FCC PART 15, SUBPART B and C
TEST REPORT

for

RF ENGINE MODULE

MODEL: IE-300

Prepared for

IBIS NETWORKS
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DATE: AUGUST 3, 2017

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	21	2	2	2	21	94	**142**

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TABLE OF CONTENTS

Section / Title	PAGE
GENERAL REPORT SUMMARY	***4***
SUMMARY OF TEST RESULTS	***5***
1. PURPOSE	**6**
2. ADMINISTRATIVE DATA	**7**
2.1 Location of Testing	7
2.2 Traceability Statement	7
2.3 Cognizant Personnel	7
2.4 Date Test Sample was Received	7
2.5 Disposition of the Test Sample	7
2.6 Abbreviations and Acronyms	7
3. APPLICABLE DOCUMENTS	**8**
4. DESCRIPTION OF TEST CONFIGURATION	**9**
4.1 Description of Test Configuration – Emissions	9
4.1.1 Cable Construction and Termination	9
5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT	**11**
5.1 EUT and Accessory List	11
5.2 Emissions Test Equipment	12
6. TEST SITE DESCRIPTION	**13**
6.1 Test Facility Description	13
6.2 EUT Mounting, Bonding and Grounding	13
7. CHARACTERISTICS OF THE TRANSMITTER	**13**
7.1 Channel Description and Frequencies	13
7.2 Antenna Gain	13
8. TEST PROCEDURES	**14**
8.1 RF Emissions	14
8.1.1 Conducted Emissions Test	14
8.1.2 Radiated Emissions (Spurious and Harmonics) Test	15
8.1.3 RF Emissions Test Results	16
8.2 DTS Bandwidth	17
8.3 Peak Output Power	17
8.4 Emissions in Non-Restricted Bands	18
8.5 RF Band Edges	18
8.6 Spectral Density Test	19
8.7 Duty Cycle Calculation	20
9. CONCLUSIONS	**21**

LIST OF APPENDICES

APPENDIX	TITLE
A	Laboratory Accreditations and Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos • Test Setup Diagrams • Radiated and Conducted Emissions Photos • Antenna and Effective Gain Factors
E	Data Sheets

LIST OF FIGURES

FIGURE	TITLE
1	Layout of the Semi-Anechoic Test Chamber
2	Conducted Emissions Test Setup

LIST OF TABLES

TABLE	TITLE
1	Conducted Emissions Test Results
2	Radiated Emissions Test Results

GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product certification, approval or endorsement by NVLAP, NIST or any agency of the federal government.

Device Tested:	RF Engine Module Model: IE-300 S/N: N/A
Product Description:	The EUT is an RF Module that is mounted inside either an InteliMeter Lighting Power Pack or InteliMeter 30A In-Line.
Modifications:	The EUT was not modified during the testing.
Customer:	IBIS Networks 841 Bishop Street, Ste 1601 Honolulu, Hawaii 96813
Test Dates:	June 6, 7, 8, 9 and 10, 2017

Test Specifications covered by accreditation:

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CFR Title 47, Part 15, Subpart B; and Subpart C sections 15.205, 15.207, 15.209, and 15.247

Test Procedures: ANSI C63.4: 2014 and ANSI C63.10: 2013

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207.
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	The EUT complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Spurious Radiated RF Emissions, 9 kHz – 30 MHz and 1000 MHz – 25000 MHz	The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
6	DTS Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2)
7	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3)
8	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d)
9	Peak Power Spectral Density from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e)

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the RF Engine Module, Model: IE-300. The emissions measurements were performed according to the measurement procedure described in ANSI C63.10 and ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The emissions tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California 92823.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

IBIS Networks

Michael Pfeffer	CEO

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
James Ross	Test Engineer

2.4 Date Test Sample was Received

The test sample was received on June 6, 2017.

2.5 Disposition of the Test Sample

The test sample has not been returned to IBIS Networks as of the date of this test report.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this emissions Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2014	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
ANSI C63.10 2013	American National Standard for Testing Unlicensed Wireless Devices
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
KDB 558074 D01 v04	Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under 15.247

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration – Emissions

Installed Inside the IM-303: The RF Engine Module Model: IE-300 (EUT) was installed inside the IM-303. The IM-303 was also connected to a lamp via its power output port. The EUT was powering the lamp on a continuous basis.

The EUT was tested in the X, Y and Z axis. The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

The voltage was varied ±15%; the transmitting signal amplitude and frequency did not vary.

Installed Inside the IM-301: The RF Engine Module Model: IM-301 (EUT) was installed inside the IM-301. The IM-301 was connected to a bulb via its neutral and load ports. A 220 ohm resistor was connected to the IM-301 via the IM-301's 24 VDC and ground ports. Finally, a switch was connected to the IM-301 via the IM-301's OCC and Switch ports. The IM-301 was powering the bulb on a continuous basis.

The EUT was tested in the X, Y and Z axis. The X orientation is when the EUT is parallel to the ground. The Y orientation is when the EUT is perpendicular to the ground mounted vertically. The Z orientation is when the EUT is perpendicular to the ground mounted horizontally.

For both configurations, the EUT was programmed to cycle to transmit at 2405, 2440, 2475, and 2480 MHz by pressing a button on the EUT.

The direct measurements tests were investigated on both units. The data shown in Appendix E for the direct measurements represents the worst case.

The voltage was varied ±15%; the transmitting signal amplitude and frequency did not vary.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The final emissions data was taken in this mode of operation and any cables were maximized. All initial investigations were performed with the measurement receiver in manual mode scanning the frequency range continuously. Photographs of the test setup are in Appendix D of this report.

4.1.1 Cable Construction and Termination

IM-303 Configuration

Cable 1

This is a 1-meter unshielded cable connecting the IM-303 to the lamp. The cable has a 3-prong male AC connector at the IM-303 end and is hardwired into the lamp.

Description of Test Configuration – Emissions (Continued)

IM-301 Configuration

Cable 1 This is a 1-meter unshielded wire with orange insulation connecting the IM-301 to the switch. The cable is hard wired at each end.

Cable 2 This is a 1-meter unshielded wire with red insulation connecting the IM-301 to the switch. The cable is hard wired at each end.

Cable 3 This is a 1-meter unshielded wire with red insulation connecting the IM-301 to a 220 ohm resistor. The cable is hard wired at each end.

Cable 4 This is a 1-meter unshielded wire with blue insulation connecting the IM-301 to the switch. The cable is hard wired at each end.

Cable 5 This is a 1-meter unshielded wire with black insulation connecting the IM-301 to the switch. The cable is hard wired at each end.

Cable 6 This is a 1-meter unshielded wire with black insulation connecting the IM-301 to a 220 ohm resistor. The cable is hard wired at each end.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
RF ENGINE MODULE (EUT)	IBIS NETWORKS	IE-300	N/A	2AECN300
LAMP*	N/A	N/A	N/A	N/A
SWITCH**	N/A	N/A	N/A	N/A
LIGHT BULB**	N/A	N/A	N/A	N/A
INTELIMETER LIGHTING POWER PACK**	IBIS NETWORKS	IM-301	N/A	N/A
220 OHM RESISTOR**	N/A	N/A	N/A	N/A
INTELIMETER 30A IN-LINE*	IBIS NETWORKS	IM-303	N/A	N/A
FIRMWARE ON MOUDLE***	IBIS NETWORKS	1.0	N/A	N/A

*Used for the IM-303 configuration only
**Used for the IM-301 configuration only
***Allows the EUT to change channels by hitting a button on the EUT.

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
CombiLog Antenna	Com-Power	AC-220	61060	September 3, 2015	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	2 Year
EMI Receive	Rohde & Schwarz	ESIB40	100194	June 14, 2016	1 Year
EMI Receiver, 20 Hz – 26.5 GHz	Keysight Technologies	N9038A	MY51210150	December 29, 2015	2 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2016	2 Year
Loop Antenna	Com-Power	AL-130R	121090	February 9, 2017	2 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	2 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
LISN (EUT)	Com-Power	LI-215A	191951	May 17, 2017	1 Year
LISN (ACC)	Com-Power	LI-215A	191952	May 17, 2017	1 Year
Transient Limiter	Com-Power	252A910	N/A	October 26, 2016	1 Year

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for emissions test location.

6.2 EUT Mounting, Bonding and Grounding

For frequencies 1 GHz and below: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

For frequencies above 1 GHz: The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 1.5 meters above the ground plane.

The EUT was grounded via the third wire saftey ground in the AC power plug.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Description and Frequencies

The lowest frequency the EUT will use is 2405 MHz and the highest frequency the EUT will use is 2480 MHz. The EUT will be able to be tuned every 5 MHz between the lowest frequency and the highest frequency.

7.2 Antenna Gain

The EUT utilizes a 2.45 GHz SMD Chip antenna with a gain of 2.0 dBi.

8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. The data was collected with the EMI Receiver in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.207.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as the measuring meter. Below 1 GHz, a built-in, internal preamplifier was used to increase the sensitivity of the instrument. At frequencies above 1 GHz, external preamplifiers were used. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above from1 GHz to 18 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies above 18 GHz. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged by using a duty cycle correction factor.

The measurement bandwidths and transducers used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Loop Antenna
150 kHz to 30 MHz	9 kHz	Loop Antenna
30 MHz to 1 GHz	120 kHz	Combilog Antenna
1 GHz to 25 GHz	1 MHz	Horn Antenna

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is in full compliance with ANSI C63.4. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Test Results:

The EUT complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.209 and 15.247 (d) for radiated emissions. Please see Appendix E for the data sheets.

8.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS
RF Engine Module, Model: IE-300

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading – Spec. Limit) dB
0.566 (BL) (IM-301)	35.23 (Avg)	46.00	-10.77
0.534 (BL) (IM-301)	35.03 (Avg)	46.00	-10.97
0.570 (BL) (IM-301)	35.02 (Avg)	46.00	-10.98
0.538 (BL) (IM-301)	34.45 (Avg)	46.00	-11.55
0.562 (BL) (IM-301)	34.17 (Avg)	46.00	-11.83
0.954 (BL) (IM-301)	32.34 (Avg)	46.00	-13.66

Table 2.0 RADIATED EMISSION RESULTS
RF Engine Module, Model: IE-300

Frequency MHz	Corrected Reading* dBuV/m	Specification Limit dBuV/m	Delta (Cor. Reading – Spec. Limit) dB
2483.50 (V) (Y-Axis) (IM-301)	53.64 (Avg)	53.97	-0.33
2843.50 (V) (Y-Axis) (IM-303)	51.58 (Avg)	53.97	-2.39
2483.50 (H) (Z-Axis) (IM-301)	51.06 (Avg)	53.97	-2.91
7320 (V) (Y-Axis) (IM-301)	50.78 (Avg)	53.97	-3.19
7320 (V) (Y-Axis) (IM-303)	50.55 (Avg)	53.97	-3.42
7320 (H) (Z-Axis) (IM-301)	50.43 (Avg)	53.97	-3.54

Notes:

*	The complete emissions data is given in Appendix E of this report.		
Pk	Peak Reading	Avg	Average Reading
H	Horizontal Polarization	V	Vertical Polarization
BL	Black Lead	QP	Quasi-Peak Reading

8.2 DTS Bandwidth

The DTS Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF output of the EUT. The following steps were performed for measuring the DTS Bandwidth.

1. Set RBW = 100 kHz
2. Set the video bandwidth (VBW) to equal or greater than 3 times the RBW
3. Detector = Peak
4. Trace Mode = Max Hold
5. Sweep = Auto Couple
6. Allow the trace to stabilize
7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

The Peak Output Power was measured using the EMI Receiver. The peak output power was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 3 MHz and the video bandwidth was 10 MHz. The cable loss was also added back into the reading using the reference level offset. The Peak Output Power was then taken.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 Emissions in Non-Restricted Bands

The emissions in the non-restricted frequency bands measurements were performed using the EMI receiver directly connected to the EUT. The reference level was established by setting the instrument center frequency to DTS channel center frequency. The span was set to ≥ 1.5 times the DTS bandwidth. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with sweep set to auto. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the level and 20 dB below that was the reference level. For emission level measurement, the center frequency and span were set to encompass the frequency range to be measured. The RBW was set to 100 kHz and the VBW was set to 300 kHz. A peak detector was used with a sweep time set to auto. The number of measurement points were greater than the span/RBW. A max hold trace was used and allowed to fully stabilize. The peak marker function was used to determine the maximum amplitude level. The final qualification data sheets are located in Appendix E.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). Note: The 2390 MHz to 2400 MHz band was also investigated. The three highest emissions in the non-restricted bands were recorded.

8.5 RF Band Edges

The RF band edges were taken at 2390 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.1.2 of this test report was used to maximize the emission.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz also meet the limits of section 15.209. Please see the data sheets located in Appendix E.

8.6 Spectral Density Test

The spectrum density output was measured using the EMI Receiver. The spectral density output was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The following steps were performed for measuring the spectral density.

1. Set analyzer center frequency to DTS channel center frequency
2. Set the span to 1.5 times the DTS bandwidth.
3. Set the RBW to 3 kHz <= RBW <= 100 kHz
4. Set the VBW >= 3 X RBW
5. Detector = peak
6. Sweep time = auto couple
7. Trace mode = max hold
8. Allow trace to fully stabilize
9. Use the peak marker function to determine the maximum amplitude level within the RBW
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (e).

8.7 Duty Cycle Calculation

The fundamental and harmonics were measured at a 3-meter test distance. The EMI Receiver was used to obtain the final test data. The final qualification data sheets are located in Appendix E.

Where

$$\delta(\mathrm{dB}) = 20\log\left[\sum\left(nt_1 + mt_2 + \ldots + \xi t_x\right)/T\right]$$

n is the number of pulses of duration *t*1
m is the number of pulses of duration *t*2
ξ is the number of pulses of duration *tx*
T is the period of the pulse train or 100 ms if the pulse train length is greater than 100 ms

Pulse Train = 47.1 ms between each pulse (worst case)

Total On Time = 4.68 ms

4.68 ms /47.1 ms = 9.94% duty cycle

The maximum 20 dB peak to average ratio can be utilized.

9. CONCLUSIONS

The RF Engine Module, Model: IE-300, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B, and Subpart C, sections 15.205, 15.209, 15.207, and 15.247.

APPENDIX A

LABORATORY ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP® TESTING
NVLAP LAB CODE 200528-0

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For US, Canada, Australia/New Zealand, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025.
For the most up-to-date version of our scopes and certificates please visit http://celectronics.com/quality/scope/

Quote from ISO-ILAC-IAF Communiqué on 17025:
"A laboratory's fulfilment of the requirements of ISO/IEC 17025:2005 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025:2005 (Section 4) are written in language relevant to laboratory operations and meet the principles of ISO 9001:2008 Quality Management Systems — Requirements."

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.247 specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

The EUT was not modified during the testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST	RF Engine Module Model: IE-300 S/N: N/A

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER

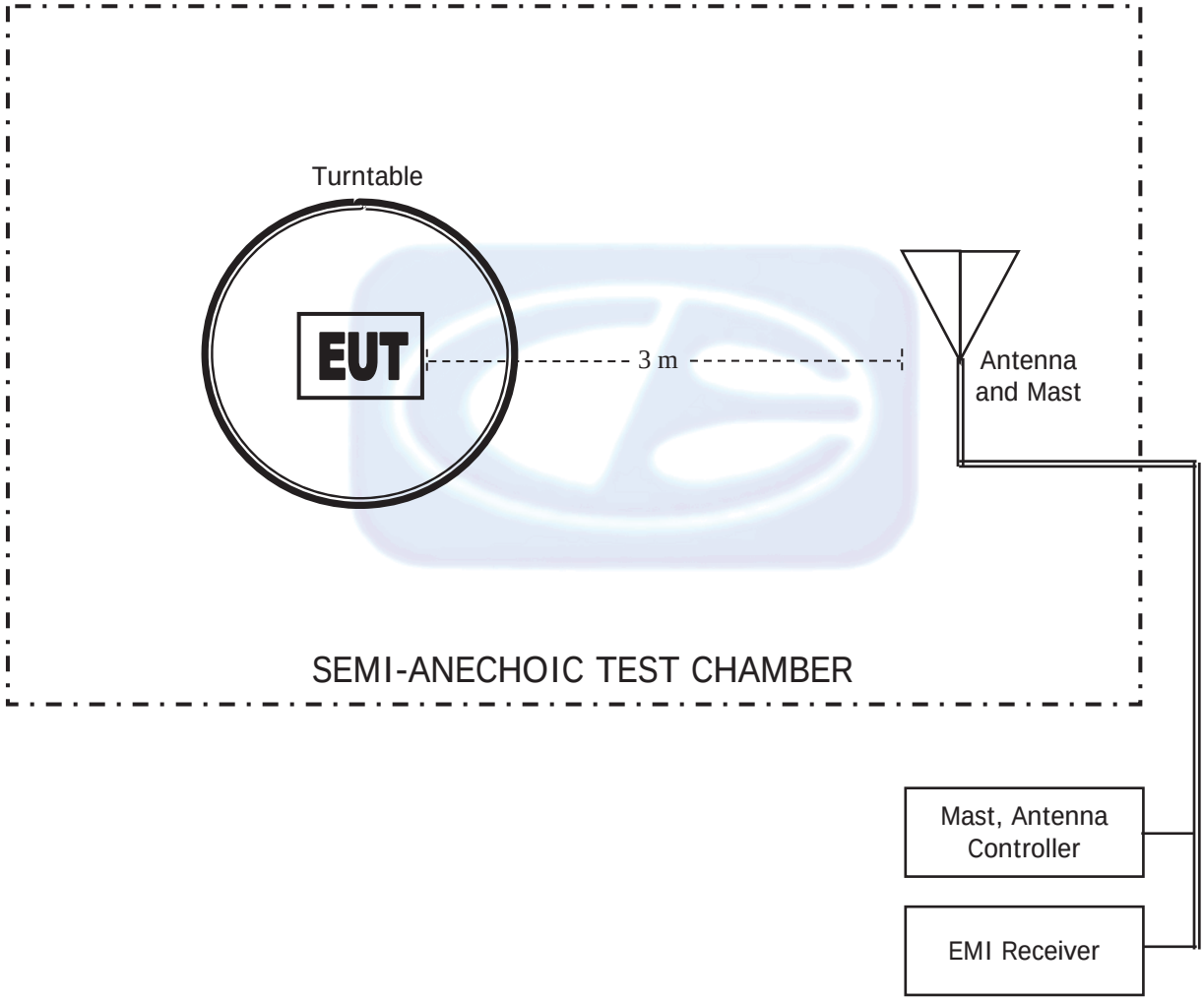
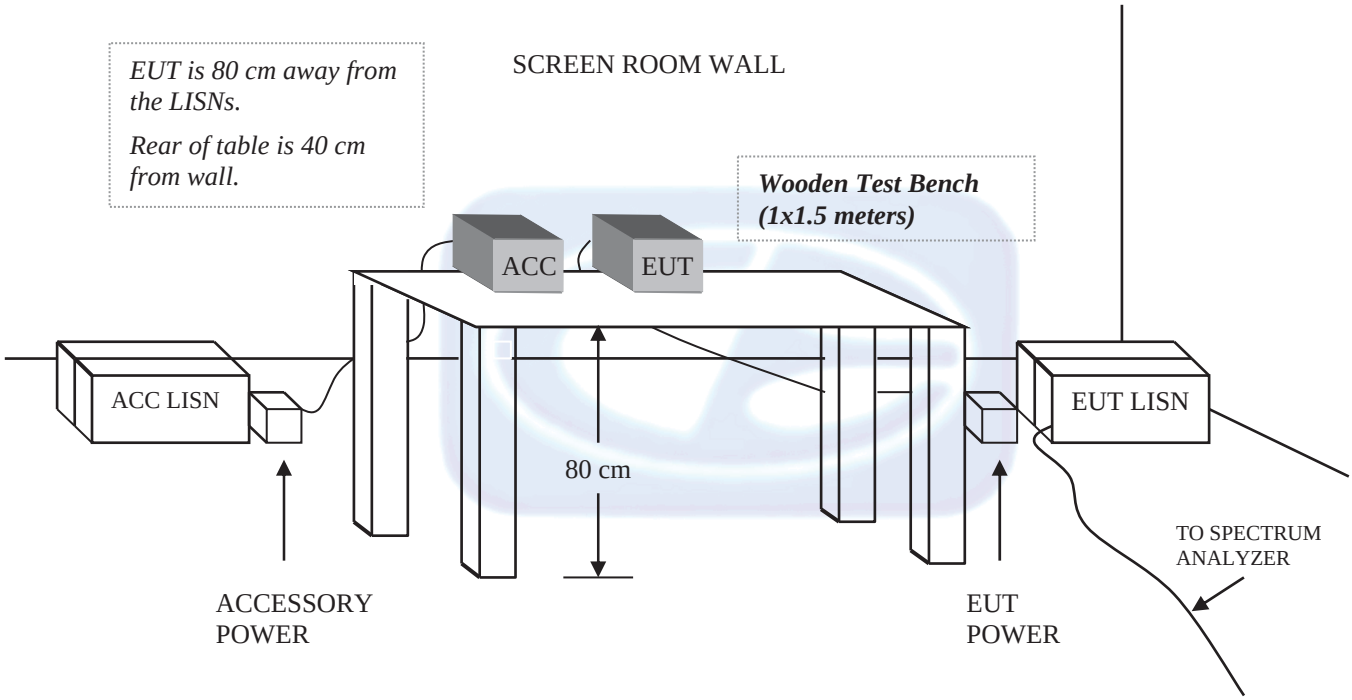


FIGURE 2: CONDUCTED EMISSIONS TEST SETUP



COM-POWER AL-130R

LOOP ANTENNA

S/N: 121090

CALIBRATION DATE: FEBRUARY 9, 2017

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-36.17	15.33
0.01	-35.86	15.64
0.02	-37.30	14.20
0.03	-36.58	14.92
0.04	-36.99	14.51
0.05	-37.66	13.84
0.06	-37.53	13.97
0.07	-37.64	13.86
0.08	-37.52	13.98
0.09	-37.62	13.88
0.1	-37.59	13.91
0.2	-37.79	13.71
0.3	-37.80	13.70
0.4	-37.70	13.80
0.5	-37.79	13.71
0.6	-37.79	13.71
0.7	-37.69	13.81
0.8	-37.49	14.01
0.9	-37.39	14.11
1	-37.39	14.11
2	-37.09	14.41
3	-37.09	14.41
4	-37.19	14.31
5	-36.98	14.52
6	-37.17	14.33
7	-37.05	14.45
8	-36.85	14.65
9	-36.84	14.66
10	-36.75	14.75
15	-37.16	14.34
20	-36.44	15.06
25	-37.88	13.62
30	-39.14	12.36

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: SEPTEMBER 3, 2015

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	24.00	200	13.00
35	24.30	250	15.30
40	25.40	300	18.20
45	21.50	350	17.90
50	22.50	400	18.60
60	15.40	450	19.80
70	12.70	500	21.60
80	11.10	550	22.40
90	13.40	600	23.70
100	13.80	650	24.30
120	15.40	700	24.00
125	15.40	750	24.50
140	13.10	800	24.30
150	17.20	850	26.30
160	13.20	900	26.90
175	14.20	950	26.00
180	14.30	1000	25.60

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 26, 2016

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	23.93	10.0	39.33
1.5	25.54	10.5	39.64
2.0	28.09	11.0	41.04
2.5	30.21	11.5	44.29
3.0	30.15	12.0	41.22
3.5	30.17	12.5	41.50
4.0	31.90	13.0	41.62
4.5	33.51	13.5	40.63
5.0	33.87	14.0	39.94
5.5	35.08	14.5	41.84
6.0	34.81	15.0	42.69
6.5	34.26	15.5	39.03
7.0	36.33	16.0	39.07
7.5	37.03	16.5	41.40
8.0	37.56	17.0	43.18
8.5	40.07	17.5	47.01
9.0	38.92	18.0	46.48
9.5	38.21		

COM-POWER PAM-118A

PREAMPLIFIER

S/N: 551024

CALIBRATION DATE: MAY 12, 2016

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.84	6.0	39.05
1.1	39.40	6.5	38.94
1.2	39.58	7.0	39.25
1.3	39.68	7.5	39.09
1.4	39.91	8.0	39.01
1.5	39.78	8.5	38.60
1.6	39.50	9.0	38.64
1.7	39.81	9.5	39.67
1.8	39.89	10.0	39.30
1.9	39.94	11.0	39.15
2.0	39.57	12.0	39.24
2.5	40.39	13.0	39.49
3.0	40.63	14.0	39.44
3.5	40.80	15.0	39.94
4.0	40.86	16.0	40.09
4.5	39.94	17.0	40.06
5.0	34.47	18.0	39.76
5.5	39.32		

COM-POWER AH-826

HORN ANTENNA

S/N: 71957

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	33.5	22.5	35.5
18.5	33.5	23.0	35.9
19.0	34.0	23.5	35.7
19.5	34.0	24.0	35.6
20.0	34.3	24.5	36.0
20.5	34.9	25.0	36.2
21.0	34.7	25.5	36.1
21.5	35.0	26.0	36.2
22.0	35.0	26.5	35.7

