

# FCC&IC Radio Test Report

## FCC ID: RGRPXB1002

## IC: 11078A-PXB1002

This report concerns (check one):  Original Grant  Class I Change  Class II Change

**Project No.** : 1506C209  
**Equipment** : AMPLIFIED CONTROLLER FOR BLUETOOTH DEVICES  
**Model Name** : PXB100.2  
**Applicant** : Stillwater Designs and Audio Inc  
**Address** : 3100 N Husband, Stillwater, OK, 74075, USA.

**Date of Receipt** : Jun. 23, 2015  
**Date of Test** : Jun. 23, 2015 ~ Aug. 27, 2015  
**Issued Date** : Aug. 31, 2015  
**Tested by** : BTL Inc.

Testing Engineer : Shawn Xiao  
(Shawn Xiao)

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# **B T L I N C .**

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### **Declaration**

**BTL** represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **CHINA**, or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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### **Limitation**

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

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### REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FICP-1-1506C209	Original Issue.	Aug. 31, 2015

## 1. CERTIFICATION

Equipment : AMPLIFIED CONTROLLER FOR BLUETOOTH DEVICES  
Brand Name : KICKER  
Model Name : PXIBT100.2  
Applicant : Stillwater Designs and Audio Inc  
Manufacturer : Hangzhou Newsources Electronics Co., Ltd  
Address : No.7 Houyang Rd, Anxi Industrial Zone, Liangzhu, Hangzhou  
Factory : Hangzhou Newsources Electronics Co., Ltd  
Address : No.7 Houyang Rd, Anxi Industrial Zone, Liangzhu, Hangzhou  
Date of Test : Jun. 23, 2015 ~ Aug. 27, 2015  
Test Sample : Engineering Sample  
Standard(s) : FCC Part15, Subpart C : 2014 (15.247)/ ANSI C63.10-2013  
RSS-247 Issue 1, May 2015  
RSS-GEN Issue 4, Nov 2014

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

The test data, data evaluation, and equipment configuration contained in our test report (Ref No. BTL-FICP-1-1506C209) were obtained utilizing the test procedures, test instruments, test sites that has been accredited by the Authority of TAF according to the ISO-17025 quality assessment standard and technical standard(s).

## 2. SUMMARY OF TEST RESULTS

Test procedures according to the technical standard(s):

<b>Applied Standard(s): 47 CFR Part 15, Subpart C: 2014; RSS-247 Issue 1, May 2015; RSS-GEN Issue 4, Nov 2014</b>				
Standard(s) Section		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN 8.8	Conducted Emission	N/A	Note(1)
15.247(d)	RSS-247 5.5	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	RSS-247 5.1 (2)	Hopping Channel Separation	PASS	
15.247(a)(1)	RSS-247 5.1 (1)	Bandwidth	PASS	
15.247 (b)(1)	RSS-247 5.4 (2)	Peak Output Power	PASS	
15.247(d) 15.209	RSS-247 5.5	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	RSS-247 5.1 (4)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	RSS-247 5.1 (4)	Dwell Time	PASS	
15.205	RSS-GEN 8.10	Restricted Bands	PASS	
15.203	-	Antenna Requirement	PASS	

Note:

(1) "N/A" denotes test is not applicable in this test report



## 2.1 TEST FACILITY

The test facilities used to collect the test data in this report is at the location of No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

BTL's test firm number for FCC: 319330

BTL's test firm number for IC: 4428B-1

## 2.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence of approximately **95 %**.

### A. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U, (dB)	Note
DG-CB03	CISPR	9KHz~30MHz	V	3.79	
		9KHz~30MHz	H	3.57	
		30MHz ~ 200MHz	V	3.82	
		30MHz ~ 200MHz	H	3.78	
		200MHz ~ 1,000MHz	V	4.10	
		200MHz ~ 1,000MHz	H	4.06	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

Note: Unless specifically mentioned, the uncertainty of measurement has not been taken into account to declare the compliance or non-compliance to the specification.

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	AMPLIFIED CONTROLLER FOR BLUETOOTH DEVICES	
Brand Name	KICKER	
Model Name	PXIBT100.2	
Model Difference	N/A	
Output Power (Max.)	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps) $\pi$ /4-DQPSK(2Mbps)
	Bit Rate of Transmitter	8-DPSK(3Mbps)
	Output Power Max.	1Mbps : 1.77 dBm 3Mbps : 1.60 dBm
Power Source	Supplied from battery	
Power Rating	DC 10.5~14.4V 15A	

Note:

1. For a more detailed features description, please refer to the manufacturer's specifications or the user's manual.

2. Channel List:

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	27	2429	54	2456
01	2403	28	2430	55	2457
02	2404	29	2431	56	2458
03	2405	30	2432	57	2459
04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	77	2479
24	2426	51	2453	78	2480
25	2427	52	2454		
26	2428	53	2455		

3 Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	AMOTECH	AMAN301512ST01	Chip	N/A	3.29

### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	TX Mode <b>Note (1)</b>

The EUT system operated these modes were found to be the worst case during the pre-scanning test as following:

For Conducted Emission	
Final Test Mode	Description
Mode 1	TX Mode

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode <b>Note (1)</b>

**Note:**

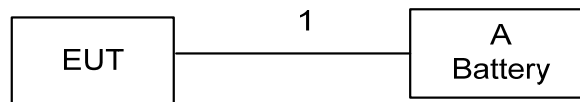
- (1) The measurements are performed at the high, middle, low available channels.
- (2) The measurements for Hopping Channel Separation, Bandwidth and Peak Output Power were tested during 1Mbps, 2Mbps and 3Mbps, the worst case are 1Mbps and 3Mbps, only worst case was documented.

### 3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING

During testing, channel & power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of FHSS

Test Software Version	CSR		
	2402 MHz	2441 MHz	2480 MHz
Parameters(1Mbps)	40.00	42.00	42.00
Parameters(3Mbps)	40.00	45.00	45.00

### 3.4 BLOCK DIAGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED



### 3.5 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
A	Battery	UNION	N100	N/A	N/A	-

Item	Shielded Type	Ferrite Core	Length	Note
1	NO	NO	1.5m	DC Cable

Note:

- (1) For detachable type I/O cable should be specified the length in m in 『Length』 column.

## 4. EMC EMISSION TEST

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 POWER LINE CONDUCTED EMISSION LIMITS (Frequency Range 150KHz-30MHz)

Frequency of Emission (MHz)	Conducted Limit (dB $\mu$ V)	
	Quasi pea	Average
0.15 -0.5	66 to 56*	56 to 46*
0.50 -5.0	56	46
5.0 -30.0	60	50

Note:

- (1) The limit of " \* " decreases with the logarithm of the frequency
- (2) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Insertion Loss + Cable Loss + Attenuator Factor(if use)  
 Margin Level = Measurement Value - Limit Value

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 KHz

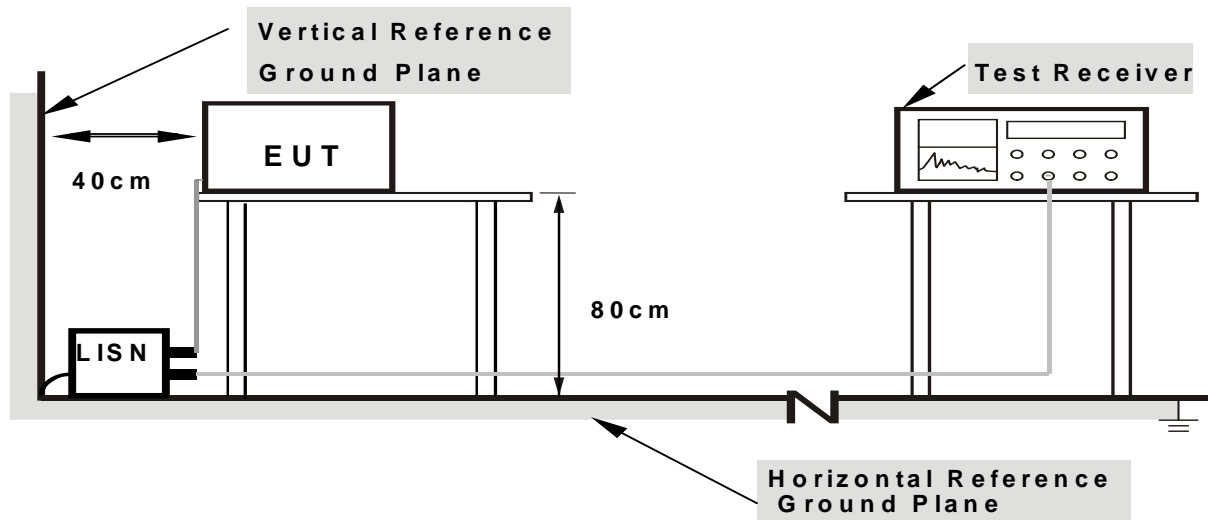
#### 4.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### 4.1.3 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.4 TEST SETUP



**Note: 1.** Support units were connected to second LISN.

**2.** Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

#### 4.1.5 EUT OPERATING CONDITIONS

The EUT was configured for testing in a typical function (as a customer would normally use it), EUT was programmed to be in continuously transmitting/receiving data or hopping on mode.

#### 4.1.6 EUT TEST CONDITIONS

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: N/A

#### 4.1.7 TEST RESULTS

Please refer to the Attachment A.

Remark:

- (1) All readings are QP Mode value unless otherwise stated AVG in column of 'Note'. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform in this case, a "\*" marked in AVG Mode column of Interference Voltage Measured.
- (2) Measuring frequency range from 150KHz to 30MHz.

## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 RADIATED EMISSION LIMITS (Frequency Range 9KHz -1000MHz)

In case the emission fall within the restricted band specified on 15.205(a) & RSS-247 5.5, then the 15.209(a) & RSS-Gen limit in the table below has to be followed.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

### LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1000MHz)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Notes:

- (1) The limit for radiated test was performed according to FCC PART 15C.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m) = 20log Emission level (uV/m).
- (4) The test result calculated as following:  
 Measurement Value = Reading Level + Correct Factor  
 Correct Factor = Antenna Factor + Cable Loss - Amplifier Gain(if use)  
 Margin Level = Measurement Value - Limit Value

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (emission in restricted band)	1 MHz / 1 MHz for Peak, 1 MHz / 10Hz for Average



Spectrum Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9KHz ~90KHz for PK/AVG detector
Start ~ Stop Frequency	90KHz ~110KHz for QP detector
Start ~ Stop Frequency	110KHz ~490KHz for PK/AVG detector
Start ~ Stop Frequency	490KHz ~30MHz for QP detector
Start ~ Stop Frequency	30MHz~1000MHz for QP detector

#### 4.2.2 DWELL TIME OF PERIODIC OPERATION MEASUREMENT

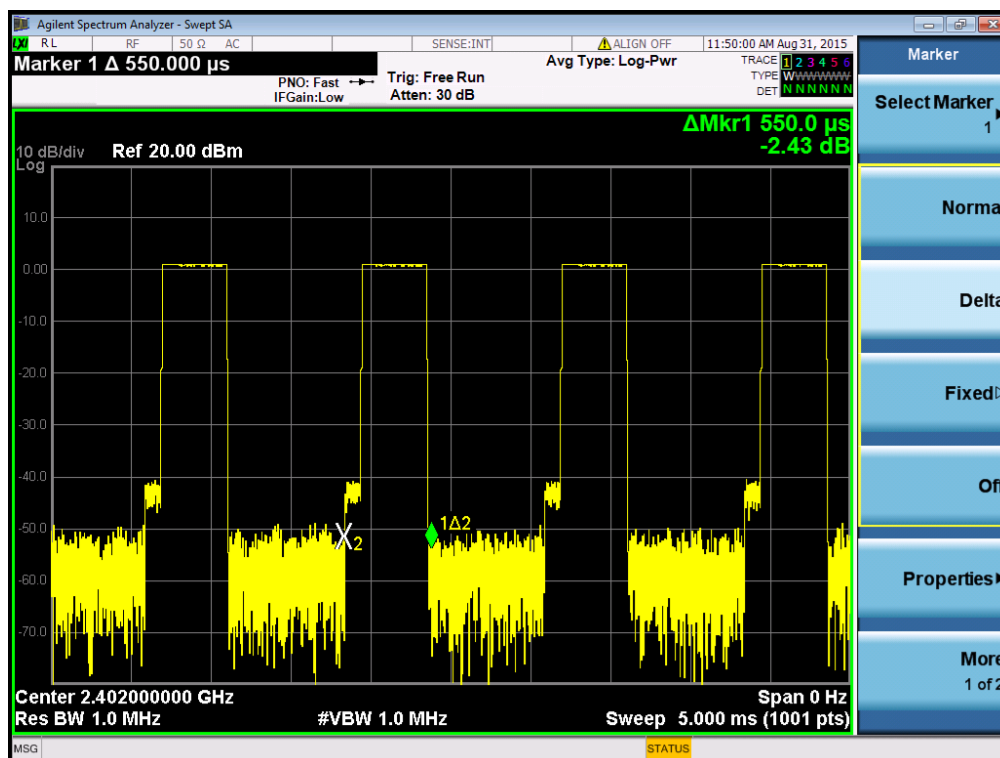
Duty Cycle = ( N1\*L1+N2\*L2+...+Nn-1\*Ln-1+Nn\*Ln)/100 or T

Duty Cycle = 0.55/1.25 100msec=44%

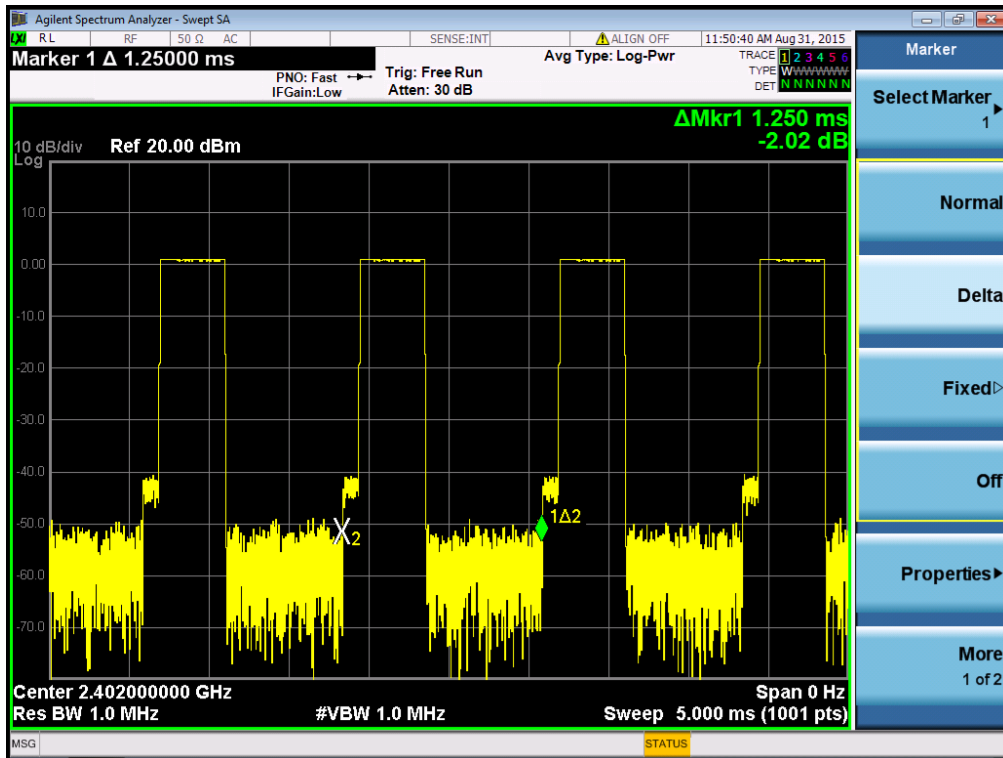
Average Reading =Peak Reading (dBuV/m)+ 20log (Duty cycle)

Average Reading = Peak value + 20log(Duty cycle) , AV=PK-7.13

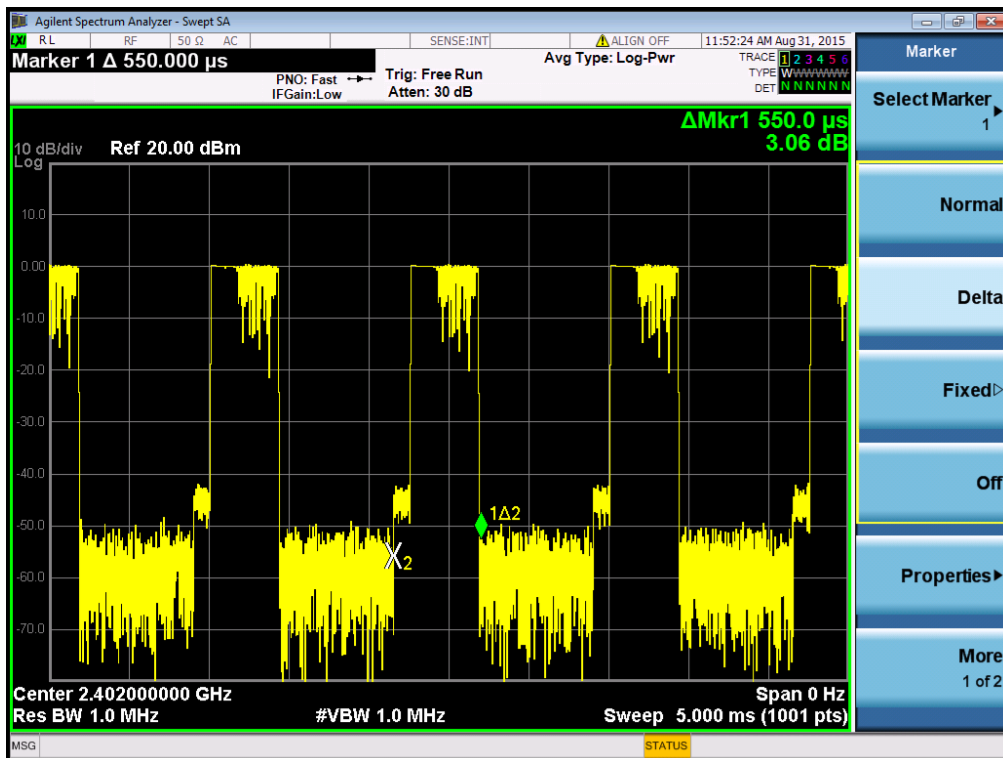
#### 1M On Time



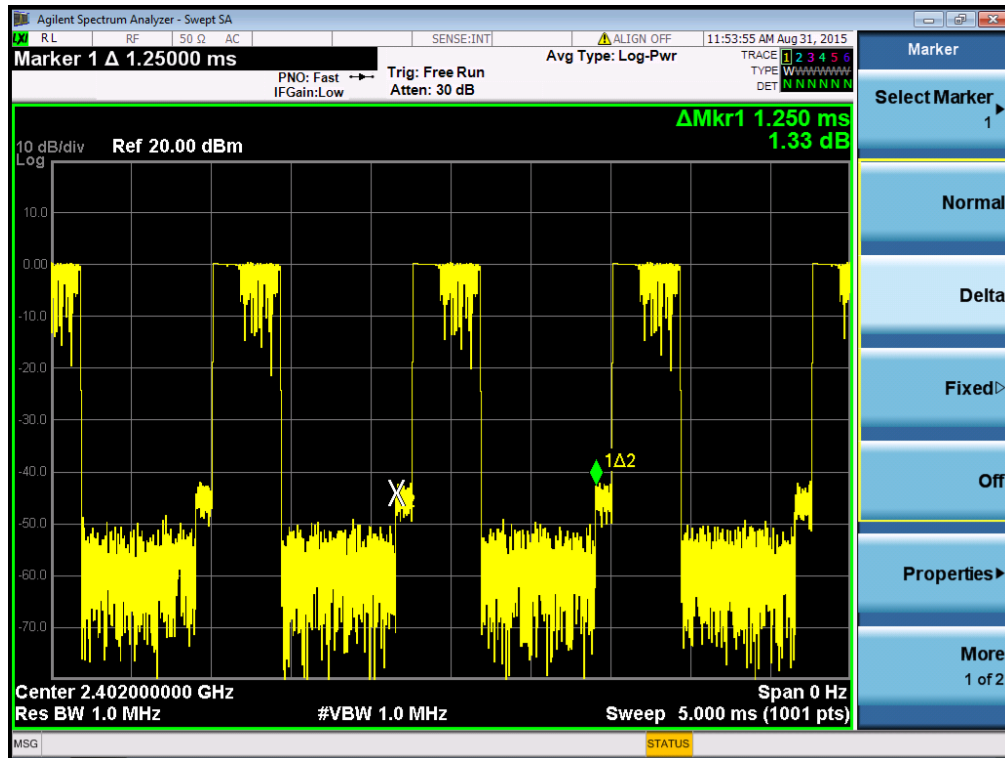
### 1M Total Time



### 3M On Time



### 3M Total Time



#### **4.2.2 TEST PROCEDURE**

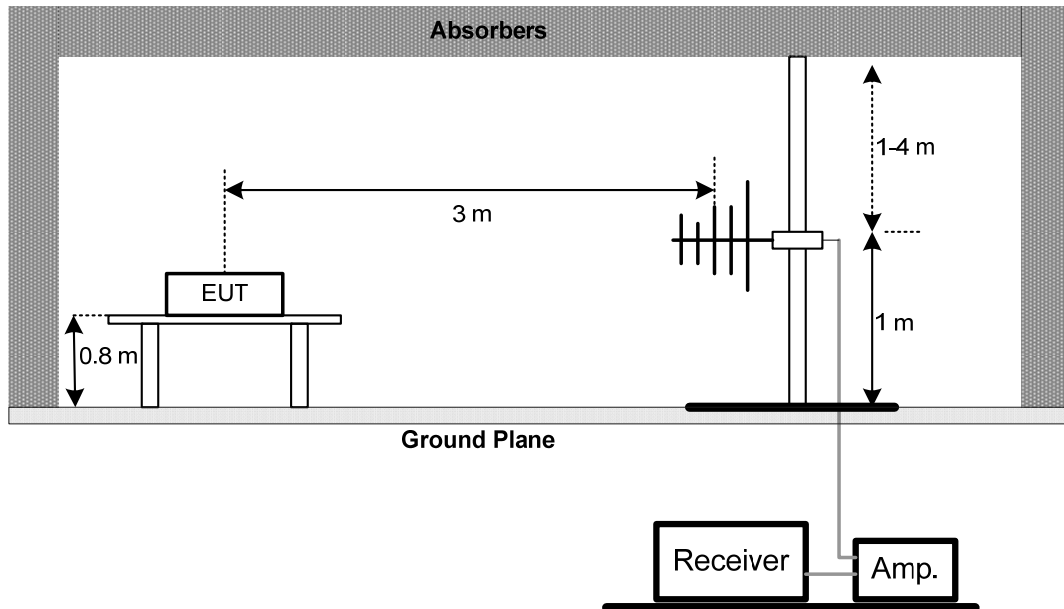
- a. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 1.5 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(above 1GHz)
- c. The height of the equipment or of the substitution antenna shall be 0.8 m or 1.5m, the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a receiver peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- e. All readings are Peak unless otherwise stated QP in column of Note. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform. (below 1GHz)
- f. All readings are Peak Mode value unless otherwise stated AVG in column of Note. If the Peak Mode Measured value compliance with the Peak Limits and lower than AVG Limits, the EUT shall be deemed to meet both Peak & AVG Limits and then only Peak Mode was measured, but AVG Mode didn't perform. (above 1GHz)
- g. For the actual test configuration, please refer to the related Item –EUT Test Photos.

#### **4.2.3 DEVIATION FROM TEST STANDARD**

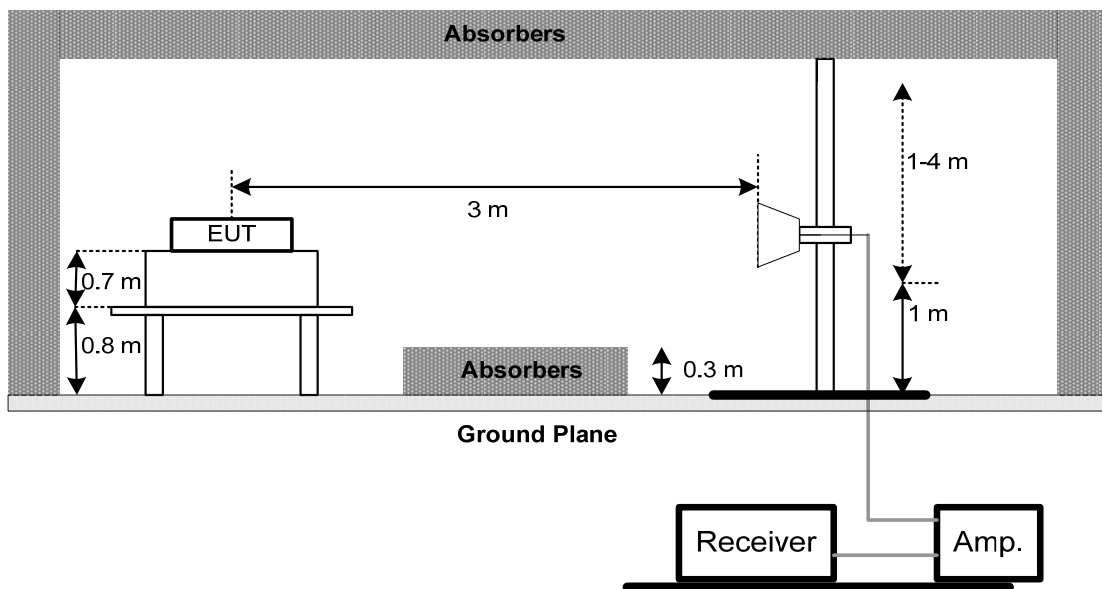
No deviation

#### 4.2.4 TEST SETUP

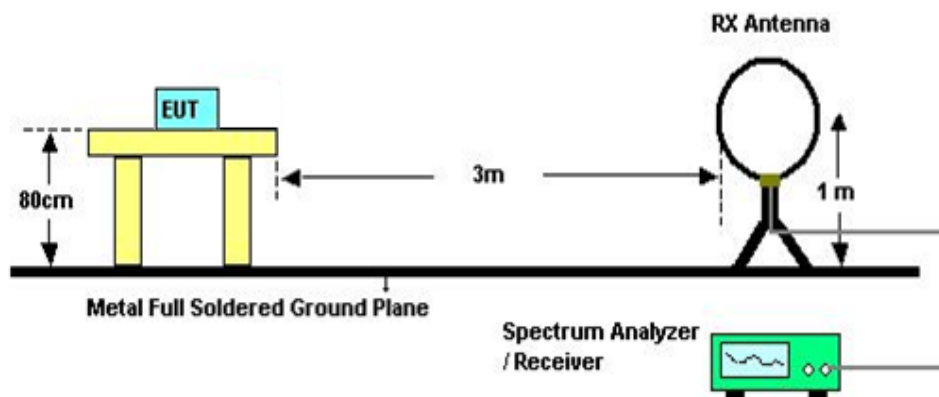
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1 GHz



(C) For Radiated Emissions Below 30MHz



#### 4.2.5 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing

#### 4.2.6 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 12V

#### 4.2.7 TEST RESULTS (9KHZ TO 30MHZ)

Please refer to the Attachment B

Remark:

- (1) The amplitude of spurious emissions which are attenuated by more than 20 dB below the permissible value has no need to be reported.
- (2) Distance extrapolation factor =  $40 \log (\text{specific distance} / \text{test distance})$  (dB).
- (3) Limit line = specific limits (dBuV) + distance extrapolation factor.

#### **4.2.8 TEST RESULTS (30MHZ TO 1000 MHZ)**

Please refer to the Attachment C.

Remark:

- (1) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (2) Measuring frequency range from 30MHz to 1000MHz.
- (3) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

#### **4.2.9 TEST RESULTS (ABOVE 1000 MHZ)**

Please refer to the Attachment D.

Remark:

- (1) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (2) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (3) EUT Orthogonal Axis:  
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
- (4) During the measurements above 1 GHz it is taken care of that the EUT is always within the 3 dB cone of radiation BW of the used antenna
- (5) No limit: This is fundamental signal, the judgment is not applicable.  
For fundamental signal judgment was referred to Peak output test.

## 5. NUMBER OF HOPPING CHANNEL

### 5.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-247			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-247 5.1 (4)	Number of Hopping Channel	2400-2483.5	PASS

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> Operating Frequency Range
RBW	100 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 5.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW=100KHz, VBW=100KHz, Sweep time = Auto.

#### 5.1.2 DEVIATION FROM STANDARD

No deviation.

