FCC PART 15, SUBPART B and C
TEST REPORT

for

2.4 GHZ TRANSCEIVER

MODEL: TR4-3.2A

Prepared for

PRESTON CINEMA SYSTEMS
1659 11th STREET, SUITE 100
SANTA MONICA, CALIFORNIA 90404

Prepared by:_____

KYLE FUJIMOTO

Approved by:_____

JAMES ROSS

COMPATIBLE ELECTRONICS INC.
114 OLINDA DRIVE
BREA, CALIFORNIA 92823
(714) 579-0500

DATE: NOVEMBER 4, 2016

	REPORT BODY	APPENDICES					TOTAL
		A	***B***	***C***	***D***	***E***	
PAGES	21	2	2	2	15	144	**186**

NVLAP® TESTING
NVLAP LAB CODE 200528-0

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF FIGURES

LIST OF TABLES

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:	2.4 GHz Transceiver Model: TR4-3.2A S/N: N/A
Product Description:	The EUT is a module intended for FI+Z lens and camera control systems.
Modifications:	The EUT was not modified during the testing.
Customer:	Preston Cinema Systems 1659 11th Street, #100 Santa Monica, CA 90404
Test Dates:	August 17, 23, 24, 29, 30, and 31, 2016; and September 1, 2016

Test Specifications covered by accreditation:

NVLAP®
TESTING
NVLAP LAB CODE 200528-0

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

Test Procedure: ANSI C63.4 and ANSI C63.10

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart B; and Section C, section 15.207
2	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart B; and Subpart C, section 15.247(d)
3	Emissions produced by the intentional radiator in restricted bands, 10 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)
4	DTS Bandwidth	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (a)(2)
5	Maximum Conducted Output Power	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(3)
6	Emissions in Non-Restricted Bands	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d)
7	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 2.4 GHz Transceiver, Model: TR4-3.2A. 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

Preston Cinema Systems

Howard Preseton	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 August 17, 2016.

2.5 Disposition of the Test Sample

The test sample has not been returned to Preston Cinema Systems as of November 9, 2016.

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
558074 D01 DTS Meas Guidance v03r05	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

The 2.4 GHz Transceiver, Model: TR4-3.2A (EUT) was connected to an ANT-2.4-CW-RCS-XXX and TE 1513504-1 antenna. The EUT was also connected to an AC Adapter.

The EUT channel was selected by pressing a button on the EUT. The LED display on the host displayed that channel being used. This allowed for the EUT to be tested at the low, middle, and high channels. Each antenna was tested individually on both ports one and two.

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.

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

Cable 1 This is a 1-meter cable connecting the EUT to the AC Adapter. The cable is hard wired at both ends..

Cable 2 This is a 10-centimeter cable connecting the ANT-2.4-CW-RCS-XXX antenna to the EUT. The cable has a u.FL connector at the EUT end and a reverse-polarity SMA connector at the antenna end.

Cable 3 This is a 10-centimeter cable connecting the TE 1513504-1 antenna to the EUT. The cable has a u.FL connector at the EUT end and is hard wired at the antenna end.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
2.4 GHz TRANSCEIVER (EUT)	PRESTON CINEMA SYSTEMS	TR4-3.2A	N/A	NMRTR432
AC ADAPTER	D-LINK	AF1805-A	LF5R00082324081	N/A
ANTENNA	ANTENN FACTOR	ANT-2.4-CW-RCS-XX	N/A	N/A
ANTNENA	TE CONNECTIVITY	1513504-1	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
RF EMISSIONS TEST EQUIPMENT					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Keysight	N9038A	MY51210150	December 29, 2015	1 Year
EMI Receiver	Rohde & Schwarz	ESIB40	100194	June 14, 2016	1 Year
CombiLog Antenna	Com-Power	AC-220	61060	September 3, 2015	1 Year
Preamplifier	Com-Power	PAM-118A	551024	May 12, 2016	1 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2016	2 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
Horn Antenna	Com-Power	AH-826	71957	N/A	N/A
Horn Antenna	Com-Power	AH-118	071175	February 26, 2016	2 Year
Antenna Mast	Com Power	AM-100	N/A	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	June 9, 2015	2 Year
Transient Limiter	Com-Power	252A910	N/A	October 14, 2015	1 Year
Variable Auto Transformer	Staco Energy Products	3PN1010	N/A	N/A	N/A
Multimeter	Fluke	87	58450372	March 17, 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 not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Channel Description and Frequencies

The EUT operates on thirty channels. The low channel is 2402 MHz and the high channel is 2476 MHz.

7.2 Antenna Gain

The EUT utilizes a single band antenna P/N: 1513504-1 with 2 dBi gain and a ¼ wave antenna P/N: ANT-2.4-CW-RCS-XXX with -0.2 dBi gain.

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 spectrum analyzer 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 EMI Receiver. 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 TDK TestLab conducted emissions software in several overlapping sweeps by running the EMI Receiver 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 **Class B** limits of CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.207 for conducted emissions. Please see Appendix E for the data sheets.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as the measuring meter. Preamplifers were used to increase the sensitivity of the instrument. 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.

For emissions above 1 GHz, the readings were averaged by "duty cycle correction factor", derived from 20 log (dwell time /100ms). This duty cycle correction factor was then subtracted from the peak reading.

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
2.4 GHz Transceiver, Model: TR4-3.2A

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
0.554 (Black Lead)	42.41 (Average)	46.00	-3.59
0.562 (White Lead)	42.32 (Average)	46.00	-3.68
0.546 (Black Lead)	41.98 (Average)	46.00	-4.02
0.538 (White Lead)	39.70 (Average)	46.00	-6.30
0.170 (White Lead)	47.57 (Average)	54.96	-7.39
0.186 (White Lead)	46.59 (Average)	54.21	-7.62

Table 2.0 RADIATED EMISSION RESULTS
2.4 GHz Transceiver, Model: TR4-3.2A

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
2483.5 (V) (2476 MHz Fund)	52.86 (Average)	53.97	-1.11
2483.5 (V) (2456 MHz Fund)	52.53 (Average)	53.97	-1.44
12200 (H) (2440 MHz Fund)	48.62 (Average)	53.97	-5.35
2390 (H) (2418 MHz Fund)	47.34 (Average)	53.97	-6.63
2483.5 (V) (2470 MHz Fund)	47.28 (Average)	53.97	-6.69
2390 (H) (2402 MHz Fund)	47.24 (Average)	53.97	-6.73

Notes:
* The complete emissions data is given in Appendix E of this report.
H Horizontal Polarization V Vertical Polarization

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 Maximum Conducted 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 greater than the DTS bandwidth and the video bandwidth was ≥ RBW. The cable loss was also added back into the reading using the reference level offset.

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 Non-Restricted Bands were measured using the EMI Receiver. The emissions were measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The reference level was established by setting the instrument center frequency to DTS channel center frequency. 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. 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).

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. Ensure that the number of measurement points in the sweep >=2 x span/RBW
7. Sweep time = auto couple
8. Use the peak marker function to determine the maximum amplitude level within the RBW
9. 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 Calculations

The Peak Transmit Radiated Field Strength was measured at a 3-meter test distance. The EMI Receiver was used to obtain the duty cycle. The 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

The duty cycle is 12.5% thus a -18.06 dB peak to average ratio could be utilized. See Appendix E for more details and the calculations.

8.8 Variation of the Input Power

The variation of the input power test was performed using the EMI Receiver. The EUT input power was varied between 85% and 115% of the nominal rated supply voltage. The carrier frequency was monitored for any change in amplitude.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.31(e).

9. CONCLUSIONS

The 2.4 GHz Transceiver, Model: TR4-3.2A, 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

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

2.4 GHz Transceiver
Model: TR4-3.2A
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

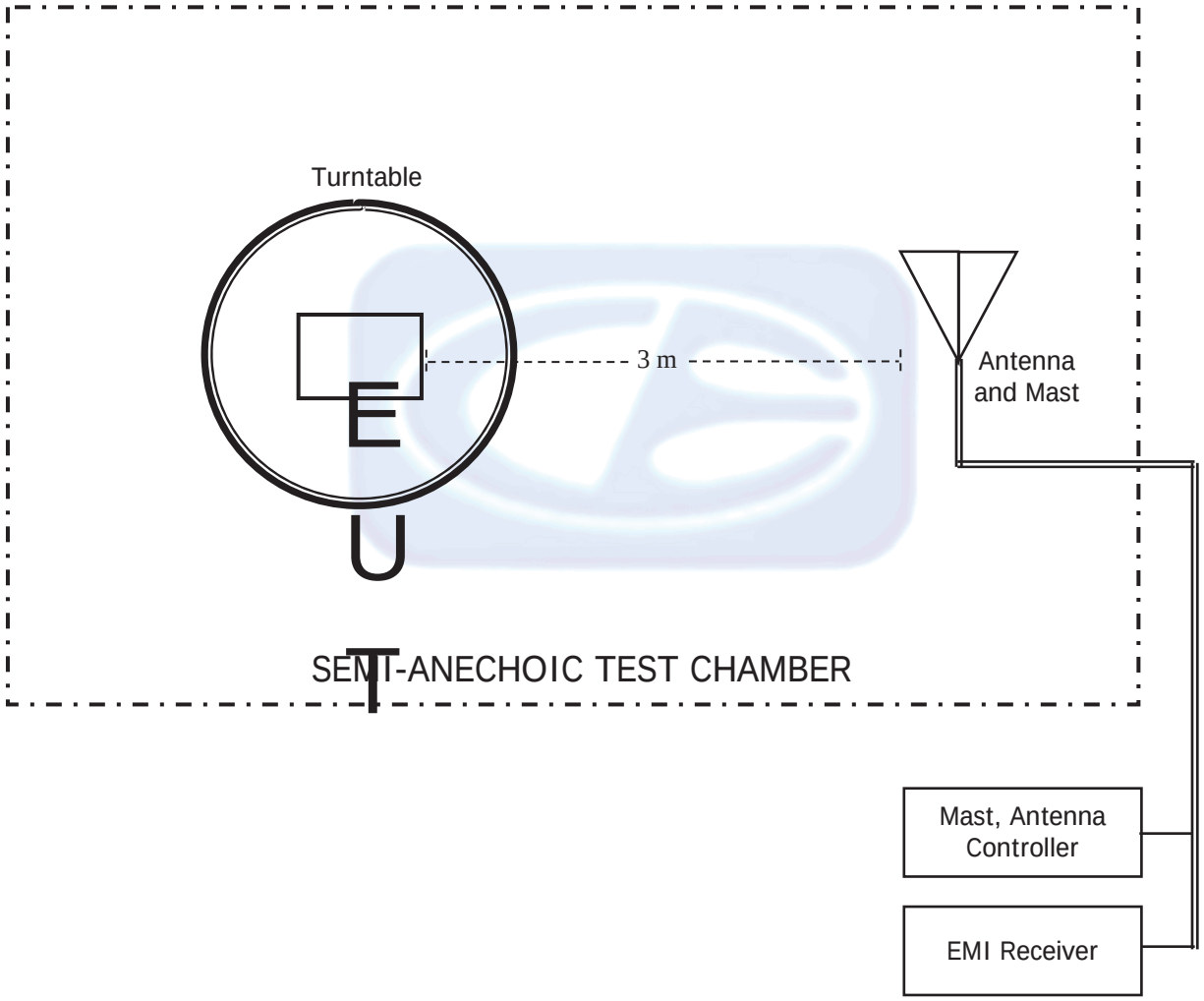
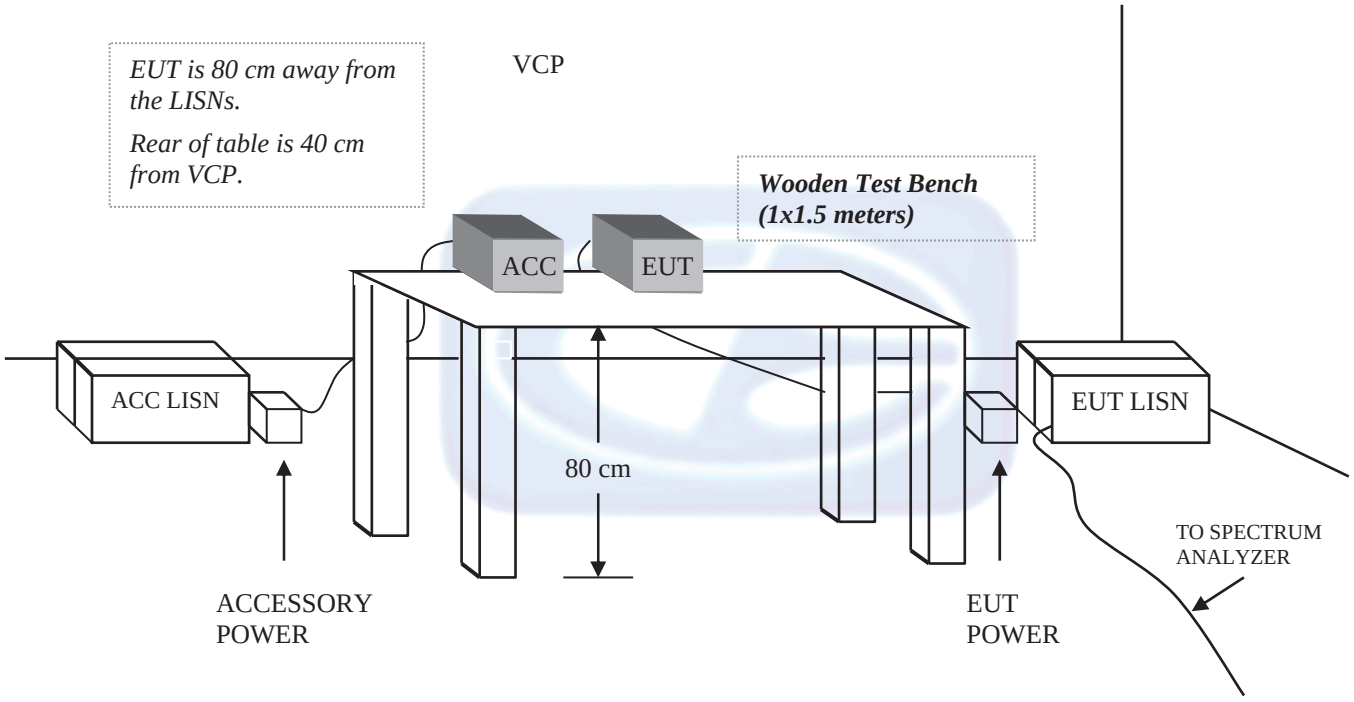


FIGURE 2: CONDUCTED EMISSIONS TEST SETUP



COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: FEBRUARY 6, 2015

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-33.18	18.32
0.01	-34.10	17.40
0.02	-38.65	12.85
0.03	-39.28	12.22
0.04	-40.09	11.41
0.05	-40.85	10.65
0.06	-40.88	10.62
0.07	-41.07	10.43
0.08	-41.04	10.46
0.09	-41.19	10.31
0.1	-41.20	10.30
0.2	-41.52	9.98
0.3	-41.53	9.97
0.4	-41.42	10.08
0.5	-41.53	9.97
0.6	-41.53	9.97
0.7	-41.43	10.07
0.8	-41.23	10.27
0.9	-41.13	10.37
1	-41.14	10.36
2	-40.80	10.70
3	-40.66	10.84
4	-40.61	10.89
5	-40.33	11.17
6	-40.53	10.97
7	-40.47	11.03
8	-40.48	11.02
9	-39.93	11.57
10	-39.81	11.69
15	-43.35	8.15
20	-39.16	12.34
25	-40.24	11.26
30	-43.18	8.32

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 PA-118

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

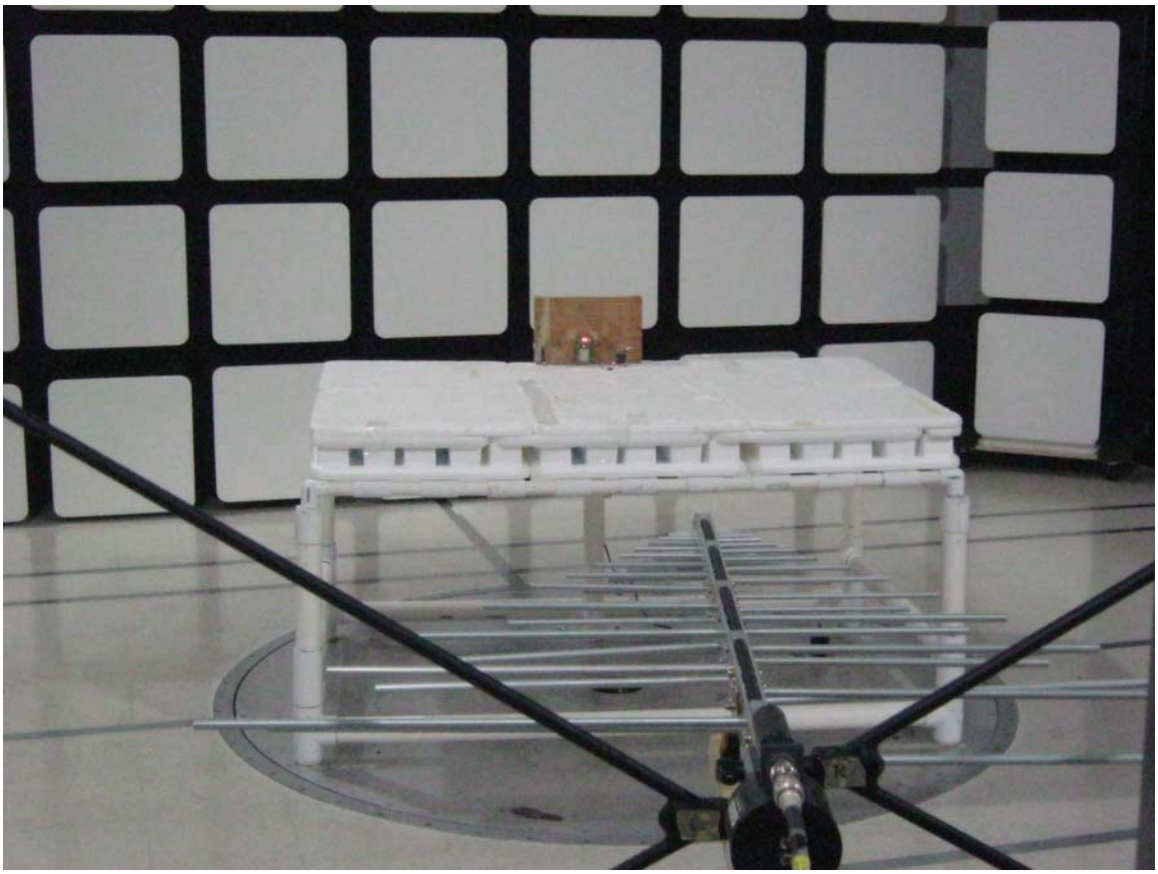
COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MAY 13, 2016

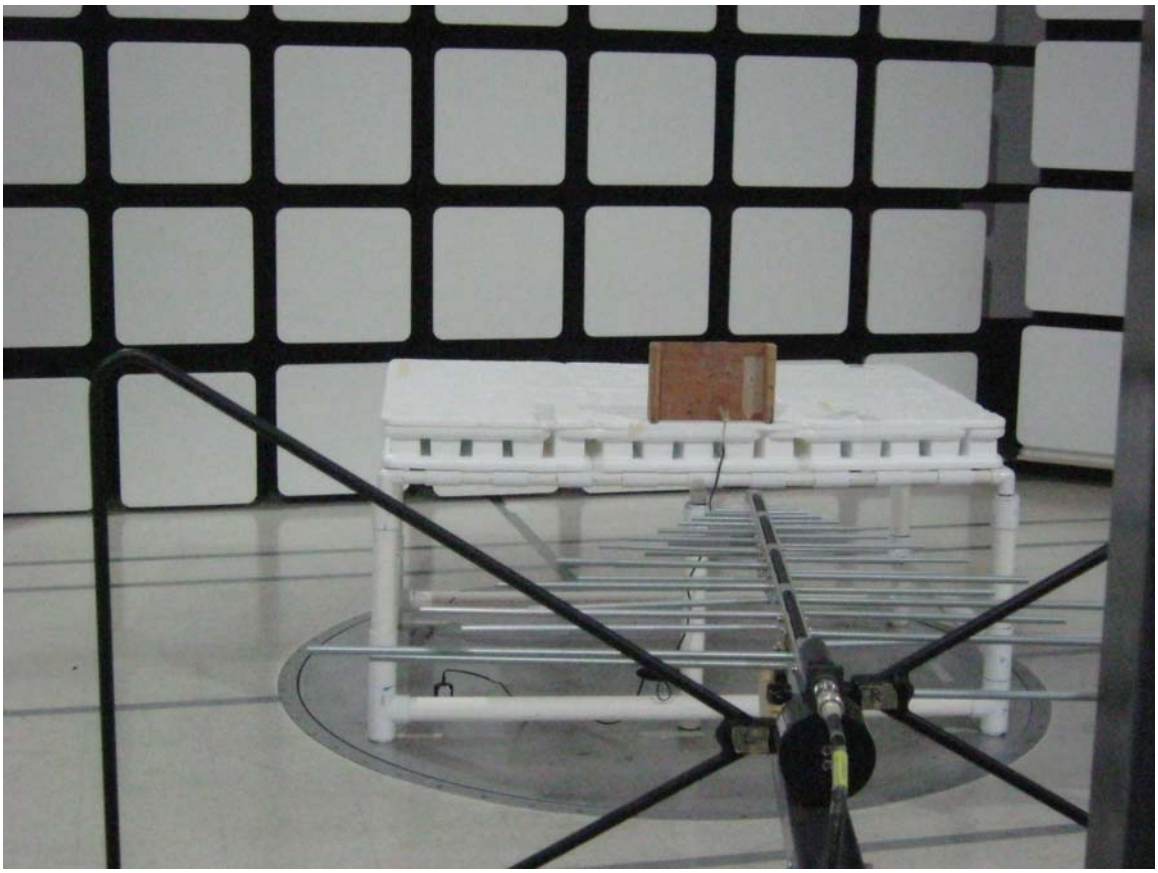
FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.19	31.0	25.69
19.0	24.48	31.5	25.74
20.0	24.39	32.0	26.35
21.0	24.73	32.5	26.64
22.0	23.49	33.0	25.98
23.0	24.23	33.5	24.68
24.0	24.59	34.0	24.61
25.0	25.32	34.5	23.78
26.0	25.66	35.0	24.74
26.5	25.99	35.5	24.39
27.0	26.26	36.0	23.46
27.5	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

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

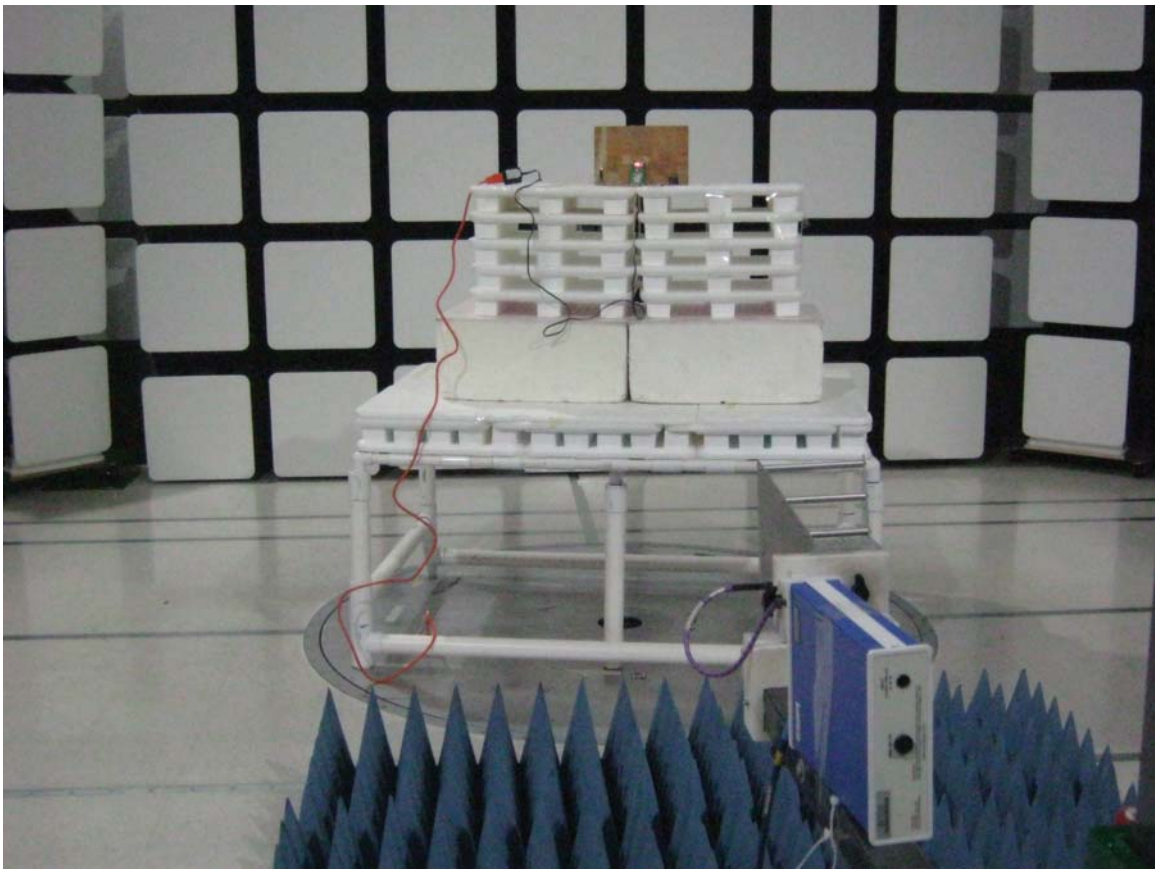
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHZ TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

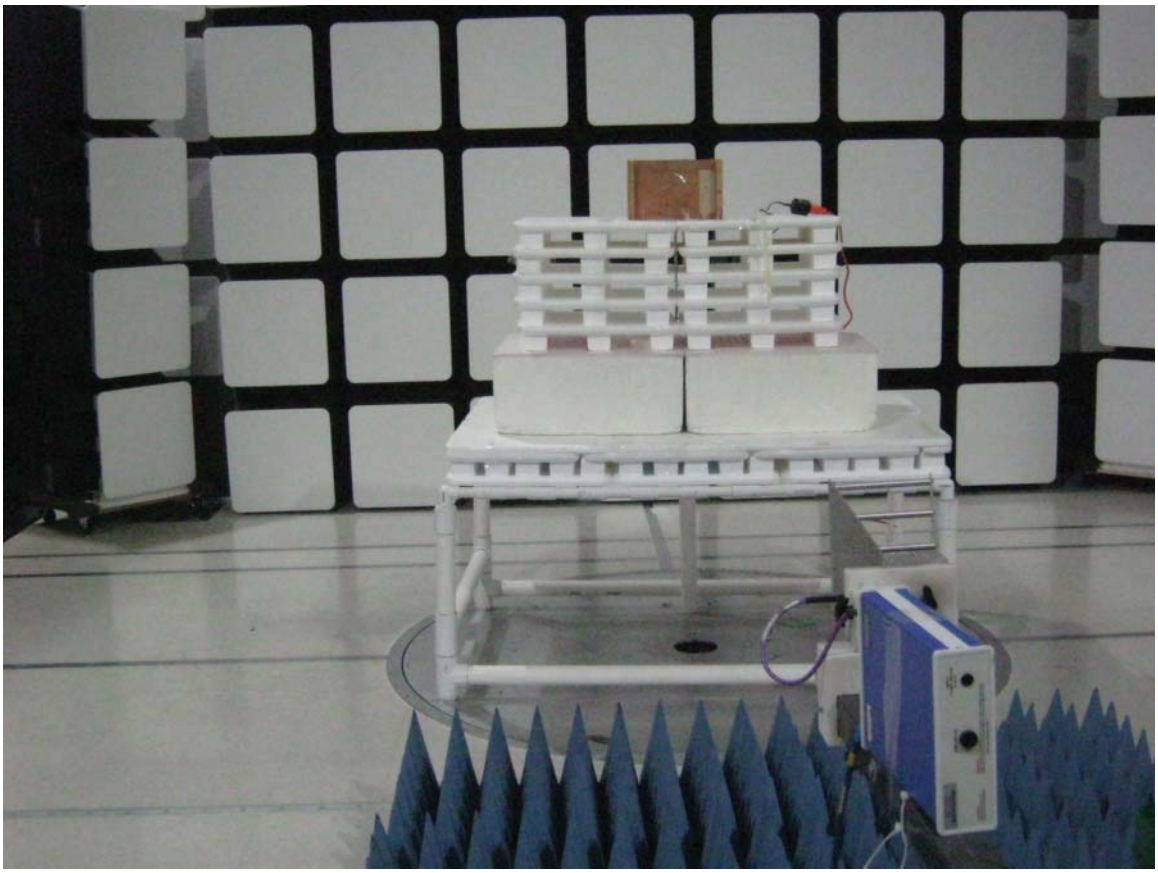
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHZ TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

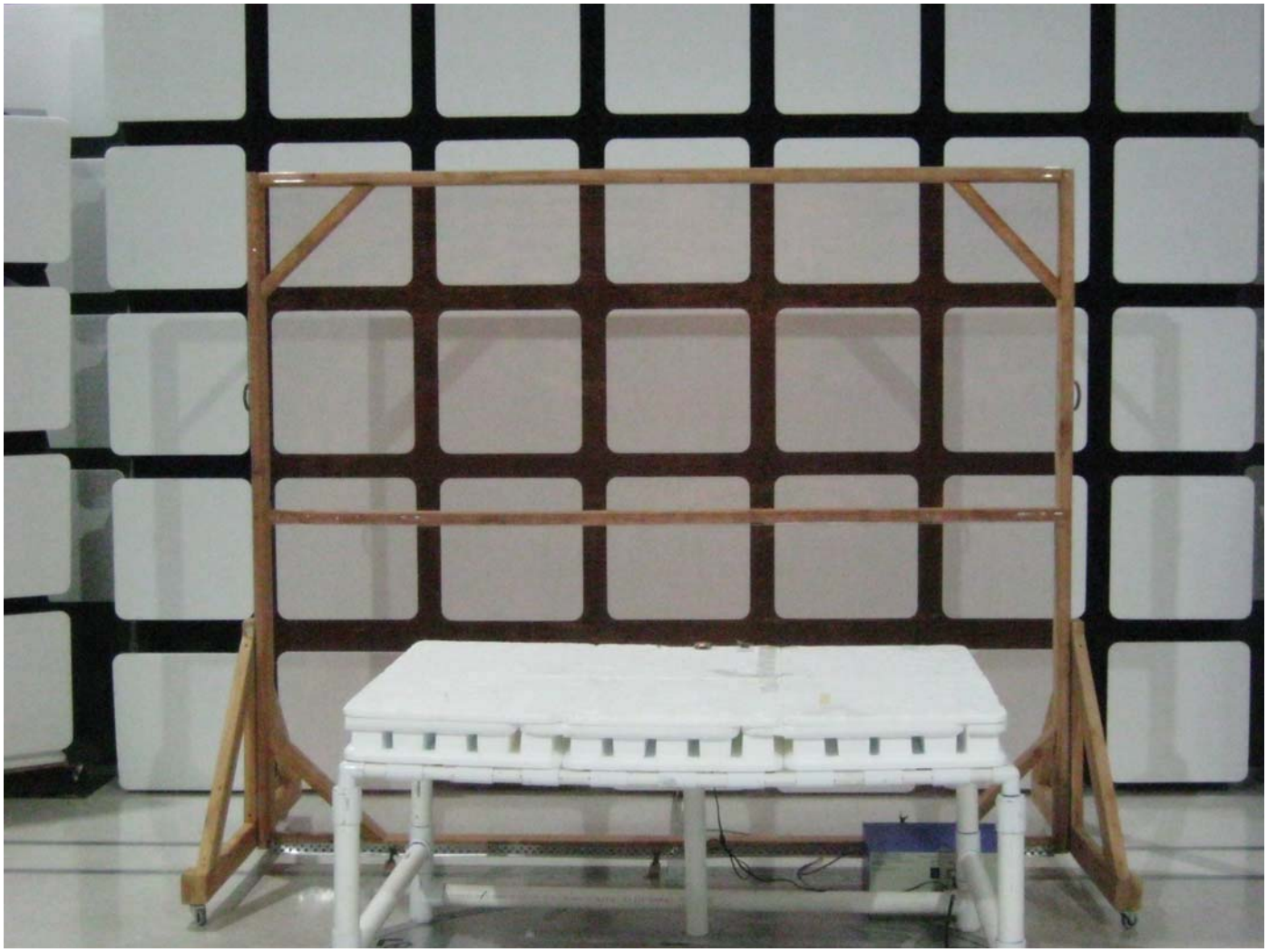
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHZ TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

