


# RF EXPOSURE EVALUATION REPORT

FCC ID : Z64-CC3135MOD  
Equipment : Dual-Band Wi-Fi® Network Processor Module  
Brand Name : Texas Instruments  
Model Name : CC3135MODRNMMOB  
Applicant : Texas Instruments Incorporated  
12500 TI BLVD., Dallas Texas, 75243  
Manufacturer : Texas Instruments Incorporated  
12500 TI BLVD., Dallas Texas, 75243  
Standard : 47 CFR Part 2.1091

We, SPORTON INTERNATIONAL INC has been evaluated this product in accordance with 47 CFR Part 2.1091 and it complies with applicable limit.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of government.

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



Approved by: Cona Huang / Deputy Manager

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## **Table of Contents**

<b>1. DESCRIPTION OF EQUIPMENT UNDER TEST (EUT) .....</b>	<b>4</b>
<b>2. MAXIMUM RF AVERAGE OUTPUT POWER AMONG PRODUCTION UNITS .....</b>	<b>5</b>
<b>3. RF EXPOSURE LIMIT INTRODUCTION .....</b>	<b>6</b>
<b>4. RADIO FREQUENCY RADIATION EXPOSURE EVALUATION .....</b>	<b>7</b>
4.1. Standalone Power Density Calculation .....	7



## History of this test report

Report No.	Version	Description	Issued Date
FA8D1931	Rev. 01	Initial issue of report	Aug. 08, 2019

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

Product Feature & Specification	
EUT Type	Dual-Band Wi-Fi® Network Processor Module
Brand Name	Texas Instruments
Model Name	CC3135MODRNMMOB
FCC ID	Z64-CC3135MOD
Wireless Technology and Frequency Range	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
Mode	WLAN: 802.11a/b/g/n HT20
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.

**Reviewed by:** Jason Wang

**Report Producer:** Wan Liu

Antenna Information					
	Antenna Type	Brand Name	Model	2.4GHz Gain(dBi)	5GHz Gain(dBi)
1.	Chip	Pulse	W3078	1.7	4.3
2.		Yageo	ANT5320LL04R2455A	2.17	3.51
3.		Ethertronics	M830520	1	2.6
4.	PCB		1000423	-0.6	4.5
5.	Laird	CAF94504	CAF94504	2	4
6.			CAF94505	2	4
7.	Dipole	LSR	001-0012	2	2
8.			080-0013	2	2
9.			080-0014	2	2
10.	PIFA		001-0016	2.5	3
11.			001-0021	2.5	3
Note: The EUT used a dual-band chip antenna (Antenna 3 from Ethertronics)					

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

Mode		Maximum Average Power (dBm)
2.4GHz WLAN	802.11b	18.1
	802.11g	17.8
	802.11n-HT20	17.5
5GHz WLAN	802.11a	16.3

### 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 <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



## **4. Radio Frequency Radiation Exposure Evaluation**

### **4.1. 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 <sup>2</sup> )	Limit (mW/cm <sup>2</sup> )
2.4GHz WLAN	2412.0	2.50	18.10	20.600	0.115	114.815	0.023	1.000
5GHz WLAN	5180.0	4.50	16.30	20.800	0.120	120.226	0.024	1.000

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

### **Conclusion:**

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