Product Integrity Laboratory

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Certification Test Report
CFR 47 FCC Part 15, Subpart C Section 15.247
Industry Canada RSS 210, Issue 6

Novatel Inc DL-V3 GPS Receiver with Bluetooth
FCC ID # UTU010117829
IC # 129A-01017829
Project Code CG-511

(Report CG-511-RA-1-1)
Revision: 1

March 29, 2007

Prepared for: Novatel Inc

Author: Glen Moore
EMC Manager

Approved by: Nick Kobrosly
Lab Manager

Report Summary

NTS Canada

Product Integrity Laboratory
5151-47th Street, N.E. Calgary Alberta T3J 3R2

Accreditation Numbers: FCC 101386
IC 46405-3978 File # IC3978-2
Standards Council of Canada Accredited Laboratory No. 440

Applicant: Novatel Inc
1120 – 68th Avenue N.E
Calgary, Alberta
Canada, T2E 8S5
Tel: 403-295-4940

Customer Representative: Roland Jackman

EUT Description:

EUT Description	Manufacturer	Model	Revision	Serial Number
2.4 GHz Bluetooth compatible Transceiver integrated in host GPS RX system	Novatel Inc	DL-V3	1.00	NBV06460005

Test Summary

Appendix	Test/Requirement Description	Deviations* from:			Pass / Fail	Applicable Rule Parts
		Base Standard	Test Basis	NTS Procedure		
A	TX 6 dB Bandwidth	No	No	No	PASS	FCC Subpart C 15.247
B	TX Peak Power Output	No	No	No	PASS	FCC Subpart C 15.247
C	TX Peak Power Density	No	No	No	PASS	FCC Subpart C 15.247
D	TX Conducted Spurious Emissions	No	No	No	PASS	FCC Subpart C 15.247, 15.205
E	TX Conducted Spurious Emissions Band edge	No	No	No	PASS	FCC Subpart C 15.247, 15.205
F	TX Radiated Spurious Emissions 30 MHz- 25 GHz ,RSS 210 Issue 5 RX Spurious Emissions	No	No	No	PASS	FCC Subpart C 15.247, 15.205, RSS 210
G	Duty Cycle Correction Factor	No	No	No	PASS	15.247
H	Test Equipment List	No	No	No	PASS	

Test Result: The product presented for testing complied with test requirements as shown above.

Prepared By: gmoore Digitally signed by gmoore DN: cn=gmoore, c=US, o=nts, email=glen.moore@ntscorp.com Date: 2007.03.30 13:08:38 -06'00'

Glen Moore
EMC Manager

Reviewed By: Alex Mathews 2007.03.30 11:12:59 -06'00'

Alex Mathews
Compliance Specialist

Approved By: Jennifer Hansen 2007.03.30 13:09:35 -06'00'

Jennifer Hansen
Quality Representative

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Register of revisions

Revision	Date	Description of Revisions
0	March 29, 2007	Draft release for Internal review
1	March 30, 2007	Release to customer/TCB

1.0 INTRODUCTION

1.1 PURPOSE

The purpose of this document is to describe the tests applied by NTS Canada to demonstrate compliance of the DL-V3 from Novatel Inc to FCC Part 15 Subpart C section 15.247 for DTS transmitter and the equivalent sections of Industry Canada's RSS 210, Issue 6

2.0 EUT DESCRIPTION

2.1 CONFIGURATION

Description of EUT

	Name	Model	Revision	Serial Number
EUT	GPS RX with Bluetooth capability	DLV3	1.00	NZH05330006
Classification	Mobile			
Channels/Frequency Range	78 channels, 2402 MHz -2480 MHz			
Functional Description	GPS Survey Receiver with Bluetooth capability			

2.1.1 EUT POWER

Voltage	14.4 VDC
Number of Feeds	1 (1 Hot, 1 Return)

2.2 EUT CABLES

Quantity	Model/Type	Routing		Shielded / Unshielded	Description	Cable Length (m)
		From	To			
1	Power	Power Supply	EUT	Unsheilded	Permanent connection to power supply	1.85
1	Power	Power Supply	AC Mains	Shielded		1.8
1	Serial Data	EUT	PC	Unshielded	DB9 connectors	1.8

2.3 MODE OF OPERATION DURING TESTS

The DL-V3 was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel to perform power, occupied bandwidth, and spurious/harmonic tests. For AC conducted emissions the device was tuned to its center frequency. The EUT continuously transmitted an unpulsed modulated packet with payload. While transmitting the EUT was setup to operate at the intended maximum power output available to the end user. For all test cases pre-scans were completed in all modes to determine worst case levels.

3.0 SUPPORT EQUIPMENT

3.1 CONFIGURATION

NA

3.2 TEST BED/PERIPHERAL CABLES

NA

APPENDICES

APPENDIX A: 6 DB BANDWIDTH

A.1. Base Standard & Test Basis

Base Standard	FCC PART 15.247 (A)
Test Basis	RF conducted as per FCC Publication 558074
Test Method	RF conducted as per FCC Publication 558074

A.2. Specifications

15.247 2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

A.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

A.4. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

A.5. Test Procedure

RF conducted as per FCC Publication 558074

A.6. Test Results

The EUT is in compliance with the limits as specified above

Channel	6 dB Bandwidth (MHz)
2402 MHz	561.12
2441 MHz	561.12
2480 MHz	561.12

A.7. Operating Mode During Test

The DL-V3 was tested while in a continuous transmit mode. The EUT was tuned to a low, middle, and high channel operating at maximum rated RF output power.

A.8. Sample Calculation

NA

A.9. Test Data

See plots on following pages

A.10. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 1 6 dB Bandwidth Low Channel

Figure 2 6 dB Bandwidth Mid Channel

Title: CG-511 Novatel Inc DL-V3
Comment A: 6 dB Bandwidth TX full power on 2441 MHz
Date: 1.MAR.2007 19:36:35

Figure 3 6 dB Bandwidth Upper Channel

Title: CG-511 Novatel Inc DL-V3
Comment A: 6 dB Bandwidth TX full power on 2480 MHz
Date: 1.MAR.2007 19:38:30

APPENDIX B: PEAK POWER OUTPUT

B.1. Base Standard & Test Basis

Base Standard	FCC 15.247
Test Basis	FCC 15.247 RF conducted as per FCC Publication 558074
Test Method	RF conducted as per FCC Publication 558074

B.2. Specifications

The maximum peak output power shall not exceed 30 dBM in the 2400 MHz- 2483.5 MHz band

B.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

B.4. Deviations

Deviation Number	**Time & Date**	**Description and Justification of Deviation**	**Deviation Reference**			**Approval**
			Base Standard	**Test Basis**	**NTS Procedure**	
none						

B.5. Test Method

RF conducted as per FCC Publication 558074

B.6. Test Results

Compliant – The maximum conducted peak power was .78 dBm

B.7. Sample Calculation

None.

