

# FCC&IC Radio Test Report

**FCC ID: TQYKPW2**

**IC: 6233A-KPW2**

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

**Project No.** : 1508198  
**Equipment** : Portable Wireless Speaker  
**Model Name** : 42KPW2W, 42KPW2B  
**Applicant** : JAZZ HIPSTER CORPORATION  
**Address** : 2FD, NO.512, YUAN-SAN RD., CHUNG-HO DISTRICT, NEW TAIPEI CITY, TAIWAN.

**Date of Receipt** : Aug. 18, 2015  
**Date of Test** : Aug. 18, 2015 ~ Sep. 15, 2015  
**Issued Date** : Sep. 16, 2015  
**Tested by** : BTL Inc.

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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.

<b>Table of Contents</b>	<b>Page</b>
<b>1 . CERTIFICATION</b>	<b>7</b>
<b>2 . SUMMARY OF TEST RESULTS</b>	<b>8</b>
2.1 TEST FACILITY	9
2.2 MEASUREMENT UNCERTAINTY	9
<b>3 . GENERAL INFORMATION</b>	<b>10</b>
3.1 GENERAL DESCRIPTION OF EUT	10
3.2 DESCRIPTION OF TEST MODES	12
3.3 TABLE OF PARAMETERS OF TEXT SOFTWARE SETTING	12
3.4 BLOCK DIAGRAM SHOWING TH ECONFIGURATION OF SYSTEM TESTED	13
3.5 DESCRIPTION OF SUPPORT UNITS	13
<b>4 . EMC EMISSION TEST</b>	<b>14</b>
4.1 CONDUCTED EMISSION MEASUREMENT	14
4.1.1 POWER LINE CONDUCTED EMISSION LIMITS	14
4.1.2 TEST PROCEDURE	14
4.1.3 DEVIATIONFROMTESTSTANDARD	14
4.1.4 TESTSETUP	15
4.1.5 EUT OPERATINGCONDITIONS	15
4.1.6 EUT TEST CONDITIONS	15
4.1.7 TEST RESULTS	15
4.2 RADIATED EMISSION MEASUREMENT	16
4.2.1 RADIATED EMISSION LIMITS	16
4.2.2 TEST PROCEDURE	17
4.2.3 DEVIATIONFROMTESTSTANDARD	17
4.2.4 TESTSETUP	18
4.2.5 EUT OPERATING CONDITIONS	19
4.2.6 EUT TEST CONDITIONS	19
4.2.7 TEST RESULTS (9KHZTO 30MHZ)	19
4.2.8 TEST RESULTS (30MHZ TO 1000 MHZ)	20
4.2.9 TEST RESULTS (ABOVE 1000 MHZ)	20
<b>5 . NUMBER OF HOPPING CHANNEL</b>	<b>21</b>
5.1 APPLIED PROCEDURES	21
5.1.1 TEST PROCEDURE	21
5.1.2 DEVIATION FROM STANDARD	21
5.1.3 TEST SETUP	21
5.1.4 EUT OPERATION CONDITIONS	21
5.1.5 EUT TEST CONDITIONS	21
5.1.6 TEST RESULTS	21

Table of Contents	Page
<b>6 . AVERAGE TIME OF OCCUPANCY</b>	<b>22</b>
<b>6.1 APPLIED PROCEDURES / LIMIT</b>	<b>22</b>
6.1.1 TEST PROCEDURE	22
6.1.2 DEVIATION FROM STANDARD	22
6.1.3 TEST SETUP	22
6.1.4 EUT OPERATION CONDITIONS	23
6.1.5 EUT TEST CONDITIONS	23
6.1.6 TEST RESULTS	23
<b>7 . HOPPING CHANNEL SEPARATION MEASUREMENT</b>	<b>24</b>
<b>7.1 APPLIED PROCEDURES /LIMIT</b>	<b>24</b>
7.1.1 TEST PROCEDURE	24
7.1.2 DEVIATION FROM STANDARD	24
7.1.3 TEST SETUP	24
7.1.4 EUT TEST CONDITIONS	24
7.1.5 TEST RESULTS	24
<b>8 . BANDWIDTH TEST</b>	<b>25</b>
<b>8.1 APPLIED PROCEDURES</b>	<b>25</b>
8.1.1 TEST PROCEDURE	25
8.1.2 DEVIATION FROM STANDARD	25
8.1.3 TEST SETUP	25
8.1.4 EUT OPERATION CONDITIONS	25
8.1.5 EUT TEST CONDITIONS	25
8.1.6 TEST RESULTS	25
<b>9 . PEAKOUTPUT POWER TEST</b>	<b>26</b>
<b>9.1 APPLIED PROCEDURES / LIMIT</b>	<b>26</b>
9.1.1 TEST PROCEDURE	26
9.1.2 DEVIATION FROM STANDARD	26
9.1.3 TEST SETUP	26
9.1.4 EUT OPERATION CONDITIONS	26
9.1.5 EUT TEST CONDITIONS	26
9.1.6 TEST RESULTS	26
<b>10 . ANTENNA CONDUCTED SPURIOUS EMISSION</b>	<b>27</b>
<b>10.1 APPLIED PROCEDURES / LIMIT</b>	<b>27</b>
10.1.1 TEST PROCEDURE	27
10.1.2 DEVIATION FROM STANDARD	27
10.1.3 TEST SETUP	27
10.1.4 EUT OPERATION CONDITIONS	27
10.1.5 EUT TEST CONDITIONS	27
10.1.6 TEST RESULTS	27
<b>11 . MEASUREMENT INSTRUMENTS LIST</b>	<b>28</b>

<b>Table of Contents</b>	<b>Page</b>
<b>12 . EUT TEST PHOTO</b>	<b>30</b>
<b>ATTACHMENT A - CONDUCTED EMISSION</b>	<b>34</b>
<b>ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ)</b>	<b>37</b>
<b>ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ)</b>	<b>39</b>
<b>ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)</b>	<b>42</b>
<b>ATTACHMENT E - NUMBER OF HOPPING CHANNEL</b>	<b>67</b>
<b>ATTACHMENT F - AVERAGE TIME OF OCCUPANCY</b>	<b>69</b>
<b>ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT</b>	<b>82</b>
<b>ATTACHMENT H - BANDWIDTH</b>	<b>87</b>
<b>ATTACHMENT I - PEAK OUTPUT POWER</b>	<b>92</b>
<b>ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION</b>	<b>97</b>

# REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FICP-1-1508198	Original Issue.	Sep. 16, 2015

## 1. CERTIFICATION

Equipment : Portable Wireless Speaker  
Brand Name : KICKER  
Model Name : 42KPW2W, 42KPW2B  
Applicant : JAZZ HIPSTER CORPORATION  
Manufacturer : CHIYU ELECTRONICS (SHEN ZHEN) CO.,LTD  
Address : No. 101, Chi-Yu Road, Chi-Yu Industrial Zone, Fu-Yong Town, Bao-An District, ShenZhen, China.  
Factory : CHIYU ELECTRONICS (SHEN ZHEN) CO.,LTD  
Address : No. 101, Chi-Yu Road, Chi-Yu Industrial Zone, Fu-Yong Town, Bao-An District, ShenZhen, China.  
Date of Test : Aug. 18, 2015 ~ Sep. 15, 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-1-1508198) 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):

Applied Standard(s): 47 CFR Part 15, Subpart C: 2014; RSS-247 Issue 1, May 2015; RSS-GEN Issue 4, Nov 2014				
Standard(s) Section		Test Item	Judgment	Remark
FCC	IC			
15.207	RSS-GEN 8.8	Conducted Emission	N/A	
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

### Conducted emission Test:

**C05:** (VCCI RN: C-4742; FCC RN:965108; FCC DN:TW1082)  
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Radiated emission Test (Below 1 GHz):

**CB08:** (VCCI RN: R-4259; FCC RN:965108; FCC DN:TW1082; IC Assigned Code:20088)  
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

### Radiated emission Test (Above 1 GHz):

**CB08:** (VCCI RN: G-867; FCC RN:965108; FCC DN:TW1082; IC Assigned Code:20088)  
No. 68-1, Ln. 169, Sec.2, Datong Rd., Xizhi Dist., New Taipei City 221, Taiwan

## 2.2 MEASUREMENT UNCERTAINTY

**The measurement uncertainty is not specified by FCC rules and Canada Industry for reference only.**

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%**.

The measurement instrumentation uncertainty considerations contained in CISPR 16-4-2.  
The BTL measurement uncertainty is less than the CISPR 16-4-2  $U_{CISPR}$  requirement.

### A. Conducted emission test:

Test Site	Measurement Frequency Range	U, (dB)	NOTE
C05	150 kHz ~ 30 MHz	1.94	

### B. Radiated emission test:

Test Site	Method	Measurement Frequency Range	Ant.	U,(dB)	Note
CB08 (3m)	CISPR	30MHz ~ 200MHz	V	4.04	
		30MHz ~ 200MHz	H	4.02	
		200MHz ~ 1,000MHz	V	4.06	
		200MHz ~ 1,000MHz		4.02	

Test Site	Method	Measurement Frequency Range	U,(dB)	Note
CB08 (3m)	CISPR	1 ~ 6 GHz	4.62	
		6 ~18 GHz	4.88	

Test Site	Method	Measurement Frequency Range	U,(dB)	Note
CB08 (3m)	CISPR	18 ~ 26.5 GHz	4.66	
		26.5 ~ 40 GHz	4.74	

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

Our calculated Measurement Instrumentation Uncertainty is shown in the tables above. These are our  $U_{lab}$  values in CISPR 16-4-2 terminology.

Since Table 1 of CISPR 16-4-2 has values of measurement instrumentation uncertainty, called  $U_{CISPR}$ , as follows:

Conducted Disturbance (mains port) – 150 kHz – 30 MHz : 3.6 dB

Radiated Disturbance (electric field strength on an open area test site or alternative test site) – 30 MHz – 1000 MHz : 5.2 dB

It can be seen that our  $U_{lab}$  values are smaller than  $U_{CISPR}$ .

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

Equipment	Portable Wireless Speaker	
Brand Name	KICKER	
Model Name	42KPW2W, 42KPW2B	
Model Difference	Model	The color of the appearance
	42KPW2W	White
	42KPW2B	Black
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.	2.20 dBm (1Mbps) 1.06 dBm (3Mbps)
PowerSource	#1 DC Voltage supplied from AC/DC adapter. Brand/ Model: DYS/ APP521-050210U #2 Supplied from Li-ion battery pack #3 EUT USB	
Power Rating	#1 I/P: 100-240V~ 50/60Hz 0.45A MAX O/P: DC 5.0V 2.1A #2 DC 3.7V 3000mAh 11.1Wh #3 O/P: 5V	

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	N/A	N/A	Printed	N/A	-5.28

### 3.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly 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>
Mode 2	TX Mode

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 2	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 TEST 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

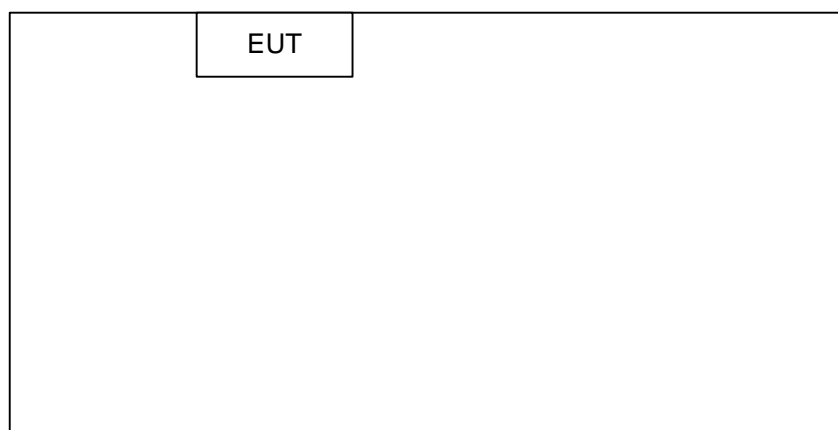
1Mbps

Test Software Version	AB1500 Family LAB Test Tool V1.3.0.0		
Frequency (MHz)	2402	2441	2480
Parameters	DEF	DEF	DEF

3Mbps

Test Software Version	AB1500 Family LAB Test Tool V1.3.0.0		
Frequency (MHz)	2402	2441	2480
Parameters	DEF	DEF	DEF

### 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
-	-	-	-	-	-	-

Item	Shielded Type	Ferrite Core	Length	Note
-	-	-	-	-

## 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 (dBμV)	
	Quasi-peak	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 = Antenna Factor + Cable Loss - Amplifier Gain(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

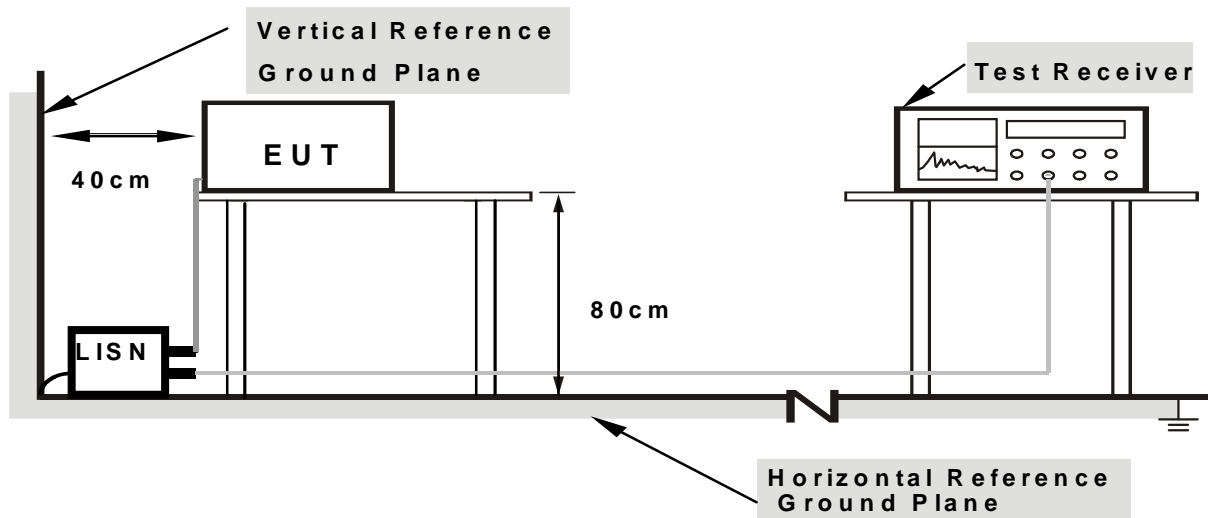
#### 4.1.2 TEST PROCEDURE

- 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 DEVIATIONFROMTESTSTANDARD

No deviation

#### 4.1.4 TESTSETUP



**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 OPERATINGCONDITIONS

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: 26°C

Relative Humidity: 59%

Test Voltage: AC 120V/60Hz

#### 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 (micro volts/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).

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

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



#### **4.2.2 TEST PROCEDURE**

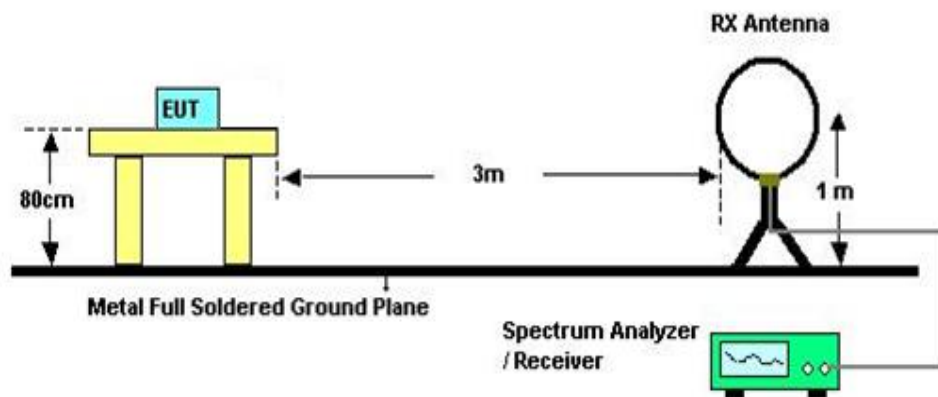
- a. The measuring distance of at 3 m shall be used for measurements. The EUT was placed on the top of a rotating table 0.8 meter above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
- b. The measuring distance 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. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights find the maximum reading (used Bore sight function).
- e. The receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.
- f. 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.
- g. 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)
- h. 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)
- i. For the actual test configuration, please refer to the related Item - Block Diagram of system tested (please refer to 3.3).

#### **4.2.3 DEVIATIONFROMTESTSTANDARD**

No deviation



(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: 24°C

Relative Humidity: 60%

Test Voltage: AC 120V/60Hz

#### 4.2.7 TEST RESULTS (9KHZTO 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:

- (2) 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.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) 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) 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) Radiated emissions measured in frequency range above 1000MHz were made with an instrument using Peak detector mode and AV detector mode of the emission
- (3) A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.
- (4) EUT Orthogonal Axis:  
"X" - denotes Laid on Table; "Y" - denotes Vertical Stand; "Z" - denotes Side Stand
- (5) 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
- (6) 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	100KHz
VBW	100KHz
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

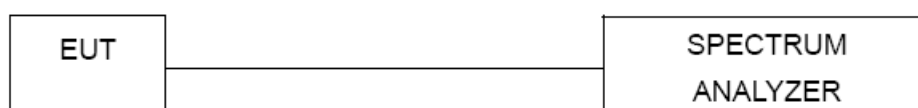
#### 5.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- 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: AC 120V/60Hz

#### 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

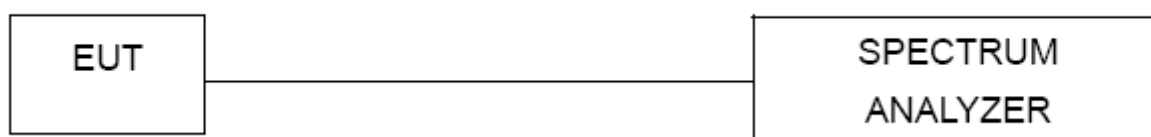
#### 6.1.1 TEST PROCEDURE

- The transmitter output (antenna port) was connected to the spectrum analyzer
- Set RBW of spectrum analyzer to 1MHz and VBW to 1MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is more than once pulse time.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.
- Set the EUT for DH5, DH3 and DH1 packet transmitting.
- Measure the maximum time duration of one single pulse.
- 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.
- 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.
- 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: AC 120V/60Hz

#### **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 band 2400-2483.5 MHz 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 that the systems operate with an output power no greater than 0.125 W.

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

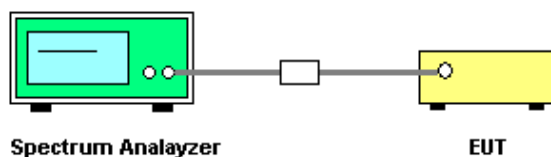
#### 7.1.1 TEST PROCEDURE

- 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) <sup>3</sup> 1% of the span
  - Video (or Average) Bandwidth (VBW) <sup>3</sup> 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: AC 120V/60Hz

#### 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	30KHz (20dB Bandwidth) / 30KHz (Channel Separation)
VBW	100KHz (20dB Bandwidth) / 100KHz (Channel Separation)
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

#### 8.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- 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: AC 120V/60Hz

#### 8.1.6 TEST RESULTS

**Please refer to the Attachment H**

## 9. PEAKOUTPUT 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 ( hopping channel >75) 0.125Watt or 21dBm (hopping channel <75	2400-2483.5	PASS

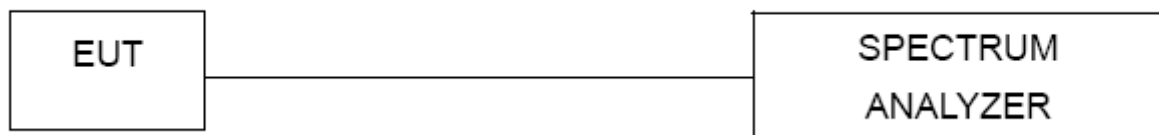
#### 9.1.1 TEST PROCEDURE

- The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
- 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: AC 120V/60Hz

#### 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.

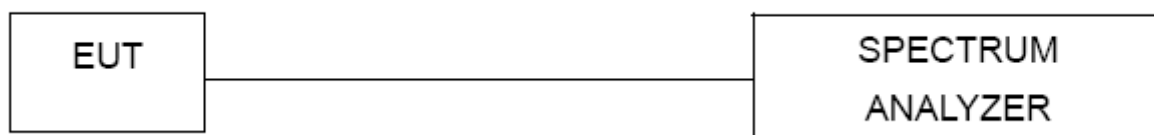
#### 10.1.1 TEST PROCEDURE

- 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: AC 120V/60Hz

#### 10.1.6 TEST RESULTS

Please refer to the Attachment J

## 11. MEASUREMENT INSTRUMENTS LIST

Conducted Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	TWO-LINE V-NETWORK	R&S	ENV216	101050	Jun. 01, 2016
2	Test Cable	TIMES	CFD300-NL	C03	Mar. 04, 2016
3	EMI Test Receiver	R&S	ESR3	101854	Dec. 09, 2015
4	Measurement Software	EZ	EZ EMC (Version NB-03A)	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016
2	Horn Antenna	Schwarzbeck	BBHA 9120	D-325	Apr. 20, 2016
3	Microwave Pre_amplifier	Agilent	8449B	3008A01714	Apr. 13, 2016
4	Microflex Cable	Harbour industries	27478LL142	1m	Apr. 13, 2016
5	Microflex Cable	EMC	S104-SMA	8m	May. 14, 2016
6	Microflex Cable	Harbour industries	27478LL142	3m	May. 13, 2016
7	Test Cable	LMR	LMR-400	10m	May. 13, 2016
8	Test Cable	LMR	LMR-400	3m	May. 13, 2016
9	Pre-Amplifier	Anritsu	MH648A	M92649	Jun. 16, 2016
10	Log-Bicon Antenna	Schwarzbeck	VULB9168-352	9168-352	Jul. 30, 2016
11	Loop Antenna	EMCO	6502	00042960	Nov. 06.2015

Number of Hopping Channel					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

Average Time of Occupancy					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

### Hopping Channel Separation Measurement

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

### Bandwidth

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

### Peak Output Power

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

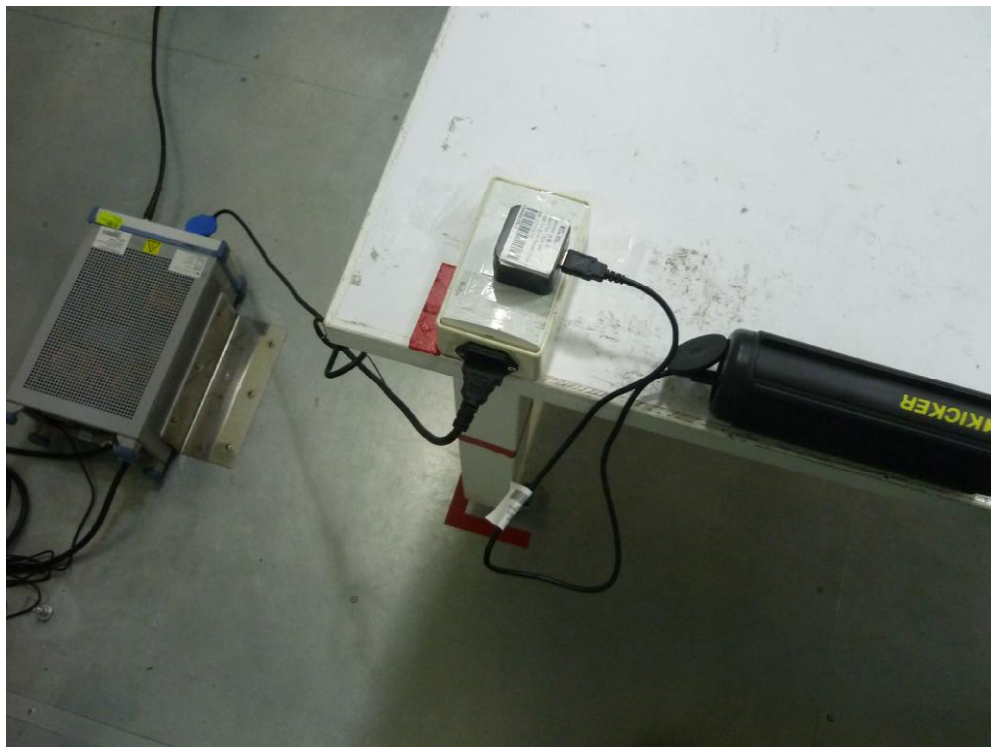
### Antenna Conducted Spurious Emission

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Spectrum Analyzer	R&S	FSP-40	100129	Jan. 07, 2016

