



# FCC TEST REPORT

**REPORT NO.:** 100645FIA01  
**MODEL NO.:** DWA-135  
**RECEIVED:** Jun. 22, 2010  
**FCC ID:** KA2WA135A1  
**TESTED:** June 22 – July 04, 2010  
**ISSUED:** July 09, 2010

**APPLICANT:** D-Link Corporation

**ADDRESS:** No.289, Sinhu 3rd Rd., Neihu District, Taipei City  
114, Taiwan, R.O.C.

**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
Ltd., Taoyuan Branch Hsin Chu Laboratory

**LAB ADDRESS :** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

**TEST LOCATION (1):** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

**TEST LOCATION (2):** No. 49, Ln. 206, Wende Rd., Shangshan Tsuen,  
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

This test report consists of 106 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by any government agencies. The test results in the report only apply to the tested sample.

# TABLE OF CONTENTS

<b>1.</b>	<b>CERTIFICATION.....</b>	<b>3</b>
<b>2.</b>	<b>SUMMARY OF TEST RESULTS.....</b>	<b>4</b>
2.1	MEASUREMENT UNCERTAINTY.....	4
<b>3.</b>	<b>GENERAL INFORMATION.....</b>	<b>5</b>
3.1	GENERAL DESCRIPTION OF EUT.....	5
3.2	DESCRIPTION OF TEST MODES.....	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS.....	11
3.4	DESCRIPTION OF SUPPORT UNITS.....	11
<b>4.</b>	<b>TEST TYPES AND RESULTS .....</b>	<b>12</b>
4.1	RADIATED EMISSION MEASUREMENT.....	12
4.2	CONDUCTED EMISSION MEASUREMENT.....	41
4.3	6dB BANDWIDTH MEASUREMENT .....	46
4.4	MAXIMUM PEAK OUTPUT POWER .....	60
4.5	POWER SPECTRAL DENSITY MEASUREMENT .....	64
4.6	BAND EDGES MEASUREMENT.....	78
4.7	ANTENNA REQUIREMENT .....	104
<b>5.</b>	<b>APPENDIX - INFORMATION ON THE TESTING LABORATORIES.....</b>	<b>105</b>
<b>6.</b>	<b>APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....</b>	<b>106</b>



# 1. CERTIFICATION

**PRODUCT:** Wireless N USB adapter

**MODEL:** DWA-135

**BRAND:** D-Link

**APPLICANT:** D-Link Corporation

**TEST SAMPLE:** ENGINEERING SAMPLE

**TESTED:** June 22 – July 04, 2010

**STANDARDS: FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003**

The above equipment (Model: DWA-135) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

**PREPARED BY** : Carol Liao , **DATE:** July 09, 2010  
( Carol Liao, Specialist )

**TECHNICAL ACCEPTANCE** : Hank Chung , **DATE:** July 09, 2010  
( Hank Chung, Deputy Manager )

**APPROVED BY** : May Chen , **DATE:** July 09, 2010  
( May Chen, Deputy Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE AND LIMIT	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -22.7dB at 1.79MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -4.09dB at 2483.5MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2 Ed 1.0.

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=2$ .

This lab's measurement uncertainty  $U_{Lab}$ , is low than  $U_{Cispr}$ , Table 1 – Values of  $U_{Cispr}$  of CISPR 16-4-2 Ed. 1.0, therefore compliance is deemed to occur if no measured disturbance exceeds the disturbance limit.

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.3 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.55 dB



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	Wireless N USB adapter
<b>MODEL NO.</b>	DWA-135
<b>FCC ID</b>	KA2WA135A1
<b>POWER SUPPLY</b>	DC 5V+/- 5%
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
<b>FREQUENCY RANGE</b>	2.4GHz: 2400 ~ 2483.5MHz
<b>NUMBER OF CHANNEL</b>	2.4GHz: 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	345.79mW for 2400.0 ~ 2483.5MHz
<b>ANTENNA TYPE</b>	2.4GHz: PCB Antenna 1 with 0dBi gain for chain 0 PCB Antenna 2 with 0dBi gain for chain 1
<b>I/O PORTS</b>	N/A
<b>ASSOCIATED DEVICES</b>	N/A

**NOTE:**

1. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2400~2483.5
802.11b	√
802.11g	√
802.11n (20MHz)	√
802.11n (40MHz)	√



A D T

2. The EUT was powered by USB port.
3. The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>802.11b</b>	1TX
<b>802.11g</b>	1TX
<b>802.11n (20MHz)</b>	2TX
<b>802.11n (40MHz)</b>	2TX

4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

### 3.2 DESCRIPTION OF TEST MODES

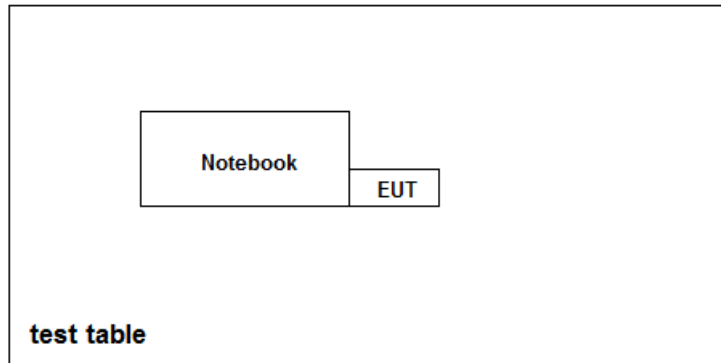
11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		

### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST





### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

#### FOR 2.400 ~ 2.4835GHz:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz      **RE<1G**: Radiated Emission below 1GHz  
**PLC**: Power Line Conducted Emission      **APCM**: Antenna Port Conducted Measurement

#### RADIATED EMISSION TEST (ABOVE 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13.0
802.11n (40MHz)	1 to 11	1, 4, 7	OFDM	BPSK	27.0

#### RADIATED EMISSION TEST (BELOW 1GHz):

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	1.0

#### POWER LINE CONDUCTED EMISSION TEST:

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	1.0

**BANDEDGE MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	DSSS	CCK	1.0
802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	13.0
802.11n (40MHz)	1 to 11	1, 7	OFDM	BPSK	27.0

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- Following channel(s) was (were) selected for the final test as listed below.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	CCK	1.0
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13.0
802.11n (40MHz)	1 to 11	1, 4, 7	OFDM	BPSK	27.0



### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C (15.247)**  
**ANSI C63.4-2003**

All test items have been performed and recorded as per the above standards.

**NOTE:** The EUT is also considered as a computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

### 3.4 DESCRIPTION OF SUPPORT UNITS

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

NO.	PRODUCT	BRAND	MODEL NO.	FCC ID
1	Notebook	Lenovo	R61i	FCC DoC Approved

## 4. TEST TYPES AND RESULTS

### 4.1 RADIATED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 02, 2010	Aug. 01, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 18, 2009	Nov. 17, 2010
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Sep. 30, 2009	Sep. 29, 2010
AISI Horn_Antenna	AIH.8018	0000320091110	Nov. 16, 2009	Nov. 15, 2010
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Sep. 30, 2009	Sep. 29, 2010
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 24, 2009	Dec. 23, 2010
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.  
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.  
3. The test was performed in 966 Chamber No. G.  
4. The FCC Site Registration No. is 966073.  
5. The VCCI Site Registration No. is G-137.  
6. The CANADA Site Registration No. is IC 7450H-2.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

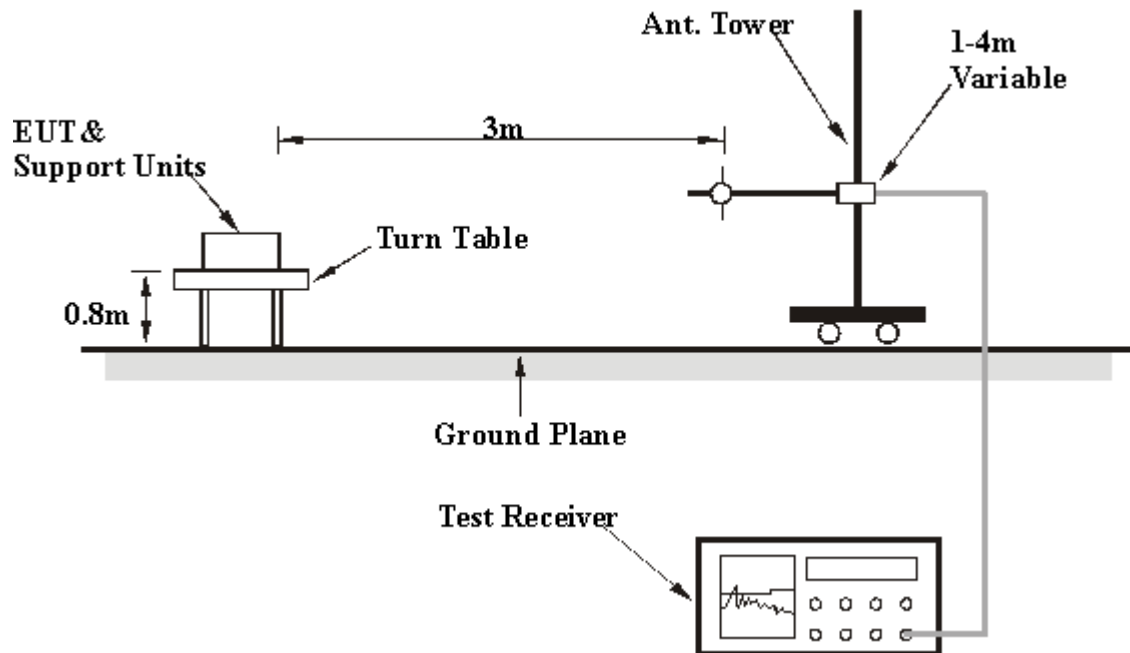
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Put EUT onto the center of the test table, then link EUT to the Notebook.
- b. Use the software to control the EUT work on the certain channel, then do the test.

#### 4.1.7 TEST RESULTS

##### 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.00	PK	32.59	22.00	54.59	74.00	-19.41
2	2390.00	AV	32.59	10.45	43.04	54.00	-10.96
3	*2412.00	PK	32.62	61.02	93.64		
4	*2412.00	AV	32.62	56.04	88.65		
5	4824.00	PK	37.82	8.10	45.92	74.00	-28.08
6	4824.00	AV	37.82	-4.21	33.61	54.00	-20.39
7	#7236.00	PK	44.64	8.26	52.90	73.64	-20.74
8	#7236.00	AV	44.64	-4.97	39.67	68.65	-28.98
9	#9648.00	PK	47.23	9.32	56.55	73.64	-17.09
10	#9648.00	AV	47.23	-4.63	42.60	68.65	-26.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2386.48	PK	32.59	22.07	54.66	74.00	-19.34
2	2386.00	AV	32.59	10.46	43.05	54.00	-10.95
3	*2412.00	PK	32.62	68.39	101.01		
4	*2412.00	AV	32.61	63.51	96.12		
5	4824.00	PK	37.82	7.58	45.40	74.00	-28.60
6	4824.00	AV	37.82	1.69	39.51	54.00	-14.49
7	#7236.00	PK	44.64	9.29	53.93	81.01	-27.08





A D T

8	#7236.00	AV	44.64	-4.82	39.82	76.12	-36.30
9	#9648.00	PK	47.23	8.77	56.00	81.01	-25.01
10	#9648.00	AV	47.23	-4.66	42.57	76.12	-33.55

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.67	60.01	92.68		
2	*2437.00	AV	32.66	53.65	86.31		
3	4874.00	PK	38.00	8.67	46.67	74.00	-27.33
4	4874.00	AV	38.00	1.66	39.66	54.00	-14.34
5	7311.00	PK	44.65	7.94	52.59	74.00	-21.41
6	7311.00	AV	44.65	-4.65	40.00	54.00	-14.00
7	#9748.00	PK	47.48	8.68	56.16	72.67	-16.51
8	#9748.00	AV	47.48	-4.75	42.73	66.31	-23.58

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.67	68.25	100.92		
2	*2437.00	AV	32.67	64.45	97.12		
3	4874.00	PK	38.00	9.26	47.26	74.00	-26.74
4	4874.00	AV	38.00	3.78	41.78	54.00	-12.22
5	7311.00	PK	44.65	8.24	52.89	74.00	-21.11



A D T

6	7311.00	AV	44.65	-4.60	40.05	54.00	-13.95
7	#9748.00	PK	47.48	8.23	55.71	80.91	-25.20
8	#9748.00	AV	47.48	-4.78	42.70	77.11	-34.41

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.72	60.50	93.22		
2	*2462.00	AV	32.72	56.08	88.80		
3	2484.82	PK	32.76	22.12	54.88	74.00	-19.12
4	2484.83	AV	32.76	10.57	43.33	54.00	-10.67
5	4924.00	PK	38.19	7.96	46.15	74.00	-27.85
6	4924.00	AV	38.19	0.20	38.39	54.00	-15.61
7	7386.00	PK	44.64	8.10	52.74	74.00	-21.26
8	7386.00	AV	44.64	-4.44	40.20	54.00	-13.80
9	#9848.00	PK	47.66	8.54	56.20	73.22	-17.02
10	#9848.00	AV	47.66	-4.44	43.22	68.80	-25.58

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.72	68.58	101.30		
2	*2462.00	AV	32.72	64.62	97.34		
3	2487.82	PK	32.76	22.97	55.73	74.00	-18.27
4	2487.82	AV	32.76	10.79	43.55	54.00	-10.45
5	4924.00	PK	38.19	8.99	47.18	74.00	-26.82
6	4924.00	AV	38.19	3.15	41.34	54.00	-12.66
7	7386.00	PK	44.64	8.75	53.39	74.00	-20.61
8	7386.00	AV	44.64	-4.29	40.35	54.00	-13.65
9	#9848.00	PK	47.66	8.69	56.35	81.29	-24.94
10	#9848.00	AV	47.66	-4.45	43.21	77.33	-34.12



- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

**802.11g OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.00	PK	32.59	22.63	55.22	74.00	-18.78
2	2390.00	AV	32.59	10.47	43.06	54.00	-10.94
3	*2412.00	PK	32.61	60.20	92.81		
4	*2412.00	AV	32.62	49.42	82.04		
5	4824.00	PK	37.82	7.73	45.55	74.00	-28.45
6	4824.00	AV	37.82	-3.99	33.83	54.00	-20.17
7	#7236.00	PK	44.64	7.26	51.90	72.81	-20.91
8	#7236.00	AV	44.64	-4.37	40.27	62.04	-21.77
9	#9648.00	PK	47.23	8.69	55.92	72.81	-16.89
10	#9648.00	AV	47.23	-4.00	43.23	62.04	-18.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.00	PK	32.59	25.21	57.80	74.00	-16.20
2	2390.00	AV	32.59	10.69	43.28	54.00	-10.72
3	*2412.00	PK	32.62	68.35	100.97		
4	*2412.00	AV	32.61	58.51	91.12		
5	4824.00	PK	37.82	7.66	45.48	74.00	-28.52
6	4824.00	AV	37.82	-3.29	34.53	54.00	-19.47
7	#7236.00	PK	44.64	8.55	53.19	80.96	-27.77
8	#7236.00	AV	44.64	-4.50	40.14	71.12	-30.98
9	#9648.00	PK	47.23	9.08	56.31	80.96	-24.65
10	#9648.00	AV	47.23	-4.22	43.01	71.12	-28.11



- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.67	59.24	91.91		
2	*2437.00	AV	32.66	49.60	82.26		
3	4874.00	PK	38.00	8.14	46.14	74.00	-27.86
4	4874.00	AV	38.00	-4.46	33.54	54.00	-20.46
5	7311.00	PK	44.65	8.32	52.97	74.00	-21.03
6	7311.00	AV	44.65	-4.53	40.12	54.00	-13.88
7	#9748.00	PK	47.48	7.68	55.16	71.91	-16.75
8	#9748.00	AV	47.48	-4.53	42.95	62.26	-19.31

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.67	67.82	100.49		
2	*2437.00	AV	32.67	58.63	91.30		
3	4874.00	AV	38.00	8.35	46.35	74.00	-27.65
4	4874.00	PK	38.00	-2.62	35.38	54.00	-18.62
5	7311.00	AV	44.65	8.18	52.83	74.00	-21.17
6	7311.00	PK	44.65	-4.40	40.25	54.00	-13.75
7	#9748.00	PK	47.48	8.78	56.26	80.49	-24.23
8	#9748.00	AV	47.48	-4.48	43.00	71.30	-28.30

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.



A D T

6. “#”: The radiated frequency falling out the restricted band.





A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.72	60.68	93.40		
2	*2462.00	AV	32.71	50.03	82.74		
3	2483.57	PK	32.76	24.71	57.47	74.00	-16.53
4	2483.63	AV	32.76	11.90	44.66	54.00	-9.34
5	4924.00	PK	38.19	8.12	46.31	74.00	-27.69
6	4924.00	AV	38.19	-4.11	34.08	54.00	-19.92
7	7386.00	PK	44.64	8.20	52.84	74.00	-21.16
8	7386.00	AV	44.64	-4.32	40.32	54.00	-13.68
9	#9848.00	PK	47.66	8.30	55.96	73.40	-17.44
10	#9848.00	AV	47.66	-4.24	43.42	62.74	-19.32

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.72	68.68	101.40		
2	*2462.00	AV	32.72	59.96	92.68		
3	2483.63	PK	32.76	30.70	63.46	74.00	-10.54
4	2483.63	AV	32.76	14.94	47.70	54.00	-6.30
5	4924.00	PK	38.19	9.57	47.76	74.00	-26.24
6	4924.00	AV	38.19	-3.02	35.17	54.00	-18.83
7	7386.00	PK	44.64	8.79	53.43	74.00	-20.57
8	7386.00	AV	44.64	-4.50	40.14	54.00	-13.86
9	#9848.00	PK	47.66	8.24	55.90	81.40	-25.50
10	#9848.00	AV	47.66	-4.29	43.37	72.68	-29.31



A D T

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

**802.11n (20MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2386.00	PK	32.59	22.26	54.85	74.00	-19.15
2	2386.00	AV	32.59	10.83	43.42	54.00	-10.58
3	*2412.00	PK	32.60	63.59	96.19		
4	*2412.00	AV	32.62	52.80	85.42		
5	4824.00	PK	37.82	7.78	45.60	74.00	-28.40
6	4824.00	AV	37.82	-5.12	32.70	54.00	-21.30
7	#7236.00	PK	44.64	7.35	51.99	76.20	-24.21
8	#7236.00	AV	44.64	-5.12	39.52	65.42	-25.90
9	#9648.00	PK	47.23	8.22	55.45	76.20	-20.75
10	#9648.00	AV	47.23	-4.89	42.34	65.42	-23.08

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2389.36	PK	32.59	25.07	57.66	74.00	-16.34
2	2389.36	AV	32.59	11.33	43.92	54.00	-10.08
3	*2412.00	PK	32.61	70.13	102.74		
4	*2412.00	AV	32.60	58.34	90.94		
5	4824.00	PK	37.82	8.13	45.95	74.00	-28.05
6	4824.00	AV	37.82	-3.86	33.96	54.00	-20.04
7	#7236.00	PK	44.64	7.83	52.47	82.74	-30.27
8	#7236.00	AV	44.64	-5.02	39.62	70.95	-31.33
9	#9648.00	PK	47.23	8.77	56.00	82.74	-26.74
10	#9648.00	AV	47.23	-4.87	42.36	70.95	-28.59



- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.65	61.78	94.43		
2	*2437.00	AV	32.65	50.55	83.20		
3	4874.00	PK	38.00	8.70	46.70	74.00	-27.30
4	4874.00	AV	38.00	-5.50	32.50	54.00	-21.50
5	7311.00	PK	44.65	8.78	53.43	74.00	-20.57
6	7311.00	AV	44.65	-5.13	39.52	54.00	-14.48
7	#9748.00	PK	47.48	8.49	55.97	74.43	-18.46
8	#9748.00	AV	47.66	-4.50	43.16	63.21	-20.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.65	70.19	102.84		
2	*2437.00	AV	32.67	58.77	91.44		
3	4874.00	PK	38.00	8.29	46.29	74.00	-27.71
4	4874.00	AV	38.00	-5.33	32.67	54.00	-21.33
5	7311.00	PK	44.65	7.85	52.50	74.00	-21.50
6	7311.00	AV	44.65	-5.07	39.58	54.00	-14.42
7	#9748.00	PK	47.48	7.83	55.31	82.84	-27.53
8	#9748.00	AV	47.48	-5.15	42.33	71.44	-29.11

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.



A D T

6. “#”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.72	61.55	94.27		
2	*2462.00	AV	32.72	50.47	83.19		
3	2484.95	PK	32.76	27.52	60.28	74.00	-13.72
4	2484.95	AV	32.76	11.90	44.66	54.00	-9.34
5	4924.00	PK	38.19	7.98	46.17	74.00	-27.83
6	4924.00	AV	38.19	-4.34	33.85	54.00	-20.15
7	7386.00	PK	44.64	8.33	52.97	74.00	-21.03
8	7386.00	AV	44.64	-4.96	39.68	54.00	-14.32
9	#9848.00	PK	47.66	9.17	56.83	74.27	-17.44
10	#9848.00	AV	47.66	-4.61	43.05	63.18	-20.13

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2462.00	PK	32.71	69.66	102.37		
2	*2462.00	AV	32.72	59.00	91.72		
3	2485.22	PK	32.76	32.16	64.92	74.00	-9.08
4	2485.22	AV	32.76	14.68	47.44	54.00	-6.56
5	4924.00	PK	38.19	8.00	46.19	74.00	-27.81
6	4924.00	AV	38.19	-5.12	33.07	54.00	-20.93
7	7386.00	PK	44.64	8.16	52.80	74.00	-21.20
8	7386.00	AV	44.64	-4.94	39.70	54.00	-14.30
9	#9848.00	PK	47.66	8.58	56.24	82.37	-26.13
10	#9848.00	AV	47.66	-4.59	43.07	71.72	-28.65



- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.





