



Registration  
No. 788871

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# TEST REPORT FOR WLAN TESTING

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Report No: SRTC2018-9004(F)-18072401(F)

Product Name: Mobile Phone

Product Model: Hisense U965

Applicant: Hisense International Co., Ltd.

Manufacturer: Hisense Communications Co., Ltd.

Specification: FCC Part 15, Subpart C (2018)

FCC ID: 2ADOBU965

The State Radio\_monitoring\_center Testing Center (SRTC)

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## **1. GENERAL INFORMATION**

### **1.1 Notes of the test report**

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The test results relate only to individual items of the samples which have been tested.

### **1.2 Information about the testing laboratory**

Company:	The State Radio_monitoring_center Testing Center (SRTC)
Address:	15th Building, No.30 Shixing Street, Shijingshan District, P.R.China
City:	Beijing
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### **1.3 Applicant's details**

Company:	Hisense International Co., Ltd.
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City:	Qingdao
Country or Region:	China
Contacted person:	Geng Ruifeng
Tel:	+86-532-80877742
Fax:	---
Email:	gengruifeng@hisense.com

### **1.4 Manufacturer's details**

Company:	Hisense Communications Co., Ltd.
Address:	218 Qianwangang Road, Qingdao Economic & Technological Development Zone, Qingdao, China
City:	Qingdao
Country or Region:	China
Contacted person:	Dai Qingtao
Tel:	+86-532-55753749
Fax:	---
Email:	daiqingtao@hisense.com

## 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2018-07-24
Testing Start Date:	2018-04-23
Testing End Date:	2018-08-06

Environmental Data:	Temperature (°C)	Humidity (%)
Ambient	25	30

Normal Supply Voltage (V d.c.):	3.80
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## 2 DESCRIPTION OF THE DEVICE UNDER TEST

### 2.1 Final Equipment Build Status

Frequency Band	2.412GHz~2.462GHz
Number of Channel For 20MHz	11
Modulation Type	DBPSK/DQPSK/CCK/BPSK/QPSK/16QAM/64QAM
Duplex Mode	TDD
Channel Spacing	5MHz
Data Rate	1Mbps/2Mbps/5.5Mbps/11Mbps/6Mbps/9Mbps/12Mbps /18Mbps/24Mbps/36Mbps/48Mbps/54Mbps/6.5Mbps /13.0Mbps/13.5Mbps/19.5Mbps/26.0Mbps/27.0Mbps /39.0Mbps/40.5Mbps/52.0Mbps/58.5Mbps/65Mbps
Duty Cycles	98%
Power Supply	Battery/Charger
Rated Power Supply Voltage	3.80
HW Version	YK737_V3.0
SW Version	Hisense_U965_40_S01_20180529
IMEI	867694031290622
Antenna type	Refer to Note
Antenna connector	Refer to Note

**Note:**

The antenna provide to the EUT, please refer to the following table:

Brand	Model	Antenna gain	Frequency range(GHz)	Antenna type	Connecter Type
N/A	N/A	-1.7Bi	2.402GHz~2.480GHz	Fixed Internal Antenna	N/A

Manufacturers ensure that their designs will not be modified by the user or third parties arbitrary antenna parameters and performance.

## 2.2 Description of Test Modes

11 channels are provided to this EUT:

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

### 2.2.1 Test Mode Applicability and Tested Channel Detail

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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	6	DBPSK/ BPSK	1,6,6.5

### 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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	6	DBPSK/ BPSK	1,6,6.5

### 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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	6	DBPSK	1

### Antenna Port Conducted Measurement:

This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

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.

AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TYPE	DATA RATE (Mbps)
1 to 11	1,3, 6,9, 11	DBPSK/ BPSK	1,6,6.5

### 2.3 Duty Cycle of Test Signal

Modulation Type	Data Rate	Duty Cycle	Correction factor
11b	1Mbps	98.9%	N/A
11g	6Mbps	93.9%	0.27dB
11n(HT20)	6.5Mbps	93.4%	0.30dB

Duty cycle of test signal is > 98 %, duty factor shall not be considered.

Correction factor =  $10 * \log (1/\text{duty cycle})$

## 2.4 EUT Operating conditions

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

The following support equipment was used to exercise the DUT during testing:

Equipment	Charger
Manufacturer	Shenzhen Tianyin Electronics Co.,Ltd
Model Number	TPA-97050100UU
Serial Number	---

Equipment	Battery
Manufacturer	Guangdong Teamgiant New Energy Tech Co.,LTD
Model Number	LIW38210A
Serial Number	---

Note: The products are different on the supplier of LCD/TP/Camera/Flash. The test results of variant product derive from original product Report No.: SRTC2018-9004(F)-18042301(F).

### Main Supply

Part Name	Model Name	Supplier
LCD	ST7701S	JIANGXI HOLITECH TECHNOLOGY CO., LTD
TP	FT6336U	JIANGXI HOLITECH TECHNOLOGY CO., LTD
Camera	GC5025/GC8034	Shenzhen Chengxiangtong technology CO.,LTD
Flash	KMFN60012M-B214	SAMSUNG

### Secondary Supply

Part Name	Model Name	Supplier
LCD	ST7701S-G5	Shenzhen Digital Technology Co., LTD
TP	FT6336U	Guizhou Yuye Opto-Electronic Co., Ltd
Camera	GC5025/GC8034	Shenzhen Union Image Co.,Ltd
Flash	08EMCP08-EL3DT227	KINGSTON

### **3 REFERENCE SPECIFICATION**

Specification	Version	Title
15.35	2018	Measurement detector functions and bandwidths.
15.209	2018	Radiated emission limits; general requirements.
15.247	2018	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
15.203	2018	Antenna requirement
ANSI C63.10	2013	Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074	April 5, 2017	GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247

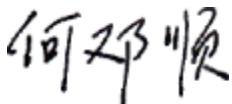
## **4 KEY TO NOTES AND RESULT CODES**

The following are the definition of the test result.

Code	Meaning
PASS	Test result shows that the requirements of the relevant specification have been met.
FAIL	Test result shows that the requirements of the relevant specification have not been met.
N/T	Test case is not tested.
NTC	Nominal voltage, Normal Temperature
HV	High voltage, Normal Temperature
LV	Low voltage, Normal Temperature
HTHV	high voltage, High Temperature
LTHV	High voltage, Low Temperature
HTLV	Low voltage, High Temperature
LTLV	Low voltage, Low Temperature

## 5 RESULT SUMMARY

No.	Test case	Reference	Verdict
1	Peak Power Output	15.247(a)(2)	Pass
2	Occupied Bandwidth	15.247(b)(3) )	Pass
3	Transmitter Power Spectral Density	15.247(e) )	Pass
4	Conducted Out of band emission measurement	15.247(d)	Pass
5	Band Edge	15.247(d)	Pass
6	Spurious Radiated Emissions	15.247(d)/15.35(b)/15.209	Pass
7	AC Power line Conducted Emission	15.207	Pass
8	Antenna requirement	15.203	Pass (refer to section 2.1)

This Test Report Is Issued by: Mr. Peng Zhen 	Checked by: Mr. Li Bin 
Tested by: Mr. He Dengshun 	Issued date: 20180806

## **6 TEST RESULT**

### **6.1 Peak Power Output**

#### **6.1.1 Ambient condition**

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

#### **6.1.2 Test Description**

A transmitter antenna terminal of EUT is connected to the power meter. Measurement is made using a broadband power meter capable of making peak and average measurements while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies.

#### **6.1.3 Test limit**

FCC Part15.247(b)(3)

The maximum permissible conducted output power is 1 Watt.

Used conversion factor: Limit (dBm) = 10 log (Limit (W)/1mW)

==> Maximum Output Power: 30.0 dBm

#### **6.1.4 Test Procedure Used**

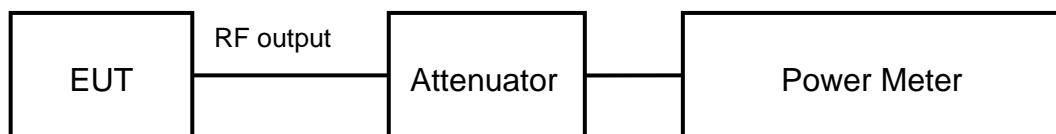
KDB 558074 D01 DTS Meas Guidance v04 - Section 9.1.3

#### **6.1.5 Test Settings**

The maximum peak conducted output power may be measured using a broadband peak RF power meter. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector.

#### **6.1.6 Test Setup**

The EUT and measurement equipment were set up as shown in the diagram below.



#### **6.1.7 Test result**

The test results are shown in Appendix A .

## 6.2 Occupied Bandwidth

### 6.2.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.2.2 Test Description

The bandwidth at 6dB down from the highest in-band spectral density is measured with a spectrum analyzer and Bluetooth test set via a power splitter with a known loss. Which connected to the transmitter antenna terminal of the EUT while the EUT is operating at maximum power and at the appropriate frequencies. All modes of operation were investigated and the worst case configuration results are reported in this section.

### 6.2.3 Test limit

FCC Part15.247(a)(2)

The minimum permissible 6dB bandwidth is 500 kHz

### 6.2.4 Test Procedure Used

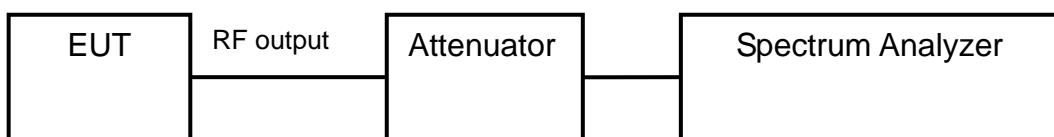
KDB 558074 D01 DTS Meas Guidance v04 - Section 8.1 Option 1

### 6.2.5 Test Settings

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

### 6.2.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.2.7 Test result

The test results are shown in Appendix A.

## 6.3 Transmitter Power Spectral Density

### 6.3.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.3.2 Test Description

The peak power density is measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated and the worst case configuration results are reported in this section.

### 6.3.3 Test limit

FCC Part15.247(e)

The maximum permissible power spectral density is 8.0 dBm in any 3 kHz band.

### 6.3.4 Test Procedure Used

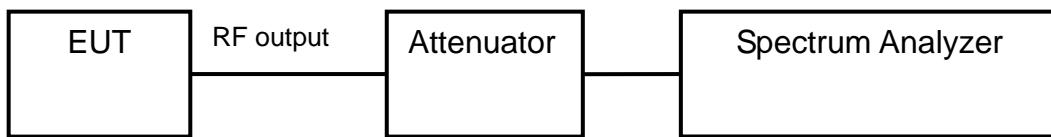
KDB 558074 D01 DTS Meas Guidance v04 Section 10.2.

### 6.3.5 Test Settings

- a) Set analyzer center frequency to DTS channel center frequency.
- b) Set the span to 1.5 times the DTS bandwidth.
- c) Set the RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .
- d) Set the VBW  $\geq 3 \times \text{RBW}$ .
- e) Detector = peak.
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level within the RBW.
- j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 6.3.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.



### 6.3.7 Test result

The test results are shown in Appendix A.

## 6.4 Conducted Out of band emission measurement

### 6.4.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.4.2 Test Description

All out of band emissions are measured with a spectrum analyzer connected to the antenna terminal of the EUT while the EUT is operating at its maximum duty cycle (>98%), at maximum power, and at the appropriate frequencies. All data rates were investigated to determine the worst case configuration.

### 6.4.3 Test limit

FCC Part 15.247(d)

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

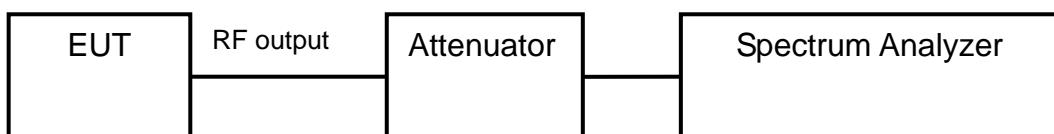
### 6.4.4 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v04 Section 11.3

### 6.4.5 Test Settings

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100kHz.
- c) Set the VBW  $\geq$  300kHz.
- d) Detector = peak.
- e) Set span to encompass the spectrum to be examined
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level.

### 6.4.6 Test Setup



### 6.4.7 Test result

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.

The test results are shown in Appendix A.

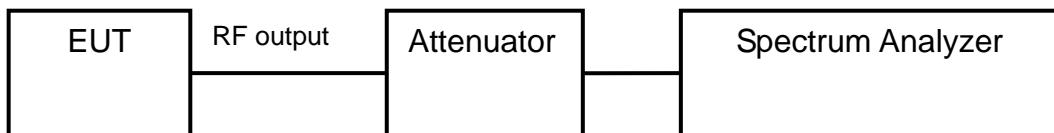
## 6.5 Band-edge measurement

### 6.5.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.5.2 Test Description

For the following out of band conducted spurious emissions plots, the EUT was set to transmit at maximum power with the largest packet size available. The worst case spurious emissions were found in this configuration.



### 6.5.3 Test limit

Part 15.247(d)

The limit for out-of-band spurious emissions at the band edge is 20dB below the fundamental emission level, as determined from the in-band power measurement of the DTS channel performed in a 100 kHz bandwidth.

### 6.5.4 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v04 Section 12.1

### 6.5.5 Test Settings

- a) Set the center frequency and span to encompass frequency range to be measured.
- b) Set the RBW = 100kHz.
- c) Set the VBW  $\geq$  300kHz.
- d) Detector = peak.
- e) Set span to encompass the spectrum to be examined
- f) Sweep time = auto couple.
- g) Trace mode = max hold.
- h) Allow trace to fully stabilize.
- i) Use the peak marker function to determine the maximum amplitude level.

### 6.5.6 Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

### 6.5.7 Test result

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. The test results are shown in Appendix A .

## 6.6 Spurious Radiated Emissions

### 6.6.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.6.2 Test Description

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

### 6.6.3 Test limit

Part15.205, 15.209, 15.247(d)

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in below Table per Section 15.209.

Frequency [MHz]	Field strength [ $\mu\text{V/m}$ ]	Measured 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

### Radiated Limits

Part15.35(b):

there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit

**Used conversion factor: Limit ( $\text{dB}\mu\text{V/m}$ ) = 20 log (Limit ( $\mu\text{V/m}$ )/1 $\mu\text{V/m}$ )**

Frequency [MHz]	Detector	Unit ( $\text{dB}\mu\text{V/m}$ )
30~88	Quasi-peak	40.0
88~216	Quasi-peak	43.5
216~960	Quasi-peak	46.0
960~1000	Quasi-peak	54.0
1000~5th harmonic of the highest frequency or 40GHz, whichever is lower	Average	54.0
	Peak	74.0

### Conversion Radiated limits

#### 6.6.4 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v04 - Section 12.2.7

##### For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Both X and Y axes of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case 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 Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

##### NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

##### For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

##### For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the

---

emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Average detection (AV) at frequency above 1GHz. If duty cycle of test signal is < 98%, the duty factor need added to measured value.
4. All modes of operation were investigated and the worst-case emissions are reported.

### 6.6.5 Test Settings

#### Average Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz > 1/T
4. Averaging type was set to RMS to ensure that video filtering was applied in the power domain
5. Detector = peak
6. Sweep time = auto
7. Trace mode = max hold
8. Trace was allowed to run for at least 50 times (1/duty cycle) traces

#### Peak Field Strength Measurements per Section 12.2.7 of KDB 558074 (Part 15.35)

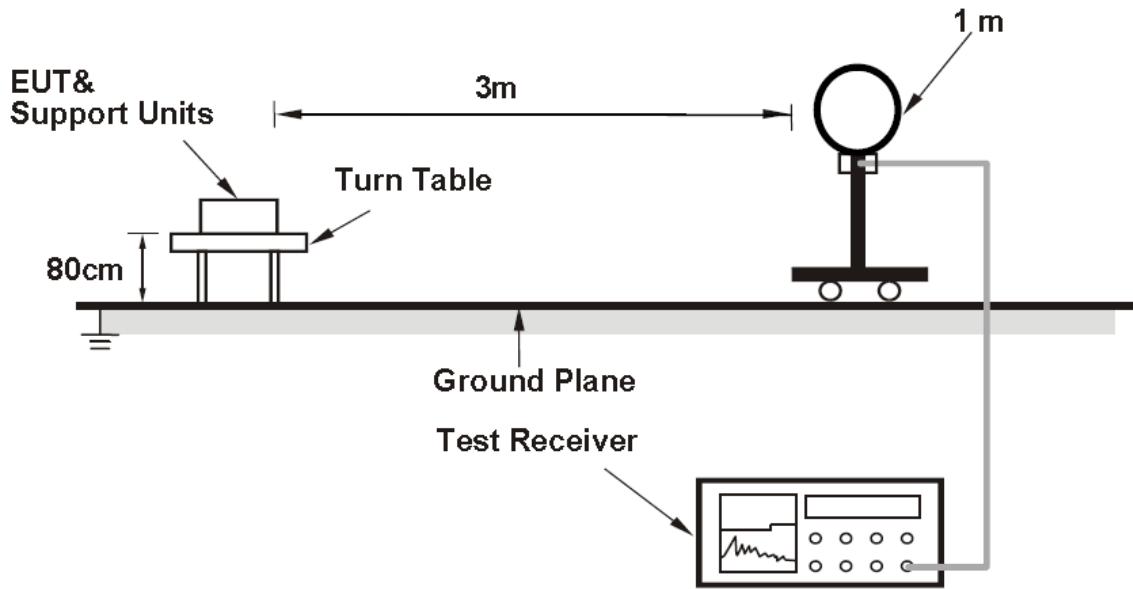
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

Frequency	RBW
9-150kHz	200-300Hz
0.15-30MHz	9-10kHz
30-1000MHz	100-120kHz
>1000MHz	1MHz

