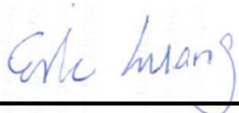


RF Exposure Evaluation Report

APPLICANT : Quanta Computer Inc.
EQUIPMENT : Clover Mini 3G
BRAND NAME : Clover
MODEL NAME : C301
FCC ID : HFS-C301
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 District, Taoyuan City, Taiwan (R.O.C.)



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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA511632	Rev. 01	Initial issue of report	Apr. 15, 2015

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 District, Taoyuan City, Taiwan (R.O.C.) TEL: +886-3-327-3456 FAX: +886-3-328-4978

Applicant	
Company Name	Quanta Computer Inc.
Address	No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan

Manufacturer	
Company Name	Quanta Computer Inc.
Address	No.188, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan

2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Clover Mini 3G
Brand Name	Clover
Model Name	C301
FCC ID	HFS-C301
Integrated WWAN Module	Brand Name: HUAWEI Model Name: MU736
Integrated WLAN Module	Brand Name: AzureWave Model Name: AW-AH691A
Wireless Technology and Frequency Range	GSM850: 824.2 MHz ~ 848.8 MHz GSM1900: 1850.2 MHz ~ 1909.8 MHz WCDMA Band V: 826.4 MHz ~ 846.6 MHz WCDMA Band IV: 1712.4 MHz ~ 1752.6 MHz WCDMA Band II: 1852.4 MHz ~ 1907.6 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz WLAN 5.2GHz Band: 5180 MHz ~ 5240 MHz WLAN 5.3GHz Band: 5260 MHz ~ 5320 MHz WLAN 5.5GHz Band: 5500 MHz ~ 5700 MHz WLAN 5.8GHz Band: 5745 MHz ~ 5825 MHz Bluetooth: 2402 MHz ~ 2480 MHz NFC: 13.56 MHz
Mode	• GPRS/EGPRS • RMC 12.2Kbps • HSDPA • HSUPA • 802.11a/b/g/n HT20/HT40 • Bluetooth v2.1+EDR , Bluetooth v4.0-LE • NFC:ASK
EUT Stage	Identical Prototype

**3. Maximum RF average output power among production units**

Mode	Burst Average Power	
	GSM 850	GSM 1900
GPRS/EDGE (GMSK, 1 Tx slot)	31.0	27.5
GPRS/EDGE (GMSK, 2 Tx slots)	31.0	25.0
EDGE (8PSK, 1 Tx slot)	25.0	23.5
EDGE (8PSK, 2 Tx slots)	25.0	23.5
EDGE (8PSK, 3 Tx slots)	25.0	23.5
EDGE (8PSK, 4 Tx slots)	25.0	23.5

Mode	Average Power		
	WCDMA Band V	WCDMA Band II	WCDMA Band IV
RMC 12.2Kbps	22.0	22.0	22.0
HSDPA Subtest-1	22.0	22.0	22.0
HSUPA Subtest-5	22.0	22.0	22.0

Mode / Band	Average Power (dBm)			
	v2.1+EDR			v4.0-LE
Bluetooth	1Mbps	2Mbps	3Mbps	
	9.0	9.0	9.0	8.0

Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)						
		Ant 0			Ant 1			Ant 0+1
		11b	11g	HT20	11b	11g	HT20	HT20
2.4GHz Band	2412	16.0	14.5	13.5	16.0	14.0	13.5	15.0
	2437	16.0	14.5	13.5	16.0	15.0	13.5	18.0
	2462	16.0	14.5	13.5	16.0	14.0	13.5	13.0