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

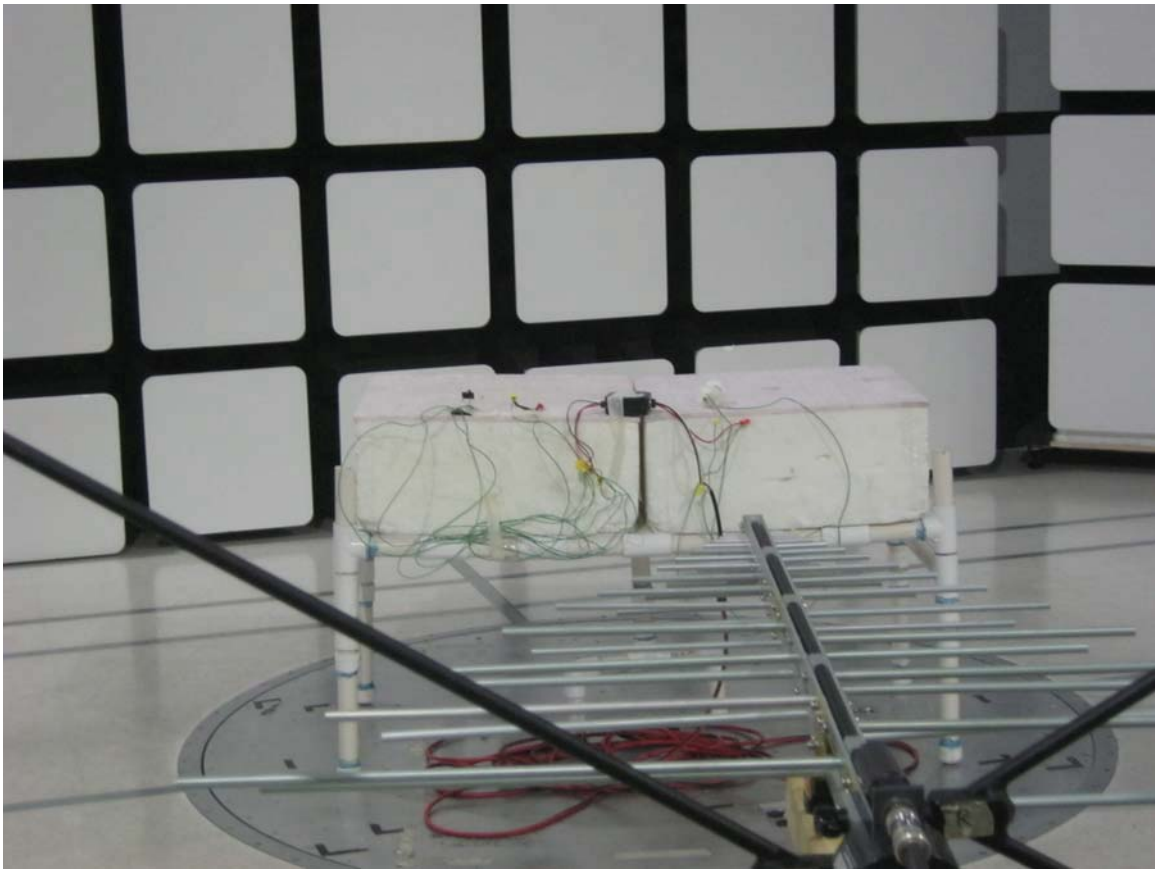
CALIBRATION DATE: MAY 13, 2016

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	25.33	36.5	23.71
28.0	24.49	37.0	26.35
28.5	24.74	37.5	23.49
29.0	25.93	38.0	25.42
29.5	26.28	38.5	24.87
30.0	26.17	39.0	22.60
30.5	26.11	39.5	20.57
		40.0	19.15

FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz – INSTALLED IN THE IM-301

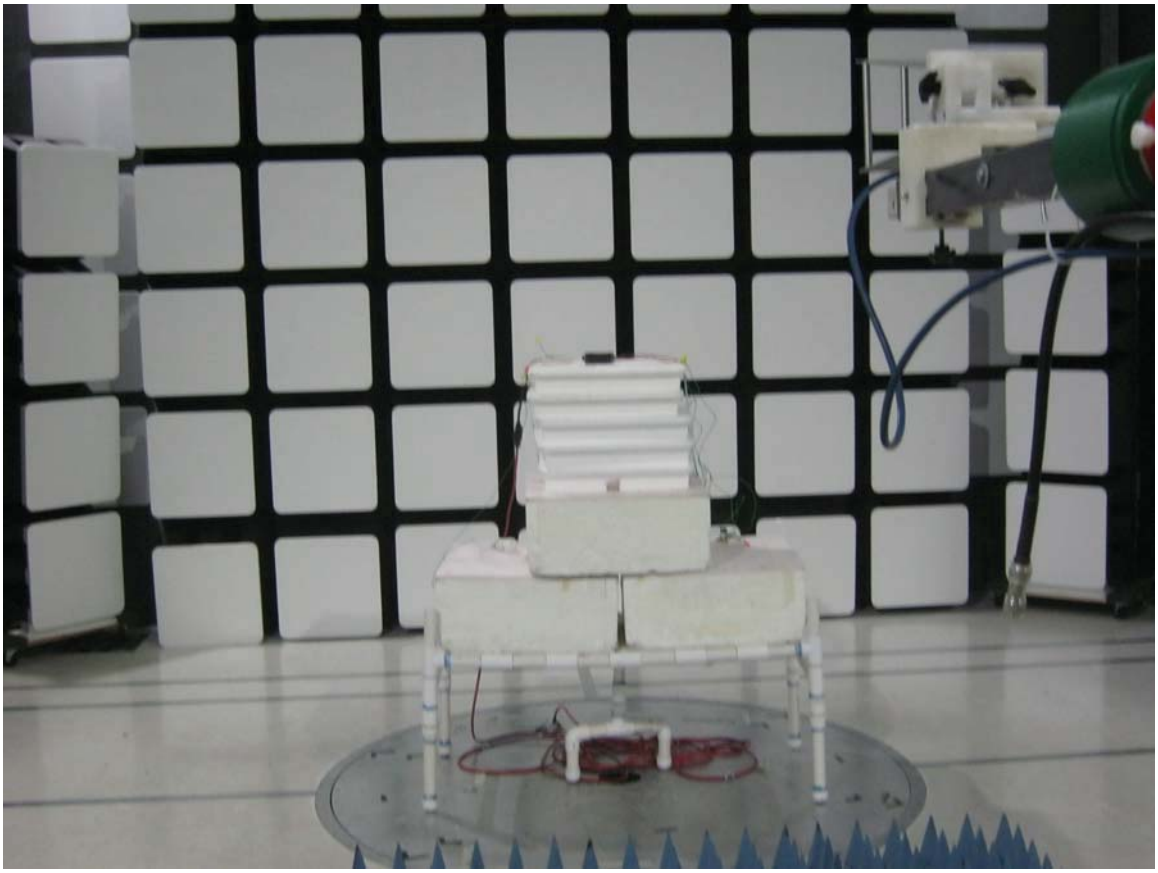
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz – INSTALLED IN THE IM-301

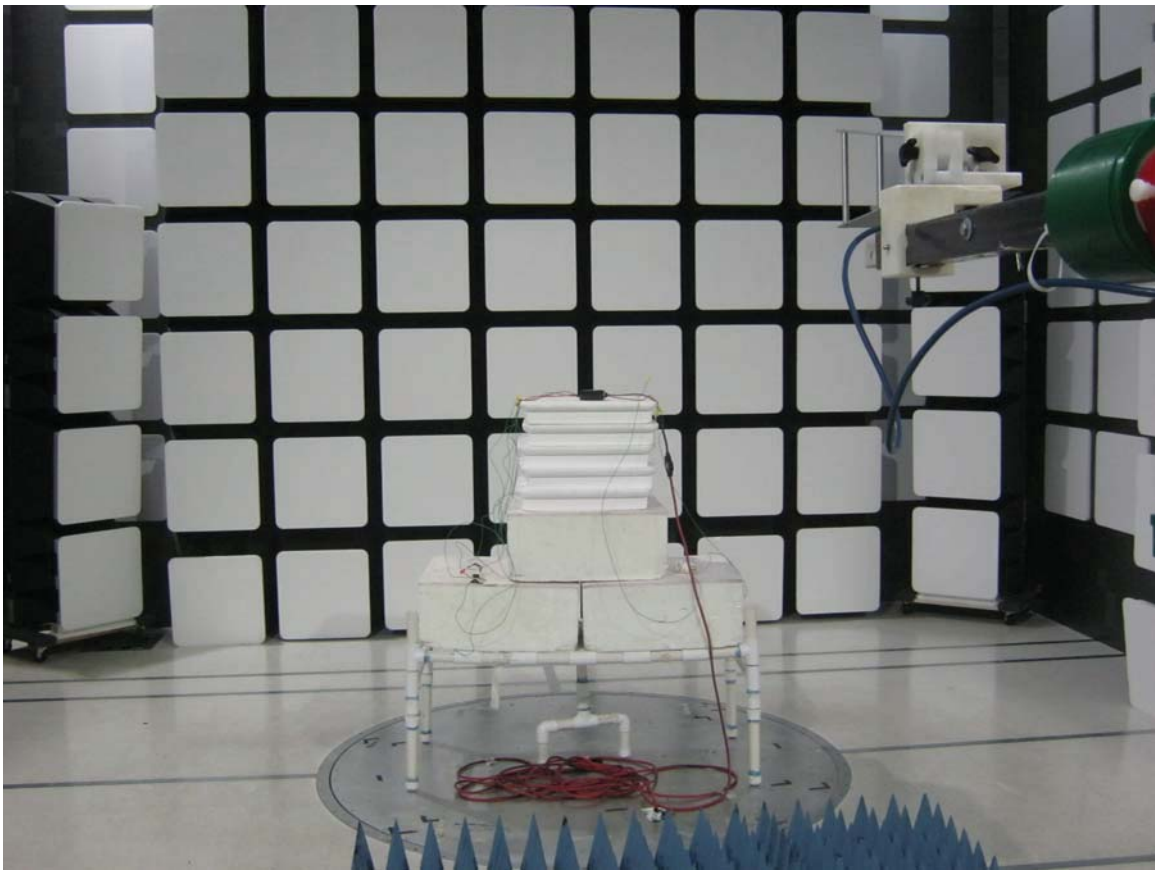
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz – INSTALLED IN THE IM-301

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz – INSTALLED IN THE IM-301

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – CONDUCTED EMISSIONS – INSTALLED IN THE IM-301

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

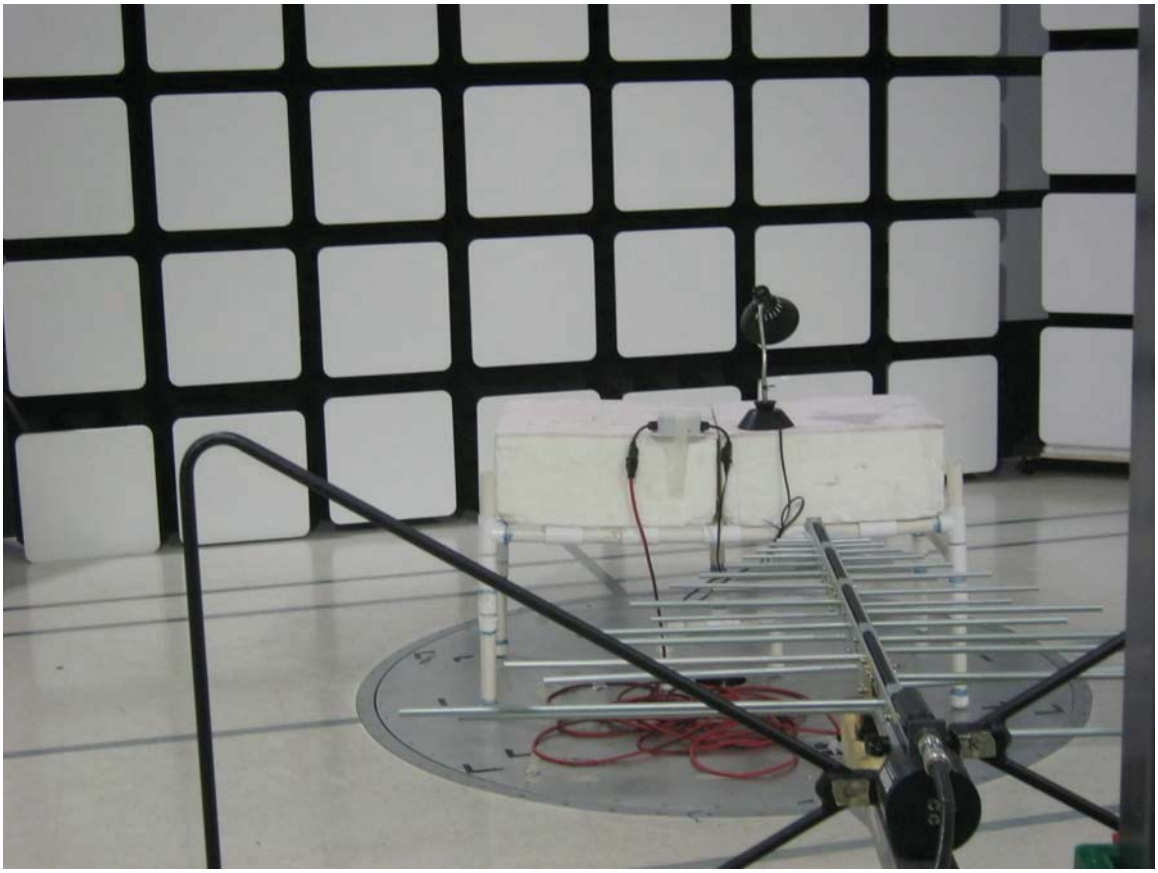
IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – CONDUCTED EMISSIONS – INSTALLED IN THE IM-301

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz – INSTALLED IN THE IM-303

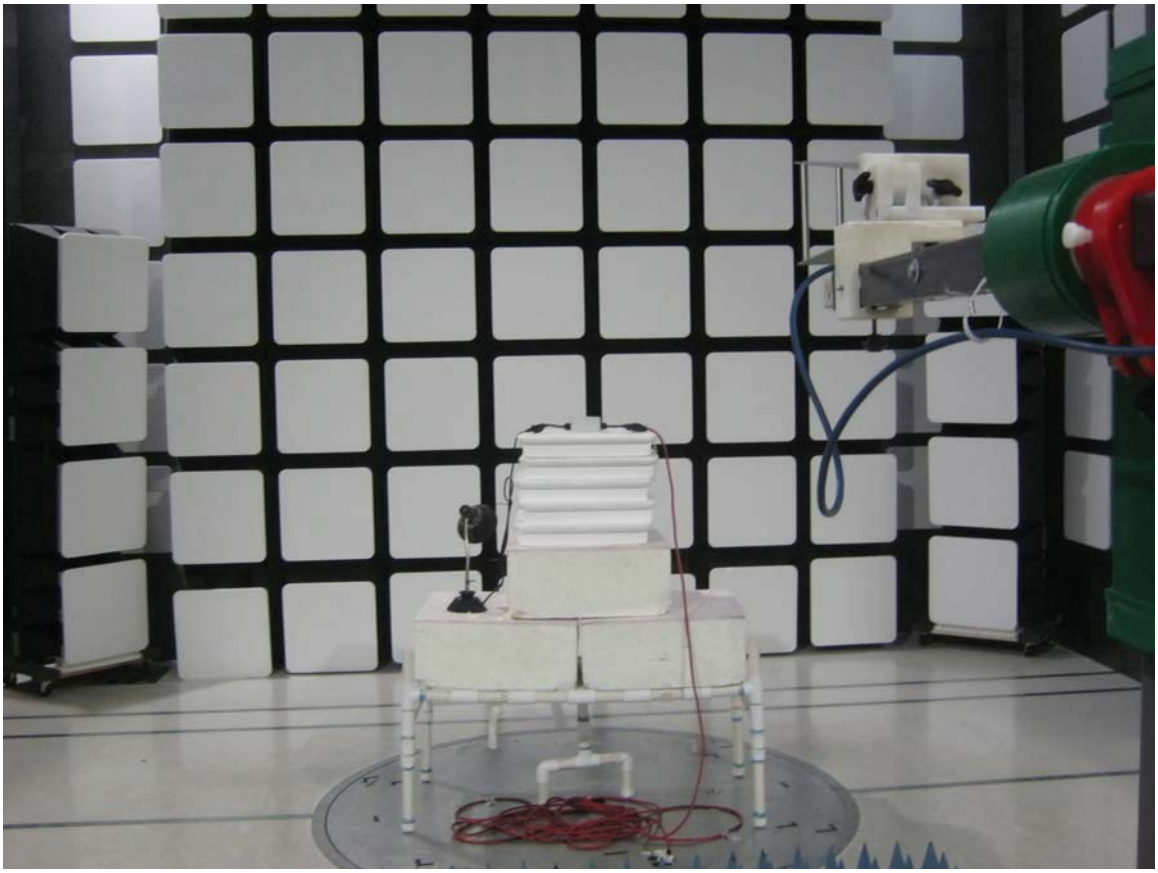
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz – INSTALLED IN THE IM-303

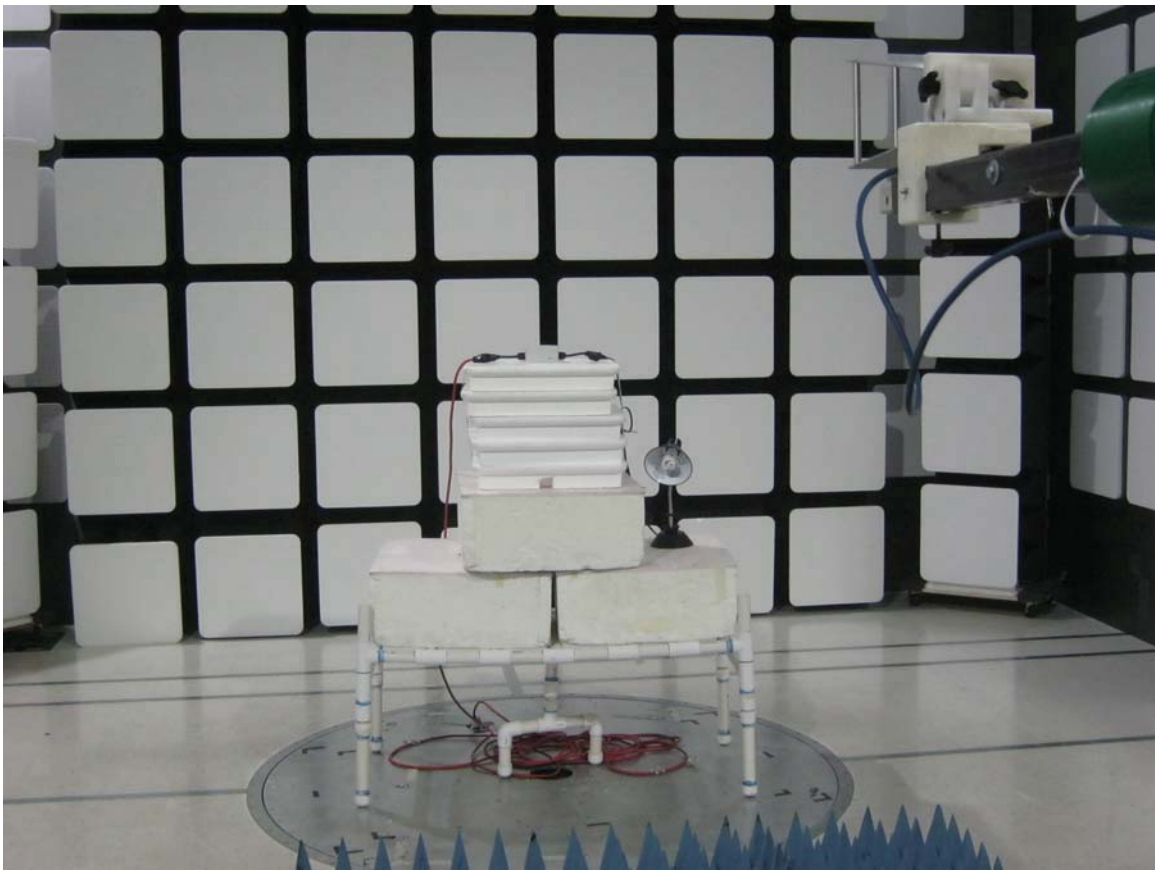
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz – INSTALLED IN THE IM-303

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz – INSTALLED IN THE IM-303

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – CONDUCTED EMISSIONS – INSTALLED IN THE IM-303

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

IBIS NETWORKS
RF ENGINE MODULE
MODEL: IE-300
FCC SUBPART B AND C – CONDUCTED EMISSIONS – INSTALLED IN THE IM-303

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	59.92	V	73.97	-14.05	Peak	137.50	139.00	
4810	39.92	V	53.97	-14.05	Avg	137.50	139.00	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	56.91	V	73.97	-17.06	Peak	49.75	196.79	
4810	36.91	V	53.97	-17.06	Avg	49.75	196.79	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	55.87	V	73.97	-18.10	Peak	136.25	115.47	
4810	35.87	V	53.97	-18.10	Avg	136.25	115.47	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	54.75	H	73.97	-19.22	Peak	138.00	189.56	
4810	34.75	H	53.97	-19.22	Avg	138.00	189.56	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	57.86	H	73.97	-16.11	Peak	20.75	135.47	
4810	37.86	H	53.97	-16.11	Avg	20.75	135.47	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	54.25	H	73.97	-19.72	Peak	155.75	153.50	
4810	34.25	H	53.97	-19.72	Avg	155.75	153.50	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.49	V	73.97	-17.49	Peak	193.25	129.26	
4880	36.49	V	53.97	-17.49	Avg	193.25	129.26	
7320	68.26	V	73.97	-5.71	Peak	50.75	151.17	
7320	48.26	V	53.97	-5.71	Avg	50.75	151.17	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	52.57	V	73.97	-21.41	Peak	82.75	191.35	
4880	32.57	V	53.97	-21.41	Avg	82.75	191.35	
7320	70.78	V	73.97	-3.19	Peak	93.50	238.88	
7320	50.78	V	53.97	-3.19	Avg	93.50	238.88	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.26	V	73.97	-17.71	Peak	160.75	129.92	
4880	36.26	V	53.97	-17.71	Avg	160.75	129.92	
7320	66.11	V	73.97	-7.86	Peak	109.75	102.25	
7320	46.11	V	53.97	-7.86	Avg	109.75	102.25	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.97	H	73.97	-20.01	Peak	199.50	217.38	
4880	33.97	H	53.97	-20.01	Avg	199.50	217.38	
7320	68.89	H	73.97	-5.08	Peak	29.75	220.01	
7320	48.89	H	53.97	-5.08	Avg	29.75	220.01	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	68.89	H	73.97	-5.08	Peak	177.25	102.25	
4880	48.89	H	53.97	-5.08	Avg	177.25	102.25	
7320	67.77	H	73.97	-6.20	Peak	112.75	101.25	
7320	47.77	H	53.97	-6.20	Avg	112.75	101.25	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2440 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	55.48	H	73.97	-18.49	Peak	4.00	196.67	
4880	35.48	H	53.97	-18.49	Avg	4.00	196.67	
7320	70.43	H	73.97	-3.54	Peak	182.50	153.20	
7320	50.43	H	53.97	-3.54	Avg	182.50	153.20	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	53.72	V	73.97	-20.25	Peak	211.75	190.52	
4960	33.72	V	53.97	-20.25	Avg	211.75	190.52	
7440	52.69	V	73.97	-21.28	Peak	202.25	181.54	
7440	32.69	V	53.97	-21.28	Avg	202.25	181.54	
9920								**Not in Restricted**
9920								**Band - Done via Conducted**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	53.98	V	73.97	-19.99	Peak	14.75	194.64	
4960	33.98	V	53.97	-19.99	Avg	14.75	194.64	
7440	53.79	V	73.97	-20.18	Peak	150.50	159.23	
7440	33.79	V	53.97	-20.18	Avg	150.50	159.23	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	53.21	V	73.97	-20.77	Peak	172.50	165.92	
4960	33.21	V	53.97	-20.77	Avg	172.50	165.92	
7440	53.96	V	73.97	-20.01	Peak	3.50	124.01	
7440	33.96	V	53.97	-20.01	Avg	3.50	124.01	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	55.64	H	73.97	-18.33	Peak	91.26	135.55	
4960	35.64	H	53.97	-18.33	Avg	91.26	135.55	
7440	64.24	H	73.97	-9.73	Peak	90.25	142.25	
7440	44.24	H	53.97	-9.73	Avg	90.25	142.25	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	55.83	H	73.97	-18.14	Peak	82.00	181.62	
4960	35.83	H	53.97	-18.14	Avg	82.00	181.62	
7440	55.04	H	73.97	-18.93	Peak	220.25	153.80	
7440	35.04	H	53.97	-18.93	Avg	220.25	153.80	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/09/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	54.29	H	73.97	-19.68	Peak	263.50	107.77	
4960	34.29	H	53.97	-19.68	Avg	263.50	107.77	
7440	54.03	H	73.97	-19.94	Peak	140.75	108.85	
7440	34.03	H	53.97	-19.94	Avg	140.75	108.85	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	54.79	V	73.97	-19.18	Peak	350.00	155.05	
4810	34.79	V	53.97	-19.18	Avg	350.00	155.05	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	51.40	V	73.97	-22.57	Peak	325.25	225.20	
4810	31.40	V	53.97	-22.57	Avg	325.25	225.20	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	53.55	V	73.97	-20.42	Peak	143.25	163.59	
4810	33.55	V	53.97	-20.42	Avg	143.25	163.59	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	55.20	H	73.97	-18.77	Peak	9.25	146.88	
4810	35.20	H	53.97	-18.77	Avg	9.25	146.88	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
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Date: 06/06/2017
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Low Channel
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	53.92	H	73.97	-20.05	Peak	150.25	209.86	
4810	33.92	H	53.97	-20.05	Avg	150.25	209.86	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
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Date: 06/06/2017
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Low Channel
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4810	50.31	H	73.97	-23.66	Peak	15.50	211.89	
4810	30.31	H	53.97	-23.66	Avg	15.50	211.89	
7215								**Not in Restricted**
7215								**Band - Done via Conducted**
9620								**Not in Restricted**
9620								**Band - Done via Conducted**
12025								**No Emissions**
12025								**Detected**
14430								**No Emissions**
14430								**Detected**
16835								**No Emissions**
16835								**Detected**
19240								**No Emissions**
19240								**Detected**
21645								**No Emissions**
21645								**Detected**
24050								**No Emissions**
24050								**Detected**

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RF ENGINE Module
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Date: 06/06/2016
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2440 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	55.03	V	73.97	-18.95	Peak	17.00	176.31	
4880	35.03	V	53.97	-18.95	Avg	17.00	176.31	
7320	63.08	V	73.97	-10.89	Peak	349.00	195.83	
7320	43.08	V	53.97	-10.89	Avg	349.00	195.83	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
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Date: 06/06/2016
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2440 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.43	V	73.97	-20.54	Peak	308.75	170.88	
4880	33.43	V	53.97	-20.54	Avg	308.75	170.88	
7320	70.55	V	73.97	-3.42	Peak	355.00	249.00	
7320	50.55	V	53.97	-3.42	Avg	355.00	249.00	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
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Date: 06/06/2016
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2440 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.07	V	73.97	-17.91	Peak	118.50	172.73	
4880	36.07	V	53.97	-17.91	Avg	118.50	172.73	
7320	65.73	V	73.97	-8.24	Peak	199.25	152.43	
7320	45.73	V	53.97	-8.24	Avg	199.25	152.43	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