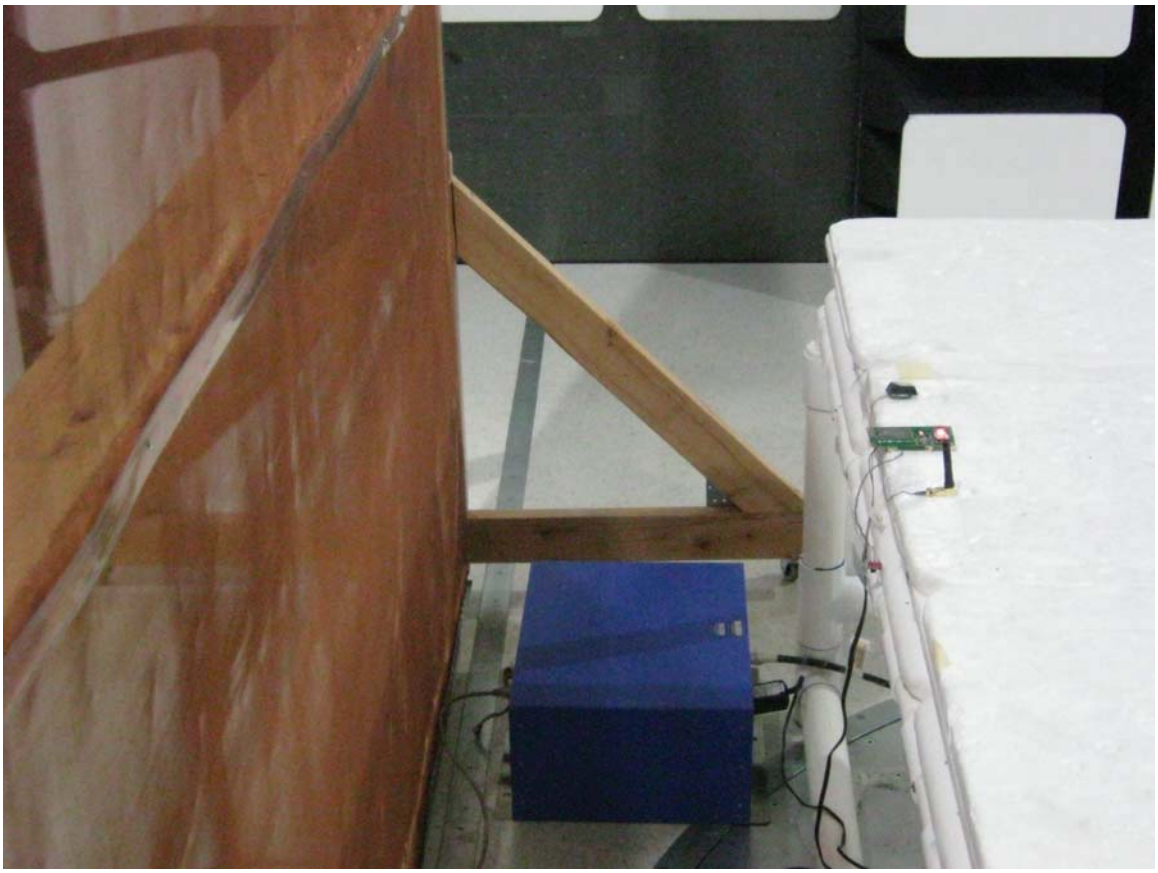
PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHZ TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHZ TRANSCEIVER
MODEL: TR4-3.2A
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	42.82	V	73.97	-31.15	Peak	98.75	163.91	
4804	24.76	V	53.97	-29.21	Avg	98.75	163.91	
7206	43.93	V	73.97	-30.04	Peak	343.75	154.47	
7206	25.87	V	53.97	-28.10	Avg	343.75	154.47	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	45.56	H	73.97	-28.41	Peak	185.25	247.67	
4804	27.50	H	53.97	-26.47	Avg	185.25	247.67	
7206	44.08	H	73.97	-29.89	Peak	195.25	125.16	
7206	26.02	H	53.97	-27.95	Avg	195.25	125.16	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	47.53	V	73.97	-26.44	Peak	212.25	161.46	
4804	29.47	V	53.97	-24.50	Avg	212.25	161.46	
7206	42.81	V	73.97	-31.16	Peak	78.25	163.45	
7206	24.75	V	53.97	-29.22	Avg	78.25	163.45	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	43.72	H	73.97	-30.25	Peak	264.75	193.76	
4804	25.66	H	53.97	-28.31	Avg	264.75	193.76	
7206	44.55	H	73.97	-29.42	Peak	35.75	161.46	
7206	26.49	H	53.97	-27.48	Avg	35.75	161.46	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	42.18	V	73.97	-31.79	Peak	60.50	142.08	
4804	24.12	V	53.97	-29.85	Avg	60.50	142.08	
7206	43.42	V	73.97	-30.55	Peak	241.00	139.91	
7206	25.36	V	53.97	-28.61	Avg	241.00	139.91	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	45.00	H	73.97	-28.97	Peak	143.50	210.29	
4804	26.94	H	53.97	-27.03	Avg	143.50	210.29	
7206	46.37	H	73.97	-27.60	Peak	248.25	196.74	
7206	28.31	H	53.97	-25.66	Avg	248.25	196.74	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	54.22	V	73.97	-19.75	Peak	98.25	111.49	
4880	36.16	V	53.97	-17.81	Avg	98.25	111.49	
7320	54.39	V	73.97	-19.58	Peak	177.00	127.49	
7320	36.33	V	53.97	-17.64	Avg	177.00	127.49	
9760								**Not in**
9760								**Restricted Band**
12200	61.45	V	73.97	-12.52	Peak	129.25	126.89	
12200	43.39	V	53.97	-10.58	Avg	129.25	126.89	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	46.84	H	73.97	-27.13	Peak	198.00	110.95	
4880	28.78	H	53.97	-25.19	Avg	198.00	110.95	
7320	51.49	H	73.97	-22.48	Peak	152.50	127.37	
7320	33.43	H	53.97	-20.54	Avg	152.50	127.37	
9760								**Not in**
9760								**Restricted Band**
12200	57.64	H	73.97	-16.33	Peak	62.00	127.31	
12200	39.58	H	53.97	-14.39	Avg	62.00	127.31	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	49.27	V	73.97	-24.70	Peak	135.50	250.11	
4880	31.21	V	53.97	-22.76	Avg	135.50	250.11	
7320	52.39	V	73.97	-21.58	Peak	196.00	111.31	
7320	34.33	V	53.97	-19.64	Avg	196.00	111.31	
9760								**Not in**
9760								**Restricted Band**
12200	62.98	V	73.97	-10.99	Peak	163.25	223.61	
12200	44.92	V	53.97	-9.05	Avg	163.25	223.61	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	42.43	H	73.97	-31.54	Peak	359.75	175.31	
4880	24.37	H	53.97	-29.60	Avg	359.75	175.31	
7320	55.29	H	73.97	-18.68	Peak	140.25	111.37	
7320	37.23	H	53.97	-16.74	Avg	140.25	111.37	
9760								**Not in**
9760								**Restricted Band**
12200	57.75	H	73.97	-16.22	Peak	83.75	159.55	
12200	39.69	H	53.97	-14.28	Avg	83.75	159.55	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.16	V	73.97	-20.81	Peak	314.50	111.31	
4880	35.10	V	53.97	-18.87	Avg	314.50	111.31	
7320	56.72	V	73.97	-17.25	Peak	0.00	126.89	
7320	38.66	V	53.97	-15.31	Avg	0.00	126.89	
9760								**Not in**
9760								**Restricted Band**
12200	63.25	V	73.97	-10.72	Peak	166.50	111.25	
12200	45.19	V	53.97	-8.78	Avg	166.50	111.25	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	42.23	H	73.97	-31.74	Peak	173.25	127.19	
4880	24.17	H	53.97	-29.80	Avg	173.25	127.19	
7320	55.96	H	73.97	-18.01	Peak	359.75	159.25	
7320	37.90	H	53.97	-16.07	Avg	359.75	159.25	
9760								**Not in**
9760								**Restricted Band**
12200	63.48	H	73.97	-10.49	Peak	90.50	191.55	
12200	45.42	H	53.97	-8.55	Avg	90.50	191.55	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	46.40	V	73.97	-27.57	Peak	105.25	207.31	
4952	28.34	V	53.97	-25.63	Avg	105.25	207.31	
7428	44.18	V	73.97	-29.79	Peak	106.25	249.94	
7428	26.12	V	53.97	-27.85	Avg	106.25	249.94	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	47.39	H	73.97	-26.58	Peak	117.00	159.43	
4952	29.33	H	53.97	-24.64	Avg	117.00	159.43	
7428	44.49	H	73.97	-29.48	Peak	159.00	238.95	
7428	26.43	H	53.97	-27.54	Avg	159.00	238.95	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	43.48	V	73.97	-30.49	Peak	95.25	174.59	
4952	25.42	V	53.97	-28.55	Avg	95.25	174.59	
7428	45.46	V	73.97	-28.51	Peak	333.00	110.95	
7428	27.40	V	53.97	-26.57	Avg	333.00	110.95	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	50.65	H	73.97	-23.32	Peak	12.00	143.13	
4952	32.59	H	53.97	-21.38	Avg	12.00	143.13	
7428	44.33	H	73.97	-29.64	Peak	137.00	248.98	
7428	26.27	H	53.97	-27.70	Avg	137.00	248.98	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	47.42	V	73.97	-26.55	Peak	117.75	127.25	
4952	29.36	V	53.97	-24.61	Avg	117.75	127.25	
7428	44.68	V	73.97	-29.29	Peak	334.75	160.56	
7428	26.62	V	53.97	-27.35	Avg	334.75	160.56	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: 1513504-1 - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	46.32	H	73.97	-27.65	Peak	0.00	111.61	
4952	28.26	H	53.97	-25.71	Avg	0.00	111.61	
7428	44.40	H	73.97	-29.57	Peak	299.75	223.55	
7428	26.34	H	53.97	-27.63	Avg	299.75	223.55	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247

Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Antenna Type: 1513504-1 - Port 1
Non Harmonic Emissions from the Tx and Digital Portion 10 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	48.55	V	73.97	-25.42	Peak	249.25	111.13	
4804	30.49	V	53.97	-23.48	Avg	249.25	111.13	
7206	48.35	V	73.97	-25.62	Peak	60.25	223.01	
7206	30.29	V	53.97	-23.68	Avg	60.25	223.01	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	48.22	H	73.97	-25.75	Peak	189.75	159.19	
4804	30.16	H	53.97	-23.81	Avg	189.75	159.19	
7206	49.16	H	73.97	-24.81	Peak	175.25	127.25	
7206	31.10	H	53.97	-22.87	Avg	175.25	127.25	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	48.68	V	73.97	-25.29	Peak	289.25	143.13	
4804	30.62	V	53.97	-23.35	Avg	289.25	143.13	
7206	47.87	V	73.97	-26.10	Peak	54.50	111.01	
7206	29.81	V	53.97	-24.16	Avg	54.50	111.01	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	52.63	H	73.97	-21.34	Peak	52.00	111.07	
4804	34.57	H	53.97	-19.40	Avg	52.00	111.07	
7206	52.52	H	73.97	-21.45	Peak	56.75	111.25	
7206	34.46	H	53.97	-19.51	Avg	56.75	111.25	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	50.76	V	73.97	-23.21	Peak	4.75	158.59	
4804	32.70	V	53.97	-21.27	Avg	4.75	158.59	
7206	50.68	V	73.97	-23.29	Peak	339.00	175.13	
7206	32.62	V	53.97	-21.35	Avg	339.00	175.13	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/17/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	48.37	H	73.97	-25.60	Peak	50.00	142.89	
4804	30.31	H	53.97	-23.66	Avg	50.00	142.89	
7206	50.50	H	73.97	-23.47	Peak	304.75	143.07	
7206	32.44	H	53.97	-21.53	Avg	304.75	143.07	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	51.65	V	73.97	-22.32	Peak	174.50	111.37	
4880	33.59	V	53.97	-20.38	Avg	174.50	111.37	
7320	53.64	V	73.97	-20.33	Peak	171.25	111.31	
7320	35.58	V	53.97	-18.39	Avg	171.25	111.31	
9760								**Not in**
9760								**Restricted Band**
12200	61.71	V	73.97	-12.26	Peak	172.75	223.07	
12200	43.65	V	53.97	-10.32	Avg	172.75	223.07	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	50.48	H	73.97	-23.49	Peak	95.75	127.07	
4880	32.42	H	53.97	-21.55	Avg	95.75	127.07	
7320	54.49	H	73.97	-19.48	Peak	176.25	191.19	
7320	36.43	H	53.97	-17.54	Avg	176.25	191.19	
9760								**Not in**
9760								**Restricted Band**
12200	60.94	H	73.97	-13.03	Peak	61.50	111.43	**No Emission**
12200	42.88	H	53.97	-11.09	Avg	61.50	111.43	**Detected**
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	50.13	V	73.97	-23.84	Peak	112.50	191.43	
4880	32.07	V	53.97	-21.90	Avg	112.50	191.43	
7320	54.02	V	73.97	-19.95	Peak	130.00	111.31	
7320	35.96	V	53.97	-18.01	Avg	130.00	111.31	
9760								**Not in**
9760								**Restricted Band**
12200	61.66	V	73.97	-12.31	Peak	142.75	127.13	
12200	43.60	V	53.97	-10.37	Avg	142.75	127.13	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	52.38	H	73.97	-21.59	Peak	164.00	127.25	
4880	34.32	H	53.97	-19.65	Avg	164.00	127.25	
7320	50.85	H	73.97	-23.12	Peak	274.00	127.37	
7320	32.79	H	53.97	-21.18	Avg	274.00	127.37	
9760								**Not in**
9760								**Restricted Band**
12200	59.72	H	73.97	-14.25	Peak	139.25	239.25	
12200	41.66	H	53.97	-12.31	Avg	139.25	239.25	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	47.39	V	73.97	-26.58	Peak	154.25	159.19	
4880	29.33	V	53.97	-24.64	Avg	154.25	159.19	
7320	51.86	V	73.97	-22.11	Peak	125.00	127.19	
7320	33.80	V	53.97	-20.17	Avg	125.00	127.19	
9760								**Not in**
9760								**Restricted Band**
12200	63.28	V	73.97	-10.69	Peak	75.75	127.25	
12200	45.22	V	53.97	-8.75	Avg	75.75	127.25	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	52.87	H	73.97	-21.10	Peak	306.00	144.74	
4880	34.81	H	53.97	-19.16	Avg	306.00	144.74	
7320	49.30	H	73.97	-24.67	Peak	189.75	159.49	
7320	31.24	H	53.97	-22.73	Avg	189.75	159.49	
9760								**Not in**
9760								**Restricted Band**
12200	59.83	H	73.97	-14.14	Peak	120.75	249.95	
12200	41.77	H	53.97	-12.20	Avg	120.75	249.95	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	43.82	V	73.97	-30.15	Peak	129.50	111.25	
4952	25.76	V	53.97	-28.21	Avg	129.50	111.25	
7428	43.74	V	73.97	-30.23	Peak	221.75	223.13	
7428	25.68	V	53.97	-28.29	Avg	221.75	223.13	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	48.56	H	73.97	-25.41	Peak	170.00	127.25	
4952	30.50	H	53.97	-23.47	Avg	170.00	127.25	
7428	44.96	H	73.97	-29.01	Peak	267.00	127.31	
7428	26.90	H	53.97	-27.07	Avg	267.00	127.31	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	44.00	V	73.97	-29.97	Peak	8.50	249.95	
4952	25.94	V	53.97	-28.03	Avg	8.50	249.95	
7428	44.17	V	73.97	-29.80	Peak	158.50	175.13	
7428	26.11	V	53.97	-27.86	Avg	158.50	175.13	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	49.10	H	73.97	-24.87	Peak	151.50	159.31	
4952	31.04	H	53.97	-22.93	Avg	151.50	159.31	
7428	44.86	H	73.97	-29.11	Peak	335.75	223.31	
7428	26.80	H	53.97	-27.17	Avg	335.75	223.31	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	47.30	V	73.97	-26.67	Peak	136.00	143.37	
4952	29.24	V	53.97	-24.73	Avg	136.00	143.37	
7428	44.13	V	73.97	-29.84	Peak	185.50	207.61	
7428	26.07	V	53.97	-27.90	Avg	185.50	207.61	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: 1513504-1 - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	43.42	H	73.97	-30.55	Peak	306.00	127.43	
4952	25.36	H	53.97	-28.61	Avg	306.00	127.43	
7428	44.16	H	73.97	-29.81	Peak	66.75	127.25	
7428	26.10	H	53.97	-27.87	Avg	66.75	127.25	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247

Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/23/2016
Lab: D
Tested By: Kyle Fujimoto

Antenna Type: 1513504-1 - Port 2
Non Harmonic Emissions from the Tx and Digital Portion 10 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	43.92	V	73.97	-30.05	Peak	113.75	125.87	
4804	25.86	V	53.97	-28.11	Avg	113.75	125.87	
7206	44.59	V	73.97	-29.38	Peak	346.50	149.45	
7206	26.53	V	53.97	-27.44	Avg	346.50	149.45	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	49.36	H	73.97	-24.61	Peak	136.00	143.43	
4804	31.30	H	53.97	-22.67	Avg	136.00	143.43	
7206	47.85	H	73.97	-26.12	Peak	234.75	223.43	
7206	29.79	H	53.97	-24.18	Avg	234.75	223.43	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	46.08	V	73.97	-27.89	Peak	91.25	159.55	
4804	28.02	V	53.97	-25.95	Avg	91.25	159.55	
7206	47.81	V	73.97	-26.16	Peak	232.25	126.71	
7206	29.75	V	53.97	-24.22	Avg	232.25	126.71	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	49.77	H	73.97	-24.20	Peak	235.25	127.25	
4804	31.71	H	53.97	-22.26	Avg	235.25	127.25	
7206	47.83	H	73.97	-26.14	Peak	255.25	127.49	
7206	29.77	H	53.97	-24.20	Avg	255.25	127.49	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	48.39	V	73.97	-25.58	Peak	195.75	143.25	
4804	30.33	V	53.97	-23.64	Avg	195.75	143.25	
7206	47.89	V	73.97	-26.08	Peak	154.50	249.99	
7206	29.83	V	53.97	-24.14	Avg	154.50	249.99	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	45.53	H	73.97	-28.44	Peak	187.25	174.53	
4804	27.47	H	53.97	-26.50	Avg	18/7.25	174.53	
7206	48.10	H	73.97	-25.87	Peak	276.25	111.13	
7206	30.04	H	53.97	-23.93	Avg	276.25	111.13	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	52.07	V	73.97	-21.90	Peak	203.50	103.34	
4880	34.01	V	53.97	-19.96	Avg	203.50	103.34	
7320	56.65	V	73.97	-17.32	Peak	255.50	128.14	
7320	38.59	V	53.97	-15.38	Avg	255.50	128.14	
9760								**Not in**
9760								**Restricted Band**
12200	58.44	V	73.97	-15.53	Peak	185.25	237.64	
12200	40.38	V	53.97	-13.59	Avg	185.25	237.64	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	54.67	H	73.97	-19.30	Peak	11.00	111.25	
4880	36.61	H	53.97	-17.36	Avg	11.00	111.25	
7320	55.98	H	73.97	-17.99	Peak	306.75	127.49	
7320	37.92	H	53.97	-16.05	Avg	306.75	127.49	
9760								**Not in**
9760								**Restricted Band**
12200	58.29	H	73.97	-15.68	Peak	109.50	127.49	
12200	40.23	H	53.97	-13.74	Avg	109.50	127.49	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.08	V	73.97	-20.89	Peak	222.00	111.13	
4880	35.02	V	53.97	-18.95	Avg	222.00	111.13	
7320	55.81	V	73.97	-18.16	Peak	307.25	111.19	
7320	37.75	V	53.97	-16.22	Avg	307.25	111.19	
9760								**Not in**
9760								**Restricted Band**
12200	43.08	V	73.97	-30.89	Peak	139.00	222.71	
12200	25.02	V	53.97	-28.95	Avg	139.00	222.71	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.11	H	73.97	-17.86	Peak	224.50	143.31	
4880	38.05	H	53.97	-15.92	Avg	224.50	143.31	
7320	59.50	H	73.97	-14.47	Peak	305.75	111.19	
7320	41.44	H	53.97	-12.53	Avg	305.75	111.19	
9760								**Not in**
9760								**Restricted Band**
12200	58.55	H	73.97	-15.42	Peak	1.25	127.31	
12200	40.49	H	53.97	-13.48	Avg	1.25	127.31	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	50.40	V	73.97	-23.57	Peak	117.75	111.37	
4880	32.34	V	53.97	-21.63	Avg	117.75	111.37	
7320	58.49	V	73.97	-15.48	Peak	322.75	127.25	
7320	40.43	V	53.97	-13.54	Avg	322.75	127.25	
9760								**Not in**
9760								**Restricted Band**
12200	63.95	V	73.97	-10.02	Peak	229.25	191.67	
12200	45.89	V	53.97	-8.08	Avg	229.25	191.67	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.76	H	73.97	-20.21	Peak	116.00	110.59	
4880	35.70	H	53.97	-18.27	Avg	116.00	110.59	
7320	57.41	H	73.97	-16.56	Peak	341.00	127.07	
7320	39.35	H	53.97	-14.62	Avg	341.00	127.07	
9760								**Not in**
9760								**Restricted Band**
12200	63.05	H	73.97	-10.92	Peak	161.25	127.37	
12200	44.99	H	53.97	-8.98	Avg	161.25	127.37	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	47.37	V	73.97	-26.60	Peak	101.25	111.43	
4952	29.31	V	53.97	-24.66	Avg	101.25	111.43	
7428	47.88	V	73.97	-26.09	Peak	129.00	144.38	
7428	29.82	V	53.97	-24.15	Avg	129.00	144.38	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.24	H	73.97	-28.73	Peak	293.25	127.61	
4952	27.18	H	53.97	-26.79	Avg	293.25	127.61	
7428	48.15	H	73.97	-25.82	Peak	297.50	175.55	
7428	30.09	H	53.97	-23.88	Avg	297.50	175.55	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.45	V	73.97	-28.52	Peak	326.75	159.49	
4952	27.39	V	53.97	-26.58	Avg	326.75	159.49	
7428	47.17	V	73.97	-26.80	Peak	99.75	207.73	
7428	29.11	V	53.97	-24.86	Avg	99.75	207.73	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.81	H	73.97	-28.16	Peak	149.25	127.55	
4952	27.75	H	53.97	-26.22	Avg	149.25	127.55	
7428	47.48	H	73.97	-26.49	Peak	359.25	144.32	
7428	29.42	H	53.97	-24.55	Avg	359.25	144.32	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.35	V	73.97	-28.62	Peak	0.25	143.37	
4952	27.29	V	53.97	-26.68	Avg	0.25	143.37	
7428	47.48	V	73.97	-26.49	Peak	94.00	111.43	
7428	29.42	V	53.97	-24.55	Avg	94.00	111.43	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 1

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	44.77	H	73.97	-29.20	Peak	115.00	111.43	
4952	26.71	H	53.97	-27.26	Avg	115.00	111.43	
7428	47.64	H	73.97	-26.33	Peak	301.25	191.43	
7428	29.58	H	53.97	-24.39	Avg	301.25	191.43	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Antenna Type: ANT-2.4-CW-RCS - Port 1
Non Harmonic Emissions from the Tx and Digital Portion 10 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	47.02	V	73.97	-26.95	Peak	251.75	144.80	
4804	28.96	V	53.97	-25.01	Avg	251.75	144.80	
7206	47.69	V	73.97	-26.28	Peak	118.00	111.61	
7206	29.63	V	53.97	-24.34	Avg	118.00	111.61	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	46.53	H	73.97	-27.44	Peak	359.00	127.37	
4804	28.47	H	53.97	-25.50	Avg	359.00	127.37	
7206	47.58	H	73.97	-26.39	Peak	6.25	241.52	
7206	29.52	H	53.97	-24.45	Avg	6.25	241.52	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	42.71	V	73.97	-31.26	Peak	215.00	144.98	
4804	24.65	V	53.97	-29.32	Avg	215.00	144.98	
7206	47.72	V	73.97	-26.25	Peak	255.00	175.31	
7206	29.66	V	53.97	-24.31	Avg	255.00	175.31	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	46.90	H	73.97	-27.07	Peak	359.75	112.62	
4804	28.84	H	53.97	-25.13	Avg	359.75	112.62	
7206	48.23	H	73.97	-25.74	Peak	167.75	248.74	
7206	30.17	H	53.97	-23.80	Avg	167.75	248.74	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	42.71	V	73.97	-31.26	Peak	215.50	144.98	
4804	24.65	V	53.97	-29.32	Avg	215.50	144.98	
7206	47.72	V	73.97	-26.25	Peak	255.00	175.31	
7206	29.66	V	53.97	-24.31	Avg	255.00	175.31	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Low Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4804	42.90	H	73.97	-31.07	Peak	263.25	126.89	
4804	24.84	H	53.97	-29.13	Avg	263.25	126.89	
7206	37.10	H	73.97	-36.87	Peak	15.25	111.31	
7206	19.04	H	53.97	-34.93	Avg	15.25	111.31	
9608								**Not in**
9608								**Restricted Band**
12010								**No Emission**
12010								**Detected**
14412								**No Emission**
14412								**Detected**
16814								**No Emission**
16814								**Detected**
19216								**No Emission**
19216								**Detected**
21618								**No Emission**
21618								**Detected**
24020								**No Emission**
24020								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.71	V	73.97	-20.26	Peak	95.50	111.13	
4880	35.65	V	53.97	-18.32	Avg	95.50	111.13	
7320	56.72	V	73.97	-17.25	Peak	256.00	127.01	
7320	38.66	V	53.97	-15.31	Avg	256.00	127.01	
9760								**Not in**
9760								**Restricted Band**
12200	62.35	V	73.97	-11.62	Peak	14.75	127.13	
12200	44.29	V	53.97	-9.68	Avg	14.75	127.13	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	54.46	H	73.97	-19.51	Peak	95.50	175.07	
4880	36.40	H	53.97	-17.57	Avg	95.50	175.07	
7320	55.74	H	73.97	-18.23	Peak	259.00	127.19	
7320	37.68	H	53.97	-16.29	Avg	259.00	127.19	
9760								**Not in**
9760								**Restricted Band**
12200	60.63	H	73.97	-13.34	Peak	93.75	127.19	
12200	42.57	H	53.97	-11.40	Avg	93.75	127.19	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.85	V	73.97	-20.12	Peak	9.25	111.19	
4880	35.79	V	53.97	-18.18	Avg	9.25	111.19	
7320	56.60	V	73.97	-17.37	Peak	333.00	111.19	
7320	38.54	V	53.97	-15.43	Avg	333.00	111.19	
9760								**Not in**
9760								**Restricted Band**
12200	64.97	V	73.97	-9.00	Peak	169.50	224.26	
12200	46.91	V	53.97	-7.06	Avg	169.50	224.26	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	56.92	H	73.97	-17.05	Peak	65.25	159.25	
4880	38.86	H	53.97	-15.11	Avg	65.25	159.25	
7320	61.54	H	73.97	-12.43	Peak	339.45	110.47	
7320	43.48	H	53.97	-10.49	Avg	339.45	110.47	
9760								**Not in**
9760								**Restricted Band**
12200	54.10	H	73.97	-19.87	Peak	82.25	111.25	
12200	36.04	H	53.97	-17.93	Avg	82.25	111.25	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	53.67	V	73.97	-20.30	Peak	304.75	192.38	
4880	35.61	V	53.97	-18.36	Avg	304.75	192.38	
7320	58.64	V	73.97	-15.33	Peak	321.75	112.44	
7320	40.58	V	53.97	-13.39	Avg	321.75	112.44	
9760								**Not in**
9760								**Restricted Band**
12200	60.62	V	73.97	-13.35	Peak	234.25	207.19	
12200	42.56	V	53.97	-11.41	Avg	234.25	207.19	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Middle Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4880	50.49	H	73.97	-23.48	Peak	147.75	144.56	
4880	32.43	H	53.97	-21.54	Avg	147.75	144.56	
7320	55.86	H	73.97	-18.11	Peak	185.25	127.19	
7320	37.80	H	53.97	-16.17	Avg	185.25	127.19	
9760								**Not in**
9760								**Restricted Band**
12200	66.68	H	73.97	-7.29	Peak	156.25	192.62	
12200	48.62	H	53.97	-5.35	Avg	156.25	192.62	
14640								**No Emission**
14640								**Detected**
17080								**No Emission**
17080								**Detected**
19520								**No Emission**
19520								**Detected**
21960								**No Emission**
21960								**Detected**
24400								**No Emission**
24400								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.16	V	73.97	-28.81	Peak	95.25	190.83	
4952	27.10	V	53.97	-26.87	Avg	95.25	190.83	
7428	47.31	V	73.97	-26.66	Peak	74.00	175.13	
7428	29.25	V	53.97	-24.72	Avg	74.00	175.13	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - X-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	45.08	H	73.97	-28.89	Peak	329.50	249.90	
4952	27.02	H	53.97	-26.95	Avg	329.50	249.90	
7428	47.77	H	73.97	-26.20	Peak	46.25	238.83	
7428	29.71	H	53.97	-24.26	Avg	46.25	238.83	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	44.73	V	73.97	-29.24	Peak	206.50	238.05	
4952	26.67	V	53.97	-27.30	Avg	206.50	238.05	
7428	48.10	V	73.97	-25.87	Peak	110.00	175.19	
7428	30.04	V	53.97	-23.93	Avg	110.00	175.19	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Y-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	47.39	H	73.97	-26.58	Peak	337.50	127.19	
4952	29.33	H	53.97	-24.64	Avg	337.50	127.19	
7428	47.71	H	73.97	-26.26	Peak	218.50	159.13	
7428	29.65	H	53.97	-24.32	Avg	218.50	159.13	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	44.91	V	73.97	-29.06	Peak	359.00	127.19	
4952	26.85	V	53.97	-27.12	Avg	359.00	127.19	
7428	47.18	V	73.97	-26.79	Peak	249.25	239.13	
7428	29.12	V	53.97	-24.85	Avg	249.25	239.13	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

High Channel - Z-Axis
Antenna Type: ANT-2.4-CW-RCS - Port 2

Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
4952	44.97	H	73.97	-29.00	Peak	222.75	250.00	
4952	26.91	H	53.97	-27.06	Avg	222.75	250.00	
7428	47.41	H	73.97	-26.56	Peak	72.00	249.11	
7428	29.35	H	53.97	-24.62	Avg	72.00	249.11	
9904								**Not in**
9904								**Restricted Band**
12380								**No Emission**
12380								**Detected**
14856								**No Emission**
14856								**Detected**
17332								**No Emission**
17332								**Detected**
19808								**No Emission**
19808								**Detected**
22284								**No Emission**
22284								**Detected**
24760								**No Emission**
24760								**Detected**

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

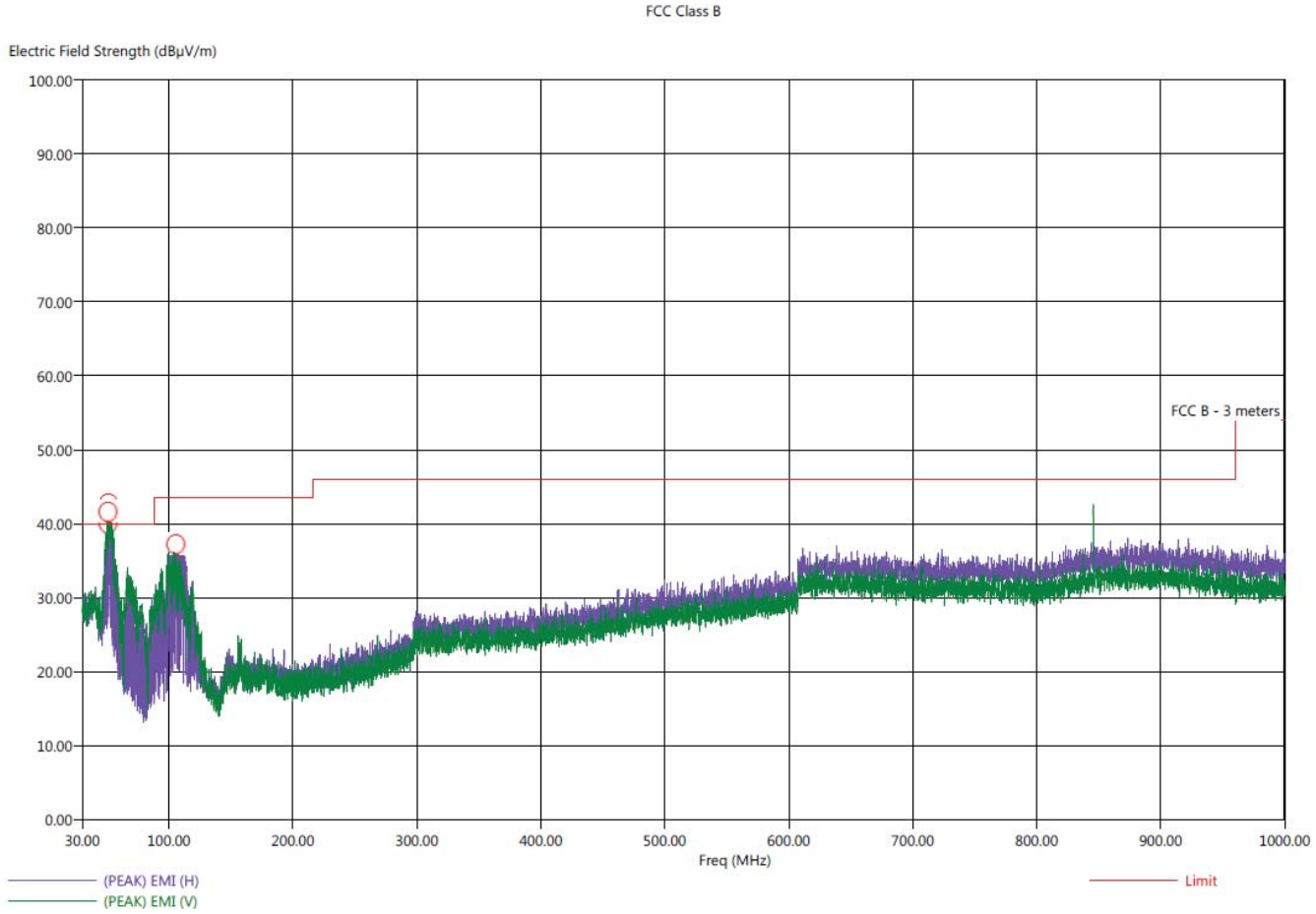
Date: 08/29/2016
Lab: D
Tested By: Kyle Fujimoto

Antenna Type: ANT-2.4-CW-RCS - Port 2
Non Harmonic Emissions from the Tx and Digital Portion 10 kHz to 30 MHz
Non Harmonic Emissions from the Tx and Digital Portion 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 10 kHz to 30 MHz
								for both Vertical and Horizontal
								Polarizations
								No Emissions Found for the
								Digital Portion
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic
								Emissions Found
								for the Tx Mode
								from 1 GHz to 25 GHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the
								X, Y, and Z-Axis

Title: Pre-Scan - FCC Class B
File: Agilent - ANT Antenna - Pre-Scan - FCC Class B - 30 MHz to 1000 MHz - X-Axis.set
Operator: Kyle Fujimoto
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel - X-Axis
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS on Port 1 (Worst Case)

