FCC PART 15, SUBPART B and C
TEST REPORT

for

BLE/ANT MODULE

MODEL: SRU233

Prepared for

DELPHIAN SYSTEMS, LLC
720 DARTMOUTH LANE
BUFFALO GROVE, ILLINOIS 60089

Prepared by:_____

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DATE: AUGUST 21, 2015

	REPORT BODY	APPENDICES					TOTAL
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GENERAL REPORT SUMMARY

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

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

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

Device Tested:	BLE/ANT Module Model: SRU233 S/N: N/A
Product Description:	The EUT was a transceiver module.
Modifications:	The EUT was not modified in order to meet the specifications.
Customer:	Delphian Systems, LLC 720 Dartmouth Lane Buffalo Grove, Illinois 60089
Test Dates:	August 18, 19 and 20, 2015
Test Specifications:	Emissions requirements CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249
Test Procedure:	ANSI C63.4
Test Deviations:	The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Spurious Radiated RF Emissions, 10 kHz – 25,000 MHz (Transmitter and Digital portion)	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 15.205, 15.209 and 15.249
2	Conducted RF Emissions, 150 kHz to 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

1. PURPOSE

This document is a qualification test report based on the emissions tests performed on the BLE/ANT Module, Model: SRU233. The emissions measurements were performed according to the measurement procedure described in ANSI C63.4. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

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

Delphian Systems, LLC

Gary Myers	Director of Technology
Ashok Hipara	Director of System Engineering

Compatible Electronics Inc.

Kenneth Lee	Test Technician
James Ross	Test Engineer

2.4 Date Test Sample was Received

The test sample was received prior to the initial test date.

2.5 Disposition of the Test Sample

The test sample has not been returned to Delphian Systems, LLC as of the date of this test report.

2.6 Abbreviations and Acronyms

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

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
N/A	Not Applicable
DNF	Do Not Fit
PCB	Printed Circuit Board
cm	Centimeter

3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
ANSI C63.4 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10: 2013	American National Standard for Testing Unlicensed Wireless Devices
EN 50147-2: 1997	Anechoic chambers. Alternative test site suitability with respect to site attenuation

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - Emissions

The BLE/ANT Module, Model: SRU233 (EUT) was mounted on a 10 cm extender PCB. The extender board was connected to the AC main via an AC adaptor. A laptop computer was used to set the channel of the EUT and was then removed from the test setup during testing.

The EUT was tested for emissions at the low, middle, and high channels while in the X, Y and Z axis using both its internal and external crystals. The EUT was continuously transmitting.

The final radiated data for the EUT as was taken in the modes described above. Please see Appendix E for the data sheets.

4.1.1 Cable Constructions and Termination

Cable 1 This is a 2-meter unshielded cable connecting the extender PCB to the AC adaptor. The cable was hardwired to the AC adaptor and had a single pin power connector on the extender PCB end.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
BLE/ANT MODULE	DELPHIAN SYSTEMS, LLC	SRU233	N/A	2AEHJSRU233
EXTENSION PCB	DELPHIAN SYSTEMS, LLC	N/A	2015-07-002	N/A
LAPTOP COMPUTER	HP	G60-441US	2CE927RF3Q	DoC
CLASS 2 TRANSFORMER	CUI, INC.	35-5-300R	N/A	N/A

5.2 Emissions Test Equipment

EQUIPMENT TYPE	MANU-FACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CAL. CYCLE
GENERAL TEST EQUIPMENT USED IN LAB B					
Computer	Compaq	CQ5210F	CNX9360CF9	N/A	N/A
Monitor	Hewlett Packard	HPs2031a	3CQ046N3MD	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	December 4, 2014	1 Year
GENERAL TEST EQUIPMENT USED IN LAB D					
TDK TestLab	TDK RF Solutions, Inc.	9.22	700145	N/A	N/A
Computer	Hewlett Packard	p6716f	MXX1030PX0	N/A	N/A
LCD Monitor	Hewlett Packard	52031a	3CQ046N3MG	N/A	N/A
EMI Receiver, 20 Hz – 26.5 GHz	Agilent Technologies	N9038A	MY51100115	April 3, 2015	1 Year
RF RADIATED EMISSIONS TEST EQUIPMENT					
CombiLog Antenna	Com-Power	AC-220	61060	May 20, 2014	2 Year
Preamplifier	Com-Power	PA-118	551024	March 6, 2015	1 Year
Loop Antenna	Com-Power	AL-130	17089	February 6, 2015	2 Year
Horn Antenna	Com-Power	AH-118	071175	February 26, 2014	2 Year
Preamplifier	Com-Power	PA-840	711013	May 13, 2014	2 Year
Horn Antenna	Com-Power	AH-826	0071957	N/A	N/A
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
System Controller	Sunol Sciences Corporation	SC110V	112213-1	N/A	N/A
Turntable	Sunol Sciences Corporation	2011VS	N/A	N/A	N/A
Antenna-Mast	Sunol Sciences Corporation	TWR95-4	112213-3	N/A	N/A
RF CONDUCTED EMISSIONS TEST EQUIPMENT					
Shield Room Test	Compatible Electronics	11CD	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	3638A08784	May 27, 2015	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85662A	2648A14530	May 27, 2015	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01363	May 27, 2015	1 Year
LISN	Com-Power	LI-215	12076	June 9, 2015	1 Year
LISN	Com-Power	LI-215	12090	June 9, 2015	1 Year
Transient Limiter	Com-Power	252A910	1	October 10, 2014	1 Year

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

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

6.2 EUT Mounting, Bonding and Grounding

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 Radiated Emissions (Spurious and Harmonics) Test – Lab B

The EMI Receiver was used as a measuring meter. A preamplifier was used to increase the sensitivity of the instrument. The Com Power Microwave Preamplifier Model: PA-118 was used for frequencies above 1 GHz and the PA 840 for frequencies above 18 GHz. The EMI Receiver was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the EMI Receiver records the highest measured reading over all the sweeps.

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

The measurement bandwidth and transducer used for the radiated emissions test were:

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
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: 2014. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test – Lab B (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 1 GHz to 25 GHz to obtain the final test data.

The EUT was tested at a 3 meter test distance. The six highest emissions are listed in Table 1.0.

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 15.249 for radiated emissions. Please see Appendix E for the data sheets.

7.1.2 Radiated Emissions (Spurious and Harmonics) Test – Lab D

The EMI Receiver was used as the measuring meter. A built-in, internal preamplifier was used to increase the sensitivity of the instrument. The EMI Receiver was initially used with the Analyzer mode feature activated. In this mode, the EMI receiver can then record the actual frequency to be measured. This final reading is then taken accurately in the EMI Receiver mode, which takes into account the cable loss, amplifier gain and antenna factors, so that a true reading is compared to the true limit. A quasi-peak reading was taken only for those readings, which are marked accordingly on the data sheets.

The EMI test chamber of Compatible Electronics, Inc. was used for radiated emissions testing. This test site is set up according to ANSI C63.4 and EN 50147-2. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT.

The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The 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 1 GHz	120 kHz	CombiLog Antenna

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 15.249 for radiated emissions. Please see Appendix E for the data sheets.

7.1.3 Conducted Emissions Test

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

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

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

The EUT was tested at 120 VAC. The six highest emissions are listed in Table 2.0.

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 15.107 for conducted emissions.

7.1.4 RF Emissions Test Results

Table 1.0 RADIATED EMISSION RESULTS
BLE/ANT Module, Model: SRU233

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
7440 (H) (Int) (High Channel)	36.67 (Avg)	54.00	-17.33
937.20 (H) (Ext) (High Channel)	28.57 (QP)	46.00	-17.43
7440 (H) (Ext) (High Channel)	36.56 (Avg)	54.00	-17.44
927.30 (H) (Ext) (High Channel)	28.41 (QP)	46.00	-17.59
39.90 (H) (Ext) (High Channel)	22.02 (QP)	40.00	-17.98
39.70 (H) (Int) (High Channel)	22.00 (QP)	40.00	-18.00

Table 2.0 CONDUCTED EMISSION RESULTS
BLE/ANT Module, Model: SRU233

Frequency MHz	Corrected Reading* dBuV	Specification Limit dBuV	Delta (Cor. Reading – Spec. Limit) dB
0.637 (BL) (Int)	35.94	46.00	-10.06
0.641 (WL) (Int)	35.83	46.00	-10.17
0.641 (BL) (Ext)	35.24	46.00	-10.76
0.641 (WL) (Ext)	34.73	46.00	-11.27
1.142 (WL) (Ext)	34.68	46.00	-11.32
0.550 (WL) (Ext)	34.42	46.00	-11.58

Notes:

(H) Horizontal
(V) Vertical
(QP) Quasi-Peak
(Avg) Average
(Int) Internal Crystal
(Ext) External Crystal
* The complete emissions data is given in Appendix E of this report.

8. CONCLUSIONS

The BLE/ANT Module, Model: SRU233, as tested, meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B and Subpart C, sections 15.205, 15.207, 15.209, and 15.249.

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, Japan, Taiwan, Korea, and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025. Please follow the link to the NIST/NVLAP site for each of our facilities' NVLAP certificate and scope of accreditation

NVLAP listing links

Agoura Division / **Brea Division** / **Silverado/Lake Forest Division**

.Quote from ISO-ILAC-IAF Communiqué on 17025:

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

ANSI listing CETCB

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

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).
APEC MRA list NIST MRA site

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

VCCI Support member: Please visit http://www.vcci.jp/vcci_e/

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

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

The modifications listed below were made to the EUT to pass FCC Subpart B and FCC 15.249 specifications.

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

No modifications were made to the EUT during the testing.

APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

BLE/ANT Module
Model: SRU233
S/N: N/A

ADDITIONALS MODELS COVERED UNDER THIS REPORT

No additional models were covered under this report.

