

*FCC PART 15, SUBPART B and C  
TEST REPORT**for***BLUETOOTH MODULE****MODEL: BT261159**

Prepared for

O'NEIL PRODUCT DEVELOPMENT  
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DATE: DECEMBER 5, 2006

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
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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 endorsement by NVLAP or any other agency of the U.S. Government.

Device Tested: Bluetooth Module  
Model: BT261159  
S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: O'Neil Product Development  
8 Mason  
Irvine, California 92618-2705

Test Dates: April 10; November 28 and 30, 2006

Test Specifications: EMI 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: 2003

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

## SUMMARY OF TEST RESULTS

<i>TEST</i>	<b>DESCRIPTION</b>	<b>RESULTS</b>
1	Conducted RF Emissions, 150 kHz – 30 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.207
2	Spurious Radiated RF Emissions, 30 MHz – 1000 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15 Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209
3	Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 25000 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(d)
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 10 kHz – 25 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (d)
6	20 dB Bandwidth	This test is covered under the Compatible Electronics Report Number: B60411B1.
7	Peak Power Output	This test is covered under the Compatible Electronics Report Number: B60411B1.
8	RF Conducted Antenna Test	This test is covered under the Compatible Electronics Report Number: B60411B1.
9	Carrier Frequency Separation	This test is covered under the Compatible Electronics Report Number: B60411B1.
10	Average Time of Occupancy	This test is covered under the Compatible Electronics Report Number: B60411B1.
11	Peak Power Spectral Density from the Intentional Radiator to the Antenna	This test is covered under the Compatible Electronics Report Number: B60411B1.

**1. PURPOSE**

This document is a Class II Permissive change test report based on the Electromagnetic Interference (EMI) tests performed on the Bluetooth Module Model: BT261159. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the Class B specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

This EUT has the same exact layout and components as the original Bluetooth Module: BT261159, covered under the Compatible Electronics Report Number B60411B1 except for the antenna. Due to this, the direct measurements were covered until the Compatible Electronics Report Number B60411B1.

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

## 2. ADMINISTRATIVE DATA

### 2.1 Location of Testing

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

### 2.2 Traceability Statement

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

### 2.3 Cognizant Personnel

O'Neil Product Development

Ken Carlson	Director of Electrical Engineering
Jonathan Mack	Electrical Design Engineer

Compatible Electronics, Inc.

Kyle Fujimoto	Test Engineer
Michael Christensen	Lab Manager

### 2.4 Date Test Sample was Received

The test sample was received on November 27, 2006.

### 2.5 Disposition of the Test Sample

The sample was returned to O'Neil Product Development on November 30, 2006.

### 2.6 Abbreviations and Acronyms

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

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

### 3. APPLICABLE DOCUMENTS

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

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



#### 4. DESCRIPTION OF TEST CONFIGURATION

##### 4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

The Bluetooth Module Model: BT261159 (EUT) was directly connected to the modular board PCB. The modular board PCB was connected to an AC Adapter via its power port.

Operation of the EUT during the testing

**For the intentional radiator portion of the test:** The EUT used a program that locked one channel at a time so that the low, middle, and high channels could be tested. This allowed the EUT to be in a no hopping mode. The EUT was tested in three orthogonal axis. The carrier was modulated in the same way it would be when the EUT was in its normal frequency hopping mode.

**For the receiver portion of the test:** The EUT used a program that locked one channel at a time so that the low, middle, and high channels could be tested. This allowed the EUT to receive at the same frequency on a continuous basis. The EUT was tested in three orthogonal axis.

**For the unintentional radiator and conducted emission portion of the test:** The EUT used a program that allowed the EUT to function as normal (the channels frequency hopping) on a continuous basis.

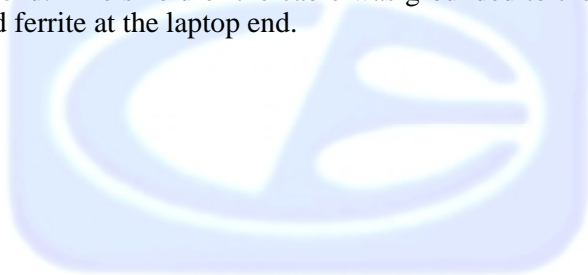
**Note #2:** The D-9 port on the modular board is a diagnostic port only. It was only connected whenever the channel needed to be changed and/or change modes on the EUT.

The final radiated as well as the conducted data was taken in the mode above. Please see Appendix E for the data sheets.

#### 4.1.1 Cable Construction and Termination

**Cable 1** This is a 6 foot unshielded cable connecting the modular board PCB to the AC Adapter. It has a 1/8 inch power connector at the modular board PCB end and is hard wired into the AC Adapter. The cable was bundled to a length of 1 meter.

**Cable 2** **(Only connected when changing channels, not during the actual test)** This is a 6 foot braid and foil shielded cable connecting the modular board PCB to the laptop. It has a D-9 pin metallic connector at each end. The shield of the cable was grounded to the chassis via the connectors. The cable has a molded ferrite at the laptop end.



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

<b>EQUIPMENT</b>	<b>MANUFACTURER</b>	<b>MODEL NUMBER</b>	<b>SERIAL NUMBER</b>	<b>FCC ID</b>
BLUETOOTH MODULE (EUT)	O'NEIL PRODUCT DEVELOPMENT	BT260146	N/A	<b>LGYBT261159</b>
AC ADAPTER FOR PCB MODULE	FAIRWAY ELECTRONICS, COMPANY, LTD.	VE20-120	N/A	N/A
LAPTOP	COMPAQ COMPUTER CORPORATION	ARMADA 1750 6366/T/6400/D/M/3	3J95CJ23M21M	<b>DoC</b>
ANTENNA FOR THE EUT	O'NEIL PRODUCT DEVELOPMENT	261194	N/A	N/A

## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CALIBRATION DATE	CALIBRATION DUE DATE
<b>GENERAL TEST EQUIPMENT USED FOR ALL RF EMISSIONS TESTS</b>					
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
EMI Receiver	Rohde & Schwarz	ESIB40	100194	November 18, 2005	Nov. 18, 2007
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
<b>RF RADIATED EMISSIONS TEST EQUIPMENT</b>					
Radiated Emissions Data Capture Program	Compatible Electronics	2.0	N/A	N/A	N/A
Preamplifier	Com Power	PA-102	1017	January 19, 2006	Jan. 19, 2007
Biconical Antenna	Com-Power	AB-900	15227	March 9, 2006	March 9, 2007
Log Periodic Antenna	Com-Power	AL-100	16060	July 17, 2006	July 17, 2007
Loop Antenna	Com Power	AL-130	17089	September 21, 2005	Sept. 21, 2006
Horn Antenna	Antenna Research	DRG-118/A	1053	March 6, 2006	March 6, 2008
Microwave Preamplifier	Com Power	PA-122	181917	January 20, 2006	Jan. 20, 2007
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Microwave Preamplifier	Com Power	PA-840	711919	January 20, 2006	Jan. 20, 2007
Horn Antenna	Com-Power	AH826	0071957	December 12, 2005	Dec. 12, 2007
<b>RF CONDUCTED EMISSIONS TEST EQUIPMENT</b>					
Emissions Program	Compatible Electronics	2.3 (SR19)	N/A	N/A	N/A
LISN	Com Power	LI-215	12090	September 21, 2006	Sept. 21, 2007
LISN	Com Power	LI-215	12076	September 21, 2006	Sept. 21, 2007
Transient Limiter	Seaward	252A910	K39-0220	September 15, 2006	Sept. 15, 2007

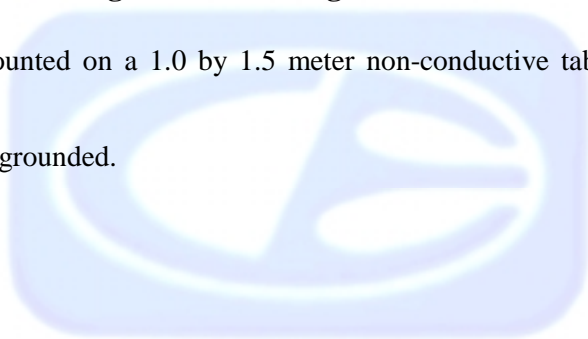
**6. TEST SITE DESCRIPTION****6.1 Test Facility Description**

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

**6.2 EUT Mounting, Bonding and Grounding**

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

The EUT was not grounded.



## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Transmitter Power

Transmit power is herein defined as the power delivered to a 50 ohm load at the RF output of the EUT.

Power	Channel
-3.29 dBm	LOW
-3.10 dBm	MIDDLE
-3.06 dBm	HIGH

### 7.2 Channel Number and Frequencies

There are a total of 79 channels. The low channel is at 2402.0 MHz and the high channel is at 2480.0 MHz. There is a 1 MHz separation between channels.

Channel 1: 2402 MHz  
Channel 2: 2403 MHz  
(Etc.)

### 7.3 Antenna Gain

The antenna has a gain of 1.68 dBi.

## 8. TEST PROCEDURES

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

### 8.1 RF Emissions

#### 8.1.1 Conducted Emissions Test

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

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

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

#### Test Results:

The EUT complies with the **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.

### 8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The 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 was used for frequencies from 30 MHz to 1 GHz, the Com Power Microwave Preamplifier Model: PA-122 was used for frequencies above 1 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used 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.

