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TEST REPORT

Report Number: 100252351LEX-001
Project Number: G100252351

Report Issue Date: 11/20/2010

Product Name: IBot
Model Number: 3804007
FCCID: VDM3804007
ICID: 7175A-3804007
Standards: Title 47 CFR Part 15 Subpart B and C, RSS-210 Issue 7 and RSS-Gen Issue 2

Tested by:
Intertek Testing Services NA, Inc.
731 Enterprise Drive
Lexington, KY 40510

Client:
Opex Corporation
305 Commerce Drive
Moorestown, NJ 08057

Report prepared by
Bryan Taylor, Team Leader

Report reviewed by
Jason Centers, Senior Project Engineer

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1 Introduction and Conclusion

The tests indicated in section 2 were performed on the product constructed as described in section 3. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test method, a list of the actual test equipment used, documentation photos, results and raw data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complied with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested.

The INTERTEK-Lexington is located 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 and ANSI C63.4. 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. The test site is listed with the FCC under registration number 485103. The test site is listed with Industry Canada under site number IC 2042M-1.

2 Test Summary

Page	Test full name	FCC Reference	IC Reference	Result
6	Radiated Emissions (Transmitter)	§ 15.249(a)	RSS-210 (2.2, 2.6)	Pass
14	Radiated Emissions (Receiver)	§ 15.109	RSS-Gen (7.2.3)	Pass
16	AC Powerline Conducted Emissions	§ 15.107, § 15.207	RSS-Gen (7.2.2)	Pass
21	Antenna Requirement per FCC Part 15.203	§ 15.203	RSS-Gen (7.1.4)	Pass
22	RF Exposure Requirements (MPE Calculations)	§ 15.247(b)(5), § 1.1310	RSP100 (4)	Pass

3 Description of Equipment Under Test

Equipment Under Test	
Manufacturer	Opex Corporation
Model Number	3804007
Serial Number	Prototype 88018
FCC Identifier	VDM3804007
IC Identifier	7175A-3804007
Receive Date	11/15/2010
Test Start Date	11/15/2010
Test End Date	11/18/2010
Device Received Condition	Good
Test Sample Type	Pre-production
Frequency Band	2405-2480MHz
Modulation Type	QPSK
Transmission Control	Test Commands (Hyperterminal)
Test Channels	0, 7, 15
Antenna Type (15.203)	PCB

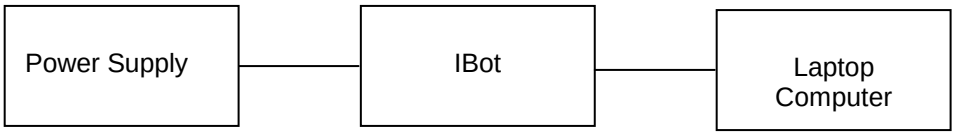
Description of Equipment Under Test
The IBot is a small radio controlled robotic vehicle which runs in a track system as part of a larger automated sorting machine.

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmitting on channels 0, 7, or 15
2	Receive / idle mode

3.1 System setup including cable interconnection details, support equipment and simplified block diagram

3.2 EUT Block Diagram:



3.3 Cables:

Cables					
Description	Length	Shielding	Ferrites	Connection	
				From	To
DC Input Cable	40ft	None	None	DC Power Supply	Test Sample
Serial Cable	40ft	None	None	Laptop	Test Sample

3.4 Support Equipment:

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Laptop Computer	Compaq	N410c	Lab 1
Power Supply	Astec	MP1-3R-3R-30	0820E398

4 Radiated Emissions (Transmitter)

4.1 Test Limits

§ 15.249(a): Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

Part 15.249: Field Strength Limits

Fundamental Frequency	Field Strength of Fundamental (millivolts/meter)	Field Strength of Harmonics (microvolts/meter)
902–928 MHz	50	500
2400 – 2483.5MHz	50	500
5725–5875 MHz	50	500
24.0–24.25 GHz	250	2500

Part 15.205(a): Restricted Bands of Operations

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	2655–2900	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

Part 15.209(a): Field Strength Limits for Restricted Bands of Operation

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

4.2 Test Procedure

ANSI C63.10: 2003 and KDB Publication No. 558074: Guidance on Measurements for Digital Transmission Systems (47 CFR 15.249)

4.3 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 calculations are listed below:

Formula:
FS = RA + AF + CF

FS = Field Strength in dBμV/m
RA = Receiver Amplitude in dBμV
AF = Antenna Factor in dB
CF = Cable Attenuation Factor in dB (Including preamplifier and filter attenuation)

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

4.4 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	6/29/2010	6/29/2011
Preamplifier	987410	Miteq	AFS44-00102000-30-10P-44	6/17/2010	6/17/2011
Preamplifier	SF456200904	Mini-Circuits	ZX60-3018G-S+	2/12/2010	2/12/2011
Biconnilog Antenna	00051864	ETS	3142C	12/21/2009	12/21/2010
Horn Antenna	6556	ETS	3115	8/9/2010	8/9/2011
System Controller	121701-1	Sunol Sciences	SC99V	Time of Use	Time of Use
High Pass Filter	3986-01 DC0408	Microwave Circuits, Inc.	H3G020G2	2/10/2010	2/10/2011

4.5 Results:

All emissions from the fundamental and harmonics were below the field strength limits of Part 15.249(a). Additionally, all emissions falling within restricted bands of operation and at the band edges were found to be below the limit specified in Part 15.209(a). The spurious emissions listed in the following tables are the worst case emissions.

