



# PCTEST ENGINEERING LABORATORY, INC.

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<http://www.pctestlab.com>



## MEASUREMENT REPORT FCC Parts 15, 27, and 90 LTE

**Applicant Name:**

Harris Corporation  
221 Jefferson Ridge Parkway  
Lynchburg, VA 24501  
United States

**Date of Testing:**

04/28 - 05/02/2017

**Test Site/Location:**

PCTEST Lab., Columbia, MD, USA

**Test Report Serial No.:**

1M1705010158-02.BV8

**FCC ID :** **BV8BBPBM214**

**APPLICANT:** **HARRIS CORPORATION**

**Application Type:** Class II Permissive Change

**FCC Classification:** Licensed Non-Broadcast Transmitter (TNB)

**FCC Rule Part(s):** §2, §15, §27, and §90

**Test Procedure(s):** ANSI/TIA-603-D-2010, KDB 971168 D01 v02r02

**EUT Type:** Wireless Module

**Model:** PBM-214

**Test Device Serial No.:** *identical prototype* [S/N: A40300000012]

**Class II Permissive Change:** Integrate LTE Wireless Module into FCC Approved radio (FCC ID: OWDTR-0133-E)

**Original Grant Date:** 09-10-2015

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in §2.947. Test results reported herein relate only to the item(s) tested.

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

  
\_\_\_\_\_  
Randy Ortanez  
President



FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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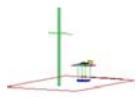
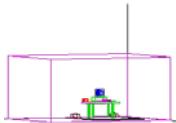
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## MEASUREMENT REPORT

### FCC Part 15, 27, and 90

#### §2.1033 General Information

**APPLICANT:** Harris Corporation  
**APPLICANT ADDRESS:** 221 Jefferson Ridge Parkway  
 Lynchburg, VA 24501, United States  
**TEST SITE:** PCTEST ENGINEERING LABORATORY, INC.  
**TEST SITE ADDRESS:** 7185 Oakland Mills Road, Columbia, MD 21045 USA  
**FCC RULE PART(S):** §2, §15, §27, and §90  
**BASE MODEL:** PBM-214  
**FCC ID:** BV8BBPBM214  
**FCC CLASSIFICATION:** Licensed Non-Broadcast Transmitter (TNB)  
**FREQUENCY TOLERANCE:**  $\pm 0.00025\%$  (2.5 ppm)  
**Test Device Serial No.:** A40300000012  Production  Pre-Production  Engineering  
**DATE(S) OF TEST:** 04/28 - 05/02/2017  
**TEST REPORT S/N:** 1M1705010158-02.BV8

#### Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EVDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

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## 1.0 INTRODUCTION

### 1.1 Scope

Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

### 1.2 Testing Facility

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

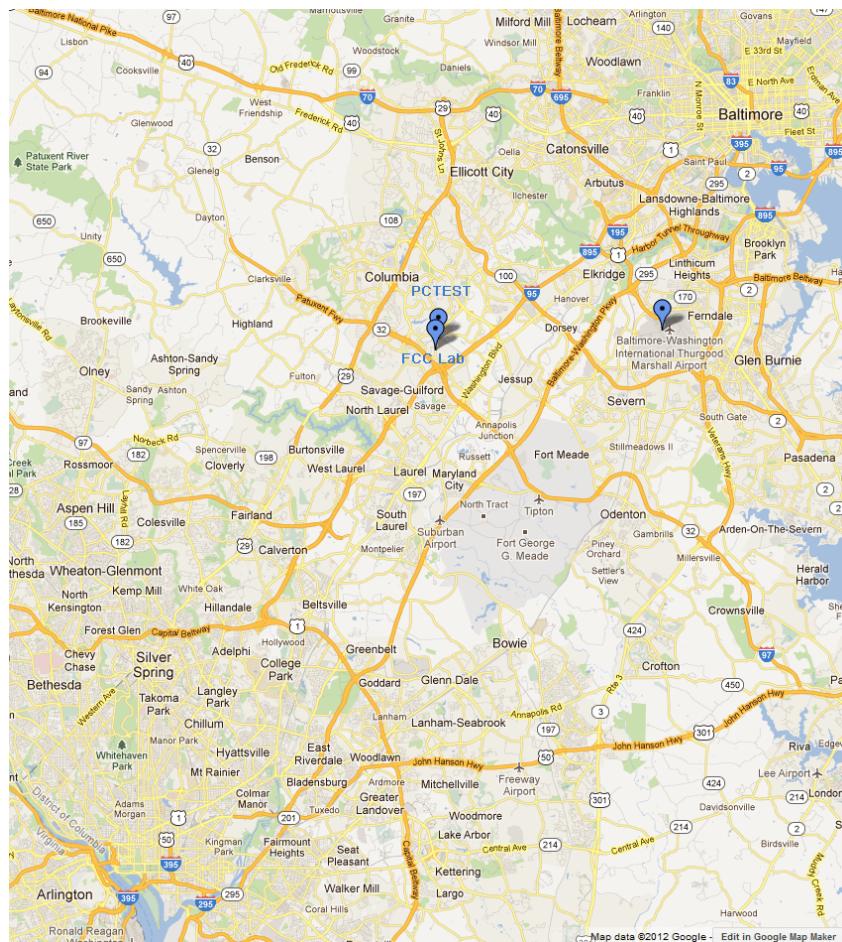


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

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## 2.0 PRODUCT INFORMATION

### 2.1 Equipment Description

The Equipment Under Test (EUT) is the **Harris Wireless Module FCC ID: BV8BBPBM214**. This filing covers the integration of the Harris wireless LTE module into a previously approved radio (FCC ID: OWDTR-0133-E, Model: XL-200P).

### 2.2 Device Capabilities

This device contains the following capabilities:

**Wireless LTE module (Harris Corp., FCC ID: BV8BBPBM214):**  
LTE Bands 4/13/14

**Push-To-Talk radio (FCC ID: OWDTR-0133-E, Model: XL-200P):**  
VHF/UHF/700MHz/800MHz, 802.11b/g/n WLAN, 802.11a UNII, Bluetooth (1x, EDR, LE)

### 2.3 Test Configuration

The Harris Wireless Module FCC ID: BV8BBPBM214 was tested per the guidance of ANSI/TIA-603-D-2010 and KDB 971168 D01 v02r02 while integrated into the host LMR PTT radio. Radiated spurious emissions were investigated while the PTT radio was configured to transmit in all modes/bands and the LTE module was transmitting simultaneously. See Section 7.0 of this test report for a description of the radiated and antenna port conducted emissions tests.

### 2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and no modifications were made during testing.

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## 3.0 DESCRIPTION OF TESTS

### 3.1 Measurement Procedure

The measurement procedures described in the document titled “Land Mobile FM or PM – Communications Equipment – Measurements and Performance Standards” (ANSI/TIA-603-D-2010) and “Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems” (KDB 971168 D01 v02r02) were used in the measurement of the EUT.

### 3.2 Radiated Power and Radiated Spurious Emissions

§2.1053 §27.50(b.10) §27.50(d.4) §27.53(f) §27.53(h)

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Figure 5.7 of Clause 5 in ANSI C63.4-2014. Absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections for measurements above 1GHz. For measurements below 1GHz, the absorbers are removed. A raised turntable is used for radiated measurement. The turn table is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

The equipment under test was transmitting while connected to its integral antenna and is placed on a turntable 3 meters from the receive antenna. The receive antenna height is adjusted between 1 and 4 meter height, the turntable is rotated through 360 degrees, and the EUT is manipulated through all orthogonal planes representative of its typical use to achieve the highest reading on the receive spectrum analyzer. Radiated power levels are also investigated with the receive antenna horizontally and vertically polarized. The maximized power level is recorded using the spectrum analyzer “Channel Power” function with the integration band set to the emissions’ occupied bandwidth, a RMS detector, RBW = 100kHz, VBW = 300kHz, and a 1 second sweep time over a minimum of 10 sweeps, per the guidelines of KDB 971168 D01 v02r02.

Per the guidance of ANSI/TIA-603-D-2010, a half-wave dipole is then substituted in place of the EUT. For emissions above 1GHz, a horn antenna is substituted in place of the EUT. The substitute antenna is driven by a signal generator with the level of the signal generator being adjusted to obtain the same receive spectrum analyzer level previously recorded from the spurious emission from the EUT. The power of the emission is calculated using the following formula:

$$P_d \text{ [dBm]} = P_g \text{ [dBm]} - \text{cable loss [dB]} + \text{antenna gain [dBd/dBi]}$$

Where,  $P_d$  is the dipole equivalent power,  $P_g$  is the generator output into the substitution antenna, and the antenna gain is the gain of the substitute antenna used relative to either a half-wave dipole (dBd) or an isotropic source (dBi). The substitute level is equal to  $P_g \text{ [dBm]} - \text{cable loss [dB]}$ .

The calculated  $P_d$  levels are then compared to the absolute spurious emission limit of -13dBm which is equivalent to the required minimum attenuation of  $43 + 10\log_{10}(\text{Power [Watts]})$ .

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## 4.0 MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014. All measurement uncertainty values are shown with a coverage factor of  $k = 2$  to indicate a 95% level of confidence. The measurement data shown herein meets or exceeds the  $U_{\text{CISPR}}$  measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Contribution	Expanded Uncertainty ( $\pm$ dB)
Conducted Bench Top Measurements	1.13
Radiated Disturbance (<1GHz)	4.98
Radiated Disturbance (>1GHz)	5.07
Radiated Disturbance (>18GHz)	5.09

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## 5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST). Measurements antennas used during testing were calibrated in accordance to the requirements of ANSI C63.5-2006.

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	7/11/2016	Annual	7/11/2017	RE1
Com-Power	PAM-103	Pre-Amplifier (1-1000MHz)	7/6/2016	Annual	7/6/2017	441119
Emco	3115	Horn Antenna (1-18GHz)	3/10/2016	Biennial	3/10/2018	9704-5182
EMCO	3160-09	Small Horn (18 - 26.5GHz)	8/23/2016	Biennial	8/23/2018	135427
ETS Lindgren	3117	1-18 GHz DRG Horn (Medium)	12/1/2016	Biennial	12/1/2018	125518
ETS Lindgren	3164-08	Quad Ridge Horn Antenna	4/26/2016	Biennial	4/26/2018	128337
K & L	11SH10-3075/U18000	High Pass Filter	7/11/2016	Annual	7/11/2017	11SH10-3075/U18000-2
K & L	11SH10-6000/T18000	High Pass Filter	7/11/2016	Annual	7/11/2017	11SH10-6000/T18000-1
Mini Circuits	PWR-SEN-4GHS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11401010036
Mini Circuits	TVA-11-422	RF Power Amp		N/A		QA1317001
Mini-Circuits	PWR-SEN-4RMS	USB Power Sensor	3/24/2017	Annual	3/24/2018	11210140001
Mini-Circuits	SSG-4000HP	Synthesized Signal Generator		N/A		11208010032
PCTEST	-	EMC Switch System	7/11/2016	Annual	7/11/2017	NM1
PCTEST	-	EMC Switch System	7/6/2016	Annual	7/6/2017	NM2
Rohde & Schwarz	CMW500	Radio Communication Tester	10/20/2016	Annual	10/20/2017	100976
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	4/19/2017	Annual	4/19/2018	100342
Rohde & Schwarz	ESU40	EMI Test Receiver (40GHz)	7/15/2016	Annual	7/15/2017	100348
Seekonk	NC-100	Torque Wrench 5/16", 8" lbs	3/2/2016	Biennial	3/2/2018	N/A
Sunol	DRH-118	Horn Antenna (1-18GHz)	7/30/2015	Biennial	7/30/2017	A050307
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/14/2016	Biennial	3/14/2018	A051107

**Table 5-1. Test Equipment**

**Note:**

Equipment with a calibration date of "N/A" shown in this list was not used to make direct calibrated measurements.

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## 6.0 SAMPLE CALCULATIONS

### Emission Designator

#### QPSK Modulation

**Emission Designator = 8M62G7D**

LTE BW = 8.62 MHz

G = Phase Modulation

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

#### 16QAM Modulation

**Emission Designator = 8M45W7D**

LTE BW = 8.45 MHz

W = Amplitude/Angle Modulated

7 = Quantized/Digital Info

D = Data transmission, telemetry, telecommand

### Spurious Radiated Emission – LTE Band

#### **Example: Middle Channel LTE Mode 2<sup>nd</sup> Harmonic (1564 MHz)**

The average spectrum analyzer reading at 3 meters with the EUT on the turntable was -81.0 dBm. The gain of the substituted antenna is 8.1 dBi. The signal generator connected to the substituted antenna terminals is adjusted to produce a reading of -81.0 dBm on the spectrum analyzer. The loss of the cable between the signal generator and the terminals of the substituted antenna is 2.0 dB at 1564 MHz. So 6.1 dB is added to the signal generator reading of -30.9 dBm yielding -24.80 dBm. The fundamental EIRP was 25.501 dBm so this harmonic was 25.501 dBm - (-24.80).

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## 7.0 TEST RESULTS

### 7.1 Summary

Company Name: Harris Corporation  
 FCC ID: BV8BBPBM214  
 FCC Classification: Licensed Non-Broadcast Transmitter (TNB)  
 Mode(s): LTE

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Result	Reference
2.1053, 27.53(c), 27.53(f), 27.53(h), 90.543	Undesirable Emissions	> 43 + 10log <sub>10</sub> (P[Watts]) for all out-of-band emissions	RADIATED	PASS	Section 7.2

Table 7-1. Summary of Test Results

#### Notes:

1. The EUT was investigated for radiated spurious emissions in all bands of operation while integrated into a host PTT radio (FCC ID: OWDTR-0133-E) per the FCC's multi-transmitter policy. Worst case emissions are shown in this section.
2. Radiated emissions were investigated with four different whip antennas. The model numbers are: 14035-4000-01, 14035-4420-01, 14035-4440-01, and 14035-4440-02.

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## 7.2 Radiated Spurious Emissions Measurements

§2.1053 §27.53(c) §27.53(f) §27.53(h) §90.543

### Test Overview

Radiated spurious emissions measurements are performed using the substitution method described in ANSI/TIA-603-D-2010 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using vertically and horizontally polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized broadband horn antennas. All measurements are performed as RMS measurements while the EUT is operating at its maximum duty cycle, at maximum power, and at the appropriate frequencies.

### Test Procedures Used

KDB 971168 D01 v02r02 – Section 5.8

ANSI/TIA-603-D-2010 – Section 2.2.12

### Test Settings

1. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
2. VBW  $\geq$  3 x RBW
3. Span = 1.5 times the OBW
4. No. of sweep points  $\geq$  2 x span / RBW
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

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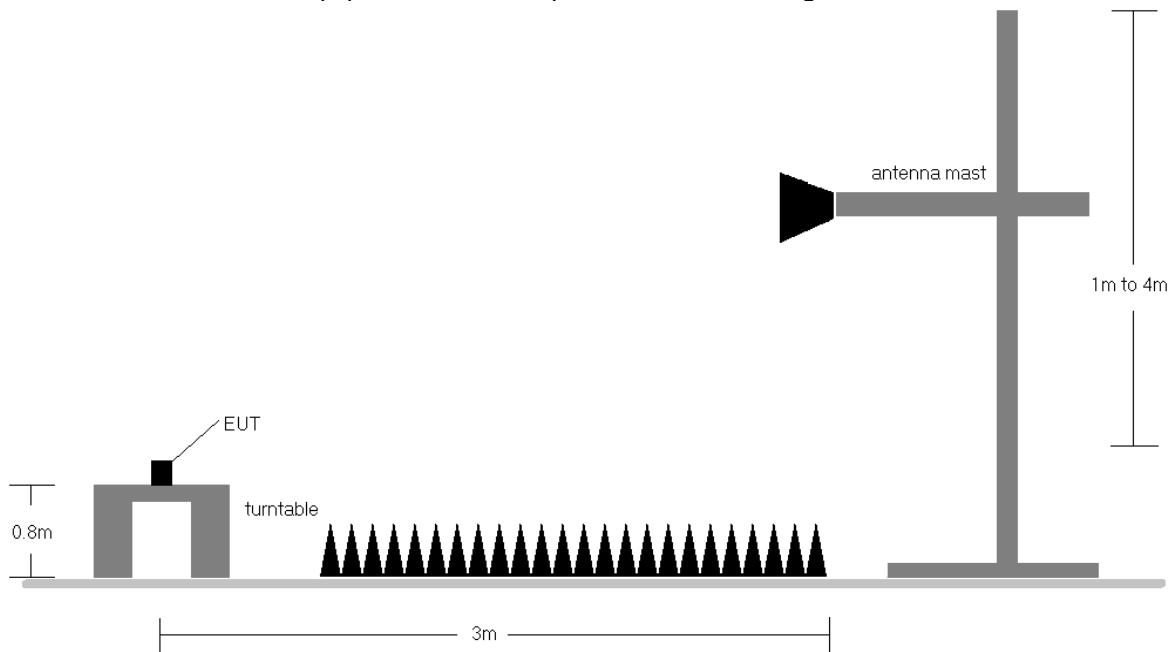
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## Test Setup

