FCC PART 15, SUBPART B
FCC 15.247 TEST REPORT
TEST METHOD: ANSI C63.4: 2003

For

SWIFTCOMM RF MODULE
Model: 41612

Prepared for

BEI INDUSTRIAL ENCODERS
7230 HOLLISTER AVENUE
GOLETA, CA 93117

Prepared by: Kyle Fujimoto

KYLE FUJIMOTO

Approved by: James Ross

JAMES ROSS

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

DATE: AUGUST 31, 2011

	REPORT BODY	APPENDICES					TOTAL
		A	*B*	*C*	*D*	*E*	
PAGES	24	2	2	2	22	106	**158**

TABLE OF CONTENTS

LIST OF APPENDICES

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

LIST OF TABLES

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

LIST OF FIGURES

FIGURE	TITLE
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Test Site
3	High Frequency Test Volume

GENERAL REPORT SUMMARY

This electromagnetic emission 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 in any form except in full, without the written permission of Compatible Electronics.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested:	SwitfComm RF Module Model: 41612 S/N: NONE
Product Description:	Please see the expository statement.
Modifications:	The EUT was not modified during the testing.
Manufacturer:	BEI Industrial Encoders 7230 Hollister Avenue Goleta, CA 93117
Test Date:	June 21, 22, 23 and 27, 2011
Test Specifications:	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: 2009.

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 the limits of CFR Title 47, Part 15, Subpart C, section 15.207.
2	Radiated RF Emissions, 10 kHz – 25000 MHz	Complies with the **Class B** limits of CFR Title 47, Part 15, Subpart B; the limits of CFR Title 47, Part 15 Subpart C, 15.209 and 15.247 (d)
3	20 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1) and (a)(1)(iii)
4	Peak Power Output	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (b)(1)
5	RF Conducted Antenna Test	Complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (d)
6	Carrier Frequency Separation	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)
7	Average Time of Occupancy	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (a)(1)(iii)
8	Peak Power Spectral Density from the International Radiator to the Antenna	This test was not performed because the EUT is a frequency hopper.

1. PURPOSE

This document is a qualification test report based on the Emissions tests performed on the Swiftcomm RF Module, Model: 41612. The emissions 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, 15.207, 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 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

BEI Industrial Encoders

Les Wolff	Chief Engineer

Compatible Electronics Inc.

Kyle Fujimoto	Test Engineer
James Ross	Test Engineer

2.4 Date Test Sample was Received

The test sample was received on June 16, 2011.

2.5 Disposition of the Test Sample

The test sample has not been returned to BEI Industrial Encoders as of the date of this test report.

2.6 Abbreviations and Acronyms

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

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this 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 – (Emissions)

The SwitfComm RF Module, Model: 41612 (EUT) was connected to the power supply board via 10-centimeter cables. The power supply board was also connected to an AC Adapter via its power port. The EUT was continuously transmitting or receiving depending on the test performed. The EUT was tested in three orthogonal axis.

The EUT was tested with the antenna having a short cable, and also with the antenna having a long cable.

The highest emissions were found when the EUT was running in the above configuration. The cables were moved to maximize the emissions. The final conducted and radiated data was taken in this mode of operation. All initial investigations were performed with the spectrum analyzer in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix D.

4.1.2 Cable Construction and Termination

Cable 1 This is a 10-centimeter unshielded cable connecting the EUT to the power supply board. The cable has a 5 pin connector at each end.

Cable 2 This is a 10-centimeter unshielded cable connecting the EUT to the power supply board. The cable has a 6 pin connector at each end.

Cable 3 This is a 2-meter unshielded cable connecting the AC Adapter to the power supply board. The cable is hard wired at each end.

Cable 4 **(For the Short Cable Configuration Only)**
This is a 10-centimeter braid shielded cable connecting the antenna to the EUT. The cable has a reverse polarity TNC connector at the antenna end a reverse polarity UFL connector at the EUT end. The shield of the cable was grounded to the chassis via the connectors.

Cable 5 (**For the Long Cable Configuration Only)**
This is a 10-centimeter braid shielded cable connecting cable #6 to the EUT. The cable has a reverse polarity TNC connector at the cable #6 end a reverse polarity UFL connector at the EUT end. The shield of the cable was grounded to the chassis via the connectors.

Cable 6 (**For the Long Cable Configuration Only)**
This is a 3-meter braid shielded cable connecting the cable #5 to the antenna. The cable has a reverse polarity TNC connector at each end. The shield of the cable was grounded to the chassis via the connectors.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

#	EQUIPMENT TYPE	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID
1	SWIFTCOMM RF MODULE (EUT)	BEI INDUSTRIAL ENCODERS	41612	N/A	VSR-SWIFTCOMM11
2	CLASS 2 TRANSFORMER	CUI, INC.	35-5-3DOR	N/A	N/A
3	RF MODULE TEST BOARD	SWIFTCOMM	N/A	N/A	N/A
4	ANTENNA	HYPERLINK TECHNOLOGIES, INC.	N/A	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	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
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 27, 2011	May 27, 2012
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	May 27, 2011	May 27, 2012
Quasi-Peak Adapter	Hewlett Packard	85650A	2430A00424	May 27, 2011	May 27, 2012
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 19, 2010	November 19, 2012
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
RF RADIATED EMISSIONS TEST EQUIPMENT					
Radiated Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Biconical Antenna	Com-Power	AB-900	15250	June 8, 2011	June 8, 2012
Log Antenna	Com-Power	AL-100	16252	June 8, 2011	June 8, 2012
Loop Antenna	Com-Power	AL-130	17089	January 21, 2011	January 21, 2012
Combilog Antenna	Com-Power	AC-220	61027	June 9, 2011	June 9, 2012
Preamplifier	Com-Power	PA-102	1017	January 11, 2011	January 11, 2012
Preamplifier	Com-Power	PA-103	1582	January 11, 2011	January 11, 2012
Microwave Preamplifier	Com-Power	PA-118	181656	December 22, 2010	December 22, 2011
Microwave Preamplifier	Com-Power	PA-840	711919	March 11, 2010	March 11, 2012
Horn Antenna	Com-Power	AH-118	071175	March 18, 2010	March 18, 2012
Horn Antenna	Com-Power	AH826	71957	NCR	NCR
Antenna Mast	Com-Power	AM-100	N/A	N/A	N/A

5.3 Emissions Test Equipment (Continued)

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
Transient Limiter	Seaward	252A910	1	November 2, 2010	November 2, 2011
LISN	Com Power	LI-215	12076	June 20, 2011	June 20, 2012
LISN	Com Power	LI-215	12090	June 20, 2011	June 20, 2012

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1.2 of this report for 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. TEST PROCEDURES

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

7.1 RF Emissions

7.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. 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 spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions 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 initial test data was taken in manual mode while scanning the frequency ranges of 0.15 MHz to 1.6 MHz, 1.6 MHz to 5 MHz, and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the computer in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The six highest emissions are listed in Table 1.

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, Section 15.207 for conducted emissions.

7.1.2 Radiated Emissions Test

The spectrum analyzer and EMI Receiver were used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 and PA-103 were used for frequencies from 30 MHz to 1 GHz, the Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies above 18 GHz. The spectrum analyzer and EMI Receiver were used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer or 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 frequencies above 1 GHz were adjusted by a “duty cycle correction factor”, derived from 20 log (dwell time / 100 ms). Since the duty cycle was below 10%, the maximum allowed 20 dB was subtracted from the peak reading.

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 25 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: 2009. 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 Test (Continued)

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 10-meter test distance from 10 kHz to 30 MHz, and at a 3 meter test distance from 30 MHz to 25 GHz 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

7.1.3 RF Emissions Test Results

Table 1.0 CONDUCTED EMISSION RESULTS (120V)
SWIFTCOMM RF MODULE Model: 41612

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
0.217	46.51	52.91	-6.41
0.469	40.09	46.53	-6.44
0.254	45.13	51.64	-6.51
0.247	45.21	51.86	-6.65
0.486	39.30	46.23	-6.93
0.266	44.15	51.24	-7.09

Table 2.0 RADIATED EMISSION RESULTS
SWIFTCOMM RF MODULE Model: 41612

Frequency MHz	Emission Level* dBuV	Specification Limit dBuV	Delta dB
7437.00 **(Horizontal) (X-Axis – Short Cable)**	50.06 **(A)**	54.00	-3.94
1618.59	49.81	54.00	-4.19
7203.00	49.39 **(A)**	54.00	-4.61
7437.00 **(Vertical) (Z-Axis – Long Cable)**	48.87 **(A)**	54.00	-5.13
1607.70	49.00	54.00	-5.00
7437.00 **(Vertical) (Z-Axis – Short Cable)**	48.19 **(A)**	54.00	-5.81

Notes:

* The complete emissions data is given in Appendix E of this report.

** The factors for the antennas and preamplifier gain are attached in Appendix D of this report.

A Average Reading

7.2 20 dB Bandwidth

The 20 dB Bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 10 kHz and the video bandwidth was 30 kHz.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1). The 20 dB bandwidth is less than the separation between channels. Please see the data sheets located in Appendix E.

7.3 Peak Output Power

The Peak Output Power was measured using the EMI Receiver. The peak output power was measured using a direct connection from the RF output of the EUT. The resolution bandwidth was 10 MHz and the video bandwidth was 10 MHz. 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)(1). The maximum peak output power is less than 125 mW. Please see the data sheets located in Appendix E.

7.4 RF Antenna Conducted Test

The RF antenna conducted test was performed using the EMI Receiver. The RF antenna conducted test 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 was 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.

7.6 Carrier Frequency Separation

The Channel Hopping Separation Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The frequency span was wide enough to include the peaks of two adjacent channels.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1). The Channel Hopping Separation is greater than the 20 dB bandwidth. Please see the data sheets located in Appendix D.

7.7 Number of Hopping Frequencies

The Channel Hopping Separation Test was measured using the EMI Receiver. The EUT was operating in its normal operating mode. The resolution bandwidth was 100 kHz, and the video bandwidth was 300 kHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1) and 15.247 (a)(1)(iii). The number of hopping frequencies is 78. Please see the data sheets located in Appendix E.

7.8 Average Time of Occupancy Test

The Average Time of Occupancy Test was measured using the EMI Receiver. The EUT was operating in normal operating mode. The frequency span was taken to 0 Hz with a sweep time of 5 msec to determine the time for each transmission.

The EUT was put into its normal transmitting mode. Please note that the EUT only transmits on 20 different channels at the most during normal operation.

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. This means the time of occupancy of any one channel cannot be greater than 0.4 seconds in an 8 second period (0.4 seconds * 20 channels).

The sweep time was then changed to 150 milliseconds and the number of pulses taken. The number of pulses was then multiplied by 53.33 to determine the number of pulses in an 8 second period. The number of pulses in an 8 second period was then multiplied by the time for each pulse to determine the average time of occupancy.

Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (a)(1)(iii). The EUT does not transmit for more than 400 msec in an 8 second period on any frequency. Please see the data sheets located in Appendix E.

7.9 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 resolution bandwidth 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 was not performed because the EUT is a frequency hopper.

8. DEVIATIONS FROM THE TEST PROCEDURES

There were no deviations from the test procedures.

9. CONCLUSIONS

The SwiftComm RF Module, Model: 41612, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart C, sections 15.205, 15.207, 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 ACCREDITATIONS AND RECOGNITIONS

LABORATORY ACCREDITATIONS AND RECOGNITIONS

NVLAP LAB CODES 200063-0, 200528-0, 200527-0

For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

NVLAP listing links
Agoura Division - http://ts.nist.gov/Standards/scopes/2000630.htm
Brea Division - http://ts.nist.gov/Standards/scopes/2005280.htm
Silverado/Lake Forest Division - http://ts.nist.gov/Standards/scopes/2005270.htm

ANSI listing
CETCB https://www.ansica.org/wwwversion2/outside/ALLdirectoryDetails.asp?menuID=1&prgID=3&orgID=123&status=4

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA).

Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA).

We are also certified/listed for IT products by the following country/agency:

VCCI Listing, from VCCI site
Enter "Compatible" in search form http://www.vcci.or.jp/vcci_e/activity/registration/setsubi.html

FCC Listing, from FCC OET site
FCC test lab search https://fjallfoss.fcc.gov/oetcf/eas/reports/TestFirmSearch.cfm

Industry Canada Industrie Canada
Compatible Electronics IC listing can be found at:
http://www.ic.gc.ca/eic/site/ic1.nsf/eng/home

APPENDIX B

MODIFICATIONS TO THE EUT

MODIFICATIONS TO THE EUT

There were no modifications made to the EUT during the test.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

SwiftComm RF Module
Model: 41612
S/N: NONE

There were no additional models covered under this report.

APPENDIX D

DIAGRAMS, CHARTS AND PHOTOS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

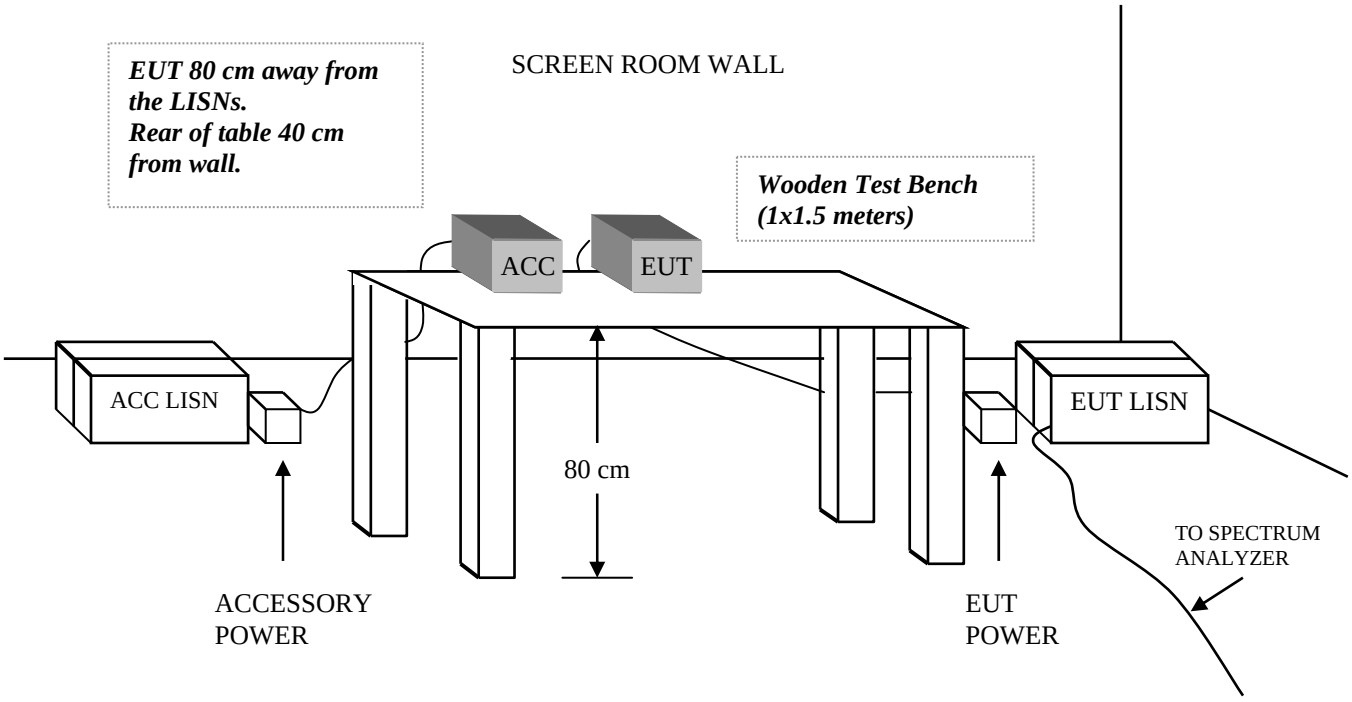


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

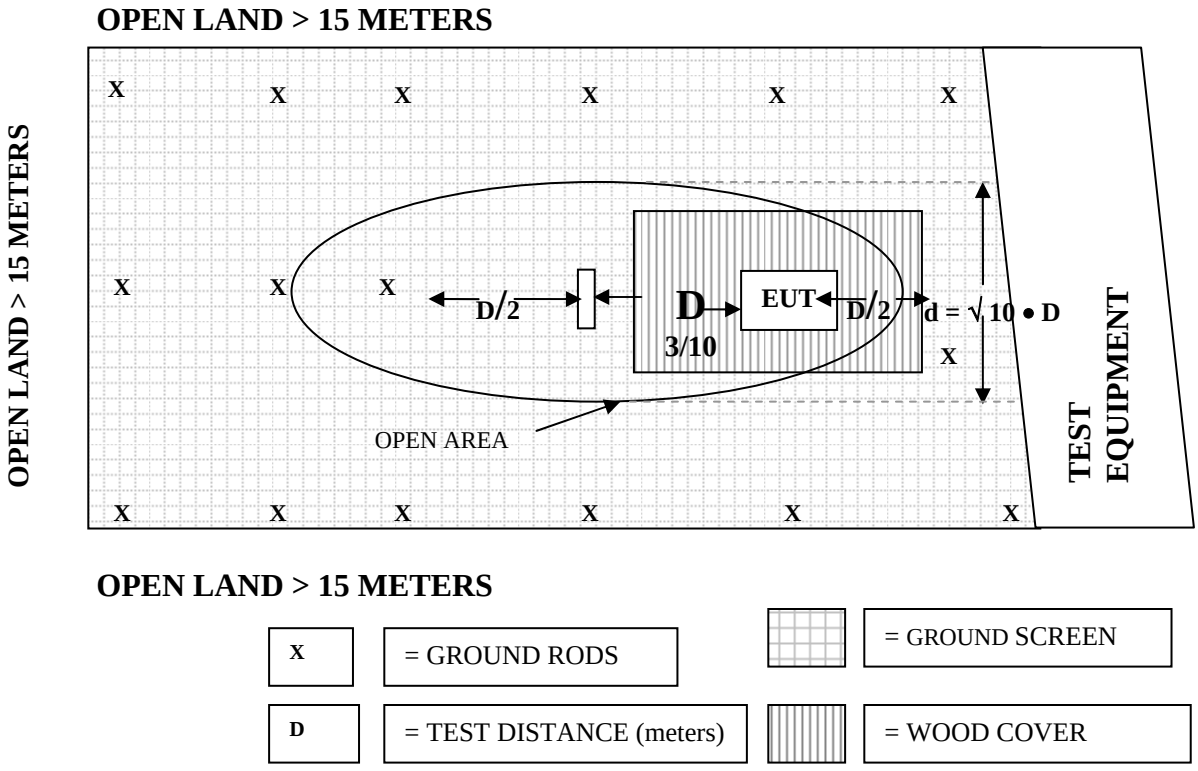
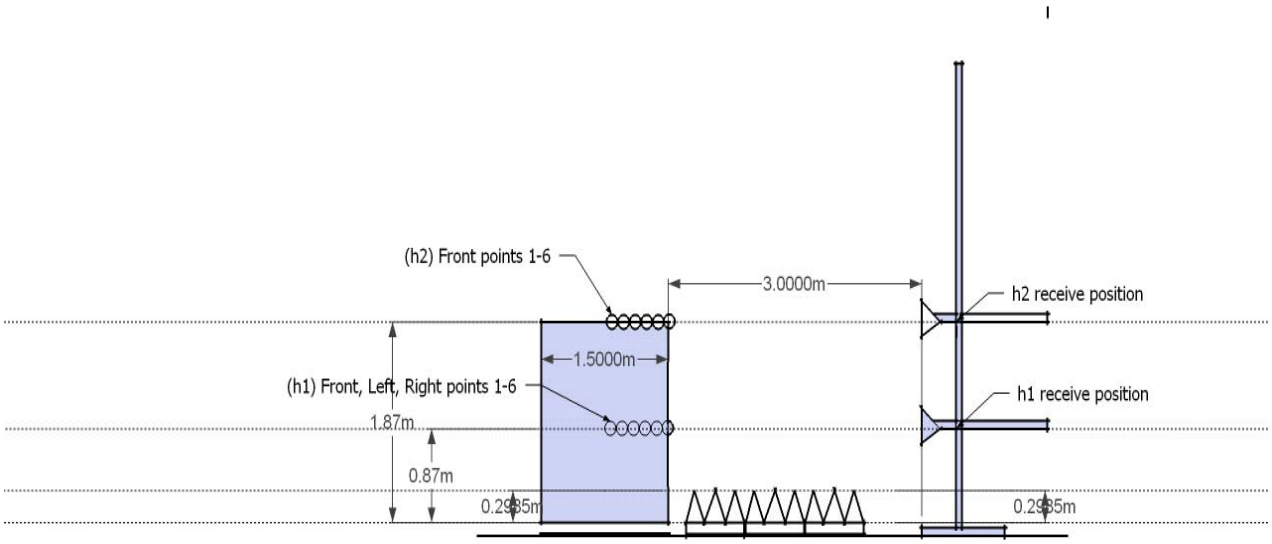


FIGURE 3: HIGH FREQUENCY TEST VOLUME



COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15250

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	10.90	160	12.40
35	11.00	180	15.70
40	11.80	200	16.20
45	11.60	250	16.10
50	11.40	300	19.00
60	9.80		
70	7.00		
80	5.70		
90	7.00		
100	9.50		
120	12.10		
140	11.40		

COM-POWER AL-100

LOG PERIODIC ANTENNA

S/N: 16252

CALIBRATION DATE: JUNE 8, 2011

FREQUENCY (MHz)	FACTOR (dB)
300	13.30
400	15.50
500	15.80
600	20.20
700	20.40
800	20.60
900	20.10
1000	22.80

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61027

CALIBRATION DATE: JUNE 9, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	16.70	160	9.00
35	17.40	180	9.30
40	18.30	200	9.30
45	17.20	250	11.60
50	17.20	300	13.00
60	13.70	400	16.90
70	8.60	500	17.20
80	6.20	600	19.00
90	7.20	700	18.90
100	9.00	800	21.80
120	10.10	900	22.00
140	10.20	1000	21.80

COM-POWER PA-103

PREAMPLIFIER

S/N: 1582

CALIBRATION DATE: JANUARY 11, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	33.0	300	32.4
40	33.0	350	32.4
50	32.9	400	32.3
60	32.9	450	32.3
70	32.9	500	32.2
80	32.9	550	32.2
90	32.9	600	32.2
100	32.9	650	32.0
125	32.9	700	32.3
150	32.8	750	31.9
175	32.8	800	32.2
200	32.7	850	32.0
225	32.7	900	32.0
250	32.7	950	32.0
275	32.7	1000	31.5

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 11, 2011

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	38.1	300	38.1
40	38.2	350	38.0
50	38.2	400	37.9
60	38.2	450	37.7
70	38.2	500	37.6
80	38.2	550	37.9
90	38.2	600	37.9
100	38.1	650	37.7
125	38.2	700	37.9
150	38.2	750	37.5
175	38.2	800	37.6
200	38.2	850	37.6
225	38.2	900	37.0
250	38.2	950	37.2
275	38.2	1000	36.8

COM-POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: MARCH 18, 2010

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	22.2	10000	39.8
1500	24.2	10500	40.2
2000	27.2	11000	39.7
2500	27.8	11500	39.9
3000	30.5	12000	41.7
3500	30.9	12500	42.7
4000	31.9	13000	42.3
4500	33.2	13500	40.3
5000	33.6	14000	42.6
5500	36.2	14500	43.4
6000	35.8	15000	41.9
6500	36.1	15500	40.8
7000	37.9	16000	41.0
7500	37.4	16500	41.5
8000	38.0	17000	44.5
8500	38.8	17500	47.6
9000	38.0	18000	50.8
9500	39.2		

COM-POWER PA-118

PREAMPLIFIER

S/N: 181656

CALIBRATION DATE: DECEMBER 22, 2010

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	24.90	12500	24.92
1500	26.50	13000	24.52
2000	26.79	13500	24.33
2500	26.90	14000	24.56
3000	27.03	14500	24.99
3500	26.94	15000	26.06
4000	27.18	15500	26.87
4500	26.79	16000	25.95
5000	26.25	16500	24.69
5500	26.16	17000	24.20
6000	25.52	17500	25.12
6500	25.29	18000	26.03
7000	24.45		
7500	24.18		
8000	24.02		
8500	24.54		
9000	24.91		
9500	25.42		
10000	26.07		
10500	24.97		
11000	24.79		
11500	24.33		
12000	24.24		

COM-POWER PA-840

PREAMPLIFIER

S/N: 711919

CALIBRATION DATE: MARCH 11, 2010

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	28.05	29500	23.78
18500	28.35	30000	21.88
19000	28.27	30500	23.42
19500	28.62	31000	21.24
20000	28.67	31500	22.69
20500	27.96	32000	21.59
21000	27.76	32500	21.09
21500	26.91	33000	21.22
22000	27.19	33500	21.38
22500	26.90	34000	20.21
23000	26.90	34500	20.89
23500	26.43	35000	20.18
24000	26.75	35500	21.23
24500	24.96	36000	20.99
25000	26.56	36500	21.09
25500	24.75	37000	14.63
26000	25.13	37500	16.74
26500	24.79	38000	22.62
27000	24.54	38500	24.14
27500	23.72	39000	25.97
28000	24.34	39500	27.40
28500	24.01	40000	22.69
29000	24.96		

COM-POWER AH826

HORN ANTENNA

S/N: 71957

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
18000	33.5	22500	35.5
18500	33.5	23000	35.9
19000	34.0	23500	35.7
19500	34.0	24000	35.6
20000	34.3	24500	36.0
20500	34.9	25000	36.2
21000	34.7	25500	36.1
21500	35.0	26000	36.2
22000	35.0	26500	35.7

COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

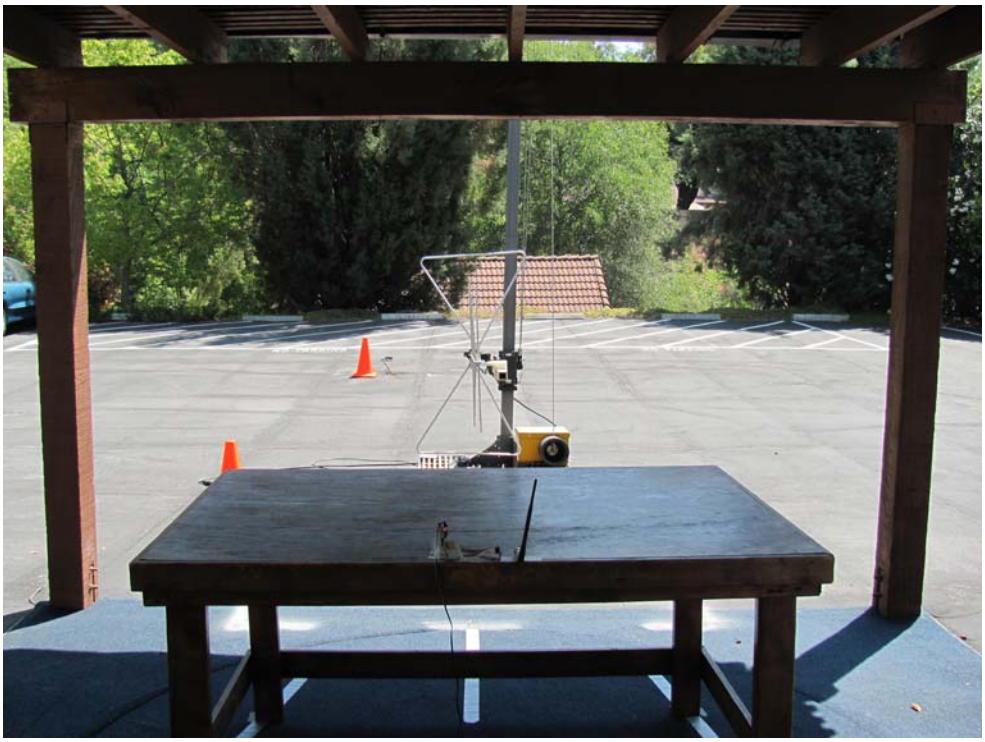
CALIBRATION DATE: JANUARY 21, 2011

FREQUENCY (MHz)	MAGNETIC (dB/m)	ELECTRIC (dB/m)
0.009	-41.9	9.6
0.01	-41.79	9.71
0.02	-41.43	10.07
0.05	-41.53	9.97
0.07	-41.47	10.03
0.1	-41.44	10.06
0.2	-41.61	9.89
0.3	-41.62	9.88
0.5	-41.66	9.84
0.7	-41.48	10.02
1	-41.13	10.37
2	-40.89	10.61
3	-41.00	10.50
4	-41.14	10.36
5	-41.02	10.48
10	-40.69	10.82
15	-40.41	11.09
20	-41.07	10.43
25	-42.10	9.40
30	-41.15	10.35

FRONT VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
RADIATED EMISSIONS – SHORT CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
RADIATED EMISSIONS – SHORT CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
RADIATED EMISSIONS – LONG CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
RADIATED EMISSIONS – LONG CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
CONDUCTED EMISSIONS – SHORT CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
CONDUCTED EMISSIONS – SHORT CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
CONDUCTED EMISSIONS – LONG CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