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

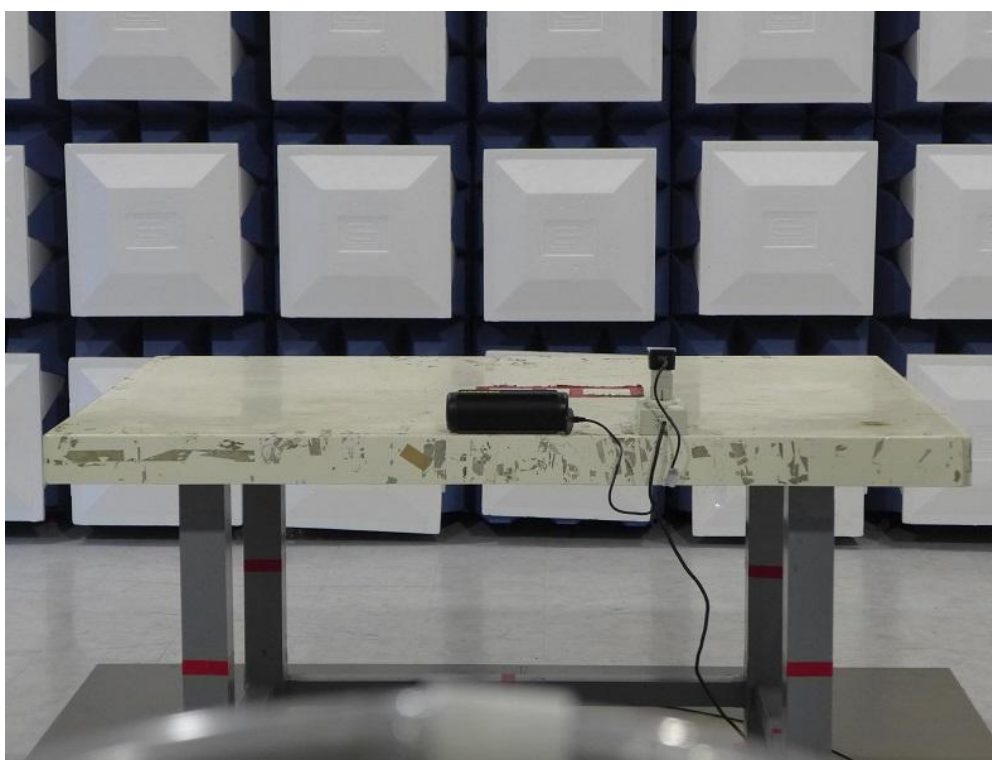
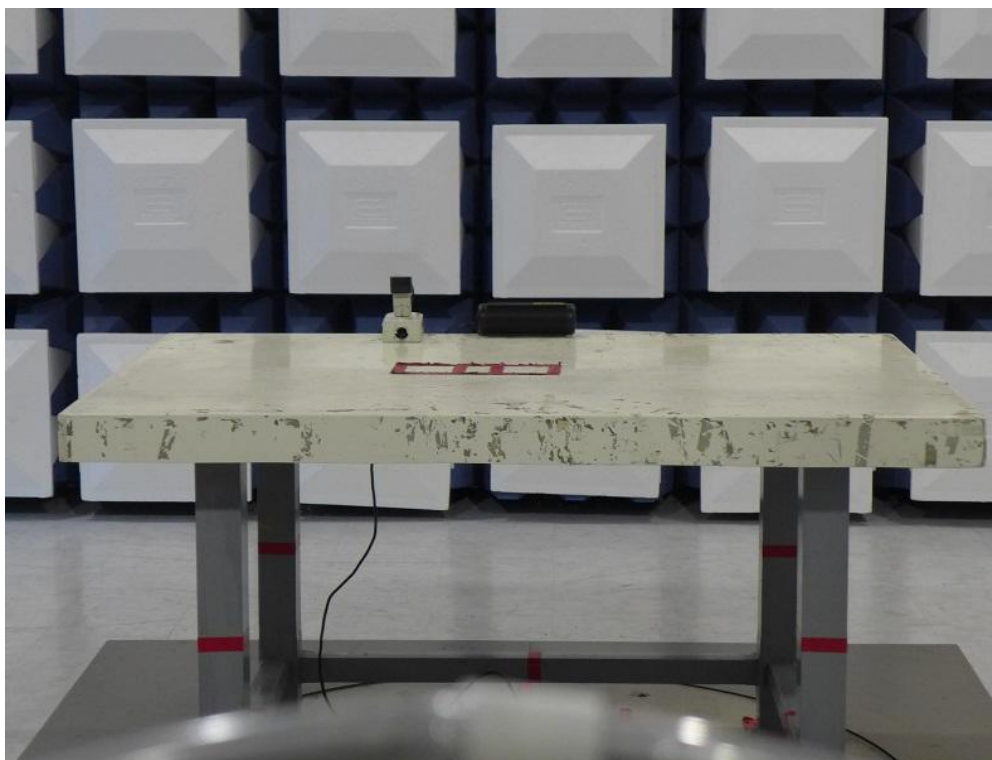
## 12. EUT TEST PHOTO

### Conducted Measurement Photos



## Radiated Measurement Photos

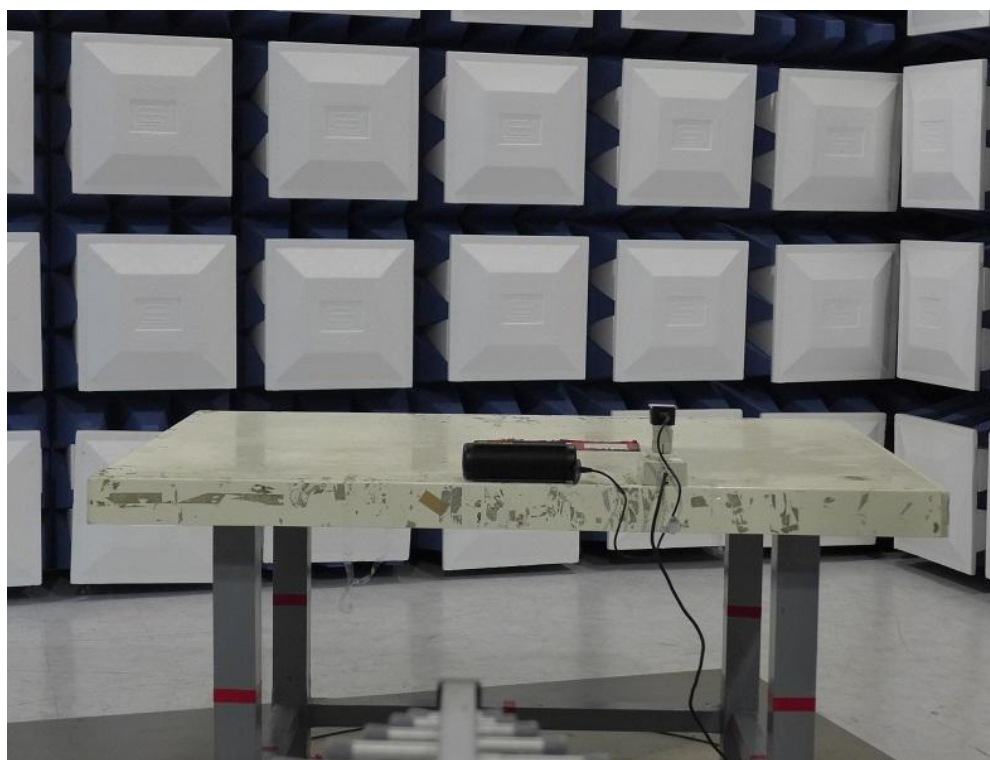
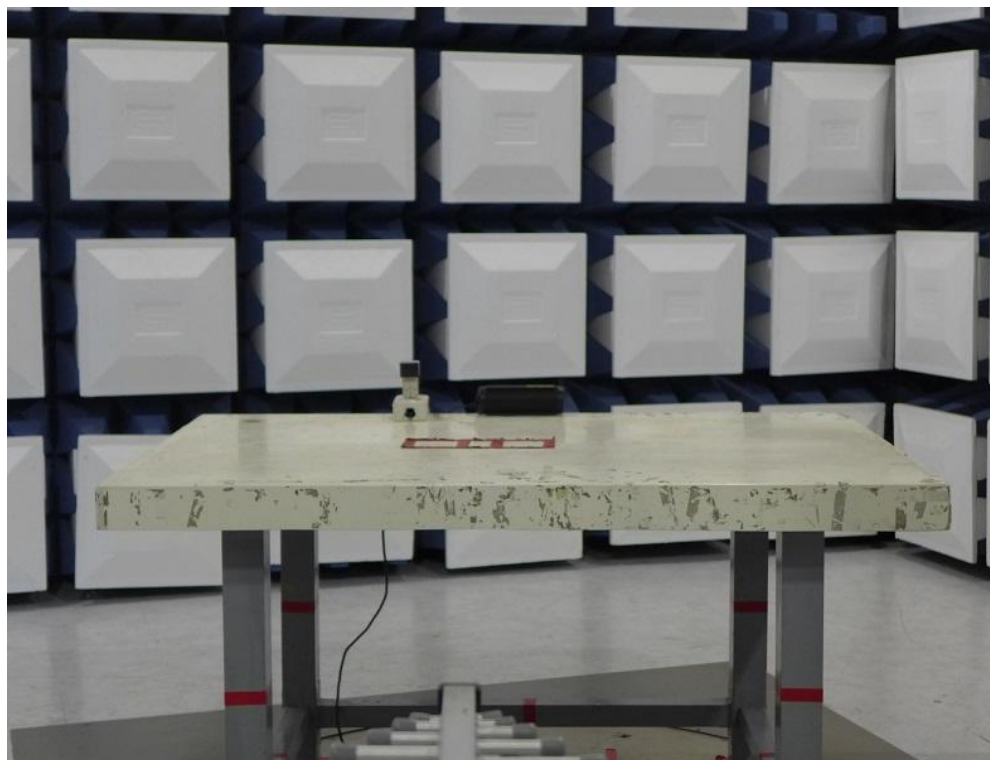
9K-30MHz





## Radiated Measurement Photos

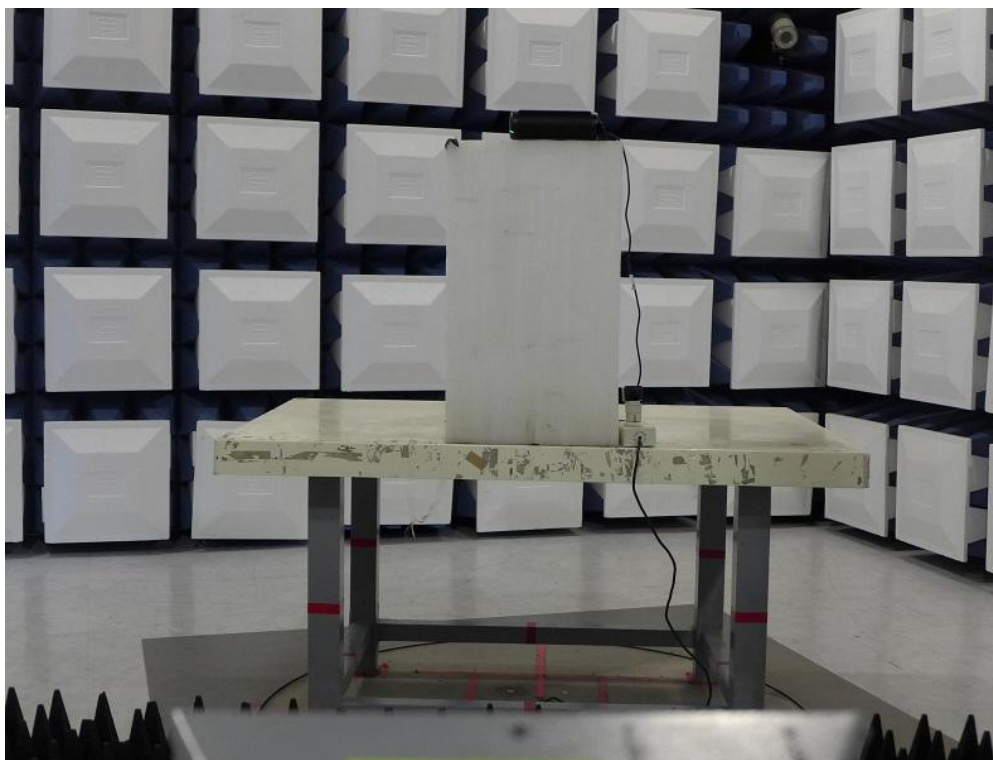
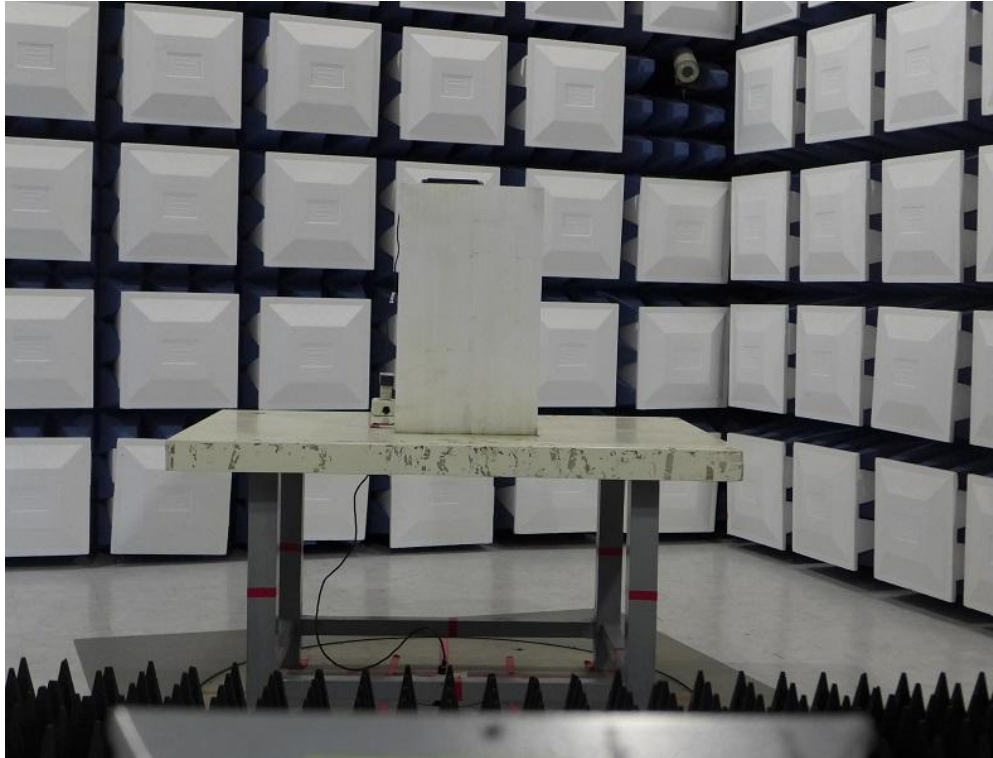
30MHz-1G





## Radiated Measurement Photos

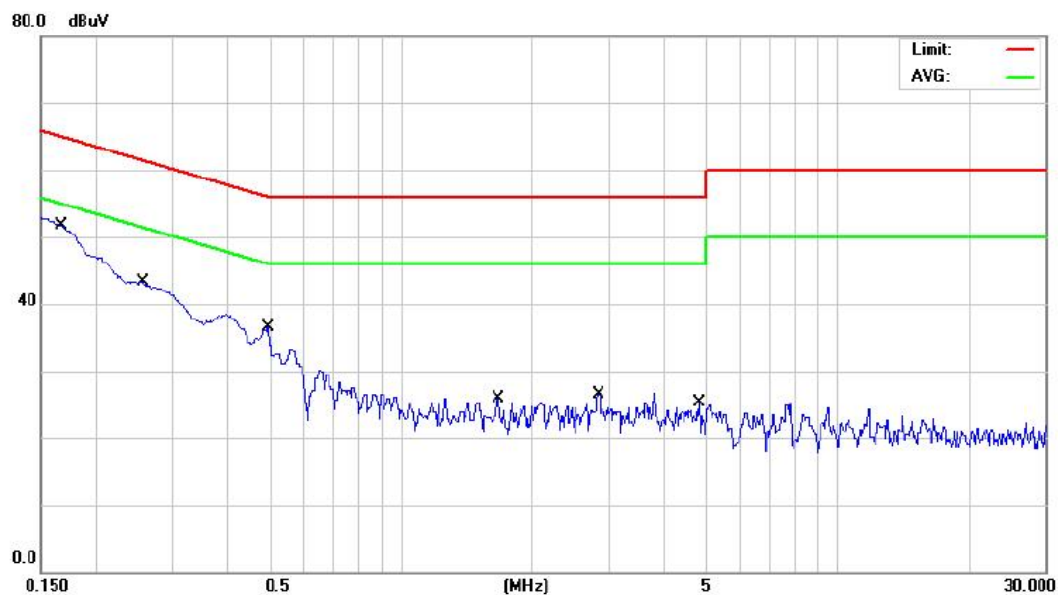
### Above 1G



## **ATTACHMENT A - CONDUCTED EMISSION**

Test Mode: TX Mode

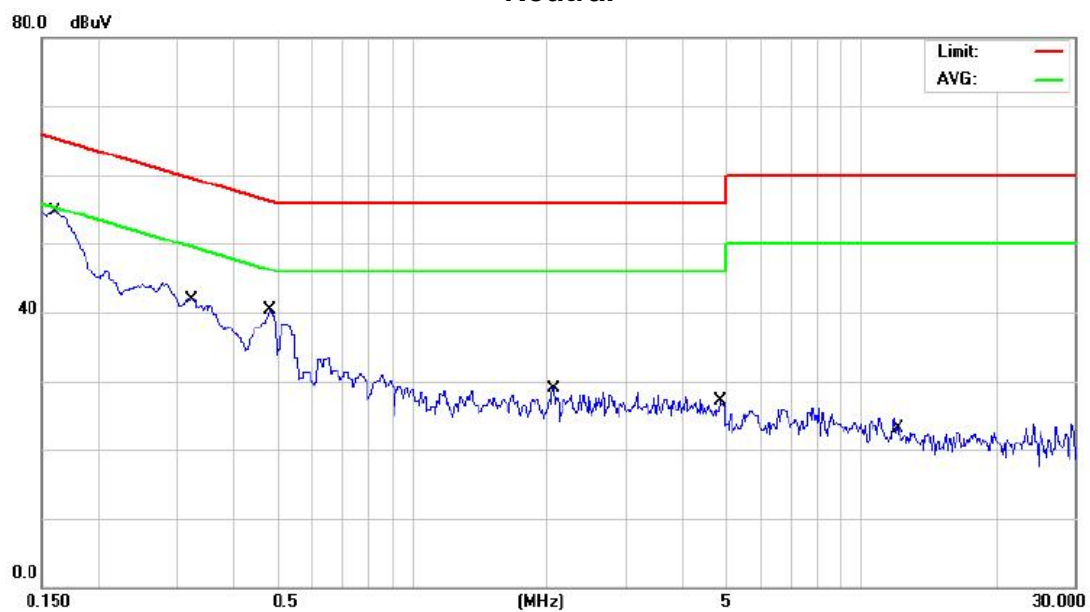
# Line



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1689	35.40	9.64	45.04	65.01	-19.97	QP	
2		0.1689	22.70	9.64	32.34	55.01	-22.67	AVG	
3		0.2592	28.00	9.63	37.63	61.45	-23.82	QP	
4		0.2592	20.60	9.63	30.23	51.45	-21.22	AVG	
5		0.4944	20.90	9.64	30.54	56.09	-25.55	QP	
6		0.4944	9.10	9.64	18.74	46.09	-27.35	AVG	
7		1.6700	7.80	9.71	17.51	56.00	-38.49	QP	
8		1.6700	0.80	9.71	10.51	46.00	-35.49	AVG	
9		2.8310	9.20	9.77	18.97	56.00	-37.03	QP	
10		2.8310	2.20	9.77	11.97	46.00	-34.03	AVG	
11		4.8200	6.70	9.85	16.55	56.00	-39.45	QP	
12		4.8200	1.80	9.85	11.65	46.00	-34.35	AVG	

Test Mode: TX Mode

### Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1598	38.00	9.63	47.63	65.47	-17.84	QP	
2		0.1598	24.60	9.63	34.23	55.47	-21.24	AVG	
3		0.3215	24.60	9.64	34.24	59.67	-25.43	QP	
4		0.3215	13.80	9.64	23.44	49.67	-26.23	AVG	
5		0.4818	22.40	9.65	32.05	56.31	-24.26	QP	
6		0.4818	18.60	9.65	28.25	46.31	-18.06	AVG	
7		2.0570	12.80	9.72	22.52	56.00	-33.48	QP	
8		2.0570	7.00	9.72	16.72	46.00	-29.28	AVG	
9		4.8380	10.20	9.84	20.04	56.00	-35.96	QP	
10		4.8380	5.80	9.84	15.64	46.00	-30.36	AVG	
11		12.0000	5.60	9.88	15.48	60.00	-44.52	QP	
12		12.0000	2.50	9.88	12.38	50.00	-37.62	AVG	