8/29/2016 4:39:59 PM
Sequence: Preliminary Scan



Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - ANT Antenna - Final Scan - FCC Class B - 30 MHz to 1000 MHz - X-Axis.set
Operator: Kyle Fujimoto
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel - X-Axis
Comments: Customer: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS on Port 1 (Worst Case)

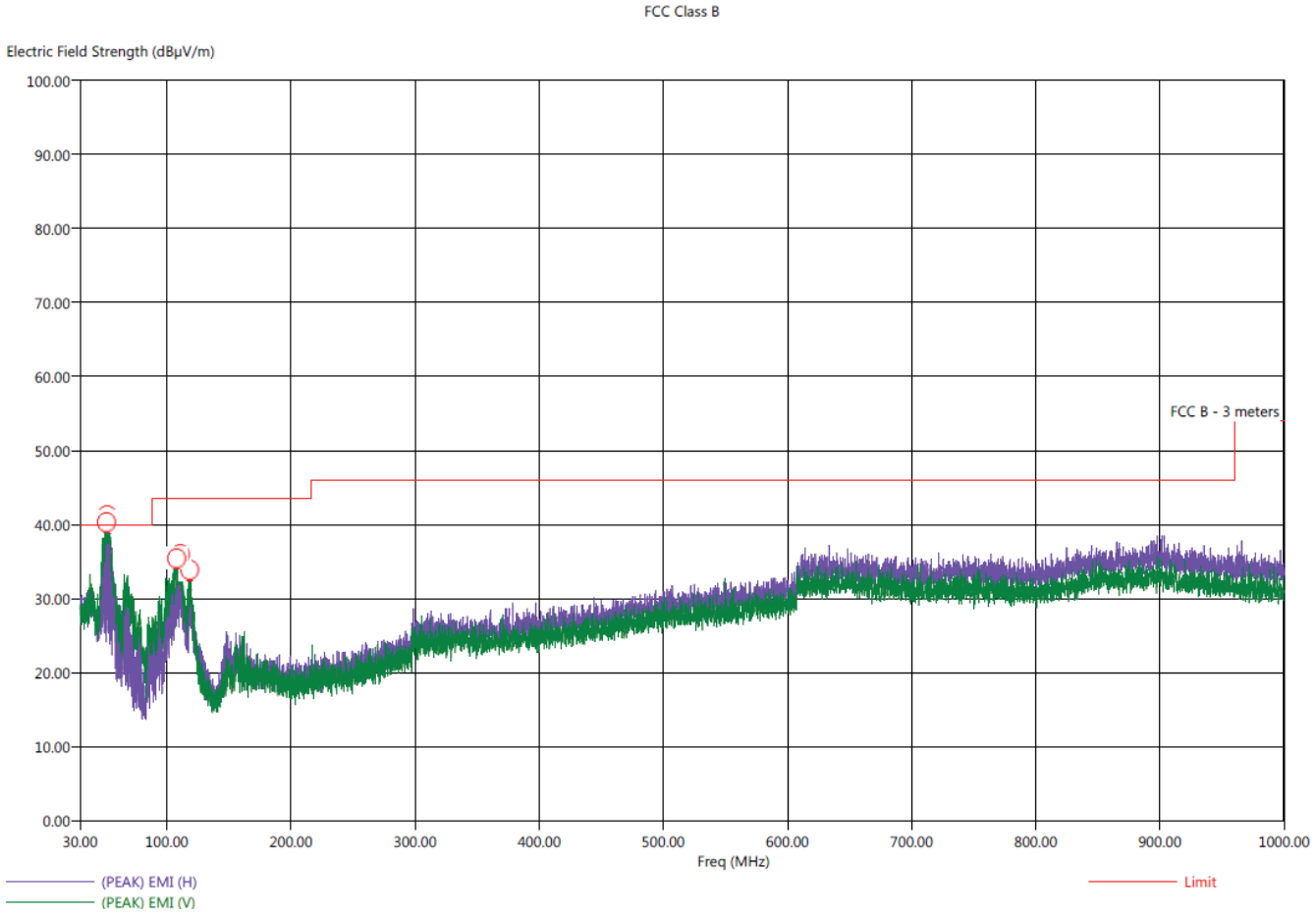
8/29/2016 4:50:09 PM
Sequence: Final Measurements

FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Twr Ht (cm)	Ttbl Agl (deg)
50.90	H	33.59	29.66	-6.41	-10.34	40.00	208.44	242.00
50.90	V	33.58	29.60	-6.42	-10.40	40.00	223.31	300.50
51.20	V	33.91	29.24	-6.09	-10.76	40.00	319.55	260.50
51.50	H	33.73	28.92	-6.27	-11.08	40.00	399.91	196.50
51.80	H	32.34	28.61	-7.66	-11.39	40.00	207.13	297.50
52.80	H	33.22	27.85	-6.78	-12.15	40.00	207.01	24.75
53.60	H	31.89	27.34	-8.11	-12.66	40.00	367.67	300.50
105.60	H	26.32	22.25	-17.18	-21.25	43.50	255.19	57.25

Title: Pre-Scan - FCC Class B
File: Agilent - 1513504-1 Antenna - Port 2 - Pre-Scan - FCC Class B - 30 MHz to 1000 MHz - Y-Axis.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel - Y-Axis
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With antenna, P/N: 1513504-1, on Port 2 (Worst Case)

8/31/2016 3:57:37 PM
Sequence: Preliminary Scan



Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - 1513504-1 Antenna - Port 2 - Final Scan - FCC Class B - 30 MHz to 1000 MHz - Y-Axis.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel - Y-Axis
Comments: Customer: Preston Cinema Systems
Model: TR4-3.2A
With antenna, P/N: 1513504-1, on Port 2 (Worst Case)

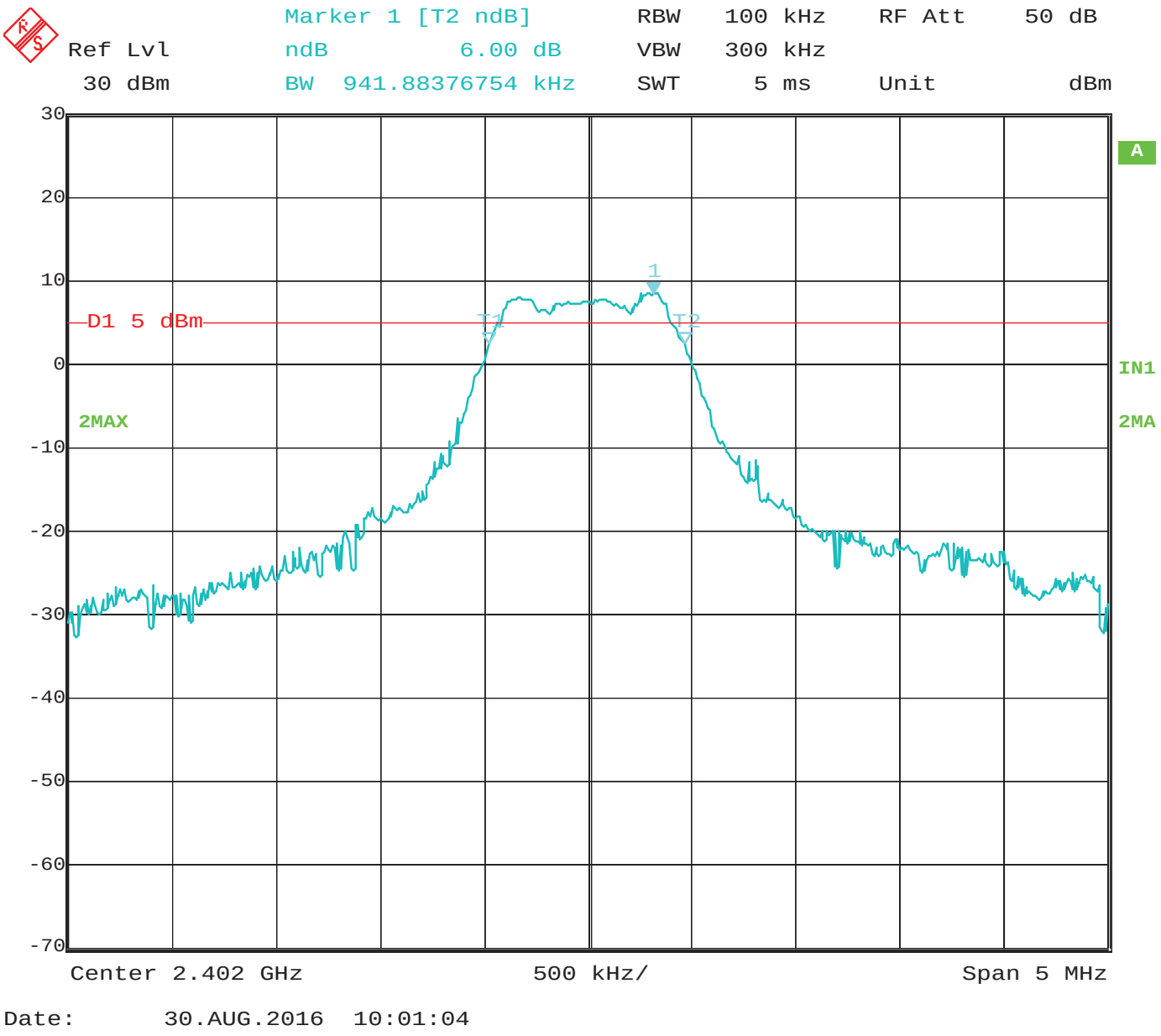
8/31/2016 4:27:14 PM
Sequence: Final Measurements

FCC Class B

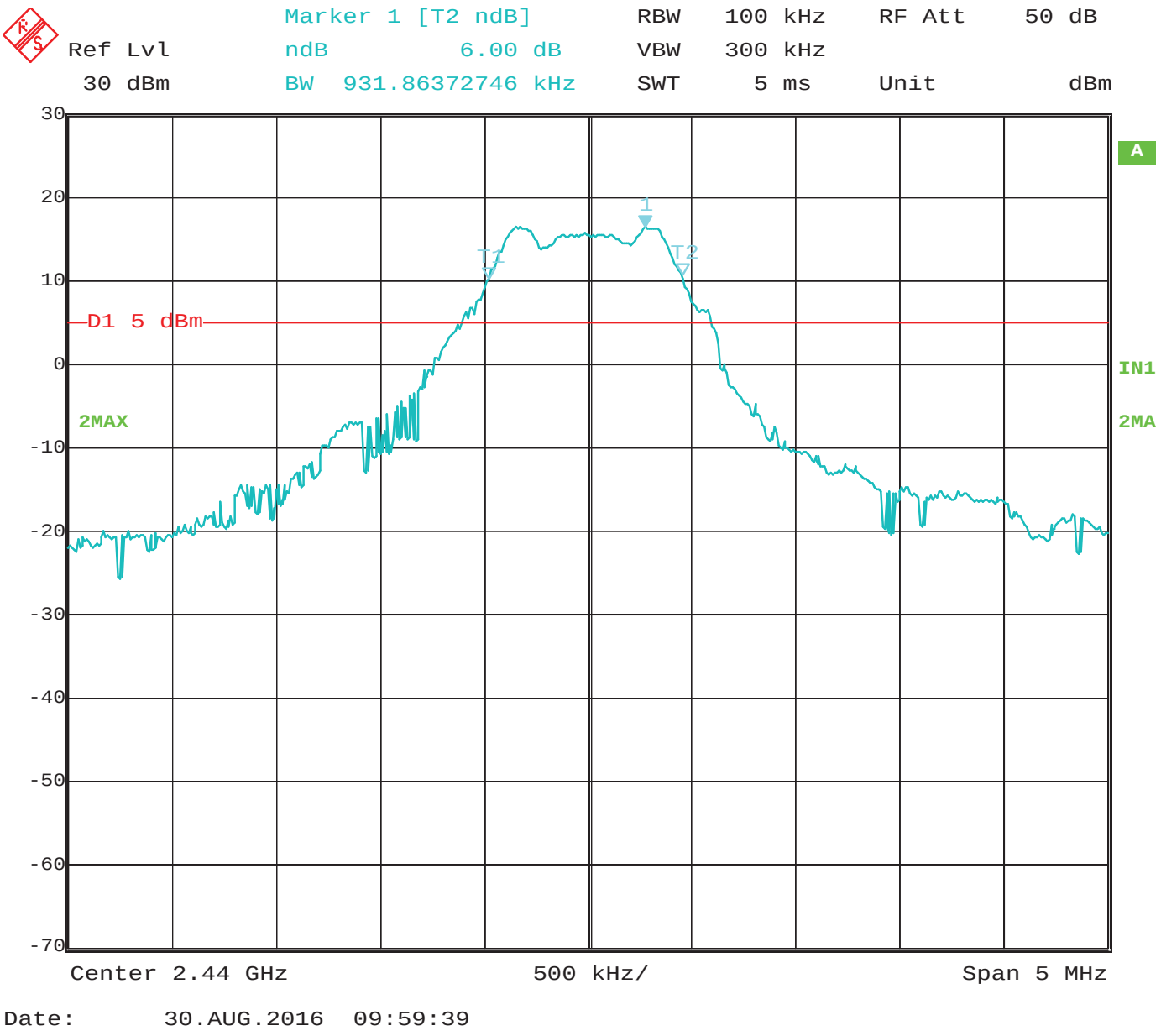
Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Twr Ht (cm)	Ttbl Aql (deg)
51.40	V	33.38	29.18	-6.62	-10.82	40.00	367.07	202.75
52.00	V	33.36	28.72	-6.64	-11.28	40.00	351.73	115.25
52.50	H	32.70	28.16	-7.30	-11.84	40.00	127.31	198.25
107.90	V	26.71	22.36	-16.79	-21.14	43.50	159.61	157.25
110.90	V	27.26	22.59	-16.24	-20.91	43.50	303.37	319.00
118.50	V	27.48	23.11	-16.02	-20.39	43.50	399.73	259.75

-6 dB BANDWIDTH

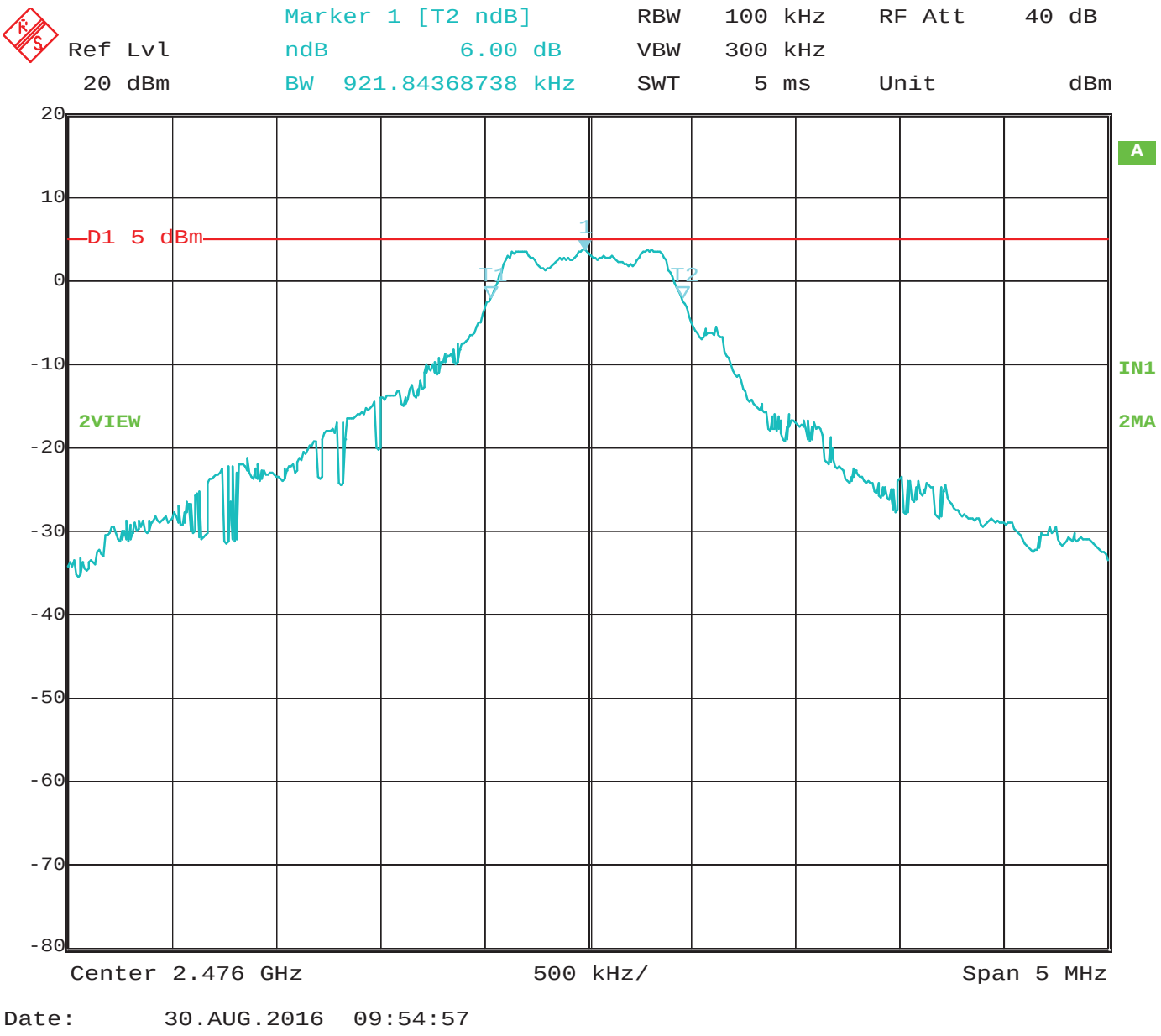
DATA SHEETS



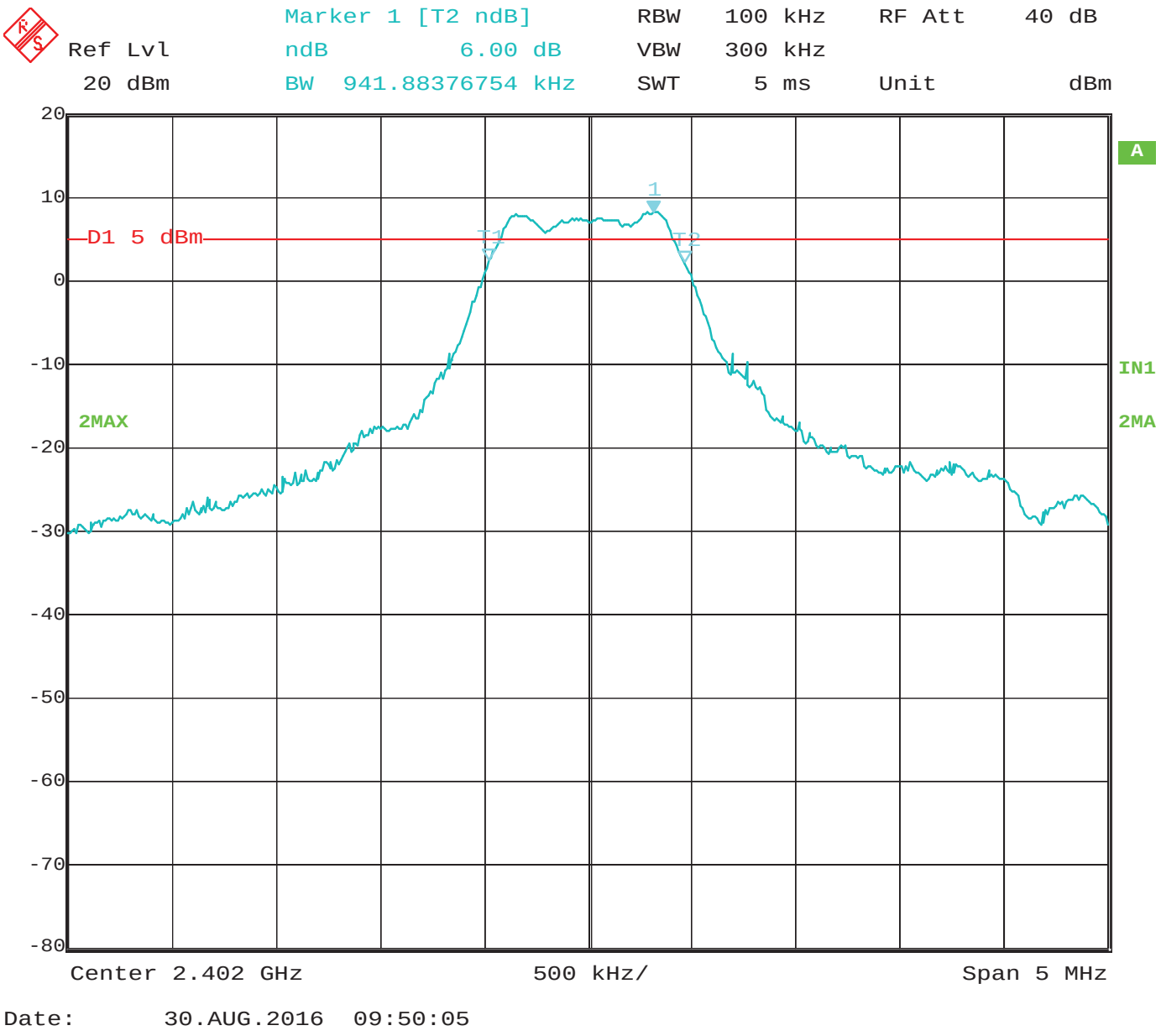
-6 dB Bandwidth – Low Channel – Port #1



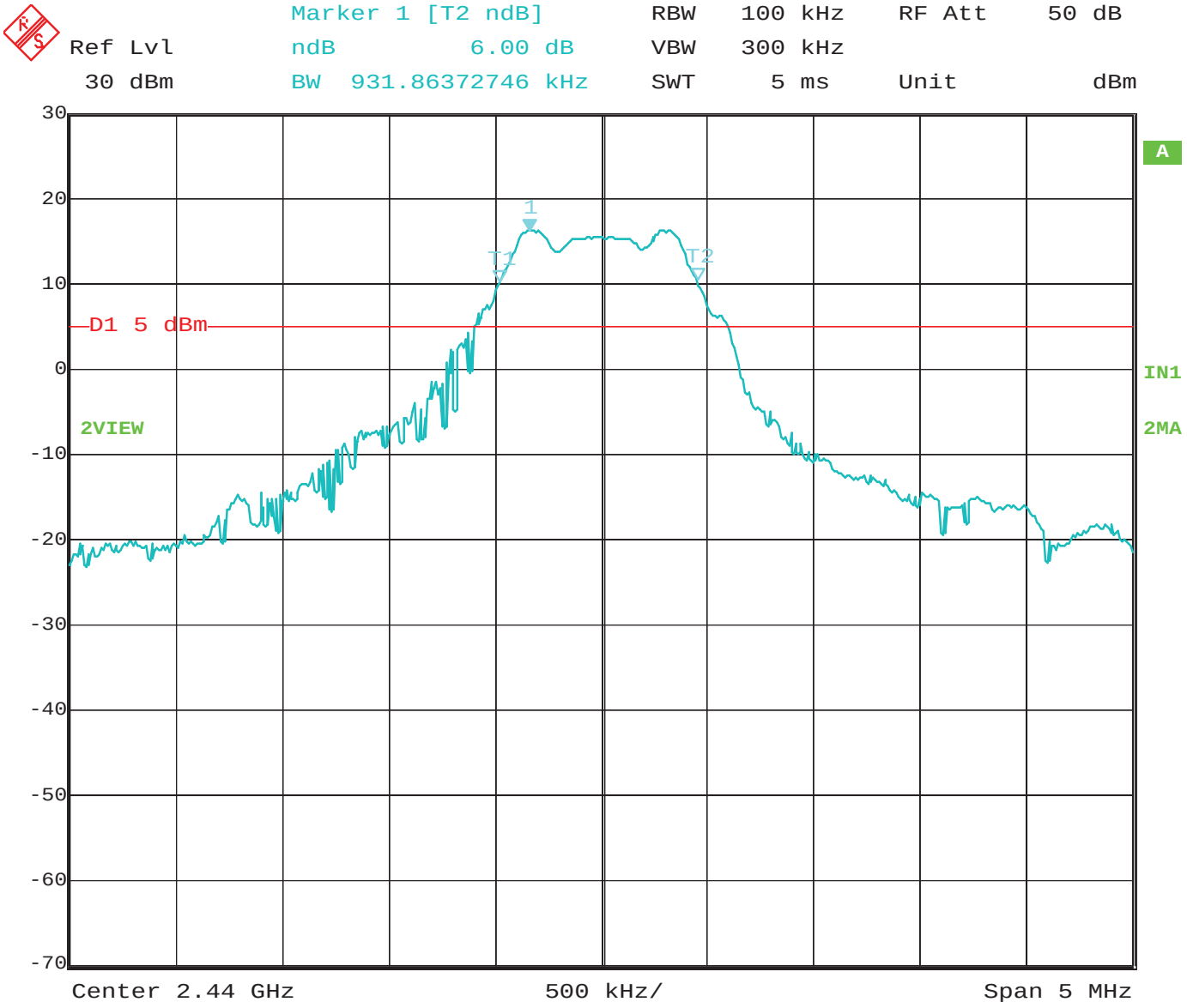
-6 dB Bandwidth – Middle Channel – Port #1



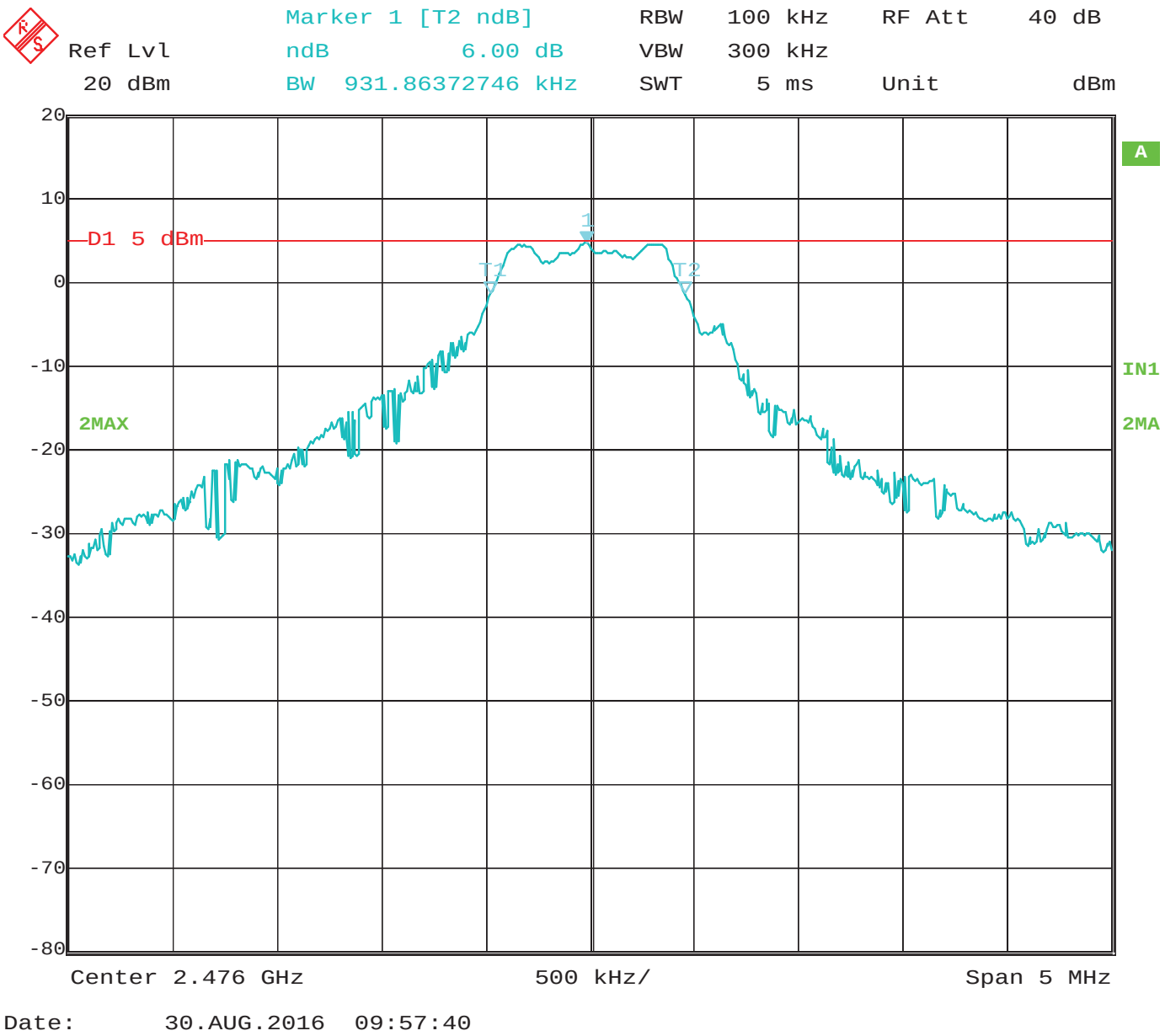
-6 dB Bandwidth – High Channel – Port #1



-6 dB Bandwidth – Low Channel – Port #2



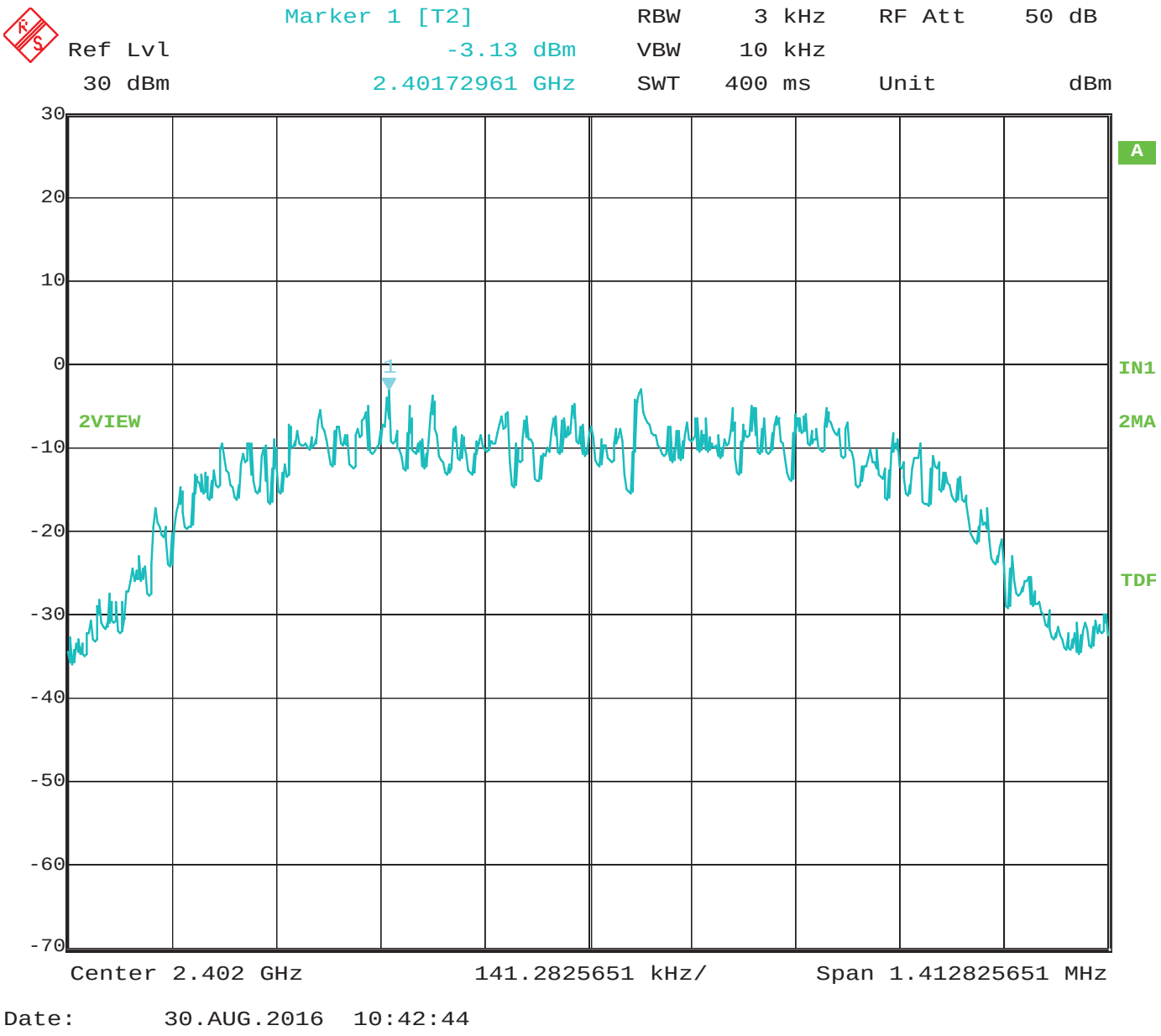
-6 dB Bandwidth – Middle Channel – Port #2



