FCC&IC Radio Test Report

FCC ID: EMOIBT55N

IC: 986B-IBT55N

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

Project No.	**:**	1503C102
Equipment	**:**	Bluetooth Rechargeable Micro Speaker
Model Name For FCC	:	iBT55; iBT55X; iBT55XC ("X"= a to Z; denote as color of cabinet)
Model Name For IC	**:**	iBT55N
Applicant	**:**	SDI TECHNOLOGIES INC.
Address	**:**	1299 Main Street, Rahway, NJ 07065, U.S.A

Date of Receipt	**:**	Mar. 12, 2015
Date of Test	**:**	Mar. 12, 2015 ~Mar. 24, 2015
Issued Date	**:**	Mar. 25, 2015
Tested by	**:**	BTL Inc.

Testing Engineer : David Mao
(David Mao)

Technical Manager : Leo Hung
(Leo Hung)

Authorized Signatory : Steven Lu
(Steven Lu)

BTL INC.

No.3, Jinshagang 1st Road, Shixia, Dalang Town, Dongguan, Guangdong, China.

TEL: +86-769-8318-3000 FAX: +86-769-8319-6000

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.**

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

BTL's reports must not be used by the client to claim product endorsement by the authorities or any agency of the Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and **BTL-self**, extracts from the test report shall not be reproduced except in full with **BTL**'s authorized written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO Guide 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

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.

Table of Contents Page

1 . CERTIFICATION 7

2 . SUMMARY OF TEST RESULTS 8

2.1 TEST FACILITY 9

2.2 MEASUREMENT UNCERTAINTY 9

3 . GENERAL INFORMATION 10

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 THE CONFIGURATION OF SYSTEM TESTED 13

3.5 DESCRIPTION OF SUPPORT UNITS 13

4 . EMC EMISSION TEST 14

4.1 CONDUCTED EMISSION MEASUREMENT 14

4.1.1 POWER LINE CONDUCTED EMISSION LIMITS 14

4.1.2 TEST PROCEDURE 14

4.1.3 DEVIATION FROM TEST STANDARD 14

4.1.4 TEST SETUP 15

4.1.5 EUT OPERATING CONDITIONS 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 DEVIATION FROM TEST STANDARD 17

4.2.4 TEST SETUP 18

4.2.5 EUT OPERATING CONDITIONS 19

4.2.6 EUT TEST CONDITIONS 19

4.2.7 TEST RESULTS (9KHZ TO 30MHZ) 19

4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ) 20

4.2.9 TEST RESULTS (ABOVE 1000 MHZ) 20

5 . NUMBER OF HOPPING CHANNEL 21

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

6 . AVERAGE TIME OF OCCUPANCY 22
6.1 APPLIED PROCEDURES / LIMIT 22
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
7 . HOPPING CHANNEL SEPARATION MEASUREMENT 24
7.1 APPLIED PROCEDURES / LIMIT 24
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
8 . BANDWIDTH TEST 25
8.1 APPLIED PROCEDURES 25
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
9 . PEAK OUTPUT POWER TEST 26
9.1 APPLIED PROCEDURES / LIMIT 26
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
10 . ANTENNA CONDUCTED SPURIOUS EMISSION 27
10.1 APPLIED PROCEDURES / LIMIT 27
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
11 . MEASUREMENT INSTRUMENTS LIST 28

Table of Contents Page

12 . EUT TEST PHOTO 30

ATTACHMENT A - CONDUCTED EMISSION 34

ATTACHMENT B - RADIATED EMISSION (9KHZ-30MHZ) 37

ATTACHMENT C - RADIATED EMISSION (30MHZ TO 1000MHZ) 39

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ) 46

ATTACHMENT E - NUMBER OF HOPPING CHANNEL 71

ATTACHMENT F - AVERAGE TIME OF OCCUPANCY 73

ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT 86

ATTACHMENT H - BANDWIDTH 91

ATTACHMENT I - PEAK OUTPUT POWER 96

ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION 101

REPORT ISSUED HISTORY

Issued No.	Description	Issued Date
BTL-FICP-1-1503C102	Original Issue.	Mar. 25, 2015

1. CERTIFICATION

Equipment	:	Bluetooth Rechargeable Micro Speaker
Brand Name	:	iHome
Model Name	:	iBT55; iBT55X; iBT55XC (“X”= a to Z; denote as color of cabinet)
For FCC		
Model Name	:	iBT55N
For IC		
Applicant		SDI TECHNOLOGIES INC.
Manufacturer	:	SDI TECHNOLOGIES INC.
Address	:	1299 Main Street, Rahway, NJ 07065, U.S.A
Factory	:	Add-On Technology Co., Ltd.
Address	:	Seven Star Shopping Mall (Crossing of Meron Road and Man Wong Road), Bao An District, ShenZhen, China
Date of Test	:	Mar. 12, 2015 ~Mar. 24, 2015
Test Sample	:	ENGINEERING SAMPLE
Standard(s)	:	FCC Part15, Subpart C : 2014 (15.247) / ANSI C63.4 : 2009 / FCC Public Notice DA 00-705, March 30, 2000. Canada RSS-210: 2010 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- 1503C102) 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; Canada RSS-210:2010; RSS-GEN Issue 4, Nov 2014				
Standard(s) Section		Test Item	Judgment	Remark
FCC	**IC**			
15.207	RSS-GEN 8.8	Conducted Emission	PASS	
15.247(d)	RSS-210, Issue 8, Annex 8, A8.5	Antenna conducted Spurious Emission	PASS	
15.247 (a)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Hopping Channel Separation	PASS	
15.247 (b)(1)	RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	PASS	
15.247(d) 15.209	RSS-210, Issue 8, Annex 8, Section 8.5	Radiated Spurious Emission	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	Number of Hopping Frequency	PASS	
15.247 (a)(1)(iii)	RSS-210, Issue 8, Annex 8, A8.1(d)	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) According to FCC Public Notice DA 00-705, March 30, 2000.

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is **DG-C02/DG-CB03** 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 reported uncertainty of measurement **y ± U**, where expended 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. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	Note
DG-C02	CISPR	150 KHz ~ 30MHz	1.94	

B. 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	3.60	
		200MHz ~ 1,000MHz	V	3.86	
		200MHz ~ 1,000MHz	H	3.94	
		1GHz~18GHz	V	3.12	
		1GHz~18GHz	H	3.68	
		18GHz~40GHz	V	4.15	
		18GHz~40GHz	H	4.14	

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

Equipment	Bluetooth Rechargeable Micro Speaker	
Brand Name	iHome	
Model Name For FCC	iBT55; iBT55X; iBT55XC	
Model Name For IC	iBT55N	
Model Difference For FCC	“X”= a to Z; denote as color of cabinet	
Output Power (Max.)	Operation Frequency	2402~2480 MHz
	Modulation Technology	GFSK(1Mbps) π/4-DQPSK(2Mbps) 8-DPSK(3Mbps)
	Bit Rate of Transmitter	
	Output Power Max.	0.47 dBm(1Mbps) 0.74 dBm(3Mbps)
Power Source	#1 Supplied from USB port #2 Supplied from battery	
Power Rating	#1 DC 5V #2 DC 3.7V 280mAh 1.03Wh	

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	2.30

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 **Note (1)**
Mode 2	Bluetooth

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	Bluetooth

For Radiated Emission	
Final Test Mode	Description
Mode 1	TX Mode **Note (1)**

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

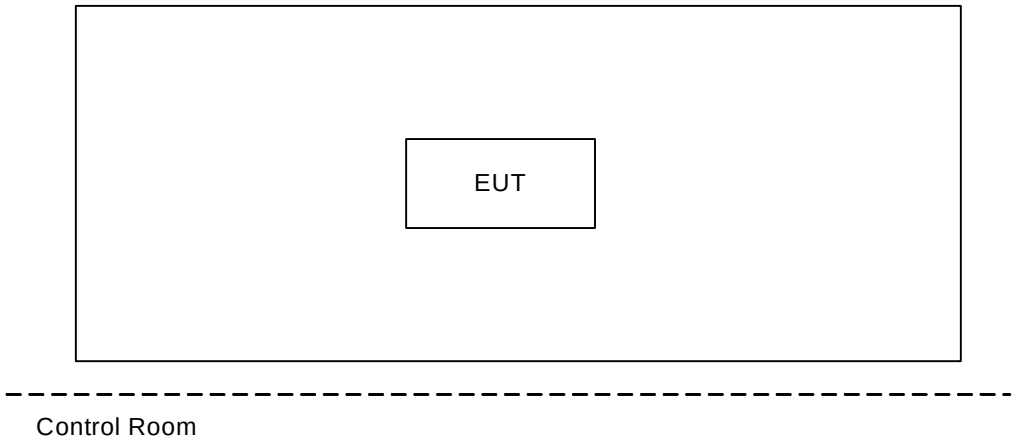
1Mbps

Test Software Version	Airoha AB1500 LAB Test Tool		
Frequency (MHz)	2402	2441	2480
Parameters	63	63	63

3Mbps

Test Software Version	Airoha AB1500 LAB Test Tool		
Frequency (MHz)	2402	2441	2480
Parameters	63	63	63

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/IC	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 = 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

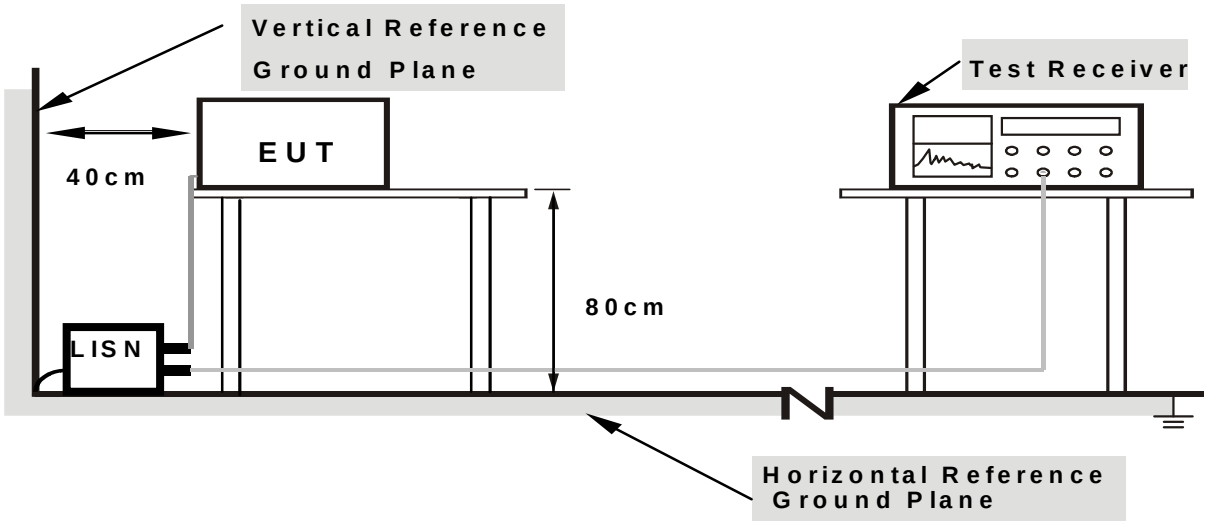
4.1.2 TEST PROCEDURE

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: 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)

20dB in any 100 KHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a) & RSS-210 section 2.2& Annex 8 (A8.5), 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 TEST PROCEDURE

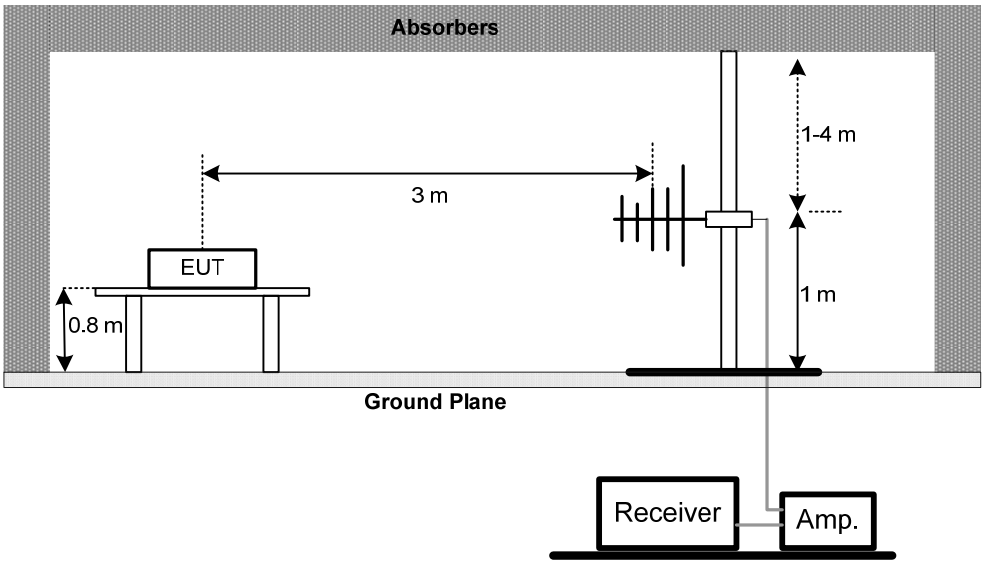
a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.(below 1GHz)
b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 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; 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 spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

4.2.3 DEVIATION FROM TEST STANDARD

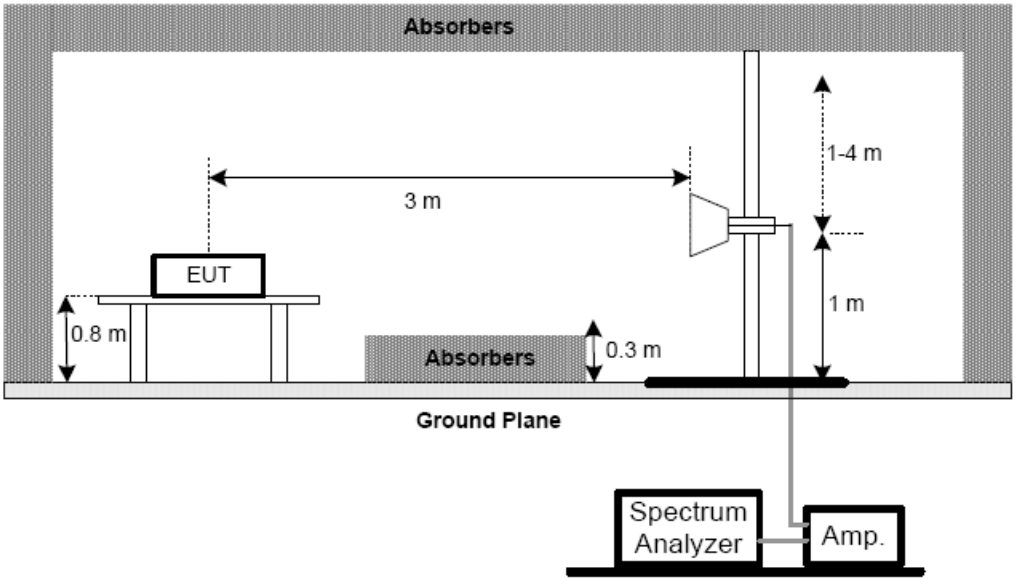
No deviation

4.2.4 TEST SETUP

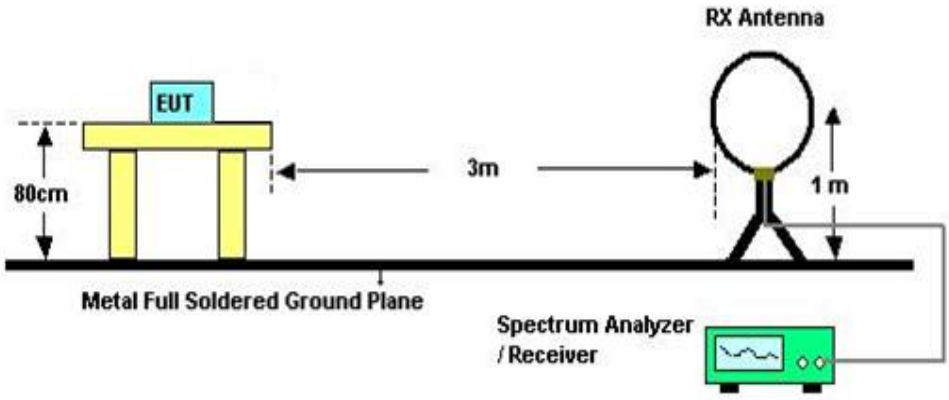
(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(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 3.7V

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 (specific distance / test distance) (dB).
(3) Limit line = specific limits (dBuV) + distance extrapolation factor.

4.2.8 TEST RESULTS (BETWEEN 30MHZ TO 1000 MHZ)

Please refer to the Attachment C.

Remark:

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz; SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz.
(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) 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-210			
Section	Test Item	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-210, Issue 8, Annex 8, A8.1(d)	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

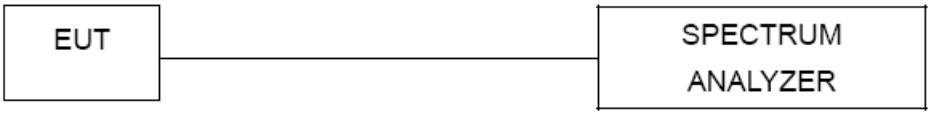
5.1.1 TEST PROCEDURE

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 3.7V

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-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(1)(iii) RSS-210, Issue 8, Annex 8, A8.1(d)	Average Time of Occupancy	0.4sec	2400-2483.5	PASS

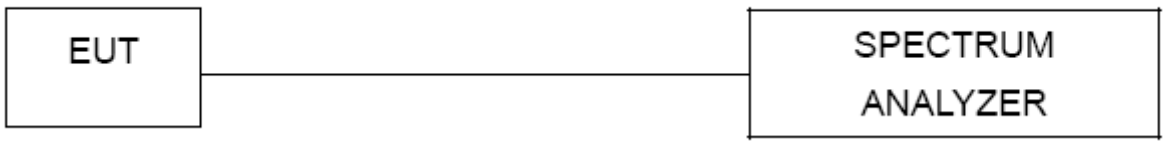
6.1.1 TEST PROCEDURE

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 x 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 x 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 x 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 3.7V

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

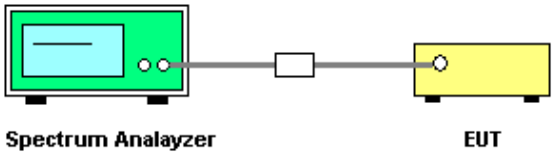
a. The EUT must have its hopping function enabled

b. Span = wide enough to capture the peaks of two adjacent channels
Resolution (or IF) Bandwidth (RBW) ≥ 1% of the span
Video (or Average) Bandwidth (VBW) ≥ 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 3.7V

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-210		
Section	Test Item	Frequency Range (MHz)
15.247(a)(2) RSS-GEN section 6.6 RSS-210, Issue 8, Annex 8, A8.1(b)	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

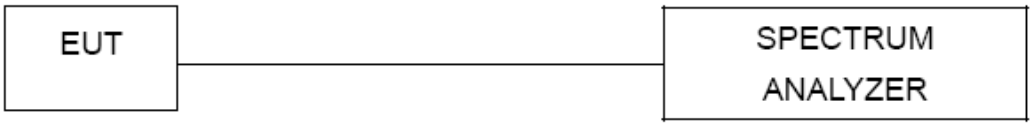
8.1.1 TEST PROCEDURE

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 3.7V

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-GEN and RSS-210				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(1) RSS-GEN section 6.12 RSS-210, Issue 8, Annex 8, A8.1(b)	Peak Output Power	1 Watt or 30dBm	2400-2483.5	PASS

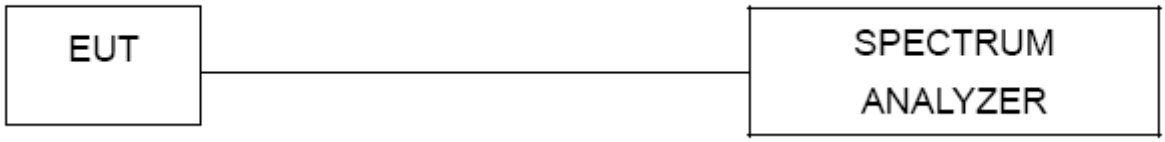
9.1.1 TEST PROCEDURE

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 3.7V

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 intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

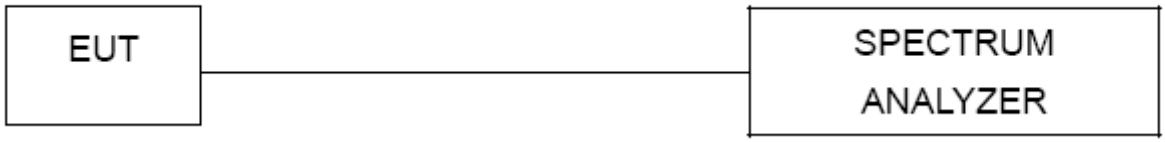
10.1.1 TEST PROCEDURE

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.

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 3.7V

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	LISN	EMCO	3816/2	00052765	Mar. 29, 2015
2	LISN	R&S	ENV216	101447	Mar. 29, 2015
3	Test Cable	N/A	C_17	N/A	Mar.13, 2016
4	EMI TEST RECEIVER	R&S	ESCS30	833364/017	Mar. 29, 2015
5	50Ω Terminator	SHX	TF2-3G-A	08122902	Mar. 29, 2015
6	Measurement Software	Farad	EZ-EMC Ver.NB-03A1-01	N/A	N/A

Radiated Emission Measurement					
Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
1	Antenna	Schwarbeck	VULB9160	9160-3232	Mar. 29, 2015
2	Amplifier	HP	8447D	2944A09673	Mar. 29, 2015
3	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
4	Test Cable	N/A	C-01_CB03	N/A	Jul. 01, 2015
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. 29, 2015
8	Amplifier	Agilent	8449B	3008A02274	Mar. 29, 2015
9	Receiver	AGILENT	N9038A	MY52130039	Sep. 30, 2015
10	Test Cable	HUBER+SUHNER	C-48	N/A	Apr. 30, 2015
11	Controller	CT	SC100	N/A	N/A
12	Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	9170319	Mar. 27, 2015
13	Microwave Preamplifier With Adaptor	EMC INSTRUMENT	EMC2654045	980039 & HA01	Mar. 26, 2015
14	Active Loop Antenna	R&S	HFH2-Z2	830749/020	Mar. 29, 2015

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

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

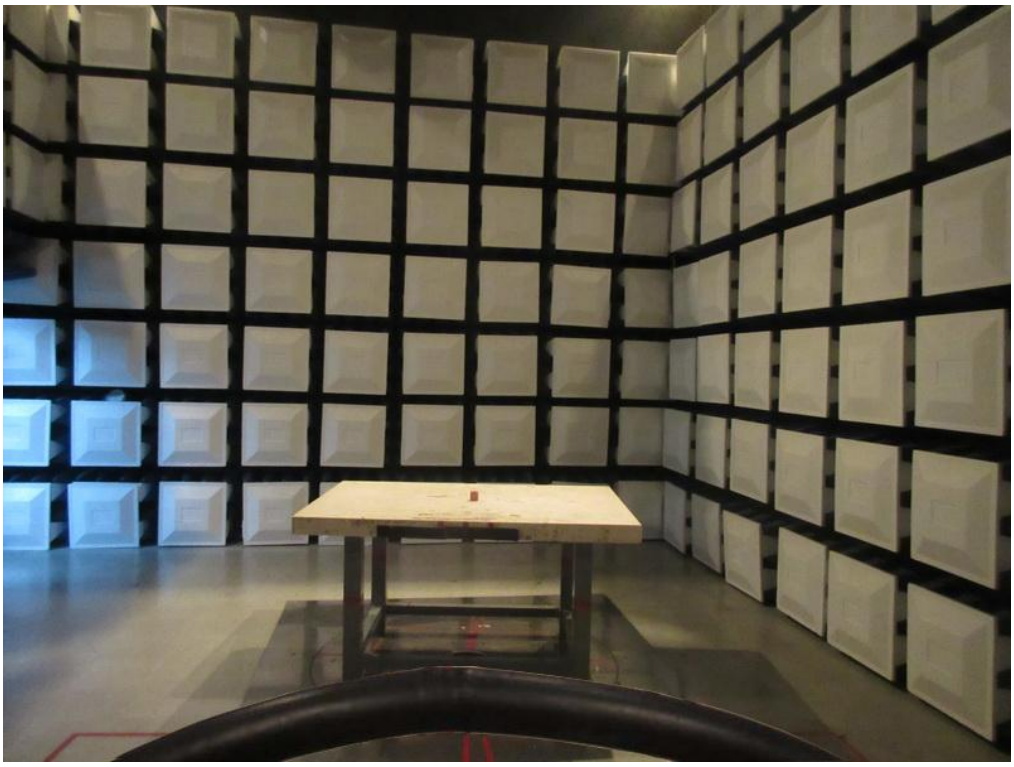
Remark: “N/A” denotes no model name, serial no. or calibration specified.
All calibration period of equipment list is one year.