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

Test Mode:	TX Mode
------------	---------

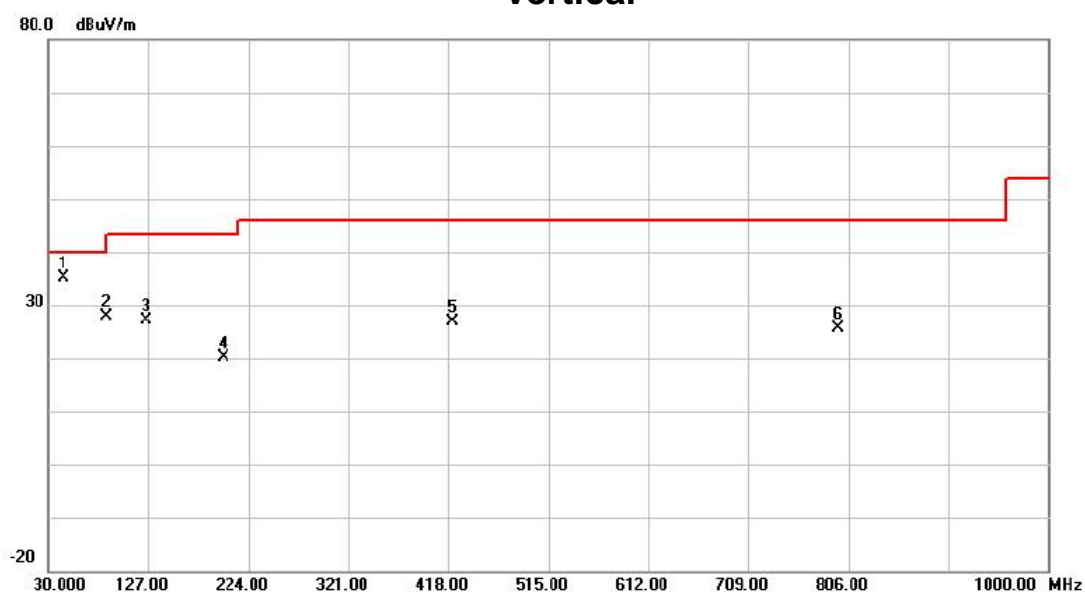
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0153	0°	32.53	22.27	54.80	103.91	-49.11	AVG
0.0153	0°	42.54	22.27	64.81	123.91	-59.10	PK
0.0266	0°	29.45	21.99	51.44	99.11	-47.67	AVG
0.0266	0°	35.35	21.99	57.34	119.11	-61.77	PK
0.0427	0°	26.43	21.58	48.01	95.00	-46.98	AVG
0.0427	0°	31.35	21.58	52.93	115.00	-62.06	PK
0.0620	0°	35.35	21.21	56.56	111.76	-55.20	PK
1.2490	0°	33.59	20.35	53.94	65.67	-11.73	QP
1.5300	0°	35.64	20.07	55.71	63.91	-8.20	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0174	90°	32.57	22.22	54.79	102.79	-48.01	AVG
0.0174	90°	43.41	22.22	65.63	122.79	-57.17	PK
0.0250	90°	28.50	22.03	50.53	99.65	-49.12	AVG
0.0250	90°	34.65	22.03	56.68	119.65	-62.97	PK
0.0463	90°	27.69	21.49	49.18	94.29	-45.11	AVG
0.0463	90°	32.41	21.49	53.90	114.29	-60.39	PK
0.0750	90°	35.63	21.00	56.63	110.10	-53.47	PK
1.4250	90°	32.51	20.18	52.69	64.53	-11.84	QP
1.7490	90°	34.92	19.85	54.77	69.54	-14.77	QP

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

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	*	44.5500	49.03	-13.99	35.04	40.00	-4.96	peak	
2		85.7750	47.45	-19.61	27.84	40.00	-12.16	peak	
3		124.5750	43.38	-16.27	27.11	43.50	-16.39	peak	
4		199.7500	36.96	-16.73	20.23	43.50	-23.27	peak	
5		422.8500	37.43	-10.56	26.87	46.00	-19.13	peak	
6		796.3000	29.58	-3.95	25.63	46.00	-20.37	peak	



Test Mode: TX 2441MHz\_CH39\_1Mbps

## Horizontal

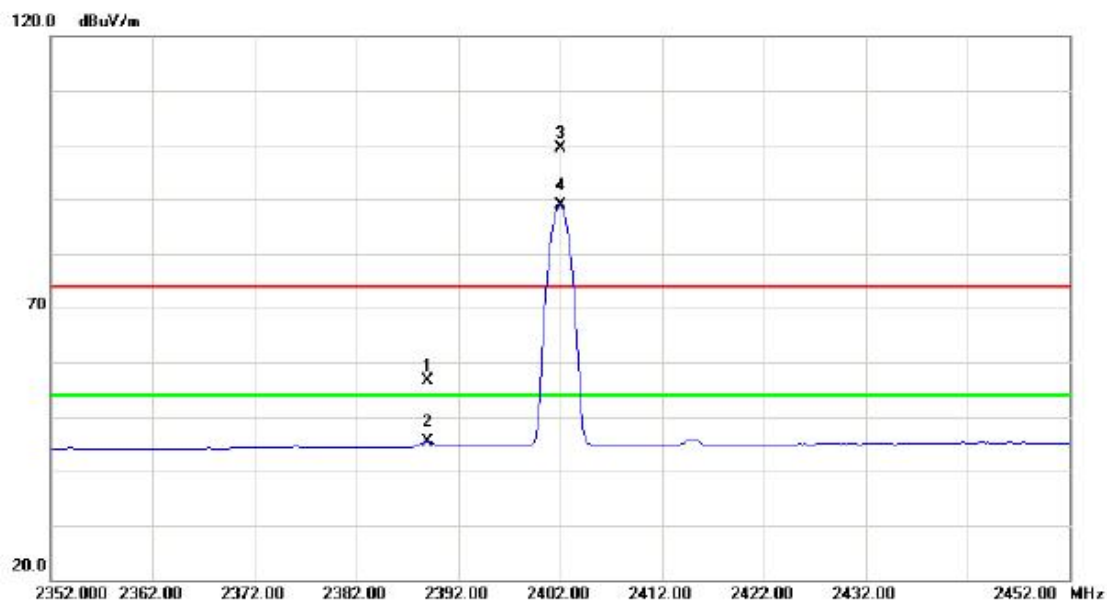


No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		85.7750	41.60	-19.61	21.99	40.00	-18.01	peak	
2	*	131.8500	41.77	-15.56	26.21	43.50	-17.29	peak	
3		199.7500	42.54	-16.73	25.81	43.50	-17.69	peak	
4		238.5500	40.38	-15.40	24.98	46.00	-21.02	peak	
5		638.6750	32.65	-6.92	25.73	46.00	-20.27	peak	
6		830.2500	30.40	-3.84	26.56	46.00	-19.44	peak	

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

Orthogonal Axis :	X
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		2389.000	25.50	31.01	56.51	74.00	-17.49	peak	
2		2389.000	14.41	31.01	45.42	54.00	-8.58	AVG	
3	X	2402.000	68.30	31.08	99.38	74.00	25.38	peak	No Limit
4	*	2402.000	57.76	31.08	88.84	54.00	34.84	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

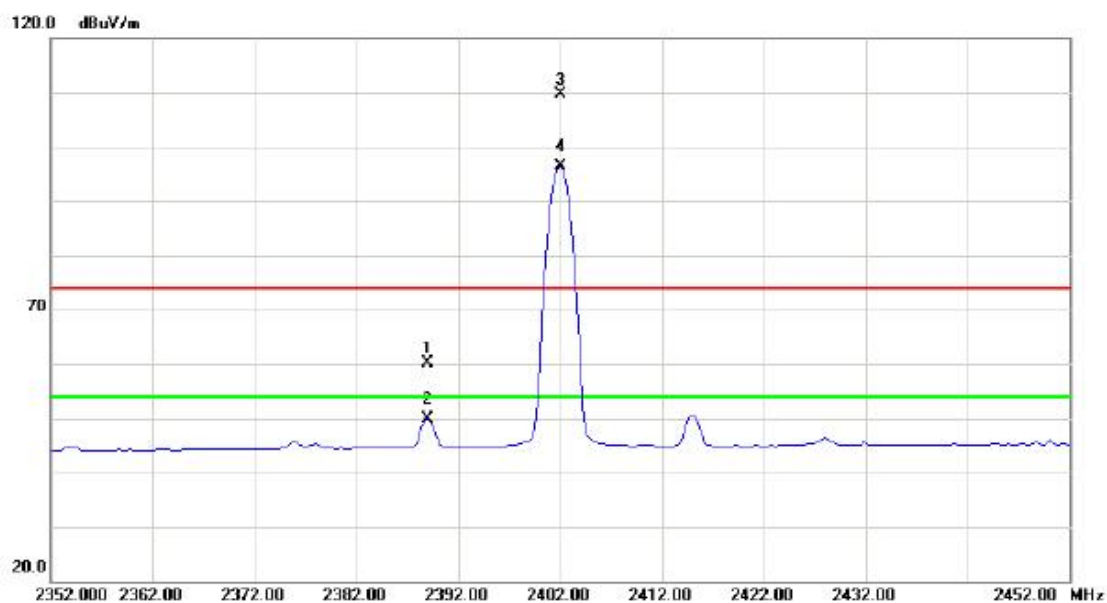
### Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4803.988	42.10	7.36	49.46	74.00	-24.54	peak	
2		4803.988	30.54	7.36	37.90	54.00	-16.10	AVG	
3		7205.863	41.86	14.74	56.60	74.00	-17.40	peak	
4	*	7205.863	32.30	14.74	47.04	54.00	-6.96	AVG	

Orthogonal Axis :	X
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		2389.000	29.20	31.01	60.21	74.00	-13.79	peak	
2		2389.000	18.78	31.01	49.79	54.00	-4.21	AVG	
3	X	2402.000	78.53	31.08	109.61	74.00	35.61	peak	No Limit
4	*	2402.000	65.23	31.08	96.31	54.00	42.31	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_1Mbps

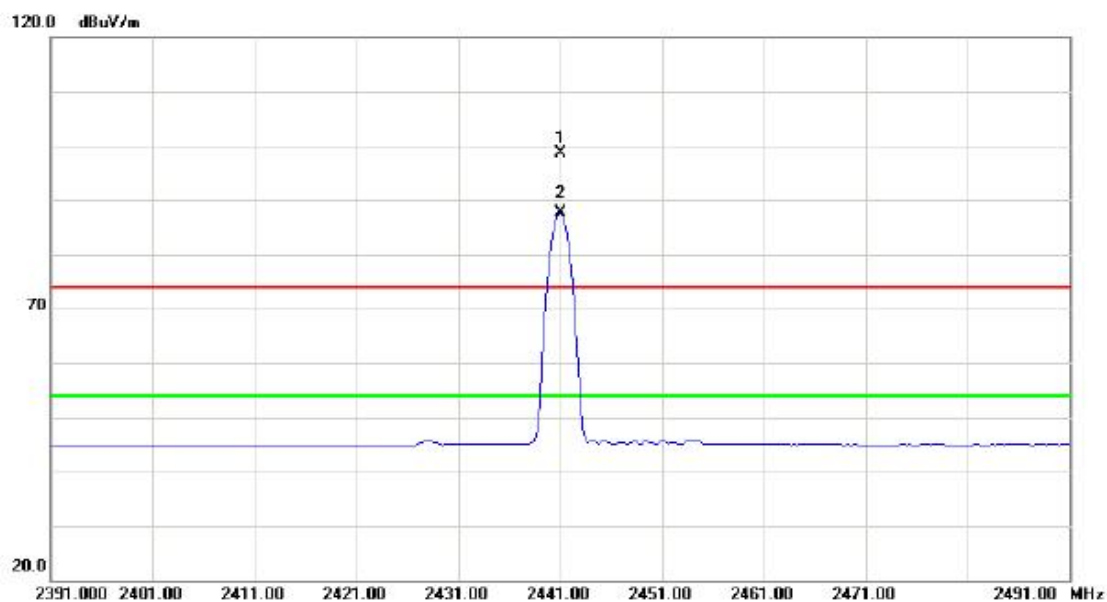
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4804.015	43.42	7.36	50.78	74.00	-23.22	peak	
2		4804.015	30.49	7.36	37.85	54.00	-16.15	AVG	
3		7205.863	41.40	14.74	56.14	74.00	-17.86	peak	
4	*	7205.863	30.98	14.74	45.72	54.00	-8.28	AVG	

Orthogonal Axis :	X
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	X	2441.000	67.43	31.26	98.69	74.00	24.69	peak	No Limit
2	*	2441.000	56.25	31.26	87.51	54.00	33.51	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

### Vertical

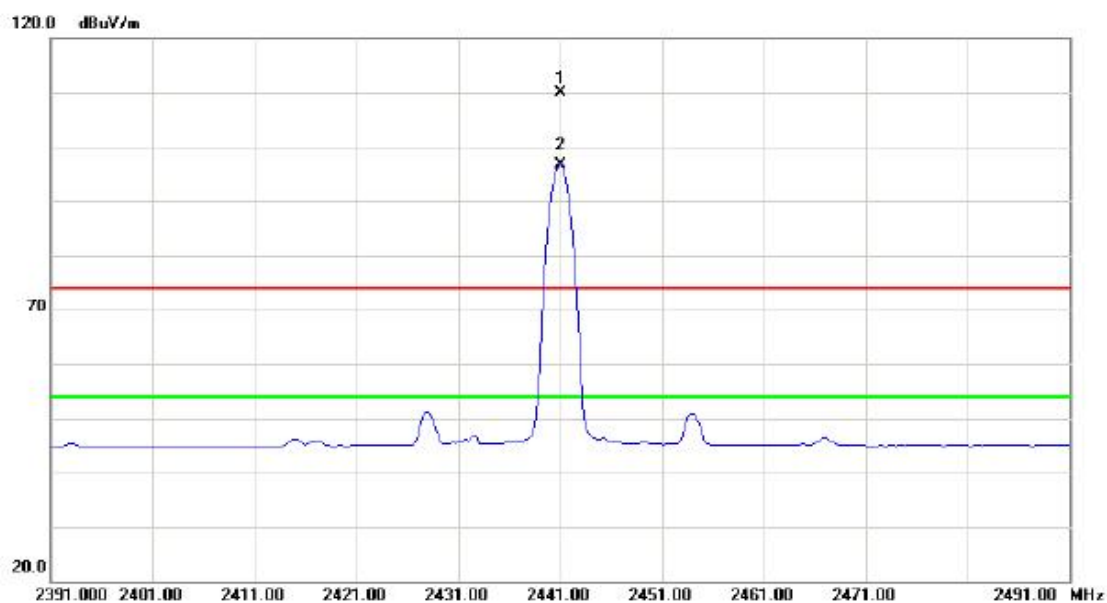


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.750	42.67	7.46	50.13	74.00	-23.87	peak	
2		4881.750	31.25	7.46	38.71	54.00	-15.29	AVG	
3		7322.920	43.37	15.24	58.61	74.00	-15.39	peak	
4	*	7322.920	32.06	15.24	47.30	54.00	-6.70	AVG	



Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

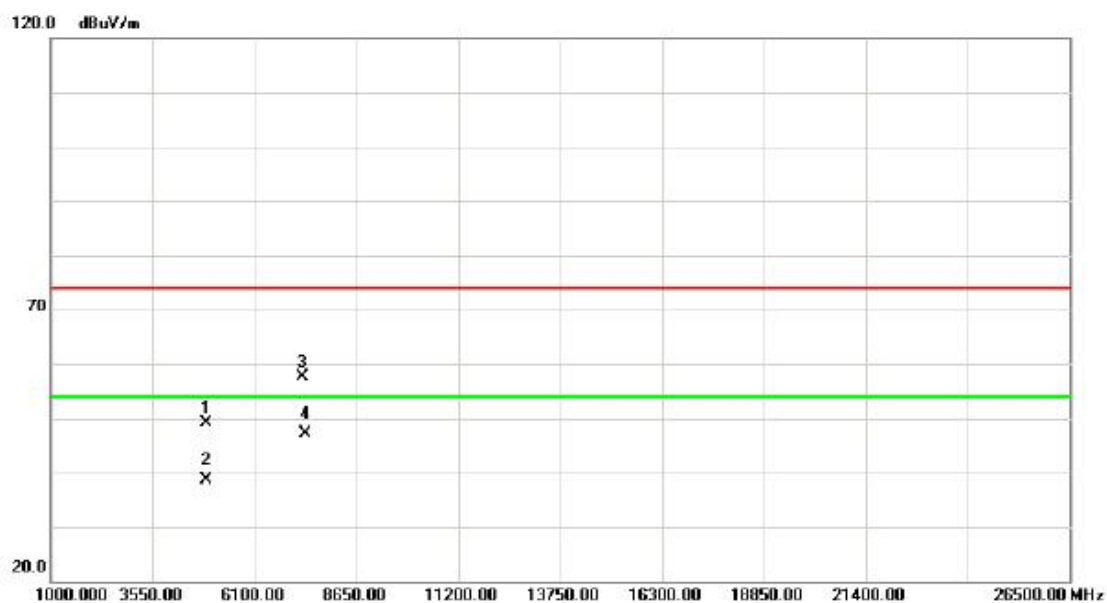
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2441.000	78.60	31.26	109.86	74.00	35.86	peak	No Limit
2	*	2441.000	65.49	31.26	96.75	54.00	42.75	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_1Mbps

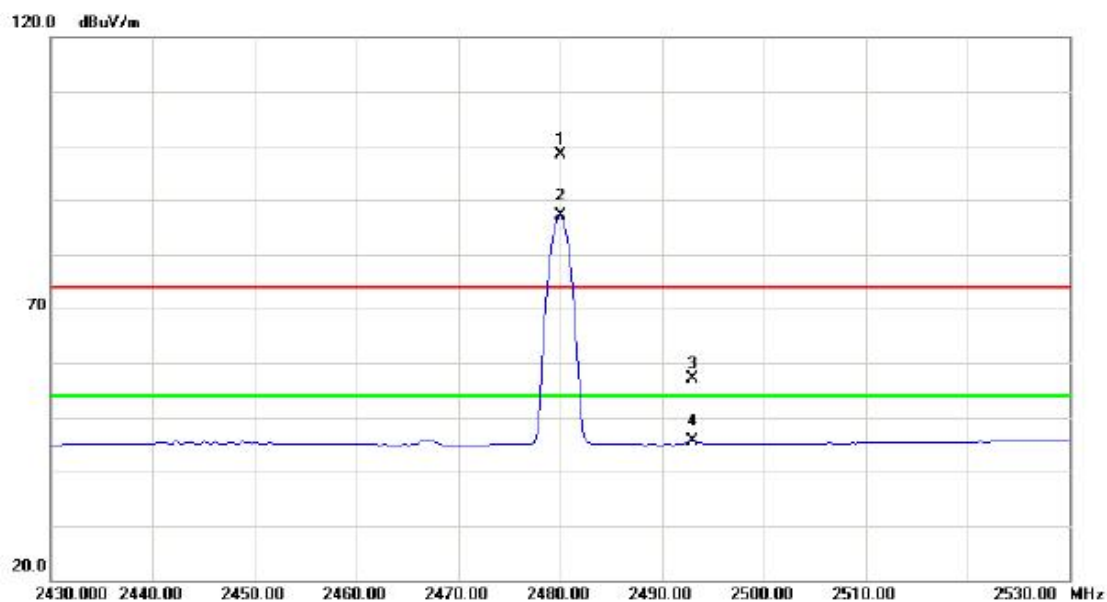
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.900	41.60	7.46	49.06	74.00	-24.94	peak	
2		4881.900	31.11	7.46	38.57	54.00	-15.43	AVG	
3		7322.830	42.45	15.24	57.69	74.00	-16.31	peak	
4	*	7322.830	31.80	15.24	47.04	54.00	-6.96	AVG	

Orthogonal Axis :	X
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	X	2480.000	66.85	31.44	98.29	74.00	24.29	peak	No Limit
2	*	2480.000	55.58	31.44	87.02	54.00	33.02	AVG	No Limit
3		2493.000	25.65	31.51	57.16	74.00	-16.84	peak	
4		2493.000	14.06	31.51	45.57	54.00	-8.43	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

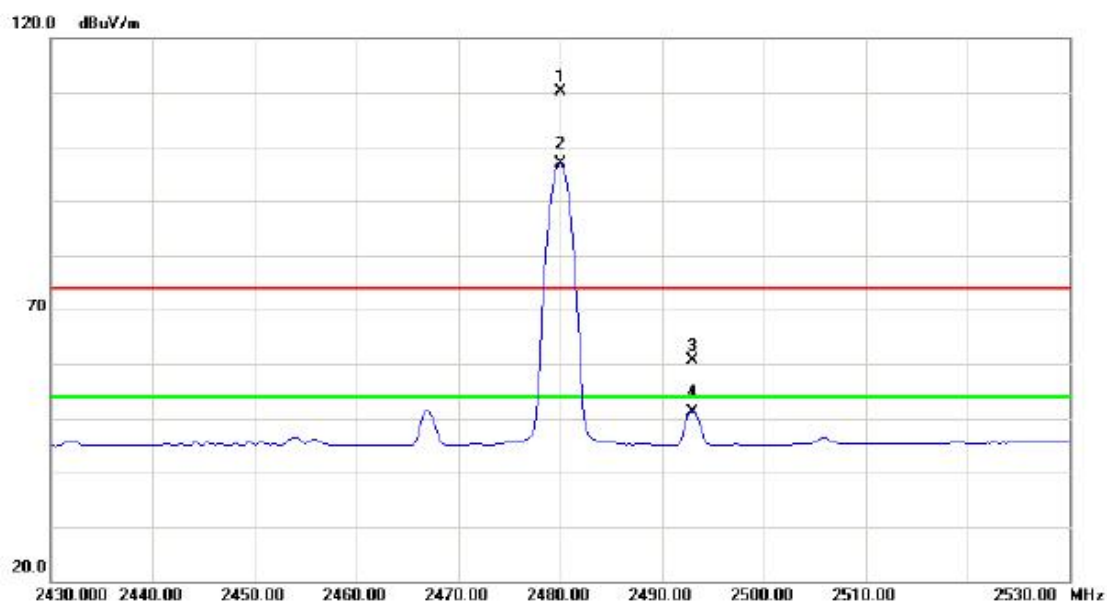
### Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.055	43.05	7.58	50.63	74.00	-23.37	peak	
2		4960.055	31.36	7.58	38.94	54.00	-15.06	AVG	
3		7440.270	42.68	15.73	58.41	74.00	-15.59	peak	
4	*	7440.270	32.26	15.73	47.99	54.00	-6.01	AVG	

Orthogonal Axis :	X
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	78.80	31.44	110.24	74.00	36.24	peak	No Limit
2	*	2480.000	65.37	31.44	96.81	54.00	42.81	AVG	No Limit
3		2493.000	29.00	31.51	60.51	74.00	-13.49	peak	
4		2493.000	19.71	31.51	51.22	54.00	-2.78	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_1Mbps

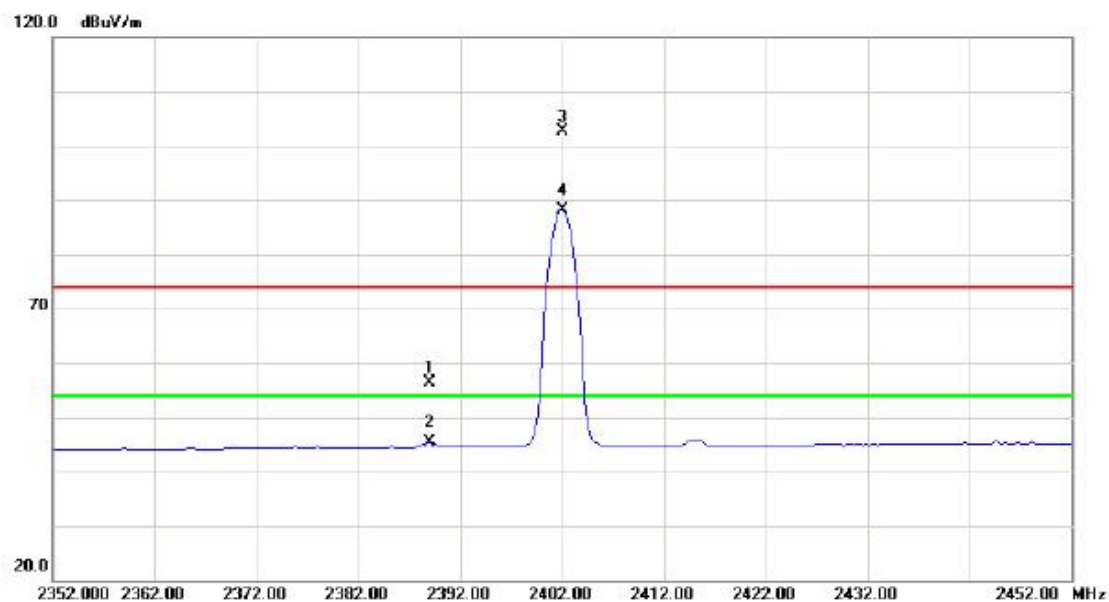
### Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB		
1		4959.900	41.97	7.58	49.55	74.00	-24.45	peak	
2		4959.900	30.99	7.58	38.57	54.00	-15.43	AVG	
3		7440.010	43.19	15.73	58.92	74.00	-15.08	peak	
4	*	7440.010	32.05	15.73	47.78	54.00	-6.22	AVG	

