



731 Enterprise Drive
Lexington, KY 40510

Telephone: 859-226-1000
Facsimile: 859-226-1040
www.intertek-etlsemko.com

TEST REPORT

Report Number: 101078559LEX-008
Project Number: G101078559

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Product Name: MC7750 Module
Integrated into the iX101T1 Rugged Tablet

FCCID: Q2GMC7750

Standards: Title 47 CFR Part 22 and 24 (Limited to Radiated Spurious Emissions)

Radios Under Test: CDMA Cell / PCS

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	Radiated Spurious Emissions (Transmitter)	§2.1053, §22.917(a)(b), and §24.238(a)(b)	RSS-132 (4.5), RSS-133 (6.5)	Pass

3 Description of Equipment Under Test

Equipment Under Test	
Manufacturer	Xplore Technologies
Model Number	MC7750
Serial Number	Test Sample #2
FCC Identifier	Q2GMC7750
Receive Date	3/20/2013
Test Start Date	4/17/2013
Test End Date	4/26/2013
Device Received Condition	Good
Test Sample Type	Production
Frequency Band	824MHz - 849MHz (CDMA Cell Band) 1850MHz – 1910MHz (CDMA PCS Band)
Modulation Type	CDMA
Transmission Control	Base Station Simulator
Maximum Measured Output Power (Conducted)	24.85dBm (Cell Band) 24.65dBm (PCS Band)
Test Channels	1013, 384, and 777 (CDMA Cell Band) 25, 600, and 1075 (CDMA PCS Band)
Antenna Type	Internal PCB
Operating Voltage	115VAC/60Hz (Via AC / DC Power Adapter)

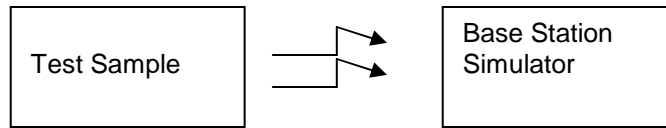
Description of Equipment Under Test	
The MC7750 is a wireless module being integrated into the Xplore Technologies iX101T1 Rugged Tablet	

Operating modes of the EUT:

No.	Descriptions of EUT Exercising
1	Transmitting a CDMA signal in either cell or PCS band
2	

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

3.2 EUT Block Diagram:



Block Diagram for Radiated Tests

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 Radiated Spurious Emissions (Transmitter)

4.1 Test Limits

§ 2.1053

- (a) Measurements shall be made to detect spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements under normal conditions of installation and operation. Curves or equivalent data shall be supplied showing the magnitude of each harmonic and other spurious emission. For this test, single sideband, independent sideband, and controlled carrier transmitters shall be modulated under the conditions specified in paragraph (c) of §2.1049, as appropriate. For equipment operating on frequencies below 890 MHz, an open field test is normally required, with the measuring instrument antenna located in the far-field at all test frequencies. In the event it is either impractical or impossible to make open field measurements (e.g. a broadcast transmitter installed in a building) measurements will be accepted of the equipment as installed. Such measurements must be accompanied by a description of the site where the measurements were made showing the location of any possible source of reflections which might distort the field strength measurements. Information submitted shall include the relative radiated power of each spurious emission with reference to the rated power output of the transmitter, assuming all emissions are radiated from halfwave dipole antennas.

§ 22.917

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 100 kHz or greater. In the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 100 kHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

§ 24.238

- (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB.
- (b) Measurement procedure. Compliance with these rules is based on the use of measurement instrumentation employing a resolution bandwidth of 1 MHz or greater. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. A narrower resolution bandwidth is permitted in all cases to improve measurement accuracy provided the measured power is integrated over the full required measurement bandwidth (i.e. 1 MHz or 1 percent of emission bandwidth, as specified). The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

4.2 Test Procedure

The EUT was placed on a non-conductive turntable. The measurement antenna was placed at a distance of 3 meters from the EUT. The EUT was forced to transmit at its maximum output power setting. During the tests, the antenna height and EUT azimuth were varied in order to identify the maximum level of emissions from the EUT.

The frequency range up to tenth harmonic was investigated in order to identify the spurious emission. Once the spurious emissions were identified, the power of the emission was determined using the substitution method described in TIA-603-C. The spurious emissions attenuation was calculated as the difference between radiated power at the fundamental frequency and at the spurious emissions frequency.

