

FCC TEST REPORT

for

ShenZhen Egreat Technology Co.,Ltd.

HD Network Set-Top Box

Model Number: X3,X1,X2,X5,X6,X7,X8,X9,
X10,X20,X30,X60,X70

FCC ID: 2AAWZX3

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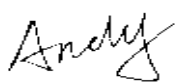
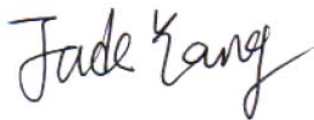
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Report No. : 13KWE08825F
Date of Test : Aug. 18~25, 2013
Date of Report : Aug. 26, 2013

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Keyway Testing Technology Co., Ltd.

Applicant:	ShenZhen Egreat Technology Co.,Ltd.		
Address:	4/F, 1Building, ShaSan Chuang Ye Industrial Park, Sha Jing, Bao An, ShenZhen ,China		
Manufacturer:	ShenZhen Egreat Technology Co.,Ltd.		
Address:	4/F, 1Building, ShaSan Chuang Ye Industrial Park, Sha Jing, Bao An, ShenZhen ,China		
E.U.T:	HD Network Set-Top Box		
Model Number:	X3,X1,X2,X5,X6,X7,X8,X9,X10,X20,X30,X60,X70		
Trade Name:	-----	Serial No.:	-----
Date of Receipt:	Aug. 16, 2013	Date of Test:	Aug. 18~25, 2013
Test Specification:	FCC Part 15, Subpart C: Oct. 1, 2012 ANSI C63.4:2009 KDB558074 D01 DTS Meas Guidance v03r01		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
Issue Date: Aug. 26, 2013			
Tested by:	Reviewed by:	Approved by:	
 	 	 	
Andy Gao / Engineer	Jade Yang/ Supervisor	Chris Du / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed n.a/N=not applicable E.U.T=equipment under tested</i>			
<i>This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Keyway Testing Technology Co., Ltd.</i>			

1. TEST SUMMARY

Test Items	Test Requirement	Result
Conducted Emissions	15.207	PASS
Radiated Emissions	15.205(a) 15.209 15.247(d)	PASS
6dB Bandwidth	15.247(a)(2)	PASS
Power density	15.247(e)	PASS
Maximum Peak Output Power	15.247(b)(3)	PASS
Emissions from out of band	15.247(d)	PASS
Antenna Requirement	15.203	PASS

2.GENERAL PRODUCT INFORMATION

2.1. Product Function

Refer to Technical Construction Form and User Manual.

2.2. Description of Device (EUT)

Product Name:	HD Network Set-Top Box
Model No.:	X3,X1,X2,X5,X6,X7,X8,X9,X10,X20,X30,X60,X70
Operation Frequency:	2412MHz~2462MHz (802.11b/802.11g/802.11n(H20)) 2422MHz~2452MHz (802.11n(H40))
Channel numbers:	11 for 802.11b/802.11g/802.11n(H20) ,7 for 802.11n(H40)
Channel separation:	5MHz
Modulation technology: (IEEE 802.11b)	Direct Sequence Spread Spectrum (DSSS)
Modulation technology: (IEEE 802.11g/802.11n)	Orthogonal Frequency Division Multiplexing(OFDM)
Data speed (IEEE 802.11b):	1Mbps, 2Mbps, 5.5Mbps, 11Mbps
Data speed (IEEE 802.11g):	6Mbps, 9Mbps, 12Mbps, 18Mbps, 24Mbps, 36Mbps, 48Mbps,54Mbps
Data speed (IEEE 802.11n):	Up to 150Mbps
Antenna Type:	External
Antenna gain:	1dBi (declare by Applicant)
Power supply:	DC 5V from adapter
Work frequency:	2.4GHz

2.3. Independent Operation Modes

The basic operation modes are:

2.3.1. EUT work continues TX mode and frequency as below:

	Channel	Frequency
802.11b	Low	2412MHz
	Middle	2437MHz
	High	2462MHz
802.11g	Low	2412MHz
	Middle	2437MHz
	High	2462MHz
802.11n(HT20)	Low	2412MHz
	Middle	2437MHz
	High	2462MHz
802.11 n(HT40)	Low	2422MHz
	Middle	2437MHz
	High	2452MHz

Remark: According to ANSI C63.4 standards, the test results are both the “worst case” and “worst setup” 1MHz for 802.11b, 54MHz for 802.11g, 6.5Mbps for 802.11n(H20), 13Mbps for 802.11n(H40).

2.4. Test Supporting System

TV	Manufacturer: SONY
	M/N: KDL-26EX546
USB	Manufacturer: Kingston
	M/N: SSK-09D11
Adapter:	Manufacturer: Egreat
	M/N: ZFXPA02000050
	Input: AC 100~240V 50/60Hz Output: DC 5V/2A

3. TEST SITES

3.1. Test Facilities

Lab Qualifications : Certificated by Industry Canada
 Registration No.: 9868A
 Date of registration: December 8, 2011

Certificated by FCC, USA
 Registration No.: 370994
 Date of registration: February 21, 2012

3.2. List of Test and Measurement Instruments

3.2.1. For conducted emission at the mains terminals test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	May 9,13	May 9,14
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	May 9,13	May 9,14
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	May 9,13	May 9,14
RF Cable	FUJIKURA	3D-2W	944 Cable	May 9,13	May 9,14

3.2.2. For radiated emission test (Below 1GHz)

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	May 9,13	May 9,14
Bilog Antenna	ETS-LINDGREN	3142D	00135452	May 20,13	May 20,14
Spectrum Analyzer	Agilent	8593E	3911A04271	May 9,13	May 9,14
3m Semi-anechoic Chamber	ETS-LINDGREN	966	KW01	May 20,13	May 20,14
Signal Amplifier	SONOMA	310	187303	May 9,13	May 9,14
RF Cable	IMRO	IMRO-400	966 Cable 1#	May 9,13	May 9,14
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Antenna Holder	ETS-LINDGREN	2070B	00109601	N/A	N/A

3.2.3. For above 1GHz radiated emission, output power,band edge, 6dB bandwidth test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Horn Antenna	DAZE	ZN30701	11003	May 11,13	May 11,14
Horn Antenna	SCHWARZBECK	BBHA9170	9170-068	May 11,13	May 11,14
Spectrum Analyzer	Agilent	8593E	3911A04271	May 9,13	May 9,14
Spectrum Analyzer	Agilent	E4408B	MY44211125	May 9,13	May 9,14
Spectrum Analyzer	Rohde&Schwarz	FSP	100394	May 9,13	May 9,14
3m Semi-anechoic Chamber	ETS-LINDGREN	966	KW01	May 20,13	May 20,14
Signal Amplifier	DAZE	ZN3380C	11001	May 9,13	May 9,14
Signal Amplifier	Agilent	8449B	3008A00251	May 9,13	May 9,14
High Pass filter	Micro	HPM50111	324216	May 9,13	May 9,14
Power Meter	R&S	NRVS	101824	May 9,13	May 9,14
Peak and Avg Power Sensor	Rohde&Schwarz	URV5-Z7	100655	May 9,13	May 9,14
RF Cable	IMRO	IMRO-400	966 Cable 1#	May 9,13	May 9,14
MULTI-DEVICE Controller	ETS-LINDGREN	2090	126913	N/A	N/A
Antenna Holder	ETS-LINDGREN	2070B	00109601	N/A	N/A

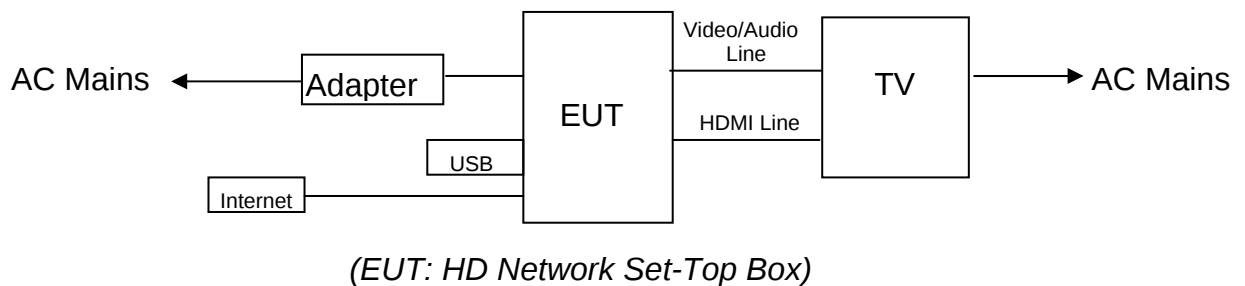
4. TEST SET-UP AND OPERATION MODES

4.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

4.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



4.3. Test Operation Mode and Test Software

None.

4.4. Special Accessories and Auxiliary Equipment

None.

4.5. Countermeasures to Achieve EMC Compliance

None.

5. EMISSION TEST RESULTS

5.1. Conducted Emission at the Mains Terminals Test

5.1.1. Limit 15.209 limits

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

5.1.2. Test Setup

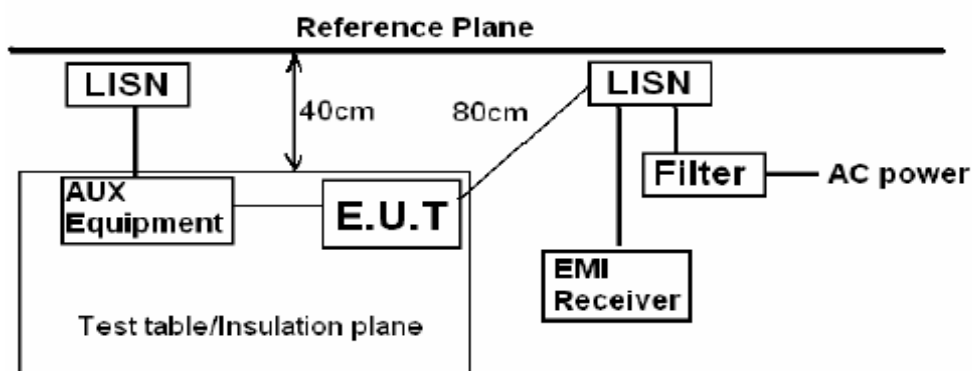
The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 0.8 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.

The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.

The frequency range from 150 kHz to 30 MHz was investigated.

The bandwidth of the test receiver was set at 9 kHz.

Pretest for all mode, The test data of the worst case condition(s) was reported on the following page.



Remark:
 E.U.T: Equipment Under Test
 LISN: Line Impedance Stabilization Network
 Test table height=0.8m

5.1.3. Test Mode

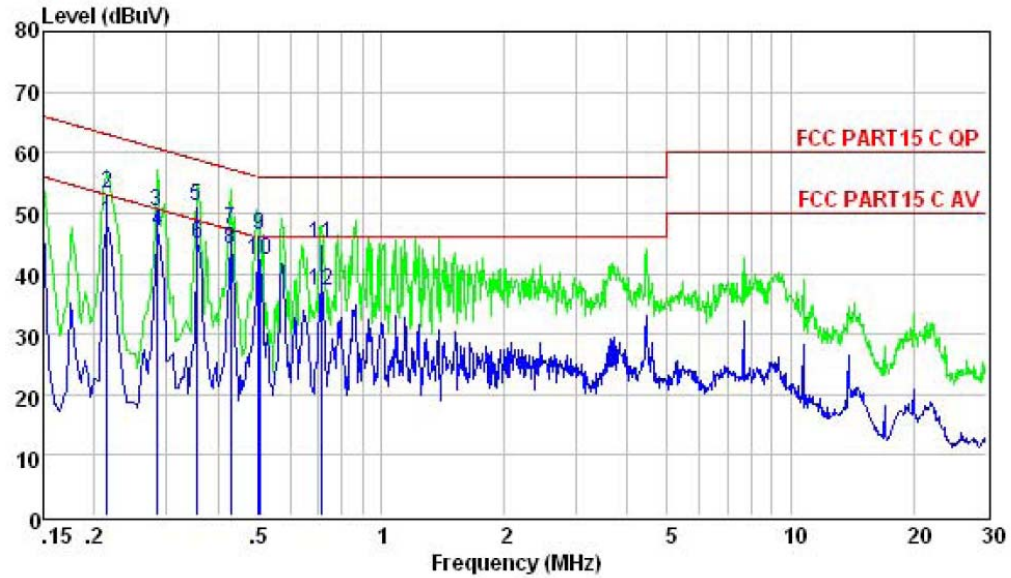
Set EUT in TX mode.

Test Data

Test mode: TX Mode

Test Line: LINE

Data: 14

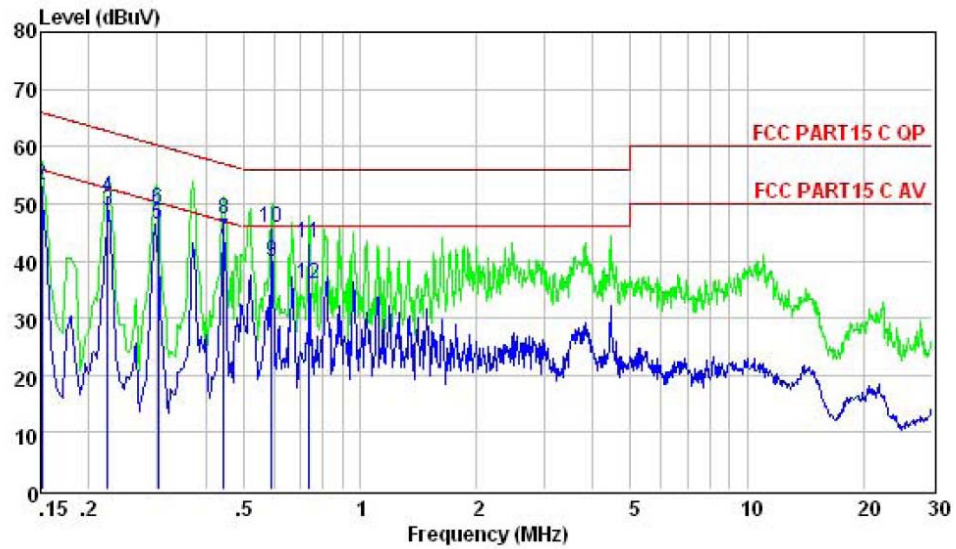


	Freq	Level	Limit	Over	
	MHz	dBuV	Line	Limit	Remark
			dBuV	dB	
1	0.215	48.40	53.01	-4.61	Average
2	0.215	53.20	63.01	-9.81	QP
3	0.284	50.40	60.70	-10.30	QP
4	0.285	46.97	50.68	-3.71	Average
5	0.355	51.30	58.84	-7.54	QP
6	0.356	45.04	48.83	-3.79	Average
7	0.430	47.30	57.25	-9.95	QP
8	0.431	44.13	47.24	-3.11	Average
9	0.504	46.50	56.00	-9.50	QP
10	0.505	42.20	46.00	-3.80	Average
11	0.715	44.80	56.00	-11.20	QP
12	0.716	37.31	46.00	-8.69	Average

Test mode: TX Mode

Test Line: NEUTRAL

Data: 16



	Freq	Level	Limit	Over	
	MHz	dBuV	Line	Limit	Remark
	MHz	dBuV	dBuV	dB	
1	0.151	51.89	55.94	-4.05	Average
2	0.151	53.10	65.94	-12.84	QP
3	0.223	48.92	52.71	-3.79	Average
4	0.223	51.10	62.71	-11.61	QP
5	0.301	46.34	50.22	-3.88	Average
6	0.301	49.10	60.22	-11.12	QP
7	0.445	43.64	46.97	-3.33	Average
8	0.445	47.20	56.97	-9.77	QP
9	0.592	39.87	46.00	-6.13	Average
10	0.592	45.80	56.00	-10.20	QP
11	0.739	43.10	56.00	-12.90	QP
12	0.739	35.96	46.00	-10.04	Average

5.2. Radiated Emission Test

5.2.1. Limit 15.209 limits

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

5.2.2. Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
¹ 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	(²)

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

5.2.3. Test setup

The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both HORIZONTAL and VERTICAL polarizations.

The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.

The bandwidth of the EMI test receiver is set at 120kHz for frequency range from 30MHz to 1000 MHz.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure above 1GHz.

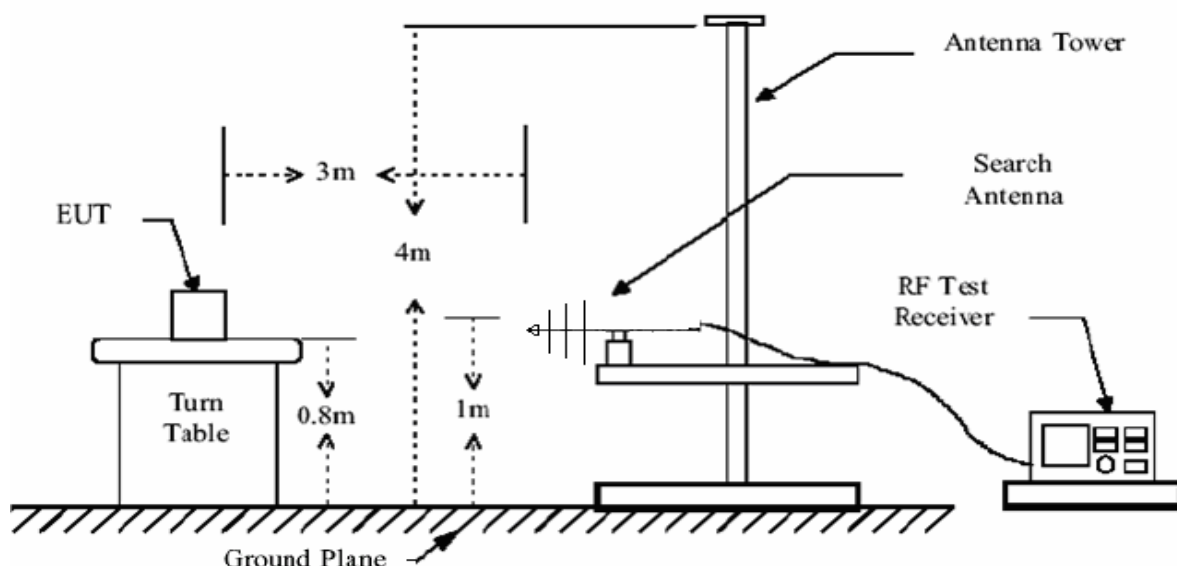
The frequency range from 30MHz to 10th harmonic (25GHz) are checked. and no any emissions were found from 18GHz to 25 GHz, So the radiated emissions from 18GHz to 25GHz were not record.

Notes: 1. Emission Level = Antenna Factor + Cable Loss + Meter Reading-Preamp Factor.

2. Measurement Uncertainty: ± 3.2 dB at a level of confidence of 95%.

3. For emissions above 1GHz, if peak level comply with average limit, then the average level is deemed to comply with average limit.

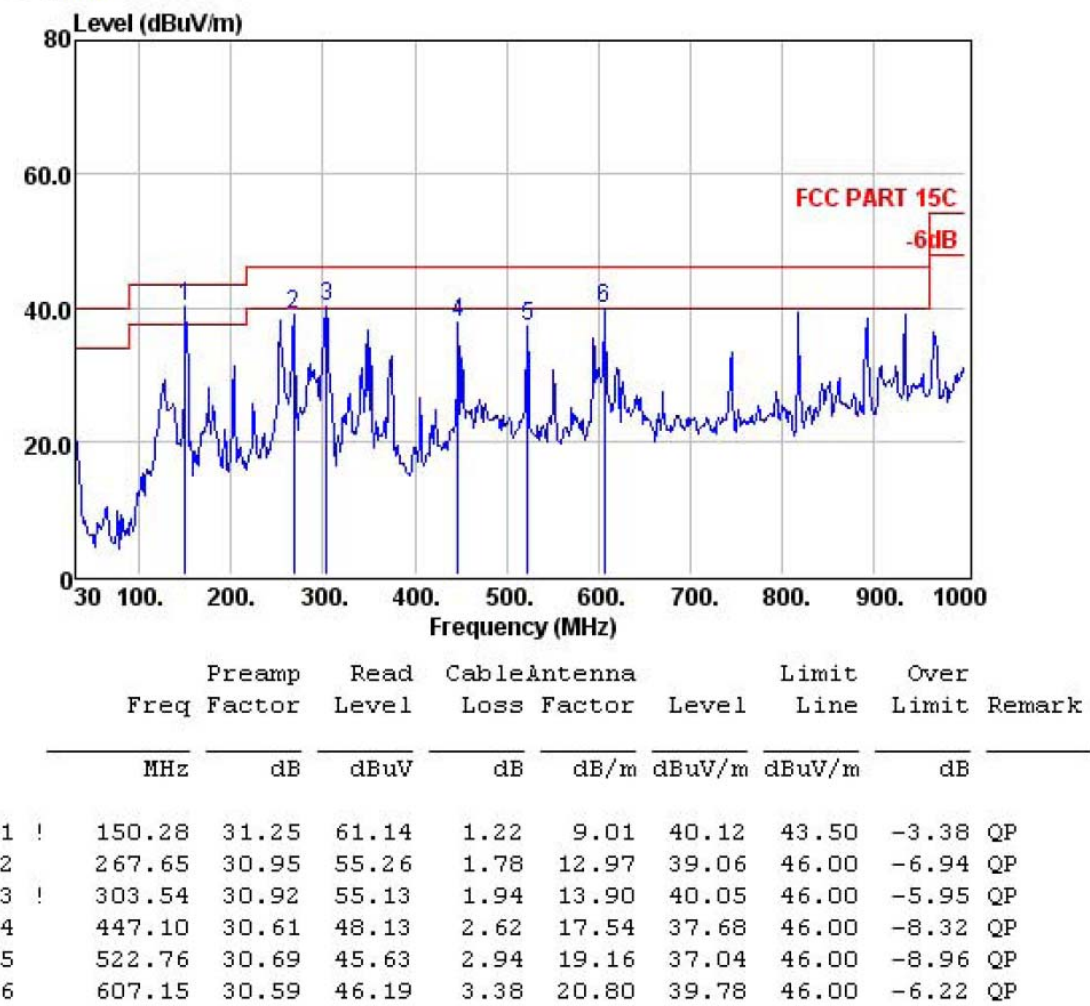
4. For emissions below 1GHz, pretest for all mode, The test data of the worst case condition(s) was reported on the following pages.



