

FCC Test Report

Product Name : Module
Trade Name : AirPrime
Model No. : HL7800
FCC ID : N7NHL78

Applicant : Sierra Wireless, Inc.

Address : 13811 Wireless Way, Richmond, BC, Canada V6V 3A4

Date of Receipt : Mar. 18, 2020
Issued Date : Mar. 31, 2020
Report No. : 2030506A-TSSRP01V00
Report Version : V2.0

The test results relate only to the samples tested.

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Test Report Certification

Issued Date : Mar. 31, 2020

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Manufacturer : Sierra Wireless, Inc.

Address : 13811 Wireless Way, Richmond, BC, Canada V6V 3A4

Trade name : AirPrime

Model No. : HL7800

FCC ID : N7NHL78

EUT Voltage : DC 3.7V

Testing Voltage : DC 3.7V

Applicable Standard : FCC CFR Title 47 Part 27 Subpart F
RF Output Power

Test Lab : Hsin Chu Laboratory

Address : No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu
County 310, Taiwan, R.O.C.
TEL: +886-3-582-8001 / FAX: +886-3-582-8958

Test Result : Complied
(Note: According to customer's request, only conducted output power test is performed and recorded in this report.)

Documented By : Lyla Yang
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(Max Chang / Senior Engineer)

Approved By : Louis Hsu
(Louis Hsu / Deputy Manager)

Revision History

Report No.	Version	Description	Issued Date
2030506A-TSSRP01V00	V1.0	Initial issue of report	Mar. 20, 2020
2030506A-TSSRP01V00	V2.0	Remove EUT photos.	Mar. 31, 2020

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1. General Information

1.1. EUT Description

Product Name	Module
Trade Name	AirPrime
Model No.	HL7800
Uplink Frequency Range (MHz)	LTE Band 12: 698~716
Downlink Frequency Range (MHz)	LTE Band 12: 729~746
Modulation	BPSK / QPSK

Accessories Information	
Antenna Type	3 Pcs

Antenna Information	
MFR. / Model	Pulse / SPDA24700/2700
Antenna Type	Dipole Antenna
Antenna Gain	2dBi

Note:

1. This HL7800 supports LTE NB-IoT Band 12 function.
2. Regarding frequency band operation, the lowest, middle and highest frequency of channel were selected to perform the test, and the details were shown on this report.
3. The EUT description is from the customer declaration.

1.2. Mode of Operation

DEKRA has verified the construction and function in typical operation. All the test modes were carried out with the EUT in normal operation, which was shown in this test report and defined as:

Test Mode
Mode 1: LTE NB-IoT_Band 12

2. Technical Test

2.1. Summary of Test Result

- No deviations from the test standards
- Deviations from the test standards as below description:

B12

Uplink: 698-716MHz

Downlink: 729-746MHz

LTE B12			
FCC Part 27 Subpart F			
Test item	FCC Reference section	FCC Limit	Result
RF Output Power	§2.1033 §2.1046 §27.50	<3 Watts ERP	Pass

Note 1: Determining compliance shall be based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

Note 2: According to customer's request, only conducted output power test is performed and recorded in this report.

2.2. Test Environment

Items	Required	Actual	Test Site
Temperature (°C)	15-35	23	3
Humidity (%RH)	25-75	52	

Note: Test site information refers to Laboratory Information.

Laboratory Information

USA : FCC Registration Number: TW3024
Canada : IC Registration Number: 22397-1 / 22397-2 / 22397-3

The address and introduction of DEKRA Testing and Certification Co., Ltd. laboratories can be founded in our Web site: <http://www.dekra.com.tw>

If you have any comments, please don't hesitate to contact us. Our test sites as below:

Test Laboratory	DEKRA Testing and Certification Co., Ltd.
Address	1. No. 75-2, 3rd Lin, WangYe Keng, Yonghxing Tsuen, Qionglin Shiang, Hsinchu County 307, Taiwan, R.O.C. 2. No.372, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C. 3. No.372-2, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County 31061, Taiwan, R.O.C.
Phone number	1. +886-3-592-8858 2. +886-3-582-8001 3. +886-3-582-8001
Fax number	1. +886-3-592-8859 2. +886-3-582-8958 3. +886-3-582-8958
E mail address	info.tw@dekra.com
Website	http://www.dekra.com.tw