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
Preamplifier	987410	Miteq	AFS44-00102000-30-10P-44	9/4/2012	9/4/2013
Preamplifier	SF456200904	Mini-Circuits	ZX60-3018G-S+	9/4/2012	9/4/2013
Biconnilog Antenna	00051864	ETS	3142C	12/14/2012	12/14/2013
Bilog Antenna	2362	ETS	3142B	12/26/2012	12/26/2013
Horn Antenna	6556	ETS	3115	8/7/2012	8/7/2013
Horn Antenna	1096	Antenna Research	DRG-118/A	9/13/2012	9/13/2013
System Controller	121701-1	Sunol Sciences	SC99V	Time of Use	Time of Use
High Pass Filter	3986-01 DC0408	Microwave Circuits, Inc.	H3G020G2	Time of Use	Time of Use
Base Station Simulator	1522	Rohde & Schwarz	CMU200	9/19/2012	9/19/2013

4.4 Results:

All radiated spurious emissions were attenuated below the transmitting power (P) by a factor of at least $43 + 10 \log(P)$ dB which is equivalent to -13dBm. Each operational mode was investigated the worst case data was reported below. Emissions not reported were below the measurement noise floor. The test sample was evaluated on three orthogonal axes since it was a hand held device and could be used in any orientation.

Worst Case Spurious Measurements (Cell Band)

Radiated Spurious Emissions Measurement									
Test Engineer: Bryan Taylor Test Date: 4/22/2013 Temp. / Humidity / Pressure: 22.9C / 52.1% / 989.4mBar Bandwidth Settings: RBW = VBW = 1MHz Notes: Spurious emissions not reported here were below the measurement noise floor.									
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBd)	Limit (dBm)	Radiated Spurious Emission Level (dBm)	
Cell Band Ch 1013	1649.4	H	-79.82	-44.94	2.84	6.70	-13	-41.07	
	1649.4	V	-79.32	-44	2.84	6.70	-13	-40.13	
	2474.1	H	-79.9	-41.14	3.78	7.16	-13	-37.76	
	2474.1	V	-79.95	-40.91	3.78	7.16	-13	-37.53	
	3298.8	H	-50.59	-42.5	4.42	7.14	-13	-39.78	
	3298.8	V	-51.01	-43.93	4.42	7.14	-13	-41.21	
	4123.5	H	-58.46	-47.59	5.66	8.15	-13	-45.10	
	4123.5	V	-59.87	-49.85	5.66	8.15	-13	-47.36	
	4948.2	H	-55.12	-42.59	6.19	8.80	-13	-39.98	
	4948.2	V	-56.74	-45.4	6.19	8.80	-13	-42.79	
	5772.9	H	-59.94	-45.01	6.54	9.27	-13	-42.28	
	5772.9	V	-60.87	-44.86	6.54	9.27	-13	-42.13	
	6597.6	H	-61.08	-38.23	7.10	9.96	-13	-35.36	
	6597.6	V	-61.45	-43.86	7.10	9.96	-13	-40.99	
	7422.3	H	Below Measurement Noise Floor						
7422.3	V	Below Measurement Noise Floor							
8247	H	Below Measurement Noise Floor							
8247	V	Below Measurement Noise Floor							
Cell Band Ch 384	1673.04	H	-78.29	-43.41	2.93	6.70	-13	-39.64	
	1673.04	V	-80.14	-44.82	2.93	6.70	-13	-41.05	
	2509.56	H	-78.38	-39.62	3.69	7.43	-13	-35.88	
	2509.56	V	-78.91	-39.87	3.69	7.43	-13	-36.13	
	3346.08	H	-50.35	-42.26	4.53	7.19	-13	-39.61	
	3346.08	V	-50.41	-43.33	4.53	7.19	-13	-40.68	
	4182.6	H	-61.92	-51.05	5.36	8.15	-13	-48.26	
	4182.6	V	-63.23	-53.21	5.36	8.15	-13	-50.42	
	5019.12	H	-59.39	-46.86	6.29	8.87	-13	-44.28	
	5019.12	V	-55.08	-43.74	6.29	8.87	-13	-41.16	
	5855.64	H	-61.88	-46.95	6.44	9.57	-13	-43.82	
	5855.64	V	-61.79	-45.78	6.44	9.57	-13	-42.65	
	6692.16	H	-61.49	-38.64	7.23	9.81	-13	-36.06	
	6692.16	V	-60.11	-42.52	7.23	9.81	-13	-39.94	
	7528.68	H	Below Measurement Noise Floor						
7528.68	V	Below Measurement Noise Floor							
8365.2	H	Below Measurement Noise Floor							
8365.2	V	Below Measurement Noise Floor							
Cell Band Ch 777	1696.62	H	-78	-43.12	2.95	6.70	-13	-39.37	
	1696.62	V	-80.81	-45.49	2.95	6.70	-13	-41.74	
	2544.93	H	-79.04	-40.28	3.79	7.43	-13	-36.65	
	2544.93	V	-78.56	-39.52	3.79	7.43	-13	-35.89	
	3393.24	H	-50.75	-42.66	4.58	7.19	-13	-40.05	
	3393.24	V	-51.06	-43.98	4.58	7.19	-13	-41.37	
	4241.55	H	-60.08	-49.21	5.48	8.37	-13	-46.33	
	4241.55	V	-61.04	-51.02	5.48	8.37	-13	-48.14	
	5089.86	H	-55.46	-42.93	6.45	8.87	-13	-40.51	
	5089.86	V	-56.82	-45.48	6.45	8.87	-13	-43.06	
	5938.17	H	-60.98	-46.05	6.66	9.53	-13	-43.18	
	5938.17	V	-61.74	-45.73	6.66	9.53	-13	-42.86	
	6786.48	H	-60.64	-37.79	7.43	9.55	-13	-35.67	
	6786.48	V	-61.23	-43.64	7.43	9.55	-13	-41.52	
	7634.79	H	Below Measurement Noise Floor						
7634.79	V	Below Measurement Noise Floor							
8483.1	H	Below Measurement Noise Floor							
8483.1	V	Below Measurement Noise Floor							