APPENDIX D

DIAGRAMS AND CHARTS

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

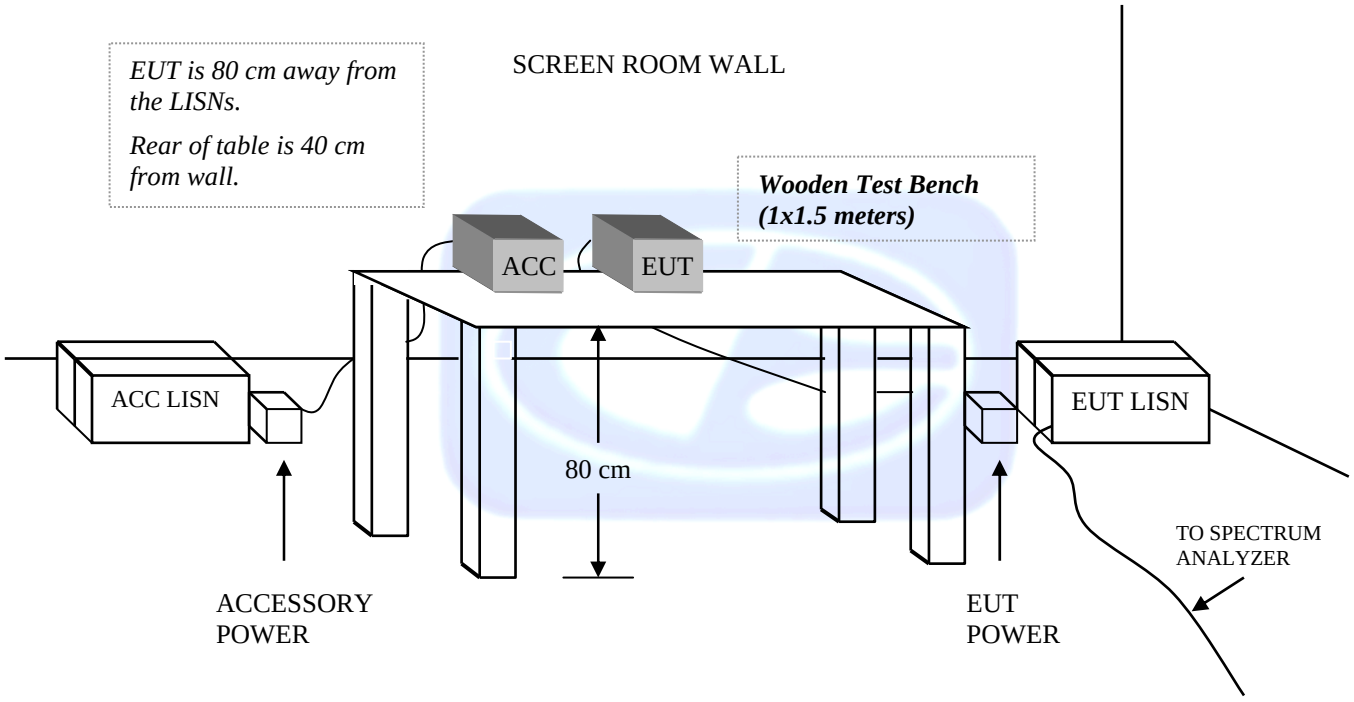


FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE

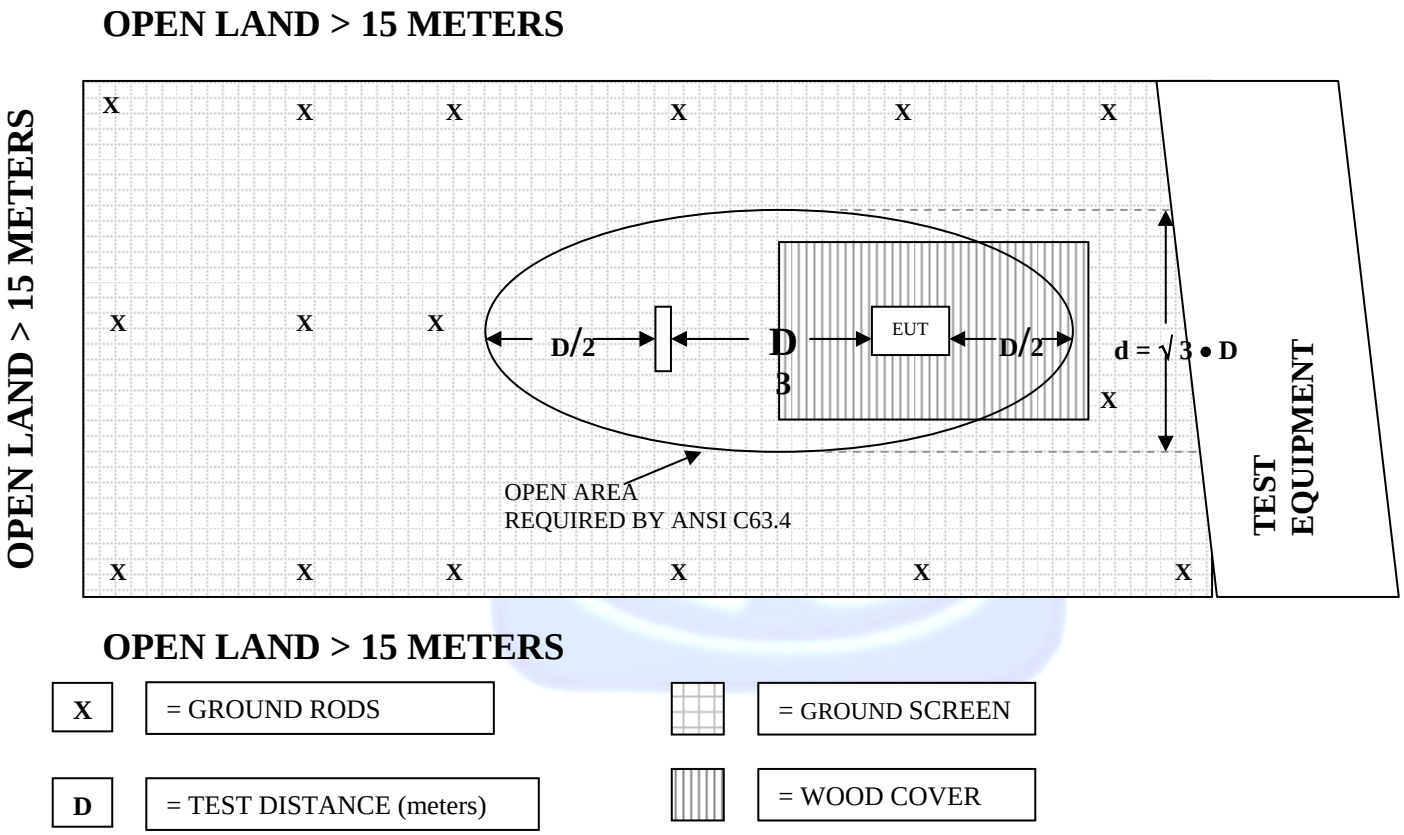
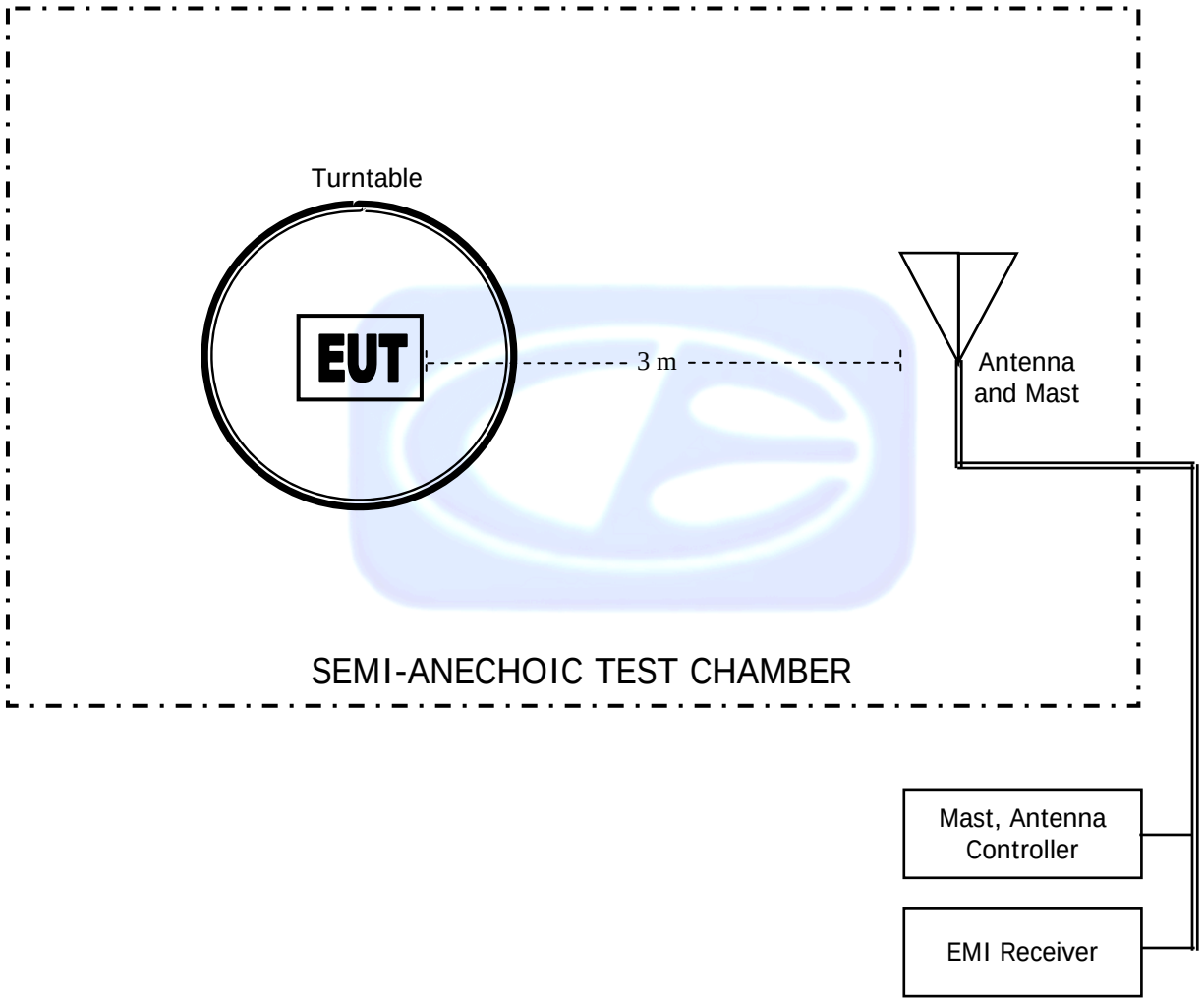


FIGURE 3: LAYOUT OF THE SEMI-ANECHOIC TEST CHAMBER



COM-POWER AL-130

LOOP ANTENNA

S/N: 17089

CALIBRATION DATE: FEBRUARY 6, 2015

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

COM-POWER AC-220

COMBILOG ANTENNA

S/N: 61060

CALIBRATION DATE: MAY 20, 2014

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	23.40	200	14.40
35	23.70	250	16.40
40	24.20	300	17.90
45	22.60	350	15.60
50	22.10	400	19.90
60	17.90	450	20.40
70	12.70	500	21.60
80	11.60	550	21.50
90	12.20	600	22.30
100	13.20	650	23.50
120	15.70	700	23.70
125	15.80	750	25.90
140	13.60	800	25.90
150	16.90	850	26.40
160	14.20	900	27.00
175	14.90	950	27.70
180	15.00	1000	27.50

COM POWER AH-118

HORN ANTENNA

S/N: 071175

CALIBRATION DATE: FEBRUARY 26, 2014

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	24.23	10.0	38.43
1.5	25.84	10.5	40.19
2.0	28.14	11.0	40.49
2.5	29.51	11.5	41.39
3.0	31.20	12.0	42.02
3.5	32.17	12.5	43.30
4.0	31.40	13.0	42.77
4.5	31.86	13.5	40.18
5.0	34.82	14.0	42.59
5.5	34.38	14.5	41.74
6.0	36.31	15.0	41.84
6.5	34.81	15.5	38.48
7.0	37.48	16.0	39.52
7.5	36.98	16.5	37.85
8.0	36.66	17.0	41.33
8.5	38.47	17.5	44.96
9.0	37.22	18.0	48.50
9.5	37.86		

COM-POWER PA-118

PREAMPLIFIER

S/N: 551024

CALIBRATION DATE: MARCH 6, 2015

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	39.76	6.0	38.77
1.1	40.46	6.5	38.46
1.2	40.05	7.0	38.27
1.3	40.58	7.5	38.77
1.4	39.50	8.0	39.25
1.5	39.92	8.5	38.63
1.6	40.40	9.0	39.58
1.7	40.10	9.5	42.12
1.8	40.49	10.0	38.53
1.9	38.86	11.0	40.21
2.0	41.53	12.0	41.15
2.5	41.05	13.0	40.51
3.0	40.29	14.0	40.32
3.5	40.82	15.0	39.47
4.0	40.88	16.0	39.88
4.5	41.37	17.0	39.79
5.0	40.73	18.0	40.61
5.5	39.05		

COM-POWER AH-826

HORN ANTENNA

S/N: 71957

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

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

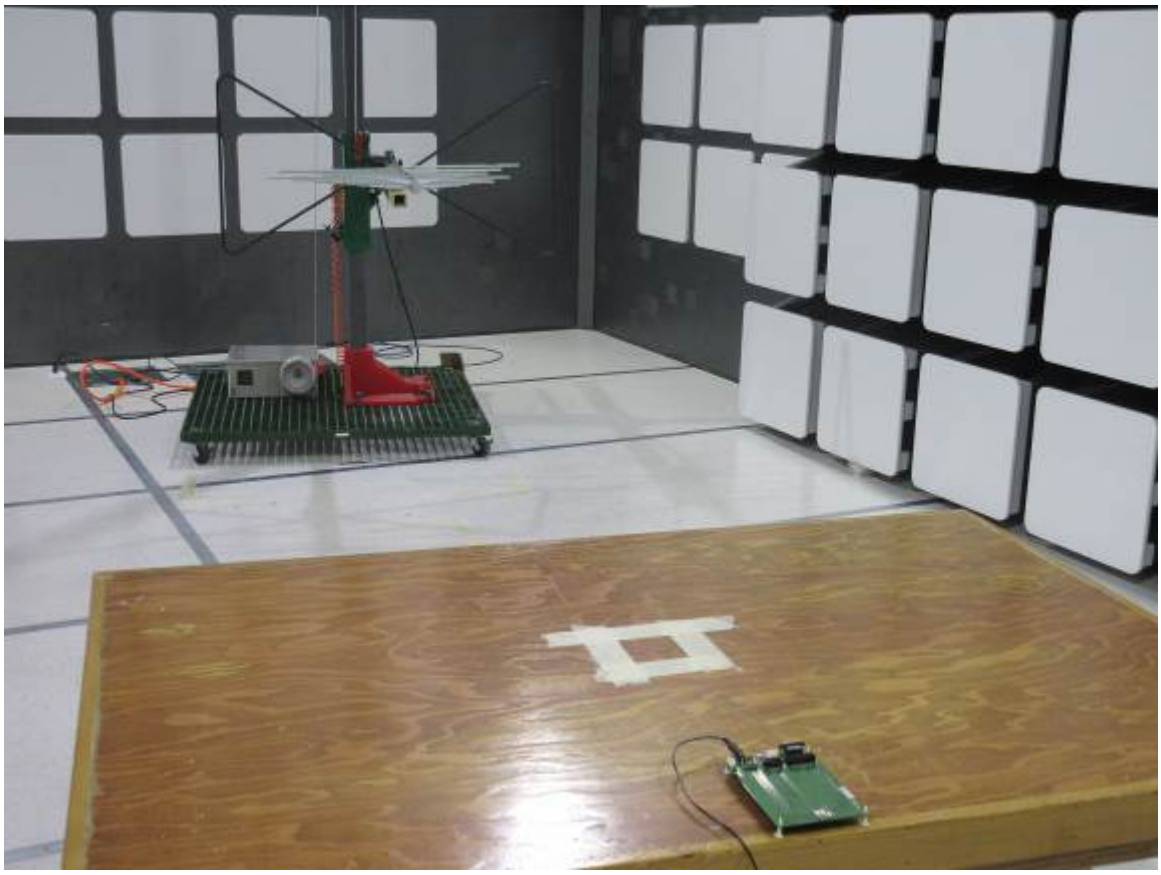
CALIBRATION DATE: MAY 13, 2014

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

FRONT VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS



REAR VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – RADIATED EMISSIONS – BELOW 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – RADIATED EMISSIONS – ABOVE 1 GHz