A D T

**802.11n (40MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.00	PK	32.59	22.45	55.04	74.00	-18.96
2	2390.00	AV	32.59	11.04	43.63	54.00	-10.37
3	*2422.00	PK	32.61	58.92	91.53		
4	*2422.00	AV	32.61	45.83	78.44		
5	4844.00	PK	37.89	8.17	46.06	74.00	-27.94
6	4844.00	AV	37.89	-4.67	33.22	54.00	-20.78
7	7266.00	PK	44.66	7.71	52.37	74.00	-21.63
8	7266.00	AV	44.66	-5.46	39.20	54.00	-14.80
9	#9688.00	PK	47.33	8.15	55.48	71.53	-16.05
10	#9688.00	AV	47.33	-5.01	42.32	58.44	-16.12

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	2390.00	PK	32.59	26.62	59.21	74.00	-14.79
2	2390.00	AV	32.59	12.91	45.50	54.00	-8.50
3	*2422.00	PK	32.65	66.58	99.23		
4	*2422.00	AV	32.65	54.32	86.97		
5	4844.00	PK	37.89	8.44	46.33	74.00	-27.67
6	4844.00	AV	37.89	-4.03	33.86	54.00	-20.14
7	7266.00	PK	44.66	7.31	51.97	74.00	-22.03
8	7266.00	AV	44.66	-5.36	39.30	54.00	-14.70
9	#9688.00	PK	47.33	8.01	55.34	79.23	-23.89
10	#9688.00	AV	47.33	-5.01	42.32	66.97	-24.65



- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.65	58.71	91.36		
2	*2437.00	AV	32.65	46.17	78.82		
3	4874.00	PK	38.00	7.84	45.84	74.00	-28.16
4	4874.00	AV	38.00	-4.64	33.36	54.00	-20.64
5	7311.00	PK	44.65	7.69	52.34	74.00	-21.66
6	7311.00	AV	44.65	-5.13	39.52	54.00	-14.48
7	#9748.00	PK	47.48	7.78	55.26	71.36	-16.10
8	#9748.00	AV	47.48	-5.18	42.30	58.82	-16.52

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2437.00	PK	32.68	66.47	99.15		
2	*2437.00	AV	32.68	54.49	87.17		
3	4874.00	PK	38.00	7.93	45.93	74.00	-28.07
4	4874.00	AV	38.00	-5.30	32.70	54.00	-21.30
5	7311.00	PK	44.65	8.03	52.68	74.00	-21.32
6	7311.00	AV	44.65	-5.04	39.61	54.00	-14.39
7	#9748.00	PK	47.48	8.23	55.71	79.15	-23.44
8	#9748.00	AV	47.48	-5.17	42.31	67.17	-24.86

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.



A D T

6. “#”: The radiated frequency falling out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Ray

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2452.00	PK	32.72	57.64	90.36		
2	*2452.00	AV	32.72	46.64	79.36		
3	2483.50	PK	32.76	24.96	57.72	74.00	-16.28
4	2483.50	AV	32.76	12.39	45.15	54.00	-8.85
5	4904.00	PK	38.11	8.42	46.53	74.00	-27.47
6	4904.00	AV	38.11	-4.76	33.35	54.00	-20.65
7	7356.00	PK	44.65	7.94	52.59	74.00	-21.41
8	7356.00	AV	44.65	-4.95	39.70	54.00	-14.30
9	#9808.00	PK	47.62	8.21	55.83	70.36	-14.53
10	#9808.00	AV	47.62	-4.59	43.03	59.36	-16.33

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M							
NO.	Frequency (MHz)	Detector	Factor (dB)	Reading (dBuV/m)	Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1	*2452.00	PK	32.72	66.70	99.42		
2	*2452.00	AV	32.72	54.92	87.64		
3	2483.50	PK	32.76	32.68	65.44	74.00	-8.56
4	<b>2483.50</b>	<b>AV</b>	<b>32.76</b>	<b>17.15</b>	<b>49.91</b>	<b>54.00</b>	<b>-4.09</b>
5	4904.00	PK	38.11	7.27	45.38	74.00	-28.62
6	4904.00	AV	38.11	-2.68	35.43	54.00	-18.57
7	7356.00	PK	44.65	7.96	52.61	74.00	-21.39
8	7356.00	AV	44.65	-4.86	39.79	54.00	-14.21
9	#9808.00	PK	47.62	8.44	56.06	79.42	-23.36
10	#9808.00	AV	47.62	-4.50	43.12	67.64	-24.52



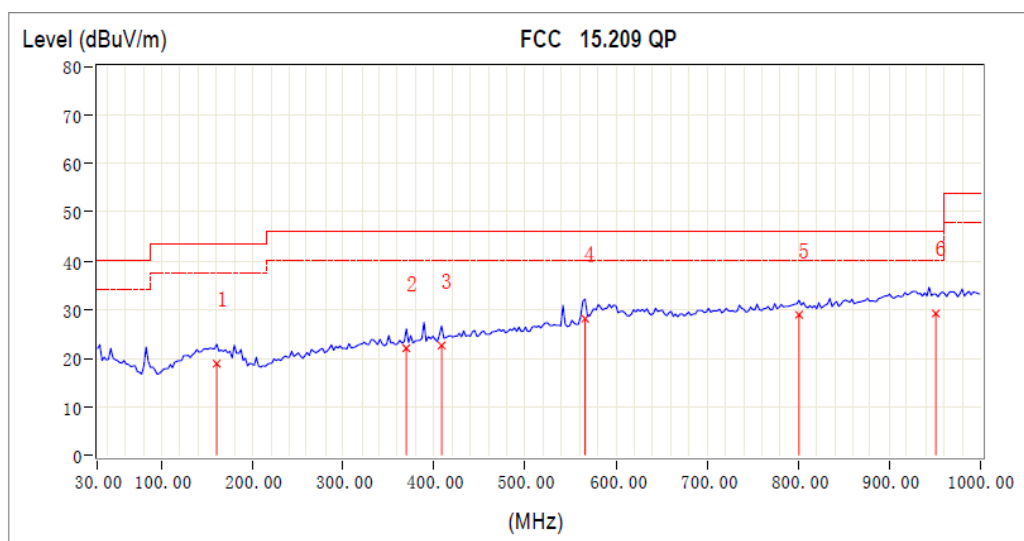
- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “: Fundamental frequency.
  6. “ # ”: The radiated frequency falling out the restricted band.

### BELOW 1GHz WORST-CASE DATA : CCK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Kevin Jiang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	160.95	16.98	1.88	18.86	43.50	-24.64	200	12
2	369.50	18.02	4.01	22.03	46.00	-23.97	139	91
3	408.30	18.92	3.69	22.61	46.00	-23.39	183	60
4	565.92	22.42	5.69	28.11	46.00	-17.89	100	122
5	801.15	25.84	3.06	28.90	46.00	-17.10	100	153
6	951.50	27.81	1.35	29.16	46.00	-16.84	100	181

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



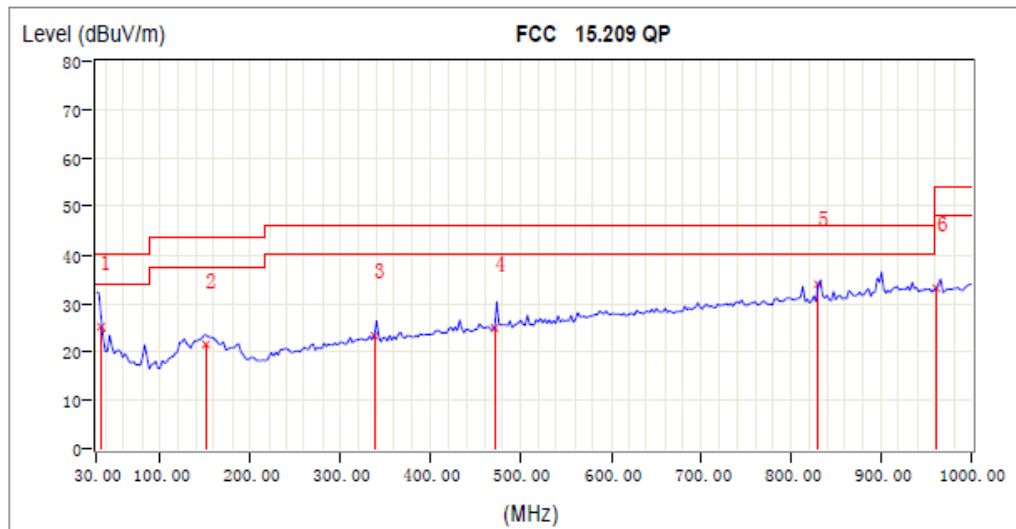


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 70%RH 999hPa	TESTED BY	Kevin Jiang

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Correction Factor (dB/m)	Raw Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
1	34.85	15.25	9.85	25.10	40.00	-14.90	181	343
2	151.25	16.98	4.46	21.44	43.50	-22.06	197	100
3	337.98	17.47	5.75	23.22	46.00	-22.78	100	106
4	471.35	20.45	4.39	24.84	46.00	-21.16	101	285
5	830.25	26.31	7.55	33.86	46.00	-12.14	100	249
6	961.20	27.77	5.33	33.10	54.00	-20.90	200	22

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.





## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 01, 2010	Feb. 28, 2011
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 11, 2010	June 10, 2011
RF Cable (JYBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 2010
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
- 3 The VCCI Con A Registration No. is C-817.

#### 4.2.3 TEST PROCEDURES

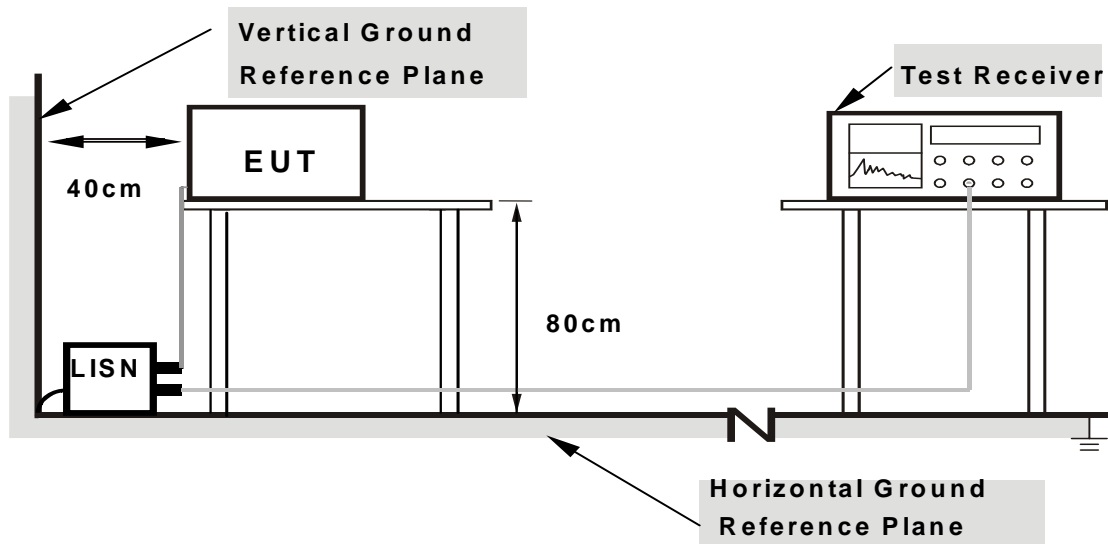
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

**NOTE:** All modes of operation were investigated and the worst-case emissions are reported.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

For the actual test configuration, please refer to the attached file (Test Setup Photo).

#### 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

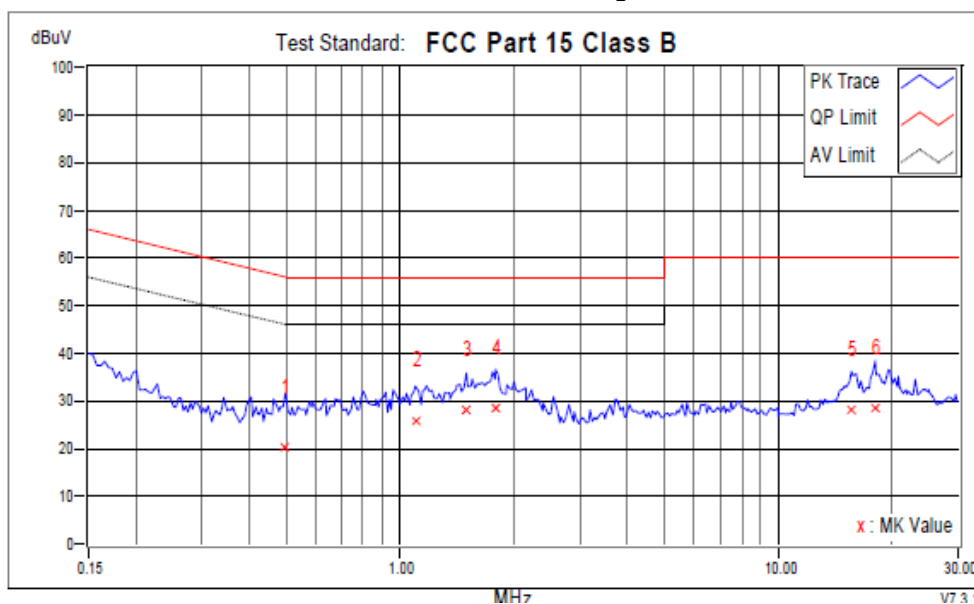
#### 4.2.7 TEST RESULTS

##### CONDUCTED WORST-CASE DATA : CCK MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	L
MODULATION TYPE	CCK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	1.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 66%RH, 988hPa	TESTED BY	Ray

No	Freq. [MHz]	Corr. Factor [dB]	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.50	9.62	10.88	5.89	20.50	15.51	56.03	46.03	-35.53	-30.52
2	1.10	9.61	16.05	8.79	25.66	18.40	56.00	46.00	-30.34	-27.60
3	1.50	9.61	18.39	12.46	28.00	22.07	56.00	46.00	-28.00	-23.93
4	1.79	9.61	18.97	13.69	28.58	23.30	56.00	46.00	-27.42	-22.70
5	15.63	9.70	18.24	13.07	27.94	22.77	60.00	50.00	-32.06	-27.23
6	18.07	9.70	18.90	13.76	28.60	23.46	60.00	50.00	-31.40	-26.54

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



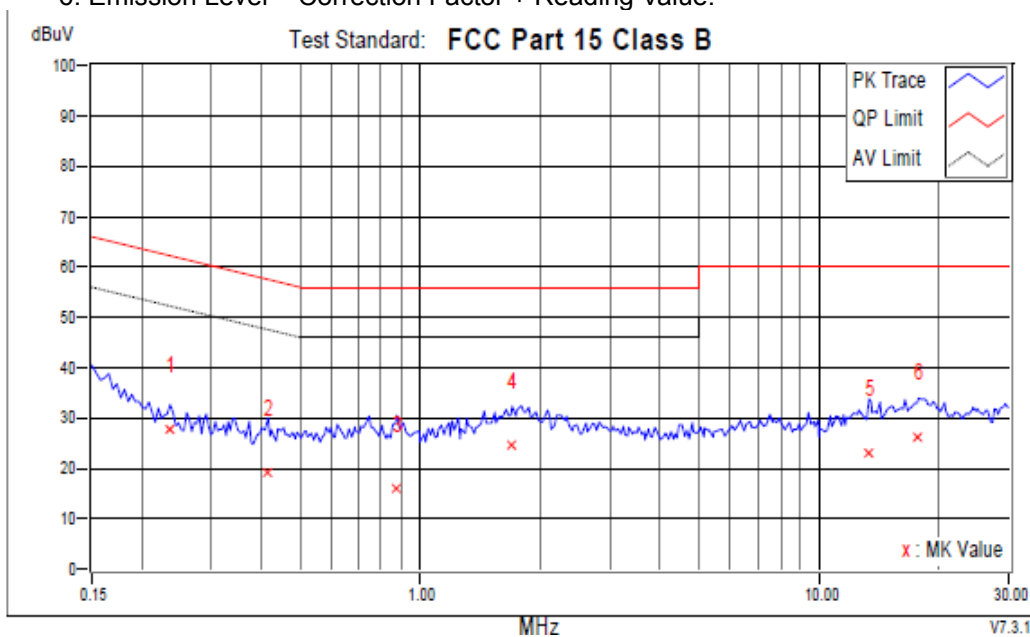


A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	N
MODULATION TYPE	CCK	INPUT POWER (SYSTEM)	120Vac, 60Hz
TRANSFER RATE	1.0Mbps	6dB BANDWIDTH	9kHz
ENVIRONMENTAL CONDITIONS	21deg. C, 66%RH, 988hPa	TESTED BY	Ray

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.24	9.62	17.94	2.80	27.56	12.42	62.24	52.24	-34.68	-39.82
2	0.42	9.61	9.60	-2.05	19.21	7.56	57.53	47.53	-38.32	-39.97
3	0.87	9.64	6.32	1.58	15.96	11.22	56.00	46.00	-40.04	-34.78
4	1.70	9.63	14.86	10.23	24.49	19.86	56.00	46.00	-31.51	-26.14
5	13.36	9.77	13.47	8.33	23.24	18.10	60.00	50.00	-36.76	-31.90
6	17.75	9.86	16.14	10.80	26.00	20.66	60.00	50.00	-34.00	-29.34

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Signal Analyzer ROHDE & SCHWARZ	FSP30	E1S1002	Aug. 04, 2010

**NOTE:** The calibration interval of the above test instruments is 12 months.

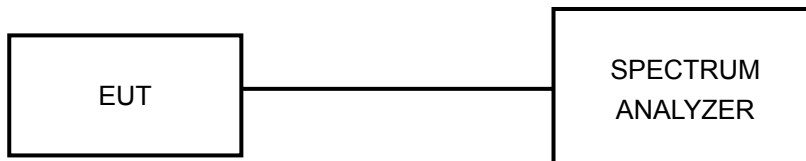
#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

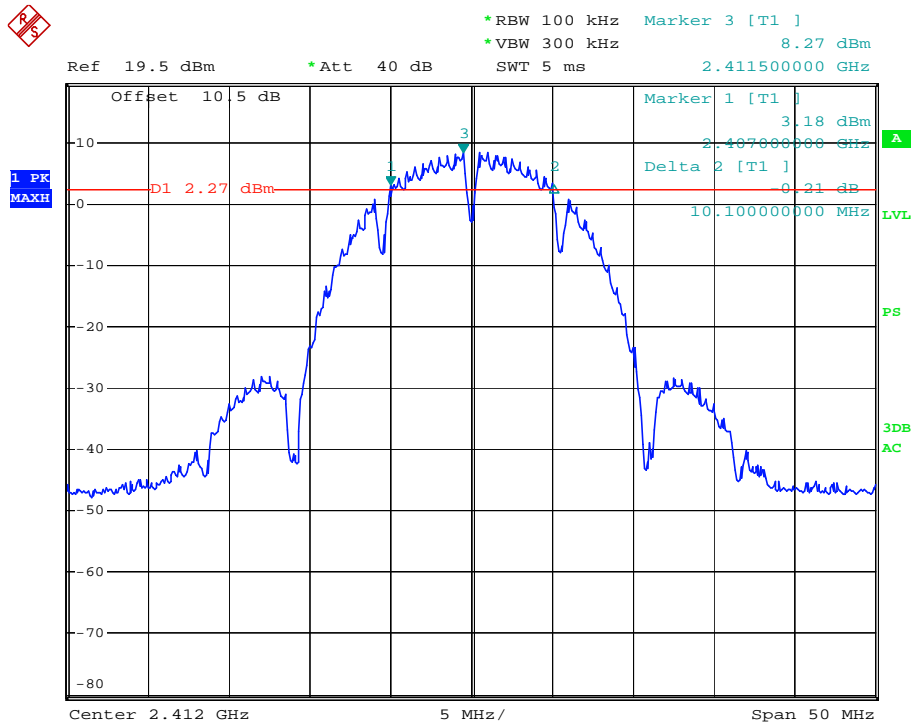
### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.1	0.5	PASS
6	2437	10.1	0.5	PASS
11	2462	10.1	0.5	PASS

