



**MOTOROLA**

**MOBILE DEVICES BUSINESS**

**PRODUCT SAFETY AND COMPLIANCE  
EMC LABORATORY**

**EMC TEST REPORT - Addendum**

**Test Report Number** –24676-1 WLAN @ 5.2 GHz

**Report Date** –2011-09-27

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

Signature:

Name: Hongpeng Yin

Title: EMC Project Manager

Test: 2011-09-10 to 2011-09-14

As the responsible test lab manager, I hereby declare that the model tested as specified in this report conforms to the requirements indicated.

Signature:

Name: Yilin Zhao

Title: Test Lab Manager

Date: 2011-09-27

This report must not be reproduced, except in full, without written approval from this laboratory.

FCC Registration Number: 177885

IC Registration Number: 109AW-1

ADR Testing Service location ADR BJ  
ISO/IEC-17025:2005 accredited by UKAS



**UKAS Certificate Number: 2404**

**Table of Contents**

Test Report Details ..... 3

Applicable Standards ..... 4

Summary of Testing..... 5

General and Special Conditions..... 5

Equipment and Cable Configurations..... 6

Measuring Equipment and Calibration Information ..... 6

Measurement Procedures and Data..... 8

**RADIATED SPURIOUS EMISSIONS**..... 8

        Measurement Procedure..... 8

        Measurement Results ..... 8

        WLAN Band (a)..... 9

        WLAN Band (n) ..... 9

**BAND-EDGE COMPLIANCE OF RF RADIATED EMISSIONS**..... 11

        Measurement Procedure..... 11

        Measurement Results ..... 11

        WLAN Band (a) sub band 1 ..... 11

        WLAN Band (n) sub band 1 400ns GI ..... 13

        WLAN Band (n) sub band 1 800ns GI ..... 14

**Test Report Details**

Tests Performed by: Motorola (China) Technologies Ltd.  
 Asia Global Compliance Labs  
 No. 1 Wang Jing East Road  
 Chao Yang District  
 Beijing, 100102, P. R. China  
 Phone: +86 10 8499 5891  
 FCC Registration Number: 177885  
 IC Registration Number: 109AW-1

Tests Performed By: ADR Testing Service  
 Location Code: ADR LV  
 Motorola Mobility Inc  
 Product Safety and Compliance Group  
 600 North US Hwy 45  
 Libertyville, IL 60048  
 FCC Registration Number: 316588  
 Industry Canada Number: 109O-1

Tests Requested by: Motorola, Inc.  
 Mobile Devices business  
 600 North US Hwy 45  
 Libertyville, IL 60048  
 U. S. A.

Product Type: wireless tablet with embedded WLAN

Signaling Capability: WCDMA 850/1900, GSM 850 /1900,  
 HSDPA,HSUPA,EDGE,GPRS, Bluetooth,  
 802.11 a & b & g & n

Serial Numbers: KPE00G0161  
 KPE00G0126

FCC ID: IHDP56MF2

Project number: 24676-1

Testing Complete Date: 2011-09-14

## **Applicable Standards**

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47 as the following parts:

- Part 15 Subpart E – Intentional Radiators
- Part 22 Subpart H - Public Mobile Services
- Part 24 - Personal Communications Services
- Part 27 - Wireless Communications Service
- Part 90 - Private Land Mobile Radio Service

Applicable Standards: ANSI C63.4-2003, RSS-Gen Issue 3, RSS-210 Issue 8.

DA 00-705, "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" published by the Federal Communications Commission was also used in the testing of this product.

The following tests were performed according to the regulations:

- The spurious radiated emission requirements of § 15.407 (b) (1), (5), (6) , (7) and 15.205 (a).
- Under this project 30 to 1000 MHz, 1 to 26.5 GHz radiated and radiated band-edge measurements were performed.
- For frequencies below 1 GHz a 100 kHz RBW (6 dB) is used and above 1 GHz a 1 MHz RBW (6 dB) is used.

**Summary of Testing**

Test	Test Name	Pass/Fail
1	Field Strength of Spurious Emissions	Pass
2	Band-edge Compliance of RF Radiated Emissions	Pass

Test	Test Name	Results
1	Field Strength of Spurious Emissions	See plots
2	Band-edge Compliance of RF Radiated Emissions	See plots

The margin with respect to the limit is the minimum margin for all modes and bands.