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2440 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	54.19	H	73.97	-19.78	Peak	326.75	151.65	
4880	34.19	H	53.97	-19.78	Avg	326.75	151.65	
7320	65.97	H	73.97	-8.00	Peak	153.50	188.67	
7320	45.97	H	53.97	-8.00	Avg	153.50	188.67	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

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2440 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.54	H	73.97	-17.43	Peak	306.25	199.47	
4880	36.54	H	53.97	-17.43	Avg	306.25	199.47	
7320	67.26	H	73.97	-6.71	Peak	229.75	195.05	
7320	47.26	H	53.97	-6.71	Avg	229.75	195.05	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

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IBIS Networks
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2440 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.46	H	73.97	-20.51	Peak	119.25	145.44	
4880	33.46	H	53.97	-20.51	Avg	119.25	145.44	
7320	69.33	H	73.97	-4.64	Peak	160.50	160.49	
7320	49.33	H	53.97	-4.64	Avg	160.50	160.49	
9760								**Not in Restricted**
9760								**Band - Done via Conducted**
12200								**No Emissions**
12200								**Detected**
14640								**No Emissions**
14640								**Detected**
17080								**No Emissions**
17080								**Detected**
19520								**No Emissions**
19520								**Detected**
21960								**No Emissions**
21960								**Detected**
24400								**No Emissions**
24400								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	54.44	V	73.97	-19.53	Peak	82.00	147.11	
4960	34.44	V	53.97	-19.53	Avg	82.00	147.11	
7440	45.30	V	73.97	-28.67	Peak	99.00	128.07	
7440	25.30	V	53.97	-28.67	Avg	99.00	128.07	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	51.50	V	73.97	-22.47	Peak	296.25	209.26	
4960	31.50	V	53.97	-22.47	Avg	296.25	209.26	
7440	46.11	V	73.97	-27.86	Peak	350.00	215.25	
7440	26.11	V	53.97	-27.86	Avg	350.00	215.25	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	51.15	V	73.97	-22.82	Peak	195.50	147.11	
4960	31.15	V	53.97	-22.82	Avg	195.50	147.11	
7440	45.55	V	73.97	-28.42	Peak	19.50	185.11	
7440	25.55	V	53.97	-28.42	Avg	19.50	185.11	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	50.26	H	73.97	-23.72	Peak	81.50	126.76	
4960	30.26	H	53.97	-23.72	Avg	81.50	126.76	
7440	51.26	H	73.97	-22.71	Peak	178.00	115.83	
7440	31.26	H	53.97	-22.71	Avg	178.00	115.83	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	51.25	H	73.97	-22.72	Peak	184.75	184.91	
4960	31.25	H	53.97	-22.72	Avg	184.75	184.91	
7440	45.80	H	73.97	-28.17	Peak	138.50	169.56	
7440	25.80	H	53.97	-28.17	Avg	138.50	169.56	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

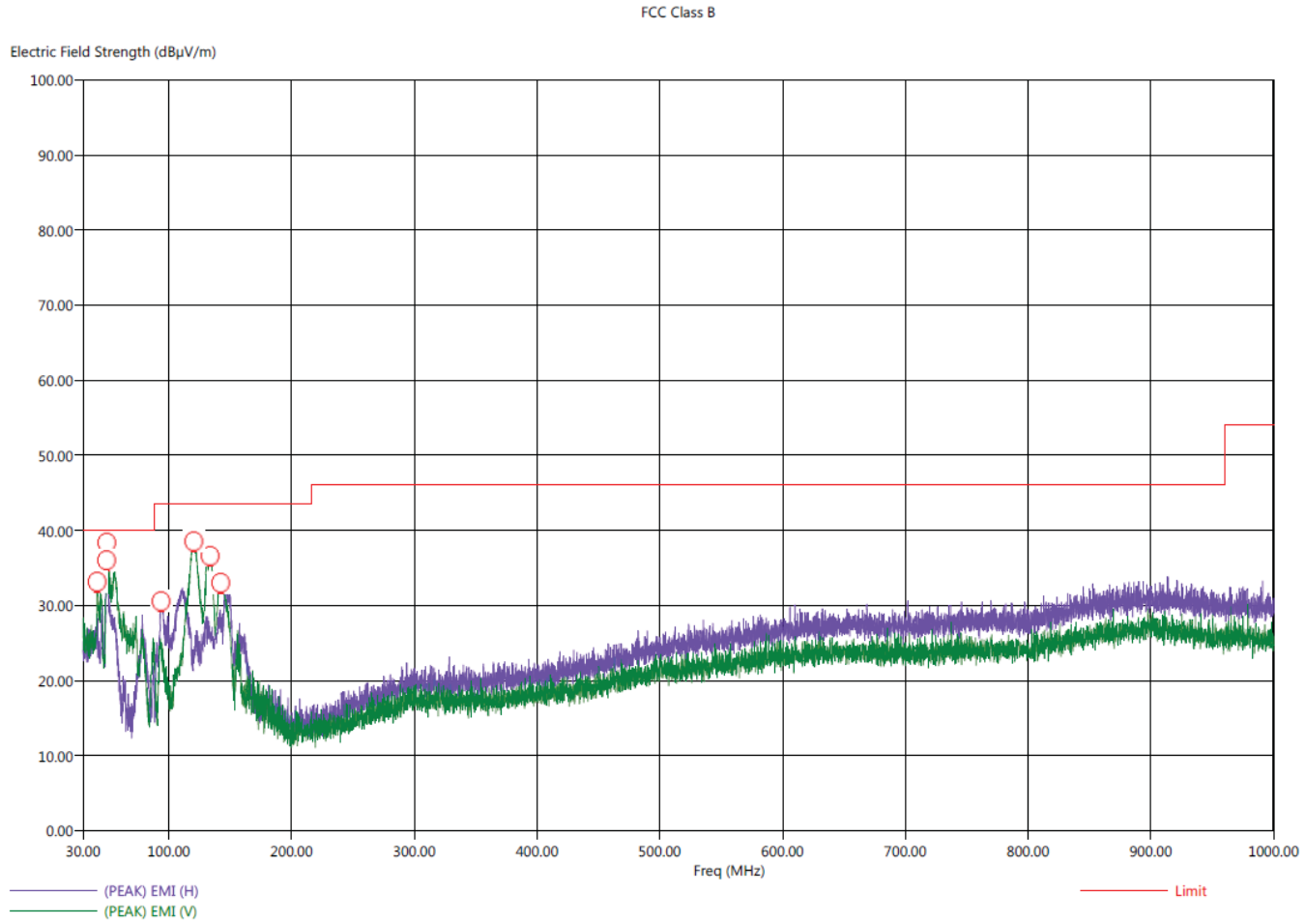
Date: 06/06/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4960	51.03	H	73.97	-22.94	Peak	10.00	196.91	
4960	31.03	H	53.97	-22.94	Avg	10.00	196.91	
7440	45.20	H	73.97	-28.77	Peak	20.00	198.95	
7440	25.20	H	53.97	-28.77	Avg	20.00	198.95	
9920								**No Emissions**
9920								**Detected**
12400								**No Emissions**
12400								**Detected**
14880								**No Emissions**
14880								**Detected**
17360								**No Emissions**
17360								**Detected**
19840								**No Emissions**
19840								**Detected**
22320								**No Emissions**
22320								**Detected**
24800								**No Emissions**
24800								**Detected**

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan - X-Axis - 30-1000Mhz - IM-301 - 06-09-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel - X-Axis
Comments: Customer: IBIS Networks
Model: IE-300
Inside the Intelimeter Lighting Power Pack

6/9/2017 8:20:55 AM
Sequence: Preliminary Scan



No additional emissions, except for harmonics, were found between 9 kHz – 30 MHz and 1 GHz – 25 GHz.

Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan - 30-1000Mhz - IM-301 - 06-09-17.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel - X-Axis
Comments: Customer: IBIS Networks
Model: IE-300
Inside the Intelimeter Lighting Power Pack

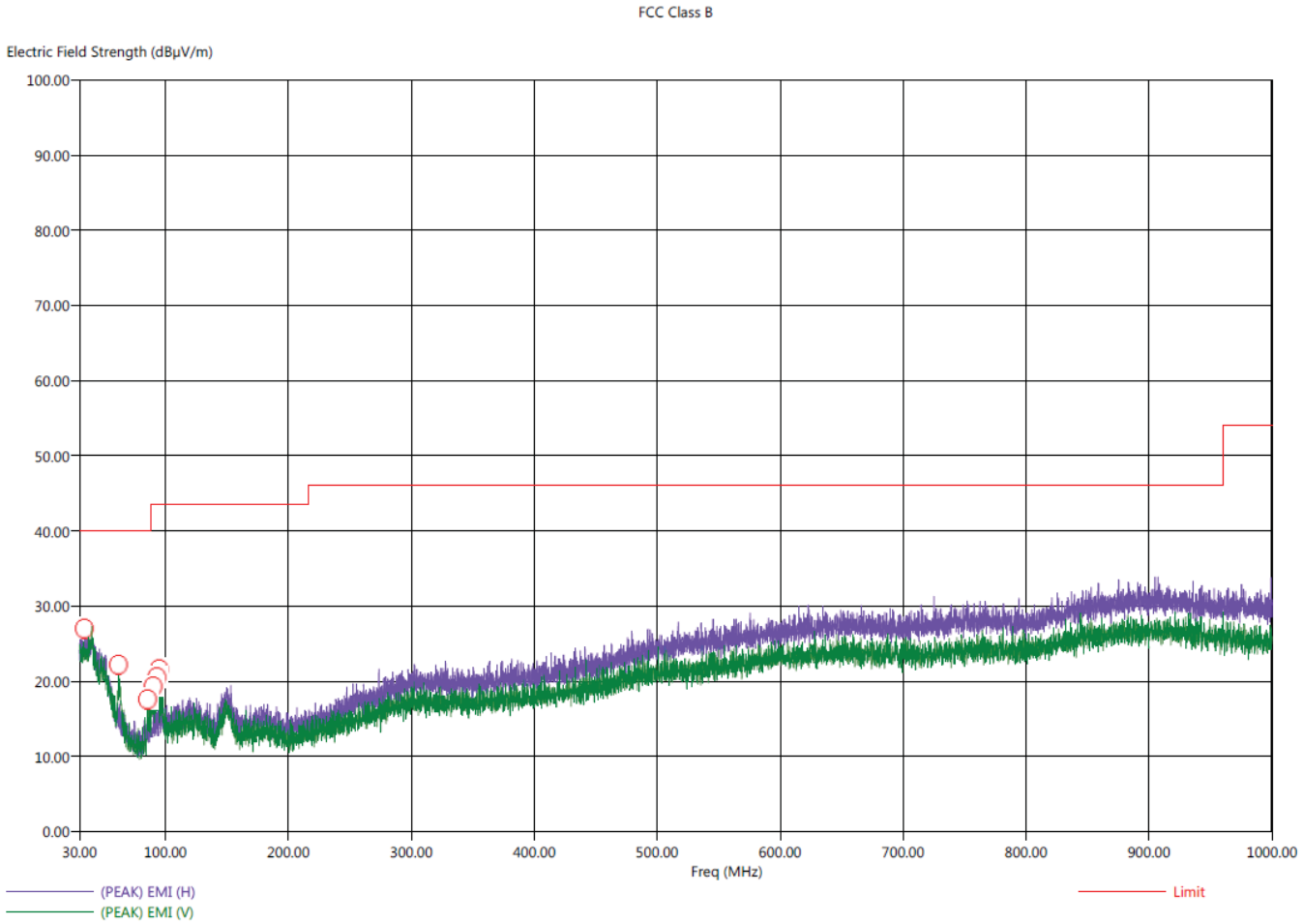
6/9/2017 8:49:31 AM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
41.60	V	35.35	33.07	-4.65	-6.93	40.00	24.01	0.40	279.50	111.23
49.30	V	37.59	35.45	-2.41	-4.55	40.00	22.38	0.40	302.75	143.41
49.40	H	36.76	34.40	-3.24	-5.60	40.00	22.43	0.40	2.00	379.95
93.70	H	29.68	26.32	-13.82	-17.18	43.50	13.55	0.70	350.75	380.25
120.30	V	39.20	37.43	-4.30	-6.07	43.50	15.40	0.70	279.25	111.29
133.70	V	39.76	37.85	-3.74	-5.65	43.50	14.06	0.74	307.00	111.29
142.30	V	36.17	34.59	-7.33	-8.91	43.50	13.98	0.77	237.75	127.41

Title: Pre-Scan - FCC Class B
File: Agilent - Radiated Pre-Scan - X-Axis - 30-1000Mhz - IM-303 - 06-08-2017.set Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel - X-Axis - Worst Case
Comments: Customer: IBIS Networks
Model: IE-300
Installed Inside the InteliMeter 30A In-Line

6/8/2017 7:59:02 AM
Sequence: Preliminary Scan



No additional emissions, except for harmonics, were found between 9 kHz – 30 MHz and 1 GHz – 25 GHz.

Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan - 30-1000Mhz - One Socket Unit - 02-04-16.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel - X-Axis
Comments: Customer: IBIS Networks
Model: IE-300
Installed Inside the InteliMeter 30A In-Line

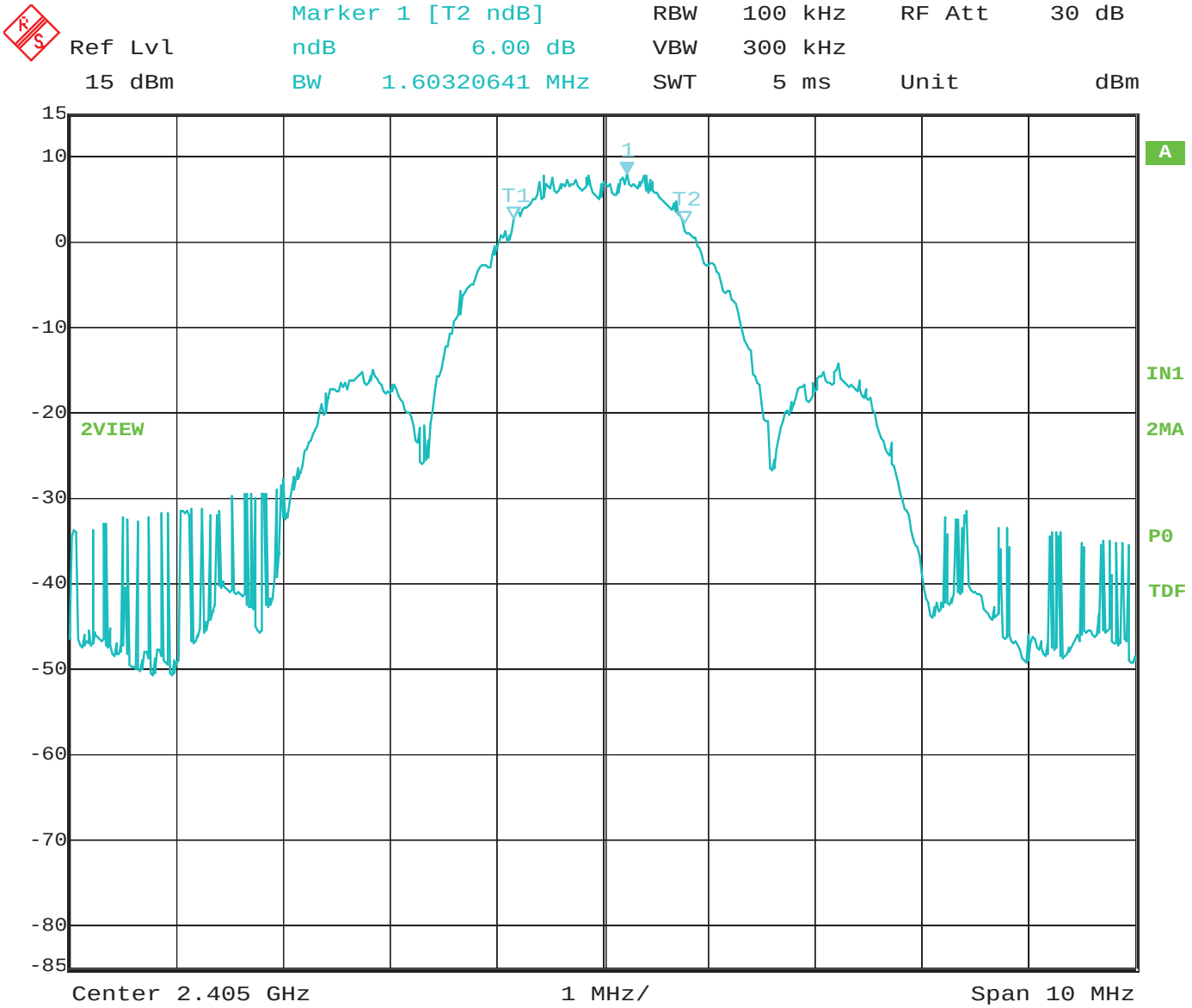
6/8/2017 8:28:55 AM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Ttbl Agl (deg)	Twr Ht (cm)
34.00	H	27.48	22.68	-12.52	-17.32	40.00	24.24	0.34	120.75	111.29
61.70	V	21.04	16.95	-18.96	-23.05	40.00	14.87	0.44	317.75	111.17
85.40	V	17.76	13.20	-22.24	-26.80	40.00	12.38	0.70	96.00	110.88
90.00	V	20.34	15.43	-23.16	-28.07	43.50	13.40	0.70	142.25	111.05
92.90	V	21.08	16.95	-22.42	-26.55	43.50	13.53	0.70	173.75	110.82
94.90	V	22.71	18.25	-20.79	-25.25	43.50	13.61	0.70	86.25	110.70