#### CH 1

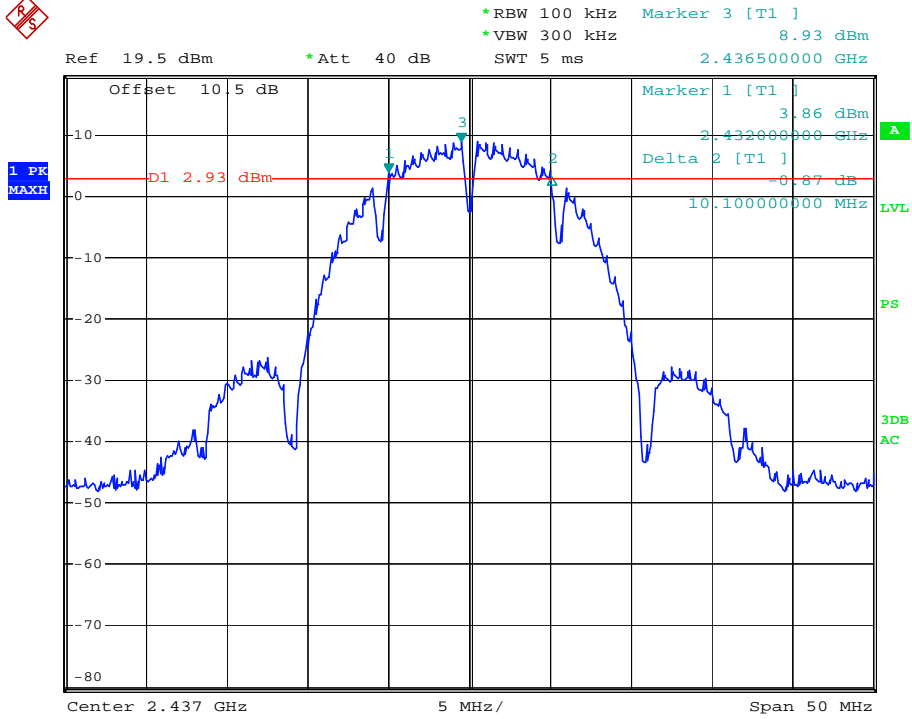




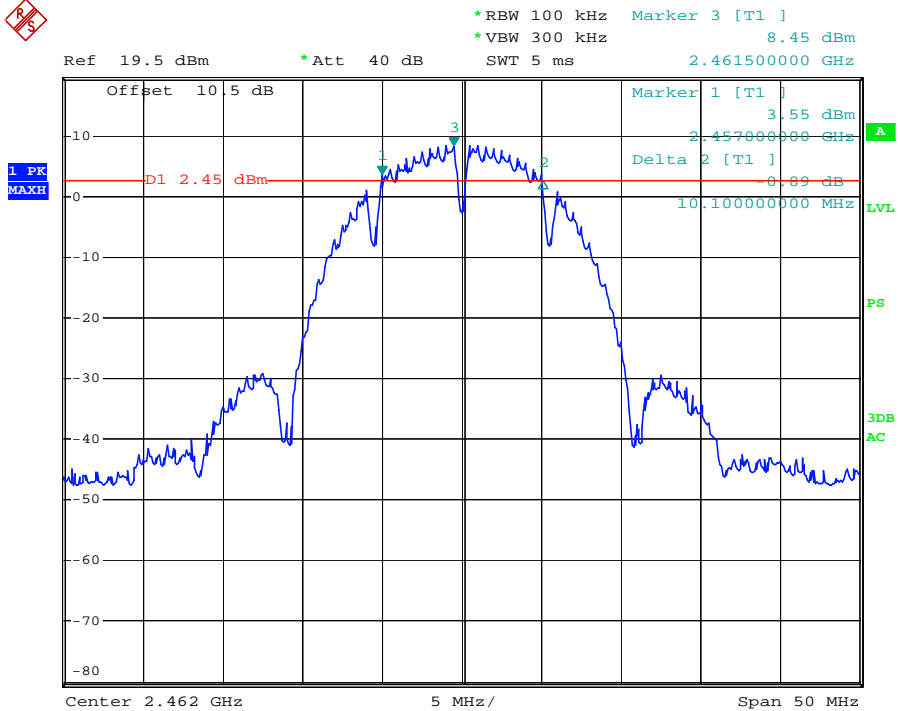


A D T

### CH 6



### CH 11





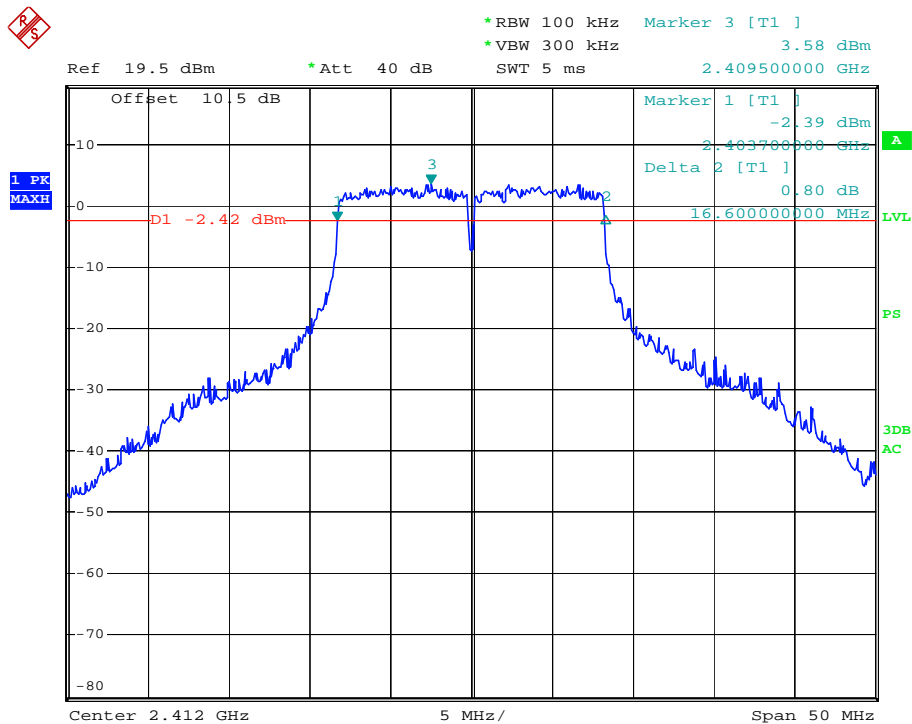
A D T

### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.6	0.5	PASS
6	2437	16.6	0.5	PASS
11	2462	16.6	0.5	PASS

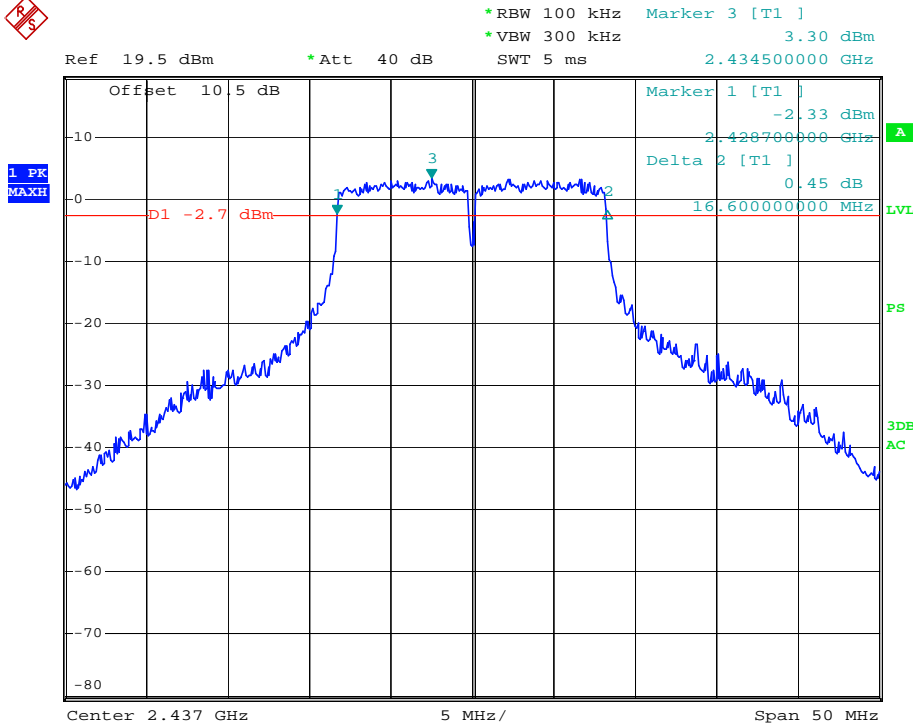
### CH 1



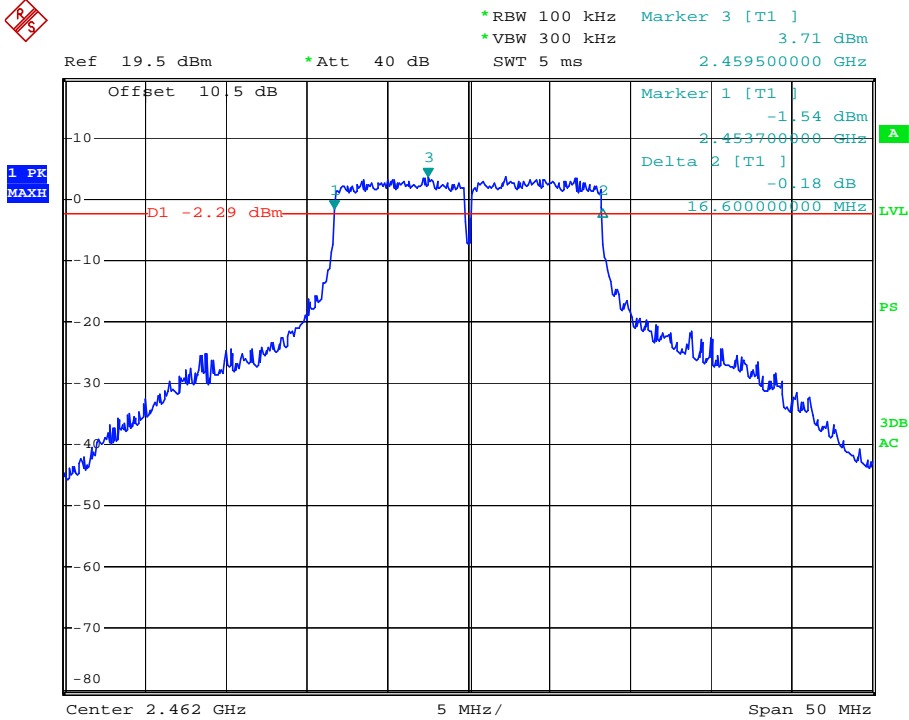


A D T

### CH 6



### CH 11





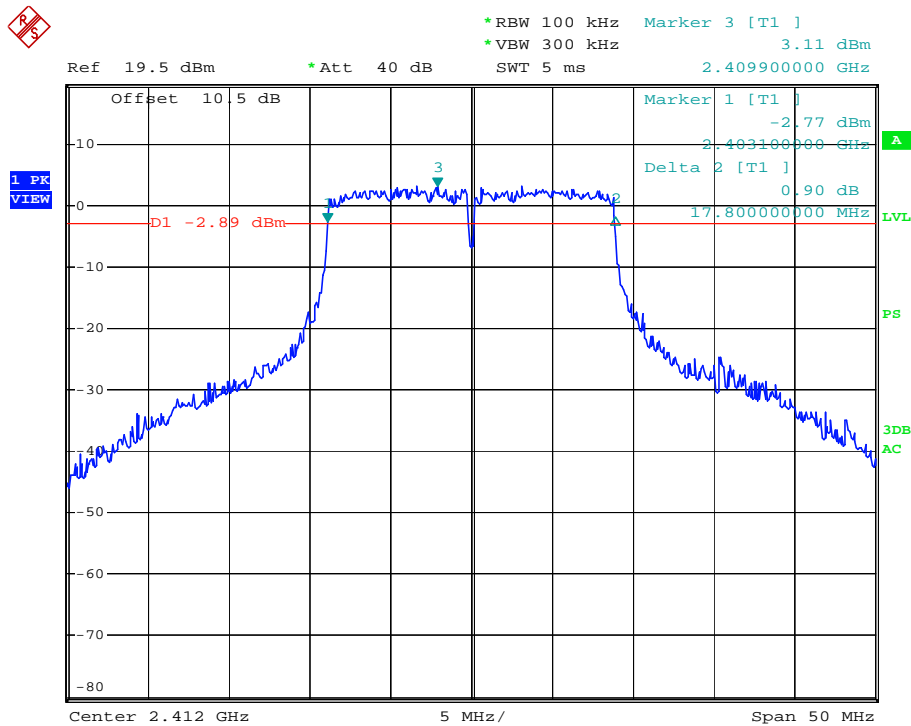
A D T

**802.11n (20MHz) OFDM MODULATION**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY(MHz)	6dB BANDWIDTH(MHz)		MINIMUM LIMIT(MHz)	PASS/FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.8	17.6	0.5	PASS
6	2437	17.8	17.7	0.5	PASS
11	2462	17.8	17.7	0.5	PASS

**FOR CHAIN(0):  
CH1**





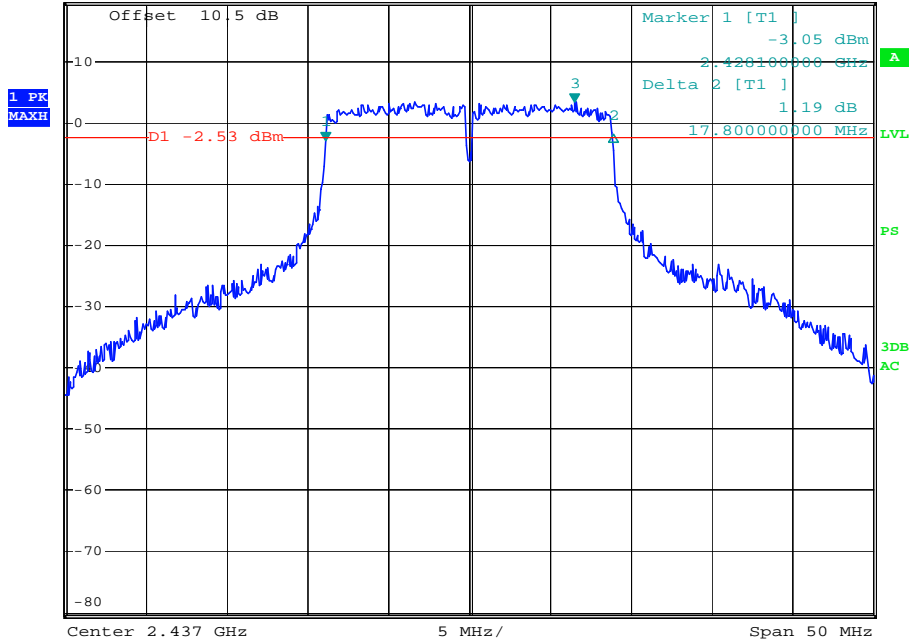
A D T

### CH6



Ref 19.5 dBm \*Att 40 dB SWT 5 ms

\*RBW 100 kHz Marker 3 [T1 ] 3.47 dBm  
\*VBW 300 kHz 2.443500000 GHz

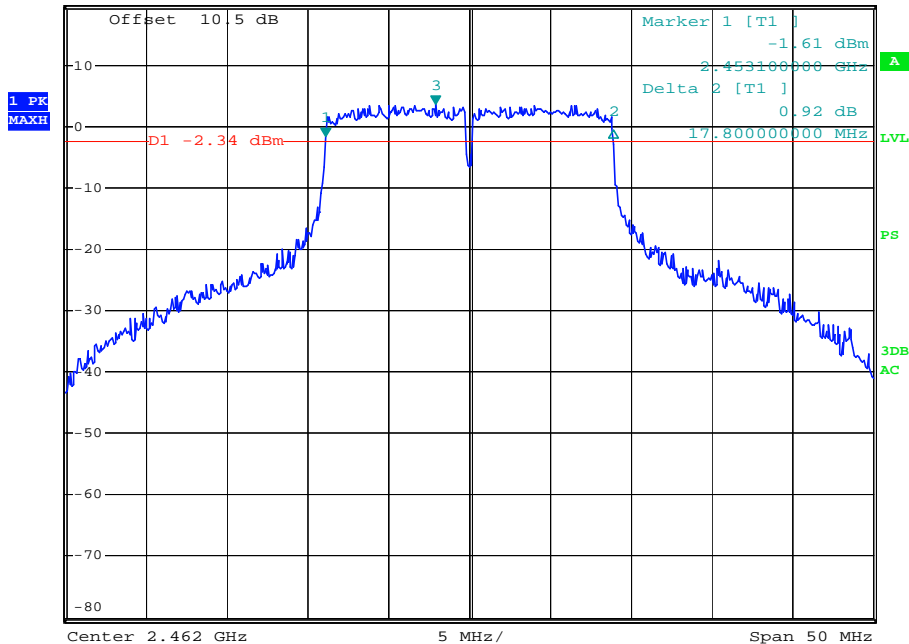


### CH11



Ref 19.5 dBm \*Att 40 dB SWT 5 ms

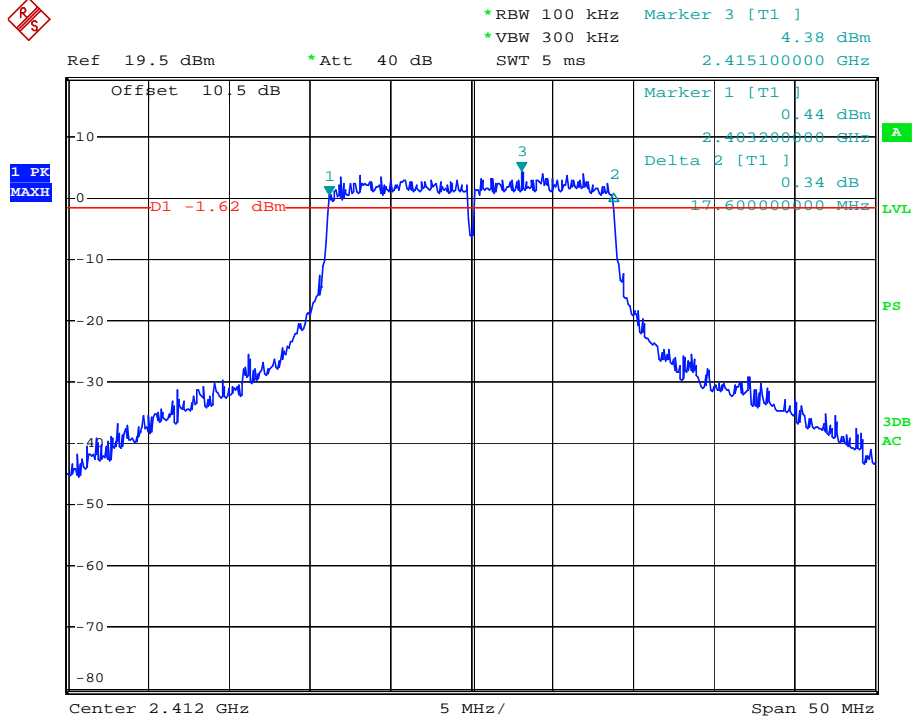
\*RBW 100 kHz Marker 3 [T1 ] 3.66 dBm  
\*VBW 300 kHz 2.459900000 GHz



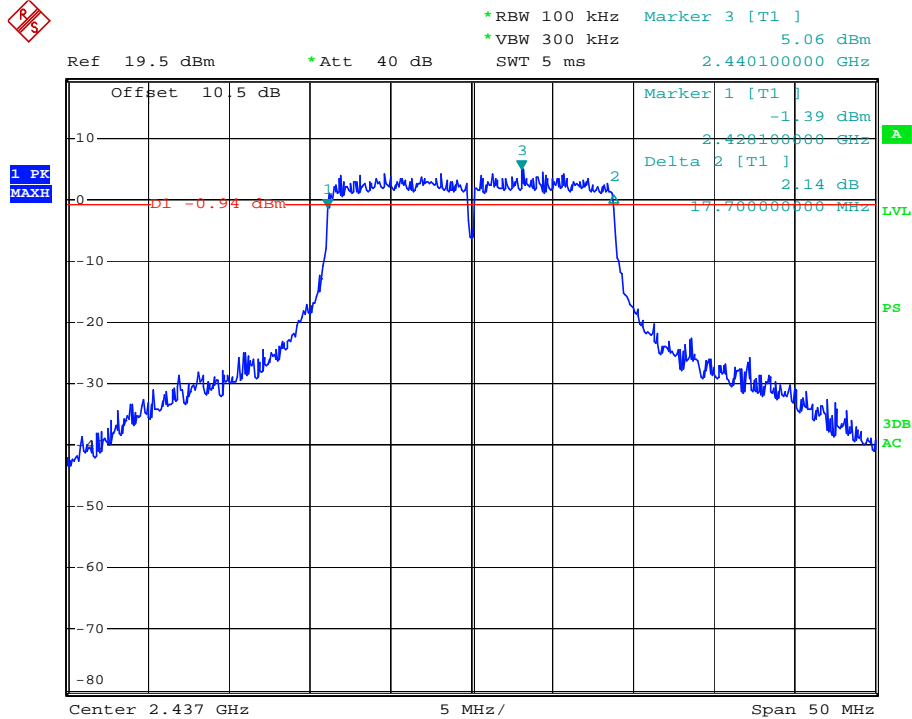


A D T

### FOR CHAIN(1): CH1



### CH6



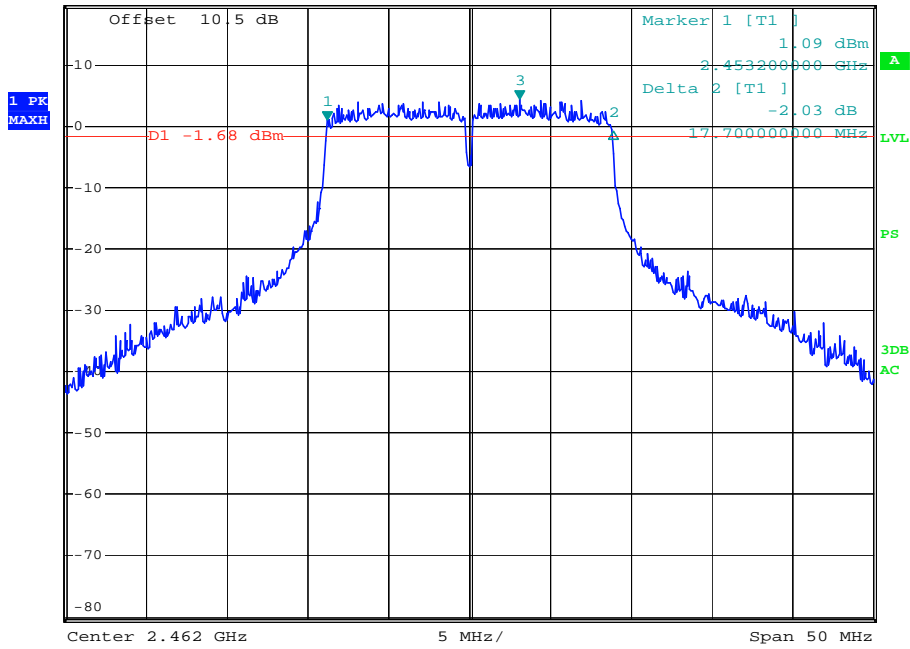


A D T

CH11



Ref 19.5 dBm      \*Att 40 dB      \*RBW 100 kHz      Marker 3 [T1 ]      4.32 dBm  
\*VBW 300 kHz      2.465100000 GHz  
SWT 5 ms