BEI INDUSTRIAL ENCODERS
SWIFTCOMM RF MODULE
Model: 41612
CONDUCTED EMISSIONS – LONG CABLE

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSION

DATA SHEETS

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	58.09	V	74	-15.91	Peak	1.25	135	
4802	38.09	V	54	-15.91	Avg	1.25	135	
7203	60.26	V	74	-13.74	Peak	1.55	225	
7203	40.26	V	54	-13.74	Avg	1.55	225	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	59.21	V	74	-14.79	Peak	1.25	225	
4802	39.21	V	54	-14.79	Avg	1.25	225	
7203	58.11	V	74	-15.89	Peak	1.25	135	
7203	38.11	V	54	-15.89	Avg	1.25	135	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	57.61	V	74	-16.39	Peak	1.25	135	
4802	37.61	V	54	-16.39	Avg	1.25	135	
7203	60.61	V	74	-13.39	Peak	1.55	155	
7203	40.61	V	54	-13.39	Avg	1.55	155	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	57.99	H	74	-16.01	Peak	1.25	135	
4802	37.99	H	54	-16.01	Avg	1.25	135	
7203	61.34	H	74	-12.66	Peak	1.25	155	
7203	41.34	H	54	-12.66	Avg	1.25	155	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	55.75	H	74	-18.25	Peak	1.25	125	
4802	35.75	H	54	-18.25	Avg	1.25	125	
7203	58.73	H	74	-15.27	Peak	1.25	155	
7203	38.73	H	54	-15.27	Avg	1.25	155	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	54.09	H	74	-19.91	Peak	1.25	225	
4802	34.09	H	54	-19.91	Avg	1.25	225	
7203	58.43	H	74	-15.57	Peak	1.25	225	
7203	38.43	H	54	-15.57	Avg	1.25	225	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	58.14	V	74	-15.86	Peak	1.25	165	
4880	38.14	V	54	-15.86	Avg	1.25	165	
7320	67.43	V	74	-6.57	Peak	1.25	155	
7320	47.43	V	54	-6.57	Avg	1.25	155	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	60.57	V	74	-13.43	Peak	1.25	135	
4880	40.57	V	54	-13.43	Avg	1.25	135	
7320	65.45	V	74	-8.55	Peak	1.55	155	
7320	45.45	V	54	-8.55	Avg	1.55	155	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	63.73	V	74	-10.27	Peak	1.25	155	
4880	43.73	V	54	-10.27	Avg	1.25	155	
7320	66.16	V	74	-7.84	Peak	1.25	155	
7320	46.16	V	54	-7.84	Avg	1.25	155	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	55.15	H	74	-18.85	Peak	2.25	155	
4880	35.15	H	54	-18.85	Avg	2.25	155	
7320	59.75	H	74	-14.25	Peak	1.25	135	
7320	39.75	H	54	-14.25	Avg	1.25	135	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	48.81	H	74	-25.19	Peak	1.25	155	
4880	28.81	H	54	-25.19	Avg	1.25	155	
7320	60.68	H	74	-13.32	Peak	1.25	155	
7320	40.68	H	54	-13.32	Avg	1.25	155	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	58.68	H	74	-15.32	Peak	1.55	45	
4880	38.68	H	54	-15.32	Avg	1.55	45	
7320	63.91	H	74	-10.09	Peak	1.25	45	
7320	43.91	H	54	-10.09	Avg	1.25	45	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	64.41	V	74	-9.59	Peak	1.25	155	
4958	44.41	V	54	-9.59	Avg	1.25	155	
7437	67.03	V	74	-6.97	Peak	1.55	165	
7437	47.03	V	54	-6.97	Avg	1.55	165	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	62.91	V	74	-11.09	Peak	1.25	155	
4958	42.91	V	54	-11.09	Avg	1.25	155	
7437	67.36	V	74	-6.64	Peak	1.25	155	
7437	47.36	V	54	-6.64	Avg	1.25	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	66.11	V	74	-7.89	Peak	2.25	135	
4958	44.11	V	54	-9.89	Avg	2.25	135	
7437	68.19	V	74	-5.81	Peak	2.25	135	
7437	48.19	V	54	-5.81	Avg	2.25	135	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	63.77	H	74	-10.23	Peak	1.15	165	
4958	43.77	H	54	-10.23	Avg	1.15	165	
7437	70.06	H	74	-3.94	Peak	1.25	155	
7437	50.06	H	54	-3.94	Avg	1.25	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	63.82	H	74	-10.18	Peak	1.25	155	
4958	43.82	H	54	-10.18	Avg	1.25	155	
7437	66.42	H	74	-7.58	Peak	1.35	165	
7437	46.42	H	54	-7.58	Avg	1.35	165	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Short Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	62.26	H	74	-11.74	Peak	1.25	135	
4958	42.26	H	54	-11.74	Avg	1.25	135	
7437	67.78	H	74	-6.22	Peak	1.25	155	
7437	47.78	H	54	-6.22	Avg	1.25	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247 and Class B
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/22/2011
Lab: B
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz
Short Cable

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1208.92	60.54	V	54	6.54	Peak	1.25	155	From the Transmitter
1208.92	40.54	V	54	-13.46	Avg	1.25	155	Same Mod. as Fundamental
1607.71	49	V	54	-5	Peak	1.25	155	
1223.06	51.38	H	54	-2.62	Peak	2.25	135	From the Transmitter
1223.06	31.38	H	54	-22.62	Avg	2.25	135	Same Mod. as Fundamental
1618.90	44.82	H	54	-9.18	Peak	2.25	135	
								Note: No Emissions
								Detected From
								10 kHz to 1 GHz
								For Both Vertical and
								Horizontal Polarizations

RSS-210
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Short Cable
Receive Mode - 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2790.8	40.91	V	74	-33.09	Peak	1.25	155	Note: No Emissions
2790.8	28.27	V	54	-25.73	Avg	1.25	155	Detected From
								10 kHz to 1 GHz
5581.6	45.69	V	74	-28.31	Peak	1.35	175	For Both Vertical and
5581.6	33.96	V	54	-20.04	Avg	1.35	175	Horizontal Polarizations
8372.4	51.11	V	74	-22.89	Peak	1.25	185	
8372.4	38.94	V	54	-15.06	Avg	1.25	185	
2790.8	37.13	H	74	-36.87	Peak	1.25	155	
2790.8	25.32	H	54	-28.68	Avg	1.25	155	
5581.6	42.81	H	74	-31.19	Peak	1.35	165	
5581.6	31.62	H	54	-22.38	Avg	1.35	165	
8372.4	47.96	H	74	-26.04	Peak	1.25	175	
8372.4	32.01	H	54	-21.99	Avg	1.25	175	

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	64.48	V	74	-9.52	Peak	1.25	225	
4802	44.48	V	54	-9.52	Avg	1.25	225	
7203	69.39	V	74	-4.61	Peak	1	225	
7203	49.39	V	54	-4.61	Avg	1	225	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	64.96	V	74	-9.04	Peak	1.25	225	
4802	44.96	V	54	-9.04	Avg	1.25	225	
7203	66.64	V	74	-7.36	Peak	2.25	135	
7203	46.64	V	54	-7.36	Avg	2.25	135	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	65.39	V	74	-8.61	Peak	1.25	180	
4802	45.39	V	54	-8.61	Avg	1.25	180	
7203	65.58	V	74	-8.42	Peak	2.25	135	
7203	45.58	V	54	-8.42	Avg	2.25	135	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	51.68	H	74	-22.32	Peak	2.25	135	
4802	31.68	H	54	-22.32	Avg	2.25	135	
7203	63.54	H	74	-10.46	Peak	1.25	135	
7203	43.54	H	54	-10.46	Avg	1.25	135	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	52.56	H	74	-21.44	Peak	1.25	225	
4802	32.56	H	54	-21.44	Avg	1.25	225	
7203	62.72	H	74	-11.28	Peak	2.75	225	
7203	42.72	H	54	-11.28	Avg	2.75	225	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Low Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4802	50.34	H	74	-23.66	Peak	1.25	225	
4802	30.34	H	54	-23.66	Avg	1.25	225	
7203	61.39	H	74	-12.61	Peak	1.25	45	
7203	41.39	H	54	-12.61	Avg	1.25	45	
9604								**Not in Restricted**
9604								**Band**
12005								**No Emission**
12005								**Detected**
14406								**Not in Restricted**
14406								**Band**
16807								**Not in Restricted**
16807								**Band**
19208								**No Emission**
19208								**Detected**
21609								**Not in Restricted**
21609								**Band**
24010								**Not in Restricted**
24010								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	49.27	V	74	-24.73	Peak	1.25	155	
4880	29.27	V	54	-24.73	Avg	1.25	155	
7320	64.04	V	74	-9.96	Peak	2.25	225	
7320	44.04	V	54	-9.96	Avg	2.25	225	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	49.65	V	74	-24.35	Peak	1.25	135	
4880	29.65	V	54	-24.35	Avg	1.25	135	
7320	60.03	V	74	-13.97	Peak	1.25	155	
7320	40.03	V	54	-13.97	Avg	1.25	155	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	49.09	V	74	-24.91	Peak	1.25	155	
4880	29.09	V	54	-24.91	Avg	1.25	155	
7320	61.65	V	74	-12.35	Peak	1.25	225	
7320	41.65	V	54	-12.35	Avg	1.25	225	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	52.54	H	74	-21.46	Peak	2.5	225	
4880	32.54	H	54	-21.46	Avg	2.5	225	
7320	62.66	H	74	-11.34	Peak	2.5	225	
7320	42.66	H	54	-11.34	Avg	2.5	225	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	49.71	H	74	-24.29	Peak	3.25	180	
4880	29.71	H	54	-24.29	Avg	3.25	180	
7320	63.08	H	74	-10.92	Peak	2.25	225	
7320	43.08	H	54	-10.92	Avg	2.25	225	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
Datamax / O'Neil
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	49.71	H	74	-24.29	Peak	1.25	135	
4880	29.71	H	54	-24.29	Avg	1.25	135	
7320	62.54	H	74	-11.46	Peak	3.25	135	
7320	42.54	H	54	-11.46	Avg	3.25	135	
9760								**Not in Restricted**
9760								**Band**
12200								**No Emission**
12200								**Detected**
14640								**Not in Restricted**
14640								**Band**
17080								**Not in Restricted**
17080								**Band**
19520								**No Emission**
19520								**Detected**
21960								**Not in Restricted**
21960								**Band**
24400								**Not in Restricted**
24400								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	53.64	V	74	-20.36	Peak	1.25	135	
4958	33.64	V	54	-20.36	Avg	1.25	135	
7437	63.74	V	74	-10.26	Peak	1.25	155	
7437	43.74	V	54	-10.26	Avg	1.25	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	51.91	V	74	-22.09	Peak	1.25	135	
4958	31.91	V	54	-22.09	Avg	1.25	135	
7437	62.93	V	74	-11.07	Peak	1.35	155	
7437	42.93	V	54	-11.07	Avg	1.35	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	65.63	V	74	-8.37	Peak	1.25	225	
4958	45.63	V	54	-8.37	Avg	1.25	225	
7437	68.87	V	74	-5.13	Peak	3	135	
7437	48.87	V	54	-5.13	Avg	3	135	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - X-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	62.56	H	74	-11.44	Peak	1.25	225	
4958	42.56	H	54	-11.44	Avg	1.25	225	
7437	67.93	H	74	-6.07	Peak	3	135	
7437	47.93	H	54	-6.07	Avg	3	135	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - Y-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	65.45	H	74	-8.55	Peak	1	90	
4958	45.45	H	54	-8.55	Avg	1	90	
7437	68.71	H	74	-5.29	Peak	2	180	
7437	48.71	H	54	-5.29	Avg	2	180	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/21/2011
Lab: B
Tested By: Kyle Fujimoto

High Channel - Long Cable
Transmit Mode - Z-Axis

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4958	61.56	H	74	-12.44	Peak	1.75	135	
4958	41.56	H	54	-12.44	Avg	1.75	135	
7437	64.67	H	74	-9.33	Peak	1.25	155	
7437	44.67	H	54	-9.33	Avg	1.25	155	
9916								**Not in Restricted**
9916								**Band**
12395								**No Emission**
12395								**Detected**
14874								**Not in Restricted**
14874								**Band**
17353								**Not in Restricted**
17353								**Band**
19832								**No Emission**
19832								**Detected**
22311								**No Emission**
22311								**Detected**
24790								**Not in Restricted**
24790								**Band**

FCC 15.247 and FCC Class B

BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/22/2011
Lab: B
Tested By: Kyle Fujimoto

Non Harmonic Emissions from the Tx and Digital Portion - 1 GHz to 25 GHz
Long Cable

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
1233.00	64.11	V	54	10.11	Peak	1	225	Note: No Emissions
1233.00	44.11	V	54	-9.89	Avg	1	225	Detected From
								10 kHz to 1 GHz
1618.59	49.81	V	54	-4.19	Peak	1.25	155	For Both Vertical and
								Horizontal Polarizations
1223.06	54.66	H	54	0.66	Peak	1.25	90	
1223.06	34.66	H	54	-19.34	Avg	1.25	90	
1626.45	46.22	H	54	-7.78	Peak	1.25	45	

RSS-210

BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

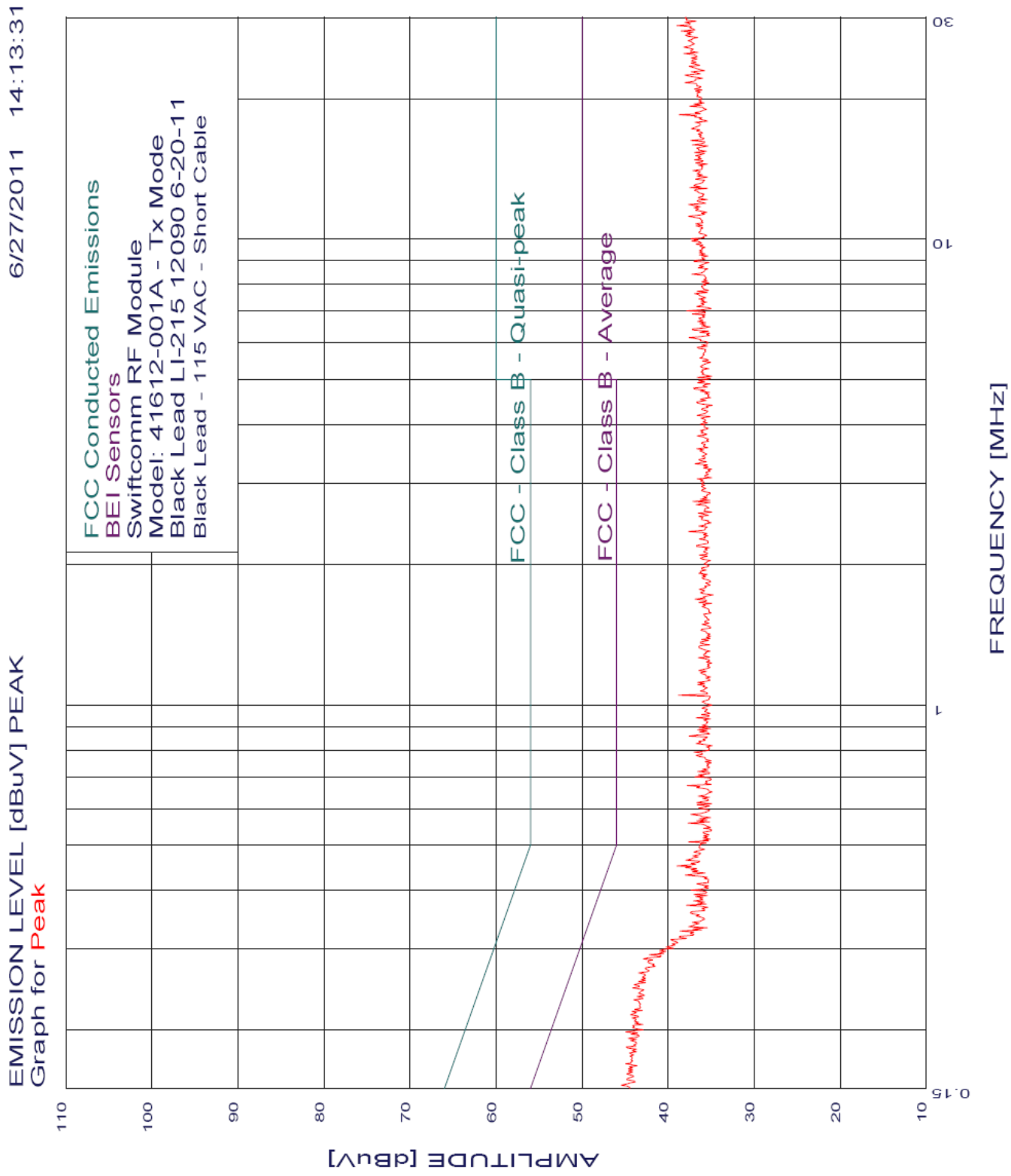
Date: 06/21/2011
Lab:B
Tested By: Kyle Fujimoto

Middle Channel - Long Cable
Receive Mode - 1 GHz to 25 GHz

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2790.8	43.16	V	74	-30.84	Peak	1.25	180	Note: No Emissions
2790.8	37.56	V	54	-16.44	Avg	1.25	180	Detected From
								10 kHz to 1 GHz
5581.6	47.79	V	74	-26.21	Peak	1.25	180	For Both Vertical and
5581.6	41.25	V	54	-6.24	Avg	1.25	180	Horizontal Polarizations
8372.4	50.25	V	74	-23.75	Peak	1.25	225	
8372.4	41.26	V	54	-12.74	Avg	1.25	225	
2790.8	45.18	H	74	-28.82	Peak	1.25	180	
2790.8	37.36	H	54	-16.64	Avg	1.25	180	
5581.6	46.15	H	74	-27.85	Peak	1.25	180	
5581.6	34.25	H	54	-19.75	Avg	1.25	180	
8372.4	50.75	H	74	-23.25	Peak	1.25	225	
8372.4	39.46	H	54	-14.54	Avg	1.25	225	

CONDUCTED EMISSION

DATA SHEETS

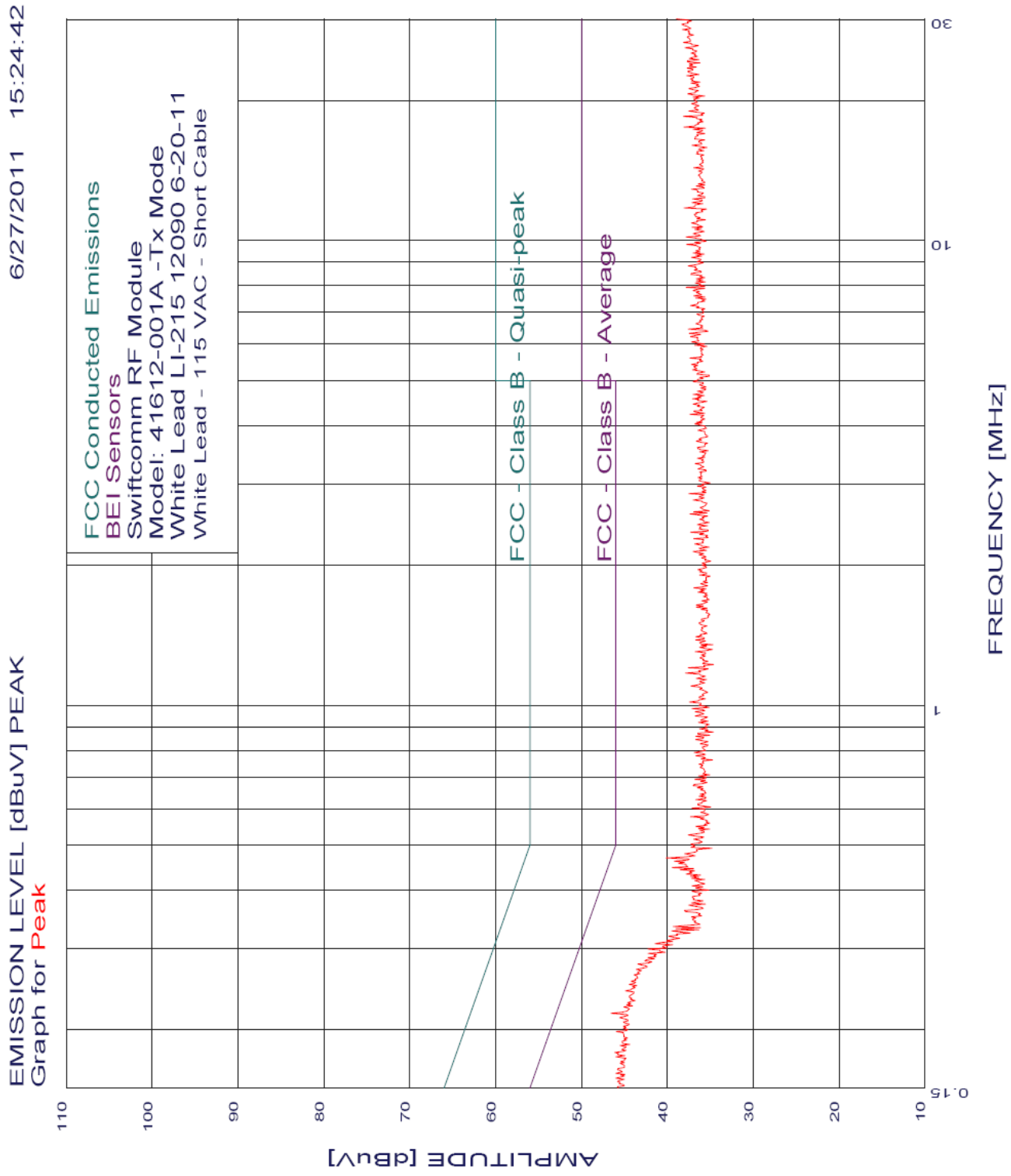

6/27/2011 14:13:31
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Tx Mode
Black Lead LI-215 12090 6-20-11
Black Lead - 115 VAC - Short Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 14:13:31
Swiftcomm RF Module
Model: 41612-001A
Black Lead - 115 VAC - Transmit Mode - Short Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	1.049	38.80	46.00	-7.20
2	0.247	44.11	51.86	-7.75
3	0.285	42.86	50.67	-7.81
4	0.452	38.98	46.85	-7.86
5	0.672	37.77	46.00	-8.23
6	0.291	42.15	50.49	-8.35
7	0.558	37.65	46.00	-8.35
8	0.233	43.98	52.34	-8.37
9	0.508	37.61	46.00	-8.39
10	2.358	37.57	46.00	-8.43
11	0.858	37.53	46.00	-8.47
12	0.216	44.34	52.96	-8.62
13	0.583	37.37	46.00	-8.63
14	0.464	37.89	46.62	-8.73
15	0.199	44.90	53.67	-8.76
16	2.736	37.10	46.00	-8.90
17	4.799	37.02	46.00	-8.98
18	0.792	36.94	46.00	-9.06
19	0.701	36.86	46.00	-9.14
20	1.690	36.83	46.00	-9.17
21	3.294	36.83	46.00	-9.17
22	0.431	37.98	47.24	-9.26
23	0.826	36.73	46.00	-9.27
24	0.205	44.11	53.40	-9.29
25	0.939	36.71	46.00	-9.29
26	2.693	36.70	46.00	-9.30
27	0.618	36.68	46.00	-9.32
28	3.547	36.65	46.00	-9.35
29	4.480	36.65	46.00	-9.35
30	0.564	36.65	46.00	-9.35
31	2.201	36.64	46.00	-9.36
32	3.059	36.61	46.00	-9.39
33	4.182	36.58	46.00	-9.42
34	3.781	36.58	46.00	-9.42
35	0.611	36.58	46.00	-9.42
36	0.184	44.85	54.28	-9.43
37	0.720	36.56	46.00	-9.44
38	0.885	36.52	46.00	-9.48
39	1.118	36.51	46.00	-9.49
40	4.928	36.51	46.00	-9.49
41	2.582	36.50	46.00	-9.50
42	0.637	36.47	46.00	-9.53
43	1.262	36.45	46.00	-9.55
44	1.184	36.42	46.00	-9.58
45	1.918	36.41	46.00	-9.59
46	2.540	36.40	46.00	-9.60
47	2.423	36.38	46.00	-9.62
48	0.601	36.38	46.00	-9.62
49	1.331	36.38	46.00	-9.62
50	1.772	36.32	46.00	-9.68

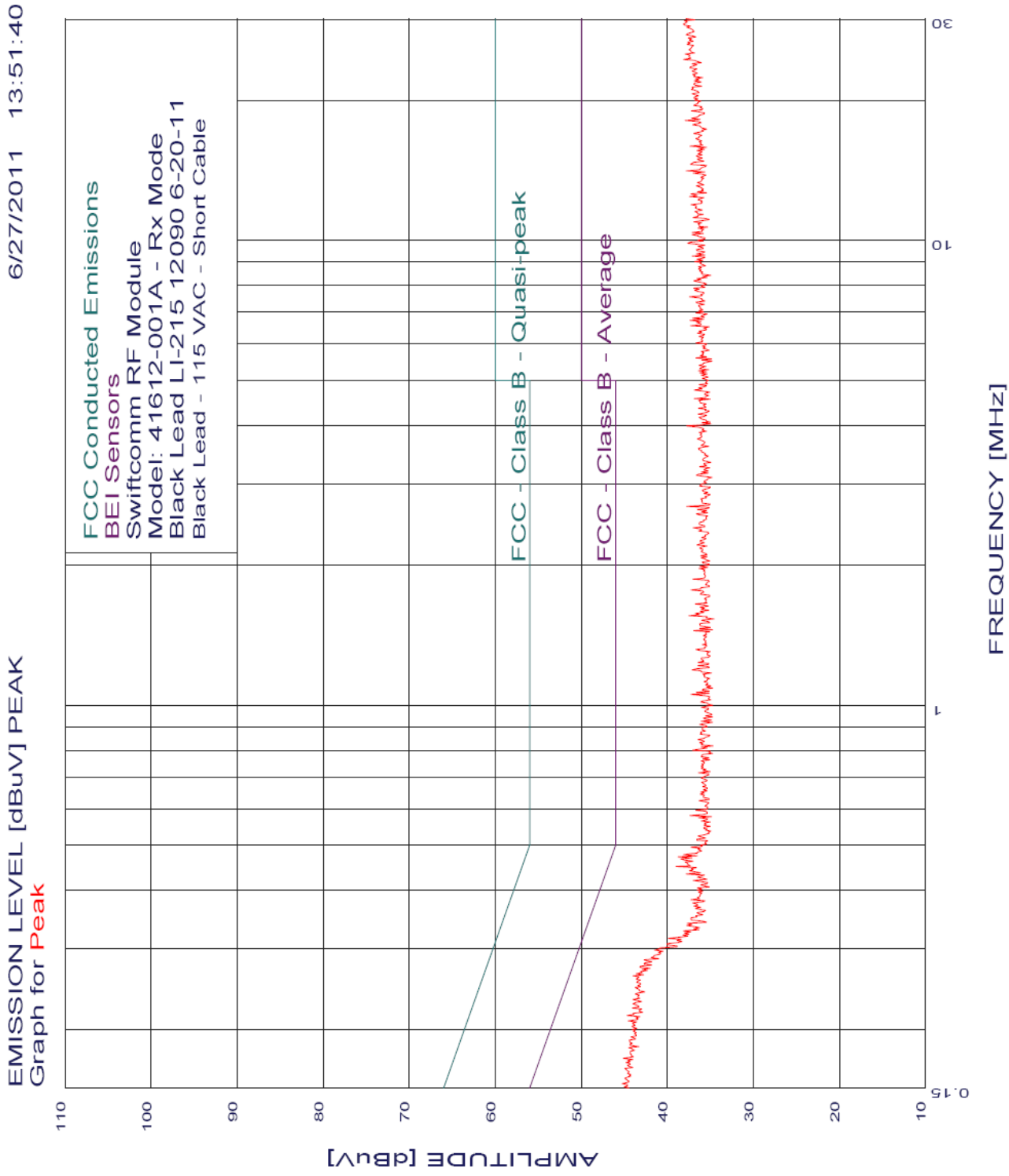

6/27/2011 15:24:42
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A -Tx Mode
White Lead LI-215 12090 6-20-11
White Lead - 115 VAC - Short Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 15:24:42
Swiftcomm RF Module
Model: 41612-001A
White Lead - 115 VAC - Transmit Mode - Short Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.217	46.51	52.91	-6.41
2	0.469	40.09	46.53	-6.44
3	0.243	44.81	52.00	-7.18
4	0.461	39.19	46.67	-7.48
5	0.277	43.38	50.89	-7.51
6	0.447	39.38	46.93	-7.55
7	0.199	45.90	53.67	-7.76
8	0.299	42.23	50.28	-8.05
9	1.172	37.82	46.00	-8.18
10	0.293	42.22	50.45	-8.23
11	0.479	37.99	46.36	-8.37
12	0.179	46.07	54.54	-8.47
13	0.527	37.52	46.00	-8.48
14	1.204	37.52	46.00	-8.48
15	2.855	37.47	46.00	-8.53
16	0.442	38.48	47.02	-8.54
17	1.016	37.40	46.00	-8.60
18	0.307	41.42	50.05	-8.63
19	4.227	37.32	46.00	-8.68
20	2.582	37.32	46.00	-8.68
21	2.358	37.30	46.00	-8.70
22	0.175	45.98	54.72	-8.74
23	0.577	37.26	46.00	-8.74
24	1.100	37.21	46.00	-8.79
25	0.502	37.20	46.00	-8.80
26	0.984	37.10	46.00	-8.90
27	0.601	37.08	46.00	-8.92
28	4.576	37.06	46.00	-8.94
29	2.145	37.00	46.00	-9.00
30	4.980	37.00	46.00	-9.00
31	4.672	36.97	46.00	-9.03
32	0.672	36.97	46.00	-9.03
33	2.766	36.95	46.00	-9.05
34	4.456	36.95	46.00	-9.05
35	4.294	36.93	46.00	-9.07
36	2.610	36.92	46.00	-9.08
37	0.516	36.91	46.00	-9.09
38	2.286	36.90	46.00	-9.10
39	1.790	36.88	46.00	-9.12
40	0.792	36.84	46.00	-9.16
41	4.029	36.80	46.00	-9.20
42	2.226	36.80	46.00	-9.20
43	0.694	36.76	46.00	-9.24
44	1.304	36.73	46.00	-9.27
45	0.948	36.71	46.00	-9.29
46	3.311	36.70	46.00	-9.30
47	0.627	36.67	46.00	-9.33
48	0.779	36.64	46.00	-9.36
49	1.404	36.64	46.00	-9.36
50	0.550	36.64	46.00	-9.36