B.8. Test Data Summary

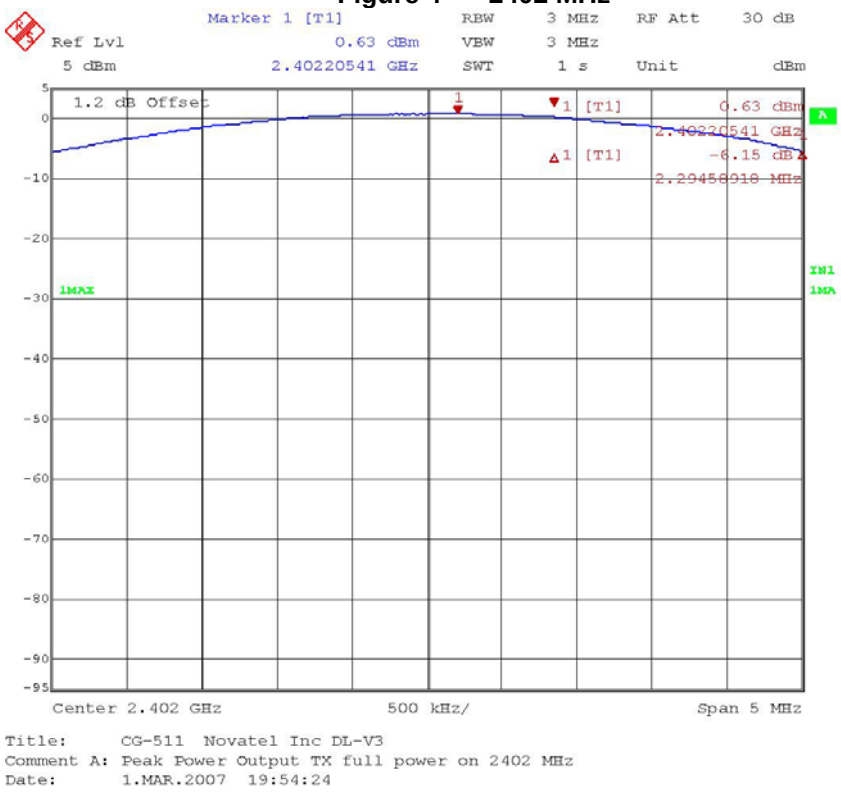
EUT Transmit Channel	Measured Output Power (dBm)
2402 MHz	0.63
2440 MHz	0.66
2480 MHz	0.78

B.9. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

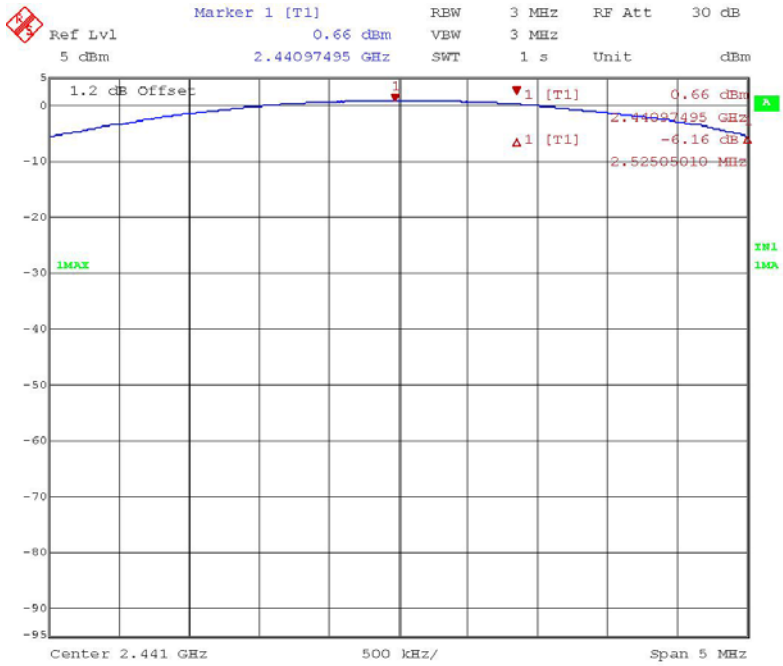
Name: Glen Moore
Function: EMC Manager

Figure 4 2402 MHz



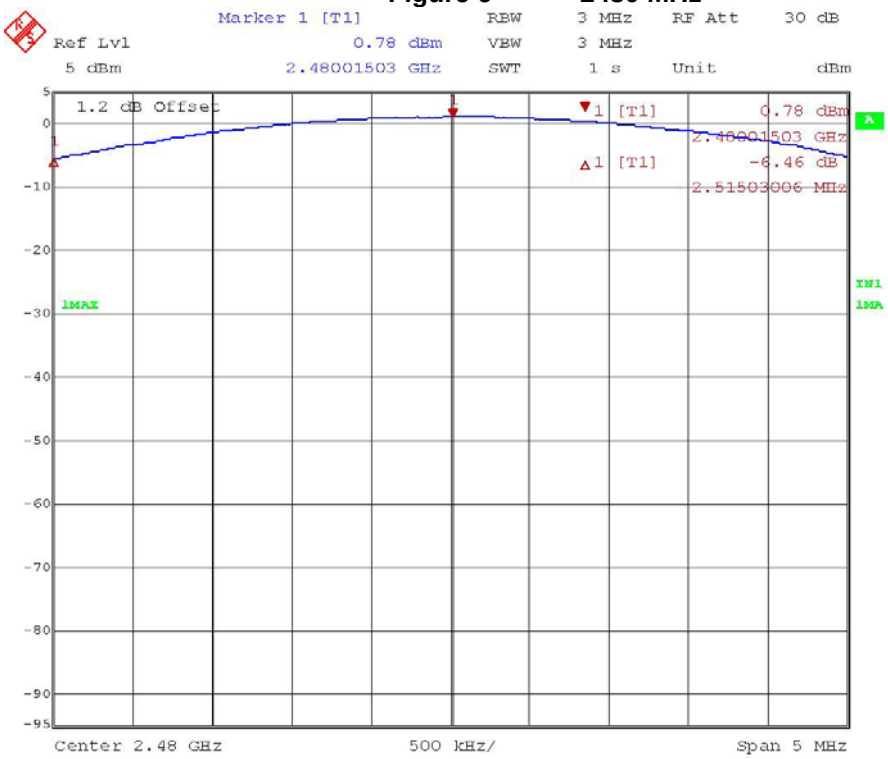
Title: CG-511 Novatel Inc DL-V3
Comment A: Peak Power Output TX full power on 2402 MHz
Date: 1.MAR.2007 19:54:24

Figure 5 2440 MHz



Title: CG-511 Novatel Inc DL-V3
Comment A: Peak Power Output TX full power on 2441 MHz
Date: 1.MAR.2007 19:52:10

Figure 6 2480 MHz



APPENDIX C: PEAK POWER DENSITY

C.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I - FCC Part 15.247 – Radio Frequency Devices - Subpart C– intentional Radiators
Test Basis	RF conducted as per FCC Publication 558074
Test Method	RF conducted as per FCC Publication 558074

C.2. Specifications

15.247 e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

C.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+1.11/-1.22

C.4. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

C.5. Test Method

RF conducted as per FCC Publication 558074

C.6. Test Results

Compliant. The maximum measured Peak Power Density was -.90 dBM

C.7. Deviations from Normal Operating Mode During Test

None.