Test Data

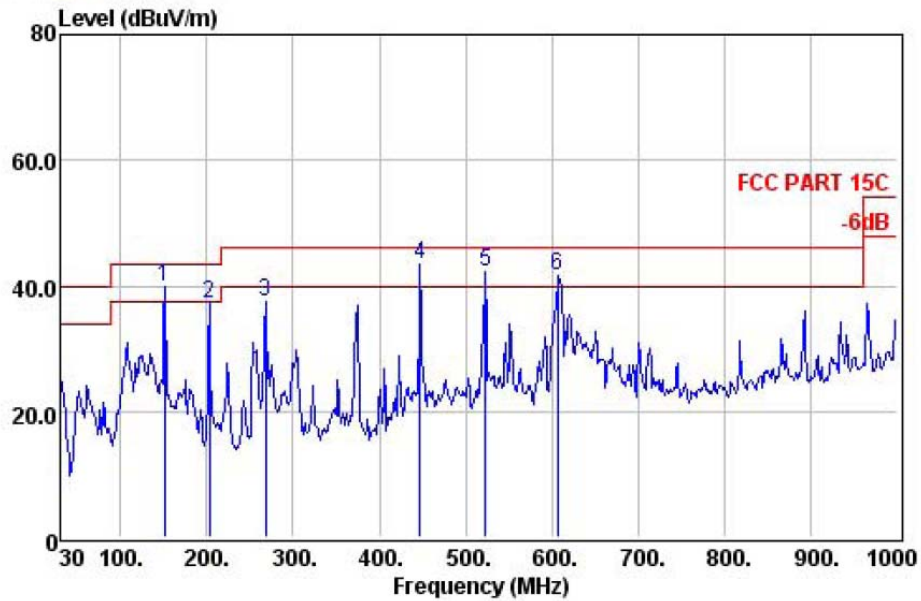
Test mode: TX Mode
Polarization: VERTICAL

Data: 107



Test mode: TX Mode
Polarization: HORIZONTAL

Data: 108

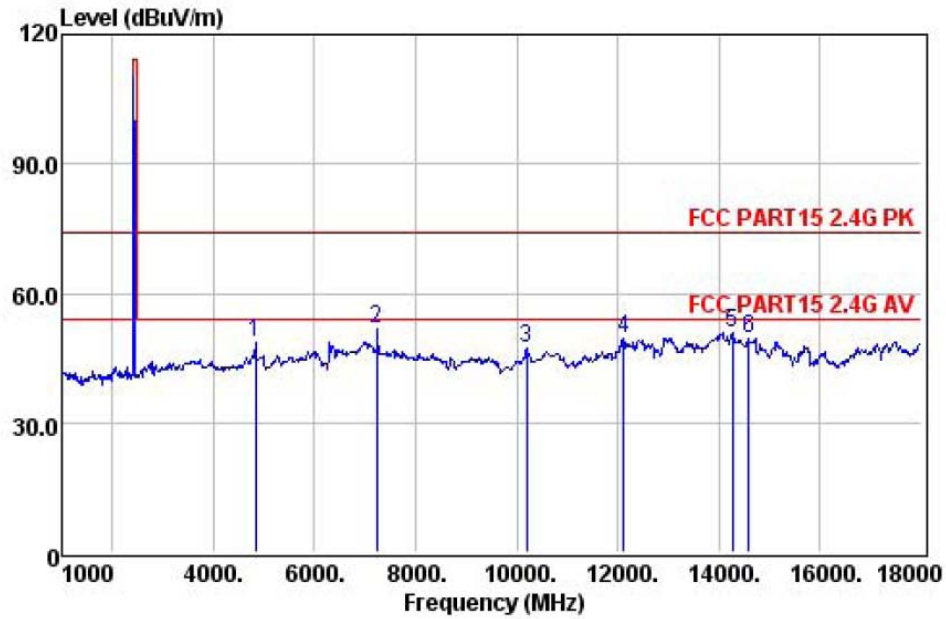


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz		dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1 !	151.25	31.25	60.78	1.22	9.02	39.77	43.50	-3.73 QP
2	202.66	31.09	55.59	1.46	11.13	37.09	43.50	-6.41 QP
3	267.65	30.95	53.70	1.78	12.97	37.50	46.00	-8.50 QP
4 !	447.10	30.61	53.79	2.62	17.54	43.34	46.00	-2.66 QP
5 !	522.76	30.69	50.75	2.94	19.16	42.16	46.00	-3.84 QP
6 !	607.15	30.59	47.92	3.38	20.80	41.51	46.00	-4.49 QP

Test mode: 802.11b 2412MHz

Polarization: HORIZONTAL

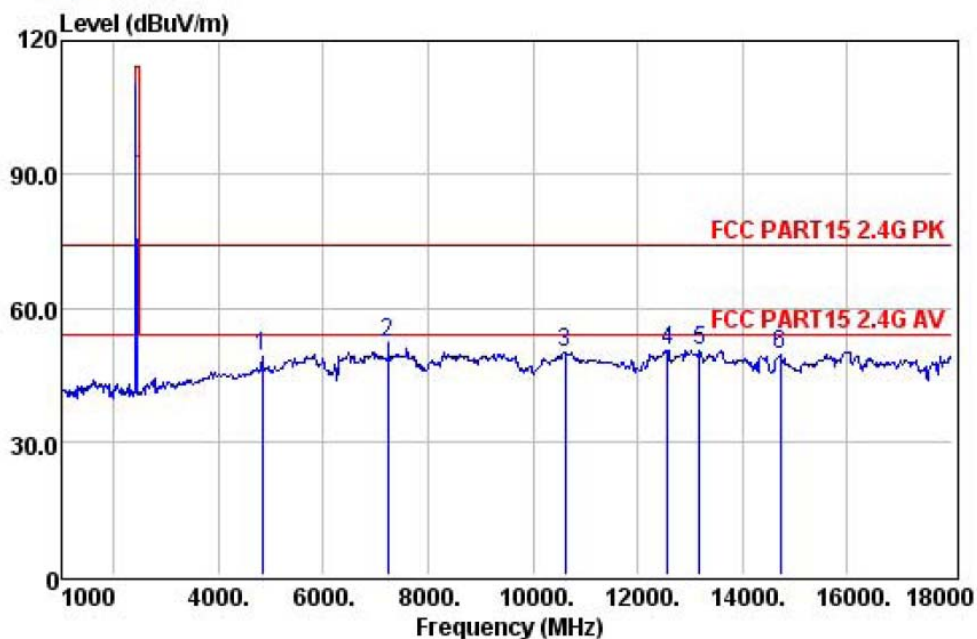
Data: 113



		Preamp	Read	Cable	Antenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4824.00	27.50	31.32	12.01	32.99	48.82	74.00	-25.18	Peak
2	7236.00	27.95	25.84	16.61	37.30	51.80	74.00	-22.20	Peak
3	10197.00	28.82	20.52	17.00	38.72	47.42	74.00	-26.58	Peak
4	12118.00	29.02	21.63	17.47	39.42	49.50	74.00	-24.50	Peak
5	14260.00	29.44	18.92	19.53	42.00	51.01	74.00	-22.99	Peak
6	14583.00	29.49	18.98	19.73	40.25	49.47	74.00	-24.53	Peak

Test mode: 802.11b 2412MHz
Polarization: VERTICAL

Data: 114

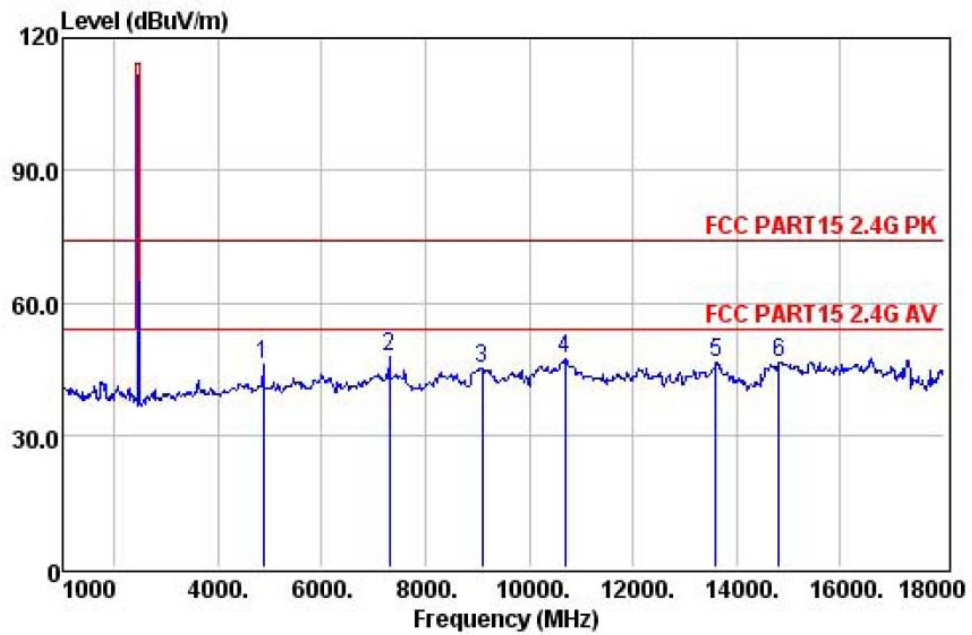


		Preamp	Read	CableAntenna		Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4824.00	27.50	31.66	12.01	32.99	49.16	74.00	-24.84	Peak
2	7236.00	27.95	26.13	16.61	37.30	52.09	74.00	-21.91	Peak
3	10605.00	28.86	22.69	17.09	39.26	50.18	74.00	-23.82	Peak
4	12577.00	29.12	22.14	17.85	39.70	50.57	74.00	-23.43	Peak
5	13189.00	29.24	19.66	18.42	41.57	50.41	74.00	-23.59	Peak
6	14719.00	29.51	19.34	19.83	39.69	49.35	74.00	-24.65	Peak

Test mode: 802.11b 2437MHz

Polarization: HORIZONTAL

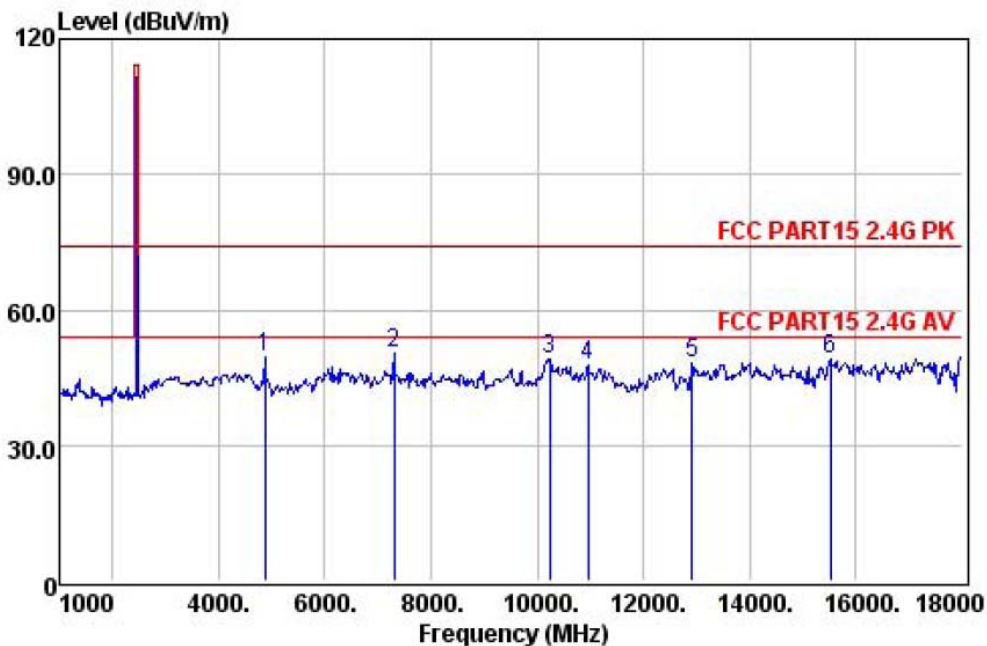
Data: 115



	Preamp Freq	Factor	Read Level	Cable&Antenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4874.00	27.53	28.42	12.14	33.11	46.14	74.00	-27.86	Peak
2	7311.00	27.96	21.85	16.62	37.32	47.83	74.00	-26.17	Peak
3	9092.00	28.43	19.06	16.89	37.50	45.02	74.00	-28.98	Peak
4	10690.00	28.87	19.94	17.10	39.31	47.48	74.00	-26.52	Peak
5	13597.00	29.32	13.63	18.89	43.10	46.30	74.00	-27.70	Peak
6	14821.00	29.52	16.87	19.88	39.27	46.50	74.00	-27.50	Peak

Test mode: 802.11b 2437MHz
Polarization: VERTICAL

Data: 116

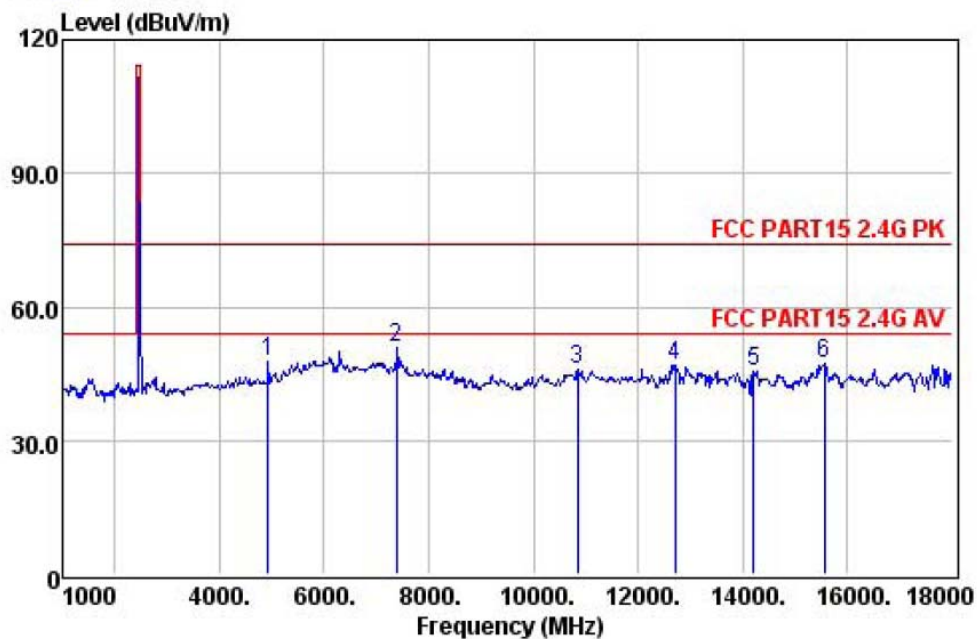


		Preamp	Read	Cable	Antenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4874.00	27.53	31.83	12.14	33.11	49.55	74.00	-24.45	Peak
2	7311.00	27.96	24.22	16.62	37.32	50.20	74.00	-23.80	Peak
3	10231.00	28.82	22.10	17.01	38.77	49.06	74.00	-24.94	Peak
4	10962.00	28.90	19.99	17.16	39.48	47.73	74.00	-26.27	Peak
5	12917.00	29.18	18.60	18.14	40.50	48.06	74.00	-25.94	Peak
6	15518.00	29.63	19.72	20.33	38.47	48.89	74.00	-25.11	Peak

Test mode: 802.11b 2462MHz

Polarization: HORIZONTAL

Data: 117

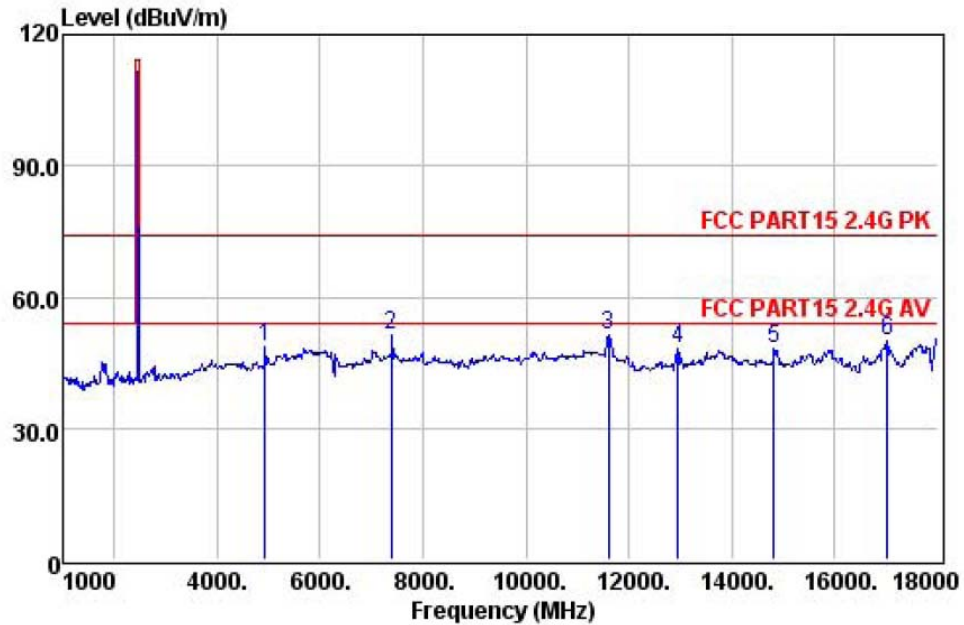


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4924.00	27.56	29.77	12.28	33.23	47.72	74.00	-26.28
2	7386.00	27.98	25.01	16.62	37.36	51.01	74.00	-22.99
3	10843.00	28.88	18.41	17.13	39.41	46.07	74.00	-27.93
4	12696.00	29.14	18.09	17.96	39.98	46.89	74.00	-27.11
5	14209.00	29.43	13.30	19.49	42.30	45.66	74.00	-28.34
6	15552.00	29.63	17.75	20.35	38.60	47.07	74.00	-26.93
								Remark

Test mode: 802.11b 2462MHz

Polarization: VERTICAL

Data: 118

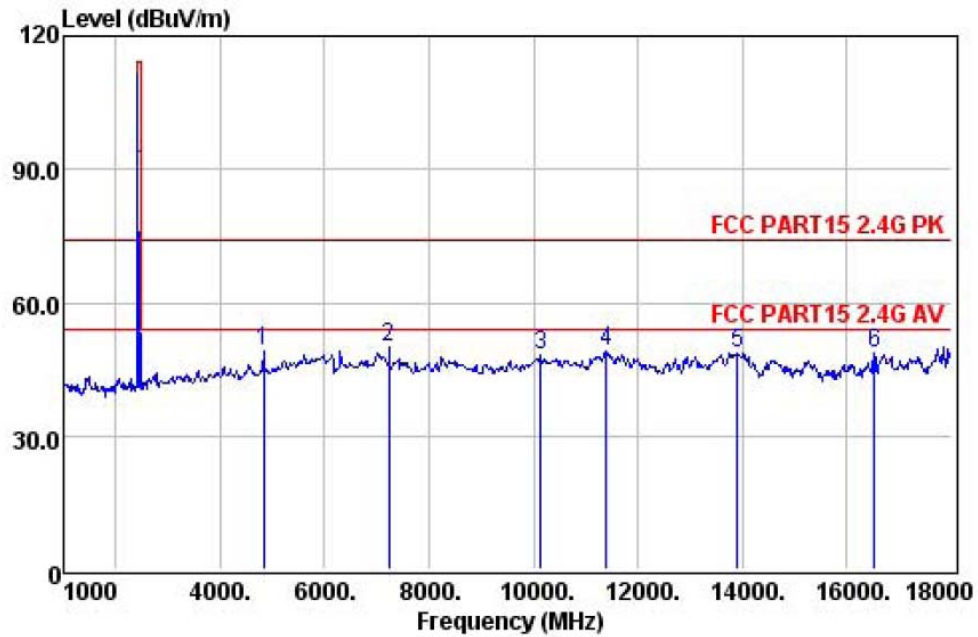


	Preamp Freq	Factor	Read Level	Cable&Antenna Loss	Factor	Limit Level	Over Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4924.00	27.56	30.79	12.28	33.23	48.74	74.00	-25.26	Peak
2	7386.00	27.98	25.32	16.62	37.36	51.32	74.00	-22.68	Peak
3	11608.00	28.96	23.24	17.29	39.80	51.37	74.00	-22.63	Peak
4	12951.00	29.19	18.51	18.17	40.58	48.07	74.00	-25.93	Peak
5	14821.00	29.52	18.35	19.88	39.27	47.98	74.00	-26.02	Peak
6	17014.00	30.11	14.01	21.33	44.63	49.86	74.00	-24.14	Peak

Test mode: 802.11g 2412MHz

Polarization: HORIZONTAL

Data: 119

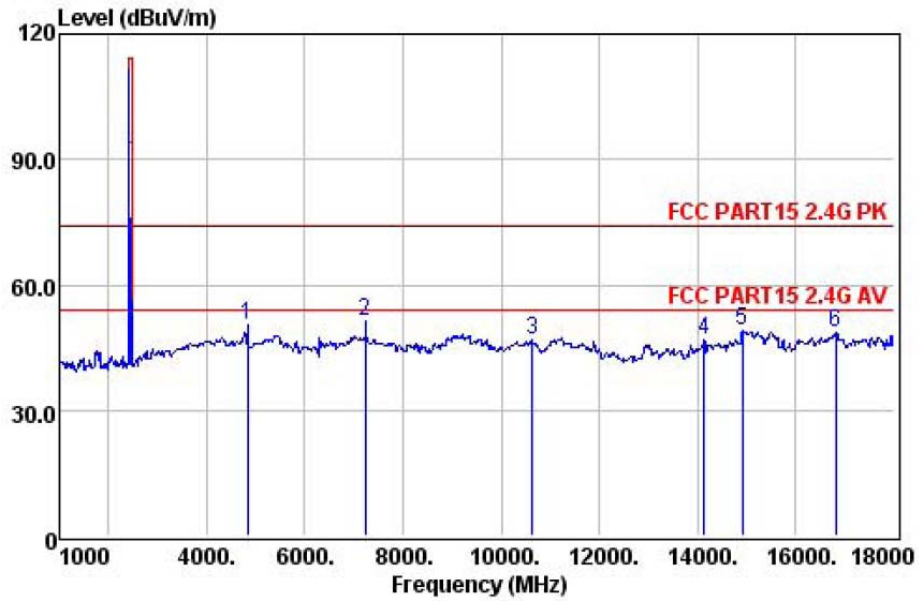


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4824.00	27.50	31.49	12.01	32.99	48.99	74.00	-25.01 Peak
2	7236.00	27.95	24.08	16.61	37.30	50.04	74.00	-23.96 Peak
3	10129.00	28.81	21.30	16.99	38.61	48.09	74.00	-25.91 Peak
4	11387.00	28.94	20.96	17.24	39.81	49.07	74.00	-24.93 Peak
5	13903.00	29.38	15.36	19.24	43.40	48.62	74.00	-25.38 Peak
6	16521.00	29.91	14.07	21.00	43.44	48.60	74.00	-25.40 Peak

Test mode: 802.11g 2412MHz

Polarization: VERTICAL

Data: 120

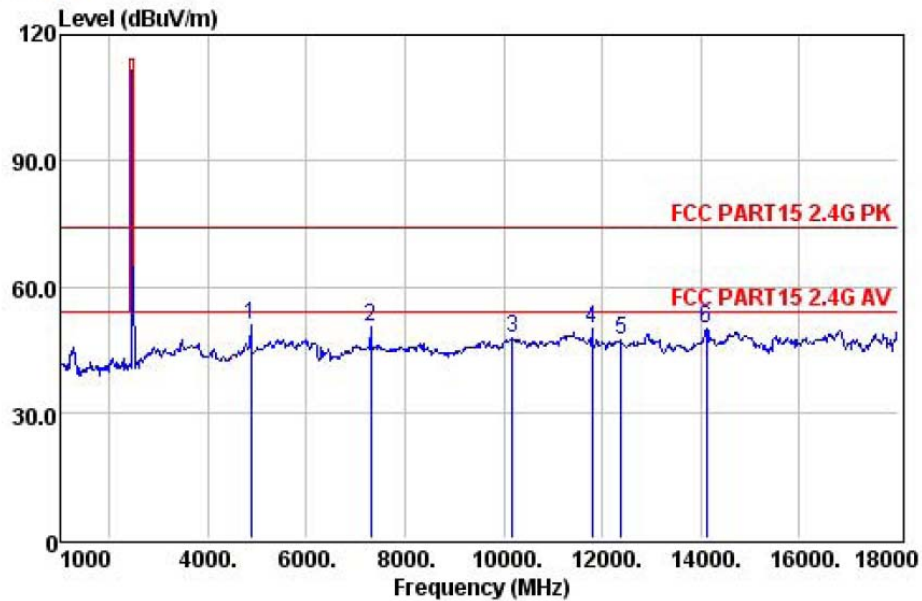


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Limit Level	Over Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4824.00	27.50	33.02	12.01	32.99	50.52	74.00	-23.48	Peak
2	7236.00	27.95	25.46	16.61	37.30	51.42	74.00	-22.58	Peak
3	10622.00	28.86	19.27	17.09	39.27	46.77	74.00	-27.23	Peak
4	14124.00	29.42	13.88	19.44	42.80	46.70	74.00	-27.30	Peak
5	14906.00	29.54	19.85	19.94	38.92	49.17	74.00	-24.83	Peak
6	16810.00	30.03	13.31	21.19	44.14	48.61	74.00	-25.39	Peak

Test mode: 802.11g 2437MHz

Polarization: HORIZONTAL

Data: 121

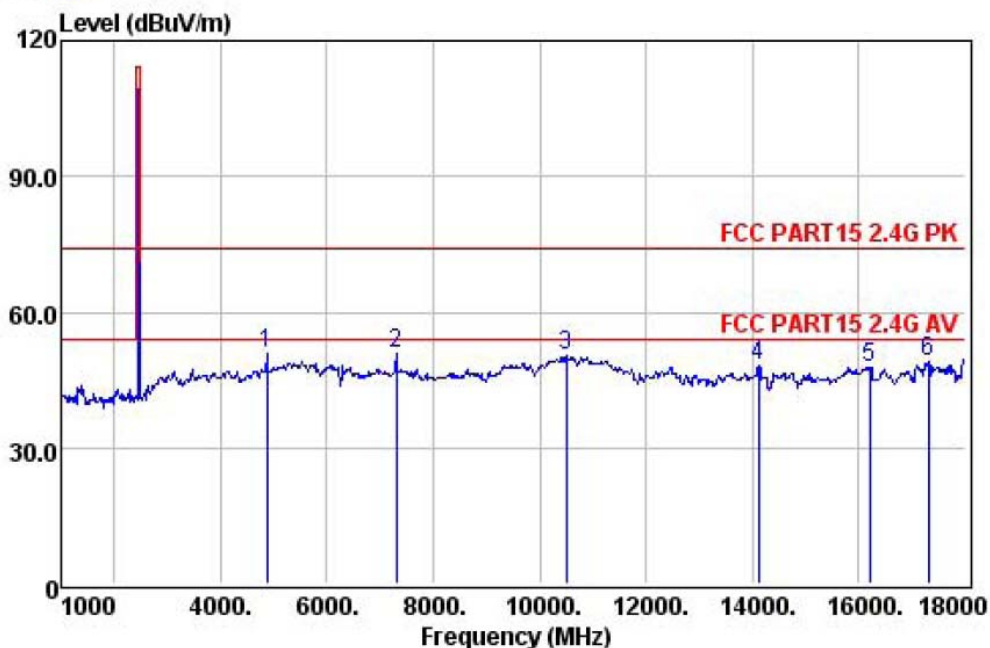


		Preamp	Read	Cable&Antenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4874.00	27.53	33.21	12.14	33.11	50.93	74.00	-23.07
2	7311.00	27.96	24.39	16.62	37.32	50.37	74.00	-23.63
3	10180.00	28.82	20.99	17.00	38.69	47.86	74.00	-26.14
4	11795.00	28.98	21.82	17.33	39.61	49.78	74.00	-24.22
5	12373.00	29.07	19.42	17.68	39.48	47.51	74.00	-26.49
6	14107.00	29.42	17.07	19.43	42.90	49.98	74.00	-24.02