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

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

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

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

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
10 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 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: 2003. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.



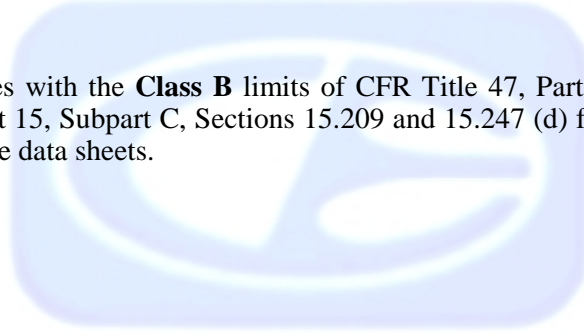
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**Radiated Emissions (Spurious and Harmonics) Test (con't)**

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance from 10 kHz 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.



**8.3 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 30 kHz and the video bandwidth was 100 kHz.

**Test Results:**

This test is covered under the Compatible Electronics Report Number: B60411B1.



**8.4 Peak Output Power**

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

**Test Results:**

This test is covered under the Compatible Electronics Report Number: B60411B1.

**8.5 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:**

This test is covered under the Compatible Electronics Report Number: B60411B1.

## 8.6 RF Band Edges

The RF band edges were taken at the edges of the ISM spectrum (2400 MHz when the EUT was on the low channel and 2483.5 MHz when the EUT was on the high channel) using the EMI Receiver. A preamplifier was used to boost the signal level, with the plots being taken at a 3 meter test distance. The radiated emissions test procedure as describe in section 8.2 of this test report was used to maximize the emission.

### Test Results:

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

## 8.7 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 1 MHz. The frequency span was wide enough to include the peaks of two adjacent channels.

### Test Results:

This test is covered under the Compatible Electronics Report Number: B60411B1.

## 8.8 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 1 MHz, and the video bandwidth was 1 MHz. The frequency span was wide enough to include all of the peaks in the frequency band of operation.

### Test Results:

This test is covered under the Compatible Electronics Report Number: B60411B1.

## 8.9 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 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 a 31.6 second period (0.4 seconds \* 79 channels).

The sweep time was then changed to 2 seconds and the number of pulses taken. The number of pulses was then multiplied by 15.8 to determine the number of pulses in a 31.6 second period. The number of pulses in a 31.6 second period was then multiplied by the time for each pulse to determine the average time of occupancy.

### **Test Results:**

This test is covered under the Compatible Electronics Report Number: B60411B1.

**8.10 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 is covered under the Compatible Electronics Report Number: B60411B1.



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**9. CONCLUSIONS**

The Bluetooth Module Model: BT261159 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 RECOGNITIONS***

---

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

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

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

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



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## ***LABORATORY RECOGNITIONS***

### **Compatible Electronics has the following agency accreditations:**

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

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

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

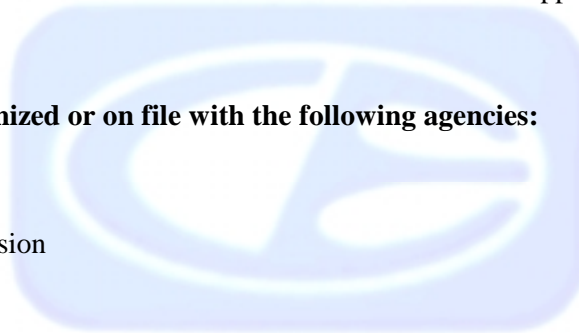
Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

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

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)



**APPENDIX B**

***MODIFICATIONS TO THE EUT***

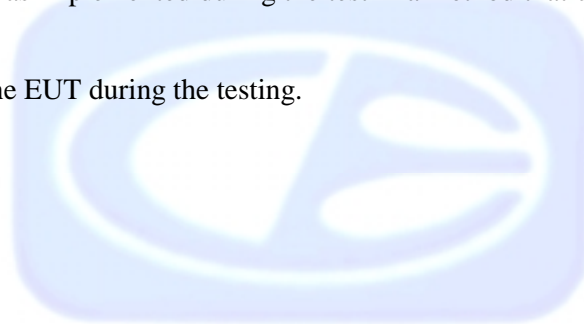
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## **MODIFICATIONS TO THE EUT**

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

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

No modifications were made to the EUT during the testing.





**APPENDIX C**

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

---

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

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

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

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

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

USED FOR THE PRIMARY TEST

Bluetooth Module  
Model: BT261159  
S/N: N/A

There were no additional models covered under this report.

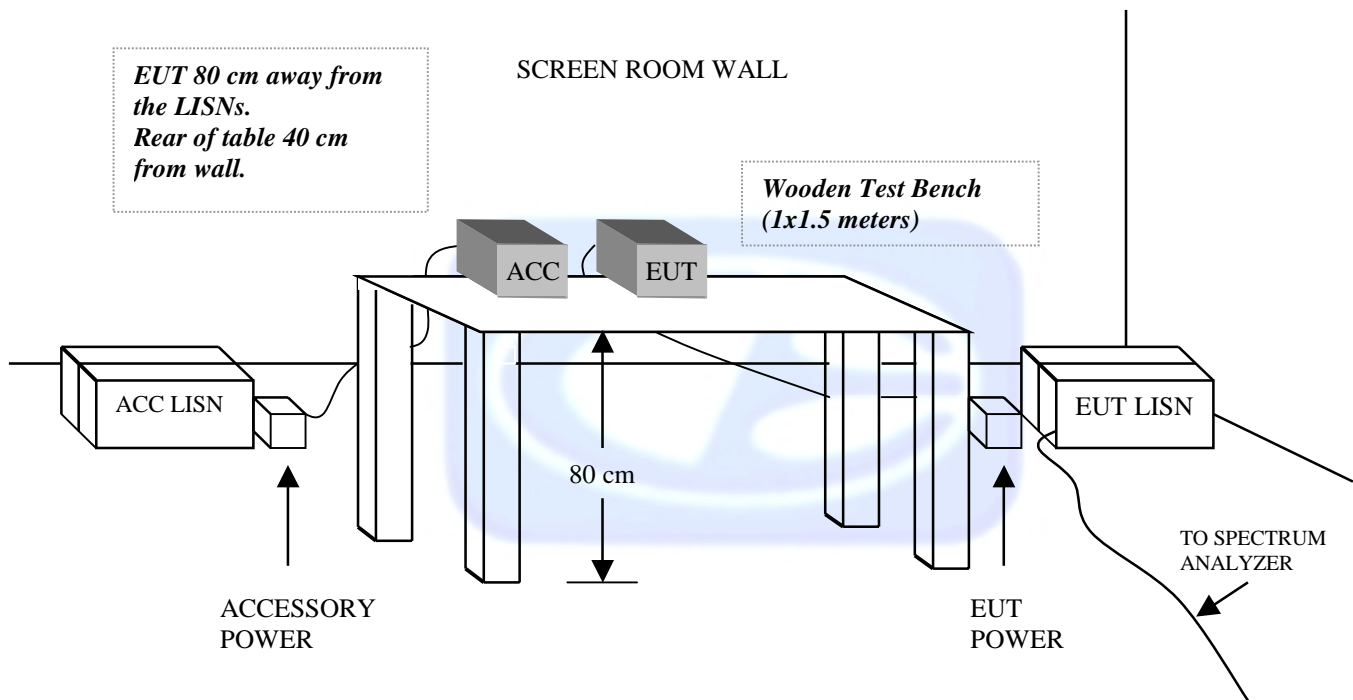




**APPENDIX D**

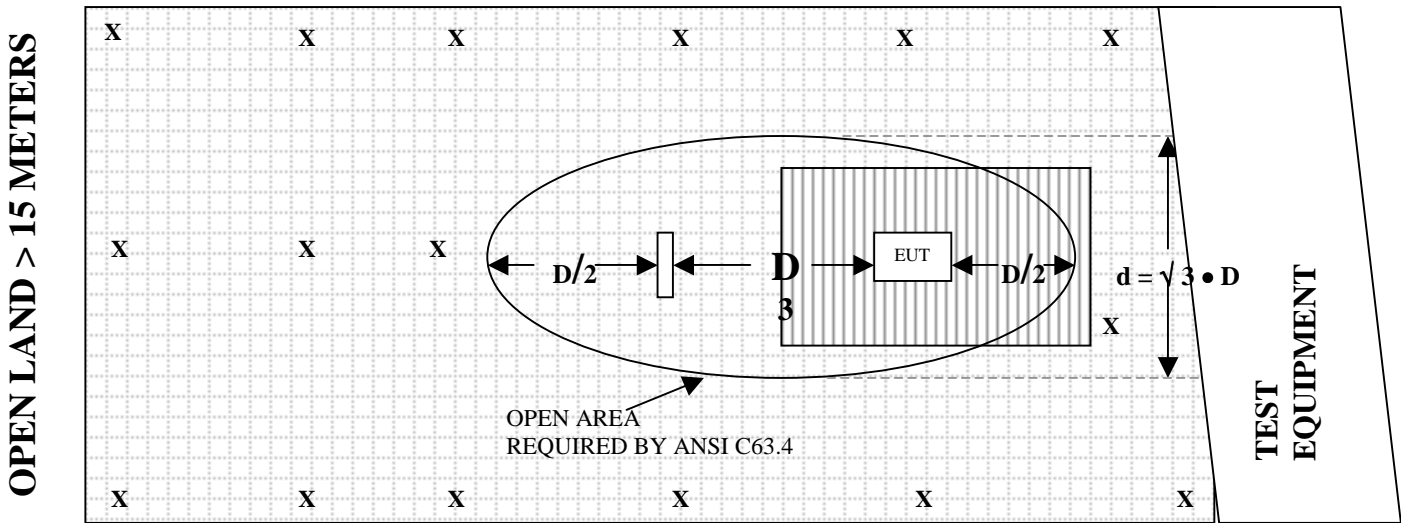
***DIAGRAMS, CHARTS, AND PHOTOS***

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**



**FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE**

**OPEN LAND > 15 METERS**



**OPEN LAND > 15 METERS**

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



COM-POWER AB-900

BICONICAL ANTENNA

S/N: 15227

CALIBRATION DATE: MARCH 9, 2006

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
30	11.12	120	13.50
35	10.17	125	12.63
40	9.75	140	12.20
45	12.22	150	11.85
50	13.28	160	13.25
60	11.36	175	15.74
70	7.95	180	16.23
80	5.95	200	16.79
90	7.62	250	16.47
100	10.89	300	17.49