C.8. Sample Calculation

None.

C.9. Test Data

EUT Transmit Channel	Peak Power Density (dBM)
2402 MHz	.27
2441 MHz	.11
2480 MHz	.01

See plots below.

C.10. Tested By

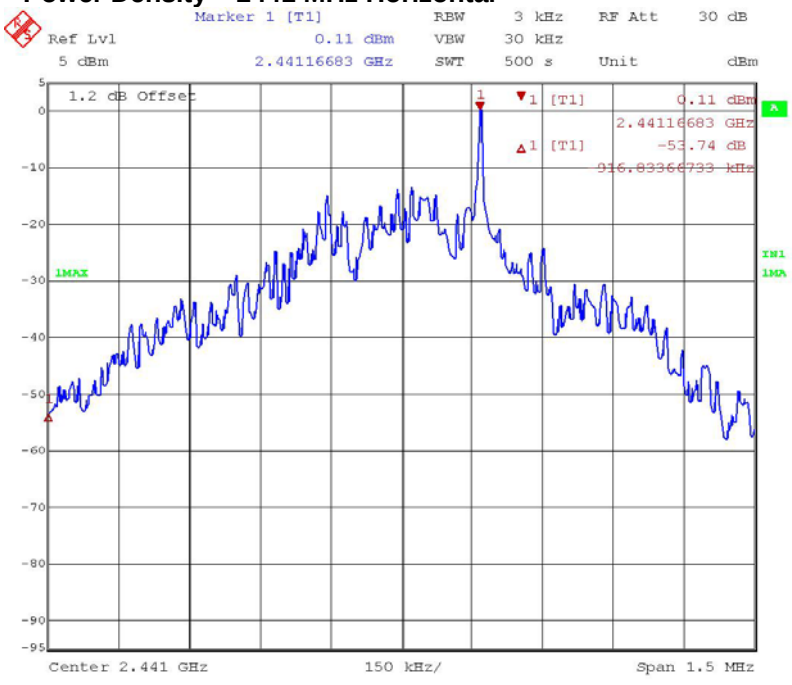
This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 7 Power Density – 2402MHz Horizontal

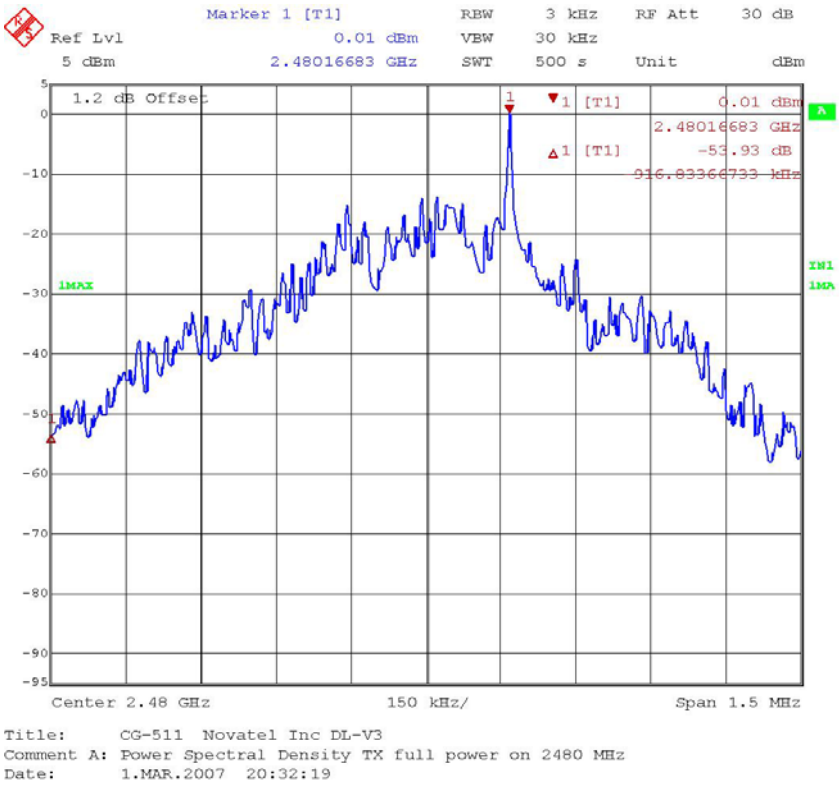
Title: CG-511 Novatel Inc DL-V3
Comment A: Power Spectral Density TX full power on 2402 MHz
Date: 1.MAR.2007 20:07:26

Figure 8 Power Density – 2441 MHz Horizontal



Title: CG-511 Novatel Inc DL-V3
Comment A: Power Spectral Density TX full power on 2441 MHz
Date: 1.MAR.2007 20:22:02

Figure 9 Power Density – 2480 MHz Horizontal



APPENDIX D: CONDUCTED SPURIOUS EMISSIONS

D.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I – FCC Part 15.247 – Radio Frequency Devices - Subpart C– intentional Radiators FCC Part 15.205 Restricted Bands of Operation
Test Basis	RF conducted as per FCC Publication 558074
Test Method	RF conducted as per FCC Publication 558074

D.2. Specifications

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

D.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
1.11/-1.22

D.4. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

D.5. Test Results

Compliant, all peak emissions were more than 20 dB below the in band power.

D.6. Test Data & Photographs

See following pages.

