

*FCC PART 15, SUBPART B and C
TEST REPORT*

for

2.4 GHz TRANSCEIVER MODULE

MODEL: TR4

Prepared for

PRESTON CINEMA SYSTEMS
1659 ELEVENTH STREET
SANTA MONICA, CALIFORNIA 90404

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DATE: SEPTEMBER 25, 2009

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
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2	Plot Map And Layout of Test Site – 3 Meters

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 endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: 2.4 GHz Transceiver Module
Model: TR4
S/N: N/A

Product Description: See Expository Statement.

Modifications: There were no modifications made to the EUT during the testing.

Manufacturer: Preston Cinema Systems
1659 Eleventh Street
Santa Monica, California 90404

Test Dates: September 4, 5, 6, and 8, 2009

Test Specifications: EMI requirements
CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.209, and 15.247

Test Procedure: ANSI C63.4: 2003

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.207. Highest reading in relation to spec limit: 44.04 dBuV/m @ 0.642 MHz (*Uc = 0.49 dB)
2	Spurious Radiated RF Emissions, 10 kHz – 25000 MHz	Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d) Highest reading in relation to spec limit: 32.16 dBuV/m @ 398.56 MHz (*Uc = 1.85 dB)
3	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25000 MHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25000 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209(a), and section 15.247 (d) Highest reading in relation to spec limit: 52.61 dBuV/m @ 7206 MHz (*Uc = 3.05 dB)
5	6 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(2)
6	Peak Power Output	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(b)(3)
7	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
8	Peak Power Spectral Density Conducted 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 Electromagnetic Interference (EMI) tests performed on the 2.4 GHz Transceiver Module, Model: TR4. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. 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, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI 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

Howard Preston President

Compatible Electronics Inc.

Kyle Fujimoto Test Engineer
Michael Christensen Lab Manager, Brea Division

2.4 Date Test Sample was Received

The EUT was received on September 4, 2009.

2.5 Disposition of the Test Sample

The EUT has not been returned to Preston Cinema Systems as of September 25, 2009.

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 EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
ANSI C63.4 2003	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators

4. DESCRIPTION OF TEST CONFIGURATION

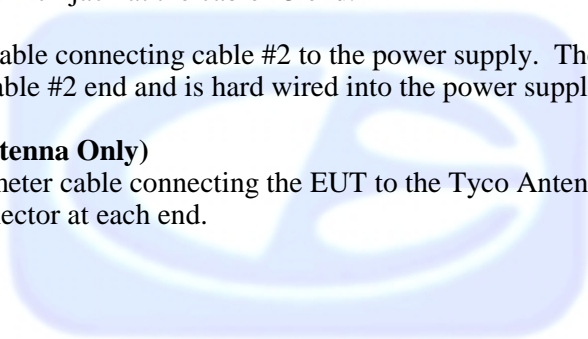
4.1 Description of Test Configuration - EMI

Tyco Antenna: The 2.4 GHz Transceiver Module, Model: TR4 (EUT) was connected to a Conan Connector, power supply, and Tyco antenna with reverse polarity UFL connector via its J6, J7, and antenna ports, respectively. The EUT was continuously transmitting and receiving. The channel was set via special channel switches on the PCB board.

Monopole Antenna: The 2.4 GHz Transceiver Module, Model: TR4 (EUT) was connected to a Conan Connector, power supply, and a monopole antenna with reverse polarity SMA connector via its J6, J7, and antenna ports, respectively. The EUT was continuously transmitting and receiving. The channel was set via special channel switches on the PCB board.

It was determined that the emissions were at their highest level when the EUT was operating in the above configurations. The final emissions data was taken in both mode of operations mentioned above and any cables were maximized. All initial investigations were performed with the EMI 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 20-centimeter cable connecting the EUT to the Conan Connector. The cable has an 11-pin Conan Connector at each end.
- Cable 2** This is a 25-centimeter cable connecting the EUT to cable #3. The cable has a 5-pin connector at the EUT end and a 1/8 inch jack at the cable #3 end.
- Cable 3** This is a 2 meter cable connecting cable #2 to the power supply. The cable has a 1/8 inch power connector at the cable #2 end and is hard wired into the power supply.
- Cable 4** **(For the Tyco Antenna Only)**
This is a 10-centimeter cable connecting the EUT to the Tyco Antenna. The cable has a reverse polarity UFL connector at each end.
- 

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT**5.1 EUT and Accessory List**

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
2.4 GHz TRANSCEIVER MODULE (EUT)	PRESTON CINEMA SYSTEMS	TR4	N/A	NMRTR4
(2) CONAN CONNECTOR BOARDS	PRESTON CINEMA SYSTEMS	N/A	N/A	N/A
POWER SUPPLY	AD-5800RDU	N/A	N/A	N/A
BLUETOOTH 802.11 b/g ANTENNA	TYCO ELECTRONICIS	P/N: 1513504-1	N/A	N/A
MONOPOLE ANTENNA	LINX TECHNOLOGIES	ANT-2.4-CW-RCS	N/A	N/A

5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	September 17, 2008	Sept. 17, 2010
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Biconical Antenna	Com Power	AB-900	15250	February 23, 2009	Feb. 23, 2010
Log Periodic Antenna	Com Power	AL-100	16060	June 15, 2009	June 15, 2010
Preamplifier	Com-Power	PA-102	1017	January 12, 2009	Jan. 12, 2010
Loop Antenna	Com-Power	AL-130	17089	September 29, 2008	Sept. 29, 2009
Horn Antenna	Com-Power	AH-118	071175	June 27, 2008	June 27, 2010
Microwave Preamplifier	Com-Power	PA-122	181921	March 12, 2009	March 12, 2010
Microwave Preamplifier	Com-Power	PA-840	711013	March 12, 2009	March 12, 2010
Horn Antenna	Com-Power	AH826	71957	December 12, 2007	Dec. 12, 2009
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
LISN	Com Power	LI-215	12076	September 29, 2008	Sept. 29, 2009
LISN	Com Power	LI-215	12090	September 29, 2008	Sept. 29, 2009
Transient Limiter	Com Power	252A910	1	September 26, 2008	Sept. 26, 2009

5.3 EMI Test Equipment (Continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
RF POWER OUPUT TEST EQUIPMENT					
Power Measuring Analyzer	Boonton Electronics	4500A-01	1282	June 20, 2008	June 30, 2010
Peak Power Sensor	Boonton Electronics	57318	3723	June 25, 2008	June 25, 2010

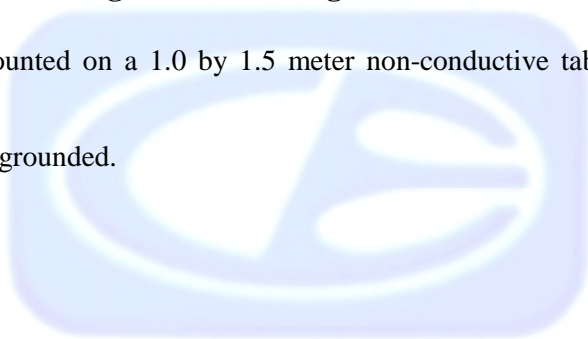
6. TEST SITE DESCRIPTION**6.1 Test Facility Description**

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

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

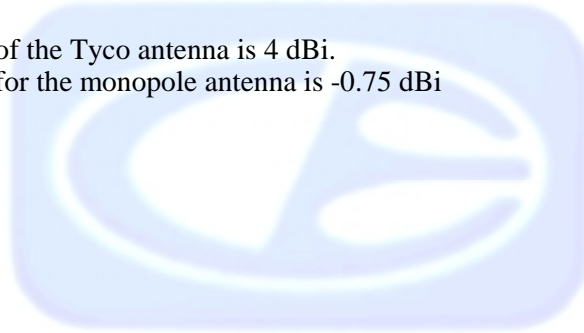


7. CHARACTERISTICS OF THE TRANSMITTER**7.1 Channel Number and Frequencies**

Please see the theory of operation exhibit for the list of channels and their frequencies.

7.2 Antenna Gain

The antenna gain of the Tyco antenna is 4 dBi.
The antenna gain for the monopole antenna is -0.75 dBi



8. TEST PROCEDURES

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

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The EMI Receiver was used as a measuring meter. The data was collected with the EMI Receiver in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A transient limiter was used for the protection of the EMI Receiver 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: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

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

Test Results:

Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.207.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The EMI Receiver was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The readings above 1 GHz were averaged using a "duty cycle correction factor", derived from $20 \log(\text{dwell time} / 100 \text{ ms})$. Since the duty cycle was below 10%, the maximum allowed 20 dB was subtracted from the peak reading. The duty cycle correction factor is explained in Appendix E.

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9.3 GHz	1 MHz	Horn Antenna

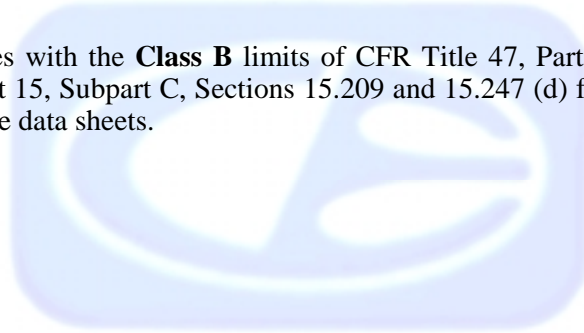
The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2003. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a 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 by the Radiated Emission Manual Test software. 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.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain the final test data.

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.



8.2 6 dB Bandwidth

The 6 dB bandwidth was measured using the EMI Receiver. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (a)(2).



8.3 Peak Output Power

The Peak Output Power was taken using the power meter and power sensor. The EUT was directly connected to the power sensor, which was directly connected to the power meter. The Peak Output Power was then taken.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 RF Antenna Conducted Test

The RF antenna conducted test was taken using the EMI Receiver. The RF antenna conducted test was measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power that is produced by the intentional radiator is at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of desired power. Please see the radiated emission data sheets located in Appendix E.

7.5 RF Band Edges

The RF band edges were taken at the edges of the ISM spectrum (2400 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 8.2 of this test report was used to maximize the emission.

Test Results:

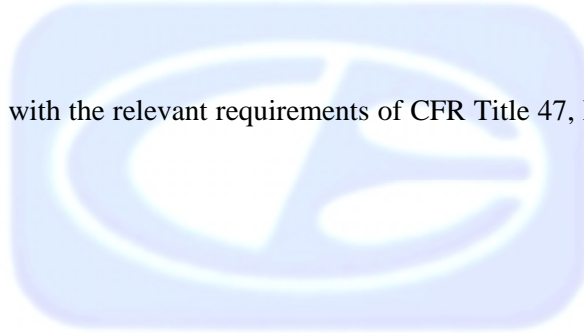
The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). The RF power at the band edges at 2400 MHz and 2483.5 MHz meet the requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d). Please see the data sheets located in Appendix E.

8.7 Spectral Density Test

The spectral 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 resolution bandwidth was 3 kHz, and the video bandwidth was 10 kHz. The highest 1.5 MHz of the signal was used as the frequency span with the sweep rate being 1 second for every 3 kHz of span.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (e).



8. CONCLUSIONS

The 2.4 GHz Transceiver Module Model: TR4 meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test, the EUT was within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B.





APPENDIX A

LABORATORY RECOGNITIONS

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada



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.

No modifications were made to the EUT during the testing.





APPENDIX C

***ADDITIONAL MODELS COVERED
UNDER THIS REPORT***

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

2.4 GHz Transceiver Module
Model: TR4
S/N: N/A

There were no additional models covered under this test report.



APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

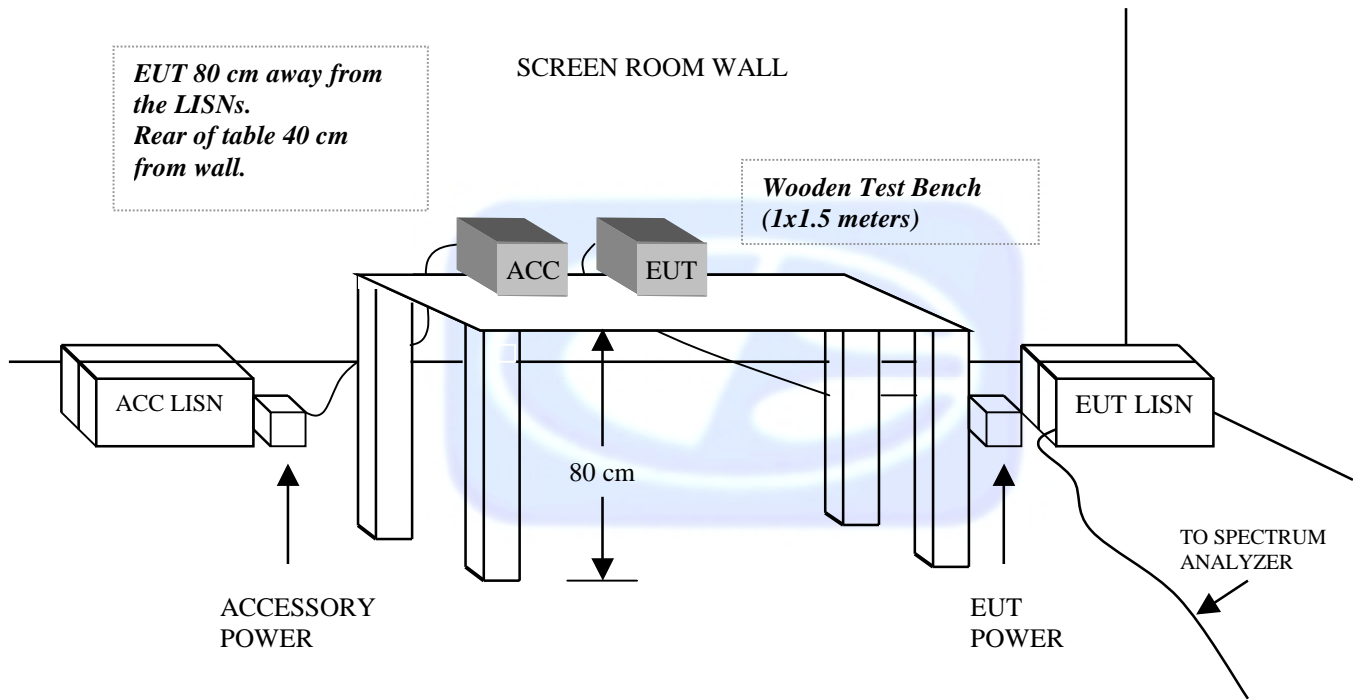
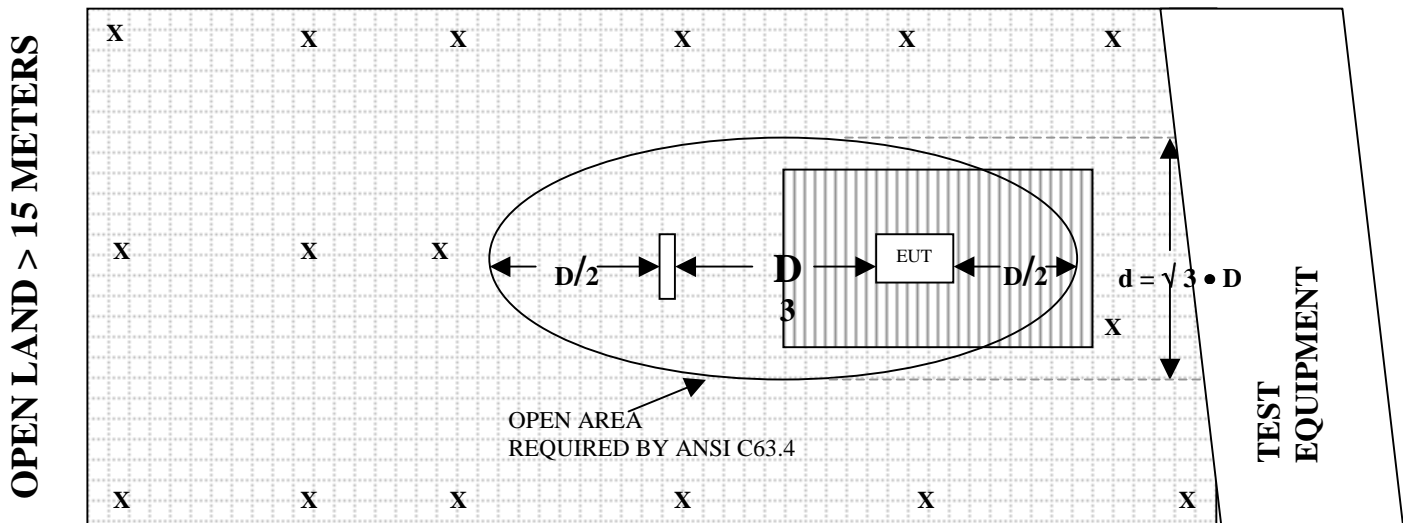


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS

- | | | | |
|----------|--------------------------|--|-----------------|
| X | = GROUND RODS | | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) | | = WOOD COVER |

COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: FEBRUARY 23, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	13.0	100	11.1
35	11.1	120	13.6
40	10.2	140	12.4
45	11.2	160	12.9
50	11.6	180	16.5
60	9.1	200	17.0
70	8.4	250	16.3
80	6.2	275	18.2
90	8.5	300	17.9

COM-POWER AL-100**LOG PERIODIC ANTENNA**

S/N: 16060

CALIBRATION DATE: JUNE 15, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	14.2	700	20.1
400	15.9	800	21.2
500	17.1	900	21.3
600	18.8	1000	22.3

COM POWER AH-118**HORN ANTENNA**

S/N: 071175

CALIBRATION DATE: JUNE 27, 2008

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.5	10.0	39.4
1.5	25.4	10.5	39.7
2.0	28.3	11.0	39.0
2.5	28.9	11.5	40.0
3.0	29.7	12.0	39.7
3.5	30.8	12.5	41.7
4.0	31.4	13.0	42.7
4.5	32.6	13.5	41.2
5.0	33.7	14.0	41.6
5.5	34.4	14.5	43.2
6.0	34.7	15.0	42.3
6.5	35.4	15.5	39.3
7.0	37.0	16.0	41.7
7.5	37.4	16.5	39.6
8.0	37.6	17.0	43.0
8.5	37.6	17.5	47.1
9.0	38.5	18.0	46.2
9.5	38.6		

COM-POWER PA-102**PREAMPLIFIER**

S/N: 1017

CALIBRATION DATE: JANUARY 12, 2009

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	39.0	300	38.8
40	39.0	350	38.8
50	38.8	400	38.7
60	38.7	450	38.6
70	38.8	500	38.3
80	38.8	550	38.9
90	39.1	600	38.4
100	39.1	650	38.8
125	38.9	700	38.4
150	38.9	750	38.5
175	38.9	800	38.3
200	38.8	850	38.4
225	39.0	900	38.1
250	38.9	950	37.4
275	38.8	1000	38.1

COM-POWER PA-122**PREAMPLIFIER**

S/N: 181921

CALIBRATION DATE: MARCH 12, 2009

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	36.46	10.0	35.06
1.5	35.36	10.5	34.82
2.0	34.76	11.0	33.12
2.5	34.94	11.5	34.33
3.0	34.59	12.0	34.75
3.5	34.55	12.5	33.94
4.0	34.25	13.0	35.50
4.5	33.89	13.5	34.89
5.0	34.22	14.0	36.56
5.5	34.81	14.5	36.06
6.0	35.74	15.0	36.67
6.5	36.51	15.5	36.84
7.0	36.66	16.0	34.31
7.5	35.72	16.5	35.11
8.0	33.28	17.0	35.35
8.5	33.11	17.5	34.11
9.0	34.71	18.0	33.88
9.5	35.50	18.5	32.20

COM-POWER AL-130**LOOP ANTENNA**

S/N: 17089

CALIBRATION DATE: SEPTEMBER 29, 2008

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.57	9.93
0.01	-42.06	9.44
0.02	-42.43	9.07
0.05	-42.50	9.00
0.07	-42.10	9.40
0.1	-42.03	9.47
0.2	-44.50	7.00
0.3	-41.93	9.57
0.5	-41.90	9.60
0.7	-41.73	9.77
1	-41.23	10.27
2	-40.90	10.60
3	-41.20	10.30
4	-41.30	10.20
5	-40.70	10.80
10	-41.10	10.40
15	-42.17	9.33
20	-42.00	9.50
25	-42.20	9.30
30	-43.10	8.40

COM-POWER PA-840**PREAMPLIFIER-MICROWAVE**

S/N: 711013

CALIBRATION DATE: MARCH 12, 2009

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
18.0	25.72	29.0	26.72
18.5	25.46	29.5	27.11
19.0	25.19	30.0	27.19
19.5	24.58	30.5	27.12
20.0	23.94	31.0	26.76
20.5	23.48	31.5	26.52
21.0	23.22	32.0	26.11
21.5	23.34	32.5	26.35
22.0	23.62	33.0	26.15
22.5	23.74	33.5	26.14
23.0	24.40	34.0	25.47
23.5	24.60	34.5	25.39
24.0	25.15	35.0	25.05
24.5	25.38	35.5	25.18
25.0	26.00	36.0	24.63
25.5	25.92	36.5	25.22
26.0	26.47	37.0	26.20
26.5	27.19	37.5	26.46
27.0	27.60	38.0	25.44
27.5	26.51	38.5	24.71
28.0	26.46	39.0	23.50
28.5	26.36	39.5	23.46

COM-POWER AH826**HORN ANTENNA**

S/N: 71957

CALIBRATION DATE: DECEMBER 12, 2007

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



FRONT VIEW

**PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCIVER MODULE
MODEL: TR4**

FCC SUBPART B AND C – RADAITED EMISSIONS – TYCO ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

**Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500**

**Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600**

**Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700**

**Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400**



REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – RADAITED EMISSIONS – TYCO ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – RADAITED EMISSIONS – MONOPOLE ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
19121 El Toro Road
Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

