FCC / IC Partial Test Report

FCC ID	:	**N7NMC7350L**
IC	:	**2417C-MC7350L**
Equipment	:	**Wireless Module**
Model No.	:	**AirPrime MC7350-L**
Brand Name	:	**AirPrime**
Applicant	:	**Sierra Wireless Inc.**
Address	:	**13811 Wireless Way Richmond, British Columbia, Canada, V6V 3A4.**
Standard	:	**47 CFR FCC Part 27 Subpart B RSS-130 Issue 1 October 2013**
Received Date	:	**Nov. 20, 2013**
Tested Date	:	**Nov. 20 ~ Nov. 30, 2013**

We, International Certification Corp., would like to declare that the tested sample has been evaluated and in compliance with the requirement of the above standards. The test results contained in this report refer exclusively to the product. It may be duplicated completely for legal use with the approval of the applicant. It shall not be reproduced except in full without the written approval of our laboratory.

Approved & Reviewed by:

Gary Chang / Manager

Testing Laboratory
2732

***RSS-130 is not included in ICC TAF accredited scope**

Table of Contents

Release Record

Report No.	Version	Description	Issued Date
FG3N2003P27B	Rev. 01	Initial issue	Dec. 04, 2013

Summary of Test Results

FCC Rules	IC Rules	Test Items	Measured	Result
2.1046 / 27.50(b)(10)	RSS-130 4.4	Effective Radiated Power	Power[dBm]: LTE: 21.93	Pass
2.1053 / 27.53(c)	RSS-130 4.6	Radiated Emissions	Meet the requirement of limit	Pass
2.1053 / 27.53(f)	RSS-130 4.6	Radiated Spurious Emission in the 1559-1610MHz band	Meet the requirement of limit	Pass

1 General Description

1.1 Information

1.1.1 Specification of the Equipment under Test (EUT)

Operating Frequency (MHz)	Channel Bandwidth: 5MHz: 779.5~784.5 Channel Bandwidth: 10MHz: 782
Modulation Type	Uplink : QPSK, 16QAM Downlink : QPSK, 16QAM, 64QAM
Duplex Mode	FDD
Category	3
H/W Version	1.0
S/W Version	SWI9x15E_05.03.02.00

1.1.2 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	Dipole	1	SMA	---

1.1.3 EUT Operational Condition

Supply Voltage	☐ AC mains	☒ DC	
Type of DC Source	☐ Internal DC supply	☐ External DC adapter	☒ From host

1.1.4 Operating Channel List

LTE Band 13		
Channel Bandwidth (MHz)	**Channel**	**Frequency (MHz)**
5	23205	779.5
5	23230	782.0
5	23255	784.5
10	23230	782.0

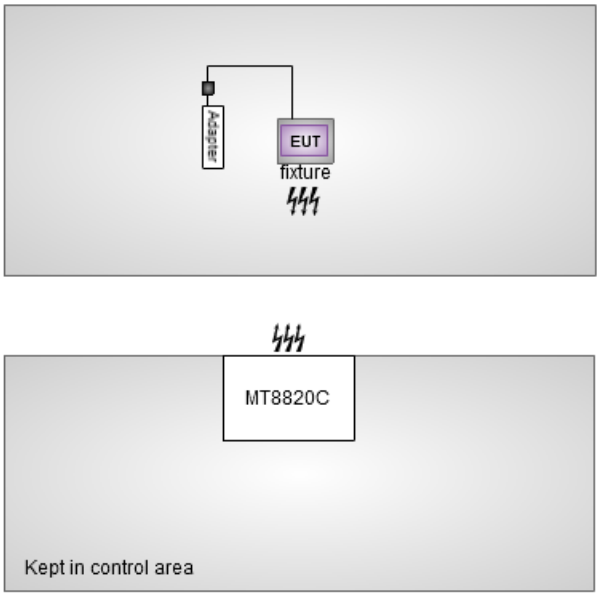
1.2 Local Support Equipment List

Support Equipment List						
No.	**Equipment**	**Brand**	**Model**	**S/N**	**FCC ID**	**Signal cable / Length (m)**
1	Fixture	---	---	---	---	---
2	Adapter for fixture	GlobTek, Inc.	GT-41062-1805	---	---	USB, 1.8m shielded w/o core

Note: Item 2 was provided by applicant.