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

S/N: 16060

CALIBRATION DATE: JULY 17, 2006

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
300	13.58	700	20.49
400	14.53	800	20.13
500	15.36	900	22.15
600	18.29	1000	22.76

**COM-POWER PA-102****PREAMPLIFIER**

S/N: 1017

CALIBRATION DATE: JANUARY 19, 2006

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
30	38.3	300	38.4
40	38.4	350	38.4
50	38.3	400	38.0
60	38.4	450	38.1
70	38.5	500	37.5
80	38.4	550	38.0
90	38.4	600	38.0
100	38.4	650	37.7
125	38.1	700	37.7
150	38.5	750	37.7
175	38.4	800	37.0
200	38.3	850	37.2
225	38.3	900	36.6
250	38.1	950	36.3
275	38.3	1000	36.3

**COM-POWER PA-122****PREAMPLIFIER**

S/N: 181917

CALIBRATION DATE: JANUARY 20, 2006

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
1.0	34.697	10.0	36.558
1.5	33.817	10.5	35.048
2.0	33.587	11.0	33.258
2.5	33.804	11.5	32.960
3.0	33.850	12.0	33.312
3.5	33.943	12.5	33.836
4.0	34.399	13.0	34.178
4.5	34.847	13.5	34.197
5.0	35.172	14.0	33.769
5.5	35.383	14.5	33.392
6.0	35.539	15.0	33.387
6.5	34.802	15.5	34.038
7.0	33.793	16.0	34.884
7.5	33.511	16.5	35.740
8.0	33.910	17.0	35.341
8.5	34.907	17.5	34.729
9.0	36.036	18.0	33.760
9.5	36.661		

**ANTENNA RESEARCH DRG-118/A****HORN ANTENNA**

S/N: 1053

CALIBRATION DATE: MARCH 6, 2006

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
1.0	24.46	10.0	39.55
1.5	25.05	10.5	39.86
2.0	28.42	11.0	38.49
2.5	29.91	11.5	40.71
3.0	31.46	12.0	40.59
3.5	31.91	12.5	40.17
4.0	31.55	13.0	39.70
4.5	31.94	13.5	40.84
5.0	32.90	14.0	41.58
5.5	34.07	14.5	45.14
6.0	35.69	15.0	42.20
6.5	33.11	15.5	39.42
7.0	36.51	16.0	38.80
7.5	37.27	16.5	41.08
8.0	37.21	17.0	44.11
8.5	37.16	17.5	46.29
9.0	38.27	18.0	41.61
9.5	39.73		

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

S/N: 711919

CALIBRATION DATE: JANUARY 20, 2006

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
18.0	27.932	29.5	27.310
18.5	28.277	30.0	26.860
19.0	28.500	30.5	27.450
19.5	28.397	31.0	27.448
20.0	28.570	31.5	27.868
20.5	28.183	32.0	27.922
21.0	28.007	32.5	27.866
21.5	27.823	33.0	27.314
22.0	27.747	33.5	27.403
22.5	27.290	34.0	26.687
23.0	27.406	34.5	26.390
23.5	26.508	35.0	26.365
24.0	26.657	35.5	26.347
24.5	27.102	36.0	26.138
25.0	27.742	36.5	26.481
25.5	27.646	37.0	26.236
26.0	27.934	37.5	27.029
26.5	27.976	38.0	27.883
27.0	26.984	38.5	29.021
27.5	26.745	39.0	29.408
28.0	27.075	39.5	28.429
28.5	27.015	39.75	27.704
29.0	27.169	40.0	26.441

**COM-POWER AH826****HORN ANTENNA**

S/N: 71957

CALIBRATION DATE: DECEMBER 12, 2005

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
18.0	32.4	22.5	32.0
18.5	31.4	23.0	32.2
19.0	31.5	23.5	31.2
19.5	30.9	24.0	33.1
20.0	33.1	24.5	33.1
20.5	33.4	25.0	33.4
21.0	32.1	25.5	33.4
21.5	32.5	26.0	32.9
22.0	32.3	26.5	33.6

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

S/N: 17089

CALIBRATION DATE: SEPTEMBER 21, 2005

<b>FREQUENCY (MHz)</b>	<b>MAGNETIC (dB/m)</b>	<b>ELECTRIC (dB/m)</b>
0.009	-42.84	8.66
0.01	-41.93	9.57
0.02	-41.29	10.21
0.05	-42.37	9.13
0.07	-41.8	9.7
0.1	-41.83	9.67
0.2	-44.13	7.37
0.3	-41.73	9.77
0.5	-41.8	9.7
0.7	-41.53	9.97
1	-41.46	10.04
2	-41.14	10.36
3	-41.26	10.24
4	-41.46	10.04
5	-41.10	10.40
10	-40.83	10.67
15	-41.47	10.03
20	-35.44	16.06
25	-42.37	9.13
30	-42.94	8.56





**FRONT VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB B – EXTERNAL ANTENNA

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



**REAR VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB B – EXTERNAL ANTENNA

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



**FRONT VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB B – EXTERNAL ANTENNA

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



**REAR VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB D – EXTERNAL ANTENNA

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



**FRONT VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB B – EXTERNAL ANTENNA

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



**REAR VIEW**

O' NEIL PRODUCT DEVELOPMENT  
BLUETOOTH MODULE  
MODEL: BT261159

FCC SUBPART B and C – RADIATED EMISSIONS – LAB B – EXTERNAL ANTENNA

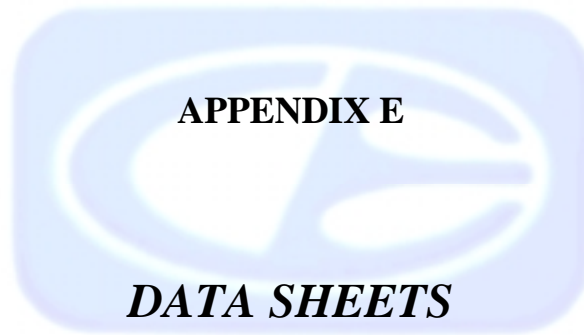
**PHOTOGRAPH SHOWING THE EUT CONFIGURATION  
FOR MAXIMUM EMISSIONS**

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

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

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

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



***CONDUCTED EMISISSONS***

***DATA SHEETS***



FCC Conducted Emissions  
 O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159 – 115 VAC  
 FCC Class B – Black Lead  
 Configuration: With the External Antenna – Transmit Mode (Worst Case)  
 Tested By: Kyle Fujimoto