Test mode: 802.11g 2437MHz

Polarization: VERTICAL

Data: 122

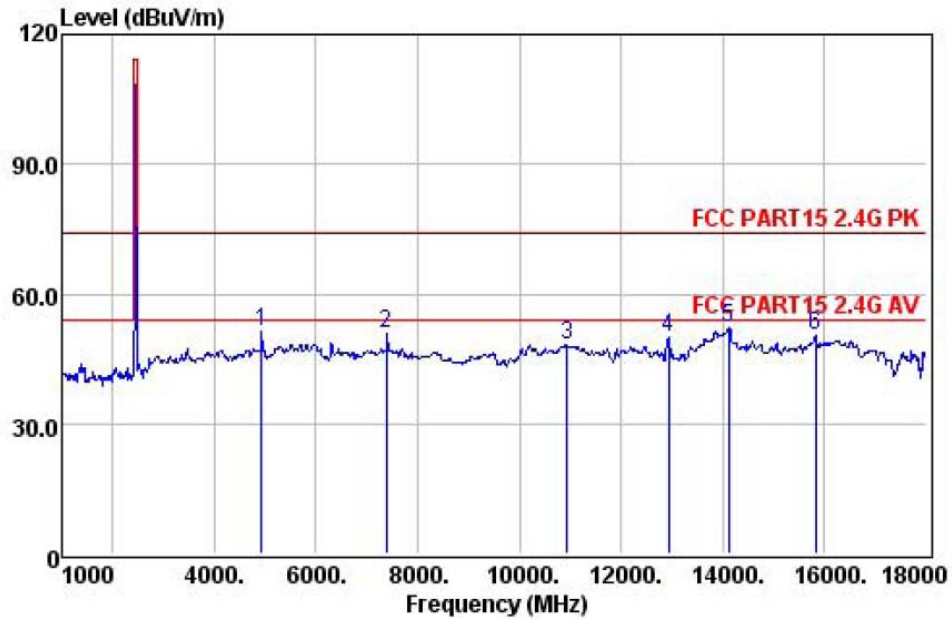


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4874.00	27.53	33.20	12.14	33.11	50.92	74.00	-23.08	Peak
2	7311.00	27.96	24.82	16.62	37.32	50.80	74.00	-23.20	Peak
3	10503.00	28.85	22.79	17.07	39.20	50.21	74.00	-23.79	Peak
4	14107.00	29.42	15.07	19.43	42.90	47.98	74.00	-26.02	Peak
5	16198.00	29.78	15.33	20.77	41.54	47.86	74.00	-26.14	Peak
6	17303.00	30.22	12.83	21.60	45.08	49.29	74.00	-24.71	Peak

Test mode: 802.11g 2462MHz

Polarization: HORIZONTAL

Data: 123

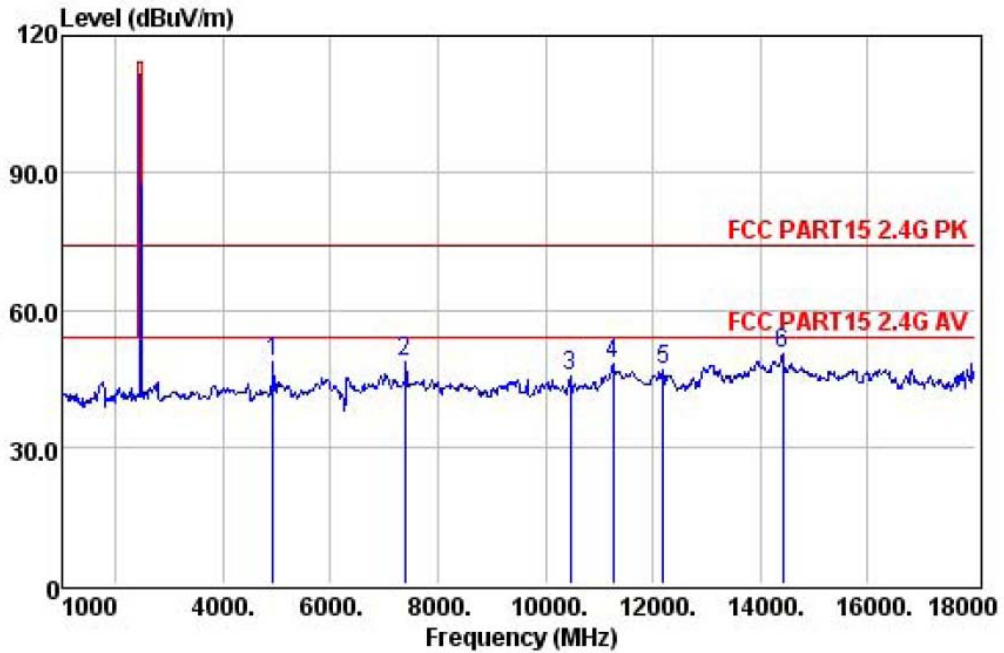


		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4924.00	27.56	33.23	12.28	33.23	51.18	74.00	-22.82	Peak
2	7386.00	27.98	25.06	16.62	37.36	51.06	74.00	-22.94	Peak
3	10928.00	28.89	20.47	17.15	39.46	48.19	74.00	-25.81	Peak
4	12934.00	29.19	20.32	18.15	40.54	49.82	74.00	-24.18	Peak
5	14107.00	29.42	19.07	19.43	42.90	51.98	74.00	-22.02	Peak
6	15824.00	29.67	19.81	20.52	39.64	50.30	74.00	-23.70	Peak

Test mode: 802.11g 2462MHz

Polarization: VERTICAL

Data: 124

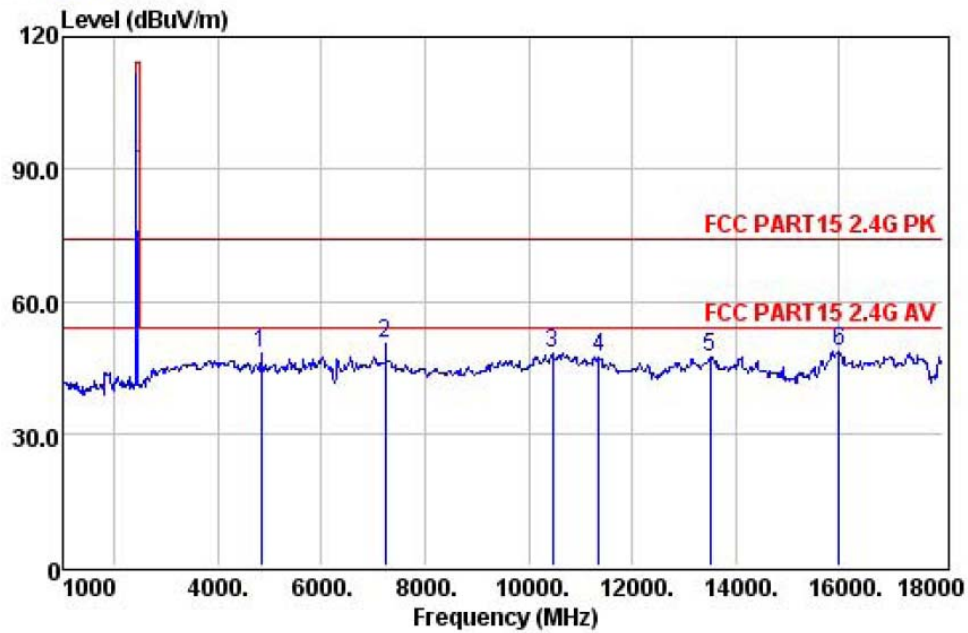


		Preamp	Read	CableAntenna		Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4924.00	27.56	30.52	12.28	33.23	48.47	74.00	-25.53	Peak
2	7386.00	27.98	22.69	16.62	37.36	48.69	74.00	-25.31	Peak
3	10469.00	28.85	18.00	17.06	39.15	45.36	74.00	-28.64	Peak
4	11268.00	28.93	20.12	17.22	39.71	48.12	74.00	-25.88	Peak
5	12186.00	29.04	18.78	17.53	39.44	46.71	74.00	-27.29	Peak
6	14413.00	29.46	19.03	19.63	41.10	50.30	74.00	-23.70	Peak

Test mode: 802.11n(HT20) 2412MHz

Polarization: HORIZONTAL

Data: 125

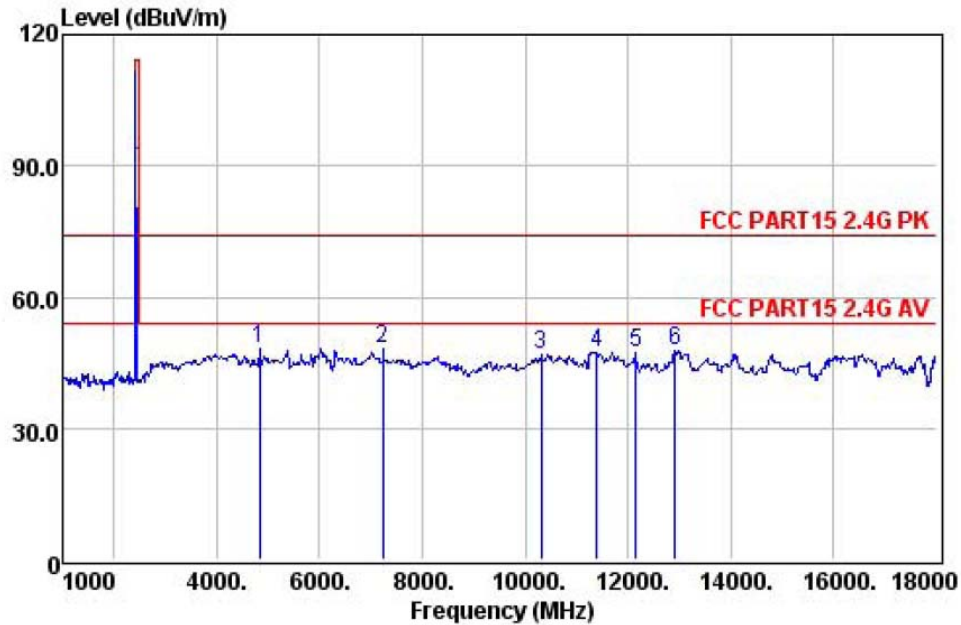


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4824.00	27.50	30.65	12.01	32.99	48.15	74.00	-25.85 Peak
2	7236.00	27.95	24.32	16.61	37.30	50.28	74.00	-23.72 Peak
3	10469.00	28.85	21.00	17.06	39.15	48.36	74.00	-25.64 Peak
4	11353.00	28.94	19.08	17.24	39.78	47.16	74.00	-26.84 Peak
5	13512.00	29.30	14.98	18.79	43.02	47.49	74.00	-26.51 Peak
6	15994.00	29.70	17.56	20.63	40.30	48.79	74.00	-25.21 Peak

Test mode: 802.11n(HT20) 2412MHz

Polarization: VERTICAL

Data: 126

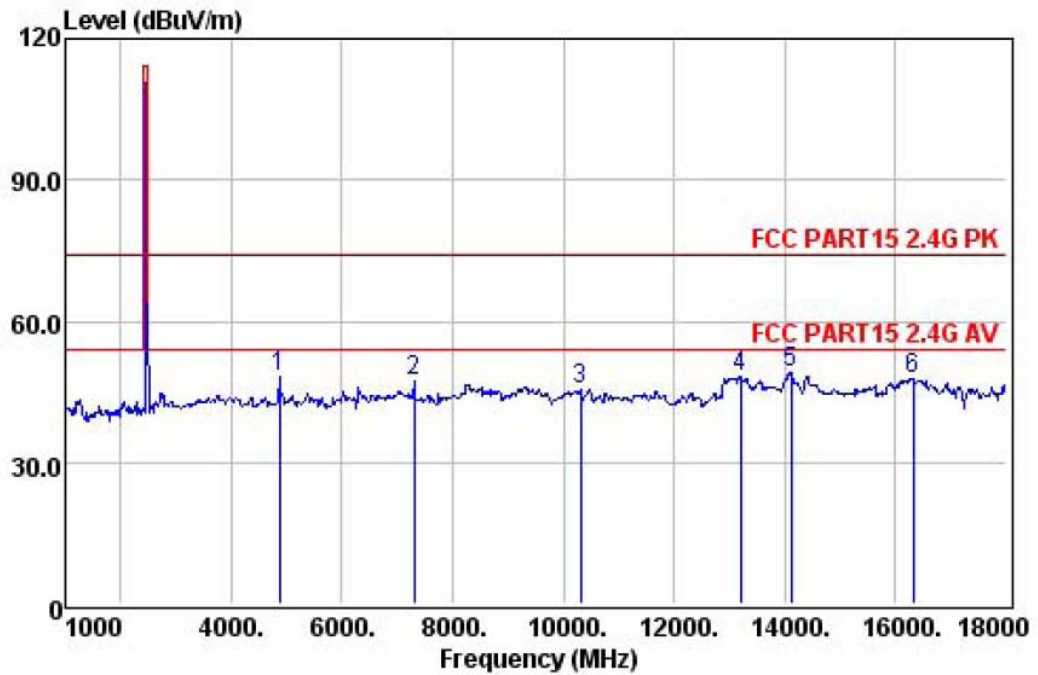


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4824.00	27.50	30.82	12.01	32.99	48.32	74.00	-25.68
2	7236.00	27.95	22.35	16.61	37.30	48.31	74.00	-25.69
3	10316.00	28.83	19.57	17.03	38.91	46.68	74.00	-27.32
4	11387.00	28.94	19.23	17.24	39.81	47.34	74.00	-26.66
5	12152.00	29.03	19.17	17.50	39.43	47.07	74.00	-26.93
6	12917.00	29.18	18.43	18.14	40.50	47.89	74.00	-26.11
								Peak

Test mode: 802.11n(HT20) 2437MHz

Polarization: HORIZONTAL

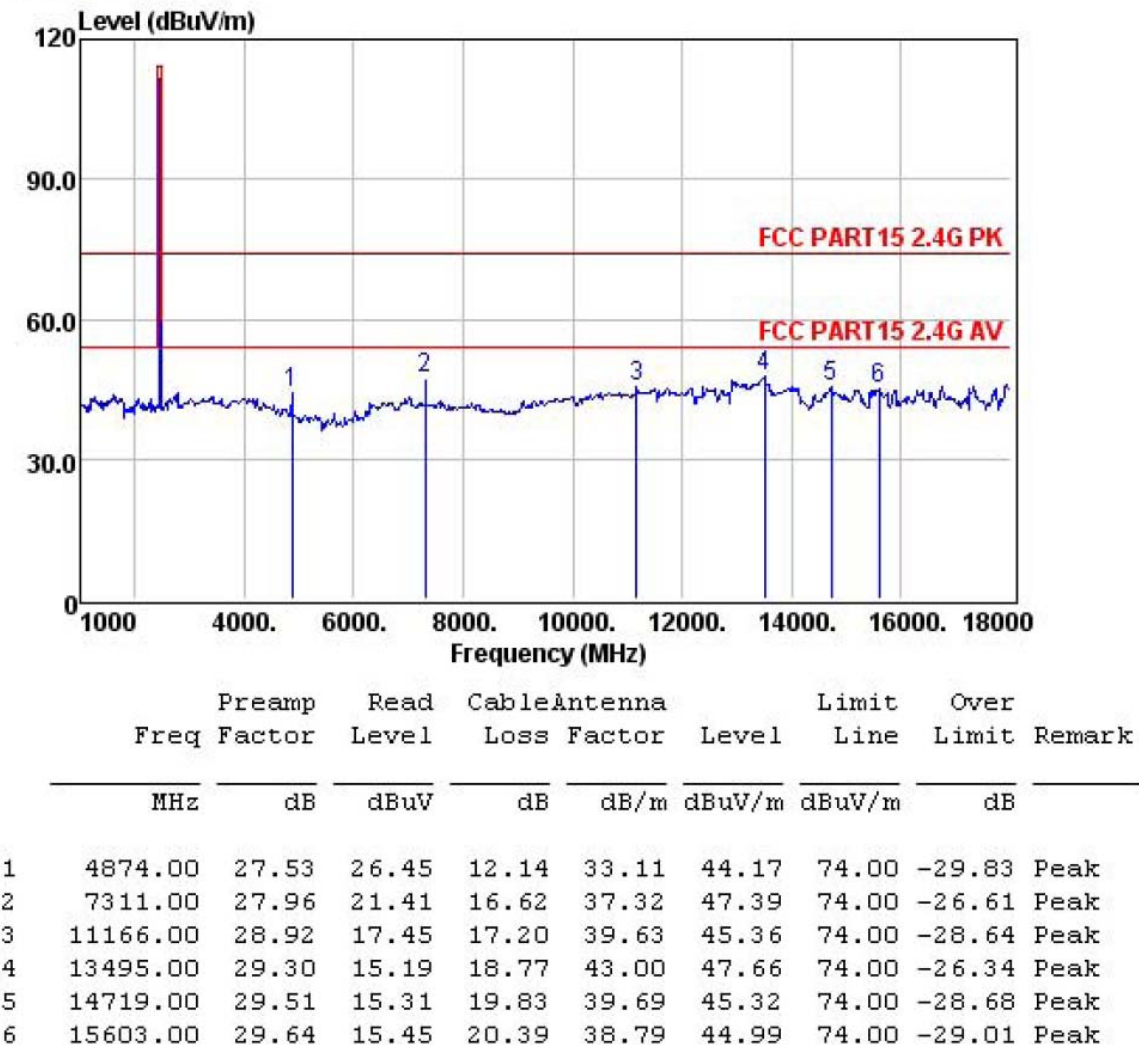
Data: 127



		Preamp	Read	CableAntenna		Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4874.00	27.53	30.45	12.14	33.11	48.17	74.00	-25.83	Peak
2	7311.00	27.96	21.41	16.62	37.32	47.39	74.00	-26.61	Peak
3	10316.00	28.83	18.57	17.03	38.91	45.68	74.00	-28.32	Peak
4	13206.00	29.24	17.22	18.44	41.65	48.07	74.00	-25.93	Peak
5	14107.00	29.42	16.33	19.43	42.90	49.24	74.00	-24.76	Peak
6	16317.00	29.83	14.56	20.85	42.26	47.84	74.00	-26.16	Peak

Test mode: 802.11n(HT20) 2437MHz
Polarization: VERTICAL

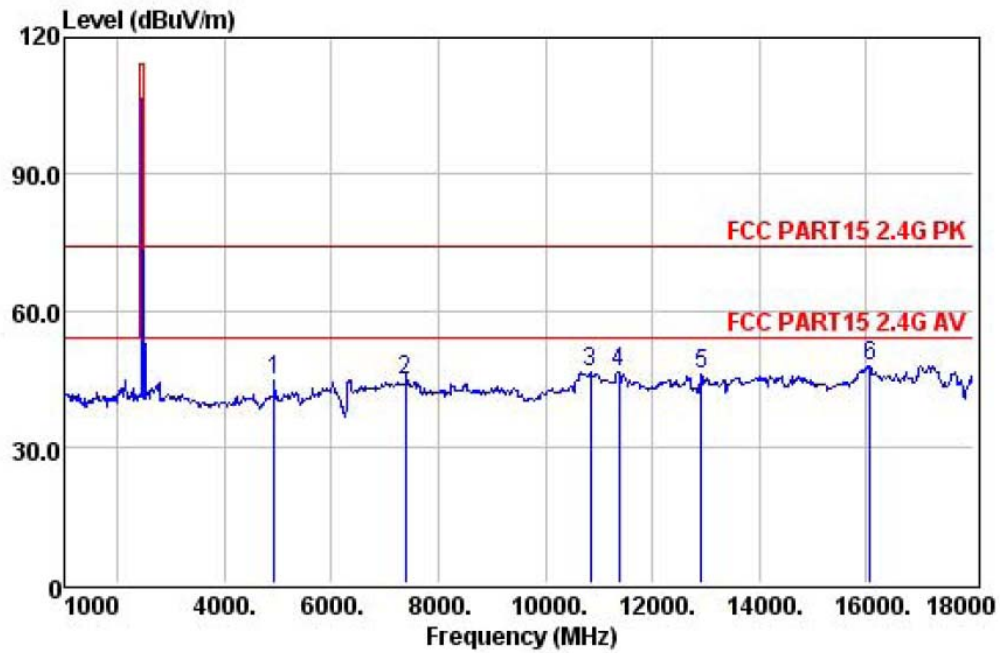
Data: 128



Test mode: 802.11n(HT20) 2462MHz

Polarization: HORIZONTAL

Data: 129

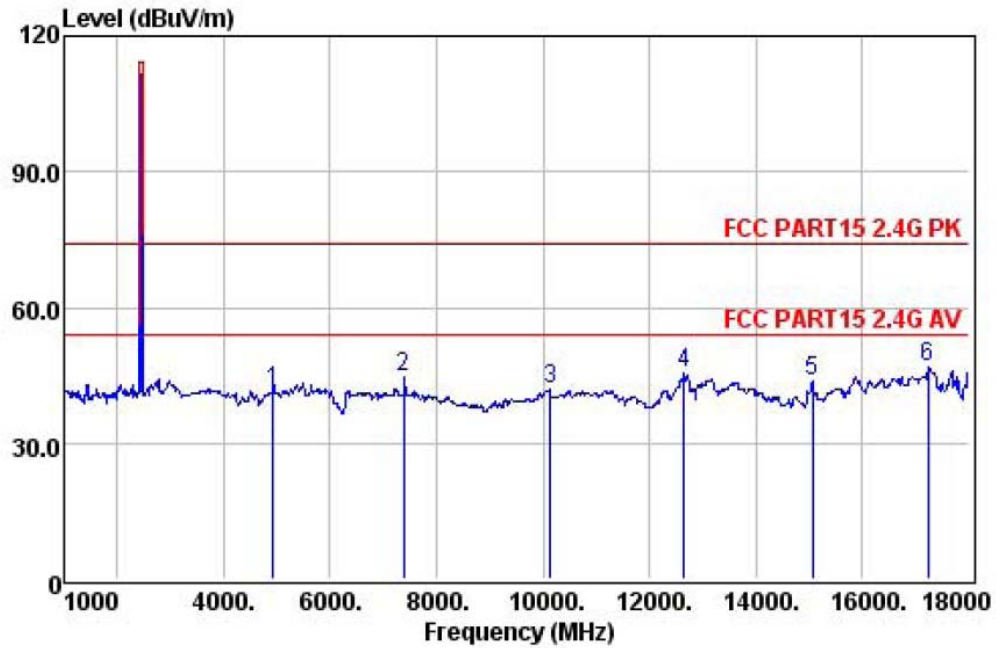


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4924.00	27.56	26.52	12.28	33.23	44.47	74.00	-29.53 Peak
2	7386.00	27.98	18.54	16.62	37.36	44.54	74.00	-29.46 Peak
3	10843.00	28.88	18.55	17.13	39.41	46.21	74.00	-27.79 Peak
4	11370.00	28.94	18.34	17.24	39.79	46.43	74.00	-27.57 Peak
5	12917.00	29.18	16.52	18.14	40.50	45.98	74.00	-28.02 Peak
6	16079.00	29.73	16.03	20.69	40.82	47.81	74.00	-26.19 Peak