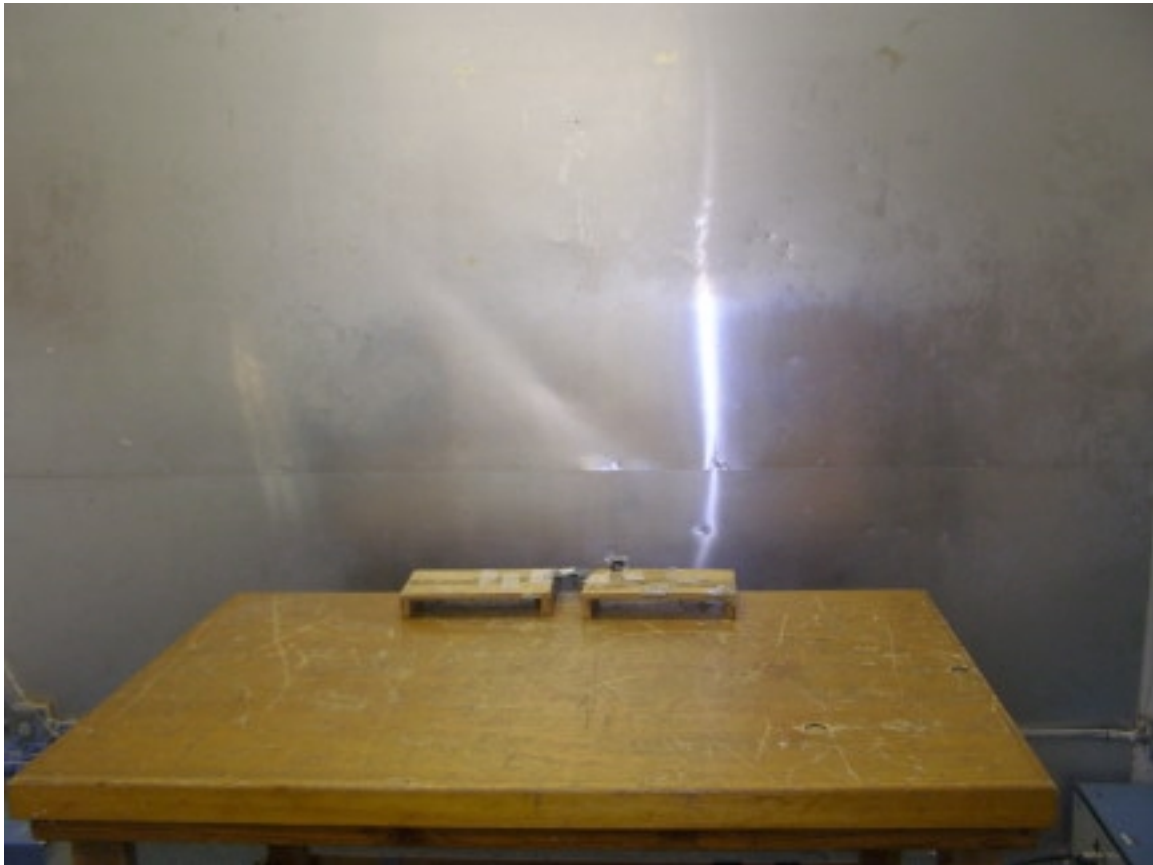


REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – RADAITED EMISSIONS – MONOPOLE ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – CONDUCTED EMISSIONS – TYCO ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

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114 Olinda Drive
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REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – CONDUCTED EMISSIONS – TYCO ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



FRONT VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – CONDUCTED EMISSIONS – MONOPOLE ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

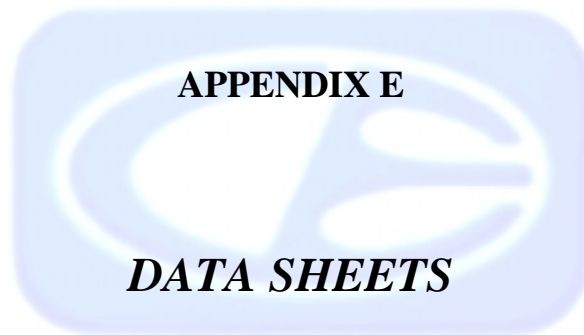


REAR VIEW

PRESTON CINEMA SYSTEMS
2.4 GHz TRANSCEIVER MODULE
MODEL: TR4

FCC SUBPART B AND C – CONDUCTED EMISSIONS – MONOPOLE ANTENNA

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



RADIATED EMISIONS

DATA SHEETS

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - X-Axis**Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	102.28	V	--	--	Peak	1.35	180	
2478	82.28	V	--	--	Avg	1.35	180	
4956	61.15	V	74	-12.85	Peak	1.25	150	
4956	41.15	V	54	-12.85	Avg	1.25	150	
7434	68.15	V	74	-5.85	Peak	1.35	150	
7434	48.15	V	54	-5.85	Avg	1.35	150	
9912	54.62	V	--	--	Peak	1.35	150	Not in
9912	34.62	V	--	--	Avg	1.35	150	Restricted Band
12390	53.14	V	74	-20.86	Peak	1.48	165	
12390	33.14	V	54	-20.86	Avg	1.48	165	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems
 2.4 GHz RF Module
 Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

**High Channel - X-Axis
 Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	96.99	H	--	--	Peak	1.25	135	
2478	76.99	H	--	--	Avg	1.25	135	
4956	56.09	H	74	-17.91	Peak	1.35	150	
4956	36.09	H	54	-17.91	Avg	1.35	150	
7434	62.86	H	74	-11.14	Peak	1.25	180	
7434	42.86	H	54	-11.14	Avg	1.25	180	
9912	51.51	H	--	--	Peak	1.35	150	Not in
9912	31.51	H	--	--	Avg	1.35	150	Restricted Band
12390	55.22	H	74	-18.78	Peak	1.26	125	
12390	35.22	H	54	-18.78	Avg	1.26	125	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Y-Axis**Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	97.64	V	--	--	Peak	1.25	225	
2478	77.64	V	--	--	Avg	1.25	225	
4956	58.59	V	74	-15.41	Peak	1.35	225	
4956	38.59	V	54	-15.41	Avg	1.35	225	
7434	66.38	V	74	-7.62	Peak	1.25	180	
7434	46.38	V	54	-7.62	Avg	1.25	180	
9912	52.82	V	--	--	Peak	1.35	150	Not in
9912	32.82	V	--	--	Avg	1.35	150	Restricted Band
12390	58.44	V	74	-15.56	Peak	1.25	135	
12390	38.44	V	54	-15.56	Avg	1.25	135	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Y-Axis**Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	100.68	H	--	--	Peak	1.25	135	
2478	80.68	H	--	--	Avg	1.25	135	
4956	57.79	H	74	-16.21	Peak	1.35	125	
4956	37.79	H	54	-16.21	Avg	1.35	125	
7434	64.11	H	74	-9.89	Peak	1.25	150	
7434	44.11	H	54	-9.89	Avg	1.25	150	
9912	53.49	H	--	--	Peak	1.35	150	Not in
9912	33.49	H	--	--	Avg	1.35	150	Restricted Band
12390	52.89	H	74	-21.11	Peak	1.26	150	
12390	32.89	H	54	-21.11	Avg	1.26	150	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Z-Axis**Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	102.4	V	--	--	Peak	1.15	225	
2478	82.4	V	--	--	Avg	1.15	225	
4956	60.56	V	74	-13.44	Peak	1.35	225	
4956	40.56	V	54	-13.44	Avg	1.35	225	
7434	66.08	V	74	-7.92	Peak	1.58	125	
7434	46.08	V	54	-7.92	Avg	1.58	125	
9912	53.31	V	--	--	Peak	1.35	150	Not in
9912	33.31	V	--	--	Avg	1.35	150	Restricted Band
12390	60.05	V	74	-13.95	Peak	1.25	150	
12390	40.05	V	54	-13.95	Avg	1.25	150	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/05/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Z-Axis**Monopole Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	96.79	H	--	--	Peak	1.25	135	
2478	76.79	H	--	--	Avg	1.25	135	
4956	54.04	H	74	-19.96	Peak	1.35	150	
4956	34.04	H	54	-19.96	Avg	1.35	150	
7434	66.19	H	74	-7.81	Peak	1.35	155	
7434	46.19	H	54	-7.81	Avg	1.35	155	
9912	54.53	H	--	--	Peak	1.25	135	Not in
9912	34.53	H	--	--	Avg	1.25	135	Restricted Band
12390	55.34	H	74	-18.66	Peak	1.28	135	
12390	35.34	H	54	-18.66	Avg	1.28	135	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - X-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	99.87	V	--	--	Peak	1.25	45	
2478	79.87	V	--	--	Avg	1.25	45	
4956	57.85	V	74	-16.15	Peak	1.26	145	
4956	37.85	V	54	-16.15	Avg	1.26	145	
7434	64.73	V	74	-9.27	Peak	1.26	170	
7434	44.73	V	54	-9.27	Avg	1.26	170	
9912	49.46	V	--	--	Peak	1.59	225	Not in
9912	29.46	V	--	--	Avg	1.59	225	Restricted Band
12390	54.44	V	74	-19.56	Peak	1.58	158	
12390	34.44	V	54	-19.56	Avg	1.58	158	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - X-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	102.15	H	--	--	Peak	1.25	135	
2478	82.15	H	--	--	Avg	1.25	135	
4956	52.02	H	74	-21.98	Peak	1.35	150	
4956	32.02	H	54	-21.98	Avg	1.35	150	
7434	64.68	H	74	-9.32	Peak	1.25	135	
7434	44.68	H	54	-9.32	Avg	1.25	135	
9912	50.52	H	--	--	Peak	1.35	125	Not in
9912	30.52	H	--	--	Avg	1.35	125	Restricted Band
12390	55.66	H	74	-18.34	Peak	1.45	135	
12390	35.66	H	54	-18.34	Avg	1.45	135	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Y-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	98.97	V	--	--	Peak	1.25	225	
2478	78.97	V	--	--	Avg	1.25	225	
4956	55.14	V	74	-18.86	Peak	1.35	225	
4956	35.14	V	54	-18.86	Avg	1.35	225	
7434	57.91	V	74	-16.09	Peak	1.58	270	
7434	37.91	V	54	-16.09	Avg	1.58	270	
9912	51.13	V	--	--	Peak	1.26	135	Not in
9912	31.13	V	--	--	Avg	1.26	135	Restricted Band
12390	54.31	V	74	-19.69	Peak	1.58	125	
12390	34.31	V	54	-19.69	Avg	1.58	125	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems
 2.4 GHz RF Module
 Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Y-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	101.59	H	--	--	Peak	1.25	150	
2478	81.59	H	--	--	Avg	1.25	150	
4956	52.91	H	74	-21.09	Peak	1.35	155	
4956	32.91	H	54	-21.09	Avg	1.35	155	
7434	60.95	H	74	-13.05	Peak	1.25	150	
7434	40.95	H	54	-13.05	Avg	1.25	150	
9912	49.97	H	--	--	Peak	1.35	150	Not in
9912	29.97	H	--	--	Avg	1.35	150	Restricted Band
12390	56.33	H	74	-17.67	Peak	1.58	165	
12390	36.33	H	54	-17.67	Avg	1.58	165	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Z-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	98.71	V	--	--	Peak	2.5	180	
2478	78.71	V	--	--	Avg	2.5	180	
4956	54.22	V	74	-19.78	Peak	1.25	135	
4956	34.22	V	54	-19.78	Avg	1.25	135	
7434	64.78	V	74	-9.22	Peak	1.58	45	
7434	44.78	V	54	-9.22	Avg	1.58	45	
9912	50.48	V	--	--	Peak	1.68	135	Not in
9912	30.48	V	--	--	Avg	1.68	135	Restricted Band
12390	56.83	V	74	-17.17	Peak	1.25	125	
12390	36.83	V	54	-17.17	Avg	1.25	125	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

FCC 15.247

Preston Cinema Systems

2.4 GHz RF Module

Model: TR4

Date: 09/06/09

Lab: B

Tested By: Kyle Fujimoto

High Channel - Z-Axis**Tyco Antenna**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2478	101.61	H	--	--	Peak	1.25	180	
2478	81.61	H	--	--	Avg	1.25	180	
4956	55.64	H	74	-18.36	Peak	1.25	135	
4956	35.64	H	54	-18.36	Avg	1.25	135	
7434	62.57	H	74	-11.43	Peak	1.35	150	
7434	42.57	H	54	-11.43	Avg	1.35	150	
9912	50.63	H	--	--	Peak	1.25	225	Not in
9912	30.63	H	--	--	Avg	1.25	225	Restricted Band
12390	57.11	H	74	-16.89	Peak	1.25	0	
12390	37.11	H	54	-16.89	Avg	1.25	0	
14868								No Emission Detected
17346								No Emission Detected
19824								No Emission Detected
22302								No Emission Detected
24780								No Emission Detected

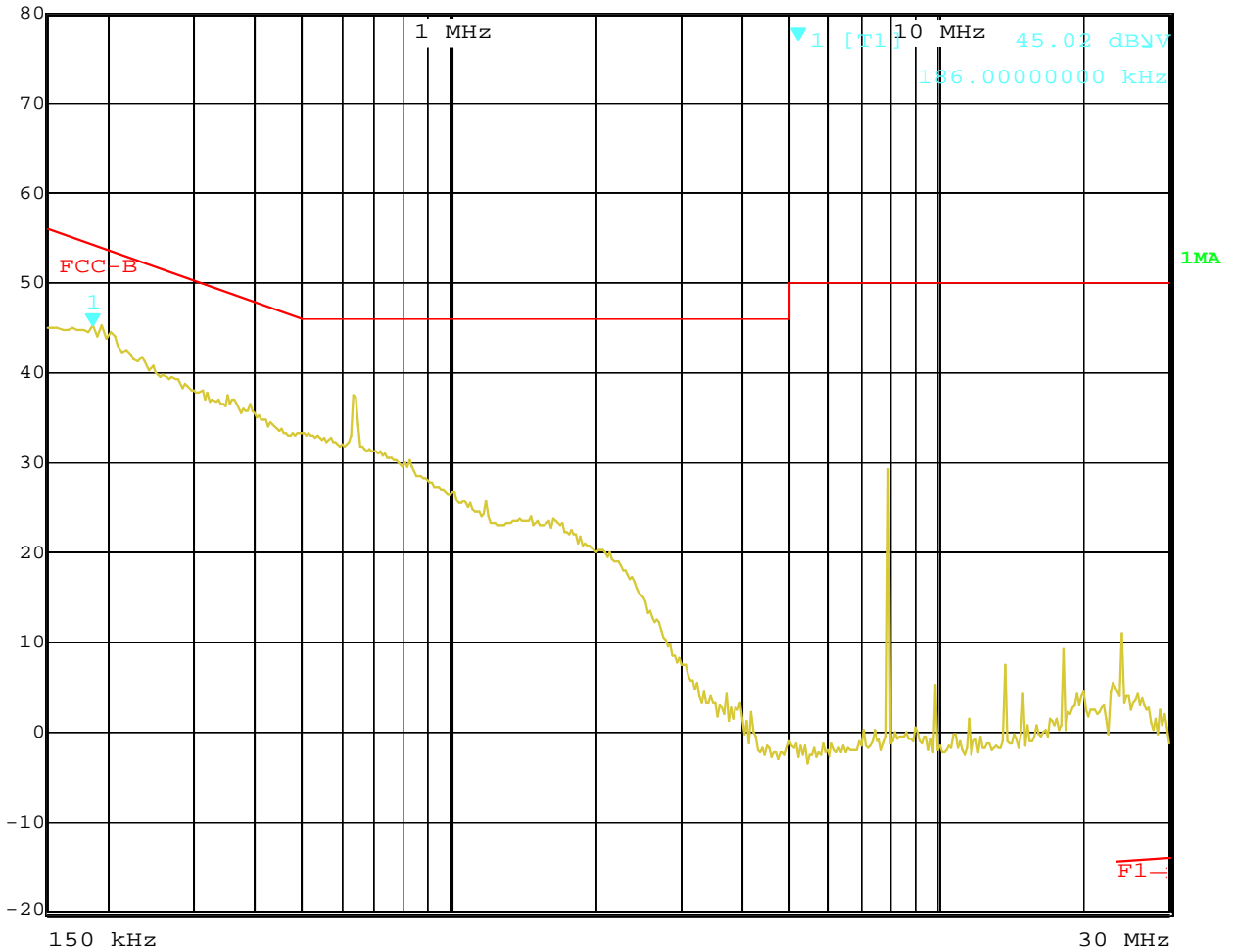
CONDUCTED EMISSIONS

DATA SHEETS

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – Black Lead
 Configuration: Monopole Antenna
 Tested By: Kyle Fujimoto



Att 0 dB AUTO Marker 1 [T1] Det MA/QP Trd 10
 INPUT 2 45.02 dBV ResBW 9 kHz
 186.0000000 kHz Meas T 100 ms Unit dBV



Date: 8.SEP.2009 14:41:32

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – Black Lead
 Configuration: Monopole Antenna
 Tested By: Kyle Fujimoto

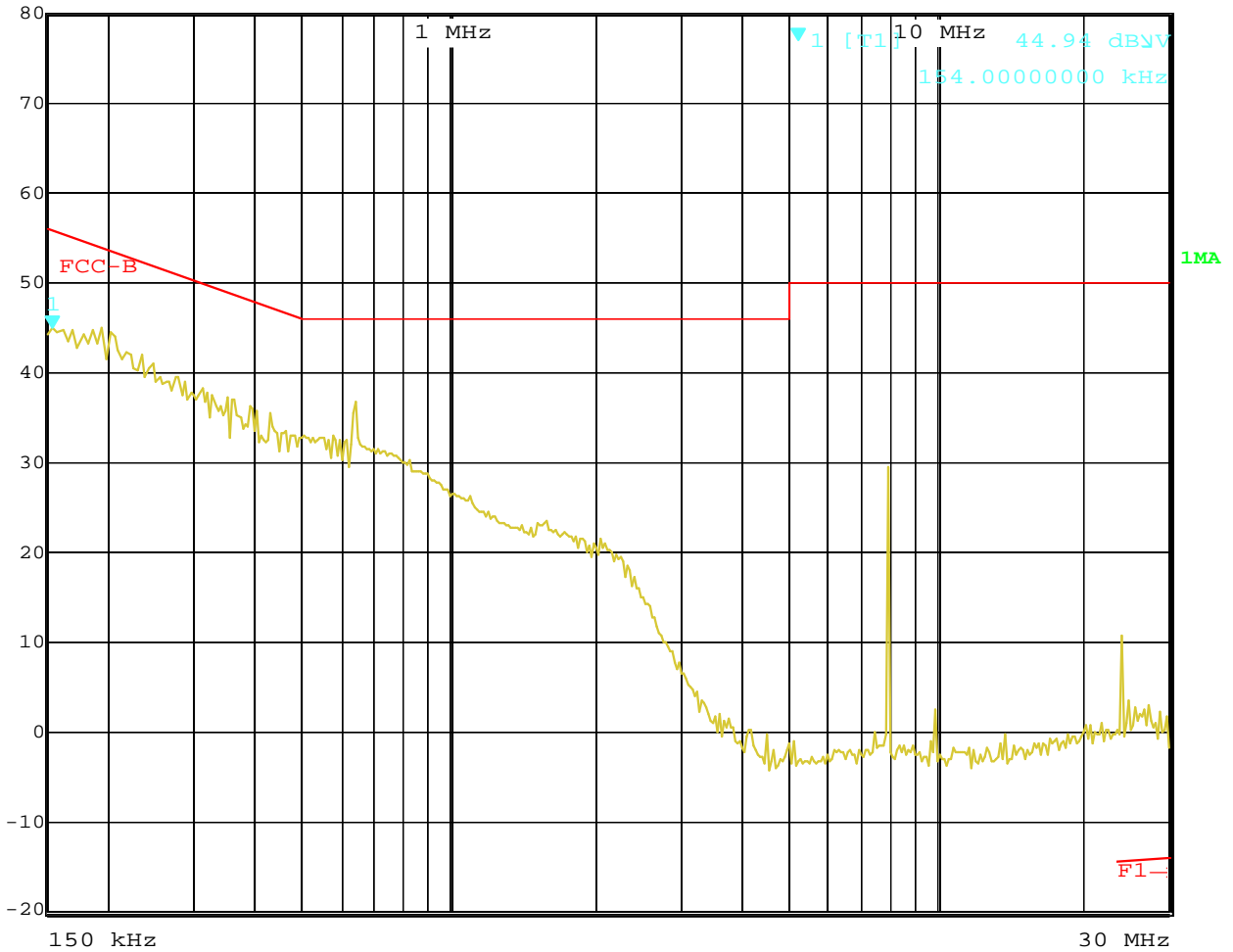
EDIT PEAK LIST (Prescan Results)			
Trace1: FCC-B		Trace2: ---	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBV	DELTA LIMIT dB
1 Max Peak	638.0000 kHz	37.33	-8.66
1 Max Peak	8.0140 MHz	29.18	-20.81
1 Max Peak	24.0420 MHz	10.92	-39.07
1 Max Peak	18.2380 MHz	9.22	-40.77
1 Max Peak	13.8460 MHz	7.31	-42.68
1 Max Peak	3.9820 MHz	3.06	-42.93
1 Max Peak	4.2020 MHz	2.00	-43.99
1 Max Peak	23.0300 MHz	5.33	-44.66
1 Max Peak	9.9820 MHz	5.17	-44.82
1 Max Peak	23.2820 MHz	4.95	-45.04
1 Max Peak	23.3140 MHz	4.82	-45.17
1 Max Peak	23.5980 MHz	4.44	-45.55
1 Max Peak	23.1540 MHz	4.43	-45.56
1 Max Peak	20.0780 MHz	4.33	-45.66
1 Max Peak	22.9660 MHz	4.29	-45.70
1 Max Peak	19.4500 MHz	4.15	-45.84
1 Max Peak	23.3780 MHz	4.04	-45.95
1 Max Peak	23.4100 MHz	4.04	-45.95
1 Max Peak	15.1300 MHz	4.03	-45.96
1 Max Peak	23.2500 MHz	4.03	-45.96