Att 10 dB

INPUT 2

Det

ResBW

Meas T

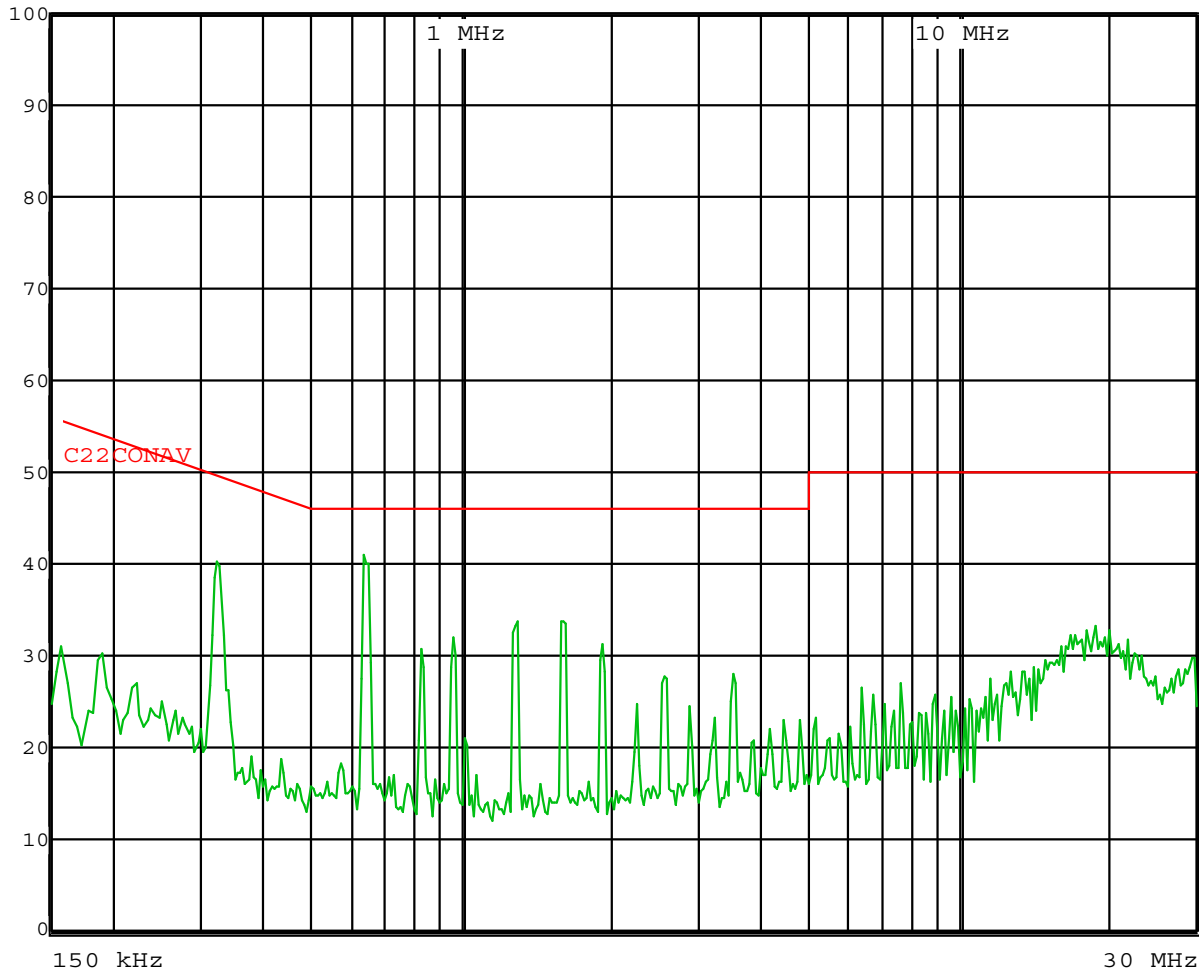
MA Trd

9 kHz

100 ms Unit

Cond

dB(V)



Date: 30.NOV.2006 16:45:10

FCC Conducted Emissions  
 O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159 – 115 VAC  
 FCC Class B – Black Lead  
 Configuration: With the External Antenna – Transmit Mode (Worst Case)  
 Tested By: Kyle Fujimoto

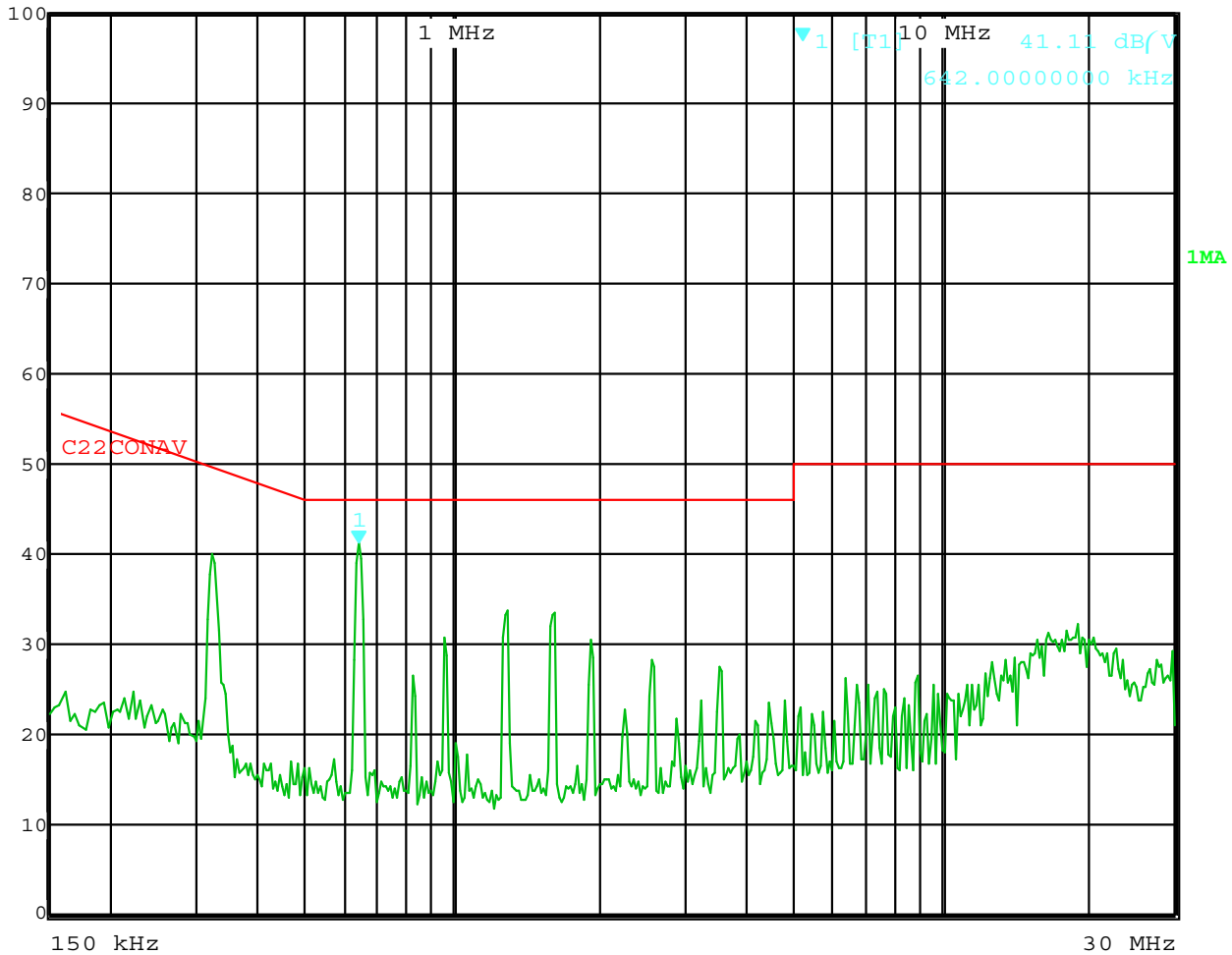
EDIT PEAK LIST (Final Results)				
Trace1: C22CONAV		Trace2: ---		
Trace3: ---		Trace4: ---		
TRACE	FREQUENCY	LEVEL dB(V)	DELTA LIMIT dB	
1 Max Peak	158.0000 kHz	30.97	-24.59	
1 Max Peak	190.0000 kHz	30.19	-23.83	
1 Max Peak	250.0000 kHz	24.87	-26.88	
1 Max Peak	322.0000 kHz	40.06	-9.59	
1 Max Peak	430.0000 kHz	18.58	-28.66	
1 Max Peak	438.0000 kHz	17.22	-29.87	
1 Max Peak	638.0000 kHz	40.82	-5.17	
1 Max Peak	726.0000 kHz	16.82	-29.18	
1 Max Peak	958.0000 kHz	31.84	-14.15	
1 Max Peak	1.0180 MHz	20.85	-25.15	
1 Max Peak	1.2940 MHz	33.56	-12.43	
1 Max Peak	1.5940 MHz	33.71	-12.28	
1 Max Peak	1.9140 MHz	31.01	-14.98	
1 Max Peak	2.5700 MHz	27.55	-18.45	
1 Max Peak	3.5380 MHz	27.94	-18.05	
1 Max Peak	4.1780 MHz	21.77	-24.23	
1 Max Peak	4.4620 MHz	22.99	-23.00	
1 Max Peak	6.3820 MHz	26.29	-23.70	
1 Max Peak	7.6660 MHz	26.84	-23.16	
1 Max Peak	8.9460 MHz	25.51	-24.48	

Date: 30.NOV.2006 16:45:52

FCC Conducted Emissions  
 O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159 – 115 VAC  
 FCC Class B – White Lead  
 Configuration: With the External Antenna – Transmit Mode (Worst Case)  
 Tested By: Kyle Fujimoto



Att 10 dB	Marker 1 [T1]	Det	MA Trd	Cond
INPUT 2	41.11 dB/V	ResBW	9 kHz	
	642.0000000 kHz	Meas T	100 ms Unit	dB/V



Date: 30.NOV.2006 16:47:08

FCC Conducted Emissions  
 O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159 – 115 VAC  
 FCC Class B – White Lead  
 Configuration: With the External Antenna – Transmit Mode (Worst Case)  
 Tested By: Kyle Fujimoto

EDIT PEAK LIST (Final Results)				
Trace1: C22CONAV		Trace2: ---		
Trace3: ---		Trace4: ---		
TRACE	FREQUENCY	LEVEL dB(V)	DELTA LIMIT dB	
1 Max Peak	162.0000 kHz	24.53	-30.83	
1 Max Peak	222.0000 kHz	24.65	-28.08	
1 Max Peak	278.0000 kHz	22.11	-28.76	
1 Max Peak	322.0000 kHz	39.82	-9.83	
1 Max Peak	354.0000 kHz	18.62	-30.24	
1 Max Peak	482.0000 kHz	16.70	-29.59	
1 Max Peak	642.0000 kHz	41.11	-4.88	
1 Max Peak	694.0000 kHz	15.77	-30.23	
1 Max Peak	958.0000 kHz	30.56	-15.43	
1 Max Peak	1.0180 MHz	18.98	-27.01	
1 Max Peak	1.2940 MHz	33.56	-12.43	
1 Max Peak	1.6180 MHz	33.32	-12.67	
1 Max Peak	1.9180 MHz	30.36	-15.63	
1 Max Peak	2.5540 MHz	28.03	-17.96	
1 Max Peak	3.5420 MHz	27.34	-18.65	
1 Max Peak	4.2020 MHz	21.29	-24.71	
1 Max Peak	4.7900 MHz	23.60	-22.40	
1 Max Peak	6.3900 MHz	26.01	-23.98	
1 Max Peak	7.1220 MHz	25.39	-24.60	
1 Max Peak	8.9460 MHz	26.49	-23.50	