Test mode: 802.11n(HT20) 2462MHz

Polarization: VERTICAL

Data: 130

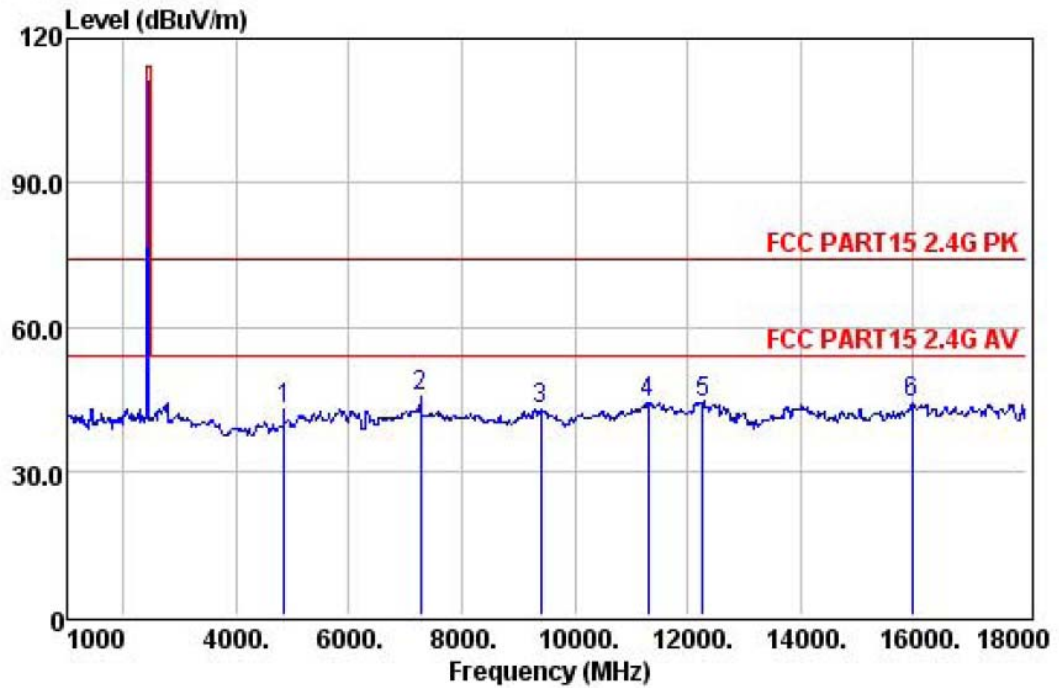


		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4924.00	27.56	23.52	12.28	33.23	41.47	74.00	-32.53	Peak
2	7386.00	27.98	18.54	16.62	37.36	44.54	74.00	-29.46	Peak
3	10129.00	28.81	15.10	16.99	38.61	41.89	74.00	-32.11	Peak
4	12645.00	29.13	16.65	17.91	39.86	45.29	74.00	-28.71	Peak
5	15059.00	29.56	14.80	20.03	38.49	43.76	74.00	-30.24	Peak
6	17235.00	30.19	10.33	21.54	44.97	46.65	74.00	-27.35	Peak

Test mode: 802.11n(HT40) 2422MHz

Polarization: HORIZONTAL

Data: 131

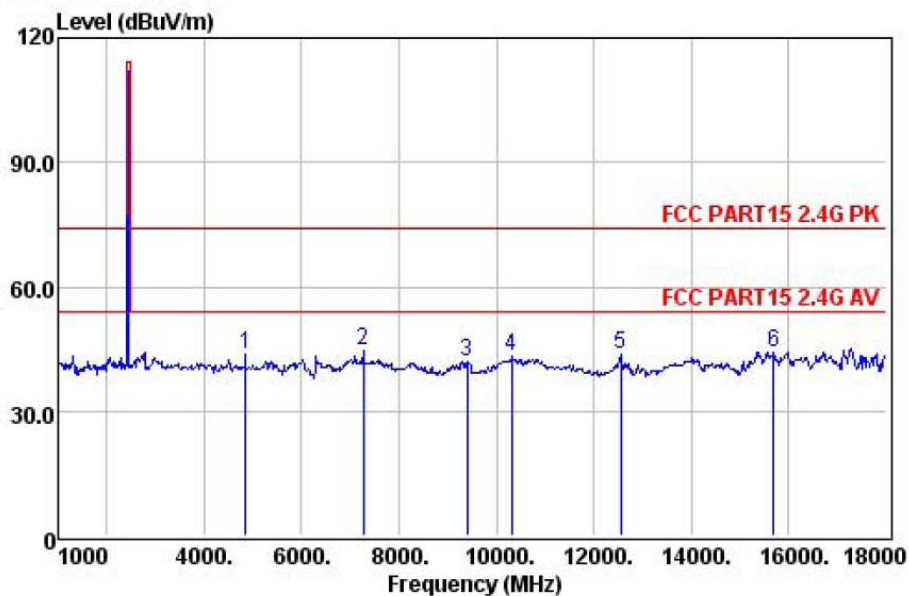


		Preamp	Read	Cable&Antenna		Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4844.00	27.51	25.08	12.05	33.03	42.65	74.00	-31.35	Peak
2	7266.00	27.95	19.58	16.61	37.31	45.55	74.00	-28.45	Peak
3	9398.00	28.56	16.62	16.91	37.88	42.85	74.00	-31.15	Peak
4	11302.00	28.93	16.29	17.22	39.74	44.32	74.00	-29.68	Peak
5	12271.00	29.05	16.35	17.59	39.46	44.35	74.00	-29.65	Peak
6	15977.00	29.70	12.82	20.62	40.23	43.97	74.00	-30.03	Peak

Test mode: 802.11n(HT40) 2422MHz

Polarization: VERTICAL

Data: 132

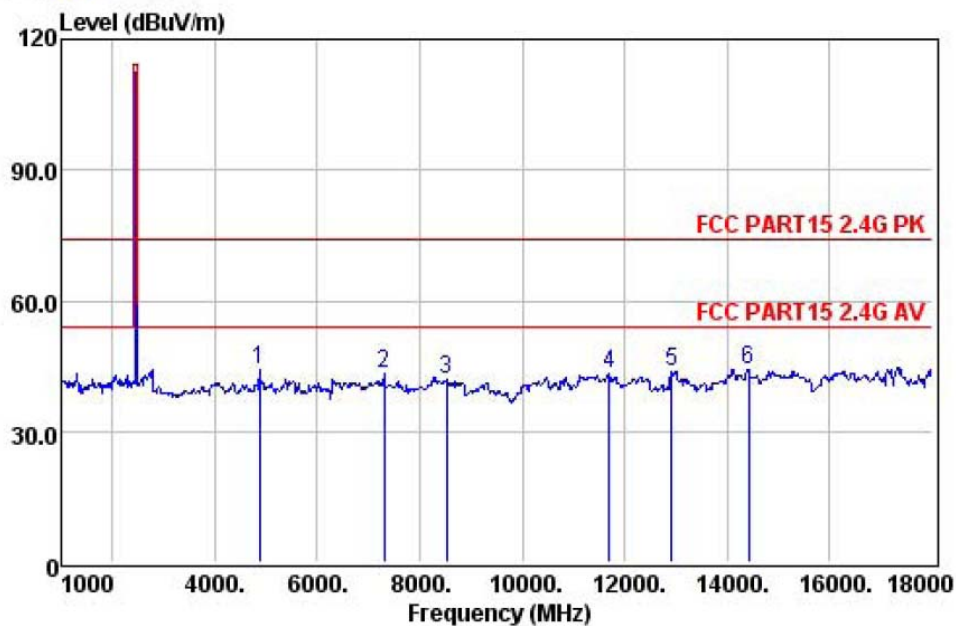


	Preamp	Read	Cable&Antenna		Limit	Over	
Freq	Factor	Level	Loss	Factor	Line	Limit	Remark
MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	27.51	26.08	12.05	33.03	43.65	74.00	-30.35 Peak
2	27.95	18.58	16.61	37.31	44.55	74.00	-29.45 Peak
3	28.56	15.62	16.91	37.88	41.85	74.00	-32.15 Peak
4	28.83	16.08	17.03	38.91	43.19	74.00	-30.81 Peak
5	29.11	15.21	17.82	39.62	43.54	74.00	-30.46 Peak
6	29.65	14.23	20.43	39.12	44.13	74.00	-29.87 Peak

Test mode: 802.11n(HT40) 2437MHz

Polarization: HORIZONTAL

Data: 133

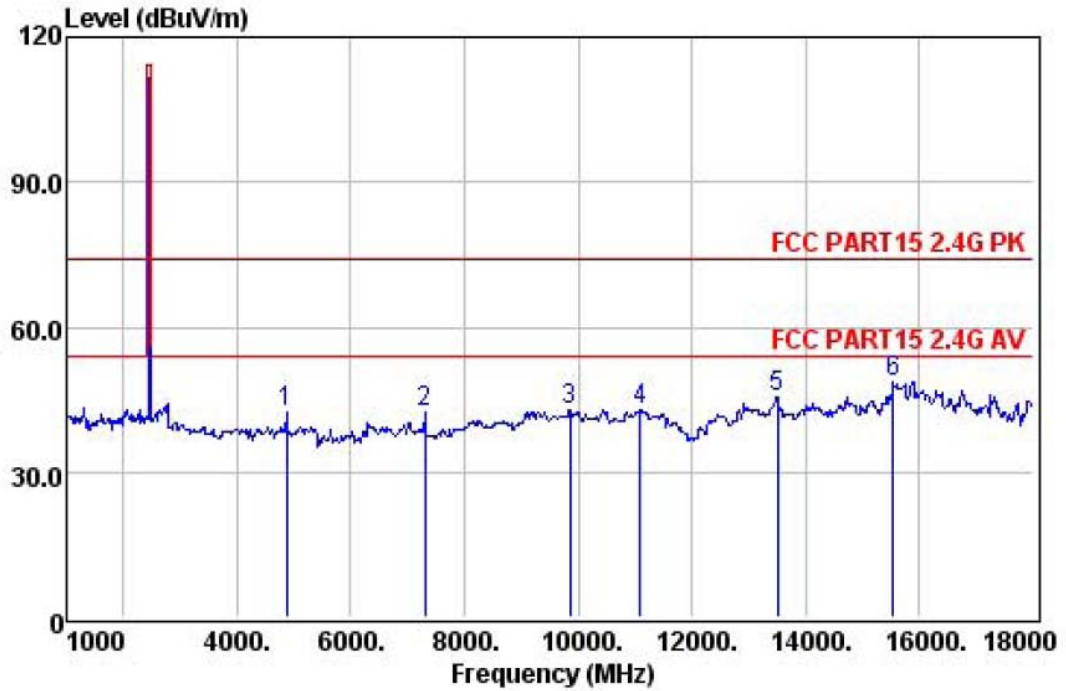


		Preamp	Read	CableAntenna		Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4874.00	27.53	26.45	12.14	33.11	44.17	74.00	-29.83
2	7311.00	27.96	17.41	16.62	37.32	43.39	74.00	-30.61
3	8514.00	28.25	16.42	16.77	36.82	41.76	74.00	-32.24
4	11693.00	28.97	15.15	17.30	39.71	43.19	74.00	-30.81
5	12917.00	29.18	14.43	18.14	40.50	43.89	74.00	-30.11
6	14413.00	29.46	13.03	19.63	41.10	44.30	74.00	-29.70
								Peak

Test mode: 802.11n(HT40) 2437MHz

Polarization: VERTICAL

Data: 134

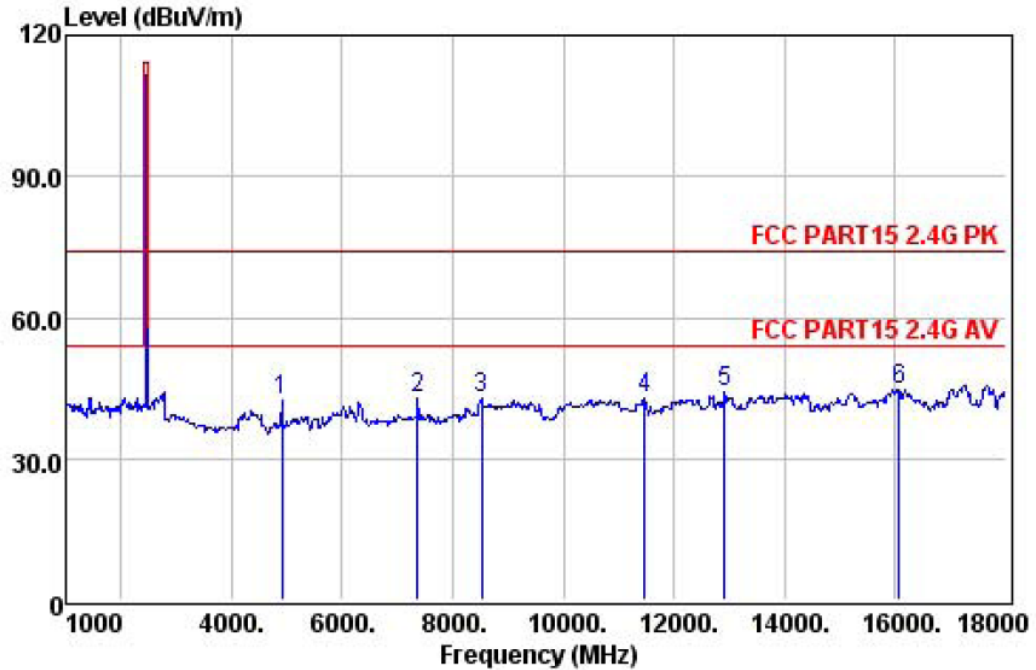


		Preamp	Read	CableAntenna			Limit	Over	
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4874.00	27.53	24.45	12.14	33.11	42.17	74.00	-31.83	Peak
2	7311.00	27.96	16.41	16.62	37.32	42.39	74.00	-31.61	Peak
3	9857.00	28.74	16.36	16.95	38.29	42.86	74.00	-31.14	Peak
4	11081.00	28.91	14.85	17.18	39.57	42.69	74.00	-31.31	Peak
5	13495.00	29.30	13.18	18.77	43.00	45.65	74.00	-28.35	Peak
6	15535.00	29.63	19.47	20.34	38.53	48.71	74.00	-25.29	Peak

Test mode: 802.11n(HT40) 2452MHz

Polarization: HORIZONTAL

Data: 135

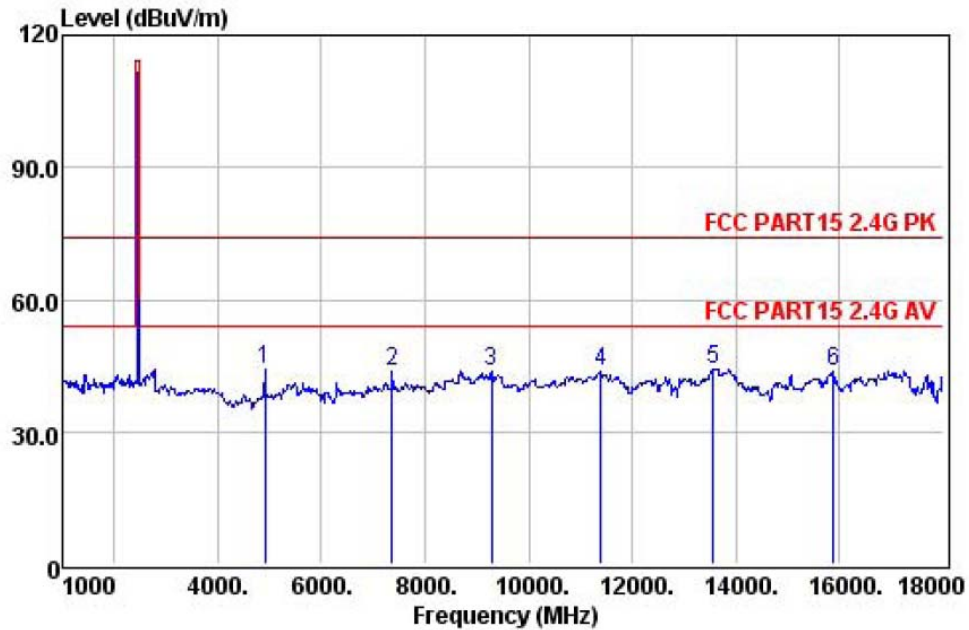


		Preamp	Read	CableAntenna		Limit	Over		
	Freq	Factor	Level	Loss	Factor	Level	Line	Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB	
1	4904.00	27.55	24.51	12.23	33.19	42.38	74.00	-31.62	Peak
2	7356.00	27.97	16.64	16.62	37.34	42.63	74.00	-31.37	Peak
3	8514.00	28.25	17.42	16.77	36.82	42.76	74.00	-31.24	Peak
4	11472.00	28.95	14.60	17.26	39.87	42.78	74.00	-31.22	Peak
5	12917.00	29.18	14.52	18.14	40.50	43.98	74.00	-30.02	Peak
6	16079.00	29.73	13.03	20.69	40.82	44.81	74.00	-29.19	Peak

Test mode: 802.11n(HT40) 2452MHz

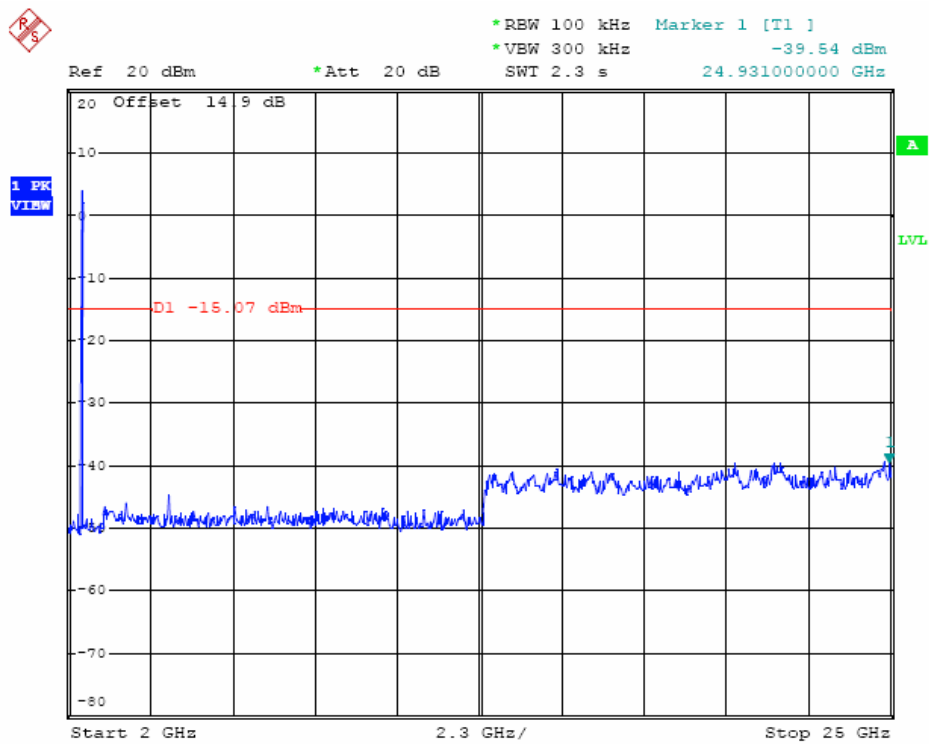
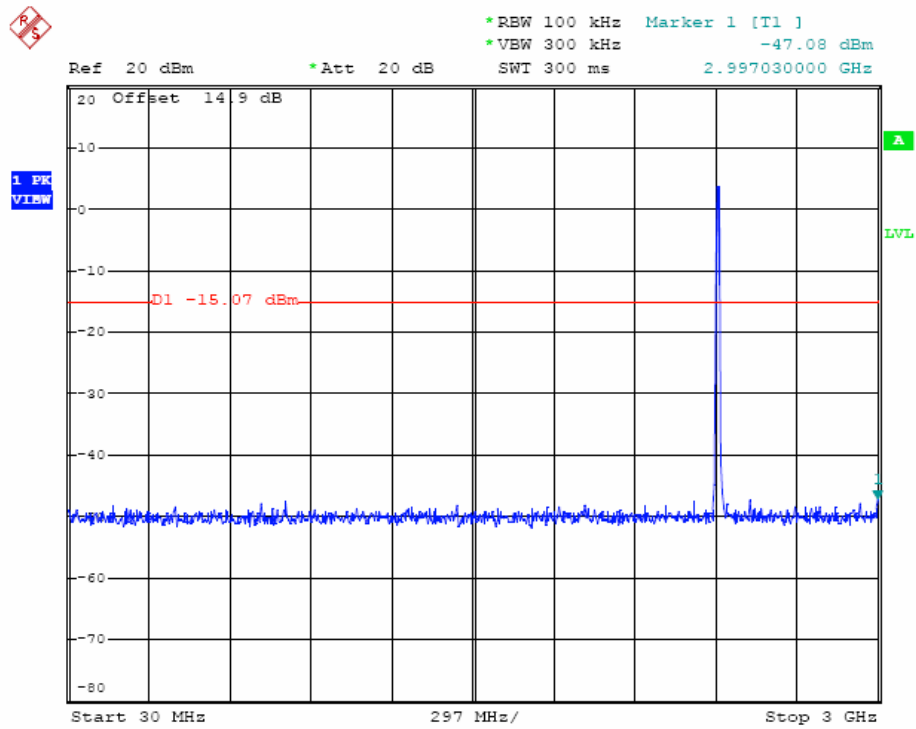
Polarization: VERTICAL

Data: 136

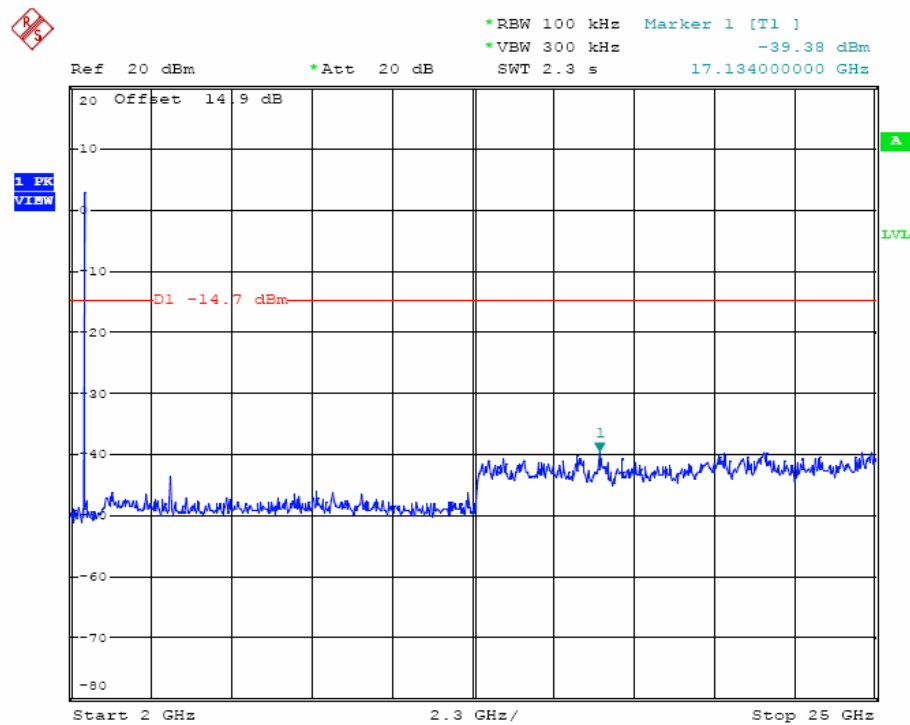
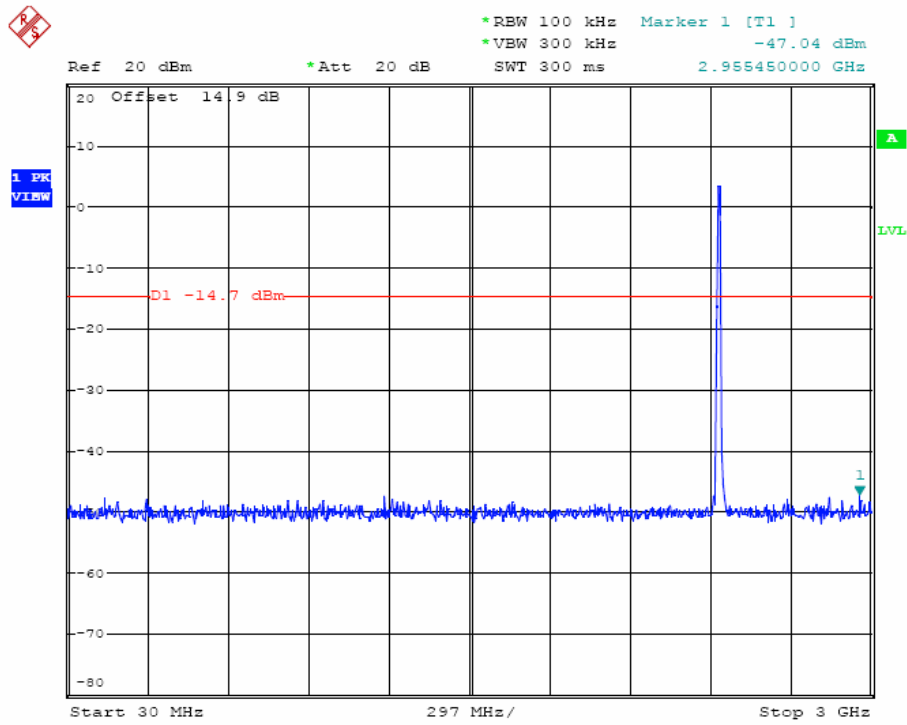