**General and Special Conditions**

The tablet was tested using a fully charged battery when applicable. Where a battery could not be used due to the need for a controlled variation of input voltage, an external power supply was utilized.

Special test SW was used for these tests. Radiated testing was done in the following modes:

- 802.11 a mode subband1 @ 6 Mbps
- 802.11 n mode 5G subband1 400ns GI @ 7.2 Mbps
- 802.11 n mode 5G subband1 800ns GI @ 6.5 Mbps

All testing was done in an indoor controlled environment with an average temperature of 25 ° C ± 1 ° C and relative humidity of 45 % ± 6 % over the dates used for testing.

## Equipment and Cable Configurations

The EUT was tested in a stand-alone configuration that is representative of typical use.

## Measuring Equipment and Calibration Information

Equipment related to the semi-anechoic chamber testing:

Equipment	Model/type	Serial number	Operational range	Date of calibration
EMI Receiver	ESU 40	100036	20 Hz – 40 GHz	11.05.2010
Pre Amplifiers	PA-02-0001:	2007343	10 kHz – 3 GHz	07.04.2011
	PA-02-218	2007344	3 GHz – 18 GHz	07.04.2011
	PA-02-5	2007345	18 GHz – 40 GHz	07.04.2011
Radio Communication Tester	CMU 200	112790	GSM 850/900/1800/1900, IS95, UMTS, CDMA, Bluetooth	N/A
Band Reject Filter	WRCG	N/A	ISM band	N/A
	4N45-24241/3/6	N/A	WLAN	N/A

The antennas used in the various tests are listed in the below table.

Antenna	Type	Serial number	Operational range	Date of calibration
Hybrid-log periodic	TDK HLP 3003C	130361	30 MHz – 3 GHz	03.11.2011
Double ridged Horn	TDK HRN0118	130303	1 GHz – 18 GHz	01.21.2009
Double ridged Horn	ETS HRN3116	00071938	18 GHz – 40 GHz	10.17.2008

### LV Equipment List

ETS	Loop Antenna	6507	00049471	02/17/11
Rohde & Schwarz	Receiver	ESU 40	100286	07/13/11

Note that the hybrid antenna and horn antenna are on a three-year calibration cycle. All other equipments are on a one-year calibration cycle.

## **Description of WLAN (WiFi) Transmitter**

The 24676-1 test sample offers WLAN as a feature. The WLAN direct sequence spread-spectrum transceiver is designed to operate between 5150 and 5240 MHz. The WLAN antenna is mounted on the PCB inside of the EUT. The antenna installation is permanent. For a more thorough description of the functionality please refer to Exhibit 12 of this package.

As a WLAN transmitter, it is designed operate with other WLAN devices as defined by industrial standard. In this application, the device is battery-operated.

## **Measurement Procedures and Data**

### **RADIATED SPURIOUS EMISSIONS**

CFR Part 15.407

#### **Measurement Procedure**

The Equipment-Under-Test is placed inside the semi-anechoic chamber on a polystyrene table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

A fully charged battery was used for the supply voltage.

**The test sample was operated during the measurements under the following conditions:**

- Tests were performed at low, mid and high channels.
- Tests were performed in both horizontal and vertical polarity.
- Tests were performed in both operational WiFi bands (a) and (n)

#### **Measurement Results**

Comments:

The peak detector limit is 54 dBuV and has been added to the results tables.

Radiated spurious emissions was measured from 9 kHz to 30 MHz and all emissions were 20 dB below the limit.

See below attached tables for the measurement results with peak detector

**WLAN Band (a)**

Only the worst field strength of spurious emissions for each channel is displayed for WLAN (a) sub band 1.