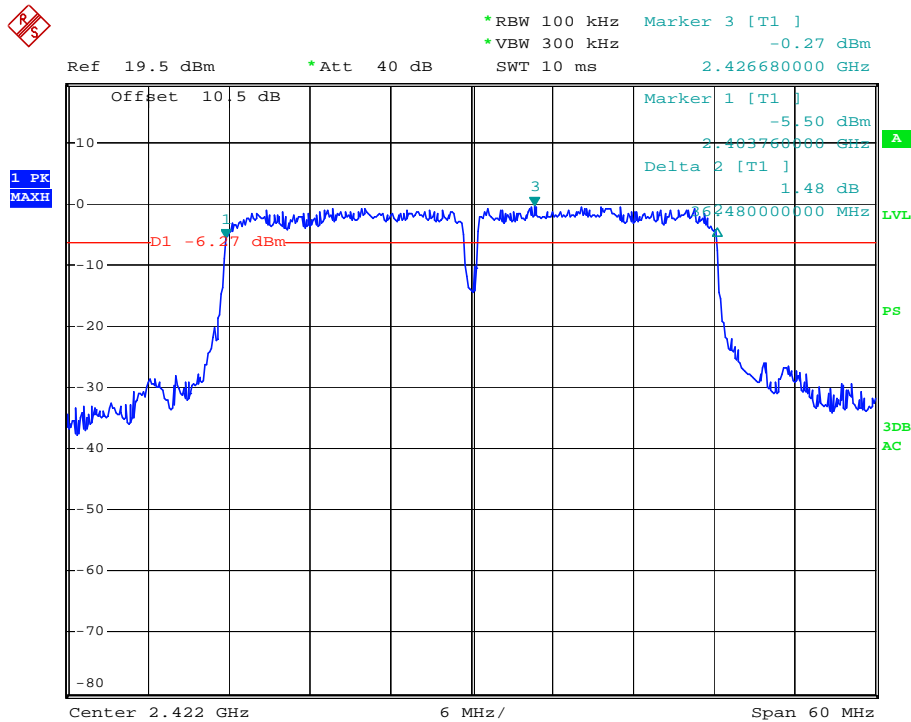
A D T

### 802.11n (40MHz) OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	13Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY(MHz)	6dB BANDWIDTH(MHz)		MINIMUM LIMIT(MHz)	PASS/FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	36.48	36.48	0.5	PASS
6	2437	36.36	36.36	0.5	PASS
11	2462	36.48	36.48	0.5	PASS

FOR CHAIN(0):  
CH1



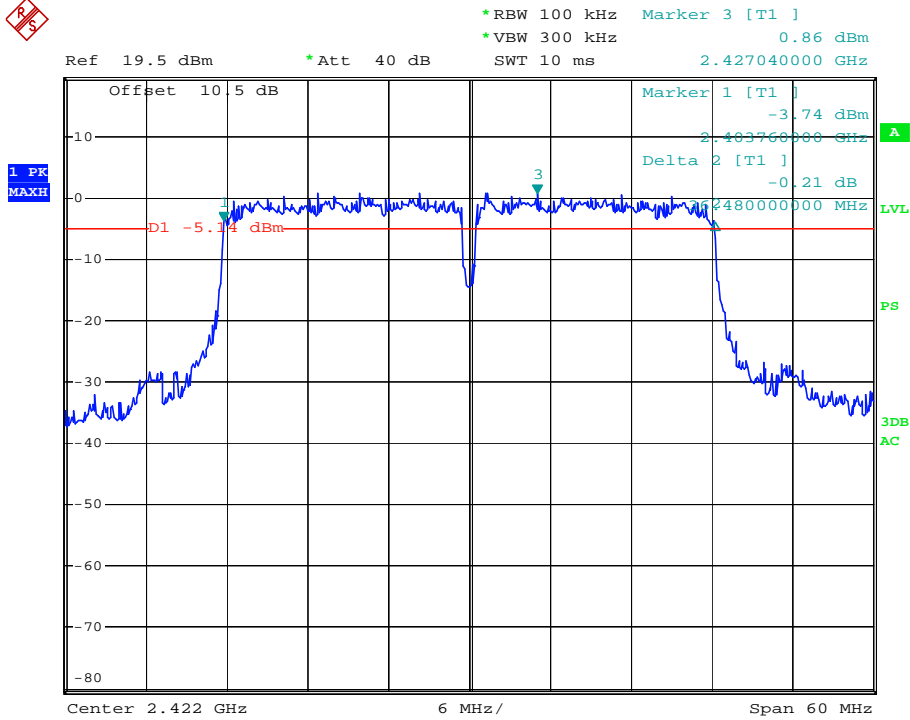




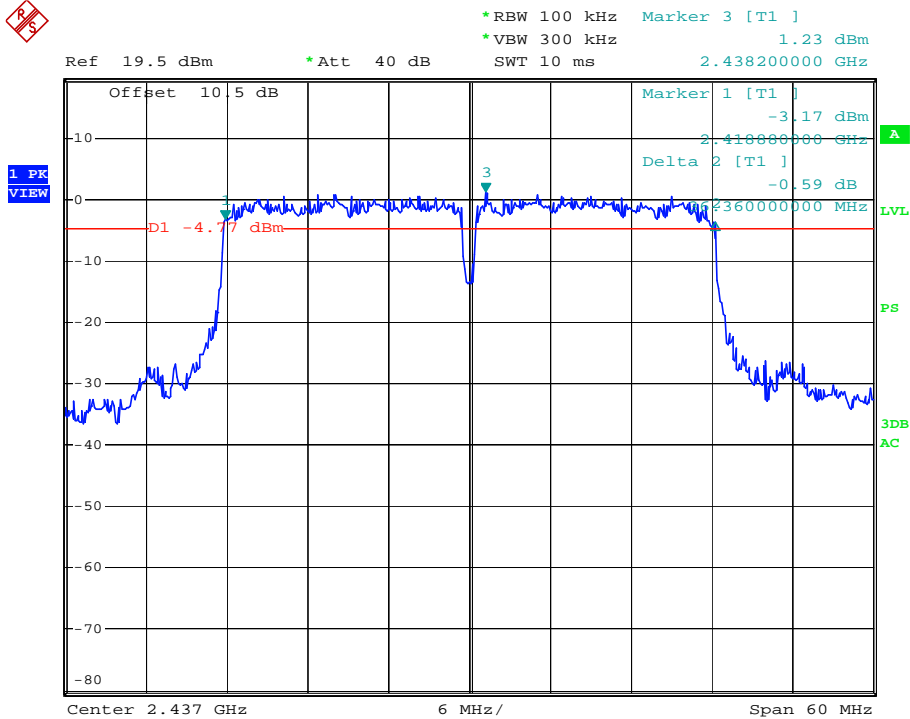


A D T

### FOR CHAIN(1): CH1



### CH4



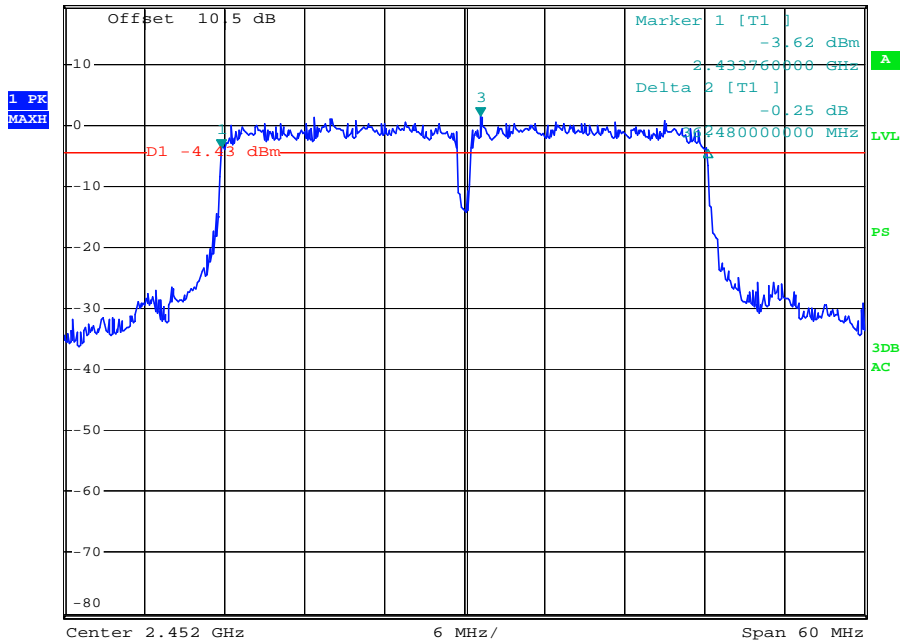


A D T

CH7



Ref 19.5 dBm \*Att 40 dB \*RBW 100 kHz Marker 3 [T1 ] 1.57 dBm  
\*VBW 300 kHz 2.453200000 GHz  
SWT 10 ms



#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Signal Analyzer ROHDE & SCHWARZ	FSP30	E1S1002	Aug. 04, 2010

**NOTE:** The calibration interval of the above test instruments is 12 months.

##### 4.4.3 TEST PROCEDURES

- a. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
- b. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
- c. Adjusted the power to have the same reading on oscilloscope. Record the power level.

#### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



A D T

#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	100.00	20.00	30	PASS
6	2437	67.30	18.28	30	PASS
11	2462	66.37	18.22	30	PASS

##### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	184.50	22.66	30	PASS
6	2437	185.78	22.69	30	PASS
11	2462	201.84	23.05	30	PASS



A D T

**802.11n (20MHz) OFDM MODULATION**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL (dBm)		TOTAL POWER (mw)	TOTAL POWER (dBm)	MAXIMUM LIMIT (dBm)	PASS /FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	21.93	22.18	321.15	25.07	30	PASS
6	2437	22.22	22.53	345.79	25.39	30	PASS
11	2462	22.19	22.45	341.37	25.33	30	PASS

**802.11n (40MHz) OFDM MODULATION:**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	13Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL (dBm)		TOTAL POWER (mw)	TOTAL POWER (dBm)	MAXIMUM LIMIT (dBm)	PASS /FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	21.69	21.95	304.25	24.83	30	PASS
4	2437	21.98	22.05	318.09	25.03	30	PASS
7	2462	21.89	22.05	314.85	24.98	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Signal Analyzer ROHDE & SCHWARZ	FSP30	E1S1002	Aug. 04, 2010

**NOTE:** The calibration interval of the above test instruments is 12 months.

### 4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

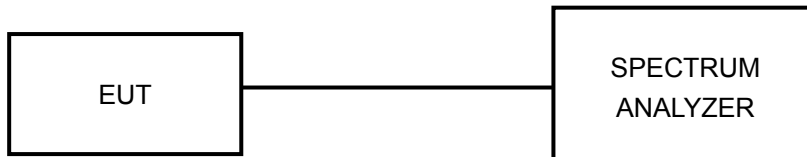
The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.



#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5.5 TEST SETUP



#### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

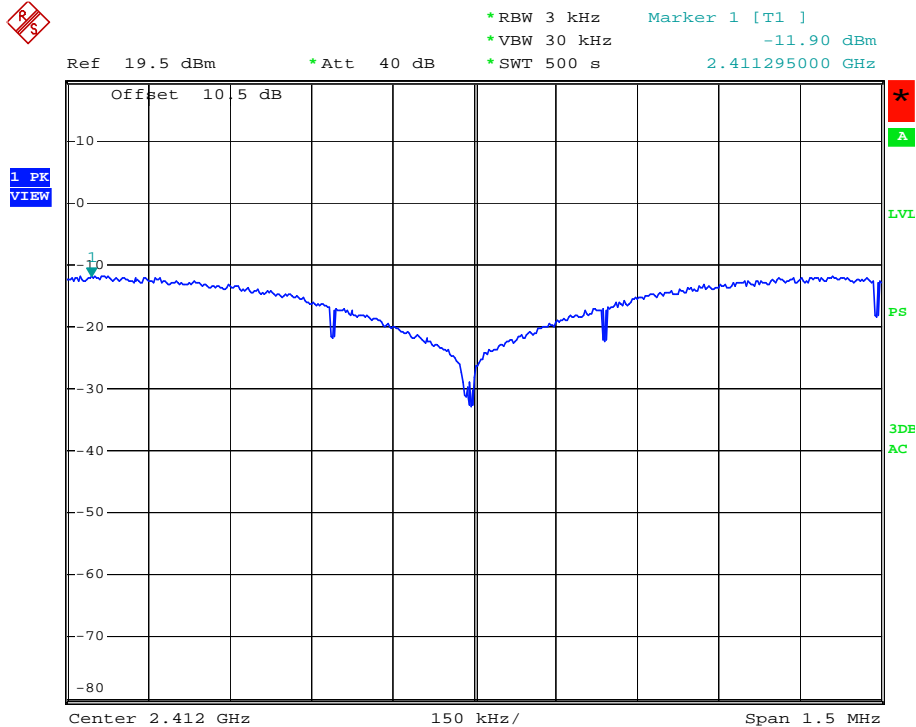
### 4.5.7 TEST RESULTS

#### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	1.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-11.90	8	PASS
6	2437	-11.50	8	PASS
11	2462	-11.72	8	PASS

#### CH1



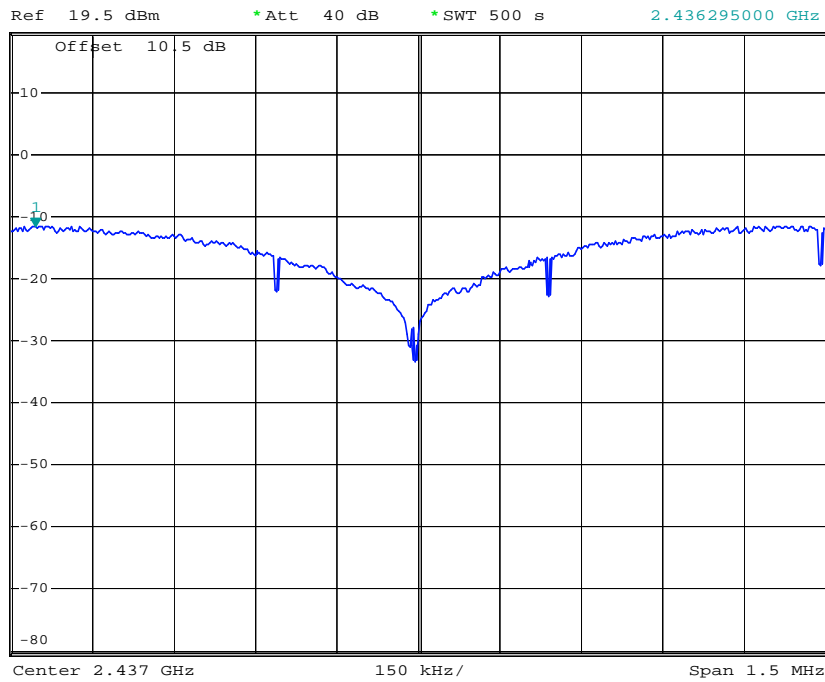


A D T

### CH6



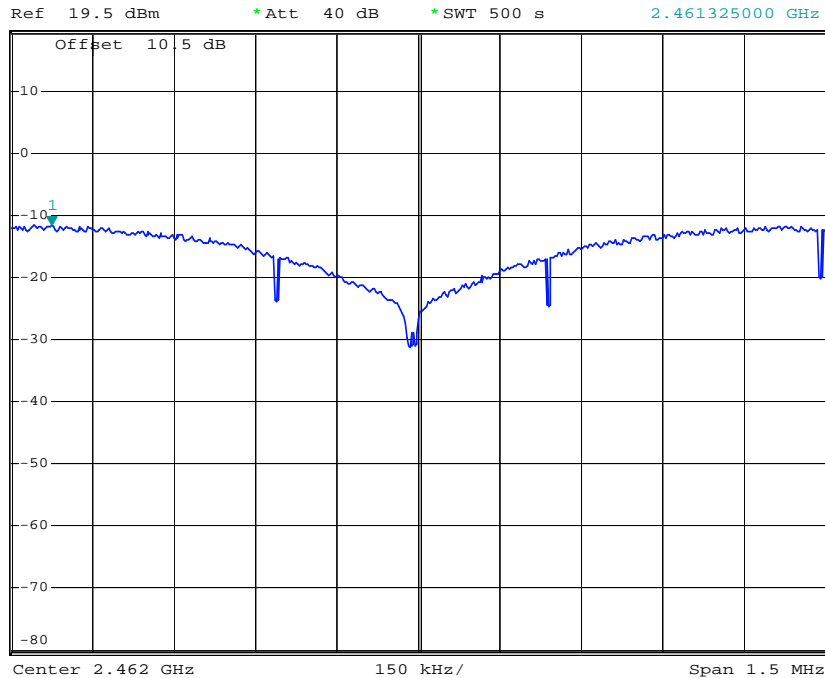
\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -11.50 dBm  
\*SWT 500 s    2.436295000 GHz



### CH11



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -11.72 dBm  
\*SWT 500 s    2.461325000 GHz





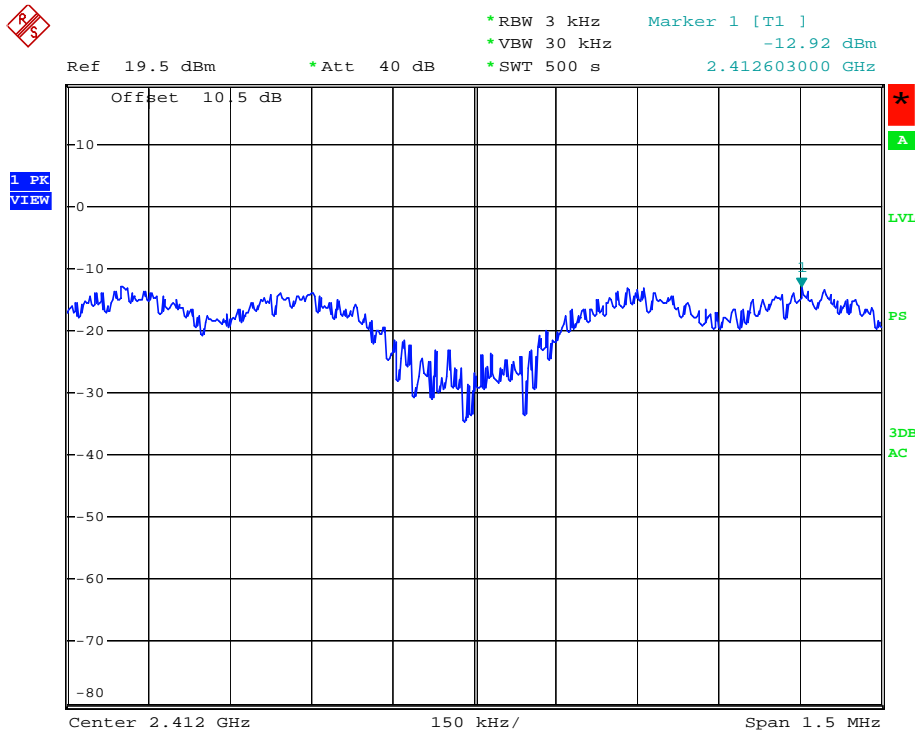
A D T

### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.0Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-12.92	8	PASS
6	2437	-12.87	8	PASS
11	2462	-12.66	8	PASS

### CH1





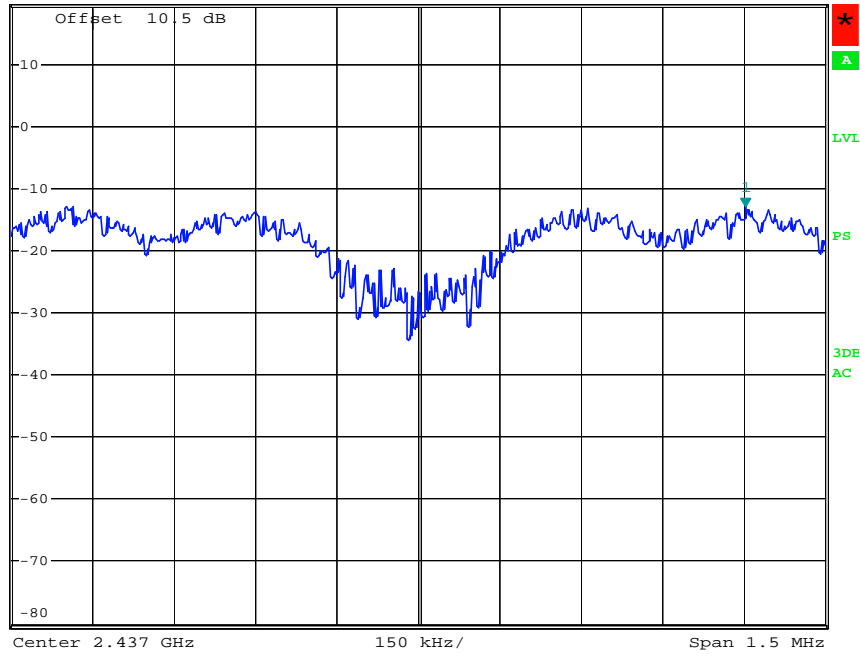
A D T

### CH6



Ref 19.5 dBm \*Att 40 dB \*RBW 3 kHz \*VBW 30 kHz \*SWT 500 s Marker 1 [T1 ] -12.87 dBm 2.437603000 GHz

1 PK VIEW

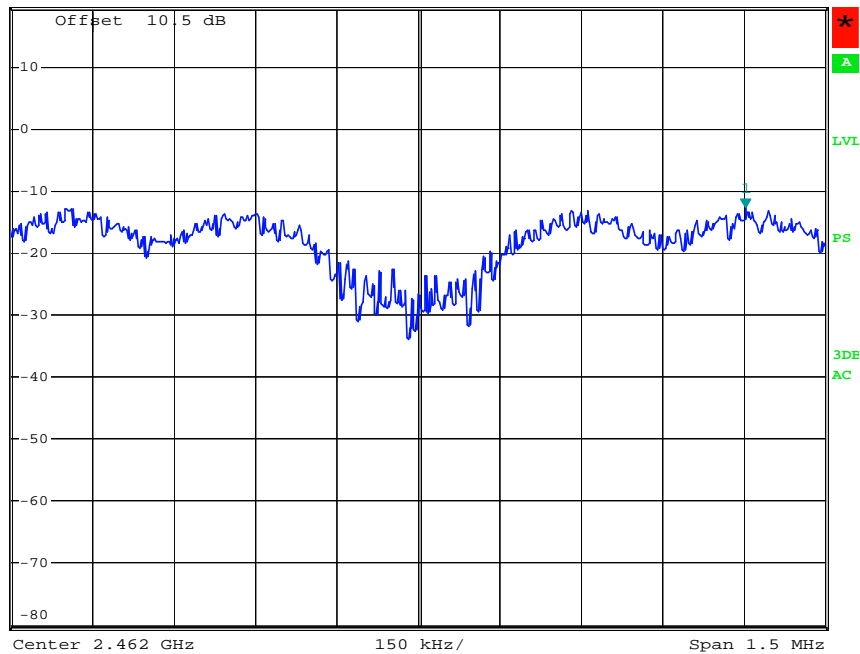


### CH11



Ref 19.5 dBm \*Att 40 dB \*RBW 3 kHz \*VBW 30 kHz \*SWT 500 s Marker 1 [T1 ] -12.66 dBm 2.462603000 GHz