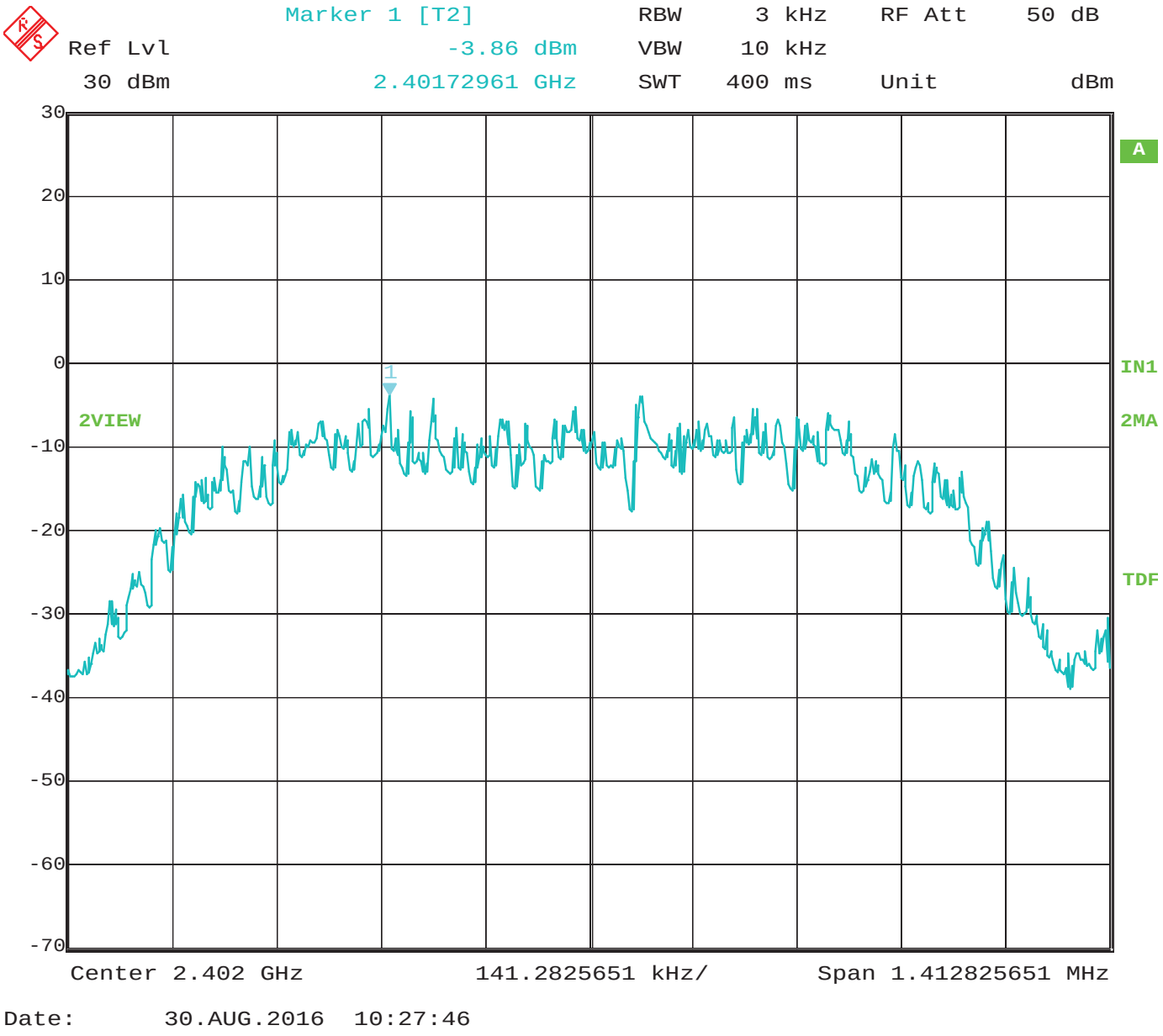
-6 dB Bandwidth – High Channel – Port #2

SPECTRAL DENSITY OUTPUT

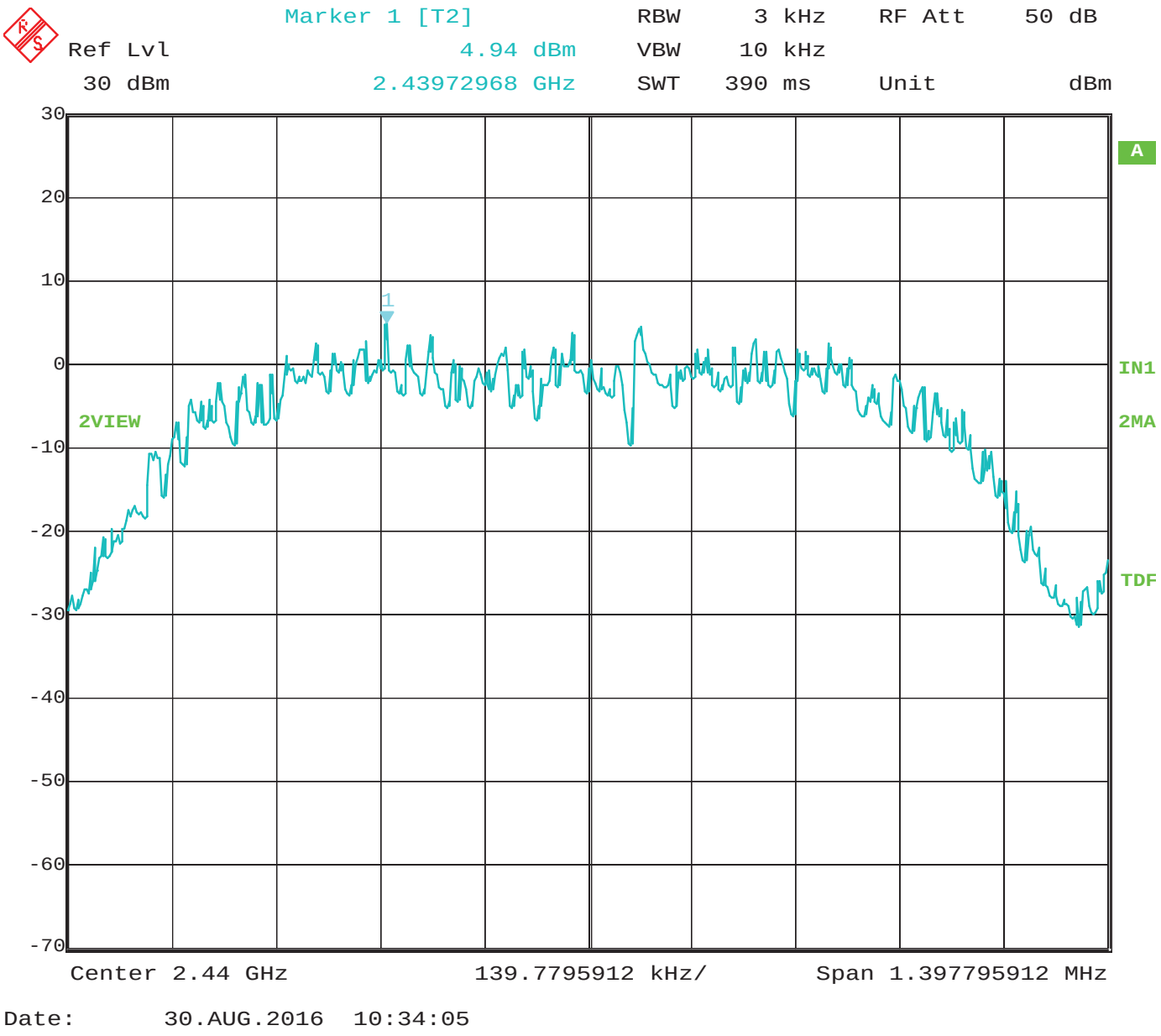
DATA SHEETS



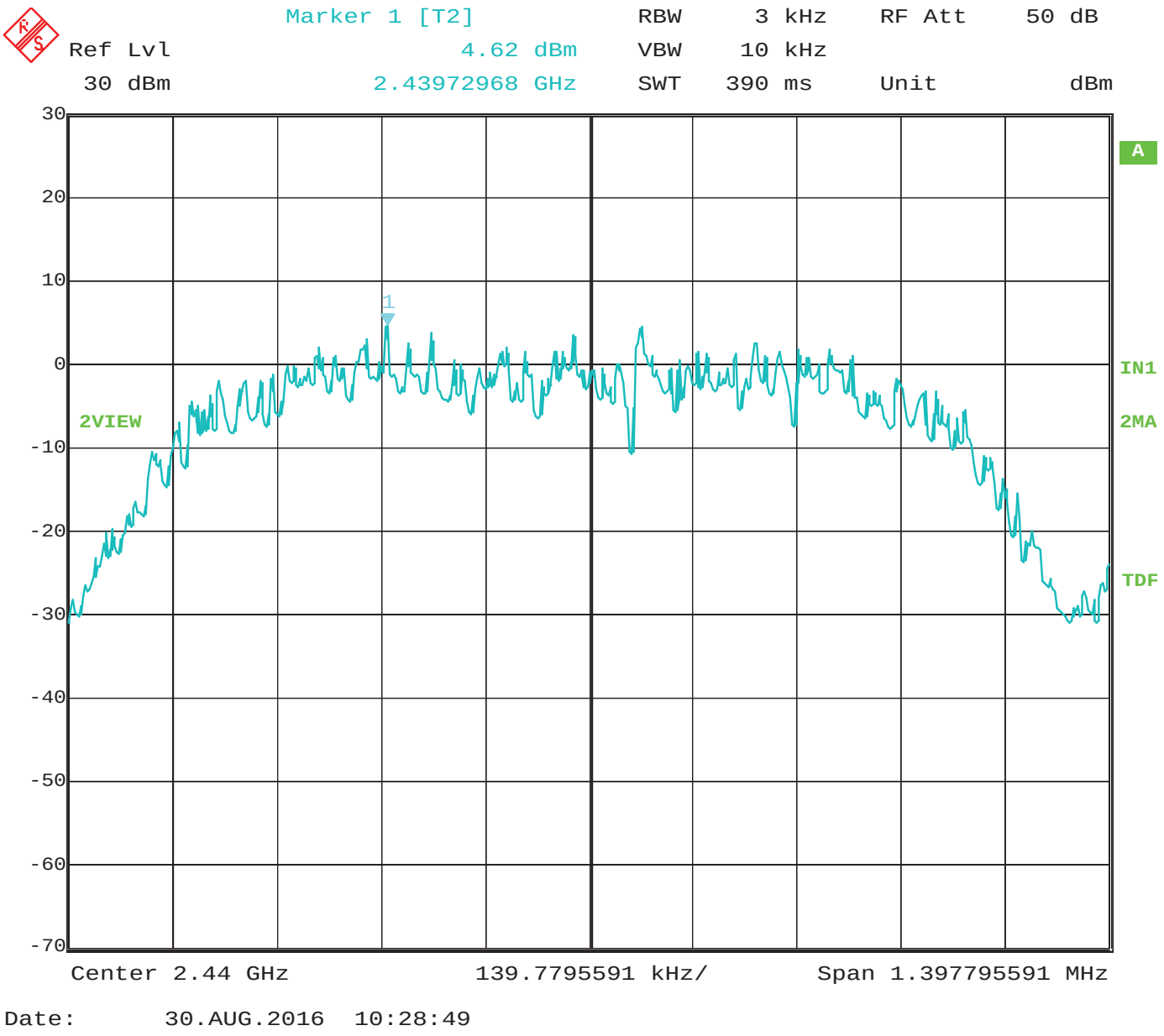
Spectral Density – Low Channel – Port #1



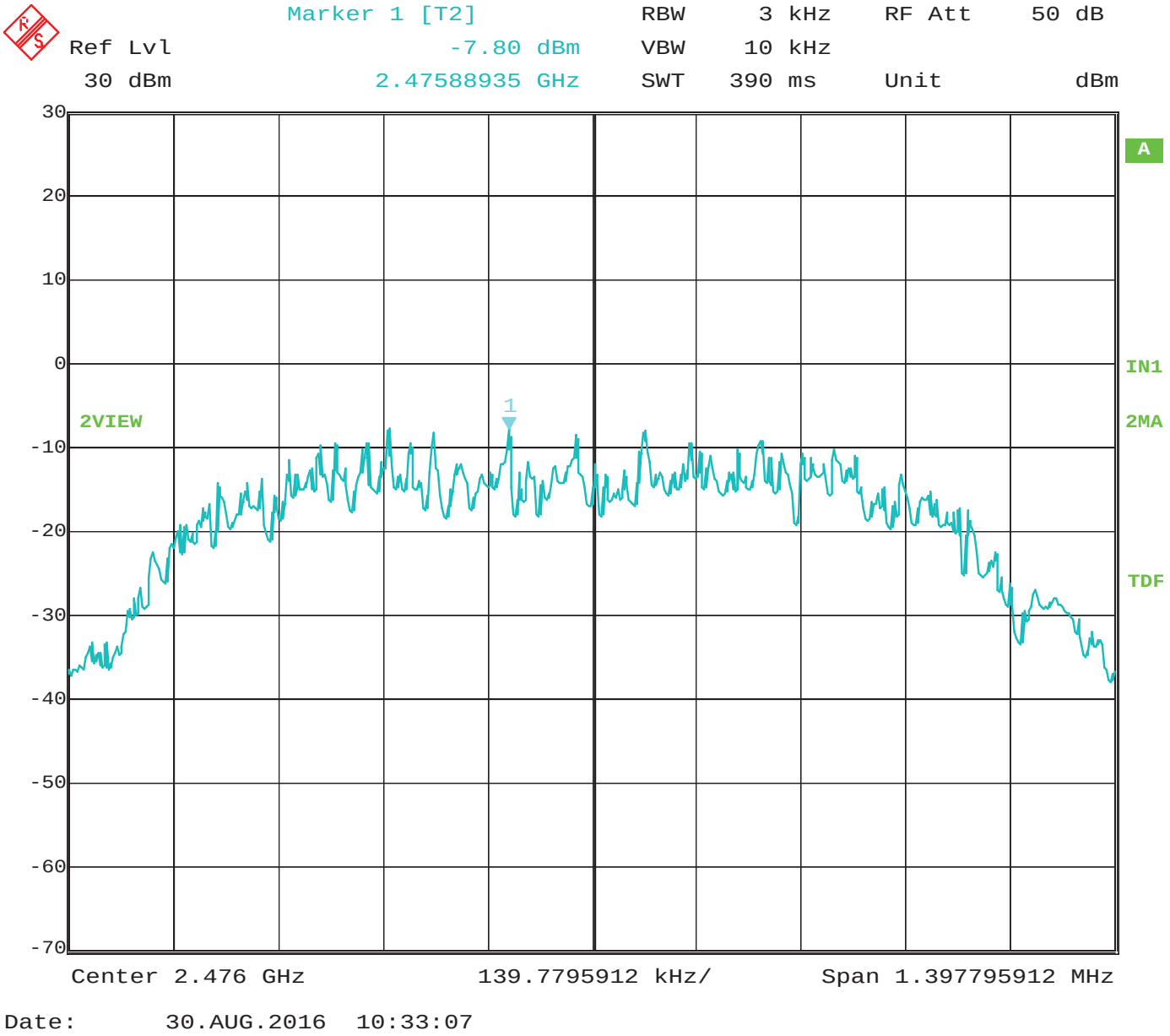
Spectral Density – Low Channel – Port #2



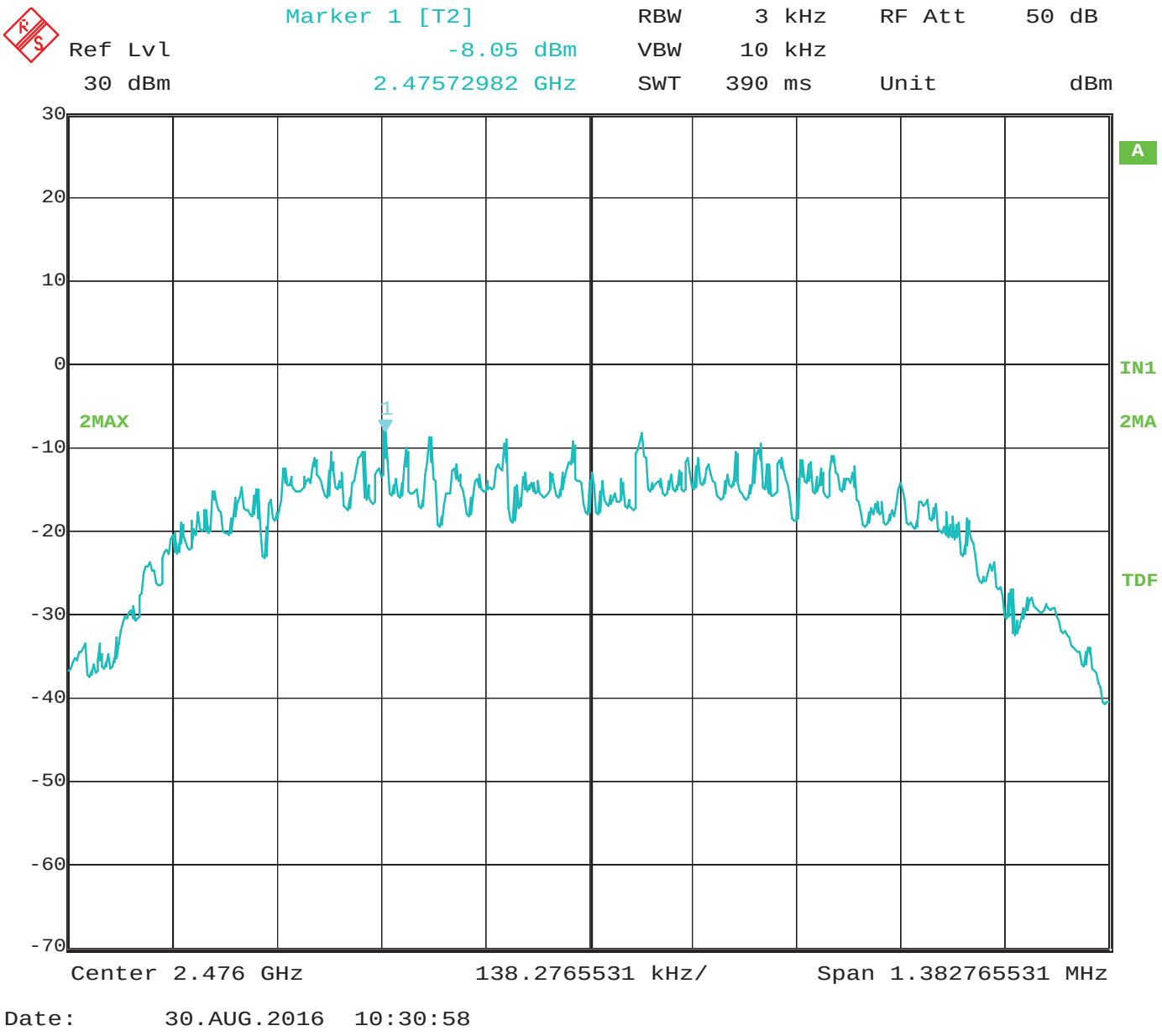
Spectral Density – Middle Channel – Port #1



Spectral Density – Middle Channel – Port #2



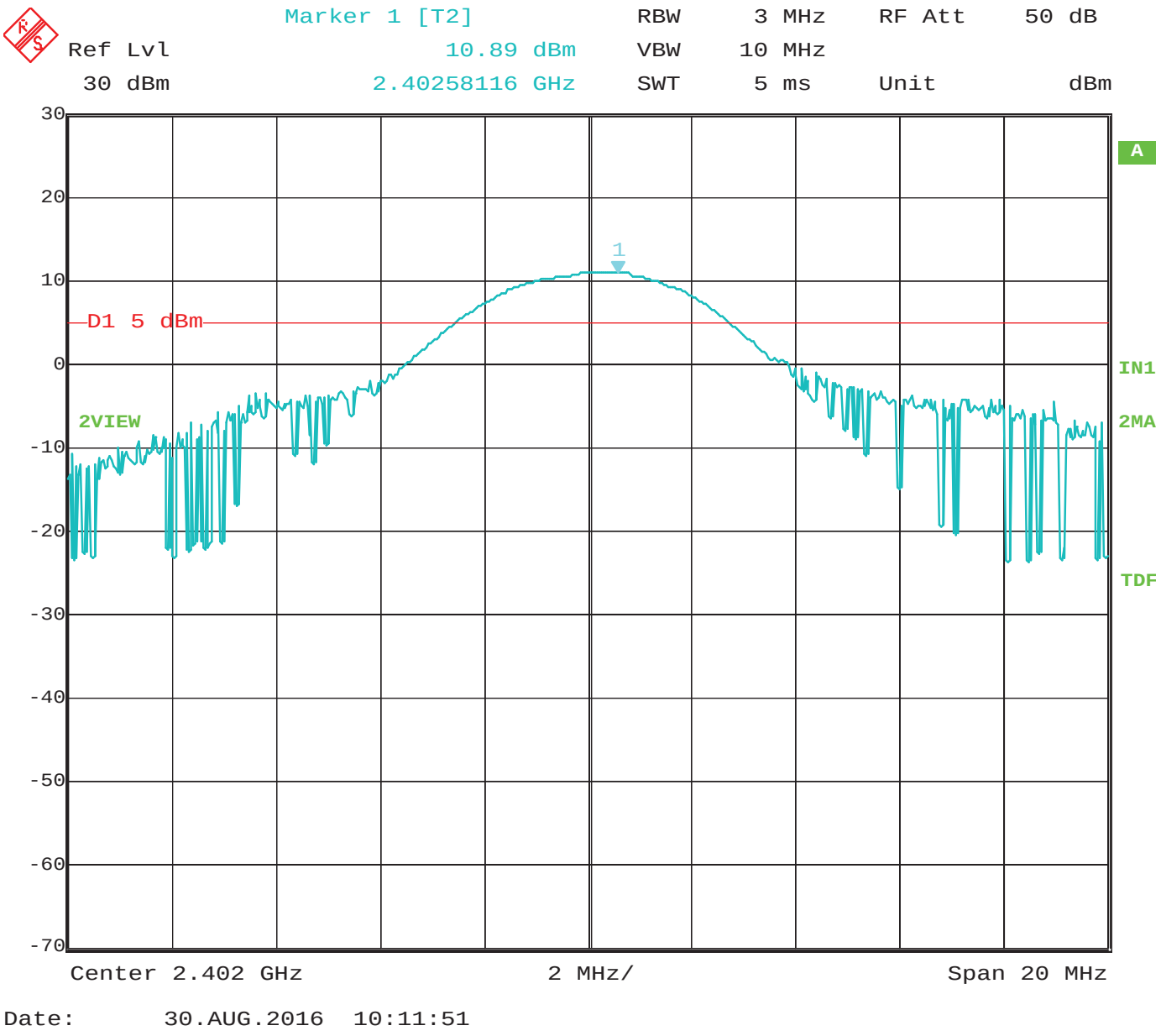
Spectral Density – High Channel – Port #1



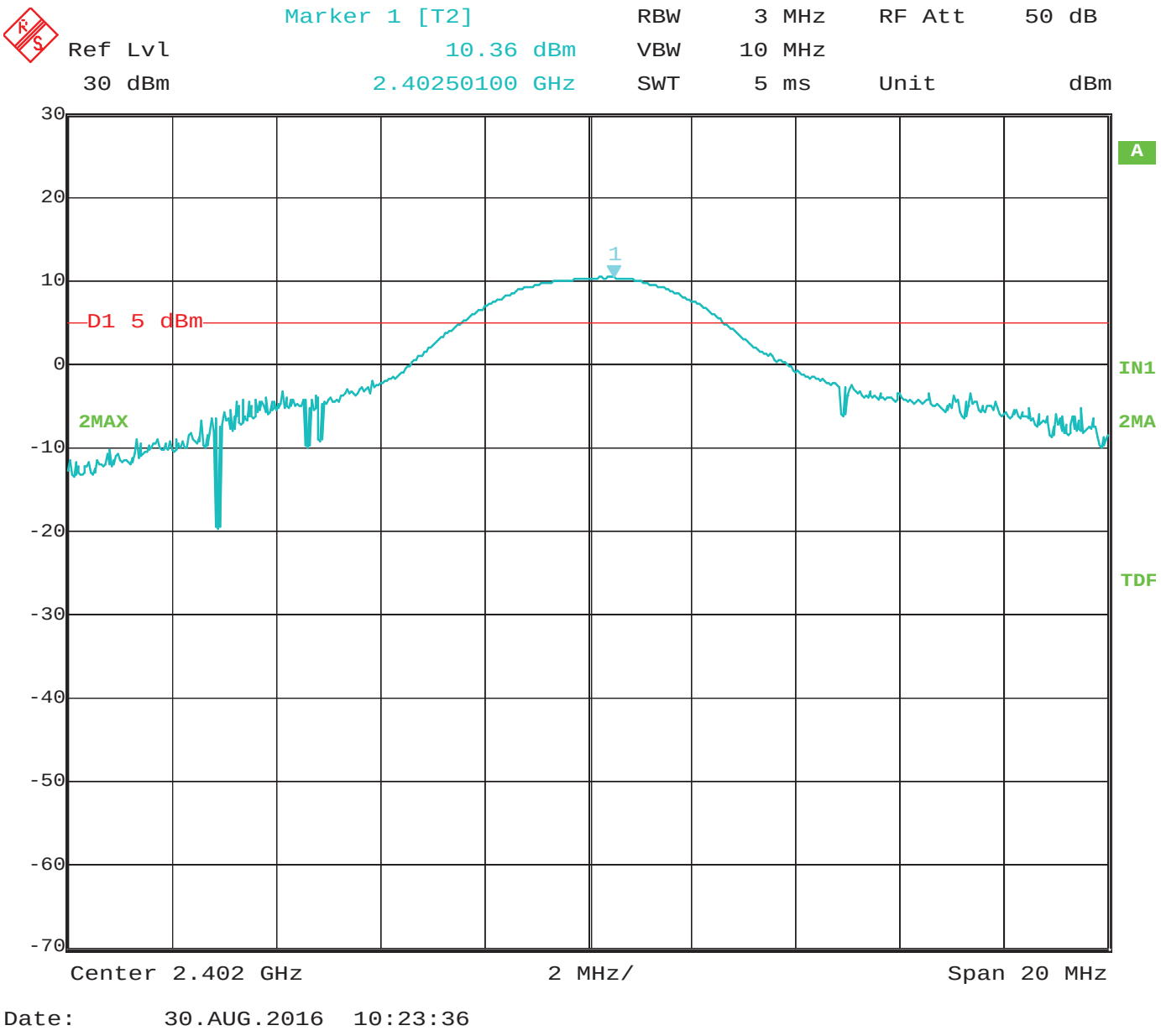
Spectral Density – High Channel – Port #2