Date: 30.NOV.2006 16:47:37

***RADIATED EMISSIONS***

***DATA SHEETS***

**FCC 15.247**

O'Neil Product Development

Bluetooth Module

Model: BT261159

Configuration: With the External Antenna

Date: 11/29/06

Lab: B

Tested By: Kyle Fujimoto

**Low Channel****Transmit Mode - X-Axis**

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Pol (v/h)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Ant. Height (m)</b>	<b>Table Angle (deg)</b>	<b>Comments</b>
4804	41.85	V	74	-32.15	Peak	1.81	135	
4804	21.85	V	54	-32.15	Avg	1.81	135	
7206	38.41	V	74	-35.59	Peak	1.81	135	
7206	18.41	V	54	-35.59	Avg	1.81	135	
9608		V	--	--	Peak			<b>No Emission Detected</b>
9608		V	--	--	Avg			<b>Detected</b>
12010		V	74	-74	Peak			<b>No Emission Detected</b>
12010		V	54	-54	Avg			<b>Detected</b>
14412		V	74	-74	Peak			<b>No Emission Detected</b>
14412		V	54	-54	Avg			<b>Detected</b>
16814		V	--	--	Peak			<b>No Emission Detected</b>
16814		V	--	--	Avg			<b>Detected</b>
19216		V	74	-74	Peak			<b>No Emission Detected</b>
19216		V	54	-54	Avg			<b>Detected</b>
21618		V	--	--	Peak			<b>No Emission Detected</b>
21618		V	--	--	Avg			<b>Detected</b>
24020		V	--	--	Peak			<b>No Emission Detected</b>
24020		V	--	--	Avg			<b>Detected</b>

**FCC 15.247**

O'Neil Product Development

Bluetooth Module

Model: BT261159

Configuration: With the External Antenna

Date: 11/29/06

Lab: B

Tested By: Kyle Fujimoto

**Low Channel****Transmit Mode - Y-Axis**

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Pol (v/h)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Ant. Height (m)</b>	<b>Table Angle (deg)</b>	<b>Comments</b>
4804	40.23	V	74	-33.77	Peak	1.94	135	
4804	20.23	V	54	-33.77	Avg	1.94	135	
7206	39.95	V	74	-34.05	Peak	1.94	135	
7206	19.95	V	54	-34.05	Avg	1.94	135	
9608		V	--	--	Peak			<b>No Emission Detected</b>
9608		V	--	--	Avg			
12010		V	74	-74	Peak			<b>No Emission Detected</b>
12010		V	54	-54	Avg			
14412		V	74	-74	Peak			<b>No Emission Detected</b>
14412		V	54	-54	Avg			
16814		V	--	--	Peak			<b>No Emission Detected</b>
16814		V	--	--	Avg			
19216		V	74	-74	Peak			<b>No Emission Detected</b>
19216		V	54	-54	Avg			
21618		V	--	--	Peak			<b>No Emission Detected</b>
21618		V	--	--	Avg			
24020		V	--	--	Peak			<b>No Emission Detected</b>
24020		V	--	--	Avg			

**FCC 15.247**

O'Neil Product Development

Bluetooth Module

Model: BT261159

Configuration: With the External Antenna

Date: 11/29/06

Lab: B

Tested By: Kyle Fujimoto

**Low Channel****Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4804	40.96	V	74	-33.04	Peak	1.35	135	
4804	20.96	V	54	-33.04	Avg	1.35	135	
7206	38.75	V	74	-35.25	Peak	2.62	180	
7206	18.75	V	54	-35.25	Avg	2.62	180	
9608		V	--	--	Peak			No Emission
9608		V	--	--	Avg			Detected
12010		V	74	-74	Peak			No Emission
12010		V	54	-54	Avg			Detected
14412		V	74	-74	Peak			No Emission
14412		V	54	-54	Avg			Detected
16814		V	--	--	Peak			No Emission
16814		V	--	--	Avg			Detected
19216		V	74	-74	Peak			No Emission
19216		V	54	-54	Avg			Detected
21618		V	--	--	Peak			No Emission
21618		V	--	--	Avg			Detected
24020		V	--	--	Peak			No Emission
24020		V	--	--	Avg			Detected



**FCC 15.247**

O'Neil Product Development

Bluetooth Module

Model: BT261159

Configuration: With the External Antenna

Date: 11/29/06

Lab: B

Tested By: Kyle Fujimoto

**Low Channel****Transmit Mode - X-Axis**

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Pol (v/h)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Ant. Height (m)</b>	<b>Table Angle (deg)</b>	<b>Comments</b>
4804	38.37	H	74	-35.63	Peak	2.51	315	
4804	18.37	H	54	-35.63	Avg	2.51	315	
7206	39.28	H	74	-34.72	Peak	1.33	135	
7206	19.28	H	54	-34.72	Avg	1.33	135	
9608		H	--	--	Peak			<b>No Emission</b>
9608		H	--	--	Avg			<b>Detected</b>
12010		H	74	-74	Peak			<b>No Emission</b>
12010		H	54	-54	Avg			<b>Detected</b>
14412		H	74	-74	Peak			<b>No Emission</b>
14412		H	54	-54	Avg			<b>Detected</b>
16814		H	--	--	Peak			<b>No Emission</b>
16814		H	--	--	Avg			<b>Detected</b>
19216		H	74	-74	Peak			<b>No Emission</b>
19216		H	54	-54	Avg			<b>Detected</b>
21618		H	--	--	Peak			<b>No Emission</b>
21618		H	--	--	Avg			<b>Detected</b>
24020		H	--	--	Peak			<b>No Emission</b>
24020		H	--	--	Avg			<b>Detected</b>

**FCC 15.247**

O'Neil Product Development

Bluetooth Module

Model: BT261159

Configuration: With the External Antenna

Date: 11/29/06

Lab: B

Tested By: Kyle Fujimoto

**Low Channel****Transmit Mode - Y-Axis**

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Pol (v/h)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Ant. Height (m)</b>	<b>Table Angle (deg)</b>	<b>Comments</b>
4804	37.97	H	74	-36.03	Peak	2.64	135	
4804	17.97	H	54	-36.03	Avg	2.64	135	
7206	38.95	H	74	-35.05	Peak	2.64	135	
7206	18.95	H	54	-35.05	Avg	2.64	135	
9608		H	--	--	Peak			<b>No Emission</b>
9608		H	--	--	Avg			<b>Detected</b>
12010		H	74	-74	Peak			<b>No Emission</b>
12010		H	54	-54	Avg			<b>Detected</b>
14412		H	74	-74	Peak			<b>No Emission</b>
14412		H	54	-54	Avg			<b>Detected</b>
16814		H	--	--	Peak			<b>No Emission</b>
16814		H	--	--	Avg			<b>Detected</b>
19216		H	74	-74	Peak			<b>No Emission</b>
19216		H	54	-54	Avg			<b>Detected</b>
21618		H	--	--	Peak			<b>No Emission</b>
21618		H	--	--	Avg			<b>Detected</b>
24020		H	--	--	Peak			<b>No Emission</b>
24020		H	--	--	Avg			<b>Detected</b>

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Low Channel**  
**Transmit Mode - Z-Axis**

<b>Freq. (MHz)</b>	<b>Level (dBuV)</b>	<b>Pol (v/h)</b>	<b>Limit</b>	<b>Margin</b>	<b>Peak / QP / Avg</b>	<b>Ant. Height (m)</b>	<b>Table Angle (deg)</b>	<b>Comments</b>
4804	39.93	H	74	-34.07	Peak	2.61	45	
4804	19.93	H	54	-34.07	Avg	2.61	45	
7206	39.11	H	74	-34.89	Peak	2.62	180	
7206	19.11	H	54	-34.89	Avg	2.62	180	
9608		H	--	--	Peak			<b>No Emission</b>
9608		H	--	--	Avg			<b>Detected</b>
12010		H	74	-74	Peak			<b>No Emission</b>
12010		H	54	-54	Avg			<b>Detected</b>
14412		H	74	-74	Peak			<b>No Emission</b>
14412		H	54	-54	Avg			<b>Detected</b>
16814		H	--	--	Peak			<b>No Emission</b>
16814		H	--	--	Avg			<b>Detected</b>
19216		H	74	-74	Peak			<b>No Emission</b>
19216		H	54	-54	Avg			<b>Detected</b>
21618		H	--	--	Peak			<b>No Emission</b>
21618		H	--	--	Avg			<b>Detected</b>
24020		H	--	--	Peak			<b>No Emission</b>
24020		H	--	--	Avg			<b>Detected</b>

