



## EMC TEST REPORT for Intentional Radiator

No. 130101217SHA-002

Applicant : Shanghai Feixun Communication Co., Ltd.  
Wing B, 15/F, GDC Building, NO.9 Gaoxinzhong  
3rd Ave., Nanshan, Shenzhen, Guangdong, China

Manufacturer : Shanghai Feixun Communication Co., Ltd.  
Wing B, 15/F, GDC Building, NO.9 Gaoxinzhong  
3rd Ave., Nanshan, Shenzhen, Guangdong, China

Product Name : 300M Wireless N NAS router

Type/Model : FWR-714U

### SUMMARY

The equipment complies with the requirements according to the following standard(s):

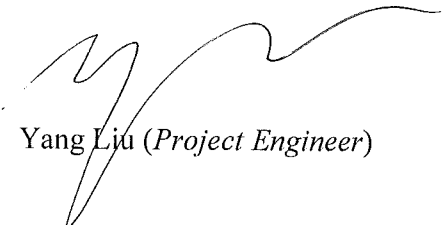
**47CFR Part 15 (2011):** Radio Frequency Devices


**ANSI C63.4 (2003):** American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Date of issue: March 6, 2013

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Reviewed by:

  
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## Description of Test Facility

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## 1. General Information

### 1.1 Applicant Information

Applicant: Shanghai Feixun Communication Co., Ltd.  
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3rd Ave., Nanshan, Shenzhen, Guangdong, China

Manufacturer: Shanghai Feixun Communication Co., Ltd.  
Wing B, 15/F, GDC Building, NO.9 Gaoxinzhong  
3rd Ave., Nanshan, Shenzhen, Guangdong, China

Sample received date : January 18, 2013

Date of test : January 18, 2013 ~ March 4, 2013

### 1.2 Identification of the EUT

Equipment: 300Mbps Wireless N Router

Type/model: FWR-714U



1.3 Technical specification

Operation Frequency Band: 2400-2483.5 MHz  
 Modulation: DSSS (802.11b) OFDM (802.11g/HT20/HT40)  
 Gain of Antenna: Fixed Omni-directional Antenna , 3dBi  
 Rating: DC voltage supplied from AC/DC adapter:  
 Model: RD1200500-CS5-8MG  
 I/P: 100-240V~ 50/60Hz 250mA  
 O/P: 12VDC 0.5A

Description of EUT: The EUT has only one model.  
 The EUT supports wireless network of 802.11b/g/n  
 The RF module used contains of two chains, namely chain 0 and chain 1.

Port identification:

Port	Description	Type	Number
1	Storage	USB2.0	1
2	LAN	RJ45	4
3	WAN	RJ45	1

Dimension: 185mm x 124mm x 27mm  
 Declared Temperature range: 0°C ~ 40°C  
 Channel Description: Channel with 5MHz step  
 Category of EUT: Class B  
 Highest working frequency : >1GHz

EUT type:  Table top  
 Floor standing

Channel List CH1-CH11 for 802.11b/g/n (HT20)  
 CH3-CH9 for 802.11n (HT40)

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	4	2427	7	2442	10	2457
2	2417	5	2432	8	2447	11	2462
3	2422	6	2437	9	2452		

**1.4 Mode of operation during the test / Test peripherals used**

While testing transmitting mode of EUT, the internal modulation and continuously transmission was applied.

The power level setting for 802.11a/b/g/n is default indicated in software offered by the manufactory (Ralink QA test Program).

Test peripherals used:

Item No	Description	Band and Model	S/No
1	Laptop computer	HP Probook 6460b	NA

The lowest, middle and highest channel were tested as representatives.

*For 802.11b/g/n (HT20)----- lowest, 2412MHz; middle, 2437MHz; highest, 2462MHz.*

*For 802.11n HT40 ----- lowest, 2422MHz; middle, 2437MHz; highest, 2452MHz.*

Antenna information:

PCB antenna



## 2. Test Specification

### 2.1 Instrument list

Equipment	Type	Manu.	Internal no.	Cal. Date	Due date
Test Receiver	ESIB 26	R&S	EC 3045	2012-10-21	2013-10-20
Semi-anechoic chamber	-	Albatross project	EC 3048	2012-5-21	2013-5-20
Bilog Antenna	CBL 6112D	TESEQ	EC 4206	2011-5-16	2013-5-15
Horn antenna	HF 906	R&S	EC 3049	2011-5-13	2013-5-12
Pre-amplifier	Pre-amp 18	R&S	EC 3222	2012-4-12	2013-4-11
Test Receiver	ESCS 30	R&S	EC 2107	2012-10-21	2013-10-20
A.M.N.	ESH2-Z5	R&S	EC 3119	2013-1-9	2014-1-8
A.M.N.	ESH3-Z5	R&S	EC 2109	2013-1-10	2014-1-9
High Pass Filter	WHKX 1.0/15G-10SS	Wainwright	EC4297-1	2013-2-8	2014-2-7
High Pass Filter	WHKX 2.8/18G-12SS	Wainwright	EC4297-2	2013-2-8	2014-2-7
High Pass Filter	WHKX 7.0/1.8G-8SS	Wainwright	EC4297-3	2013-2-8	2014-2-7
Band Reject Filter	WRCGV 2400/2483- 2390/2493- 35/10SS	Wainwright	EC4297-4	2013-2-8	2014-2-7
Test Receiver	FSV40	R&S	/	2012-10-21	2013-10-20
Preamplifier	AP-025C	Quietek	QT-AP003	2012-11-25	2013-11-24
Preamplifier	AP-180C	Quietek	CHM- 0602013	2012-11-25	2013-11-24
Broad-Band Horn Antenna	BBHA9120D	Schwarzbeck	496	2012-11-25	2013-11-24
Broad-Band Horn Antenna	BBHA9170	Schwarzbeck	294	2012-11-25	2013-11-24

### 2.2 Test Standard

47CFR Part 15 (2011)  
ANSIC63.4 (2003)



### 2.3 Test Summary

**This report applies to tested sample only. This report shall not be reproduced in part without written approval of Intertek Testing Service Shanghai Limited.**

TEST ITEM	FCC REFERANCE	RESULT
Minimum 6dB Bandwidth	15.247(a)(2)	Pass
Maximum peak output power	15.247(b)	Pass
Power spectrum density	15.247(e)	Pass
Radiated emission	15.205 & 15.209	Pass
Emission outside the frequency band	15.247(d)	Pass
Power line conducted emission	15.207	Pass

**2.4 Chain Power**

Mode	Chain	CH	Output Power (dBm)
802.11b	0	M	17.49
	1	M	<b>18.82</b>
802.11g	0	M	18.13
	1	M	<b>19.53</b>
802.11n, HT20	0	L	18.55
	1	L	<b>19.25</b>
802.11n, HT40	0	L	17.78
	1	L	<b>18.78</b>

**Based on the test data above, in this report, the chain 1 with higher output power is chosen to perform all tests for single chain mode.**

**2.5 Data rate VS power**

Mode	Data Rate (Mbps)	CH	Level at Chain 1 (dBm)
802.11b	1	M	18.82
	2	M	19.27
	5.5	M	20.68
	11	M	<b>21.79</b>
802.11g	6	M	19.53
	9	M	19.67
	12	M	19.60
	18	M	19.61
	24	M	20.08
	36	M	20.26
	48	M	20.40
54	M	<b>20.77</b>	
802.11n HT20	MCS0	L	19.25
	MCS1	L	19.25
	MCS2	L	19.23
	MCS3	L	19.59

	MCS4	L	19.53
	MCS5	L	19.63
	MCS6	L	19.81
	MCS7	L	<b>20.17</b>
802.11n, HT40	MCS0	H	18.78
	MCS1	H	18.69
	MCS2	H	19.11
	MCS3	H	19.43
	MCS4	H	19.49
	MCS5	H	20.16
	MCS6	H	19.78
	MCS7	H	<b>20.23</b>

**Based on the test data above, in this report, the highest speed is applied for all tests in every mode.**

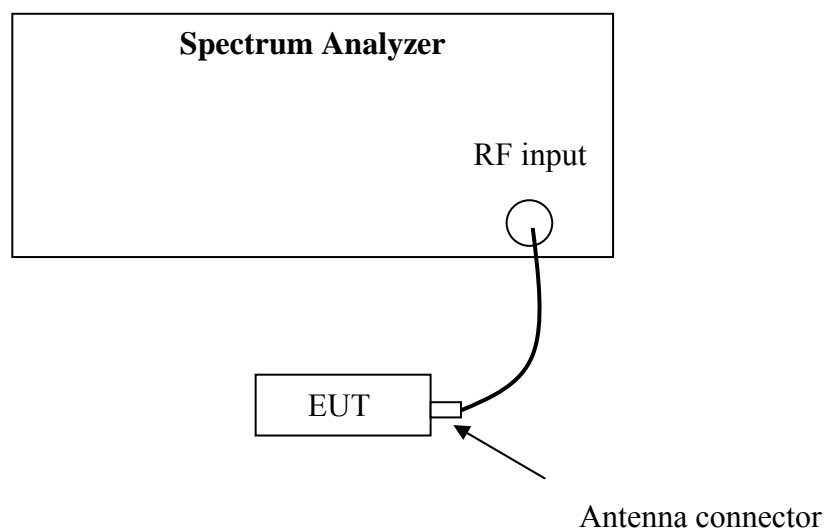
### 3. Minimum 6dB Bandwidth

Test result: PASS

#### 3.1 Limit

For systems using digital modulation techniques that may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz and 5725 - 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz.

#### 3.2 Test Configuration



#### 3.3 Test Procedure and test setup

The minimum 6dB bandwidth per FCC §15.247(a)(2) is measured using the Spectrum Analyzer according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v02” for compliance to FCC 47CFR 15.247 requirements.

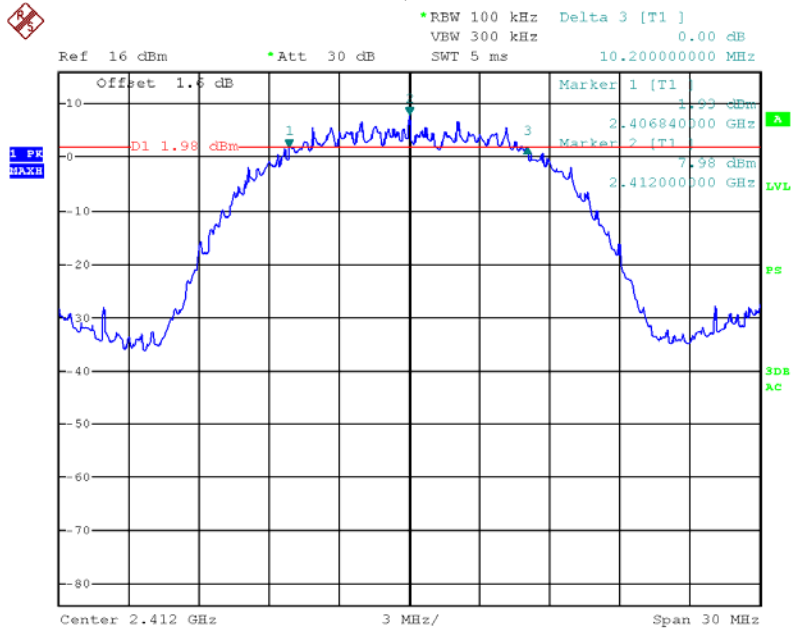
**3.4 Test Protocol**

Temperature : 22°C  
 Relative Humidity : 43%

**Single Chain**

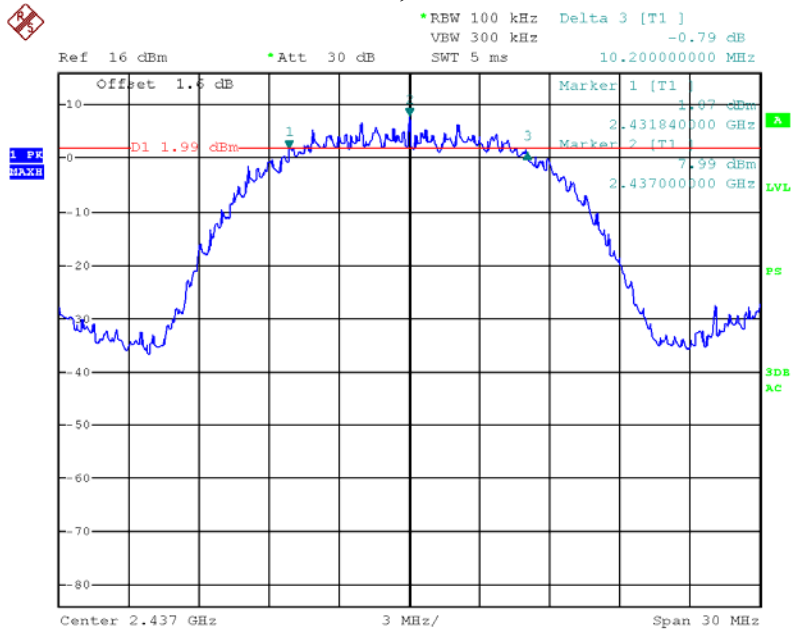
Mode	CH	Chain 1 (MHz)	Limit (MHz)
802.11b	L	10.20	≥0.5
	M	10.20	
	H	10.26	
802.11g	L	16.44	
	M	16.44	
	H	16.44	
802.11n, HT20	L	16.74	
	M	16.56	
	H	16.80	
802.11n, HT40	L	35.32	
	M	35.32	
	H	35.32	

11b, Channel L



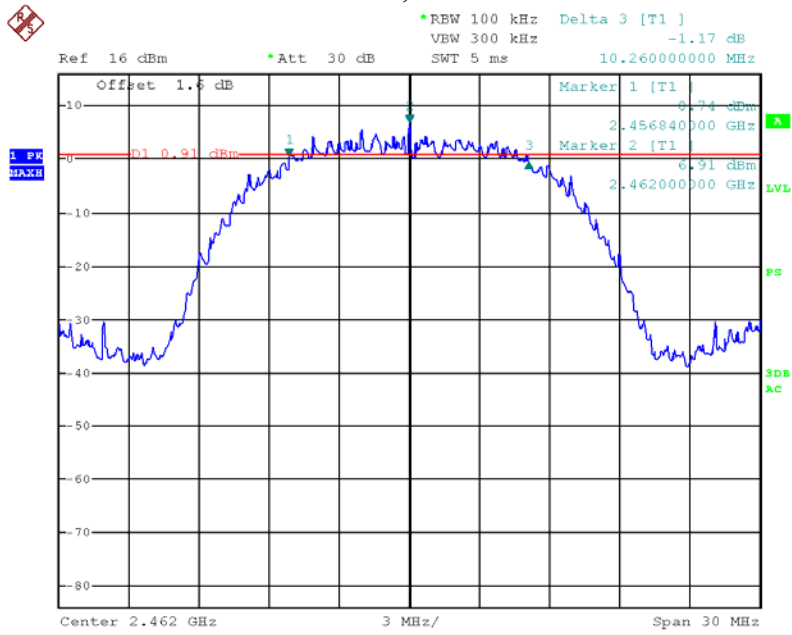
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11b, Channel M



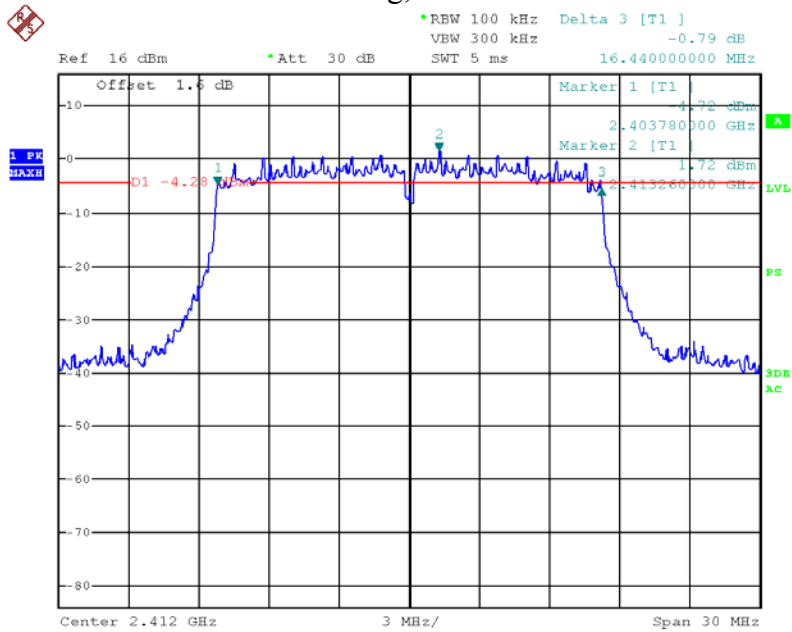
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11b, Channel H



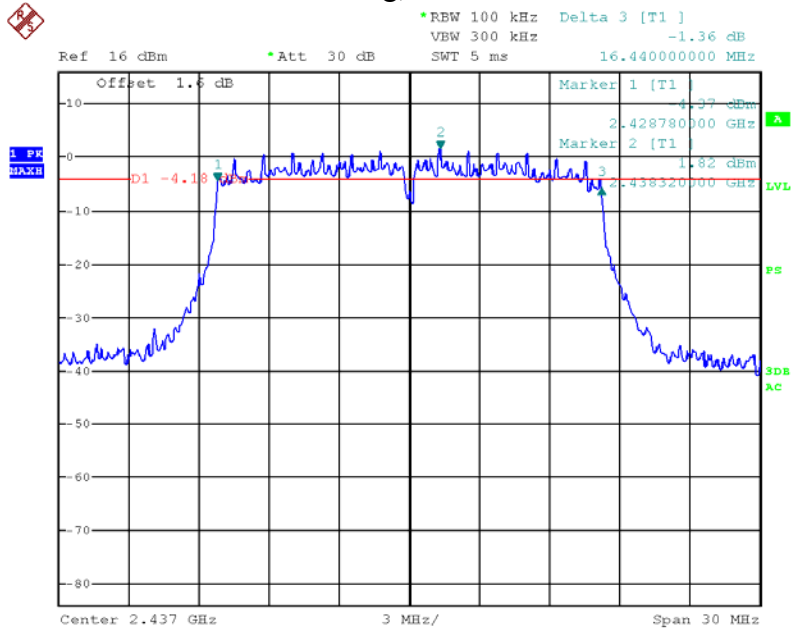
Date: 17.JAN.2013 17:19:07

11g, Channel L



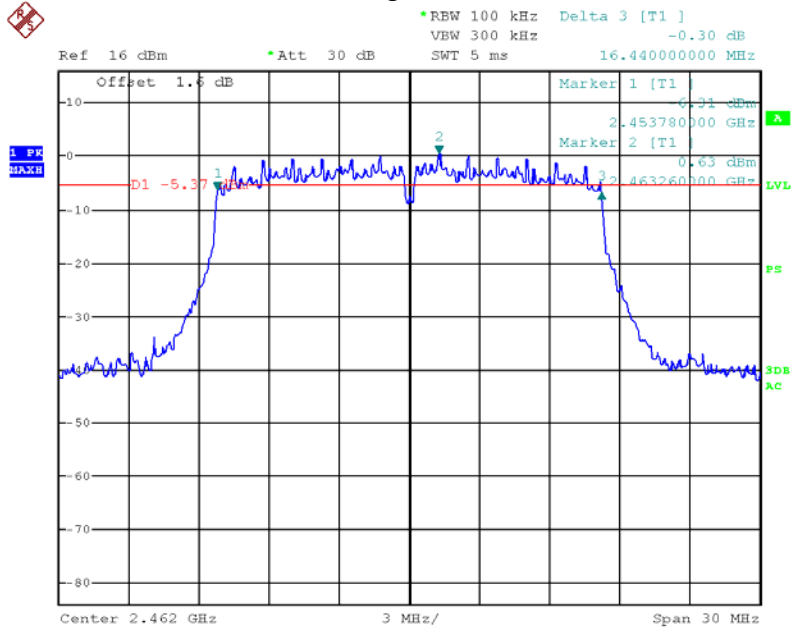
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11g, Channel M



Date: 17.JAN.2013 17:23:45

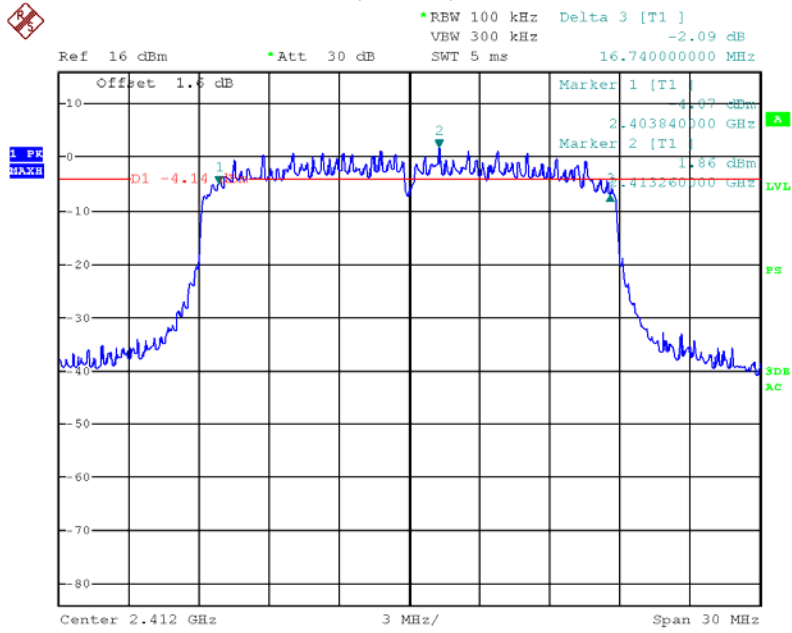
11g, Channel H



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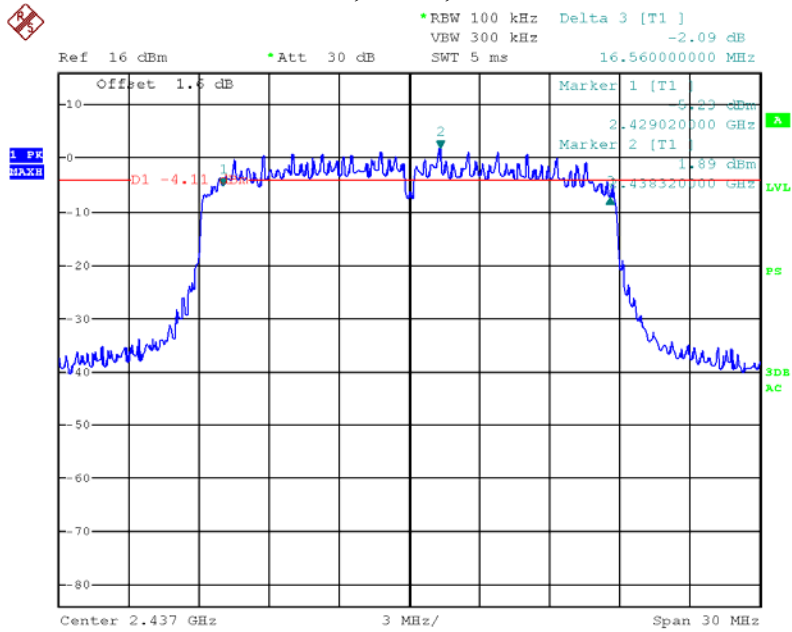


11n, HT20, Channel L



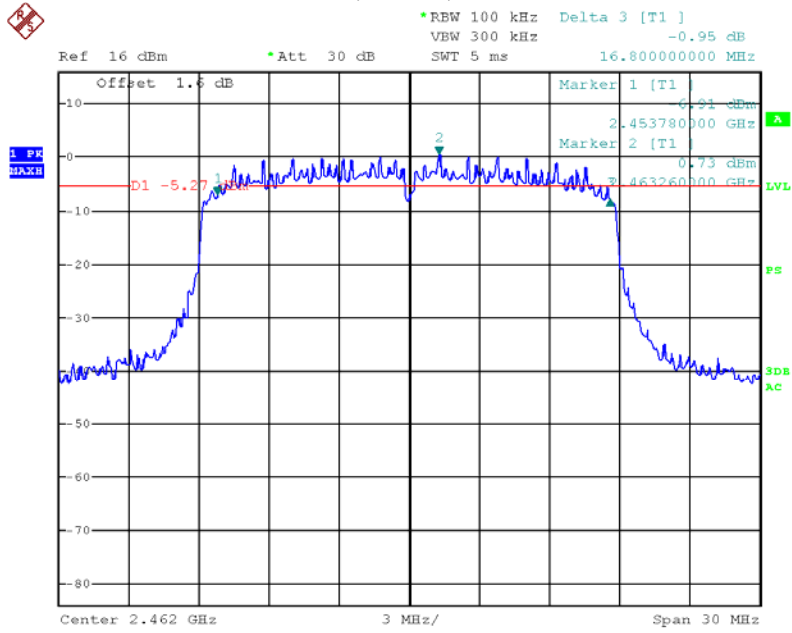
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11n, HT20, Channel M



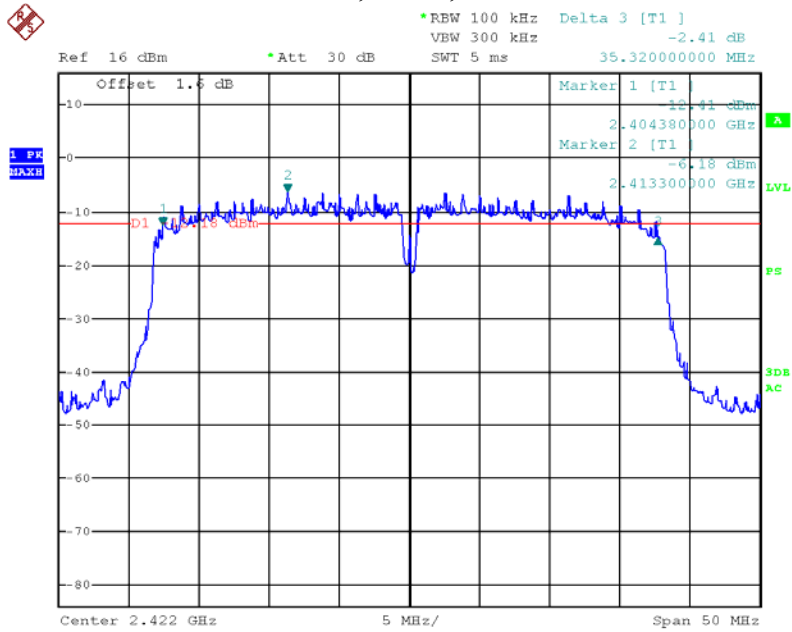
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11n, HT20, Channel H