Date: 8.SEP.2009 14:42:22

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – White Lead
 Configuration: Monopole Antenna
 Tested By: Kyle Fujimoto



Att 0 dB AUTO	Marker 1 [T1]	Det	MA/QP Trd	9
INPUT 2	44.94 dBV	ResBW	9 kHz	
	154.0000000 kHz	Meas T	100 ms Unit	dBVV



Date: 8.SEP.2009 14:44:29

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – White Lead
 Configuration: Monopole Antenna
 Tested By: Kyle Fujimoto

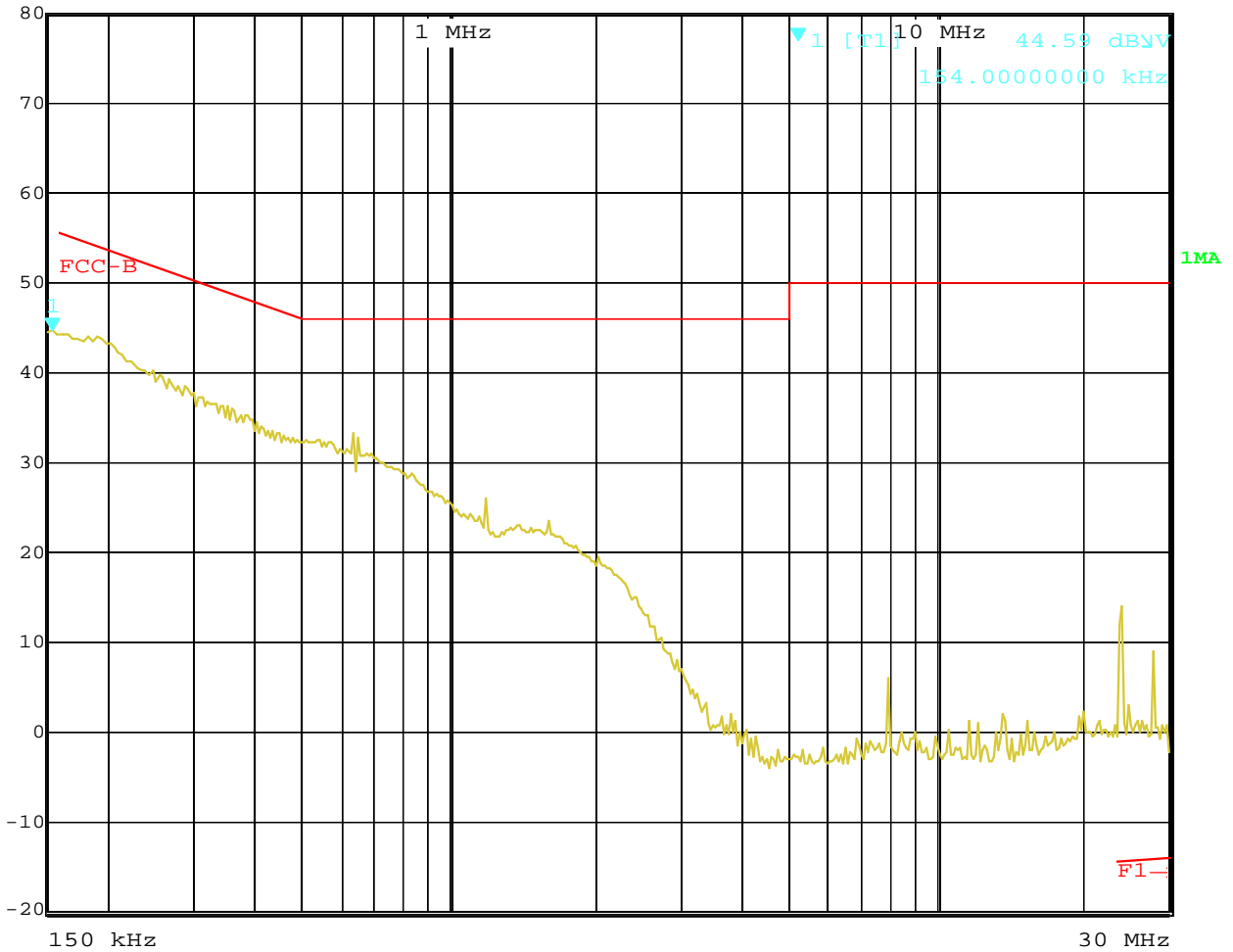
EDIT PEAK LIST (Prescan Results)			
Trace1: FCC-B		Trace2: ---	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBV	DELTA LIMIT dB
1 Max Peak	194.0000 kHz	44.79	-9.06
1 Max Peak	642.0000 kHz	36.67	-9.32
1 Max Peak	1.0540 MHz	26.14	-19.86
1 Max Peak	1.0460 MHz	26.14	-19.86
1 Max Peak	1.1060 MHz	26.00	-19.99
1 Max Peak	8.0140 MHz	29.30	-20.69
1 Max Peak	1.2020 MHz	24.26	-21.74
1 Max Peak	1.5940 MHz	23.30	-22.70
1 Max Peak	1.5780 MHz	23.16	-22.83
1 Max Peak	1.6220 MHz	22.48	-23.51
1 Max Peak	2.3220 MHz	18.25	-27.74
1 Max Peak	2.3620 MHz	17.72	-28.27
1 Max Peak	2.3940 MHz	17.05	-28.94
1 Max Peak	2.4060 MHz	16.68	-29.31
1 Max Peak	2.5140 MHz	14.58	-31.41
1 Max Peak	2.5580 MHz	14.17	-31.82
1 Max Peak	2.5380 MHz	14.17	-31.82
1 Max Peak	2.5500 MHz	14.04	-31.95
1 Max Peak	2.5780 MHz	13.77	-32.22
1 Max Peak	2.5700 MHz	13.77	-32.22

Date: 8.SEP.2009 14:44:51

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – Black Lead
 Configuration: Tyco Antenna
 Tested By: Kyle Fujimoto



Att 0 dB AUTO	Marker 1 [T1]	Det	MA/QP Trd	10
INPUT 2	44.59 dBV	ResBW	9 kHz	
	154.0000000 kHz	Meas T	100 ms Unit	dBV



Date: 8.SEP.2009 15:06:25

FCC Conducted Emissions
Preston Cinema Systems
2.4 GHz Transceiver Module
Model: TR4
FCC Class B – Black Lead
Configuration: Tyco Antenna
Tested By: Kyle Fujimoto

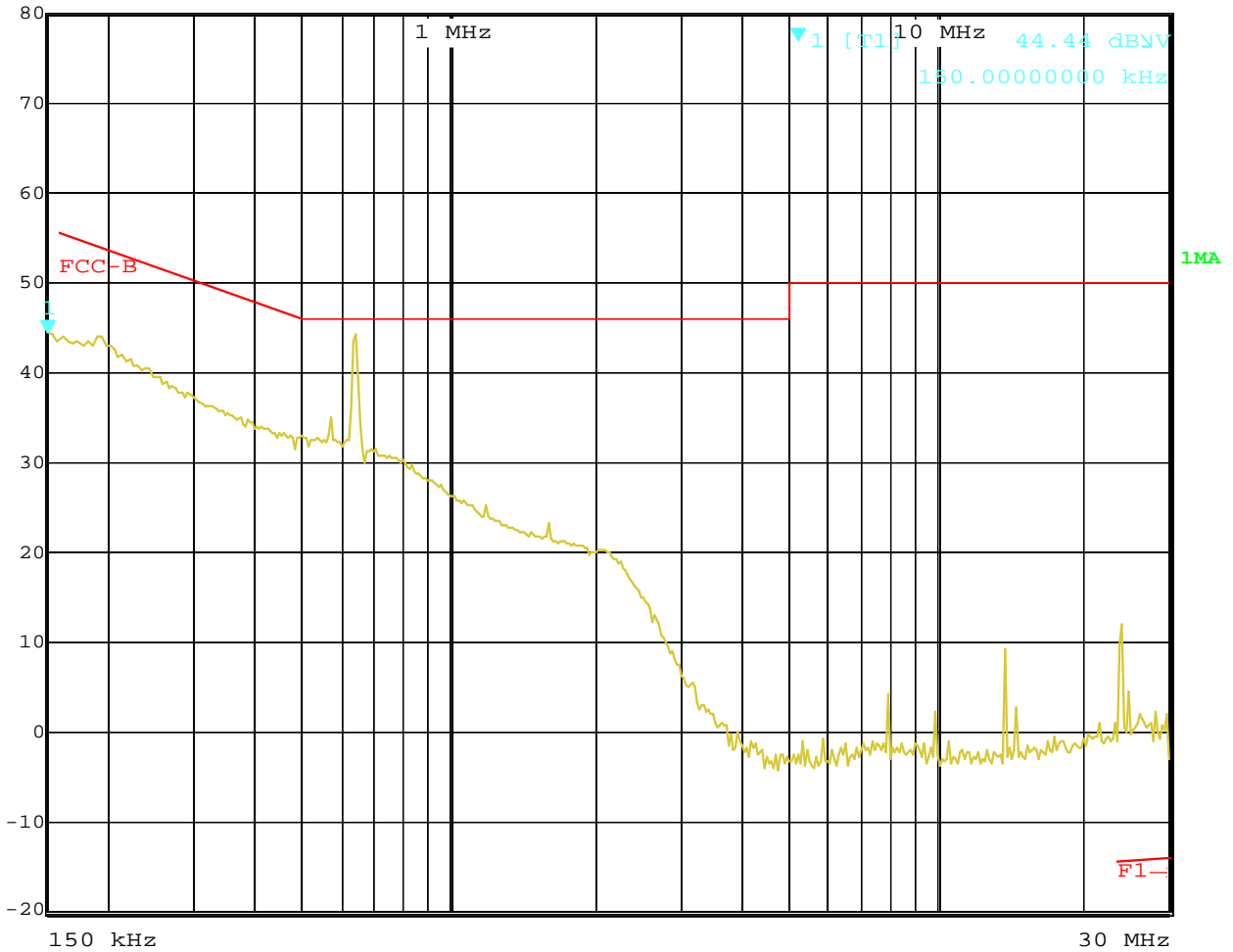
EDIT PEAK LIST (Prescan Results)			
Trace1: FCC-B		Trace2: ---	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBV	DELTA LIMIT dB
1 Max Peak	190.0000 kHz	43.97	-10.06
1 Max Peak	1.1900 MHz	25.95	-20.04
1 Max Peak	2.6580 MHz	11.74	-34.25
1 Max Peak	2.7220 MHz	10.42	-35.57
1 Max Peak	2.6820 MHz	10.16	-35.83
1 Max Peak	2.7340 MHz	9.91	-36.08
1 Max Peak	24.0020 MHz	13.81	-36.18
1 Max Peak	2.7460 MHz	9.21	-36.78
1 Max Peak	2.7540 MHz	9.08	-36.91
1 Max Peak	2.8020 MHz	8.94	-37.05
1 Max Peak	2.7900 MHz	8.94	-37.05
1 Max Peak	2.8540 MHz	8.68	-37.31
1 Max Peak	2.8340 MHz	8.68	-37.31
1 Max Peak	2.9420 MHz	7.91	-38.08
1 Max Peak	2.8860 MHz	7.66	-38.33
1 Max Peak	2.8660 MHz	7.66	-38.33
1 Max Peak	2.8780 MHz	7.28	-38.71
1 Max Peak	2.8980 MHz	6.90	-39.09
1 Max Peak	2.9980 MHz	6.77	-39.22
1 Max Peak	2.9180 MHz	6.77	-39.22

Date: 8.SEP.2009 15:06:56

FCC Conducted Emissions
 Preston Cinema Systems
 2.4 GHz Transceiver Module
 Model: TR4
 FCC Class B – White Lead
 Configuration: Tyco Antenna
 Tested By: Kyle Fujimoto



Att 0 dB AUTO	Marker 1 [T1]	Det	MA/QP Trd	9
INPUT 2	44.44 dBµV	ResBW	9 kHz	
	150.0000000 kHz	Meas T	100 ms Unit	dBµV



Date: 8.SEP.2009 14:52:11

FCC Conducted Emissions
Preston Cinema Systems
2.4 GHz Transceiver Module
Model: TR4
FCC Class B – White Lead
Configuration: Tyco Antenna
Tested By: Kyle Fujimoto

EDIT PEAK LIST (Prescan Results)			
Trace1: FCC-B		Trace2: ---	
Trace3: ---		Trace4: ---	
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Max Peak	642.0000 kHz	44.04	-1.95
1 Max Peak	194.0000 kHz	43.90	-9.95
1 Max Peak	1.0700 MHz	25.74	-20.25
1 Max Peak	2.5020 MHz	14.85	-31.14
1 Max Peak	2.5340 MHz	14.31	-31.68
1 Max Peak	2.5220 MHz	14.17	-31.82
1 Max Peak	2.5540 MHz	14.04	-31.95
1 Max Peak	2.5900 MHz	13.63	-32.36
1 Max Peak	2.5660 MHz	13.36	-32.63
1 Max Peak	2.6340 MHz	12.83	-33.16
1 Max Peak	2.6020 MHz	12.70	-33.29
1 Max Peak	2.6540 MHz	12.45	-33.54
1 Max Peak	2.6220 MHz	12.07	-33.92
1 Max Peak	2.6940 MHz	11.94	-34.05
1 Max Peak	2.6740 MHz	11.94	-34.05
1 Max Peak	2.6420 MHz	11.67	-34.32
1 Max Peak	2.7060 MHz	11.26	-34.73
1 Max Peak	2.7220 MHz	10.74	-35.25
1 Max Peak	2.7420 MHz	10.61	-35.38
1 Max Peak	2.7540 MHz	10.36	-35.64

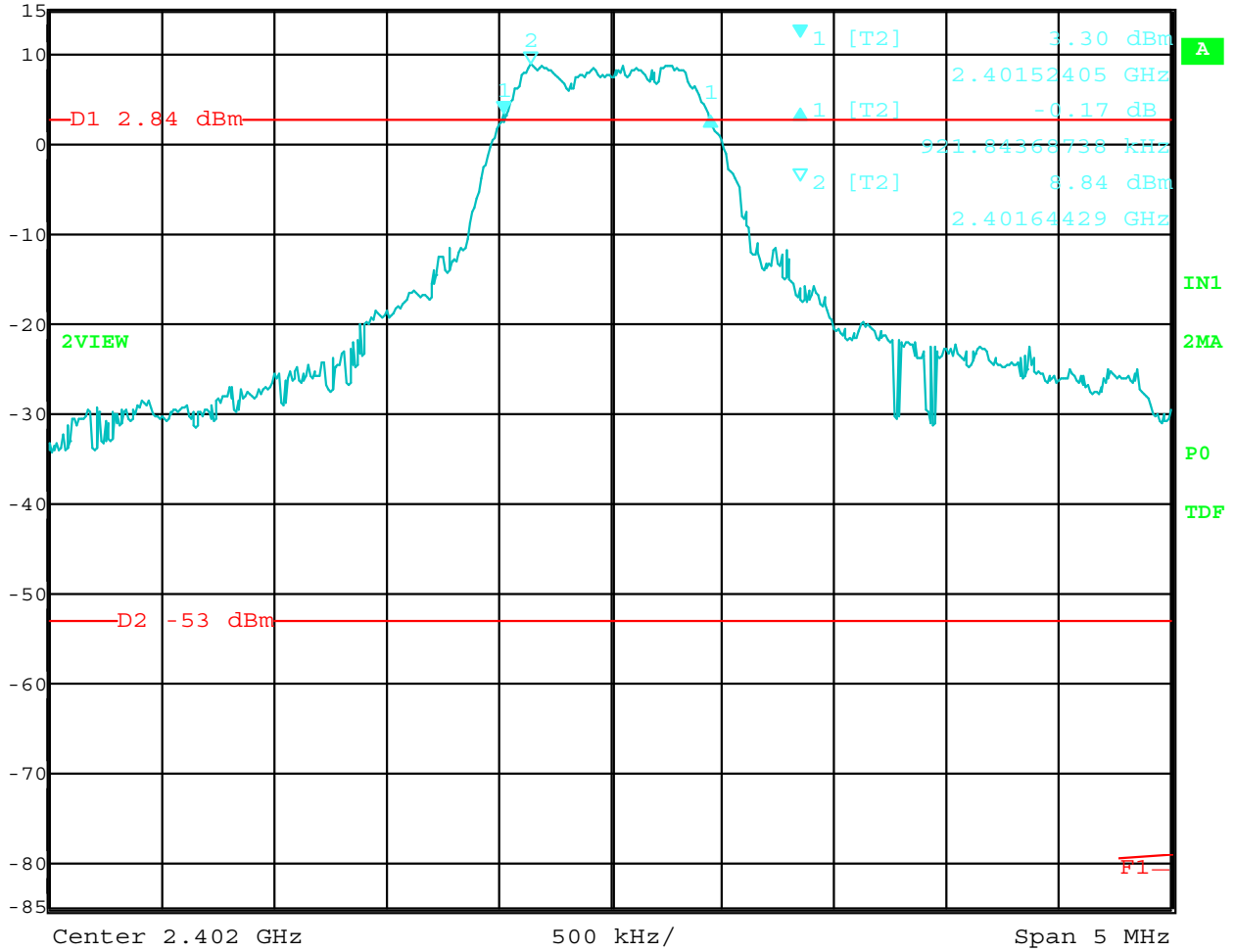
Date: 8.SEP.2009 14:52:31

-20 dB BANDWIDTH

DATA SHEETS



Delta 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -0.17 dB VBW 300 kHz
15 dBm 921.84368738 kHz SWT 5 ms Unit dBm

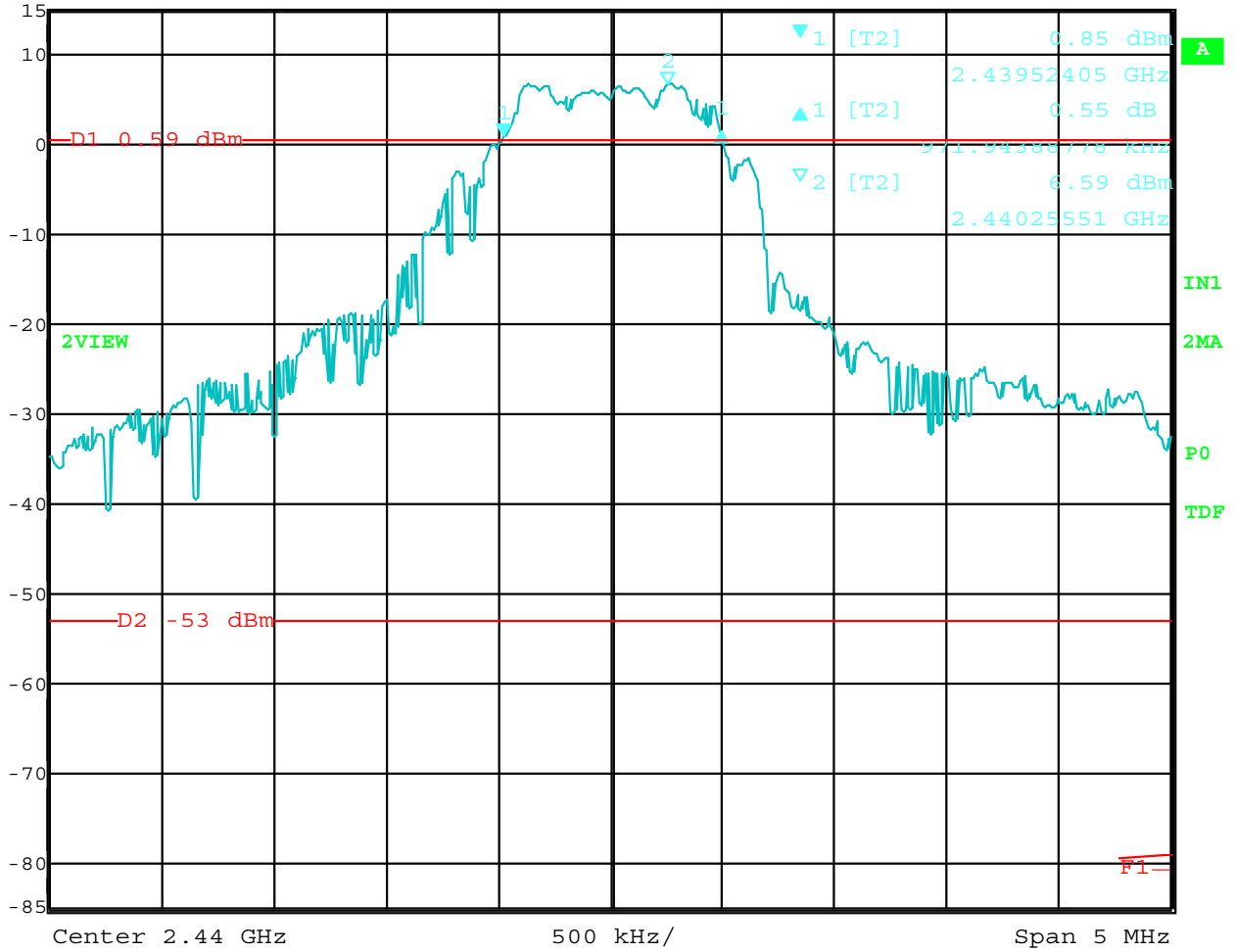


Date: 6.SEP.2009 17:52:36

6 dB Bandwidth of Fundamental – Low Channel



Delta 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl 0.55 dB VBW 300 kHz
15 dBm 971.94388778 kHz SWT 5 ms Unit dBm