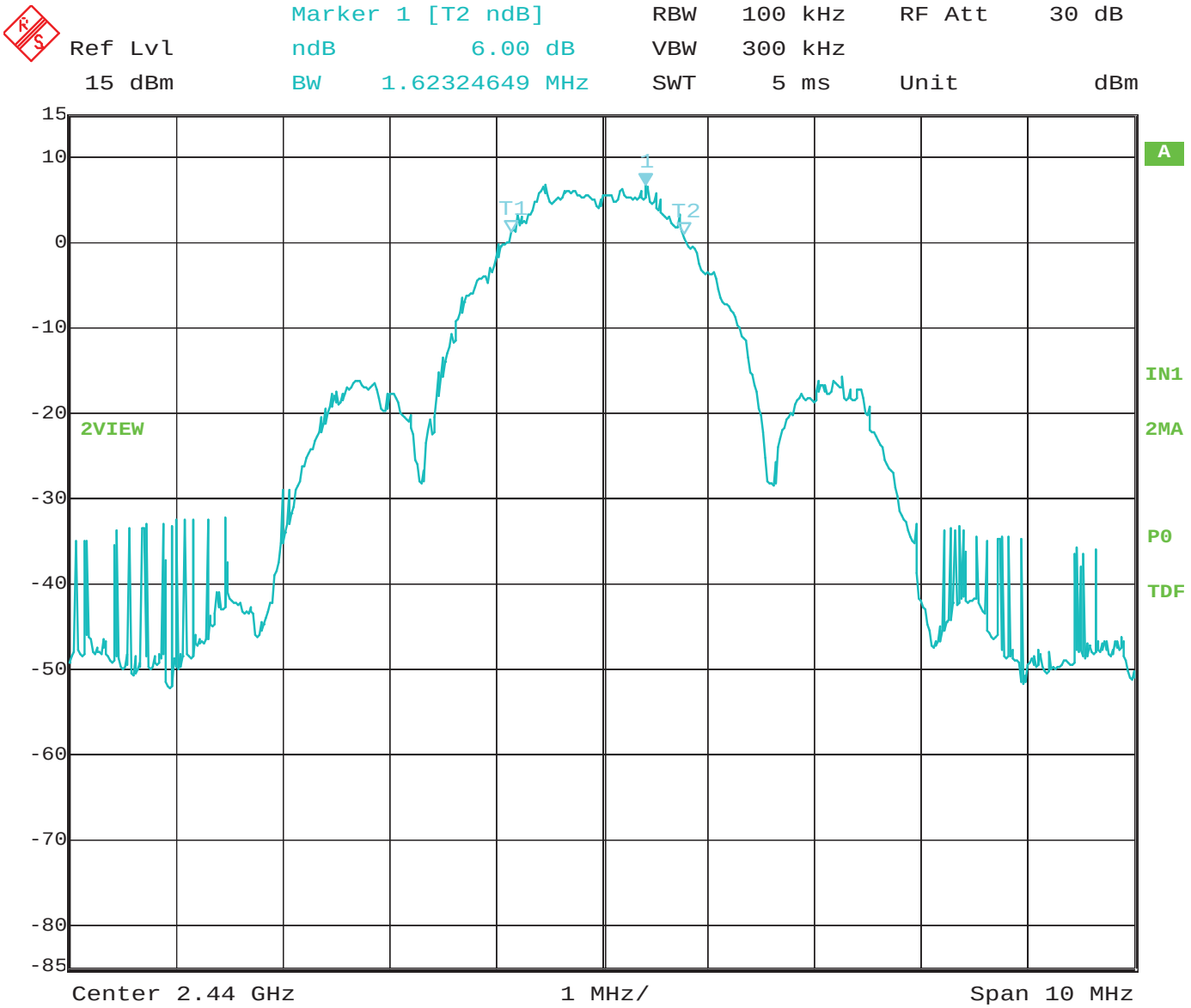
-6 dB BANDWIDTH

DATA SHEETS



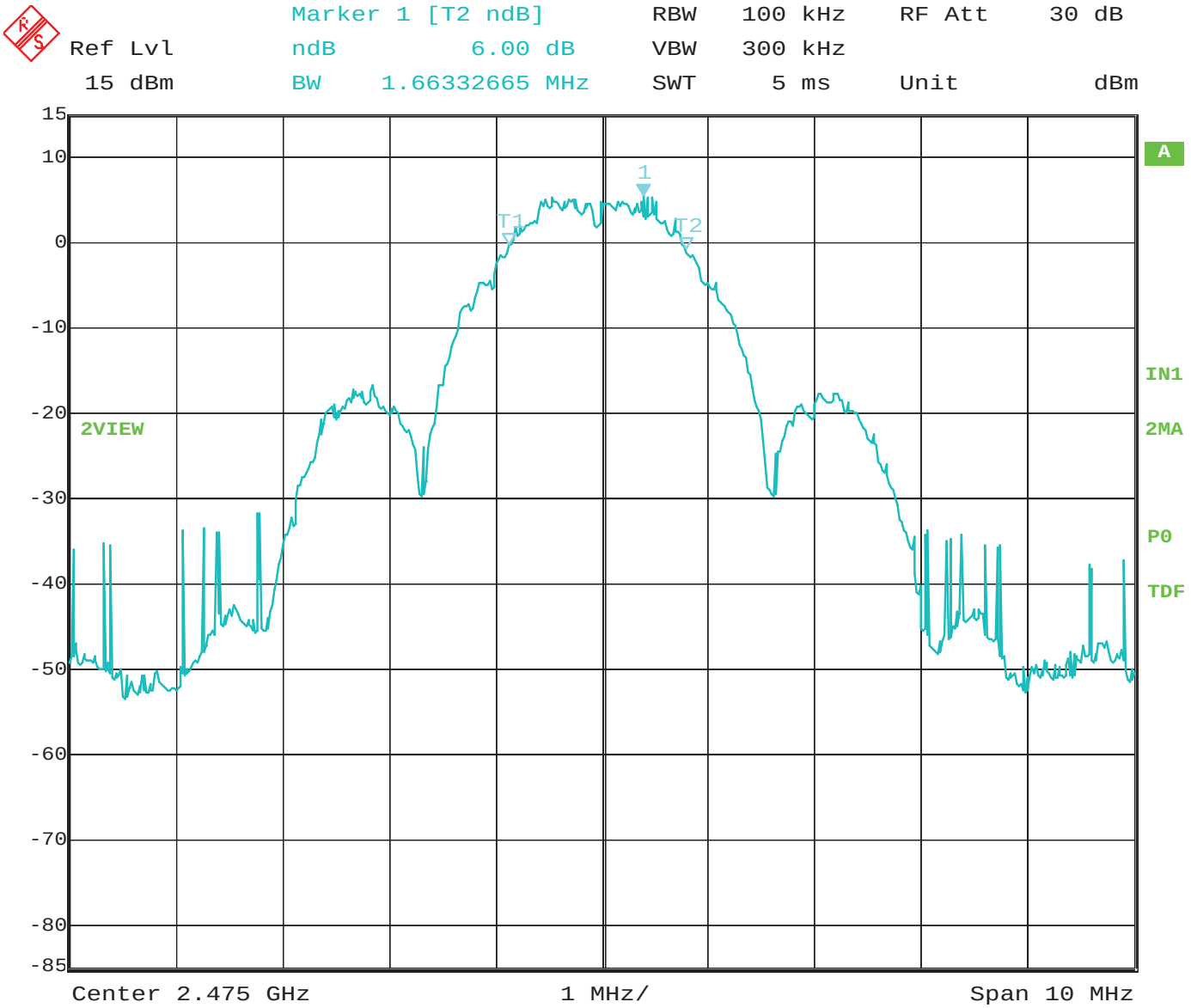
Date: 8.JUN.2017 12:11:00

-6 dB Bandwidth – 2405 MHz



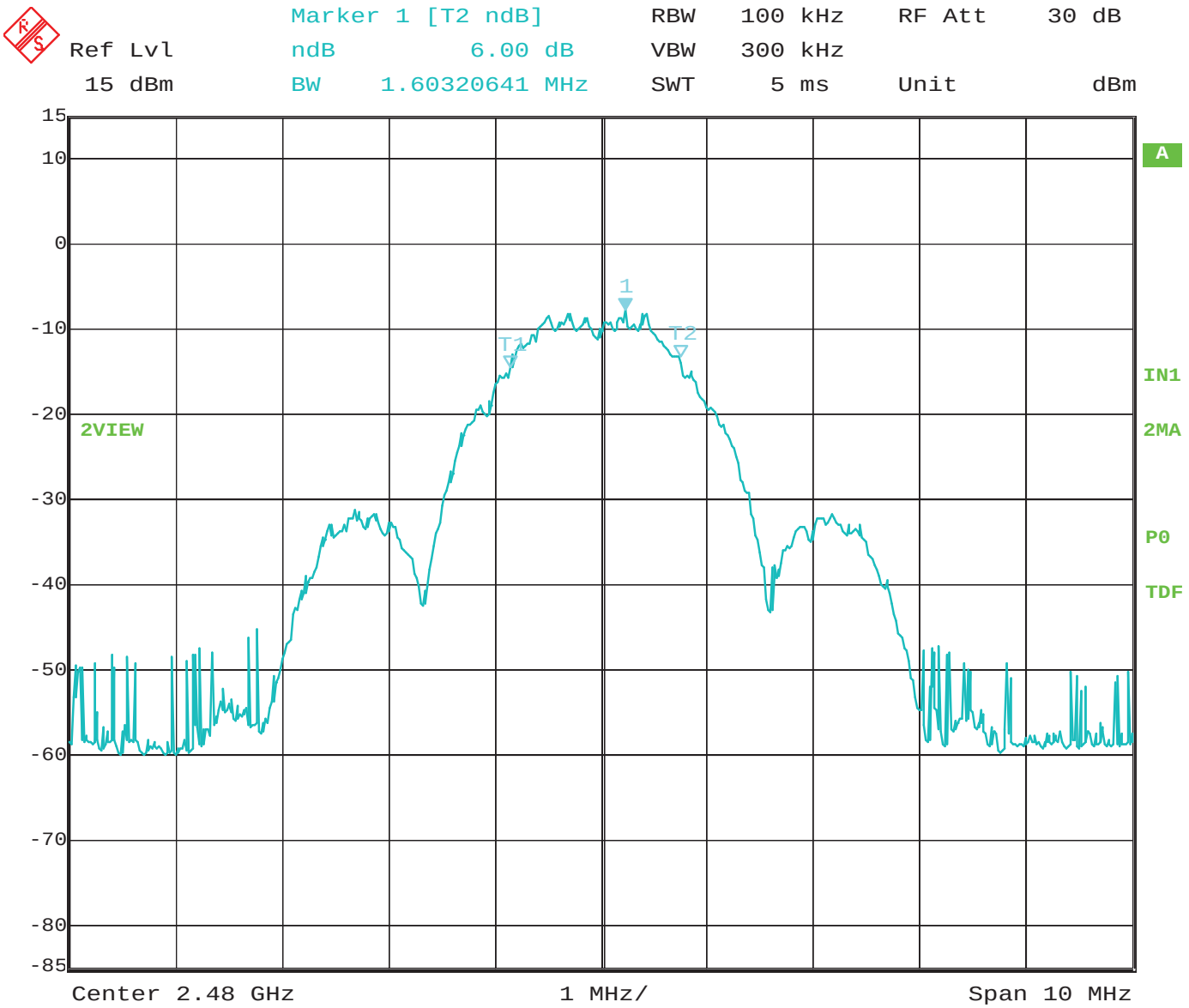
Date: 8.JUN.2017 12:11:49

-6 dB Bandwidth – 2440 MHz



Date: 8.JUN.2017 12:09:04

-6 dB Bandwidth – 2475 MHz

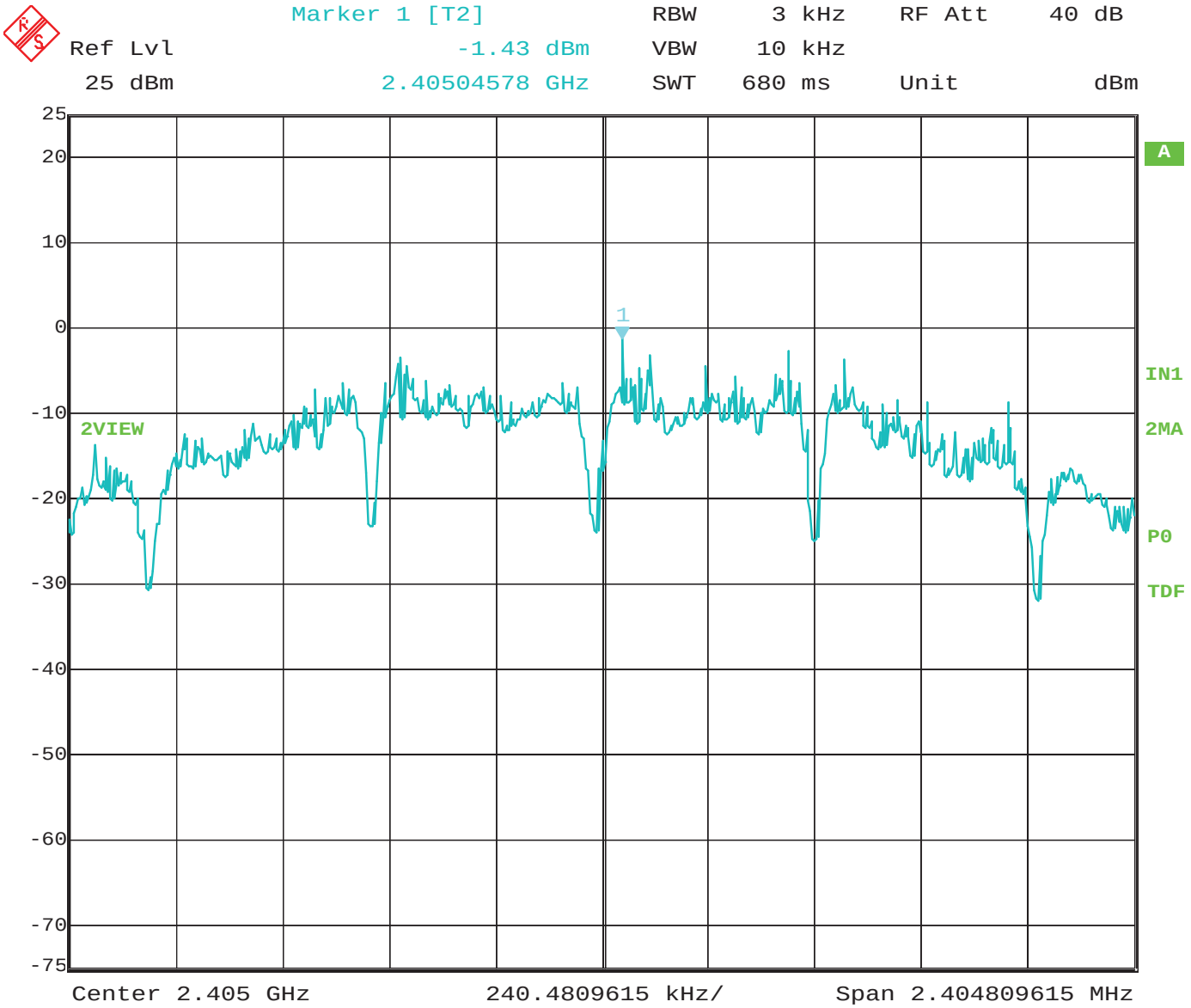


Date: 8.JUN.2017 12:10:04

-6 dB Bandwidth – 2480 MHz

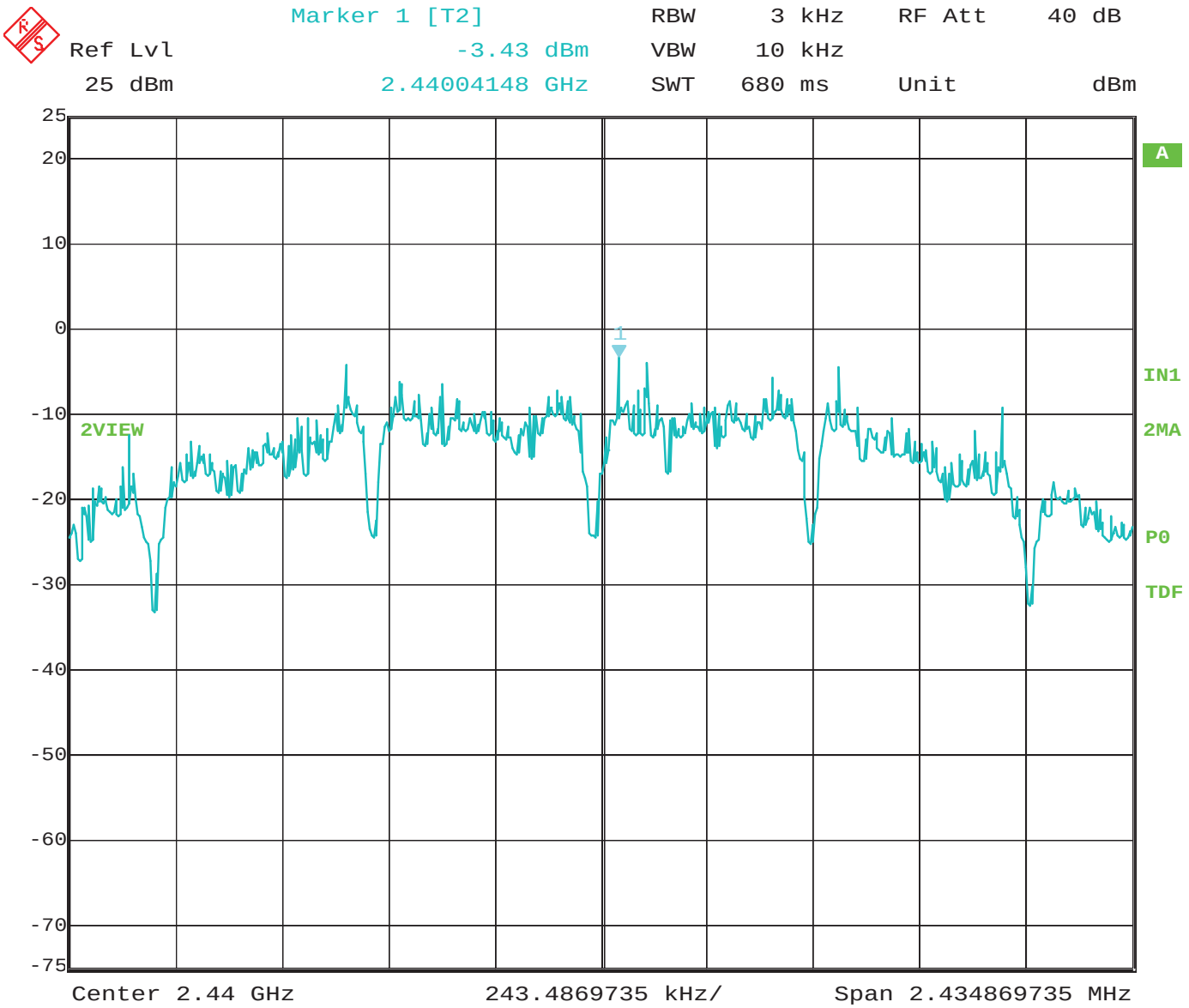
SPECTRAL DENSITY OUTPUT

DATA SHEETS



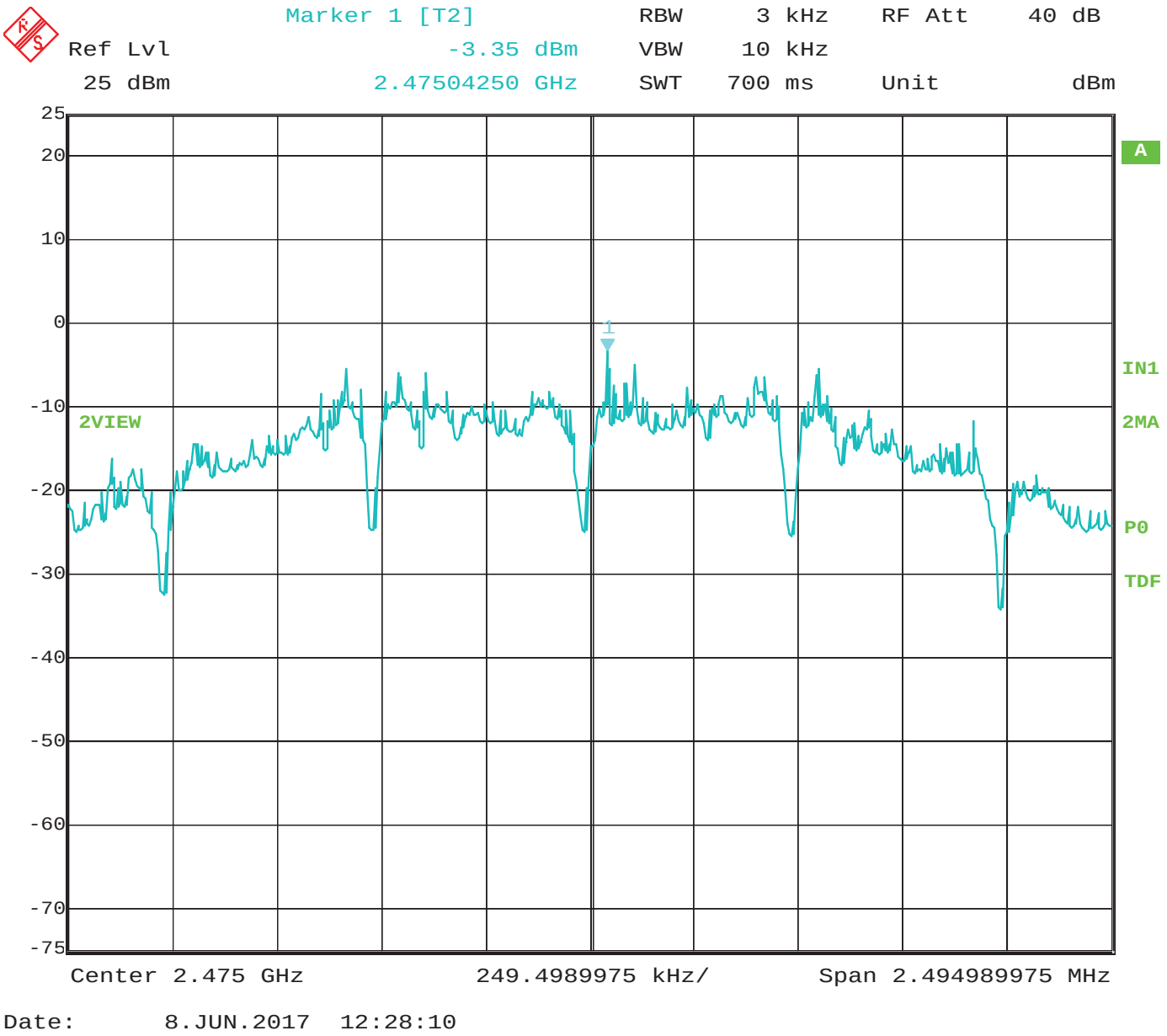
Date: 8.JUN.2017 12:22:50

Spectral Density – 2405 MHz



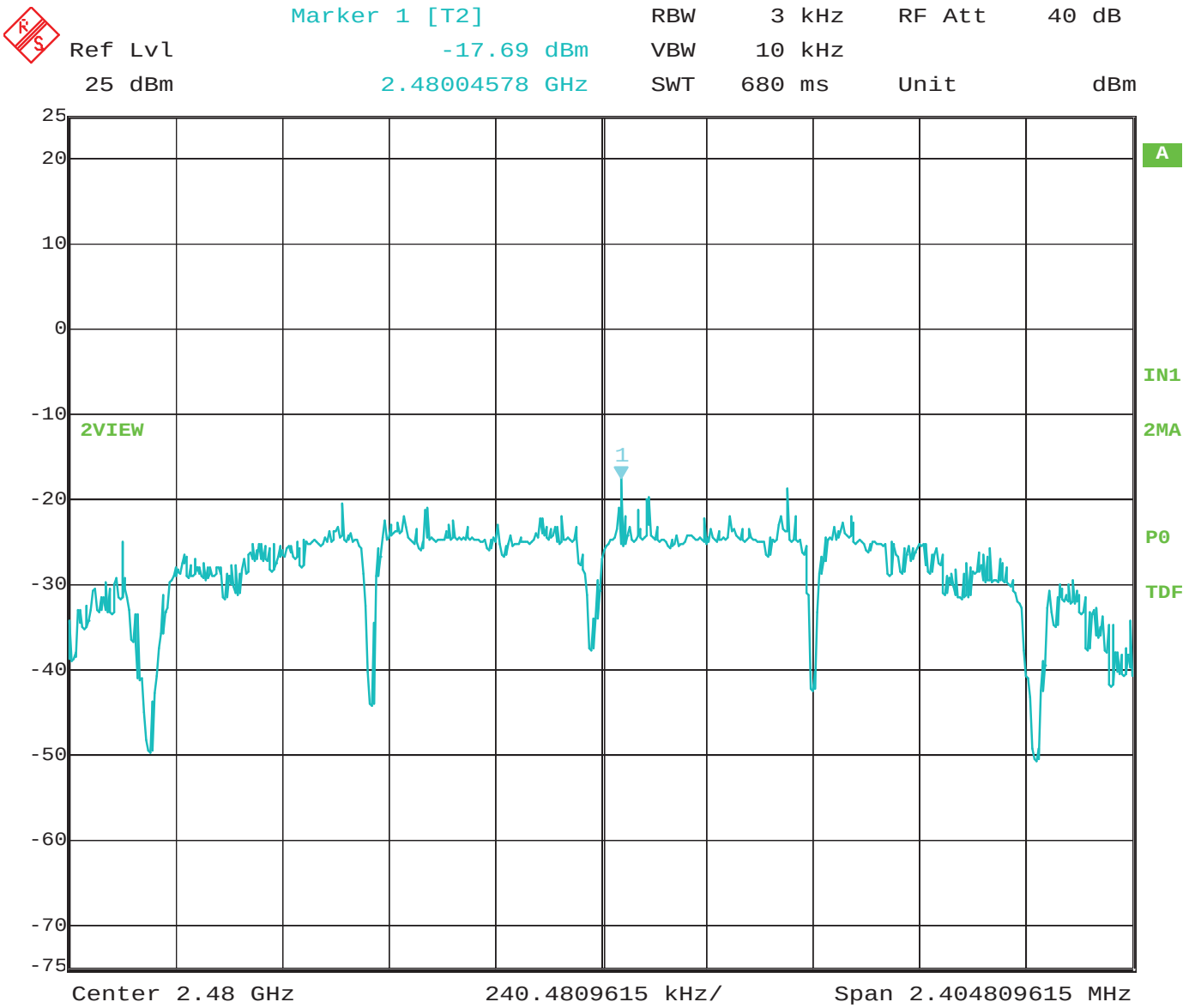
Date: 8.JUN.2017 12:26:58

Spectral Density – 2440 MHz



Date: 8.JUN.2017 12:28:10

Spectral Density – 2475 MHz

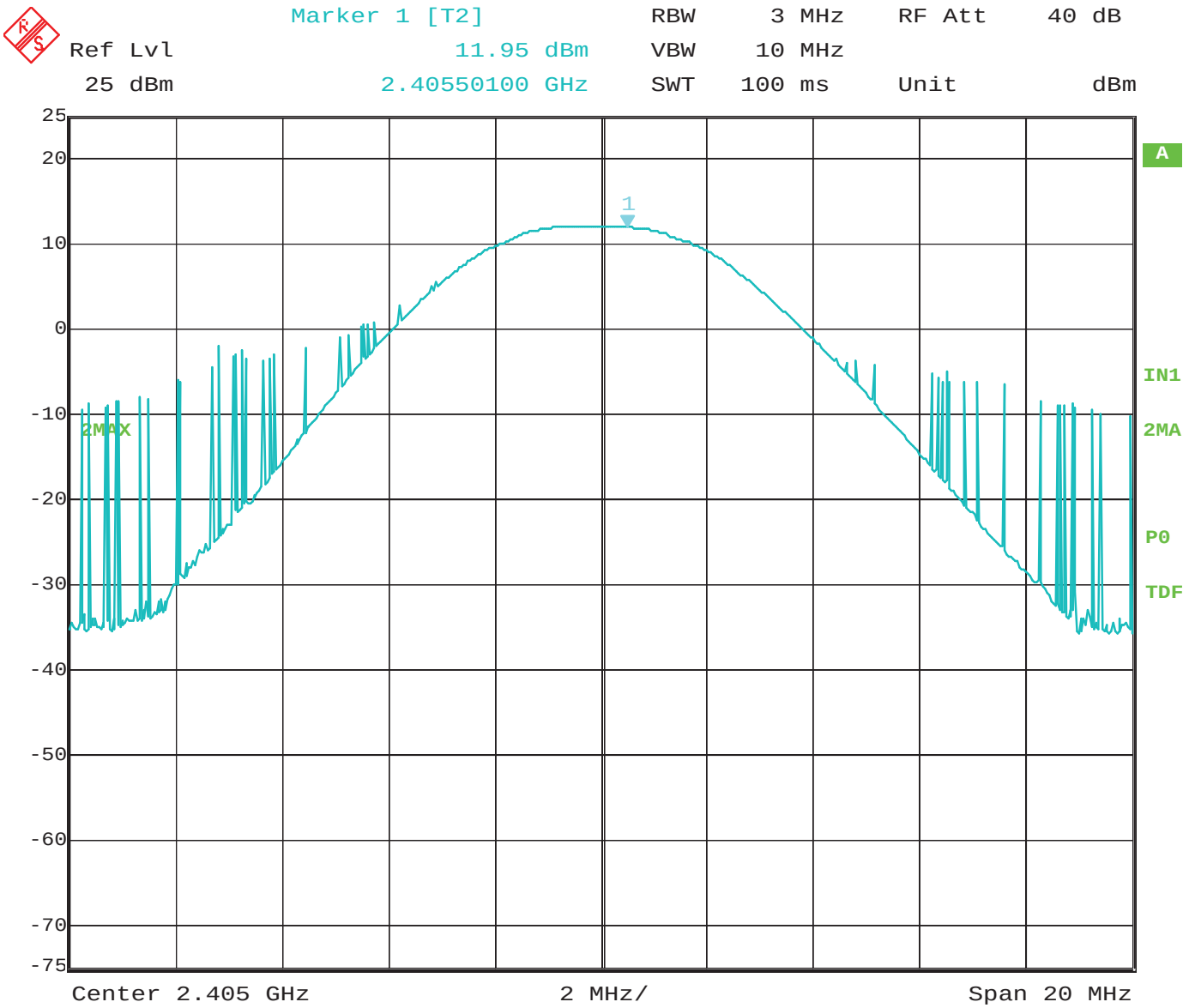


Date: 8.JUN.2017 12:29:06

Spectral Density – 2480 MHz

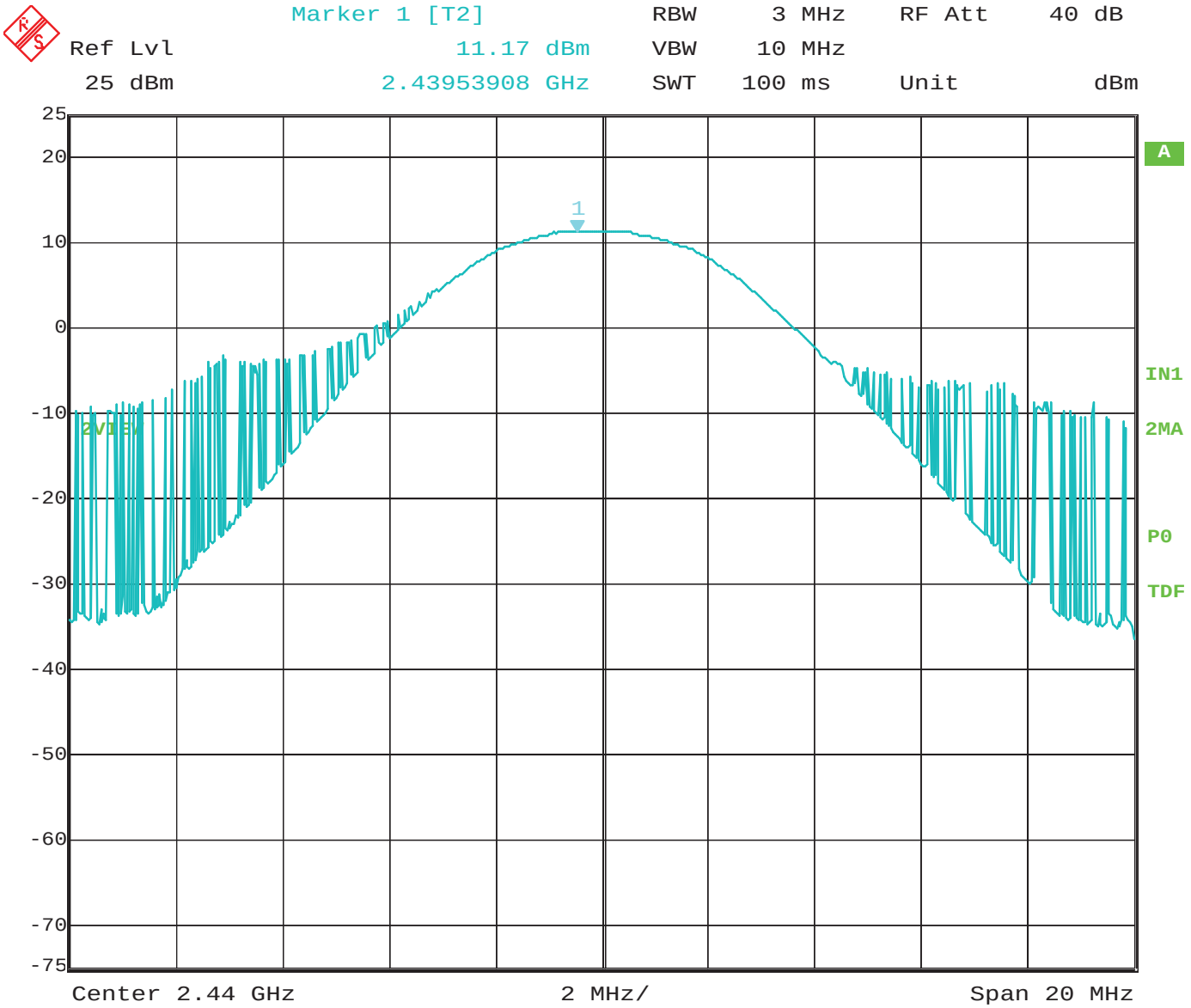
PEAK POWER

DATA SHEETS



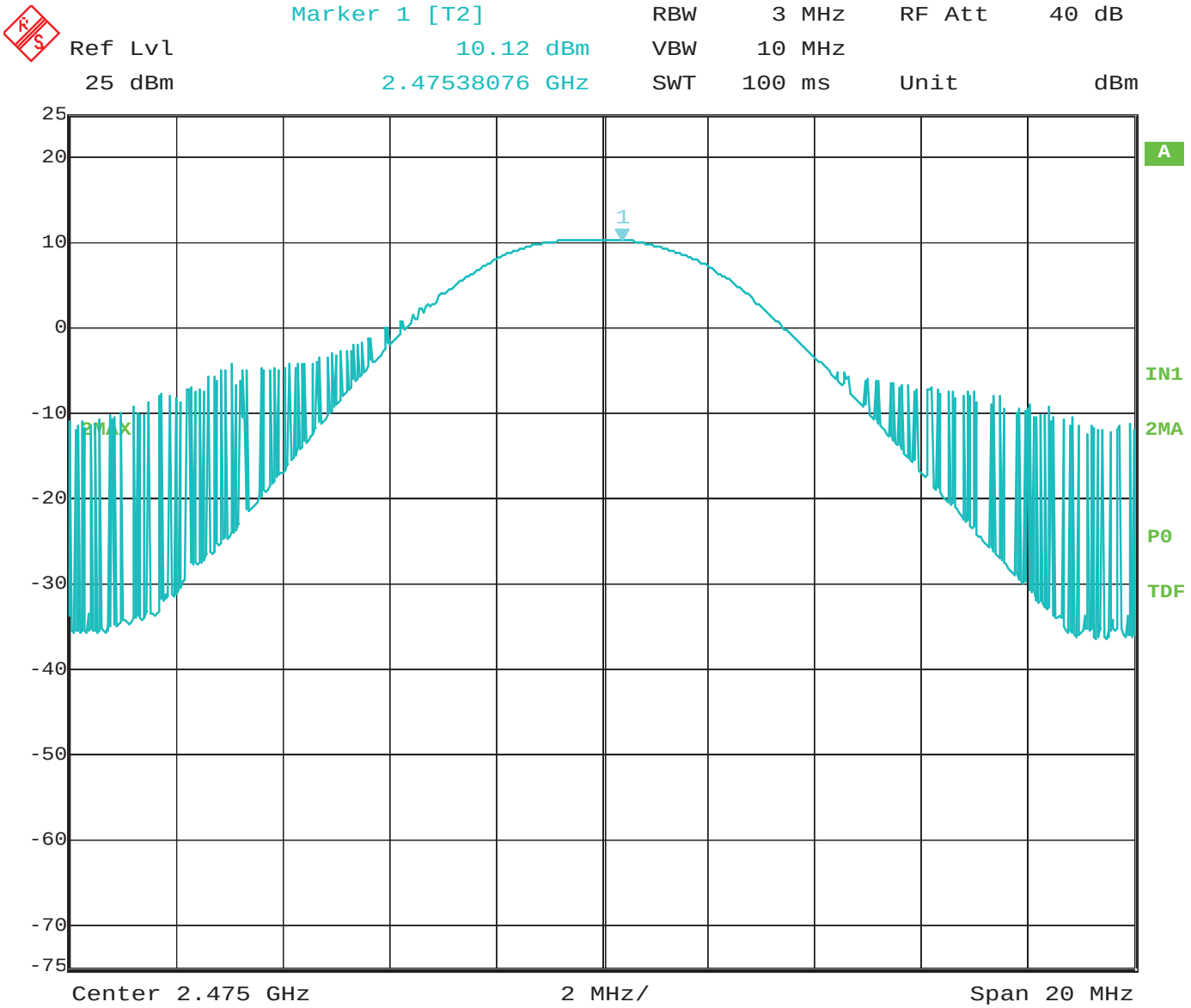
Date: 8.JUN.2017 12:17:03

Peak Power Output – 2405 MHz



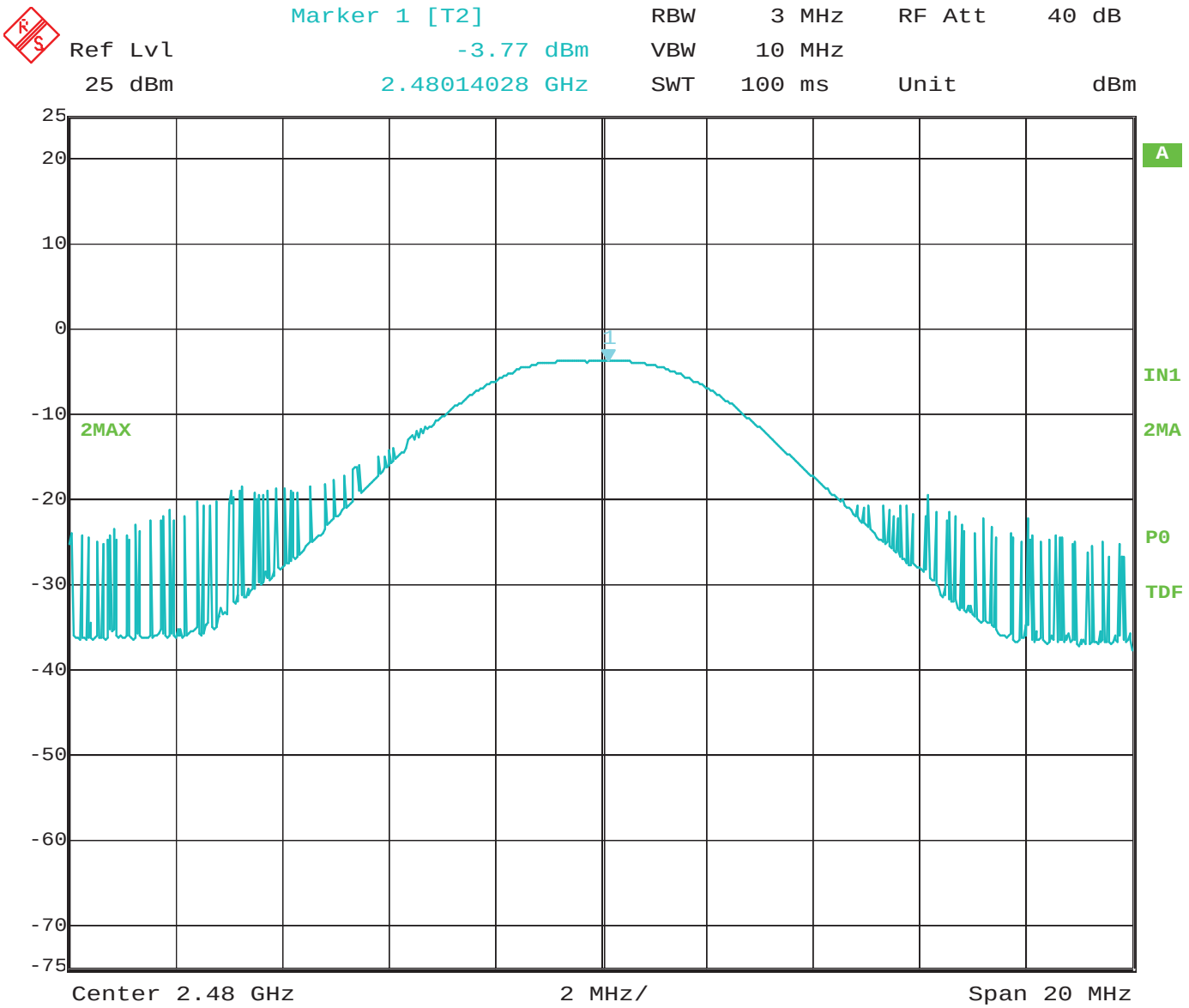
Date: 8.JUN.2017 12:18:23

Peak Power Output – 2440 MHz



Date: 8.JUN.2017 12:19:06

Peak Power Output – 2475 MHz



Date: 8.JUN.2017 12:19:43

Peak Power Output – 2480 MHz

BAND EDGES

DATA SHEETS

FCC 15.247

IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/10/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Band Edges - Vertical and Horizontal Polarization

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2405.00	108.88	V	--	--	Peak	11.25	194.76	**Band Edge - Low Channel**
2405.00	88.88	V	--	--	Avg	11.25	194.76	**Fundamental - Y-Axis**
2390.00	68.67	V	73.97	-5.30	Peak	11.25	194.76	**Band Edge**
2390.00	48.67	V	53.97	-5.30	Avg	11.25	194.76	**Low Channel - Y-Axis**
2405.00	109.47	H	--	--	Peak	145.25	150.28	**Band Edge**
2405.00	89.47	H	--	--	Avg	145.25	150.28	**Fundamental - X-Axis**
2390.00	68.47	H	73.97	-5.45	Peak	145.25	150.28	**Band Edge - Low Channel**