PEAK POWER

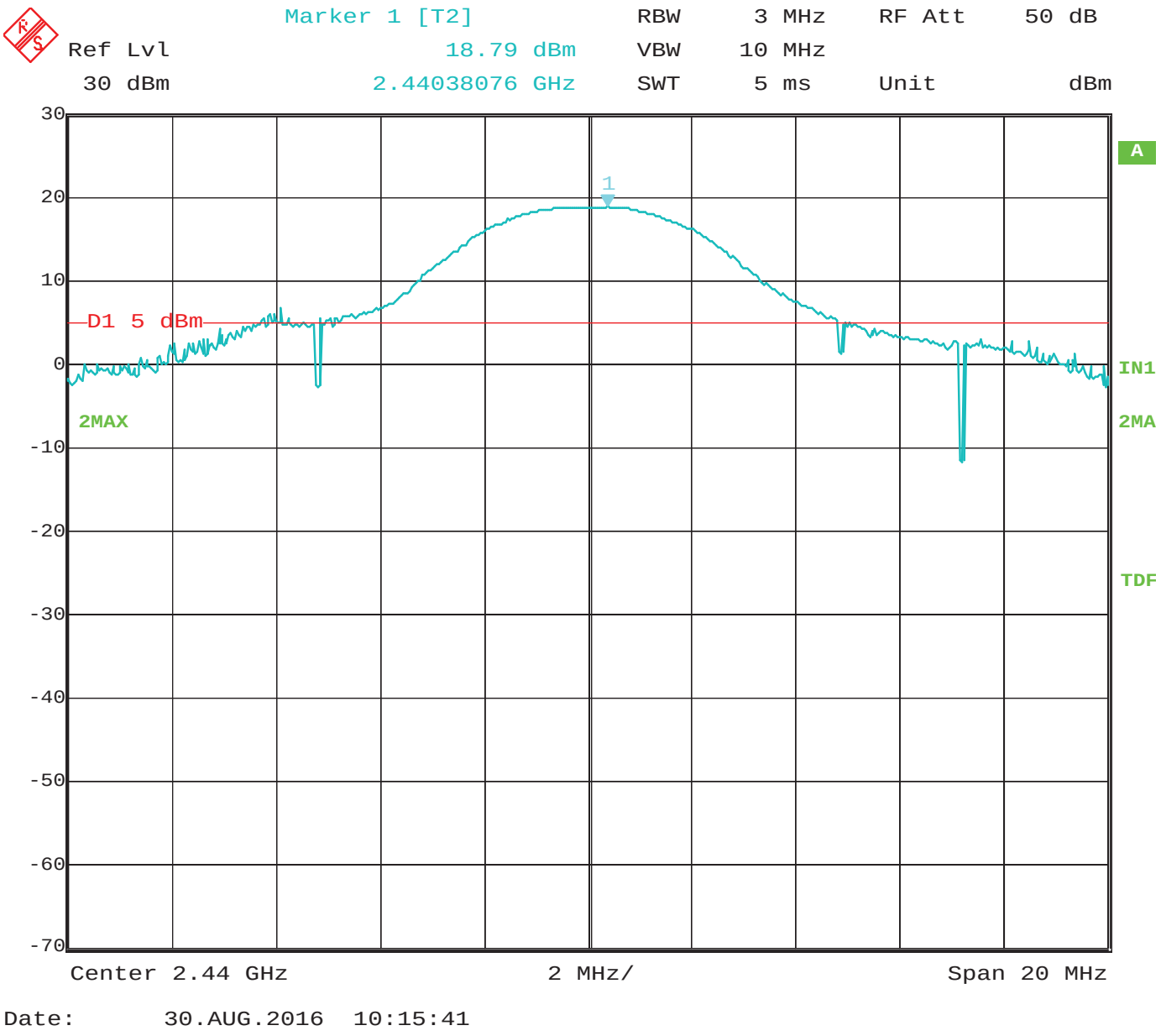
DATA SHEETS



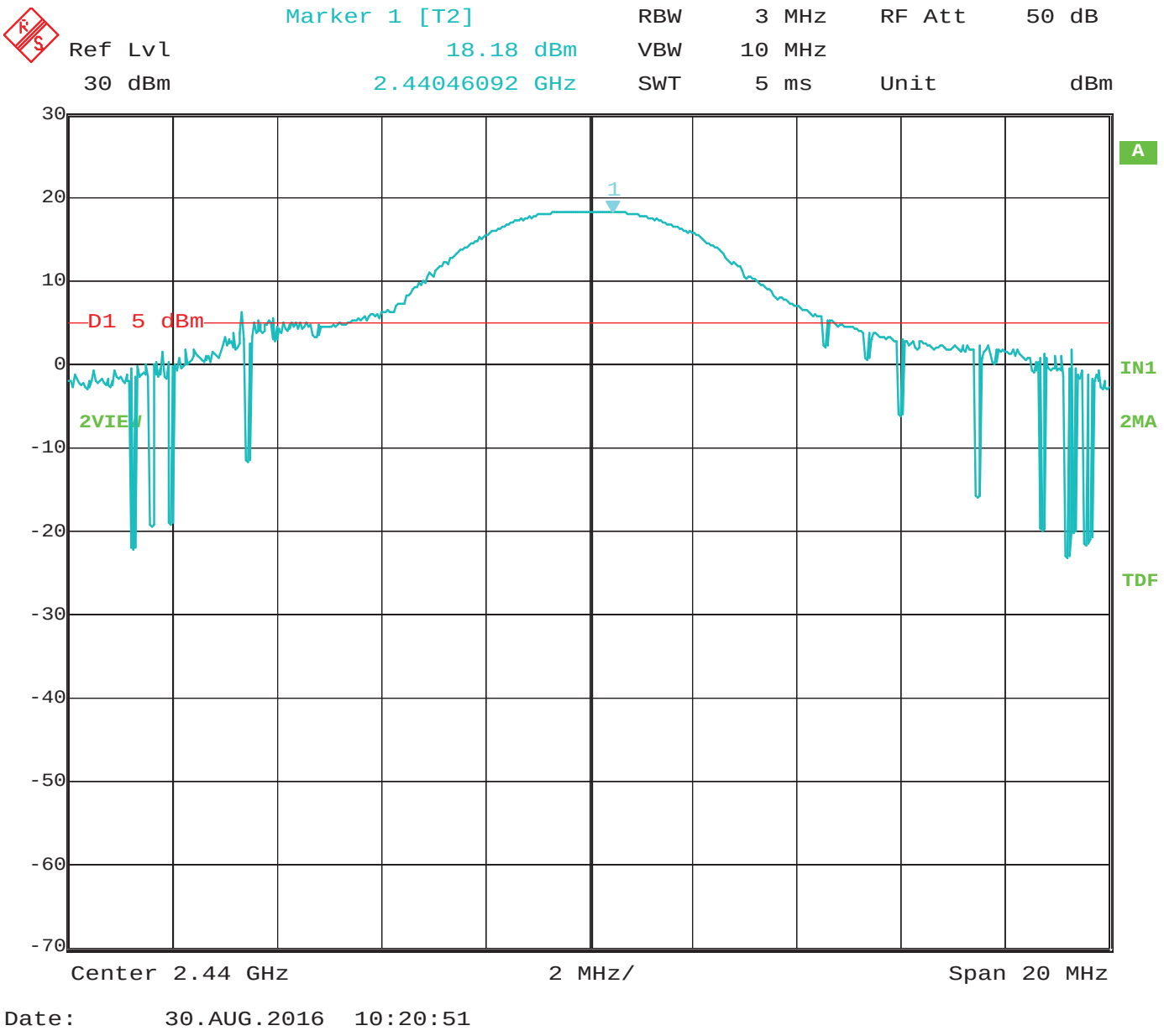
Peak Power – Low Channel – Port #1



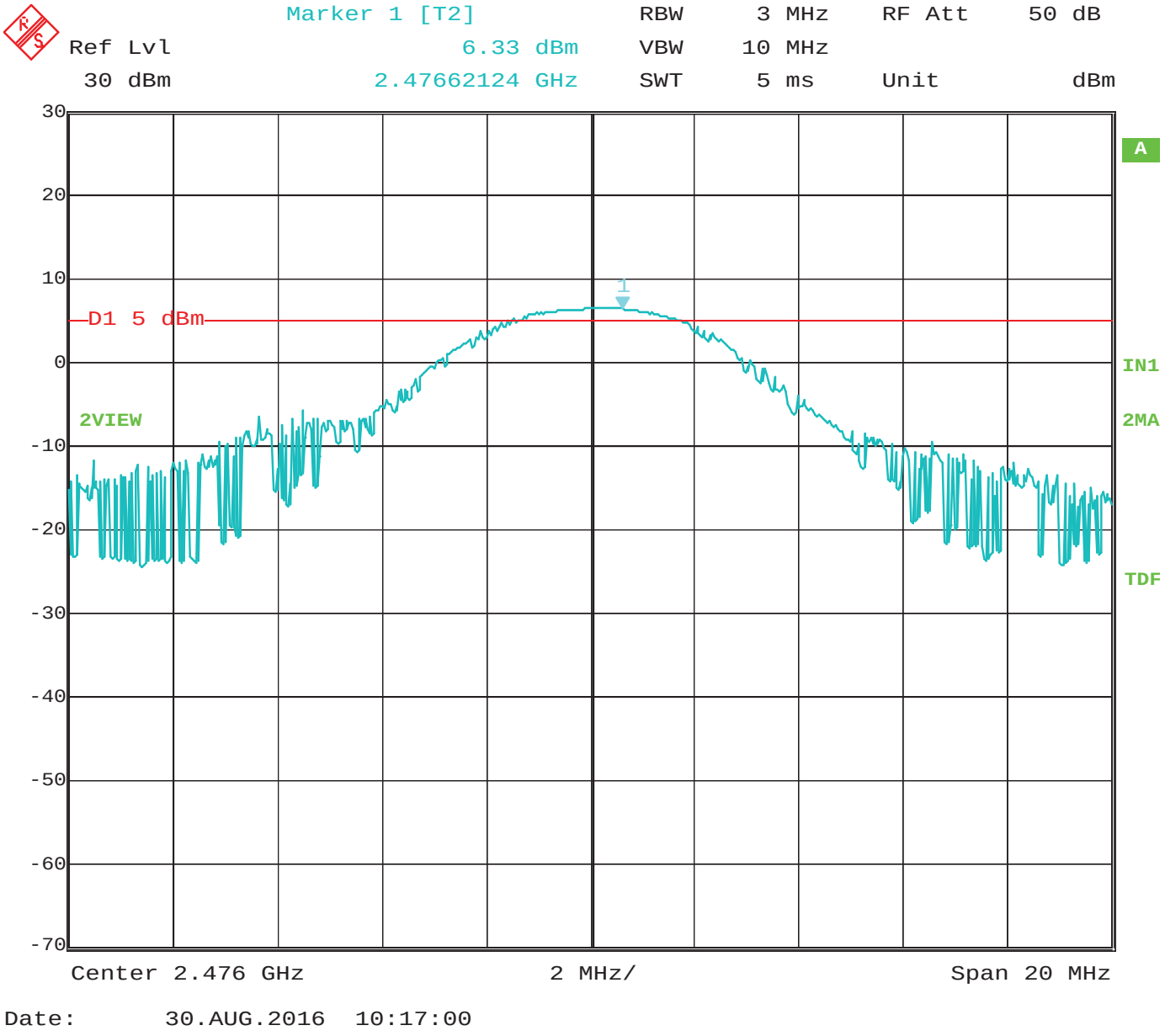
Peak Power – Low Channel – Port #2



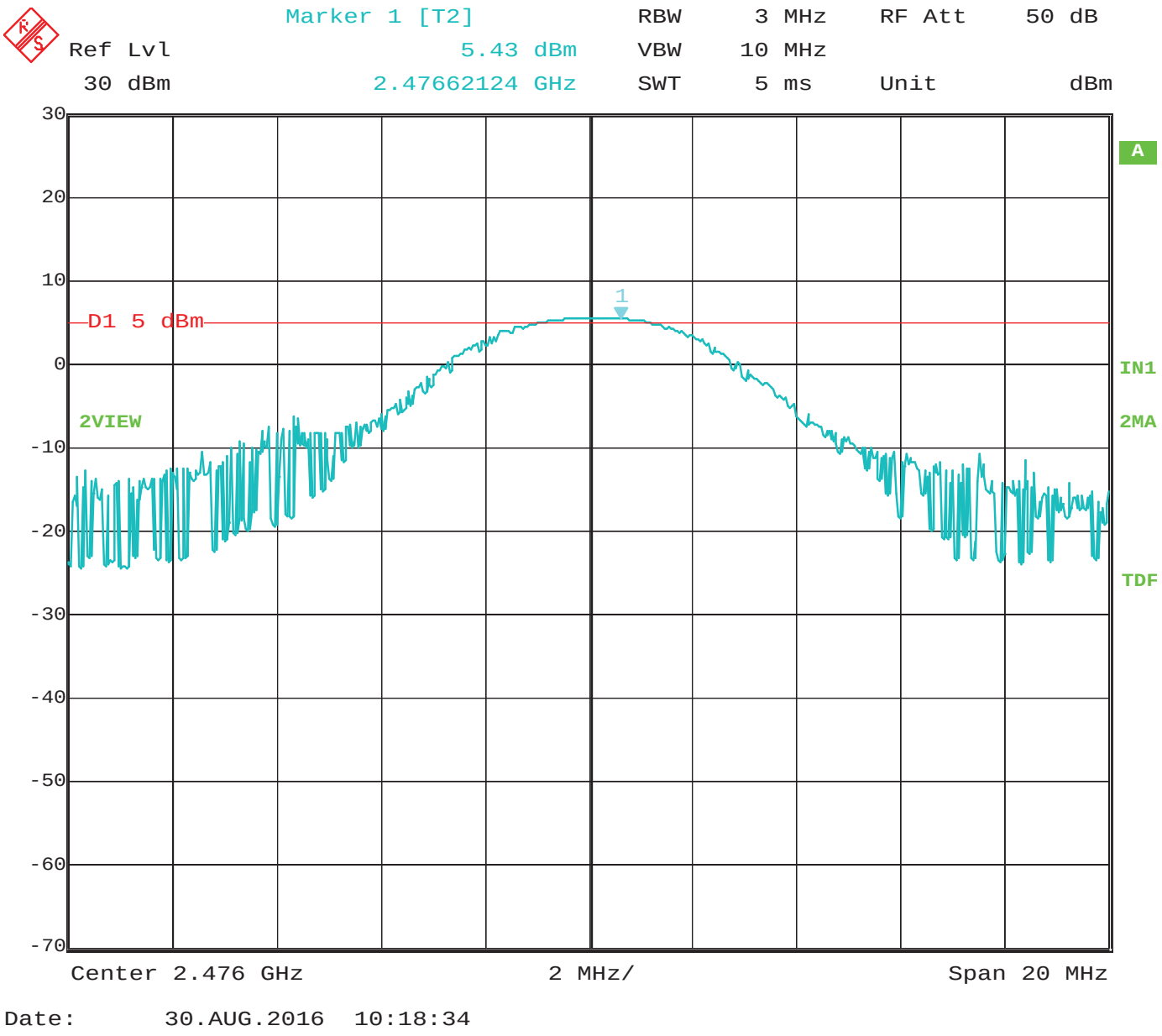
Peak Power – Middle Channel – Port #1



Peak Power – Middle Channel – Port #2



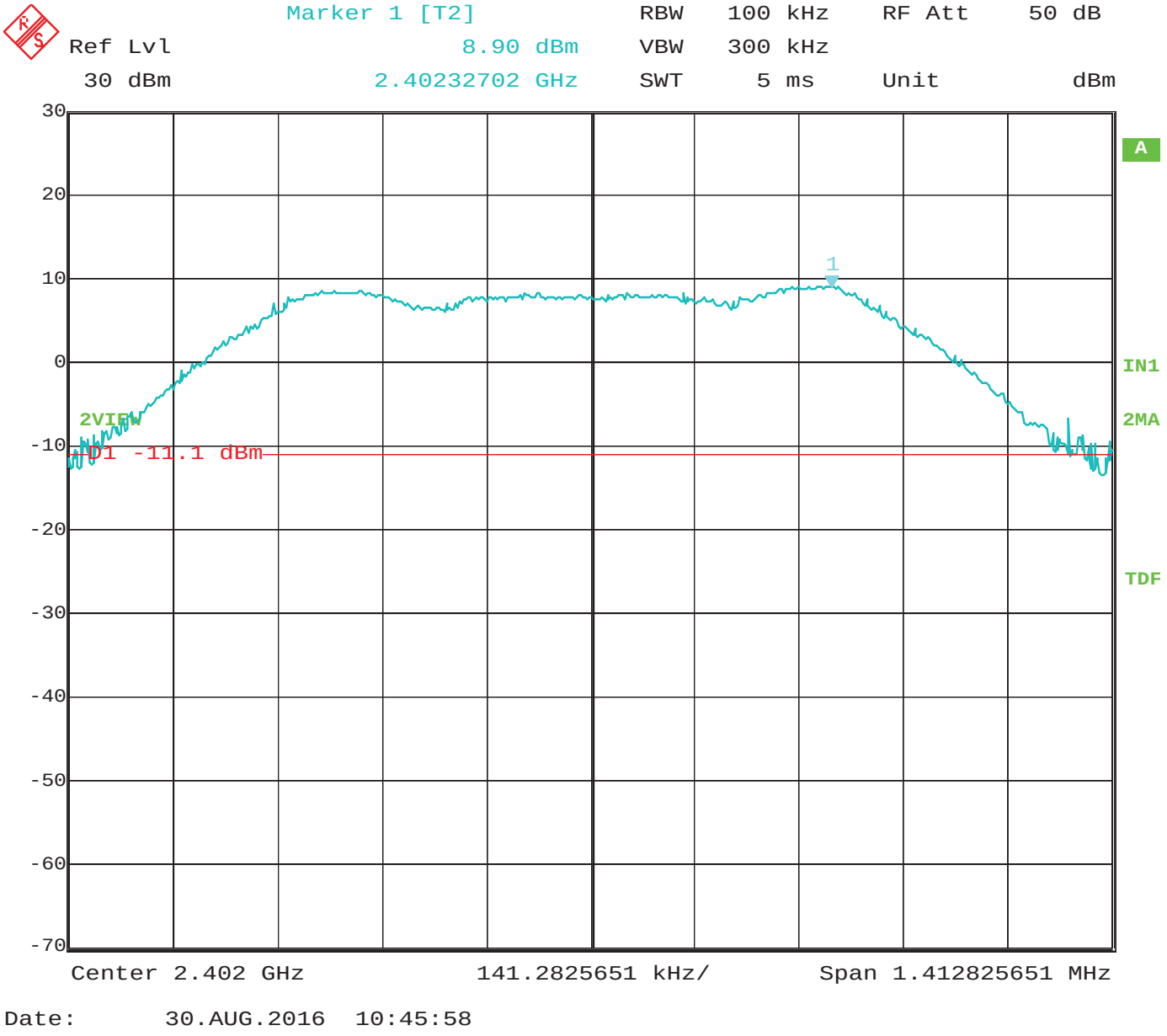
Peak Power – High Channel – Port #1



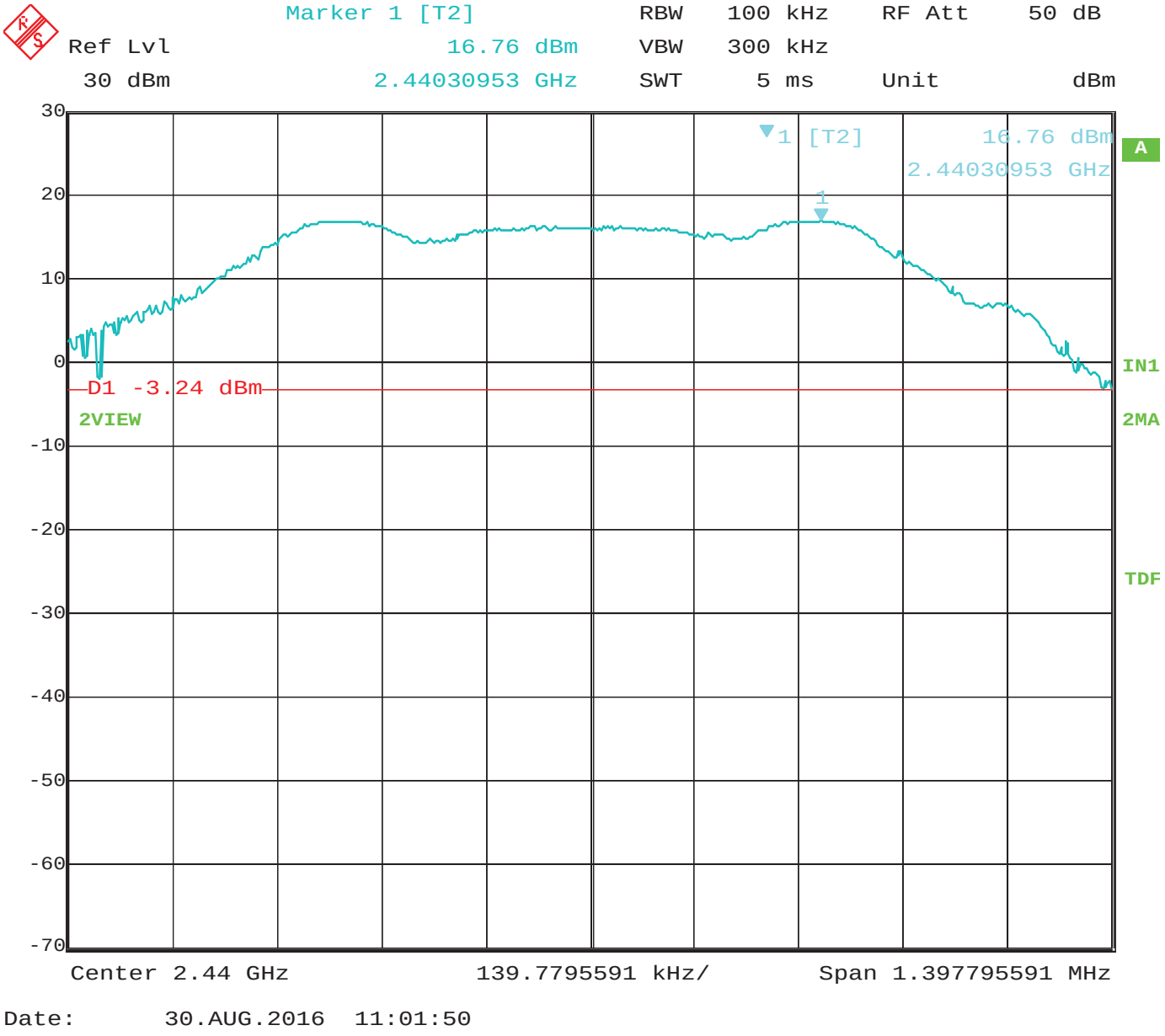
Peak Power – High Channel – Port #2

HARMONIC EMISSIONS IN NON-RESTRICTED FREQUENCY BANDS

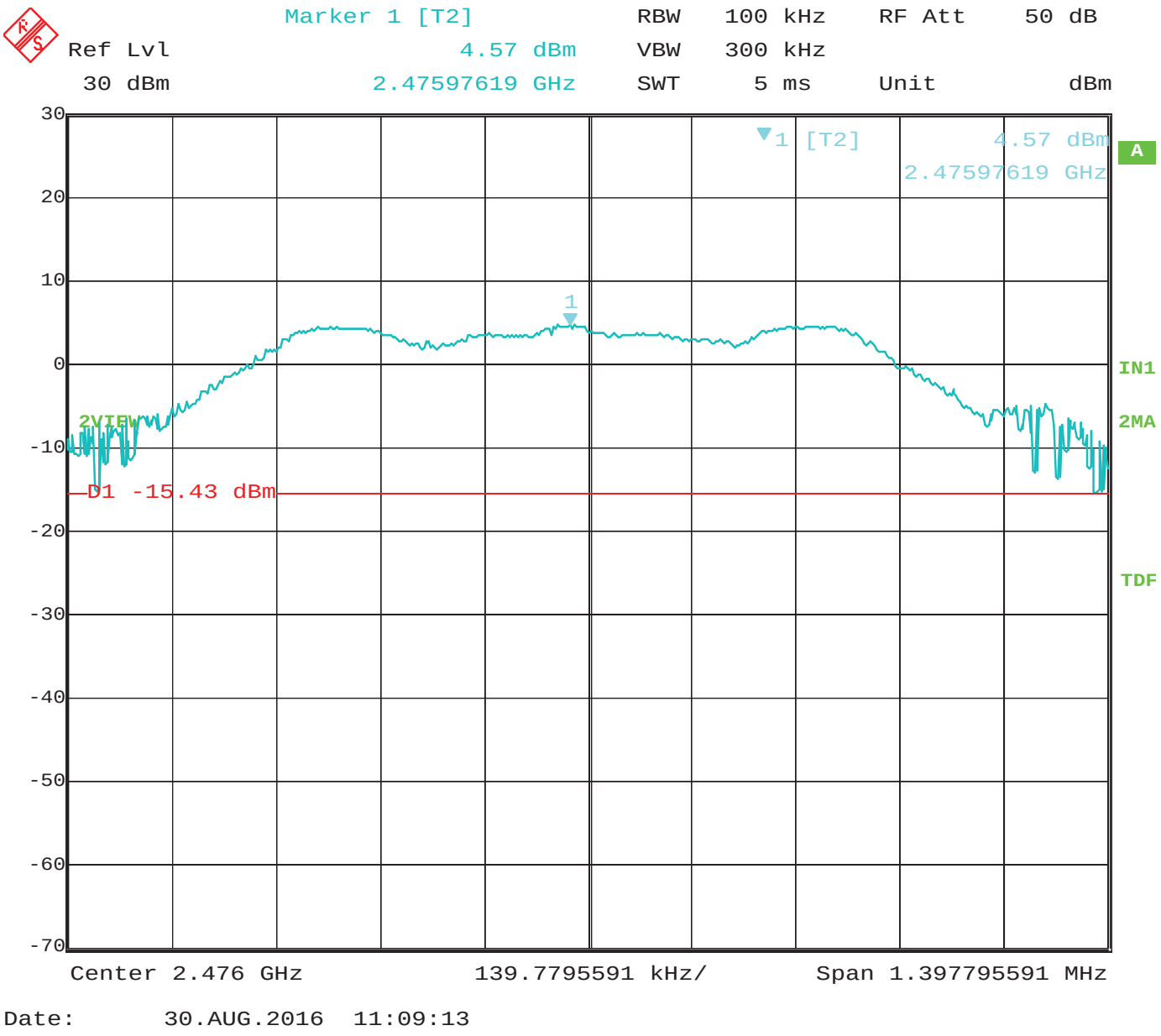
DATA SHEETS



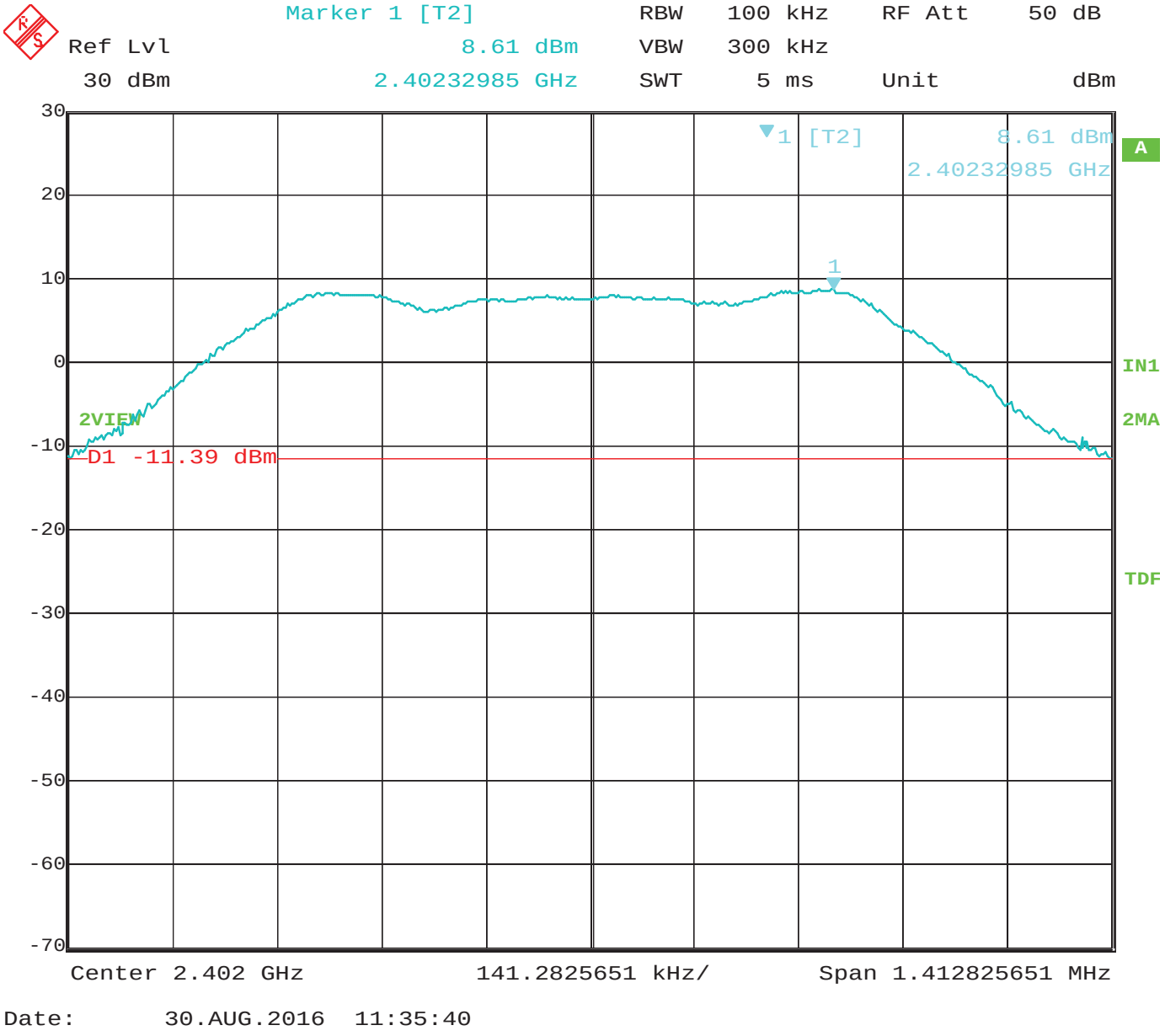
RF Antenna Conducted Test – Low Channel – Port #1 – Reference Level



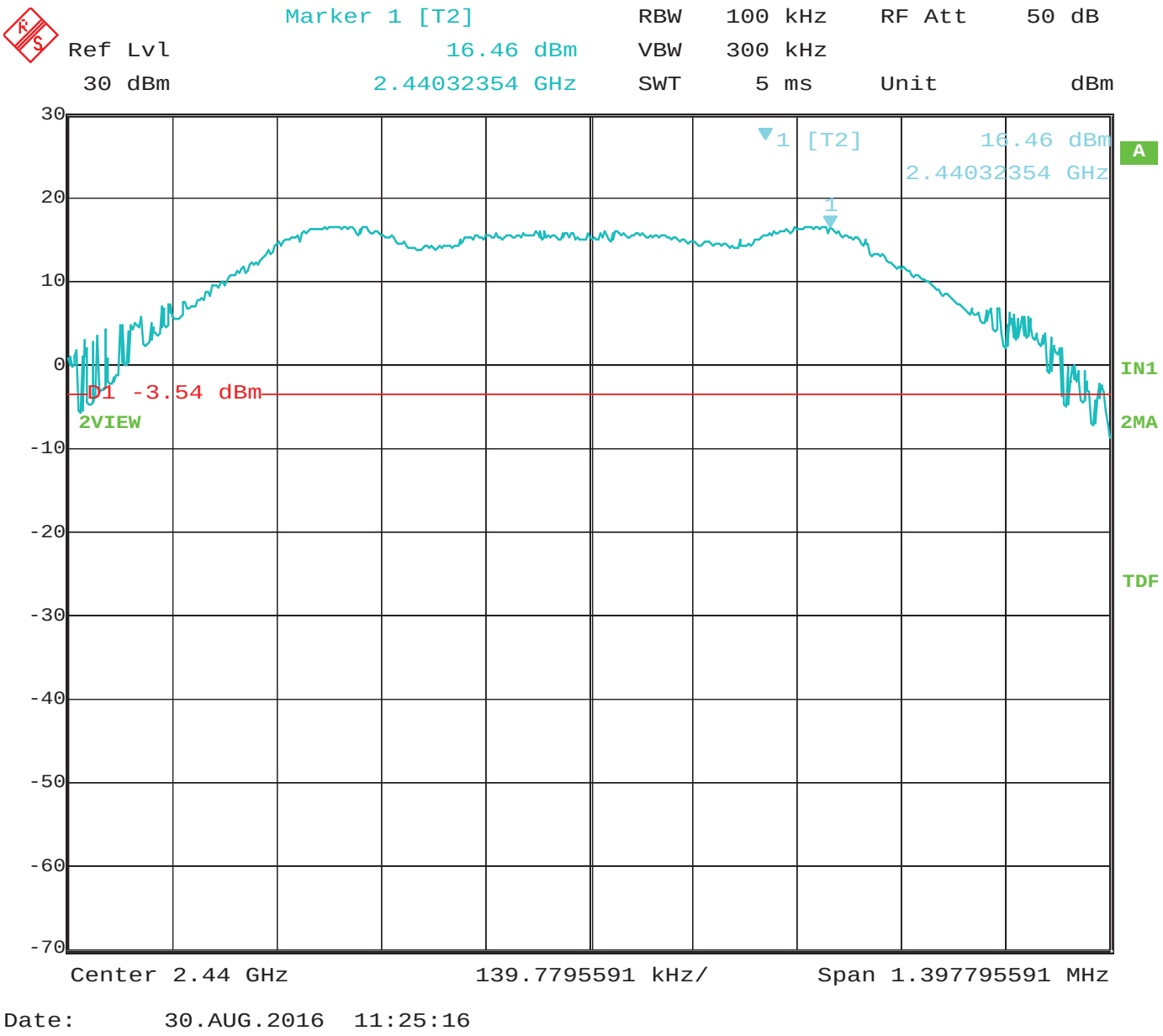
RF Antenna Conducted Test – Middle Channel – Port #1 – Reference Level



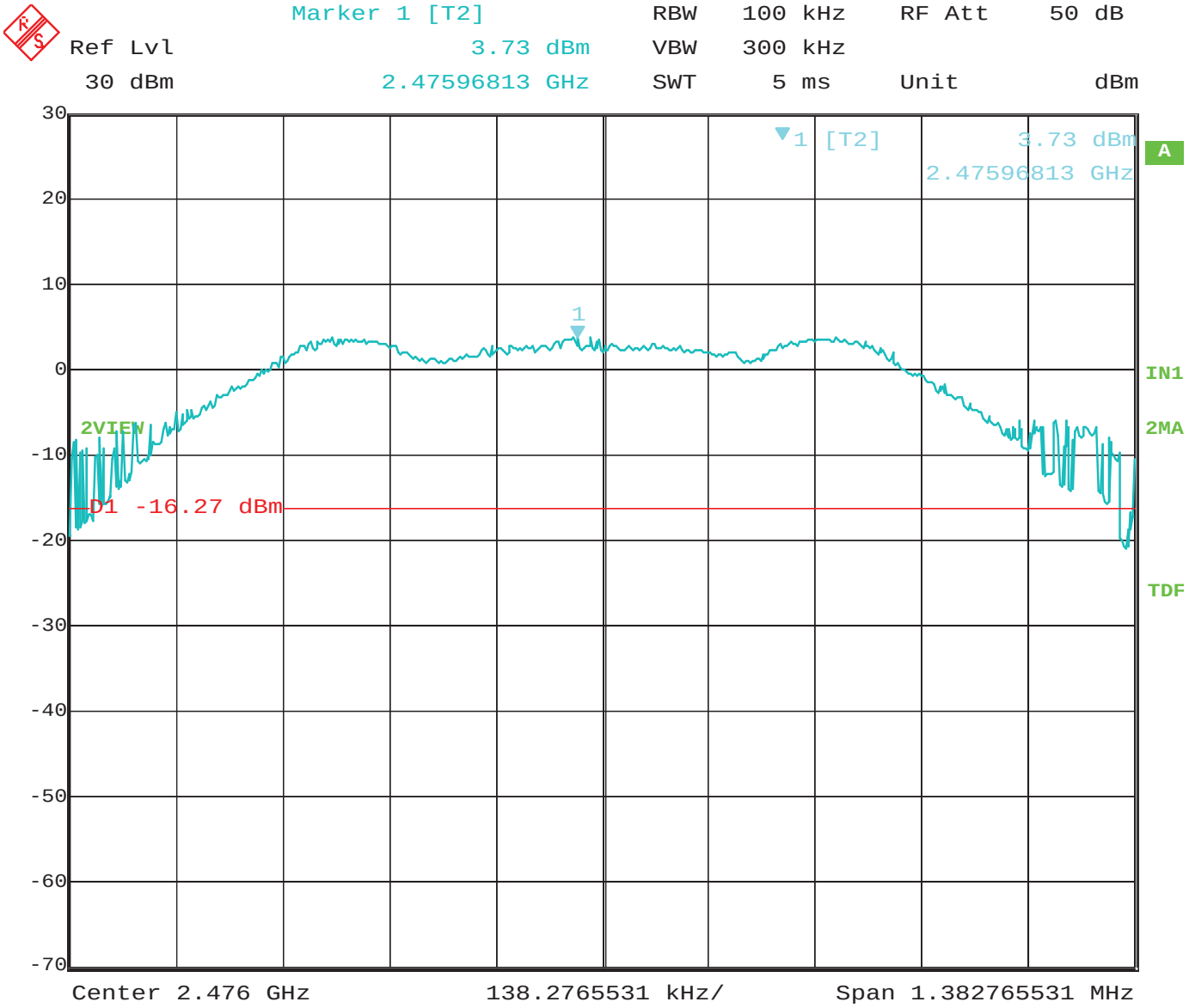
RF Antenna Conducted Test – High Channel – Port #1 – Reference Level



RF Antenna Conducted Test – Low Channel – Port #2 – Reference Level



RF Antenna Conducted Test – Middle Channel – Antenna #2 – Reference Level



RF Antenna Conducted Test – High Channel – Antenna #2 – Reference Level

EMISSIONS IN NON-RESTRICTED BANDS
HIGHEST EMISSIONS TO THE LIMIT

Freq. (MHz)	Level (dBm)	Limit	Margin	Comments
2476	4.57	--	--	**Worst Case Reference Level – Port #1**
9502	-28.15	-15.43	-12.72	**Non-Restricted Frequency – Port #1**
21723	-30.57	-15.43	-15.14	**Non-Restricted Frequency – Port #1**
21724	-29.80	-15.43	-14.37	**Non-Restricted Frequency – Port #1**
2476	3.73	--	--	**Worst Case Reference Level – Port #2**
9548	-28.22	-16.27	-11.95	**Non-Restricted Frequency – Port #2**
21723	-30.29	-16.27	-14.02	**Non-Restricted Frequency – Port #2**
2395	-35.43	-16.27	-19.16	**Non-Restricted Frequency – Port #2**