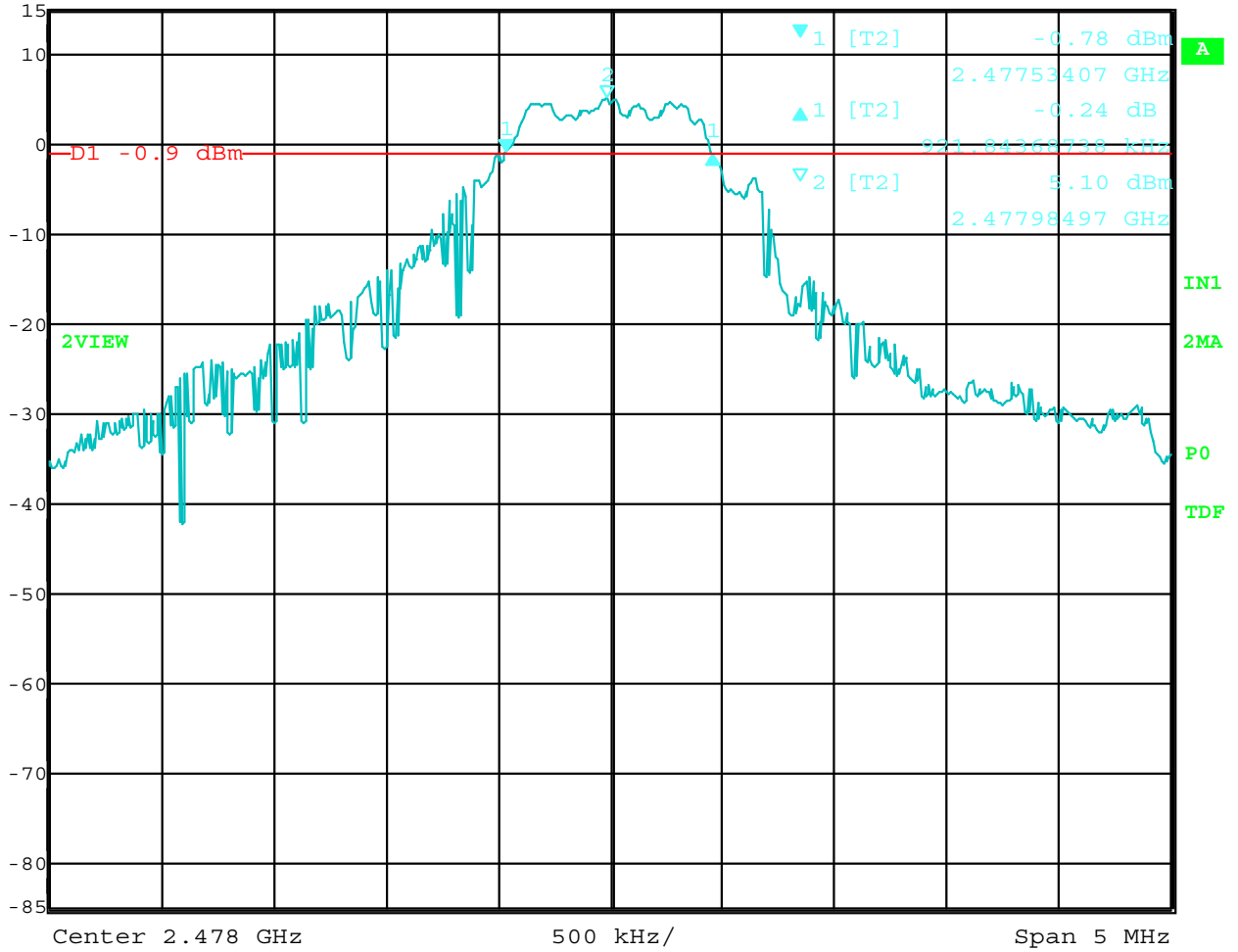


Date: 6.SEP.2009 18:00:24

6 dB Bandwidth of Fundamental – Middle Channel



Delta 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -0.24 dB VBW 300 kHz
15 dBm 921.84368738 kHz SWT 5 ms Unit dBm



Date: 8.SEP.2009 05:47:41

6 dB Bandwidth of Fundamental – High Channel

PEAK POWER OUTPUT

DATA SHEETS

PEAK OUTPUT POWER

Preston Cinema Systems

2.4 GHz Transceiver Module

Model: TR4

Test Date: September 6, 2009

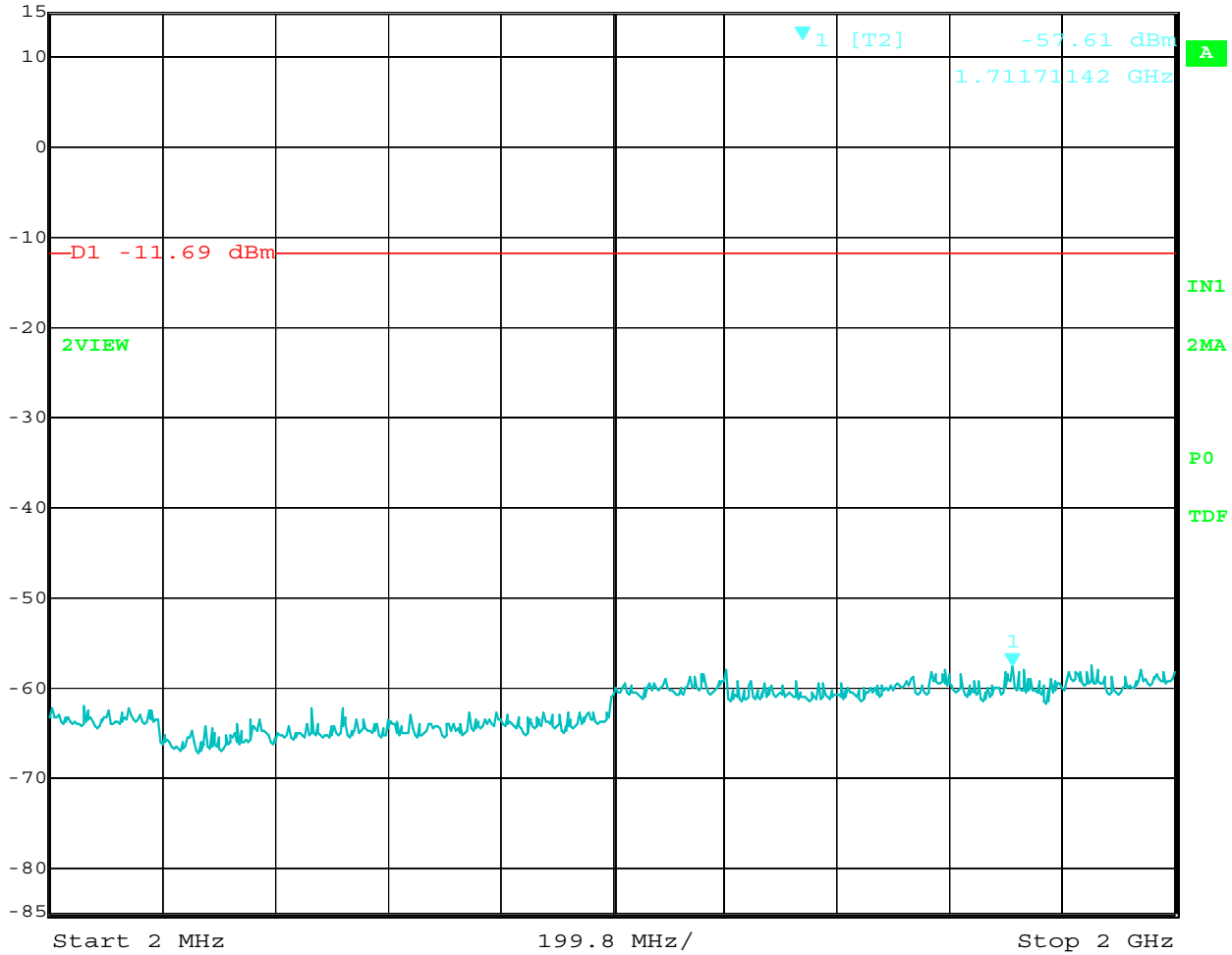
CHANNEL	FREQUENCY	100% PEAK POWER OUTPUT (dBm)
00	2402 MHz	12.70
14	2440 MHz	11.40
27	2478 MHz	11.28

RF CONDUCTED ANTENNA TEST

DATA SHEETS



Marker 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -57.61 dBm VBW 300 kHz
15 dBm 1.71171142 GHz SWT 1.15 s Unit dBm

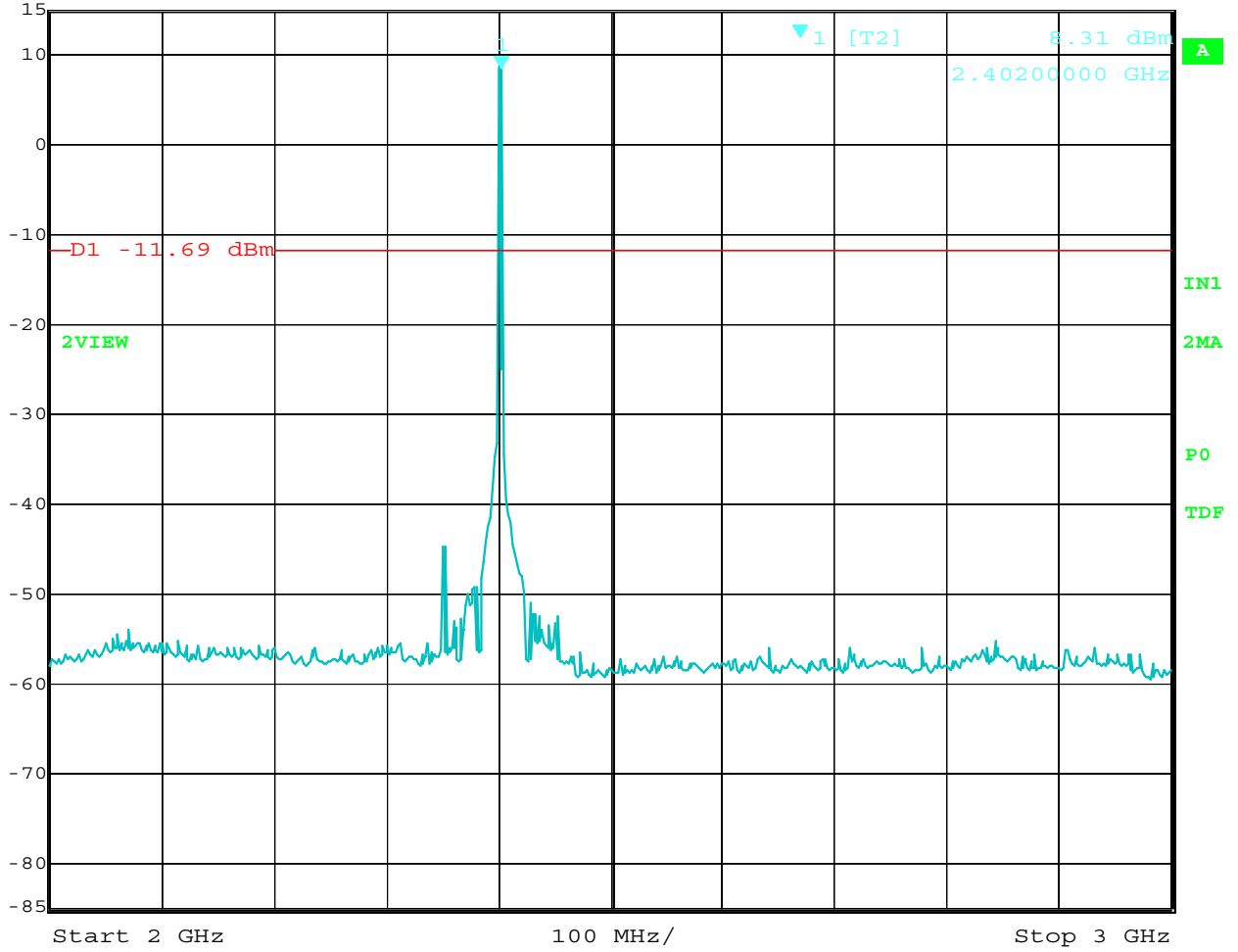


Date: 6.SEP.2009 18:09:18

RF Antenna Conducted Test – Low Channel – 2 MHz to 2 GHz



Ref Lvl 15 dBm
Marker 1 [T2] 8.31 dBm
2.40200000 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 250 ms Unit dBm

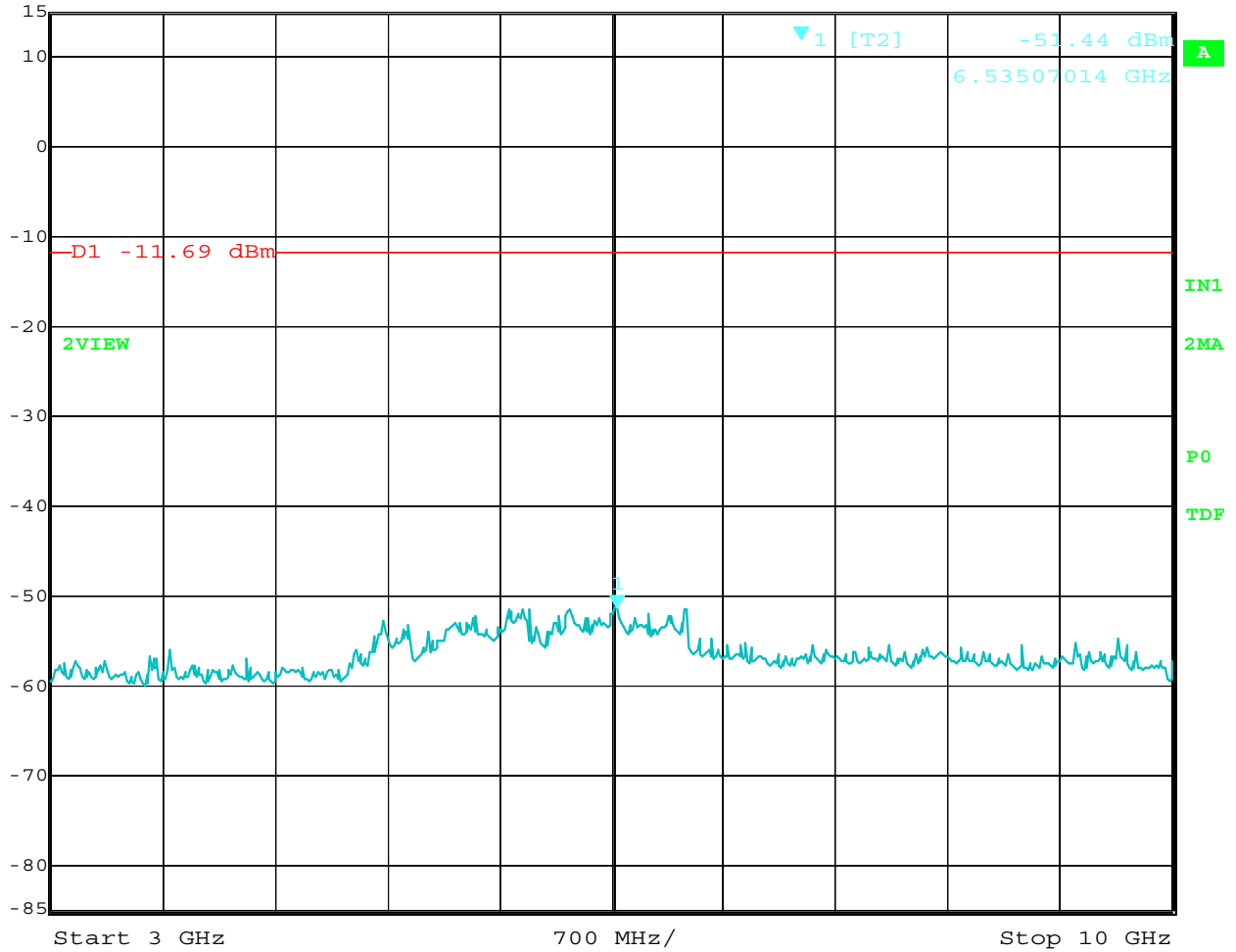


Date: 6.SEP.2009 18:07:35

RF Antenna Conducted Test – Low Channel – 2 GHz to 3 GHz



Ref Lvl 15 dBm
Marker 1 [T2] -51.44 dBm
6.53507014 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 1.75 s Unit dBm

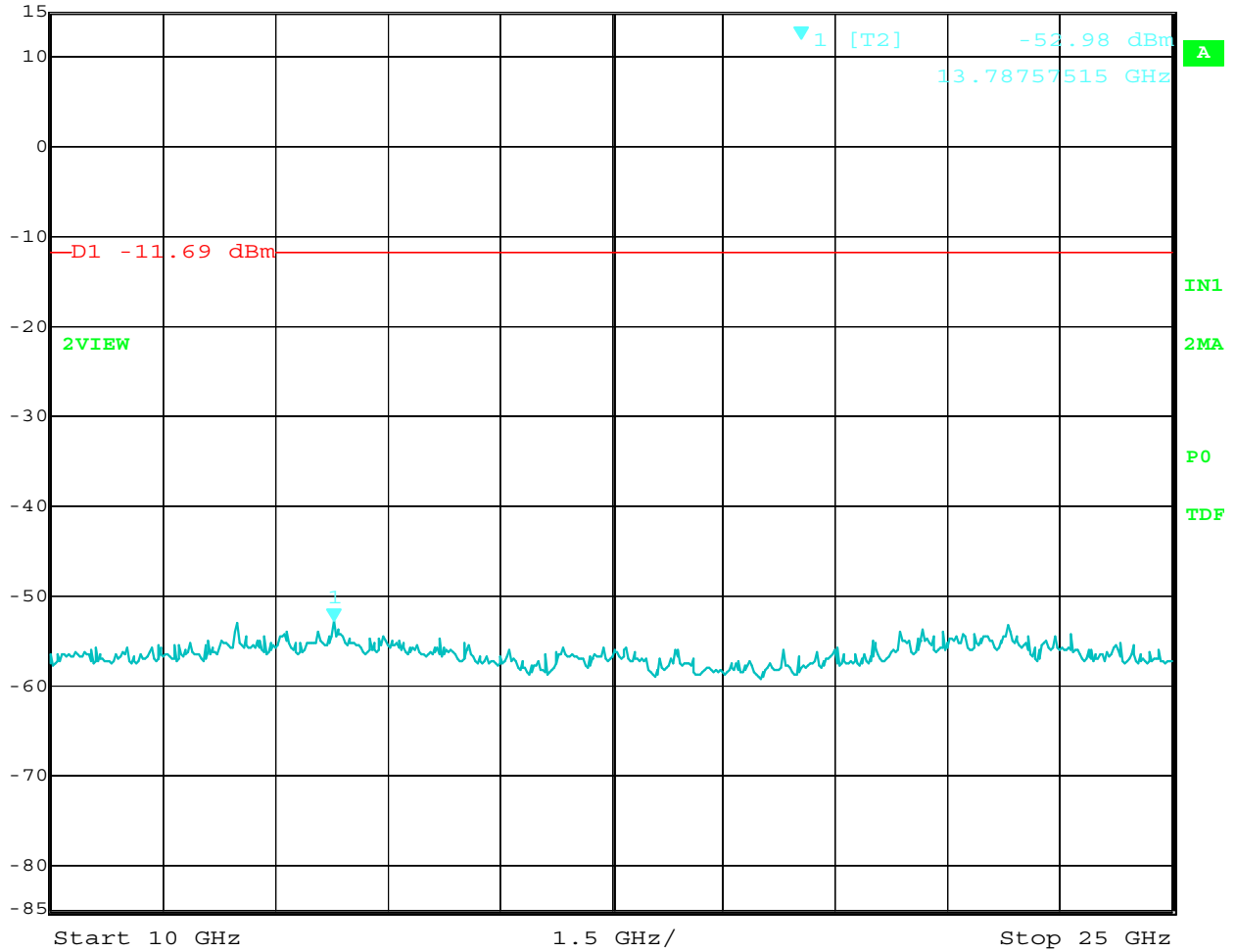


Date: 6.SEP.2009 18:09:55

RF Antenna Conducted Test – Low Channel – 3 GHz to 10 GHz



Marker 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -52.98 dBm VBW 300 kHz
15 dBm 13.78757515 GHz SWT 3.8 s Unit dBm