2390.00	48.47	H	53.97	-5.45	Avg	145.25	150.28	**Low Channel - X-Axis**

FCC 15.247

IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

Date: 06/10/2017
Lab: D
Tested By: Kyle Fujimoto

2475 MHz

Band Edges - Vertical and Horizontal Polarization

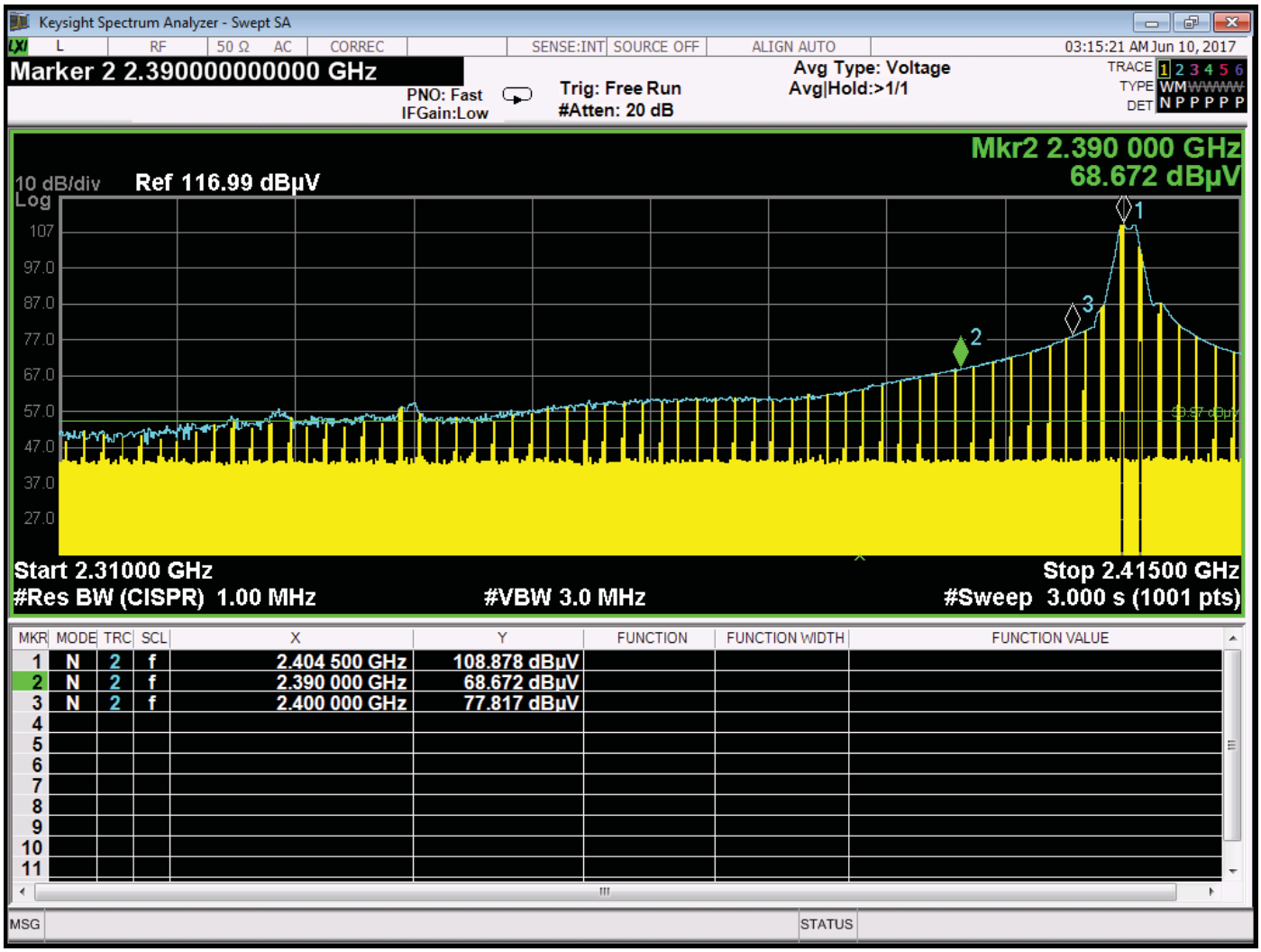
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475.00	106.36	V	--	--	Peak	100.75	192.13	**Band Edge - Low Channel**
2475.00	86.36	V	--	--	Avg	100.75	192.13	**Fundamental - Y-Axis**
2483.50	73.64	V	73.97	-0.33	Peak	100.75	192.13	**Band Edge**
2483.50	53.64	V	53.97	-0.33	Avg	100.75	192.13	**High Channel - Y-Axis**
2475.00	106.02	H	--	--	Peak	205.25	162.22	**Band Edge - Low Channel**
2475.00	86.02	H	--	--	Avg	205.25	162.22	**Fundamental - Z-Axis**
2483.50	71.06	H	73.97	-2.91	Peak	205.25	162.22	**Band Edge**
2483.50	51.06	H	53.97	-2.91	Avg	205.25	162.22	**High Channel - Z-Axis**

FCC 15.247
IBIS Networks
RF Engine Module
Model: IE-300
Inside the InteliMeter Lighting Power Pack

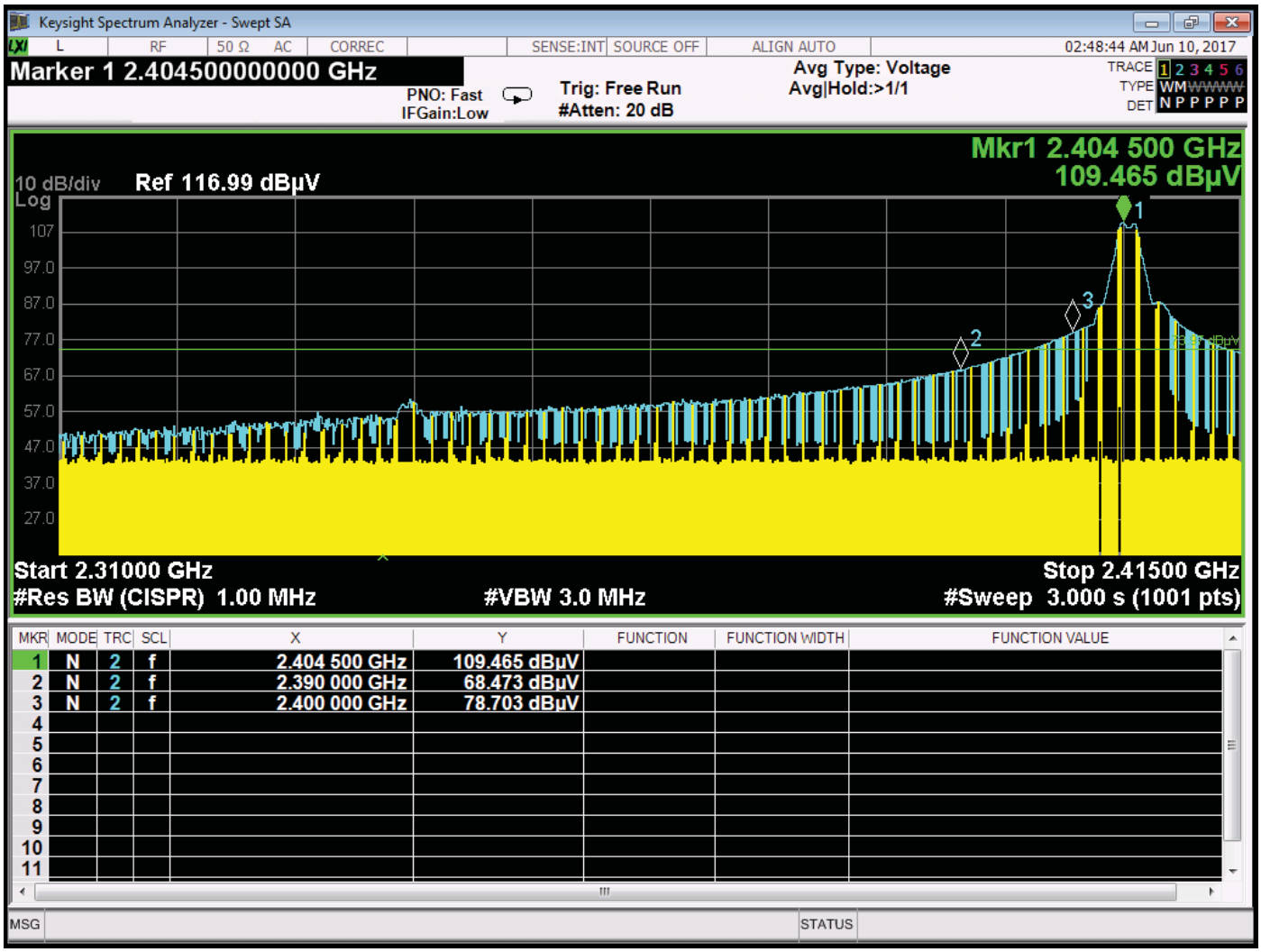
Date: 06/10/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Band Edges - Vertical and Horizontal Polarization

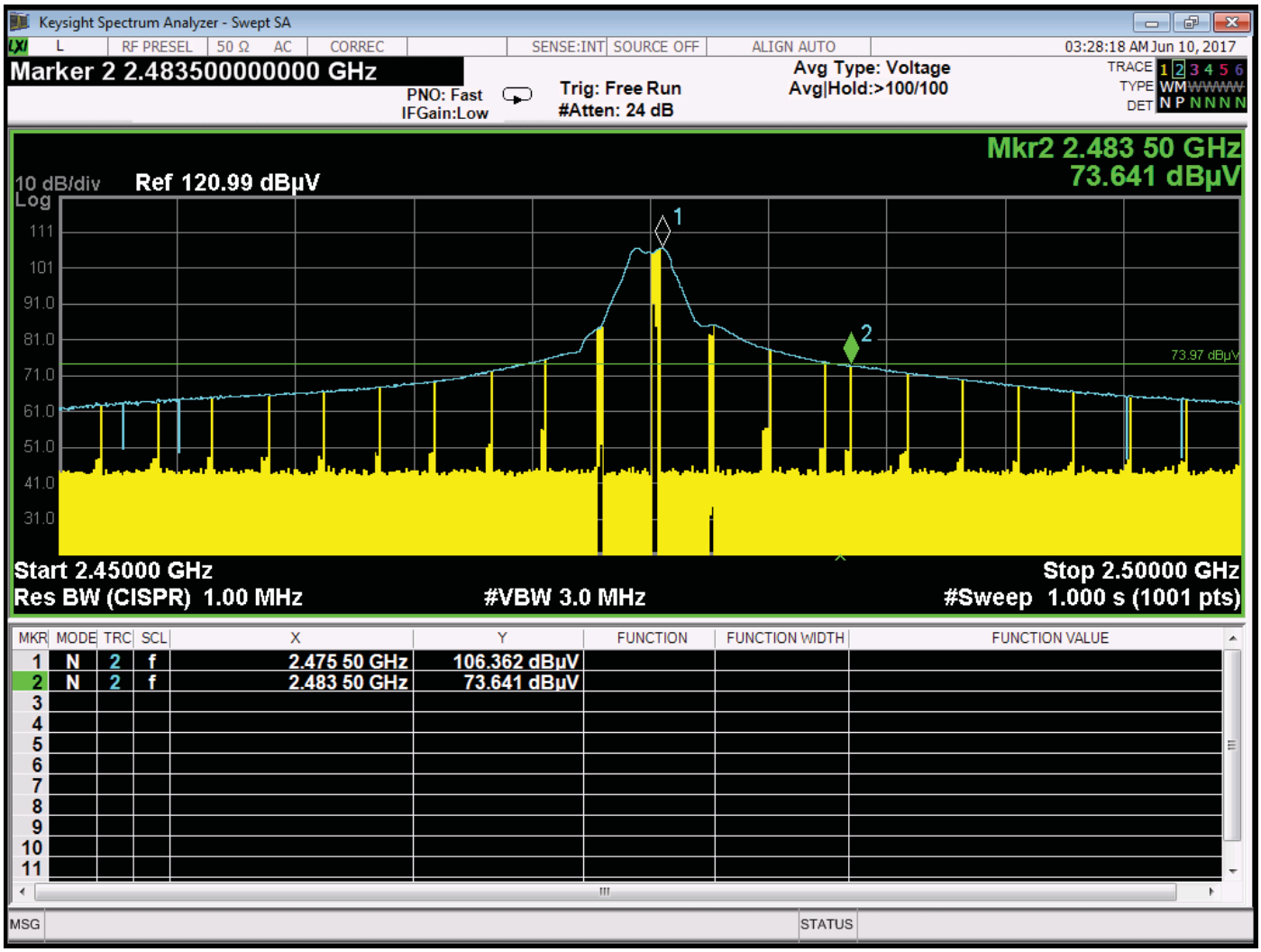
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	92.39	V	--	--	Peak	104.00	173.50	**Band Edge - Low Channel**
2480.00	72.39	V	--	--	Avg	104.00	173.50	**Fundamental - Y-Axis**
2483.50	68.56	V	73.97	-5.41	Peak	104.00	173.50	**Band Edge**
2483.50	48.56	V	53.97	-5.41	Avg	104.00	173.50	**Low Channel - Y-Axis**
2480.00	88.63	H	--	--	Peak	165.75	152.31	**Band Edge - Low Channel**
2480.00	68.63	H	--	--	Avg	165.75	152.31	**Fundamental - X-Axis**
2483.50	65.16	H	73.97	-8.81	Peak	165.75	152.31	**Band Edge**
2483.50	45.16	H	53.97	-8.81	Avg	165.75	152.31	**Low Channel - X-Axis**



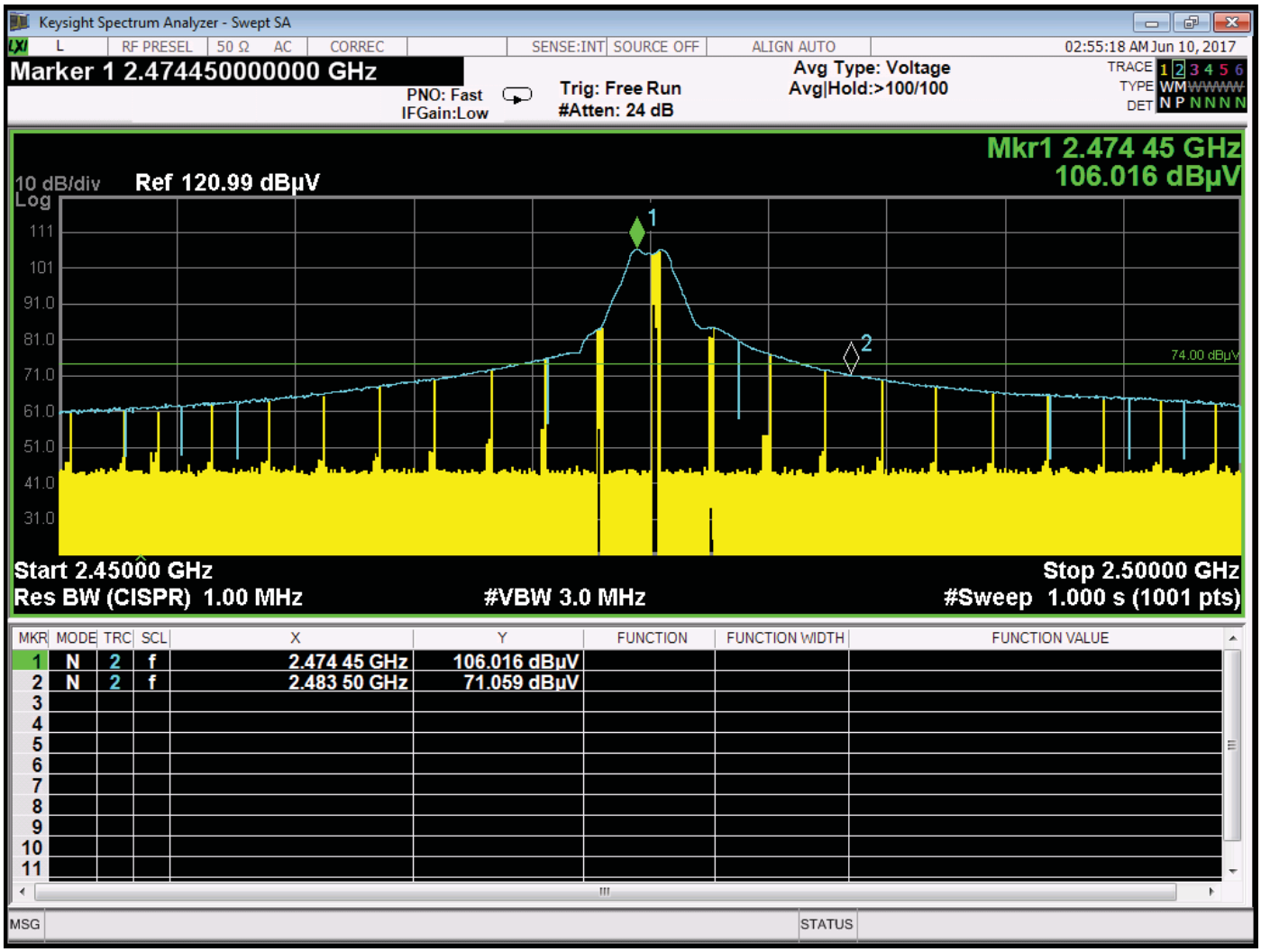
Band Edge – 2405 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack



