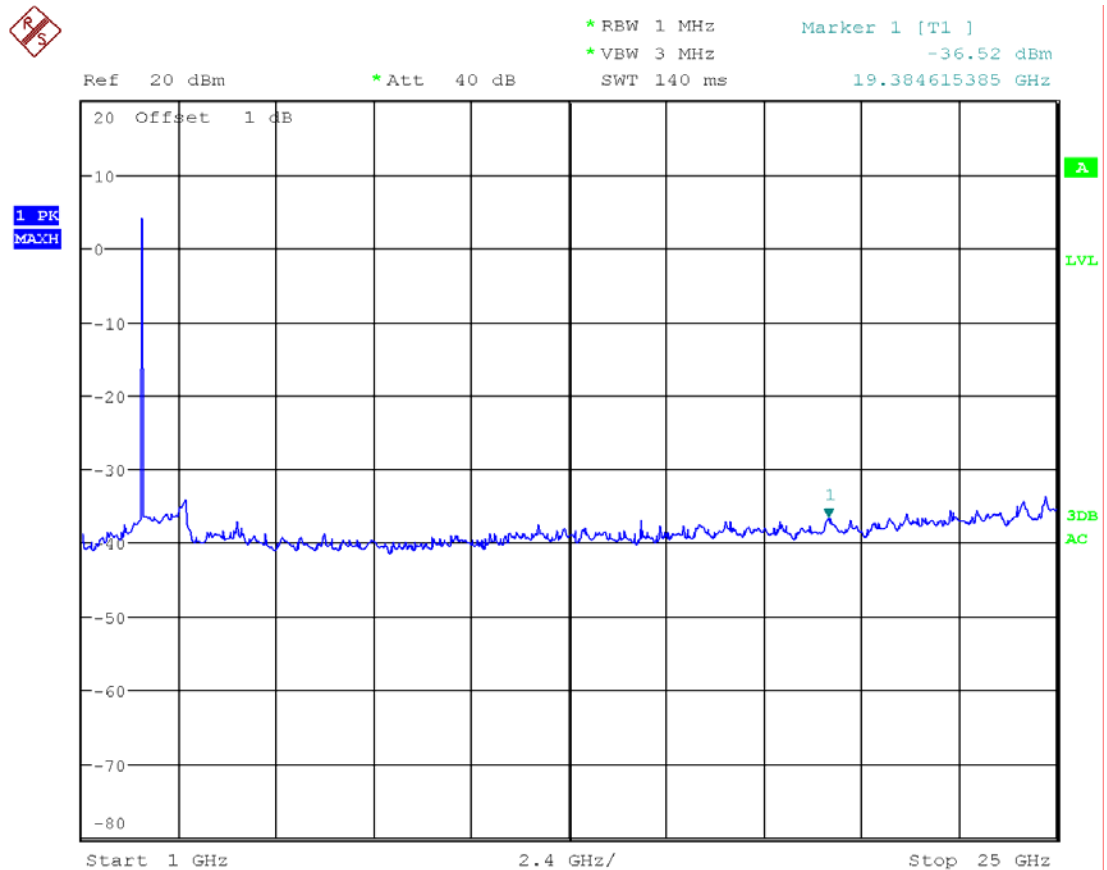


Highest Channel

30M to 1GHz



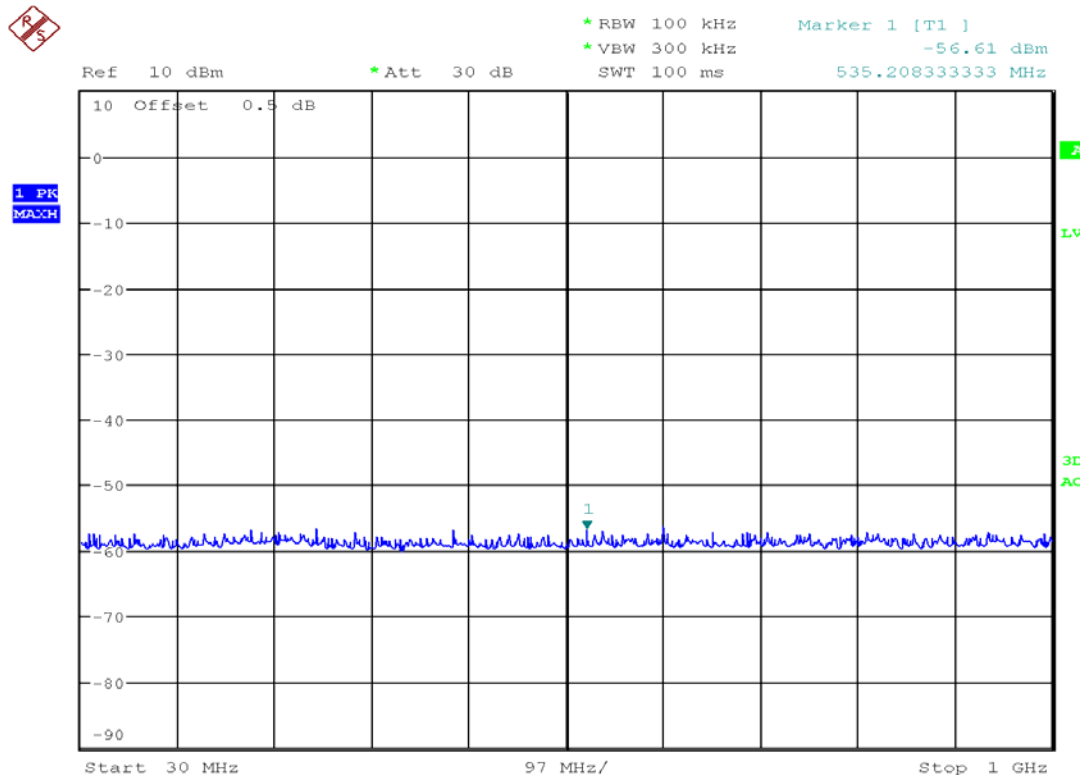
