

# Digital Path

## ADDENDUM TO TEST REPORT 96184-9

**GEN6 CPE**  
**Models: 2x-24 and 2x-29**

**Tested To The Following Standards:**

**FCC Part 15 Subpart C Section(s)**

**15.207**

**&**

**FCC Part 15 Subpart E Section(s)**

**15.407**

**Report No.: 96184-9A**

**Date of issue: May 6, 2015**



This test report bears the accreditation symbol indicating that the testing performed herein meets the test and reporting requirements of ISO/IEC 17025 under the applicable scope of EMC testing for CKC Laboratories, Inc.

We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.

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# ADMINISTRATIVE INFORMATION

## Test Report Information

**REPORT PREPARED FOR:**

Digital Path  
275 Air Park Blvd. Suite 500  
Chico, CA 95973

**REPORT PREPARED BY:**

Terri Rayle  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

**REPRESENTATIVE:** Brock Eastman  
**Customer Reference Number:** DP-CA-102

**Project Number:** 96184

**DATE OF EQUIPMENT RECEIPT:**

February 10, 2015

**DATE(S) OF TESTING:**

February 10-20 & March 1, 2015

## Revision History

**Original:** Testing of GEN6 CPE Models: 2x-24 and 2x-29 to FCC Part 15 Subpart C Section(s), 15.207 & FCC Part 15 Subpart E Section(s) 15.407.

**Addendum A:** Add a manufacturer's declaration statement to the Conditions During Testing, corrected the referenced section from Section II.C.1 to Section II.H.1 in section 15.407(a)(1)(i), added a voltage varied statement to the Test Conditions in section 15.407 (a)(1)(iii), replaced data for spurious emissions, and added the Frequency Stability section 15.407(g).

## Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.



*Steve Behm*  
**Director of Quality Assurance & Engineering Services**  
**CKC Laboratories, Inc.**

## Test Facility Information



Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

**TEST LOCATION(S):**  
CKC Laboratories, Inc.  
5046 Sierra Pines Drive  
Mariposa, CA 95338

## Software Versions

CKC Laboratories Proprietary Software	Version
EMITest Emissions	5.00.14
Immunity	5.00.07

## Site Registration & Accreditation Information

Location	CB #	TAIWAN	CANADA	FCC	JAPAN
Mariposa A	US0103	SL2-IN-E-1147R	3082A-2	90477	A-0136
Mariposa D	US0103	SL2-IN-E-1147R	3082A-1	784962	A-0136

## SUMMARY OF RESULTS

### Standard / Specification: FCC Part 15 Subpart C

Test Procedure	Description	Modifications*	Results
15.207	Conducted Emissions	NA	Pass
15.215(c)	Occupied Bandwidth	NA	Pass

### Standard / Specification: FCC Part 15 Subpart E

Test Procedure	Description	Modifications*	Results
15.407(a)(1)(i)	30 Degree Elevation Angle	NA	Pass
15.407 (a)(1)(iii)	Maximum Conducted Output Power and Power Spectral Density	NA	Pass
15.407(b)(1)	Undesirable Emissions and Band Edge	NA	Pass
15.407(g)	Frequency Stability	NA	Pass

## Modifications\* During Testing

This list is a summary of the modifications made to the equipment during testing.

### Summary of Conditions

No modifications were made during testing.

**\*Modifications listed above must be incorporated into all production units.**

## Conditions During Testing

This list is a summary of the conditions noted to the equipment during testing.

### Summary of Conditions

The manufacturer declares that the EUT is intended exclusively for fixed point-to-point operation.

The EUT utilizes two RF chains simultaneously.

Chain 0 represents transmissions for the Horizontal Polarity.

Chain 1 represents transmissions for the Vertical Polarity.

Two Configurations were tested to include the two possible antennas used with the EUT.

Only one antenna can be used with the EUT at one time.

Both configurations utilize the same PCB. The only difference between the configurations is the antenna used.

Model 2x-24 represents use of the 24dBi antenna. Model 2x-29 represents use of the 29dBi antenna.

For the 24dBi antenna, a power setting of 24dBm is used to comply with the limits.

For the 29dBi antenna, a power setting of 20dBm is used to comply with the limits.

For each band, testing was performed in two operating bandwidths: 5MHz and 10MHz.

This project is testing two different bands of operation: 5.15-5.25GHz, and 5.725-5.85GHz.

FCC Part 15.407 covers the 5.15-5.25GHz band.

FCC Part 15.247 covers the 5.725-5.85GHz band and the testing is contained in a different report.

The screen captured dates on the plots are incorrect. Actual testing dates are noted on the section's datasheet.

## EQUIPMENT UNDER TEST (EUT)

### EQUIPMENT UNDER TEST

#### GEN6 CPE

Manuf: Digital Path

Model: 2x-24 and 2x-29

Serial: C6:A6

#### POE Power Adapter

Manuf: HP

Model: FAS24000050-C44

Serial: NA

### PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

#### AC/DC Power Adapter

Manuf: HP

Model: Series PPP012H-S

Serial: F12941126327228

#### Laptop Computer

Manuf: HP

Model: Probook 6565b

Serial: NA

## FCC PART 15 SUBPART C

### 15.207 AC Conducted Emissions

#### Test Data

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **96184** Date: **2/17/2015**  
 Test Type: **Conducted Emissions** Time: **7:10:51 PM**  
 Equipment: **GEN6 CPE** Sequence#: **4**  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29 120V 60Hz  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP05624	Attenuator	PE7010-10	1/15/2015	1/15/2017
T2	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T3	AN02609	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
T4	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	NA
GEN6 CPE*	Digital Path	2x-29	C6:A6

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

AC Conducted Emissions

The EUT is configured to operate at the middle channel (5210MHz), transmitting continuously.

Software Used: art2\_ver2\_28\_6BIN

Frequency Range of Interest: 0.15 - 30MHz

RBW = 9kHz; VBW &gt; RBW

Tx Power Setting = 24dBm

Bandwidth setting = 5MHz

Data rate = 19.5Mbps

Environmental Conditions:

Temperature: 18.3°C

Humidity: 41 %

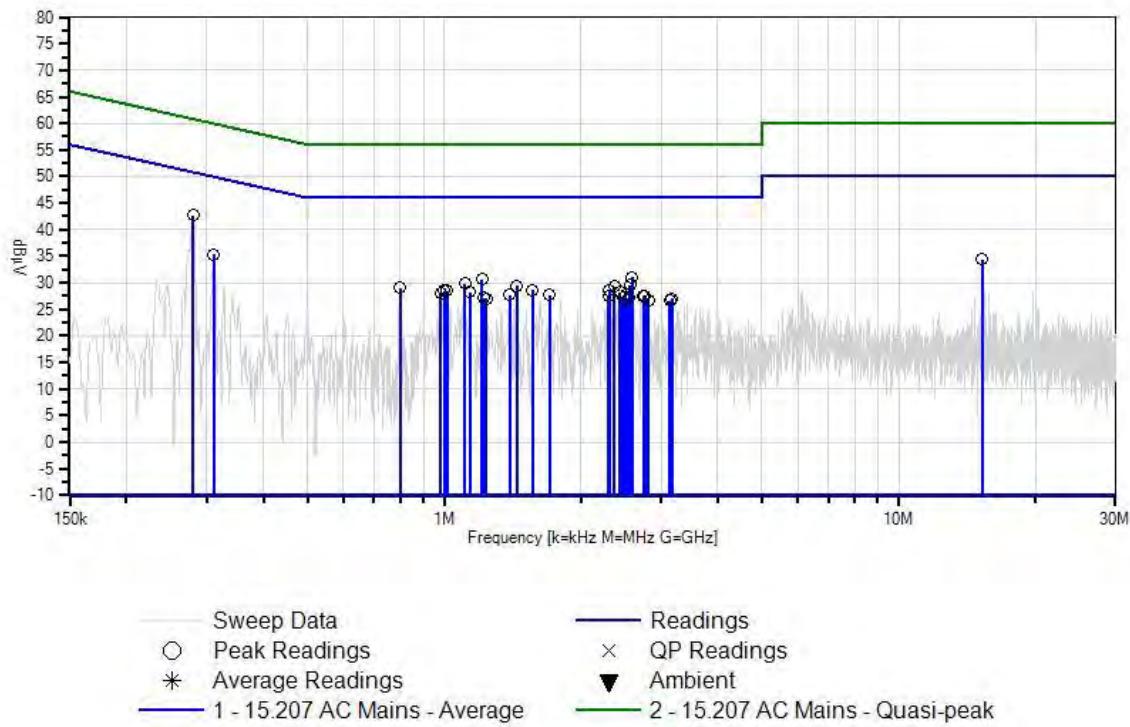
Atmospheric Pressure: 97.8 kPa

Ext Attn: 0 dB

#	Freq MHz	Rdng dB $\mu$ V	Reading listed by margin.				Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
			T1 dB	T2 dB	T3 dB	T4 dB					
1	280.170k	32.5	+9.9	+0.0	+0.2	+0.1	+0.0	42.7	50.8	-8.1	Black
2	311.440k	25.2	+9.9	+0.0	+0.1	+0.1	+0.0	35.3	49.9	-14.6	Black
3	2.587M	20.9	+9.9	+0.1	+0.1	+0.1	+0.0	31.1	46.0	-14.9	Black
4	1.213M	20.3	+9.9	+0.1	+0.2	+0.1	+0.0	30.6	46.0	-15.4	Black
5	15.256M	23.9	+9.9	+0.3	+0.1	+0.2	+0.0	34.4	50.0	-15.6	Black
6	1.111M	19.5	+9.9	+0.1	+0.2	+0.1	+0.0	29.8	46.0	-16.2	Black
7	2.561M	19.4	+9.9	+0.1	+0.1	+0.1	+0.0	29.6	46.0	-16.4	Black
8	1.447M	19.2	+9.9	+0.1	+0.2	+0.1	+0.0	29.5	46.0	-16.5	Black
9	2.366M	19.1	+9.9	+0.1	+0.1	+0.1	+0.0	29.3	46.0	-16.7	Black
10	800.122k	18.8	+9.9	+0.1	+0.2	+0.1	+0.0	29.1	46.0	-16.9	Black
11	1.566M	18.4	+9.9	+0.1	+0.2	+0.1	+0.0	28.7	46.0	-17.3	Black
12	2.310M	18.4	+9.9	+0.1	+0.1	+0.1	+0.0	28.6	46.0	-17.4	Black
13	1.001M	18.2	+9.9	+0.1	+0.2	+0.1	+0.0	28.5	46.0	-17.5	Black
14	1.013M	18.2	+9.9	+0.1	+0.2	+0.1	+0.0	28.5	46.0	-17.5	Black
15	2.438M	18.0	+9.9	+0.1	+0.1	+0.1	+0.0	28.2	46.0	-17.8	Black
16	1.141M	17.9	+9.9	+0.1	+0.2	+0.1	+0.0	28.2	46.0	-17.8	Black

17	983.523k	17.8	+9.9	+0.1	+0.2	+0.1	+0.0	28.1	46.0	-17.9	Black
18	2.510M	17.7	+9.9	+0.1	+0.1	+0.1	+0.0	27.9	46.0	-18.1	Black
19	1.396M	17.4	+9.9	+0.1	+0.2	+0.1	+0.0	27.7	46.0	-18.3	Black
20	1.706M	17.4	+9.9	+0.1	+0.2	+0.1	+0.0	27.7	46.0	-18.3	Black
21	2.744M	17.4	+9.9	+0.1	+0.1	+0.1	+0.0	27.6	46.0	-18.4	Black
22	2.765M	17.3	+9.9	+0.1	+0.1	+0.1	+0.0	27.5	46.0	-18.5	Black
23	2.298M	17.2	+9.9	+0.1	+0.1	+0.1	+0.0	27.4	46.0	-18.6	Black
24	2.476M	17.1	+9.9	+0.1	+0.1	+0.1	+0.0	27.3	46.0	-18.7	Black
25	2.544M	17.0	+9.9	+0.1	+0.1	+0.1	+0.0	27.2	46.0	-18.8	Black
26	1.226M	16.8	+9.9	+0.1	+0.2	+0.1	+0.0	27.1	46.0	-18.9	Black
27	1.239M	16.7	+9.9	+0.1	+0.2	+0.1	+0.0	27.0	46.0	-19.0	Black
28	3.174M	16.8	+9.9	+0.1	+0.1	+0.1	+0.0	27.0	46.0	-19.0	Black
29	2.812M	16.6	+9.9	+0.1	+0.1	+0.1	+0.0	26.8	46.0	-19.2	Black
30	3.140M	16.4	+9.9	+0.1	+0.1	+0.1	+0.0	26.6	46.0	-19.4	Black

CKC Laboratories, Inc. Date: 2/17/2015 Time: 7:10:51 PM Digital Path WO#: 96184  
 15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 4 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **96184** Date: **2/17/2015**  
 Test Type: **Conducted Emissions** Time: **7:12:53 PM**  
 Equipment: **GEN6 CPE** Sequence#: **5**  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29 120V 60Hz  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP05624	Attenuator	PE7010-10	1/15/2015	1/15/2017
T2	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T3	AN02609	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
T4	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	NA
GEN6 CPE*	Digital Path	2x-29	C6:A6

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

AC Conducted Emissions  
 The EUT is configured to operate at the middle channel (5210MHz), transmitting continuously.

Software Used: art2\_ver2\_28\_6BIN

Frequency Range of Interest: 0.15 - 30MHz  
 RBW = 9kHz; VBW > RBW  
 Tx Power Setting = 24dBm  
 Bandwidth setting = 5MHz  
 Data rate = 19.5Mbps

Environmental Conditions:

Temperature: 18.3°C  
 Humidity: 41 %  
 Atmospheric Pressure: 97.8 kPa

Ext Attn: 0 dB

**Measurement Data:**

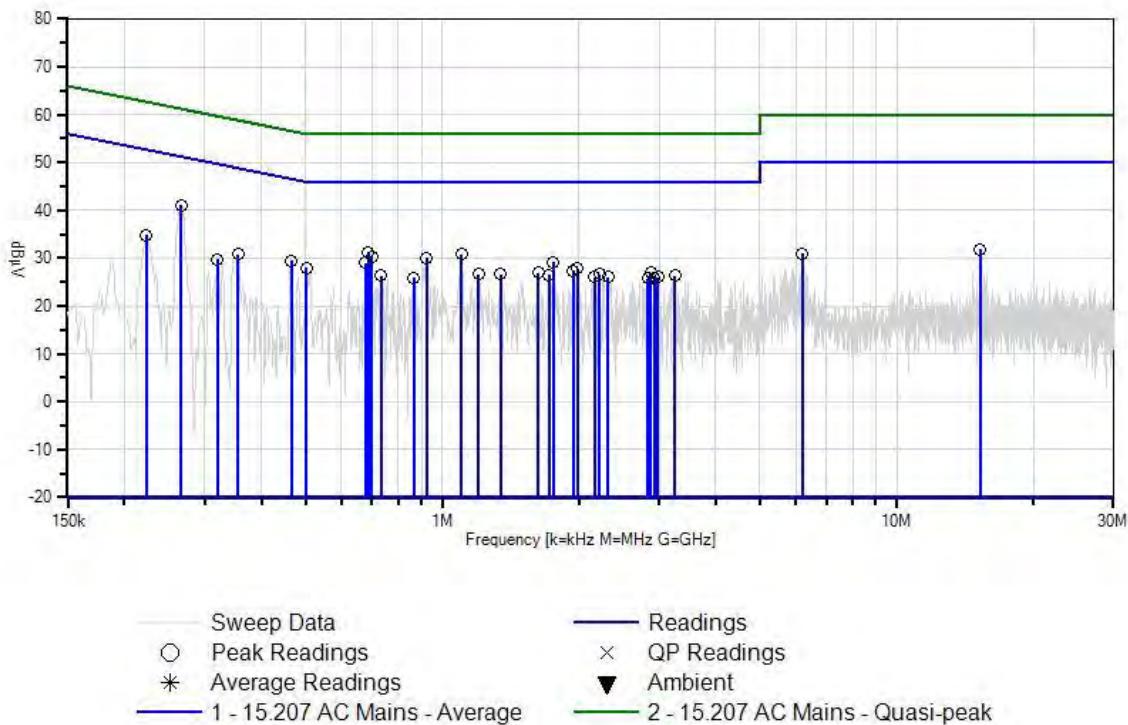
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	266.353k	30.9	+9.9	+0.0	+0.2	+0.1	+0.0	41.1	51.2	-10.1	White
2	688.860k	20.8	+9.9	+0.1	+0.2	+0.1	+0.0	31.1	46.0	-14.9	White
3	1.103M	20.5	+9.9	+0.1	+0.2	+0.1	+0.0	30.8	46.0	-15.2	White
4	699.041k	20.0	+9.9	+0.1	+0.2	+0.1	+0.0	30.3	46.0	-15.7	White
5	923.985k	19.7	+9.9	+0.1	+0.2	+0.1	+0.0	30.0	46.0	-16.0	White
6	1.753M	18.9	+9.9	+0.1	+0.2	+0.1	+0.0	29.2	46.0	-16.8	White
7	677.224k	18.7	+9.9	+0.1	+0.2	+0.1	+0.0	29.0	46.0	-17.0	White
8	465.607k	19.3	+9.9	+0.0	+0.2	+0.1	+0.0	29.5	46.6	-17.1	White
9	223.448k	24.6	+9.9	+0.0	+0.2	+0.1	+0.0	34.8	52.7	-17.9	White
10	355.072k	20.7	+9.9	+0.0	+0.1	+0.1	+0.0	30.8	48.8	-18.0	White
11	502.695k	17.8	+9.9	+0.0	+0.2	+0.1	+0.0	28.0	46.0	-18.0	White
12	1.987M	17.7	+9.9	+0.1	+0.1	+0.1	+0.0	27.9	46.0	-18.1	White
13	15.256M	21.3	+9.9	+0.3	+0.1	+0.2	+0.0	31.8	50.0	-18.2	White
14	1.940M	17.2	+9.9	+0.1	+0.1	+0.1	+0.0	27.4	46.0	-18.6	White
15	2.880M	16.8	+9.9	+0.1	+0.1	+0.1	+0.0	27.0	46.0	-19.0	White
16	1.630M	16.7	+9.9	+0.1	+0.2	+0.1	+0.0	27.0	46.0	-19.0	White
17	6.193M	20.6	+9.9	+0.2	+0.1	+0.1	+0.0	30.9	50.0	-19.1	White
18	1.200M	16.4	+9.9	+0.1	+0.2	+0.1	+0.0	26.7	46.0	-19.3	White
19	2.221M	16.5	+9.9	+0.1	+0.1	+0.1	+0.0	26.7	46.0	-19.3	White
20	1.345M	16.3	+9.9	+0.1	+0.2	+0.1	+0.0	26.6	46.0	-19.4	White
21	1.719M	16.2	+9.9	+0.1	+0.2	+0.1	+0.0	26.5	46.0	-19.5	White
22	734.674k	16.0	+9.9	+0.1	+0.2	+0.1	+0.0	26.3	46.0	-19.7	White
23	3.250M	16.1	+9.9	+0.1	+0.1	+0.1	+0.0	26.3	46.0	-19.7	White
24	320.893k	19.7	+9.9	+0.0	+0.1	+0.1	+0.0	29.8	49.7	-19.9	White

25	2.166M	15.9	+9.9	+0.1	+0.1	+0.1	+0.0	26.1	46.0	-19.9	White
26	2.315M	15.9	+9.9	+0.1	+0.1	+0.1	+0.0	26.1	46.0	-19.9	White
27	2.982M	15.8	+9.9	+0.1	+0.1	+0.1	+0.0	26.0	46.0	-20.0	White
28	864.843k	15.6	+9.9	+0.1	+0.2	+0.1	+0.0	25.9	46.0	-20.1	White
29	2.931M	15.7	+9.9	+0.1	+0.1	+0.1	+0.0	25.9	46.0	-20.1	White
30	2.833M	15.5	+9.9	+0.1	+0.1	+0.1	+0.0	25.7	46.0	-20.3	White

CKC Laboratories, Inc. Date: 2/17/2015 Time: 7:12:53 PM Digital Path WO#: 96184  
 15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 5 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **96184** Date: 2/17/2015  
 Test Type: **Conducted Emissions** Time: 6:38:02 PM  
 Equipment: **GEN6 CPE** Sequence#: 3  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29 120V 60Hz  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP05624	Attenuator	PE7010-10	1/15/2015	1/15/2017
T2	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T3	AN02609	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
T4	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	NA
GEN6 CPE*	Digital Path	2x-29	C6:A6

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

AC Conducted Emissions  
 The EUT is configured to operate at the middle channel (5210MHz), transmitting continuously.