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Middle Channel**  
**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	39.89	V	74	-34.11	Peak	2.79	135	
4882	19.89	V	54	-34.11	Avg	2.79	135	
7323	40.35	V	74	-33.65	Peak	2.03	135	
7323	20.35	V	54	-33.65	Avg	2.03	135	
9764		V	--	--	Peak			No Emission
9764		V	--	--	Avg			Detected
12205		V	74	-74	Peak			No Emission
12205		V	54	-54	Avg			Detected
14646		V	--	--	Peak			No Emission
14646		V	--	--	Avg			Detected
17087		V	--	--	Peak			No Emission
17087		V	--	--	Avg			Detected
19528		V	74	-74	Peak			No Emission
19528		V	54	-54	Avg			Detected
21969		V	--	--	Peak			No Emission
21969		V	--	--	Avg			Detected
24410		V	74	-74	Peak			No Emission
24410		V	54	-54	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Middle Channel**  
**Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	35.81	V	74	-38.19	Peak	2.03	135	
4882	15.81	V	54	-38.19	Avg	2.03	135	
7323	40.27	V	74	-33.73	Peak	2.03	135	
7323	20.27	V	54	-33.73	Avg	2.03	135	
9764		V	--	--	Peak			No Emission
9764		V	--	--	Avg			Detected
12205		V	74	-74	Peak			No Emission
12205		V	54	-54	Avg			Detected
14646		V	--	--	Peak			No Emission
14646		V	--	--	Avg			Detected
17087		V	--	--	Peak			No Emission
17087		V	--	--	Avg			Detected
19528		V	74	-74	Peak			No Emission
19528		V	54	-54	Avg			Detected
21969		V	--	--	Peak			No Emission
21969		V	--	--	Avg			Detected
24410		V	74	-74	Peak			No Emission
24410		V	54	-54	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Middle Channel**  
**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	41.43	V	74	-32.57	Peak	1.92	135	
4882	21.43	V	54	-32.57	Avg	1.92	135	
7323	39.64	V	74	-34.36	Peak	2.72	180	
7323	19.64	V	54	-34.36	Avg	2.72	180	
9764		V	--	--	Peak			No Emission
9764		V	--	--	Avg			Detected
12205		V	74	-74	Peak			No Emission
12205		V	54	-54	Avg			Detected
14646		V	--	--	Peak			No Emission
14646		V	--	--	Avg			Detected
17087		V	--	--	Peak			No Emission
17087		V	--	--	Avg			Detected
19528		V	74	-74	Peak			No Emission
19528		V	54	-54	Avg			Detected
21969		V	--	--	Peak			No Emission
21969		V	--	--	Avg			Detected
24410		V	74	-74	Peak			No Emission
24410		V	54	-54	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Middle Channel**  
**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4882	38.41	H	74	-35.59	Peak	2.17	135	
4882	18.41	H	54	-35.59	Avg	2.17	135	
7323	38.65	H	74	-35.35	Peak	2.32	135	
7323	18.65	H	54	-35.35	Avg	2.32	135	
9764		H	--	--	Peak			<b>No Emission</b>
9764		H	--	--	Avg			<b>Detected</b>
12205		H	74	-74	Peak			<b>No Emission</b>
12205		H	54	-54	Avg			<b>Detected</b>
14646		H	--	--	Peak			<b>No Emission</b>
14646		H	--	--	Avg			<b>Detected</b>
17087		H	--	--	Peak			<b>No Emission</b>
17087		H	--	--	Avg			<b>Detected</b>
19528		H	74	-74	Peak			<b>No Emission</b>
19528		H	54	-54	Avg			<b>Detected</b>
21969		H	--	--	Peak			<b>No Emission</b>
21969		H	--	--	Avg			<b>Detected</b>
24410		H	74	-74	Peak			<b>No Emission</b>
24410		H	54	-54	Avg			<b>Detected</b>







**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**High Channel**  
**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	41.42	V	74	-32.58	Peak	3.81	90	
4960	21.42	V	54	-32.58	Avg	3.81	90	
7440	39.95	V	74	-34.05	Peak	1.77	45	
7440	19.95	V	54	-34.05	Avg	1.77	45	
9920		V	--	--	Peak			No Emission
9920		V	--	--	Avg			Detected
12400		V	74	-74	Peak			No Emission
12400		V	54	-54	Avg			Detected
14880		V	--	--	Peak			No Emission
14880		V	--	--	Avg			Detected
17360		V	--	--	Peak			No Emission
17360		V	--	--	Avg			Detected
19840		V	74	-74	Peak			No Emission
19840		V	54	-54	Avg			Detected
22320		V	74	-74	Peak			No Emission
22320		V	54	-54	Avg			Detected
24800		V	--	--	Peak			No Emission
24800		V	--	--	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**High Channel  
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	36.75	V	74	-37.25	Peak	3.09	135	
4960	16.75	V	54	-37.25	Avg	3.09	135	
7440	40.58	V	74	-33.42	Peak	2.26	135	
7440	20.58	V	54	-33.42	Avg	2.26	135	
9920		V	--	--	Peak			Not in Restricted Band
9920		V	--	--	Avg			Not in Restricted Band
12400		V	74	-74	Peak			<b>No Emission Detected</b>
12400		V	54	-54	Avg			
14880		V	--	--	Peak			<b>No Emission Detected</b>
14880		V	--	--	Avg			
17360		V	--	--	Peak			<b>No Emission Detected</b>
17360		V	--	--	Avg			
19840		V	74	-74	Peak			<b>No Emission Detected</b>
19840		V	54	-54	Avg			
22320		V	74	-74	Peak			<b>No Emission Detected</b>
22320		V	54	-54	Avg			
24800		V	--	--	Peak			<b>No Emission Detected</b>
24800		V	--	--	Avg			

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**High Channel**  
**Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	43.46	V	74	-30.54	Peak	3.58	105	
4960	23.46	V	54	-30.54	Avg	3.58	105	
7440	41.64	V	74	-32.36	Peak	1.87	90	
7440	21.64	V	54	-32.36	Avg	1.87	90	
9920		V	--	--	Peak			No Emission
9920		V	--	--	Avg			Detected
12400		V	74	-74	Peak			No Emission
12400		V	54	-54	Avg			Detected
14880		V	--	--	Peak			No Emission
14880		V	--	--	Avg			Detected
17360		V	--	--	Peak			No Emission
17360		V	--	--	Avg			Detected
19840		V	74	-74	Peak			No Emission
19840		V	54	-54	Avg			Detected
22320		V	74	-74	Peak			No Emission
22320		V	54	-54	Avg			Detected
24800		V	--	--	Peak			No Emission
24800		V	--	--	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**High Channel**  
**Transmit Mode - X-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	38.86	H	74	-35.14	Peak	2.79	135	
4960	18.86	H	54	-35.14	Avg	2.79	135	
7440	41.05	H	74	-32.95	Peak	2.08	135	
7440	21.05	H	54	-32.95	Avg	2.08	135	
9920		H	--	--	Peak			No Emission
9920		H	--	--	Avg			Detected
12400		H	74	-74	Peak			No Emission
12400		H	54	-54	Avg			Detected
14880		H	--	--	Peak			No Emission
14880		H	--	--	Avg			Detected
17360		H	--	--	Peak			No Emission
17360		H	--	--	Avg			Detected
19840		H	74	-74	Peak			No Emission
19840		H	54	-54	Avg			Detected
22320		H	74	-74	Peak			No Emission
22320		H	54	-54	Avg			Detected
24800		H	--	--	Peak			No Emission
24800		H	--	--	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**High Channel  
 Transmit Mode - Y-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	37.68	H	74	-36.32	Peak	1.98	45	
4960	17.68	H	54	-36.32	Avg	1.98	45	
7440	40.75	H	74	-33.25	Peak	1.98	225	
7440	20.75	H	54	-33.25	Avg	1.98	225	
9920		H	--	--	Peak			No Emission
9920		H	--	--	Avg			Detected
12400		H	74	-74	Peak			No Emission
12400		H	54	-54	Avg			Detected
14880		H	--	--	Peak			No Emission
14880		H	--	--	Avg			Detected
17360		H	--	--	Peak			No Emission
17360		H	--	--	Avg			Detected
19840		H	74	-74	Peak			No Emission
19840		H	54	-54	Avg			Detected
22320		H	74	-74	Peak			No Emission
22320		H	54	-54	Avg			Detected
24800		H	--	--	Peak			No Emission
24800		H	--	--	Avg			Detected

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

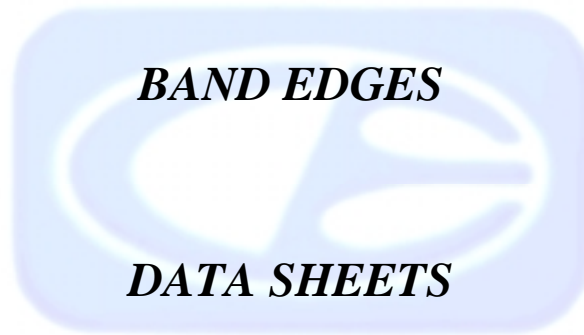
**High Channel  
 Transmit Mode - Z-Axis**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
4960	42.32	H	74	-31.68	Peak	3.15	135	
4960	22.32	H	54	-31.68	Avg	3.15	135	
7440	39.42	H	74	-34.58	Peak	3.15	225	
7440	19.42	H	54	-34.58	Avg	3.15	225	
9920		H	--	--	Peak			No Emission
9920		H	--	--	Avg			Detected
12400		H	74	-74	Peak			No Emission
12400		H	54	-54	Avg			Detected
14880		H	--	--	Peak			No Emission
14880		H	--	--	Avg			Detected
17360		H	--	--	Peak			No Emission
17360		H	--	--	Avg			Detected
19840		H	74	-74	Peak			No Emission
19840		H	54	-54	Avg			Detected
22320		H	74	-74	Peak			No Emission
22320		H	54	-54	Avg			Detected
24800		H	--	--	Peak			No Emission
24800		H	--	--	Avg			Detected