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



**Figure 7-1. Test Instrument & Measurement Setup**

## Test Notes

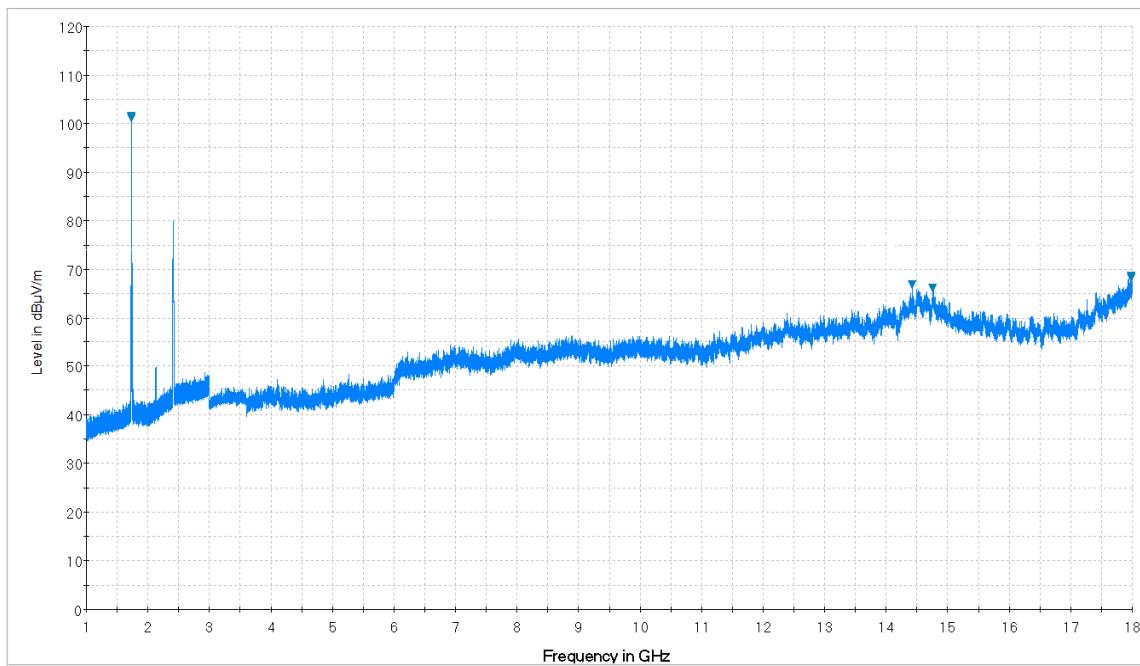
- 1) The EUT was tested in three orthogonal planes and in all possible test configurations and positioning. The worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations shown in the tables below.
- 2) The EUT was set to transmit in each of its available LTE bands. While operating in LTE, the host radio was set to transmit on one configuration from each of its available bands and modes of operation. The worst case simultaneous transmit radiated spurious emissions are shown in this section.
- 3) This unit was tested with its standard battery.
- 4) The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter. The worst-case emissions are reported.
- 5) The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section. Rohde & Schwarz EMC32, Version 9.15.00 automated test software was used to perform the Radiated Spurious Emissions Pre-Scan testing.
- 6) Measurements were made only on emissions that were the result of two transmitters operating simultaneously, per the FCC's multi-transmitter policy.
- 7) Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.

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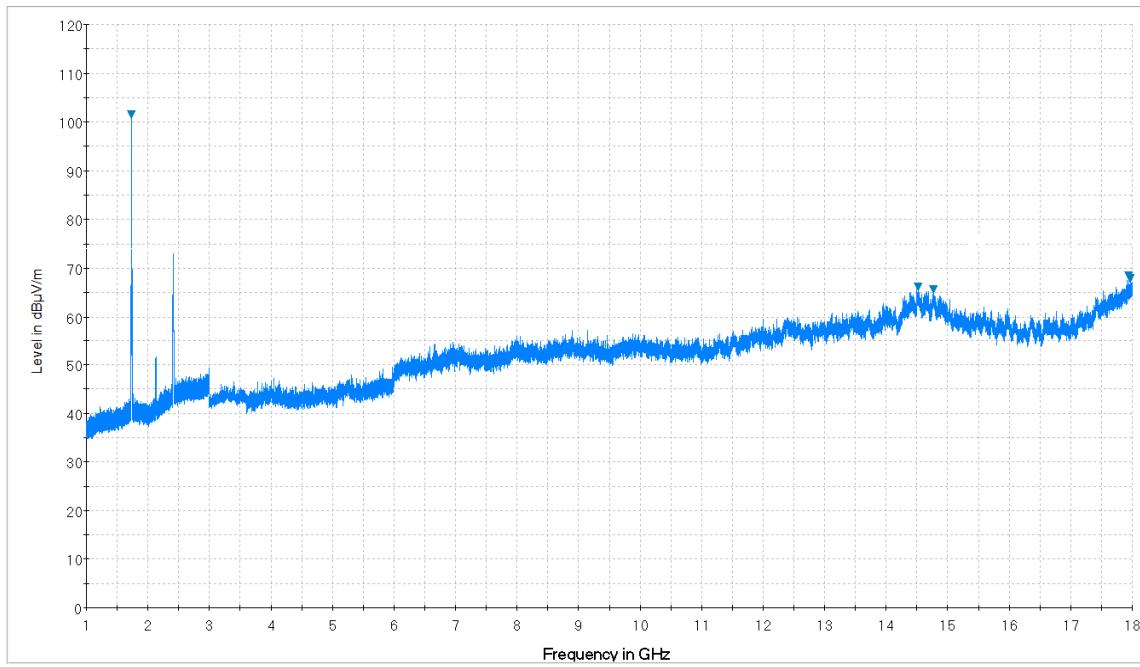
- 8) Emissions that were found to be a result of simultaneous transmission from two licensed band carriers applied a -13dBm limit per FCC Parts 27 and 90.
- 9) Emissions that were found to be a result of simultaneous transmission from one licensed and one unlicensed band carrier applied the tighter of the two limits for licensed operations under FCC Parts 27 and 90 and unlicensed operations under FCC Part 15.
- 10) Based on a 3 meter test distance, a conversion factor of 95.2dB was used to convert the -13dBm licensed power limit to a radiated spurious limit of 82.2dBuV/m.
- 11) The "-" shown in the following RSE tables are used to denote a noise floor measurement.
- 12) No significant emissions were found above 18GHz.

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## 7.2.1 Radiated Spurious Emissions Measurements (LTE Band 13/14 + 2.4GHz WIFI)

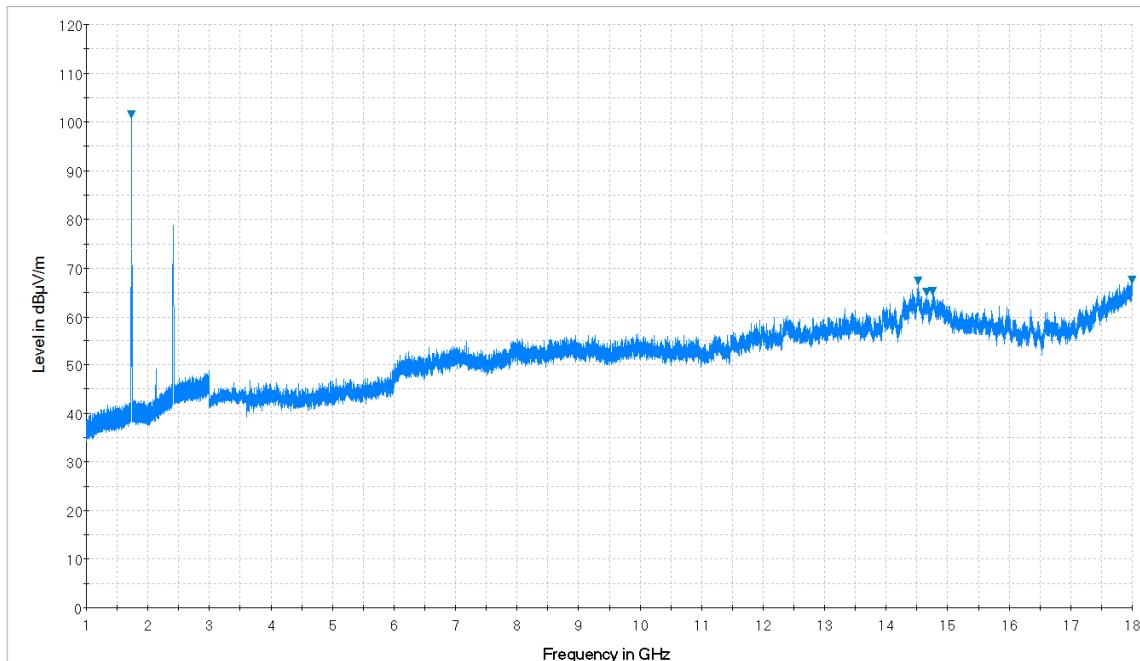


Plot 7-2. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. H)

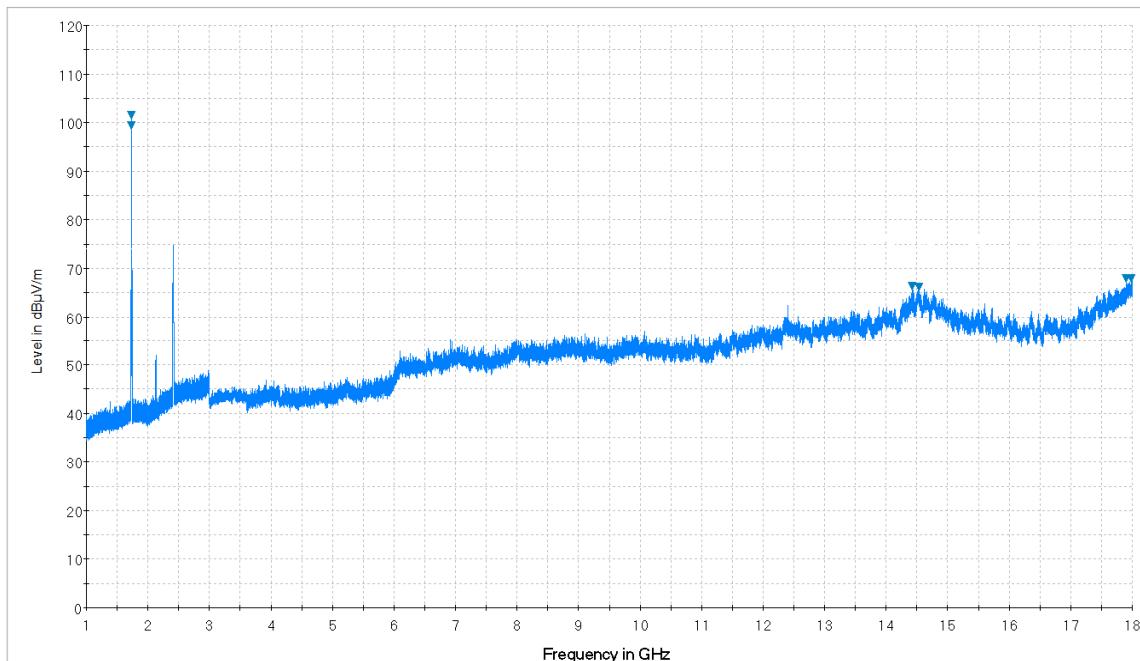


Plot 7-3. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. V)