#### 5.1.3 TEST SETUP



#### 5.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 5.1.5 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 12V

#### 5.1.6 TEST RESULTS

Please refer to the Attachment E



## 6. AVERAGE TIME OF OCCUPANCY

### 6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-247				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-247 5.1 (4)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

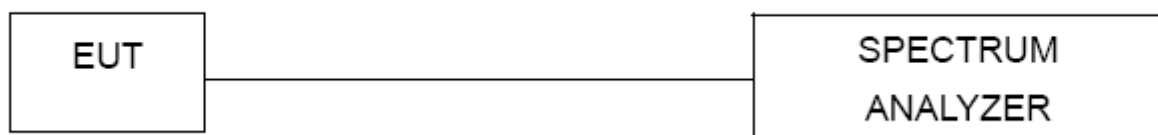
#### 6.1.1 TEST PROCEDURE

- a. The transmitter output (antenna port) was connected to the spectrum analyzer
- b. Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- c. Use a video trigger with the trigger level set to enable triggering only on full pulses.
- d. Sweep Time is more than once pulse time.
- e. Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- f. Measure the maximum time duration of one single pulse.
- g. Set the EUT for DH5, DH3 and DH1 packet transmitting.
- h. Measure the maximum time duration of one single pulse.
- i. DH5 Packet permit maximum  $1600 / 79 / 6 = 3.37$  hops per second in each channel (5 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $3.37 \times 31.6 = 106.6$  within 31.6 seconds.
- j. DH3 Packet permit maximum  $1600 / 79 / 4 = 5.06$  hops per second in each channel (3 time slots TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $5.06 \times 31.6 = 160$  within 31.6 seconds.
- k. DH1 Packet permit maximum  $1600 / 79 / 2 = 10.12$  hops per second in each channel (1 time slot TX, 1 time slot RX). So, the dwell time is the time duration of the pulse times  $10.12 \times 31.6 = 320$  within 31.6 seconds.

#### 6.1.2 DEVIATION FROM STANDARD

No deviation.

#### 6.1.3 TEST SETUP



#### **6.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### **6.1.5 EUT TEST CONDITIONS**

Temperature: 25°C

Relative Humidity: 55%

Test Voltage: DC 12V

#### **6.1.6 TEST RESULTS**

Please refer to the Attachment F

## 7. HOPPING CHANNEL SEPARATION MEASUREMENT

### 7.1 APPLIED PROCEDURES / LIMIT

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.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz
VBW	100 KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

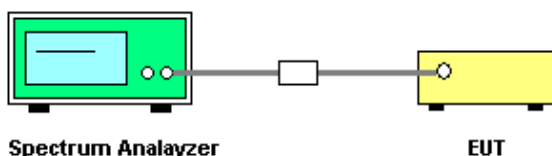
#### 7.1.1 TEST PROCEDURE

- a. The EUT must have its hopping function enabled
- b. Span = wide enough to capture the peaks of two adjacent channels
  - Resolution (or IF) Bandwidth (RBW)  $\geq$  1% of the span
  - Video (or Average) Bandwidth (VBW)  $\geq$  RBW
  - Sweep = Auto
  - Detector function = Peak
  - Trace = Max Hold

#### 7.1.2 DEVIATION FROM STANDARD

No deviation.

#### 7.1.3 TEST SETUP



#### 7.1.4 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 12V

#### 7.1.5 TEST RESULTS

Please refer to the Attachment G

## 8. BANDWIDTH TEST

### 8.1 APPLIED PROCEDURES

FCC Part15 (15.247) , Subpart C/ RSS-GEN and RSS-247		
Section	Test Item	Frequency Range (MHz)
15.247(a)(2) RSS-GEN 6.6 RSS-247 5.1 (1)	Bandwidth	2400-2483.5

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	> Measurement Bandwidth or Channel Separation
RBW	30 KHz (20dB Bandwidth) / 30 KHz (Channel Separation)
VBW	100 KHz (20dB Bandwidth) / 100 KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 8.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 30KHz, VBW=100KHz, Sweep Time = Auto.

#### 8.1.2 DEVIATION FROM STANDARD

No deviation.

#### 8.1.3 TEST SETUP



#### 8.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 8.1.5 EUT TEST CONDITIONS

Temperature: 25°C  
Relative Humidity: 55%  
Test Voltage: DC 12V

#### 8.1.6 TEST RESULTS

Please refer to the Attachment H

## 9. PEAK OUTPUT POWER TEST

### 9.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C/ RSS-247				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1) RSS-247 5.4 (2)	Peak Output Power	1 Watt or 30dBm	2400-2483.5	PASS

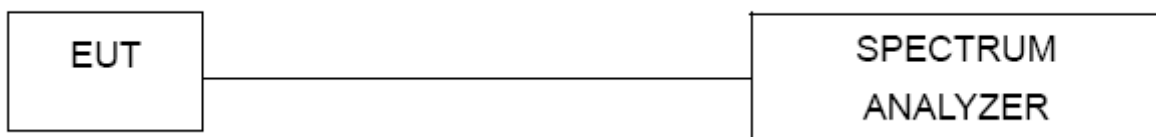
#### 9.1.1 TEST PROCEDURE

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 1MHz/3MHz, VBW= 1MHz/3MHz, Sweep time = Auto.

#### 9.1.2 DEVIATION FROM STANDARD

No deviation.

#### 9.1.3 TEST SETUP



#### 9.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### 9.1.5 EUT TEST CONDITIONS

Temperature: 25°C  
 Relative Humidity: 55%  
 Test Voltage: DC 12V

#### 9.1.6 TEST RESULTS

Please refer to the Attachment I

## **10. ANTENNA CONDUCTED SPURIOUS EMISSION**

### **10.1 APPLIED PROCEDURES / LIMIT**

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced 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 that the transmitter demonstrates compliance with the peak conducted power limits.

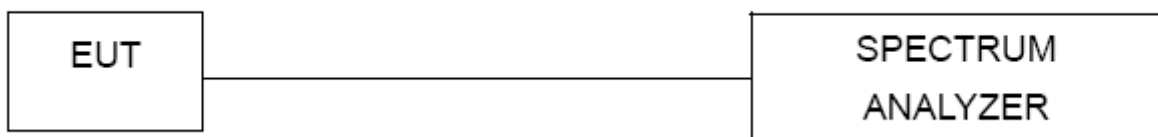
#### **10.1.1 TEST PROCEDURE**

- a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- b. Spectrum Setting: RBW= 100KHz, VBW=100KHz, Sweep time = Auto.
- c. Offset=antenna gain+cable loss

#### **10.1.2 DEVIATION FROM STANDARD**

No deviation.

#### **10.1.3 TEST SETUP**



#### **10.1.4 EUT OPERATION CONDITIONS**

The EUT tested system was configured as the statements of 4.1.5 unless otherwise a special operating condition is specified in the follows during the testing.

#### **10.1.5 EUT TEST CONDITIONS**

Temperature: 25°C  
Relative Humidity: 55%  
Test Voltage: DC 12V

#### **10.1.6 TEST RESULTS**

Please refer to the Attachment J

## 11. MEASUREMENT INSTRUMENTS LIST

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarzbeck	VULB9160	9160-3232	Mar. 28, 2016
2	Amplifier	HP	8447D	2944A09673	Nov. 17, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	emci	LMR-400(30MHz-1GHz)	C-01	Jun. 28, 2016
5	Controller	CT	SC100	N/A	N/A
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A
7	Antenna	ETS	3115	00075789	Mar. 28, 2016
8	Amplifier	Agilent	8449B	3008A02274	Nov. 02, 2015
9	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
10	Test Cable	emci	EMC104-SM-S M-10000(1GHz-26.5GHz)	C-68	Jun. 28, 2016
11	Controller	CT	SC100	N/A	N/A
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 28, 2016
13	Microwave Pre-amplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 28, 2016
14	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Aug. 15, 2016

Number of Hopping Channel					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	EXA Spectrum Analyzer	Agilent	N9010A	MY50520044	Mar. 28, 2016

Average Time of Occupancy					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Hopping Channel Separation Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Bandwidth					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Peak Output Power					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

Antenna Conducted Spurious Emission					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP 40	100185	Nov. 02, 2015

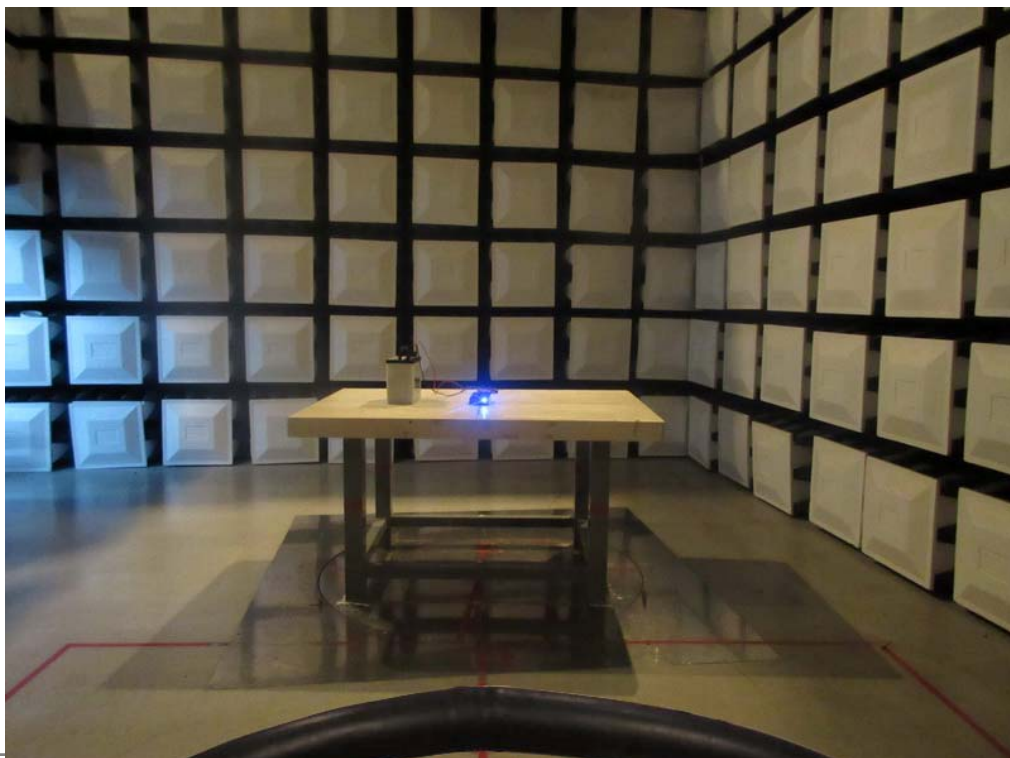
Remark: "N/A" denotes no model name, serial no. or calibration specified.  
 All calibration period of equipment list is one year.



## 12. EUT TEST PHOTO

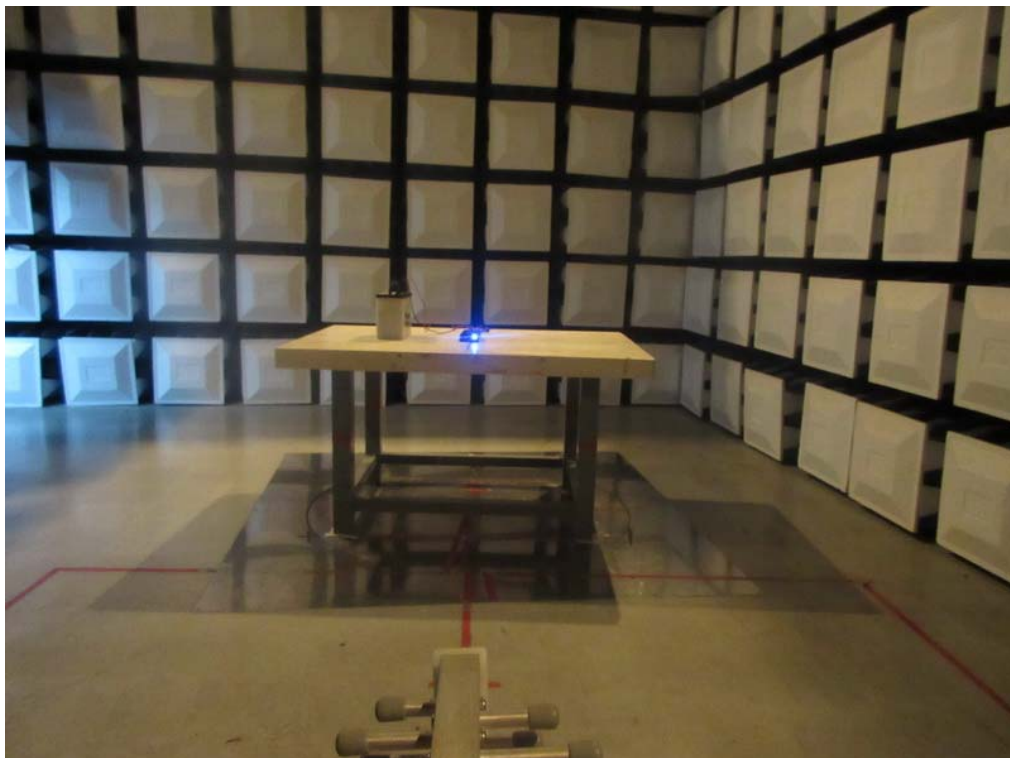
### Radiated Measurement Photos

9KHz to 30MHz



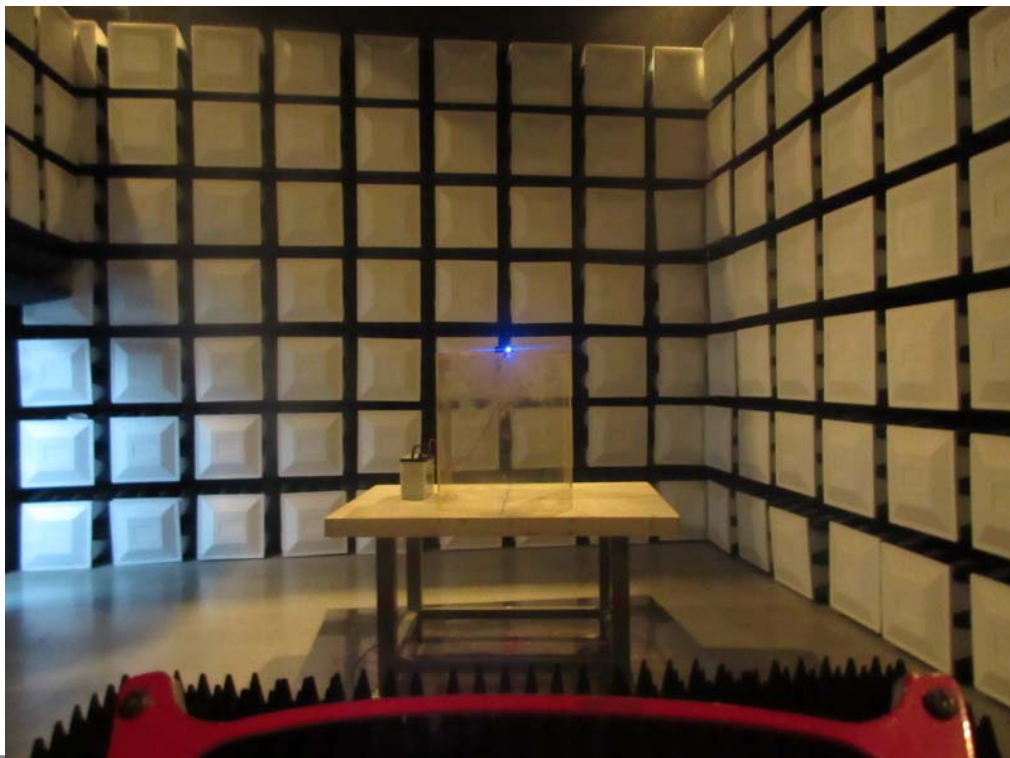
## Radiated Measurement Photos

30MHz to 1000MHz



## Radiated Measurement Photos

Above 1000MHz



## ATTACHMENT A - CONDUCTED EMISSION

**Test Mode: N/A**

Note: "N/A" denotes test is not applicable to this device.

## **ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)**



Test Mode:	TX Mode
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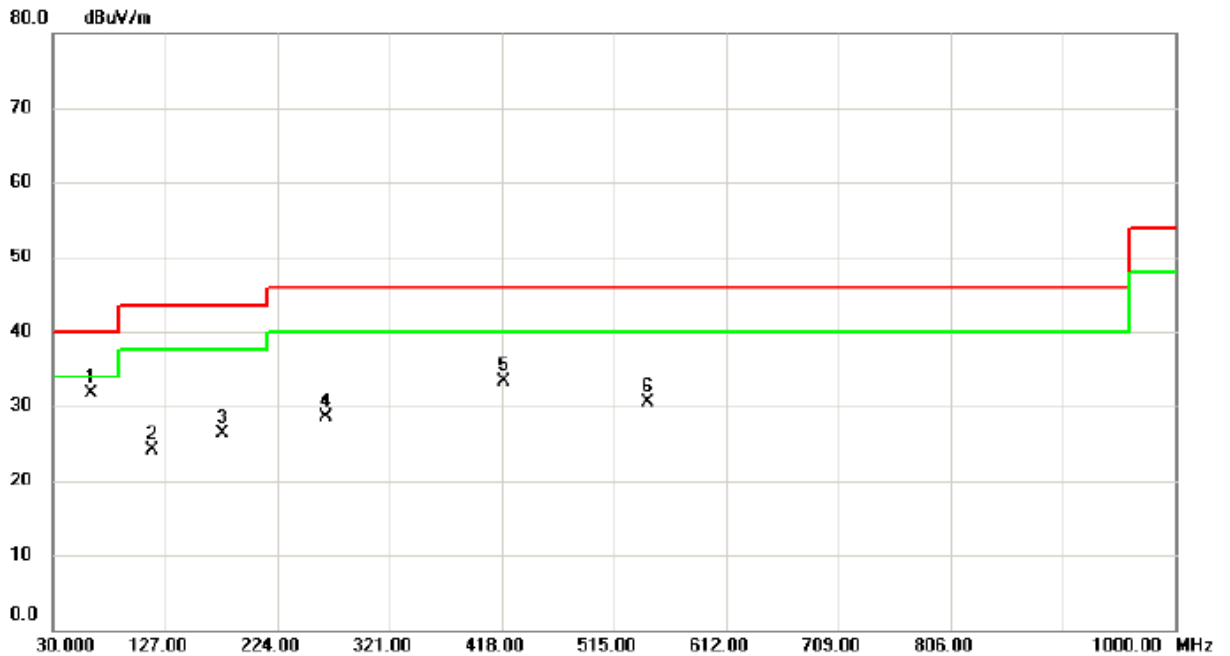
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.00938	0°	13.29	24.9726	38.2626	128.1602	-89.8976	AVG
0.0094338	0°	14.17	24.9726	39.1426	148.1602	-109.0176	PEAK
0.0232	0°	6.79	24.0973	30.8873	120.2945	-89.4071	AVG
0.0232	0°	8.31	24.0973	32.4073	140.2945	-107.8871	PEAK
0.0326	0°	3.24	23.5020	26.7420	117.3399	-90.5979	AVG
0.0326	0°	5.76	23.5020	29.2620	137.3399	-108.0779	PEAK
0.0419	0°	1.25	22.9130	24.1630	115.1599	-90.9969	AVG
0.0419	0°	2.68	22.9130	25.5930	135.1599	-109.5669	PEAK
0.4931	0°	19.47	19.8166	39.2866	73.7455	-34.4590	QP
1.7183	0°	23.93	19.5282	43.4582	69.5400	-26.0818	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.00953	90°	13.24	24.3000	37.5400	128.0224	-90.4824	AVG
0.00953	90°	14.96	24.3000	39.2600	148.0224	-108.7624	PEAK
0.0246	90°	7.35	24.0087	31.3587	119.7855	-88.4269	AVG
0.0246	90°	8.97	24.0087	32.9787	139.7855	-106.8069	PEAK
0.0327	90°	5.32	23.4957	28.8157	117.3133	-88.4976	AVG
0.0327	90°	6.23	23.4957	29.7257	137.3133	-107.5876	PEAK
0.0442	90°	1.71	22.7673	24.4773	114.6958	-90.2184	AVG
0.0442	90°	2.95	22.7673	25.7173	134.6958	-108.9784	PEAK
0.4936	90°	22.33	19.8154	42.1454	73.7367	-31.5914	QP
1.7178	90°	24.74	19.5282	44.2682	69.5400	-25.2718	QP

## **ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)**

Test Mode: TX 2402MHz\_CH00\_1Mbps

### Vertical

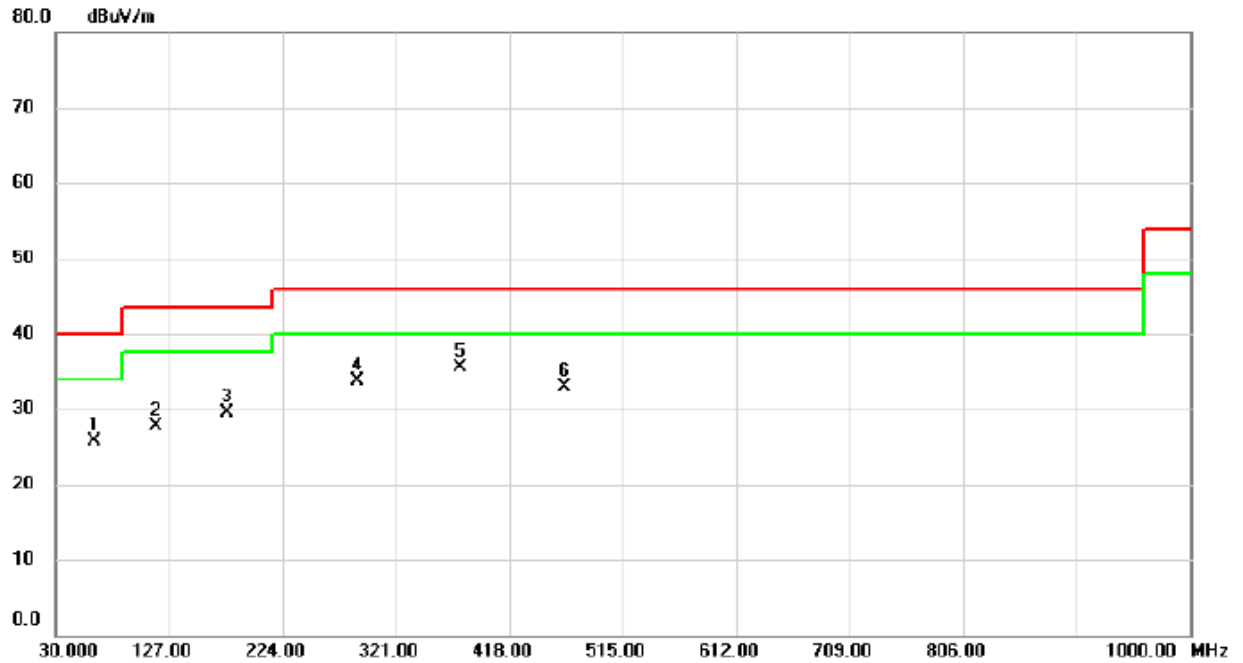


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	62.9800	45.63	-13.89	31.74	40.00	-8.26	peak	
2		115.3600	37.31	-13.14	24.17	43.50	-19.33	peak	
3		176.4700	37.67	-11.35	26.32	43.50	-17.18	peak	
4		265.7100	40.58	-12.15	28.43	46.00	-17.57	peak	
5		419.9400	40.12	-6.72	33.40	46.00	-12.60	peak	
6		544.1000	35.42	-4.95	30.47	46.00	-15.53	peak	



Test Mode: TX 2402MHz\_CH00\_1Mbps

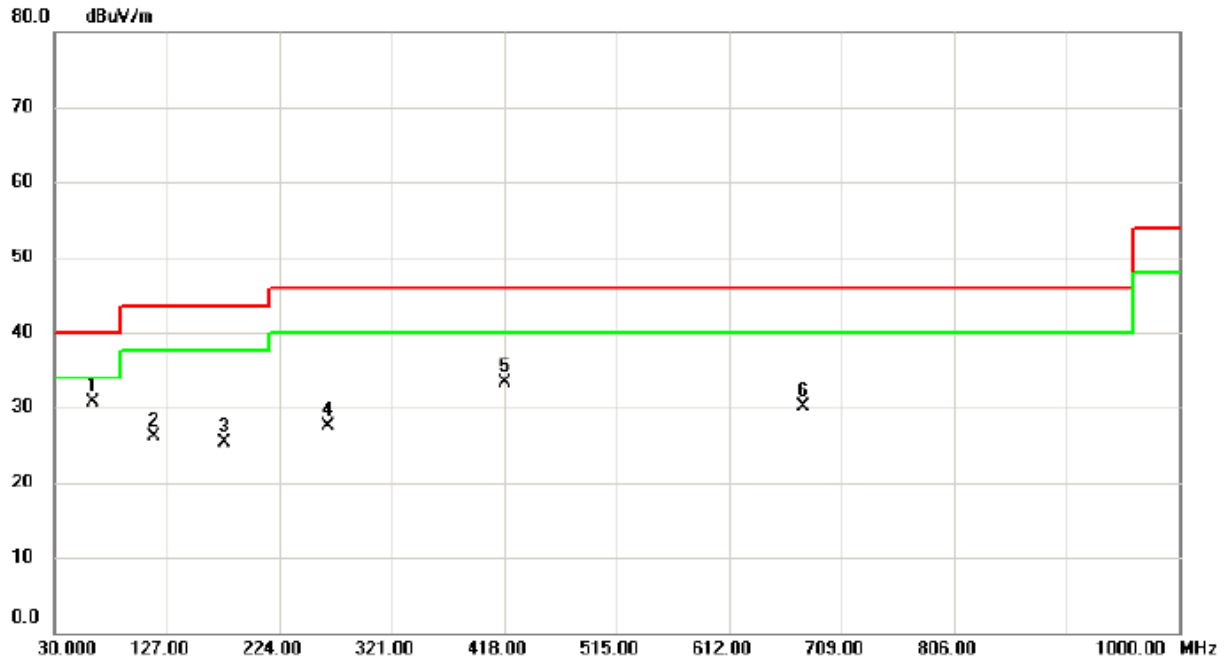
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		62.9800	39.64	-13.89	25.75	40.00	-14.25	peak	
2		115.3600	40.93	-13.14	27.79	43.50	-15.71	peak	
3		176.4700	40.78	-11.35	29.43	43.50	-14.07	peak	
4		288.0200	43.74	-10.07	33.67	46.00	-12.33	peak	
5	*	376.2900	44.06	-8.52	35.54	46.00	-10.46	peak	
6		464.5600	39.30	-6.33	32.97	46.00	-13.03	peak	

Test Mode: TX 2441MHz\_CH39\_1Mbps

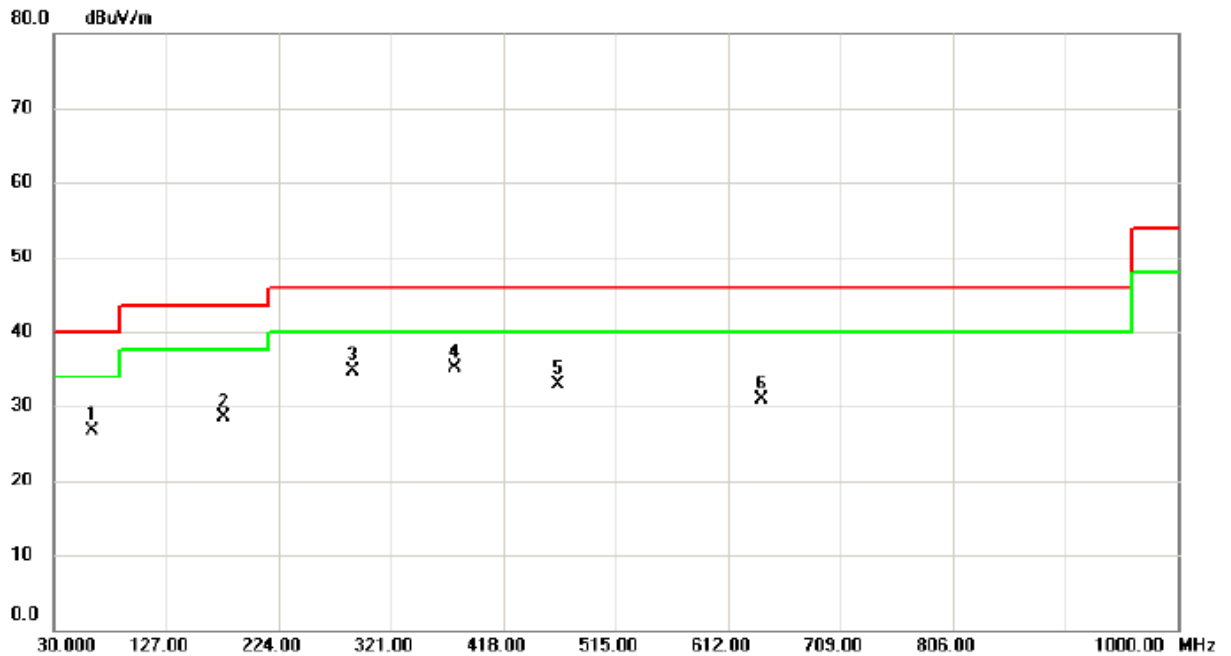
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	62.9800	44.63	-13.89	30.74	40.00	-9.26	peak	
2		115.3600	39.31	-13.14	26.17	43.50	-17.33	peak	
3		176.4700	36.67	-11.35	25.32	43.50	-18.18	peak	
4		265.7100	39.58	-12.15	27.43	46.00	-18.57	peak	
5		418.9700	39.96	-6.74	33.22	46.00	-12.78	peak	
6		676.0200	31.62	-1.56	30.06	46.00	-15.94	peak	

