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TEST REPORT

Report Number:	**101078559LEX-012**
Project Number:	**G101078559**
Report Issue Date:	**6/14/2013**
Product Name:	**iX101T1 Rugged Tablet**
Model Number:	**iX101T1**
FCCID:	**Q2GWG7550**
ICID:	**4596A-WG7550**
Standards:	**Title 47 CFR Part 15 Subpart C and RSS-210 Issue 8**
Radios Under Test:	**FM Radio Transmitter**

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

Client:
Xplore Technologies
14000 Summit Dr.
Austin, TX 78728

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	Occupied Bandwidth	§ 15.239(a)	RSS-210 (A2.8)	Pass
10	Radiated Fundamental and Spurious Emissions (Transmitter)	§ 15.239(b)(c), § 15.209	RSS-210 (A2.8)	Pass
16	Radiated Spurious Emissions (Receiver)	§ 15.109	RSS-Gen (6.1)	Pass
19	AC Powerline Conducted Emissions	§ 15.107, § 15.207	RSS-Gen (7.2.4)	Pass
22	Antenna Requirement per FCC Part 15.203	§ 15.203	RSS-Gen (7.1.2)	Pass

3 Description of Equipment Under Test

Equipment Under Test	
Manufacturer	Xplore Technologies
Model Number	iX101T1
Serial Number	Test Sample #2
FCC Identifier	Q2GWG7550
IC Identifier	4596A-WG7550
Receive Date	3/20/2013
Test Start Date	3/21/2013
Test End Date	3/27/2013
Device Received Condition	Good
Test Sample Type	Production
Frequency Band	88MHz – 108MHz
Mode(s) of Operation	FM Radio Transmitter
Modulation Type	FM
Duty Cycle	100%
Transmission Control	Test Commands
Test Channels	88.1MHz, 98MHz, 107.9MHz
Antenna Type (15.203)	Internal
Power Supply	115VAC/60Hz (Via AC / DC Power Adapter)

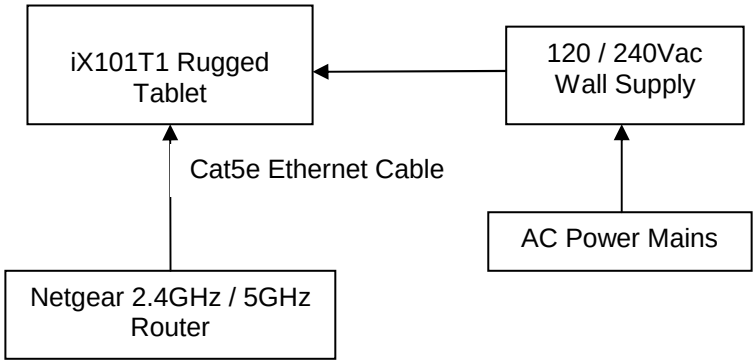
Description of Equipment Under Test
The iX101T1 is a ruggedized tablet PC.

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmitting an FM signal at full output power while modulated with streaming music and volume adjusted to maximum.
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
120 / 240Vac Power Cable	1m	No	No	120 / 240Vac Wall Supply	Xplore Tablet
Cat5e Ethernet Cable	1m	No	No	Netgear Ethernet / Wi-Fi Router	Xplore Tablet
HDMI Mini Cable	1m	Yes	No	Xplore Tablet	Unterminated
HDMI Cable	1m	Yes	No	Xplore Tablet	Unterminated
Micro USB Cable	1m	Yes	No	Xplore Tablet	Unterminated
USB Cable	1m	Yes	No	USB Mouse	Xplore Tablet

3.4 Support Equipment:

Support Equipment			
Description	Manufacturer	Model Number	Serial Number
Wireless Router	Netgear	WNDR3700v4	311315801CC9

4 Occupied Bandwidth

4.1 Test Limits

§ 15.239(a): Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88-108 MHz

4.2 Test Procedure

ANSI C63.10: 2009.

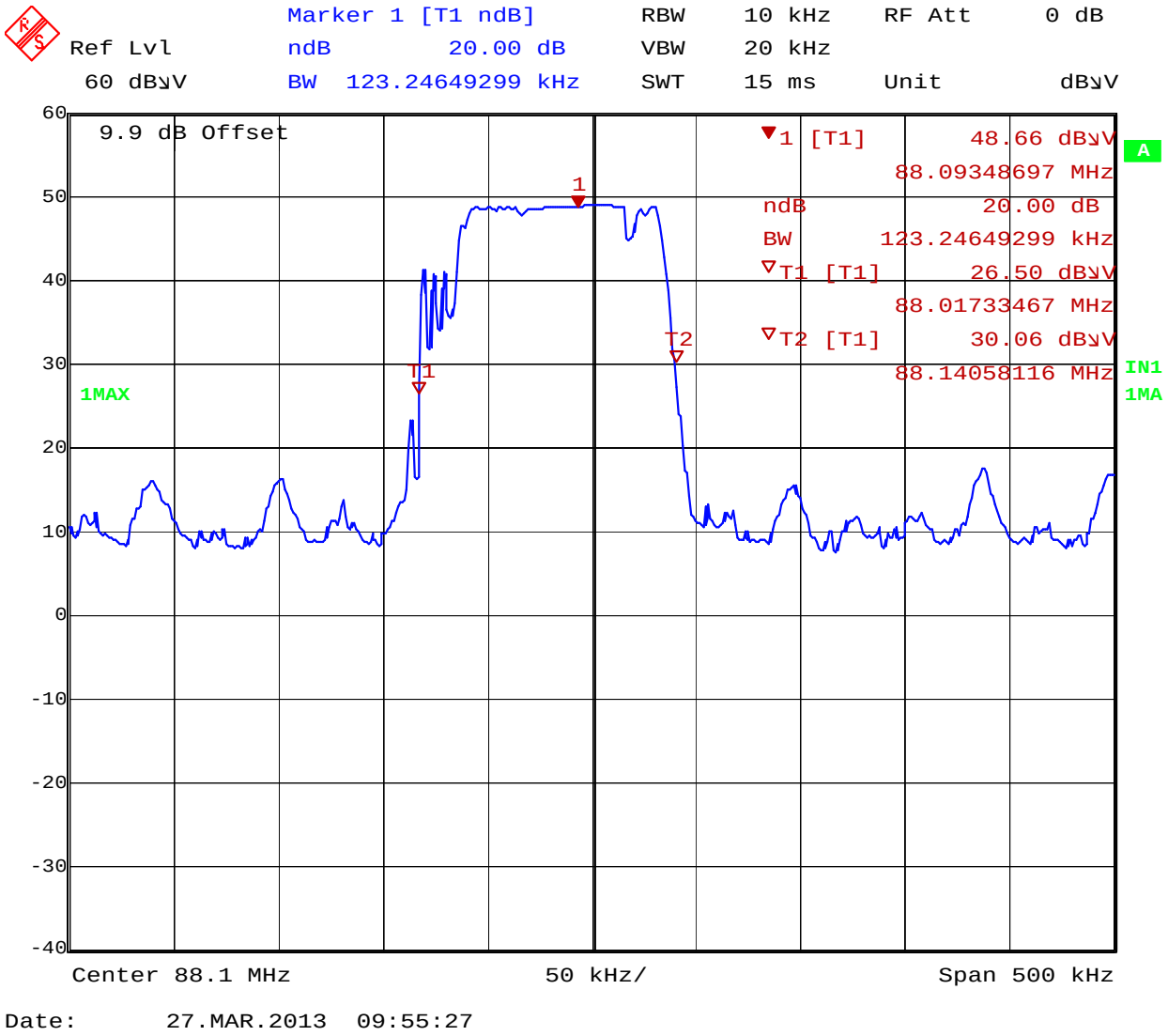
The N-dB down function was used to measure the 20dB emission bandwidth of the fundamental at low, mid, and high channels.