Software Used: art2\_ver2\_28\_6BIN

Frequency Range of Interest: 0.15 - 30MHz  
 RBW = 9kHz; VBW > RBW  
 Tx Power Setting = 24dBm  
 Bandwidth setting = 10MHz  
 Data rate = 19.5Mbps

Environmental Conditions:

Temperature: 18.3°C  
 Humidity: 41 %  
 Atmospheric Pressure: 97.8 kPa

Ext Attn: 0 dB

**Measurement Data:**

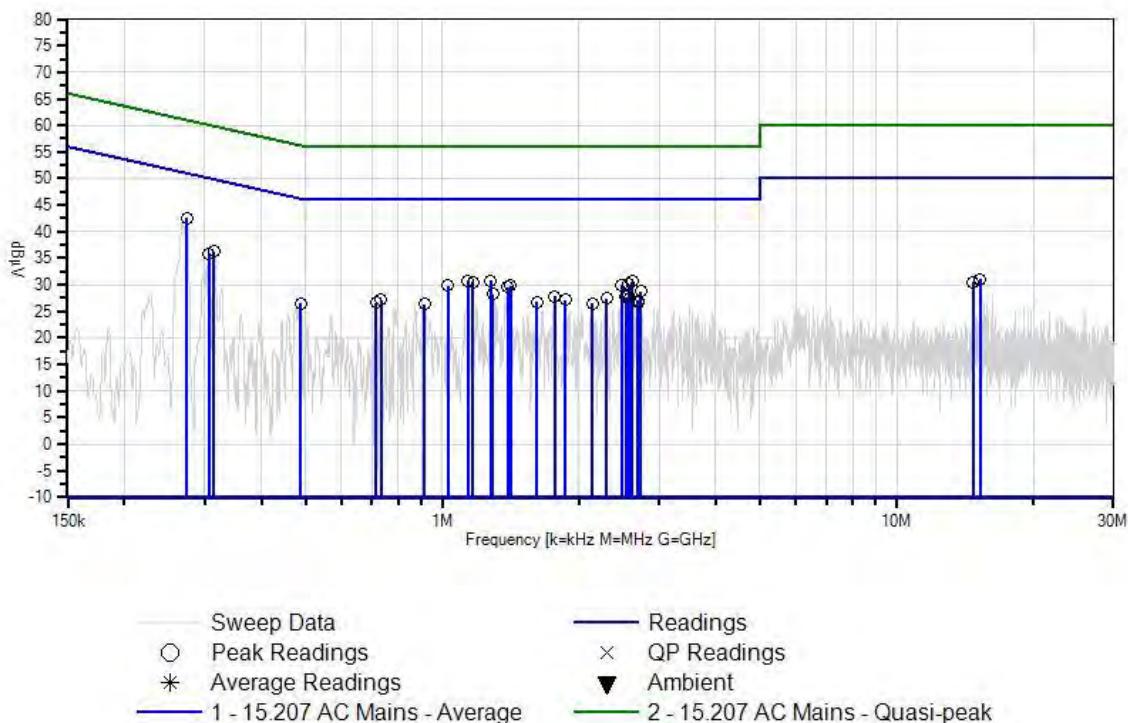
Reading listed by margin.

Test Lead: Black

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	274.352k	32.4	+9.9	+0.0	+0.2	+0.1	+0.0	42.6	51.0	-8.4	Black
2	315.076k	26.2	+9.9	+0.0	+0.1	+0.1	+0.0	36.3	49.8	-13.5	Black
3	307.076k	25.8	+9.9	+0.0	+0.1	+0.1	+0.0	35.9	50.0	-14.1	Black
4	1.141M	20.5	+9.9	+0.1	+0.2	+0.1	+0.0	30.8	46.0	-15.2	Black
5	1.277M	20.5	+9.9	+0.1	+0.2	+0.1	+0.0	30.8	46.0	-15.2	Black
6	2.617M	20.5	+9.9	+0.1	+0.1	+0.1	+0.0	30.7	46.0	-15.3	Black
7	1.166M	20.2	+9.9	+0.1	+0.2	+0.1	+0.0	30.5	46.0	-15.5	Black
8	2.574M	19.9	+9.9	+0.1	+0.1	+0.1	+0.0	30.1	46.0	-15.9	Black
9	2.485M	19.8	+9.9	+0.1	+0.1	+0.1	+0.0	30.0	46.0	-16.0	Black
10	1.030M	19.6	+9.9	+0.1	+0.2	+0.1	+0.0	29.9	46.0	-16.1	Black
11	1.413M	19.5	+9.9	+0.1	+0.2	+0.1	+0.0	29.8	46.0	-16.2	Black
12	1.396M	19.3	+9.9	+0.1	+0.2	+0.1	+0.0	29.6	46.0	-16.4	Black
13	2.731M	18.6	+9.9	+0.1	+0.1	+0.1	+0.0	28.8	46.0	-17.2	Black
14	1.294M	17.9	+9.9	+0.1	+0.2	+0.1	+0.0	28.2	46.0	-17.8	Black
15	1.766M	17.5	+9.9	+0.1	+0.2	+0.1	+0.0	27.8	46.0	-18.2	Black
16	2.532M	17.5	+9.9	+0.1	+0.1	+0.1	+0.0	27.7	46.0	-18.3	Black
17	2.553M	17.5	+9.9	+0.1	+0.1	+0.1	+0.0	27.7	46.0	-18.3	Black
18	2.587M	17.3	+9.9	+0.1	+0.1	+0.1	+0.0	27.5	46.0	-18.5	Black
19	2.302M	17.2	+9.9	+0.1	+0.1	+0.1	+0.0	27.4	46.0	-18.6	Black
20	734.674k	16.9	+9.9	+0.1	+0.2	+0.1	+0.0	27.2	46.0	-18.8	Black
21	1.864M	16.9	+9.9	+0.1	+0.1	+0.1	+0.0	27.1	46.0	-18.9	Black
22	15.247M	20.6	+9.9	+0.3	+0.1	+0.2	+0.0	31.1	50.0	-18.9	Black
23	2.697M	16.8	+9.9	+0.1	+0.1	+0.1	+0.0	27.0	46.0	-19.0	Black
24	1.617M	16.5	+9.9	+0.1	+0.2	+0.1	+0.0	26.8	46.0	-19.2	Black

25	716.493k	16.3	+9.9	+0.1	+0.2	+0.1	+0.0	26.6	46.0	-19.4	Black
26	2.710M	16.4	+9.9	+0.1	+0.1	+0.1	+0.0	26.6	46.0	-19.4	Black
27	2.140M	16.3	+9.9	+0.1	+0.1	+0.1	+0.0	26.5	46.0	-19.5	Black
28	14.706M	20.0	+9.9	+0.3	+0.1	+0.2	+0.0	30.5	50.0	-19.5	Black
29	488.878k	16.3	+9.9	+0.0	+0.2	+0.1	+0.0	26.5	46.2	-19.7	Black
30	915.480k	16.0	+9.9	+0.1	+0.2	+0.1	+0.0	26.3	46.0	-19.7	Black

CKC Laboratories, Inc. Date: 2/17/2015 Time: 6:38:02 PM Digital Path WO#: 96184  
 15.207 AC Mains - Average Test Lead: Black 120V 60Hz Sequence#: 3 Ext ATTN: 0 dB



Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.207 AC Mains - Average**  
 Work Order #: **96184** Date: 2/17/2015  
 Test Type: **Conducted Emissions** Time: 6:43:56 PM  
 Equipment: **GEN6 CPE** Sequence#: 4  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29 120V 60Hz  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP05624	Attenuator	PE7010-10	1/15/2015	1/15/2017
T2	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T3	AN02609	High Pass Filter	HE9615-150K-50-720B	3/25/2014	3/25/2016
T4	AN00374	50uH LISN-White (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015
	AN00374	50uH LISN-Black (dB)	8028-TS-50-BNC	3/15/2014	3/15/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	NA
GEN6 CPE*	Digital Path	2x-29	C6:A6

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

AC Conducted Emissions  
 The EUT is configured to operate at the middle channel (5210MHz), transmitting continuously.

Software Used: art2\_ver2\_28\_6BIN

Frequency Range of Interest: 0.15 - 30MHz  
 RBW = 9kHz; VBW > RBW  
 Tx Power Setting = 24dBm  
 Bandwidth setting = 10MHz  
 Data rate = 13Mbps

Environmental Conditions:

Temperature: 18.3°C  
 Humidity: 41 %  
 Atmospheric Pressure: 97.8 kPa

Ext Attn: 0 dB

**Measurement Data:**

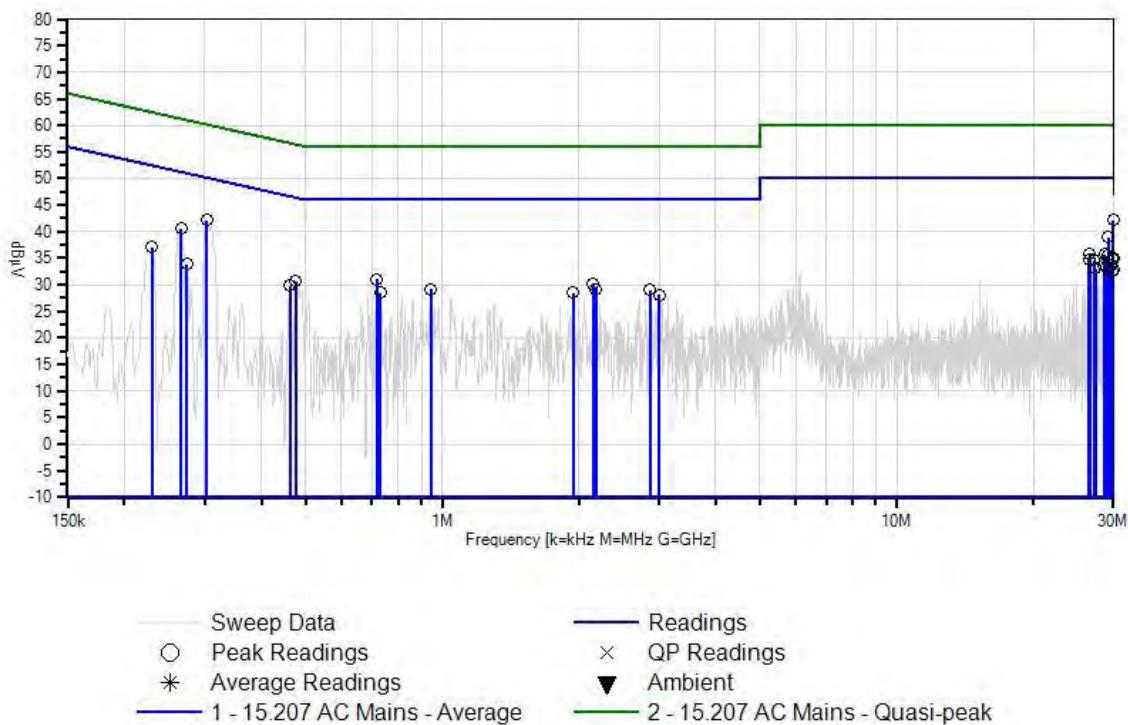
Reading listed by margin.

Test Lead: White

#	Freq MHz	Rdng dB $\mu$ V	T1 dB	T2 dB	T3 dB	T4 dB	Dist Table	Corr dB $\mu$ V	Spec dB $\mu$ V	Margin dB	Polar Ant
1	303.440k	32.1	+9.9	+0.0	+0.1	+0.1	+0.0	42.2	50.1	-7.9	White
2	29.993M	31.5	+9.9	+0.4	+0.2	+0.1	+0.0	42.1	50.0	-7.9	White
3	266.353k	30.3	+9.9	+0.0	+0.2	+0.1	+0.0	40.5	51.2	-10.7	White
4	29.233M	28.4	+9.9	+0.4	+0.2	+0.1	+0.0	39.0	50.0	-11.0	White
5	26.608M	25.2	+9.9	+0.4	+0.2	+0.1	+0.0	35.8	50.0	-14.2	White
6	28.684M	25.2	+9.9	+0.4	+0.2	+0.1	+0.0	35.8	50.0	-14.2	White
7	29.109M	24.9	+9.9	+0.4	+0.2	+0.1	+0.0	35.5	50.0	-14.5	White
8	717.221k	20.8	+9.9	+0.1	+0.2	+0.1	+0.0	31.1	46.0	-14.9	White
9	29.842M	24.4	+9.9	+0.4	+0.2	+0.1	+0.0	35.0	50.0	-15.0	White
10	29.904M	24.3	+9.9	+0.4	+0.2	+0.1	+0.0	34.9	50.0	-15.1	White
11	229.993k	26.9	+9.9	+0.0	+0.2	+0.1	+0.0	37.1	52.4	-15.3	White
12	26.485M	24.0	+9.9	+0.4	+0.2	+0.1	+0.0	34.6	50.0	-15.4	White
13	27.156M	24.0	+9.9	+0.4	+0.2	+0.1	+0.0	34.6	50.0	-15.4	White
14	476.515k	20.5	+9.9	+0.0	+0.2	+0.1	+0.0	30.7	46.4	-15.7	White
15	2.145M	20.1	+9.9	+0.1	+0.1	+0.1	+0.0	30.3	46.0	-15.7	White
16	29.479M	23.1	+9.9	+0.4	+0.2	+0.1	+0.0	33.7	50.0	-16.3	White
17	28.623M	23.0	+9.9	+0.4	+0.2	+0.1	+0.0	33.6	50.0	-16.4	White
18	29.664M	23.0	+9.9	+0.4	+0.2	+0.1	+0.0	33.6	50.0	-16.4	White
19	28.869M	22.7	+9.9	+0.4	+0.2	+0.1	+0.0	33.3	50.0	-16.7	White
20	462.699k	19.6	+9.9	+0.0	+0.2	+0.1	+0.0	29.8	46.6	-16.8	White
21	945.249k	18.9	+9.9	+0.1	+0.2	+0.1	+0.0	29.2	46.0	-16.8	White
22	2.183M	19.0	+9.9	+0.1	+0.1	+0.1	+0.0	29.2	46.0	-16.8	White
23	27.341M	22.5	+9.9	+0.4	+0.2	+0.1	+0.0	33.1	50.0	-16.9	White
24	2.867M	18.8	+9.9	+0.1	+0.1	+0.1	+0.0	29.0	46.0	-17.0	White

25	29.966M	22.3	+9.9	+0.4	+0.2	+0.1	+0.0	32.9	50.0	-17.1	White
26	274.352k	23.6	+9.9	+0.0	+0.2	+0.1	+0.0	33.8	51.0	-17.2	White
27	730.310k	18.2	+9.9	+0.1	+0.2	+0.1	+0.0	28.5	46.0	-17.5	White
28	1.940M	18.3	+9.9	+0.1	+0.1	+0.1	+0.0	28.5	46.0	-17.5	White
29	29.815M	21.9	+9.9	+0.4	+0.2	+0.1	+0.0	32.5	50.0	-17.5	White
30	3.008M	17.9	+9.9	+0.1	+0.1	+0.1	+0.0	28.1	46.0	-17.9	White

CKC Laboratories, Inc. Date: 2/17/2015 Time: 6:43:56 PM Digital Path WO#: 96184  
 15.207 AC Mains - Average Test Lead: White 120V 60Hz Sequence#: 4 Ext ATTN: 0 dB



## Test Setup Photos



## 15.215(c) Occupied Bandwidth

### Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.215(c) Emission Bandwidth**  
 Work Order #: **96184** Date: **2/20/2015**  
 Test Type: **Conducted Emissions** Time: **08:47:22**  
 Equipment: **GEN6 CPE** Sequence#: **1**  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T2	ANP01391	Attenuator	85053-60001	12/8/2014	12/8/2016
T3	AN03362	Cable	32026-2-29094K-48TC	12/8/2014	12/8/2016
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
GEN6 CPE*	Digital Path	2x-29	C6:A6
POE Power Adapter	HP	FAS24000050-C44	NA

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

The EUT is directly connected to the spectrum analyzer for conducted measurements. The EUT is set to transmit at 100% duty cycle, operating in the band 5.15-5.25GHz.

Tested in accordance with KDB 789003 D02 Section II.C.1

Chain 0 and Chain 1, labeled appropriately.

Channel Bandwidth: 5MHz and 10MHz, labeled appropriately.

Data rate: 19.5Mbps for 5MHz channel bandwidth; 13Mbps for 10MHz channel bandwidth

Tx Power setting: 24dBm

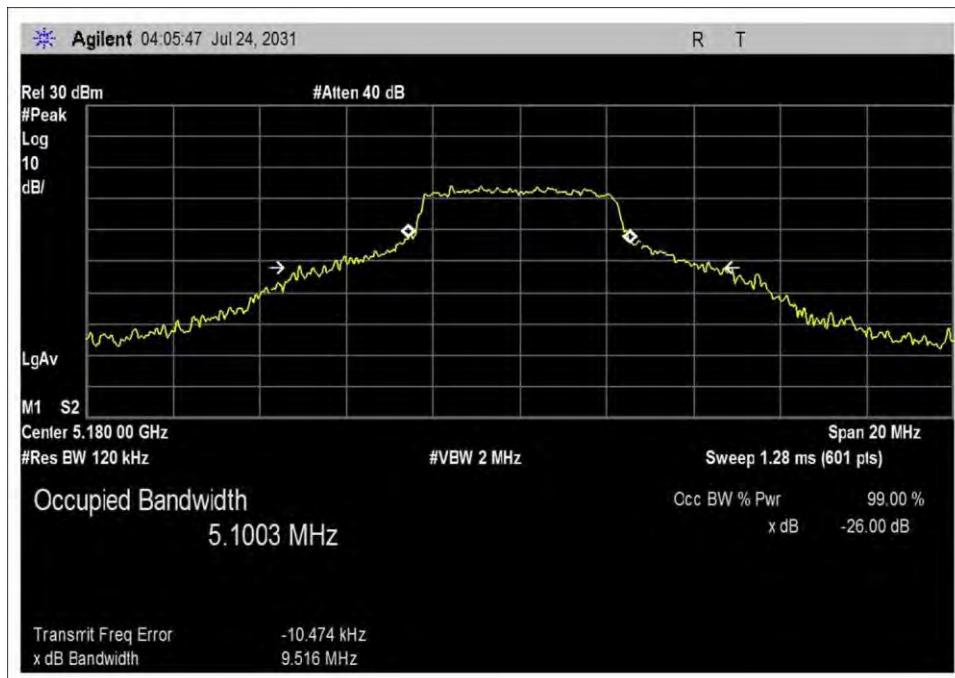
Environmental Conditions:

Temperature: 19°C

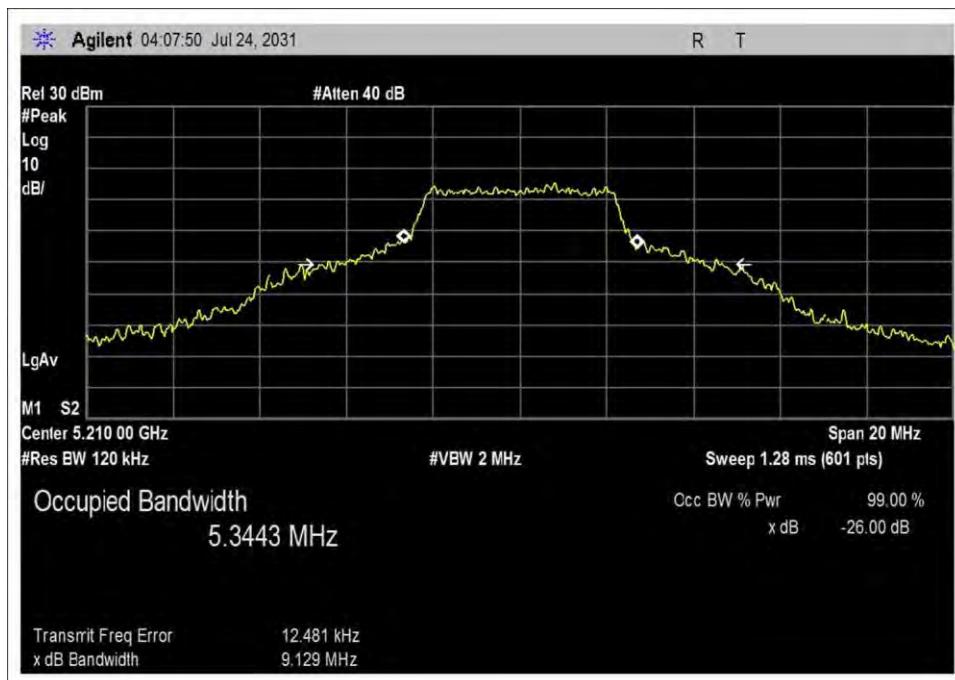
Relative Humidity: 40%

Atmospheric Pressure: 97.8kPa

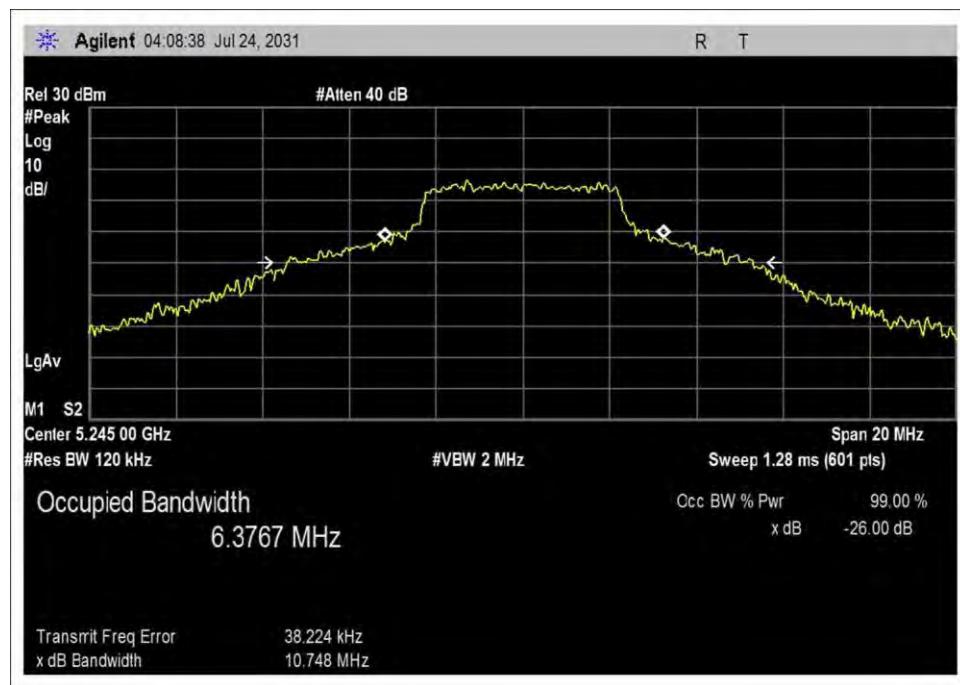
## Test Data



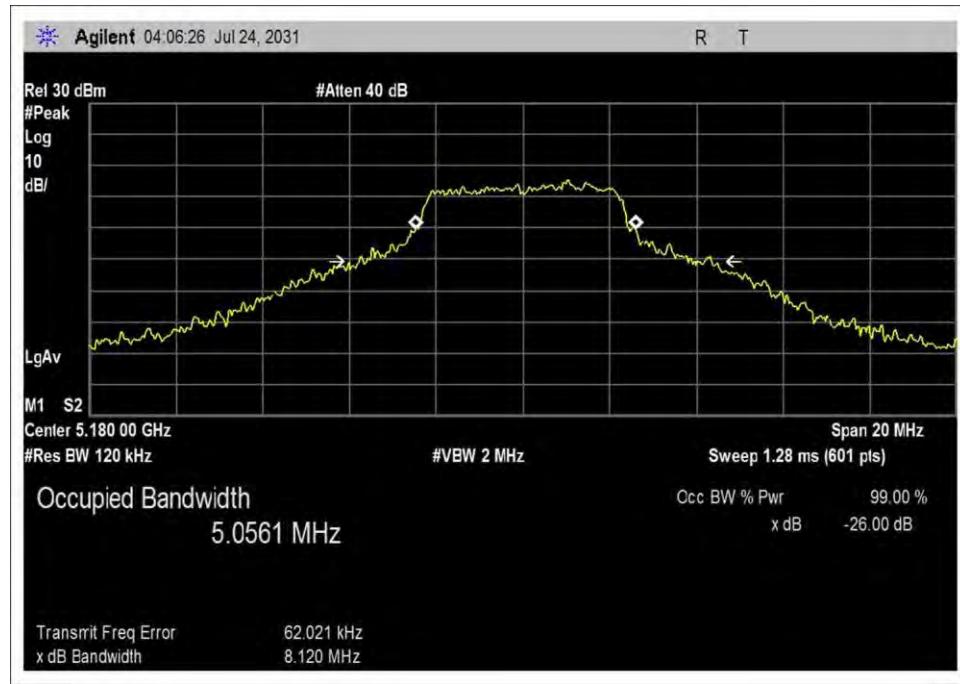
5MHz, Low, Chain 0



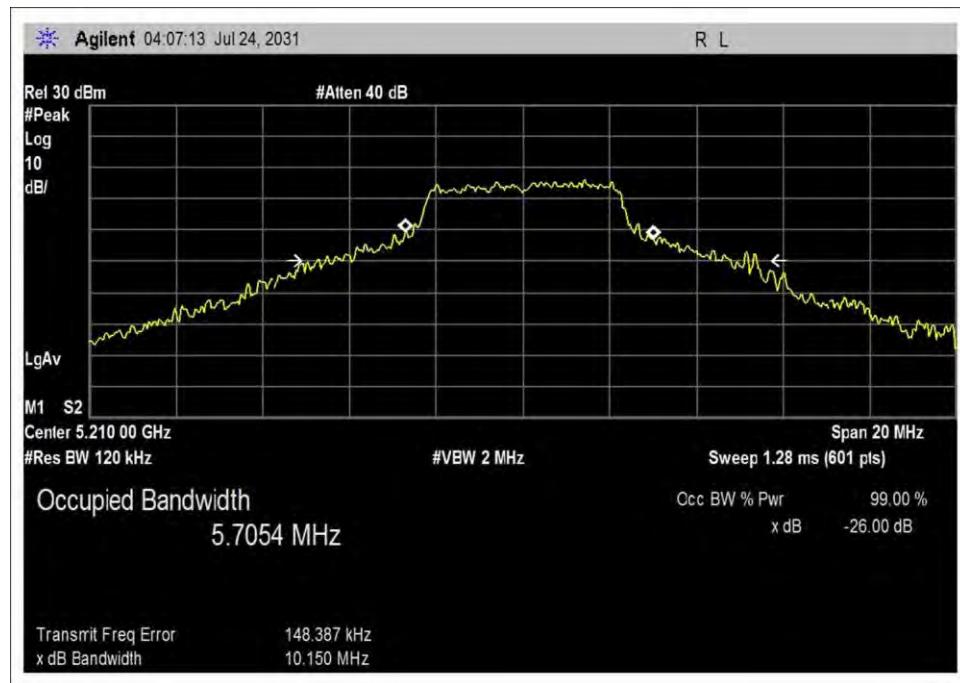
5MHz, Mid, Chain 0



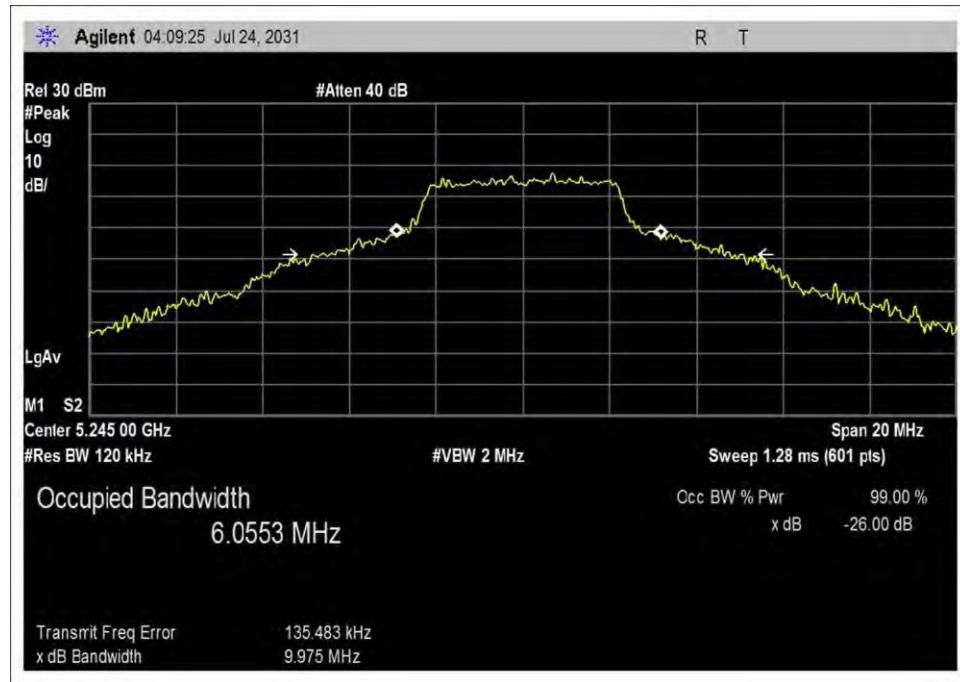
5MHz, High, Chain 0



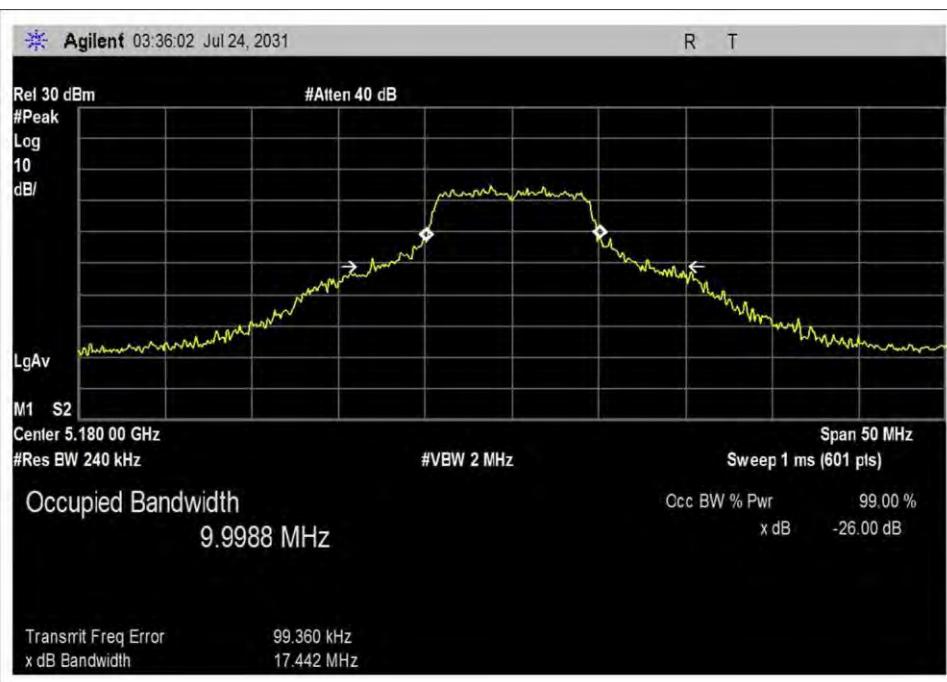
5MHz, Low, Chain 1



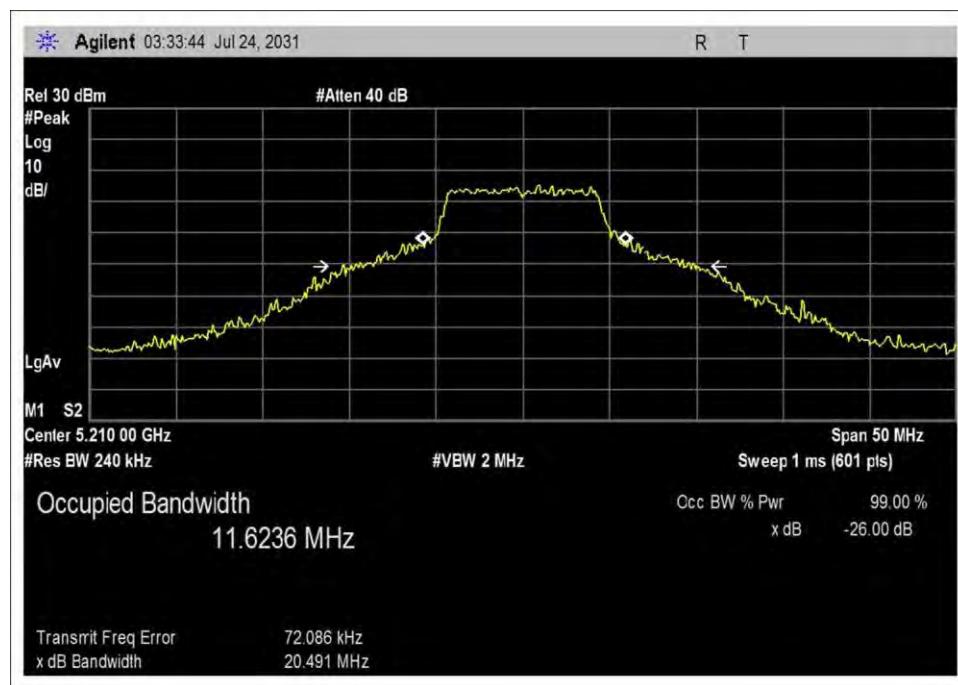
5MHz, Mid, Chain 1



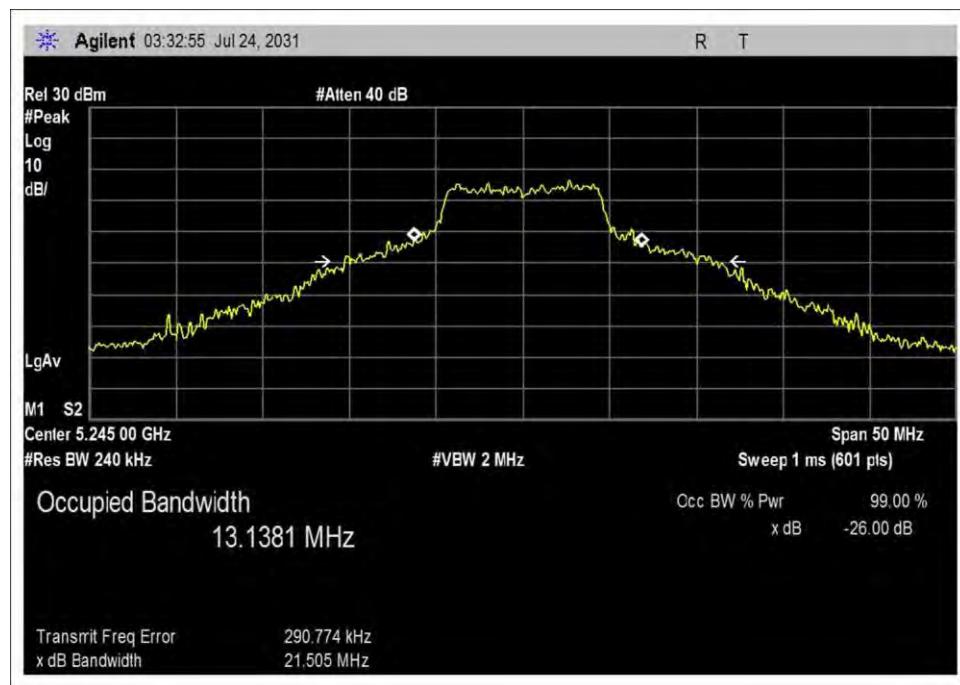
5MHz, High, Chain 1



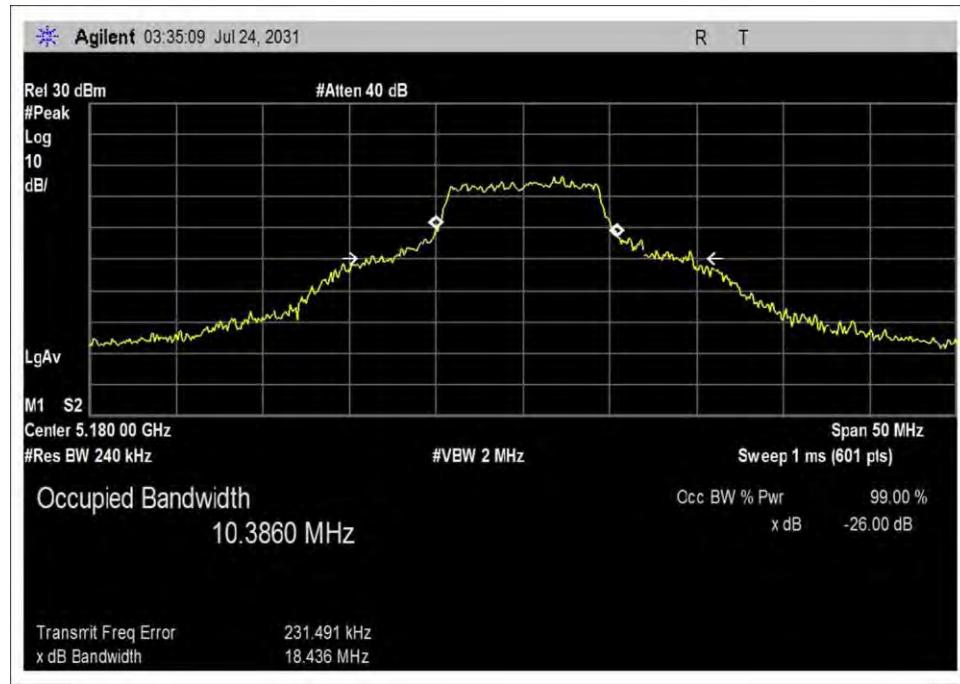
10MHz, Low, Chain 0



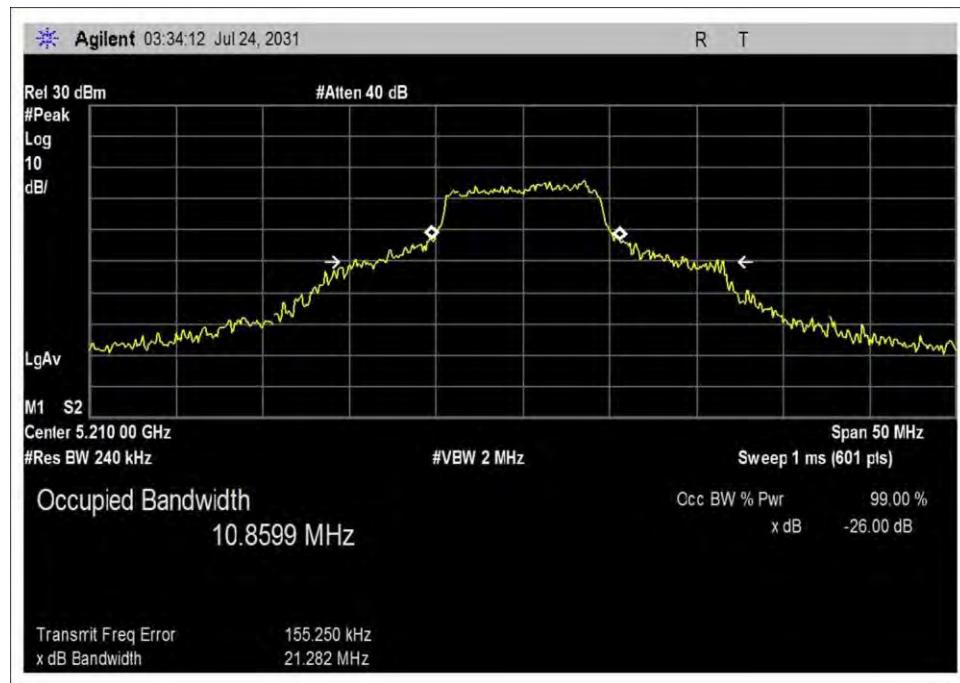
10MHz, Mid, Chain 0



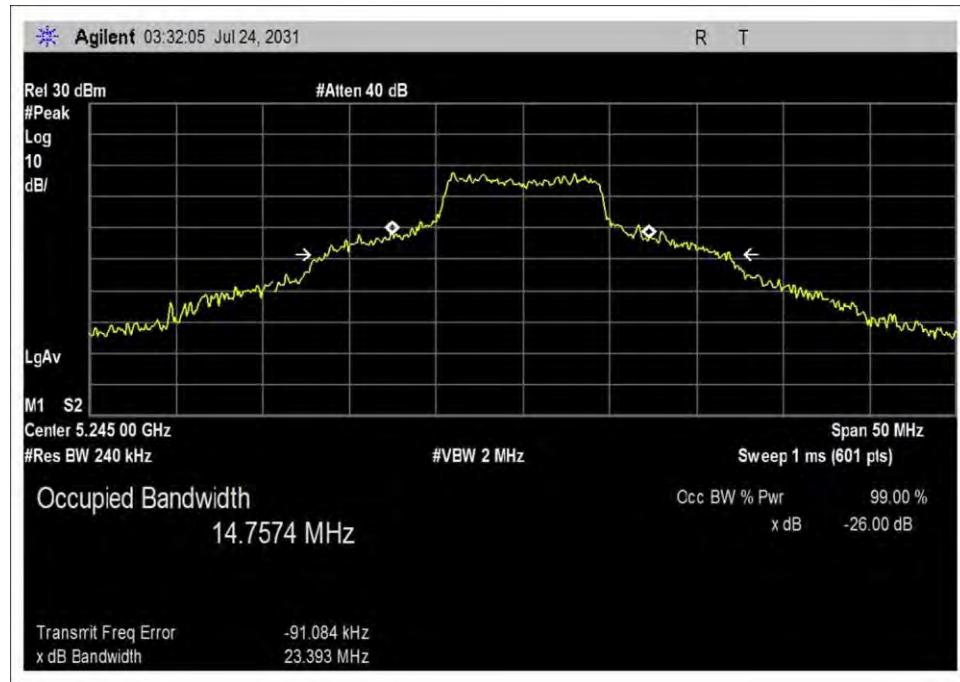
10MHz, High, Chain 0



10MHz, Low, Chain 1

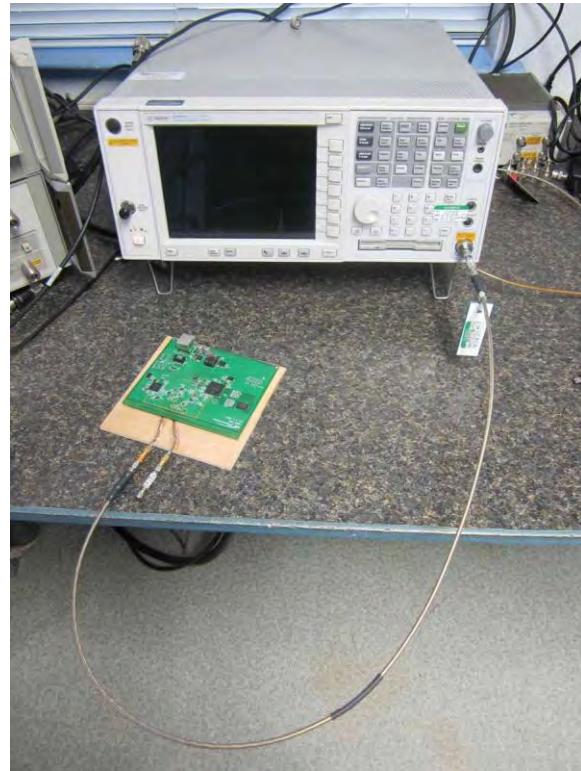


10MHz, Mid, Chain 1



10MHz, High, Chain 1

## Test Setup Photo



## FCC PART 15 SUBPART E

### 15.407(a)(1)(i) 30 Degree Elevation Angle

#### Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.407(a)(1)(i) 30 Degree Elevation**  
 Work Order #: **96184** Date: **3/1/2015**  
 Test Type: **Maximized Emissions** Time: **19:57:51**  
 Equipment: **GEN6 CPE** Sequence#: **3**  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	3/18/2014	3/18/2016
T3	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T4	AN03355	Cable	32026-2-29094K- 48TC	12/8/2014	12/8/2016
T5	AN03361	Cable	32022-2-29094- 48TC	12/8/2014	12/8/2016
T6	AN03362	Cable	32022-2-29094- 48TC	12/8/2014	12/8/2016
T7	ANP05904	Cable	32022-2-29094K- 144TC	12/8/2014	12/8/2016

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
GEN6 CPE*	Digital Path	2x-29	C6:A6
POE Power Adapter	HP	FAS24000050-C44	NA

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

The EUT is set atop a wooden non-conductive turntable of height 80cm.

