FCC CFR47 PART 95 SUBPART G
LOW POWER RADIO SERVICE
CLASS II PERMISSIVE CHANGE
CERTIFICATION TEST REPORT

FOR

GSM MULTI-BAND SELF-CONTAINED GPS TRACKING DEVICE WITH BEACON TECHNOLOGY

MODEL NAME: GT33000C

FCC ID: Q2UGT33000A

REPORT NUMBER: 07U11044-1, REVISION B

ISSUE DATE: JUNE 28, 2007

Prepared for
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/22/07	Initial Issue	T. Chan
B	06/28/07	Corrected Description of Class II Change Section and minor edits.	S. Radecki

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS 4
2. TEST METHODOLOGY 5
3. FACILITIES AND ACCREDITATION 5
4. CALIBRATION AND UNCERTAINTY 5
4.1. MEASURING INSTRUMENT CALIBRATION 5
4.2. MEASUREMENT UNCERTAINTY 5
5. EQUIPMENT UNDER TEST 6
5.1. DESCRIPTION OF EUT 6
5.2. DESCRIPTION OF CLASS II CHANGE 6
5.3. WORST-CASE CONFIGURATION AND MODE 6
5.4. MAXIMUM OUTPUT POWER 6
5.5. DESCRIPTION OF AVAILABLE ANTENNAS 7
5.6. SOFTWARE AND FIRMWARE 7
5.7. DESCRIPTION OF TEST SETUP 7
6. TEST AND MEASUREMENT EQUIPMENT 9
7. LIMITS AND RESULTS 10
7.1. OCCUPIED BANDWIDTH 10
7.1. RF POWER OUTPUT 12
7.2. FREQUENCY STABILITY 14
7.3. SPURIOUS EMISSION AT ANTENNA TERMINAL 15
7.4. FIELD STRENGTH OF SPURIOUS RADIATION 17
8. SETUP PHOTOS 20

1. ATTESTATION OF TEST RESULTS

COMPANY NAME:	GEOTRAX PROTECTION LLC P O BOX 6021 SCOTTSDALE, AZ 85261, USA
EUT DESCRIPTION:	GSM MULTI-BAND SELF-CONTAINED GPS TRACKING DEVICE WITH BEACON TECHNOLOGY
MODEL TESTED:	GT33000C
SERIAL NUMBER:	0106660000191169
DATE TESTED:	JUNE 14-15, 2007

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC PART 95 SUBPART G	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

Tested By:

THANH NGUYEN
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 95, 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055 and 2.1057.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://www.ccsemc.com.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM multi-band self-contained GPS device with beacon technology.
It operates on channel 50 at 216.475MHz in extra band channel 50 kHz.
The device is manufactured by Geotrax Protection LLC.

5.2. DESCRIPTION OF CLASS II CHANGE

The change filed under this application is adding support for Section 95.629(a) of the FCC Rules for channels in the 216 MHz low power radio service (LPRS) spectrum that are available exclusively for law enforcement tracking purposes.

5.3. WORST-CASE CONFIGURATION AND MODE

All radiated emissions tests were performed on the GT330000C as worst case condition described above.

The portable configuration at Y-Axis has the worst field strength emissions for portable configuration.
So, all radiated emissions tests were performed at Y-axis portable configuration.

5.4. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

RF Beacon

Frequency Range (MHz)	Modulation	Conducted Output Power (dBm)	Conducted Output Power (mW)
216.475	Beacon	10.38	10.91

5.5. DESCRIPTION OF AVAILABLE ANTENNAS

The device uses a loop type antenna with a maximum gain of 0dBi for the RF Beacon transmitter.