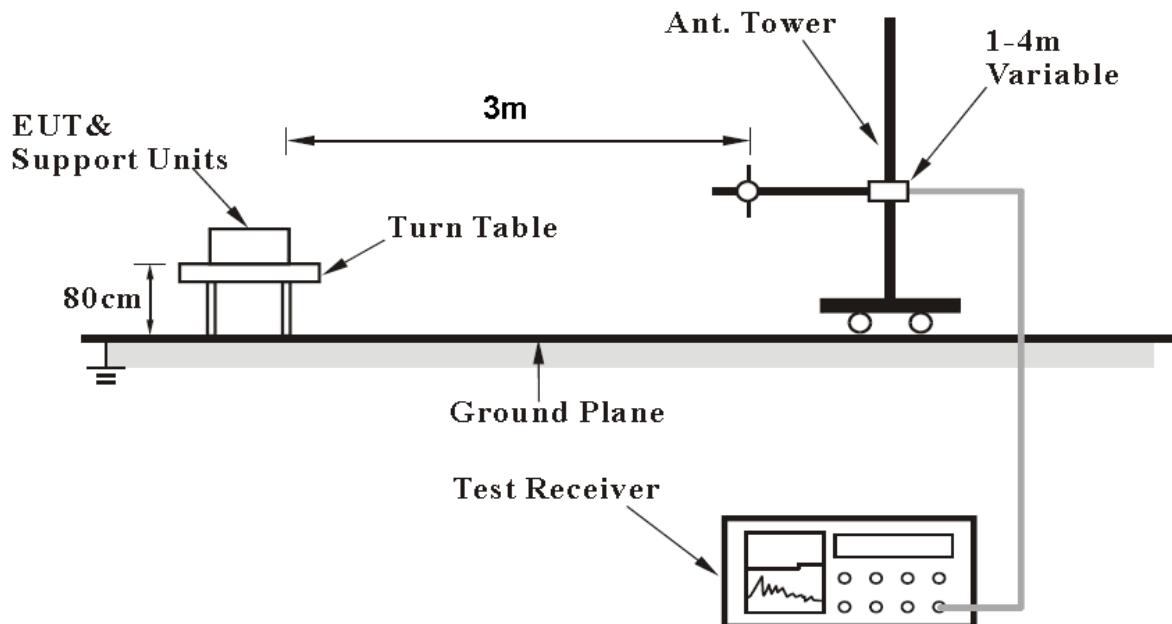
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.6.6 Test Setup

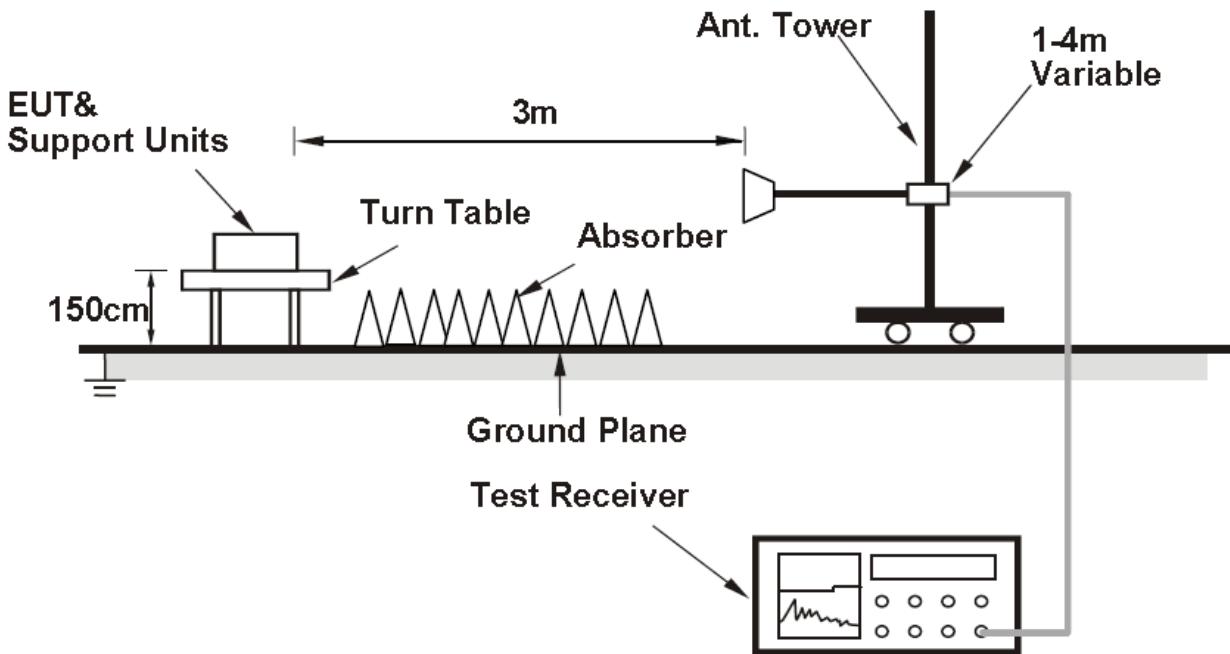
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



### For Radiated emission above 1GHz



#### 6.6.7 Test result

The test results are shown in Appendix B.

## 6.7 AC Power line Conducted Emission

### 6.7.1 Ambient condition

Temperature	Relative humidity	Pressure
22°C	40%	101.5kPa

### 6.7.2 Test limit

FCC Part15.207, RSS-247

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 *	56 to 46 *
	56	46
	60	50

\* Decreases with the logarithm of the frequency.

The measurement is made according to ANSI C63.10-2013

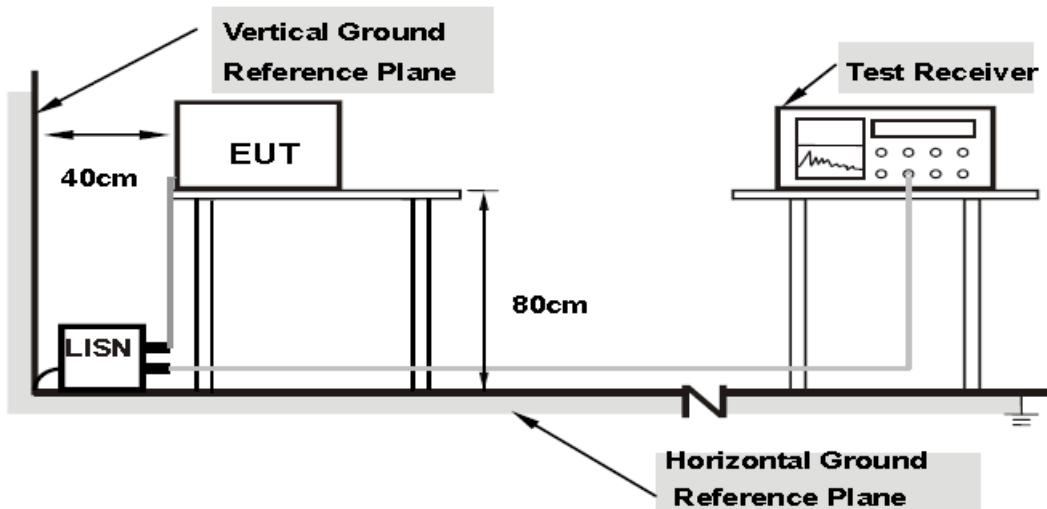
### 6.7.3 Test Procedures

- 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:** The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

The EUT shall test under the power AC120V/60Hz.

#### 6.7.4 Test Setup



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

#### 6.7.5 Test result

The test results are shown in AppendixB .

## 7 MEASUREMENT UNCERTAINTIES

Items	Uncertainty	
Occupied Bandwidth	3kHz	
Peak power output	0.67dB	
Band edge compliance	1.20dB	
Spurious emissions	30MHz~1GHz	2.83dB
	1GHz~12.75GHz	2.50dB
	12.75GHz~25GHz	2.75dB

## 8 TEST EQUIPMENTS

No.	Name/ Model	Manufacturer	S/N	Cal date	Cal Due date
1.	Spectrum Analyzer FSV	ROHDE&SCHWARZ	101065	2017.08.20	2018.08.19
2.	Power Meter E4416A	Agilent	MY52370013	2018.03.01	2019.02.28
3.	Power Sensor E9327A	Agilent	MY52420006	2018.03.01	2019.02.28
4.	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	----	----
5.	12.65m×8.03m×7.50m Fully-Anechoic Chamber	FRANKONIA	----	----	----
6.	Turn table Diameter:5m	HD	----	----	----
7.	Turn table Diameter:1m	HD	----	----	----
8.	Antenna master FAC(MA4.0)	MATURO	----	----	----
9.	Antenna master SAC(MA4.0)	MATURO	----	----	----
10.	9.080m×5.255m×3.525m Shielding room	FRANKONIA	----	----	----
11.	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100029	2017.08.20	2018.08.19
12.	HF 906 Double-Ridged Waveguide Horn Antenna	R&S	100030	2017.08.20	2018.08.19
13.	HL562 Ultra log antenna	R&S	100016	2017.08.20	2018.08.19
14.	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2017.08.20	2018.08.19
15.	ESI 40 EMI test receiver	R&S	100015	2017.08.20	2018.08.19
16.	ESCS30 EMI test receiver	R&S	100029	2017.08.20	2018.08.19
17.	ESH3-Z5 LISN	R&S	100020	2017.08.20	2018.08.19
18.	HFH2-Z2	R&S	100340	2017.08.20	2018.08.19

## APPENDIX A – TEST DATA OF CONDUCTED EMISSION

Please refer to the attachment.

## APPENDIX B – TEST DATA OF RADIATED EMISSION

Please refer to the attachment.

## APPENDIX A – TEST DATA OF CONDUCTED EMISSION

### Peak Power Output test result

Modulation type		Peak power output (dBm)		
		2412MHz	2437MHz	2462MHz
11b	1 Mbps	18.15	18.41	18.57
	2 Mbps	18.21	18.40	18.54
	5.5 Mbps	18.26	18.40	18.53
	11 Mbps	18.34	18.39	18.49
11g	6 Mbps	21.81	22.18	21.96
	9 Mbps	21.81	22.13	21.93
	12 Mbps	21.82	22.09	21.91
	18 Mbps	21.82	22.04	21.88
	24 Mbps	21.82	21.99	21.85
	36 Mbps	21.82	21.94	21.82
	48 Mbps	21.83	21.90	21.80
	54 Mbps	21.83	21.85	21.77
11n HT20	6.5 Mbps	21.86	21.84	21.99
	13 Mbps	21.74	21.76	21.88
	19.5 Mbps	21.61	21.68	21.77
	26 Mbps	21.49	21.60	21.66
	39 Mbps	21.37	21.53	21.55
	52 Mbps	21.25	21.45	21.44
	58.5 Mbps	21.12	21.37	21.33
	65 Mbps	21.00	21.29	21.22

Modulation type		Average power output (dBm)		
		2412MHz	2437MHz	2462MHz
11b	1 Mbps	15.74	16.09	16.17
	2 Mbps	15.81	16.07	16.16
	5.5 Mbps	15.85	16.05	16.16
	11 Mbps	15.94	16.02	16.15
11g	6 Mbps	14.64	14.89	14.88
	9 Mbps	14.29	14.54	14.54
	12 Mbps	13.94	14.18	14.21
	18 Mbps	13.59	13.83	13.87
	24 Mbps	13.24	13.48	13.54
	36 Mbps	12.89	13.13	13.20
	48 Mbps	12.54	12.77	12.87
	54 Mbps	12.19	12.42	12.53
11n HT20	6.5 Mbps	14.72	14.88	15.06
	13 Mbps	14.22	14.38	14.55
	19.5 Mbps	13.71	13.87	14.05
	26 Mbps	13.21	13.37	13.54
	39 Mbps	12.70	12.87	13.03
	52 Mbps	12.20	12.37	12.52
	58.5 Mbps	11.69	11.86	12.02
	65 Mbps	11.19	11.36	11.51

In order to find the worst case condition, Pre-tests are needed at the presence of different data rate. Data rate below means worst-case rate of each test item.

Worst-case data rates are shown as following table.

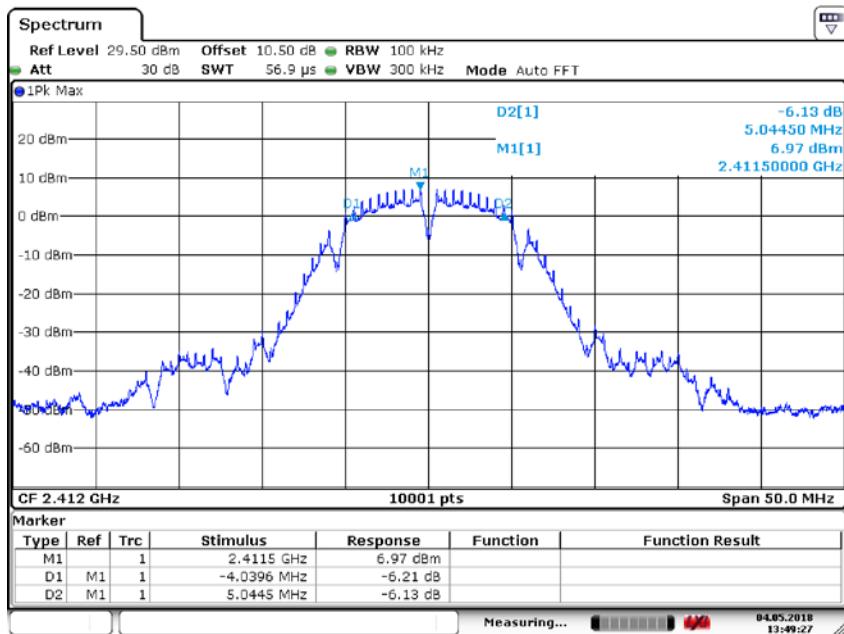
Test Mode	Data Rate
802.11b	1Mbps
802.11g	6Mbps
802.11n HT20	MCS0(6.5 Mbps)

## Occupied Bandwidth

Offset 10.5dB = Attenuator 10dB+ Temporary Ant connector loss 0.5dB

Test Mode: 802.11b

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	9084.1
2437	6	9084.0
2462	11	9094.1

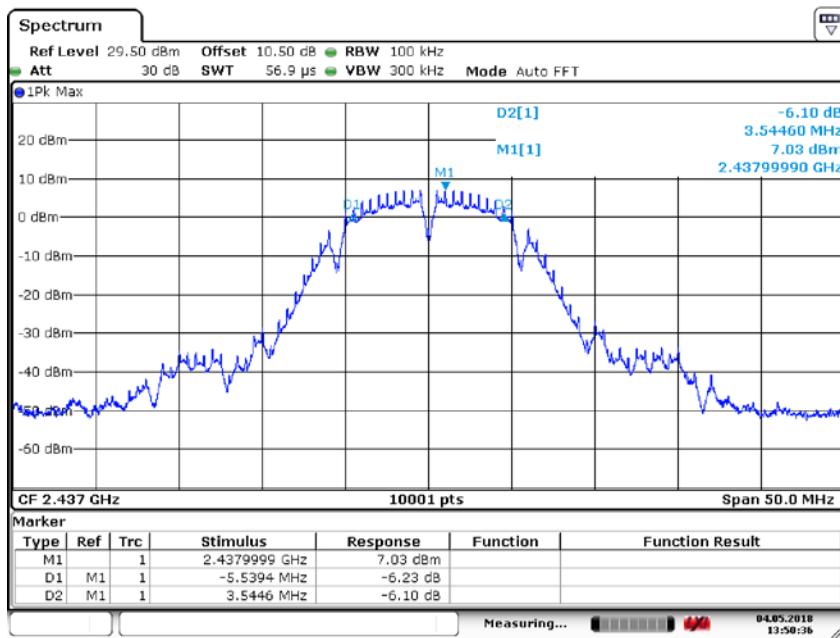


Date: 4.MAY.2018 13:49:27

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

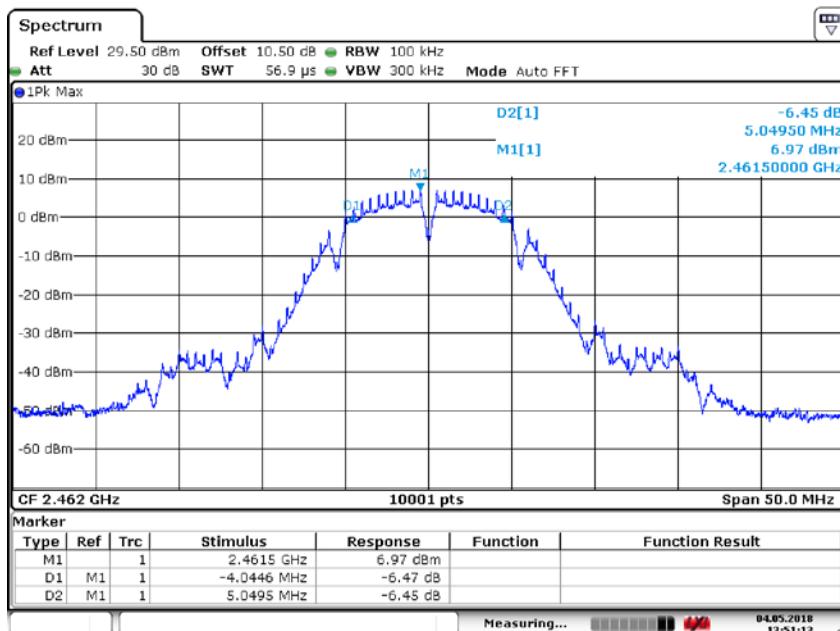


Date: 4.MAY.2018 13:50:36

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11b



Date: 4.MAY.2018 13:51:13

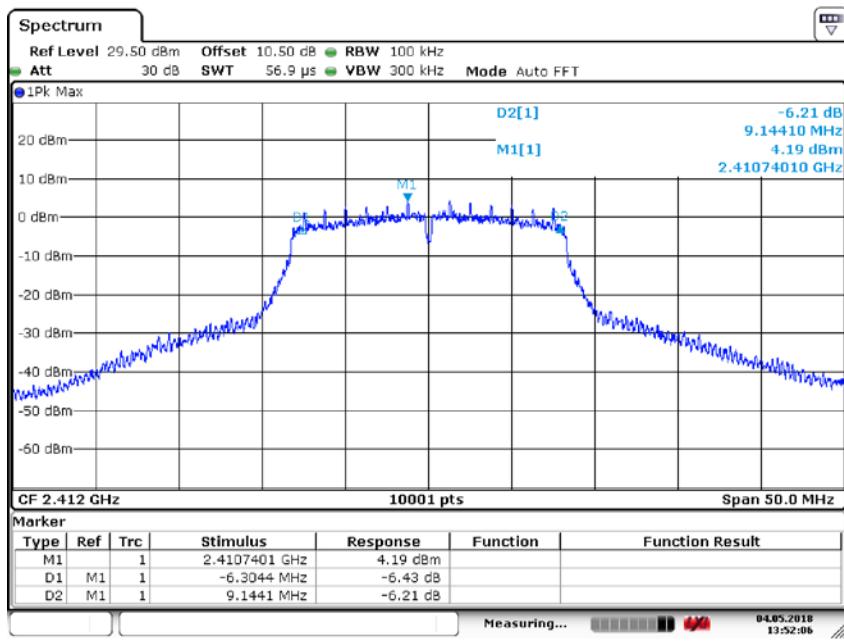
Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