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 14 of 44

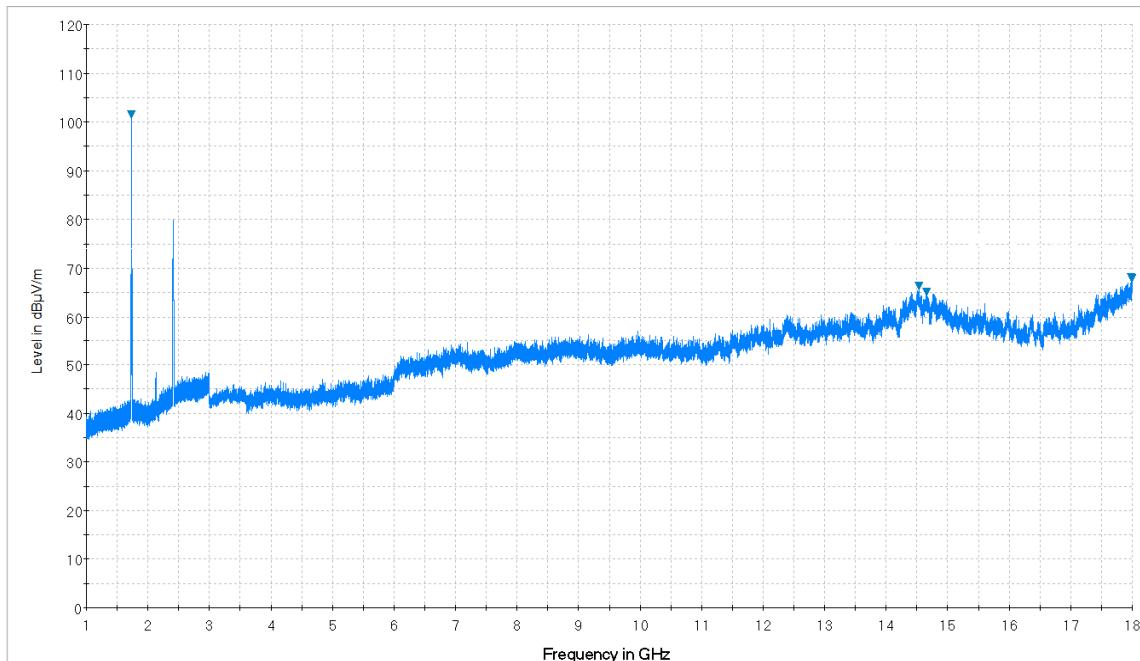


**Plot 7-4. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. H)**

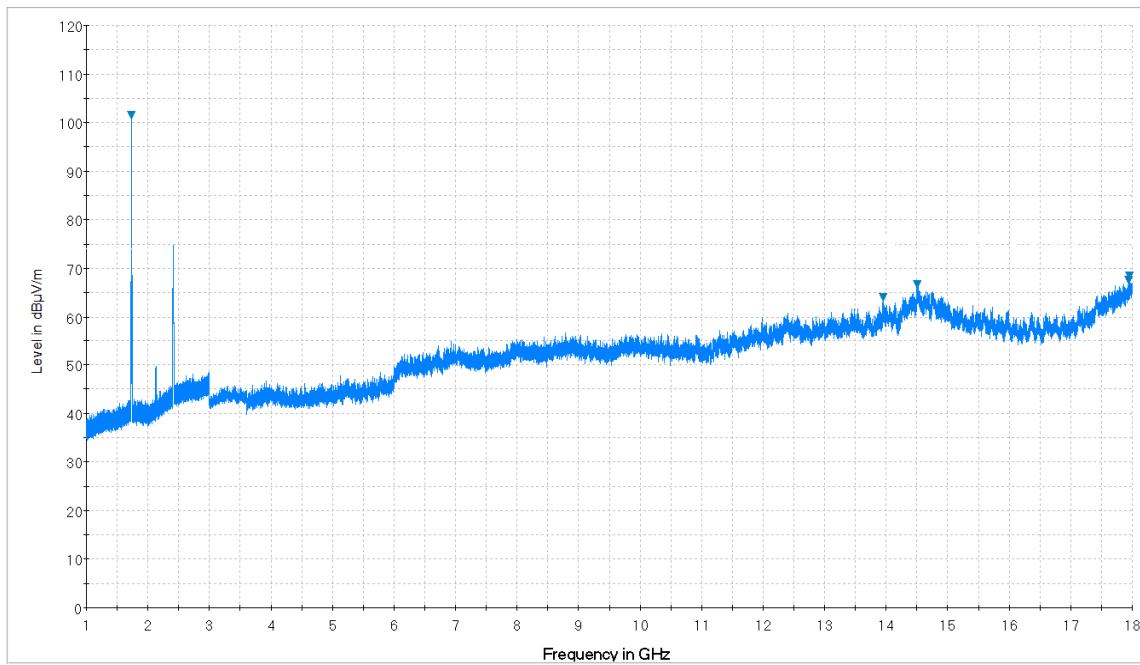


**Plot 7-5. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 15 of 44

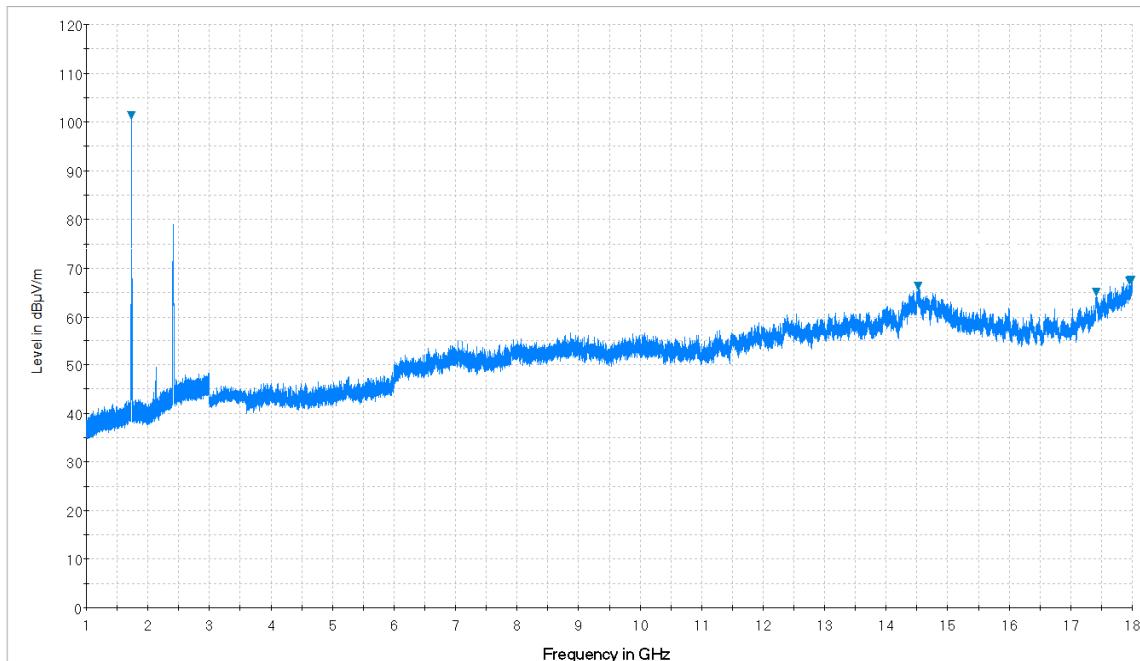


**Plot 7-6. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

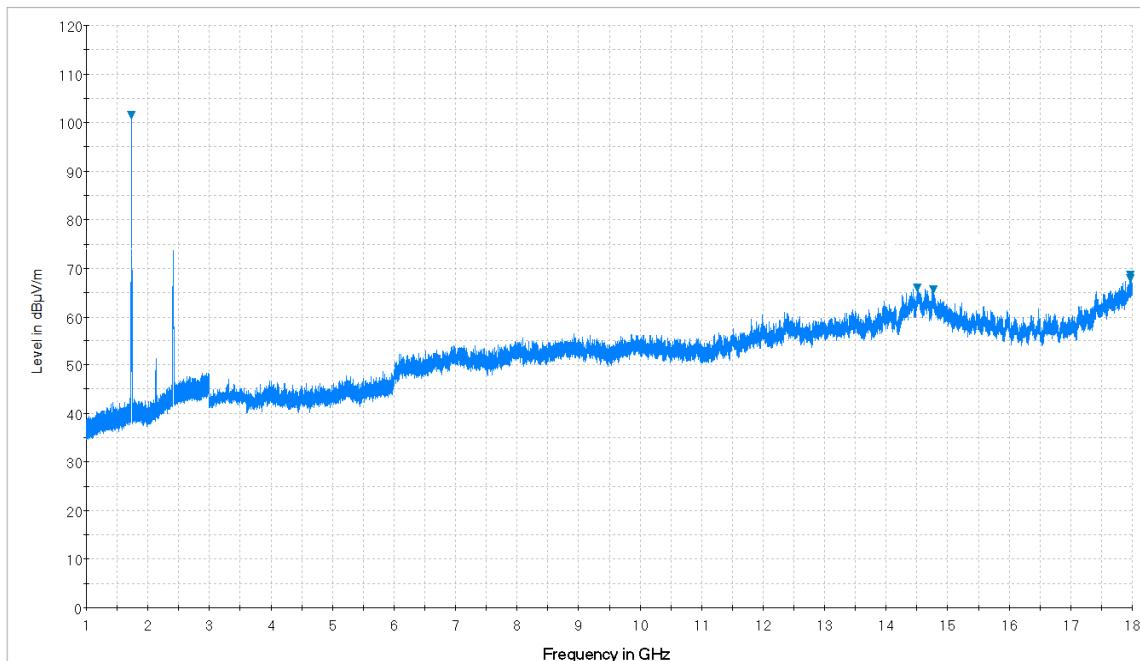


**Plot 7-7. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 16 of 44



**Plot 7-8. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. H)**



**Plot 7-9. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. V)**

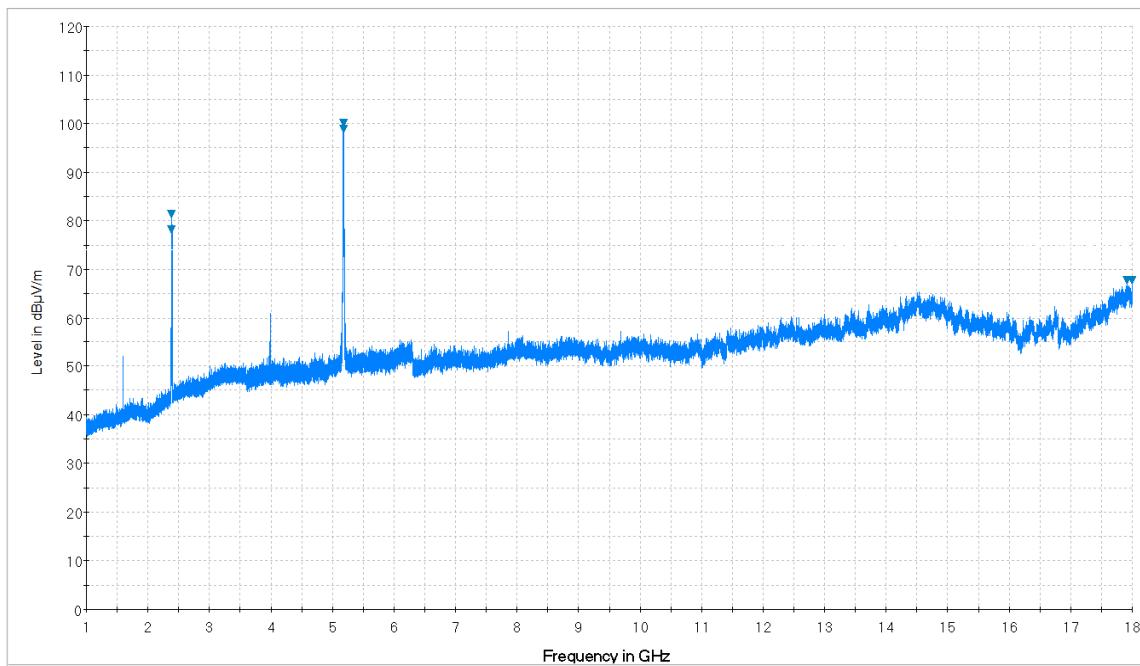
FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 17 of 44

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4073.00	Average	H	-	-	-69.01	-1.22	36.77	53.98	-17.21
4073.00	Peak	H	-	-	-56.89	-1.22	48.89	73.98	-25.09

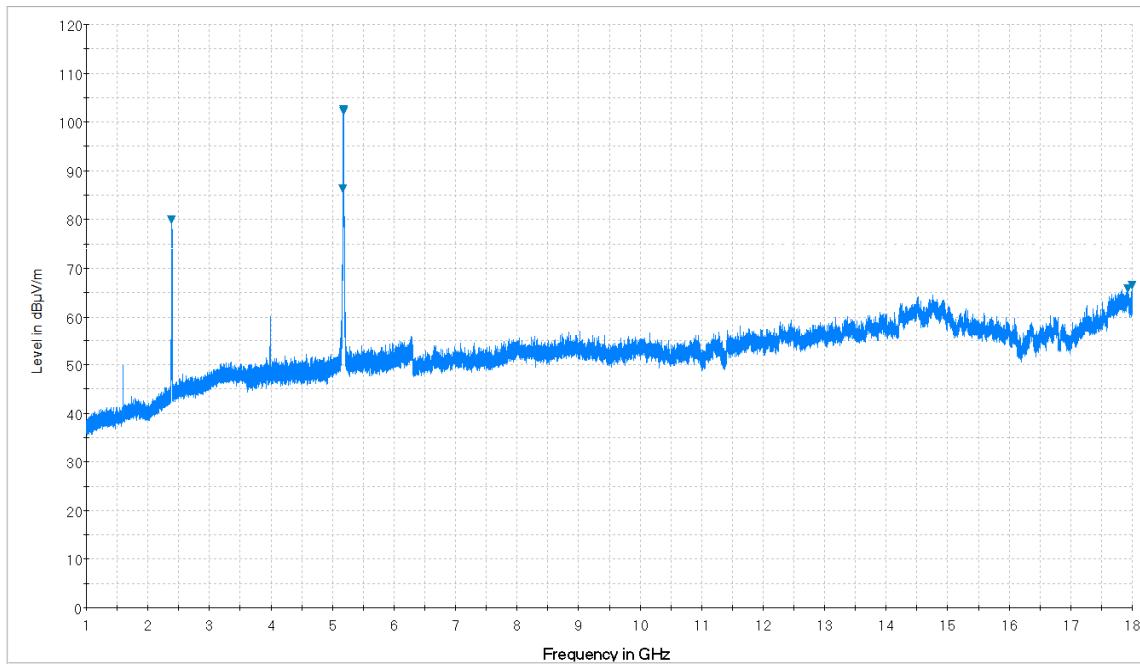
Table 7-2. Radiated Spurious Data

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 18 of 44

## 7.2.2 Radiated Spurious Emissions Measurements (LTE Band 13/14 + 5GHz WIFI)

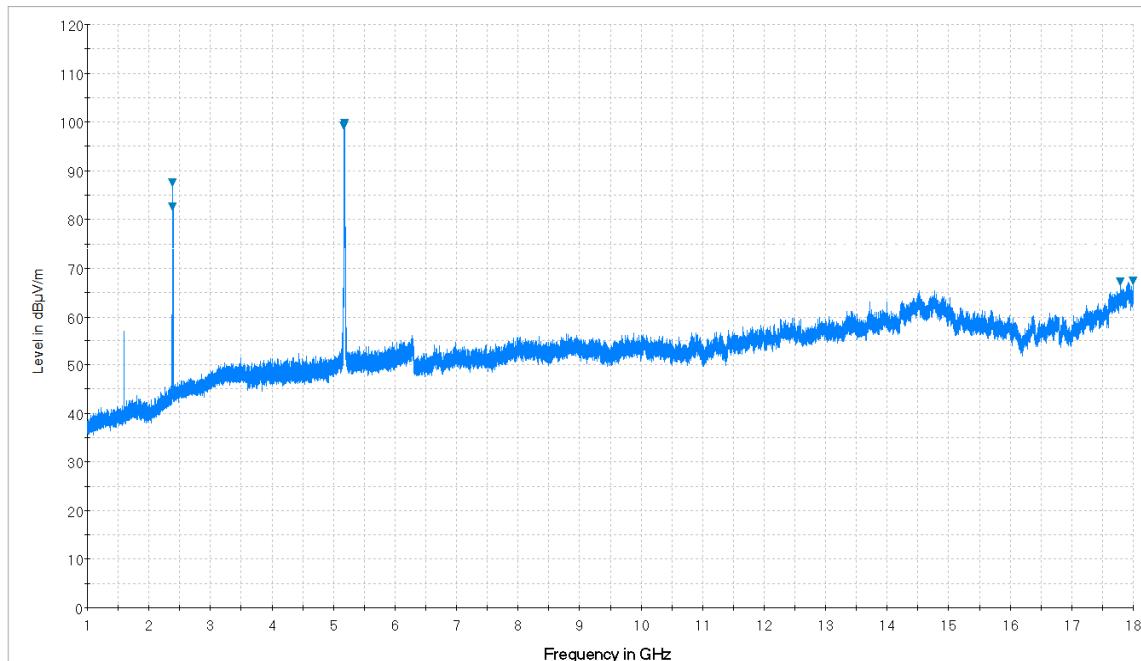


**Plot 7-10. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. H)**

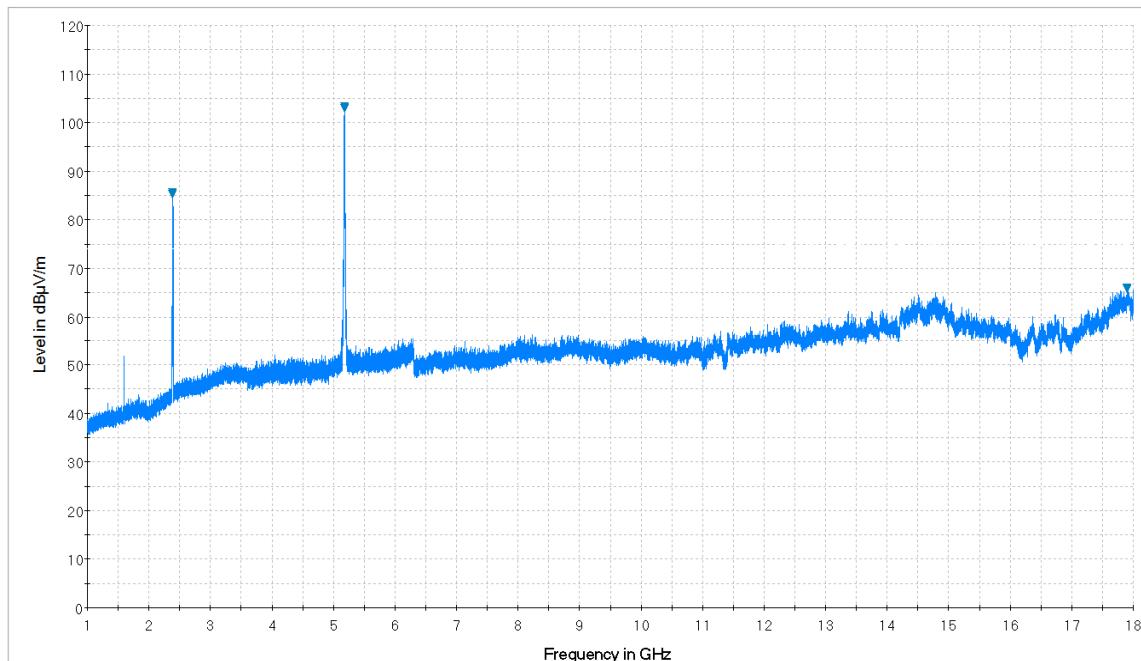


**Plot 7-11. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. V)**

FCC ID: BV8BBPBM214	 PCTEST Engineering Laboratory, Inc.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 HARRIS	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 19 of 44

