

# 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 L  
RSS-139 Issue 2 February 2009  
**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



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## Release Record

Report No.	Version	Description	Issued Date
FG3N2003P27L	Rev. 01	Initial issue	Dec. 04, 2013

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## Summary of Test Results

FCC Rules	IC Rules	Test Items	Measured	Result
2.1046 27.50(d)(4)	RSS-139 6.4	Equivalent Isotropically Radiated Power	Power[dBm]: LTE: 24.89	Pass
2.1053 27.53(h)	RSS-139 6.5	Radiated Emissions	Meet the requirement of limit	Pass

# 1 General Description

## 1.1 Information

### 1.1.1 Specification of the Equipment under Test (EUT)

<b>Operating Frequency (MHz)</b>	Channel Bandwidth: 1.4MHz: 1710.7~1754.3 Channel Bandwidth: 3MHz: 1711.5~1753.5 Channel Bandwidth: 5MHz: 1712.5~1752.5 Channel Bandwidth: 10MHz: 1715~1750 Channel Bandwidth: 15MHz: 1717.5~1747.5 Channel Bandwidth: 20MHz: 1720~1745
<b>Modulation Type</b>	Uplink : QPSK, 16QAM Downlink : QPSK, 16QAM, 64QAM
<b>Duplex Mode</b>	FDD
<b>Category</b>	3
<b>H/W Version</b>	1.0
<b>S/W Version</b>	SWI9x15E_05.03.02.00

### 1.1.2 Antenna Details

Ant. No.	Type	Gain (dBi)	Connector	Remark
1	Dipole	1.75	SMA	---

### 1.1.3 EUT Operational Condition

<b>Supply Voltage</b>	<input type="checkbox"/> AC mains	<input checked="" type="checkbox"/> DC	
<b>Type of DC Source</b>	<input type="checkbox"/> Internal DC supply	<input type="checkbox"/> External DC adapter	<input checked="" type="checkbox"/> From host

### 1.1.4 Operating Channel List

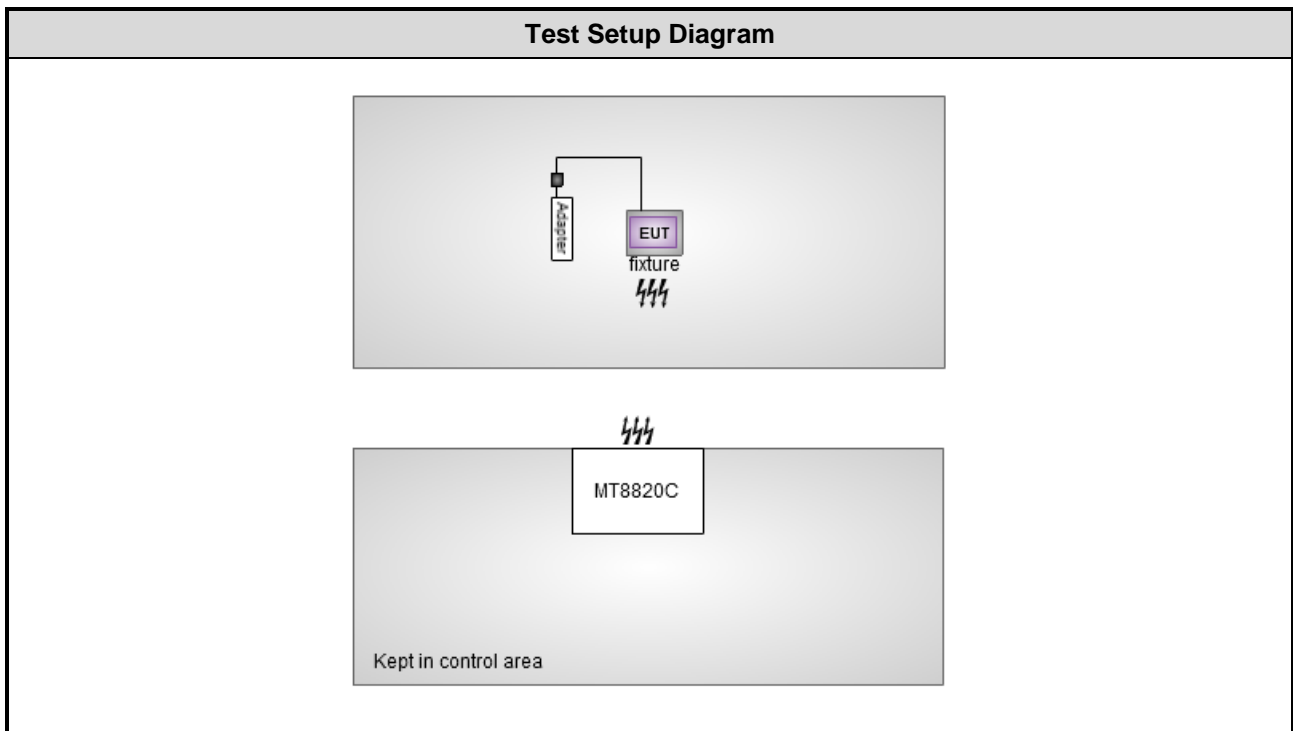
LTE Band 4		
Channel Bandwidth (MHz)	Channel	Frequency (MHz)
1.4	19957	1710.7
1.4	20175	1732.5
1.4	20393	1754.3
3	19965	1711.5
3	20175	1732.5
3	20385	1753.5
5	19975	1712.5
5	20175	1732.5
5	20375	1752.5
10	20000	1715.0
10	20175	1732.5
10	20350	1750.0
15	20025	1717.5
15	20175	1732.5
15	20325	1747.5
20	20050	1720.0
20	20175	1732.5
20	20300	1745.0