**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

**Low Channel - 2402 MHz**  
**Middle Channel - 2441 MHz**  
**High Channel - 2480 MHz**

**Y-Axis - Worst Case**

Freq. (MHz)	Level (dBUV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	86.78	V	--	--	Peak	1.68	135	Fundamental of Low Channel @ 3 meters
2333.04	39.02	V	54	-14.98	Peak	1.68	135	No Marker Delta Method Method Used
2441	83.56	V	--	--	Peak	2.93	225	Fundamental of Middle Channel @ 3 meters
2480	86.46	V	--	--	Peak	2.89	135	Fundamental of High Channel @ 3 meters
2483.5	31.99	V	54	-22.01	Peak	2.89	135	No Marker Delta Method Method Used

**FCC 15.247**

O'Neil Product Development  
 Bluetooth Module  
 Model: BT261159  
 Configuration: With the External Antenna

Date: 11/29/06  
 Lab: B  
 Tested By: Kyle Fujimoto

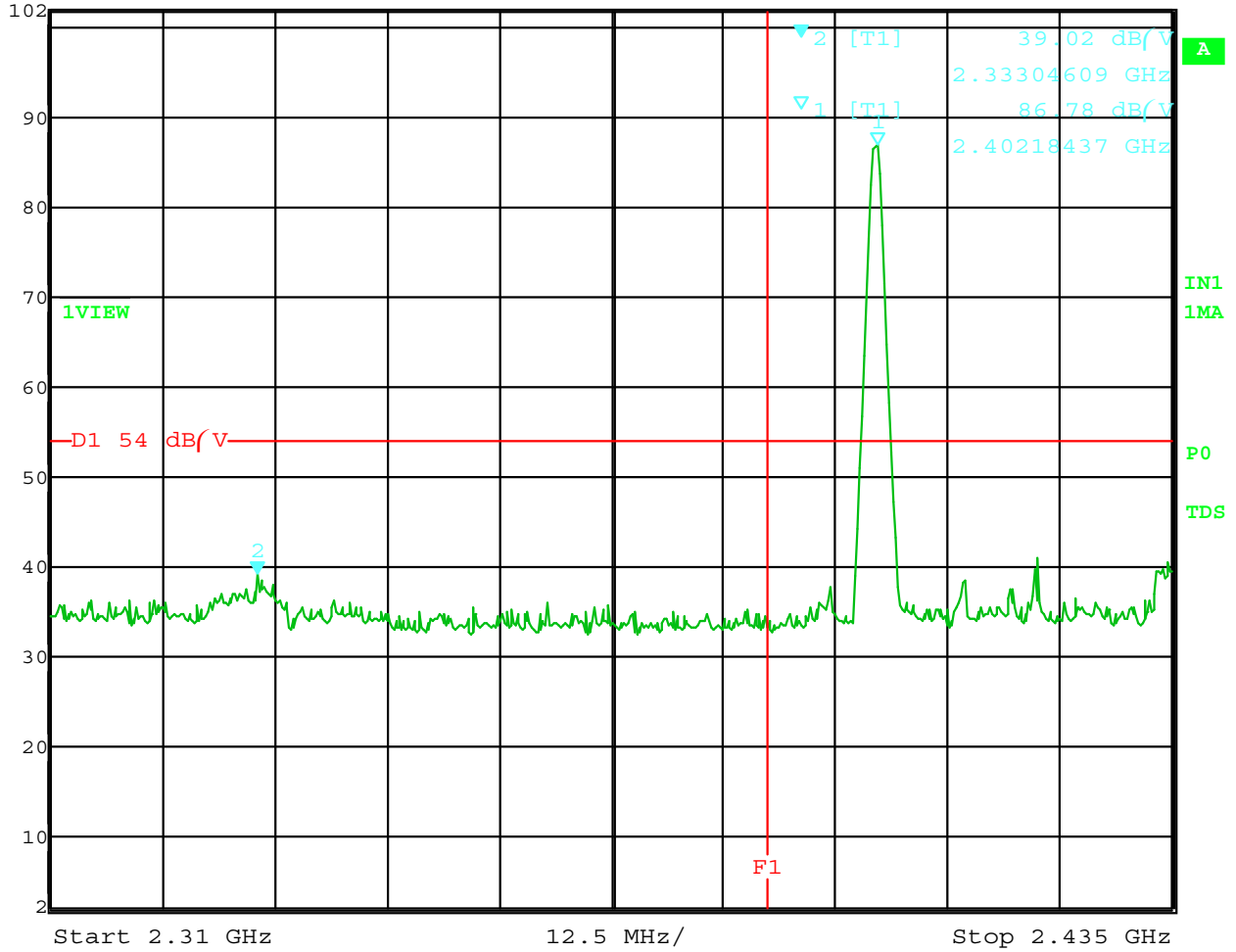
**Low Channel - 2402 MHz**  
**Middle Channel - 2441 MHz**  
**High Channel - 2480 MHz**

**X-Axis - Worst Case**

Freq. (MHz)	Level (dBuV)	Pol (v/h)	Limit	Margin	Peak / QP / Avg	Ant. Height (m)	Table Angle (deg)	Comments
2402	85.99	H	--	--	Peak	2.54	135	Fundamental of Low Channel @ 3 meters
2343.81	37.85	H	54	-16.15	Peak	2.54	135	No Marker Delta Method Method Used
2441	83.83	H	--	--	Peak	2.77	0	Fundamental of Middle Channel @ 3 meters
2480	85.05	H	--	--	Peak	2.68	180	Fundamental of High Channel @ 3 meters
2483.5	31.50	H	54	-22.50	Peak	2.68	180	No Marker Delta Method Method Used



Ref Lvl 102 dB/V  
Marker 2 [T1] 39.02 dB/V  
2.33304609 GHz  
RBW 1 MHz RF Att 10 dB  
VBW 1 MHz  
SWT 5 ms Unit dB/V

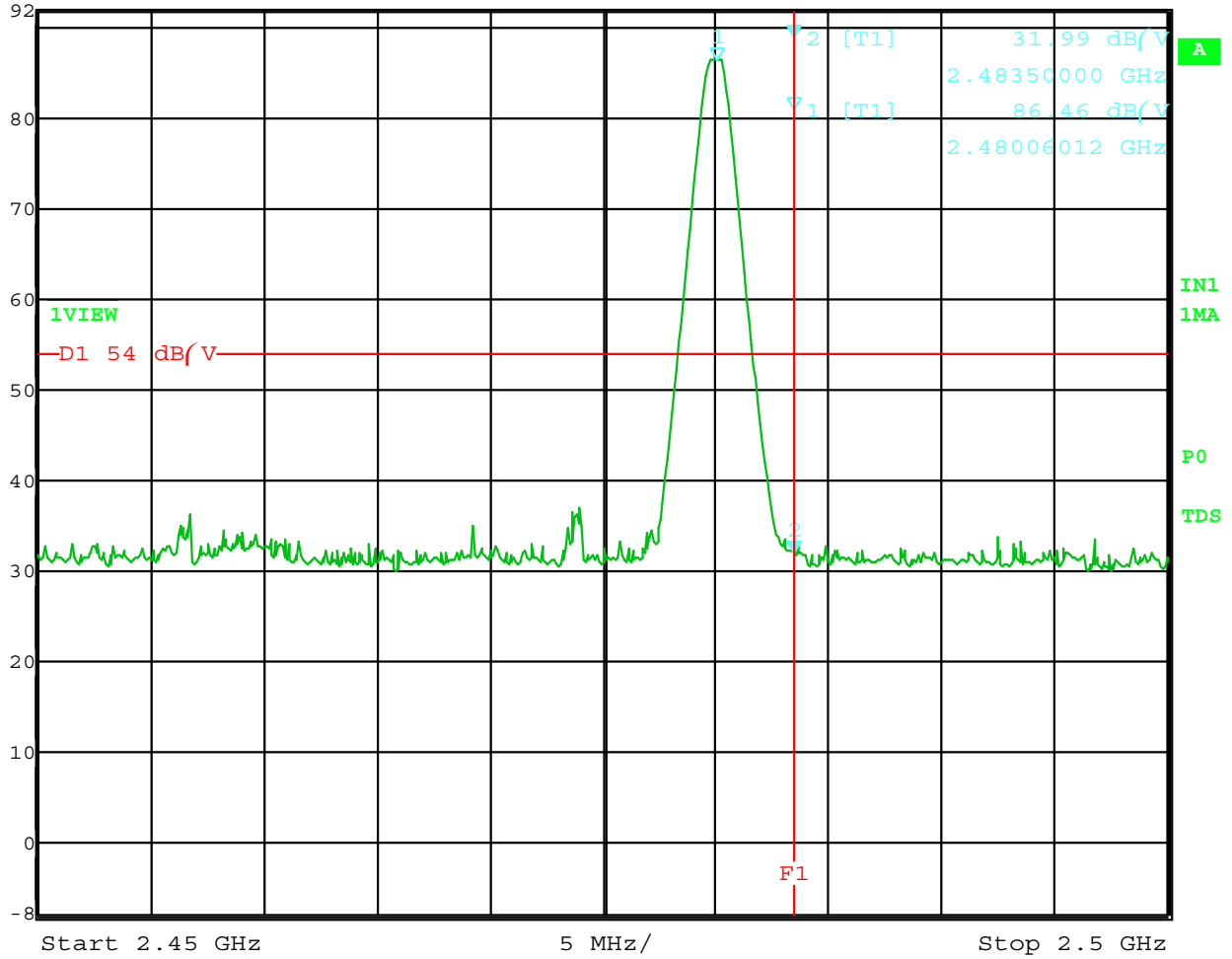


Date: 29.NOV.2006 13:45:22

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



Ref Lvl 92 dB/V  
Marker 2 [T1] 31.99 dB/V  
2.48350000 GHz  
RBW 1 MHz RF Att 0 dB  
VBW 1 MHz  
SWT 5 ms Unit dB/V