5.6. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was V7.29.10

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

N/A

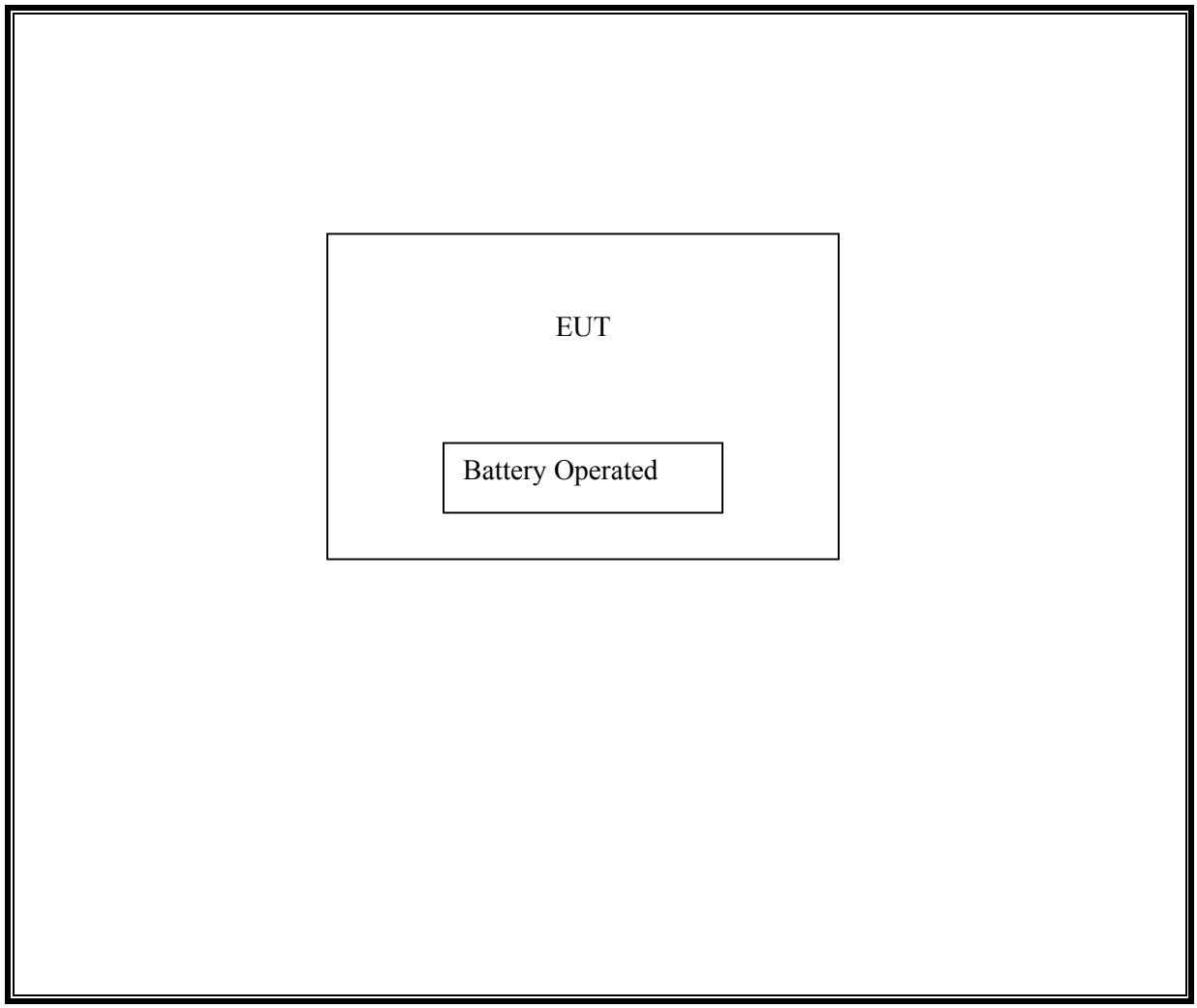
I/O CABLES

N/A

TEST SETUP

The EUT was tested stand alone

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	**Manufacturer**	**Model**	**Serial Number**	**Cal Due**
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A0022704	8/13/07
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	1/23/08
Spectrum Analyzer, 1.8 GHz	Agilent / HP	8591A	3009A00791	10/12/07
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	11/26/07
Antenna, Loop 9 kHz ~ 30 MHz	EMCO	6502	9202-2722	10/24/08
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	2238	4/22/08
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	29800	7/12/07

7. LIMITS AND RESULTS

7.1. OCCUPIED BANDWIDTH

LIMIT

95.633 (d)(3) The channel bandwidth for extra band frequency is 50 kHz.