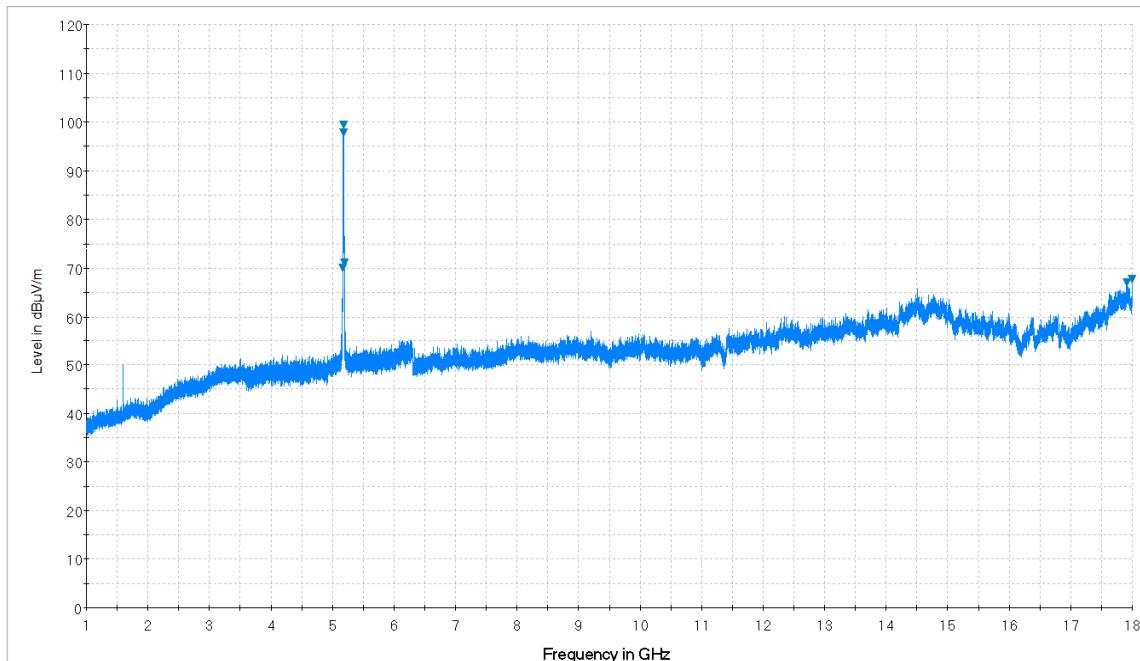


**Plot 7-12. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. H)**

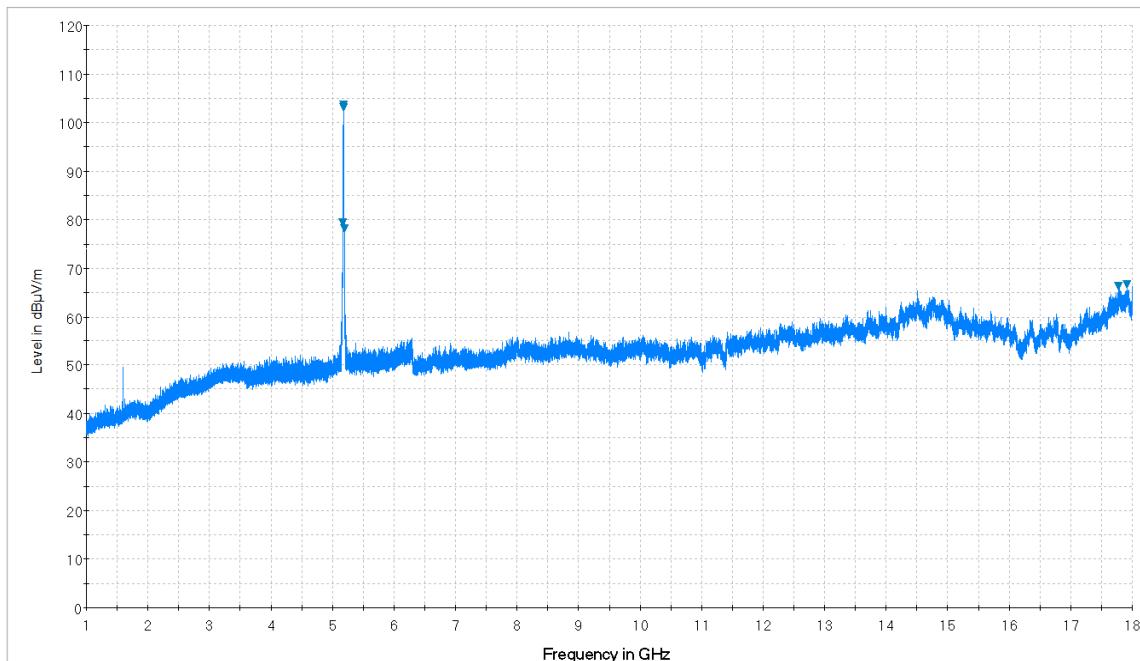


**Plot 7-13. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 20 of 44

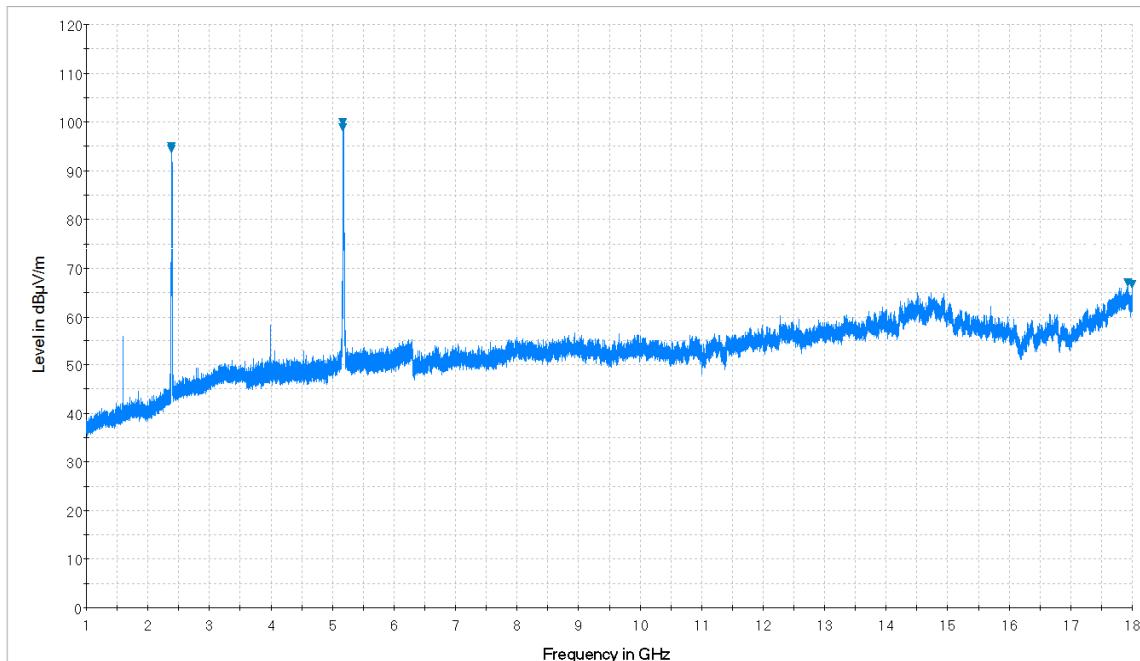


**Plot 7-14. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

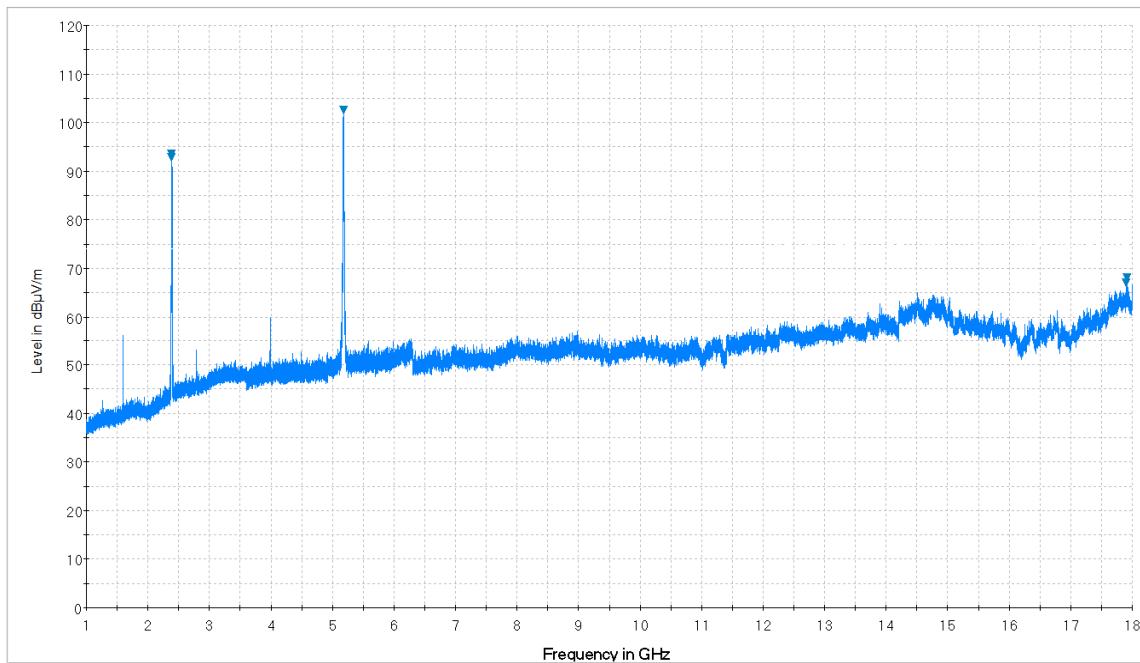


**Plot 7-15. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 21 of 44



**Plot 7-16. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. H)**



**Plot 7-17. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. V)**

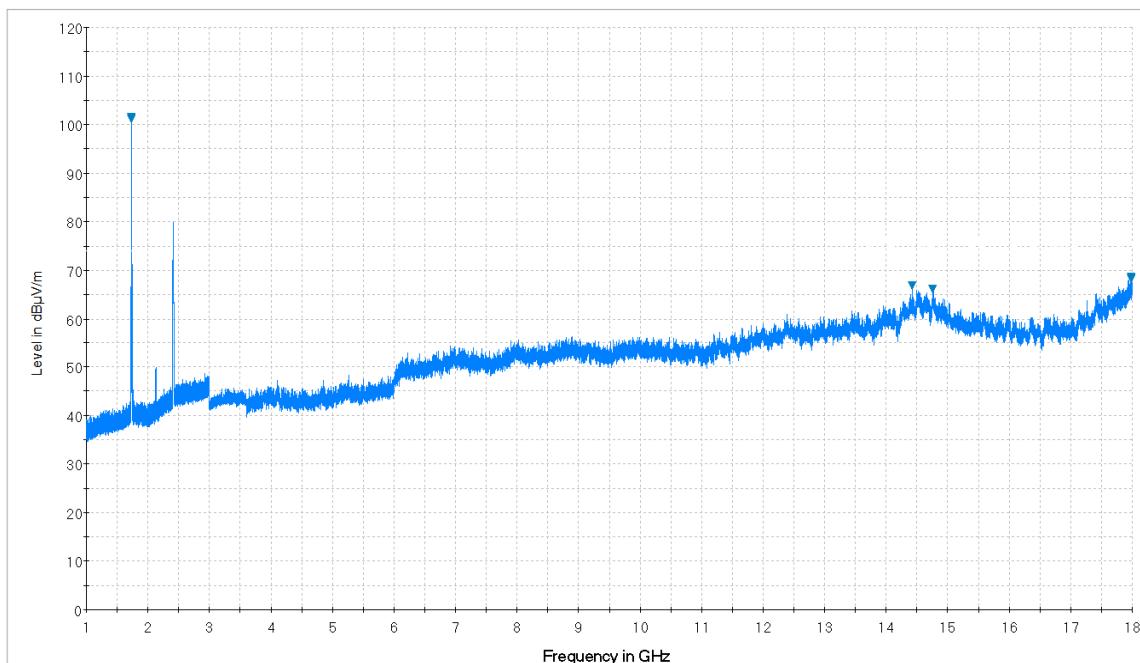
FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 22 of 44

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
6759.00	Average	V	-	-	-71.30	9.73	45.43	53.98	-8.55
6759.00	Peak	V	-	-	-59.81	9.73	56.92	73.98	-17.06

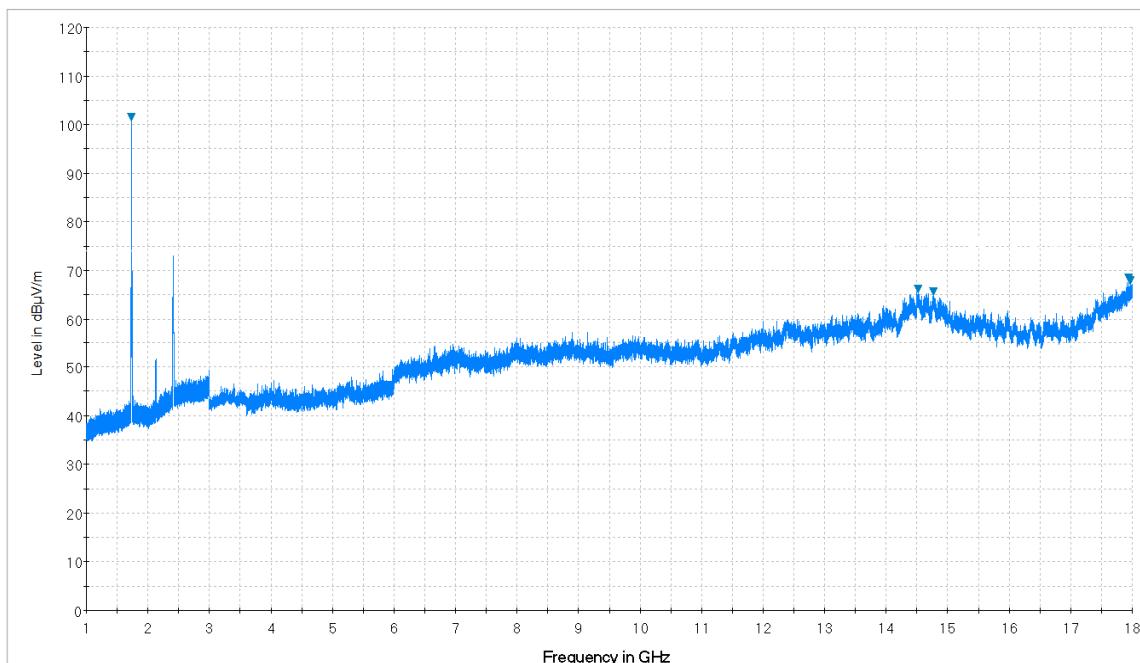
Table 7-3. Radiated Spurious Data

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 23 of 44

### 7.2.3 Radiated Spurious Emissions Measurements (LTE Band 4 + 2.4GHz WIFI)

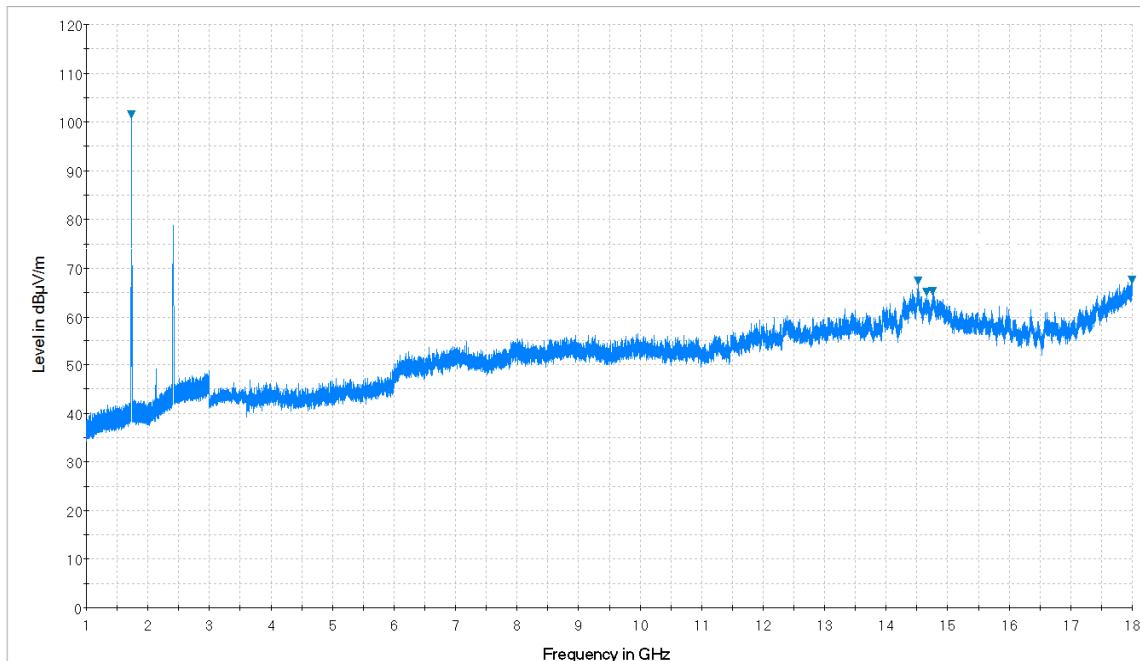


Plot 7-18. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. H)

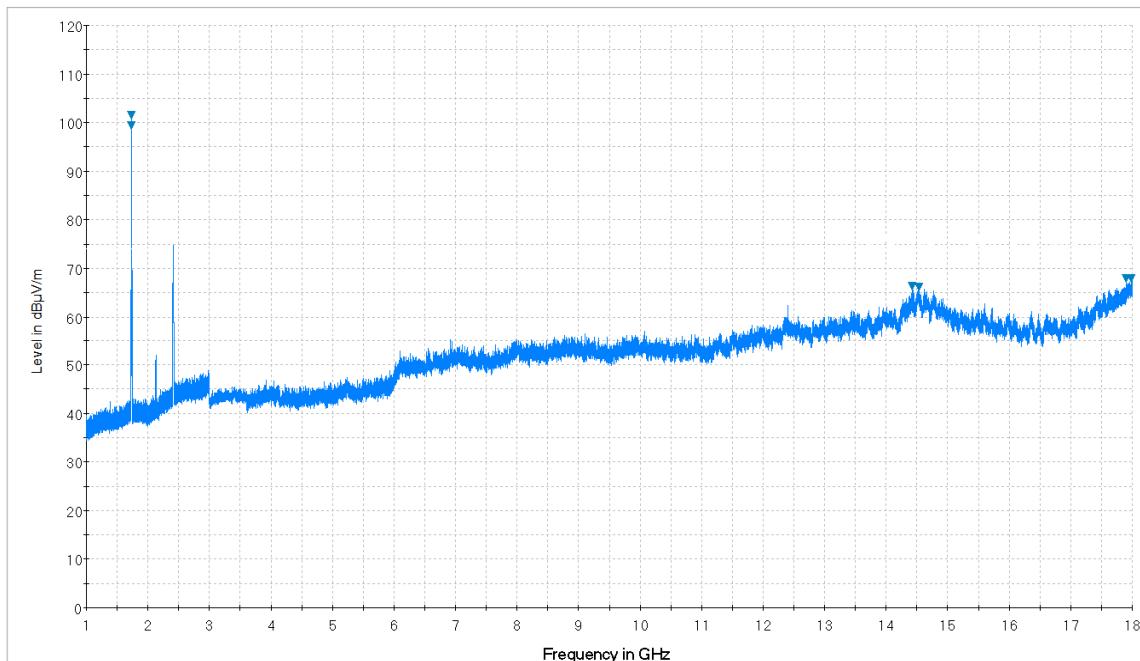


Plot 7-19. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. V)