Worst Case Fundamental Measurements

TX Channel	Frequency	Polarity	Corr. Peak Reading. (dBuV/m)	Corr. Avg Reading. (dBuV/m)	Peak Limit (dBuV/m)	Avg. Limit (dBuV/m)	Results	Comments
Low	2.4055 GHz	V	87.71	80.93	114	94	**Compliant**	Fundamental
Low	2.4045 GHz	H	92.48	77.718	114	94	**Compliant**	Fundamental
Middle	2.4405 GHz	V	87.786	78.056	114	94	**Compliant**	Fundamental
Middle	2.4396 GHz	H	90.803	80.643	114	94	**Compliant**	Fundamental
High	2.4796 GHz	V	89.196	78.616	114	94	**Compliant**	Fundamental
High	2.4806 GHz	H	93.76	77.79	114	94	**Compliant**	Fundamental

Worst Case Spurious Measurements (1 – 18GHz)

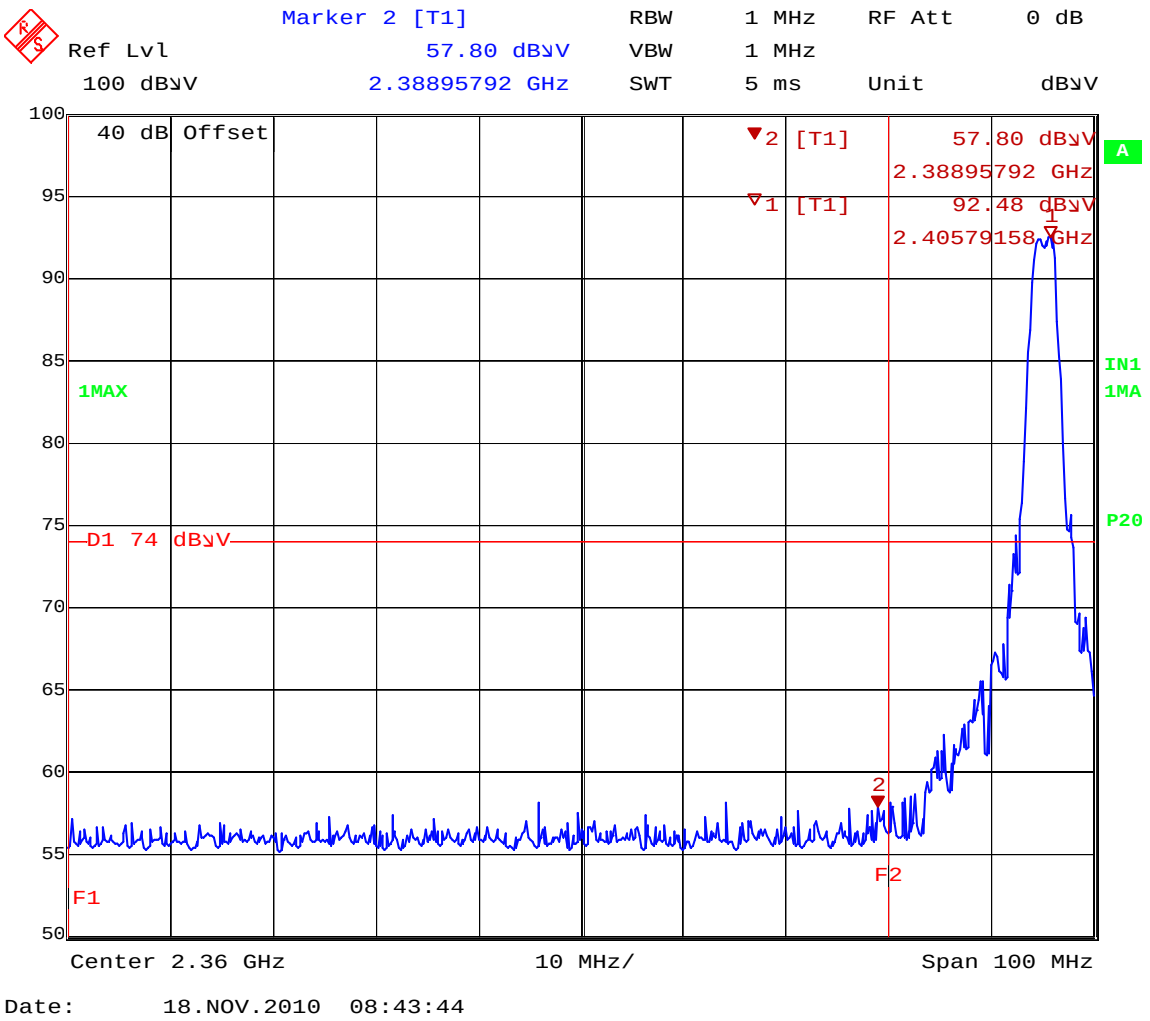
TX Channel	Spurious Frequency	Polarity	Corr. Peak Reading. (dBuV/m)	Corr. Avg Reading. (dBuV/m)	Peak Limit (dBuV/m)	Avg. Limit (dBuV/m)	Results	Comments
Low	4.8091 GHz	V	51.915	37.205	74	54	**Compliant**	Restricted Band
Low	7.2137 GHz	V	51.043	37.773	74	54	**Compliant**	Restricted Band
Low	4.809 GHz	H	48.839	35.989	74	54	**Compliant**	Restricted Band
Low	7.2137 GHz	H	51.803	38.983	74	54	**Compliant**	Restricted Band
Mid	4.8791 GHz	V	47.562	36.332	74	54	**Compliant**	Restricted Band
Mid	7.3186 GHz	V	53.311	39.521	74	54	**Compliant**	Restricted Band
Mid	4.8791 GHz	H	48.563	35.933	74	54	**Compliant**	Restricted Band
Mid	7.3189 GHz	H	50.846	37.896	74	54	**Compliant**	Restricted Band
High	4.959 GHz	V	50.843	37.843	74	54	**Compliant**	Restricted Band
High	7.4417 GHz	V	53.406	39.106	74	54	**Compliant**	Restricted Band
High	4.959 GHz	H	48.522	35.222	74	54	**Compliant**	Restricted Band
High	7.4387 GHz	H	51.92	38.85	74	54	**Compliant**	Restricted Band

Worst Case Spurious Measurements (30MHz – 1GHz)