Orthogonal Axis :	X
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		2389.000	25.30	31.01	56.31	74.00	-17.69	peak	
2		2389.000	14.45	31.01	45.46	54.00	-8.54	AVG	
3	X	2402.000	71.63	31.08	102.71	74.00	28.71	peak	No Limit
4	*	2402.000	57.11	31.08	88.19	54.00	34.19	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

### Vertical

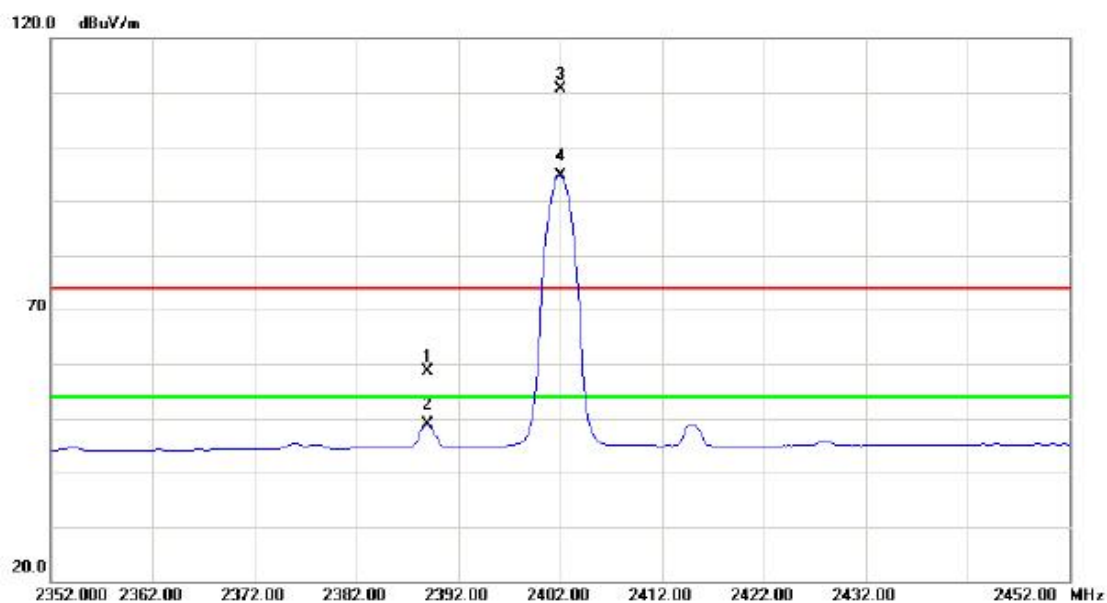


No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4806.250	40.81	7.36	48.17	74.00	-25.83	peak	
2		4806.250	30.73	7.36	38.09	54.00	-15.91	AVG	
3		7205.570	42.49	14.74	57.23	74.00	-16.77	peak	
4	*	7205.570	31.38	14.74	46.12	54.00	-7.88	AVG	



Orthogonal Axis :	X
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		2389.000	27.59	31.01	58.60	74.00	-15.40	peak	
2		2389.000	17.75	31.01	48.76	54.00	-5.24	AVG	
3	X	2402.000	79.55	31.08	110.63	74.00	36.63	peak	No Limit
4	*	2402.000	63.63	31.08	94.71	54.00	40.71	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz_CH00_3Mbps

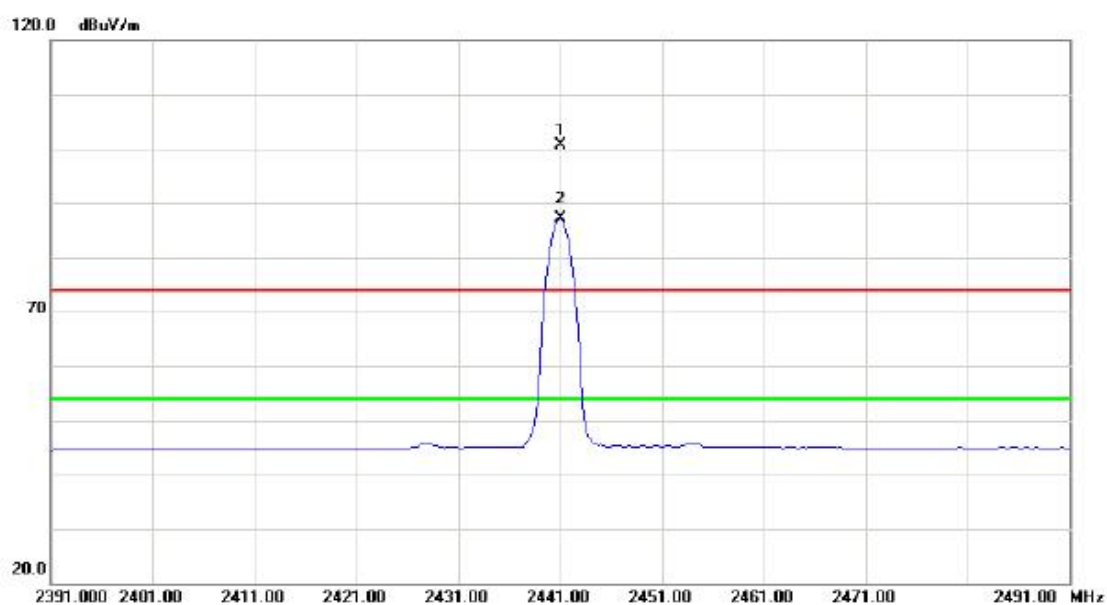
### Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB		
1		4803.800	42.50	7.36	49.86	74.00	-24.14	peak	
2		4803.800	30.83	7.36	38.19	54.00	-15.81	AVG	
3		7205.105	42.46	14.74	57.20	74.00	-16.80	peak	
4	*	7205.105	31.38	14.74	46.12	54.00	-7.88	AVG	

Orthogonal Axis :	X
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	2441.000	69.30	31.26	100.56	74.00	26.56	peak	No Limit
2	*	2441.000	55.79	31.26	87.05	54.00	33.05	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

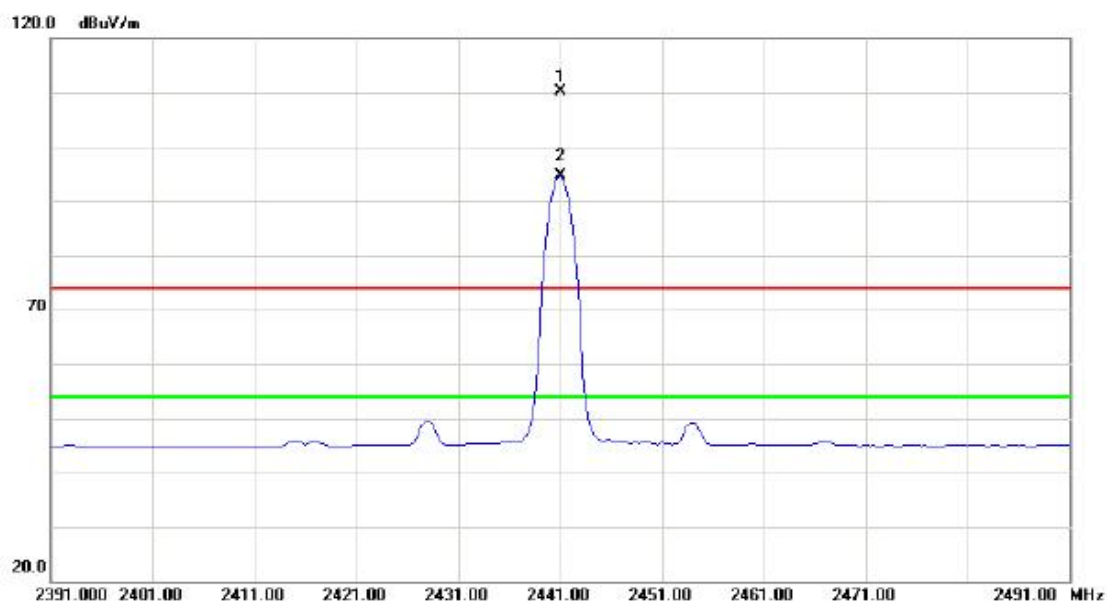
### Vertical



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4882.300	41.59	7.46	49.05	74.00	-24.95	peak	
2		4882.300	30.91	7.46	38.37	54.00	-15.63	AVG	
3		7323.215	41.08	15.24	56.32	74.00	-17.68	peak	
4	*	7323.215	31.47	15.24	46.71	54.00	-7.29	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

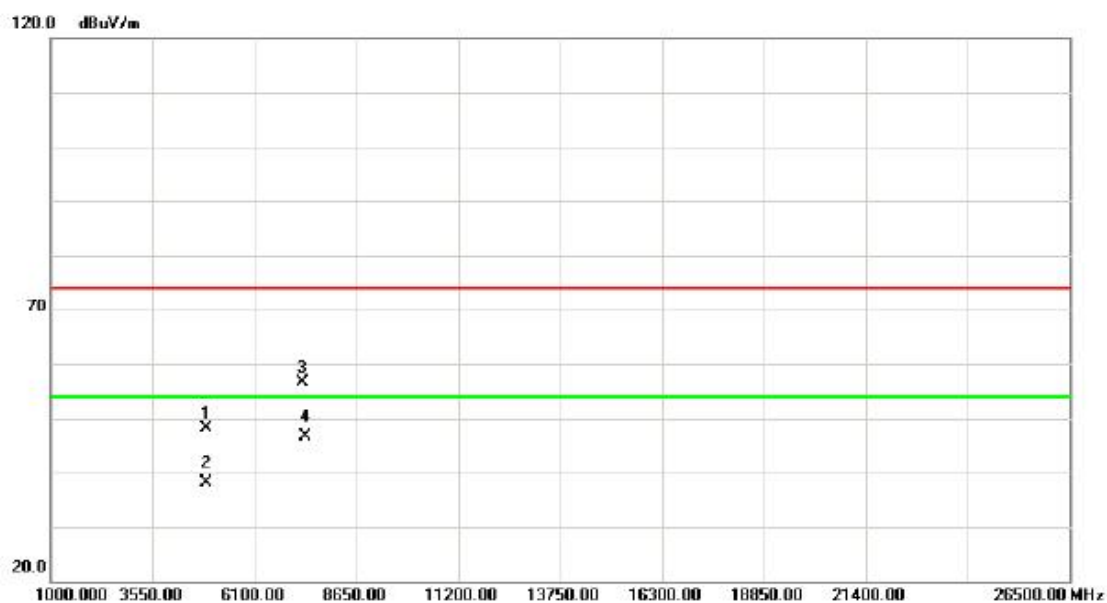
### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1	X	2441.000	78.95	31.26	110.21	74.00	36.21	peak	No Limit
2	*	2441.000	63.26	31.26	94.52	54.00	40.52	AVG	No Limit

Orthogonal Axis :	X
Test Mode :	TX 2441MHz_CH39_3Mbps

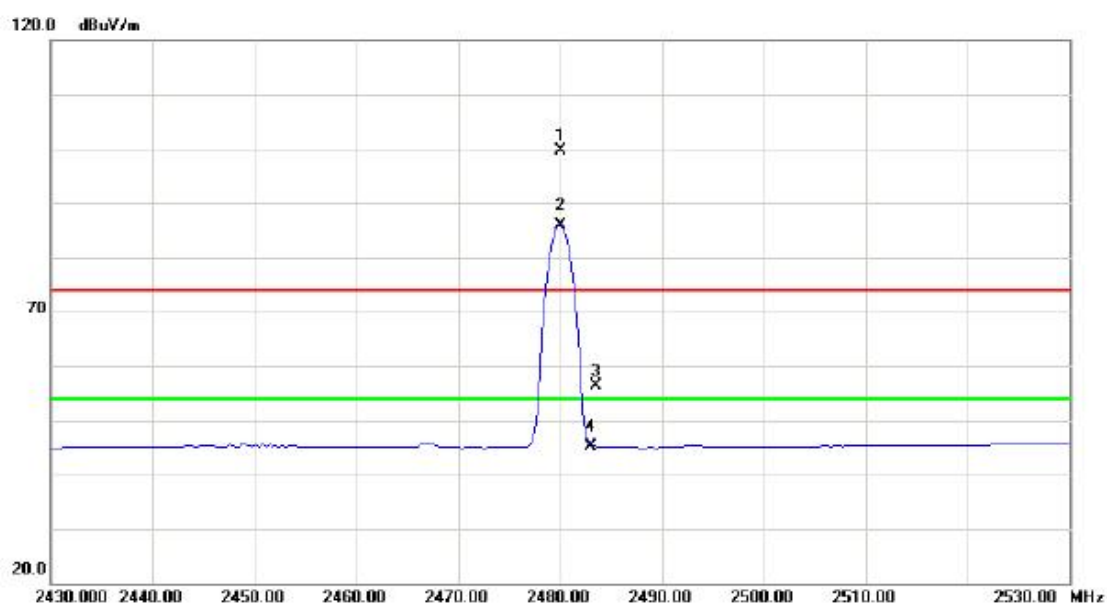
### Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4881.720	40.70	7.46	48.16	74.00	-25.84	peak	
2		4881.720	30.69	7.46	38.15	54.00	-15.85	AVG	
3		7323.215	41.34	15.24	56.58	74.00	-17.42	peak	
4	*	7323.215	31.39	15.24	46.63	54.00	-7.37	AVG	

Orthogonal Axis :	X
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	2480.000	68.20	31.44	99.64	74.00	25.64	peak	No Limit
2	*	2480.000	54.48	31.44	85.92	54.00	31.92	AVG	No Limit
3		2483.500	24.90	31.46	56.36	74.00	-17.64	peak	
4		2483.500	13.68	31.46	45.14	54.00	-8.86	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

### Vertical

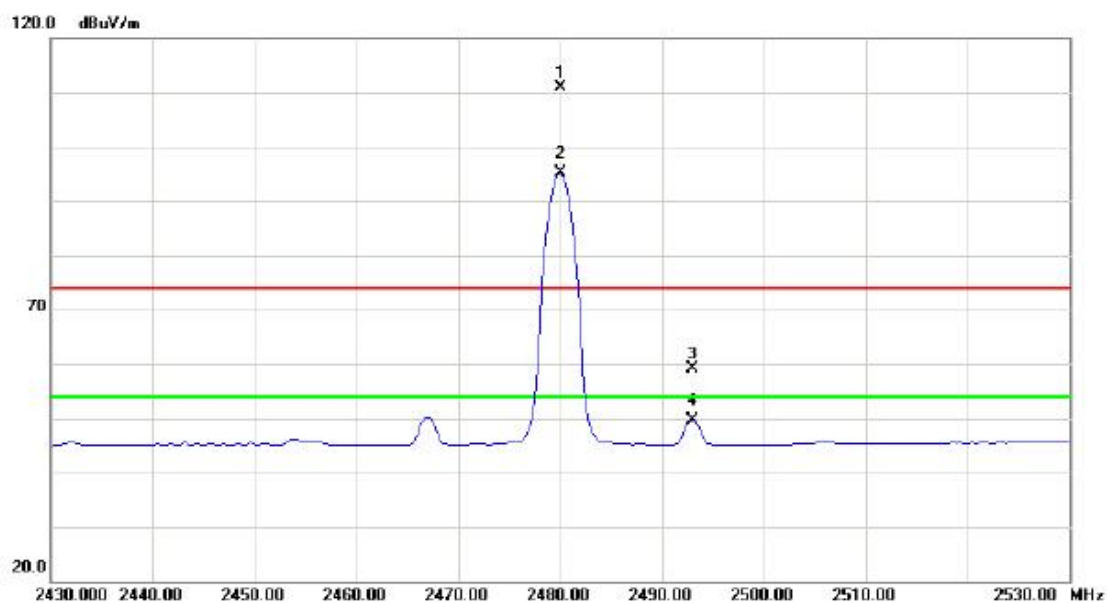


No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Margin		
		MHz	Level	Factor	ment			Detector	Comment
			dBuV	dB	dBuV/m	dBuV/m	dB		
1		4959.615	41.08	7.58	48.66	74.00	-25.34	peak	
2		4959.615	30.67	7.58	38.25	54.00	-15.75	AVG	
3		7439.845	41.08	15.73	56.81	74.00	-17.19	peak	
4	*	7439.845	31.56	15.73	47.29	54.00	-6.71	AVG	



Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

### 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	79.45	31.44	110.89	74.00	36.89	peak	No Limit
2	*	2480.000	63.65	31.44	95.09	54.00	41.09	AVG	No Limit
3		2493.000	27.68	31.51	59.19	74.00	-14.81	peak	
4		2493.000	18.03	31.51	49.54	54.00	-4.46	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz_CH78_3Mbps

### Horizontal



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		4959.870	40.40	7.58	47.98	74.00	-26.02	peak	
2		4959.870	30.05	7.58	37.63	54.00	-16.37	AVG	
3		7440.130	40.85	15.73	56.58	74.00	-17.42	peak	
4	*	7440.130	31.58	15.73	47.31	54.00	-6.69	AVG	

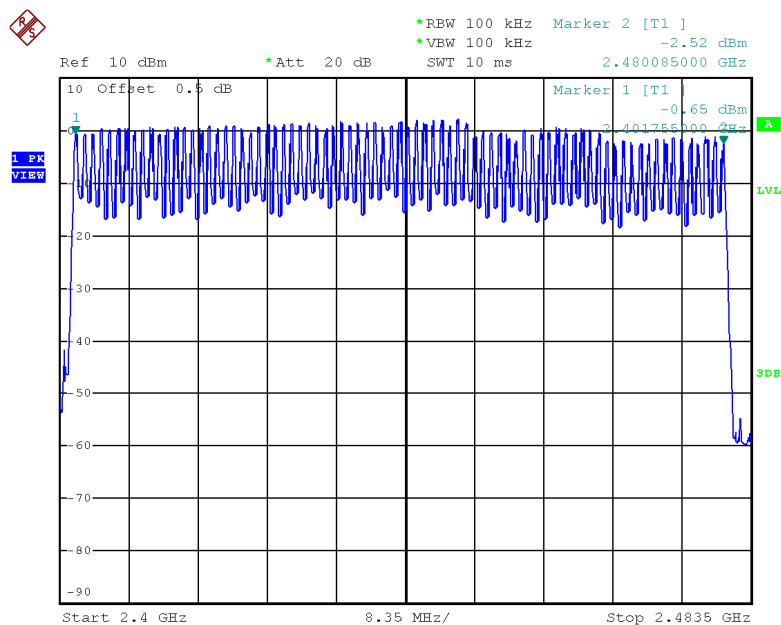
## **ATTACHMENT E - NUMBER OF HOPPING CHANNEL**

## Test Mode

## Hopping Mode\_1Mbps

Number of Hopping Channel

79



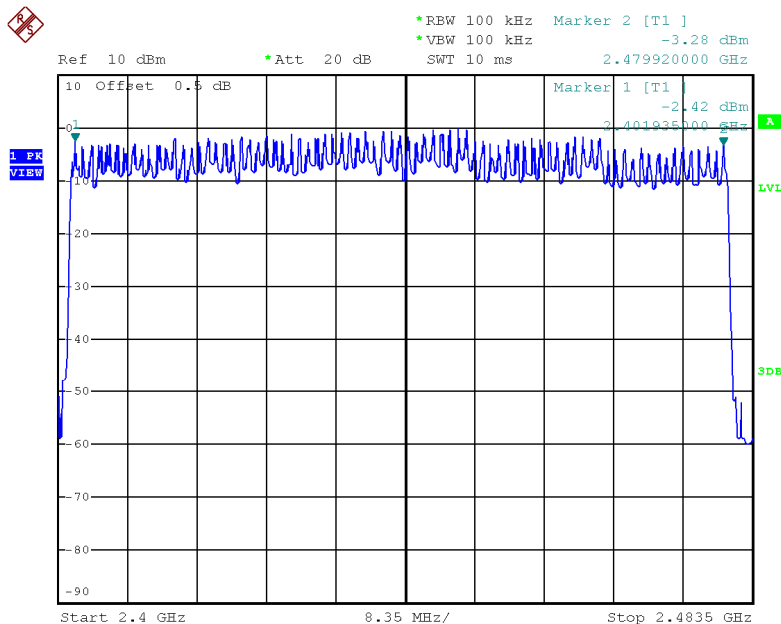
Date: 14.SEP.2015 11:49:25

## Test Mode

## Hopping Mode\_3Mbps

Number of Hopping Channel

79



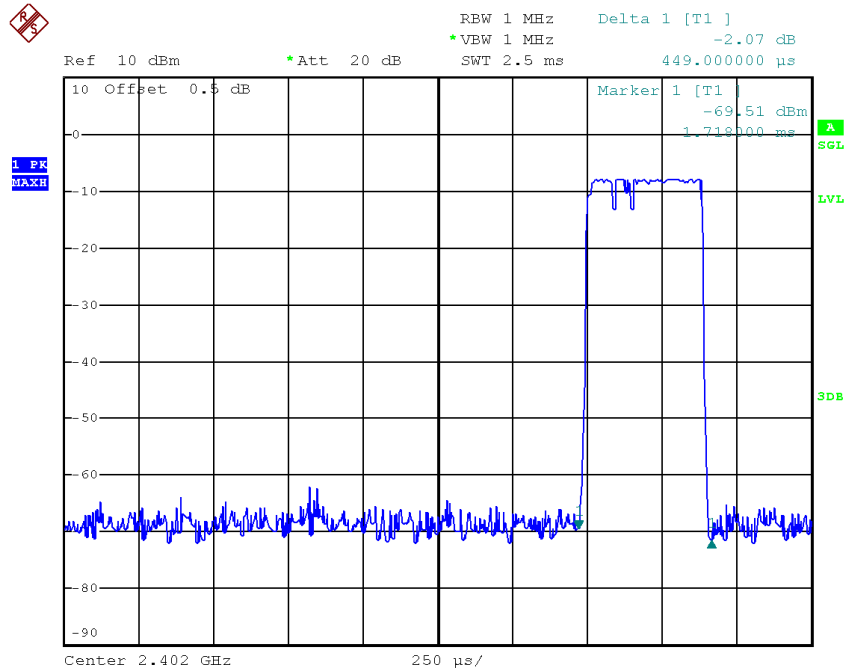
Date: 14.SEP.2015 14:29:58

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

Test Mode :	TX Mode_1Mbps
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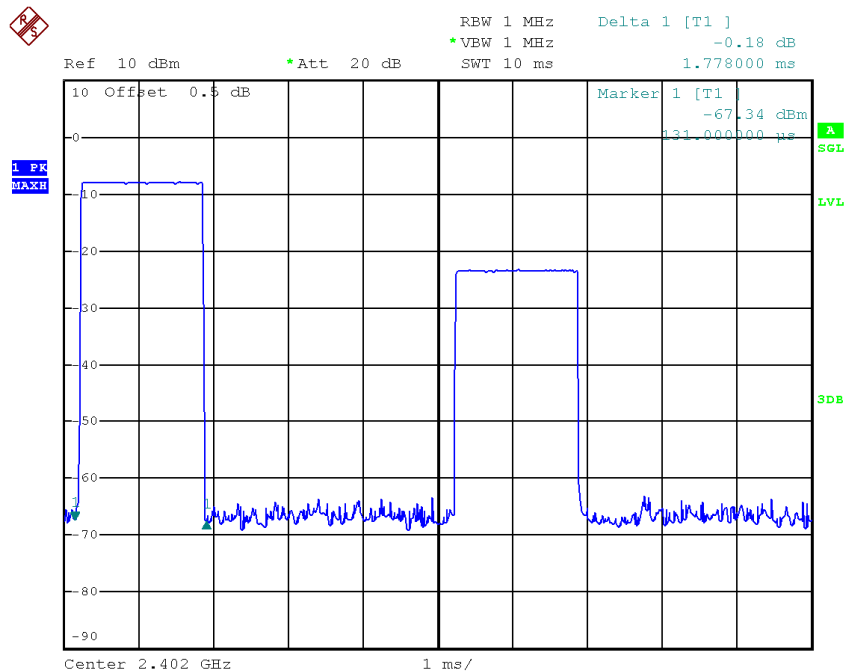
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.1190	0.3327	0.4000	Complies
DH3	2402	1.7780	0.2845	0.4000	Complies
DH1	2402	0.4490	0.1437	0.4000	Complies
DH5	2441	3.1180	0.3326	0.4000	Complies
DH3	2441	1.7590	0.2814	0.4000	Complies
DH1	2441	0.4490	0.1437	0.4000	Complies
DH5	2480	3.0390	0.3242	0.4000	Complies
DH3	2480	1.7790	0.2846	0.4000	Complies
DH1	2480	0.4540	0.1453	0.4000	Complies