1G to 25GHz



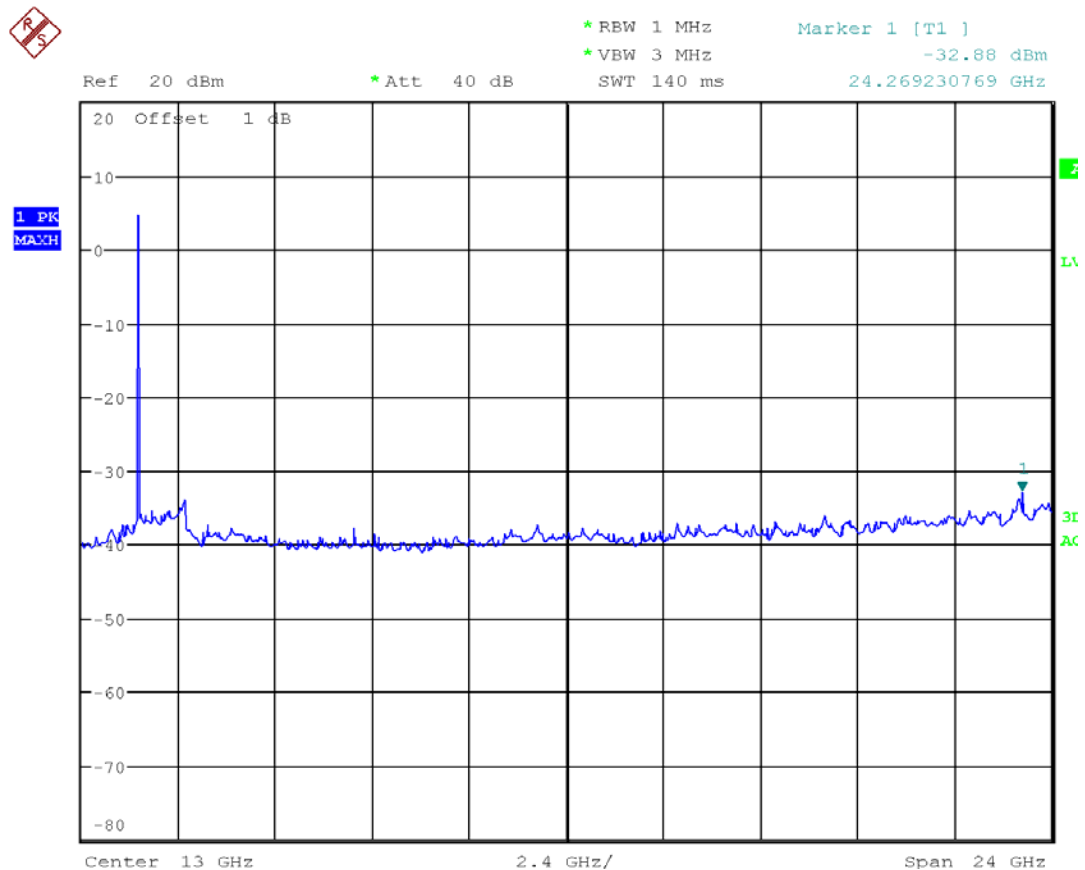
For 8DPSK

Lowest Channel:

30M to 1GHz

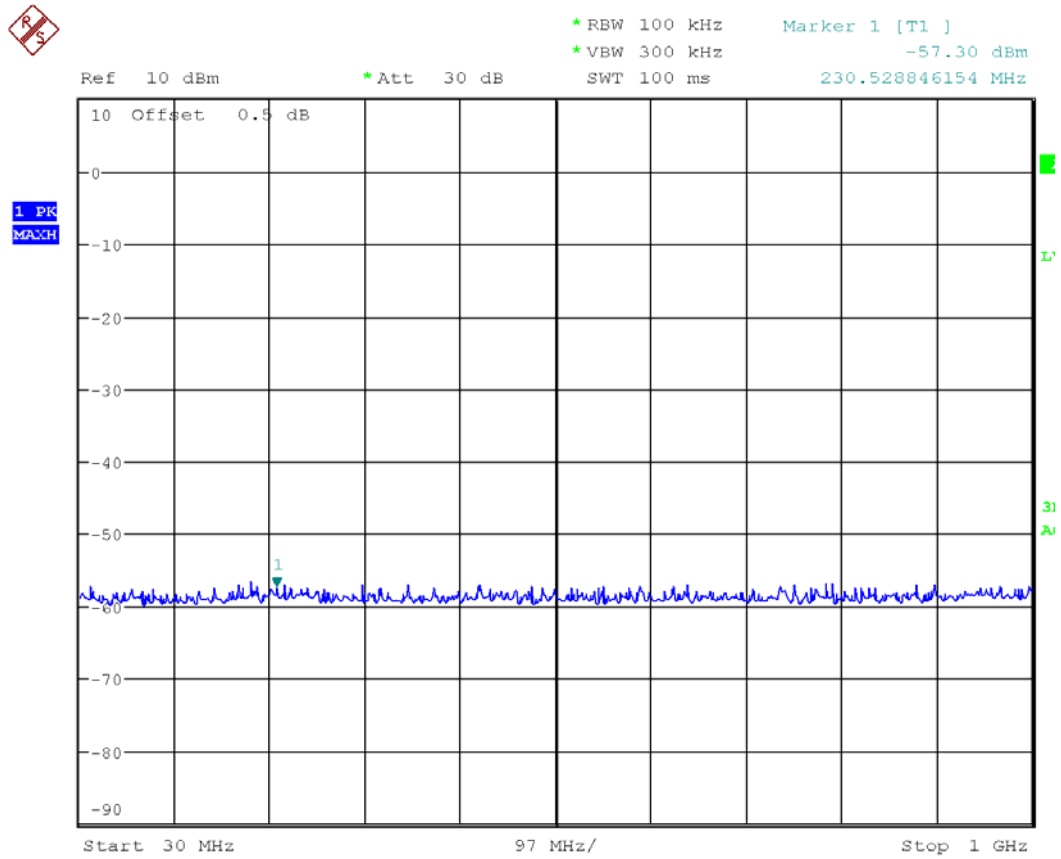


1G to 25GHz

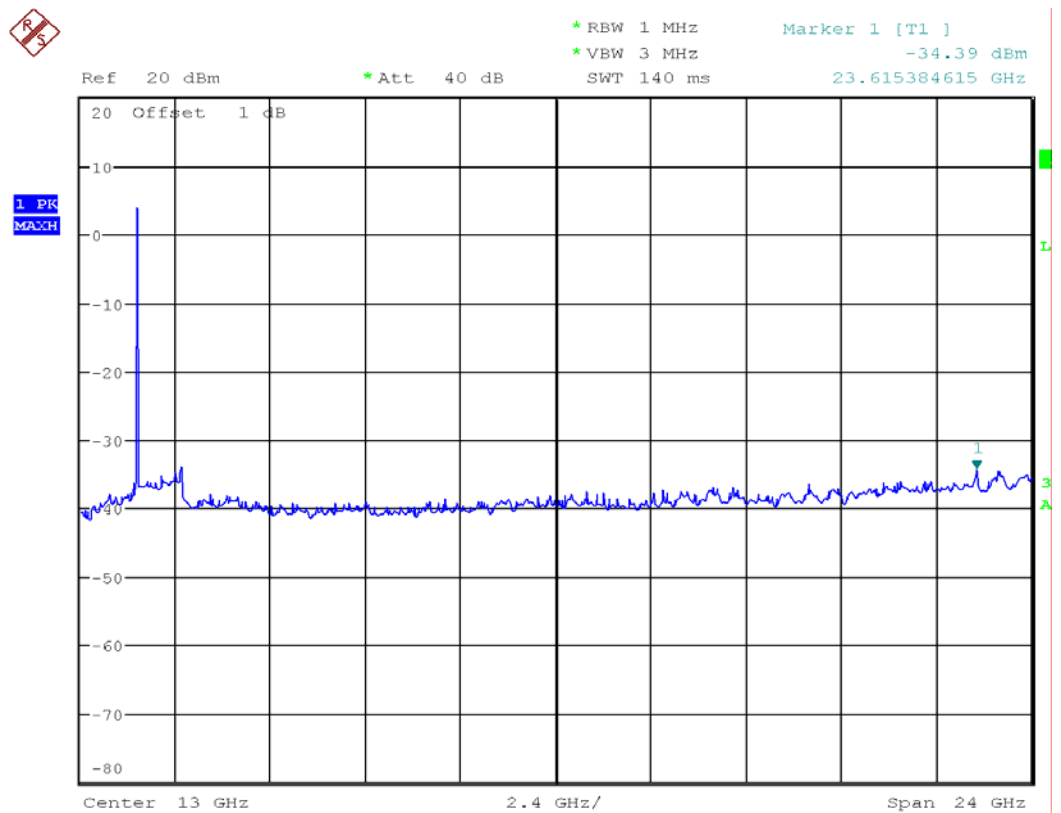


Middle Channel:

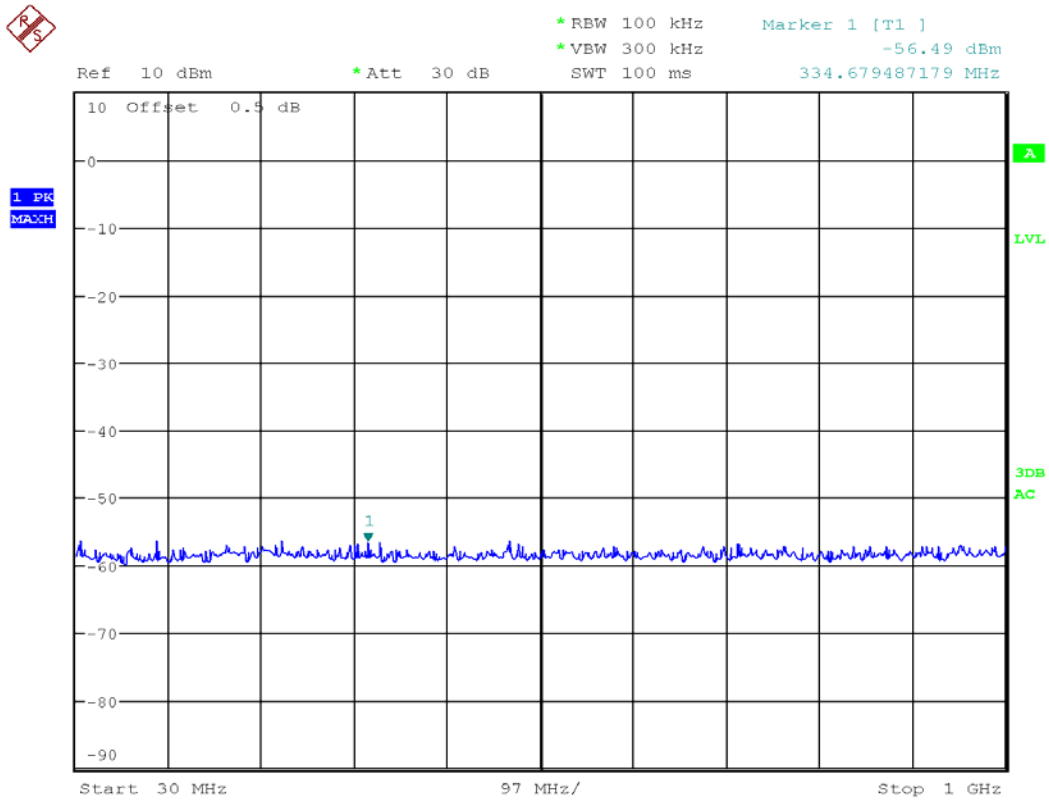
30M to 1GHz



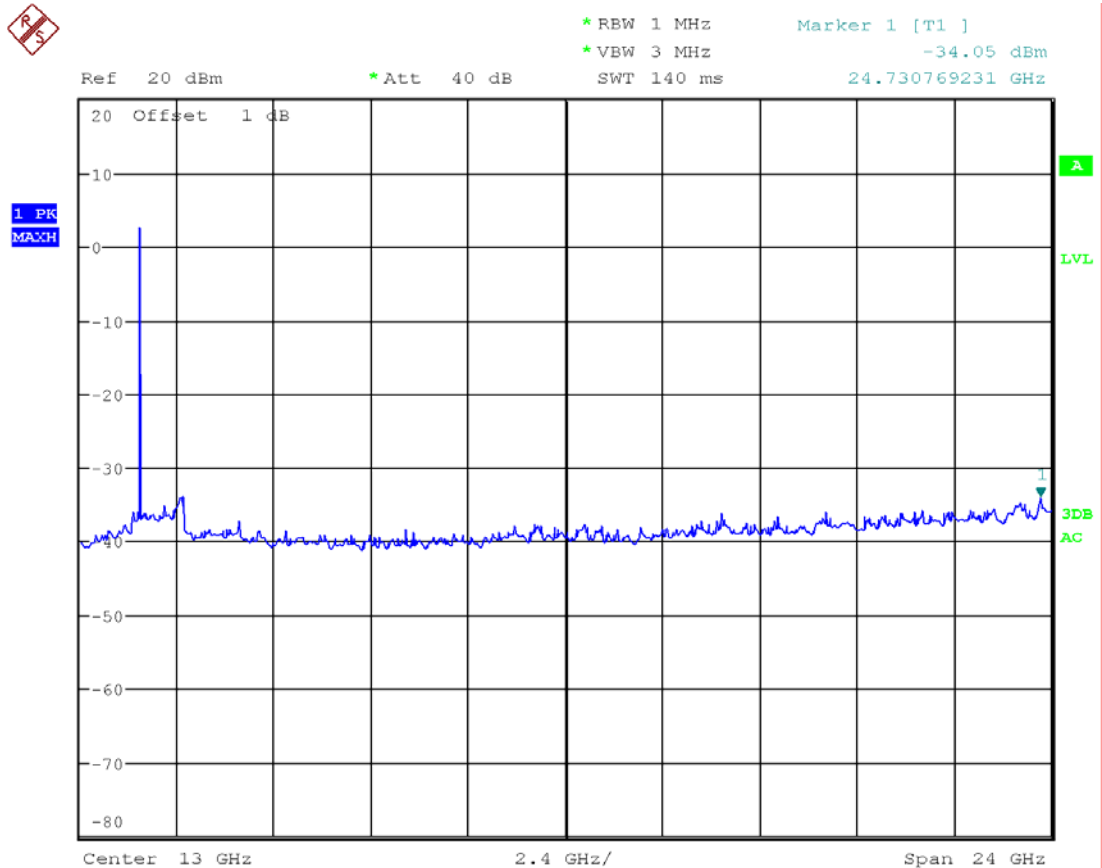
1G to 25GHz



Highest Channel
30M to 1GHz



1G to 25GHz



4.10 RADIATED SPURIOUS EMISSIONS

| | |
|-------------------|--|
| Test Requirement: | FCC 15.247(d) & 15.209 |
| Test Method: | ANSI C63.10 section 8 & 13 |
| Test Date: | 2012-07-12 |
| Test Status: | Test in fixing frequency transmitting mode. |
| Test site: | Measurement Distance: 3m (Semi-Anechoic Chamber) Test instrumentation resolution bandwidth 120 kHz and Quasi-Peak detector applies (30 MHz – 1000 MHz). 1MHz resolution bandwidth and Peak and Average-Peak detector apply (1000 MHz – 25GHz). Receive antenna scan height 1 m – 4 m. polarization Vertical / Horizontal |
| Power supply: | Connected with convert board powered by PC USB ports, and to fix frequency transmitting. |
| 15.209 Limit: | 40.0 dB μ V/m between 30MHz & 88MHz 43.5 dB μ V/m between 88MHz & 216MHz 46.0 dB μ V/m between 216MHz & 960MHz 54.0 dB μ V/m above 960MHz 1G ~26.5GHz , 74dB μ V/m in Peak , 54.0 dB μ V/m in AV. |
| 15.247(d) limit: | (d) 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, provided the transmitter demonstrates compliance with the peak conducted power limits. |

Test Configuration:

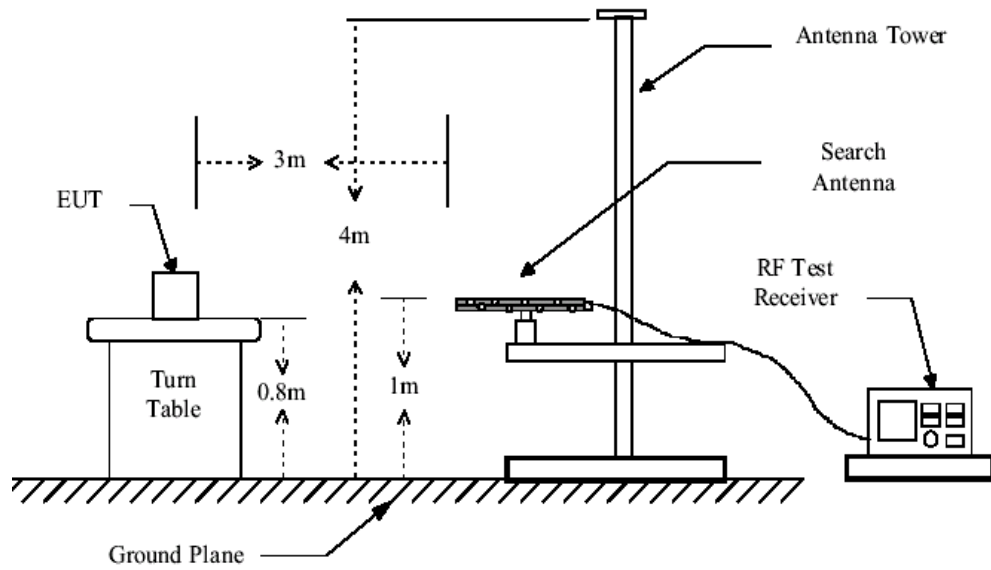


Figure 1. 30MHz to 1GHz radiated emissions test configuration

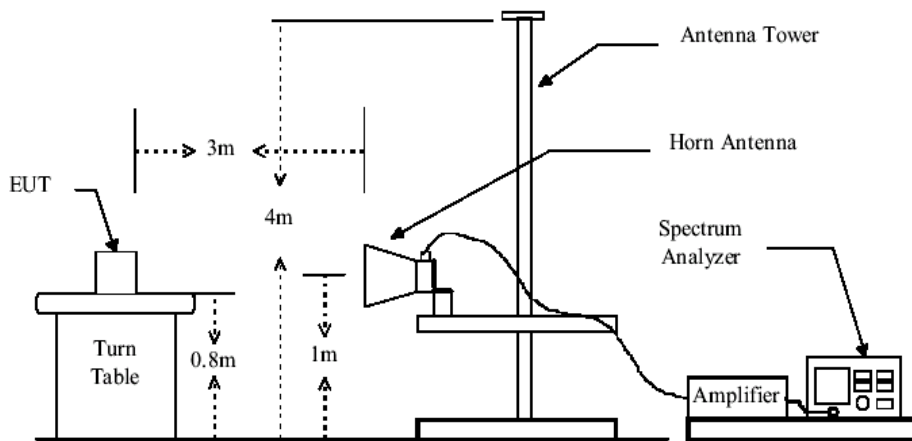


Figure 2. Above 1GHz radiated emissions test configuration

Test Procedure: The procedure used was ANSI Standard C63.10:2009. The receiver was scanned from 30MHz to 25GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

Pre-test for normal mode and EDR mode, to find the EDR is the worst case. The worst case emissions were reported.

Test Results

1. Low Frequency 2402MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 64.0605 | 21.73 | 7.87 | 29.60 | 43.5 | -13.90 | Vertical |
| 2 | 93.8739 | 23.03 | 9.77 | 32.80 | 43.5 | -10.70 | Vertical |
| 3 | 103.8662 | 24.90 | 9.80 | 34.70 | 43.5 | -8.80 | Vertical |
| 4 | 103.8662 | 29.70 | 9.80 | 33.50 | 43.5 | -10.00 | Horizontal |
| 5 | 200.4536 | 22.80 | 11.40 | 34.20 | 43.5 | -9.30 | Horizontal |
| 6 | 256.6826 | 22.55 | 13.85 | 36.40 | 46.0 | -9.60 | Horizontal |

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 6493.816 | 30.33 | 18.32 | 48.65 | 74.00 | -25.35 | Vertical |
| 2 | 8013.941 | 31.45 | 23.29 | 54.74 | 74.00 | -19.26 | Vertical |
| 3 | 9889.909 | 31.08 | 25.51 | 56.59 | 74.00 | -17.41 | Vertical |
| 4 | 6541.918 | 31.01 | 18.38 | 49.39 | 74.00 | -24.61 | Horizontal |
| 5 | 8073.304 | 31.04 | 23.40 | 54.44 | 74.00 | -19.56 | Horizontal |
| 6 | 9709.112 | 30.90 | 25.21 | 56.11 | 74.00 | -17.89 | Horizontal |
| 7 | 22967.124 | 32.30 | 25.96 | 58.26 | 74.00 | -15.74 | Vertical |
| 8 | 22445.604 | 33.65 | 25.63 | 59.28 | 74.00 | -14.72 | Horizontal |

AV Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 6493.816 | 19.48 | 18.32 | 37.80 | 54.00 | -16.20 | Vertical |
| 2 | 8013.941 | 18.81 | 23.29 | 42.10 | 54.00 | -11.90 | Vertical |
| 3 | 9889.909 | 18.99 | 25.51 | 44.50 | 54.00 | -9.50 | Vertical |
| 4 | 6541.918 | 19.32 | 18.38 | 37.70 | 54.00 | -16.30 | Horizontal |
| 5 | 8073.304 | 19.10 | 23.40 | 42.50 | 54.00 | -11.50 | Horizontal |
| 6 | 9709.112 | 18.99 | 25.21 | 44.20 | 54.00 | -9.80 | Horizontal |
| 7 | 22967.124 | 20.24 | 25.96 | 46.20 | 54.00 | -7.80 | Vertical |
| 8 | 22445.604 | 20.57 | 25.63 | 46.20 | 54.00 | -7.80 | Horizontal |

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Correct Factor

2. Middle Frequency 2441MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 80.2067 | 23.12 | 8.58 | 31.70 | 40.00 | -8.30 | Vertical |
| 2 | 85.3210 | 21.67 | 9.13 | 30.80 | 40.00 | -9.20 | Vertical |
| 3 | 103.8662 | 25.30 | 9.80 | 35.10 | 43.50 | -8.40 | Vertical |
| 4 | 103.8662 | 27.80 | 9.80 | 37.60 | 43.50 | -5.90 | Horizontal |
| 5 | 208.4958 | 19.54 | 11.86 | 31.40 | 43.50 | -12.10 | Horizontal |
| 6 | 321.3783 | 17.89 | 16.31 | 34.20 | 46.00 | -11.80 | Horizontal |