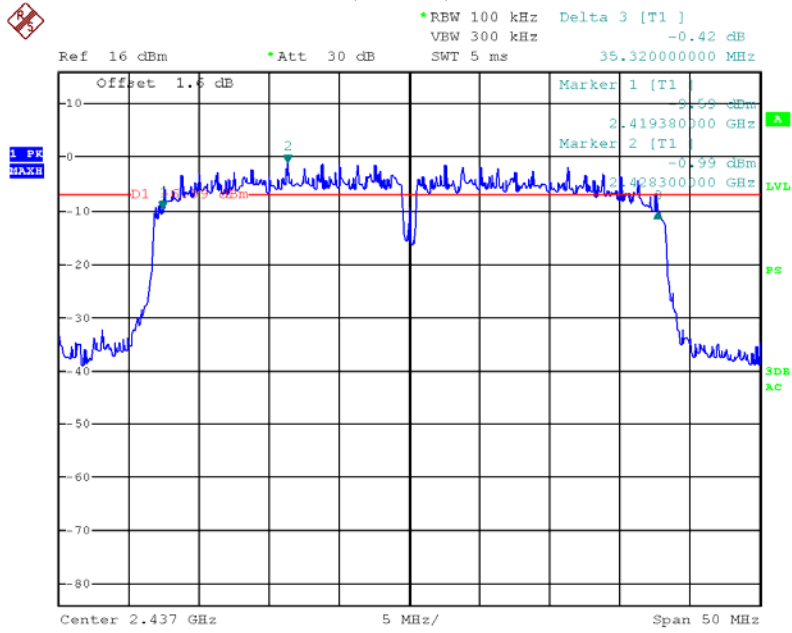
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11n, HT40, Channel L



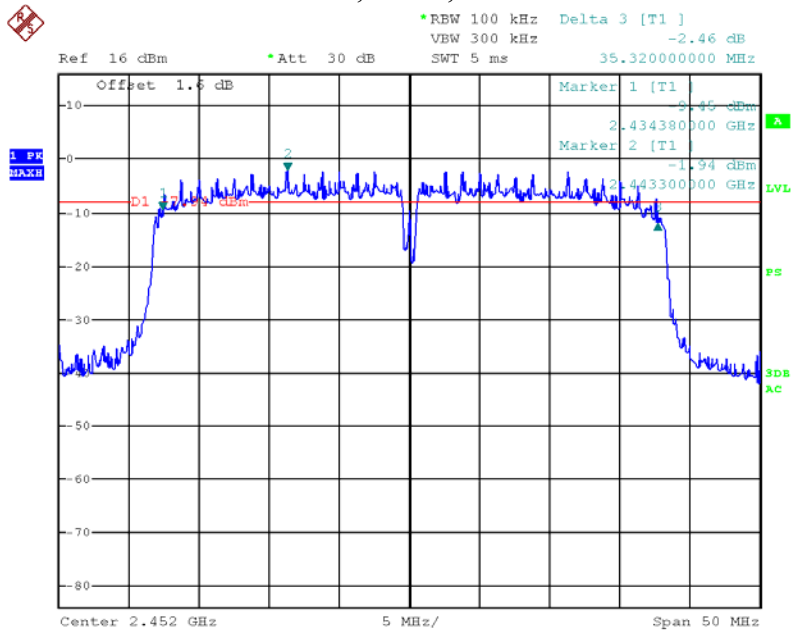
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11n, HT40, Channel M



Date: 17.JAN.2013 17:35:17

11n, HT40, Channel H



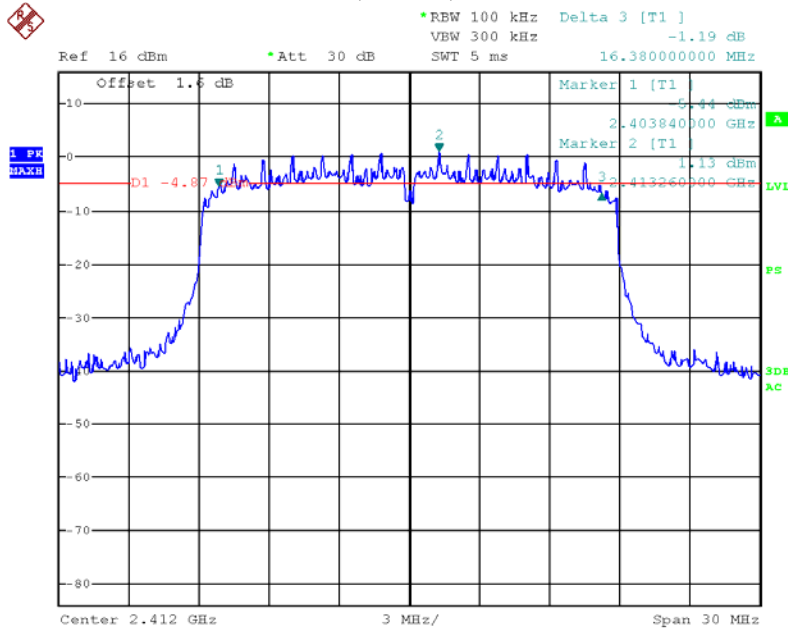
Date: 17.JAN.2013 17:34:07



Dual Chain

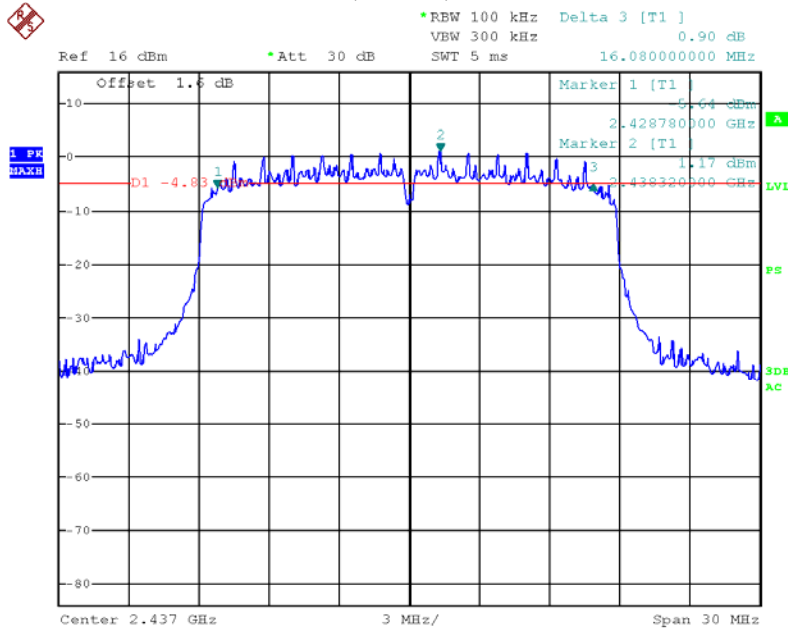
Mode	CH	Chain 1 (MHz)	Limit (MHz)
11na, HT20	L	16.38	$\geq 0.5$
	M	16.08	
	H	15.80	
11na, HT40	L	35.32	$\geq 0.5$
	M	35.30	
	H	35.30	

11n, HT20, Channel L



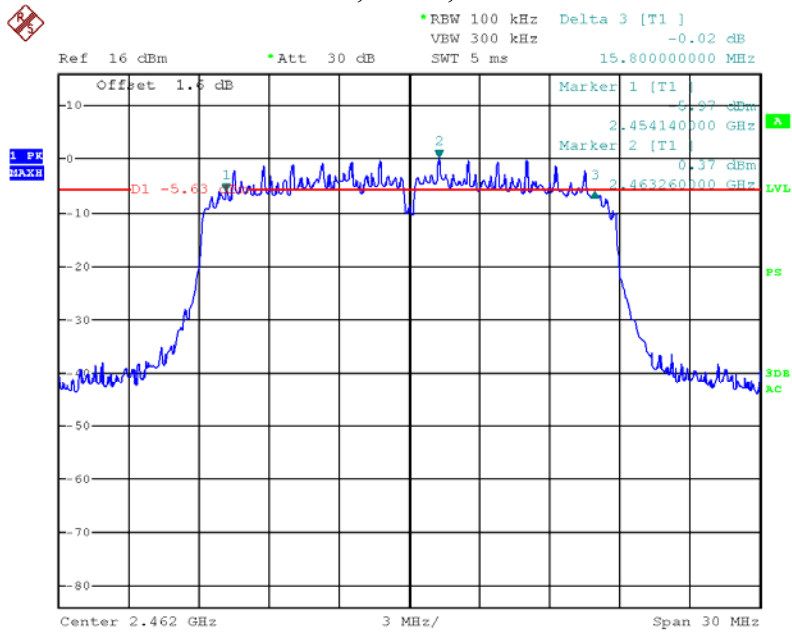
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11n, HT20, Channel M



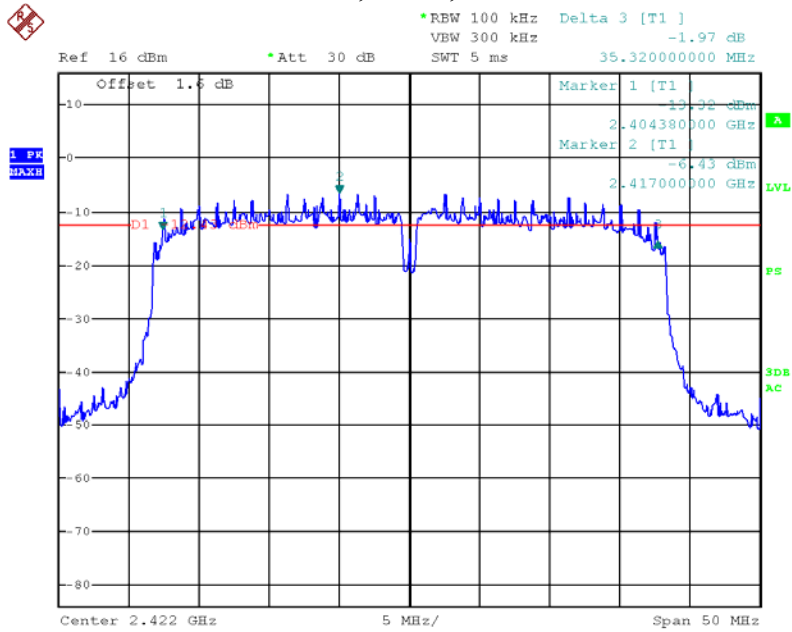
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11n, HT20, Channel H



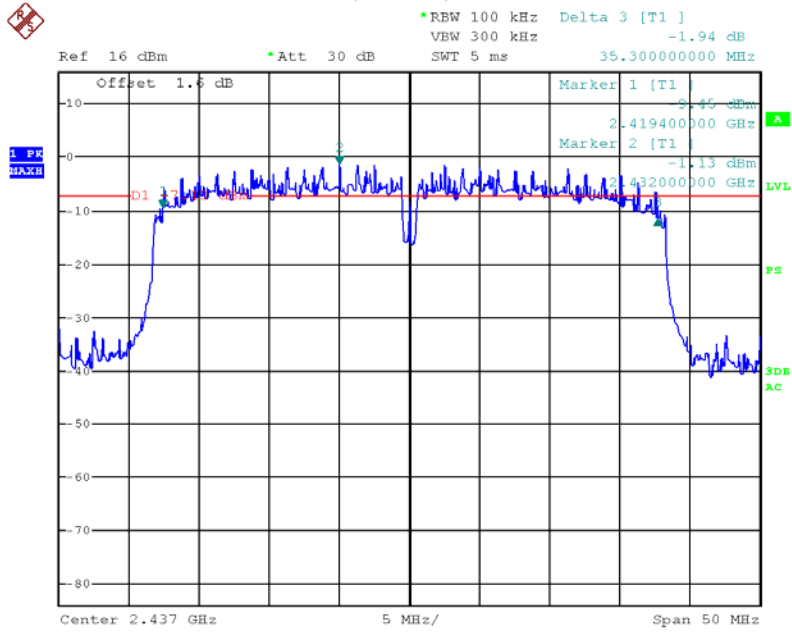
Date: 17.JAN.2013 17:42:32

11n, HT40, Channel L



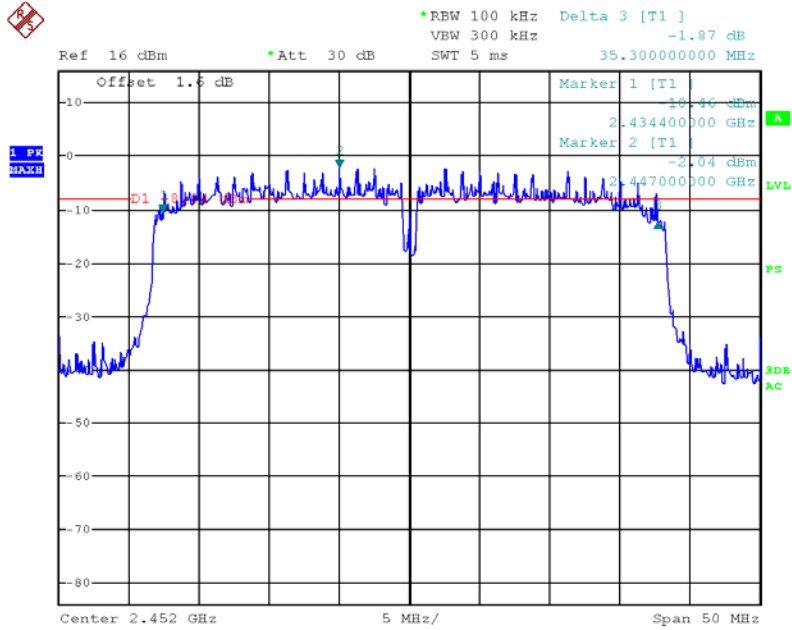
Date: 17.JAN.2013 17:38:32

### 11n, HT40, Channel M



Date: 17.JAN.2013 17:39:43

### 11n, HT40, Channel H



Date: 17.JAN.2013 17:40:39

#### 4. Maximum peak output power

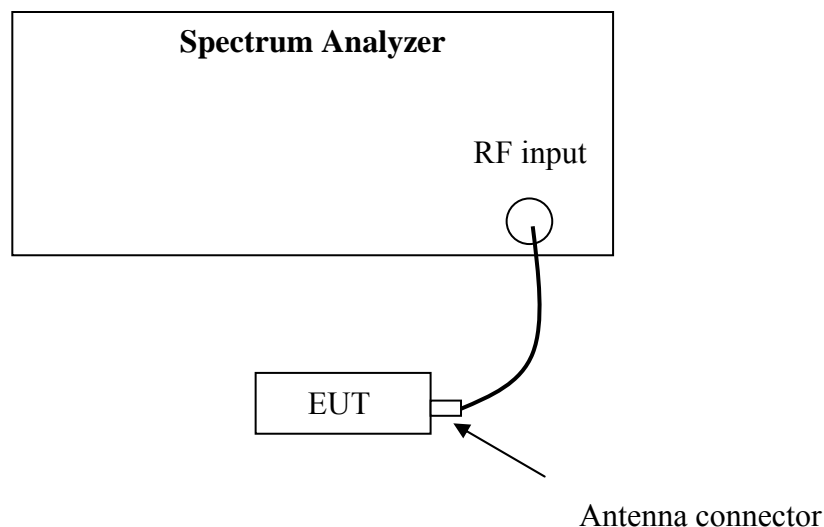
**Test result: Pass**

##### 4.1 Test limit

- For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725-5850 MHz band: 1 watt
- For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts
- For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt.

If the transmitting antenna of directional gain greater than 6dBi is used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

##### 4.2 Test Configuration



##### 4.3 Test procedure and test setup

The EUT was tested according to DTS test procedure of "KDB558074 D01 DTS Meas Guidance v02" for compliance to FCC 47CFR 15.247 requirements (Measurement Procedure PK option 2).



**4.4 Test protocol**

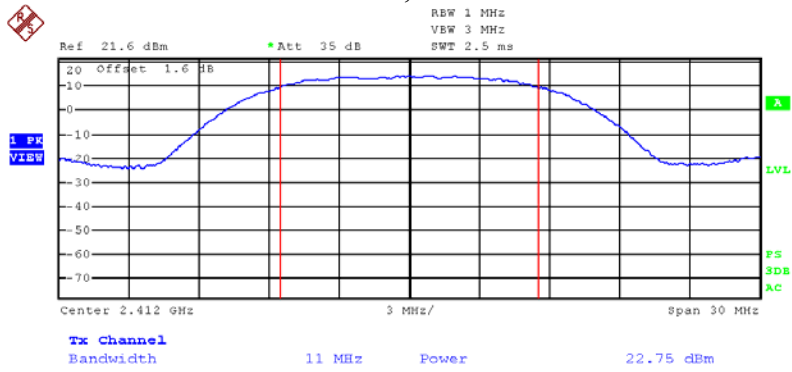
Temperature: 22 °C

Relative Humidity: 43 %

**Single Chain**

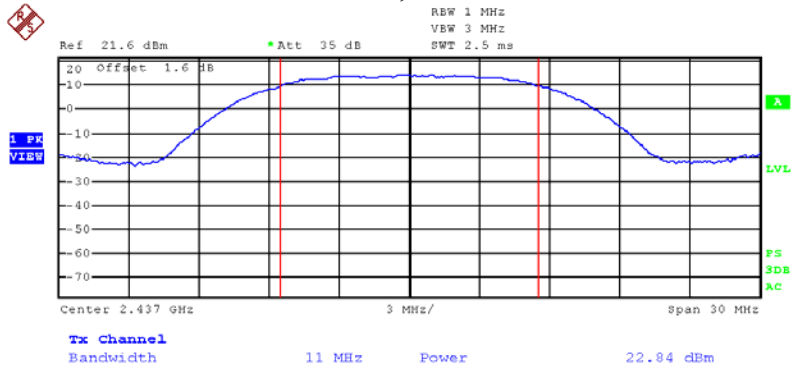
<b>Mode</b>	<b>CH</b>	<b>Chain 1 (dBm)</b>	<b>Limit (dBm)</b>
11b	L	22.75	≤30
	M	22.84	
	H	21.75	
11g	L	21.72	
	M	21.67	
	H	20.75	
11n, HT20	L	21.36	
	M	21.36	
	H	20.16	
11n, HT40	L	16.38	
	M	21.32	
	H	20.59	

### 11b, Channel L



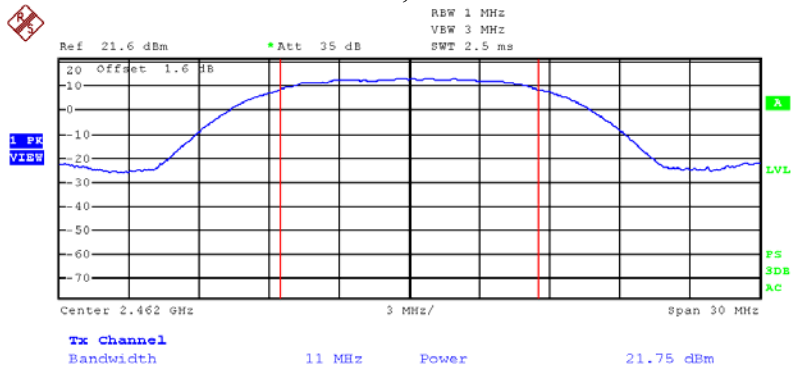
Date: 18.JAN.2013 10:07:00

### 11b, Channel M



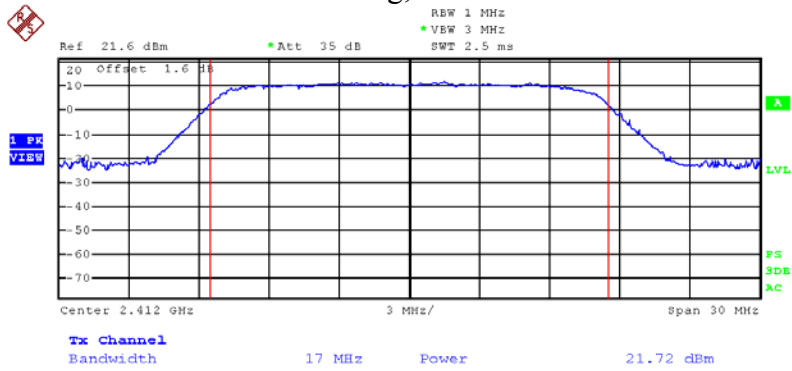
Date: 18.JAN.2013 10:07:36

### 11b, Channel H



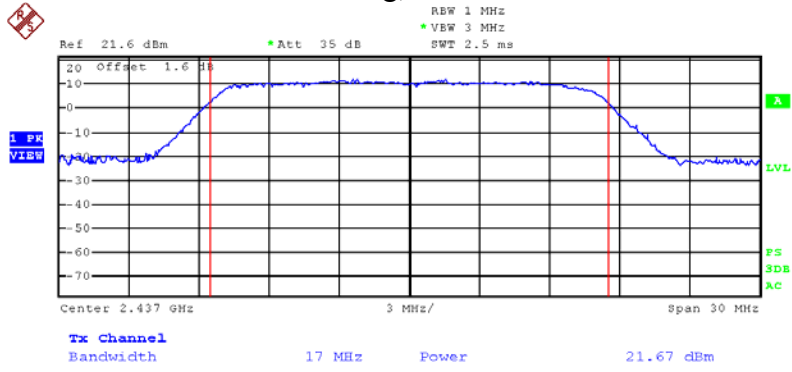
Date: 18.JAN.2013 10:08:06

### 11g, Channel L



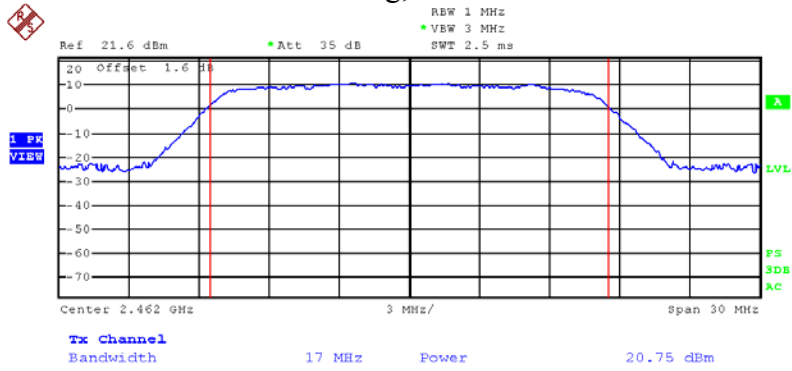
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### 11g, Channel M



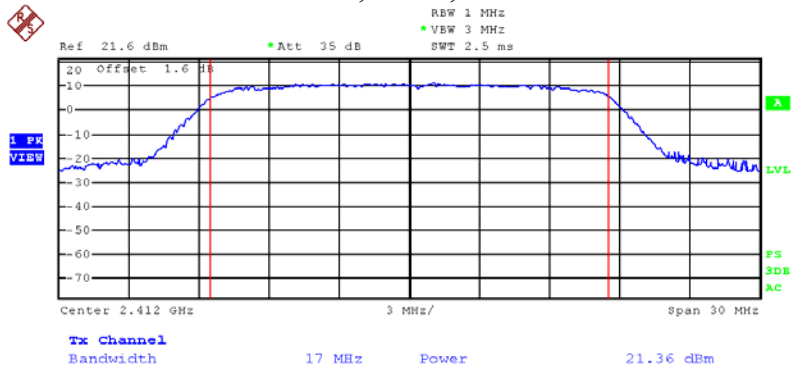
Date: 18.JAN.2013 10:10:06

### 11g, Channel H



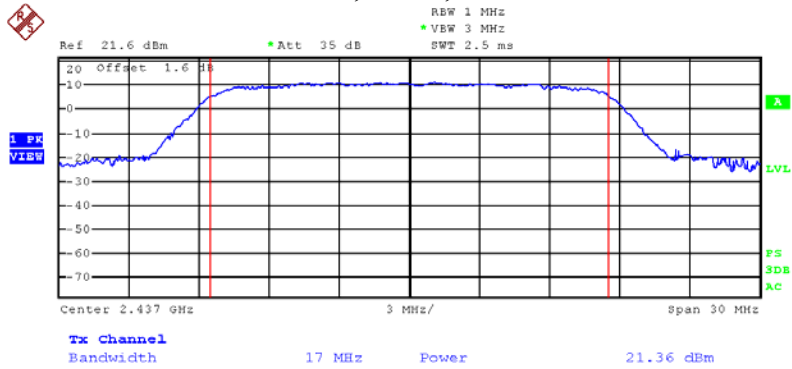
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**11n, HT20, Channel L**



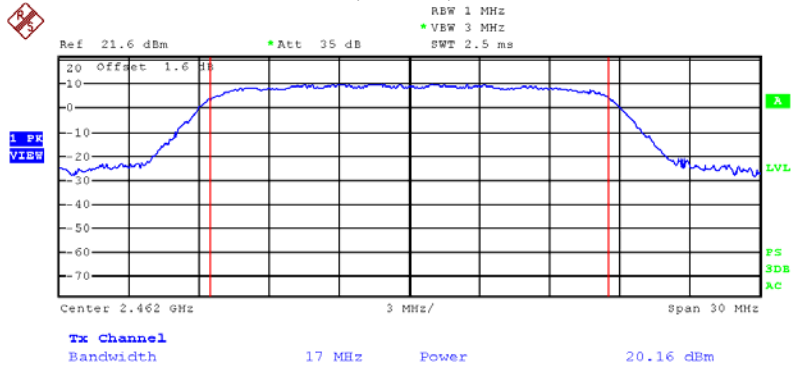
Date: 18.JAN.2013 10:16:46

**11n, HT20, Channel M**



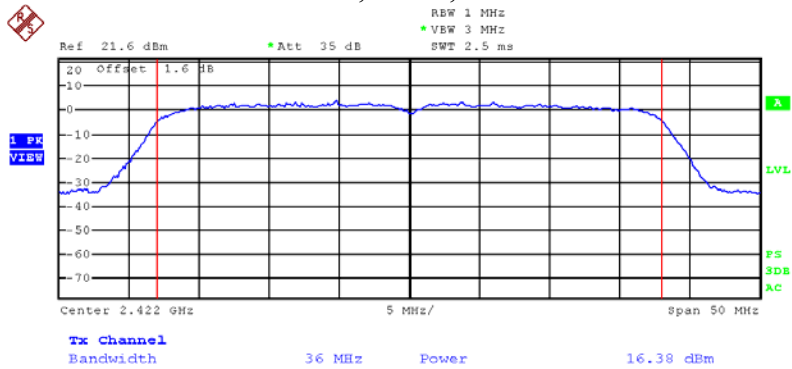
Date: 18.JAN.2013 10:17:17

### 11n, HT20, Channel H



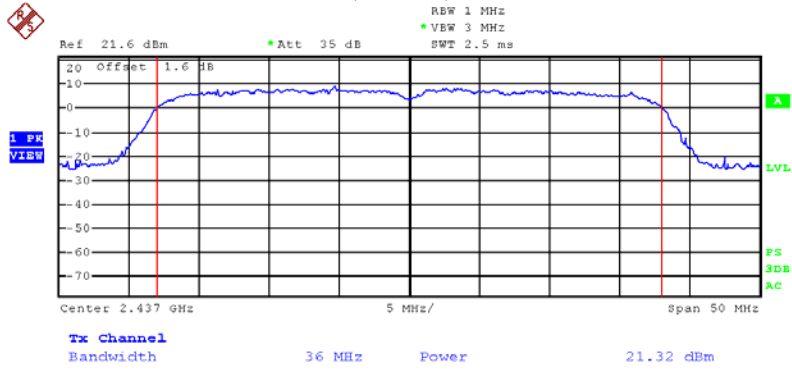
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### 11n, HT40, Channel L