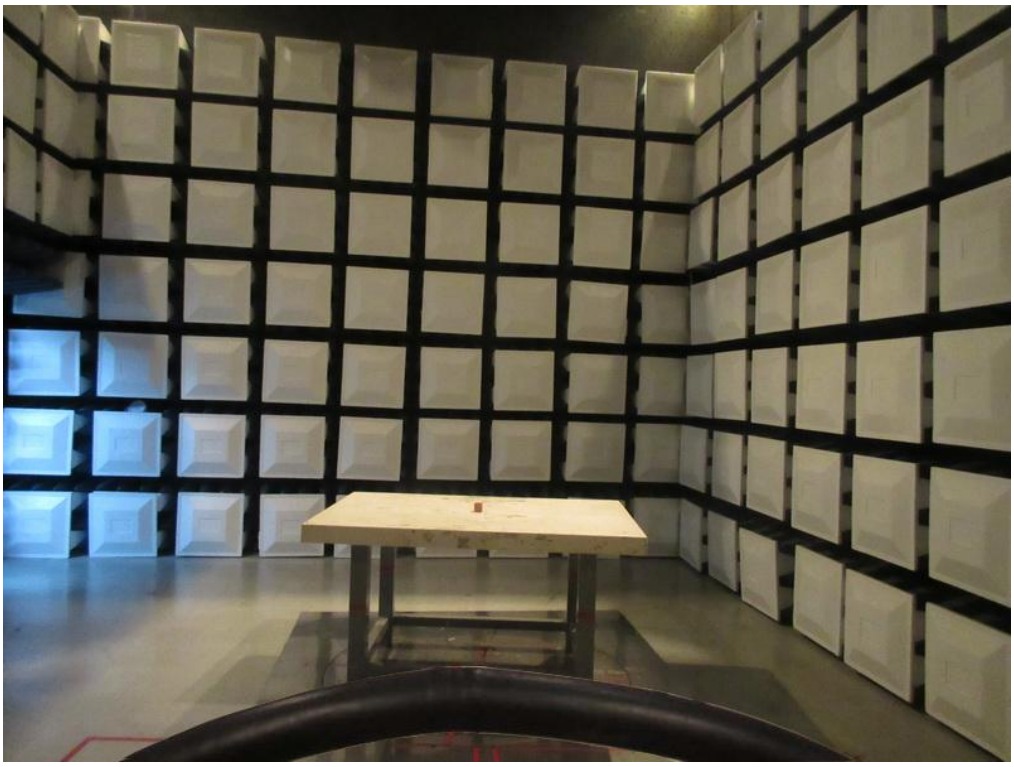
12. EUT TEST PHOTO

Conducted Measurement Photos

Radiated Measurement Photos

9KHz to 30MHz



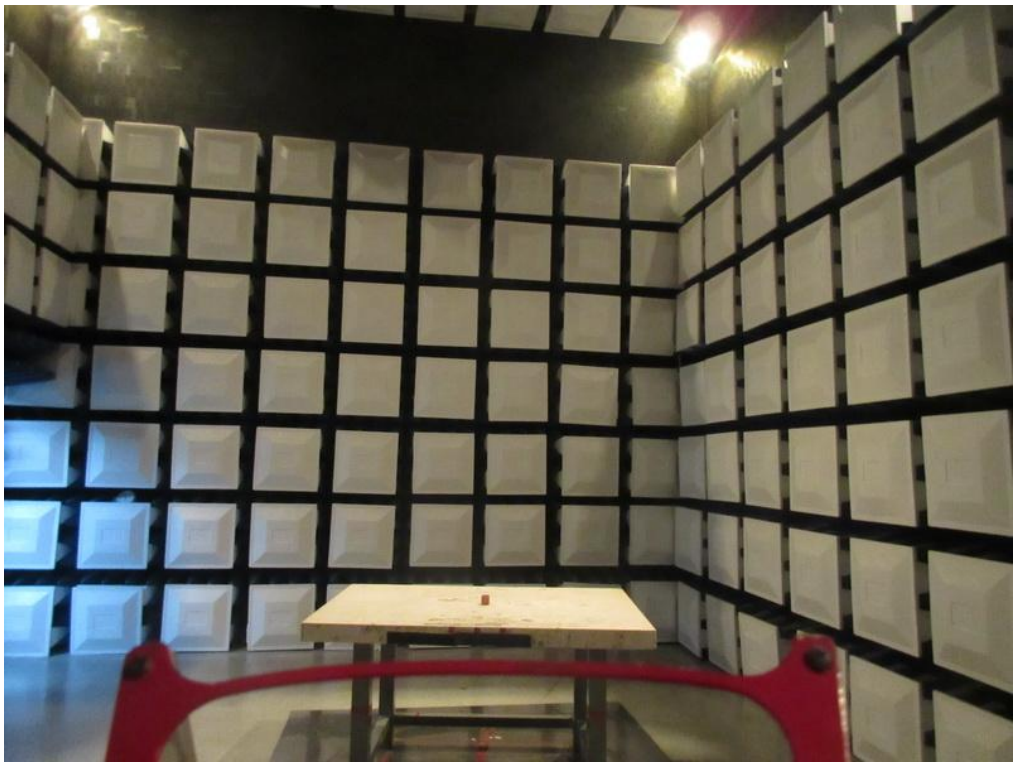


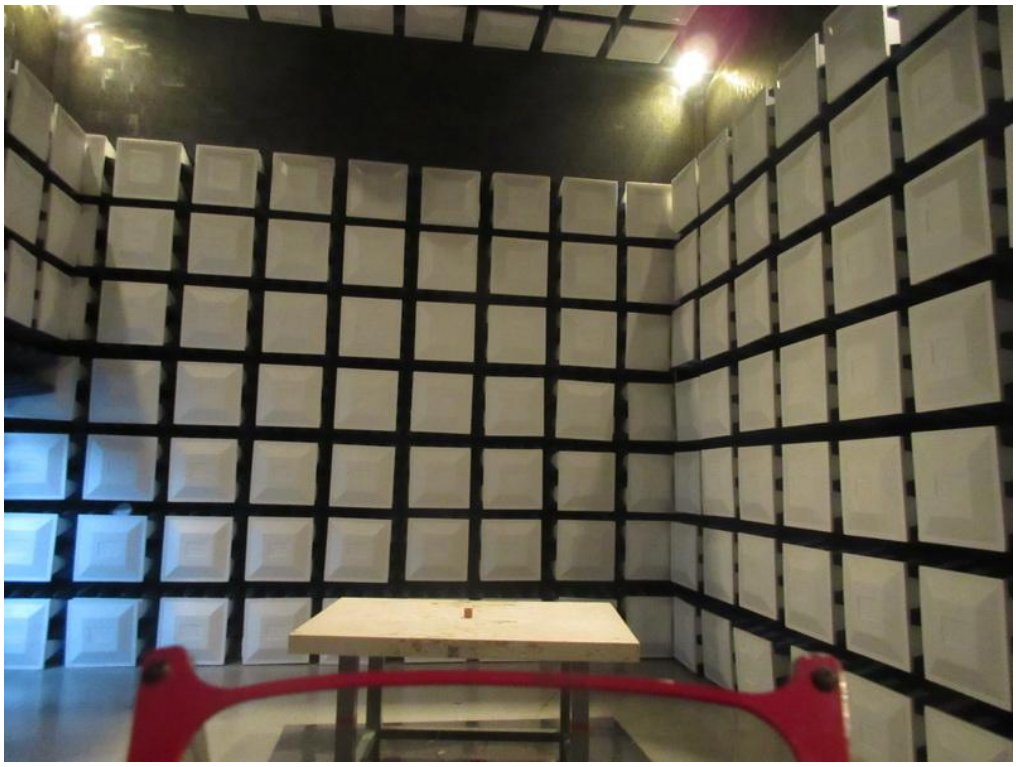
Radiated Measurement Photos

30MHz to 1000MHz

Radiated Measurement Photos

Above 1000MHz

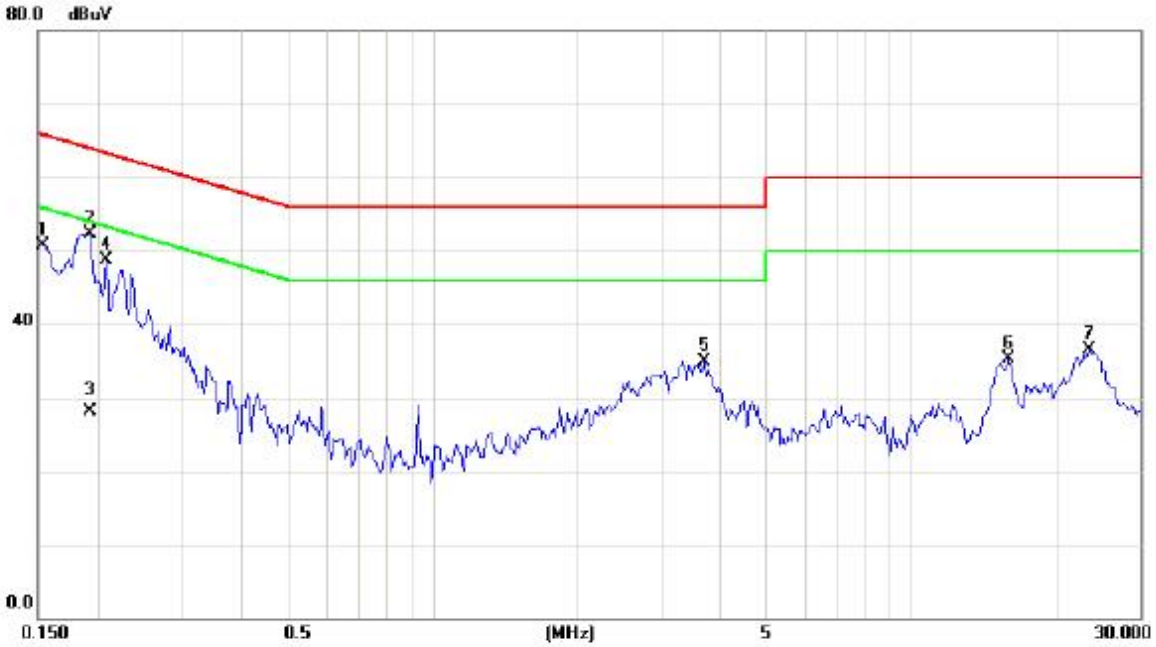




ATTACHMENT A - CONDUCTED EMISSION

Test Mode:	TX Mode

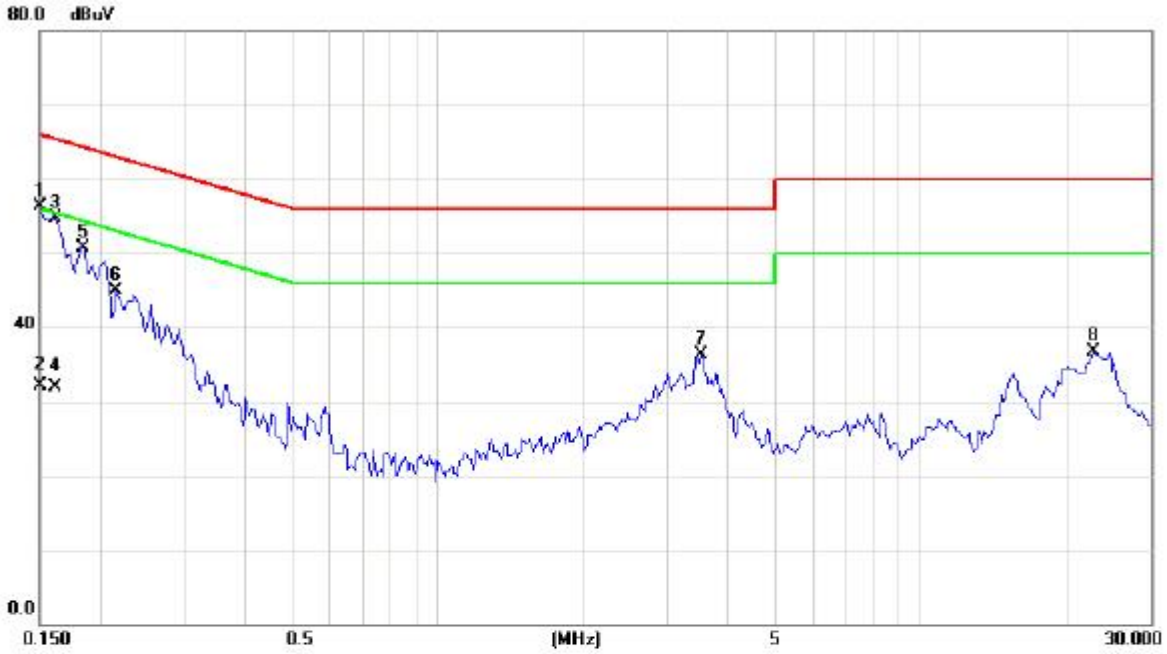
Line



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1		0.1540	41.23	9.48	50.71	65.78	-15.07	peak	
2	*	0.1930	42.85	9.50	52.35	63.91	-11.56	peak	
3		0.1930	18.60	9.50	28.10	53.91	-25.81	AVG	
4		0.2086	39.20	9.50	48.70	63.26	-14.56	peak	
5		3.6992	25.32	9.64	34.96	56.00	-21.04	peak	
6		15.9375	25.34	9.91	35.25	60.00	-24.75	peak	
7		23.6250	26.43	10.09	36.52	60.00	-23.48	peak	

Test Mode:	TX Mode

Neutral



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1500	46.62	9.59	56.21	66.00	-9.79	peak	
2		0.1500	22.60	9.59	32.19	56.00	-23.81	AVG	
3		0.1617	45.11	9.59	54.70	65.38	-10.68	peak	
4		0.1617	22.40	9.59	31.99	55.38	-23.39	AVG	
5		0.1852	41.10	9.58	50.68	64.25	-13.57	peak	
6		0.2164	35.28	9.57	44.85	62.96	-18.11	peak	
7		3.5195	26.55	9.66	36.21	56.00	-19.79	peak	
8		22.8965	26.39	10.23	36.62	60.00	-23.38	peak	

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

Test Mode:	TX Mode

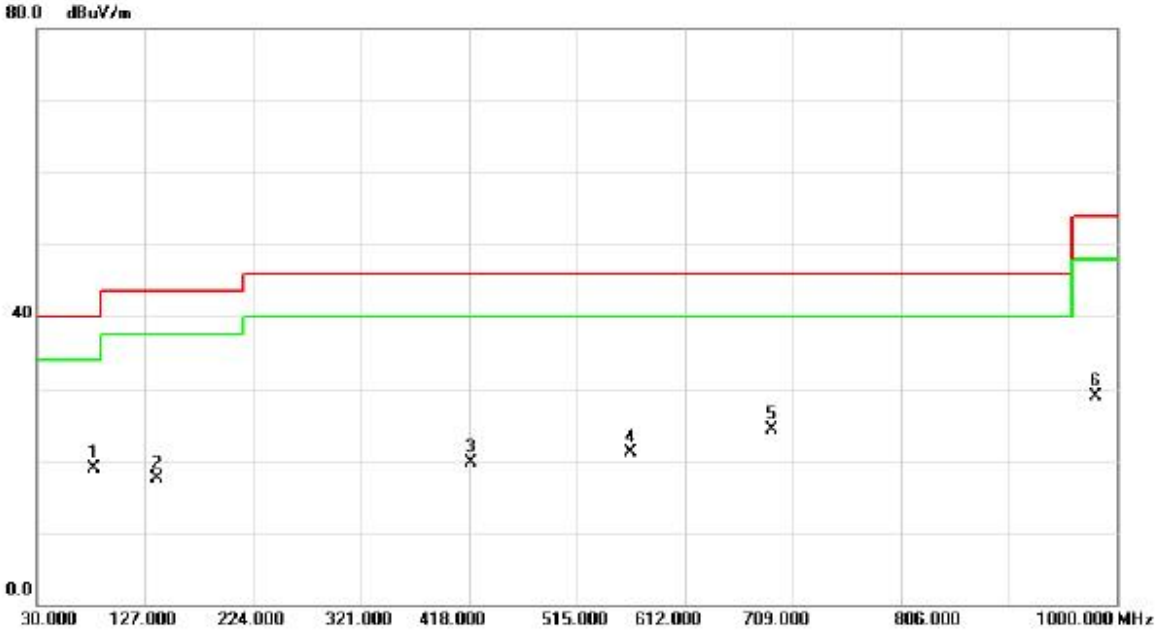
Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0193	0°	2.28	24.34	26.62	121.89	-95.27	AVG
0.0193	0°	4.87	24.34	29.21	141.89	-112.68	PK
0.0275	0°	3.15	23.83	26.98	118.82	-91.84	AVG
0.0275	0°	6.91	23.83	30.74	138.82	-108.08	PK
0.0687	0°	5.72	22.03	27.75	110.87	-83.12	AVG
0.0687	0°	8.11	22.03	30.14	130.87	-100.73	PK
0.0941	0°	4.59	21.52	26.11	108.13	-82.02	AVG
0.0941	0°	7.35	21.52	28.87	128.13	-99.26	PK
1.2158	0°	13.81	19.58	33.39	65.91	-32.52	QP
2.4275	0°	19.62	19.24	38.86	69.54	-30.68	QP

Frequency (MHz)	Ant 0°/90°	Read level dBuV/m	Factor (dB)	Measured(FS) (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Note
0.0165	90°	3.37	24.30	27.67	123.25	-95.58	AVG
0.0165	90°	5.64	24.30	29.94	143.25	-113.31	PK
0.0387	90°	4.12	23.12	27.24	115.85	-88.61	AVG
0.0387	90°	7.78	23.12	30.90	135.85	-104.95	PK
0.0524	90°	6.42	22.35	28.77	113.22	-84.45	AVG
0.0524	90°	9.35	22.35	31.70	133.22	-101.52	PK
0.0749	90°	5.91	21.90	27.81	110.11	-82.30	AVG
0.0749	90°	8.79	21.90	30.69	130.11	-99.42	PK
1.9647	90°	15.98	19.50	35.48	69.54	-34.06	QP
3.2685	90°	20.73	19.45	40.18	69.54	-29.36	QP

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

Test Mode:	TX 2402MHz _CH00_1Mbps

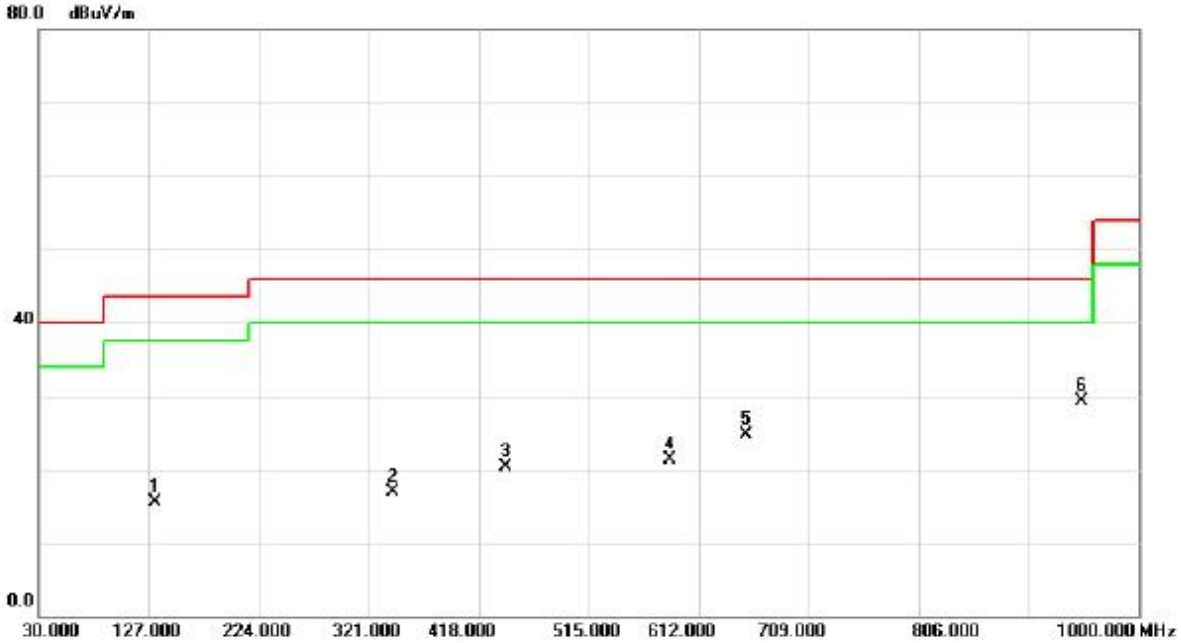
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	81.4100	36.11	-17.23	18.88	40.00	-21.12	peak	
2		138.6400	30.65	-13.15	17.50	43.50	-26.00	peak	
3		419.9400	28.93	-9.17	19.76	46.00	-26.24	peak	
4		563.5000	29.04	-7.93	21.11	46.00	-24.89	peak	
5		690.5700	29.32	-4.97	24.35	46.00	-21.65	peak	
6		980.6000	29.22	-0.33	28.89	54.00	-25.11	peak	

Test Mode:	TX 2402MHz _CH00_1Mbps

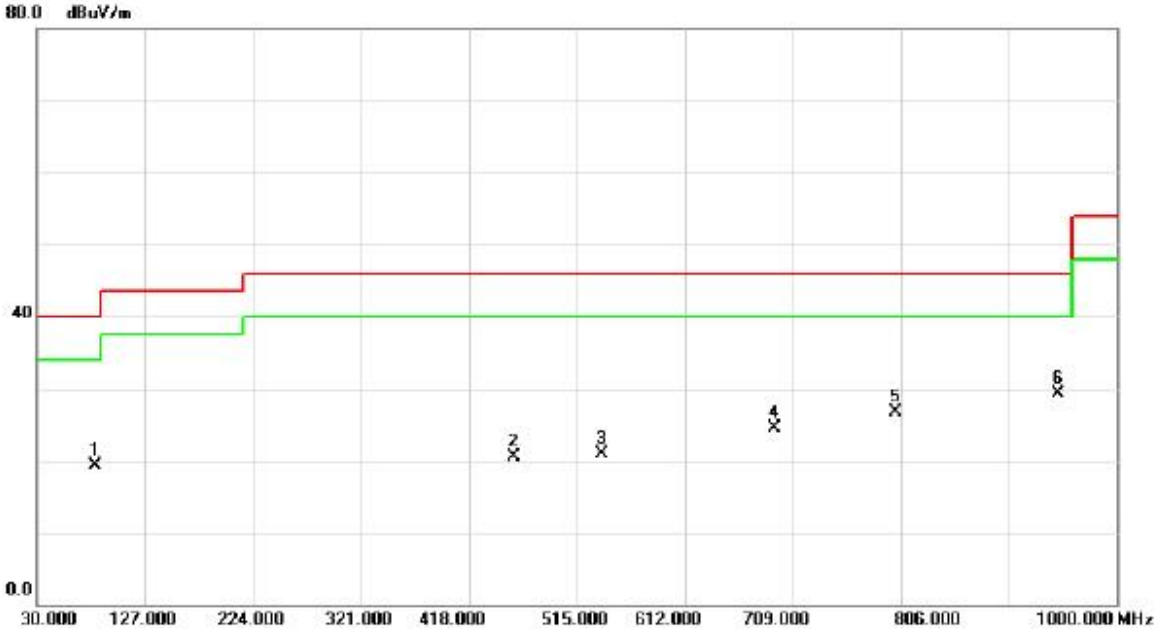
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		132.8200	28.56	-13.09	15.47	43.50	-28.03	peak	
2		342.3400	28.61	-11.67	16.94	46.00	-29.06	peak	
3		442.2500	29.05	-8.76	20.29	46.00	-25.71	peak	
4		586.7800	29.28	-7.91	21.37	46.00	-24.63	peak	
5		653.7100	29.79	-5.13	24.66	46.00	-21.34	peak	
6	*	949.5600	29.55	-0.22	29.33	46.00	-16.67	peak	

Test Mode:	TX 2441MHz _CH39_1Mbps

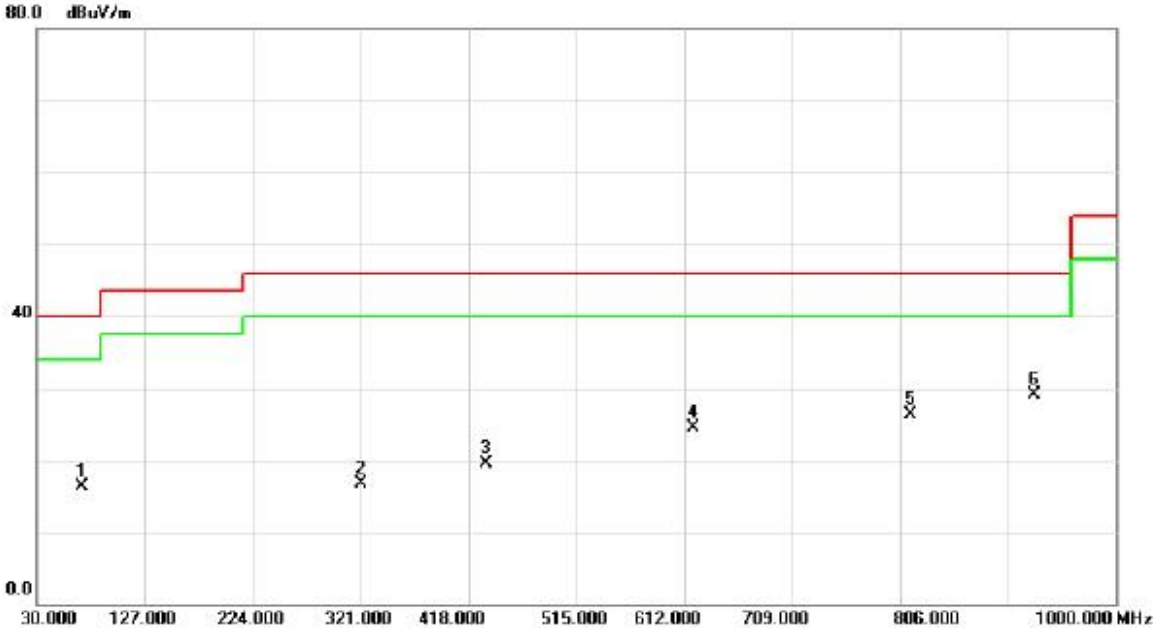
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		82.3800	36.61	-17.29	19.32	40.00	-20.68	peak	
2		458.7400	29.38	-8.95	20.43	46.00	-25.57	peak	
3		537.3100	29.39	-8.58	20.81	46.00	-25.19	peak	
4		692.5100	29.45	-4.96	24.49	46.00	-21.51	peak	
5		801.1500	29.53	-2.90	26.63	46.00	-19.37	peak	
6	*	947.6200	29.58	-0.28	29.30	46.00	-16.70	peak	