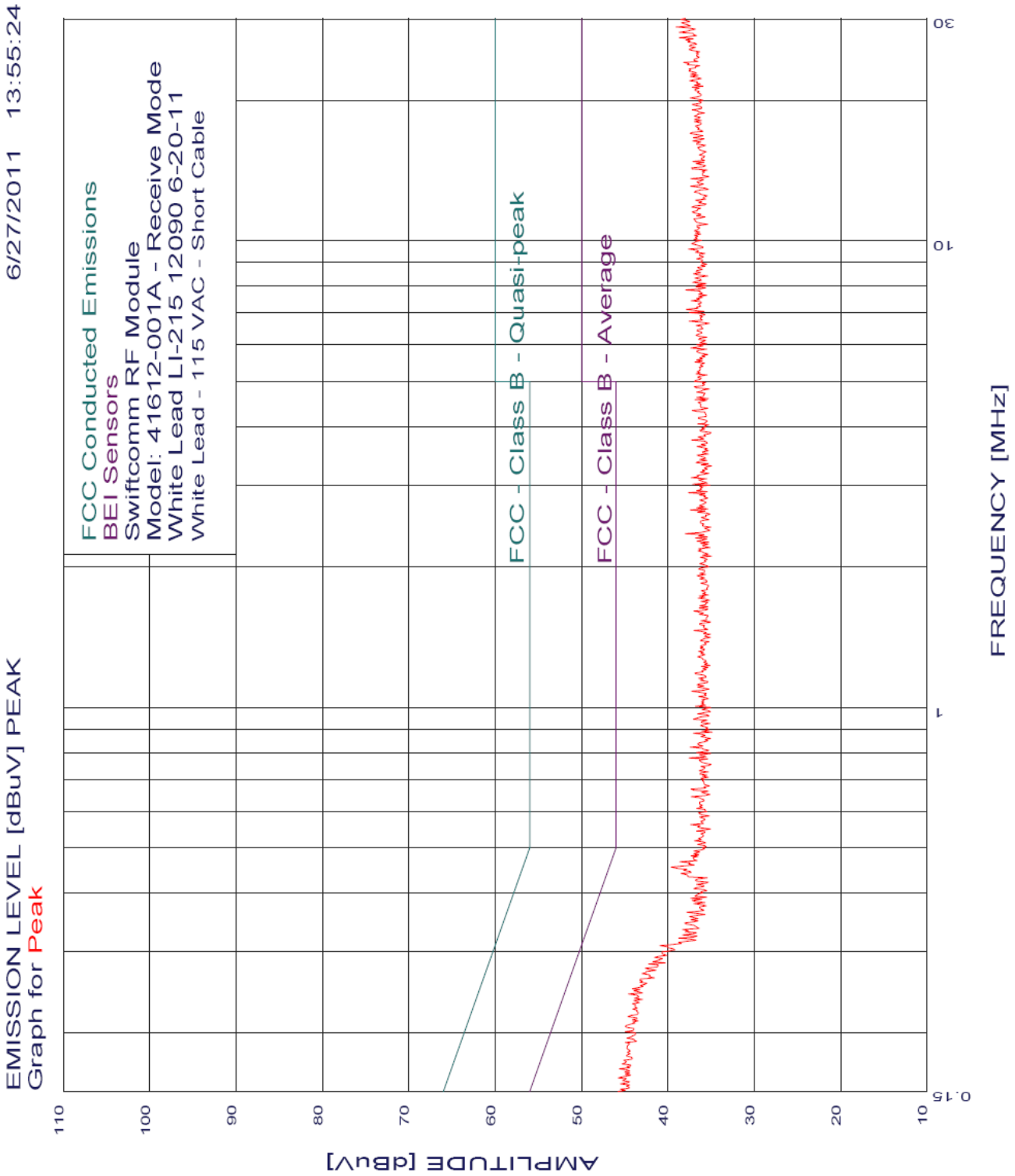

6/27/2011 13:51:40
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Rx Mode
Black Lead LI-215 12090 6-20-11
Black Lead - 115 VAC - Short Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 13:51:40
Swiftcomm RF Module
Model: 41612-001A
Black Lead - 115 VAC - Receive Mode - Short Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.262	44.00	51.38	-7.38
2	0.471	38.69	46.49	-7.80
3	0.273	43.18	51.02	-7.84
4	0.449	38.98	46.89	-7.91
5	0.466	38.39	46.58	-8.19
6	2.679	37.70	46.00	-8.30
7	3.987	37.70	46.00	-8.30
8	0.476	38.09	46.40	-8.31
9	0.233	43.98	52.34	-8.37
10	0.215	44.64	53.00	-8.37
11	1.560	37.44	46.00	-8.56
12	0.580	37.36	46.00	-8.64
13	0.223	44.05	52.70	-8.64
14	0.210	44.52	53.23	-8.70
15	1.772	37.22	46.00	-8.78
16	1.055	37.21	46.00	-8.79
17	1.191	37.12	46.00	-8.88
18	0.494	37.20	46.09	-8.90
19	0.801	37.04	46.00	-8.96
20	1.869	37.01	46.00	-8.99
21	2.410	36.98	46.00	-9.02
22	1.449	36.93	46.00	-9.07
23	4.576	36.84	46.00	-9.16
24	4.774	36.82	46.00	-9.18
25	1.654	36.73	46.00	-9.27
26	0.595	36.68	46.00	-9.32
27	1.318	36.67	46.00	-9.33
28	3.124	36.61	46.00	-9.39
29	1.066	36.61	46.00	-9.39
30	2.582	36.60	46.00	-9.40
31	0.433	37.78	47.19	-9.42
32	2.214	36.54	46.00	-9.46
33	0.516	36.51	46.00	-9.49
34	2.637	36.50	46.00	-9.50
35	3.741	36.47	46.00	-9.53
36	1.236	36.44	46.00	-9.56
37	0.844	36.43	46.00	-9.57
38	1.217	36.43	46.00	-9.57
39	4.227	36.38	46.00	-9.62
40	4.361	36.36	46.00	-9.64
41	0.573	36.36	46.00	-9.64
42	0.716	36.36	46.00	-9.64
43	3.565	36.36	46.00	-9.64
44	0.174	45.09	54.77	-9.68
45	0.624	36.28	46.00	-9.72
46	1.496	36.25	46.00	-9.75
47	1.464	36.23	46.00	-9.77
48	3.260	36.23	46.00	-9.77
49	0.909	36.22	46.00	-9.78
50	2.963	36.20	46.00	-9.80

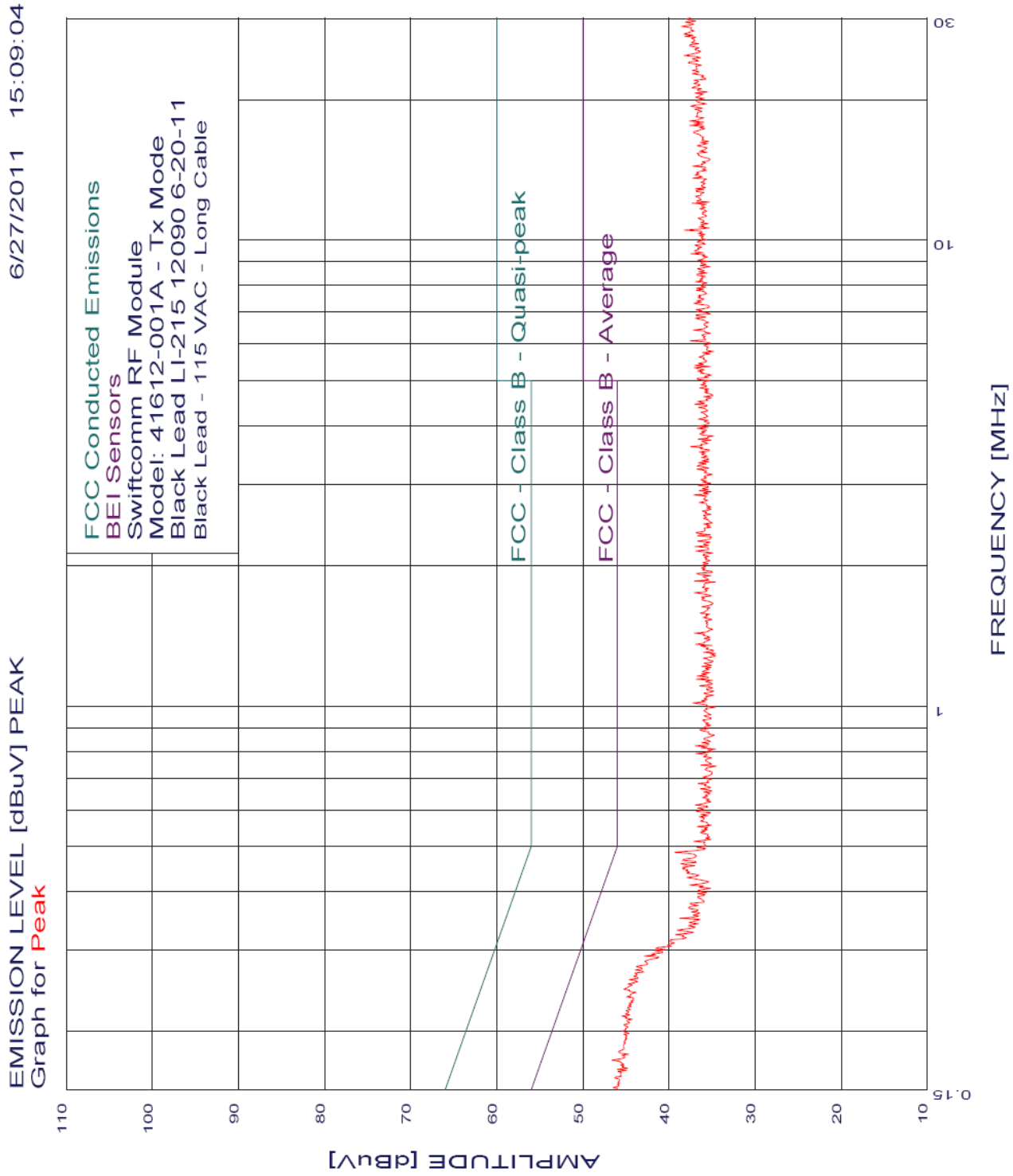

6/27/2011 13:55:24
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Receive Mode
White Lead LI-215 12090 6-20-11
White Lead - 115 VAC - Short Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 13:55:24
Swiftcomm RF Module
Model: 41612-001A
White Lead - 115 VAC - Receive Mode - Short Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.454	39.58	46.80	-7.22
2	0.243	44.51	52.00	-7.48
3	0.250	44.12	51.77	-7.65
4	0.466	38.59	46.58	-7.99
5	2.358	38.00	46.00	-8.00
6	0.269	42.96	51.15	-8.19
7	0.217	44.61	52.91	-8.31
8	0.276	42.58	50.94	-8.36
9	0.207	44.90	53.31	-8.41
10	2.885	37.58	46.00	-8.42
11	0.779	37.54	46.00	-8.46
12	0.822	37.44	46.00	-8.56
13	0.282	42.19	50.76	-8.57
14	2.651	37.43	46.00	-8.57
15	0.440	38.48	47.06	-8.58
16	0.561	37.35	46.00	-8.65
17	3.107	37.30	46.00	-8.70
18	0.644	37.27	46.00	-8.73
19	0.669	37.27	46.00	-8.73
20	1.083	37.21	46.00	-8.79
21	3.741	37.20	46.00	-8.80
22	4.339	37.13	46.00	-8.87
23	3.011	37.10	46.00	-8.90
24	0.285	41.70	50.67	-8.97
25	0.881	37.02	46.00	-8.98
26	0.944	37.01	46.00	-8.99
27	1.611	36.96	46.00	-9.04
28	1.464	36.95	46.00	-9.05
29	0.196	44.71	53.80	-9.08
30	0.518	36.91	46.00	-9.09
31	0.309	40.92	50.01	-9.09
32	4.877	36.89	46.00	-9.11
33	4.576	36.86	46.00	-9.14
34	1.184	36.82	46.00	-9.18
35	1.006	36.80	46.00	-9.20
36	2.310	36.80	46.00	-9.20
37	3.346	36.70	46.00	-9.30
38	2.916	36.68	46.00	-9.32
39	4.748	36.67	46.00	-9.33
40	0.801	36.64	46.00	-9.36
41	2.679	36.64	46.00	-9.36
42	0.544	36.64	46.00	-9.36
43	1.118	36.61	46.00	-9.39
44	3.474	36.60	46.00	-9.40
45	3.624	36.60	46.00	-9.40
46	2.274	36.60	46.00	-9.40
47	1.918	36.59	46.00	-9.41
48	0.168	45.60	55.07	-9.47
49	1.283	36.53	46.00	-9.47
50	0.969	36.51	46.00	-9.49

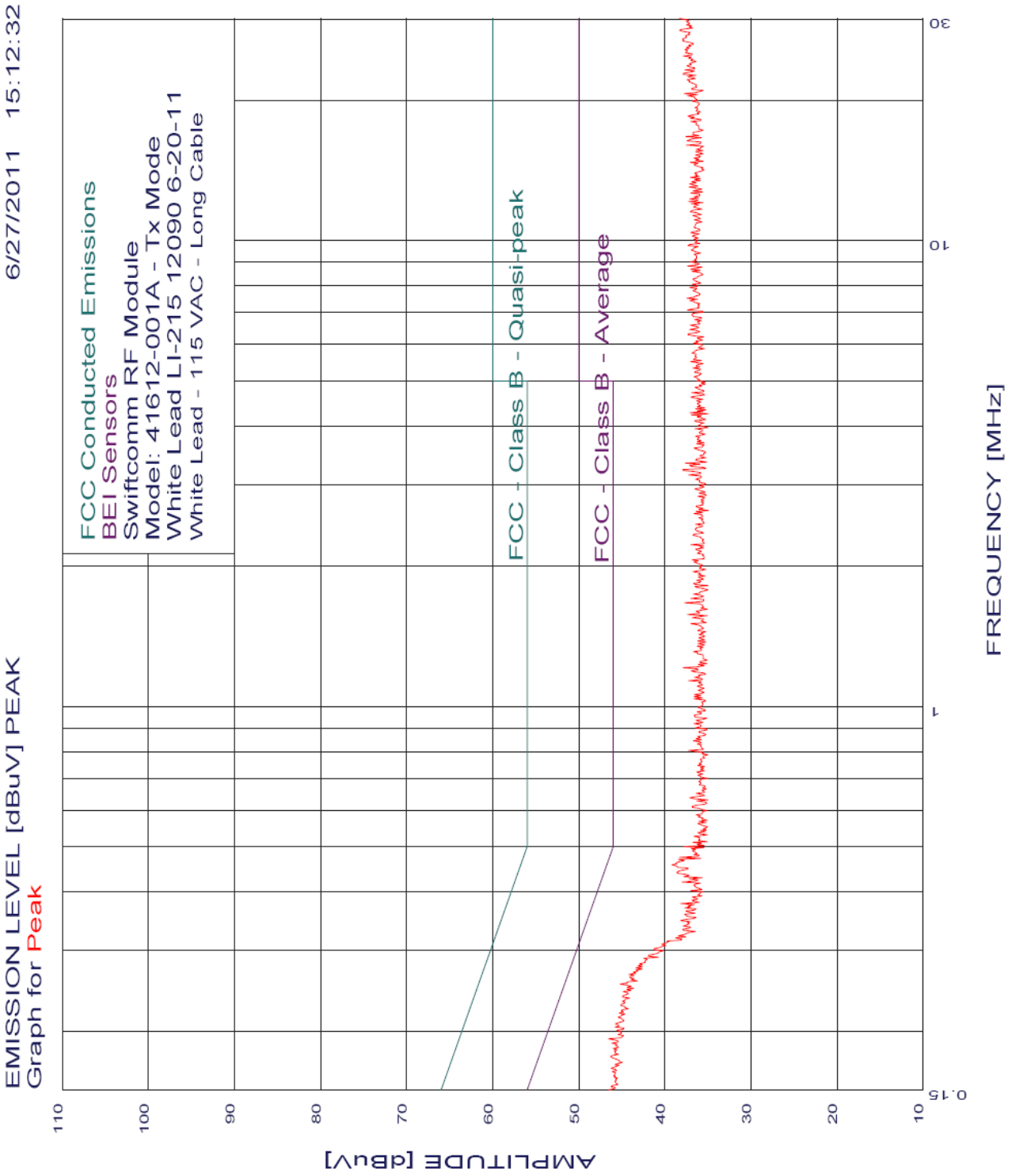

6/27/2011 15:09:04
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Tx Mode
Black Lead LI-215 12090 6-20-11
Black Lead - 115 VAC - Long Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 15:09:04
Swiftcomm RF Module
Model: 41612-001A
Black Lead - 115 VAC - Transmit Mode - Long Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.247	45.21	51.86	-6.65
2	0.486	39.30	46.23	-6.93
3	0.216	45.44	52.96	-7.52
4	0.291	42.85	50.49	-7.65
5	0.459	38.59	46.71	-8.12
6	0.174	46.59	54.77	-8.18
7	0.466	38.39	46.58	-8.19
8	0.452	38.38	46.85	-8.46
9	3.605	37.46	46.00	-8.54
10	0.182	45.86	54.41	-8.55
11	0.302	41.54	50.19	-8.65
12	1.016	37.20	46.00	-8.80
13	0.513	37.11	46.00	-8.89
14	2.840	37.10	46.00	-8.90
15	1.754	37.02	46.00	-8.98
16	1.434	37.02	46.00	-8.98
17	1.859	37.01	46.00	-8.99
18	4.456	36.95	46.00	-9.05
19	2.201	36.94	46.00	-9.06
20	0.822	36.94	46.00	-9.06
21	1.359	36.89	46.00	-9.11
22	0.614	36.88	46.00	-9.12
23	2.358	36.87	46.00	-9.13
24	0.792	36.84	46.00	-9.16
25	0.166	46.00	55.16	-9.16
26	2.156	36.83	46.00	-9.17
27	1.142	36.81	46.00	-9.19
28	1.929	36.81	46.00	-9.19
29	0.595	36.78	46.00	-9.22
30	0.552	36.74	46.00	-9.26
31	3.277	36.73	46.00	-9.27
32	3.226	36.72	46.00	-9.28
33	1.160	36.72	46.00	-9.28
34	3.945	36.69	46.00	-9.31
35	2.322	36.66	46.00	-9.34
36	2.262	36.65	46.00	-9.35
37	2.979	36.60	46.00	-9.40
38	0.428	37.88	47.28	-9.41
39	4.137	36.59	46.00	-9.41
40	3.741	36.57	46.00	-9.43
41	0.683	36.56	46.00	-9.44
42	4.384	36.56	46.00	-9.44
43	2.900	36.50	46.00	-9.50
44	3.987	36.50	46.00	-9.50
45	0.580	36.46	46.00	-9.54
46	3.511	36.45	46.00	-9.55
47	0.890	36.42	46.00	-9.58
48	4.825	36.42	46.00	-9.58
49	1.106	36.41	46.00	-9.59
50	0.665	36.37	46.00	-9.63

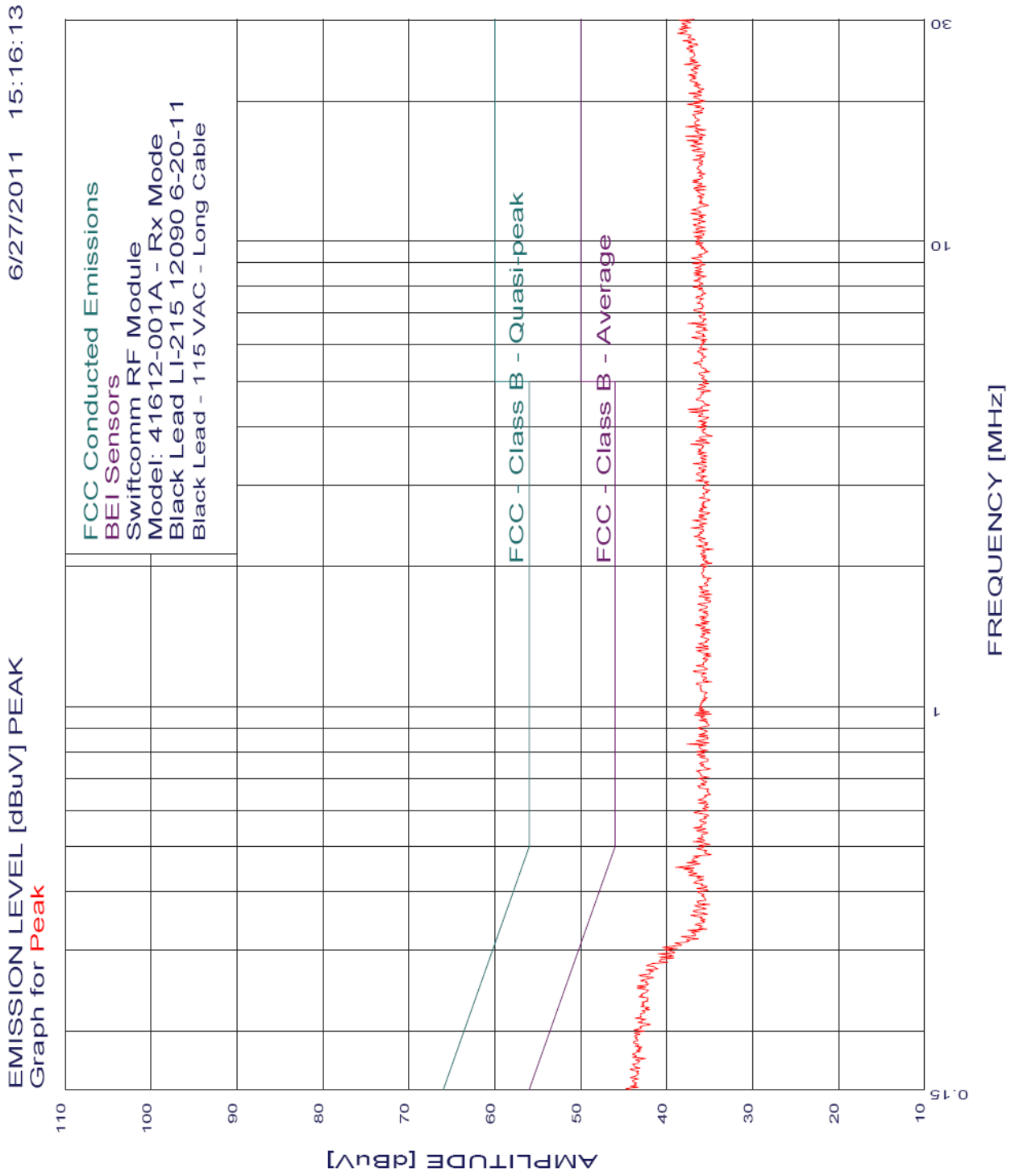

6/27/2011 15:12:32
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Tx Mode
White Lead LI-215 12090 6-20-11
White Lead - 115 VAC - Long Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 15:12:32
Swiftcomm RF Module
Model: 41612-001A
White Lead - 115 VAC - Transmit Mode - Long Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.254	45.13	51.64	-6.51
2	0.266	44.15	51.24	-7.09
3	0.194	46.52	53.88	-7.36
4	0.457	39.19	46.76	-7.57
5	0.205	45.80	53.40	-7.60
6	3.226	37.90	46.00	-8.10
7	0.474	38.29	46.45	-8.16
8	1.210	37.82	46.00	-8.18
9	0.500	37.70	46.01	-8.31
10	1.671	37.67	46.00	-8.33
11	3.328	37.60	46.00	-8.40
12	0.440	38.58	47.06	-8.48
13	0.291	41.91	50.49	-8.58
14	1.577	37.36	46.00	-8.64
15	0.805	37.24	46.00	-8.76
16	1.136	37.21	46.00	-8.79
17	3.141	37.20	46.00	-8.80
18	3.294	37.10	46.00	-8.90
19	0.637	37.07	46.00	-8.93
20	4.272	37.03	46.00	-8.97
21	2.226	37.00	46.00	-9.00
22	0.300	41.23	50.23	-9.00
23	1.708	36.97	46.00	-9.03
24	4.624	36.96	46.00	-9.04
25	1.504	36.95	46.00	-9.05
26	4.227	36.92	46.00	-9.08
27	4.722	36.87	46.00	-9.13
28	2.066	36.80	46.00	-9.20
29	0.608	36.78	46.00	-9.22
30	1.552	36.76	46.00	-9.24
31	0.510	36.71	46.00	-9.29
32	2.334	36.70	46.00	-9.30
33	1.950	36.69	46.00	-9.31
34	1.840	36.68	46.00	-9.32
35	1.745	36.67	46.00	-9.33
36	0.844	36.63	46.00	-9.37
37	1.311	36.63	46.00	-9.37
38	0.527	36.62	46.00	-9.38
39	2.596	36.62	46.00	-9.38
40	0.919	36.62	46.00	-9.38
41	1.049	36.60	46.00	-9.40
42	3.585	36.60	46.00	-9.40
43	0.419	37.97	47.46	-9.49
44	4.114	36.51	46.00	-9.49
45	0.953	36.51	46.00	-9.49
46	3.945	36.50	46.00	-9.50
47	2.932	36.49	46.00	-9.51
48	4.851	36.49	46.00	-9.51
49	1.810	36.48	46.00	-9.52
50	4.361	36.44	46.00	-9.56

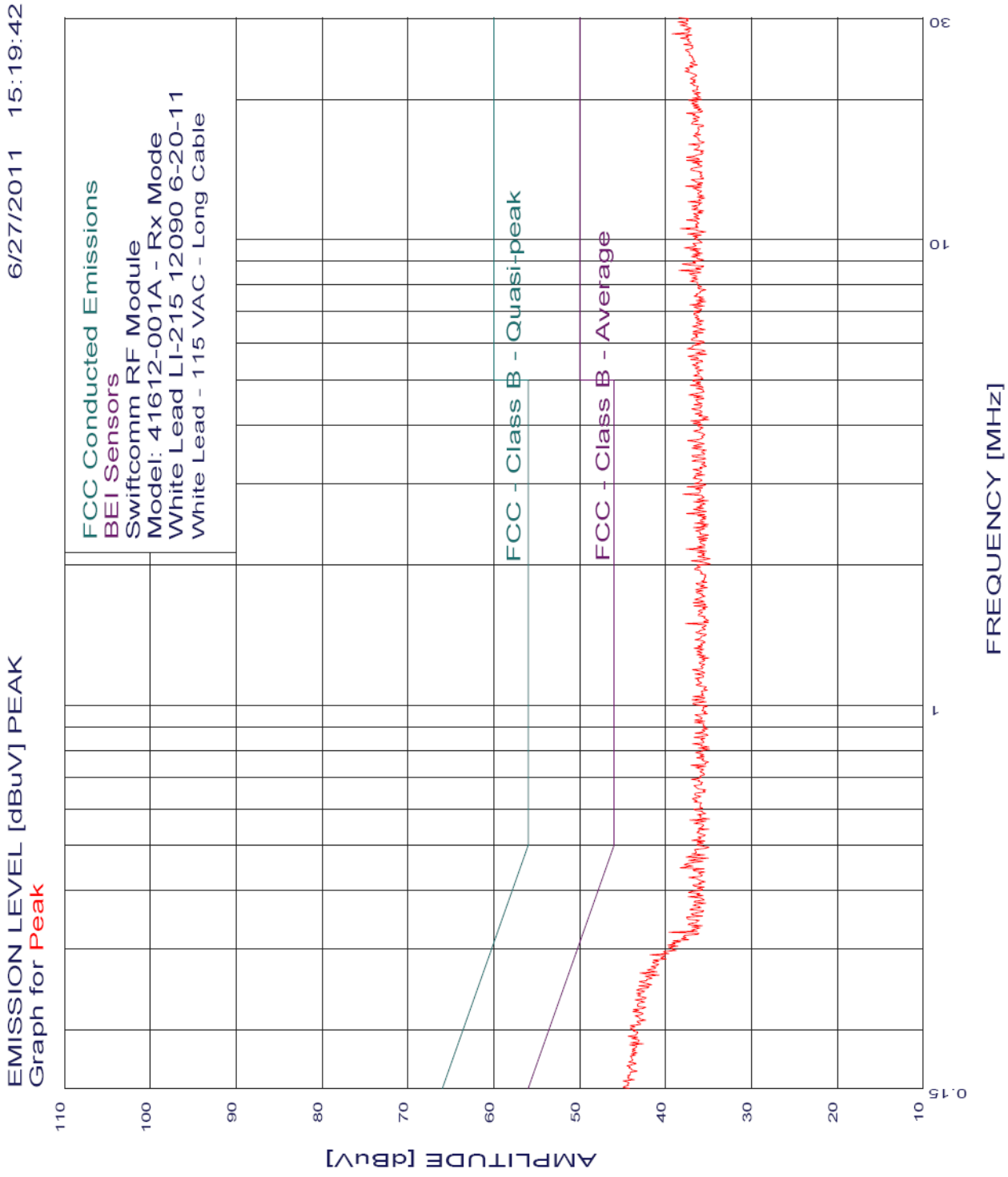

6/27/2011 15:16:13
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Rx Mode
Black Lead LI-215 12090 6-20-11
Black Lead - 115 VAC - Long Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 15:16:13
Swiftcomm RF Module
Model: 41612-001A
Black Lead - 115 VAC - Receive Mode - Long Cable
Test Engineer: David Tran

