



**FCC 47 CFR PART 15 SUBPART C**

**CERTIFICATION TEST REPORT**

**FOR**

**AIRBORNE STATION**

**MODEL NUMBER: ABR**

**FCC ID: 2AJN8-ABR1**

**REPORT NUMBER: R11150849-E3**

**ISSUE DATE: 2016-09-28**

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Revision History

Ver.	Issue Date	Revisions	Revised By
1	2016-09-08	Initial Issue	M. Heckrotte
2	2016-09-28	Revised Section 5.5 to clarify the configurations tested.	Jeff Moser

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## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** HARRIS CORP.  
2400 PALM BAY RD NE.  
PALM BAY, FL, 32905 USA

**EUT DESCRIPTION:** AIRBORNE STATION

**MODEL:** ABR, P/N 1521K0012

**SERIAL NUMBER:** T0002845

**DATE TESTED:** 2016-02-02 – 2016-06-02

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL LLC based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL LLC and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL LLC will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For  
UL Verification Services Inc. By:

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MICHAEL HECKROTTE  
PRINCIPAL ENGINEER  
UL Verification Services Inc.



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EMC PROGRAM MANAGER  
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## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, KDB 558074 D01 v03r05.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 12 Laboratory Dr., Research Triangle Park, NC 27709, USA and 2800 Suite B Perimeter Park Dr., Morrisville, NC 27560.

12 Laboratory Dr., RTP, NC 27709	
<input type="checkbox"/>	Chamber A
<input type="checkbox"/>	Chamber C

2800 Suite B Perimeter Park Dr., Morrisville, NC 27560	
<input type="checkbox"/>	Chamber NORTH
<input checked="" type="checkbox"/>	Chamber SOUTH

UL LLC (RTP) is accredited by NVLAP, Laboratory Code 200246-0. The full scope of accreditation can be viewed at <http://www.nist.gov/nvlap/>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned}\text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamplifier Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m}\end{aligned}$$

### 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus.

PARAMETER		UNCERTAINTY
Total RF power, conducted	+/-	0.45
RF power density, conducted	+/-	1.50
Spurious emissions, conducted	+/-	2.94
All emissions, radiated up to 18 GHz	+/-	5.36
Temperature	+/-	0.07
Humidity	+/-	2.26
DC and low frequency voltages	+/-	1.27
Conducted Disturbance, 0.15 to 30 MHz	+/-	2.37

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a airborne 2.4 GHz transceiver intended to communicate with ground stations.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power (dBm)	Output Power (mW)
Patch Antenna			
2408.57-2437.03	540 kHz	29.40	870.96
2410.30-2435.30	4.5 MHz	30.00	1000.00
2412.80-2432.80	9 MHz	28.80	758.58
Yagi			
2408.57-2437.03	540 kHz	26.50	446.68
2410.30-2435.30	4.5 MHz	26.90	489.78
2412.80-2432.80	9 MHz	26.30	426.58

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

At installation, the radio is connected to two antennas. The Full Duplex Quad (FDQ) antenna is a transmit and receive antenna containing two Yagi antennas and two patch antennas within the radome. Switches and other components in the antenna permit the radio to connect to any one of the four antennas. The FDQ is approximately ten inches tall and is mounted on the underside of the aircraft. The second antenna connected to the radio is a High Performance Blade (HPB) antenna. The HPB is a receive-only antenna thirty inches long and three inches wide, mounted on the underside of the aircraft. The HPB contains multiple columns of patch antennas to form receive beams broadside to the aircraft. The HPB contains low-noise amplifiers and switches. The HPB and FDQ antennas were included in the FCC test setup.

The FDQ Patch antennas, have a maximum gain of 4.25 dBi and the FDQ Yagi antennas have a maximum gain of 6.08 dBi.



## **5.4. SOFTWARE AND FIRMWARE**

The software/firmware is as follows:

Version: 0.0.3  
Revision: 6002  
Build ID: 203  
Package ID: 2.

## **5.5. WORST-CASE CONFIGURATION AND MODE**

Radiated emission tests from 1 GHz to 18 GHz was tested at L/M/H channels. Conducted emissions was not performed since the ABR is intended for installation on an aircraft. Below 1GHz and above 18GHz was tested at highest power for the lowest and highest available BW.

The fundamental of the EUT was investigated in three orthogonal orientations: 1, 2, and 3. It was determined that orientation 1 was worst-case orientation for the Yagi antenna and orientation 2 was worst-case orientation for the Patch antenna; therefore, all final radiated testing was performed with the EUT in those respective orientations. Please refer to the setup photos for more details.

The manufacturer configured the system to provide the maximum throughput based on the highest output power. The manufacturer deemed that QPSK modulation yields highest power and yields worst-case results. Therefore, QPSK modulation was used for all testing.

Radiated emissions for EUT with antenna was performed and passed; therefore, antenna port spurious was not performed.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Support Equipment List				
Description	Manufacturer	Model	Serial Number	FCC ID
Power Supply (28V)	Astron	28VDC	N/A	N/A
Duplexer	Harris	N/A	N/A	N/A
RRH	Harris	RRH-1	T0002748	2AJN8-GS1
BBU	Harris	BBU-1	T0002780	N/A
RRH POWER SUPPLY	Newmar	D/C 1639	N/A	N/A

### I/O CABLES

I/O Cable List						
Cable No	Port	# of identical ports	Connector Type	Cable Type	Cable Length (m)	Remarks
1	DC	1	-	-	3.05	
2	GPS	1	Coax	Coax	15.25	
3	Tx Antenna Port	1	SMA	Coax	1.5	
4	Rx Antenna Port	4	SMA	Coax	1.5	
5	LAN	1	RJ45	CAT5e	10.5	

## **TEST SETUP**

### **Antenna Port Conducted Test Setup**

The ABR was connected to a Linux PC to enable commanding of the system to perform FCC testing. The Ground system (BBU Chassis (BBU & SCM), RRH and EPC emulator) was directly connected to the ABR to enable FCC testing. A 28 VDC power supply was connected to the ABR to emulate aircraft power. A GPS antenna was connected to the ABR to emulate aircraft supplied GPS signals. The ABR Transmit output (J9) was connected to the Spectrum Analyzer and all FCC measurements were made at this port.

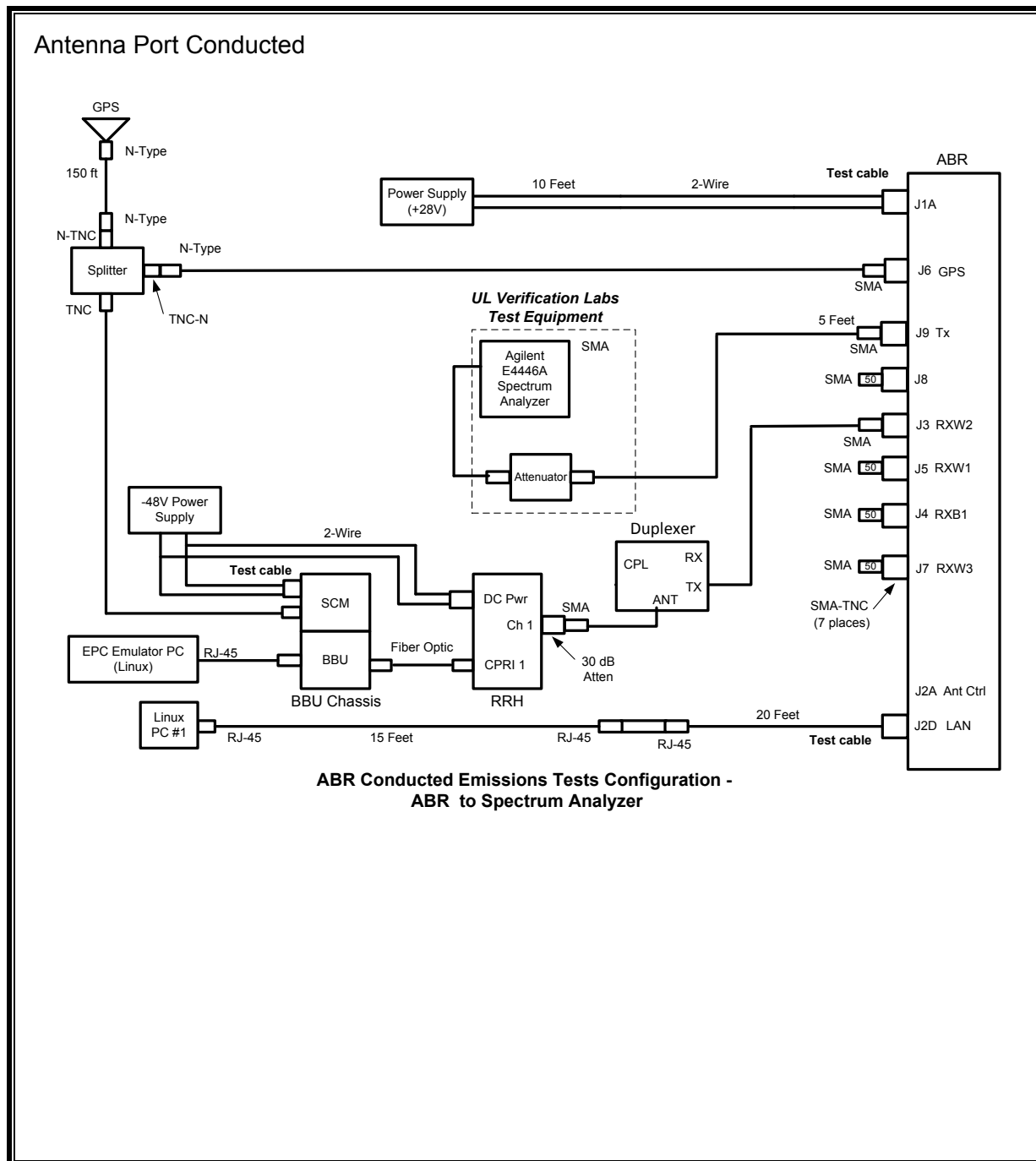
### **Radiated Test Setup**

The ABR was connected to a Linux PC to enable commanding of the system to perform FCC testing. The Ground system (BBU Chassis (BBU & SCM), RRH and EPC emulator) was directly connected to the ABR to enable FCC testing. A 28 VDC power supply was connected to the ABR to emulate aircraft power. A GPS antenna was connected to the ABR to emulate aircraft supplied GPS signals. The ABR, FDQ and HPB antennas were located in the EMI chamber and the Ground station components were located outside of the EMI chamber. The ABR Transmit output (J9) was connected to the FDQ antenna and the ABR Receive ports (J4, J5 and J7) were connected to the HPB antenna. UL Verification Labs utilized various test antennas to measure the radiated emissions of the ABR system.

### **Power Settings**

Conducted Testing Note – The manufacturer states that the maximum cable loss from the antenna port to the antenna is 3 dB. Therefore, the EUT was set at the highest allowed power setting to overcome the antenna cable 3 dB loss during testing. This power setting was determined by the output power measurements made at the end of the antenna cable and was used throughout testing.

All tests were performed at the maximum allowed power setting (setting for 4.25 dBi Patch antenna) determined during power measurements, except Output Power which was performed at two different settings (4.25 dBi Patch and 6.06 dBi Yagi antenna setting). With the exception of Power and PSD, all testing was performed at the antenna port connector at the maximum allowed power setting which would be considered worst-case. Power and PSD were performed at the maximum power setting that was determined during Output Power measurements and measured at the end of the antenna cable (3dB cable loss).





## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

### Test Equipment Used - Wireless Conducted Measurement Equipment

Equipment ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
<b>Conducted Room 1</b>					
SA0019	Spectrum Analyzer	Agilent Technologies	E4446A	2015-09-02	2016-09-30
SA0026	Spectrum Analyzer	Agilent	N9030A	2015-03-27	2016-03-31
PWM004	RF Power Meter	Keysight Technologies	N1911A	2015-06-08	2016-06-30
PWS004	Peak and Avg Power Sensor, 50MHz to 6GHz	Keysight Technologies	E9323A	2015-06-05	2016-06-30
HI0079	Temp/Humid/Pressure Meter	Springfield	PreciseTemp	2015-07-1	2016-07-31
MM0167	True RMS Multimeter	Agilent	U1232A	2015-08-17	2016-08-31
76022	DC Regulated Power Supply	CircuitSpecialists.Com	CSI3005X5	NA	NA
T1023	EMPower USB RF Power Sensor, 10MHz to 6GHz	ETS Lindgren	7002-006	2015-10-01	2016-10-01

Note - All conducted testing performed prior to 2016-03-31.

### Test Equipment Used - Radiated Disturbance Emissions Test Equipment (Morrisville - South Chamber)

Equip. ID	Description	Manufacturer	Model Number	Last Cal.	Next Cal.
AT0073	Hybrid Broadband Antenna, 30-1000MHz	Sunol Sciences Corp.	JB3	2015-06-10	2016-06-30
AT0069	Double-Ridged Waveguide Horn Antenna, 1 to 18 GHz	ETS Lindgren	3117	2016-03-07	2017-03-31
AT0076	Horn Antenna, 18-26.5GHz	ARA	MWH-1826/B	2015-08-27	2016-08-31
S-SAC02	Gain-loss string: 30-1000MHz	Various	Various	2015-06-09	2016-06-30
S-SAC03	Gain-loss string: 1-18GHz	Various	Various	2015-08-22	2016-08-31
S-SAC04	Gain-loss string: 18-40GHz	Various	Various	2016-02-29	2017-02-28
SA0025	Spectrum Analyzer	Agilent	N9030A	2016-03-17	2017-03-31
SA0026 (18-40GHz RSE)	Spectrum Analyzer	Agilent	N9030A	2016-02-24	2017-02-28
SOFTEMI	EMI Software	UL	Version 9.5	NA	NA
HI0050	Temp/Humid/Pressure Meter	Cole-Parmer	99760-00	2015-07-01	2016-07-31

Note - All final radiated testing was performed between 2016-05-15 and 2016-06-15.

## 7. MEASUREMENT METHODS

Duty Cycle: KDB 558074 D01 v03r05 Section 6.0

6 dB BW: KDB 558074 D01 v03r05, Section 8.1.

Output Power: KDB 558074 D01 v03r05, Section 9.2.3.1.

Power Spectral Density: KDB 558074 D01 v03r05, Section 10.2.

Power Spectral Density: KDB 558074 D01 v03r05, Section 10.3 & 10.5.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v03r05, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.1.

Out-of-band emissions in restricted bands: KDB 558074 D01 v03r05, Section 12.2.

General Radiated Emissions – ANSI C63.10 Sections 6.3-6.6

Line Conducted Emissions – ANSI C63.10 Section 6.2

## 8. ANTENNA PORT TEST RESULTS – AUTHORIZED BAND

### 8.1. ON TIME AND DUTY CYCLE

#### LIMITS

None; for reporting purposes only.

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

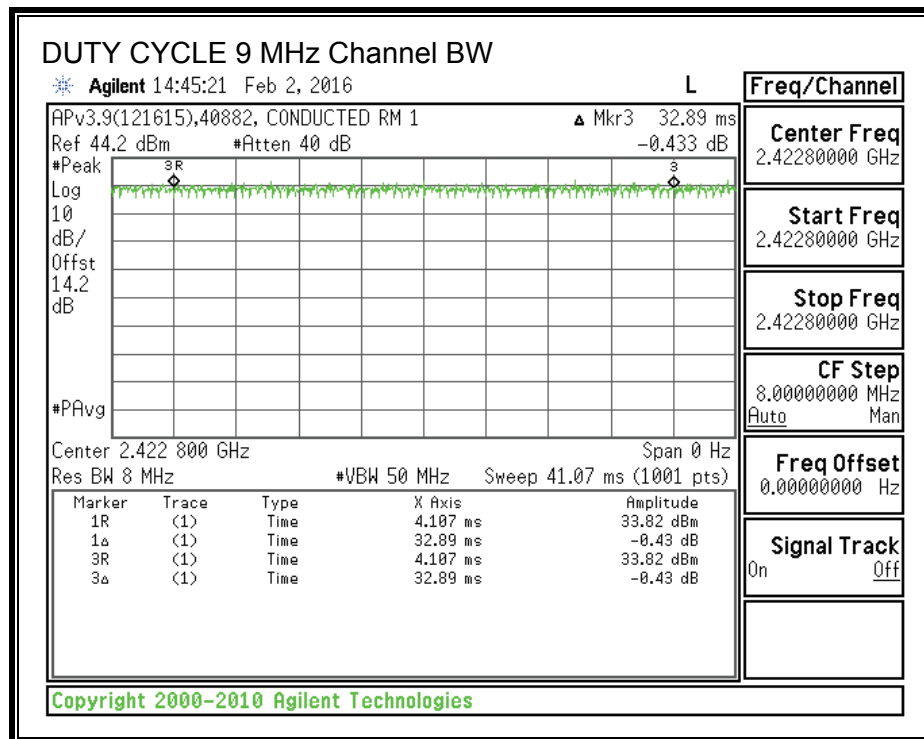
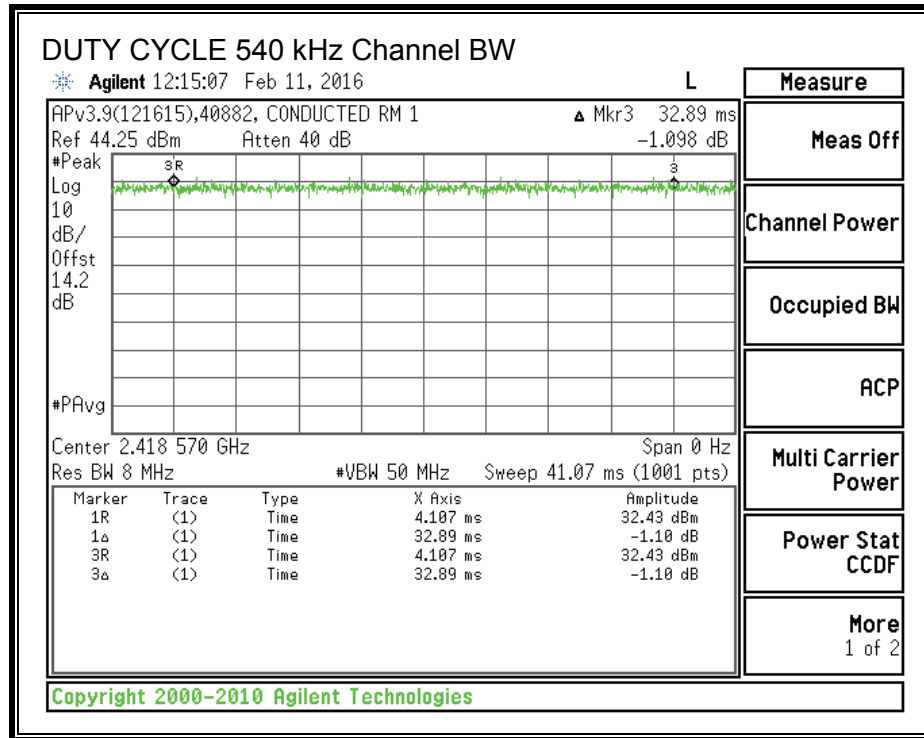
#### ON TIME AND DUTY CYCLE RESULTS

Mode	ON Time B (msec)	Period (msec)	Duty Cycle x (linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/B Minimum VBW (kHz)
<b>2.4GHz Band</b>						
540 kHz	4.107	4.107	1.000	100.00%	0.00	0.010
9MHz	4.107	4.107	1.000	100.00%	0.00	0.010



## DUTY CYCLE PLOTS

### 2.4 GHz BAND



## 8.2. 540 kHz CHANNEL BANDWIDTH IN THE 2.4 GHz BAND

### 8.2.1. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

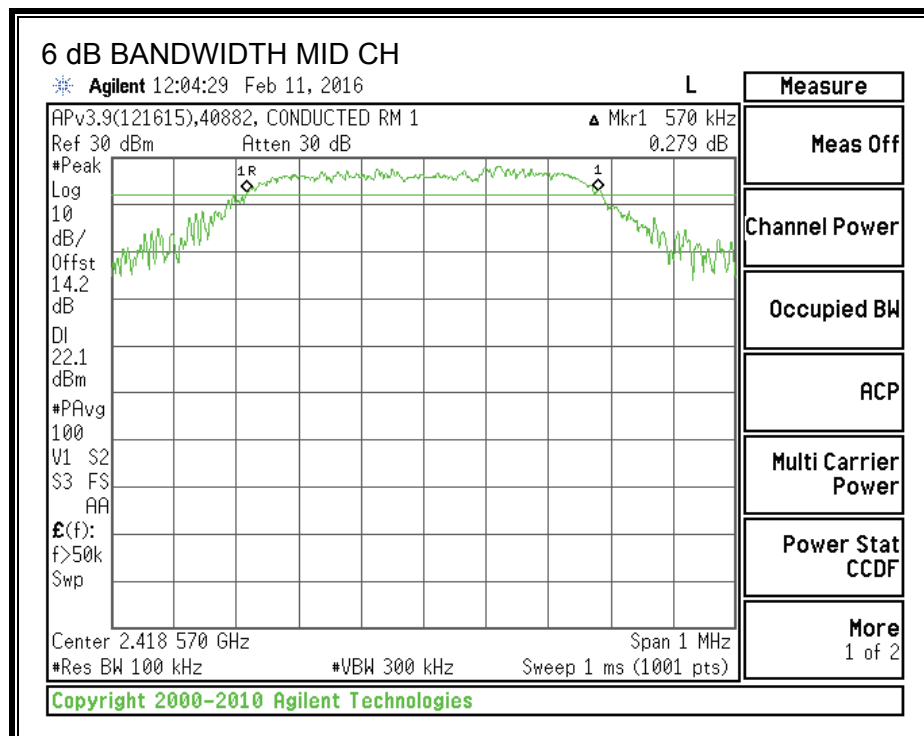
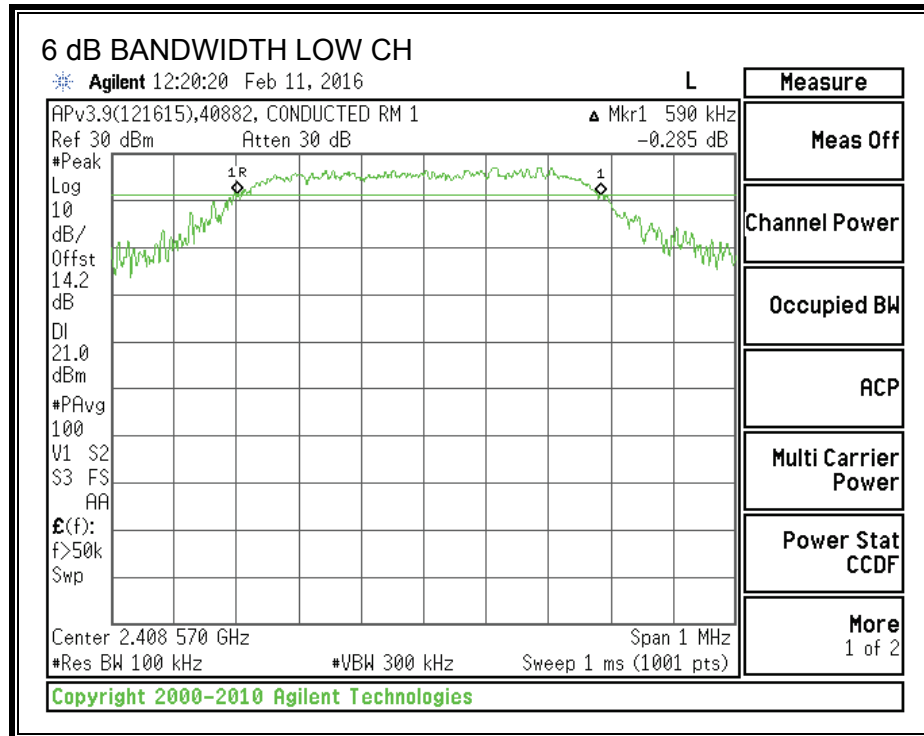
The minimum 6 dB bandwidth shall be at least 500 kHz.

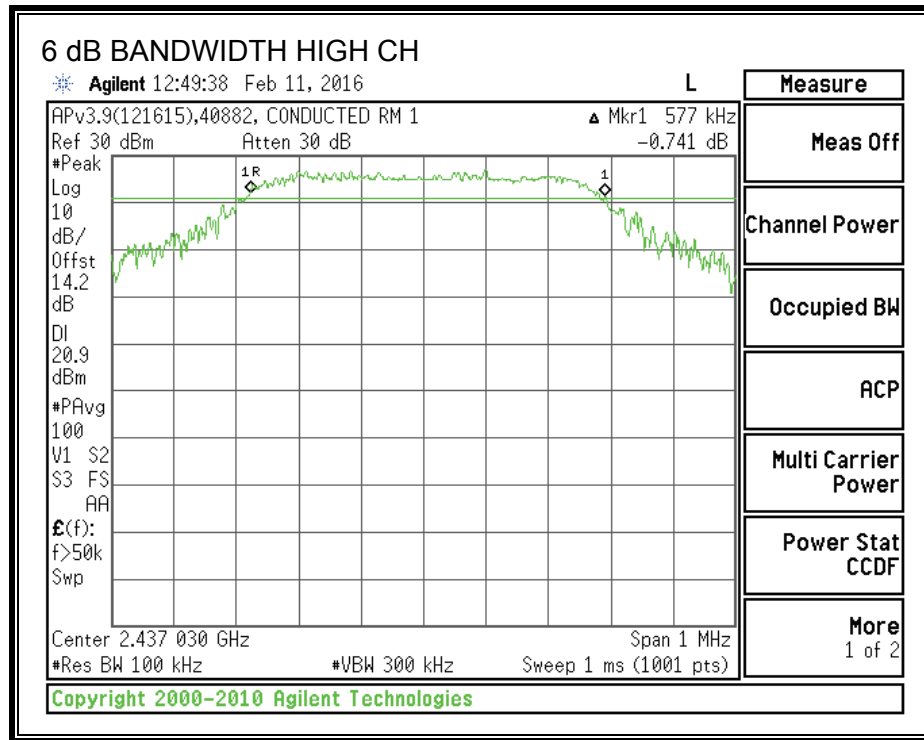
#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2408.57	0.590	0.5
Mid	2418.57	0.570	0.5
High	2437.03	0.577	0.5

## 6 dB BANDWIDTH

NOTE: This test was performed at the maximum allowed power settings determined during Output Power measurements (4.25 dBi antenna setting). It was also performed at the antenna output of the EUT which is worst-case.





## **8.2.2. OUTPUT POWER**

### **LIMITS**

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

## **RESULTS**

NOTE: This test was performed at both antenna power settings (4.25 dBi Patch antenna and 6.08 dBi Yagi antenna). The power for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to highest allowable level to overcome the 3 dB cable loss. The maximum setting was dictated by these power measurements.

### **Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2408.57	4.25	30.00	30	36	30.00
Mid	2418.57	4.25	30.00	30	36	30.00
High	2437.03	4.25	30.00	30	36	30.00

<b>Duty Cycle CF (dB)</b>	0.00	<b>Included in Calculations of Corr'd Power</b>
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### **Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2408.57	27.90	27.90	30.00	-2.10
Mid	2418.57	29.40	29.40	30.00	-0.60
High	2437.03	27.20	27.20	30.00	-2.80

# Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2408.57	6.08	29.92	30	36	29.92
Mid	2418.57	6.08	29.92	30	36	29.92
High	2437.03	6.08	29.92	30	36	29.92

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power
--------------------	------	--

# Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2408.57	24.70	24.70	29.92	-5.22
Mid	2418.57	24.70	24.70	29.92	-5.22
High	2437.03	26.50	26.50	29.92	-3.42

### 8.2.3. POWER SPECTRAL DENSITY

#### LIMITS

FCC §15.247 (e)

#### RESULTS

NOTE: This test was performed at the maximum allowed power settings (4.25 dBi Patch antenna). The power spectral density for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to maximum allowed by the power measurements to overcome the 3 dB cable loss.