Test Mode:	TX 2441MHz _CH39_1Mbps

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		70.7400	32.66	-16.30	16.36	40.00	-23.64	peak	
2		321.9700	28.12	-11.35	16.77	46.00	-29.23	peak	
3		433.5200	28.47	-8.92	19.55	46.00	-26.45	peak	
4		620.7300	31.25	-6.77	24.48	46.00	-21.52	peak	
5		815.7000	29.23	-2.97	26.26	46.00	-19.74	peak	
6	*	926.2800	29.93	-0.83	29.10	46.00	-16.90	peak	

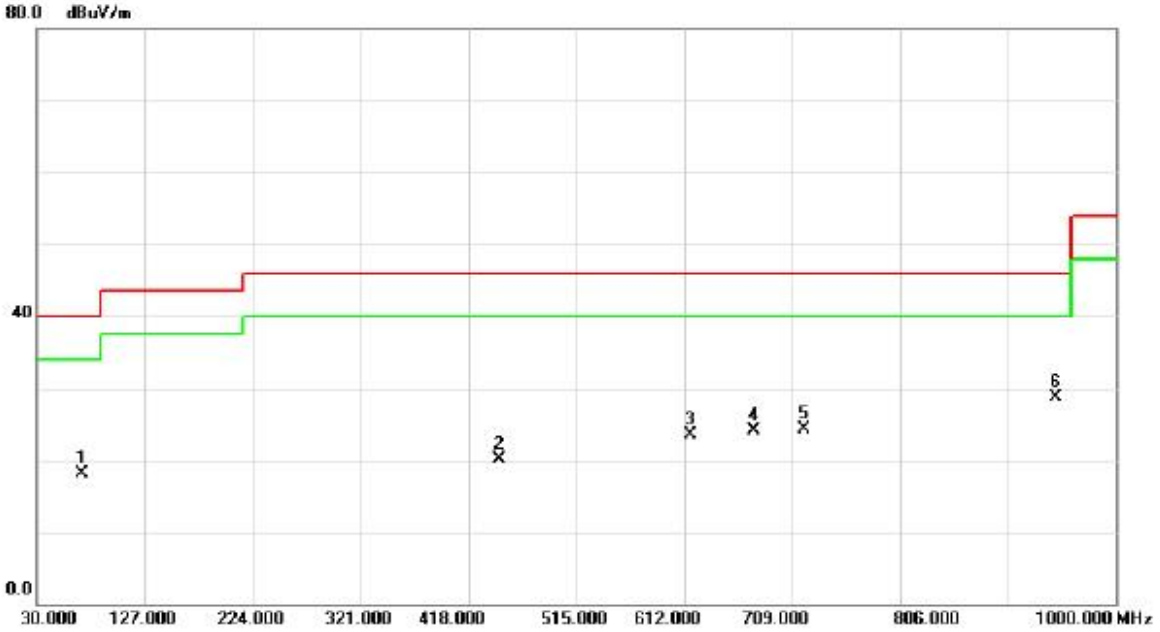
Test Mode:	TX 2480MHz _CH78_1Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		81.4100	36.86	-17.23	19.63	40.00	-20.37	peak	
2		457.7700	30.04	-8.91	21.13	46.00	-24.87	peak	
3		657.5900	29.10	-5.11	23.99	46.00	-22.01	peak	
4		703.1800	29.20	-4.90	24.30	46.00	-21.70	peak	
5		811.8200	28.73	-2.95	25.78	46.00	-20.22	peak	
6	*	917.5500	29.81	-1.07	28.74	46.00	-17.26	peak	

Test Mode:	TX 2480MHz _CH78_1Mbps

Horizontal

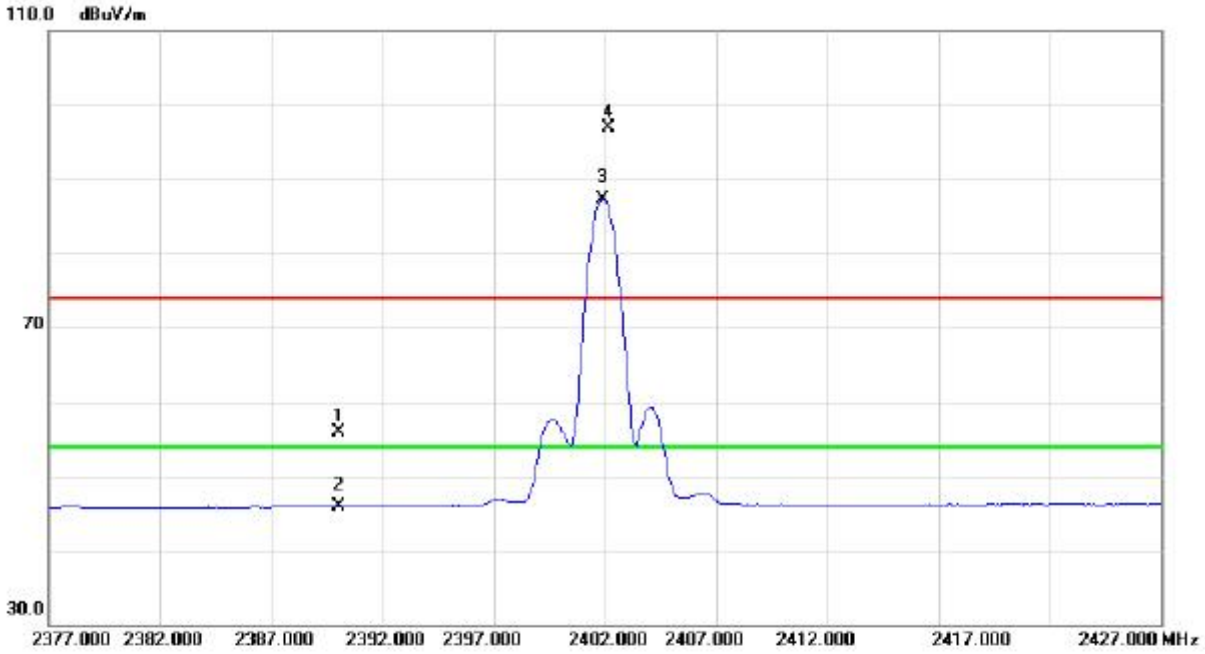


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		70.7400	34.49	-16.30	18.19	40.00	-21.81	peak	
2		446.1300	28.80	-8.69	20.11	46.00	-25.89	peak	
3		617.8200	30.52	-6.92	23.60	46.00	-22.40	peak	
4		674.0800	29.11	-5.04	24.07	46.00	-21.93	peak	
5		719.6700	29.14	-4.81	24.33	46.00	-21.67	peak	
6	*	946.6500	28.95	-0.30	28.65	46.00	-17.35	peak	

ATTACHMENT D - RADIATED EMISSION (ABOVE 1000MHZ)

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.05	31.88	55.93	74.00	-18.07	peak	
2		2390.000	14.00	31.88	45.88	54.00	-8.12	AVG	
3	*	2401.900	55.49	31.89	87.38	54.00	33.38	AVG	no limit
4	X	2402.200	65.07	31.89	96.96	74.00	22.96	peak	no limit

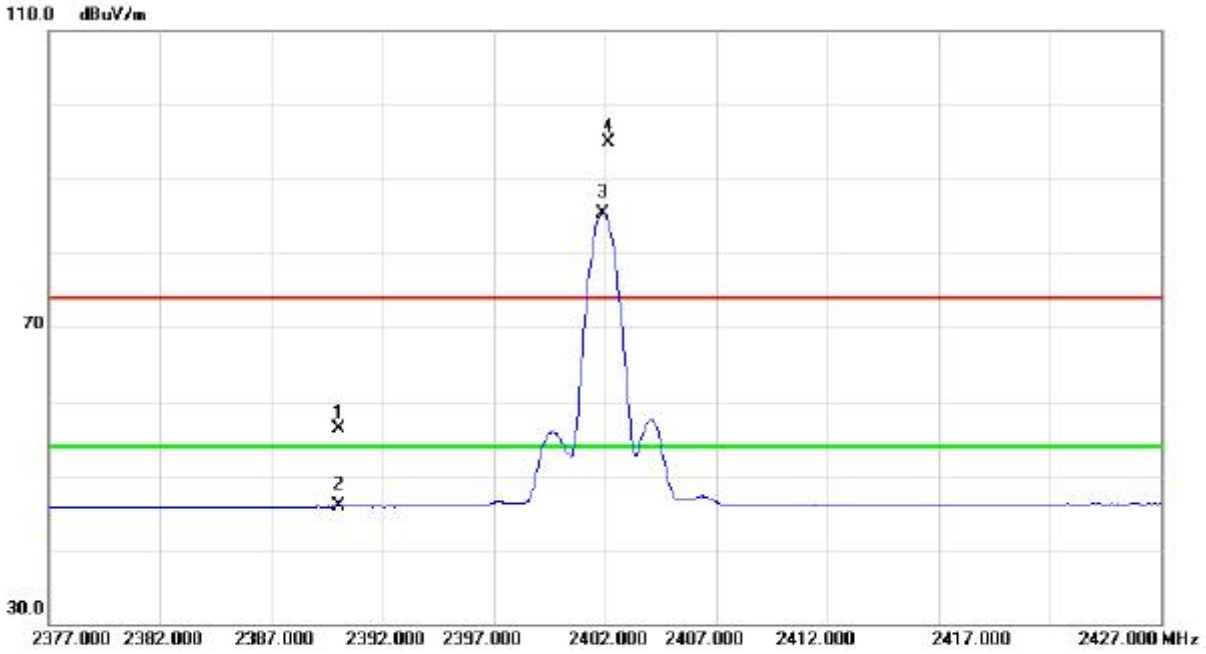
Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4805.005	34.61	3.58	38.19	54.00	-15.81	AVG	
2		4805.050	44.60	3.58	48.18	74.00	-25.82	peak	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

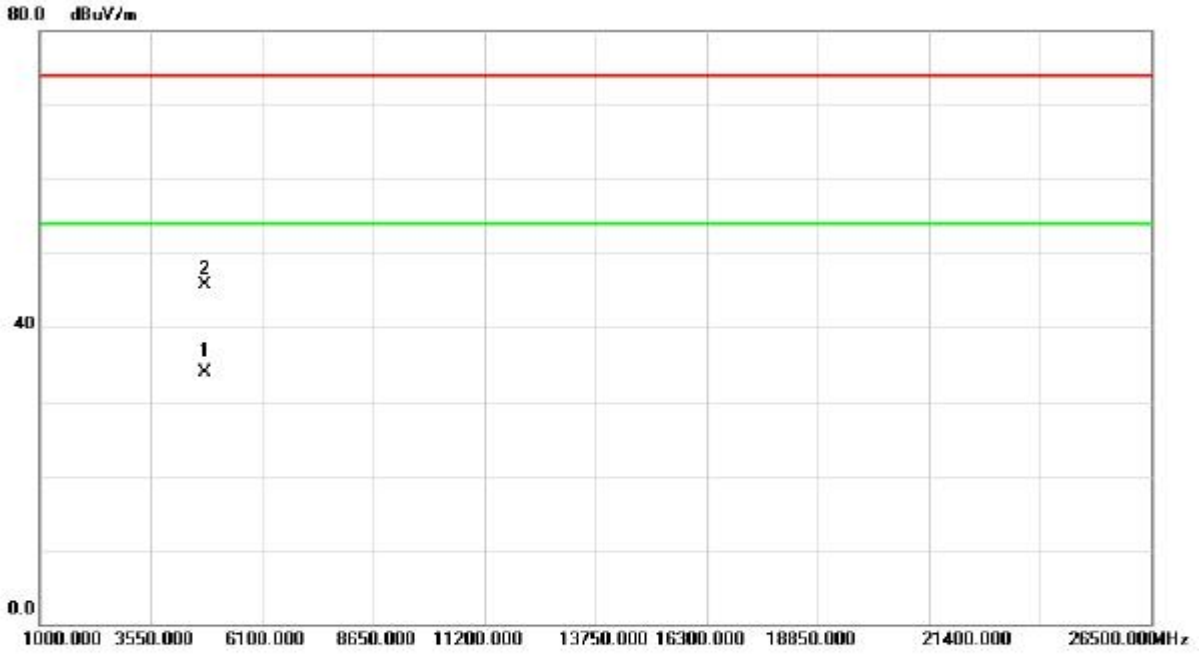
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.50	31.88	56.38	74.00	-17.62	peak	
2		2390.000	13.94	31.88	45.82	54.00	-8.18	AVG	
3	*	2401.900	53.45	31.89	85.34	54.00	31.34	AVG	no limit
4	X	2402.200	62.97	31.89	94.86	74.00	20.86	peak	no limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_1Mbps

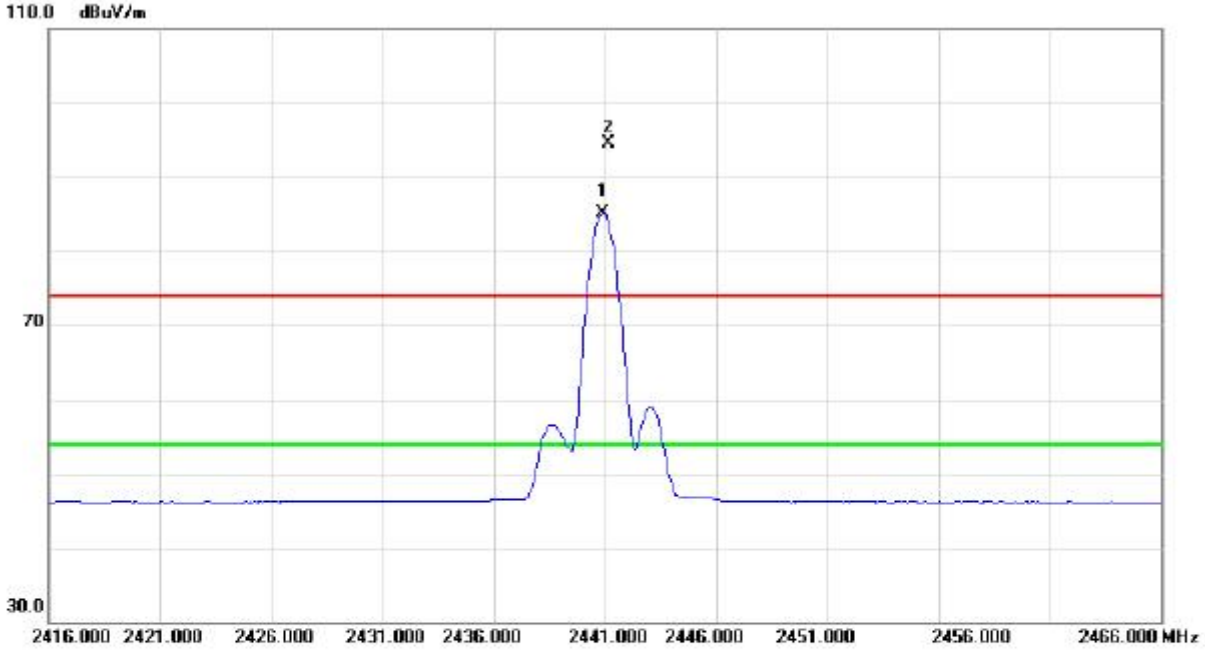
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4804.025	30.24	3.58	33.82	54.00	-20.18	AVG	
2		4804.300	42.04	3.58	45.62	74.00	-28.38	peak	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_1Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.900	53.08	31.95	85.03	54.00	31.03	AVG	no limit
2	X	2441.200	62.60	31.95	94.55	74.00	20.55	peak	no limit

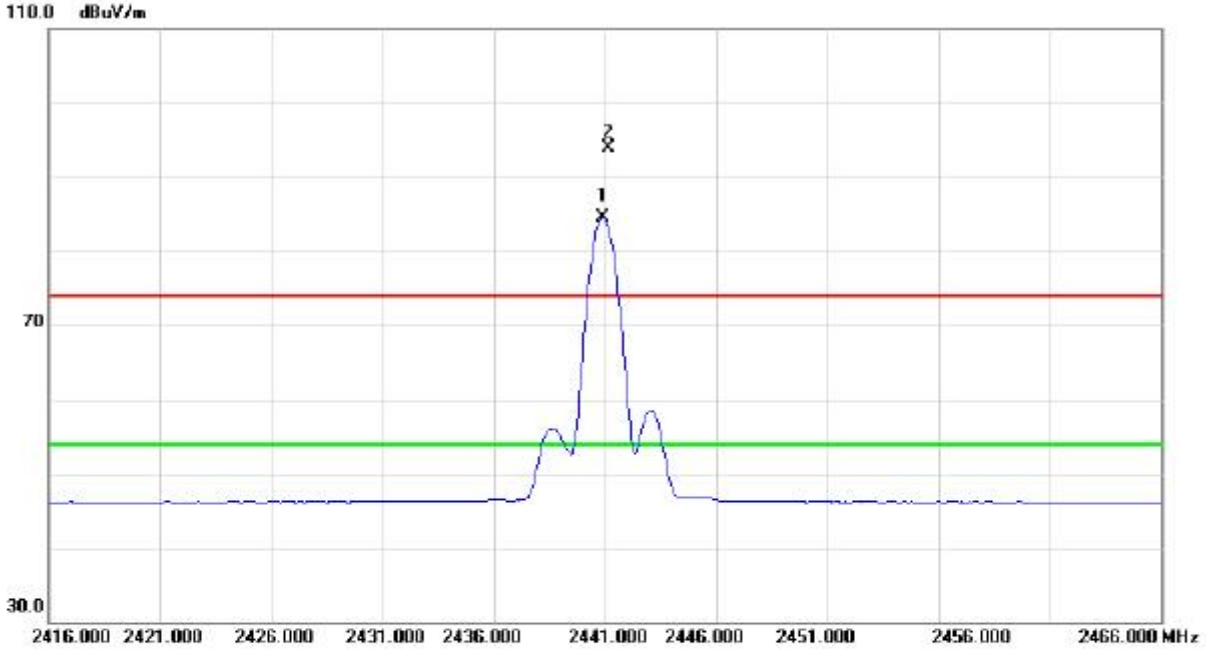
Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_1Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4883.980	33.39	3.73	37.12	54.00	-16.88	AVG	
2		4883.995	43.88	3.73	47.61	74.00	-26.39	peak	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_1Mbps

Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2440.900	52.51	31.95	84.46	54.00	30.46	AVG	no limit
2	X	2441.200	61.95	31.95	93.90	74.00	19.90	peak	no limit

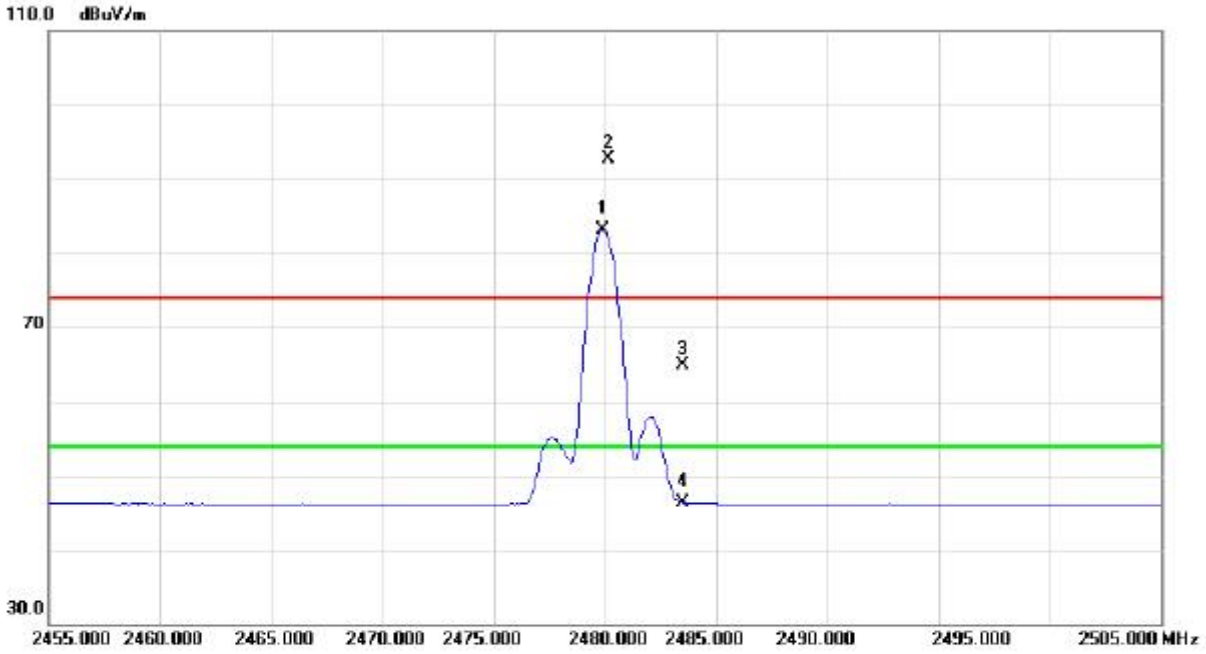
Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_1Mbps

Horizontal

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4882.025	29.99	3.73	33.72	54.00	-20.28	AVG	
2		4883.805	41.61	3.73	45.34	74.00	-28.66	peak	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_1Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2479.900	51.18	32.00	83.18	54.00	29.18	AVG	no limit
2	X	2480.200	60.77	32.00	92.77	74.00	18.77	peak	no limit
3		2483.500	32.97	32.01	64.98	74.00	-9.02	peak	
4		2483.500	14.39	32.01	46.40	54.00	-7.60	AVG	

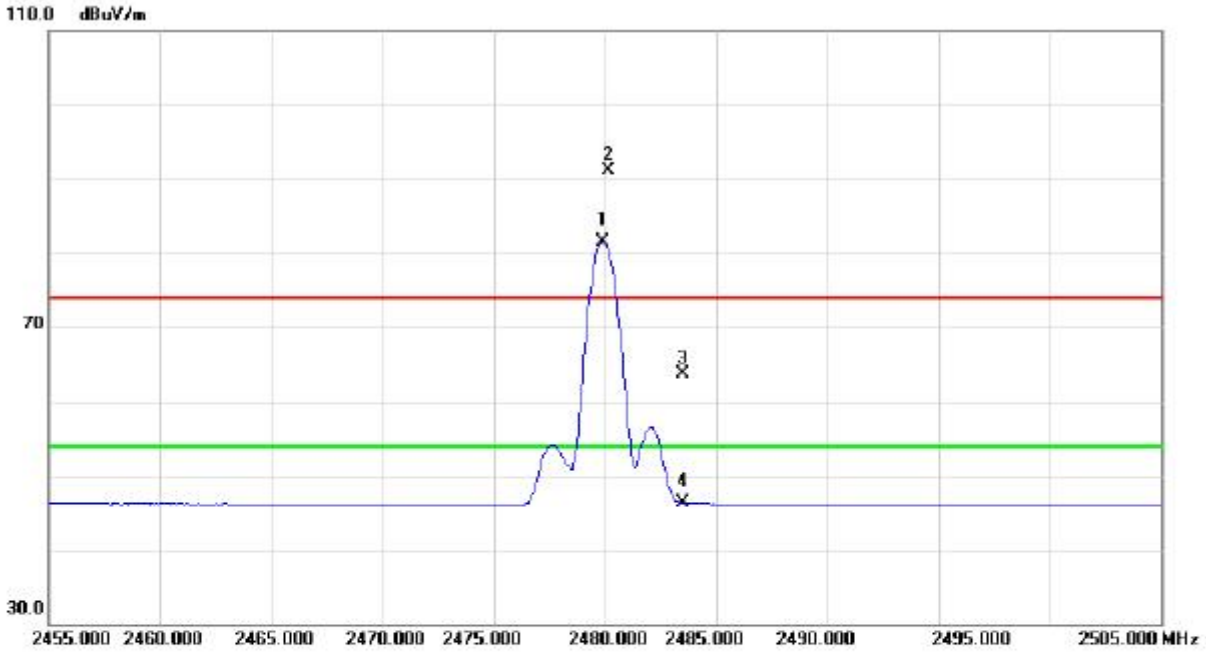
Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_1Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4960.940	31.21	3.88	35.09	54.00	-18.91	AVG	
2		4961.185	42.41	3.88	46.29	74.00	-27.71	peak	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_1Mbps