---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.452	38.98	46.85	-7.86
2	0.265	43.19	51.29	-8.10
3	0.251	43.42	51.73	-8.31
4	0.831	37.63	46.00	-8.37
5	0.277	42.37	50.89	-8.52
6	4.361	37.46	46.00	-8.54
7	4.294	37.37	46.00	-8.63
8	2.423	37.18	46.00	-8.82
9	3.663	37.17	46.00	-8.83
10	0.447	37.98	46.93	-8.95
11	0.238	43.19	52.17	-8.98
12	0.461	37.69	46.67	-8.98
13	2.514	37.00	46.00	-9.00
14	3.328	36.93	46.00	-9.07
15	1.191	36.92	46.00	-9.08
16	0.513	36.91	46.00	-9.09
17	0.550	36.84	46.00	-9.16
18	0.592	36.77	46.00	-9.23
19	2.322	36.76	46.00	-9.24
20	0.958	36.71	46.00	-9.29
21	1.496	36.65	46.00	-9.35
22	3.059	36.61	46.00	-9.39
23	0.214	43.63	53.05	-9.42
24	1.338	36.58	46.00	-9.42
25	3.722	36.57	46.00	-9.43
26	0.728	36.55	46.00	-9.45
27	2.214	36.54	46.00	-9.46
28	4.576	36.54	46.00	-9.46
29	0.294	40.94	50.41	-9.46
30	0.541	36.53	46.00	-9.47
31	0.844	36.53	46.00	-9.47
32	1.223	36.53	46.00	-9.47
33	3.158	36.52	46.00	-9.48
34	1.118	36.51	46.00	-9.49
35	0.969	36.51	46.00	-9.49
36	3.987	36.50	46.00	-9.50
37	1.318	36.47	46.00	-9.53
38	0.788	36.44	46.00	-9.56
39	4.825	36.42	46.00	-9.58
40	0.494	36.50	46.09	-9.60
41	0.631	36.37	46.00	-9.63
42	0.676	36.36	46.00	-9.64
43	1.663	36.33	46.00	-9.67
44	0.899	36.32	46.00	-9.68
45	0.304	40.44	50.14	-9.70
46	1.367	36.29	46.00	-9.71
47	0.621	36.28	46.00	-9.72
48	0.202	43.80	53.53	-9.73
49	1.611	36.24	46.00	-9.76
50	0.862	36.23	46.00	-9.77


6/27/2011 15:19:42
FCC Conducted Emissions
BEI Sensors
Swiftcomm RF Module
Model: 41612-001A - Rx Mode
White Lead LI-215 12090 6-20-11
White Lead - 115 VAC - Long Cable
FCC - Class B - Quasi-peak
FCC - Class B - Average
EMISSION LEVEL [dBuV] PEAK
Graph for Peak
AMPLITUDE [dBuV]
FREQUENCY [MHz]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30

BEI Sensors 6/27/2011 15:19:42
Swiftcomm RF Module
Model: 41612-001A
White Lead - 115 VAC - Receive Mode - Long Cable
Test Engineer: David Tran

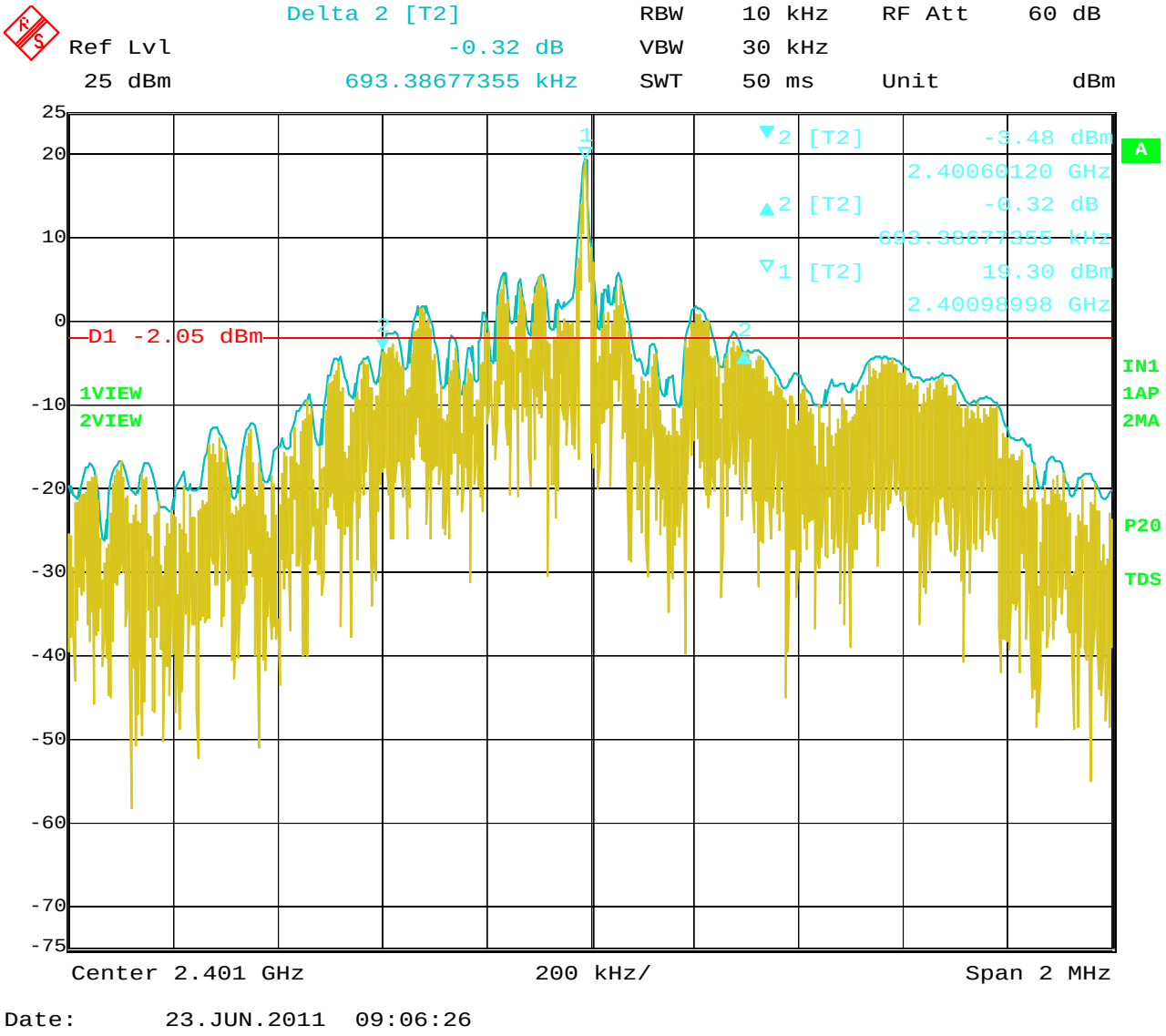
---

50 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 1.00 dB, Curve : Peak

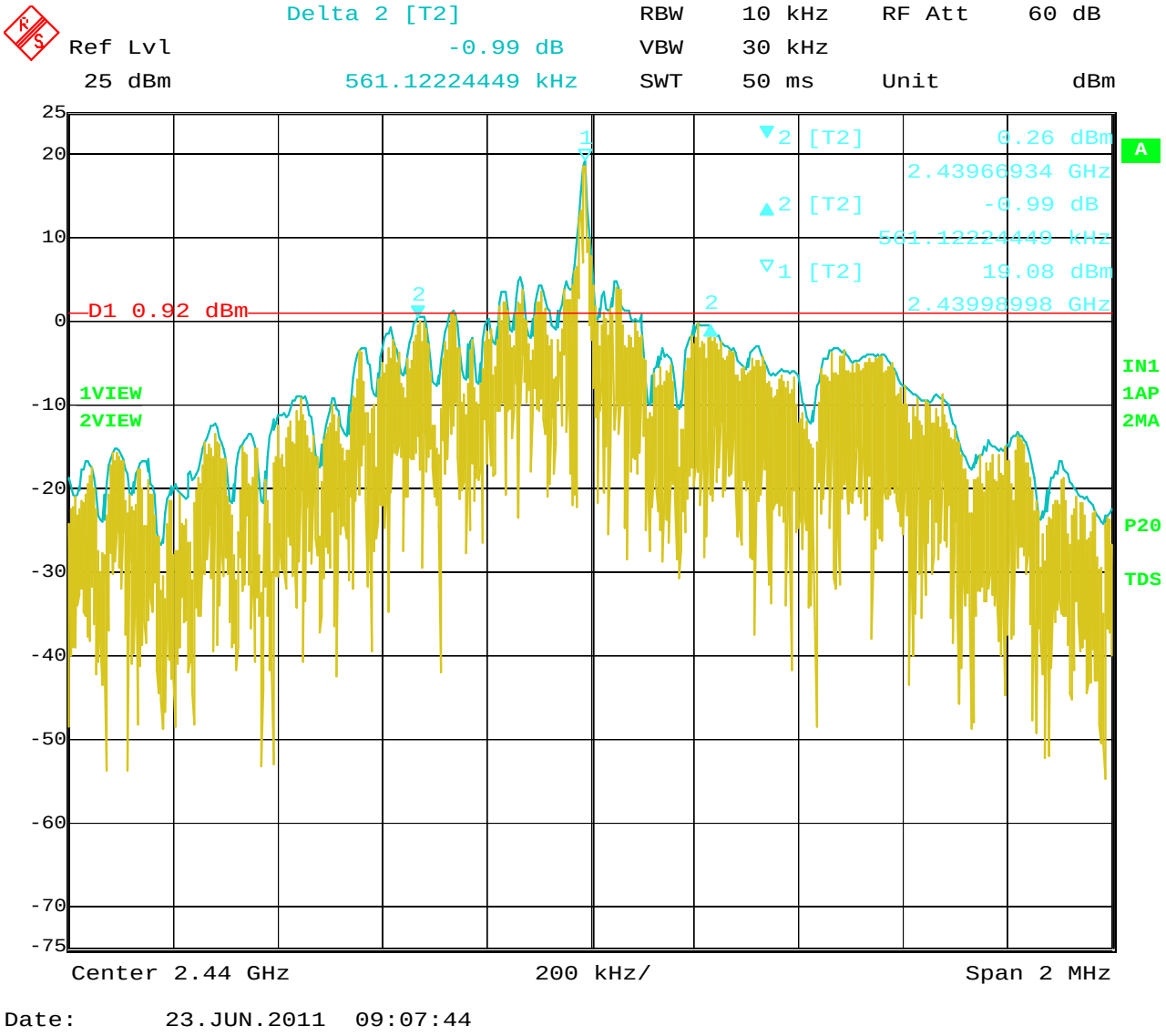
Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	2.840	37.97	46.00	-8.03
2	0.266	42.95	51.24	-8.29
3	1.496	37.65	46.00	-8.35
4	2.168	37.60	46.00	-8.40
5	2.582	37.52	46.00	-8.48
6	2.948	37.49	46.00	-8.51
7	0.255	43.03	51.60	-8.57
8	3.702	37.40	46.00	-8.60
9	0.244	43.31	51.95	-8.64
10	0.447	38.28	46.93	-8.65
11	0.250	43.12	51.77	-8.65
12	0.291	41.81	50.49	-8.68
13	4.648	37.26	46.00	-8.74
14	0.233	43.51	52.34	-8.83
15	0.567	37.15	46.00	-8.85
16	0.471	37.59	46.49	-8.90
17	4.877	37.09	46.00	-8.91
18	0.743	37.05	46.00	-8.95
19	4.092	37.01	46.00	-8.99
20	2.044	37.00	46.00	-9.00
21	0.454	37.78	46.80	-9.02
22	0.220	43.81	52.83	-9.02
23	0.694	36.96	46.00	-9.04
24	0.270	42.06	51.11	-9.05
25	4.339	36.93	46.00	-9.07
26	0.513	36.91	46.00	-9.09
27	1.027	36.90	46.00	-9.10
28	3.346	36.90	46.00	-9.10
29	3.438	36.90	46.00	-9.10
30	3.565	36.90	46.00	-9.10
31	0.631	36.87	46.00	-9.13
32	0.826	36.83	46.00	-9.17
33	1.191	36.82	46.00	-9.18
34	1.043	36.80	46.00	-9.20
35	1.006	36.80	46.00	-9.20
36	3.075	36.80	46.00	-9.20
37	3.209	36.80	46.00	-9.20
38	1.663	36.77	46.00	-9.23
39	2.736	36.75	46.00	-9.25
40	2.637	36.73	46.00	-9.27
41	2.410	36.70	46.00	-9.30
42	3.882	36.70	46.00	-9.30
43	0.464	37.29	46.62	-9.33
44	0.672	36.67	46.00	-9.33
45	1.637	36.66	46.00	-9.34
46	0.558	36.65	46.00	-9.35
47	1.325	36.63	46.00	-9.37
48	0.853	36.63	46.00	-9.37
49	0.919	36.62	46.00	-9.38
50	0.929	36.61	46.00	-9.39