BAND EDGES

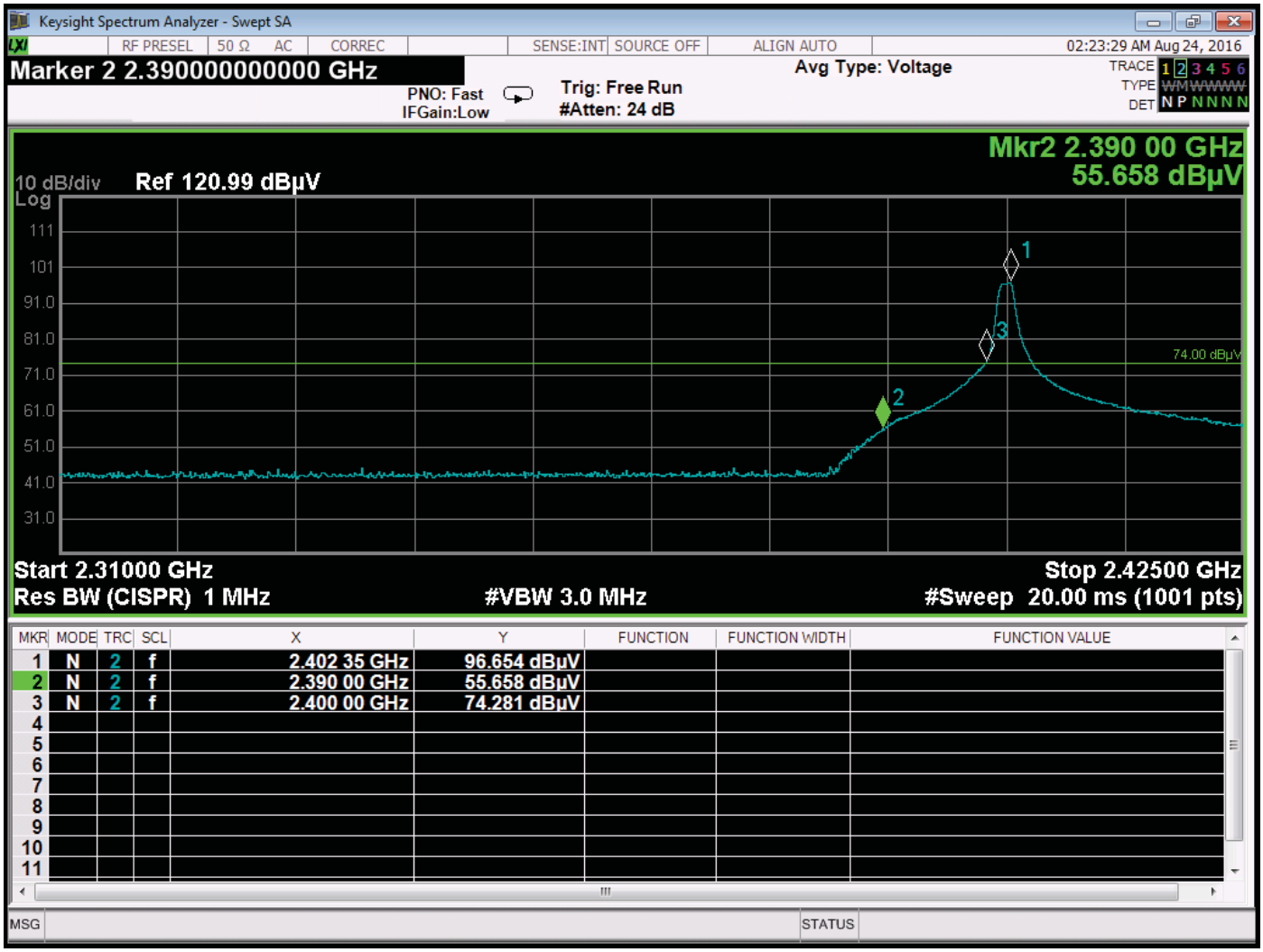
DATA SHEETS

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

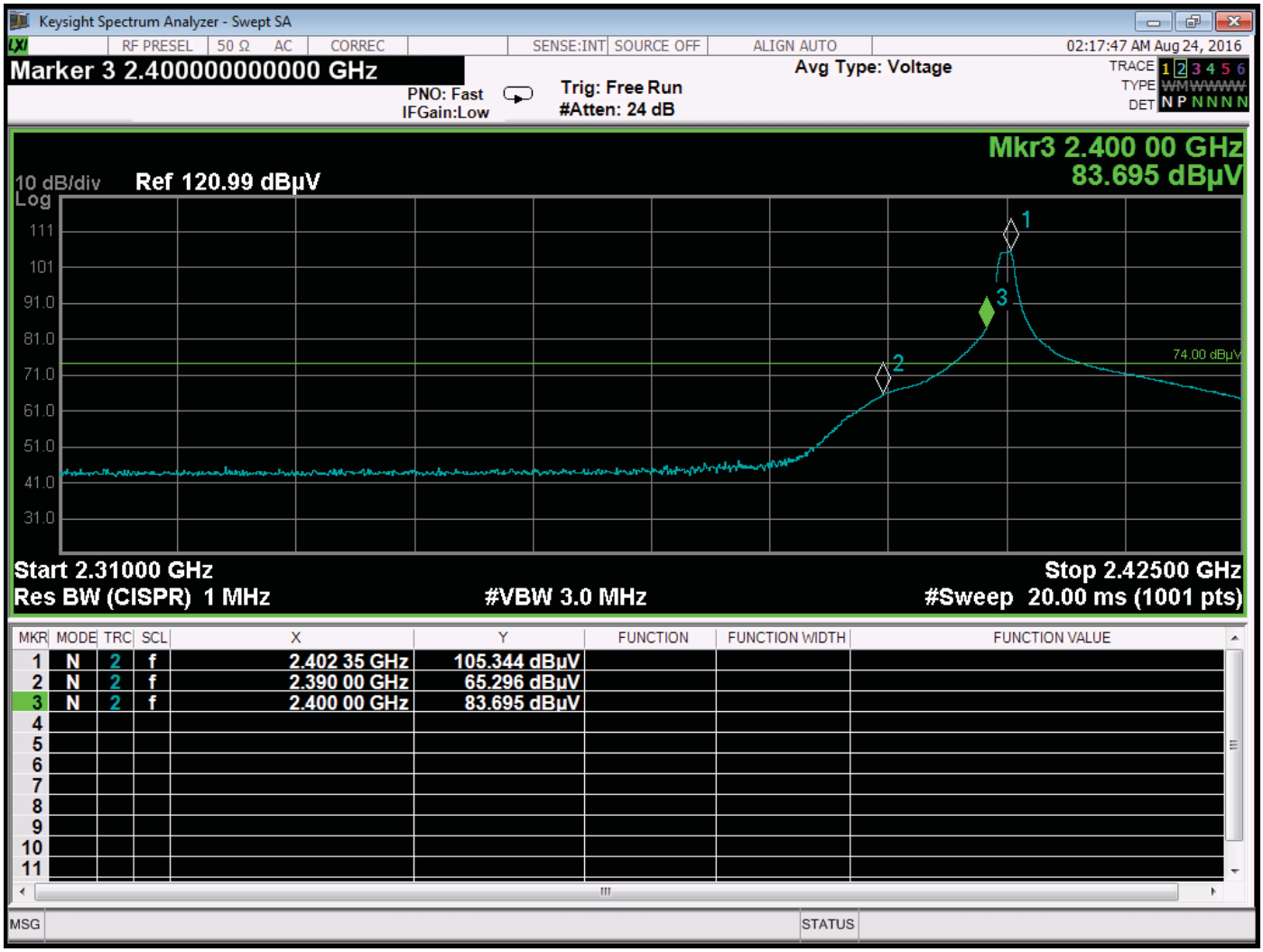
Date: 08/24/2016
Lab: D
Tested By: Kyle Fujimoto

Band Edges - Low Channel
Antenna Type: 1513504-1
Port 1 Worst Case

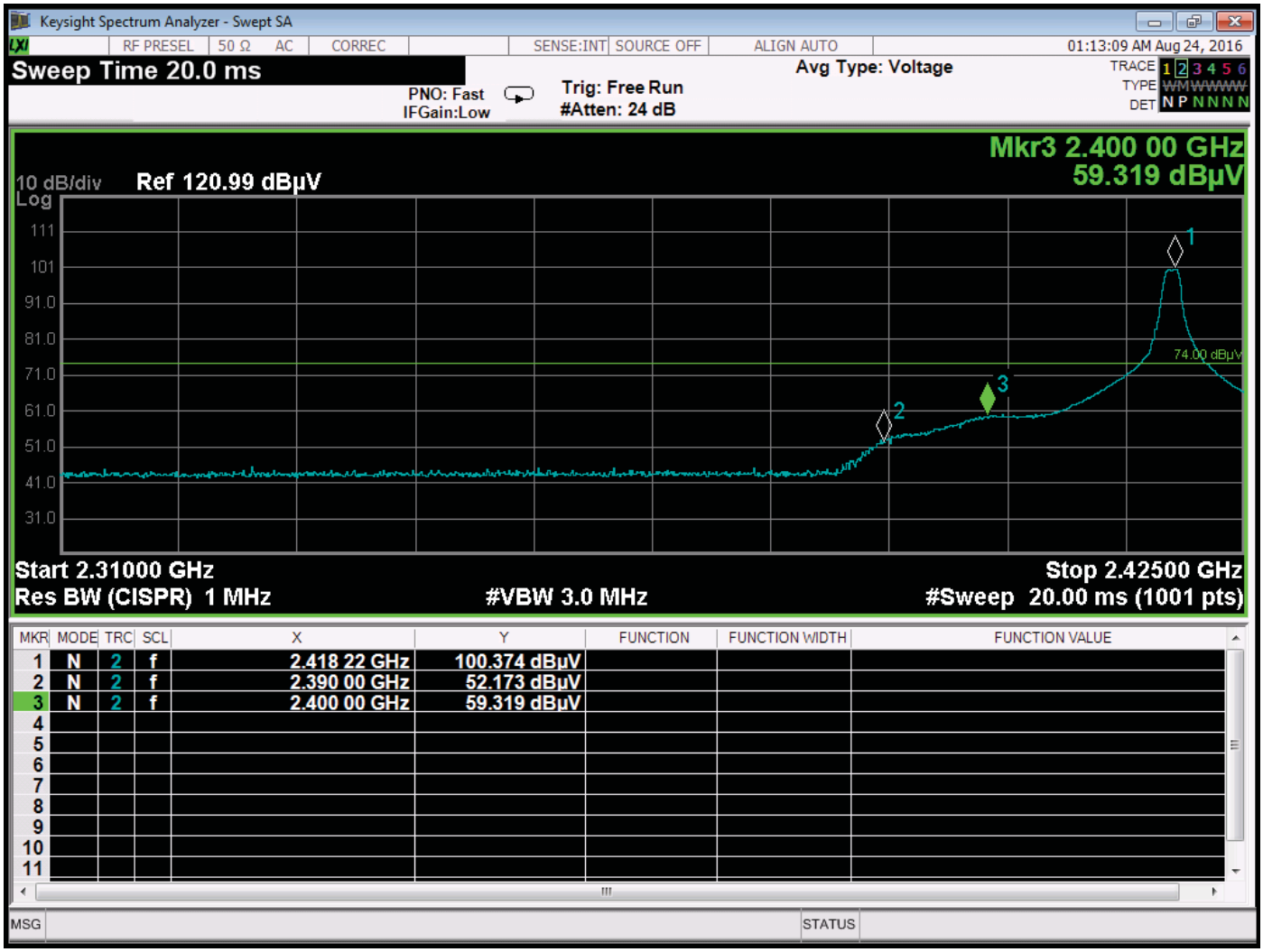
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402	96.65	V	--	--	Peak	33.00	114.41	**Fundamental - 2402 MHz**
2402	78.59	V	--	--	Avg	33.00	114.41	**10 dBm / Y-Axis**
2390	55.66	V	73.97	-18.31	Peak	33.00	114.41	**Lower Band Edge**
2390	37.60	V	53.97	-16.37	Avg	33.00	114.41	**10 dBm / Y-Axis**
2402	105.34	H	--	--	Peak	336.75	186.41	**Fundamental - 2402 MHz**
2402	87.28	H	--	--	Avg	336.38	186.41	**10 dBm / X-Axis**
2390	65.30	H	73.97	-8.67	Peak	336.75	186.41	**Lower Band Edge**
2390	47.24	H	53.97	-6.73	Avg	336.38	186.41	**10 dBm / X-Axis**
2418	108.71	H	--	--	Peak	233.75	181.22	**Fundamental - 2418 MHz**
2418	90.65	H	--	--	Avg	233.75	181.22	**17 dBm / Y-Axis**
2390	65.40	H	73.97	-8.57	Peak	233.75	181.22	**Lower Band Edge**
2390	47.34	H	53.97	-6.63	Avg	233.75	181.22	**17 dBm / Y-Axis**
2418	100.37	V	--	--	Peak	267.50	151.31	**Fundamental - 2418 MHz**
2418	82.31	V	--	--	Avg	267.50	151.31	**17 dBm / Y-Axis**
2390	52.17	V	73.97	-21.80	Peak	267.50	151.31	**Lower Band Edge**
2390	34.11	V	53.97	-19.86	Avg	267.50	151.31	**17 dBm / Y-Axis**



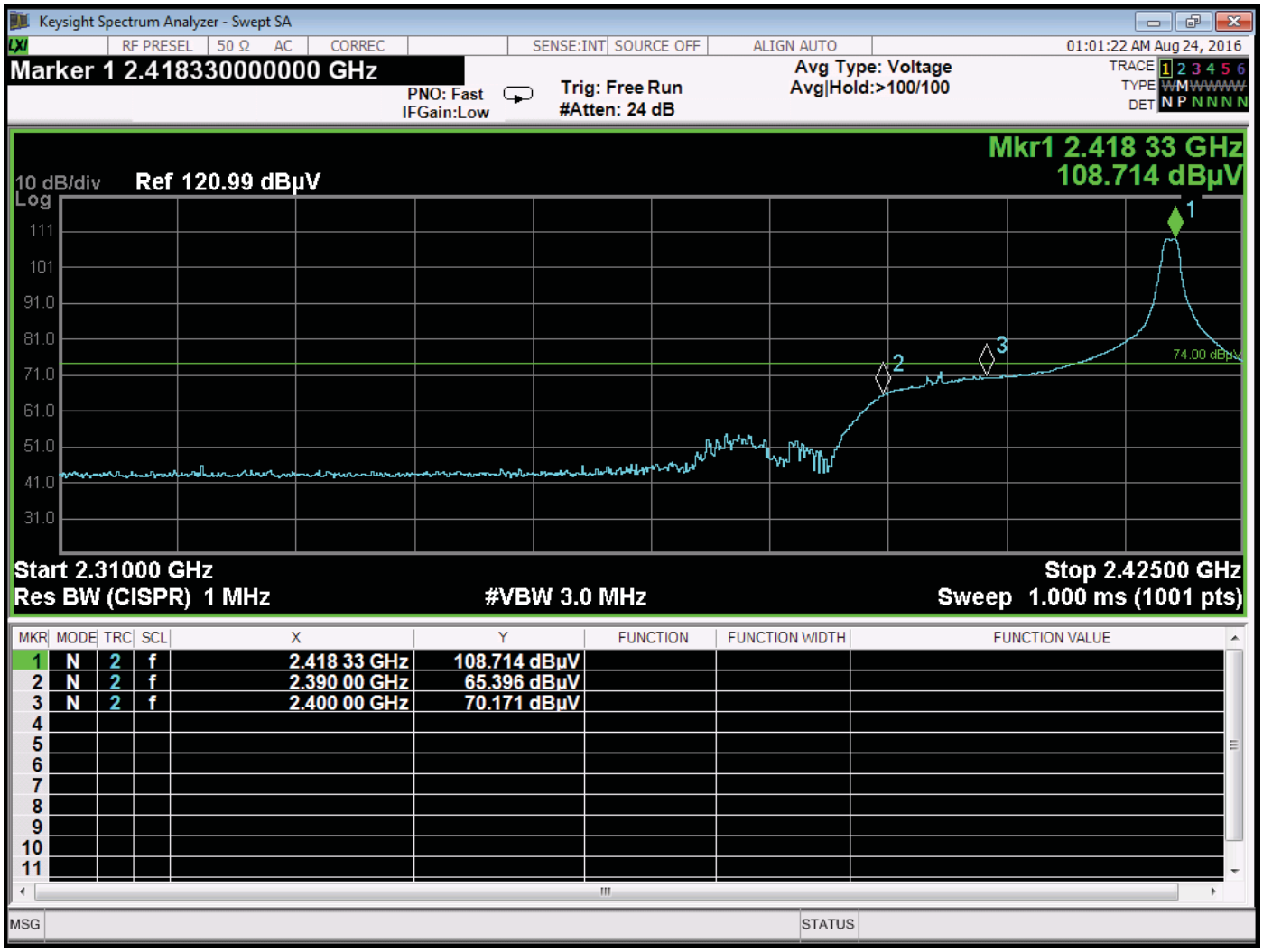
Band Edge – 2402 MHz – Vertical – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case



Band Edge – 2402 MHz – Horizontal – X-Axis – 1513504-1 Antenna – Port #1 Worst Case



Band Edge – 2418 MHz – Vertical – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case



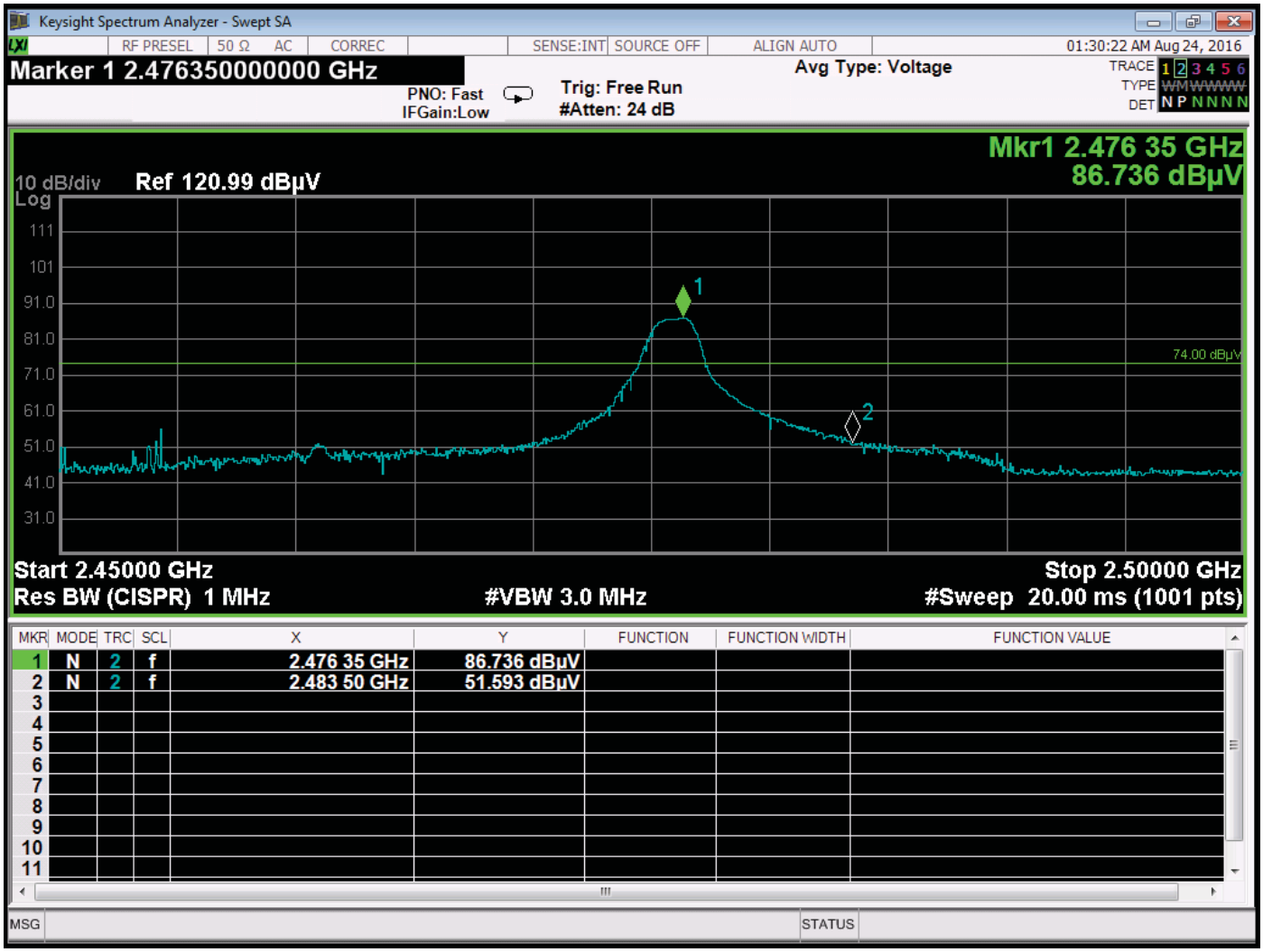
Band Edge – 2418 MHz – Horizontal – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

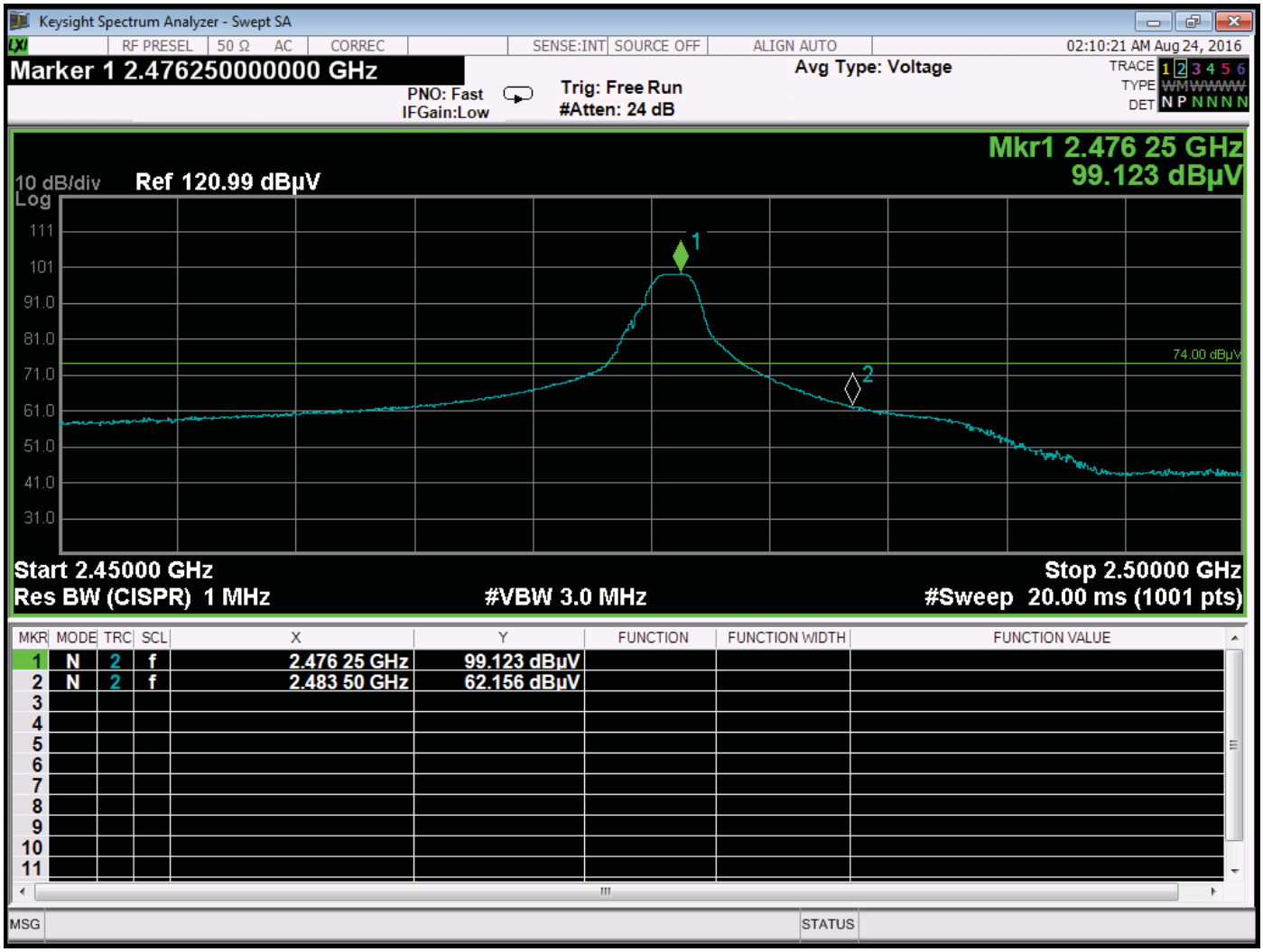
Date: 08/24/2016
Lab: D
Tested By: Kyle Fujimoto

Band Edges - High Channel
Antenna Type: 1513504-1
Port 1 Worst Case

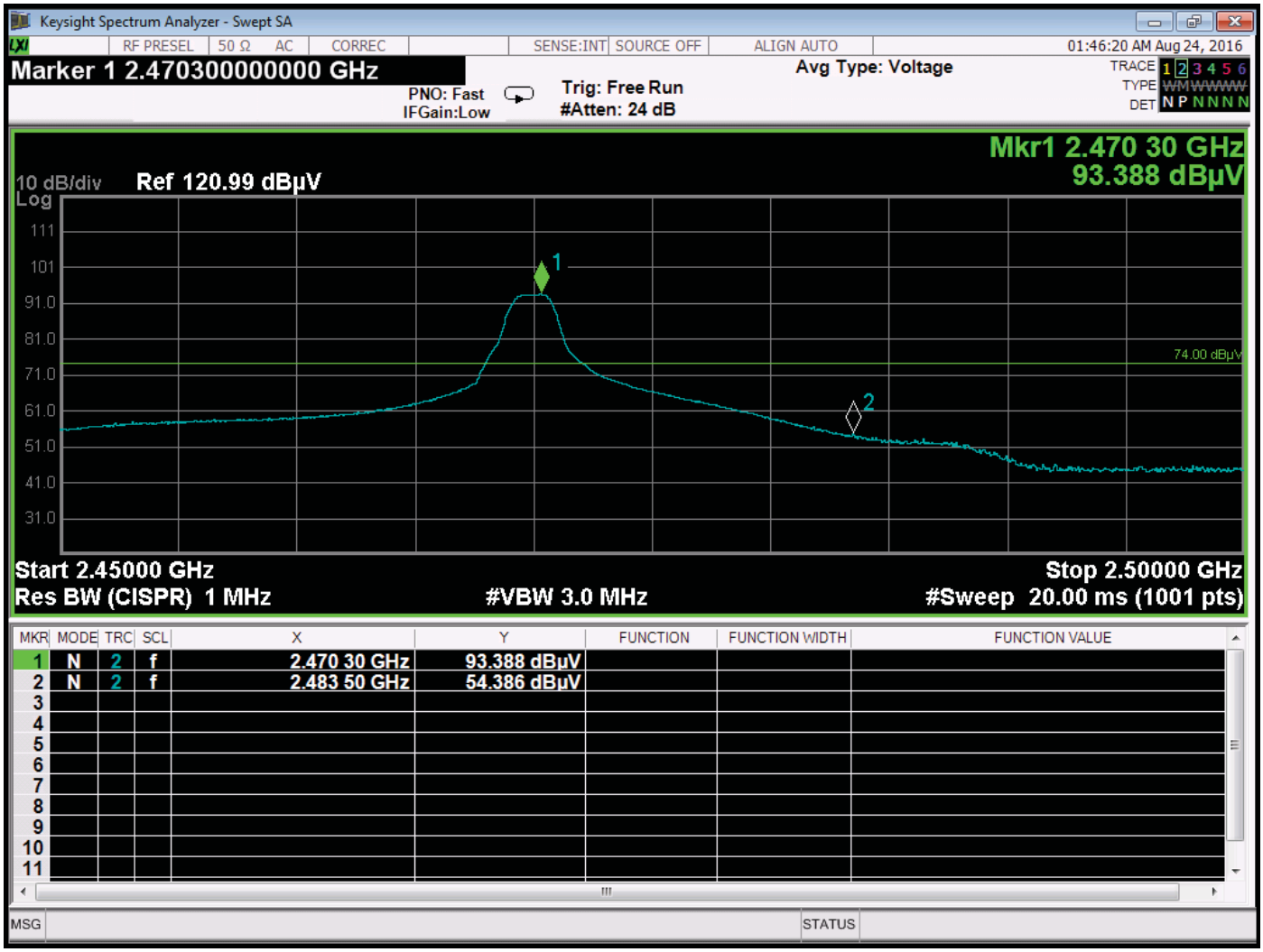
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2476	86.74	V	--	--	Peak	5.00	122.71	Fundamental - 2476 MHz
2476	68.68	V	--	--	Avg	5.00	122.71	7 dBm / Y-Axis
2483.5	51.59	V	73.97	-22.38	Peak	5.00	122.71	Upper Band Edge
2483.5	33.53	V	53.97	-20.44	Avg	5.00	122.71	7 dBm / Y-Axis
2476	99.12	H	--	--	Peak	326.00	181.16	Fundamental - 2476 MHz
2476	81.06	H	--	--	Avg	326.00	181.16	7 dBm / X-Axis
2483.5	62.16	H	73.97	-11.81	Peak	326.00	181.16	Upper Band Edge
2483.5	44.10	H	53.97	-9.87	Avg	326.00	181.16	7 dBm / X-Axis
2470	93.39	V	--	--	Peak	314.75	161.40	Fundamental - 2470 MHz
2470	75.33	V	--	--	Avg	314.75	161.40	10 dBm / Y-Axis
2483.5	54.39	V	73.97	-19.58	Peak	314.75	161.40	Upper Band Edge
2483.5	36.33	V	53.97	-17.64	Avg	314.75	161.40	10 dBm / Y-Axis
2470	102.72	H	--	--	Peak	112.25	202.71	Fundamental - 2470 MHz
2470	84.66	H	--	--	Avg	112.25	202.71	10 dBm / X-Axis
2483.5	61.39	H	73.97	-12.58	Peak	112.25	202.71	Upper Band Edge
2483.5	43.33	H	53.97	-10.64	Avg	112.25	202.71	10 dBm / X-Axis
2456	100.42	V	--	--	Peak	355.00	203.49	Fundamental - 2456 MHz
2456	82.36	V	--	--	Avg	355.00	203.49	17 dBm / Y-Axis
2483.5	46.66	V	73.97	-27.31	Peak	355.00	203.49	Upper Band Edge
2483.5	28.60	V	53.97	-25.37	Avg	355.00	203.49	17 dBm / Y-Axis
2456	108.53	H	--	--	Peak	110.00	115.55	Fundamental - 2456 MHz
2456	90.47	H	--	--	Avg	110.00	115.55	17 dBm / X-Axis
2483.5	63.49	H	73.97	-10.48	Peak	110.00	115.55	Upper Band Edge
2483.5	45.43	H	53.97	-8.54	Avg	110.00	115.55	17 dBm / X-Axis
2487.7	64.16	H	73.97	-9.81	Peak	110.00	115.55	Upper Band Edge
2487.7	46.10	H	53.97	-7.87	Avg	110.00	115.55	17 dBm / X-Axis



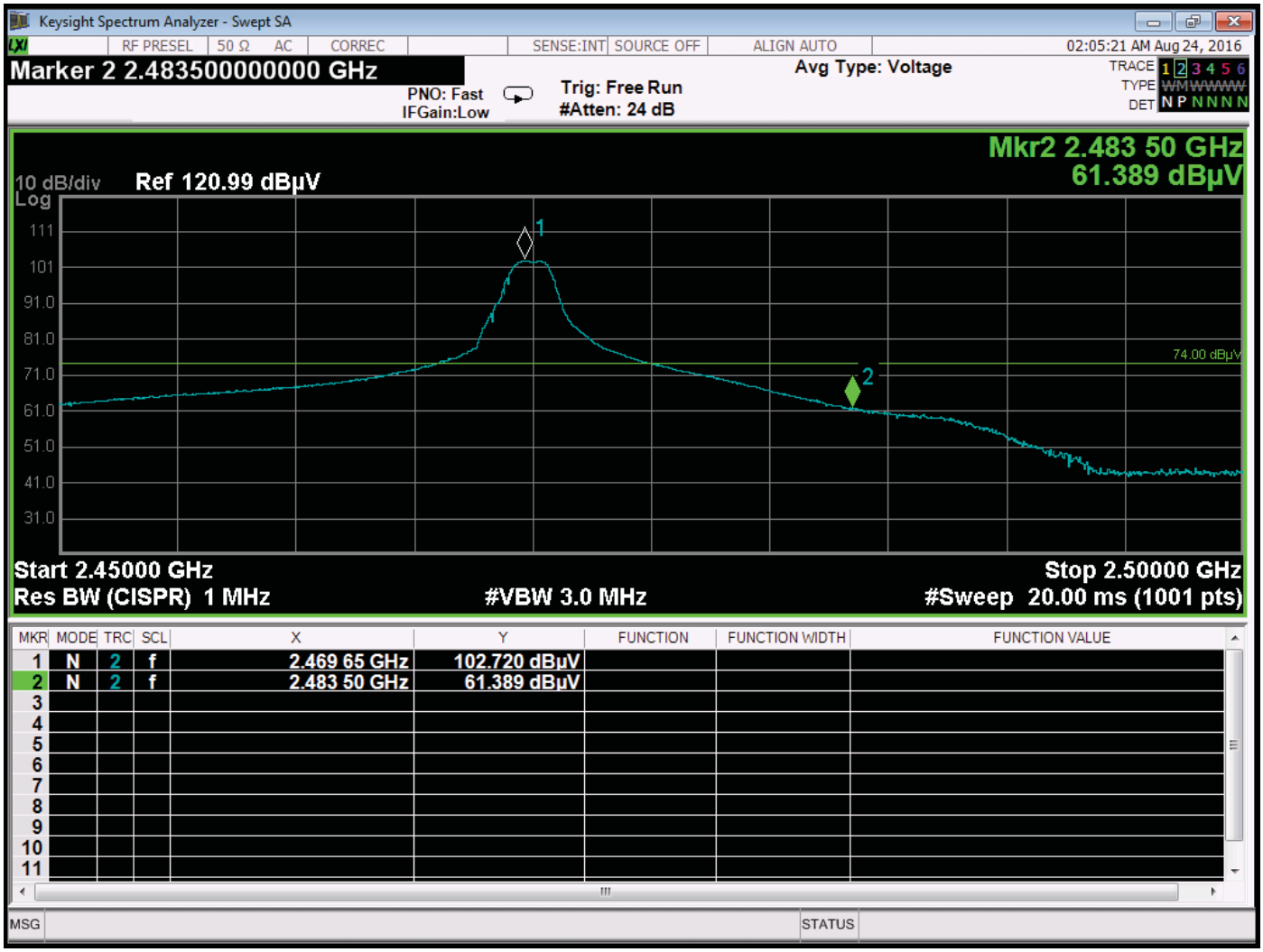
Band Edge – 2476 MHz – Vertical – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case



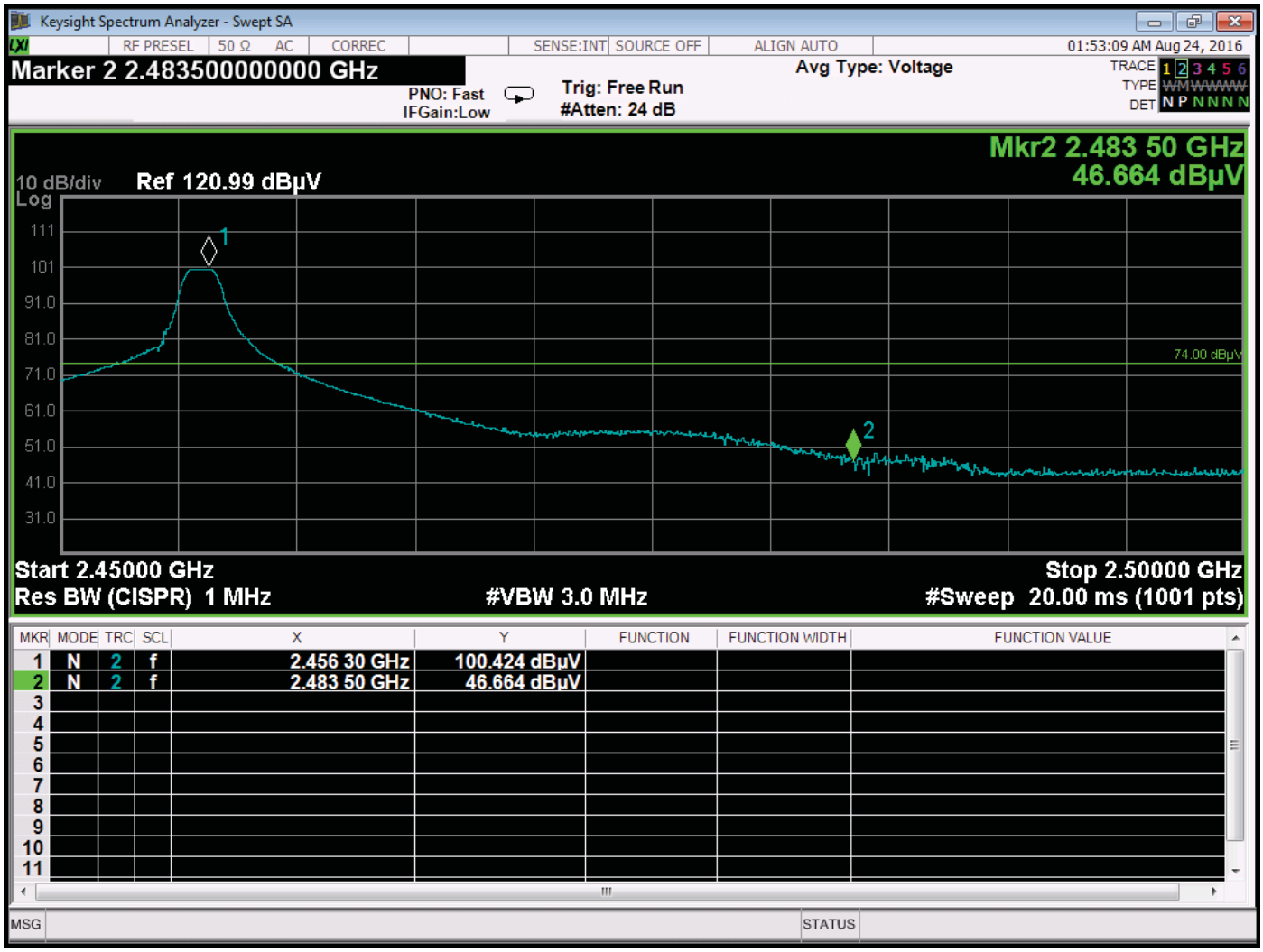
Band Edge – 2476 MHz – Horizontal – X-Axis – 1513504-1 Antenna – Port #1 Worst Case