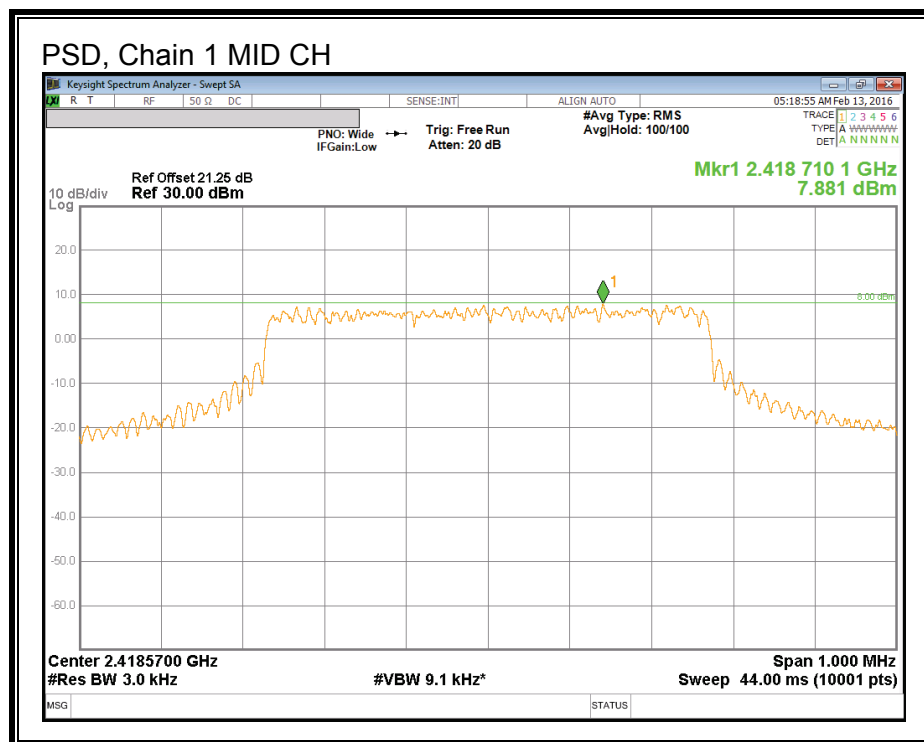
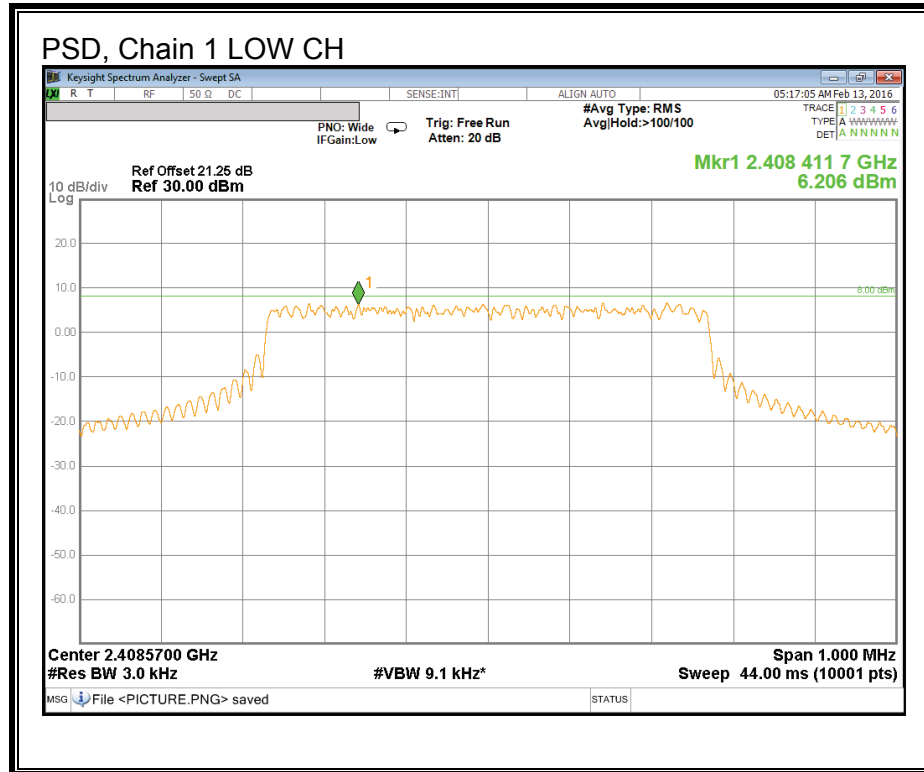
<b>Duty Cycle CF (dB)</b>	0.00	<b>Included in Calculations of Corr'd PSD</b>
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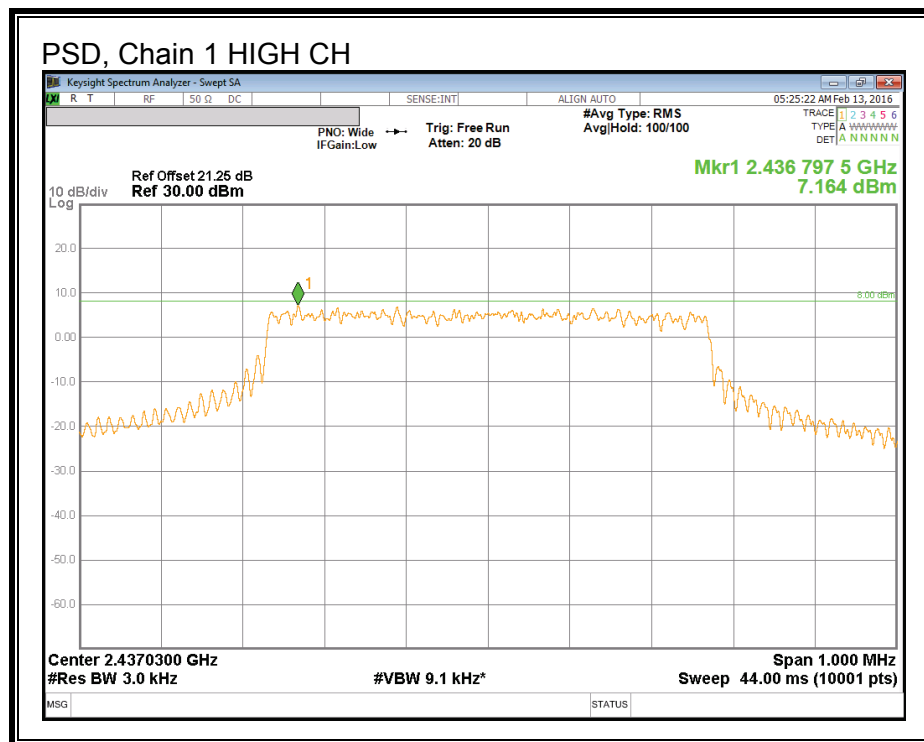
#### **PSD Results**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Chain 0 Meas (dBm)</b>	<b>Total Corr'd PSD (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
Low	2408.57	6.21	6.21	8.0	-1.8
Mid	2418.57	7.88	7.88	8.0	-0.1
High	2437.03	7.16	7.16	8.0	-0.8



**PSD, Chain 1**





## **8.2.4. OUT-OF-BAND EMISSIONS**

### **LIMITS**

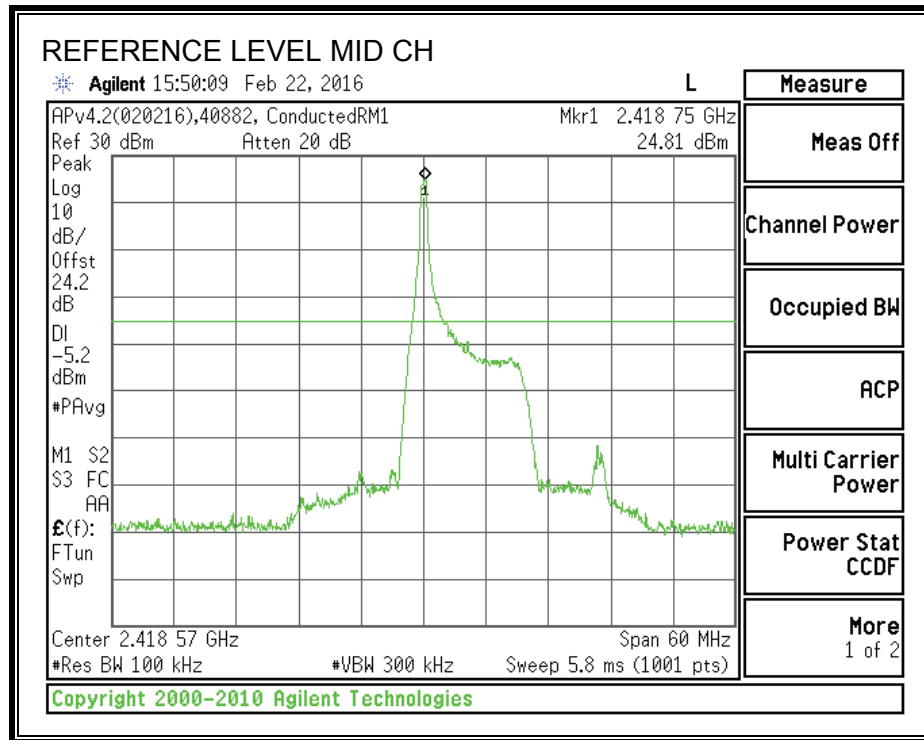
FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

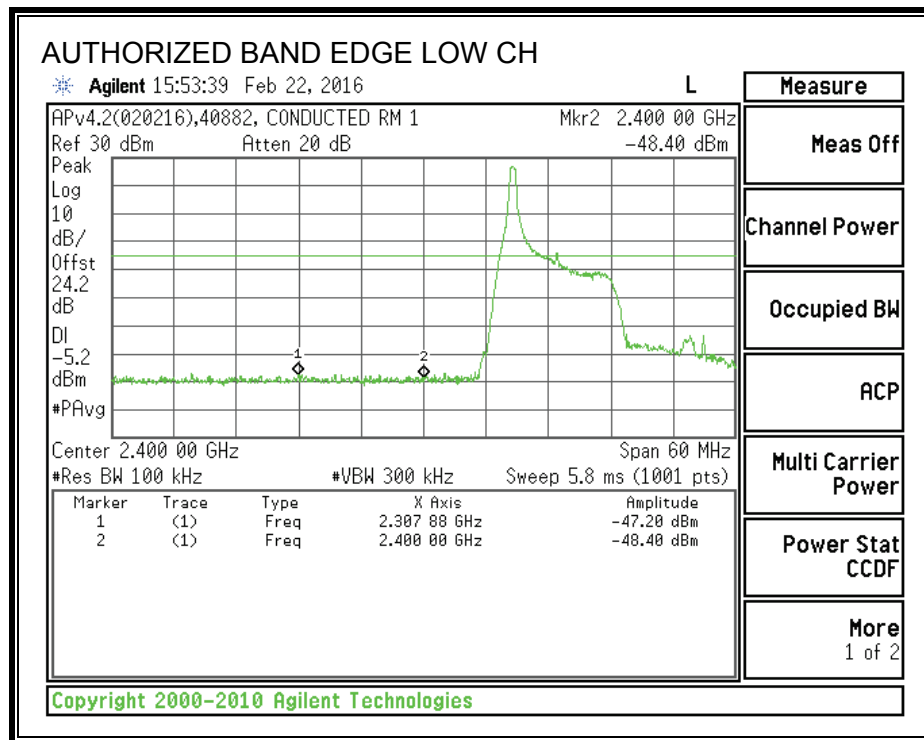
## RESULTS

NOTE: This test was performed at the maximum allowed power settings determined during Output Power measurements (4.25 dBi Patch antenna setting). It was also performed at the antenna output of the EUT which is worst-case.

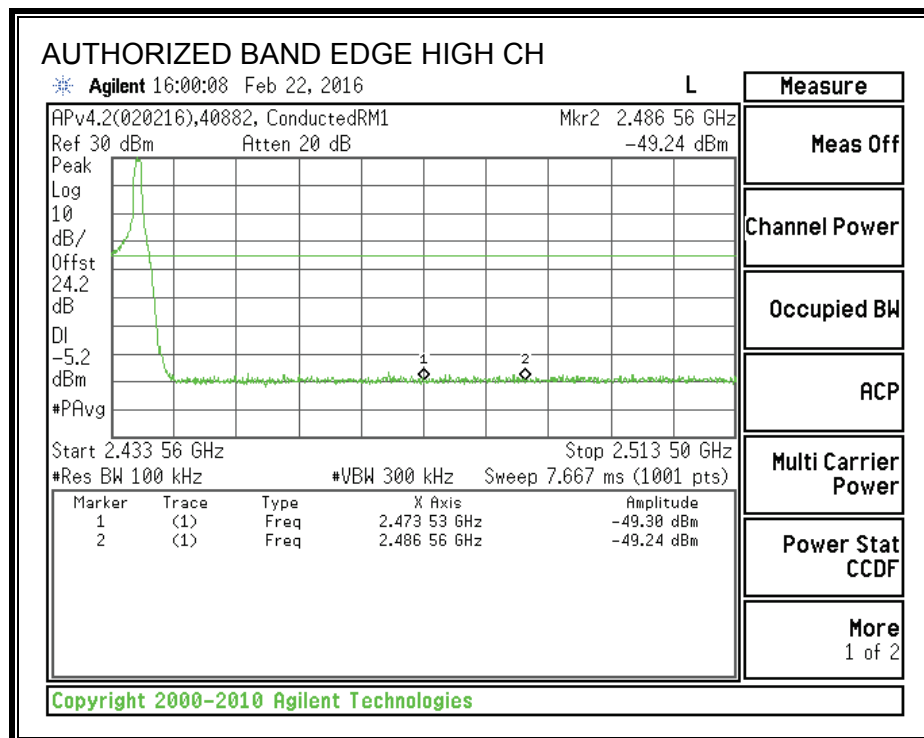
## IN-BAND REFERENCE LEVEL



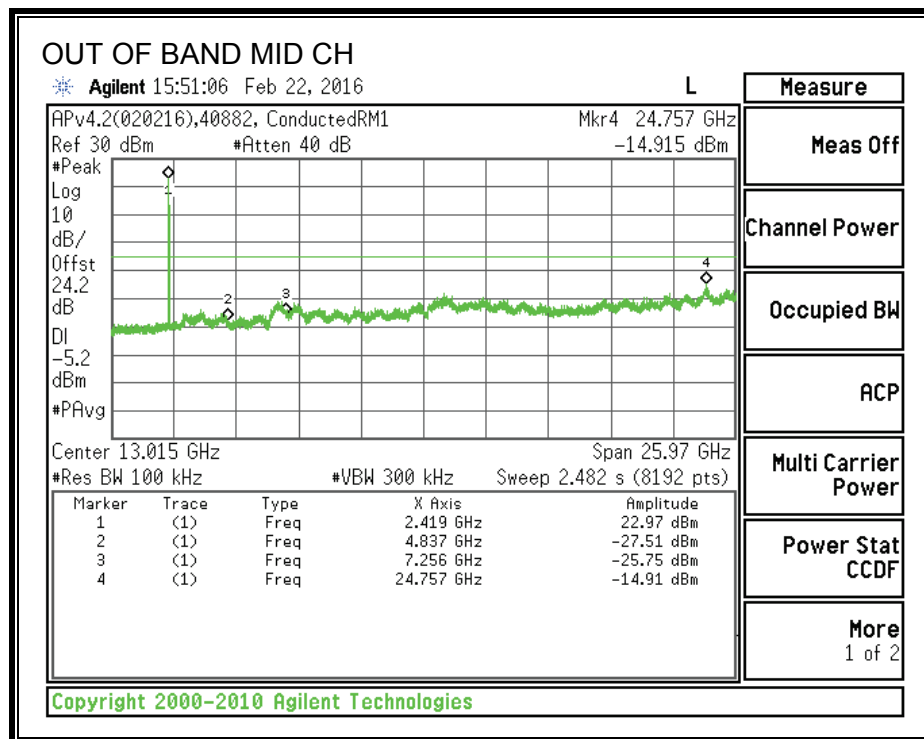
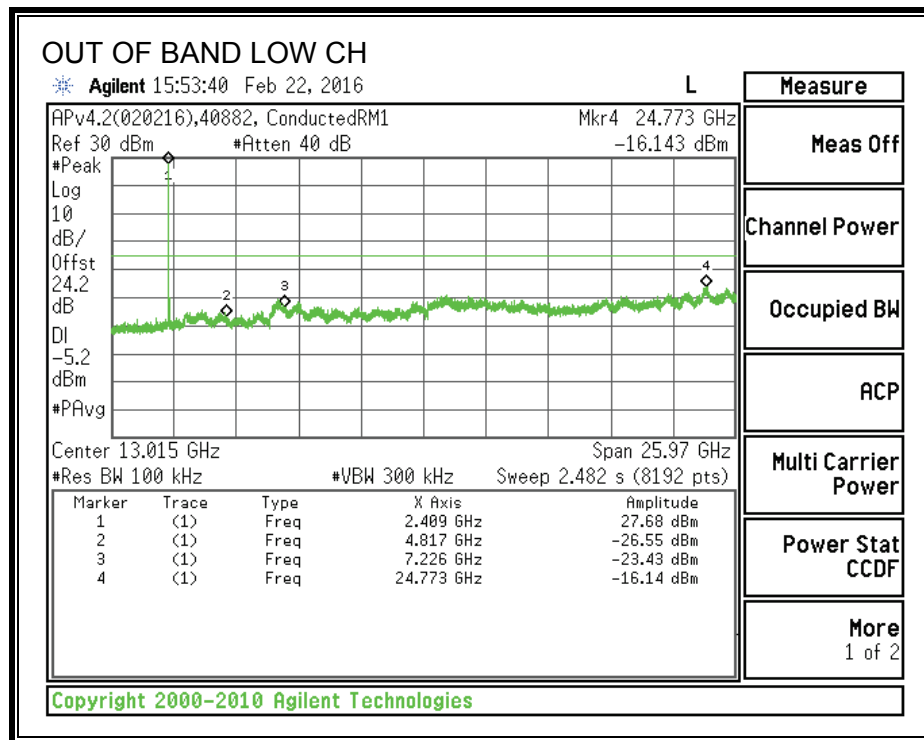
# LOW CHANNEL BANDEDGE

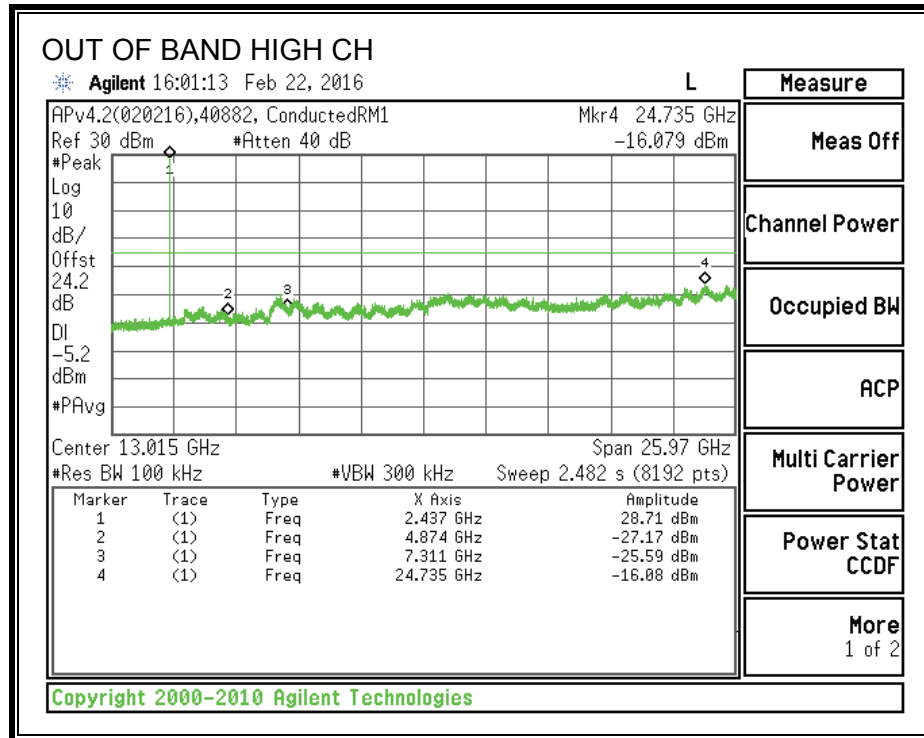


# HIGH CHANNEL BANDEDGE



**OUT-OF-BAND EMISSIONS**





### **8.3. 4.5 MHz CHANNEL BANDWIDTH IN THE 2.4 GHz BAND**

#### **8.3.1. OUTPUT POWER**

##### **LIMITS**

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

##### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.



## RESULTS

NOTE: This test was performed at both antenna power settings (4.25 dBi Patch antenna and 6.08 dBi Yagi antenna). The power for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to highest allowable level to overcome the 3 dB cable loss. The maximum setting was dictated by these power measurements.

### Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2410.30	4.25	30.00	30	36	30.00
Mid	2422.80	4.25	30.00	30	36	30.00
High	2435.30	4.25	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power
--------------------	------	--

### Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2410.3	28.50	28.50	30.00	-1.50
Mid	2422.8	28.80	28.80	30.00	-1.20
High	2435.3	30.00	30.00	30.00	0.00

### Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2410.30	6.08	29.92	30	36	29.92
Mid	2422.80	6.08	29.92	30	36	29.92
High	2435.30	6.08	29.92	30	36	29.92

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power
--------------------	------	--

### Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2410.3	26.50	26.50	29.92	-3.42
Mid	2422.8	26.90	26.90	29.92	-3.02
High	2435.3	26.30	26.30	29.92	-3.62

### 8.3.2. POWER SPECTRAL DENSITY

#### LIMITS

FCC §15.247 (e)

#### RESULTS

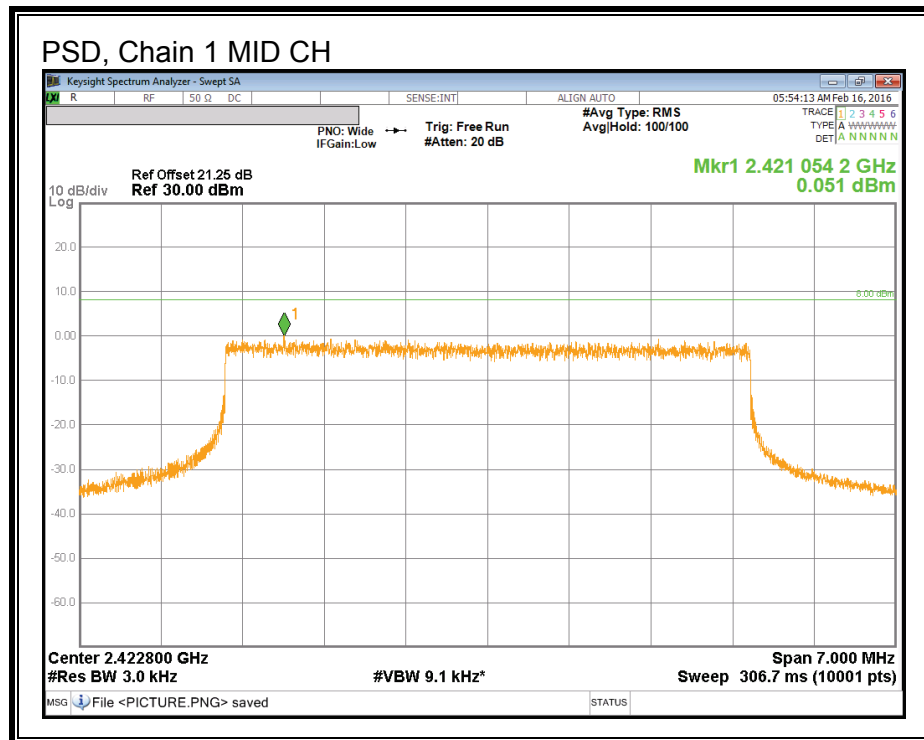
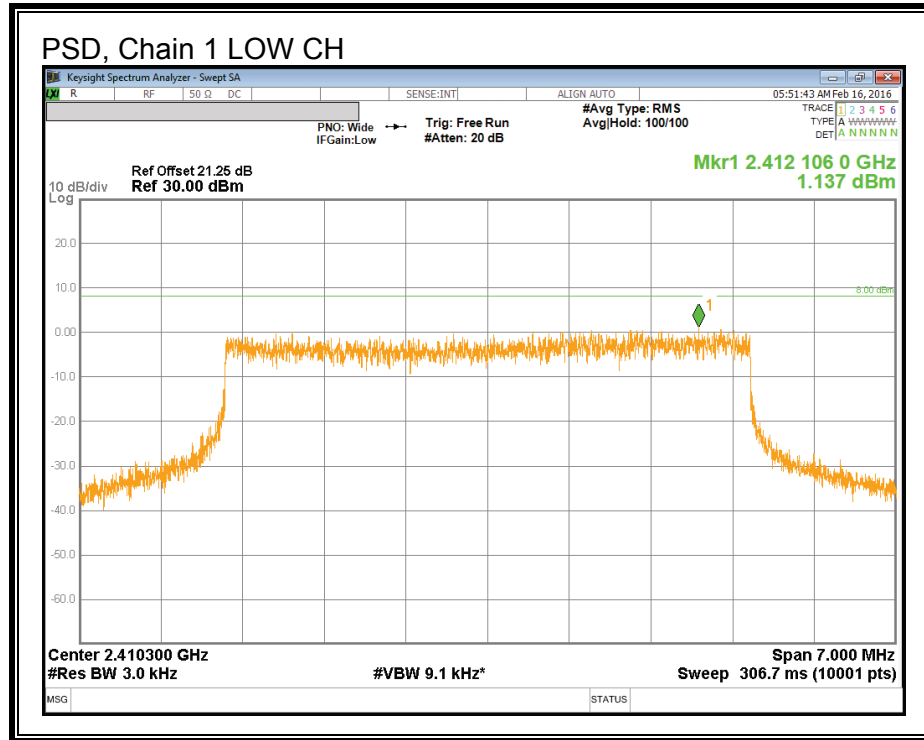
NOTE: This test was performed at the maximum allowed power settings (4.25 dBi Patch antenna). The power spectral density for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to maximum allowed by the power measurements to overcome the 3 dB cable loss.

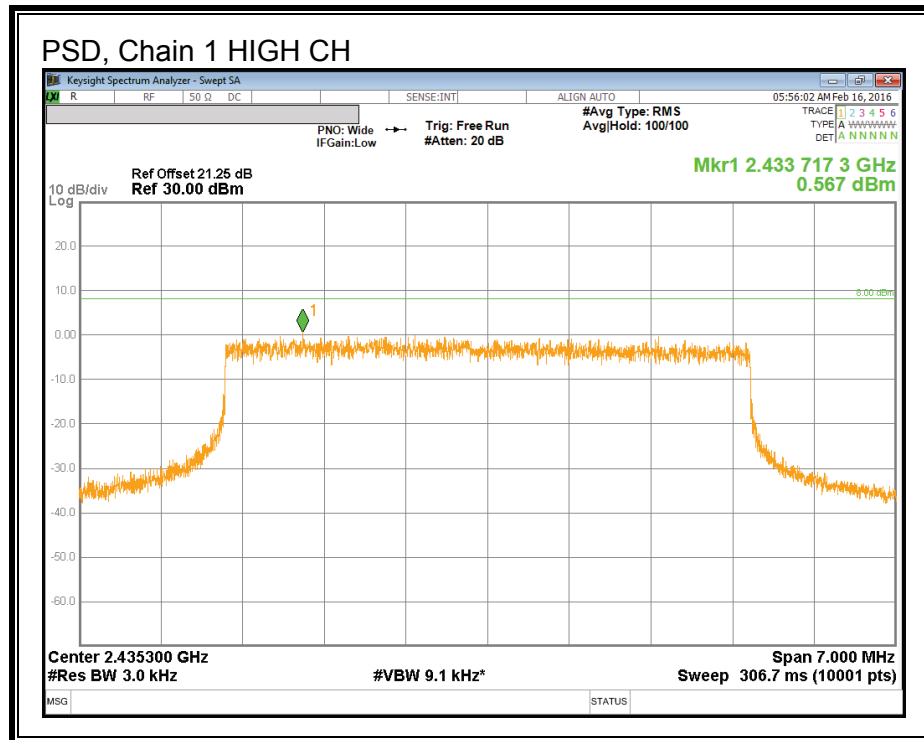
<b>Duty Cycle CF (dB)</b>	0.00	<b>Included in Calculations of Corr'd PSD</b>
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#### **PSD Results**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Chain 0 Meas (dBm)</b>	<b>Total Corr'd PSD (dBm)</b>	<b>Limit (dBm)</b>	<b>Margin (dB)</b>
Low	2410.3	1.14	1.14	8.0	-6.9
Mid	2422.8	0.05	0.05	8.0	-7.9
High	2435.3	0.57	0.57	8.0	-7.4

**PSD, Chain 1**





## 8.4. 9 MHz MODE IN THE 2.4 GHz BAND

### 8.4.1. 6 dB BANDWIDTH

#### LIMITS

FCC §15.247 (a) (2)

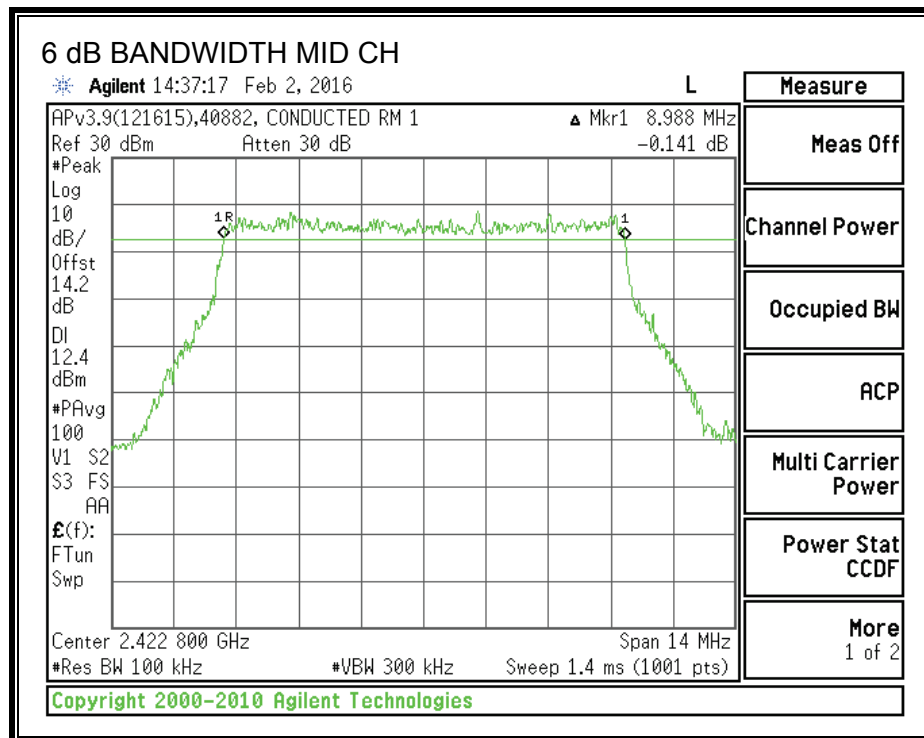
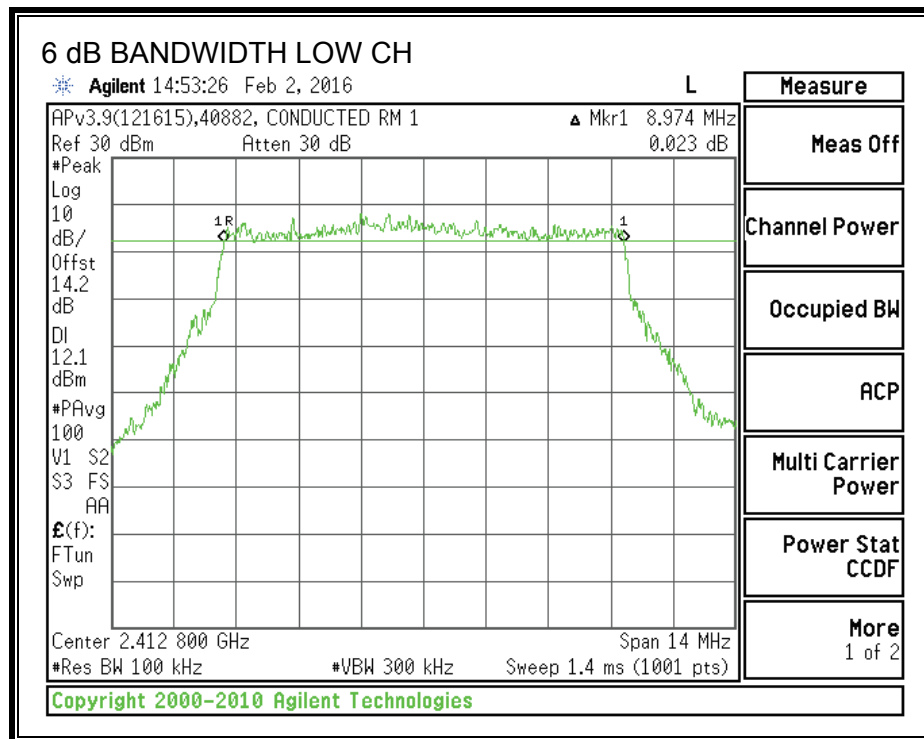
The minimum 6 dB bandwidth shall be at least 500 kHz.

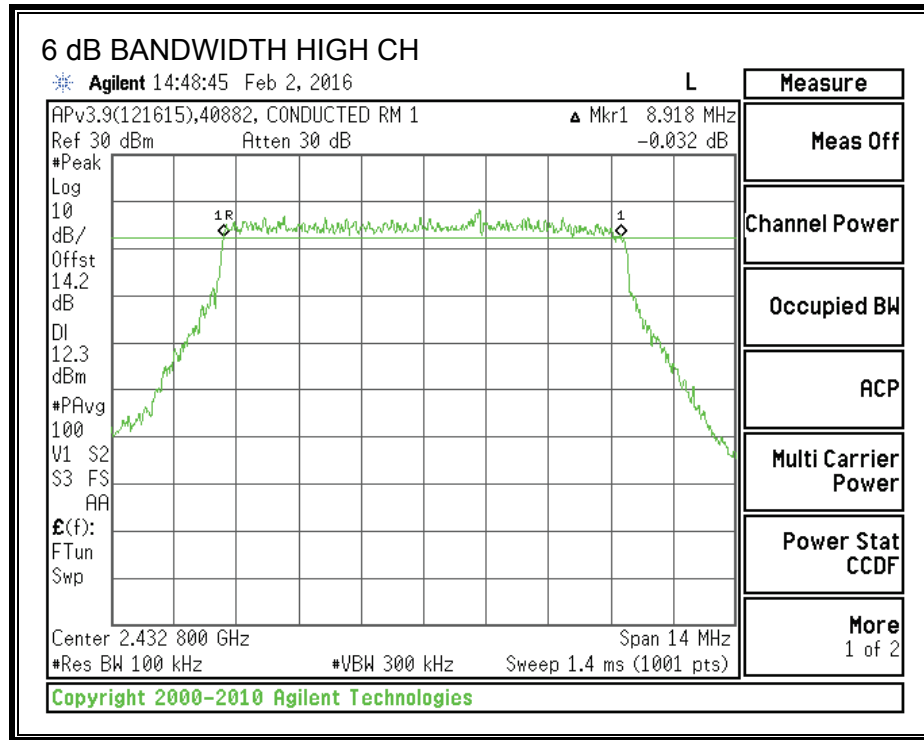
#### RESULTS

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)
Low	2412.8	8.974	0.5
Mid	2422.8	8.988	0.5
High	2432.8	8.918	0.5

## 6 dB BANDWIDTH

NOTE: This test was performed at the antenna output of the EUT which is worst-case.