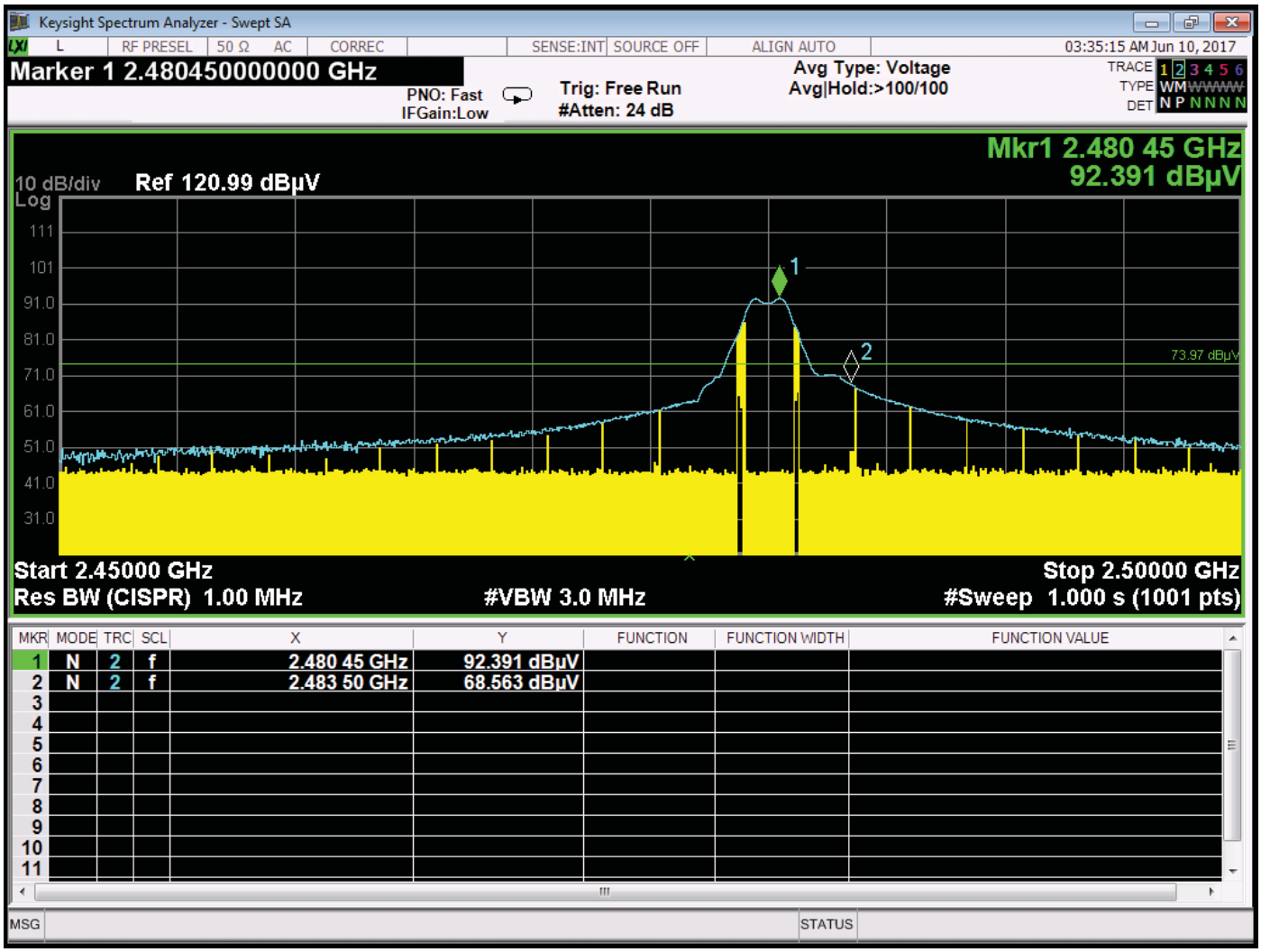
Band Edge – 2405 MHz – Horizontal – X-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack



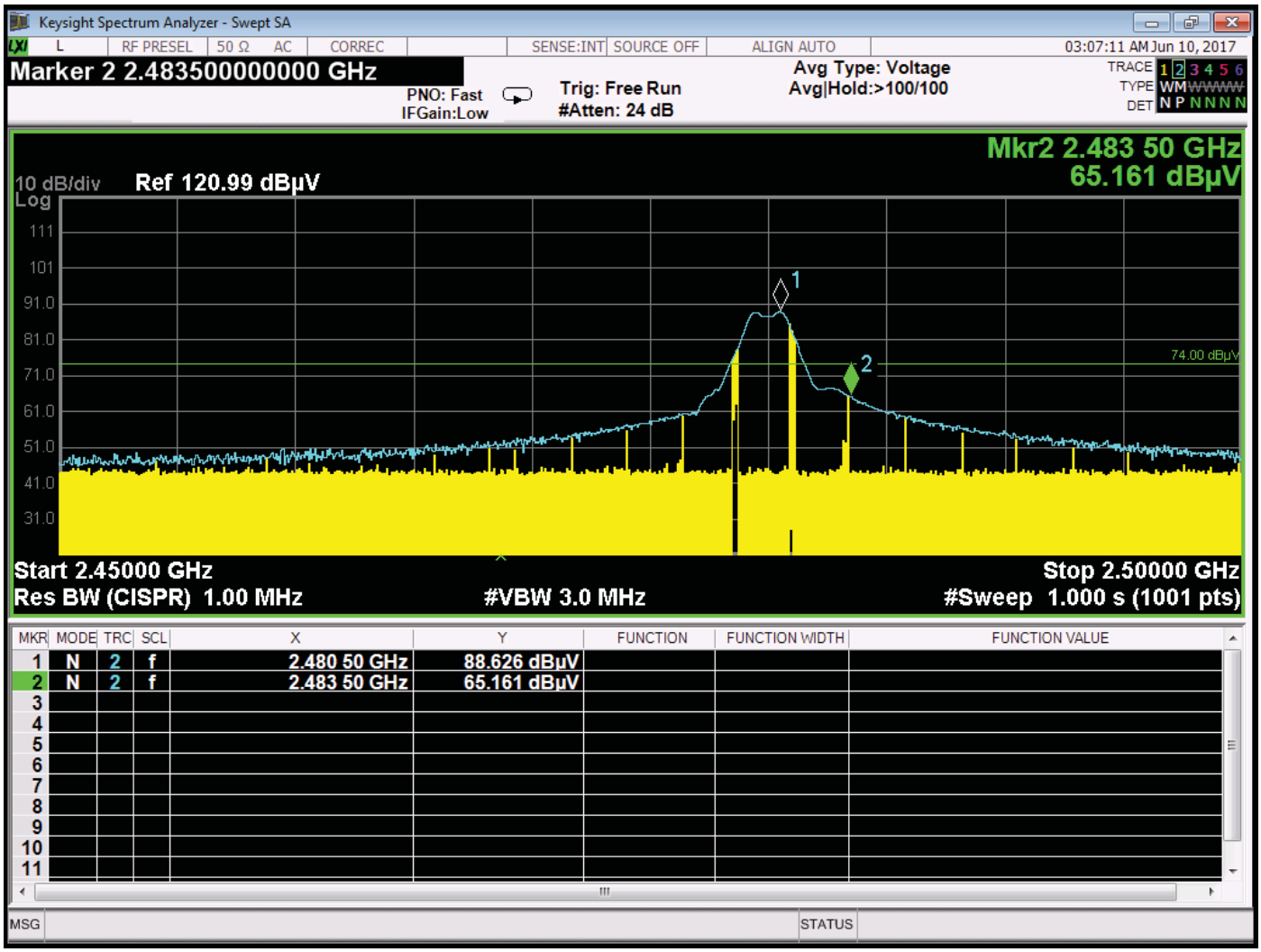
Band Edge – 2475 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack



Band Edge – 2475 MHz – Horizontal – Z-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack



Band Edge – 2480 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack



Band Edge – 2480 MHz – Horizontal – X-Axis – Worst Case – Installed Inside the IntelliMeter Lighting Power Pack

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/07/2017
Lab: D
Tested By: Kyle Fujimoto

Low Channel
Band Edges - Vertical and Horizontal Polarization

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2405.00	103.67	V	--	--	Peak	186.75	159.29	**Band Edge - Low Channel**
2405.00	83.67	V	--	--	Avg	186.75	159.29	**Fundamental - Y-Axis**
2390.00	65.62	V	73.97	-8.38	Peak	186.75	159.29	**Band Edge**
2390.00	45.62	V	53.97	-8.38	Avg	186.75	159.29	**Low Channel - Y-Axis**
2405.00	105.05	H	--	--	Peak	317.75	220.97	**Band Edge**
2405.00	85.05	H	--	--	Avg	317.75	220.97	**Fundamental - X-Axis**
2390.00	65.30	H	73.97	-8.67	Peak	317.75	220.97	**Band Edge - Low Channel**
2390.00	45.30	H	53.97	-8.67	Avg	317.75	220.97	**Low Channel - X-Axis**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

Date: 06/07/2017
Lab: D
Tested By: Kyle Fujimoto

2475 MHz
Band Edges - Vertical and Horizontal Polarization

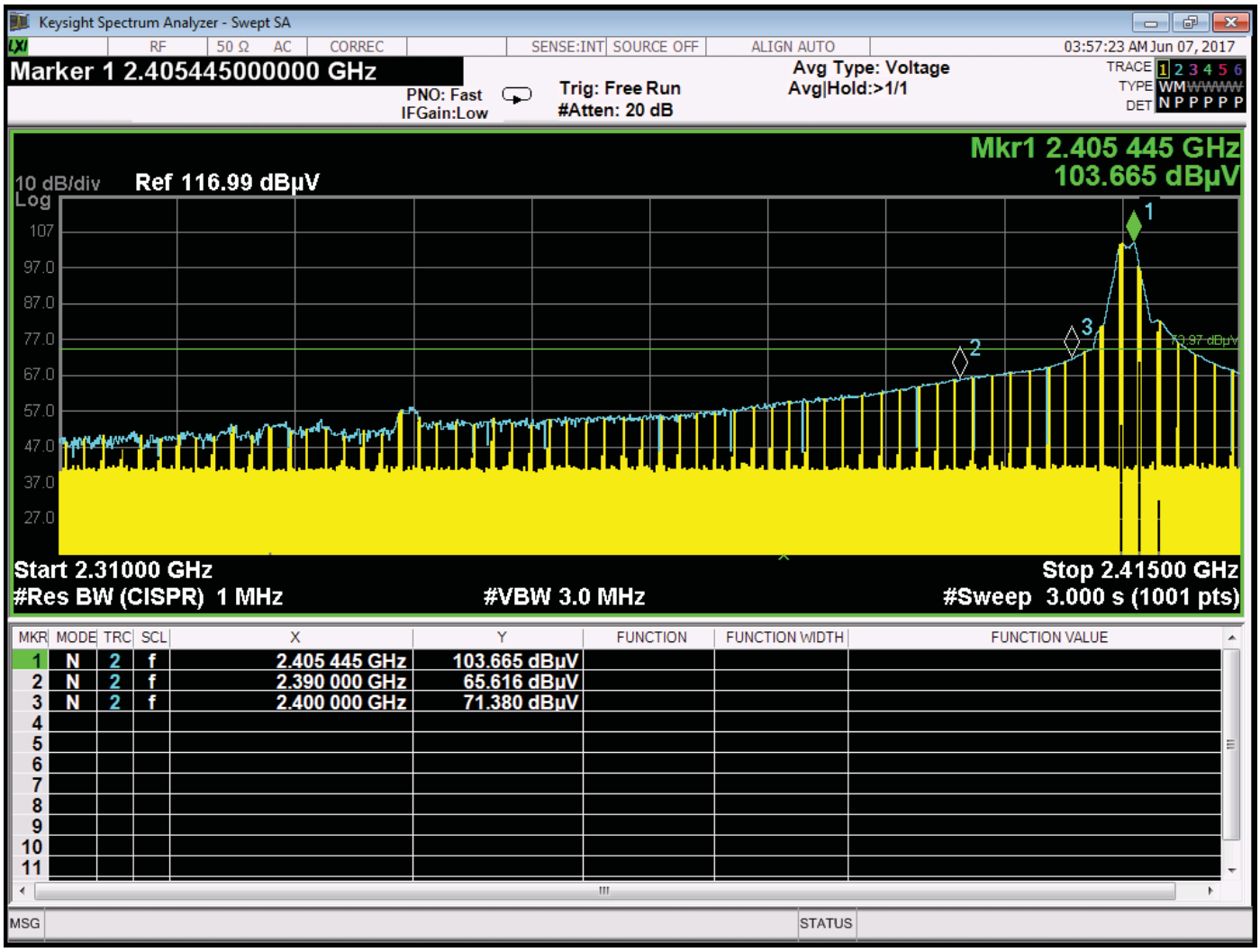
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2475.00	104.66	V	--	--	Peak	350.00	162.82	**Band Edge - Low Channel**
2475.00	84.66	V	--	--	Avg	350.00	162.82	**Fundamental - Y-Axis**
2483.50	71.58	V	73.97	-2.39	Peak	350.00	162.82	**Band Edge**
2483.50	51.58	V	53.97	-2.39	Avg	350.00	162.82	**High Channel - Y-Axis**
2475.00	103.50	H	--	--	Peak	296.00	139.47	**Band Edge - Low Channel**
2475.00	83.50	H	--	--	Avg	296.00	139.47	**Fundamental - X-Axis**
2483.50	70.48	H	73.97	-3.59	Peak	314.50	137.67	**Band Edge**
2483.50	50.48	H	53.97	-3.59	Avg	314.50	137.67	**High Channel - X-Axis**

FCC 15.247
IBIS Networks
RF ENGINE Module
Model: IE-300
Inside the InteliMeter 30A In-Line

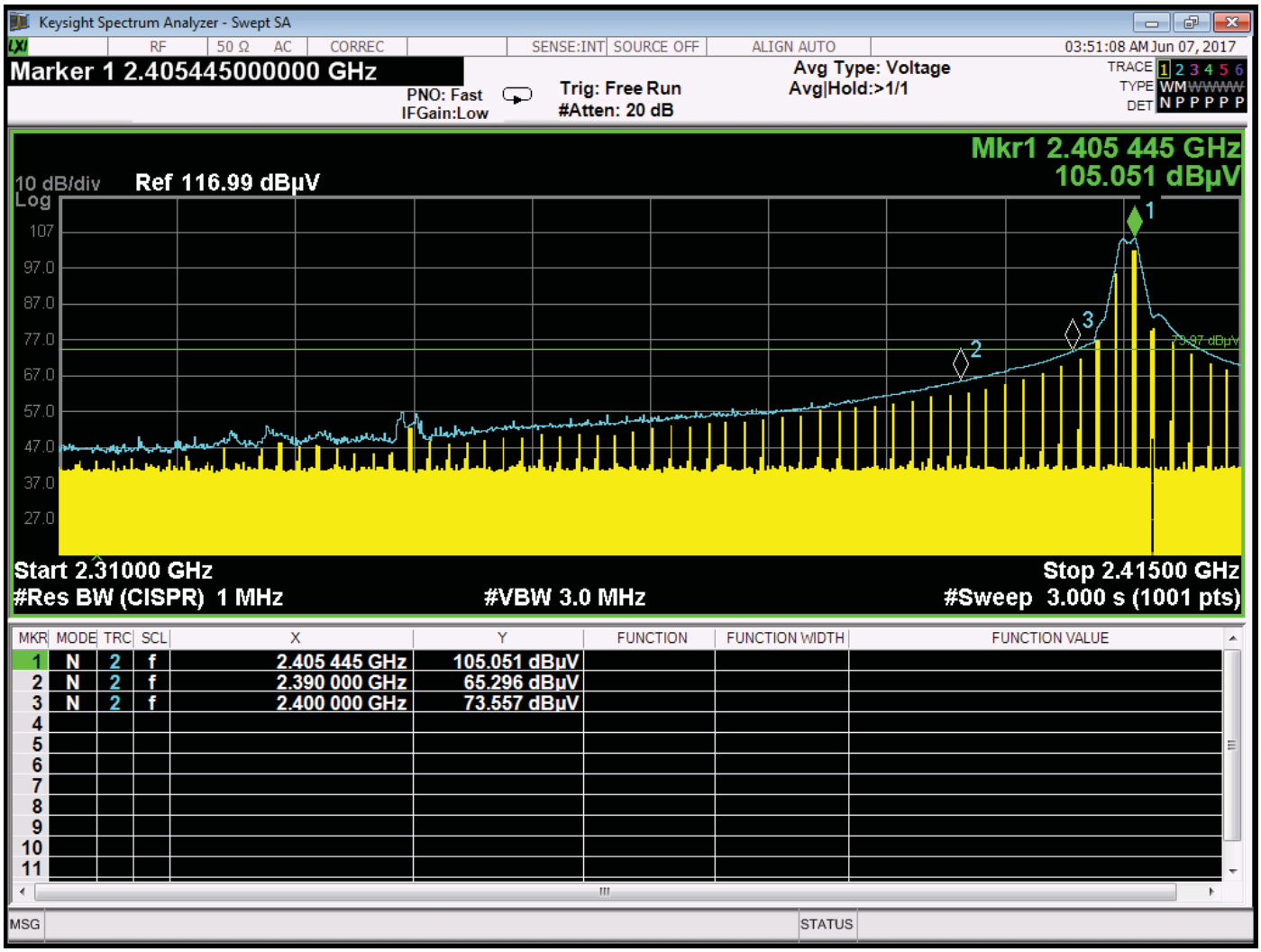
Date: 06/07/2017
Lab: D
Tested By: Kyle Fujimoto

2480 MHz
Band Edges - Vertical and Horizontal Polarization

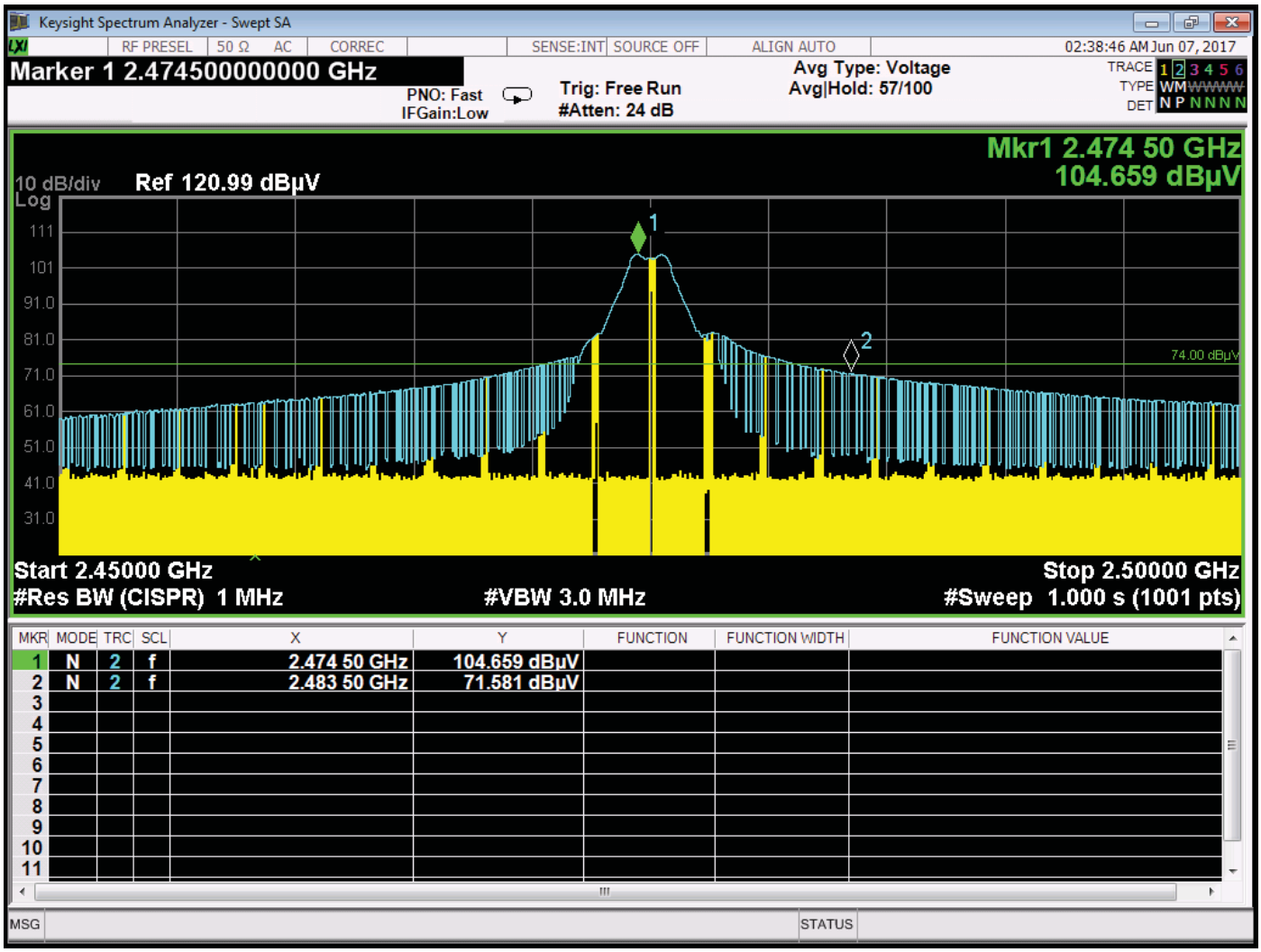
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2480.00	87.16	V	--	--	Peak	98.25	165.25	**Band Edge - Low Channel**
2480.00	67.16	V	--	--	Avg	98.25	165.25	**Fundamental - Y-Axis**
2483.50	63.48	V	73.97	-10.49	Peak	98.25	165.25	**Band Edge**
2483.50	43.48	V	53.97	-10.49	Avg	98.25	165.25	**Low Channel - Y-Axis**
2480.00	90.07	H	--	--	Peak	168.25	199.98	**Band Edge - Low Channel**
2480.00	70.07	H	--	--	Avg	168.25	199.98	**Fundamental - X-Axis**
2483.50	66.21	H	73.97	-7.76	Peak	168.25	199.98	**Band Edge**
2483.50	46.21	H	53.97	-7.76	Avg	168.25	199.98	**Low Channel - X-Axis**



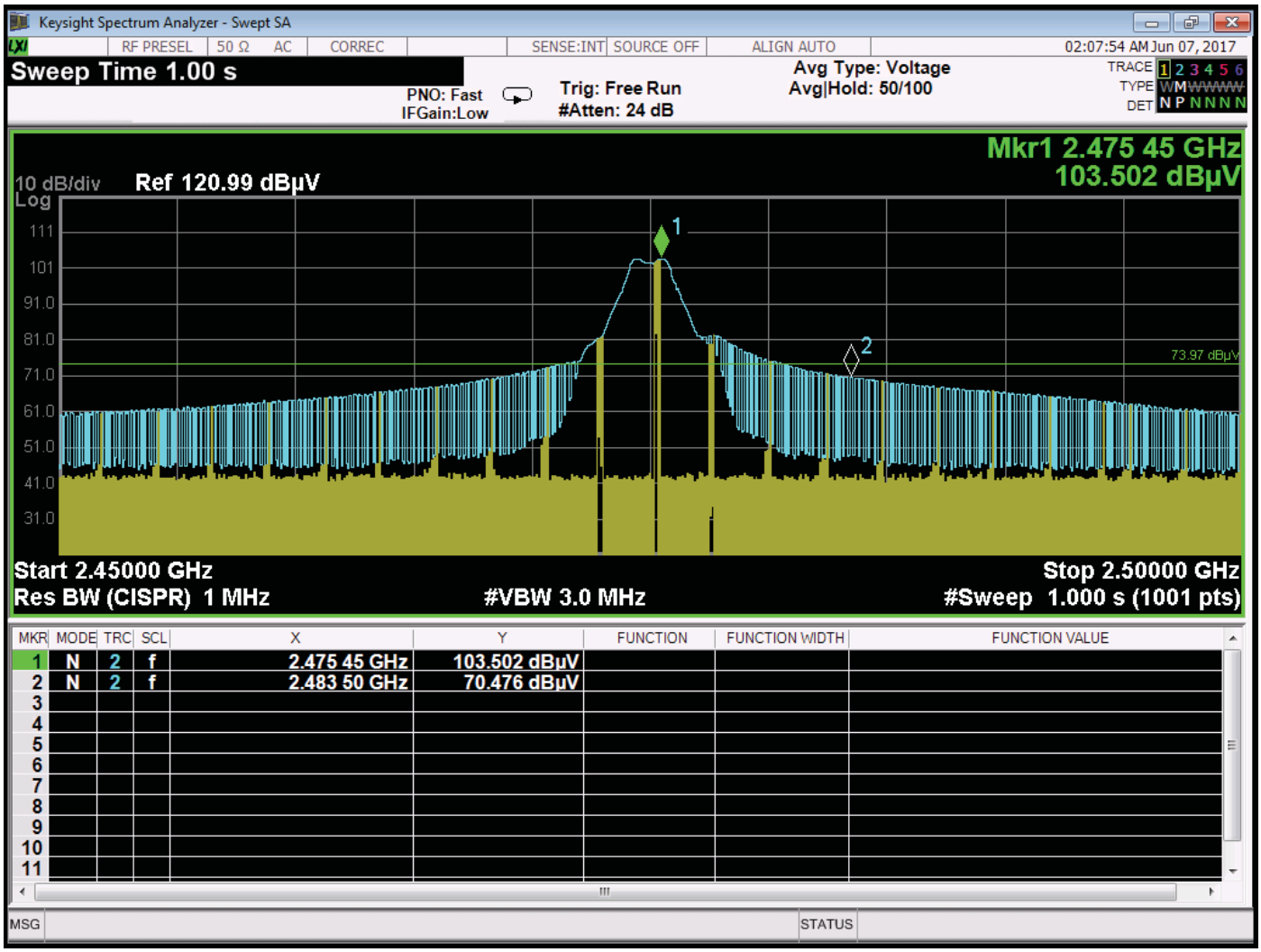
Band Edge – 2405 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line