1 PK VIEW





A D T

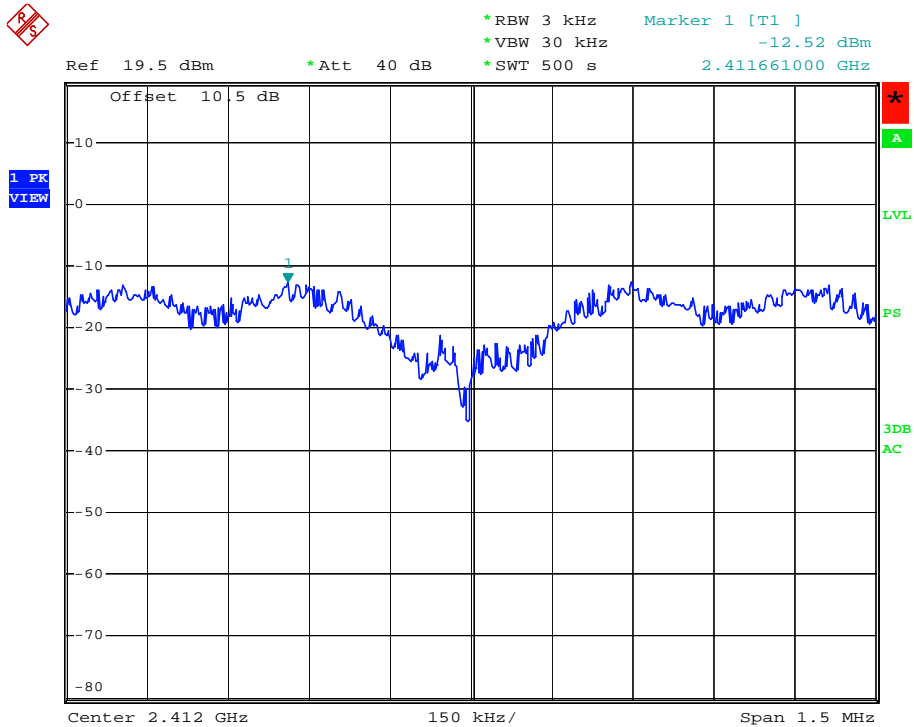
### 802.11n (20MHz) OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 65%RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW(dBm)		TOTAL POWER DENSITY (mw)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS /FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	-12.52	-13.10	0.10	-9.79	8	PASS
6	2437	-12.44	-13.22	0.10	-9.80	8	PASS
11	2462	-12.29	-13.18	0.11	-9.70	8	PASS

FOR CHAIN(0):

CH1





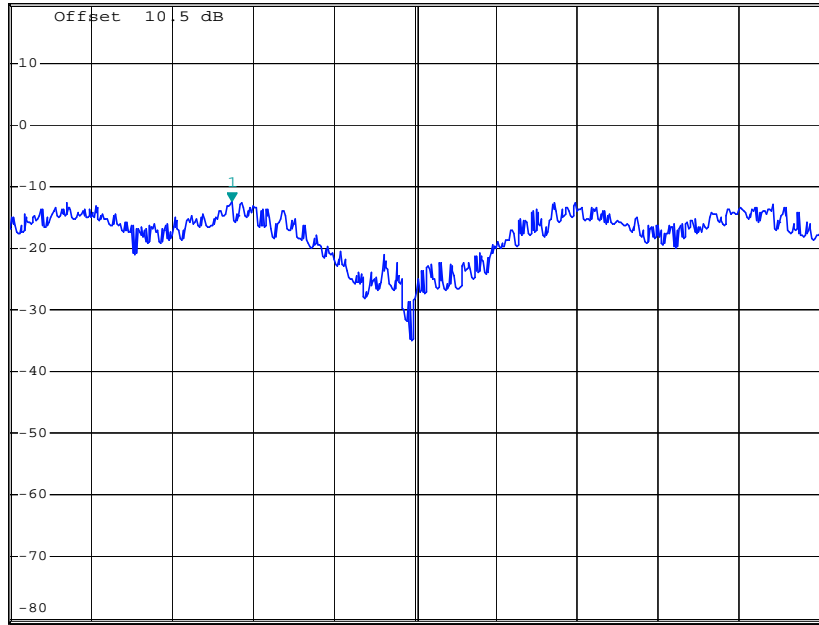
A D T

### CH6



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -12.44 dBm  
\*Att 40 dB    \*SWT 500 s    2.436661000 GHz

Ref 19.5 dBm

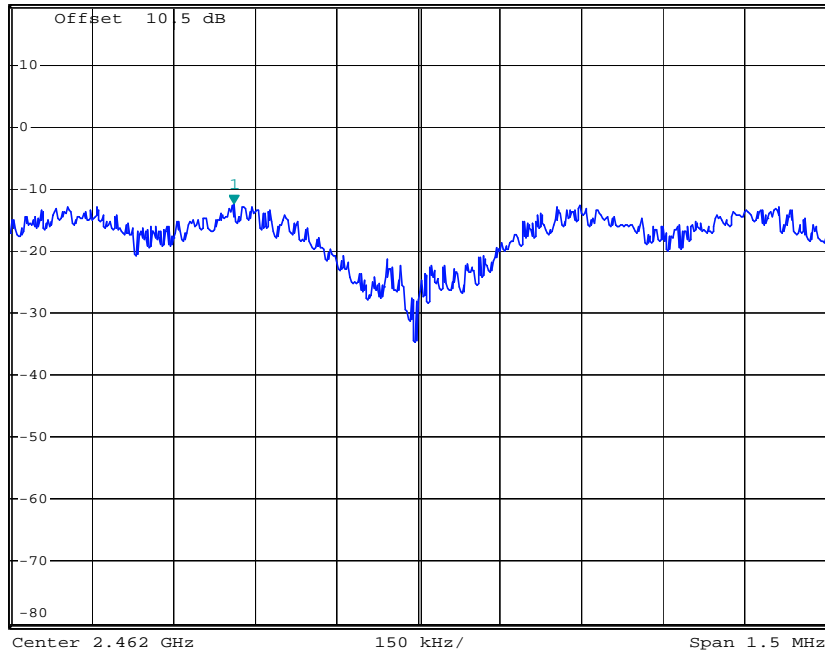


### CH11



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -12.29 dBm  
\*Att 40 dB    \*SWT 500 s    2.461661000 GHz

Ref 19.5 dBm





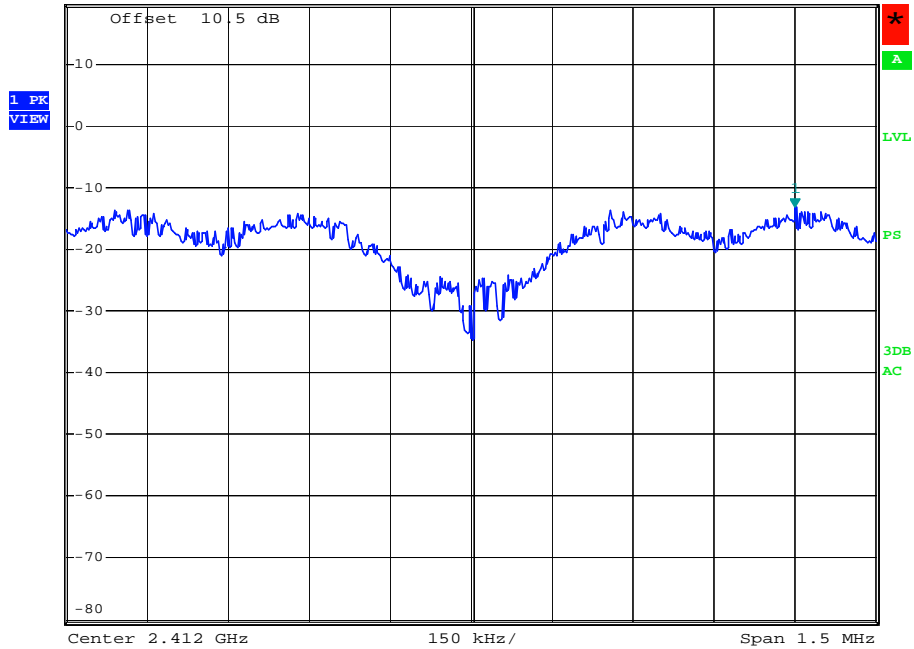
A D T

FOR CHAIN(1):

CH1



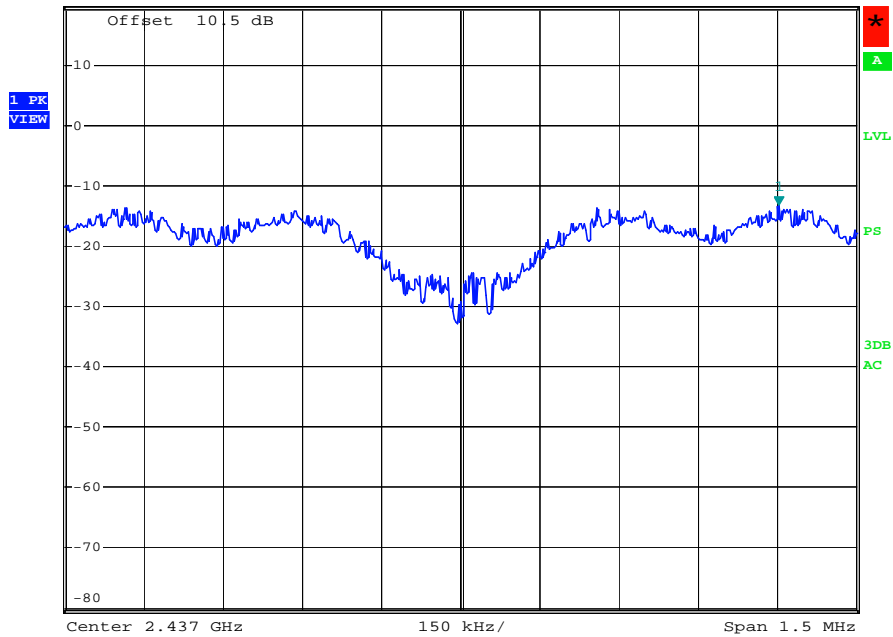
Ref 19.5 dBm \*Att 40 dB \*RBW 3 kHz Marker 1 [T1 ]  
\*VBW 30 kHz -13.10 dBm  
\*SWT 500 s 2.41260000 GHz



CH6



Ref 19.5 dBm \*Att 40 dB \*RBW 3 kHz Marker 1 [T1 ]  
\*VBW 30 kHz -13.22 dBm  
\*SWT 500 s 2.437603000 GHz









A D T

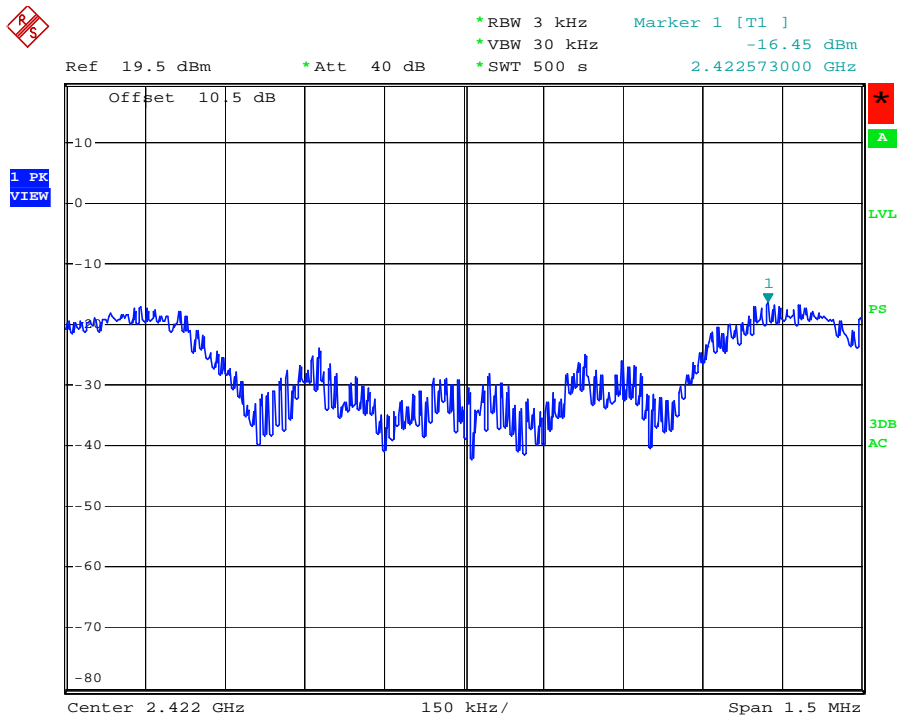
**802.11n (40MHz) OFDM MODULATION**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	13Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 65 %RH, 991hPa
<b>TESTED BY</b>	Ray		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW(dBm)		TOTAL POWER DENSITY (mw)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS /FAIL
		CHAIN(0)	CHAIN(1)				
1	2422	-16.45	-16.67	0.04	-13.55	8	PASS
4	2437	-16.08	-16.47	0.05	-13.26	8	PASS
7	2452	-16.12	-16.79	0.05	-13.43	8	PASS

**FOR CHAIN(0):**

**CH1**





A D T

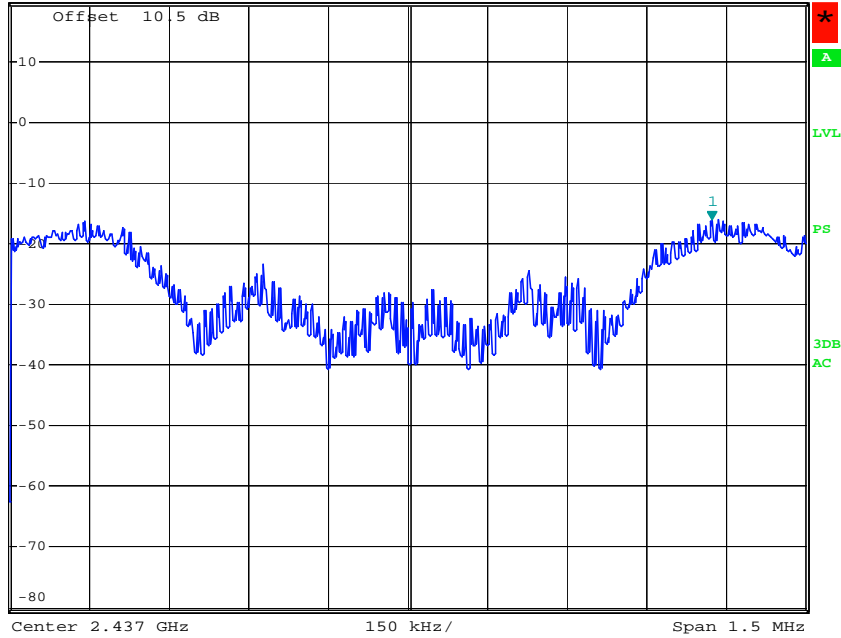
### CH4



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -16.08 dBm  
\*SWT 500 s    2.437573000 GHz

Ref 19.5 dBm    \*Att 40 dB

1 PK  
VIEW



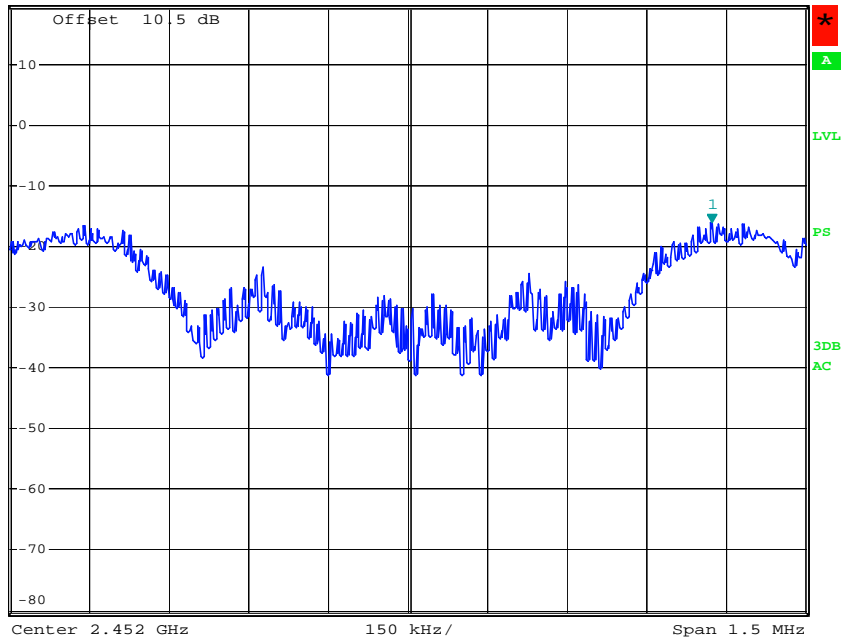
### CH7



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -16.12 dBm  
\*SWT 500 s    2.452573000 GHz

Ref 19.5 dBm    \*Att 40 dB

1 PK  
VIEW





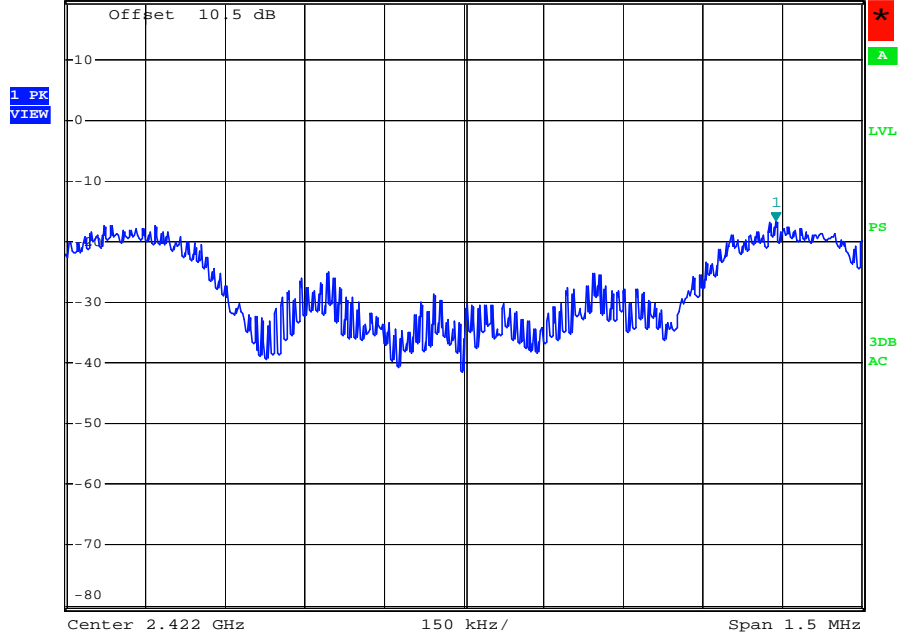
A D T

### FOR CHAIN(1):

### CH1



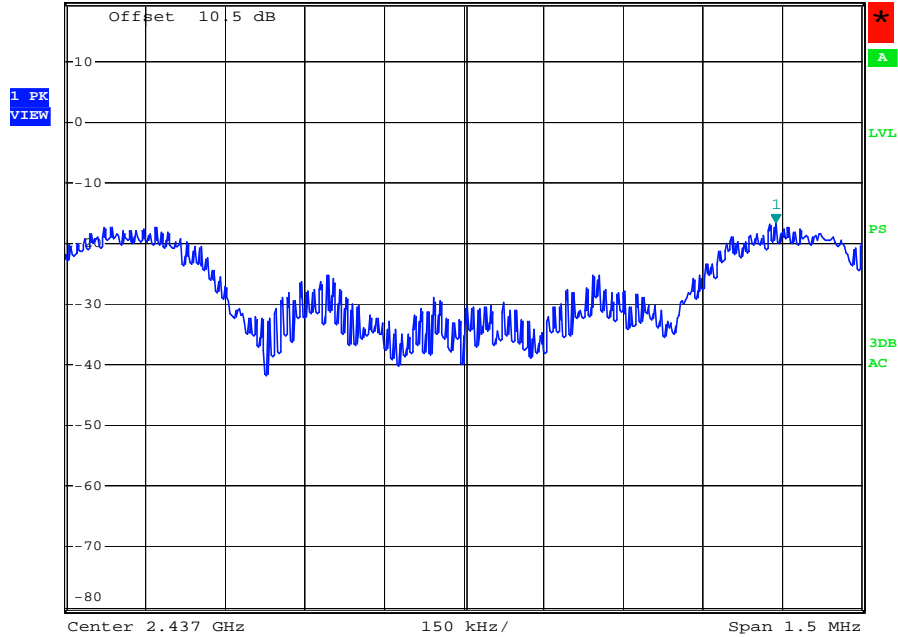
Ref 19.5 dBm      \*Att 40 dB      \*RBW 3 kHz      Marker 1 [T1]      -16.67 dBm  
\*VBW 30 kHz      2.422588000 GHz  
\*SWT 500 s



### CH4



Ref 19.5 dBm      \*Att 40 dB      \*RBW 3 kHz      Marker 1 [T1]      -16.47 dBm  
\*VBW 30 kHz      2.437588000 GHz  
\*SWT 500 s