## Test Mode: 802.11g

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	15448.5
2437	6	15448.5
2462	11	15323.5

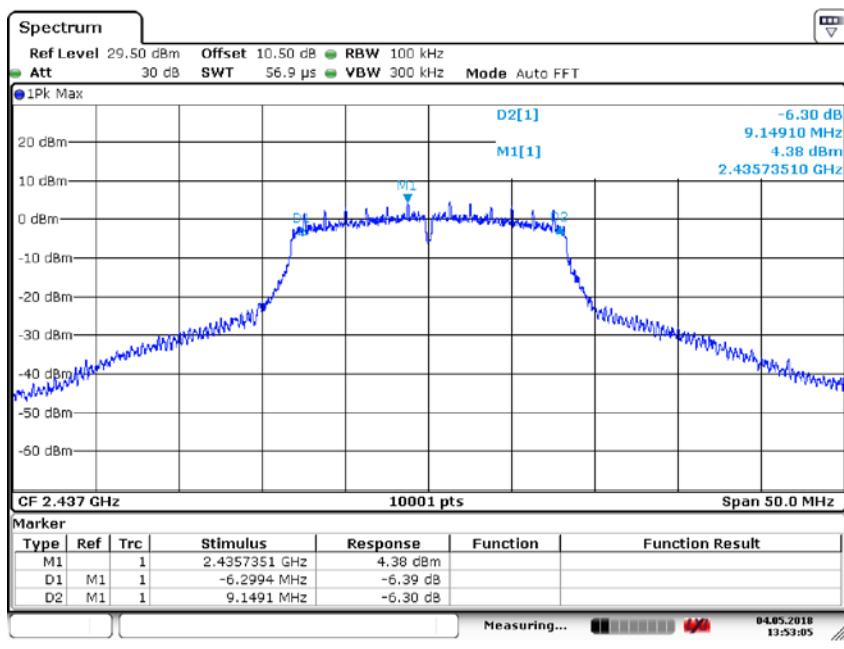


Date: 4.MAY.2018 13:52:06

Carrier frequency (MHz): 2412

Channel No.:1

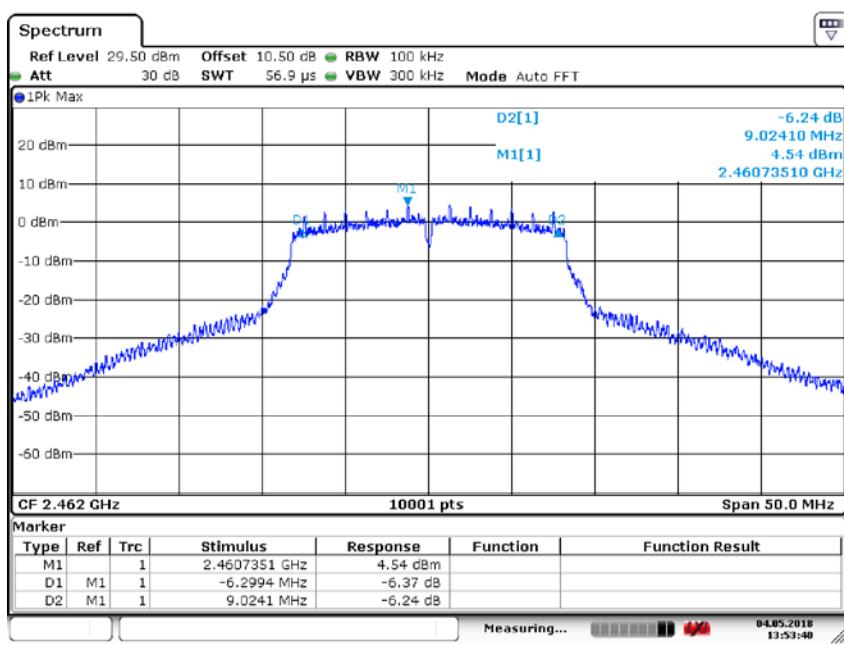
Test Mode: 802.11g



Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11g



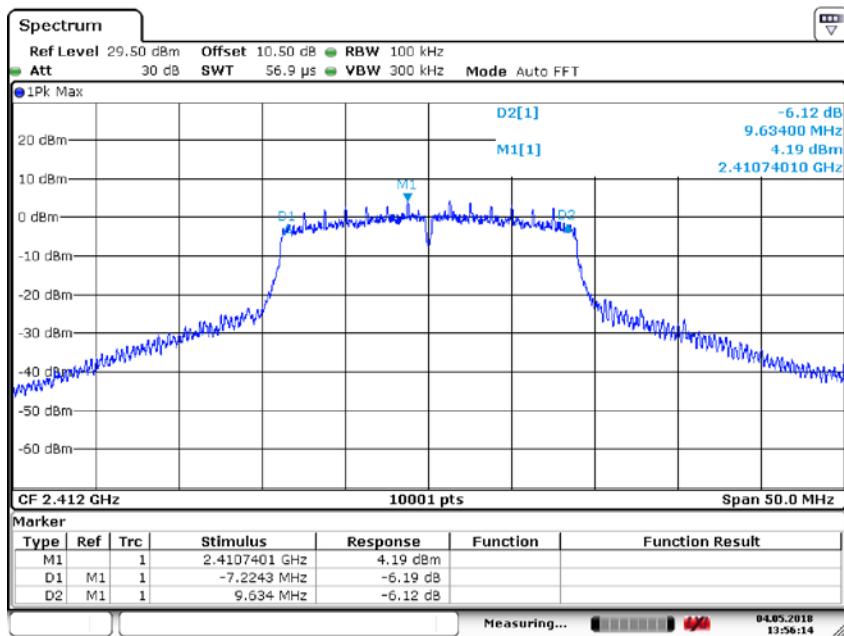
Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

## Test Mode: 802.11n (HT20)

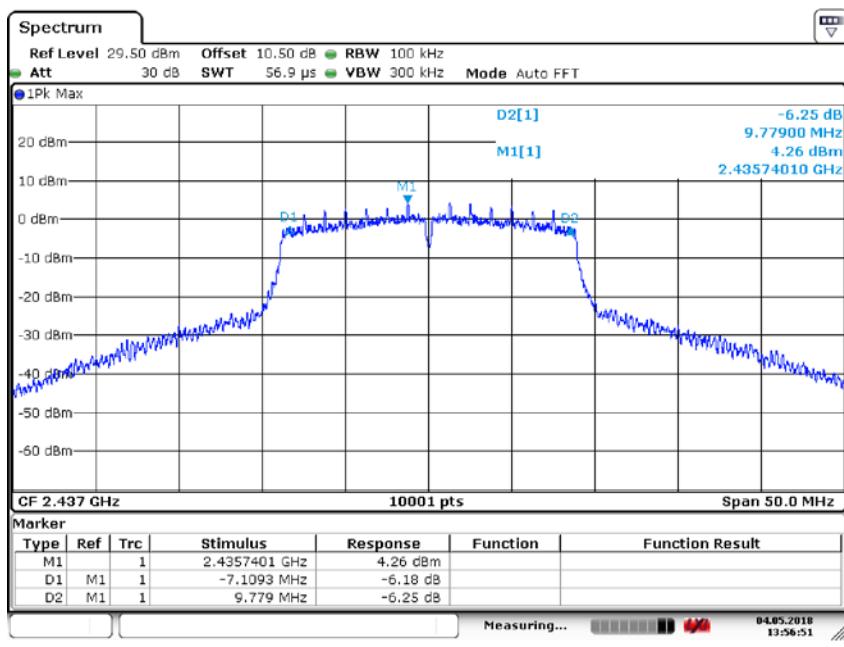
Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	16858.3
2437	6	16888.3
2462	11	16873.3



Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n (HT20)

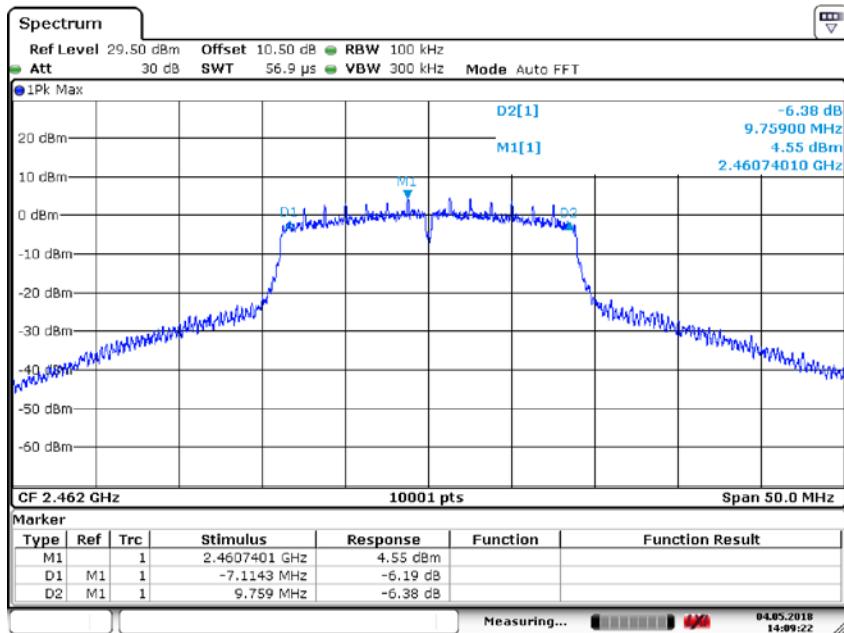


Date: 4.MAY.2018 13:56:51

Carrier frequency (MHz): 2437

Channel No.:6

Test Mode: 802.11n (HT20)



Date: 4.MAY.2018 14:09:22

Carrier frequency (MHz): 2462

Channel No.:11

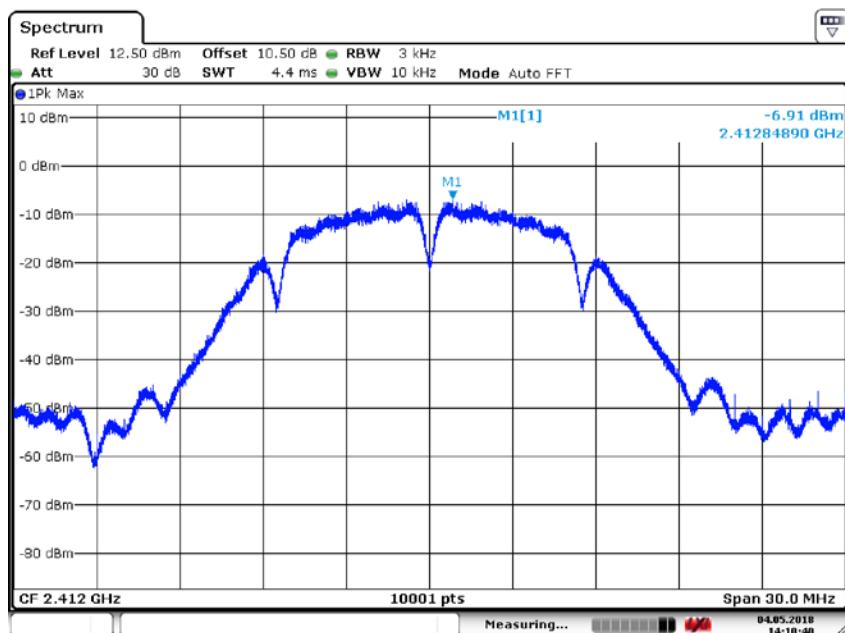
Test Mode: 802.11n (HT20)

## Transmitter Power Spectral Density

Offset 10.5dB = Attenuator 10dB+ Temporary Ant connector loss 0.5dB

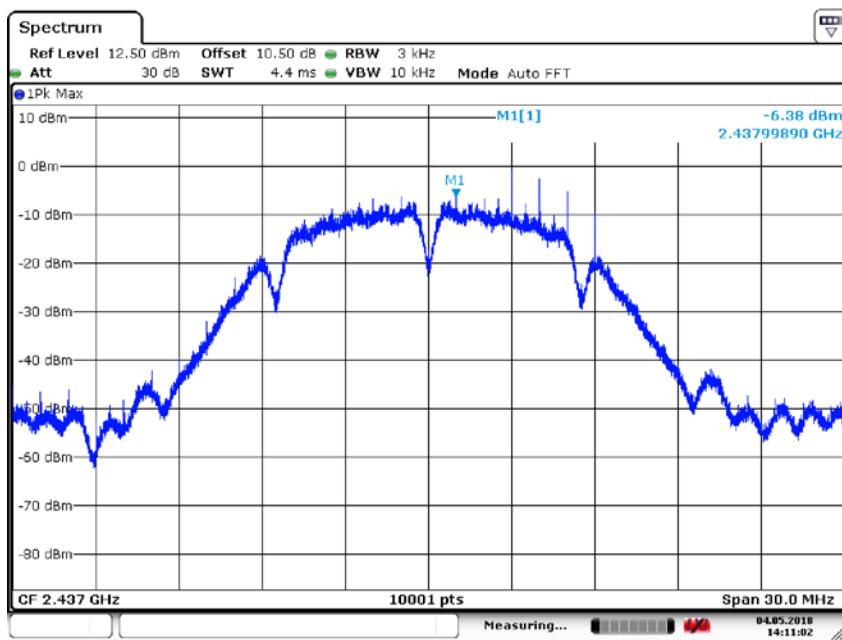
Test Mode: 802.11b

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-6.91
2437	6	-6.38
2462	11	-6.51



Date: 4.MAY.2018 14:10:40

Carrier frequency (MHz): 2412  
Channel No.1  
Test Mode: 802.11b

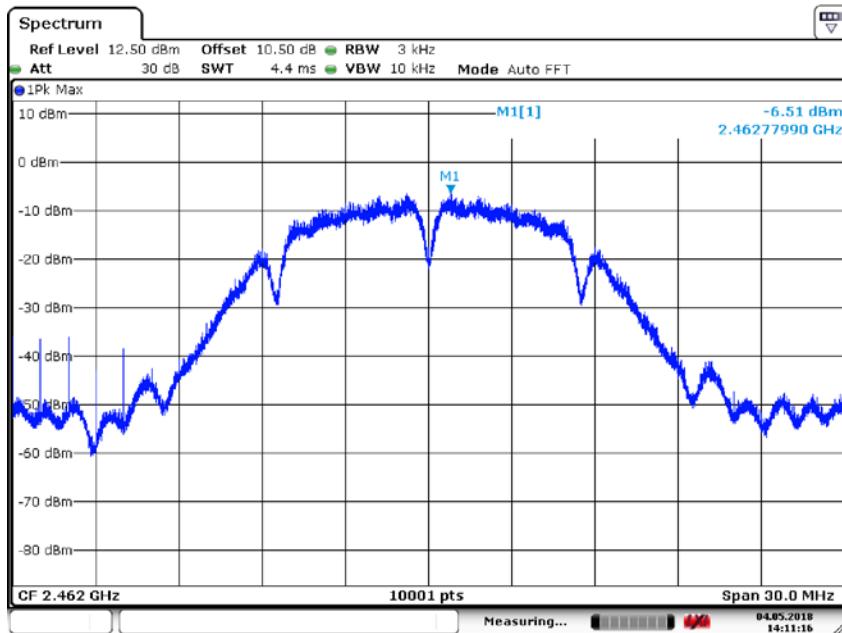


Date: 4.MAY.2018 14:11:01

Carrier frequency (MHz): 2437

Channel No.6

Test Mode: 802.11b



Date: 4.MAY.2018 14:11:16

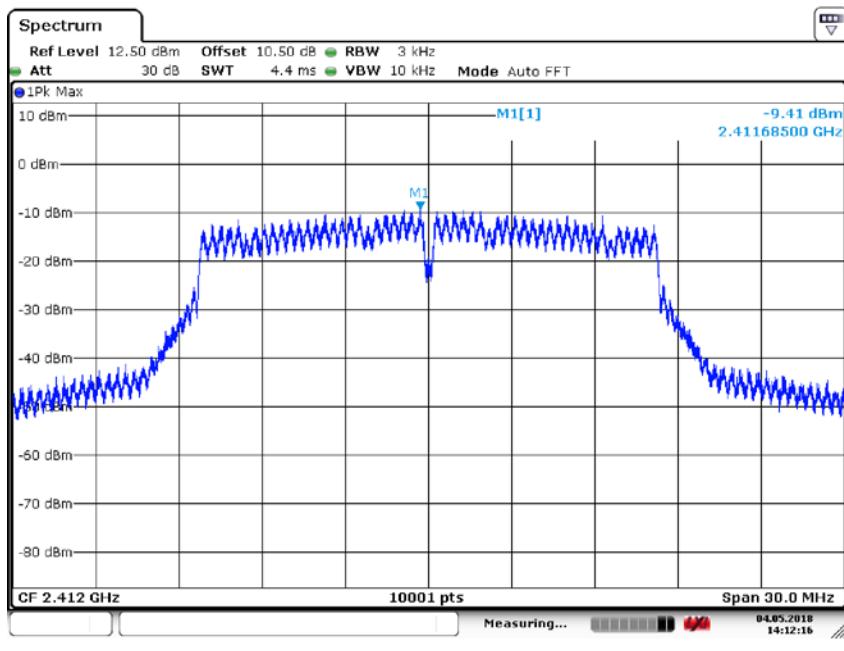
Carrier frequency (MHz): 2462

Channel No.11

Test Mode: 802.11b

Test Mode: 802.11g

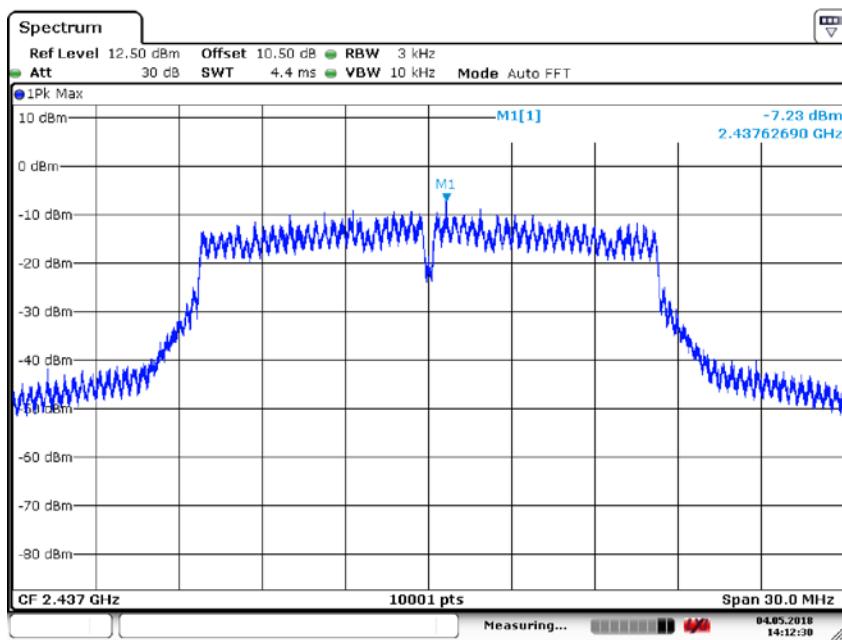
Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-9.41
2442	6	-7.23
2472	11	-9.38