Test Mode: TX 2441MHz\_CH39\_1Mbps

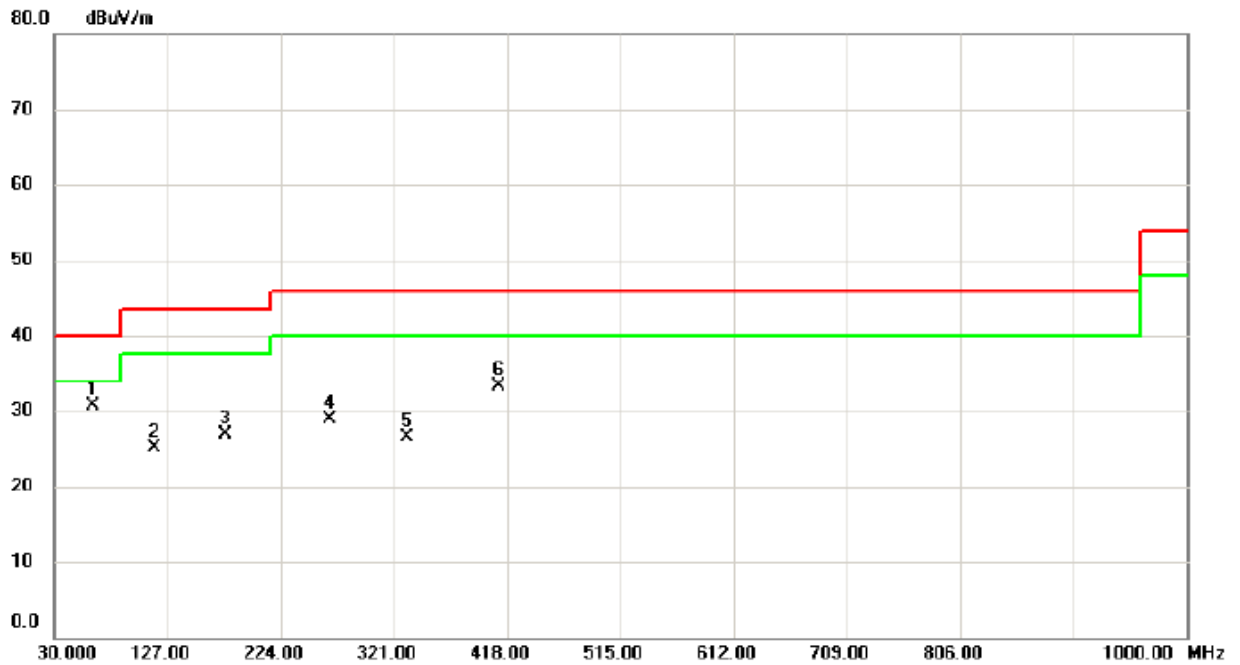
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		62.9800	40.64	-13.89	26.75	40.00	-13.25	peak	
2		176.4700	39.78	-11.35	28.43	43.50	-15.07	peak	
3		288.0200	44.74	-10.07	34.67	46.00	-11.33	peak	
4	*	376.2900	43.56	-8.52	35.04	46.00	-10.96	peak	
5		464.5600	39.30	-6.33	32.97	46.00	-13.03	peak	
6		641.1000	32.99	-2.18	30.81	46.00	-15.19	peak	

Test Mode: TX 2480MHz\_CH78\_1Mbps

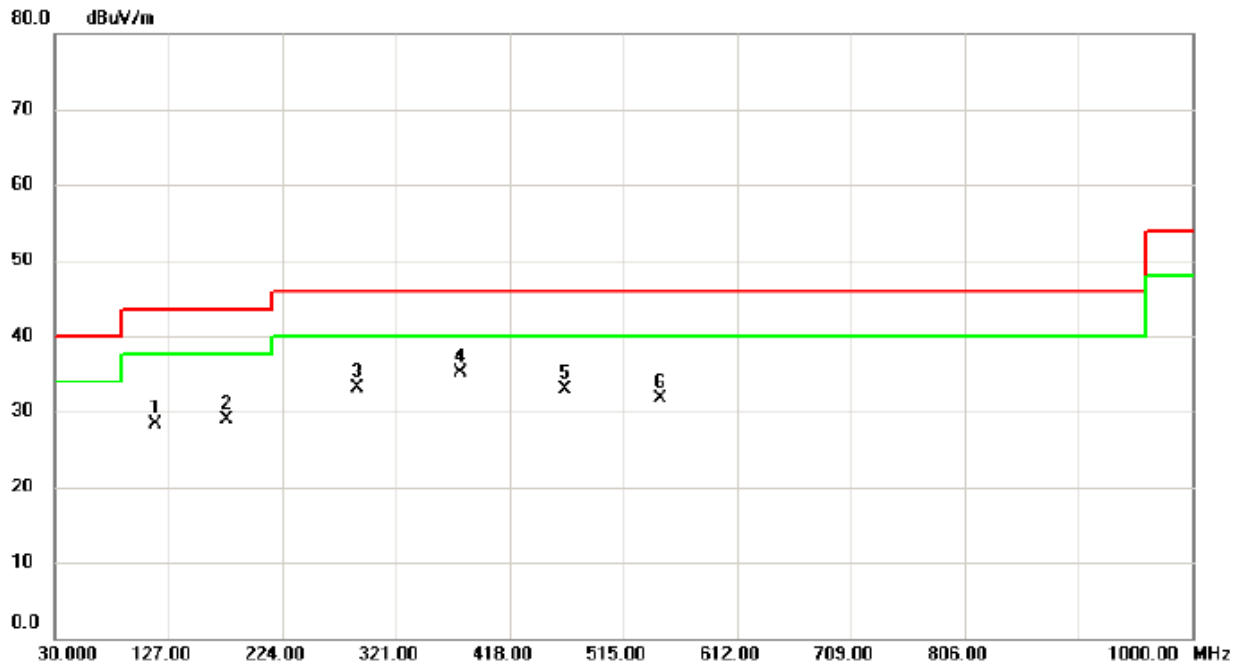
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	*	62.9800	44.63	-13.89	30.74	40.00	-9.26	peak	
2		115.3600	38.31	-13.14	25.17	43.50	-18.33	peak	
3		176.4700	38.17	-11.35	26.82	43.50	-16.68	peak	
4		265.7100	41.08	-12.15	28.93	46.00	-17.07	peak	
5		331.6700	36.25	-9.80	26.45	46.00	-19.55	peak	
6		411.2100	40.17	-6.95	33.22	46.00	-12.78	peak	

Test Mode: TX 2480MHz\_CH78\_1Mbps

### Horizontal

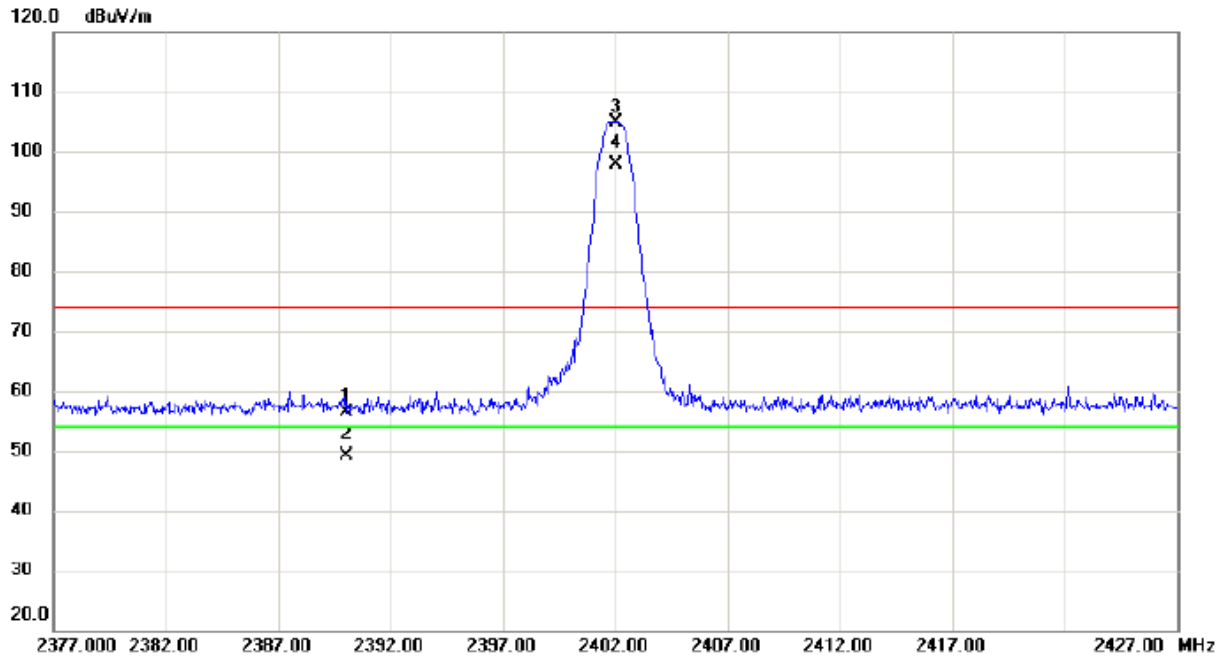


No. Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	115.3600	41.43	-13.14	28.29	43.50	-15.21	peak	
2	176.4700	40.28	-11.35	28.93	43.50	-14.57	peak	
3	288.0200	43.24	-10.07	33.17	46.00	-12.83	peak	
4 *	376.2900	43.56	-8.52	35.04	46.00	-10.96	peak	
5	464.5600	39.30	-6.33	32.97	46.00	-13.03	peak	
6	547.0100	36.49	-4.79	31.70	46.00	-14.30	peak	

## **ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)**

Test Mode : TX 2402MHz\_CH00\_1Mbps

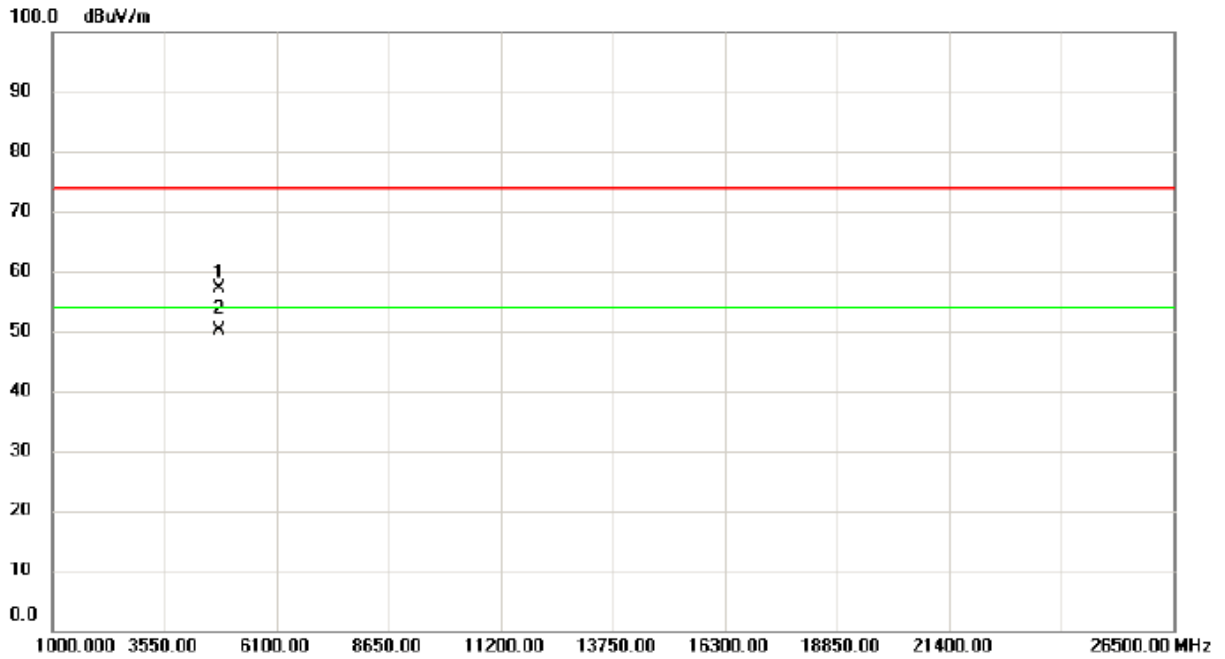
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	22.94	33.43	56.37	74.00	-17.63	peak	
2		2390.000	15.81	33.43	49.24	54.00	-4.76	AVG	
3	X	2402.000	71.52	33.45	104.97	74.00	30.97	peak	No Limit
4	*	2402.000	64.39	33.45	97.84	54.00	43.84	AVG	No Limit

Test Mode : TX 2402MHz \_CH00\_ 1Mbps

Vertical

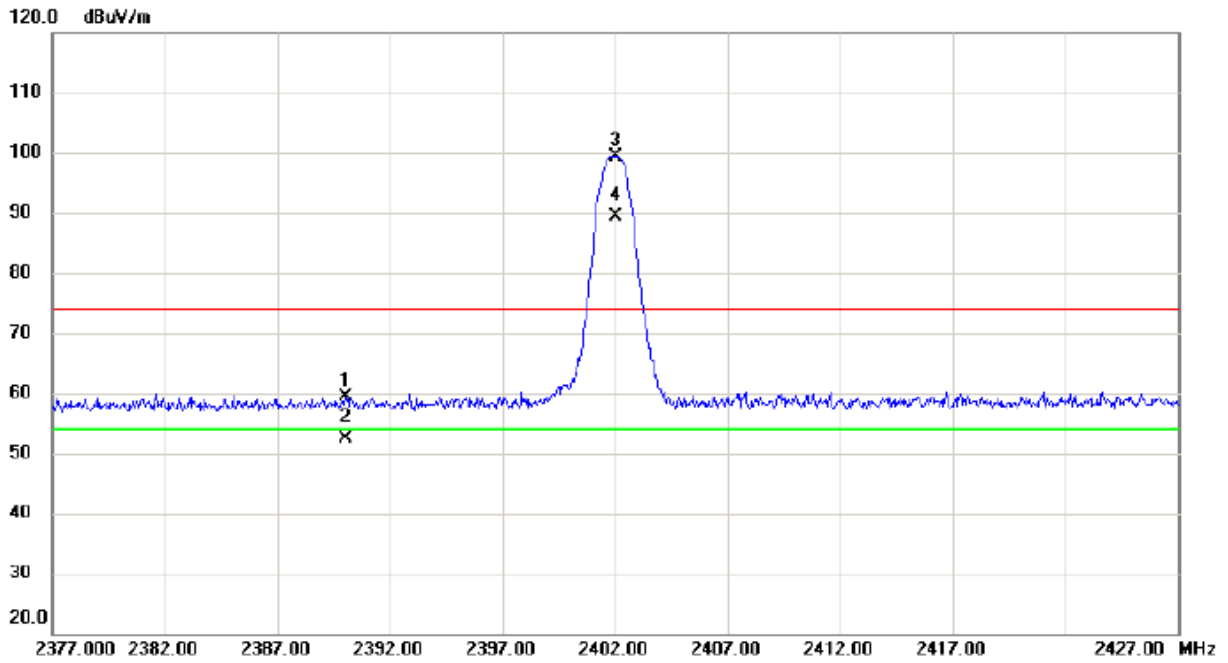


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4803.900	50.48	6.76	57.24	74.00	-16.76	peak	
2	*	4803.900	43.35	6.76	50.11	54.00	-3.89	AVG	



Test Mode : TX 2402MHz \_CH00\_ 1Mbps

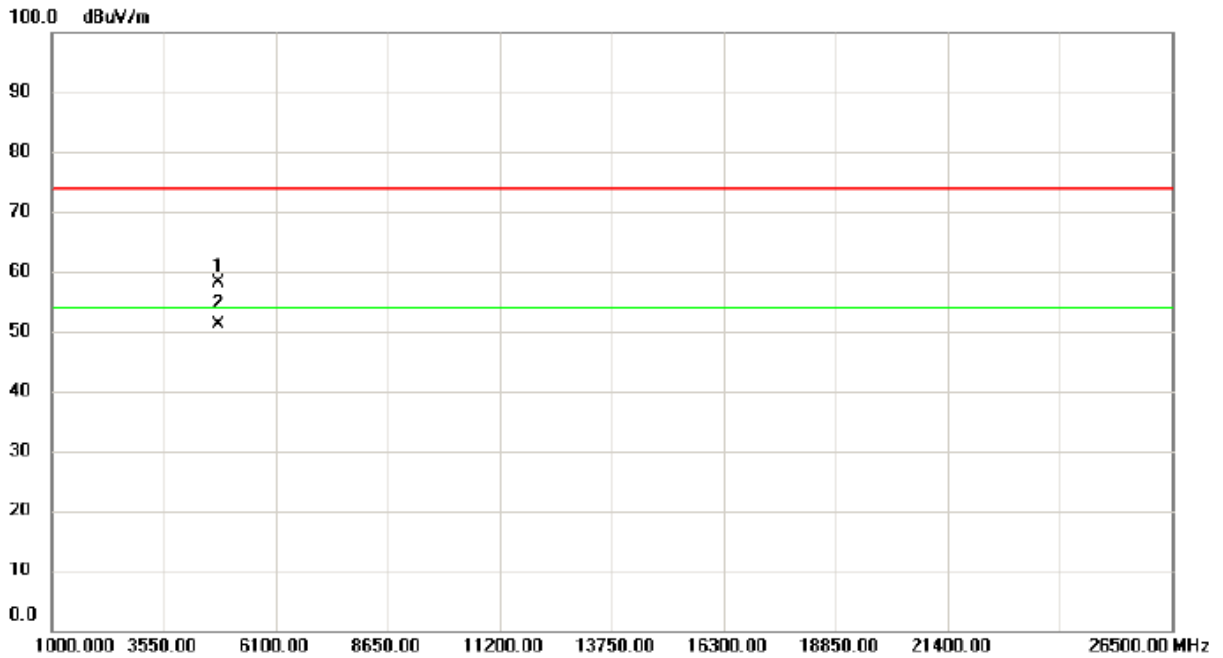
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	26.00	33.43	59.43	74.00	-14.57	peak	
2		2390.000	18.87	33.43	52.30	54.00	-1.70	AVG	
3	X	2402.000	65.93	33.45	99.38	74.00	25.38	peak	No Limit
4	*	2402.000	55.85	33.45	89.30	54.00	35.30	AVG	No Limit

Test Mode : TX 2402MHz \_CH00\_1Mbps

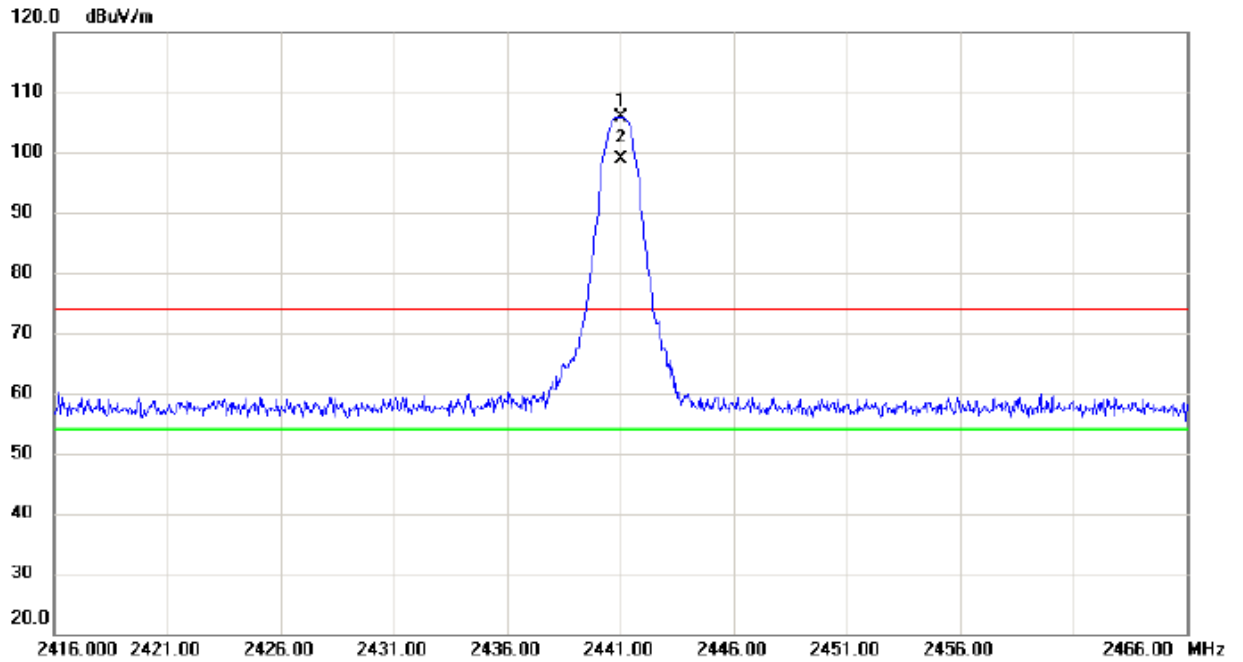
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4803.950	51.47	6.76	58.23	74.00	-15.77	peak	
2	*	4803.950	44.34	6.76	51.10	54.00	-2.90	AVG	

Test Mode : TX 2441MHz\_CH39\_1Mbps

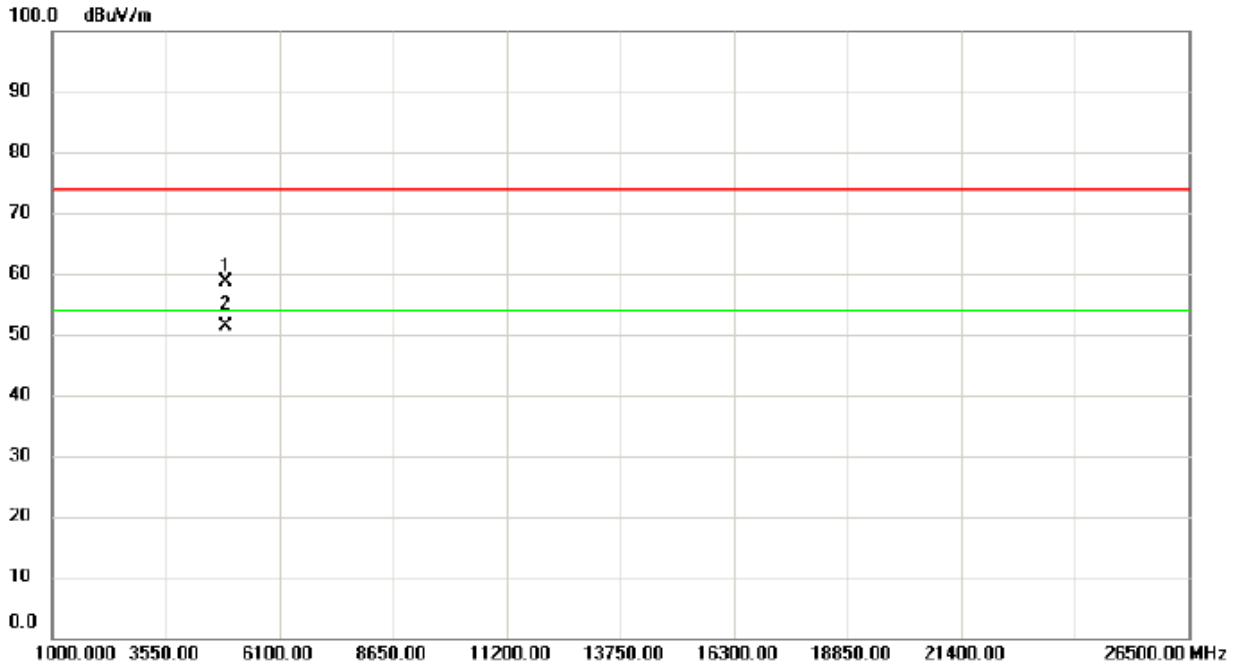
**Vertical**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2441.000	72.42	33.52	105.94	74.00	31.94	peak	No Limit
2	*	2441.000	65.29	33.52	98.81	54.00	44.81	AVG	No Limit

Test Mode : TX 2441MHz \_CH39\_ 1Mbps

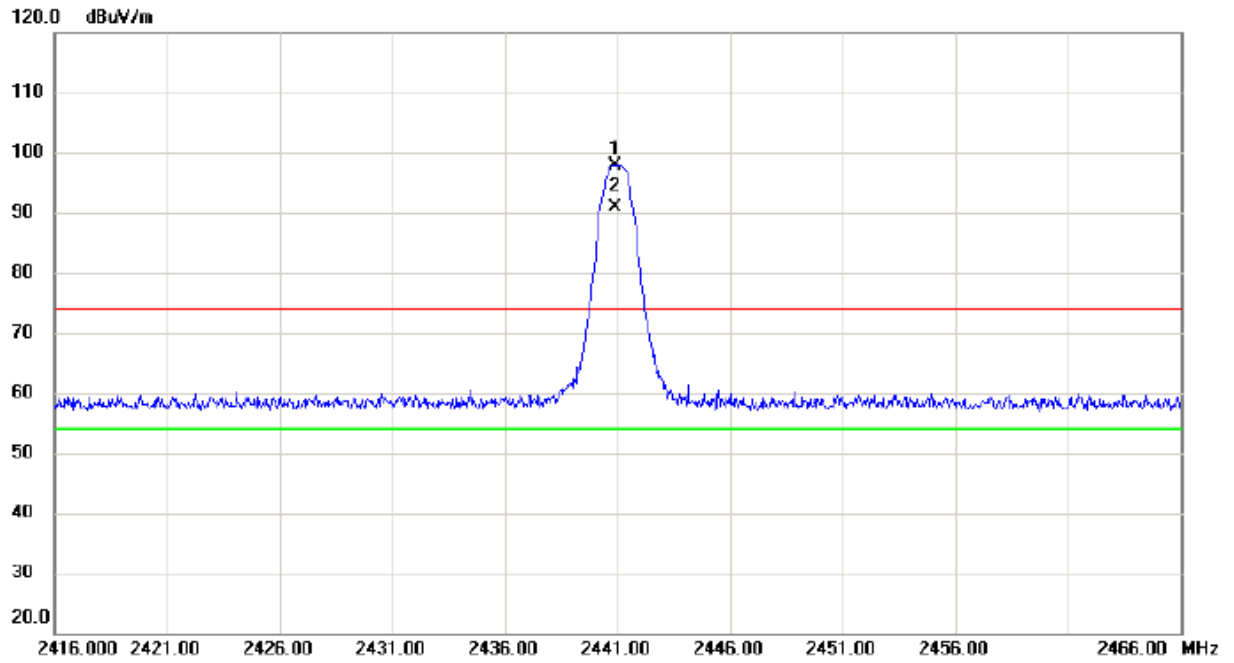
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4881.800	51.61	7.00	58.61	74.00	-15.39	peak	
2	*	4881.800	44.48	7.00	51.48	54.00	-2.52	AVG	

Test Mode : TX 2441MHz \_CH39\_1Mbps

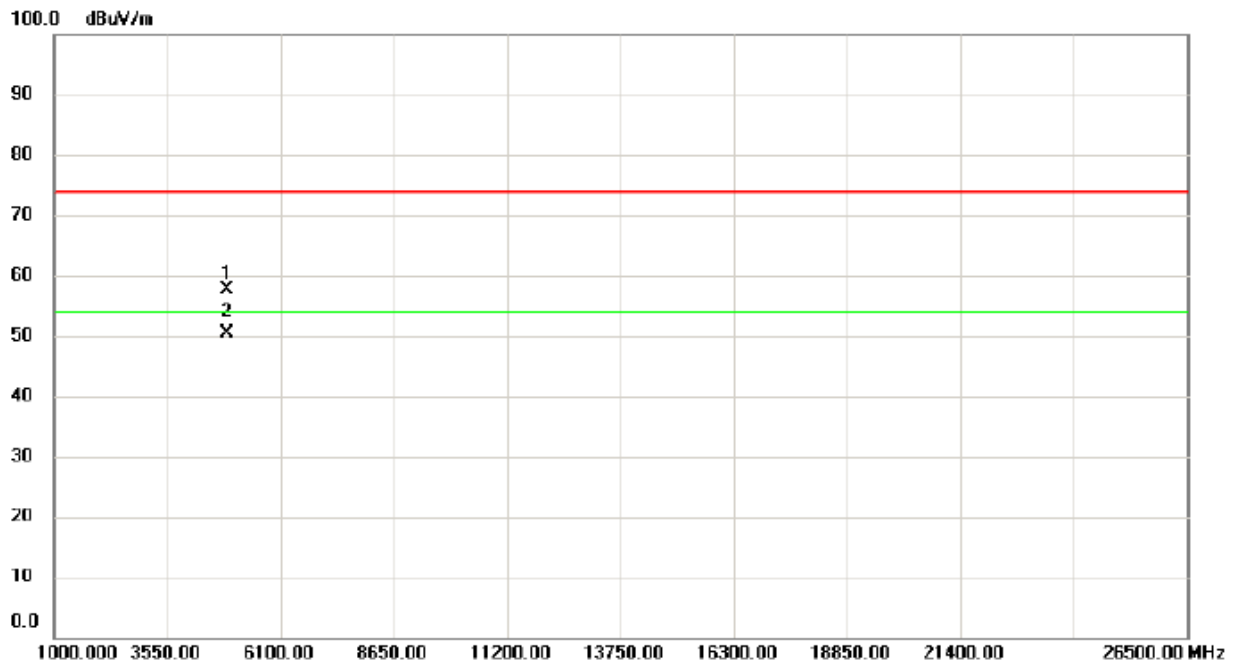
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2440.900	64.37	33.52	97.89	74.00	23.89	peak	No Limit
2	*	2440.900	57.24	33.52	90.76	54.00	36.76	AVG	No Limit

