



CERTIFICATION TEST REPORT

Report Number. : 11799874-E1V2

Applicant : Loop Labs, Inc.
1530 Blake St.
Denver, CO
80202

Model : 0007

FCC ID : 2AE5C-5280-S2

IC : 20391-5280S2

EUT Description : ENVIRONMENTAL SENSOR

Test Standard(s) : FCC 47 CFR PART 15 SUBPART C
INDUSTRY CANADA RSS - 247 ISSUE 2

Date Of Issue:

July 31, 2017

Prepared by:

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NVLAP LAB CODE 200065-0

Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
--	6/30/17	Initial Issue	---
V2	7/31/17	Updated sections 2, 7	---

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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: Loop Labs, Inc.
1530 Blake St.
Denver, CO 80202

EUT DESCRIPTION: SENSOR

MODEL: 0007

SERIAL NUMBER: Proto 1

DATE TESTED: June 13, 2017 – June 21, 2017

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	Pass
INDUSTRY CANADA RSS-247 Issue 2	Pass
INDUSTRY CANADA RSS-GEN Issue 4	Pass

UL Verification Services Inc. 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 Verification Services Inc. 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 Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. 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 the U.S. government.

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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, KDB 558074 D01 v04, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 2.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

47173 Benicia Street	47266 Benicia Street
<input checked="" type="checkbox"/> Chamber A	<input type="checkbox"/> Chamber D
<input type="checkbox"/> Chamber B	<input type="checkbox"/> Chamber E
<input type="checkbox"/> Chamber C	<input type="checkbox"/> Chamber F
	<input type="checkbox"/> Chamber G
	<input type="checkbox"/> Chamber H

The above test sites and facilities are covered under FCC Test Firm Registration # 208313. Chambers A through C are covered under Industry Canada company address code 2324B with site numbers 2324B -1 through 2324B-3, respectively. Chambers D through H are covered under Industry Canada company address code 22541 with site numbers 22541 -1 through 22541-5, respectively.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://ts.nist.gov/standards/scopes/2000650.htm>.

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:

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

4.3. MEASUREMENT UNCERTAINTY

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

Parameter	Uncertainty
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.84 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.65 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	3.15 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	5.36 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.32 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.45 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.24 dB

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

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is an environmental sensor intended for use in smart homes.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum conducted output power as follows:

Frequency Range (MHz)	Mode	Output Power Average (dBm)	Output Power Average (mW)	Output Power Peak (dBm)	Output Power Peak (mW)
2405-2480	802.15.4	4.25	2.66	4.91	3.10

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an FPCB antenna, with a maximum gain of 2.6 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was FCCV1.1

5.5. WORST-CASE CONFIGURATION AND MODE

For below 1GHz radiated emission and power line conducted emission were performed with the EUT set to transmit at the channel with highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations X/Y/Z, it was determined that X orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in X orientation.

Worst-case data rates as provided by the client were:

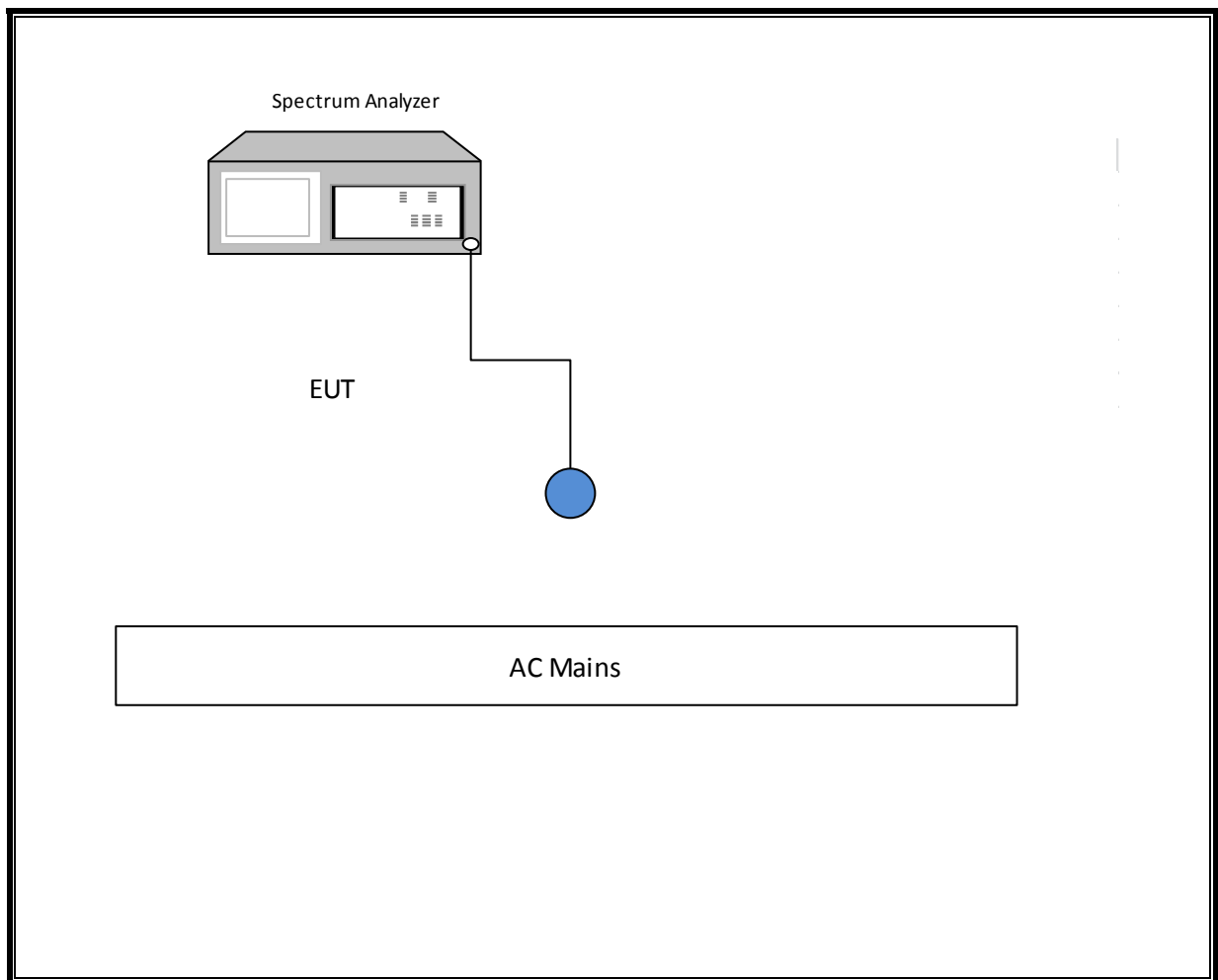
802.15.4 250Khz Mbps

5.6. DESCRIPTION OF TEST SETUP

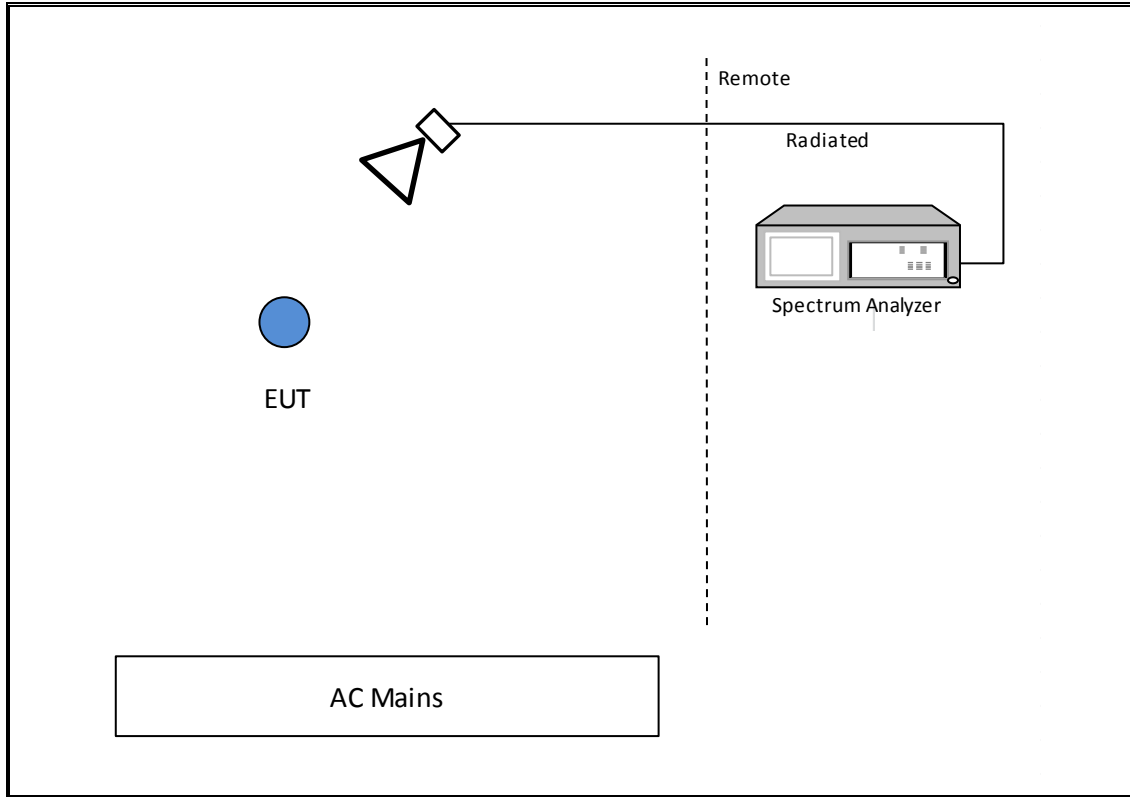
TEST SETUP

The EUT is battery powered and transmits without any support equipment or cables. Once the batteries are plugged in, the EUT turns on. To change channels, firmly double tapping the top of the EUT will change channels. Single blinking light is unmodulated and double blinking light is modulated transmission. Red is Low Channel, Green in Mid Channel, Blue is High Channel.