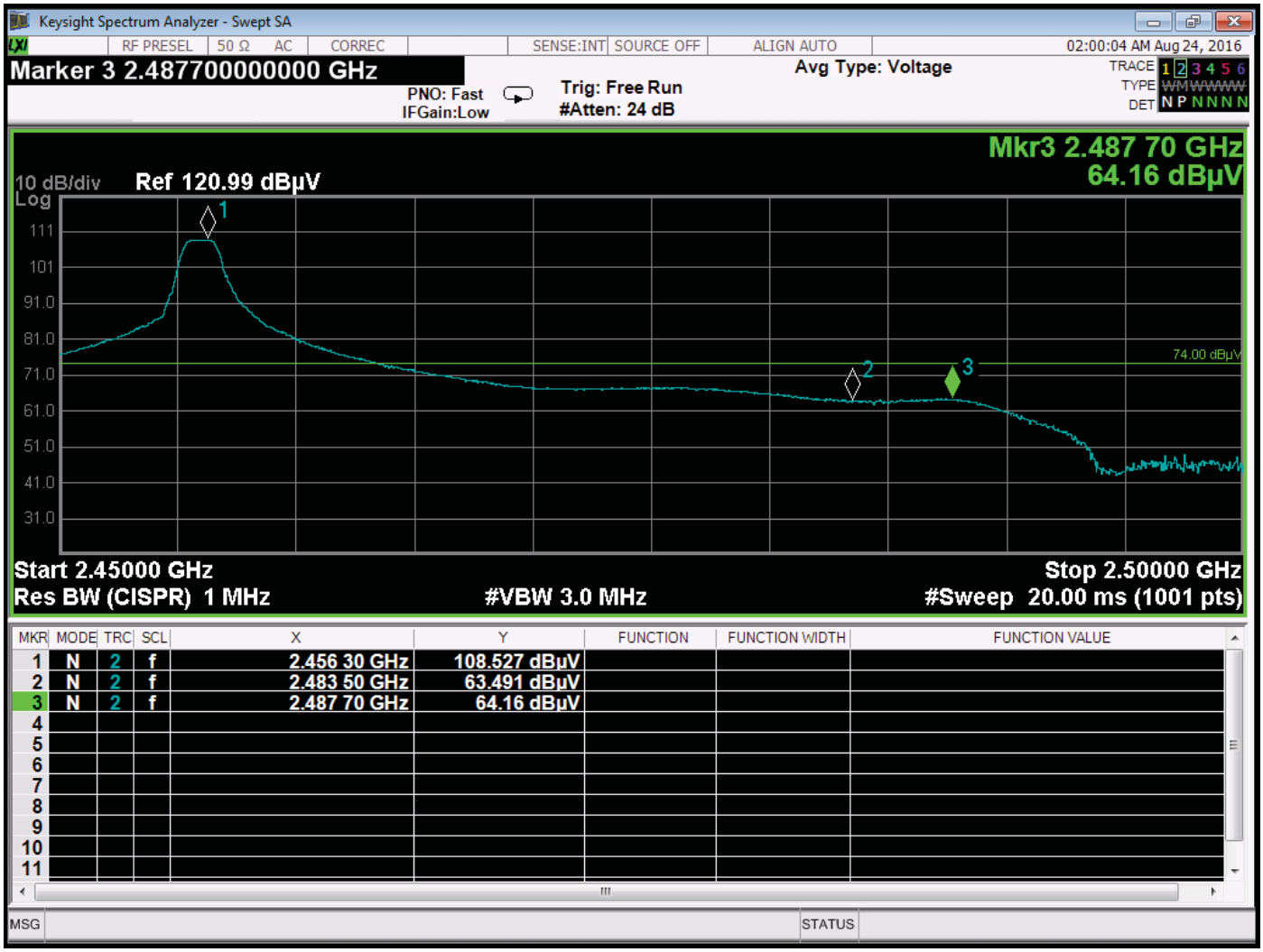
Band Edge – 2470 MHz – Vertical – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case



Band Edge – 2470 MHz – Horizontal – X-Axis – 1513504-1 Antenna – Port #1 Worst Case



Band Edge – 2456 MHz – Vertical – Y-Axis – 1513504-1 Antenna – Port #1 Worst Case



Band Edge – 2456 MHz – Horizontal – X-Axis – 1513504-1 Antenna – Port #1 Worst Case

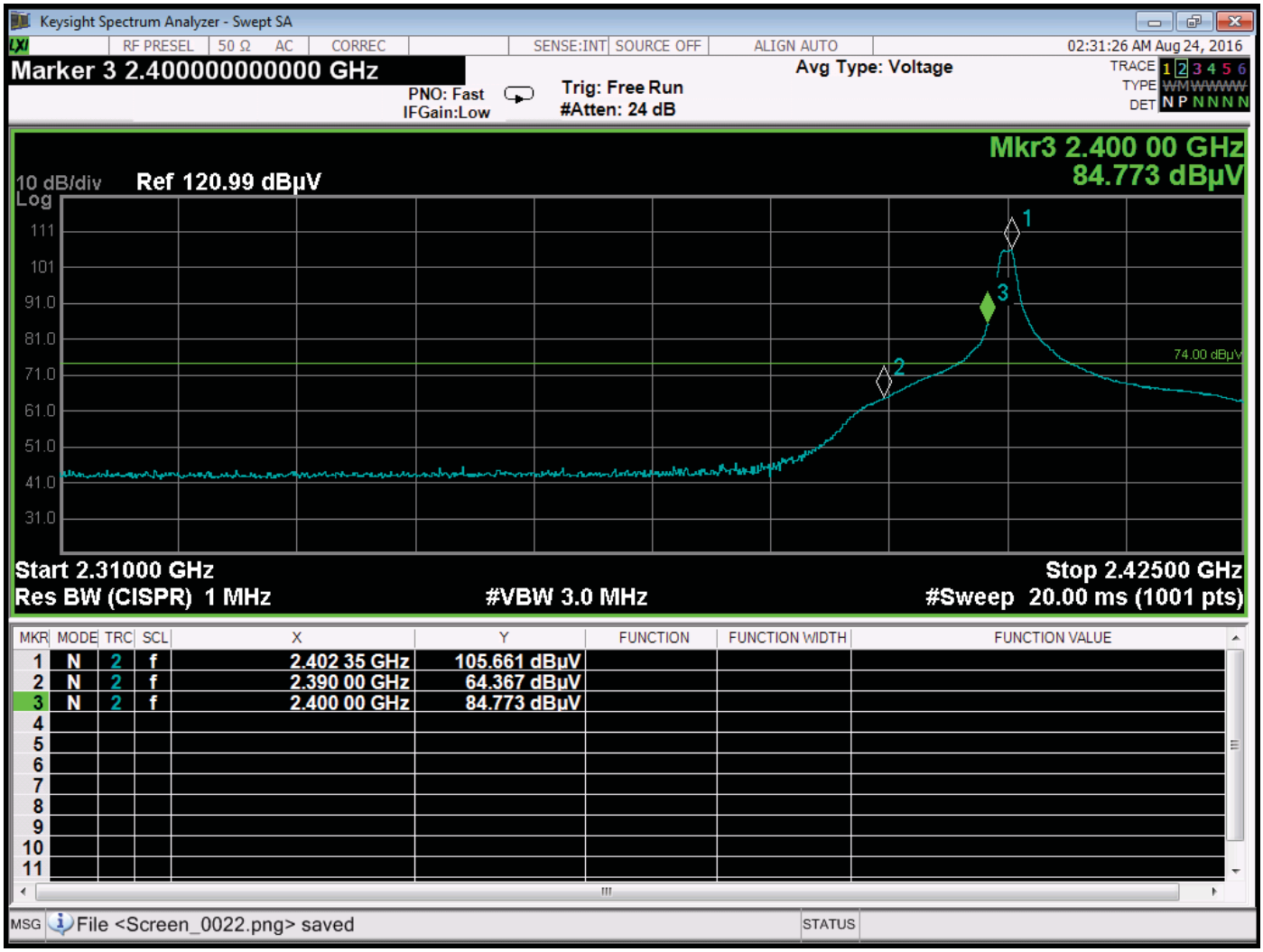
FCC 15.247

Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

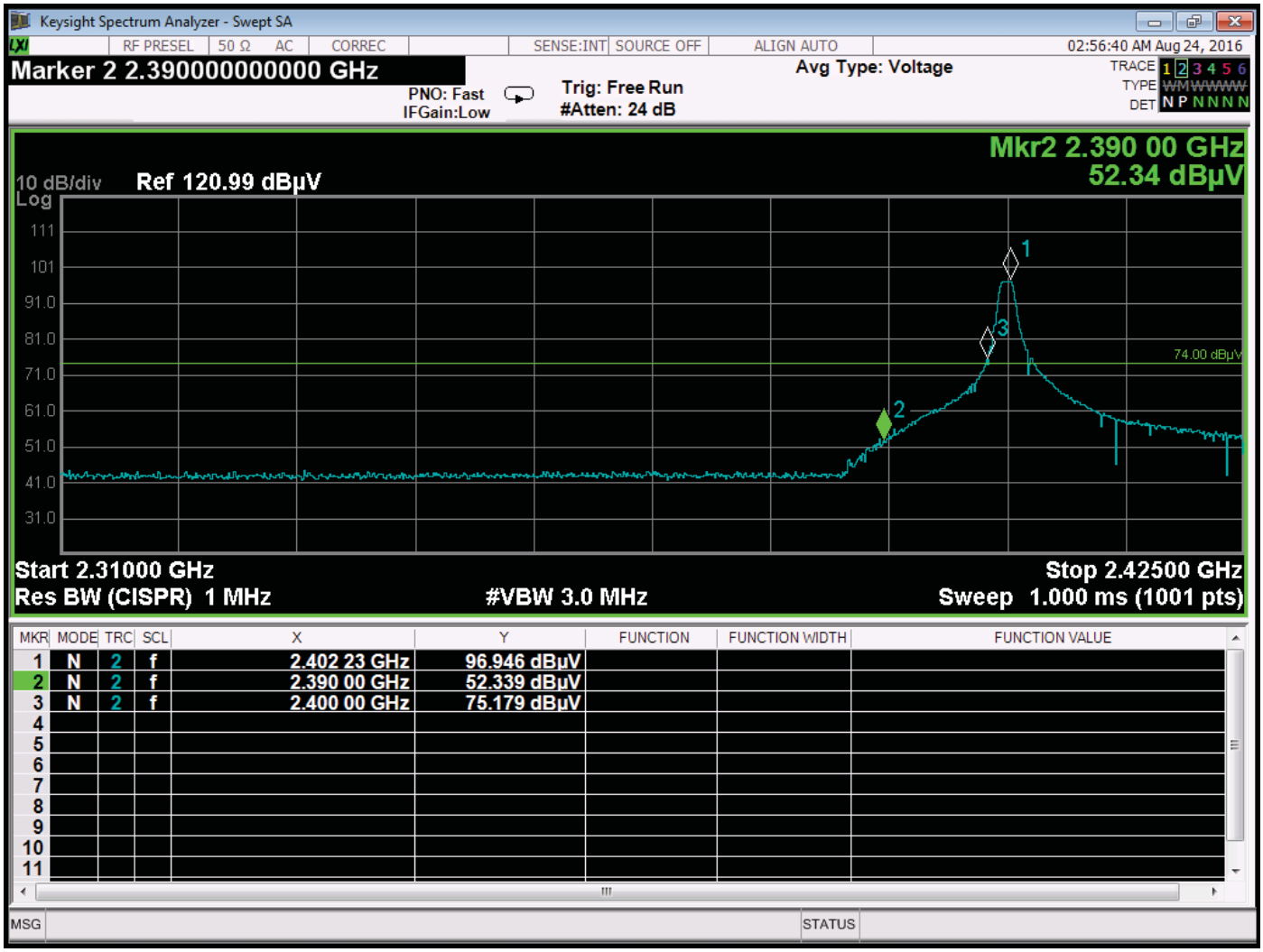
Date: 08/24/2016
Lab: D
Tested By: Kyle Fujimoto

Band Edges - Low Channel
Antenna Type: ANT-2.4-CW-RCS
Port 2 Worst Case

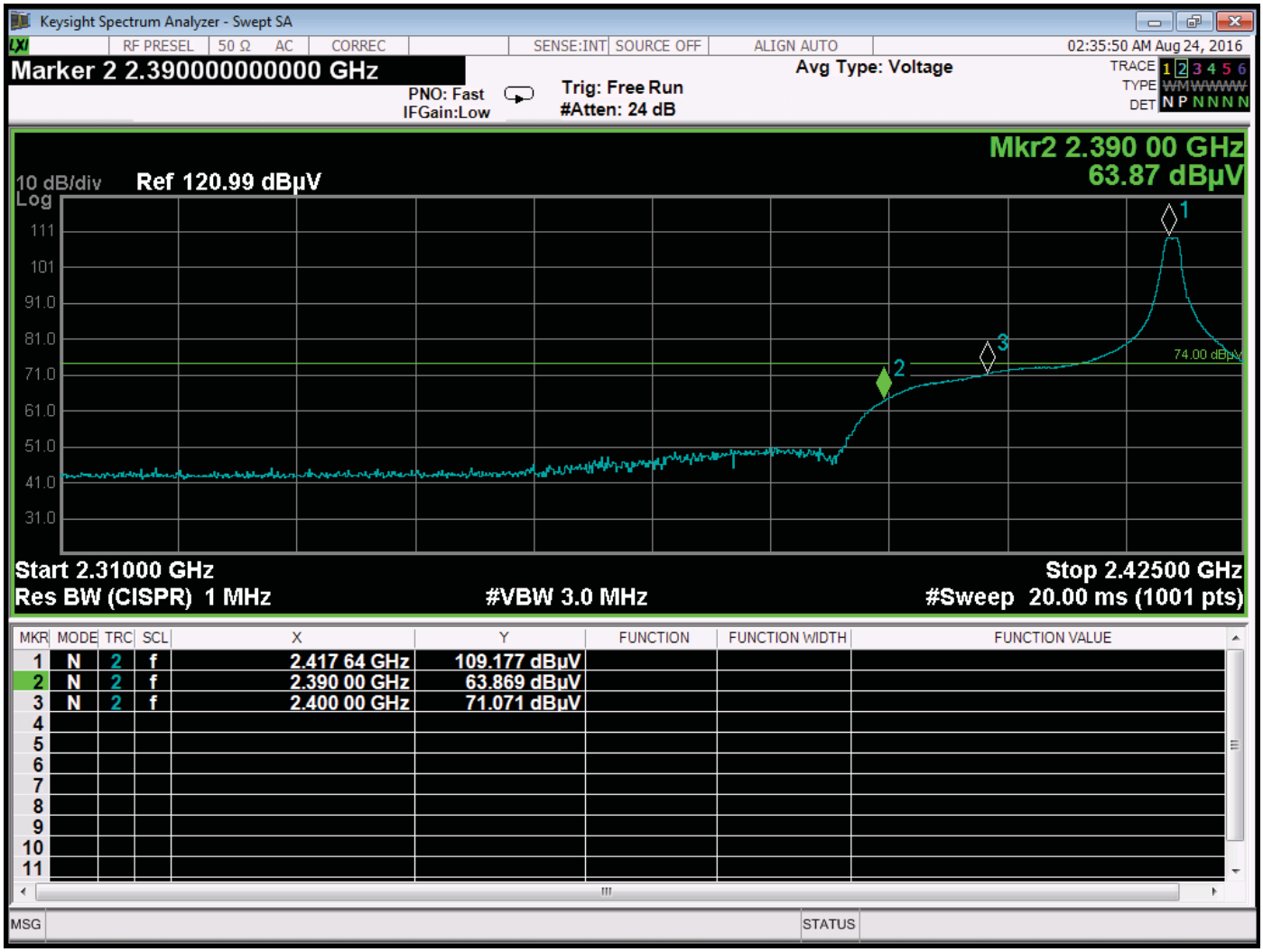
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2402	105.66	V	--	--	Peak	198.50	159.97	**Fundamental - 2402 MHz**
2402	87.60	V	--	--	Avg	198.50	159.97	**10 dBm / Y-Axis**
2390	64.37	V	73.97	-9.60	Peak	198.50	159.97	**Lower Band Edge**
2390	46.31	V	53.97	-7.66	Avg	198.50	159.97	**10 dBm / Y-Axis**
2402	96.95	H	--	--	Peak	112.25	101.74	**Fundamental - 2402 MHz**
2402	78.89	H	--	--	Avg	112.25	101.74	**10 dBm / X-Axis**
2390	52.34	H	73.97	-21.63	Peak	112.25	101.74	**Lower Band Edge**
2390	34.28	H	53.97	-19.69	Avg	112.25	101.74	**10 dBm / X-Axis**
2418	106.75	H	--	--	Peak	64.50	129.58	**Fundamental - 2418 MHz**
2418	88.69	H	--	--	Avg	64.50	129.58	**17 dBm / X-Axis**
2390	56.09	H	73.97	-17.88	Peak	64.50	129.58	**Lower Band Edge**
2390	38.03	H	53.97	-15.94	Avg	64.50	129.58	**17 dBm / X-Axis**
2418	109.18	V	--	--	Peak	60.75	171.79	**Fundamental - 2418 MHz**
2418	91.12	V	--	--	Avg	60.75	171.79	**17 dBm / Y-Axis**
2390	63.87	V	73.97	-10.10	Peak	60.75	171.79	**Lower Band Edge**
2390	45.81	V	53.97	-8.16	Avg	60.75	171.79	**17 dBm / Y-Axis**



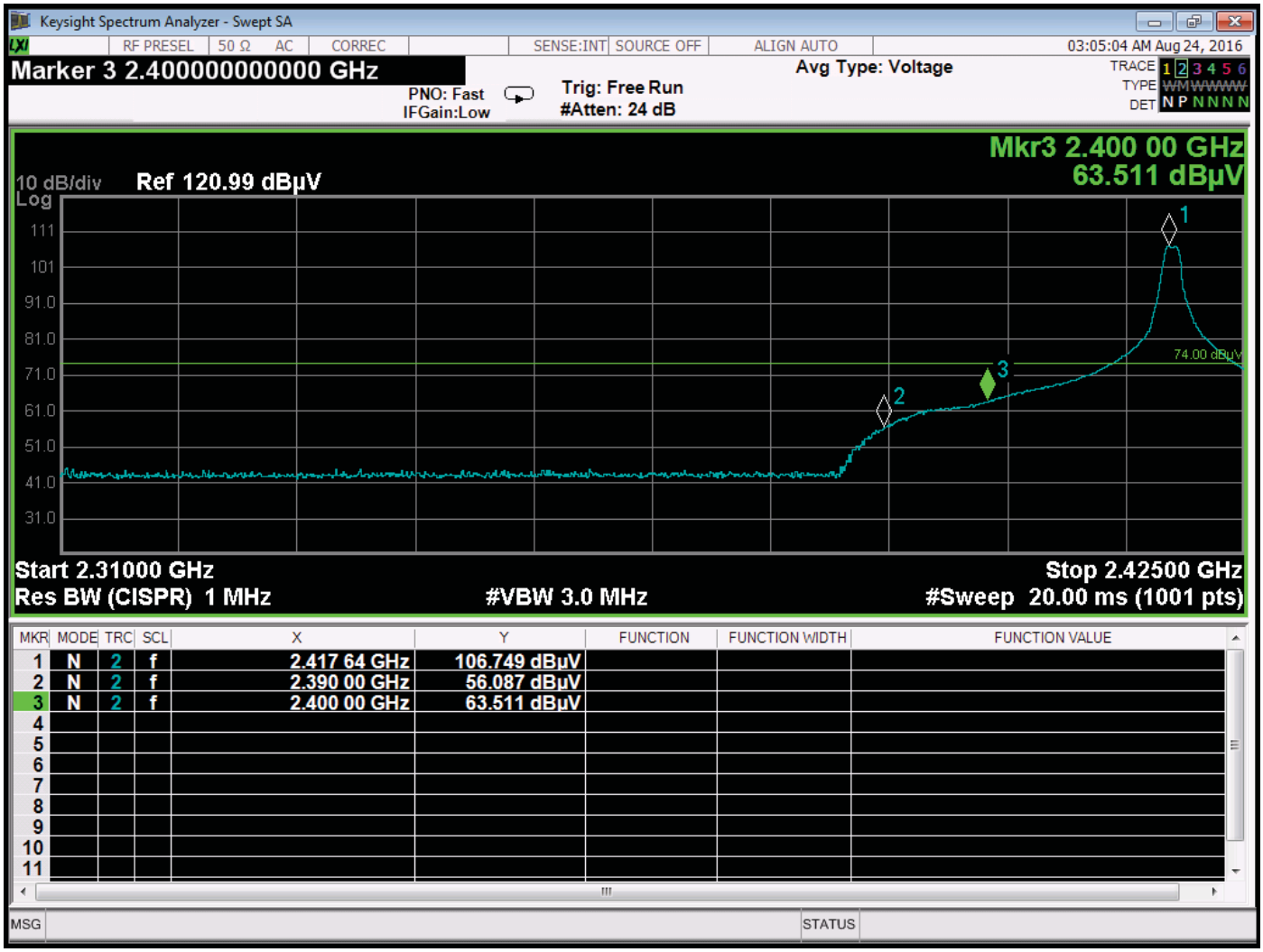
Band Edge – 2402 MHz – Vertical – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



Band Edge – 2402 MHz – Horizontal – X-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



Band Edge – 2418 MHz – Vertical – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



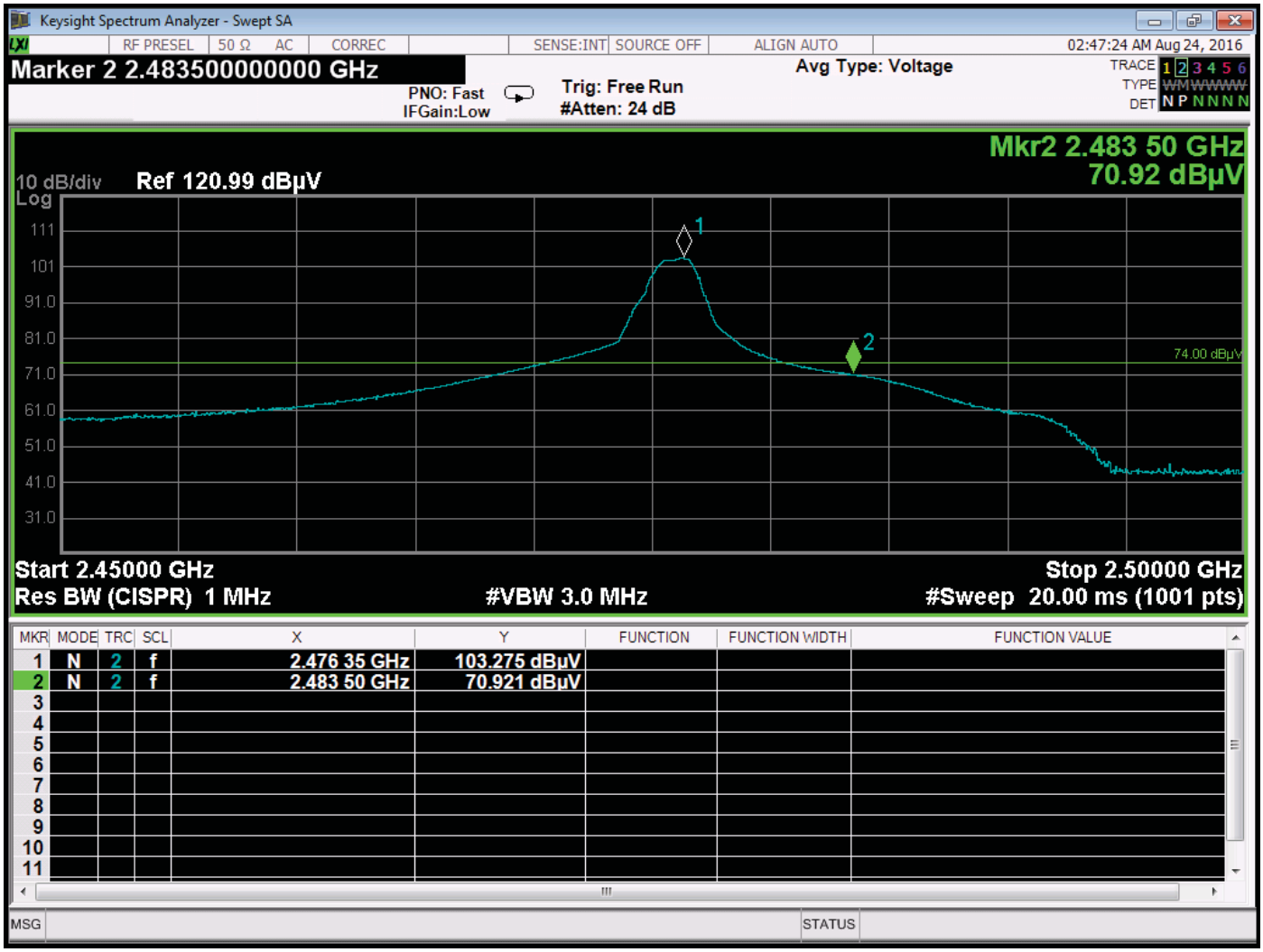
Band Edge – 2418 MHz – Horizontal – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case

FCC 15.247
Preston Cinema Systems
2.4 GHz Transceiver
Model: TR4-3.2A

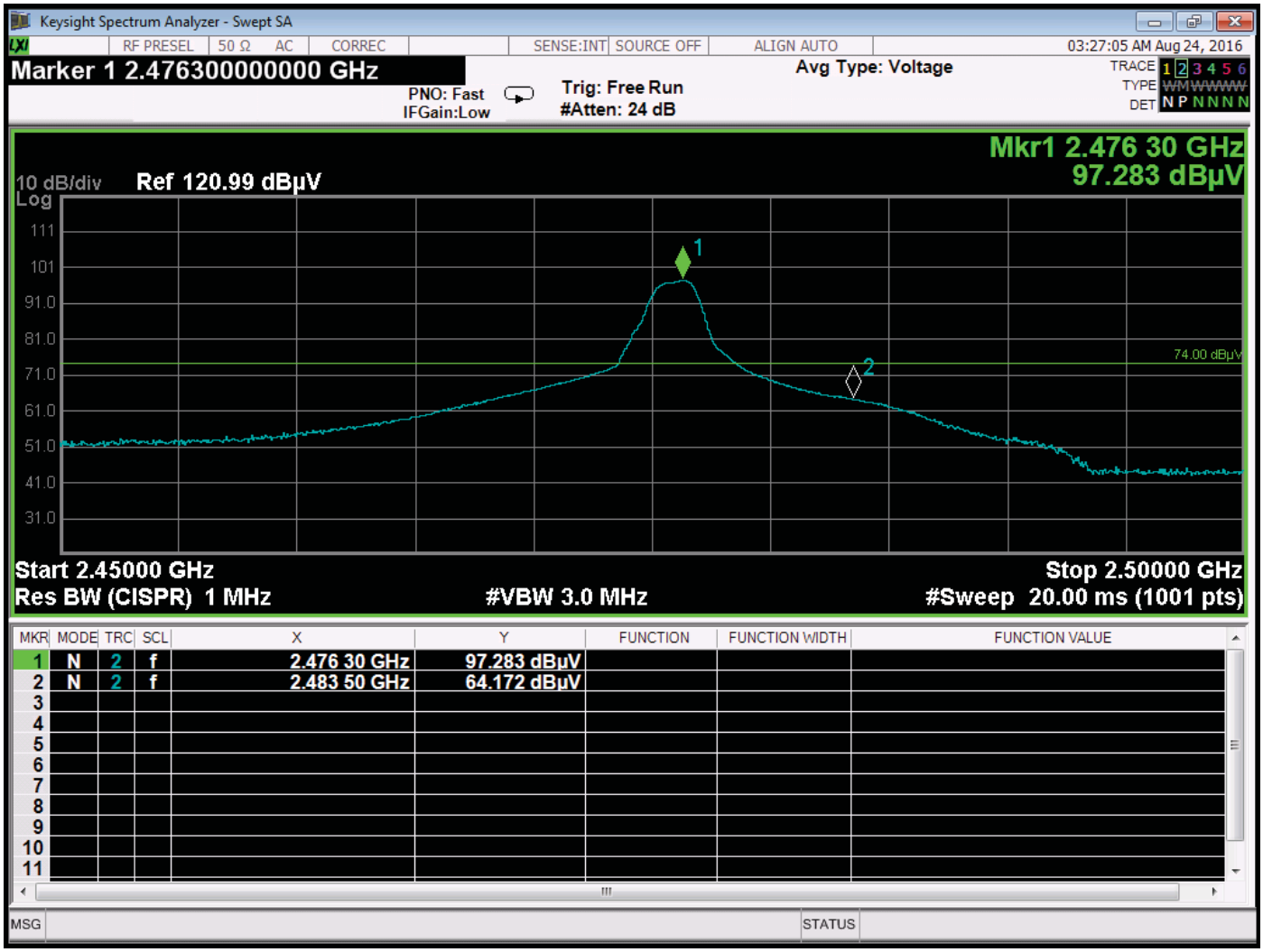
Date: 08/24/2016
Lab: D
Tested By: Kyle Fujimoto