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 8756.039 | 30.95 | 24.22 | 55.17 | 74.00 | -18.83 | Horizontal |
| 2 | 7582.417 | 30.89 | 21.80 | 52.69 | 74.00 | -21.31 | Horizontal |
| 3 | 8013.941 | 29.77 | 23.29 | 53.06 | 74.00 | -20.94 | Vertical |
| 4 | 9426.685 | 31.33 | 24.76 | 56.09 | 74.00 | -17.91 | Vertical |
| 5 | 22480.000 | 32.22 | 25.65 | 57.87 | 74.00 | -16.13 | Vertical |
| 6 | 22967.124 | 32.13 | 25.96 | 58.09 | 74.00 | -15.91 | Vertical |
| 7 | 22583.507 | 32.20 | 25.72 | 57.92 | 74.00 | -16.08 | Horizontal |
| 8 | 22240.327 | 31.83 | 25.50 | 57.33 | 74.00 | -16.67 | Horizontal |

AV Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 7582.417 | 18.40 | 21.80 | 40.20 | 54.00 | -13.80 | Horizontal |
| 2 | 8756.039 | 18.58 | 24.22 | 42.80 | 54.00 | -11.20 | Horizontal |
| 3 | 8013.941 | 18.91 | 23.29 | 42.20 | 54.00 | -11.80 | Vertical |
| 4 | 9426.685 | 18.84 | 24.76 | 43.60 | 54.00 | -10.40 | Vertical |
| 5 | 22480.000 | 20.15 | 25.65 | 45.80 | 54.00 | -8.20 | Vertical |
| 6 | 22967.124 | 20.34 | 25.96 | 46.30 | 54.00 | -7.70 | Vertical |
| 7 | 22240.327 | 20.20 | 25.50 | 45.70 | 54.00 | -8.30 | Horizontal |
| 8 | 22583.507 | 20.58 | 25.72 | 46.30 | 54.00 | -7.70 | Horizontal |

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Correct Factor

3. High Frequency 2480MHz

30MHz~1GHz Spurious Emissions .Quasi-Peak Measurement

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 72.0843 | 24.67 | 7.83 | 32.50 | 40.00 | -7.50 | Vertical |
| 2 | 92.8248 | 22.97 | 9.73 | 32.70 | 43.50 | -10.80 | Vertical |
| 3 | 103.8662 | 25.00 | 9.80 | 34.80 | 43.50 | -8.70 | Vertical |
| 4 | 256.6826 | 20.05 | 13.85 | 33.90 | 46.00 | -12.10 | Horizontal |
| 5 | 321.3785 | 21.89 | 16.31 | 38.20 | 46.00 | -7.80 | Horizontal |
| 6 | 409.2217 | 14.05 | 18.25 | 32.30 | 46.00 | -13.70 | Horizontal |

1~25 GHz Harmonics & Spurious Emissions. Peak & Average Measurement

Peak Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 8756.039 | 30.58 | 24.22 | 54.80 | 74.00 | -19.20 | Vertical |
| 2 | 9357.371 | 31.63 | 24.67 | 56.30 | 74.00 | -17.70 | Vertical |
| 3 | 9254.355 | 30.86 | 24.54 | 55.40 | 74.00 | -18.60 | Horizontal |
| 4 | 9853.482 | 30.95 | 25.45 | 56.40 | 74.00 | -17.60 | Horizontal |
| 5 | 22583.507 | 33.15 | 25.72 | 58.87 | 74.00 | -15.13 | Vertical |
| 6 | 23108.231 | 31.68 | 25.73 | 57.41 | 74.00 | -16.59 | Vertical |
| 7 | 22480.000 | 31.52 | 25.65 | 57.17 | 74.00 | -16.83 | Horizontal |
| 8 | 22931.982 | 32.33 | 25.93 | 58.26 | 74.00 | -15.74 | Horizontal |

AV Measurement:

| No. | Frequency (MHz) | Reading (dBuV/m) | Correct Factor(dB/m) | Result (dBuV/m) | Limit (dBuV/m) | Over Limit (dB) | Antenna polarization |
|-----|--------------------|---------------------|-------------------------|--------------------|-------------------|--------------------|-------------------------|
| 1 | 8756.039 | 18.38 | 24.22 | 42.60 | 54.00 | -11.40 | Vertical |
| 2 | 9357.371 | 18.53 | 24.67 | 43.20 | 54.00 | -10.80 | Vertical |
| 3 | 9254.355 | 18.46 | 24.54 | 43.00 | 54.00 | -11.00 | Horizontal |
| 4 | 9853.482 | 18.35 | 25.45 | 43.80 | 54.00 | -10.20 | Horizontal |
| 5 | 22583.507 | 20.48 | 25.72 | 46.20 | 54.00 | -7.80 | Vertical |
| 6 | 23108.231 | 20.07 | 25.73 | 45.80 | 54.00 | -8.20 | Vertical |
| 7 | 22480.000 | 19.95 | 25.65 | 45.60 | 54.00 | -8.40 | Horizontal |
| 8 | 22931.982 | 20.47 | 25.93 | 46.40 | 54.00 | -7.60 | Horizontal |

The field strength is calculated by adding the Antenna Factor. Correct Factor.

The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Correct Factor

Remark: No any other emissions level which are attenuated less than 20dB below the limit.

According to 15.31(o), The amplitude of spurious emissions from intentional radiators and emissions from unintentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this Part.

Hence there no other emissions have been reported.

Remark:

- 1). N/A: For this intentional radiator operates below 25 GHz. The spectrum shall be investigated to the tenth harmonic of the highest fundamental frequency. And above the third harmonic of this intentional radiator, the disturbance is very low. So the test result only displays to 3rd harmonic.
- 2). As shown in Section, for frequencies above 1000 MHz. the above field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.
- 3). The test only perform the EUT in transmitting status since the test frequencies were over 1GHz only required transmitting status.