SETUP DIAGRAM FOR ANTENNA PORT CONDUCTED TESTS



SETUP DIAGRAM FOR RADIATED TESTS



6. TEST AND MEASUREMENT EQUIPMENT

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

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, PSA, 3Hz to 26.5GHz	Agilent (Keysight) Technologies	E4440A	T199	7/22/2017
Power Meter, P-series single channel	Agilent (Keysight) Technologies	N1911A	T1264	7/08/2017
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Agilent (Keysight) Technologies	N1921A	T413	6/20/2017
Antenna, Horn 1-18GHz	ETS-Lindgren	3117	T711	1/30/2018
Antenna, Broadband Hybrid, 30MHz to 2000MHz	Sunol Sciences Corp.	JB1	T130	9/23/2017
Antenna, Horn 18-26.5GHz	ARA	MWH-1826/B	T449	06/12/2018
Amplifier, 1-26.5GHz	Agilent (Keysight) Technologies	8449B	T404	07/05/2018
Spectrum Analyzer	Agilent (Keysight) Technologies	N9030A	T1466	4/11/2018
Amplifier, 10KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310N	T300	11/10/2017

Test Software List			
Description	Manufacturer	Model	Version
Radiated Software	UL	UL EMC	9.5, 4/26/16
Antenna Port Software	UL	UL RF	6.9, 6/13/17
Conducted Emissions Software	UL	UL EMC	9.5, 5/26/15

7. MEASUREMENT METHODS

On Time and Duty Cycle: KDB 558074 D01 v04, Section 6.

6 dB BW: KDB 558074 D01 v04, Section 8.1.

Average Power: KDB 558074 D01 v04, Section 9.2.3.2.

Output Power: KDB 558074 D01 v04, Section 9.2.2.

Power Spectral Density: KDB 558074 D01 v04, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.1.

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.2.5.1

Band-edge: KDB 558074 D01 v04, Section 13.3.1

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME, DUTY CYCLE

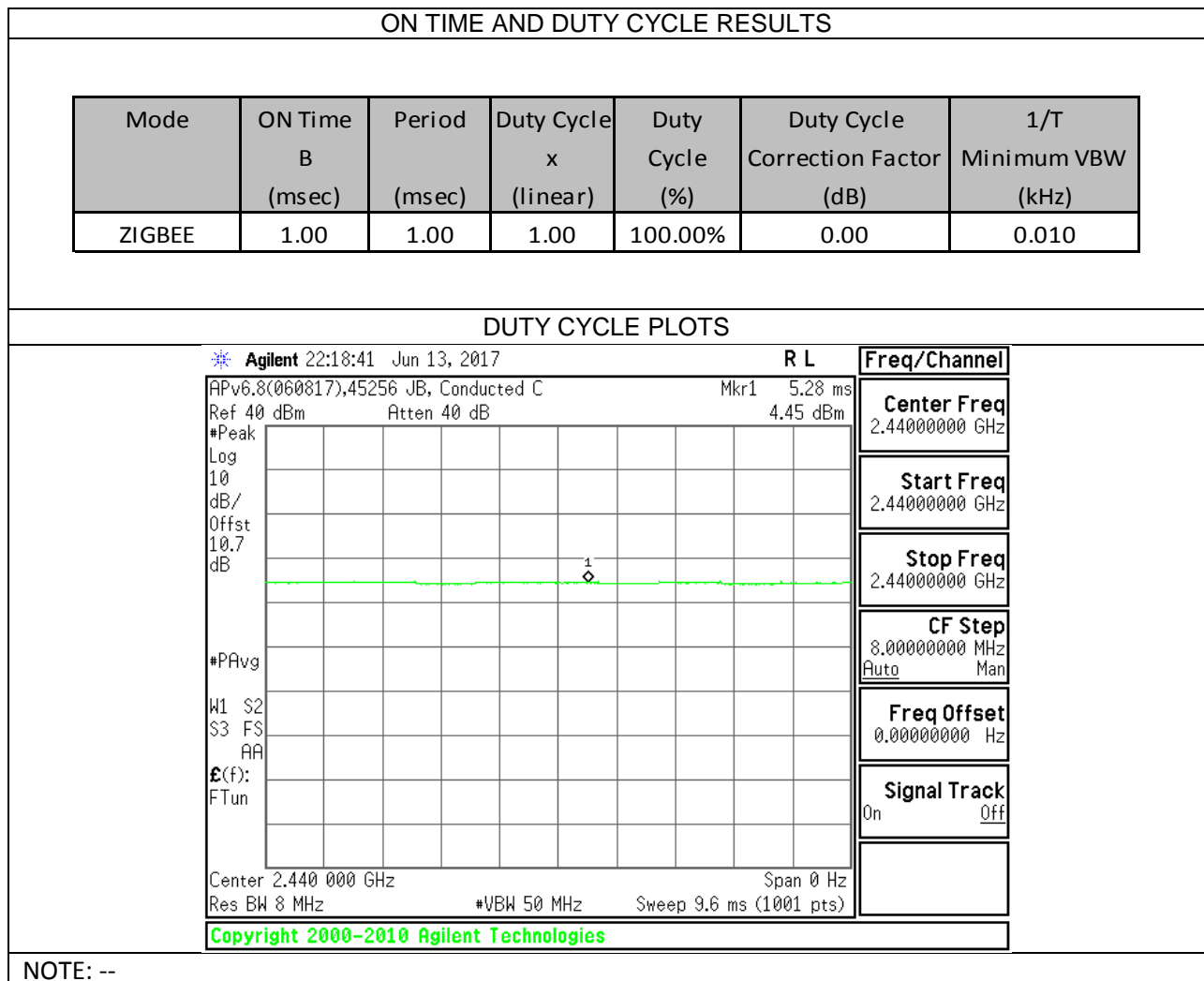
LIMITS

None; for reporting purposes only.

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method.

RESULTS



8.2. 6 dB BANDWIDTH

LIMITS

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

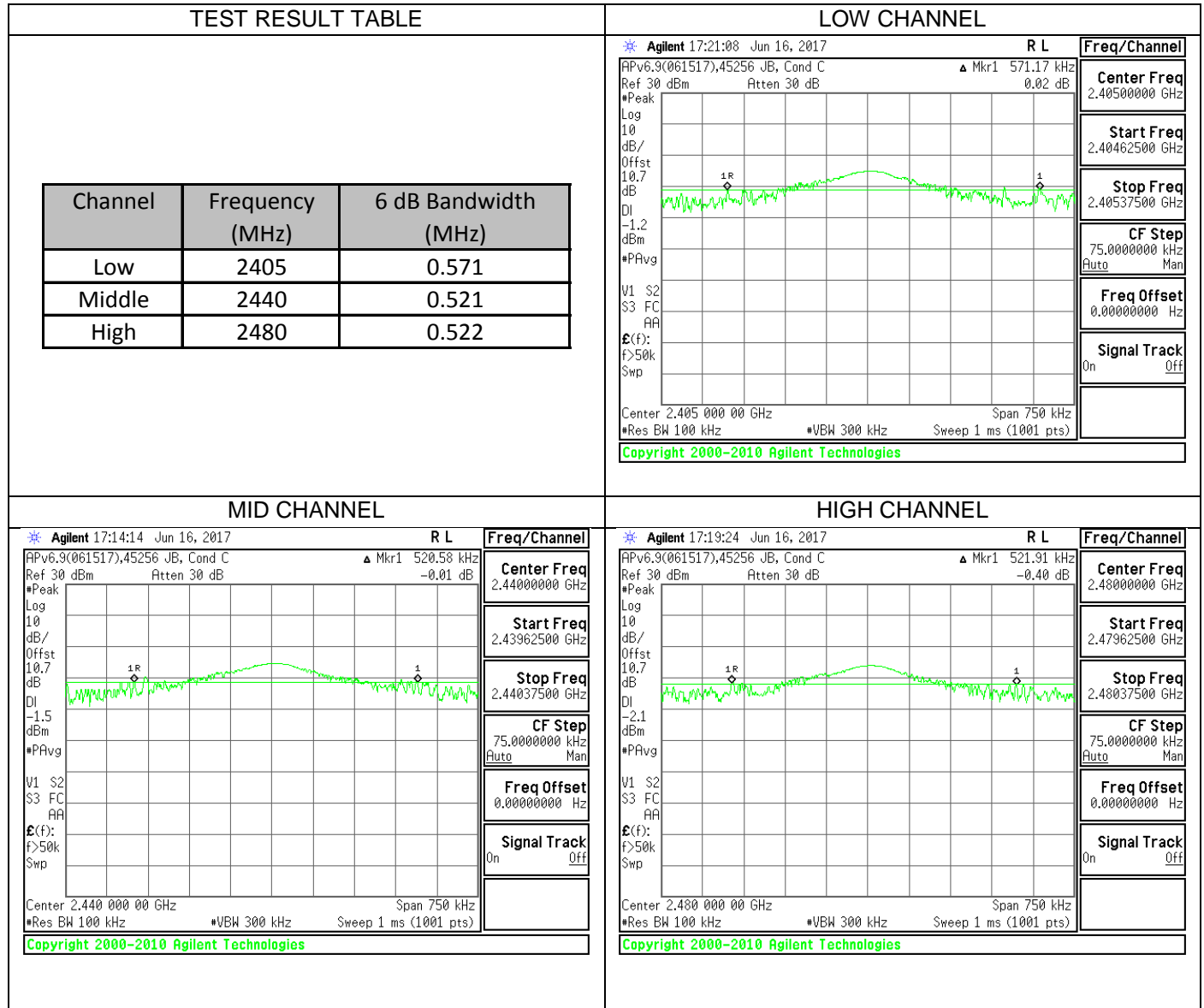
The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The RBW is set to 100 kHz and the VBW is set to 300 kHz. The sweep time is coupled.

