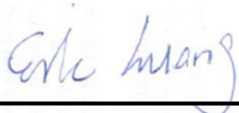


RF Exposure Evaluation Report

APPLICANT : Quanta Computer Inc.
EQUIPMENT : LTE M.2 Card
BRAND NAME : Quanta
MODEL NAME : LM175
FCC ID : HFS-LM175
STANDARD : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC., would like to declare that the device has been evaluated in accordance with 47 CFR Part 2.1091, and pass the limit. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.



Reviewed by: Eric Huang / Deputy Manager



Approved by: Jones Tsai / Manager



SPORTON INTERNATIONAL INC.

No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA460690	Rev. 01	Initial issue of report	Jul. 10, 2014

1. Administration Data
1.1. Testing Laboratory

Testing Laboratory	
Test Site	SPORTON INTERNATIONAL INC.
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Quanta Computer Inc.
Address	211 Wen Hwa 2nd Rd., Kueishan, Taoyuan 33377, Taiwan

Manufacturer	
Company Name	1. Quanta Computer Inc. 2. Aptos Technology Inc.
Address	1. 211 Wen Hwa 2nd Rd., Kueishan, Taoyuan 33377, Taiwan 2. No.398, Youyi Rd., Jhunan Township, Miaoli County 350, Taiwan

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	LTE M.2 Card
Brand Name	Quanta
Model Name	LM175
FCC ID	HFS-LM175
Wireless Technology and Frequency Range	LTE Band 13: 779.5 MHz ~ 784.5 MHz LTE Band 4: 1710.7 MHz ~ 1754.3 MHz
Mode	• LTE: QPSK, 16QAM
Antenna Type	LTE: PIFA Antenna
EUT Stage	Identical Prototype

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

3. Maximum RF average output power among production units

Mode	Average Power (dBm)
LTE Band 4	24.7
LTE Band 13	24.7



4. 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



5. Radio Frequency Radiation Exposure Evaluation

5.1. Standalone Power Density Calculations

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP (dBm)	Maximum ERP (W)	Maximum EIRP (dBm)	Maximum EIRP (W)	Maximum Output Power Limit (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)
LTE Band 13	777	9.0	24.7	31.560	1.432	33.700	2.344	3.0 ERP	2344.229	0.467	0.518
LTE Band 4	1710	5.0	24.7	27.560	0.570	29.700	0.933	1.0 EIRP	933.254	0.186	1.000

5.2. Collocated Power Density Calculations

Note:

1. This MPE analysis is applicable to any collocated transmitters with EIRP for WLAN is less than or equal to 34dBm and EIRP for Bluetooth is less than or equal to 20dBm.
2. A maximum antenna gain of 5 dBi for WLAN/BT has been assumed for all collocated antennas.

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum ERP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
LTE Band 13	777	6.0	24.7	30.7	1.17	1174.90	0.234	0.518	0.451
LTE Band 4	1710	5.0	24.7	29.7	0.93	933.25	0.186	1.000	0.186
WLAN2.4GHz Band	2412	5.0	29.0	34.0	2.51	2511.89	0.500	1.000	0.500
WLAN5GHz Band	5180	5.0	29.0	34.0	2.51	2511.89	0.500	1.000	0.500
Bluetooth	2402	5.0	15.0	20.0	0.10	100.00	0.020	1.000	0.020

<Collocated analysis>

Note:

1. For collocation analysis, LTE Band 13 is chosen for summation due to the highest (power density/limit) among all WWAN wireless modes.
2. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WWAN + WLAN + Bluetooth.
3. Considering the WWAN module collocation with the other transmitters 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.

Max WLAN Power Density / Limit	Max Bluetooth Power Density / Limit	Max WWAN Power Density / Limit	Σ (Power Density / Limit) of WWAN + WLAN + Bluetooth
0.451	0.500	0.020	0.971

**Conclusion:**

Based on 47 CFR§2.1091, the analysis concludes that this product is compliant with the RF exposure requirements in mobile exposure condition, provided the peak gain of the connected WWAN antenna, the conducted power and the antenna gain of the collocated transmitter, do not exceed the limits for each frequency band listed below.

Device	Technology	Band	Maximum Conducted Power (dBm)	Standalone Maximum Antenna Gain (dBi)	Collocated Maximum Antenna Gain (dBi)
LM175	LTE	Band 13	24.7	9.0	6.0
		Band 4	24.7	5.0	5.0
Collocated Transmitters	WLAN	2.4GHz	29.0		5.0
	WLAN	5GHz	29.0		5.0
	BT	2.4GHz	15.0		5.0