Test result: The unit does meet the requirements.

4.10.1 RADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS

Section 15.247(d) 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 15.205(c)).

Test Requirement:

Test Method: Base on ANSI 63.10

Test Date: 2012-07-12

Measurement Distance: 3m (Semi-Anechoic Chamber)

Limit: 40.0 dB μ V/m between 30MHz & 88MHz;
 43.5 dB μ V/m between 88MHz & 216MHz;
 46.0 dB μ V/m between 216MHz & 960MHz;
 54.0 dB μ V/m above 960MHz.

Detector: Peak for pre-scan:
 100kHz resolution bandwidth and 100kHz video bandwidth within 1GHz.
 1MHz resolution bandwidth and 1MHz video bandwidth above 1GHz

Section 15.205 Restricted bands of operation.

(a) Except as shown in paragraph (d) of this section. only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|-----|-----|-----|-----|
|-----|-----|-----|-----|

| | | | |
|----------------------------|-----------------------|-----------------|---------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - 156.52525 | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.7 - 156.9 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 162.0125 - 167.17 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 167.72 - 173.2 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 240 - 285 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 322 - 335.4 | 3600 - 4400 | |
| 13.36 - 13.41 | | | |

Test Result:

Pretest the Bluetooth normal mode

The field strength was measured with an EMI measuring receiver and 1 MHz RBW / VBW for peak and with 1MHz RBW / 10Hz VBW for average at a distance of 3m.

Max field strength in 3m distance:**Horizontal :**

| No. | Frequency | PK Reading | AV Reading | Correct | Peak | Average |
|-----|-----------|------------|------------|--------------|----------|----------|
| | (MHz) | (dBuV/m) | (dBuV/m) | Factor(dB/m) | (dBuV/m) | (dBuV/m) |
| 1 | 2390.000 | 36.75 | 32.34 | 5.88 | 42.63 | 38.22 |
| 2 | 2483.500 | 33.32 | 31.67 | 5.02 | 38.34 | 36.69 |

Vertical :

| No. | Frequency | PK Reading | AV Reading | Correct | Peak | Average |
|-----|-----------|------------|------------|--------------|----------|----------|
| | (MHz) | (dBuV/m) | (dBuV/m) | Factor(dB/m) | (dBuV/m) | (dBuV/m) |
| 1 | 2390.000 | 35.78 | 32.15 | 5.88 | 41.66 | 38.03 |
| 2 | 2483.500 | 32.98 | 30.89 | 5.02 | 38.00 | 35.91 |

Remark: No any other emission which fall in restricted bands can be detected and be reported.

4.11 BAND EDGES REQUIREMENT

| | |
|------------------------|---|
| Test Requirement: | FCC Part 15 C |
| Test Method: | Based on ANSI 63.10 Operation within the band 2400 – 2483.5 MHz |
| Test Date: | 2012-07-12 |
| Power supply: | Connected with convert board powered by PC USB ports, and to fix frequency transmitting. |
| Requirements: | Section 15.247 (d) 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, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. |
| Method of Measurement: | Set RBW of spectrum analyzer to 100 kHz and VBW of spectrum analyzer to 300 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded. |

GFSK and 8DPSK mode:

The band edges was measured and recorded Result:

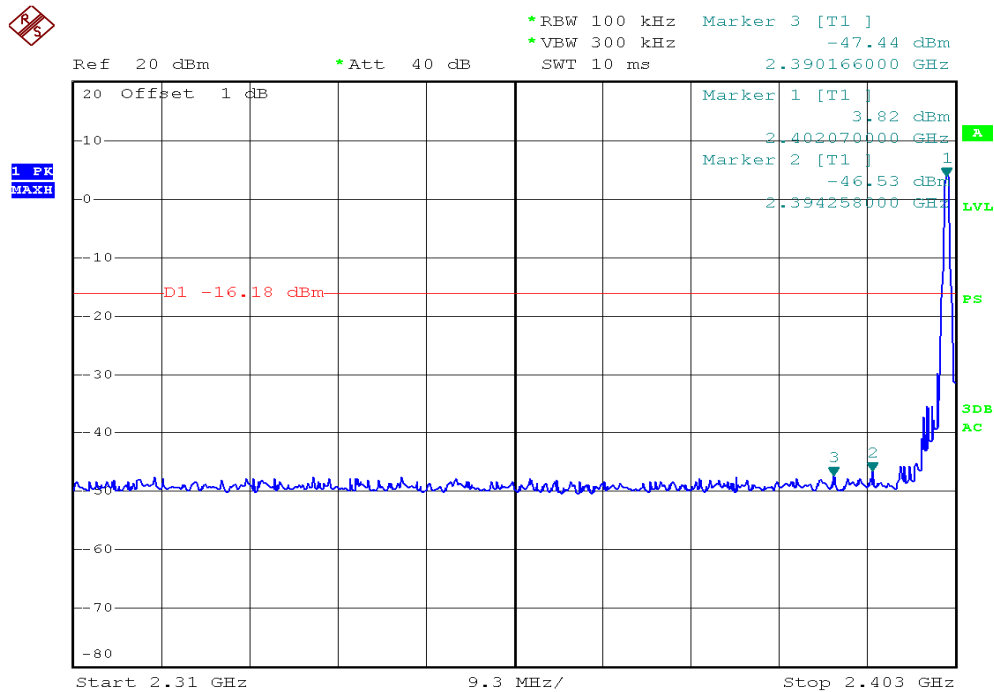
The Lower Edges attenuated more than 20dB.

The Upper Edges attenuated more than 20dB.

The graph as below. Represents the emissions take for this device.