RESULTS

8.2.1. 6 dB BANDWIDTH PLOTS AND TABLE



8.3. 99% BANDWIDTH

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to KDB558074 D01 DTS Meas Guidance v04: The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

RESULTS

8.3.1. 99% BANDWIDTH PLOTS AND TABLE

TEST RESULT TABLE	LOW CHANNEL																								
<table border="1" style="margin: auto;"> <thead> <tr> <th>Channel</th> <th>Frequency (MHz)</th> <th>99% Bandwidth (MHz)</th> </tr> </thead> <tbody> <tr> <td>Low</td> <td>2405</td> <td>2.171</td> </tr> <tr> <td>Middle</td> <td>2440</td> <td>2.211</td> </tr> <tr> <td>High</td> <td>2480</td> <td>2.132</td> </tr> </tbody> </table>	Channel	Frequency (MHz)	99% Bandwidth (MHz)	Low	2405	2.171	Middle	2440	2.211	High	2480	2.132	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small;">* Agilent 18:13:27 Jul 31, 2017 L</p> <p style="text-align: center;">Ch Freq 2.405 GHz Trig Free</p> <p>Occupied Bandwidth Averages: 100</p> <hr/> <p style="font-size: x-small;">APV7.0.1(072717),45256 JB, Conducted B Ref 20 dBm *Atten 30 dB</p> <p style="font-size: x-small;">Center 2.405 000 GHz Span 5 MHz *Res BW 47 kHz VBW 150 kHz Sweep 2.2 ms (1001 pts)</p> <table border="1" style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Occ BW % Pwr</td> <td>99.00 %</td> </tr> <tr> <td>2.1711 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> <tr> <td>Transmit Freq Error</td> <td></td> <td>-28.058 kHz</td> </tr> <tr> <td>x dB Bandwidth</td> <td></td> <td>2.448 MHz</td> </tr> </table> <p style="font-size: x-small; color: green;">Copyright 2000-2011 Agilent Technologies</p> </div>	Occupied Bandwidth	Occ BW % Pwr	99.00 %	2.1711 MHz	x dB	-26.00 dB	Transmit Freq Error		-28.058 kHz	x dB Bandwidth		2.448 MHz
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MID CHANNEL	HIGH CHANNEL																								
<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small;">* Agilent 18:09:55 Jul 31, 2017 L</p> <p style="text-align: center;">Ch Freq 2.44 GHz Trig Free</p> <p>Occupied Bandwidth Averages: 100</p> <hr/> <p style="font-size: x-small;">APV7.0.1(072717),45256 JB, Conducted B Ref 20 dBm *Atten 30 dB</p> <p style="font-size: x-small;">Center 2.440 000 GHz Span 5 MHz *Res BW 47 kHz VBW 150 kHz Sweep 2.2 ms (1001 pts)</p> <table border="1" style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Occ BW % Pwr</td> <td>99.00 %</td> </tr> <tr> <td>2.2111 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> <tr> <td>Transmit Freq Error</td> <td></td> <td>37.689 kHz</td> </tr> <tr> <td>x dB Bandwidth</td> <td></td> <td>2.387 MHz</td> </tr> </table> <p style="font-size: x-small; color: green;">Copyright 2000-2011 Agilent Technologies</p> </div>	Occupied Bandwidth	Occ BW % Pwr	99.00 %	2.2111 MHz	x dB	-26.00 dB	Transmit Freq Error		37.689 kHz	x dB Bandwidth		2.387 MHz	<div style="border: 1px solid black; padding: 5px;"> <p style="font-size: small;">* Agilent 18:12:05 Jul 31, 2017 L</p> <p style="text-align: center;">Ch Freq 2.48 GHz Trig Free</p> <p>Occupied Bandwidth Averages: 100</p> <hr/> <p style="font-size: x-small;">APV7.0.1(072717),45256 JB, Conducted B Ref 20 dBm *Atten 30 dB</p> <p style="font-size: x-small;">Center 2.480 000 GHz Span 5 MHz *Res BW 47 kHz VBW 150 kHz Sweep 2.2 ms (1001 pts)</p> <table border="1" style="width: 100%; font-size: small;"> <tr> <td>Occupied Bandwidth</td> <td>Occ BW % Pwr</td> <td>99.00 %</td> </tr> <tr> <td>2.1322 MHz</td> <td>x dB</td> <td>-26.00 dB</td> </tr> <tr> <td>Transmit Freq Error</td> <td></td> <td>33.135 kHz</td> </tr> <tr> <td>x dB Bandwidth</td> <td></td> <td>2.397 MHz</td> </tr> </table> <p style="font-size: x-small; color: green;">Copyright 2000-2011 Agilent Technologies</p> </div>	Occupied Bandwidth	Occ BW % Pwr	99.00 %	2.1322 MHz	x dB	-26.00 dB	Transmit Freq Error		33.135 kHz	x dB Bandwidth		2.397 MHz
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2.1322 MHz	x dB	-26.00 dB																							
Transmit Freq Error		33.135 kHz																							
x dB Bandwidth		2.397 MHz																							

8.4. OUTPUT POWER

LIMITS

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

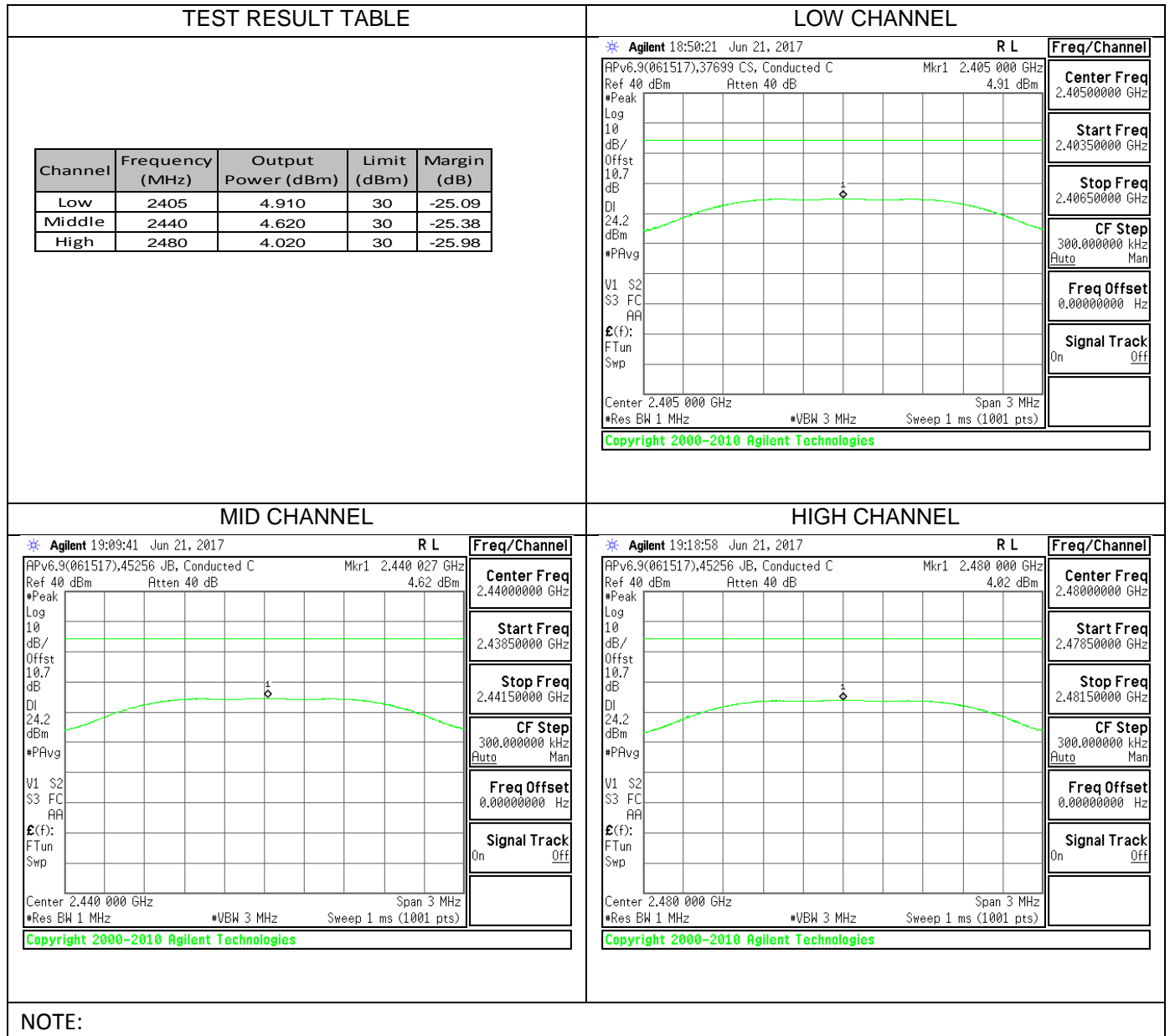
The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

TEST PROCEDURE

Peak power is measured using KDB558074 D01 DTS Meas Guidance v04 spectrum analyzer.