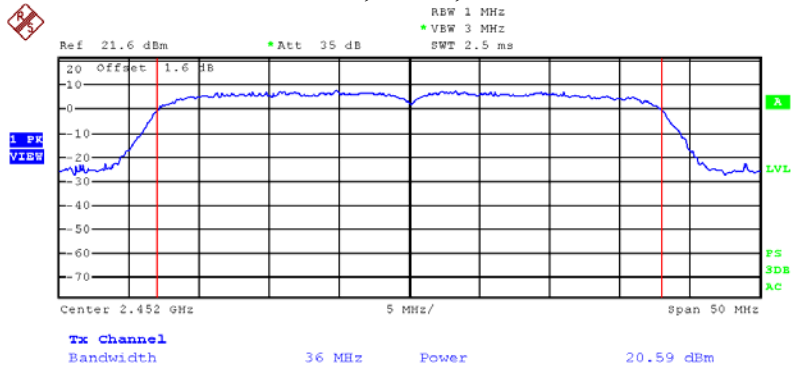
Date: 18.JAN.2013 10:22:13

### 11n, HT40, Channel M



Date: 18.JAN.2013 10:23:38

### 11na, HT40, Channel H



Date: 18.JAN.2013 10:24:05

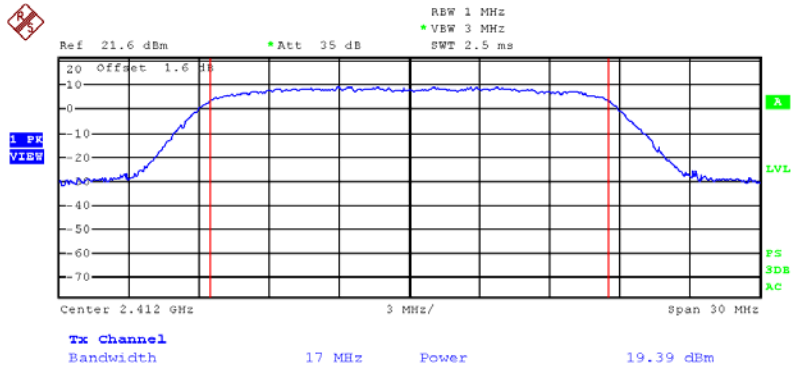


Dual Chain

Mode	CH	Chain 0 (dBm)	Chain 1 (dBm)	Total Power (dBm)	Limit (dBm)
11n, HT20	L	19.39	20.33	22.90	≤30
	M	19.43	20.64	23.09	
	H	18.53	19.35	21.97	
11n, HT40	L	14.44	15.65	18.10	
	M	18.93	20.51	22.80	
	H	18.85	20.12	22.54	

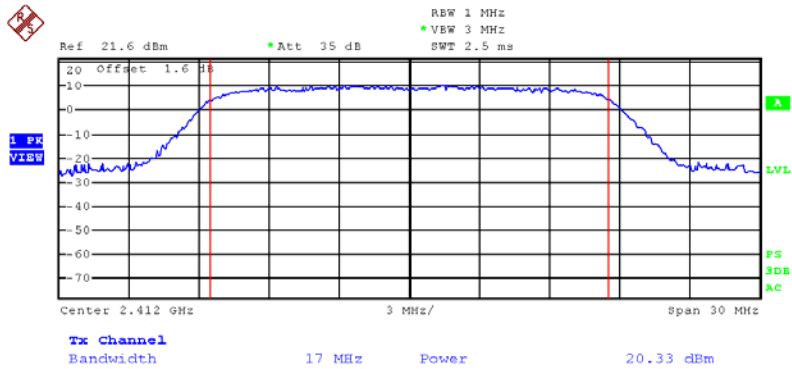


11n, HT20, Channel L  
Chain 0



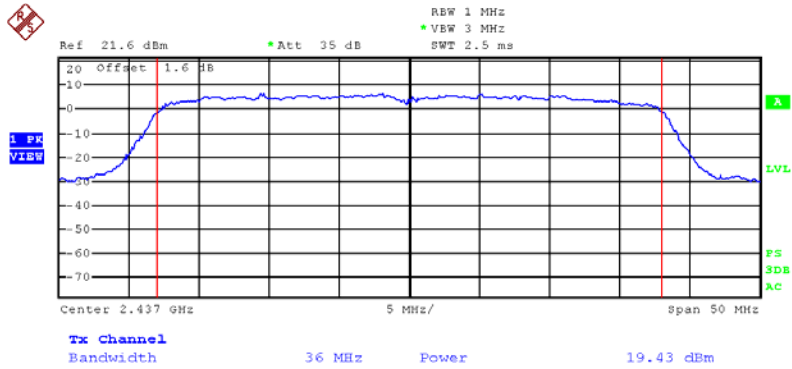
Date: 18.JAN.2013 10:32:35

Chain 1



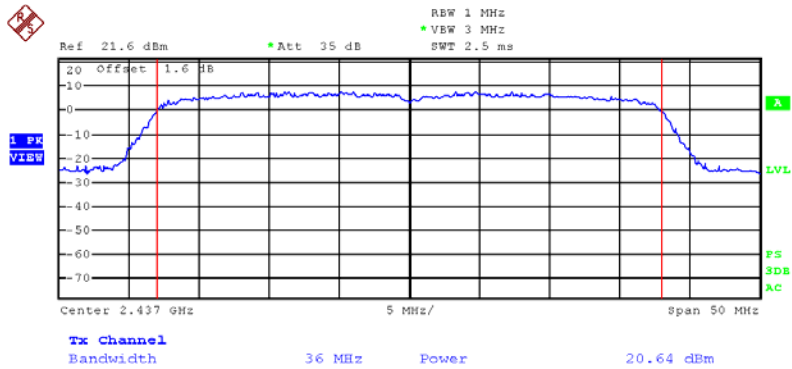
Date: 18.JAN.2013 10:20:41

### 11n, HT20, Channel M Chain 0



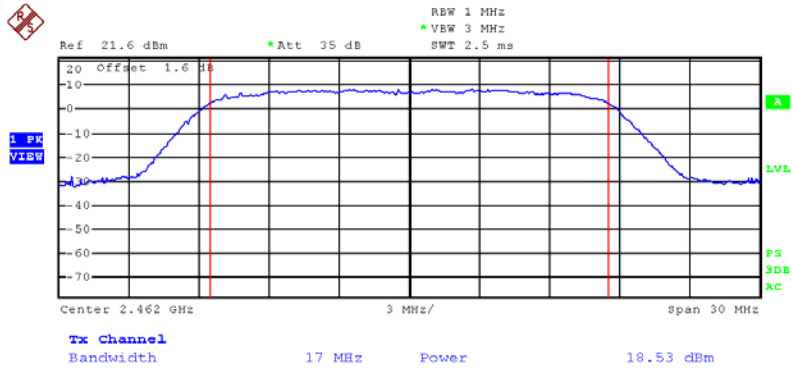
Date: 18.JAN.2013 10:28:39

### Chain 1



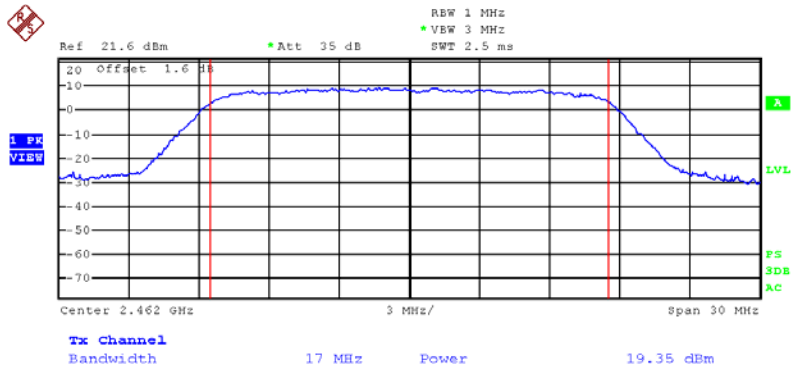
Date: 18.JAN.2013 10:25:10

### 11n, HT20, Channel H Chain 0



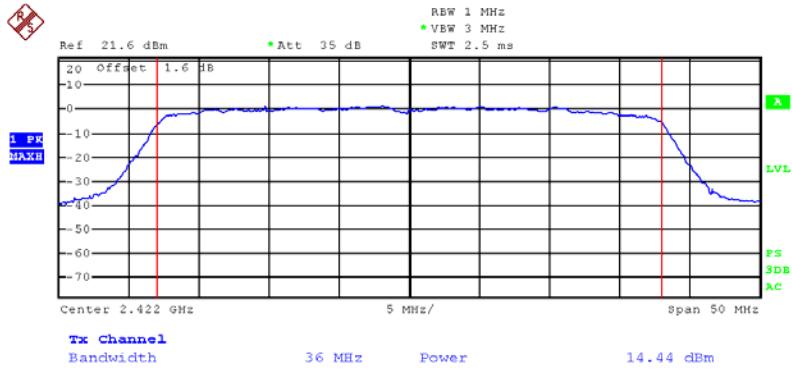
Date: 18.JAN.2013 10:30:39

### Chain 1



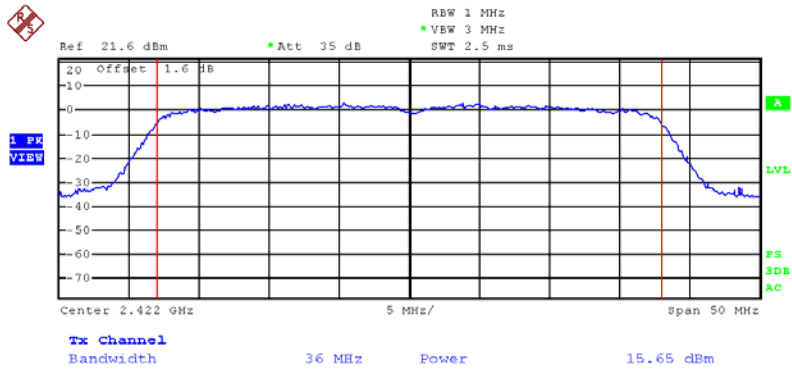
Date: 18.JAN.2013 10:19:19

### 11n, HT40, Channel L Chain 0



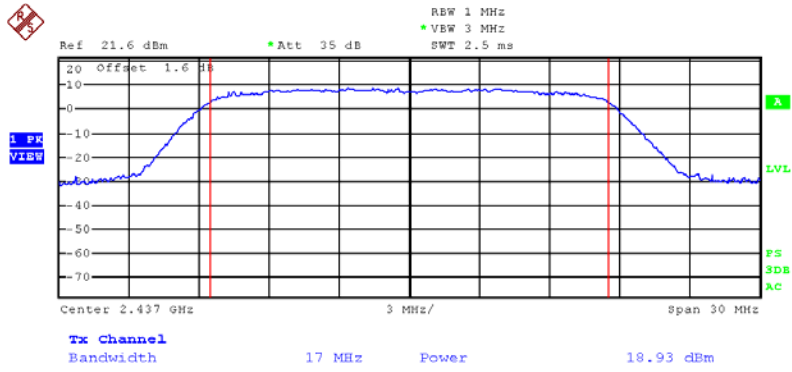
Date: 18.JAN.2013 10:28:01

### Chain 1



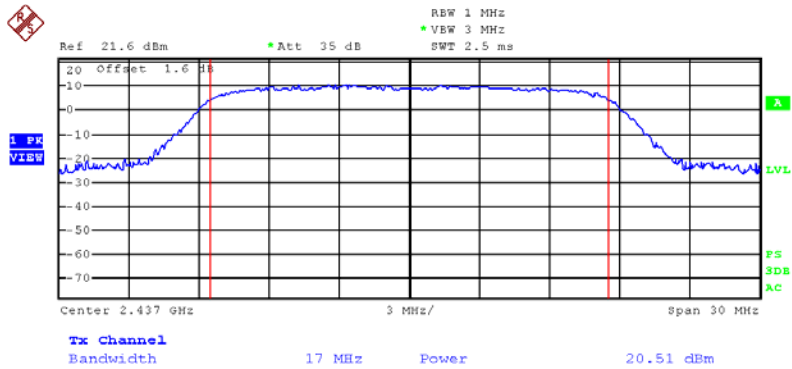
Date: 18.JAN.2013 10:25:42

### 11n, HT40, Channel M Chain 0



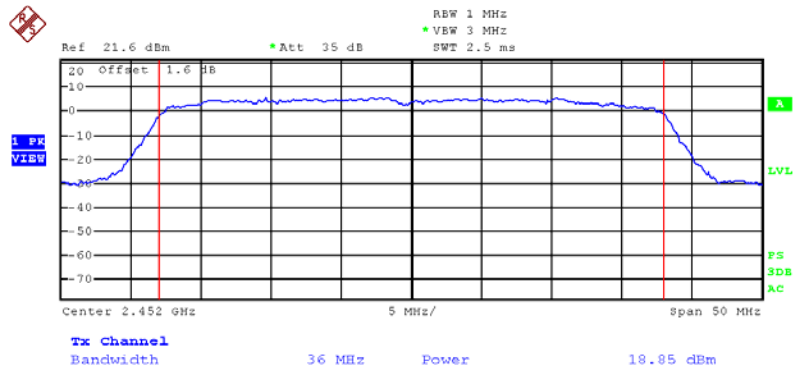
Date: 18.JAN.2013 10:31:36

### Chain 1



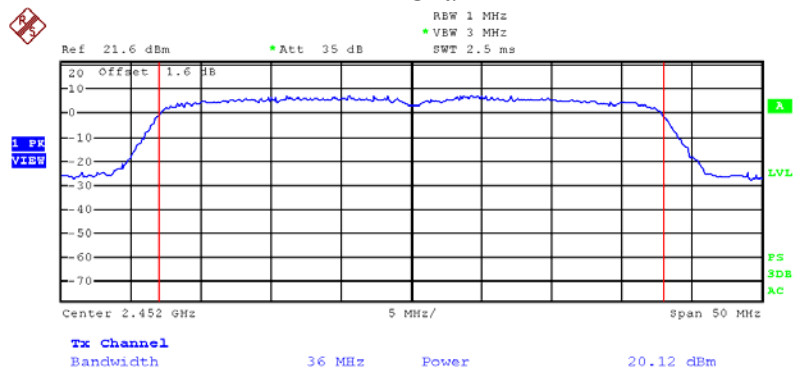
Date: 18.JAN.2013 10:19:56

### 11n, HT40, Channel H Chain 0



Date: 18.JAN.2013 10:29:18

### Chain 1



Date: 18.JAN.2013 10:24:40

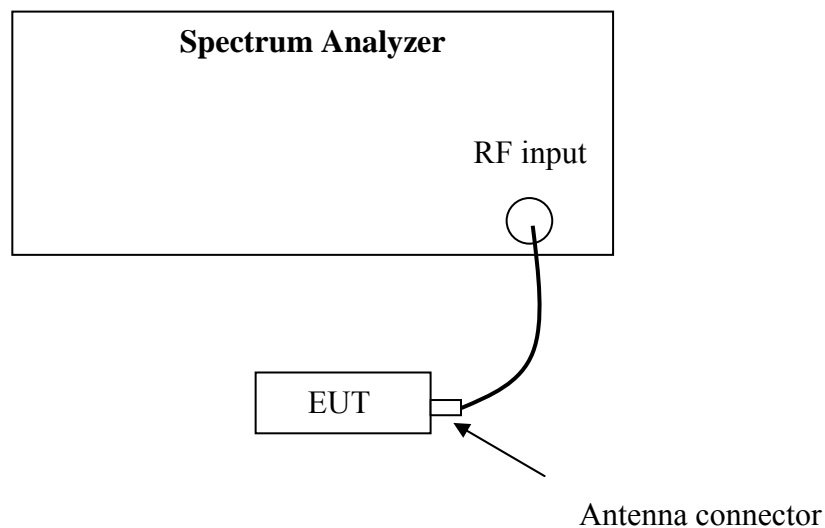
## 5. Power spectrum density

Test result: Pass

### 5.1 Test limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

### 5.2 Test Configuration



### 5.3 Test procedure and test setup

The power output per FCC §15.247(e) was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v02” for compliance to FCC 47CFR 15.247 requirements.

**5.4 Test Protocol**

Temperature: 22 °C

Relative Humidity: 43 %

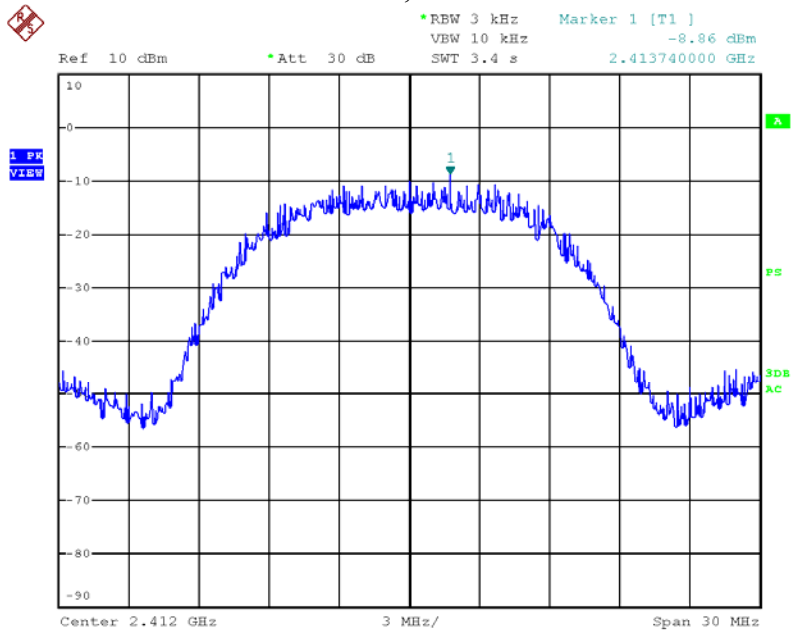
Note: when performing this test, the offset 1.6dB(cable loss) is not set in the test instrument, so the limit for this test should be  $8-1.6=6.4\text{dBm}/3\text{kHz}$

**Single Chain**

Mode	CH	Chain 1 (dBm/3kHz)	Limit (dBm/3kHz)
11b	L	-8.86	≤6.4
	M	-6.73	
	H	-9.86	
11g	L	-16.65	
	M	-16.70	
	H	-18.28	
11n, HT20	L	-17.43	
	M	-16.42	
	H	-17.33	
11n, HT40	L	-26.25	
	M	-22.62	
	H	-22.10	