D.7. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name: Glen Moore
Function: EMC Manager

Figure 10 Conducted Spurious 1 MHz- 3 GHz Channel 2402 MHz

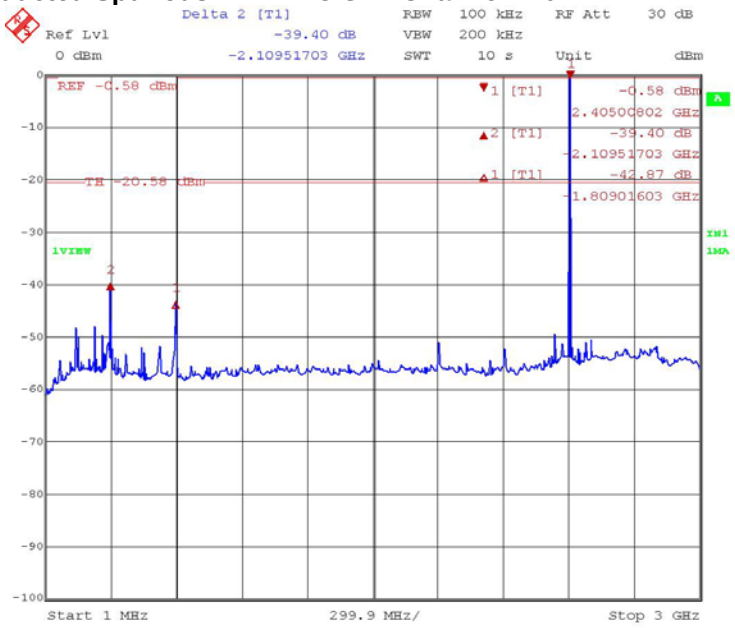


Figure 11 Conducted Spurious 1 MHz-3 GHz Channel 2441 MHz

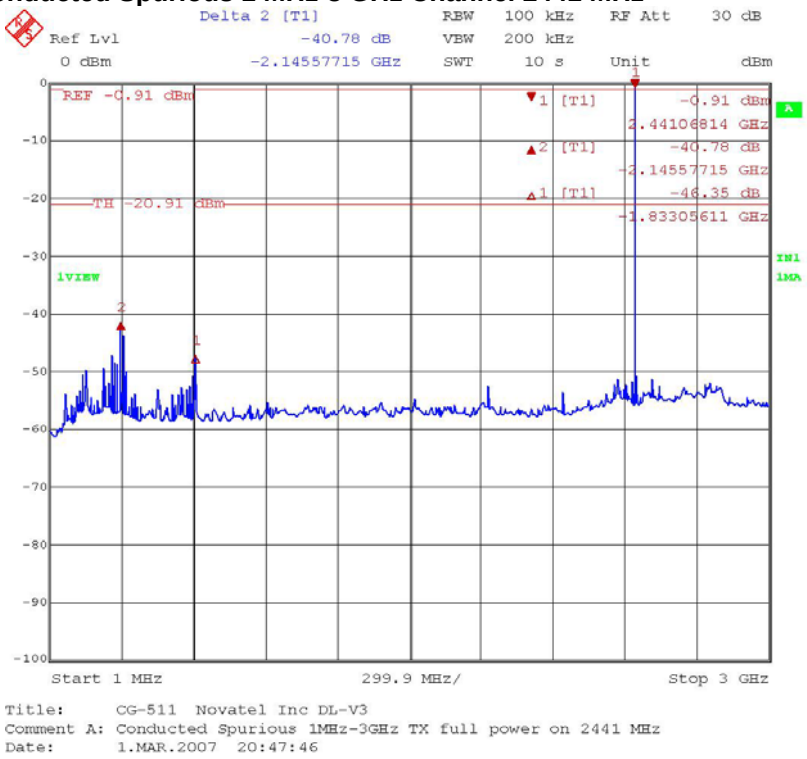
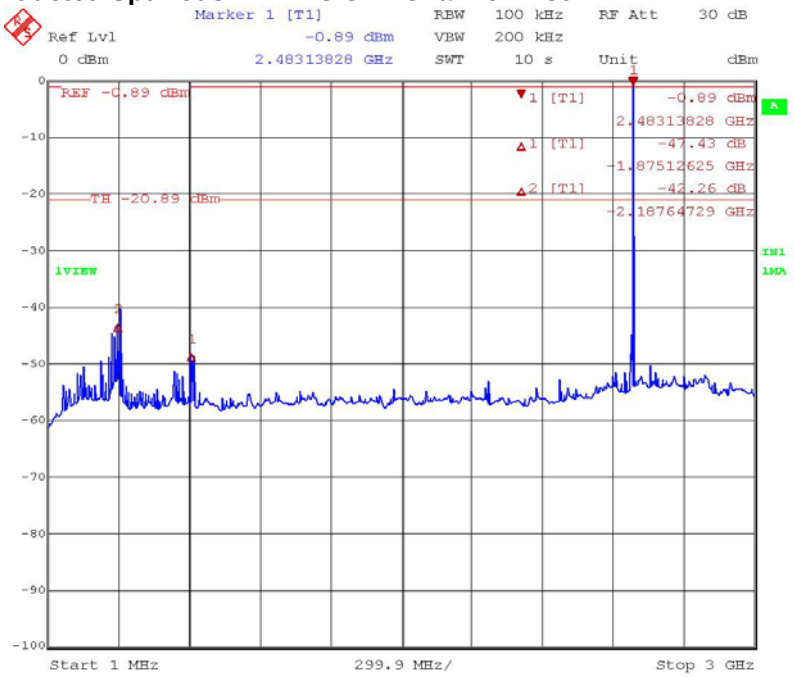
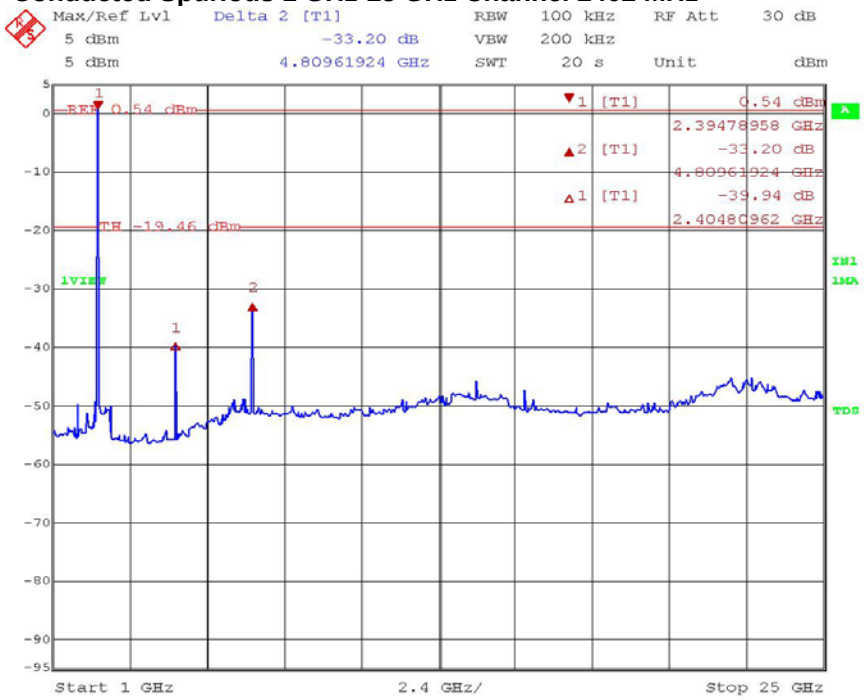