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 24 of 44

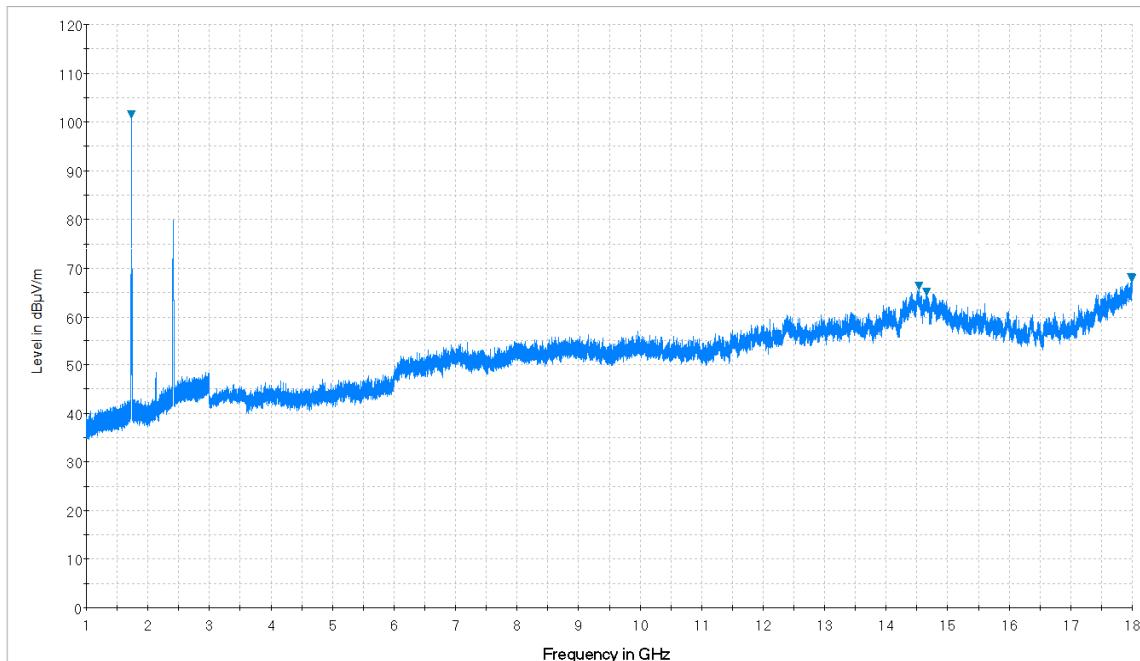


**Plot 7-20. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. H)**

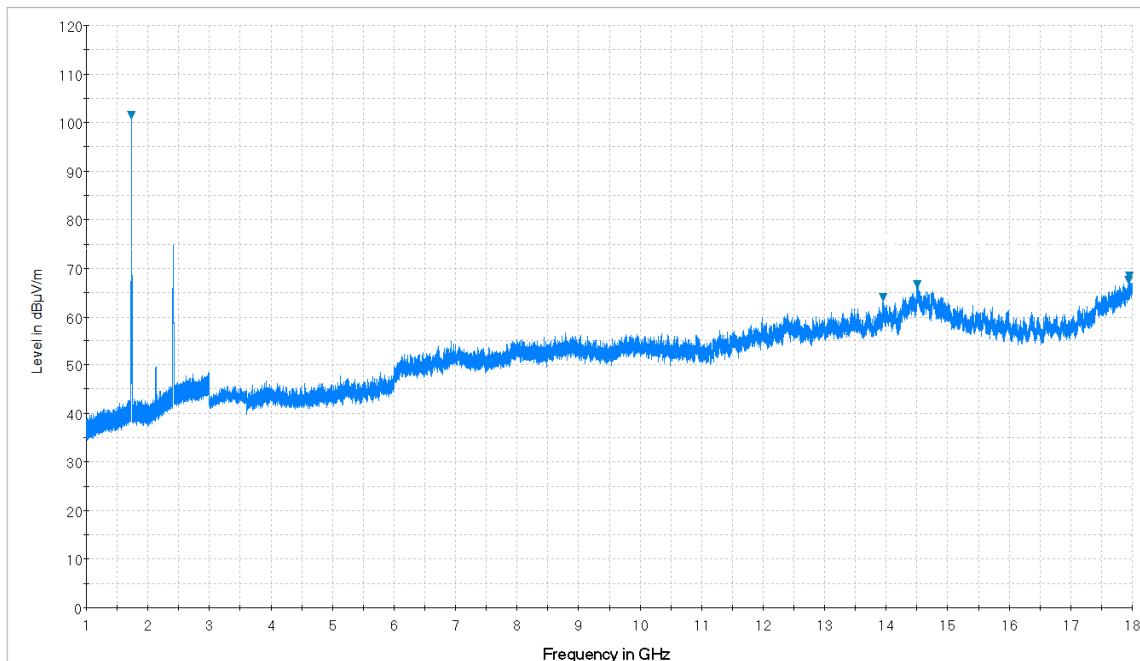


**Plot 7-21. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 25 of 44

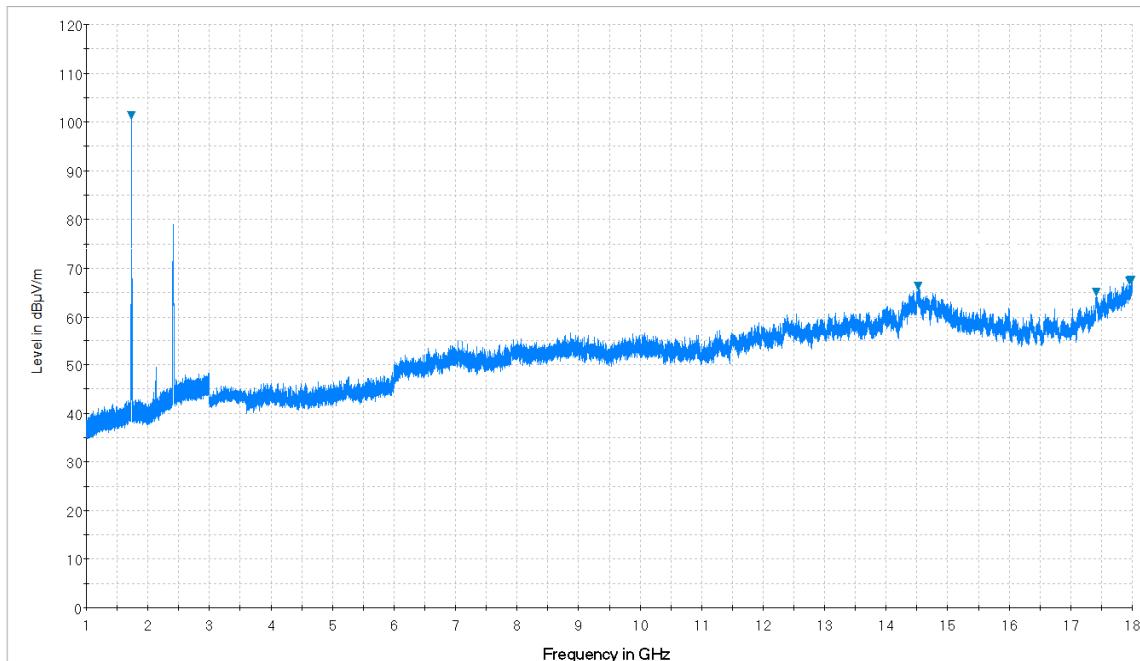


**Plot 7-22. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

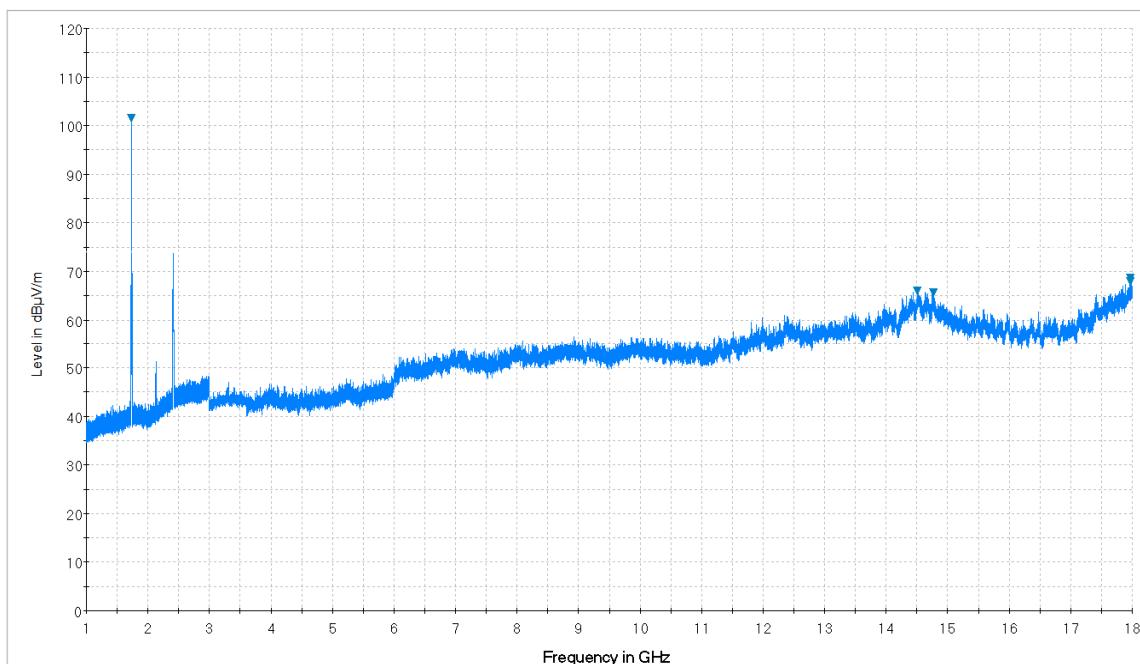


**Plot 7-23. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 26 of 44



**Plot 7-24. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. H)**



**Plot 7-25. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. V)**

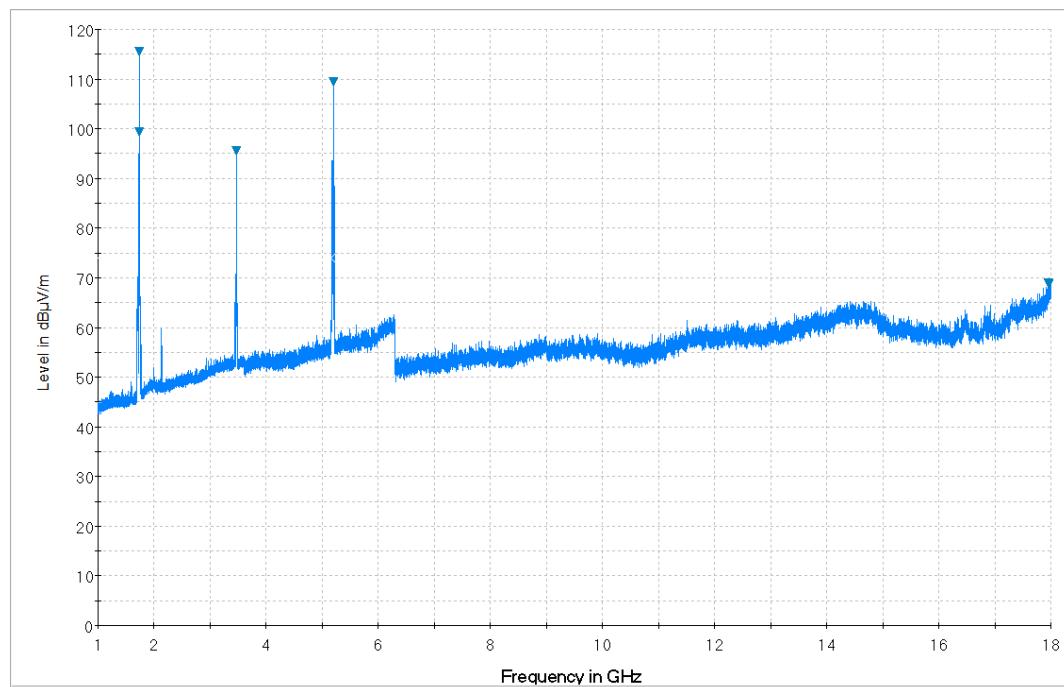
FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 27 of 44

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
4278.00	Average	H	-	-	-68.98	-1.22	36.80	53.98	-17.18
4278.00	Peak	H	-	-	-57.63	-1.22	48.15	73.98	-25.83

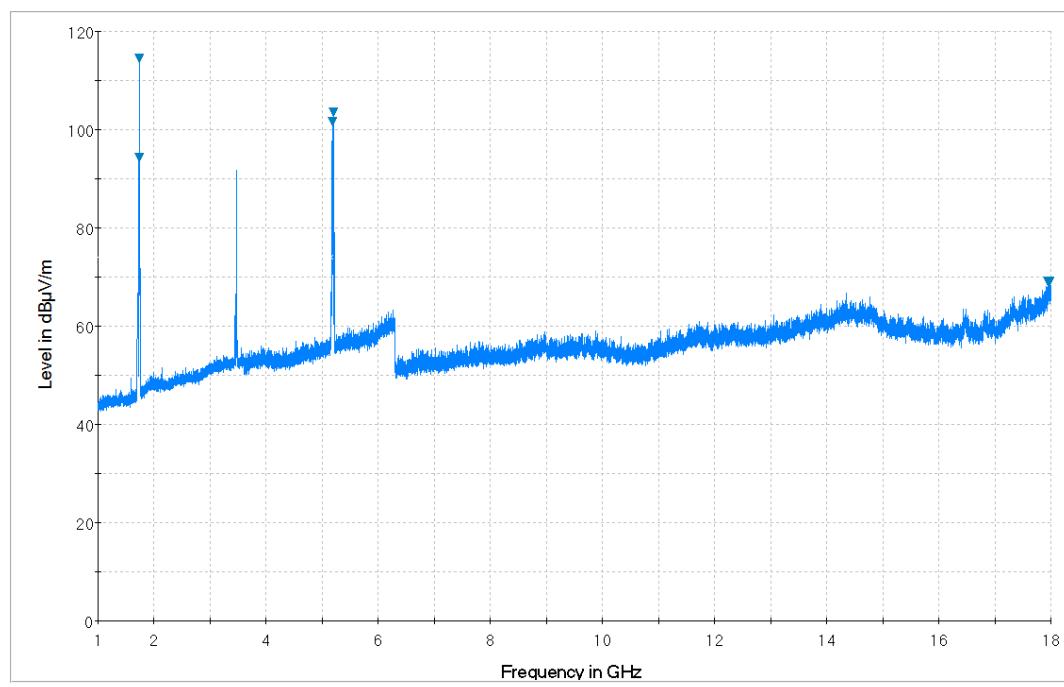
Table 7-4. Radiated Spurious Data

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 28 of 44

## 7.2.4 Radiated Spurious Emissions Measurements (LTE Band 4 + 5GHz WIFI)

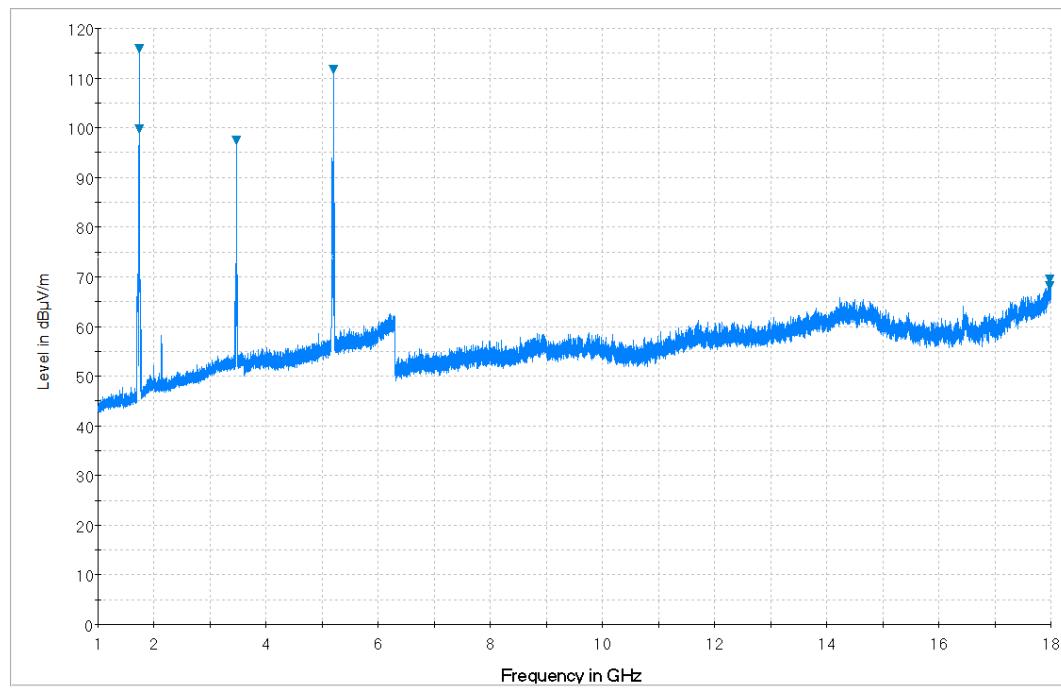


**Plot 7-26. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. H)**

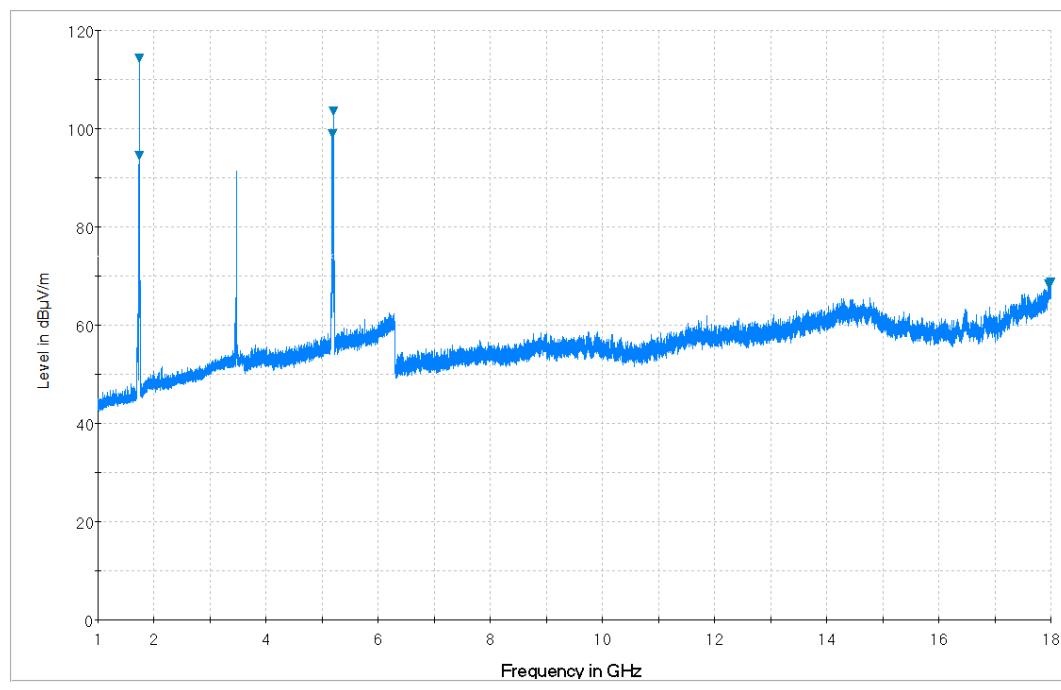


**Plot 7-27. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4000-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 29 of 44

