



# RF EXPOSURE EVALUATION REPORT

**FCC ID** : ZAT-CC2652RSIP  
**Equipment** : CC2652RSIPMOT  
**Brand Name** : Texas Instruments Incorporated  
**Model Name** : CC2652RSIPMOT  
**Marketing Name** : CC2652RSIP SimpleLink™ Multiprotocol 2.4-GHz Wireless System-in-Package  
**Applicant** : Texas Instruments  
12500 TI BLVD., Dallas, Texas, 75243  
**Manufacturer** : Texas Instruments  
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 Part2.1091 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.

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>6</b>
4.1. Standalone Power Density Calculation .....	6



### History of this test report

Report No.	Version	Description	Issued Date
FA1N0955	Rev. 01	Initial issue of report	Mar. 07, 2022



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

Product Feature & Specification	
EUT Type	CC2652RSIPMOT
Brand Name	Texas Instruments Incorporated
Model Name	CC2652RSIPMOT
Marketing Name	CC2652RSIP SimpleLink™ Multiprotocol 2.4-GHz Wireless System-in-Package
FCC ID	ZAT-CC2652RSIP
Wireless Technology and Frequency Range	Bluetooth: 2400 MHz ~ 2483.5 MHz Zigbee: 2405 MHz ~ 2480 MHz
Mode	Bluetooth LE Zigbee: BPSK
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.

**Reviewed by: Jason Wang**

**Report Producer: Daisy Peng**

Antenna Information				
	Brand	Antenna Type	Model	2.4 GHz Gain
1	Texas Instruments	Inverted F - PCB	Custom Antenna	3.3dBi
2			Custom Antenna	5.3dBi
3	Ethertronics	Dipole	1000423	-0.6dBi
4	LSR	Rubber Whip / Dipole	001-0012	2dBi
5			080-0013	2dBi
6			080-0014	2dBi
7		PIFA	001-0016	2.5dBi
8	001-0021		2.5dBi	
9	Laird	PCB	CAF94504	2dBi
10			CAF9405	2dBi
11	Pulse	Ceramic Chip	W3006	3.2dBi
12	ACX	Multilayer Chip	AT3216-BR2R7HAA	0.5dBi
13			AT312-T2R4PAA	1.5dBi
14	TDK	Multilayer Ceramic Chip Antenna	ANT016008LCD2442MA1	1.6dBi
15			ANT016008LCD2442MA2	2.5dBi
16	Mitsubishi Material	Chip Antenna	AM03DP-ST01	1.6dBi
17		Antenna Unit	UB18CP-100ST01	-1.0dBi
18	Taiyo Yuden	Chip Antenna / Helical Monopole	AF216M245001	1.5dBi
19		Chip Antenna / Monopole Type	AH212M245001	1.3dBi

20			AH316M245001	1.9dBi
21	Antenna Technology	Dipole	AA2402SPU	2.0dBi
22			AA2402RSPU	2.0dBi
23			AA2402A-UFLLP	2.0dBi
24			AA2402AU-UFLLP	2.0dBi
25			Staf	Mono-pole
26	1019-017	2.14dBi		
27	1019-018	2.14dBi		
28	1019-019	2.14dBi		
29	Map Electronics	Rubber Whip	MEIWX-2411SAXX-2400	2.0dBi
30			MEIWX-2411RSXX-2400	2.0dBi
31			MEIWX-1511RSXX-2400	5.0dBi
32			MEIWX-151XSAXX-2400	5.0dBi
33			MEIWX-1451RSXX-2400	4.0dBi
34			MEIWX-282XSAXX-2400	2.0dBi
35			MEIWX-282XRSXX-2400	2.0dBi
36			MEIWF-HP01RS2X-2400	2.0dBi
37	Yageo	Chip	ANT3216A063R2400A	1.69dBi
38	Mag Layers	Chip	LTA-3216-2G4S3-A1	1dBi
39	Scientific		LTA-3216-2G4S3-A3	2dBi
40	Advantech	Rubber Whip / Dipole	AN2450-5706RS	2.38dBi
41			AN2450-5010BRS	5.03dBi
42			AN2450-92K01BRS	5.03dBi
43			R-AN2400-5701RS	3.3dBi

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

Mode	Maximum Average Power (dBm)
Bluetooth LE	5
ZigBee	5



### 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	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> )
Zigbee	5.30	5.00	10.30	0.01	10.72	0.002	1.000
Bluetooth	5.30	5.00	10.30	0.01	10.72	0.002	1.000

### Conclusion:

According to 47 CFR §1.1307, the RF exposure analysis concludes that the RF Exposure is FCC compliant.