-20 dB BANDWIDTH

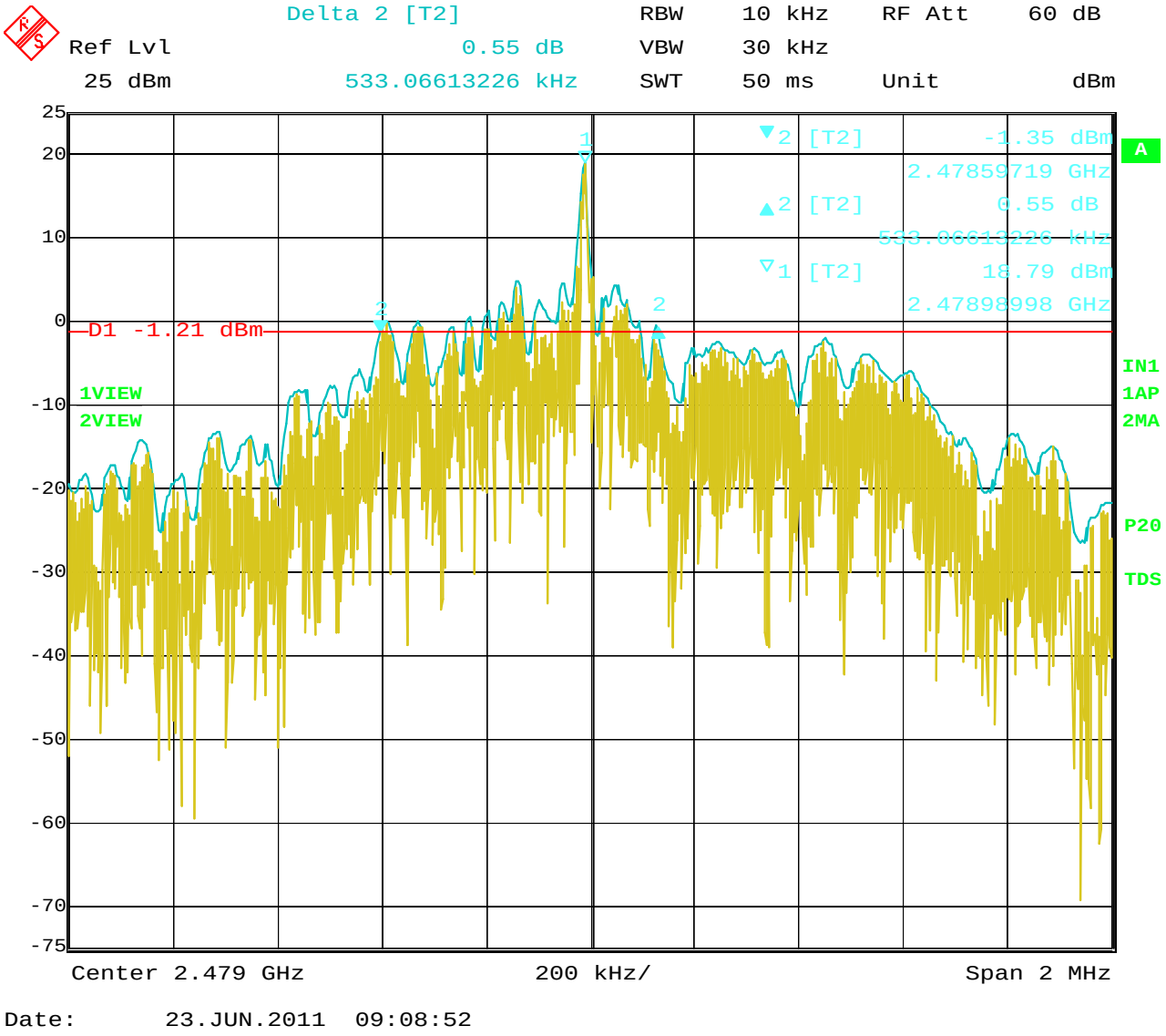
DATA SHEETS



-20 dB Bandwidth of the Low Channel



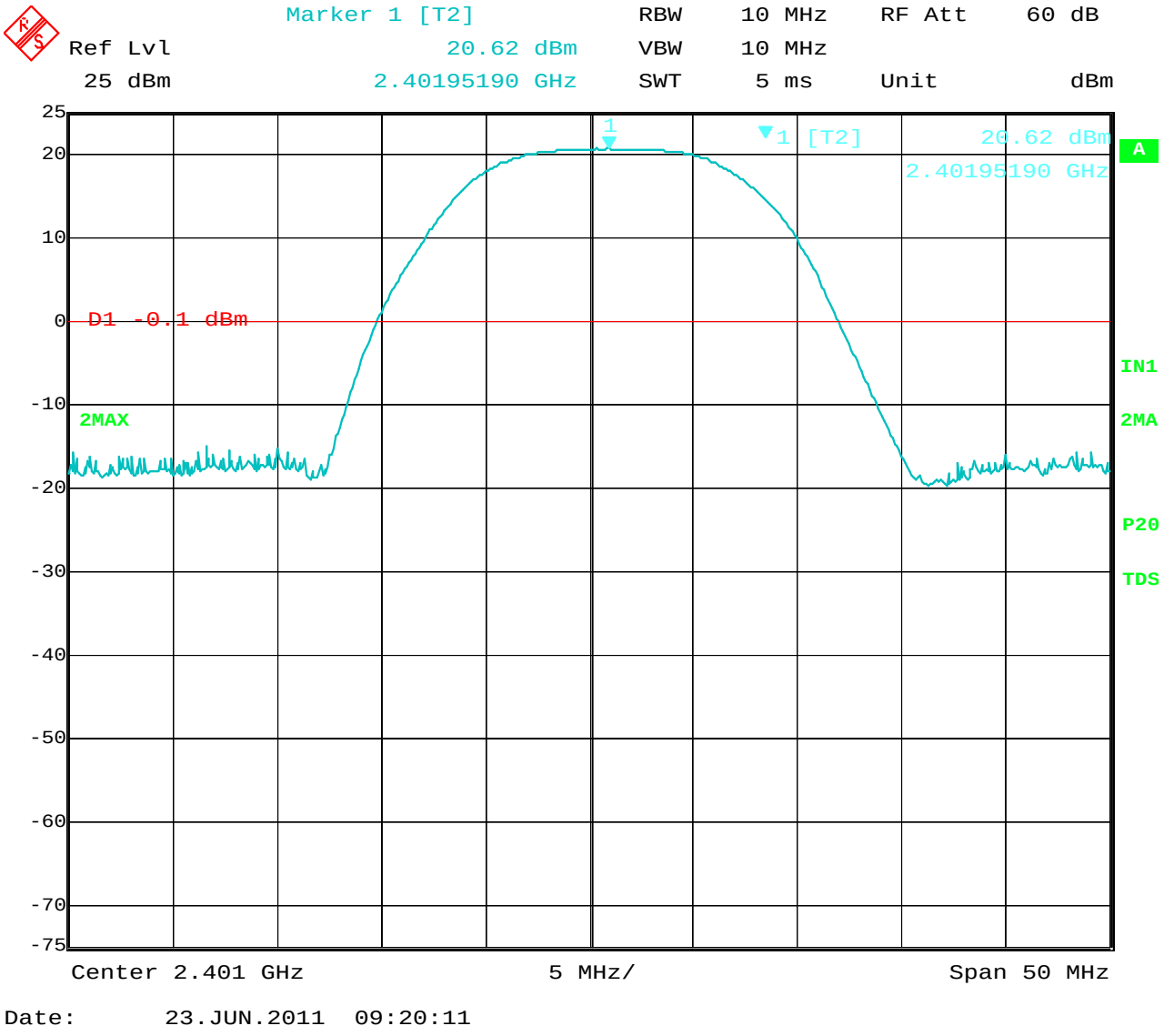
-20 dB Bandwidth of the Middle Channel



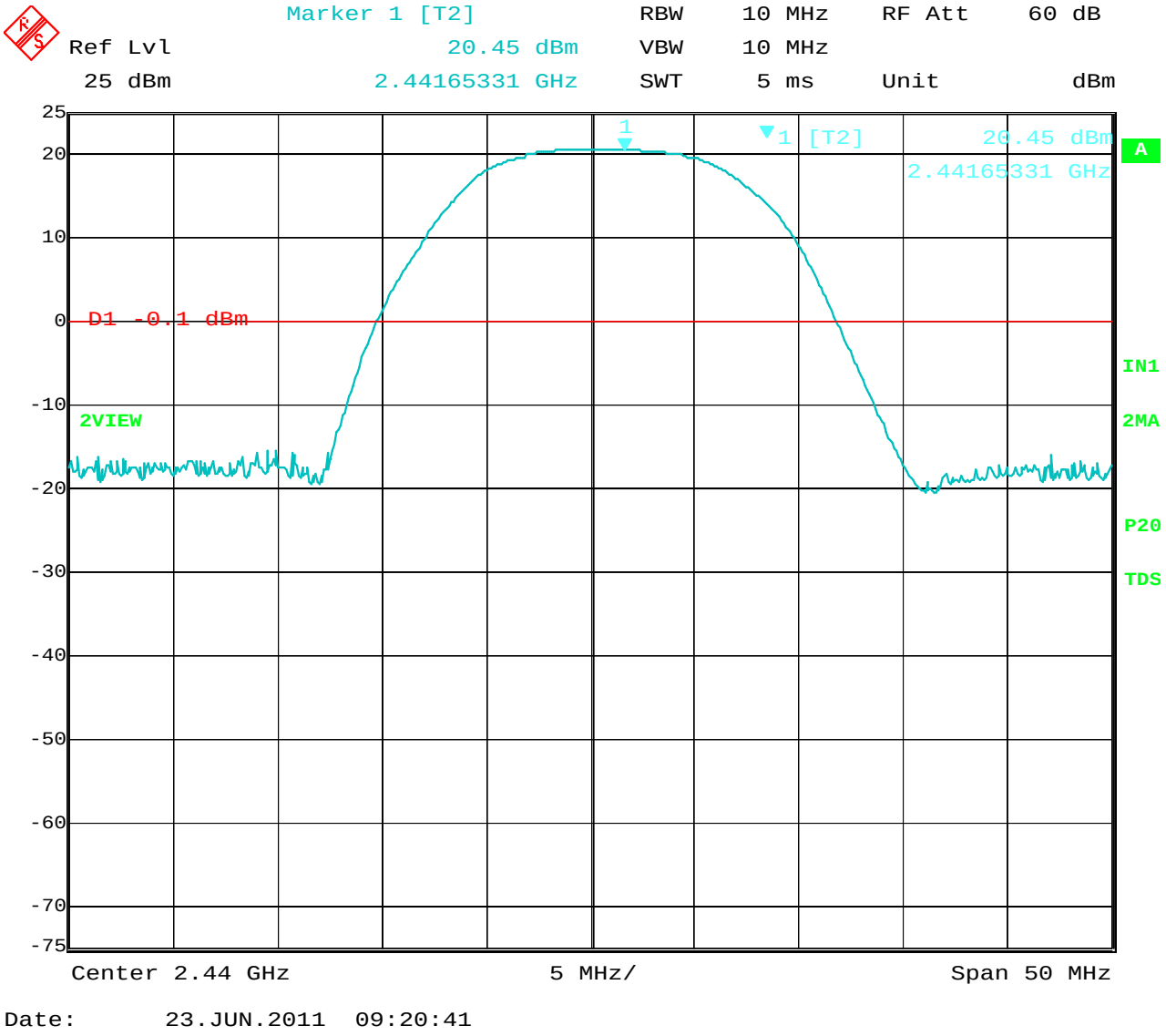
-20 dB Bandwidth of the High Channel

PEAK POWER

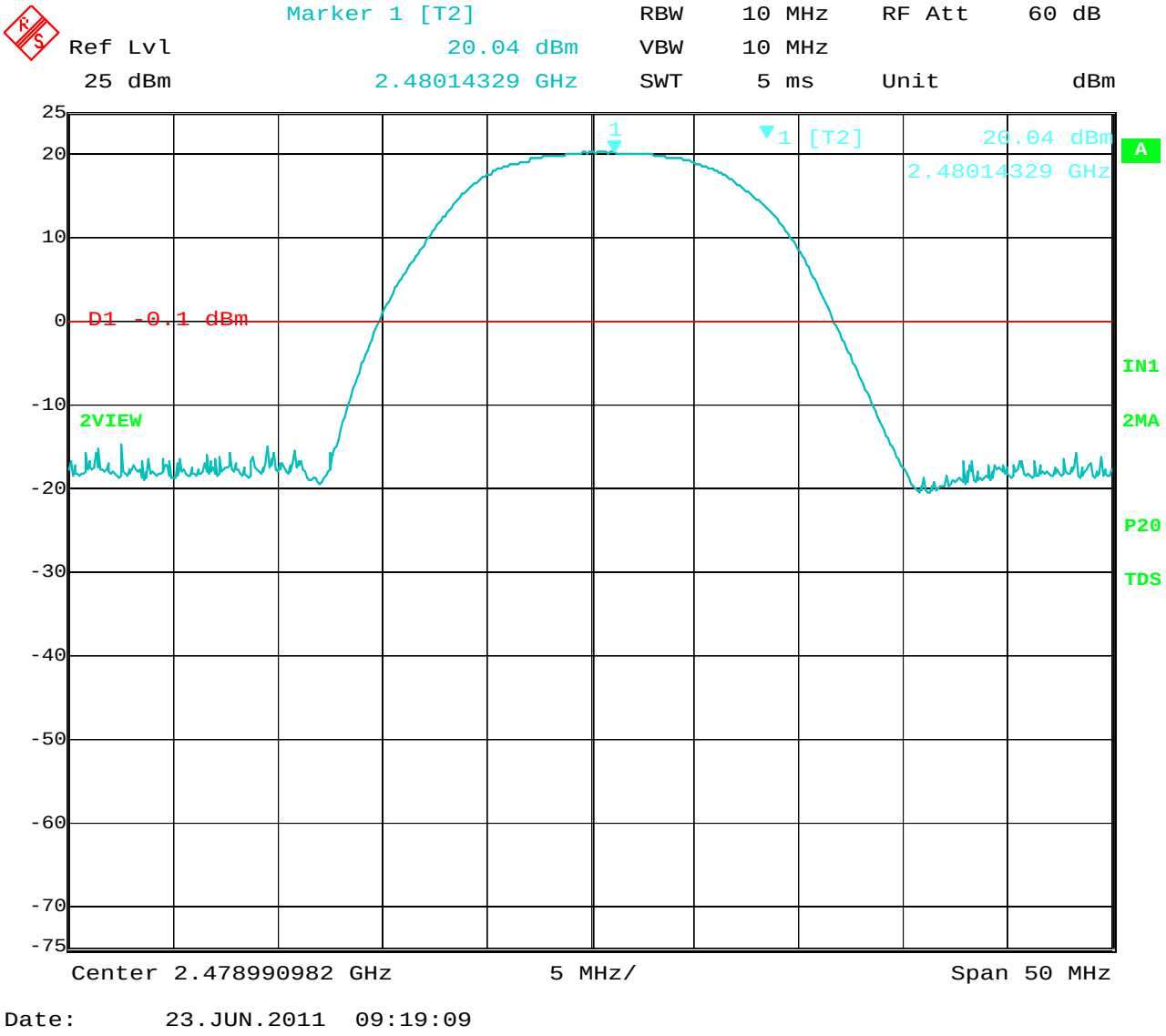
DATA SHEETS



Peak Power Output – Low Channel



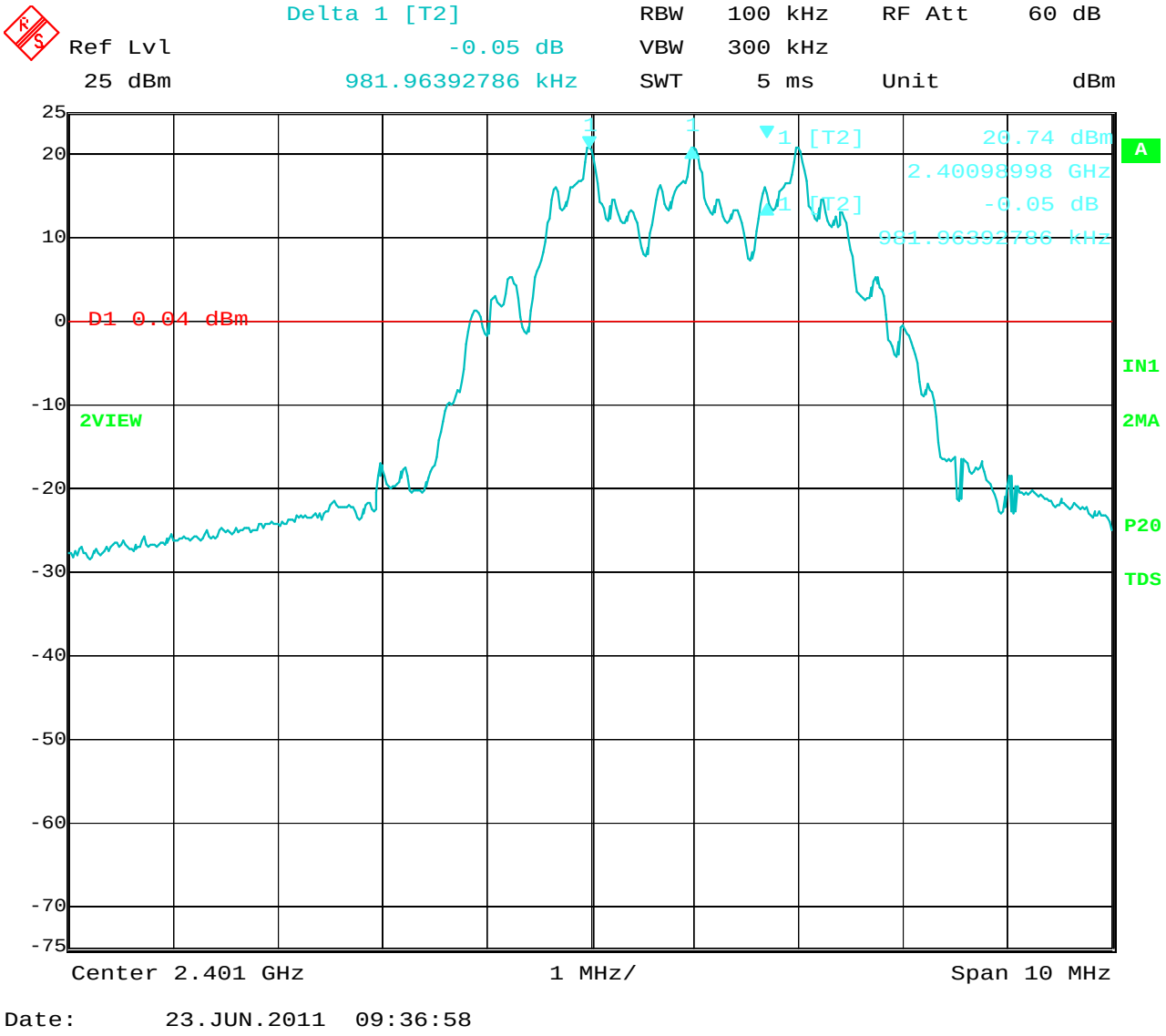
Peak Power Output – Middle Channel



Peak Power Output – High Channel

CHANNEL SEPARATION TEST

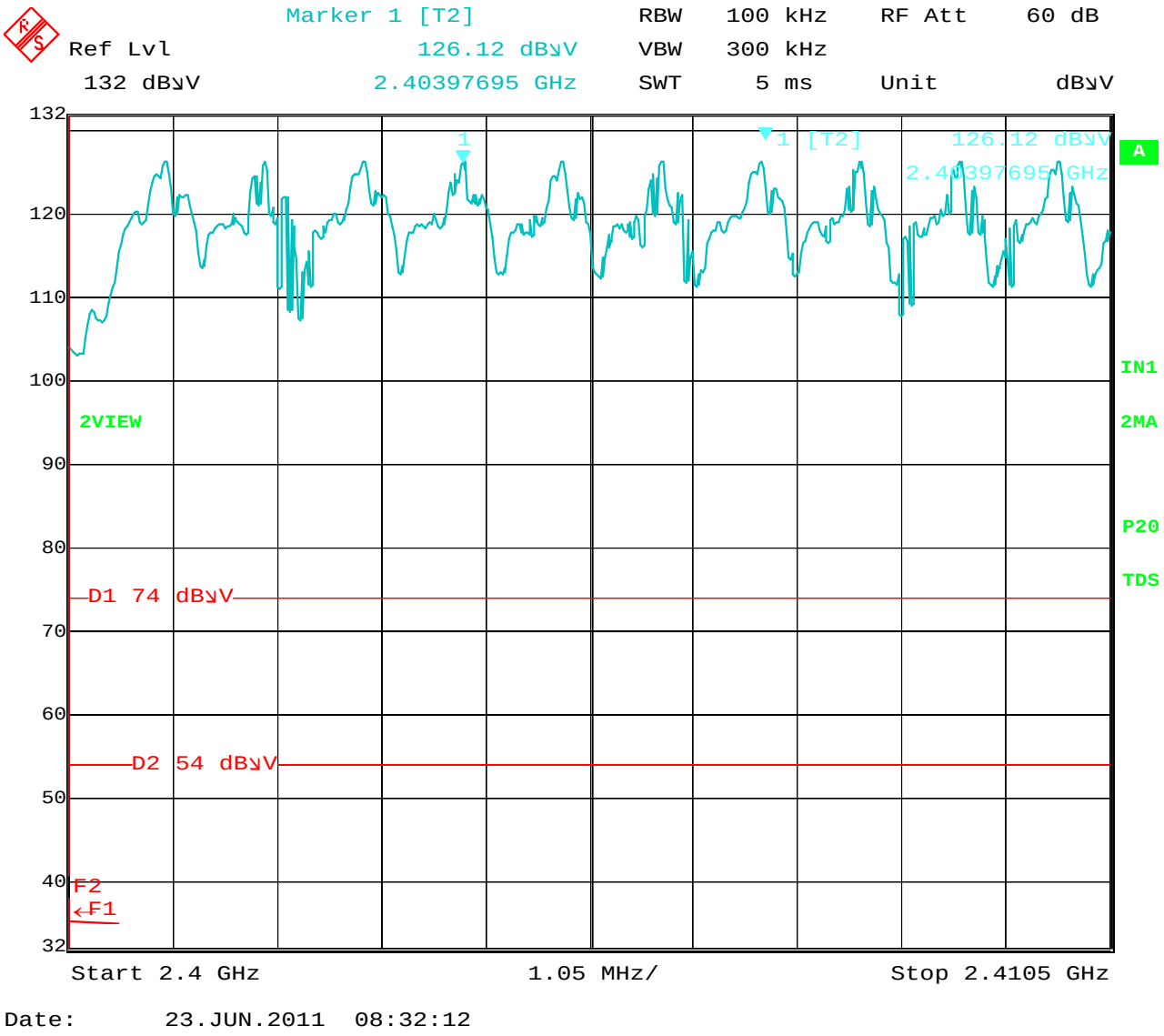
DATA SHEET



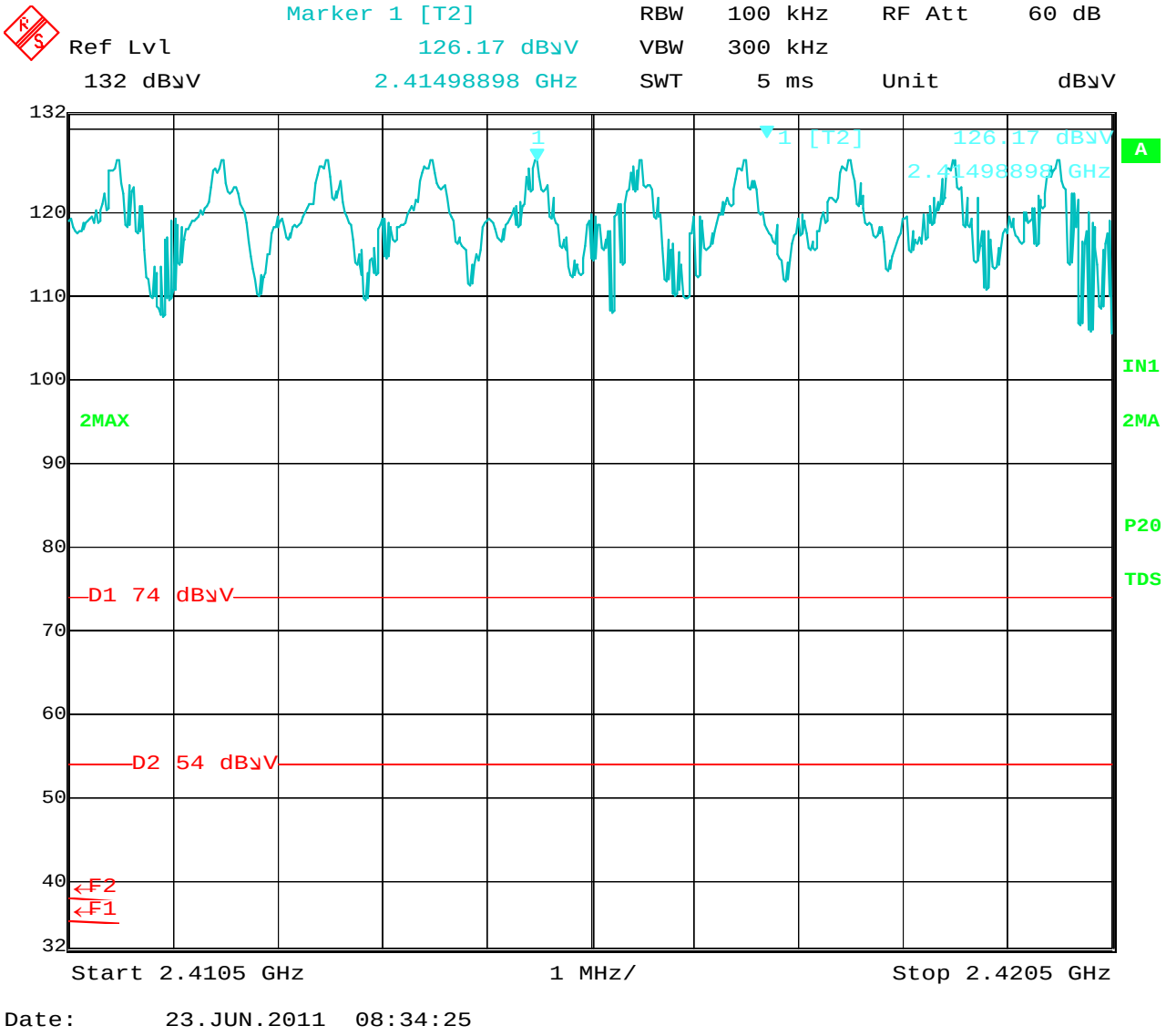
Carrier Frequency Separation Test

NUMBER OF FREQUENCIES

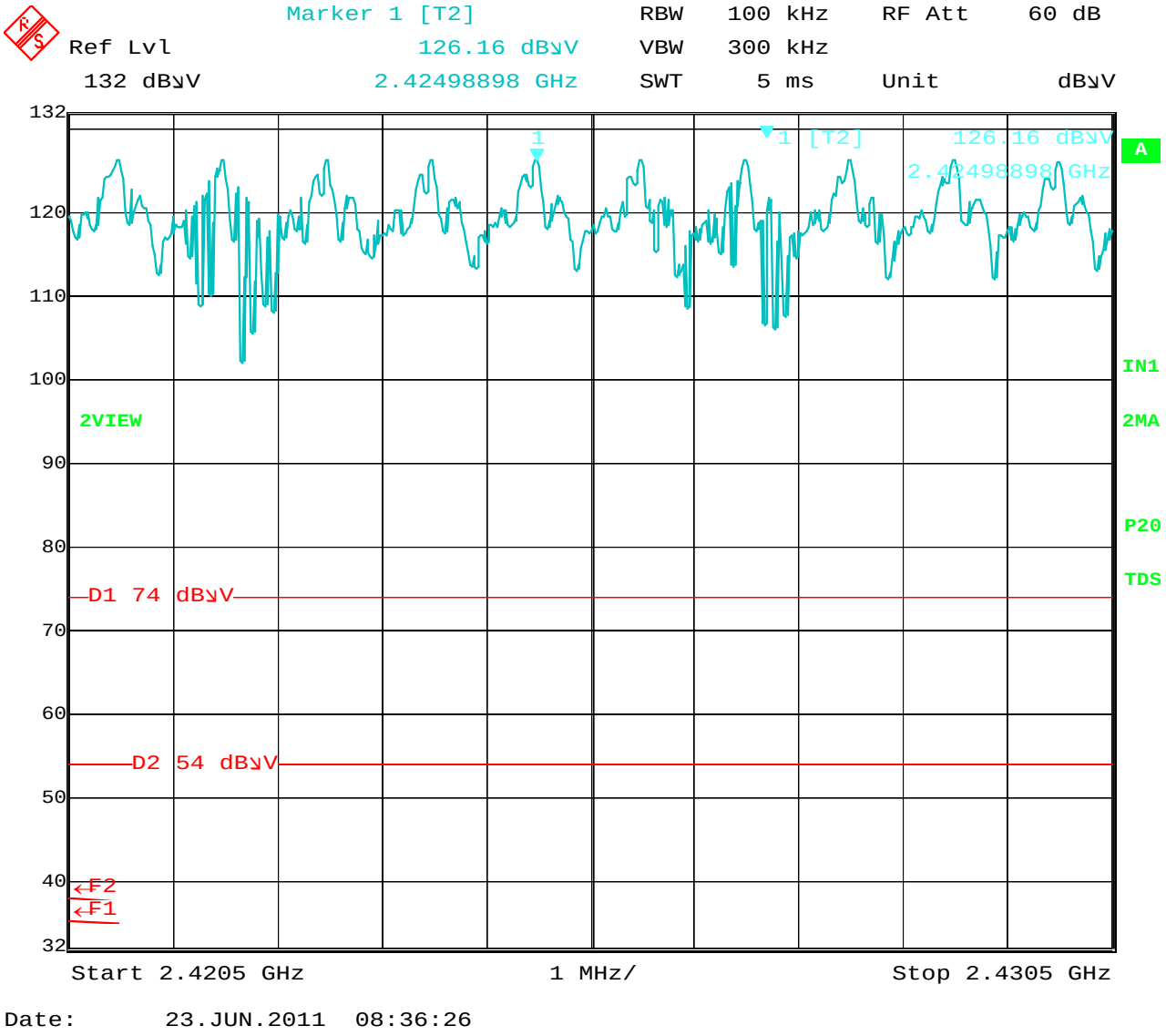
DATA SHEETS



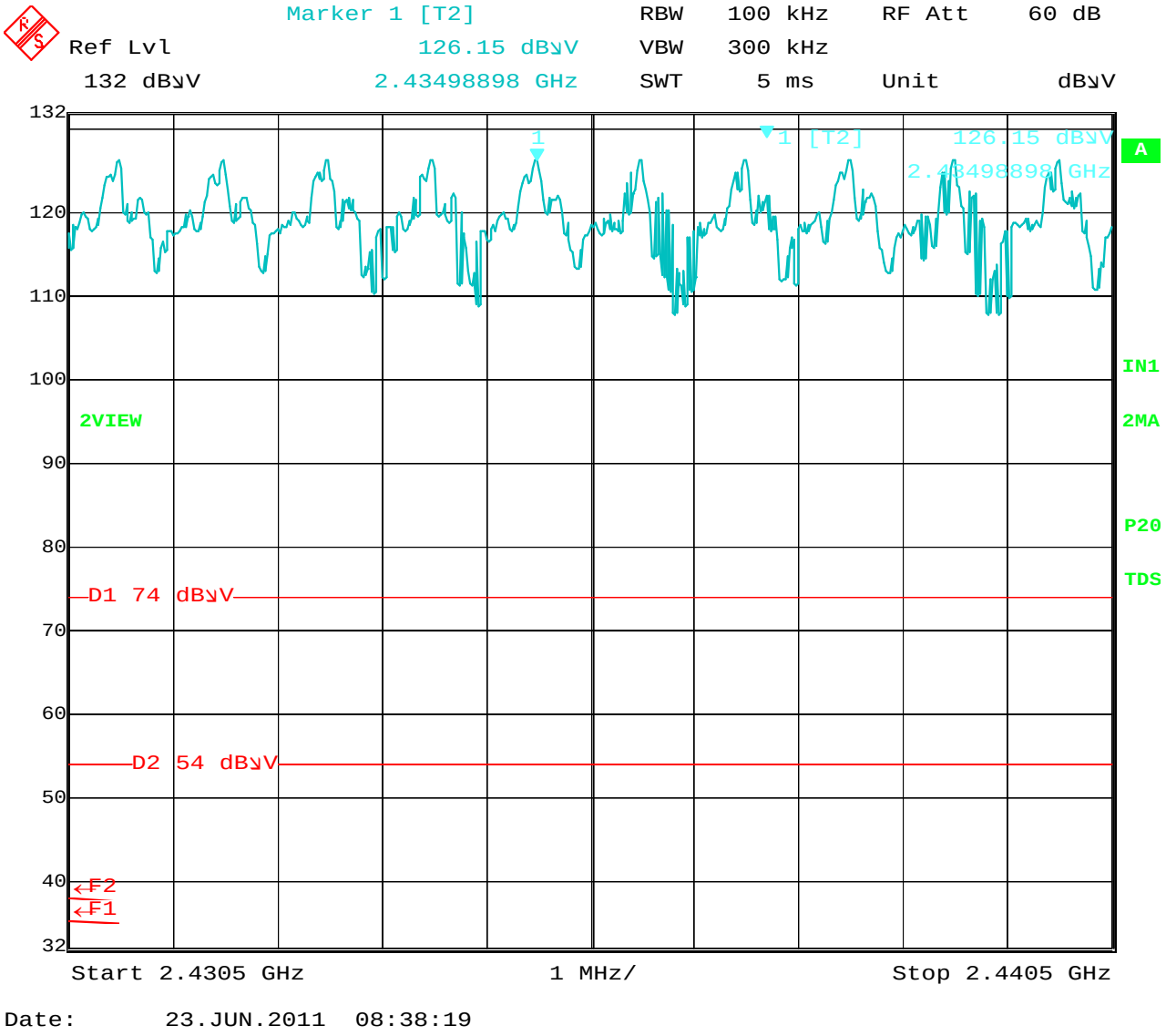
Channels 1 to 10



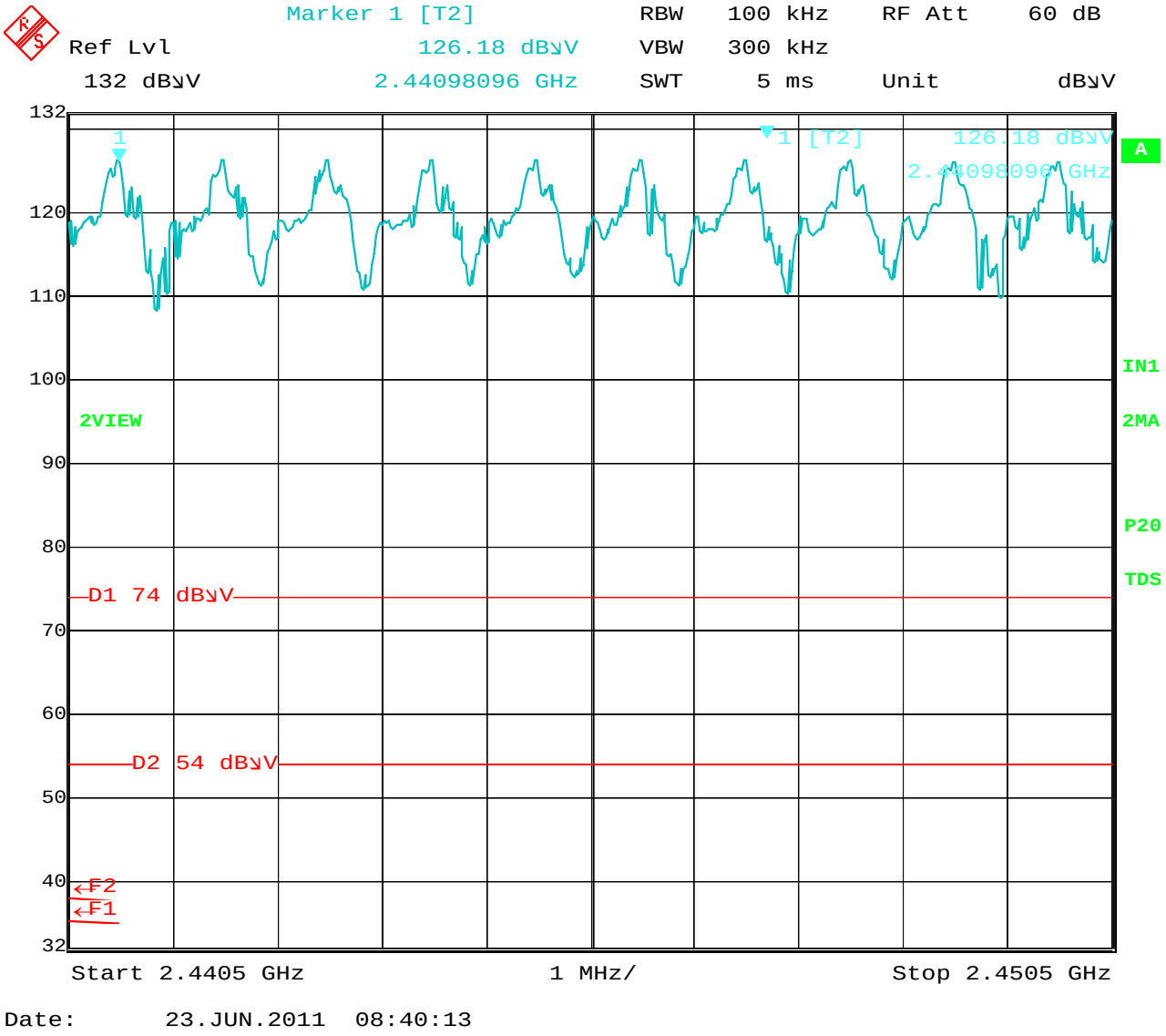
Channels 10 to 20



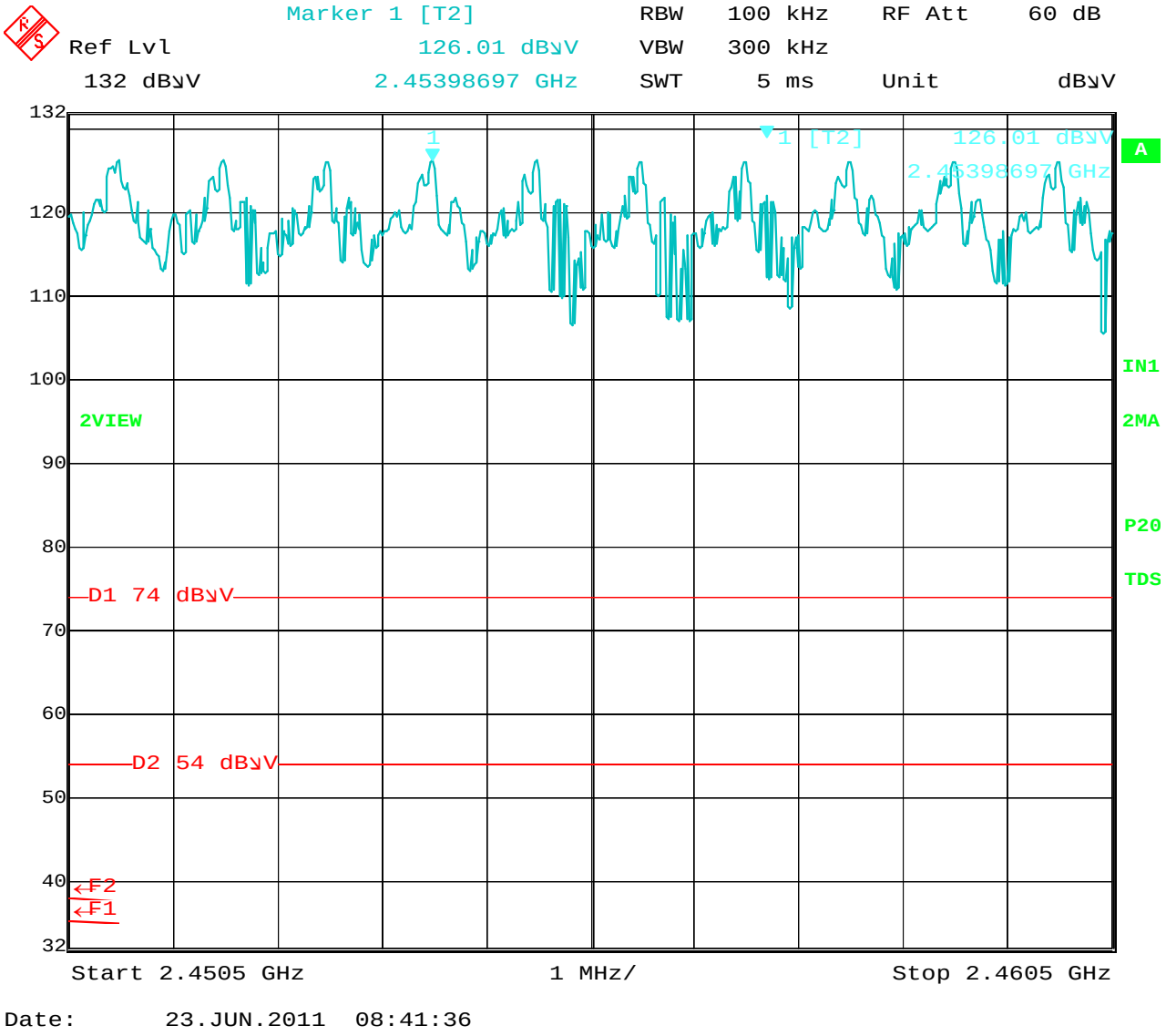
Channels 20 to 30



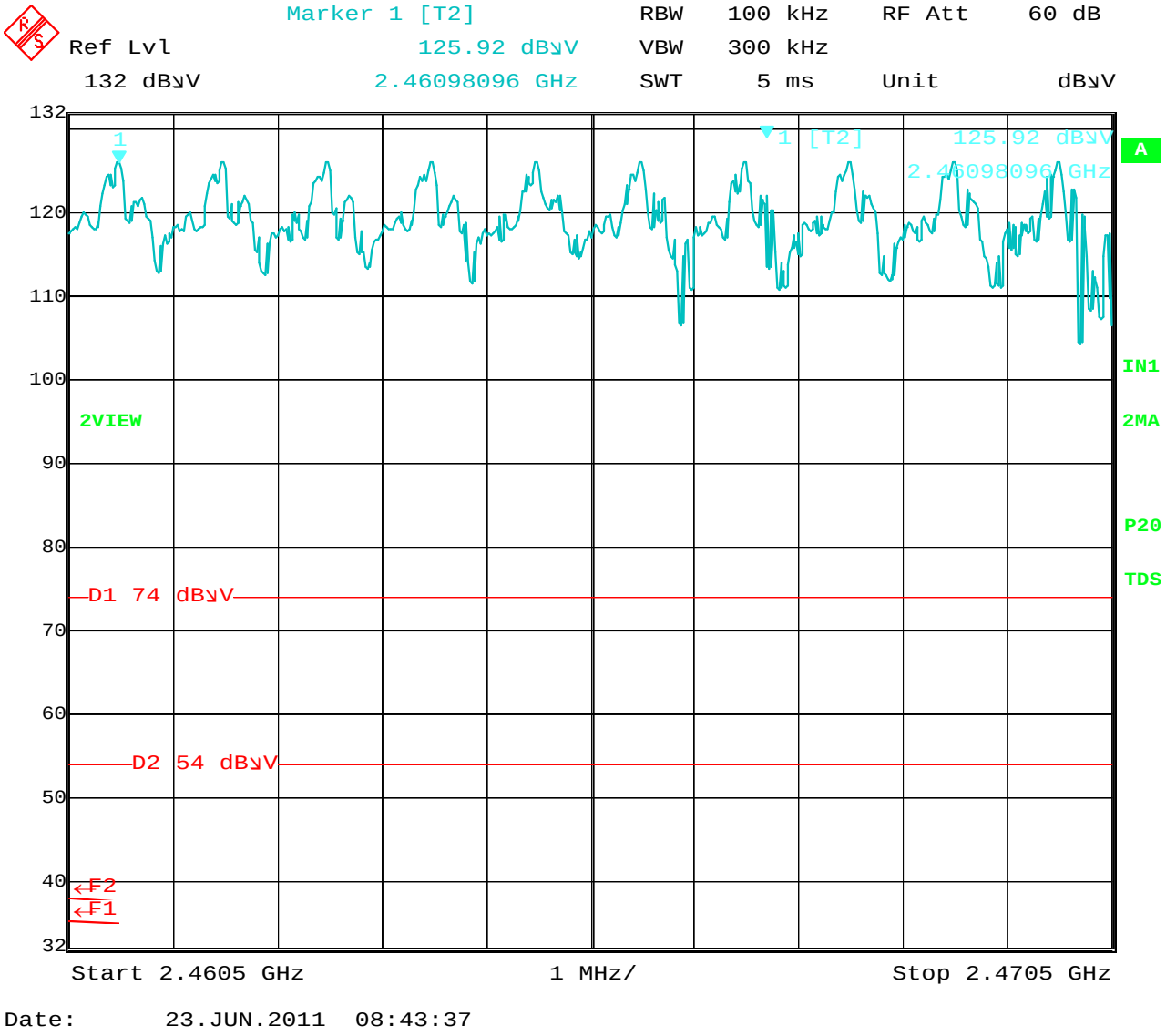
Channels 30 to 40



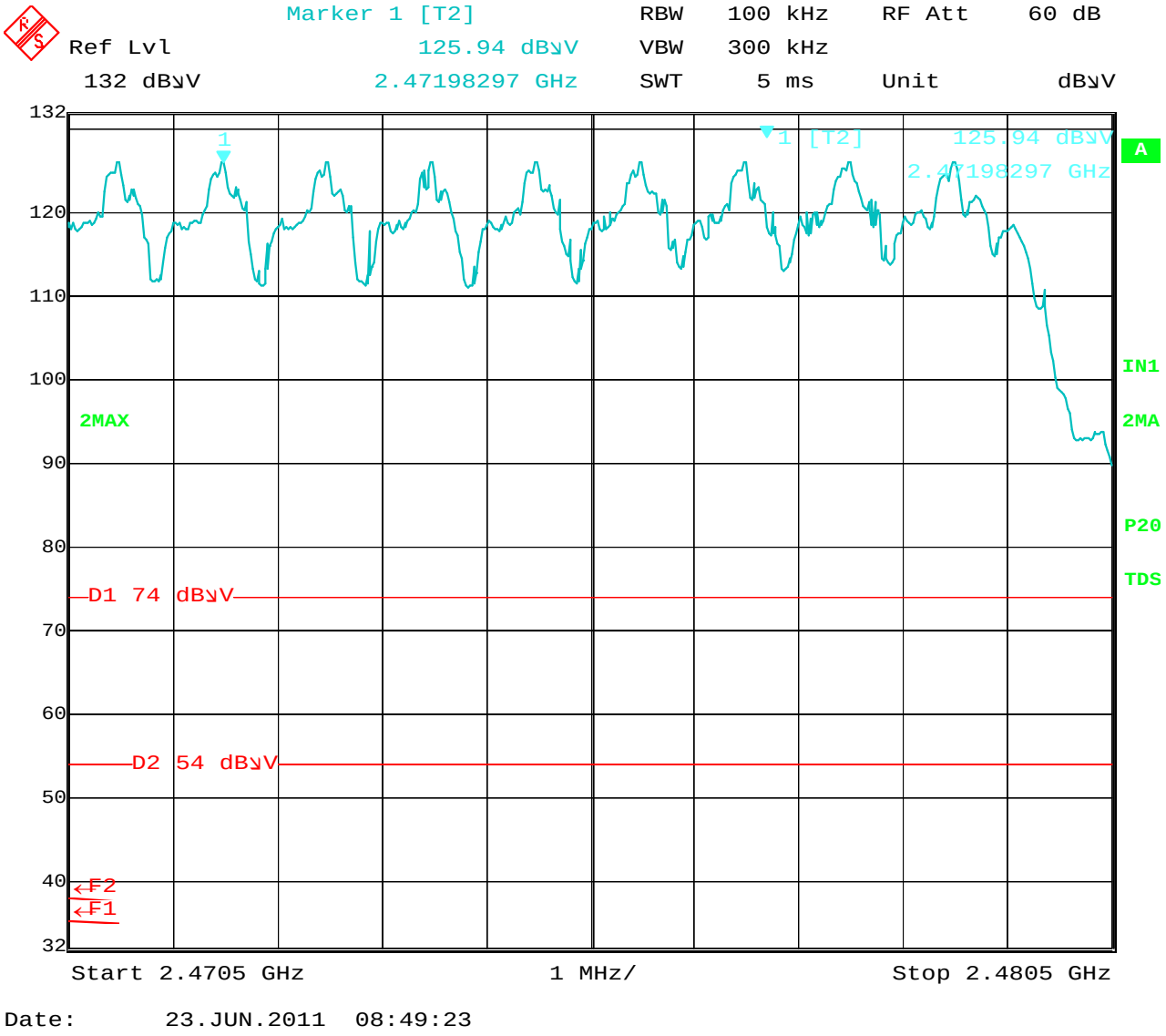
Channels 40 to 50



Channels 50 to 60



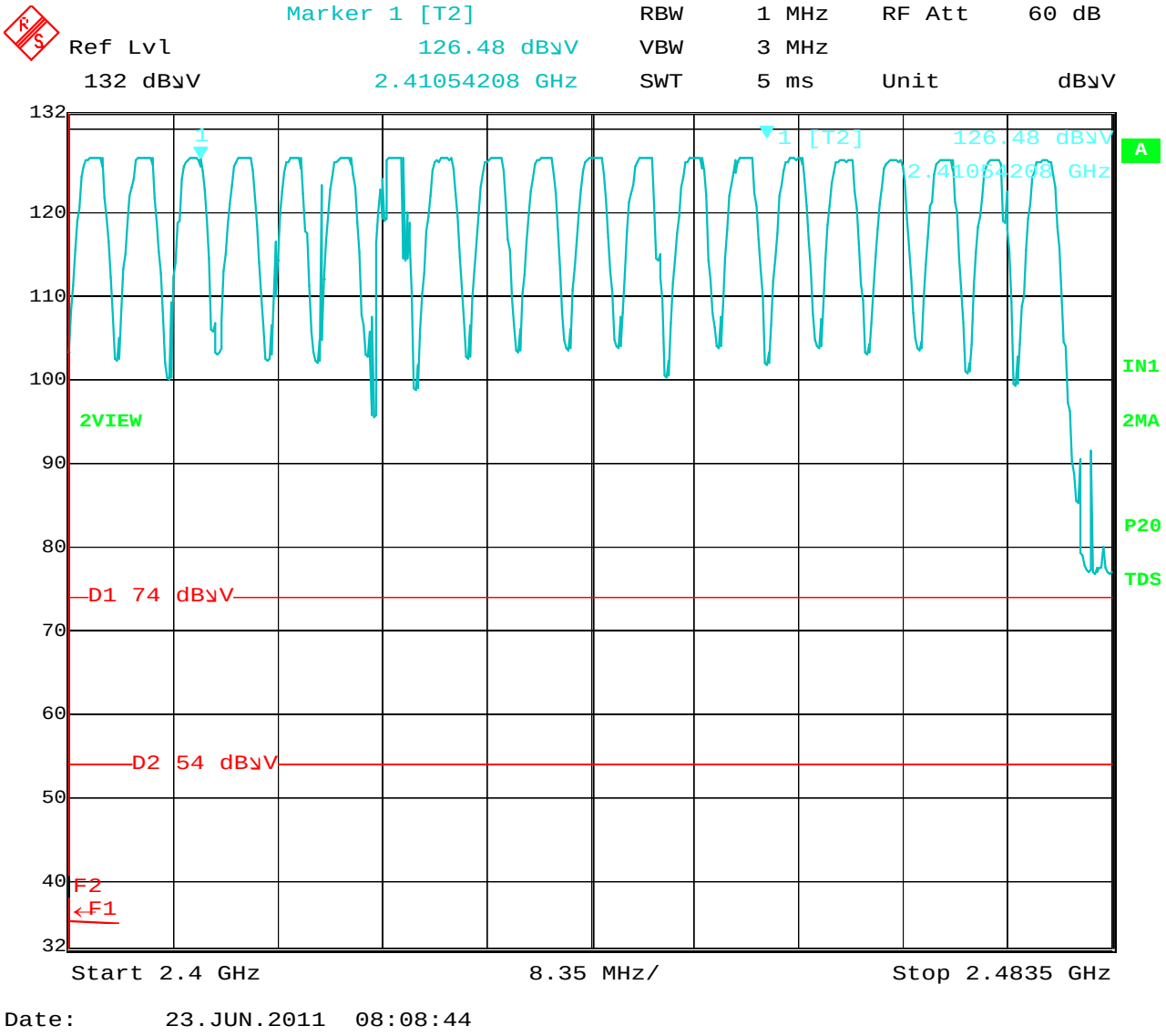
Channels 60 to 70



Channels 70 to 79

20 CHANNEL OVERVIEW

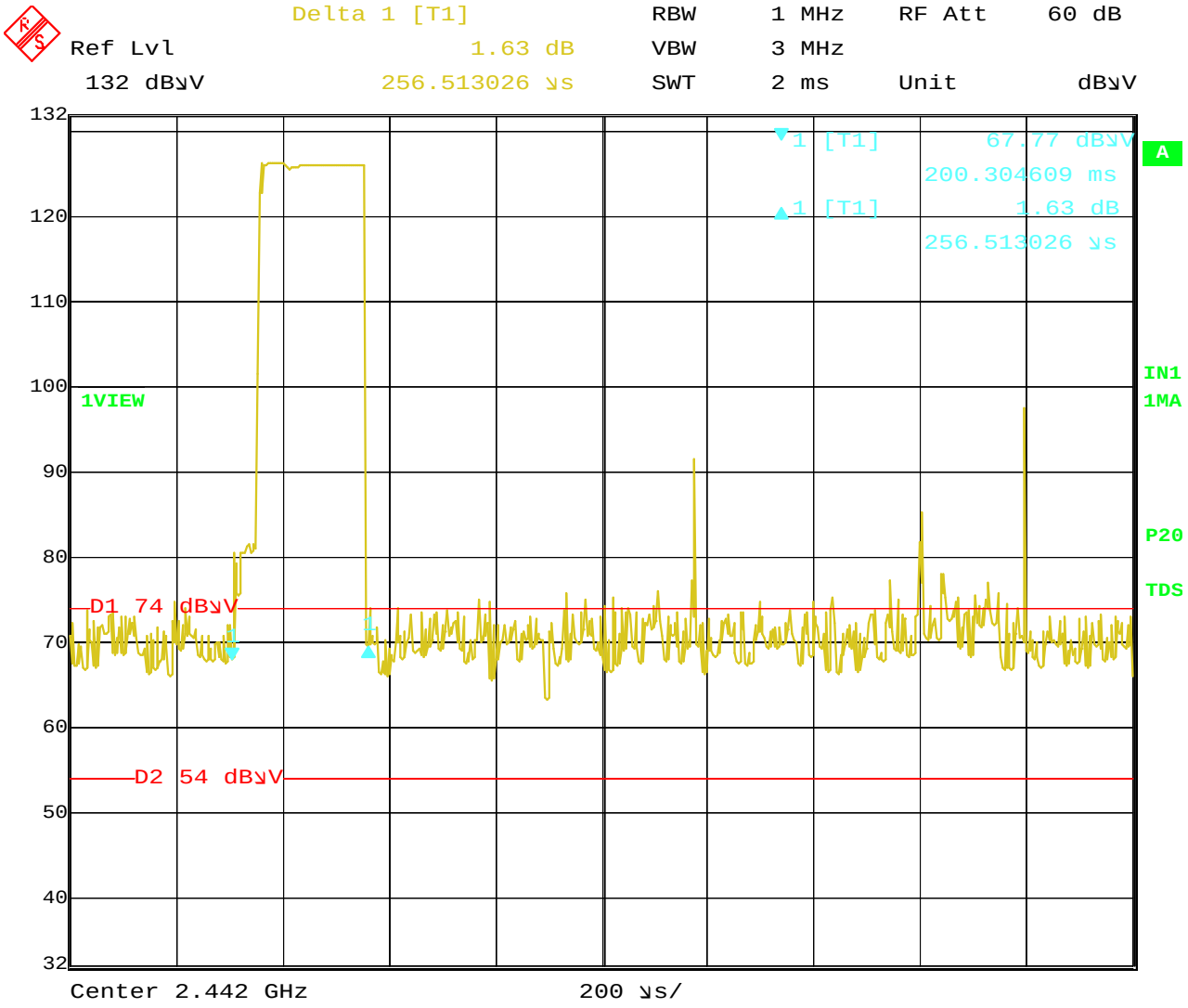
DATA SHEET



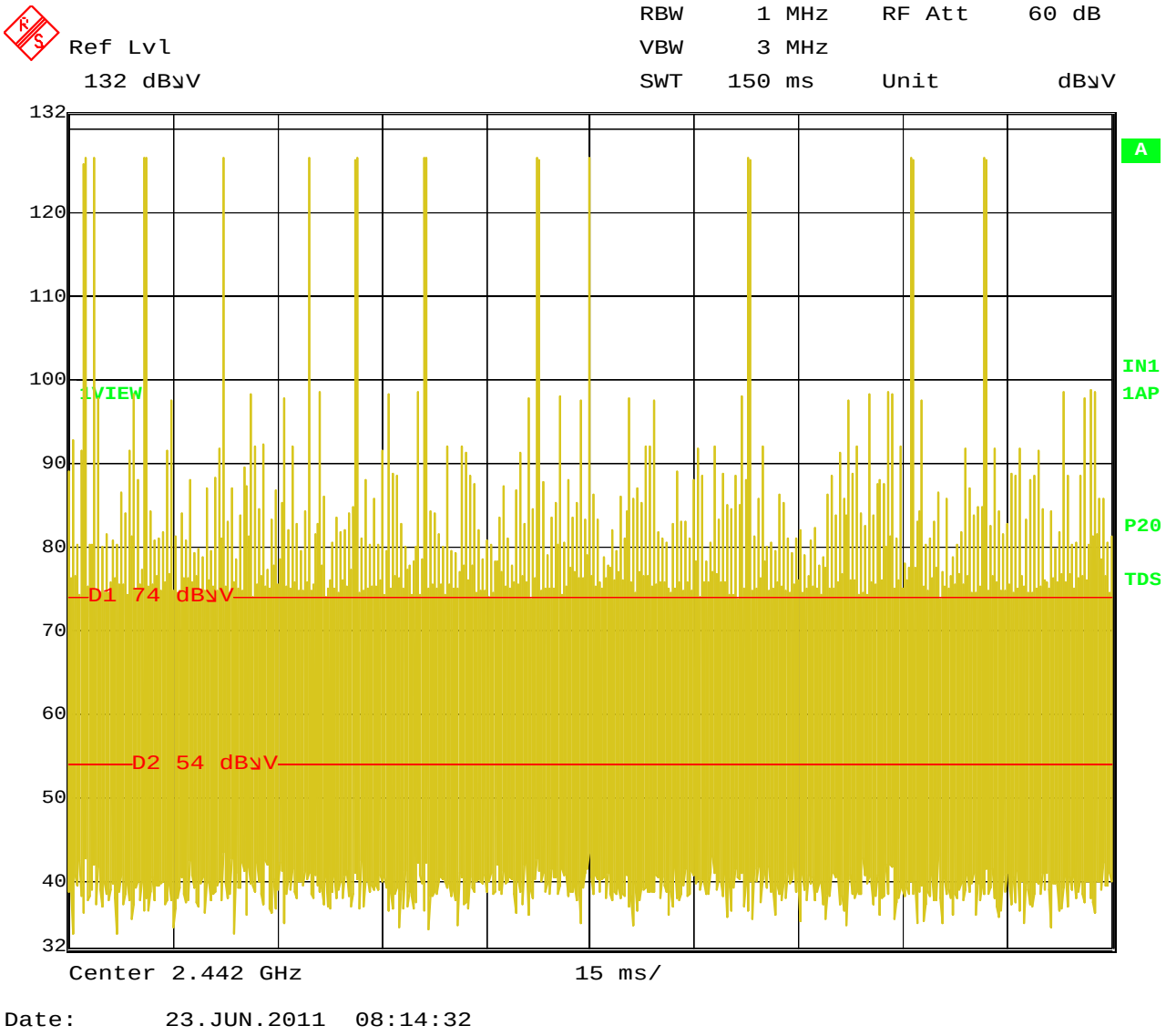
Overview Showing 20 Channels – The EUT only uses 20 channels at 1 time.

TIME OF OCCUPANCY

DATA SHEETS



Time of One Pulse = 256.513026 uS



Number of Pulses in 150 ms = 20
Number of Pulses in (400 ms*20 Channels) = 20 * 53.33 = 1066.67 Pulses
Time of Occupancy = 1066.67 * 256.513026 us = 273.61 ms
Limit = 400 ms per 8000 ms (400 ms * 20 Channels)

BAND EDGES

DATA SHEETS

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/20/2011
Lab: B
Tested By: Kyle Fujimoto

Band Edge - Long Cable
Low Channel - 2401 MHz
Middle Channel - 2440 MHz
High Channel - 2479 MHz

Y-Axis (Worst Case) - Low Channel