A D T

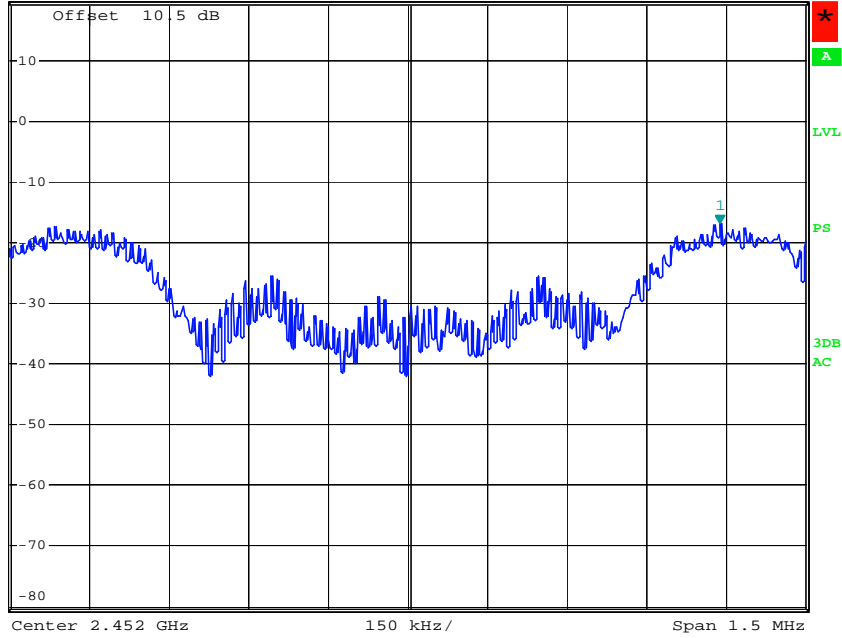
CH7



\*RBW 3 kHz    Marker 1 [T1 ]  
\*VBW 30 kHz    -16.79 dBm  
\*SWT 500 s    2.452588000 GHz

Ref 19.5 dBm    \*Att 40 dB

1 PK  
VIEW



## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Signal Analyzer ROHDE & SCHWARZ	FSP30	E1S1002	Aug. 04, 2010

**NOTE:** The calibration interval of the above test instruments is 12 months.

#### 4.6.3 TEST PROCEDURE

##### FOR CONDUCTED MEASUREMENT:

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

##### FOR RADIATED MEASUREMENT:

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

**NOTE:** The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

#### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6



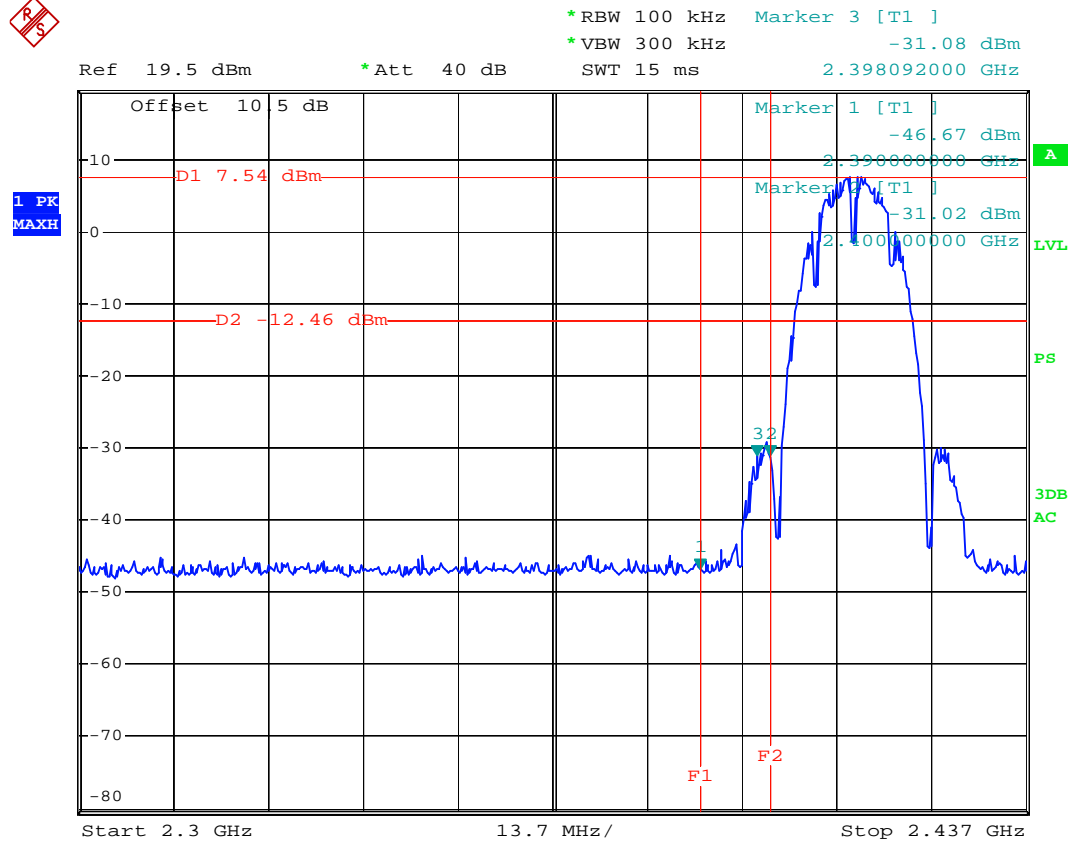
A D T

## 4.6.6 TEST RESULTS

The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

### 802.11b DSSS MODULATION

#### CH 1



Date: 27.JUN.2010 08:31:01



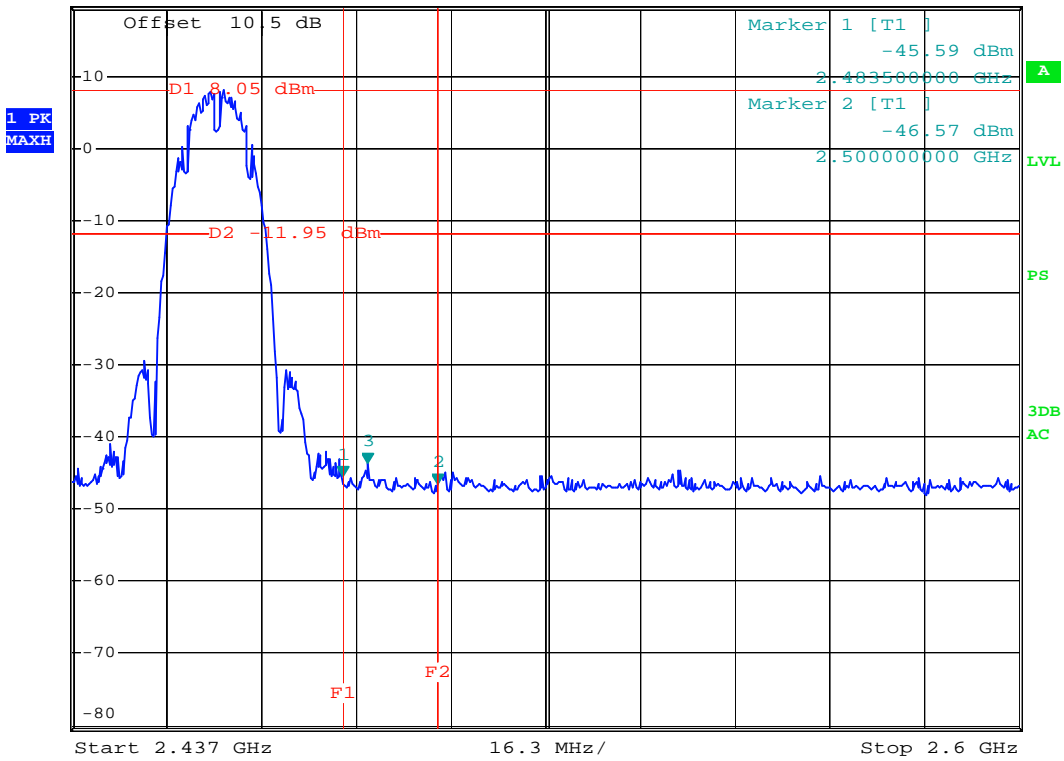




A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -43.69 dBm  
 Ref 19.5 dBm \*Att 40 dB SWT 20 ms 2.487856000 GHz



Date: 27.JUN.2010 08:32:24

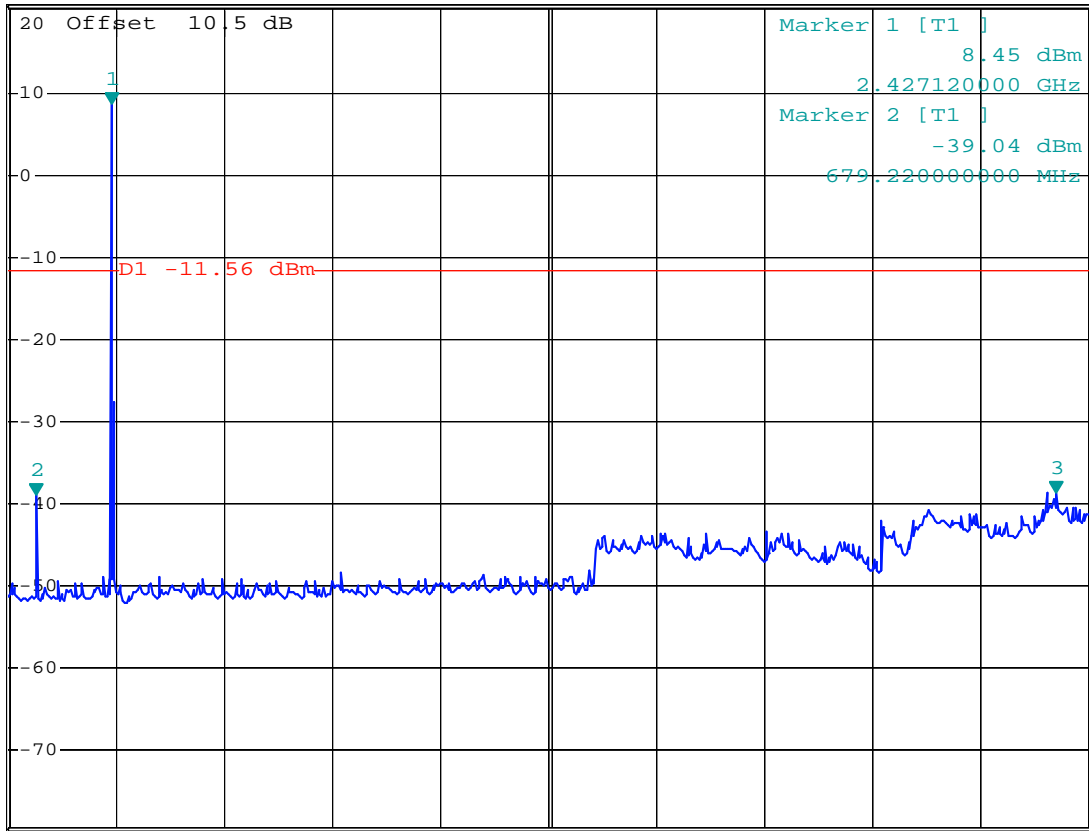


A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -38.60 dBm  
 Ref 20.5 dBm \*Att 20 dB SWT 2.5 s 24.250900000 GHz

1 PK VIEW



Start 30 MHz 2.497 GHz/ Stop 25 GHz

Date: 29.JUN.2010 12:36:28



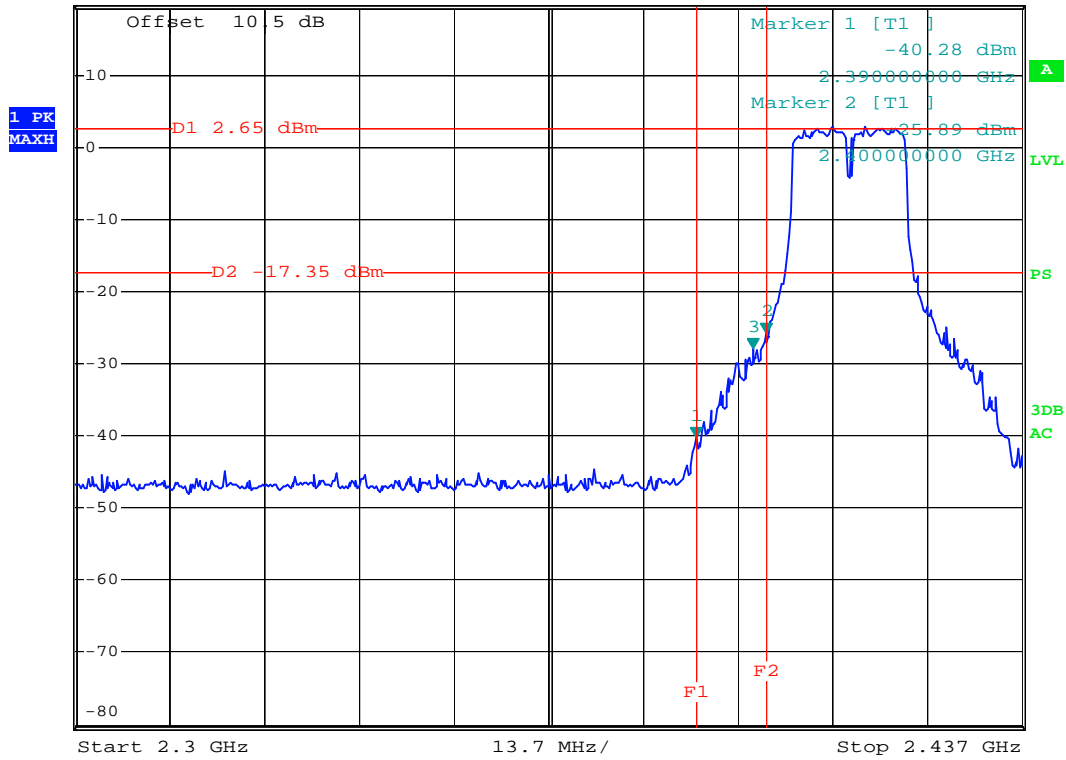
A D T

# 802.11g OFDM MODULATION

## CH 1



Ref 19.5 dBm \*Att 40 dB \*RBW 100 kHz Marker 3 [T1 ]  
\*VBW 300 kHz -27.98 dBm  
SWT 15 ms 2.398092000 GHz



Date: 27.JUN.2010 08:33:46



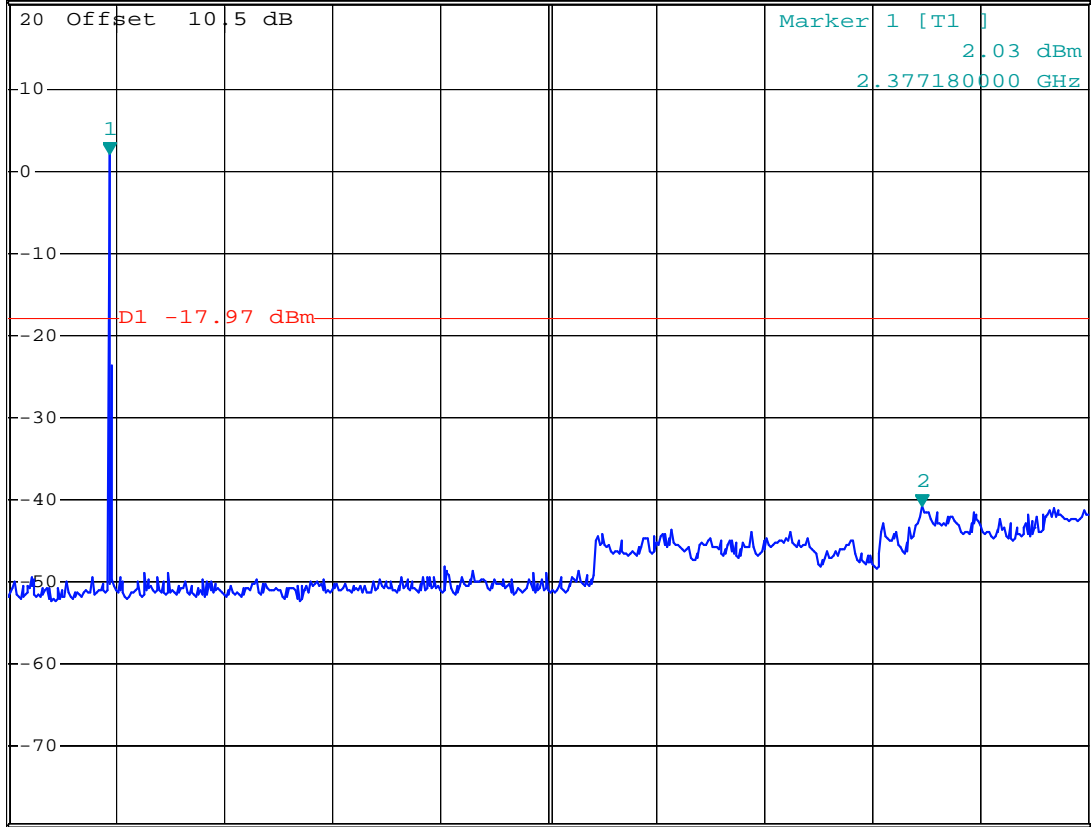
A D T



\*RBW 100 kHz Marker 2 [T1 ]  
\*VBW 300 kHz -40.66 dBm  
SWT 2.5 s 21.154620000 GHz

Ref 20.5 dBm \*Att 20 dB

1 PK  
VIEW



Date: 29.JUN.2010 12:38:02

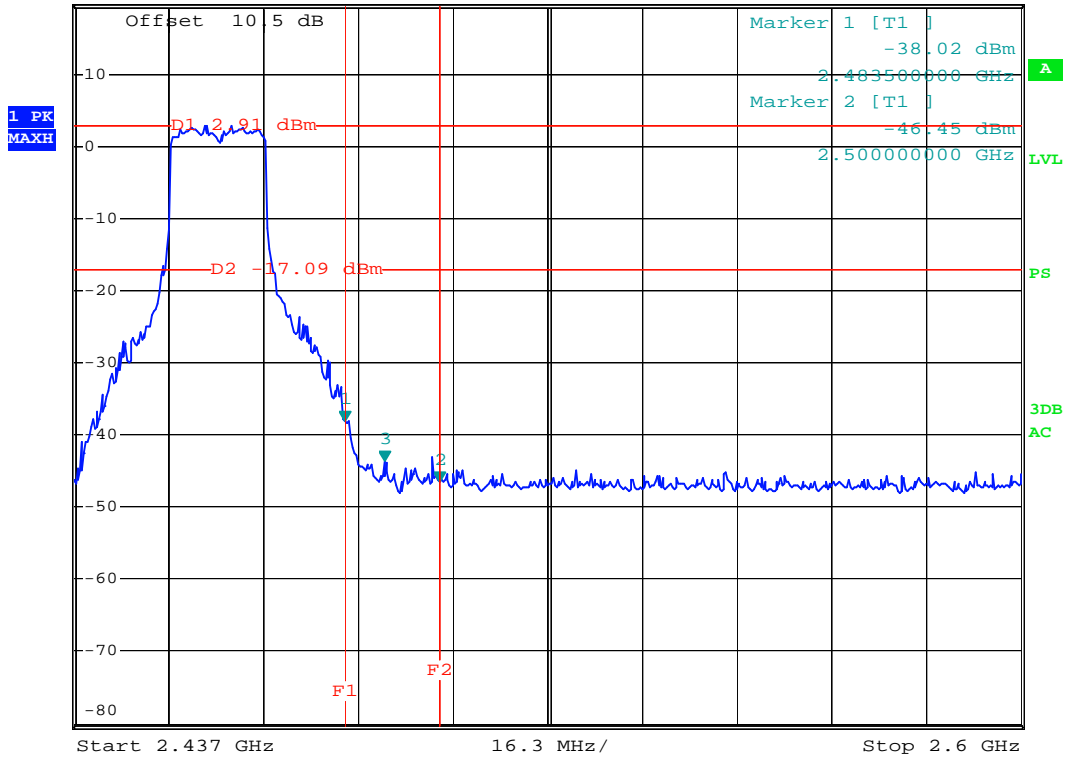
CH 11



A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -43.70 dBm  
 Ref 19.5 dBm \*Att 40 dB SWT 20 ms 2.490464000 GHz