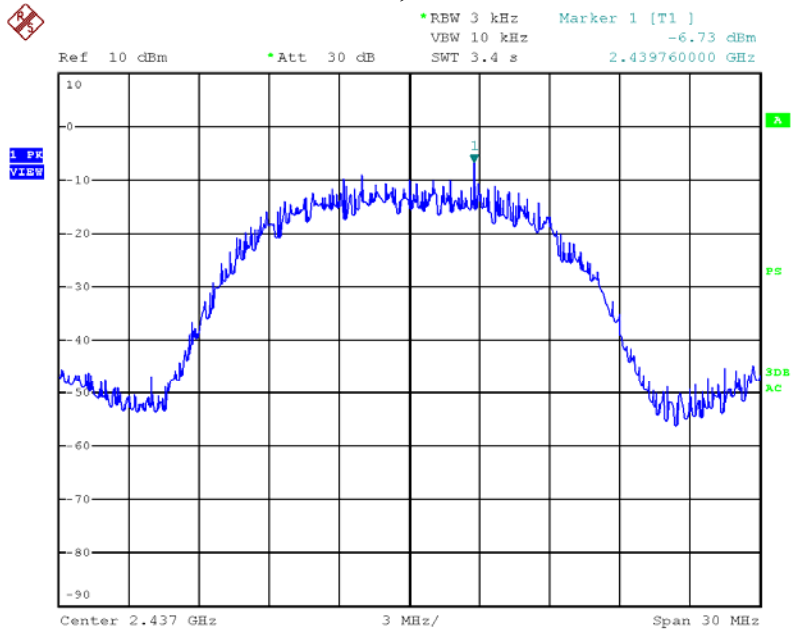


### 11b, Channel L



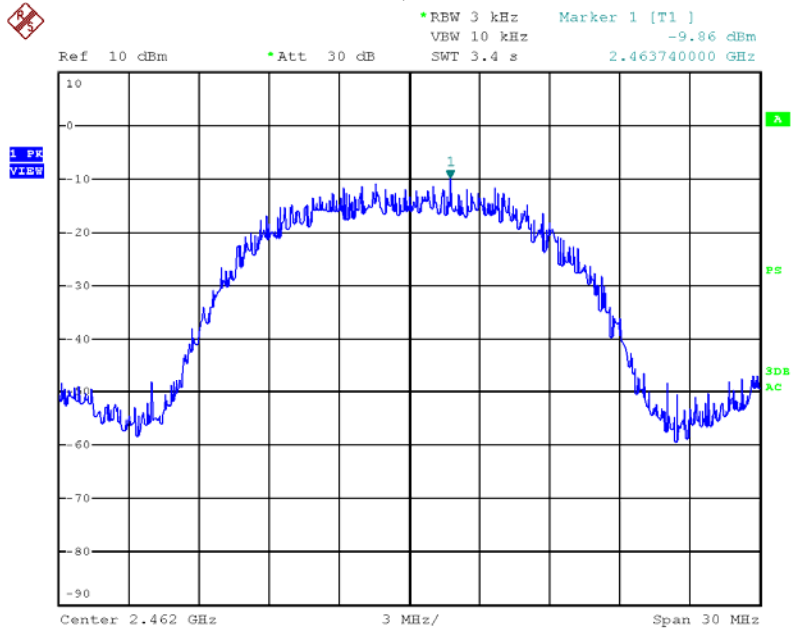
Date: 20.FEB.2013 10:23:33

### 11b, Channel M



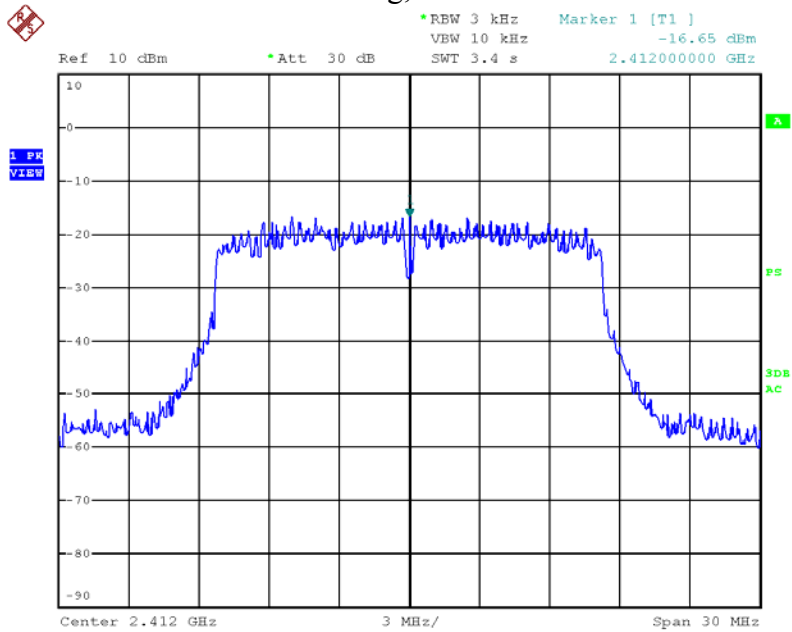
Date: 20.FEB.2013 10:24:28

### 11b, Channel H



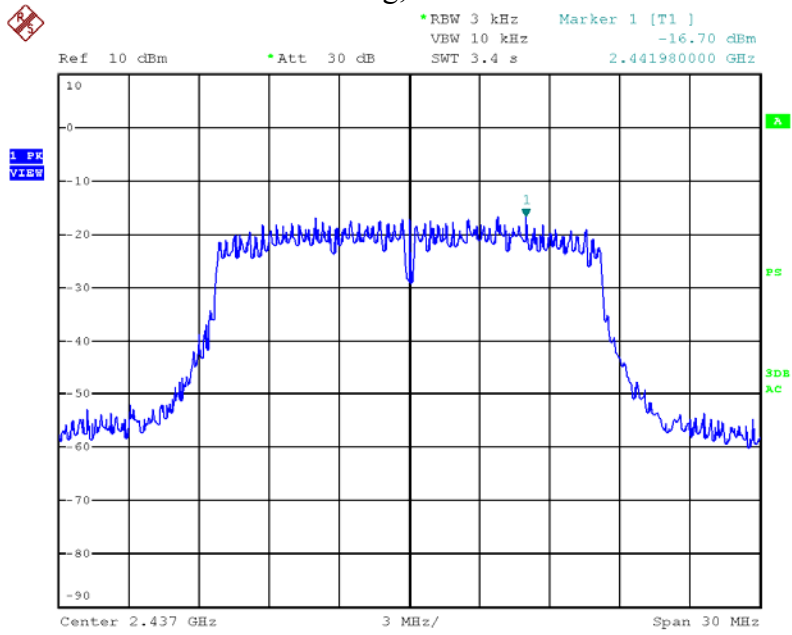
Date: 20.FEB.2013 10:25:42

### 11g, Channel L



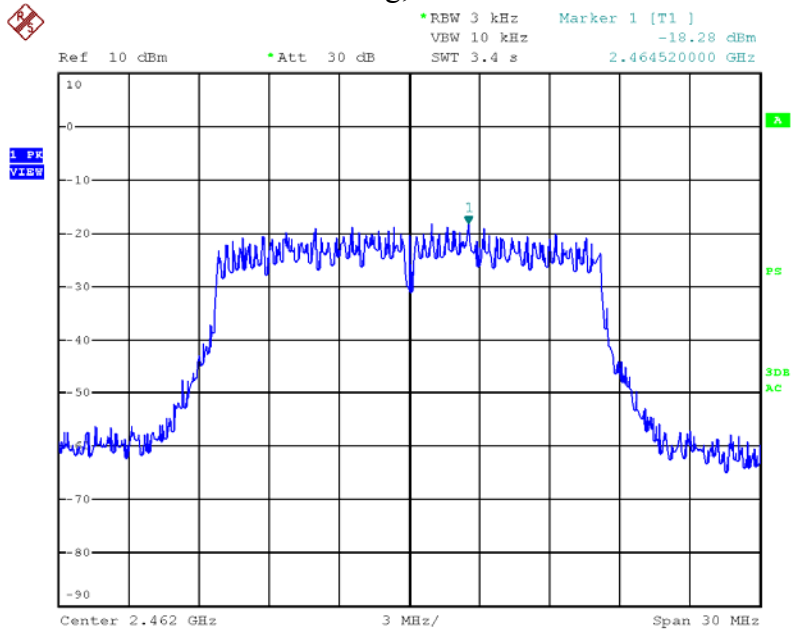
Date: 20.FEB.2013 10:30:06

### 11g, Channel M



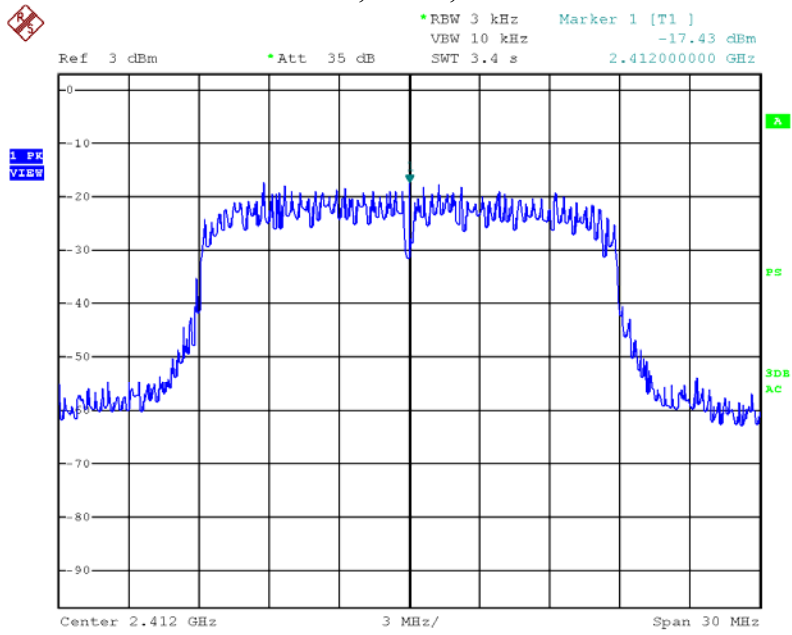
Date: 20.FEB.2013 10:29:05

### 11g, Channel H



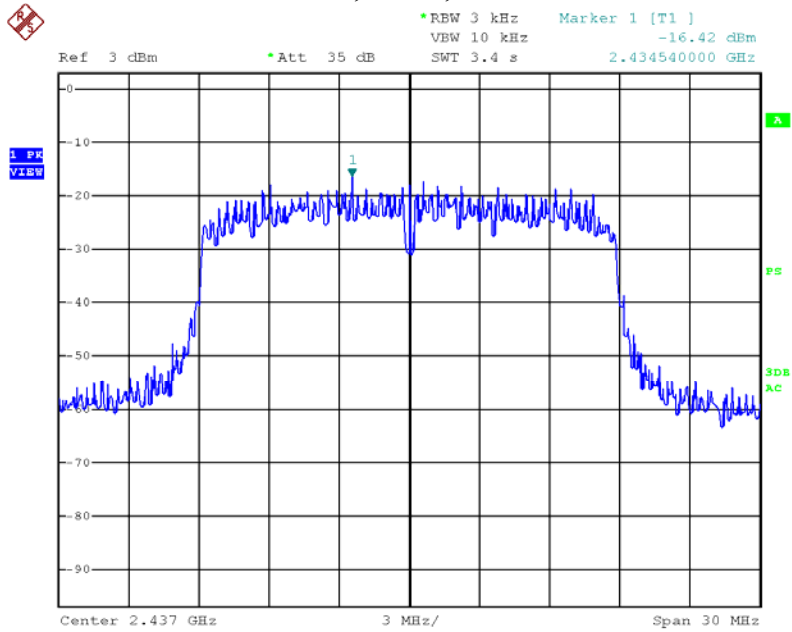
Date: 20.FEB.2013 10:28:03

### 11n, HT20, Channel L



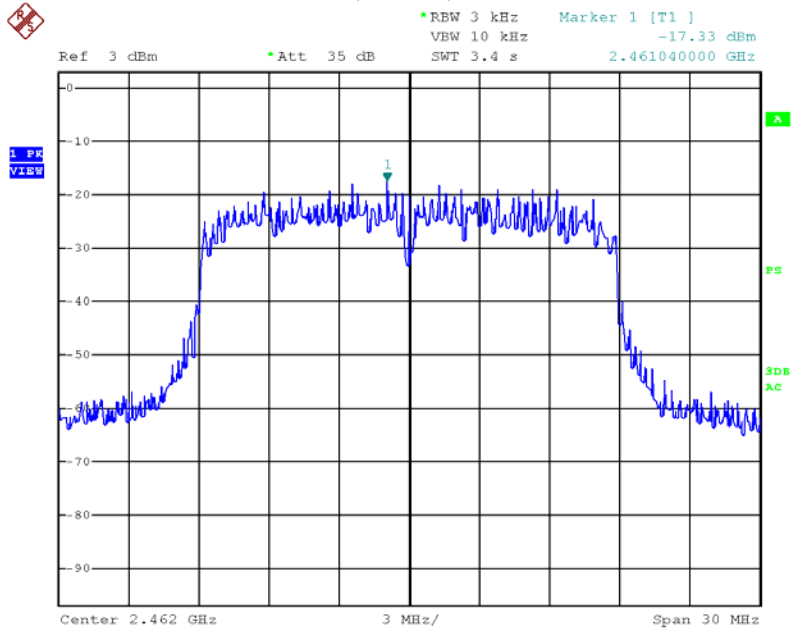
Date: 18.JAN.2013 10:50:06

### 11n, HT20, Channel M



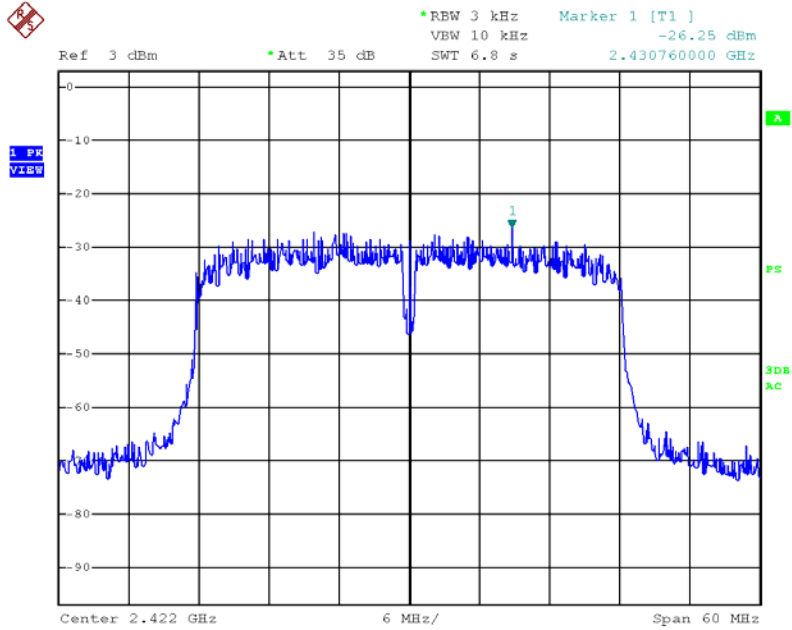
Date: 18.JAN.2013 10:50:40

### 11n, HT20, Channel H



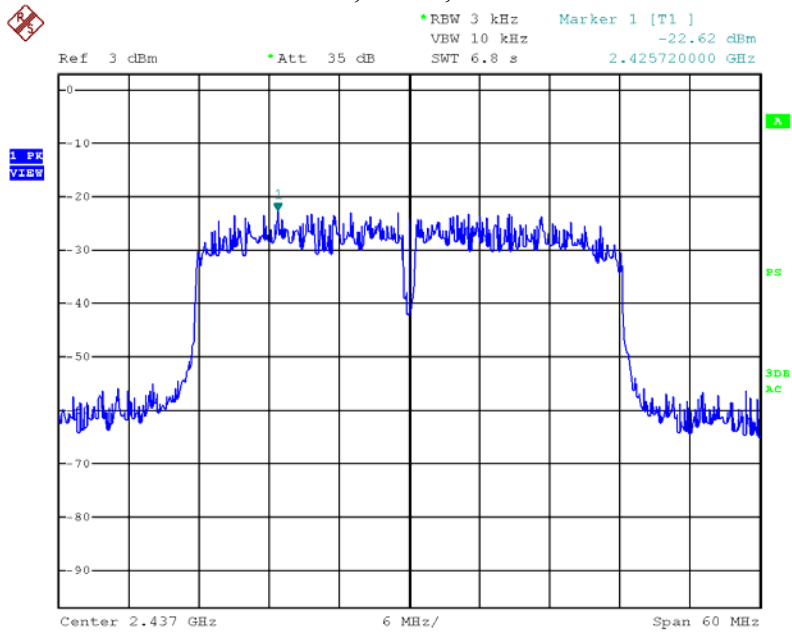
Date: 18.JAN.2013 10:51:08

### 11n, HT40, Channel L



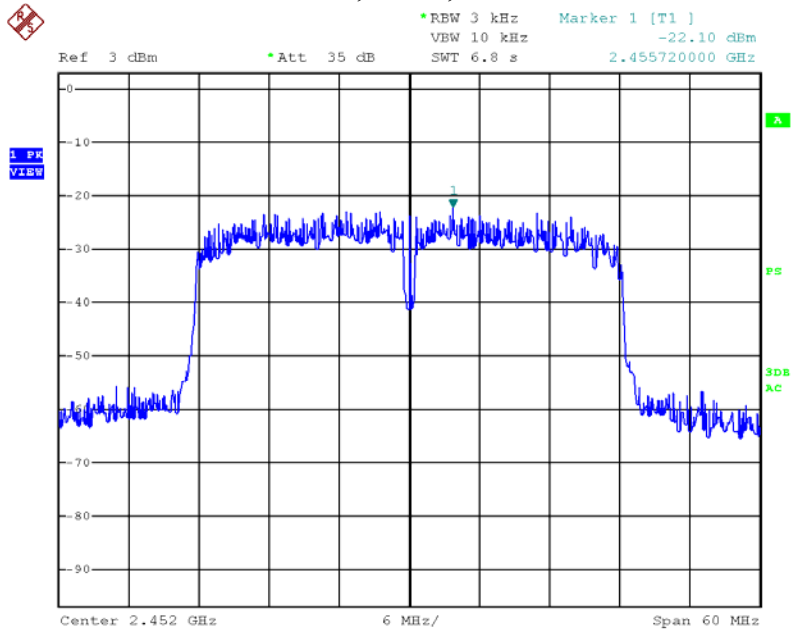
Date: 18.JAN.2013 10:47:37

### 11n, HT40, Channel M



Date: 18.JAN.2013 10:47:01

### 11n, HT40, Channel H

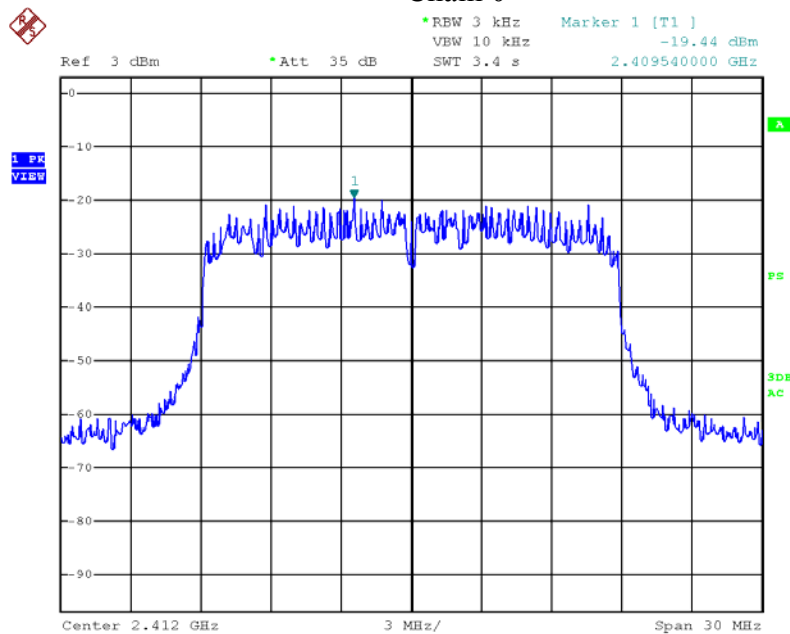


Date: 18.JAN.2013 10:46:28

Dual Chain

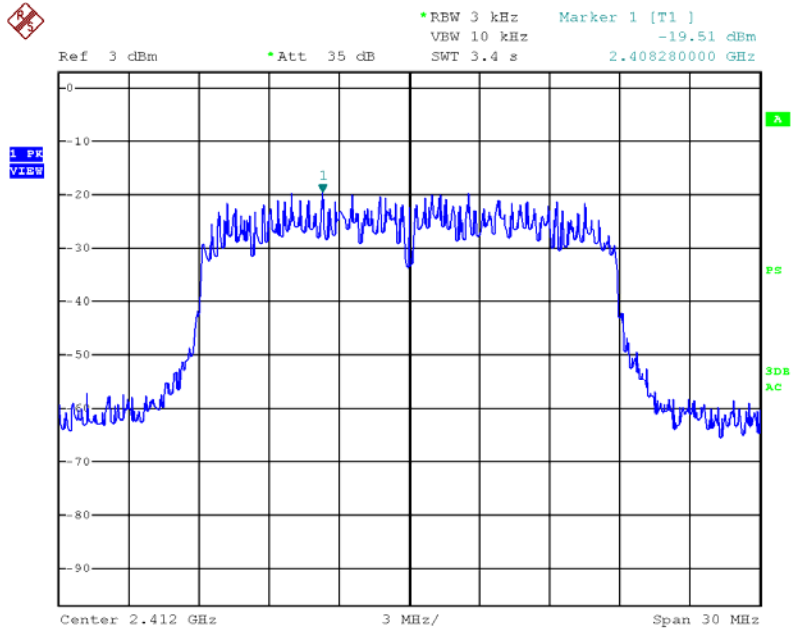
Mode	CH	Chain 0 (dBm/3kHz)	Chain 1 (dBm/3kHz)	Total power density (dBm/3kHz)	Limit (dBm/3kHz)
11n, HT20	L	-19.44	-19.51	-16.46	≤6.4
	M	-19.70	-19.61	-16.64	
	H	-21.04	-19.89	-17.42	
11n, HT40	L	-29.40	-27.33	-25.23	
	M	-23.07	-22.61	-19.82	
	H	-25.22	-23.05	-20.99	

