

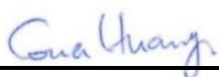
RF EXPOSURE EVALUATION REPORT

FCC ID : N7NHL78C
Equipment : Radio Module
Brand Name : AirPrime
Model Name : HL7812
Applicant : Sierra Wireless, ULC
13811 Wireless Way, Richmond, BC V6V 3A4 Canada
Manufacturer : Sierra Wireless, ULC
13811 Wireless Way, Richmond, BC V6V 3A4 Canada
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part2.1091 and it complies with applicable limit.

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code: 1190) and the FCC designation No. TW1190 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC evaluation.

The results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC. Laboratory, the test report shall not be reproduced except in full.



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA461112	Rev. 01	Initial issue of report	Jan. 16, 2025

**1. Description of Equipment Under Test (EUT)**

Product Feature & Specification	
EUT Type	Radio Module
Brand Name	AirPrime
Model Name	HL7812
FCC ID	N7NHL78C
Wireless Technology and Frequency Range	NTN Band 23: 2000.1 MHz ~ 2019.9 MHz NTN Band 255: 1626.6 MHz ~ 1660.4 MHz
Mode	LTE: BPSK, QPSK
EUT Stage	Production Unit

Accessories Information					
Accessories Information	Fixture	Brand Name	Sierra Wireless	Model Name	HL DevKit

Reviewed by: Jason Wang**Report Producer: Carlie Tsai****2. Maximum RF average output power among production units**

Mode		Maximum Average power(dBm)
NTN	Band 23	24.5
	Band 255	24.5

3. RF Exposure Limit Introduction

According to ANSI/IEEE C95.1-1992, the criteria listed in Table 1 shall be used to evaluate the environmental impact of human exposure to radio frequency (RF) radiation as specified in §1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposures				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f ²)	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500			f/1500	30
1500-100,000			1.0	30

The MPE was calculated at 20 cm to show compliance with the power density limit.

The following formula was used to calculate the Power Density:

$$S = \frac{PG}{4\pi R^2}$$

Where:

S = Power Density

P = Output Power at Antenna Terminals

G = Gain of Transmit Antenna (linear gain)

R = Distance from Transmitting Antenna

4. Radio Frequency Radiation Exposure Evaluation

4.1. Standalone Power Density Calculation

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum EIRP Limit (W)	Maximum PG (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
NTN Band 23	8.50	24.50	33.000	1.995	2.000	1995.262	0.397	1.000
NTN Band 255	8.50	24.50	33.000	1.995	2.000	1995.262	0.397	1.000

4.2. Collocated Power Density Calculation

Note:

- This MPE analysis is applicable to any collocated transmitters, with the maximum EIRP for WLAN assumed to be 30 dBm and the maximum EIRP for BT assumed to be 20 dBm.

Band	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum PG (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
NTN Band 23	8.50	24.50	33.0	2.00	1995.26	0.397	1.000	0.397
NTN Band 255	8.50	24.50	33.0	2.00	1995.26	0.397	1.000	0.397
WLAN2.4GHz Band			30.0	1.00	1000.00	0.199	1.000	0.199
WLAN5GHz Band			30.0	1.00	1000.00	0.199	1.000	0.199
Bluetooth			20.0	0.10	100.00	0.020	1.000	0.020

NTN Power Density / Limit	WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of NTN+WLAN+Bluetooth
0.397	0.199	0.020	0.616

Note:

- Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for NTN + WLAN + Bluetooth.
- Considering the NTN module collocation with the WLAN and Bluetooth transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 3 collocated transmitters is compliant.

Conclusion:

Based on FCC 47 CFR §1.1307, the analysis concludes that this product when transmitting in standalone within a host device, is compliant with the FCC RF exposure requirements in mobile exposure condition, provided the conducted power and antenna gain do not exceed the limits for each given frequency band per wireless technology as follow table:

Device	Technology	Band	Frequency (MHz)	Maximum Conducted Power (dBm)	Stanalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
HL7812	NTN	Band 23	2000.1 ~ 2019.9	24.5	8.5	8.5
		Band 255	1626.6 ~ 1660.4	24.5	8.5	8.5