## 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



## 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 L  
47 CFR FCC Part 2  
ANSI C63.4-2003  
RSS-139 Issue 2 February 2009  
SRSP-513 Issue 2, February 2009  
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	$\pm 39.332$ Hz
Conducted power	$\pm 0.552$ dB
Frequency error	$\pm 39.332$ Hz
Temperature	$\pm 0.3$ °C
Conducted emission	$\pm 2.946$ dB
AC conducted emission	$\pm 2.43$ dB
Radiated emission	$\pm 2.49$ dB

## 2 Test Configuration

### 2.1 Testing Condition and Location Information

Test Item	Test Site	Ambient Condition	Tested By
Radiated Emissions	03CH01-WS	24°C / 60%	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.I.R.P	10 MHz	QPSK / 16QAM	20350
	20 MHz	QPSK / 16QAM	20175
Radiated Emission ≤ 1GHz	20 MHz	QPSK	20175
Radiated Emission > 1GHz	20 MHz	QPSK	20175

## 3 Test Results

### 3.1 Equivalent Isotropically Radiated Power

#### 3.1.1 Limit of Equivalent Isotropically Radiated Power

Fixed, mobile, and portable (hand-held) stations operating in the 1710–1755 MHz band are limited to 1 Watt EIRP.

#### 3.1.2 Test Procedures

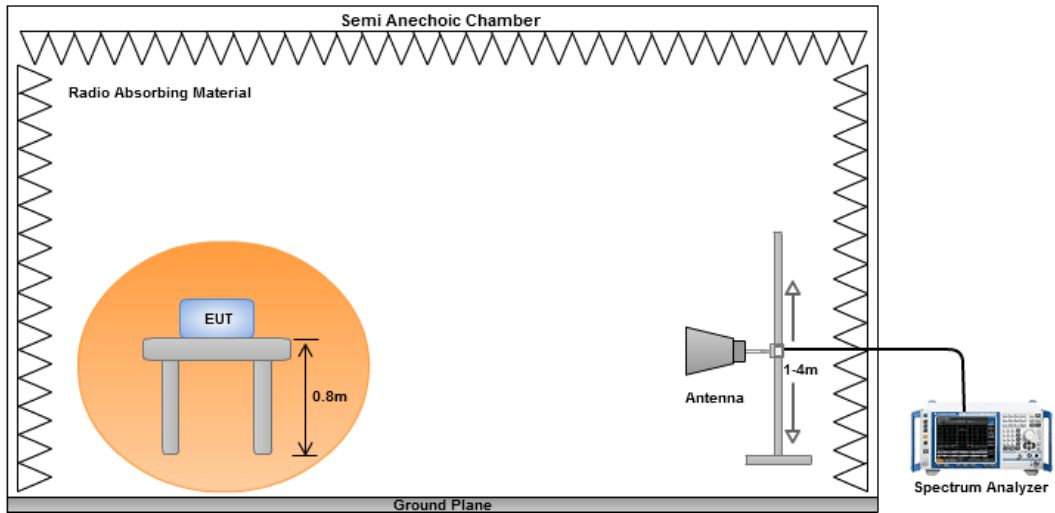
1. Measurement is made at a semi-anechoic chamber that incorporates a turntable allowing a EUT rotation of 360°. A continuously-rotating, remotely-controlled turntable is installed at the test site to support the EUT and facilitate determination of the direction of maximum radiation for each EUT emission 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 and 4 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.