RESULTS

8.4.1. OUTPUT POWER PLOTS



8.5. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The cable assembly insertion loss of 10.66 dB (including 10 dB pad and 0.66 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

Channel	Frequency (MHz)	Power (dBm)
Low	2405	4.25
Middle	2440	3.91
High	2480	3.31

TEST INFORMATION

Date: June 12, 2017
Project No: 11799874
Tester: 45256 JB

8.6. POWER SPECTRAL DENSITY

LIMITS

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

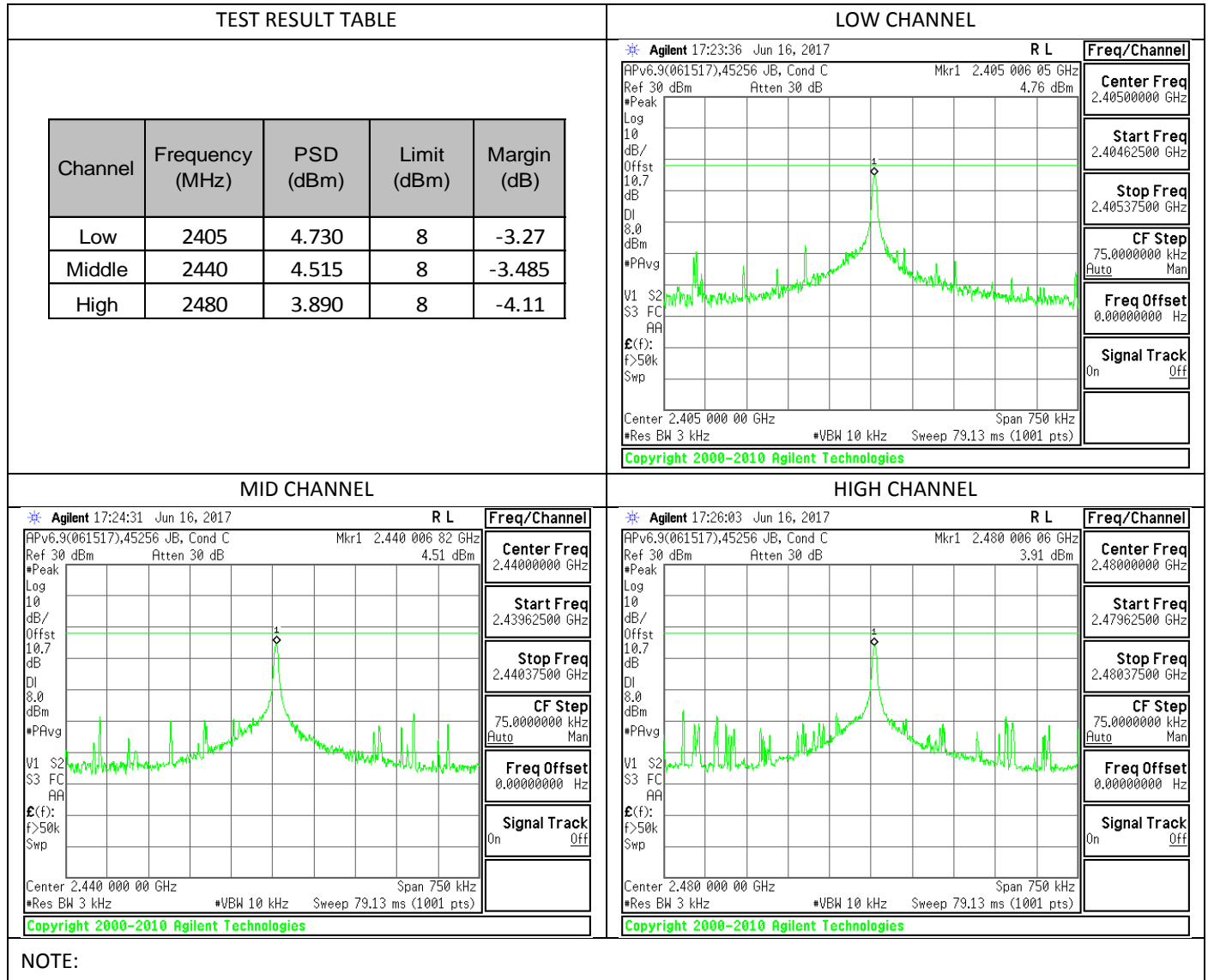
The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST PROCEDURE

Power Spectral Density was performed utilizing the “Method PKPSD (Peak PSD)” under KDB558074 D01 DTS Meas Guidance v04.

RESULTS

8.6.1. POWER SPECTRAL DENSITY PLOTS AND TABLE



8.7. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §15.247 (d)

IC RSS-247 (5.5)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

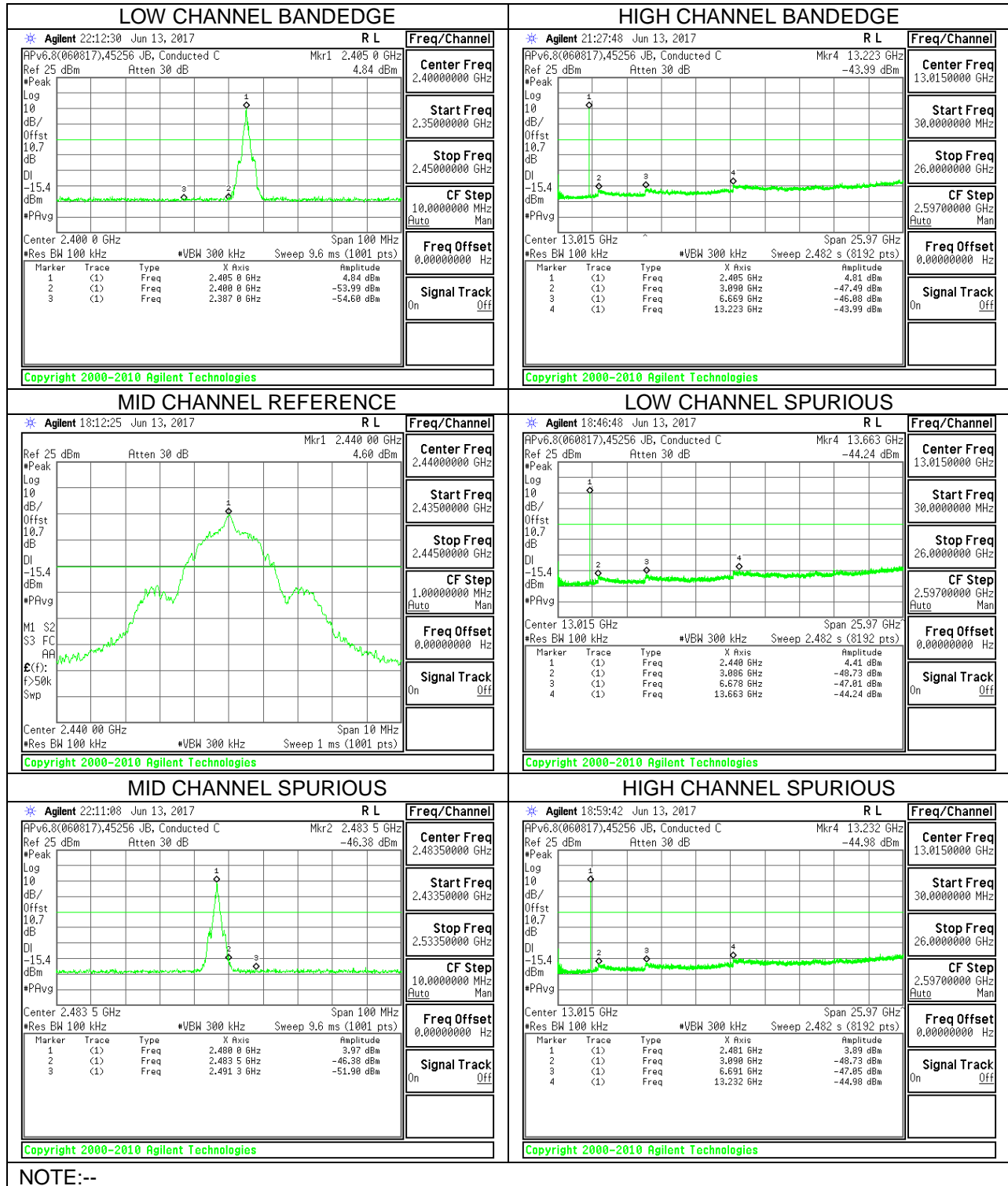
TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer. The resolution bandwidth is set to 100 kHz. The video bandwidth is set to 300 kHz.

