



# RF Exposure Evaluation Report

**APPLICANT** : Super Micro Computer, Inc.  
**EQUIPMENT** : IoT Gateway System  
**BRAND NAME** : Super Micro Computer, Inc  
**MODEL NAME** : SYS-E100-8Q-TDAW/SYS-E100-8QE-TDAW  
**MARKETING NAME** : IoT Gateway System  
**FCC ID** : 2AEVX-E100TDAW  
**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
FA560819	Rev. 01	Initial issue of report	Aug. 31, 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	Super Micro Computer, Inc.
Address	980 Rock Ave., San Jose, CA, 95131, USA

Manufacturer	
Company Name	Super Micro Computer, Inc.
Address	980 Rock Ave., San Jose, CA, 95131, USA

## 2. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	IoT Gateway System
Brand Name	Super Micro Computer, Inc
Model Name	SYS-E100-8Q-TDAW/SYS-E100-8QE-TDAW
Marketing Name	IoT Gateway System
FCC ID	2AEVX-E100TDAW
Wireless Technology and Frequency Range	CDMA2000 BC0: 824.7 MHz ~ 848.31 MHz CDMA 2000 BC1: 1851.25 MHz ~ 1908.75 MHz WLAN 2.4GHz Band: 2412 MHz ~ 2462 MHz
Mode	<ul style="list-style-type: none"><li>CDMA2000 : 1xRTT/1xEv-Do(Rev.A)</li><li>802.11b/g/n HT20/HT40</li></ul>
HW Version	Module: HE910-DUAL: 1.01, A1SQN-E/A1SQN MB V1.02
SW Version	Module: firmware 15.00.024 (Verizon CDMA), system:RCPL23
EUT Stage	Production Unit

**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)	
	CDMA2000 BC0	CDMA2000 BC1
1xRTT RC1 SO55	24.00	24.00
1xRTT RC3 SO55	24.00	24.00
1xEVDO RTAP 153.6Kbps	24.00	24.00
1xEVDO RETAP 4096 Bits	24.00	24.00

Band / Frequency (MHz)	IEEE 802.11 Average Power (dBm)			
	11b	11g	HT20	HT40
2.4GHz WLAN	18	16	15	15



#### 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 <sup>2</sup> )	Averaging time (minutes)
<b>(A) Limits for Occupational/Controlled Exposures</b>				
0.3-3.0	614	1.63	*(100)	6
3.0-30	1842/f	4.89/f	*(900/f <sup>2</sup> )	6
30-300	61.4	0.163	1.0	6
300-1500			f/300	6
1500-100,000			5	6
<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
0.3-1.34	614	1.63	*(100)	30
1.34-30	824/f	2.19/f	*(180/f <sup>2</sup> )	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
CDMA2000 BC0	824.7	2.10	24.00	26.100	0.407	407.380	0.081	0.550	0.147
CDMA2000 BC1	1851.3	2.80	24.00	26.800	0.479	478.630	0.095	1.000	0.095
2.4GHz WLAN	2412.0	2.10	18.00	20.100	0.102	102.329	0.020	1.000	0.020

**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 Calculations

Maximum WLAN Power Density / Limit	Maximum WWAN Power Density / Limit	$\Sigma$ (Power Density / Limit) of WWAN+WLAN
0.020	0.147	0.167

**Note:**

1.  $\Sigma$ (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
2. Considering the WWAN collocation with the WLAN transmitter of the EIRP performance listed in the table above, the aggregated (power density /limit) is smaller than 1, and MPE of 2 collocated transmitters is compliant

### Conclusion:

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