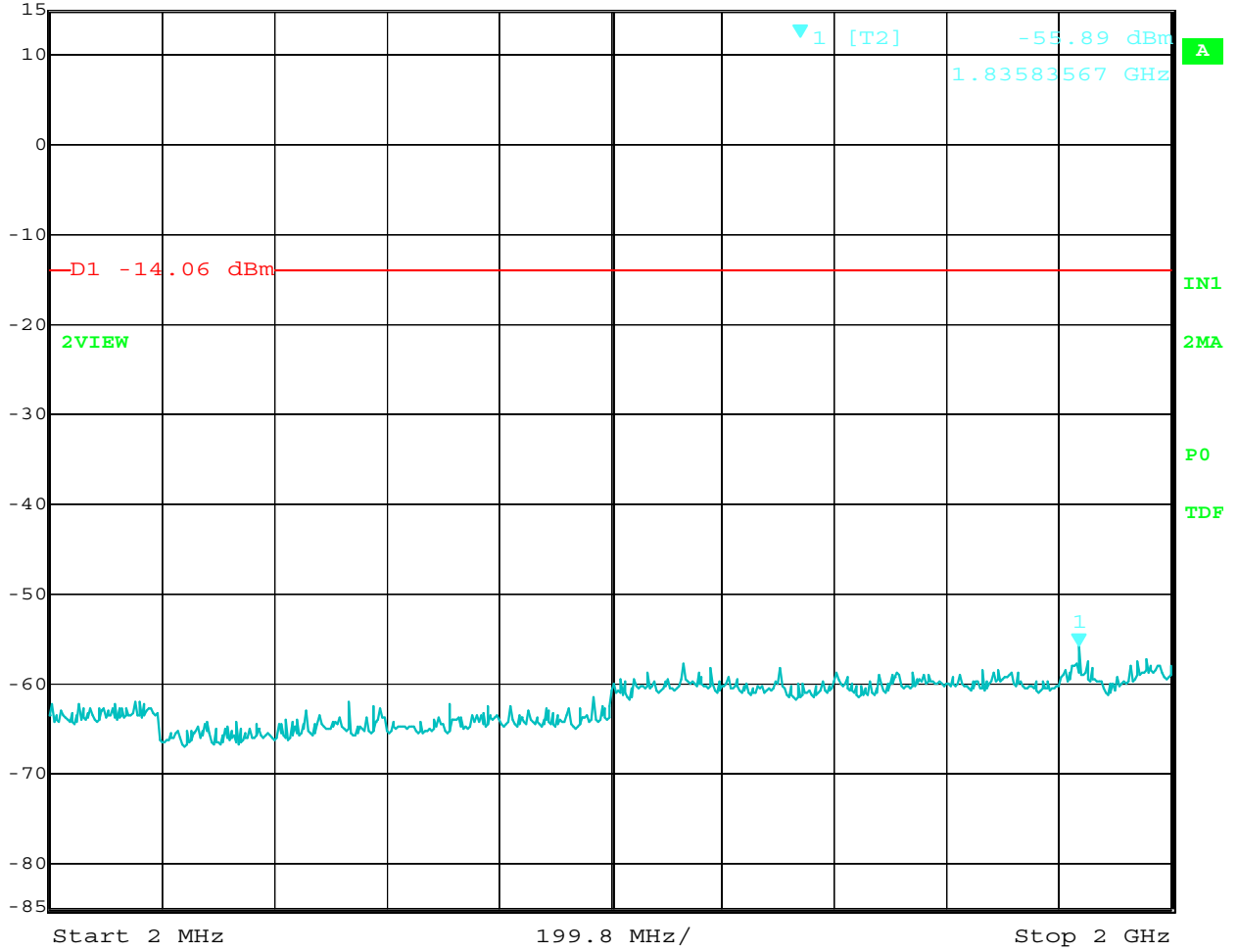


Date: 6.SEP.2009 18:10:28

RF Antenna Conducted Test – Low Channel – 10 GHz to 25 GHz



Marker 1 [T2] RBW 100 kHz RF Att 30 dB
Ref Lvl -55.89 dBm VBW 300 kHz
15 dBm 1.83583567 GHz SWT 1.15 s Unit dBm

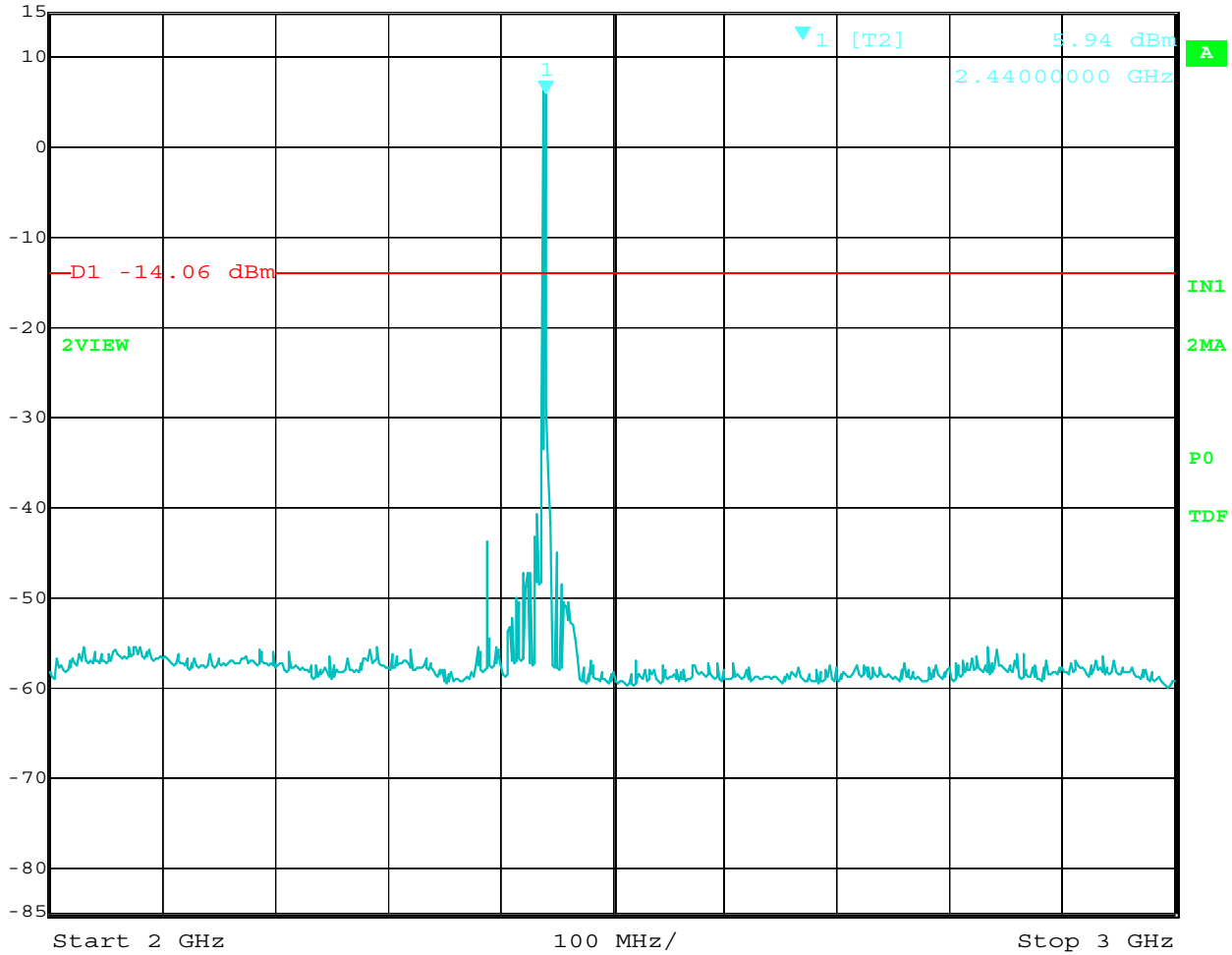


Date: 6.SEP.2009 18:05:20

RF Antenna Conducted Test – Middle Channel – 2 MHz to 2 GHz



Ref Lvl 15 dBm
Marker 1 [T2] 5.94 dBm
2.44000000 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 250 ms Unit dBm

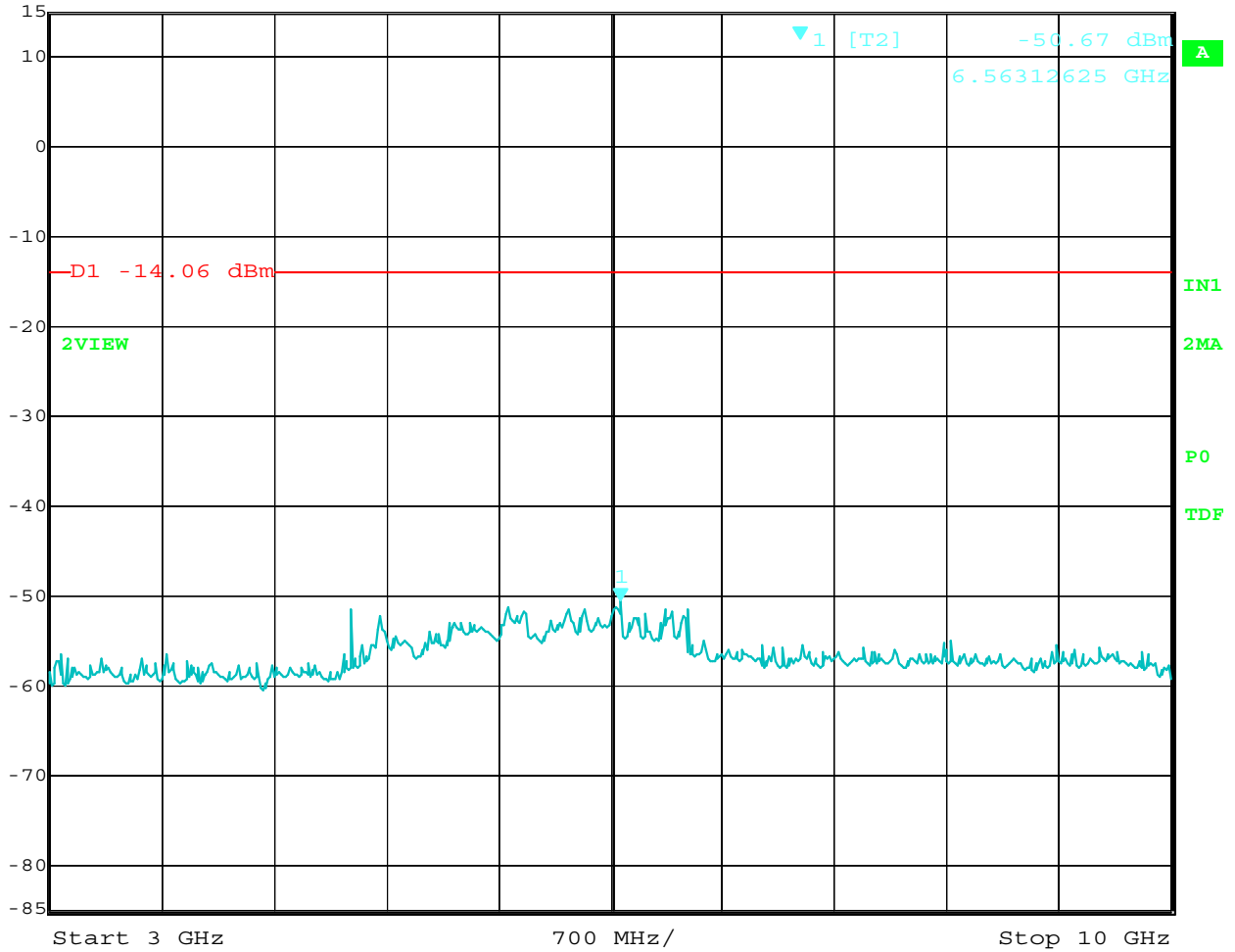


Date: 6.SEP.2009 18:04:48

RF Antenna Conducted Test – Middle Channel – 2 GHz to 3 GHz



Ref Lvl 15 dBm
Marker 1 [T2] -50.67 dBm
6.56312625 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 1.75 s Unit dBm

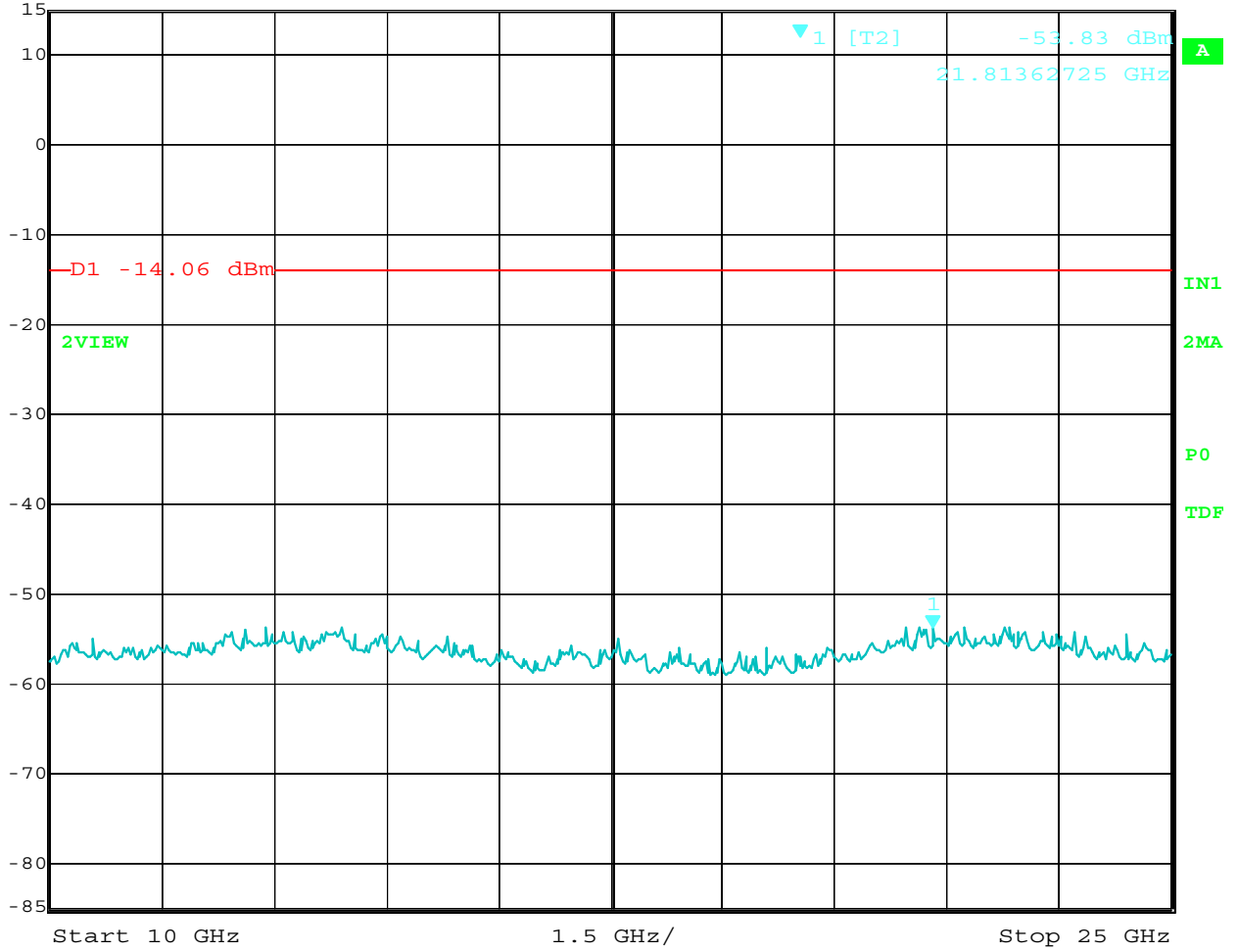


Date: 6.SEP.2009 18:05:45

RF Antenna Conducted Test – Middle Channel – 3 GHz to 10 GHz



Ref Lvl 15 dBm
Marker 1 [T2] -53.83 dBm
21.81362725 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 3.8 s Unit dBm

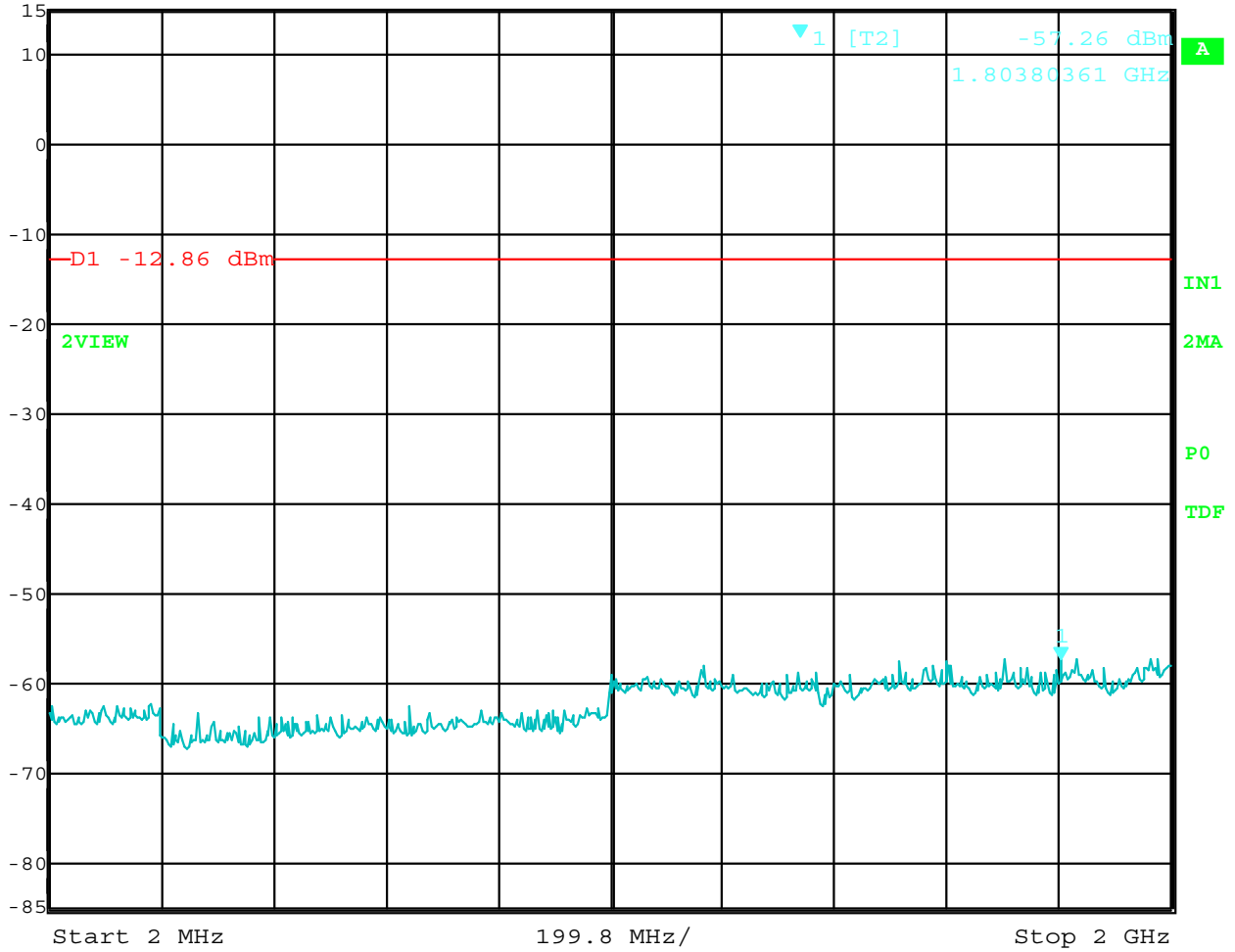


Date: 6.SEP.2009 18:06:26

RF Antenna Conducted Test – Middle Channel – 10 GHz to 25 GHz



Ref Lvl 15 dBm
Marker 1 [T2] -57.26 dBm
1.80380361 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 1.15 s Unit dBm

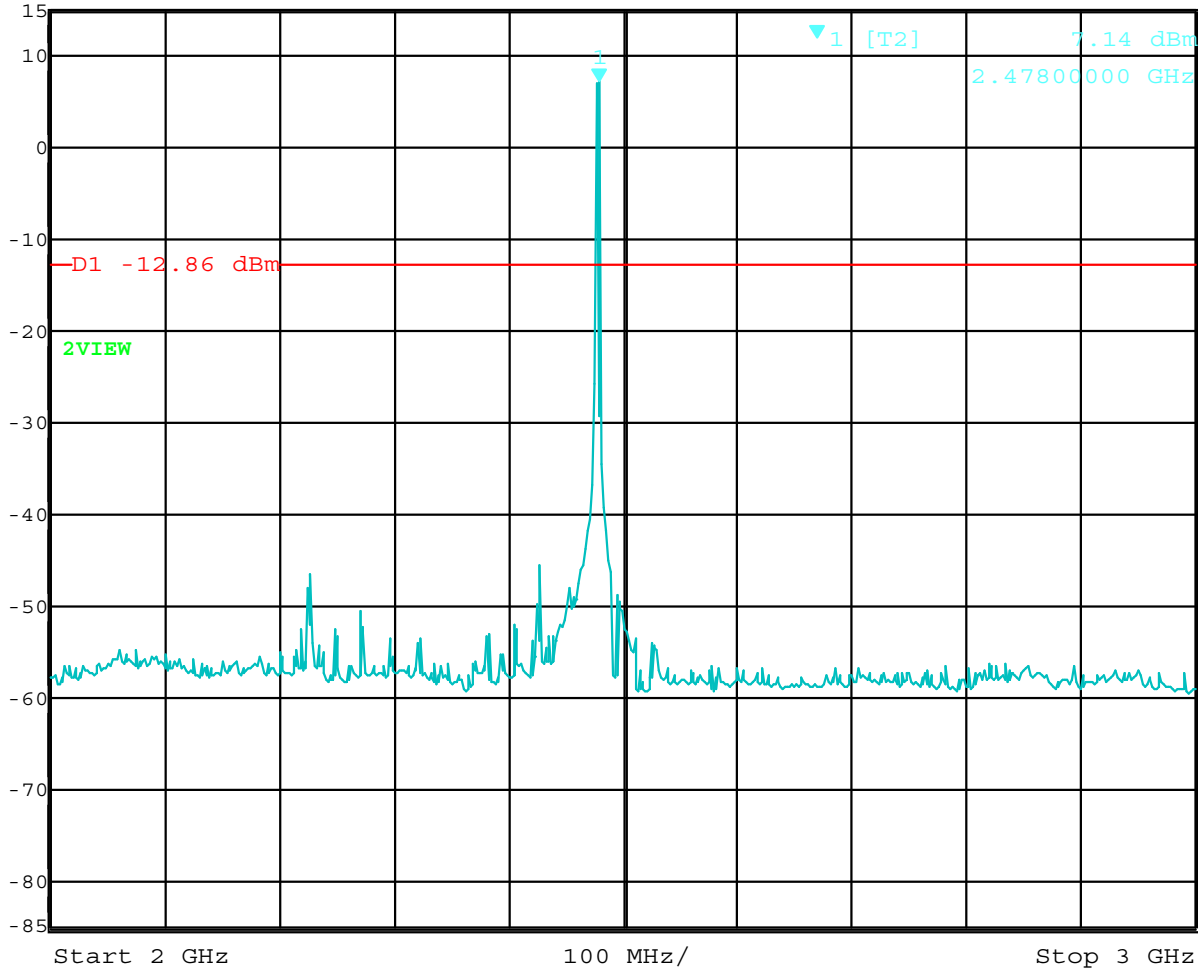


Date: 8.SEP.2009 05:33:51

RF Antenna Conducted Test – High Channel – 2 MHz to 2 GHz



Ref Lvl 15 dBm
Marker 1 [T2] 7.14 dBm
2.47800000 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 250 ms Unit dBm