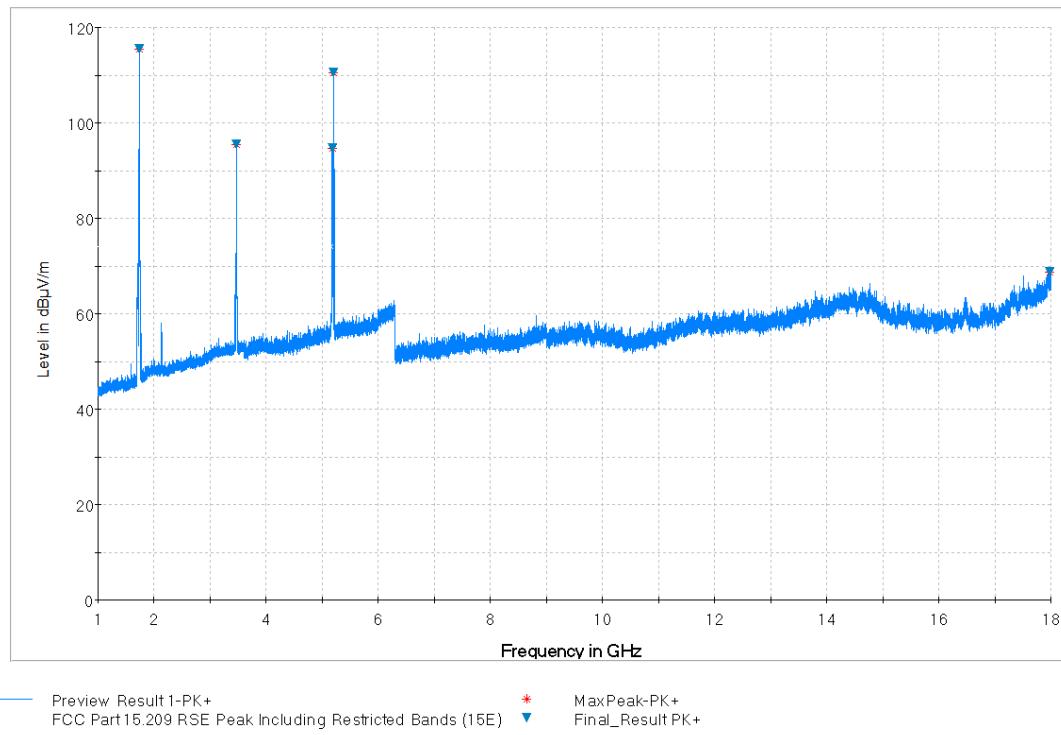


Plot 7-28. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. H)

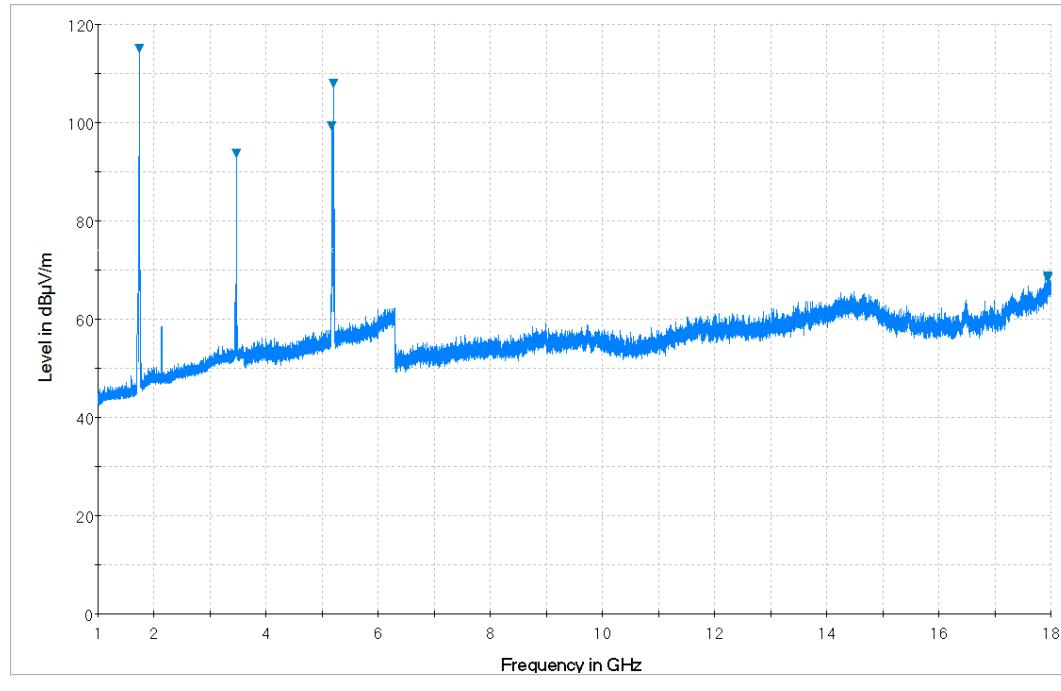


Plot 7-29. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4420-01) (Pol. V)

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 30 of 44

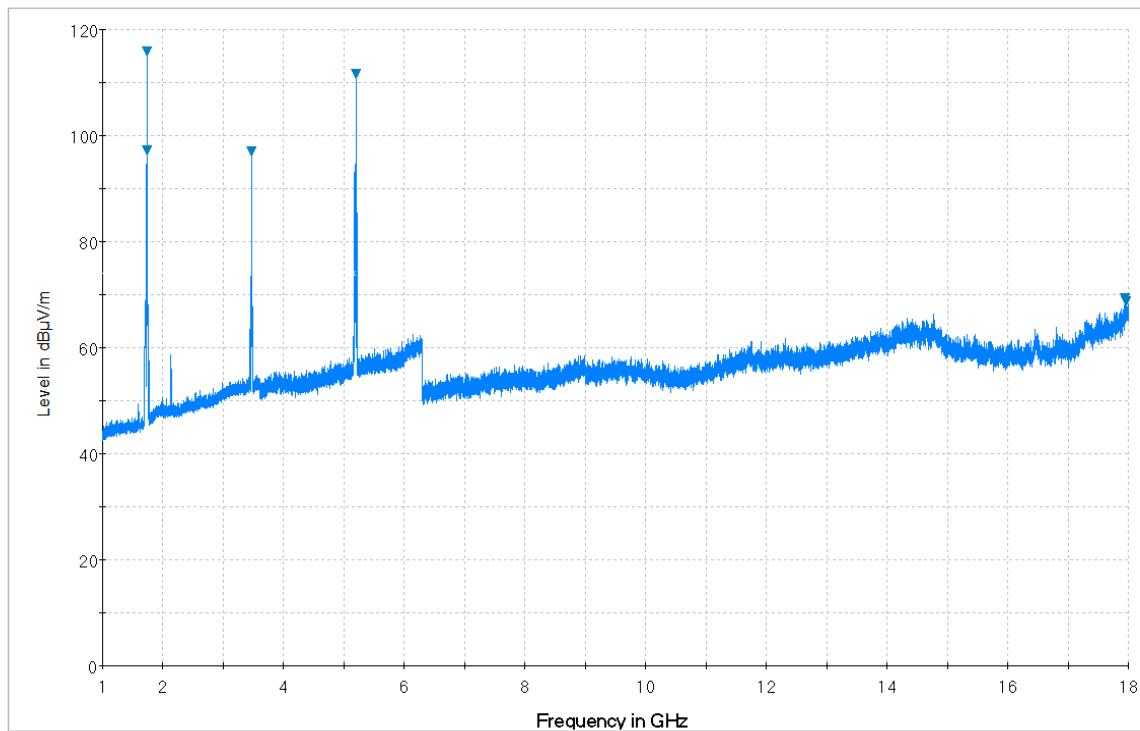


**Plot 7-30. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

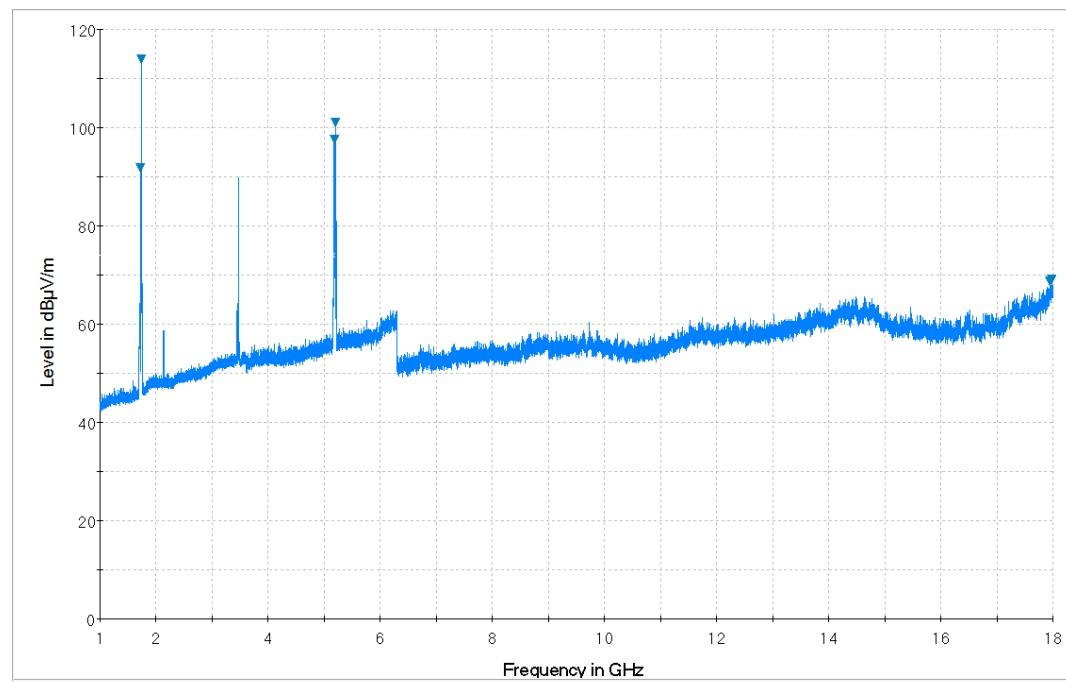


**Plot 7-31. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214	<b>PCTEST</b> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	<b>HARRIS</b>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 31 of 44



Plot 7-32. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. H)



Plot 7-33. Radiated Spurious Plot from 1GHz – 18GHz (Whip Antenna: 14035-4440-02) (Pol. V)

FCC ID: BV8BBPBM214	 <b>FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)</b>			Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 32 of 44

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V 6.2

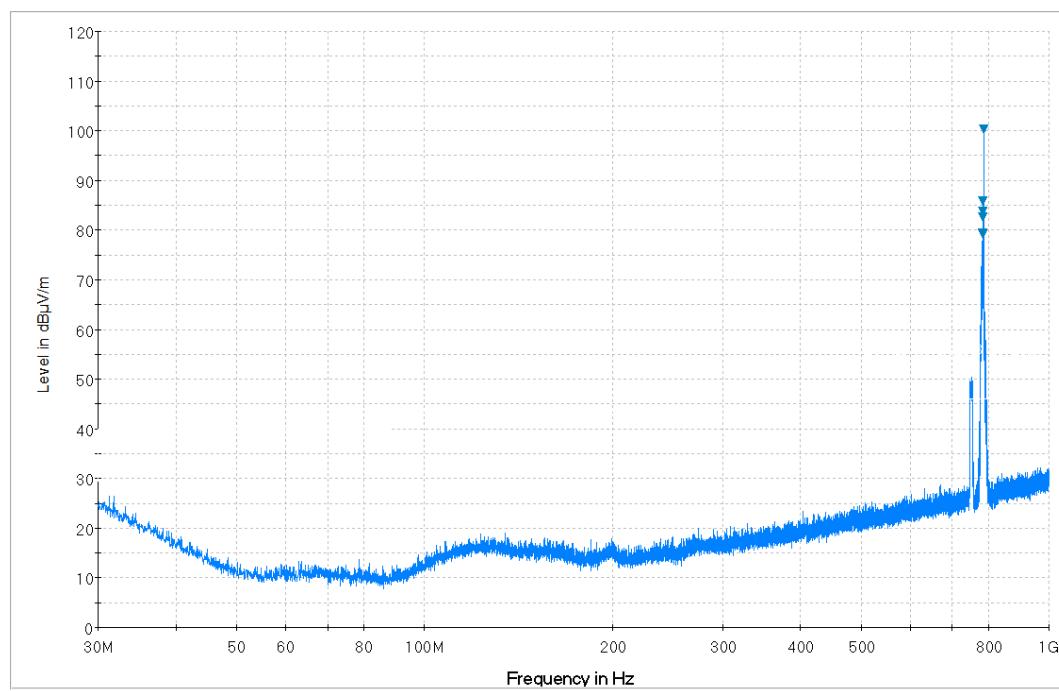
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Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
6525.00	Average	V	-	-	-70.21	9.27	46.06	53.98	-7.92
6525.00	Peak	V	-	-	-59.10	9.27	57.17	73.98	-16.81