4.3 Test Equipment Used:

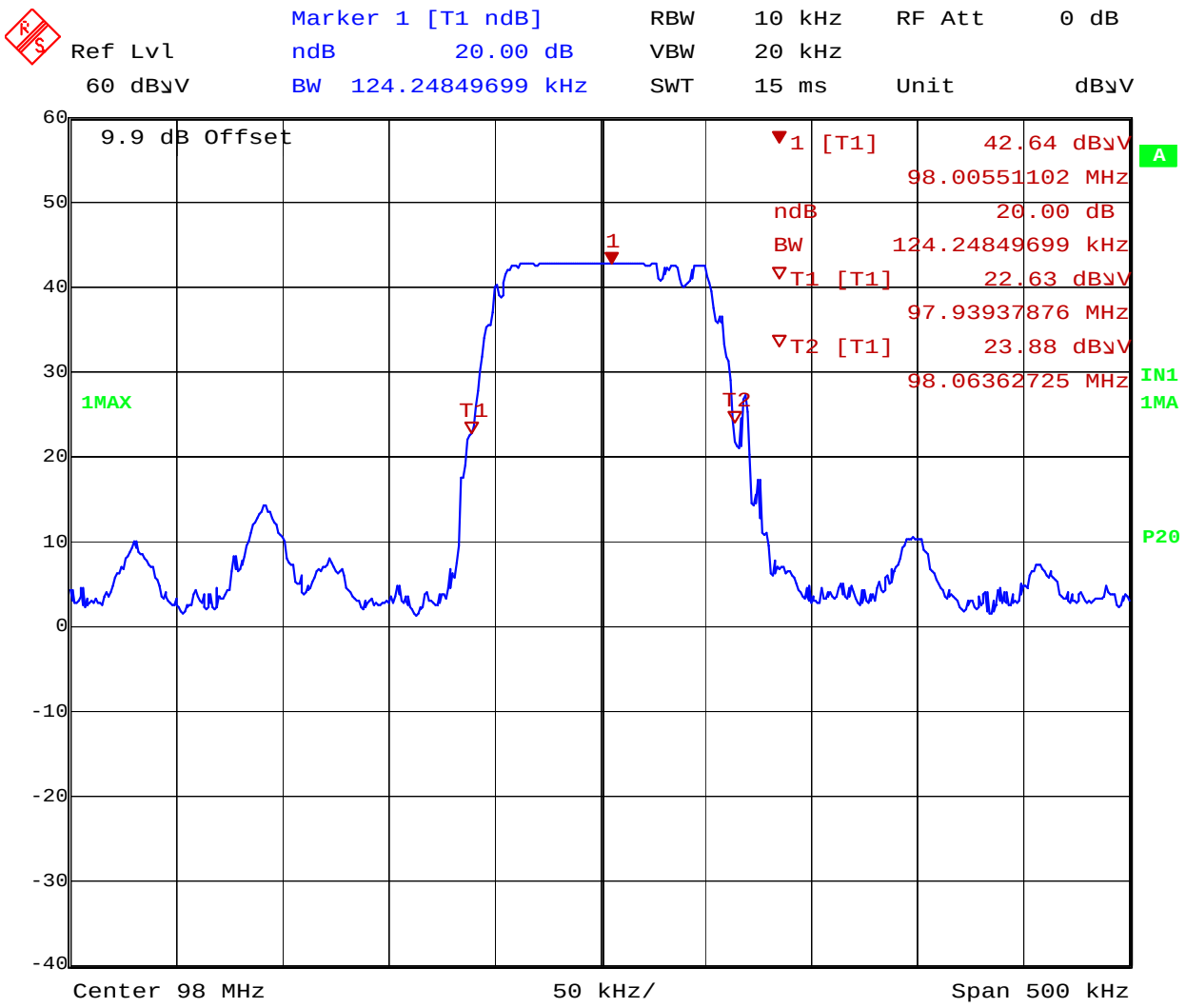
Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	9/15/2012	9/14/2013

4.4 Results:

Channel	Frequency (MHz)	20dB Bandwidth	Limit	Result
Low	88.1	123.4kHz	200kHz	**Pass**
Mid	98	124.2kHz	200kHz	**Pass**
High	107.9	155.3kHz	200kHz	**Pass**



20dB Bandwidth Plot (88.1MHz)



20dB Bandwidth Plot (98MHz)

20dB Bandwidth Plot (107.9MHz)

5 Radiated Fundamental and Spurious Emissions (Transmitter)

5.1 Test Limits

§ 15.239: (b) The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in § 15.35 for limiting peak emissions apply.

(c) The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in § 15.209.