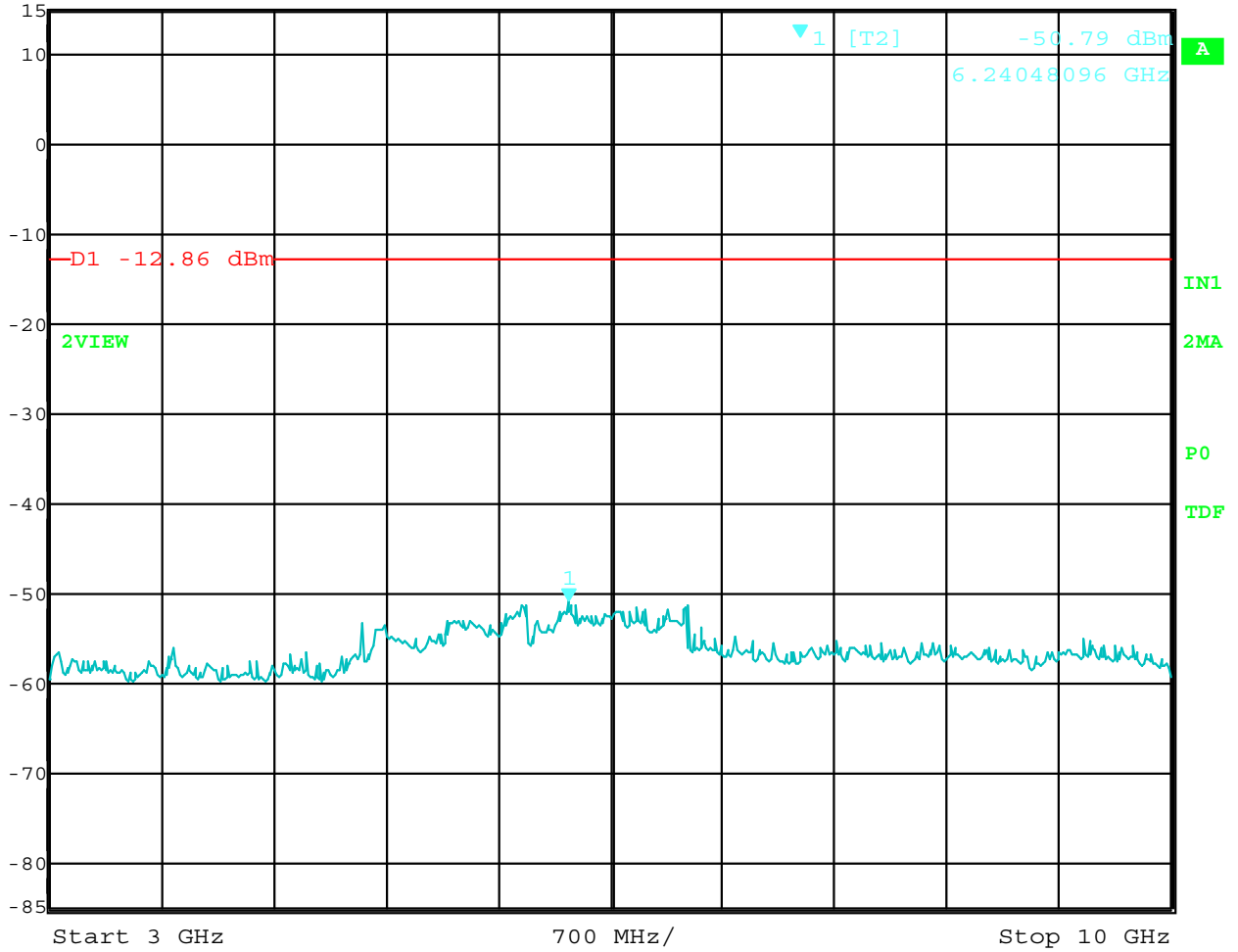


Date: 8.SEP.2009 05:33:15

RF Antenna Conducted Test – High Channel – 2 GHz to 3 GHz



Ref Lvl 15 dBm
Marker 1 [T2] -50.79 dBm
6.24048096 GHz
RBW 100 kHz RF Att 30 dB
VBW 300 kHz
SWT 1.75 s Unit dBm



Date: 8.SEP.2009 05:34:19

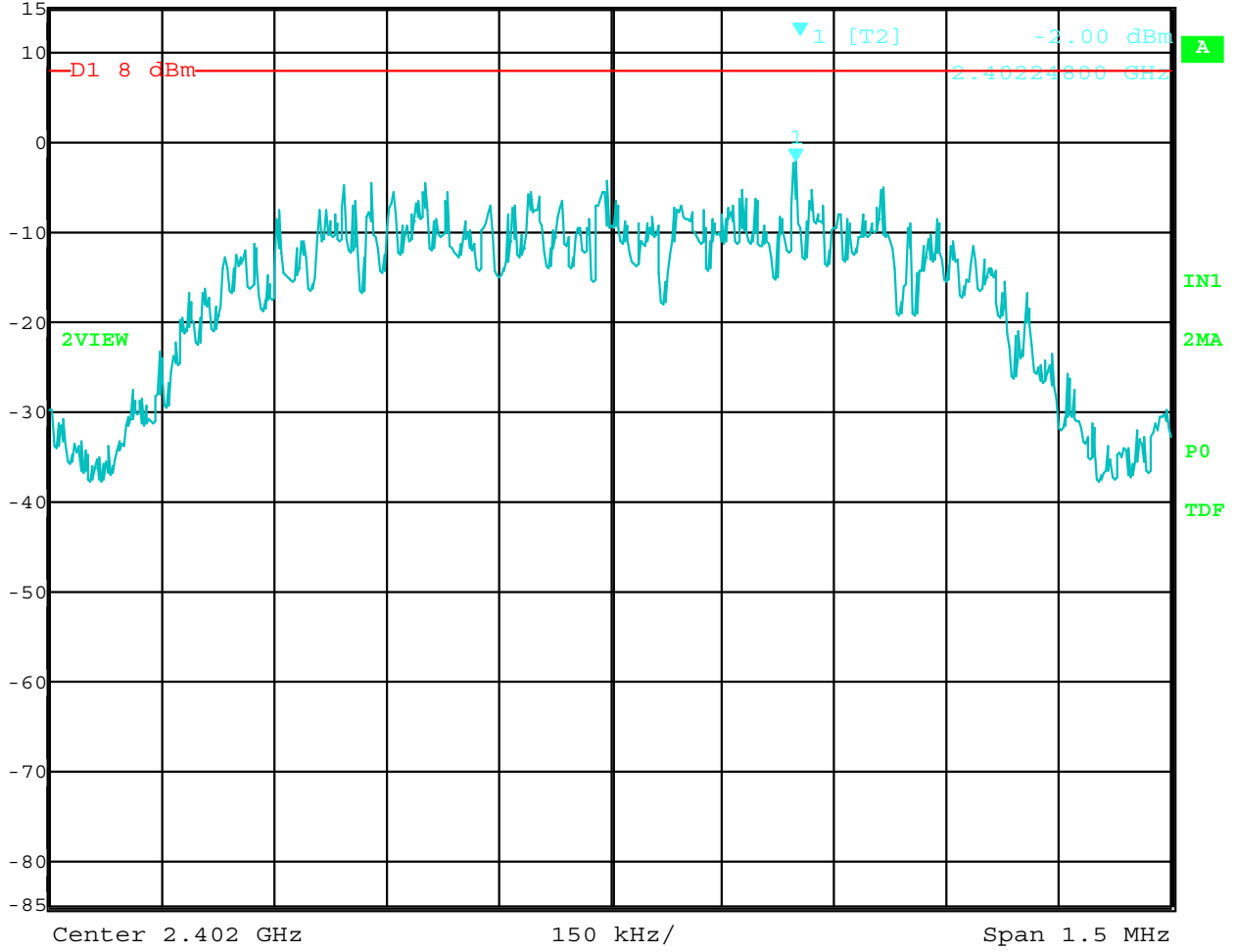
RF Antenna Conducted Test – High Channel – 3 GHz to 10 GHz

SPECTRAL DENSITY OUTPUT

DATA SHEETS



Ref Lvl	Marker 1 [T2]	RBW	3 kHz	RF Att	30 dB
15 dBm	-2.00 dBm	VBW	10 kHz		
	2.40224800 GHz	SWT	500 s	Unit	dBm

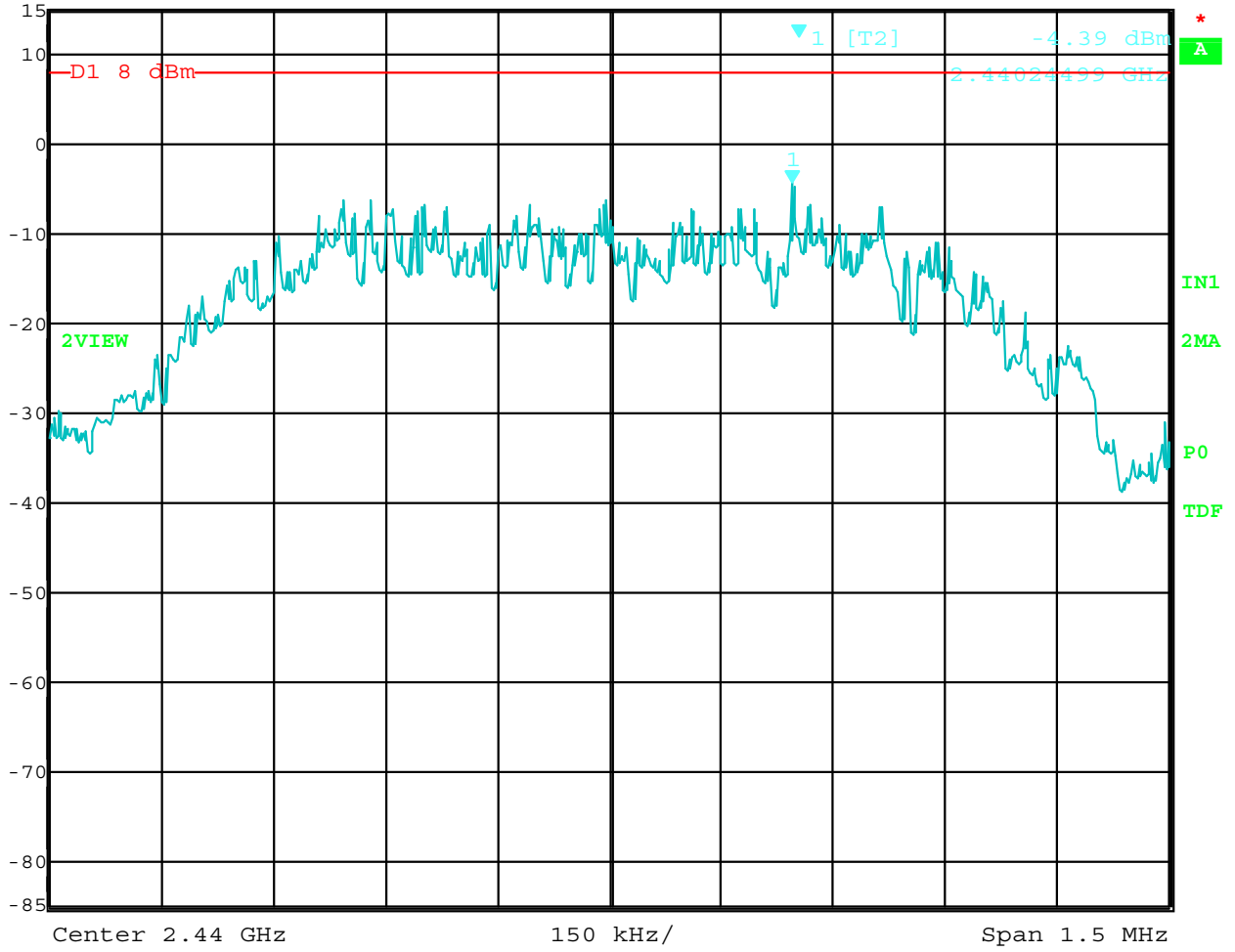


Date: 8.SEP.2009 06:26:45

Spectral Density Output – Low Channel



Marker 1 [T2] RBW 3 kHz RF Att 30 dB
Ref Lvl -4.39 dBm VBW 10 kHz
15 dBm 2.44024499 GHz SWT 500 s Unit dBm

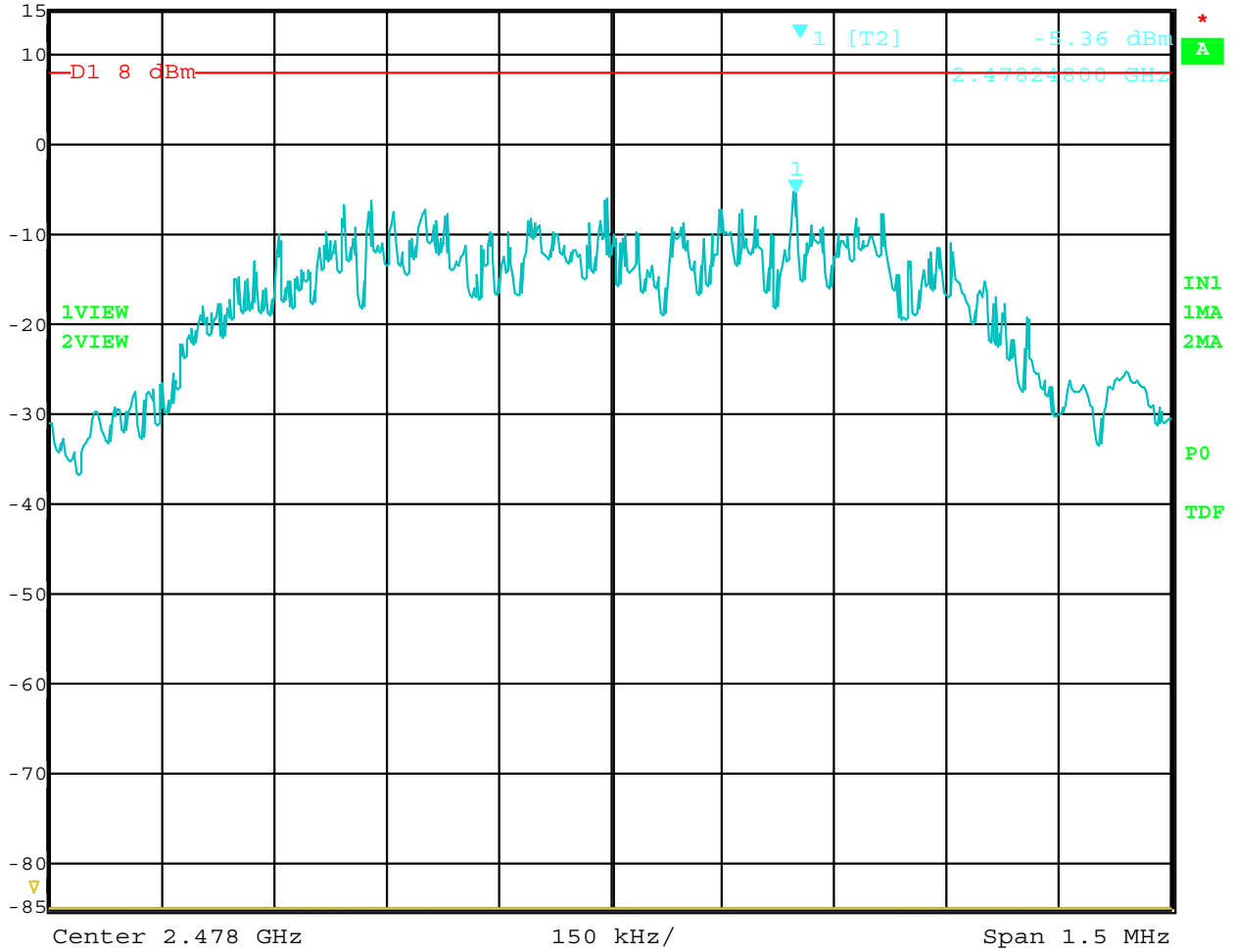


Date: 8.SEP.2009 06:15:51

Spectral Density Output – Middle Channel

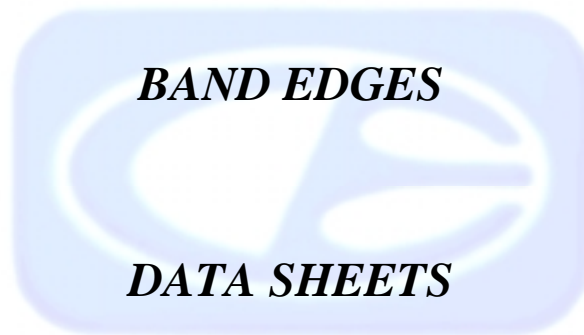


Ref Lvl 15 dBm
Marker 1 [T2] 2.47824800 GHz -5.36 dBm
RBW 3 kHz RF Att 30 dB
VBW 10 kHz
SWT 500 s Unit dBm



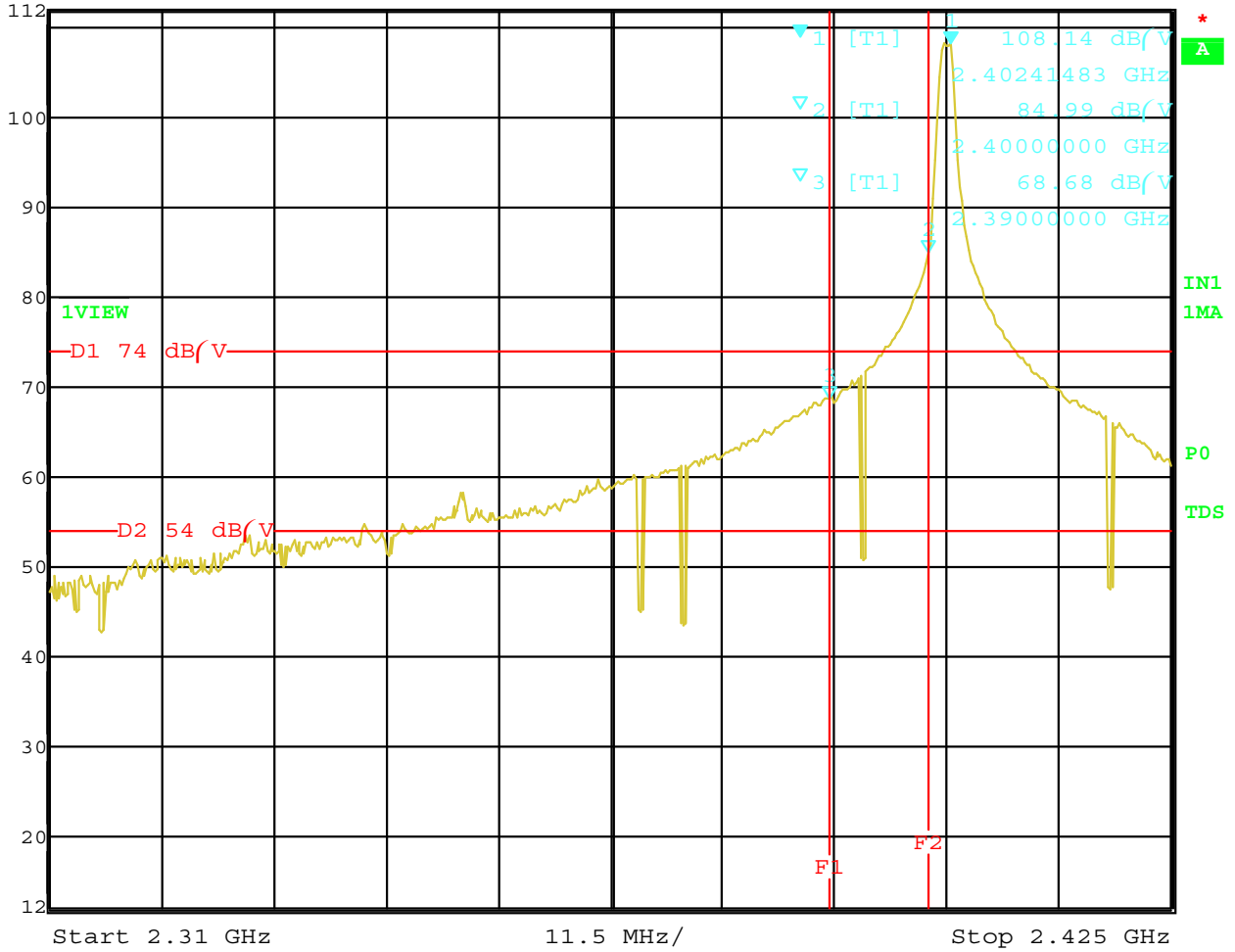
Date: 8.SEP.2009 06:03:51

Spectral Density Output – High Channel





Ref Lvl 112 dB/V
Marker 1 [T1] 108.14 dB/V
2.40241483 GHz
RBW 1 MHz RF Att 20 dB
VBW 3 MHz
SWT 5 ms Unit dB/V