Carrier frequency (MHz): 2412

Channel No.1

Test Mode: 802.11g

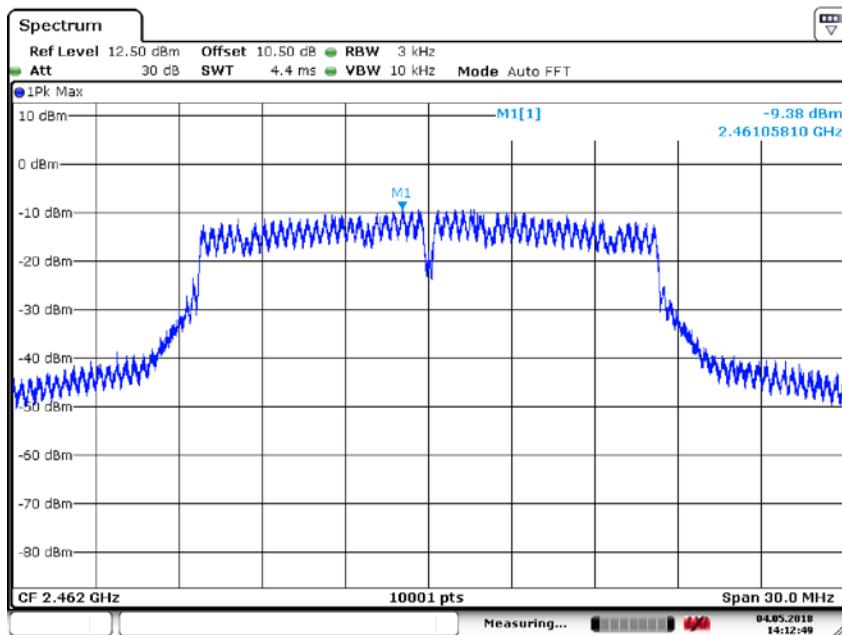


Date: 4.MAY.2018 14:12:30

Carrier frequency (MHz): 2437

Channel No.6

Test Mode: 802.11g



Date: 4.MAY.2018 14:12:48

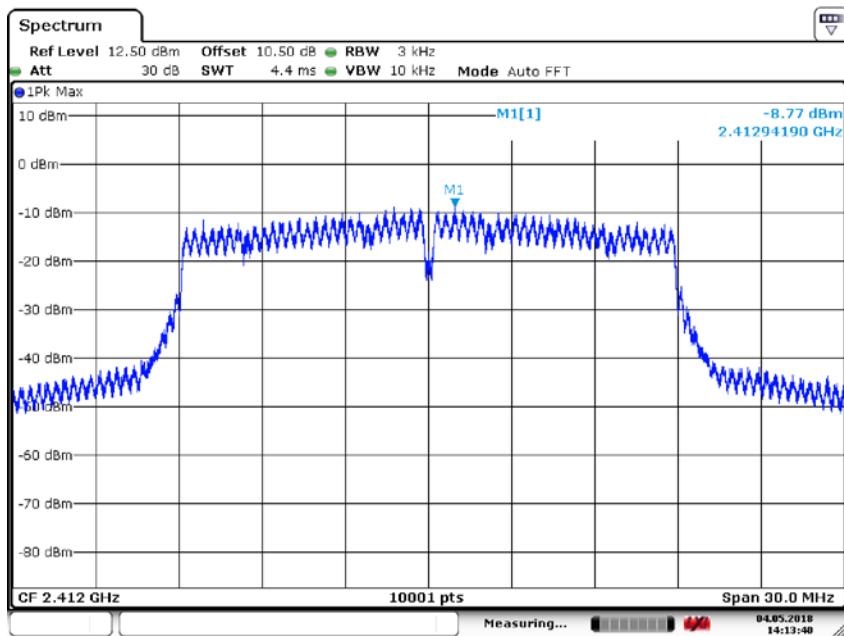
Carrier frequency (MHz): 2462

Channel No.11

Test Mode: 802.11g

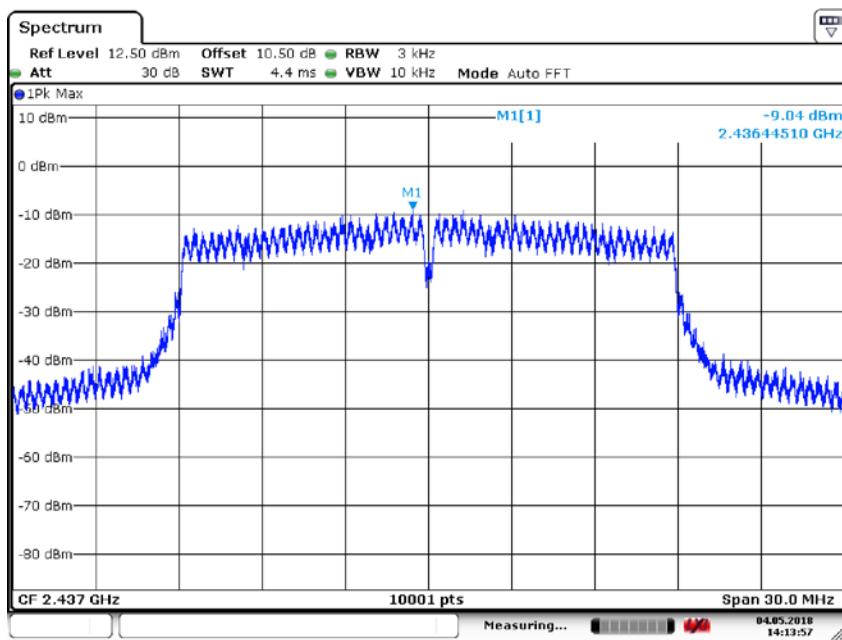
Test Mode: 802.11n (HT20)

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-8.77
2437	6	-9.04
2462	11	-9.85



Date: 4.MAY.2018 14:13:40

Carrier frequency (MHz): 2412  
 Channel No.1  
 Test Mode: 802.11n (HT20)

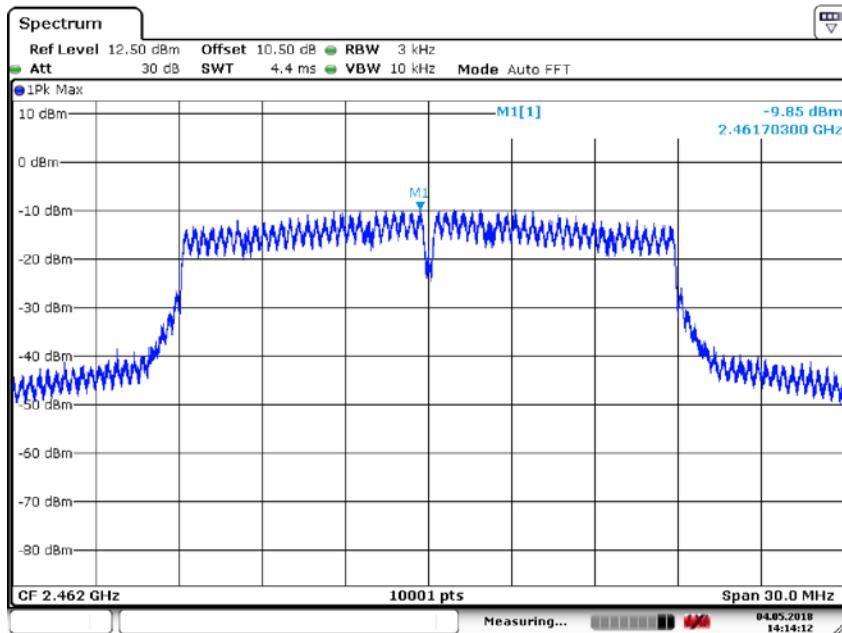


Date: 4.MAY.2018 14:13:57

Carrier frequency (MHz): 2437

Channel No.6

Test Mode: 802.11n (HT20)



Date: 4.MAY.2018 14:14:12

Carrier frequency (MHz): 2462

Channel No.11

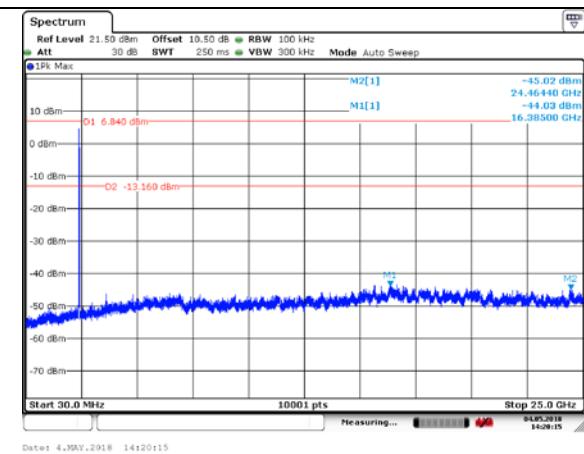
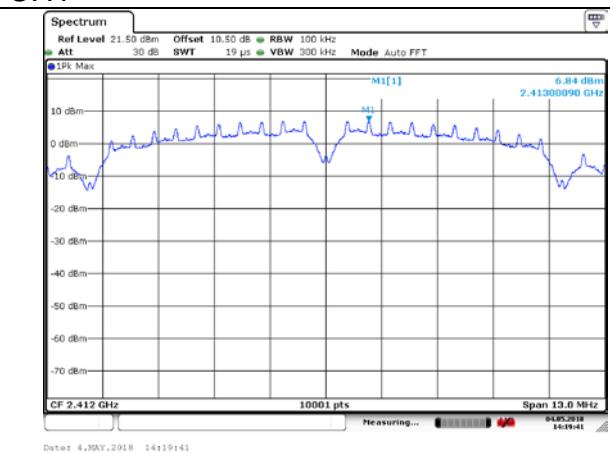
Test Mode: 802.11n (HT20)

## Conducted Out of band emission measurement

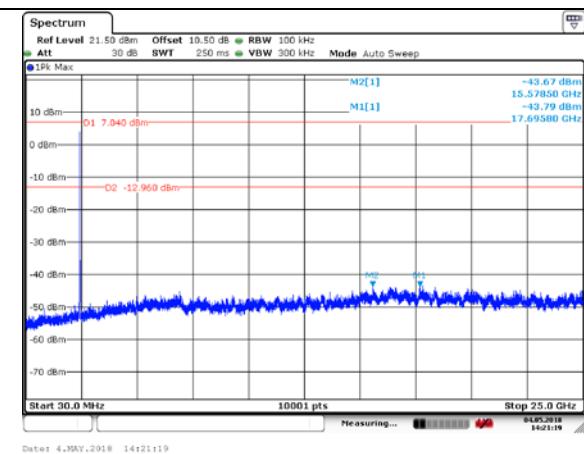
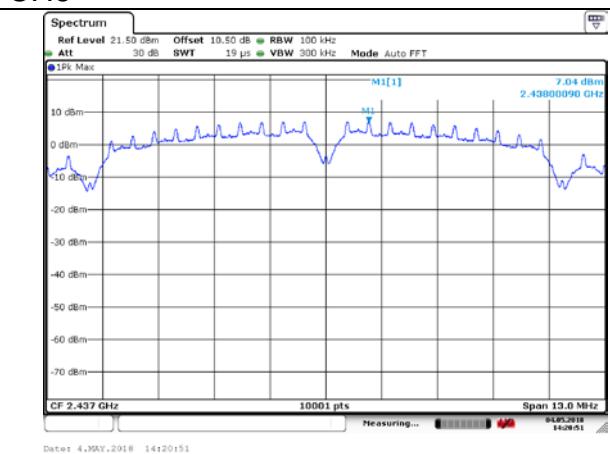
Offset 10.5dB = Attenuator 10dB+ Temporary Ant connector loss 0.5dB

802.11b

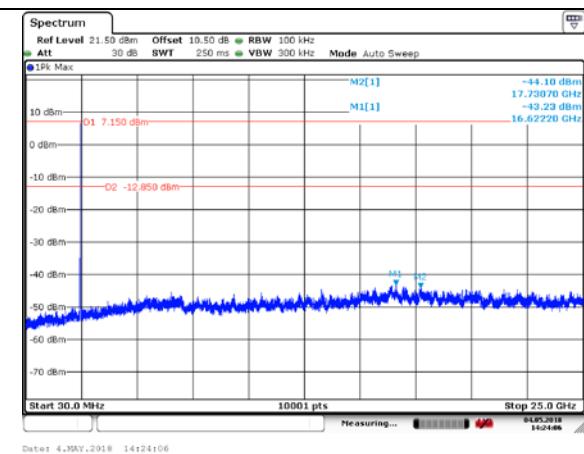
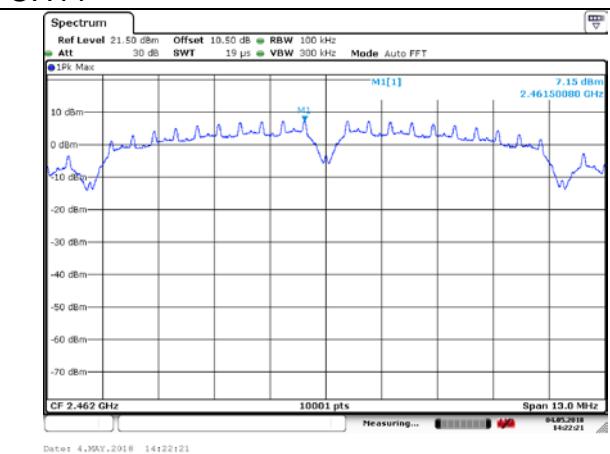
CH1



CH6

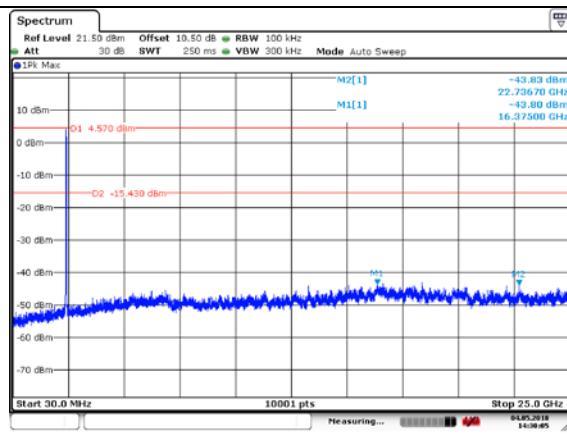
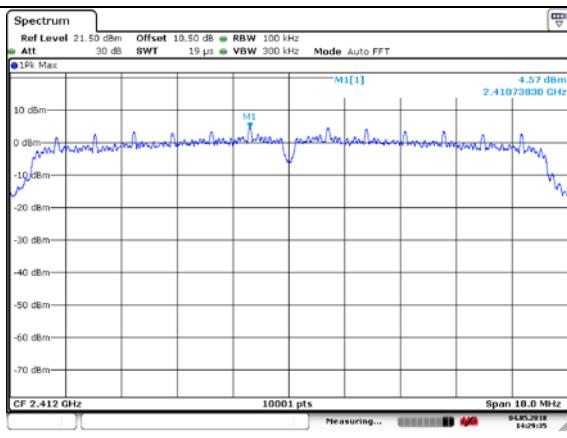


CH11

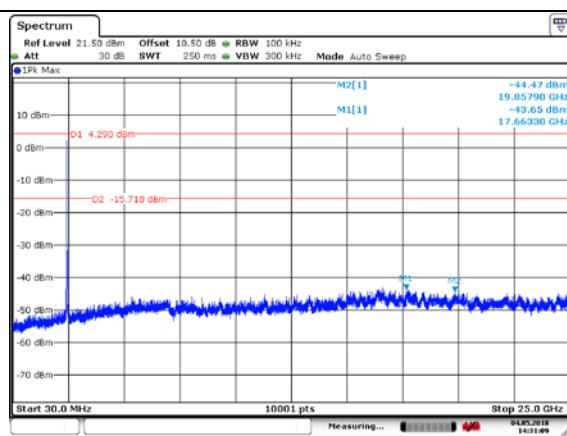
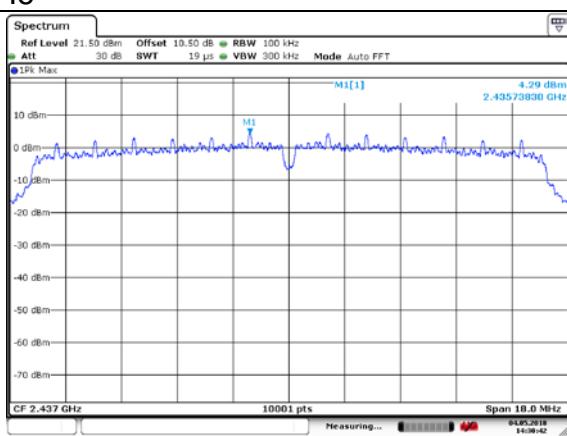


## 802.11g

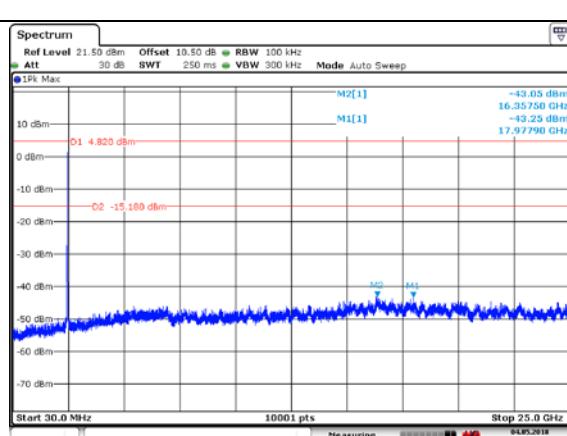
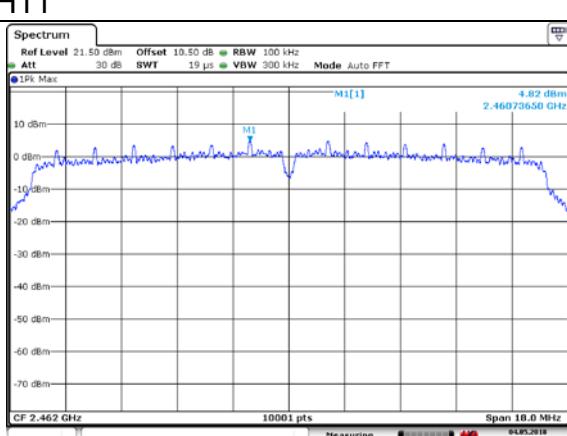
### CH1