## **8.4.2. OUTPUT POWER**

### **LIMITS**

FCC §15.247 (b) (3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt, based on the use of antennas with directional gains that do not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

### **DIRECTIONAL ANTENNA GAIN**

There is only one transmitter output therefore the directional gain is equal to the antenna gain.

## RESULTS

NOTE: This test was performed at both antenna power settings (4.25 dBi Patch antenna and 6.08 dBi Yagi antenna). The power for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to highest allowable level to overcome the 3 dB cable loss. The maximum setting was dictated by these power measurements.

### Limits

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412.8	4.25	30.00	30	36	30.00
Mid	2422.8	4.25	30.00	30	36	30.00
High	2432.8	4.25	30.00	30	36	30.00

Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd Power
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### Results

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412.8	28.10	28.10	30.00	-1.90
Mid	2422.8	28.80	28.80	30.00	-1.20
High	2432.8	28.50	28.50	30.00	-1.50

**Limits**

Channel	Frequency (MHz)	Directional Gain (dBi)	FCC Power Limit (dBm)	IC Power Limit (dBm)	IC EIRP Limit (dBm)	Max Power (dBm)
Low	2412.8	6.08	29.92	30	36	29.92
Mid	2422.8	6.08	29.92	30	36	29.92
High	2432.8	6.08	29.92	30	36	29.92

<b>Duty Cycle CF (dB)</b>	0.00	<b>Included in Calculations of Corr'd Power</b>
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**Results**

Channel	Frequency (MHz)	Chain 0 Meas Power (dBm)	Total Corr'd Power (dBm)	Power Limit (dBm)	Margin (dB)
Low	2412.8	25.20	25.20	29.92	-4.72
Mid	2422.8	25.80	25.80	29.92	-4.12
High	2432.8	26.30	26.30	29.92	-3.62

### 8.4.3. POWER SPECTRAL DENSITY

#### LIMITS

FCC §15.247 (e)

#### RESULTS

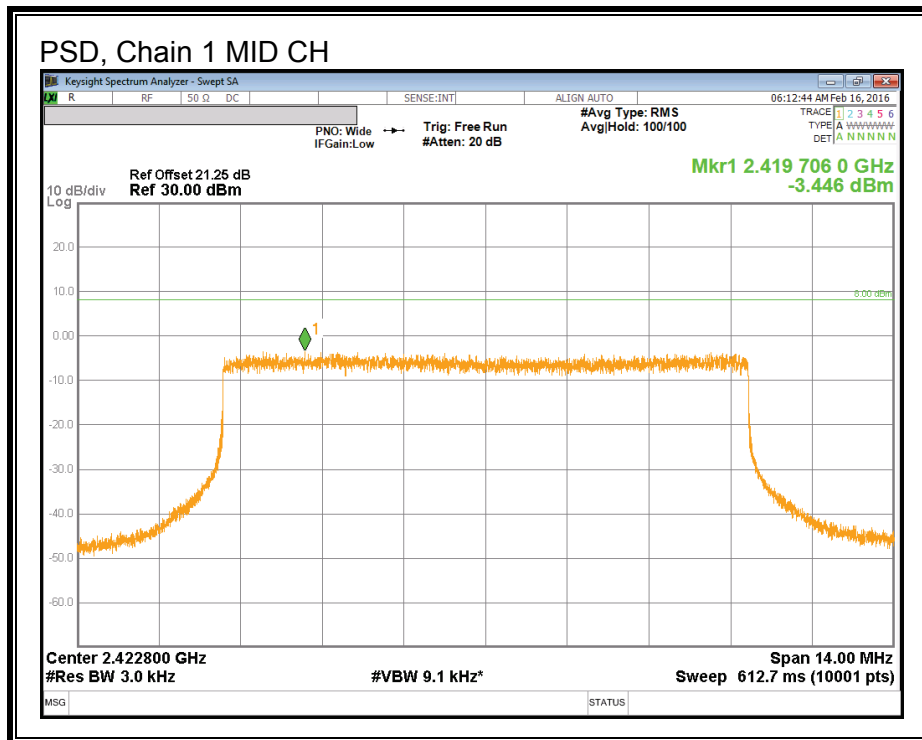
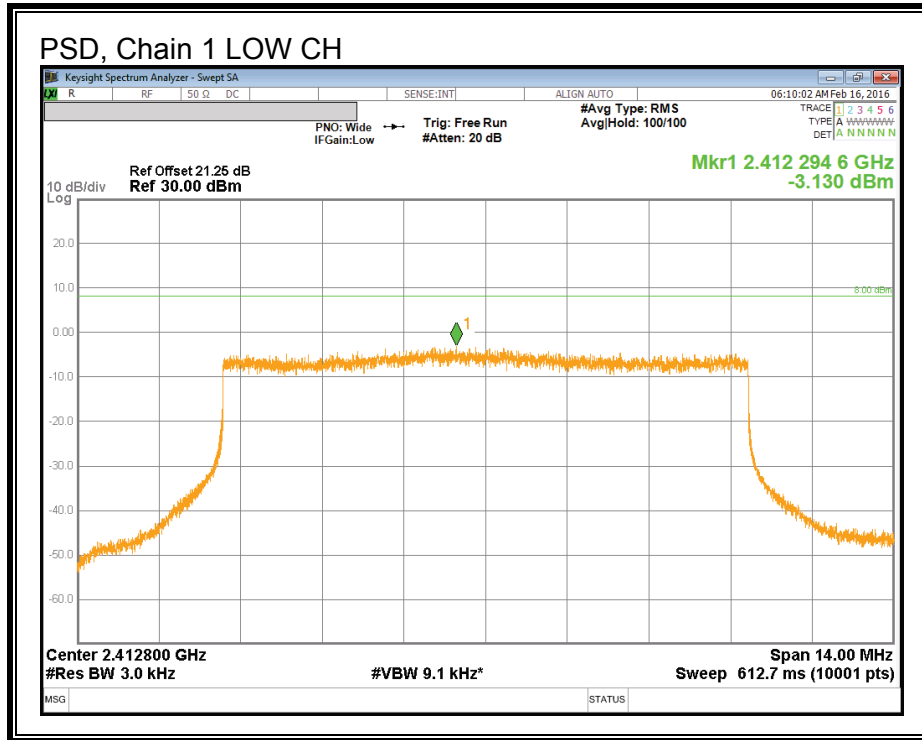
NOTE: This test was performed at the maximum allowed power settings (4.25 dBi Patch antenna). The power spectral density for this test was measured at the end of the antenna cable to incorporate worst-case cable loss (3 dB). The EUT's power setting was set to maximum allowed by the power measurements to overcome the 3 dB cable loss.

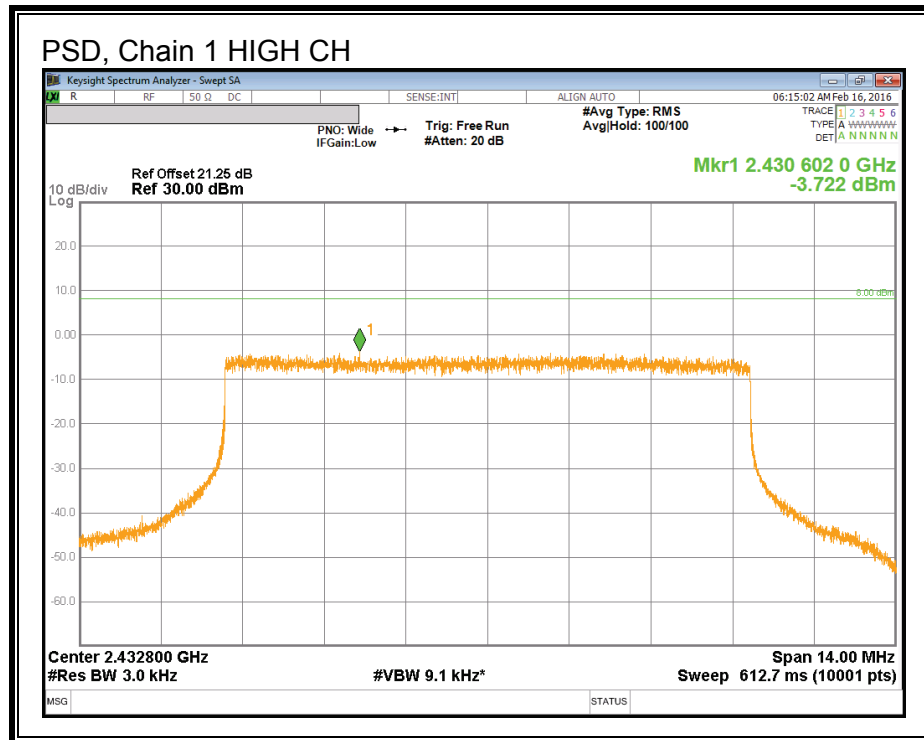
Duty Cycle CF (dB)	0.00	Included in Calculations of Corr'd PSD
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#### PSD Results

Channel	Frequency (MHz)	Chain 0 Meas (dBm)	Total Corr'd PSD (dBm)	Limit (dBm)	Margin (dB)
Low	2412.8	-3.13	-3.13	8.0	-11.1
Mid	2422.8	-3.45	-3.45	8.0	-11.4
High	2432.8	-3.72	-3.72	8.0	-11.7

**PSD, Chain 1**





#### **8.4.4. OUT-OF-BAND EMISSIONS**

##### **LIMITS**

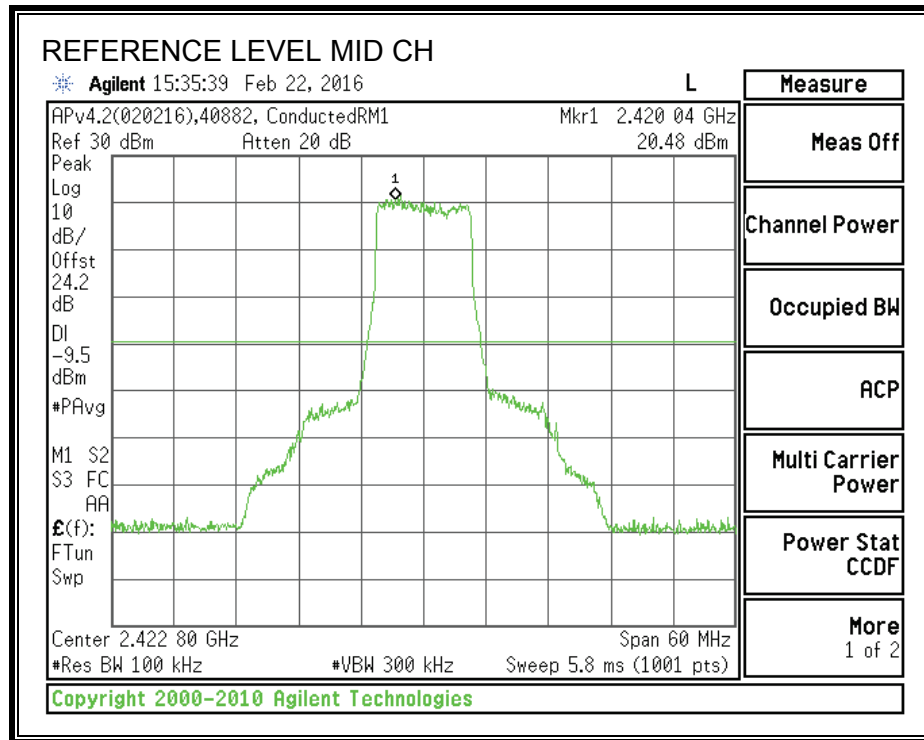
FCC §15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required.

## RESULTS

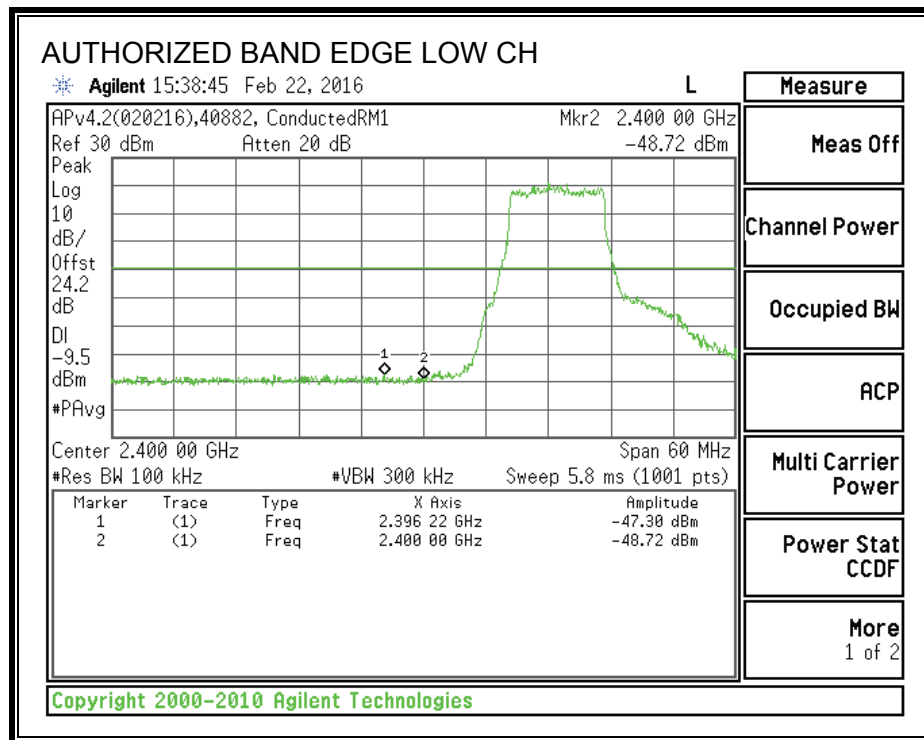
NOTE: This test was performed at the maximum allowed power settings determined during Output Power measurements (4.25 dBi Patch antenna setting). It was also performed at the antenna output of the EUT which is worst-case.

### IN-BAND REFERENCE LEVEL

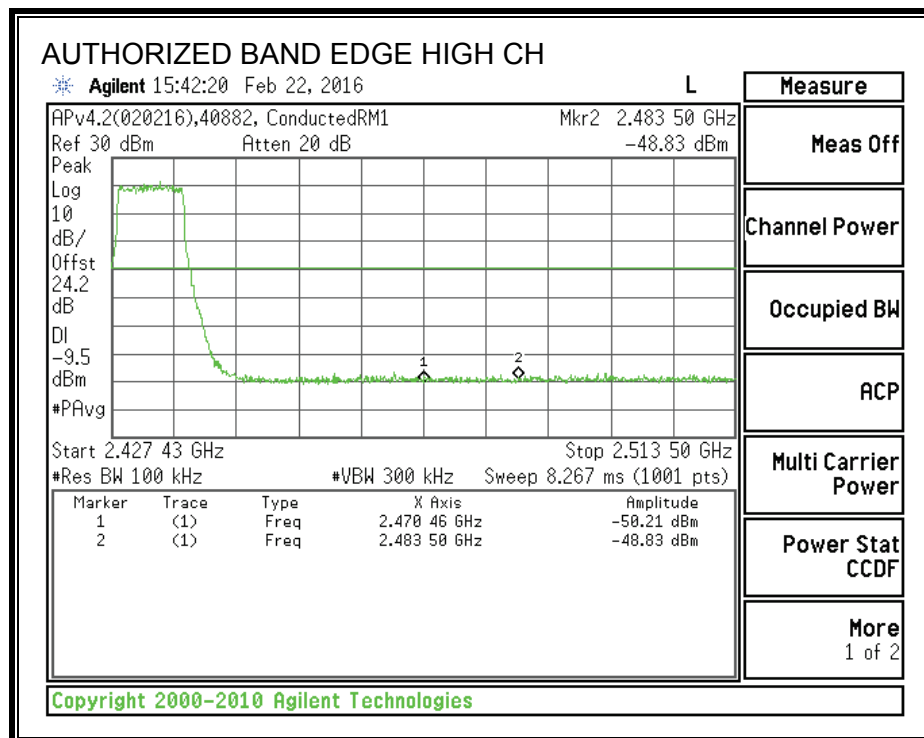




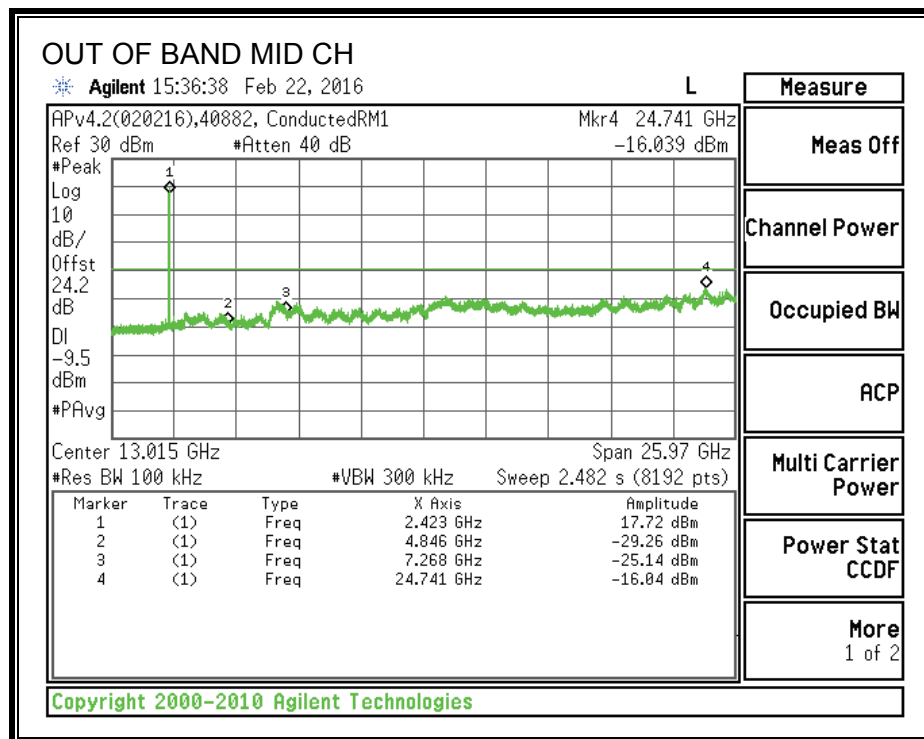
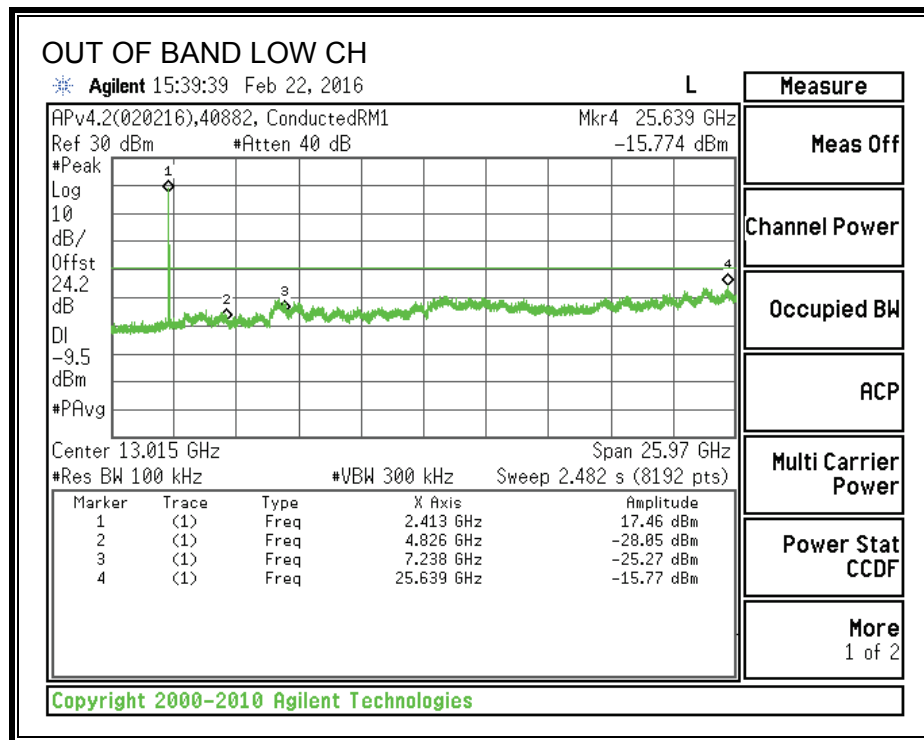
**LOW CHANNEL BANDEDGE**

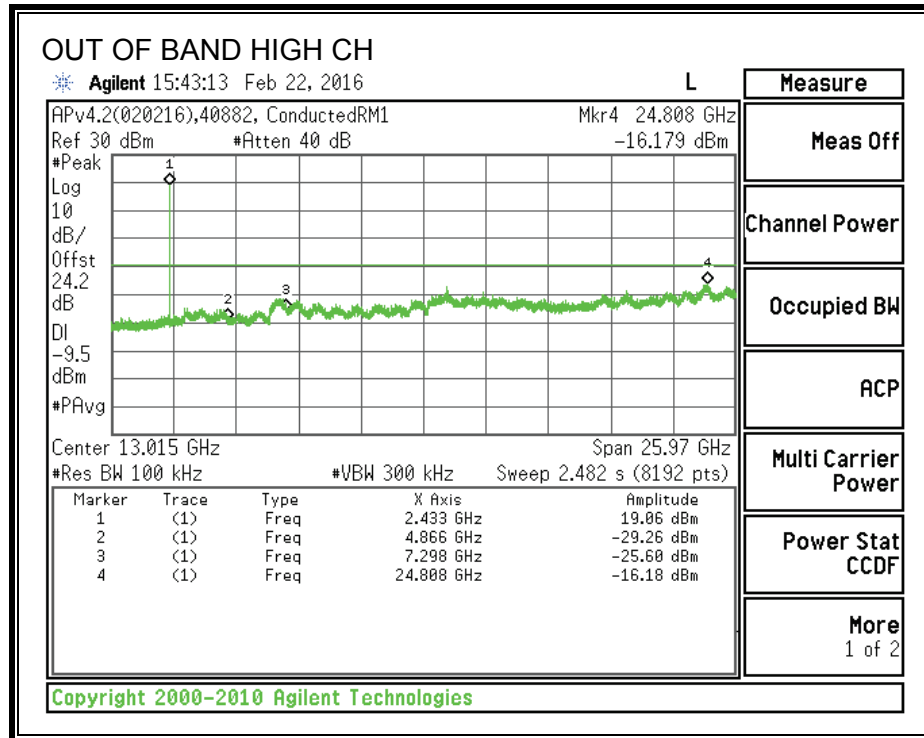


**HIGH CHANNEL BANDEDGE**



**OUT-OF-BAND EMISSIONS**





## 9. RADIATED TEST RESULTS

### 9.1. LIMITS AND PROCEDURE

#### LIMITS

FCC §15.205, 15.209, 15.247 (d)

Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m
30 - 88	100	40
88 - 216	150	43.5
216 - 960	200	46
Above 960	500	54

#### TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane for below 1GHz measurements and 1.5 m above the ground plane for above 1GHz measurements. The antenna to EUT distance is 3 meters.

For measurements below 1 GHz the resolution bandwidth is set to 120 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements for the 30-1000 MHz range, 9 kHz for peak detection measurements or 9 kHz for quasi-peak detection measurements for the 0.15-30 MHz range and 200 Hz for peak detection measurements or 200 Hz for quasi-peak detection measurements for the 9 to 150 kHz range. Peak detection is used unless otherwise noted as quasi-peak.

For peak measurements above 1 GHz, the resolution bandwidth is set to 1 MHz and the video bandwidth is set to 3 MHz. For average measurements above 1GHz, the resolution bandwidth and video bandwidth are set as described in ANSI C63.10:2013 for the applicable measurement. For this evaluation, RMS Power Averaging was used and the resolution/video bandwidth settings were 1MHz/3MHz.

The spectrum from 30MHz to 26 GHz is investigated with the transmitter set to the lowest, middle, and highest channels in each applicable band.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

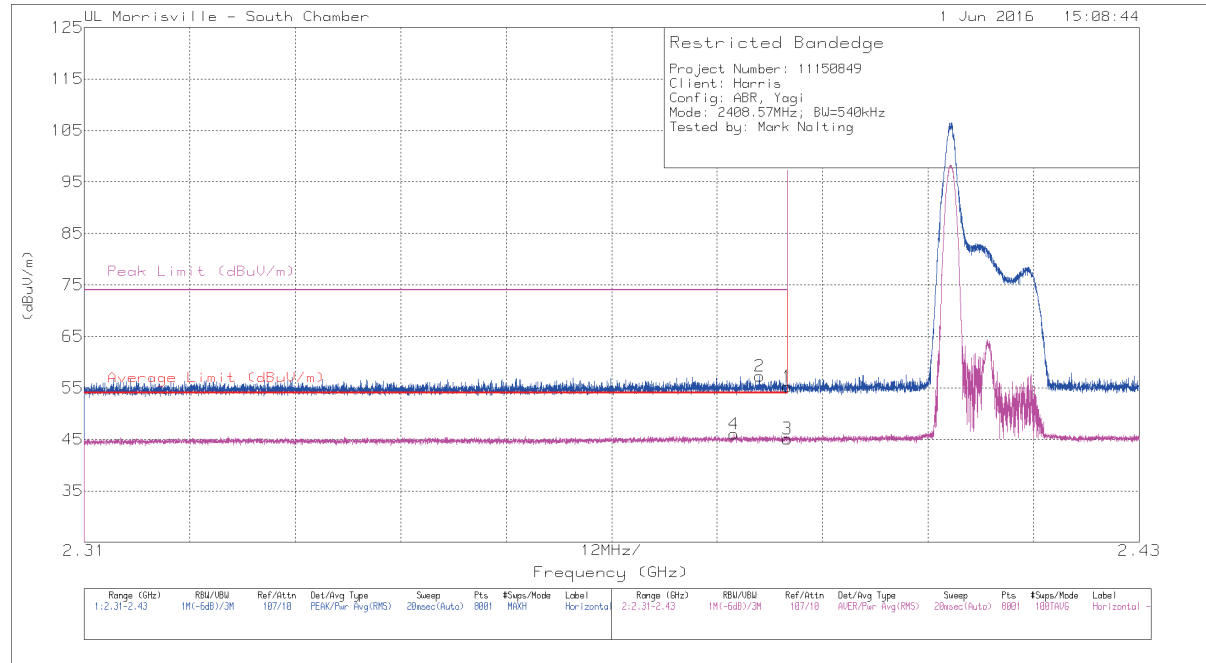
## 9.2. TRANSMITTER ABOVE 1 GHz

## 9.3. TX ABOVE 1 GHz, 540 KHZ MODE IN THE 2.4 GHz BAND

### 9.3.1. YAGI Antenna

#### ADJACENT RESTRICTED BAND LOW

#### HORIZONTAL



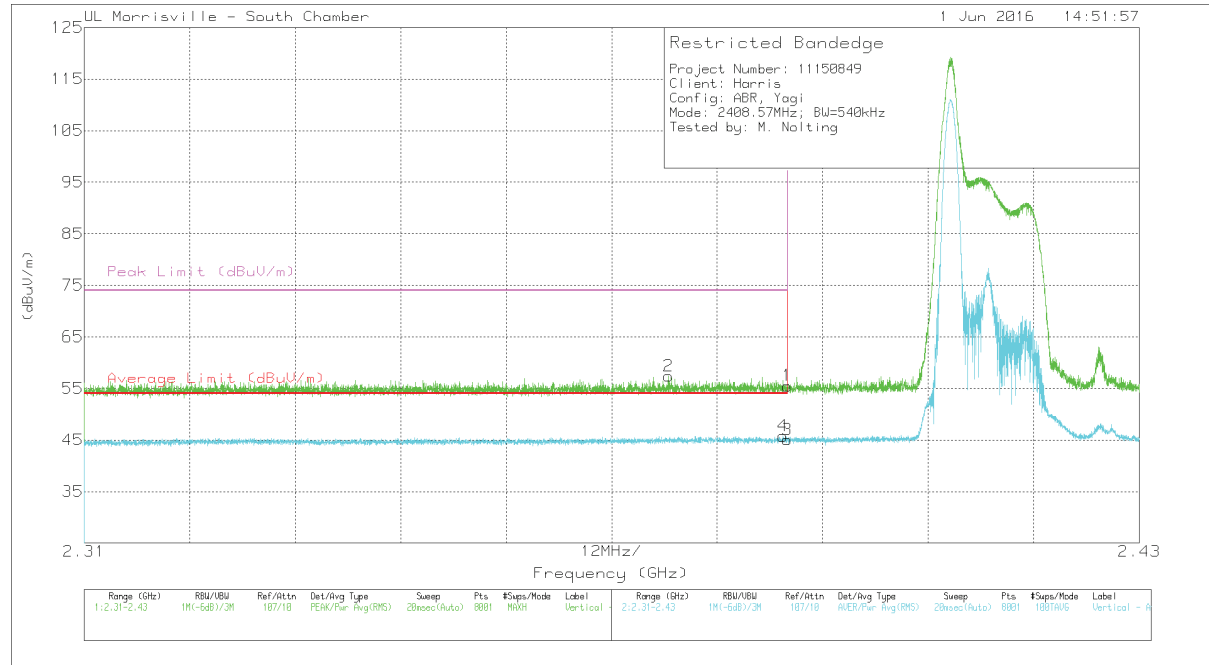
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fltr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 2.384	25.96	RMS	32.1	-24.1	2.1	10	46.06	54	-7.94	-	-	74	150	H
2	* 2.387	37.07	Pk	32.2	-24.1	2.1	10	57.27	-	-	74	-16.73	74	150	H
1	* 2.39	35.13	Pk	32.2	-24.2	2.1	10	55.23	-	-	74	-18.77	74	150	H
3	* 2.39	25	RMS	32.2	-24.2	2.1	10	45.1	54	-8.9	-	-	74	150	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



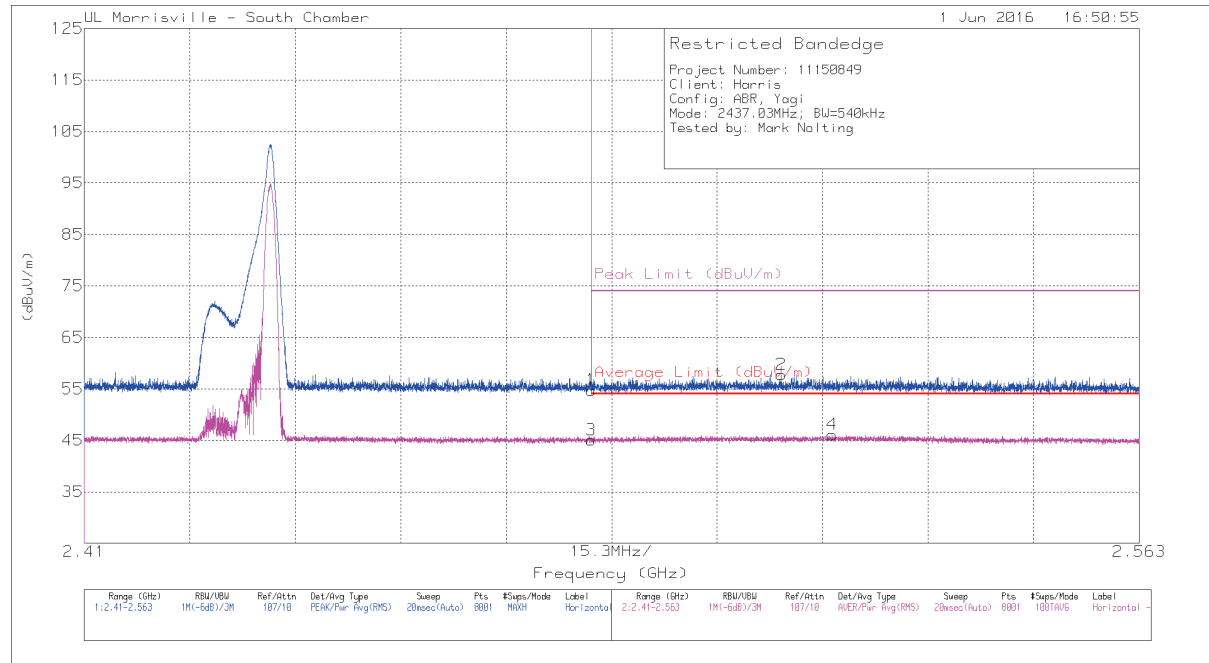
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.376	37.28	Pk	32.1	-24.1	2.1	10	57.38	-	-	74	-16.62	35	134	V
1	* 2.39	35.42	Pk	32.2	-24.2	2.1	10	55.52	-	-	74	-18.48	35	134	V
3	* 2.39	24.94	RMS	32.2	-24.2	2.1	10	45.04	54	-8.96	-	-	35	134	V
4	* 2.39	25.56	RMS	32.2	-24.1	2.1	10	45.76	54	-8.24	-	-	35	134	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **ADJACENT RESTRICTED BAND HIGH** **HORIZONTAL**