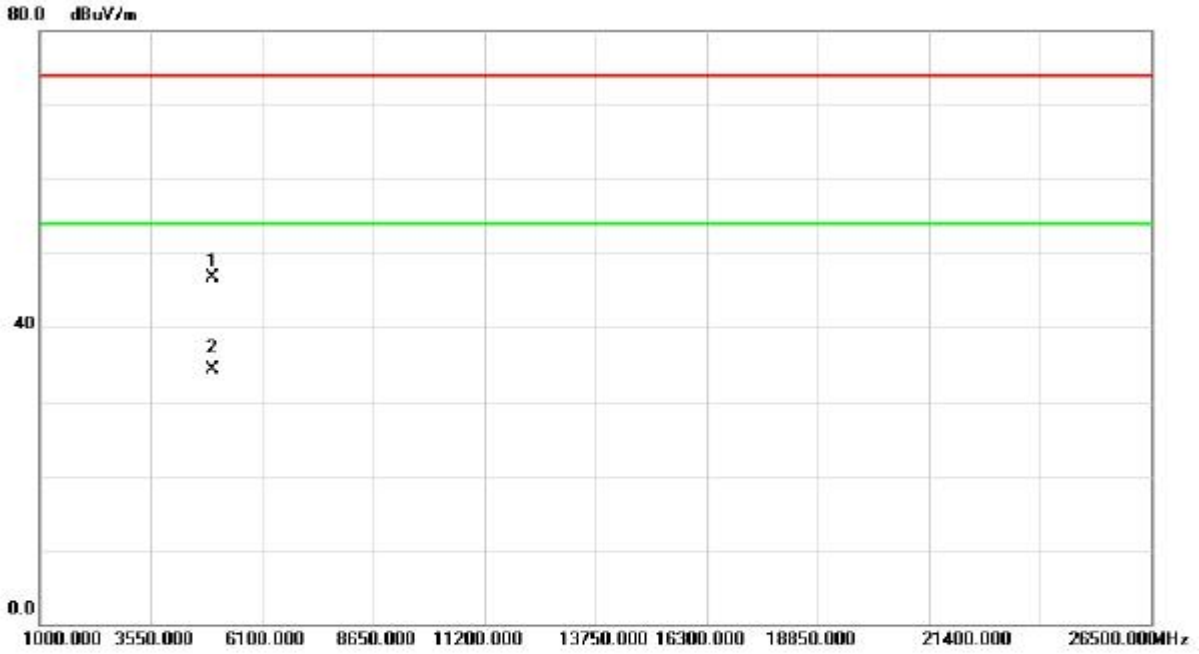
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2479.900	49.49	32.00	81.49	54.00	27.49	AVG	no limit
2	X	2480.200	59.08	32.00	91.08	74.00	17.08	peak	no limit
3		2483.500	31.79	32.01	63.80	74.00	-10.20	peak	
4		2483.500	14.28	32.01	46.29	54.00	-7.71	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_1Mbps

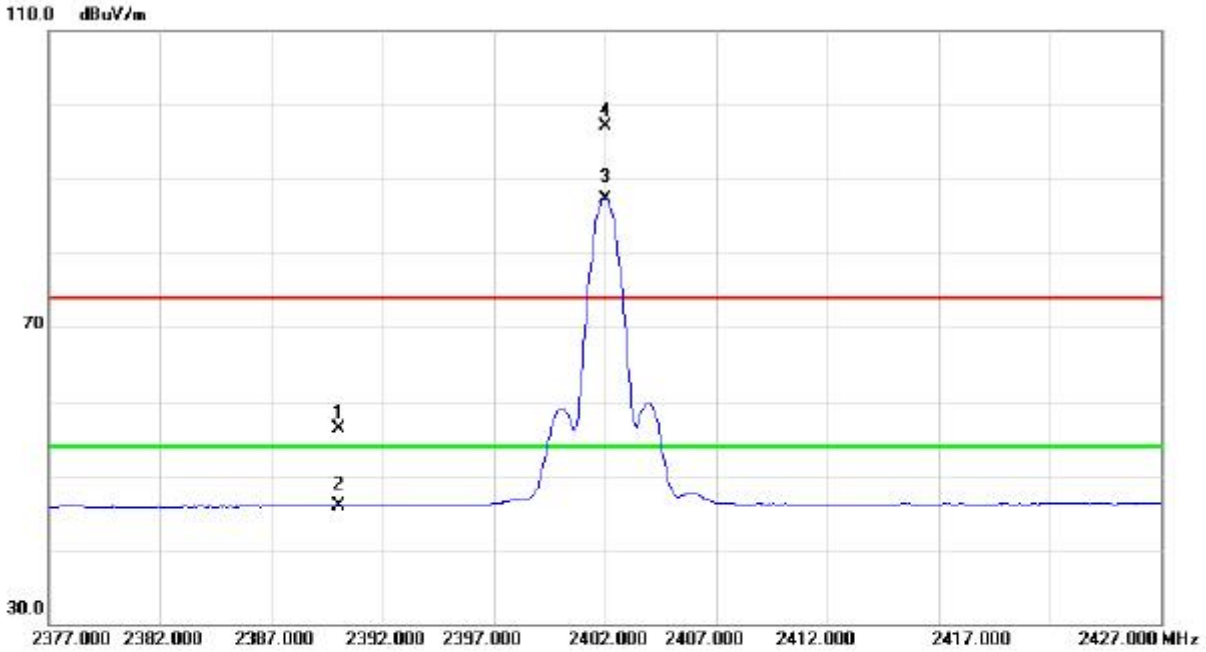
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.875	42.90	3.88	46.78	74.00	-27.22	peak	
2	*	4961.010	30.37	3.88	34.25	54.00	-19.75	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_3Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	24.49	31.88	56.37	74.00	-17.63	peak	
2		2390.000	14.00	31.88	45.88	54.00	-8.12	AVG	
3	*	2402.000	55.50	31.89	87.39	54.00	33.39	AVG	no limit
4	X	2402.050	65.14	31.89	97.03	74.00	23.03	peak	no limit

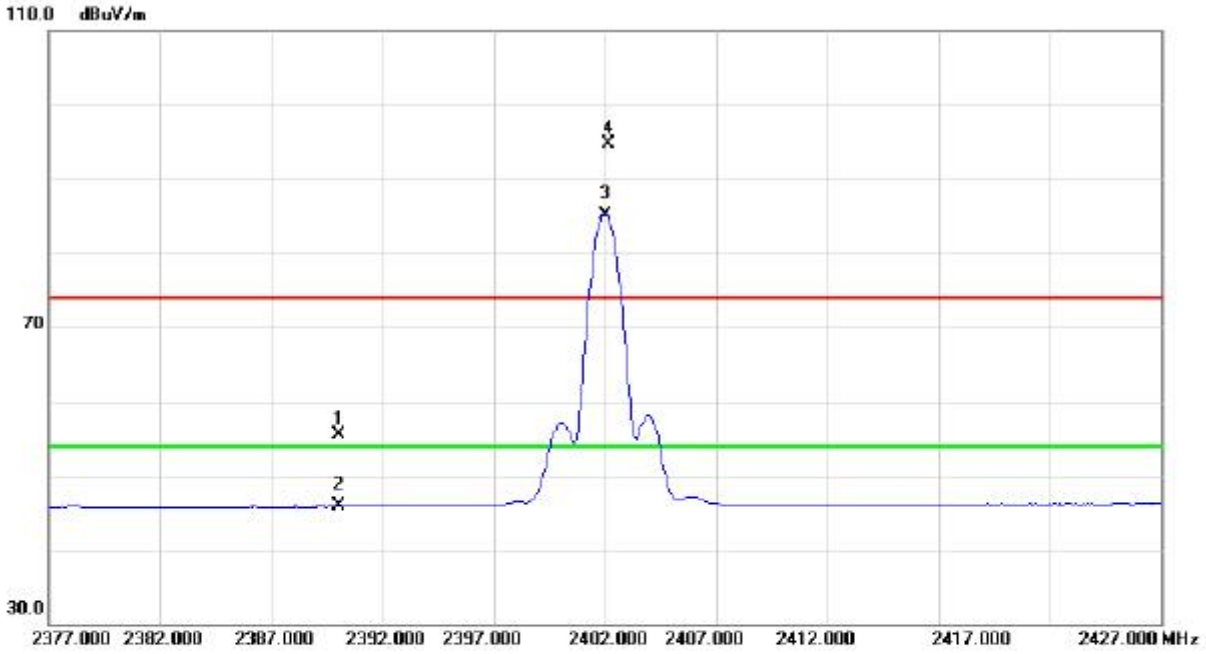
Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_3Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4805.065	45.15	3.58	48.73	74.00	-25.27	peak	
2	*	4805.985	34.56	3.58	38.14	54.00	-15.86	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_3Mbps

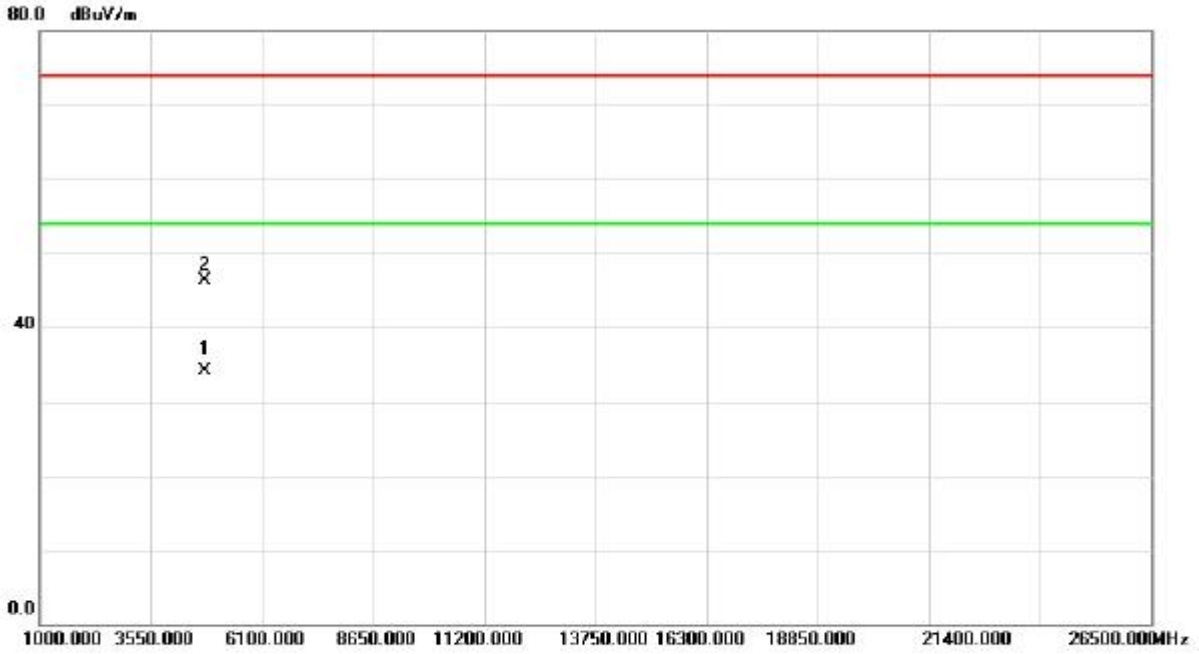
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		2390.000	23.68	31.88	55.56	74.00	-18.44	peak	
2		2390.000	13.99	31.88	45.87	54.00	-8.13	AVG	
3	*	2402.000	53.31	31.89	85.20	54.00	31.20	AVG	no limit
4	X	2402.200	62.86	31.89	94.75	74.00	20.75	peak	no limit

Orthogonal Axis :	X
Test Mode :	TX 2402MHz _CH00_3Mbps

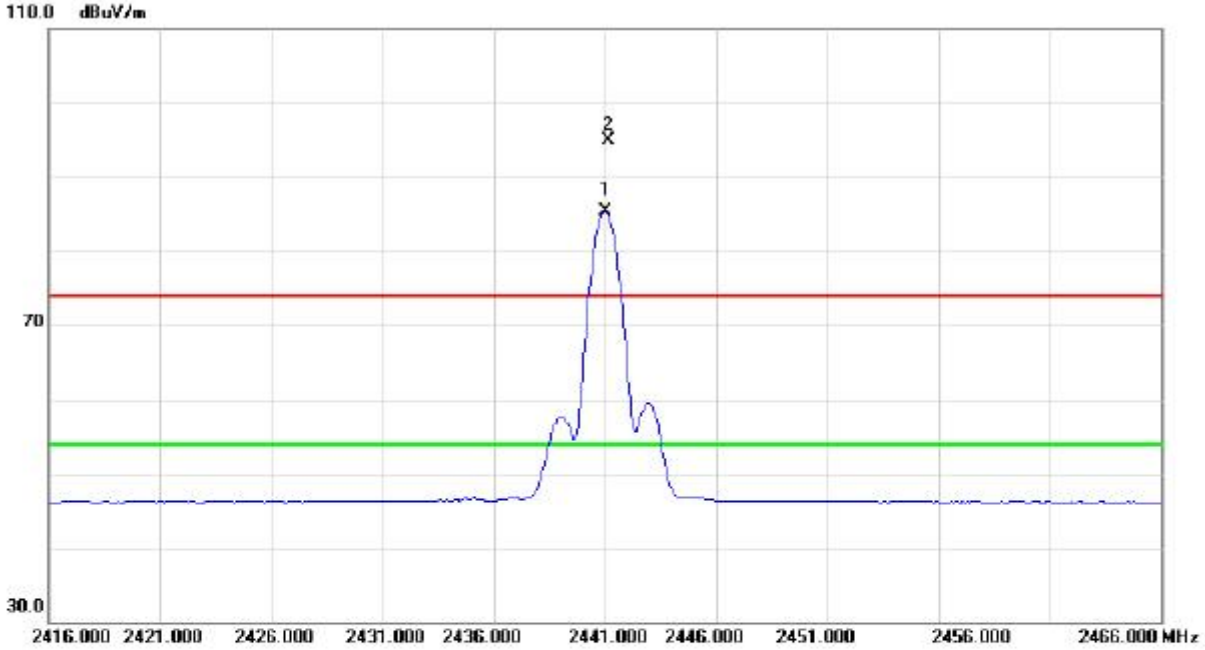
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4805.025	30.49	3.58	34.07	54.00	-19.93	AVG	
2		4805.955	42.64	3.58	46.22	74.00	-27.78	peak	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_3Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2441.000	53.29	31.95	85.24	54.00	31.24	AVG	no limit
2	X	2441.200	62.91	31.95	94.86	74.00	20.86	peak	no limit

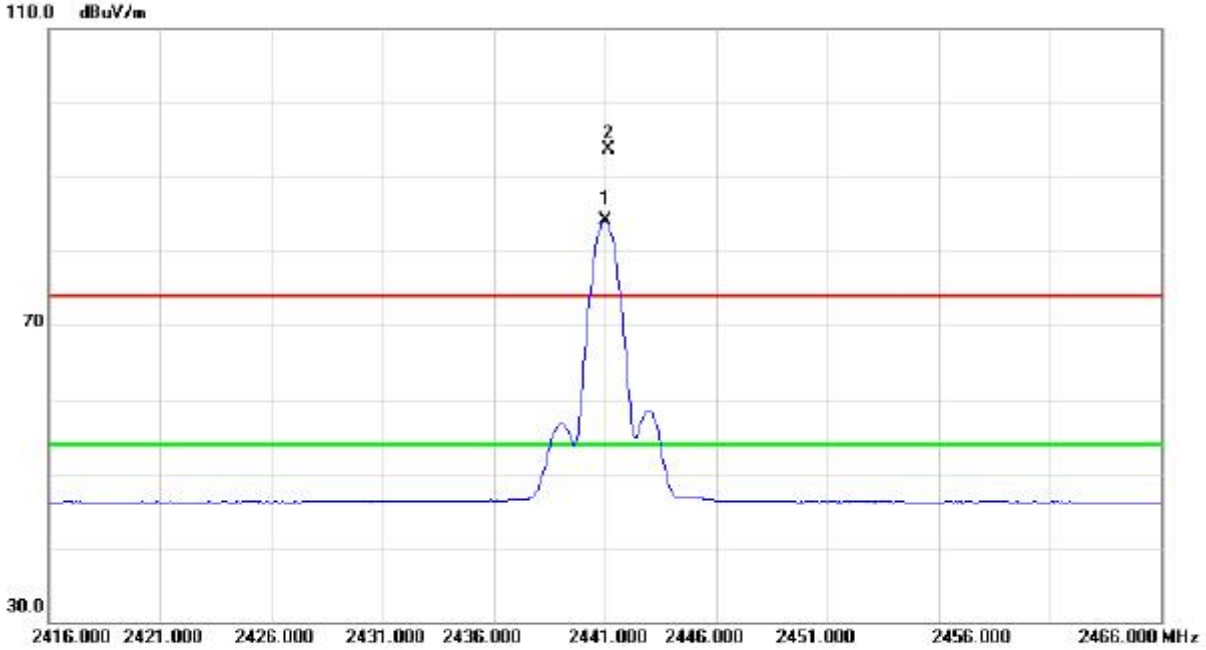
Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_3Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4883.665	43.42	3.73	47.15	74.00	-26.85	peak	
2	*	4883.990	32.98	3.73	36.71	54.00	-17.29	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_3Mbps

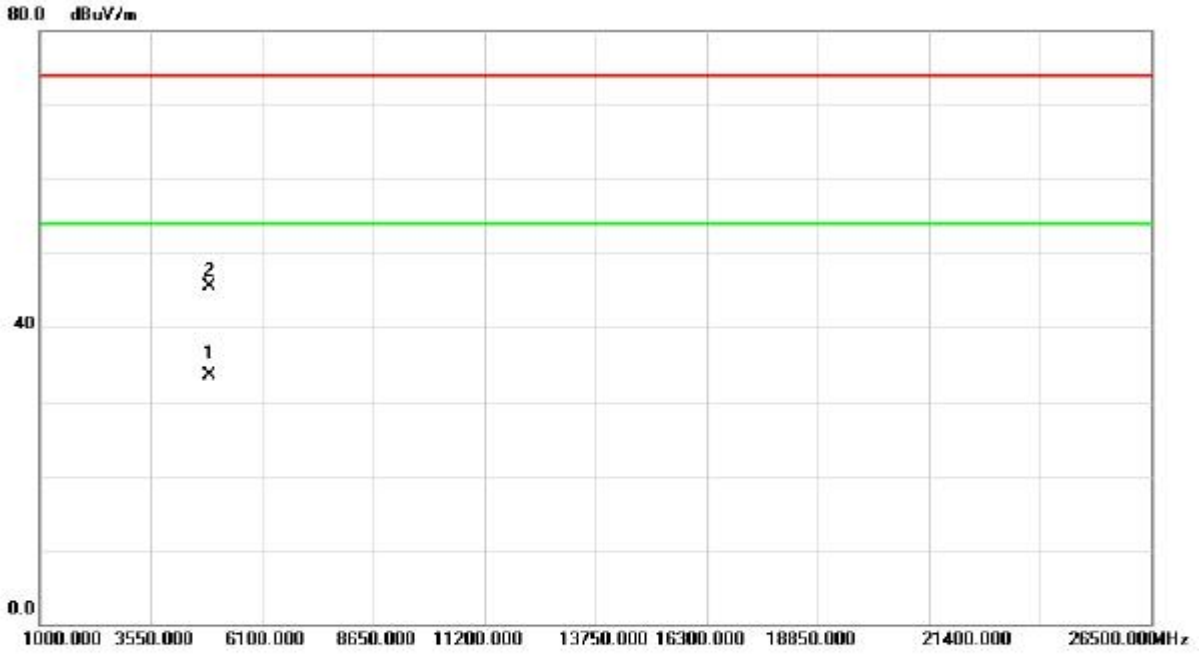
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2441.000	52.16	31.95	84.11	54.00	30.11	AVG	no limit
2	X	2441.200	61.75	31.95	93.70	74.00	19.70	peak	no limit

Orthogonal Axis :	X
Test Mode :	TX 2441MHz _CH39_3Mbps

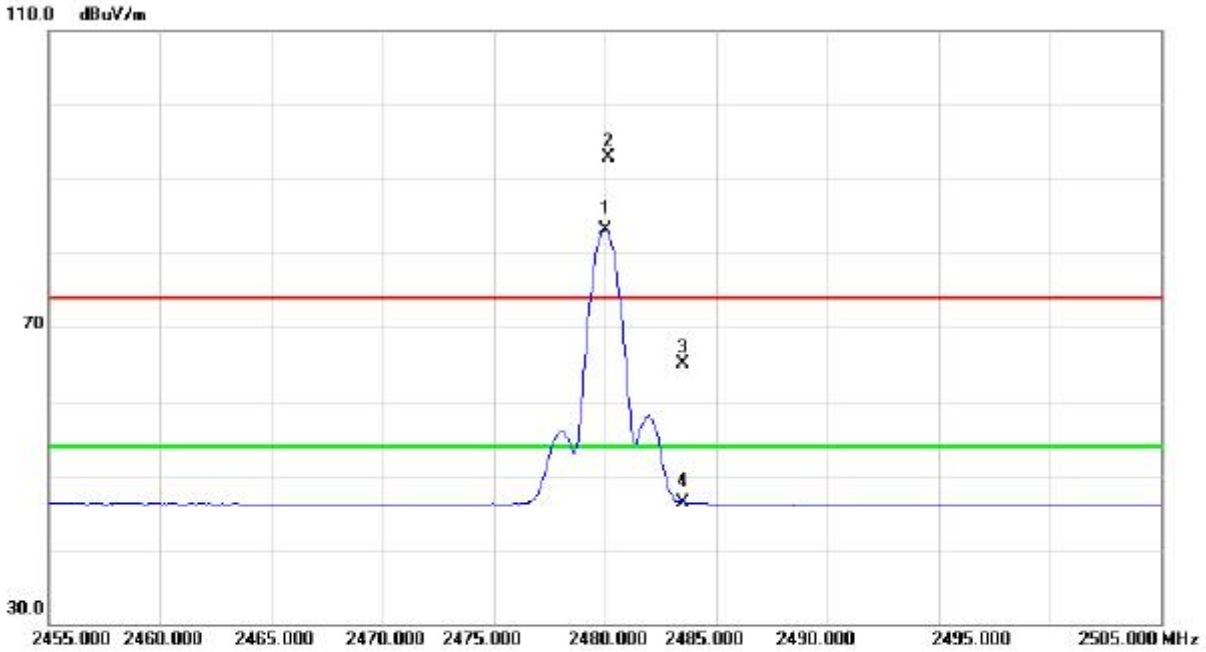
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4882.040	29.85	3.73	33.58	54.00	-20.42	AVG	
2		4882.545	41.81	3.73	45.54	74.00	-28.46	peak	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_3Mbps

Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2480.000	51.15	32.00	83.15	54.00	29.15	AVG	no limit
2	X	2480.200	60.88	32.00	92.88	74.00	18.88	peak	no limit
3		2483.500	33.00	32.01	65.01	74.00	-8.99	peak	
4		2483.500	14.39	32.01	46.40	54.00	-7.60	AVG	

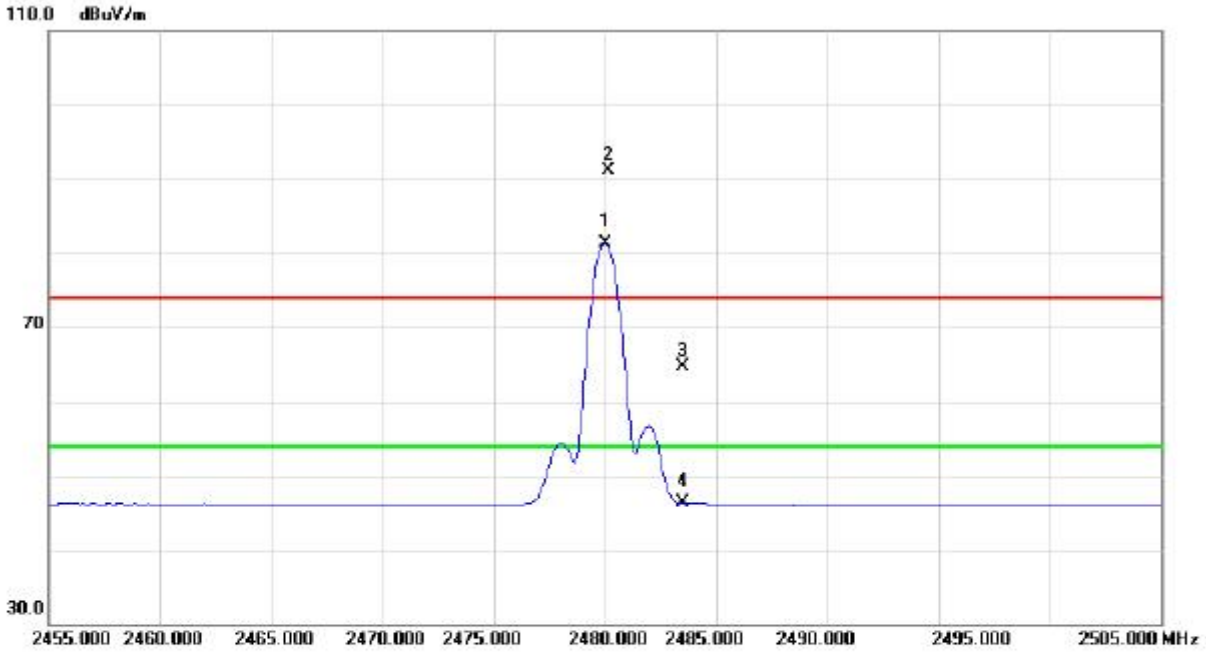
Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_3Mbps

Vertical

No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1		4960.010	42.76	3.88	46.64	74.00	-27.36	peak	
2	*	4961.930	30.69	3.88	34.57	54.00	-19.43	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_3Mbps