Figure 12 Conducted Spurious 1 MHz-3 GHz Channel 2480 MHz



Title: CG-511 Novatel Inc DL-V3
Comment A: Conducted Spurious 1MHz-3GHz TX full power on 2480 MHz
Date: 1.MAR.2007 20:52:53

Figure 13 Conducted Spurious 1 GHz-25 GHz Channel 2402 MHz



Title: CG 511 Novatel Inc DLV3
Comment A: Conducted Spurious 1-25 GHz TX full power channel 2402 MHz
Date: 1.MAR.2007 21:58:54

Figure 14 Conducted Spurious 1 GHz-25 GHz Channel 2441 MHz

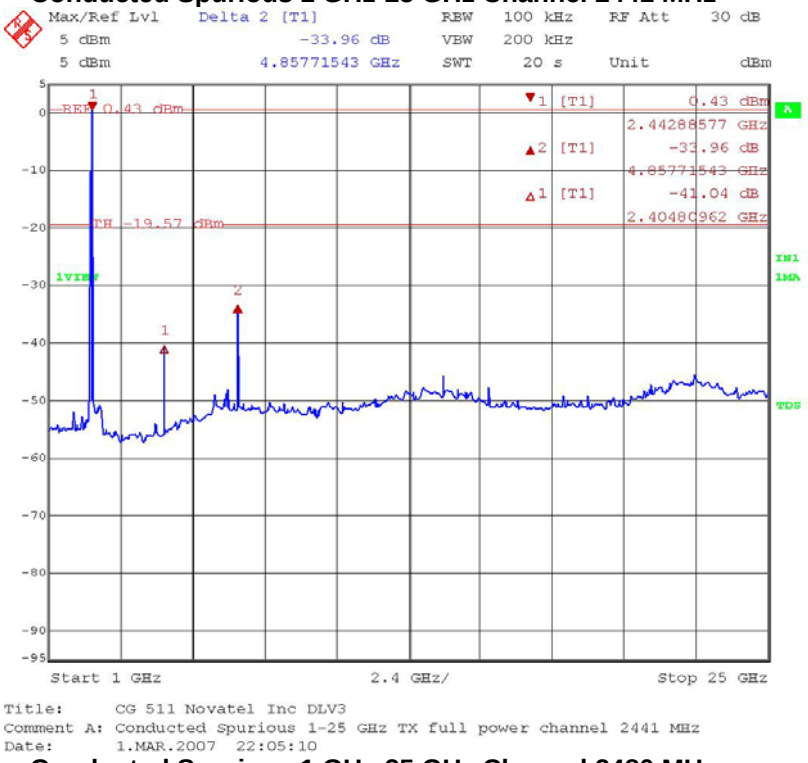
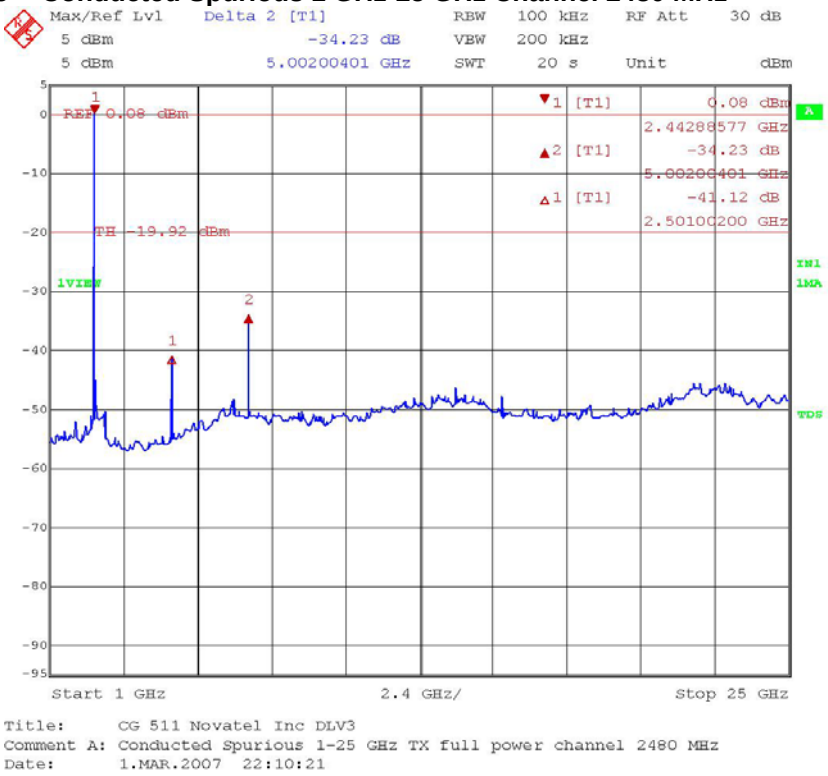


Figure 15 Conducted Spurious 1 GHz-25 GHz Channel 2480 MHz



APPENDIX E: CONDUCTED SPURIOUS EMISSIONS BAND EDGE MEASUREMENTS

E.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I – FCC Part 15.247 – Radio Frequency Devices - Subpart C– intentional Radiators.
Test Basis	RF conducted as per FCC Publication 558074
Test Method	RF conducted as per FCC Publication 558074

E.2. Limits

(d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

E.3. Measurement Uncertainty

Expanded Uncertainty (K=2)
+1.11/-1.22

E.4. Test Results

Compliant. All out of band spurious emissions are more than 20 dB below the in band power of the fundamental.

E.5. Deviations from Normal Operating Mode During Test

None.

E.6. Sample Calculation

NA.

E.7. Test Data

See plots on following pages.