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

FRONT VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

REAR VIEW

DELPHIAN SYSTEMS, LLC
BLE/ANT MODULE
MODEL: SRU233
FCC SUBPART B AND C – CONDUCTED EMISSIONS

PHOTOGRAPH SHOWING THE EUT CONFIGURATION FOR MAXIMUM EMISSIONS

APPENDIX E

DATA SHEETS

RADIATED EMISSIONS

DATA SHEETS

INTERNAL CRYSTAL

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	79.49	V	114	-34.51	Peak	2.5	235	X-Axis
2402	59.49	V	94	-34.51	Avg	2.5	235	Vertical Polarization
2402	89.55	H	114	-24.45	Peak	1	0	X-Axis
2402	69.55	H	94	-24.45	Avg	1	0	Horizontal Polarization
2402	86.05	V	114	-27.95	Peak	1	70	Y-Axis
2402	66.05	V	94	-27.95	Avg	1	70	Vertical Polarization
2402	89.43	H	114	-24.57	Peak	1.5	180	Y-Axis
2402	69.43	H	94	-24.57	Avg	1.5	180	Horizontal Polarization
2402	89.55	V	114	-24.45	Peak	1.5	335	Z-Axis
2402	69.55	V	94	-24.45	Avg	1.5	335	Vertical Polarization
2402	83.06	H	114	-30.94	Peak	2.25	135	Z-Axis
2402	63.06	H	94	-30.94	Avg	2.25	135	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2440	80.49	V	114	-33.51	Peak	3	135	X-Axis
2440	60.49	V	94	-33.51	Avg	3	135	Vertical Polarization
2440	89.45	H	114	-24.55	Peak	1.75	350	X-Axis
2440	69.45	H	94	-24.55	Avg	1.75	350	Horizontal Polarization
2440	87.07	V	114	-26.93	Peak	1	90	Y-Axis
2440	67.07	V	94	-26.93	Avg	1	90	Vertical Polarization
2440	91.22	H	114	-22.78	Peak	1.5	0	Y-Axis
2440	71.22	H	94	-22.78	Avg	1.5	0	Horizontal Polarization
2440	91.43	V	114	-22.57	Peak	1	45	Z-Axis
2440	71.43	V	94	-22.57	Avg	1	45	Vertical Polarization
2440	84.85	H	114	-29.15	Peak	2.1	135	Z-Axis
2440	64.85	H	94	-29.15	Avg	2.1	135	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2480	79.59	V	114	-34.41	Peak	2.25	135	X-Axis
2480	59.59	V	94	-34.41	Avg	2.25	135	Vertical Polarization
2480	90.63	H	114	-23.37	Peak	1.5	30	X-Axis
2480	70.63	H	94	-23.37	Avg	1.5	30	Horizontal Polarization
2480	86.01	V	114	-27.99	Peak	1	90	Y-Axis
2480	66.01	V	94	-27.99	Avg	1	90	Vertical Polarization
2480	91.1	H	114	-22.9	Peak	1.5	135	Y-Axis
2480	71.1	H	94	-22.9	Avg	1.5	135	Horizontal Polarization
2480	90.74	V	114	-23.26	Peak	1.1	235	Z-Axis
2480	70.74	V	94	-23.26	Avg	1.1	235	Vertical Polarization
2480	84.9	H	114	-29.1	Peak	2.1	135	Z-Axis
2480	64.9	H	94	-29.1	Avg	2.1	135	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	47.55	V	74	-26.45	Peak	1.75	80	
4804	27.55	V	54	-26.45	Avg	1.75	80	
7206	50.08	V	74	-23.92	Peak	1	135	
7206	30.08	V	54	-23.92	Avg	1	135	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	49.67	V	74	-24.33	Peak	1.5	190	
4804	29.67	V	54	-24.33	Avg	1.5	190	
7206	51.5	V	74	-22.5	Peak	1	235	
7206	31.5	V	54	-22.5	Avg	1	235	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	49.87	V	74	-24.13	Peak	1	90	
4804	29.87	V	54	-24.13	Avg	1	90	
7206	52.98	V	74	-21.02	Peak	1.15	90	
7206	32.98	V	54	-21.02	Avg	1.15	90	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	45.72	H	74	-28.28	Peak	1	45	
4804	25.72	H	54	-28.28	Avg	1	45	
7206	51.7	H	74	-22.3	Peak	1	90	
7206	31.7	H	54	-22.3	Avg	1	90	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	50.48	H	74	-23.52	Peak	2	180	
4804	30.48	H	54	-23.52	Avg	2	180	
7206	53.52	H	74	-20.48	Peak	1	355	
7206	33.52	H	54	-20.48	Avg	1	355	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Low Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	47.45	H	74	-26.55	Peak	1.5	270	
4804	27.45	H	54	-26.55	Avg	1.5	270	
7206	52.61	H	74	-21.39	Peak	1	160	
7206	32.61	H	54	-21.39	Avg	1	160	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	47.92	V	74	-26.08	Peak	2	45	
4880	27.92	V	54	-26.08	Avg	2	45	
7320	49.48	V	74	-24.52	Peak	1.5	290	
7320	29.48	V	54	-24.52	Avg	1.5	290	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	50.87	V	74	-23.13	Peak	1.5	190	
4880	30.87	V	54	-23.13	Avg	1.5	190	
7320	49.9	V	74	-24.1	Peak	1	15	
7320	29.9	V	54	-24.1	Avg	1	15	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.61	V	74	-22.39	Peak	1.75	90	
4880	31.61	V	54	-22.39	Avg	1.75	90	
7320	50.72	V	74	-23.28	Peak	1.5	250	
7320	30.72	V	54	-23.28	Avg	1.5	250	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	48.75	H	74	-25.25	Peak	1.5	180	
4880	28.75	H	54	-25.25	Avg	1.5	180	
7320	47.91	H	74	-26.09	Peak	1	170	
7320	27.91	H	54	-26.09	Avg	1	170	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	50.72	H	74	-23.28	Peak	2.1	180	
4880	30.72	H	54	-23.28	Avg	2.1	180	
7320	51.57	H	74	-22.43	Peak	1.25	355	
7320	31.57	H	54	-22.43	Avg	1.25	355	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
Middle Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.85	H	74	-22.15	Peak	2	240	
4880	31.85	H	54	-22.15	Avg	2	240	
7320	50.51	H	74	-23.49	Peak	1	150	
7320	30.51	H	54	-23.49	Avg	1	150	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	53.79	V	74	-20.21	Peak	2.1	100	
4960	33.79	V	54	-20.21	Avg	2.1	100	
7440	52.6	V	74	-21.4	Peak	1	235	
7440	32.6	V	54	-21.4	Avg	1	235	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	51.44	V	74	-22.56	Peak	1.75	335	
4960	31.44	V	54	-22.56	Avg	1.75	335	
7440	52.13	V	74	-21.87	Peak	1	300	
7440	32.13	V	54	-21.87	Avg	1	300	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	51.68	V	74	-22.32	Peak	1.5	335	
4960	31.68	V	54	-22.32	Avg	1.5	335	
7440	55.29	V	74	-18.71	Peak	1.15	90	
7440	35.29	V	54	-18.71	Avg	1.15	90	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - X-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	48.64	H	74	-25.36	Peak	1.5	335	
4960	28.64	H	54	-25.36	Avg	1.5	335	
7440	53.35	H	74	-20.65	Peak	1.1	335	
7440	33.35	H	54	-20.65	Avg	1.1	335	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - Y-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	53.47	H	74	-20.53	Peak	1.5	180	
4960	33.47	H	54	-20.53	Avg	1.5	180	
7440	56.67	H	74	-17.33	Peak	1	350	
7440	36.67	H	54	-17.33	Avg	1	350	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal
High Channel
Transmit Mode - Z-Axis

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	50.72	H	74	-23.28	Peak	1.25	325	
4960	30.72	H	54	-23.28	Avg	1.25	325	
7440	54.52	H	74	-19.48	Peak	1.85	45	
7440	34.52	H	54	-19.48	Avg	1.85	45	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal

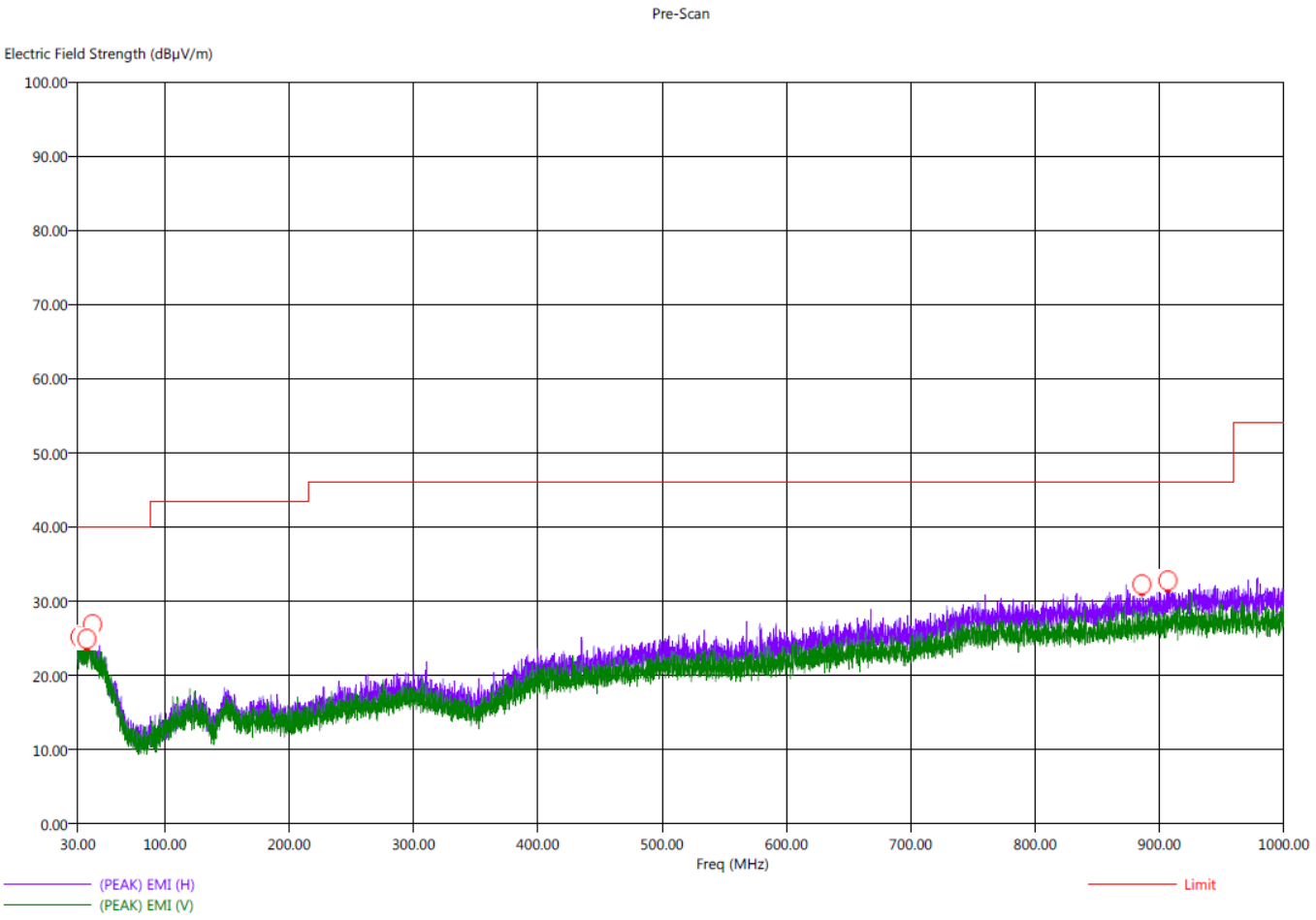
Date: 08/18/2015
Labs: B and D
Tested By: Kenneth Lee

Non Harmonic Emissions from the Tx and Digital Portion -- 10 kHz to 25000 MHz
Vertical and Horizontal Polarizations

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic Emissions Found
								for the Tx Mode
								from 10 kHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis

Title: Pre-Scan - FCC Class B
File: Radiated Pre-Scan 30-1000Mhz - FCC Class B - X-Axis - Internal.set
Operator: Kenneth Lee
EUT Type: BLE/ANT Module
EUT Condition: Continously Transmitting - X-Axis - Worst Case
Comments: Customer: Delphian Systems, LLC
Model: SRU233
Note: Internal Crystal

8/19/2015 2:37:37 PM
Sequence: Preliminary Scan



Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan 30-1000Mhz - FCC Class B - Internal.set
Operator: Kenneth Lee
EUT Type: BLE/ANT Module
EUT Condition: Continously Transmitting - X-Axis - Worst Case
Comments: Customer: Delphian Systems, LLC
Model: SRU233
Note: Internal Crystal

8/19/2015 3:25:05 PM
Sequence: Final Measurements

Final Scan - FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deg)
31.80	H	26.79	21.48	-13.21	-18.52	40.00	23.61	0.37	239.07	360.00
37.30	V	26.19	21.73	-13.81	-18.27	40.00	23.89	0.41	191.37	261.50
39.70	H	26.96	22.00	-13.04	-18.00	40.00	24.12	0.42	351.73	122.75
42.00	V	25.69	21.23	-14.31	-18.77	40.00	23.46	0.45	335.97	165.75
885.90	H	32.35	27.68	-13.65	-18.32	46.00	26.83	2.61	287.97	172.75
906.90	H	32.74	27.99	-13.26	-18.01	46.00	27.10	2.65	384.14	124.50

RADIATED EMISSIONS

DATA SHEETS

EXTERNAL CRYSTAL

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	82.1	V	114	-31.9	Peak	2.5	235	X-Axis
2402	62.1	V	94	-31.9	Avg	2.5	235	Vertical Polarization
2402	88.69	H	114	-25.31	Peak	1.75	45	X-Axis
2402	68.69	H	94	-25.31	Avg	1.75	45	Horizontal Polarization
2402	84.21	V	114	-29.79	Peak	1	325	Y-Axis
2402	64.21	V	94	-29.79	Avg	1	325	Vertical Polarization
2402	89.25	H	114	-24.75	Peak	2	0	Y-Axis
2402	69.25	H	94	-24.75	Avg	2	0	Horizontal Polarization
2402	88.79	V	114	-25.21	Peak	1.25	335	Z-Axis
2402	68.79	V	94	-25.21	Avg	1.25	335	Vertical Polarization
2402	84.18	H	114	-29.82	Peak	2.25	135	Z-Axis
2402	64.18	H	94	-29.82	Avg	2.25	135	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2440	83.38	V	114	-30.62	Peak	2.25	200	X-Axis
2440	63.38	V	94	-30.62	Avg	2.25	200	Vertical Polarization
2440	88.17	H	114	-25.83	Peak	1.85	135	X-Axis
2440	68.17	H	94	-25.83	Avg	1.85	135	Horizontal Polarization
2440	85.47	V	114	-28.53	Peak	1.5	45	Y-Axis
2440	65.47	V	94	-28.53	Avg	1.5	45	Vertical Polarization
2440	90.22	H	114	-23.78	Peak	1.5	170	Y-Axis
2440	70.22	H	94	-23.78	Avg	1.5	170	Horizontal Polarization
2440	89.44	V	114	-24.56	Peak	1.5	325	Z-Axis
2440	69.44	V	94	-24.56	Avg	1.5	325	Vertical Polarization
2440	81.35	H	114	-32.65	Peak	1	100	Z-Axis
2440	61.35	H	94	-32.65	Avg	1	100	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2480	78.52	V	114	-35.48	Peak	3	235	X-Axis
2480	58.52	V	94	-35.48	Avg	3	235	Vertical Polarization
2480	89.97	H	114	-24.03	Peak	1.85	350	X-Axis
2480	69.97	H	94	-24.03	Avg	1.85	350	Horizontal Polarization
2480	86.49	V	114	-27.51	Peak	1.15	60	Y-Axis
2480	66.49	V	94	-27.51	Avg	1.15	60	Vertical Polarization
2480	91.79	H	114	-22.21	Peak	1.5	180	Y-Axis
2480	71.79	H	94	-22.21	Avg	1.5	180	Horizontal Polarization
2480	90.92	V	114	-23.08	Peak	1.1	235	Z-Axis
2480	70.92	V	94	-23.08	Avg	1.1	235	Vertical Polarization
2480	83.07	H	114	-30.93	Peak	1.75	270	Z-Axis
2480	63.07	H	94	-30.93	Avg	1.75	270	Horizontal Polarization