### CH00-DH1



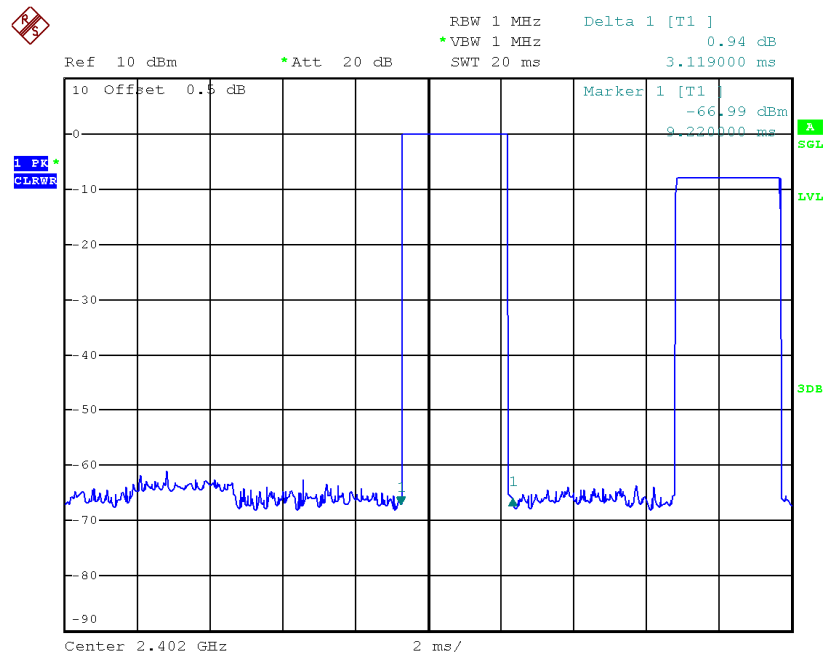
Date: 14.SEP.2015 10:25:41

### CH00-DH3



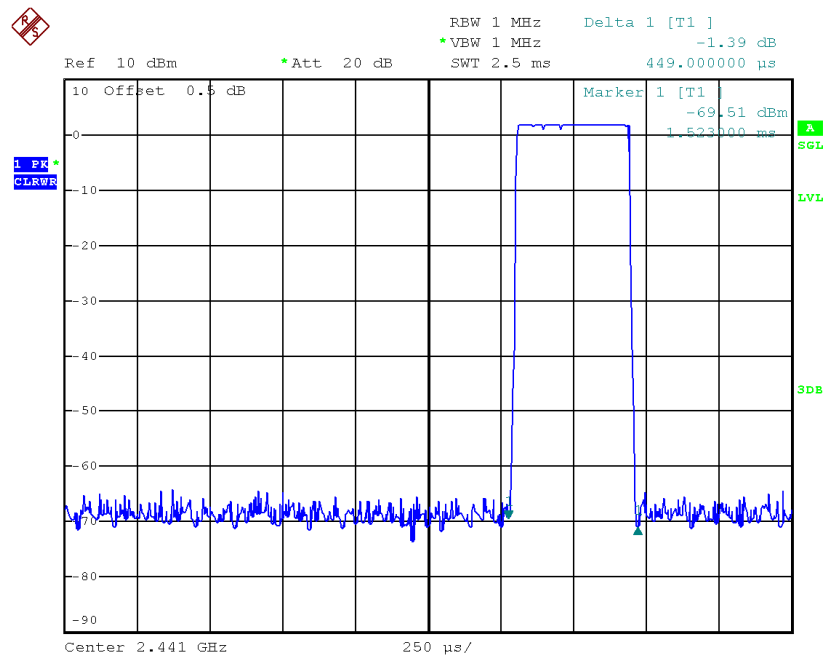
Date: 14.SEP.2015 12:03:18

### CH00-DH5



Date: 14.SEP.2015 12:04:59

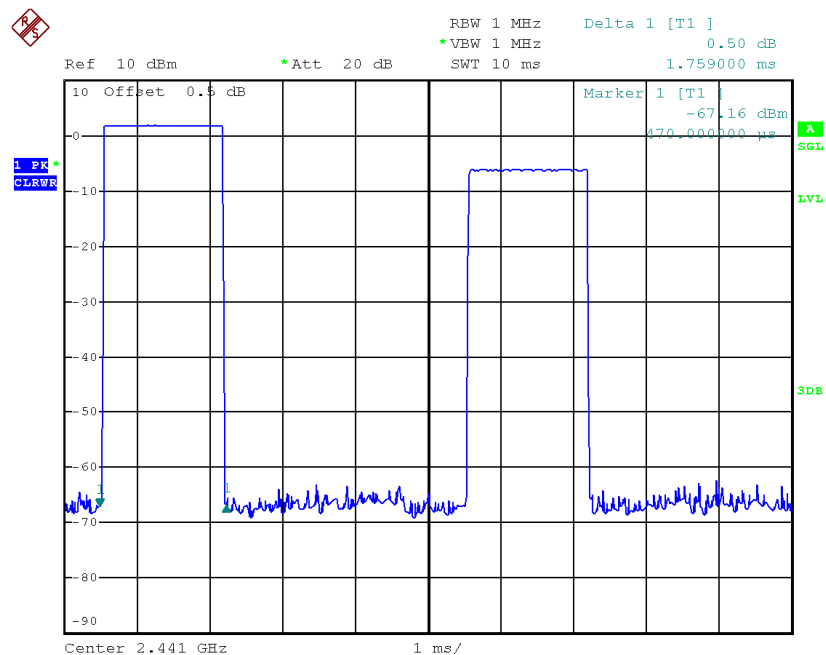
### CH39-DH1



Date: 14.SEP.2015 11:44:04

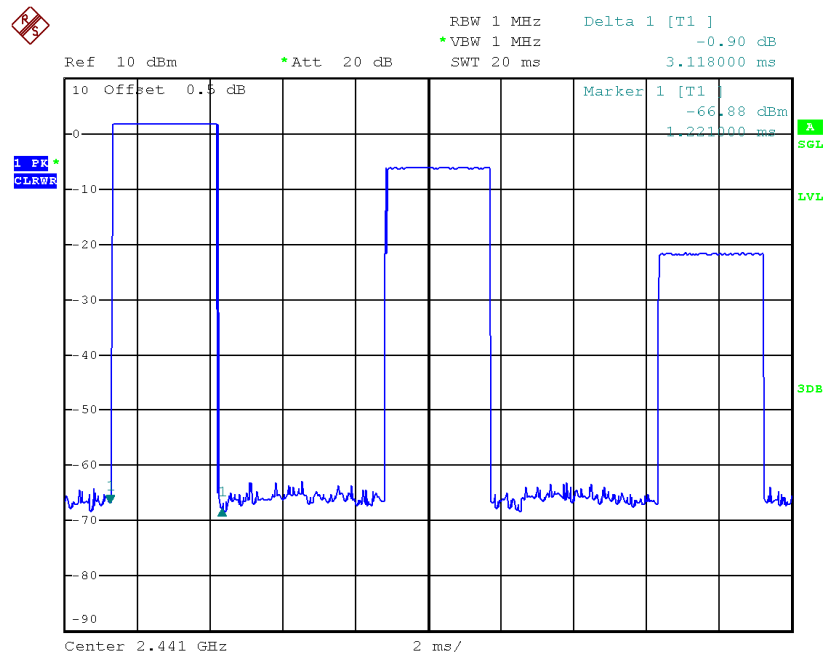


### CH39-DH3



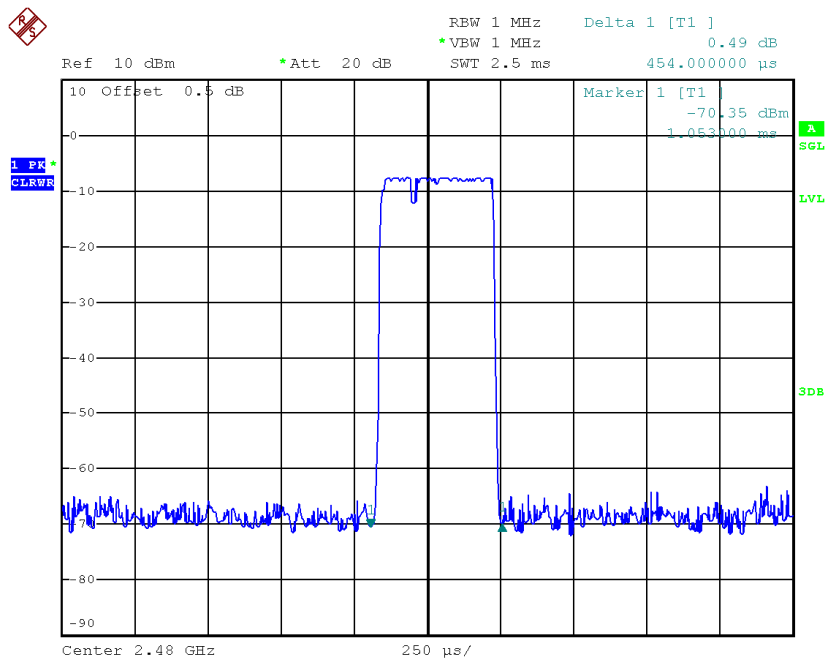
Date: 14.SEP.2015 12:03:29

### CH39-DH5



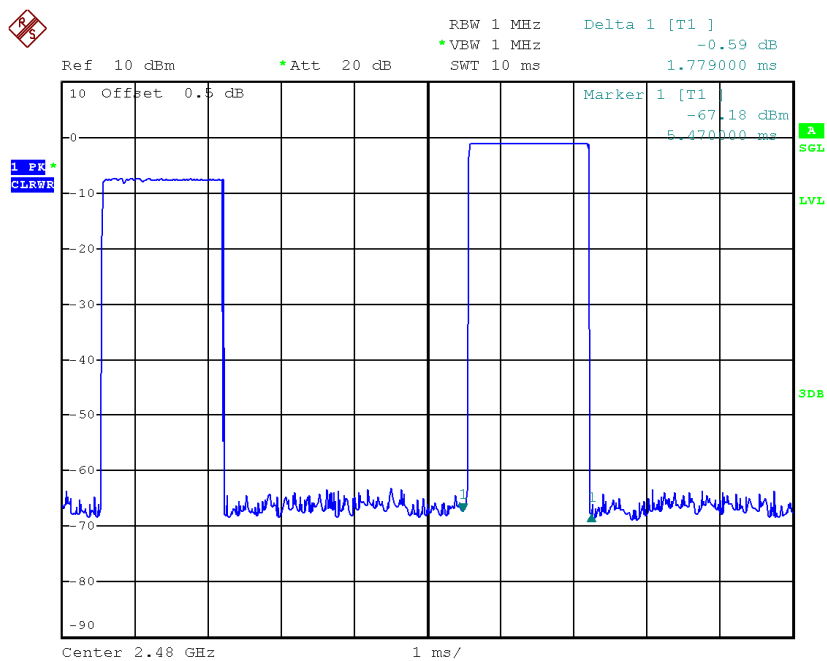
Date: 14.SEP.2015 12:05:16

### CH78-DH1



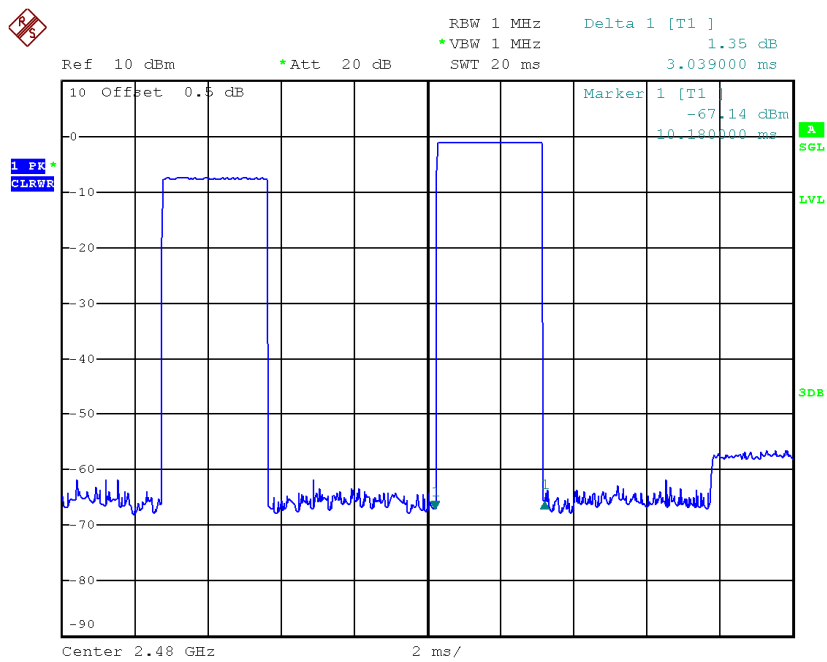
Date: 14.SEP.2015 11:44:12

### CH78-DH3



Date: 14.SEP.2015 12:03:38

# CH78-DH5

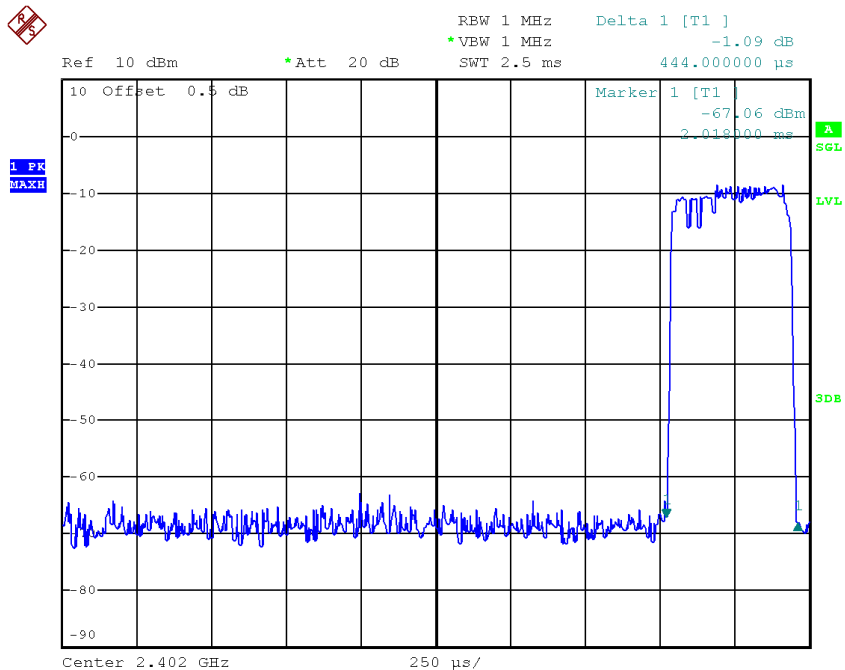


Date: 14.SEP.2015 12:05:25

Test Mode :	TX Mode_3Mbps
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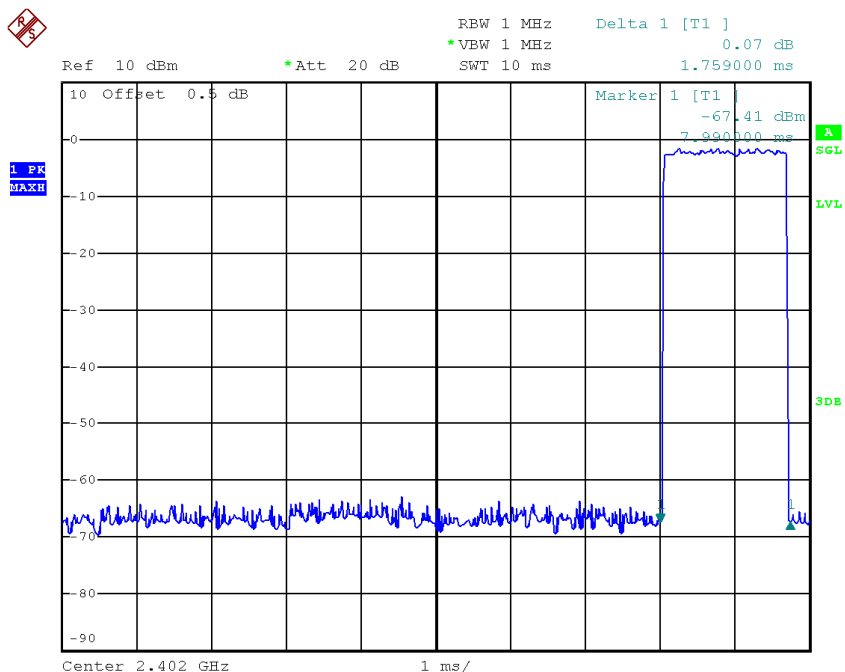
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.0790	0.3284	0.4000	Complies
DH3	2402	1.7590	0.2814	0.4000	Complies
DH1	2402	0.4440	0.1421	0.4000	Complies
DH5	2441	3.1190	0.3327	0.4000	Complies
DH3	2441	1.7390	0.2782	0.4000	Complies
DH1	2441	0.4640	0.1485	0.4000	Complies
DH5	2480	3.1590	0.3370	0.4000	Complies
DH3	2480	1.7790	0.2846	0.4000	Complies
DH1	2480	0.4490	0.1437	0.4000	Complies