1.3 Test Setup Chart

Test Setup Diagram



1.4 The Equipment List

Test Item	Radiated Emission above 1GHz				
Test Site	966 chamber1 / (03CH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
3m semi-anechoic chamber	CHAMPRO	SAC-03	03CH01-WS	Jan. 04, 2013	Jan. 03, 2014
Spectrum Analyzer	R&S	FSV40	101498	Jan. 24, 2013	Jan. 23, 2014
Receiver	ROHDE&SCHWARZ	ESR3	101658	Jan. 28, 2013	Jan. 27, 2014
Bilog Antenna	SCHWARZBECK	VULB9168	VULB9168-522	Jan. 11, 2013	Jan. 10, 2014
Horn Antenna 1G-18G	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D 1096	Feb. 18, 2013	Feb. 17, 2014
Horn Antenna 18G-40G	SCHWARZBECK	BBHA 9170	BBHA 9170517	Jan. 14, 2013	Jan. 13, 2014
Amplifier	Burgeon	BPA-530	100218	Dec. 14, 2012	Dec. 13, 2013
Amplifier	Agilent	83017A	MY39501308	Dec. 18, 2012	Dec. 17, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16014/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16019/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable	HUBER+SUHNER	SUCOFLEX104	MY16139/4	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R03m	Woken	CFD400NL-LW	CFD400NL-001	Dec. 25, 2012	Dec. 24, 2013
RF Cable-R10m	Woken	CFD400NL-LW	CFD400NL-002	Dec. 25, 2012	Dec. 24, 2013
control	EM Electronics	EM1000	60612	N/A	N/A
Note: Calibration Interval of instruments listed above is one year.					

Loop Antenna	R&S	HFH2-Z2	100330	Nov. 15, 2012	Nov. 14, 2014
Amplifier	MITEQ	AMF-6F-260400	9121372	Apr. 19, 2013	Apr. 18, 2015
Note: Calibration Interval of instruments listed above is two year.					

Test Item	RF Conducted				
Test Site	RF Conducted (TH01-WS)				
Instrument	**Manufacturer**	**Model No.**	**Serial No.**	**Calibration Date**	**Calibration Until**
Spectrum Analyzer	R&S	FSV 40	101063	Feb. 18, 2013	Feb. 17, 2014
Signal Generator	R&S	SMB100A	175727	Jan. 14, 2013	Jan. 13, 2014
Radio Communication Analyzer	Anritsu	MT8820C	6201240341	Mar. 13, 2013	Mar. 12, 2014
Note: Calibration Interval of instruments listed above is one year.					

1.5 Test Standards

According to the specification of EUT, the EUT must comply with following standards.

47 CFR FCC Part 27 Subpart B
47 CFR FCC Part 2
RSS-130 Issue 1 October 2013
SRSP-518 Issue 1 October 2013
ANSI C63.4-2003
ANSI / TIA / EIA-603-C -2004

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty	
Parameters	**Uncertainty**
Bandwidth	±35.101 Hz
Conducted power	±0.536 dB
Frequency error	±35.101 Hz
Temperature	±0.3 ^{o}C
Conducted emission	±2.946 dB
AC conducted emission	±2.43 dB
Radiated emission	±2.49 dB

2 Test Configuration

2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	23°C / 61%	Anderson Hong
RF conducted	TH01-WS	21°C / 60%	Brad Wu

- FCC site registration No.: 657002
- IC site registration No.: 10807A-1

2.2 The Worst Test Modes and Channel Details

Test item	Channel Bandwidth	Modulation	Test channel
E.R.P	5 MHz 10 MHz	QPSK / 16QAM QPSK / 16QAM	23255 23230
Radiated Emission ≤ 1GHz	10 MHz	QPSK	23230
Radiated Emission > 1GHz	10 MHz	QPSK	23230

3 Test Results

3.1 Effective Radiated Power

3.1.1 Limit of Effective Radiated Power

Portable stations (hand-held devices) transmitting in the 746~757 MHz, 758~763 MHz, 776~793MHz, and 805~806 MHz bands are limited to 3 watts ERP.