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	48.37	V	74	-25.63	Peak	1.15	45	
4804	28.37	V	54	-25.63	Avg	1.15	45	
7206	49.84	V	74	-24.16	Peak	1	235	
7206	29.84	V	54	-24.16	Avg	1	235	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	49.02	V	74	-24.98	Peak	1.1	355	
4804	29.02	V	54	-24.98	Avg	1.1	355	
7206	51.23	V	74	-22.77	Peak	1.25	90	
7206	31.23	V	54	-22.77	Avg	1.25	90	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	50.12	V	74	-23.88	Peak	1.75	290	
4804	30.12	V	54	-23.88	Avg	1.75	290	
7206	52.87	V	74	-21.13	Peak	1.1	90	
7206	32.87	V	54	-21.13	Avg	1.1	90	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	48.36	H	74	-25.64	Peak	1	15	
4804	28.36	H	54	-25.64	Avg	1	15	
7206	51.73	H	74	-22.27	Peak	1	270	
7206	31.73	H	54	-22.27	Avg	1	270	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	49.68	H	74	-24.32	Peak	1	10	
4804	29.68	H	54	-24.32	Avg	1	10	
7206	52.82	H	74	-21.18	Peak	1.25	235	
7206	32.82	H	54	-21.18	Avg	1.25	235	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Low Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	49.67	H	74	-24.33	Peak	2	270	
4804	29.67	H	54	-24.33	Avg	2	270	
7206	51.24	H	74	-22.76	Peak	2.1	45	
7206	31.24	H	54	-22.76	Avg	2.1	45	
9608								No Emissions
9608								Detected
12010								No Emissions
12010								Detected
14412								No Emissions
14412								Detected
16814								No Emissions
16814								Detected
19216								No Emissions
19216								Detected
21618								No Emissions
21618								Detected
24020								No Emissions
24020								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.92	V	74	-22.08	Peak	2	90	
4880	31.92	V	54	-22.08	Avg	2	90	
7320	48.35	V	74	-25.65	Peak	2	110	
7320	28.35	V	54	-25.65	Avg	2	110	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.02	V	74	-22.98	Peak	1.35	210	
4880	31.02	V	54	-22.98	Avg	1.35	210	
7320	48.73	V	74	-25.27	Peak	1.5	235	
7320	28.73	V	54	-25.27	Avg	1.5	235	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.92	V	74	-22.08	Peak	1.85	280	
4880	31.92	V	54	-22.08	Avg	1.85	280	
7320	50.31	V	74	-23.69	Peak	1.1	270	
7320	30.31	V	54	-23.69	Avg	1.1	270	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	48.12	H	74	-25.88	Peak	1.25	0	
4880	28.12	H	54	-25.88	Avg	1.25	0	
7320	50.81	H	74	-23.19	Peak	1.25	0	
7320	30.81	H	54	-23.19	Avg	1.25	0	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	51.05	H	74	-22.95	Peak	1.5	335	
4880	31.05	H	54	-22.95	Avg	1.5	335	
7320	52.01	H	74	-21.99	Peak	1	0	
7320	32.01	H	54	-21.99	Avg	1	0	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
Middle Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4880	52.13	H	74	-21.87	Peak	1.5	35	
4880	32.13	H	54	-21.87	Avg	1.5	35	
7320	51.28	H	74	-22.72	Peak	1	135	
7320	31.28	H	54	-22.72	Avg	1	135	
9760								No Emissions
9760								Detected
12200								No Emissions
12200								Detected
14640								No Emissions
14640								Detected
17080								No Emissions
17080								Detected
19520								No Emissions
19520								Detected
21960								No Emissions
21960								Detected
24400								No Emissions
24400								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	50.27	V	74	-23.73	Peak	1	235	
4960	30.27	V	54	-23.73	Avg	1	235	
7440	53.42	V	74	-20.58	Peak	2.5	270	
7440	33.42	V	54	-20.58	Avg	2.5	270	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	46.23	V	74	-27.77	Peak	1	50	
4960	26.23	V	54	-27.77	Avg	1	50	
7440	49.41	V	74	-24.59	Peak	1	335	
7440	29.41	V	54	-24.59	Avg	1	335	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	55.96	V	74	-18.04	Peak	1.1	90	
4960	35.96	V	54	-18.04	Avg	1.1	90	
7440	50.84	V	74	-23.16	Peak	1.15	110	
7440	30.84	V	54	-23.16	Avg	1.15	110	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - X-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	52.39	H	74	-21.61	Peak	1.1	45	
4960	32.39	H	54	-21.61	Avg	1.1	45	
7440	50.58	H	74	-23.42	Peak	1.1	235	
7440	30.58	H	54	-23.42	Avg	1.1	235	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - Y-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	53.84	H	74	-20.16	Peak	1	180	
4960	33.84	H	54	-20.16	Avg	1	180	
7440	56.56	H	74	-17.44	Peak	2.25	45	
7440	36.56	H	54	-17.44	Avg	2.25	45	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal
High Channel
Transmit Mode - Z-Axis

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	52.60	H	74	-21.4	Peak	2.1	190	
4960	32.6	H	54	-21.4	Avg	2.1	190	
7440	50.73	H	74	-23.27	Peak	1	85	
7440	30.73	H	54	-23.27	Avg	1	85	
9920								No Emissions
9920								Detected
12400								No Emissions
12400								Detected
14880								No Emissions
14880								Detected
17360								No Emissions
17360								Detected
19840								No Emissions
19840								Detected
22320								No Emissions
22320								Detected
24800								No Emissions
24800								Detected

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal

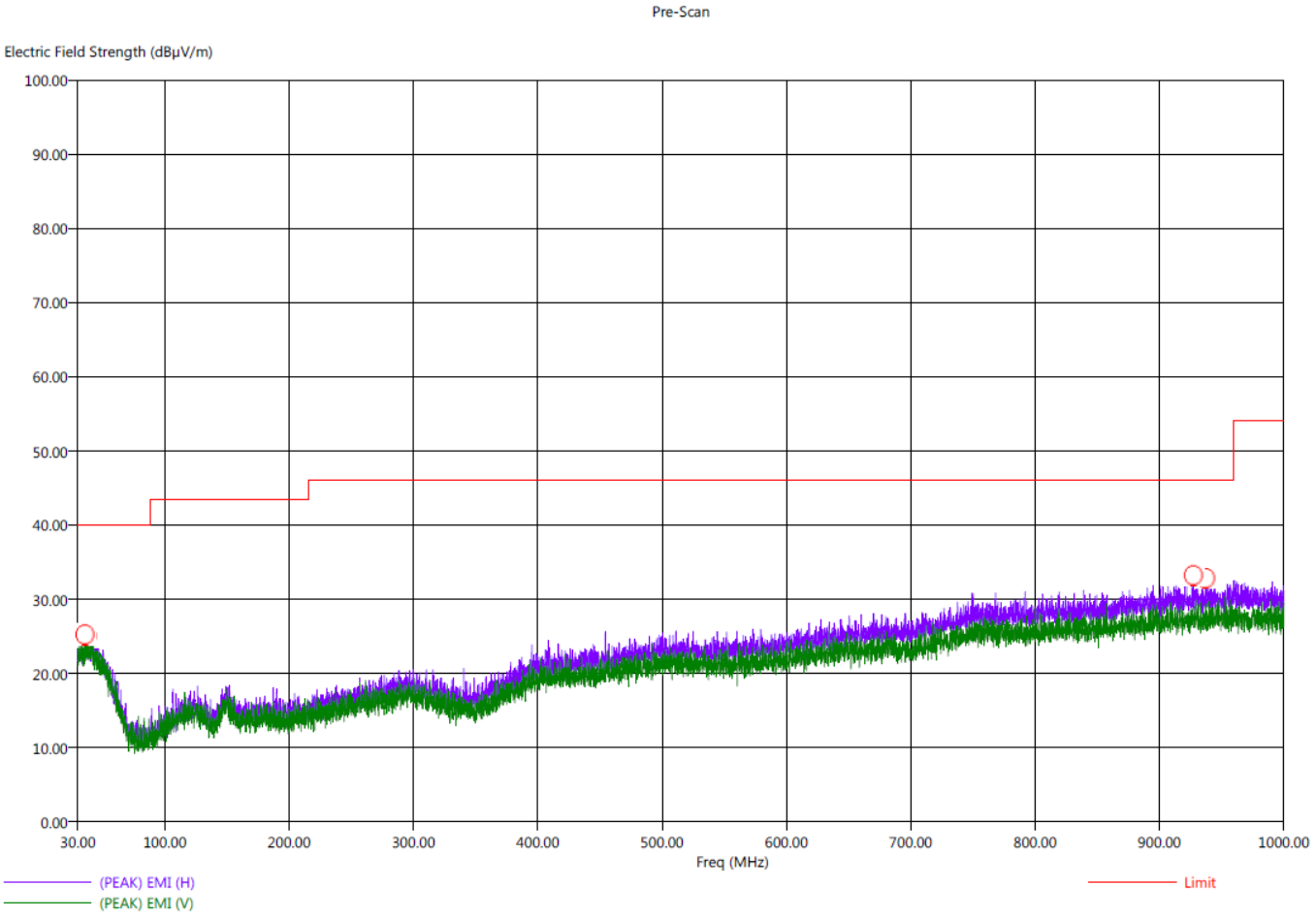
Date: 08/19/2015
Labs: B and D
Tested By: Kenneth Lee

Non Harmonic Emissions from the Tx and Digital Portion -- 10 kHz to 25000 MHz
Vertical and Horizontal Polarizations

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
								No Emissions Found for the
								Digital Portion
								from 10 kHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations
								No Non Harmonic Emissions Found
								for the Tx Mode
								from 10 kHz to 25000 MHz
								for both Vertical and Horizontal
								Polarizations
								Investigated in the X-Axis,
								Y-Axis, and Z-Axis

Title: Pre-Scan - FCC Class B
File: Radiated Pre-Scan 30-1000Mhz - FCC Class B - X-Axis - External.set
Operator: Kenneth Lee
EUT Type: BLE/ANT Module
EUT Condition: Continously Transmitting - X-Axis
Comments: Customer: Delphian Systems, LLC
Model: SRU233
Note: External Crystal

8/19/2015 2:48:10 PM
Sequence: Preliminary Scan



Title: Radiated Final - 30-1000 MHz - FCC Class B
File: Agilent - Radiated Final Scan 30-1000Mhz - FCC Class B - External.set
Operator: Kenneth Lee
EUT Type: BLE/ANT Module
EUT Condition: Continously Transmitting - X-Axis - Worst Case
Comments: Customer: Delphian Systems, LLC
Model: SRU233
Note: External Crystal

8/19/2015 3:41:53 PM
Sequence: Final Measurements

Final Scan - FCC Class B

Freq (MHz)	Pol	(PEAK) EMI (dBµV/m)	(QP) EMI (dBµV/m)	(PEAK) Margin (dB)	(QP) Margin (dB)	Limit (dBµV/m)	Transducer (dB)	Cable (dB)	Twr Ht (cm)	Ttbl Aql (deg)
35.80	V	25.78	21.59	-14.22	-18.41	40.00	23.79	0.40	367.79	57.00
37.50	H	25.70	21.84	-14.30	-18.16	40.00	23.95	0.41	111.37	190.75
38.80	H	26.18	21.94	-13.82	-18.06	40.00	24.10	0.42	191.19	102.50
39.90	H	26.64	22.02	-13.36	-17.98	40.00	24.19	0.43	111.37	308.50
927.30	H	32.70	28.41	-13.30	-17.59	46.00	27.39	2.68	271.55	84.75
937.20	H	33.16	28.57	-12.84	-17.43	46.00	27.53	2.69	191.31	360.25

BAND EDGES

DATA SHEETS

INTERNAL CRYSTAL

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal

Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Band Edges
Low Channel - See Comments for Worst Case Axis

