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# TEST REPORT FOR WLAN TESTING

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Report No.: SRTC2019-9004(F)-19080101(F)

Product Name: LTE/WCDMA/GSM (GPRS) Multi-Mode Digital  
Mobile Phone

Product Model: ZTE Blade A7 2019

Applicant: ZTE Corporation

Manufacturer: ZTE Corporation

Specification: FCC Part 15, Subpart C (2019)

FCC ID: SRQ-A72019

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

15th Building, No.30 Shixing Street, Shijingshan District,

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## 1. GENERAL INFORMATION

### 1.1 Notes of the test report

The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written permission of The State Radio\_monitoring\_center Testing Center (SRTC).

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

The certification and accreditation identifiers used in this report shall not be applicable to the tested or calibrated samples thereof. The manufacturer shall not mark the tested samples or items (or a separate part of the item) with the identifiers of certification and accreditation to mislead relevant parties about the tested samples or items.

### 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
Country or Region:	P.R.China
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### 1.3 Applicant's details

Company:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South,Hi-Tech, Industrial Park, Nanshan District,Shenzhen, P.R.China
City:	Shenzhen
Country or Region:	P.R.China
Contacted person:	Gong Yu
Tel:	86-21-68895397
Fax:	---
Email:	gongyu@zte.com.cn

### 1.4 Manufacturer's details

Company:	ZTE Corporation
Address:	ZTE Plaza, Keji Road South,Hi-Tech, Industrial Park, Nanshan District,Shenzhen, P.R.China
City:	Shenzhen
Country or Region:	P.R.China
Contacted person:	Gong Yu
Tel:	86-21-68895397
Fax:	---
Email:	gongyu@zte.com.cn

### 1.5 Test Environment

Date of Receipt of test sample at SRTC:	2019-08-01
Testing Start Date:	2019-08-01
Testing End Date:	2019-08-26

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

Normal Supply Voltage (V d.c.):	3.85
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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	802.11b:1Mbps-11Mbps 802.11g:6Mbps-54Mbps 802.11n HT20:MCS0-MCS7
Power Supply	Battery/Charger
HW Version	ukhB
SW Version	TEL_BHM_ZTE_Blade_A7_2019V1.0
IMEI	864432040465643
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	1.5dBi	2.412GHz~2.462GHz	PIFA 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 ≥ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE 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	99.47%	0.02dB
11g	6Mbps	97.11%	0.13dB
11n(HT20)	6.5Mbps	97.34%	0.12dB

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.

## 2.5 Support Equipment

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

Equipment	Battery 1
Manufacturer	Ningbo Veken Battery Co., Ltd.
Model Number	Li3931T44P8h806139
Equipment	Battery 2
Manufacturer	Zhongshan Tianmao Battery Co., Ltd.
Model Number	Li3931T44P8h806139
Equipment	Charge 1
Manufacturer	RUIJING
Model Number	STC-A515A-Z
Equipment	Charge 2
Manufacturer	CHENYANG
Model Number	STC-A515A-Z
Equipment	USB Cable 1
Manufacturer	Dongguan Guojun Plastic Electronic Co.,Ltd
Model Number	USB-MU5-W-70-M-L
Equipment	USB Cable 1
Manufacturer	Shen Zhen Shi Yi HUA XING Electron Co.,Ltd
Model Number	USB-MU5-W-70-M-L



### **3 REFERENCE SPECIFICATION**

Specification	Version	Title
15.35	2019	Measurement detector functions and bandwidths.
15.209	2019	Radiated emission limits; general requirements.
15.247	2019	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850MHz.
15.203	2019	Antenna requirement
ANSI C63.10	2013	Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
KDB 558074D01 V05r02	April 2, 2019	GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247

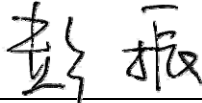

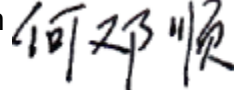
### **4 KEY TO NOTES AND RESULT CODES**

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:  20190829

## **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**

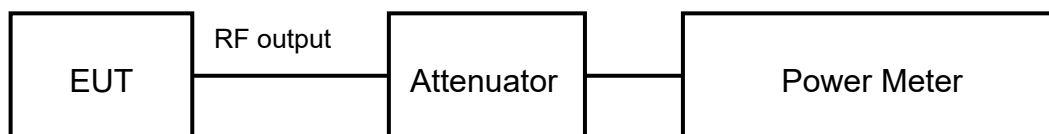
KDB 558074 D01 DTS Meas Guidance v05r02 - Section 9.1.3

#### **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
25°C	30%	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

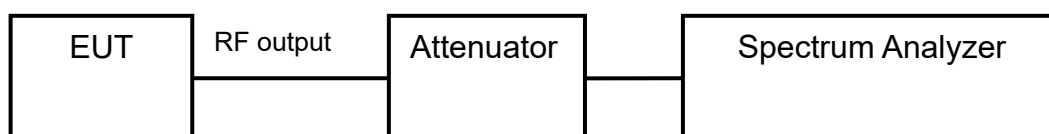
KDB 558074 D01 DTS Meas Guidance v05r02 - Section 8.1 Option 1

### 6.2.5 Test Settings

- Set RBW = 100 kHz.
- Set the video bandwidth (VBW)  $\geq 3 \times$  RBW.
- Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Allow the trace to stabilize.
- 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
25°C	30%	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

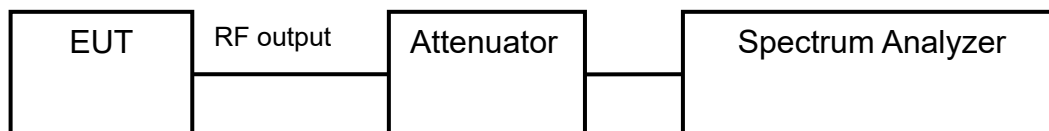
KDB 558074 D01 DTS Meas Guidance v05r02 Section 10.2.

### 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
25°C	30%	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.

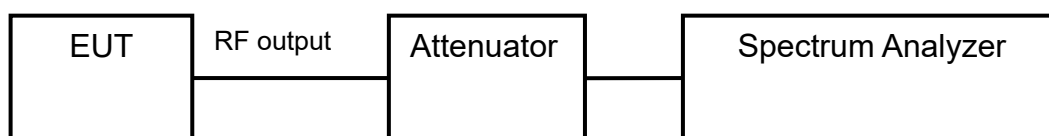
#### 6.4.4 Test Procedure Used

KDB 558074 D01 DTS Meas Guidance v05r02 Section 11.3

#### 6.4.5 Test Settings

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100kHz.
- Set the VBW  $\geq$  300kHz.
- Detector = peak.
- Set span to encompass the spectrum to be examined
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- 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.

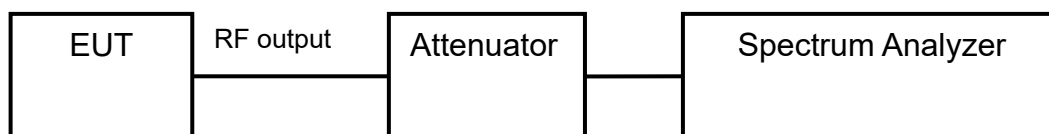
## 6.5 Band-edge measurement

### 6.5.1 Ambient condition

Temperature	Relative humidity	Pressure
25°C	30%	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 v05r02 Section 12.1

### 6.5.5 Test Settings

- Set the center frequency and span to encompass frequency range to be measured.
- Set the RBW = 100kHz.
- Set the VBW  $\geq$  300kHz.
- Detector = peak.
- Set span to encompass the spectrum to be examined
- Sweep time = auto couple.
- Trace mode = max hold.
- Allow trace to fully stabilize.
- 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
25°C	30%	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 [μV/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 (dBμV/m) = 20 log (Limit (μV/m)/1μV/m)**

Frequency [MHz]	Detector	Unit (dBμV/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 v05r02 – 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 = average
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)**

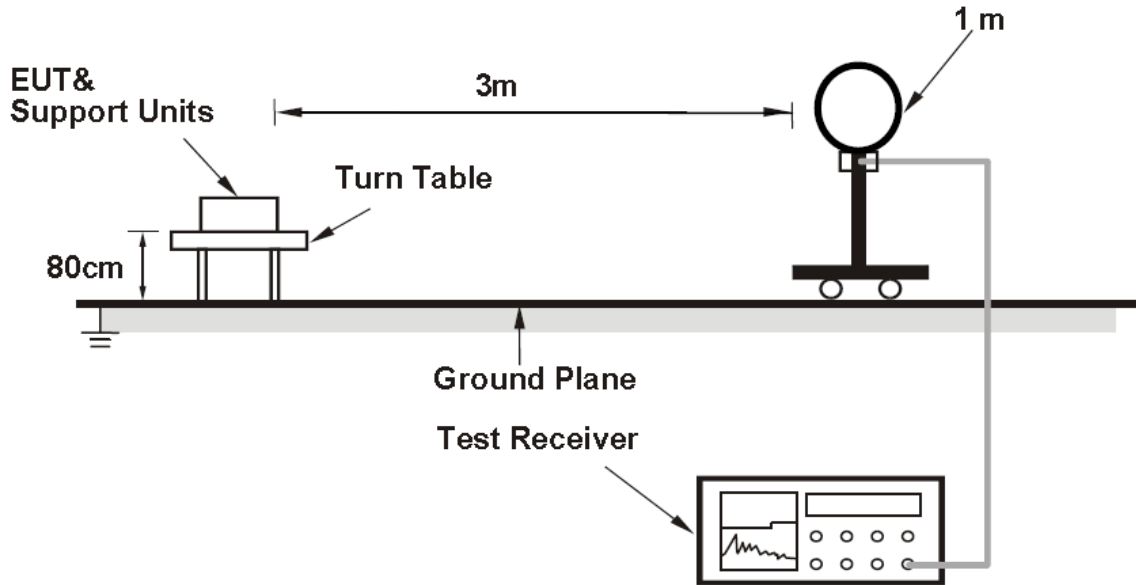
1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW is set depending on measurement frequency, as specified in following table

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

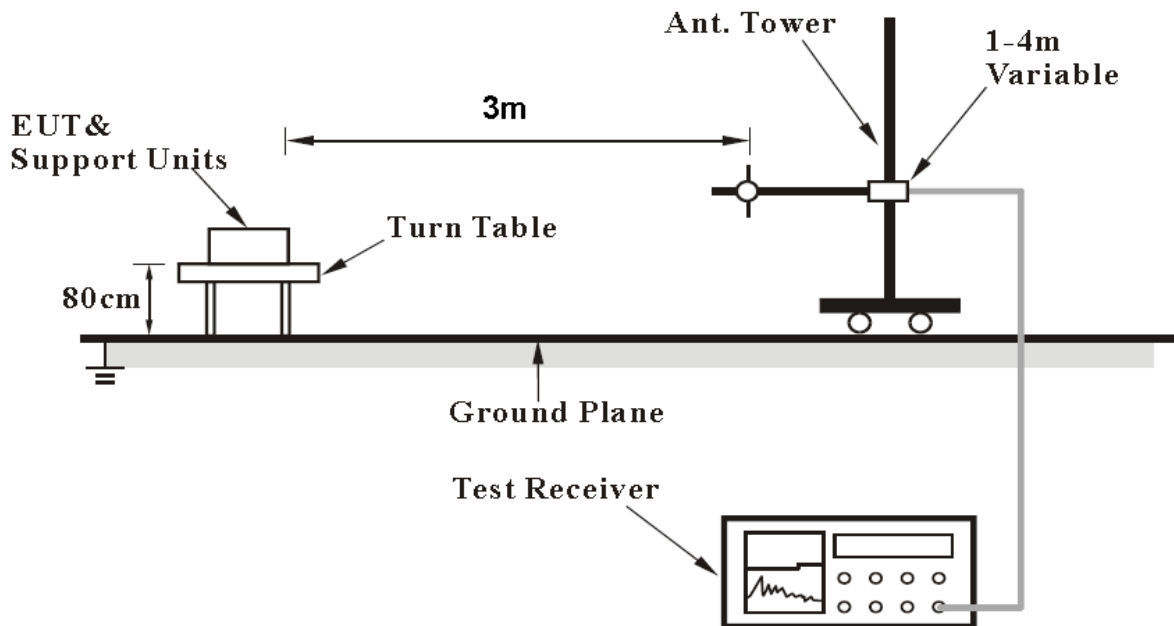
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

### 6.6.6 Test Setup

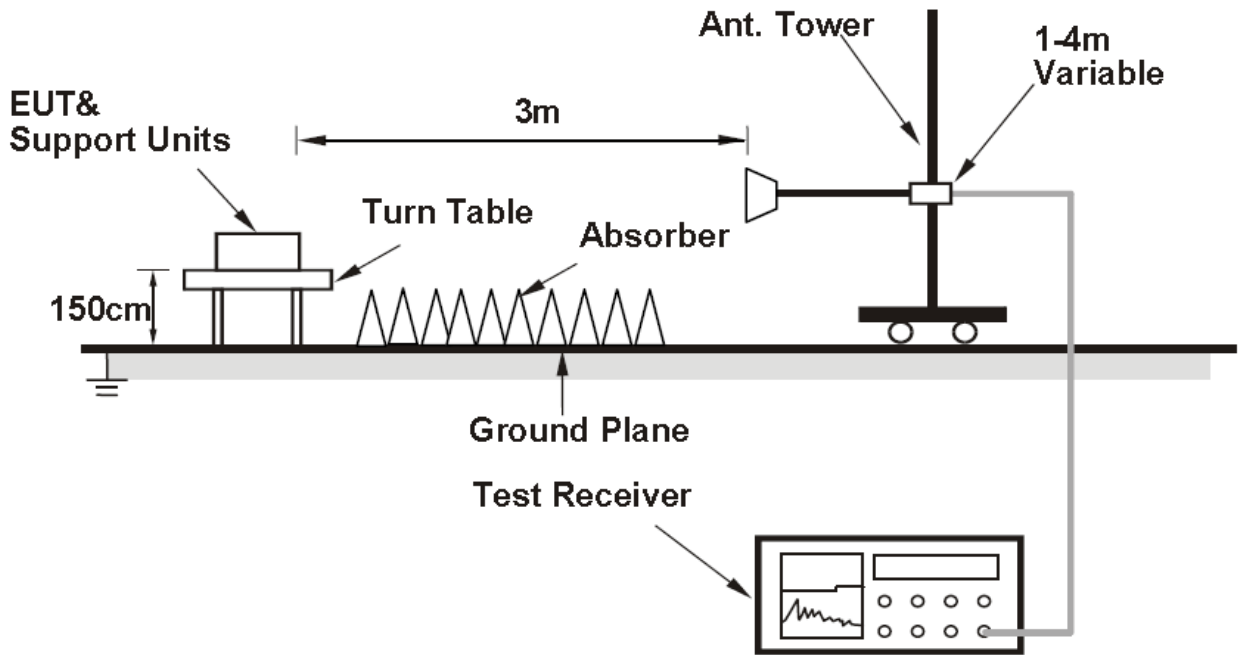
For Radiated emission below 30MHz



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
25°C	30%	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 *
0.5-5	56	46
5-30	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.

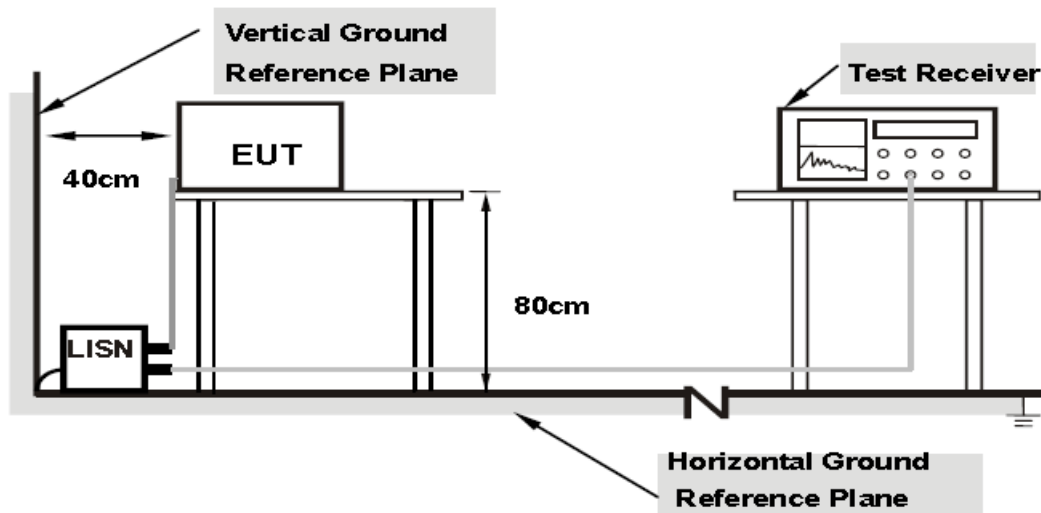
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 Appendix B.