E.8. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.
Name: Glen Moore
Function: EMC Manager

Figure 16 2402 MHz Conducted Band edge Measurement

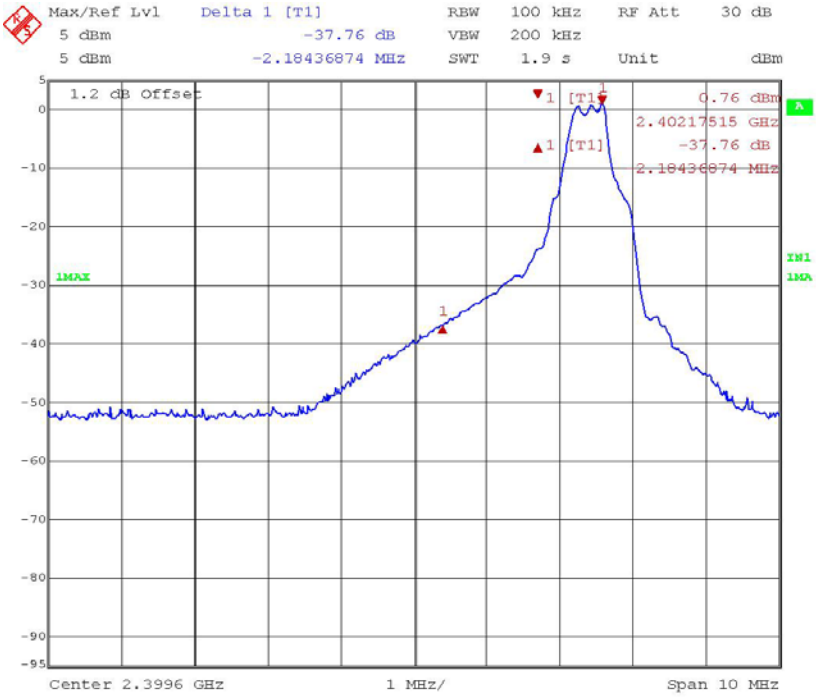
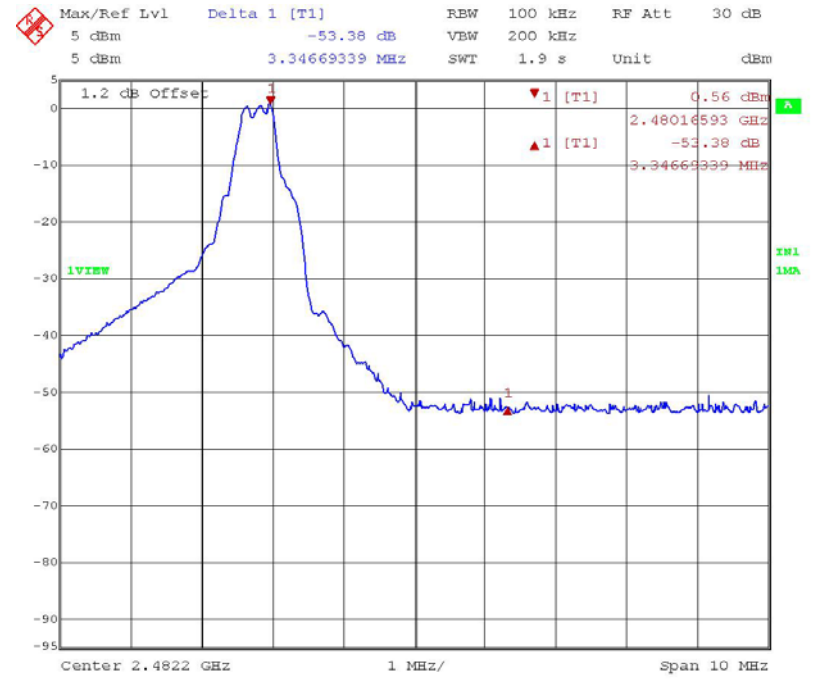


Figure 17 2480 MHz Conducted Band edge Measurement



APPENDIX F: RADIATED SPURIOUS EMISSIONS 30 MHZ – 25 GHZ (TX AND RX)

F.1. Base Standard & Test Basis

Base Standard	CFR Title 47 – Telecommunications, Chapter I - FCC Part 15.209 – Radio Frequency Devices
Test Basis	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
Test Method	NTS Radiated Emissions Test Method E001R7

Specifications

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
\1\ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(\2\)
13.36-13.41			

\1\ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
\2\ Above 38.6

(b) Except as provided in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in §15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in §15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in §15.35 apply to these measurements.

F.2. Measurement Uncertainty

Radiated Emissions 30 MHz – 1 GHz	Measurement Uncertainty	Expanded Uncertainty (K=2)
(dB)	+2.32/-2.36	+4.65/-4.72

F.3. Deviations

Deviation Number	Time & Date	Description and Justification of Deviation	Deviation Reference			Approval
			Base Standard	Test Basis	NTS Procedure	
none						

F.4. Test Results

The EUT is in compliance with FCC CFR47 Part 15.247/15.205/15.209 Radiated emission limits. The worst case emission was 50.89 dBμV/m @ 3 meters @ 4803.48 MHz, a pass margin of 3.11 dB.

Test results 30 MHz – 1GHz

Product Integrity Laboratory V2.5

Project Number: CG-511
Model: DL-V3
Tester: Parminder Singh
Test ID: RE02-10m-366

Standard: FCC15_B
Measurement Distance: <1GHz 10 meters
3 meters

Antenna Polarization	Frequency (MHz)	Measured Level (dBμV)	Measurement Detector	Correction Factors (dB/m)	Emission Level (dBμV/m)	Limit Line	Limit (dBμV/m)	Margin (dB)	Mast Height (cm)	Turntable Angle (degrees)
Horizontal	121.44	20.21	Q.Peak	-13.09	7.12	Q.Peak	33.06	25.94	228.6	210.6
Horizontal	147.98	23.9	Q.Peak	-13.74	10.16	Q.Peak	33.06	22.90	210.6	182.3
Horizontal	550.38	27.02	Q.Peak	-5.86	21.16	Q.Peak	35.56	14.40	182.3	64.1
Vertical	73.61	27.12	Q.Peak	-18.65	8.47	Q.Peak	29.54	21.07	277.7	350.1
Vertical	99.48	41.49	Q.Peak	-15.18	26.30	Q.Peak	33.06	6.76	124	359.8
Vertical	108.49	24.23	Q.Peak	-14.06	10.17	Q.Peak	33.06	22.89	210.8	164.3

Positive Margin indicates a Pass

Test Results 1GHz-25 GHz

Product Integrity Laboratory V2.5

Project Number: CG-511
Model: DL-V3
Comments: Eut transmitting continously on low mid high channels in Bluetooth mode
Tester: Deniz Demerci
Test ID: RE03-10m-511