	Preamp Freq	Factor	Read Level	CableAntenna Loss	Factor	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dB	dB/m	dBuV/m	dBuV/m	dB
1	4904.00	27.55	26.51	12.23	33.19	44.38	74.00	-29.62 Peak
2	7356.00	27.97	17.64	16.62	37.34	43.63	74.00	-30.37 Peak
3	9279.00	28.51	17.65	16.90	37.73	43.77	74.00	-30.23 Peak
4	11387.00	28.94	15.39	17.24	39.81	43.50	74.00	-30.50 Peak
5	13563.00	29.31	11.56	18.85	43.07	44.17	74.00	-29.83 Peak
6	15875.00	29.68	12.85	20.56	39.84	43.57	74.00	-30.43 Peak

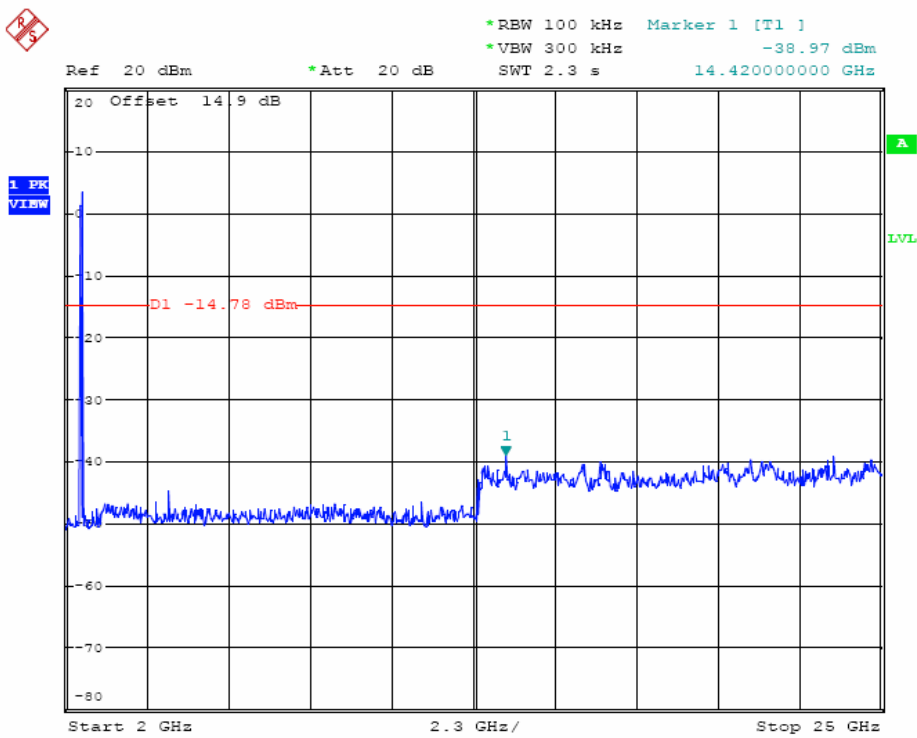
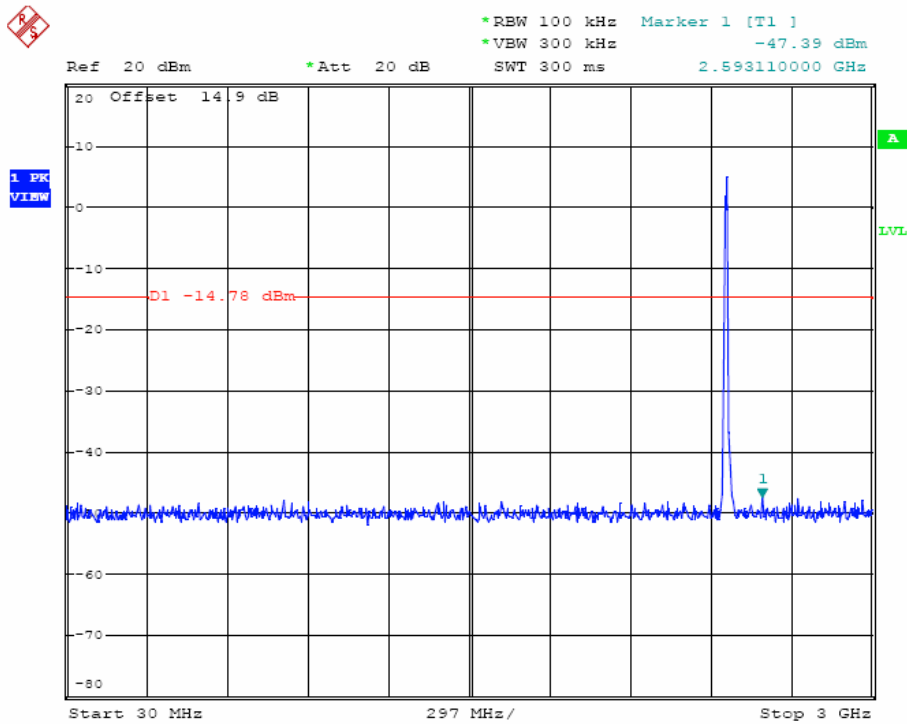
**For conducted test
80.211b 2412MHz**



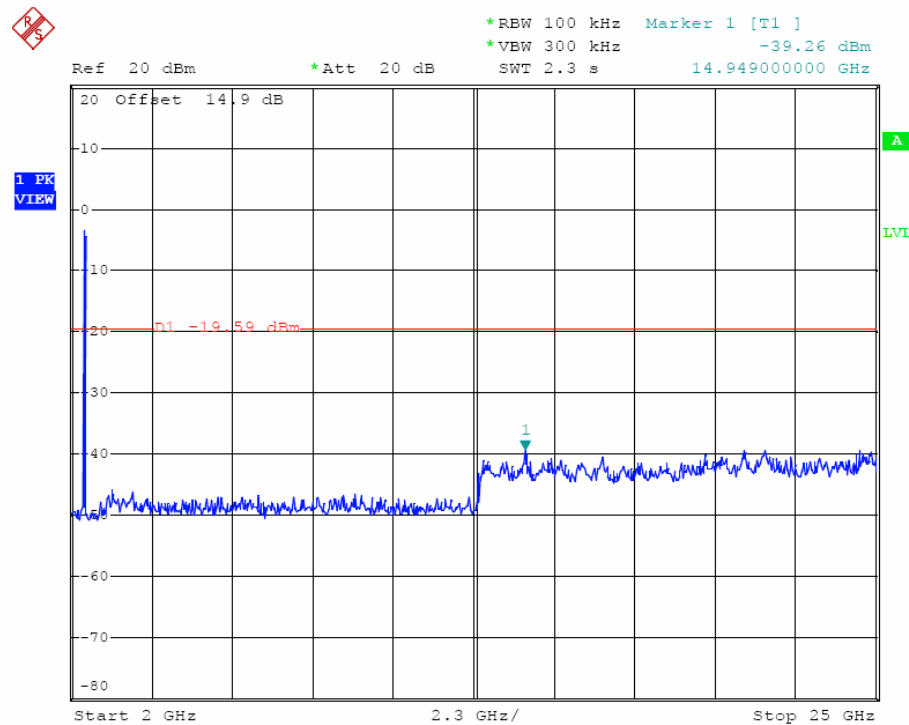
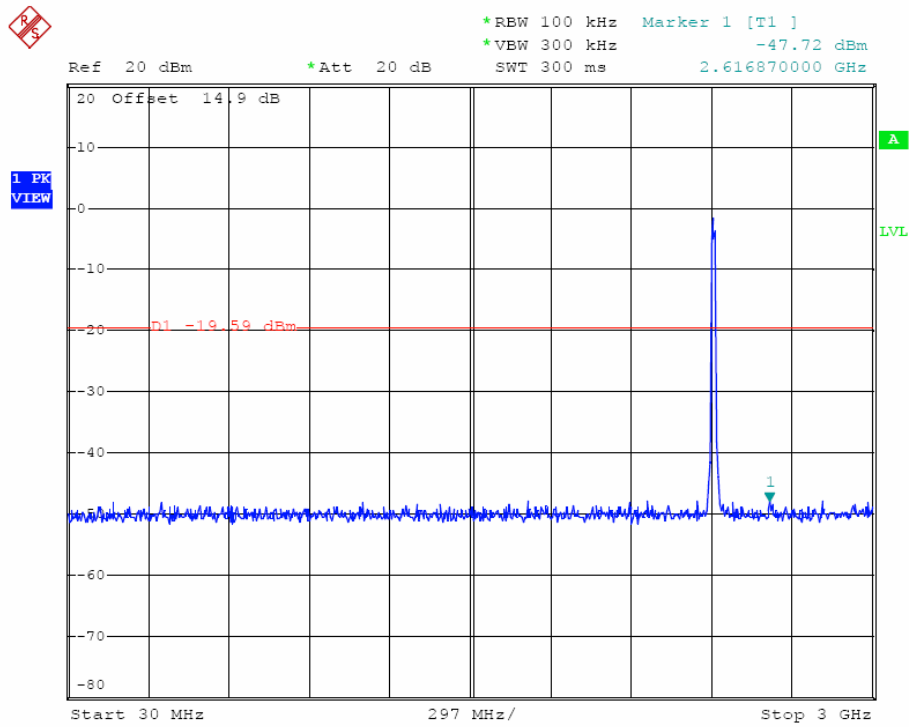
80.211b 2437MHz



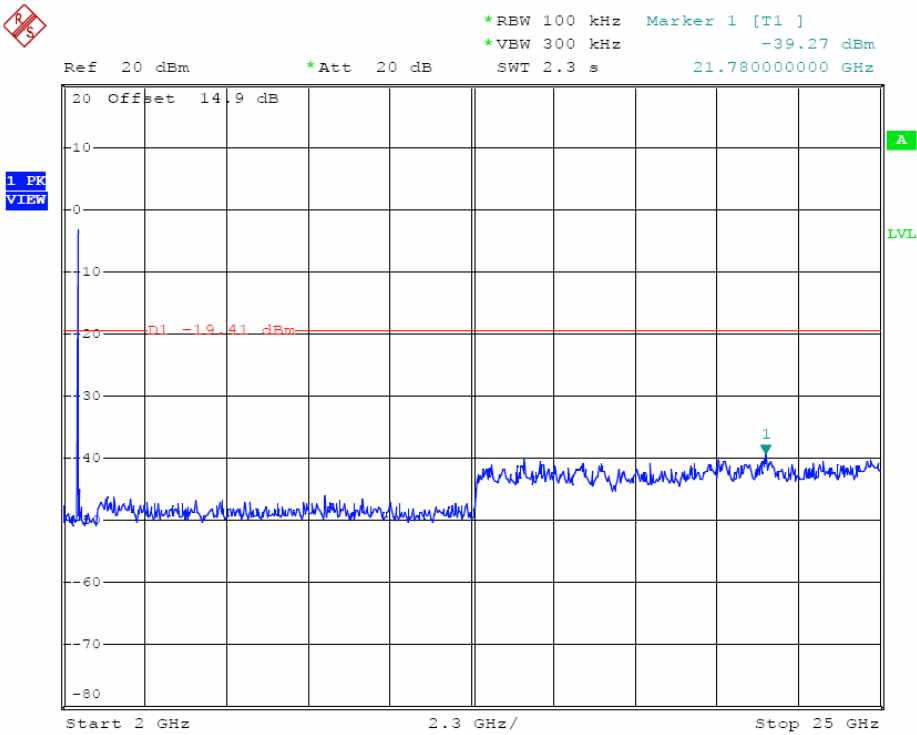
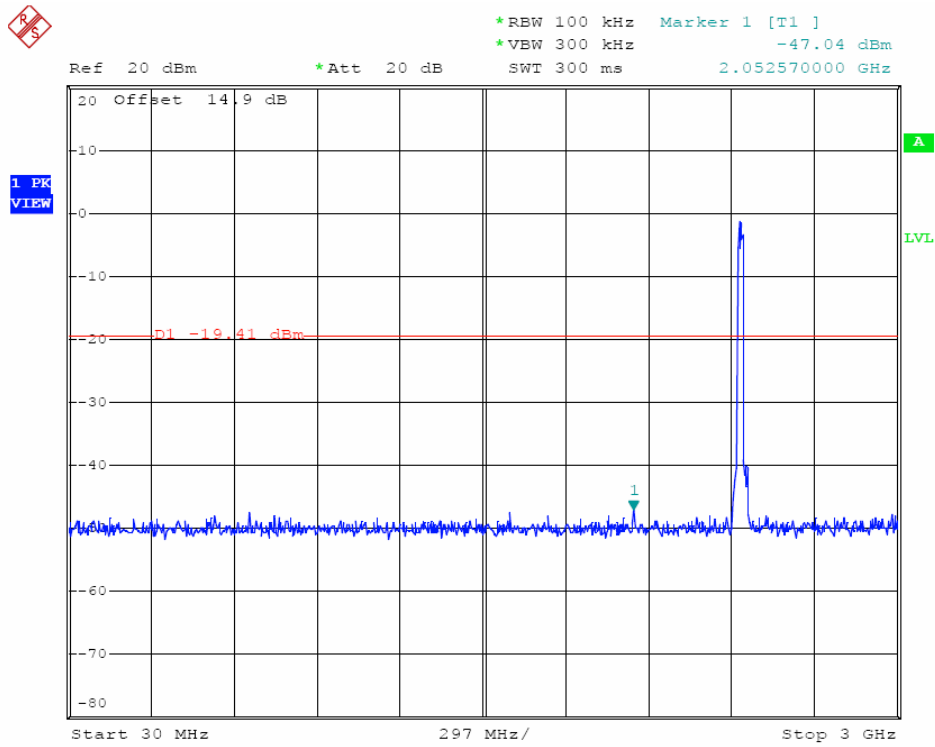
80.211b 2462MHz



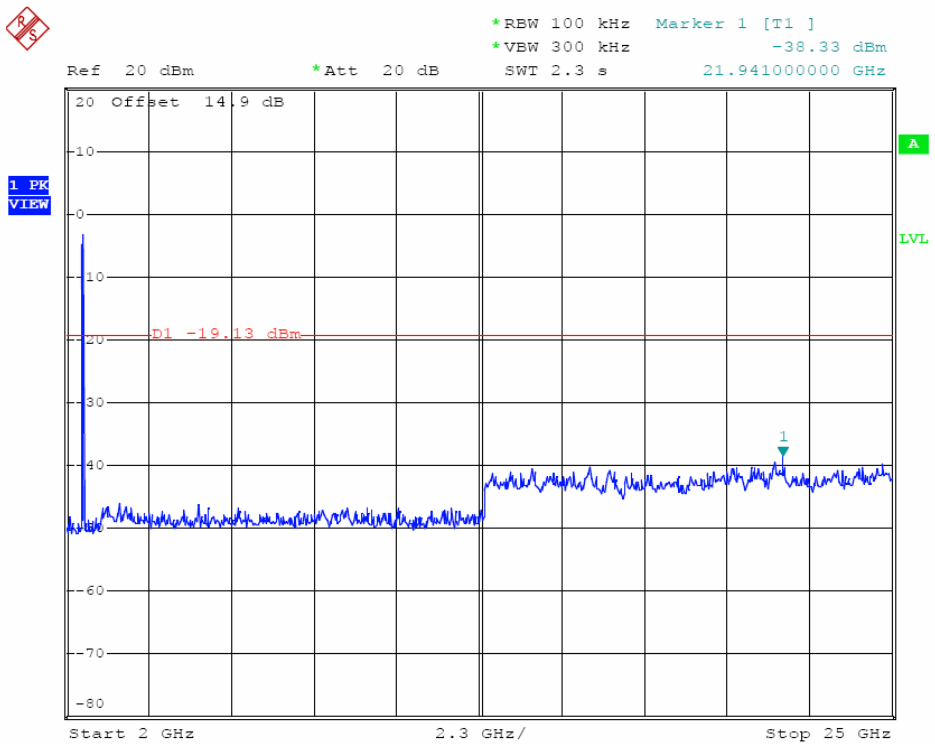
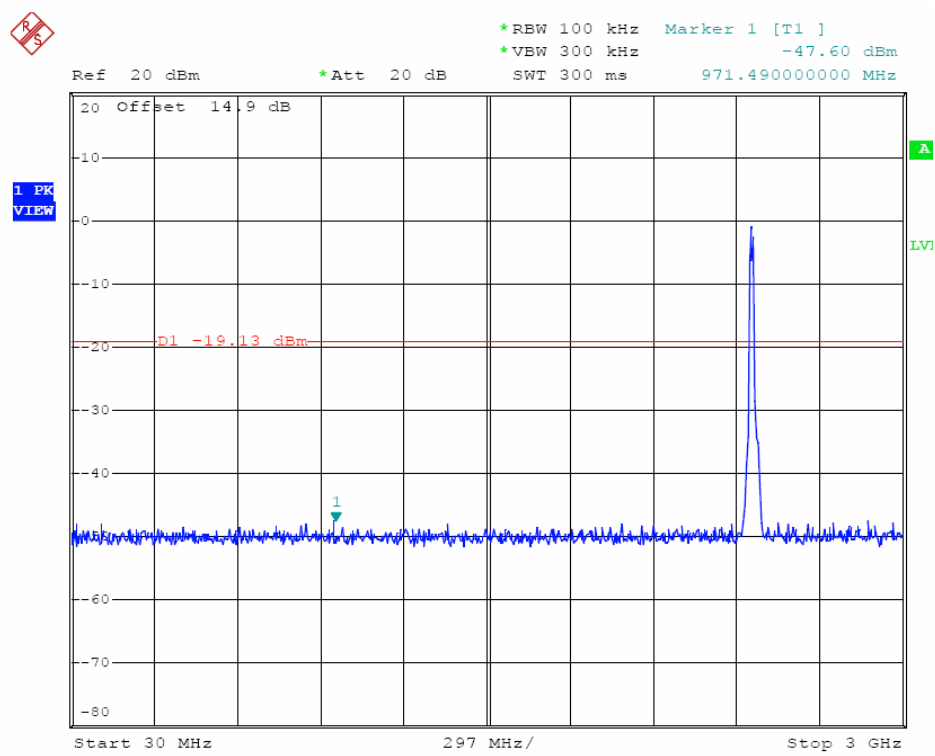
80.211g 2412MHz



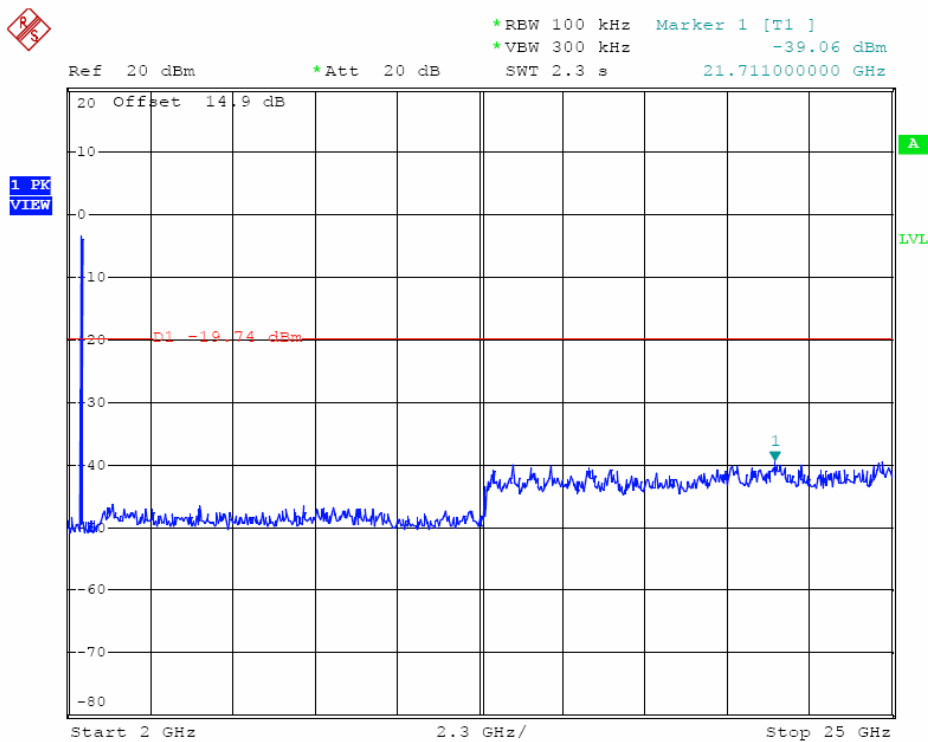
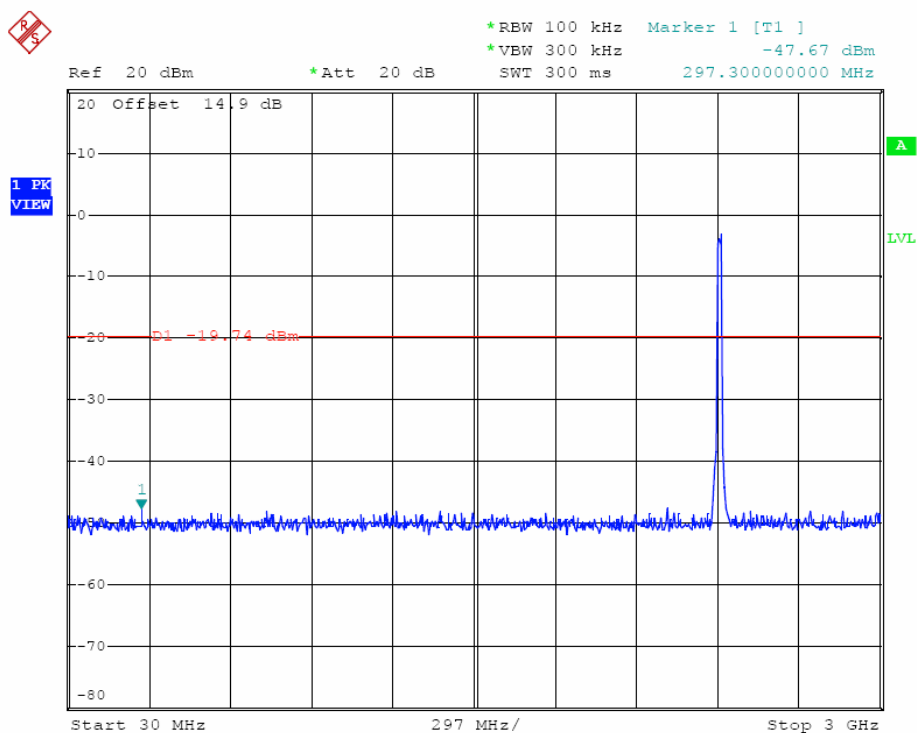
80.211g 2437MHz



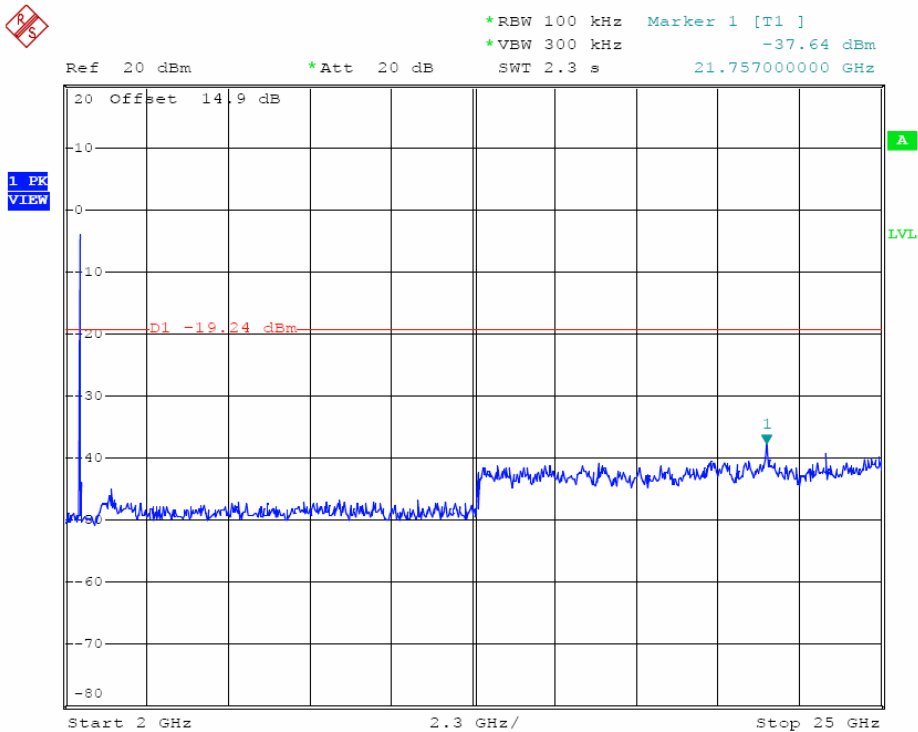
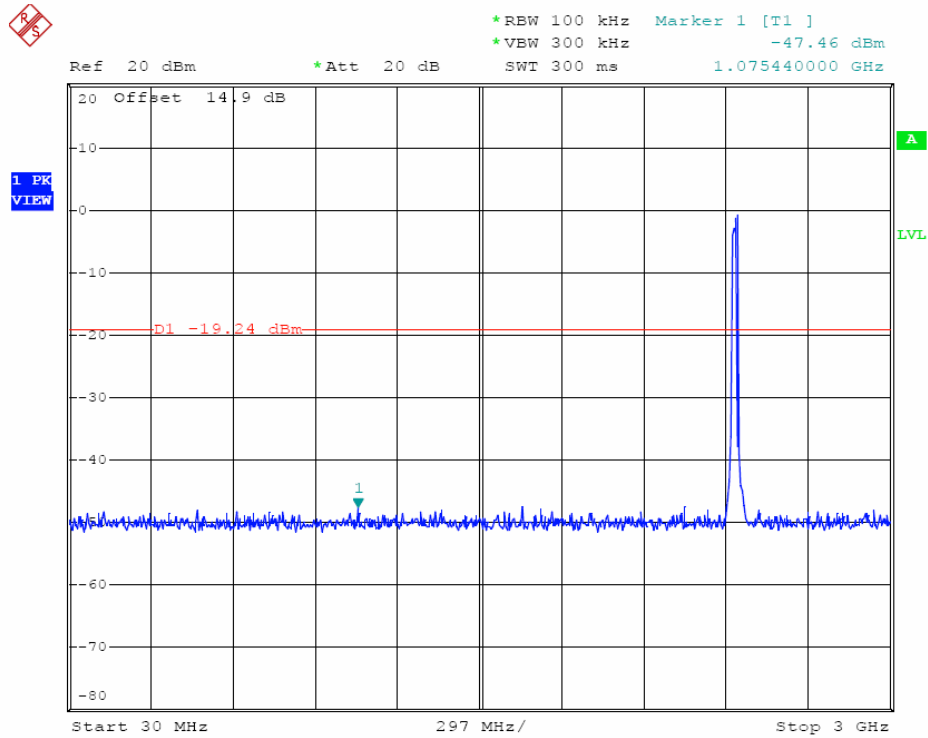
80.211g 2462MHz