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

RESULTS

8.7.1. BANDEDGE AND SPURIOUS EMISSIONS PLOTS



NOTE:--

9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

LIMITS

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

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 measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

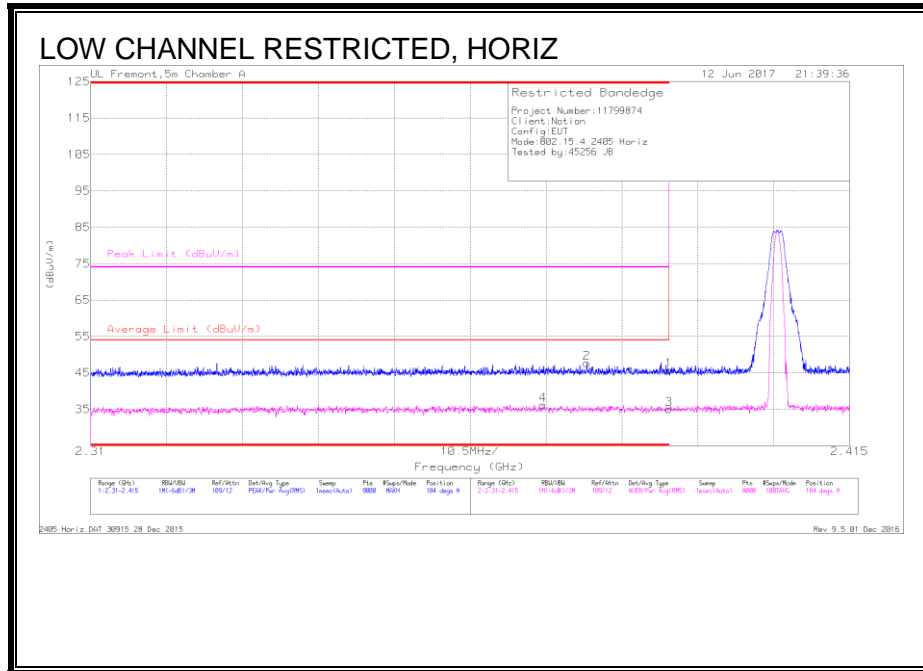
For final measurements above 1 GHz the resolution bandwidth was set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and 30KHz for average measurements.

The spectrum from 30 MHz to 1GHz and 18GHz to 26 GHz is investigated with the transmitter set to transmit at the channel with highest output power as worst-case scenario. 1GHz to 18GHz was set to the lowest, middle, and highest channels in the 2.4 GHz 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. TX ABOVE 1 GHz FOR 802.15.4 MODE IN THE 2.4 GHz BAND

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



Trace Markers

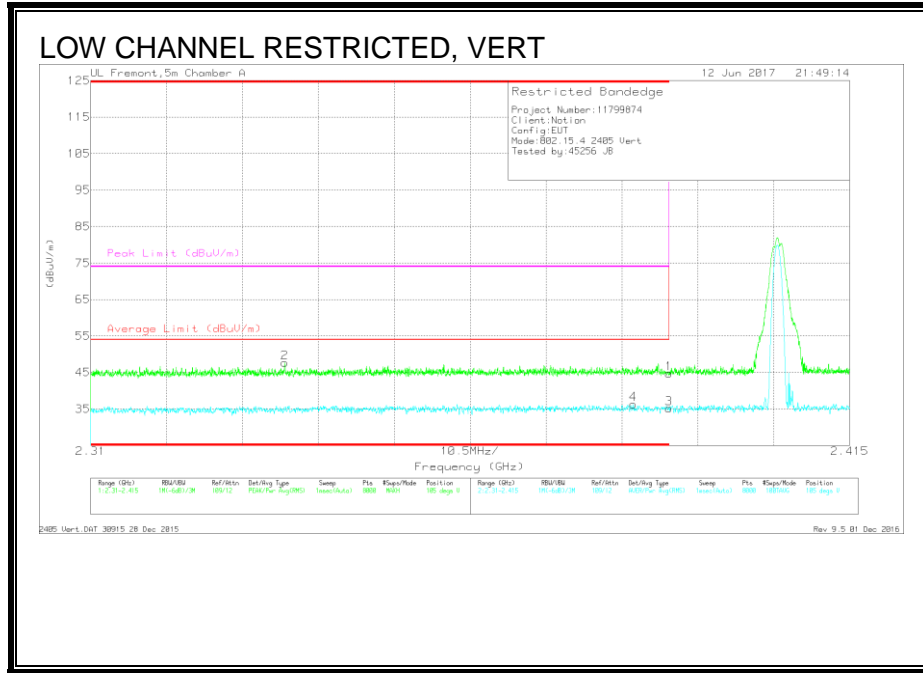
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cb/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	37.34	Pk	32.1	-23.7	45.74	-	-	74	-28.26	184	121	H
2	* 2.379	39.28	Pk	32.1	-23.7	47.68	-	-	74	-26.32	184	121	H
3	* 2.39	26.57	RMS	32.1	-23.7	34.97	54	-19.03	-	-	184	121	H
4	* 2.373	27.76	RMS	32.1	-23.7	36.16	54	-17.84	-	-	184	121	H

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

Pk - Peak detector

RMS - RMS detection

RESTRICTED BANDEGE (LOW CHANNEL, VERTICAL)



Trace Markers

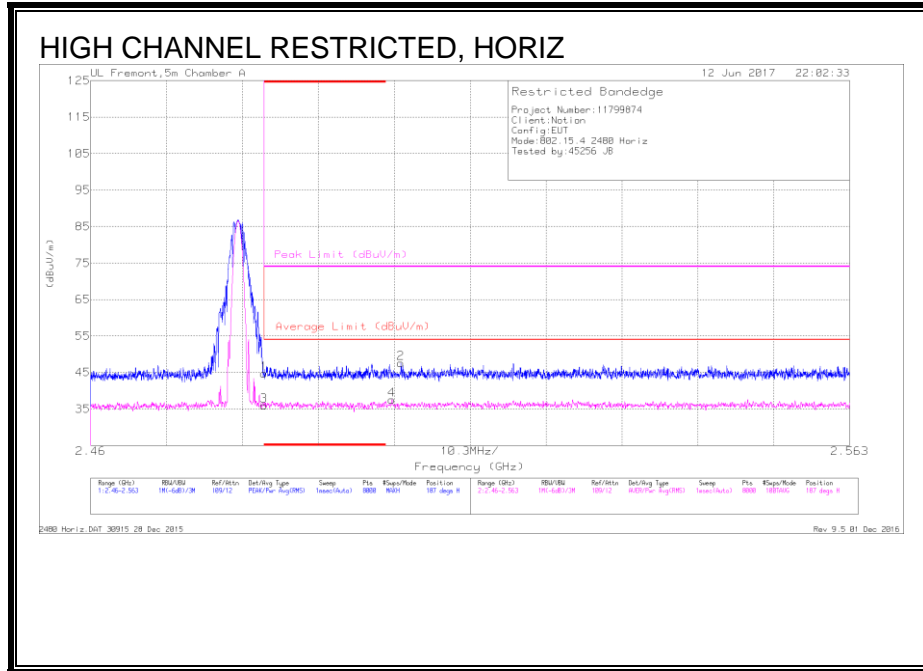
Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/P ad (dB)	Corrected Reading (dBuV/m)	Average Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 2.39	36.28	Pk	32.1	-23.7	44.68	-	-	74	-29.32	105	175	V
2	* 2.337	39.34	Pk	32	-23.7	47.64	-	-	74	-26.36	105	175	V
3	* 2.39	26.8	RMS	32.1	-23.7	35.2	54	-18.8	-	-	105	175	V
4	* 2.385	27.92	RMS	32.1	-23.7	36.32	54	-17.68	-	-	105	175	V

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

Pk - Peak detector

RMS - RMS detection

RESTRICTED BANDEGE (HIGH CHANNEL, HORIZONTAL)