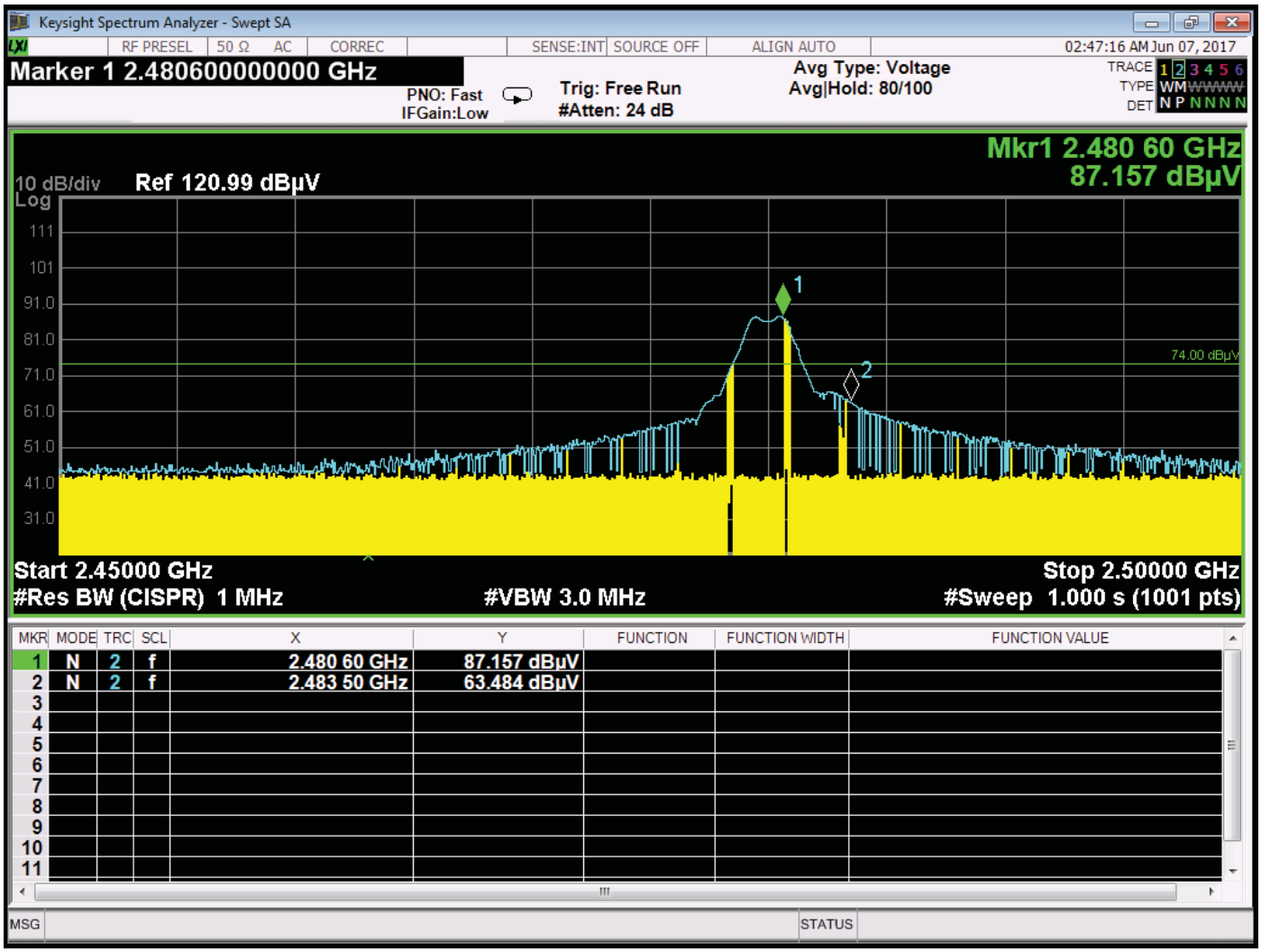
Band Edge – 2405 MHz – Horizontal – X-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line



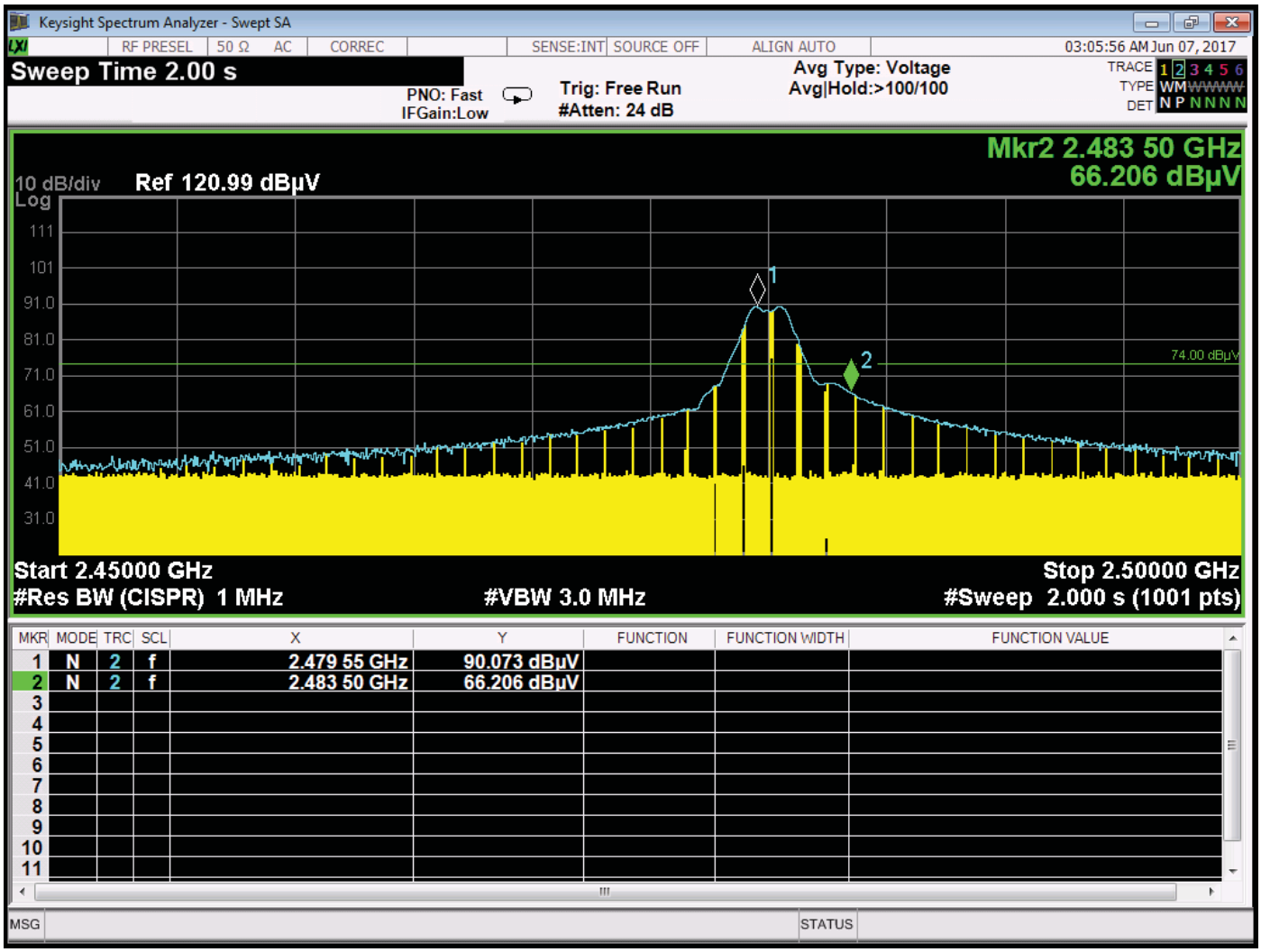
Band Edge – 2475 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line



Band Edge – 2475 MHz – Horizontal – X-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line



Band Edge – 2480 MHz – Vertical – Y-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line



Band Edge – 2480 MHz – Horizontal – X-Axis – Worst Case – Installed Inside the InteliMeter 30A In-Line

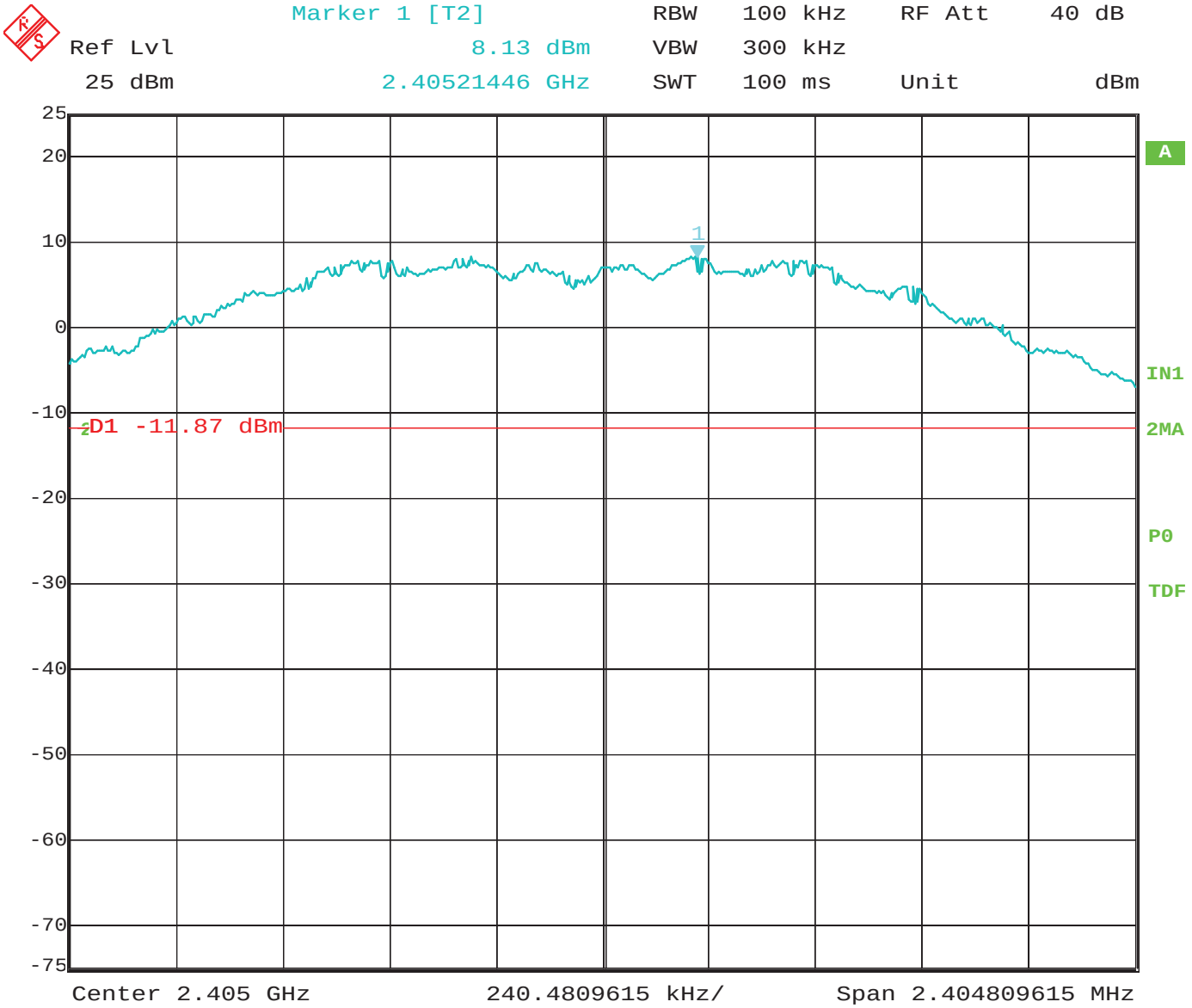
EMISSIONS IN
NON-RESRTICTED BANDS
DATA SHEETS

FCC 15.247 - Emissions in Non-Restricted Bands

IBIS Networks
RF ENGINE Module
Model: IE-300
Configuration: Continuously Transmitting

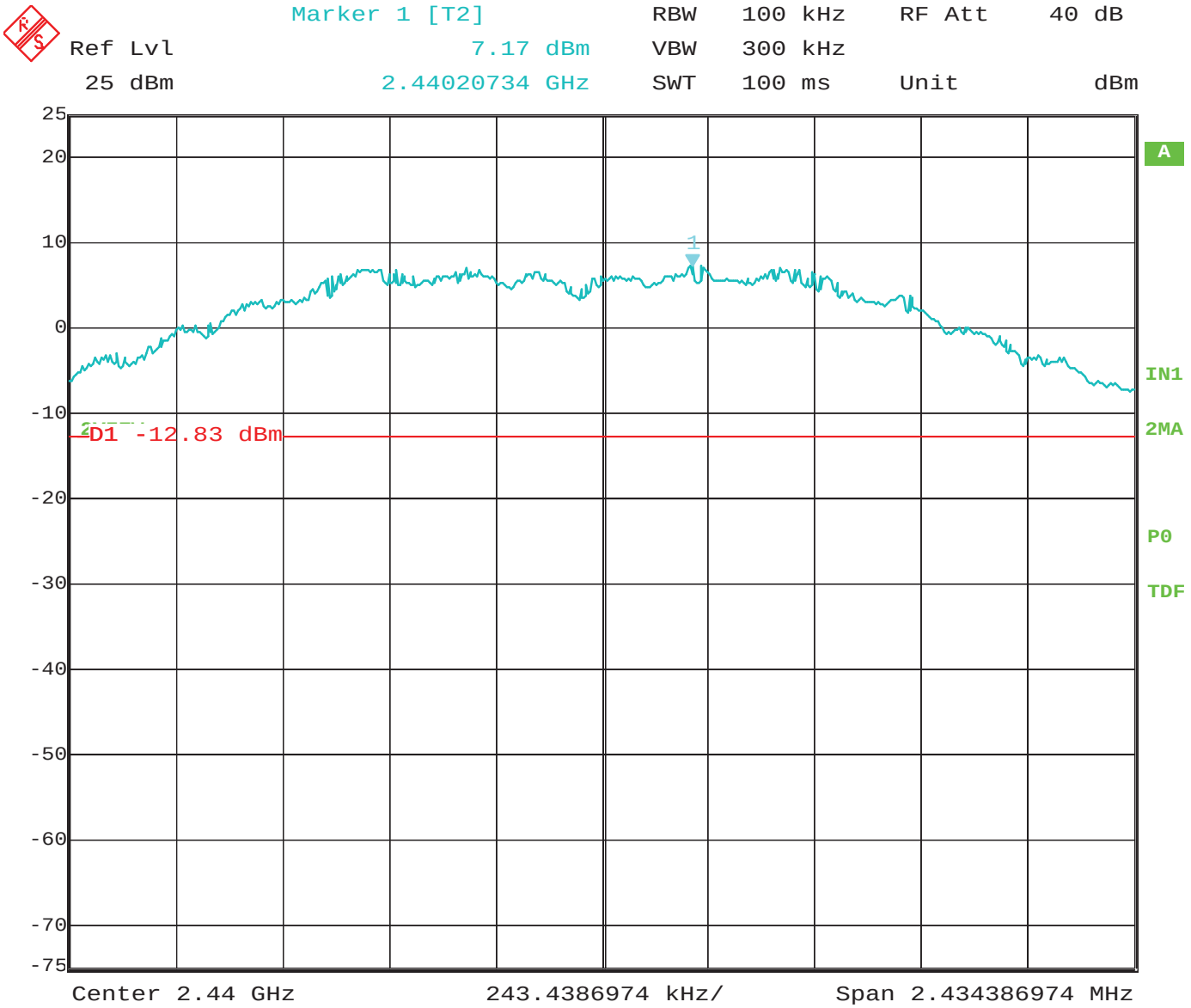
Date: 06/08/2017
Lab: D
Tested By: Kyle Fujimoto

Freq. (MHz)	Level (dBm)	Limit (dBm)	Margin	Peak / QP / Avg	Comments
9504.00	-38.88	-27.89	-10.99	Peak	High Channel (2480 MHz)
9545.21	-40.25	-13.74	-26.51	Peak	High Channel (2475 MHz)
9531.28	-39.35	-12.83	-26.52	Peak	Middle Channel (2440 MHz)



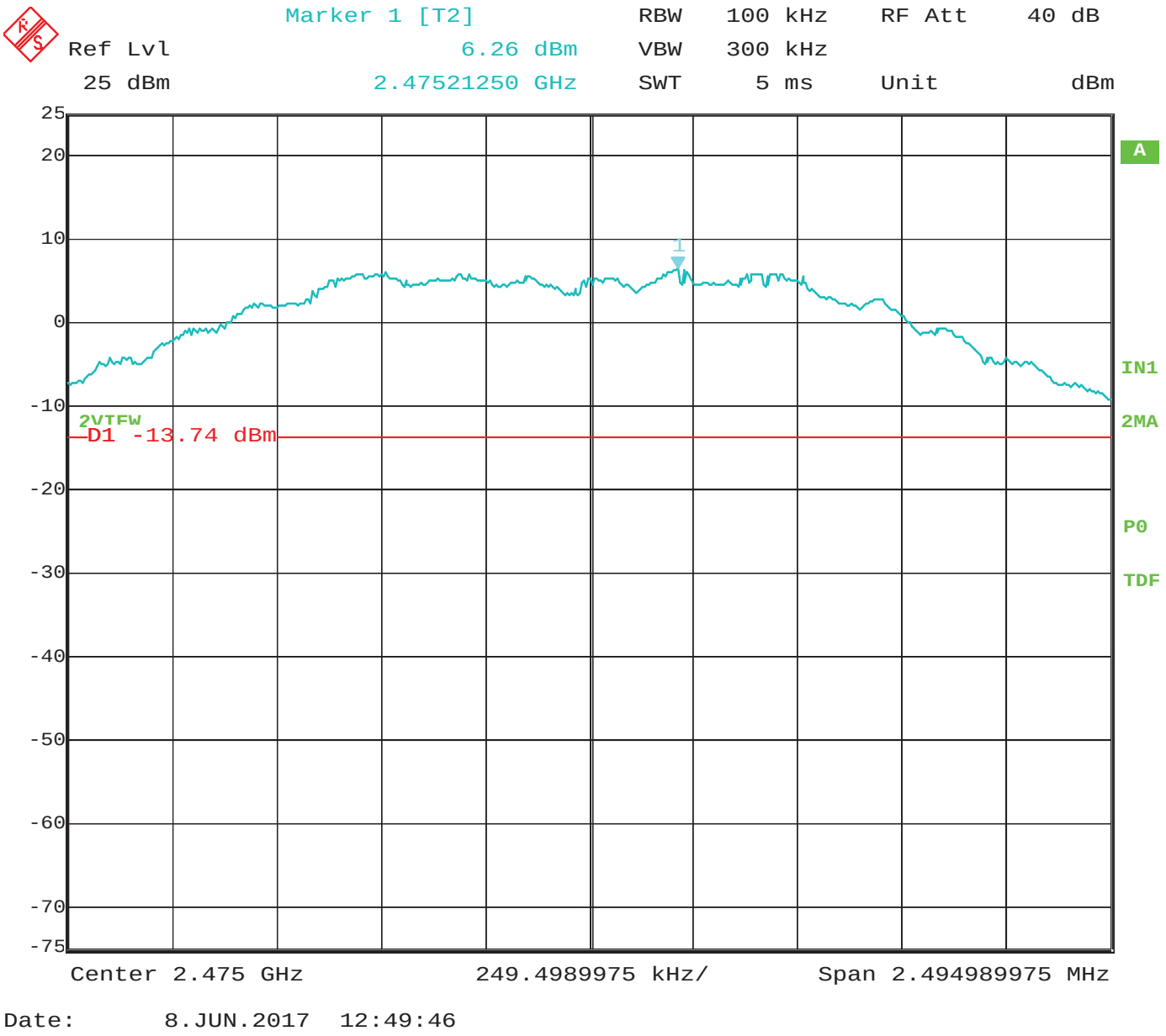
Date: 8.JUN.2017 12:37:29

Reference Level – Low Channel (2405 MHz)



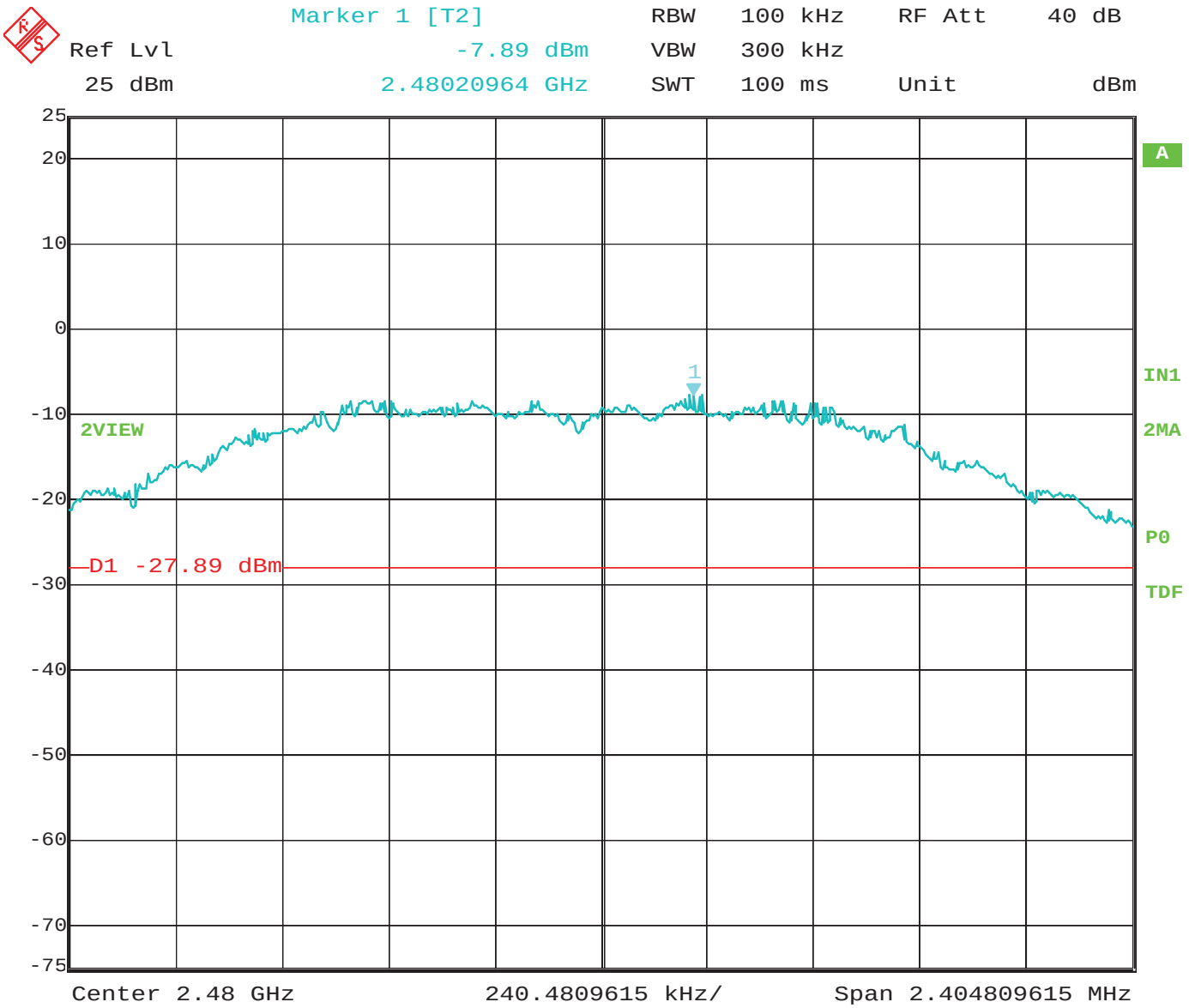
Date: 8.JUN.2017 12:42:08

Reference Level – Middle Channel (2440 MHz)



Date: 8.JUN.2017 12:49:46

Reference Level – High Channel (2475 MHz)



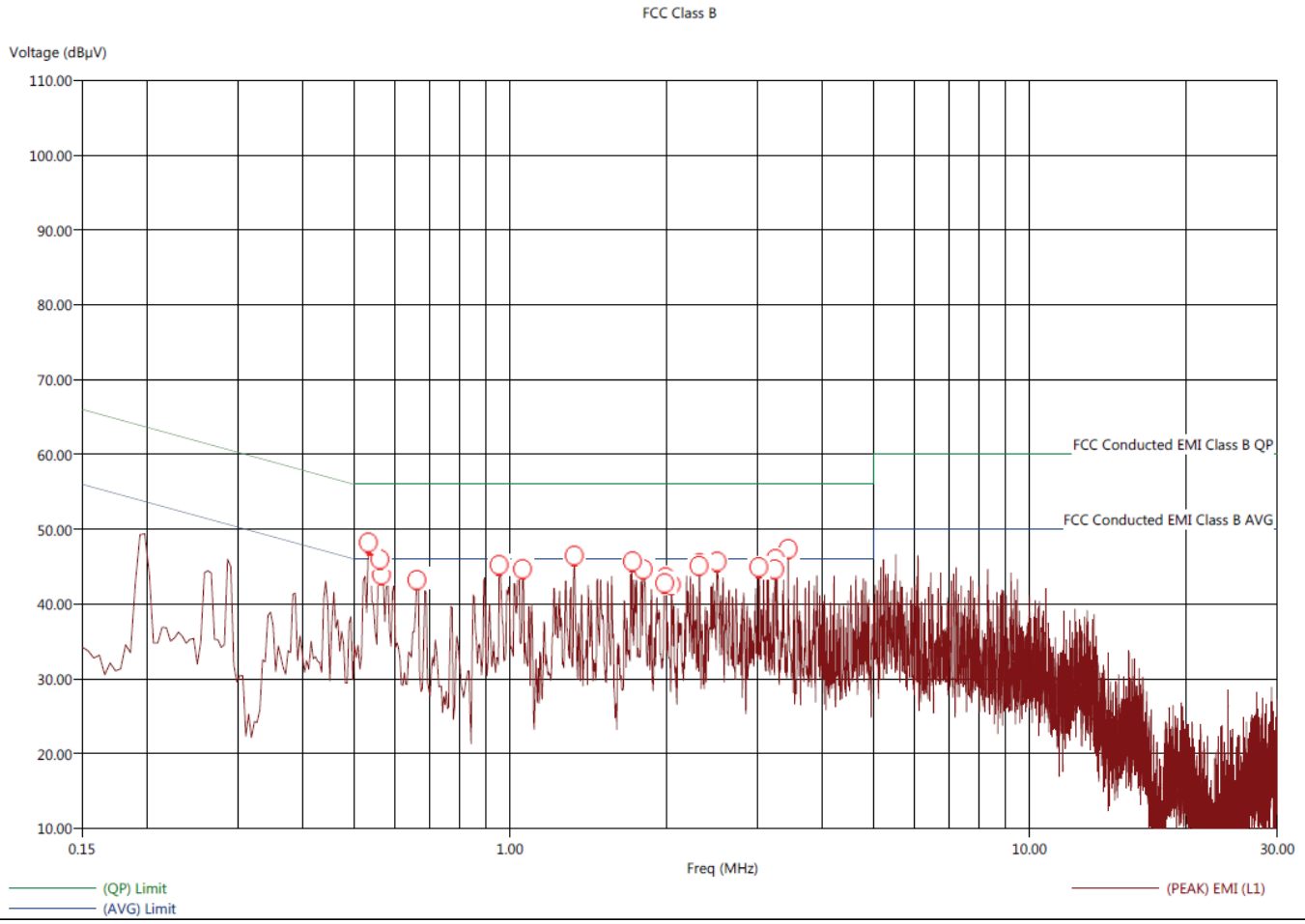
Date: 8.JUN.2017 12:33:08

Reference Level – High Channel (2480 MHz)