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10480.00	10475.13	51.26	54.00	-2.74	177.00	99.10	H
10480.00	10484.80	50.63	54.00	-3.37	188.00	244.80	V

**Low Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10440.00	10437.09	50.19	54.00	-3.81	199.00	293.70	H
10440.00	10442.23	50.32	54.00	-3.68	100.00	231.10	V

**Middle Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10480.00	10480.30	51.11	54.00	-2.89	108.00	208.00	H
10480.00	10483.95	50.82	54.00	-3.18	161.00	360.00	V

**High Channel Dual Polarization Z**

The spectrum is measured from 30MHz to 10<sup>th</sup> harmonic and the worst-case emissions are reported.

There are no discernible emissions are found beyond the 2<sup>nd</sup> harmonic for this device.

**WLAN Band (n)**

Only the worst field strength of spurious emissions for each channel is displayed for WLAN (n) 5G sub band 1 400ns GI.

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10360.00	10362.62	50.77	54.00	-3.23	199.00	27.90	H
10360.00	10362.77	51.47	54.00	-2.53	104.00	98.70	V

**Low Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10440.00	10436.05	50.08	54.00	-3.92	125.00	29.80	H
10440.00	10442.91	51.01	54.00	-2.99	100.00	111.30	V

**Middle Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10480.00	10481.46	50.57	54.00	-3.43	128.00	326.70	H
10480.00	10478.96	51.43	54.00	-2.57	100.00	110.00	V

**High Channel Dual Polarization Z**

Only the worst field strength of spurious emissions for each channel is displayed for WLAN (n) 5G sub band 1 800ns GI.

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10480.00	10475.75	51.67	54.00	-2.33	129.00	130.90	H
10480.00	10475.77	51.21	54.00	-2.79	135.00	61.30	V

**Low Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10440.00	10440.22	50.85	54.00	-3.15	138.00	360.10	H
10440.00	10438.06	50.79	54.00	-3.21	186.00	-0.10	V

**Middle Channel Dual Polarization Z**

Freq (MHz)	Freq (Max) (MHz)	(PEAK) EMI (dBµV/m)	Limit (dBµV/m)	(PEAK) Margin (dB)	Twr Ht (cm)	Ttbl Agl (deg)	Pol
10480.00	10476.46	50.92	54.00	-3.08	112.00	277.80	H
10480.00	10483.11	50.98	54.00	-3.02	102.00	289.50	V

**High Channel Dual Polarization Z**

The spectrum is measured from 30MHz to 10<sup>th</sup> harmonic and the worst-case emissions are reported.

There are no discernible emissions are found beyond the 2<sup>nd</sup> harmonic for this device.

## **BAND-EDGE COMPLIANCE OF RF RADIATED EMISSIONS**

CFR 47 Part 15.407

### **Measurement Procedure**

The test sample is placed inside the semi-anechoic chamber on a wooden table at the turntable center. For each spurious frequency, the antenna mast is raised and lowered from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The test sample WLAN transmitter was enabled using a test script.

A fully charged battery was used for the supply voltage.

### **Measurement Results**

Comments:

The peak detector limit is -27dBm and has been added to the graphical plots.

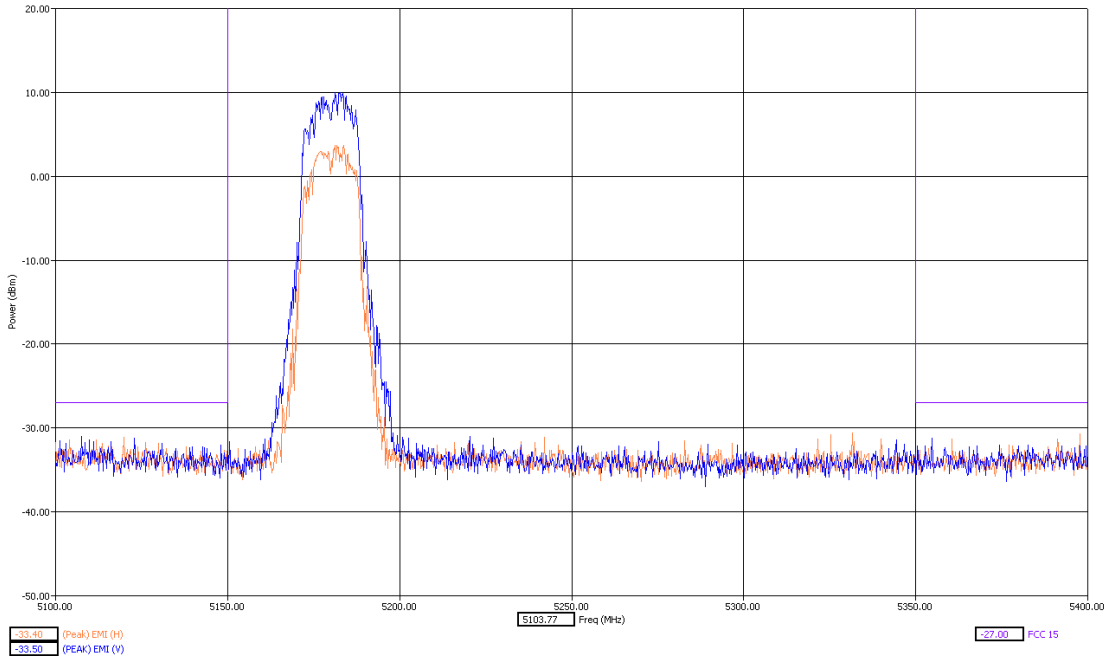
Note: No WLAN band notch filters were used.