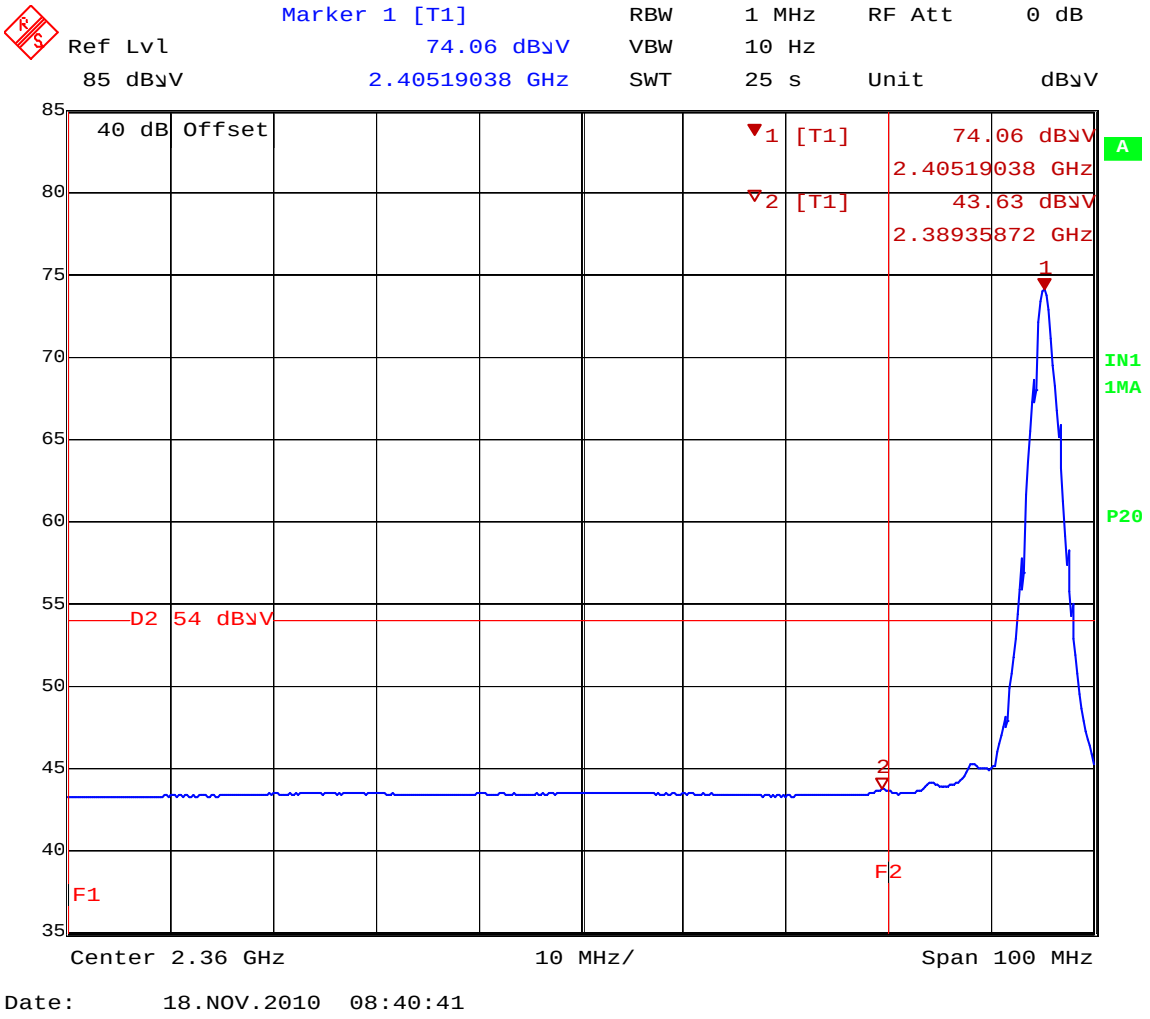
TX Channel	Spurious Frequency	Polarity	Corr. QP Reading. (dBuV/m)	QP Limit (dBuV/m)	Results	Comments
Low	98.102 MHz	V	31.73	43.52	**Compliant**	QP Detector
Low	217.49 MHz	V	29.68	46.02	**Compliant**	QP Detector
Low	226.2 MHz	V	35.61	46.02	**Compliant**	QP Detector
Low	215.2 MHz	H	36.44	43.52	**Compliant**	QP Detector
Low	223.8 MHz	H	41.16	46.02	**Compliant**	QP Detector
Low	245.0 MHz	H	32.87	46.02	**Compliant**	QP Detector
Mid	222.71 MHz	V	34.4	46.02	**Compliant**	QP Detector
Mid	222.7 MHz	H	40.12	46.02	**Compliant**	QP Detector
High	222.91 MHz	V	36.08	46.02	**Compliant**	QP Detector
High	222.9 MHz	H	35.52	46.02	**Compliant**	QP Detector