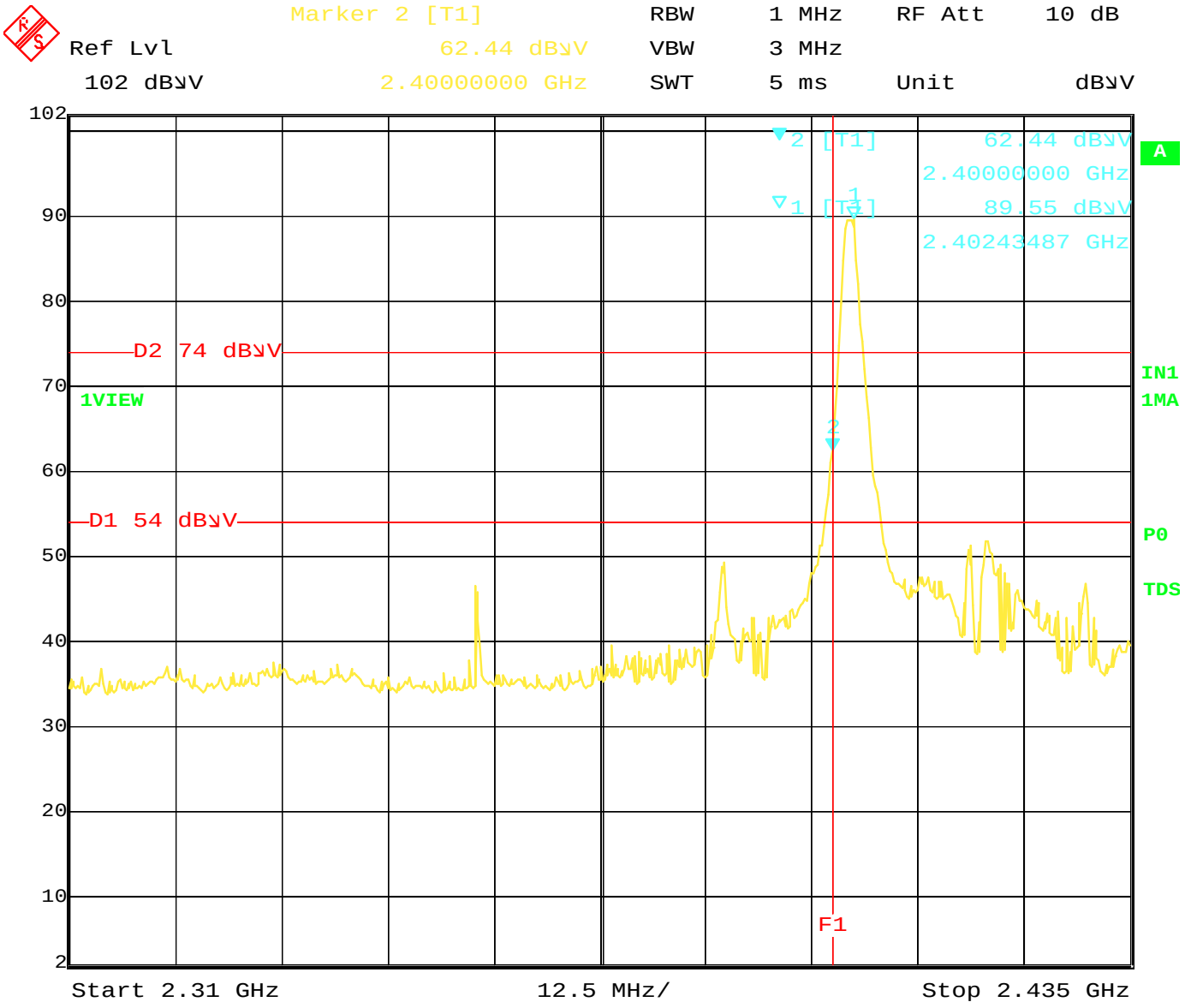
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	89.55	H	114	-24.45	Peak	1	0	Fundamental
2402	69.55	H	94	-24.45	Avg	1	0	of Low Channel
2400	62.16	H	74	-11.84	Peak	1	0	Band Edge of Low Channel
2400	42.16	H	54	-11.84	Avg	1	0	X-Axis Worst Case
2402	89.55	V	114	-24.45	Peak	1.5	335	Fundamental of
2402	69.55	V	94	-24.45	Avg	1.5	335	Low Channel
2400	62.44	V	74	-11.56	Peak	1.5	335	Band Edge of Low Channel
2400	42.44	V	54	-11.56	Avg	1.5	335	Z-Axis Worst Case

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: Internal Crystal

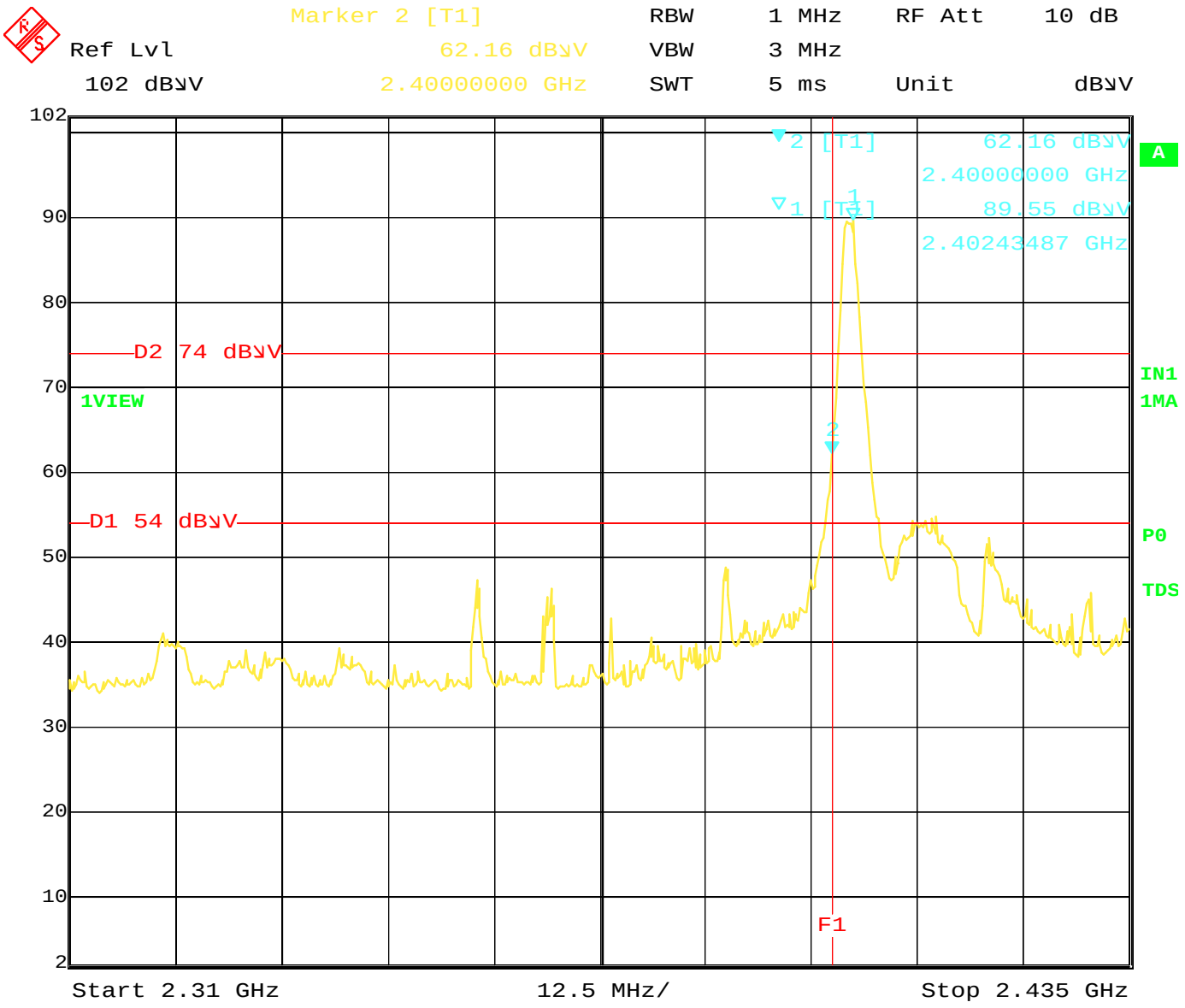
Date: 08/18/2015
Lab: B
Tested By: Kenneth Lee

Band Edges
High Channel - See Comments for Worst Case Axis

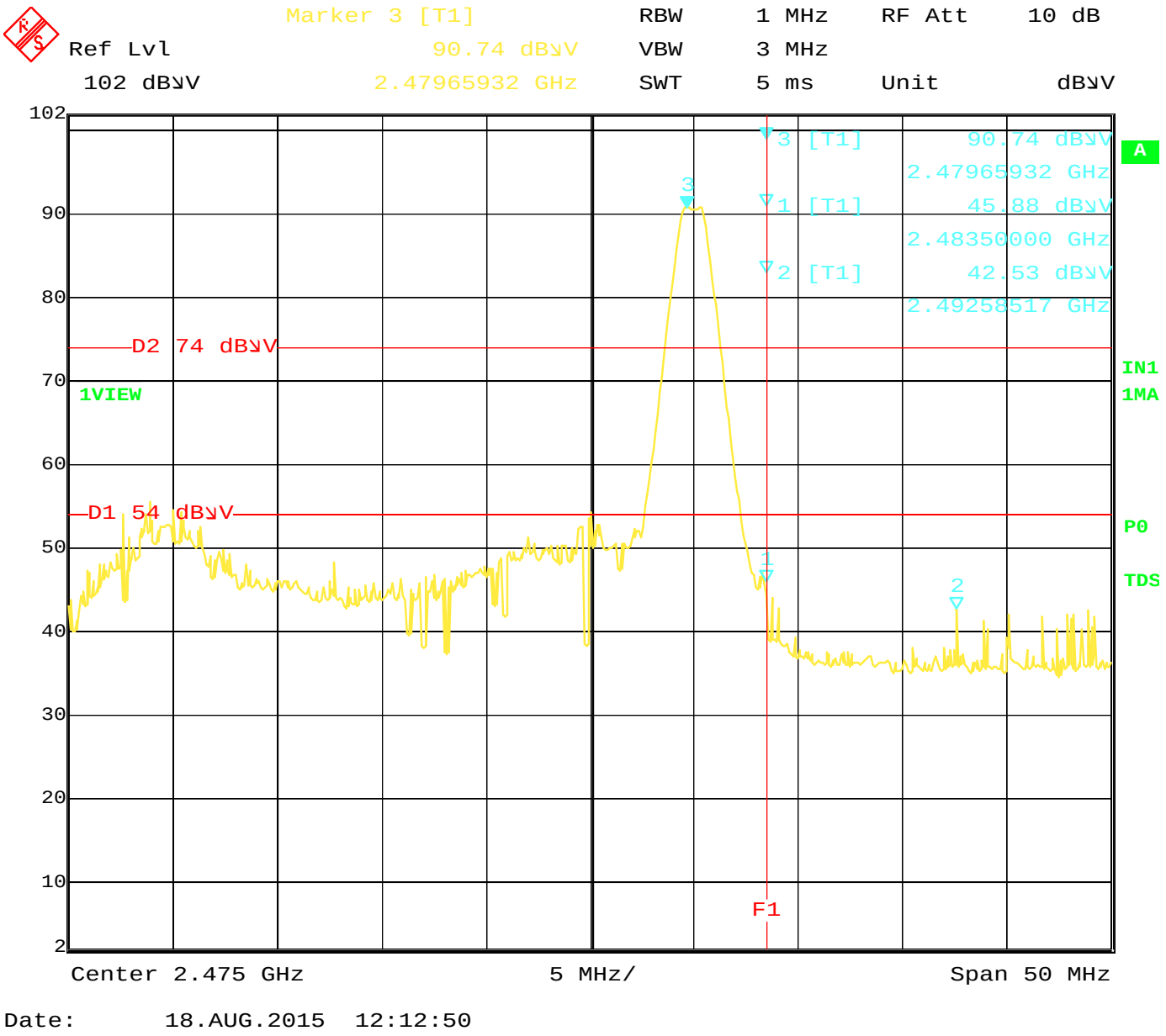
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2480	91.1	H	114	-22.9	Peak	1.5	135	Fundamental
2480	71.1	H	94	-22.9	Avg	1.5	135	of High Channel
2497	45.26	H	74	-28.74	Peak	1.5	135	**Band Edge of High Channel**
2497	25.26	H	54	-28.74	Avg	1.5	135	**Y-Axis Worst Case**
2480	90.74	V	114	-23.26	Peak	1.1	235	Fundamental of
2480	70.74	V	94	-23.26	Avg	1.1	235	High Channel
2483.5	45.88	V	74	-28.12	Peak	1.1	235	**Band Edge of High Channel**
2483.5	25.88	V	54	-28.12	Avg	1.1	235	**Z-Axis Worst Case**



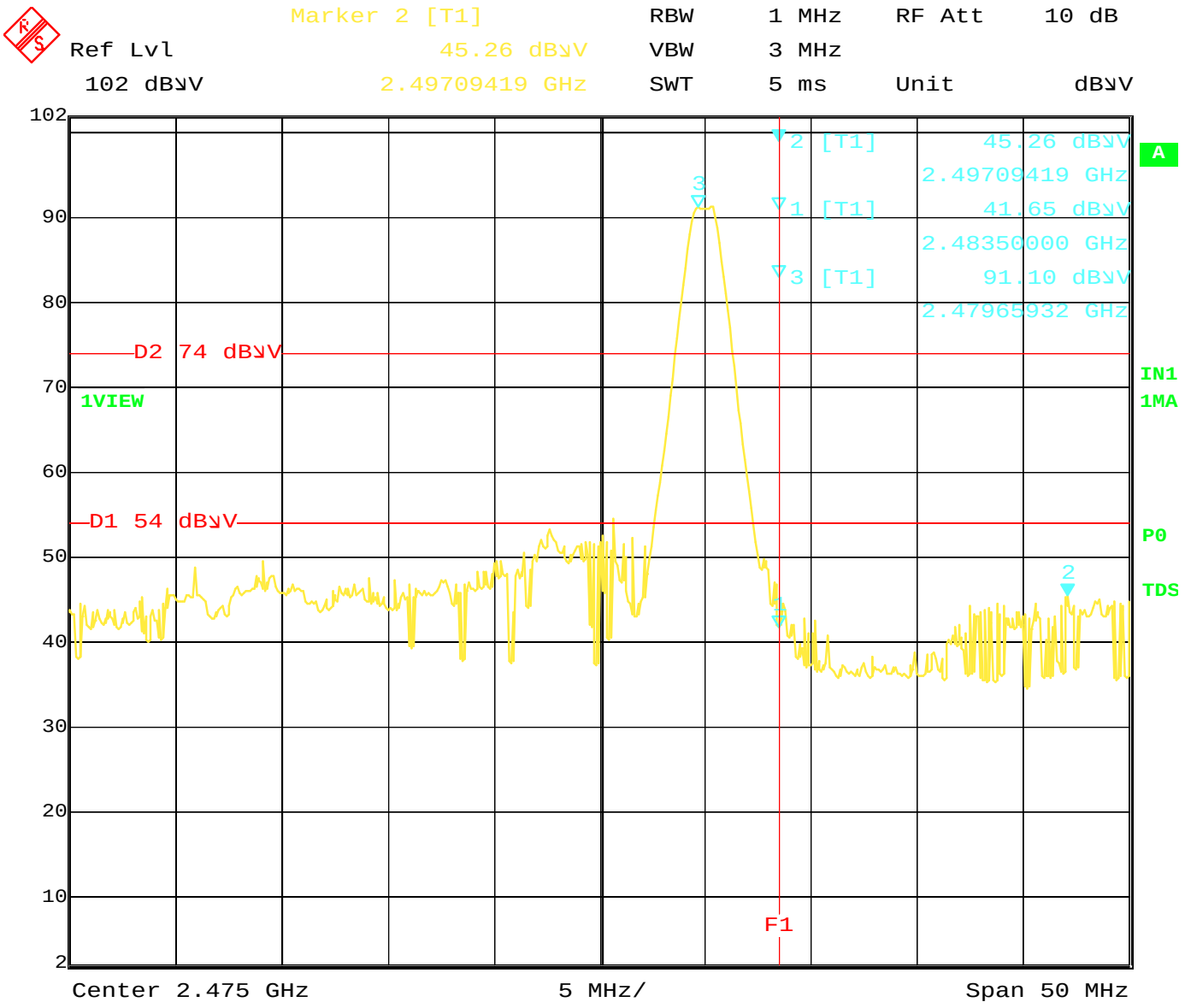
Band Edge – Low Channel – Vertical Polarization – Internal Crystal – Z-Axis – Worst Case



