TEST REPORT

Report Number: 3125064LEX-001
Project Number: 3125064

Evaluation of Model Number: System 5000 Base

FCC ID: OAM5000BASE

FCC Part 15 Subpart B & FCC Part 15 Subpart C

For

iSECUREtrac Corporation

Test Performed by:	Test Authorized by:
Intertek 731 Enterprise Drive Lexington, KY 40510	iSECUREtrac Corporation 5022 South 114th Street Omaha, NE 68137

Prepared By:_____ **Date:**____6/21/2007_____

Jason Centers, Senior Project Engineer

Approved By:_____ **Date:**____6/21/2007_____

Bryan C. Taylor, Team Leader

TABLE OF CONTENTS

1 JOB DESCRIPTION

1.1 Company Information

Company Information	
Manufacturer:	iSECUREtrac Corporation
Address:	5022 South 114th Street Omaha, NE 68137
Contact Name:	Jef Higgason
Telephone Number:	(402) 537-5663
Email Address:	jhiggason@isecuretrac.com

1.2 Test Sample Information

The iSECUREtrac Corporation System 5000 Base is a charging and communications base that connects to the System 5000 PTU unit that is used by law enforcement to locate and track offenders.

Test sample	
Model Number:	System 5000 Base
Serial Number:	Not Labeled
FCC ID:	OAM5000BASE
Device Category:	Mobile
RF Exposure Category:	General Population/Uncontrolled Environment
Transmission:	AM Modulation
Frequency Range (MHz)	439.21 MHz & 451.4 MHz
Antenna Type:	Wire Antenna
Antenna Location:	Internal
Power Supply	Manufacture: Sunny Computer Technology Co., LTD Model – SYS1089-1005-T3 Input: 100-240VAC, 1A Output: 5VDC, 2.0A

1.3 System Support Equipment

No support equipment was necessary for the evaluation.

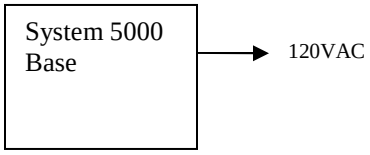
1.4 Cables Used During Testing

Cables					
Description	**Length**	**Shielding**	**Ferrites**	**Connection**	
				From	**To**
Power	12 ft.	No	No	EUT	120VAC

1.5 System Block Diagram(s)

The diagrams below detail the interconnection of the EUT and its accessories during the testing.

Figure 1-1: Test Configuration



1.6 Mode(s) of operation / Engineering Judgments

The System 5000 Base was powered 120VAC using the supplied power adapter. iSECUREtrac Corporation provided test commands to enable constant modulated transmission. Tests were performed on the two transmit frequencies on each internal antenna at the maximum output power and in receive mode. See the table below describing the operating modes referenced in this report.

Operating Mode	Frequency/Antenna Configuration
2	439.21 MHz, Modulated – Edge Antenna
4	451.4 MHz, Modulated – Edge Antenna
6	439.21 MHz, Modulated – Center Antenna
8	451.4 MHz, Modulated – Center Antenna

2 EXECUTIVE SUMMARY

Testing performed for: iSECUREtrac Corporation

Equipment Under Test: System 5000 Base

Receipt of Test Sample: 6/4/2007

Test Start Date: 6/7/2007

Test End Date: 6/15/2007

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
§15.231, §15.205	Field Strength of Fundamental and Spurious Radiation, Emission Bandwidth	**Compliant**	7
§15.231(a)(2)	Transmitter Activated Automatically Shall Cease Transmission Within 5 Seconds After Activation	**Compliant**[1]	-
§15.109	Radiated Receiver Emissions	**Compliant**	15
§15.207	Conducted Voltage Emissions	**Compliant**	18

2.1 Modifications required for compliance

No modifications were implemented by Intertek. All results in this report pertain to the un-modified sample provided to Intertek.

[1] The device complies with this requirement because the maximum duration of the transmission by design is 10 ms in 32 sec interval.

3 TEST FACILITY

All testing was completed at the INTERTEK-Lexington location at 731 Enterprise Drive, Lexington Kentucky, 40510. The radiated emission test site is a 10-meter semi-anechoic chamber. The chamber meets the characteristics of CISPR 16-1: 1993 and ANSI C63.4: 1992. For measurements, a remotely controlled flush-mount metal-top turntable is used to rotate the EUT a full 360 degrees. A remote controlled non-conductive antenna mast is used to scan the antenna height from one to four meters.

For radiated immunity testing, removable ferrite tiles are positioned between the transmitting antenna and the area occupied by the equipment under test. The remaining tests typically are performed outside the chamber on the conducting ground reference plane.

The Industry Canada filing number for this site is 2055A-1. The FCC registration number is 485103. The VCCI registration numbers are R-2056, C-2214, and T-195.

3.1 Test Equipment

Description	Manufacturer	Model Number	Serial Number	Calibration due date
Horn Antenna	EMCO	3115	6556	7/28/2007
EMI Receiver	Rohde & Schwarz	ESI 26	1088.7490	9/6/2007
Bilog Antenna	EMCO	3142C	00051864	11/14/2007
Preamplifier	Miteq	AFS44-00102000-30-10P-44	987410	6/15/2007
LISN	Fischer Custom Communication	FCC-LISN-50-50-2M	1026	5/11/2008

4 FIELD STRENGTH OF FUNDAMENAL & SPURIOUS RADIATION, EMISSION BANDWIDTH

FCC §15.205, §15.231

4.1 Test Procedure

- Measurements were made over the frequency range of 30 MHz to ten times the highest frequency operating within the device.
- The measuring receiver meets the requirements of Section One of CISPR 16 and the measuring antenna correlates to a balanced dipole.
- From 30 to 1000 MHz, a quasi-peak detector was used for measurement. Above 1000 MHz, average measurements were performed.
- The antenna is adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.
- The antenna-to-EUT azimuth is varied during the measurement to find the maximum field-strength readings.
- The antenna-to-EUT polarization (horizontal and vertical) is varied during the measurements to find the maximum field-strength readings.
- The EUT was placed on a wooden table 80 cm above the ground reference plane.
- Equipment setup for radiated disturbance tests followed the guidelines of ANSI C63.4.
- The bandwidths of the fundamental emissions were measured 20 dB down from the modulated carrier using the ANSI C63.4 specified bandwidths. The bandwidth measurement was performed using a peak detector and the peak-hold function of the analyzer.
- The test was performed on the low and high transmitting frequencies at maximum output power.
- The readings obtained from the measurement receiver were corrected for antenna factor, cable loss, and pre-amp gain. An example calculation is shown below.

Example of Field Strength Calculation Method:

The measured field strength was calculated by summing the readings taken from the spectrum analyzer with the appropriate correction factors associated with the antenna losses and cable losses. The calculation formula and sample calculation are listed below.