Band Edges - High Channel
Antenna Type: ANT-2.4-CW-RCS
Port 2 Worst Case

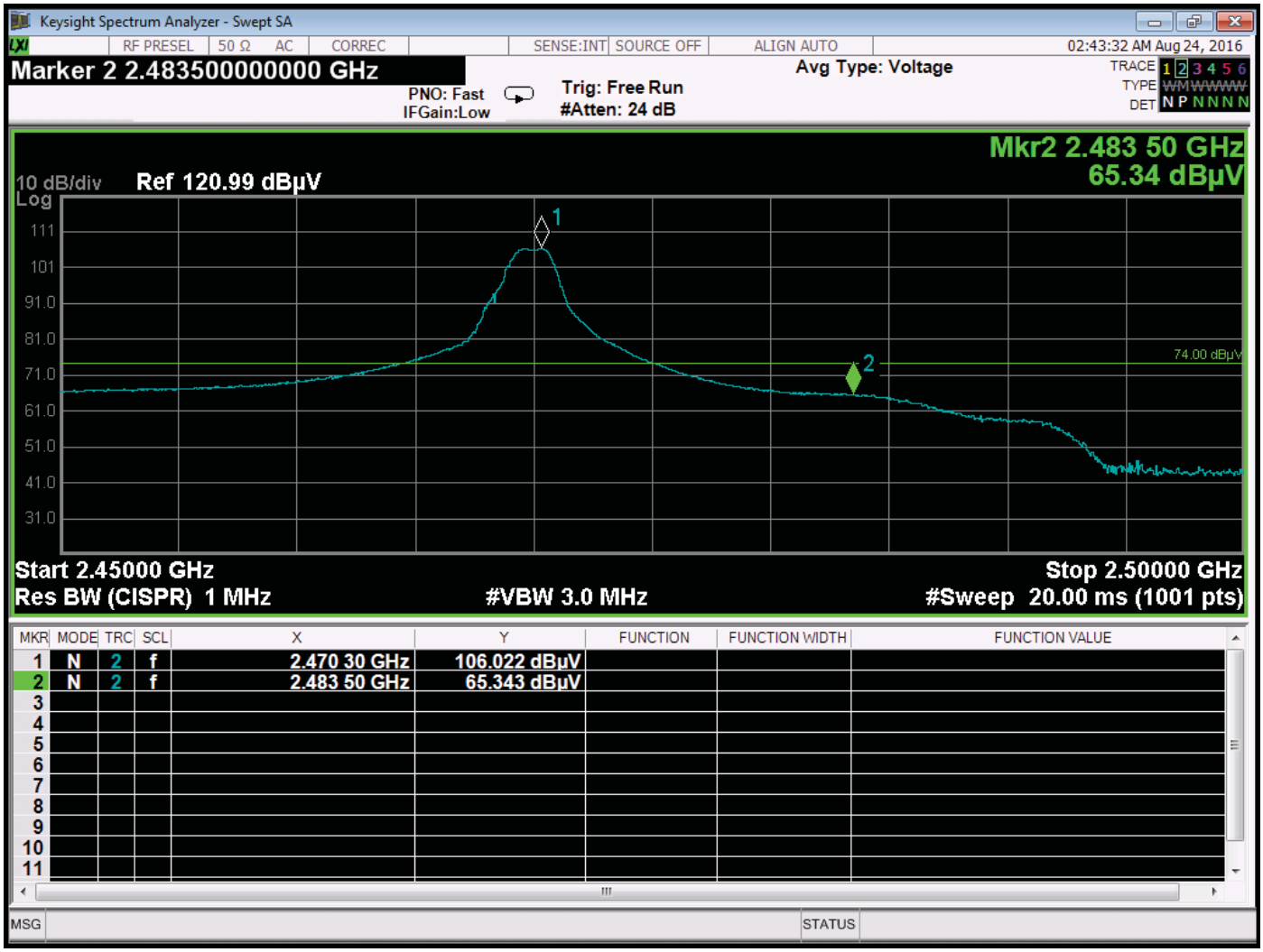
Freq. (MHz)	Level (dBuV/m)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Table Angle (deg)	Ant. Height (cm)	Comments
2476	103.28	V	--	--	Peak	196.25	147.07	Fundamental - 2476 MHz
2476	85.22	V	--	--	Avg	196.25	147.07	7 dBm / Y-Axis
2483.5	70.92	V	73.97	-3.05	Peak	196.25	147.07	Upper Band Edge
2483.5	52.86	V	53.97	-1.11	Avg	196.25	147.07	7 dBm / Y-Axis
2476	97.28	H	--	--	Peak	74.00	130.71	Fundamental - 2476 MHz
2476	79.22	H	--	--	Avg	74.00	130.71	7 dBm / X-Axis
2483.5	64.17	H	73.97	-9.80	Peak	74.00	130.71	Upper Band Edge
2483.5	46.11	H	53.97	-7.86	Avg	74.00	130.71	7 dBm / X-Axis
2470	106.02	V	--	--	Peak	106.50	165.04	Fundamental - 2470 MHz
2470	87.96	V	--	--	Avg	106.50	165.04	10 dBm / Y-Axis
2483.5	65.34	V	73.97	-8.63	Peak	106.50	165.04	Upper Band Edge
2483.5	47.28	V	53.97	-6.69	Avg	106.50	165.04	10 dBm / Y-Axis
2470	99.77	H	--	--	Peak	74.50	131.31	Fundamental - 2470 MHz
2470	81.71	H	--	--	Avg	74.50	131.31	10 dBm / X-Axis
2483.5	59.08	H	73.97	-14.89	Peak	74.50	131.31	Upper Band Edge
2483.5	41.02	H	53.97	-12.95	Avg	74.50	131.31	10 dBm / X-Axis
2456	109.14	V	--	--	Peak	231.00	216.32	Fundamental - 2456 MHz
2456	91.08	V	--	--	Avg	231.00	216.32	17 dBm / Y-Axis
2483.5	70.59	V	73.97	-3.38	Peak	231.00	216.32	Upper Band Edge
2483.5	52.53	V	53.97	-1.44	Avg	231.00	216.32	17 dBm / Y-Axis
2456	107.06	H	--	--	Peak	59.25	170.83	Fundamental - 2456 MHz
2456	89.00	H	--	--	Avg	59.25	170.83	17 dBm / X-Axis
2483.5	62.96	H	73.97	-11.01	Peak	59.25	170.83	Upper Band Edge
2483.5	44.90	H	53.97	-9.07	Avg	59.25	170.83	17 dBm / X-Axis
2484.35	63.09	H	73.97	-10.88	Peak	59.25	170.83	Upper Band Edge
2484.35	45.03	H	53.97	-8.94	Avg	59.25	170.83	17 dBm / X-Axis



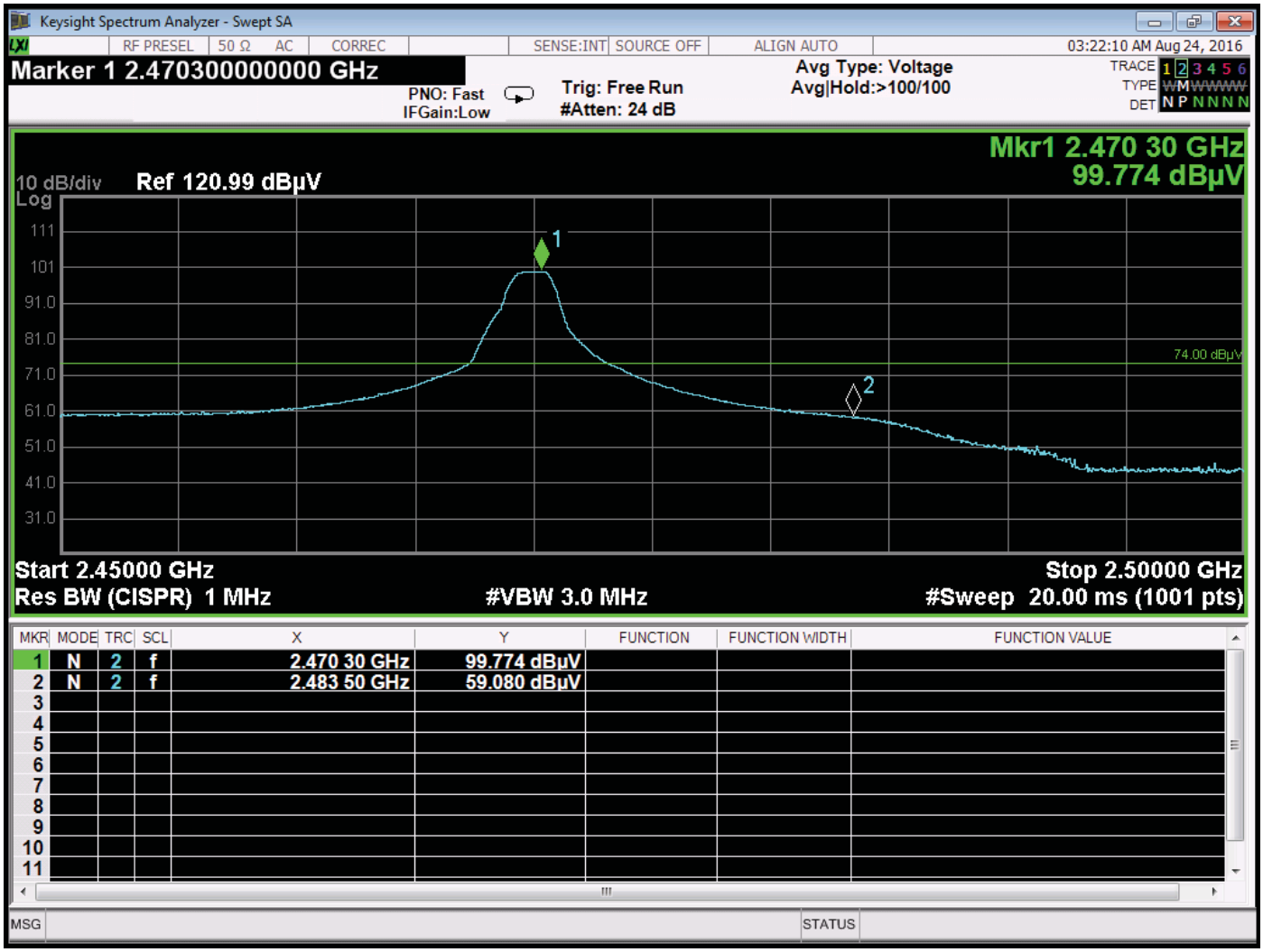
Band Edge – 2476 MHz – Vertical – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



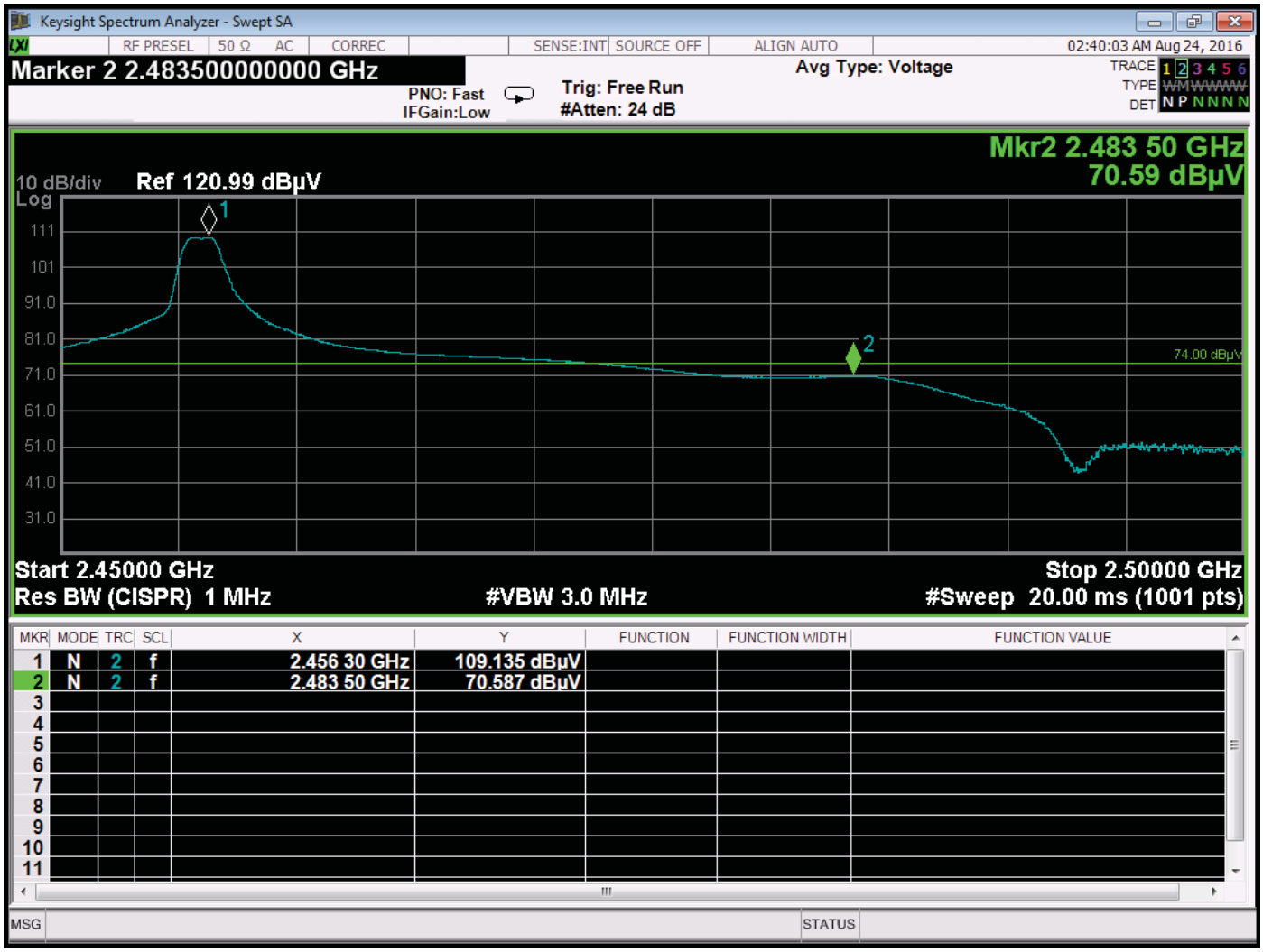
Band Edge – 2476 MHz – Horizontal – X-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



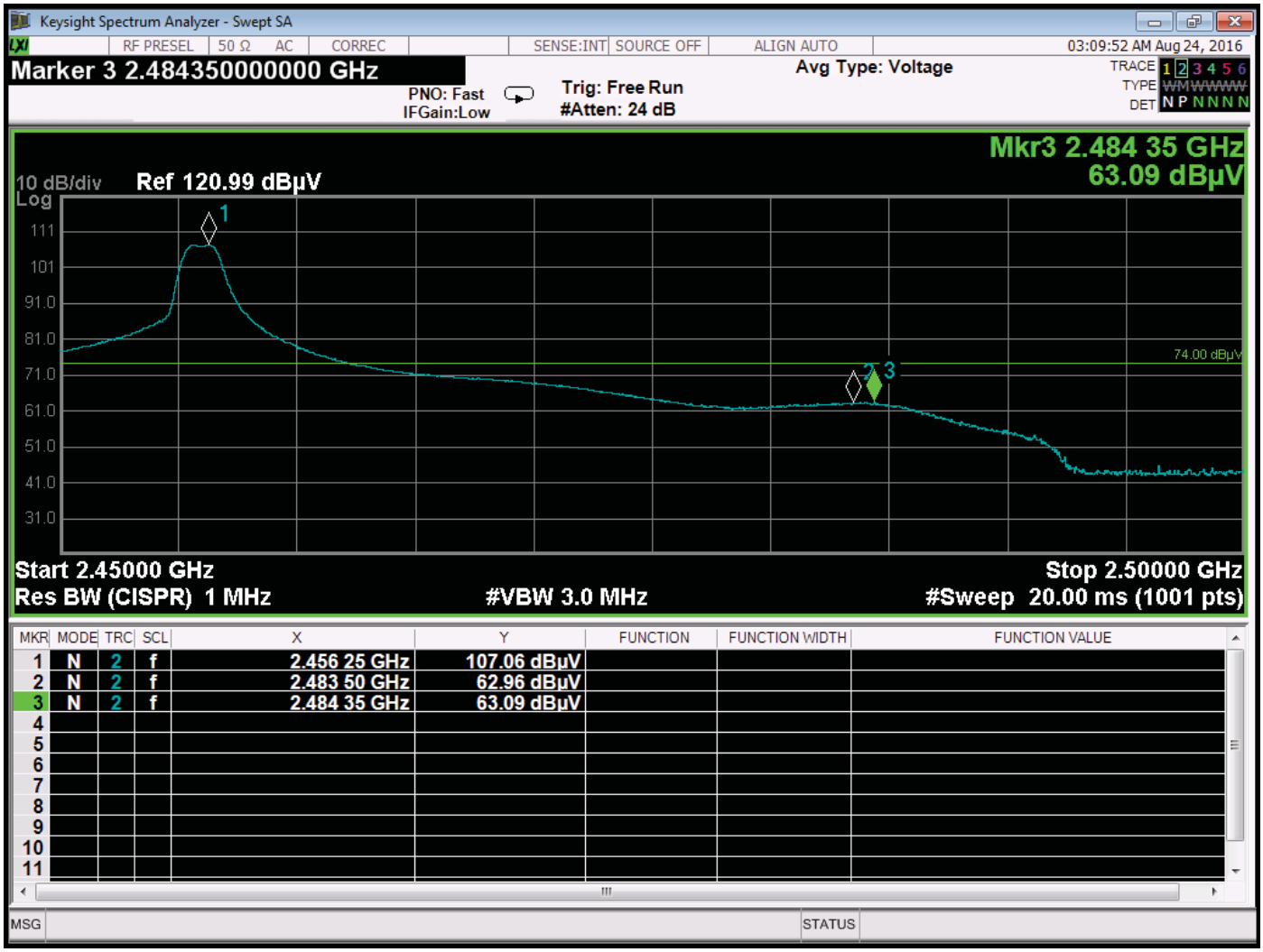
Band Edge – 2470 MHz – Vertical – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



Band Edge – 2470 MHz – Horizontal – X-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



Band Edge – 2456 MHz – Vertical – Y-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case



Band Edge – 2456 MHz – Horizontal – X-Axis – ANT-2.4-CW-RCS Antenna – Port #2 Worst Case

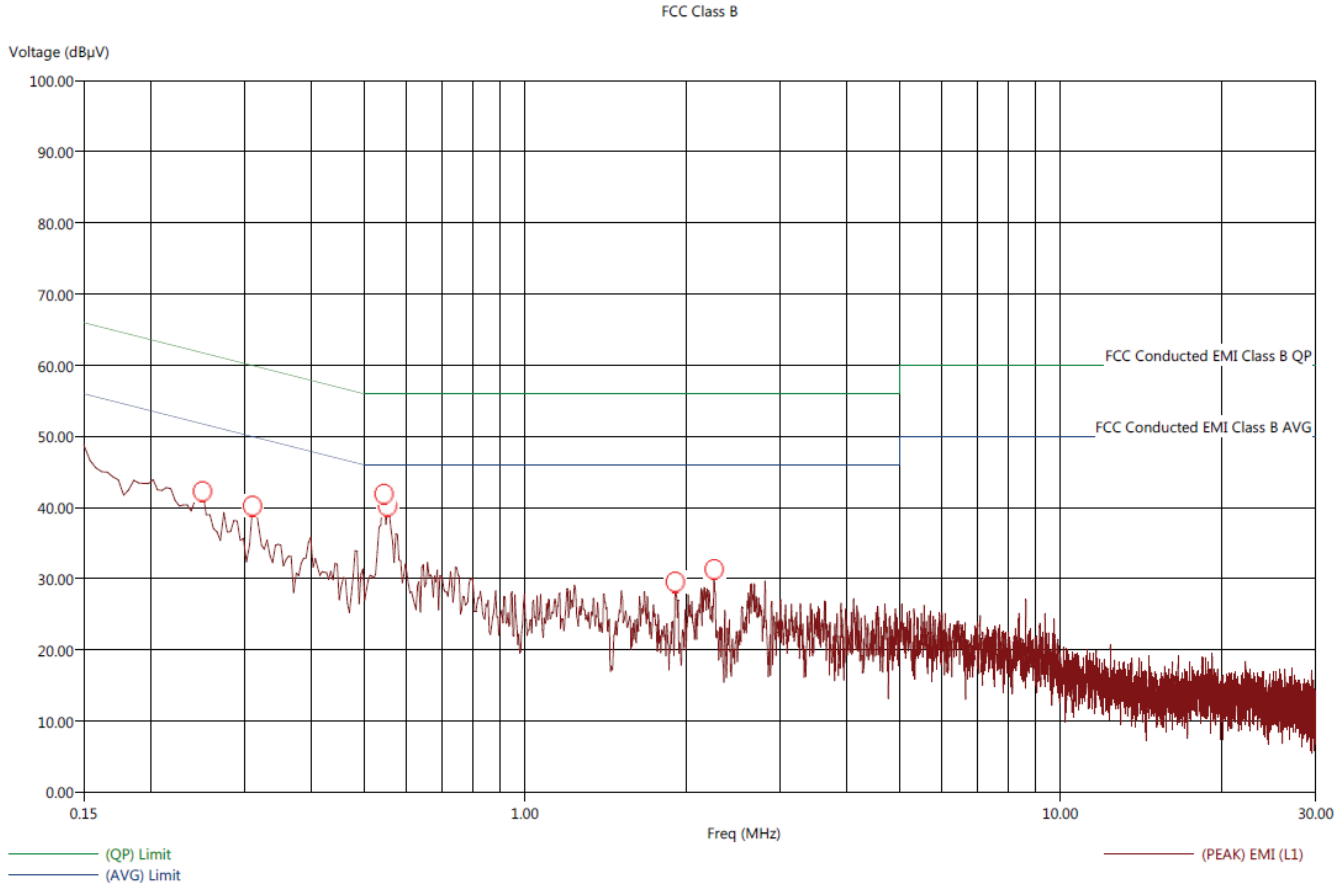
CONDUCTED EMISSIONS

DATA SHEETS

Title: FCC Class B - Black Lead
File: Agilent - ANT-2,4-CW-RCS Antenna - Port 1 - Conducted Pre-Scan Line 0.15-30 MHz -FCC-B - 8-1-16.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS Antenna on Port 1 (worst case)

AC input: 115 VAC / 60 Hz

9/1/2016 11:28:26 AM
Sequence: Preliminary Scan



Title: FCC Class B - Black Lead
File: Agilent - ANT-2,4-CW-RCS Antenna - Port 1 - Conducted Final Scan Line 0.15-30 MHz - FCC-B - 8-1-16.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS Antenna on Port 1 (worst case)

9/1/2016 11:42:18 AM
Sequence: Final Measurements

AC input: 115 VAC / 60 Hz

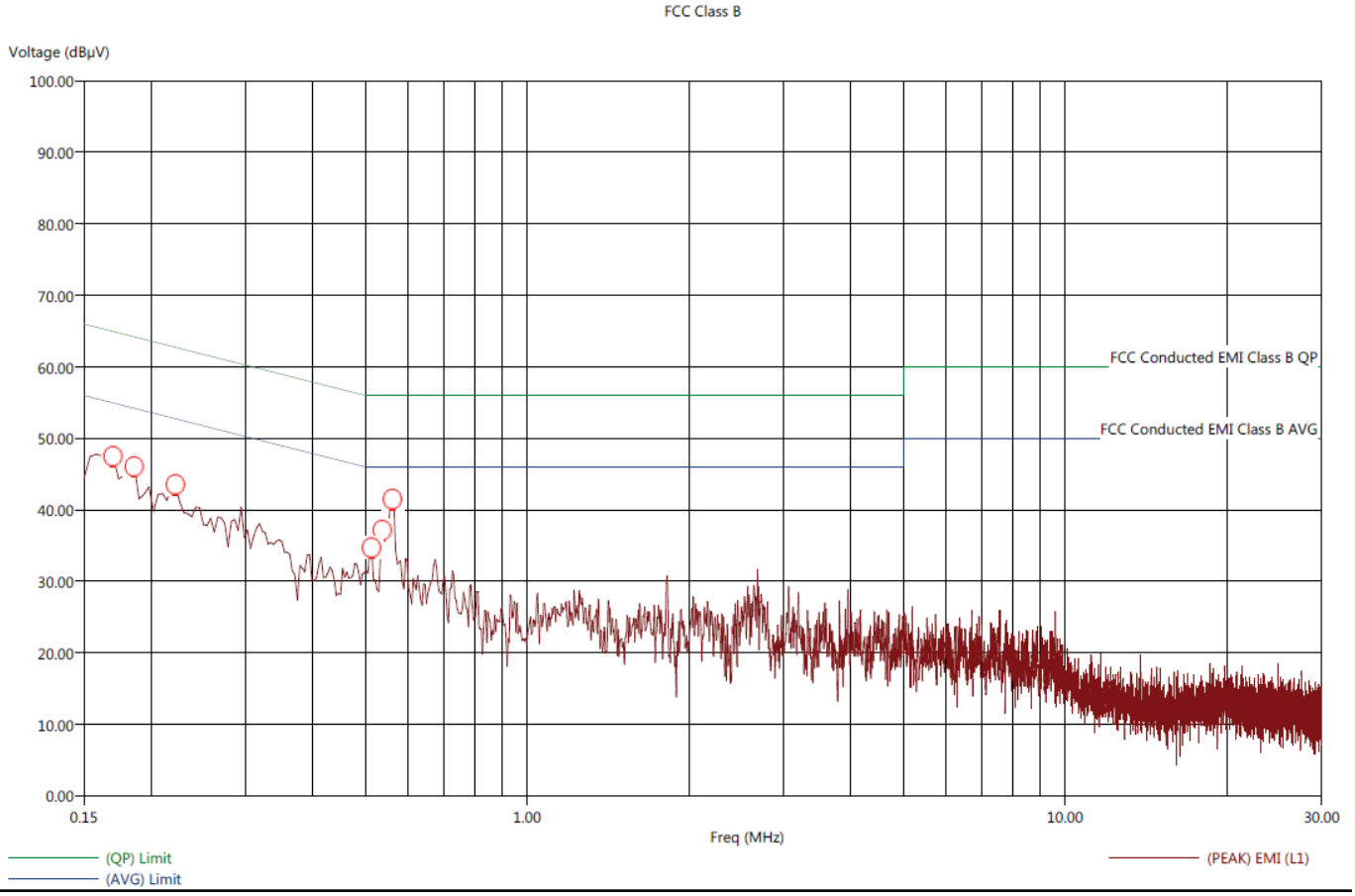
FCC Class B

Freq (MHz)	(PEAK) EMI (dBµV)	(QP) EMI (dBµV)	(AVG) EMI (dBµV)	(QP) Margin QPL (dB)	(AVG) Margin AVL (dB)	(QP) Limit (dBµV)	(AVG) Limit (dBµV)	Cable (dB)
0.250	43.43	40.24	42.09	-21.52	-9.67	61.76	51.76	0.08
0.310	41.15	37.25	38.49	-22.72	-11.48	59.97	49.97	0.08
0.546	43.20	38.07	41.98	-17.93	-4.02	56.00	46.00	0.08
0.554	43.31	40.51	42.41	-15.49	-3.59	56.00	46.00	0.08
1.910	31.08	24.93	28.44	-31.07	-17.56	56.00	46.00	0.17
2.258	32.26	25.86	30.08	-30.14	-15.92	56.00	46.00	0.18

Title: FCC Class A - White Lead
File: Agilent - ANT-2,4-CW-RCS Antenna - Port 1 - Conducted Pre-Scan Neutral 0.15-30 MHz - FCC-B - 8-1-16.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS Antenna - Port 1 (worst case)

AC input: 115 VAC / 60 Hz

9/1/2016 11:50:42 AM
Sequence: Preliminary Scan



Title: FCC Class B - White Lead
File: Agilent - ANT-2,4-CW-RCS Antenna - Port 1 - Conducted Final Scan Neutral 0.15-30 MHz - FCC-B - 8-1-16.set
Operator: James Ross
EUT Type: 2.4 GHz Transceiver
EUT Condition: The EUT is transmitting at the Middle Channel
Comments: Company: Preston Cinema Systems
Model: TR4-3.2A
With ANT-2.4-CW-RCS Antenna - Port 1 (worst case)

9/1/2016 11:53:19 AM
Sequence: Final Measurements

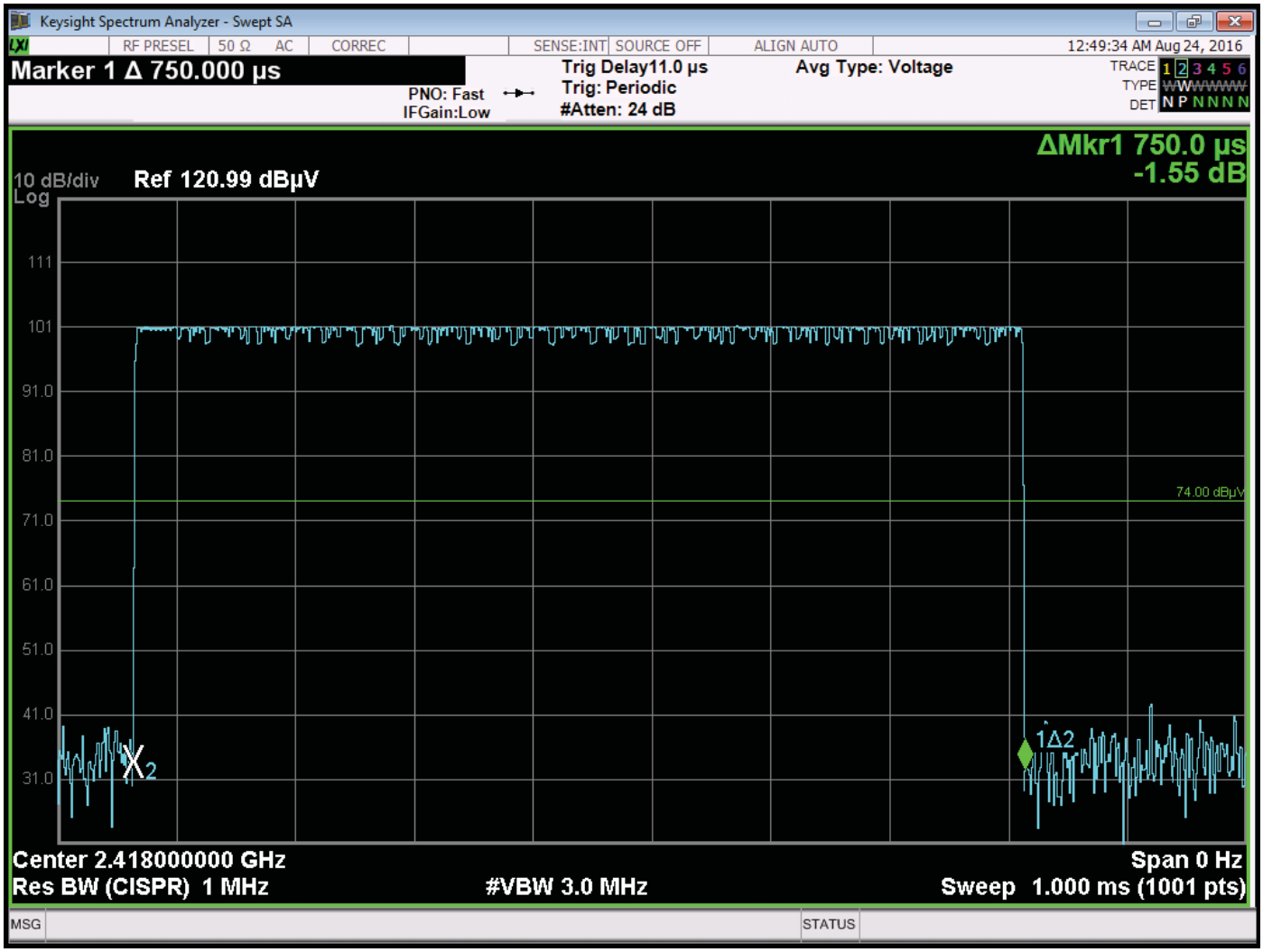
AC input: 115 VAC / 60 Hz

FCC Class B

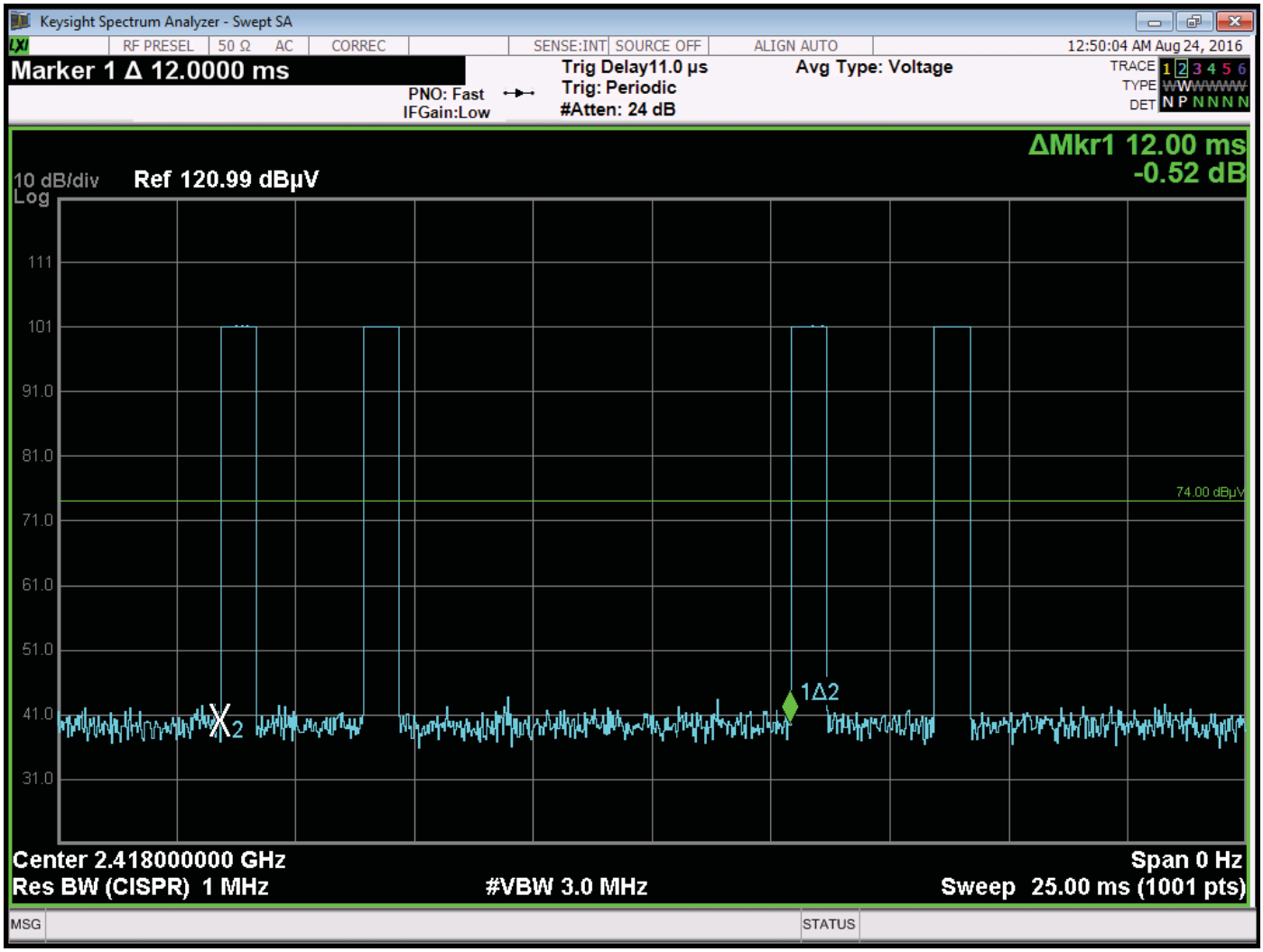
Freq (MHz)	(PEAK) EMI (dBµV)	(QP) EMI (dBµV)	(AVG) EMI (dBµV)	(QP) Margin QPL (dB)	(AVG) Margin AVL (dB)	(QP) Limit (dBµV)	(AVG) Limit (dBµV)	Cable (dB)
0.170	49.53	45.80	47.57	-19.16	-7.39	64.96	54.96	0.07
0.186	48.61	44.55	46.59	-19.66	-7.62	64.21	54.21	0.07
0.222	44.86	41.49	42.79	-21.26	-9.96	62.74	52.74	0.08
0.514	35.81	31.58	33.50	-24.42	-12.50	56.00	46.00	0.08
0.538	42.36	36.63	39.70	-19.37	-6.30	56.00	46.00	0.08
0.562	43.07	41.02	42.32	-14.98	-3.68	56.00	46.00	0.09

DUTY CYCLE

DATA SHEETS



Time of One Pule = 750 us



Number of Pulses in each pulse train = 2
Time Between each pulse train = 12 ms
Duty Cycle = (750 us * 2 / 12 ms) = 12.5%
A -18.06 dB Peak to Average Ratio was used.