Test Mode : TX 2441MHz \_CH39\_1Mbps

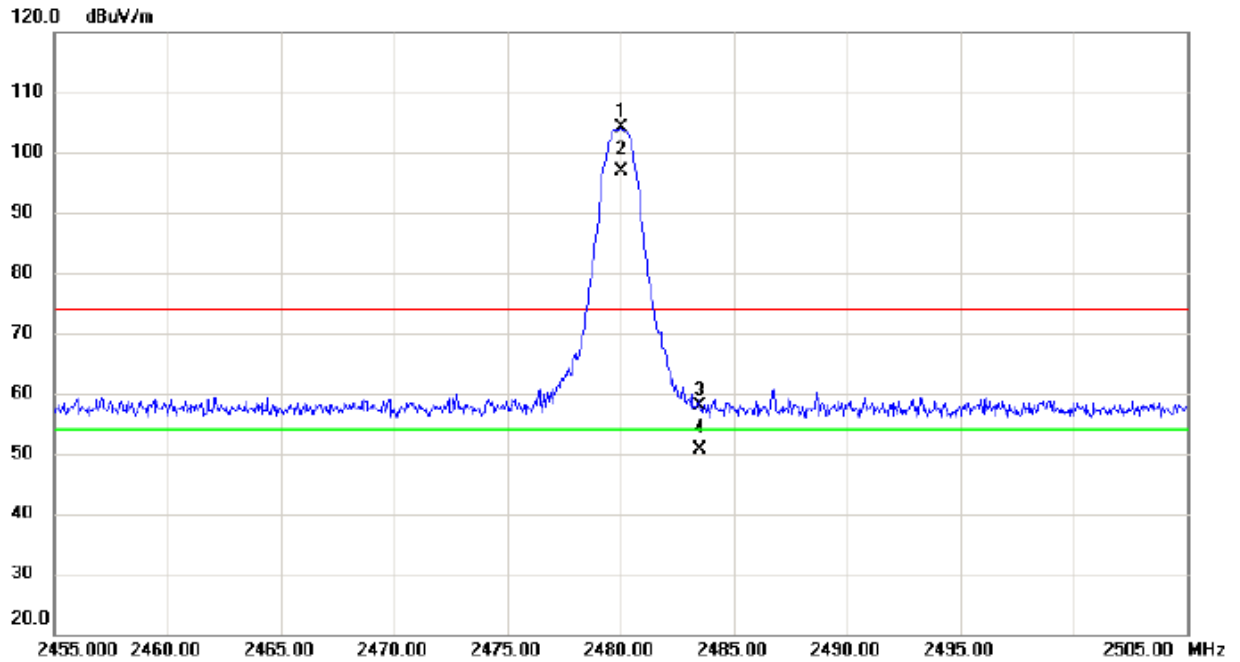
Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.000	50.60	7.00	57.60	74.00	-16.40	peak	
2	*	4882.000	43.47	7.00	50.47	54.00	-3.53	AVG	

Test Mode : TX 2480MHz \_CH78\_1Mbps

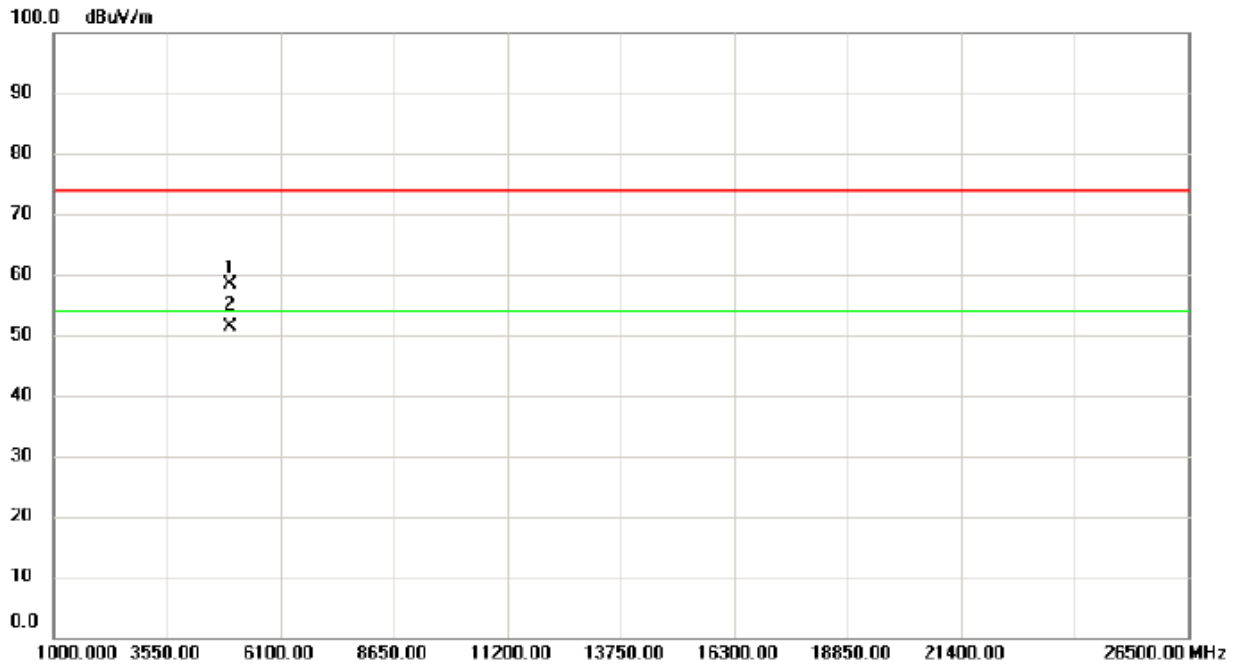
### Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	X	2480.000	70.51	33.58	104.09	74.00	30.09	peak	No Limit
2	*	2480.000	63.38	33.58	96.96	54.00	42.96	AVG	No Limit
3		2483.500	24.22	33.59	57.81	74.00	-16.19	peak	
4		2483.500	17.09	33.59	50.68	54.00	-3.32	AVG	

Test Mode : TX 2480MHz \_CH78\_1Mbps

**Vertical**

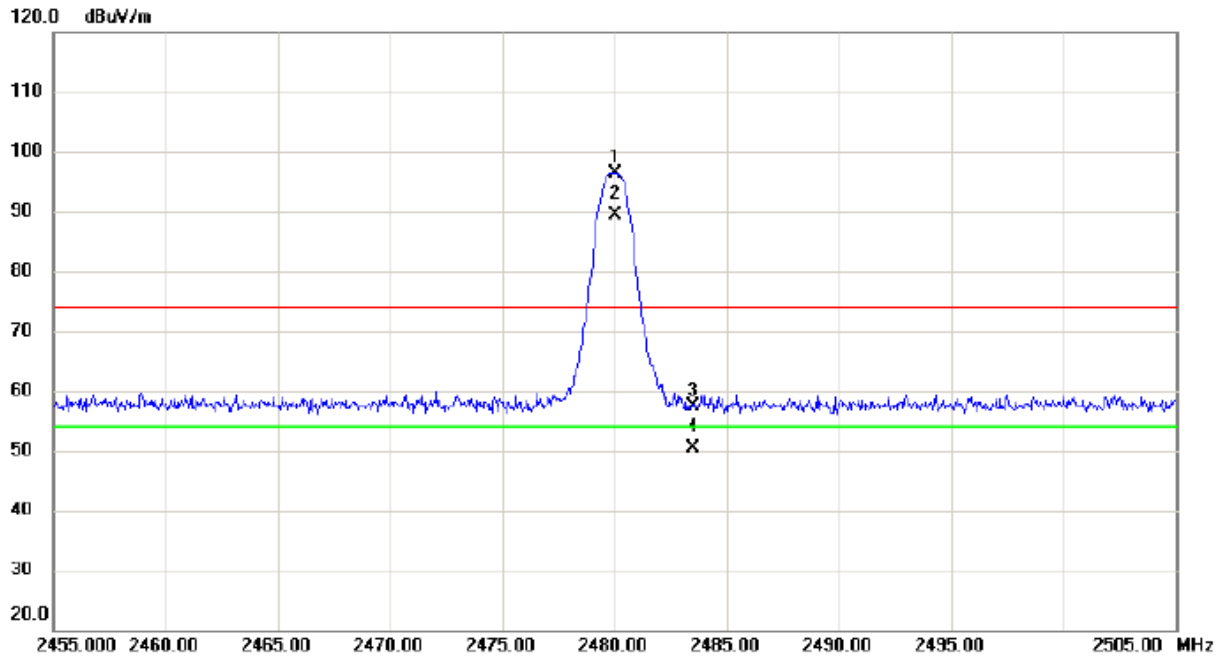


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4959.600	51.26	7.22	58.48	74.00	-15.52	peak	
2	*	4959.600	44.13	7.22	51.35	54.00	-2.65	AVG	



Test Mode : TX 2480MHz \_CH78\_1Mbps

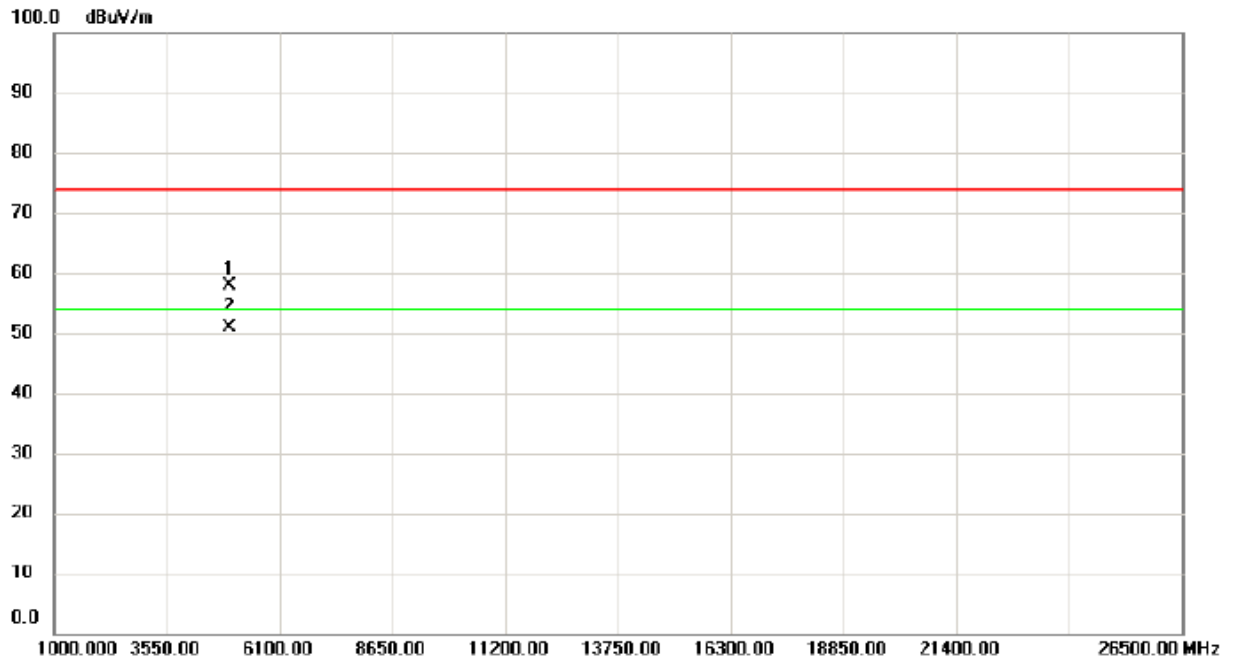
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2480.000	62.85	33.58	96.43	74.00	22.43	peak	No Limit
2	*	2480.000	55.72	33.58	89.30	54.00	35.30	AVG	No Limit
3		2483.500	23.89	33.59	57.48	74.00	-16.52	peak	
4		2483.500	16.72	33.59	50.31	54.00	-3.69	AVG	

Test Mode : TX 2480MHz \_CH78\_1Mbps

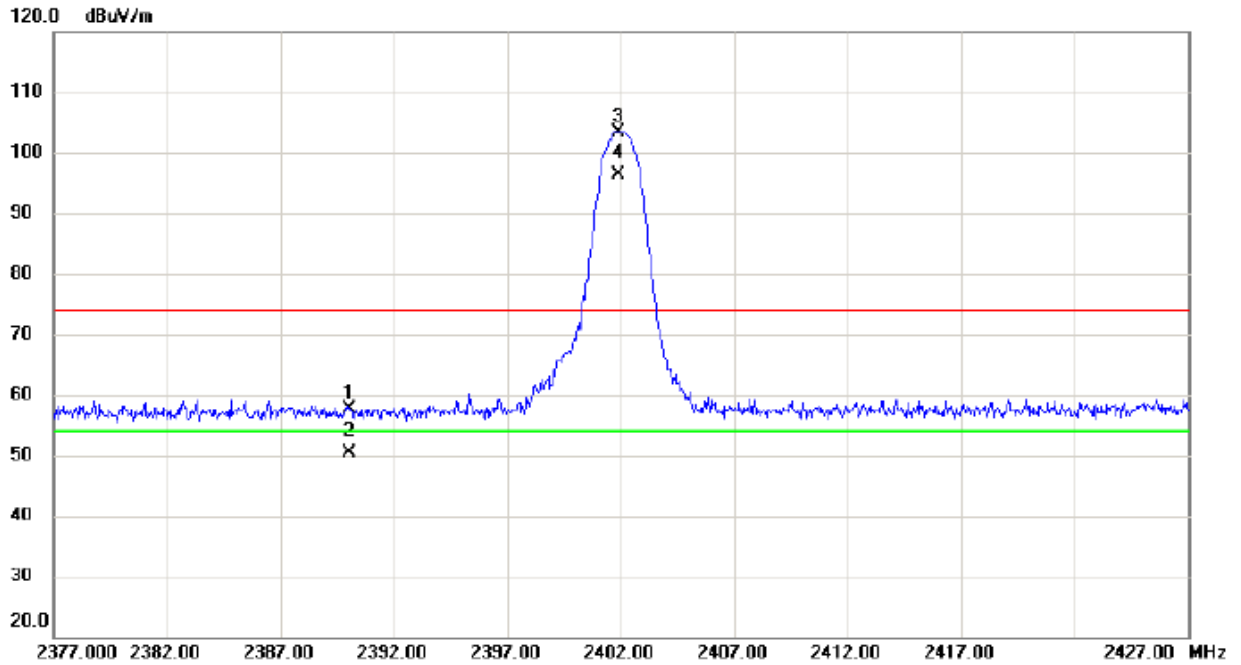
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4959.650	50.70	7.22	57.92	74.00	-16.08	peak	
2	*	4959.650	43.57	7.22	50.79	54.00	-3.21	AVG	

Test Mode : TX 2402MHz\_CH00\_3Mbps

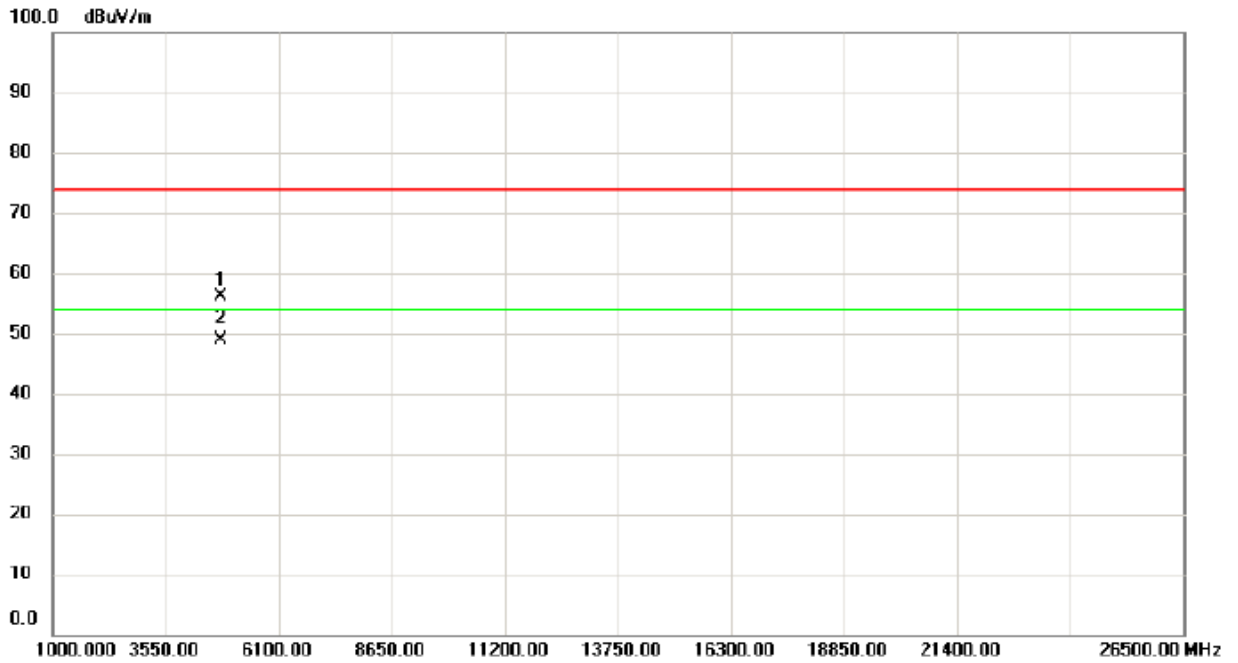
**Vertical**



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		2390.000	24.18	33.43	57.61	74.00	-16.39	peak	
2		2390.000	17.05	33.43	50.48	54.00	-3.52	AVG	
3	X	2401.900	70.04	33.45	103.49	74.00	29.49	peak	No Limit
4	*	2401.900	62.91	33.45	96.36	54.00	42.36	AVG	No Limit

Test Mode : TX 2402MHz \_CH00\_3Mbps

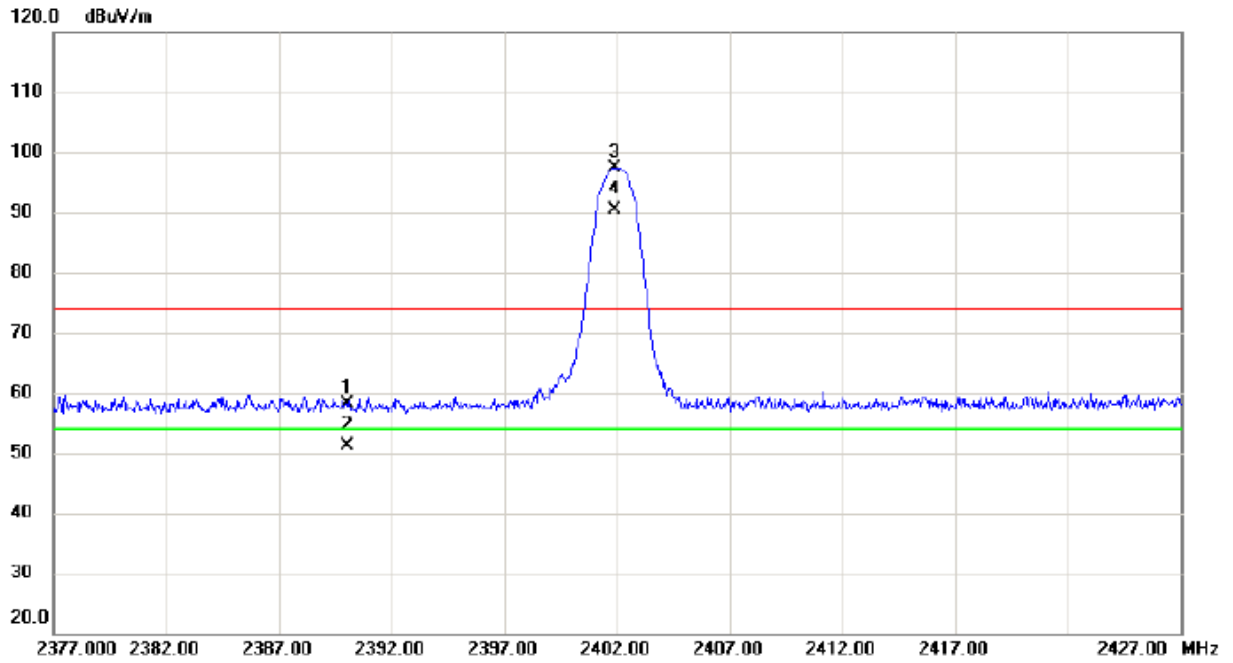
Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4803.950	49.36	6.76	56.12	74.00	-17.88	peak	
2	*	4803.950	42.23	6.76	48.99	54.00	-5.01	AVG	

Test Mode : TX 2402MHz \_CH00\_3Mbps

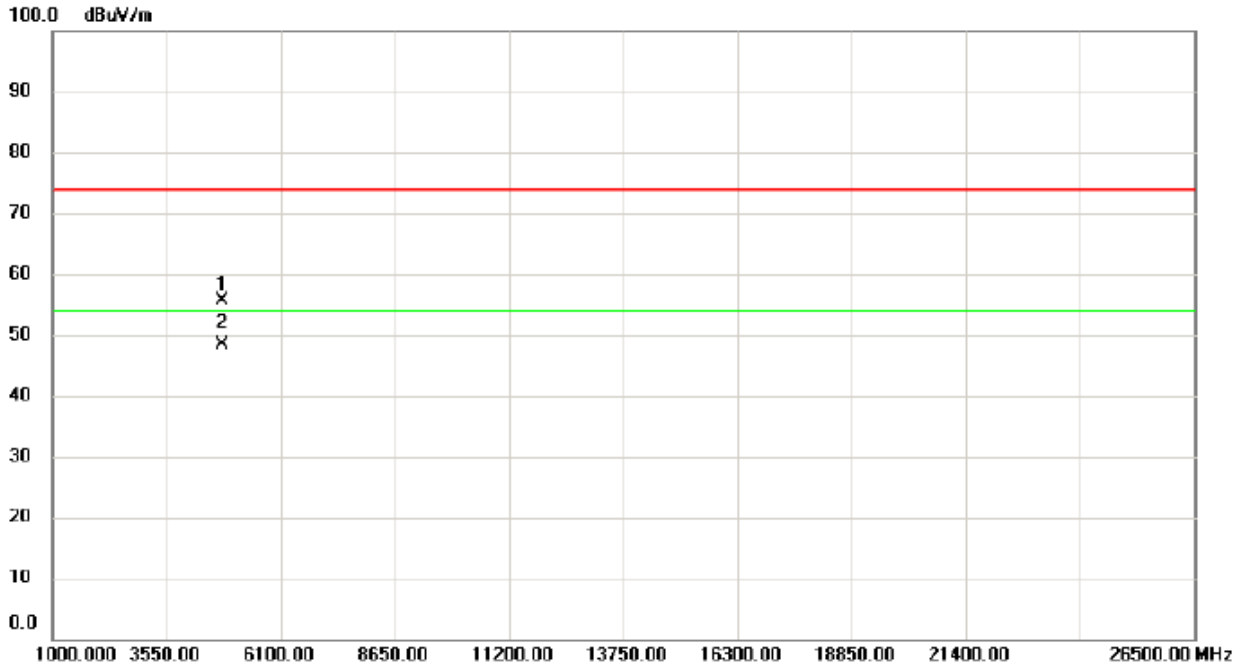
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2390.000	24.82	33.43	58.25	74.00	-15.75	peak	
2		2390.000	17.69	33.43	51.12	54.00	-2.88	AVG	
3	X	2401.900	64.00	33.45	97.45	74.00	23.45	peak	No Limit
4	*	2401.900	56.87	33.45	90.32	54.00	36.32	AVG	No Limit

Test Mode : TX 2402MHz \_CH00\_3Mbps

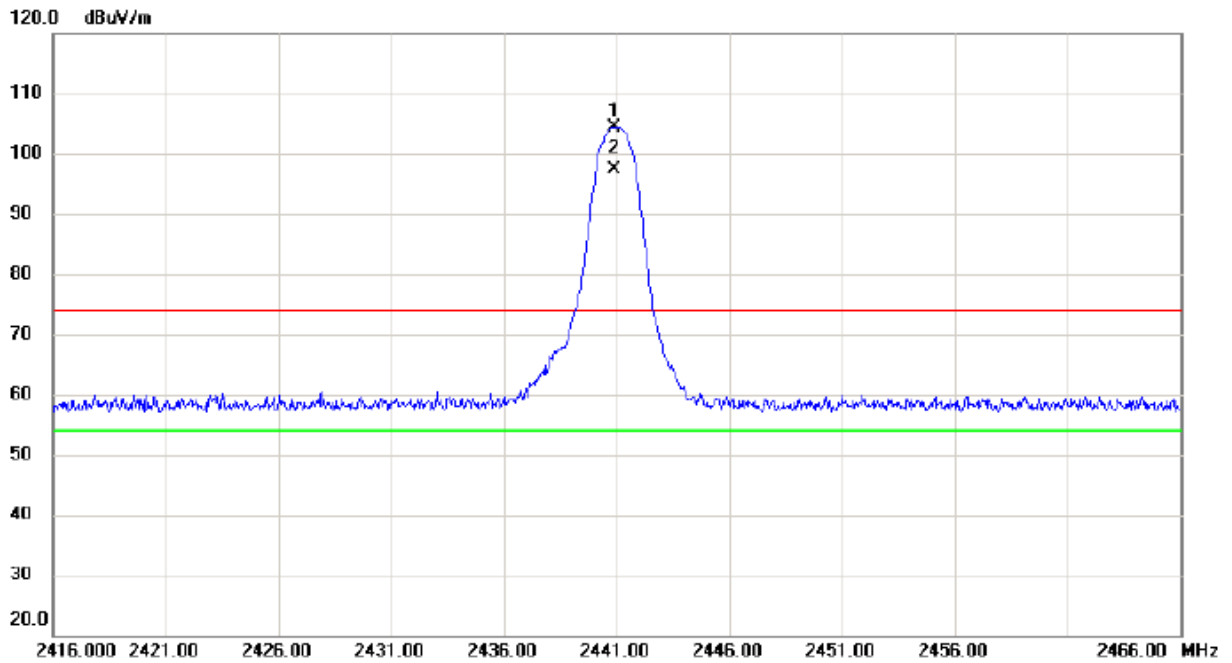
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4803.950	48.86	6.76	55.62	74.00	-18.38	peak	
2	*	4803.950	41.73	6.76	48.49	54.00	-5.51	AVG	

Test Mode : TX 2441MHz \_CH39\_3Mbps

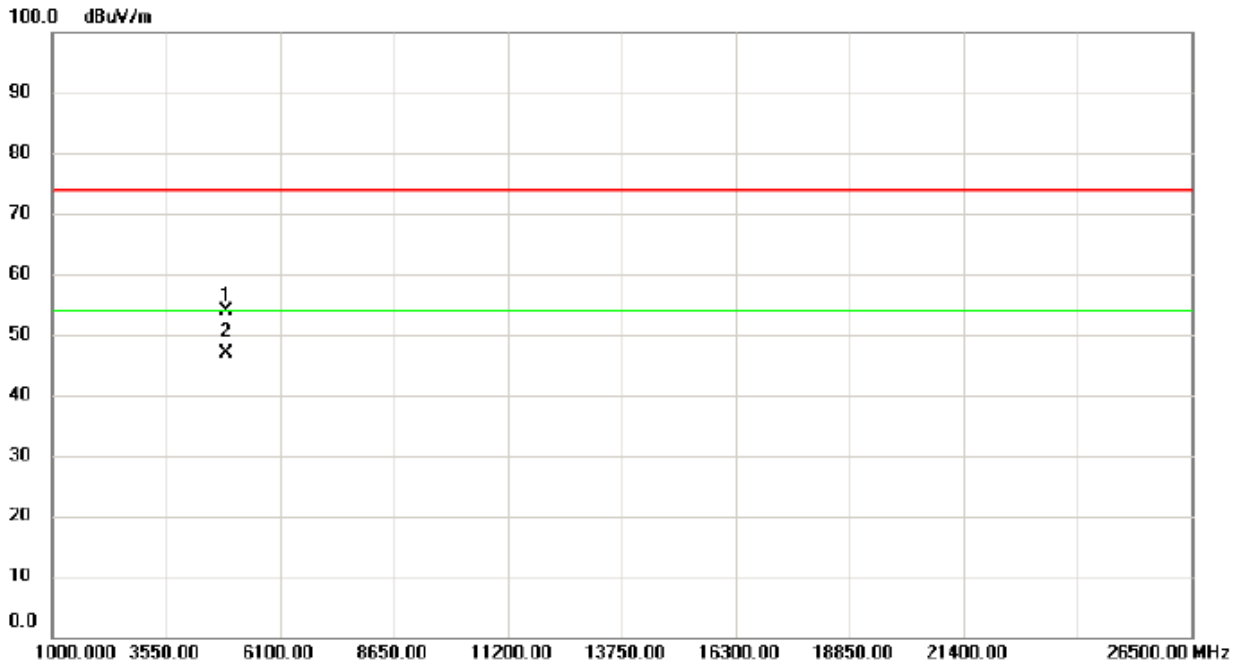
**Vertical**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2440.900	70.93	33.52	104.45	74.00	30.45	peak	No Limit
2	*	2440.900	63.80	33.52	97.32	54.00	43.32	AVG	No Limit