Formula:

FS = RA + AF + CF

FS = Field Strength in dBµV/m

RA = Receiver Amplitude (Quasi-Peak) in dBµV

AF = Antenna Factor in dB

CF = Cable Attenuation Factor in dB

Example Calculation:

RA = 19.48 dBµV

AF = 18.52 dB

CF = 0.78 dB

FS = 19.48 + 18.52 + 0.78 = 38.78 dBµV/m

Level in µV/m = Common Antilogarithm [(38.78 dBµV/m)/20] = 86.89 µV/m

4.2 Test Results

The System 5000 Base met the field strength and bandwidth requirements of FCC §15.231 for the fundamental and spurious emissions. See Table 4-1 for the measured fundamental and spurious emissions. The peak value of the fundamental and spurious emissions did not exceed the limits of FCC §15.231 5b. Additionally, there were no radiated emissions from the device in the restricted bands of §15.205 which exceeded the limit of §15.209. All other spurious emissions not shown below were greater than 20dB below the limit. The 20dB bandwidth of the fundamental emission was less than 0.25% of the carrier frequency. See Exhibit 5 through Exhibit 8 for emission bandwidth plots.

Table 4-1: Field Strength of Fundamental and Spurious Radiation

Mode	TX Channel	Frequency	Polarity	Cable Factor (dB)	Antenna Factor (dB/m)	Corr. Peak Reading. (dBuV/m)	Corr. QP Reading (dBuV/m)	Corr. Avg Reading. (dBuV/m)	Avg. Limit (dBuV/m)	Results
2	Low	439.22 MHz	V	3.21	16.24	68.713	68.253	67.453	81	**Compliant**
2	Low	439.22 MHz	H	3.21	16.77	60.144	59.104	58.094	81	**Compliant**
4	High	451.41 MHz	H	3.21	17.56	59.704	58.634	57.874	81.4	**Compliant**
4	High	451.4 MHz	V	3.21	16.77	68.089	67.519	67.049	81.4	**Compliant**
6	Low	439.22 MHz	H	3.21	16.77	59.304	58.164	57.304	81	**Compliant**
6	Low	439.2 MHz	V	3.21	16.24	67.512	66.972	66.302	81	**Compliant**
8	High	451.4 MHz	H	3.21	17.56	61.274	60.304	59.444	81.4	**Compliant**
8	High	451.39 MHz	V	3.21	16.77	67.47	67.09	66.12	81.4	**Compliant**