For Conducted power measurement

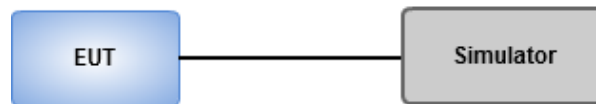
1. The EUT links up with simulator and is set to maximum output power level at low / middle / high channel.
2. Measure the output power of low / middle / high channel of the EUT

### 3.1.3 Test Setup

#### Equivalent Isotropically Radiated Power Measurement



#### Conducted Power Measurement



### 3.1.4 Test Result of Conducted power (dBm)

Band / Channel Bandwidth			LTE Band 4 / CB: 1.4MHz		
Channel			19957	20175	20393
Frequency (MHz)			1710.7	1732.5	1754.3
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.61	22.73	22.55
	1	5	22.60	22.70	22.68
	3	2	22.61	22.65	22.52
	6	0	21.65	21.66	21.60
16QAM	1	0	21.69	21.72	21.50
	1	5	21.59	21.70	21.50
	3	2	21.59	21.75	21.60
	6	0	20.61	20.69	20.57

Band / Channel Bandwidth			LTE Band 4 / CB: 3MHz		
Channel			19965	20175	20385
Frequency (MHz)			1711.5	1732.5	1753.5
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.61	22.78	22.61
	1	14	22.73	22.76	22.52
	8	4	21.83	21.80	21.56
	15	0	21.72	21.70	21.53
16QAM	1	0	21.97	21.53	21.45
	1	14	21.90	21.70	21.75
	8	4	20.56	20.68	20.49
	15	0	20.77	20.82	20.42

Band / Channel Bandwidth			LTE Band 4 / CB: 5MHz		
Channel			19975	20175	20375
Frequency (MHz)			1712.5	1732.5	1752.5
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.65	22.73	22.56
	1	24	22.52	22.71	22.65
	12	6	21.69	21.69	21.47
	25	0	21.55	21.54	21.59
16QAM	1	0	21.44	21.33	21.86
	1	24	21.51	21.70	21.23
	12	6	20.69	20.69	20.49
	25	0	20.48	20.36	20.39

Band / Channel Bandwidth			LTE Band 4 / CB: 10MHz		
Channel			20000	20175	20350
Frequency (MHz)			1715	1732.5	1750
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.69	22.73	22.80
	1	49	22.64	22.61	22.44
	25	12	21.51	21.42	21.63
	50	0	21.53	21.55	21.48
16QAM	1	0	21.61	21.66	21.67
	1	49	21.60	21.63	21.47
	25	12	20.47	20.41	20.35
	50	0	20.26	20.25	20.16

Band / Channel Bandwidth			LTE Band 4 / CB: 15MHz		
Channel			20025	20175	20325
Frequency (MHz)			1717.5	1732.5	1747.5
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.65	22.70	22.78
	1	74	22.66	22.67	22.55
	36	18	21.51	21.39	21.34
	75	0	21.45	21.37	21.28
16QAM	1	0	21.59	21.33	21.99
	1	74	21.88	21.96	21.36
	36	18	20.45	20.37	20.35
	75	0	20.27	20.30	20.26

Band / Channel Bandwidth			LTE Band 4 / CB: 20MHz		
Channel			20050	20175	20300
Frequency (MHz)			1720	1732.5	1745
Mode	RB	RB Offset	Maximum AV Power (dBm)		
QPSK	1	0	22.69	22.85	22.73
	1	99	22.55	22.71	22.53
	50	25	21.61	21.58	21.55
	100	0	21.63	21.50	21.53
16QAM	1	0	21.54	21.66	21.55
	1	99	21.29	21.51	21.03
	50	25	20.34	20.18	20.28
	100	0	20.32	20.30	20.27

### 3.1.5 Test Result of Equivalent Isotropically Radiated Power (dBm)

Mode	CB: 10MHz, 1RB, Offset 0, QPSK						
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
20350	1750.0	24.89	30	-5.11	-12.03	20.04	4.85

Mode	CB: 10MHz, 1RB, Offset 0, 16QAM						
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
20350	1750.0	23.49	30	-6.51	-13.43	18.64	4.85

Mode	CB: 20MHz, 1RB, Offset 0, QPSK						
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
20175	1732.5	24.52	30	-5.48	-14.51	19.63	4.89