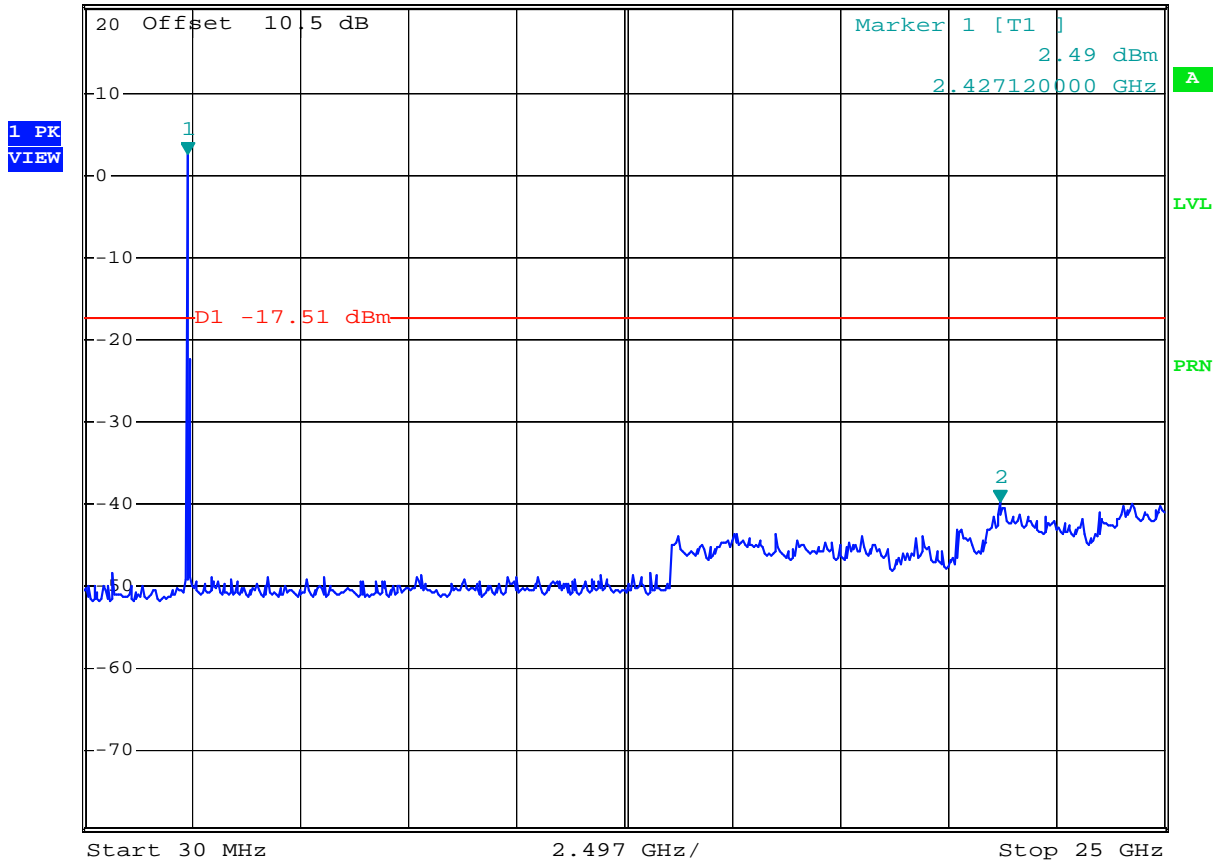
Date: 27.JUN.2010 08:34:47



A D T

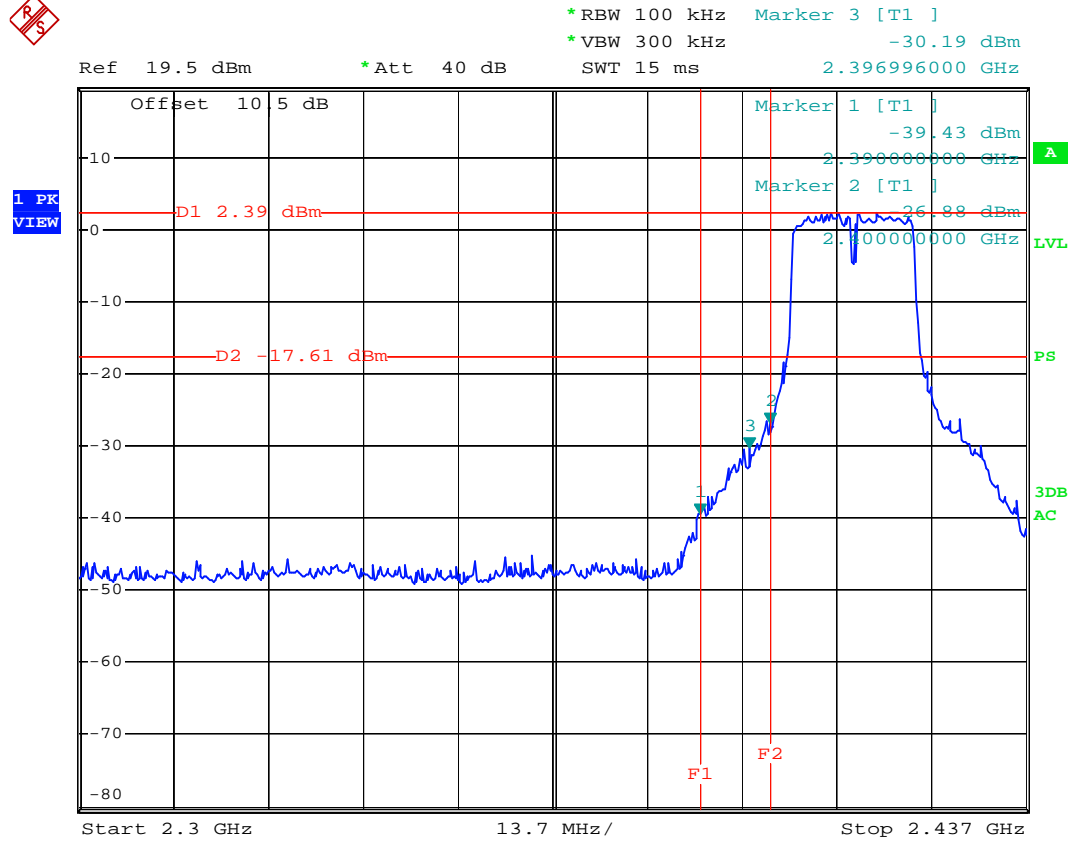


\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -39.64 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    21.204560000 GHz



Date: 29.JUN.2010 12:38:58

# 802.11n (20MHz) OFDM MODULATION For Chain (0):CH1



Date: 27.JUN.2010 08:36:30



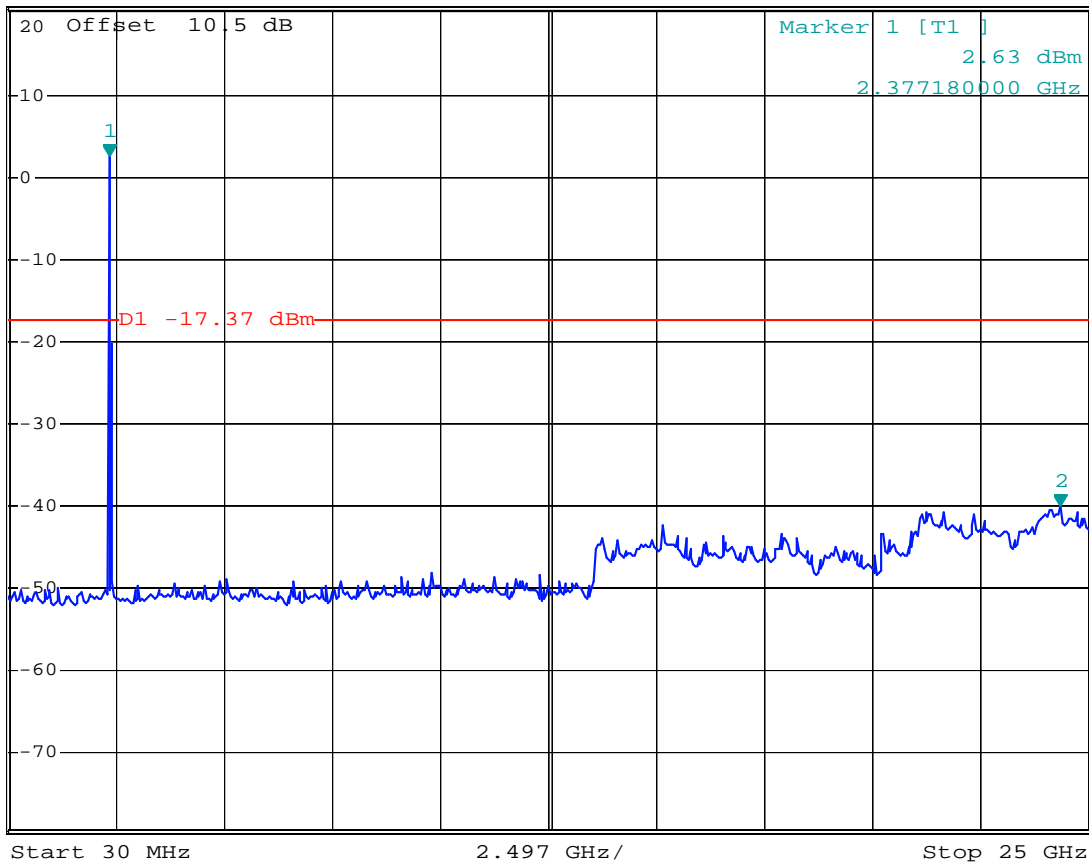


A D T



\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -40.11 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    24.350780000 GHz

1 PK  
VIEW



\*  
A

LVL

PRN

Date: 29.JUN.2010 12:40:01

CH11



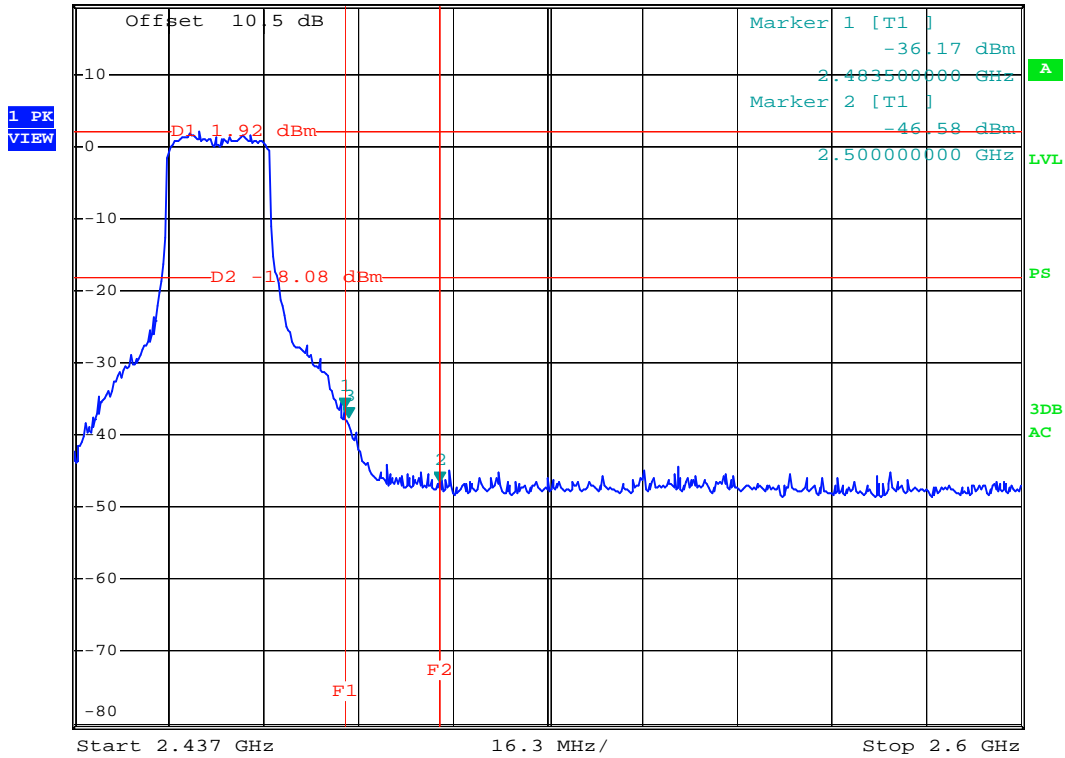
A D T



\*RBW 100 kHz Marker 3 [T1 ]  
\*VBW 300 kHz -37.68 dBm  
SWT 20 ms 2.484270000 GHz

Ref 19.5 dBm

\*Att 40 dB



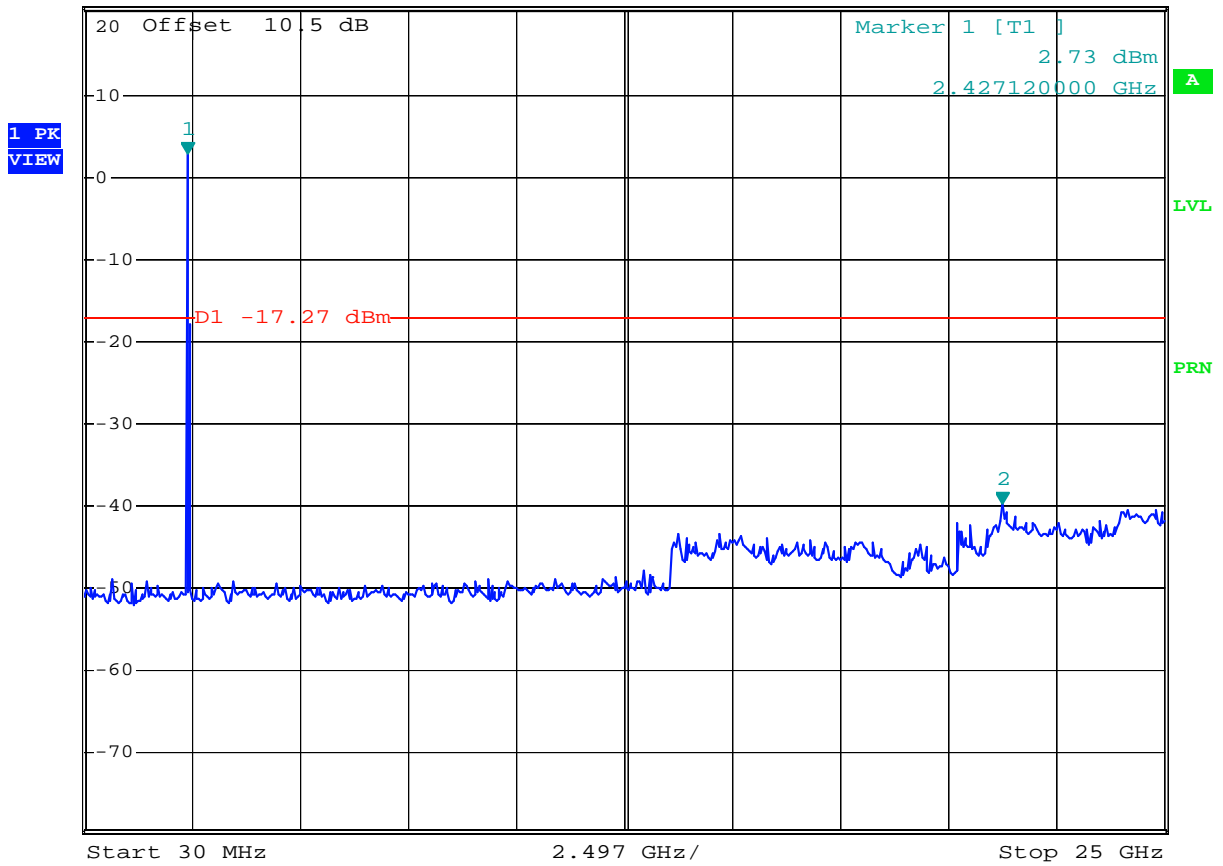
Date: 27.JUN.2010 08:40:24



A D T



\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -39.61 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    21.254500000 GHz



Date: 29.JUN.2010 12:41:19

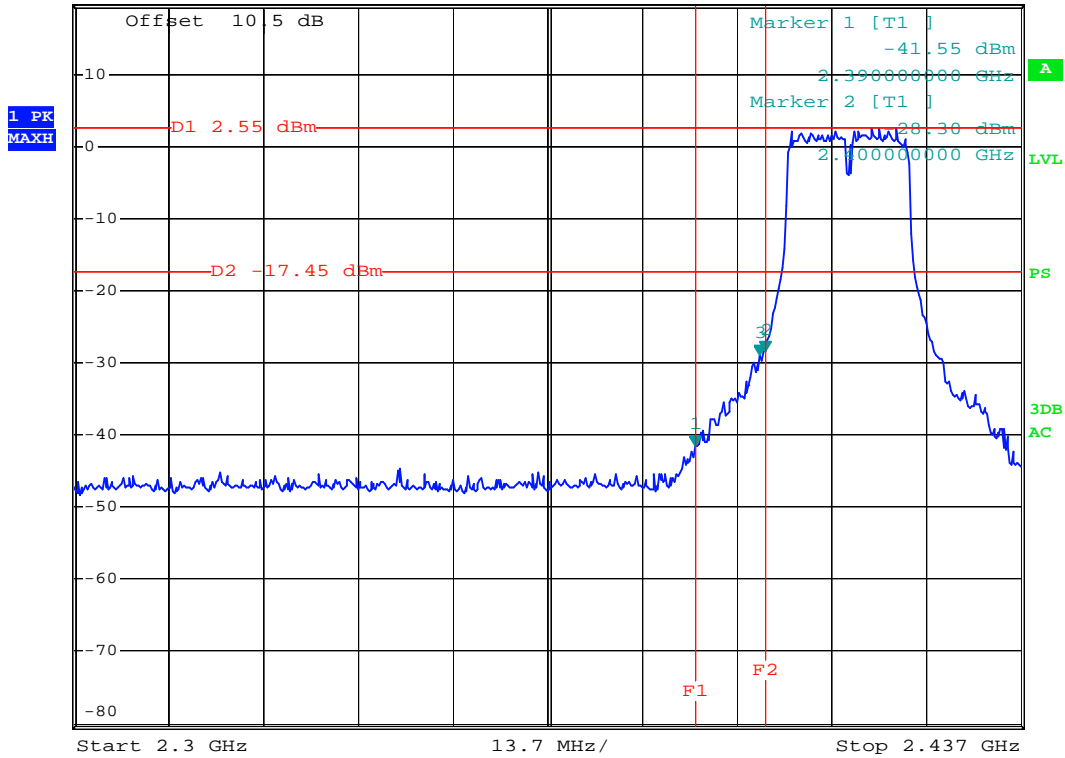
For Chain (1):CH1



A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -28.98 dBm  
 Ref 19.5 dBm \*Att 40 dB SWT 15 ms 2.399188000 GHz



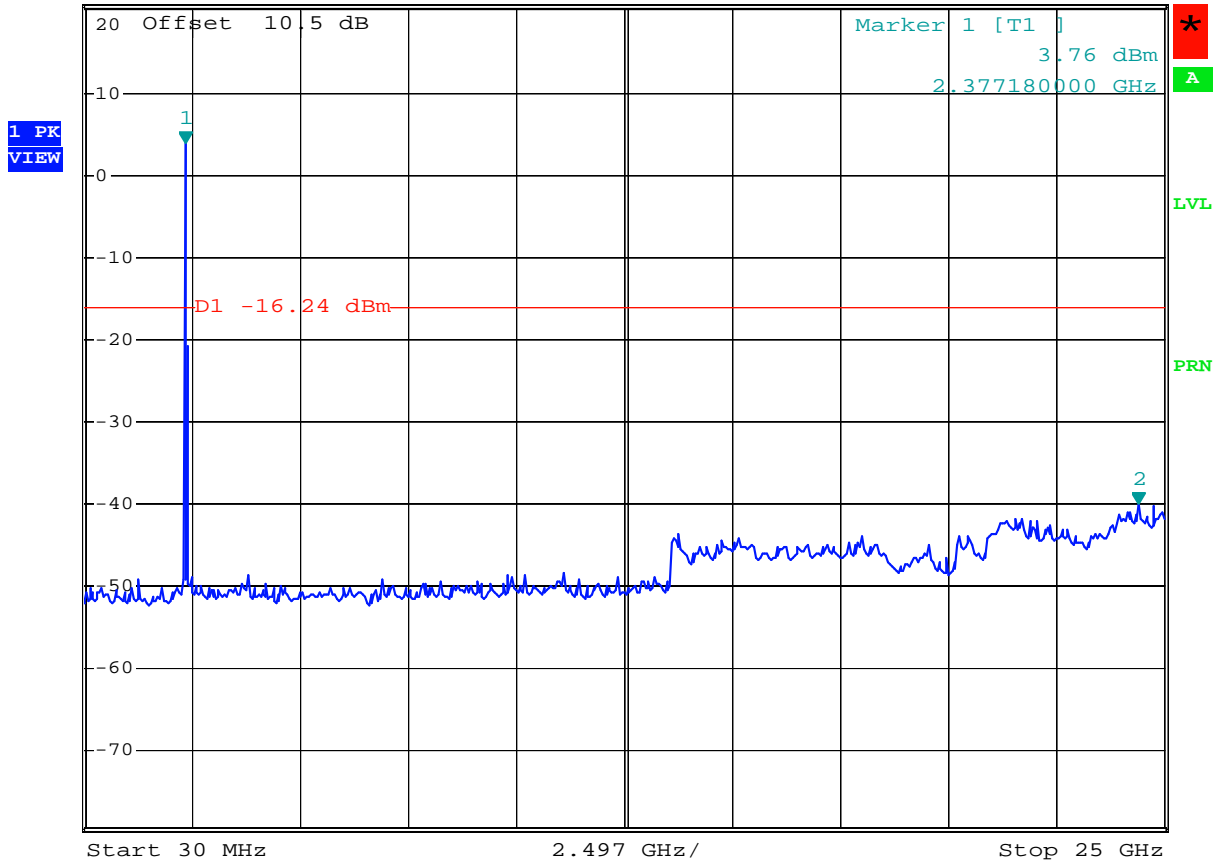
Date: 27.JUN.2010 08:37:40



A D T



\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -39.97 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    24.400720000 GHz



Date: 29.JUN.2010 12:51:24

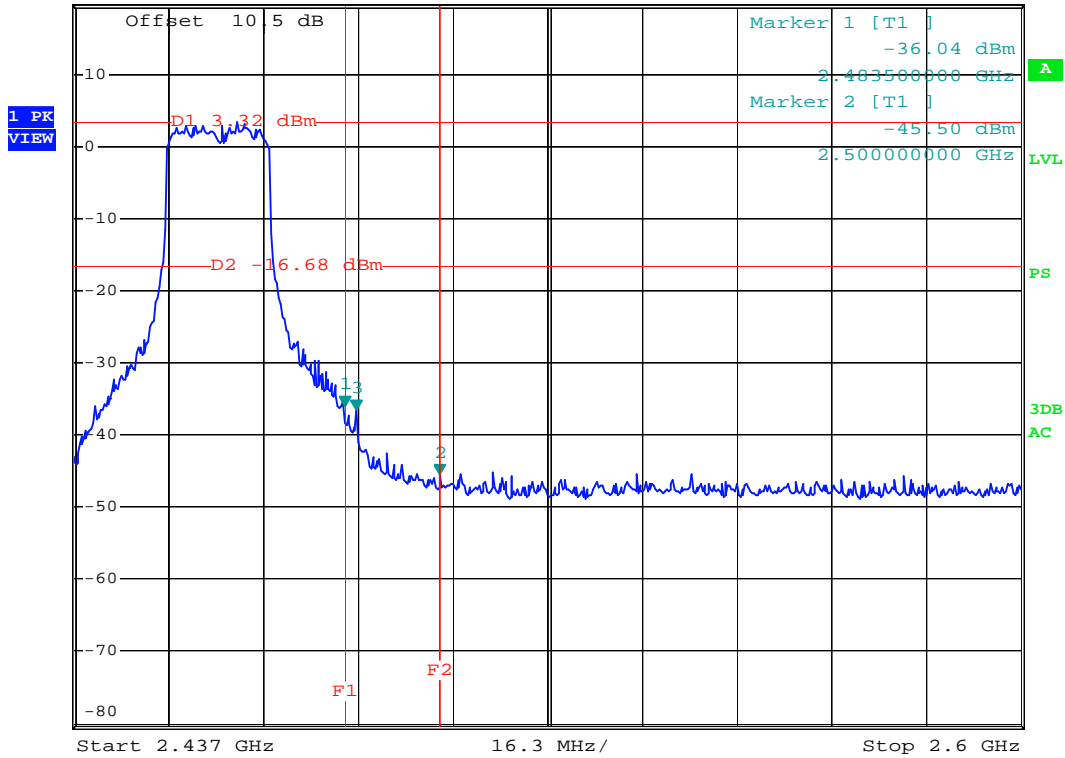
CH11



A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -36.61 dBm  
 Ref 19.5 dBm \*Att 40 dB SWT 20 ms 2.485574000 GHz