Standard:FCC 15.247, 15.209, 15.205
Measurement Distance: >1 GHz 3 meters

EUT Channel/Fundamental (MHz)	Emission Frequency (MHz)	Received Emission Level (corrected) (dBμV)	Measurement Detector	Receive Antenna Pol (H/V)	Average Limit (dBμV/m)	Peak Limit (dBμV/m)	Duty cycle Correction Factor (dB)	Final Corrected Emission (dB)	Margin to Pk Limit (dB)	Margin to Ave Limit (dB)	Mast Height (cm)	Turntable Angle (degrees)
2402	4803.48	70.89	Peak	V	54.00	74.00	20.0	50.89	23.11	3.11	144	326
2441	4881.47	69.63	Peak	V	54.00	74.00	20.0	49.63	24.37	4.37	146	328
2480	4959.5	65.22	Peak	V	54.00	74.00	20.0	45.22	28.78	8.78	133	122
2402	7205.03	63.43	Peak	V	54.00	74.00	20.0	43.43	30.57	10.57	183	0
2441	7321.89	63.68	Peak	V	54.00	74.00	20.0	43.68	30.32	10.32	161	0
2480	7439	66.9	Peak	V	54.00	74.00	20.0	46.90	27.10	7.10	164	190
2402	4803.64	54.46	Peak	H	54.00	74.00	20.0	34.46	39.54	19.54	144	326
2441	4881.45	57.28	Peak	H	54.00	74.00	20.0	37.28	36.72	16.72	158	295
2480	4959.46	52.49	Peak	H	54.00	74.00	20.0	32.49	41.51	21.51	149	252
2402	7205.11	54.38	Peak	H	54.00	74.00	20.0	34.38	39.62	19.62	170	217
2441	7322.05	57.45	Peak	H	54.00	74.00	20.0	37.45	36.55	16.55	102	208
2480	7439.04	57.8	Peak	H	54.00	74.00	20.0	37.80	36.20	16.20	168	191

Positive Margin indicates a Pass

F.5. Observations

The EUT was operating in RX and TX mode during this test

F.6. Deviations from Normal Operating Mode During Test

None.

F.7. Sample Calculation

Emission Level = Measured Level + Correction Factors.
Margin = Limit – Emission Level.

F.8. Test Data & Photographs

Plots were not provided in order to reduce file size.

F.9. Tested By

This testing was conducted in accordance with the ISO 17025:1999 scope of accreditation, table 1; Quality Manual.

Name:	Glen Moore	Deniz Demerci	Parminder Singh
Function:	EMC Manager	EMC Tester	EMC Tester

Figure 18 30 MHz- 1GHz Horizontal Polarization

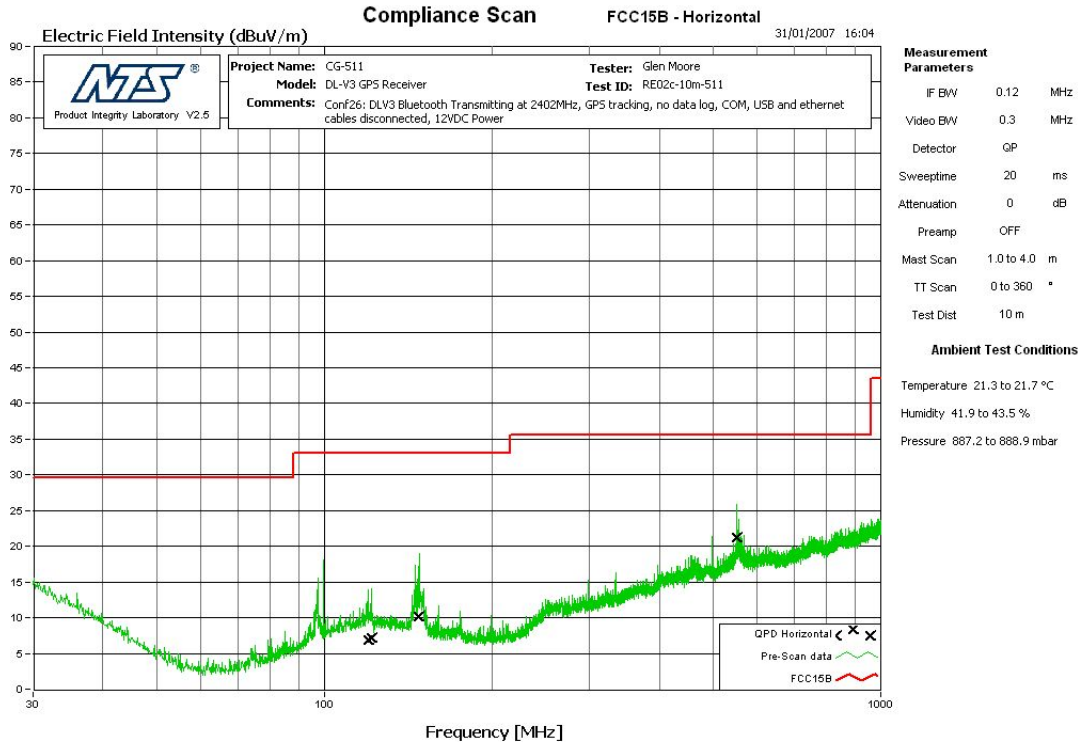
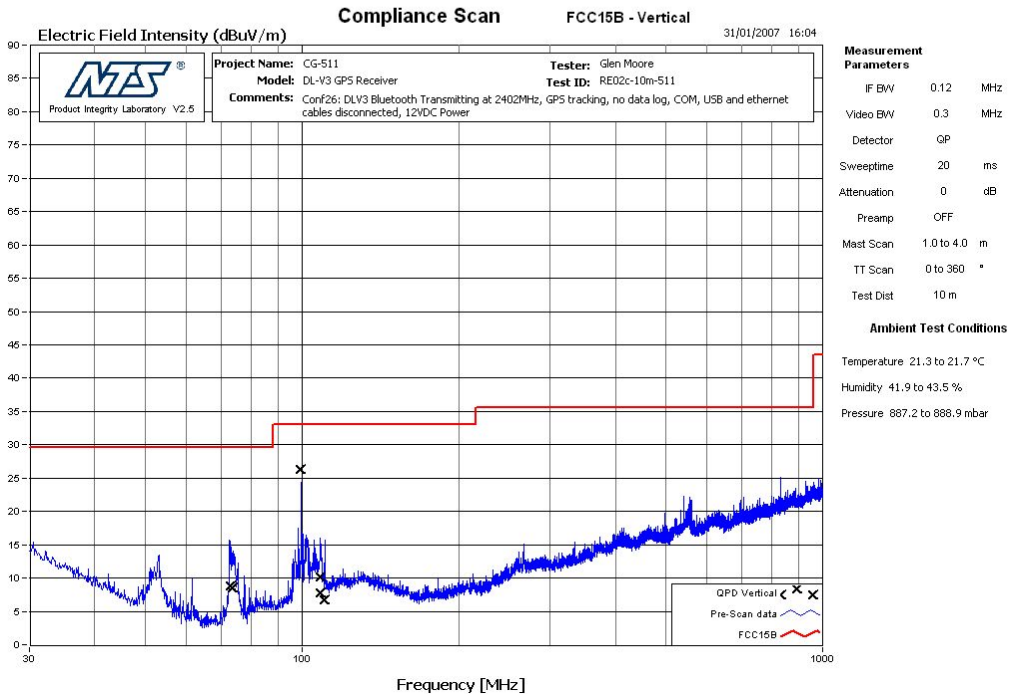
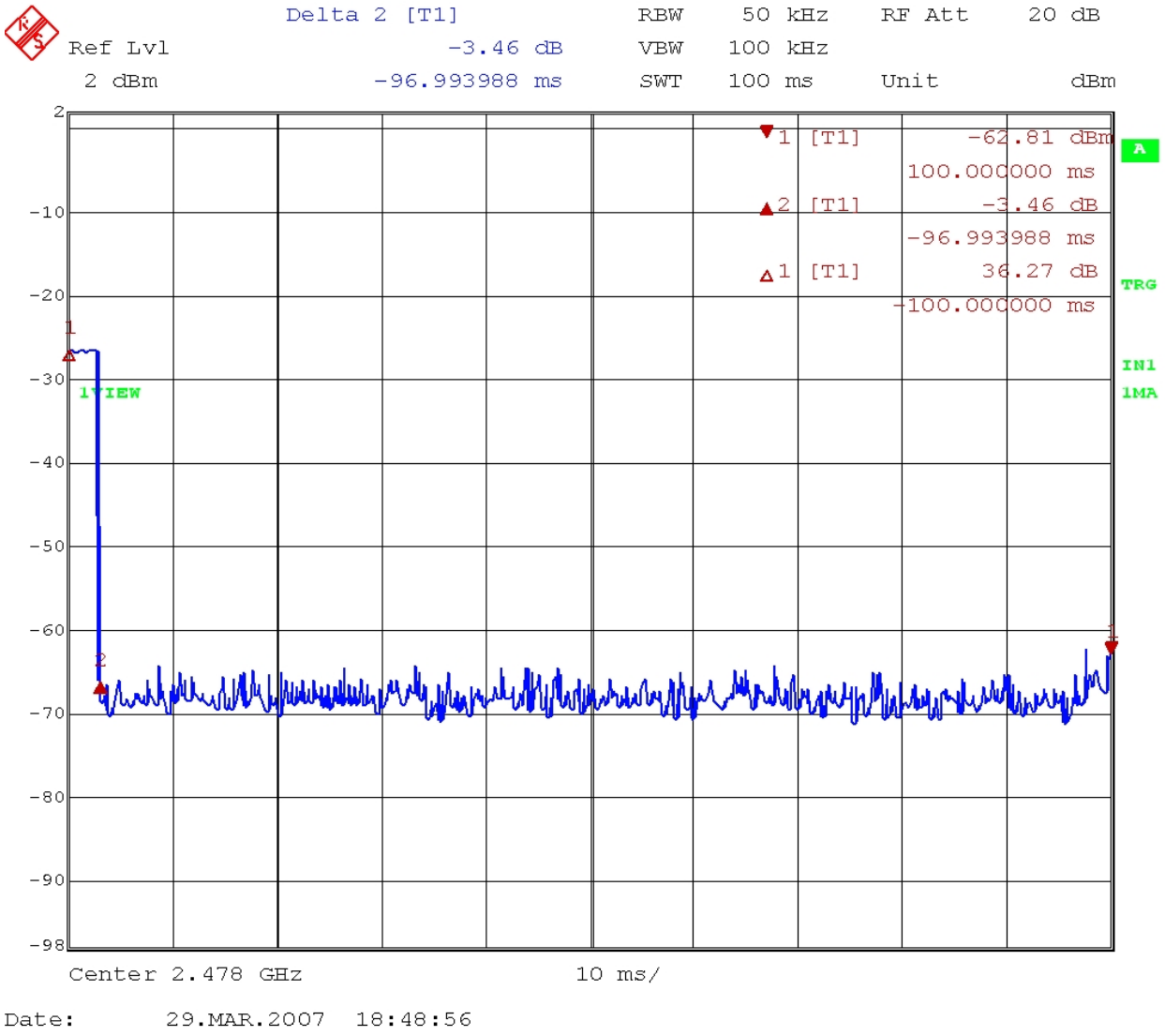