### CH00-DH1



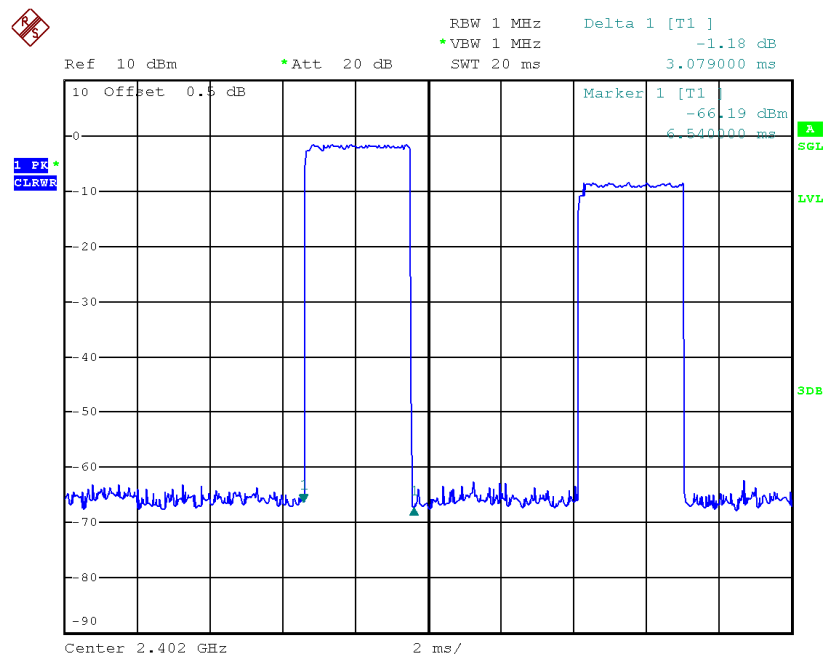
Date: 14.SEP.2015 14:24:34

### CH00-DH3



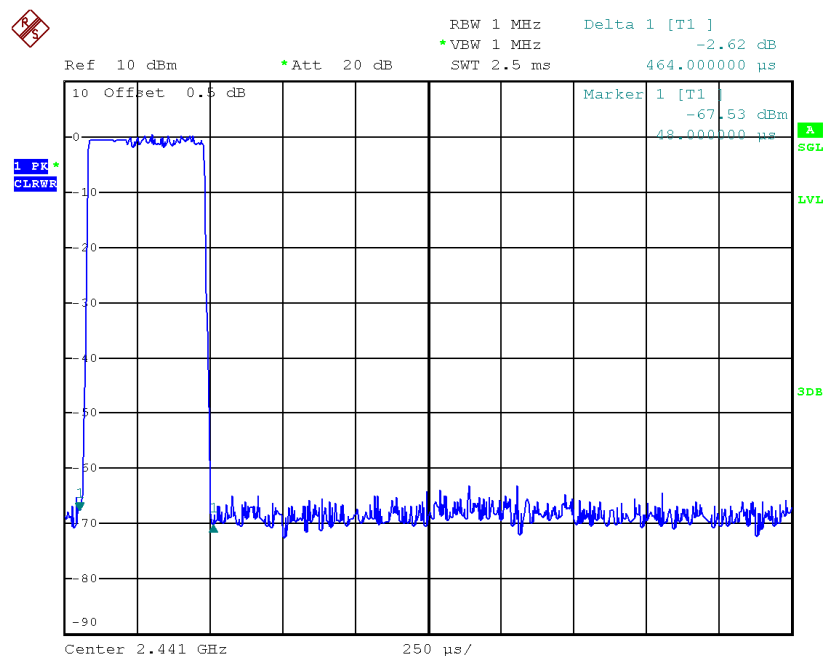
Date: 14.SEP.2015 14:34:27

# CH00-DH5



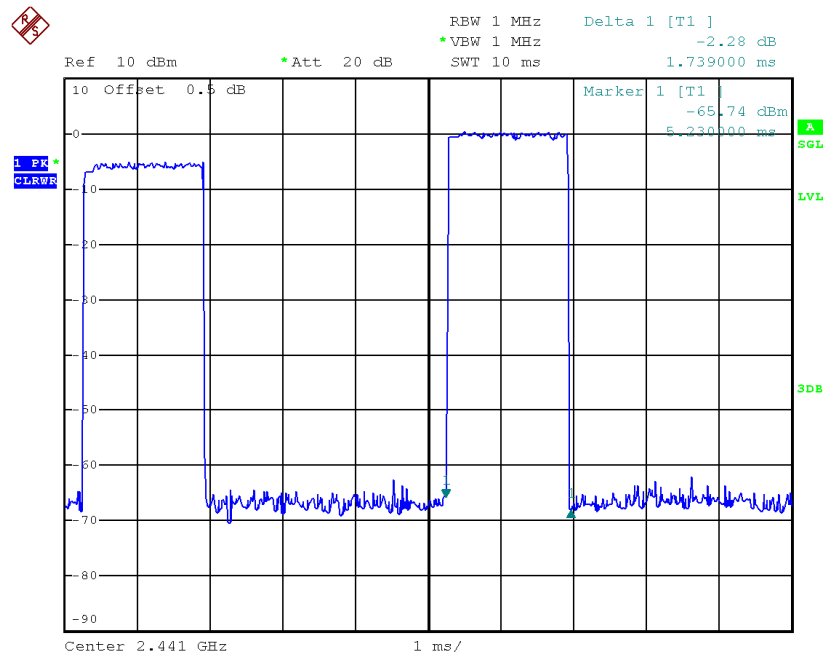
Date: 14.SEP.2015 14:36:23

# CH39-DH1



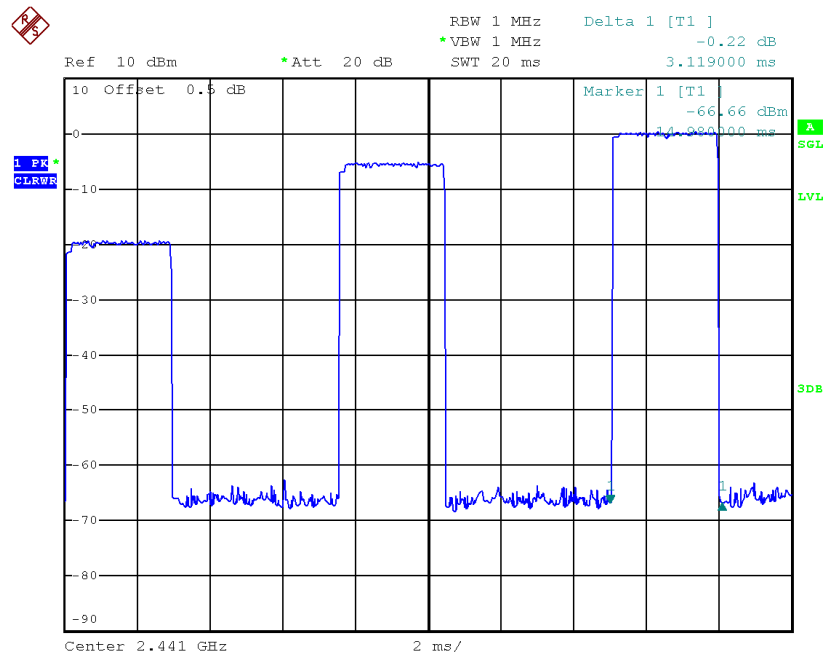
Date: 14.SEP.2015 14:24:41

### CH39-DH3



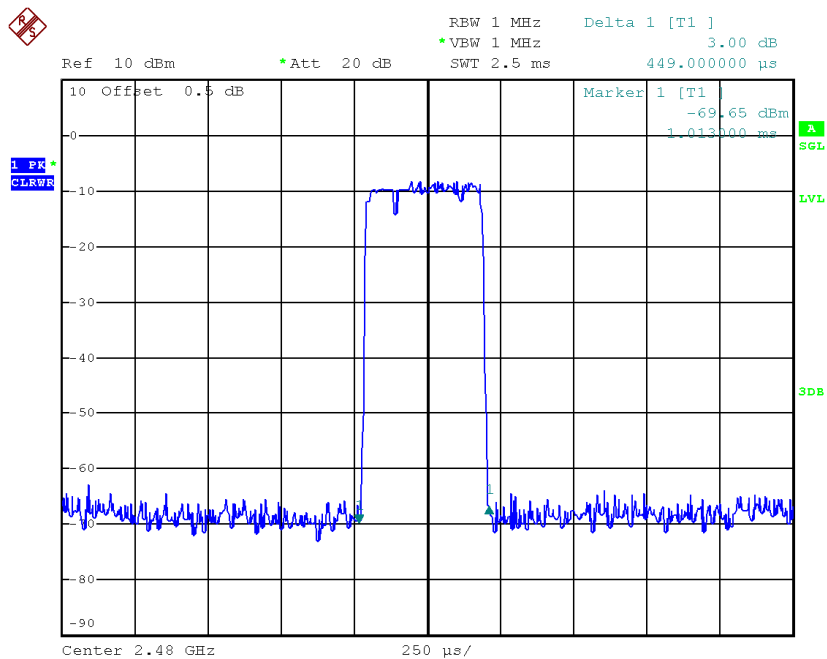
Date: 14.SEP.2015 14:35:41

### CH39-DH5



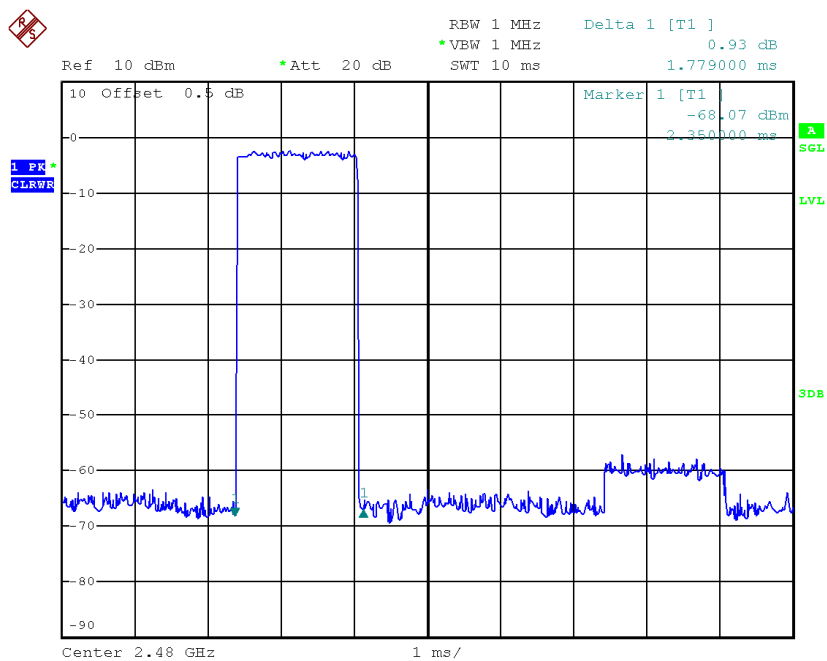
Date: 14.SEP.2015 14:36:33

### CH78-DH1



Date: 14.SEP.2015 14:24:52

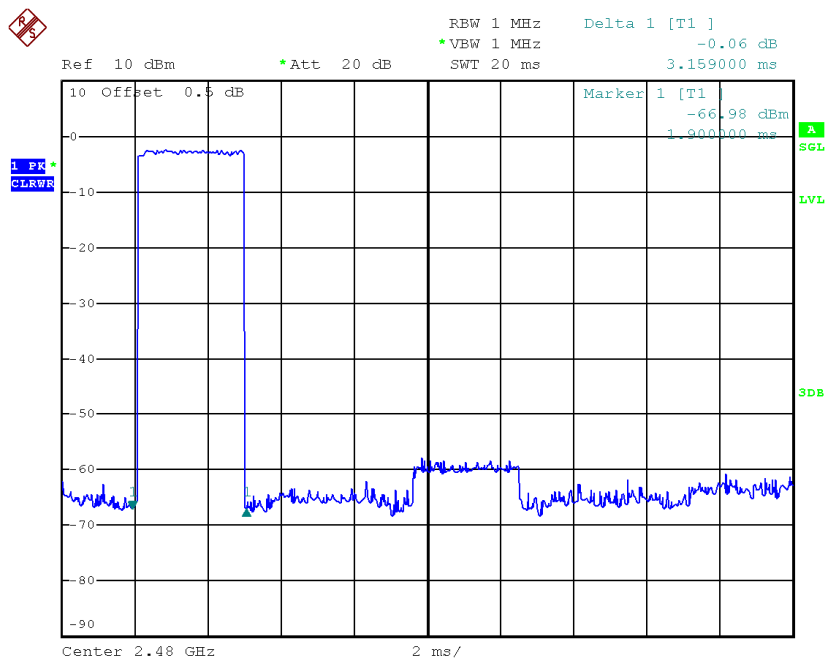
### CH78-DH3



Date: 14.SEP.2015 14:35:56



# CH78-DH5

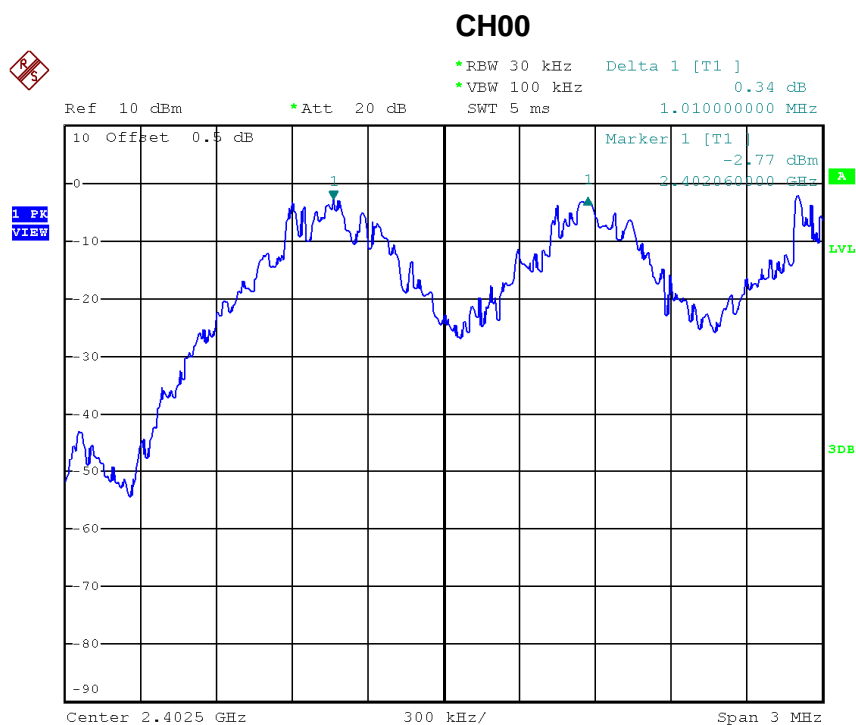


Date: 14.SEP.2015 14:36:52

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

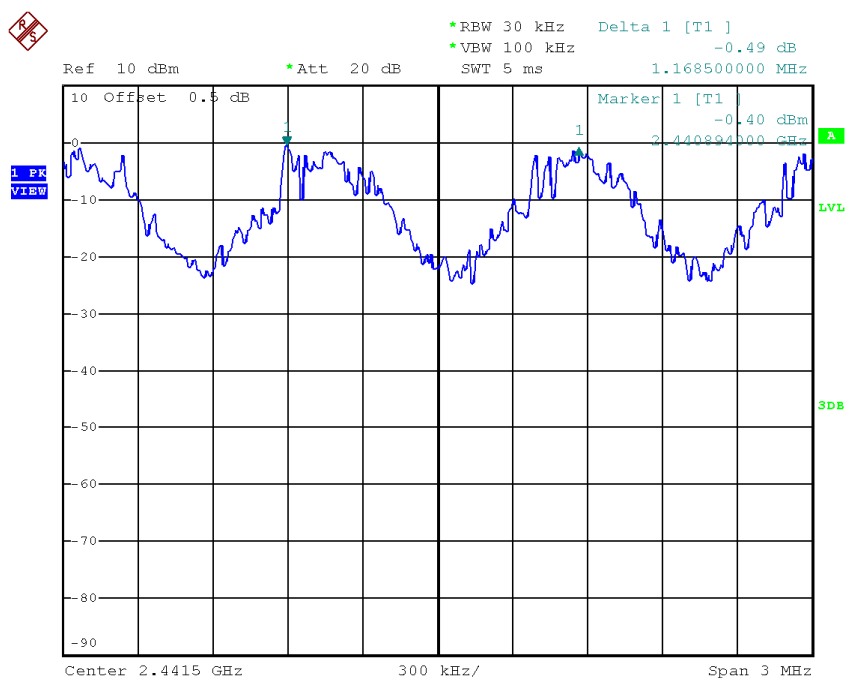
Test Mode :	Hopping on _1Mbps
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Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	1.010	0.637	Complies
2441	1.165	0.635	Complies
2480	1.186	0.635	Complies



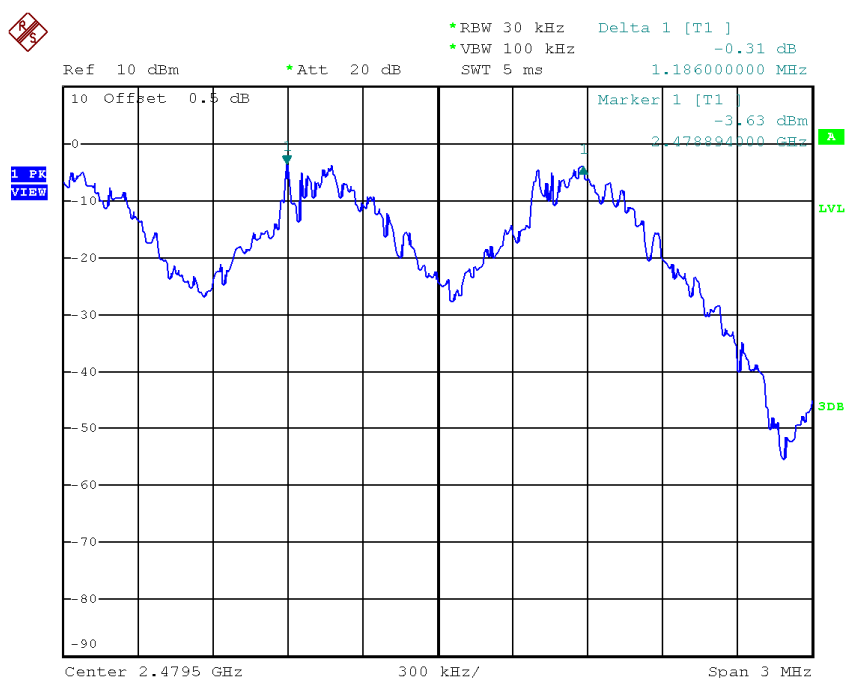
Date: 14.SEP.2015 11:45:20

### CH39



Date: 14.SEP.2015 11:46:29

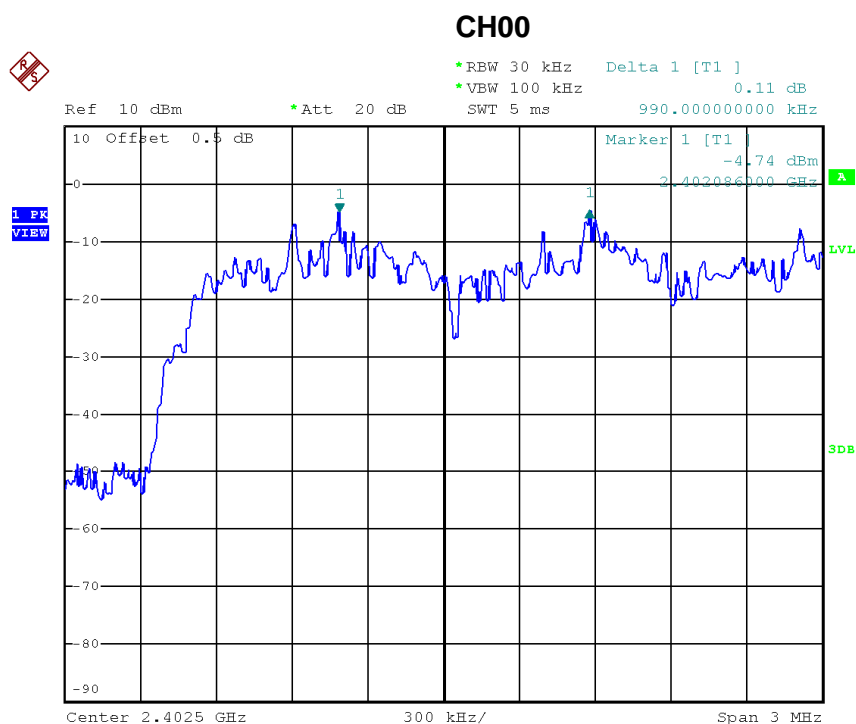
### CH78



Date: 14.SEP.2015 11:47:37

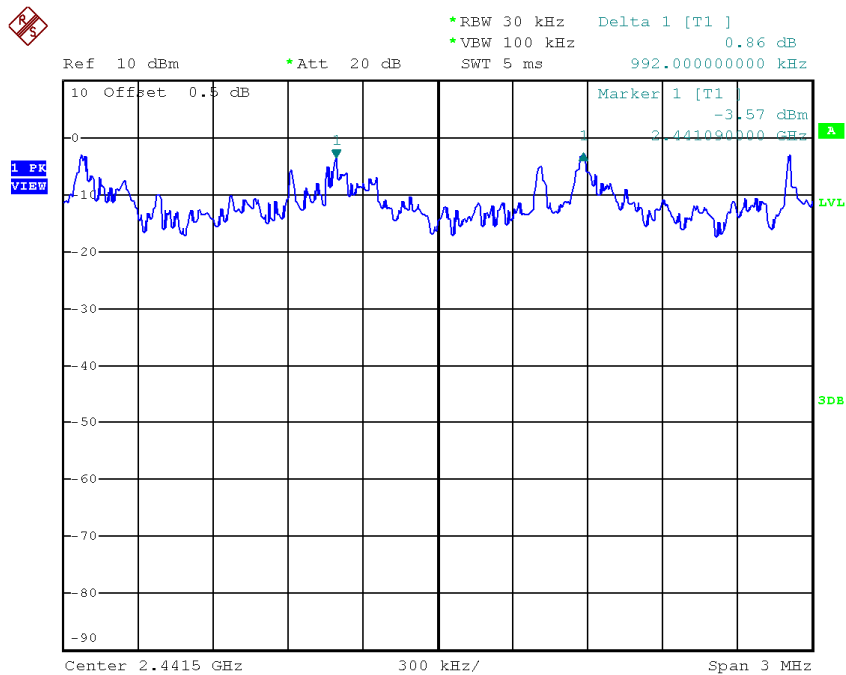
Test Mode :	Hopping on _3Mbps
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Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.990	0.876	Complies
2441	0.992	0.853	Complies
2480	1.002	0.855	Complies



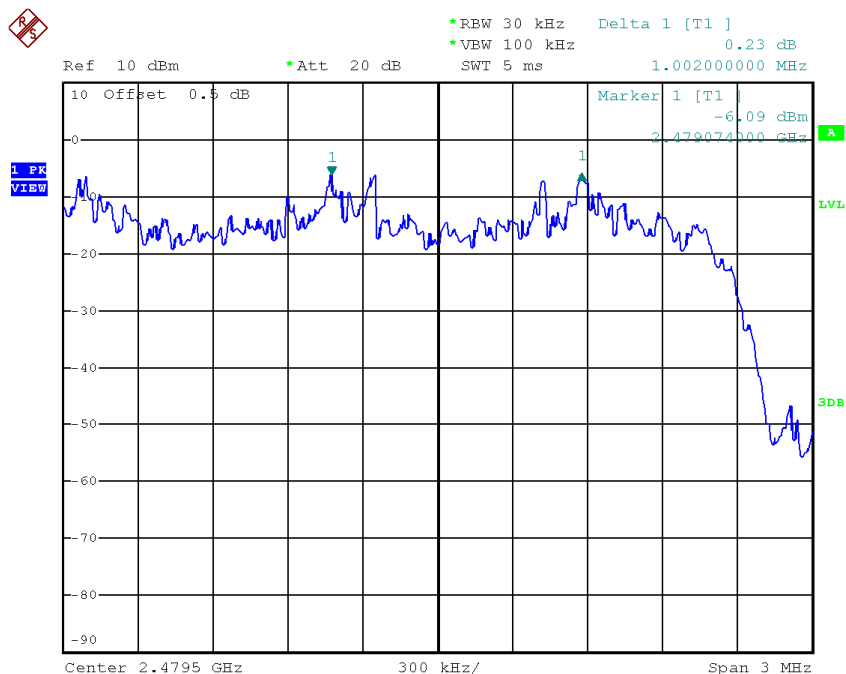
Date: 14.SEP.2015 14:25:56

### CH39



Date: 14.SEP.2015 14:27:05

### CH78

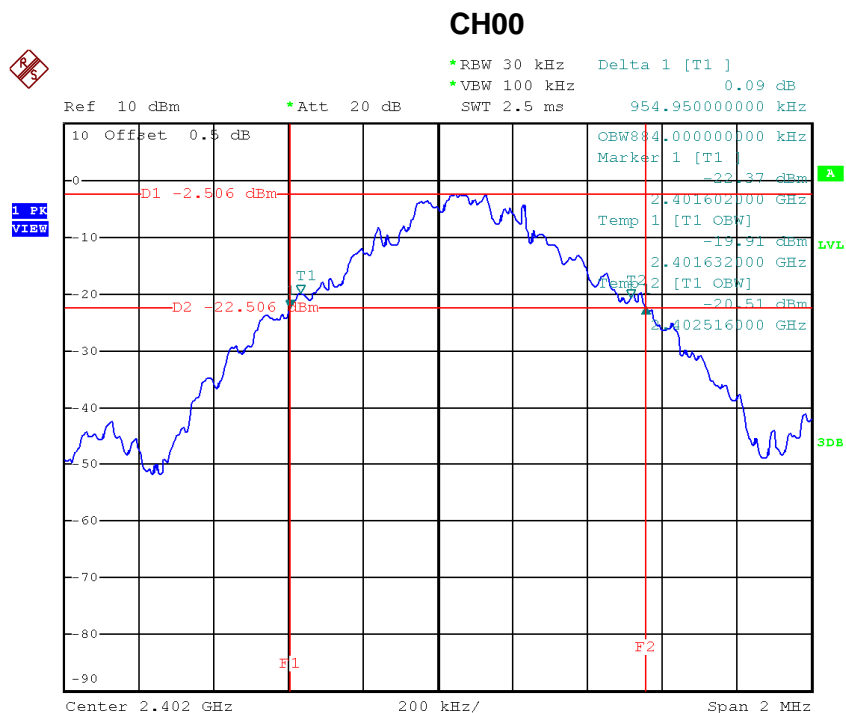


Date: 14.SEP.2015 14:28:09

## **ATTACHMENT H - BANDWIDTH**

Test Mode :	TX Mode _1Mbps
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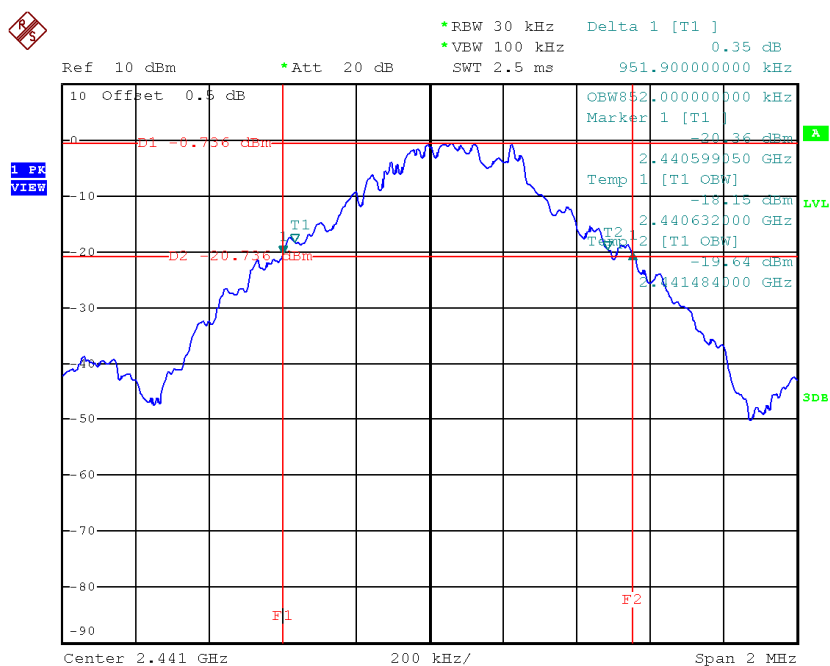
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.955	0.884	Complies
2441	0.952	0.852	Complies
2480	0.952	0.868	Complies