Mode	CB: 20MHz, 1RB, Offset 0, 16QAM						
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	S.A Reading (dBm)	S.G Power Vaule (dBm)	Correction Factor (dB)
20175	1732.5	23.24	30	-6.76	-15.79	18.35	4.89

Note: EIRP = S.G Power value + Correction factor

## 3.2 Radiated Emissions

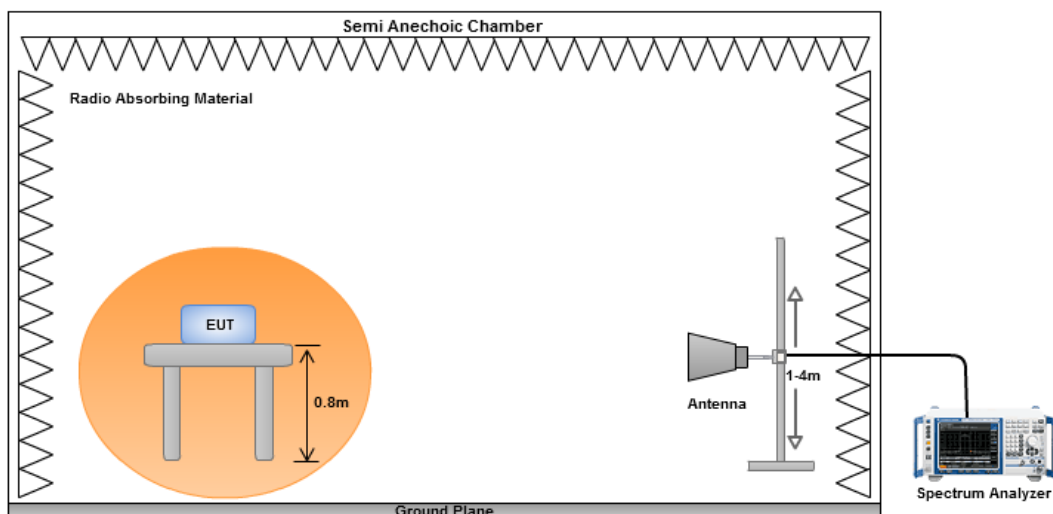
### 3.2.1 Limit of Radiated Emissions

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 -13 dBm.

### 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.
3. This investigation is performed with the EUT rotated 360°, the antenna height scanned between 1 m and 4 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.  $E.I.R.P = \text{output power of step 4} + \text{gain of substitution antenna} - \text{cable loss of RF cable}$ .

### 3.2.3 Test Setup





### 3.2.4 Test Result of Radiated Emissions below 1GHz

Mode							
LTE Band 4, CB: 20MHz, 1RB, Offset 0, Channel : 20175							
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)
124.48	H	-60.16	-13	-47.16	-49.37	-60.23	0.07
193.28	H	-65.61	-13	-52.61	-54.93	-70.79	5.18
255.3	H	-61.80	-13	-48.80	-52.8	-67.40	5.60
297.94	H	-62.26	-13	-49.26	-54.77	-67.83	5.57
363.83	H	-63.01	-13	-50.01	-56.13	-68.55	5.54
429.73	H	-62.61	-13	-49.61	-56.8	-67.82	5.21
95.41	V	-47.77	-13	-34.77	-38.31	-48.23	0.46
122.54	V	-50.57	-13	-37.57	-44.84	-50.64	0.07
257.24	V	-56.25	-13	-43.25	-48.74	-61.85	5.60
297.94	V	-58.00	-13	-45.00	-51.66	-63.57	5.57
363.83	V	-57.43	-13	-44.43	-52.48	-62.97	5.54
429.73	V	-54.94	-13	-41.94	-52.12	-60.15	5.21

Note: EIRP = S.G Power value + Correction factor

### 3.2.5 Test Result of Radiated Emissions above 1GHz

Mode							
LTE Band 4, CB: 20MHz, 1RB, Offset 0, Channel : 20175							
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)
3447.2	H	-47.02	-13	-34.02	-58.49	-52.62	5.60
5170.7	H	-43.77	-13	-30.77	-54.69	-48.76	4.99
6894.4	H	-52.41	-13	-39.41	-70.85	-55.41	3.00
3447.2	V	-37.30	-13	-24.30	-49.81	-42.90	5.60
5170.7	V	-44.61	-13	-31.61	-51.81	-49.60	4.99
6894.4	V	-50.33	-13	-37.33	-70.04	-53.33	3.00

Note: EIRP = S.G Power value + Correction factor

## 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>.

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

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Email: ICC\_Service@icertifi.com.tw

==END==