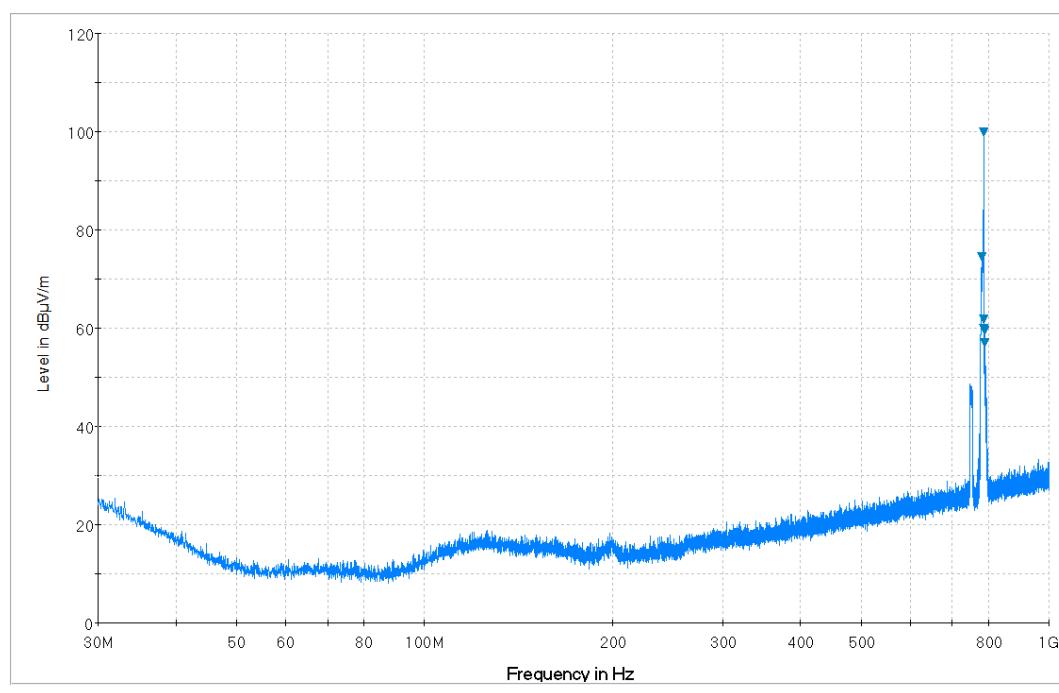
Table 7-5. Radiated Spurious Data

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 33 of 44

## 7.2.5 Radiated Spurious Emissions Measurements (LTE Band 13/14 + 5GHz WIFI)

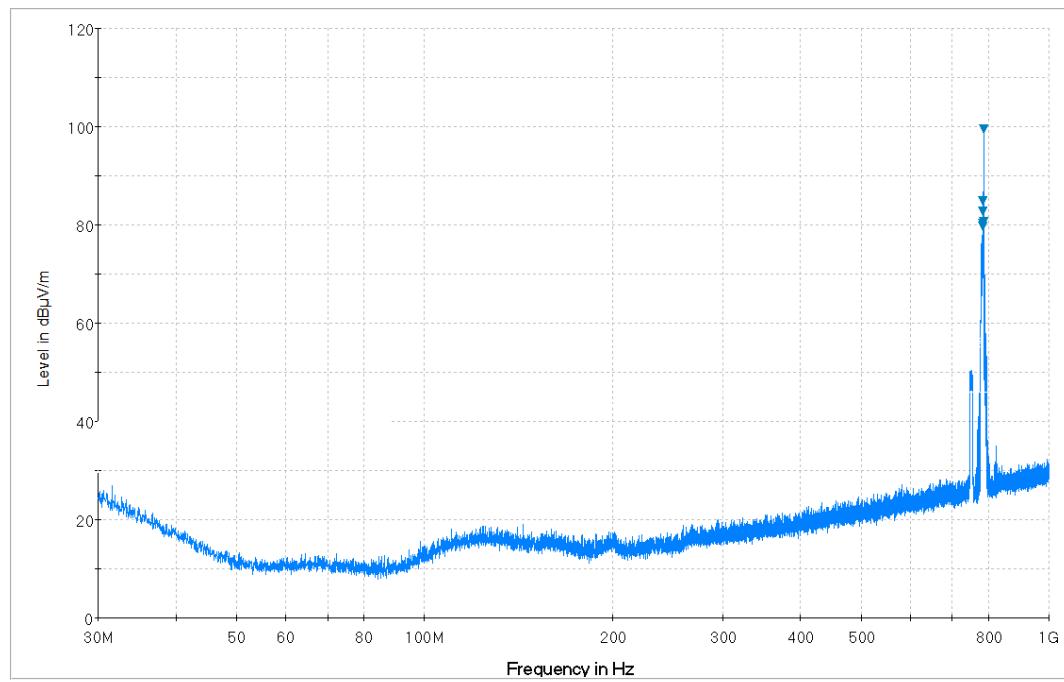


**Plot 7-34. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4000-01) (Pol. H)**

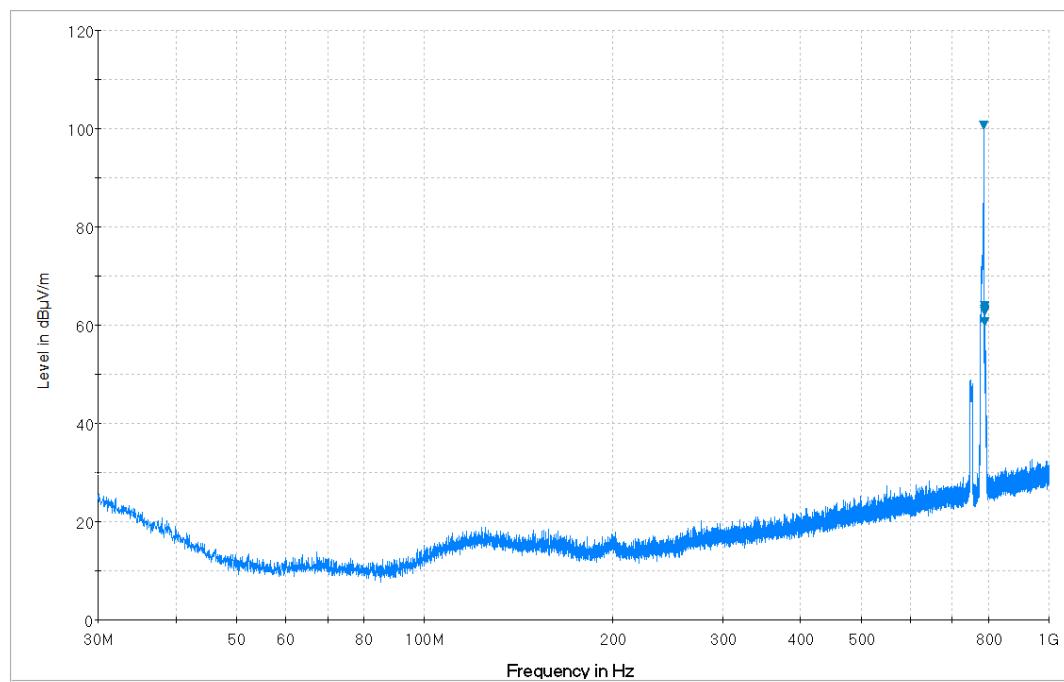


**Plot 7-35. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4000-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 34 of 44

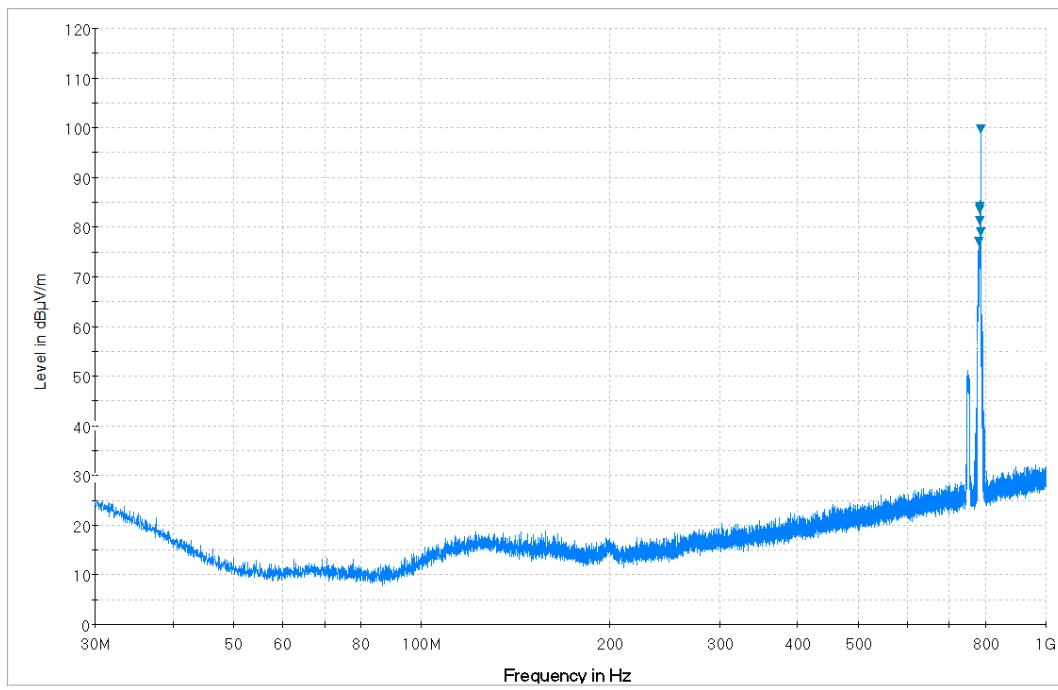


**Plot 7-36. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4420-01) (Pol. H)**

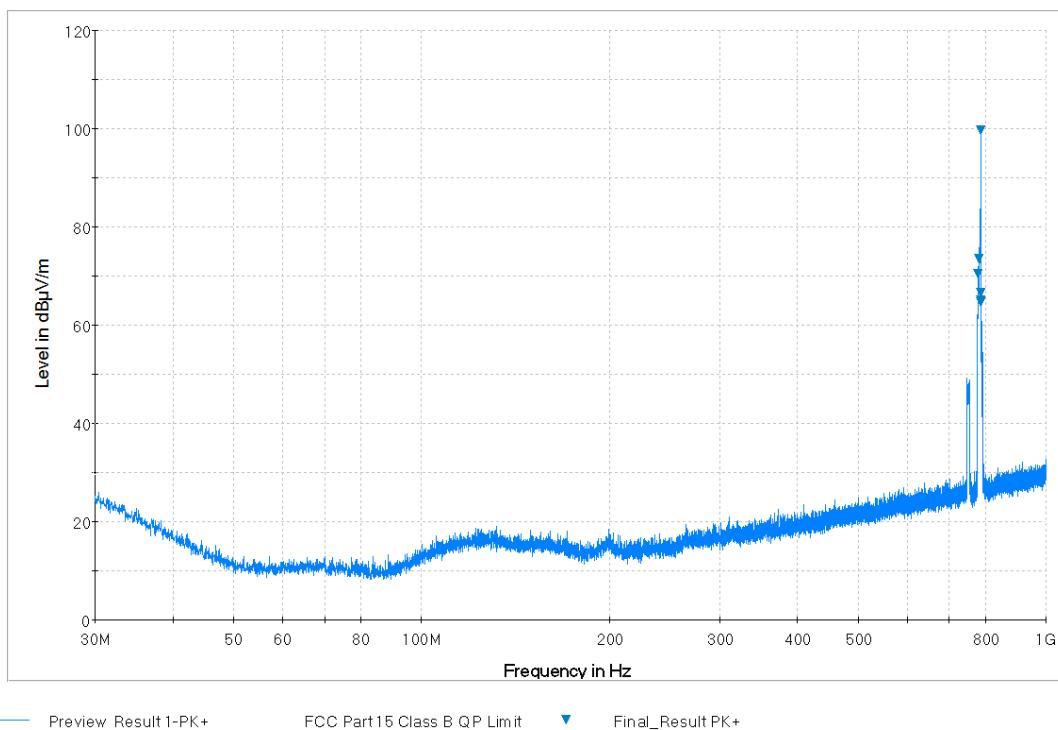


**Plot 7-37. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4420-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 35 of 44

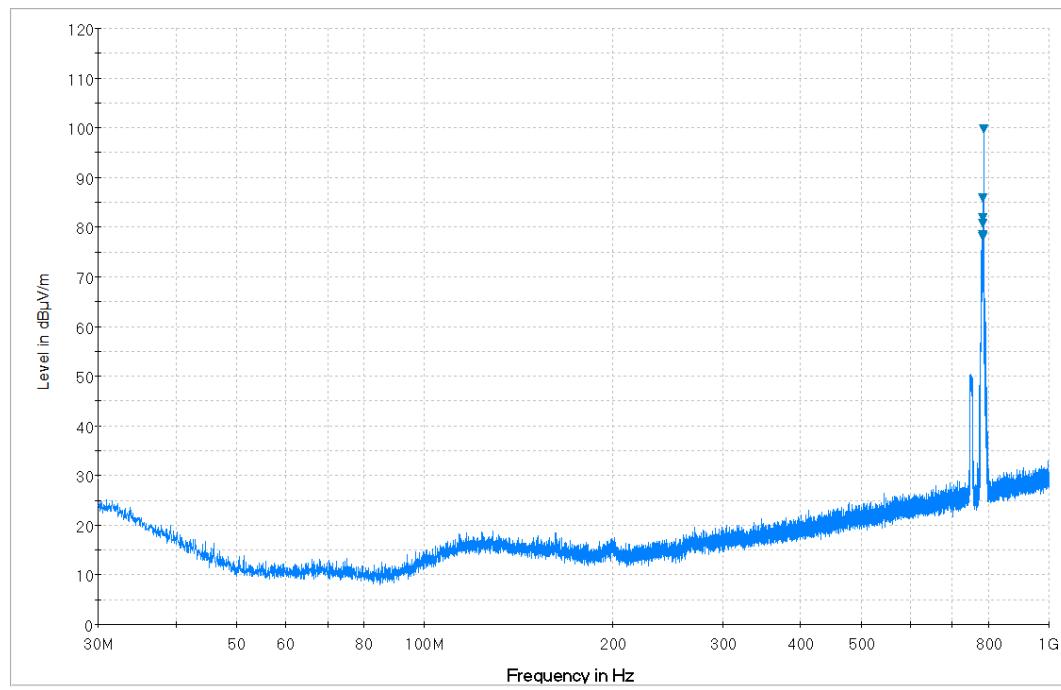


**Plot 7-38. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

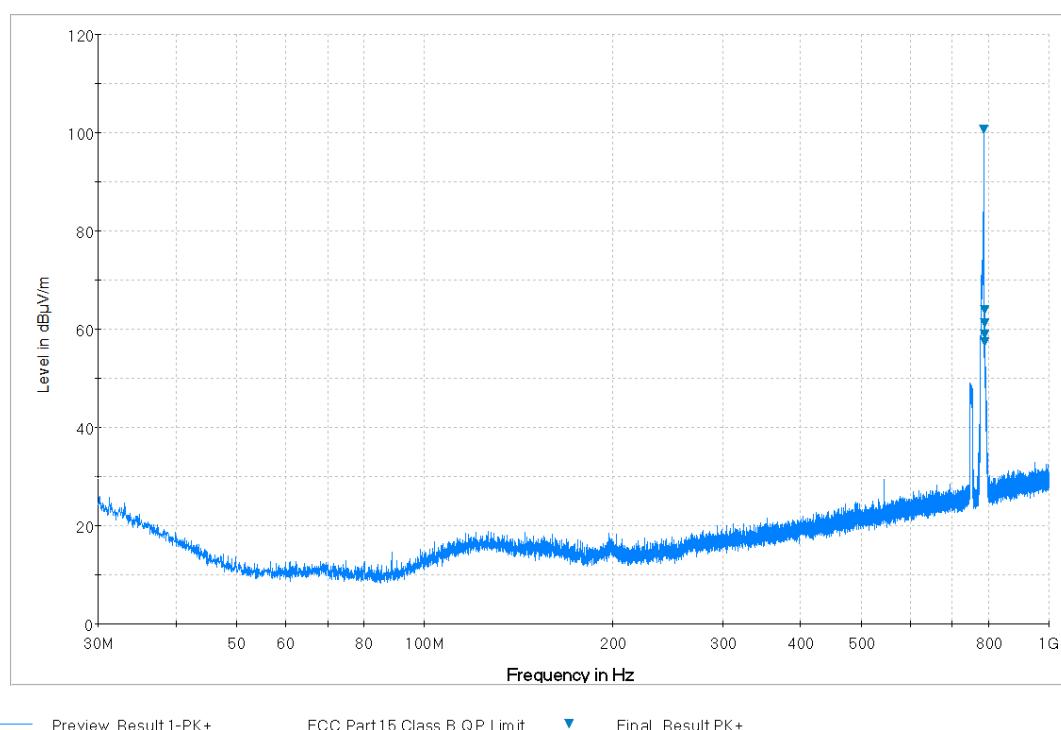


**Plot 7-39. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 36 of 44



**Plot 7-40. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-02) (Pol. H)**



**Plot 7-41. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-02) (Pol. V)**

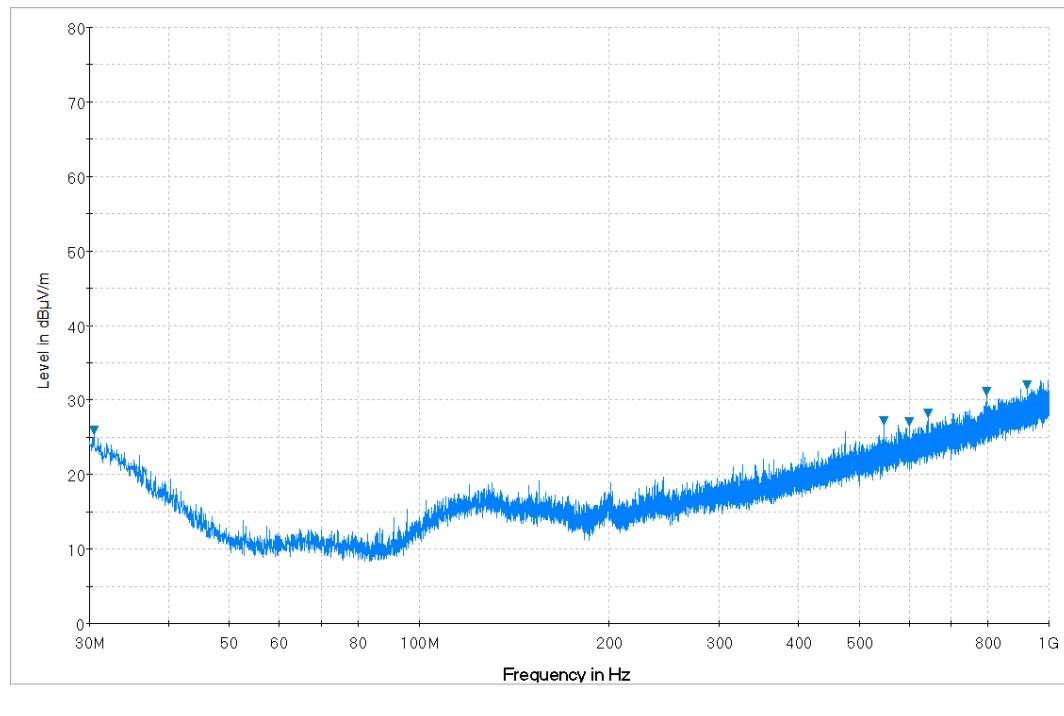
FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 37 of 44

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
37.80	Peak	H	110	287	-61.19	-13.72	32.09	40.00	-7.91