Test Mode : TX 2441MHz \_CH39\_3Mbps

Vertical

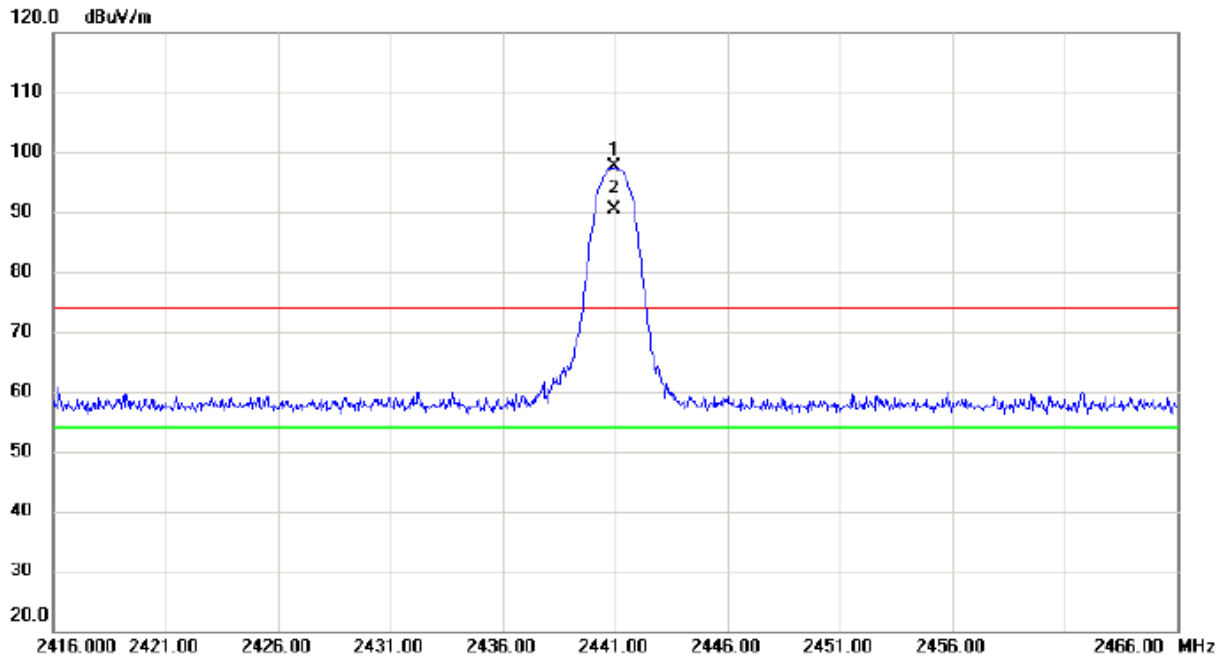


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4881.900	46.89	7.00	53.89	74.00	-20.11	peak	
2	*	4881.900	39.76	7.00	46.76	54.00	-7.24	AVG	



Test Mode : TX 2441MHz \_CH39\_3Mbps

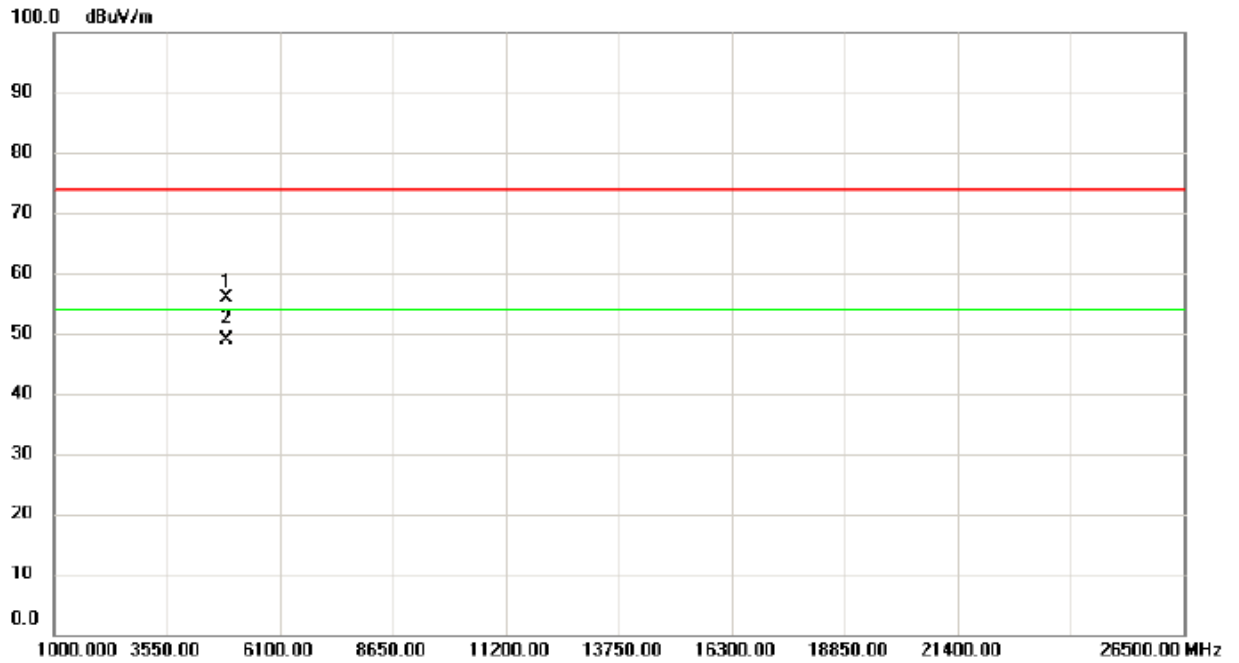
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	X	2440.950	64.02	33.52	97.54	74.00	23.54	peak	No Limit
2	*	2440.950	56.89	33.52	90.41	54.00	36.41	AVG	No Limit

Test Mode : TX 2441MHz \_CH39\_3Mbps

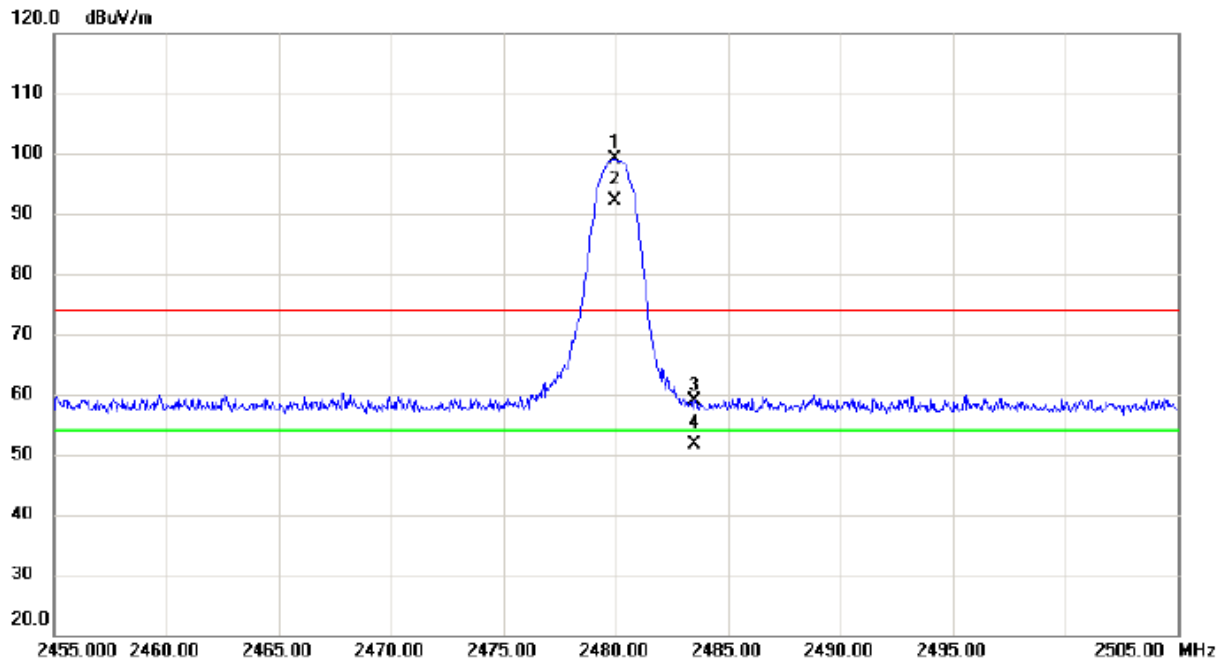
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.050	49.00	7.00	56.00	74.00	-18.00	peak	
2	*	4882.050	41.87	7.00	48.87	54.00	-5.13	AVG	

Test Mode : TX 2480MHz \_CH78\_3Mbps

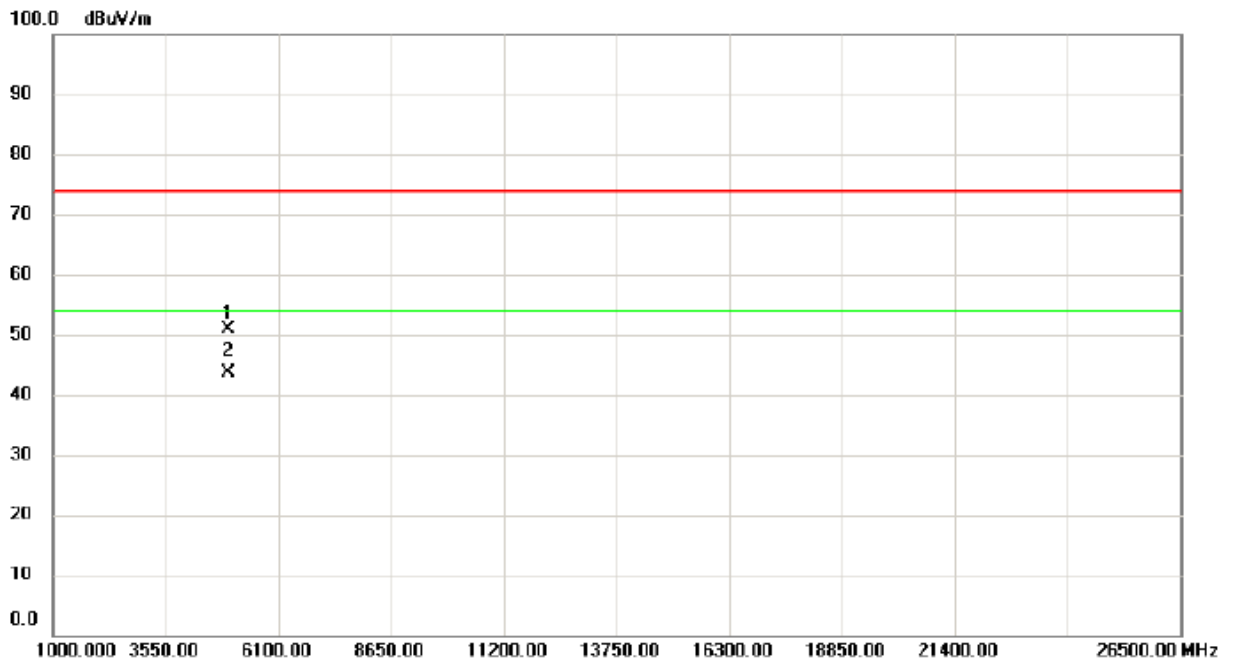
**Vertical**



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2479.950	65.66	33.58	99.24	74.00	25.24	peak	No Limit
2	*	2479.950	58.53	33.58	92.11	54.00	38.11	AVG	No Limit
3		2483.500	25.17	33.59	58.76	74.00	-15.24	peak	
4		2483.500	18.04	33.59	51.63	54.00	-2.37	AVG	

Test Mode : TX 2480MHz \_CH78\_3Mbps

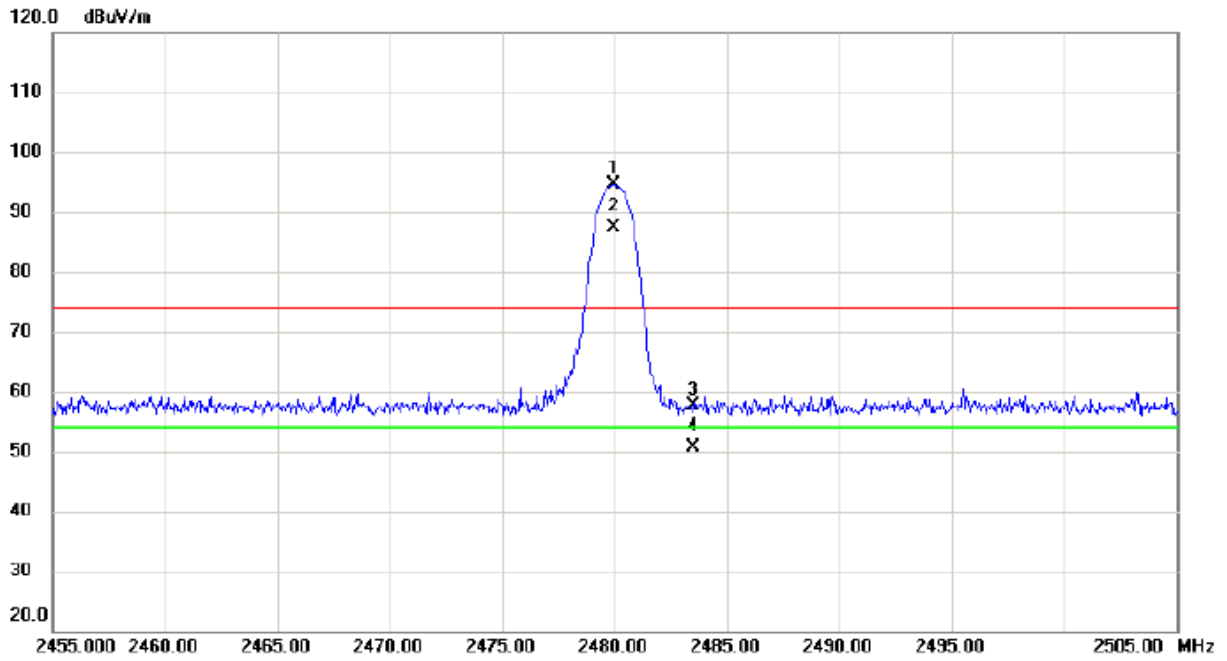
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4959.550	43.59	7.22	50.81	74.00	-23.19	peak	
2	*	4959.550	36.46	7.22	43.68	54.00	-10.32	AVG	

Test Mode : TX 2480MHz \_CH78\_3Mbps

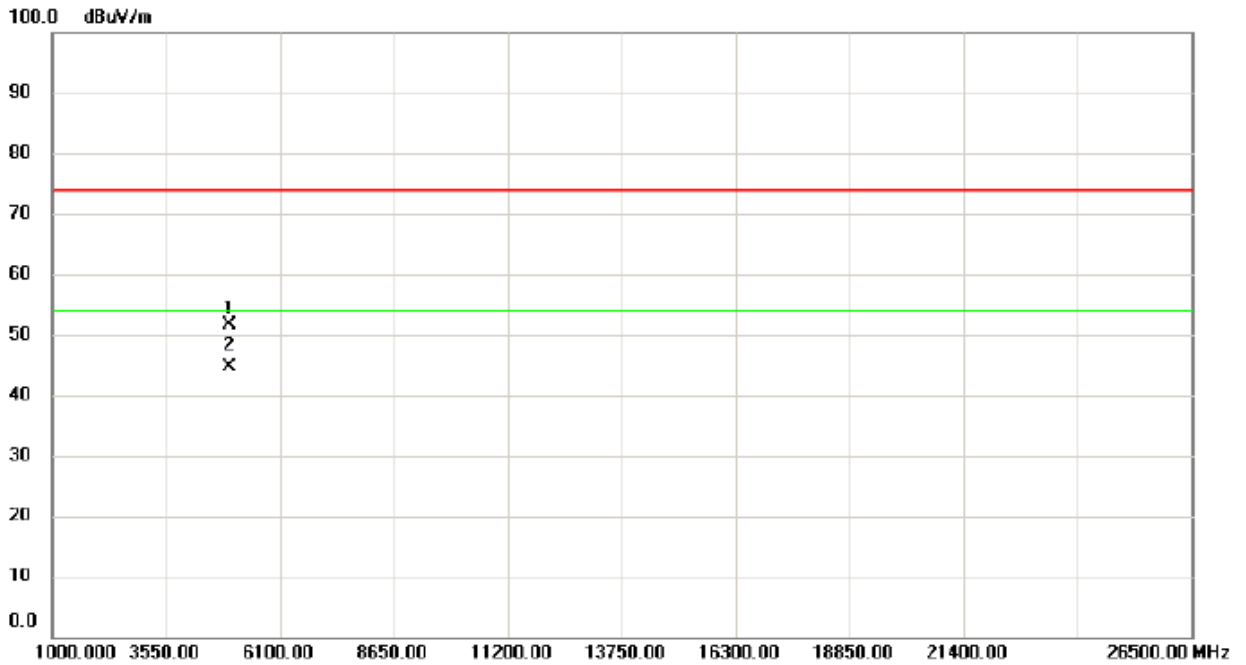
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1	X	2479.950	61.03	33.58	94.61	74.00	20.61	peak	No Limit
2	*	2479.950	53.90	33.58	87.48	54.00	33.48	AVG	No Limit
3		2483.500	24.07	33.59	57.66	74.00	-16.34	peak	
4		2483.500	16.94	33.59	50.53	54.00	-3.47	AVG	

Test Mode : TX 2480MHz \_CH78\_3Mbps

### Horizontal

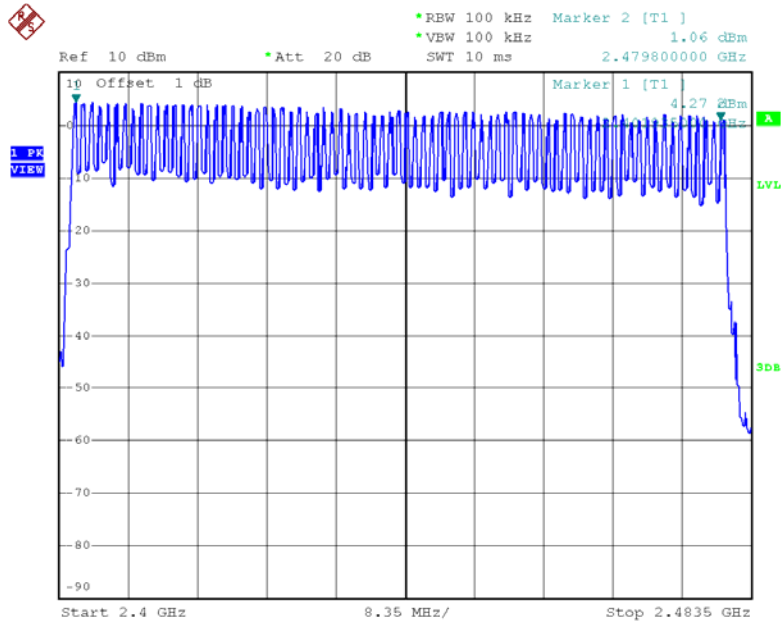


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB		
1		4959.900	44.46	7.22	51.68	74.00	-22.32	peak	
2	*	4959.900	37.33	7.22	44.55	54.00	-9.45	AVG	

## **ATTACHMENT E - NUMBER OF HOPPING CHANNEL**

**Test Mode**      **Hopping Mode\_1Mbps**

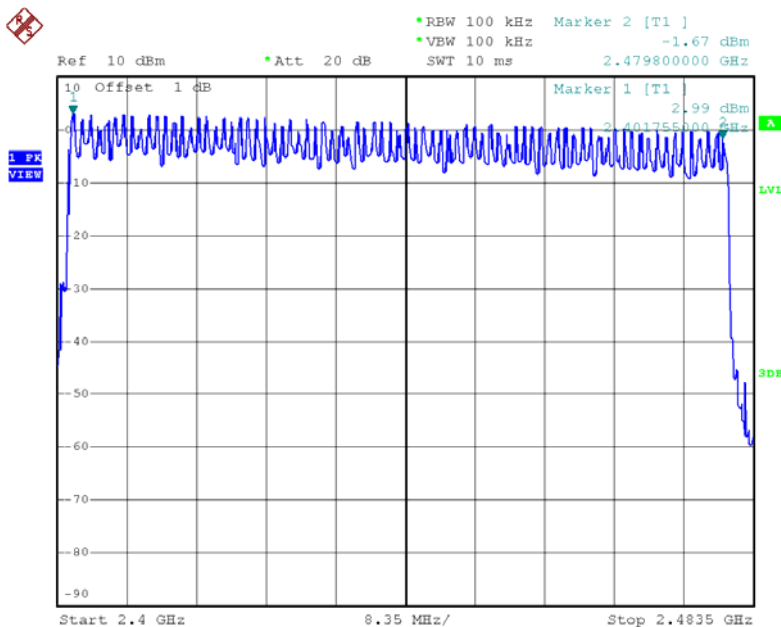
Number of Hopping Channel      79



Date: 25.AUG.2015 17:34:25

**Test Mode**      **Hopping Mode\_3Mbps**

Number of Hopping Channel      79



Date: 25.AUG.2015 17:57:26

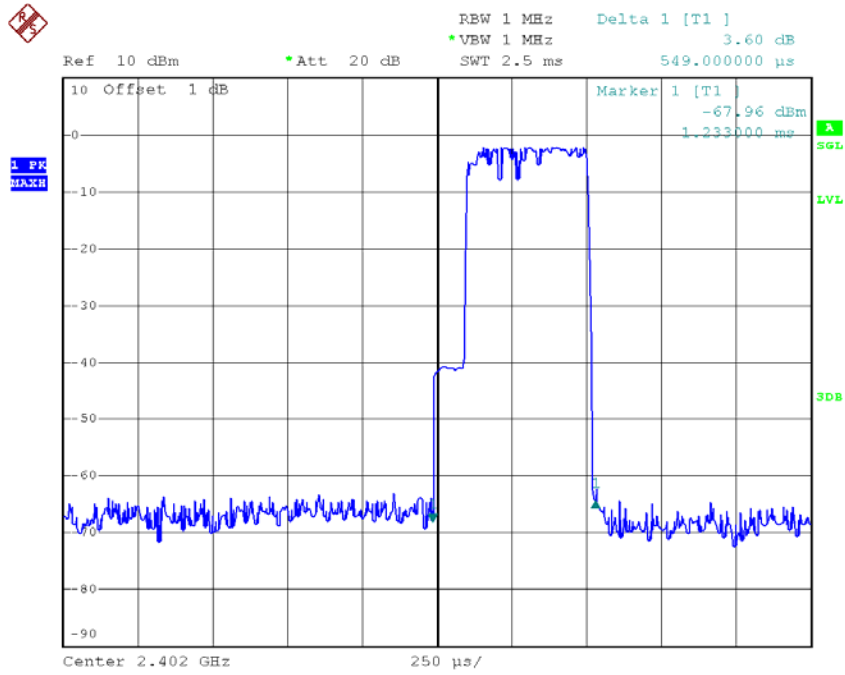


## **ATTACHMENT F - AVERAGE TIME OF OCCUPANCY**

Test Mode :	TX Mode_1Mbps
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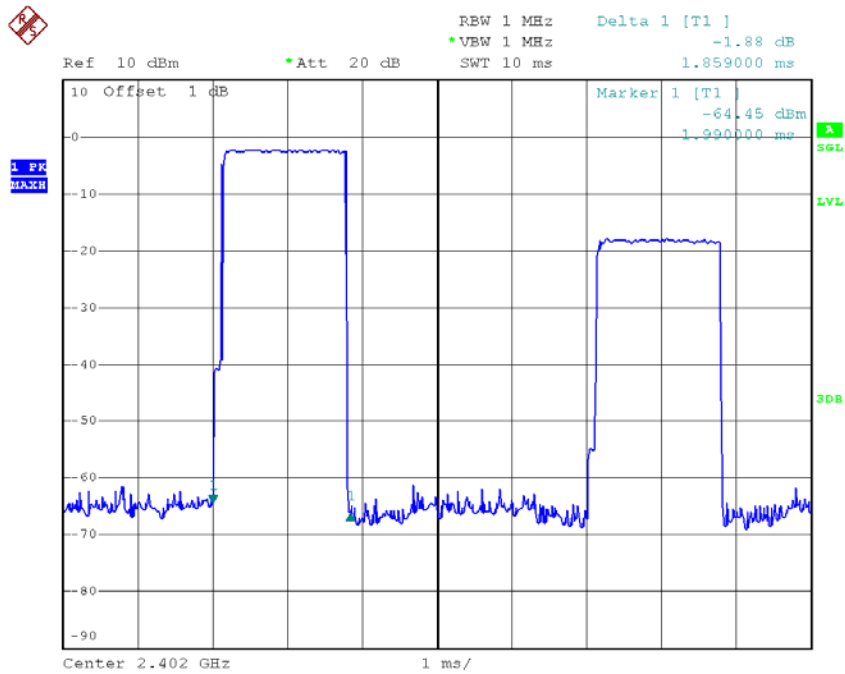
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.2790	0.3498	0.4000	Pass
DH3	2402	1.8590	0.1983	0.4000	Pass
DH1	2402	0.5490	0.0586	0.4000	Pass
DH5	2441	3.2390	0.3455	0.4000	Pass
DH3	2441	1.8590	0.1983	0.4000	Pass
DH1	2441	0.5440	0.0580	0.4000	Pass
DH5	2480	3.2780	0.3497	0.4000	Pass
DH3	2480	1.9180	0.2046	0.4000	Pass
DH1	2480	0.5490	0.0586	0.4000	Pass