Graphical Peak Scan – Mode 2

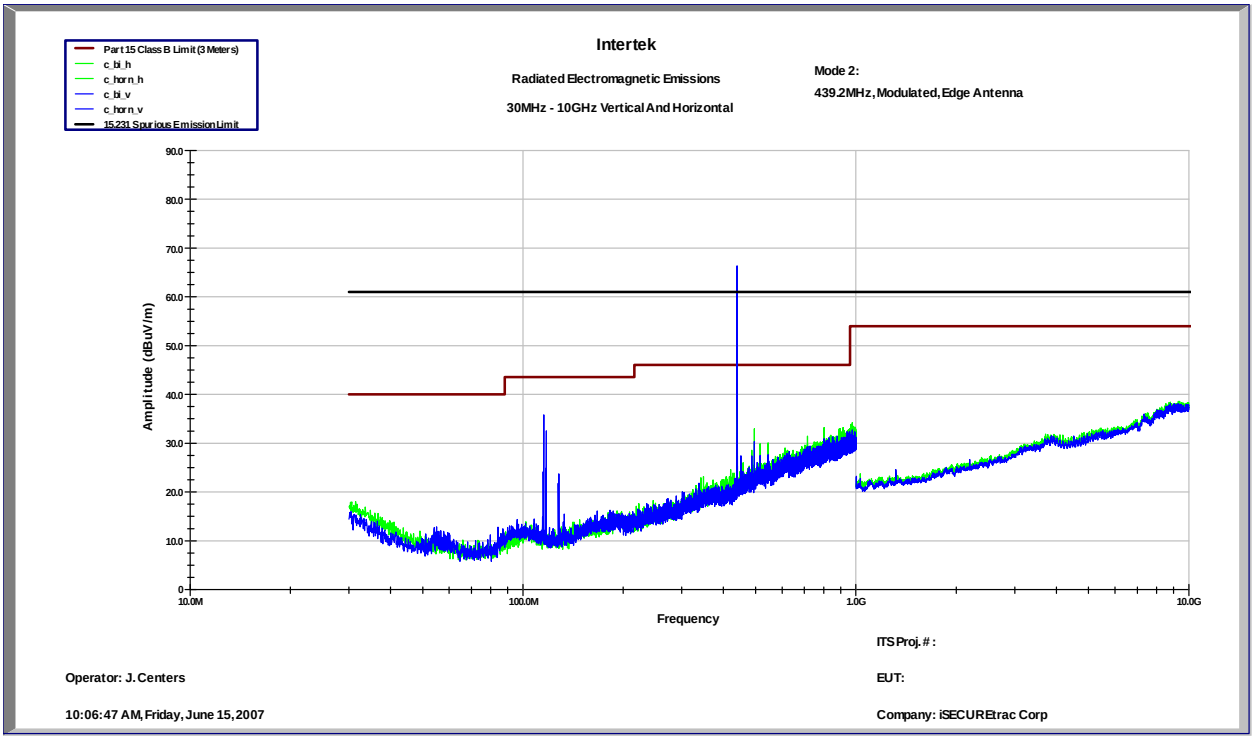


Exhibit 1

Graphical Peak Scan – Mode 4

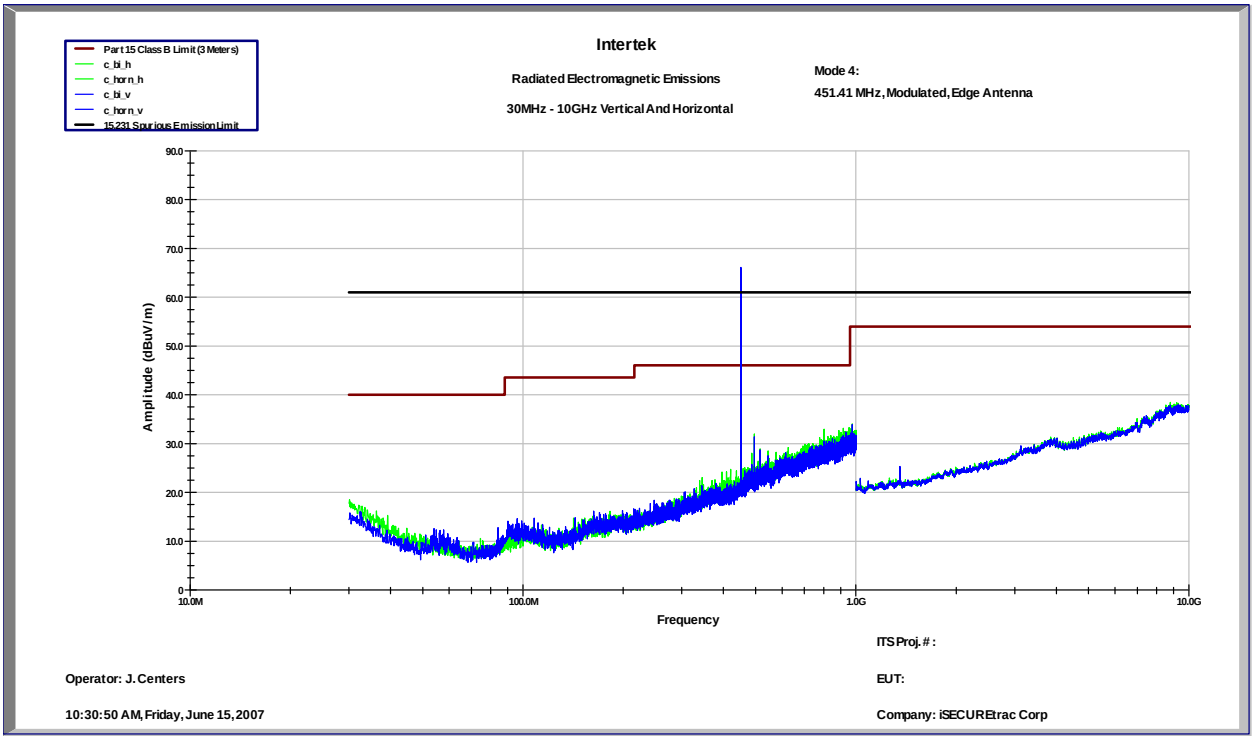


Exhibit 2

Graphical Peak Scan – Mode 6

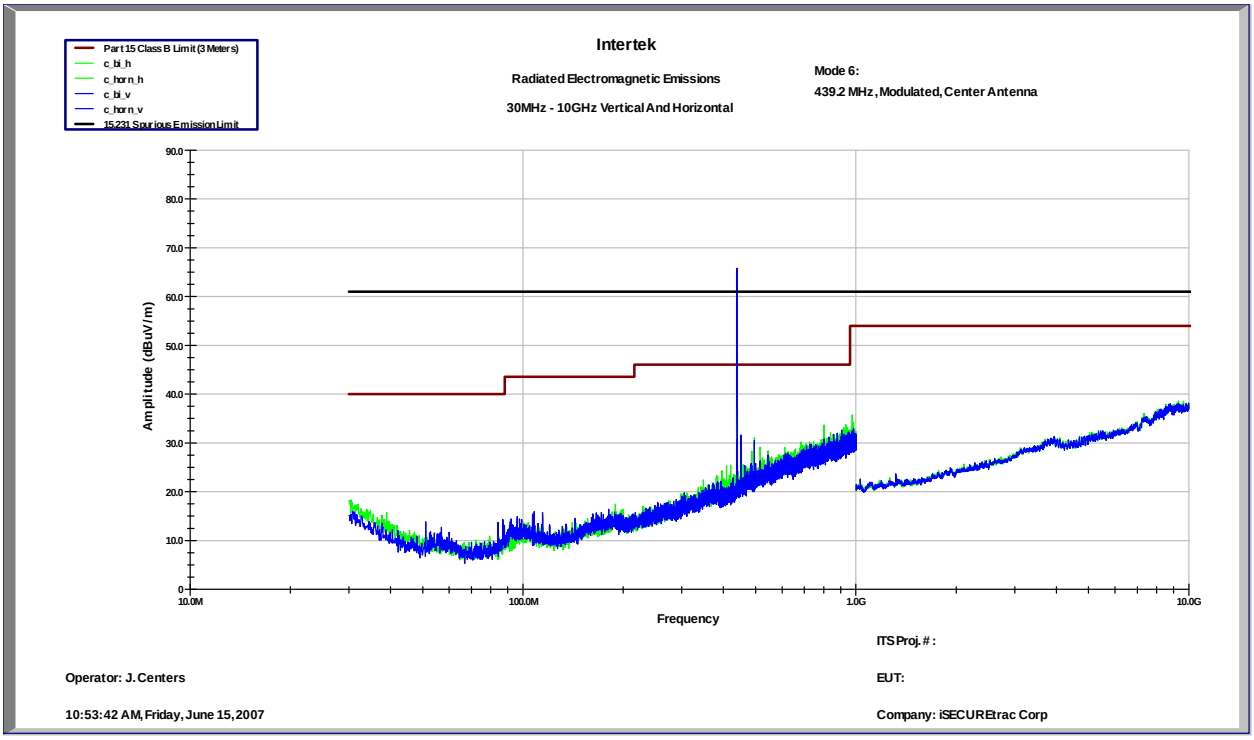


Exhibit 3

Graphical Peak Scan – Mode 8

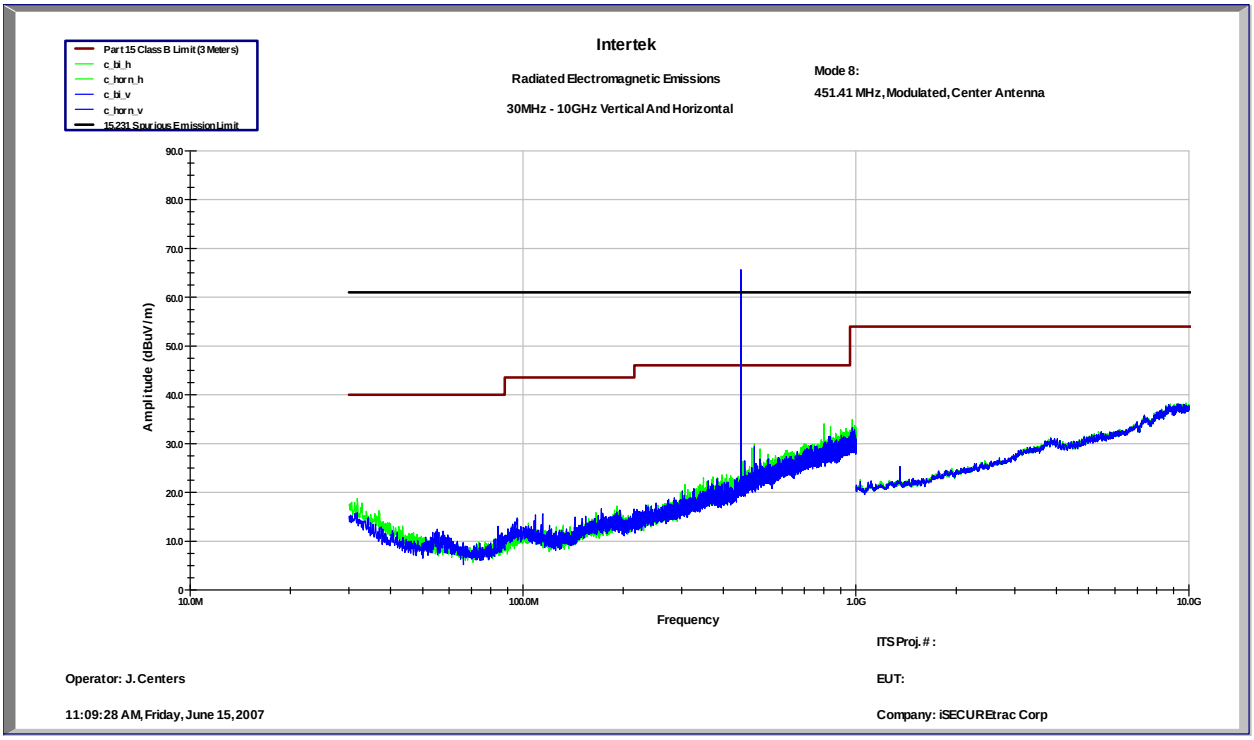


Exhibit 4

Emission Bandwidth – Mode 2

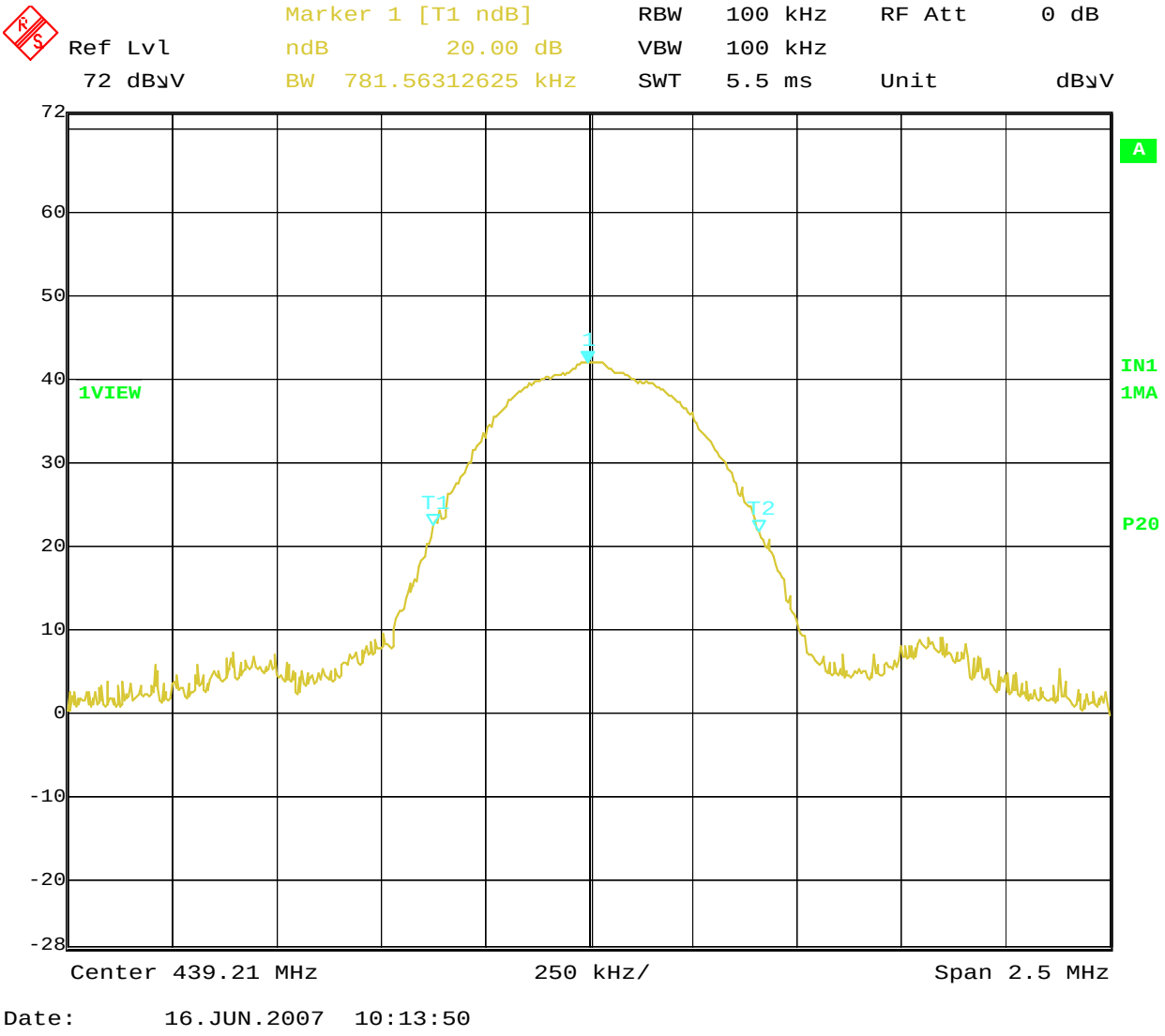


Exhibit 5

Emission Bandwidth – Mode 4

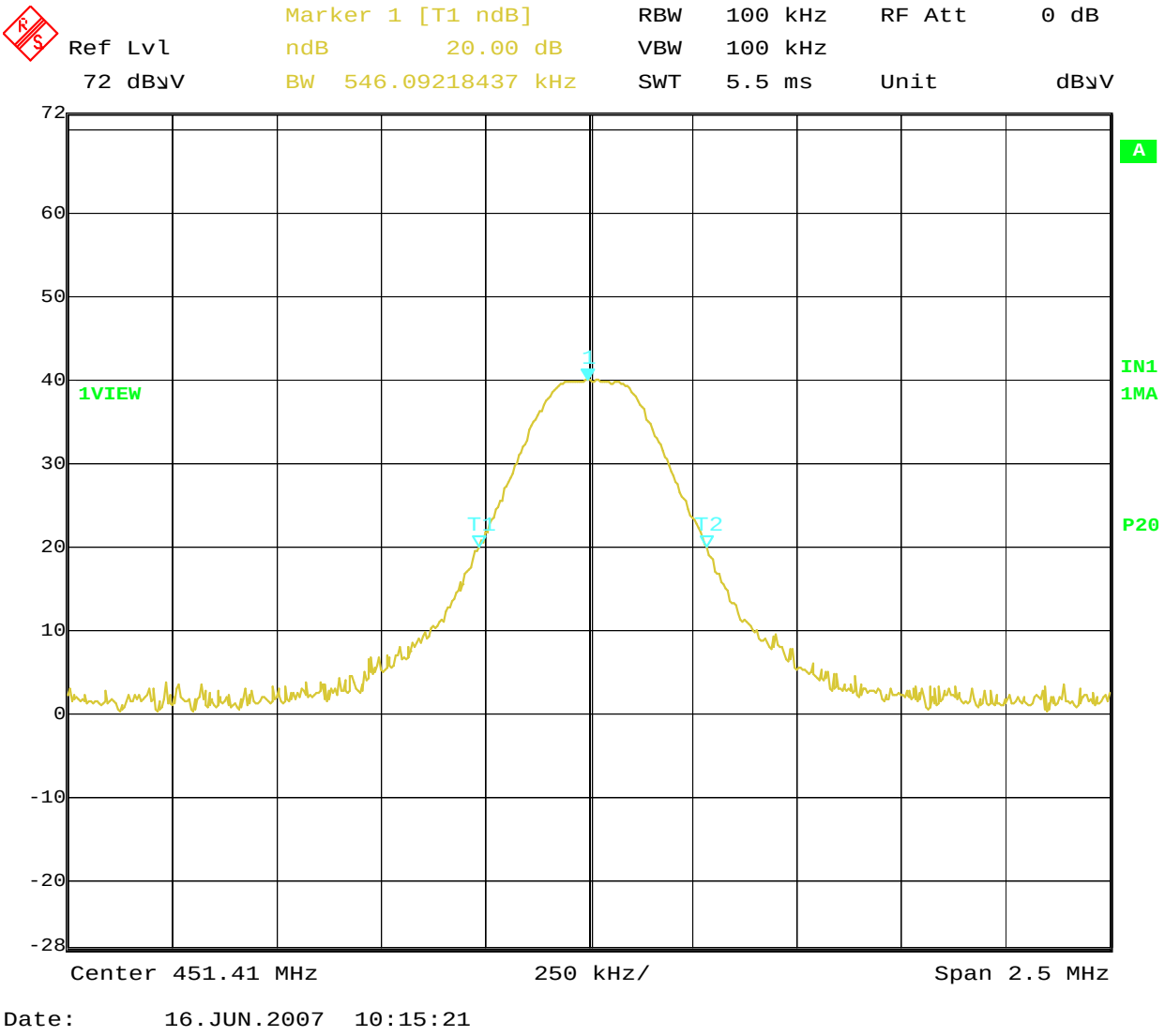


Exhibit 6

Emission Bandwidth – Mode 6

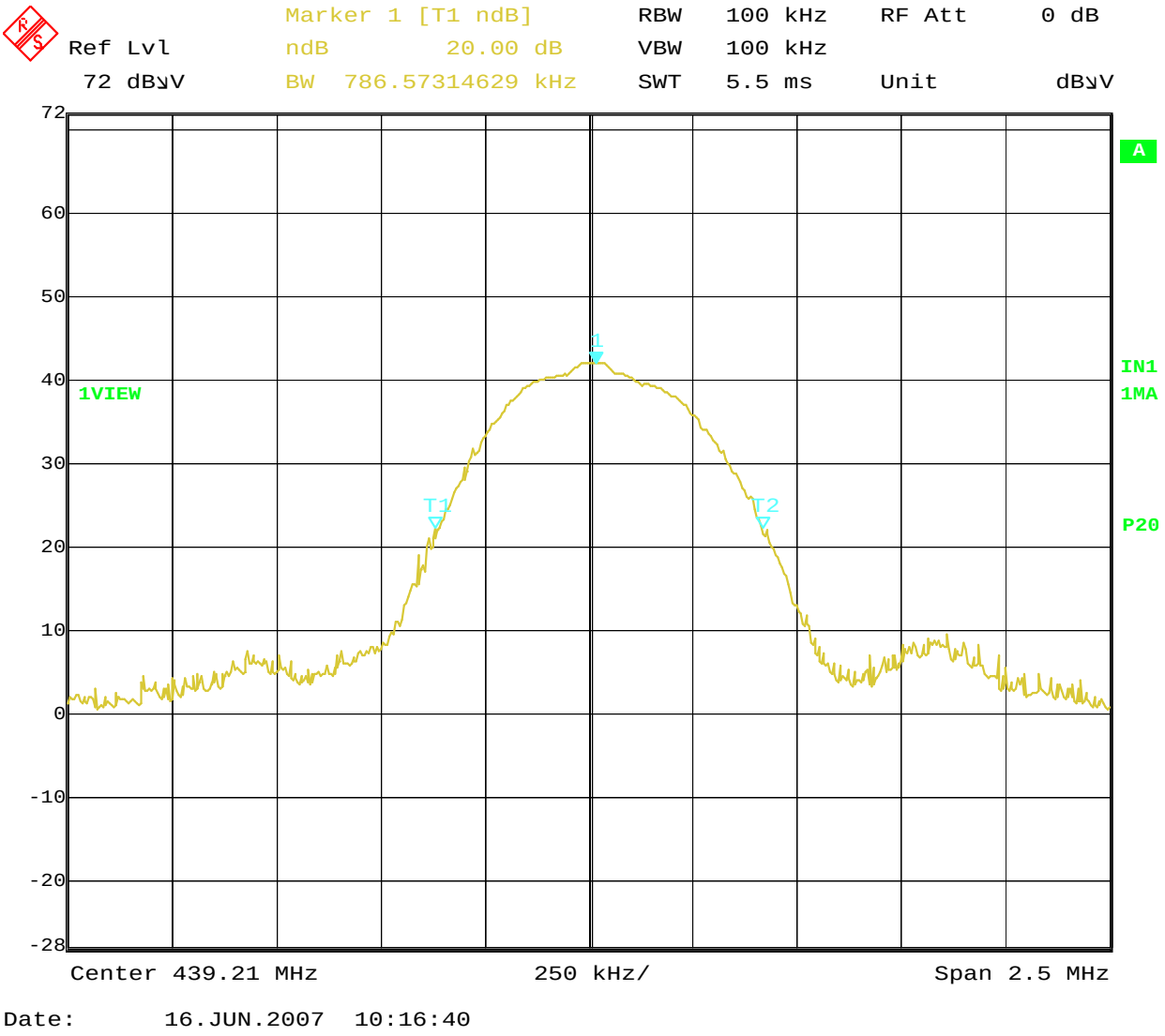


Exhibit 7

Emission Bandwidth – Mode 8

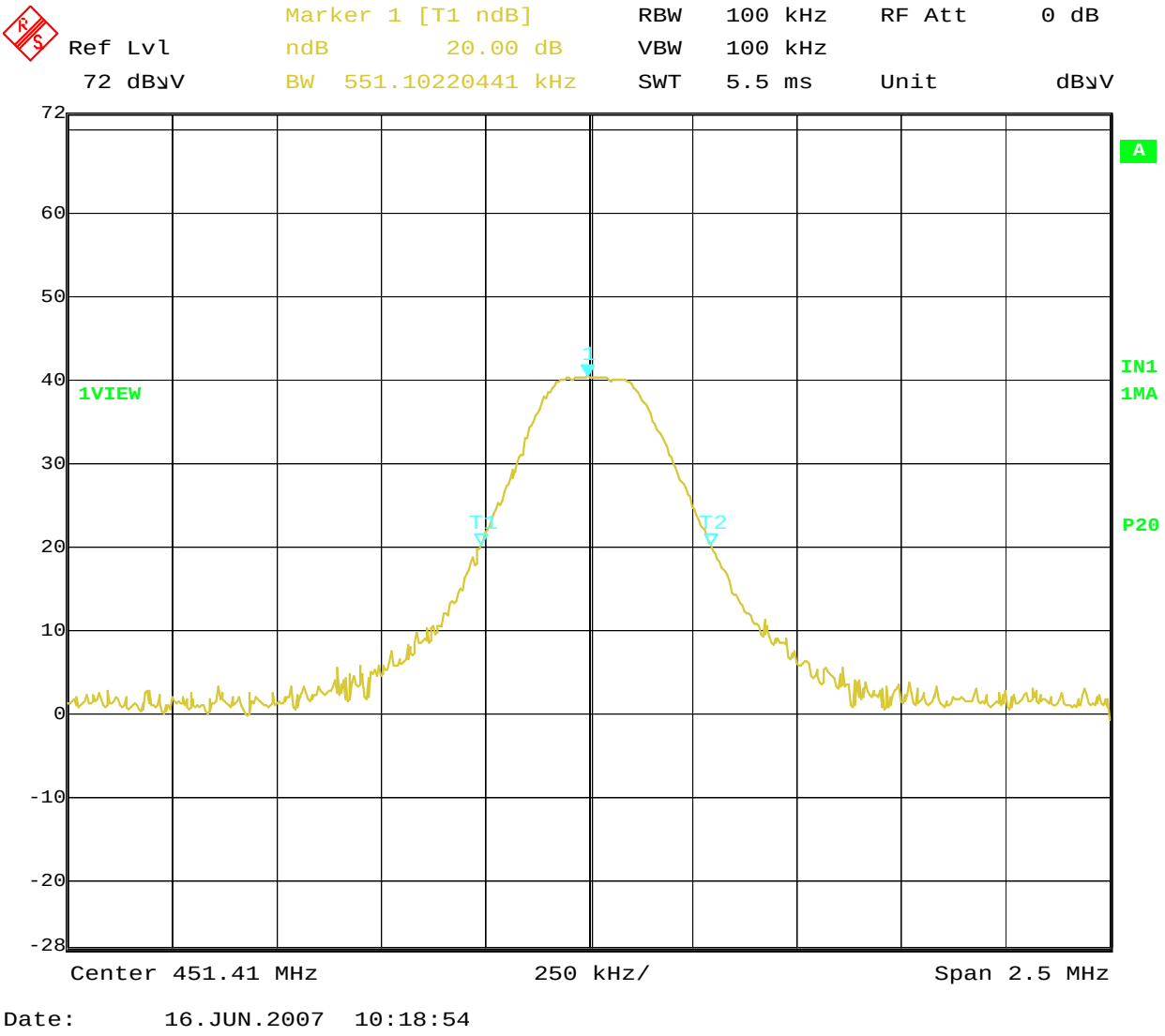


Exhibit 8

5 RADIATED RECEIVER EMISSIONS

FCC §15.109

ICES-003, RSS-Gen 6a

5.1 Test Procedure

- Measurements were made over the frequency range of 30 MHz to five times the highest frequency operating within the device.
- The measuring receiver meets the requirements of Section One of CISPR 16 and the measuring antenna correlates to a balanced dipole.