The EUT is set to transmit at 100% duty cycle.

Tested in accordance with KDB 789033 D02 Section II.H.1.

Chains 0 and 1 are operating simultaneously.

Operating at 5180MHz then repeated at 5245MHz

Data rate: 19.5 and 13Mbps

Channel Bandwidth: 5 and 10MHz

Tx Power setting: 24dBm

Frequency Range of Interest: Fundamental

RBW = 1MHz; VBW > RBW

Environmental Conditions:

Temperature: 19°C

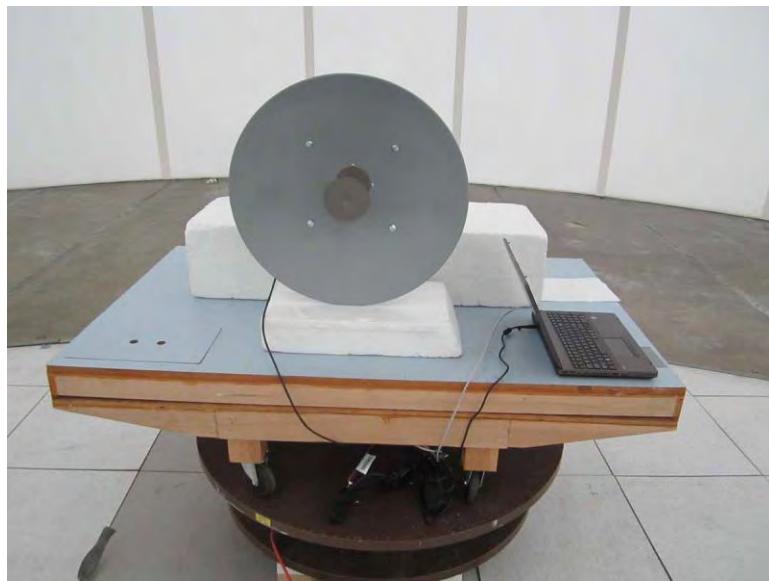
Relative Humidity: 40%

Atmospheric Pressure: 97.8kPa

### Test Data

Freq	Operating Bandwidth	Pol	dBuV/m	EIRP (dBm)	Limit (dBm)	Angle of elevation	Test Result
5180	5MHz	H	111.4	16.2	21	37.0°	Pass
	5MHz	V	108.4	13.2	21	38.2°	Pass
	10MHz	V	107.5	12.3	21	63.9°	Pass
	10MHz	H	110	14.8	21	36.0°	Pass
5245	5MHz	H	113.9	18.7	21	37.0°	Pass
	5MHz	V	108.6	13.4	21	72.8°	Pass
	10MHz	V	106.6	11.4	21	44.2°	Pass
	10MHz	H	111.5	16.3	21	34.8°	Pass

## Test Setup Photos



## 15.407(a)(1)(iii) Maximum Conducted Output Power and Power Spectral Density

### Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.407 (a)(1)(iii) Maximum Conducted Output Power and Power Spectral Density**  
 Work Order #: **96184** Date: **2/10/2015**  
 Test Type: **Conducted Emissions** Time: **11:36:47**  
 Equipment: **GEN6 CPE** Sequence#: **1**  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29  
 S/N: C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T2	ANP01391	Attenuator	85053-60001	12/8/2014	12/8/2016
T3	AN03362	Cable	32026-2-29094K-48TC	12/8/2014	12/8/2016
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
GEN6 CPE*	Digital Path	2x-29	C6:A6
GEN6 CPE*	Digital Path	2x-24	C6:A6
POE Power Adapter	HP	FAS24000050-C44	NA

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

The EUT is directly connected to the spectrum analyzer for conducted measurements.

The EUT is set to transmit at 100% duty cycle, operating in the band 5.15-5.25GHz.

Tested in accordance with KDB 789033 D02 section II. E.2.b (Method SA-1).

Voltage was varied IAW FCC 15.31(e) with no change in power noted.

The transmit signals of the EUT are completely uncorrelated as defined in KDB 662911 D01.

The manufacturer declares that the two transmit chains of the EUT transmit unique data in orthogonal polarities. Therefore, each transmit chain shall be assessed individually.

Chain 0 and Chain 1, labeled appropriately

Channel Bandwidth: 5MHz and 10MHz, labeled appropriately

Data rate: 19.5Mbps for 5MHz channel bandwidth; 13Mbps for 10MHz channel bandwidth

Tx Power setting: 24dBm for the 24dBi antenna; 20dBm for the 29dBi antenna.

Cable loss and attenuator loss were taken into account in the plots below.

Limits are derived from 15.407 section(a)(1)(iii) regarding antennas with directional antenna gain exceeding 23dBi.

Environmental Conditions:

Temperature: 19°C

Relative Humidity: 40%

Atmospheric Pressure: 97.8kPa

## Test Data

**Antenna: 24dBi**

Max Conducted Output Power (dBm)						
Channel	Chain 0 5MHz BW	Chain 1 5MHz BW	Chain 0 10MHz BW	Chain 1 10MHz BW	Limit	Results
Low	18.00	19.08	18.28	18.84	29.00	Pass
Mid	18.37	19.32	18.72	19.44	29.00	Pass
High	18.56	20.20	18.82	19.96	29.00	Pass

**Antenna: 24dBi**

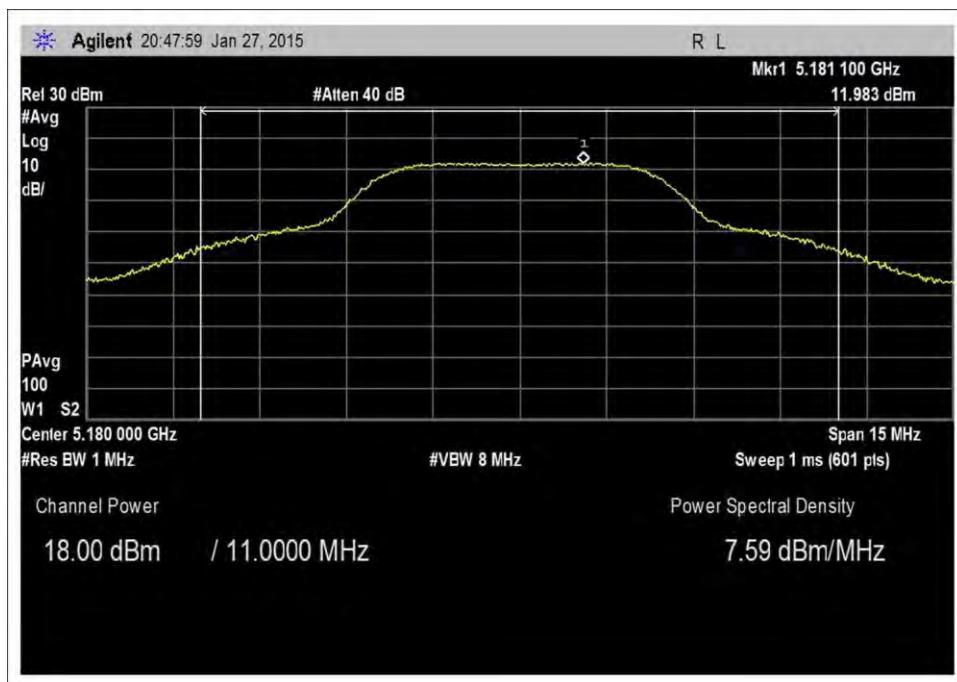
Max Conducted Power Spectral Density (dBm/MHz)						
Channel	Chain 0 5MHz BW	Chain 1 5MHz BW	Chain 0 10MHz BW	Chain 1 10MHz BW	Limit	Results
Low	11.98	13.47	8.74	9.57	16.00	Pass
Mid	11.59	13.06	9.25	9.94	16.00	Pass
High	12.02	14.06	9.62	10.45	16.00	Pass

**Antenna: 29dBi**

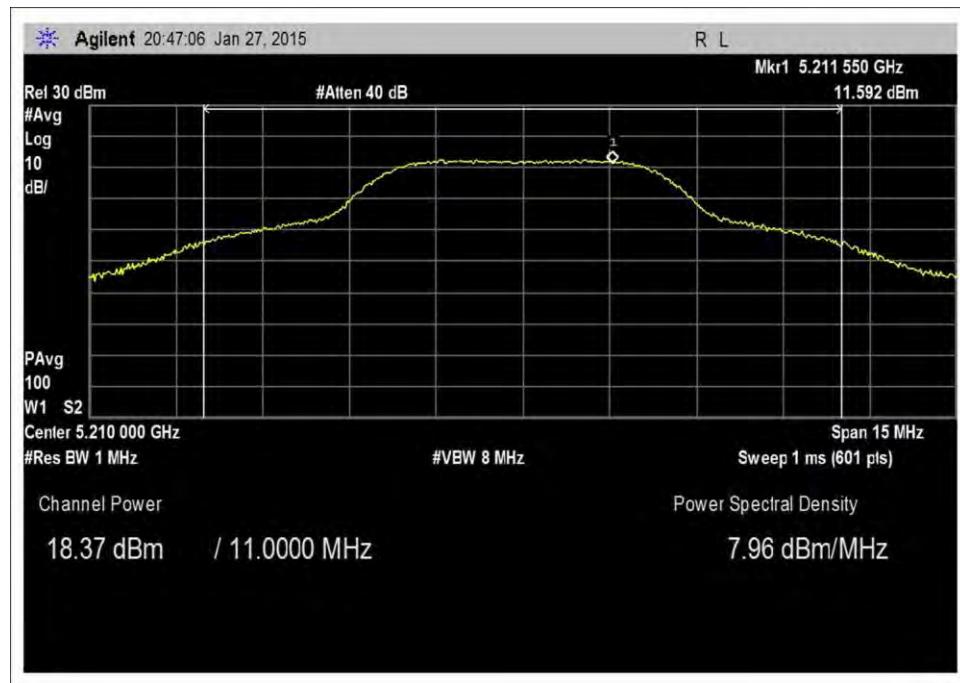
Max Conducted Output Power (dBm)						
Channel	Chain 0 5MHz BW	Chain 1 5MHz BW	Chain 0 10MHz BW	Chain 1 10MHz BW	Limit	Results
Low	15.53	14.76	15.63	14.91	24.00	Pass
Mid	16.02	15.86	16.12	15.79	24.00	Pass
High	16.42	16.72	16.62	16.85	24.00	Pass

**Antenna: 29dBi**

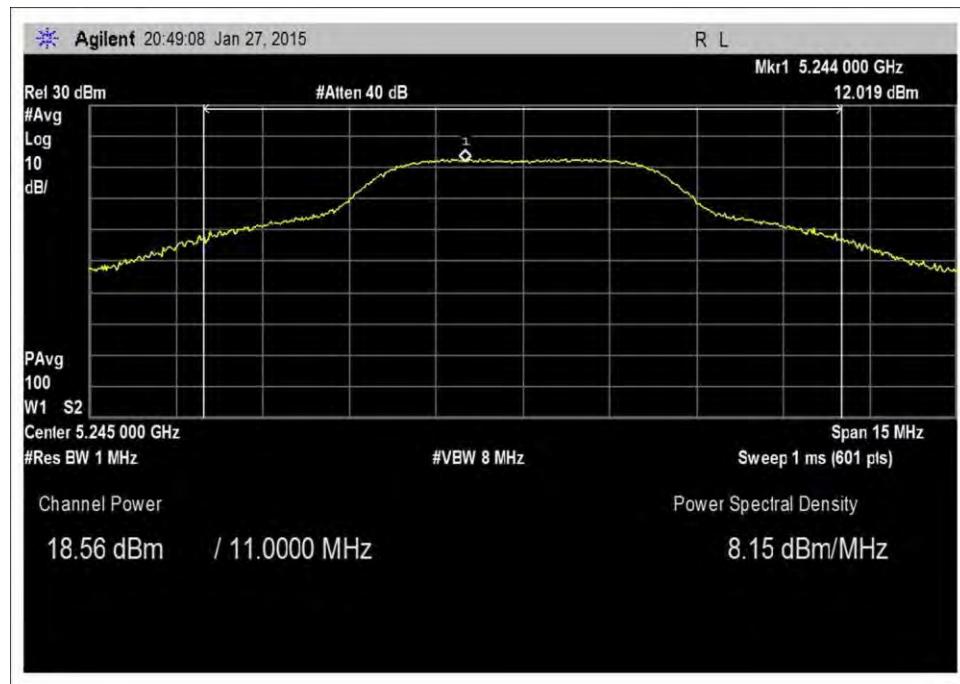
Max Conducted Power Spectral Density (dBm/MHz)						
Channel	Chain 0 5MHz BW	Chain 1 5MHz BW	Chain 0 10MHz BW	Chain 1 10MHz BW	Limit	Results
Low	9.20	8.10	5.81	4.98	11.00	Pass
Mid	9.61	9.40	7.28	6.41	11.00	Pass
High	9.91	10.98	7.78	8.08	11.00	Pass