TEST PROCEDURE

95.633 (e)(3) The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the -20 dB bandwidth. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal -20 dB bandwidth function is utilized.

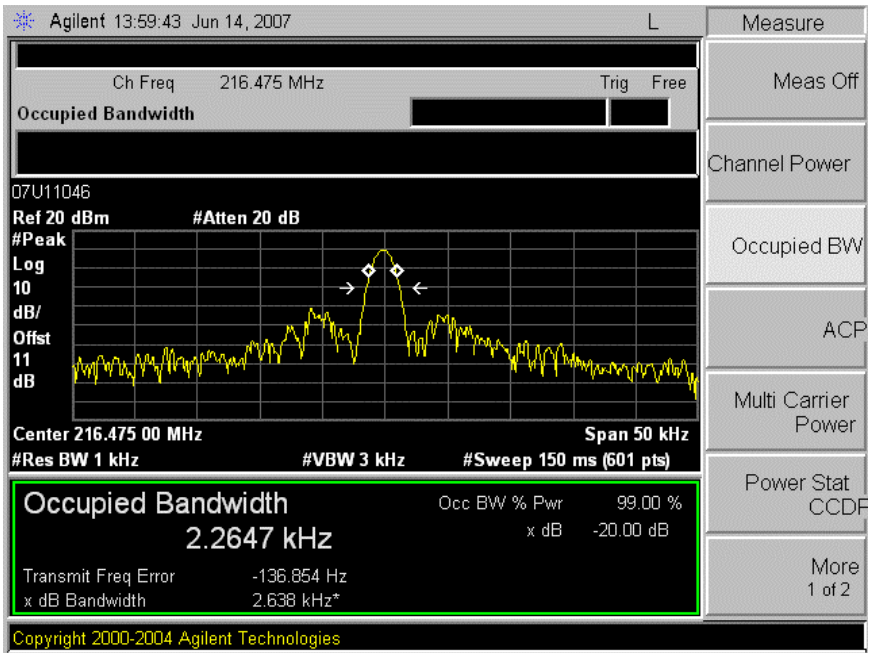
RESULTS

No non-compliance noted:

Frequency (MHz)	Bandwidth (Hz)
216.475	2638

20dB BANDWIDTH

BANDWIDTH



7.1. RF POWER OUTPUT

LIMIT

95.639 (e) The maximum transmitter output power authorized for LPRS stations is 100mW.

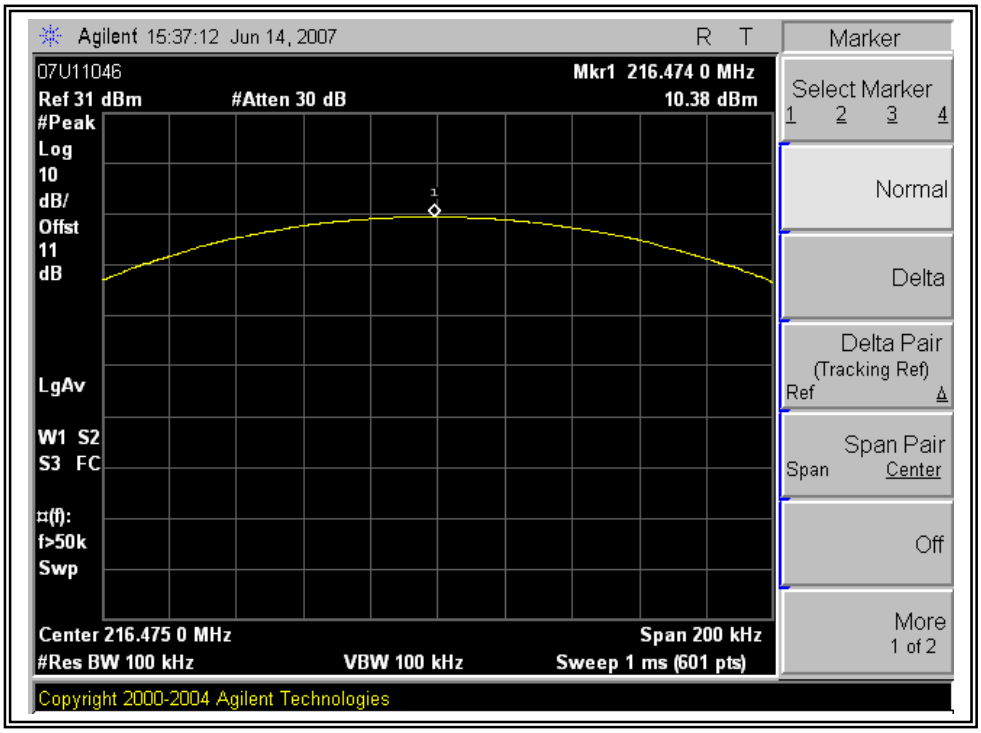
TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