Y-Axis (Worst Case) - Middle Channel
Y-Axis (Worst Case) - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2401	112.55	V	--	--	Peak	1.55	125	Fundamental of Low Channel
								@ 3 meters
2390	68.44	V	74	-5.56	Peak	1.55	125	Band Edge Low Channel
2390	48.44	V	54	-5.56	Avg	1.55	125	Corrected back to 1 MHz RBW*
2440	110.21	V	--	--	Peak	1.25	225	Fundamental of Middle Channel
								@ 3 meters
2479	110.57	V	--	--	Peak	1.25	135	Fundamental of High Channel
								@ 3 meters
2483.5	71.97	V	74	-2.03	Peak	1.25	135	Band Edge High Channel
2483.5	51.97	V	54	-2.03	Avg	1.25	135	Corrected back to 1 MHz RBW*

*The Band Edges were taken with an RBW of 100 kHz with the measurement
being correct back to 1 MHz RBW using the factor of 10 log (1 MHz / 100 kHz) = 10 dB.

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

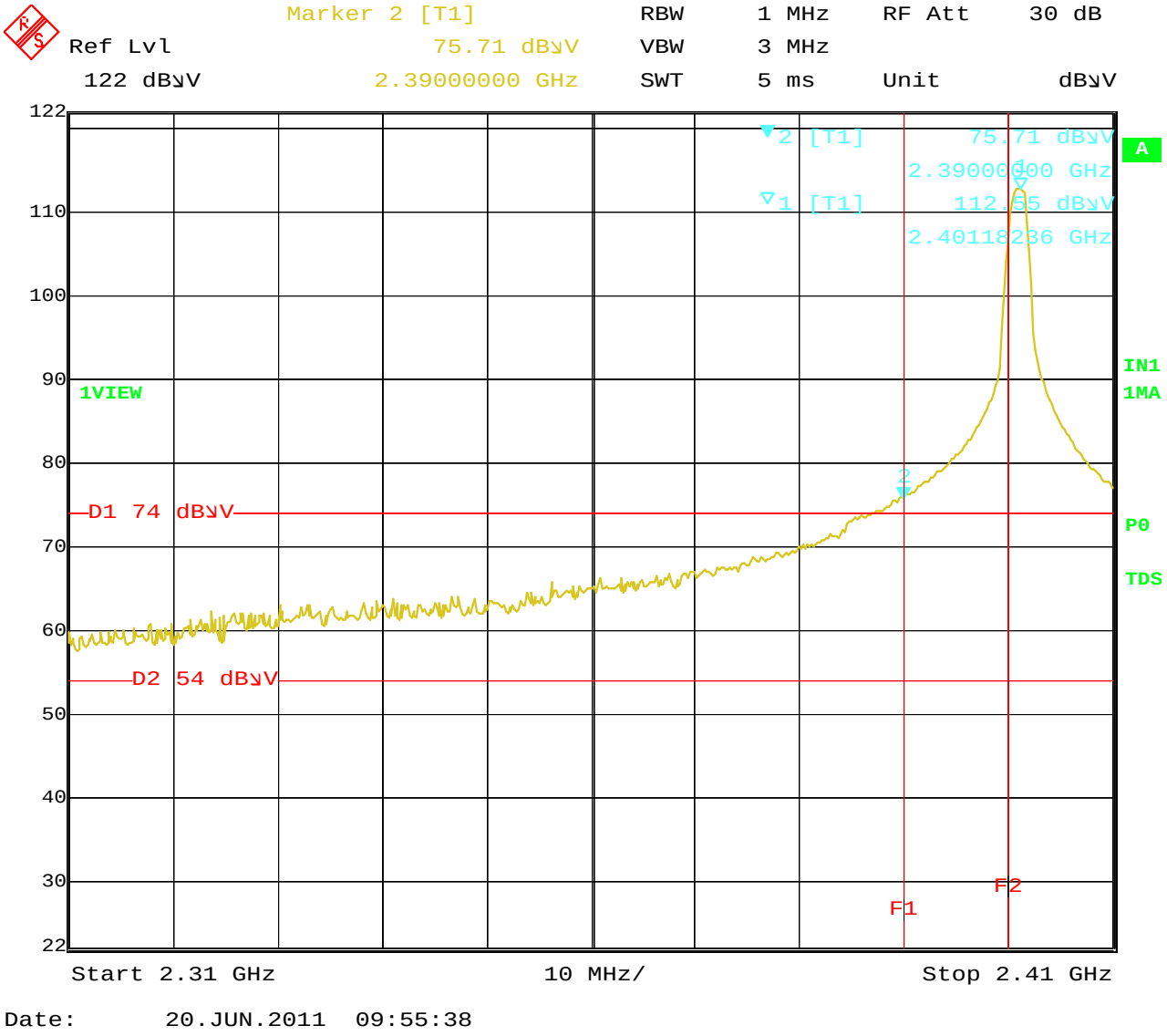
Date: 06/20/2011
Lab: B
Tested By: Kyle Fujimoto

Band Edge - Long Cable
Low Channel - 2401 MHz
Middle Channel - 2440 MHz
High Channel - 2479 MHz

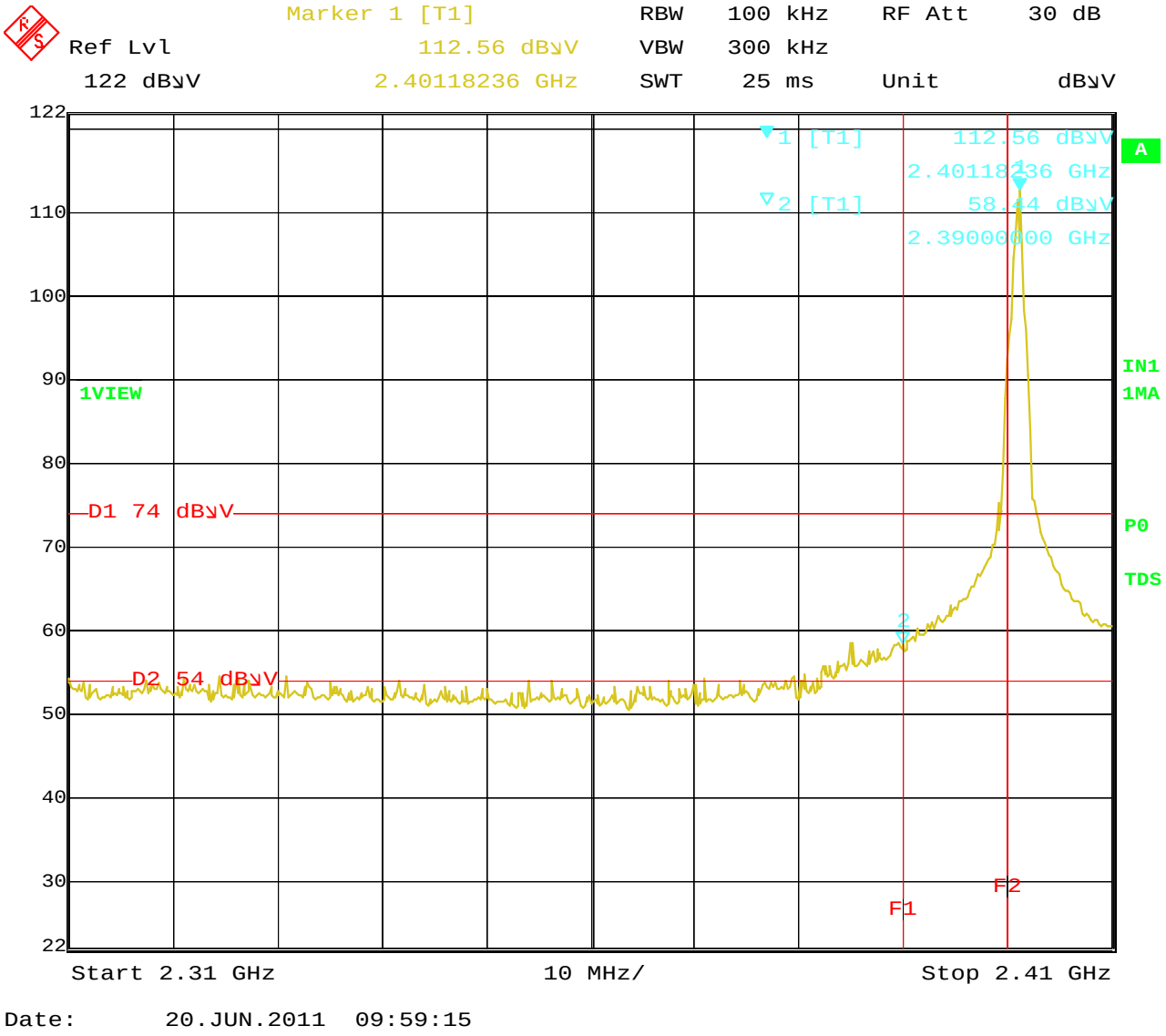
Y-Axis (Worst Case) - Low Channel
Y-Axis (Worst Case) - Middle Channel
Y-Axis (Worst Case) - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2401	109.3	H	--	--	Peak	1.25	135	Fundamental of Low Channel
								@ 3 meters
2390	65.22	H	54	11.22	Peak	1.25	135	Band Edge Low Channel
2390	45.22	H	54	-8.78	Avg	1.25	135	Corrected back to 1 MHz RBW*
2440	102.25	H	--	--	Peak	1.25	225	Fundamental of Middle Channel
								@ 3 meters
2479	98.11	H	--	--	Peak	1.25	135	Fundamental of High Channel
								@ 3 meters
2483.5	62.9	H	54	8.9	Peak	1.25	135	Band Edge High Channel
2483.5	42.9	H	54	-11.1	Avg	1.25	135	Corrected back to 1 MHz RBW*

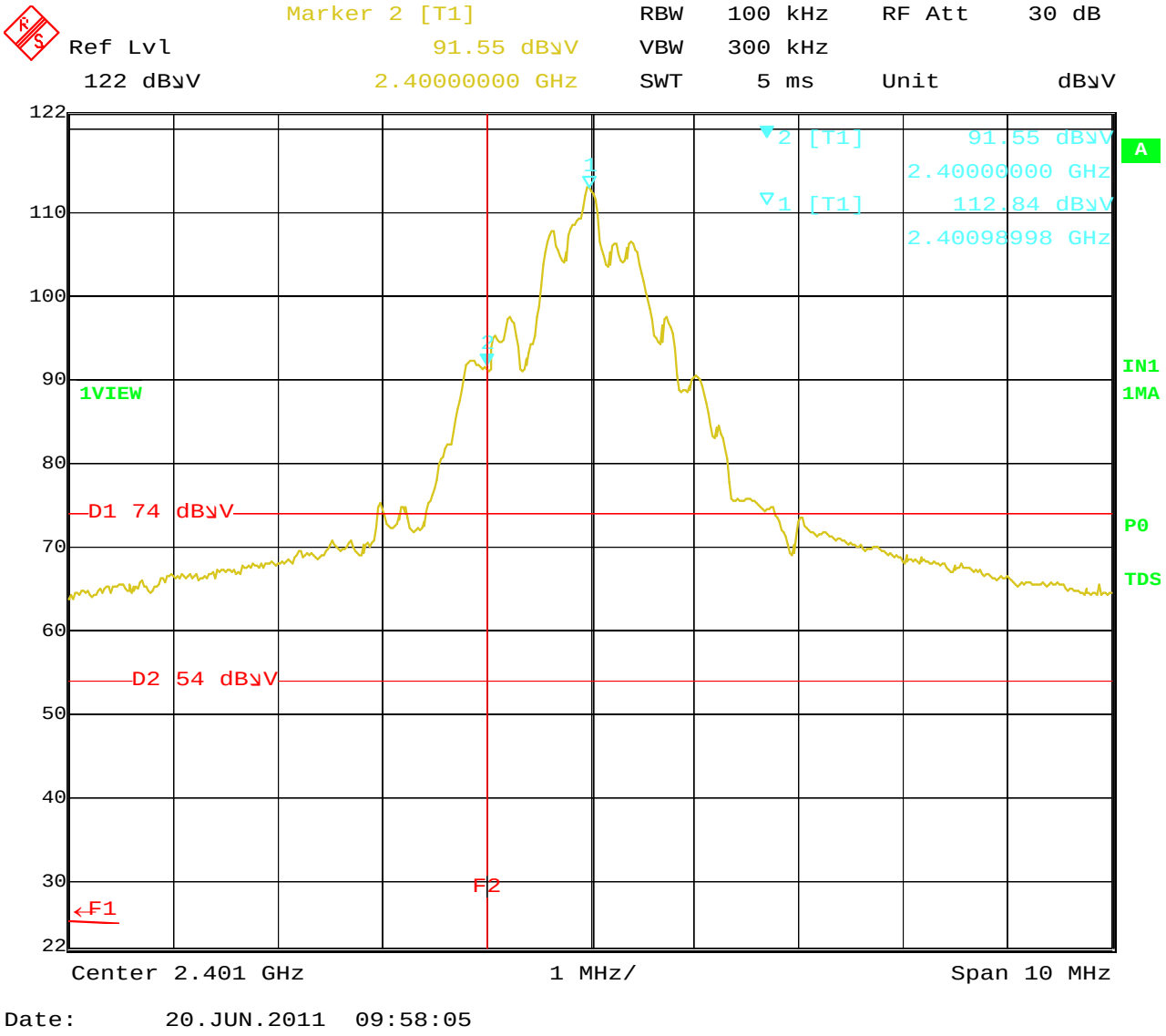
*The Band Edges were taken with an RBW of 100 kHz with the measurement being correct back to 1 MHz RBW using the factor of 10 log (1 MHz / 100 kHz) = 10 dB.