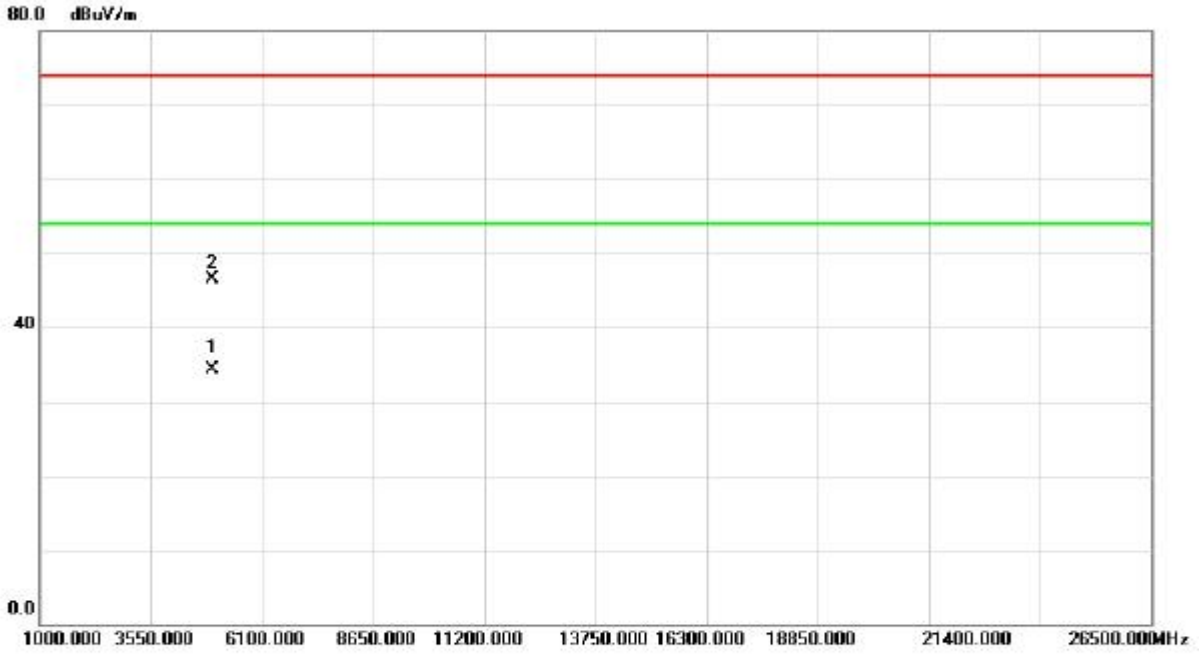
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	2480.000	49.23	32.00	81.23	54.00	27.23	AVG	no limit
2	X	2480.200	59.04	32.00	91.04	74.00	17.04	peak	no limit
3		2483.500	32.63	32.01	64.64	74.00	-9.36	peak	
4		2483.500	14.32	32.01	46.33	54.00	-7.67	AVG	

Orthogonal Axis :	X
Test Mode :	TX 2480MHz _CH78_3Mbps

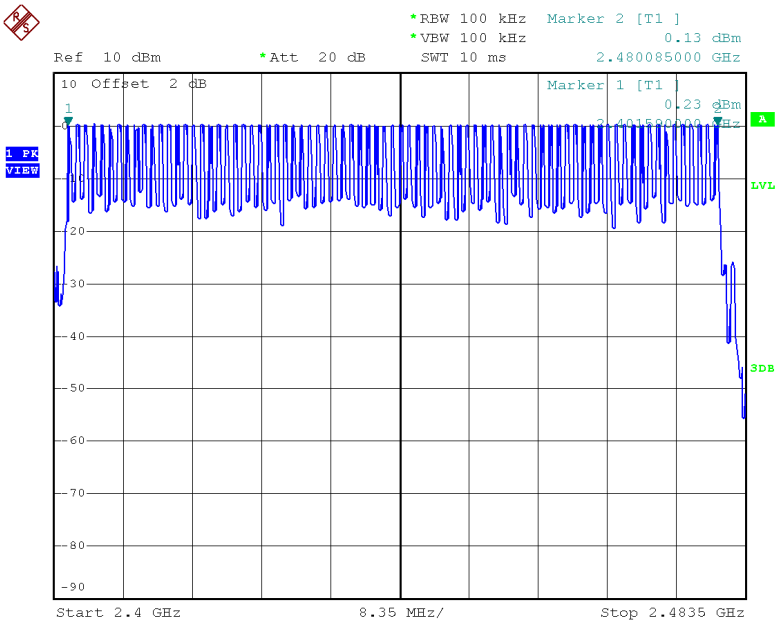
Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	Comment
1	*	4961.000	30.43	3.88	34.31	54.00	-19.69	AVG	
2		4961.345	42.69	3.88	46.57	74.00	-27.43	peak	

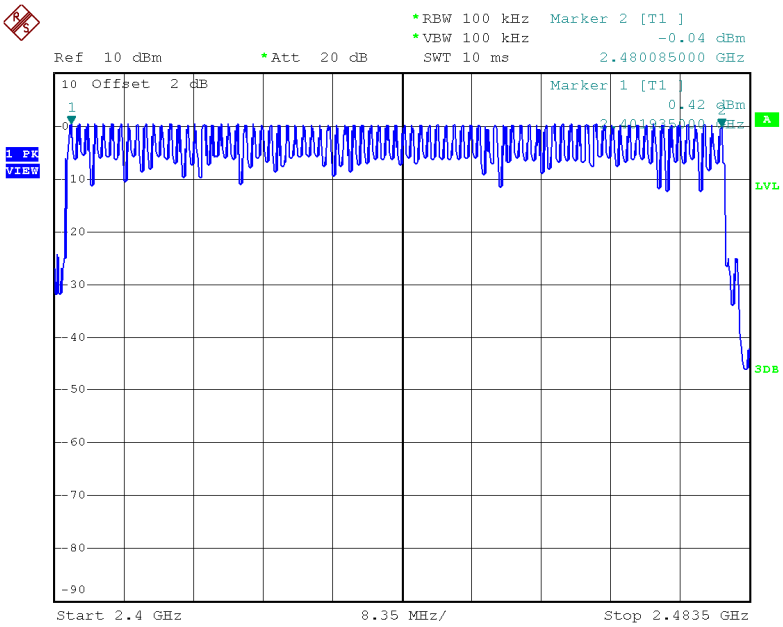
ATTACHMENT E - NUMBER OF HOPPING CHANNEL

Test Mode	Hopping Mode_1Mbps
Number of Hopping Channel	79



Date: 18.MAR.2015 15:53:41

Test Mode	Hopping Mode_3Mbps
Number of Hopping Channel	79



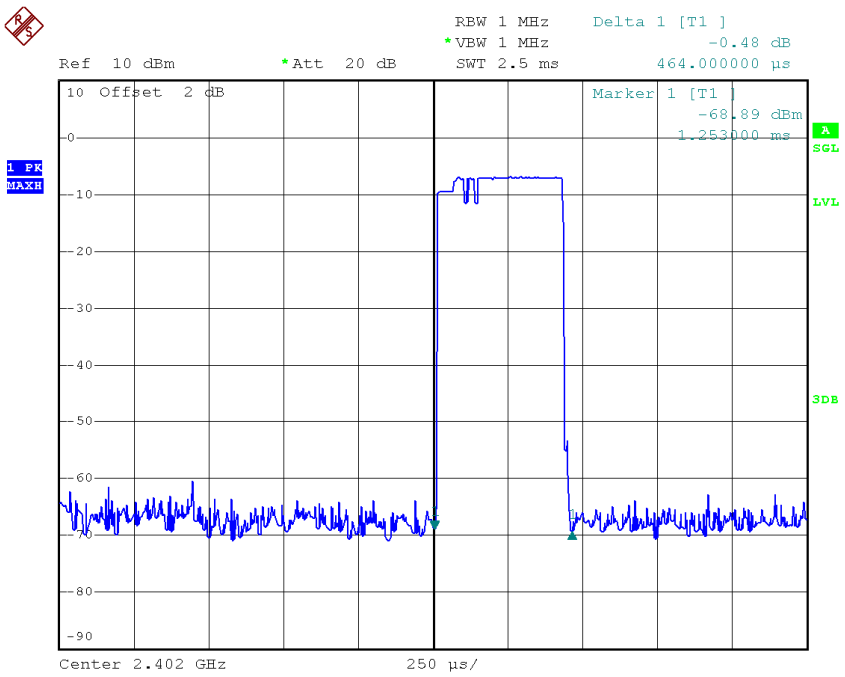
Date: 18.MAR.2015 16:48:39

ATTACHMENT F - AVERAGE TIME OF OCCUPANCY

Test Mode :	TX Mode_1Mbps

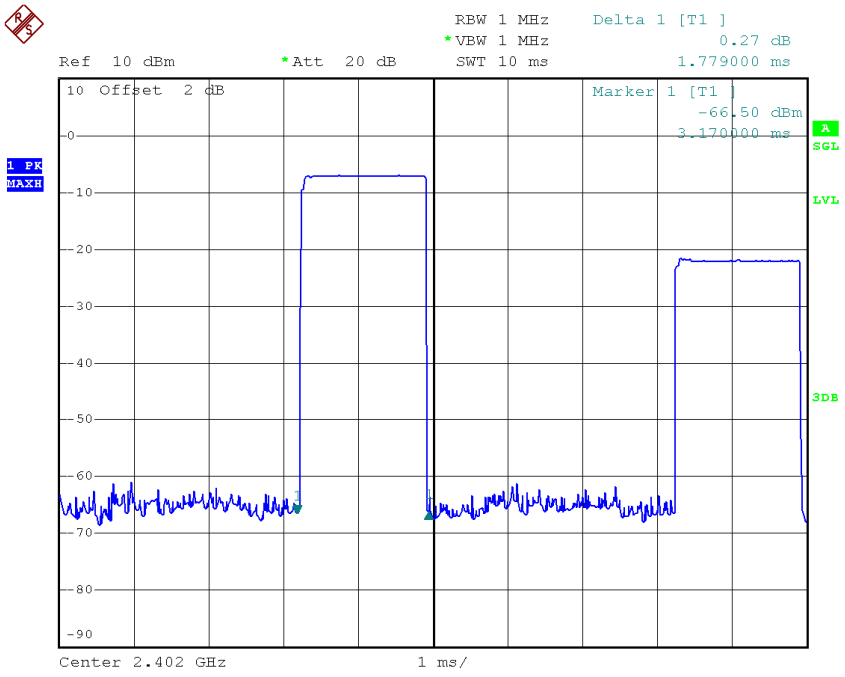
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.0780	0.3283	0.4000	Complies
DH3	2402	1.7790	0.2846	0.4000	Complies
DH1	2402	0.4640	0.1485	0.4000	Complies
DH5	2441	3.1190	0.3327	0.4000	Complies
DH3	2441	1.7590	0.2814	0.4000	Complies
DH1	2441	0.4590	0.1469	0.4000	Complies
DH5	2480	3.1180	0.3326	0.4000	Complies
DH3	2480	1.8200	0.2912	0.4000	Complies
DH1	2480	0.4640	0.1485	0.4000	Complies

CH00-DH1



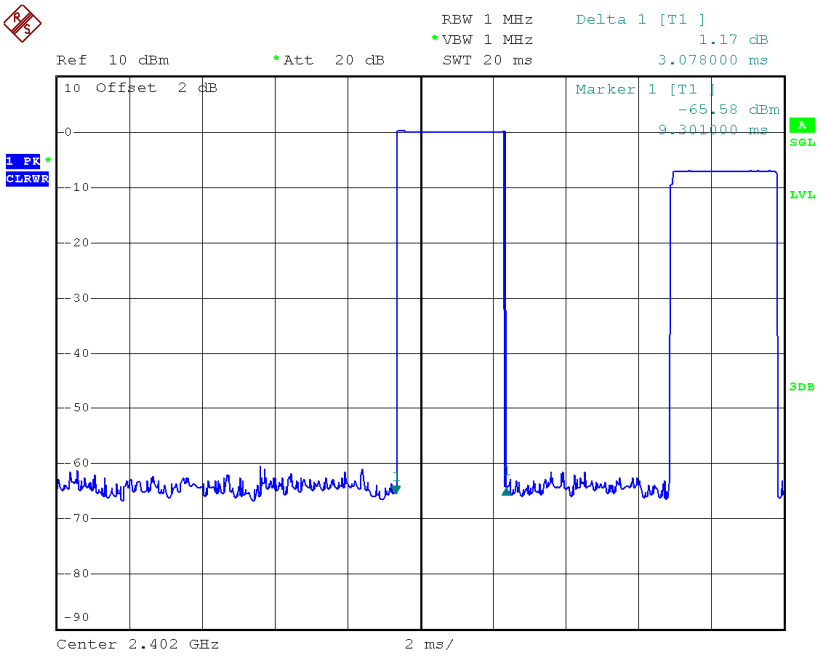
Date: 18.MAR.2015 15:38:07

CH00-DH3



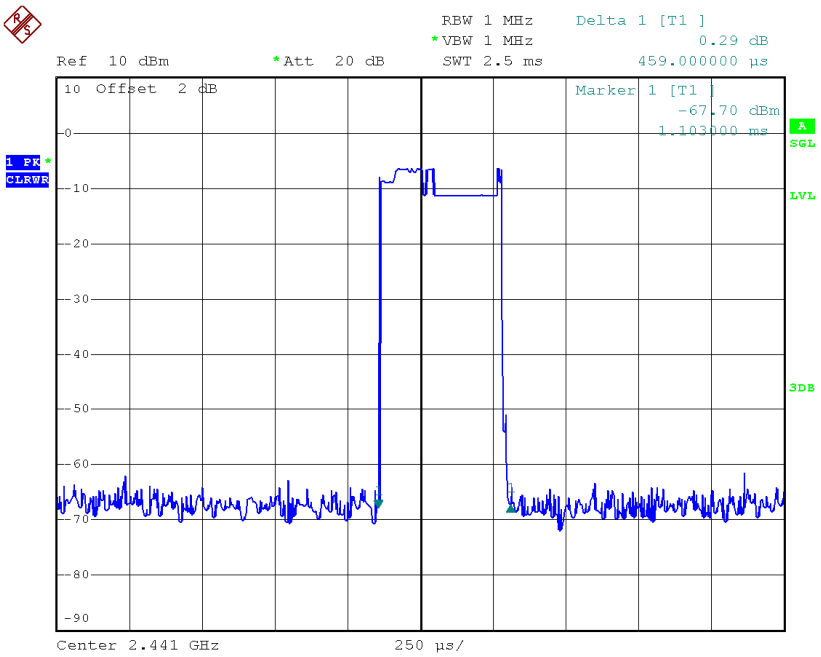
Date: 18.MAR.2015 15:59:27

CH00-DH5



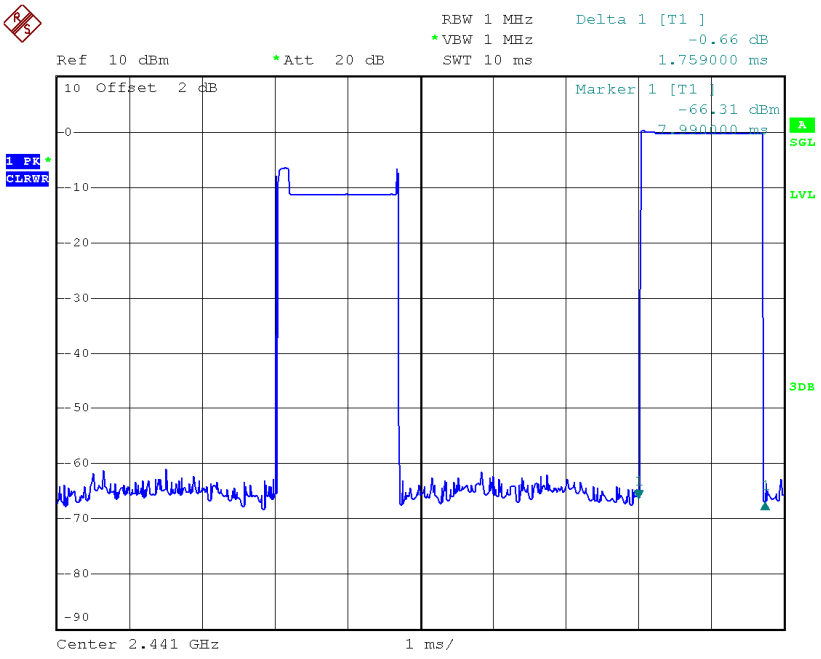
Date: 18.MAR.2015 16:00:12

CH39-DH1



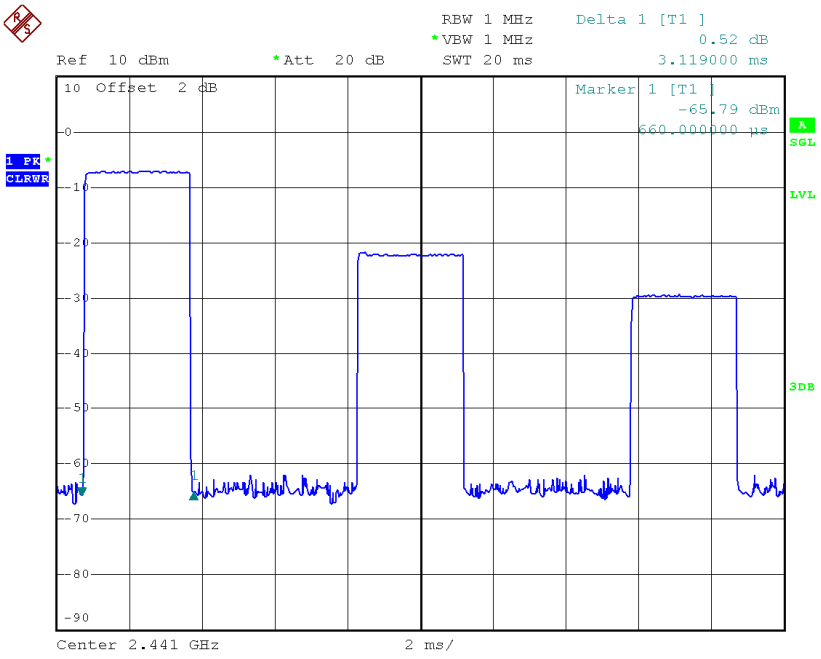
Date: 18.MAR.2015 15:38:15

CH39-DH3



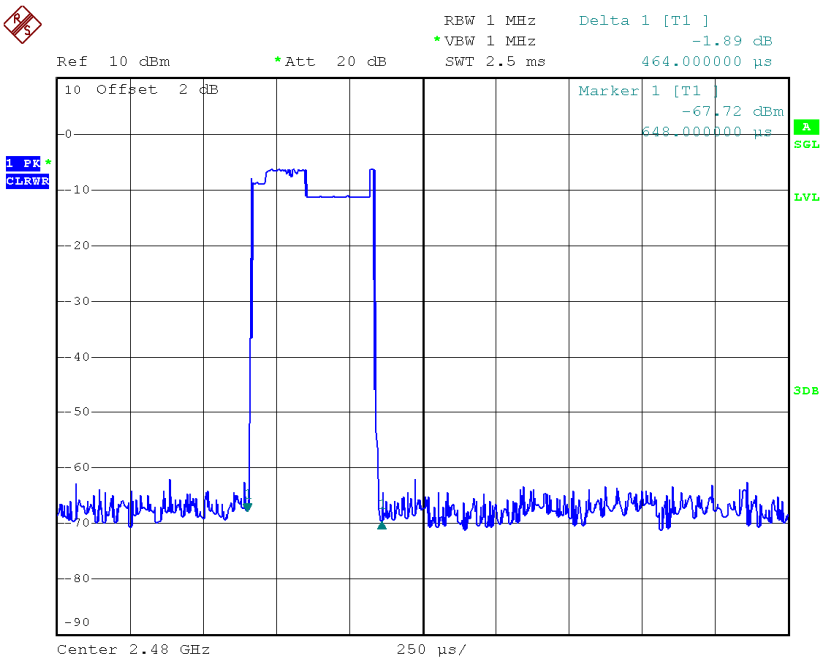
Date: 18.MAR.2015 15:59:35

CH39-DH5



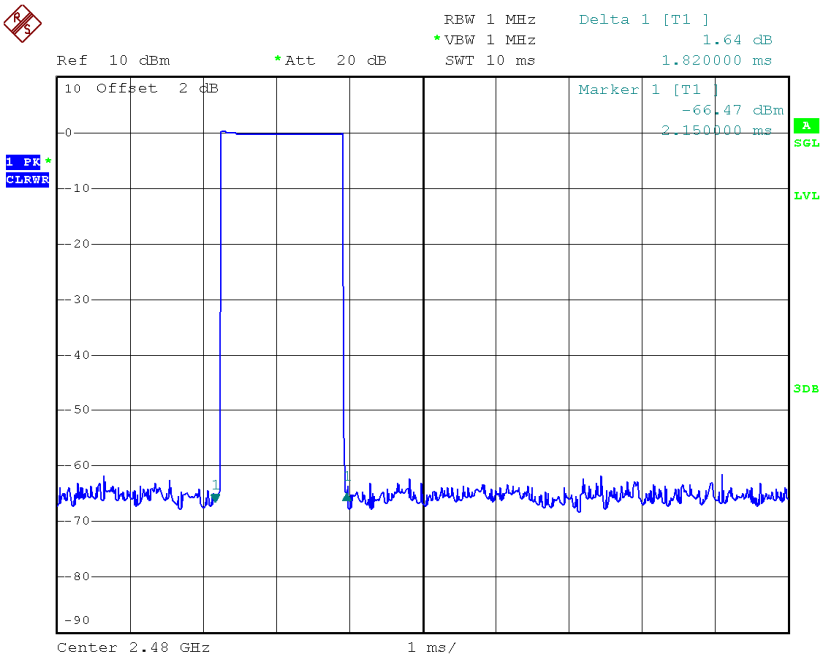
Date: 18.MAR.2015 16:00:26

CH78-DH1



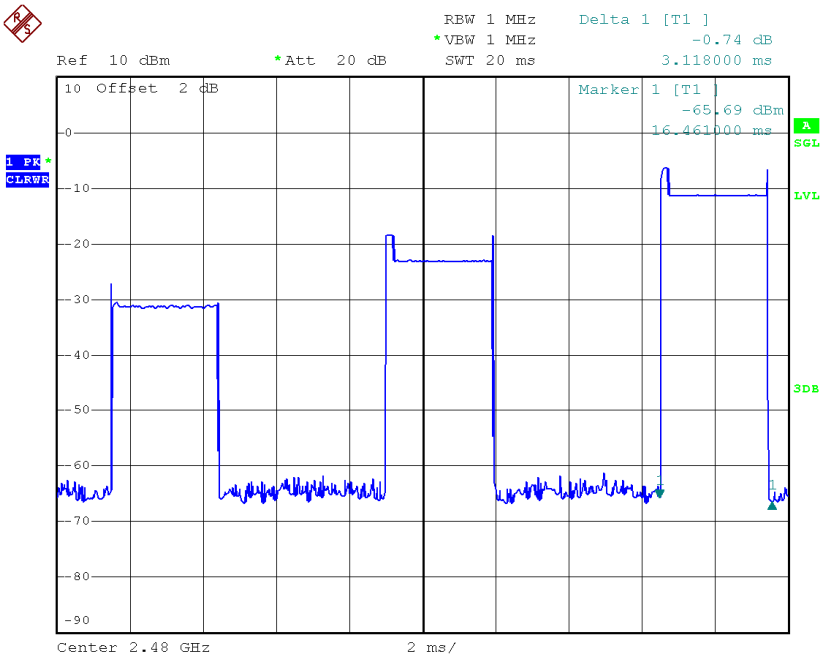
Date: 18.MAR.2015 15:38:25

CH78-DH3



Date: 18.MAR.2015 15:59:47

CH78-DH5

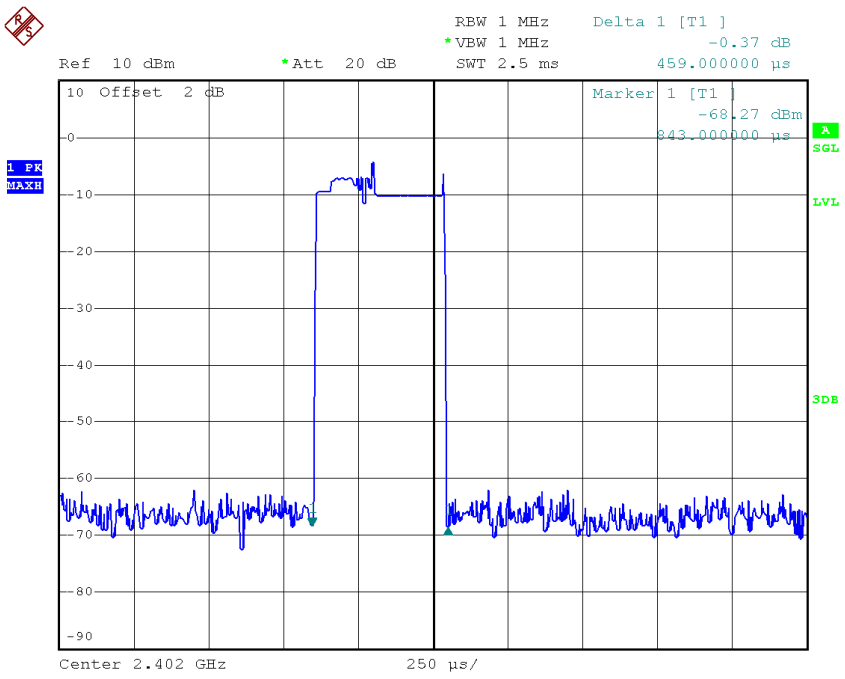


Date: 18.MAR.2015 16:00:36

Test Mode :	TX Mode_3Mbps

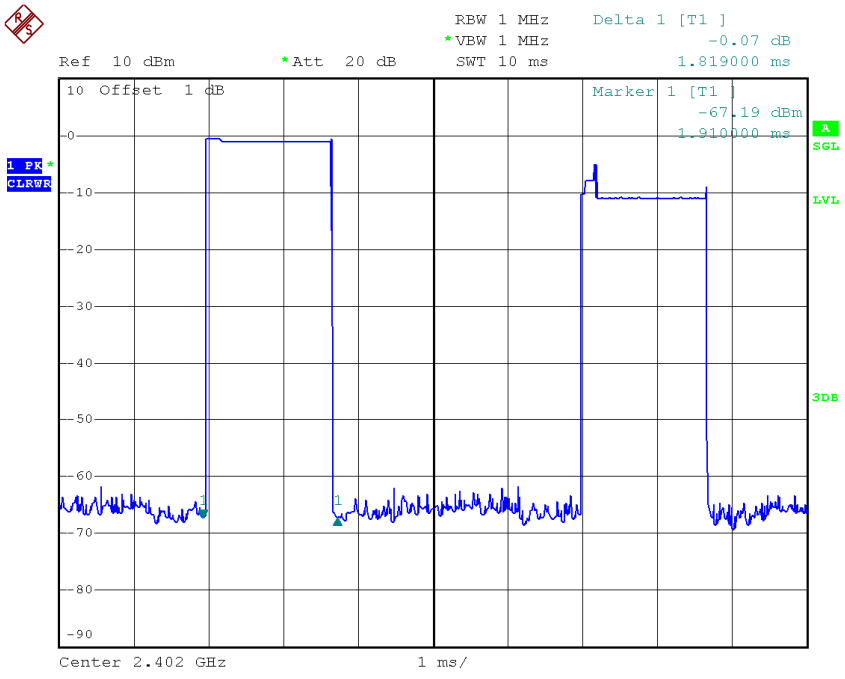
Data Packet	Frequency (MHz)	Pulse Duration (ms)	Dwell Time (s)	Limits (s)	Test Result
DH5	2402	3.1990	0.3412	0.4000	Complies
DH3	2402	1.8190	0.2910	0.4000	Complies
DH1	2402	0.4590	0.1469	0.4000	Complies
DH5	2441	3.1590	0.3370	0.4000	Complies
DH3	2441	1.7390	0.2782	0.4000	Complies
DH1	2441	0.4540	0.1453	0.4000	Complies
DH5	2480	3.0400	0.3243	0.4000	Complies
DH3	2480	1.7590	0.2814	0.4000	Complies
DH1	2480	0.4540	0.1453	0.4000	Complies