Band Edge Emissions

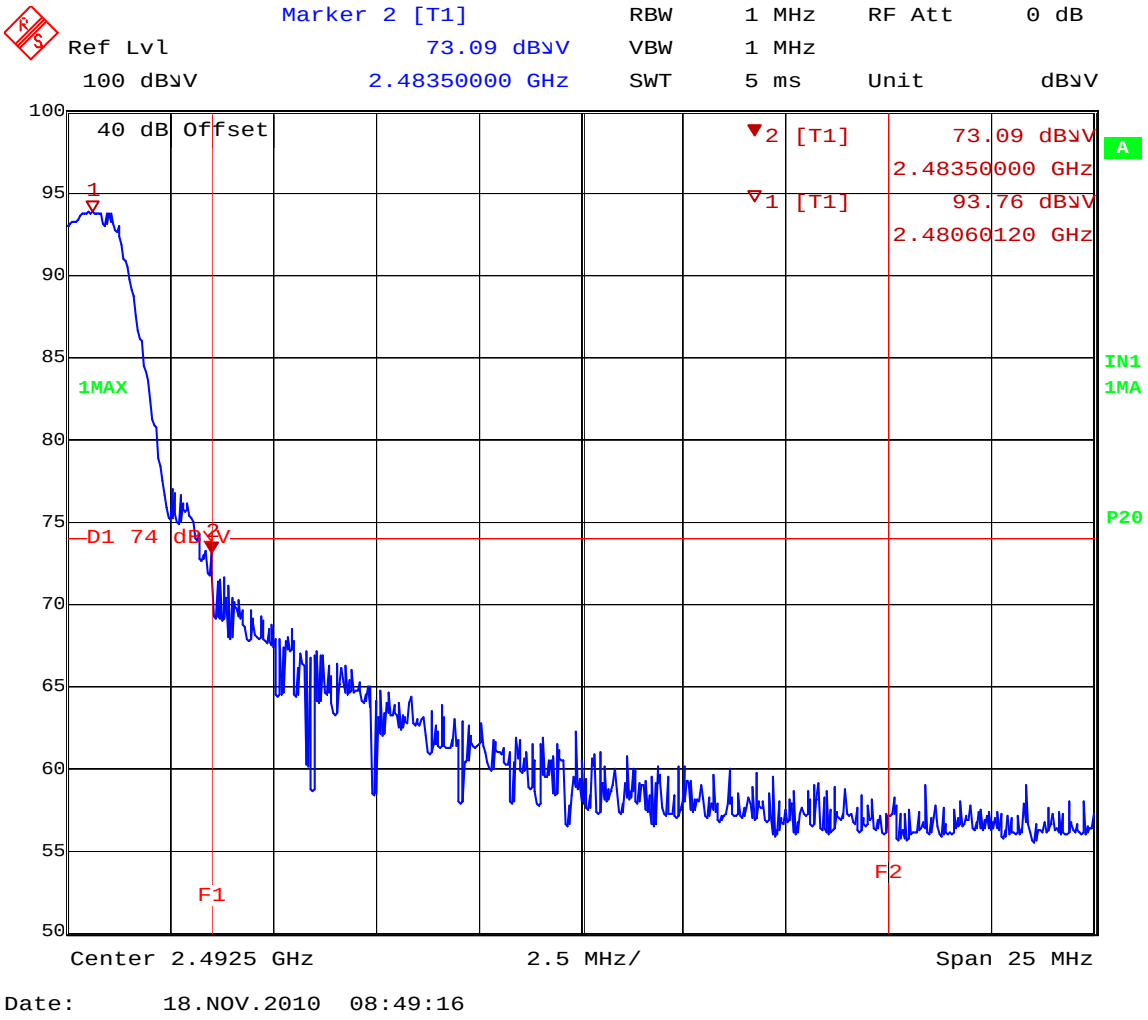
Channel	Freq (GHz)	Pol	Corr. Peak Reading. (dBuV/m)	Corr. Avg Reading. (dBuV/m)	Peak Limit (dBuV/m)	Avg. Limit (dBuV/m)	Results	Comments
Low	2.389GHz	H	57.8	43.63	74	54	**Compliant**	Low Band Edge
High	2.4835GHz	H	73.09	51.15	74	54	**Compliant**	High Band Edge



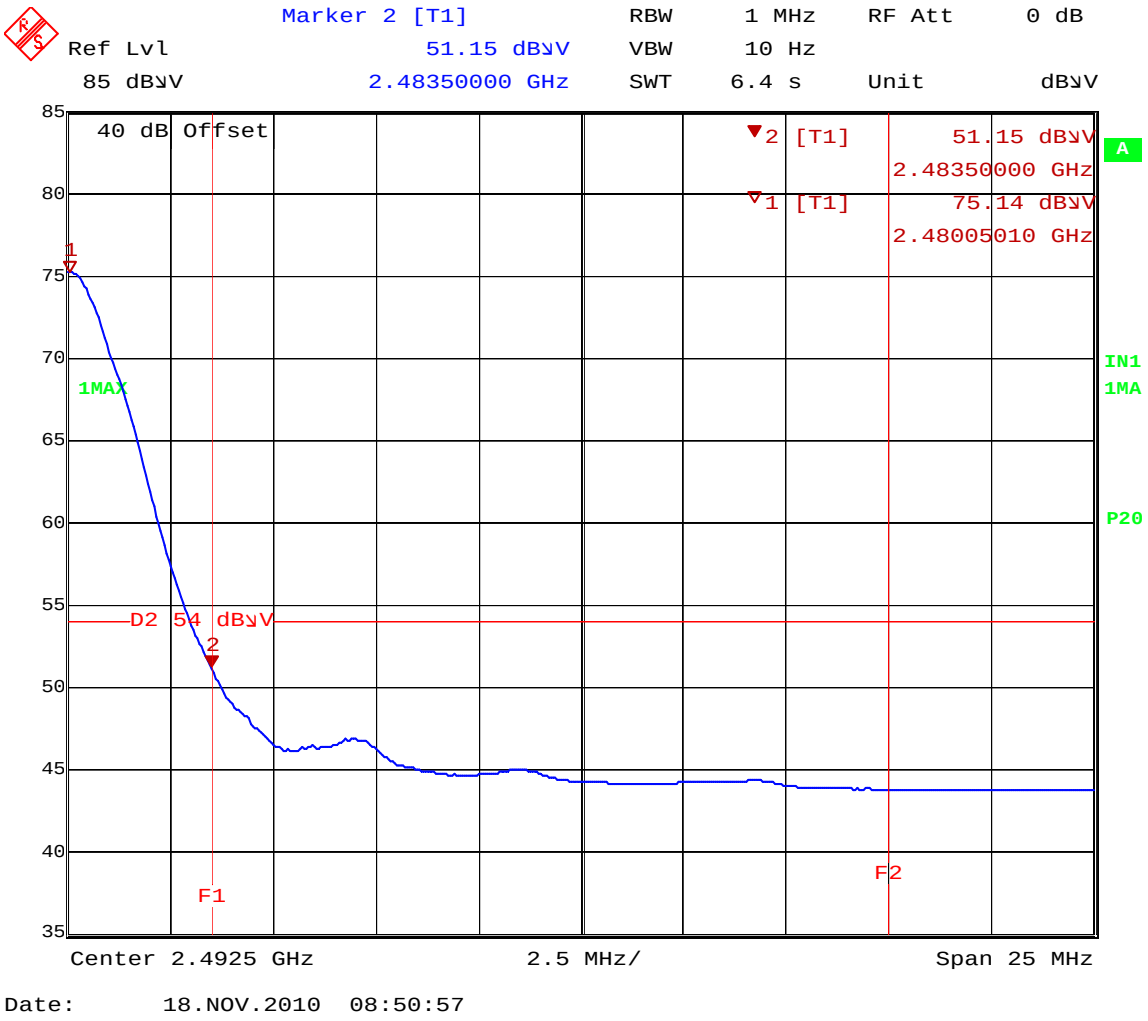
Low Channel Band Edge Emissions (Peak Detection)



Low Channel Band Edge Emissions (Average Detection)



High Channel Band Edge Emissions (Peak Detection)