11n, HT20, Channel L  
Chain 0



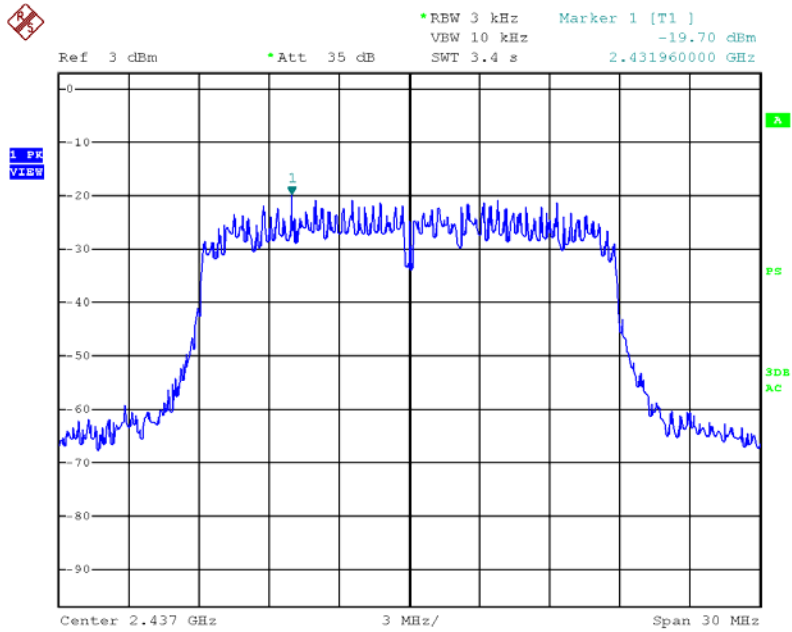
Date: 18.JAN.2013 10:38:29

Chain 1



Date: 18.JAN.2013 10:52:41

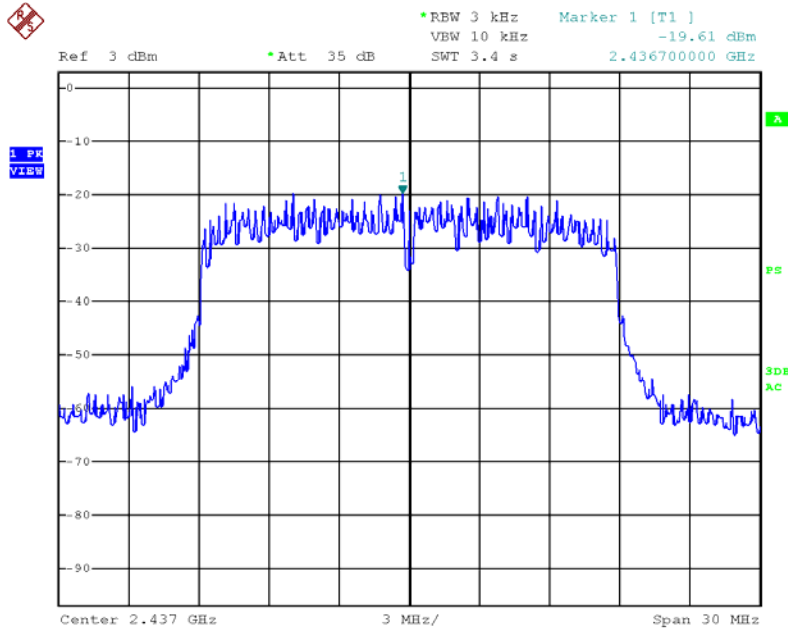
11n, HT20, Channel M  
Chain 0



Date: 18.JAN.2013 10:39:12

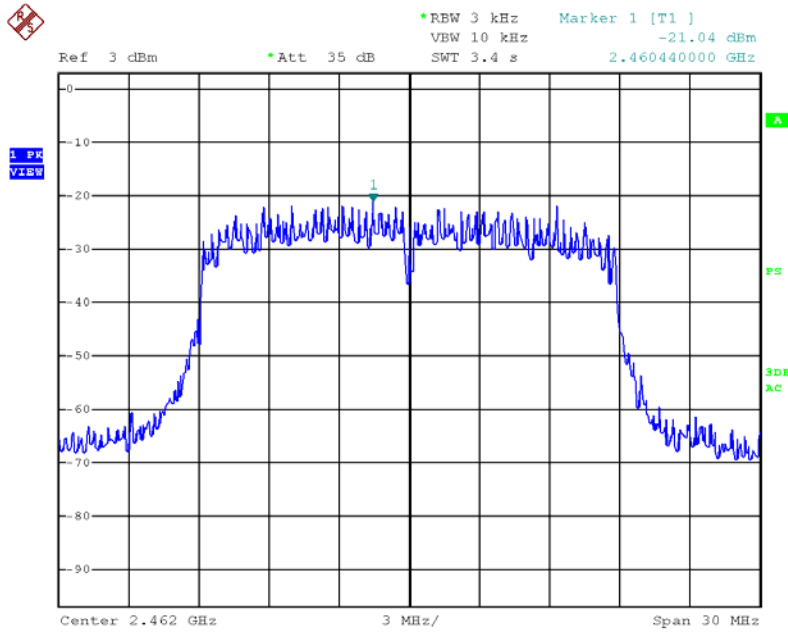


Chain 1



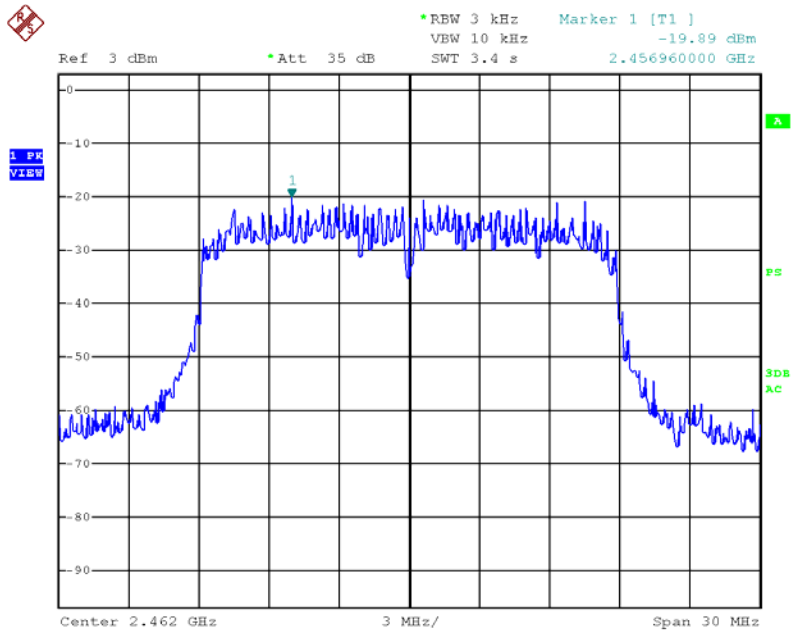
Date: 18.JAN.2013 10:52:09

11n, HT20, Channel H  
Chain 0



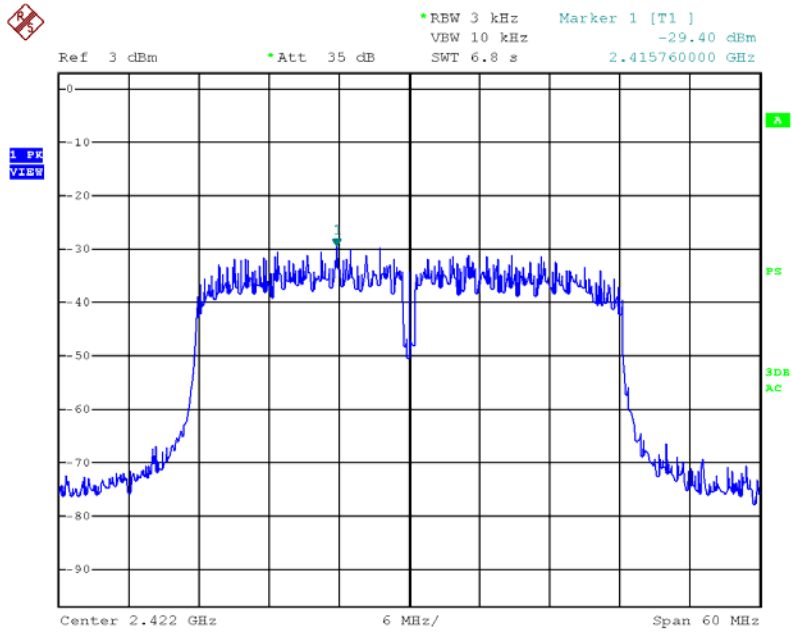
Date: 18.JAN.2013 10:39:45

### Chain 1



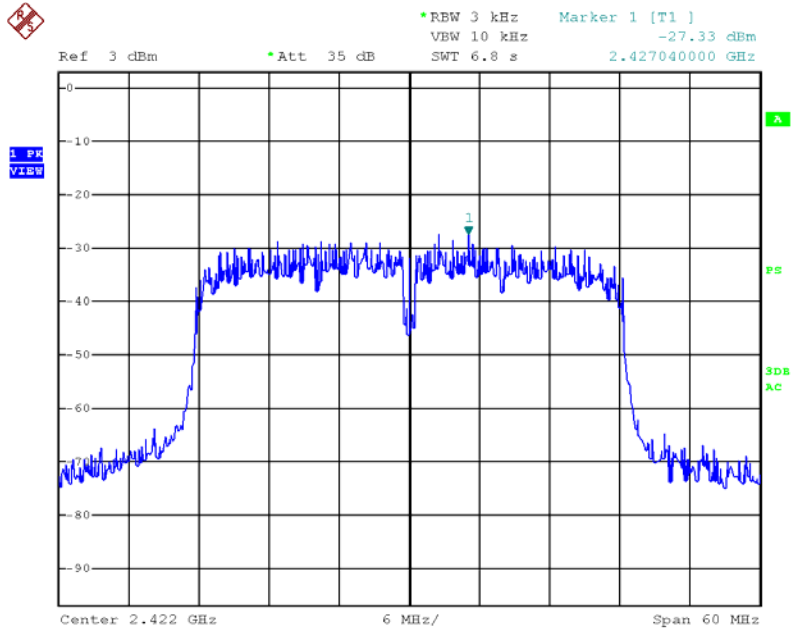
Date: 18.JAN.2013 10:51:39

### 11n, HT40, Channel L Chain 0



Date: 18.JAN.2013 10:42:37

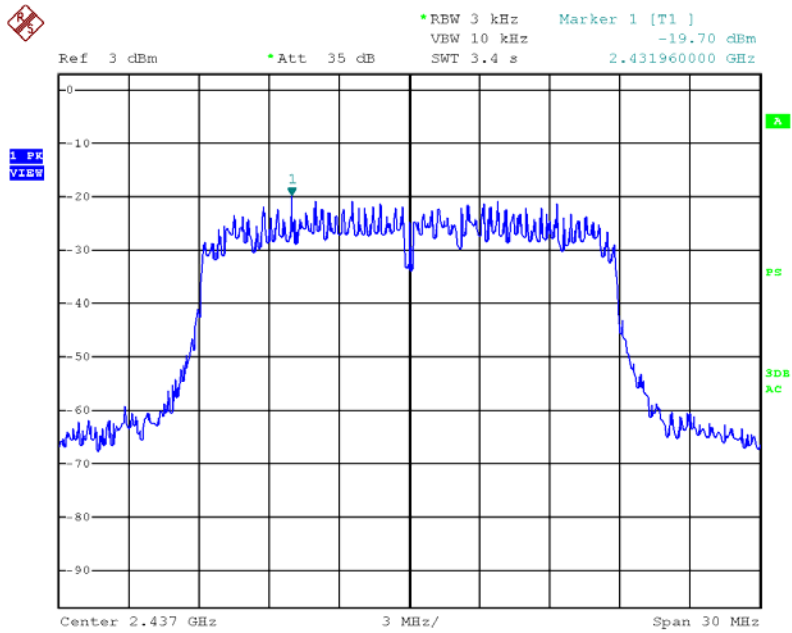
### Chain 1



Date: 18.JAN.2013 10:44:17

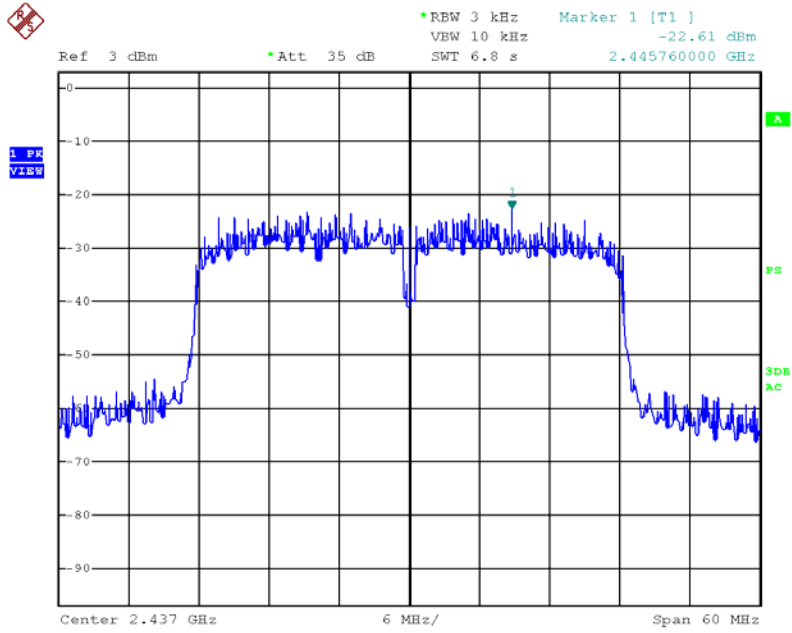
### 11n, HT40, Channel M

### Chain 0



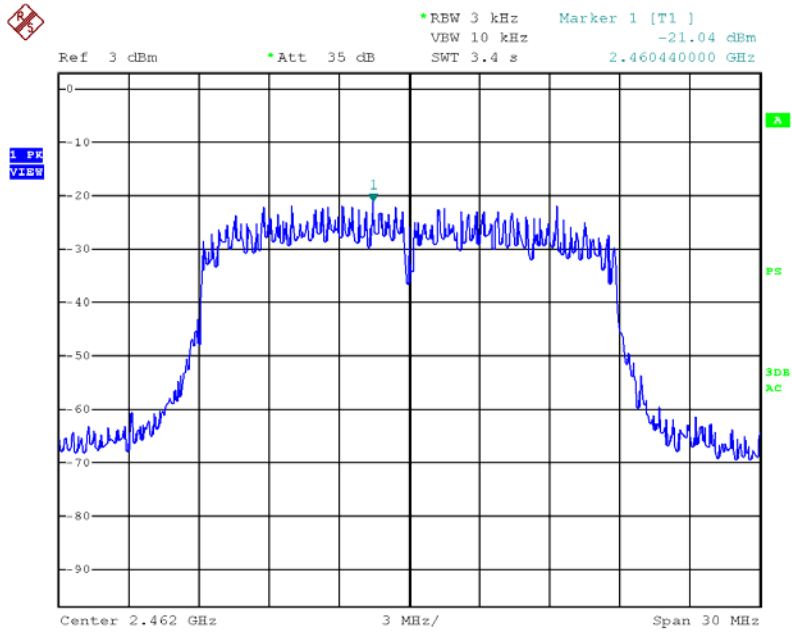
Date: 18.JAN.2013 10:39:12

### Chain 1



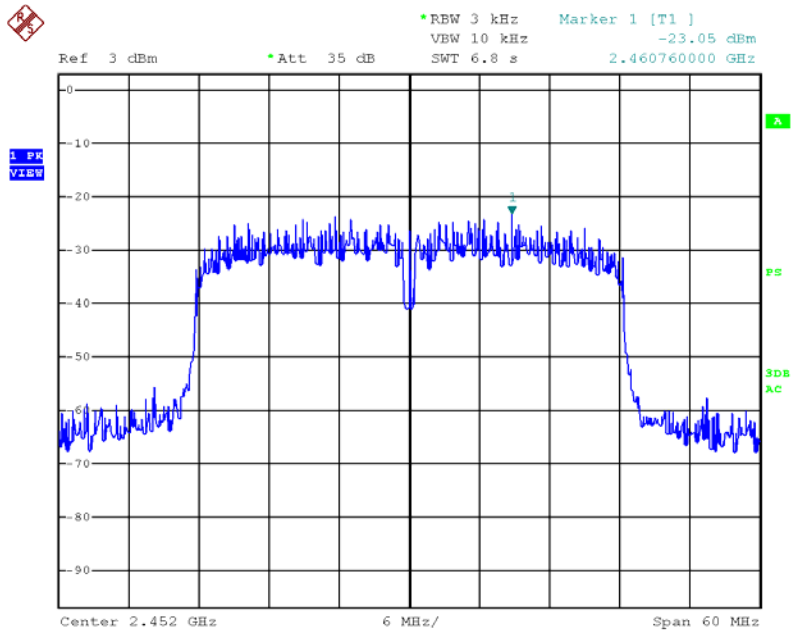
Date: 18.JAN.2013 10:44:59

### 11n, HT40, Channel H Chain 0



Date: 18.JAN.2013 10:39:45

Chain 1



Date: 18.JAN.2013 10:45:34

## 6. Radiated emission

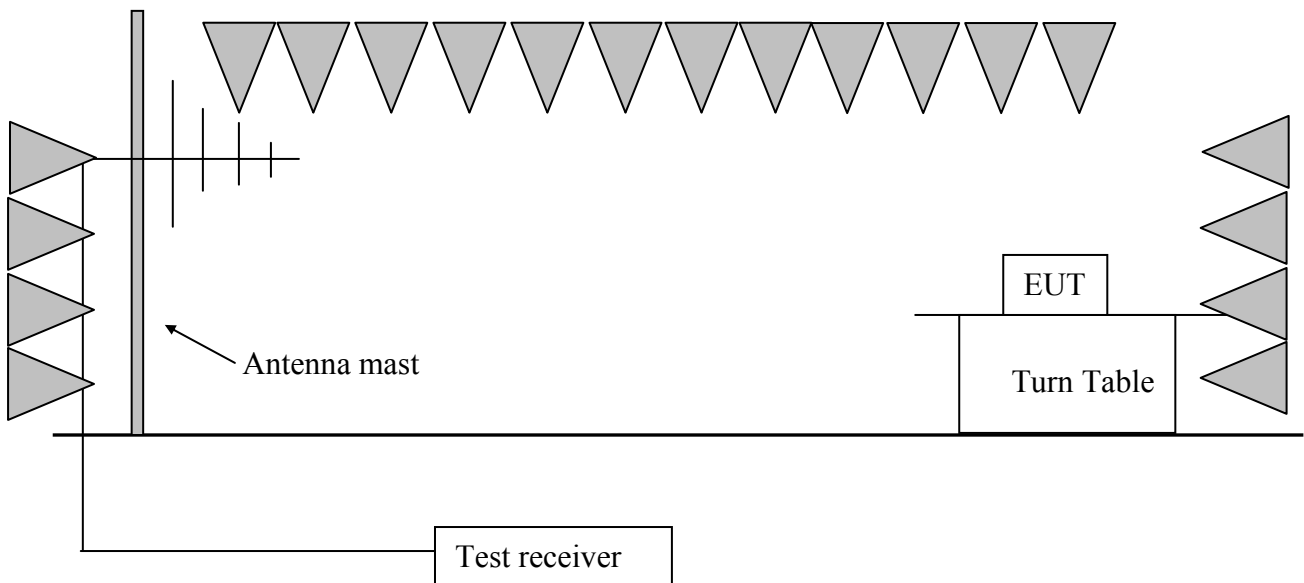
**Test result: PASS**

### 6.1 Test limit

The radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequency (MHz)	Field Strength (dBuV/m)	Measurement Distance (m)
30 - 88	40.0	3
88 - 216	43.5	3
216 - 960	46.0	3
Above 960	54.0	3

### 6.2 Test Configuration



### 6.3 Test procedure and test setup

The measurement was applied in a semi-anechoic chamber. While testing for spurious emission higher than 1GHz, if applied, the pre-amplifier would be equipped just at the output terminal of the antenna.

The EUT and simulators were placed on a 0.8m high wooden turntable above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mast. The antenna moved up and down between from 1meter to 4 meters to find out the maximum emission level.

The EUT was tested according to DTS test procedure of KDB558074 D01 DTS “Meas Guidance v02” for compliance to FCC 47CFR 15.247 requirements.

The radiated emission was measured using the Spectrum Analyzer with the resolutions bandwidth set as:

RBW = 100kHz, VBW = 300kHz (30MHz-1GHz)

RBW = 1MHz, VBW = 3MHz (>1GHz for PK);

RBW = 1MHz, VBW = 10Hz (>1GHz for AV);

**6.4 Test protocol**

Pre-Scan has been conducted to determine the worst-case mode from all possible combinations and the worst case Dual chain, 11n, HT20 mode which is selected and listed the all channel test data as following:

CH	Polarization	Frequency (MHz)	Correct Factor (dB/m)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
L	V	2418.83	34.2	99.70	Fundamental	/	PK
	V	31.94	19.8	37.00	40.00	3.00	PK
	V	64.98	8.2	37.20	40.00	2.80	PK
	H	125.01	15.3	37.20	43.50	6.30	PK
	H	250.01	13.2	43.90	46.00	2.10	PK
	H	1609.21	29.9	53.40	74.00	20.60	PK
	V	1609.21	29.9	57.30	74.00	16.70	PK
	V	4803.60	-0.8	47.50	74.00	26.50	PK
	V	1609.21	29.9	44.50	54.00	9.50	AV
M	V	2438.87	34.3	102.00	Fundamental	/	PK
	V	49.43	11.0	38.60	40.00	1.40	PK
	H	125.01	15.3	37.00	43.50	6.50	PK
	H	250.01	13.2	41.60	46.00	4.40	PK
	V	250.01	13.2	40.40	46.00	5.60	PK
	H	500.01	20.0	37.80	46.00	8.20	PK
	V	1624.65	30.0	59.10	74.00	14.90	PK
	V	4863.72	-0.6	47.20	74.00	26.80	PK
	V	1624.65	30.0	49.30	54.00	4.70	AV
	V	2358.71	33.9	46.50	54.00	7.50	AV



H	V	2458.91	34.4	92.70	Fundamental	/	PK
	V	49.43	11.0	38.80	40.00	1.20	PK
	V	125.01	15.3	36.30	43.50	7.20	PK
	H	125.01	15.3	37.40	43.50	6.10	PK
	V	250.01	13.2	38.70	46.00	7.30	PK
	H	250.01	13.2	43.40	46.00	2.60	PK
	V	500.01	20.0	35.10	46.00	10.90	PK
	V	1729.45	30.7	56.90	74.00	17.10	PK
	V	1729.45	30.7	48.70	54.00	5.30	AV
	V	2378.75	34.0	47.20	54.00	6.80	AV
	H	2492.62	34.5	50.40	54.00	3.60	PK
	V	2497.39	34.5	52.70	54.00	1.30	PK

- Remark: 1. Correct Factor = Antenna Factor + Cable Loss (-Amplifier, is employed)  
 2. Corrected Reading = Original Receiver Reading + Correct Factor  
 3. Margin = limit – Corrected Reading  
 4. If the PK reading is lower than AV limit, the AV test can be elided.

Example: Assuming Antenna Factor = 30.20dB/m, Cable Loss = 2.00dB,  
 Gain of Preamplifier = 32.00dB, Original Receiver Reading = 10dBuV.  
 Then Correct Factor = 30.20 + 2.00 – 32.00 = 0.20dB/m; Corrected Reading =  
 10dBuV + 0.20dB/m = 10.20dBuV/m  
 Assuming limit = 54dBuV/m, Corrected Reading = 10.20dBuV/m, then Margin =  
 54 -10.20 = 43.80dBuV/m

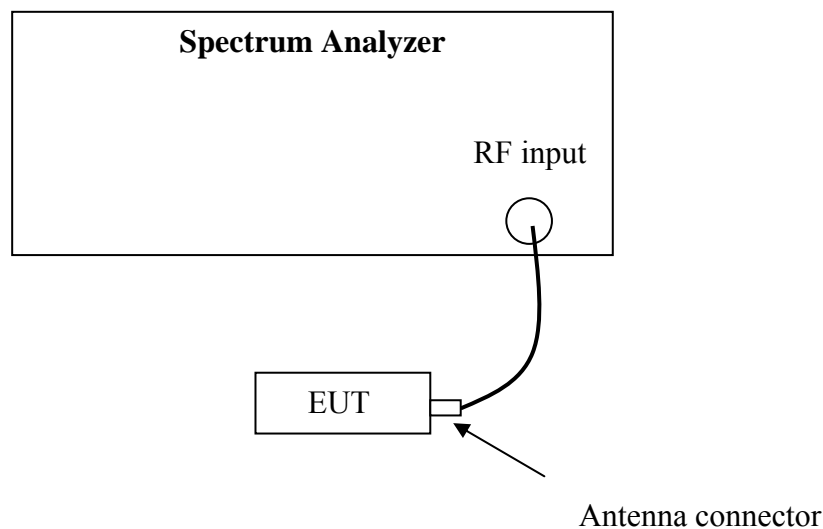
## 7. Emission outside the frequency Band

**Test result: PASS**

### 7.1 Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.

### 7.2 Test Configuration



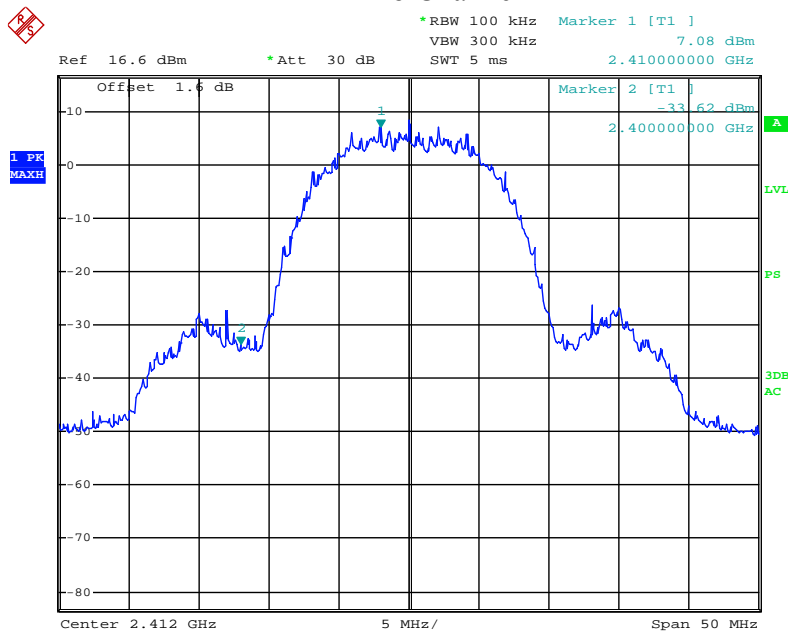
### 7.3 Test procedure and test setup

The Emission outside the frequency Band per FCC §15.247(d) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW.

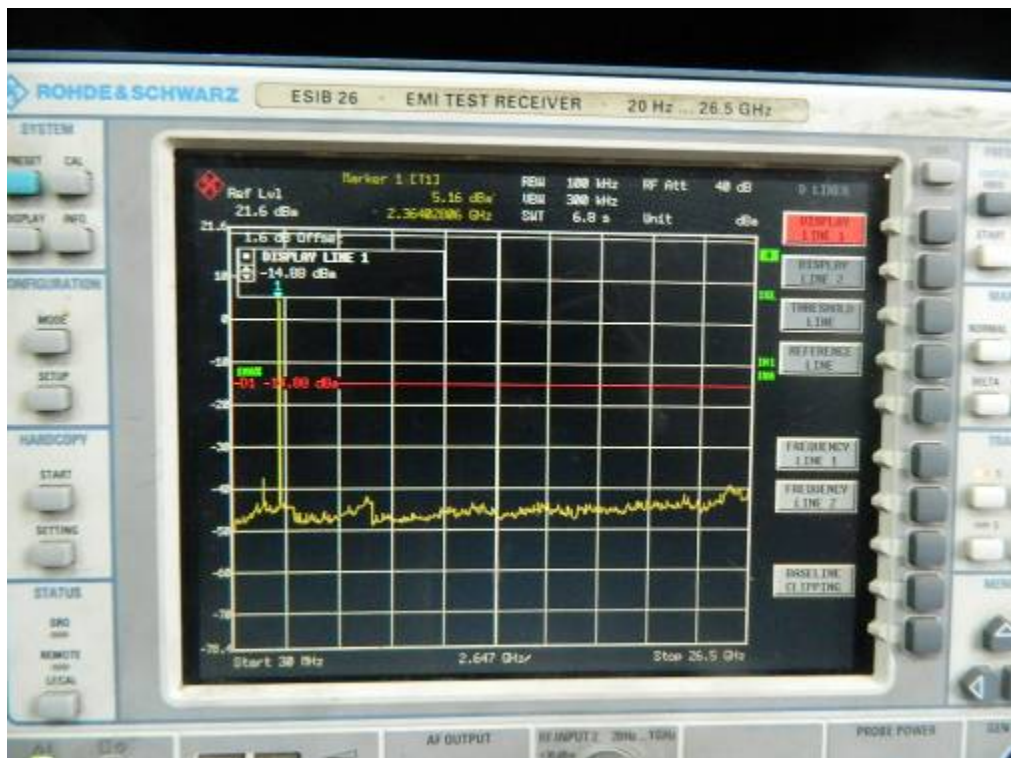
The EUT was tested according to DTS test procedure of “KDB558074 D01 DTS Meas Guidance v02” for compliance to FCC 47CFR 15.247 requirements.