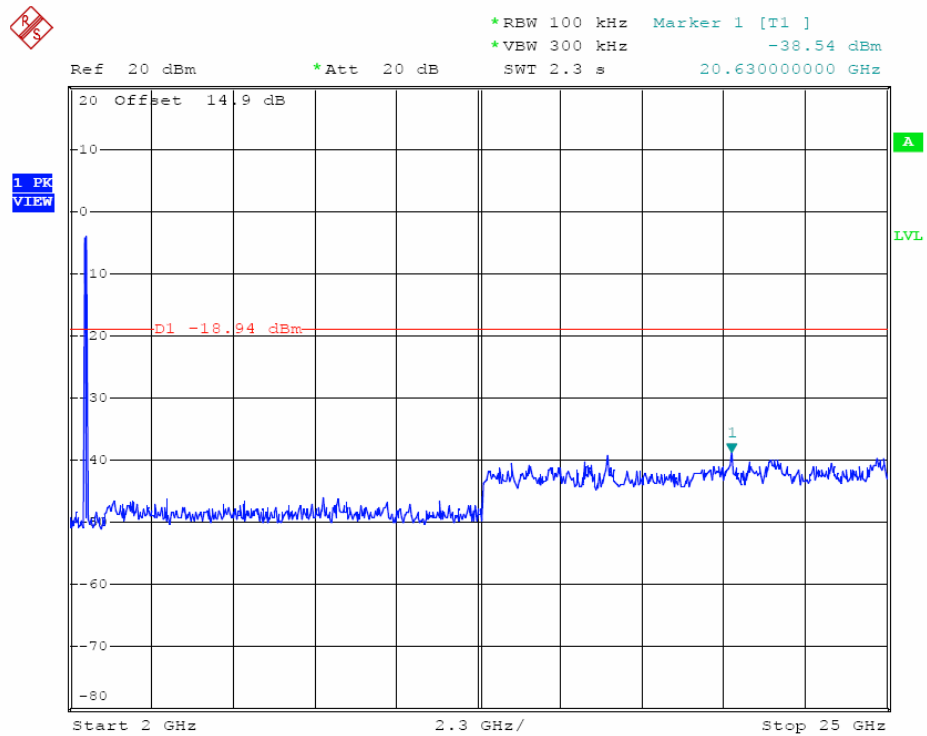
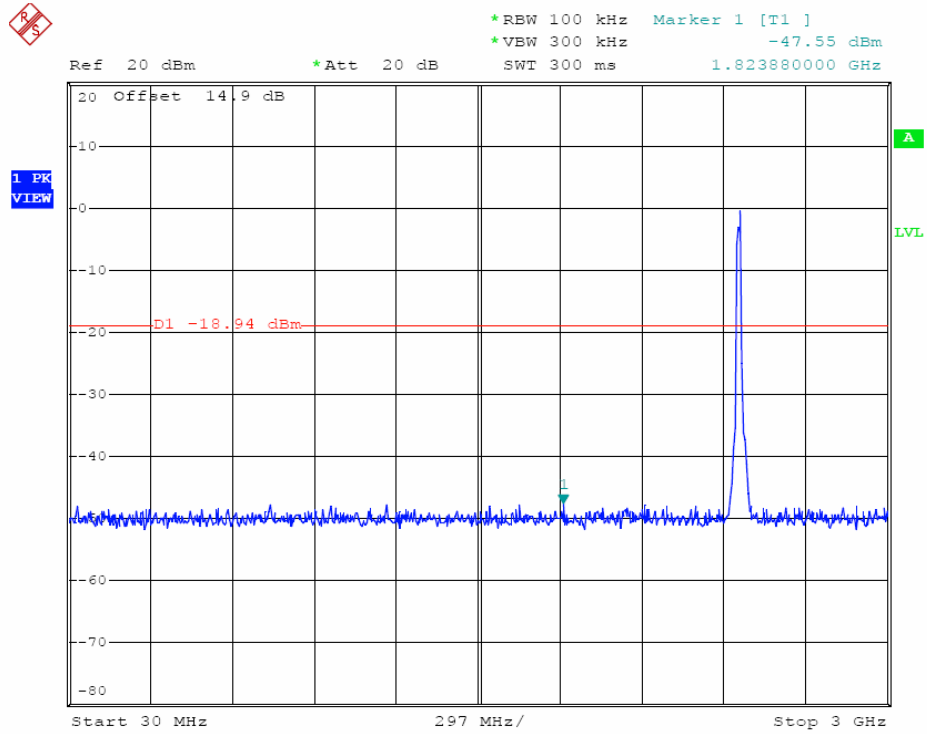
80.211n(HT20) 2412MHz



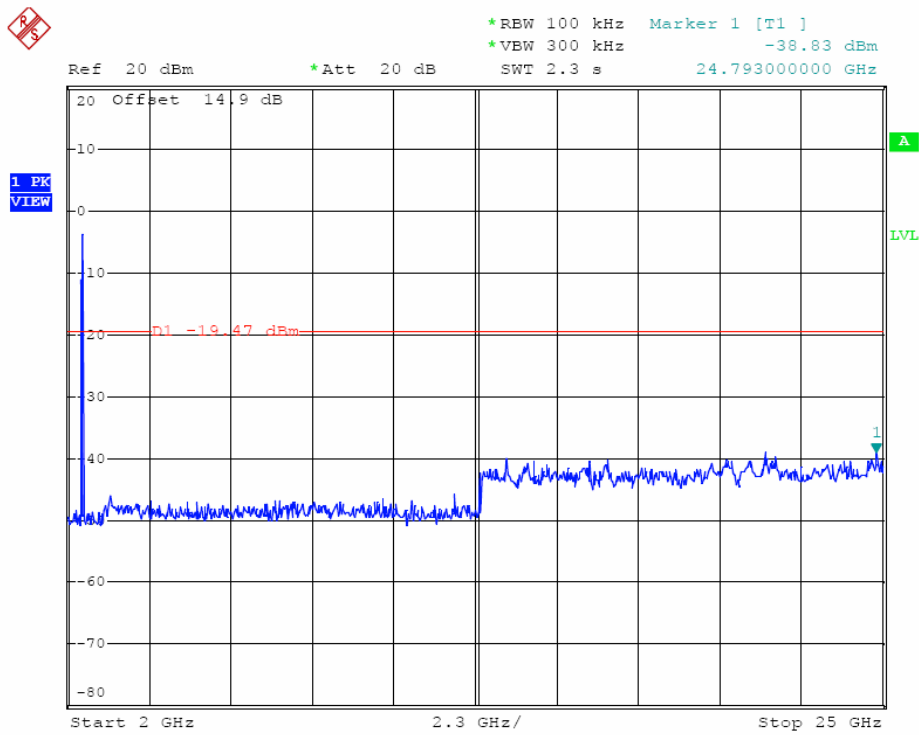
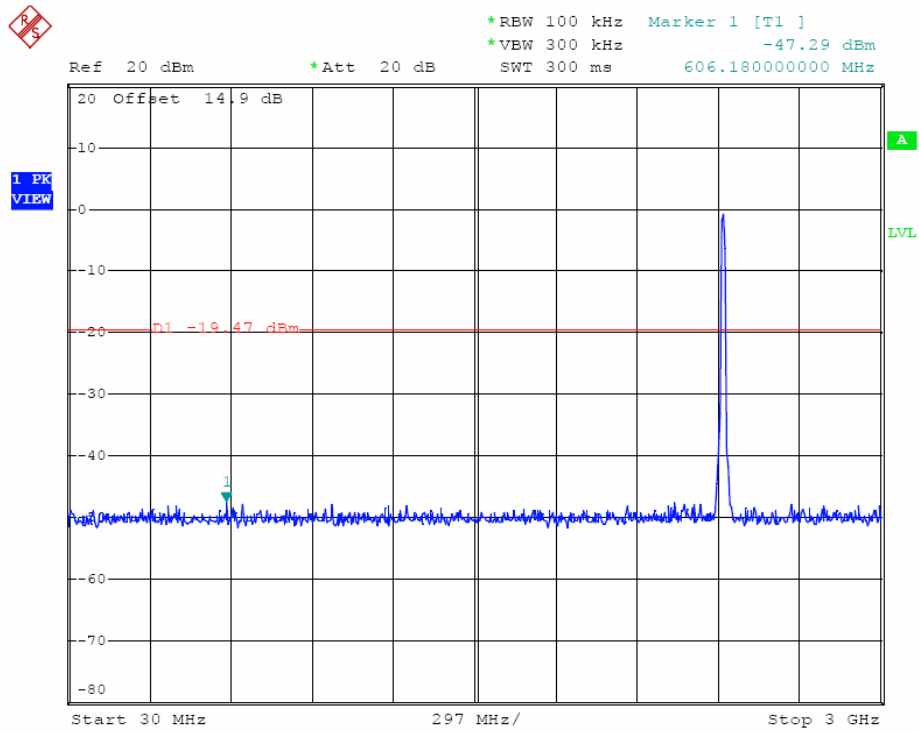
80.211n(HT20) 2437MHz



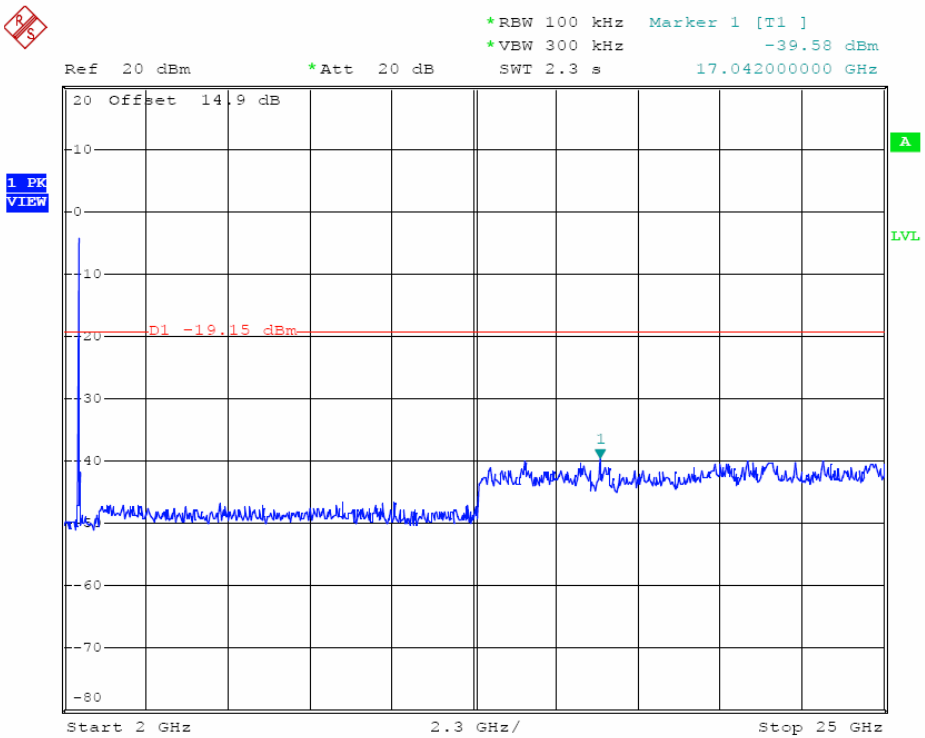
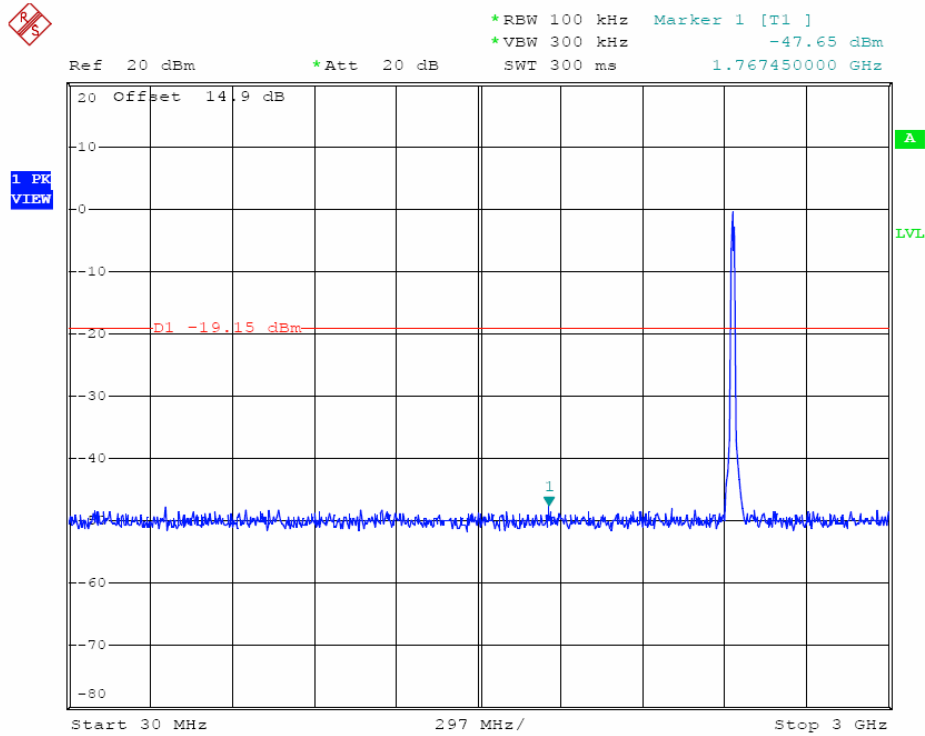
80.211n(HT20) 2462MHz



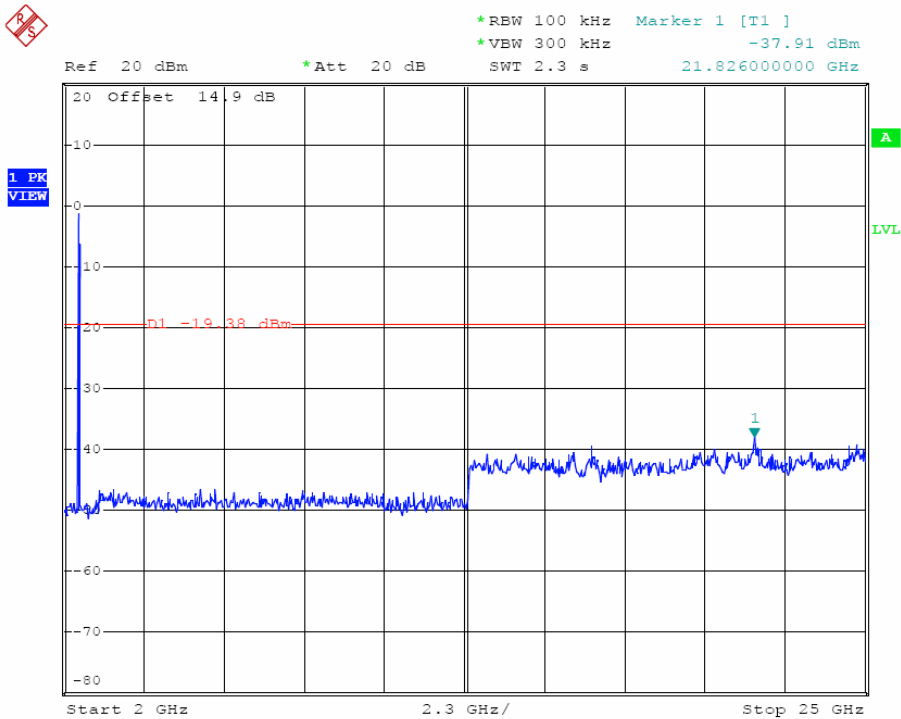
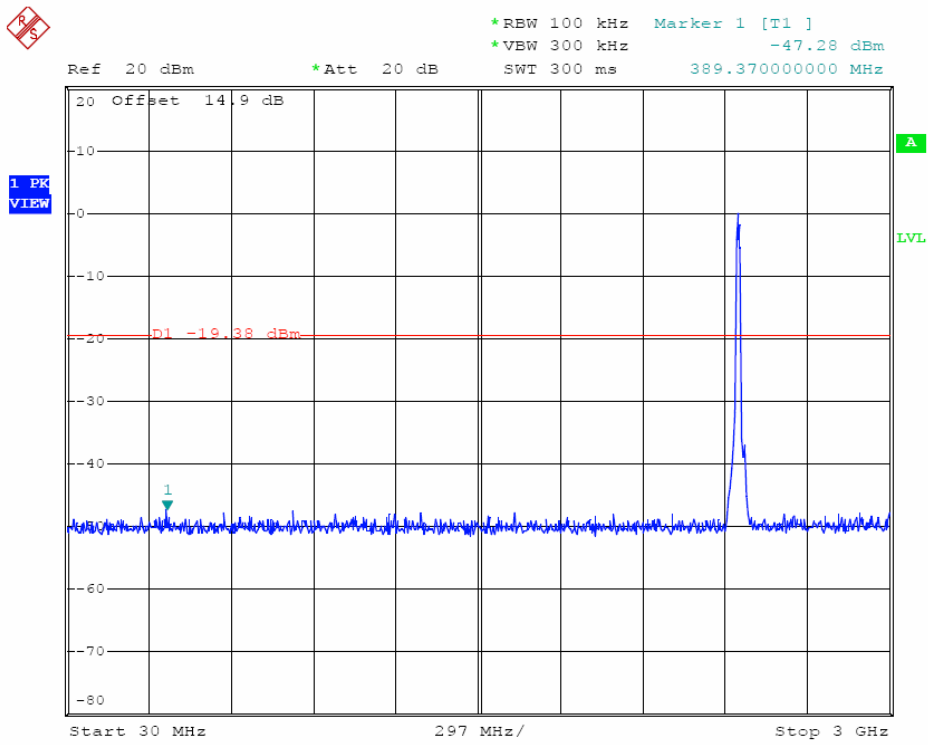
80.211n(HT40) 2422MHz



80.211n(HT40) 2437MHz



80.211n(HT40) 2452MHz



6.6 OCCUPY BANDWIDTH

6.1. Limits

For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz Test data:

6.2. Test setup

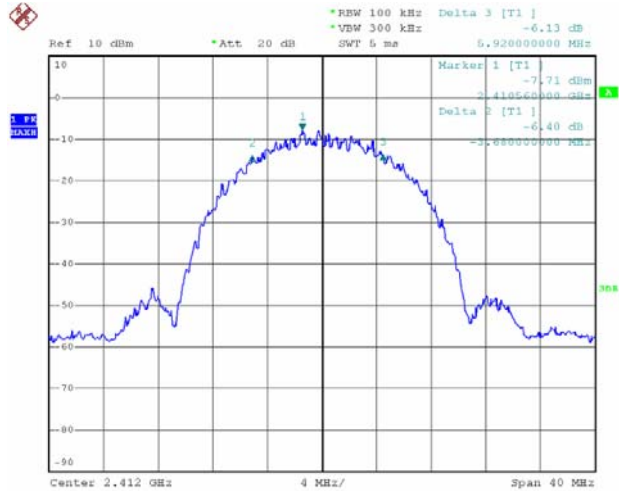
1. Set analyzer center frequency to DTS channel center frequency.
2. Set the RBW =100kHz.
3. Set the VBW = 300 RBW.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Measure and record the result in the test report.