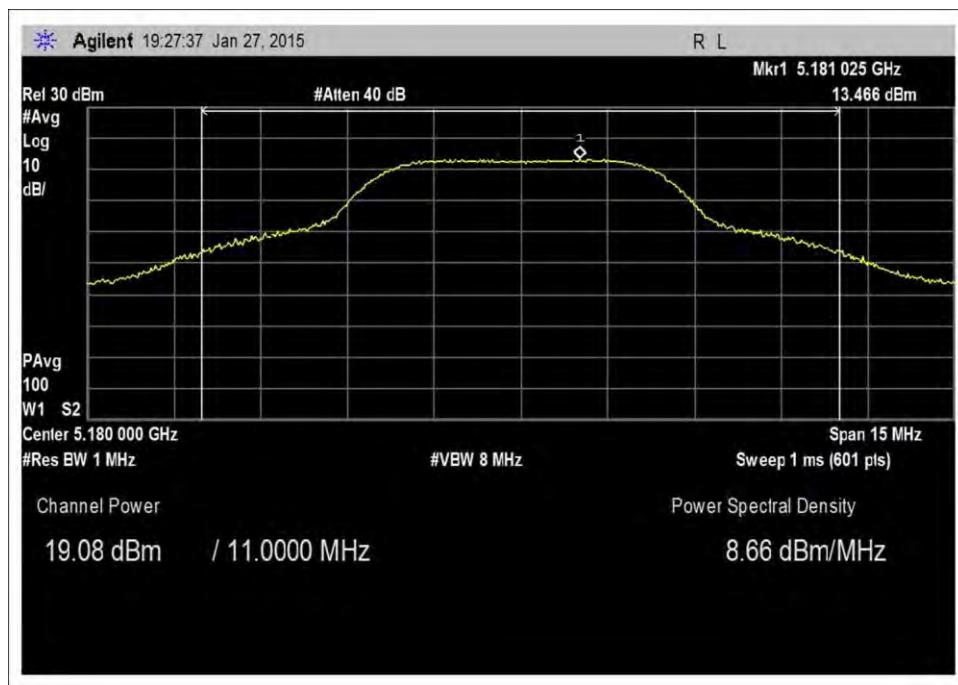
24dBi, 5MHz, Low, Chain 0



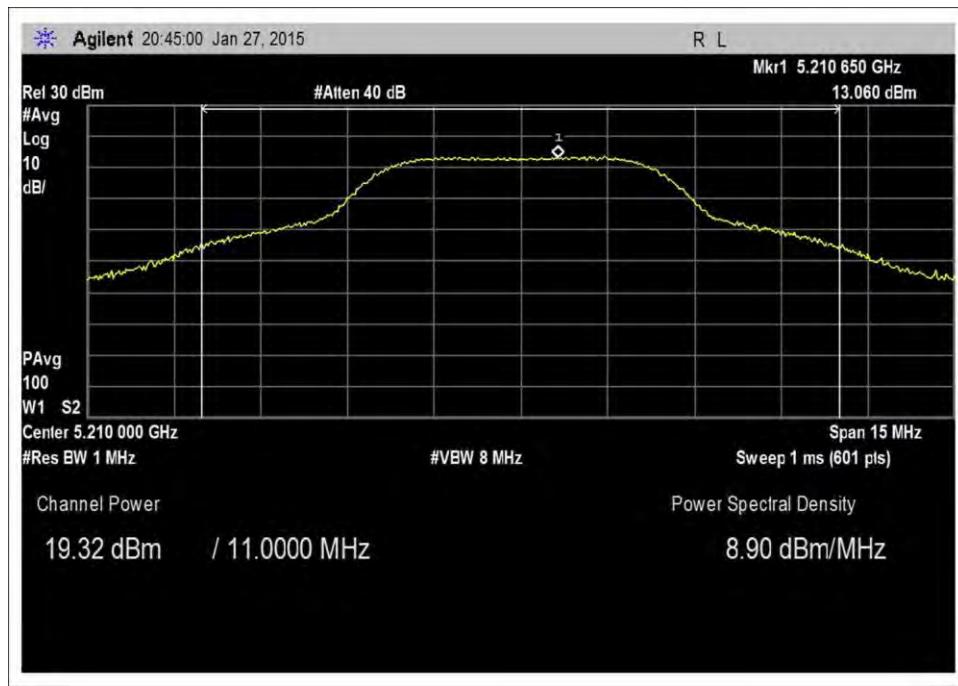
24dBi, 5MHz, Mid, Chain 0



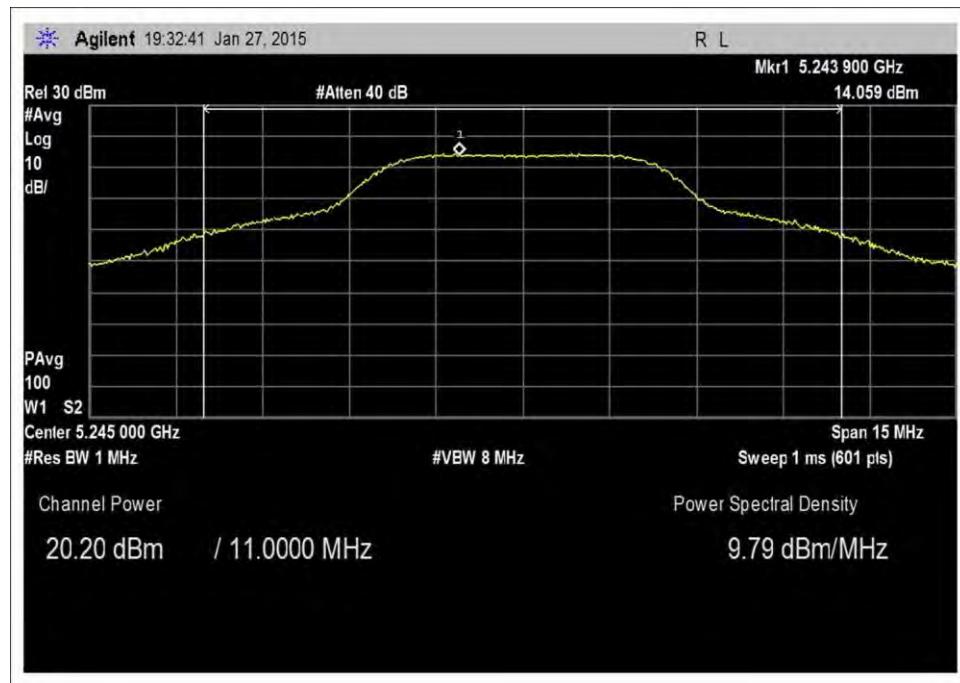
24dBi, 5MHz, High, Chain 0



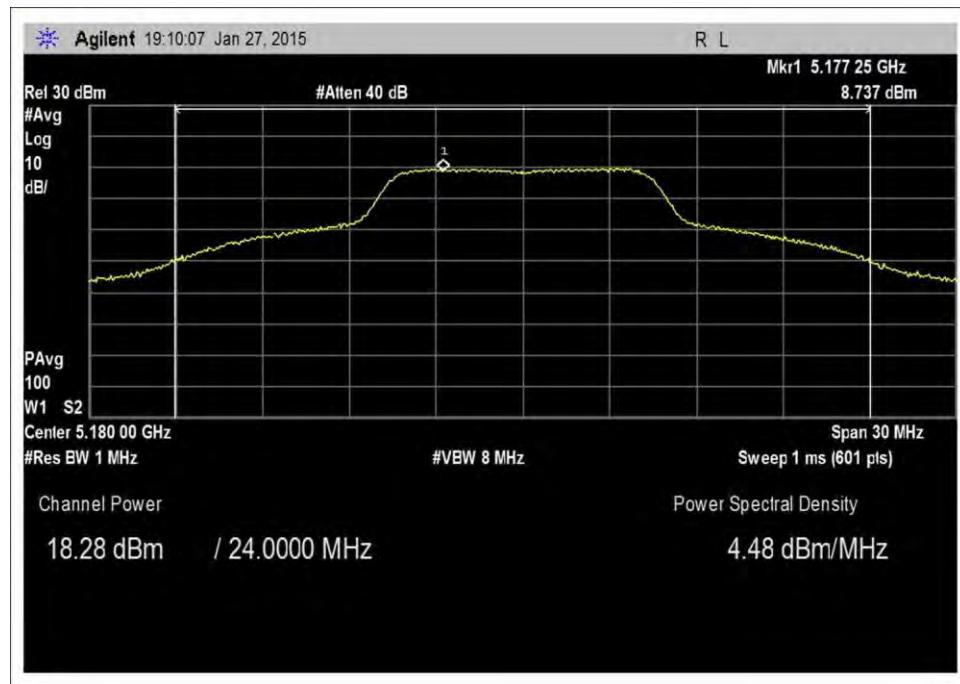
24dBi, 5MHz, Low, Chain 1



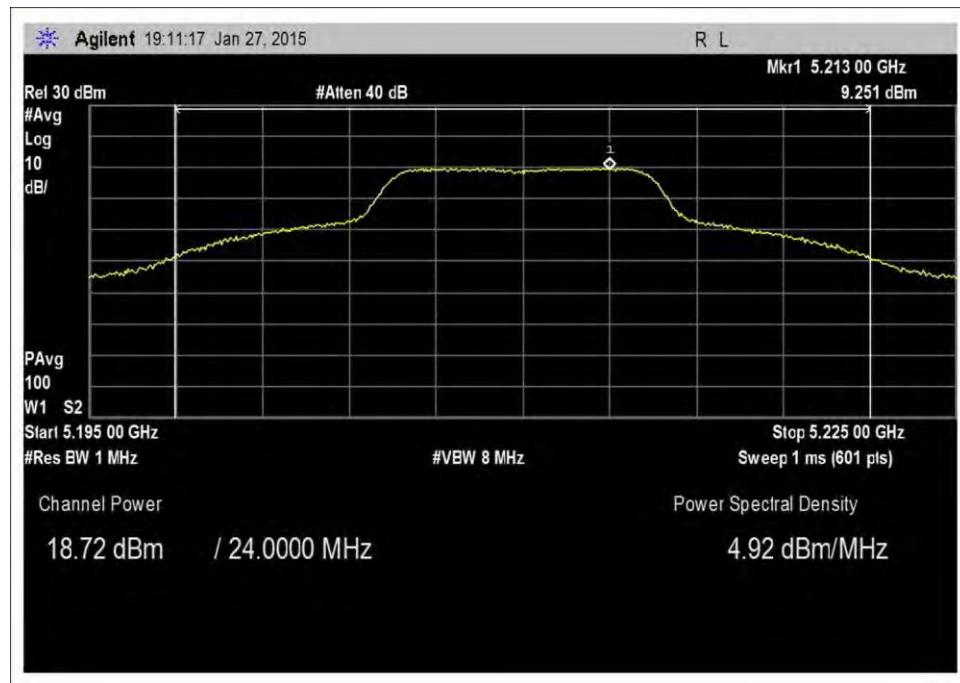
24dBi, 5MHz, Mid, Chain 1



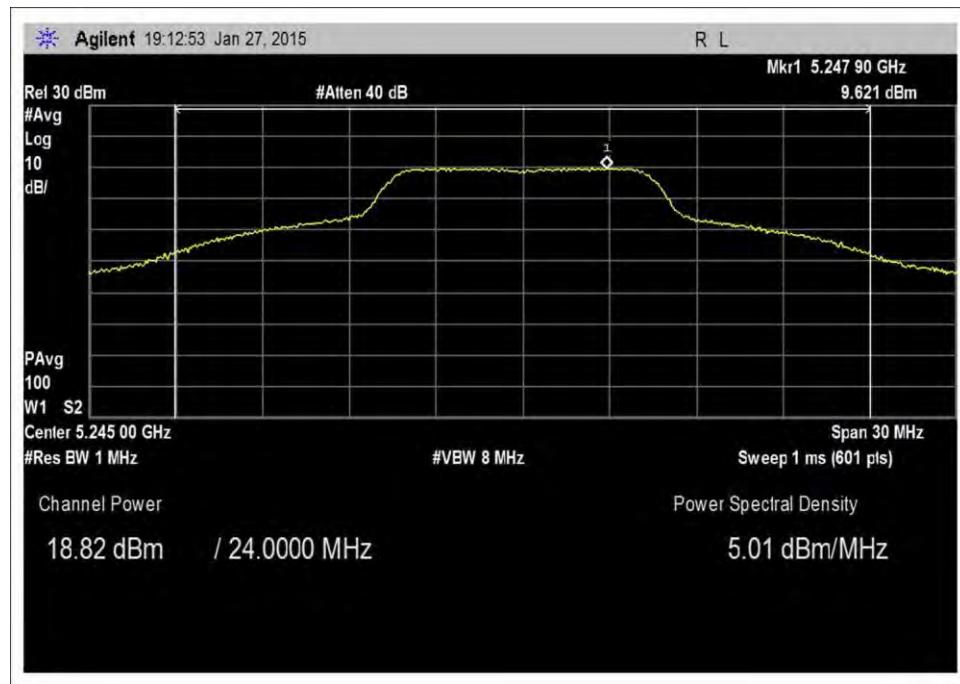
24dBi, 5MHz, High, Chain 1



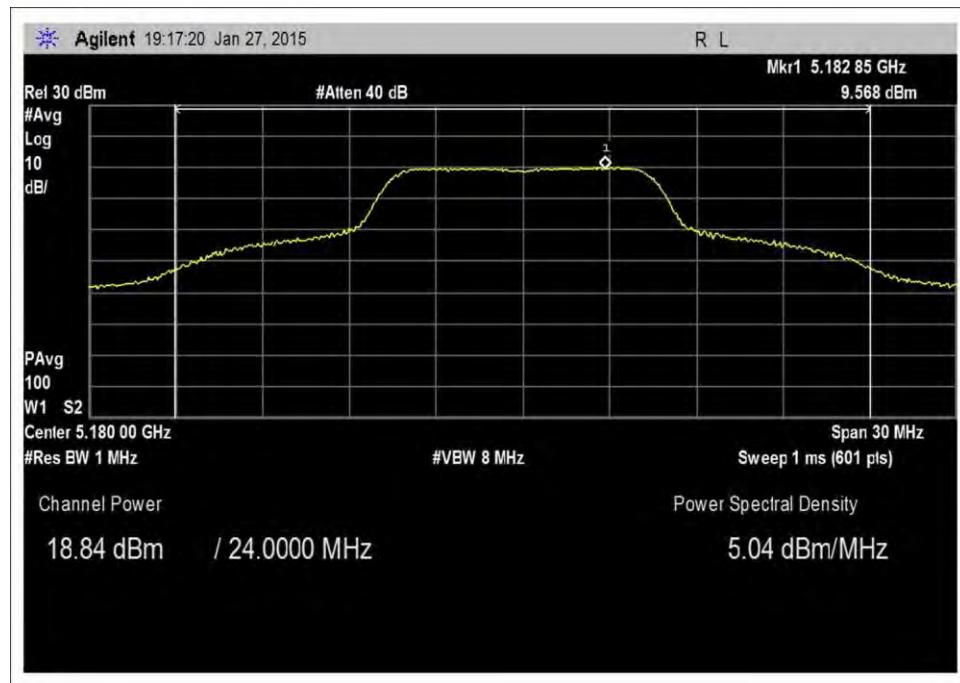
24dBi, 10MHz, Low, Chain 0



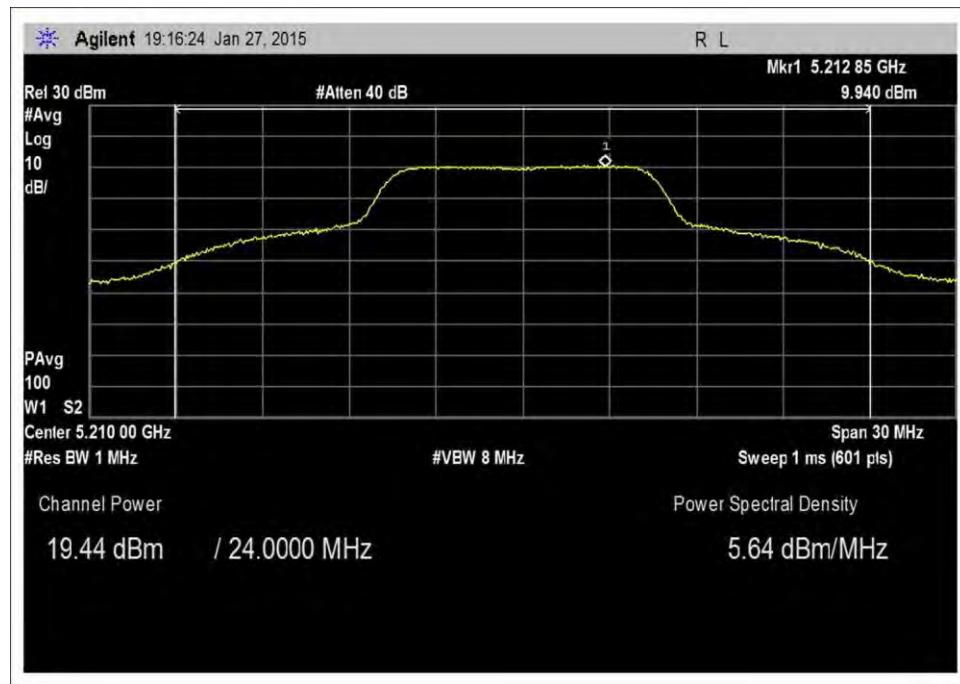
24dBi, 10MHz, Mid, Chain 0



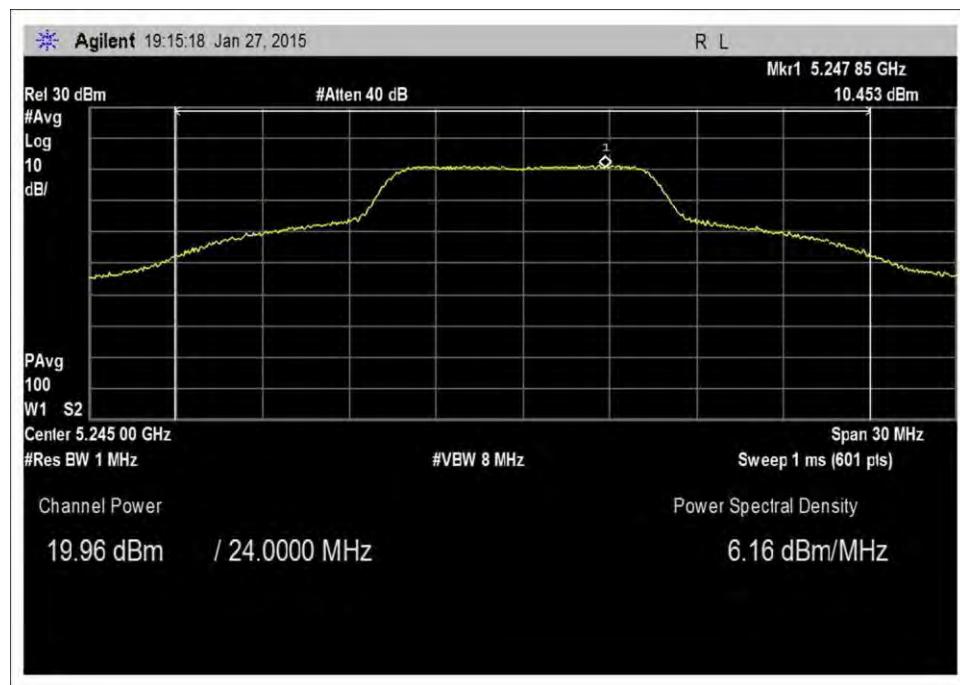
24dBi, 10MHz, High, Chain 0



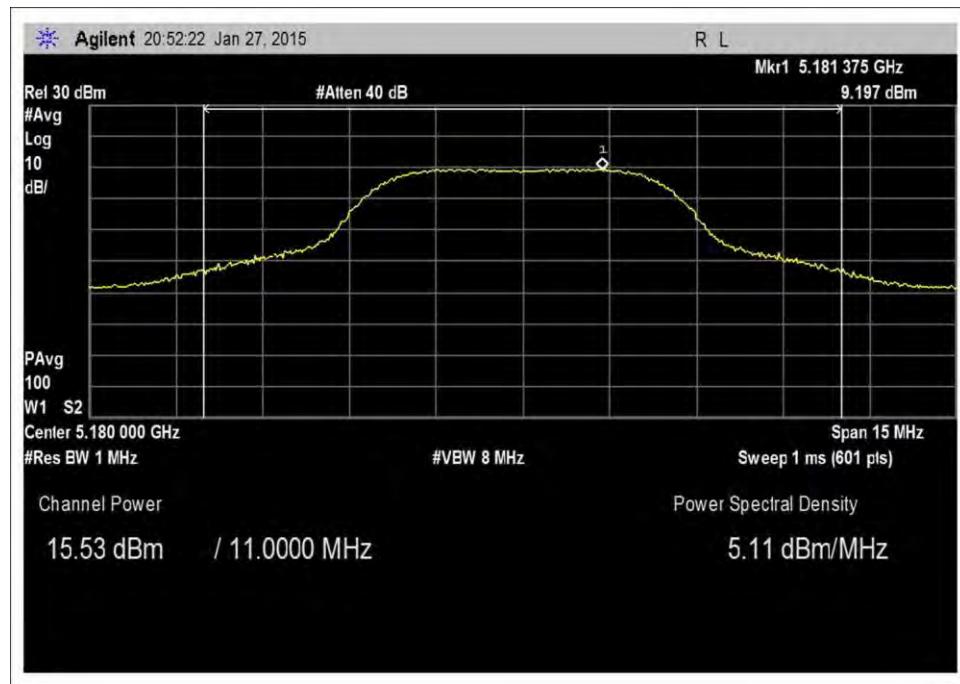
24dBi, 10MHz, Low, Chain 1



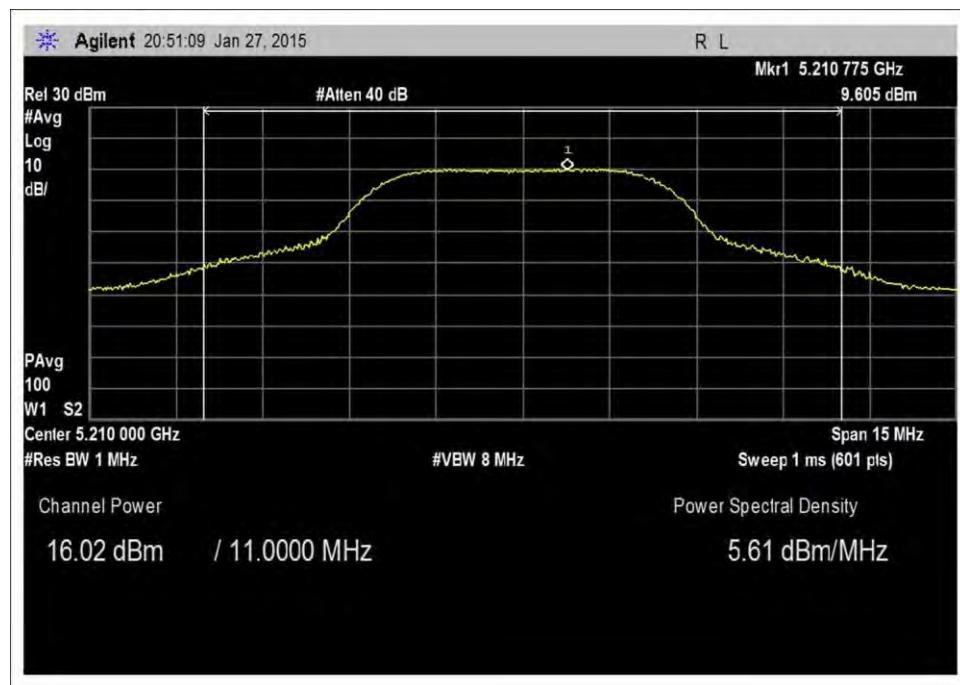
24dBi, 10MHz, Mid, Chain 1



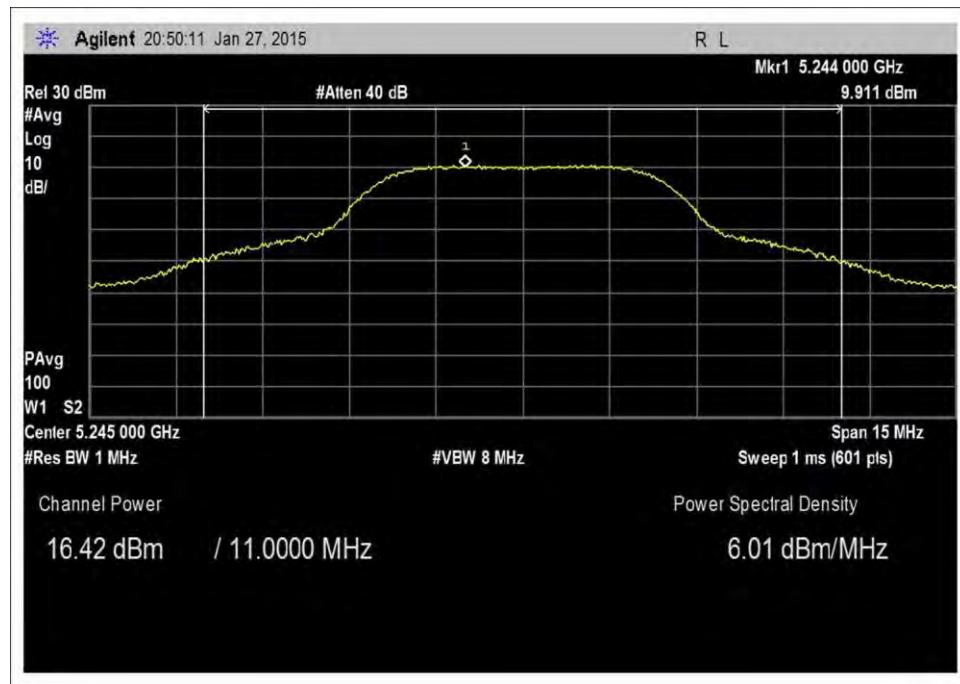
24dBi, 10MHz, High, Chain 1



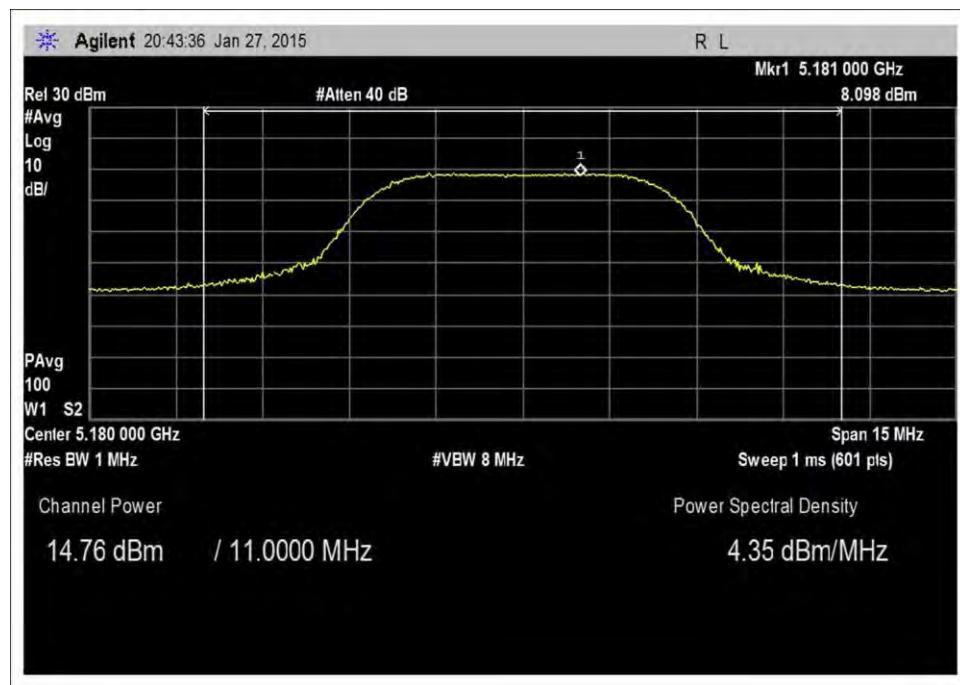
29dBi, 5MHz, Low, Chain 0



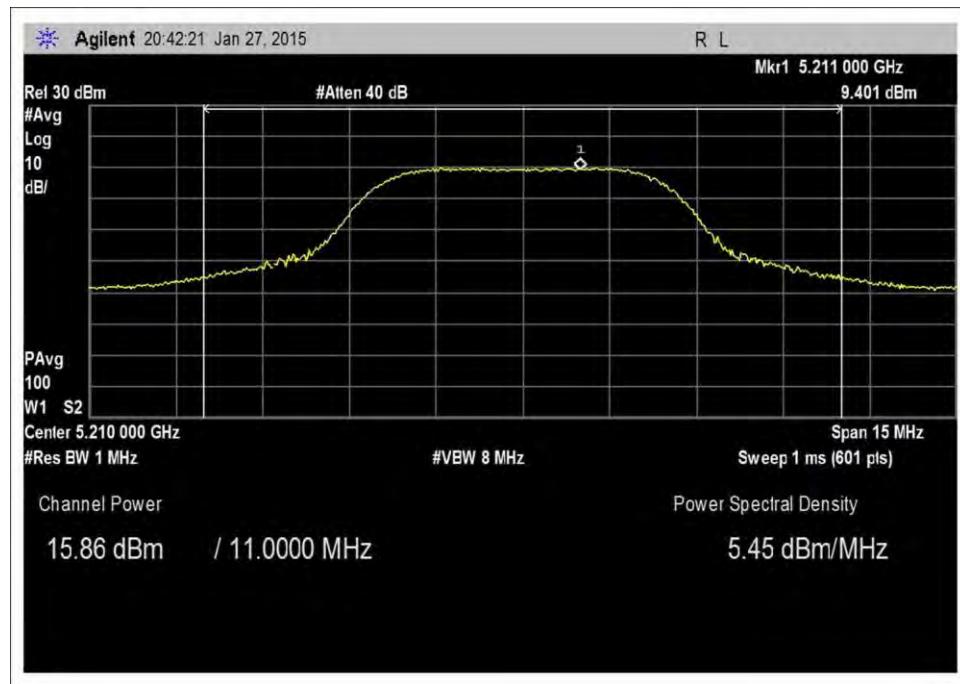
29dBi, 5MHz, Mid, Chain 0



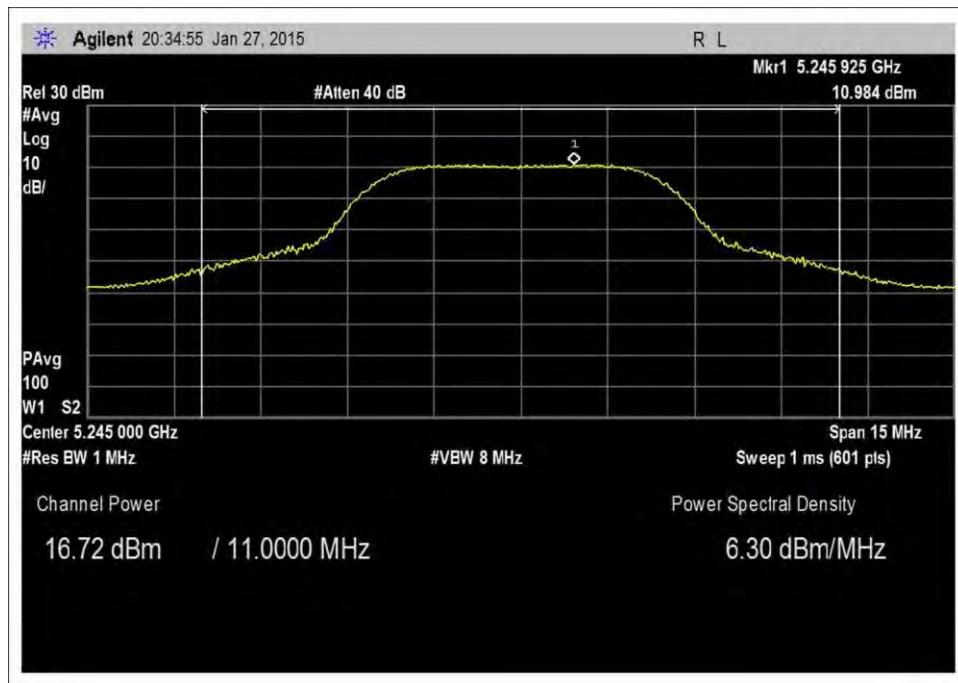
29dBi, 5MHz, High, Chain 0



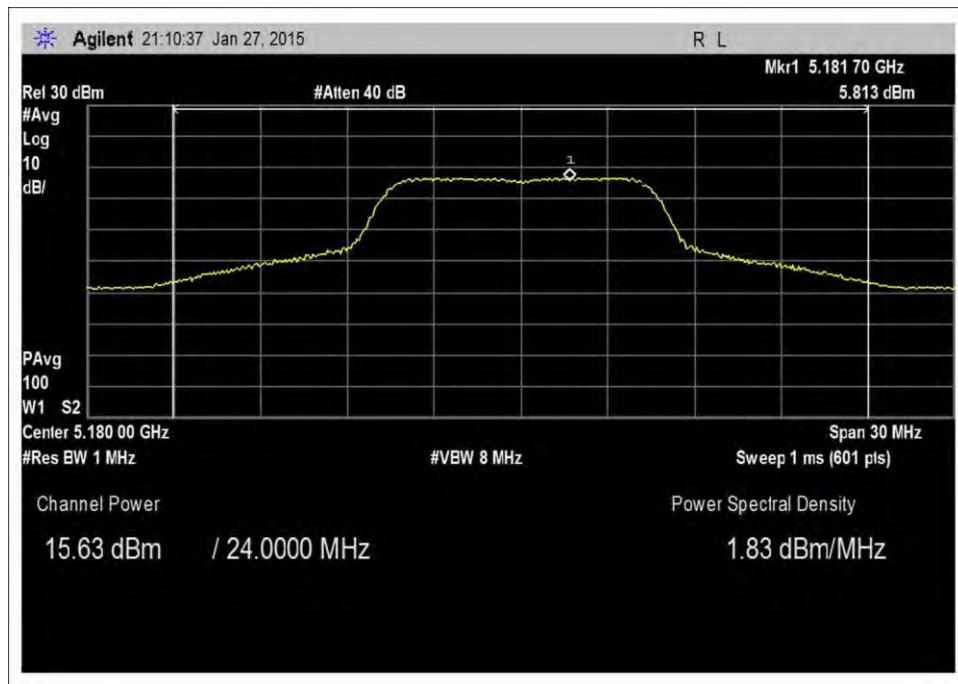
29dBi, 5MHz, Low, Chain 1



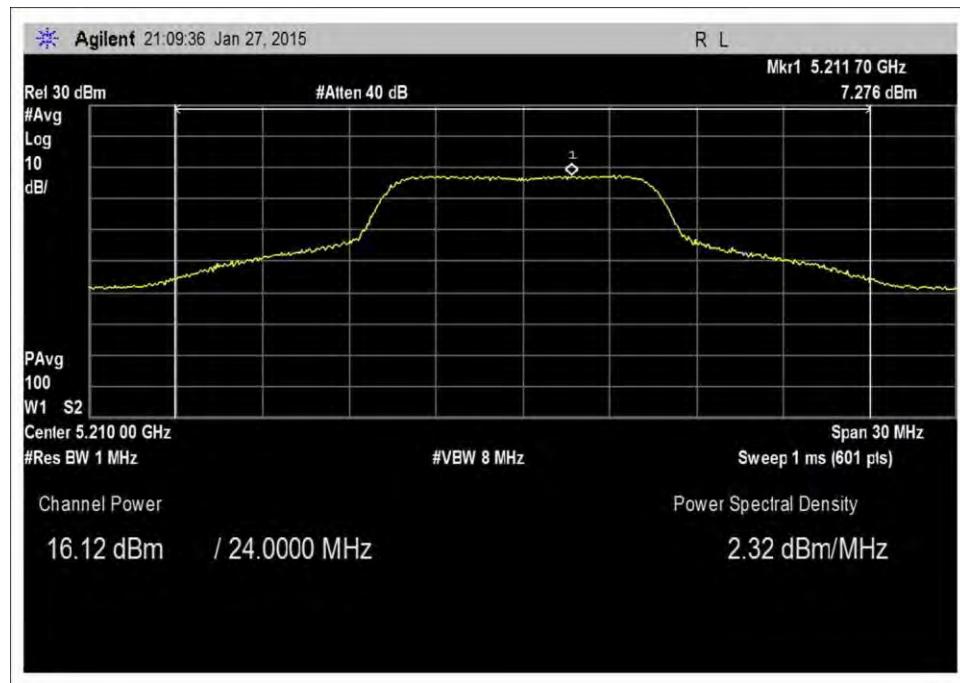
29dBi, 5MHz, Mid, Chain 1



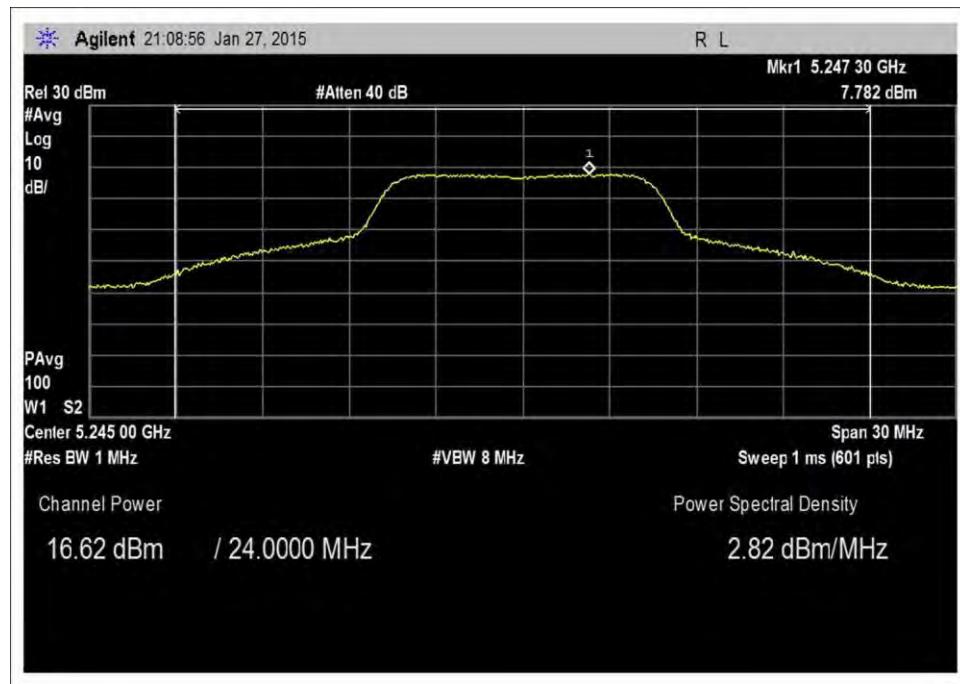
29dBi, 5MHz, High, Chain 1



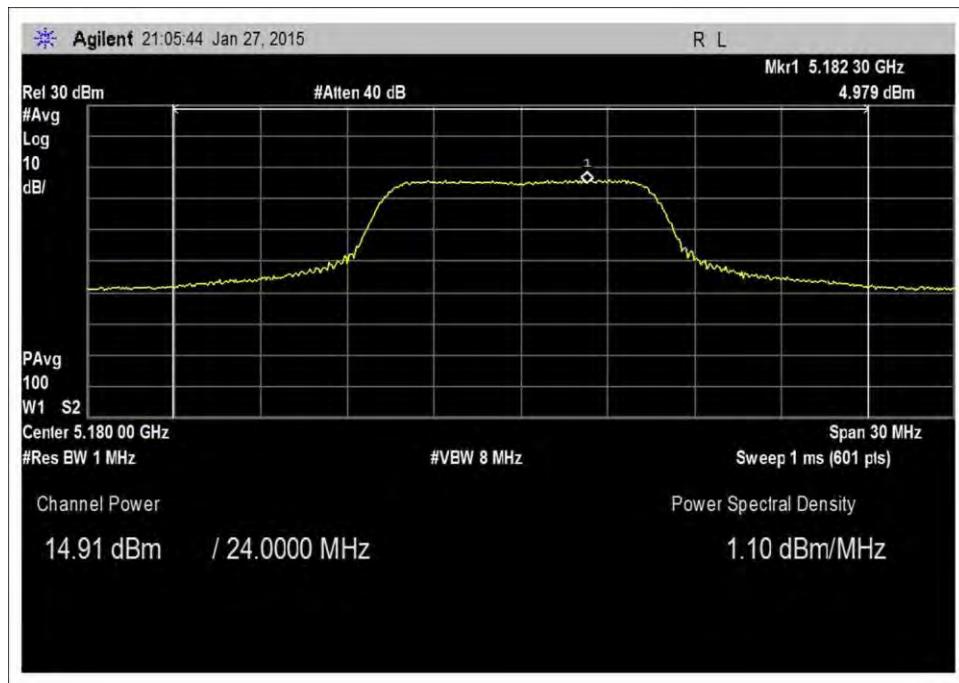
29dBi, 10MHz, Low, Chain 0



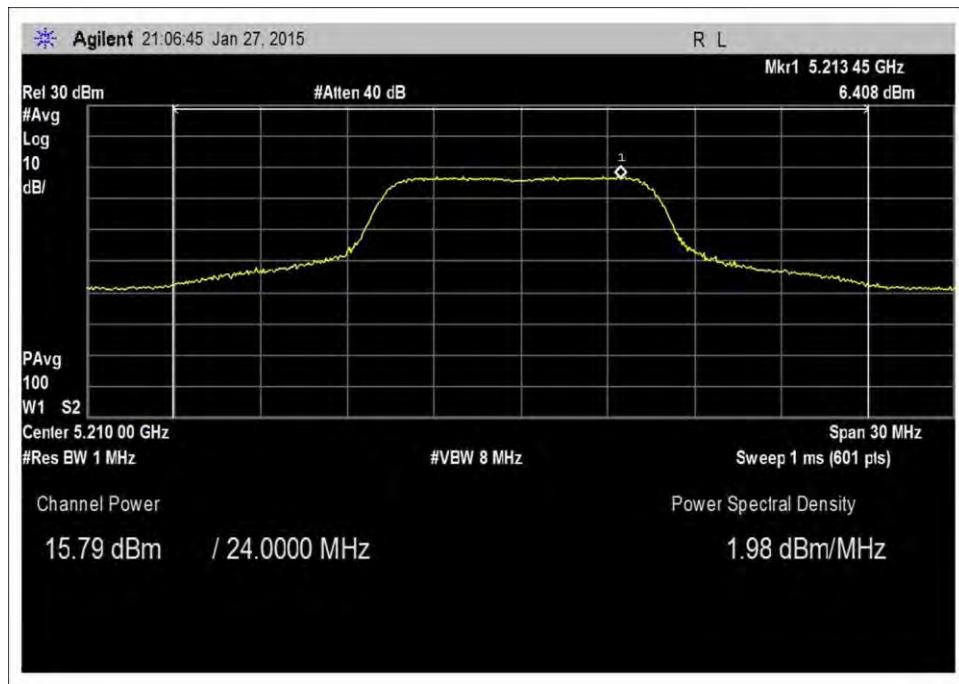
29dBi, 10MHz, Mid, Chain 0



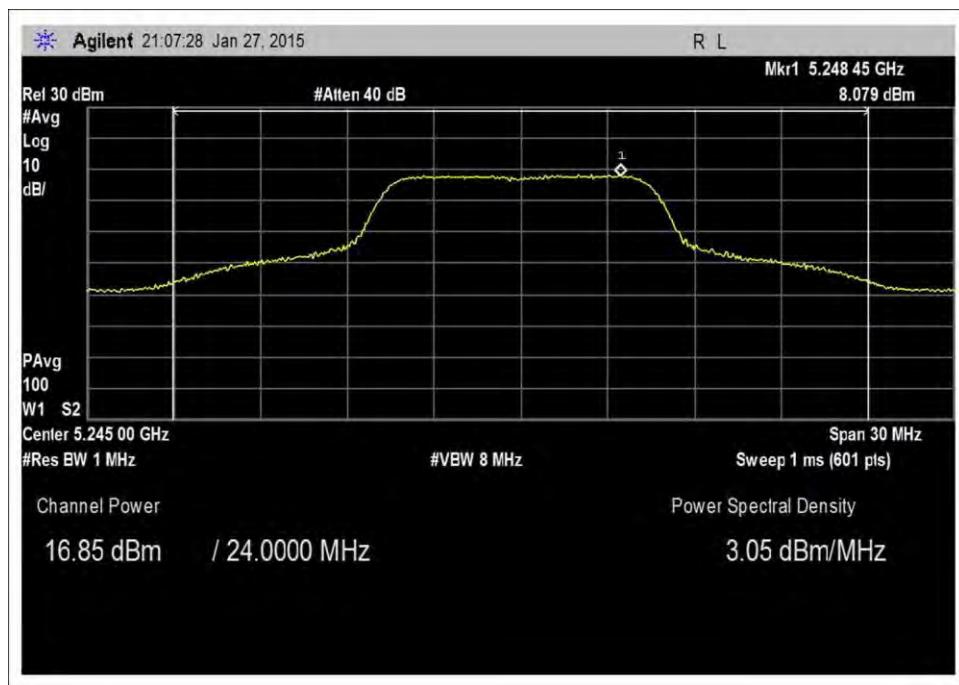
29dBi, 10MHz, High, Chain 0



29dBi, 10MHz, Low, Chain 1

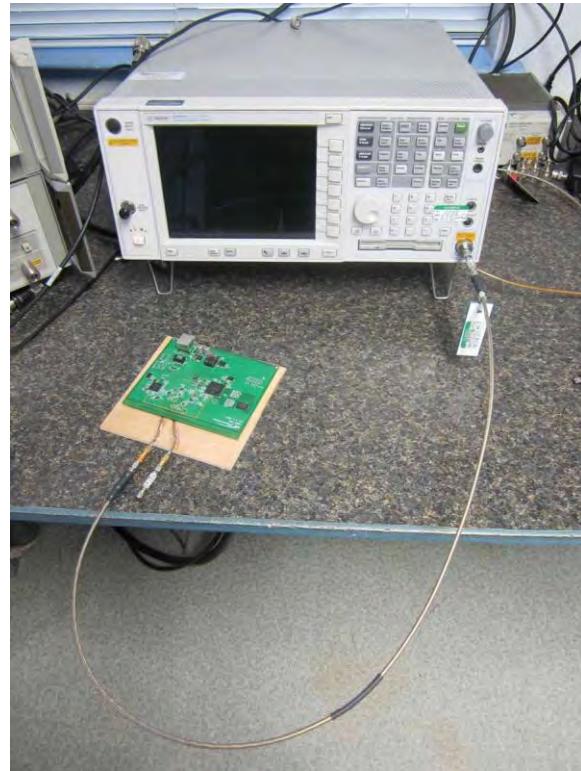


29dBi, 10MHz, Mid, Chain 1



29dBi, 10MHz, High, Chain 1

## Test Setup Photo



## 15.407(b)(1) Undesirable Emissions and Band Edge

### Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**

Specification: **15.407(b) Radiated Spurious Emissions**

Work Order #: **96184**

Date: 3/1/2015

Test Type: **Maximized Emissions**

Time: 19:57:51

Equipment: **GEN6 CPE**

Sequence#: 3

Manufacturer: Digital Path

Tested By: Eddie Mariscal

Model: 2x-29

S/N: C6:A6

#### Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	3/18/2014	3/18/2016