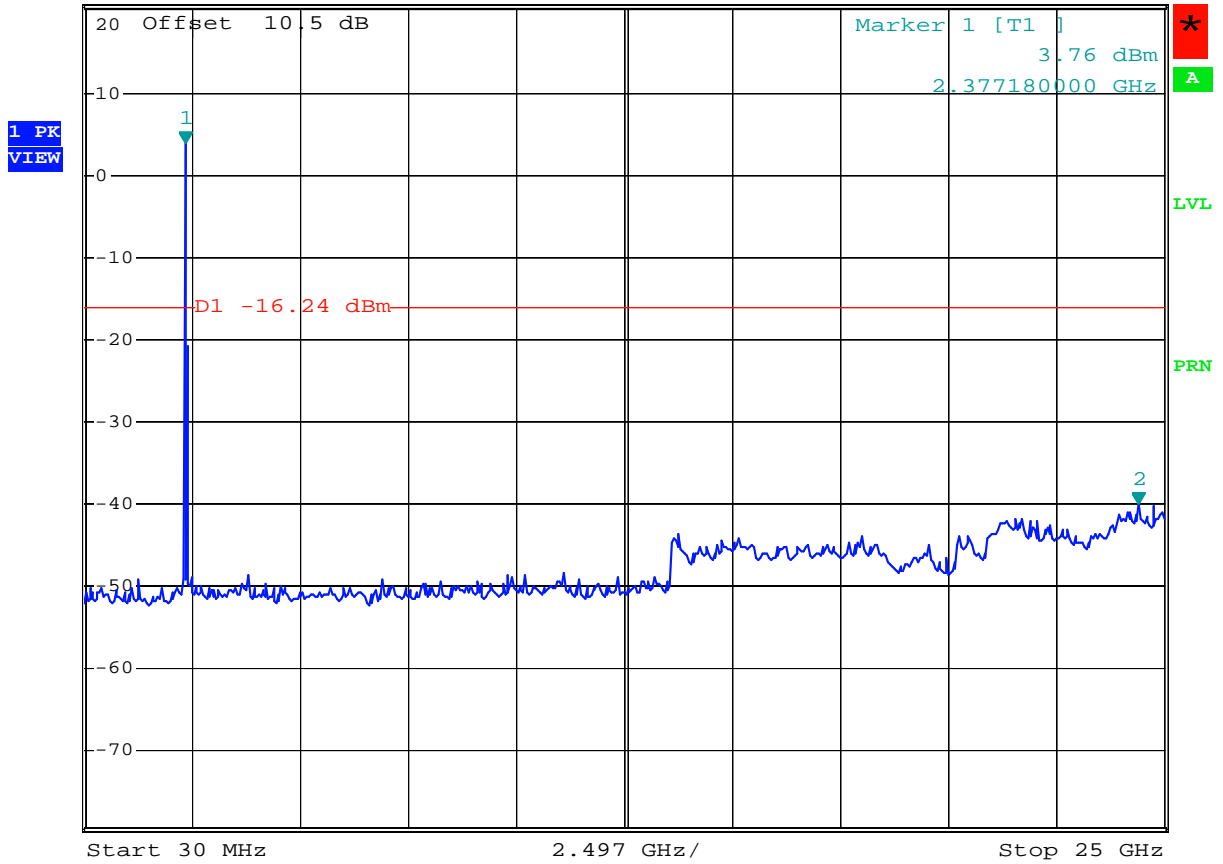
Date: 27.JUN.2010 08:39:04



A D T



\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -39.97 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    24.400720000 GHz



Date: 29.JUN.2010 12:51:24



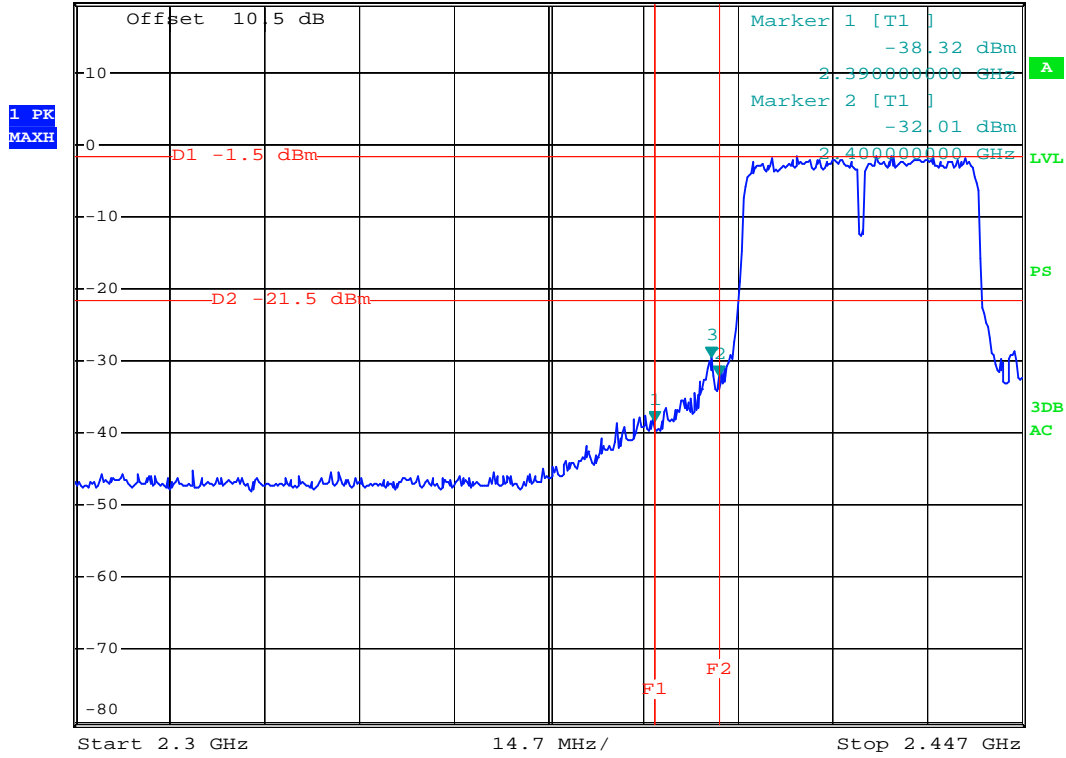
A D T

# 802.11n (40MHz) OFDM MODULATION

For Chain (0):CH1



\*RBW 100 kHz    Marker 3 [T1 ]  
\*VBW 300 kHz    -29.51 dBm  
Ref 19.5 dBm    \*Att 40 dB    SWT 15 ms    2.398784000 GHz



Date: 27.JUN.2010 08:41:48



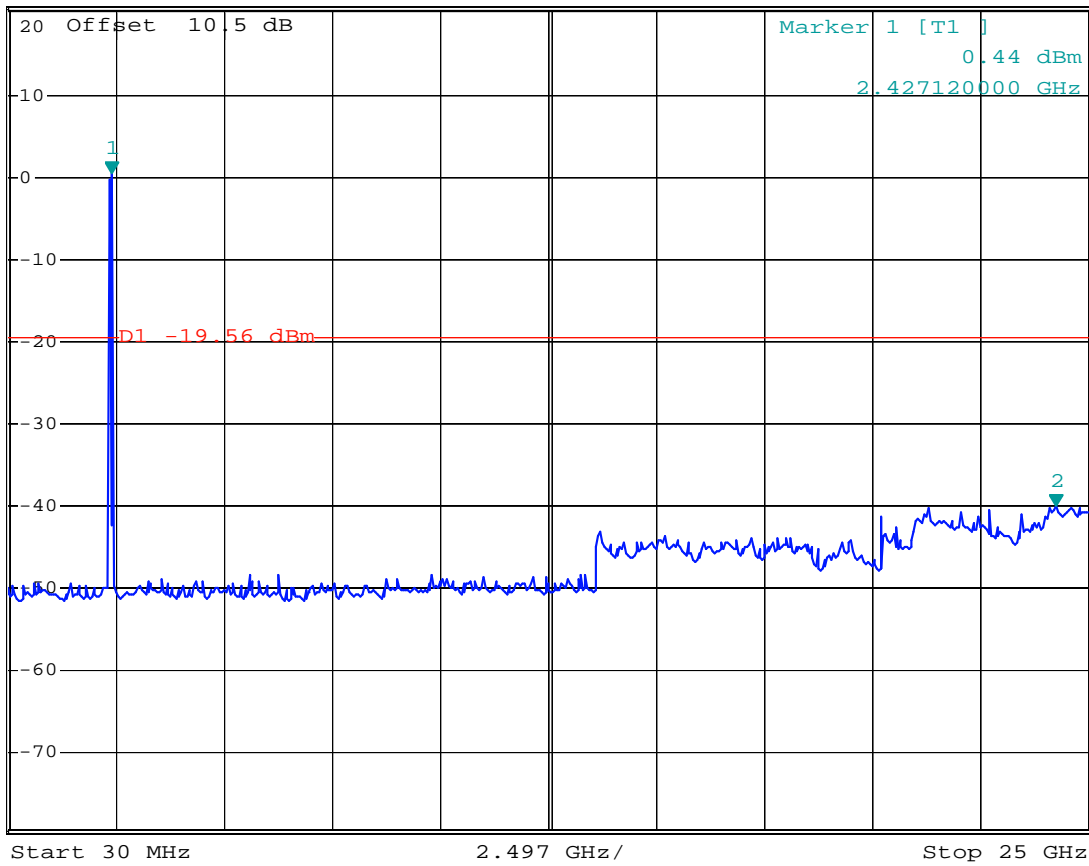


A D T



\*RBW 100 kHz    Marker 2 [T1 ]  
 \*VBW 300 kHz                    -39.93 dBm  
 Ref 20.5 dBm                    \*Att 20 dB                    SWT 2.5 s                    24.250900000 GHz

1 PK VIEW



Date: 29.JUN.2010 12:44:17

CH7

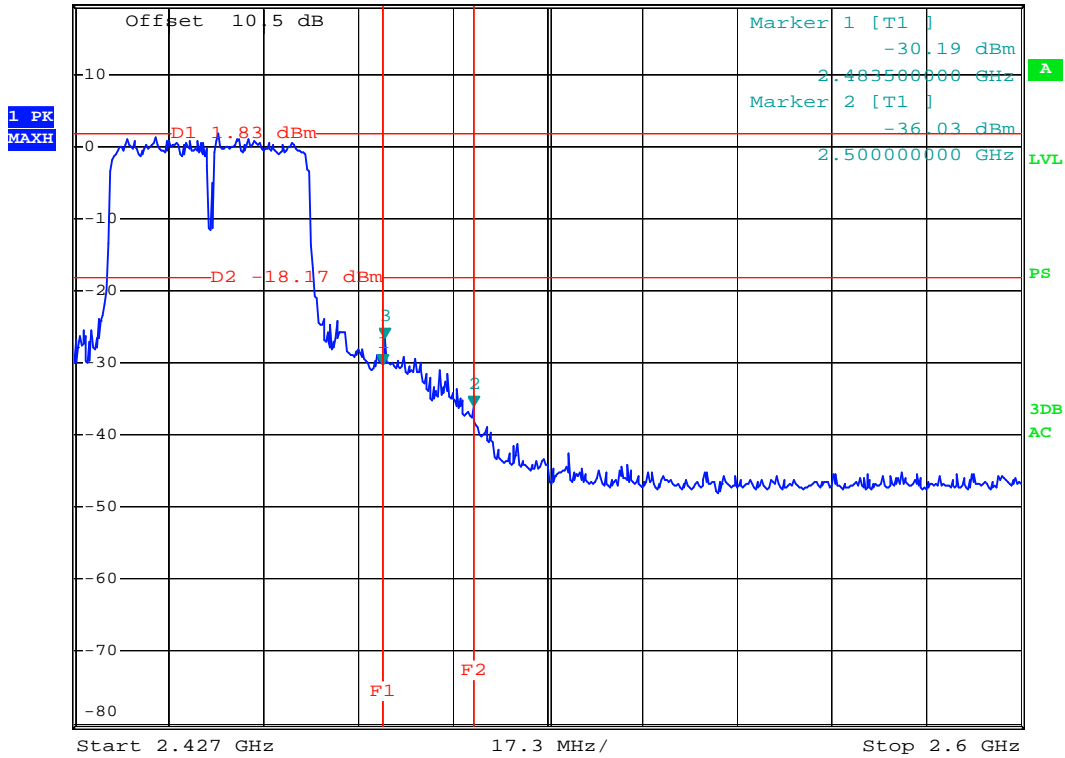


A D T



\*RBW 100 kHz Marker 3 [T1 ]  
\*VBW 300 kHz -26.61 dBm  
SWT 20 ms 2.483744000 GHz

Ref 19.5 dBm \*Att 40 dB



Date: 27.JUN.2010 08:45:29





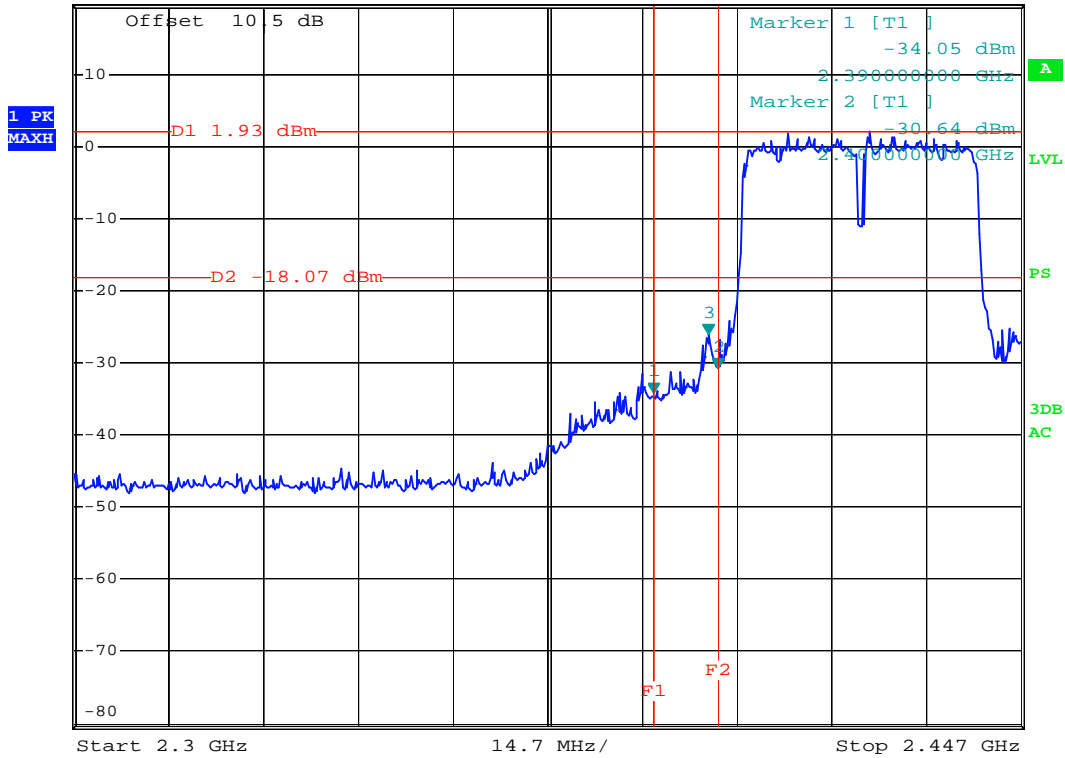
A D T



\*RBW 100 kHz Marker 3 [T1 ]  
\*VBW 300 kHz -26.11 dBm  
SWT 15 ms 2.398490000 GHz

Ref 19.5 dBm

\*Att 40 dB



Date: 27.JUN.2010 08:42:49

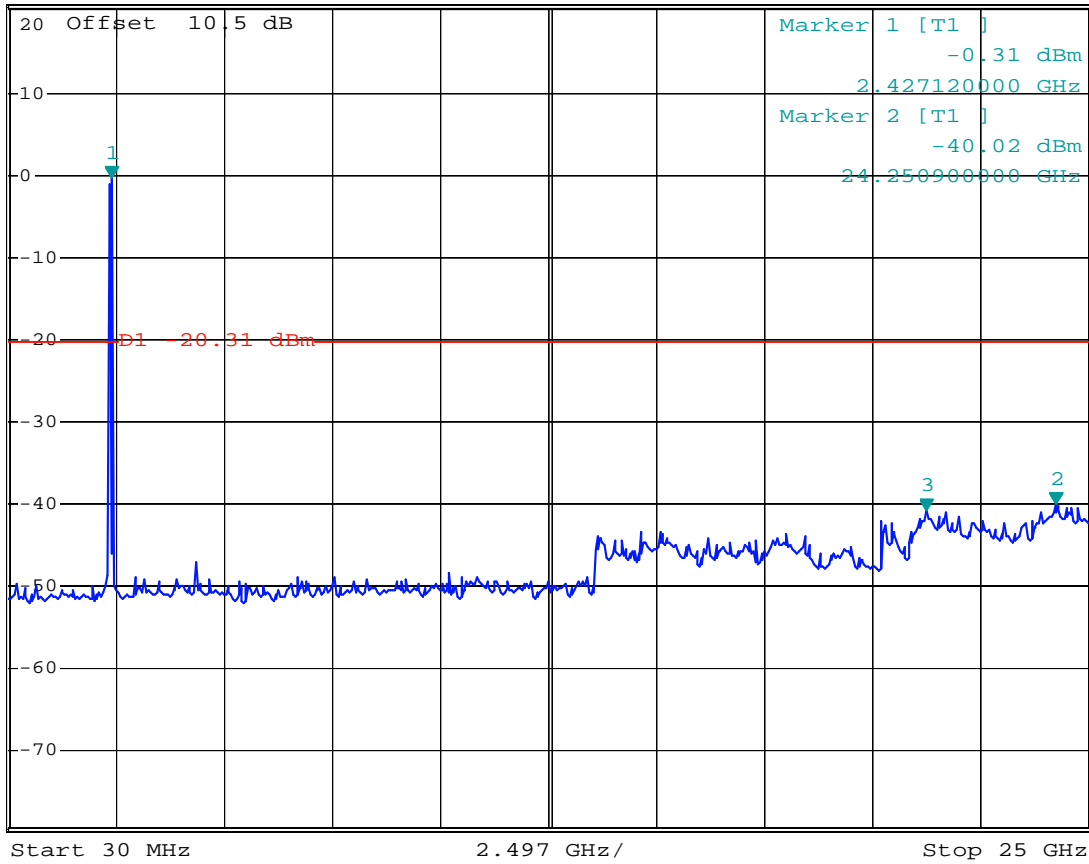


A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -40.74 dBm  
 Ref 20.5 dBm \*Att 20 dB SWT 2.5 s 21.254500000 GHz

1 PK VIEW



Date: 29.JUN.2010 12:46:42

CH7

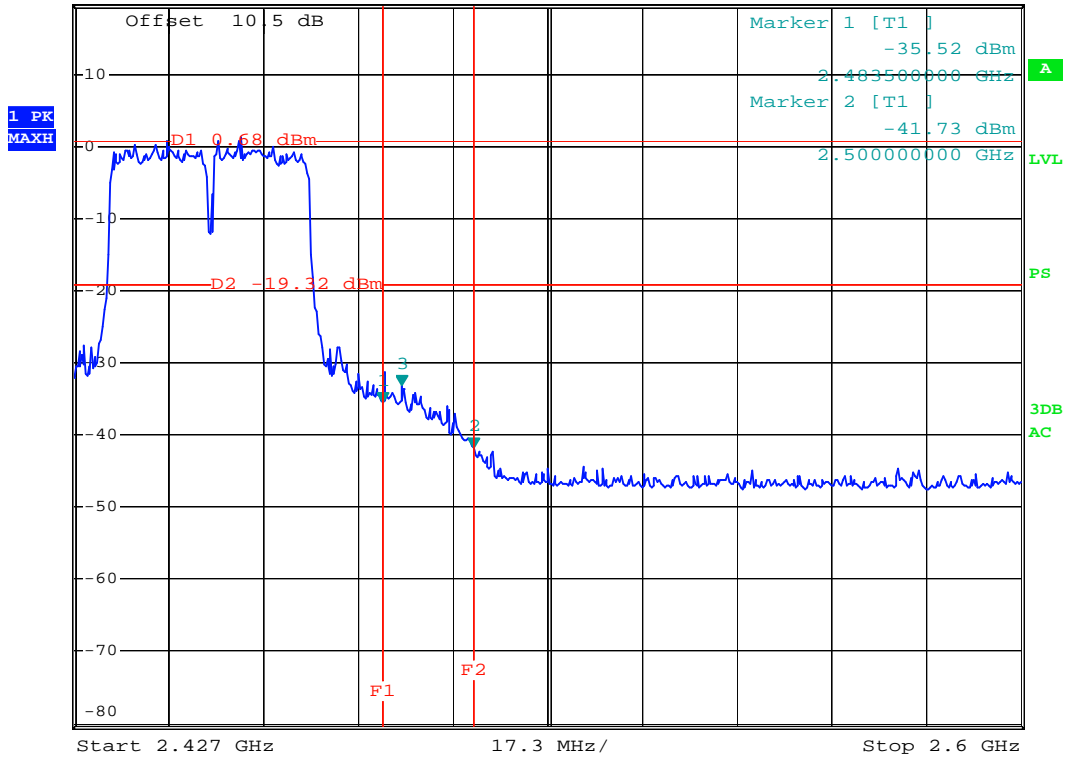


A D T



\*RBW 100 kHz Marker 3 [T1 ]  
 \*VBW 300 kHz -33.24 dBm  
 SWT 20 ms 2.486858000 GHz

Ref 19.5 dBm \*Att 40 dB



Date: 27.JUN.2010 08:44:29



## **4.7 ANTENNA REQUIREMENT**

### **4.7.1 STANDARD APPLICABLE**

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.

### **4.7.2 ANTENNA CONNECTED CONSTRUCTION**

The antennas used in this product are PCB antennas. The maximum Gain of the antenna is 0dBi.





## 5. APPENDIX - INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025:

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).  
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

**Email:** [service@adt.com.tw](mailto:service@adt.com.tw)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

The address and road map of all our labs can be found in our web site



A D T

## 6.APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

--- END ---