Part 15.209(a): Field Strength Limits, General Requirements

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

5.2 Test Procedure

ANSI C63.10: 2009

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:

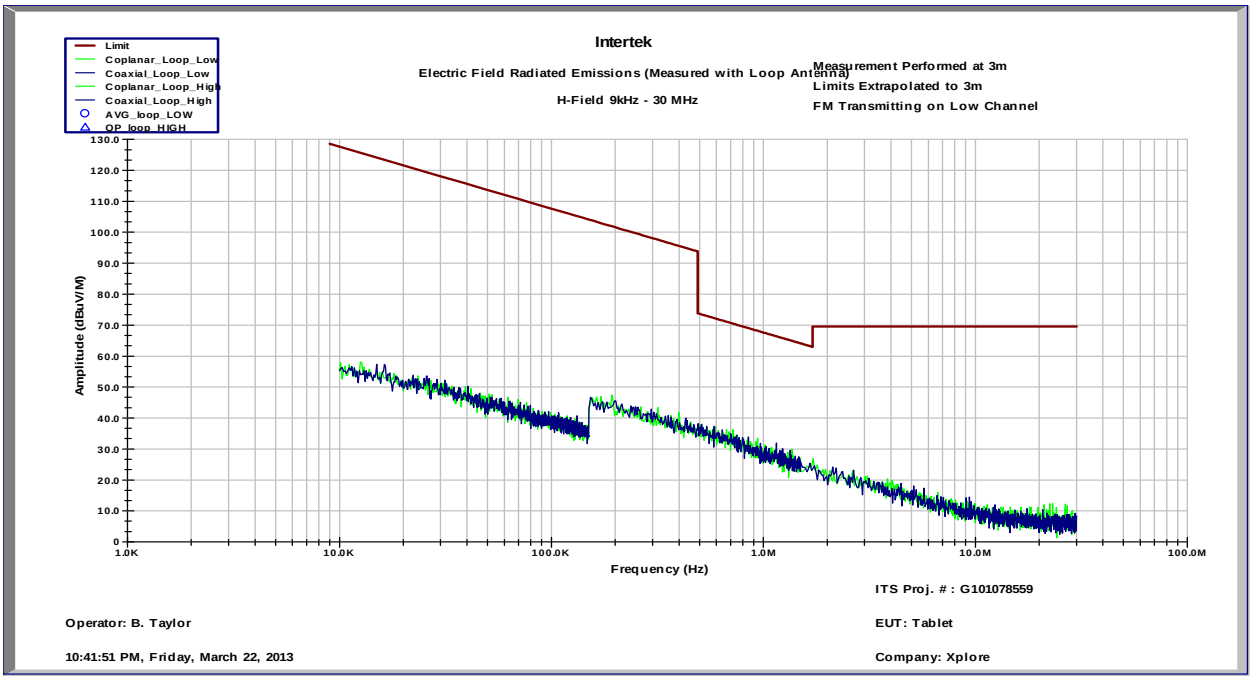
Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	9/15/2012	9/14/2013
Preamplifier	SF456200904	Mini-Circuits	ZX60-3018G-S+	9/4/2012	9/4/2013
Biconnilog Antenna	00051864	ETS	3142C	12/14/2012	12/14/2013
System Controller	121701-1	Sunol Sciences	SC99V	Calibration Not Required	Calibration Not Required
Active Loop Antenna	3416	ETS	6502	4/19/2013	4/19/2014

5.5 Results:

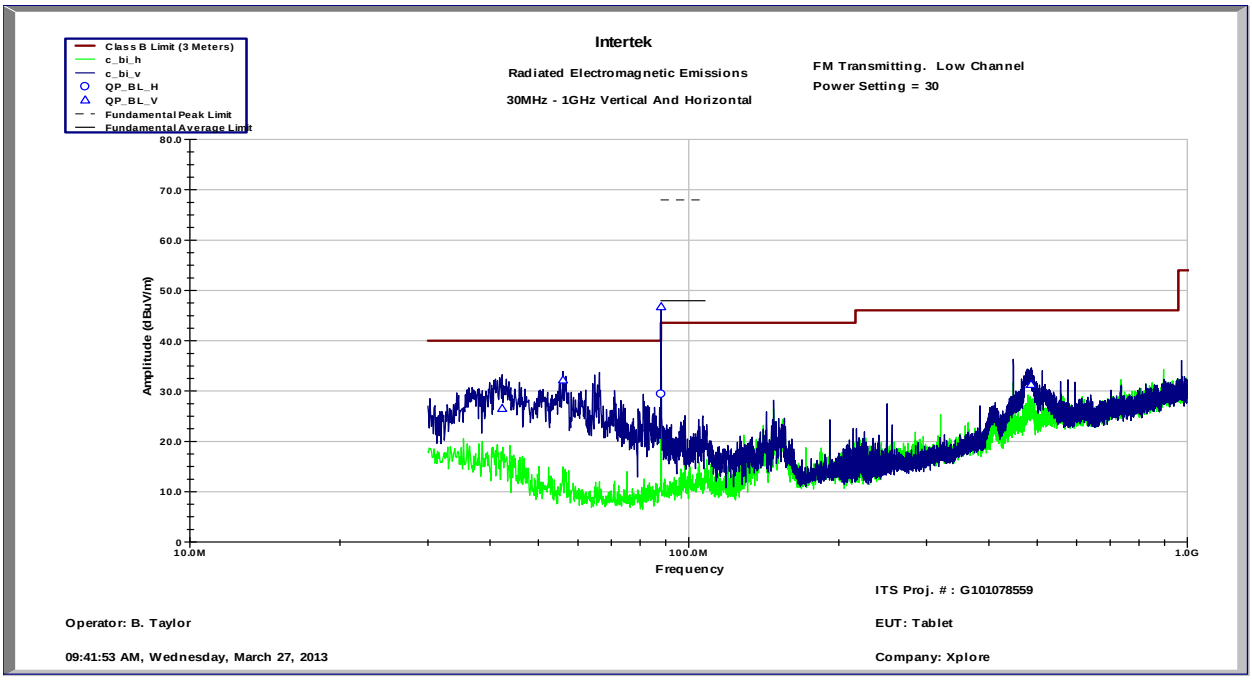
The fundamental measurements were below the Part 15.239 average limits as well as the Part 15.35 peak limits. Additionally, all emissions outside the specified 200kHz band were found to be below the general field strength limits from Part 15.209(a). The emissions listed in the following tables are the worst case. The test sample was evaluated on three orthogonal axes since it was a hand held device and could be used in any orientation.