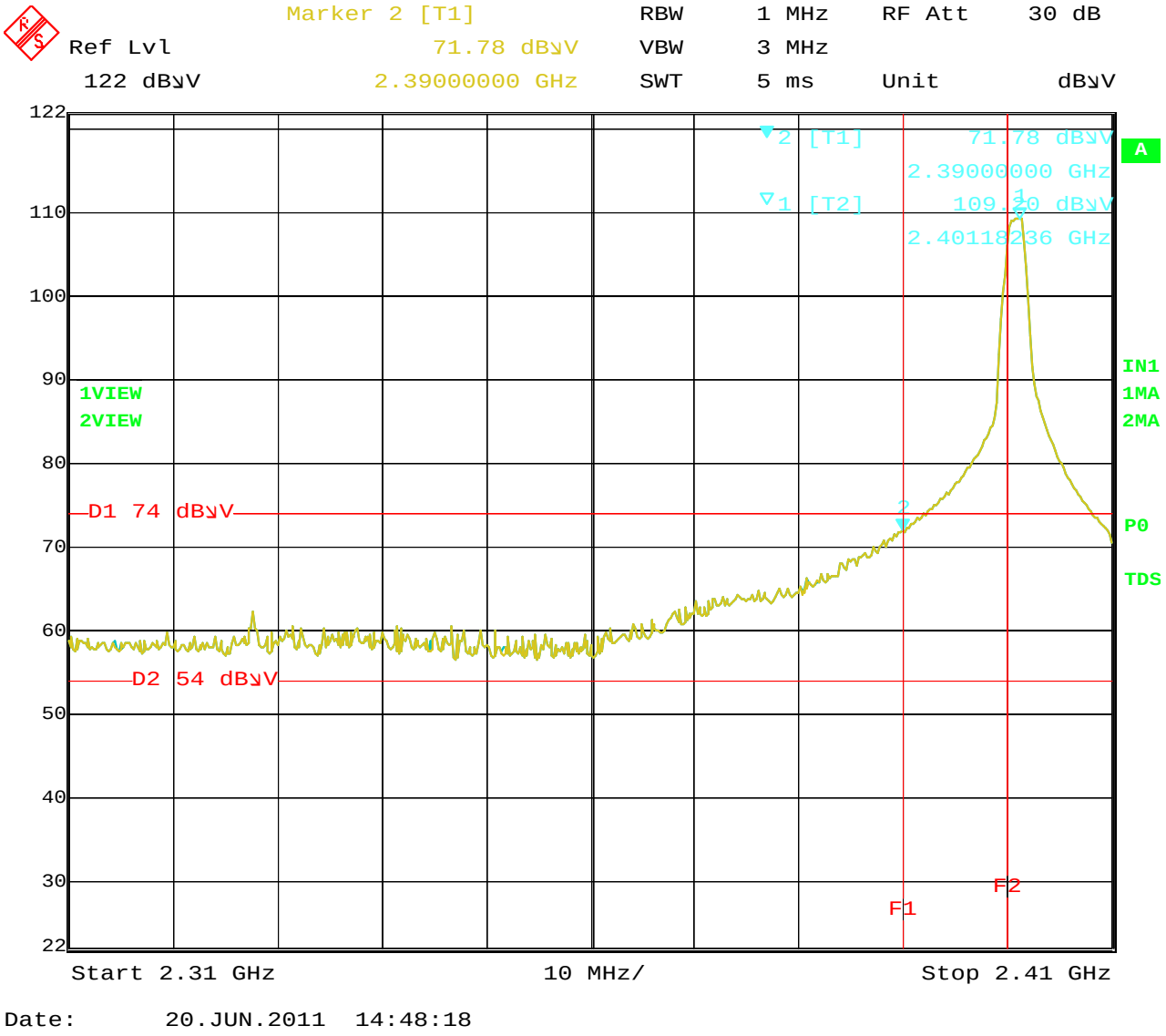
Band Edge – Low Channel – Long Cable –Vertical Polarization – Fundamental



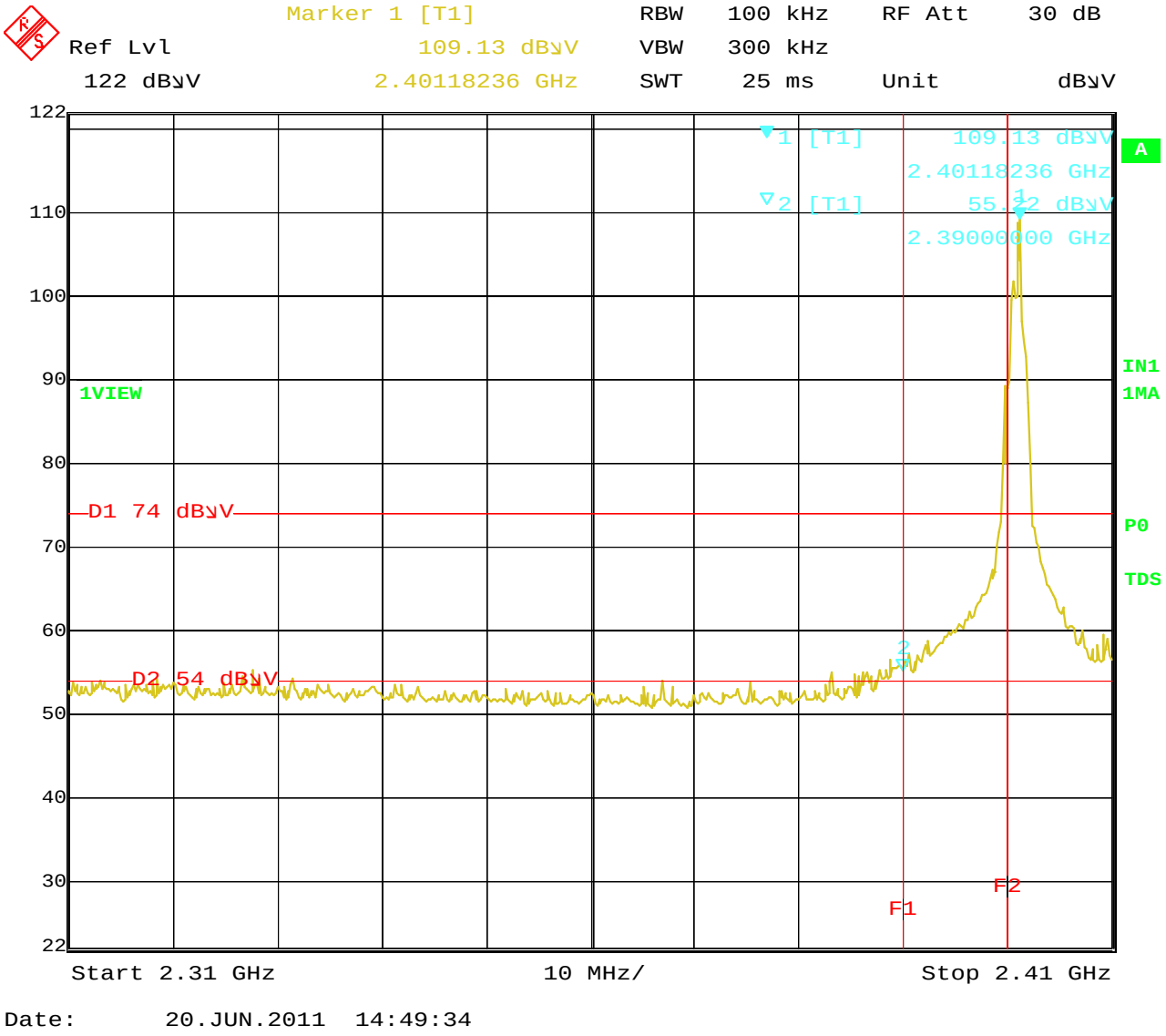
Band Edge – Low Channel – Long Cable – Vertical Polarization – Band Edge at 2390 MHz



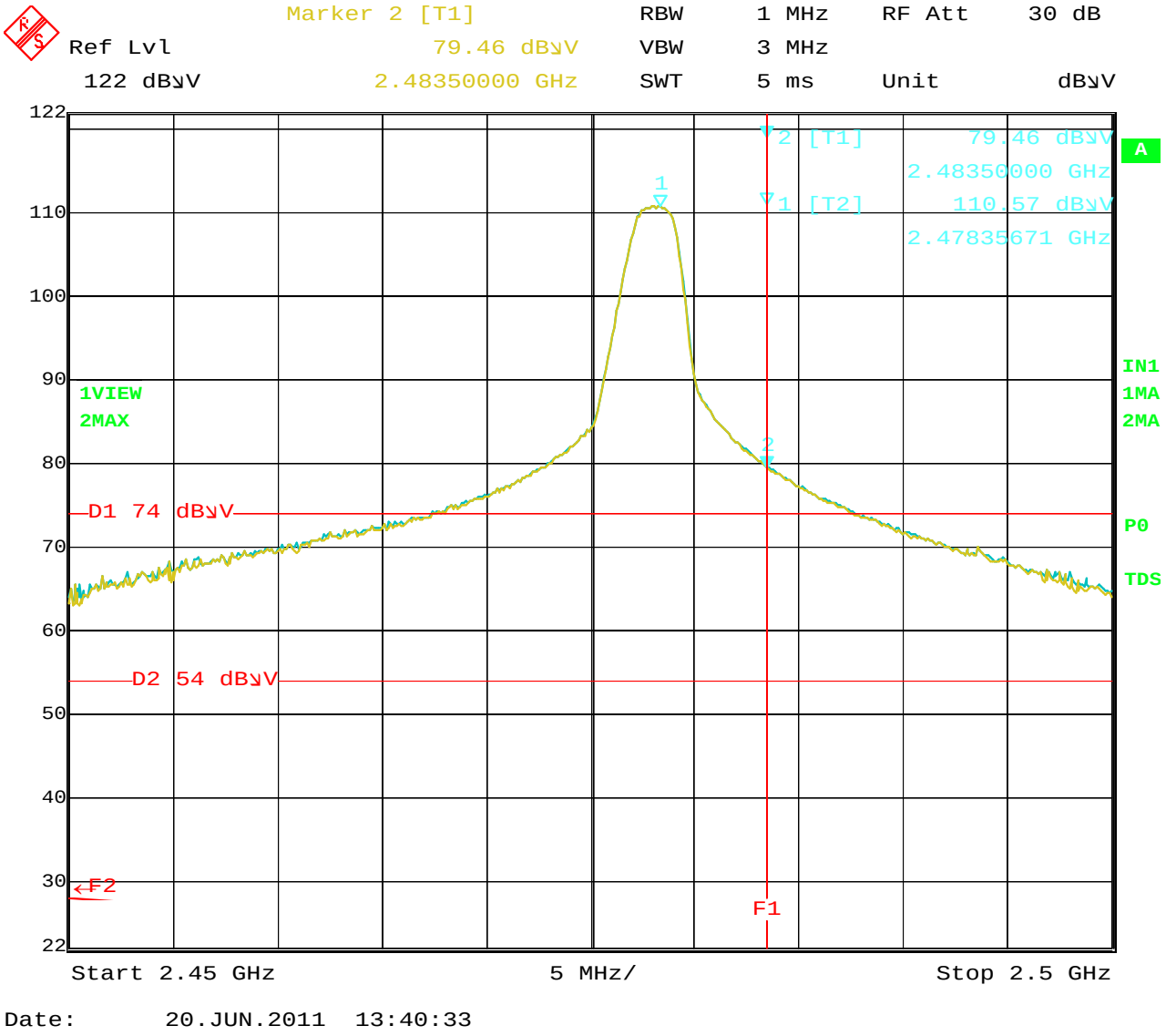
Band Edge – Low Channel – Long Cable – Band Edge at 2400 MHz



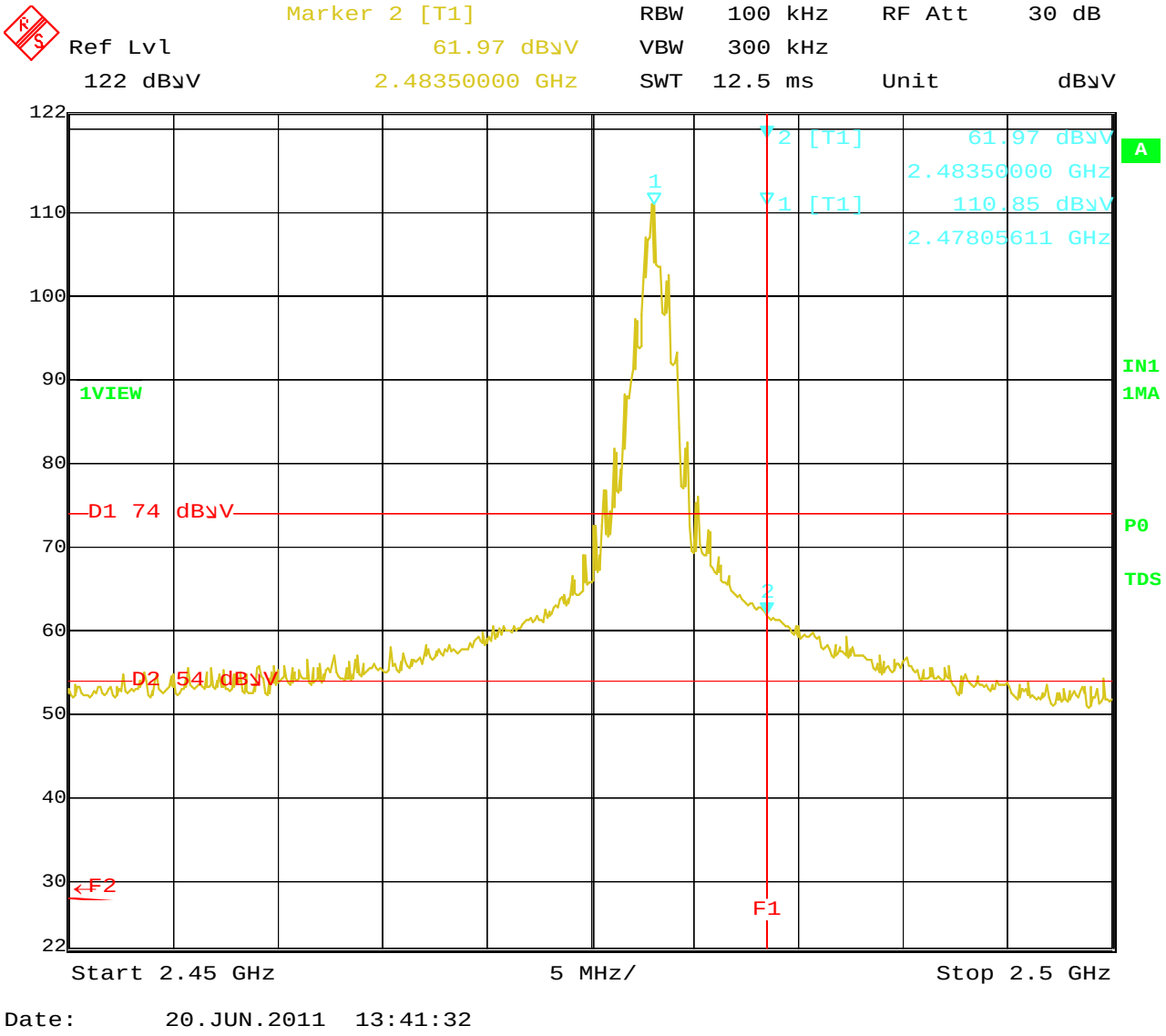
Band Edge – Low Channel – Long Cable – Horizontal Polarization – Fundamental



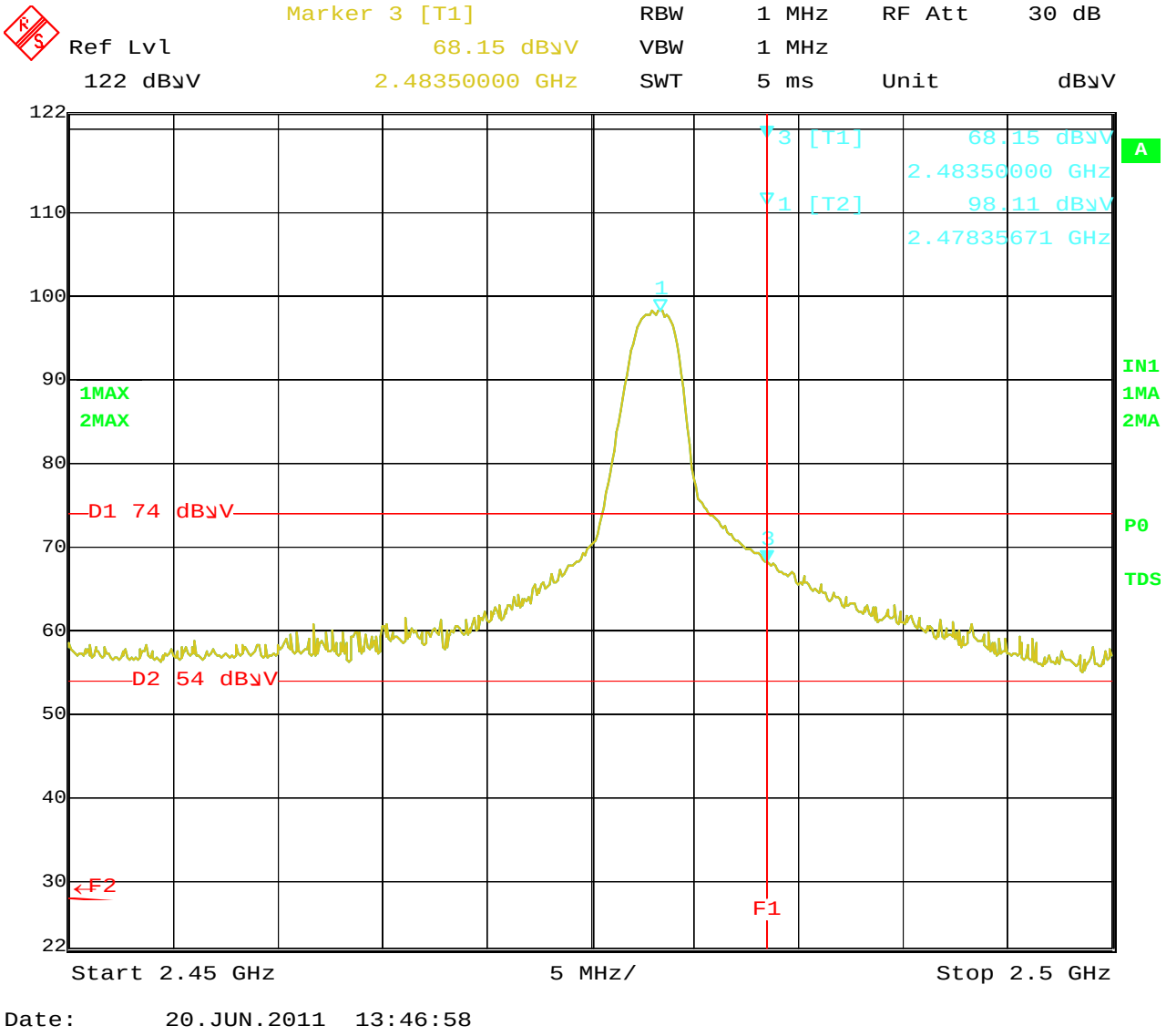
Band Edge – Low Channel – Long Cable –Horizontal Polarization – Band Edge at 2390 MHz



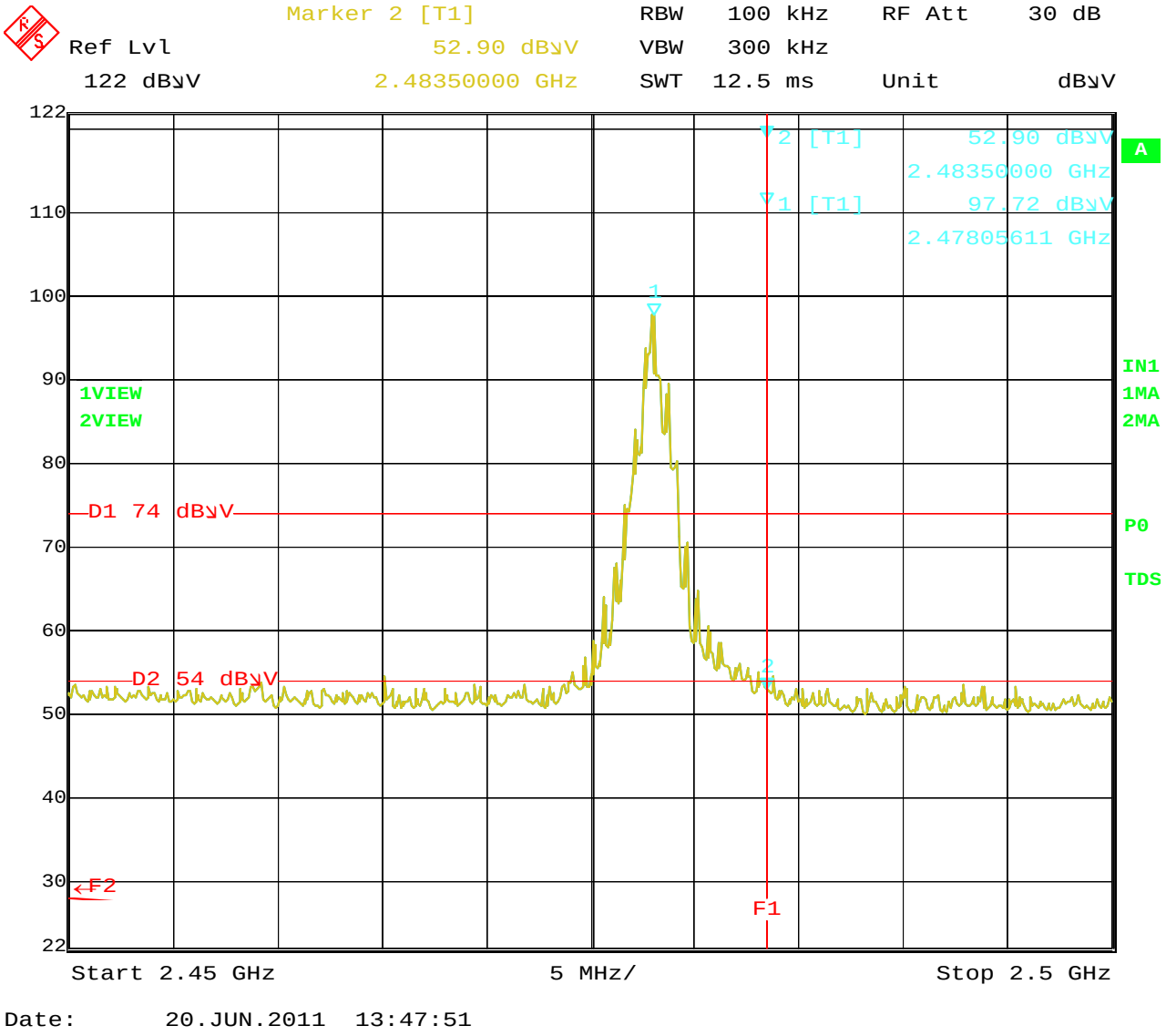
Band Edge – High Channel – Long Cable – Vertical Polarization – Fundamental



Band Edge – High Channel – Long Cable – Vertical Polarization – Band Edge at 2483.50 MHz



Band Edge – High Channel – Long Cable – Horizontal Polarization – Fundamental



Band Edge – High Channel – Long Cable – Horizontal Polarization – Band Edge at 2483.50 MHz

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

Date: 06/20/2011
Lab: B
Tested By: Kyle Fujimoto

Band Edge - Short Cable
Low Channel - 2401 MHz
Middle Channel - 2440 MHz
High Channel - 2479 MHz

Y-Axis (Worst Case) - Low Channel
Y-Axis (Worst Case) - Middle Channel
Y-Axis (Worst Case) - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	112.36	V	--	--	Peak	1.5	180	Fundamental of Low Channel
								@ 3 meters
2390	67.9	V	74	-6.1	Peak	1.5	180	Band Edge Low Channel
2390	47.9	V	54	-6.1	Avg	1.5	180	Corrected back to 1 MHz RBW*
2440	111.31	V	--	--	Peak	1.25	180	Fundamental of Middle Channel
								@ 3 meters
2479	110.98	V	--	--	Peak	1.5	180	Fundamental of High Channel
								@ 3 meters
2483.5	73.45	V	74	-0.55	Peak	1.5	180	Band Edge High Channel
2483.5	53.45	V	54	-0.55	Avg	1.5	180	Corrected back to 1 MHz RBW*

*The Band Edges were taken with an RBW of 100 kHz with the measurement being correct back to 1 MHz RBW using the factor of 10 log (1 MHz / 100 kHz) = 10 dB.

FCC 15.247
BEI Sensors
SwiftComm RF Module
Part/Model #: 41612

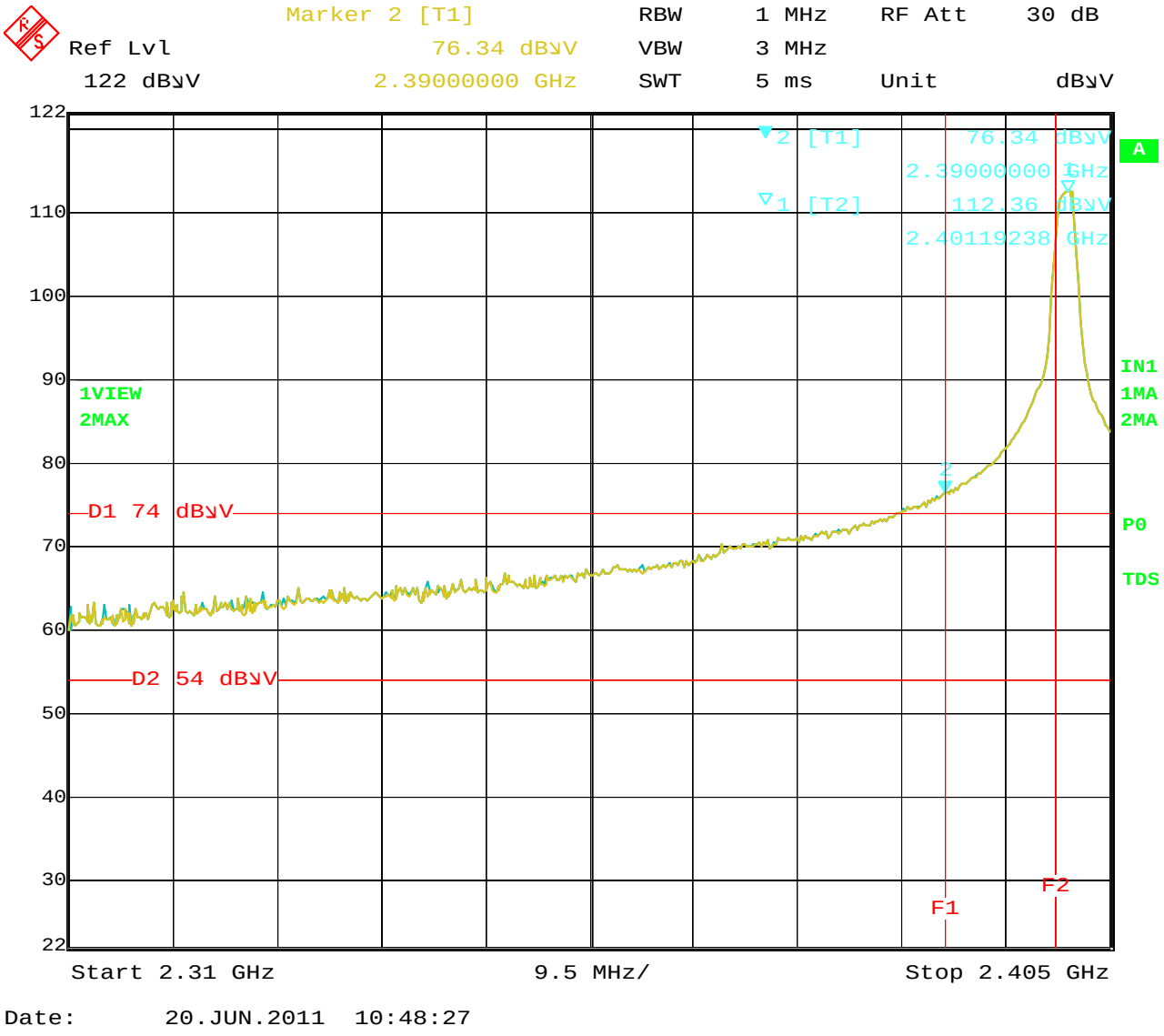
Date: 06/20/2011
Lab: B
Tested By: Kyle Fujimoto

Band Edge - Short Cable
Low Channel - 2401 MHz
Middle Channel - 2440 MHz
High Channel - 2479 MHz

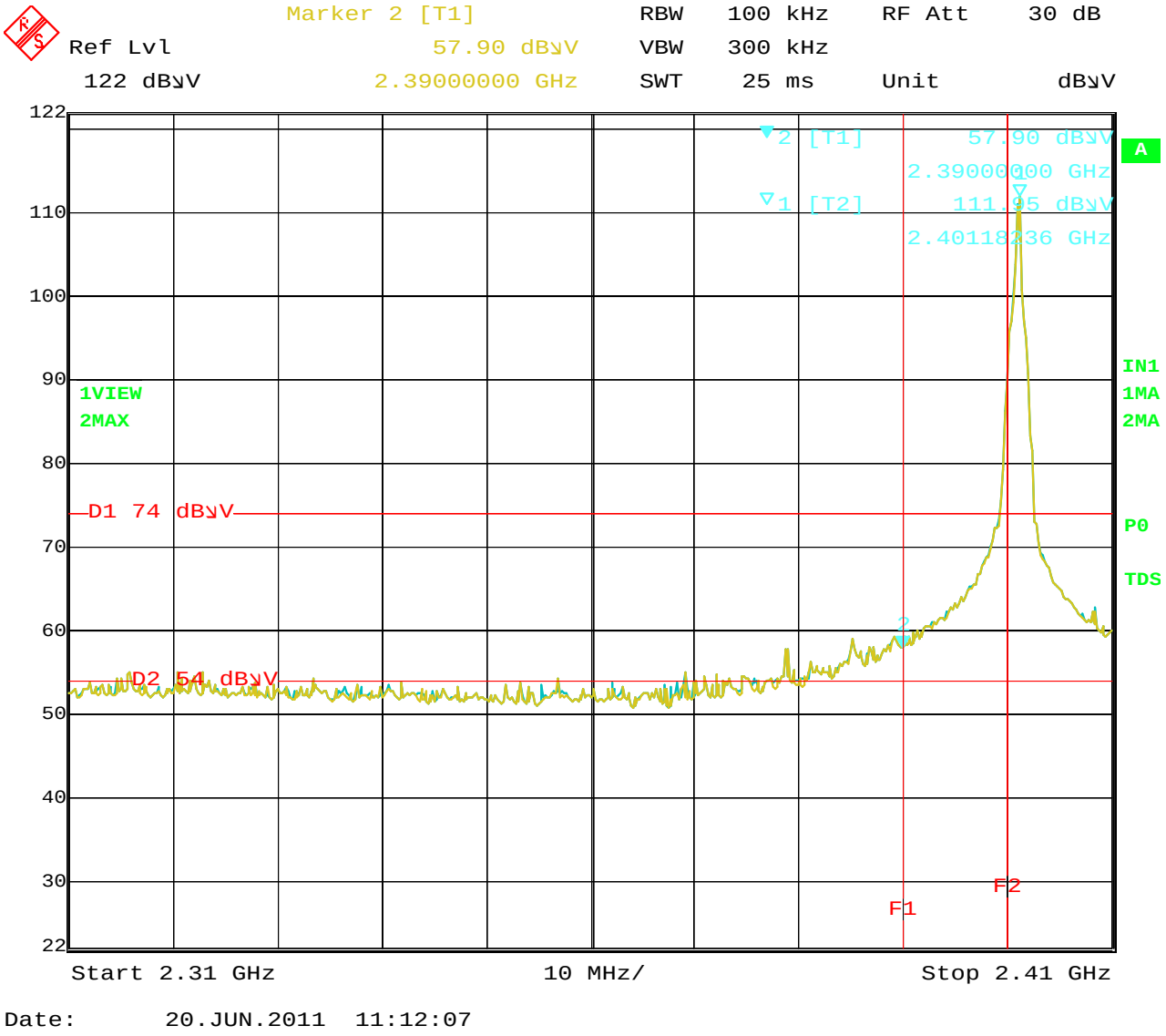
Y-Axis (Worst Case) - Low Channel
Y-Axis (Worst Case) - Middle Channel
Y-Axis (Worst Case) - High Channel