### 7.4 Test protocol

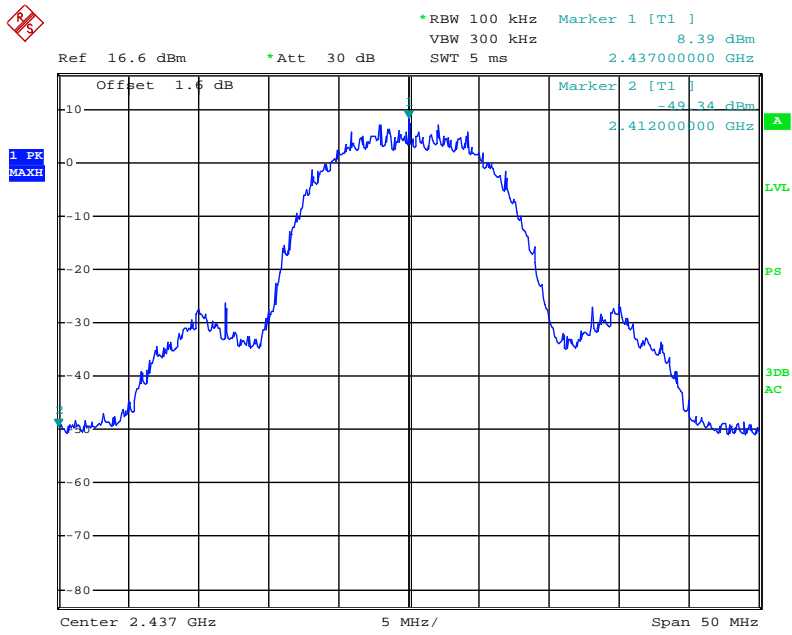
#### Single Chain 11b Channel L



Date: 11.MAR.2013 11:04:09



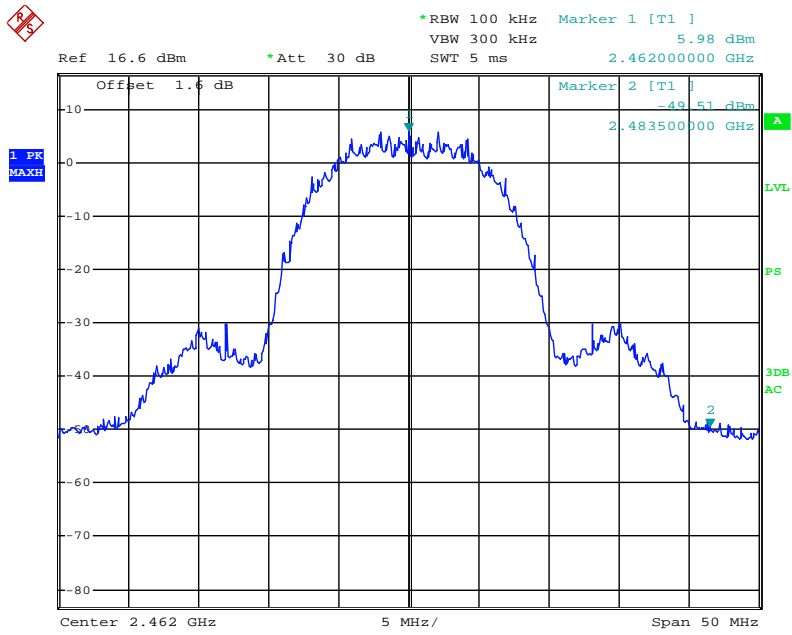
11b Channel M



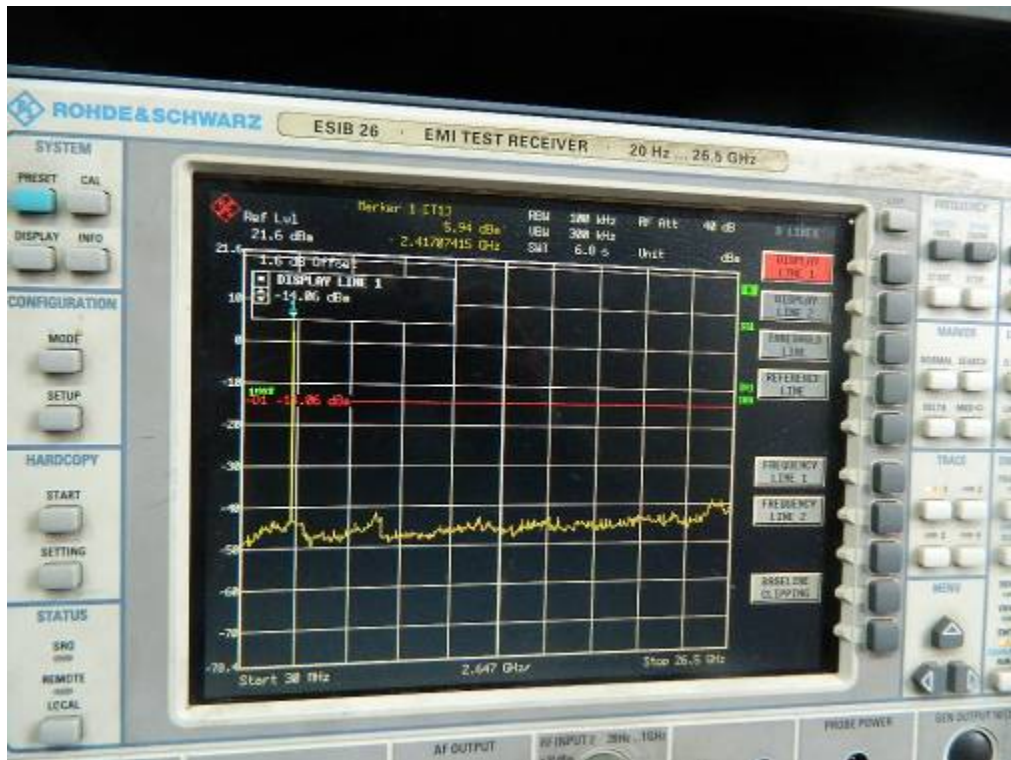
Date: 11.MAR.2013 11:11:50



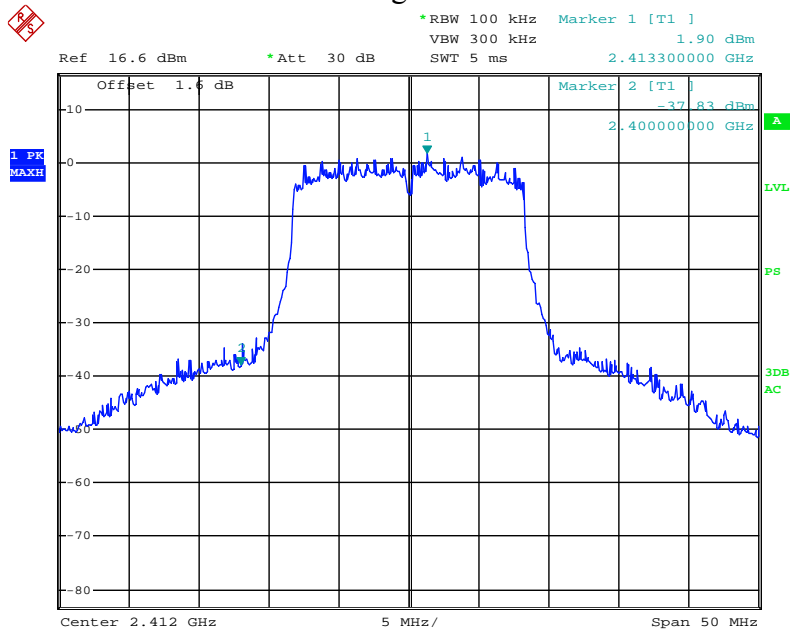
11b Channel H



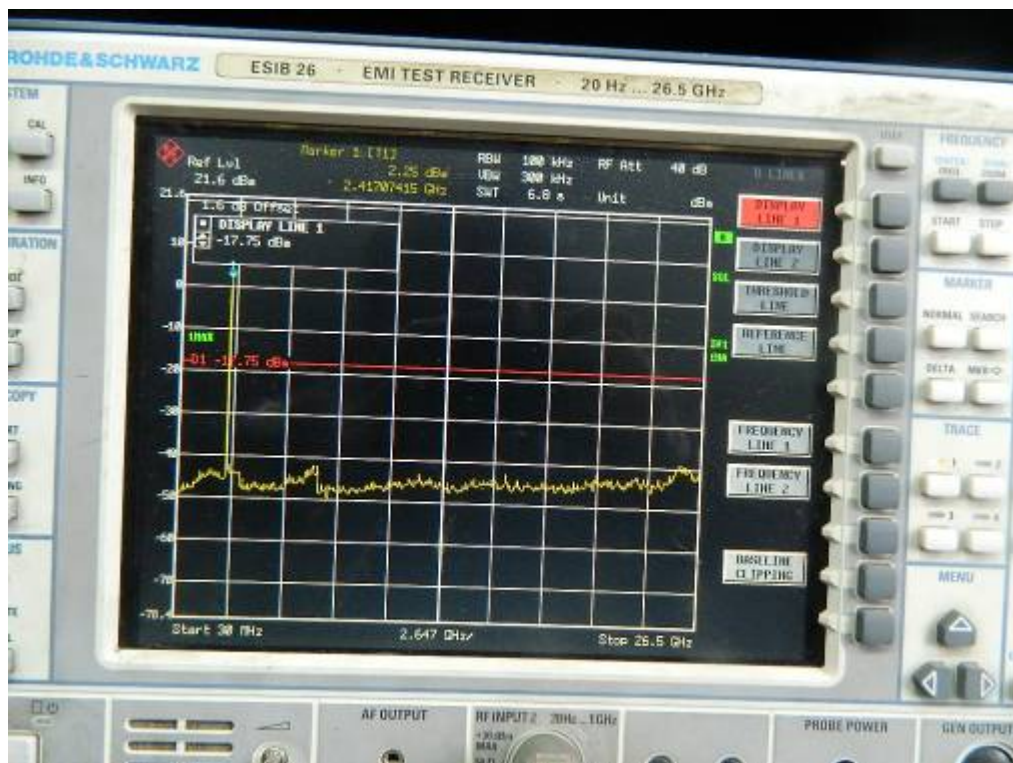
Date: 11.MAR.2013 11:14:44



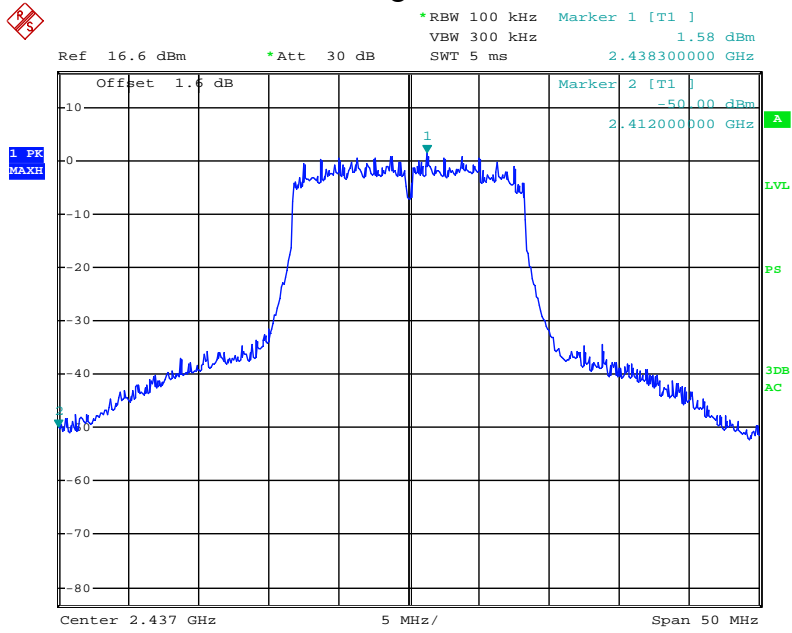
11g Channel L



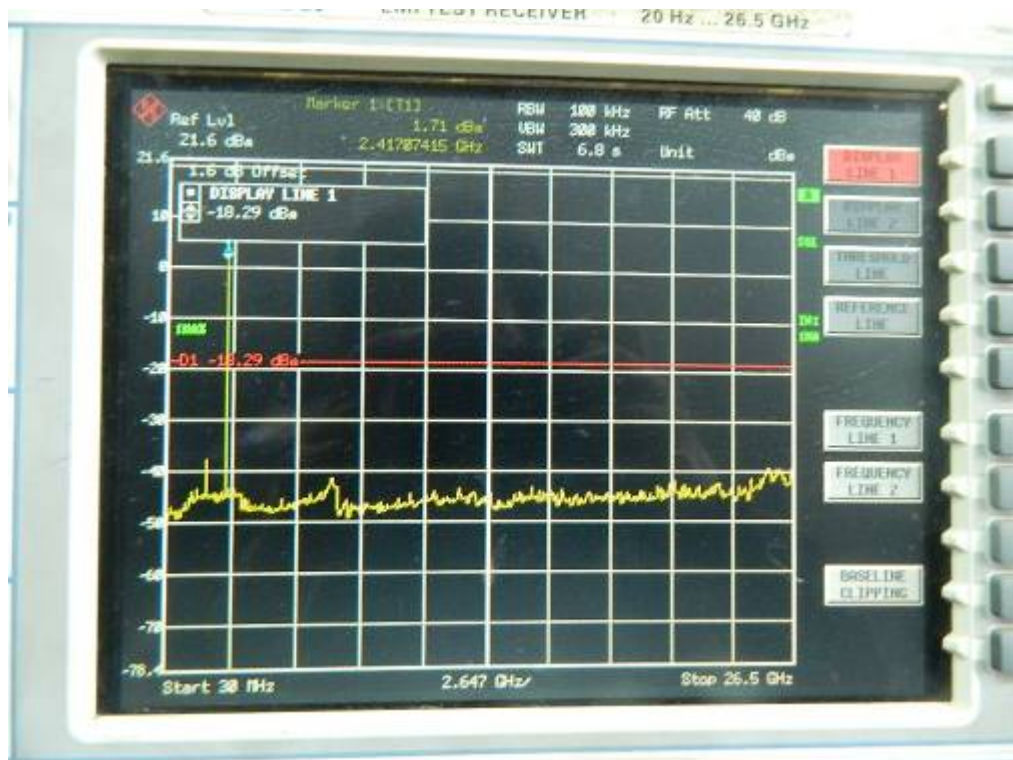
Date: 11.MAR.2013 11:04:52



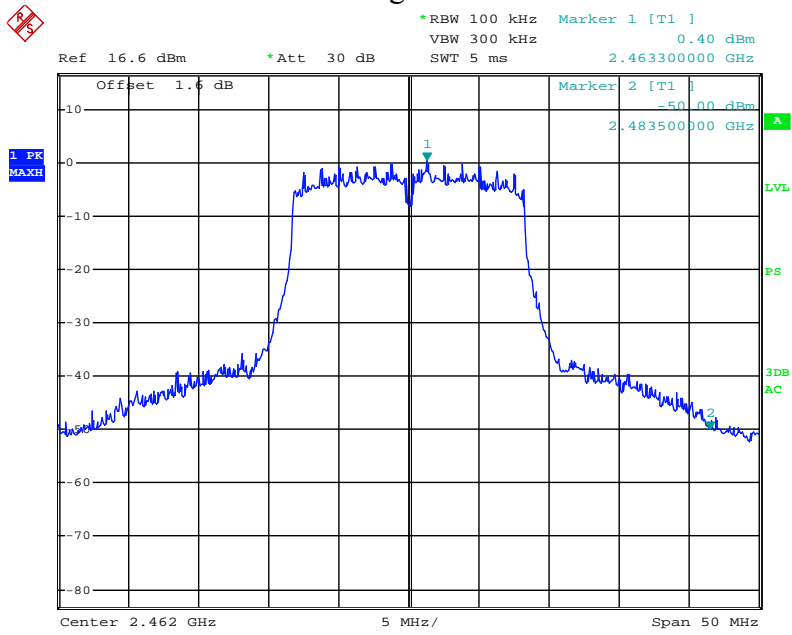
11g Channel M



Date: 11.MAR.2013 11:12:29



11g Channel H

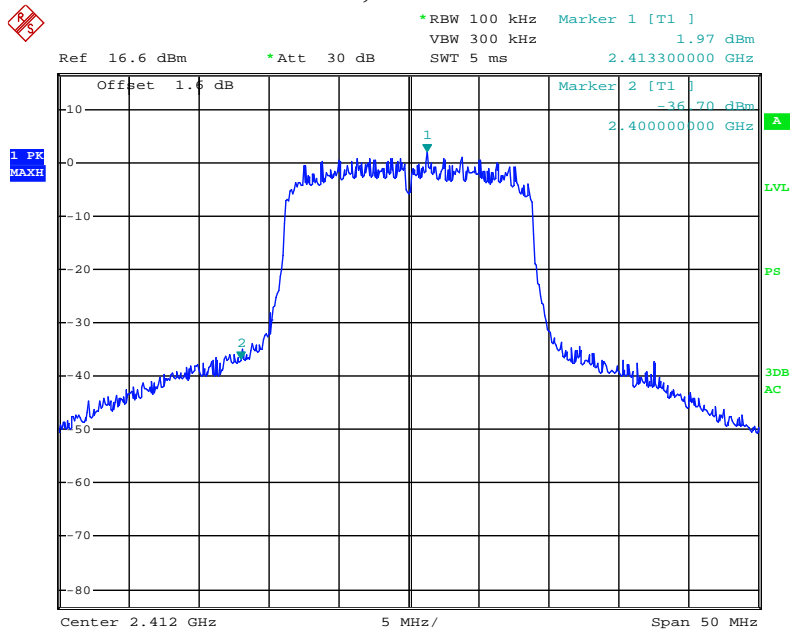


Date: 11.MAR.2013 11:15:55

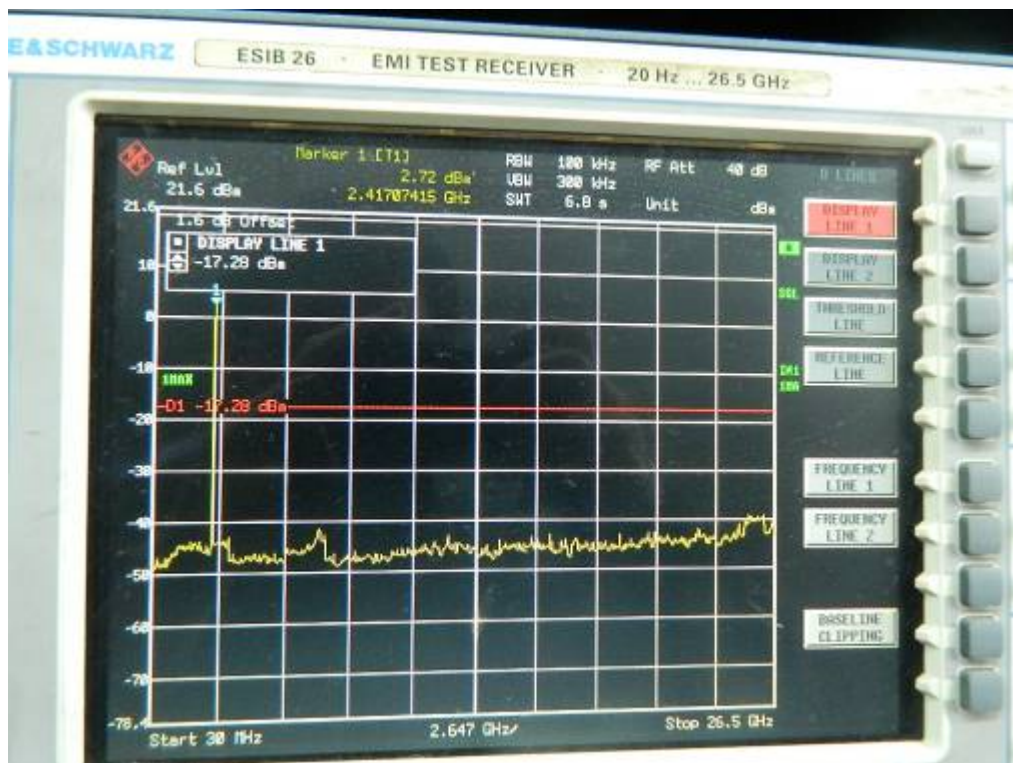




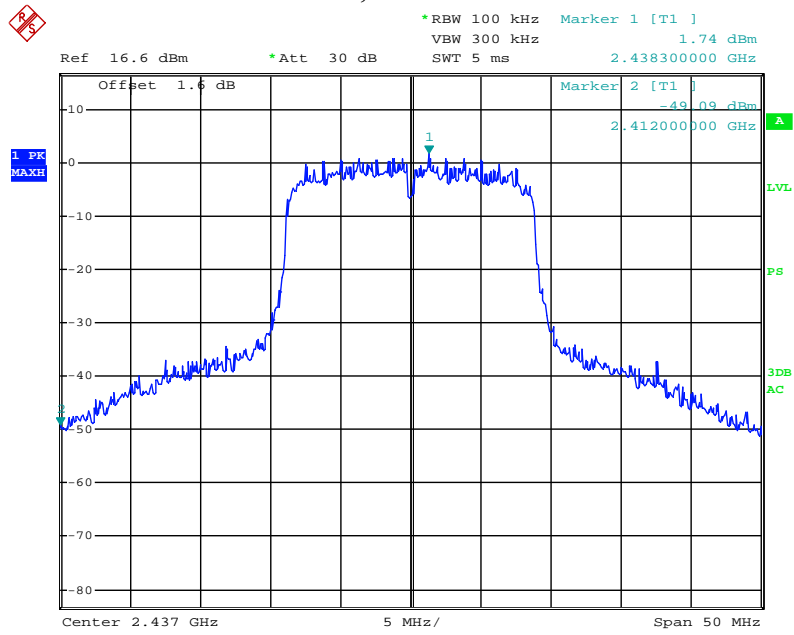
11n, HT20 Channel L



Date: 11.MAR.2013 11:09:15



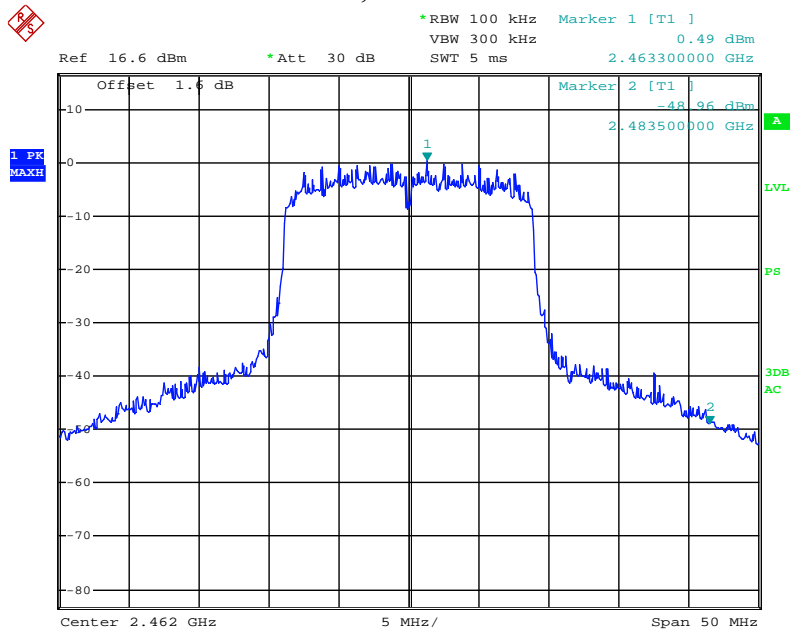
11n, HT20 Channel M



Date: 11.MAR.2013 11:13:15



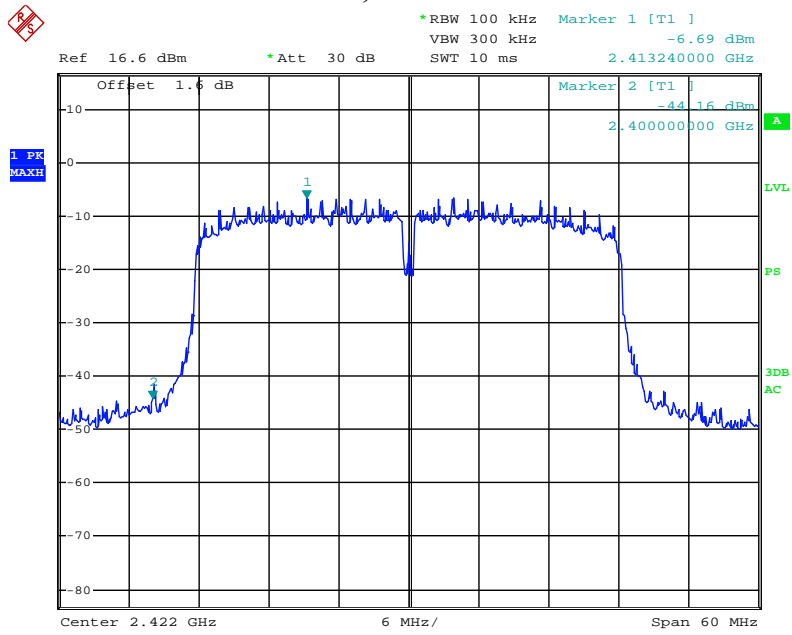
11n, HT20 Channel H



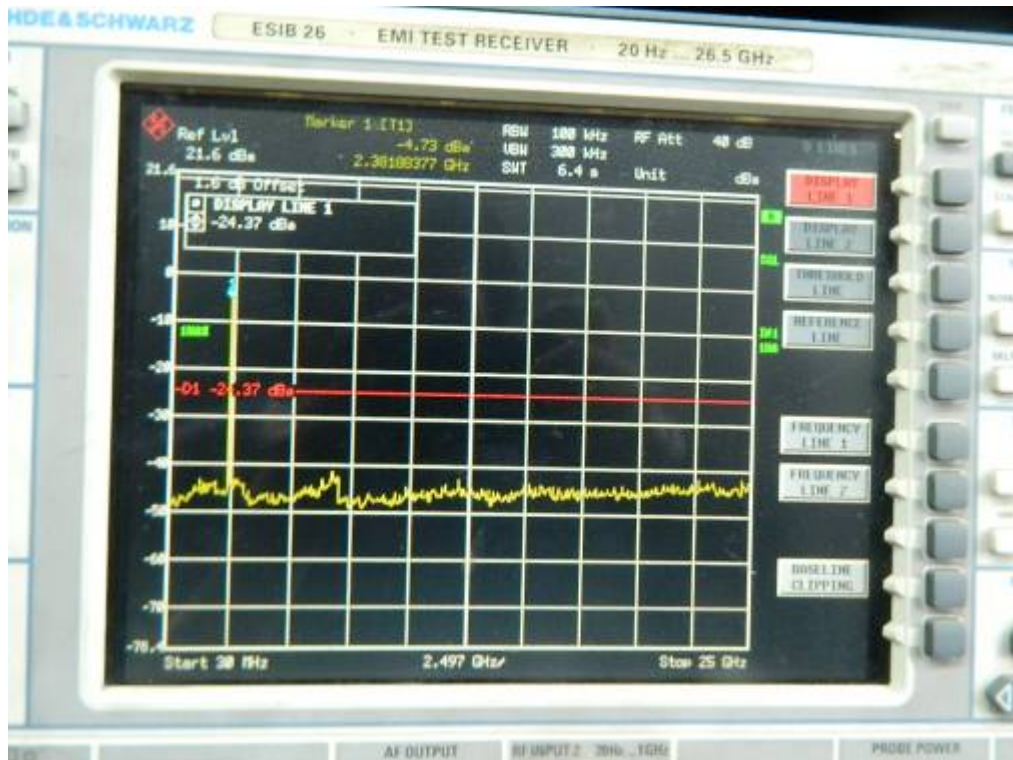
Date: 11.MAR.2013 11:16:25



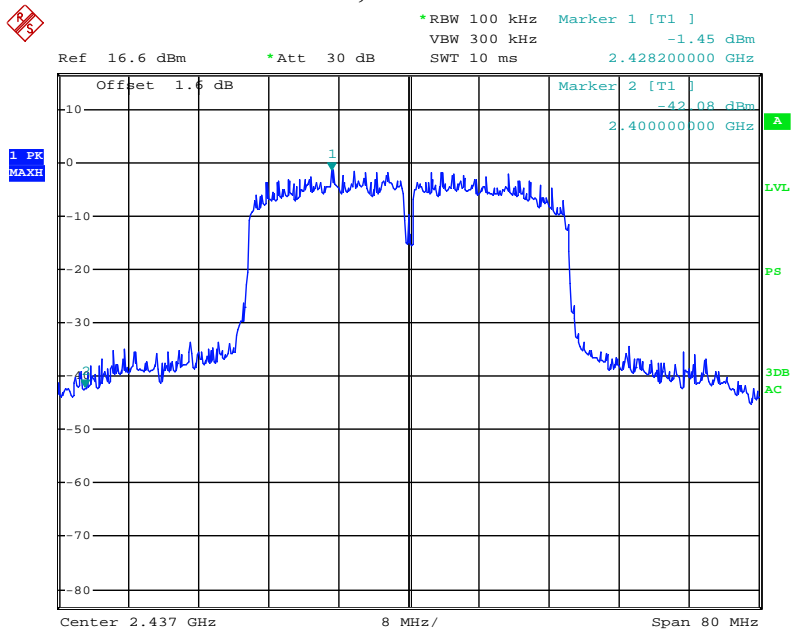
11n, HT40 Channel L



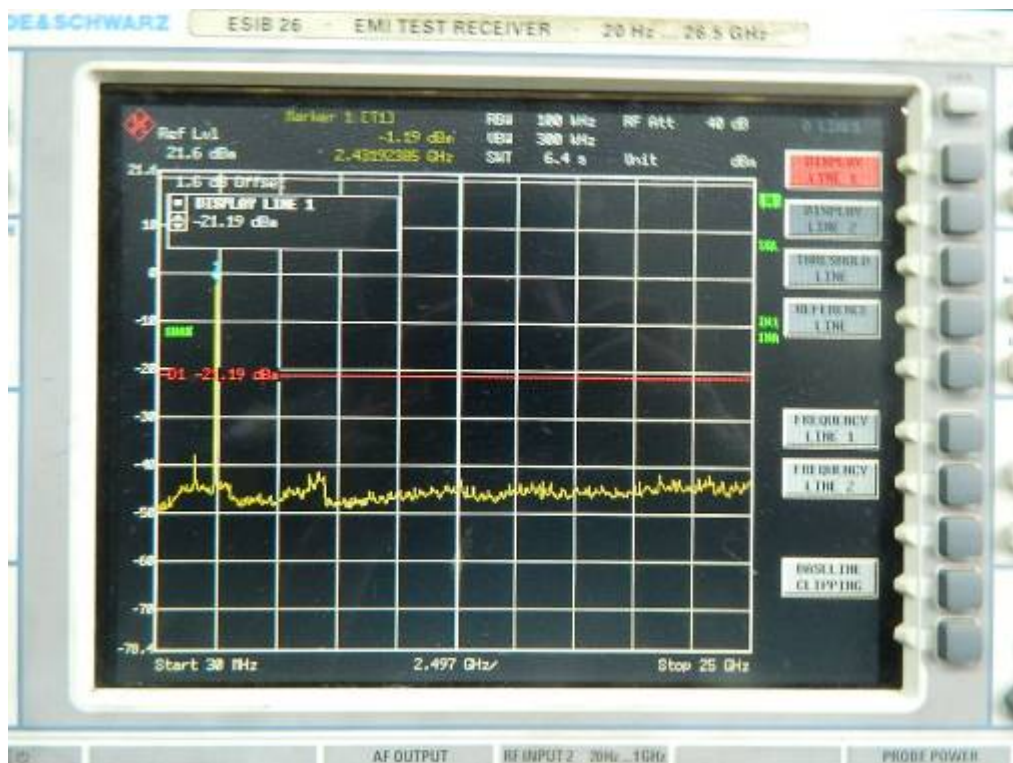
Date: 11.MAR.2013 11:22:39



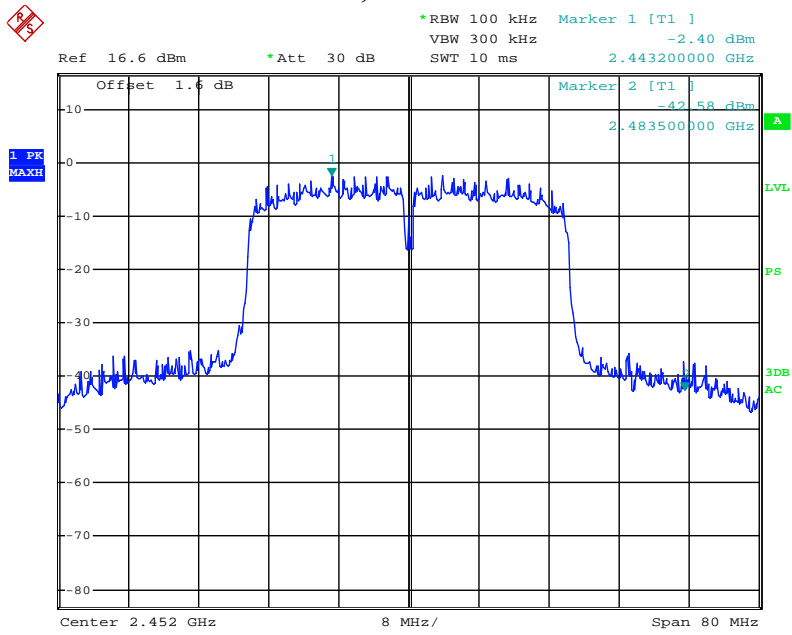
11n, HT40 Channel M



Date: 11.MAR.2013 11:24:00



### 11n, HT40 Channel H

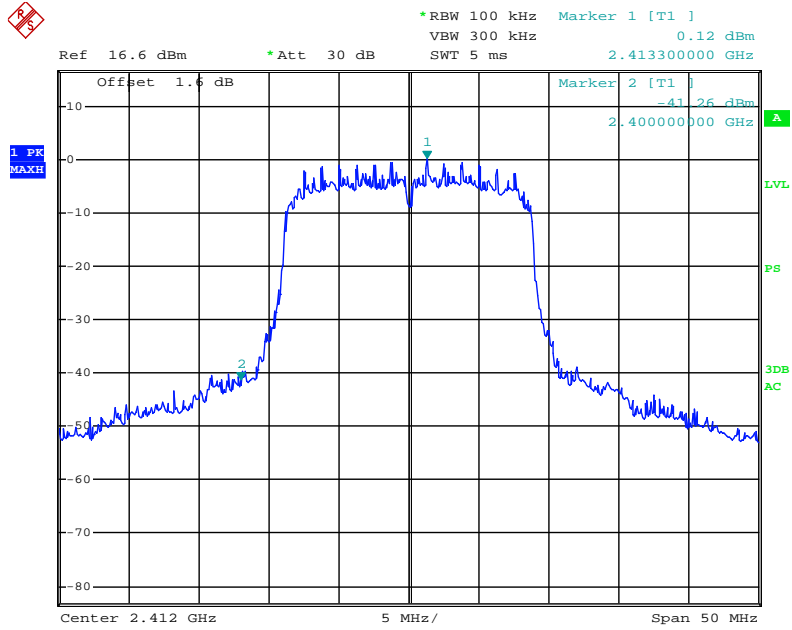


Date: 11.MAR.2013 11:26:10

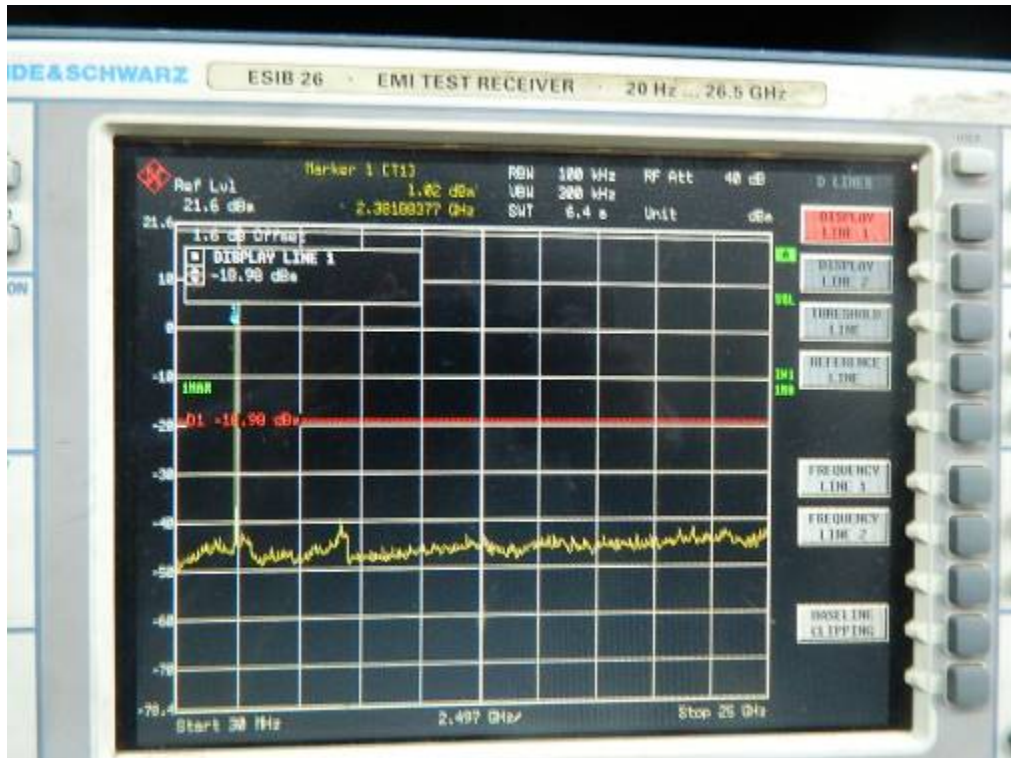


**Dual Chain, Chain 0**

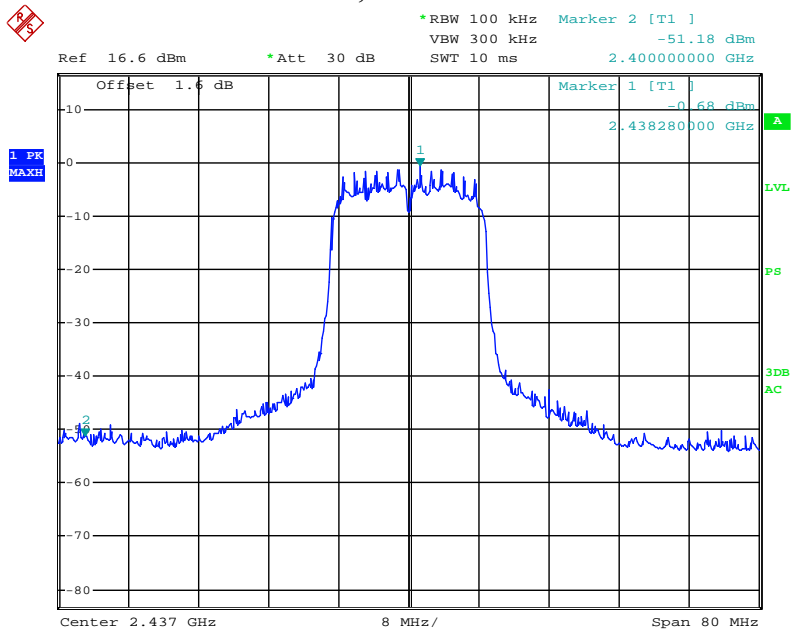
11n, HT20 Channel L



Date: 11.MAR.2013 11:35:18



### 11n, HT20 Channel M

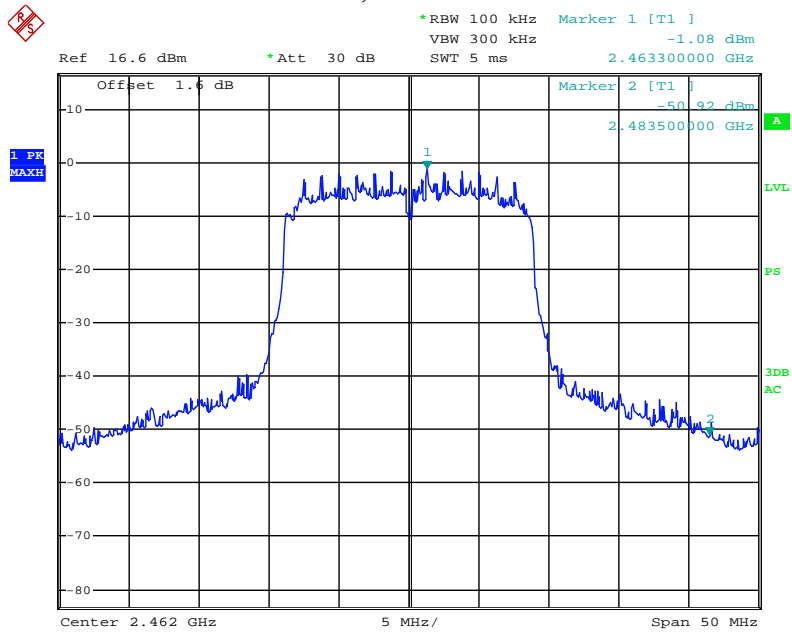


Date: 11.MAR.2013 11:36:39

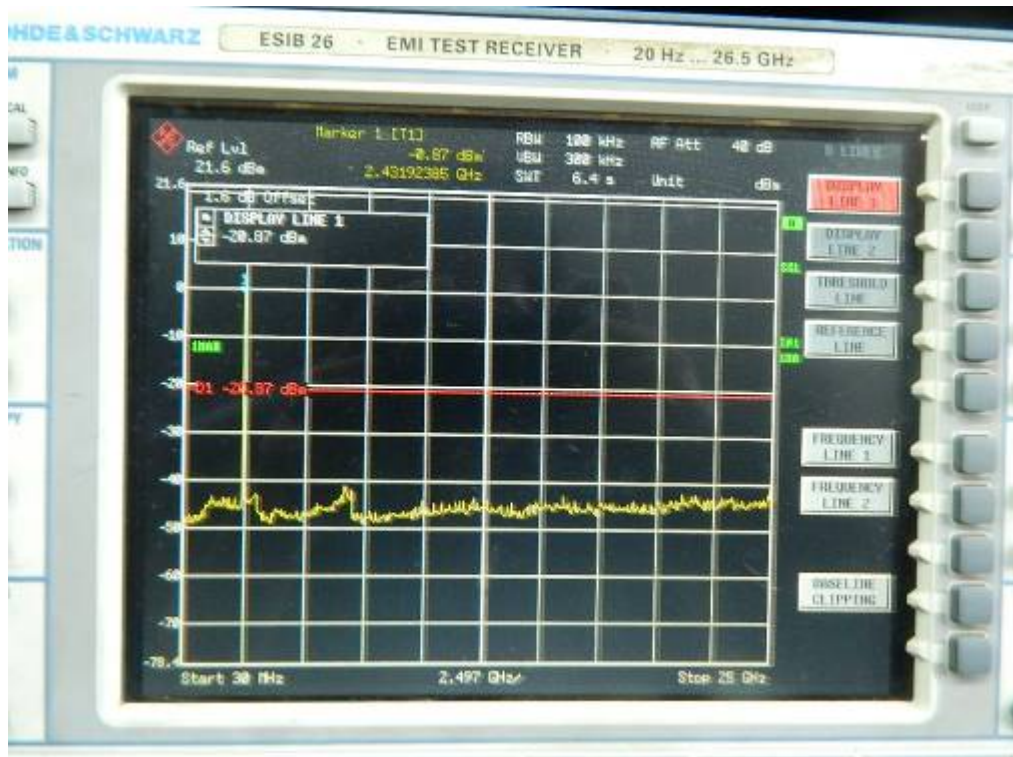




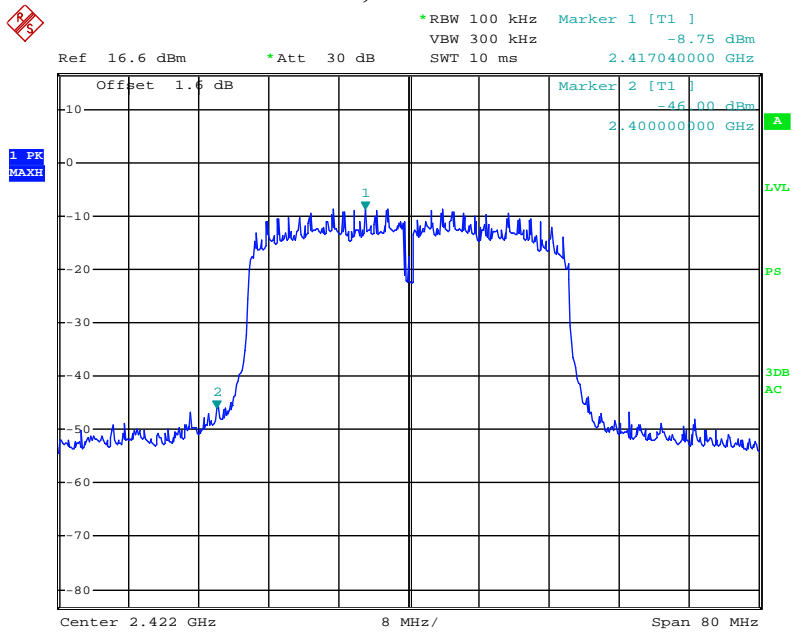
11n, HT20 Channel H



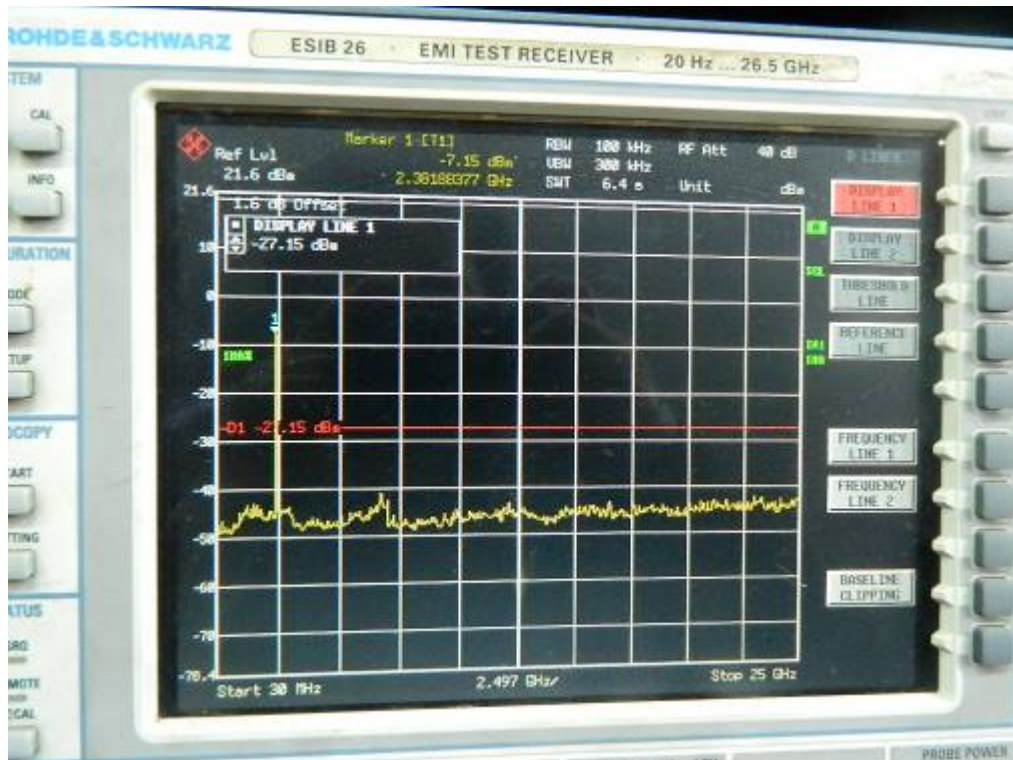
Date: 11.MAR.2013 11:37:37



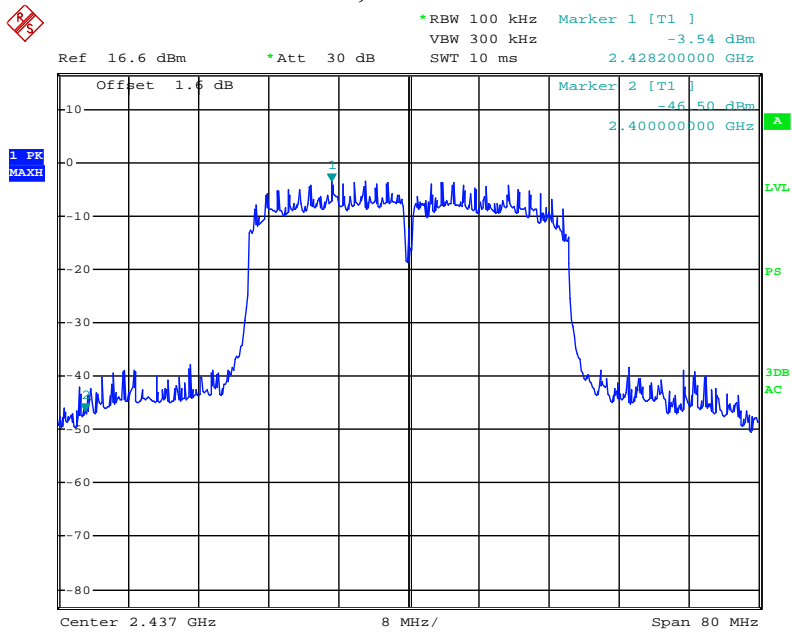
11n, HT40 Channel L



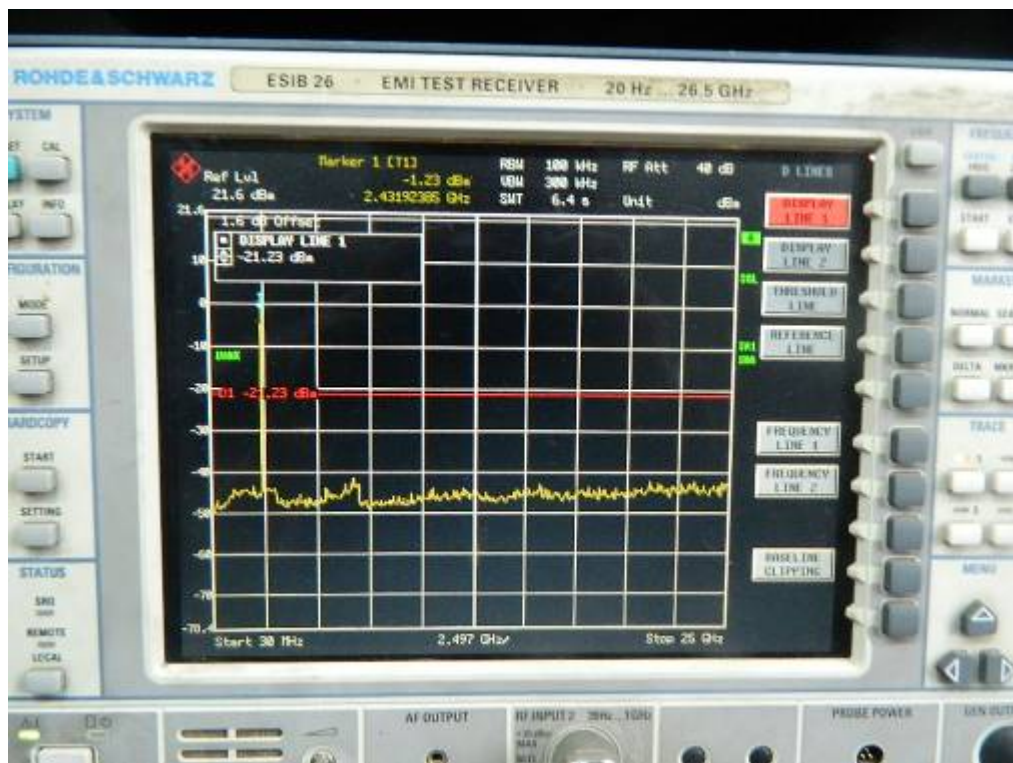
Date: 11.MAR.2013 11:30:27



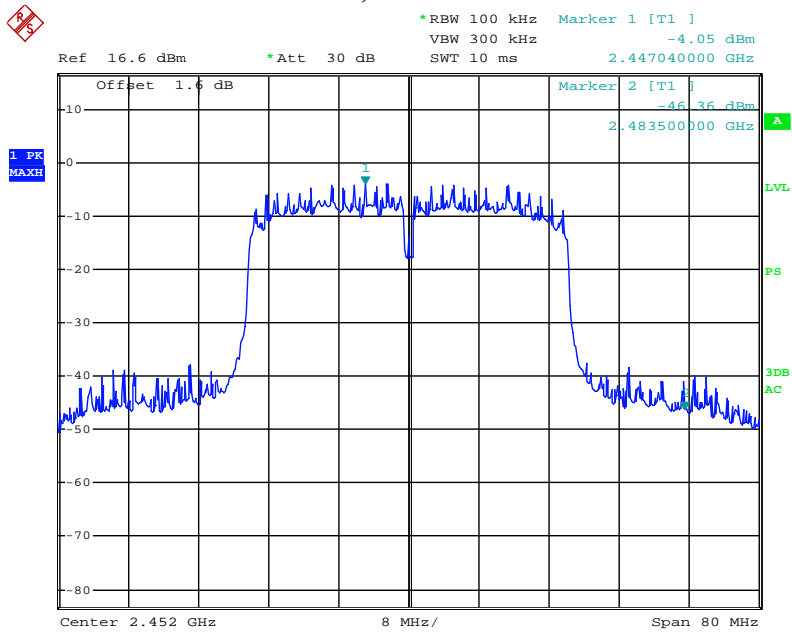
11n, HT40 Channel M



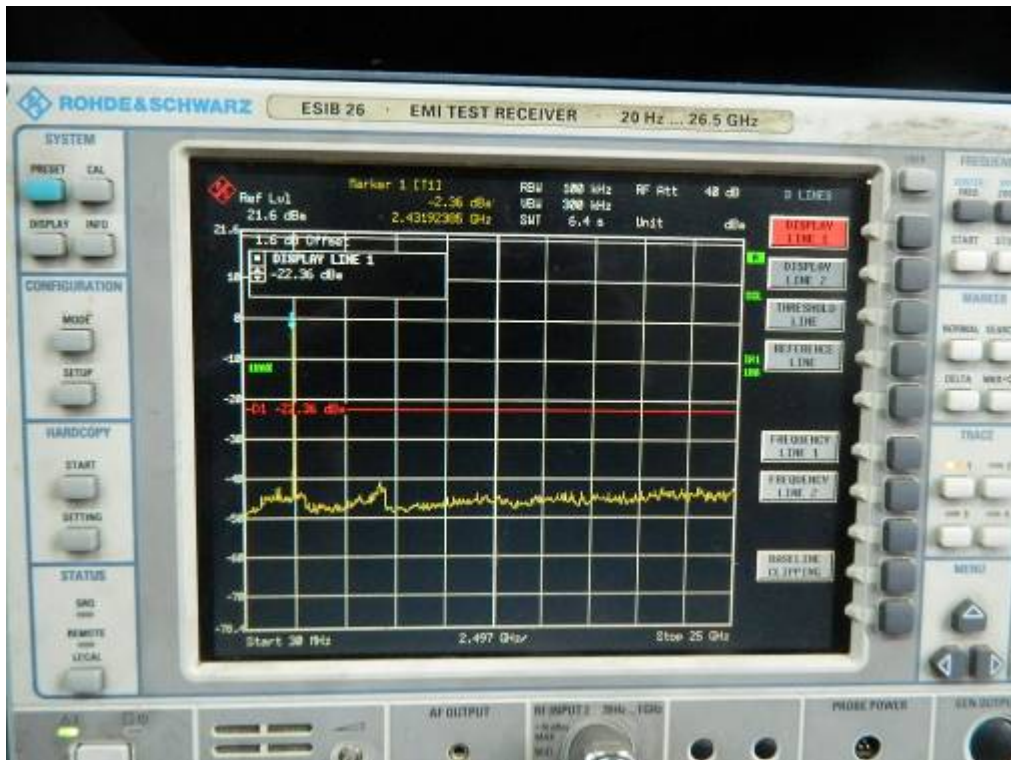
Date: 11.MAR.2013 11:31:34



11n, HT40 Channel H