Radiated Emission Fundamental and Spurious Measurements

Radiated Emissions										
Test Engineer:	Bryan Taylor	**Start Date:**	3/27/2013		**End Date:**	3/27/2013				
Temperature:	23.8C	**Humidity:**	46.30%		**Pressure:**	988.4mBar				
Specification:	FCC Part 15C				**Test Limit:**	Class B				
Notes:	FM Transmitting. Low, Mid, and High Channels. Spurs reported are the worst case across all measured channels.									
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**
Fundamental Measurements										
98.002 MHz	V	31.05	1.3	8.6	40.95	47.96	-7.01	120kHz / AV	3m	**Compliant**
98.002 MHz	V	31.21	1.3	8.6	41.11	67.96	-26.85	120kHz / PK	3m	**Compliant**
97.999 MHz	H	15.63	1.3	8.6	25.53	47.96	-22.43	120kHz / AV	3m	**Compliant**
97.999 MHz	H	17.9	1.3	8.6	27.8	67.96	-40.16	120kHz / PK	3m	**Compliant**
88.104 MHz	V	38.12	1.22	7.42	46.76	47.96	-1.2	120kHz / AV	3m	**Compliant**
88.104 MHz	V	38.57	1.22	7.42	47.21	67.96	-20.75	120kHz / PK	3m	**Compliant**
88.095 MHz	H	20.78	1.22	7.42	29.42	47.96	-18.54	120kHz / AV	3m	**Compliant**
88.095 MHz	H	21.42	1.22	7.42	30.06	67.96	-37.9	120kHz / PK	3m	**Compliant**
107.9 MHz	V	33.8	1.38	8.51	43.69	47.96	-4.27	120kHz / AV	3m	**Compliant**
107.9 MHz	V	34.5	1.38	8.51	44.39	67.96	-23.57	120kHz / PK	3m	**Compliant**
107.89 MHz	H	17.16	1.38	8.51	27.05	47.96	-20.91	120kHz / AV	3m	**Compliant**
107.89 MHz	H	21.2	1.38	8.51	31.09	67.96	-36.87	120kHz / PK	3m	**Compliant**
Spurious / Harmonic Measurements										
40.893 MHz	V	13.07	0.83	12.15	26.05	40	-13.95	120kHz / QP	3m	**Compliant**
66.265 MHz	V	22.05	1.07	6.77	29.89	40	-10.11	120kHz / QP	3m	**Compliant**
448.0 MHz	V	18.55	2.88	17.32	38.75	46.02	-7.27	120kHz / QP	3m	**Compliant**
42.298 MHz	V	14.11	0.84	11.58	26.53	40	-13.47	120kHz / QP	3m	**Compliant**
56.0 MHz	V	22.92	0.97	8.3	32.19	40	-7.81	120kHz / QP	3m	**Compliant**
486.01 MHz	V	9.82	3.01	18.48	31.31	46.02	-14.71	120kHz / QP	3m	**Compliant**
36.402 MHz	V	13.63	0.78	14.38	28.79	40	-11.21	120kHz / QP	3m	**Compliant**
36.902 MHz	V	7.34	0.79	13.98	22.11	40	-17.89	120kHz / QP	3m	**Compliant**
896.02 MHz	H	11.19	4.16	23.52	38.87	46.02	-7.15	120kHz / QP	3m	**Compliant**
Calculations:					F = C + D + E		H = F - G			