T2	AN03155	Preamp	83017A	6/26/2013	6/26/2015
T3	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T4	AN03355	Cable	32026-2-29094K-48TC	12/8/2014	12/8/2016
T5	AN03361	Cable	32022-2-29094-48TC	12/8/2014	12/8/2016
T6	AN03362	Cable	32022-2-29094-48TC	12/8/2014	12/8/2016
T7	ANP05904	Cable	32022-2-29094K-144TC	12/8/2014	12/8/2016
T8	AN02118	High Pass Filter	84300-80039	12/9/2014	12/9/2016
	AN01413	Horn Antenna	84125-80008	11/25/2014	11/25/2016
	ANP01991	Band Pass Filter	BPF-L-102-631-11484	12/8/2014	12/8/2016
	AN03158A	Horn Antenna-ANSI C63.5 Calibration	GH-28-25	1/14/2015	1/14/2017
	AN00226	Loop Antenna	6502	3/28/2014	3/28/2016
	AN01991	Biconilog Antenna	CBL6111C	3/7/2014	3/7/2016
	AN00449	Preamp-Bottom Amp (dB)	8447F	4/7/2014	4/7/2016

#### Equipment Under Test (\* = EUT):

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	None
GEN6 CPE*	Digital Path	2x-29	C6:A6

#### Support Devices:

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	None

#### Test Conditions / Notes:

The EUT is set atop a wooden non-conductive turntable of height 80cm. The EUT is set to transmit at 100% duty cycle.

Tested IAW ANSI C63.10(2013) Section 6.4 - 6.6.

Chain 0 and Chain 1 operating simultaneously.

Channel Bandwidth: 5MHz

Data rate: 19.5Mbps

Frequency Range of Interest: 9kHz - 40GHz

9 - 150kHz: RBW = 200Hz; VBW > RBW

0.15-30MHz; RBW = 9kHz; VBW > RBW

30-1000MHz; RBW = 120kHz; VBW > RBW

1-40GHz; RBW = 1MHz; VBW > RBW

Emissions limits were derived IAW KDB 789033 D02 section G.2.d.

For emissions falling within the restricted bands as defined in 15.205, the limits of 15.209 were used.

For emissions falling outside of the restricted bands as defined in 15.205, the limits defined in 15.407(b) were used as shown in the calculation below:

$$EIRP[dBm] = E[dBuV/m] - 95.2$$

$$E[dBuV/m] = EIRP[dBm] + 95.2$$

$$E[dBuV/m] = -27dBm/MHz + 95.2$$

$$E[dBuV/m] = 68.2dBuV/m$$

Demonstration of compliance to 15.209 limits implies compliance to 15.407(b) limits as the limits of 15.209 are more stringent than the limits of 15.407(b) as indicated in the calculations above.

