

RF EXPOSURE EVALUATION REPORT

FCC ID : UZ7TM2000
Equipment : Trailer Monitoring Unit
Brand Name : ZEBRA
Model Name : TM2000
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Manufacturer : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
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



SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory
No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)



Table of Contents

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



History of this test report

Report No.	Version	Description	Issued Date
FA850206-04	Rev. 01	Initial issue of report	Apr. 22, 2022

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

Product Feature & Specification	
EUT Type	Trailer Monitoring Unit
Brand Name	ZEBRA
Model Name	TM2000
FCC ID	UZ7TM2000
Wireless Technology and Frequency Range	WLAN 2.4GHz Band: 2400 MHz ~ 2483.5 MHz WLAN 5.2GHz Band: 5150 MHz ~ 5250 MHz WLAN 5.3GHz Band: 5250 MHz ~ 5350 MHz WLAN 5.5GHz Band: 5470 MHz ~ 5725 MHz WLAN 5.8GHz Band: 5725 MHz ~ 5850 MHz
Mode	WLAN: 802.11a/b/g/n HT20
HW Version	REV B
SW Version	2.0.33
FW Version	2.0.33
MFD	16DEC21
EUT Stage	Engineering sample

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

2. Maximum RF average output power among production units

Band / Channel / Frequency (MHz)			IEEE 802.11 Average Power (dBm)		
			11b	11g	HT20
2.4GHz WLAN (DTS)	Ch 1	2412	19.0	15.5	15.0
	Ch 6	2437	19.0	16.5	16.5
	Ch 11	2462	19.0	14.0	13.5

Band / Channel / Frequency (MHz)			IEEE 802.11 Average Power (dBm)	
			11a	HT20
5.2GHz WLAN (U-NII-1)	Ch 36	5180	13.5	13.5
	Ch 40	5200	13.5	13.5
	Ch 44	5220	13.5	13.5
	Ch 48	5240	13.5	13.5
5.3GHz WLAN (U-NII-2A)	Ch 52	5260	13.5	13.5
	Ch 56	5280	13.5	13.5
	Ch 60	5300	13.5	13.5
	Ch 64	5320	13.5	13.5
5.5GHz WLAN (U-NII-2C)	Ch 100	5500	13.5	13.5
	Ch 116	5580	13.5	13.5
	Ch 124	5620	13.5	13.5
	Ch 132	5660	13.5	13.5
	Ch 140	5700	13.5	13.5
5.8GHz WLAN (U-NII-3)	Ch 149	5745	13.5	13.5
	Ch 157	5785	13.5	13.5
	Ch 165	5825	13.5	13.5



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 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)
WLAN2.4GHz Band	1.54	19.00	20.54	0.11	113.24	0.023	1.000
WLAN5GHz Band	3.07	13.50	16.57	0.05	45.39	0.009	1.000

Conclusion:

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