### CH6

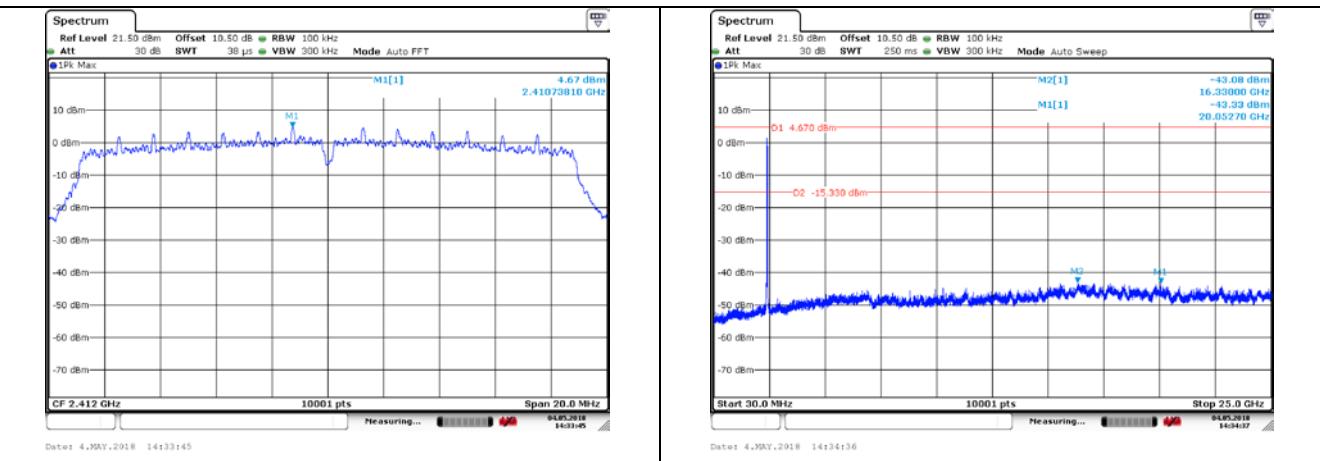


### CH11

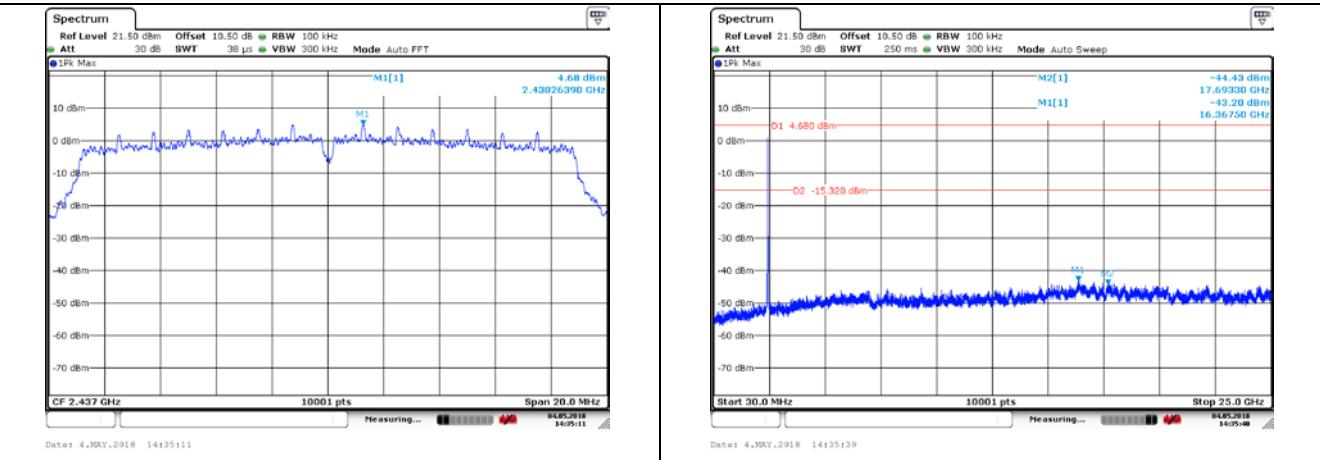


## 802.11n (20MHz)

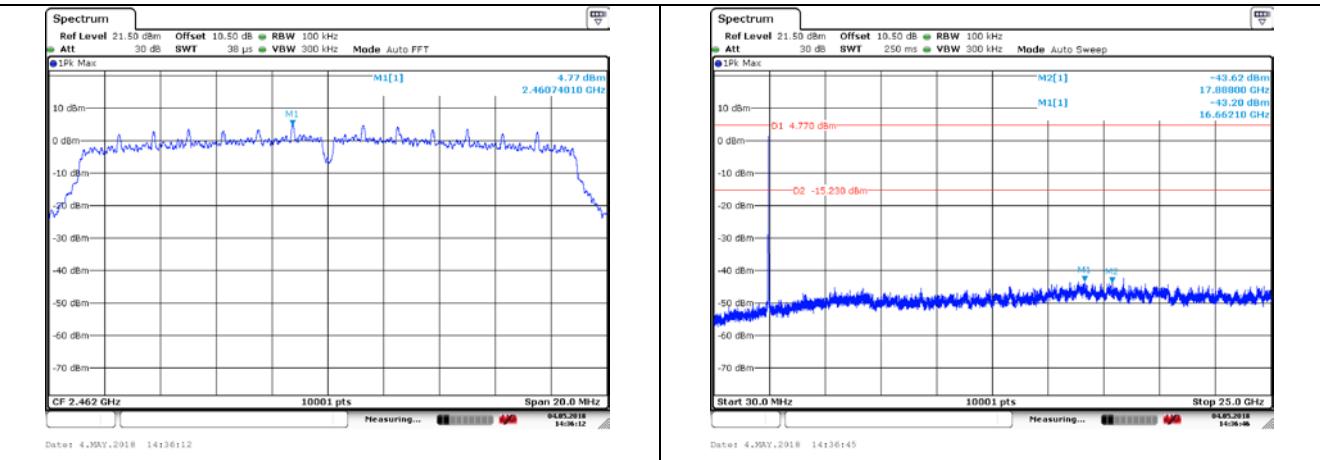
### CH1



### CH6



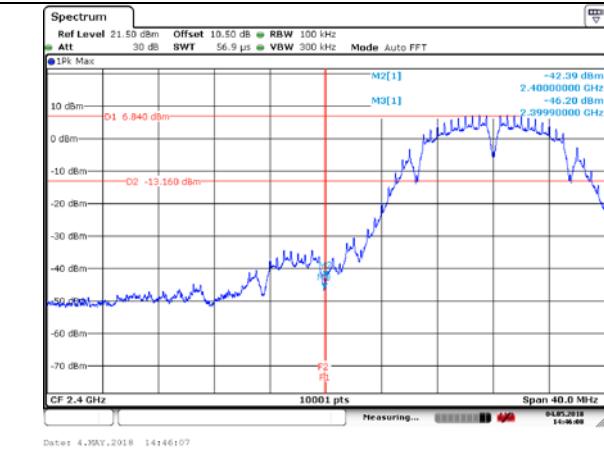
### CH11



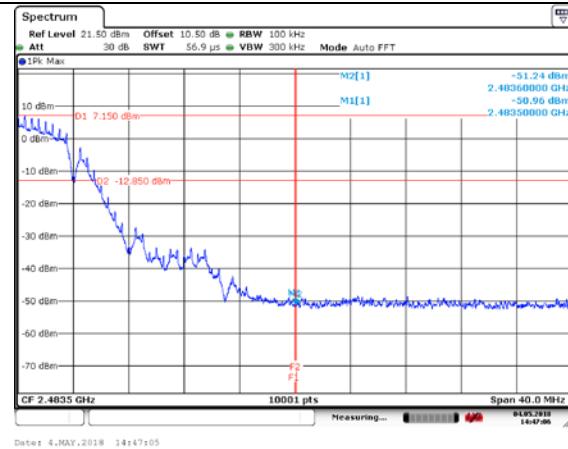
### Band edge measurement (RF Conducted measurement)

Offset 10.5dB = Attenuator 10dB+ Temporary Ant connector loss 0.5dB  
802.11b

CH1

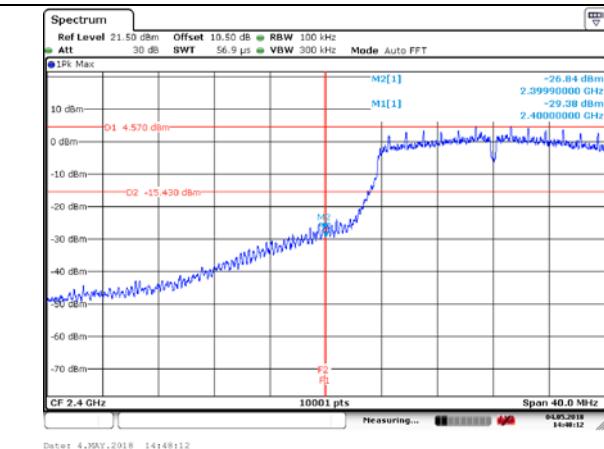


CH11

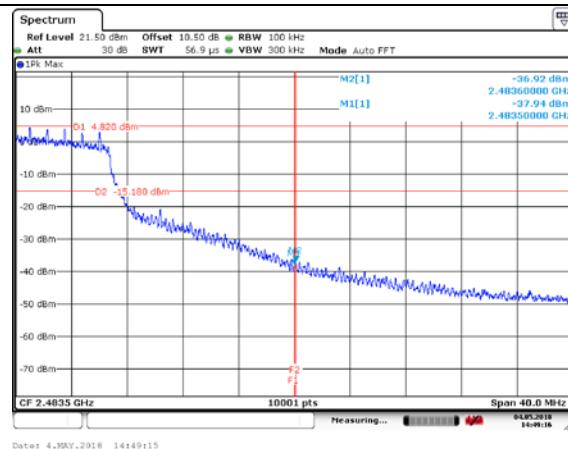


802.11g

CH1

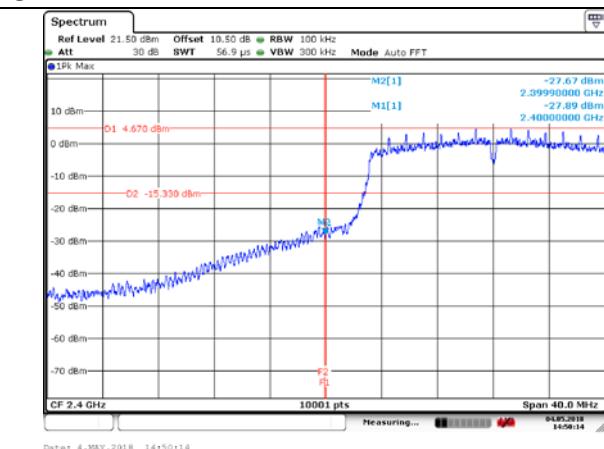


CH11

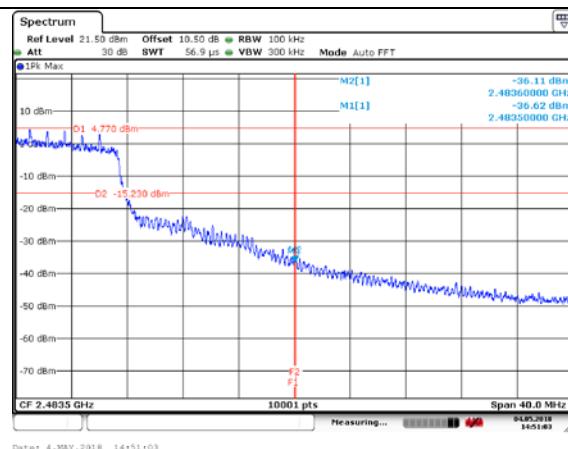


802.11n (20MHz)

CH1



CH11



## **APPENDIX B – TEST DATA OF RADIATED EMISSION**

### **Radiated Emission Band Edge**

#### Main Supply Test Result

The worst case attitude: The mobile lay down.

Peak detector: RBW=1MHz,VBW=3MHz,sweep time=200ms;

Average detector: RBW=1MHz,VBW=3MHz,sweep time=auto;

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	103.24	69.24	N/A	N/A	8.90	25.10
2	2390	47.31	13.31	-26.69	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	97.11	63.11	N/A	N/A	8.90	25.10
2	2390	45.58	11.58	-28.42	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.39	53.39	N/A	N/A	8.90	25.10
2	2390	37.05	3.05	-16.95	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.33	53.33	N/A	N/A	8.90	25.10
2	2390	36.38	2.38	-17.62	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	100.46	66.46	N/A	N/A	8.90	25.10
2	2483.5	51.06	17.06	-22.94	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	96.87	62.87	N/A	N/A	8.90	25.10
2	2483.5	43.56	9.56	-30.44	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	90.55	56.55	N/A	N/A	8.90	25.10
2	2483.5	36.85	2.85	-17.15	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	85.03	51.03	N/A	N/A	8.90	25.10
2	2483.5	36.61	2.61	-17.39	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	102.90	68.90	N/A	N/A	8.90	25.10
2	2390	48.46	14.46	-25.54	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	97.79	63.79	N/A	N/A	8.90	25.10
2	2390	45.12	11.12	-28.88	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.96	53.96	N/A	N/A	8.90	25.10
2	2390	36.66	2.66	-17.34	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.91	53.91	N/A	N/A	8.90	25.10
2	2390	35.85	1.85	-18.15	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	100.94	66.94	N/A	N/A	8.90	25.10
2	2483.5	47.25	13.25	-26.75	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	97.52	63.52	N/A	N/A	8.90	25.10
2	2483.5	45.55	11.55	-28.45	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.40	54.40	N/A	N/A	8.90	25.10
2	2483.5	36.37	2.37	-17.63	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	85.96	51.96	N/A	N/A	8.90	25.10
2	2483.5	36.49	2.49	-17.51	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	103.13	69.13	N/A	N/A	8.90	25.10
2	2390	47.09	13.09	-26.91	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	97.20	63.20	N/A	N/A	8.90	25.10
2	2390	45.10	11.10	-28.90	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	88.93	54.93	N/A	N/A	8.90	25.10
2	2390	37.63	3.63	-16.37	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	85.57	51.57	N/A	N/A	8.90	25.10
2	2390	35.77	1.77	-18.23	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	100.26	66.26	N/A	N/A	8.90	25.10
2	2483.5	47.98	13.98	-26.02	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	95.93	61.93	N/A	N/A	8.90	25.10
2	2483.5	43.43	9.43	-30.57	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	89.90	55.90	N/A	N/A	8.90	25.10
2	2483.5	35.81	1.81	-18.19	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	85.41	51.41	N/A	N/A	8.90	25.10
2	2483.5	35.42	1.42	-18.58	54.00	8.90	25.10

For 802.11b

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
30.161667	27.09	13.6	13.49	Vertical
41.518750	33.56	19.0	14.56	Vertical
43.014167	34.30	19.9	14.4	Vertical
70.012500	21.76	24.5	-2.74	Horizontal
110.510000	22.02	21.6	0.42	Vertical
171.498750	7.25	22.9	-15.65	Vertical
195.263750	16.82	22.6	-5.78	Vertical

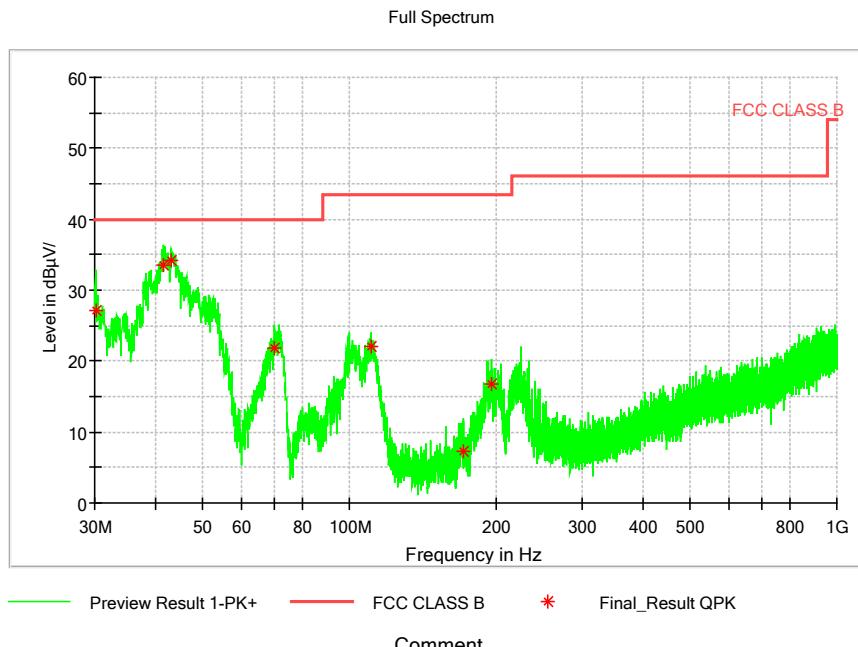
For 802.11g

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
31.172083	25.33	14.0	11.33	Vertical
41.357083	33.29	18.9	14.39	Vertical
42.690833	33.79	19.7	14.09	Vertical
48.147083	28.72	23.1	5.62	Vertical
70.457083	21.80	24.5	-2.7	Vertical
100.810000	22.03	21.9	0.13	Horizontal
171.458333	6.95	22.9	-15.95	Vertical