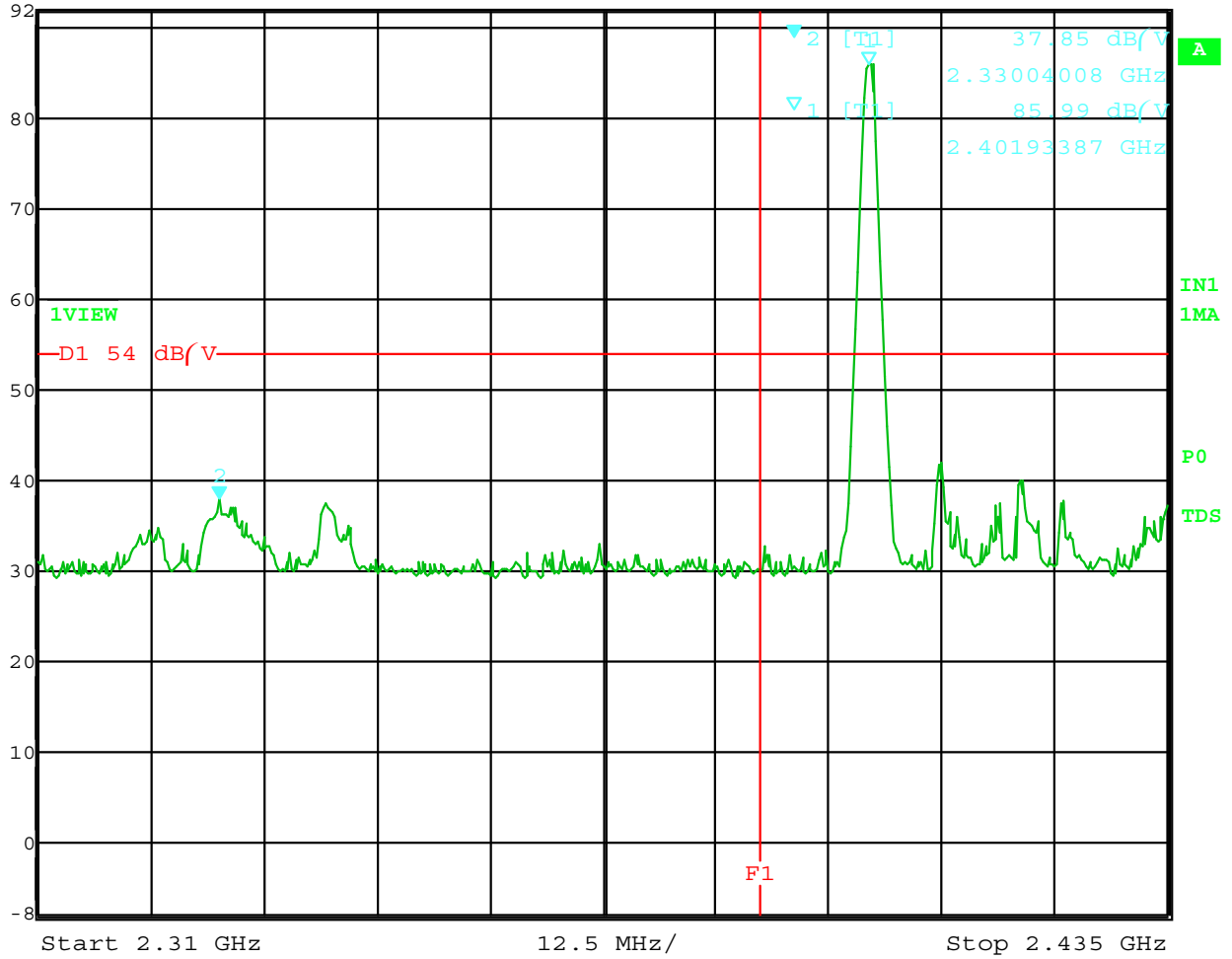


Date: 29.NOV.2006 14:32:32

Band Edge – High Channel – Vertical Polarization – External Antenna – Y-Axis (Worst Case)



Ref Lvl 92 dB/V  
Marker 2 [T1] 37.85 dB/V  
2.33004008 GHz  
RBW 1 MHz RF Att 0 dB  
VBW 1 MHz  
SWT 5 ms Unit dB/V

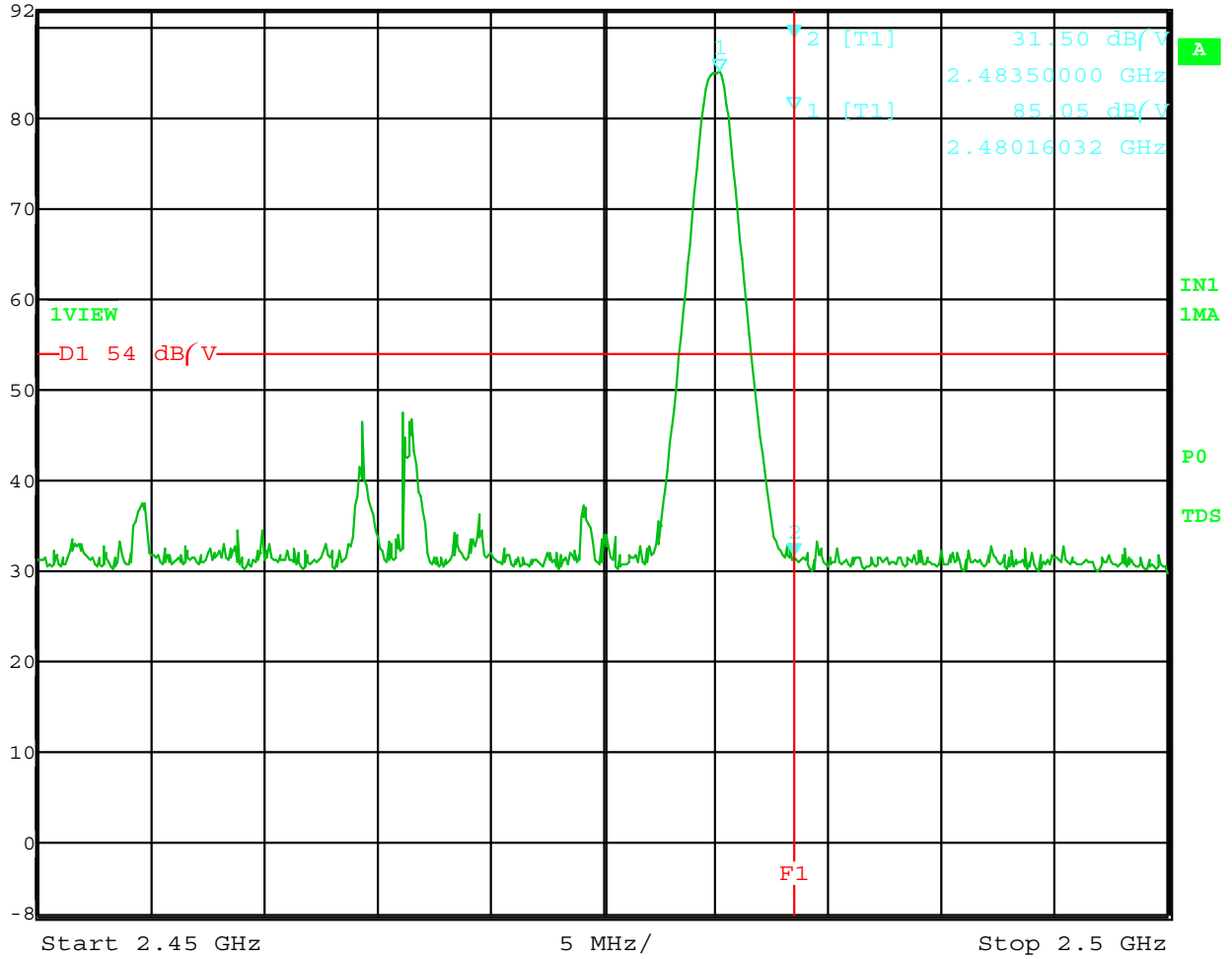


Date: 29.NOV.2006 14:02:36

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



Ref Lvl 92 dB/V  
Marker 2 [T1] 31.50 dB/V  
2.48350000 GHz  
RBW 1 MHz RF Att 0 dB  
VBW 1 MHz  
SWT 5 ms Unit dB/V



Date: 29.NOV.2006 14:52:55

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