

# FCC RF Exposure Report

**FCC ID** : N7NHL7688  
**Equipment** : Wireless Module  
**Model No.** : HL7688  
**Brand Name** : AirPrime  
**Applicant** : Sierra Wireless Inc.  
**Address** : 13811 Wireless Way Richmond, BC, V6V 3A4  
Canada  
**Standard** : 47 CFR FCC Part 2.1091  
**Received Date** : Jul. 12, 2016  
**Tested Date** : Aug. 03 ~ Aug. 08, 2016

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:

  
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Gary Chang / Manager



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## Release Record

Report No.	Version	Description	Issued Date
FA571601-01	Rev. 01	Initial issue	Aug. 18, 2016

## 1 MPE EVALUATION OF MOBILE DEVICES

Human exposure to RF emissions from mobile devices (47 CFR §2.1091) may be evaluated based on the MPE limits adopted by the FCC for electric and magnetic field strength and/or power density, as appropriate, since exposures are assumed to occur at distances of 20 cm or more from persons.

### 1.1 LIMITS FOR GENERAL POPULATION/UNCONTROLLED EXPOSURE

Frequency Range (MHz)	Power Density (mW /cm <sup>2</sup> )	Averaging Time (minutes)
300~1500	F/1500	30
1500~100000	1.0	30

### 1.2 MPE EVALUATION FORMULA

$$Pd = \frac{Pt}{4 * Pi * R^2}$$

Where

Pd= Power density in mW/cm<sup>2</sup>  
Pt= EIRP in mW  
Pi= 3.1416  
R= Measurement distance

### 1.3 MPE EVALUATION RESULTS

Mode	Frequency Range (MHz)	Maximum Conducted Power (dBm)	Antenna Gain (dBi)	Distance (cm)	Power Density (mW/cm <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
WCDMA 850	826.4	23.24	2	20	0.066	0.551
	836.4	23.35	2	20	0.068	0.558
	846.6	23.27	2	20	0.067	0.564
LTE Band 5	824.7	23.03	2	20	0.063	0.550
	836.5	22.93	2	20	0.062	0.558
	848.3	22.71	2	20	0.059	0.566
LTE Band 17	706.5	22.79	2	20	0.060	0.471
	710.0	22.82	2	20	0.060	0.473
	713.5	22.83	2	20	0.060	0.476
WCDMA 1900	1852.4	23.91	2	20	0.078	1.000
	1880.0	23.92	2	20	0.078	1.000
	1907.6	23.85	2	20	0.077	1.000
LTE Band 2	1850.7	23.70	2	20	0.074	1.000
	1880.0	23.53	2	20	0.071	1.000
	1909.3	23.78	2	20	0.075	1.000
LTE Band 4	1710.7	23.21	2	20	0.066	1.000
	1732.5	23.20	2	20	0.066	1.000
	1754.3	23.48	2	20	0.070	1.000

#### 1.4 MAXIMUM ANTENNA GAIN EVALUATION (REFERENCE ONLY)

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
WCDMA 850	826.4	23.24	24.00	10.42	20	0.551	16.60	7
	836.4	23.35	24.00	10.48	20	0.558	16.60	7
	846.6	23.27	24.00	10.53	20	0.564	16.60	7

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 10.42 dBi in WCDMA 850.

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
LTE Band 5	824.7	23.03	24.00	10.41	20	0.550	16.60	7
	836.5	22.93	24.00	10.48	20	0.558	16.60	7
	848.3	22.71	24.00	10.54	20	0.566	16.60	7

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 10.41 dBi in LTE band 5.

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
LTE Band 17	706.5	22.79	24.00	9.74	20	0.471	12.92	3
	710.0	22.82	24.00	9.76	20	0.473	12.92	3
	713.5	22.83	24.00	9.79	20	0.476	12.92	3

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 9.74 dBi in LTE band 17.

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
WCDMA 1900	1852.4	23.91	24.00	13.01	20	1.000	9.01	2
	1880.0	23.92	24.00	13.01	20	1.000	9.01	2
	1907.6	23.85	24.00	13.01	20	1.000	9.01	2

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 9.01 dBi in WCDMA 1900.

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
LTE Band 2	1850.7	23.70	24.00	13.01	20	1.000	9.01	2
	1880.0	23.53	24.00	13.01	20	1.000	9.01	2
	1909.3	23.78	24.00	13.01	20	1.000	9.01	2

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 9.01 dBi in LTE band 2.

Mode	Freq. (MHz)	Conducted power (dBm)	Maximum tune up power (dBm)	Max Gain to comply with MPE			Max Gain to comply with ERP/EIRP	
				Antenna Gain (dBi)	Distance (cm)	Limit (mW/cm <sup>2</sup> )	Antenna Gain (dBi)	Limit (ERP/EIRP,W)
LTE Band 4	1710.7	23.21	24.00	13.01	20	1.000	6.00	1
	1732.5	23.20	24.00	13.01	20	1.000	6.00	1
	1754.3	23.48	24.00	13.01	20	1.000	6.00	1

Note: In order to comply with both Maximum Permissible Exposure and ERP/EIRP limit, the maximum antenna gain shall not be greater than 6 dBi in LTE band 4.

## 2 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 (EMC and Wireless Communication Laboratory), 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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### **Kwei Shan**

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

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