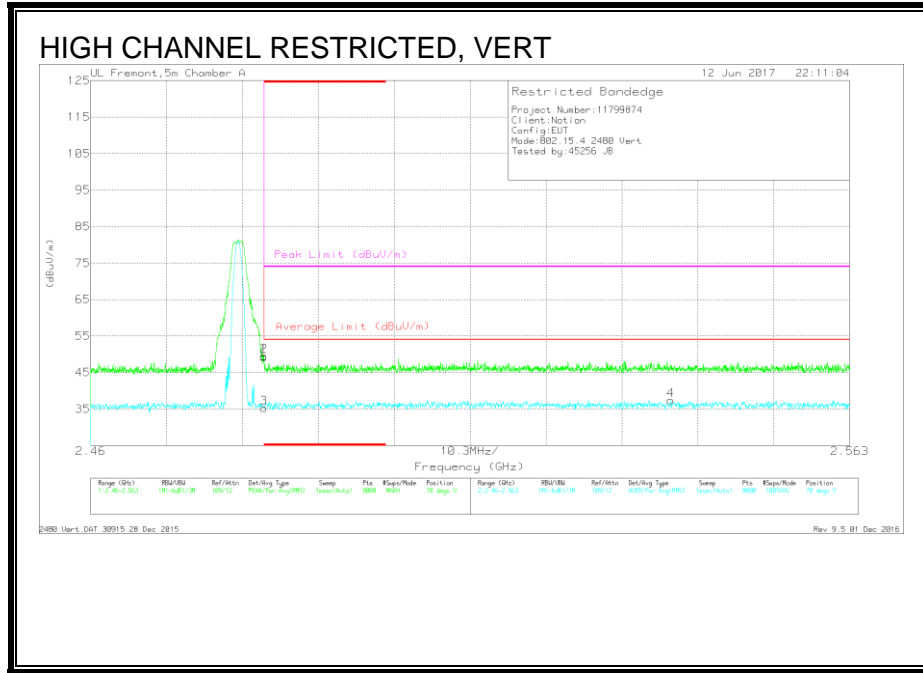


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/P ad (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	35.81	Pk	32.5	-23.6	44.71	-	-	74	-29.29	187	366	H
3	* 2.484	26.98	RMS	32.5	-23.6	35.88	54	-18.12	-	-	187	366	H
4	2.501	28.51	RMS	32.6	-23.6	37.51	54	-16.49	-	-	187	366	H
2	2.502	38.55	Pk	32.6	-23.6	47.55	-	-	74	-26.45	187	366	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

RESTRICTED BANDEGE (HIGH CHANNEL, VERTICAL)

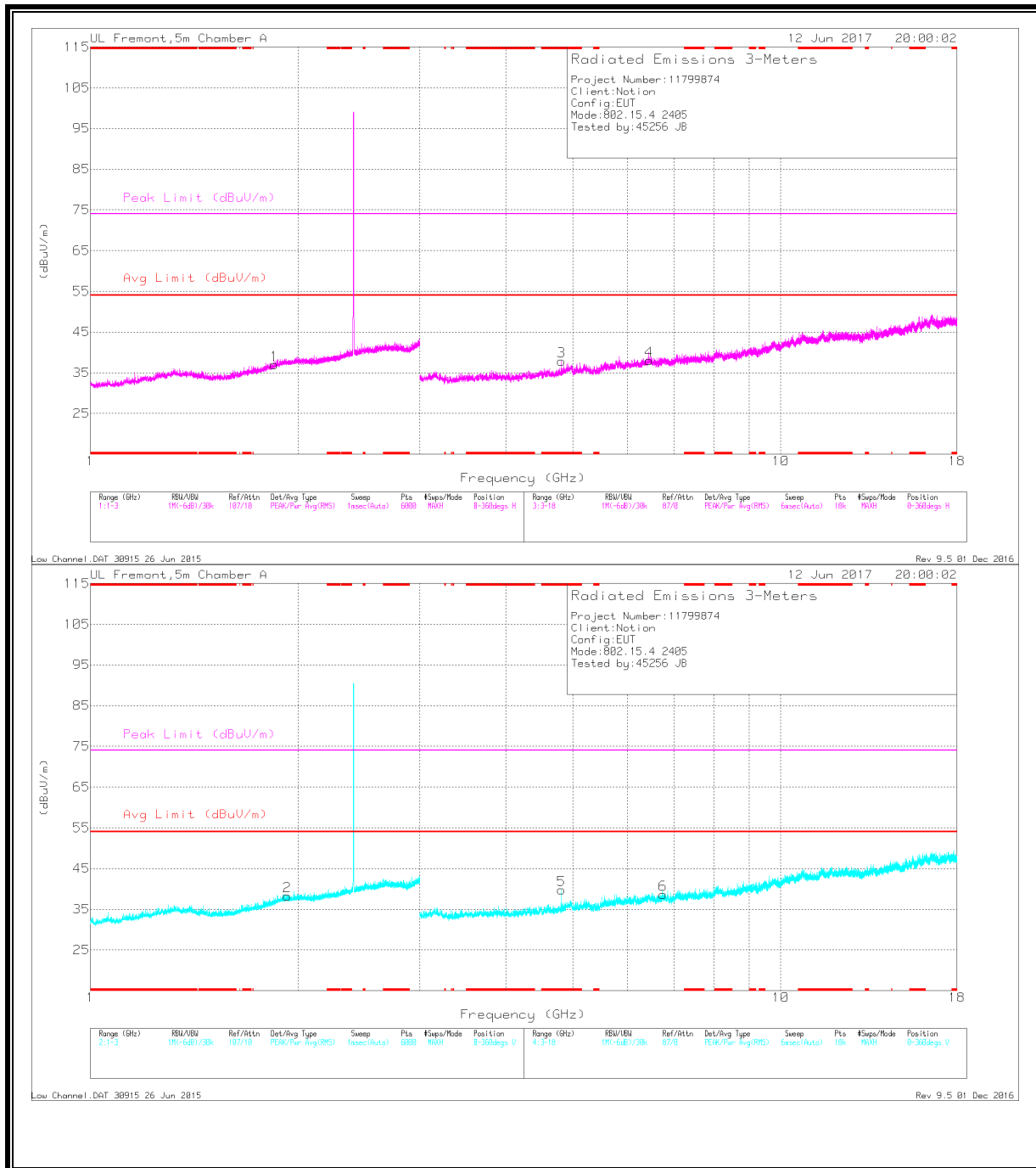


Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Filtr/P ad (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	40.43	Pk	32.5	-23.6	49.33	-	-	74	-24.67	70	120	V
2	* 2.484	40.58	Pk	32.5	-23.6	49.48	-	-	74	-24.52	70	120	V
3	* 2.484	26.41	RMS	32.5	-23.6	35.31	54	-18.69	-	-	70	120	V
4	2.539	28.29	RMS	32.6	-23.5	37.39	54	-16.61	-	-	70	120	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector
 RMS - RMS detection