High Channel Band Edge Emissions (Average Detection)

5 Radiated Emissions (Receiver)

5.1 Test Limits

§ 15.109: Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency of emission (MHz)	Field strength (microvolts/meter)	Field strength (dBuV/m)
30–88	100	40
88–216	150	43.5
216–960	200	46
Above 960	500	54

5.2 Test Procedure

ANSI C63.4: 2003

5.3 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 calculations are listed below:

Formula:
FS = RA + AF + CF

FS = Field Strength in dBµV/m
RA = Receiver Amplitude in dBµV
AF = Antenna Factor in dB
CF = Cable Attenuation Factor in dB (Including preamplifier and filter attenuation)

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

5.4 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	6/29/2010	6/29/2011
Preamplifier	987410	Miteq	AFS44-00102000-30-10P-44	6/17/2010	6/17/2011
Preamplifier	SF456200904	Mini-Circuits	ZX60-3018G-S+	2/12/2010	2/12/2011
Biconnilog Antenna	00051864	ETS	3142C	12/21/2009	12/21/2010
Horn Antenna	6556	ETS	3115	8/9/2010	8/9/2011
System Controller	121701-1	Sunol Sciences	SC99V	Time of Use	Time of Use

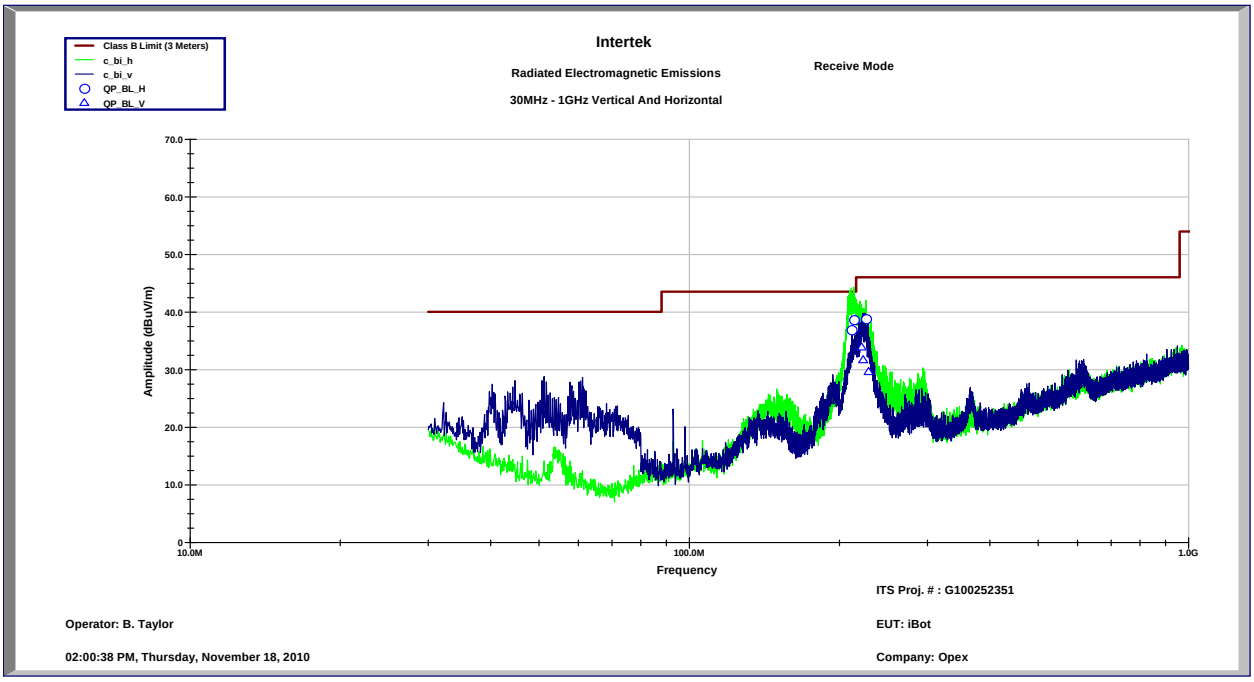
5.5 Results:

All spurious emissions with the test sample in receive mode were below the limits specified in Part 15.109 for a class B digital device.

Radiated Emissions										
Test Engineer:	Bryan Taylor	**Start Date:**	11/18/2010	**End Date:**	11/18/2010					
Temperature:	23.2C	**Humidity:**	43.40%	**Pressure:**	989.3mBar					
Specification:	FCC Part 15B	**Test Limit:**	Class B							
Notes:										

A	B	C	D	E	F	G	H	I	J	K
Frequency	**Polarity (H/V)**	**Raw Reading (dBuV)**	**Cab. (dB)**	**Ant. (dB)**	**Corr. Reading. (dBuV/m)**	**Limit (dBuV/m)**	**Delta (dB)**	**RBW / Detector**	**Test Distance**	**Results**
211.41 MHz	H	23.82	1.93	11.16	36.91	43.52	-6.61	120kHz / QP	3m	**Compliant**
213.8 MHz	H	25.31	2.09	11.25	38.65	43.52	-4.87	120kHz / QP	3m	**Compliant**
226.1 MHz	H	25.13	2.23	11.47	38.83	46.02	-7.19	120kHz / QP	3m	**Compliant**
221.51 MHz	V	20.69	1.9	11.33	33.92	46.02	-12.1	120kHz / QP	3m	**Compliant**
223.01 MHz	V	18.23	2.09	11.36	31.68	46.02	-14.34	120kHz / QP	3m	**Compliant**
228.7 MHz	V	16.02	2	11.62	29.65	46.02	-16.37	120kHz / QP	3m	**Compliant**
Calculations:					F = C + D + E		H = F - G			

Maximized Quasi Peak Emissions



Peak Scan (Receive Mode)