CONDUCTED EMISSIONS DATA SHEETS

Title: FCC Class B - Black Lead
File: Agilent - Pre-Scan - Conducted - Black Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Company: IBIS Networks
Model: Installed Inside the InteliMeter 30A In-Line

6/9/2017 4:04:17 PM
Sequence: Preliminary Scan



Title: FCC Class B - Black Lead
File: Agilent - Final Scan - Conducted - Black Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Comapny: Ibis Networks
Model: IE-300
Installed Inside the InteliMeter 30A In-Line

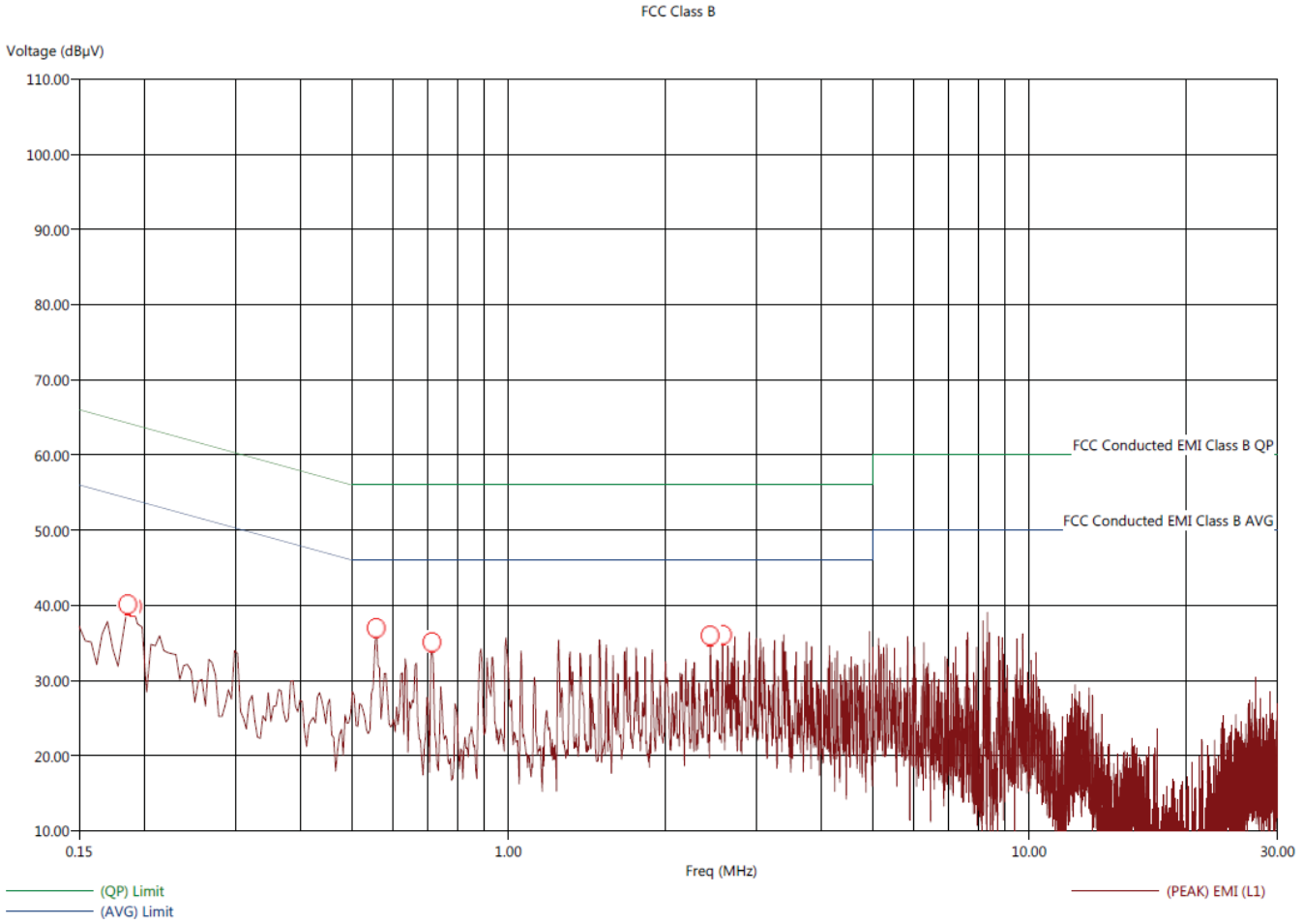
6/9/2017 4:06:54 PM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - Black Lead

Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(PEAK) Margin AVL (dB)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)
0.534	50.61	35.03	4.61	-10.97	46.00	0.09	0.05
0.538	49.98	34.45	3.98	-11.55	46.00	0.09	0.05
0.562	50.49	34.17	4.49	-11.83	46.00	0.09	0.05
0.566	50.09	35.23	4.09	-10.77	46.00	0.09	0.05
0.570	50.08	35.02	4.08	-10.98	46.00	0.08	0.05
0.662	51.04	31.99	5.04	-14.01	46.00	0.06	0.04
0.666	47.84	30.42	1.84	-15.58	46.00	0.06	0.04
0.954	48.04	32.34	2.04	-13.66	46.00	0.01	0.03
1.058	50.26	31.11	4.26	-14.89	46.00	0.00	0.03
1.330	48.59	31.50	2.59	-14.50	46.00	0.04	0.04
1.722	46.35	30.29	0.35	-15.71	46.00	0.08	0.05
1.806	47.47	31.14	1.47	-14.86	46.00	0.08	0.05
1.810	48.18	31.08	2.18	-14.92	46.00	0.08	0.05
1.986	45.90	30.30	-0.10	-15.70	46.00	0.10	0.05
1.994	45.97	30.32	-0.03	-15.68	46.00	0.10	0.05
2.046	46.80	31.28	0.80	-14.72	46.00	0.10	0.05
2.050	46.46	31.12	0.46	-14.88	46.00	0.11	0.05
2.314	47.48	31.14	1.48	-14.86	46.00	0.11	0.05
2.318	48.28	30.76	2.28	-15.24	46.00	0.11	0.05
2.506	47.56	30.95	1.56	-15.05	46.00	0.13	0.05
3.014	46.72	30.54	0.72	-15.46	46.00	0.14	0.05
3.018	47.58	31.20	1.58	-14.80	46.00	0.14	0.05
3.234	44.60	28.96	-1.40	-17.04	46.00	0.15	0.05
3.246	47.48	30.14	1.48	-15.86	46.00	0.16	0.05
3.434	48.18	30.43	2.18	-15.57	46.00	0.16	0.05

Title: FCC Class B - White Lead
File: Agilent - Pre-Scan - Conducted - White Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the low channel
Comments: Company: Ibis Networks
Model: IE-300
Installed Inside the InteliMeter 30A In-Line

6/9/2017 4:20:53 PM
Sequence: Preliminary Scan



Title: FCC Class B - White Lead
File: Agilent - Final Scan - Conducted - White Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Company: Ibis Networks
Model: IE-300
Installed Inside the InteliMeter 30A In-Line

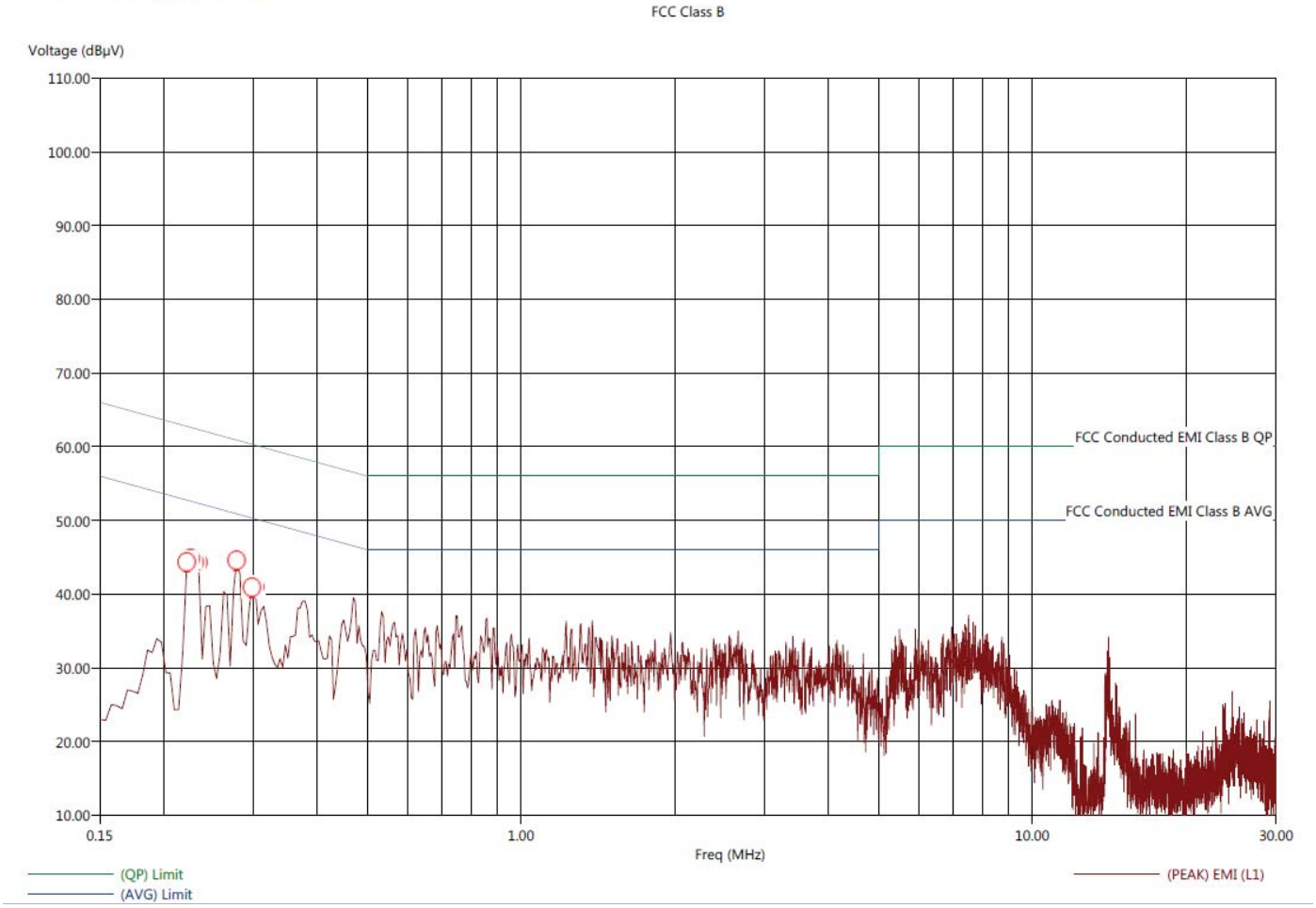
6/9/2017 4:22:36 PM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - White Lead

Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(PEAK) Margin AVL (dB)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)
0.186	48.64	28.46	-5.43	-25.61	54.07	0.09	0.37
0.190	48.10	27.85	-6.17	-26.42	54.27	0.09	0.38
0.558	43.22	26.66	-2.78	-19.34	46.00	0.08	0.02
0.714	34.23	17.42	-11.77	-28.58	46.00	0.05	0.03
2.442	37.54	21.92	-8.46	-24.08	46.00	0.12	0.05
2.582	39.71	22.90	-6.29	-23.10	46.00	0.13	0.04

Title: FCC Class B - Black Lead
File: Agilent - Pre-Scan - Conducted - Black Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Company: Ibis Networks
Model: IE-300
Inside the Intelimeter Lighting Power Pack

6/9/2017 4:34:45 PM
Sequence: Preliminary Scan



Title: FCC Class B - Black Lead
File: Agilent - Final Scan - Conducted - Black Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Company: Ibis Networks
Model: IE-300
Inside the InteliMeter Lighting Power Pack

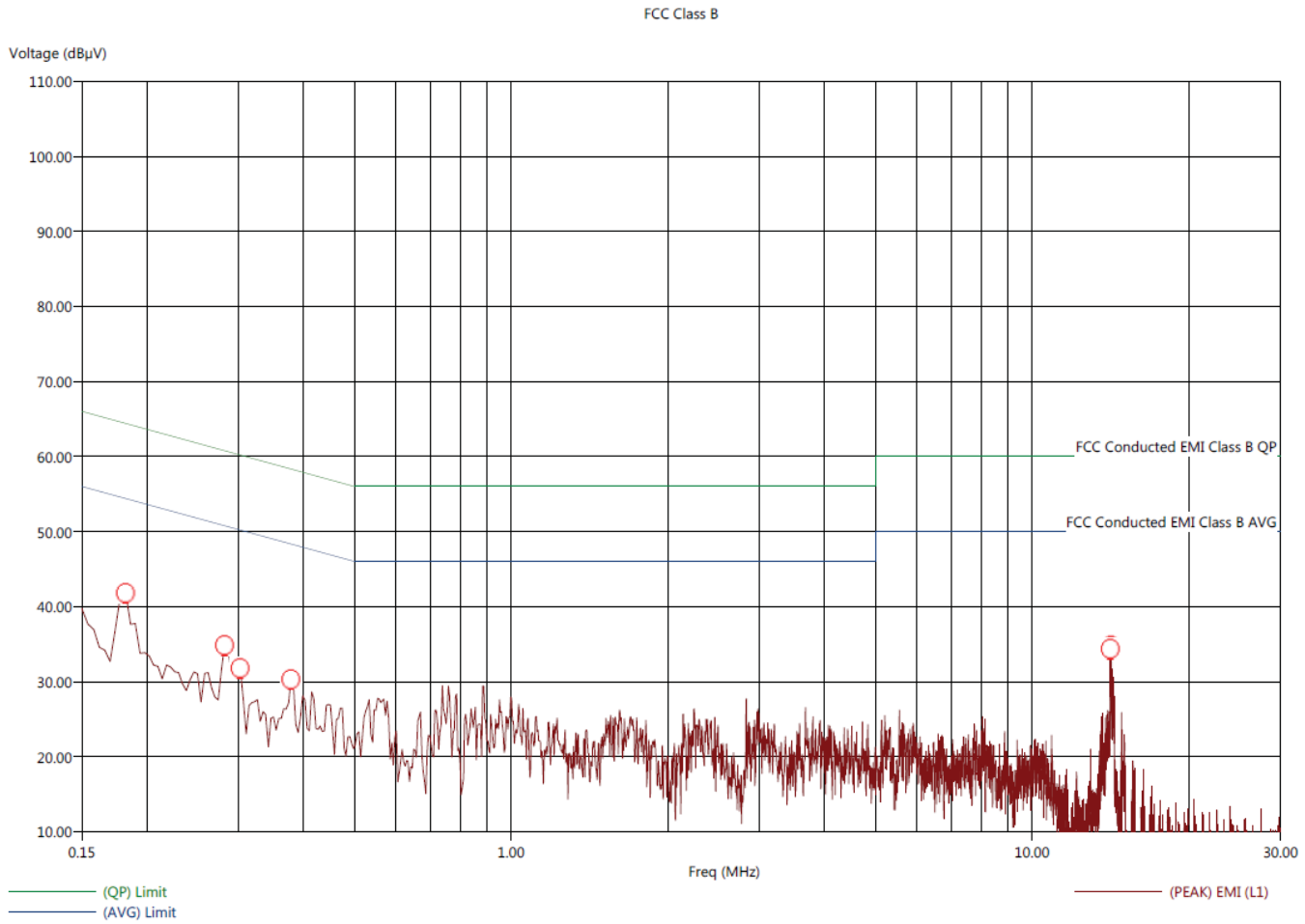
6/9/2017 4:36:15 PM
Sequence: Final Measurements

FCC Class B - Conducted Emissions – Black Lead

Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(PEAK) Margin AVL (dB)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)
0.180	41.91	26.03	-10.90	-26.78	52.81	0.09	0.37
0.280	34.43	18.97	-16.35	-31.81	50.78	0.09	0.05
0.300	27.74	12.35	-22.72	-38.11	50.46	0.09	0.05
0.380	29.91	14.02	-18.65	-34.54	48.56	0.09	0.05
14.14	34.46	19.56	-15.54	-30.44	50.00	0.10	0.16
14.19	34.72	20.23	-15.28	-29.77	50.00	0.10	0.14

Title: FCC Class B - White Lead
File: Agilent - Pre-Scan - Conducted - White Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the low channel
Comments: Company: Ibis Networks
Model: IE-300
Inside the Intelimeter LIghting Power Pack

6/9/2017 4:47:52 PM
Sequence: Preliminary Scan



Title: FCC Class B - White Lead
File: Agilent - Final Scan - Conducted - White Lead - FCC Class B - 6-2-2017.set
Operator: Kyle Fujimoto
EUT Type: RF ENGINE Module
EUT Condition: The EUT is continuously transmitting at the Low Channel
Comments: Company: Ibis Networks
Model: Inside the Intelimeter Lighting Power Pack

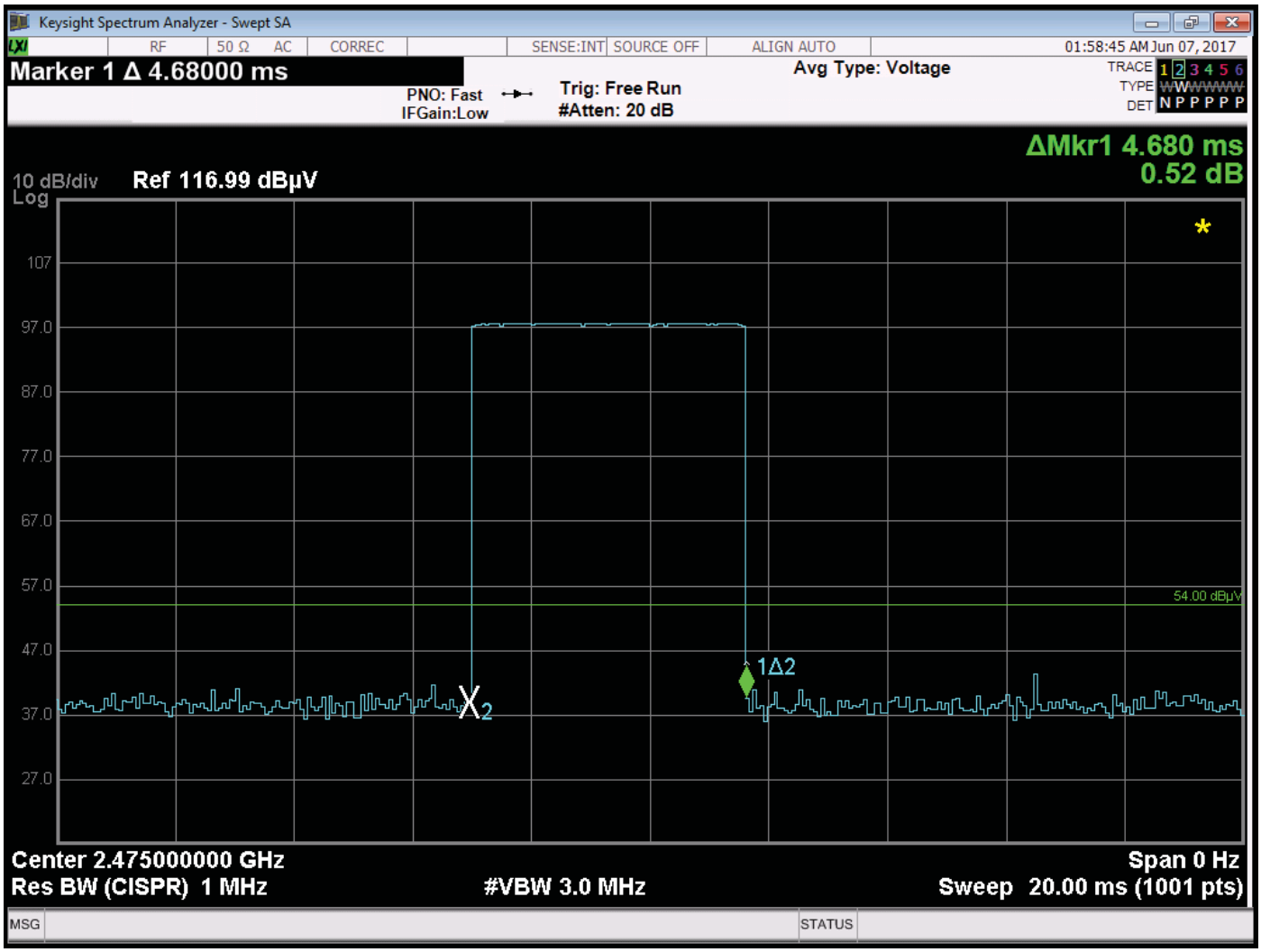
6/9/2017 4:22:36 PM
Sequence: Final Measurements

FCC Class B - Conducted Emissions - White Lead

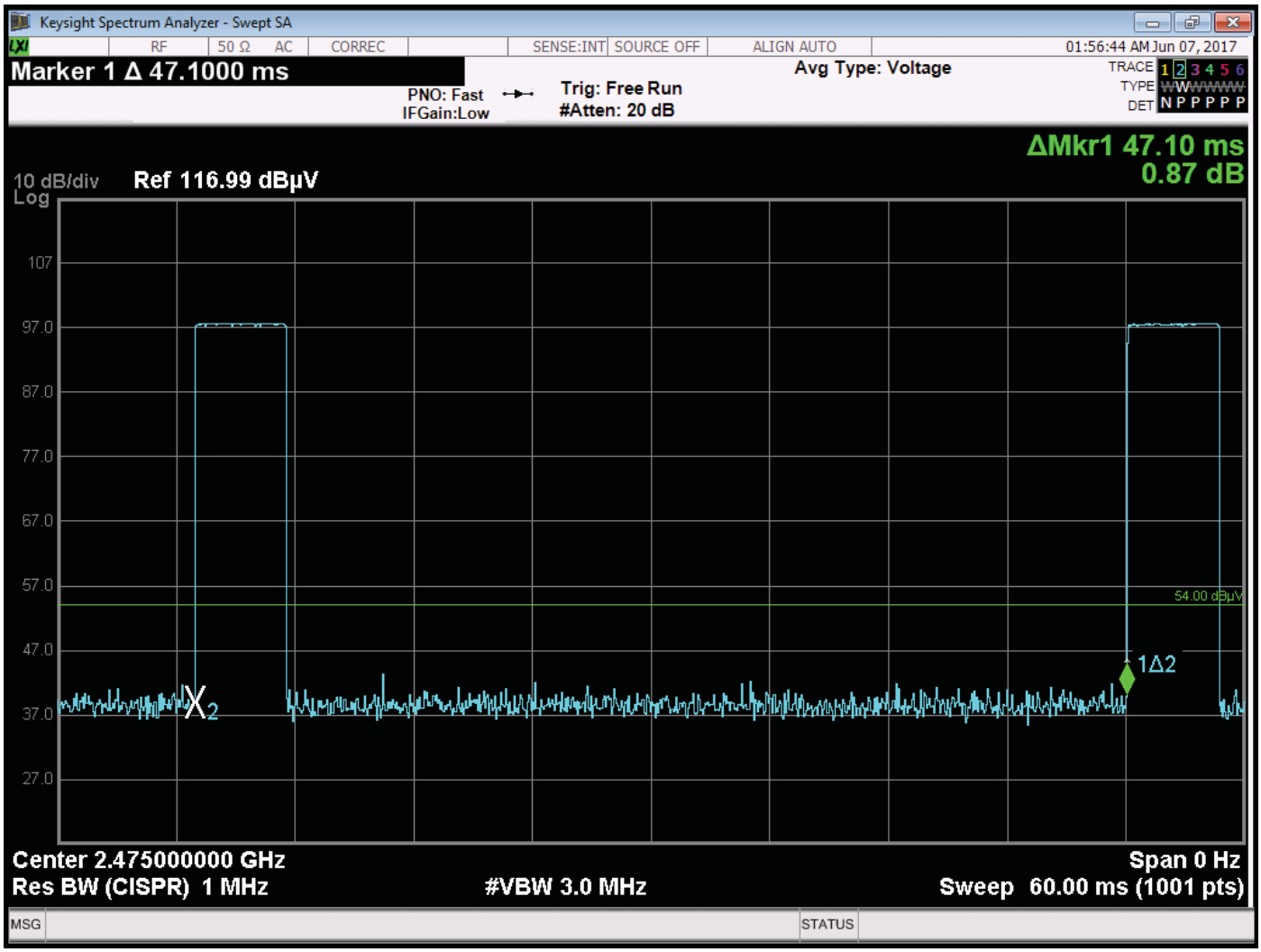
Freq (MHz)	(PEAK) EMI (dBµV)	(AVG) EMI (dBµV)	(PEAK) Margin AVL (dB)	(AVG) Margin AVL (dB)	(AVG) Limit (dBµV)	Cable (dB)	Transducer (dB)
0.186	48.64	28.46	-5.43	-25.61	54.07	0.09	0.37
0.190	48.10	27.85	-6.17	-26.42	54.27	0.09	0.38
0.558	43.22	26.66	-2.78	-19.34	46.00	0.08	0.02
0.714	34.23	17.42	-11.77	-28.58	46.00	0.05	0.03
2.442	37.54	21.92	-8.46	-24.08	46.00	0.12	0.05
2.582	39.71	22.90	-6.29	-23.10	46.00	0.13	0.04

DUTY CYCLE

DATA SHEETS



Time of One Pulse = 4.68 ms



Time Between Pulses – 47.1 ms

Total Duty Cycle = 4.68 ms / 47.1 ms = 9.94%

The full -20 dB peak to average ratio can be utilized.