3.1.2 Test Procedures

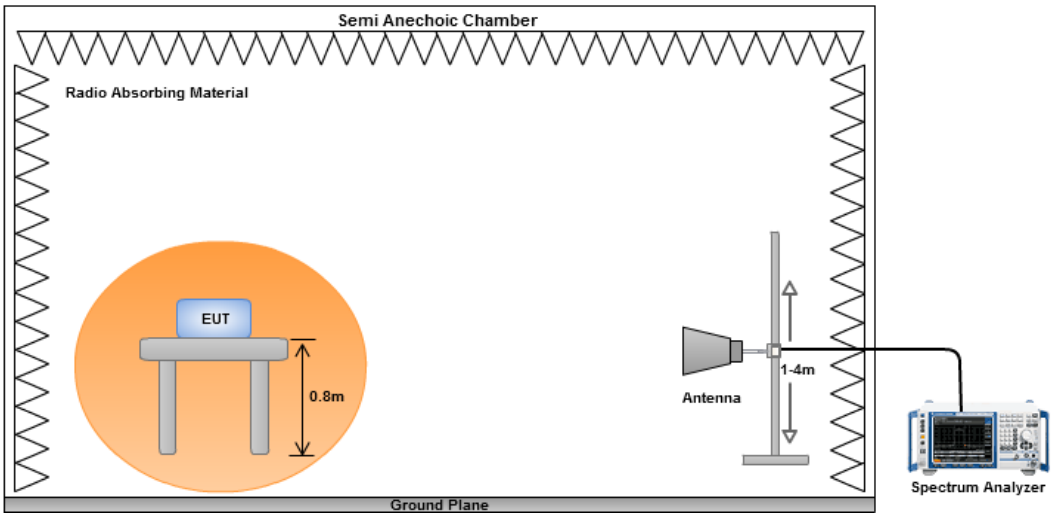
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and4 m, and the antenna rotated to repeat the measurements for both the horizontal and vertical antenna polarizations.
4. After finding the max radiated emission, substitution method will be used for getting effective radiated power. EUT will be removed and substitution antenna will be placed at same position. Signal generator will output CW signal to substitution antenna through a RF cable. Rotate turntable and move antenna to find maximum radiated emission. Adjust output power of signal generator to let the maximum radiated emission is same as step 3. Record the output power level.
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:
   E.R.P= E.I.R.P –2.15dB

For Conducted power measurement

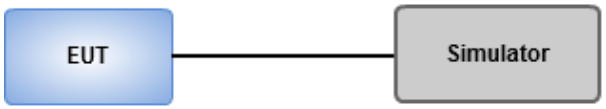
1. The EUT links up with simulator and is set to maximum output power level at low / middel / high channel.
2. Measure the output power of low / middle / high channel of the EUT

3.1.3 Test Setup

Effective Radiated Power Measurement



Conducted Power Measurement



3.1.4 Test Result of Conducted power (dBm)

Band / Channel Bandwidth			LTE Band 13 / CB: 5MHz		
Channel			23205	23230	23255
Frequency (MHz)			779.5	782	784.5
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.71	22.74	22.54
	1	24	22.62	22.67	22.78
	12	6	21.82	21.67	21.63
	25	0	21.74	21.59	21.61
16QAM	1	0	21.77	21.69	21.69
	1	24	21.64	21.59	21.85
	12	6	20.91	20.77	20.71
	25	0	20.70	20.45	20.66

Band / Channel Bandwidth			LTE Band 13 / CB: 10MHz		
Channel			23230	---	---
Frequency (MHz)			782	---	---
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.72	---	---
	1	49	22.83	---	---
	25	12	21.63	---	---
	50	0	21.60	---	---
16QAM	1	0	21.61	---	---
	1	49	21.95	---	---
	25	12	20.56	---	---
	50	0	20.55	---	---

3.1.5 Test Result of Effective Radiated Power (dBm)

Mode	CB: 5MHz, 1RB, Offset 24, QPSK						
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
23255	784.5	21.82	34.8	-12.98	-8.71	20.22	3.75

Mode	CB: 5MHz, 1RB, Offset 24, 16QAM						
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
23255	784.5	20.22	34.8	-14.58	-10.31	18.62	3.75

Mode	CB: 10MHz, 1RB, Offset 49, QPSK						
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
23255	782	21.93	34.8	-12.87	-8.6	20.34	3.74

Mode	CB: 10MHz, 1RB, Offset 49 16QAM						
Channel	Frequency (MHz)	ERP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
23255	782	20.28	34.8	-14.52	-10.25	18.69	3.74

NOTE: ERP = S.G power value + correction factor - 2.15

3.2 Radiated Emissions

3.2.1 Limit of Radiated 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 equal to -13dBm. Emissions in the band 1559-1610 MHz shall be limited to −70 dBW/MHz equivalent isotropically radiated power (EIRP)