Low Channel Harmonics

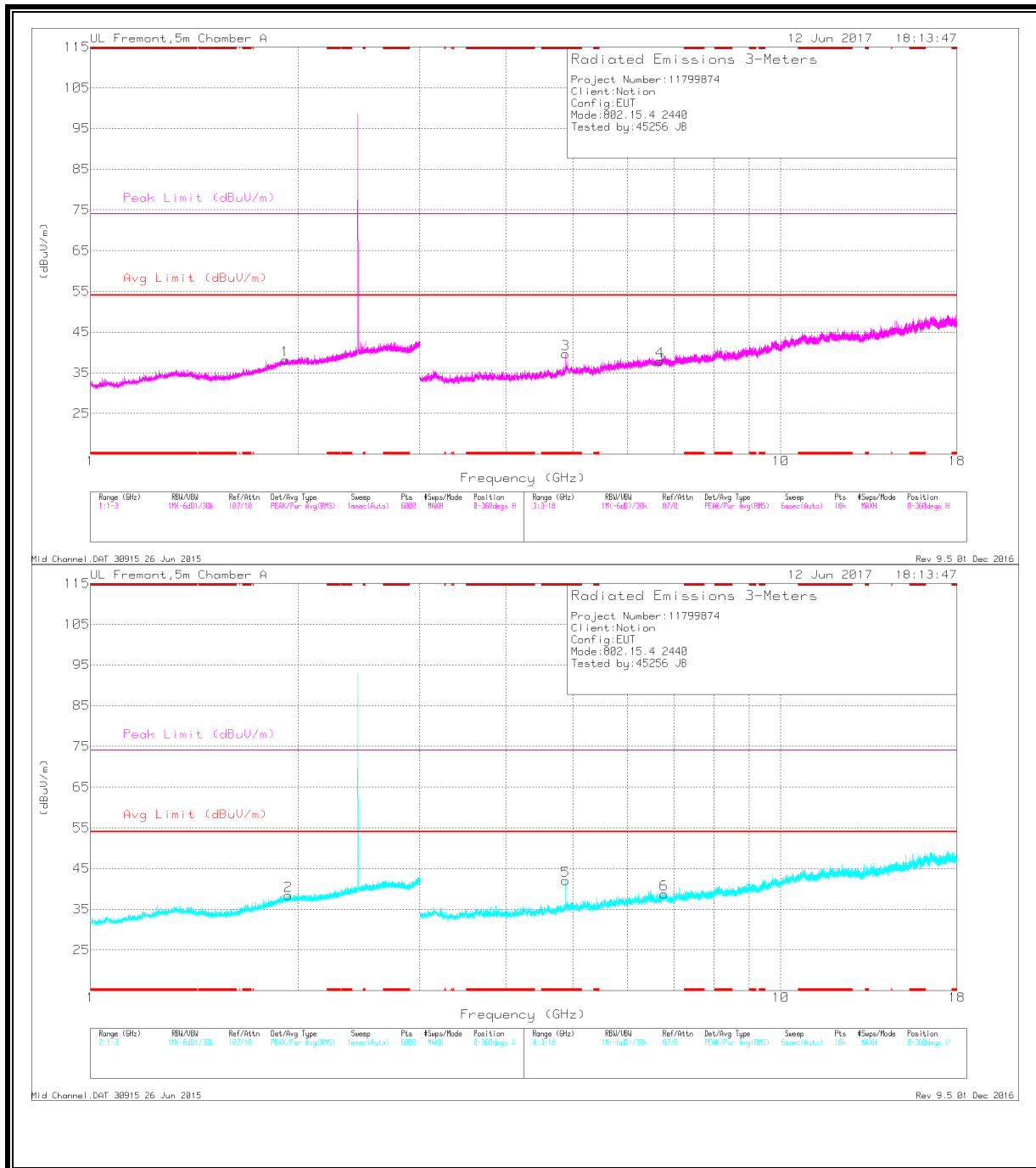


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Fitr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.81	38.79	PK2	34	-28.4	0	44.39	-	-	74	-29.61	237	299	H
* 4.81	31.54	MAv1	34	-28.4	0	37.14	54	-16.86	-	-	237	299	H
* 4.81	39.87	PK2	34	-28.4	0	45.47	-	-	74	-28.53	98	198	V
* 4.81	32.83	MAv1	34	-28.4	0	38.43	54	-15.57	-	-	98	198	V
1.847	24.4	MAv1	30.8	-23.6	0	31.6	-	-	-	-	277	394	H
1.848	36.79	PK2	30.8	-23.6	0	43.99	-	-	-	-	277	394	H
1.926	24.32	MAv1	31.3	-23.5	0	32.12	-	-	-	-	92	355	V
1.928	36.83	PK2	31.3	-23.6	0	44.53	-	-	-	-	92	355	V
6.448	23.07	MAv1	35.5	-25.3	0	33.27	-	-	-	-	281	186	H
6.45	34.78	PK2	35.5	-25.3	0	44.98	-	-	-	-	281	186	H
6.755	23.19	MAv1	35.6	-24.6	0	34.19	-	-	-	-	98	198	V
6.756	33.66	PK2	35.6	-24.6	0	44.66	-	-	-	-	98	198	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

Mid Channel Harmonics

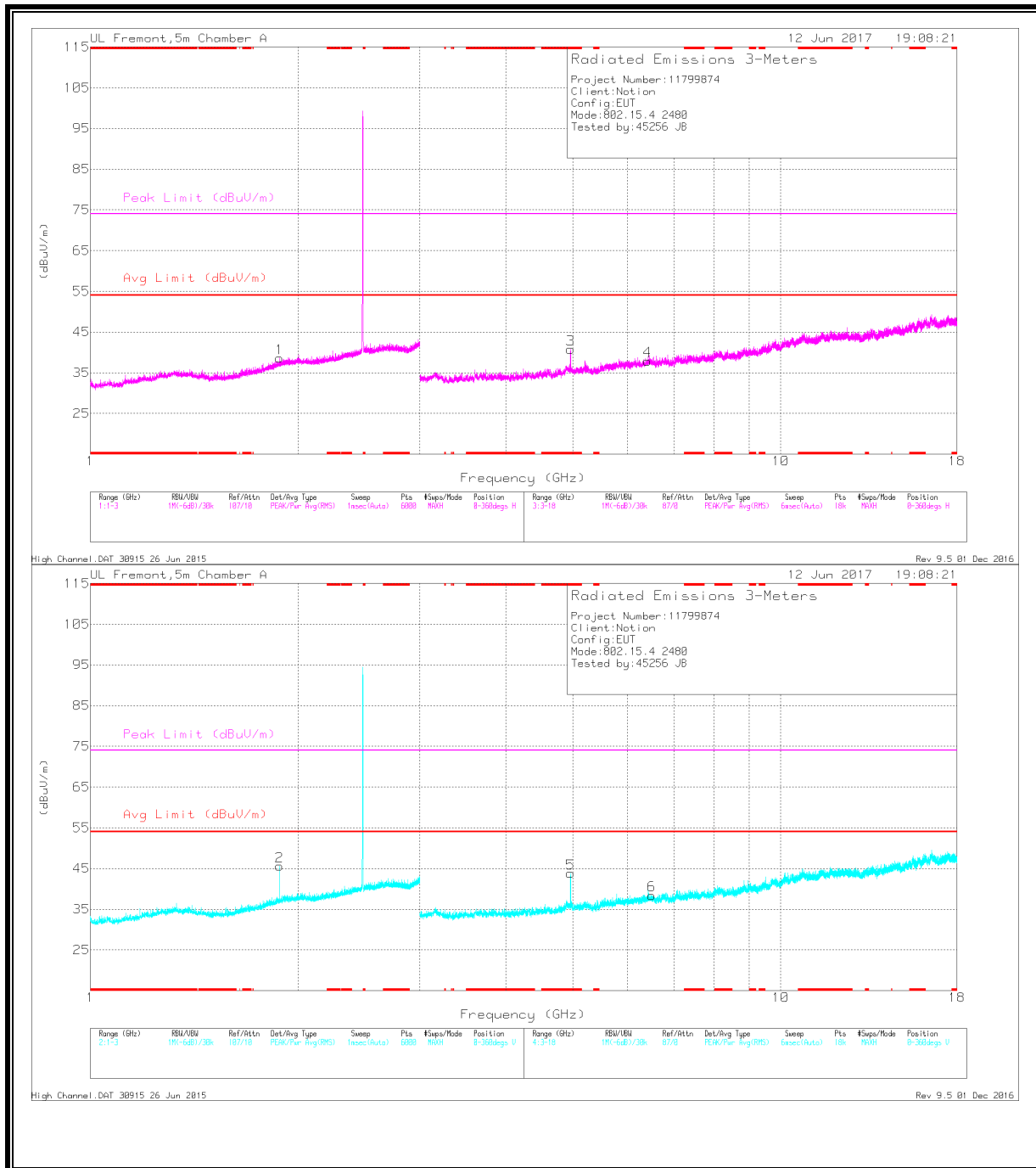


Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Fitr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.88	40.1	PK2	34	-27.9	0	46.2	-	-	74	-27.8	309	400	H
* 4.88	31.87	MAv1	34	-27.9	0	37.97	54	-16.03	-	-	309	400	H
* 4.88	40.75	PK2	34	-27.9	0	46.85	-	-	74	-27.15	195	230	V
* 4.88	34.45	MAv1	34	-27.9	0	40.55	54	-13.45	-	-	195	230	V
1.915	24.34	MAv1	31.3	-23.5	0	32.14	-	-	-	-	297	284	H
1.916	36.85	PK2	31.3	-23.5	0	44.65	-	-	-	-	297	284	H
1.933	36.71	PK2	31.4	-23.6	0	44.51	-	-	-	-	246	348	V
1.934	24.36	MAv1	31.4	-23.6	0	32.16	-	-	-	-	246	348	V
6.679	23.19	MAv1	35.6	-25.9	0	32.89	-	-	-	-	284	196	H
6.681	34.81	PK2	35.6	-25.9	0	44.51	-	-	-	-	284	196	H
6.774	21.99	MAv1	35.6	-24.6	0	32.99	-	-	-	-	337	118	V
6.775	33.9	PK2	35.6	-24.6	0	44.9	-	-	-	-	337	118	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