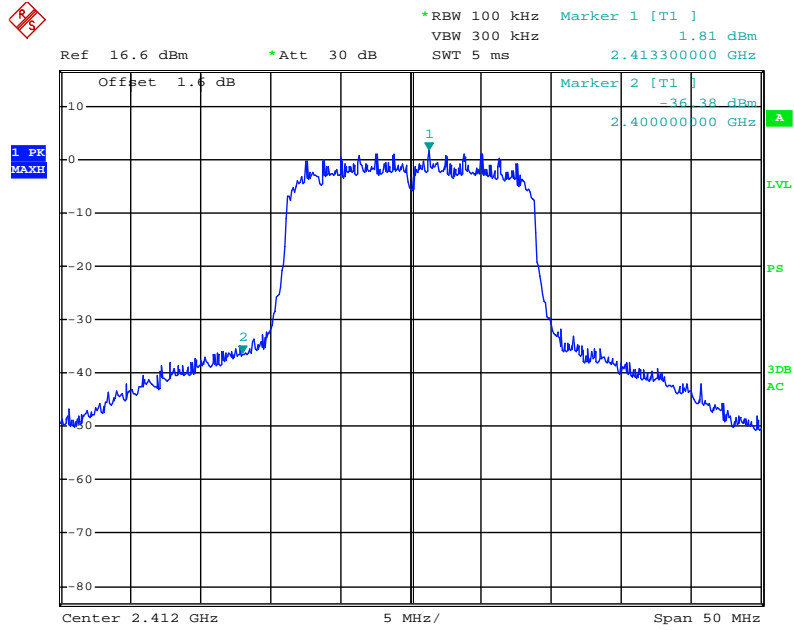


Date: 11.MAR.2013 11:32:51

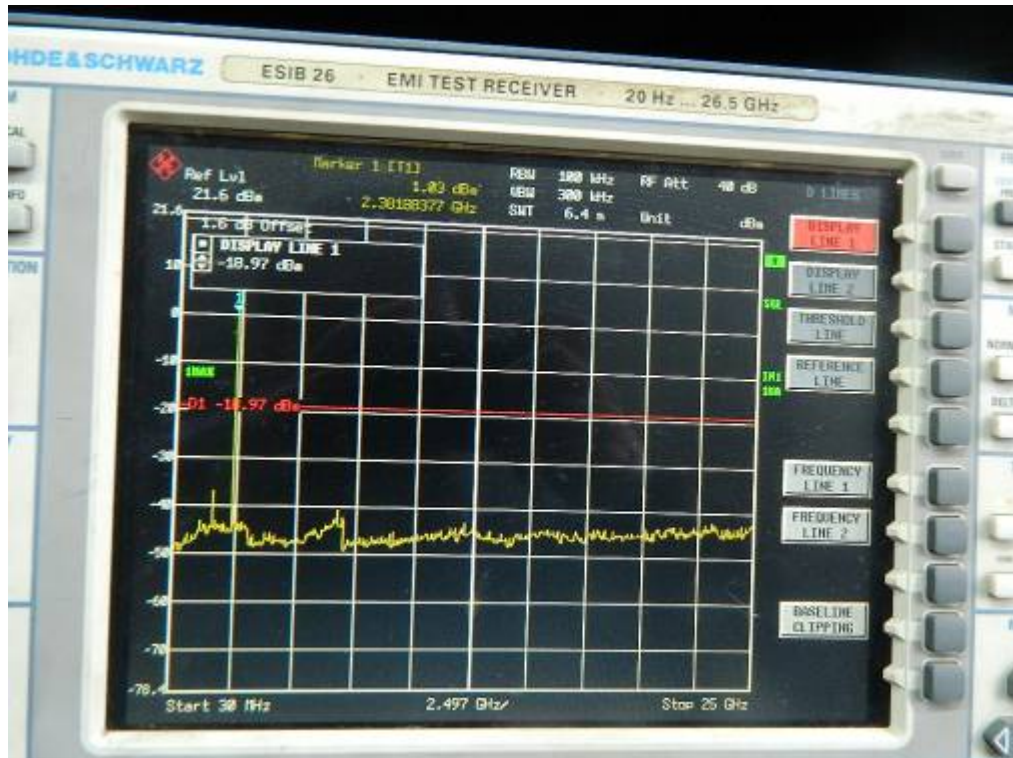


**Dual Chain, Chain 1**

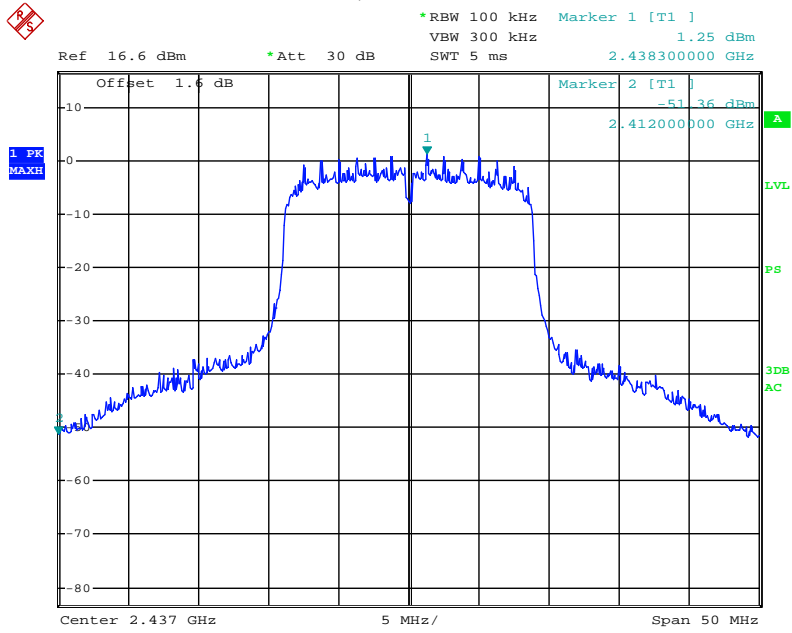
11n, HT20 Channel L



Date: 11.MAR.2013 11:10:41



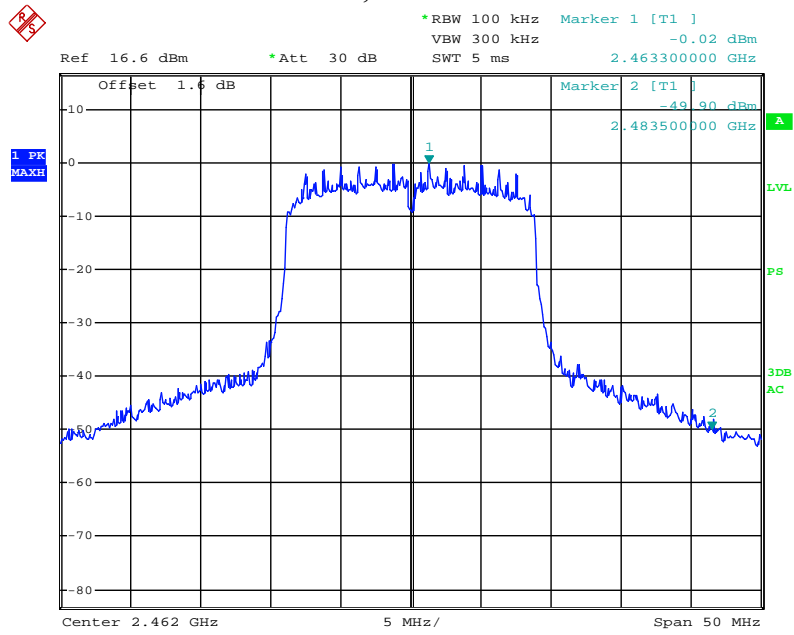
11n, HT20 Channel M



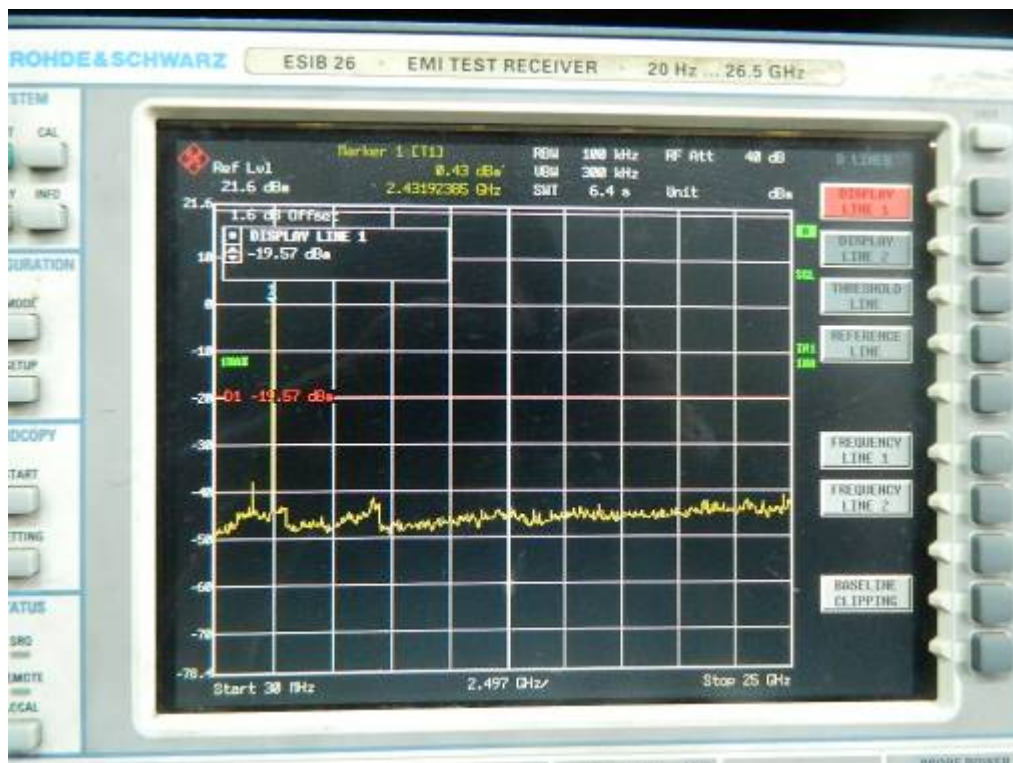
Date: 11.MAR.2013 11:13:51



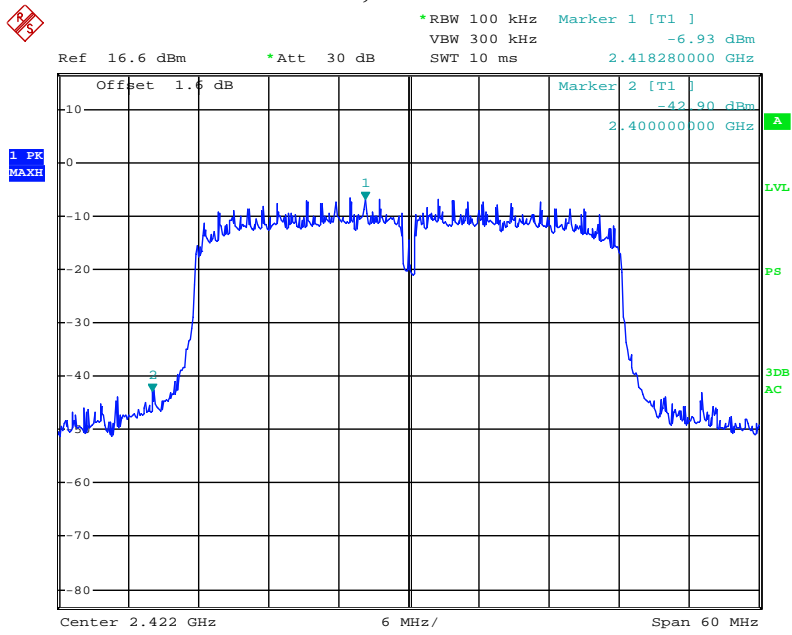
11n, HT20 Channel H



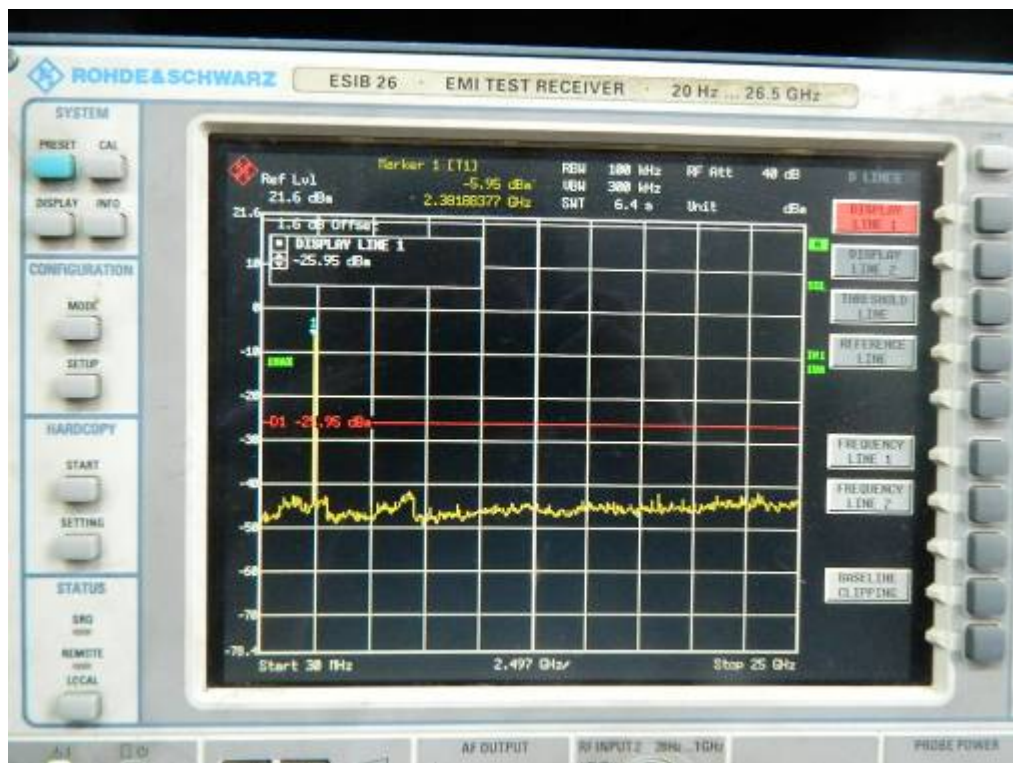
Date: 11.MAR.2013 11:16:55



11n, HT40 Channel L

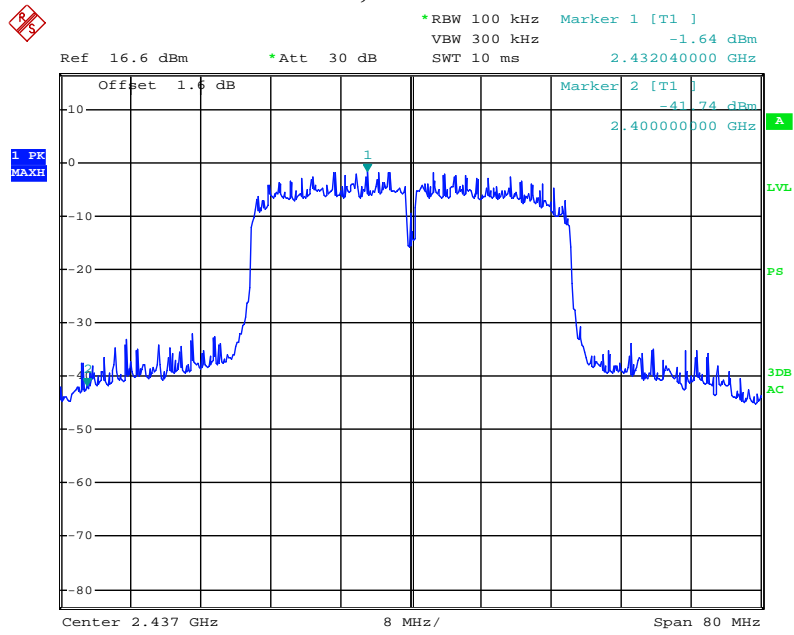


Date: 11.MAR.2013 11:23:06





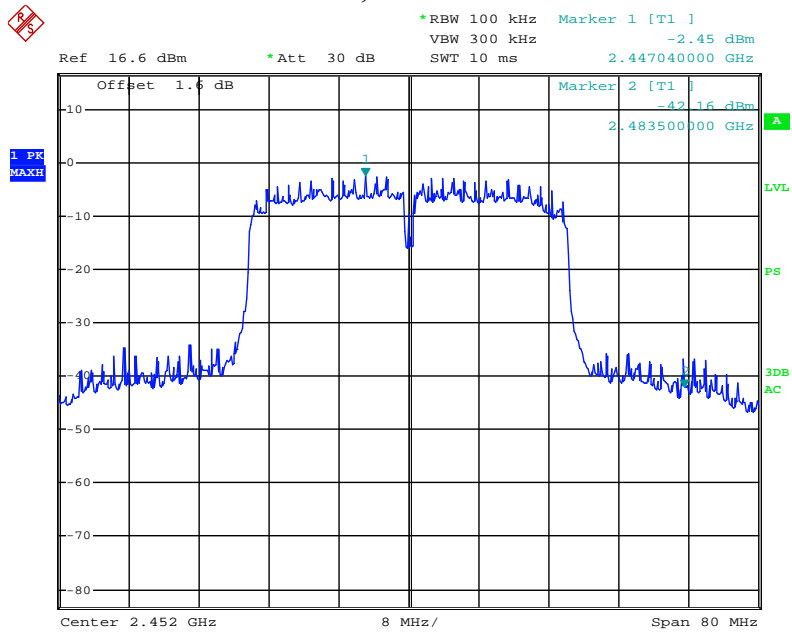
11n, HT40 Channel M



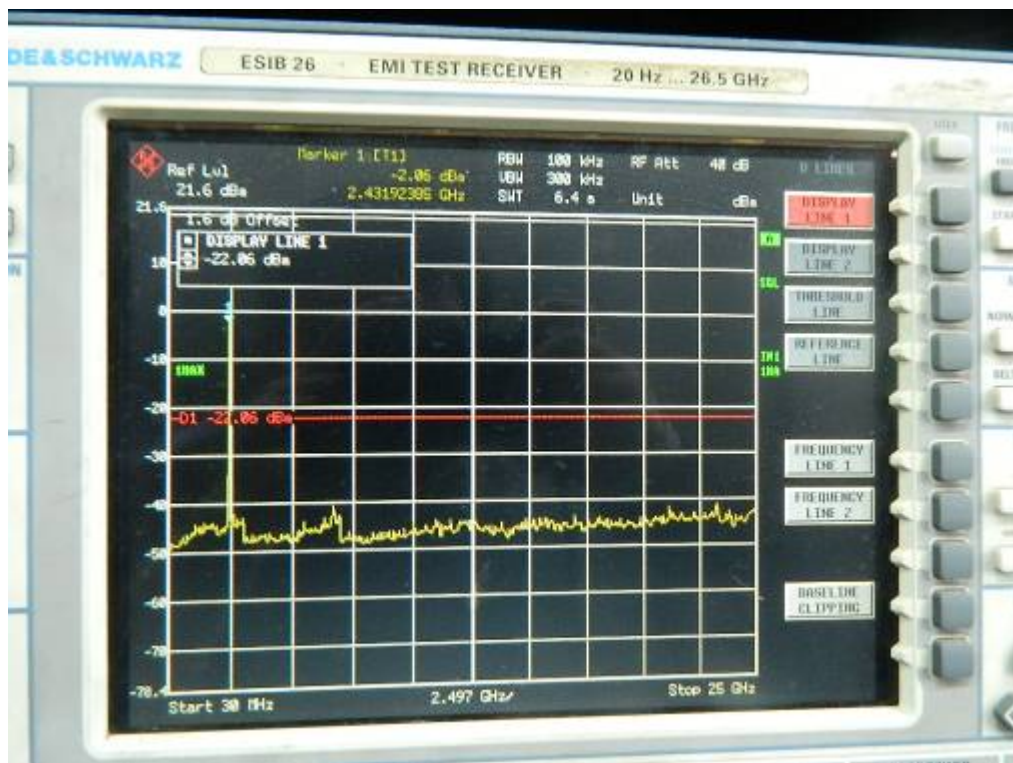
Date: 11.MAR.2013 11:24:49



11n, HT40 Channel H



Date: 11.MAR.2013 11:27:43



## 8. Power line conducted emission

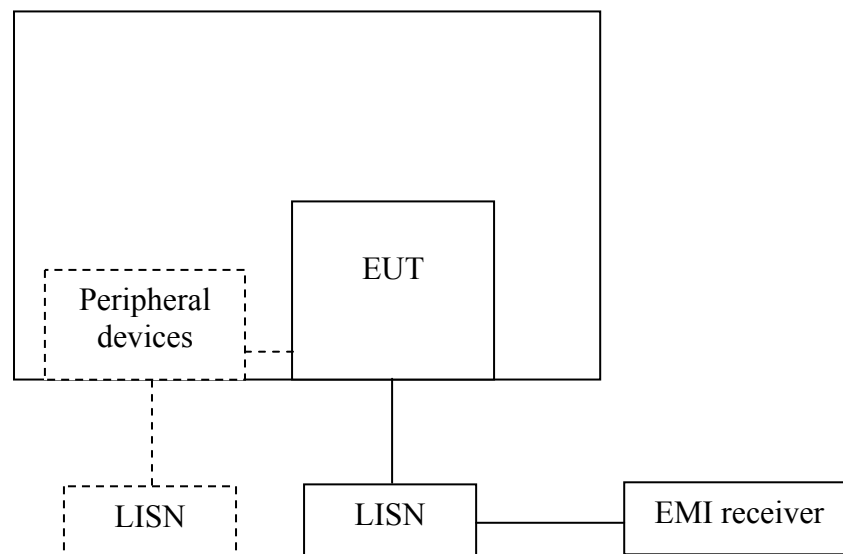
**Test result:** Pass

### 8.1 Limit

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	QP	AV
0.15-0.5	66 to 56*	56 to 46 *
0.5-5	56	46
5-30	60	50

\* Decreases with the logarithm of the frequency.

### 8.2 Test configuration



For table top equipment, wooden support is 0.8m height table

For floor standing equipment, wooden support is 0.1m height rack.

### 8.3 Test procedure and test set up

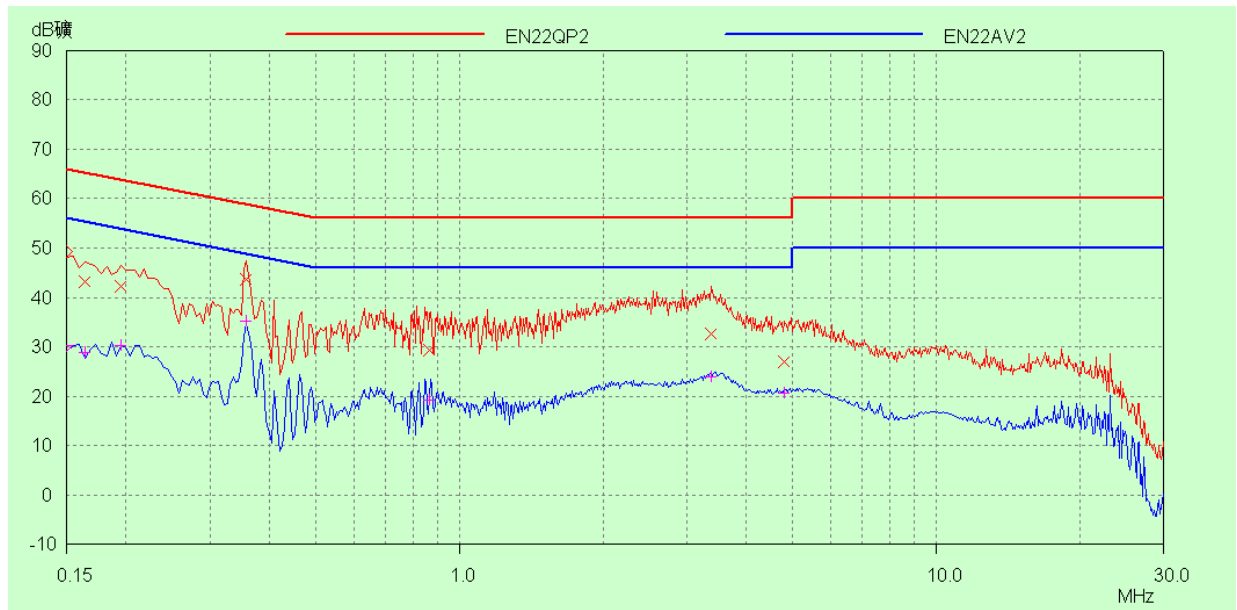
The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a  $50\Omega/50\mu\text{H}$  coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a  $50\Omega/50\mu\text{H}$  coupling impedance with  $50\Omega$  termination.

Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4 on conducted measurement. The bandwidth of the test receiver is set at 9 kHz.

### 8.4 Test protocol

Dual chain, 11n, HT20 mode (which mode with max. output power):

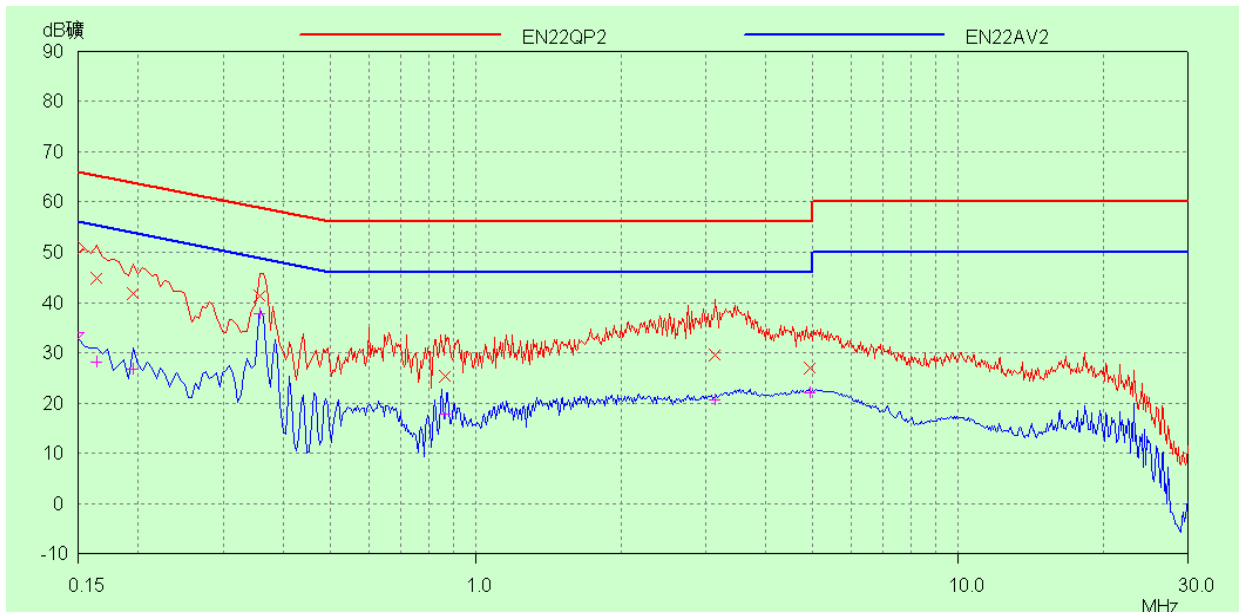
L line



Frequency	Correct Factor (dB)	Corrected Reading (dBuV)		Limit (dBuV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.16	3.00	43.22	28.87	65.28	55.28	22.06	26.41
0.19	3.00	42.16	30.24	63.82	53.82	21.66	23.58
0.36	3.00	43.73	35.11	58.80	48.80	15.07	13.69
0.87	3.00	29.26	19.10	56.00	46.00	26.74	26.90