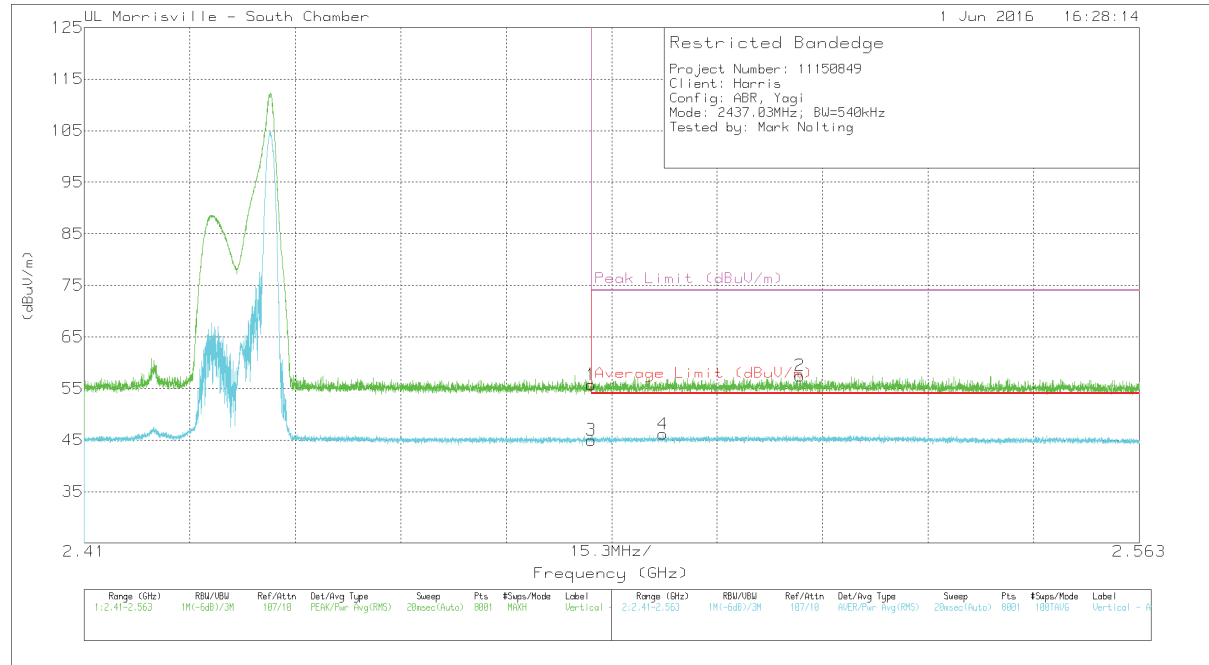
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	34.99	Pk	32.4	-24.7	2.1	10	54.79	-	-	74	-19.21	358	124	H
3	* 2.484	25.27	RMS	32.4	-24.7	2.1	10	45.07	54	-8.93	-	-	358	124	H
2	2.511	37.96	Pk	32.5	-24.9	2.2	10	57.76	-	-	74	-16.24	358	124	H
4	2.518	26.31	RMS	32.5	-24.9	2.2	10	46.11	54	-7.89	-	-	358	124	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.92	Pk	32.4	-24.7	2.1	10	55.72	-	-	74	-18.28	33	150	V
3	* 2.484	25.2	RMS	32.4	-24.7	2.1	10	45	54	-9	-	-	33	150	V
4	* 2.494	26.44	RMS	32.4	-24.8	2.1	10	46.14	54	-7.86	-	-	33	150	V
2	2.514	37.68	Pk	32.5	-24.9	2.2	10	57.48	-	-	74	-16.52	33	150	V

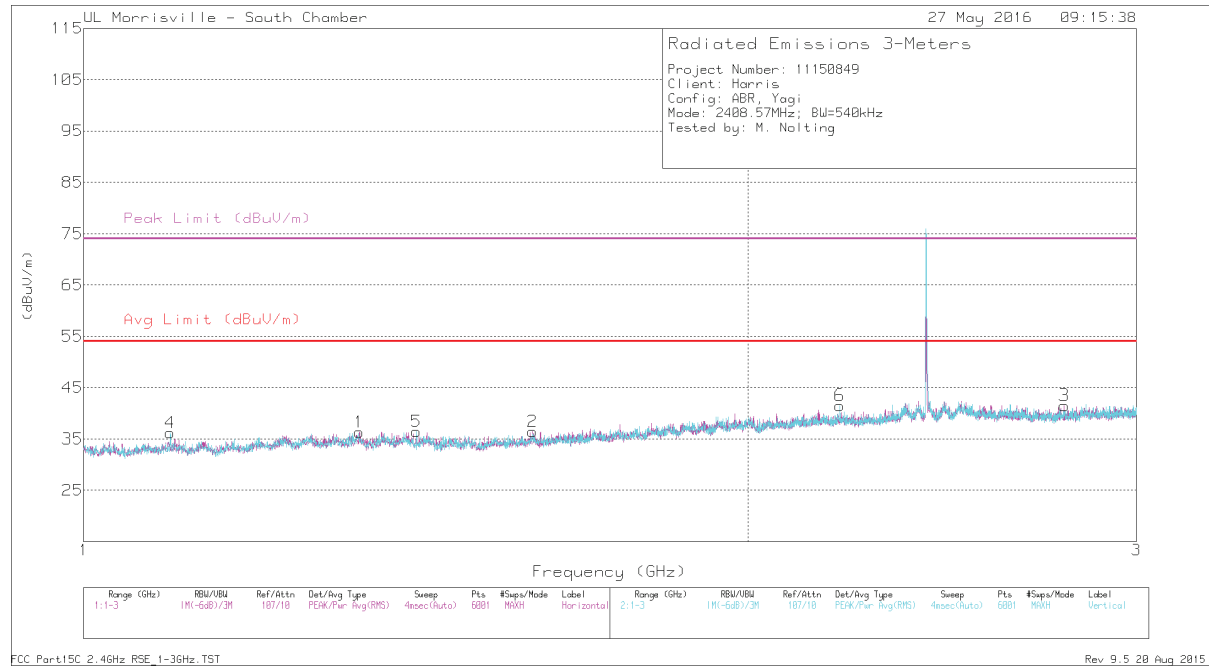
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection



# **HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 1-3 MHZ**

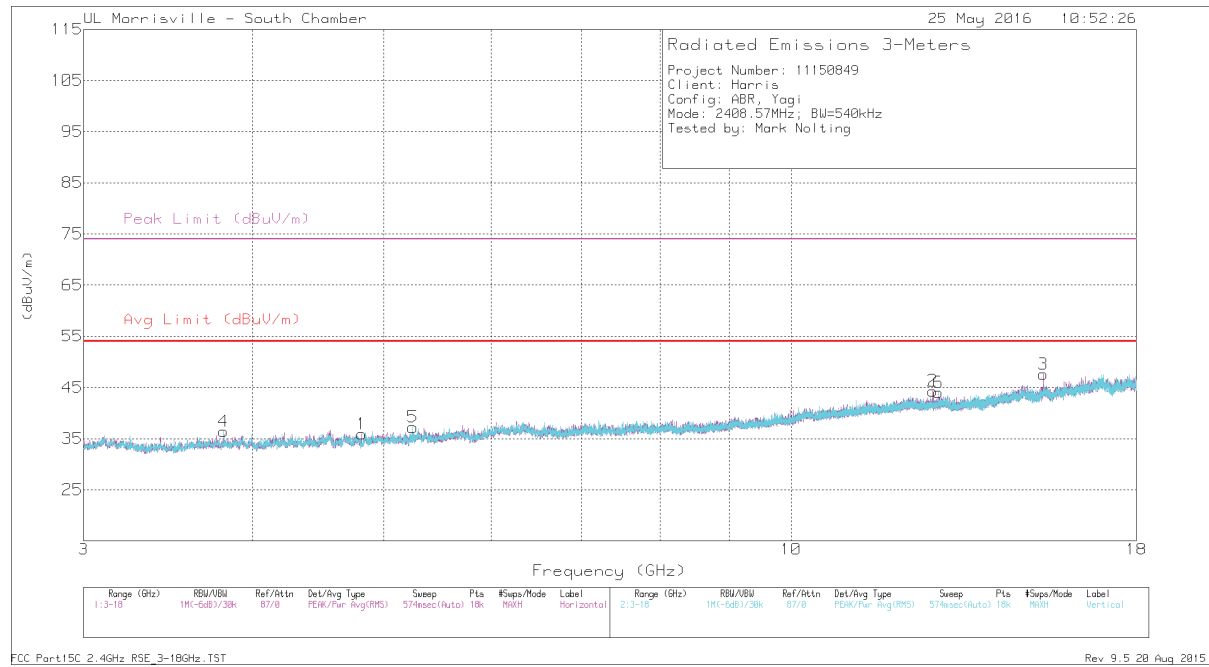


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.333	42.64	Pk	28.8	-35.6	.5	36.34	54	-17.66	74	-37.66	0-360	299	H
2	* 1.598	42.83	Pk	28.3	-35.3	.6	36.43	54	-17.57	74	-37.57	0-360	200	H
3	* 2.782	42.82	Pk	32.4	-34.5	.8	41.52	54	-12.48	74	-32.48	0-360	102	H
4	* 1.095	43.93	Pk	27.7	-35.9	.5	36.23	54	-17.77	74	-37.77	0-360	102	V
5	* 1.415	42.76	Pk	28.6	-35.5	.6	36.46	54	-17.54	74	-37.54	0-360	202	V
6	* 2.201	43.61	Pk	31.9	-34.9	.9	41.51	54	-12.49	74	-32.49	0-360	299	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 3-18 MHZ



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.817	43.93	PK2	34	-31.5	46.43	-	-	74	-27.57	33	326	H
	* 4.817	31.15	MAv1	34	-31.5	33.65	54	-20.35	-	-	33	326	H
3	* 15.36	38.61	PK2	40	-23.7	54.91	-	-	74	-19.09	164	200	H
	* 15.36	30.3	MAv1	40	-23.7	46.6	54	-7.4	-	-	164	200	H
4	* 3.809	40.9	PK2	33.4	-33.1	41.2	-	-	74	-32.8	54	101	V
	* 3.805	29.3	MAv1	33.4	-33.1	29.6	54	-24.4	-	-	54	101	V
5	5.254	33.82	Pk	34.3	-30.9	37.22	-	-	-	-	0-360	199	V
2	12.723	30.42	Pk	39.2	-25.3	44.32	-	-	-	-	0-360	199	H
6	12.844	30.11	Pk	39.3	-25.4	44.01	-	-	-	-	0-360	199	V

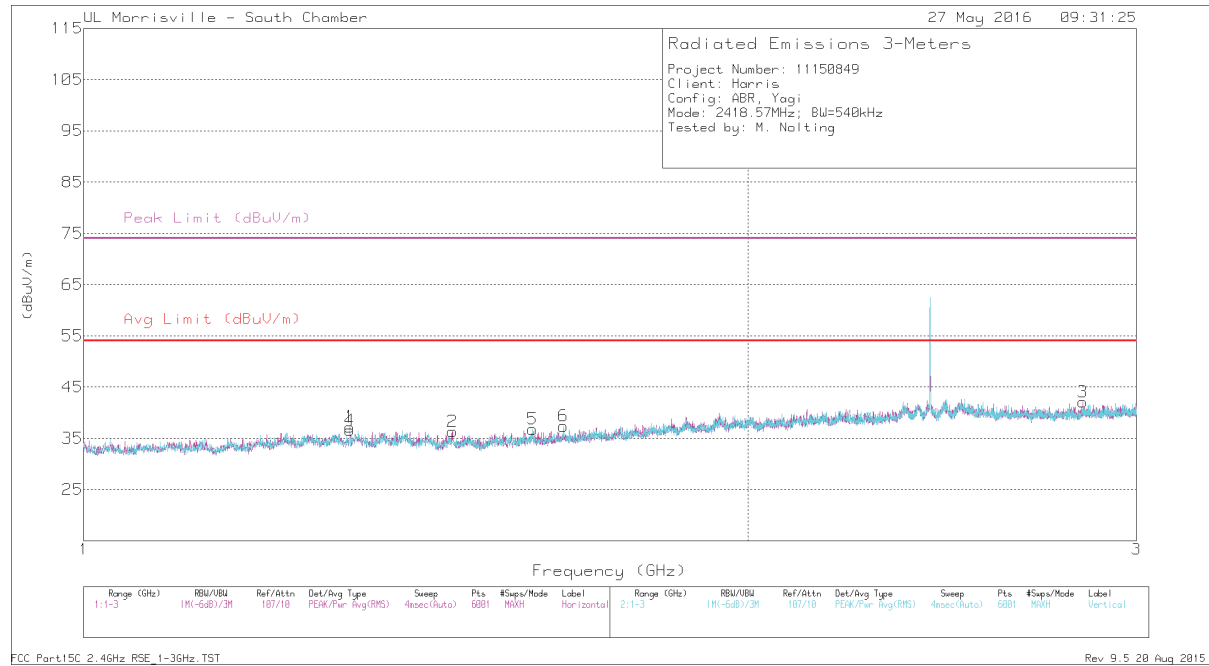
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 1-3 MHZ**

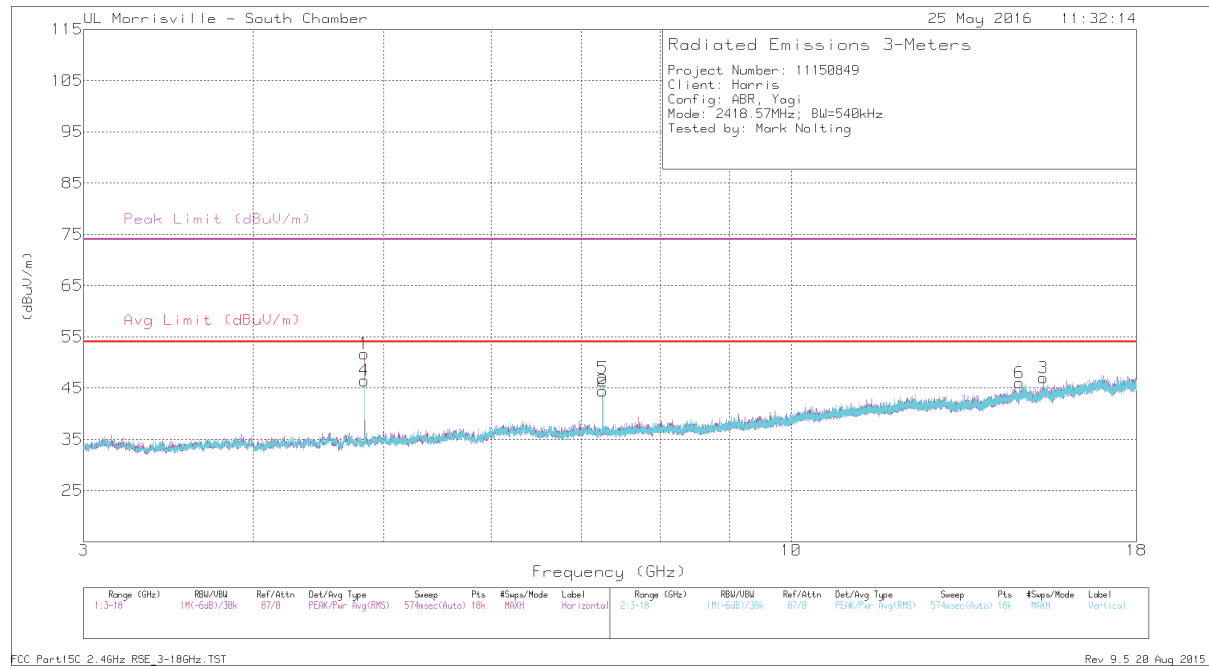


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.32	43.43	Pk	28.8	-35.6	.6	37.23	54	-16.77	74	-36.77	0-360	299	H
4	* 1.32	42.79	Pk	28.8	-35.6	.6	36.59	54	-17.41	74	-37.41	0-360	201	V
2	* 1.469	43.21	Pk	28.1	-35.6	.6	36.31	54	-17.69	74	-37.69	0-360	102	H
5	* 1.597	43.17	Pk	28.3	-35.3	.6	36.77	54	-17.23	74	-37.23	0-360	102	V
3	* 2.837	42.97	Pk	32.7	-34.4	.8	42.07	54	-11.93	74	-31.93	0-360	299	H
6	1.65	43.48	Pk	28.6	-35.3	.6	37.38	-	-	-	-	0-360	102	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 3-18 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.837	62.21	PK2	34.1	-31.4	64.91	-	-	74	-9.09	37	128	H
	* 4.837	44.85	MAv1	34.1	-31.4	47.55	54	-6.45	-	-	37	128	H
2	* 7.256	53.99	PK2	35.5	-28.5	60.99	-	-	74	-13.01	122	205	H
	* 7.256	31.35	MAv1	35.5	-28.5	38.35	54	-15.65	-	-	122	205	H
3	* 15.36	38.69	PK2	40	-23.7	54.99	-	-	74	-19.01	164	200	H
	* 15.36	30.25	MAv1	40	-23.7	46.55	54	-7.45	-	-	164	200	H
4	* 4.837	57.43	PK2	34.1	-31.4	60.13	-	-	74	-13.87	350	106	V
	* 4.837	39.63	MAv1	34.1	-31.4	42.33	54	-11.67	-	-	350	106	V
5	* 7.256	52.15	PK2	35.5	-28.5	59.15	-	-	74	-14.85	158	193	V
	* 7.256	29.62	MAv1	35.5	-28.5	36.62	54	-17.38	-	-	158	193	V
6	14.748	31.5	Pk	39.8	-25.3	46	-	-	-	-	0-360	199	V

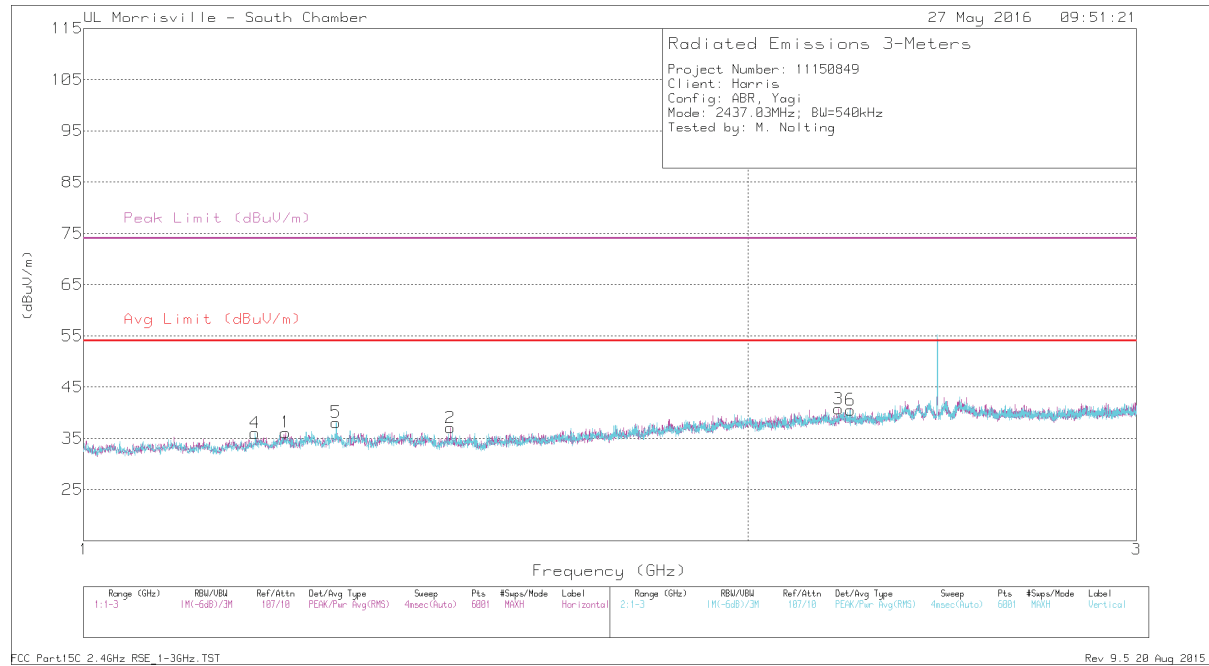
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 1-3 MHZ**

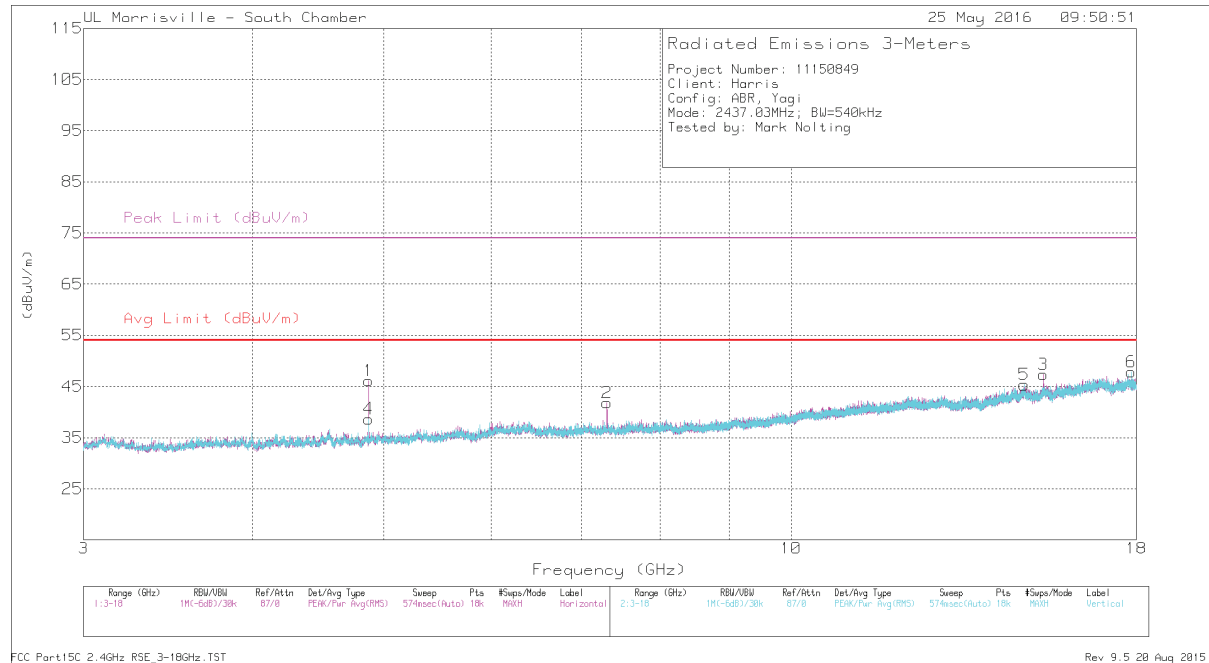


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.196	43.24	Pk	28.2	-35.9	.5	36.04	54	-17.96	74	-37.96	0-360	300	V
1	* 1.234	42.85	Pk	28.6	-35.8	.5	36.15	54	-17.85	74	-37.85	0-360	200	H
5	* 1.301	44.39	Pk	28.8	-35.6	.5	38.09	54	-15.91	74	-35.91	0-360	101	V
2	* 1.466	43.98	Pk	28.1	-35.6	.6	37.08	54	-16.92	74	-36.92	0-360	102	H
6	* 2.225	42.83	Pk	31.8	-34.9	.8	40.53	54	-13.47	74	-33.47	0-360	202	V
3	2.198	42.84	Pk	31.9	-34.9	.9	40.74	-	-	-	-	0-360	300	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 3-18 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	54.64	PK2	34.1	-31.6	57.14	-	-	74	-16.86	86	201	H
	* 4.874	37.76	MAv1	34.1	-31.6	40.26	54	-13.74	-	-	86	201	H
2	* 7.311	45.75	PK2	35.5	-28.3	52.95	-	-	74	-21.05	124	210	H
	* 7.311	26.71	MAv1	35.5	-28.3	33.91	54	-20.09	-	-	124	210	H
3	* 15.36	38.41	PK2	40	-23.7	54.71	-	-	74	-19.29	164	200	H
	* 15.36	30.53	MAv1	40	-23.7	46.83	54	-7.17	-	-	164	200	H
4	* 4.874	49.38	PK2	34.1	-31.6	51.88	-	-	74	-22.12	351	105	V
	* 4.874	33.01	MAv1	34.1	-31.6	35.51	54	-18.49	-	-	351	105	V
6	* 17.843	34.69	PK2	41.2	-22.5	53.39	-	-	74	-20.61	266	101	V
	* 17.845	22.76	MAv1	41.2	-22.6	41.36	54	-12.64	-	-	266	101	V
5	14.868	29.24	Pk	39.9	-23.8	45.34	-	-	-	-	0-360	102	V

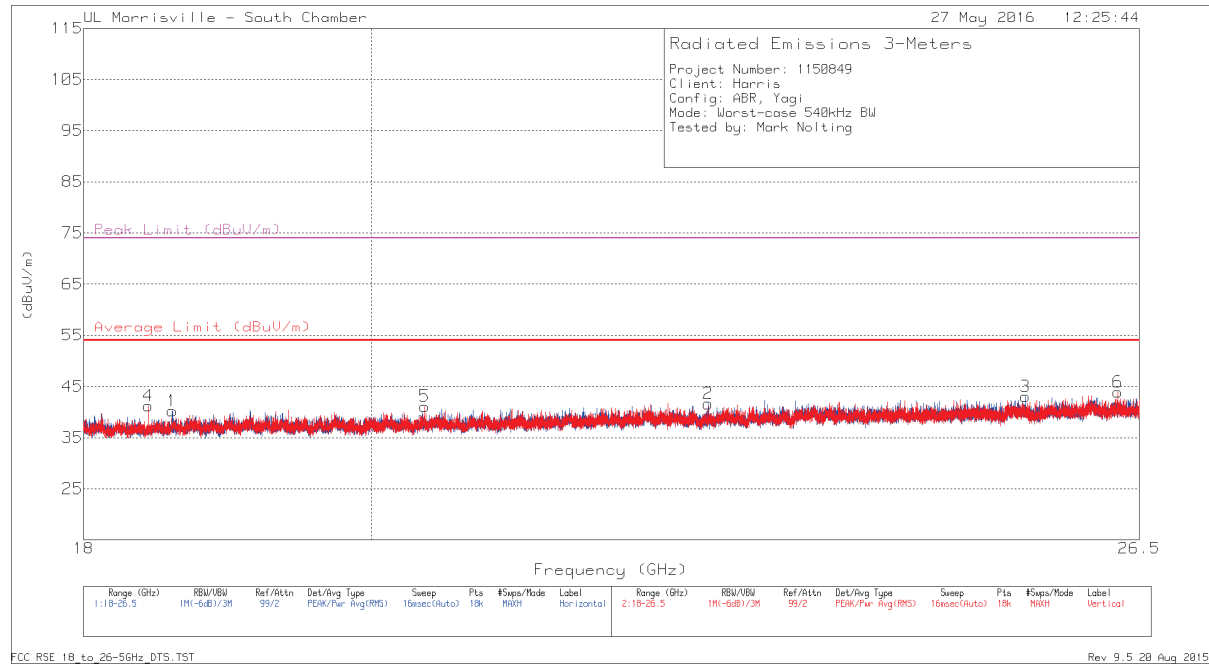
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**WORST CASE HARMONICS AND SPURIOUS EMISSIONS 18-26 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0076 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.595	48.01	Pk	32.9	-40.7	40.21	54	-13.79	74	-33.79	0-360	102	H
2	* 22.627	47.45	Pk	33.7	-39.5	41.65	54	-12.35	74	-32.35	0-360	299	H
4	* 18.432	53.15	PK2	32.5	-40.8	44.85	-	-	74	-29.15	121	102	V
	* 18.432	47.85	MAv1	32.5	-40.8	39.55	54	-14.45	-	-	121	102	V
5	* 20.395	47.92	Pk	33.3	-40.1	41.12	54	-12.88	74	-32.88	0-360	202	V
3	25.417	46.42	Pk	34.7	-38.1	43.02	54	-10.98	74	-30.98	0-360	299	H
6	26.293	46.31	Pk	35	-37.4	43.91	54	-10.09	74	-30.09	0-360	299	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

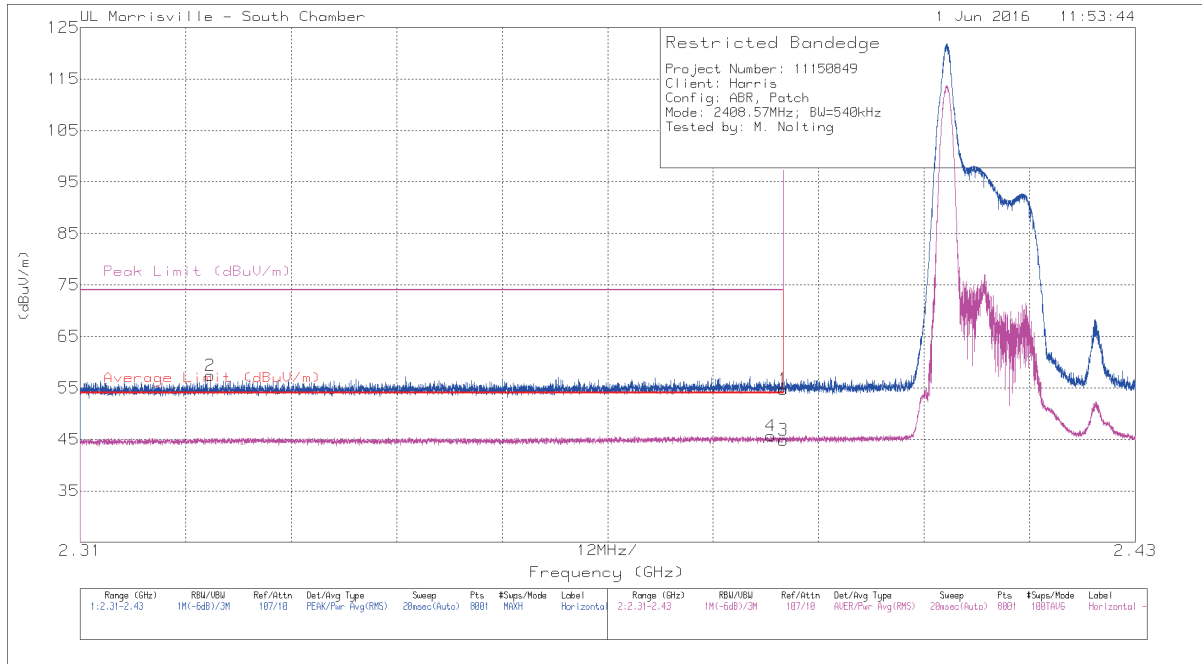
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

### 9.3.1. PATCH Antenna

#### ADJACENT RESTRICTED BAND LOW

#### HORIZONTAL



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	34.64	Pk	32.2	-24.2	2.1	10	54.74	-	-	74	-19.26	120	251	H
2	* 2.325	37.51	Pk	31.7	-23.8	2	10	57.41	-	-	74	-16.59	120	251	H
3	* 2.39	24.78	RMS	32.2	-24.2	2.1	10	44.88	54	-9.12	-	-	120	251	H
4	* 2.389	25.47	RMS	32.2	-24.1	2.1	10	45.67	54	-8.33	-	-	120	251	H