## **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	2019.08.20	2020.08.19
2.	Power Meter E4416A	Agilent	MY52370013	2019.03.01	2020.02.29
3.	Power Sensor E9327A	Agilent	MY52420006	2019.03.01	2020.02.29
4.	Attenuator 6810.17.B	HUBER+SUHNER	768710	2019.08.20	2020.08.19
5.	23.18m×16.88m×9.60m Semi-Anechoic Chamber	FRANKONIA	---	----	----
6.	Turn table Diameter:5m	FRANKONIA	----	----	----
7.	Antenna master SAC(MA4.0)	MATURO	----	----	----
8.	9.080m×5.255m×3.525m Shielding room	FRANKONIA	----	----	----
9.	HF 907 Double-Ridged Waveguide Horn Antenna	R&S	100512	2019.08.20	2020.08.19
10.	3160-09 Receive antenna	SCHWARZ-BECK	002058-002	2019.08.20	2020.08.19
11.	ESI 40 EMI test receiver	R&S	100015	2019.08.20	2020.08.19
12.	ESCS30 EMI test receiver	R&S	100029	2019.08.20	2020.08.19
13.	HL562 Receive antenna	R&S	100167	2019.08.20	2020.08.19
14.	ENV216 AMN	R&S	3560.6550.12	2019.08.20	2020.08.19



## **APPENDIX A – TEST DATA OF CONDUCTED EMISSION**

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)

### **Conducted power**

Modulation type	Peak power output (dBm)		
	2412MHz	2437MHz	2462MHz
11b	18.31	17.99	19.18
11g	19.96	20.13	21.00
11n HT20	19.77	20.23	20.86

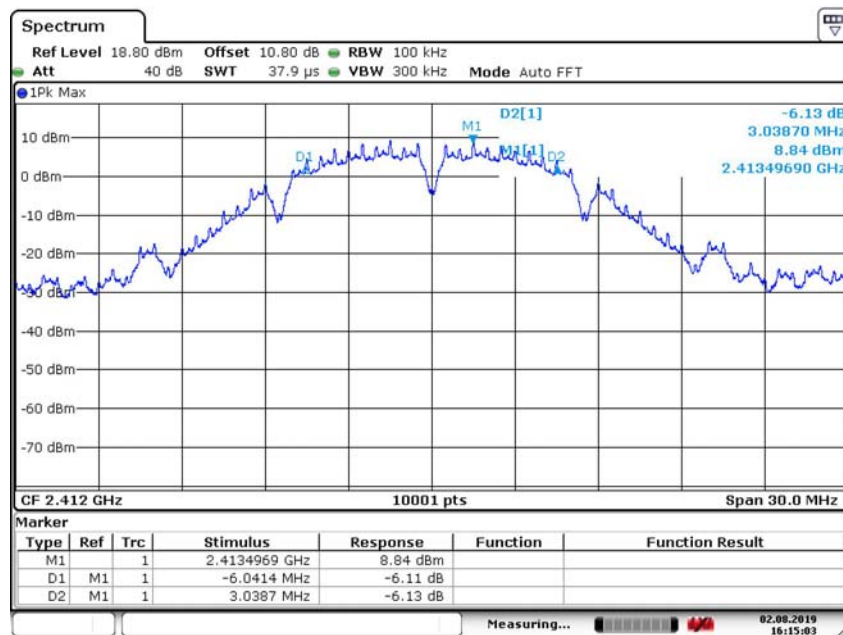
Modulation type	Average power output (dBm)		
	2412MHz	2437MHz	2462MHz
11b	16.92	16.52	17.85
11g	15.86	15.83	17.27
11n HT20	14.72	14.68	16.22

### 6dB Bandwidth

Offset 10.8dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 0.6dB

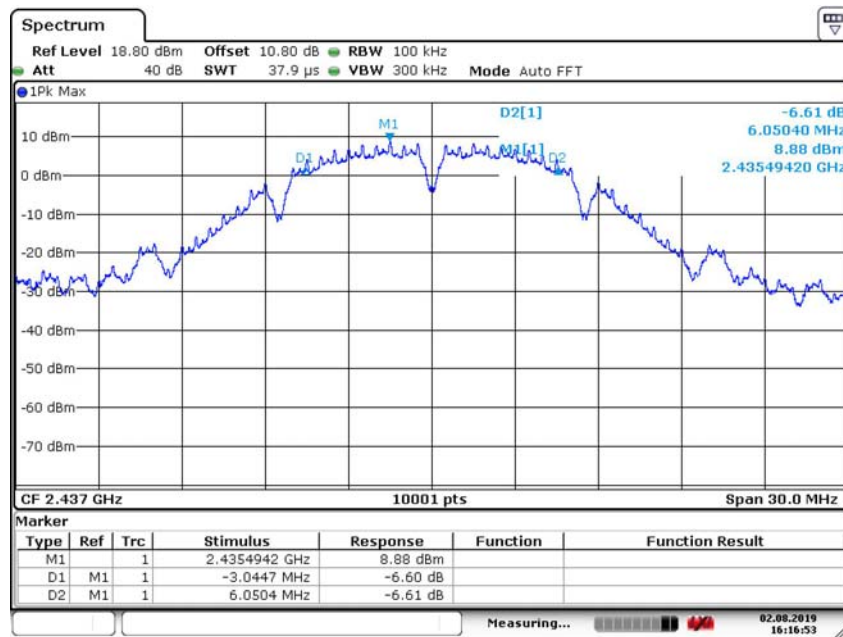
Test Mode: 802.11b

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	9080.1
2437	6	9095.1
2462	11	9107.1



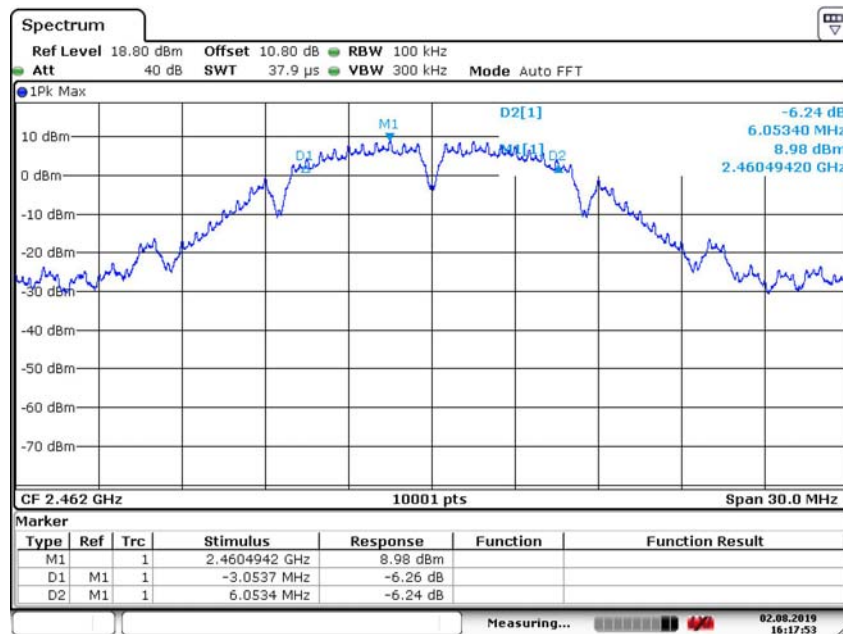
Date: 2.AUG.2019 16:15:02

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



Date: 2.AUG.2019 16:16:53

Carrier frequency (MHz): 2437  
Channel No.:6  
Test Mode: 802.11b

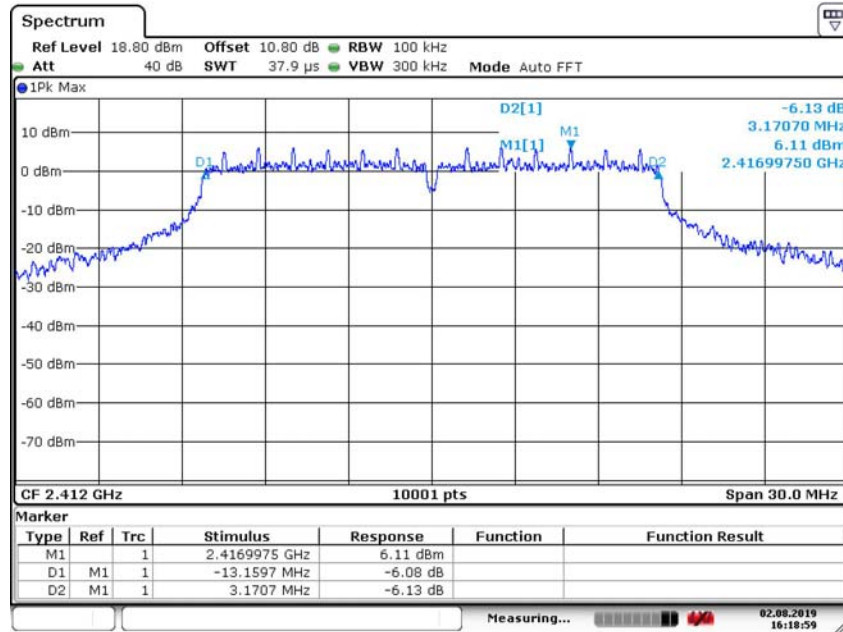


Date: 2.AUG.2019 16:17:53

Carrier frequency (MHz): 2462  
Channel No.:11  
Test Mode: 802.11b

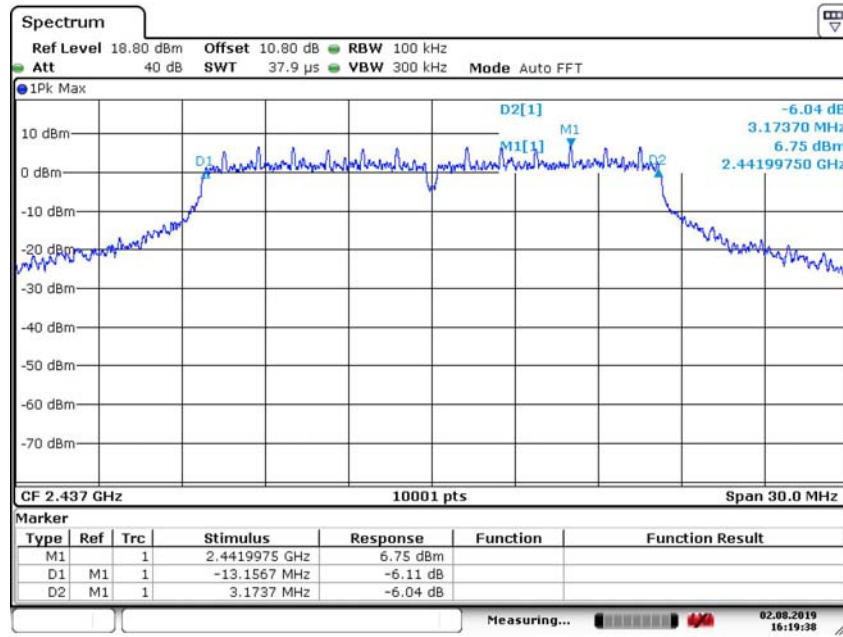
Test Mode: 802.11g

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	16330.4
2437	6	16330.4
2462	11	16321.4



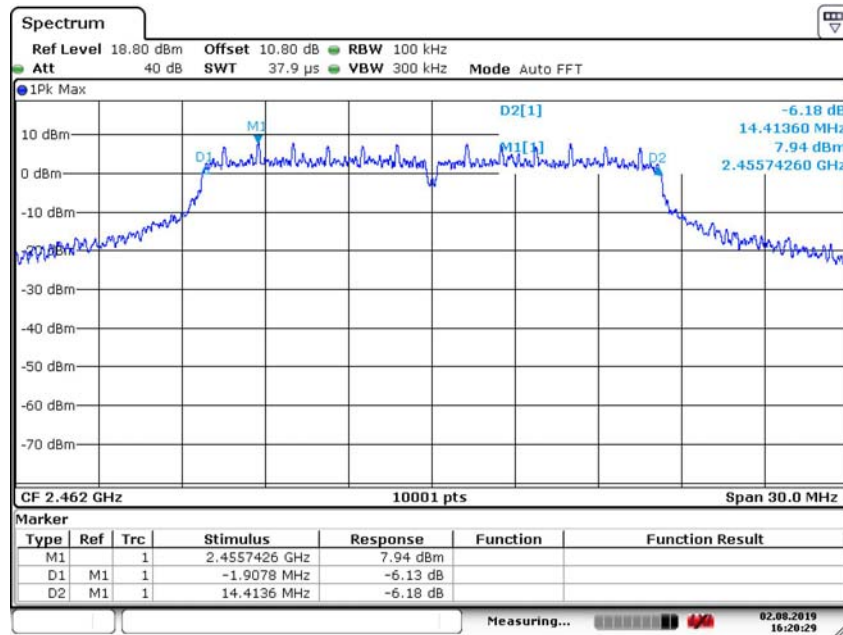
Date: 2.AUG.2019 16:18:59

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



Date: 2.AUG.2019 16:19:38

Carrier frequency (MHz): 2437  
Channel No.:6  
Test Mode: 802.11g

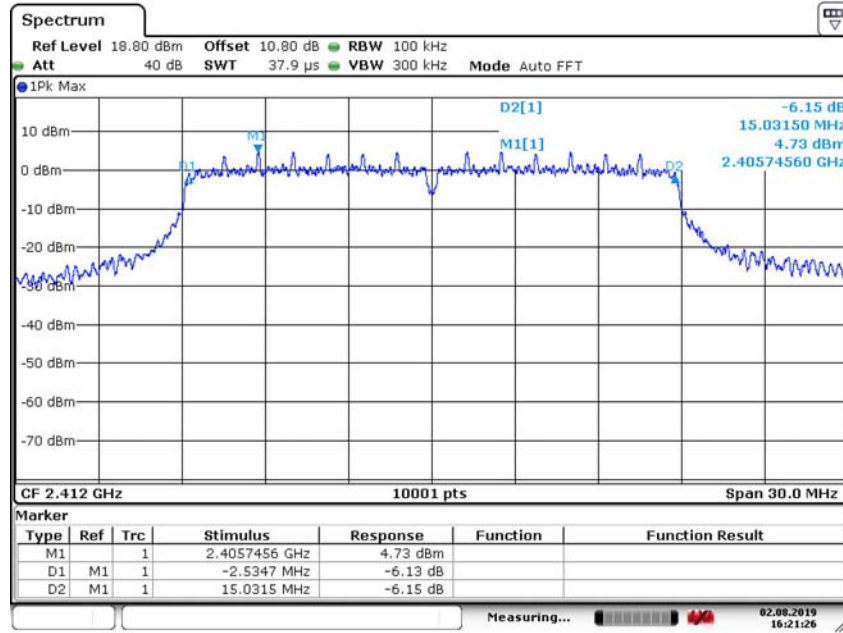


Date: 2.AUG.2019 16:20:29

Carrier frequency (MHz): 2462  
Channel No.:11  
Test Mode: 802.11g

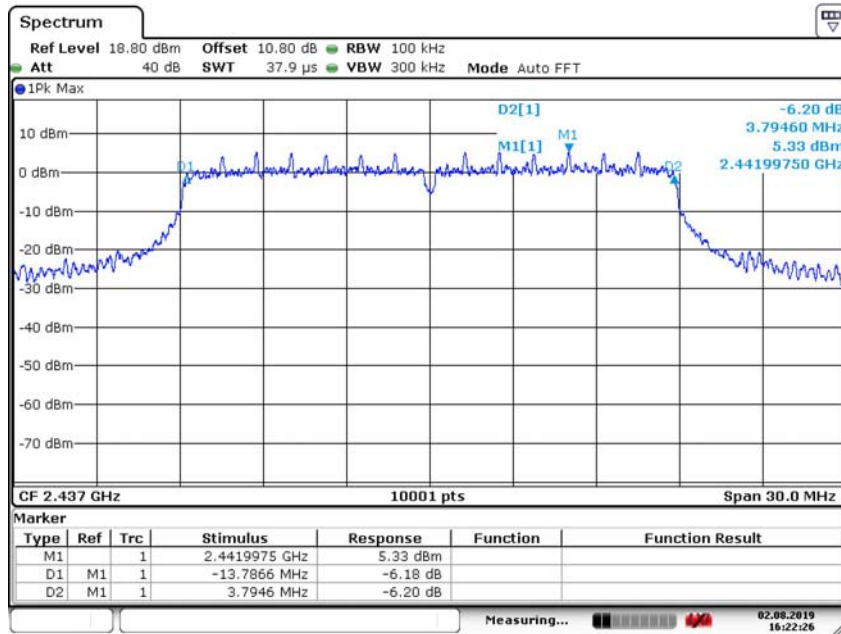
Test Mode: 802.11n (HT20)

Carrier frequency (MHz)	Channel No.	6 dB bandwidth(kHz)
2412	1	17566.2
2437	6	17581.2
2462	11	17548.2



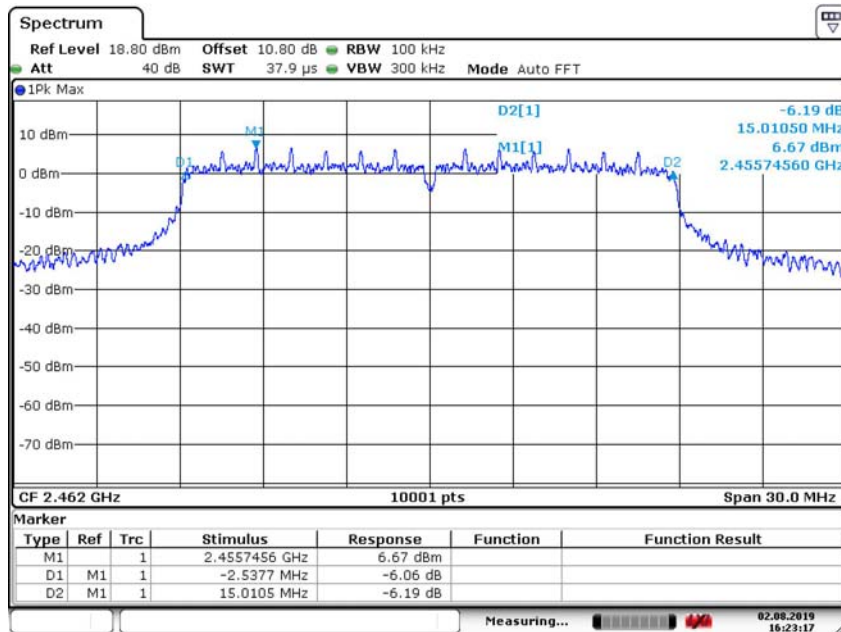
Date: 2.AUG.2019 16:21:26

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



Date: 2.AUG.2019 16:22:26

Carrier frequency (MHz): 2437  
Channel No.:6  
Test Mode: 802.11n (HT20)