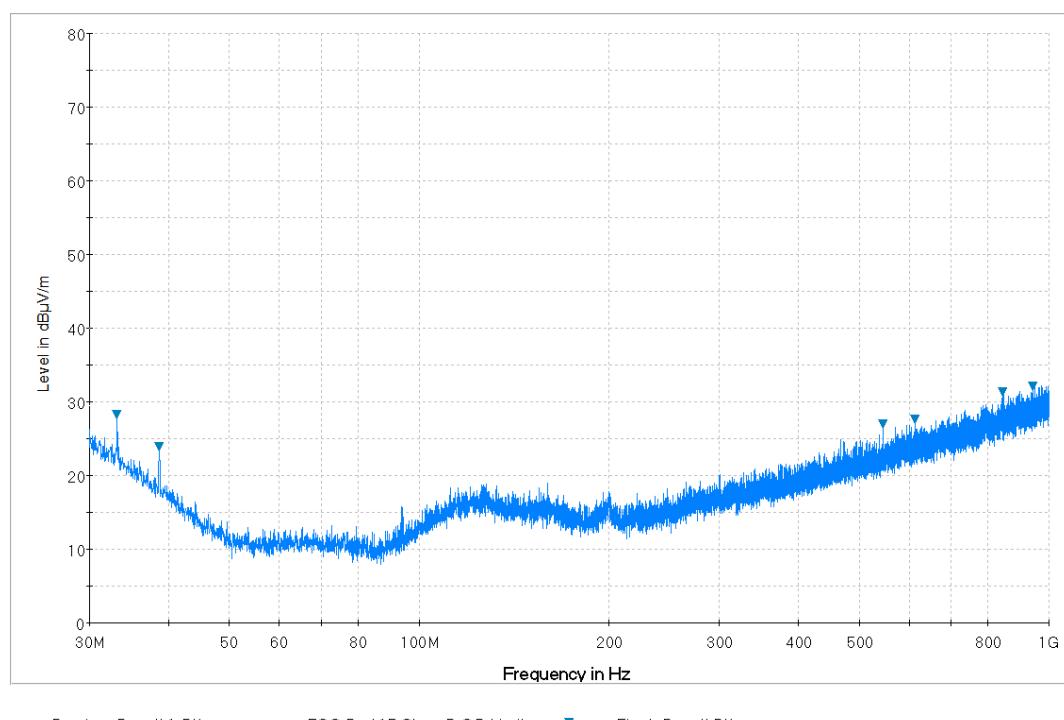
Table 7-5. Radiated Spurious Data (Whip Antenna 14035-4000-01)

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
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## 7.2.6 Radiated Spurious Emissions Measurements (LTE Band 4 + 5GHz WIFI)

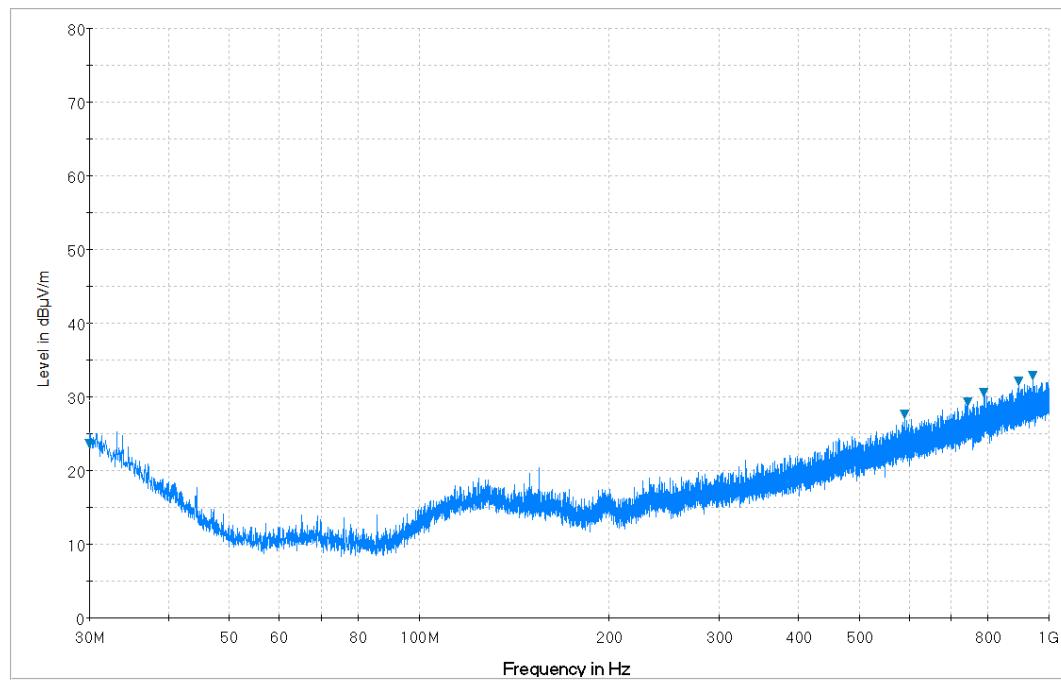


**Plot 7-42. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4000-01) (Pol. H)**

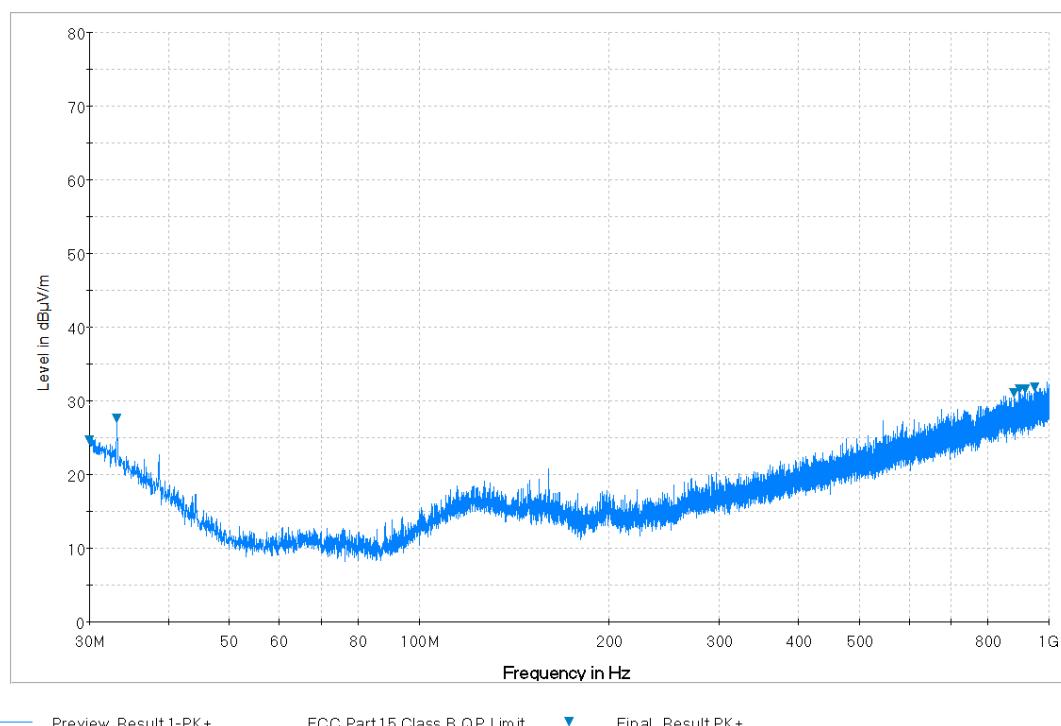


**Plot 7-43. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4000-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 39 of 44

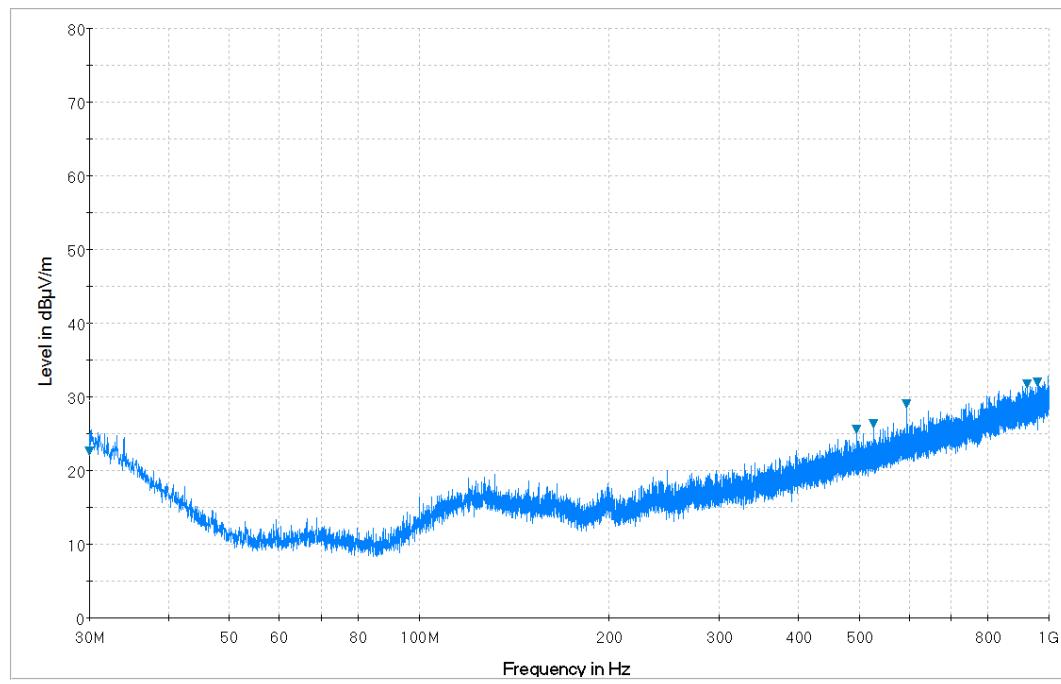


**Plot 7-44. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4420-01) (Pol. H)**

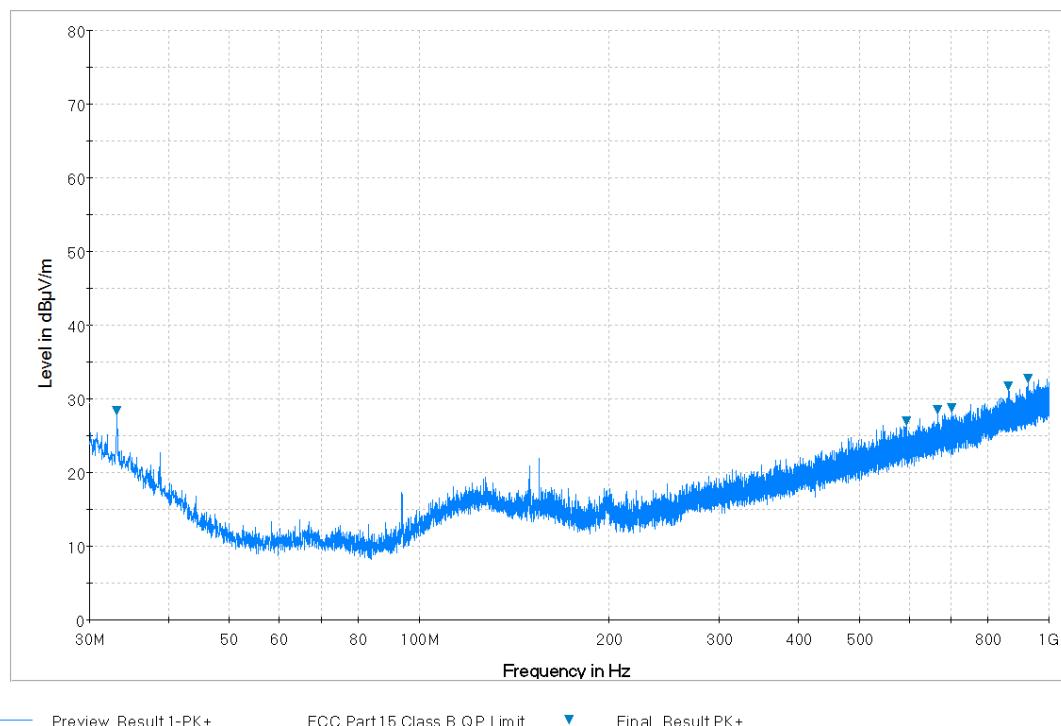


**Plot 7-45. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4420-01) (Pol. V)**

FCC ID: BV8BBPBM214	 <b>FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)</b>			Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 40 of 44

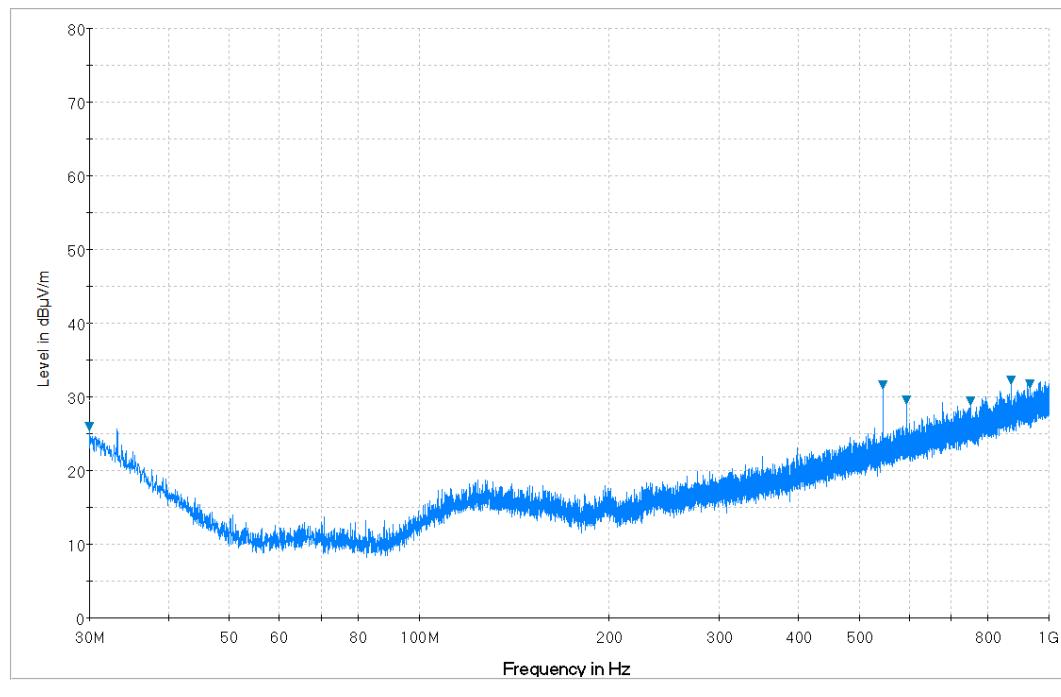


**Plot 7-46. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-01) (Pol. H)**

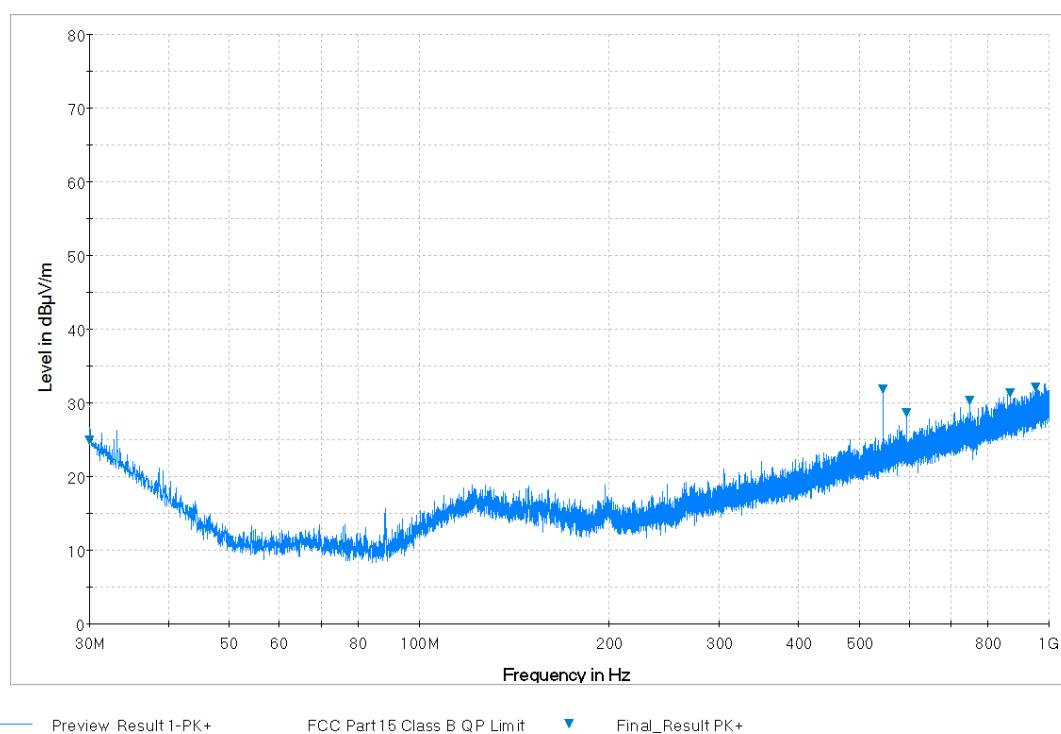


**Plot 7-47. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-01) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 41 of 44



**Plot 7-48. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-02) (Pol. H)**



**Plot 7-49. Radiated Spurious Plot from 30MHz - 1GHz (Whip Antenna: 14035-4440-02) (Pol. V)**

FCC ID: BV8BBPBM214		FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)		Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 42 of 44

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Antenna Height [cm]	Turntable Azimuth [degree]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dB $\mu$ V/m]	Limit [dB $\mu$ V/m]	Margin [dB]
84.07	Peak	H	-	-	-72.80	-21.71	12.49	40.00	-27.51

Table 7-6. Radiated Spurious Data

FCC ID: BV8BBPBM214	 FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module

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## 8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **Harris Wireless Module, FCC ID: BV8BBPBM214, integrated into PTT Radio (FCC ID: OWDTR-0133-E)** complies with the requirements of Parts 15, 27, and 90 of the FCC rules for simultaneous transmission operation.

FCC ID: BV8BBPBM214	 PCTEST <sup>®</sup> ENGINEERING LABORATORY, INC.	FCC Pt. 15, 27, and 90 MEASUREMENT REPORT (CLASS II PERMISSIVE CHANGE)	 HARRIS <sup>®</sup>	Approved by: Quality Manager
Test Report S/N: 1M1705010158-02.BV8	Test Dates: 04/28 - 05/02/2017	EUT Type: Wireless Module		Page 44 of 44

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