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2401	99.44	H	--	--	Peak	1.25	135	Fundamental of Low Channel
								@ 3 meters
2390	55.78	H	54	1.78	Peak	1.25	135	Band Edge Low Channel
2390	35.78	H	54	-18.22	Avg	1.25	135	Corrected back to 1 MHz RBW*
2440	101.19	H	--	--	Peak	1.25	155	Fundamental of Middle Channel
								@ 3 meters
2479	100.41	H	--	--	Peak	1.25	135	Fundamental of High Channel
								@ 3 meters
2483.5	64.48	H	74	-9.52	Peak	1.25	135	Band Edge High Channel
2483.5	44.48	H	54	-9.52	Avg	1.25	135	Corrected back to 1 MHz RBW*

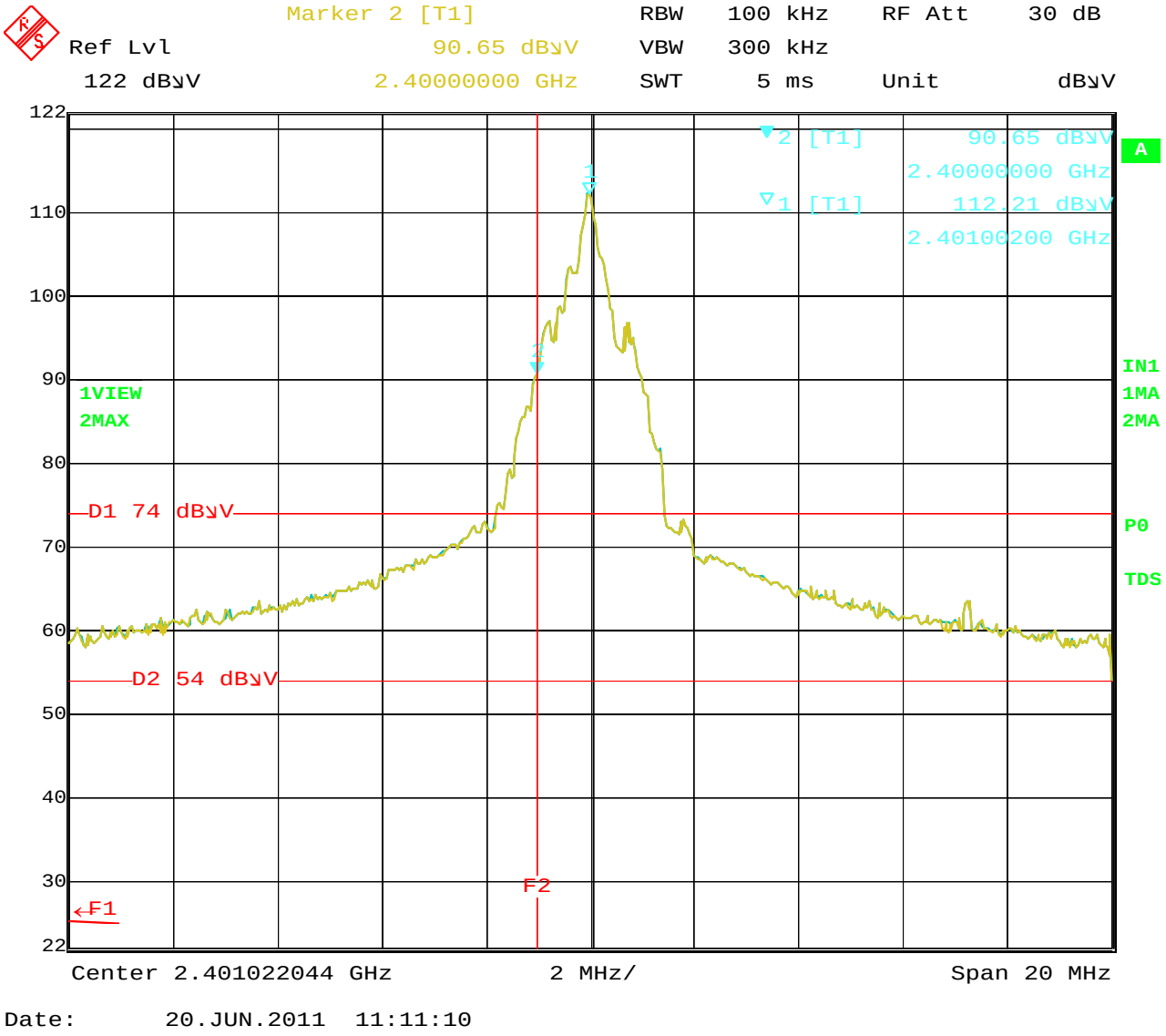
*The Band Edges were taken with an RBW of 100 kHz with the measurement being correct back to 1 MHz RBW using the factor of 10 log (1 MHz / 100 kHz) = 10 dB.



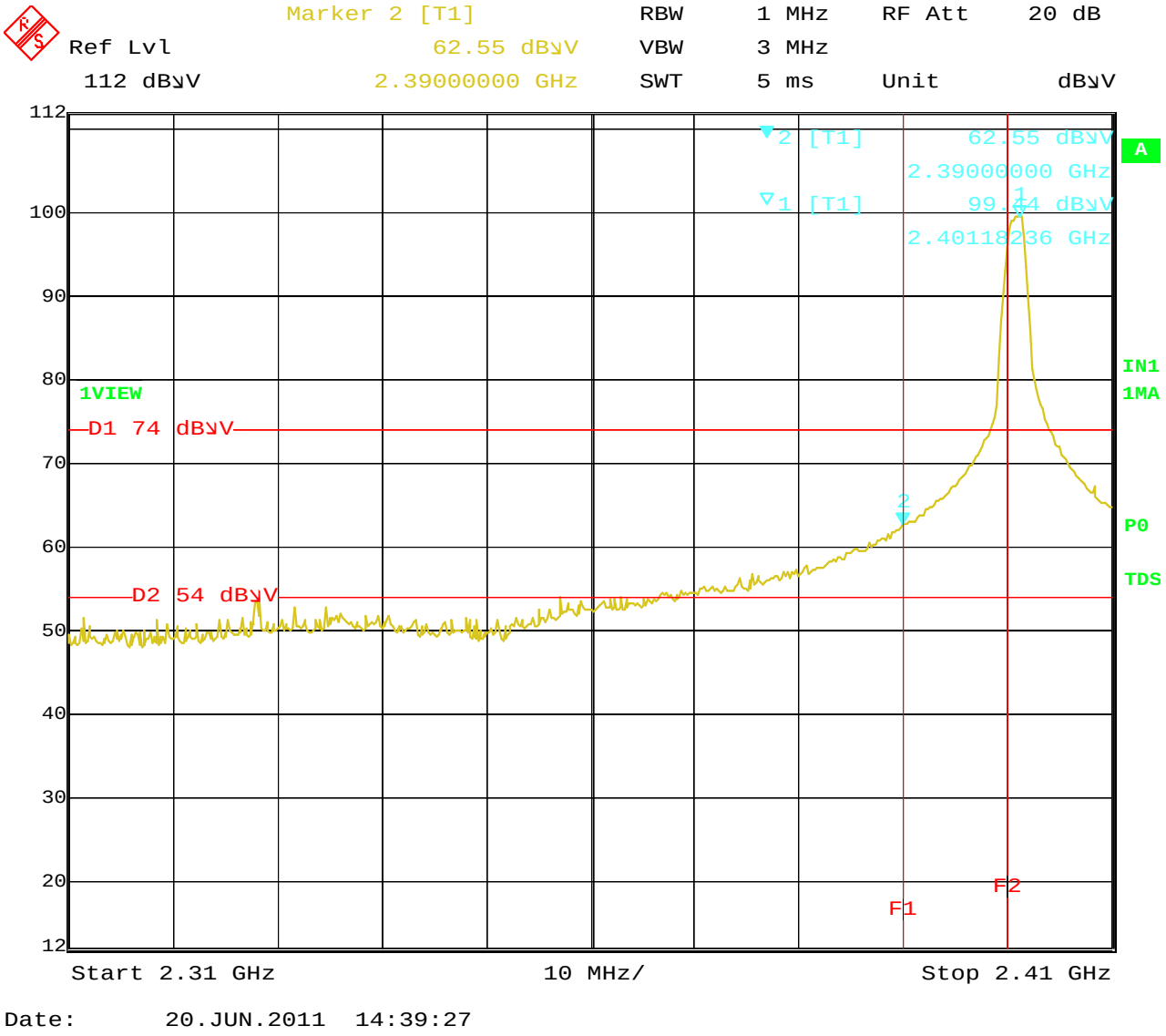
Band Edge – Low Channel – Short Cable – Vertical Polarization – Fundamental



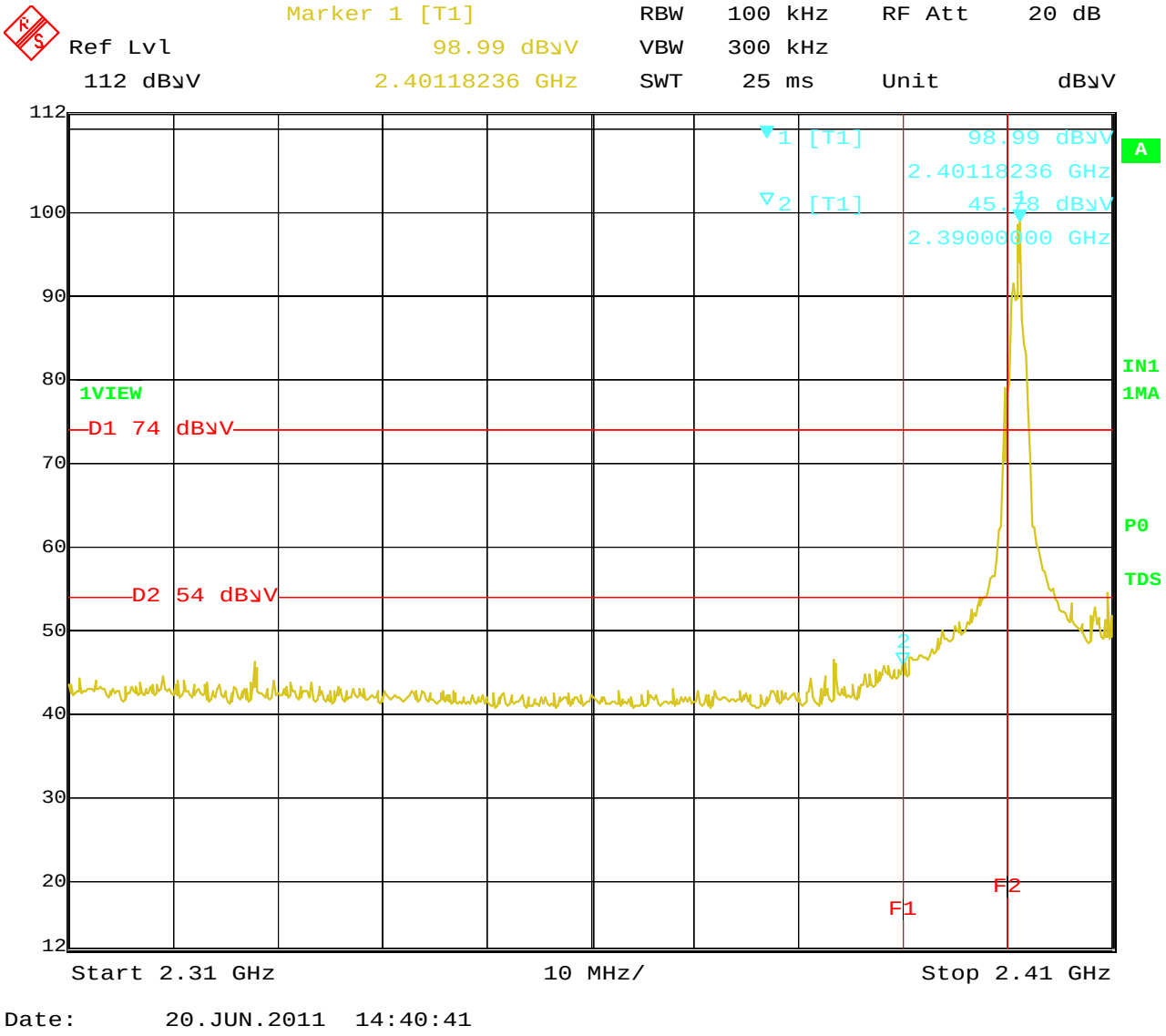
Band Edge – Low Channel – Short Cable – Vertical Polarization – Band Edge at 2390 MHz



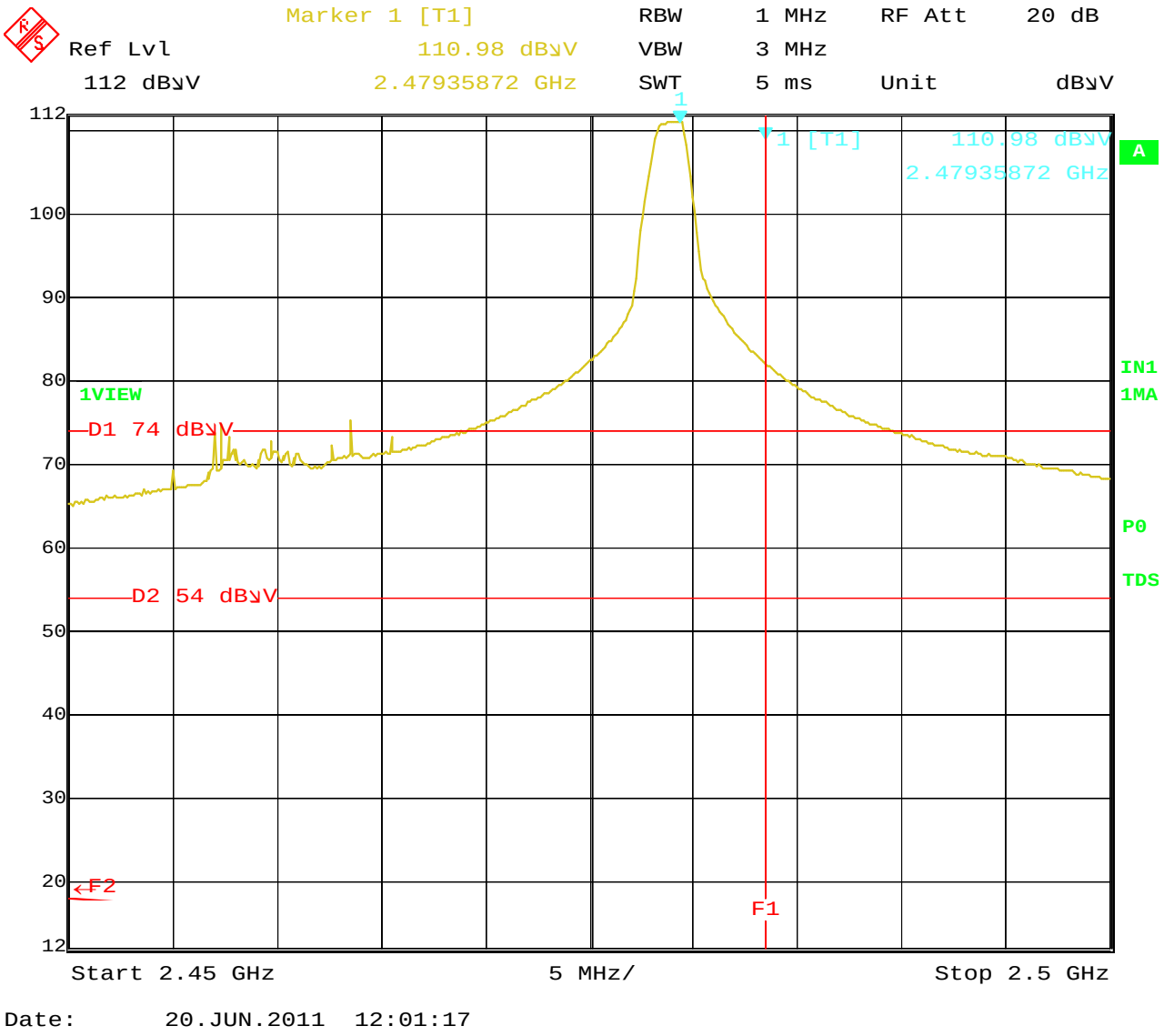
Band Edge – Low Channel – Short Cable – Vertical Polarization – Band Edge at 2400 MHz



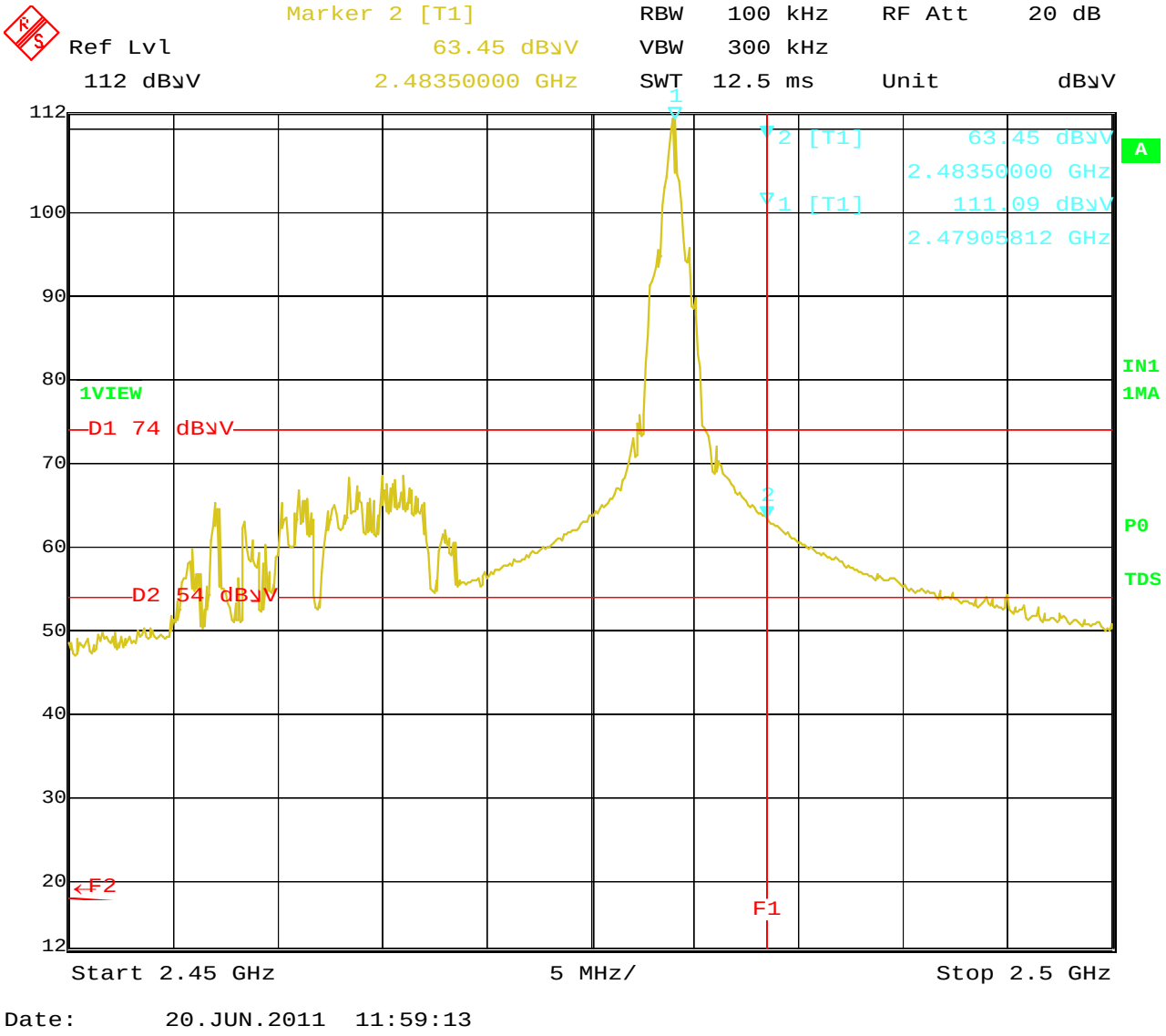
Band Edge – Low Channel – Horizontal Polarization – Fundamental



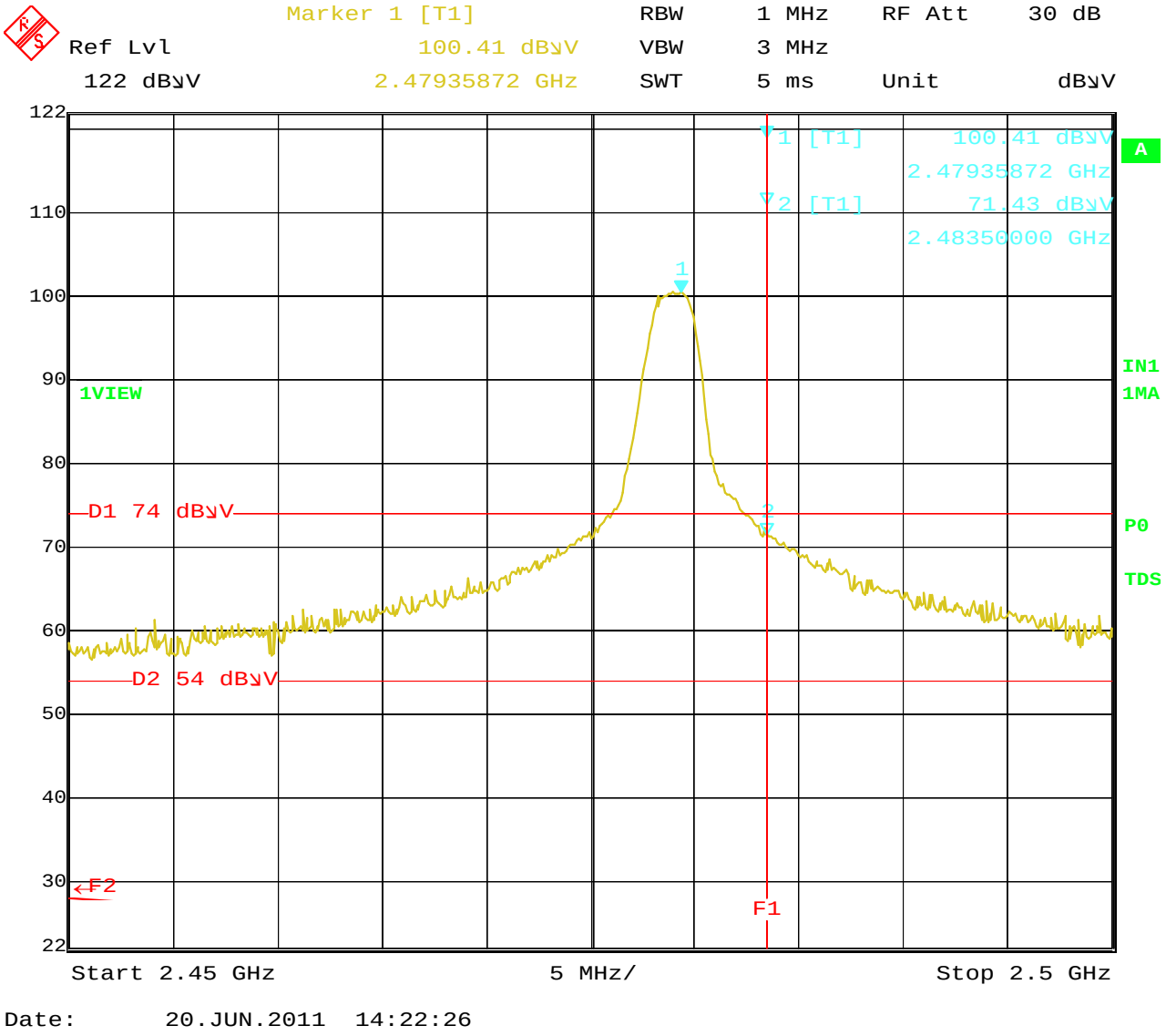
Band Edge – Low Channel – Horizontal Polarization – Band Edge at 2390 MHz



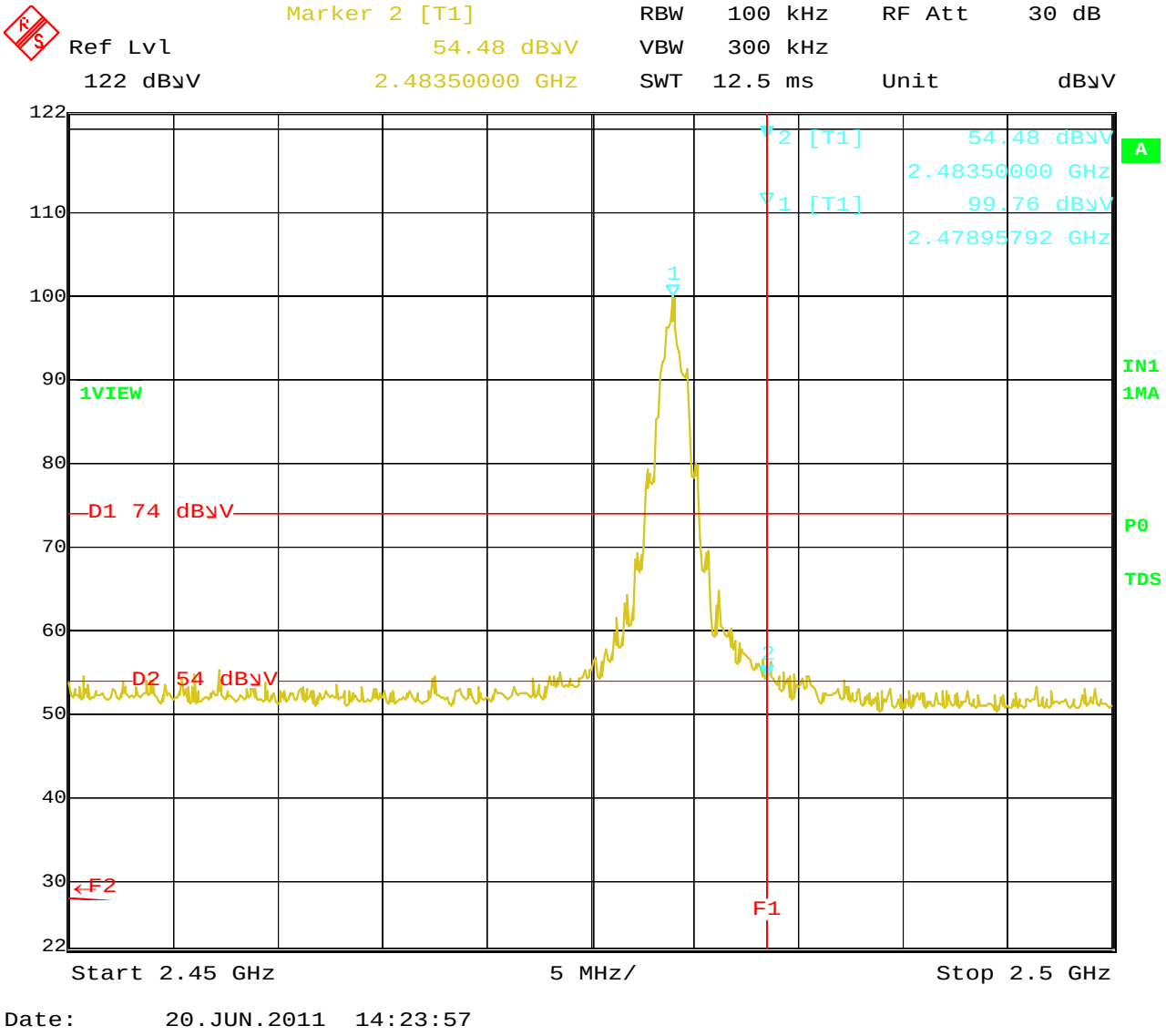
Band Edge – High Channel – Short Cable – Vertical Polarization – Fundamental



Band Edge – High Channel – Short Cable – Vertical Polarization – Band Edge at 2483.50 MHz



Band Edge – High Channel – Short Cable – Horizontal Polarization – Fundamental



Band Edge – High Channel – Short Cable – Horizontal Polarization – Band Edge at 2483.50 MHz