Date: 2.AUG.2019 16:23:17

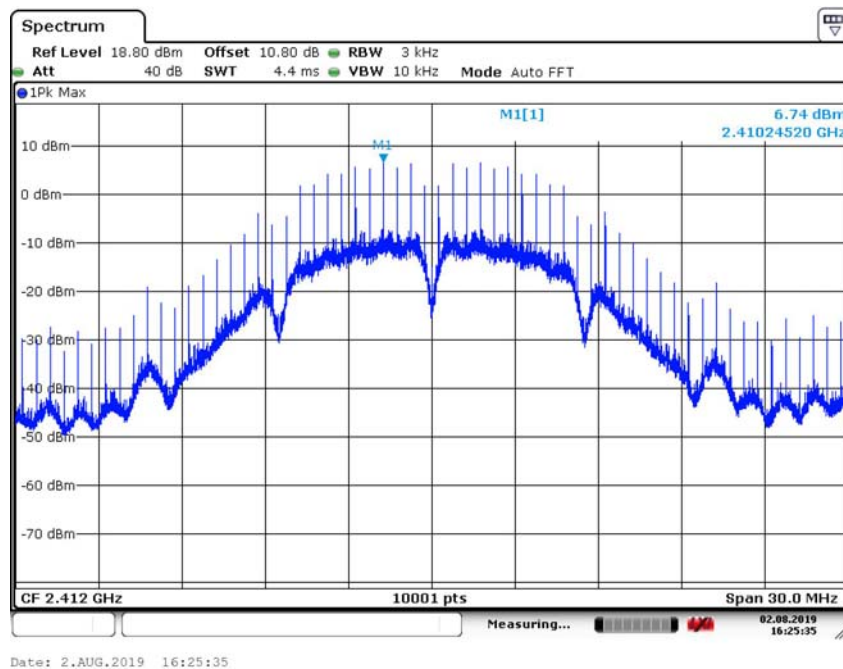
Carrier frequency (MHz): 2462  
Channel No.:11  
Test Mode: 802.11n (HT20)

### Transmitter Power Spectral Density

Offset 10.8dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 0.6dB

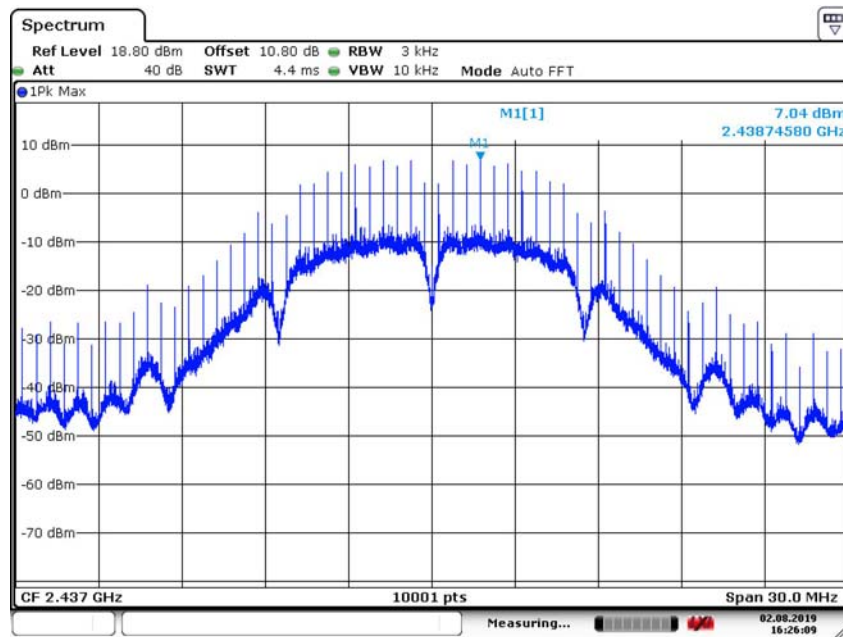
Test Mode: 802.11b

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	6.74
2437	6	7.04
2462	11	7.86



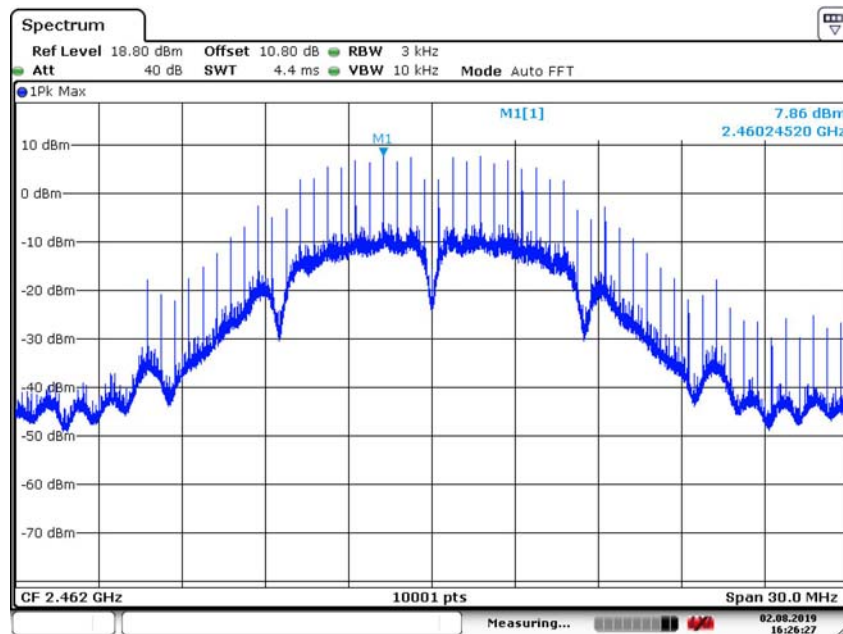
Carrier frequency (MHz): 2412  
Channel No.1  
Test Mode: 802.11b





Date: 2.AUG.2019 16:26:09

Carrier frequency (MHz): 2437  
Channel No.6  
Test Mode: 802.11b

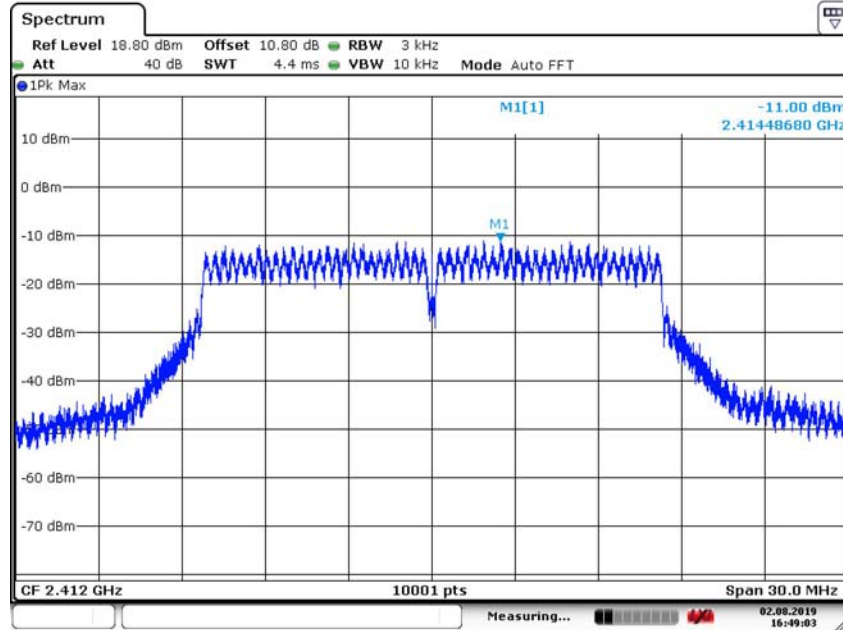


Date: 2.AUG.2019 16:26:27

Carrier frequency (MHz): 2462  
Channel No.11  
Test Mode: 802.11b

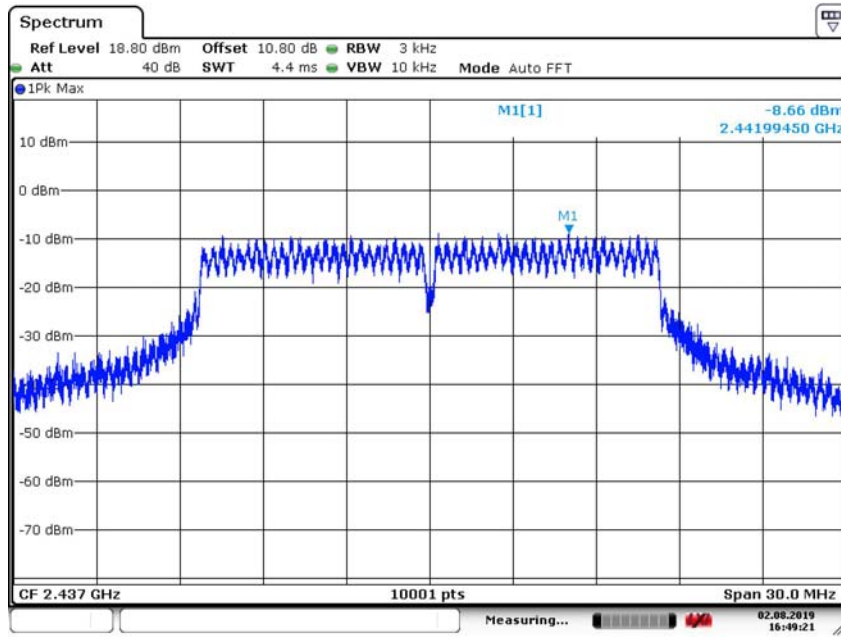
Test Mode: 802.11g

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-11.00
2442	6	-8.66
2472	11	-6.19



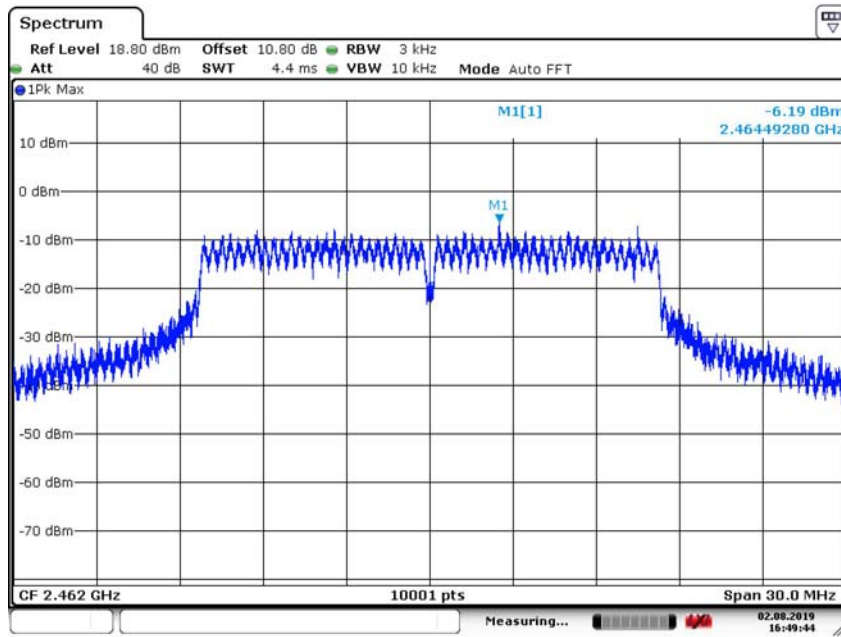
Date: 2.AUG.2019 16:49:03

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



Date: 2.AUG.2019 16:49:20

Carrier frequency (MHz): 2437  
Channel No.6  
Test Mode: 802.11g

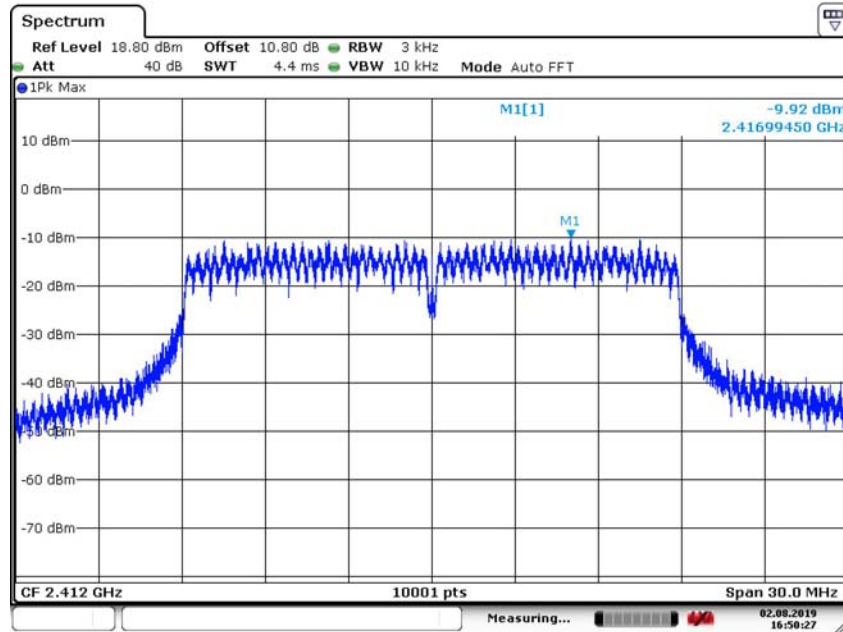


Date: 2.AUG.2019 16:49:44

Carrier frequency (MHz): 2462  
Channel No.11  
Test Mode: 802.11g

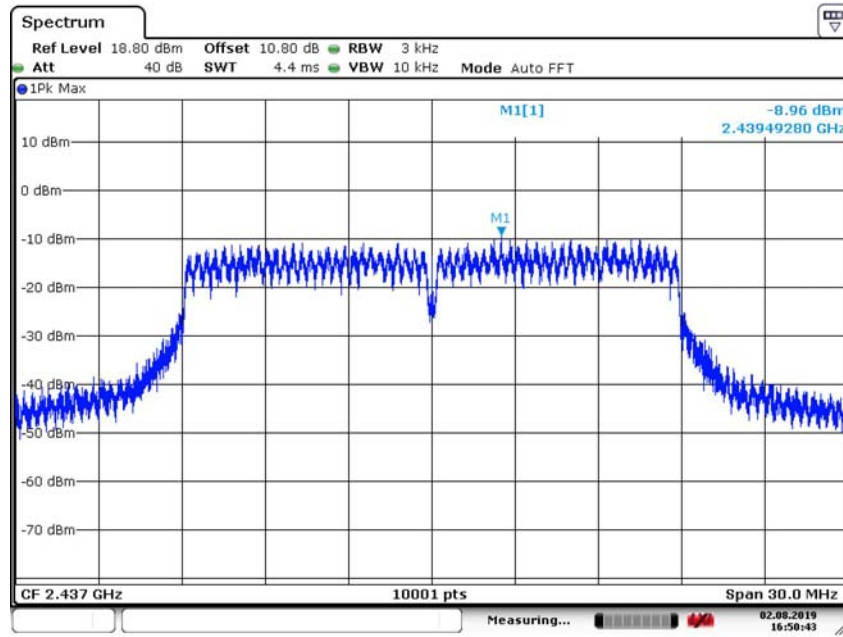
Test Mode: 802.11n (HT20)

Carrier frequency (MHz)	Channel No	Power Density (dBm)
2412	1	-9.92
2437	6	-8.96
2462	11	-8.66



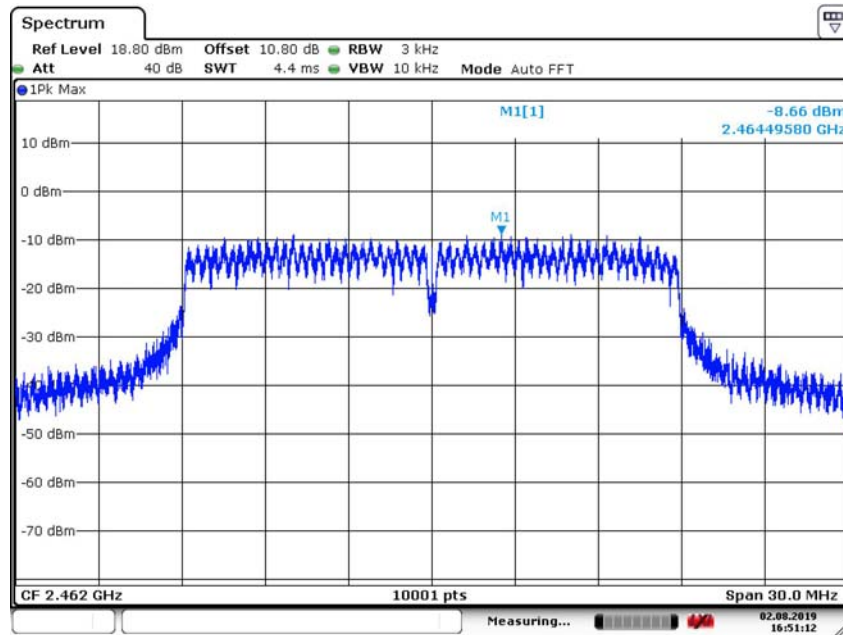
Date: 2.AUG.2019 16:50:26

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



Date: 2.AUG.2019 16:50:43

Carrier frequency (MHz): 2437  
Channel No.6  
Test Mode: 802.11n (HT20)