High Channel Harmonics



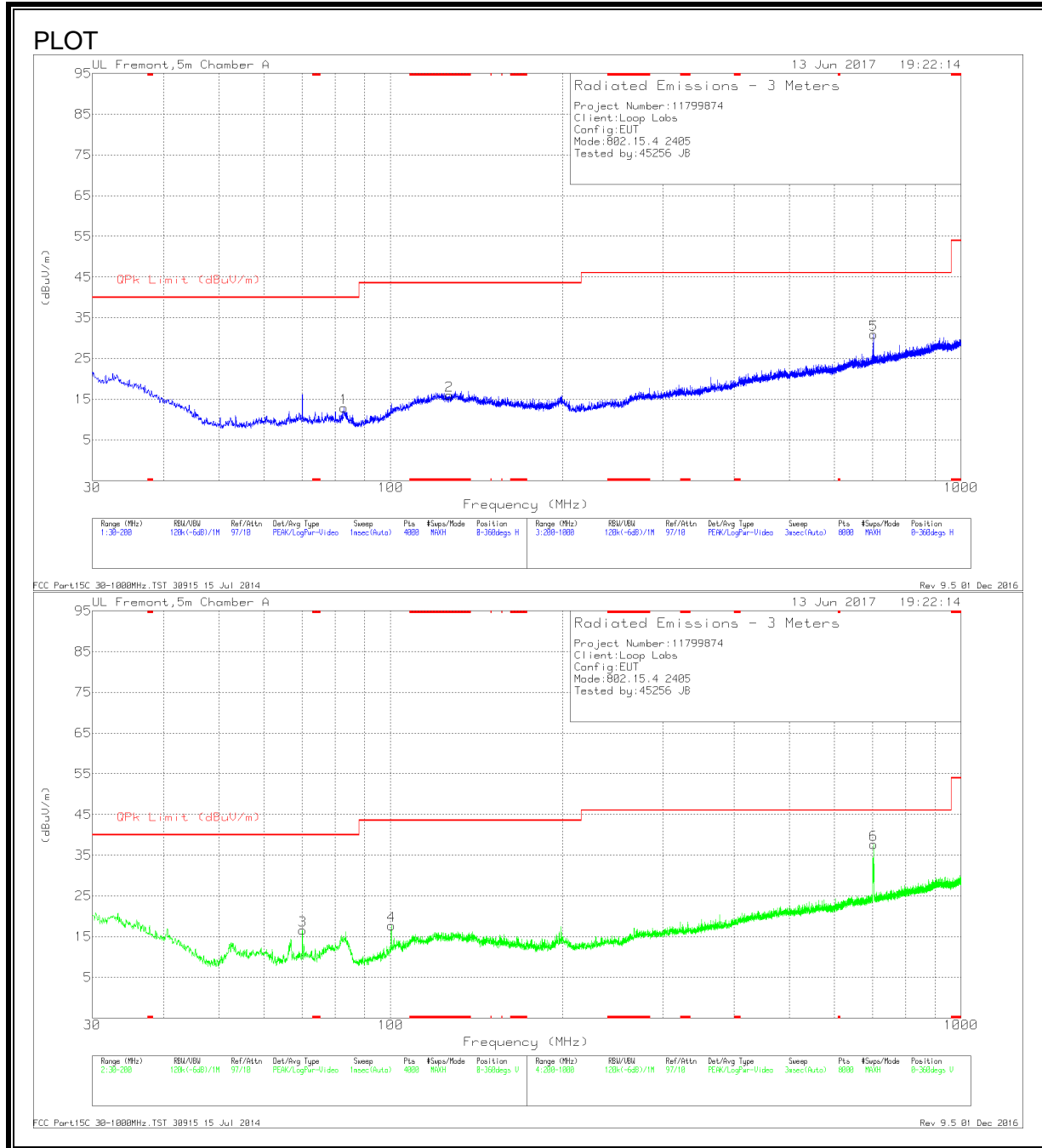
Radiated Emissions

Frequency (GHz)	Meter Reading (dBuV)	Det	AF T711 (dB/m)	Amp/Cbl/Fitr/ Pad (dB)	DC Corr (dB)	Corrected Reading (dBuV/m)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
* 4.96	39.81	PK2	34.1	-28.2	0	45.71	-	-	74	-28.29	300	302	H
* 4.96	32.54	MAv1	34.1	-28.2	0	38.44	54	-15.56	-	-	300	302	H
* 4.96	42.32	PK2	34.1	-28.2	0	48.22	-	-	74	-25.78	196	241	V
* 4.96	36.52	MAv1	34.1	-28.2	0	42.42	54	-11.58	-	-	196	241	V
1.879	24.45	MAv1	31.1	-23.6	0	31.95	-	-	-	-	168	262	H
1.88	36.99	PK2	31.1	-23.6	0	44.49	-	-	-	-	168	262	H
1.88	24.5	MAv1	31.1	-23.6	0	32	-	-	-	-	107	214	V
1.881	36.22	PK2	31.1	-23.6	0	43.72	-	-	-	-	107	214	V
6.415	34.75	PK2	35.5	-25.6	0	44.65	-	-	-	-	155	213	H
6.417	23.32	MAv1	35.5	-25.6	0	33.22	-	-	-	-	155	213	H
6.502	22.91	MAv1	35.5	-25.4	0	33.01	-	-	-	-	34	193	V
6.505	34.52	PK2	35.5	-25.4	0	44.62	-	-	-	-	34	193	V

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 PK2 - KDB558074 Method: Maximum Peak
 MAv1 - KDB558074 Option 1 Maximum RMS Average

9.3. WORST-CASE BELOW 1 GHz

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



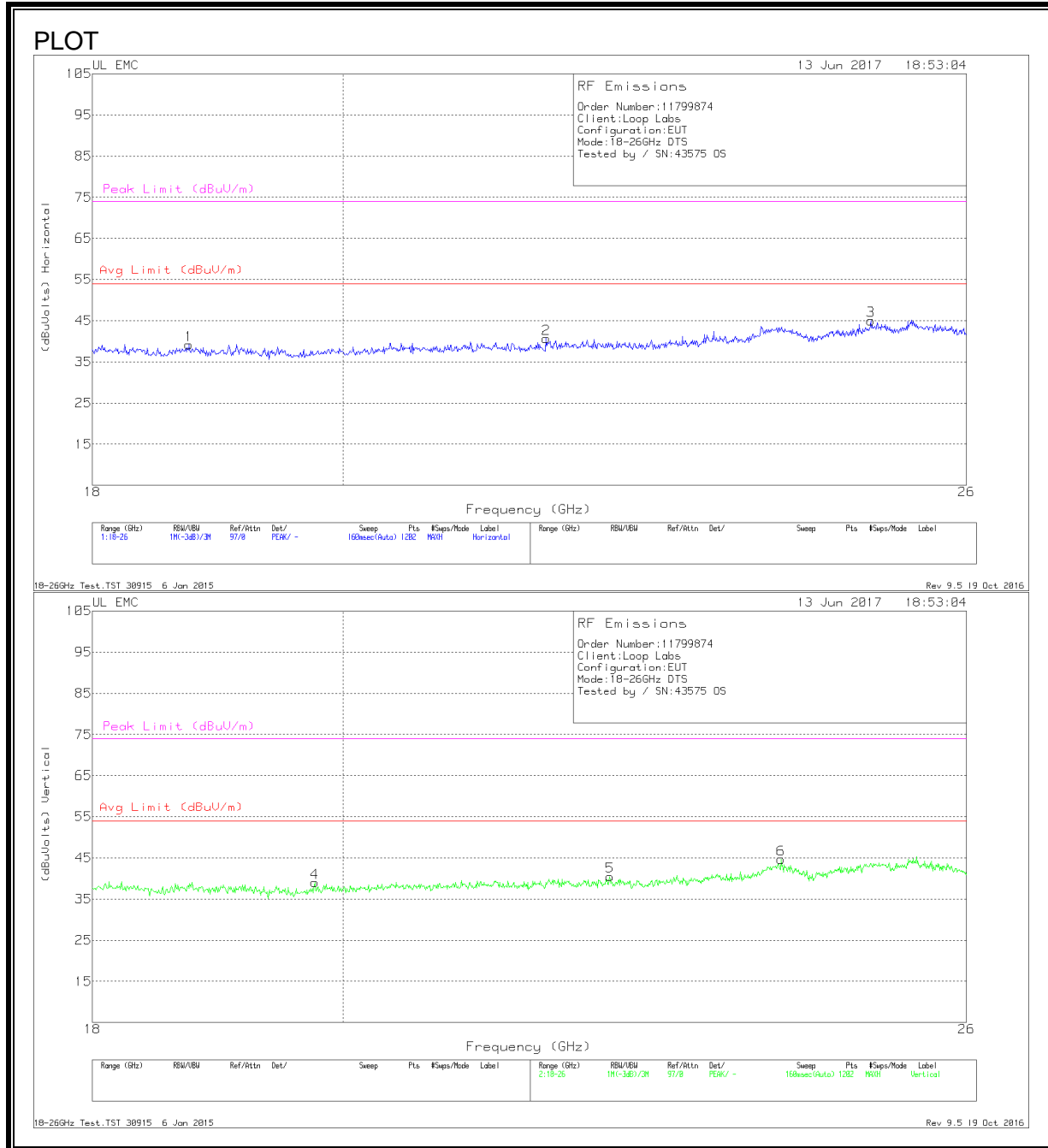
Trace Markers

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	AF T130 (dB/m)	Amp/Cbl (dB/m)	DC Corr (dB)	Corrected Reading (dBuV/m)	QPk Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	* 126.7125	28.5	Pk	17.9	-30.4	0	16	43.52	-27.52	0-360	200	H
3	70.0454	34.94	Pk	12.5	-30.8	0	16.64	40	-23.36	0-360	100	V
1	82.7987	32.05	Pk	11.5	-30.7	0	12.85	40	-27.15	0-360	300	H
4	100.3557	34.06	Pk	14.3	-30.6	0	17.76	43.52	-25.76	0-360	100	V
6	702.9654	41.52	Pk	24.3	-28.2	0	37.62	46.02	-8.4	0-360	101	V
5	703.1654	34.89	Pk	24.3	-28.2	0	30.99	46.02	-15.03	0-360	300	H

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
 Pk - Peak detector

9.4. WORST-CASE 18 to 26 GHz

SPURIOUS EMISSIONS 18 to 26 GHz (WORST-CASE CONFIGURATION)



Trace Markers

Marker	Frequency (GHz)	Meter Reading (dBuV)	Det	T447 AF (dB/m)	Amp/Cbl (dB)	Dist Corr (dB)	Corrected Reading (dBuVolts)	Avg Limit (dBuV/m)	Margin (dB)	Peak Limit (dBuV/m)	PK Margin (dB)
1	18.746	41.07	Pk	32.2	-24.6	-9.5	39.17	54	-14.83	74	-34.83
2	21.784	41.97	Pk	33.1	-24.9	-9.5	40.67	54	-13.33	74	-33.33
3	24.974	44.3	Pk	34.4	-24.2	-9.5	45	54	-9	74	-29
4	19.765	40.5	Pk	32.8	-24.8	-9.5	39	54	-15	74	-35
5	22.376	41.4	Pk	33.5	-24.9	-9.5	40.5	54	-13.5	74	-33.5
6	24.048	44.37	Pk	34.2	-24.4	-9.5	44.67	54	-9.33	74	-29.33

Pk - Peak detector