See below attached plots for the measurement results with peak detector

### **WLAN Band (a) sub band 1**

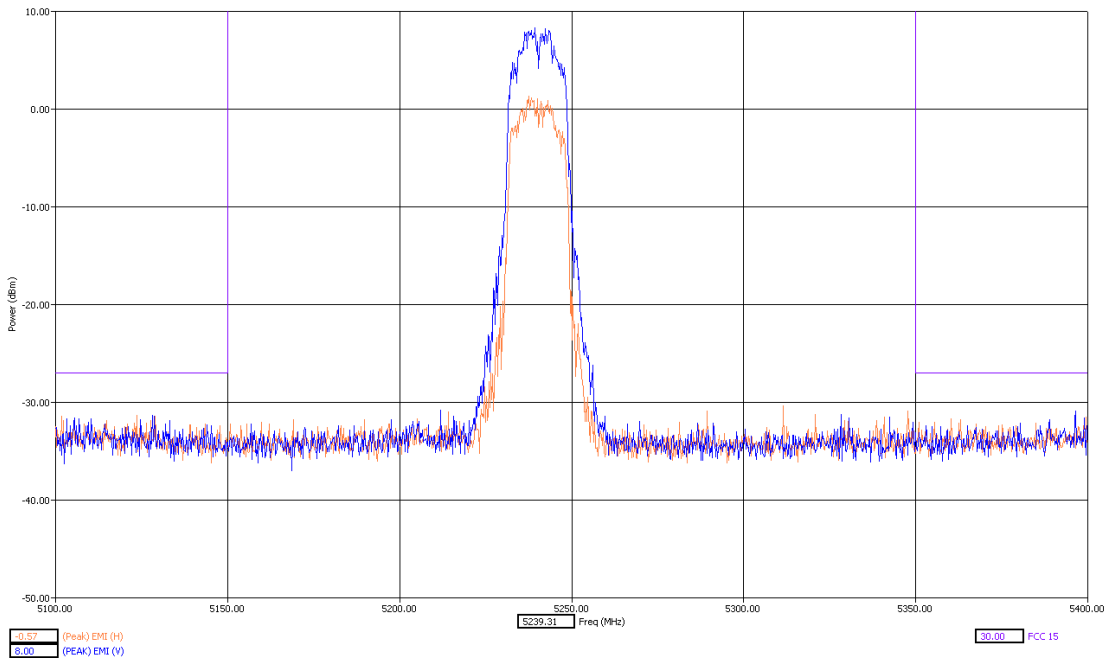
Only the worst band edge is displayed for WLAN band (a).