Date: 5.SEP.2009 09:33:36

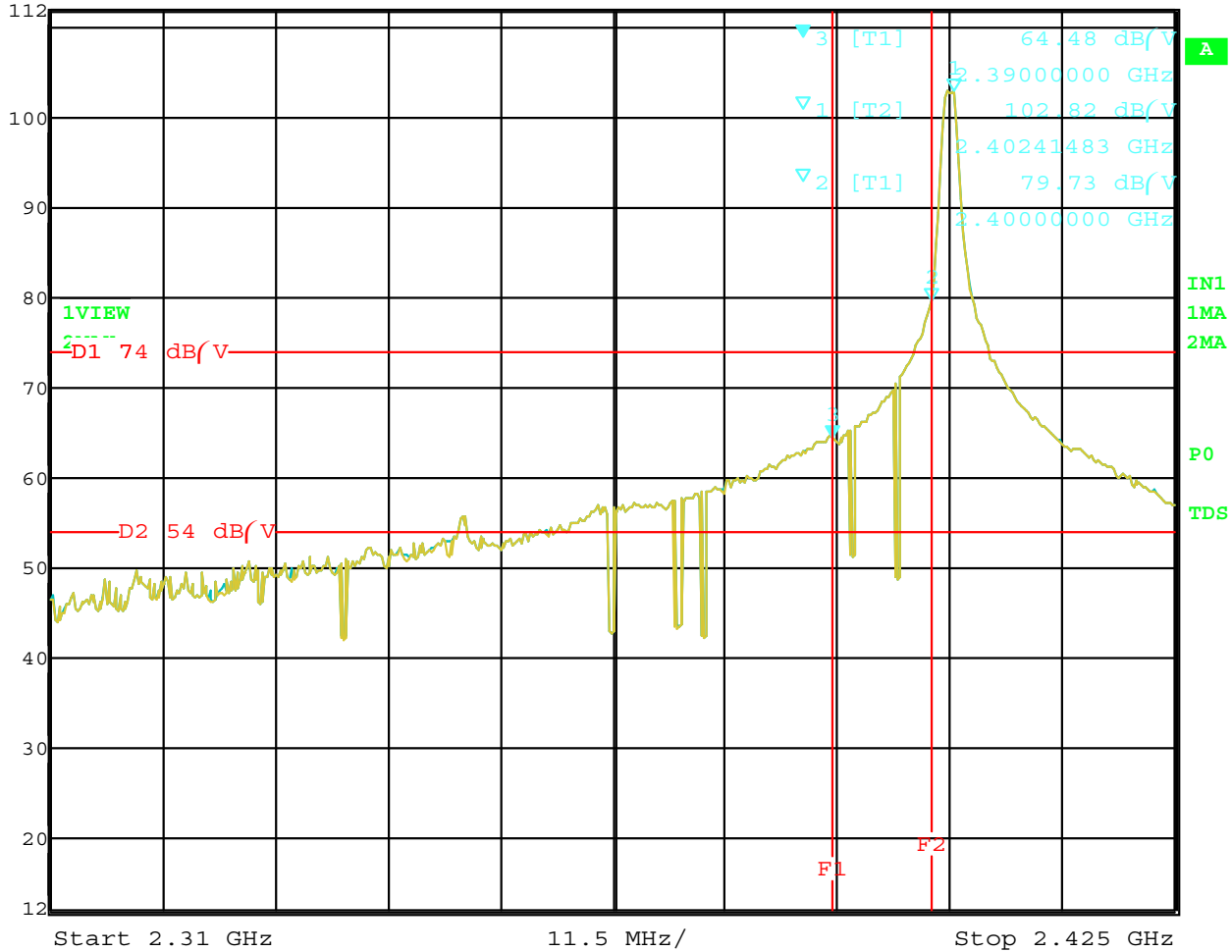
Band Edge – Monopole Antenna – Low Channel – Vertical Polarization – X-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 3 [T1] 64.48 dB/V
2.39000000 GHz
RBW 1 MHz RF Att 20 dB
VBW 1 MHz
SWT 5 ms Unit dB/V



Date: 5.SEP.2009 12:23:02

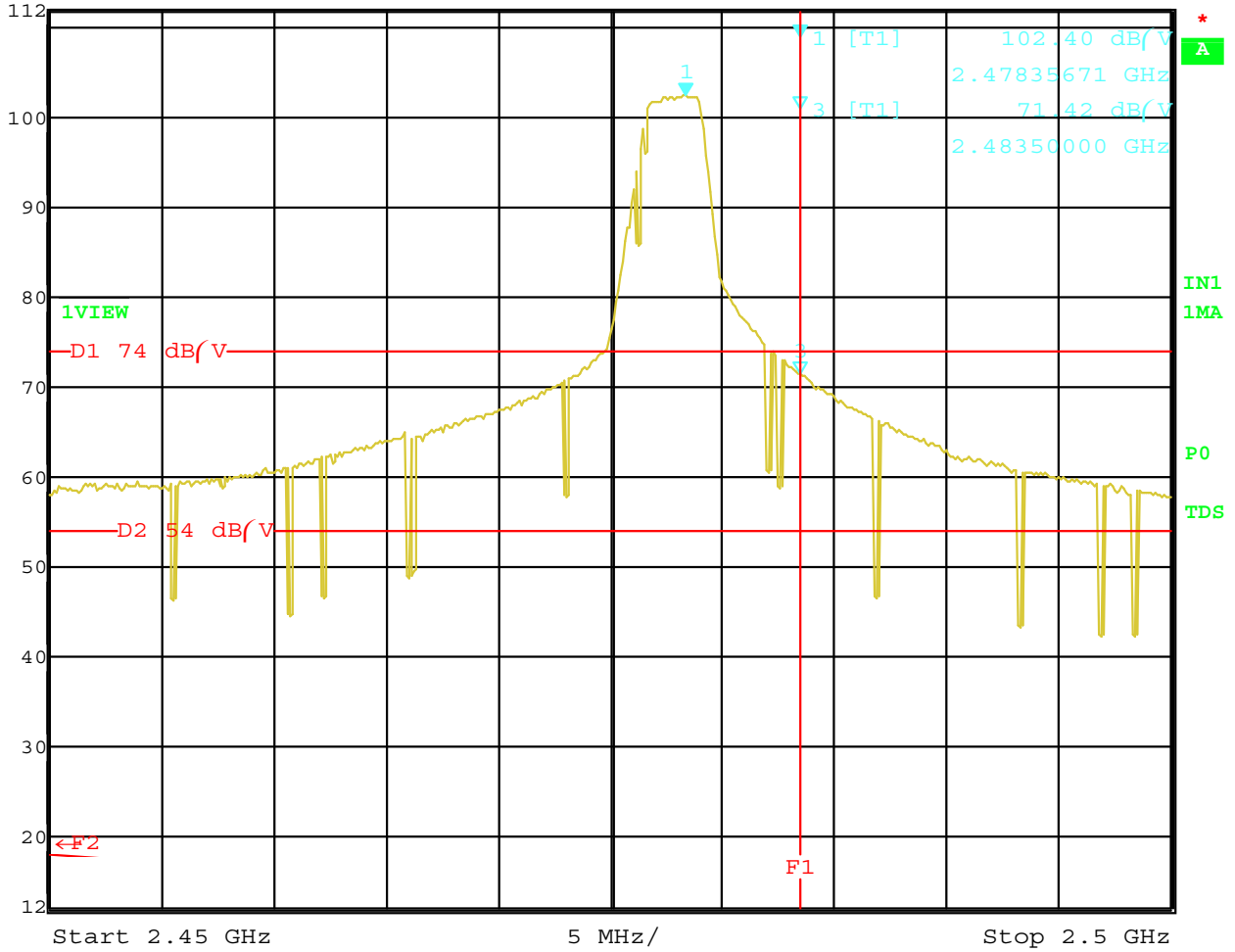
Band Edge – Monopole Antenna – Low Channel – Horizontal Polarization – X-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 1 [T1] 102.40 dB/V
2.47835671 GHz
RBW 1 MHz RF Att 20 dB
VBW 2 kHz
SWT 64 ms Unit dB/V



Date: 5.SEP.2009 13:36:17

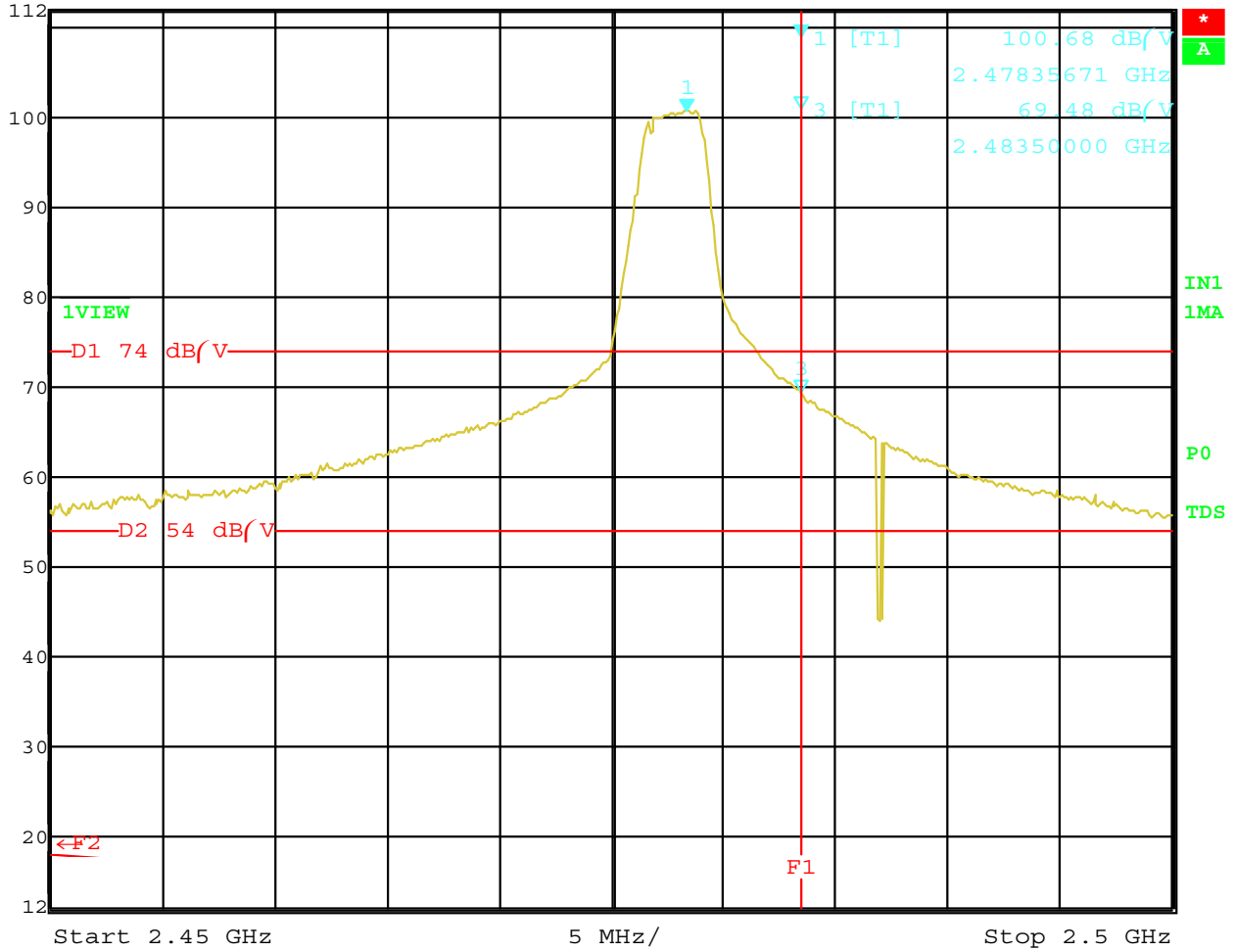
Band Edge – Monopole Antenna – High Channel – Vertical Polarization – Z-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 1 [T1] 100.68 dB/V
2.47835671 GHz
RBW 1 MHz
RF Att 20 dB
VBW 2 kHz
SWT 64 ms
Unit dB/V



Date: 5.SEP.2009 13:51:01

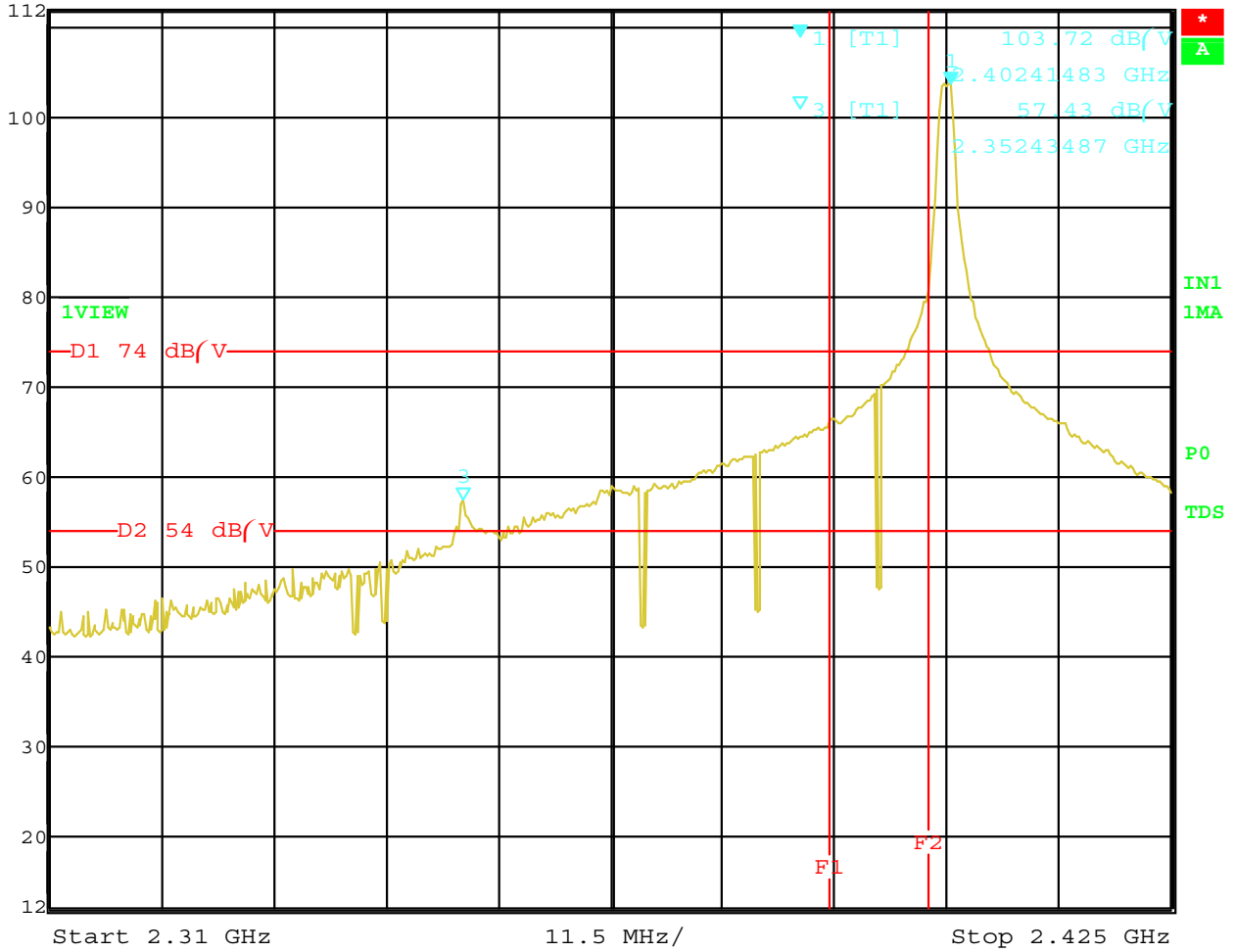
Band Edge – Monopole Antenna – High Channel – Horizontal Polarization – Y-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Marker 1 [T1] RBW 1 MHz RF Att 20 dB
Ref Lvl 103.72 dB/V VBW 2 kHz
112 dB/V 2.40241483 GHz SWT 145 ms Unit dB/V



Date: 6.SEP.2009 10:00:02

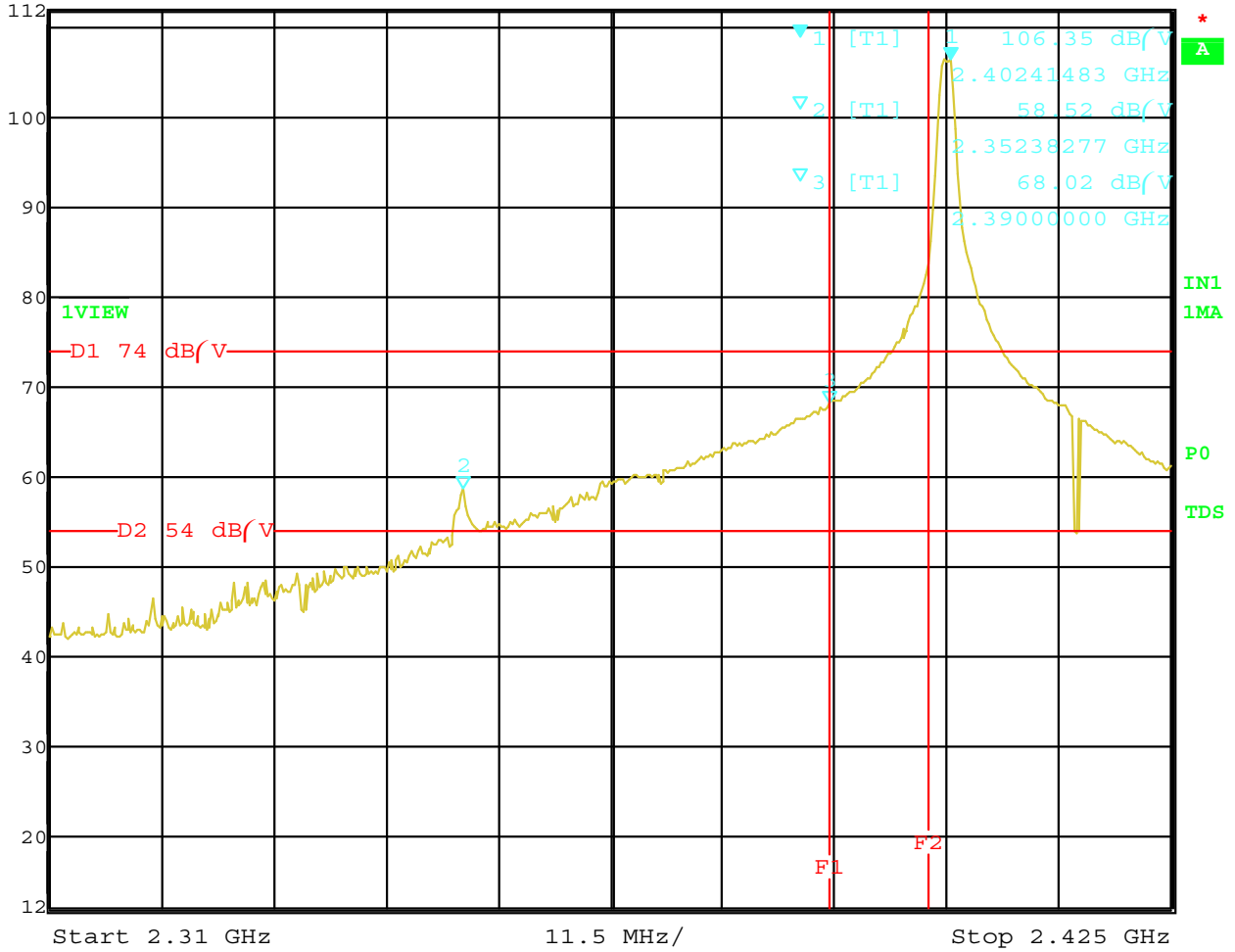
Band Edge – Tyco Antenna – Low Channel – Vertical Polarization – Y-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 1 [T1] 106.35 dB/V
2.40241483 GHz
RBW 1 MHz
RF Att 20 dB
VBW 2 kHz
SWT 145 ms
Unit dB/V



Date: 5.SEP.2009 17:43:32

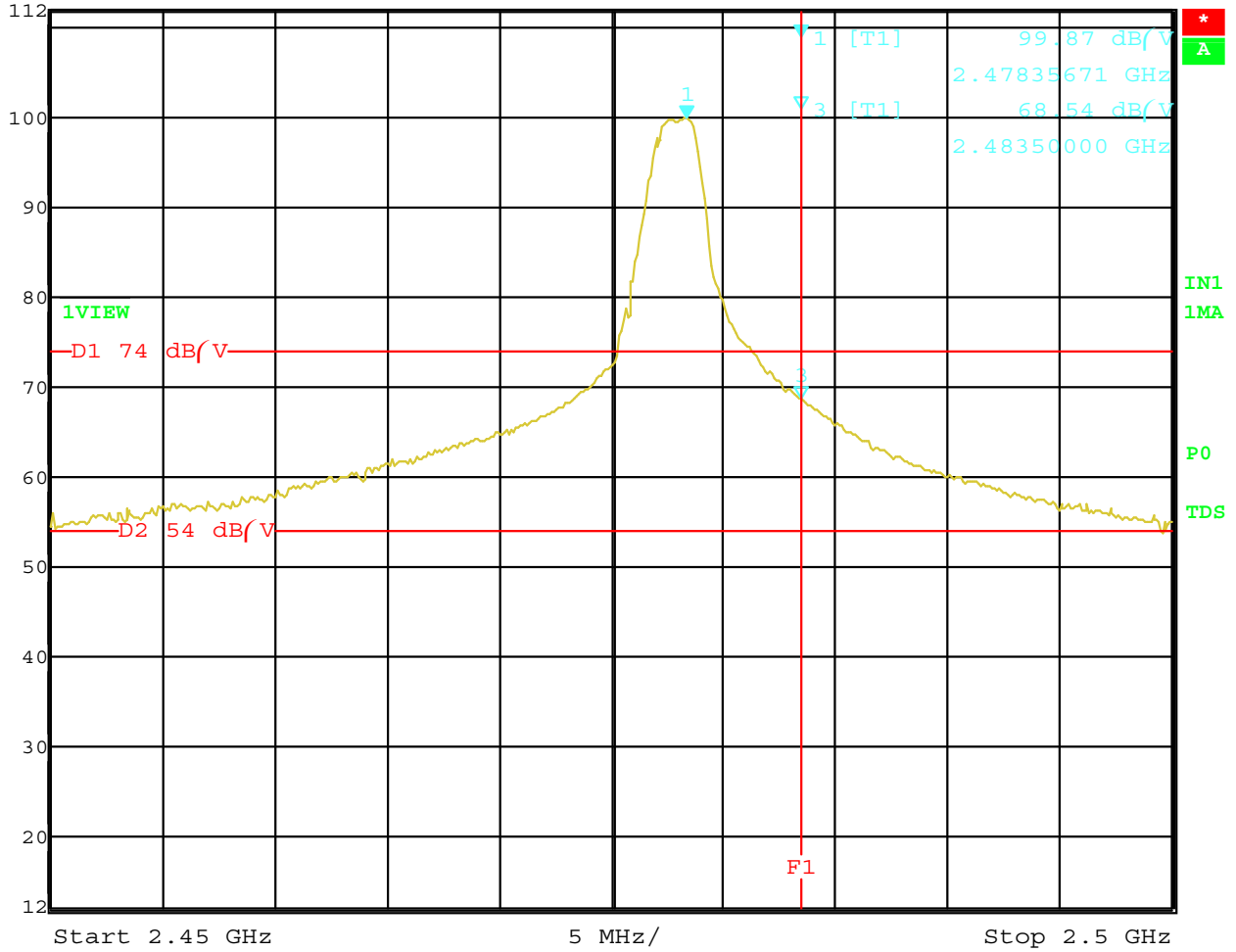
Band Edge – Tyco Antenna – Low Channel – Horizontal Polarization – X-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 1 [T1] 99.87 dB/V
2.47835671 GHz
RBW 1 MHz RF Att 20 dB
VBW 2 kHz
SWT 100 ms Unit dB/V