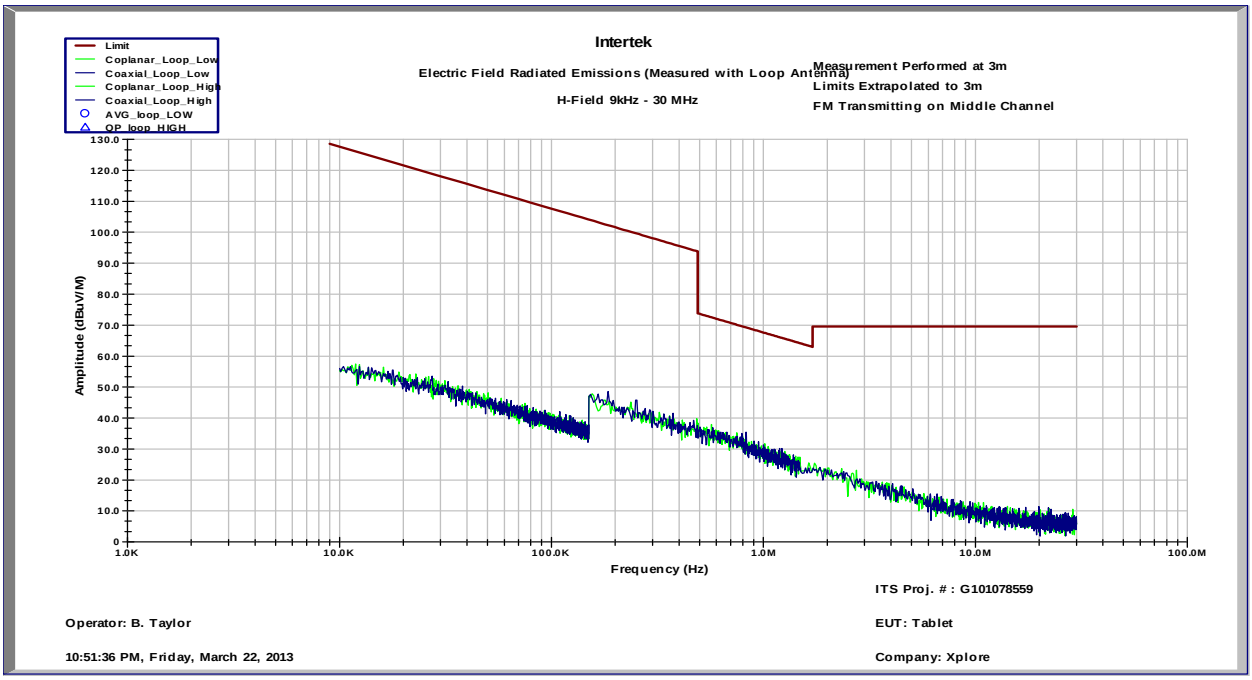


Loop Prescan

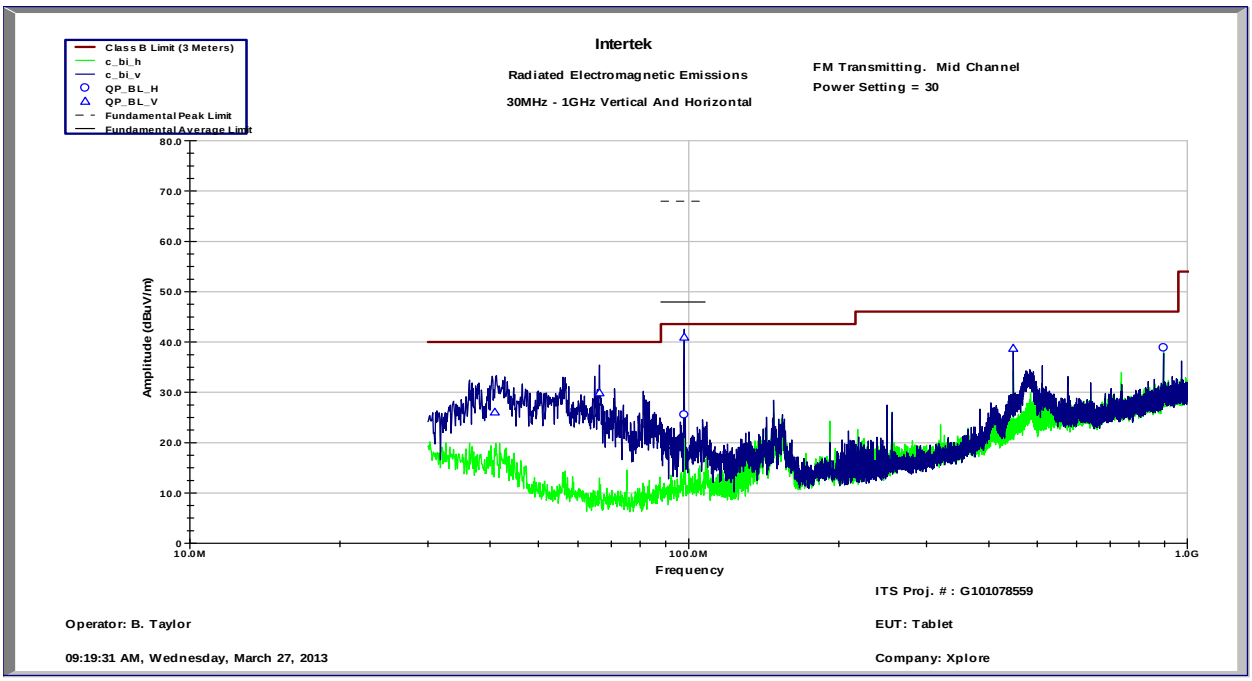


Bilog Prescan

Radiated Prescan (88.1MHz)