2.3. List of Test Equipment

RF Output Power / SR12-H

Instrument	Manufacturer	Model No.	Serial No.	Cal. Date	Next Cal. Date
High Speed Peak Power Meter Dual Input	Anritsu	ML2496A	1602004	2019/12/02	2020/12/01
Pulse Power Sensor	Anritsu	MA2411B	1531043	2019/12/02	2020/12/01
Pulse Power Sensor	Anritsu	MA2411B	1531044	2019/12/02	2020/12/01
Radio Communication Tester	Anritsu	MT8821C	6261915489	2019/11/26	2020/11/25

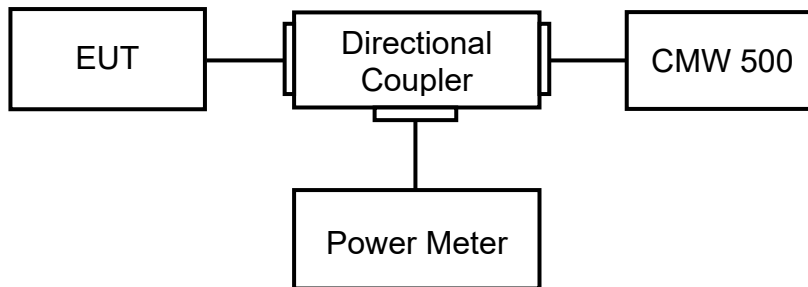
Note: All equipment upon which need to calibrated are with calibration period of 1 year.

2.4. Uncertainty

Test Item	Uncertainty
RF Output Power	± 1.27 dB

3. RF Output Power

3.1. Test Setup



3.2. Test Procedure

- The RF output of the transmitter was connected to base station simulator.
- The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement..
- Set EUT at maximum average power by base station simulator.
- Measure lowest, middle, and highest channels for each bandwidth and different modulation.

Effective Isotropic Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi)

Effective Radiated Power = Conducted Power(dBm) + Antenna Gain(dBi) - 2.15dB

The conversion of dBm to watts is given by the formula:

$$P_{(W)} = 1W \times \frac{10^{\left(\frac{P_{(dBm)}}{10}\right)}}{1000} = 10^{\left(\left(P_{(dBm)} - 30\right)/10\right)}$$

3.3. Test Method

KDB 971168 D01 Power Meas License Digital Systems v03 sub-clause 5.2.4

ANSI C63.26: 2015 Sub-clause 5.2.4.2

3.4. Test Result

Product	Module		
Test Item	RF Output Power		
Test Mode	Mode 1: LTE NB-IoT_Band 12		
Date of Test	2020/03/18	Test Site	SR12-H
Temperature (°C)	22.0	Temperature (°C)	55.0

Channel	Freq. (MHz)	Modulation	BW (kHz)	RB No.	RB offset	Conducted Output Power (dBm)	RF Output Power (W) ERP	Limit (W) ERP			
23011	699.1	BPSK	3.75	1	0	21.62	0.140	3			
			15	1	0	22.51	0.172	3			
		QPSK	3.75	1	0	21.59	0.139	3			
				1	0	22.79	0.184	3			
			15	3	3	22.65	0.178	3			
				12	0	20.28	0.103	3			
23095	707.5	BPSK	3.75	1	0	23.12	0.198	3			
				1	47	23.10	0.197	3			
			15	1	0	23.22	0.203	3			
		QPSK	3.75	1	0	23.11	0.198	3			
				1	0	23.52	0.217	3			
			15	1	11	23.51	0.217	3			
				3	3	23.45	0.214	3			
				12	0	21.25	0.129	3			
			23179	715.9	BPSK	3.75	1	47	22.26	0.163	3
						15	1	11	22.11	0.157	3
QPSK	3.75	1			47	22.23	0.161	3			
		1			11	22.07	0.156	3			
	15	3			3	22.04	0.155	3			
		12			0	20.13	0.100	3			