RESULTS

No non-compliance noted.

CONDUCTED PEAK OUTPUT



RADIATED OUTPUT POWER - ERP

30 - 1000MHz Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: GeoTrax Protection LLC
Project #: 07U11044
Date: 6/14/2007
Test Engineer: Thanh Nguyen
Configuration: EUT only
Mode: Normal Operation

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable	T5 8447D	ERP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
X position (Laydown)										
216.475	67.11	V	-43.1	1.9	5.8	3.6	-41.4	-13.0	-28.4	
216.475	78.33	H	-32.0	1.9	5.8	3.6	-30.2	-13.0	-17.2	
Z Position (Side down)										
216.475	72.19	H	-38.1	1.9	5.8	3.6	-36.3	-13.0	-23.3	
216.475	69.89	V	-40.4	1.9	5.8	3.6	-38.6	-13.0	-25.6	
Y Position(Upward)										
216.475	70.22	V	-40.0	1.9	5.8	3.6	-38.2	-13.0	-25.2	
216.475	66.64	H	-43.7	1.9	5.8	3.6	-41.9	-13.0	-28.9	

7.2. FREQUENCY STABILITY

LIMIT

a). According to CFR 47 section 1055(a)(1), the frequency stability shall be measured with variation of ambient temperature from –30°C to +50°C centigrade.
b). According to CFR 47 section 1055(d)(2), for hand carried battery powered equipment, the frequency stability shall be measured with reducing primary supply voltage to the battery operating end point, which is specified by the manufacture.
c). According to CFR 47 section 95.629 (c)(2), LPRS transmitters operating on standard band channels must be maintained within a frequency stability of 50 parts per million.
.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

RESULTS

No non-compliance noted.

Reference Frequency: CW 216.474860MHz @ 25*C Limit: to stay ± 50 ppm = 10823.743 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measureed with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.70	50	216.474831	0.13	± 50
3.70	40	216.474837	0.11	± 50
3.70	30	216.474856	0.02	± 50
3.70	***25***	***216.474860***	*0.00*	± *50*
3.70	20	216.474870	-0.05	± 50
3.70	10	216.474879	-0.09	± 50
3.70	0	216.474864	-0.02	± 50
3.70	-10	216.474887	-0.12	± 50
3.70	-20	216.474847	0.06	± 50
3.70	-30	216.474888	-0.13	± 50
2.90 (end point)	25	216.474859	0.00	± 50
3.4	25	216.474867	-0.03	± 50
4	25	216.474866	-0.03	± 50

7.3. SPURIOUS EMISSION AT ANTENNA TERMINAL

LIMIT

95.635(c)(3), the channel bandwidth for extra band channels (50 kHz) shall be attenuated below the un-modulated carrier in accordance with the following:
(i) Emissions 25 kHZ to 35 kHz from the channel center freqyuency: at least 30 dB; and
(ii) Emissions more than 35 kHz away from the channel center frequency: at least $43 + 10 \log_{10}$(carrier power in watts) dB.