- From 30 to 1000 MHz, a quasi-peak detector was used for measurement. Above 1000 MHz, average measurements were performed.
- The antenna is adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.
- The antenna-to-EUT azimuth is varied during the measurement to find the maximum field-strength readings.
- The antenna-to-EUT polarization (horizontal and vertical) is varied during the measurements to find the maximum field-strength readings.
- The EUT, where intended for tabletop use, is placed on a table whose top is 0.8m above the ground plane. The table is constructed of non-conductive materials. Its dimensions are 1m by 1.5m, but may be extended for larger EUT.
- The test was performed on the device while in receive mode.
- Equipment setup for radiated disturbance tests followed the guidelines of ANSI C63.4.
- The readings obtained from the measurement receiver were corrected for antenna factor, cable loss, and pre-amp gain. An example calculation is shown below.

Example of Field Strength Calculation Method:

The measured field strength was calculated by summing the readings taken from the spectrum analyzer with the appropriate correction factors associated with the antenna losses and cable losses. The calculation formula and sample calculation are listed below.

Formula:

FS = RA + AF + CF

FS = Field Strength in dBµV/m

RA = Receiver Amplitude (Quasi-Peak) in dBµV

AF = Antenna Factor in dB

CF = Cable Attenuation Factor in dB

Example Calculation:

RA = 19.48 dBµV

AF = 18.52 dB

CF = 0.78 dB

FS = 19.48 + 18.52 + 0.78 = 38.78 dBµV/m

Level in µV/m = Common Antilogarithm [(38.78 dBµV/m)/20] = 86.89 µV/m

5.2 Test Results

The System 5000 Base was **compliant** with the radiated emissions requirements of FCC §15.109 of Class B limits. The maximized radiated emissions data can be found in Exhibit 9. Graphical results are shown in Exhibit 10.