Date: 2.AUG.2019 16:51:12

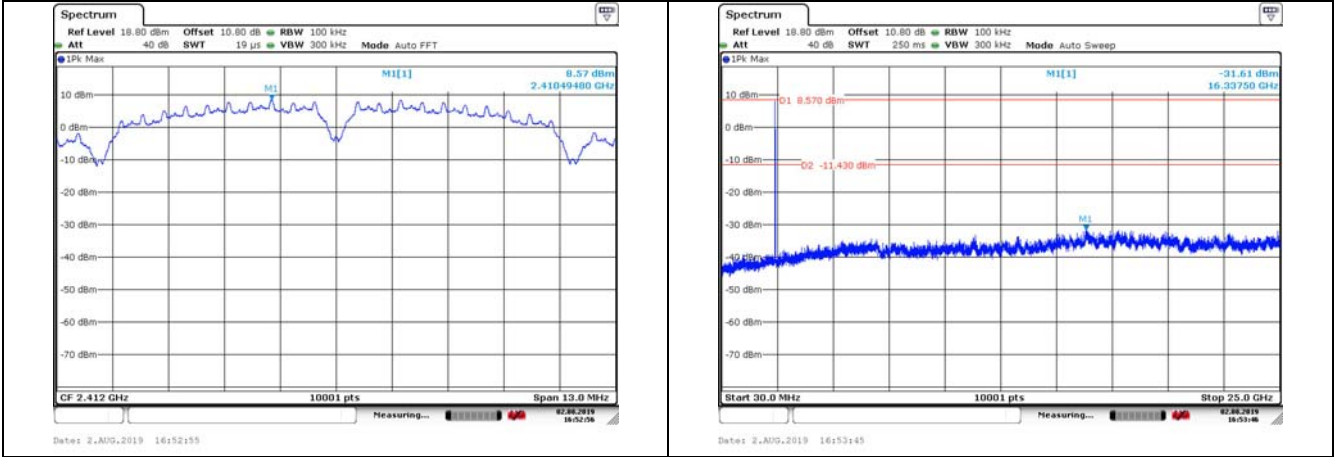
Carrier frequency (MHz): 2462  
Channel No.11  
Test Mode: 802.11n (HT20)

**Conducted Out of band emission measurement**

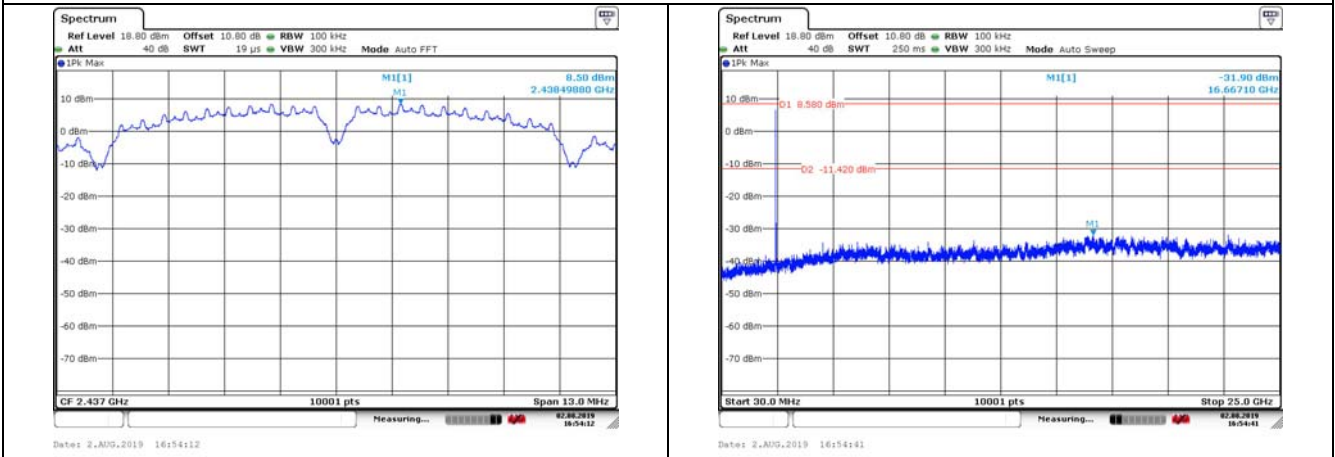
Offset 10.8dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 0.6dB

802.11b

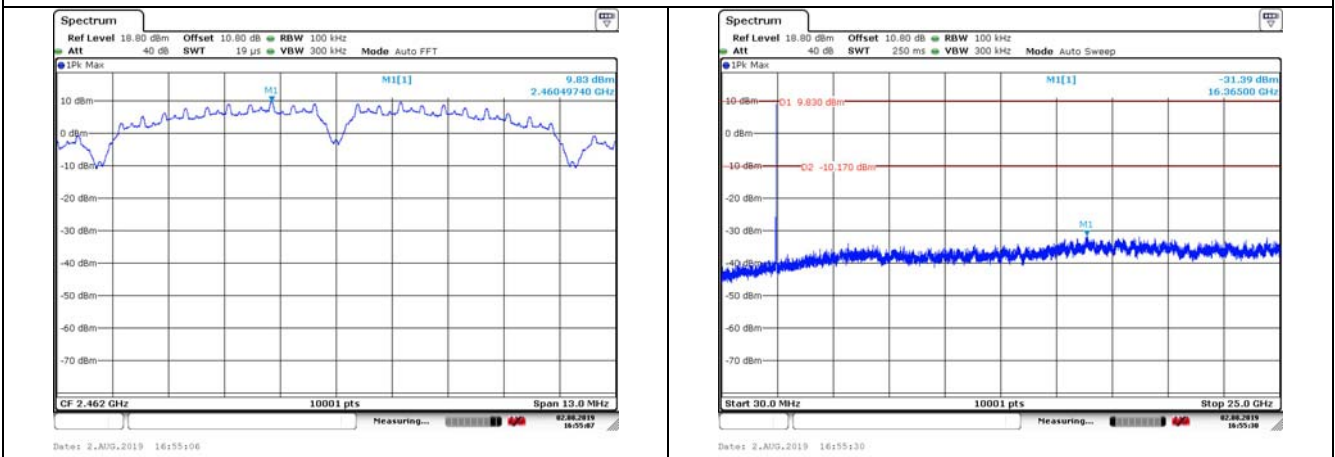
CH1



CH6

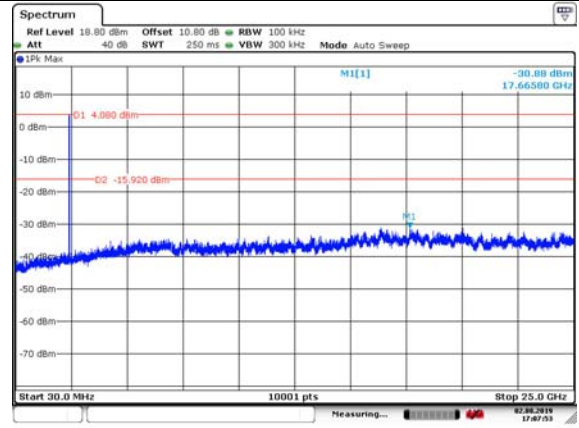
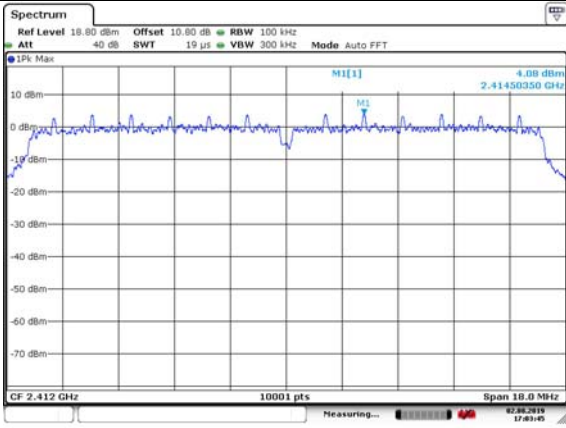


CH11

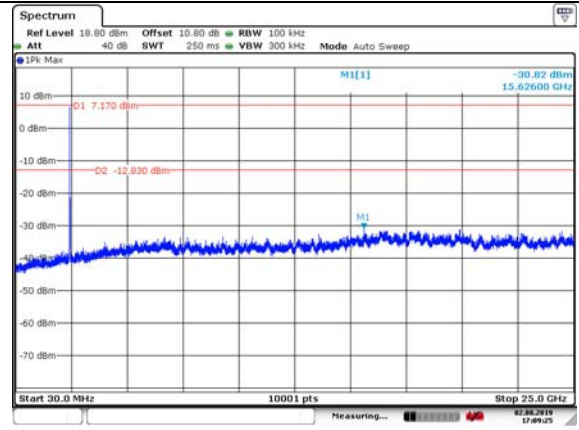
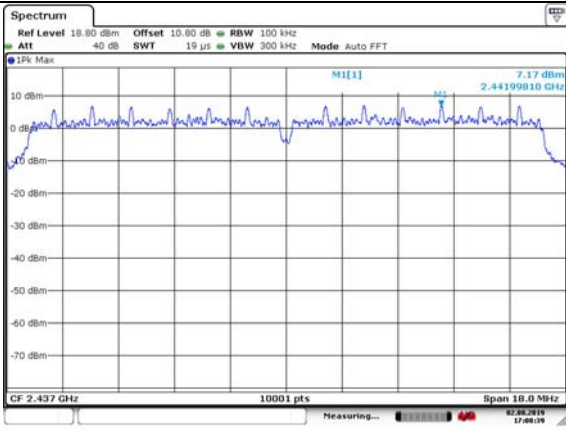


802.11g

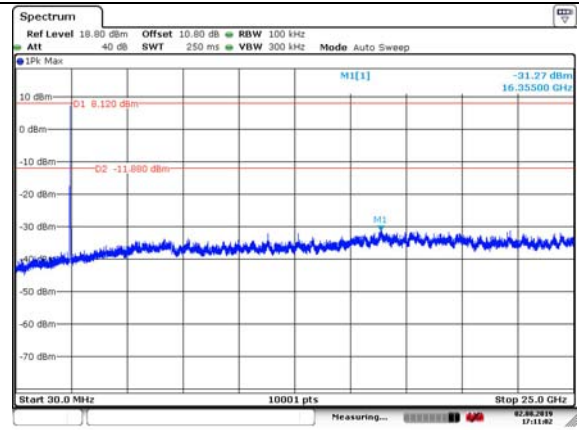
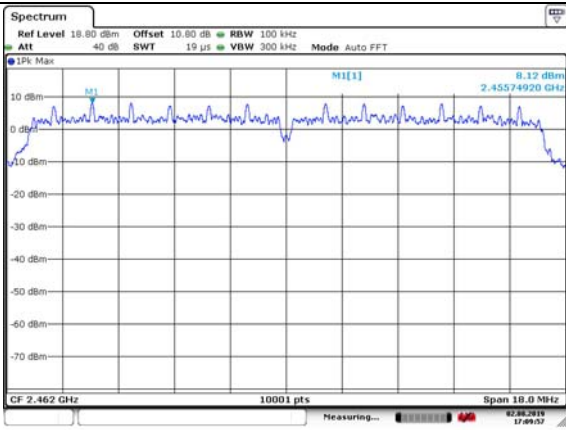
CH1



CH6

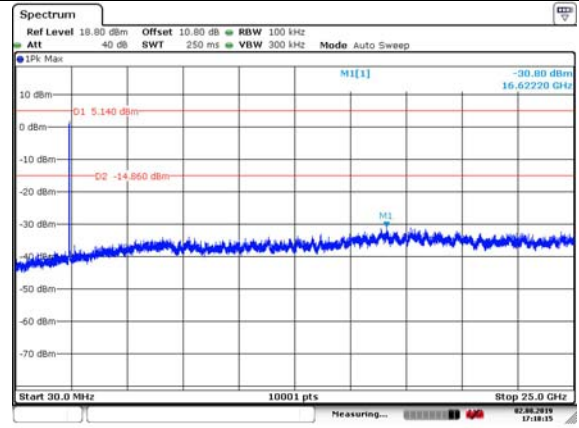
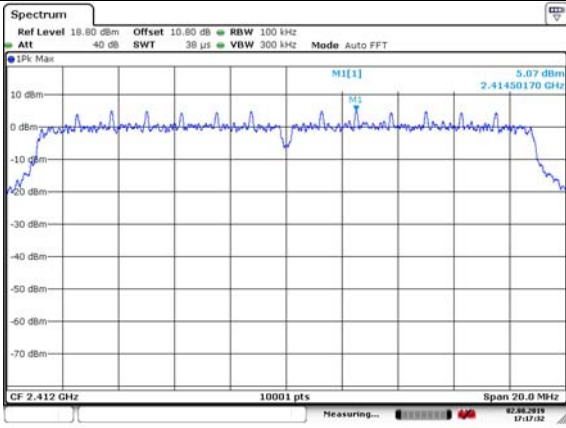


CH11

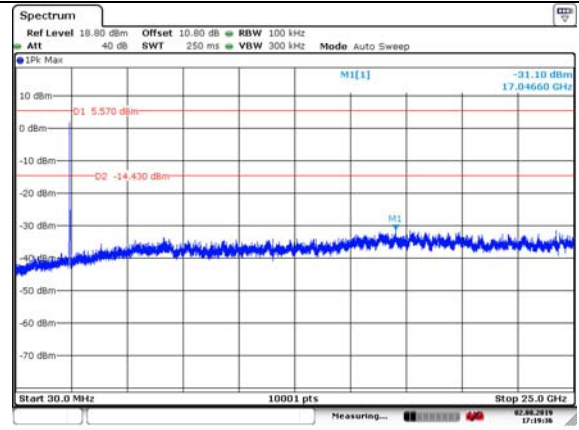
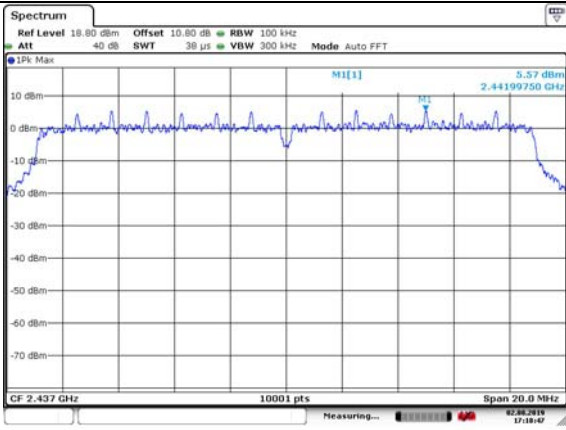


802.11n (HT20)

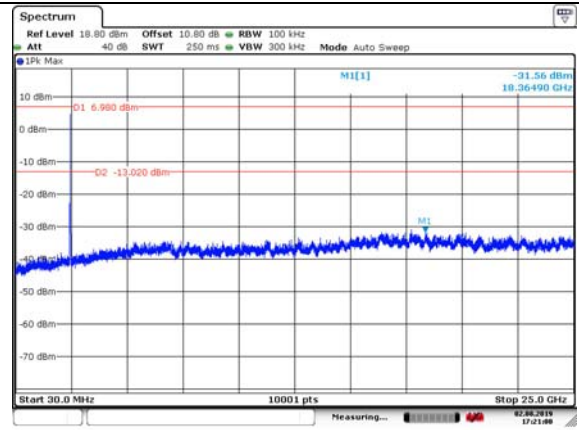
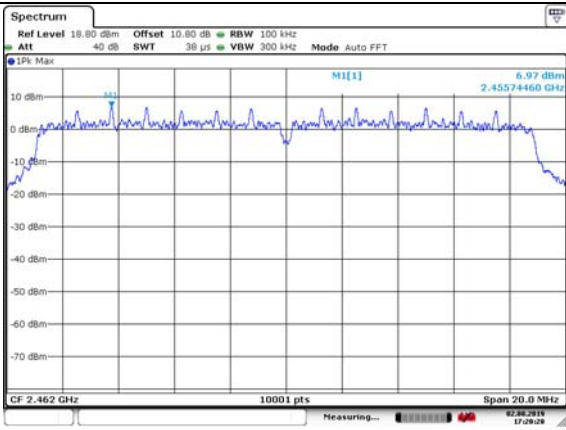
CH1



CH6



CH11



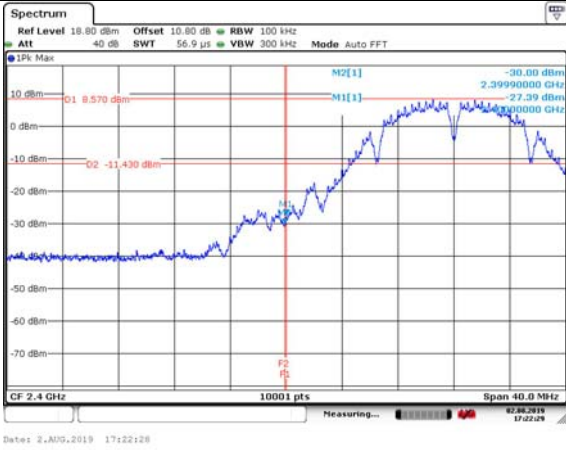


**Band edge measurement (RF Conducted measurement)**

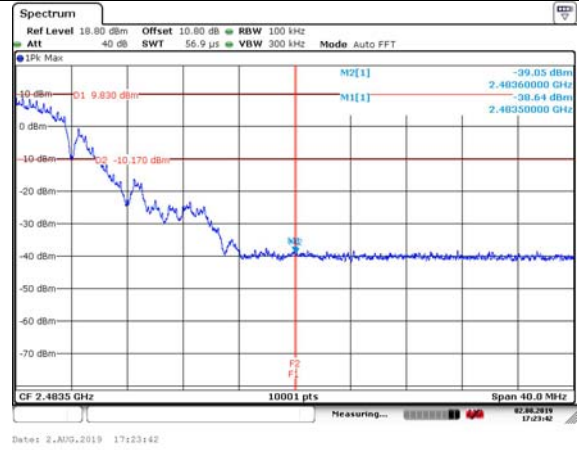
Offset 10.8dB = Attenuator 10dB+ Temporary antenna connector loss 0.2dB+ Cable loss 0.6dB