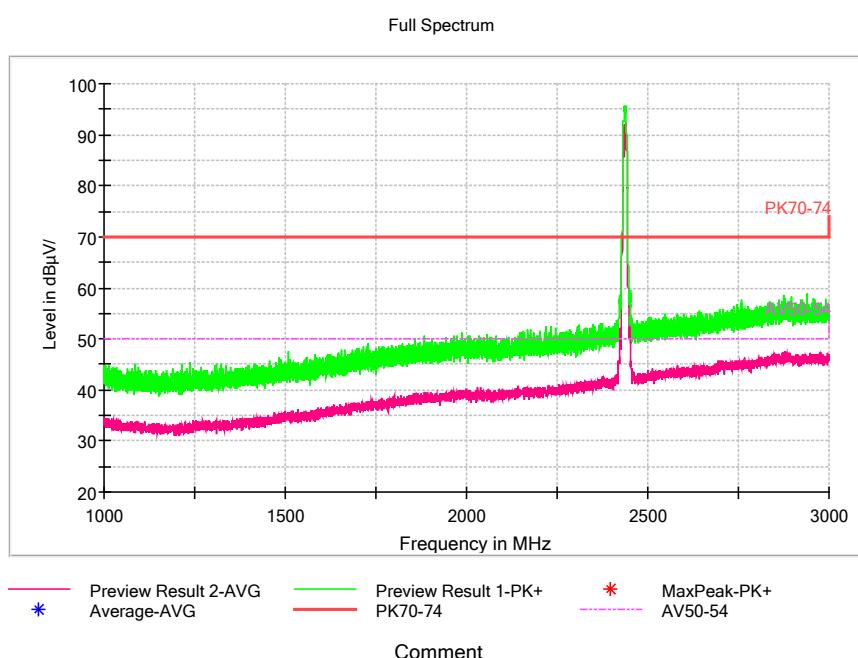
For 802.11n(HT20)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
30.000000	27.41	13.5	13.91	Vertical
38.770417	29.81	17.5	12.31	Vertical
41.882500	33.47	19.2	14.27	Horizontal
42.650417	33.71	19.7	14.01	Vertical
71.144167	22.43	24.5	-2.07	Vertical
100.365417	21.89	21.9	-0.01	Vertical
152.785833	4.47	23.2	-18.73	Vertical

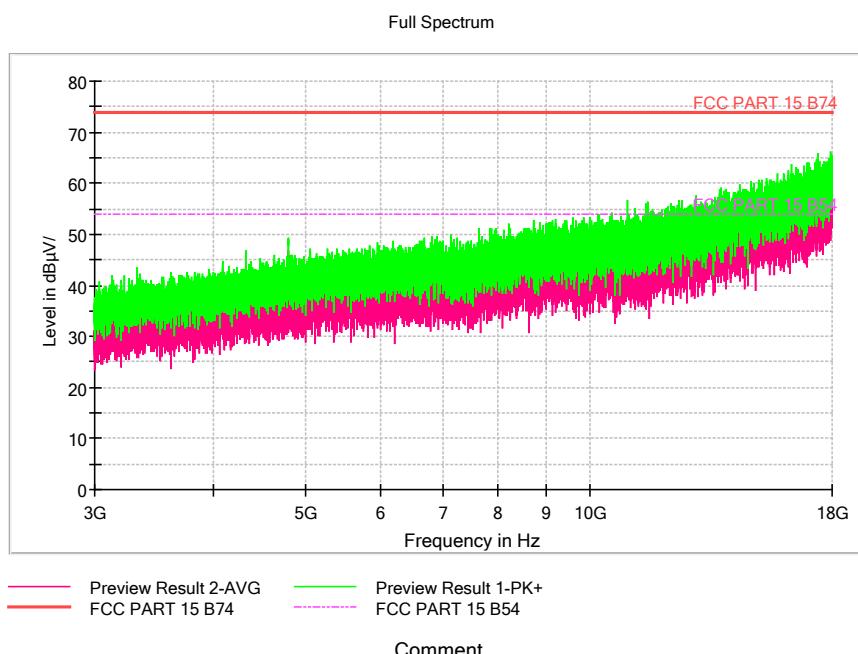
Carrier frequency (MHz): 2437  
 Channel No.:6



Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11b



Frequency Range: 1GHz -3GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b

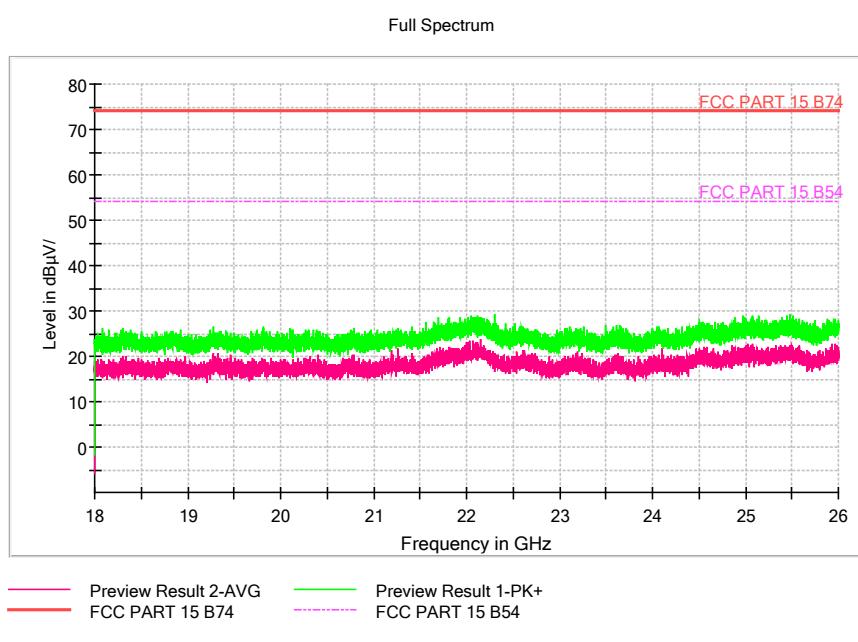


Comment

Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11b

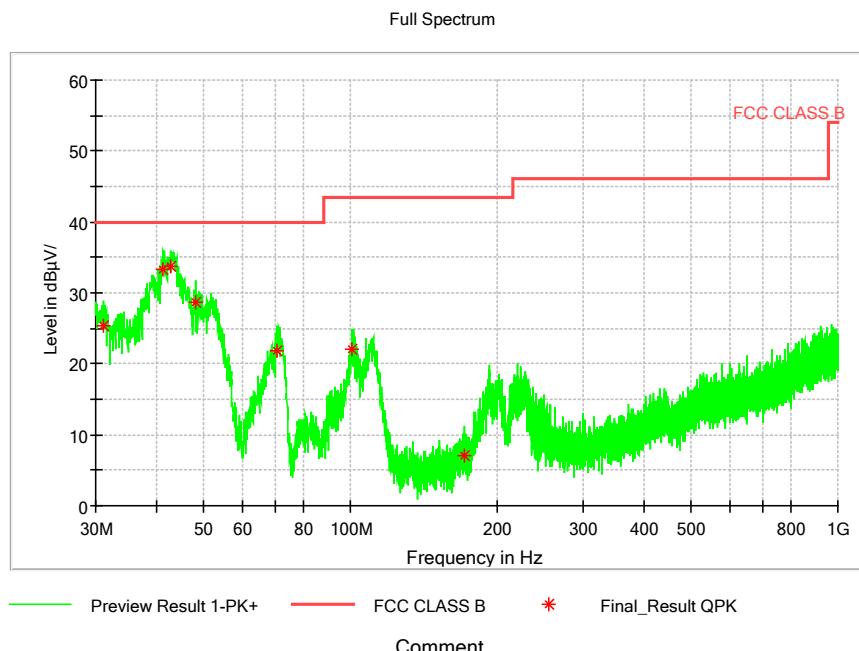


Comment

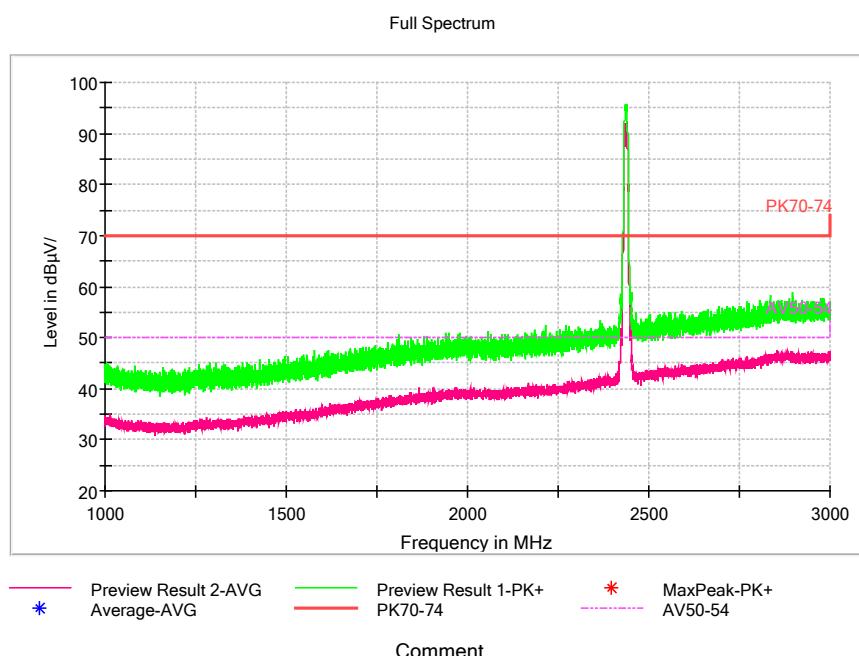
Frequency Range: 18GHz -25GHz

Detector: Av mode and PK mode

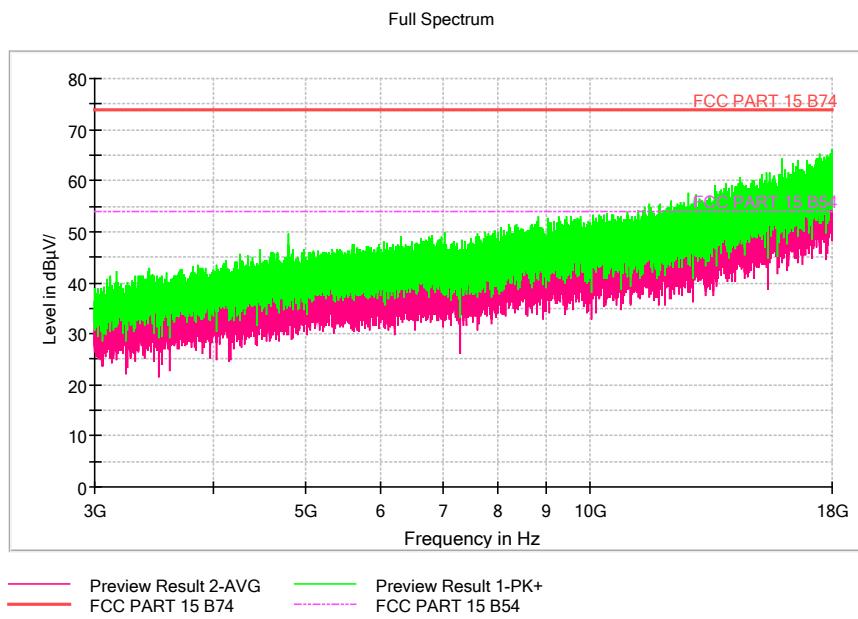
Modulation type: 802.11b



Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Modulation type: 802.11g



Frequency Range: 1GHz -3GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

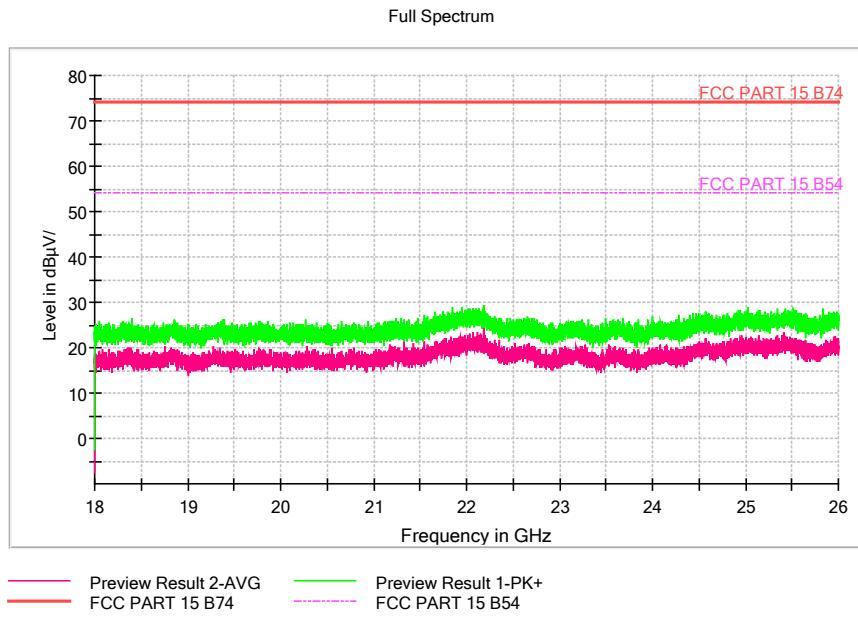


Comment

Frequency Range: 3GHz -18GHz

Detector: Av mode and PK mode

Modulation type: 802.11g

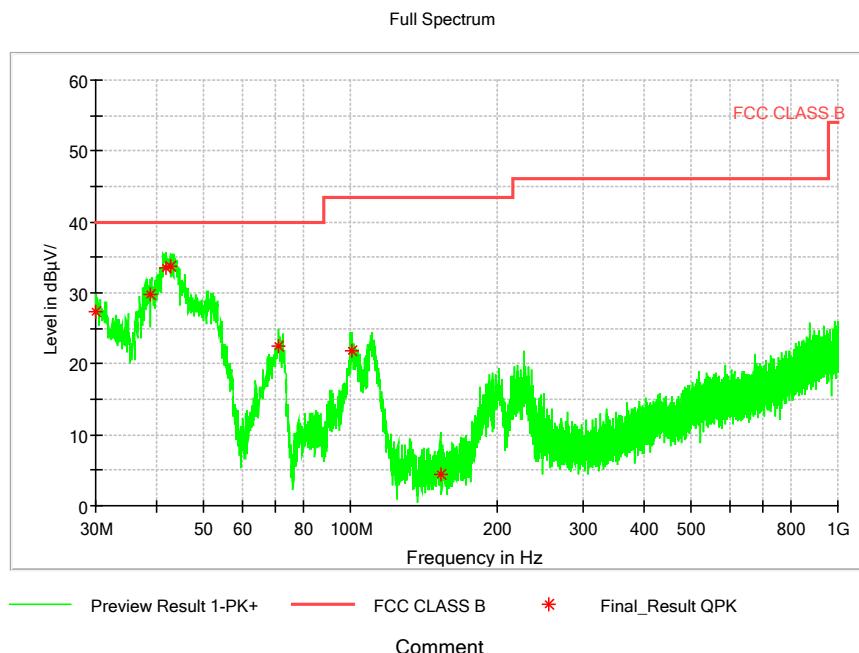


Comment

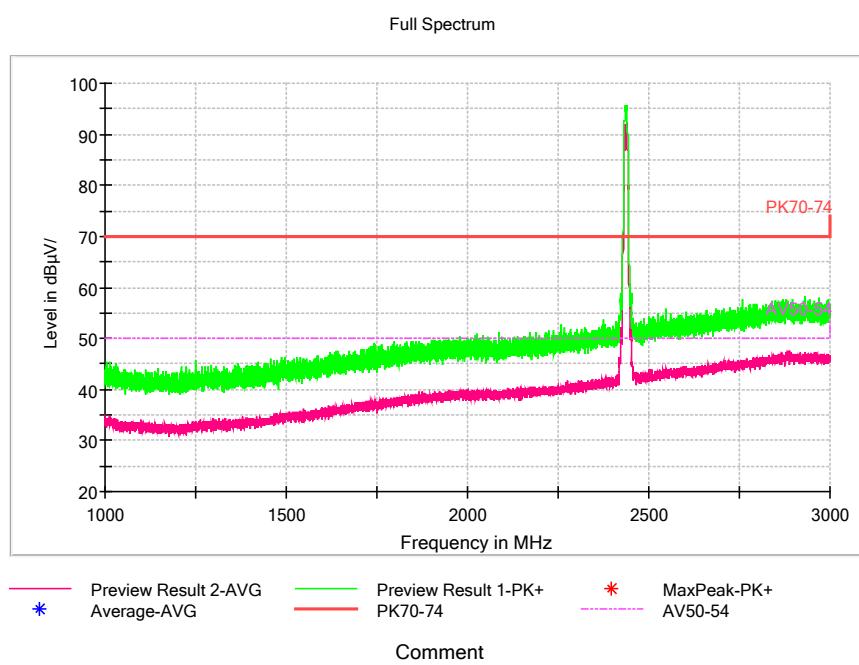
Frequency Range: 18GHz -25GHz

Detector: Av mode and PK mode

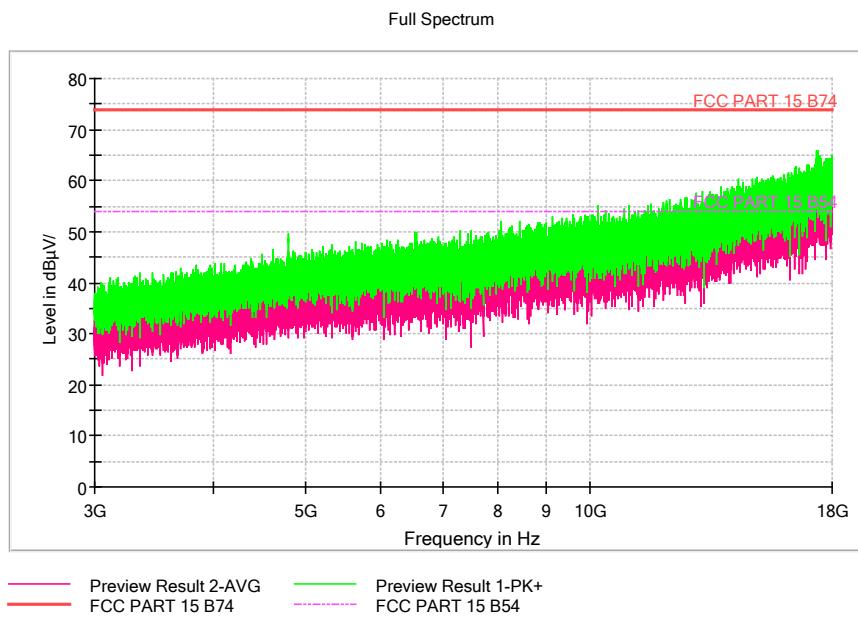
Modulation type: 802.11g



Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11n(HT20)