3.37	3.00	32.62	23.78	56.00	46.00	23.38	22.22
4.80	3.00	27.06	20.60	56.00	46.00	28.94	25.40

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).  
 2. Margin (dB) = Limit - Corrected Reading.

N line



Frequency	Correct Factor (dB)	Corrected Reading (dBUV)		Limit (dBUV)		Margin (dB)	
		QP	AV	QP	AV	QP	AV
0.16	3.00	44.82	28.23	65.28	55.28	20.46	27.05
0.19	3.00	41.66	26.79	63.82	53.82	22.16	27.03
0.36	3.00	41.30	37.79	58.80	48.80	17.50	11.01
0.87	3.00	25.38	17.85	56.00	46.00	30.62	28.15
3.13	3.00	29.48	20.71	56.00	46.00	26.52	25.29
4.94	3.00	26.98	22.11	56.00	46.00	29.02	23.89

Remark: 1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB).  
 2. Margin (dB) = Limit - Corrected Reading.

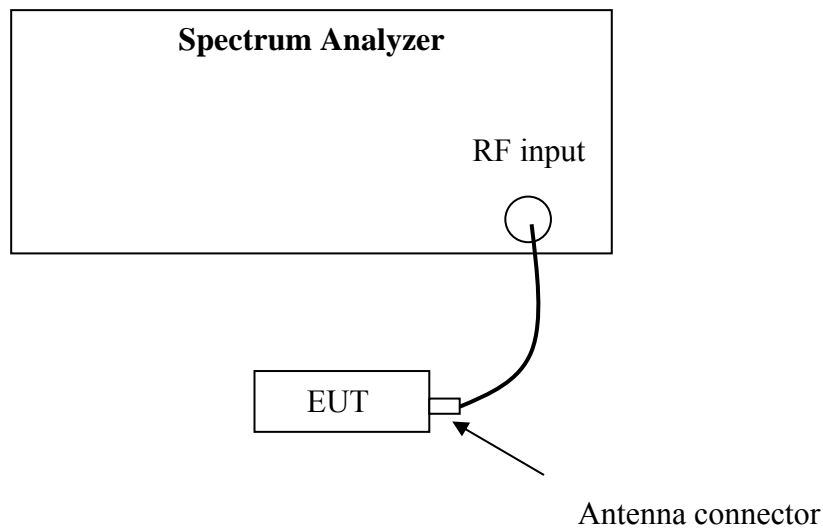
### 9. Channel Number of hopping system

Test result: NA

#### 9.1 Limit

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

#### 9.2 Test Configuration



#### 9.3 Test procedure and test setup

The channel number per FCC §15.247(a)(1)(iii) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN>>RBW.

The RF passband of the EUT was divided into 3 appropriate bands to test.

#### 9.4 Test protocol

Channel Number	Limit
-	≥15

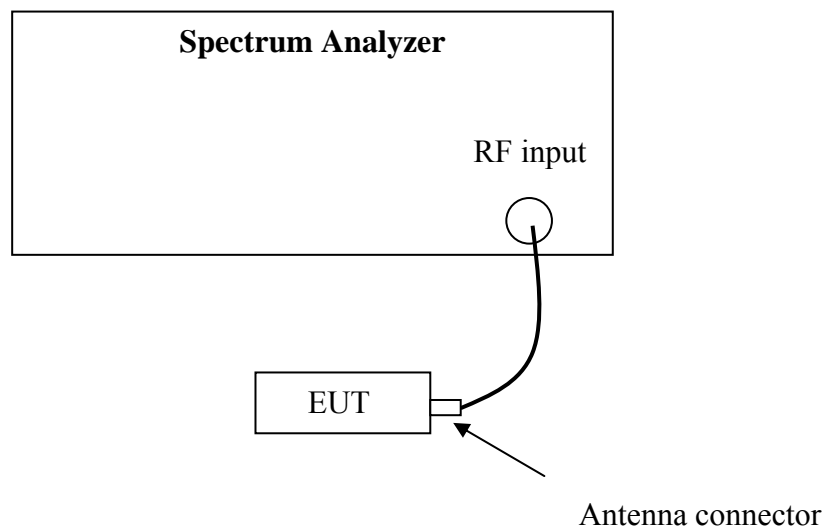
## 10. Average time of occupancy in any channel

Test result: NA

### 10.1 Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

### 10.2 Test Configuration



### 10.3 Test procedure and test setup

Average time of occupancy in any channel per FCC § 15.247(a)(1)(iii) is measured using the Spectrum Analyzer with the resolutions bandwidth set at 100kHz, the video bandwidth set at 300kHz, and the SPAN set to be 0Hz to test in time domain. The test is performed at the middle channel.



**10.4 Test protocol**

Packet	Observed period (s) <b>P</b>	Time of occupancy for single hopping (ms) <b>O</b>	Hops among the interval of 3.6 s <b>I</b>	Average time of occupancy (s) <b>T</b>	Limit (s)
Packet Type 4	-	-	-	-	≤0.4
Packet Type 11	-	-	-	-	≤0.4
Packet Type 15	-	-	-	-	≤0.4

Remark: 1. There are 79 channels in all. So the observed period  $P = 0.4 * 79 = 31.6$  s.  
 2. Average time of occupancy  $T = O * I * P / 3.6$