Band / Frequency (MHz)		IEEE 802.11 Average Power (dBm)							
		Ant 0			Ant 1			Ant 0+1	
		11a	HT20	HT40	11a	HT20	HT40	HT20	HT40
5.2GHz Band	5180	15.0	13.5	13.0	15.0	13.0	14.0	16.0	
	5190								15.0
	5200							19.0	
	5220							19.0	
	5230								19.0
	5240							19.0	
5.3GHz Band	5260	15.0	13.0	13.0	15.0	13.0		19.0	
	5270						14.0		19.0
	5280							19.0	
	5300							19.0	
	5310						13.0		15.0
	5320							16.0	
5.5GHz Band	5500	15.0	13.0		16.0	14.0		17.0	
	5510			13.0			14.0		15.0
	5520				16.0	14.0		19.0	
	5540				16.0	14.0		19.0	
	5550			13.0			14.0		19.0
	5560				16.0	14.0		19.0	
	5580				16.0	14.0		19.0	
	5600				16.0	14.0		19.0	
	5620				16.0	14.0		19.0	
	5630			13.0			14.0		19.0
	5640				16.0	14.0		19.0	
	5660				16.0	14.0		19.0	
	5670			13.0			14.0		15.0
	5680				16.0	14.0		19.0	
	5700				13.0	13.0		14.0	
5.8GHz Band	5745				11.0	11.0		14.0	
	5755			11.0			10.0		11.0
	5765				16.0	14.0		19.0	
	5785				16.0	14.0		19.0	
	5795			13.0			13.0		15.0
	5805				16.0	14.0		19.0	
	5825				13.0	14.0		16.0	



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 Calculation

Band	Frequency (MHz)	Antenna Gain (dBi)	Maximum Power (dBm)	Maximum EIRP (dBm)	Maximum EIRP (W)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
GPRS 850 (1 Tx slot)	824.2	0.04	31.0	31.040	1.271	159.956	0.032	0.549	0.058
GPRS 850 (2 Tx slots)	824.2	0.04	31.0	31.040	1.271	319.154	0.064	0.549	0.116
EGPRS 850 (1 Tx slot)	824.2	0.04	25.0	25.040	0.319	40.179	0.008	0.549	0.015
EGPRS 850 (2 Tx slots)	824.2	0.04	25.0	25.040	0.319	80.168	0.016	0.549	0.029
EGPRS 850 (3 Tx slots)	824.2	0.04	25.0	25.040	0.319	119.674	0.024	0.549	0.043
EGPRS 850 (4 Tx slots)	824.2	0.04	25.0	25.040	0.319	159.956	0.032	0.549	0.058
GPRS 1900 (1 Tx slot)	1850.2	1.02	27.5	28.520	0.711	89.536	0.018	1.000	0.018
GPRS 1900 (2 Tx slots)	1850.2	1.02	27.5	28.520	0.711	178.649	0.036	1.000	0.036
EGPRS 1900 (1 Tx slot)	1850.2	1.02	23.5	24.520	0.283	35.645	0.007	1.000	0.007
EGPRS 1900 (2 Tx slots)	1850.2	1.02	23.5	24.520	0.283	71.121	0.014	1.000	0.014
EGPRS 1900 (3 Tx slots)	1850.2	1.02	23.5	24.520	0.283	106.170	0.021	1.000	0.021
EGPRS 1900 (4 Tx slots)	1850.2	1.02	23.5	24.520	0.283	141.906	0.028	1.000	0.028
WCDMA Band 5	826.4	0.04	22.0	22.040	0.160	159.956	0.032	0.551	0.058
WCDMA Band 4	1712.4	1.08	22.0	23.080	0.203	203.236	0.040	1.000	0.040
WCDMA Band 2	1852.4	1.02	22.0	23.020	0.200	200.447	0.040	1.000	0.040
2.4GHz WLAN	2412.0	1.70	18.0	19.700	0.093	93.325	0.019	1.000	0.019
5GHz WLAN	5180.0	5.80	19.0	24.800	0.302	301.995	0.060	1.000	0.060
Bluetooth	2402.0	1.70	9.0	10.700	0.012	11.749	0.002	1.000	0.002

Note: For conservativeness, the lowest uplink frequency of each band is used to determine the MPE limit of that band

5.2. Collocated Power Density Calculation

WLAN Power Density / Limit	Bluetooth Power Density / Limit	WWAN Power Density / Limit	Σ (Power Density / Limit) of WWAN+WLAN+Bluetooth
0.060	0.002	0.116	0.196

Note:

1. For collocation analysis, GSM850 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 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:

According to 47 CFR §2.1091, the RF exposure analysis concludes that the RF Exposure is FCC compliant.