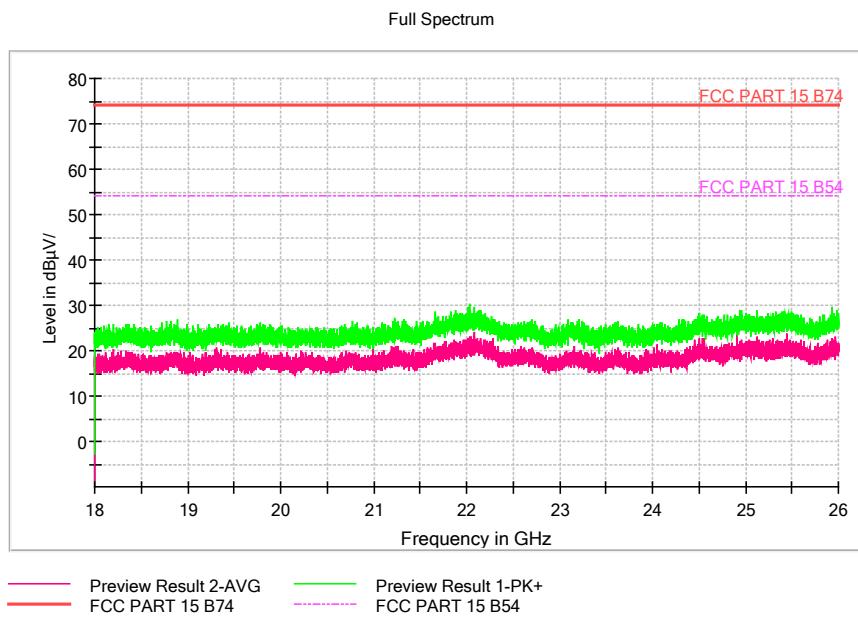


Frequency Range: 1GHz -3GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11n(HT20)



Comment

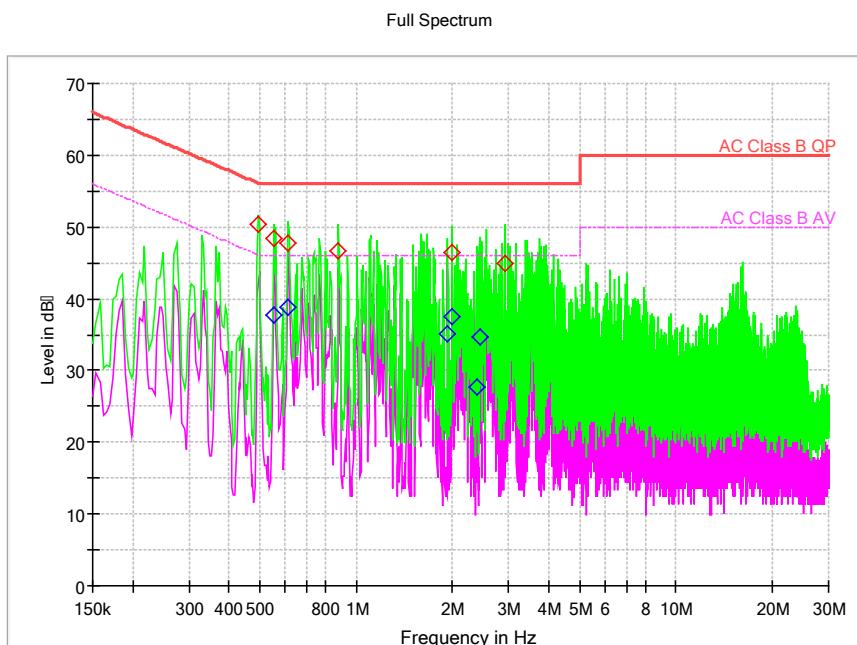
Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11n(HT20)



Comment

Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11n(HT20)

## AC Power line Conducted Emission



L +N Line

### MEASUREMENT RESULT: "MOBILE\_fin QP"

Frequency (MHz)	QuasiPeak (dB)	Limit (dB)	Margin (dB)	Line
0.494000	50.45	56.10	5.65	L1
0.554000	48.40	56.00	7.60	L1
0.614000	47.70	56.00	8.30	L1
0.882000	46.70	56.00	9.30	N
1.994000	46.51	56.00	9.49	L1
2.930000	44.82	56.00	11.18	N

### MEASUREMENT RESULT: "MOBILE\_fin AV"

Frequency (MHz)	Average (dB)	Limit (dB)	Margin (dB)	Line
0.554000	37.71	46.00	8.29	N
0.614000	38.89	46.00	7.11	L1
1.934000	35.10	46.00	10.90	N
1.994000	37.53	46.00	8.47	L1
2.374000	27.78	46.00	18.22	L1
2.430000	34.71	46.00	11.29	L1

## Secondary Supply Test Result

The worst case attitude: The mobile lay down.

Peak detector: RBW=1MHz,VBW=3MHz,sweep time=200ms;

Average detector: RBW=1MHz,VBW=3MHz,sweep time=auto;

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	103.85	69.85	N/A	N/A	8.90	25.10
2	2390	51.93	17.93	-22.07	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	98.16	64.16	N/A	N/A	8.90	25.10
2	2390	46.37	12.37	-27.63	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	95.12	61.12	N/A	N/A	8.90	25.10
2	2390	39.94	5.94	-14.06	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	91.20	57.20	N/A	N/A	8.90	25.10
2	2390	39.86	5.86	-14.14	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	105.66	71.66	N/A	N/A	8.90	25.10
2	2483.5	49.78	15.78	-24.22	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	99.39	65.39	N/A	N/A	8.90	25.10
2	2483.5	46.87	12.87	-27.13	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	92.97	58.97	N/A	N/A	8.90	25.10
2	2483.5	39.26	5.26	-14.74	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11b

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	87.98	53.98	N/A	N/A	8.90	25.10
2	2483.5	38.49	4.49	-15.51	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	106.33	72.33	N/A	N/A	8.90	25.10
2	2390	50.19	16.19	-23.81	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	97.83	63.83	N/A	N/A	8.90	25.10
2	2390	45.58	11.58	-28.42	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	94.91	60.91	N/A	N/A	8.90	25.10
2	2390	39.58	5.58	-14.42	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	91.35	57.35	N/A	N/A	8.90	25.10
2	2390	39.49	5.49	-14.51	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	104.81	70.81	N/A	N/A	8.90	25.10
2	2483.5	49.27	15.27	-24.73	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	97.01	63.01	N/A	N/A	8.90	25.10
2	2483.5	45.19	11.19	-28.81	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	93.06	59.06	N/A	N/A	8.90	25.10
2	2483.5	39.46	5.46	-14.54	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11g

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	88.17	54.17	N/A	N/A	8.90	25.10
2	2483.5	39.20	5.20	-14.80	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	104.61	70.61	N/A	N/A	8.90	25.10
2	2390	49.42	15.42	-24.58	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	98.58	64.58	N/A	N/A	8.90	25.10
2	2390	45.63	11.63	-28.37	74.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	94.32	60.32	N/A	N/A	8.90	25.10
2	2390	41.15	7.15	-12.85	54.00	8.90	25.10

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2412	90.18	56.18	N/A	N/A	8.90	25.10
2	2390	40.88	6.88	-13.12	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	104.96	70.96	N/A	N/A	8.90	25.10
2	2483.5	49.89	15.89	-24.11	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Peak

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	97.49	63.49	N/A	N/A	8.90	25.10
2	2483.5	43.90	9.90	-30.10	74.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity: Vertical

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	94.77	60.77	N/A	N/A	8.90	25.10
2	2483.5	42.37	8.37	-11.63	54.00	8.90	25.10

Carrier frequency (MHz): 2462

Channel No.:11

Test Mode: 802.11n(HT20)

Polarity:Horizontal

Detector: Average

No	Frequency (MHz)	Measure Level (dBuV/m)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV/m)	cable loss (dB)	antenna factor (dB)
1	2462	87.45	53.45	N/A	N/A	8.90	25.10
2	2483.5	41.73	7.73	-12.27	54.00	8.90	25.10

For 802.11b

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
30.000000	19.29	-13.5	32.79	Vertical
30.080000	18.84	-13.5	32.34	Vertical
38.510000	19.10	-17.4	36.5	Vertical
43.316250	22.18	-20.1	42.28	Vertical
52.447500	19.01	-24.9	43.91	Vertical
83.897083	25.08	-23.6	48.68	Vertical

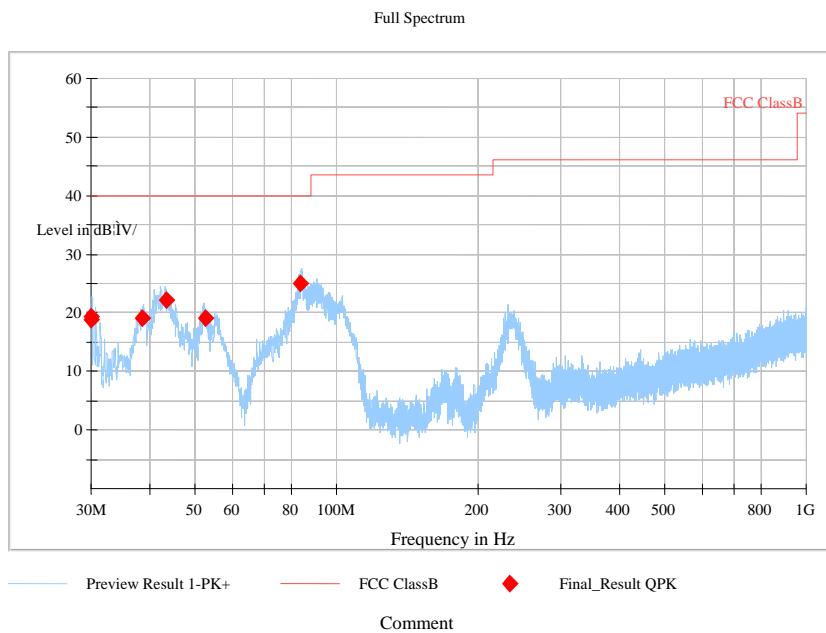
For 802.11g

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
30.431250	17.71	-13.7	31.41	Vertical
38.552083	19.33	-17.4	36.73	Vertical
41.784583	21.63	-19.1	40.73	Vertical
52.566250	19.02	-24.9	43.92	Vertical
83.973333	24.79	-23.5	48.29	Vertical
101.186667	21.57	-21.8	43.37	Vertical

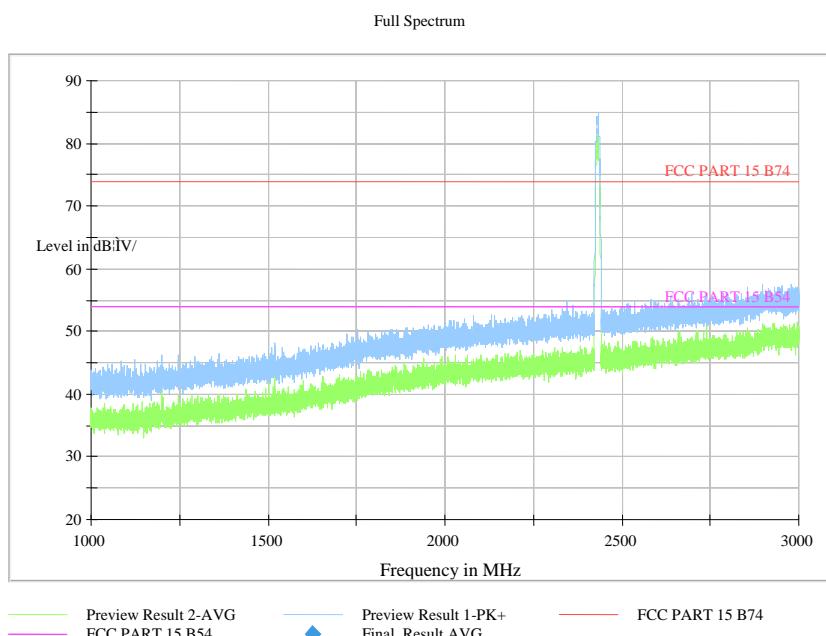
For 802.11n(HT20)

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity
38.670417	19.27	-17.5	36.77	Vertical
43.118333	21.53	-19.9	41.43	Vertical
45.421250	17.26	-21.4	38.66	Vertical
51.844583	18.26	-24.8	43.06	Vertical
83.847083	25.23	-23.6	48.83	Vertical
102.161250	21.40	-21.8	43.2	Vertical

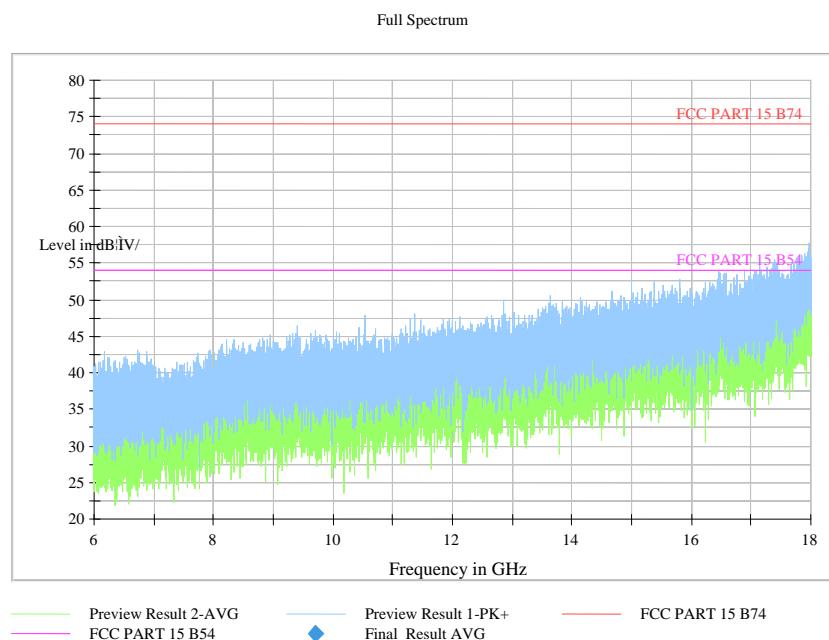
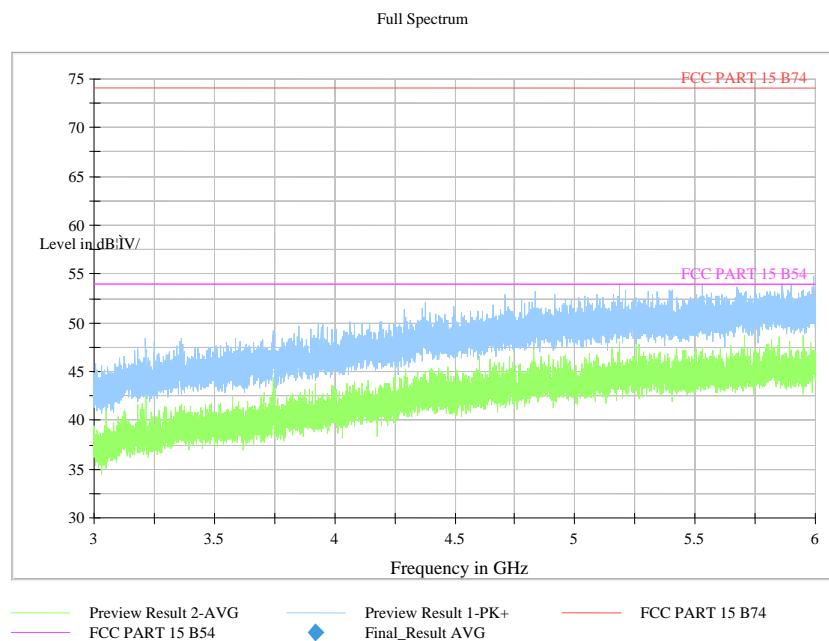
Carrier frequency (MHz): 2437  
 Channel No.:6