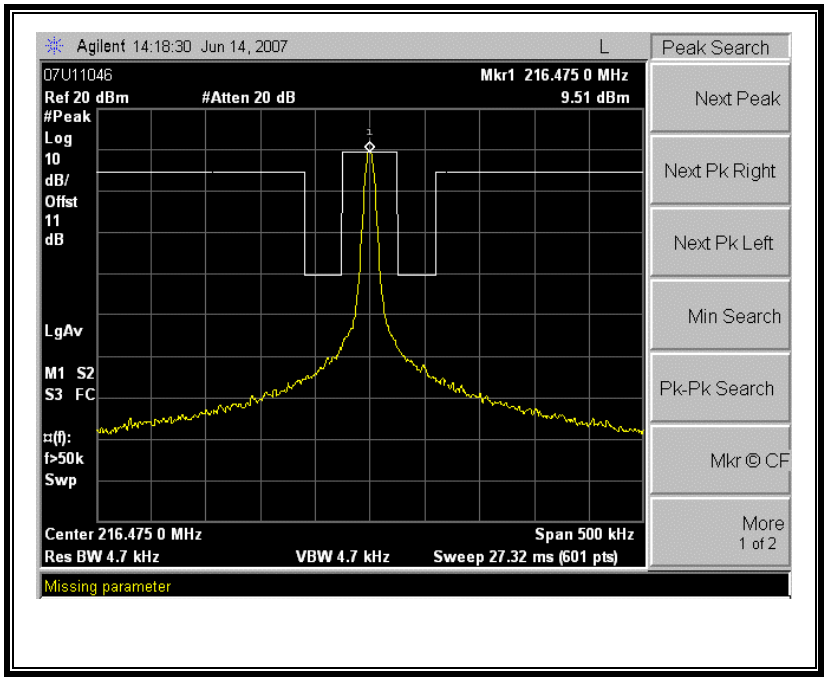
TEST PROCEDURE

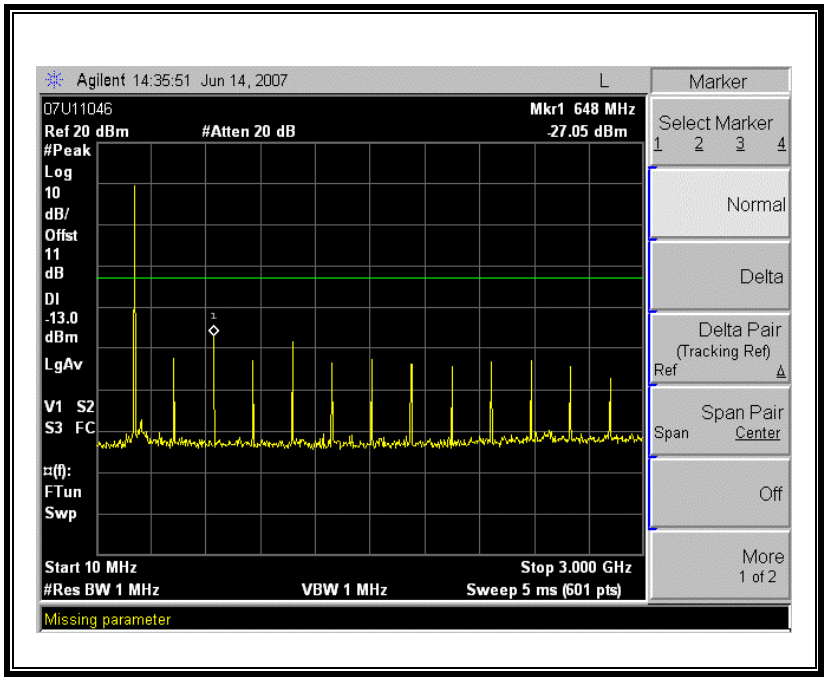
ANSI / TIA / EIA 603 Clause 3.2.12

RESULTS

No non-compliance noted.