6 AC Powerline Conducted Emissions

6.1 Test Limits

§ 15.107(e): Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

6.2 Test Procedure

ANSI C63.4: 2003

6.3 Test Equipment Used:

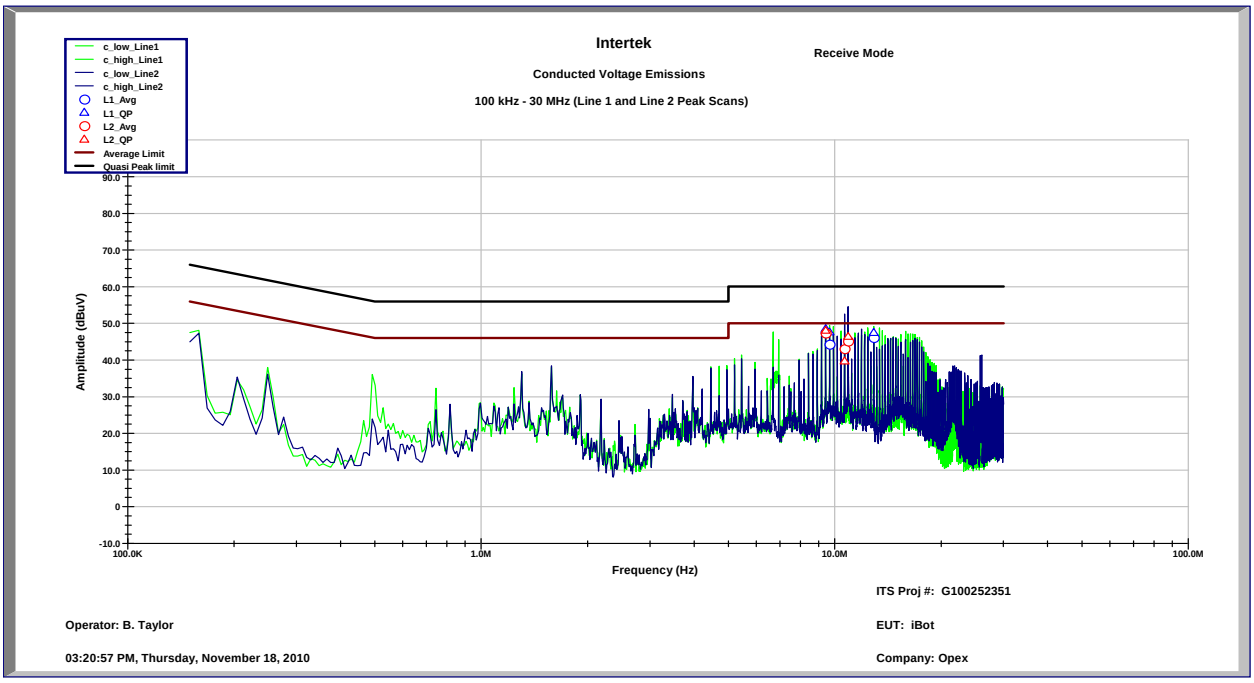
Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	6/29/2010	6/29/2011
LISN	3333	Teseq	NNB52	2/23/2010	2/23/2011

6.4 Results:

Conducted Voltage Emissions on Power Lines								
Test Engineer:	Bryan Taylor	**Start Date:**	11/18/2010	**End Date:**	11/18/2010			
Temperature:	23.2C	**Humidity:**	43.40%	**Pressure:**	989.3mBar			
Specification:	FCC Part 15	**Test Limit:**	Class B	**RBW:**	9kHz			
Notes:	Receive Mode							

Line	Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Delta (dB)	Average (dBuV)	Average Limit (dBuV)	Average Delta (dB)	Results
Line 1	9.42 MHz	48.55	60	-11.45	47.53	50	-2.47	**Compliant**
Line 1	9.6679 MHz	47.63	60	-12.37	44.32	50	-5.68	**Compliant**
Line 1	12.89 MHz	47.53	60	-12.47	46.1	50	-3.9	**Compliant**
Line 2	9.4189 MHz	48.07	60	-11.93	47.33	50	-2.67	**Compliant**
Line 2	10.658 MHz	39.74	60	-20.26	43.09	50	-6.91	**Compliant**
Line 2	10.907 MHz	46.41	60	-13.59	45.16	50	-4.84	**Compliant**

Quasi-Peak and Average Measurements (Receive Mode)

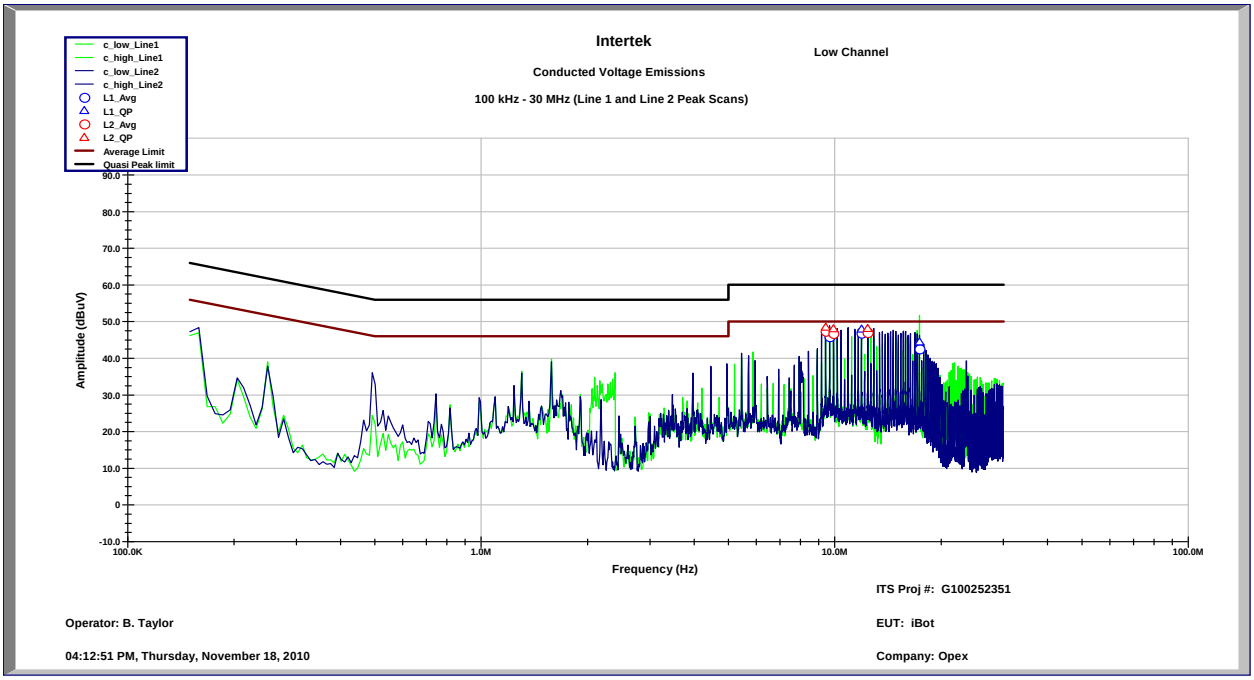


Peak Scan (Receive Mode)