Date: 14.SEP.2015 10:25:41

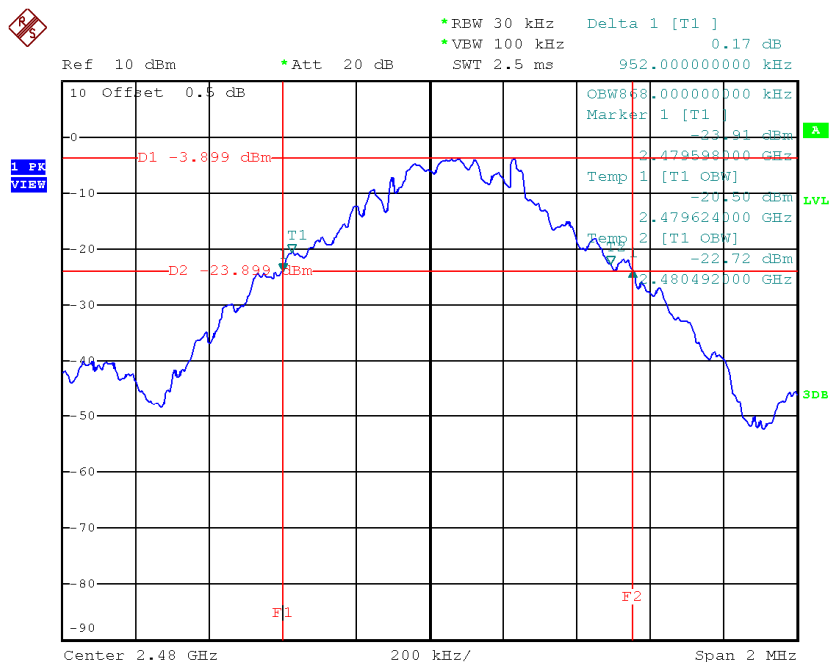


## CH39



Date: 14.SEP.2015 11:23:48

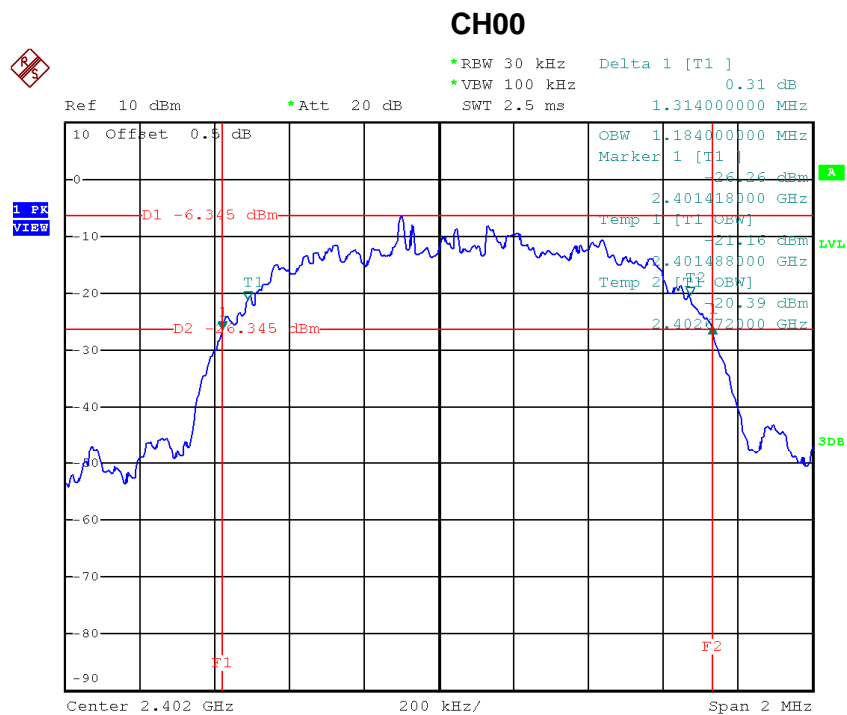
## CH78



Date: 14.SEP.2015 11:27:31

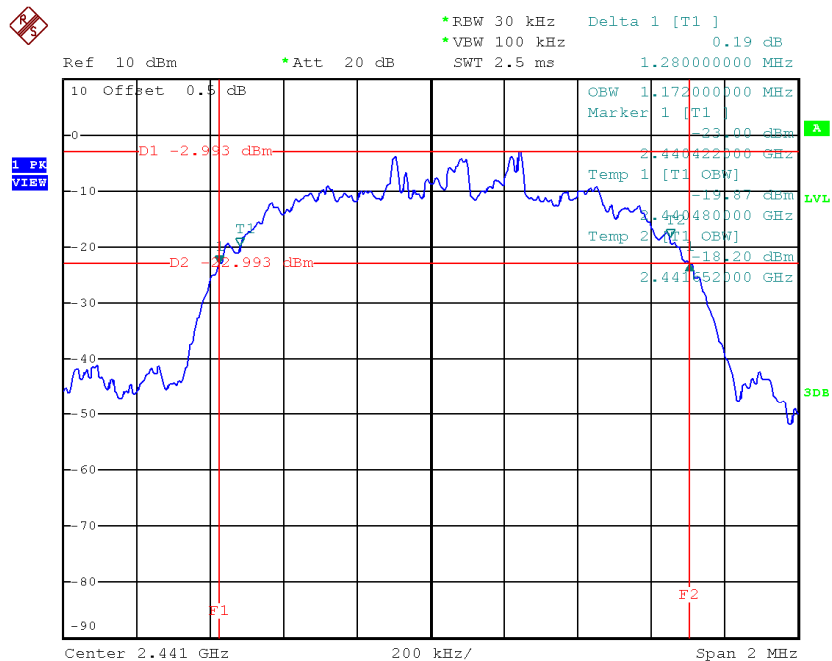
Test Mode :	TX Mode _3Mbps
-------------	----------------

Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.314	1.184	Complies
2441	1.280	1.172	Complies
2480	1.283	1.184	Complies



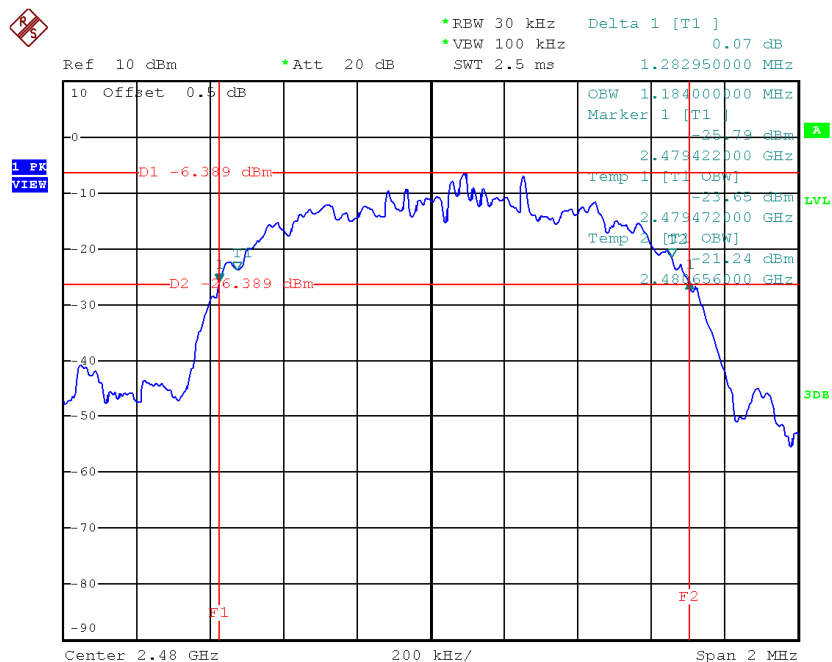
Date: 14.SEP.2015 14:19:29

### CH39



Date: 14.SEP.2015 14:20:56

### CH78

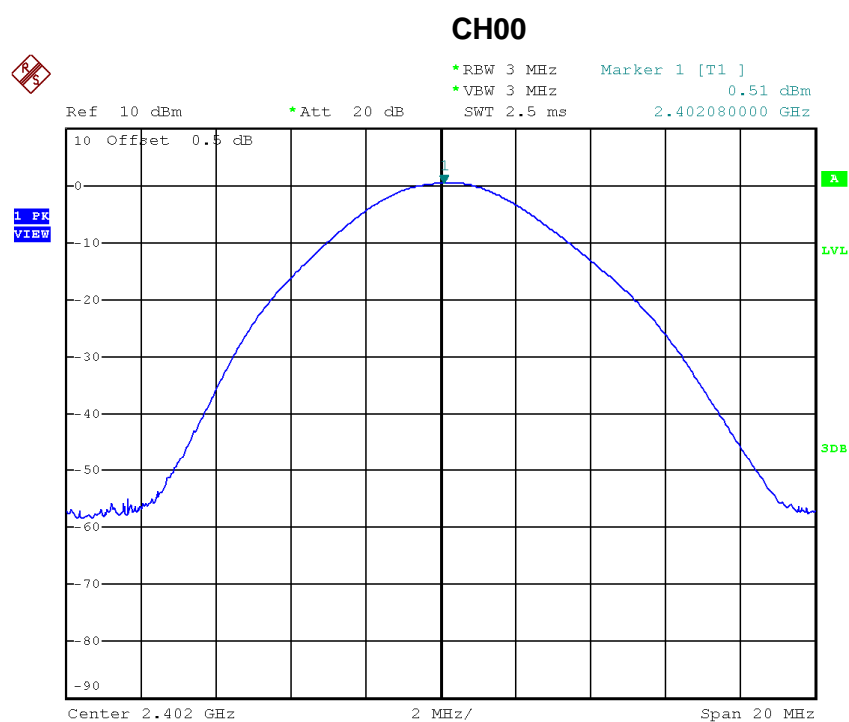


Date: 14.SEP.2015 14:22:41

## **ATTACHMENT I - PEAK OUTPUT POWER**

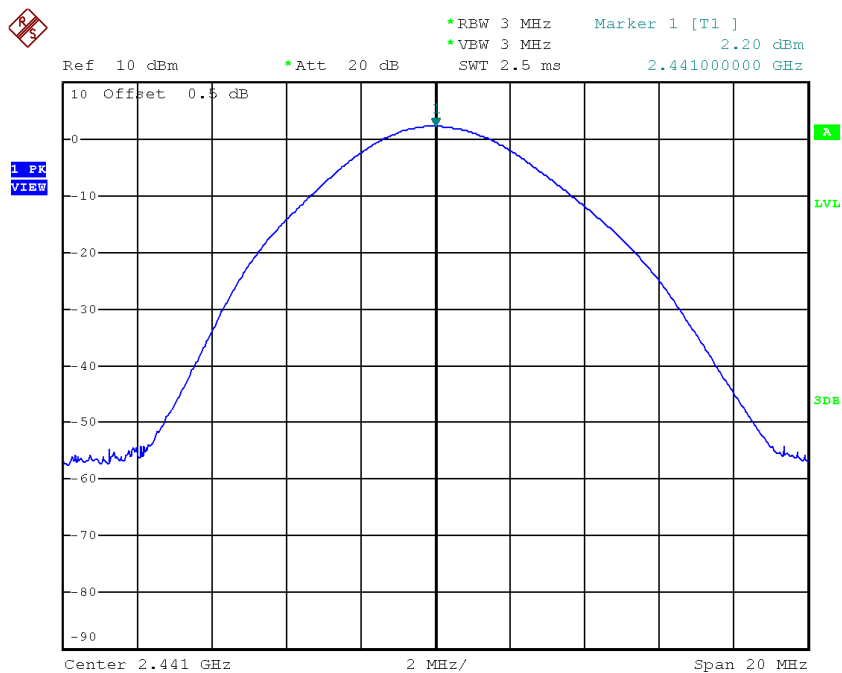
Test Mode :	TX Mode _1Mbps
-------------	----------------

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	0.51	0.0011	30.00	1.0000	Complies
2441	2.20	0.0017	30.00	1.0000	Complies
2480	-1.01	0.0008	30.00	1.0000	Complies



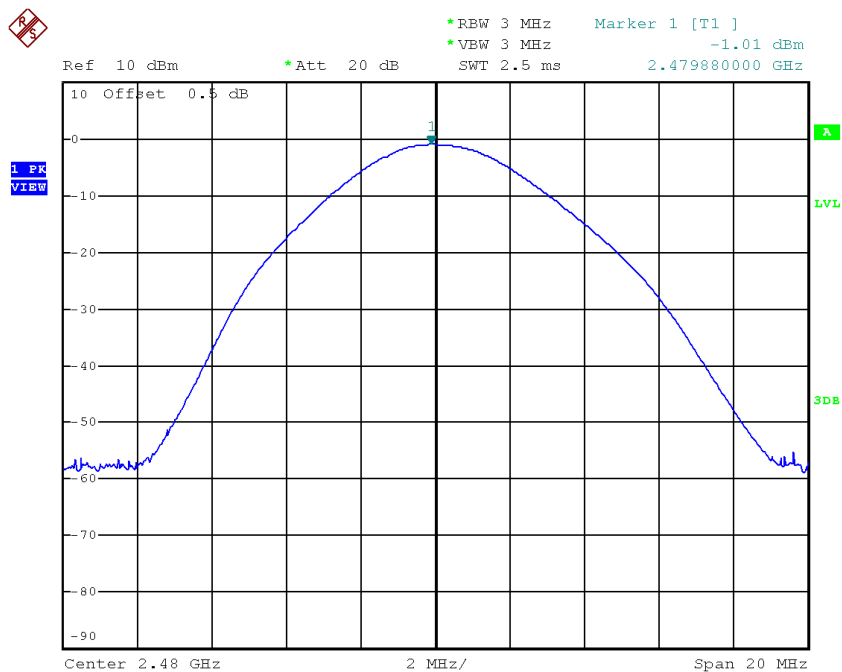
Date: 14.SEP.2015 11:21:17

# CH39



Date: 14.SEP.2015 11:23:53

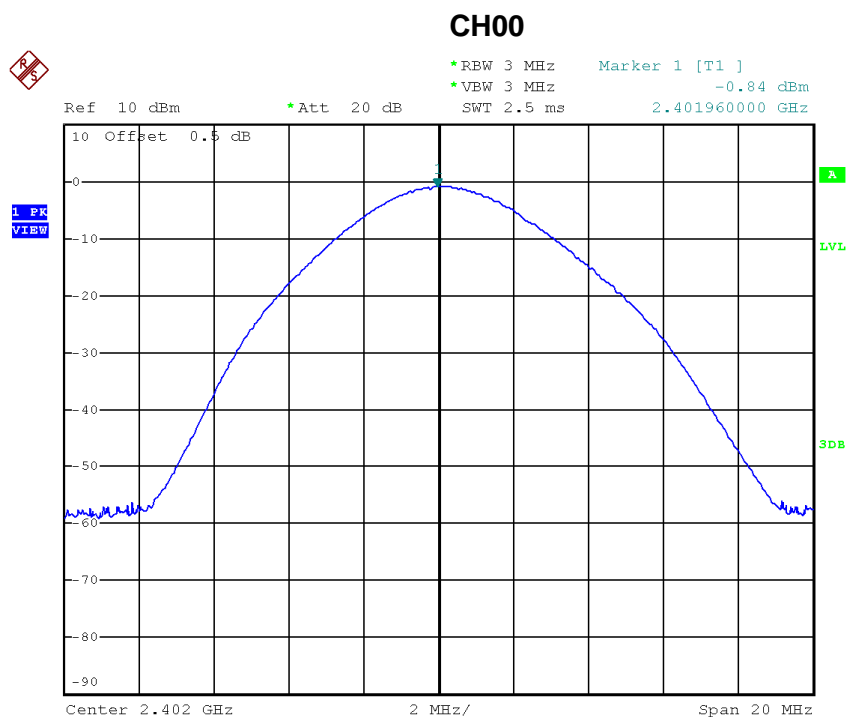
# CH78



Date: 14.SEP.2015 11:27:50

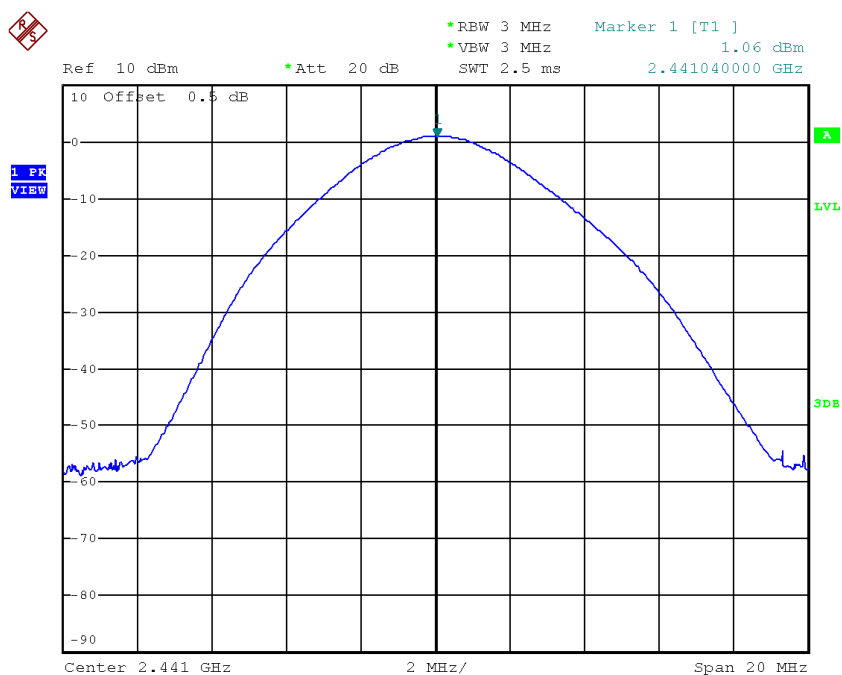
Test Mode : TX Mode \_3Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	-0.84	0.0008	30.00	1.0000	Complies
2441	1.06	0.0013	30.00	1.0000	Complies
2480	-1.61	0.0007	30.00	1.0000	Complies



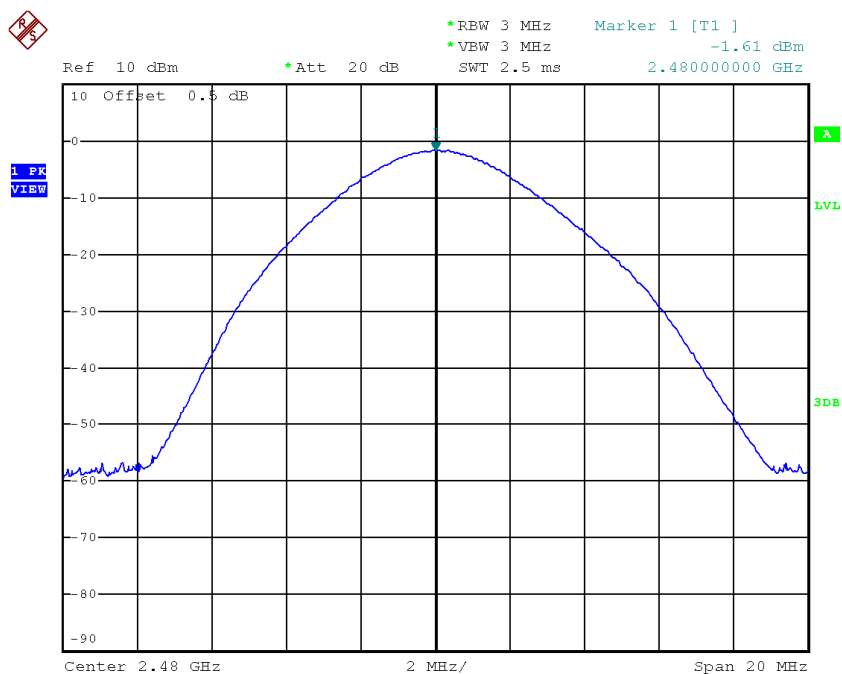
Date: 14.SEP.2015 14:19:48

### CH39



Date: 14.SEP.2015 14:21:03

### CH78

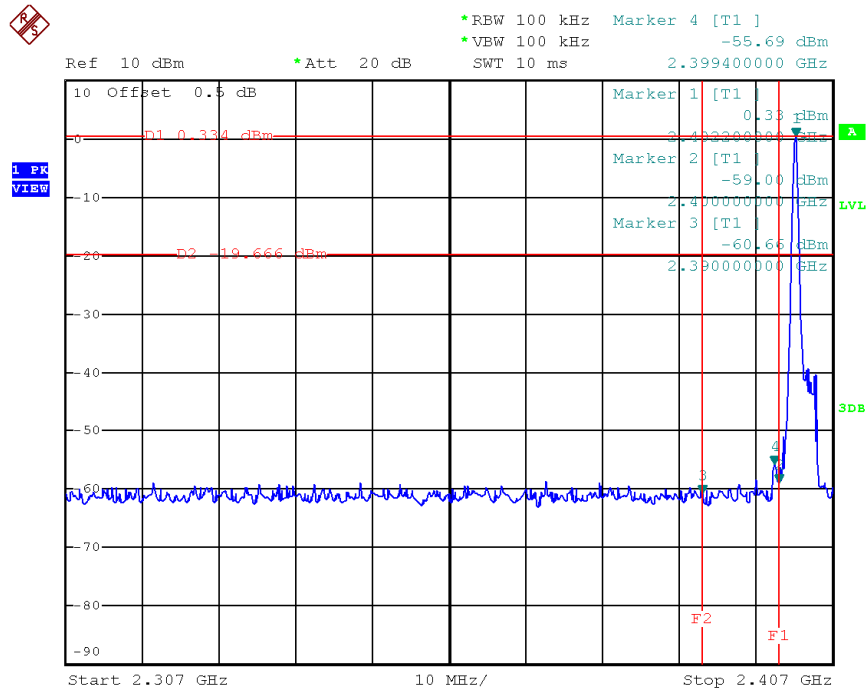


Date: 14.SEP.2015 14:23:04



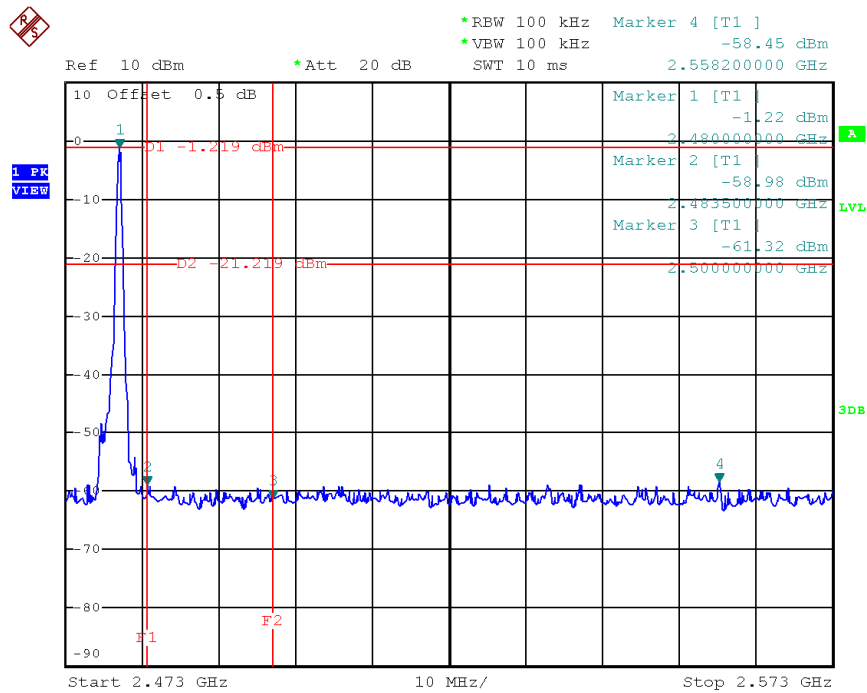
## **ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION**

