

RF EXPOSURE EVALUATION REPORT

FCC ID : TX2-RTL8735BDM
Equipment : 11n RTL8735BDM combo module
Brand Name : REALTEK
Model Name : RTL8735BDM
Applicant : Realtek Semiconductor Corp.
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu
300, Taiwan
Manufacturer : Realtek Semiconductor Corp.
No. 2, Innovation Road II, Hsinchu Science Park, Hsinchu
300, Taiwan
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.

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.

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Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA371824	Rev. 01	Initial issue of report	Dec. 13, 2023

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	11n RTL8735BDM combo module
Brand Name	REALTEK
Model Name	RTL8735BDM
FCC ID	TX2-RTL8735BDM
Wireless Technology and Frequency Range	WLAN 2.4 GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2 GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3 GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.6 GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8 GHz Band: 5725 MHz ~ 5850 MHz Bluetooth: 2400 MHz ~ 2483.5 MHz
Mode	WLAN: 802.11a/b/g/n HT20 Bluetooth LE
HW Version	SM35B02_2V2
SW Version	v38_4b9e0eb2_lab_v1
EUT Stage	Identical Prototype

Reviewed by: Jason Wang

Report Producer: Daisy Peng

Ant.	Port			Brand	Model Name	Antenna Type	Connector	Gain (dBi)
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth					
1	1	1	1	LYNwave	ALA110-222050-300011	PIFA	IPEX MHF4	Note 1
2	1	1	1	RTANT	K212-10068-A	PIFA	IPEX MHF4	

Note 1

Ant.	Port			WLAN 2.4GHz	WLAN 5GHz	Bluetooth
	WLAN 2.4GHz	WLAN 5GHz	Bluetooth			
1	1	1	1	3.50	5.00	3.50
2	1	1	1	2.77	0.84	2.77

Note 2: There are two antenna models provided by different manufacturers. All tests were conducted using the high-gain antenna.

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

2.4GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 1 Tune-up Limit
	802.11b 1Mbps	1	2412	18.50
		6	2437	18.50
		11	2462	18.50
	802.11g 6Mbps	1	2412	17.50
		6	2437	17.50
		11	2462	17.50
	802.11n-HT20 MCS0	1	2412	17.00
		6	2437	17.50
		11	2462	16.00

5.2GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 1 Tune-up Limit
	802.11a 6Mbps	36	5180	18.50
		44	5220	18.50
		48	5240	18.50
	802.11n-HT20 MCS0	36	5180	18.50
		44	5220	18.50
		48	5240	18.50

5.3GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 1 Tune-up Limit
	802.11a 6Mbps	52	5260	18.50
		60	5300	18.50
		64	5320	18.50
	802.11n-HT20 MCS0	52	5260	18.50
		60	5300	18.50
		64	5320	18.50

5.5GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 1 Tune-up Limit
	802.11a 6Mbps	100	5500	18.50
		116	5580	18.50
		140	5700	17.00
		144	5720	18.50
	802.11n-HT20 MCS0	100	5500	18.50
		116	5580	18.50
		140	5700	17.00
		144	5720	18.50



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5.8GHz WLAN	Mode	Channel	Frequency (MHz)	Ant 1 Tune-up Limit
	802.11a 6Mbps	149	5745	18.50
		157	5785	16.50
		165	5825	16.00
	802.11n-HT20 MCS0	149	5745	18.50
		157	5785	16.50
		165	5825	16.00

Bluetooth	Mode	Channel	Frequency (MHz)	Tune-Up Limit
	LE 1Mbps	0	2402	12.50
		19	2440	12.50
		39	2480	12.50
	LE 2Mbps	0	2402	12.50
		19	2440	12.50
		39	2480	12.50

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)	Average EIRP (mW)	Power Density at 20cm (mW/cm ²)	Limit (mW/cm ²)	Power Density / Limit
WLAN2.4GHz Band	3.50	18.50	22.0	0.16	158.49	0.032	1.000	0.032
WLAN5GHz Band	5.00	18.50	23.5	0.22	223.87	0.045	1.000	0.045
Bluetooth	3.50	12.50	16.0	0.04	39.81	0.008	1.000	0.008

4.2. Collocated Power Density Calculation

WLAN Power Density / Limit	Bluetooth Power Density / Limit	Σ (Power Density / Limit) of WLAN+Bluetooth
0.045	0.008	0.053

Note:

1. Σ (Power Density / Limit): This is a summation of [(power density for each transmitter/antenna included in the simultaneous transmission)/ (corresponding MPE limit)], for WLAN + Bluetooth.
2. Considering the WLAN module collocation with the Bluetooth 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.