Environmental Conditions:

Temperature: 19°C

Relative Humidity: 40%

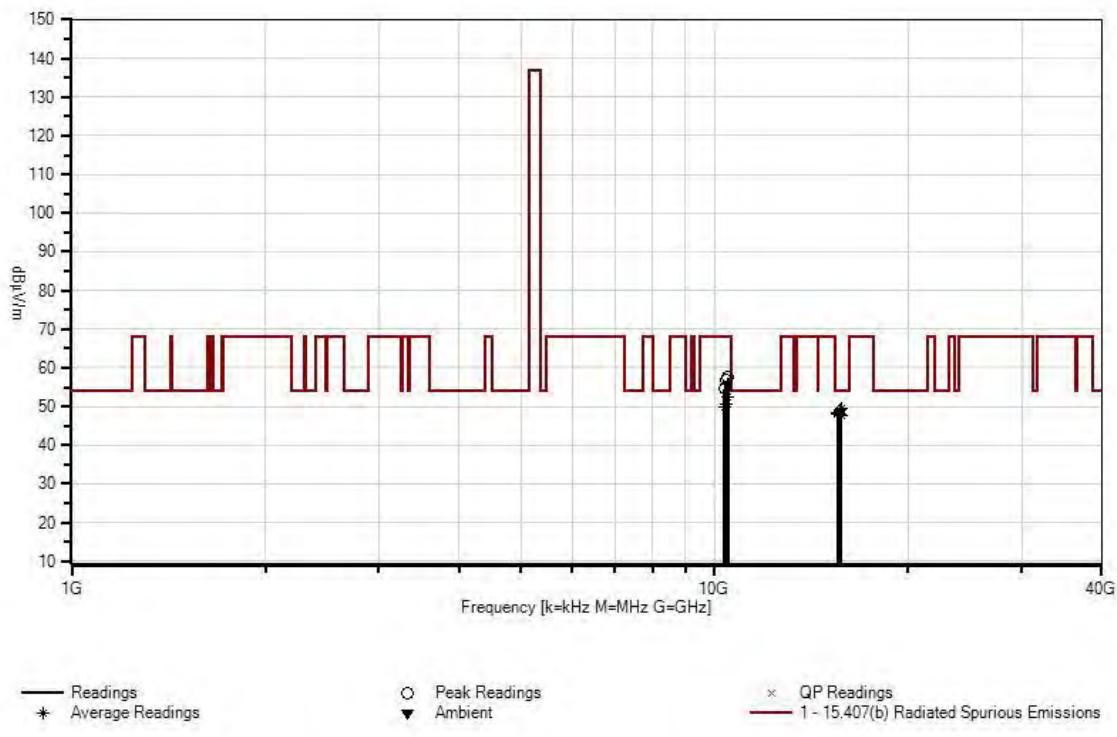
Atmospheric Pressure: 97.8kPa

Ext Attn: 0 dB

<b>Measurement Data:</b>			Reading listed by margin.				Test Distance: 3 Meters				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
	MHz	dB $\mu$ V	T5	T6	T7	T8	Table	dB $\mu$ V/m	dB $\mu$ V/m	dB	Ant
1	15735.000	31.4	+36.9	-32.4	+0.0	+2.3	+0.0	49.6	54.0	-4.4	Horiz
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5245MHz
^	15735.000	39.9	+36.9	-32.4	+0.0	+2.3	+0.0	58.1	54.0	+4.1	Horiz
	M		+2.0	+2.0	+6.6	+0.8					
											Operating at 5245MHz
3	15630.000	30.7	+37.2	-32.4	+0.0	+2.3	+0.0	49.2	54.0	-4.8	Horiz
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5210MHz
^	15630.000	39.7	+37.2	-32.4	+0.0	+2.3	+0.0	58.2	54.0	+4.2	Horiz
	M		+2.0	+2.0	+6.6	+0.8					
											Operating at 5210MHz

5	15540.000	30.0	+37.4	-32.4	+0.0	+2.3	+0.0	48.5	54.0	-5.5	Horiz
	M		+1.9	+2.0	+6.6	+0.7					
	Ave										Operating at 5180MHz
^	15540.000	42.0	+37.4	-32.4	+0.0	+2.3	+0.0	60.5	54.0	+6.5	Horiz
	M		+1.9	+2.0	+6.6	+0.7					
	Ave										Operating at 5180MHz
7	15630.000	29.6	+37.2	-32.4	+0.0	+2.3	+0.0	48.1	54.0	-5.9	Vert
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5210MHz
^	15630.000	38.2	+37.2	-32.4	+0.0	+2.3	+0.0	56.7	54.0	+2.7	Vert
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5210MHz
9	15540.000	29.6	+37.4	-32.4	+0.0	+2.3	+0.0	48.1	54.0	-5.9	Vert
	M		+1.9	+2.0	+6.6	+0.7					
	Ave										Operating at 5180MHz
^	15540.000	42.2	+37.4	-32.4	+0.0	+2.3	+0.0	60.7	54.0	+6.7	Vert
	M		+1.9	+2.0	+6.6	+0.7					
	Ave										Operating at 5180MHz
11	15735.000	29.5	+36.9	-32.4	+0.0	+2.3	+0.0	47.7	54.0	-6.3	Vert
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5245MHz
^	15735.000	36.2	+36.9	-32.4	+0.0	+2.3	+0.0	54.4	54.0	+0.4	Vert
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5245MHz
13	10487.670	42.8	+36.6	-32.2	+0.0	+1.9	+0.0	57.5	68.2	-10.7	Vert
	M		+1.6	+1.6	+5.2	+0.0					
	Ave										Operating at 5245MHz
14	10418.670	42.1	+36.5	-32.2	+0.0	+1.9	+0.0	56.8	68.2	-11.4	Vert
	M		+1.6	+1.6	+5.2	+0.1					
	Ave										Operating at 5210MHz
15	10360.000	39.8	+36.5	-32.2	+0.0	+1.9	+0.0	54.5	68.2	-13.7	Vert
	M		+1.6	+1.6	+5.2	+0.1					
	Ave										Operating at 5180MHz
16	10490.000	37.8	+36.6	-32.2	+0.0	+1.9	+0.0	52.5	68.2	-15.7	Horiz
	M		+1.6	+1.6	+5.2	+0.0					
	Ave										Operating at 5245MHz
^	10490.000	51.5	+36.6	-32.2	+0.0	+1.9	+0.0	66.2	68.2	-2.0	Horiz
	M		+1.6	+1.6	+5.2	+0.0					
	Ave										Operating at 5245MHz

18	10418.333	35.8	+36.5	-32.2	+0.0	+1.9	+0.0	50.5	68.2	-17.7	Horiz
	M		+1.6	+1.6	+5.2	+0.1					
	Ave									Operating at	
										5210MHz	
^	10418.330	51.7	+36.5	-32.2	+0.0	+1.9	+0.0	66.4	68.2	-1.8	Horiz
	M		+1.6	+1.6	+5.2	+0.1					
	Ave									Operating at	
										5210MHz	
20	10360.000	35.2	+36.5	-32.2	+0.0	+1.9	+0.0	49.9	68.2	-18.3	Horiz
	M		+1.6	+1.6	+5.2	+0.1					
	Ave									Operating at	
										5180MHz	
^	10360.000	49.5	+36.5	-32.2	+0.0	+1.9	+0.0	64.2	68.2	-4.0	Horiz
	M		+1.6	+1.6	+5.2	+0.1					
										Operating at	
										5180MHz	

CKC Laboratories, Inc. Date: 3/1/2015 Time: 19:57:51 Digital Path WO#: 96184  
15.407(b) Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 3 Ext ATTN: 0 dB


Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer:

**Digital Path**

Specification:

**15.407(b) Radiated Spurious Emissions**

Work Order #:

**96184**

Date: 3/1/2015

Test Type:

**Maximized Emissions**

Time: 19:24:57

Equipment:

**GEN6 CPE**

Sequence#: 3

Manufacturer:

Digital Path

Tested By: Eddie Mariscal

Model:

2x-29

S/N:

C6:A6

**Test Equipment:**

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
T1	AN00327	Horn Antenna	3115	3/18/2014	3/18/2016
T2	AN03155	Preamp	83017A	6/26/2013	6/26/2015
T3	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T4	AN03355	Cable	32026-2-29094K- 48TC	12/8/2014	12/8/2016
T5	AN03361	Cable	32022-2-29094- 48TC	12/8/2014	12/8/2016
T6	AN03362	Cable	32022-2-29094- 48TC	12/8/2014	12/8/2016
T7	ANP05904	Cable	32022-2-29094K- 144TC	12/8/2014	12/8/2016
T8	AN02118	High Pass Filter	84300-80039	12/9/2014	12/9/2016
AN01413	Horn Antenna		84125-80008	11/25/2014	11/25/2016
ANP01991	Band Pass Filter		BPF-L-102-631- 11484	12/8/2014	12/8/2016
AN03158A	Horn Antenna-ANSI C63.5 Calibration		GH-28-25	1/14/2015	1/14/2017
AN00226	Loop Antenna		6502	3/28/2014	3/28/2016
AN01991	Biconilog Antenna		CBL6111C	3/7/2014	3/7/2016
AN00449	Preamp-Bottom Amp (dB)		8447F	4/7/2014	4/7/2016

**Equipment Under Test (\* = EUT):**

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	None
GEN6 CPE*	Digital Path	2x-29	C6:A6

**Support Devices:**

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	None

**Test Conditions / Notes:**

The EUT is set atop a wooden non-conductive turntable of height 80cm. The EUT is set to transmit at 100% duty cycle.

Tested IAW ANSI C63.10(2013) Section 6.4 - 6.6.

Chain 0 and Chain 1 operating simultaneously.

Channel Bandwidth: 10MHz

Data rate: 13Mbps

Frequency Range of Interest: 9kHz - 40GHz

9 - 150kHz: RBW = 200Hz; VBW > RBW

0.15-30MHz; RBW = 9kHz; VBW > RBW

30-1000MHz; RBW = 120kHz; VBW > RBW

1-40GHz; RBW = 1MHz; VBW > RBW

Emissions limits were derived IAW KDB 789033 D02 section G.2.d.

For emissions falling within the restricted bands as defined in 15.205, the limits of 15.209 were used.

For emissions falling outside of the restricted bands as defined in 15.205, the limits defined in 15.407(b) were used as shown in the calculation below:

$$\text{EIRP[dBm]} = \text{E[dBuV/m]} - 95.2$$

$$\text{E[dBuV/m]} = \text{EIRP[dBm]} + 95.2$$

$$\text{E[dBuV/m]} = -27\text{dBm/MHz} + 95.2$$

$$\text{E[dBuV/m]} = 68.2\text{dBuV/m}$$

Demonstration of compliance to 15.209 limits implies compliance to 15.407(b) limits as the limits of 15.209 are more stringent than the limits of 15.407(b) as indicated in the calculations above.

Environmental Conditions:

Temperature: 19°C

Relative Humidity: 40%

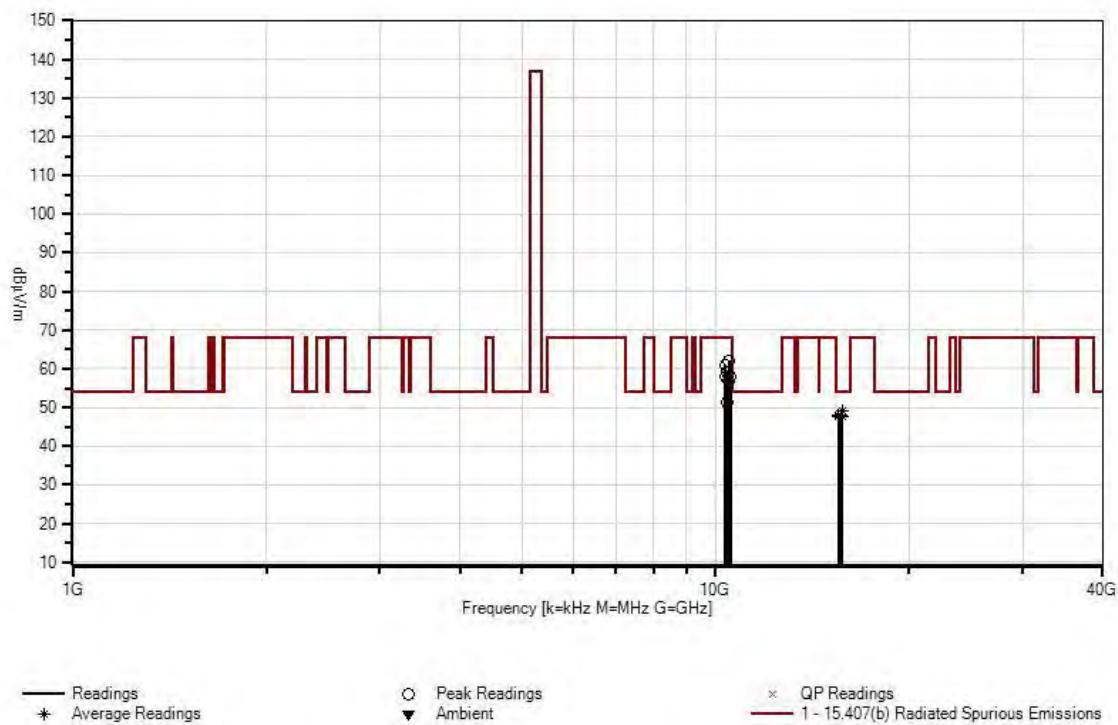
Atmospheric Pressure: 97.8kPa

Ext Attn: 0 dB

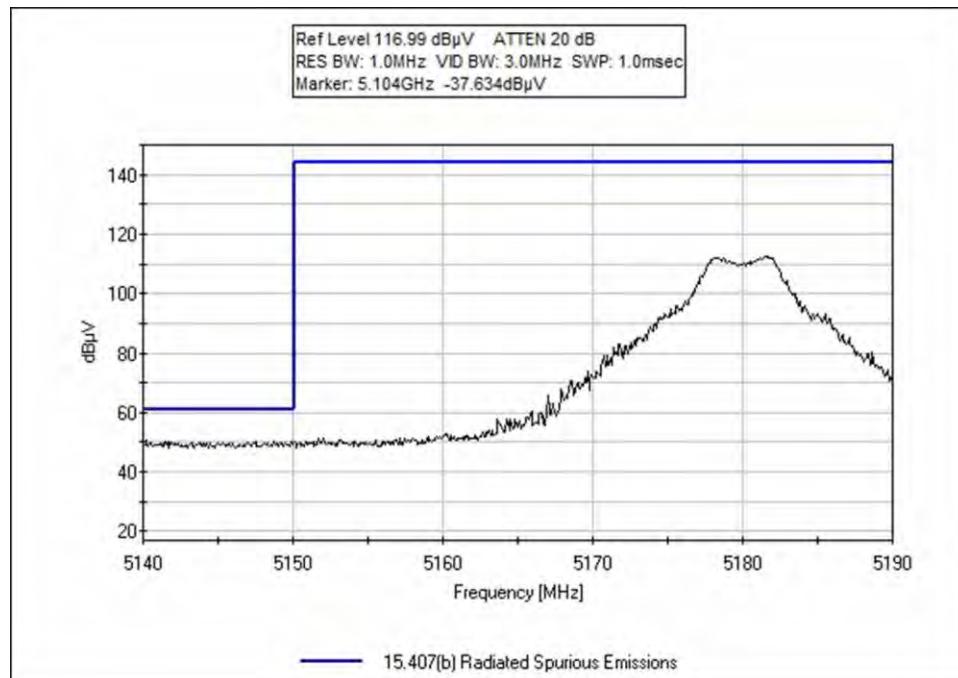
Measurement Data:			Reading listed by margin.				Test Distance: 3 Meters				
#	Freq	Rdng	T1	T2	T3	T4	Dist	Corr	Spec	Margin	Polar
			T5	T6	T7	T8	Table	dB $\mu$ V/m	dB $\mu$ V/m		
MHz		dB $\mu$ V	dB	dB	dB	dB	Table	dB $\mu$ V/m	dB $\mu$ V/m		
1	15735.000	31.0	+36.9	-32.4	+0.0	+2.3	+0.0	49.2	54.0	-4.8	Horiz
	M		+2.0	+2.0	+6.6	+0.8					
	Ave										Operating at 5245MHz
^	15735.000	40.8	+36.9	-32.4	+0.0	+2.3	+0.0	59.0	54.0	+5.0	Horiz
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5245MHz
3	15630.000	29.7	+37.2	-32.4	+0.0	+2.3	+0.0	48.2	54.0	-5.8	Vert
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5210MHz
	Ave										

^	15630.000	40.2	+37.2	-32.4	+0.0	+2.3	+0.0	58.7	54.0	+4.7	Vert
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5210MHz
5	15630.000	29.7	+37.2	-32.4	+0.0	+2.3	+0.0	48.2	54.0	-5.8	Horiz
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5210MHz
^	15630.000	38.7	+37.2	-32.4	+0.0	+2.3	+0.0	57.2	54.0	+3.2	Horiz
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5210MHz
7	15540.000	29.6	+37.4	-32.4	+0.0	+2.3	+0.0	48.1	54.0	-5.9	Vert
	M		+1.9	+2.0	+6.6	+0.7					Operating at 5180MHz
^	15540.000	39.2	+37.4	-32.4	+0.0	+2.3	+0.0	57.7	54.0	+3.7	Vert
	M		+1.9	+2.0	+6.6	+0.7					Operating at 5180MHz
9	10487.500	47.2	+36.6	-32.2	+0.0	+1.9	+0.0	61.9	68.2	-6.3	Horiz
	M		+1.6	+1.6	+5.2	+0.0					Operating at 5245MHz
10	15735.000	29.4	+36.9	-32.4	+0.0	+2.3	+0.0	47.6	54.0	-6.4	Vert
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5245MHz
^	15735.000	41.2	+36.9	-32.4	+0.0	+2.3	+0.0	59.4	54.0	+5.4	Vert
	M		+2.0	+2.0	+6.6	+0.8					Operating at 5245MHz
12	15540.000	29.0	+37.4	-32.4	+0.0	+2.3	+0.0	47.5	54.0	-6.5	Horiz
	M		+1.9	+2.0	+6.6	+0.7					Operating at 5180MHz
^	15540.000	38.2	+37.4	-32.4	+0.0	+2.3	+0.0	56.7	54.0	+2.7	Horiz
	M		+1.9	+2.0	+6.6	+0.7					Operating at 5180MHz
14	10360.000	46.1	+36.5	-32.2	+0.0	+1.9	+0.0	60.8	68.2	-7.4	Vert
	M		+1.6	+1.6	+5.2	+0.1					Operating at 5180MHz
15	10420.000	44.3	+36.5	-32.2	+0.0	+1.9	+0.0	59.0	68.2	-9.2	Horiz
	M		+1.6	+1.6	+5.2	+0.1					Operating at 5210MHz
16	10536.330	43.3	+36.6	-32.2	+0.0	+1.9	+0.0	58.0	68.2	-10.2	Vert
	M		+1.6	+1.6	+5.2	+0.0					Operating at 5245MHz

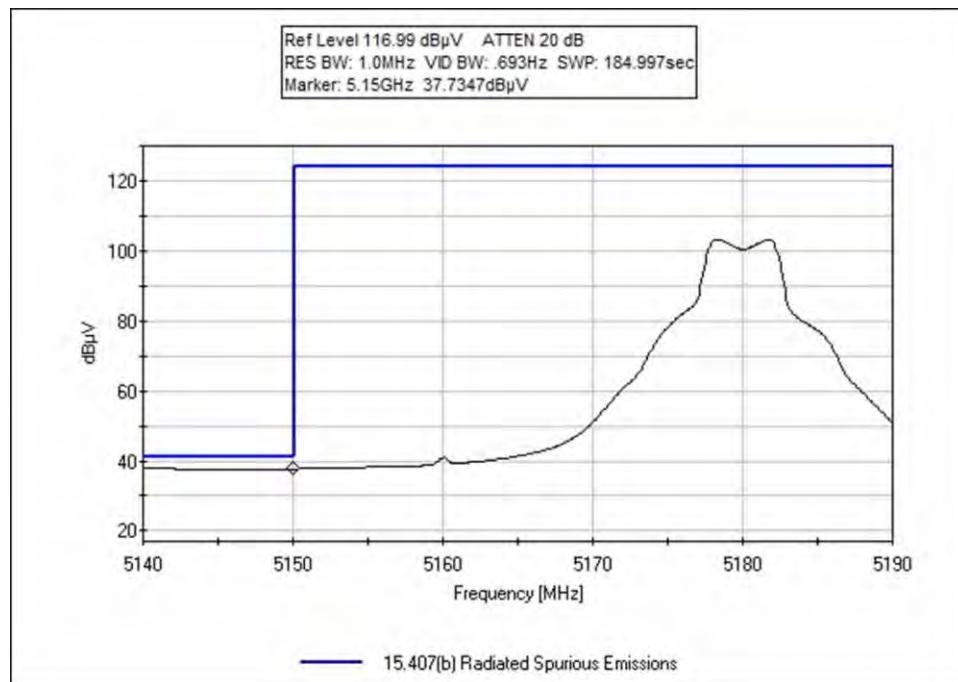
17	10360.000	43.1	+36.5	-32.2	+0.0	+1.9	+0.0	57.8	68.2	-10.4	Horiz
	M		+1.6	+1.6	+5.2	+0.1					
Operating at 5180MHz											
18	10493.330	42.3	+36.6	-32.2	+0.0	+1.9	+0.0	57.0	68.2	-11.2	Vert
	M		+1.6	+1.6	+5.2	+0.0					
Operating at 5245MHz											
19	10420.000	36.5	+36.5	-32.2	+0.0	+1.9	+0.0	51.2	68.2	-17.0	Vert
	M		+1.6	+1.6	+5.2	+0.1					
Operating at 5210MHz											

CKC Laboratories, Inc. Date: 3/1/2015 Time: 19:24:57 Digital Path WO#: 96184  
15.407(b) Radiated Spurious Emissions Test Distance: 3 Meters Sequence#: 3 Ext ATTN: 0 dB