6.3. Test result

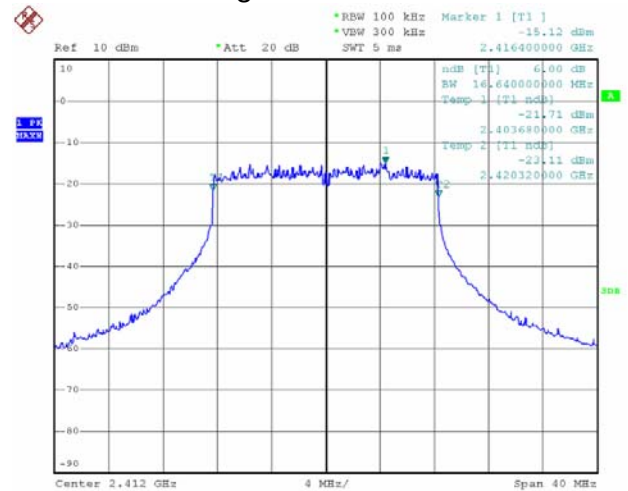
	Channel Frequency (MHz)	6dB Bandwidth (MHz)	Limit (MHz)	Result
802.11b	2412	9.6	>0.5	Pass
	2437	9.5	>0.5	Pass
	2462	9.5	>0.5	Pass
802.11g	2412	16.6	>0.5	Pass
	2437	16.6	>0.5	Pass
	2462	16.6	>0.5	Pass
802.11n(HT20)	2412	17.8	>0.5	Pass
	2437	17.8	>0.5	Pass
	2462	17.9	>0.5	Pass
802.11n(HT40)	2422	36.5	>0.5	Pass
	2437	36.5	>0.5	Pass
	2452	36.5	>0.5	Pass

Test plot as follows:

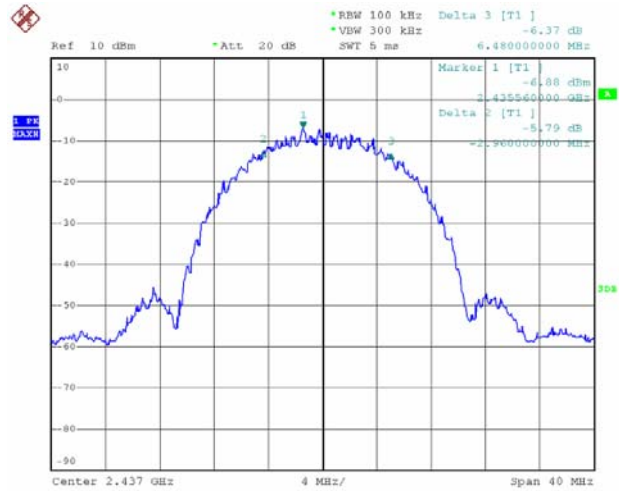
802.11b 2412MHz



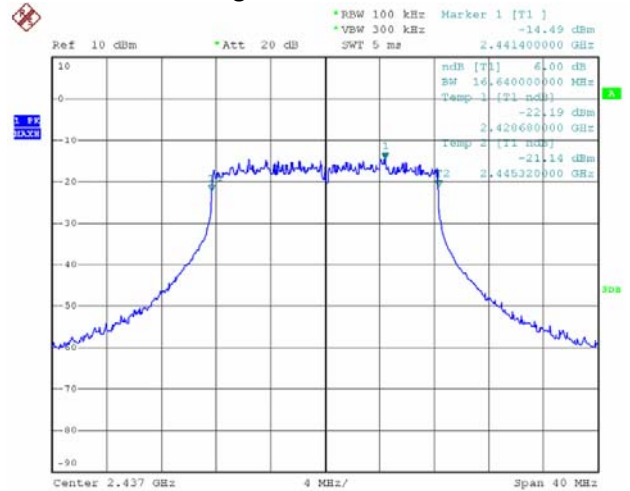
802.11g 2412MHz



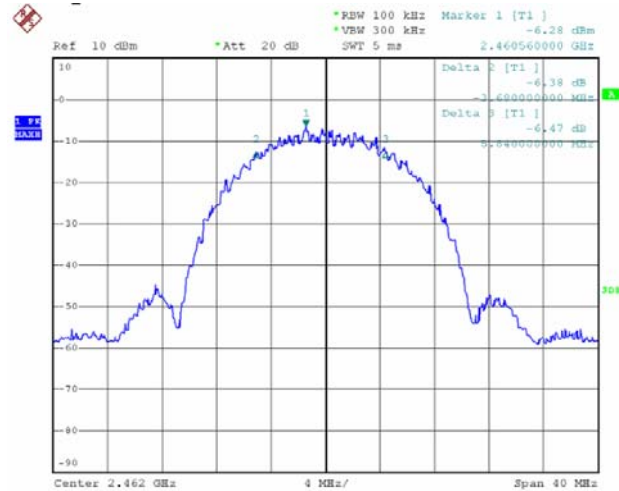
802.11b 2437MHz



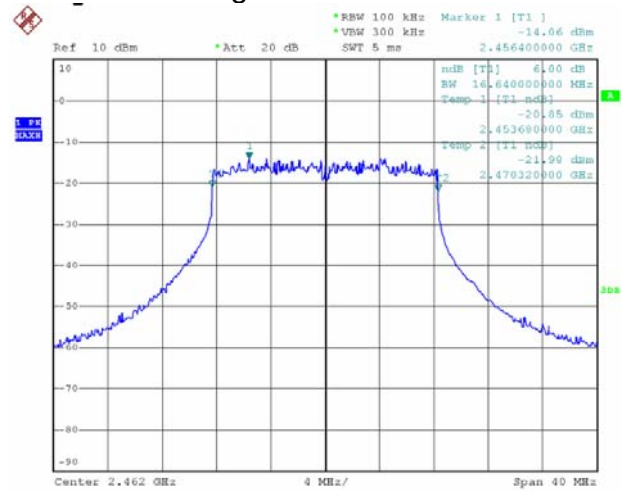
802.11g 2437MHz



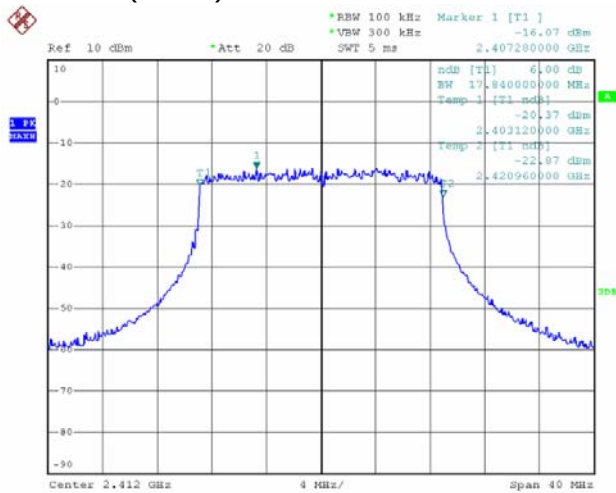
802.11b 2462MHz



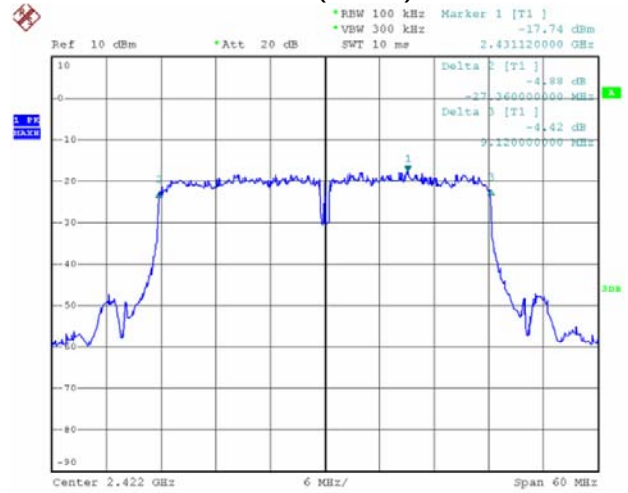
802.11g 2462MHz



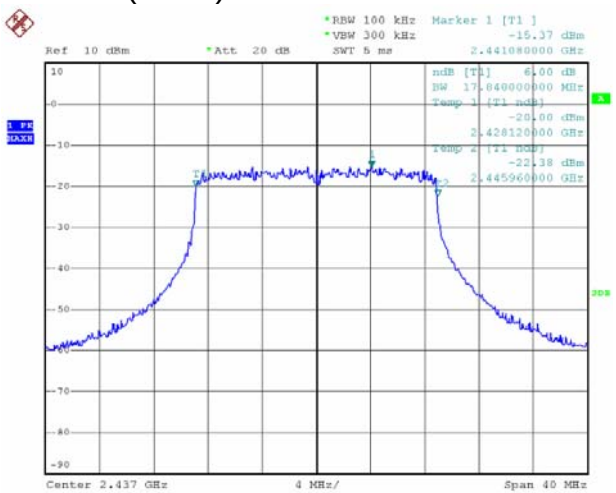
802.11n (HT20) 2412MHz



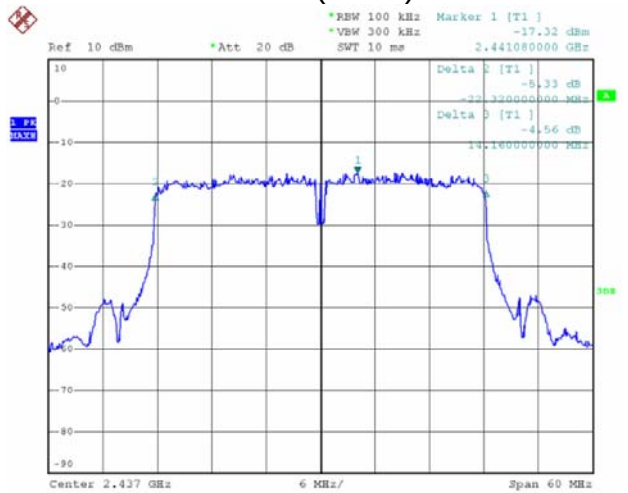
802.11 n (HT40) 2422MHz



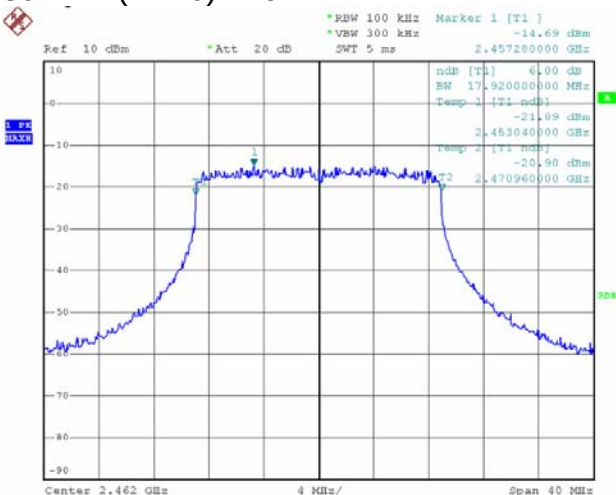
802.11n (HT20) 2437MHz



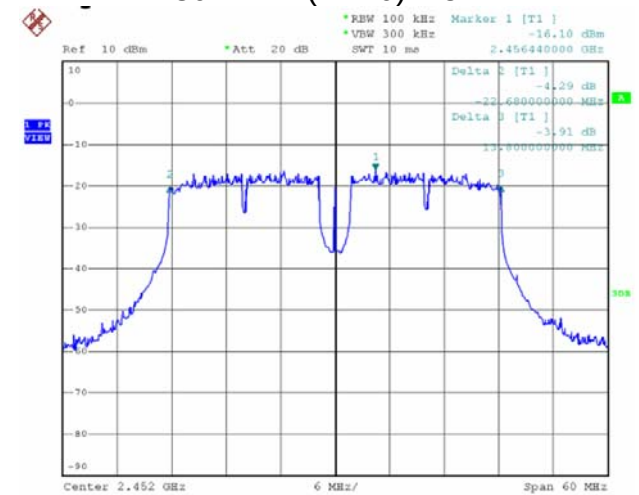
802.11 n (HT40) 2437MHz



802.11n(HT20) 2462MHz



802.11 n (HT40)2452MHz



7. BAND EDGE COMPLIANCE TEST

7.1. Limits

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

7.2. Test setup

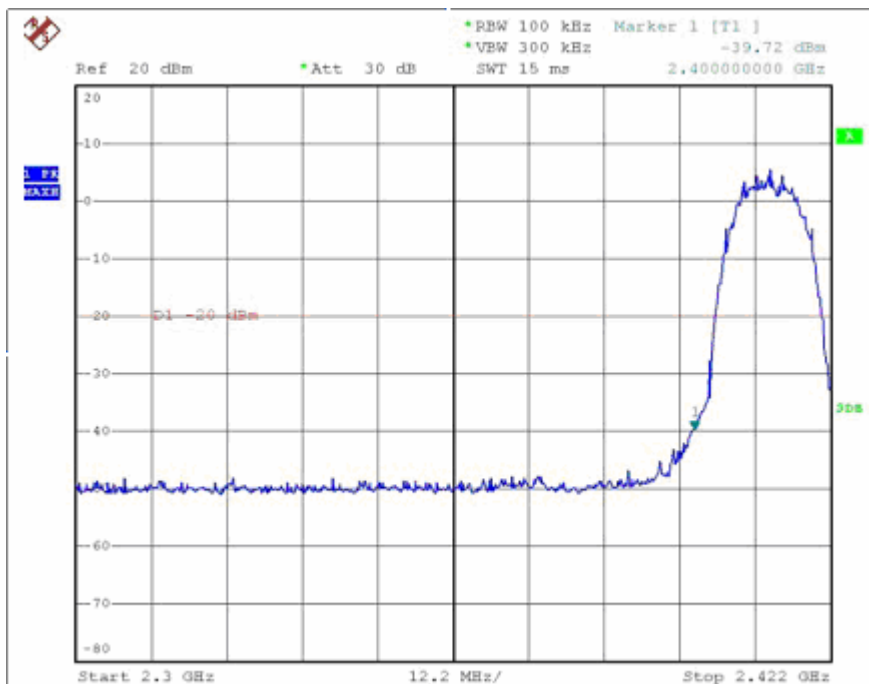
The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both HORIZONTAL and VERTICAL polarizations.

The bandwidth of the Spectrum's VBW is set at 3MHz and RBW is set at 1MHz for peak emissions measurement above 1GHz and 1MHz RBW, 10Hz VBW for average emissions measure.

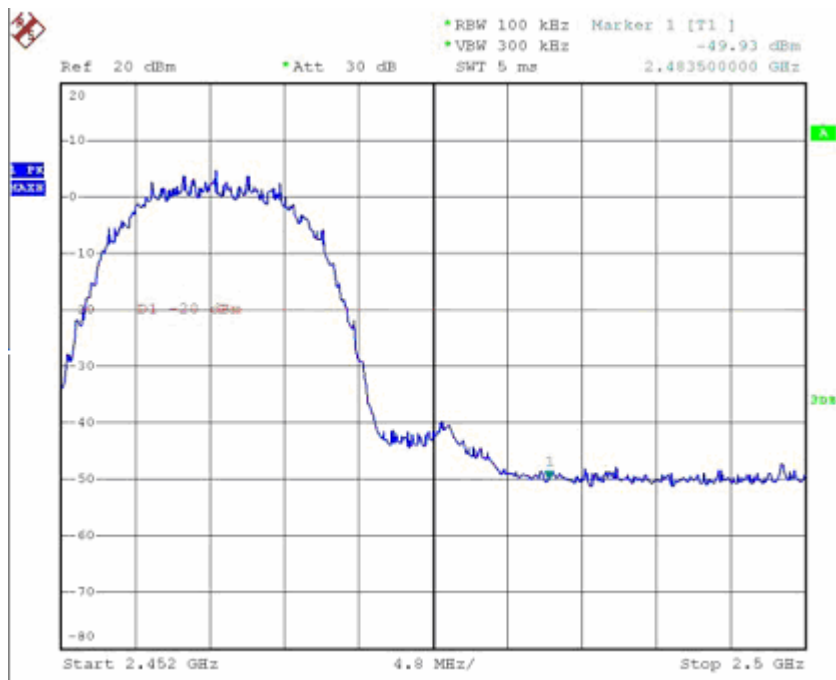
Note: If the PK measured levels comply with average limit, then the average level were deemed to comply with average limit.

Test plot as follows:

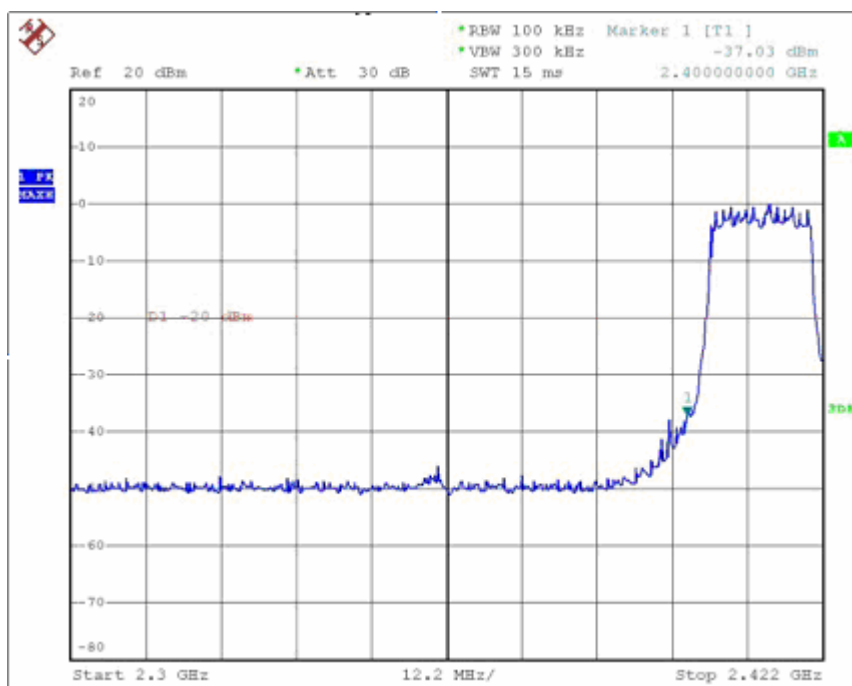
802.11b 2412MHz



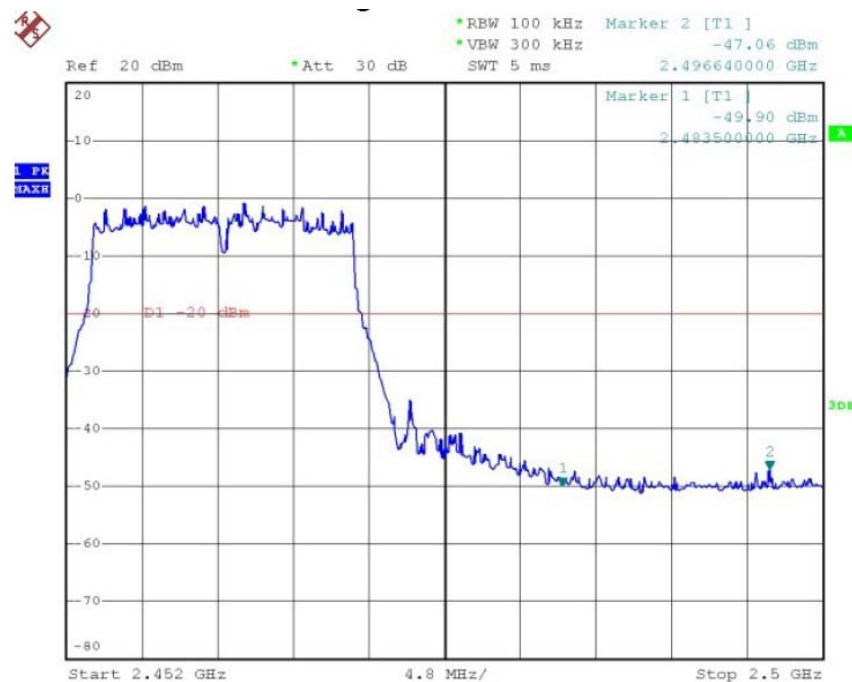
802.11b 2462MHz



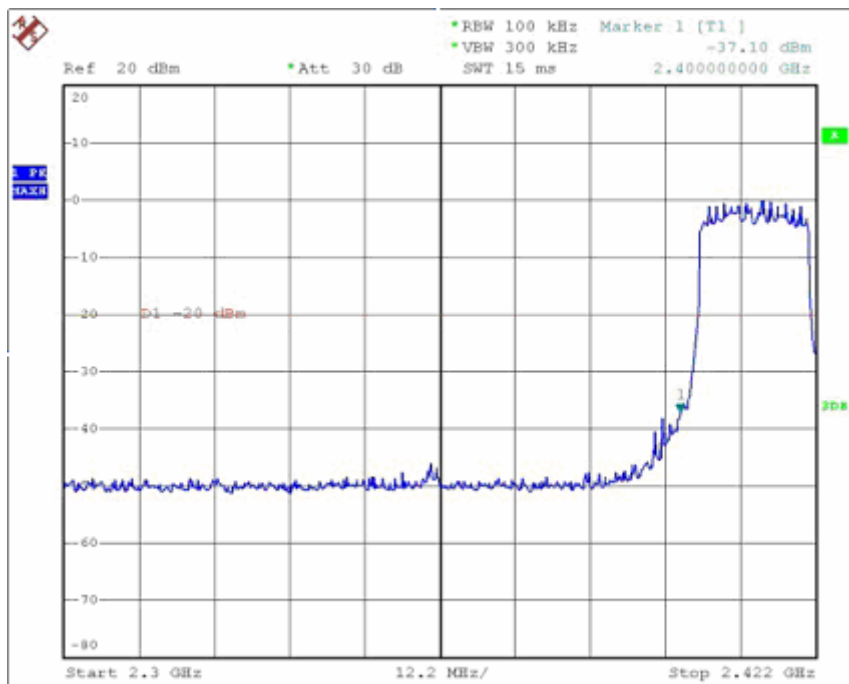
802.11g 2412MHz



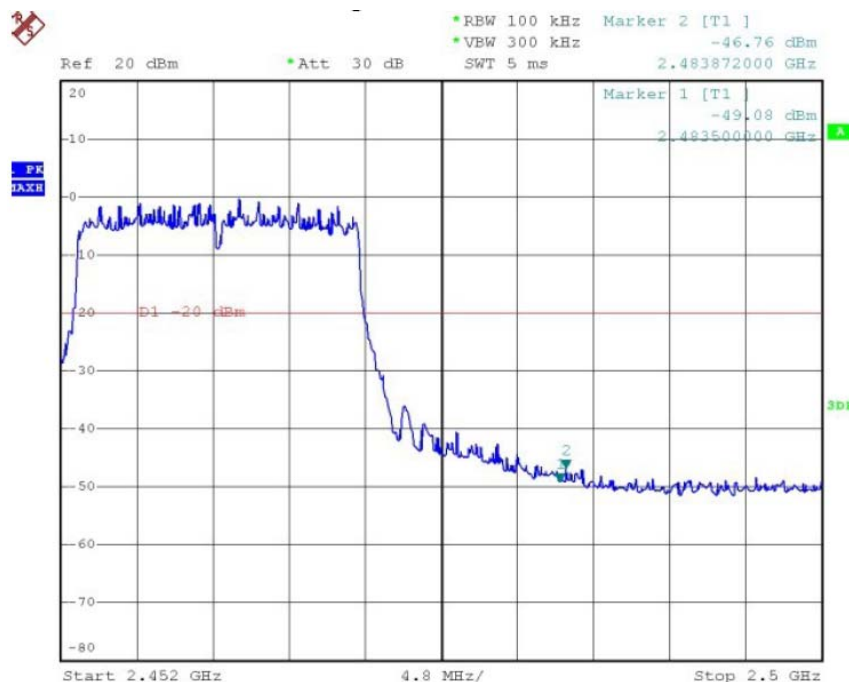
802.11g 2462MHz



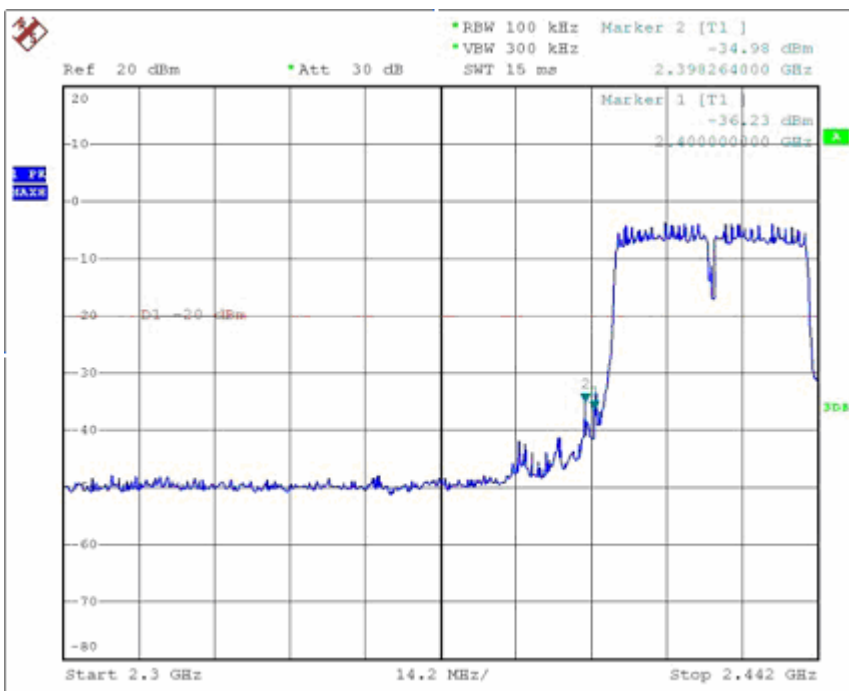
802.11n(HT20) 2412MHz



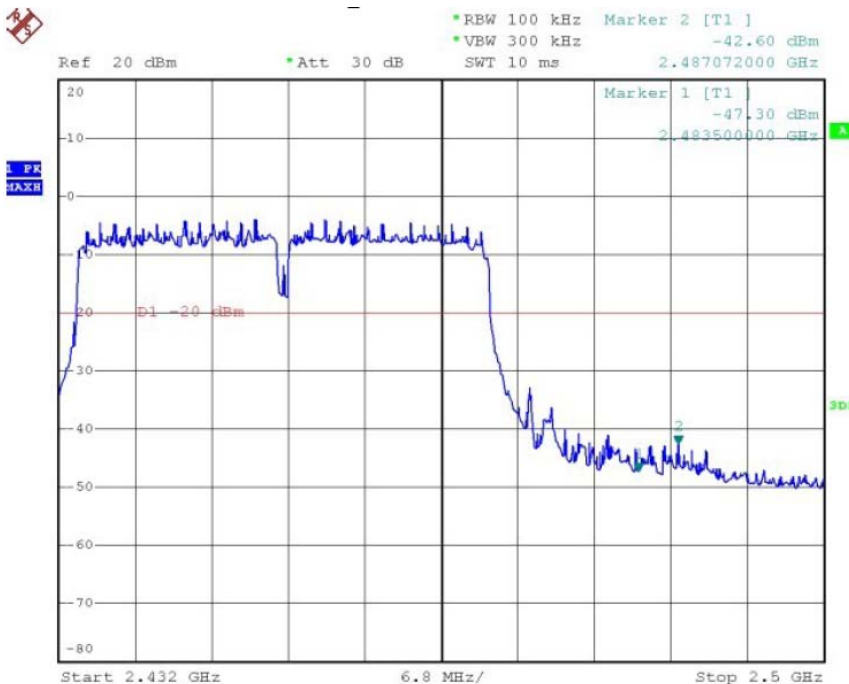
802.11 n(HT20) 2462MHz



802.11n(HT40) 2422MHz



802.11 n(HT40) 2452MHz



8. OUTPUT POWER TEST

8.1. Limits

For systems using digital modulation in the 2400~2483.5MHz, The Peak out put Power shall not exceed 1W(30dBm)

8.2. Test setup

1. The Transmitter output (antenna port) was connected to the power meter.
2. Turn on the EUT and power meter and then record the peak power value.
3. Repeat above procedures on all channels needed to be tested.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

8.3. Test result

	Channel Frequency (MHz)	Peak output Power(dBm)	Limit (dBm)	Result
802.11b	2412	13.12	30	Pass
	2437	13.15	30	Pass
	2462	13.13	30	Pass
802.11g	2412	10.08	30	Pass
	2437	10.11	30	Pass
	2462	10.17	30	Pass
802.11n(HT20)	2412	10.09	30	Pass
	2437	10.16	30	Pass
	2462	10.05	30	Pass
802.11n(HT40)	2422	9.67	30	Pass
	2437	9.87	30	Pass
	2452	9.74	30	Pass

9. POWER SPECTRAL DENSITY TEST

9.1. Limits

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

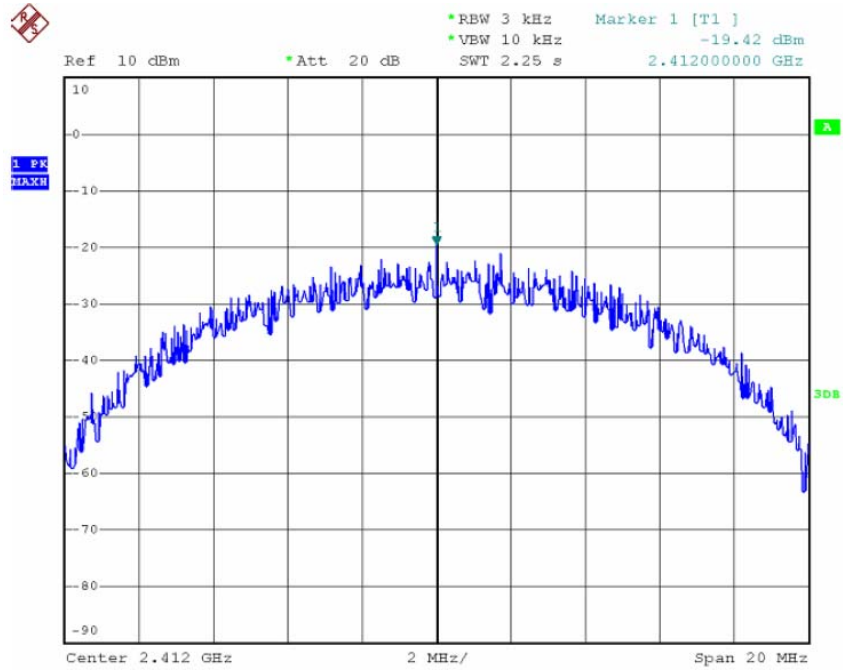
9.2. Test setup

1. Set analyzer center frequency to DTS channel center frequency.
2. Set the span to 1.5 times the DTS channel bandwidth.
3. Set the RBW = 100kHz.
4. Set the VBW = 300 RBW.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level.