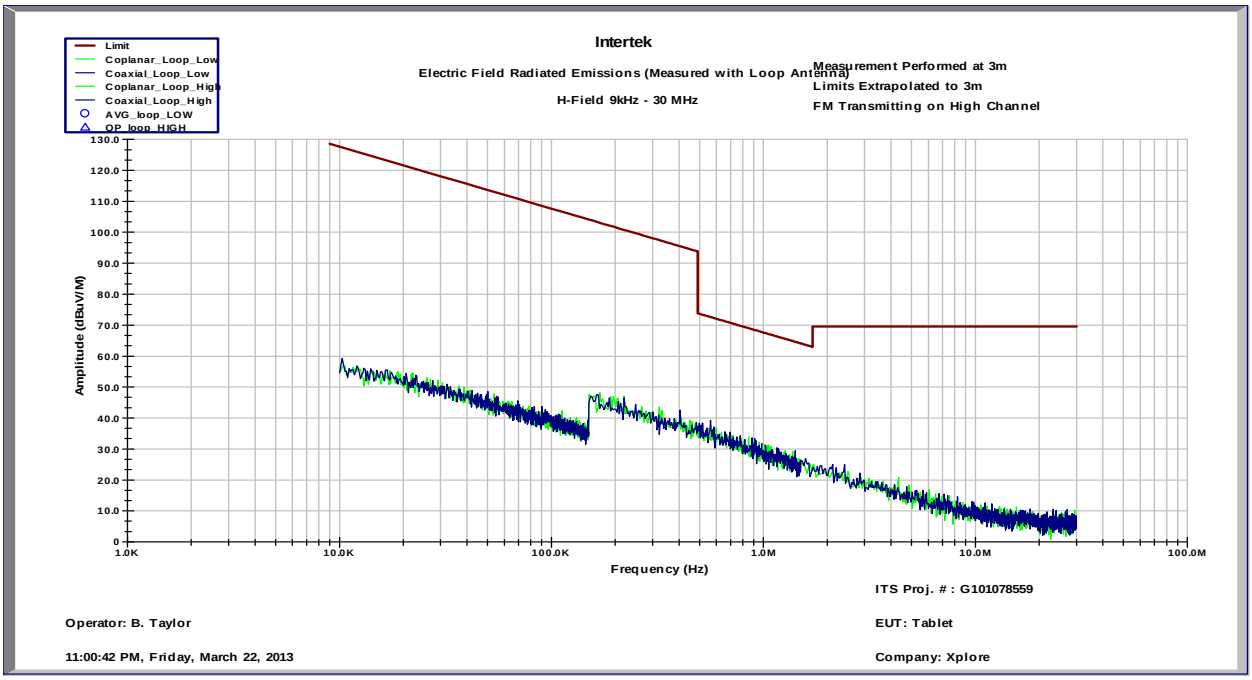


Loop Prescan

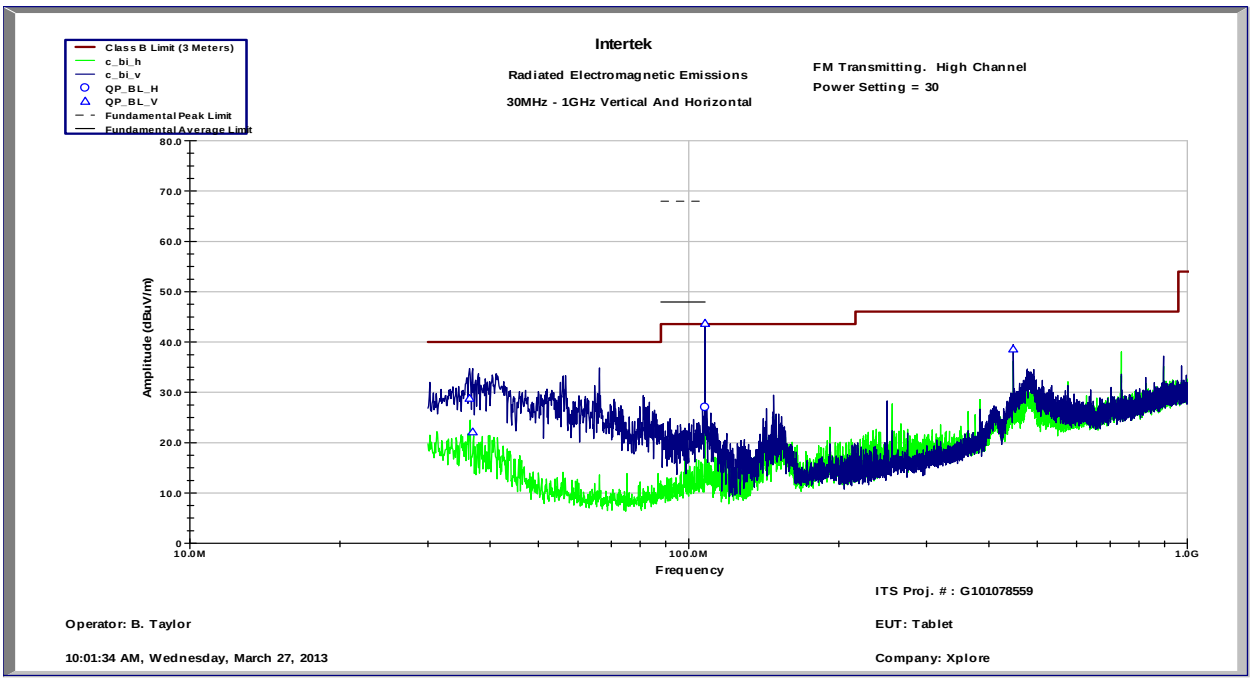


Bilog Prescan

Radiated Prescan (98MHz)



Loop Prescan



Bilog Prescan

Radiated Prescan (107.9MHz)

6 Radiated Spurious Emissions (Receiver)

6.1 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

These limits are identical to those in RSS-GEN

6.2 Test Procedure

ANSI C63.4: 2009

6.3 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

6.4 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	9/15/2012	9/14/2013
Preamplifier	SF456200904	Mini-Circuits	ZX60-3018G-S+	9/4/2012	9/4/2013
Biconnilog Antenna	00051864	ETS	3142C	12/14/2012	12/14/2013
Horn Antenna	6556	ETS	3115	9/13/2012	9/13/2013
System Controller	121701-1	Sunol Sciences	SC99V	Time of Use	Time of Use

6.5 Results:

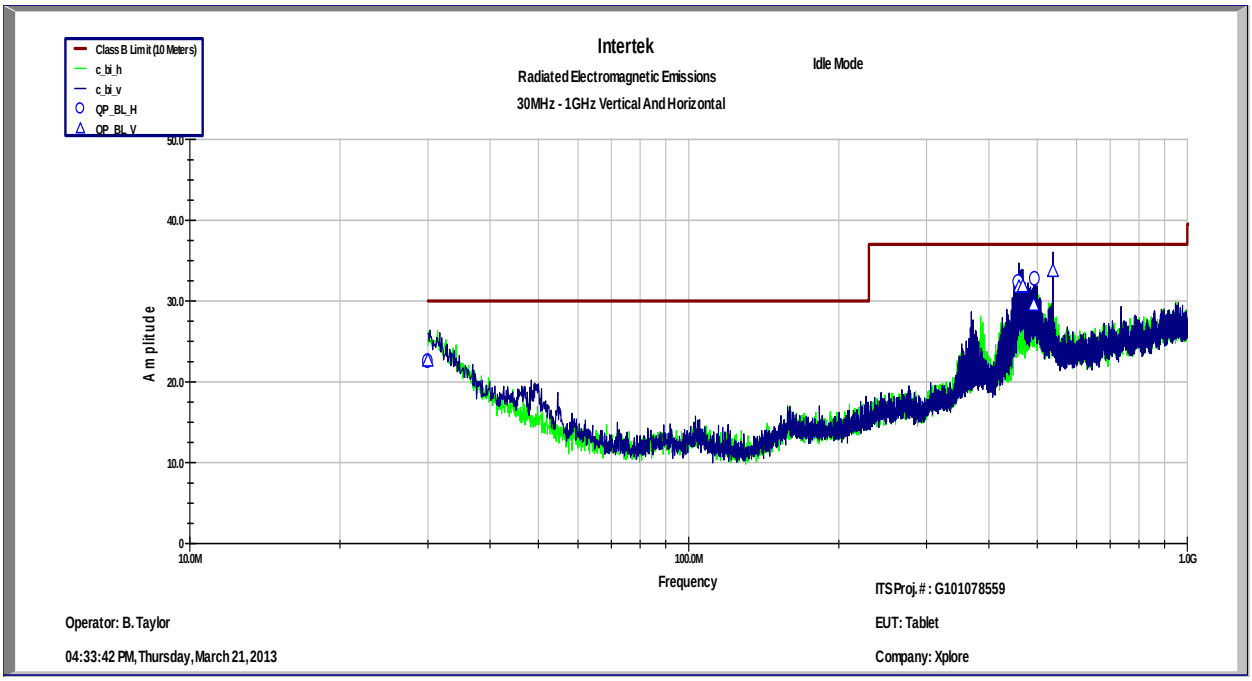
All spurious emissions with the test sample in receive mode were below the limits specified in Part 15.109 for a class B digital device and RSS-GEN Section 6.1.