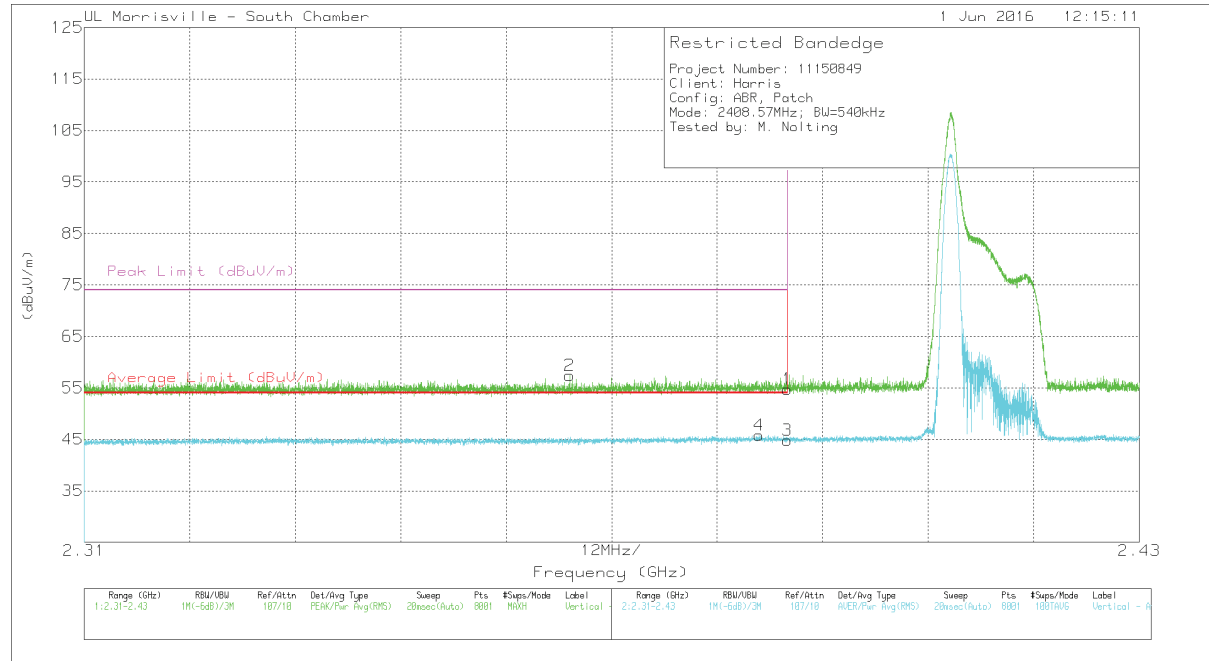
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection



# VERTICAL



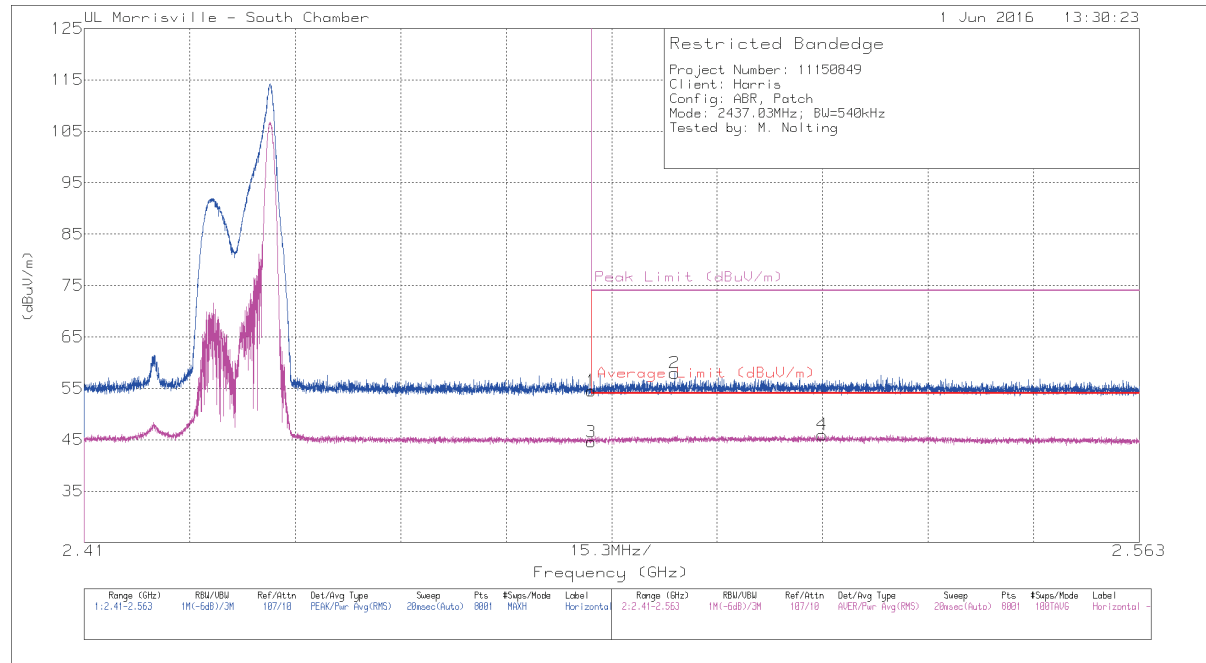
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.365	37.51	Pk	31.9	-24.1	2.1	10	57.41	-	-	74	-16.59	87	374	V
4	* 2.387	25.6	RMS	32.2	-24.1	2.1	10	45.8	54	-8.2	-	-	87	374	V
1	* 2.39	34.64	Pk	32.2	-24.2	2.1	10	54.74	-	-	74	-19.26	87	374	V
3	* 2.39	24.74	RMS	32.2	-24.2	2.1	10	44.84	54	-9.16	-	-	87	374	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **ADJACENT RESTRICTED BAND HIGH** **HORIZONTAL**



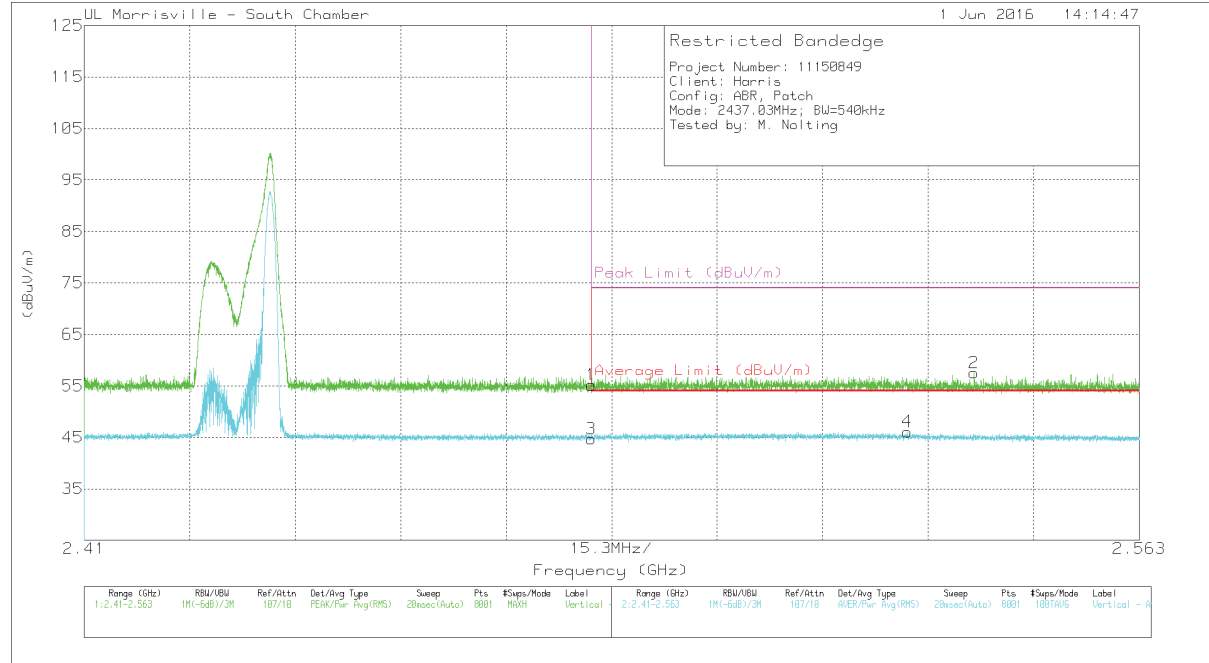
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	34.7	Pk	32.4	-24.7	2.1	10	54.5	-	-	74	-19.5	122	250	H
3	* 2.484	24.78	RMS	32.4	-24.7	2.1	10	44.58	54	-9.42	-	-	122	250	H
2	* 2.496	38.18	Pk	32.5	-24.8	2.1	10	57.98	-	-	74	-16.02	122	250	H
4	2.517	26.18	RMS	32.5	-24.9	2.2	10	45.98	54	-8.02	-	-	122	250	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



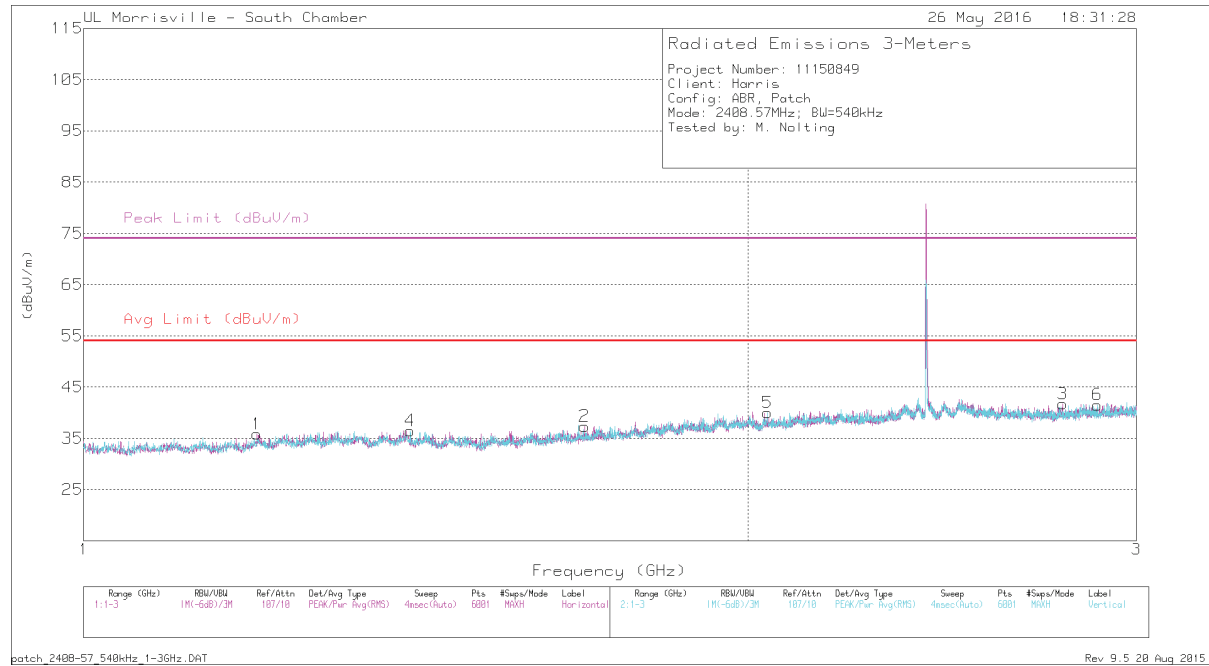
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.36	Pk	32.4	-24.7	2.1	10	55.16	-	-	74	-18.84	80	377	V
3	* 2.484	24.91	RMS	32.4	-24.7	2.1	10	44.71	54	-9.29	-	-	80	377	V
4	2.529	26.3	RMS	32.5	-24.9	2.2	10	46.1	54	-7.9	-	-	80	377	V
2	2.539	38.1	Pk	32.4	-25.1	2.1	10	57.5	-	-	74	-16.5	80	377	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 1-3 MHZ**

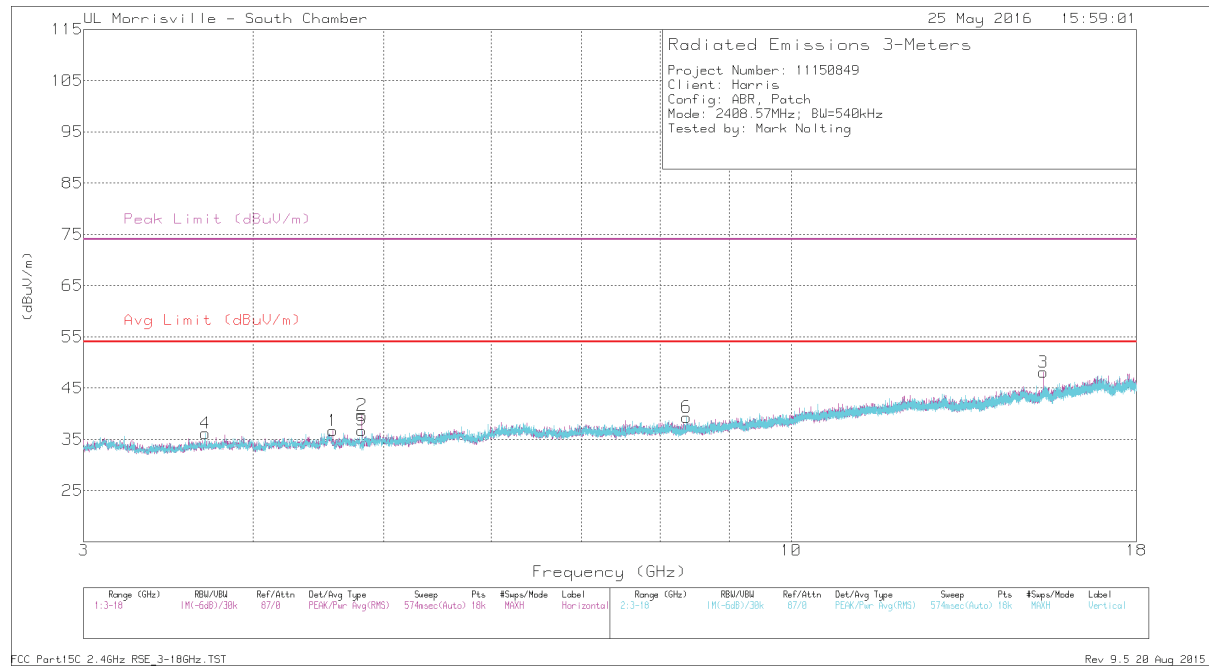


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.198	43.02	Pk	28.2	-35.9	.5	35.82	54	-18.18	74	-38.18	0-360	102	H
4	* 1.406	42.79	Pk	28.7	-35.6	.6	36.49	54	-17.51	74	-37.51	0-360	102	V
2	* 1.686	43.06	Pk	29	-35.3	.6	37.36	54	-16.64	74	-36.64	0-360	199	H
3	* 2.777	43.02	Pk	32.4	-34.5	.8	41.72	54	-12.28	74	-32.28	0-360	299	H
6	* 2.879	42.54	Pk	32.7	-34.5	.8	41.54	54	-12.46	74	-32.46	0-360	299	V
5	2.041	43.28	Pk	31.1	-35.1	.7	39.98	-	-	-	-	0-360	299	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 3-18 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.583	40.11	PK2	34	-32.3	41.81	-	-	74	-32.19	318	255	H
	* 4.586	28.21	MAv1	34	-32.3	29.91	54	-24.09	-	-	318	255	H
2	* 4.817	47.14	PK2	34	-31.5	49.64	-	-	74	-24.36	12	209	H
	* 4.817	35.94	MAv1	34	-31.5	38.44	54	-15.56	-	-	12	209	H
3	* 15.36	38.43	PK2	40	-23.7	54.73	-	-	74	-19.27	164	201	H
	* 15.36	30.34	MAv1	40	-23.7	46.64	54	-7.36	-	-	164	201	H
4	* 3.687	42.46	PK2	33.3	-33	42.76	-	-	74	-31.24	99	184	V
	* 3.686	30.85	MAv1	33.3	-33	31.15	54	-22.85	-	-	99	184	V
5	* 4.817	44.88	PK2	34	-31.5	47.38	-	-	74	-26.62	64	204	V
	* 4.817	31.14	MAv1	34	-31.5	33.64	54	-20.36	-	-	64	204	V
6	* 8.372	37.03	PK2	35.7	-27.9	44.83	-	-	74	-29.17	278	267	V
	* 8.374	24.77	MAv1	35.7	-27.9	32.57	54	-21.43	-	-	278	267	V

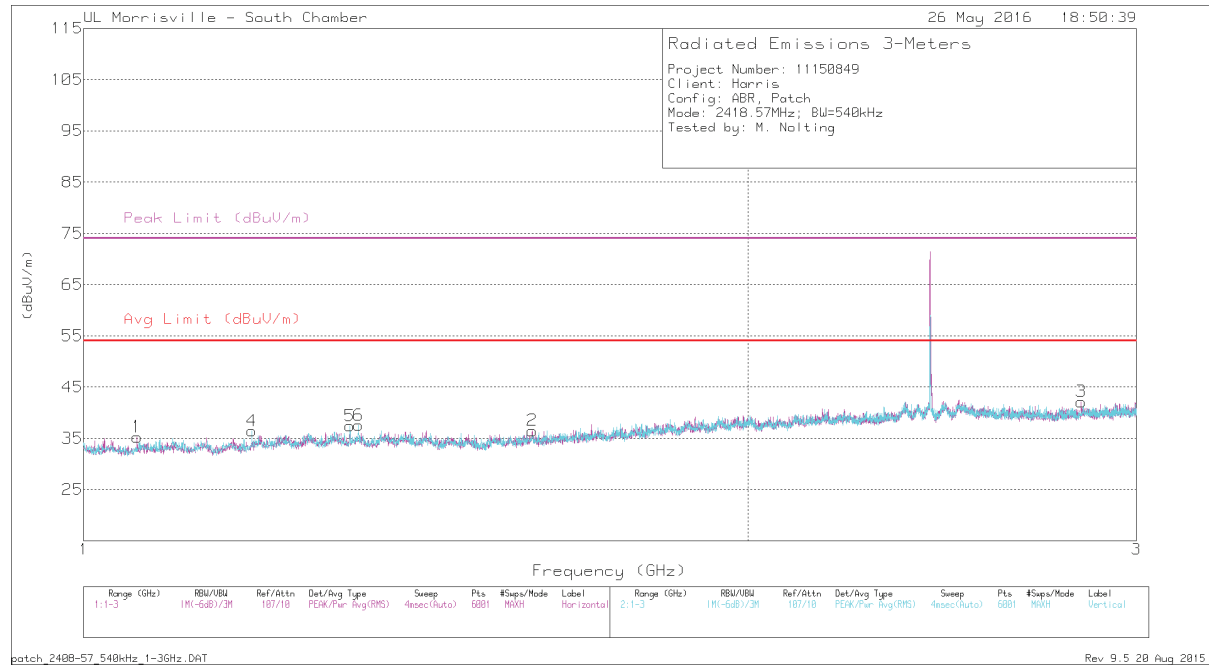
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 1-3 MHZ**

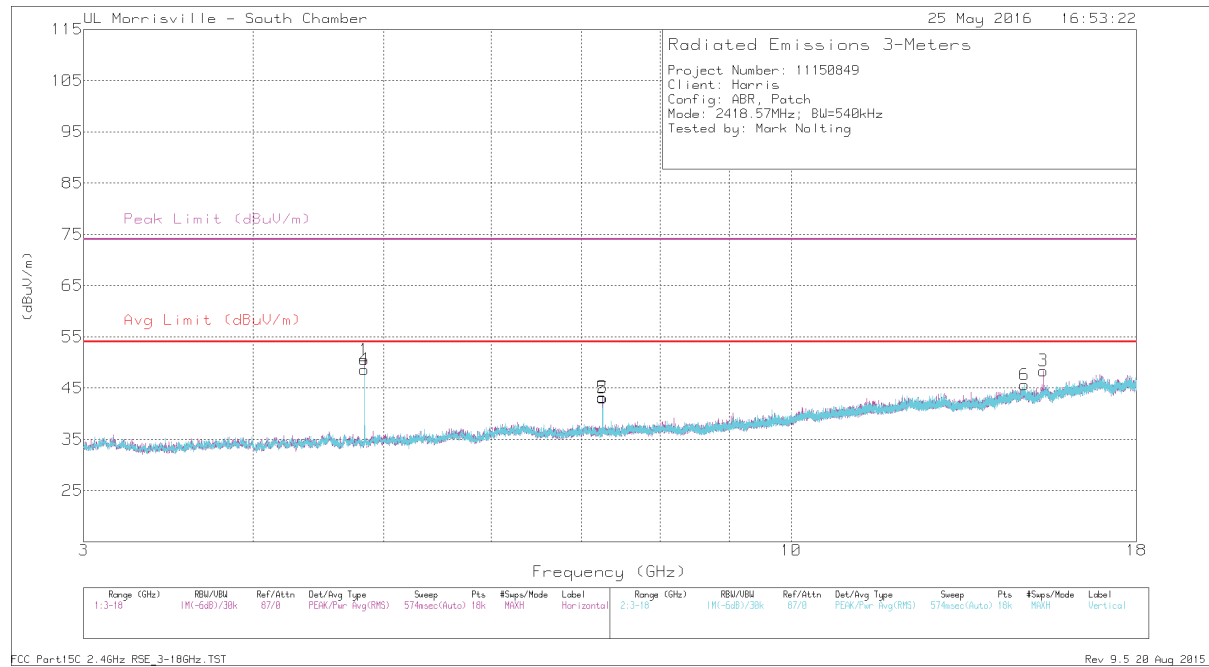


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.057	43.48	Pk	27.3	-36	.5	35.28	54	-18.72	74	-38.72	0-360	299	H
4	* 1.192	43.73	Pk	28.1	-35.9	.5	36.43	54	-17.57	74	-37.57	0-360	299	V
5	* 1.32	43.6	Pk	28.8	-35.6	.6	37.4	54	-16.6	74	-36.6	0-360	102	V
6	* 1.332	43.86	Pk	28.8	-35.6	.5	37.56	54	-16.44	74	-36.44	0-360	201	V
2	* 1.597	42.91	Pk	28.3	-35.3	.6	36.51	54	-17.49	74	-37.49	0-360	299	H
3	* 2.832	43.16	Pk	32.7	-34.5	.8	42.16	54	-11.84	74	-31.84	0-360	299	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 3-18 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.837	57.63	PK2	34.1	-31.4	60.33	-	-	74	-13.67	42	110	H
	* 4.837	46.22	MAv1	34.1	-31.4	48.92	54	-5.08	-	-	42	110	H
2	* 7.256	50.43	PK2	35.5	-28.5	57.43	-	-	74	-16.57	236	268	H
	* 7.256	31.66	MAv1	35.5	-28.5	38.66	54	-15.34	-	-	236	268	H
3	* 15.36	38.64	PK2	40	-23.7	54.94	-	-	74	-19.06	161	202	H
	* 15.36	31.08	MAv1	40	-23.7	47.38	54	-6.62	-	-	161	202	H
4	* 4.837	57.06	PK2	34.1	-31.4	59.76	-	-	74	-14.24	15	181	V
	* 4.837	43.16	MAv1	34.1	-31.4	45.86	54	-8.14	-	-	15	181	V
5	* 7.256	47.66	PK2	35.5	-28.5	54.66	-	-	74	-19.34	108	202	V
	* 7.256	29.7	MAv1	35.5	-28.5	36.7	54	-17.3	-	-	108	202	V
6	14.875	29.33	Pk	39.9	-23.6	45.63	-	-	-	-	0-360	101	V

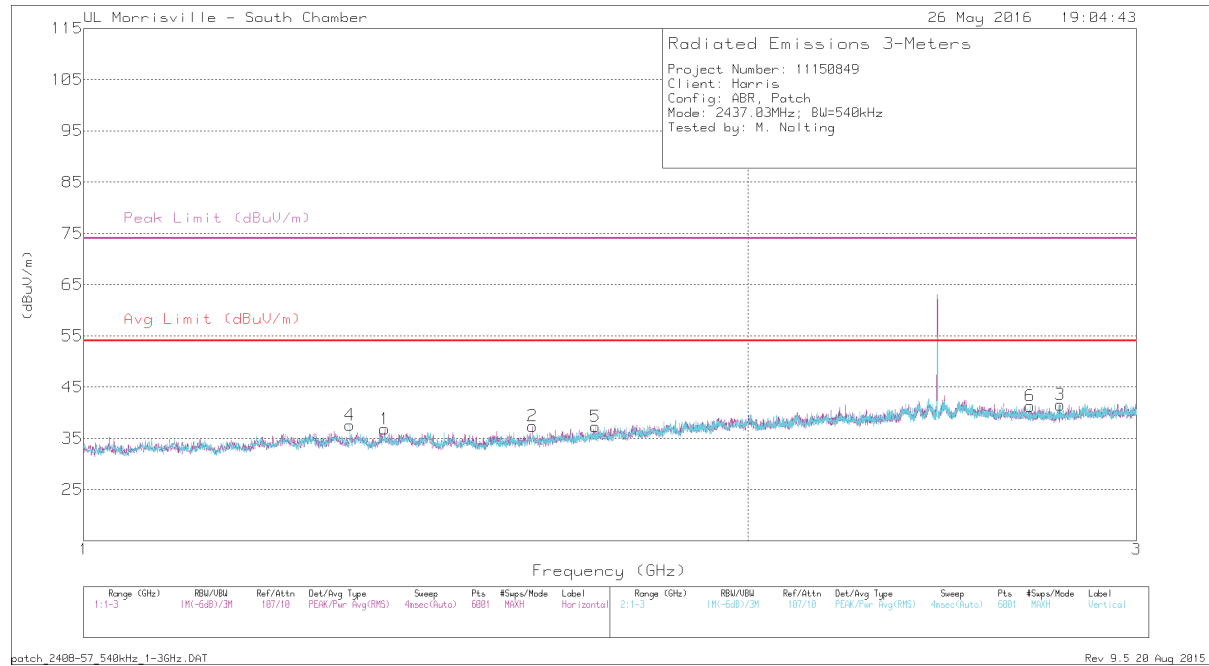
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 1-3 MHZ**



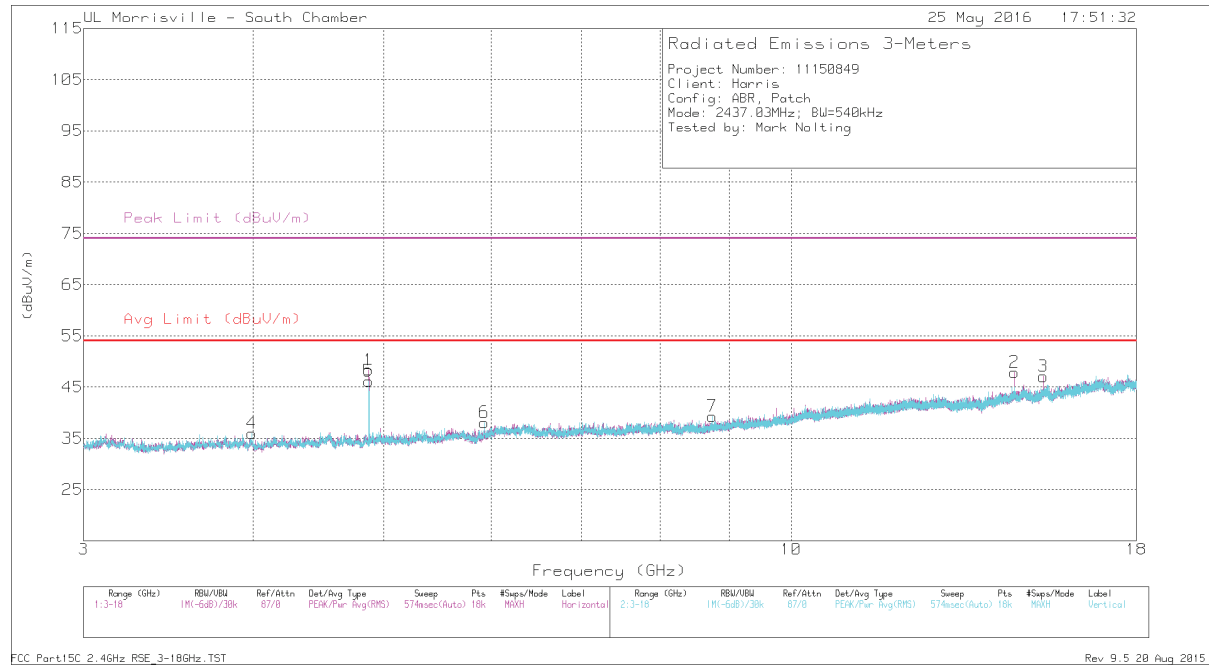
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.32	43.79	Pk	28.8	-35.6	.6	37.59	54	-16.41	74	-36.41	0-360	299	V
1	* 1.369	43	Pk	28.8	-35.6	.6	36.8	54	-17.2	74	-37.2	0-360	199	H
2	* 1.597	43.78	Pk	28.3	-35.3	.6	37.38	54	-16.62	74	-36.62	0-360	299	H
5	* 1.706	42.68	Pk	29.1	-35.1	.6	37.28	54	-16.72	74	-36.72	0-360	102	V
6	* 2.685	42.71	Pk	32.4	-34.7	.9	41.31	54	-12.69	74	-32.69	0-360	299	V
3	* 2.771	42.95	Pk	32.3	-34.5	.8	41.55	54	-12.45	74	-32.45	0-360	299	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector



# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 3-18 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.874	56.42	PK2	34.1	-31.6	58.92	-	-	74	-15.08	44	110	H
	* 4.874	40.82	MAv1	34.1	-31.6	43.32	54	-10.68	-	-	44	110	H
3	* 15.36	38.94	PK2	40	-23.7	55.24	-	-	74	-18.76	161	199	H
	* 15.36	31.07	MAv1	40	-23.7	47.37	54	-6.63	-	-	161	199	H
4	* 3.994	43.32	PK2	33.3	-32.4	44.22	-	-	74	-29.78	282	215	V
	* 3.993	32.37	MAv1	33.3	-32.4	33.27	54	-20.73	-	-	282	215	V
5	* 4.874	55.62	PK2	34.1	-31.6	58.12	-	-	74	-15.88	87	115	V
	* 4.874	40.5	MAv1	34.1	-31.6	43	54	-11	-	-	87	115	V
6	5.929	32.89	Pk	35	-29.8	38.09	-	-	-	-	0-360	102	V
7	8.743	30.9	Pk	35.8	-27.4	39.3	-	-	-	-	0-360	199	V
2	14.622	31.8	Pk	39.8	-23.7	47.9	-	-	-	-	0-360	102	H