Band Edge – Low Channel – Horizontal Polarization – Internal Crystal – X-Axis – Worst Case



Band Edge – High Channel – Vertical Polarization – Internal Crystal – Z-Axis – Worst Case



Band Edge – High Channel – Horizontal Polarization – Internal Crystal – Y-Axis – Worst Case

BAND EDGES

DATA SHEETS

EXTERNAL CRYSTAL

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal

Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Band Edges
Low Channel - See Comments for Worst Case Axis

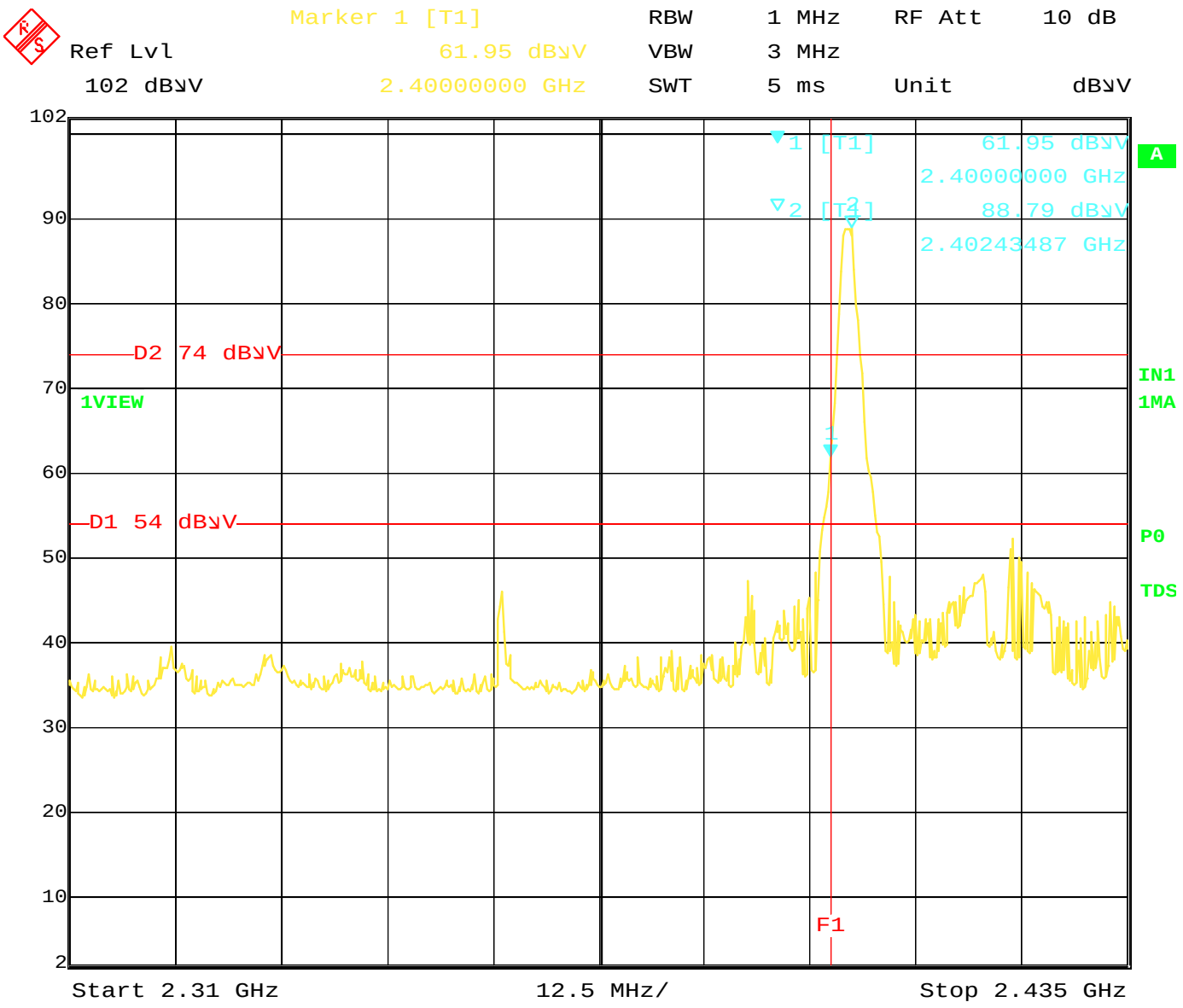
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	89.25	H	114	-24.75	Peak	2	0	Fundamental
2402	69.25	H	94	-24.75	Avg	2	0	of Low Channel
2400	61.41	H	74	-12.59	Peak	2	0	Band Edge of Low Channel
2400	41.41	H	54	-12.59	Avg	2	0	Y-Axis Worst Case
2402	88.79	V	114	-25.21	Peak	1.25	335	Fundamental of
2402	68.79	V	94	-25.21	Avg	1.25	335	Low Channel
2400	61.95	V	74	-12.05	Peak	1.25	335	Band Edge of Low Channel
2400	41.95	V	54	-12.05	Avg	1.25	335	Z-Axis Worst Case

FCC 15.249
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Note: External Crystal

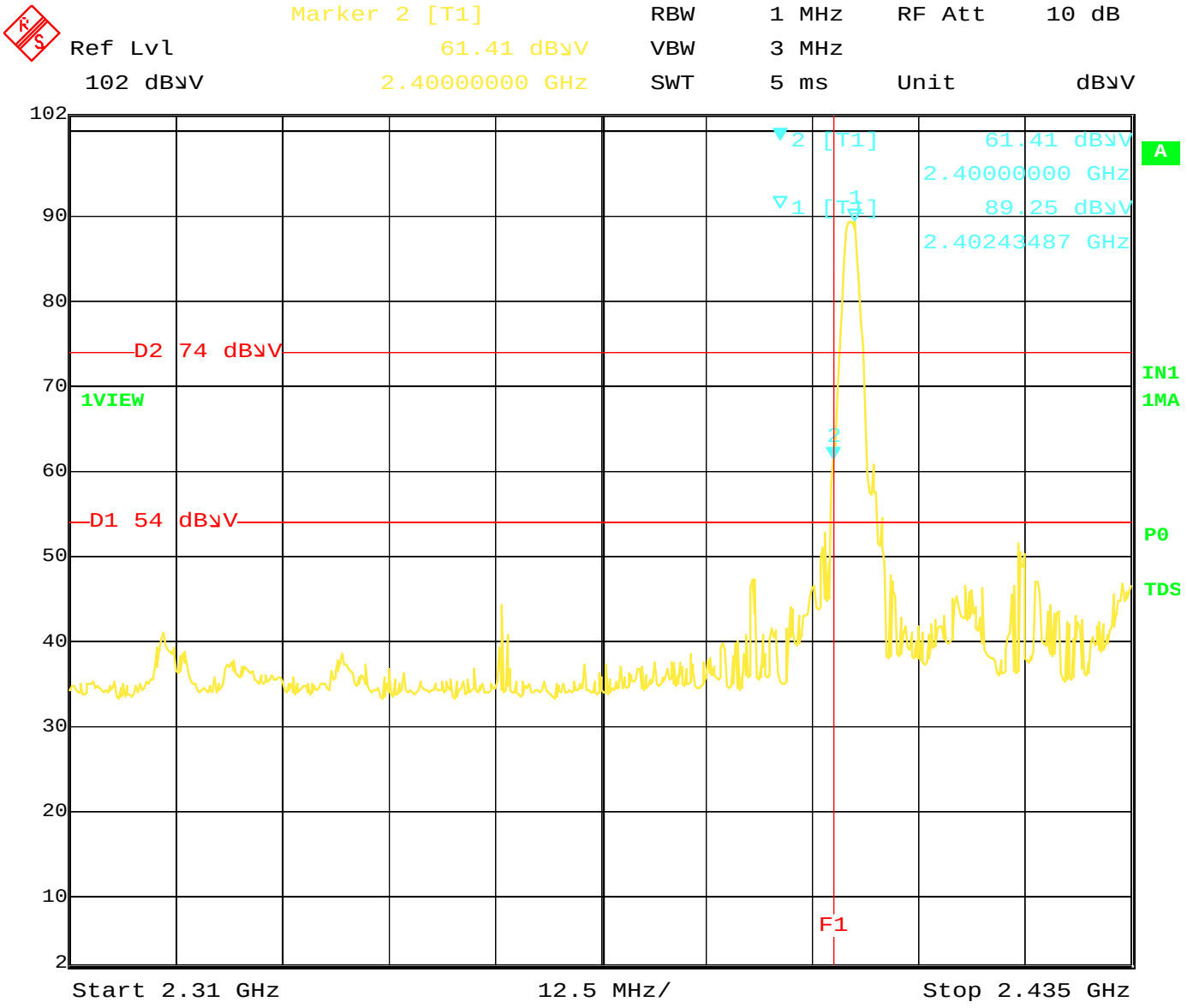
Date: 08/19/2015
Lab: B
Tested By: Kenneth Lee

Band Edges
High Channel - See Comments for Worst Case Axis

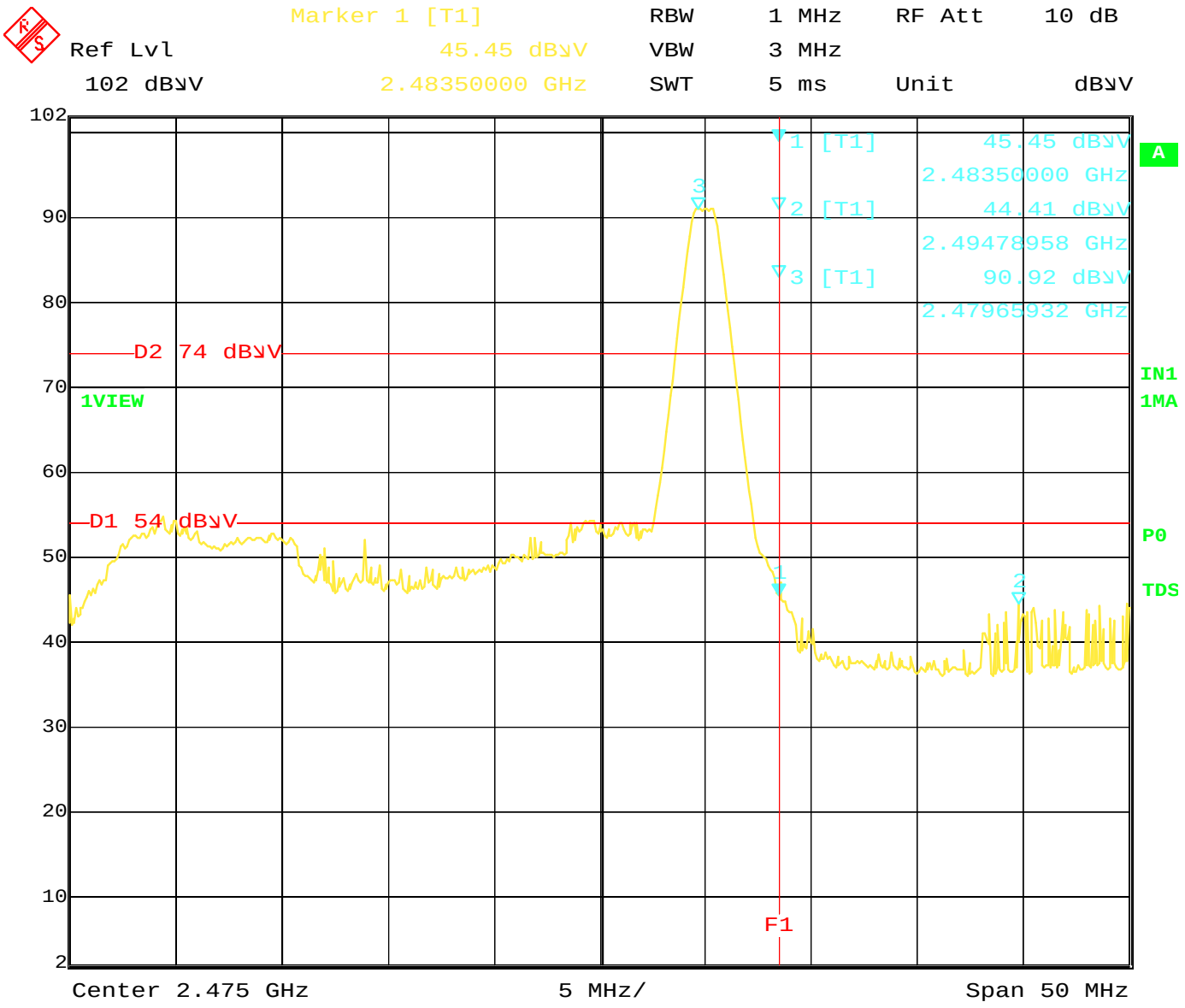
Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2480	91.79	H	114	-22.21	Peak	1.5	180	Fundamental
2480	71.79	H	94	-22.21	Avg	1.5	180	of High Channel
2483.5	46.13	H	74	-27.87	Peak	1.5	180	**Band Edge of High Channel**
2483.5	26.13	H	54	-27.87	Avg	1.5	180	**Y-Axis Worst Case**
2480	90.92	V	114	-23.08	Peak	1.1	235	Fundamental of
2480	70.92	V	94	-23.08	Avg	1.1	235	High Channel
2483.5	45.45	V	74	-28.55	Peak	1.1	235	**Band Edge of High Channel**
2483.5	25.45	V	54	-28.55	Avg	1.1	235	**Z-Axis Worst Case**