### CH00-DH1



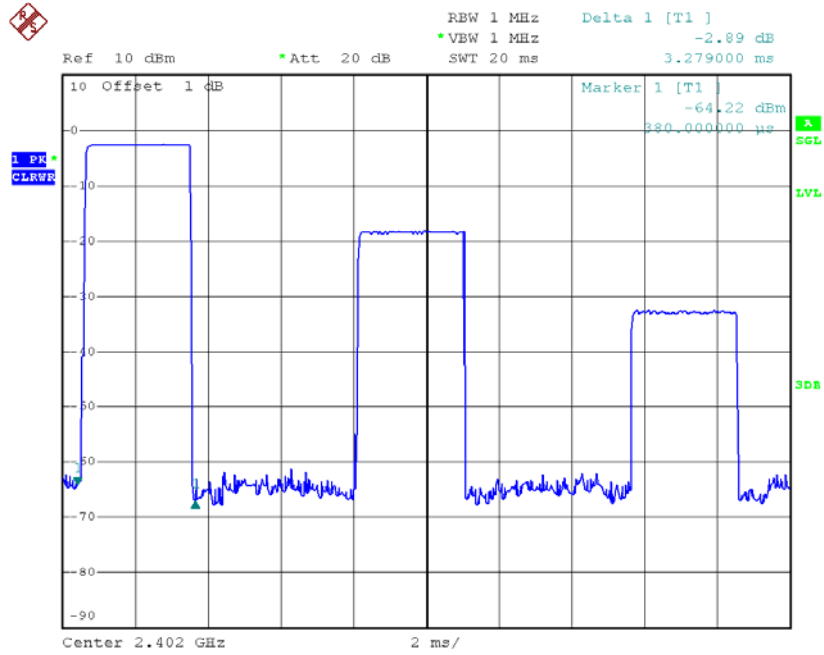
Date: 25.AUG.2015 17:28:53

### CH00-DH3



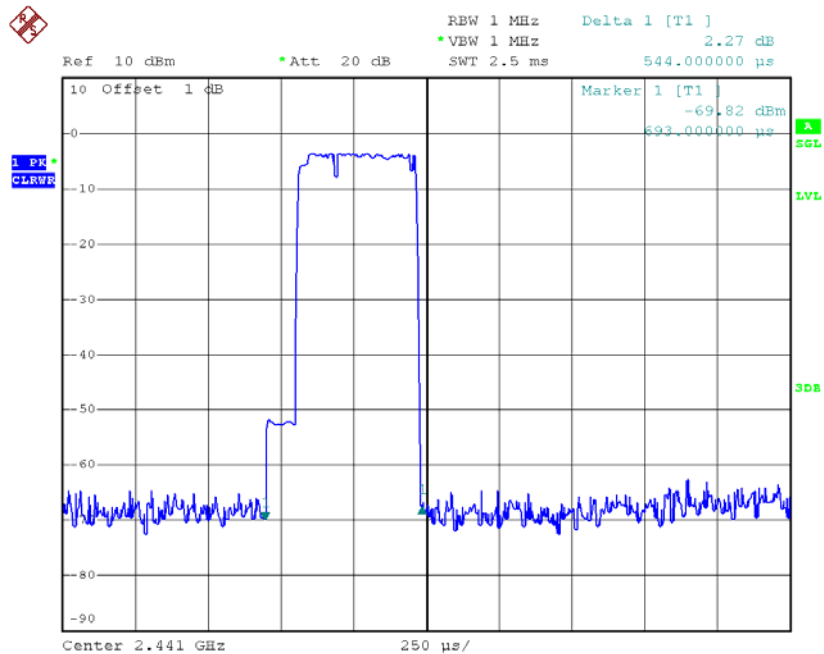
Date: 25.AUG.2015 17:36:31

**CH00-DH5**



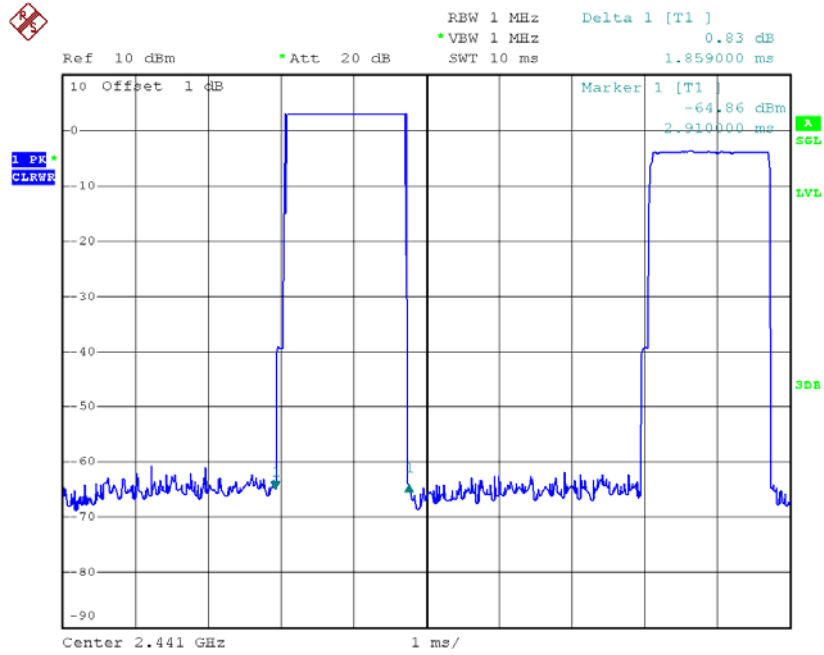
Date: 25.AUG.2015 17:39:09

**CH39-DH1**



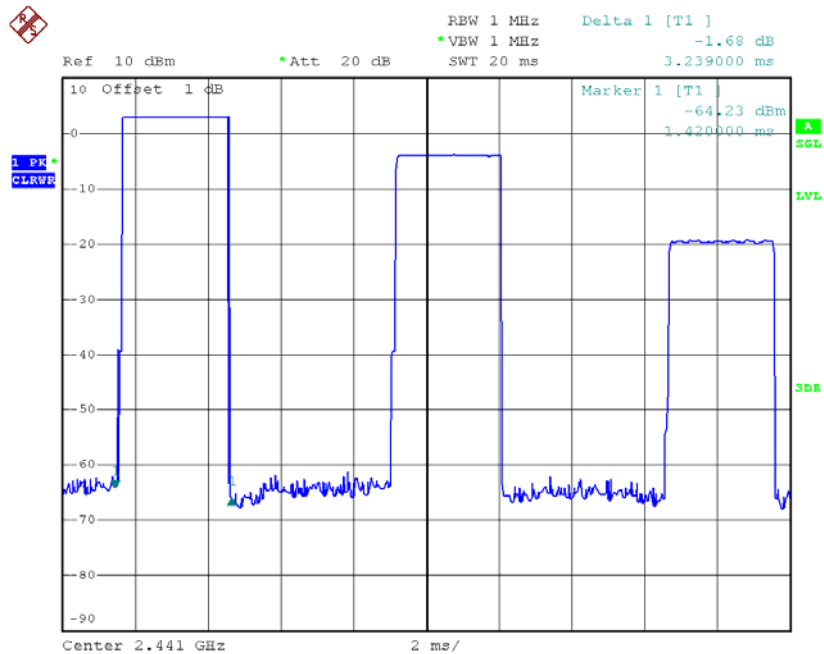
Date: 25.AUG.2015 17:28:59

**CH39-DH3**



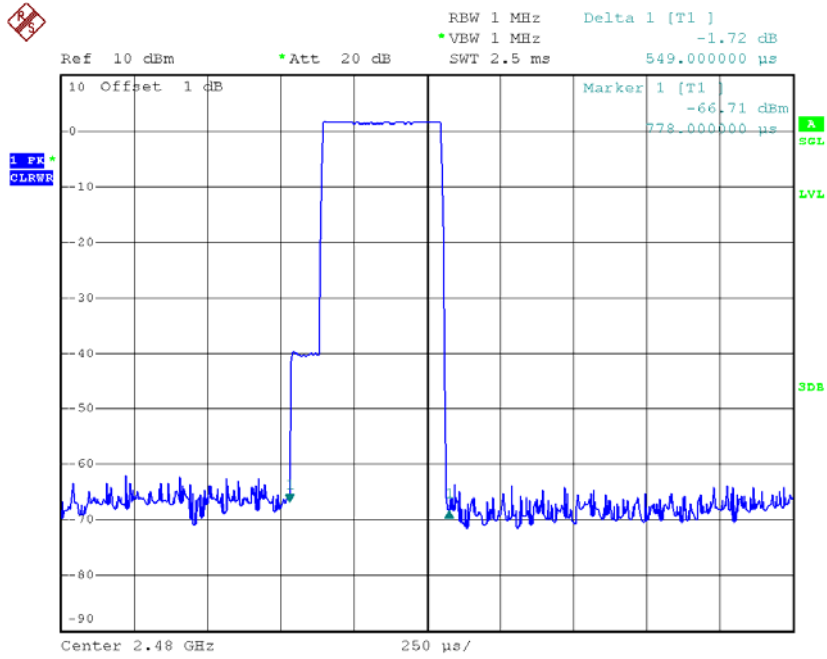
Date: 25.AUG.2015 17:36:42

**CH39-DH5**



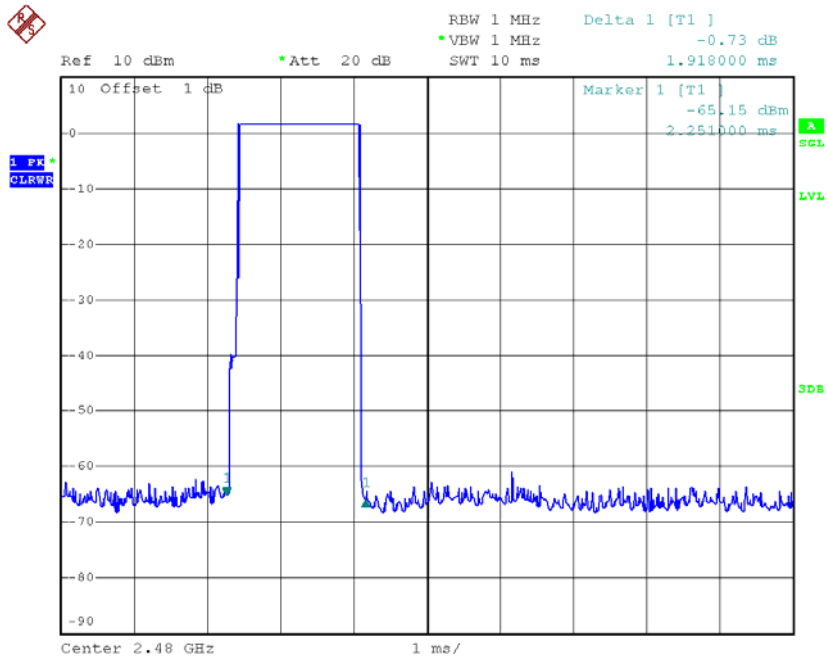
Date: 25.AUG.2015 17:39:29

## CH78-DH1



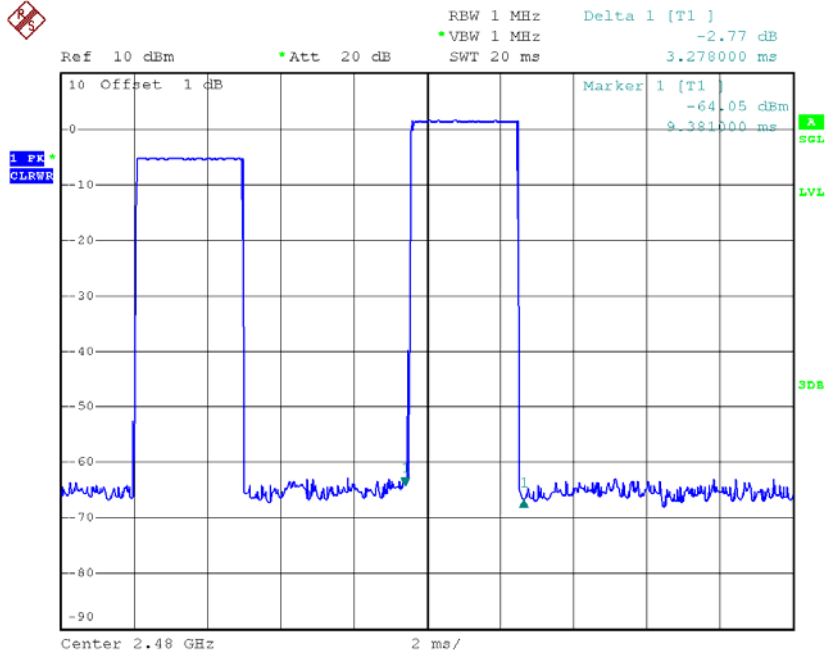
Date: 25.AUG.2015 17:29:10

## CH78-DH3



Date: 25.AUG.2015 17:36:55

### CH78-DH5



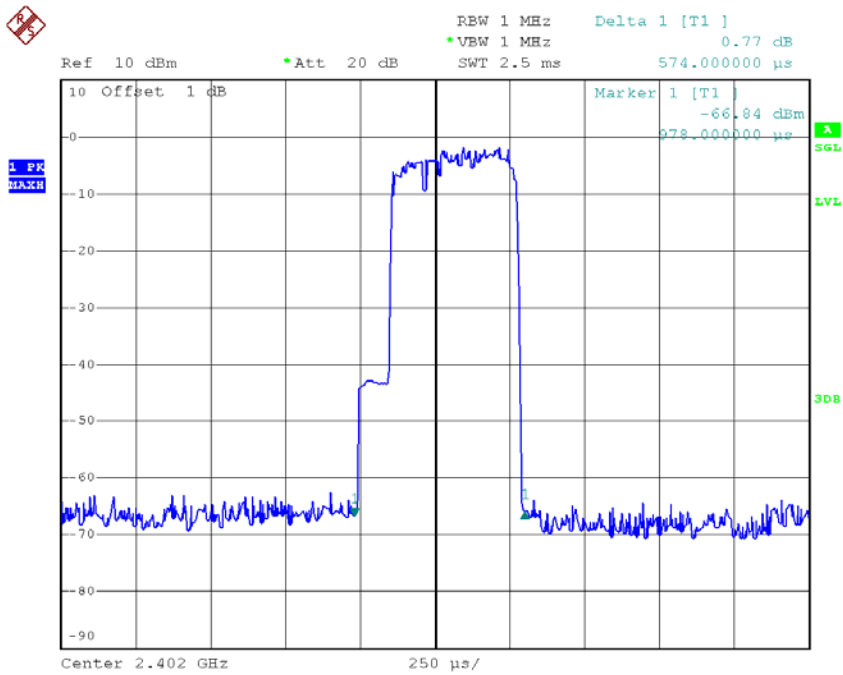
Date: 25.AUG.2015 17:39:46

Test Mode :	TX Mode_3Mbps
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Data Packet	Frequency	Pulse Duration(ms)	Dwell Time(s)	Limits(s)	Test Result
DH5	2402	3.2790	0.3498	0.4000	Pass
DH3	2402	1.8790	0.2004	0.4000	Pass
DH1	2402	0.5740	0.0612	0.4000	Pass
DH5	2441	3.2390	0.3455	0.4000	Pass
DH3	2441	1.8790	0.2004	0.4000	Pass
DH1	2441	0.5640	0.0602	0.4000	Pass
DH5	2480	3.1590	0.3370	0.4000	Pass
DH3	2480	1.8580	0.1982	0.4000	Pass
DH1	2480	0.5540	0.0591	0.4000	Pass

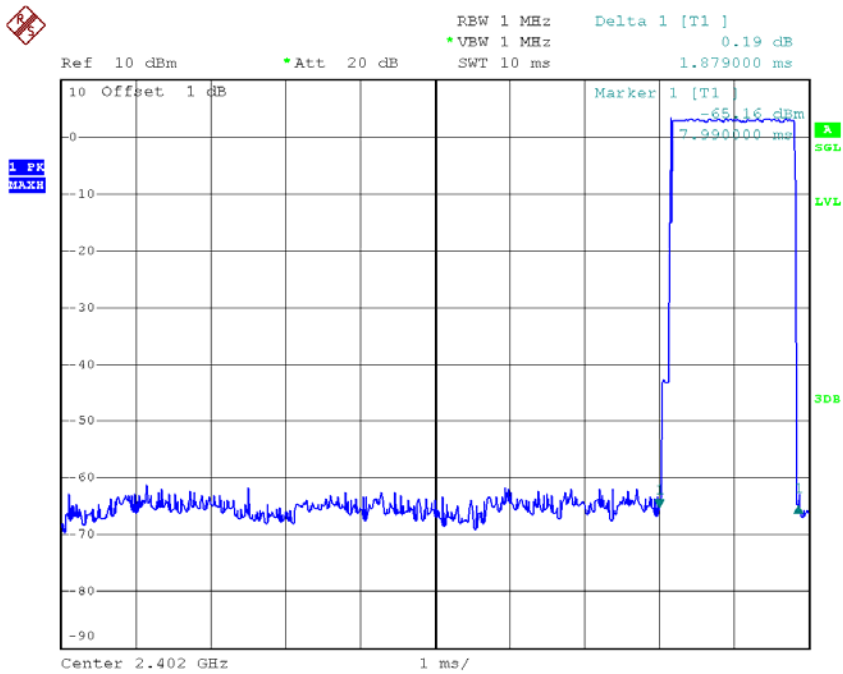


### CH00-DH1



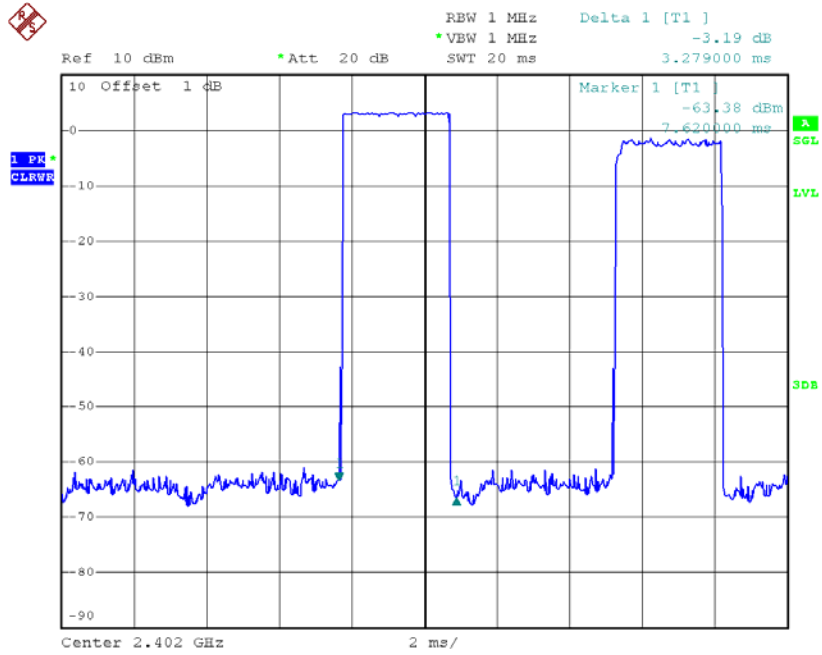
Date: 25.AUG.2015 17:51:54

### CH00-DH3



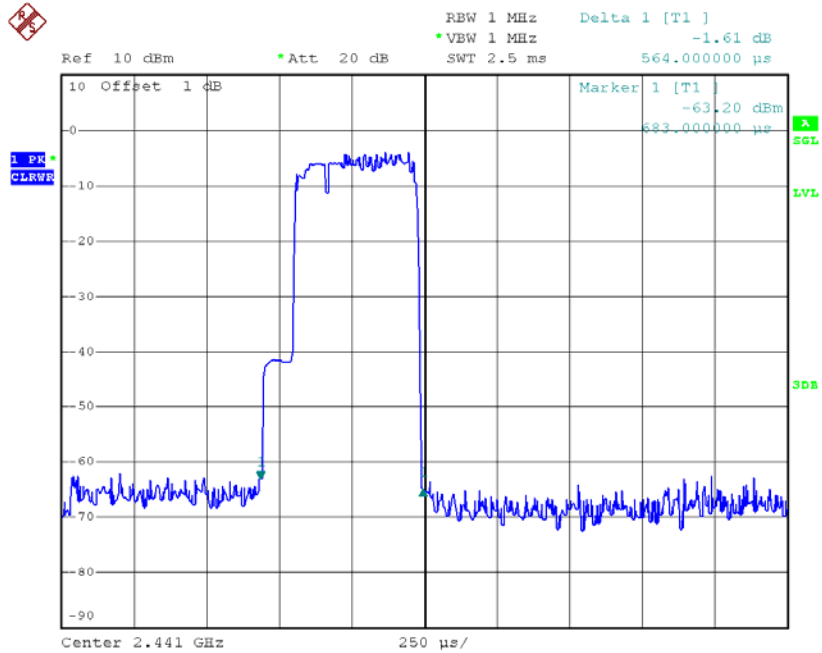
Date: 25.AUG.2015 18:03:30

**CH00-DH5**



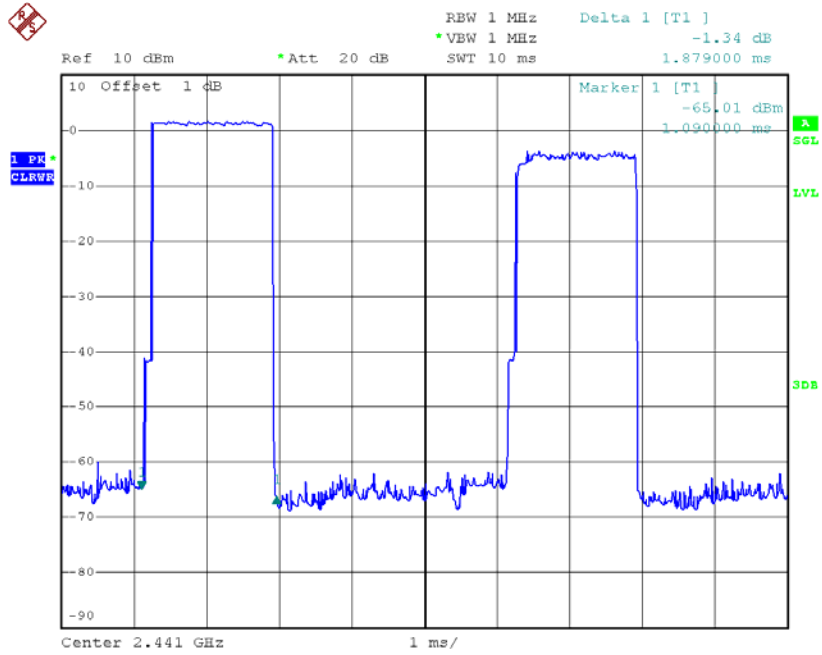
Date: 25.AUG.2015 18:04:42

**CH39-DH1**



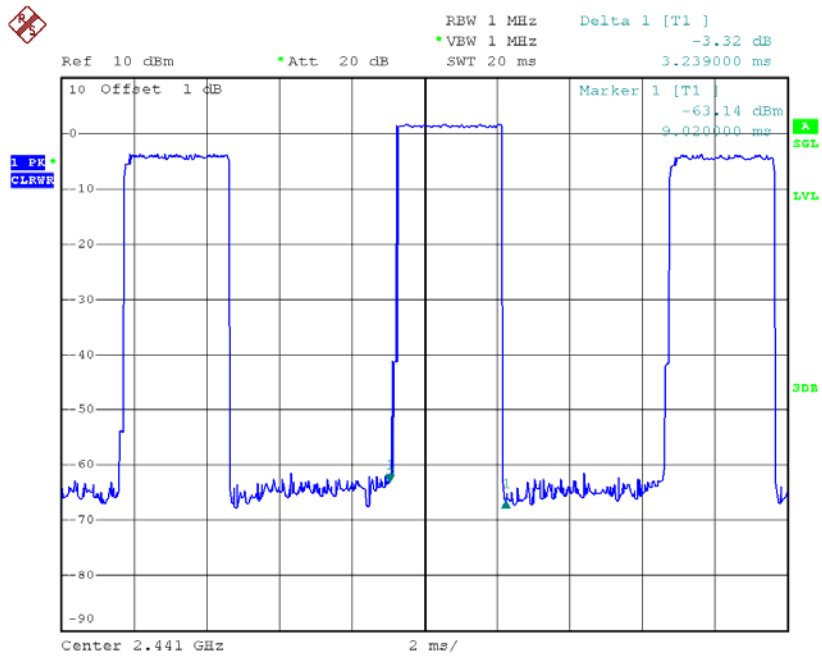
Date: 25.AUG.2015 17:52:03

### CH39-DH3



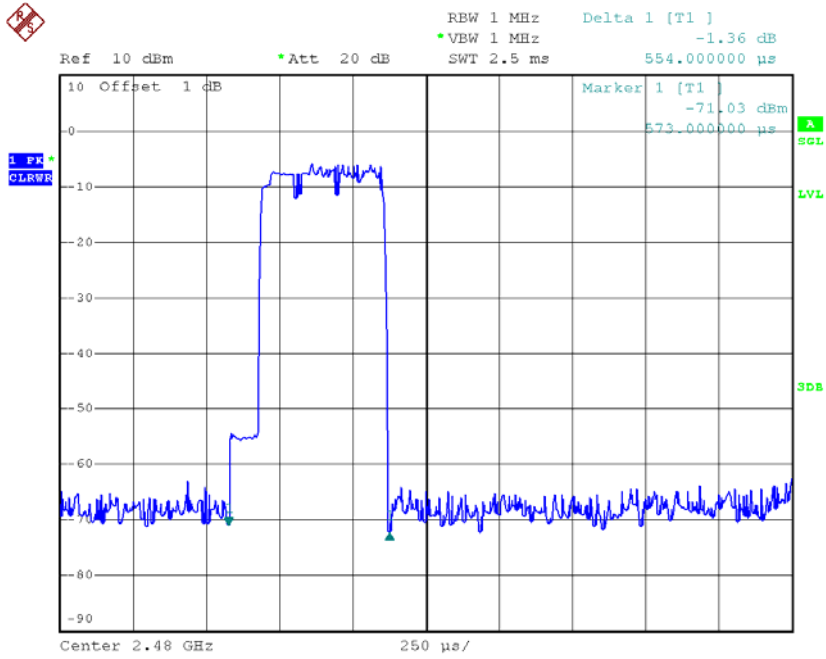
Date: 25.AUG.2015 18:03:42

### CH39-DH5



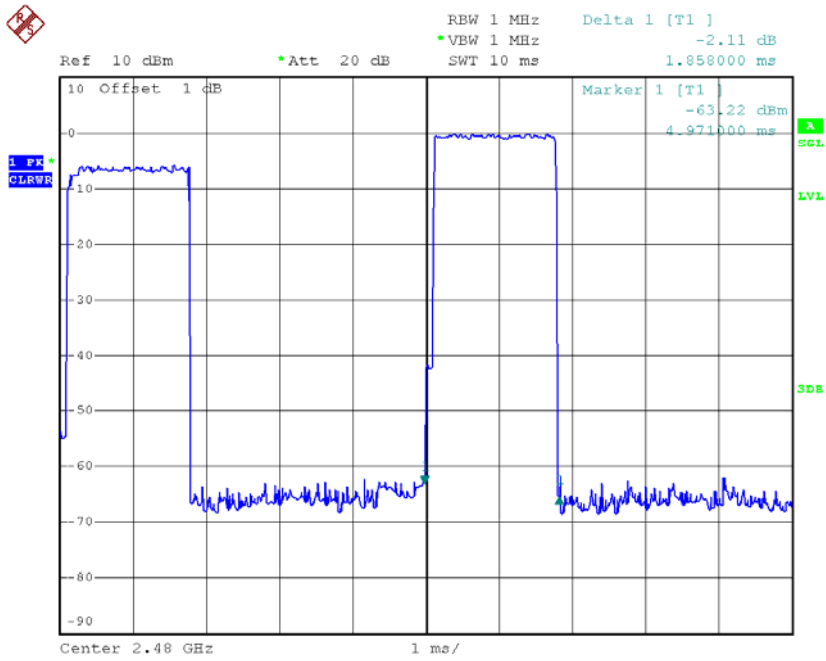
Date: 25.AUG.2015 18:04:57

**CH78-DH1**



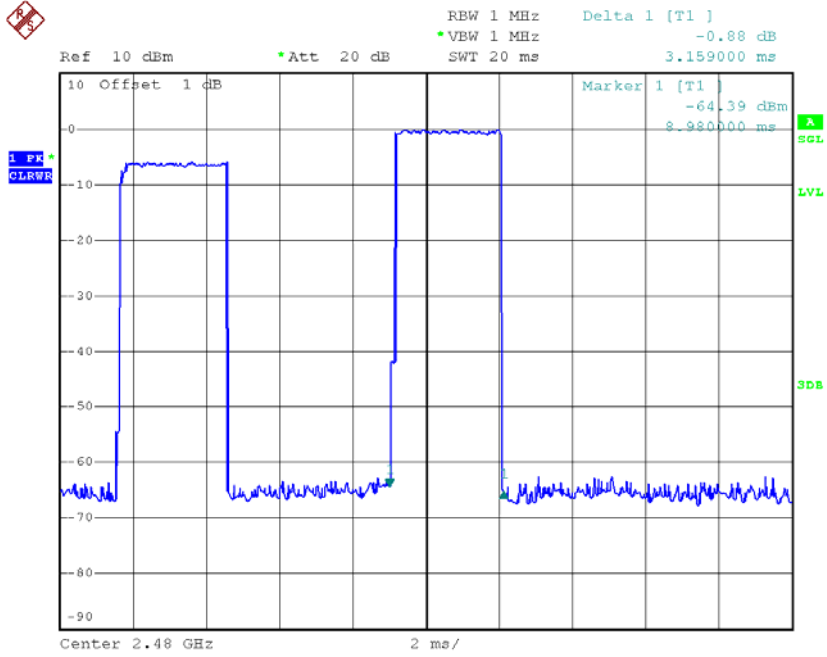
Date: 25.AUG.2015 17:52:10

**CH78-DH3**



Date: 25.AUG.2015 18:03:51

### CH78-DH5

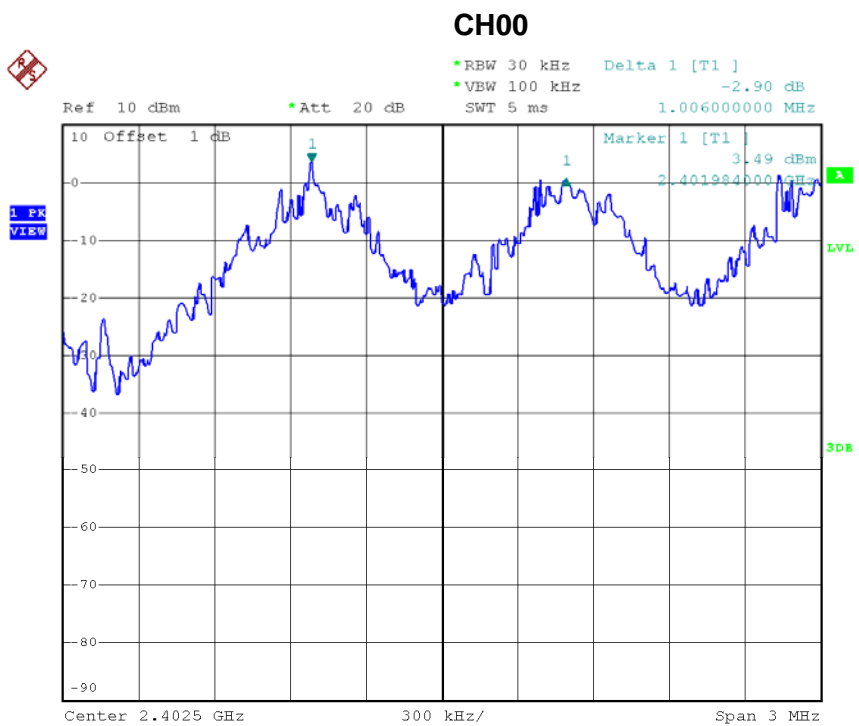


Date: 25.AUG.2015 18:05:11

## **ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT**

Test Mode : Hopping on \_1Mbps

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	1.006	0.577	Pass
2441	0.969	0.545	Pass
2480	1.160	0.564	Pass