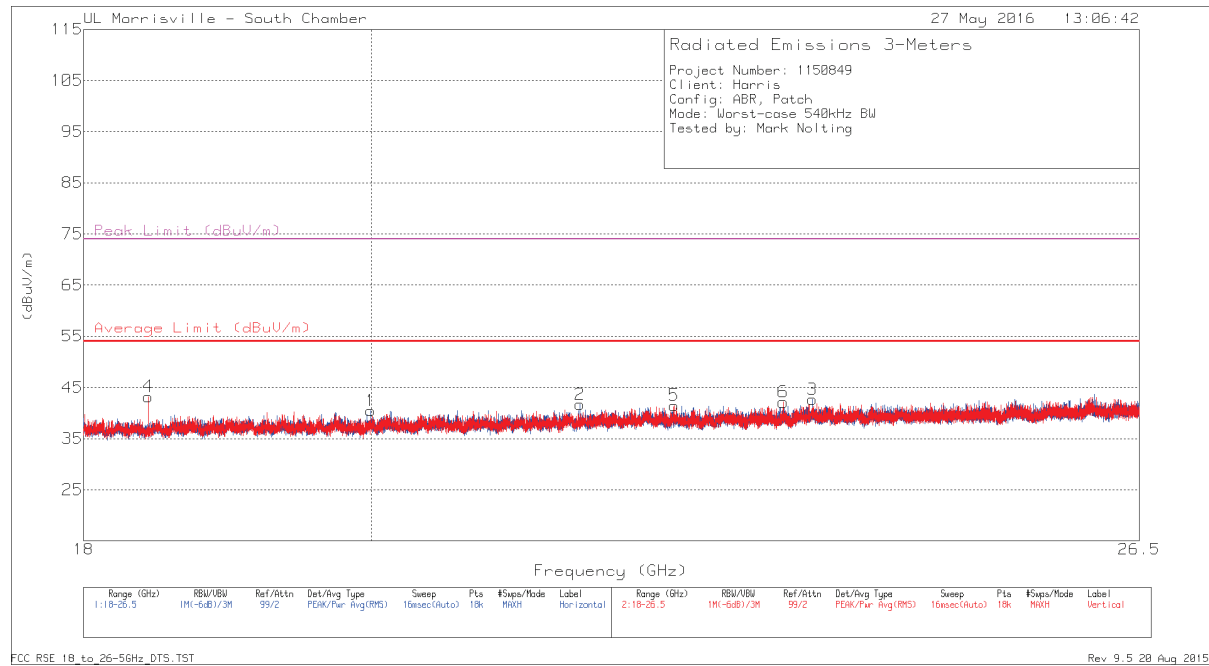
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**WORST CASE HARMONICS AND SPURIOUS EMISSIONS 18-26 MHZ**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0076 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19.997	47.66	Pk	33.1	-40.3	40.46	54	-13.54	74	-33.54	0-360	102	H
4	* 18.432	54.17	PK2	32.5	-40.8	45.87	-	-	74	-28.13	104	101	V
	* 18.432	49.73	MAv1	32.5	-40.8	41.43	54	-12.57	-	-	104	101	V
5	* 22.347	47.19	Pk	33.9	-39.6	41.49	54	-12.51	74	-32.51	0-360	252	V
2	21.589	47.96	Pk	33.6	-39.9	41.66	54	-12.34	74	-32.34	0-360	299	H
6	23.259	47.24	Pk	34	-39.1	42.14	54	-11.86	74	-31.86	0-360	201	V
3	23.508	47.26	Pk	34.5	-39.1	42.66	54	-11.34	74	-31.34	0-360	149	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

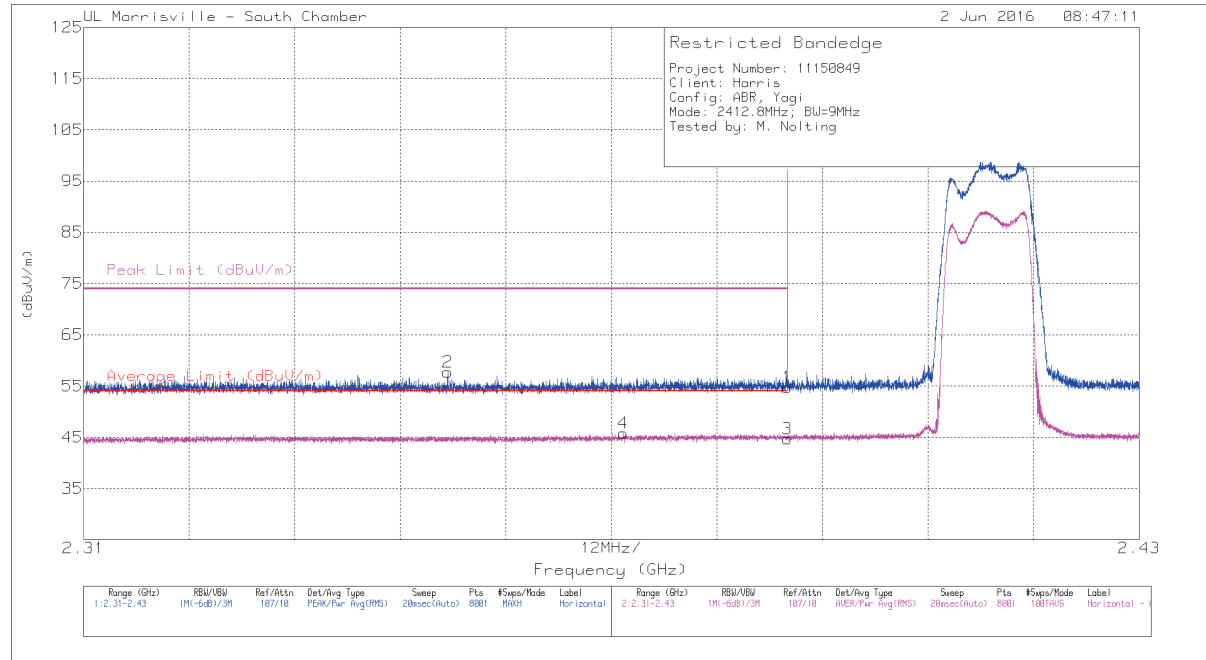
MAv1 - KDB558074 Option 1 Maximum RMS Average

## 9.4. TX ABOVE 1 GHz, 9 MHz MODE IN THE 2.4 GHz BAND

### 9.4.1. YAGI Antenna

#### ADJACENT RESTRICTED BAND LOW

#### HORIZONTAL



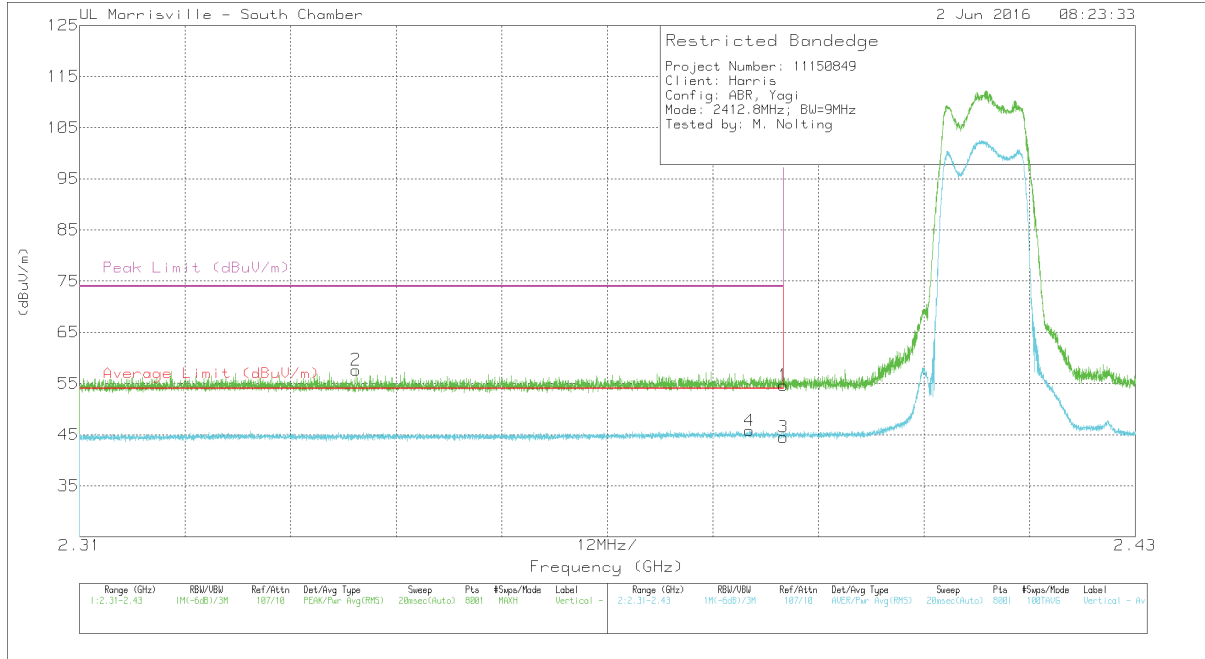
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.351	37.81	Pk	31.8	-24	2.1	10	57.71	-	-	74	-16.29	75	142	H
4	* 2.371	25.8	RMS	32	-24.1	2.1	10	45.8	54	-8.2	-	-	75	142	H
1	* 2.39	34.67	Pk	32.2	-24.2	2.1	10	54.77	-	-	74	-19.23	75	142	H
3	* 2.39	24.58	RMS	32.2	-24.2	2.1	10	44.68	54	-9.32	-	-	75	142	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



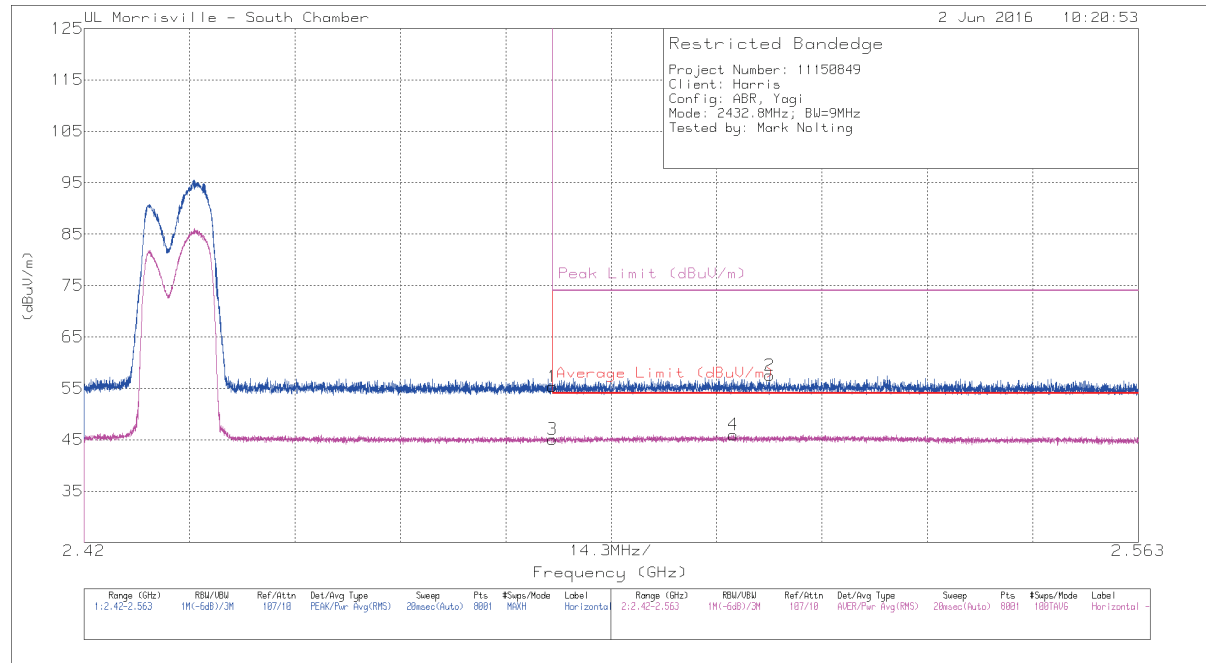
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Ftr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	34.58	Pk	32.2	-24.2	2.1	10	54.68	-	-	74	-19.32	36	135	V
2	* 2.341	37.74	Pk	31.8	-24	2.1	10	57.64	-	-	74	-16.36	36	135	V
3	* 2.39	24.41	RMS	32.2	-24.2	2.1	10	44.51	54	-9.49	-	-	36	135	V
4	* 2.386	25.61	RMS	32.2	-24.1	2.1	10	45.81	54	-8.19	-	-	36	135	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **ADJACENT RESTRICTED BAND HIGH** **HORIZONTAL**



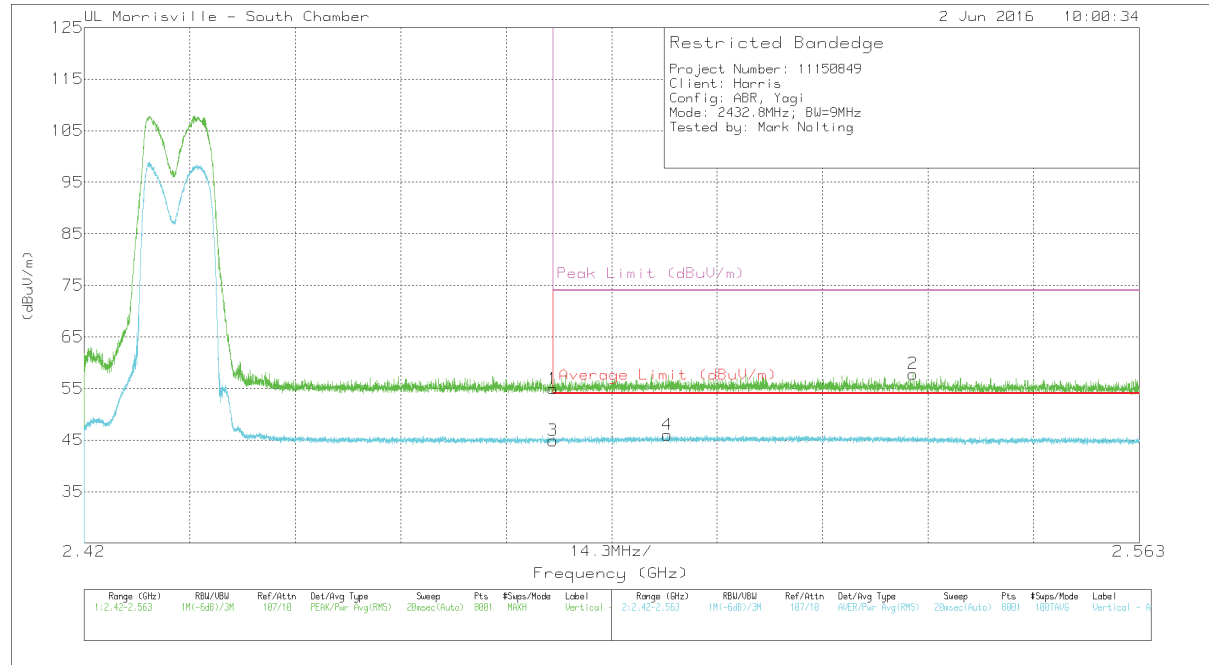
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Fitr/ Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.51	Pk	32.4	-24.7	2.1	10	55.31	-	-	74	-18.69	46	143	H
3	* 2.484	25.3	RMS	32.4	-24.7	2.1	10	45.1	54	-8.9	-	-	46	143	H
4	2.508	26.18	RMS	32.5	-24.9	2.2	10	45.98	54	-8.02	-	-	46	143	H
2	2.513	37.71	Pk	32.5	-24.9	2.2	10	57.51	-	-	74	-16.49	46	143	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



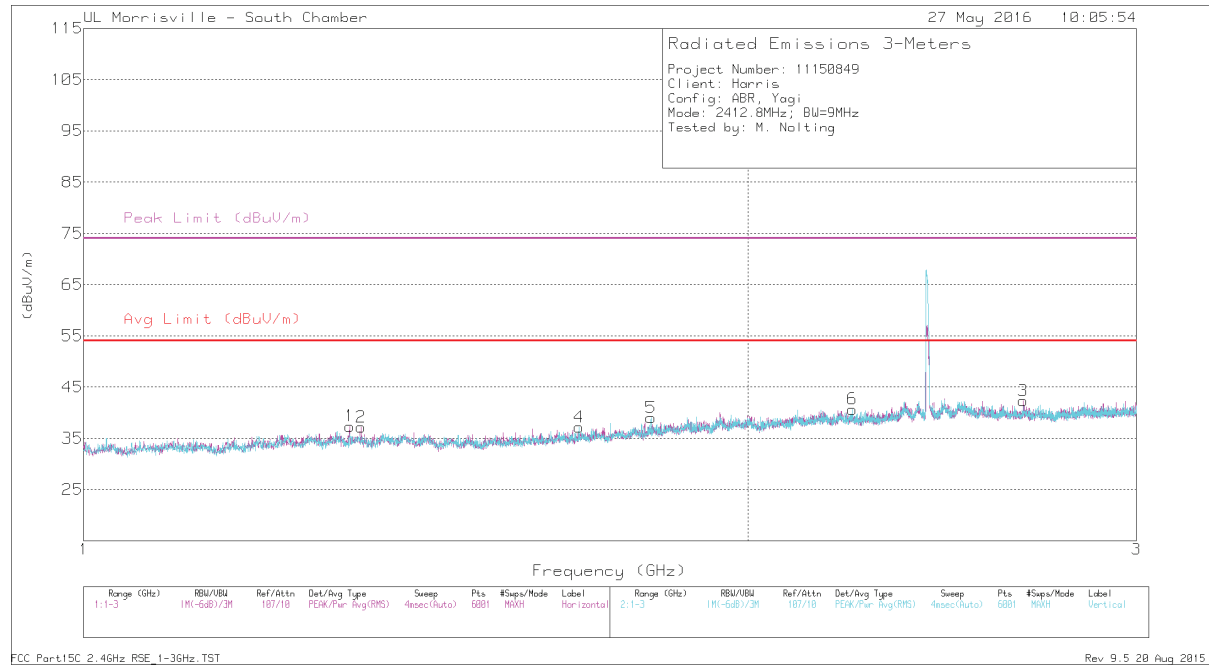
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.15	Pk	32.4	-24.7	2.1	10	54.95	-	-	74	-19.05	33	156	V
3	* 2.484	25.11	RMS	32.4	-24.7	2.1	10	44.91	54	-9.09	-	-	33	156	V
4	* 2.499	26.2	RMS	32.5	-24.8	2.1	10	46	54	-8	-	-	33	156	V
2	2.532	38.24	Pk	32.4	-25	2.2	10	57.84	-	-	74	-16.16	33	156	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 1-3 MHz**

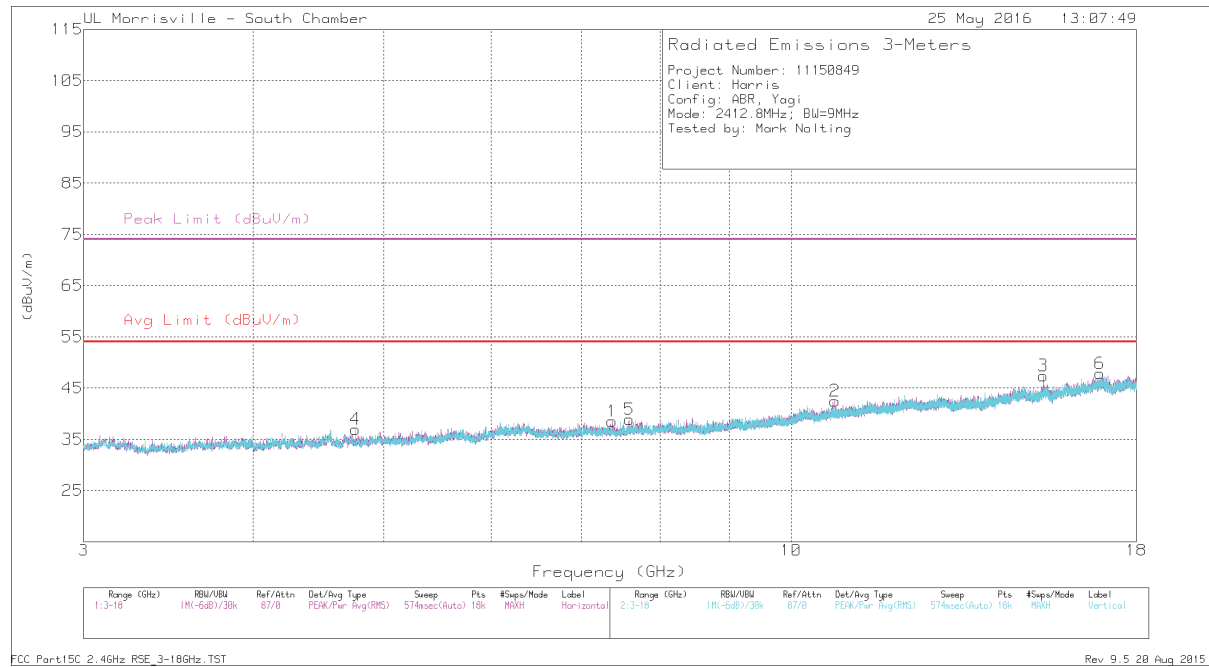


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.32	43.57	Pk	28.8	-35.6	.6	37.37	54	-16.63	74	-36.63	0-360	300	H
2	* 1.336	43.46	Pk	28.8	-35.6	.5	37.16	54	-16.84	74	-36.84	0-360	300	H
4	* 1.677	42.97	Pk	28.9	-35.3	.6	37.17	54	-16.83	74	-36.83	0-360	201	V
6	* 2.23	42.98	Pk	31.8	-34.9	.8	40.68	54	-13.32	74	-33.32	0-360	300	V
3	* 2.665	43.71	Pk	32.4	-34.7	.9	42.31	54	-11.69	74	-31.69	0-360	199	H
5	1.808	43.49	Pk	30.1	-35.2	.6	38.99	-	-	-	-	0-360	300	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 3-18 MHz



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 7.372	36.84	PK2	35.5	-28.3	44.04	-	-	74	-29.96	77	180	H
	* 7.373	24.73	MAv1	35.5	-28.3	31.93	54	-22.07	-	-	77	180	H
2	* 10.775	34.26	PK2	37.9	-25.4	46.76	-	-	74	-27.24	148	133	H
	* 10.775	23.21	MAv1	37.9	-25.4	35.71	54	-18.29	-	-	148	133	H
3	* 15.36	38.35	PK2	40	-23.7	54.65	-	-	74	-19.35	165	200	H
	* 15.36	30.02	MAv1	40	-23.7	46.32	54	-7.68	-	-	165	200	H
4	* 4.763	39.71	PK2	34	-32.1	41.61	-	-	74	-32.39	71	157	V
	* 4.766	28.48	MAv1	34	-32.1	30.38	54	-23.62	-	-	71	157	V
5	* 7.59	36.12	PK2	35.7	-28.4	43.42	-	-	74	-30.58	21	102	V
	* 7.589	25.09	MAv1	35.7	-28.4	32.39	54	-21.61	-	-	21	102	V
6	16.911	30.36	Pk	41.6	-24.1	47.86	-	-	-	-	0-360	199	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

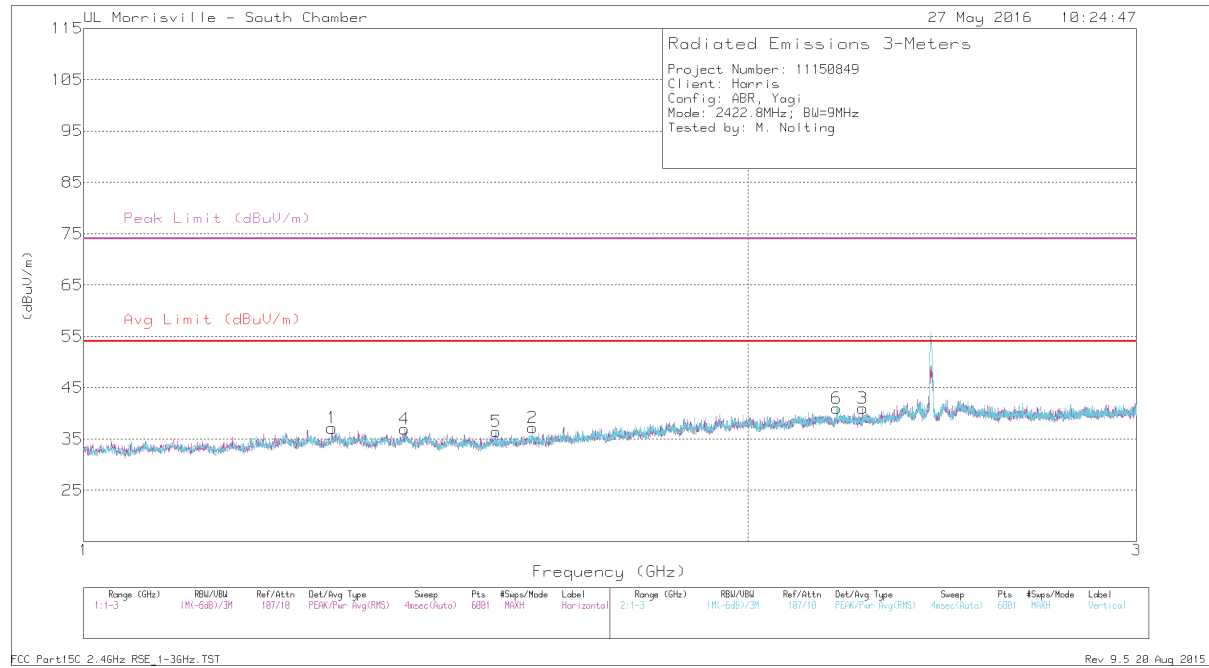
Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average



# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 1-3 MHz**

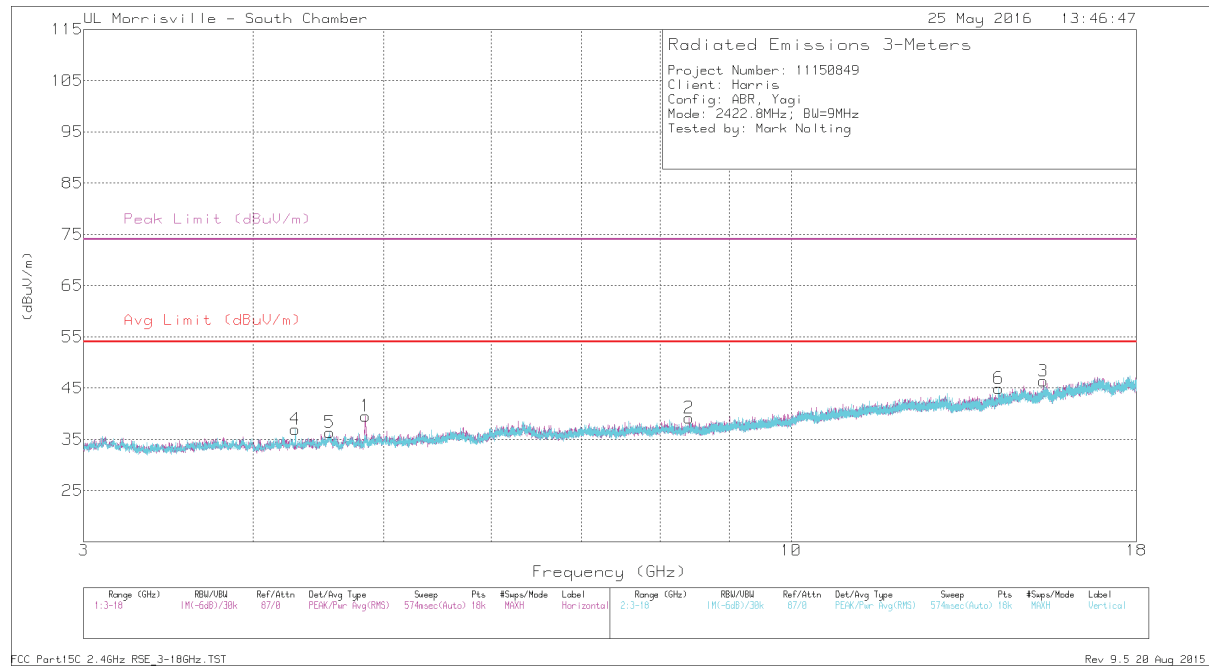


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.296	43.44	Pk	28.8	-35.6	.5	37.14	54	-16.86	74	-36.86	0-360	101	H
4	* 1.398	43.13	Pk	28.8	-35.6	.6	36.93	54	-17.07	74	-37.07	0-360	102	V
5	* 1.538	42.97	Pk	28.1	-35.3	.7	36.47	54	-17.53	74	-37.53	0-360	202	V
2	* 1.597	43.61	Pk	28.3	-35.3	.6	37.21	54	-16.79	74	-36.79	0-360	300	H
3	* 2.254	43.38	Pk	31.7	-34.9	.8	40.98	54	-13.02	74	-33.02	0-360	300	H
6	2.194	43.08	Pk	31.9	-34.9	.9	40.98	-	-	-	-	0-360	300	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 3-18 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ ftr/Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.846	44.84	PK2	34.1	-31.3	47.64	-	-	74	-26.36	201	177	H
	* 4.846	32.38	MAv1	34.1	-31.3	35.18	54	-18.82	-	-	201	177	H
2	* 8.402	37.06	PK2	35.7	-27.9	44.86	-	-	74	-29.14	224	167	H
	* 8.405	24.82	MAv1	35.7	-27.9	32.62	54	-21.38	-	-	224	167	H
3	* 15.36	38.12	PK2	40	-23.7	54.42	-	-	74	-19.58	163	200	H
	* 15.36	29.85	MAv1	40	-23.7	46.15	54	-7.85	-	-	163	200	H
4	* 4.301	44.33	PK2	33.4	-32.3	45.43	-	-	74	-28.57	284	244	V
	* 4.301	32.45	MAv1	33.4	-32.3	33.55	54	-20.45	-	-	284	244	V
5	* 4.558	40.11	PK2	34	-32	42.11	-	-	74	-31.89	220	232	V
	* 4.556	28.99	MAv1	34	-32	30.99	54	-23.01	-	-	220	232	V
6	14.236	30.26	Pk	39.3	-24.6	44.96	-	-	-	-	0-360	102	V

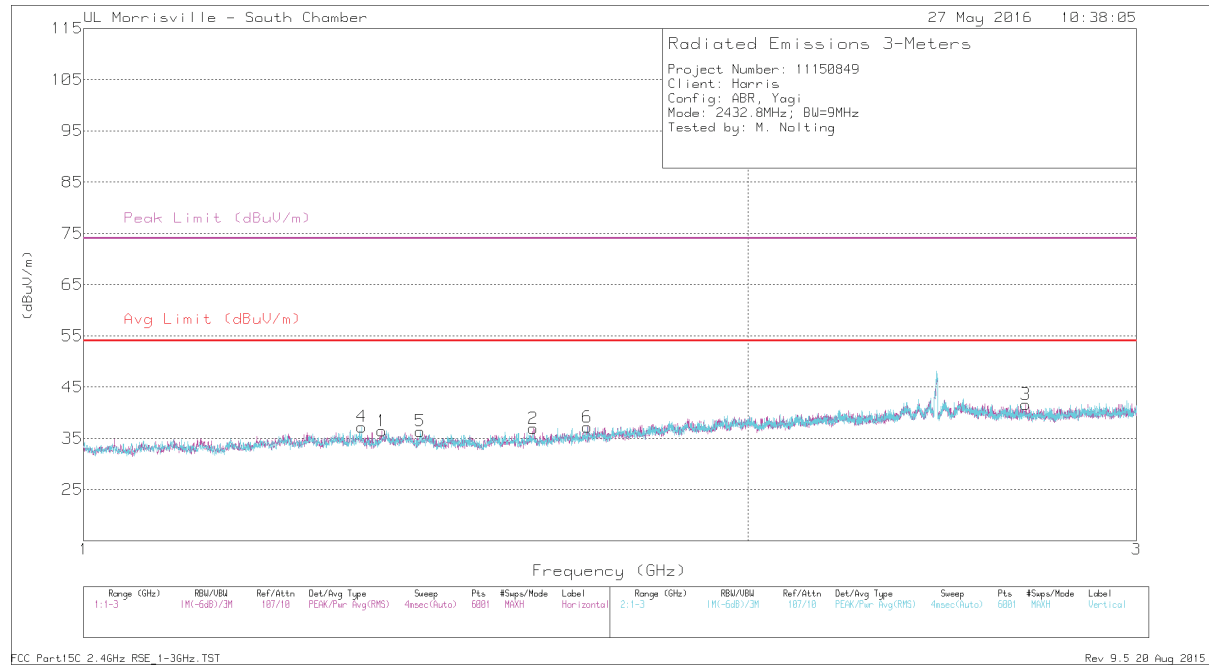
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 1-3 MHz**