CH00-DH1



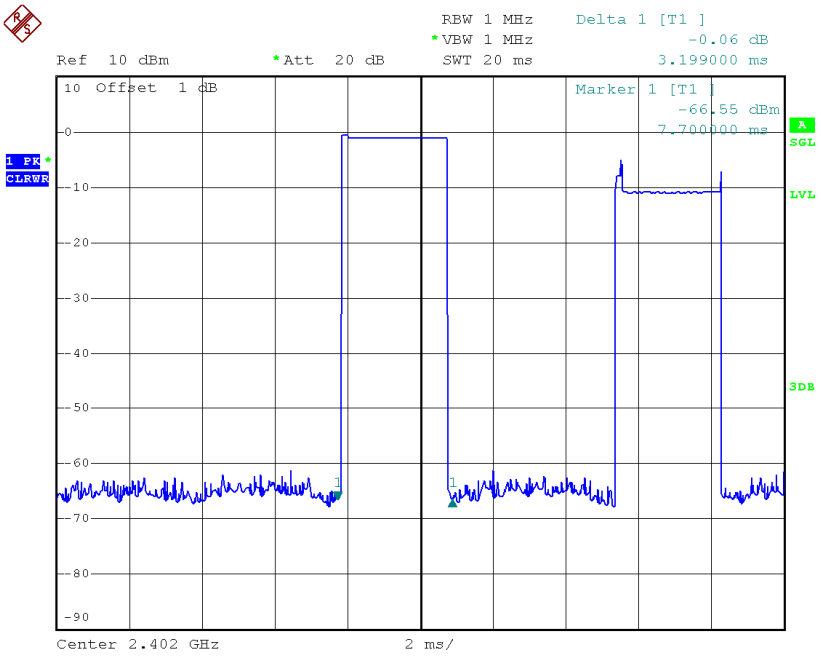
Date: 18.MAR.2015 16:12:40

CH00-DH3



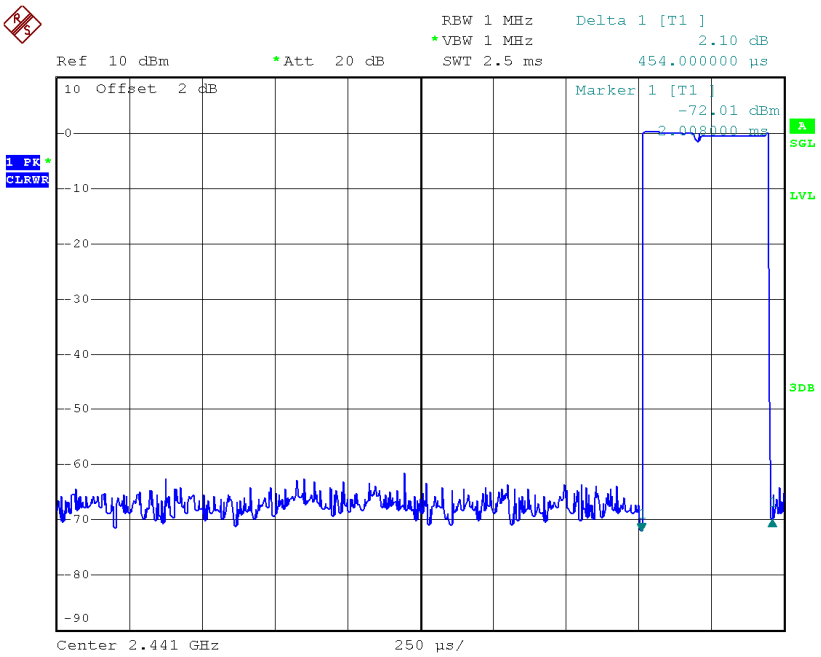
Date: 18.MAR.2015 17:15:47

CH00-DH5



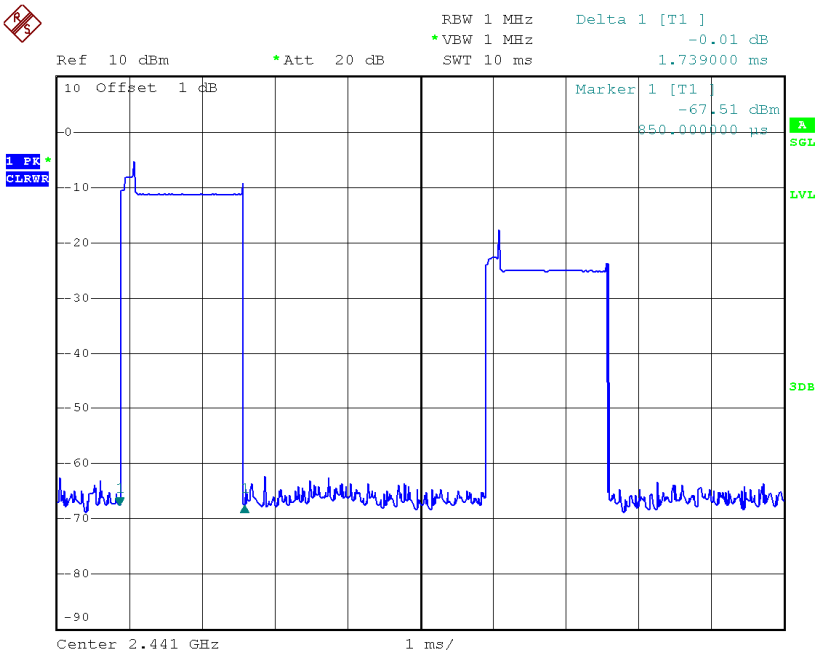
Date: 18.MAR.2015 17:16:50

CH39-DH1



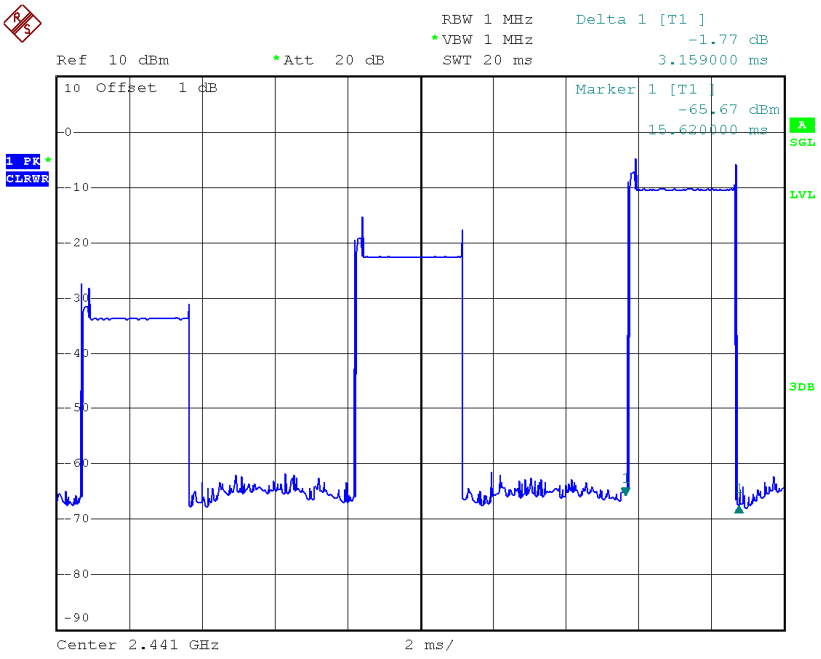
Date: 18.MAR.2015 16:12:48

CH39-DH3



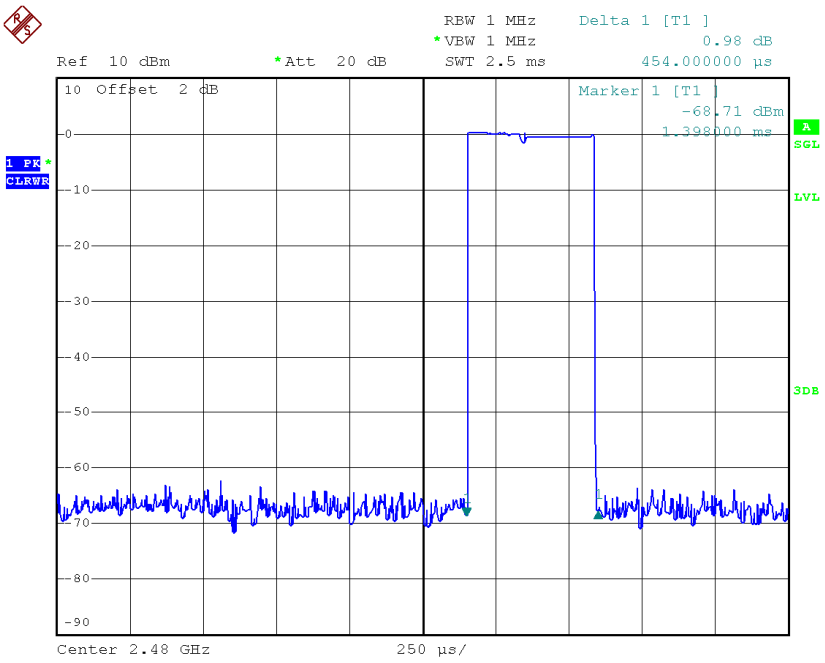
Date: 18.MAR.2015 17:15:56

CH39-DH5



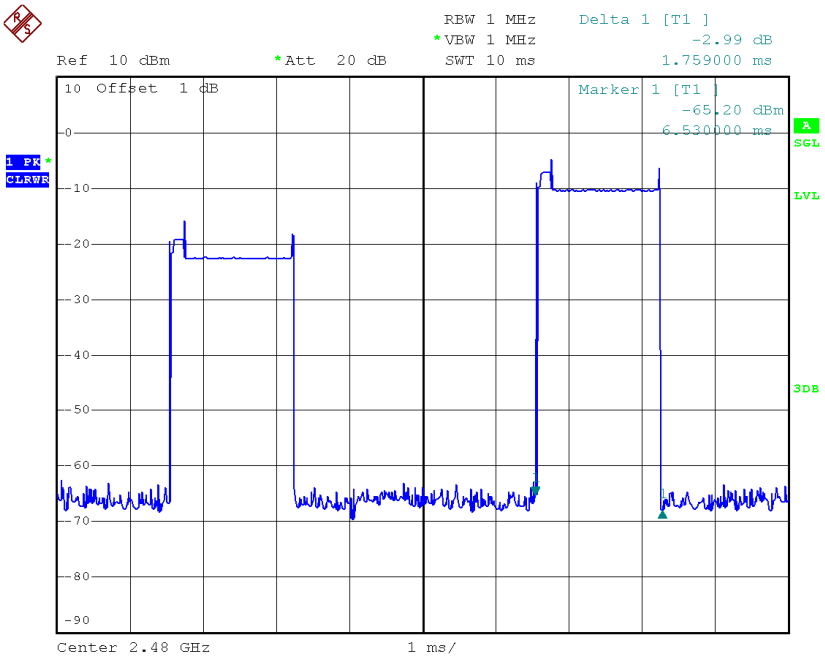
Date: 18.MAR.2015 17:17:04

CH78-DH1



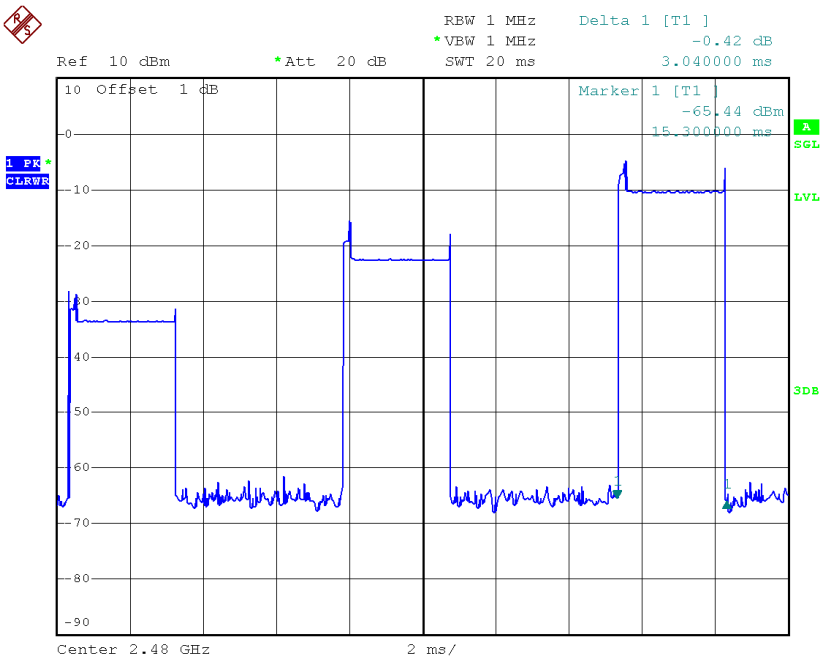
Date: 18.MAR.2015 16:12:54

CH78-DH3



Date: 18.MAR.2015 17:16:03

CH78-DH5



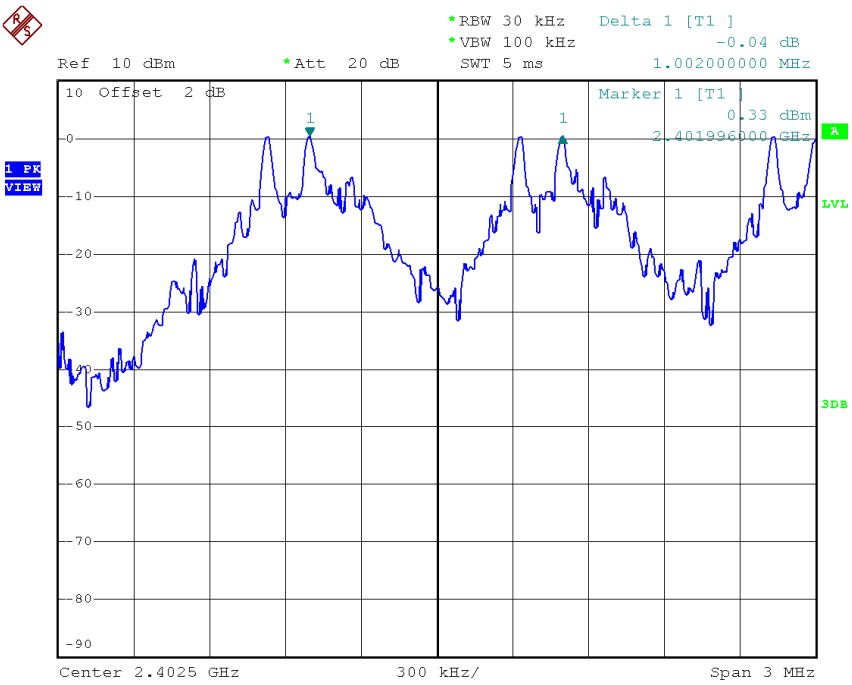
Date: 18.MAR.2015 17:17:14

ATTACHMENT G - HOPPING CHANNEL SEPARATION MEASUREMENT

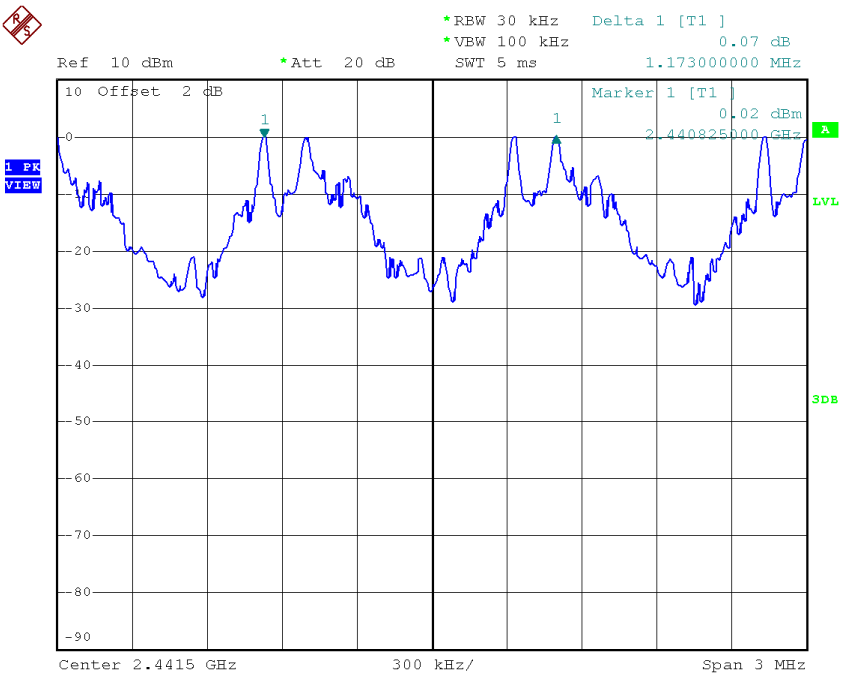
Test Mode :	Hopping on _1Mbps

Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	1.002	0.450	Complies
2441	1.173	0.425	Complies
2480	0.834	0.458	Complies

CH00

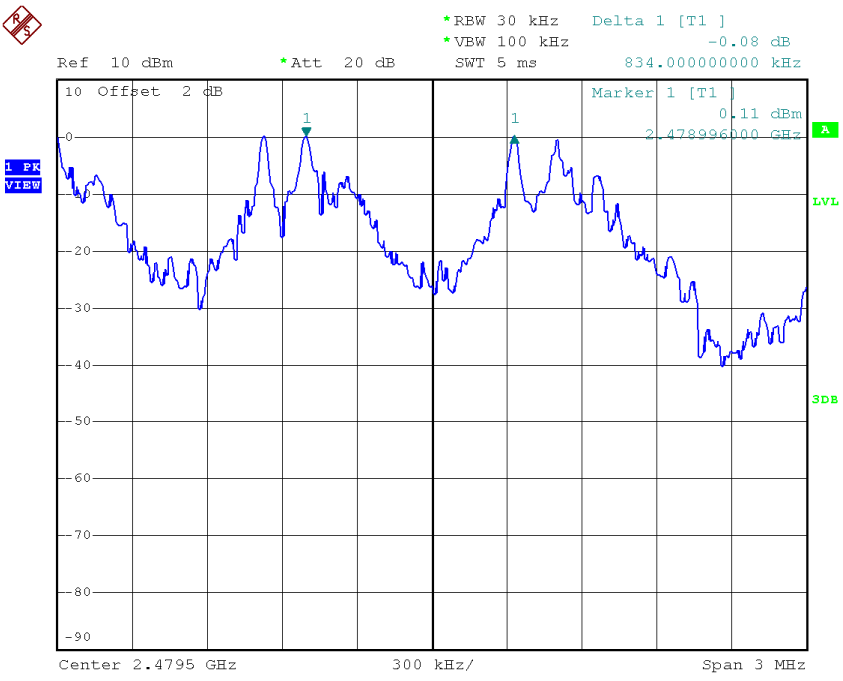


CH39



Date: 18.MAR.2015 15:49:58

CH78

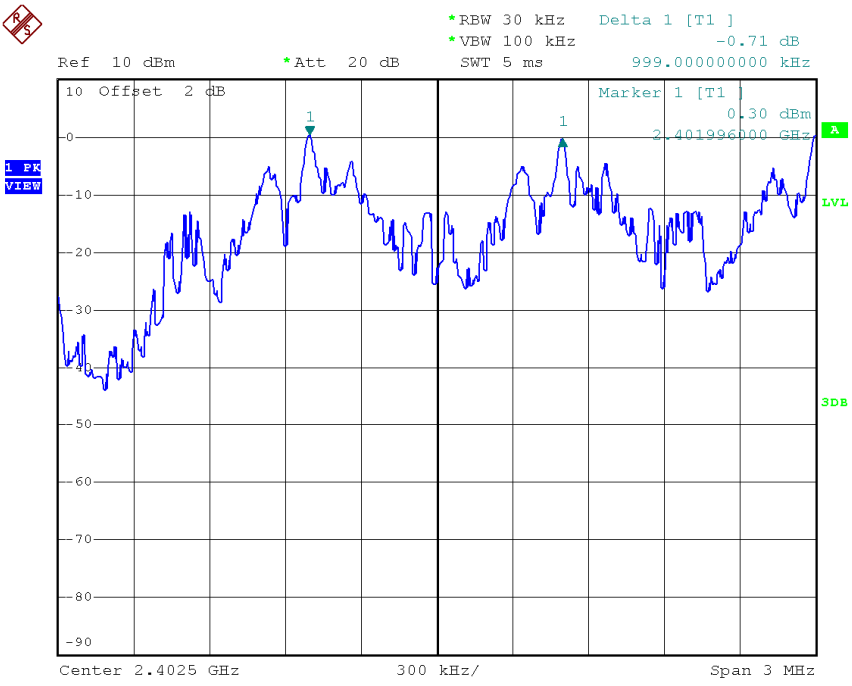


Date: 18.MAR.2015 15:51:32

Test Mode :	Hopping on _3Mbps

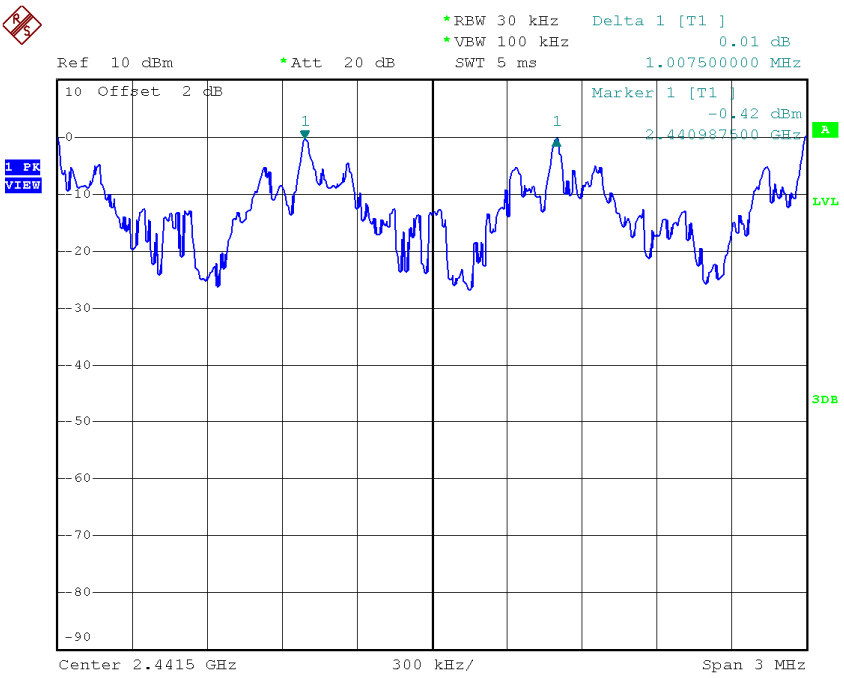
Frequency (MHz)	Channel Separation (MHz)	2/3 of 20dB Bandwidth (MHz)	Test Result
2402	0.999	0.758	Complies
2441	1.008	0.753	Complies
2480	1.002	0.706	Complies