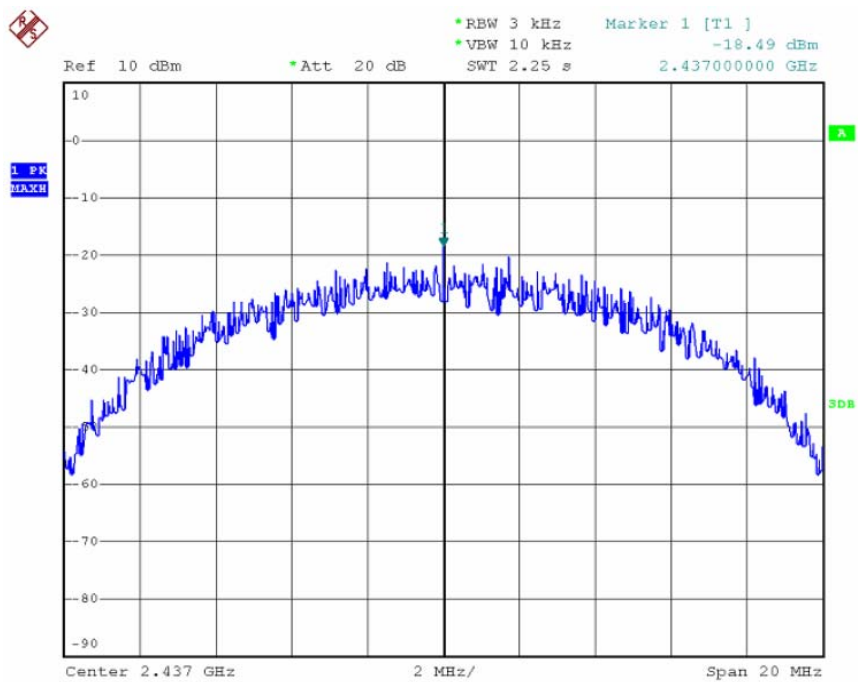
9.3. Test result

	Channel Frequency (MHz)	Power density (dBm/100KHz)	Limit (dBm/3KHz)	Result
802.11b	2412	-19.42	<8	Pass
	2437	-18.49	<8	Pass
	2462	-17.80	<8	Pass
802.11g	2412	-28.99	<8	Pass
	2437	-28.18	<8	Pass
	2462	-27.82	<8	Pass
802.11n (HT20)	2412	-30.14	<8	Pass
	2437	-29.11	<8	Pass
	2462	-28.59	<8	Pass
802.11n (HT40)	2422	-30.87	<8	Pass
	2437	-30.39	<8	Pass
	2452	-30.27	<8	Pass

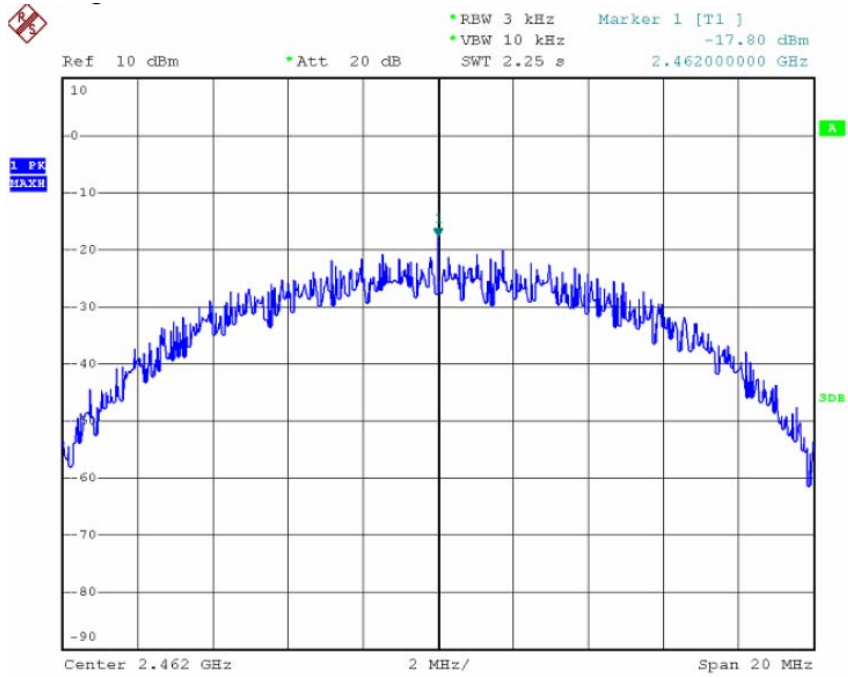
802.11b 2412MHz



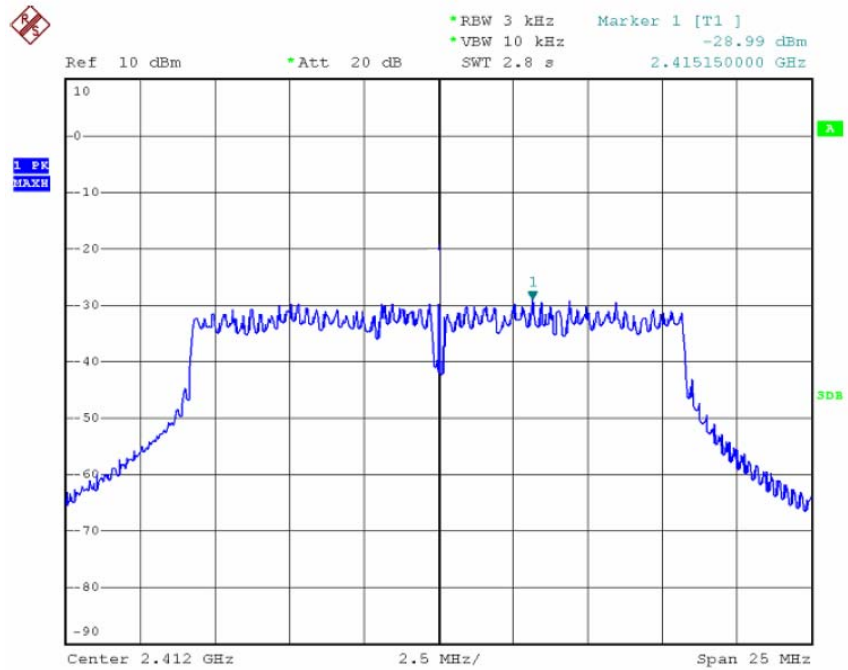
802.11b 2437MHz



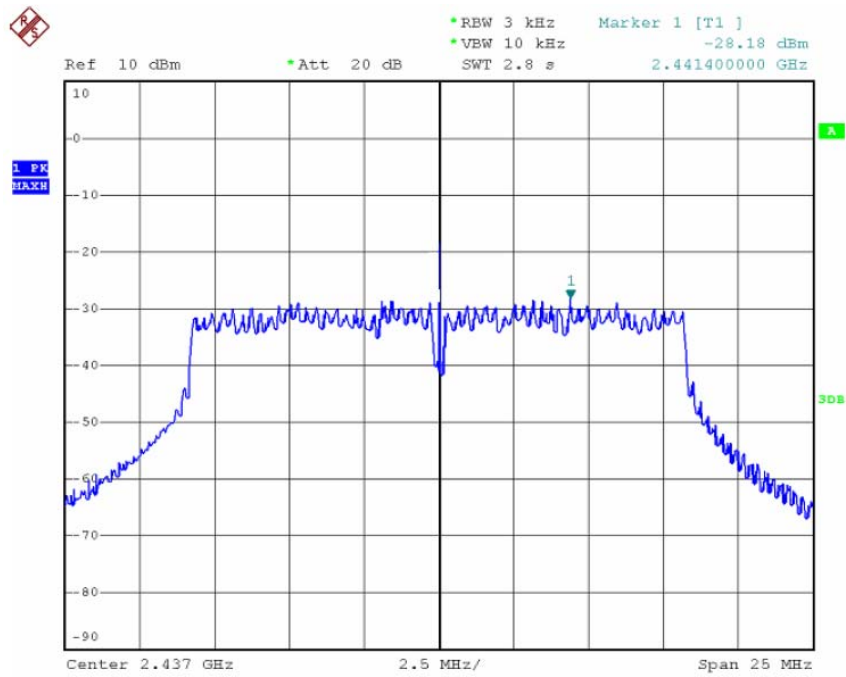
802.11b 2462MHz



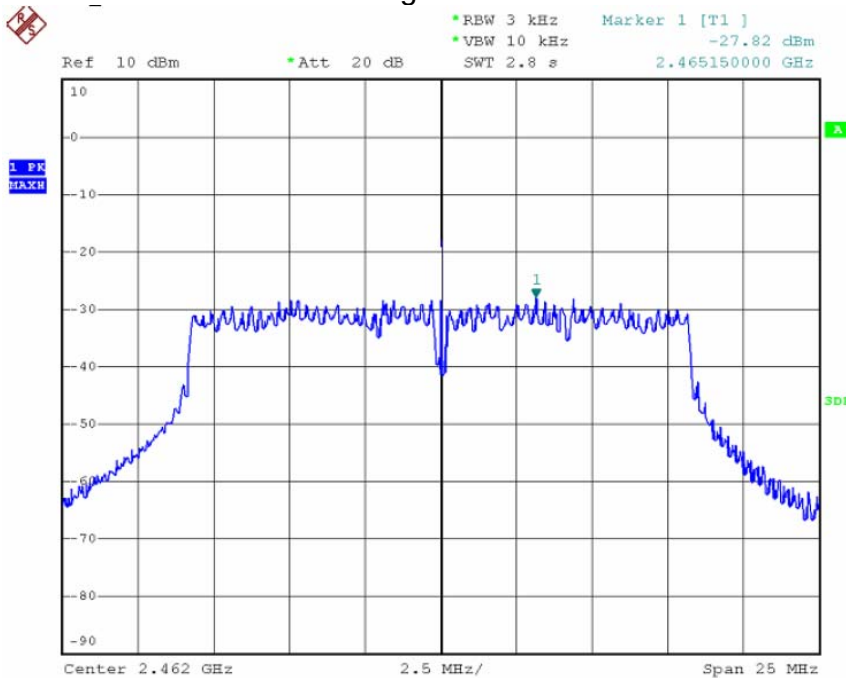
802.11g 2412MHz



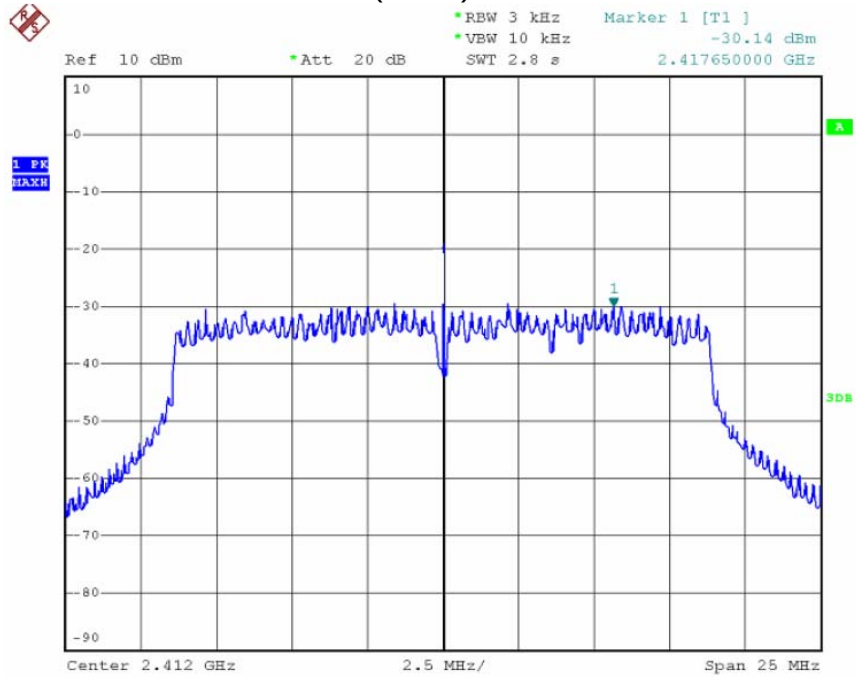
802.11g 2437MHz



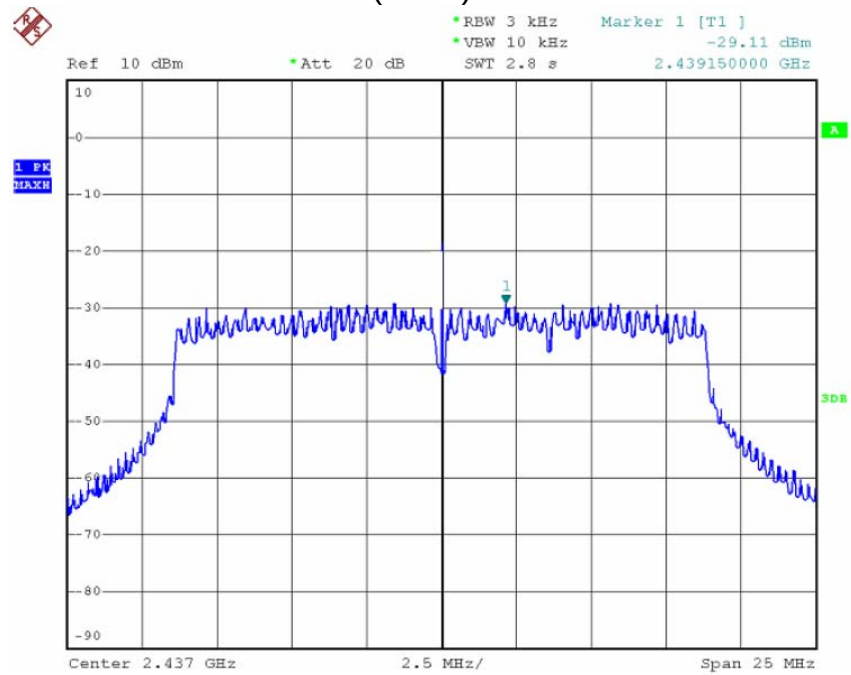
802.11g 2462MHz



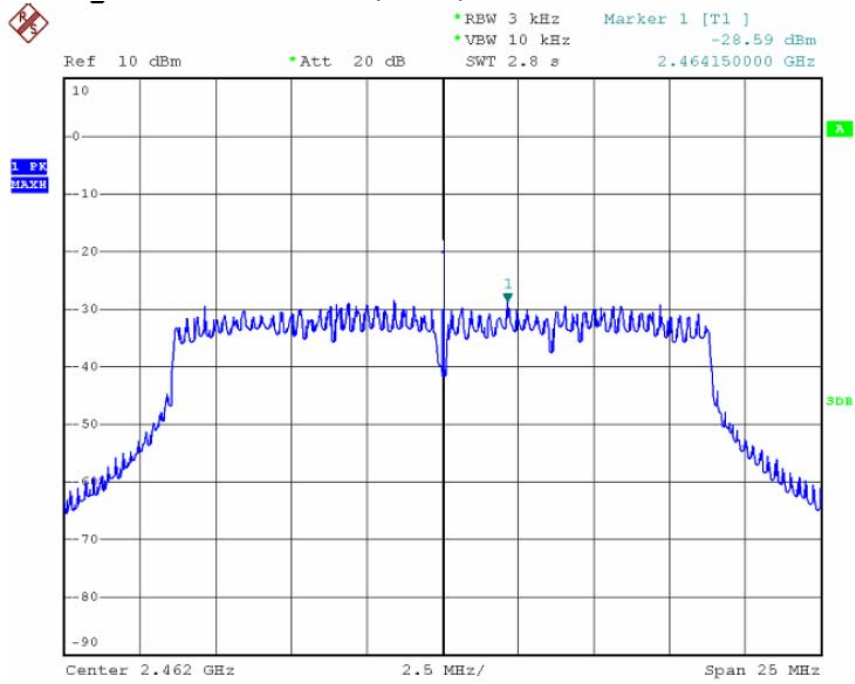
802.11n (HT20) 2412MHz



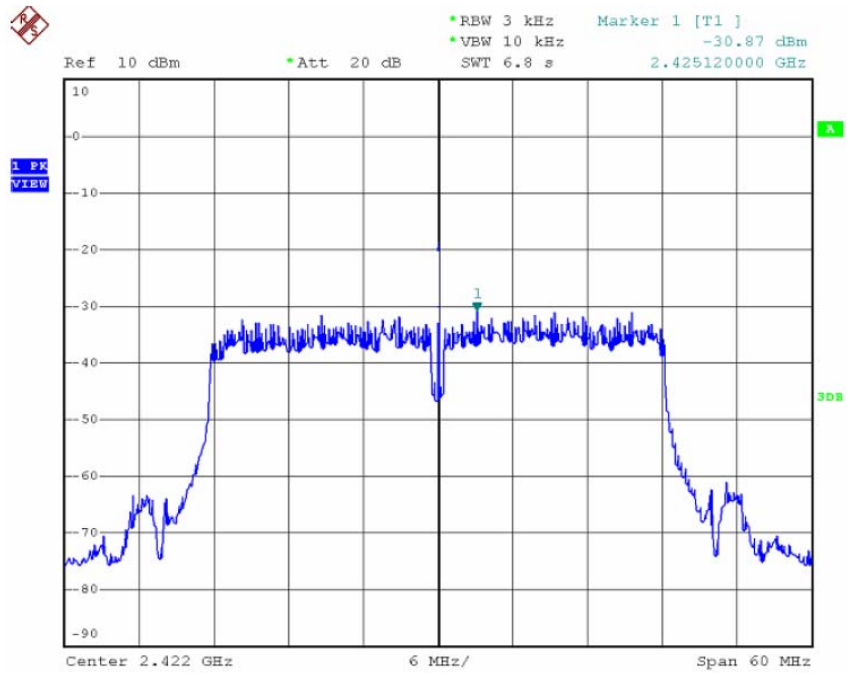
802.11n (HT20) 2437MHz



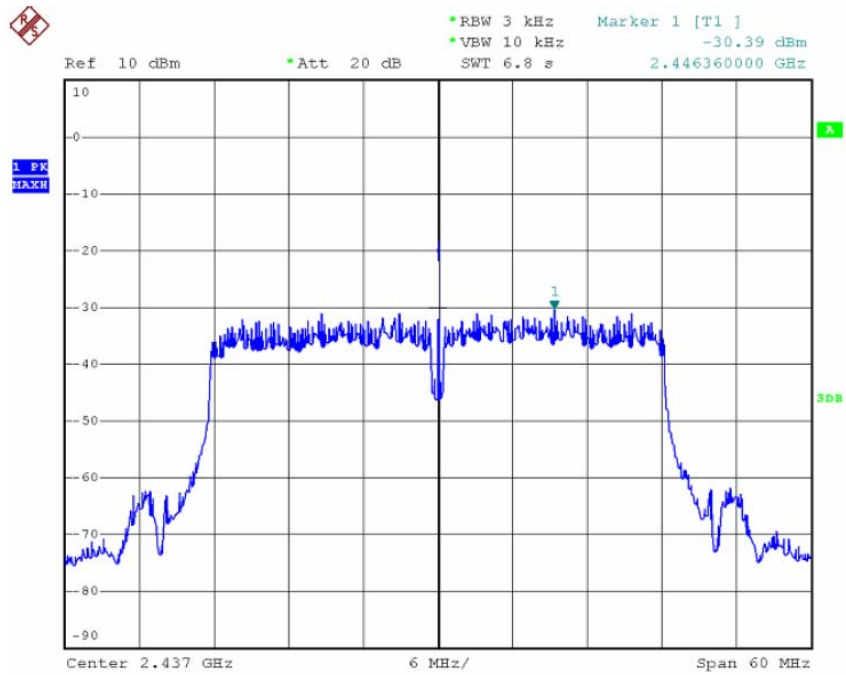
802.11n(HT20) 2462MHz



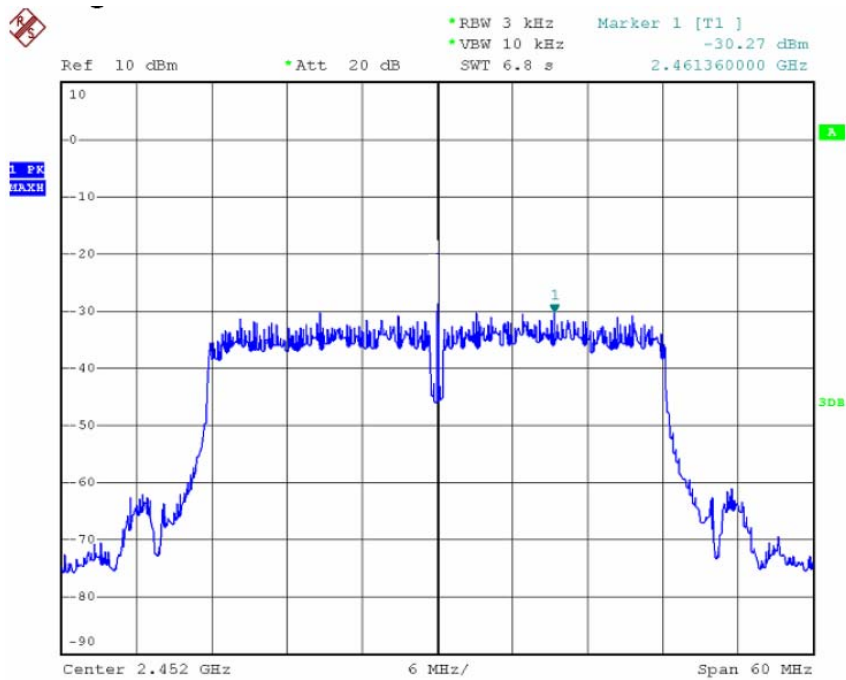
802.11 n (HT40) 2422MHz



802.11 n (HT40) 2437MHz



802.11 n (HT40)2452MHz



10. ANTENNA REQUIREMENTS

10.1. Limits

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

10.2. Result

The antennas used for this product are external Antenna and that no antenna other than that furnished by the responsible party shall be used with the device, the maximum peak gain of the transmit antenna is only 1.0 dBi.

11. PHOTOGRAPHS OF TEST SET-UP

Please see annex.

12. PHOTOGRAPHS OF THE EUT



END.