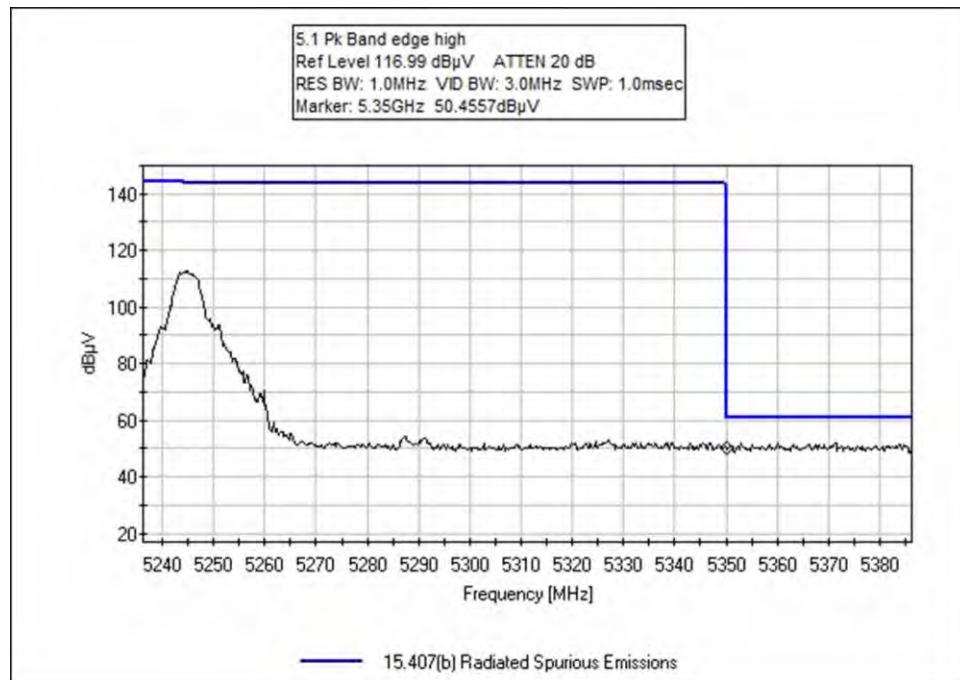
## Band Edge



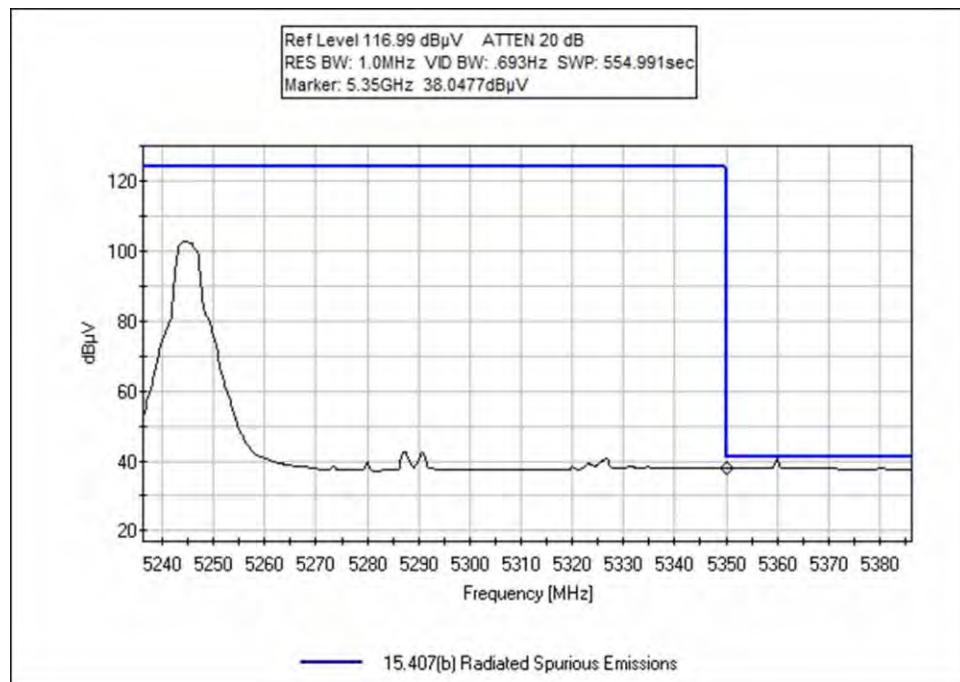
5MHz, Low, Peak



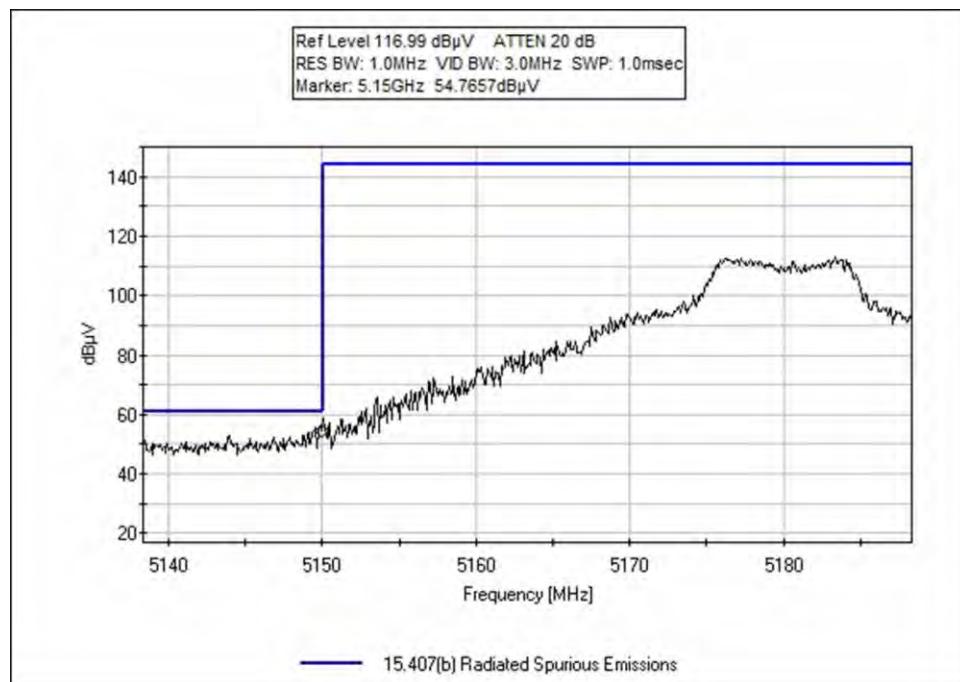
5MHz, Low, Average



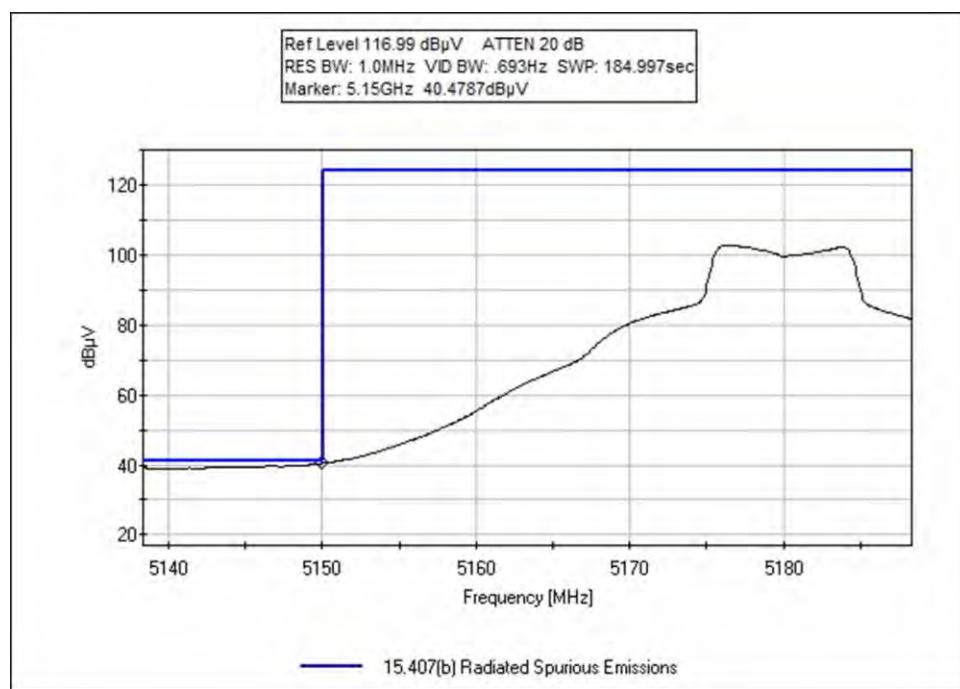
5MHz High, Peak



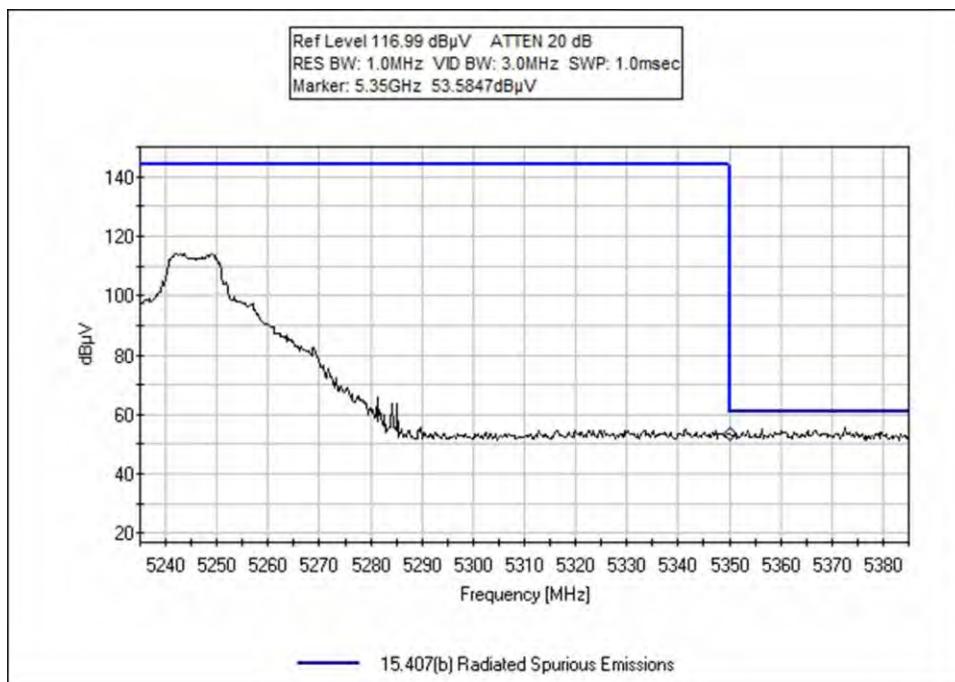
5MHz High, Average



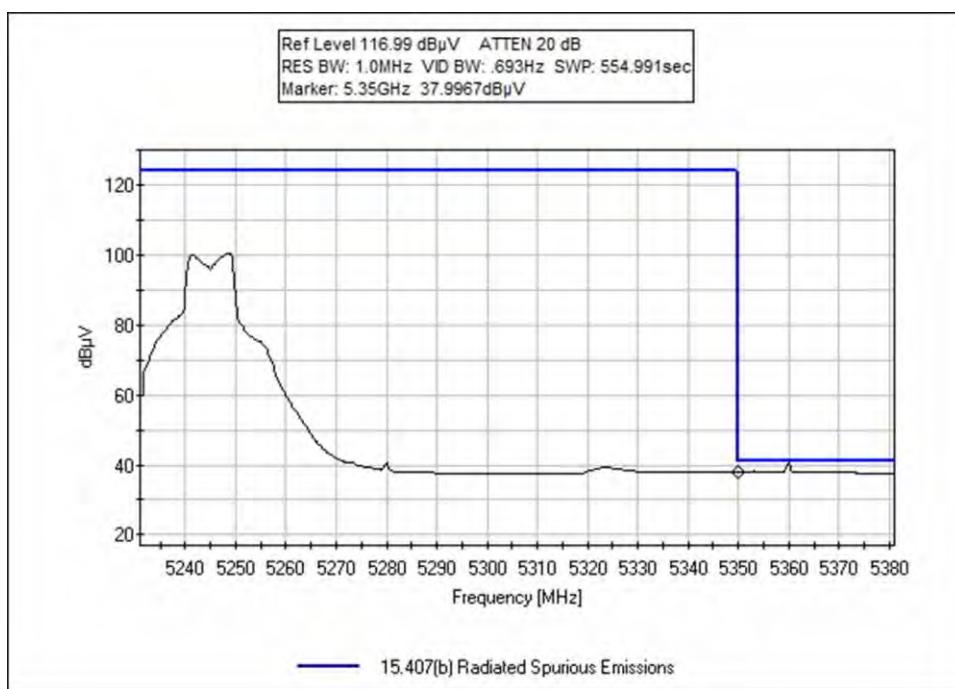
10MHz, Low, Peak



10MHz, Low, Average

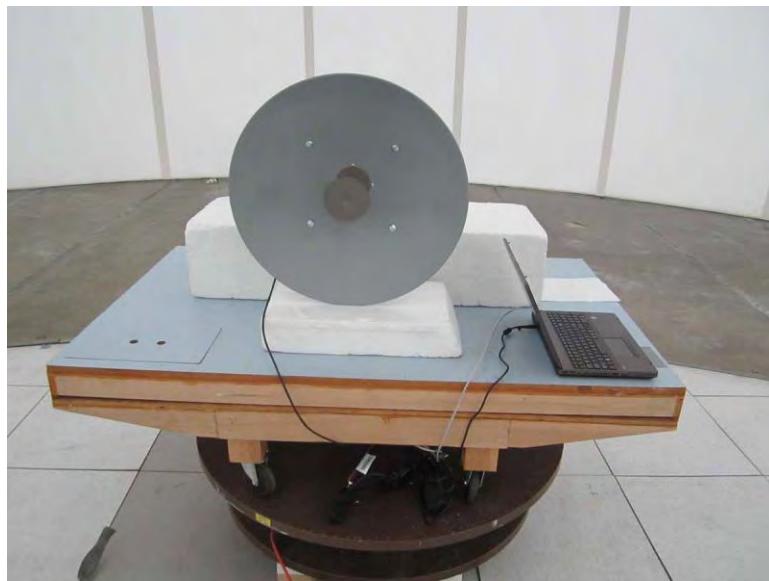


10MHz, High, Peak



10MHz, High, Average

## Test Setup Photos



## 15.407(g) Frequency Stability

### Test Conditions / Setup

Test Location: CKC Laboratories, Inc. • 5046 Sierra Pines Dr. • Mariposa, CA 95338 • (209) 966-5240

Customer: **Digital Path**  
 Specification: **15.407 (g) Frequency Stability**  
 Work Order #: **96184** Date: 4/16/2015  
 Test Type: **Temperature Variation** Time: 1:10:51 PM  
 Equipment: **GEN6 CPE** Sequence#: 1  
 Manufacturer: Digital Path Tested By: Eddie Mariscal  
 Model: 2x-29  
 S/N: C6:A6

#### Test Equipment:

ID	Asset #	Description	Model	Calibration Date	Cal Due Date
	AN02668	Spectrum Analyzer	E4446A	8/4/2014	8/4/2015
T1	ANP05624	Attenuator	PE7010-10	1/15/2015	1/15/2017
T2	ANP06232	Cable	CXTA04A-35	9/5/2014	9/5/2016
T3	AN01879	Temperature Chamber	S-1.2 Min.	12/5/2014	12/5/2016
T4	AN02242	Thermometer	HH-26K	5/2/2014	5/2/2016

#### Equipment Under Test (\* = EUT):

Function	Manufacturer	Model #	S/N
POE Power Adapter	HP	FAS24000050-C44	NA
GEN6 CPE*	Digital Path	2x-29	C6:A6

#### Support Devices:

Function	Manufacturer	Model #	S/N
AC/DC power Adapter	HP	Series PPP012H-S	F12941126327228
Laptop Computer	HP	Probook 6565b	NA

**Test Conditions / Notes:**

Frequency Stability

Voltage Variations:

The voltage was varied from 100-240VAC. No significant frequency drift was noted.

Temperature Variations:

The frequency drift was monitored while the EUT was operating at its lowest operating frequency then at its highest operating frequency to ensure that the carrier remained within the band of operation.

The frequencies at which the signal was 10dB below the peak value were recorded at room temperature.

These values became the reference frequencies.

The temperature was then varied in 10degree increments (°C) and the 10dB frequencies were recorded at each temperature.

The difference between these values and the reference frequencies were then used to determine the worst-case frequencies.

Worst-case measurements were also taken during radiated emissions.

These values were adjusted based on the frequency drift measured during temperature variations, and these values are presented below.

Software Used: art2\_ver2\_28\_6BIN

RBW = 30kHz; VBW > RBW

Tx Power Setting = 24dBm

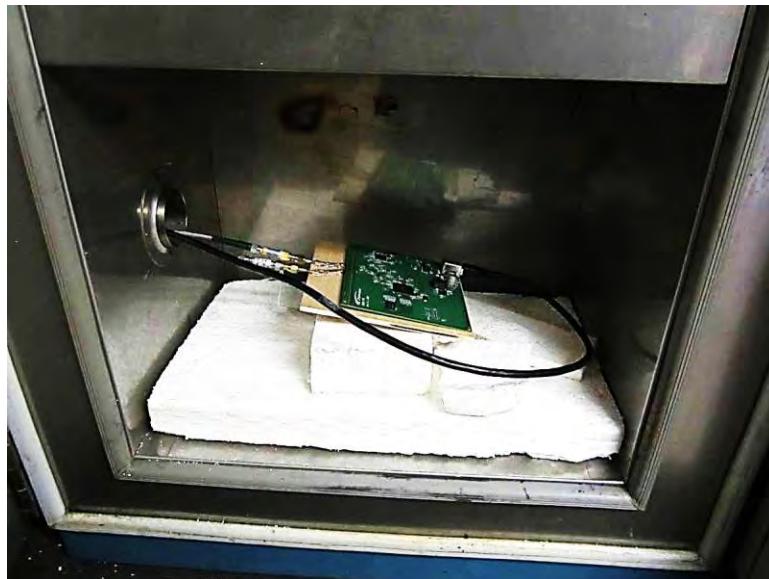
Bandwidth setting = 5MHz and 10MHz

Data rate = 19.5Mbps for 5MHz BW and 13Mbps for 10MHz BW

**Frequency Stability Data**

Temperature (°C)	5MHz Bandwidth		10MHz Bandwidth	
	FL (MHz)	FH (MHz)	FL (MHz)	FH (MHz)
-20	5167.128	5260.897	5153.323	5285.222
-10	5167.150	5260.883	5153.327	5285.226
0	5167.140	5260.871	5153.348	5285.237
10	5167.137	5260.856	5153.339	5285.213
20	5167.124	5260.831	5153.300	5285.200
30	5167.117	5260.861	5153.314	5285.197
40	5167.100	5260.796	5153.278	5285.187
50	5167.102	5260.788	5153.245	5285.171
Limit	>5150	<5350	>5150	<5350
Result	Pass	Pass	Pass	Pass
Data Rate	19.5Mbps	19.5Mbps	13Mbps	13Mbps

## Test Setup Photos



## SUPPLEMENTAL INFORMATION

### Measurement Uncertainty

Uncertainty Value	Parameter
4.73 dB	Radiated Emissions
3.34 dB	Mains Conducted Emissions
3.30 dB	Disturbance Power

Reported uncertainties represent expanded uncertainties expressed at approximately the 95% confidence level using a coverage factor of k=2.

### Emissions Test Details

#### TESTING PARAMETERS

Unless otherwise indicated, the following configuration parameters are used for equipment setup: The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. Cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the setup photographs. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables.

The emissions data was taken with a spectrum analyzer or receiver. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the table below. The corrected data was then compared to the applicable emission limits. Preliminary and final measurements were taken in order to ensure that all emissions from the EUT were found and maximized.

#### CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dB $\mu$ V/m, the spectrum analyzer reading in dB $\mu$ V was corrected by using the following formula. This reading was then compared to the applicable specification limit.

<b>SAMPLE CALCULATIONS</b>	
Meter reading	(dB $\mu$ V)
+ Antenna Factor	(dB)
+ Cable Loss	(dB)
- Distance Correction	(dB)
- Preamplifier Gain	(dB)
= Corrected Reading	(dB $\mu$ V/m)

#### TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed were used to collect the emissions data. A spectrum analyzer or receiver was used for all measurements. Unless otherwise specified, the following table shows the measuring equipment bandwidth settings that were used in designated frequency bands. For testing emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used.

<b>MEASURING EQUIPMENT BANDWIDTH SETTINGS PER FREQUENCY RANGE</b>			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	>1 GHz	1 MHz

#### SPECTRUM ANALYZER/RECEIVER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the emissions tables indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "positive peak" detector mode. Whenever a "quasi-peak" or "average" reading was recorded, the measurement was annotated with a "QP" or an "Ave" on the appropriate rows of the data sheets. In cases where quasi-peak or average limits were employed and data exists for multiple measurement types for the same frequency then the peak measurement was retained in the report for reference, however the numbering for the affected row was removed and an arrow or carrot ("") was placed in the far left-hand column indicating that the row above takes precedence for comparison to the limit. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data.

##### Peak

In this mode, the spectrum analyzer or receiver recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature called "peak hold," the measurement device had the ability to measure intermittent or low duty cycle transient emission peak levels. In this mode the measuring device made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

##### Quasi-Peak

Quasi-peak measurements were taken using the quasi-peak detector when the true peak values exceeded or were within 2 dB of a quasi-peak specification limit. Additional QP measurements may have been taken at the discretion of the operator.

##### Average

Average measurements were taken using the average detector when the true peak values exceeded or were within 2 dB of an average specification limit. Additional average measurements may have been taken at the discretion of the operator. If the specification or test procedure requires trace averaging, then the averaging was performed using 100 samples or as required by the specification. All other average measurements are performed using video bandwidth averaging. To make these measurements, the test engineer reduces the video bandwidth on the measuring device until the modulation of the signal is filtered out. At this point the measuring device is set into the linear mode and the scan time is reduced.