CH00



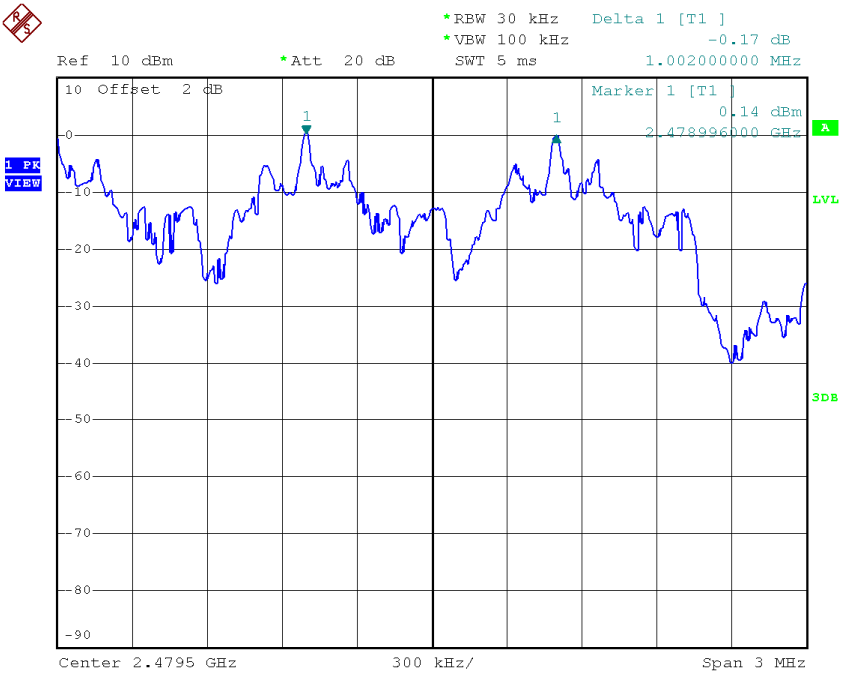
Date: 18.MAR.2015 16:21:56

CH39



Date: 18.MAR.2015 16:23:48

CH78



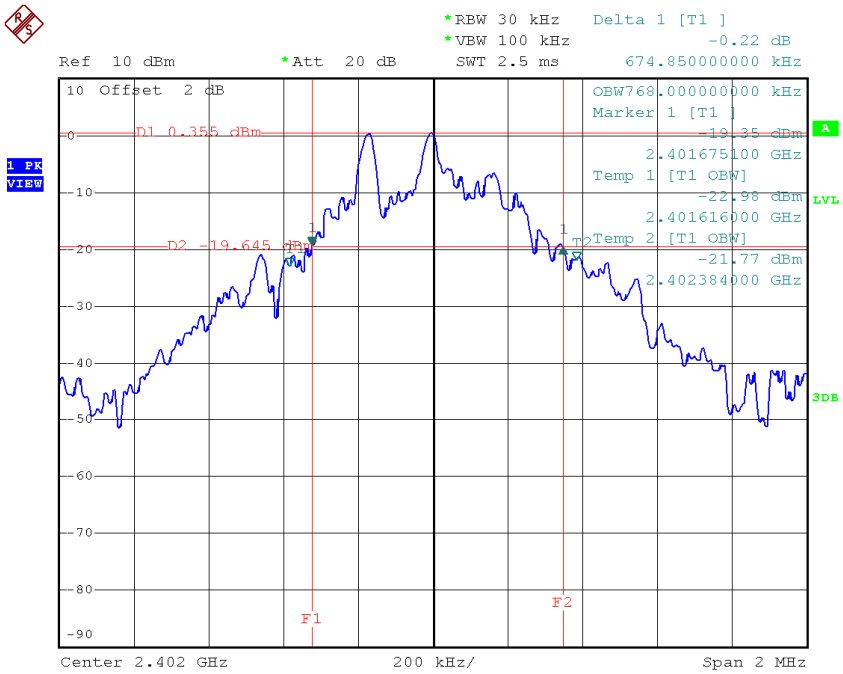
Date: 18.MAR.2015 16:38:09

ATTACHMENT H - BANDWIDTH

Test Mode :	TX Mode _1Mbps

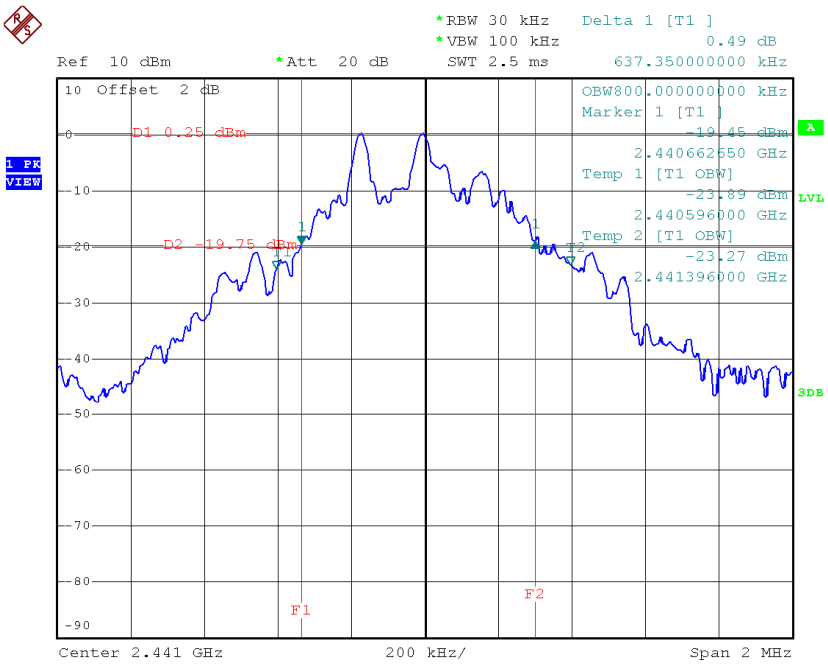
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	0.675	0.768	Complies
2441	0.637	0.800	Complies
2480	0.687	0.860	Complies

CH00



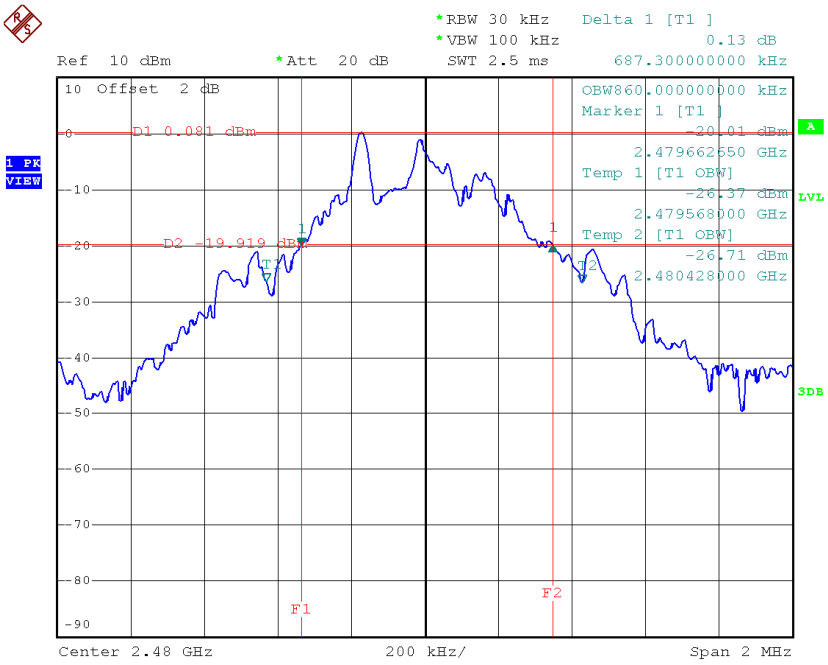
Date: 18.MAR.2015 15:35:38

CH39



Date: 18.MAR.2015 15:36:32

CH78

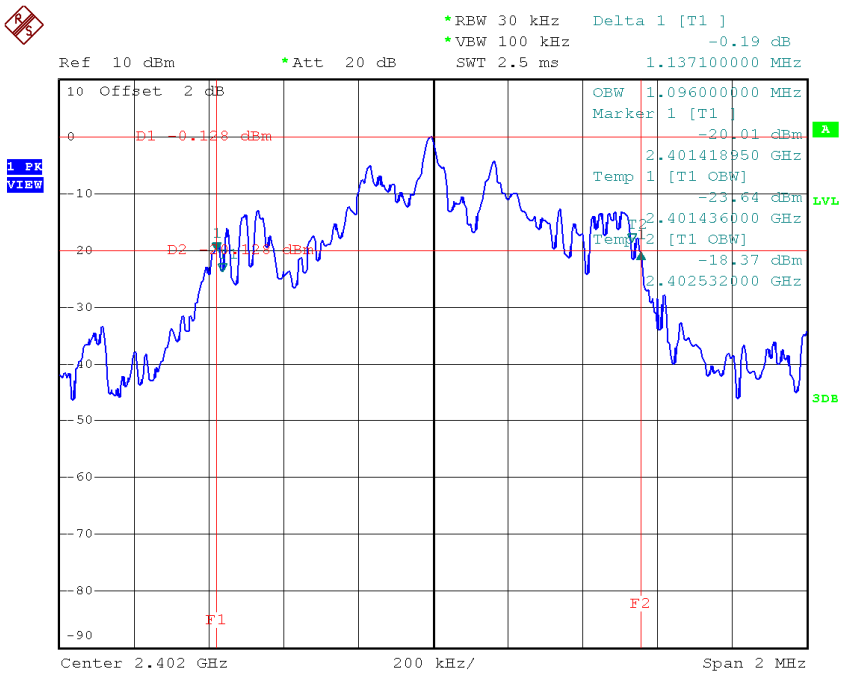


Date: 18.MAR.2015 15:37:08

Test Mode :	TX Mode _3Mbps

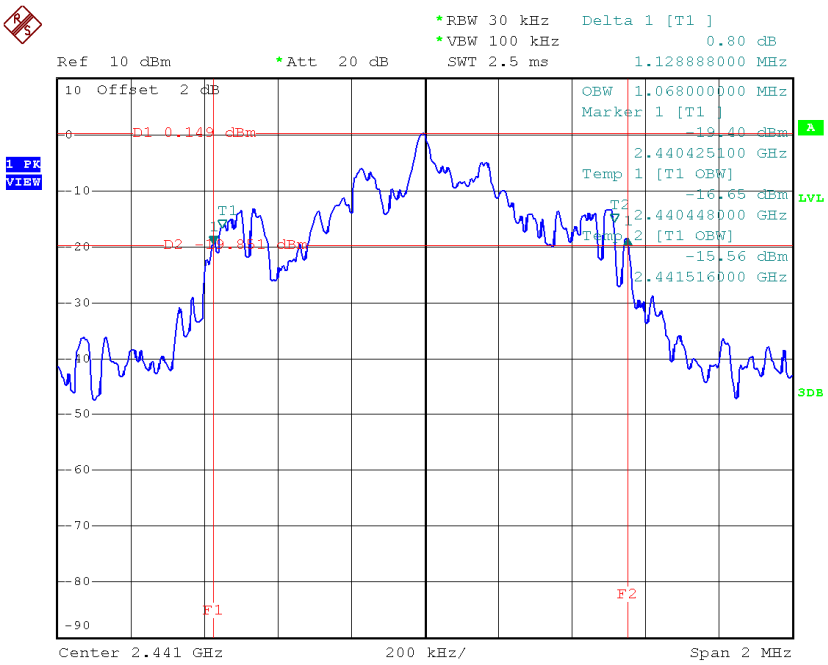
Frequency (MHz)	20dB Bandwidth (MHz)	99% Occupied BW (MHz)	Test Result
2402	1.137	1.096	Complies
2441	1.129	1.068	Complies
2480	1.059	1.084	Complies

CH00



Date: 18.MAR.2015 16:10:21

CH39



Date: 18.MAR.2015 16:11:14

CH78

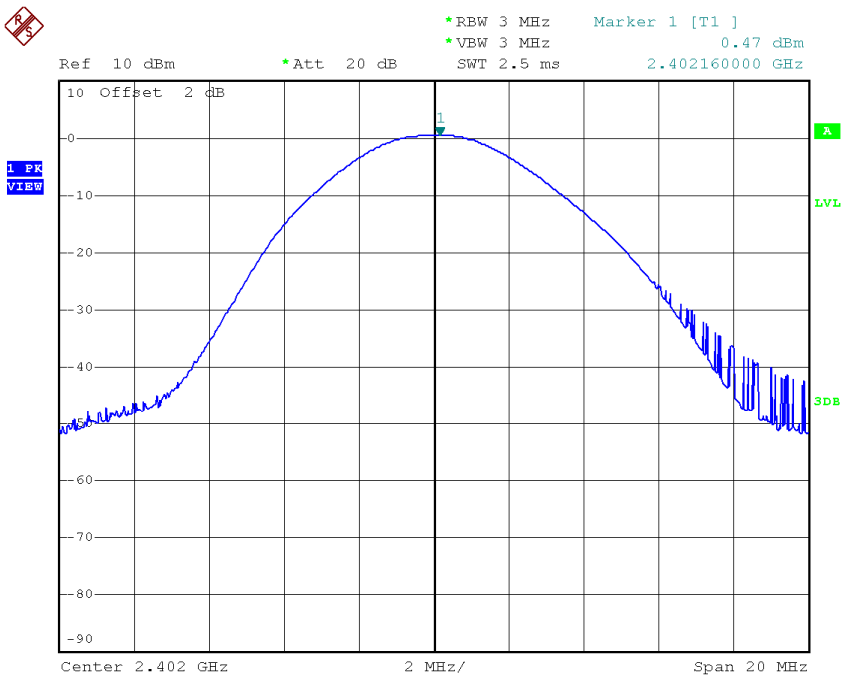
Date: 18.MAR.2015 16:11:48

ATTACHMENT I - PEAK OUTPUT POWER

Test Mode :	TX Mode _1Mbps

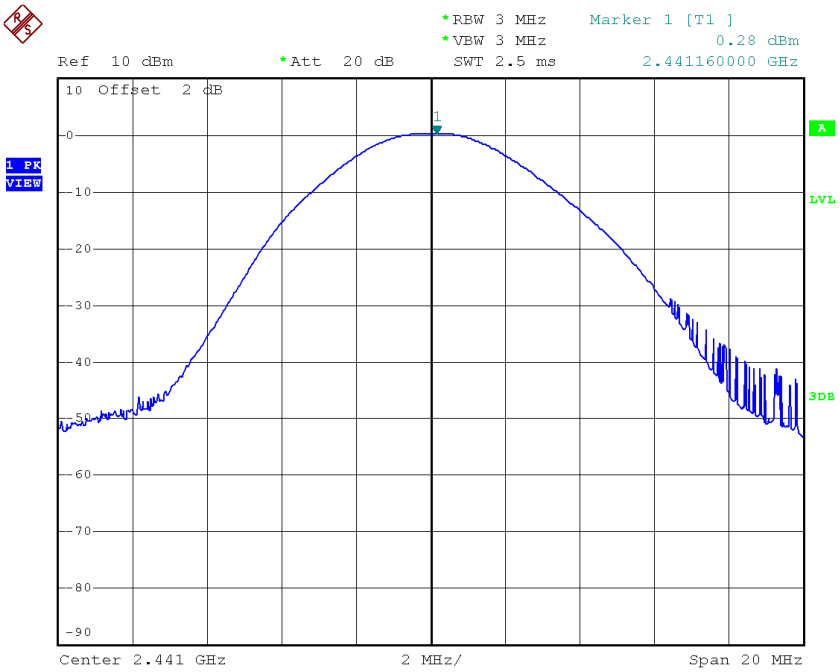
Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	0.47	0.0011	30.00	1.0000	Complies
2441	0.28	0.0011	30.00	1.0000	Complies
2480	0.30	0.0011	30.00	1.0000	Complies

CH00



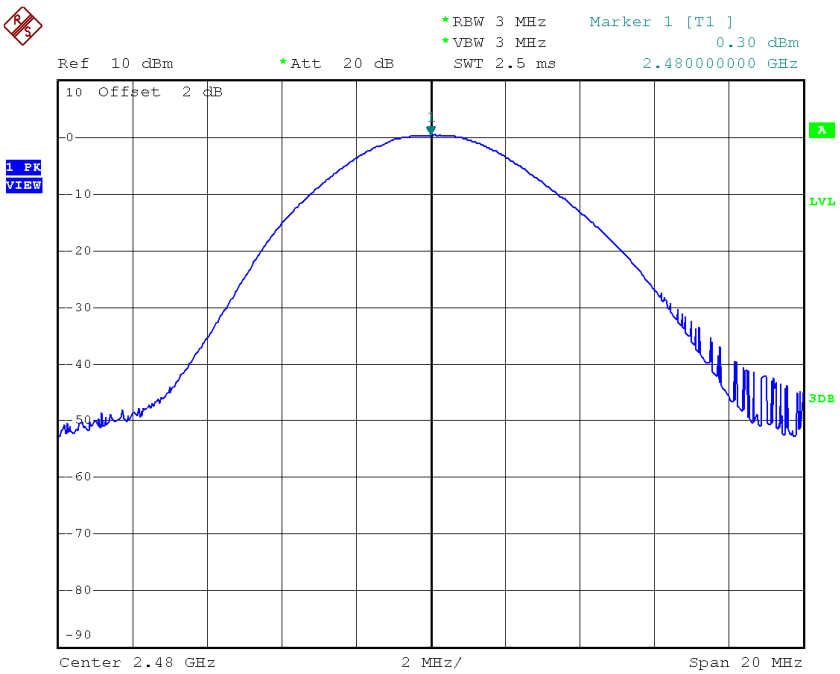
Date: 18.MAR.2015 15:35:57

CH39



Date: 18.MAR.2015 15:36:38

CH78

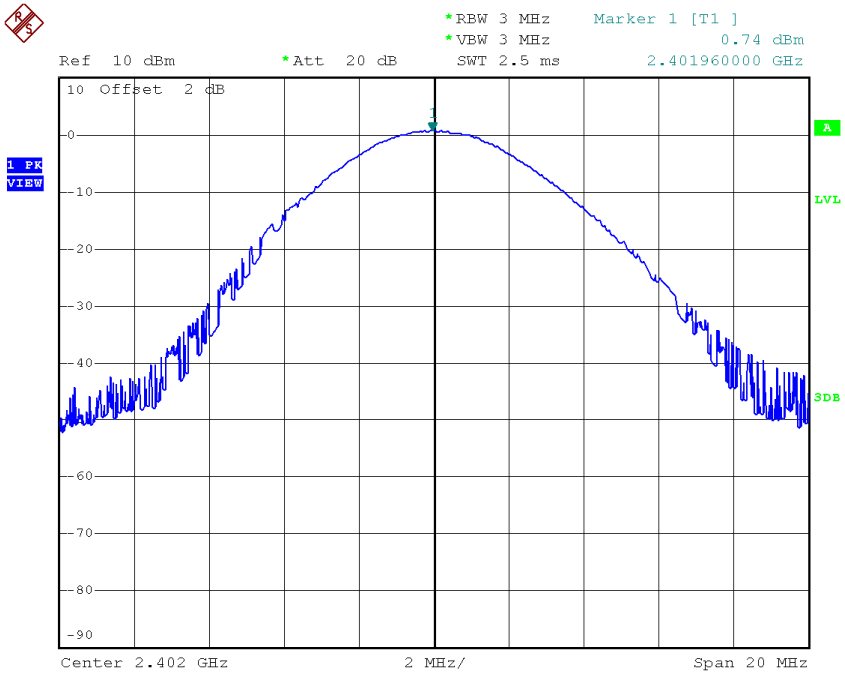


Date: 18.MAR.2015 15:37:35

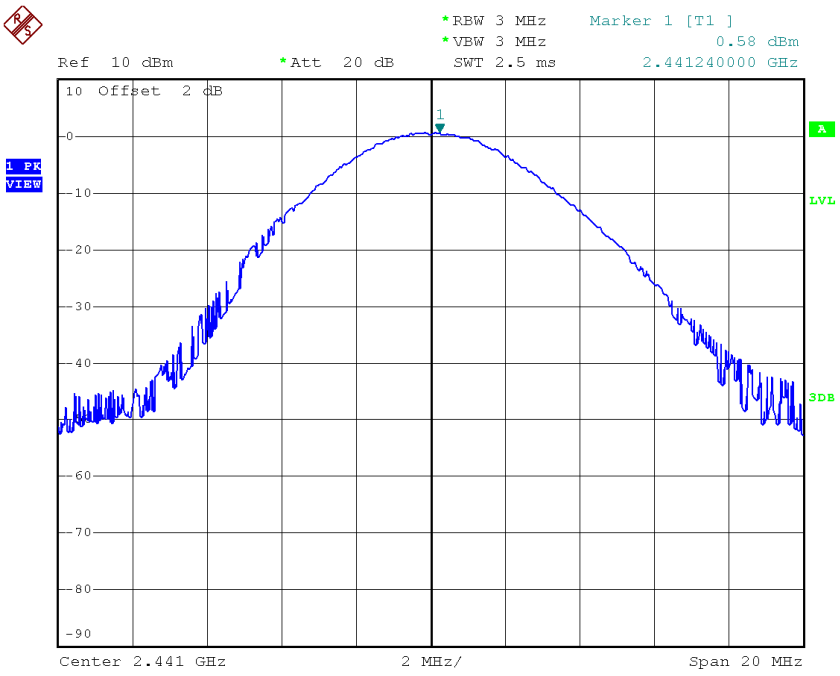
Test Mode :	TX Mode _3Mbps

Frequency (MHz)	Conducted Power (dBm)	Conducted Power (Watt)	Max. Limit (dBm)	Max. Limit (Watt)	Test Result
2402	0.74	0.0012	30.00	1.0000	Complies
2441	0.58	0.0011	30.00	1.0000	Complies
2480	0.74	0.0012	30.00	1.0000	Complies

CH00

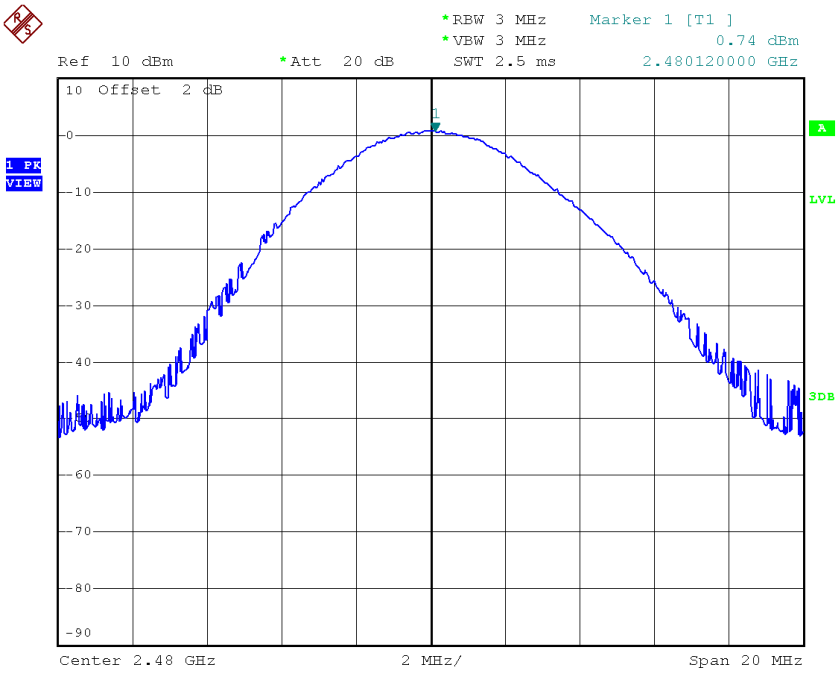


CH39



Date: 18.MAR.2015 16:11:20

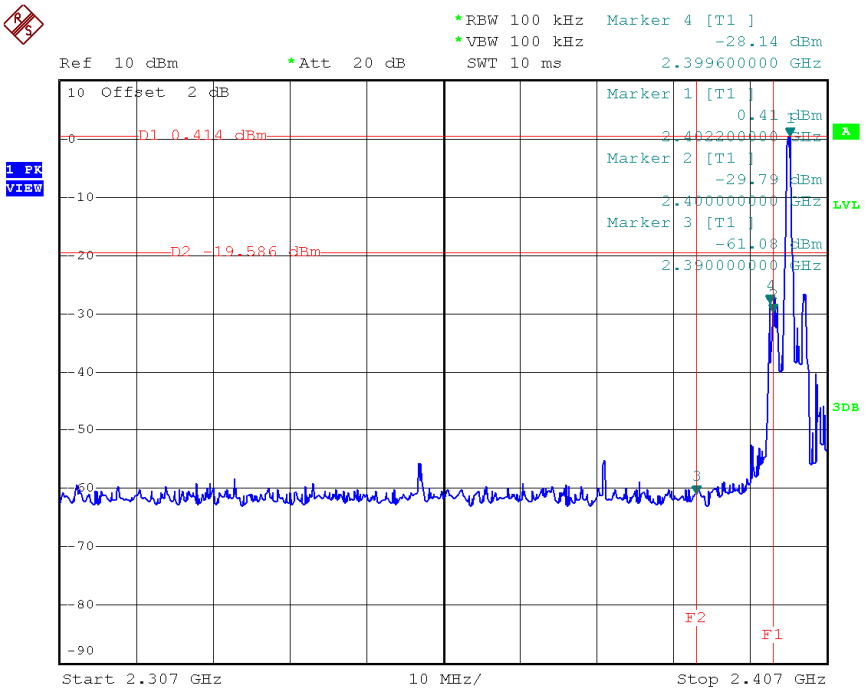
CH78



Date: 18.MAR.2015 16:12:07

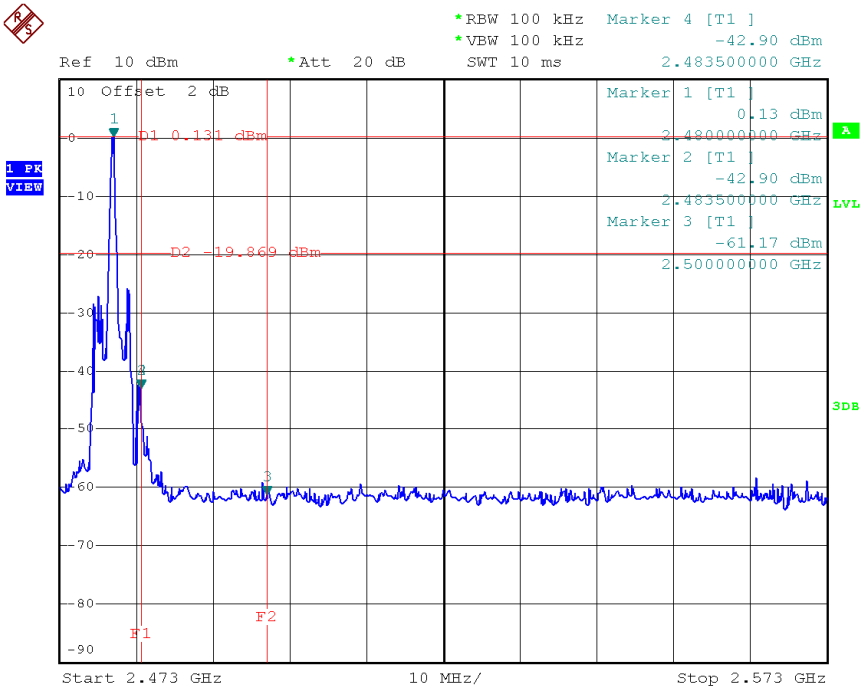
ATTACHMENT J - ANTENNA CONDUCTED SPURIOUS EMISSION