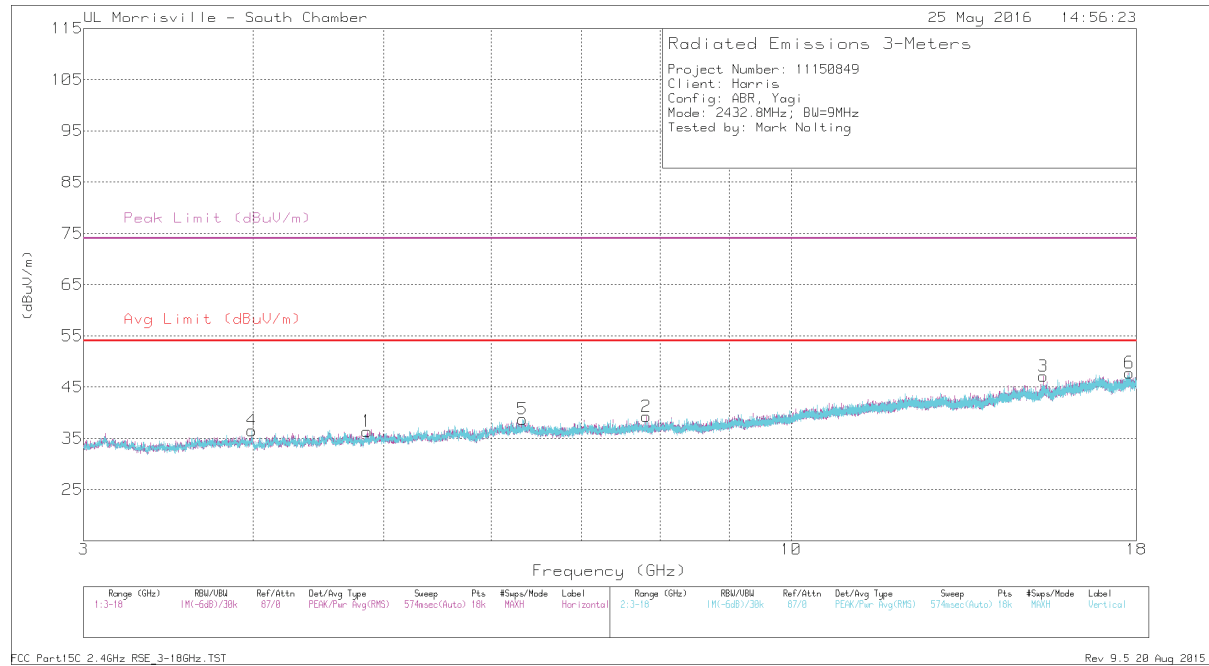


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.337	43.55	Pk	28.8	-35.6	.5	37.25	54	-16.75	74	-36.75	0-360	202	V
1	* 1.365	42.63	Pk	28.8	-35.6	.6	36.43	54	-17.57	74	-37.57	0-360	199	H
5	* 1.42	42.69	Pk	28.6	-35.5	.6	36.39	54	-17.61	74	-37.61	0-360	202	V
2	* 1.598	43.44	Pk	28.3	-35.4	.6	36.94	54	-17.06	74	-37.06	0-360	299	H
6	* 1.691	42.91	Pk	29	-35.3	.6	37.21	54	-16.79	74	-36.79	0-360	102	V
3	* 2.672	43.04	Pk	32.4	-34.7	.9	41.64	54	-12.36	74	-32.36	0-360	299	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 3-18 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.859	43.32	PK2	34.1	-31.5	45.92	-	-	74	-28.08	82	183	H
	* 4.859	30.63	MAv1	34.1	-31.5	33.23	54	-20.77	-	-	82	183	H
3	* 15.36	37.95	PK2	40	-23.7	54.25	-	-	74	-19.75	162	199	H
	* 15.36	29.95	MAv1	40	-23.7	46.25	54	-7.75	-	-	162	199	H
4	* 3.994	43.84	PK2	33.3	-32.4	44.74	-	-	74	-29.26	280	215	V
	* 3.993	33.03	MAv1	33.3	-32.4	33.93	54	-20.07	-	-	280	215	V
6	* 17.783	34.67	PK2	41.2	-22.7	53.17	-	-	74	-20.83	334	128	V
	* 17.787	23.26	MAv1	41.2	-22.7	41.76	54	-12.24	-	-	334	128	V
5	6.329	32.03	Pk	35.4	-28.7	38.73	-	-	-	-	0-360	200	V
2	7.815	31.65	Pk	35.8	-28.2	39.25	-	-	-	-	0-360	200	H

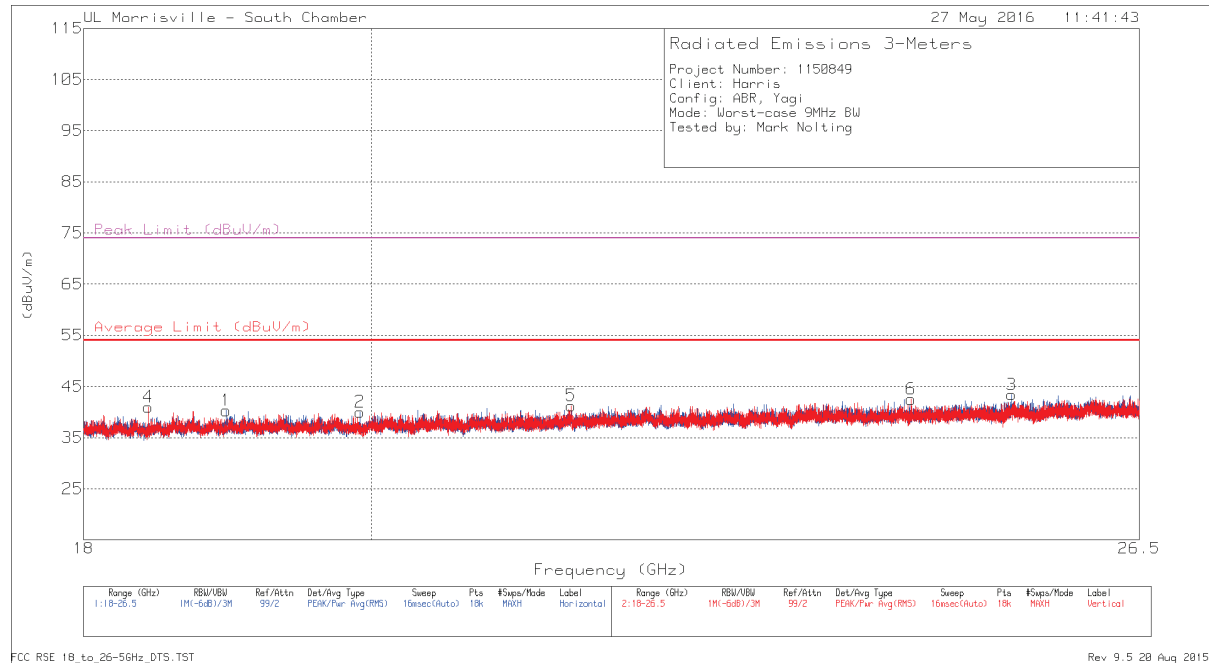
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**WORST CASE HARMONICS AND SPURIOUS EMISSIONS 18-26 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0076 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18.965	47.99	Pk	32.9	-40.6	40.29	54	-13.71	74	-33.71	0-360	149	H
2	* 19.917	47.73	Pk	32.8	-40.5	40.03	54	-13.97	74	-33.97	0-360	299	H
4	* 18.432	52.51	PK2	32.5	-40.8	44.21	-	-	74	-29.79	121	102	V
	* 18.432	47.27	MAv1	32.5	-40.8	38.97	54	-15.03	-	-	121	102	V
5	21.52	47.66	Pk	33.6	-40	41.26	54	-12.74	74	-32.74	0-360	151	V
6	24.374	46.81	Pk	34.4	-38.7	42.51	54	-11.49	74	-31.49	0-360	102	V
3	25.289	46.89	Pk	34.8	-38.3	43.39	54	-10.61	74	-30.61	0-360	250	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

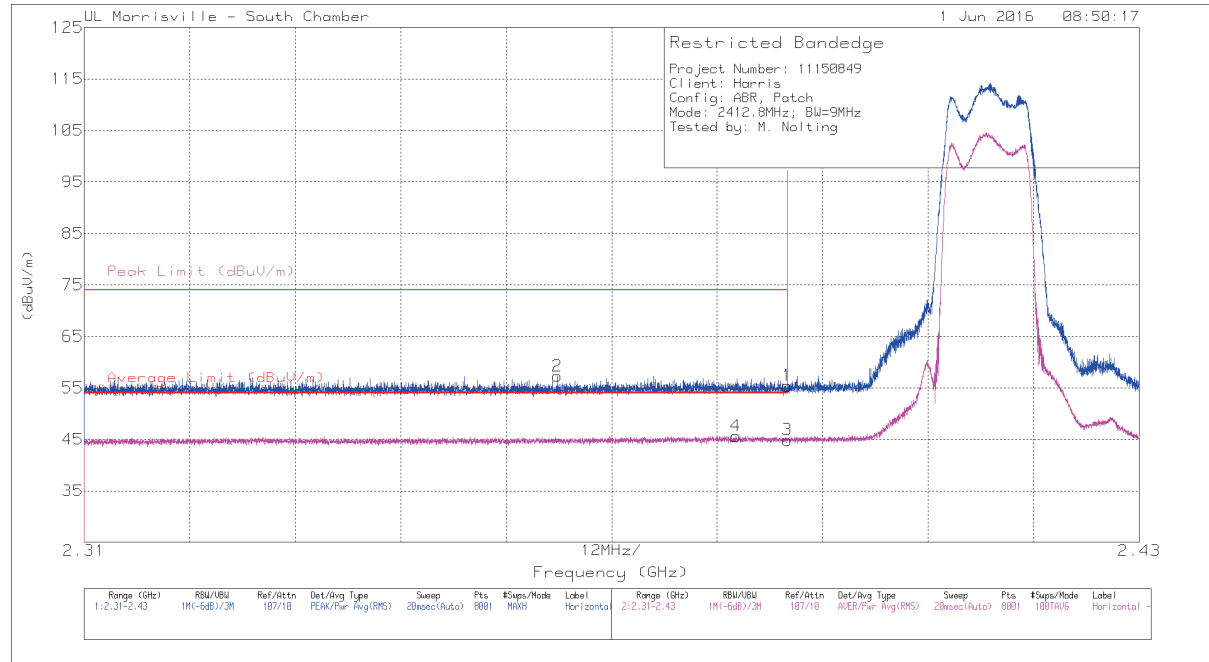
PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

## 9.4.2. PATCH Antenna

### ADJACENT RESTRICTED BAND LOW

#### HORIZONTAL



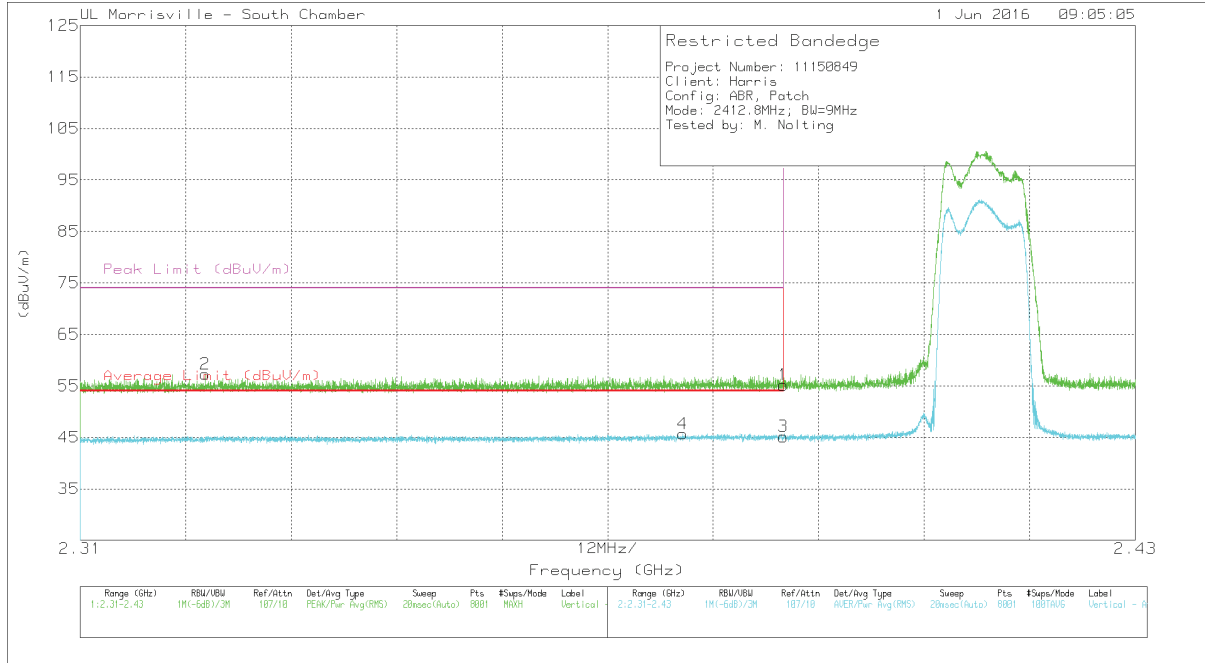
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/Filtr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	35.31	Pk	32.2	-24.2	2.1	10	55.41	-	-	74	-18.59	121	253	H
2	* 2.364	37.5	Pk	31.9	-24.2	2.1	10	57.3	-	-	74	-16.7	121	253	H
3	* 2.39	24.79	RMS	32.2	-24.2	2.1	10	44.89	54	-9.11	-	-	121	253	H
4	* 2.384	25.53	RMS	32.1	-24.1	2.1	10	45.63	54	-8.37	-	-	121	253	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# VERTICAL



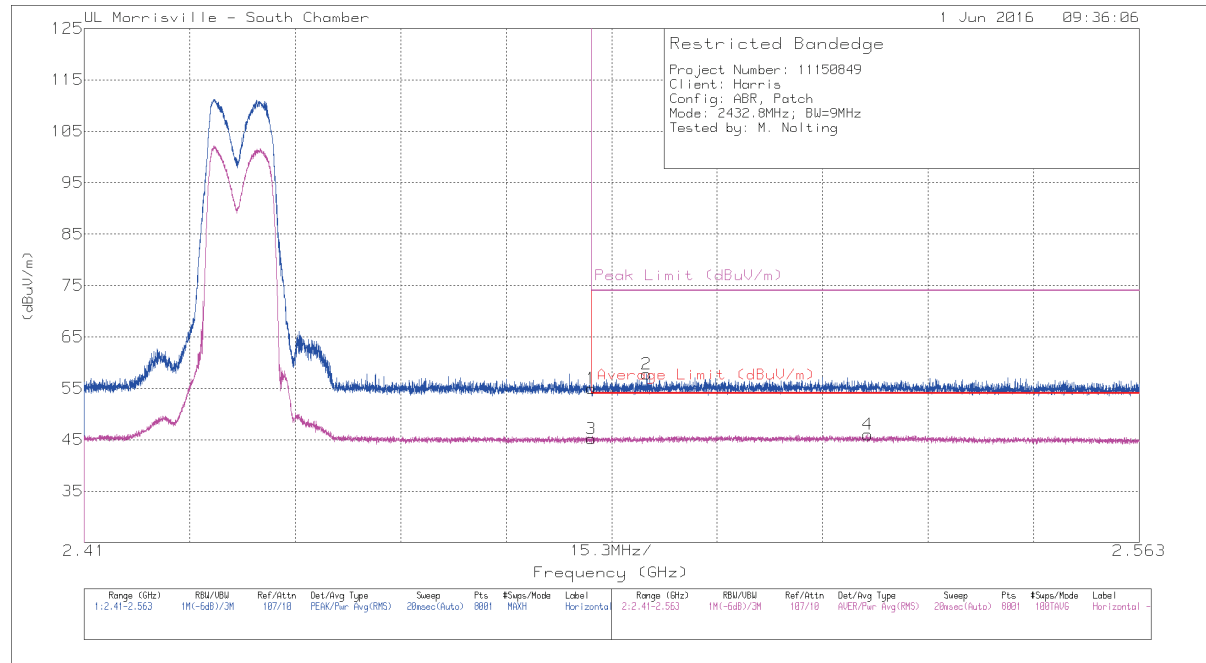
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fitr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 2.324	37.5	Pk	31.7	-23.9	2	10	57.3	-	-	74	-16.7	86	377	V
4	* 2.379	25.47	RMS	32.1	-24	2.1	10	45.67	54	-8.33	-	-	86	377	V
1	* 2.39	35.07	Pk	32.2	-24.2	2.1	10	55.17	-	-	74	-18.83	86	377	V
3	* 2.39	25.04	RMS	32.2	-24.2	2.1	10	45.14	54	-8.86	-	-	86	377	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

**ADJACENT RESTRICTED BAND HIGH**  
**HORIZONTAL**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ Fltr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	35.15	Pk	32.4	-24.7	2.1	10	54.95	-	-	74	-19.05	121	248	H
3	* 2.484	25.38	RMS	32.4	-24.7	2.1	10	45.18	54	-8.82	-	-	121	248	H
2	* 2.492	38.07	Pk	32.4	-24.8	2.1	10	57.77	-	-	74	-16.23	121	248	H
4	2.524	26.2	RMS	32.5	-24.9	2.2	10	46	54	-8	-	-	121	248	H

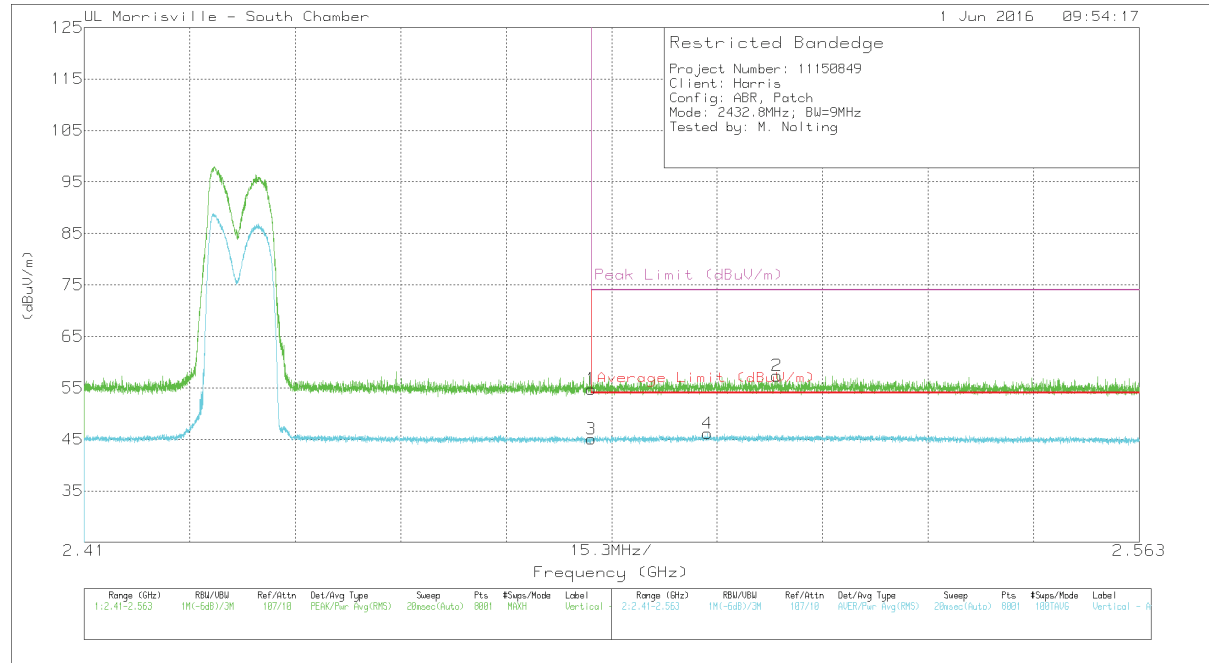
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection



# VERTICAL



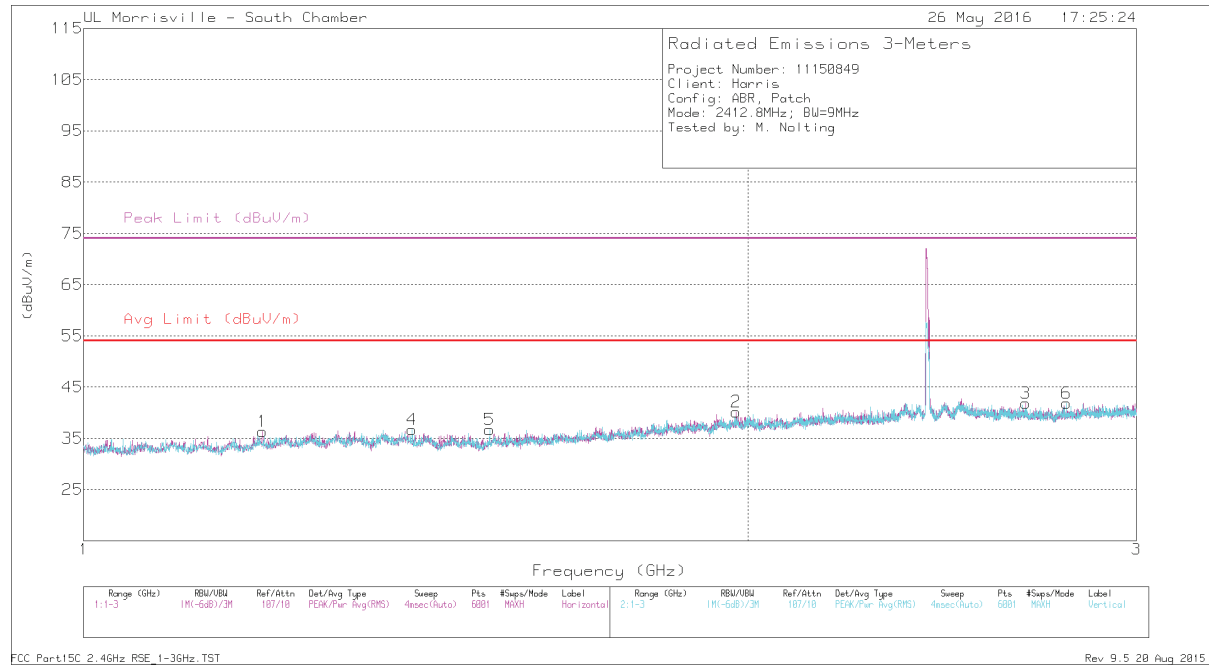
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl Fltr/Pad (dB)	BRF (dB)	Pad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.484	34.97	Pk	32.4	-24.7	2.1	10	54.77	-	-	74	-19.23	78	376	V
3	* 2.484	25.27	RMS	32.4	-24.7	2.1	10	45.07	54	-8.93	-	-	78	376	V
4	2.5	26.34	RMS	32.5	-24.8	2.1	10	46.14	54	-7.86	-	-	78	376	V
2	2.51	37.57	Pk	32.5	-24.9	2.2	10	57.37	-	-	74	-16.63	78	376	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

RMS - RMS detection

# **HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 1-3 MHz**

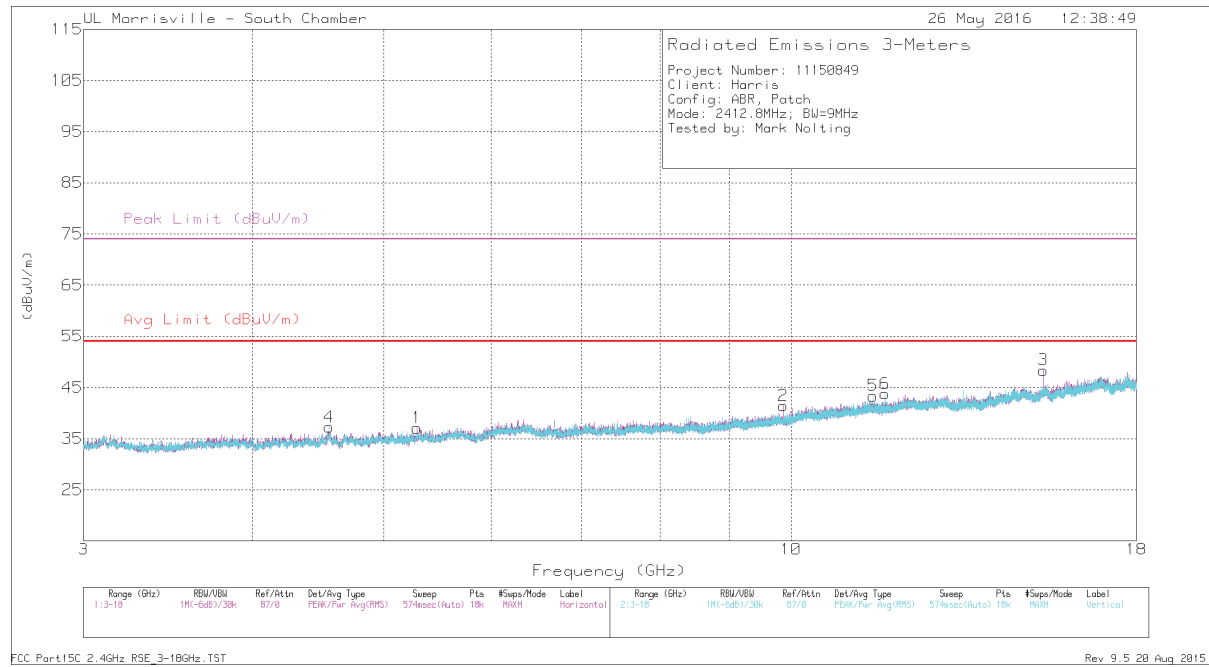


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 1.205	43.35	Pk	28.3	-35.8	.5	36.35	54	-17.65	74	-37.65	0-360	299	H
4	* 1.409	43.01	Pk	28.7	-35.6	.6	36.71	54	-17.29	74	-37.29	0-360	102	V
5	* 1.527	43.61	Pk	28	-35.5	.6	36.71	54	-17.29	74	-37.29	0-360	102	V
3	* 2.672	43.27	Pk	32.4	-34.7	.9	41.87	54	-12.13	74	-32.13	0-360	199	H
6	* 2.789	43.17	Pk	32.4	-34.5	.8	41.87	54	-12.13	74	-32.13	0-360	201	V
2	1.976	43.26	Pk	31.2	-35.1	.8	40.16	-	-	-	-	0-360	299	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# HARMONICS AND SPURIOUS EMISSIONS, LOW CHANNEL, 3-18 MHz



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 15.36	38.29	PK2	40	-23.7	54.59	-	-	74	-19.41	162	199	H
	* 15.36	30.51	MAv1	40	-23.7	46.81	54	-7.19	-	-	162	199	H
4	* 4.556	40.7	PK2	34	-32	42.7	-	-	74	-31.3	33	172	V
	* 4.557	28.88	MAv1	34	-32	30.88	54	-23.12	-	-	33	172	V
5	* 11.503	35.05	PK2	38.4	-25.2	48.25	-	-	74	-25.75	93	224	V
	* 11.501	23.23	MAv1	38.4	-25.2	36.43	54	-17.57	-	-	93	224	V
6	* 11.729	34.19	PK2	38.6	-25.1	47.69	-	-	74	-26.31	3	136	V
	* 11.731	22.84	MAv1	38.6	-25.1	36.34	54	-17.66	-	-	3	136	V
1	5.291	32.9	Pk	34.4	-30.2	37.1	-	-	-	-	0-360	102	H
2	9.871	30.86	Pk	37	-26.4	41.46	-	-	-	-	0-360	199	H

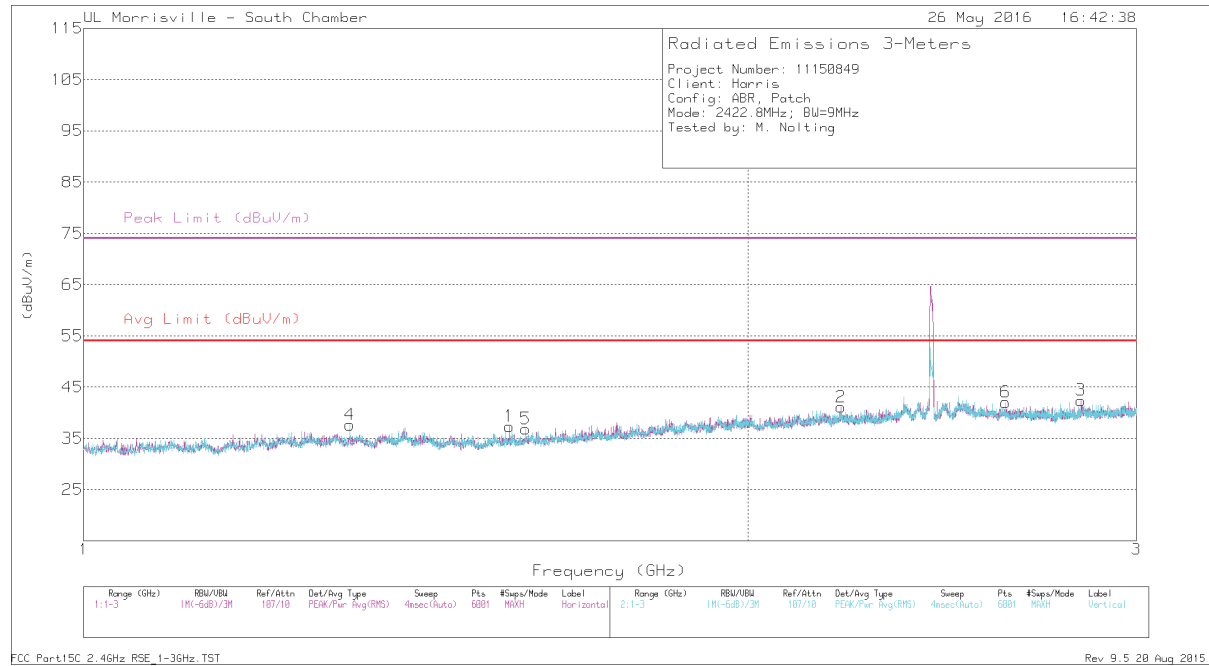
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 1-3 MHz**