For GFSK

Lowest Channel

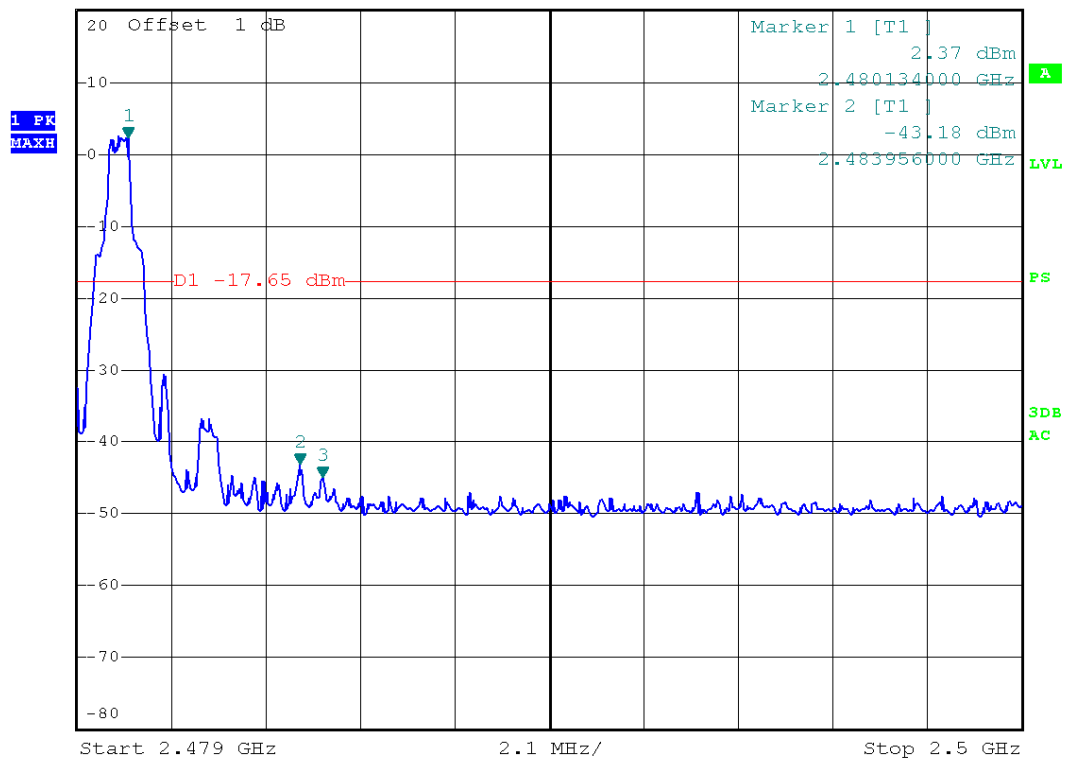


Highest Channel



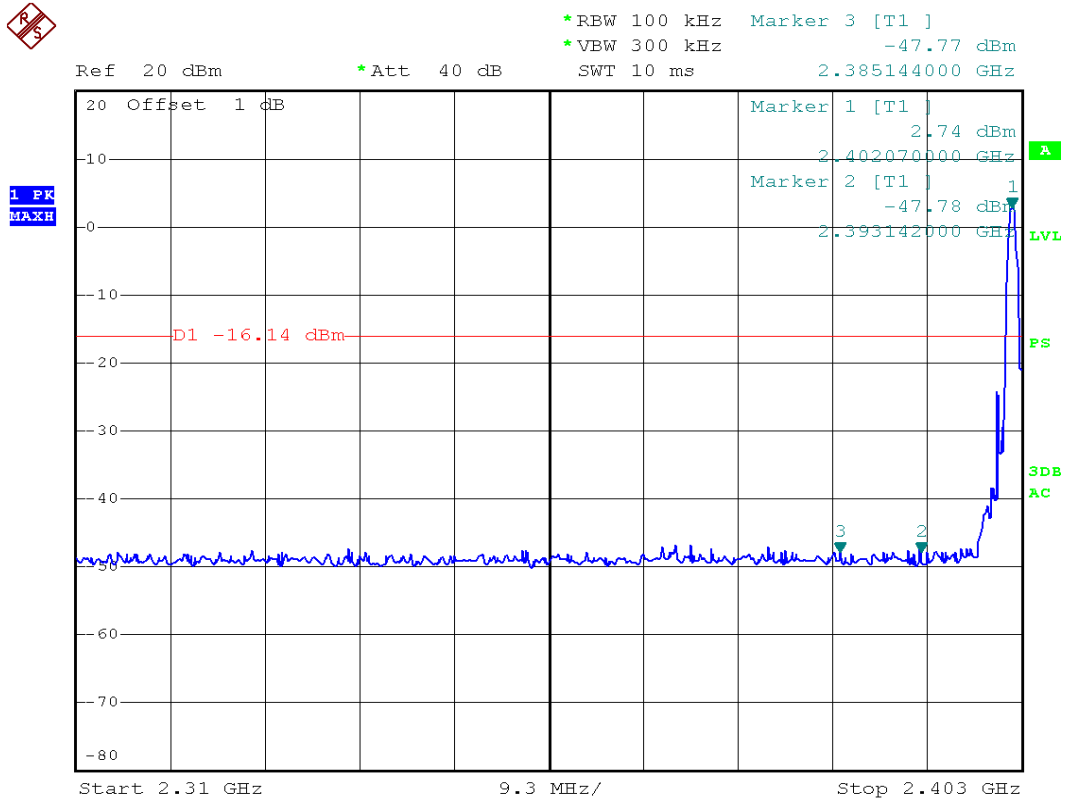
*RBW 100 kHz Marker 3 [T1]
*VBW 300 kHz -44.94 dBm
SWT 2.5 ms 2.484460000 GHz

Ref 20 dBm *Att 40 dB



For 8DPSK

Lowest Channel



Highest Channel