CH00 (Lower)_1Mbps



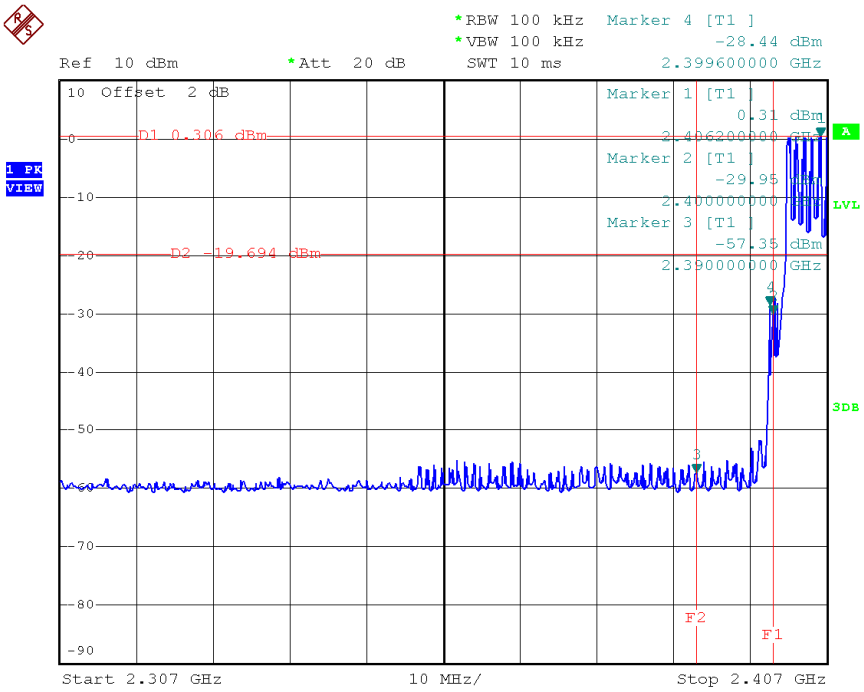
Date: 18.MAR.2015 15:35:29

CH78 (Upper) _1Mbps



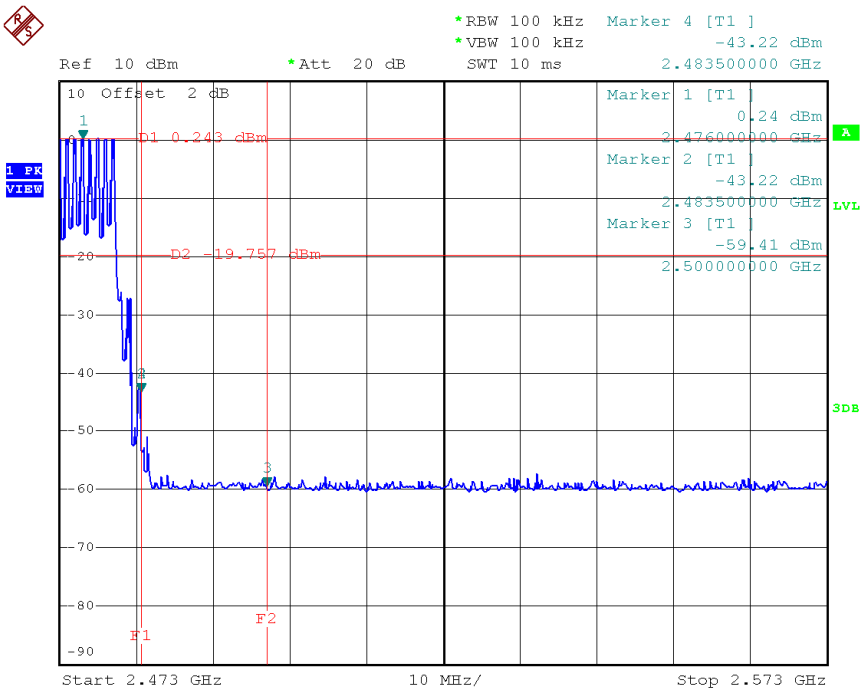
Date: 18.MAR.2015 15:37:02

CH00 Hopping on mode (Lower)_1Mbps



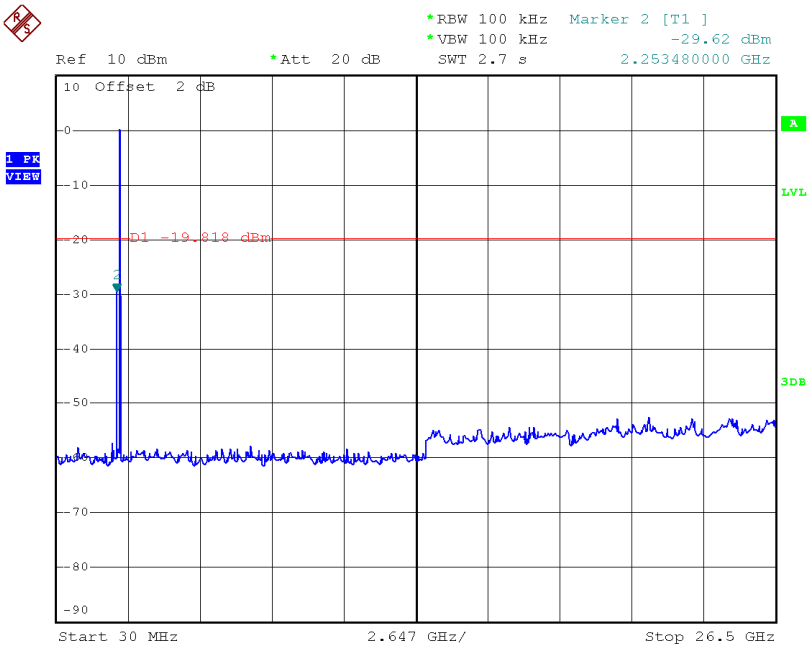
Date: 18.MAR.2015 15:54:56

CH78 Hopping on mode (Upper) _1Mbps



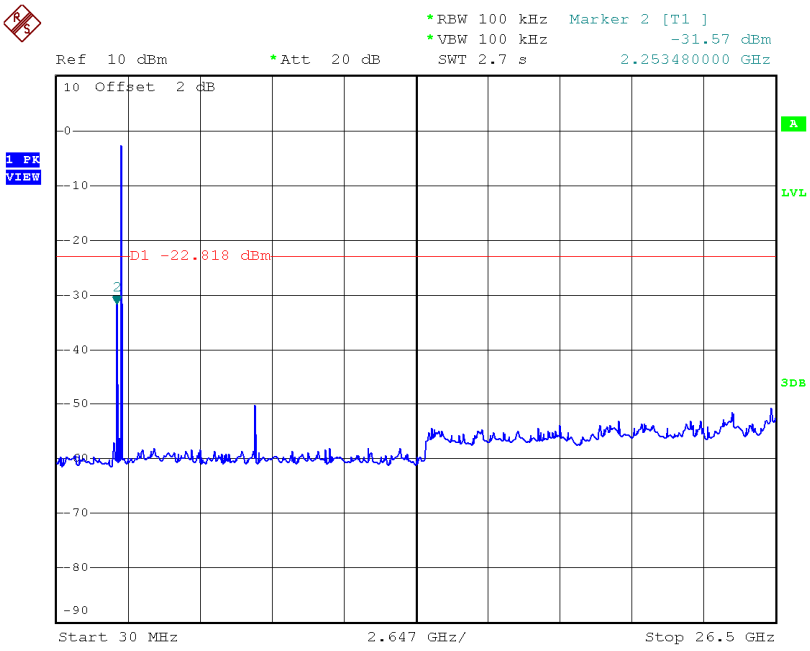
Date: 18.MAR.2015 16:06:19

CH00 (10 Harmonic of the frequency) _1Mbps



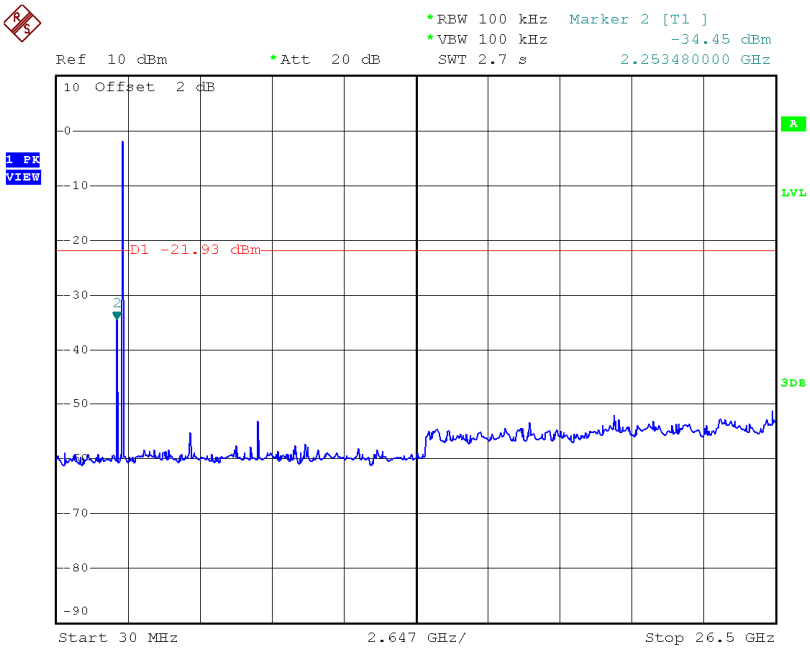
Date: 18.MAR.2015 15:35:51

CH39 (10 Harmonic of the frequency) _1Mbps



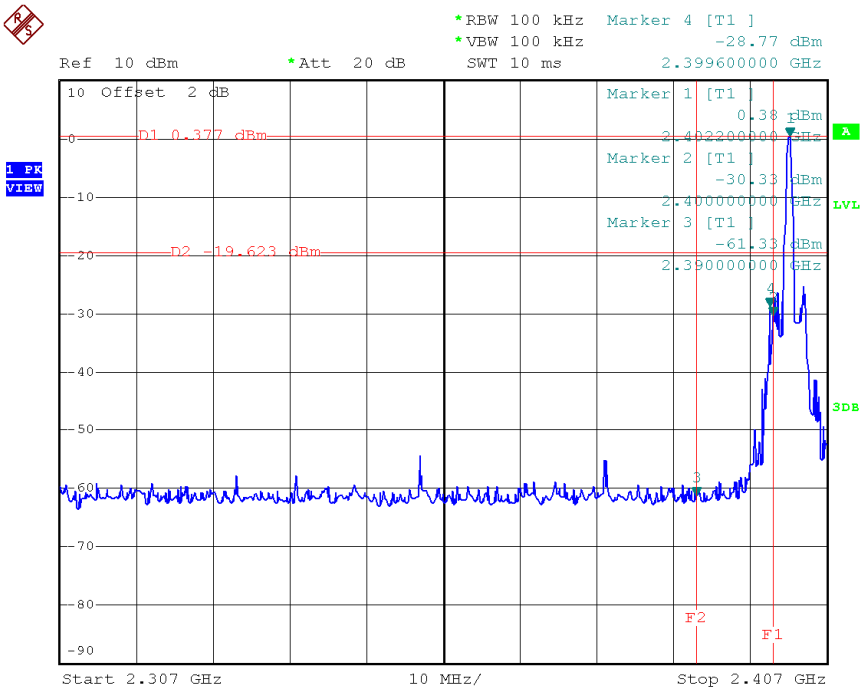
Date: 18.MAR.2015 15:36:25

CH78 (10 Harmonic of the frequency) _1Mbps



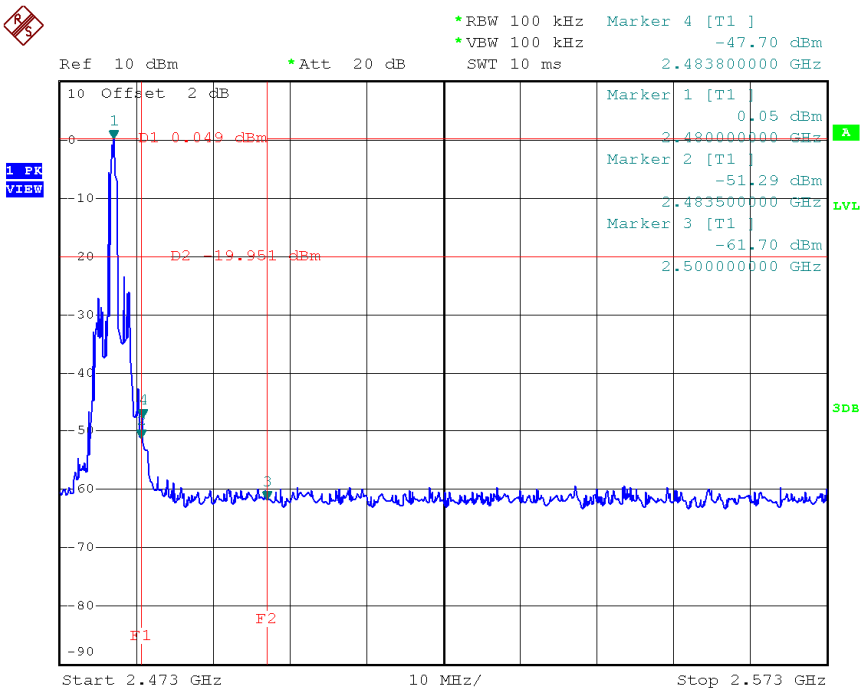
Date: 18.MAR.2015 15:37:29

CH00 (Lower) _3Mbps



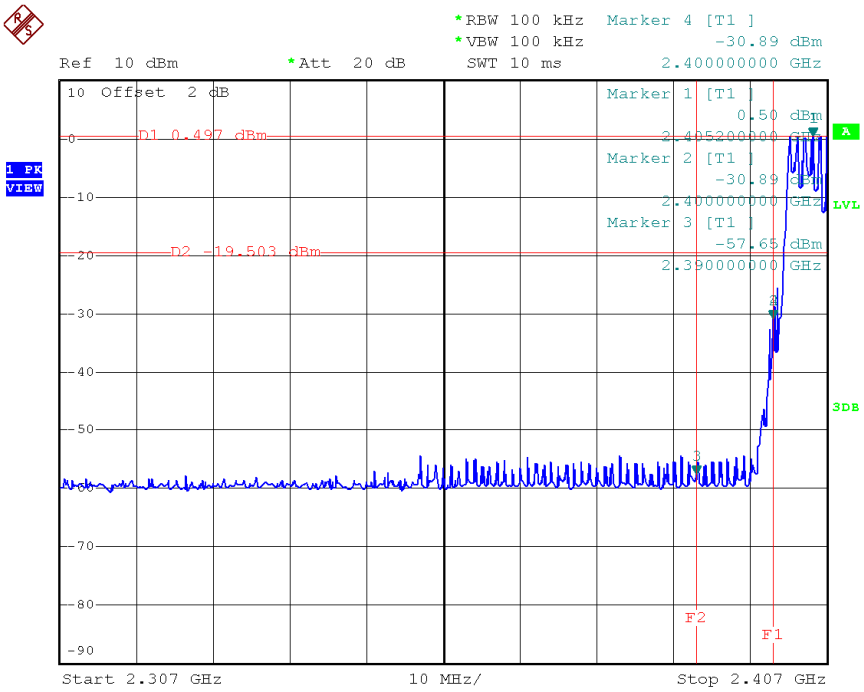
Date: 18.MAR.2015 16:10:13

CH78 (Upper) _3Mbps



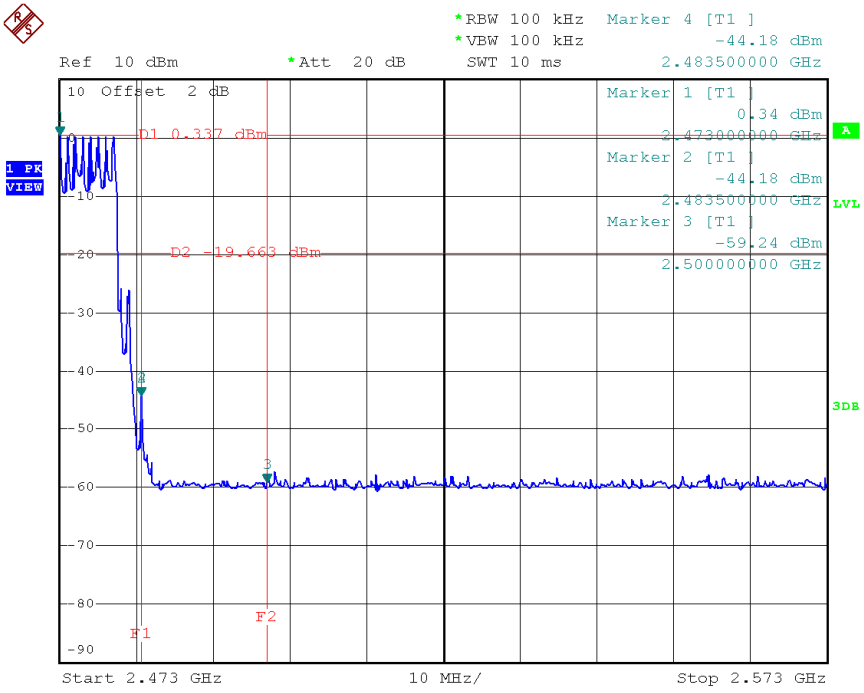
Date: 18.MAR.2015 16:11:40

CH00 Hopping on mode (Lower)_3Mbps



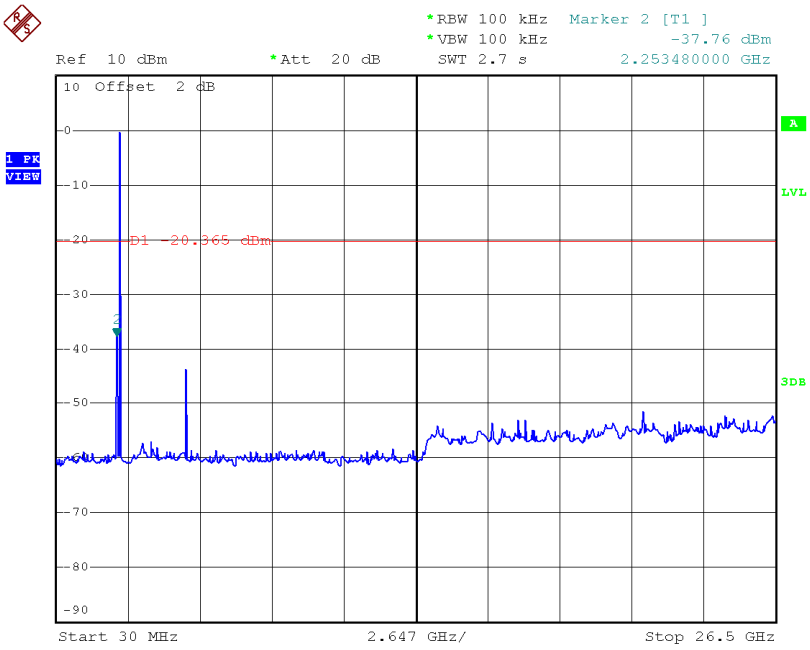
Date: 18.MAR.2015 16:30:29

CH78 Hopping on mode (Upper) _3Mbps



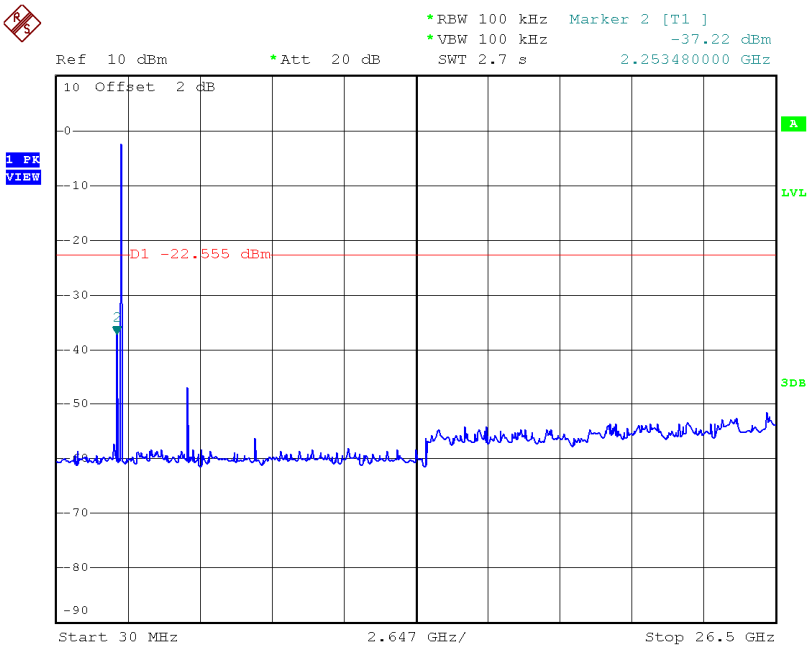
Date: 18.MAR.2015 16:32:34

CH00 (10 Harmonic of the frequency) _3Mbps



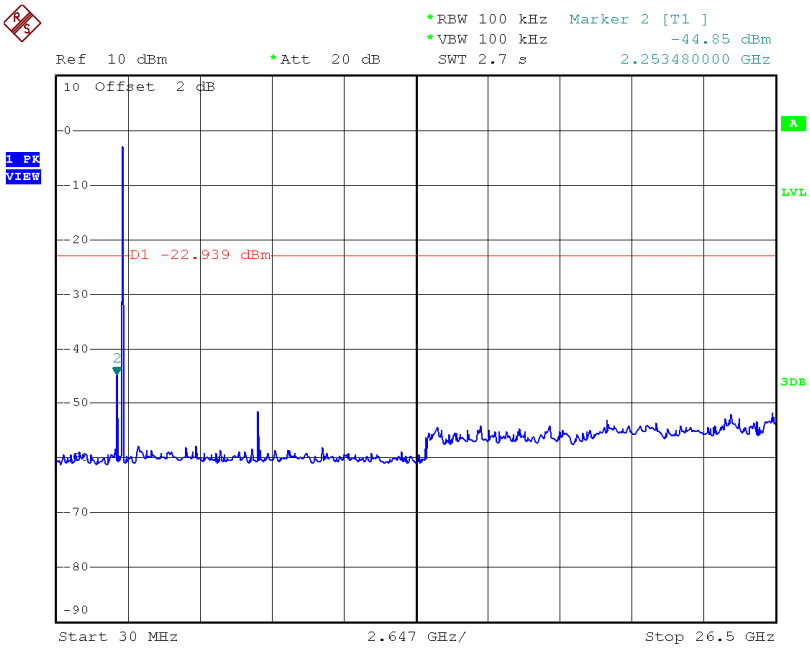
Date: 18.MAR.2015 16:10:34

CH39 (10 Harmonic of the frequency) _3Mbps



Date: 18.MAR.2015 16:11:07

CH78 (10 Harmonic of the frequency) _3Mbps



Date: 18.MAR.2015 16:12:01