802.11b

CH1

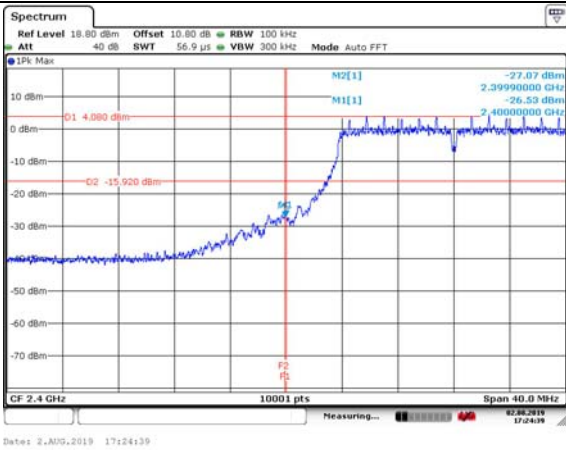


CH11

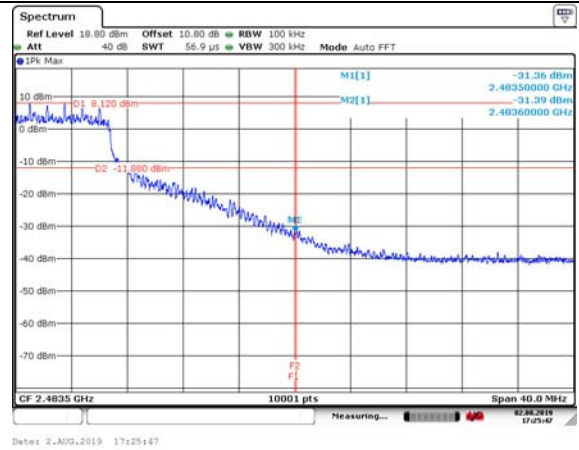


802.11g

CH1

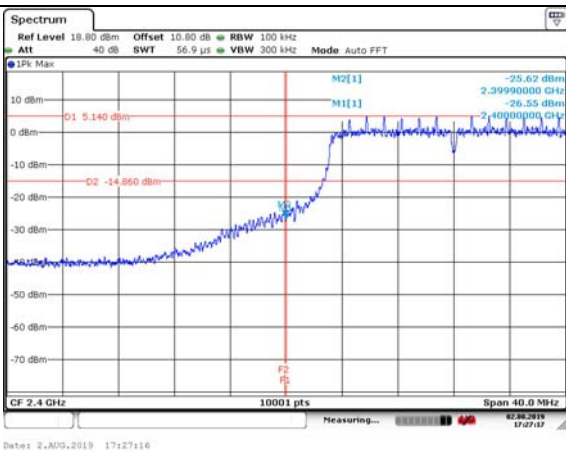


CH11

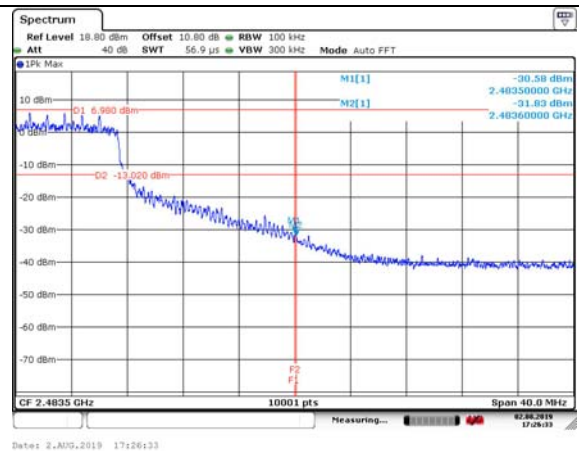


802.11n (HT20)

CH1



CH11



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

### **Radiated Emission Band Edge**

The worst case attitude: The mobile lay down.

The measurement results are obtained as described below:

Measure Level = Reading Level + cable loss + antenna factor

Sample calculation: (93.74 dB $\mu$ V/m) = (59.74 dB $\mu$ V) + (8.90 dB) + (25.10 dB), the corresponding frequency is 2412MHz.

Carrier frequency (MHz): 2412

Channel No.:1

Test Mode: 802.11b

Polarity:Vertical

Detector: Peak

No	Frequency (MHz)	Measure Level (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Over Limit (dB)	Limit (dB $\mu$ V/m)	cable loss (dB)	antenna factor (dB)
1	2412	93.74	59.74	N/A	N/A	8.90	25.10
2	2390	38.46	4.46	-35.54	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 (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Over Limit (dB)	Limit (dB $\mu$ V/m)	cable loss (dB)	antenna factor (dB)
1	2412	87.93	53.93	N/A	N/A	8.90	25.10
2	2390	37.10	3.10	-36.90	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 (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Over Limit (dB)	Limit (dB $\mu$ V/m)	cable loss (dB)	antenna factor (dB)
1	2412	78.59	44.59	N/A	N/A	8.90	25.10
2	2390	26.89	-7.11	-27.11	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 (dB $\mu$ V/m)	Reading Level (dB $\mu$ V)	Over Limit (dB)	Limit (dB $\mu$ V/m)	cable loss (dB)	antenna factor (dB)
1	2412	76.90	42.90	N/A	N/A	8.90	25.10
2	2390	27.62	-6.38	-26.38	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	91.61	57.61	N/A	N/A	8.90	25.10
2	2483.5	38.78	4.78	-35.22	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	88.03	54.03	N/A	N/A	8.90	25.10
2	2483.5	36.02	2.02	-37.98	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	77.63	43.63	N/A	N/A	8.90	25.10
2	2483.5	28.35	-5.65	-25.65	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	76.57	42.57	N/A	N/A	8.90	25.10
2	2483.5	27.52	-6.48	-26.48	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	93.09	59.09	N/A	N/A	8.90	25.10
2	2390	41.10	7.10	-32.90	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	87.13	53.13	N/A	N/A	8.90	25.10
2	2390	34.56	0.56	-39.44	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	80.79	46.79	N/A	N/A	8.90	25.10
2	2390	28.33	-5.67	-25.67	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	78.12	44.12	N/A	N/A	8.90	25.10
2	2390	27.87	-6.13	-26.13	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	91.37	57.37	N/A	N/A	8.90	25.10
2	2483.5	39.60	5.60	-34.40	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	87.67	53.67	N/A	N/A	8.90	25.10
2	2483.5	36.81	2.81	-37.19	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	77.62	43.62	N/A	N/A	8.90	25.10
2	2483.5	27.69	-6.31	-26.31	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	75.26	41.26	N/A	N/A	8.90	25.10
2	2483.5	26.43	-7.57	-27.57	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	94.40	60.40	N/A	N/A	8.90	25.10
2	2390	39.09	5.09	-34.91	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	87.78	53.78	N/A	N/A	8.90	25.10
2	2390	36.50	2.50	-37.50	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	77.25	43.25	N/A	N/A	8.90	25.10
2	2390	27.13	-6.87	-26.87	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	74.55	40.55	N/A	N/A	8.90	25.10
2	2390	27.01	-6.99	-26.99	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	92.89	58.89	N/A	N/A	8.90	25.10
2	2483.5	40.81	6.81	-33.19	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	87.45	53.45	N/A	N/A	8.90	25.10
2	2483.5	35.56	1.56	-38.44	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	78.81	44.81	N/A	N/A	8.90	25.10
2	2483.5	28.19	-5.81	-25.81	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	74.83	40.83	N/A	N/A	8.90	25.10
2	2483.5	27.27	-6.73	-26.73	54.00	8.90	25.10

## Sample Calculations

### Determining Spurious Emissions Levels

A “reference path loss” is established and the  $A_{Rpl}$  is the attenuation of “reference path loss”, and including the gain of receive antenna, the gain of the preamplifier, the cable loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{mea}} + A_{Rpl}$$

Sample calculation:  $(30.02 \text{ dB}\mu\text{V/m}) = (44.92 \text{ dB}\mu\text{V}) + (-14.9 \text{ dB/m})$ , the corresponding frequency is 30.990000MHz.

The worst case attitude: The mobile lay down.

For 802.11b Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.990000	30.02	-14.9	44.92	Vertical	40.00
31.155000	29.44	-14.8	44.24	Vertical	40.00
32.430500	26.19	-14.5	40.69	Vertical	40.00
33.386000	24.34	-14.2	38.54	Vertical	40.00
38.316000	22.98	-12.7	35.68	Vertical	40.00
46.989000	26.97	-11.4	38.37	Vertical	40.00

For 802.11g Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
31.646000	28.62	-14.7	43.32	Vertical	40.00
32.451000	26.46	-14.4	40.86	Vertical	40.00
38.279500	23.12	-12.7	35.82	Vertical	40.00
38.296500	23.05	-12.7	35.75	Vertical	40.00
46.915000	26.82	-11.4	38.22	Vertical	40.00
920.591500	23.46	4.8	18.66	Vertical	46.00

For 802.11n(HT20) Channel No.:1

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.867500	29.41	-14.9	44.31	Vertical	40.00
38.011500	22.55	-12.8	35.35	Vertical	40.00
39.041000	21.07	-12.5	33.57	Vertical	40.00
44.316500	23.97	-11.6	35.57	Vertical	40.00
46.978000	26.75	-11.4	38.15	Vertical	40.00
946.350000	23.70	5.1	18.6	Vertical	46.00



For 802.11b Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.836000	29.23	-14.9	44.13	Vertical	40.00
33.210000	24.69	-14.2	38.89	Vertical	40.00
33.278000	24.75	-14.2	38.95	Vertical	40.00
38.208000	23.12	-12.7	35.82	Vertical	40.00
39.891000	21.83	-12.2	34.03	Vertical	40.00
46.838500	26.63	-11.4	38.03	Vertical	40.00

For 802.11g Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
31.121000	30.38	-14.8	45.18	Vertical	40.00
37.957000	24.08	-12.8	36.88	Vertical	40.00
40.216000	22.57	-12.1	34.67	Vertical	40.00
44.618500	25.13	-11.6	36.73	Vertical	40.00
47.043500	27.13	-11.4	38.53	Vertical	40.00
915.216500	23.46	4.7	18.76	Vertical	46.00

For 802.11n(HT20) Channel No.:6

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
31.127000	35.99	-20.8	56.79	Vertical	40.00
32.319000	33.68	-20.5	54.18	Vertical	40.00
33.708500	32.25	-20.1	52.35	Vertical	40.00
38.575500	21.31	-18.6	39.91	Vertical	40.00
39.731000	22.41	-18.2	40.61	Vertical	40.00
49.342500	25.37	-17.2	42.57	Vertical	40.00

For 802.11b Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.433500	32.07	-21.0	53.07	Vertical	40.00
31.803500	34.25	-20.6	54.85	Vertical	40.00
31.954000	34.83	-20.6	55.43	Vertical	40.00
33.404000	30.54	-20.2	50.74	Vertical	40.00
40.453500	21.57	-18.1	39.67	Vertical	40.00
48.566500	24.82	-17.2	42.02	Vertical	40.00

For 802.11g Channel No.:11

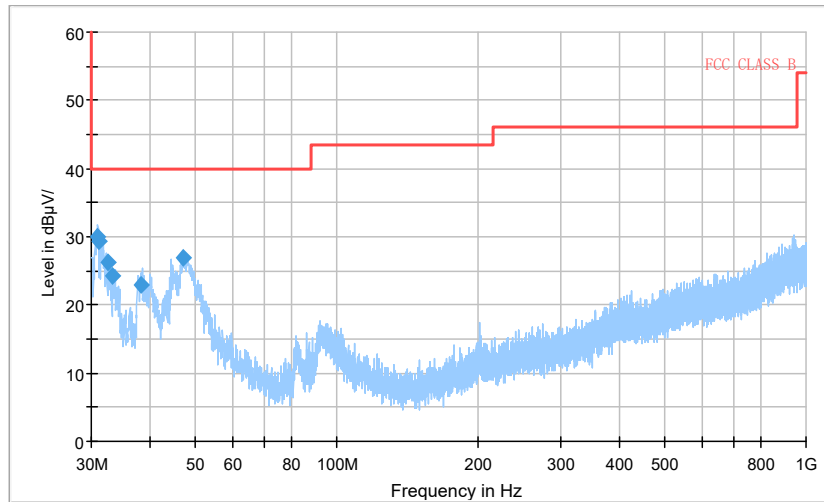
Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.160000	29.82	-21.1	50.92	Vertical	40.00
31.415500	33.15	-20.7	53.85	Vertical	40.00
31.646000	33.98	-20.7	54.68	Vertical	40.00
34.356000	26.82	-19.9	46.72	Vertical	40.00
35.891000	24.03	-19.4	43.43	Vertical	40.00
49.091500	24.42	-17.2	41.62	Vertical	40.00

For 802.11n(HT20) Channel No.:11

Frequency(MHz)	Result(dBuV/m)	ARpl (dB)	Pmea (dBuV/m)	Polarity	Limit (dBuV/m)
30.448000	28.07	-21.0	49.07	Vertical	40.00
31.378000	33.34	-20.8	54.14	Vertical	40.00
33.012500	31.36	-20.3	51.66	Vertical	40.00
33.894000	28.51	-20.0	48.51	Vertical	40.00
33.919500	28.48	-20.0	48.48	Vertical	40.00
34.065000	27.48	-20.0	47.48	Vertical	40.00

Carrier frequency (MHz): 2412  
 Channel No.:1

Full Spectrum

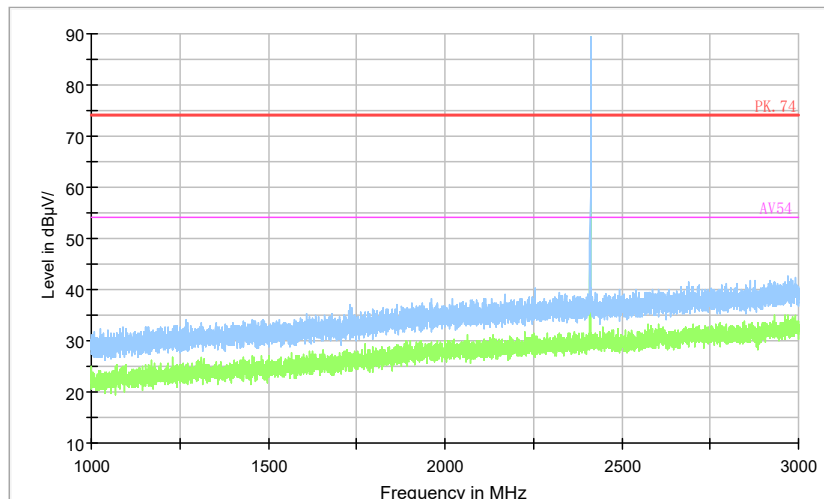


Preview Result 1-PK+    FCC CLASS B    Final\_Result QPK

Comment

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

Full Spectrum

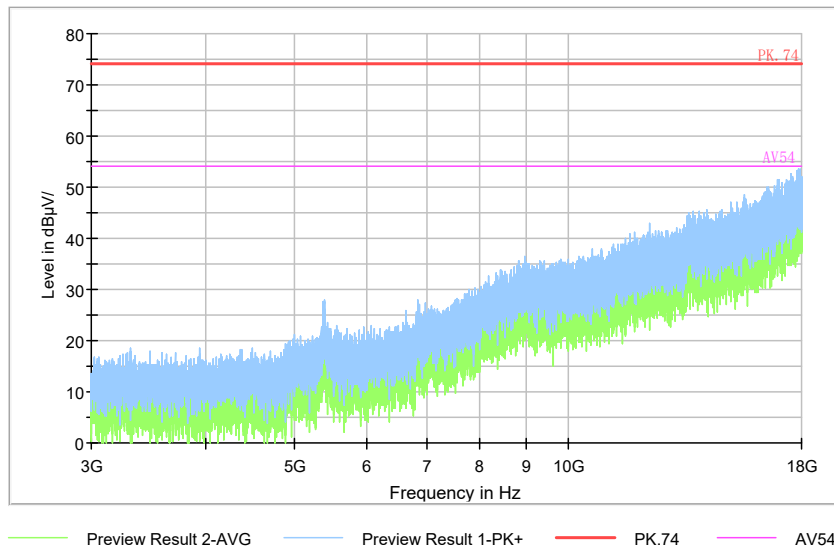


Preview Result 2-AVG    Preview Result 1-PK+    PK.74    AV54

Comment

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

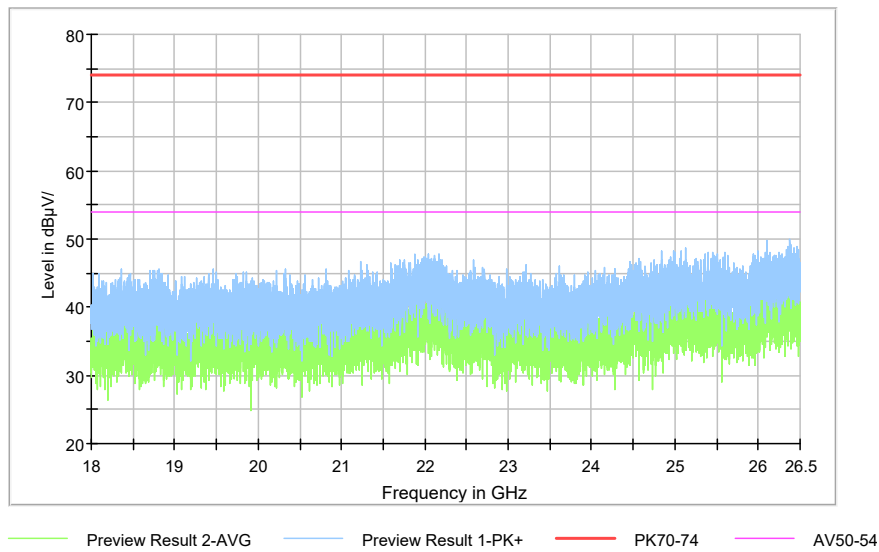
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b