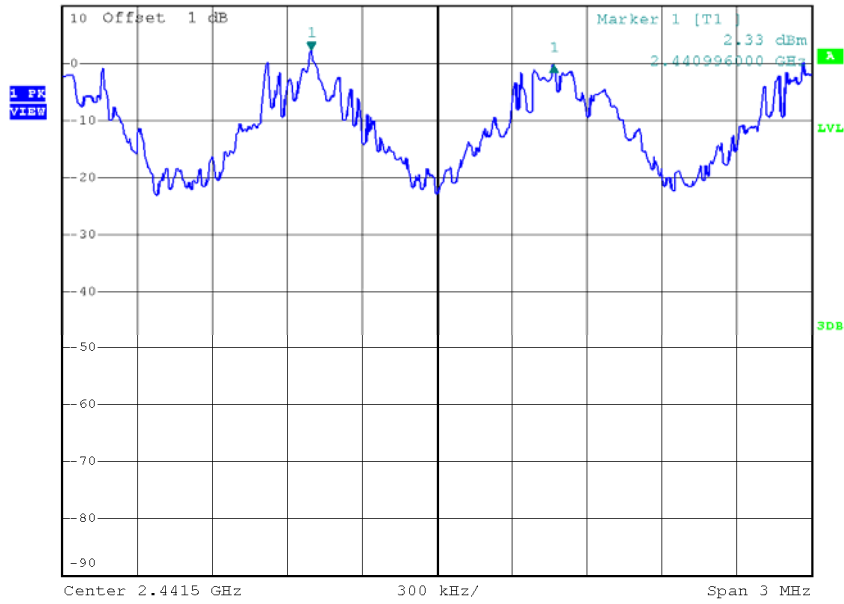


Date: 25.AUG.2015 17:30:20

**CH39**



\*RBW 30 kHz Delta 1 [T1 ]  
 \*VBW 100 kHz -2.65 dB  
 Ref 10 dBm \*Att 20 dB SWT 5 ms 969.000000000 kHz



Date: 25.AUG.2015 17:31:29

**CH78**



\*RBW 30 kHz Delta 1 [T1 ]  
 \*VBW 100 kHz 2.28 dB  
 Ref 10 dBm \*Att 20 dB SWT 5 ms 1.160000000 MHz

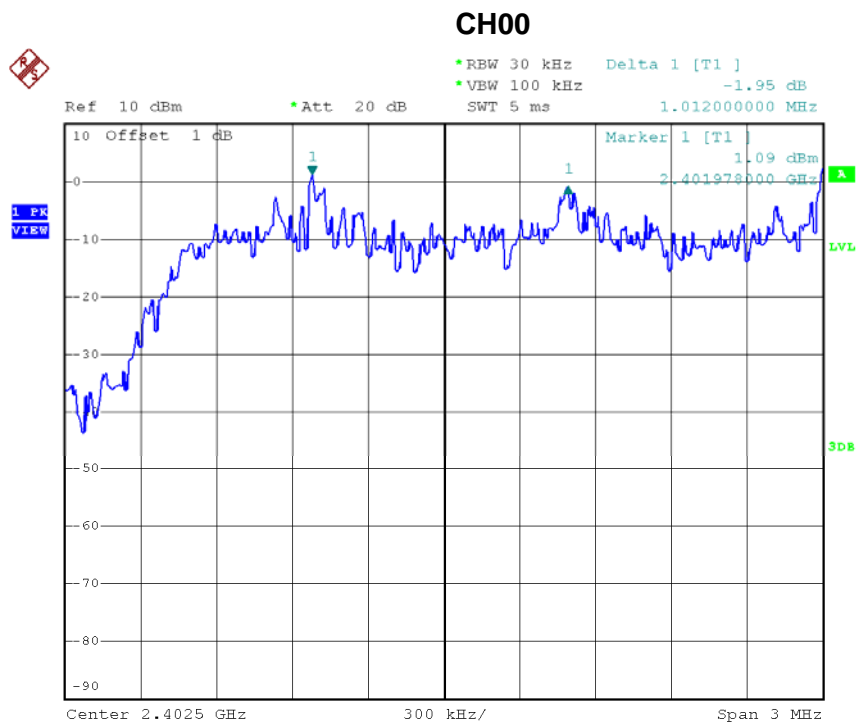


Date: 25.AUG.2015 17:32:36



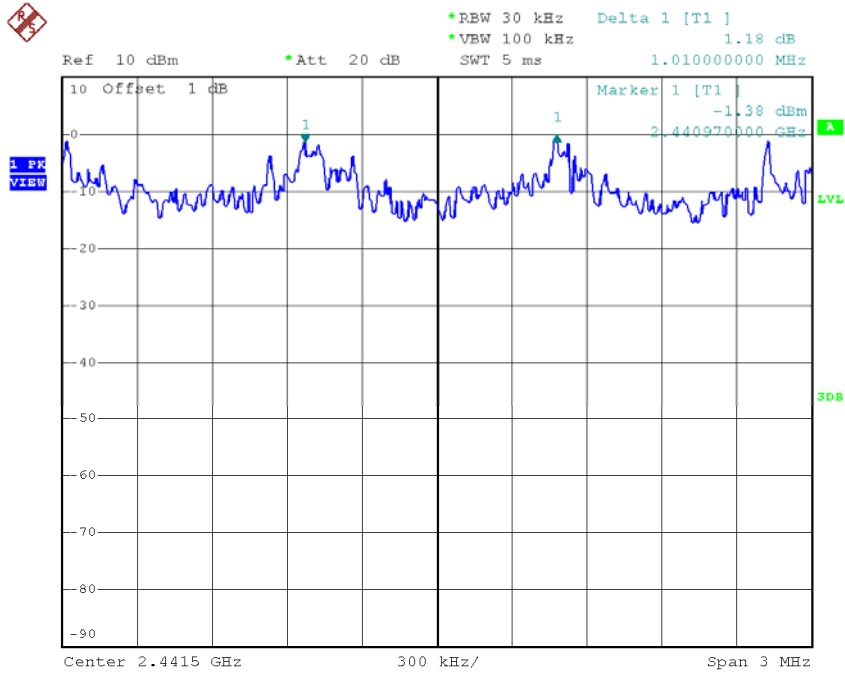
Test Mode : Hopping on \_3Mbps

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	1.012	0.799	Pass
2441	1.010	0.812	Pass
2480	1.018	0.806	Pass



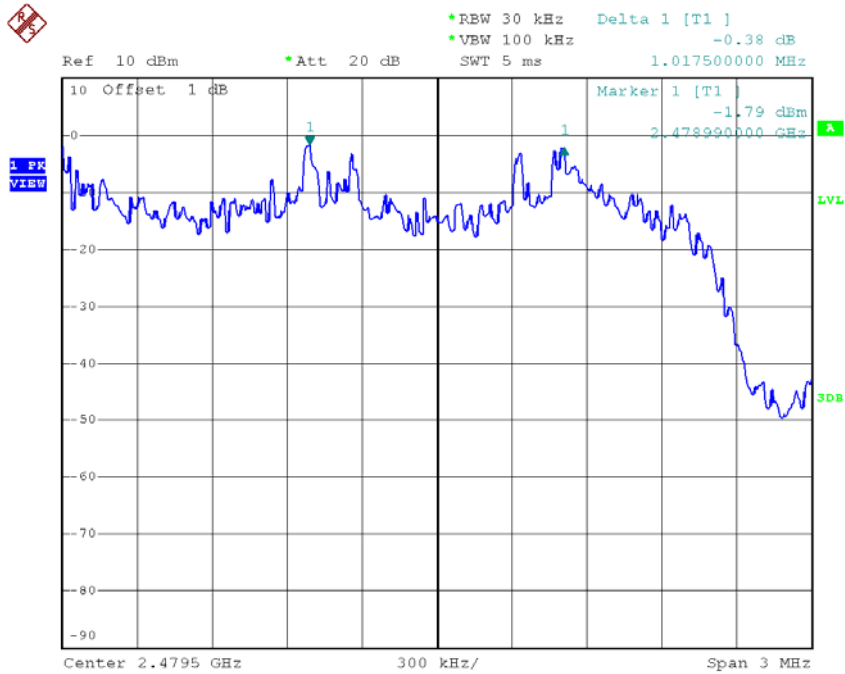
Date: 25.AUG.2015 17:53:20

### CH39



Date: 25.AUG.2015 17:54:28

### CH78

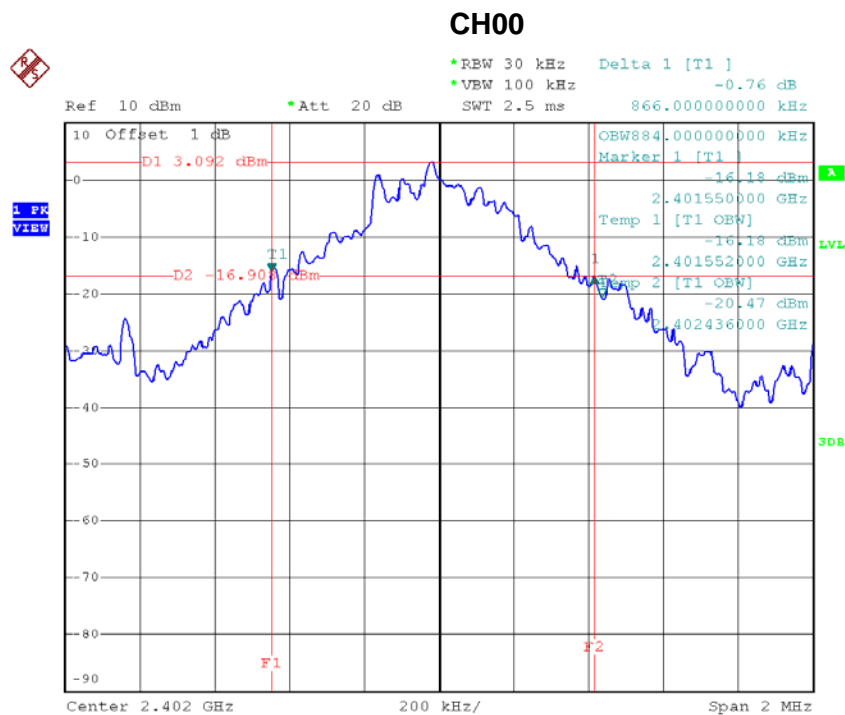


Date: 25.AUG.2015 17:55:37

## ATTACHMENT H - BANDWIDTH

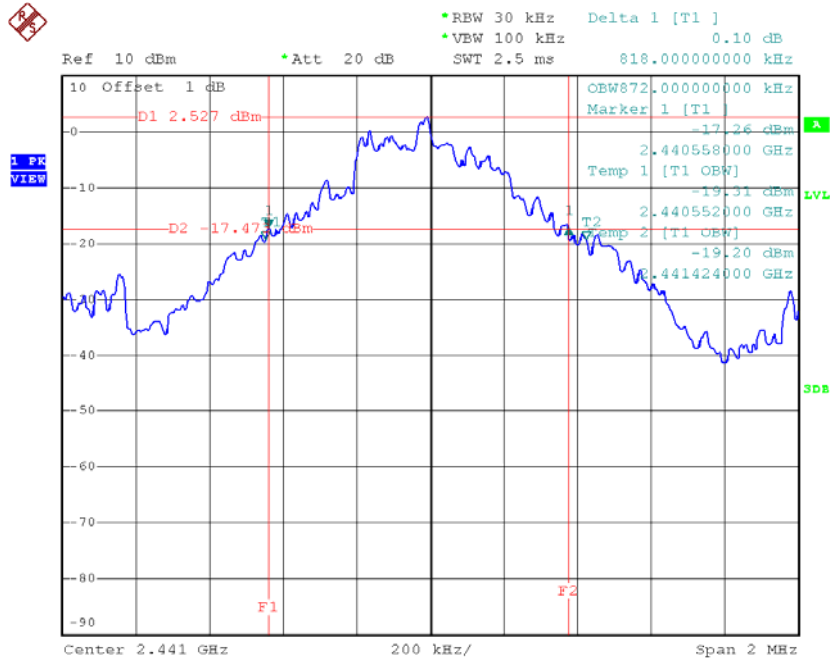
Test Mode : TX Mode\_1Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.866	0.884	Pass
2441	0.818	0.872	Pass
2480	0.846	0.832	Pass



Date: 25.AUG.2015 17:23:47

### CH39



Date: 25.AUG.2015 17:25:32

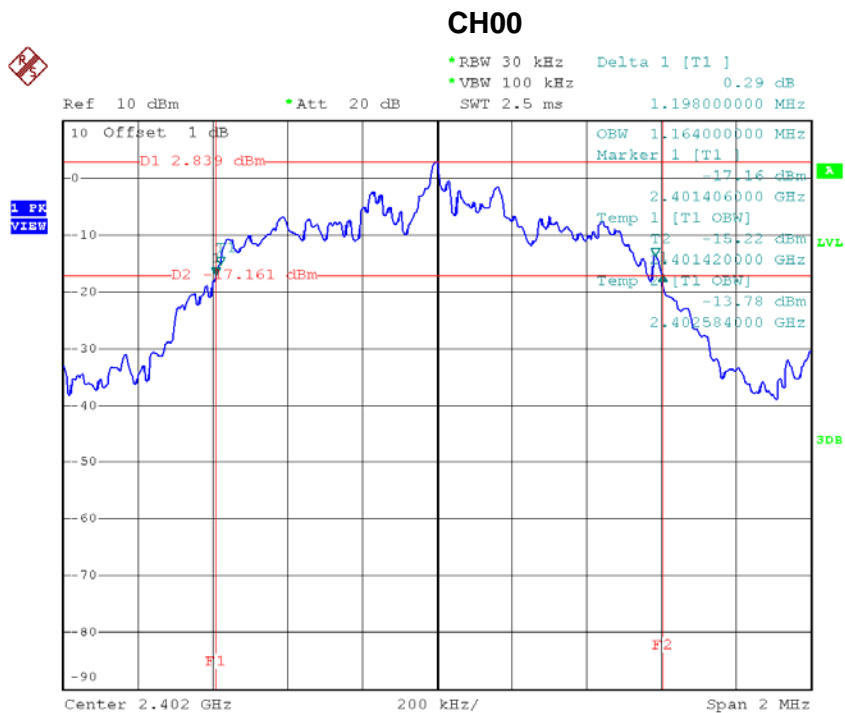
### CH78



Date: 25.AUG.2015 17:26:40

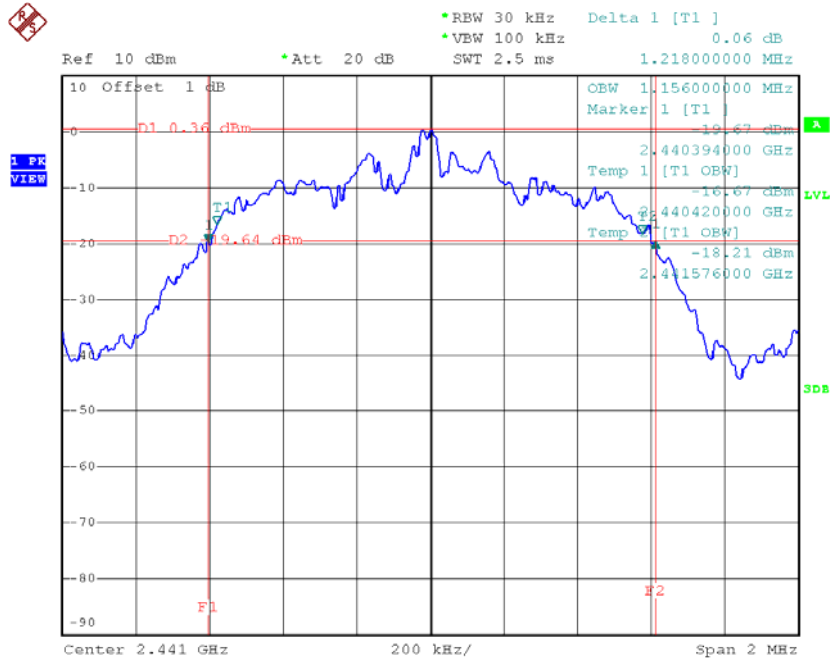
Test Mode : TX Mode\_3Mbps

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.198	1.164	Pass
2441	1.218	1.156	Pass
2480	1.209	1.136	Pass



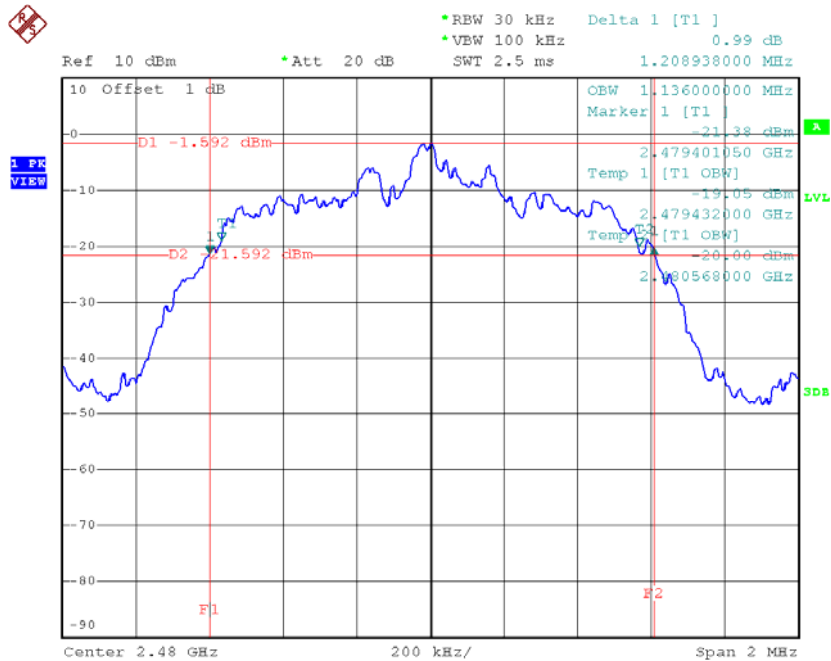
Date: 25.AUG.2015 17:48:00

### CH39



Date: 25.AUG.2015 17:49:34

### CH78



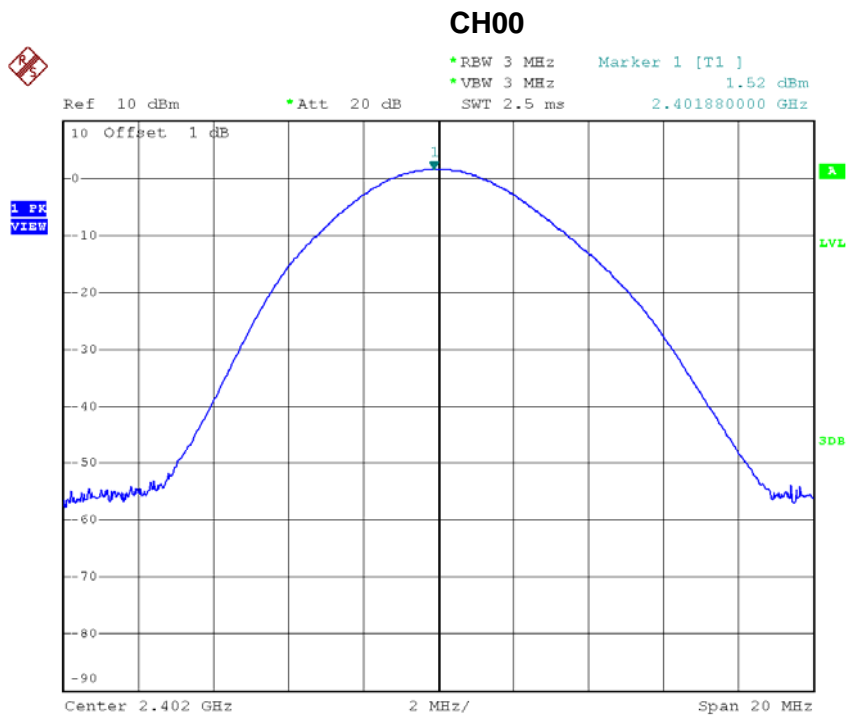
Date: 25.AUG.2015 17:50:32

## ATTACHMENT I - PEAK OUTPUT POWER



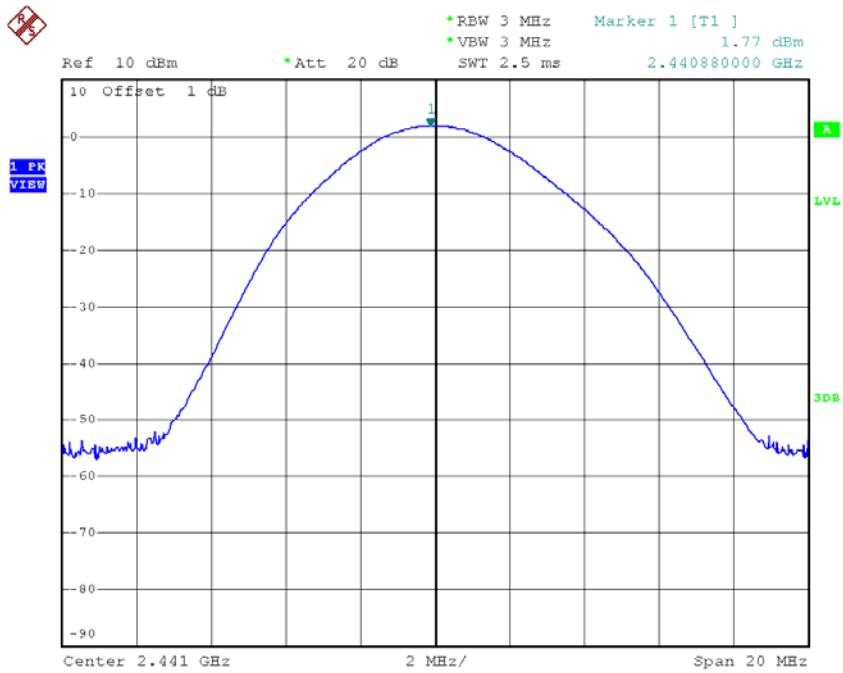
Test Mode : TX Mode\_1Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	1.52	0.0014	30.00	1.00	Pass
2441	1.77	0.0015	30.00	1.00	Pass
2480	1.63	0.0015	30.00	1.00	Pass



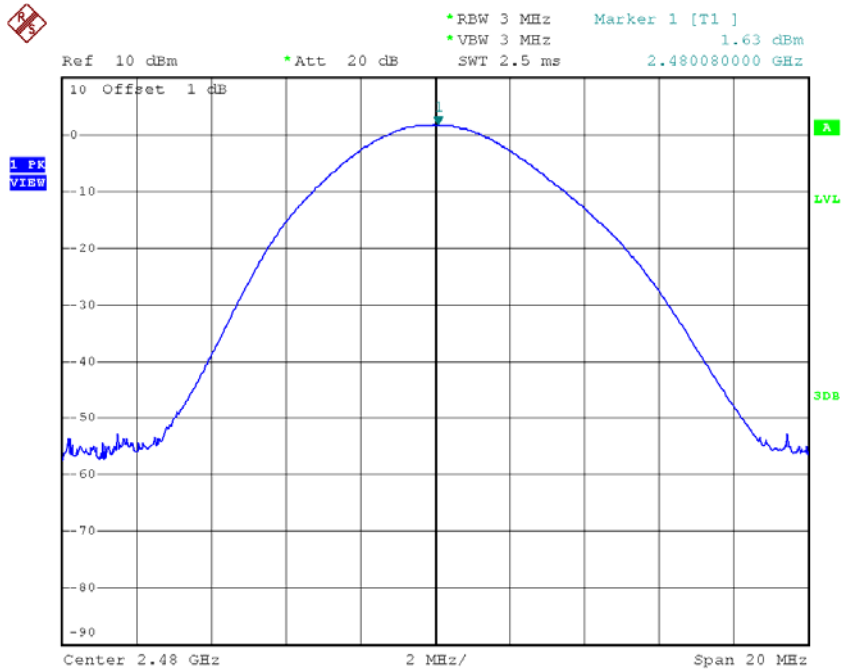
Date: 8.OCT.2015 15:43:28

### CH39



Date: 8.OCT.2015 15:44:11

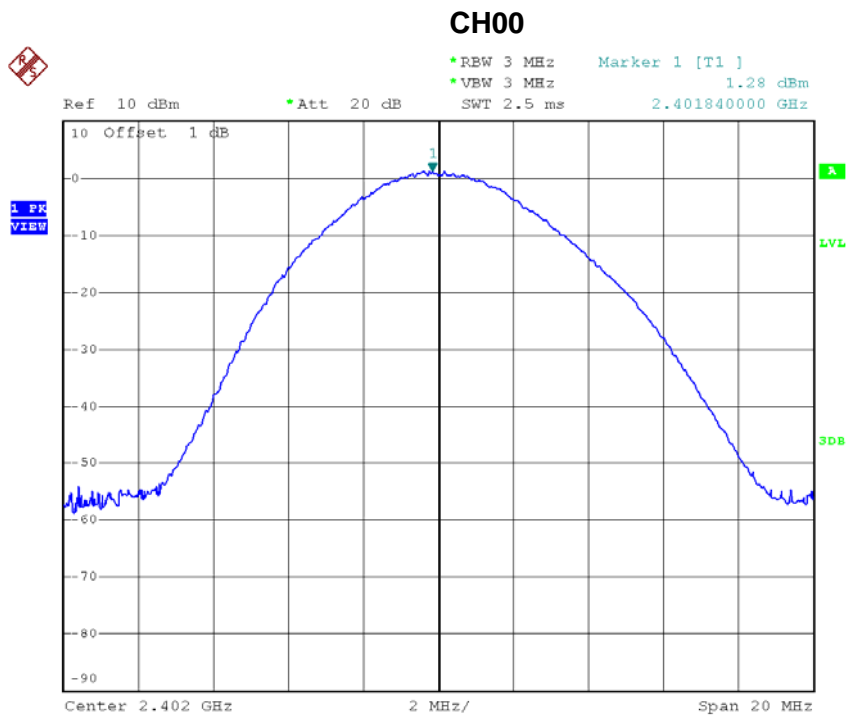
### CH78



Date: 8.OCT.2015 15:44:42

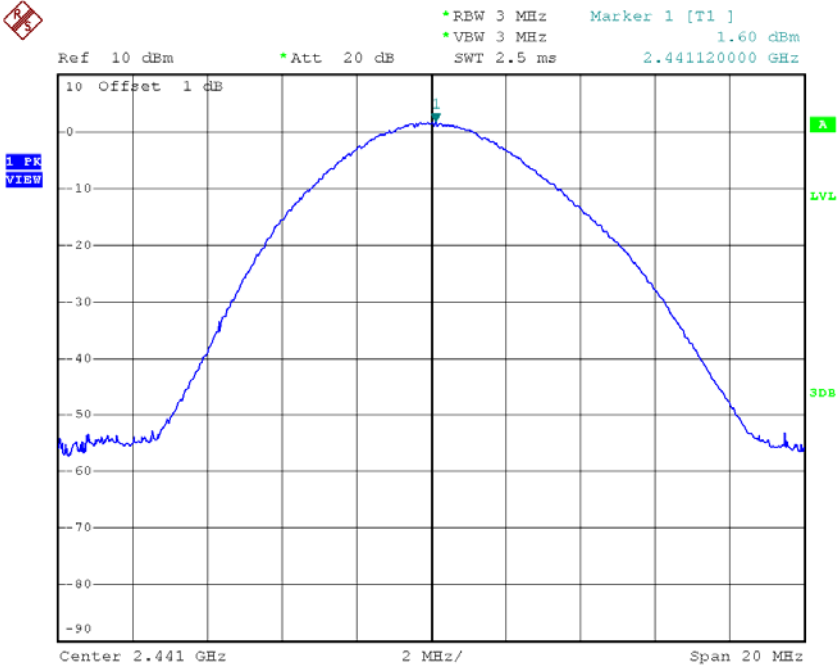
Test Mode : TX Mode\_3Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (W)	Max. Limit (dBm)	Max. Limit (W)	Test Result
2402	1.28	0.0013	30.00	1.00	Pass
2441	1.60	0.0014	30.00	1.00	Pass
2480	1.46	0.0014	30.00	1.00	Pass