Conducted Voltage Emissions on Power Lines								
Test Engineer:	Bryan Taylor	**Start Date:**	11/18/2010	**End Date:**	11/18/2010			
Temperature:	23.2C	**Humidity:**	43.40%	**Pressure:**	989.3mBar			
Specification:	FCC Part 15	**Test Limit:**	Class B	**RBW:**	9kHz			
Notes:	Low Channel							

Line	Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Delta (dB)	Average (dBuV)	Average Limit (dBuV)	Average Delta (dB)	Results
Line 1	9.6644 MHz	46.95	60	-13.05	45.83	50	-4.17	**Compliant**
Line 1	11.897 MHz	47.9	60	-12.1	46.79	50	-3.21	**Compliant**
Line 1	17.35 MHz	44.46	60	-15.54	42.55	50	-7.45	**Compliant**
Line 2	9.4203 MHz	48.42	60	-11.58	47.37	50	-2.63	**Compliant**
Line 2	9.9131 MHz	48.02	60	-11.98	46.77	50	-3.23	**Compliant**
Line 2	12.394 MHz	48.12	60	-11.88	47	50	-3	**Compliant**

Quasi-Peak and Average Measurements (Low Channel)

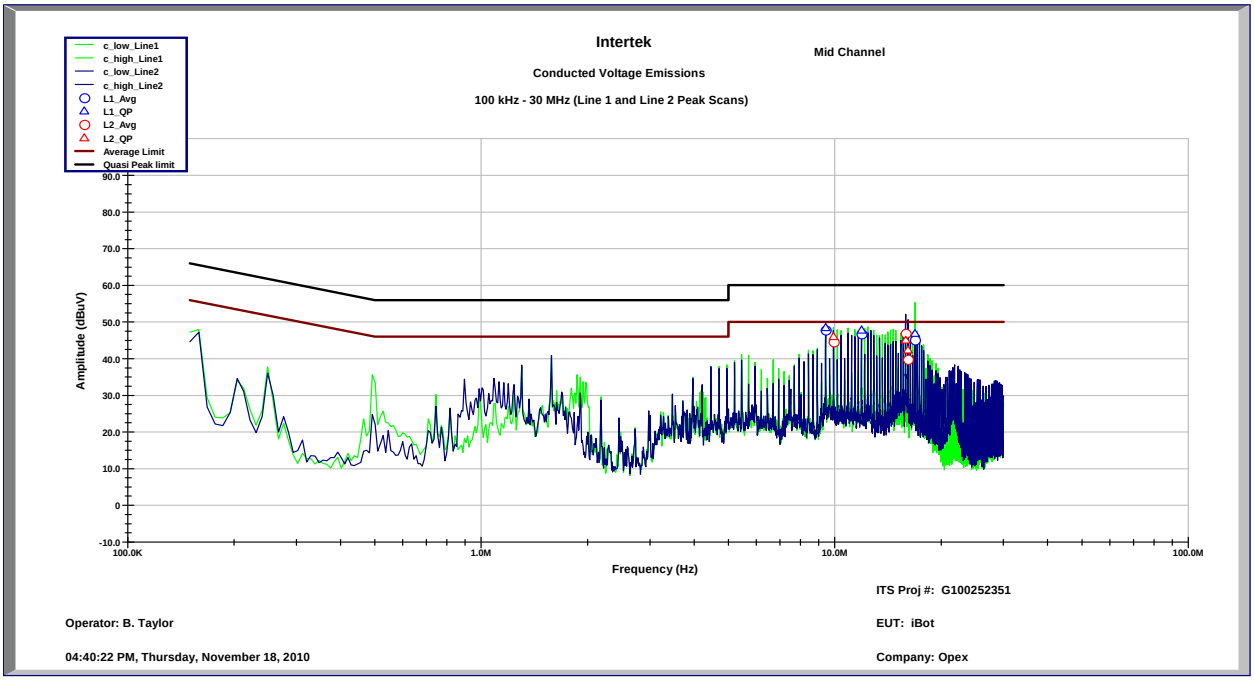


Peak Scan (Low Channel)

Conducted Voltage Emissions on Power Lines								
Test Engineer:	Bryan Taylor	**Start Date:**	11/18/2010	**End Date:**	11/18/2010			
Temperature:	23.2C	**Humidity:**	43.40%	**Pressure:**	989.3mBar			
Specification:	FCC Part 15	**Test Limit:**	Class B	**RBW:**	9kHz			
Notes:	Mid Channel							

Line	Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Delta (dB)	Average (dBuV)	Average Limit (dBuV)	Average Delta (dB)	Results
Line 1	9.419 MHz	48.48	60	-11.52	47.8	50	-2.2	**Compliant**
Line 1	11.898 MHz	47.77	60	-12.23	46.71	50	-3.29	**Compliant**
Line 1	16.856 MHz	46.85	60	-13.15	45.13	50	-4.87	**Compliant**
Line 2	9.9164 MHz	46.01	60	-13.99	44.56	50	-5.44	**Compliant**
Line 2	15.863 MHz	45.01	60	-14.99	46.88	50	-3.12	**Compliant**
Line 2	16.111 MHz	42.37	60	-17.63	39.81	50	-10.19	**Compliant**

Quasi-Peak and Average Measurements (Mid Channel)