Test title: FCC 15.205, 15.209, 15.247, 15.407  
Operator name: Liangjie Lian  
EUT type: 24659-1, SN:KPE00G0126  
EUT condition: HW:P2 SW: 1.6.0\_142  
Date: 9/15/2011  
Time: 8:52:30 AM  
Comments: FCC 15.407 (c) (1) WiFi emission in TCH mode.  
WiFi ch. 36 (5180 MHz) do in test mode. Orientation Z=V  
HRN 0118 antenna (3 - 18 GHz)



### Low Band Edge Z Orientation Peak Detector

Test title: FCC 15.205, 15.209, 15.247, 15.407  
Operator name: Liangjie Lian  
EUT type: 24659-1, SN:KPE00G0126  
EUT condition: HW:P2 SW: 1.6.0\_142  
Date: 9/15/2011  
Time: 8:57:39 AM  
Comments: FCC 15.407 (c) (1) WiFi emission in TCH mode.  
WiFi ch. 48 (5240 MHz) do in test mode. Orientation Z=V  
HRN 0118 antenna (3 - 18 GHz)

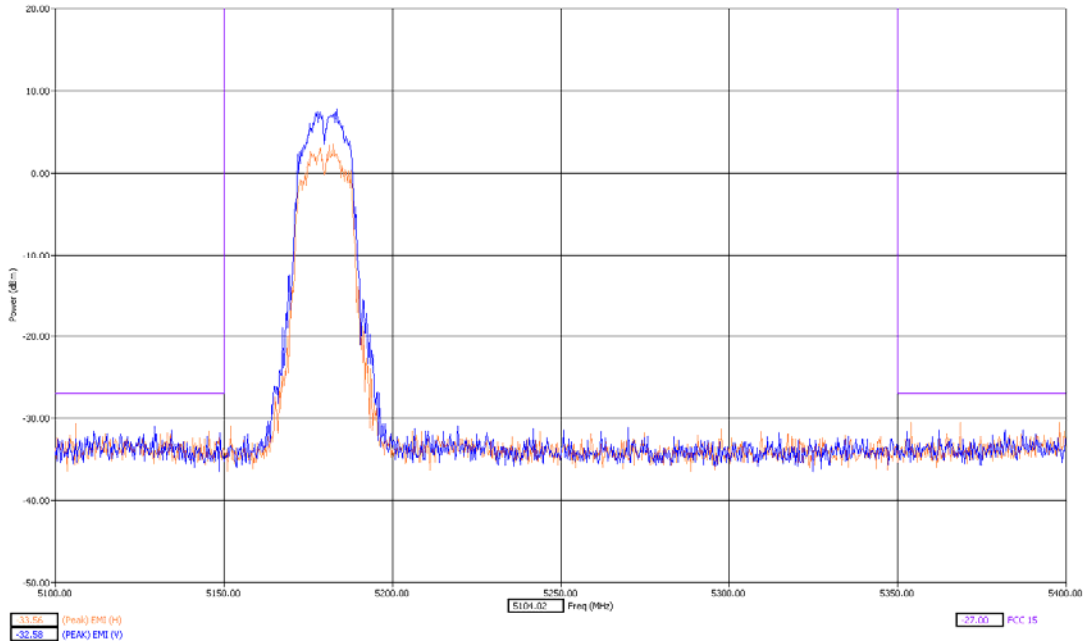


### High Band Edge Z Orientation Peak Detector

### WLAN Band (n) sub band 1 400ns GI

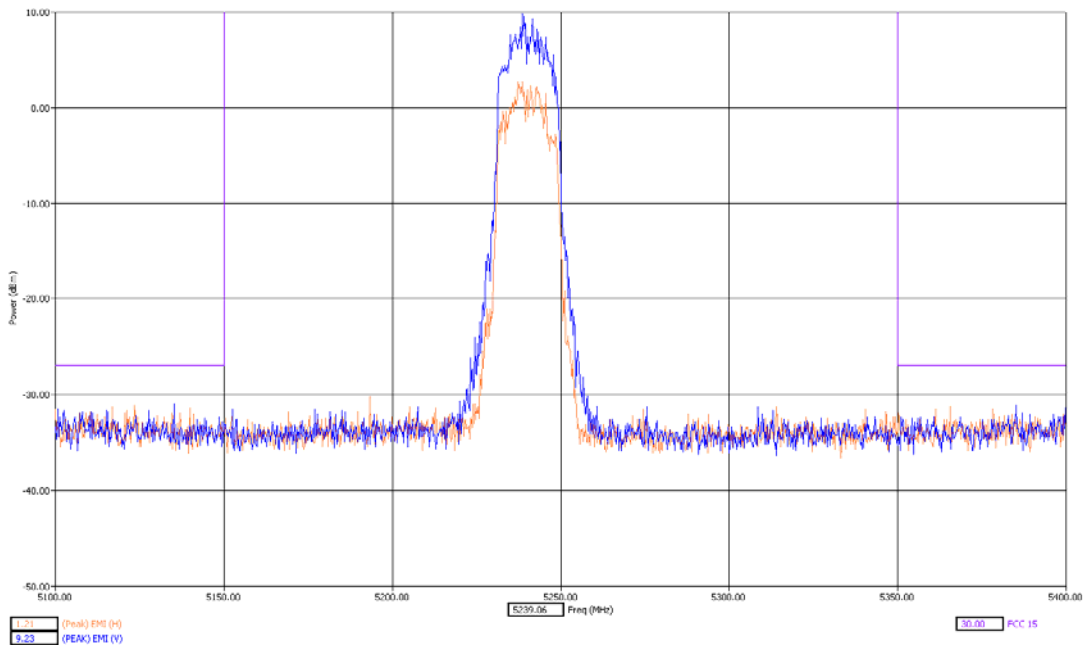
Only the worst band edge is displayed for WLAN band (n).

Test title: FCC 15.205, 15.209, 15.247, 15.407  
 Operator name: Liangjie Lian  
 EUT type: 24659-1, 5NKP00002126  
 EUT condition: HW/P2 SW: 1.6.0.142  
 Date: 9/15/2011  
 Time: 9:04:39 AM  
 Comments: FCC 15.407 (c) (1) WPH emission in TCH mode.  
 WPH ch. 36 (5.180 MHz) do in test mode. Orientation Z=V  
 HRN 0110 antenna (2 - 19 GHz)



### Low Band Edge Z Orientation Peak Detector

Test title: FCC 15.205, 15.209, 15.247, 15.407  
 Operator name: Liangjie Lian  
 EUT type: 24659-1, 5NKP00002126  
 EUT condition: HW/P2 SW: 1.6.0.142  
 Date: 9/15/2011  
 Time: 9:09:51 AM  
 Comments: FCC 15.407 (c) (1) WPH emission in TCH mode.  
 WPH ch. 48 (5.240 MHz) do in test mode. Orientation Z=V  
 HRN 0110 antenna (2 - 19 GHz)