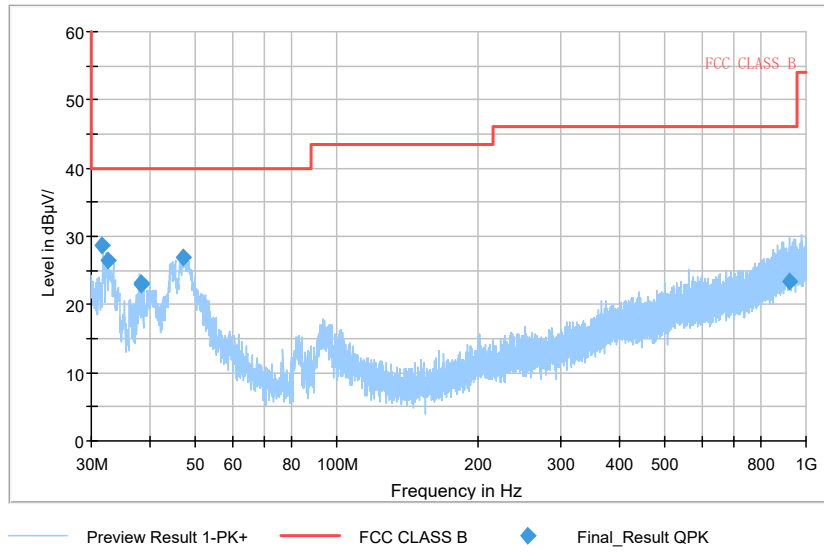
Full Spectrum



Comment

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

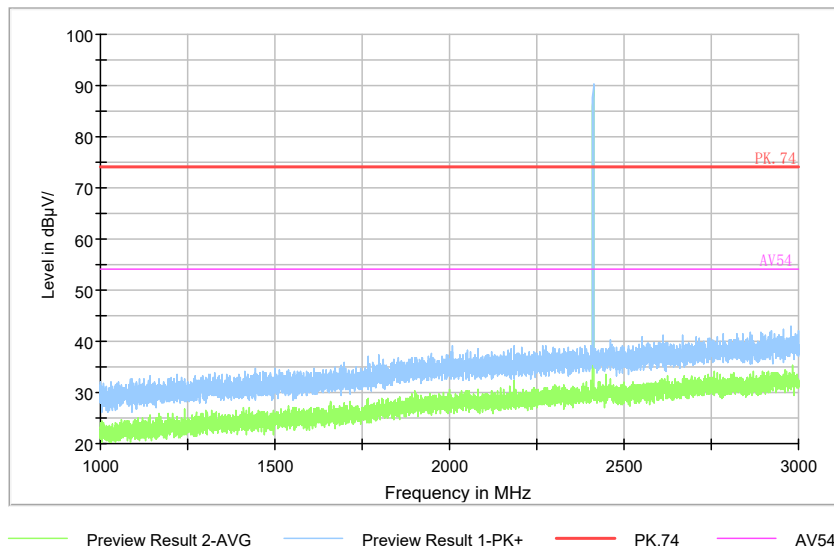
Full Spectrum



Comment

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

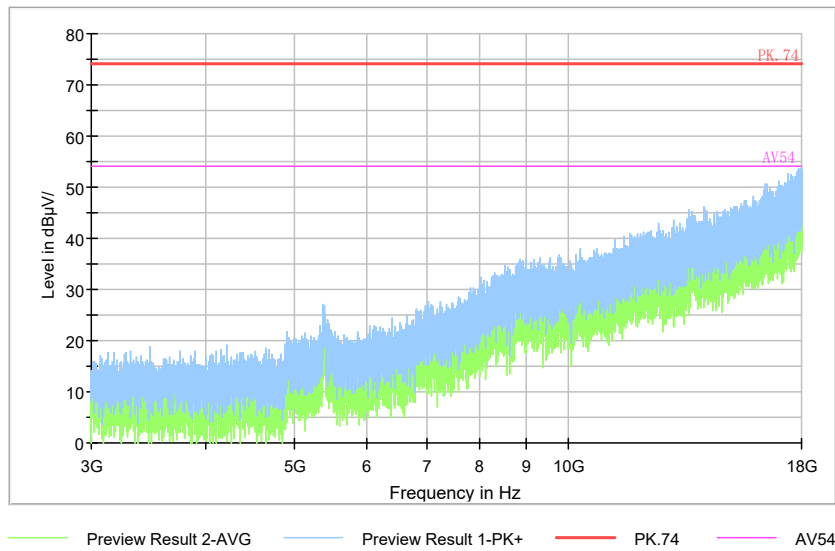
Full Spectrum



Comment

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

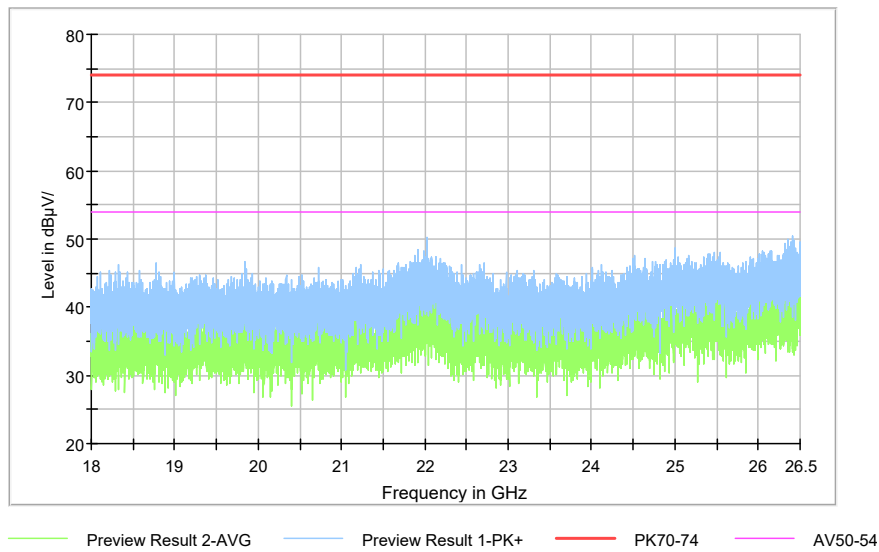
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

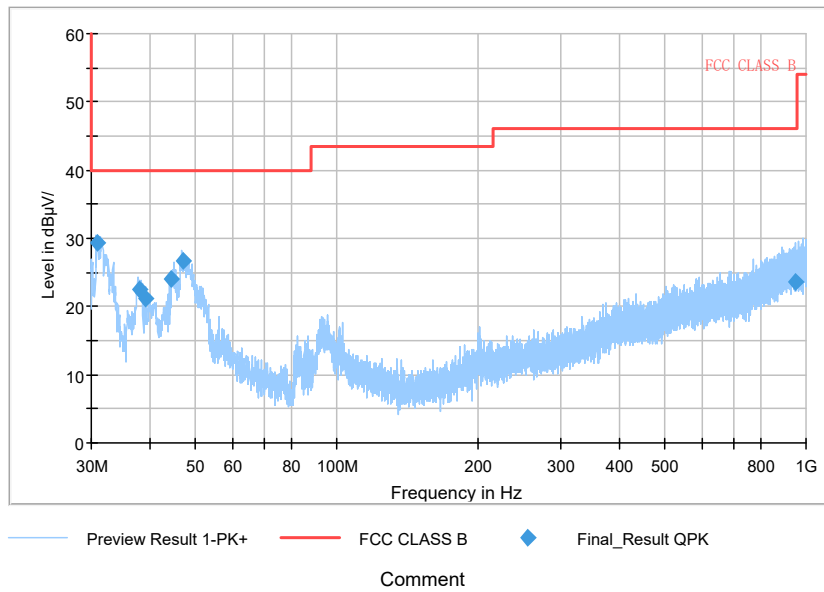
Full Spectrum



Comment

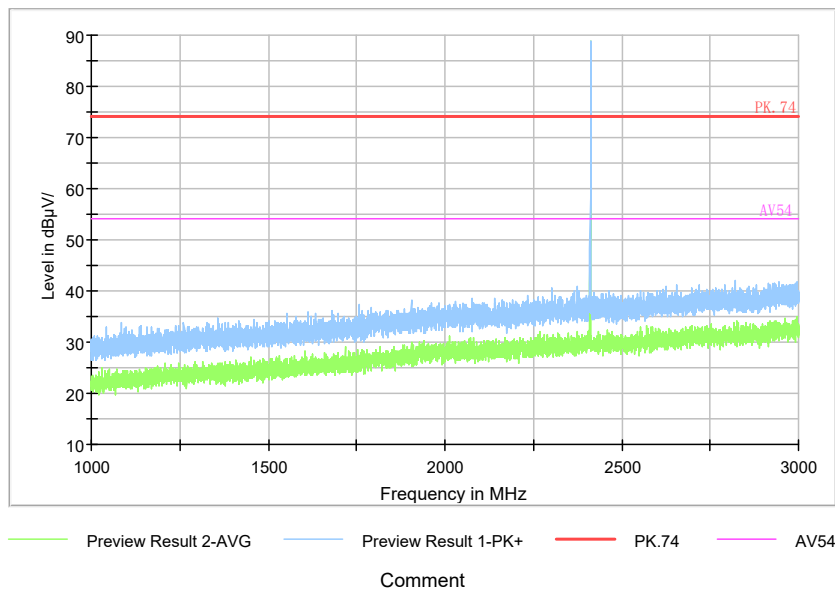
Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



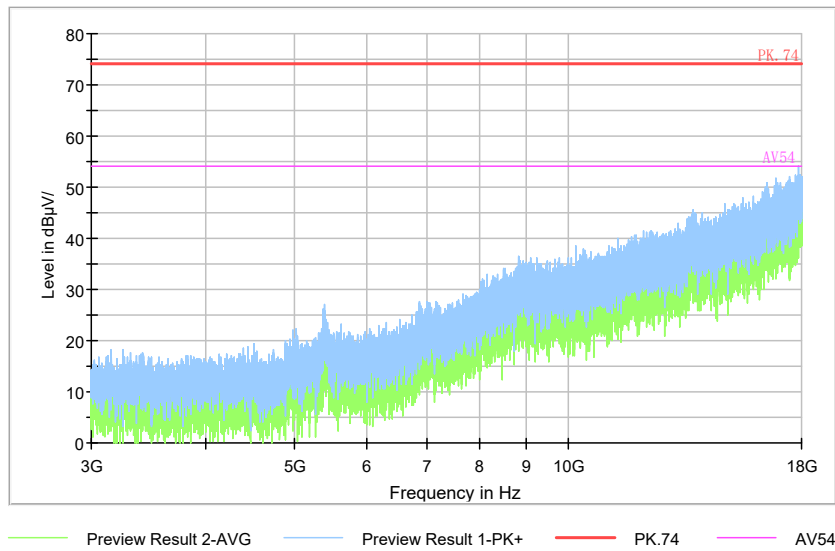
Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11n(HT20)

Full Spectrum



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

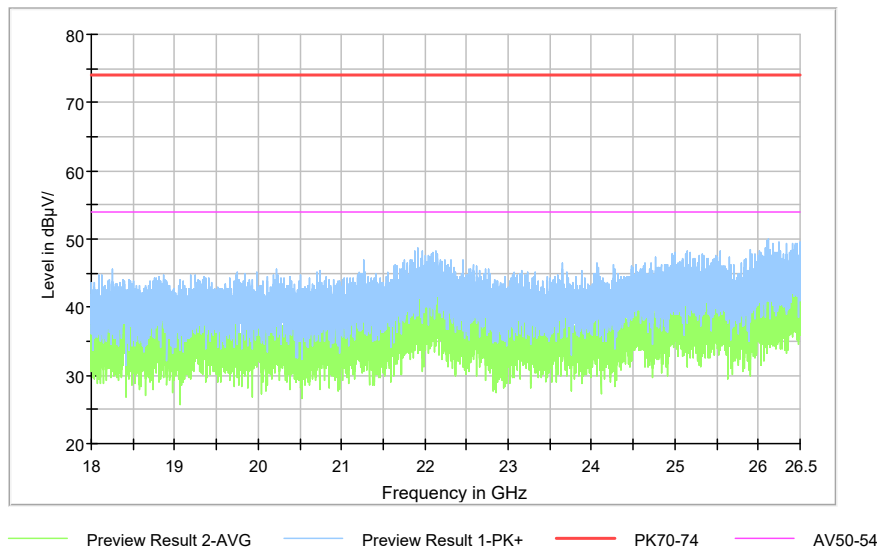
Full Spectrum



Comment

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

Full Spectrum



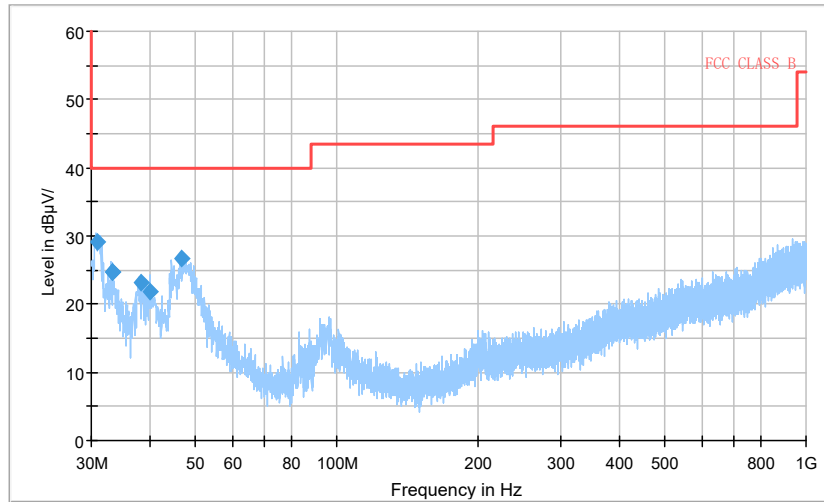
Comment

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



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

Full Spectrum

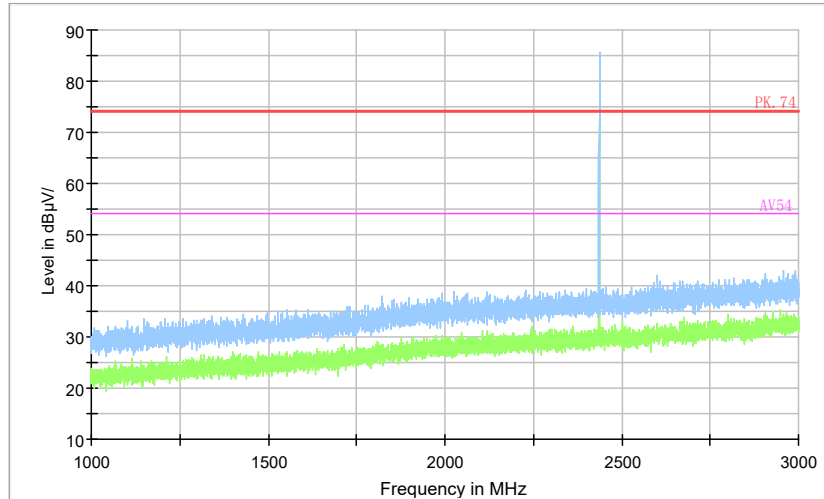


— Preview Result 1-PK+    — FCC CLASS B    ◆ Final\_Result QPK

Comment

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

Full Spectrum

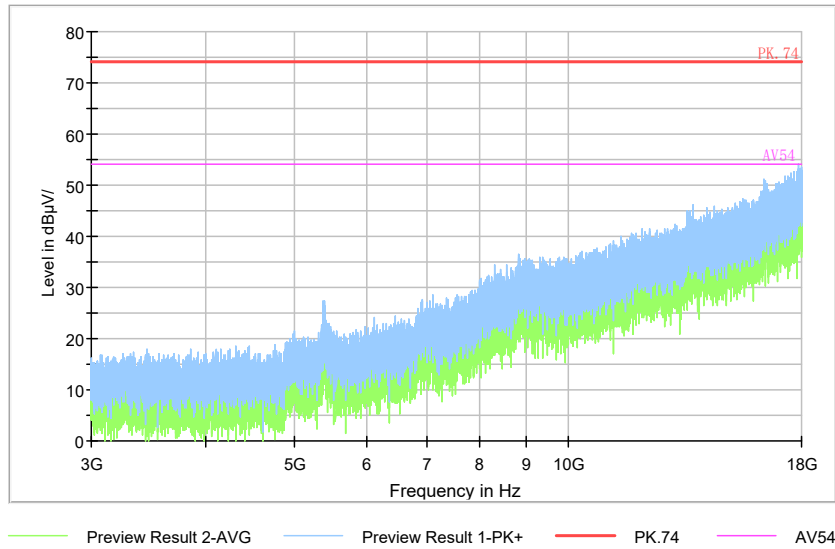


— Preview Result 2-AVG    — Preview Result 1-PK+    — PK.74    — AV54

Comment

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

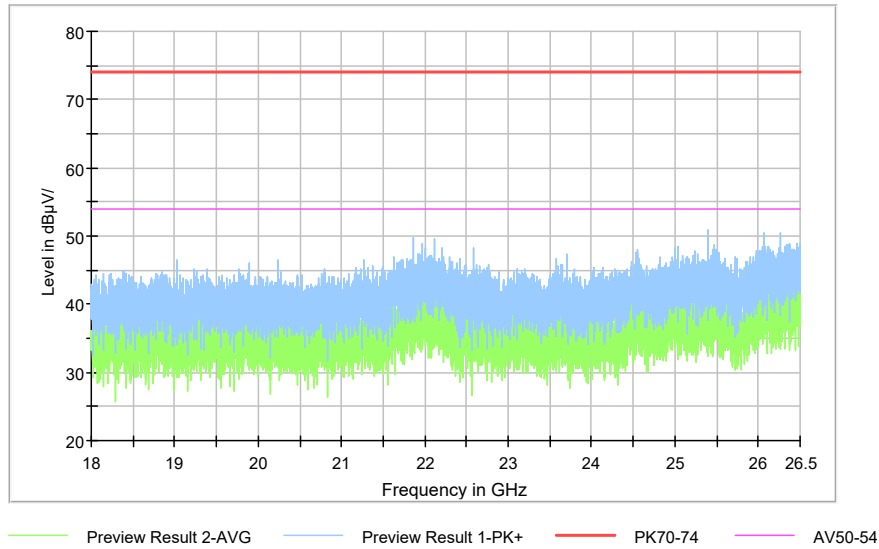
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b