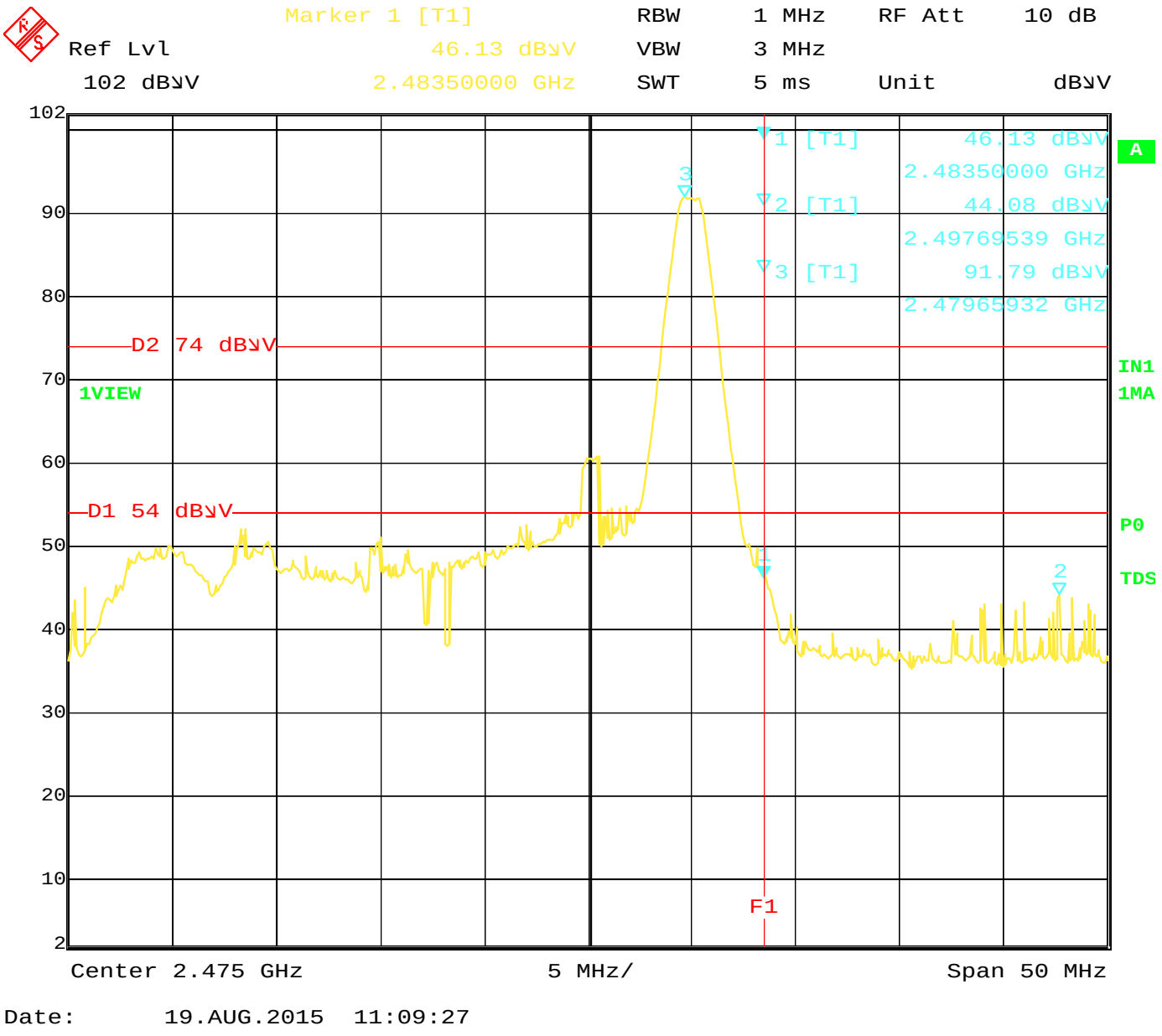
Band Edge – Low Channel – Vertical Polarization – External Crystal – Z-Axis – Worst Case



Band Edge – Low Channel – Horizontal Polarization – External Crystal – Y-Axis – Worst Case



Band Edge – High Channel – Vertical Polarization – External Crystal – Z-Axis – Worst Case

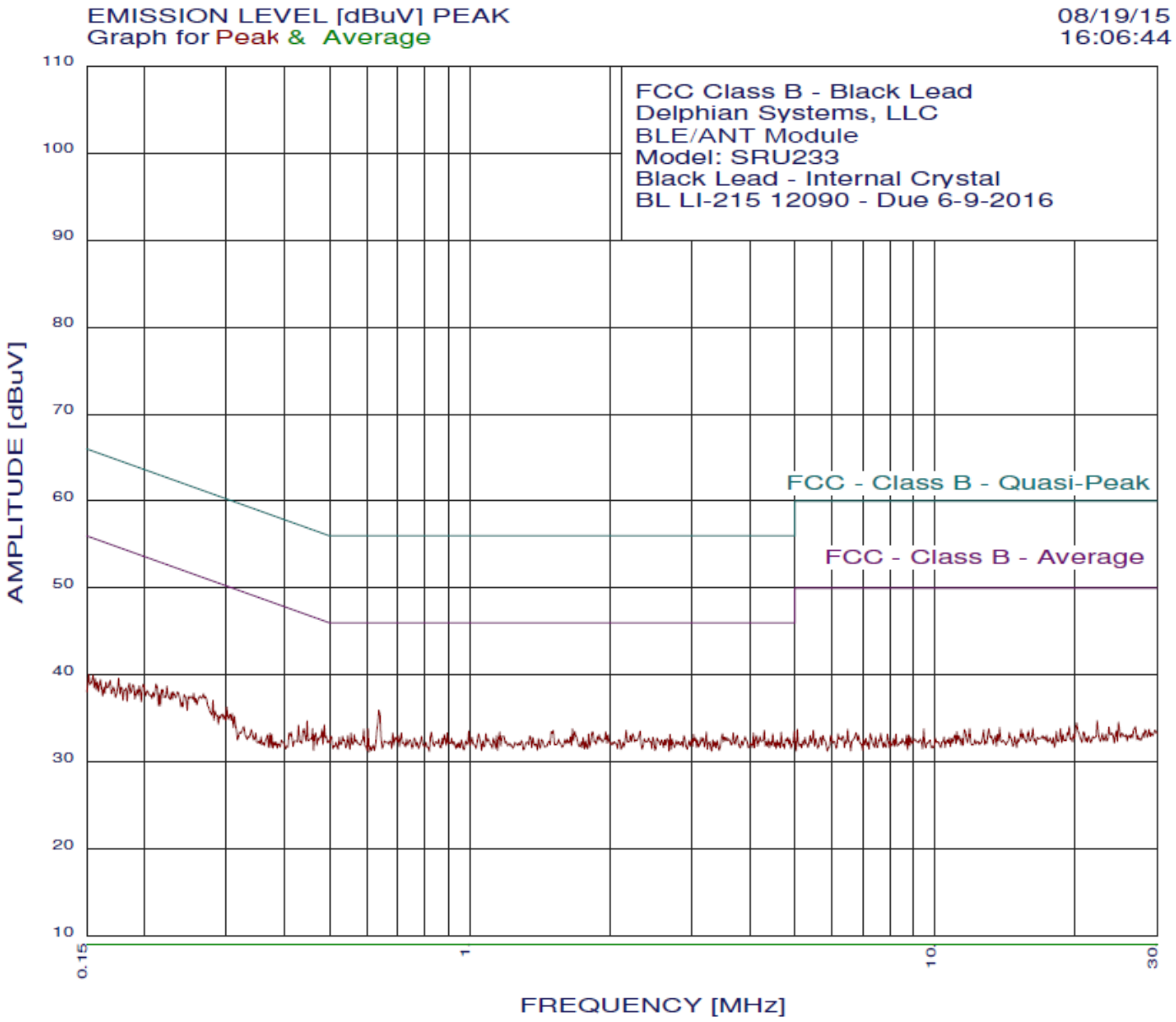


Band Edge – High Channel – Horizontal Polarization – External Crystal – Y-Axis – Worst Case

CONDUCTED EMISSIONS

DATA SHEETS

INTERNAL CRYSTAL


EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
08/19/15
16:06:44
FCC Class B - Black Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - Internal Crystal
BL LI-215 12090 - Due 6-9-2016
FCC - Class B - Quasi-Peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]

page 1/1

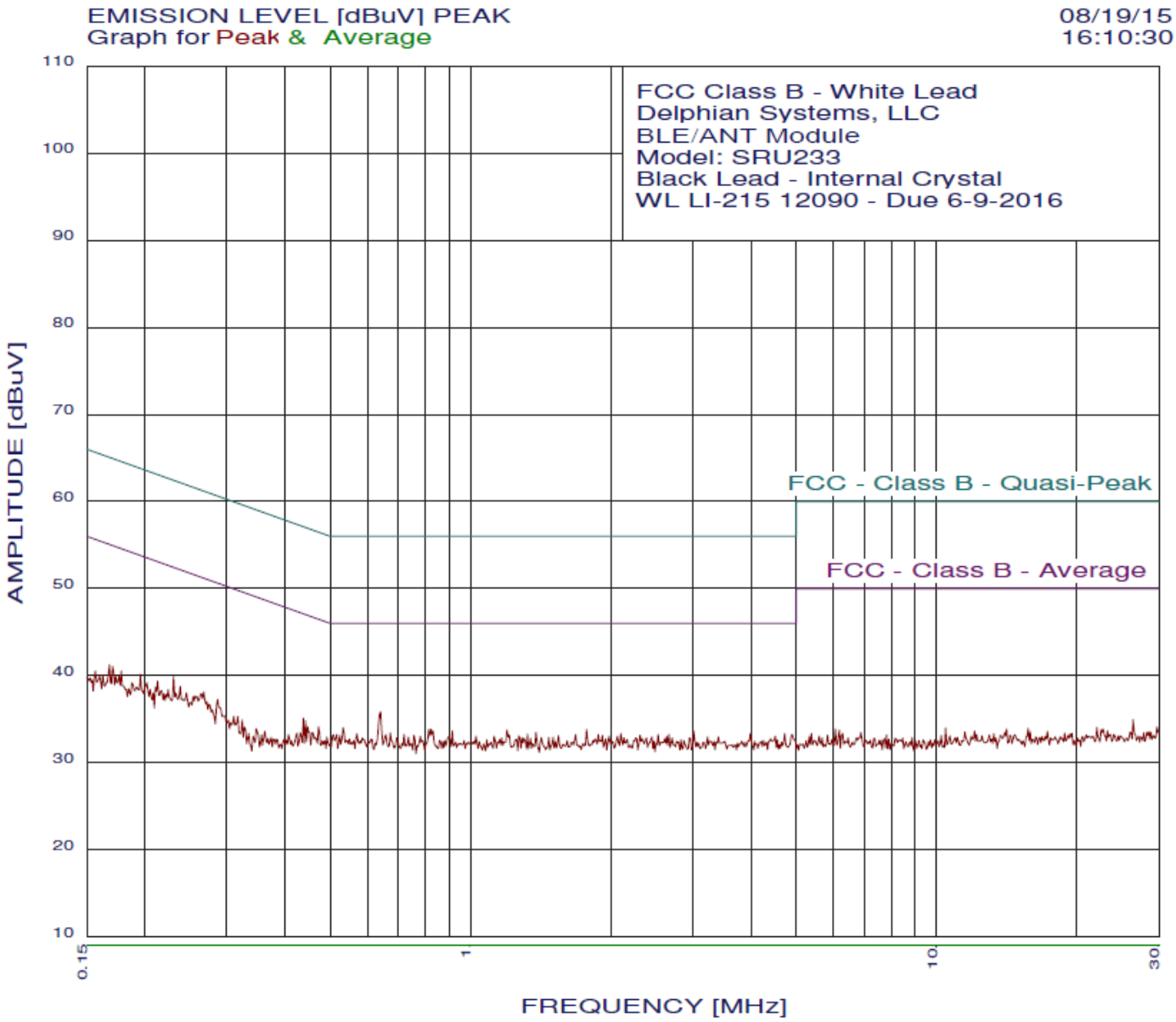
08/19/15 16:06:44

FCC Class B - Black Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - Internal Crystal
BL LI-215 12090 - Due 6-9-2016
Test Engineer : Kenneth Lee

---

40 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.637	35.94	46.00	-10.06
2	0.486	34.24	46.23	-11.99
3	0.605	33.84	46.00	-12.16
4	1.663	33.81	46.00	-12.19
5	0.447	34.73	46.93	-12.20
6	0.592	33.74	46.00	-12.26
7	2.168	33.65	46.00	-12.35
8	4.294	33.64	46.00	-12.36
9	1.512	33.59	46.00	-12.41
10	2.322	33.55	46.00	-12.45
11	4.980	33.54	46.00	-12.46
12	0.995	33.53	46.00	-12.47
13	1.680	33.51	46.00	-12.49
14	1.496	33.49	46.00	-12.51
15	1.160	33.45	46.00	-12.55
16	3.226	33.45	46.00	-12.55
17	1.960	33.45	46.00	-12.55
18	4.672	33.44	46.00	-12.56
19	0.826	33.43	46.00	-12.57
20	1.840	33.43	46.00	-12.57
21	0.481	33.74	46.32	-12.57
22	0.555	33.35	46.00	-12.65
23	3.683	33.34	46.00	-12.66
24	0.683	33.34	46.00	-12.66
25	0.713	33.34	46.00	-12.66
26	4.071	33.34	46.00	-12.66
27	0.895	33.33	46.00	-12.67
28	2.238	33.25	46.00	-12.75
29	3.492	33.24	46.00	-12.76
30	1.083	33.24	46.00	-12.76
31	4.480	33.24	46.00	-12.76
32	1.043	33.24	46.00	-12.76
33	1.800	33.23	46.00	-12.77
34	2.693	33.15	46.00	-12.85
35	1.981	33.15	46.00	-12.85
36	3.027	33.15	46.00	-12.85
37	0.564	33.14	46.00	-12.86
38	1.899	33.14	46.00	-12.86
39	0.881	33.13	46.00	-12.87
40	0.459	33.84	46.71	-12.88


EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
08/19/15
16:10:30
FCC Class B - White Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - Internal Crystal
WL LI-215 12090 - Due 6-9-2016
FCC - Class B - Quasi-Peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]

page 1/1

08/19/15 16:10:30

FCC Class B - White Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - Internal Crystal
WL LI-215 12090 - Due 6-9-2016
Test Engineer : Kenneth Lee