F=B-C+D

Worst Case Spurious Measurements (PCS Band)

Radiated Spurious Emissions Measurement									
Test Engineer: Bryan Taylor / Toby Carrier Test Date: 4/22/2013 Temp. / Humidity / Pressure: 22.9C / 52.1% / 989.4mBar Bandwidth Settings: RBW = VBW = 1MHz Notes: Spurious emissions not reported here were below the measurement noise floor.									
			A	B	C	D	E	F	
Band/Channel	Spurious Frequency (MHz)	Polarity	Device Reading (dBm)	Signal Generator Level (dBm)	Cable Loss (dB)	Tx Antenna Gain (dBd)	Limit (dBm)	Radiated Spurious Emission Level (dBm)	
PCS Band Ch 25	3702.5	H	-46.71	-38.66	4.88	7.07	-13	-36.47	
	3702.5	V	-46.95	-39.11	4.88	7.07	-13	-36.92	
	5553.75	H	-71.35	-58.07	6.46	8.48	-13	-56.05	
	5553.75	V	-70.88	-57.11	6.46	8.48	-13	-55.09	
	7405	H	Below Measurement Noise Floor						
	7405	V							
	9256.26	H							
	9256.26	V							
11107.5	H								
11107.5	V								
PCS Band Ch 600	3760	H	-46.54	-35.68	4.87	7.07	-13	-33.48	
	3760	V	-45.77	-36.83	4.87	7.07	-13	-34.63	
	5640	H	-68.34	-54.73	6.45	8.84	-13	-52.34	
	5640	V	-70.38	-57.26	6.45	8.84	-13	-54.87	
	7520	H	Below Measurement Noise Floor						
	7520	V							
	9400	H							
	9400	V							
11280	H								
11280	V								
PCS Band Ch 1175	3817.5	H	-45.77	-36	5.00	6.73	-13	-34.27	
	3817.5	V	-45.97	-33	5.00	6.73	-13	-31.27	
	5726.25	H	-69.42	-53.91	6.89	9.27	-13	-51.54	
	5726.25	V	-70.69	-59.09	6.89	9.27	-13	-56.72	
	7635	H	Below Measurement Noise Floor						
	7635	V							
	9543.75	H							
	9543.75	V							
11452.5	H								
11452.5	V								

F=B-C+D

5 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	

6 Revision History

Revision Level	Date	Report Number	Notes
0	6/14/2013	101078559LEX-008	Original Issue