216.475MHz EMISSION MASK AND OUT OF BAND





7.4. FIELD STRENGTH OF SPURIOUS RADIATION

LIMIT

95.635(c)(3), the channel bandwidth for extra band channels (50 kHz) shall be attenuated below the un-modulated carrier in accordance with the following:
(i) Emissions 25 kHz to 35 kHz from the channel center freqyuency: at least 30 dB; and
(ii) Emissions more than 35 kHz away from the channel center frequency: at least $43 + 10 \log_{10}$(carrier power in watts) dB.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12

RESULTS

No non-compliance noted.

30-1000MHz SPURIOUS EMISSIONS

30 - 1000MHz Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: GeoTrax Protection LLC
Project #: 07U11044
Date: 6/14/2007
Test Engineer: Thanh Nguyen
Configuration: EUT at worst Position
Mode: Normal Operation

Test Equipment:

Bilog Antenna	Cable	Pre-amplifer 8447D	Limit
5m Chamber Sunol Bilog	5m Chamber Cable	T5 8447D	ERP

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
X position (Laydown)										
432.95	40.06	V	-64.1	2.5	6.1	3.9	-62.6	-13.0	-49.6	
649.425	42.14	V	-59.2	3.0	6.8	4.7	-57.5	-13.0	-44.5	
865.900	48.16	V	-49.4	3.5	6.7	4.6	-48.4	-13.0	-35.4	
357.400	42.62	H	-62.5	2.3	6.0	3.9	-60.8	-13.0	-47.8	
649.425	50.95	H	-51.0	3.0	6.8	4.7	-49.3	-13.0	-36.3	
865.900	47.18	H	-50.9	3.5	6.7	4.6	-49.9	-13.0	-36.9	
No other emissions were detected up to 1 GHz										

Rev. 3.13.7

ABOVE 1GHZ HARMONIC SPURIOUS EMISSIONS

High Frequency Substitution Measurement
Compliance Certification Services, Fremont 5m A-Chamber

Company: GeoTrax Protection LLC
Project #: 07U11044
Date: 6/14/2007
Test Engineer: Thanh Nguyen
Configuration: EUT at worst position
Mode: Normal Operation

Test Equipment:

EMCO Horn 1-18 GHz: T60; S/N: 2238 @3m
Horn > 18GHz:
Limit: ERP
High Pass Filter: ☐
Hi Frequency Cables: ☐ (2 ft) ☐ (2 ~ 3 ft) ☐ (4 ~ 6 ft) ☑ (12 ft)
Pre-amplifer 1-26GHz: T34 HP 8449B
Pre-amplifer 26-40GHz:

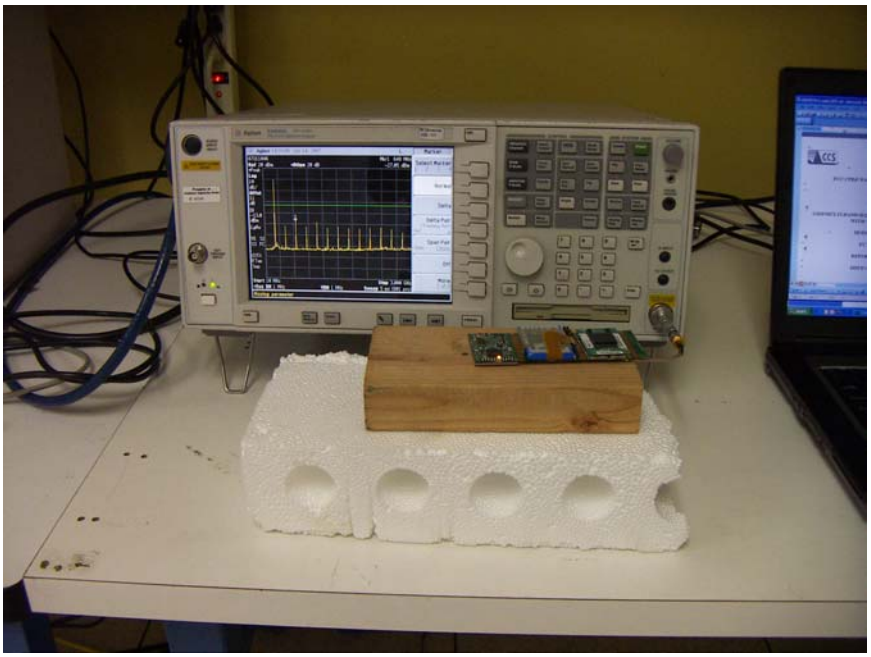
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.731	65.2	H	-40.7	4.0	7.4	5.2	-39.5	-13.0	-26.5	
1.515	61.9	H	-44.6	3.7	6.6	4.4	-43.8	-13.0	-30.8	
2.165	53.0	H	-52.0	4.5	8.7	6.5	-49.9	-13.0	-36.9	
2.382	55.7	H	-48.6	4.8	9.2	7.1	-46.4	-13.0	-33.4	
1.731	54.3	V	-52.4	4.0	7.4	5.2	-51.1	-13.0	-38.1	
1.515	60.7	V	-46.6	3.7	6.6	4.4	-45.8	-13.0	-32.8	
1.948	50.5	V	-55.5	4.2	8.1	6.0	-53.7	-13.0	-40.7	
2.165	51.6	V	-53.6	4.5	8.7	6.5	-51.6	-13.0	-38.6	
2.382	49.2	V	-55.3	4.8	9.2	7.1	-53.0	-13.0	-40.0	
No other emissions were detected up to 3GHz										

Rev. 4.12.7

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

ANTENNA PORT CONDUCTED PHOTO

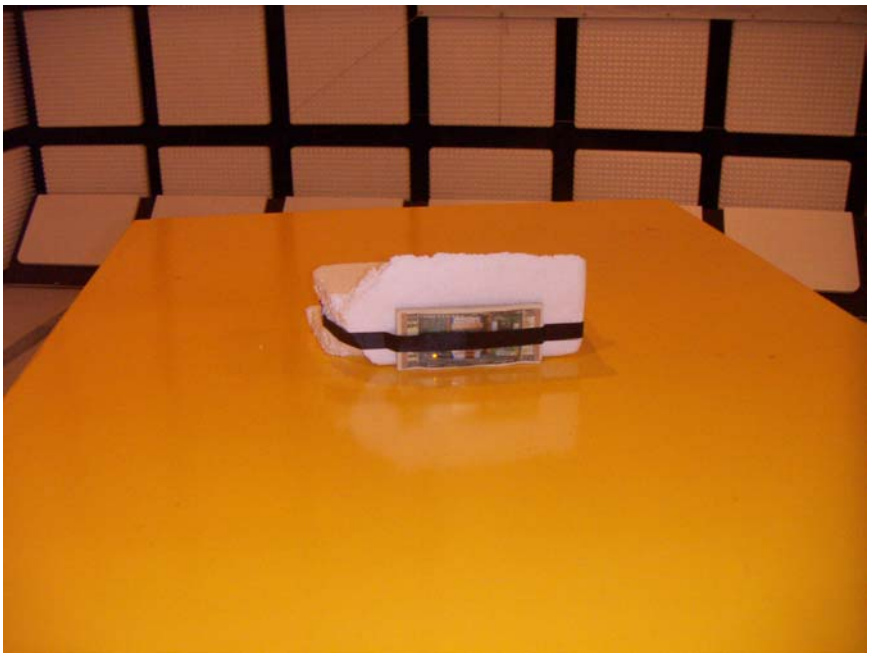


RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION

X-AXIS PHOTO

Y-AXIS PHOTO

Z-AXIS PHOTO



TEMPERATURE CHAMBER PHOTO

END OF REPORT