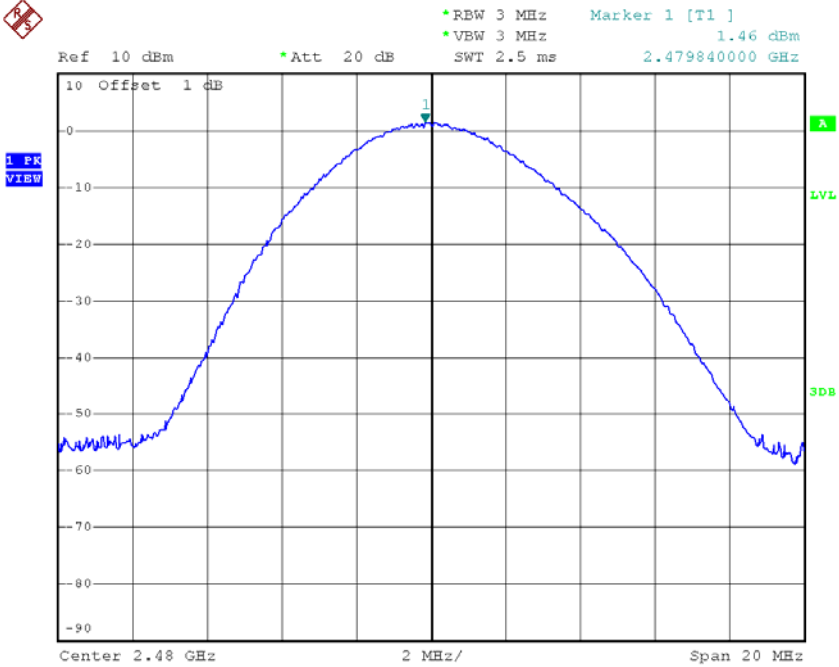
Date: 8.OCT.2015 15:46:37

### CH39



Date: 8.OCT.2015 15:47:05

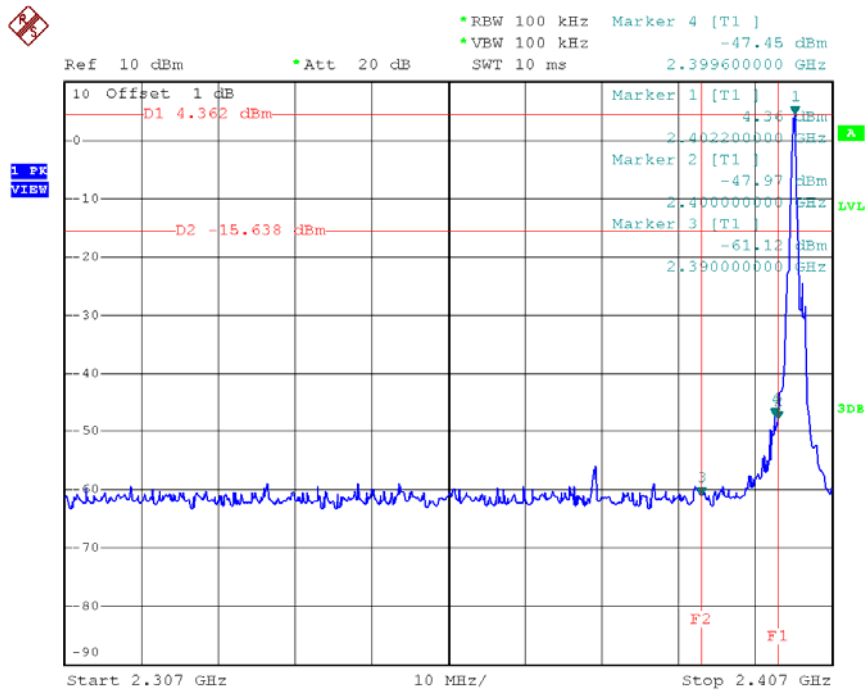
### CH78



Date: 8.OCT.2015 15:47:31

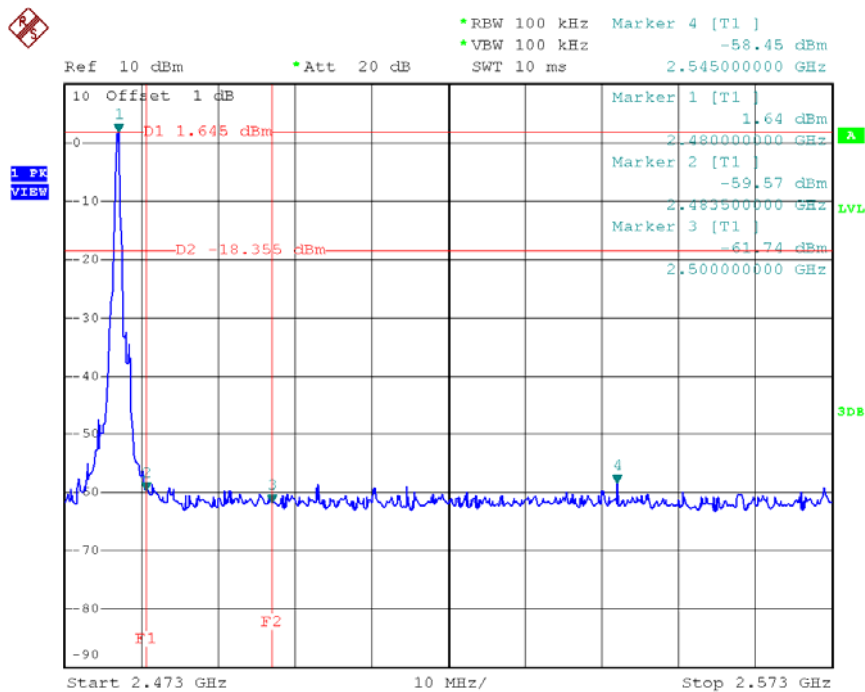
## **ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION**

### CH00 (Lower)\_1Mbps



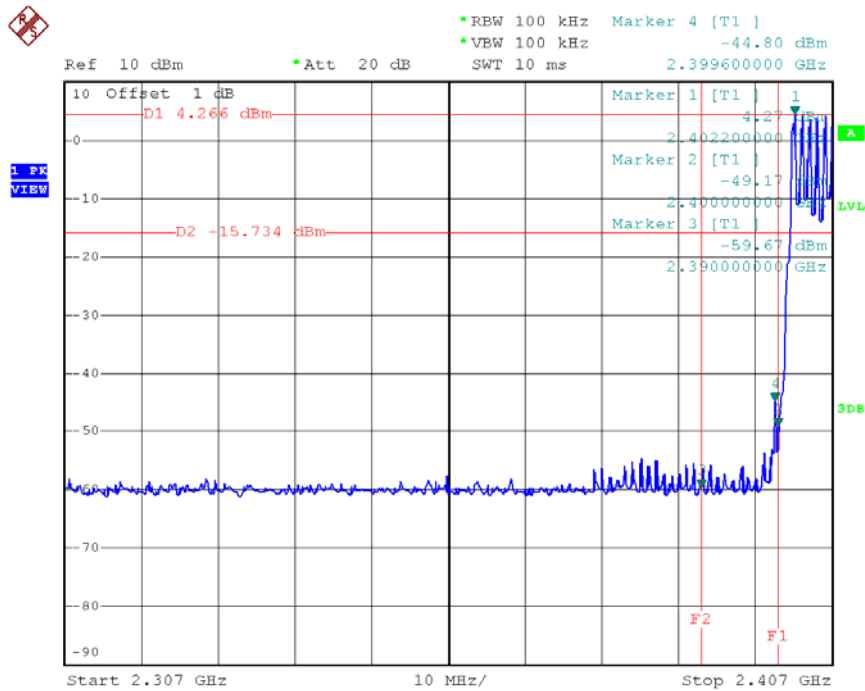
Date: 25.AUG.2015 17:23:17

### CH78 (Upper)\_1Mbps



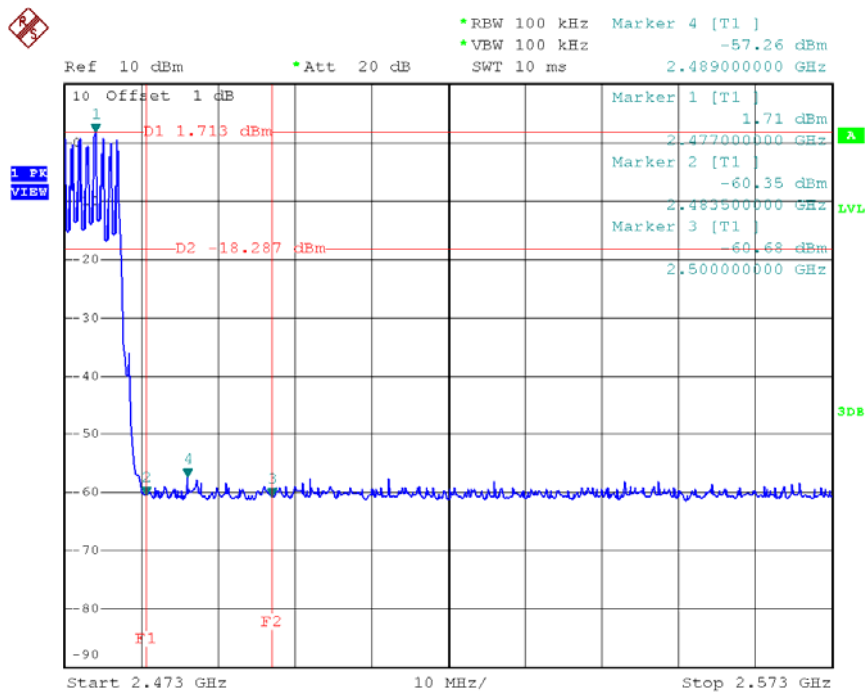
Date: 25.AUG.2015 17:26:11

### CH00 Hopping on mode (Lower)\_1Mbps



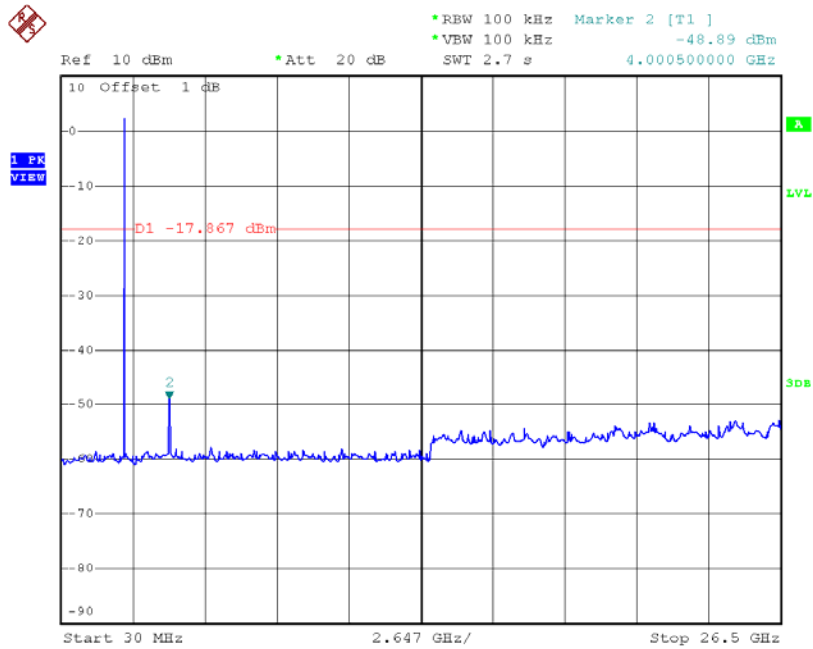
Date: 25.AUG.2015 17:43:35

### CH78 Hopping on mode (Upper)\_1Mbps



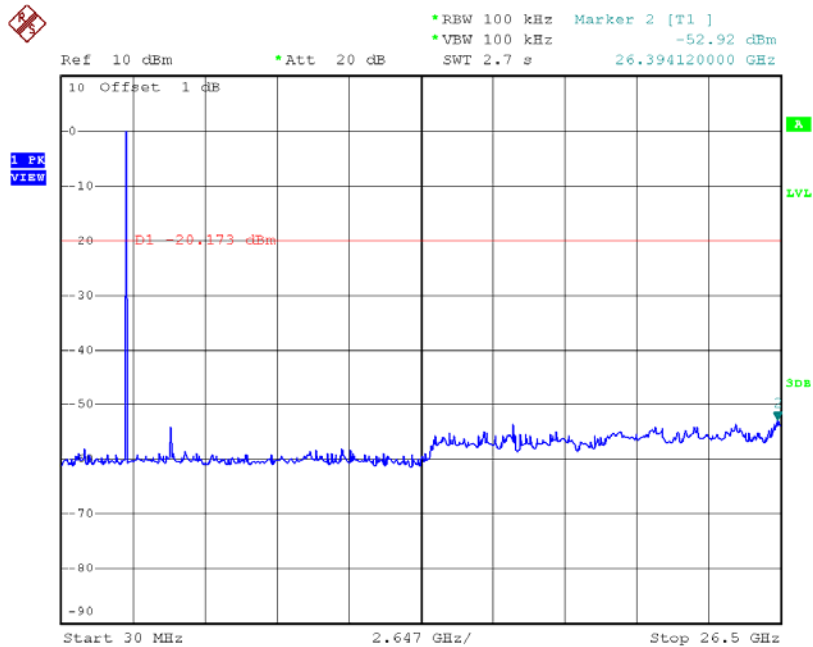
Date: 25.AUG.2015 17:35:35

### CH00 (10 Harmonic of the frequency) \_1Mbps



Date: 25.AUG.2015 17:24:20

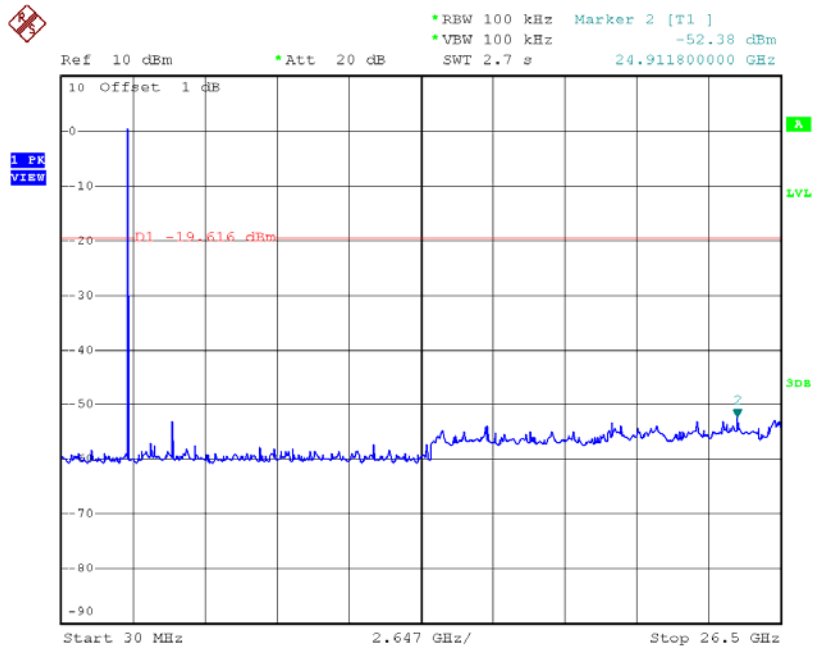
### CH39 (10 Harmonic of the frequency) \_1Mbps



Date: 25.AUG.2015 17:25:02

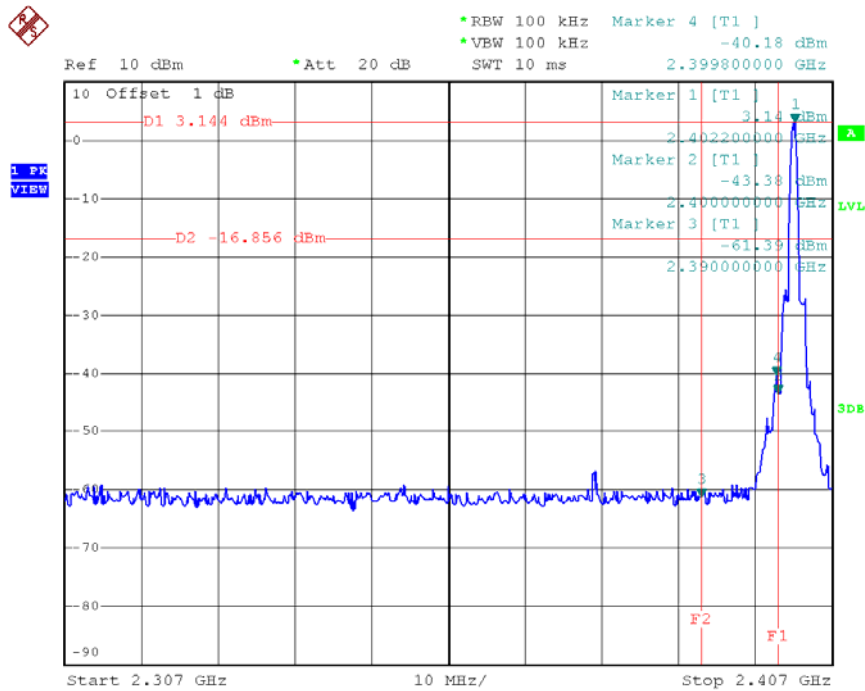


### CH78 (10 Harmonic of the frequency) \_1Mbps



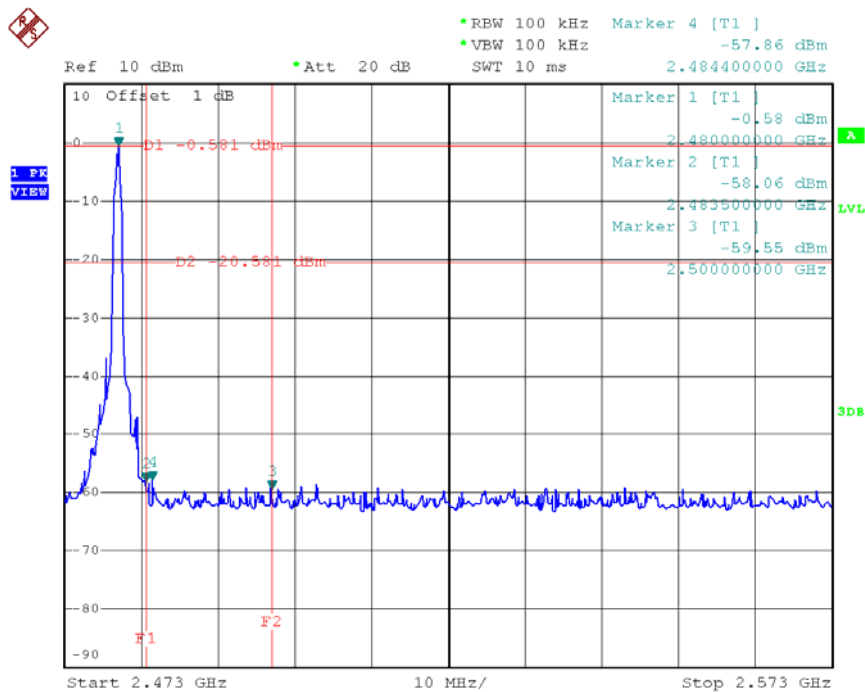
Date: 25.AUG.2015 17:27:06

### CH00 (Lower) \_3Mbps



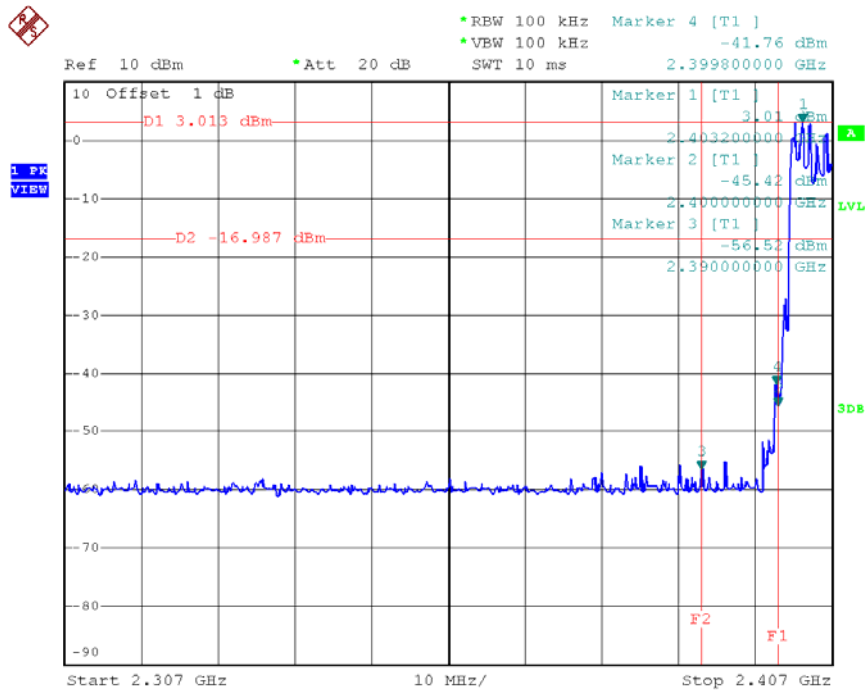
Date: 25.AUG.2015 17:47:37

### CH78 (Upper) \_3Mbps



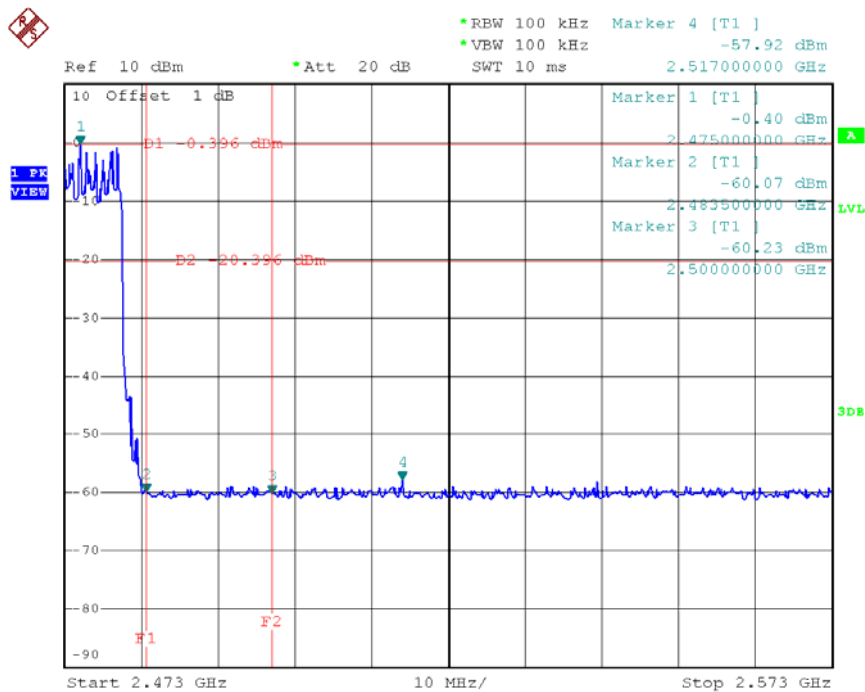
Date: 25.AUG.2015 17:50:10

### CH00 Hopping on mode (Lower)\_3Mbps



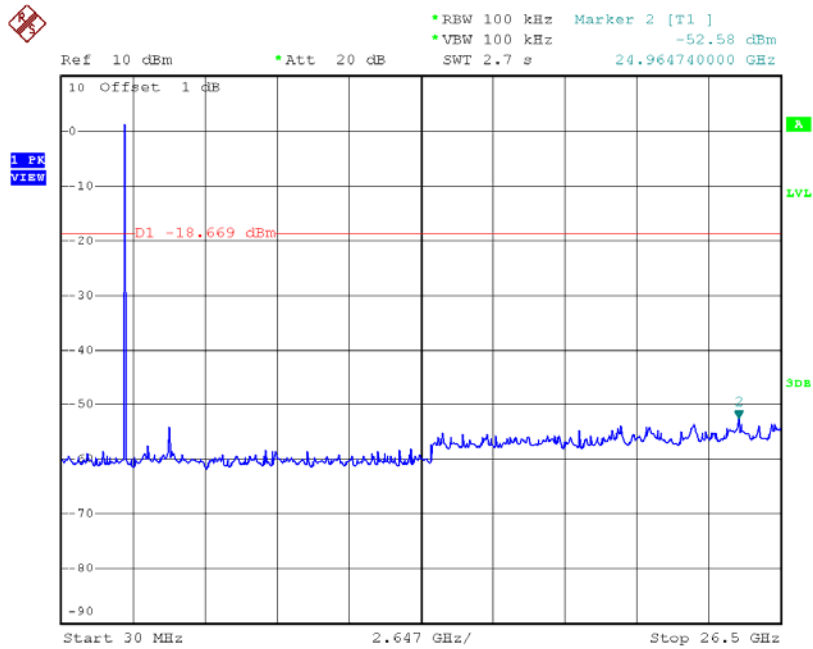
Date: 25.AUG.2015 18:01:50

### CH78 Hopping on mode (Upper)\_3Mbps



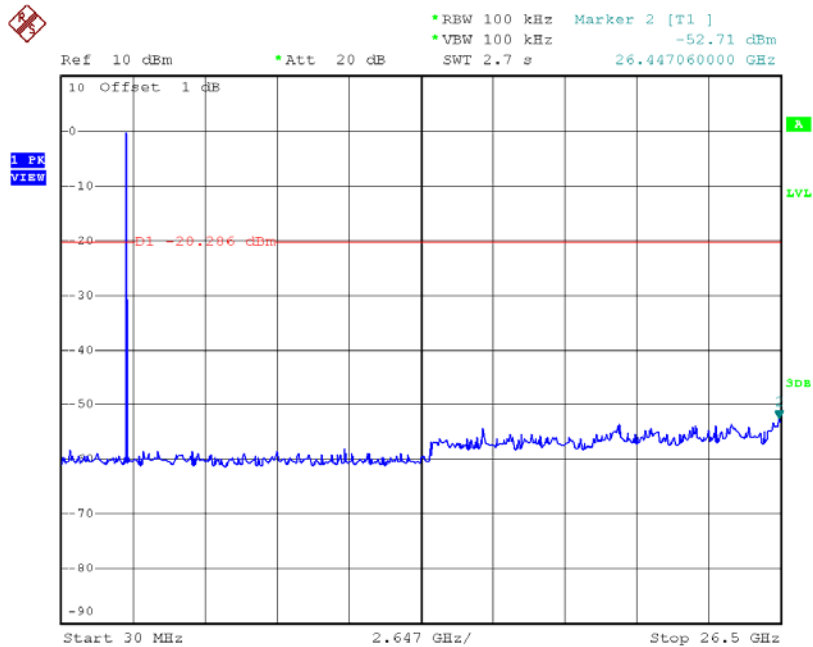
Date: 25.AUG.2015 18:02:35

### CH00 (10 Harmonic of the frequency) \_3Mbps



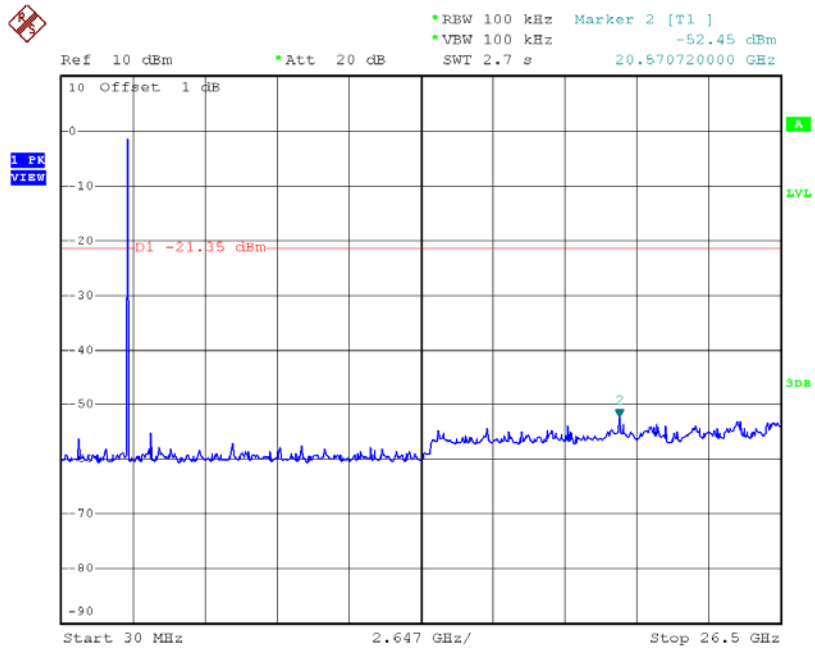
Date: 25.AUG.2015 17:48:14

### CH39 (10 Harmonic of the frequency) \_3Mbps



Date: 25.AUG.2015 17:49:12

### CH78 (10 Harmonic of the frequency) \_3Mbps



Date: 25.AUG.2015 17:51:06