Date: 6.SEP.2009 14:40:30

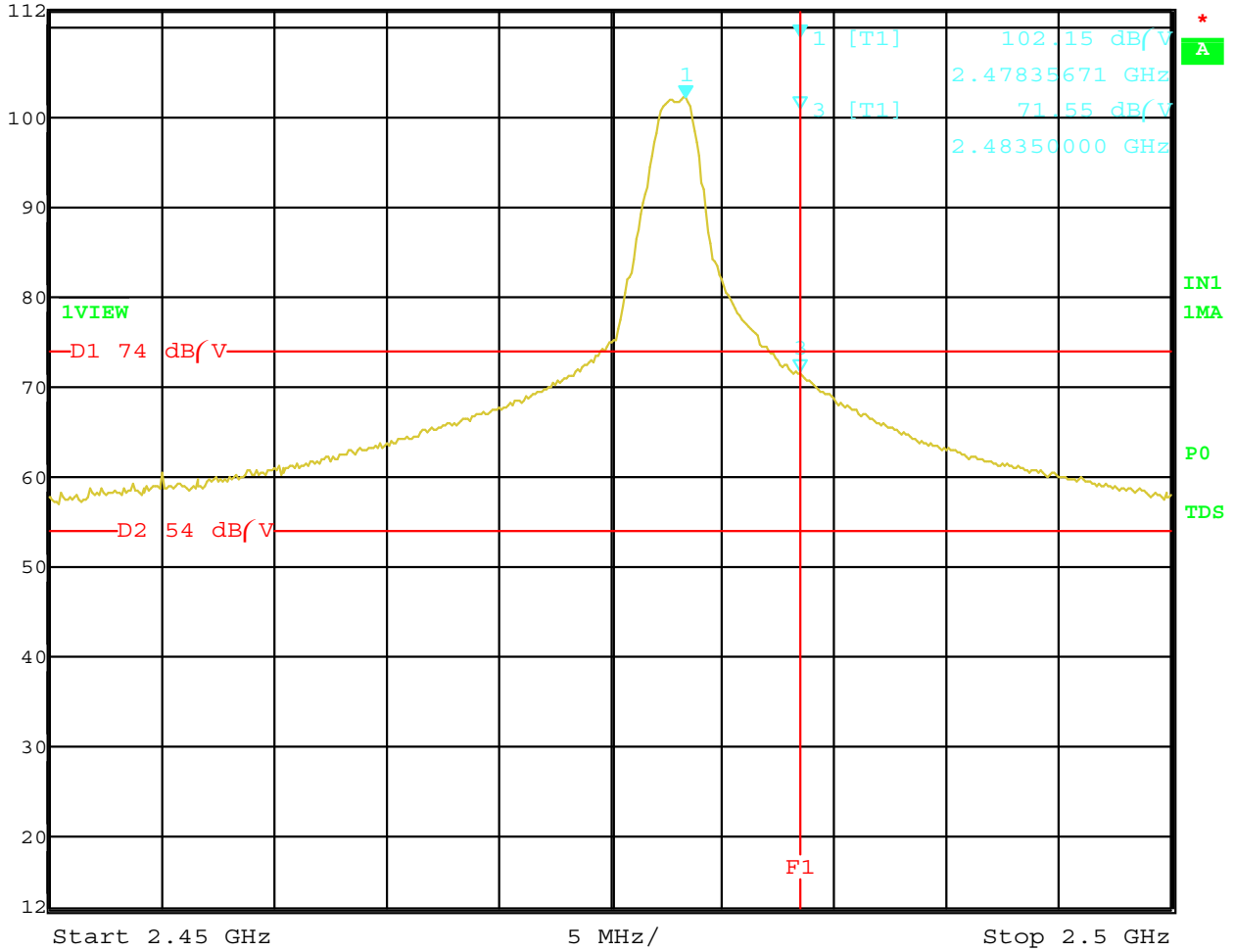
Band Edge – Tyco Antenna – High Channel – Vertical Polarization – X-Axis (Worst Case)

Plot represents peak readings

Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%



Ref Lvl 112 dB/V
Marker 1 [T1] 102.15 dB/V
2.47835671 GHz
RBW 1 MHz RF Att 20 dB
VBW 2 kHz
SWT 100 ms Unit dB/V



Date: 6.SEP.2009 13:11:05

Band Edge – Tyco Antenna – High Channel – Horizontal Polarization – X-Axis (Worst Case)

Plot represents peak readings

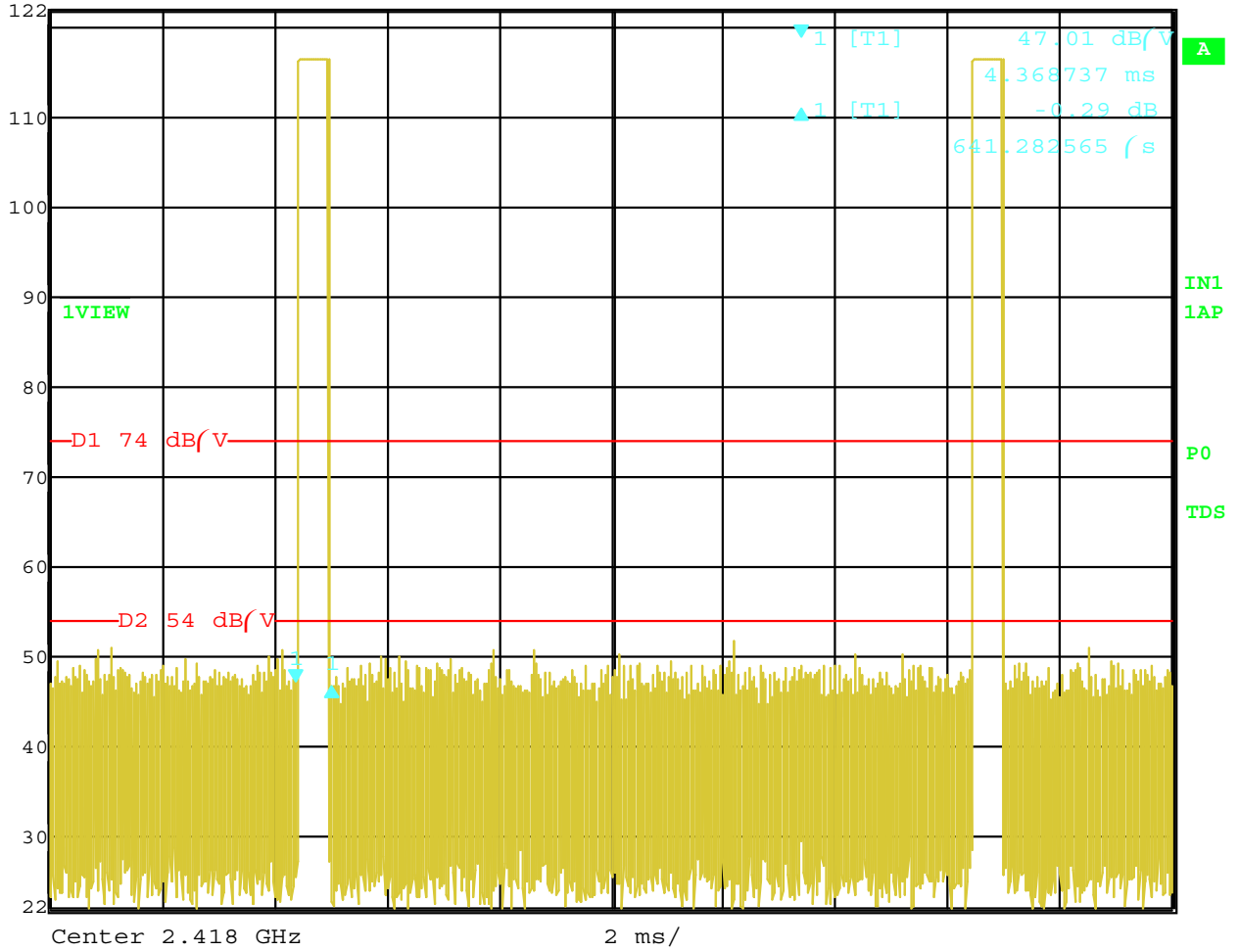
Note: the Average Reading for all peaks will be 20 dB down based on the Duty Cycle being less than 10%

DUTY CYCLE INFORMATION

DATA SHEETS



Delta 1 [T1] RBW 1 MHz RF Att 30 dB
Ref Lvl -0.29 dB VBW 1 MHz
122 dB/V 641.282565 (s) SWT 20 ms Unit dB/V

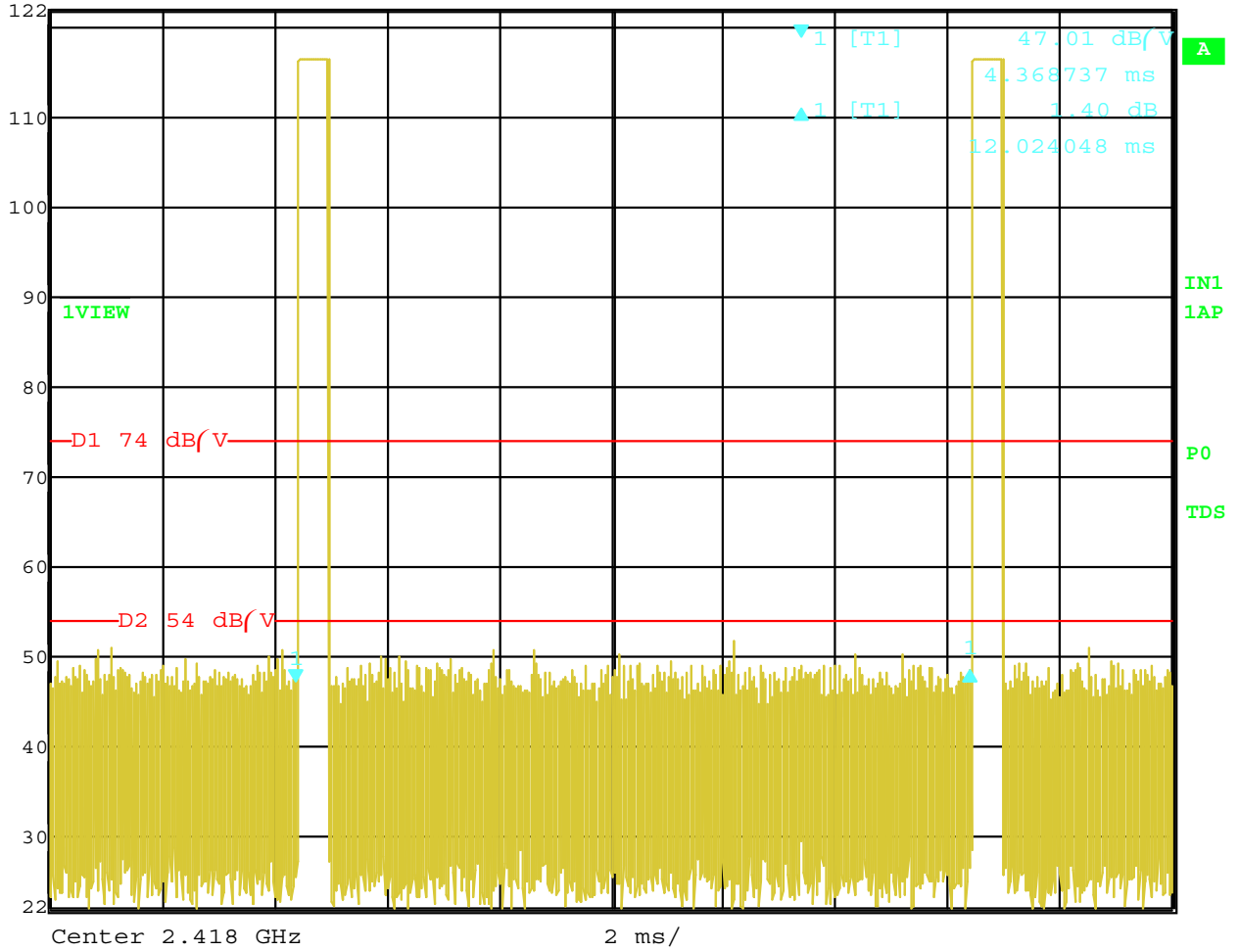


Date: 4.SEP.2009 09:24:26

Time of One Pulse = 641.282565 uS



Delta 1 [T1] RBW 1 MHz RF Att 30 dB
Ref Lvl 1.40 dB VBW 1 MHz
122 dB/V 12.024048 ms SWT 20 ms Unit dB/V

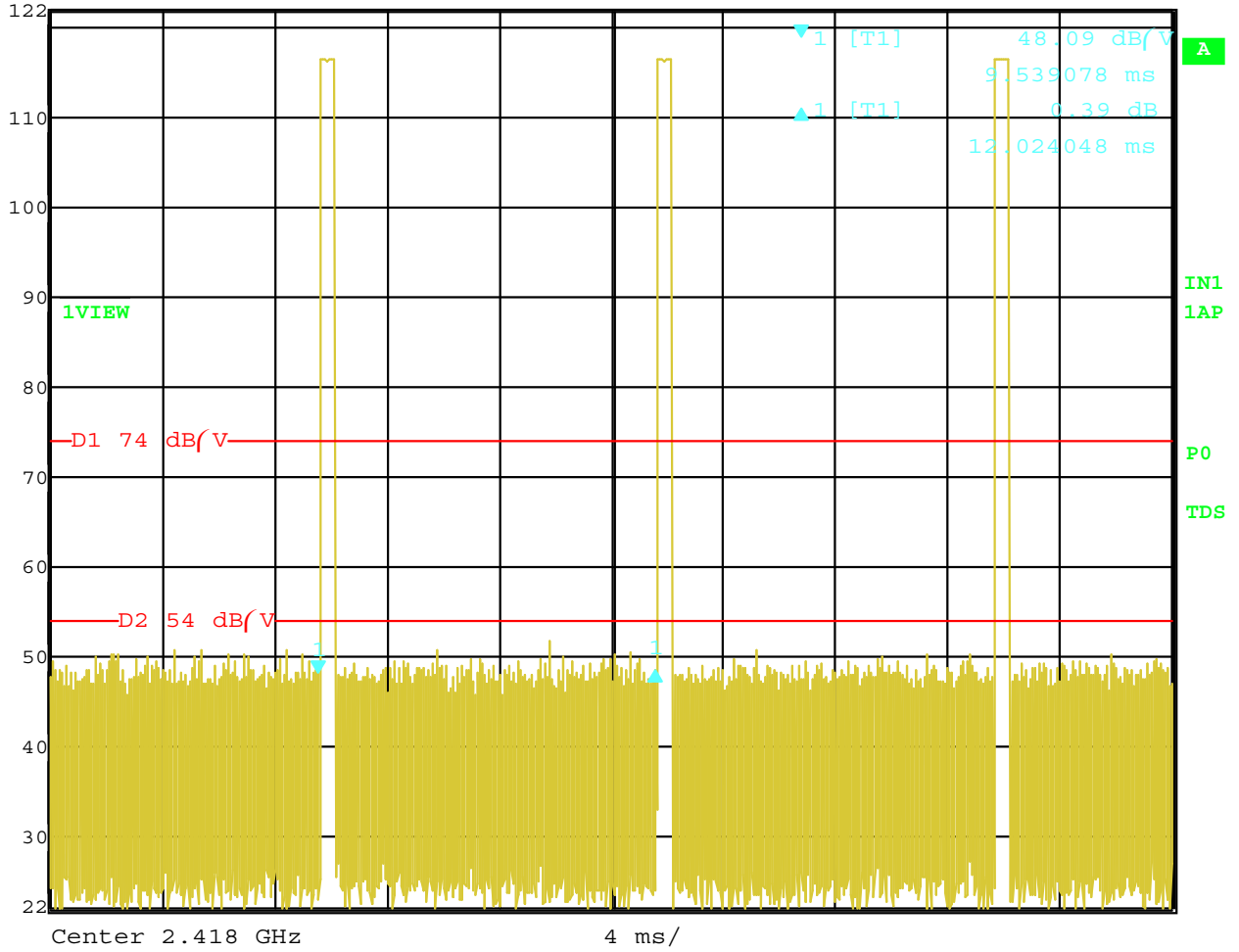


Date: 4.SEP.2009 09:24:02

Time of One Pulse Train with Blanking Interval = 12.024048 mS



Delta 1 [T1] RBW 1 MHz RF Att 30 dB
Ref Lvl 0.39 dB VBW 1 MHz
122 dB/V 12.024048 ms SWT 40 ms Unit dB/V

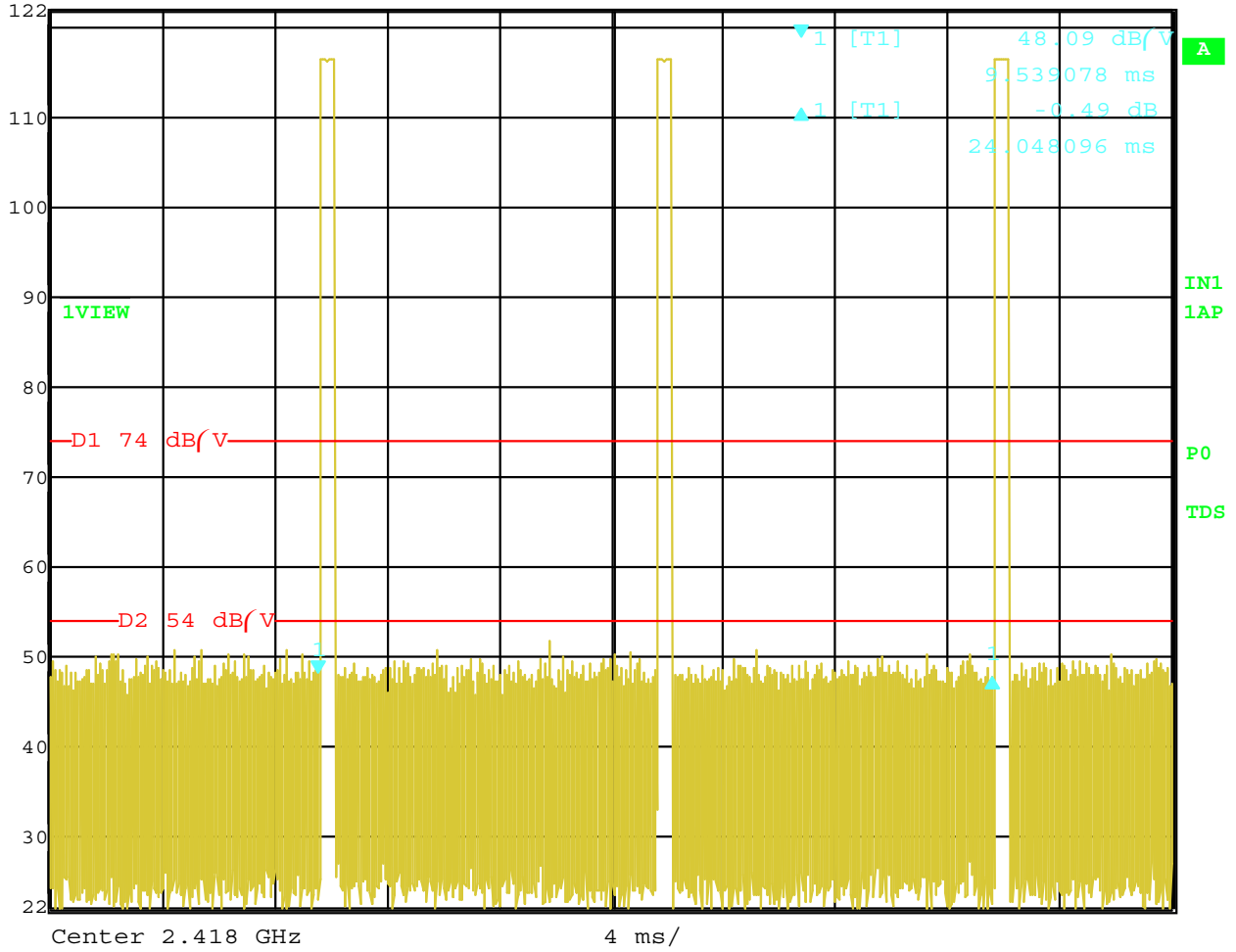


Date: 4.SEP.2009 09:25:25

Time of One Pulse Train with Blanking Interval = 12.024048 mS



Delta 1 [T1] RBW 1 MHz RF Att 30 dB
Ref Lvl -0.49 dB VBW 1 MHz
122 dB/V 24.048096 ms SWT 40 ms Unit dB/V



Date: 4.SEP.2009 09:25:05

Plot Showing the Pulse Train repeats at 12.024048 mS

Total Duty Cycle = 641.282565 uS / 12.024048 mS = 5.33%