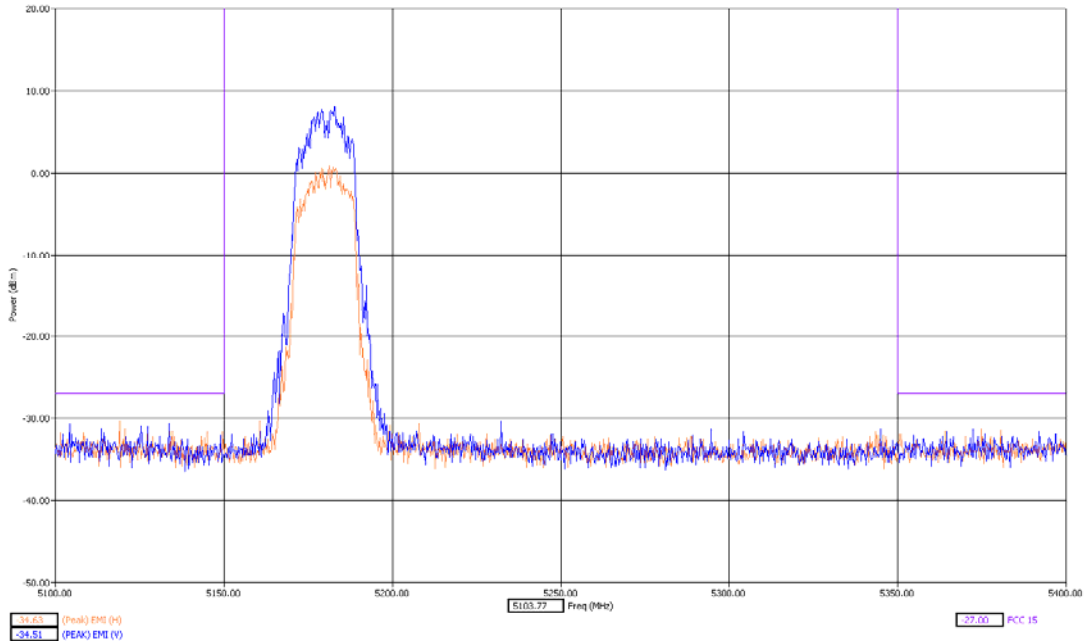


### High Band Edge Z Orientation Peak Detector

### WLAN Band (n) sub band 1 800ns GI

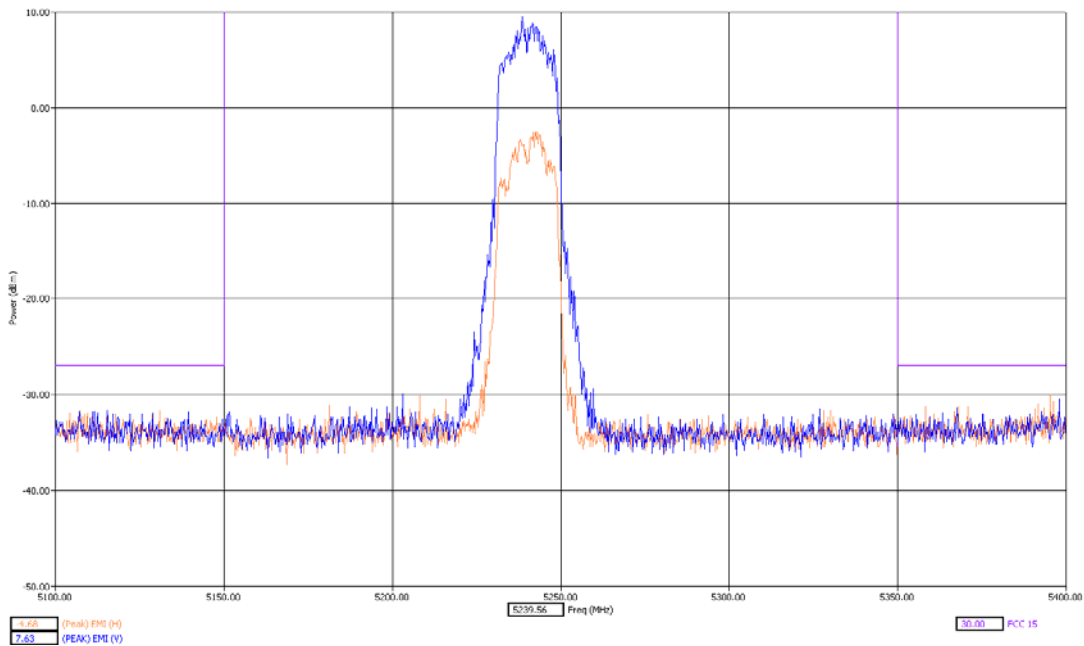
Only the worst band edge is displayed for WLAN band (n).

Test title: FCC 15.205, 15.209, 15.247, 15.407  
Operator name: Liangjie Lian  
EUT type: 24659-1, 5NKP00002126  
EUT condition: HW/P2 SW: 1.6.0.142  
Date: 9/15/2011  
Time: 9:15:08 AM  
Comments: FCC 15.407 (c) (1) WPI emission in TCH mode.  
WPI ch. 36 (5.180 MHz) do in test mode. Orientation Z=V  
HRN 0110 antenna (2 - 19 GHz)



Low Band Edge Z Orientation Peak Detector

Test title: FCC 15.205, 15.209, 15.247, 15.407  
Operator name: Liangjie Lian  
EUT type: 24659-1, 5NKP00002126  
EUT condition: HW/P2 SW: 1.6.0.142  
Date: 9/15/2011  
Time: 9:22:36 AM  
Comments: FCC 15.407 (c) (1) WPI emission in TCH mode.  
WPI ch. 48 (5.240 MHz) do in test mode. Orientation Z=V  
HRN 0110 antenna (2 - 19 GHz)



High Band Edge Z Orientation Peak Detector

## **End of Test Report**