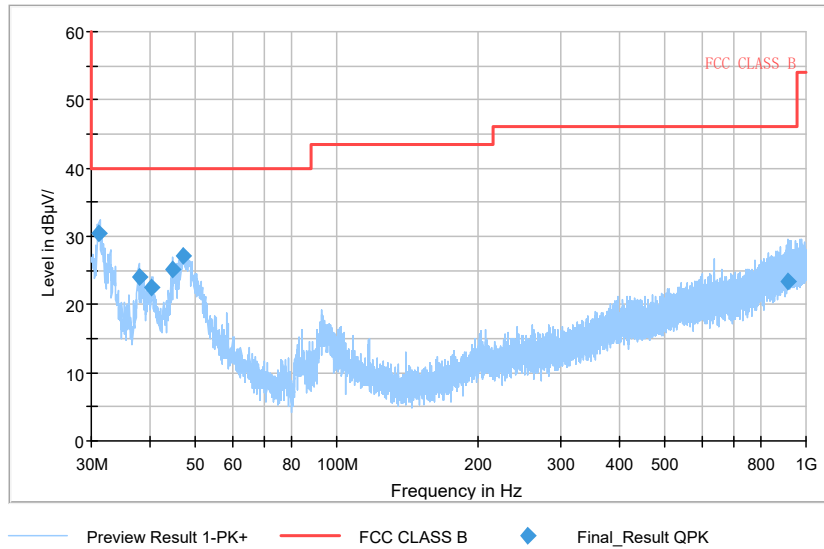
Full Spectrum



Comment

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

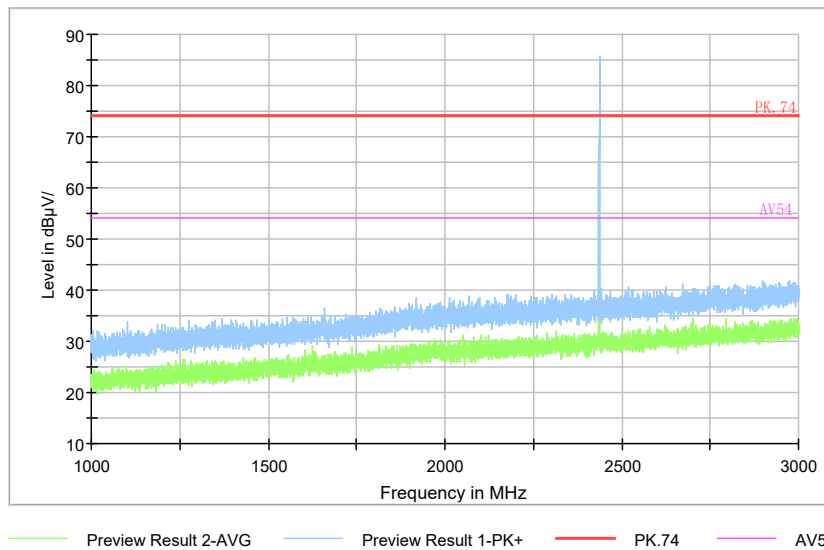
Full Spectrum



Comment

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

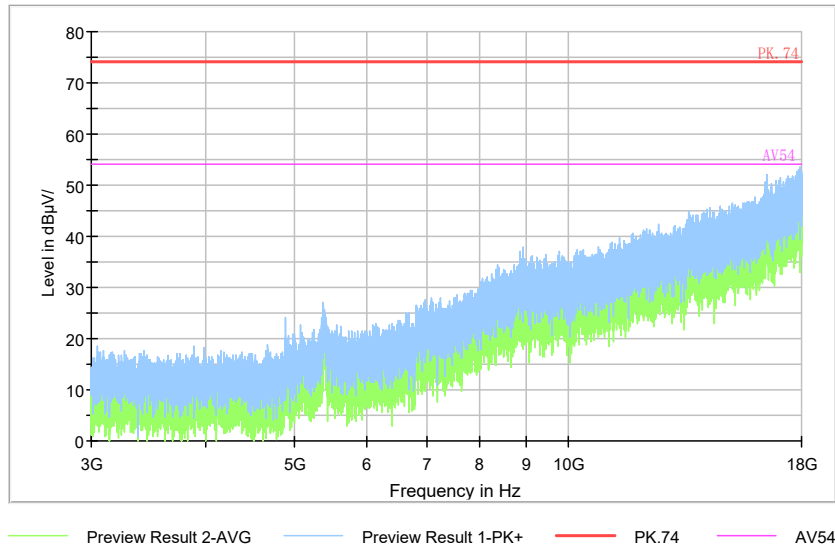
Full Spectrum



Comment

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

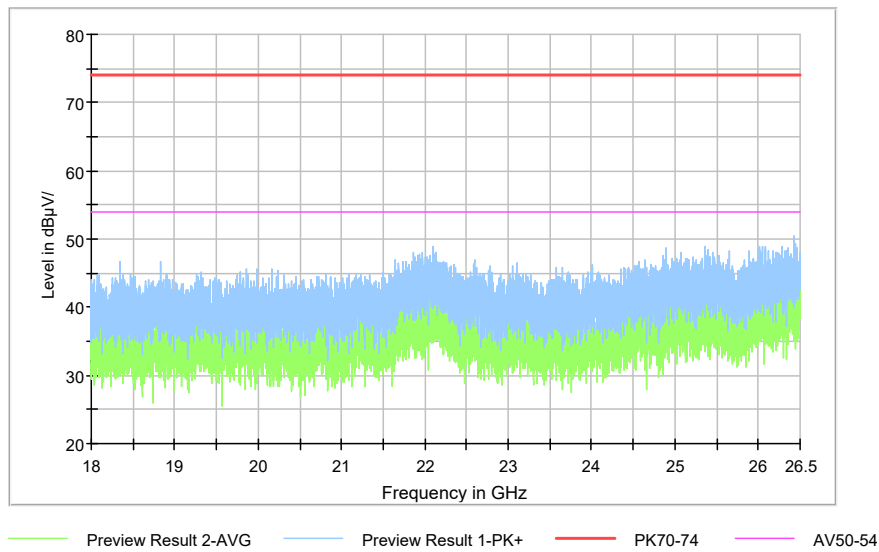
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

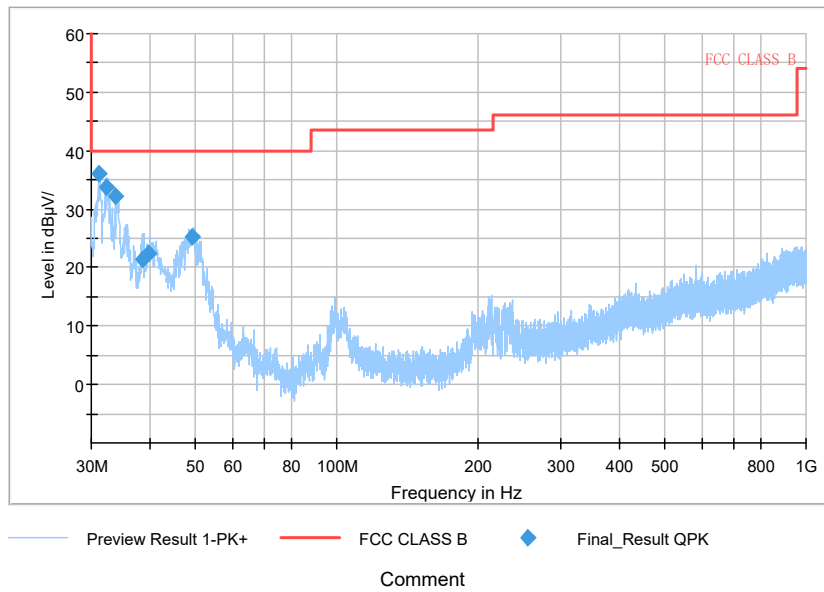
Full Spectrum



Comment

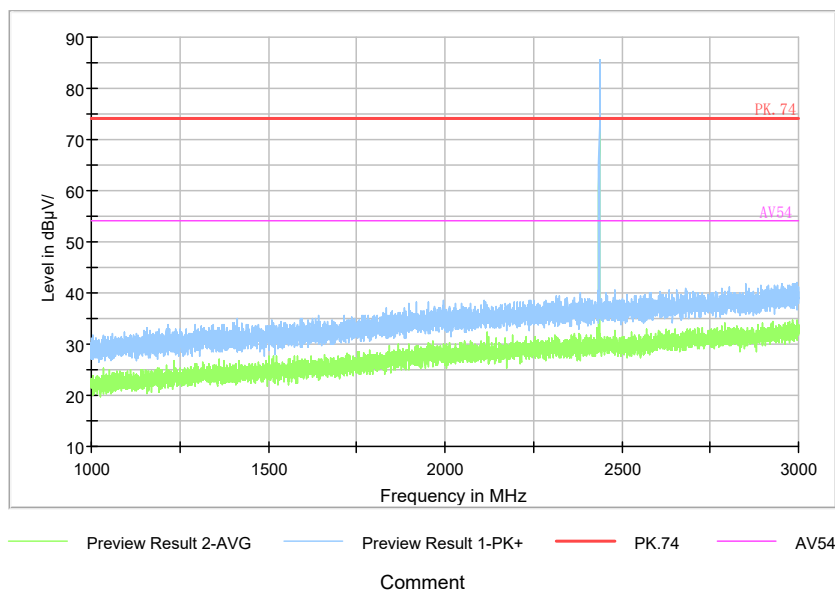
Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



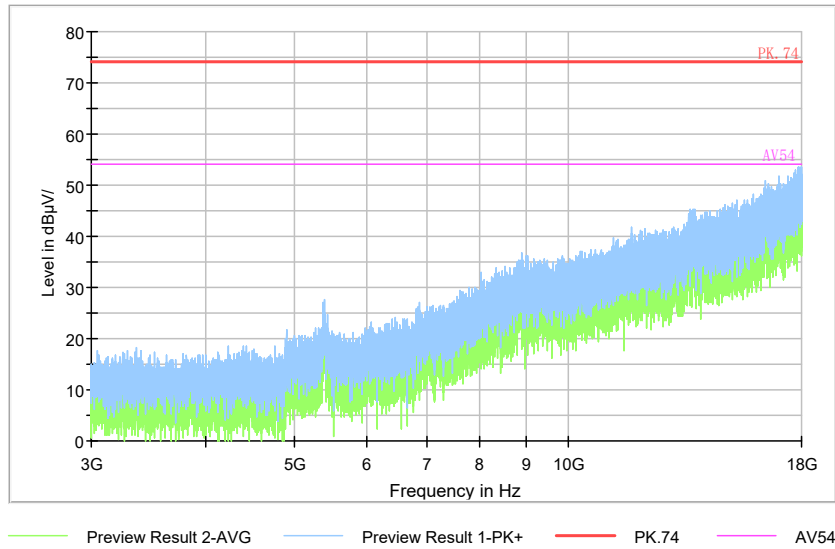
Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11n(HT20)

Full Spectrum



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

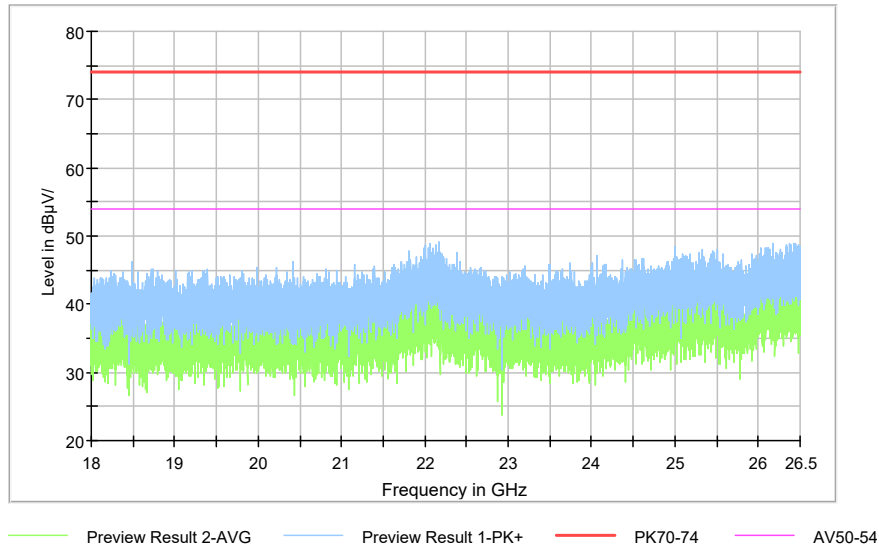
Full Spectrum



Comment

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

Full Spectrum

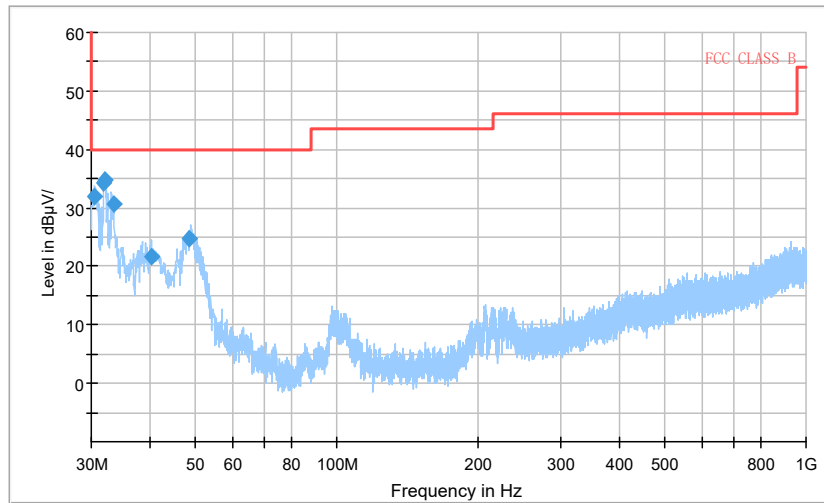


Comment

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

Carrier frequency (MHz): 2462  
Channel No.:11

Full Spectrum

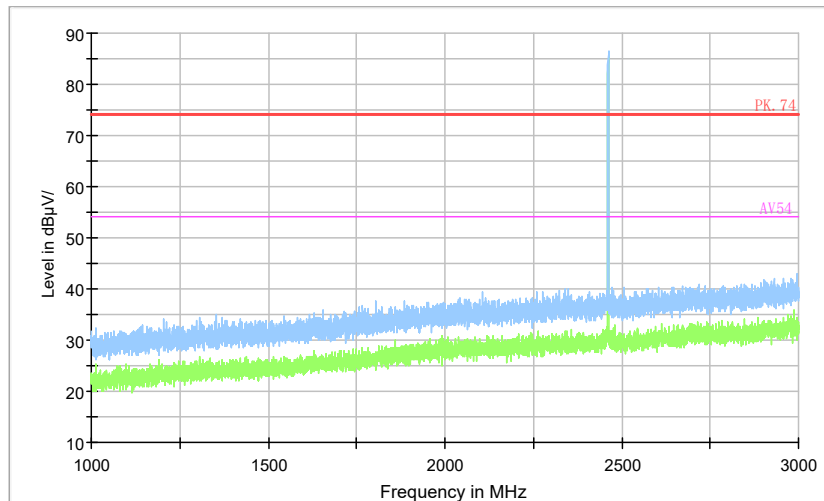


— Preview Result 1-PK+    — FCC CLASS B    ◆ Final\_Result QPK

Comment

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

Full Spectrum

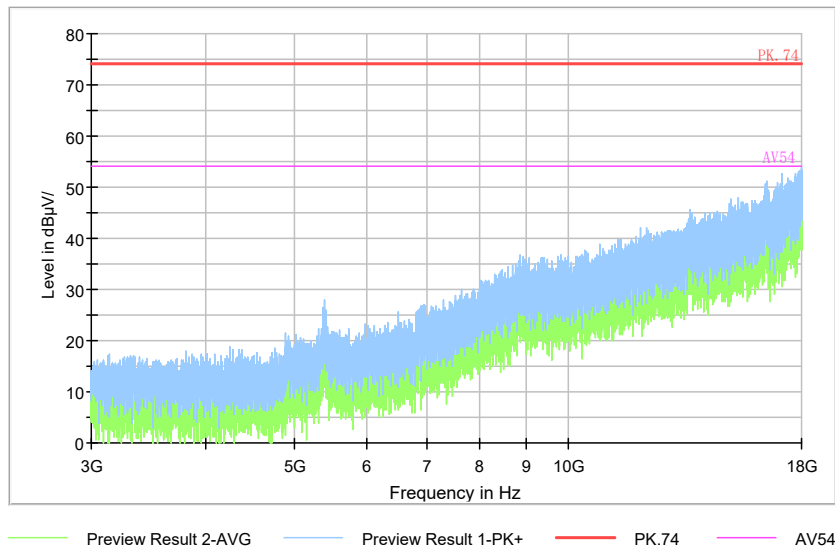


— Preview Result 2-AVG    — Preview Result 1-PK+    — PK.74    — AV54

Comment

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

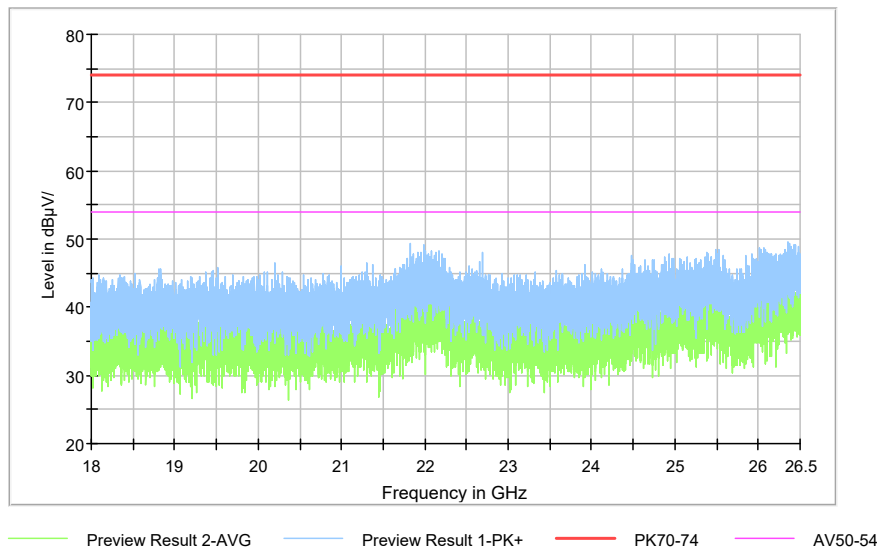
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11b