6.6 Test Data:

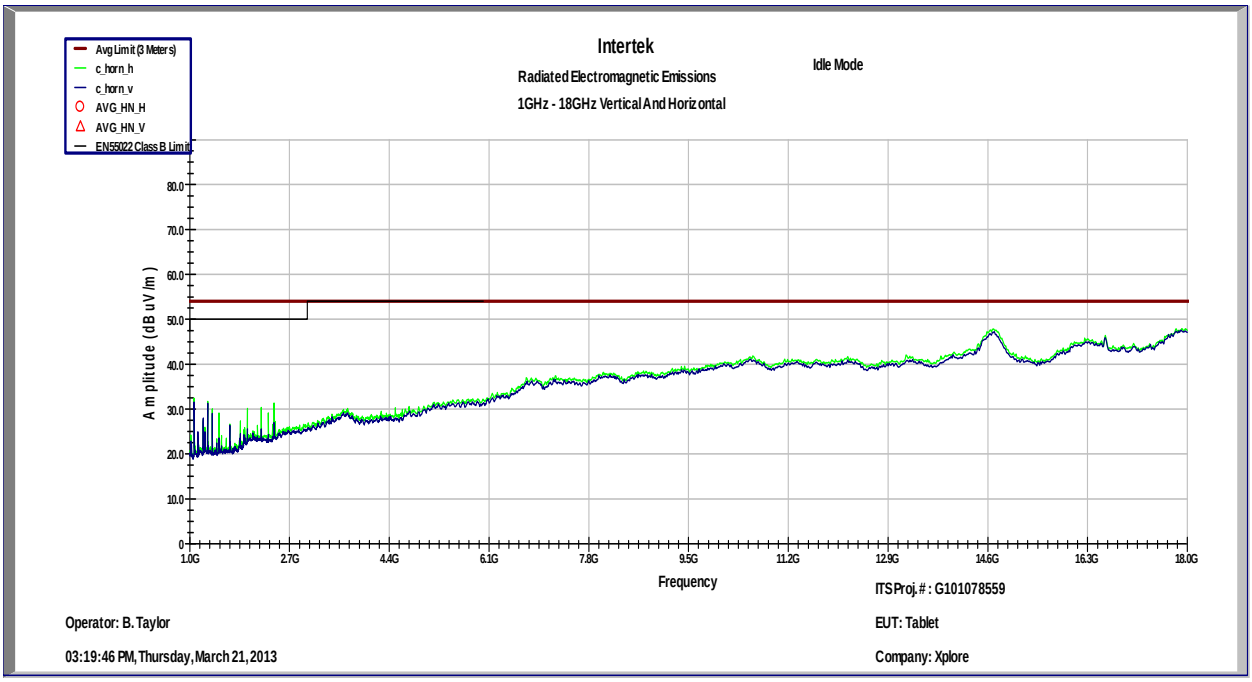
Radiated Emissions										
Test Engineer:	Bryan Taylor	**Start Date:**	3/21/2013		**End Date:**	3/21/2013				
Temperature:	23.4C	**Humidity:**	38.20%		**Pressure:**	987.8mBar				
Specification:	FCC Part 15 / EN55022				**Test Limit:**	Class B				
Notes:	Idle Mode									

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**
30.0 MHz	V	19.08	-13.77	17.3	22.61	30	-7.39	120kHz / QP	10m	**Compliant**
459.8 MHz	V	26.49	-11.4	16.62	31.71	37	-5.29	120kHz / QP	10m	**Compliant**
467.9 MHz	V	25.71	-11.36	17.43	31.78	37	-5.22	120kHz / QP	10m	**Compliant**
492.1 MHz	V	22.3	-11.26	18.44	29.48	37	-7.52	120kHz / QP	10m	**Compliant**
537.6 MHz	V	25.96	-10.95	18.69	33.7	37	-3.3	120kHz / QP	10m	**Compliant**
30.0 MHz	H	18.98	-13.77	17.3	22.51	30	-7.49	120kHz / QP	10m	**Compliant**
458.7 MHz	H	27.01	-11.42	16.73	32.32	37	-4.68	120kHz / QP	10m	**Compliant**
494.47 MHz	H	25.48	-11.25	18.49	32.72	37	-4.28	120kHz / QP	10m	**Compliant**
Calculations:					F = C + D + E		H = F - G			

Deviations, Additions, or Exclusions: None



Bilog Prescan



Horn Prescan

7 AC Powerline Conducted Emissions

7.1 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.

7.2 Test Procedure

ANSI C63.4: 2003

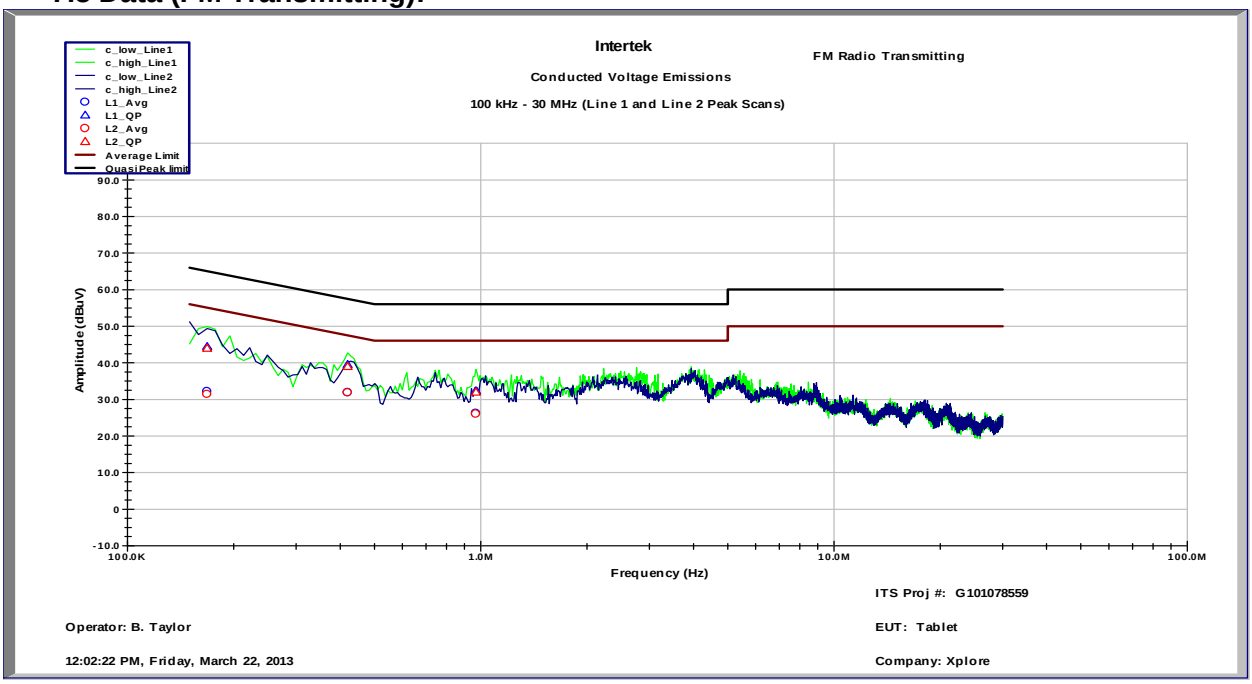
7.3 Test Equipment Used:

Description	Serial Number	Manufacturer	Model	Cal. Date	Cal. Due
EMI Test Receiver	10887490.26	Rohde & Schwarz	ESI26	9/15/2012	9/14/2013
LISN	3333	Teseq	NNB52	3/11/2013	3/11/2014

7.4 Results:

The sample tested was found to Comply.

7.5 Data (FM Transmitting):

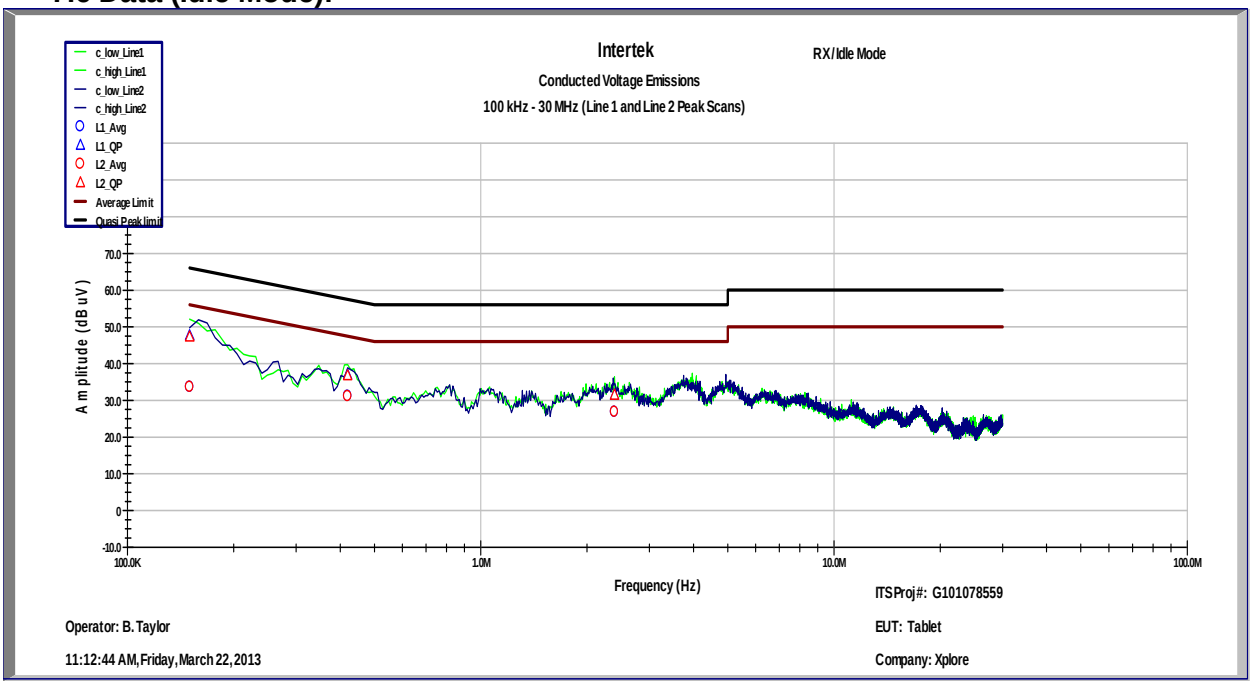


Conducted Voltage Emissions on Power Lines					
Test Engineer:	Bryan Taylor	**Start Date:**	3/21/2013	**End Date:**	3/21/2013
Temperature:	23.4C	**Humidity:**	38.20%	**Pressure:**	987.8mBar
Specification:	FCC Part 15 / EN55022	**Test Limit:**	Class B	**RBW:**	9kHz
Notes:	FM Radio Transmitting				

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	168.0 KHz	44.44	65.06	-20.61	32.13	55.06	-22.92	**Compliant**
Line 1	420.0 KHz	39.49	57.45	-17.96	31.89	47.45	-15.56	**Compliant**
Line 1	969.0 KHz	32.38	56	-23.62	26.26	46	-19.74	**Compliant**
Line 2	168.0 KHz	43.98	65.06	-21.07	31.43	55.06	-23.62	**Compliant**
Line 2	420.0 KHz	39	57.45	-18.45	31.85	47.45	-15.6	**Compliant**
Line 2	969.0 KHz	32.01	56	-23.99	26.02	46	-19.98	**Compliant**

Deviations, Additions, or Exclusions: None

7.6 Data (Idle Mode):



Conducted Voltage Emissions on Power Lines								
Test Engineer:	Bryan Taylor		**Start Date:**	3/21/2013		**End Date:**	3/21/2013	
Temperature:	23.4C		**Humidity:**	38.20%		**Pressure:**	987.8mBar	
Specification:	FCC Part 15 / EN55022		**Test Limit:**	Class B		**RBW:**	9kHz	
Notes:	Idle 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	150.0 KHz	47.66	66	-18.34	33.64	56	-22.36	**Compliant**
Line 1	420.0 KHz	36.94	57.45	-20.51	31.2	47.45	-16.25	**Compliant**
Line 1	2.391 MHz	31.47	56	-24.53	26.82	46	-19.18	**Compliant**
Line 2	150.0 KHz	47.29	66	-18.71	33.57	56	-22.43	**Compliant**
Line 2	420.0 KHz	36.73	57.45	-20.72	31.1	47.45	-16.35	**Compliant**
Line 2	2.391 MHz	31.47	56	-24.53	26.85	46	-19.15	**Compliant**

Deviations, Additions, or Exclusions: None

8 Antenna Requirement per FCC Part 15.203

8.1 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.

8.2 Results:

The sample tested met the antenna requirement. The antenna utilized a U.fl connector for connection to the PCB antenna.

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	6/14/2013	101078559LEX-012	Original Issue