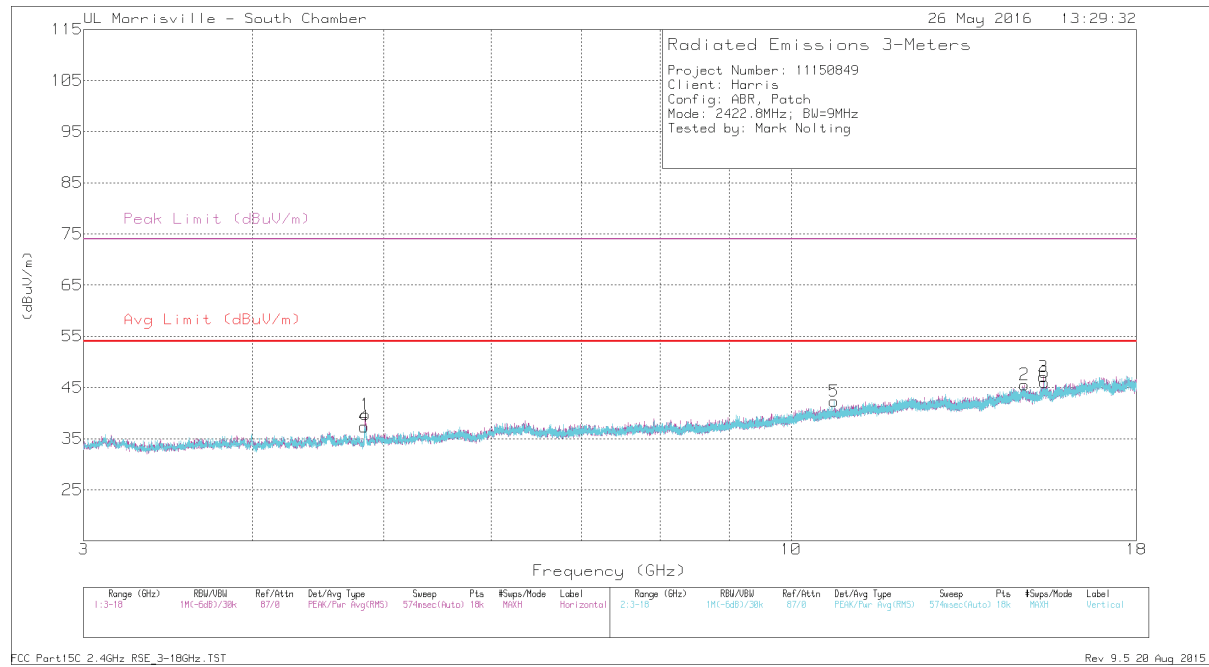


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 1.32	43.84	Pk	28.8	-35.6	.6	37.64	54	-16.36	74	-36.36	0-360	102	V
1	* 1.559	44.05	Pk	28.1	-35.4	.6	37.35	54	-16.65	74	-36.65	0-360	102	H
5	* 1.586	43.36	Pk	28.3	-35.4	.6	36.86	54	-17.14	74	-37.14	0-360	299	V
2	* 2.204	43.23	Pk	31.9	-34.9	.9	41.13	54	-12.87	74	-32.87	0-360	102	H
3	* 2.832	43.4	Pk	32.7	-34.5	.8	42.4	54	-11.6	74	-31.6	0-360	102	H
6	2.617	43.44	Pk	32.4	-34.8	1	42.04	-	-	-	-	0-360	102	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, MID CHANNEL, 3-18 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/ftr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.853	45.03	PK2	34.2	-31.4	47.83	-	-	74	-26.17	51	119	H
	* 4.846	33.42	MAv1	34.1	-31.3	36.22	54	-17.78	-	-	51	119	H
3	* 15.36	38.33	PK2	40	-23.7	54.63	-	-	74	-19.37	162	199	H
	* 15.36	30.68	MAv1	40	-23.7	46.98	54	-7.02	-	-	162	199	H
4	* 4.846	44.53	PK2	34.1	-31.3	47.33	-	-	74	-26.67	13	190	V
	* 4.846	32.76	MAv1	34.1	-31.3	35.56	54	-18.44	-	-	13	190	V
5	* 10.761	34.97	PK2	37.9	-25.4	47.47	-	-	74	-26.53	11	121	V
	* 10.761	23.07	MAv1	37.9	-25.4	35.57	54	-18.43	-	-	11	121	V
6	* 15.398	34.26	PK2	40	-23.2	51.06	-	-	74	-22.94	49	228	V
	* 15.4	22.93	MAv1	40	-23.2	39.73	54	-14.27	-	-	49	228	V
2	14.875	29.24	Pk	39.9	-23.6	45.54	-	-	-	-	0-360	199	H

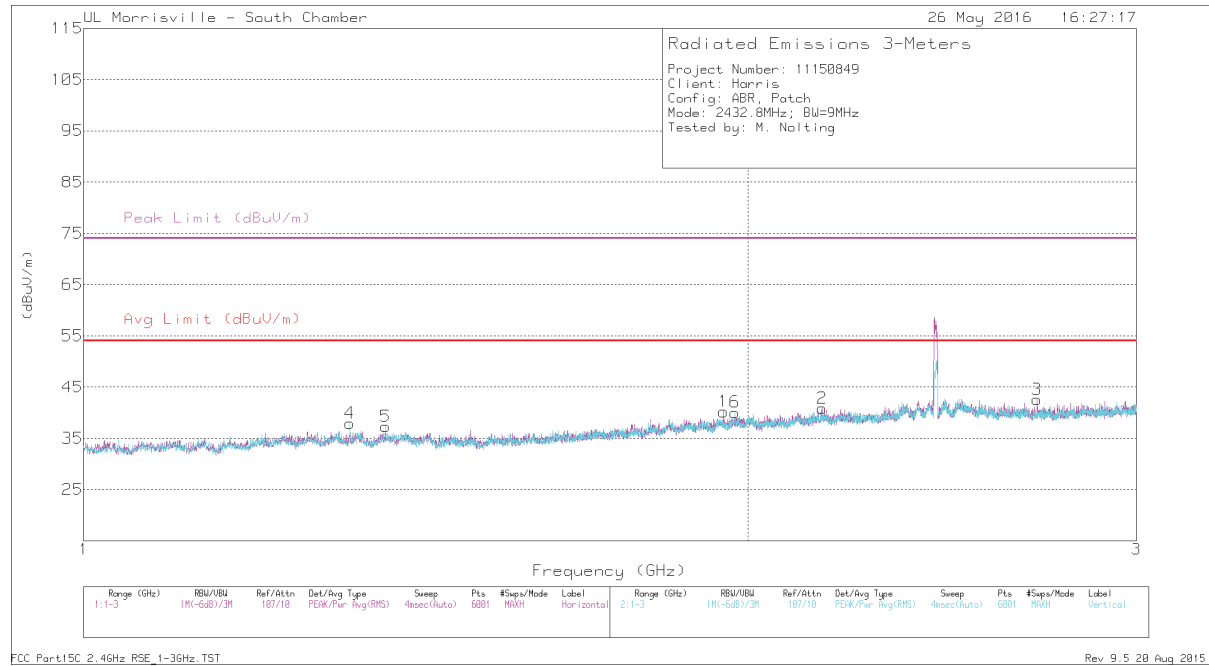
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 1-3 MHz**

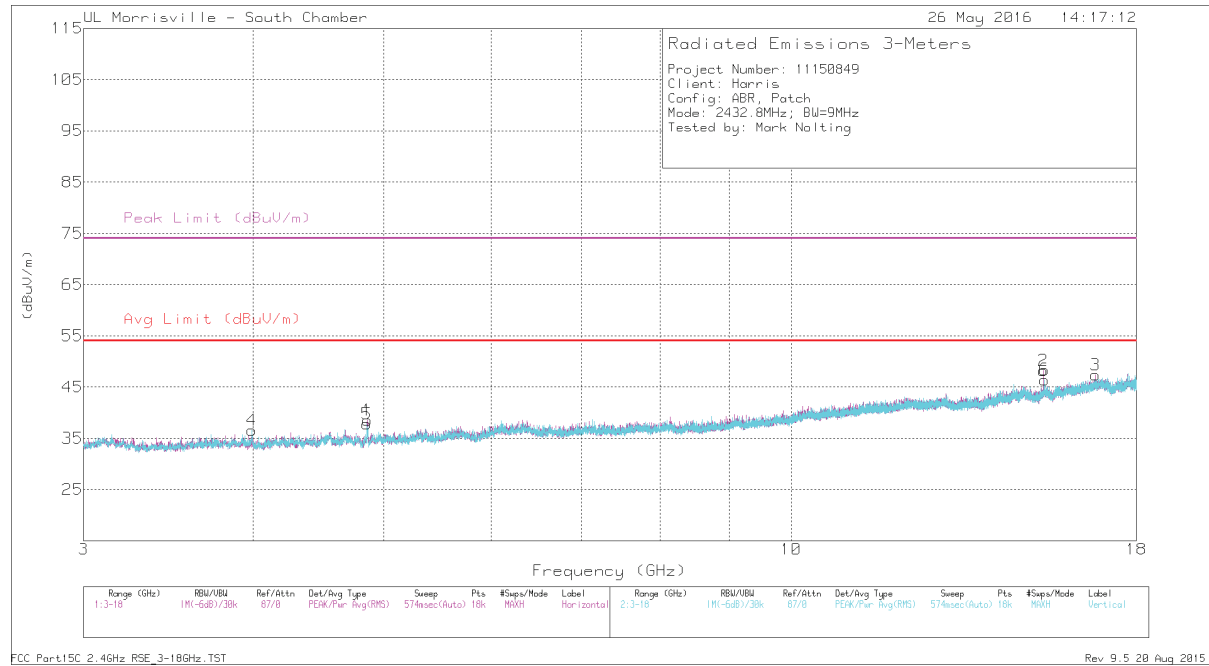


Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl (dB)	BRF (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 2.704	44	Pk	32.3	-34.5	.8	42.6	54	-11.4	74	-31.4	0-360	101	H
4	* 1.32	44.16	Pk	28.8	-35.6	.6	37.96	54	-16.04	74	-36.04	0-360	102	V
5	* 1.371	43.49	Pk	28.8	-35.6	.6	37.29	54	-16.71	74	-36.71	0-360	299	V
1	1.95	43.41	Pk	31.2	-35.1	.7	40.21	-	-	-	-	0-360	299	H
6	1.973	43.27	Pk	31.2	-35.1	.7	40.07	-	-	-	-	0-360	102	V
2	2.161	43.29	Pk	31.7	-35	.9	40.89	-	-	-	-	0-360	101	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

# **HARMONICS AND SPURIOUS EMISSIONS, HIGH CHANNEL, 3-18 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0069 (dB/m)	Amp/Cbl/filtr/ Pad (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 4.858	46.99	PK2	34.1	-31.5	49.59	-	-	74	-24.41	56	130	H
	* 4.86	32.92	MAv1	34.1	-31.5	35.52	54	-18.48	-	-	56	130	H
2	* 15.36	38.46	PK2	40	-23.7	54.76	-	-	74	-19.24	158	201	H
	* 15.36	30.67	MAv1	40	-23.7	46.97	54	-7.03	-	-	158	201	H
4	* 3.994	44.47	PK2	33.3	-32.4	45.37	-	-	74	-28.63	283	212	V
	* 3.994	33.53	MAv1	33.3	-32.4	34.43	54	-19.57	-	-	283	212	V
5	* 4.858	42.83	PK2	34.1	-31.5	45.43	-	-	74	-28.57	11	193	V
	* 4.864	30.52	MAv1	34.1	-31.5	33.12	54	-20.88	-	-	11	193	V
6	* 15.396	34.22	PK2	40	-23.2	51.02	-	-	74	-22.98	279	199	V
	* 15.395	22.9	MAv1	40	-23.2	39.7	54	-14.3	-	-	279	199	V
3	16.784	30.58	Pk	41.6	-24.8	47.38	-	-	-	-	0-360	200	H

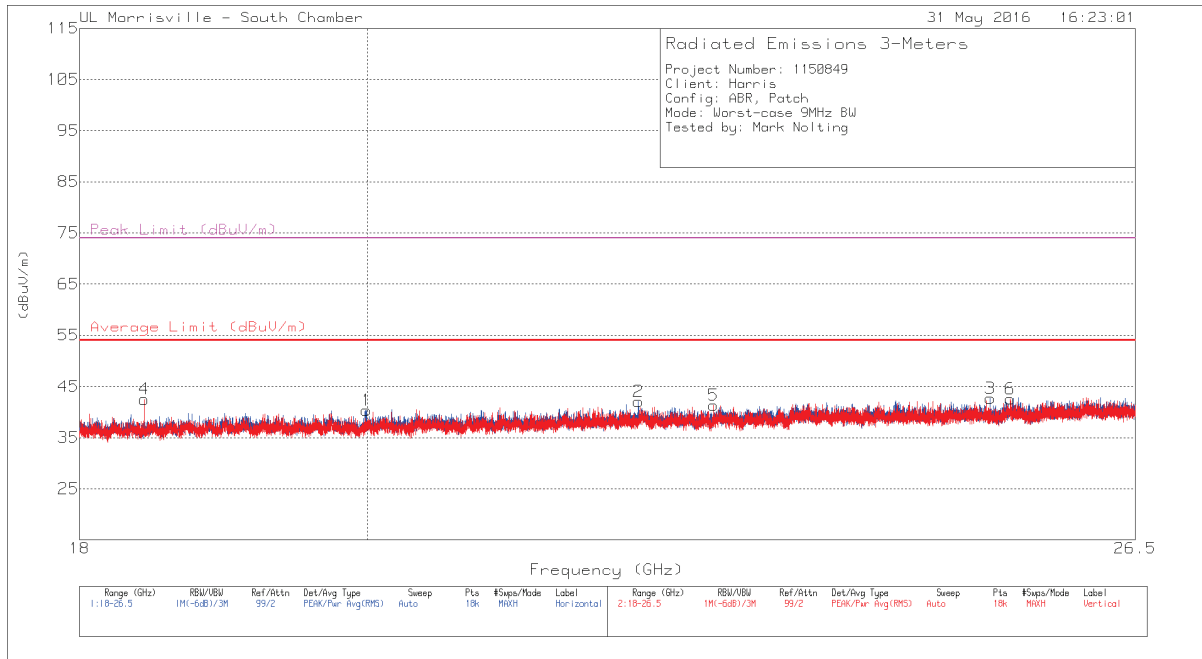
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

**WORST CASE HARMONICS AND SPURIOUS EMISSIONS 18-26 MHz**



Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF AT0076 (dB/m)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19.994	47.52	Pk	33.1	-40.3	40.32	54	-13.68	74	-33.68	0-360	249	H
2	* 22.09	47.97	Pk	34	-39.9	42.07	54	-11.93	74	-31.93	0-360	199	H
4	* 18.432	53.78	PK2	32.5	-40.8	45.48	-	-	74	-28.52	114	104	V
	* 18.432	49.76	MAV1	32.5	-40.8	41.46	54	-12.54	-	-	114	104	V
5	* 22.704	46.54	Pk	34.1	-39.3	41.34	54	-12.66	74	-32.66	0-360	152	V
3	25.129	46.45	Pk	34.5	-38.3	42.65	54	-11.35	74	-31.35	0-360	149	H
6	25.311	45.82	Pk	34.9	-38.2	42.52	54	-11.48	74	-31.48	0-360	152	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

PK2 - KDB558074 Method: Maximum Peak

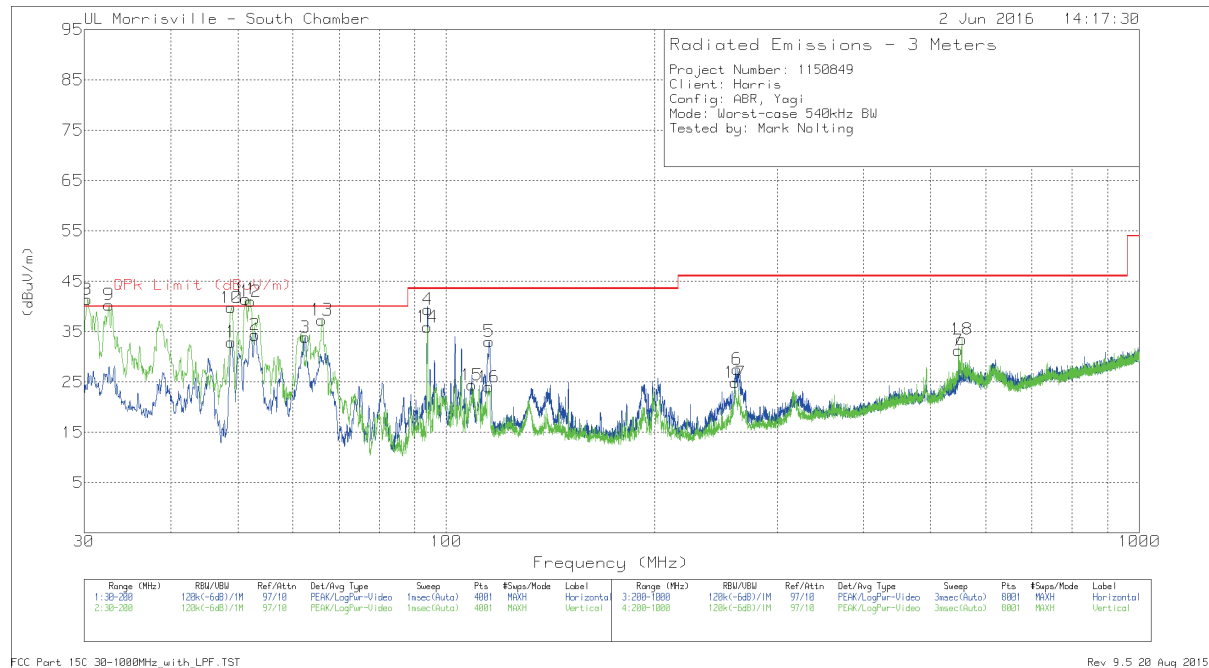
MAV1 - KDB558074 Option 1 Maximum RMS Average



## 9.5. WORST-CASE BELOW 1 GHz, 540 kHz MODE

### 9.5.1. YAGI Antenna

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



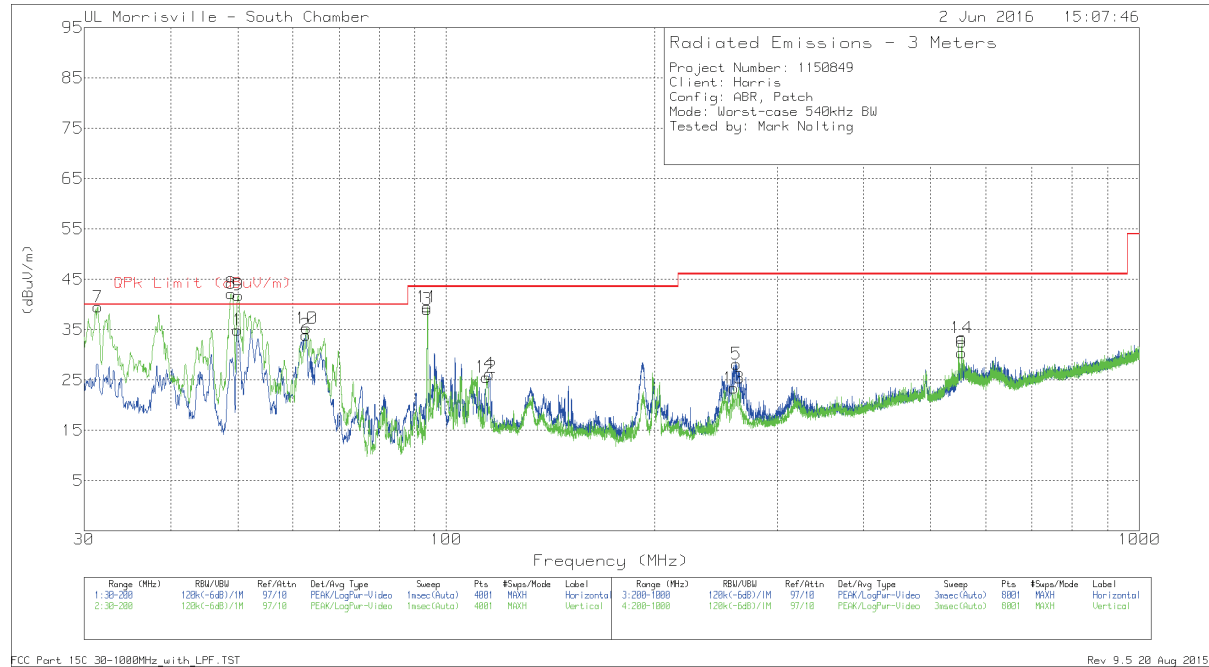
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	LPF (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 115.2975	46.16	Pk	17.6	-30.9	.2	33.06	43.52	-10.46	0-360	399	H
15	* 108.795	38.41	Pk	16.7	-30.9	.2	24.41	43.52	-19.11	0-360	102	V
16	* 115.17	37.1	Pk	17.6	-30.9	.2	24	43.52	-19.52	0-360	102	V
6	* 262.6	39.87	Pk	17.2	-29.8	.3	27.57	46.02	-18.45	0-360	100	H
17	* 261.2	37.37	Pk	17	-29.8	.3	24.87	46.02	-21.15	0-360	102	V
8	30.34	47.17	Pk	25.9	-31.8	.1	41.37	-	-	0-360	102	V
9	32.5925	47.93	Pk	24.1	-31.8	.1	40.33	-	-	0-360	102	V
1	48.955	51.24	Pk	13.1	-31.5	.1	32.94	-	-	0-360	399	H
10	48.955	58.04	Pk	13.1	-31.5	.1	39.74	-	-	0-360	102	V
11	51.335	60.57	Pk	12.4	-31.6	.1	41.47	-	-	0-360	102	V
12	52.185	60.3	Pk	12.2	-31.6	.1	41	-	-	0-360	102	V
2	52.95	54.04	Pk	12	-31.8	.1	34.34	-	-	0-360	399	H
3	62.5975	53.27	Pk	12	-31.5	.1	33.87	-	-	0-360	399	H
13	66.125	56.1	Pk	12.2	-31.1	.1	37.3	-	-	0-360	102	V
14	93.8775	54.32	Pk	12.5	-31	.1	35.92	-	-	0-360	102	V
4	94.005	57.82	Pk	12.5	-31	.1	39.42	-	-	0-360	299	H
7	548.3	36.75	Pk	22.9	-28.8	.4	31.25	-	-	0-360	199	H
18	554.3	38.87	Pk	22.9	-28.7	.4	33.47	-	-	0-360	102	V

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## 9.5.2. PATCH Antenna

### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	LPF (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
4	* 115.3825	39.32	Pk	17.6	-30.9	.2	26.22	43.52	-17.3	0-360	199	H
12	* 114.235	38.76	Pk	17.5	-30.9	.2	25.56	43.52	-17.96	0-360	102	V
5	* 262.3	40.48	Pk	17.2	-29.8	.3	28.18	46.02	-17.84	0-360	102	H
13	* 259.9	36.11	Pk	16.9	-29.9	.3	23.41	46.02	-22.61	0-360	99	V
7	31.4025	46.12	Pk	25.1	-31.8	.1	39.52	-	-	0-360	102	V
8	48.8913	60.48	Pk	13.1	-31.5	.1	42.18	-	-	0-360	102	V
1	49.975	53.51	Pk	12.8	-31.5	.1	34.91	-	-	0-360	299	H
9	50.1025	60.53	Pk	12.8	-31.6	.1	41.83	-	-	0-360	102	V
2	62.6825	53.35	Pk	12	-31.5	.1	33.95	-	-	0-360	399	H
10	62.895	54.76	Pk	12	-31.6	.1	35.26	-	-	0-360	102	V
11	93.835	57.89	Pk	12.5	-31	.1	39.49	-	-	0-360	102	V
3	93.8775	57.46	Pk	12.5	-31	.1	39.06	-	-	0-360	299	H
6	554.3	35.86	Pk	22.9	-28.7	.4	30.46	-	-	0-360	102	H
14	554.3	38.75	Pk	22.9	-28.7	.4	33.35	-	-	0-360	99	V

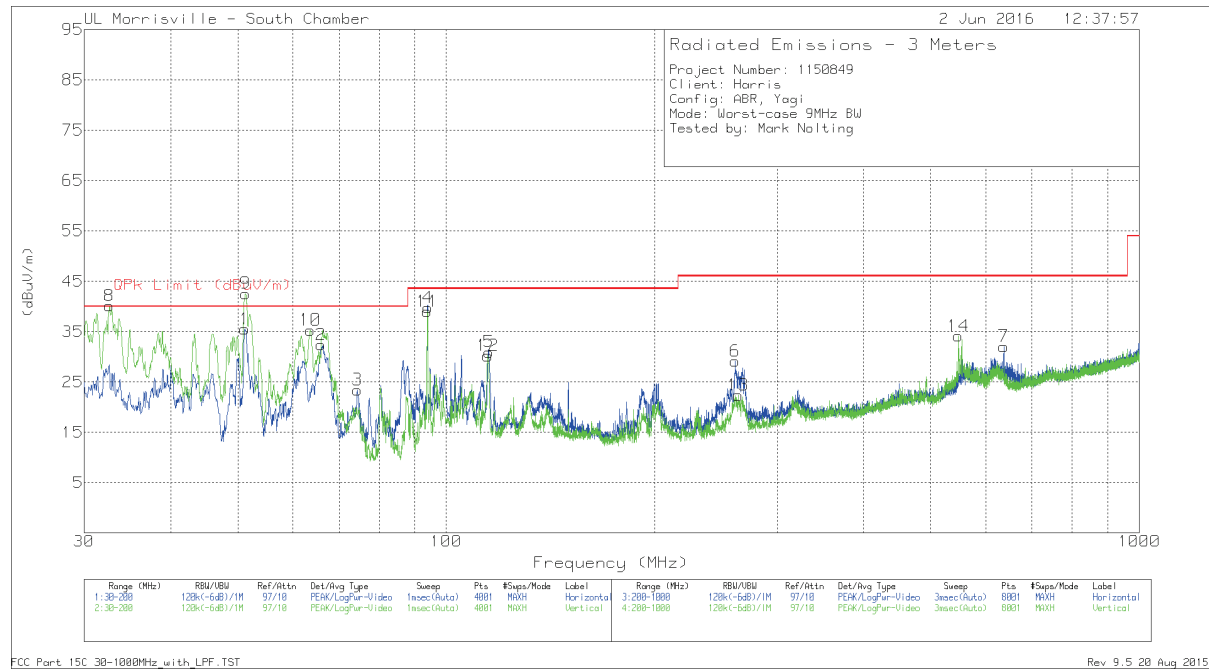
\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## 9.6. WORST-CASE BELOW 1 GHz, 9 MHz MODE

### 9.6.1. YAGI Antenna

#### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



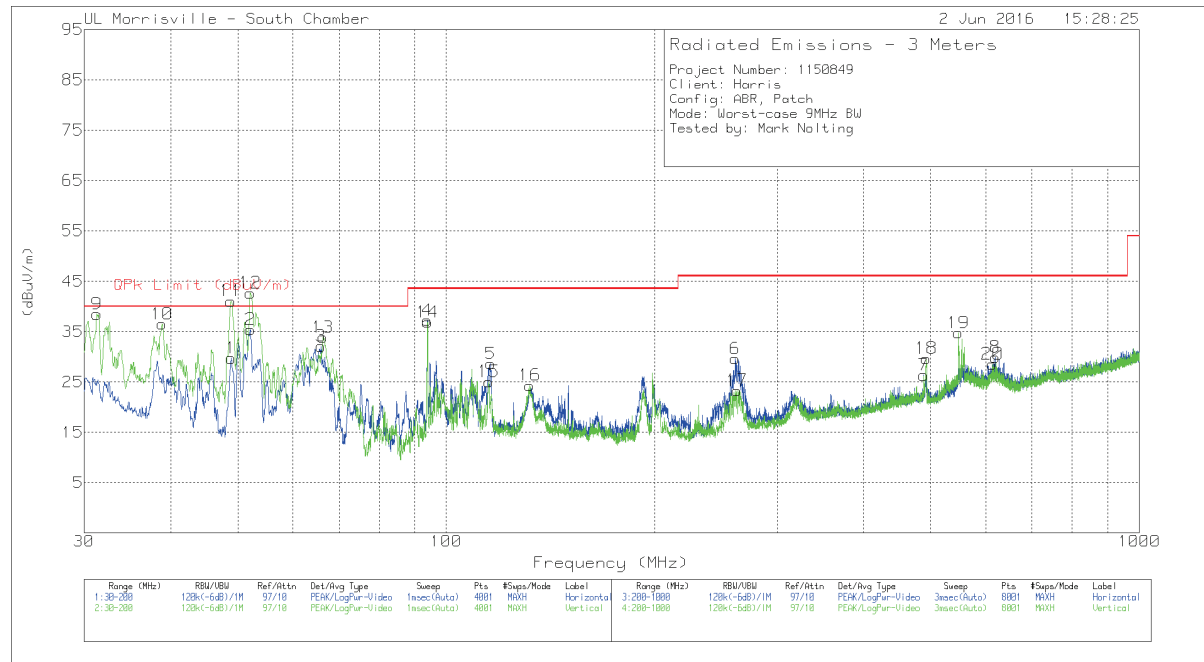
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	LPF (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
3	* 74.4125	42.14	Pk	12.4	-31.2	.1	23.44	40	-16.56	0-360	299	H
5	* 115.17	44.06	Pk	17.6	-30.9	.2	30.96	43.52	-12.56	0-360	199	H
12	* 114.7875	43.33	Pk	17.6	-30.9	.2	30.23	43.52	-13.29	0-360	102	V
6	* 261.2	41.62	Pk	17	-29.8	.3	29.12	46.02	-16.9	0-360	102	H
13	* 263.7	34.56	Pk	17.3	-29.8	.3	22.36	46.02	-23.66	0-360	199	V
8	32.635	47.75	Pk	24.1	-31.8	.1	40.15	-	-	0-360	102	V
1	51.165	54.52	Pk	12.5	-31.6	.1	35.52	-	-	0-360	399	H
9	51.3138	61.68	Pk	12.4	-31.6	.1	42.58	-	-	0-360	102	V
10	63.6175	54.5	Pk	12.1	-31.4	.1	35.3	-	-	0-360	102	V
2	65.955	51.19	Pk	12.2	-31.1	.1	32.39	-	-	0-360	399	H
11	93.92	57.4	Pk	12.5	-31	.1	39	-	-	0-360	102	V
4	94.005	58.16	Pk	12.5	-31	.1	39.76	-	-	0-360	199	H
14	548.3	39.65	Pk	22.9	-28.8	.4	34.15	-	-	0-360	102	V
7	637.5	35.95	Pk	24.3	-28.6	.4	32.05	-	-	0-360	102	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## 9.6.2. PATCH Antenna

### SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION)



Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AT0073 AF (dB/m)	Amp/Cbl (dB)	LPF (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
5	* 115.8925	41.55	Pk	17.7	-30.8	.2	28.65	43.52	-14.87	0-360	199	H
15	* 115.1488	38.16	Pk	17.6	-30.9	.2	25.06	43.52	-18.46	0-360	102	V
16	* 132	36.84	Pk	18.1	-30.8	.2	24.34	43.52	-19.18	0-360	102	V
6	* 261.2	42.14	Pk	17	-29.8	.3	29.64	46.02	-16.38	0-360	102	H
17	* 262.6	35.6	Pk	17.2	-29.8	.3	23.3	46.02	-22.72	0-360	102	V
20	* 613.8	33.07	Pk	23.7	-28.6	.4	28.57	46.02	-17.45	0-360	102	V
9	31.3175	45.08	Pk	25.1	-31.8	.1	38.48	-	-	0-360	102	V
10	38.8825	48.83	Pk	19.3	-31.7	.1	36.53	-	-	0-360	102	V
11	48.87	59.27	Pk	13.2	-31.5	.1	41.07	-	-	0-360	102	V
1	48.9125	48.02	Pk	13.1	-31.5	.1	29.72	-	-	0-360	399	H
2	52.1425	54.72	Pk	12.2	-31.6	.1	35.42	-	-	0-360	399	H
12	52.1425	61.98	Pk	12.2	-31.6	.1	42.68	-	-	0-360	102	V
3	65.955	50.89	Pk	12.2	-31.1	.1	32.09	-	-	0-360	199	H
13	66.3588	52.79	Pk	12.2	-31.2	.1	33.89	-	-	0-360	102	V
4	93.92	55.64	Pk	12.5	-31	.1	37.24	-	-	0-360	299	H
14	93.9625	55.27	Pk	12.5	-31	.1	36.87	-	-	0-360	102	V
7	488.3	32.75	Pk	22.1	-28.9	.4	26.35	-	-	0-360	199	H
18	492.9	35.99	Pk	22.1	-28.8	.4	29.69	-	-	0-360	102	V
19	548.3	40.24	Pk	22.9	-28.8	.4	34.74	-	-	0-360	102	V
8	619.6	34.34	Pk	23.7	-28.5	.4	29.94	-	-	0-360	299	H

\* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

Pk - Peak detector

## 10. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

FCC §15.207 (a)

Frequency of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 <sup>*</sup>	56 to 46 <sup>*</sup>
0.5-5	56	46
5-30	60	50

<sup>\*</sup> Decreases with the logarithm of the frequency.

### TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80 cm above the horizontal ground plane. The EUT is configured in accordance with ANSI C63.4.

The receiver is set to a resolution bandwidth of 9 kHz. Peak detection is used unless otherwise noted as quasi-peak or average.

Line conducted data is recorded for both NEUTRAL and HOT lines.

### RESULTS

This testing was deemed not applicable because the EUT is supplied via an aircraft's APU (auxiliary power unit) and not via direct or indirect connection to the public utility (AC) power line.