3.2.2 Test Procedures

1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission frequency. The EUT is placed at a height of 0.8 m test table above the ground plane.
2. Measurement is made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement antenna is varied in height (1m ~ 4m) above the reference ground plane to obtain the maximum signal strength. Distance between EUT and antenna is 3 m.
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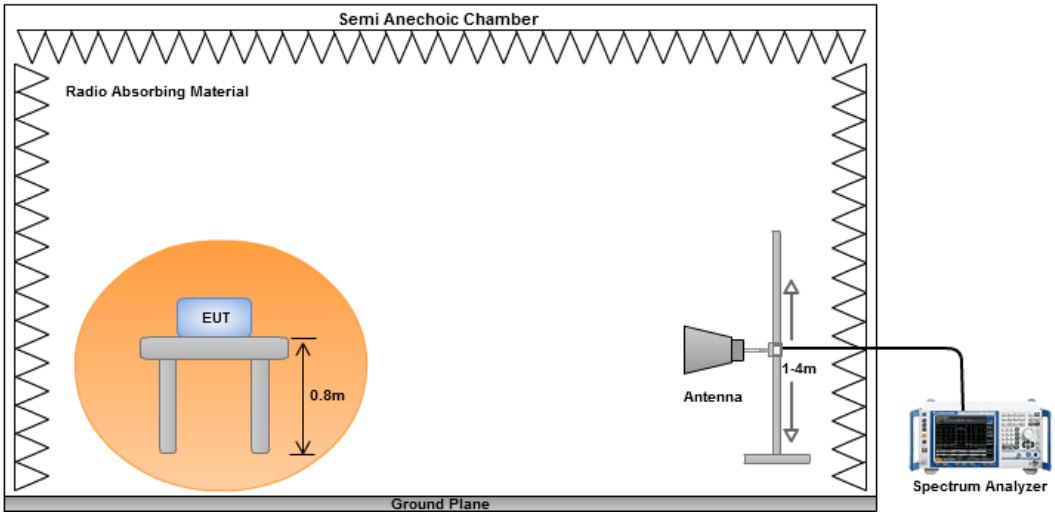
5. E.I.R.P = output power of step 4 + gain of substitution antenna – cable loss of RF cable. ERP can be calculated by below formula:
   E.R.P= E.I.R.P –2.15dB

3.2.3 Test Setup



3.2.4 Test Result of Radiated Emissions below 1GHz

Mode	LTE Band 13, CB: 10MHz, 1RB, Offset 49, Channel : 23230						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
99.29	H	-74.24	-13	-61.24	-58.11	-72.60	0.51
121.57	H	-71.64	-13	-58.64	-58.20	-69.57	0.08
255.3	H	-69.69	-13	-56.69	-58.54	-73.14	5.60
296.97	H	-67.06	-13	-54.06	-57.38	-70.59	5.68
362.86	H	-69.19	-13	-56.19	-60.15	-72.58	5.54
428.76	H	-67.47	-13	-54.47	-59.50	-70.54	5.22
99.29	V	-60.21	-13	-47.21	-48.81	-58.57	0.51
255.3	V	-65.43	-13	-52.43	-55.71	-68.88	5.60
296.97	V	-62.37	-13	-49.37	-53.85	-65.79	5.57
362.86	V	-60.39	-13	-47.39	-53.26	-63.78	5.54
428.76	V	-59.13	-13	-46.13	-54.12	-62.20	5.22
494.65	V	-65.39	-13	-52.39	-61.09	-68.41	5.17

NOTE: ERP = S.G power value + correction factor - 2.15

3.2.5 Test Result of Radiated Emissions above 1GHz

Mode	LTE Band 13, CB: 10MHz, 1RB, Offset 49, Channel : 23230						
Frequency (MHz)	Antenna Polarity	E.R.P (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1318.0	H	-53.78	-13	-40.78	-52.83	-56.67	5.04
2357.7	H	-57.10	-13	-44.10	-62.63	-60.78	5.83
2500.0	H	-59.07	-13	-46.07	-65.53	-63.10	6.18
1318.0	V	-51.40	-13	-38.40	-50.16	-54.29	5.04
2357.7	V	-52.91	-13	-39.91	-57.50	-56.59	5.83
2500.0	V	-57.03	-13	-44.03	-62.44	-61.06	6.18

NOTE: ERP = S.G power value + correction factor - 2.15

3.2.6 Test Result of Radiated Emissions in the 1559-1610MHz band

Mode	LTE Band 13, CB: 10MHz, 1RB, Offset 49, Channel : 23230						
Frequency (MHz)	Antenna Polarity	E.I.R.P. (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
1571.8	H	-46.18	-40	-6.18	-48.82	-51.41	5.23
1571.8	V	-50.59	-40	-10.59	-53.29	-55.82	5.23

4 Test laboratory information

Established in 2012, ICC provides foremost EMC & RF Testing and advisory consultation services by our skilled engineers and technicians. Our services employ a wide variety of advanced edge test equipment and one of the widest certification extents in the business.

International Certification Corp, it is our definitive objective is to institute long term, trust-based associations with our clients. The expectation we set up with our clients is based on outstanding service, practical expertise and devotion to a certified value structure. Our passion is to grant our clients with best EMC / RF services by oriented knowledgeable and accommodating staff.

Our Test sites are located at Linkou District and Kwei Shan Hsiang. Location map can be found on our website http://www.icertifi.com.tw.

Linkou

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Kwei Shan

Tel: 886-3-271-8666

No. 3-1, Lane 6, Wen San 3rd St., Kwei Shan Hsiang, Tao Yuan Hsien 333, Taiwan, R.O.C.

If you have any suggestion, please feel free to contact us as below information

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Fax: 886-3-318-0155
Email: ICC_Service@icertifi.com.tw

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