### CH00 (Lower)\_1Mbps



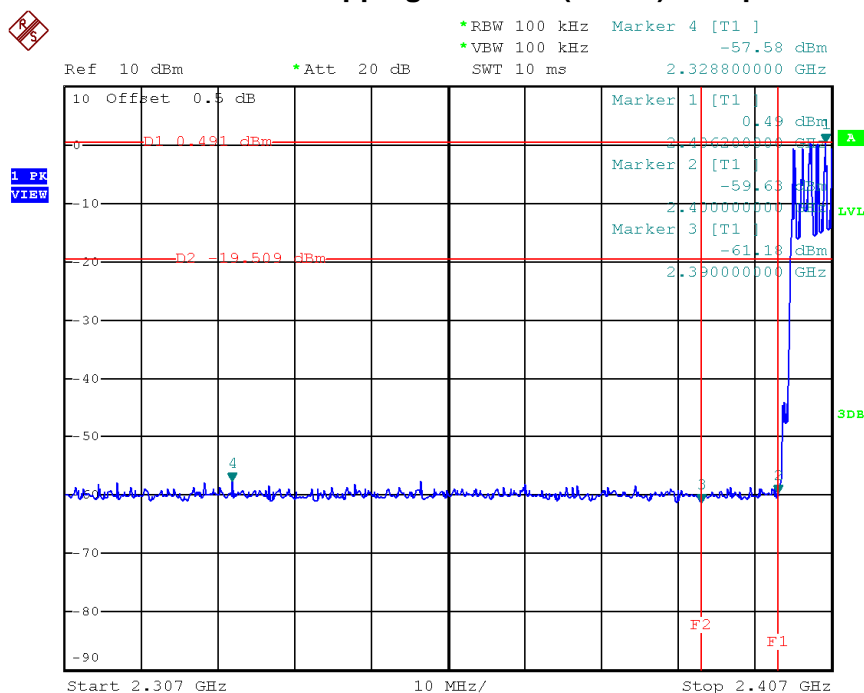
Date: 14.SEP.2015 10:25:41

### CH78 (Upper)\_1Mbps



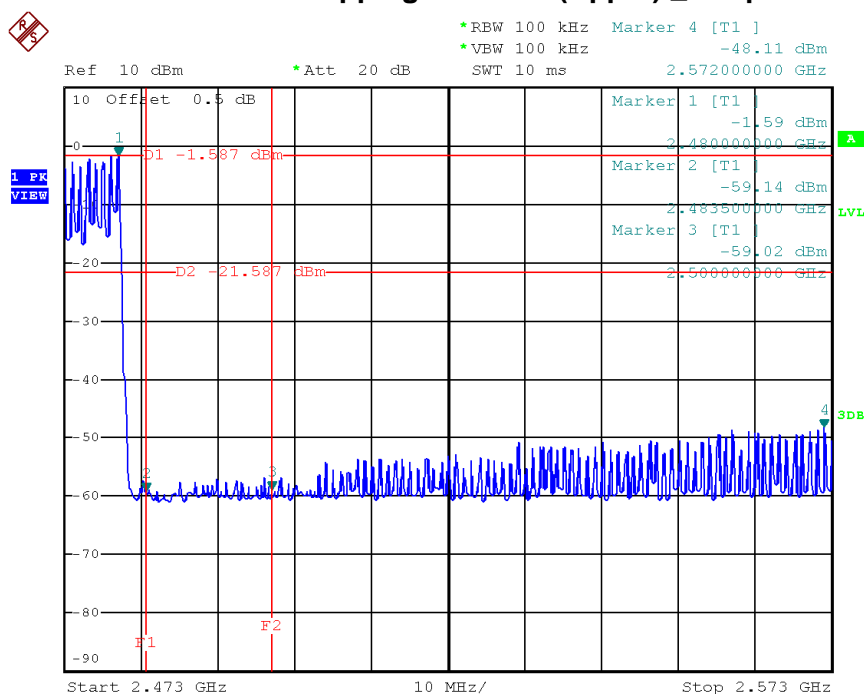
Date: 14.SEP.2015 11:26:53

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



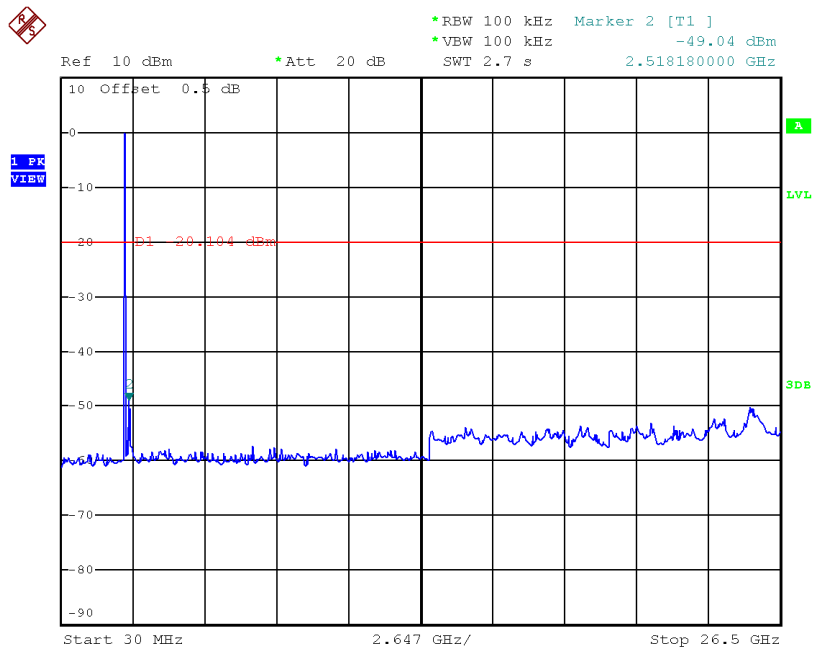
Date: 14.SEP.2015 11:50:16

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



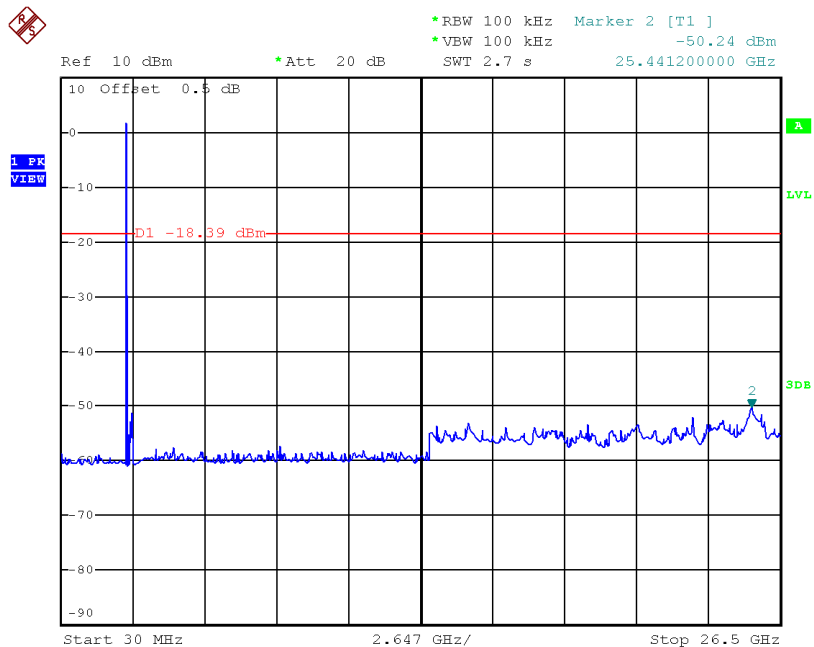
Date: 14.SEP.2015 11:50:52

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



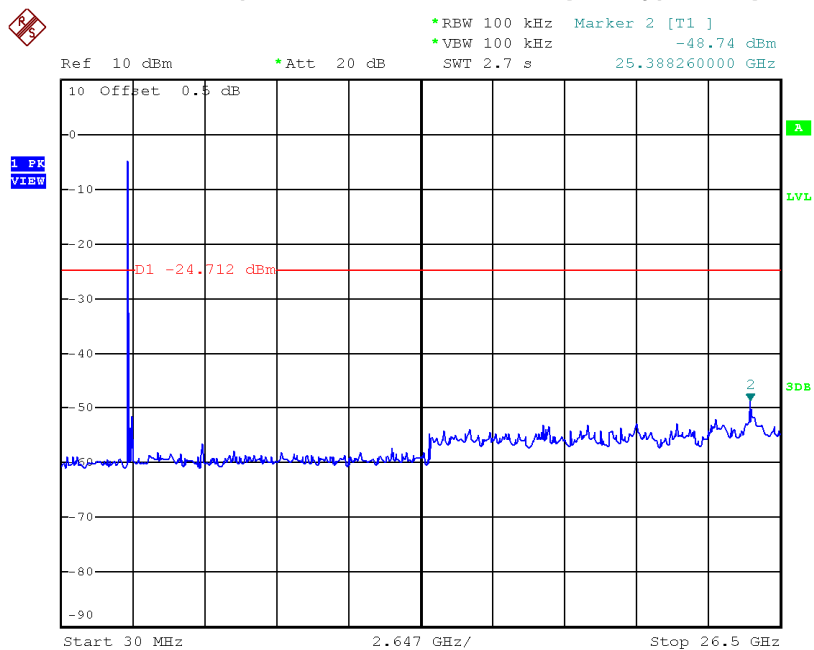
Date: 14.SEP.2015 10:25:41

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



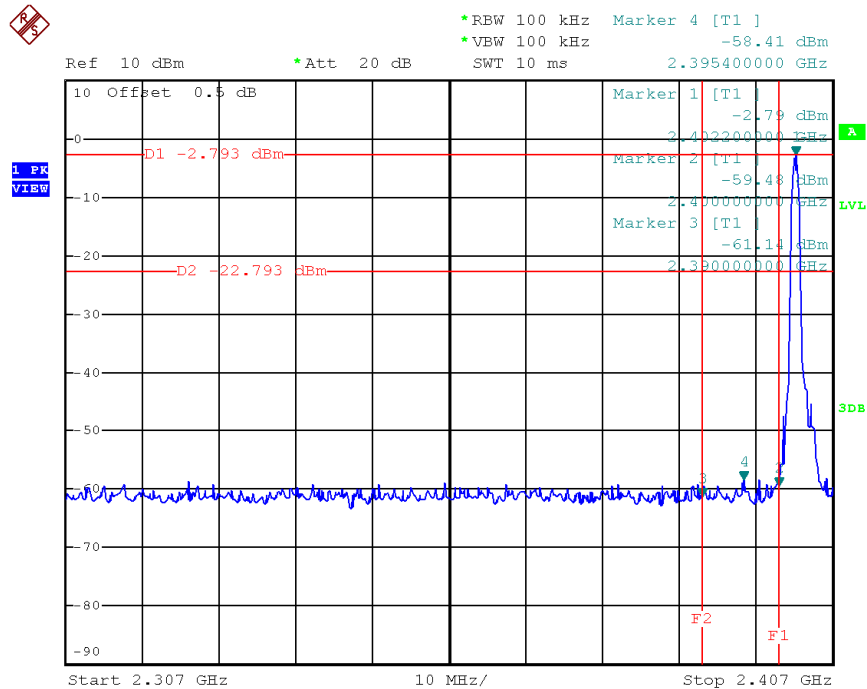
Date: 14.SEP.2015 11:23:17

# CH78 (10 Harmonic of the frequency) \_1Mbps



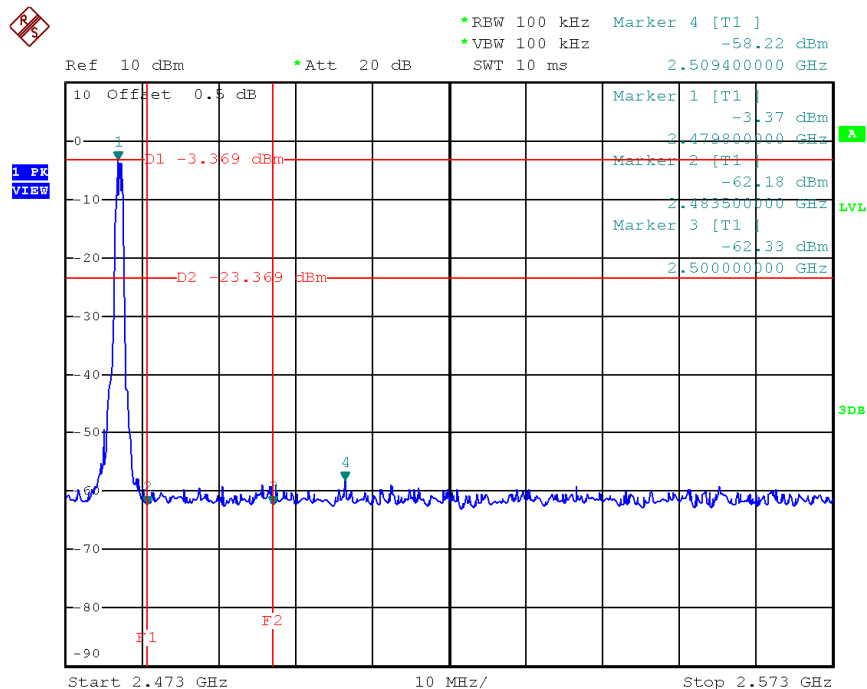
Date: 14.SEP.2015 11:27:45

### CH00 (Lower) \_3Mbps



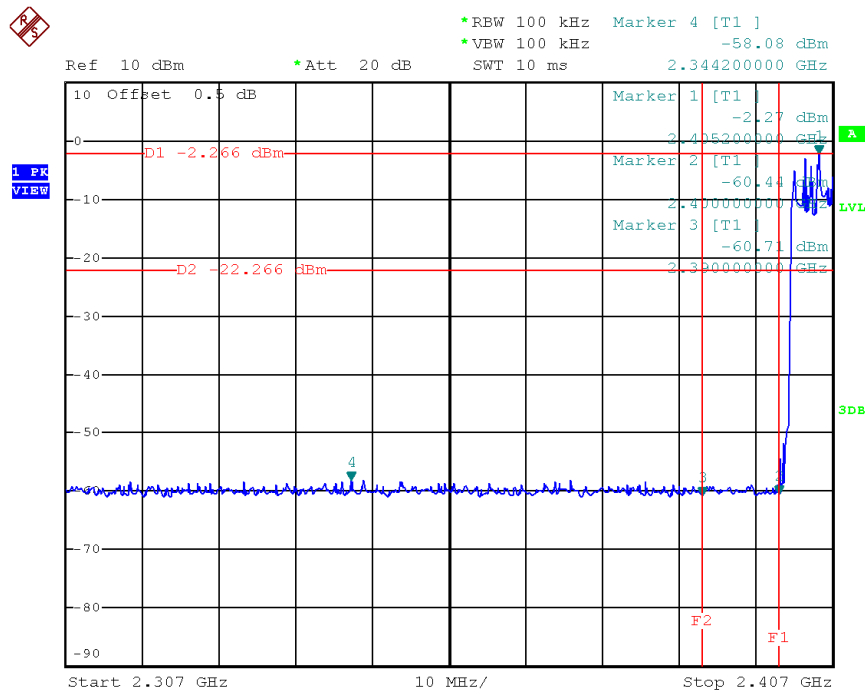
Date: 14.SEP.2015 14:19:06

### CH78 (Upper) \_3Mbps



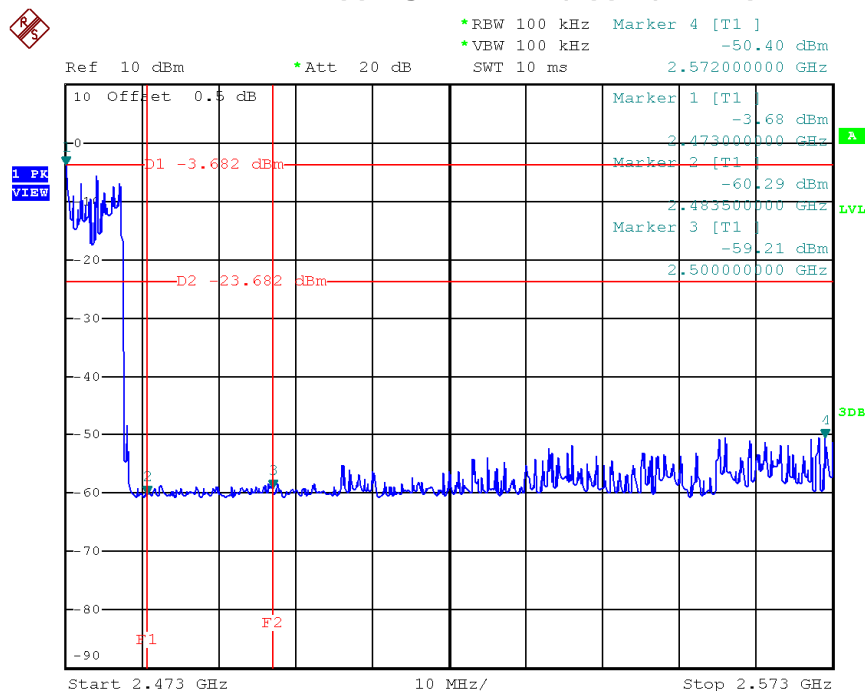
Date: 14.SEP.2015 14:22:12

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



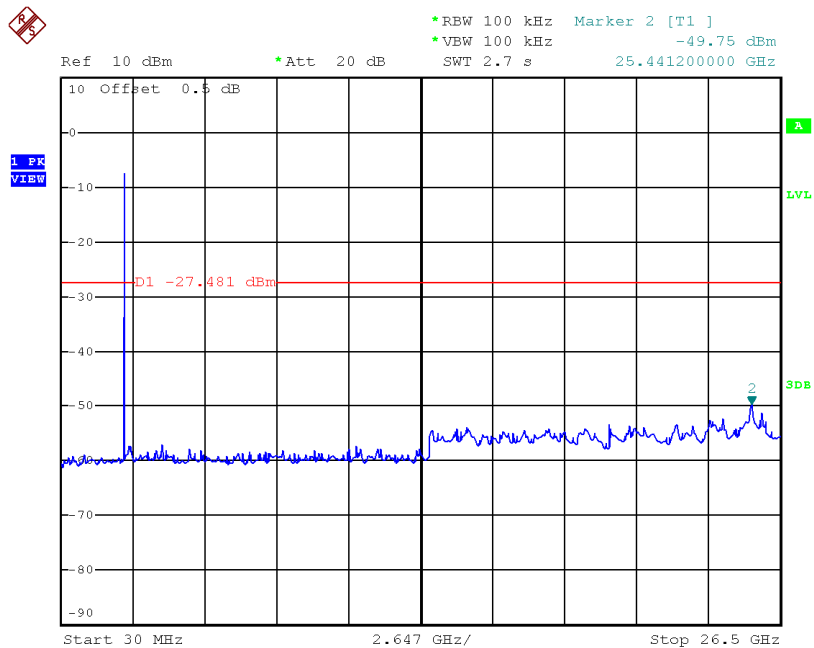
Date: 14.SEP.2015 14:30:33

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



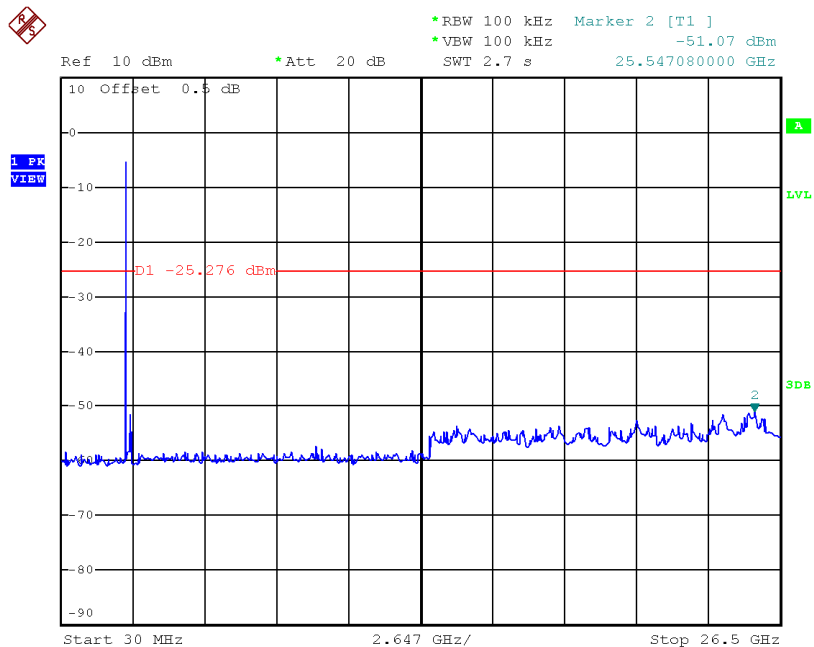
Date: 14.SEP.2015 14:31:08

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



Date: 14.SEP.2015 14:19:42

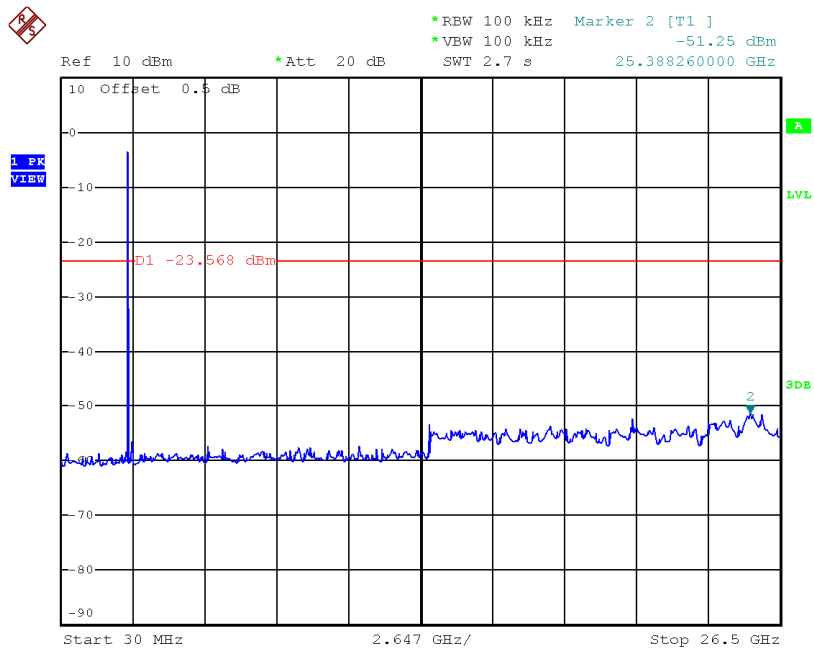
### CH39 (10 Harmonic of the frequency) \_3Mbps



Date: 14.SEP.2015 14:20:33



# CH78 (10 Harmonic of the frequency) \_3Mbps



Date: 14.SEP.2015 14:22:58