Maximized Quasi Peak and Average Emissions (Sorted by Delta)

Test Engineer: Jason Centers

Test Start Date: 6/12/2007 **Test End Date:** 6/12/2007

Emission Limit Tested To: Class B **Test Distance (EUT to Antenna):** 3m

Frequency (MHz)	Polarity (H/V)	Cab. (dB)	Ant. (dB)	Corr. Reading. (dBuV/m)	Limit (dBuV/m)	Delta (dB)	Results
440.71 MHz	H	3.2	16.86	37.08	46.02	-8.94	**Compliant**
440.71 MHz	V	3.2	16.34	36.73	46.02	-9.29	**Compliant**
801.83 MHz	H	4.36	22.04	36.06	46.02	-9.96	**Compliant**
495.24 MHz	V	3.36	17.7	33.31	46.02	-12.71	**Compliant**
384.0 MHz	H	2.94	16.04	31.09	46.02	-14.93	**Compliant**
486.82 MHz	H	3.36	18.53	29.35	46.02	-16.67	**Compliant**

Exhibit 9

Graphical Peak Scan

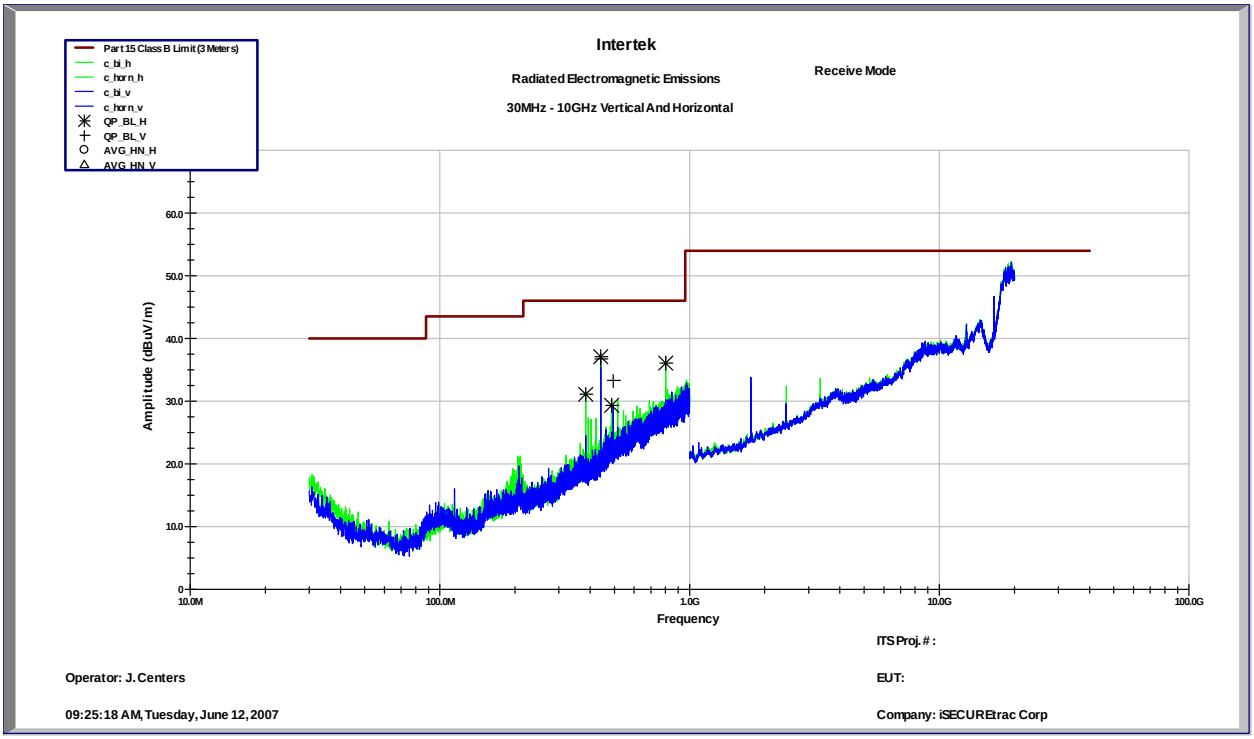


Exhibit 10

6 CONDUCTED VOLTAGE EMISSIONS

§15.207, §15.107

ICES-003

RSS-Gen 7.2.2

6.1 Test Method:

Conducted voltage emission measurements were performed as follows:

- The System 5000 Base was connected to the power source using a Line Impedance Stabilization Network (LISN) in line with each current carrying conductor.
- A spectrum analyzer was connected to the RF port of the LISN installed on the line under test.
- The LISNs installed on all lines not under test were terminated into 50 Ω.
- The System 5000 Base was powered.
- The orientation of each connecting cable was varied to find the configuration that maximized the conducted emission.
- The insertion loss of the measurement cable, the LISN insertion loss, and the output of the spectrum analyzer were added together to give a corrected reading in dBuV.
- The corrected reading was compared to the limit above to determine compliance.
- A quasi-peak and/or average detector was used for measurements close to or exceeding the limit with a peak detector.
- The test was performed on the low and high transmitting frequencies at maximum output power and in receive mode.

6.2 Test Results:

The System 5000 Base was **compliant** with conducted voltage emissions requirements of Part 15.207 and 15.107. No conducted voltage emissions on the AC power interface exceeded the quasi-peak or average limits. See Exhibit 11 for tabular and Exhibit 12 through Exhibit 14 graphical results of conducted voltage emissions.

Conducted Voltage Emissions Tabular Data (L1 & L2)

Test Engineer: Jason Centers

Test Start Date: 6/16/2007 **Test End Date:** 6/16/2007

Emission Limit Tested To: 15.207, 15.107

General Notes / Comments / Performance Monitoring Method:
Device powered by 120VAC, 60Hz

Tx Channel	Line	Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Delta (dB)	Average (dBuV)	Average Limit (dBuV)	Average Delta (dB)	Results
Low	L1	150.0 KHz	44.72	66	-21.28	35.12	56	-20.88	**Compliant**
Low	L1	210.7 KHz	27.56	63.18	-35.62	20.22	53.18	-32.96	**Compliant**
Low	L1	362.3 KHz	26.51	58.68	-32.17	20.62	48.68	-28.06	**Compliant**
Low	L1	3.8047 MHz	30.01	56	-25.99	20.16	46	-25.84	**Compliant**
Low	L2	150.0 KHz	39.23	66	-26.77	25.05	56	-30.95	**Compliant**
Low	L2	210.7 KHz	39.92	63.18	-23.26	27.11	53.18	-26.07	**Compliant**
Low	L2	345.7 KHz	30.27	59.07	-28.79	24.53	49.07	-24.53	**Compliant**
Low	L2	3.8047 MHz	31.92	56	-24.08	20.83	46	-25.17	**Compliant**
High	L1	150.0 KHz	53.03	66	-12.97	39.92	56	-16.08	**Compliant**
High	L1	231.0 KHz	38.9	62.41	-23.52	25.71	52.41	-26.71	**Compliant**
High	L1	377.1 KHz	34.96	58.34	-23.38	29.18	48.34	-19.16	**Compliant**
High	L1	3.7752 MHz	30.64	56	-25.36	20.52	46	-25.48	**Compliant**
High	L2	150.0 KHz	49.91	66	-16.09	35.64	56	-20.36	**Compliant**
High	L2	231.0 KHz	36.42	62.41	-26	24.44	52.41	-27.98	**Compliant**
High	L2	377.1 KHz	30.84	58.34	-27.5	25.34	48.34	-23	**Compliant**
High	L2	3.7752 MHz	31.78	56	-24.22	20.84	46	-25.16	**Compliant**
Receive	L1	168.0 KHz	35.55	65.06	-29.51	22.61	55.06	-32.45	**Compliant**
Receive	L1	204.0 KHz	40.45	63.45	-23	27.29	53.45	-26.16	**Compliant**
Receive	L1	2.229 MHz	31.4	56	-24.6	20.11	46	-25.89	**Compliant**
Receive	L2	150.0 KHz	40.89	66	-25.11	24.87	56	-31.13	**Compliant**
Receive	L2	220.0 KHz	29.79	62.82	-33.03	21.05	52.82	-31.77	**Compliant**
Receive	L2	3.723 MHz	31.77	56	-24.23	20.98	46	-25.02	**Compliant**