---

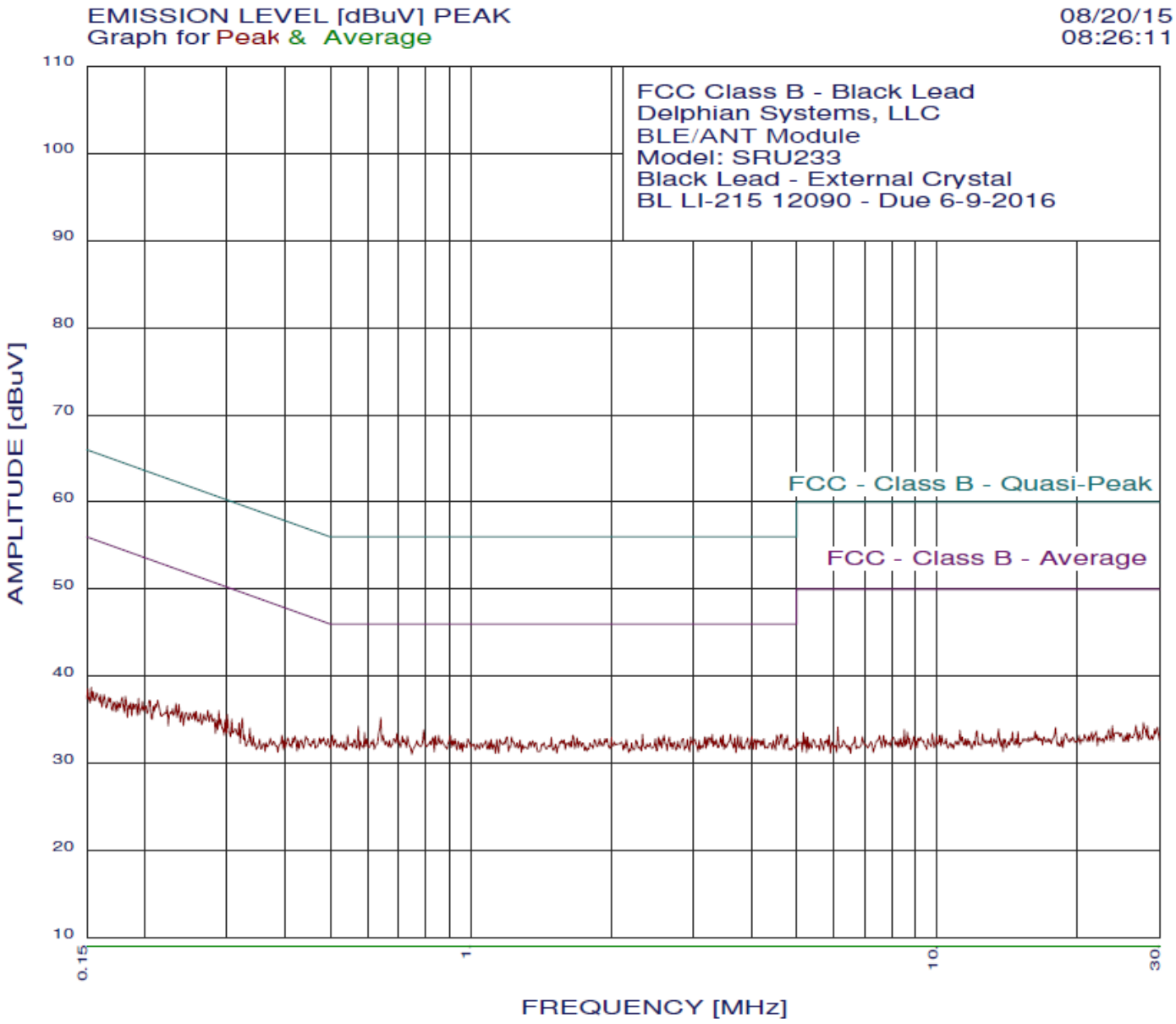
40 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.641	35.83	46.00	-10.17
2	0.532	34.02	46.00	-11.98
3	0.438	35.11	47.11	-11.99
4	0.822	33.83	46.00	-12.17
5	0.814	33.83	46.00	-12.17
6	1.772	33.82	46.00	-12.18
7	0.442	34.82	47.02	-12.20
8	1.197	33.76	46.00	-12.24
9	3.011	33.64	46.00	-12.36
10	0.914	33.63	46.00	-12.37
11	0.831	33.63	46.00	-12.37
12	0.471	34.12	46.49	-12.37
13	1.382	33.48	46.00	-12.52
14	0.230	39.88	52.43	-12.55
15	0.672	33.43	46.00	-12.57
16	2.100	33.35	46.00	-12.65
17	3.987	33.35	46.00	-12.65
18	4.722	33.34	46.00	-12.66
19	0.570	33.32	46.00	-12.68
20	1.325	33.27	46.00	-12.73
21	2.527	33.25	46.00	-12.75
22	2.665	33.25	46.00	-12.75
23	4.902	33.24	46.00	-12.76
24	1.879	33.24	46.00	-12.76
25	0.720	33.23	46.00	-12.77
26	0.658	33.23	46.00	-12.77
27	0.516	33.22	46.00	-12.78
28	0.508	33.22	46.00	-12.78
29	1.680	33.21	46.00	-12.79
30	0.447	34.12	46.93	-12.82
31	1.210	33.16	46.00	-12.84
32	2.310	33.15	46.00	-12.85
33	1.918	33.14	46.00	-12.86
34	0.755	33.13	46.00	-12.87
35	0.524	33.12	46.00	-12.88
36	1.544	33.10	46.00	-12.90
37	1.269	33.06	46.00	-12.94
38	2.066	33.05	46.00	-12.95
39	1.124	33.05	46.00	-12.95
40	1.981	33.05	46.00	-12.95

CONDUCTED EMISSIONS

DATA SHEETS

EXTERNAL CRYSTAL


EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
08/20/15
08:26:11
FCC Class B - Black Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - External Crystal
BL LI-215 12090 - Due 6-9-2016
FCC - Class B - Quasi-Peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]

page 1/1

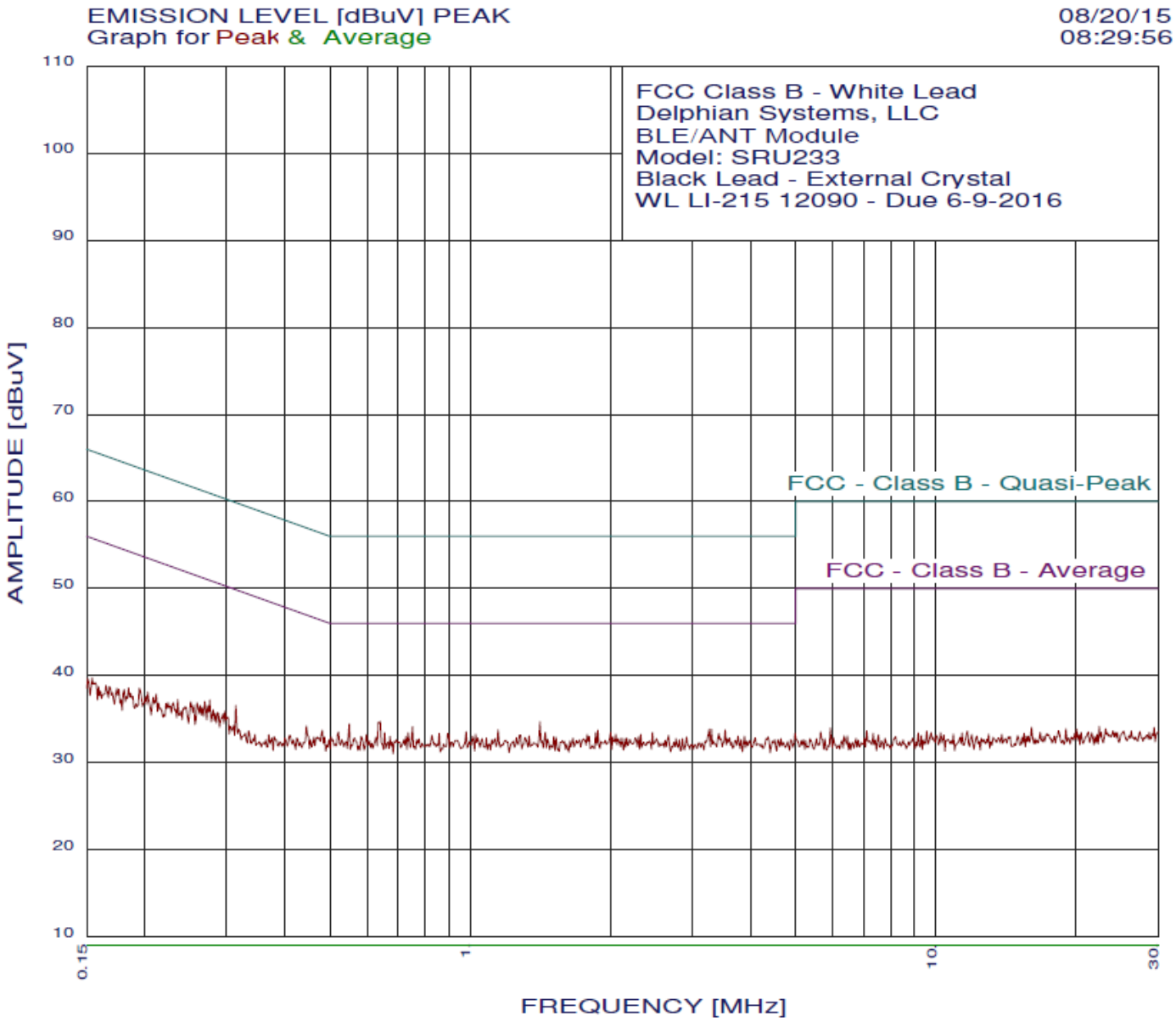
08/20/15 08:26:11

FCC Class B - Black Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - External Crystal
BL LI-215 12090 - Due 6-9-2016
Test Engineer : Kenneth Lee

---

40 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.641	35.24	46.00	-10.76
2	0.573	34.24	46.00	-11.76
3	0.792	33.84	46.00	-12.16
4	0.592	33.54	46.00	-12.46
5	0.694	33.44	46.00	-12.56
6	2.334	33.35	46.00	-12.65
7	3.294	33.35	46.00	-12.65
8	3.605	33.34	46.00	-12.66
9	4.648	33.34	46.00	-12.66
10	2.596	33.25	46.00	-12.75
11	0.505	33.25	46.00	-12.75
12	0.544	33.25	46.00	-12.75
13	3.474	33.24	46.00	-12.76
14	0.648	33.24	46.00	-12.76
15	4.774	33.24	46.00	-12.76
16	3.741	33.24	46.00	-12.76
17	4.528	33.24	46.00	-12.76
18	0.853	33.23	46.00	-12.77
19	0.904	33.23	46.00	-12.77
20	1.654	33.21	46.00	-12.79
21	0.713	33.14	46.00	-12.86
22	0.731	33.14	46.00	-12.86
23	0.839	33.13	46.00	-12.87
24	1.223	33.06	46.00	-12.94
25	1.197	33.06	46.00	-12.94
26	2.527	33.05	46.00	-12.95
27	2.665	33.05	46.00	-12.95
28	2.963	33.05	46.00	-12.95
29	3.175	33.05	46.00	-12.95
30	3.438	33.04	46.00	-12.96
31	3.800	33.04	46.00	-12.96
32	4.008	33.04	46.00	-12.96
33	0.831	33.03	46.00	-12.97
34	1.488	32.99	46.00	-13.01
35	2.002	32.95	46.00	-13.05
36	3.209	32.95	46.00	-13.05
37	3.243	32.95	46.00	-13.05
38	3.683	32.94	46.00	-13.06
39	3.924	32.94	46.00	-13.06
40	1.690	32.91	46.00	-13.09


EMISSION LEVEL [dBuV] PEAK
Graph for Peak & Average
08/20/15
08:29:56
FCC Class B - White Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - External Crystal
WL LI-215 12090 - Due 6-9-2016
FCC - Class B - Quasi-Peak
FCC - Class B - Average
AMPLITUDE [dBuV]
110
100
90
80
70
60
50
40
30
20
10
0.15
1
10
30
FREQUENCY [MHz]

page 1/1

08/20/15 08:29:56

FCC Class B - White Lead
Delphian Systems, LLC
BLE/ANT Module
Model: SRU233
Black Lead - External Crystal
WL LI-215 12090 - Due 6-9-2016
Test Engineer : Kenneth Lee

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40 highest peaks above -50.00 dB of FCC - Class B - Average limit line
Peak criteria : 0.10 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.641	34.73	46.00	-11.27
2	1.412	34.68	46.00	-11.32
3	0.550	34.42	46.00	-11.58
4	0.751	34.13	46.00	-11.87
5	3.294	33.84	46.00	-12.16
6	3.260	33.84	46.00	-12.16
7	1.148	33.75	46.00	-12.25
8	3.529	33.75	46.00	-12.25
9	1.879	33.74	46.00	-12.26
10	0.979	33.53	46.00	-12.47
11	0.521	33.52	46.00	-12.48
12	1.449	33.49	46.00	-12.51
13	2.002	33.45	46.00	-12.55
14	2.462	33.45	46.00	-12.55
15	1.859	33.43	46.00	-12.57
16	0.735	33.43	46.00	-12.57
17	0.655	33.43	46.00	-12.57
18	0.481	33.72	46.32	-12.60
19	3.419	33.34	46.00	-12.66
20	4.980	33.34	46.00	-12.66
21	0.895	33.33	46.00	-12.67
22	0.858	33.33	46.00	-12.67
23	2.055	33.25	46.00	-12.75
24	2.322	33.25	46.00	-12.75
25	0.445	34.22	46.98	-12.76
26	1.027	33.24	46.00	-12.76
27	0.598	33.22	46.00	-12.78
28	1.781	33.22	46.00	-12.78
29	1.283	33.17	46.00	-12.83
30	2.665	33.15	46.00	-12.85
31	0.826	33.13	46.00	-12.87
32	1.338	33.07	46.00	-12.93
33	3.882	33.05	46.00	-12.95
34	3.761	33.05	46.00	-12.95
35	1.011	33.03	46.00	-12.97
36	0.728	33.03	46.00	-12.97
37	0.672	33.03	46.00	-12.97
38	1.800	33.03	46.00	-12.97
39	0.583	33.02	46.00	-12.98
40	1.512	32.99	46.00	-13.01