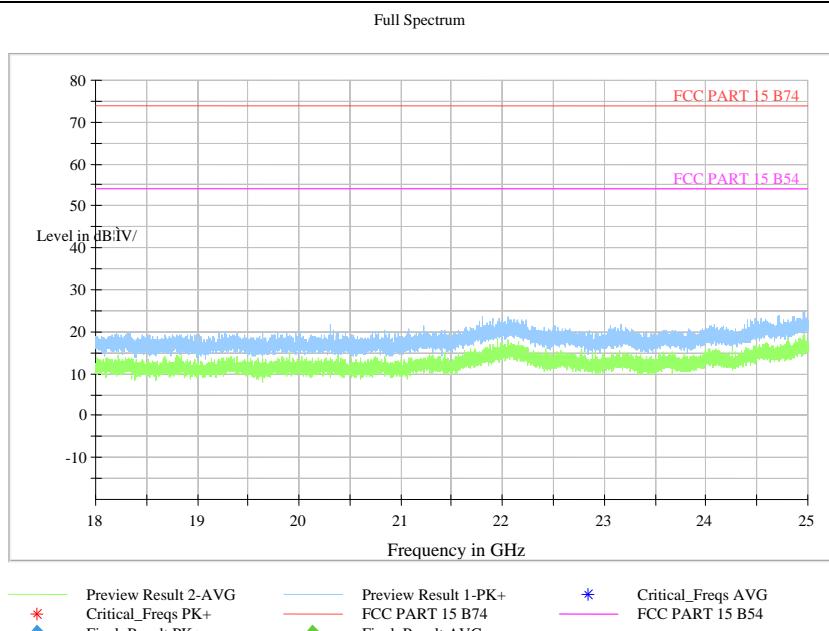


Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11b

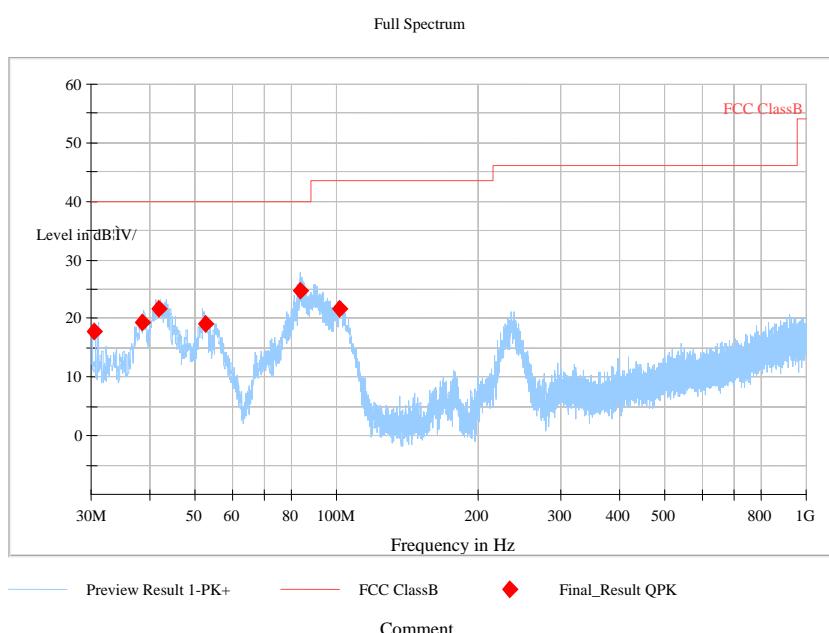


Frequency Range: 1GHz -3GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b



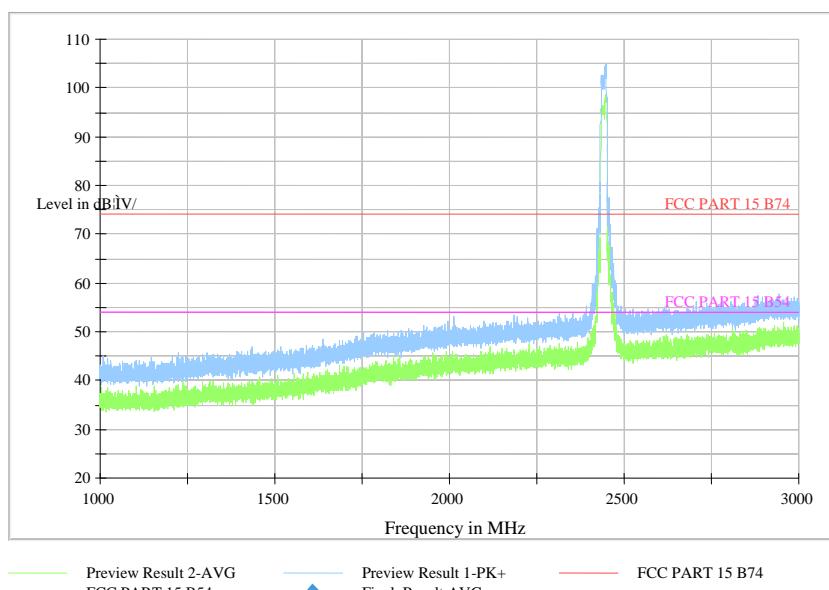


Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b



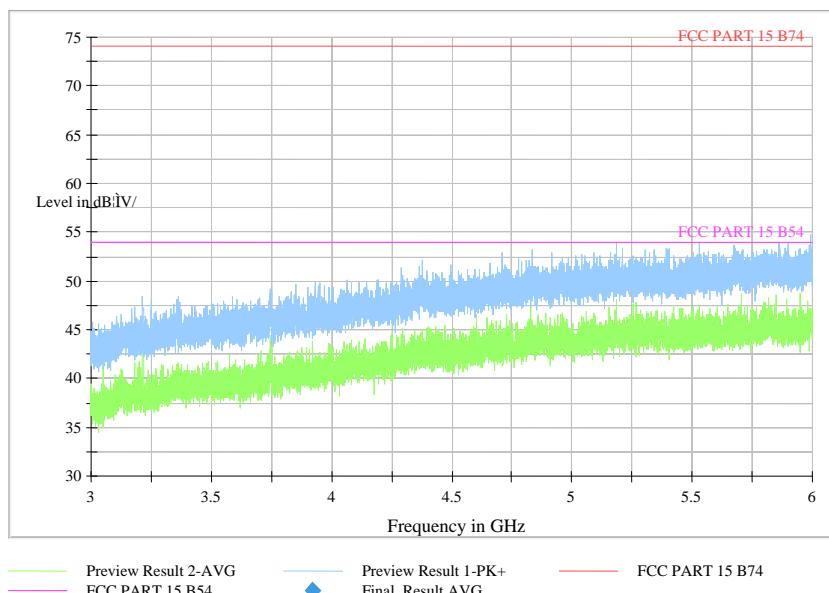
Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Modulation type: 802.11g

Full Spectrum



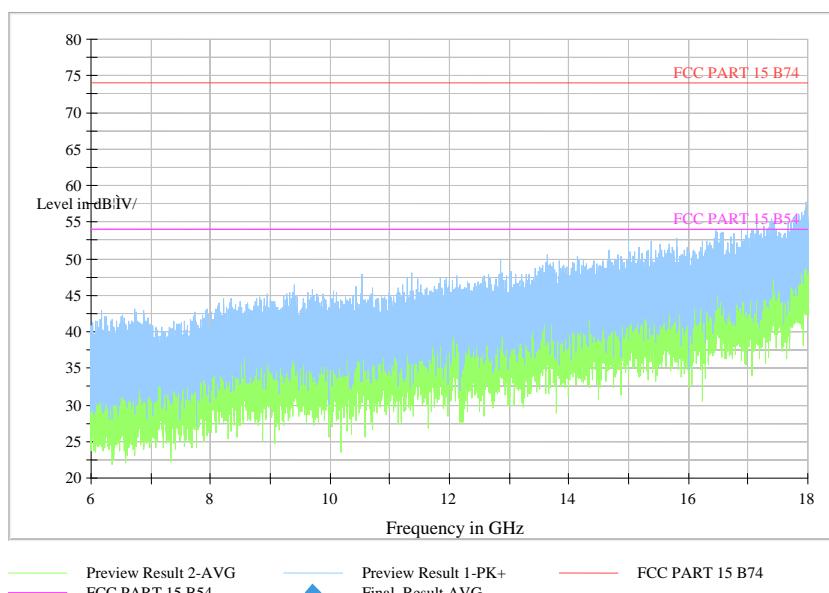
Frequency Range: 1GHz -3GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



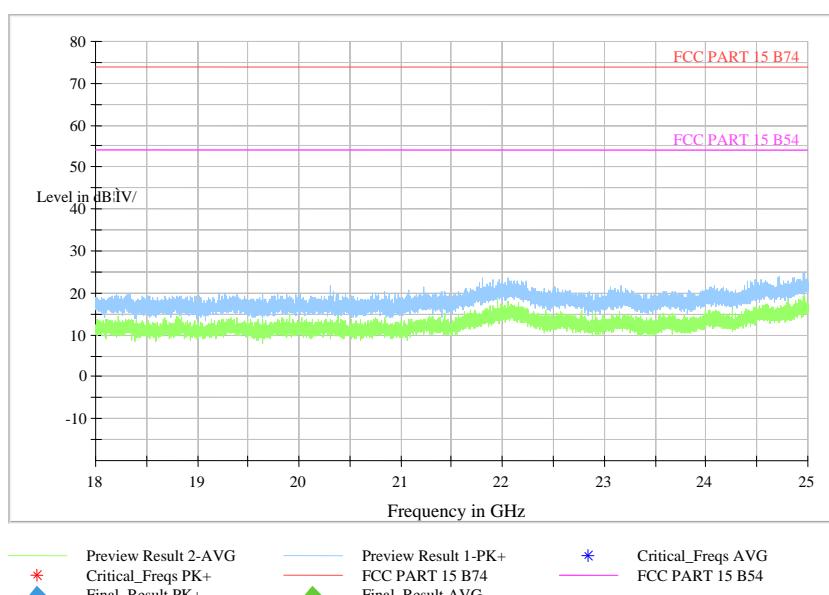
Frequency Range: 3GHz -6GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



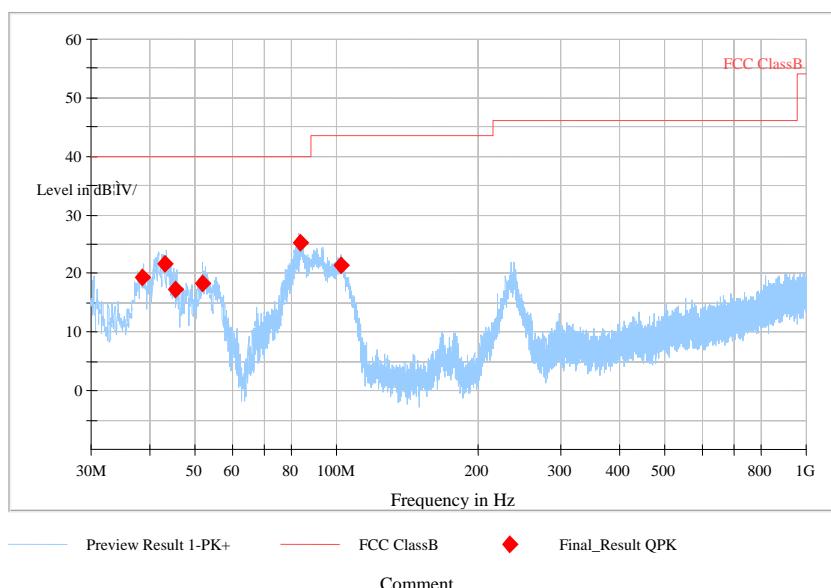
Frequency Range: 6GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



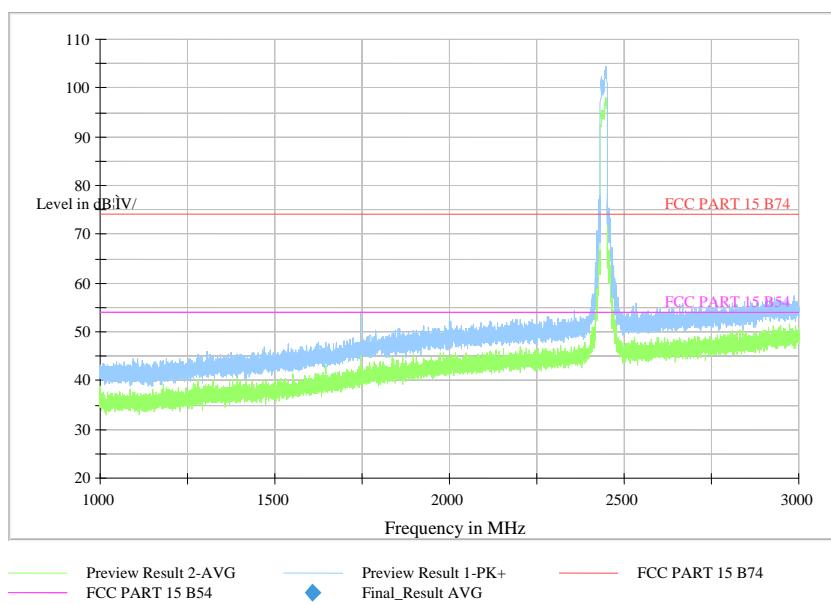
Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum

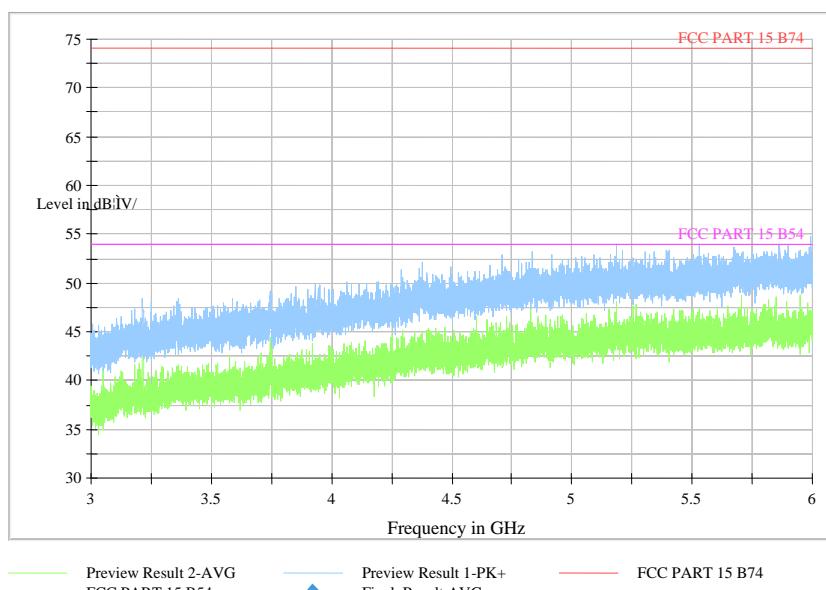


Comment

Full Spectrum

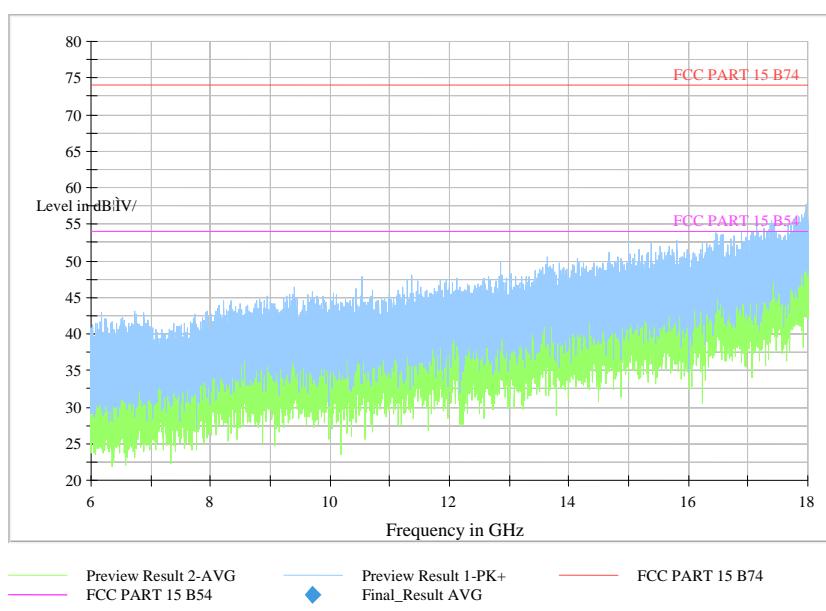


Full Spectrum

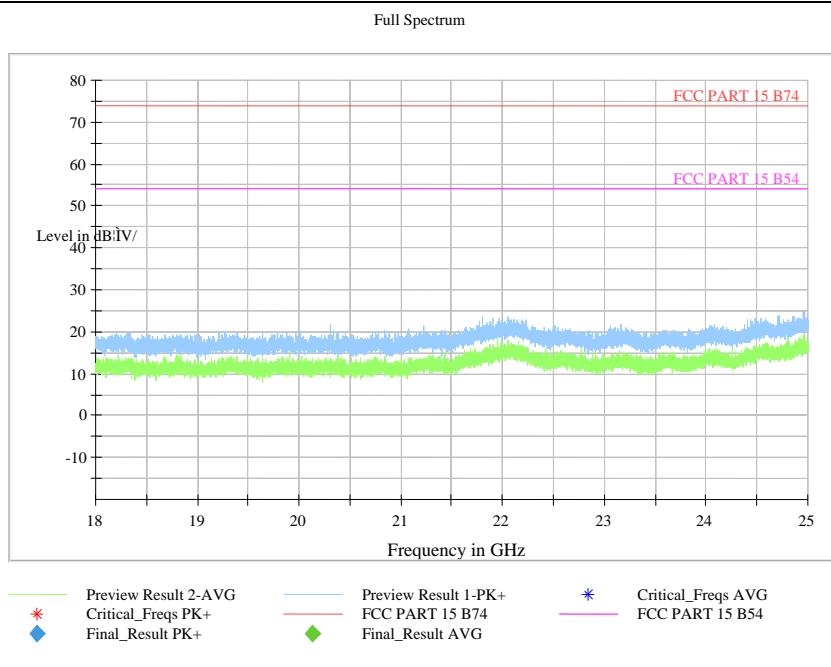


Frequency Range: 3GHz -6GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11n(HT20)

Full Spectrum



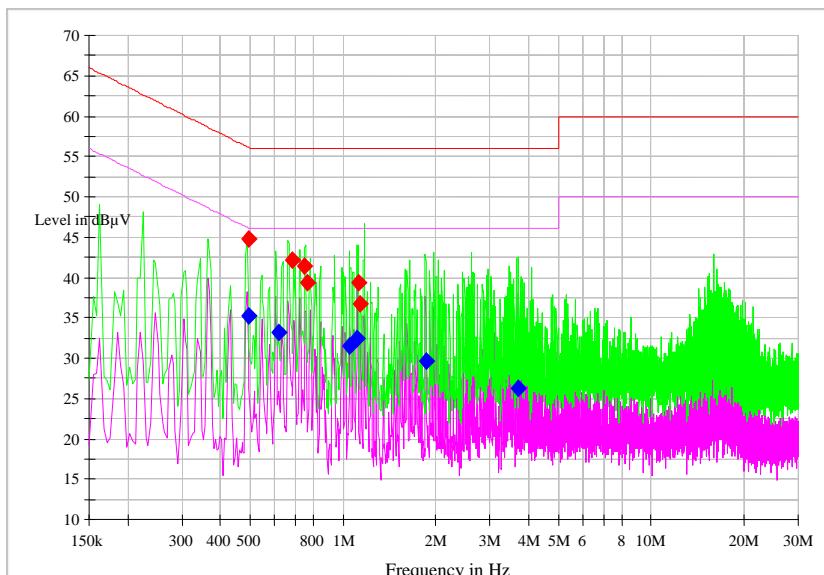
Frequency Range: 6GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11n(HT20)



Frequency Range: 18GHz -25GHz  
Detector: Av mode and PK mode  
Modulation type: 802.11n(HT20)

## AC Power line Conducted Emission

Full Spectrum



L + N Line

### MEASUREMENT RESULT: "MOBILE\_fin QP"

Frequency (MHz)	QuasiPeak (dB <sub>µV</sub> )	Limit (dB <sub>µV</sub> )	Margin (dB)	Line
0.495007	44.69	56.08	11.40	L1
0.682596	42.15	56.00	13.85	N
0.746779	41.39	56.00	14.61	L1
0.769051	39.43	56.00	16.57	L1
1.118346	39.31	56.00	16.69	N
1.140191	36.75	56.00	19.25	L1

### MEASUREMENT RESULT: "MOBILE\_fin AV"

Frequency (MHz)	Average (dB <sub>µV</sub> )	Limit (dB <sub>µV</sub> )	Margin (dB)	Line
0.495007	35.28	46.08	10.80	L1
0.617140	33.23	46.00	12.77	L1
1.052890	31.55	46.00	14.45	L1
1.110346	32.42	46.00	13.58	N
1.856206	29.67	46.00	16.33	N
3.700662	26.32	46.00	19.68	L1

---End of Test Report---