

RF EXPOSURE EVALUATION REPORT

FCC ID : ZAT-1312PSIP-3
Equipment : CC1312PSIP
Brand Name : Texas Instruments
Model Name : CC1312PSIPMOT3
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 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. Laboratory, the test report shall not be reproduced except in full



Approved by: Cona Huang / Deputy Manager



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History of this test report

Report No.	Version	Description	Issued Date
FA341305-02	Rev. 01	Initial issue of report	Feb. 7, 2024
FA341305-02	Rev. 02	Updtae FCC ID	May 06, 2024

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	CC1312PSIP
Brand Name	Texas Instruments
Model Name	CC1312PSIPMOT3
FCC ID	ZAT-1312PSIP-3
Wireless Technology and Frequency Range	MIOTY: 902 MHz ~ 928 MHz WB-DSSS: 902 MHz ~ 928 MHz TI 15.4: 902 MHz ~ 928 MHz Wi-SUN: 902 MHz ~ 928 MHz PowerG PHY: 902 MHz ~ 928 MHz
Mode	MIOTY:GMSK, 2380bit/s (yields a 20dB bandwidth of ~3.1kHz) WB-DSSS: 30 kbps (480 ksps), 195 kHz Deviation, 2-GFSK, 784 kHz RX Bandwidth, FEC = 1.2, DSSS = 1:8 TI 15.4: 50 kbps, 25 kHz Deviation, 2-GFSK, 98 kHz RX Bandwidth Wi-SUN: 100 kbps, 25 kHz Deviation, 2- GFSK, 137kHz RX Bandwidth PowerG PHY: 50 kbps, GFSK, 25 kHz Deviation

Reviewed by: Jason Wang

Report Producer: Daisy Peng

Antenna Information				
	Brand	Antenna Type	Model	915MHz Gain
1	TI	Integrated PCB antenna	LP-EM-CC1312PSIP antenna	+2.69 dBi
2	Kaadas	Flexi PCB antenna	K1	-5.82 dBi
3	Leederson	Integrated PCB antenna	L1	-4.51 dBi
4	Leederson	Integrated PCB antenna	L2	-1.83 dBi
5	Leederson	Stanced antenna	L3	-9.48 dBi
6	Leederson	Stanced antenna	L4	+0.37 dBi
7	Leederson	Integrated PCB antenna	L5	-1.74 dBi
8	Pulse	External whip antenna	W5017	+0.90 dBi
9	Johanson Technology	Chip antenna	0900AT43A0070	-0.50 dBi
10	Johanson Technology	Chip antenna	0915AT43A0026	+1.0 dBi
11	Pulse	Wire antenna	W3113	+0.80 dBi

2. Maximum RF average output power among production units

Mode	Maximum Average power(dBm)
MIOTY	19.5
WB-DSSS	15
TI 15.4	19
Wi-SUN	19
PowerG PHY	20
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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)
MIOTY	2.69	19.50	22.2	0.17	165.58	0.033	0.601
WB-DSSS	2.69	15.00	17.7	0.06	58.75	0.012	0.601
TI 15.4	2.69	19.00	21.7	0.15	147.57	0.029	0.601
Wi-SUN	2.69	19.00	21.7	0.15	147.57	0.029	0.601
PowerG PHY	2.69	20.00	22.7	0.19	185.78	0.037	0.601

Conclusion:

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