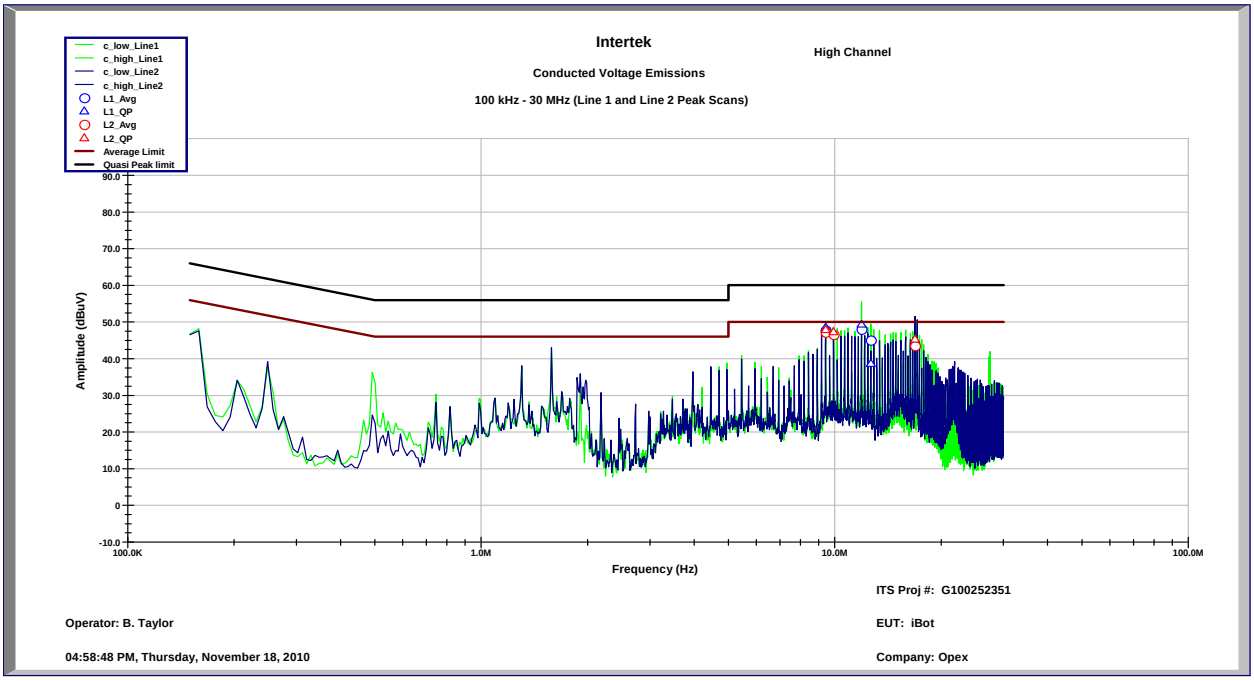


Peak Scan (Mid Channel)

Conducted Voltage Emissions on Power Lines								
Test Engineer:	Bryan Taylor	**Start Date:**	11/18/2010	**End Date:**	11/18/2010			
Temperature:	23.2C	**Humidity:**	43.40%	**Pressure:**	989.3mBar			
Specification:	FCC Part 15	**Test Limit:**	Class B	**RBW:**	9kHz			
Notes:	High Channel							

Line	Frequency (MHz)	Quasi-Peak (dBuV)	Quasi-Peak Limit (dBuV)	Quasi-Peak Delta (dB)	Average (dBuV)	Average Limit (dBuV)	Average Delta (dB)	Results
Line 1	9.4198 MHz	48.57	60	-11.43	47.74	50	-2.26	**Compliant**
Line 1	11.899 MHz	49.36	60	-10.64	48.01	50	-1.99	**Compliant**
Line 1	12.642 MHz	38.7	60	-21.3	45.05	50	-4.95	**Compliant**
Line 2	9.4189 MHz	47.91	60	-12.09	47.21	50	-2.79	**Compliant**
Line 2	9.915 MHz	47.29	60	-12.71	46.54	50	-3.46	**Compliant**
Line 2	16.856 MHz	45.33	60	-14.67	43.52	50	-6.48	**Compliant**

Quasi-Peak and Average Measurements (High Channel)



Peak Scan (High Channel)

7 Antenna Requirement per FCC Part 15.203

7.1 Test Limits

§ 15.203: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

7.2 Results:

The sample tested met the antenna requirement. The antenna used was permanently attached and integral to the PCB.

8 RF Exposure Requirements (MPE Calculations)

8.1 Test Limits

§ 1.1310: The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in §1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of §2.1093 of this chapter.

Part 1.1310 Limits for Maximum Permissible Exposure (MPE)

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3–3.0	614	1.63	*(100)	6
3.0–30	1842/f	4.89/f	*(900/f^2)	6
30–300	61.4	0.163	1.0	6
300–1500	.....	.....	f/300	6
1500–100,000	.....	.....	5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f^2)	30
30–300	27.5	0.073	0.2	30
300–1500	.....	.....	f/1500	30
1500–100,000	.....	.....	1.0	30

f = frequency in MHz
* = Plane-wave equivalent power density
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.
NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

8.2 Test Procedure

The radiated RF power (calculated from the field strength measurement) was used to calculate the maximum RF exposure at a 20 cm distance using the formula:

Maximum RF Exposure at 20cm = (EIRP in mW)/(4Pi(20cm)^2)

Once the Maximum RF Exposure calculations were complete the results were compared to the MPE limits above.

8.3 Results:

The following calculations show the Maximum RF Exposure from the test sample at 20cm for the worst case EIRP. The MPE level is well below the limits for the general population described in the table above.

Maximum Field Strength at 2.48GHz = 93.76dBuV/m at 3m

Maximum EIRP = 0.71mW

MPE = 0.71mW / (4Pi(20cm)^2) = 0.71mW / 5025.6 cm^2 = **0.00014mW/cm^2** (Limit = 1 mW/cm^2)

9 Measurement Uncertainty

The measured value related to the corresponding limit will be used to decide whether the equipment meets the requirements.

The measurement uncertainty figures were calculated and correspond to a coverage factor of k = 2, providing a confidence level of respectively 95.45 % in the case where the distributions characterizing the actual measurement uncertainties are normal (Gaussian).

Measurement uncertainty Table

Parameter	Uncertainty	Notes
Radiated emissions, 30 to 1000 MHz	±3.9dB	
Radiated emissions, 1 to 18 GHz	±4.2dB	
Radiated emissions, 18 to 40 GHz	±4.3dB	
Power Port Conducted emissions, 150kHz to 30 MHz	±2.8dB	

10 Revision History

Revision Level	Date	Report Number	Notes
0	11/20/2010	100252351LEX-001	Original Issue