Figure 19 30 MHz – 1GHz Vertical Polarization



APPENDIX G: DUTY CYCLE CORRECTION FACTOR



The total transmission time over a 100 ms period is only 3 ms, therefore the duty cycle correction factor is greater than 20 dB.

APPENDIX H: MEASUREMENT EQUIPMENT

Description	Manufacturer	Type/Model	Asset #	Cal Due	Cal Date
Bilog Antenna	☒ Chase	CBL 6111B	260398	23APR07	23APR04
	☐ Chase	CBL 6112B	260301		
RF Cable	Suhner Sucoflex	Ferrite bead loaded cable	260388	13APR07	13APR06
Test Receiver	☐ Rohde & Schwarz	ESMI	260424 / 260423	02FEB08	02FEB05
	☒ Rohde & Schwarz	ESAI	260110 / 260111		
Mast Controller	EMCO	2090	260166	N/A	N/A
Multi Device Controller TT1 (Turntable)	EMCO	2090	260165	N/A	N/A
RF 10m East site Link				13APR07	13APR06
- Cable 1	Suhner Sucoflex	NA	263191		
- Cable 2	Suhner Sucoflex	NA	263135		
- Cable 3	Suhner Sucoflex	NA	263161		
- Cable 4	Suhner Sucoflex	NA	263162		
- Switch Matrix Controller	TDL	SMC-002	260162		
- Amplifier	Hewlett Packard	8447F	260164		
Horn Antenna (Rx) 1 GHz – 18 GHz	☒ EMCO	3115	260092	30AUG07	30AUG06
Standard Gain Horn (Rx) 18 GHz – 26.5 GHz	☒ EMCO	3160-09	260064	N/A	27NOV01
Standard Gain Horn (Rx) 26.5 GHz – 40 GHz	☒ EMCO	3160-10	260065	N/A	27NOV01
Test Receiver/Spectrum Analyzer	Rohde & Schwarz	ESI-40	CG0109	13SEP07	13SEP06
High pass filter	MicroTronics	HPM14576	CG963	10AUG07	10AUG06
LNA	Miteq	JSD00121	CG031	10AUG07	10AUG06
LNA	Miteq	JSD00119	513217	19JAN08	19JAN07
LNA	Miteq	JSD00120	513213	19JAN08	19JAN07
Cable from Antenna to LNA	Sucoflex 104	2422774A	263187	10AUG07	10AUG06
Cable from LNA to SA	Sucoflex 100	115757-4	263187	10AUG07	10AUG06
Spectrum Analyzer 9k-40GHz	Rohde & Schwarz	FSEK-20	260104	09MAY07	09MAY06
LNA DC Power Supply	Xantrex	LXO 30-2	260483	NA	NA
HPIB Extender	HP	37204	260096	N/A	N/A

HPIB Extender	HP	37204	260168	N/A	N/A
Mast Controller	EMCO	2090	260166	N/A	N/A
Multi Device Controller TT1	EMCO	2090	260165	N/A	N/A

END OF DOCUMENT