Exhibit 11

Graphical Peak Scan – Low Channel

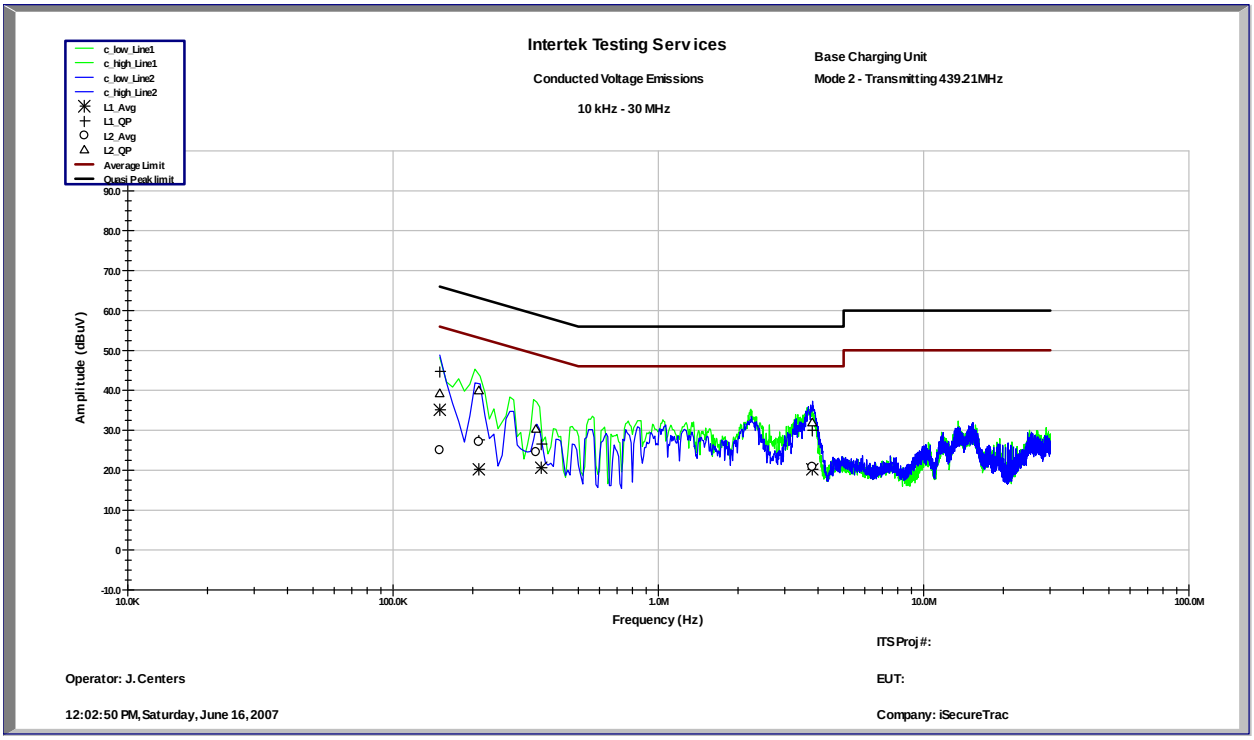


Exhibit 12

Graphical Peak Scan – High Channel

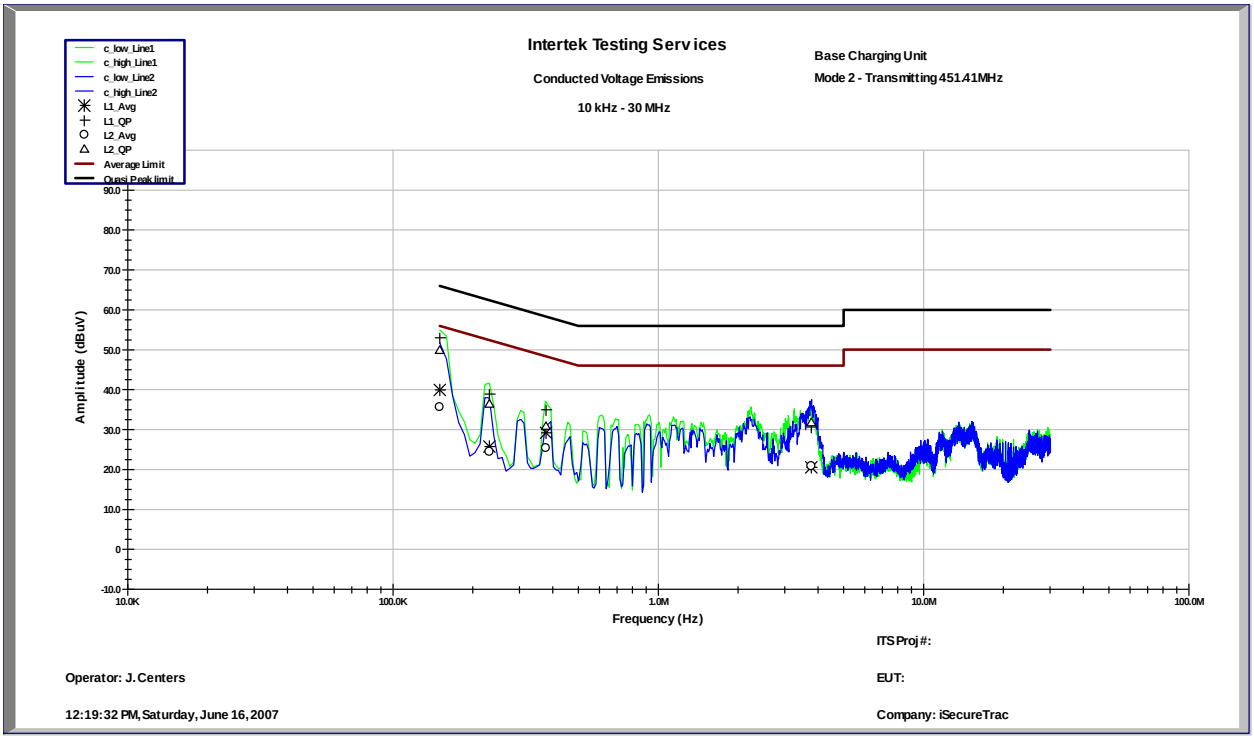


Exhibit 13

Graphical Peak Scan – Receive Mode

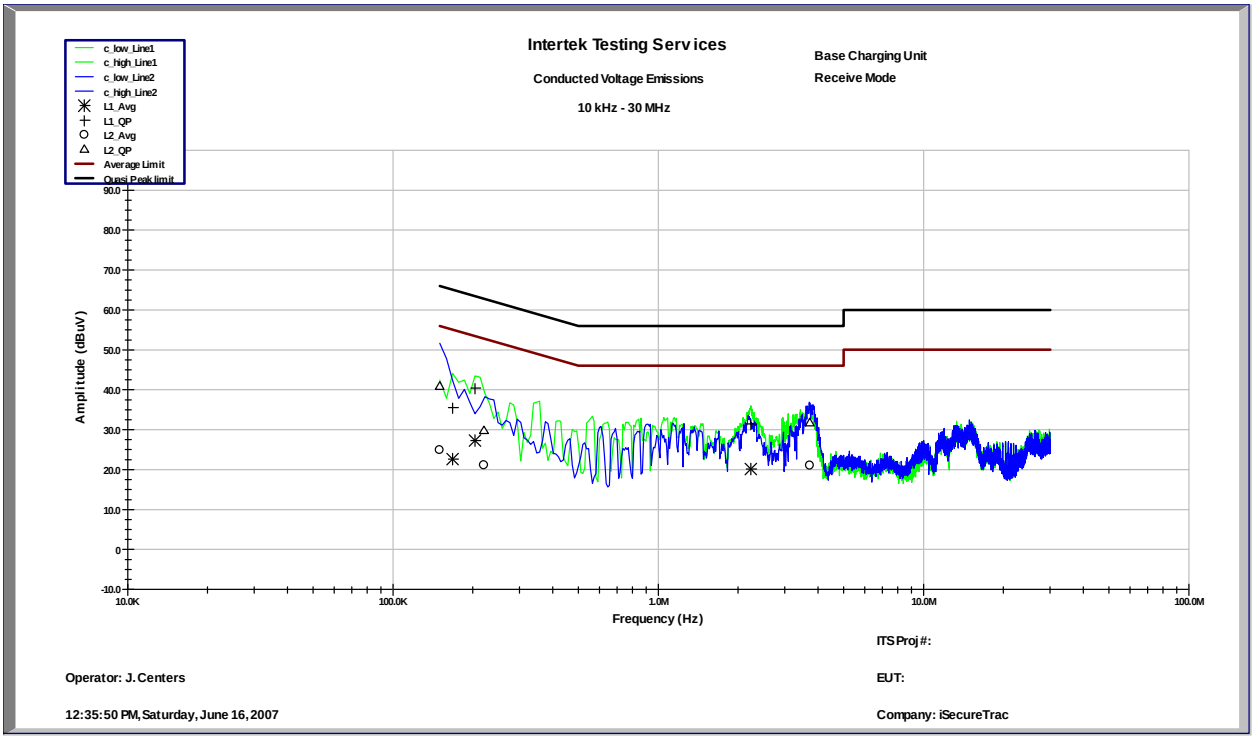


Exhibit 14