Full Spectrum

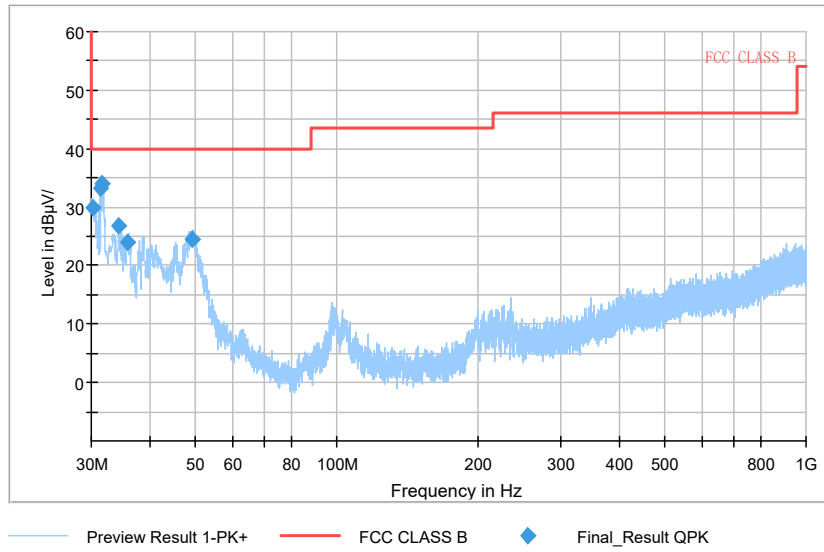


Comment

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



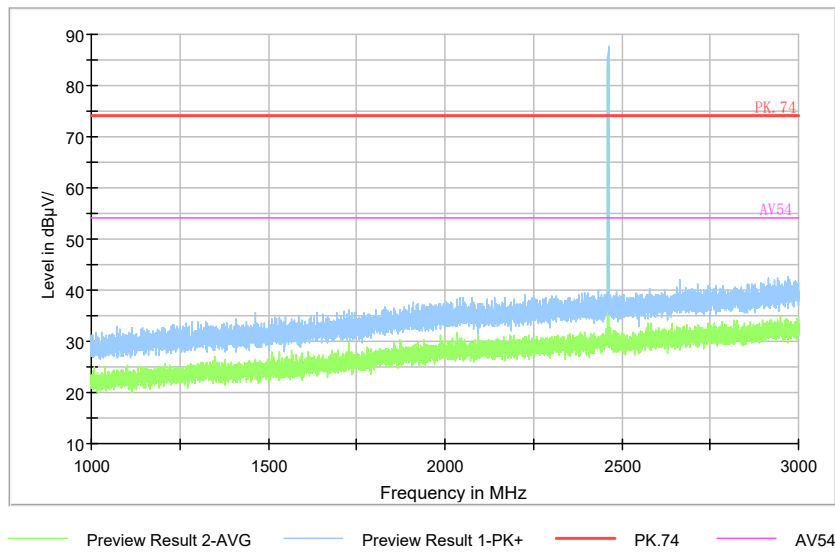
Full Spectrum



Comment

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

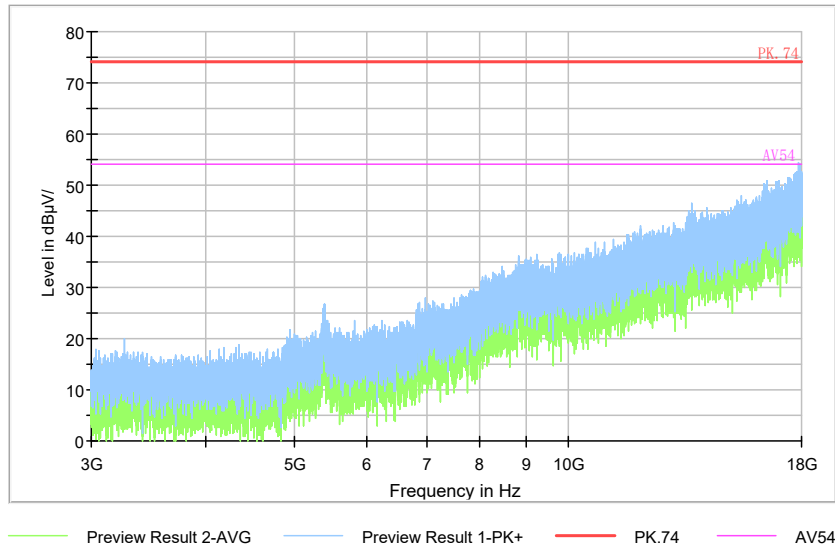
Full Spectrum



Comment

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

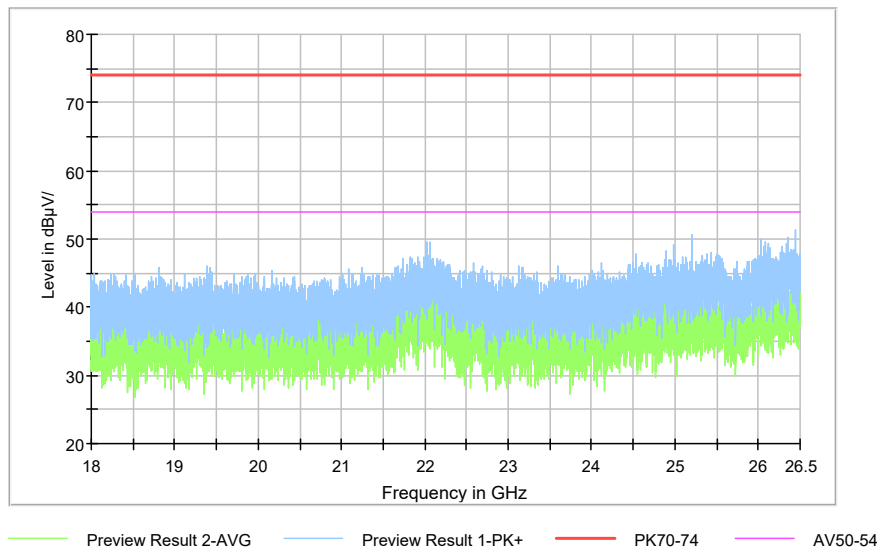
Full Spectrum



Comment

Frequency Range: 3GHz -18GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

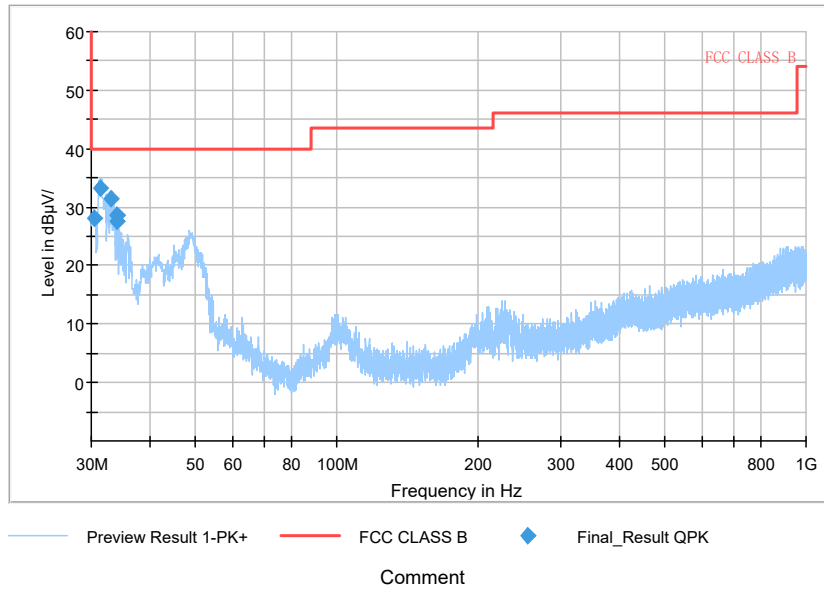
Full Spectrum



Comment

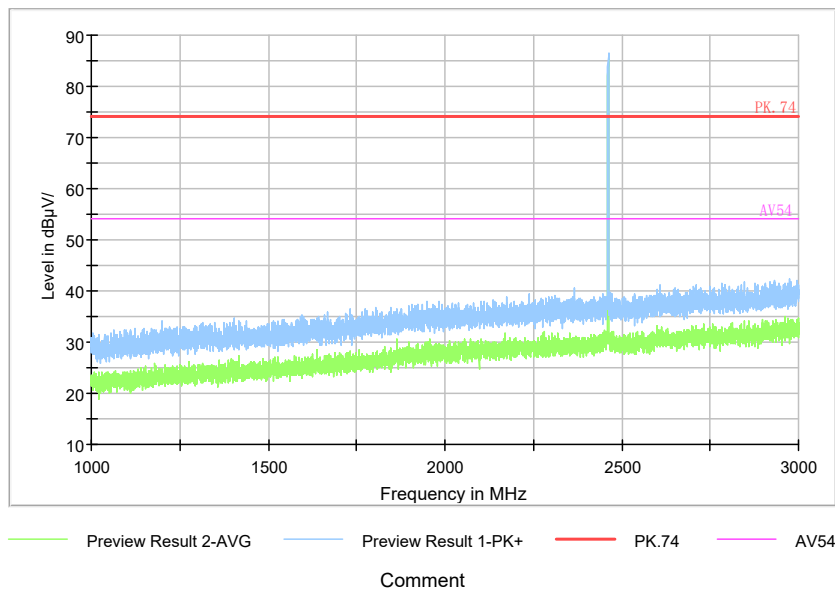
Frequency Range: 18GHz -25GHz  
 Detector: Av mode and PK mode  
 Modulation type: 802.11g

Full Spectrum



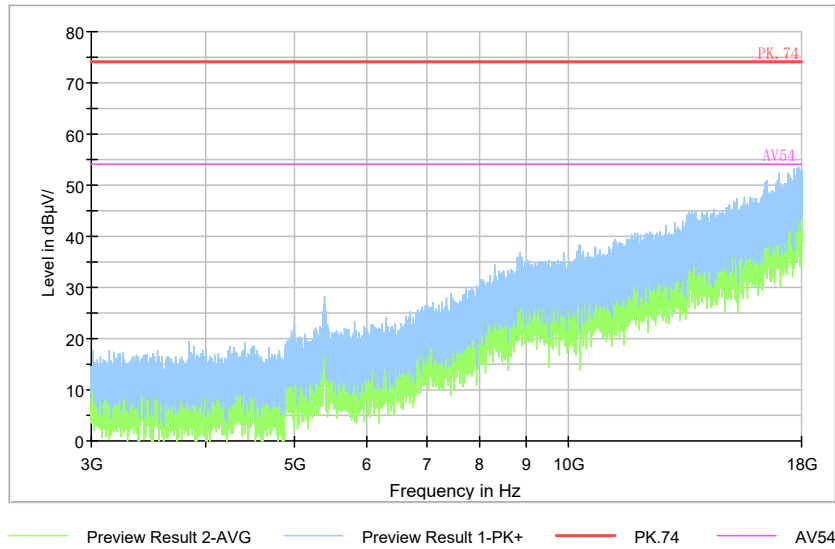
Frequency Range: 30MHz -1GHz  
 Detector: QP mode  
 Test Mode: 802.11n(HT20)

Full Spectrum



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

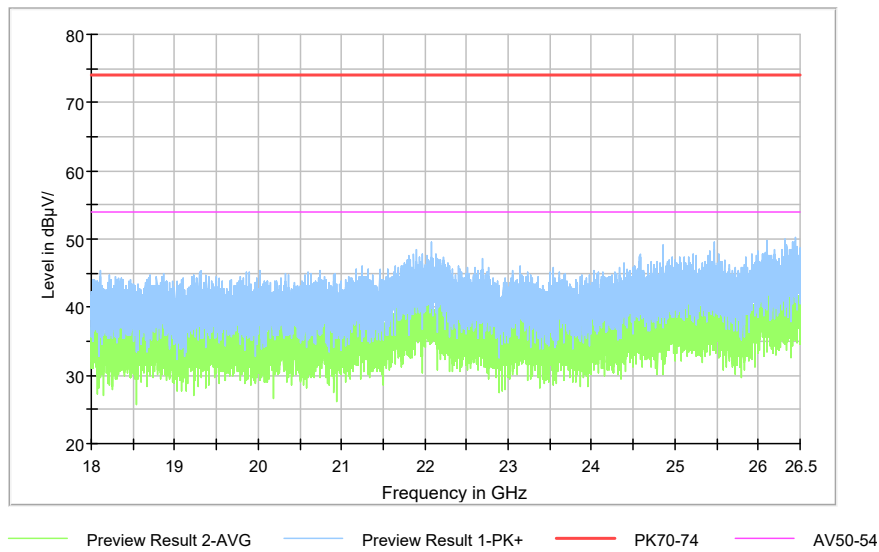
Full Spectrum



Comment

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

Full Spectrum



Comment

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

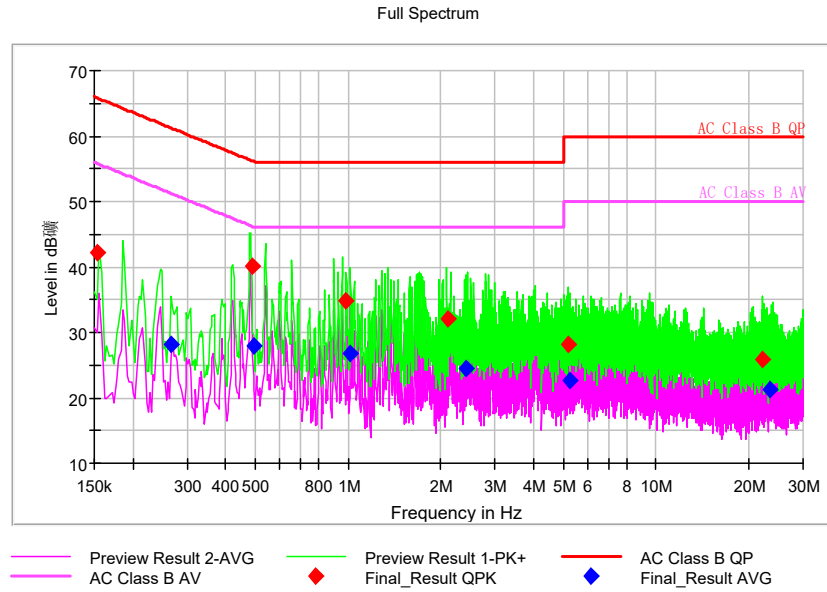
### AC Power line Conducted Emission (11b + Charging)

A "reference path loss" Corr.(dB) is established and the  $L_{cable}+ATT+VDF$  is the attenuation of "reference path loss", and including the cable loss, the attenuation of the attenuator, the voltage division factor of AMN.

The measurement results are obtained as described below:

$$P_{result}=P_{mea}+ Corr.(dB)$$

According to the test result of PART 15B, the charger by CHENYANG is selected for testing. Sample calculation:  $(42.21 \text{ dB}\mu\text{V}) = (12.51 \text{ dB}\mu\text{V}) + (29.7 \text{ dB})$ , the corresponding frequency is 0.154000MHz.



Comment

### L+N Line

#### MEASUREMENT RESULT:

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)	Pmea Quasi Peak (dBµV)	Pmea Average (dBµV)
0.154000	42.21	---	65.78	23.57	L1	29.7	12.51	---
0.266000	---	28.19	51.24	23.05	L1	29.7	---	-1.51
0.489335	40.11	---	56.18	16.07	L1	29.7	10.41	---
0.494350	---	27.96	46.09	18.13	L1	29.7	---	-1.74
0.978935	34.86	---	56.00	21.14	L1	29.7	5.16	---
1.019650	---	26.72	46.00	19.28	L1	29.7	---	-2.98
2.104935	32.17	---	56.00	23.83	L1	29.8	2.37	---
2.423735	---	24.47	46.00	21.53	L1	29.8	---	-5.33
5.163665	28.18	---	60.00	31.82	L1	29.8	-1.62	---
5.243665	---	22.64	50.00	27.36	N	29.8	---	-7.16
22.157510	25.89	---	60.00	34.11	N	30.0	-4.11	---
23.516225	---	21.17	50.00	28.83	L1	29.9	---	-8.73

---End of Test Report---