

RF EXPOSURE EVALUATION REPORT

FCC ID : UZ7FXR9000
Equipment : Industrial Fixed RFID Reader
Brand Name : ZEBRA
Model Name : FXR9000
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.

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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
FA381616-01	Rev. 01	Initial issue of report	Nov. 01, 2023

1. Description of Equipment Under Test (EUT)

Product Feature & Specification	
EUT Type	Industrial Fixed RFID Reader
Brand Name	ZEBRA
Model Name	FXR9000
FCC ID	UZ7FXR9000
Wireless Technology and Frequency Range	RFID : 902.75 MHz ~ 927.25 MHz
Mode	RFID: ASK
HW Version	EV2
SW Version	0.4.11
MFD	01AUG23
EUT Stage	Identical Prototype

Reviewed by: Jason Wang

Report Producer: Daisy Peng

RFID Antenna information				
RFID (Internal Antenna)	Ant. Type	Patch		
	Model No.	L000213-01	Brand Name	TE
	Peak Gain (dBi)			
	865-868MHz	6.5		
	902-928MHz	7.2		
RFID (External Antenna)	Ant. Type	Patch		
	Model No.	AN650	Brand Name	ZEBRA
	Peak Gain (dBi)			
	865-868MHz	6		
	902-928MHz	6		
RFID (External Antenna)	Ant. Type	Patch		
	Model No.	AN480	Brand Name	ZEBRA
	Peak Gain (dBi)			
	865-868MHz	6		
	902-928MHz	6		
RFID (External Antenna)	Ant. Type	Patch		
	Model No.	SR5502	Brand Name	ZEBRA
	Peak Gain (dBi)			
	865-868MHz	2.0		
	902-928MHz	6.7		

Support Unit for Test				
Cable, 3-way USB Splitter	Brand Name	ZEBRA	Model Name	ADP-USB0010-M12
Cable, USB-C Host, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBCHST015-M12
Cable, USB-C Host, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBCHST035-M12
Cable, USB-C Client, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBCCLT015-M12
Cable, USB-C Client, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBCCLT035-M12
Cable, USB-A Client, 5ft.	Brand Name	ZEBRA	Model Name	CBL-USBACLT015-M12
Cable, USB-A Client, 15ft.	Brand Name	ZEBRA	Model Name	CBL-USBACLT035-M12
Cable, GPIO	Brand Name	ZEBRA	Model Name	CBL-GP0050-M12M12A
Cable, 12V (Cigarette Lighter) Power Adapter, 3.5 meter	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M12CL
Cable, DC Power Cord (Flying Leads), 3.5m	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M1200
Cable, DC Power Cord (Flying Leads), 10m	Brand Name	ZEBRA	Model Name	CBL-PWRD100-M1200
Cable, Power Supply Output Adapter, 3.5m	Brand Name	ZEBRA	Model Name	CBL-PWRD035-M12M12
Cable, Power Supply Output Adapter, 10m	Brand Name	ZEBRA	Model Name	CBL-PWRD100-M12M12
Cable, DC-DC Power Supply Input	Brand Name	ZEBRA	Model Name	CBL-PWRD150-M12M00
Cable, AC-DC Power Supply Input (Flying Leads)	Brand Name	ZEBRA	Model Name	CBL-PWRA150-M1200
Cable, AC-DC Power Supply Input (IEC plug)	Brand Name	ZEBRA	Model Name	CBL-PWRA035-M12IEC
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 68", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4000680R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 180", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4001800R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 240", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4002400R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 360", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-3B4003600R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 68", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4000680R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 180", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4001800R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 240", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4002400R
CBL: RF, N STR PLUG TO RP-TNC STR PLUG ON LMR-240, 360", IP67 Sealed	Brand Name	ZEBRA	Model Name	CBLRD-1B4003600R
CHIMERA ETHERNET CABLE 5M	Brand Name	ZEBRA	Model Name	CBL-ENT00500-M1200
CHIMERA ETHERNET CABLE 15M	Brand Name	ZEBRA	Model Name	CBL-ENT01500-M1200
Outdoor AC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V90W0WW (Spec PD-007875-01)
Forklift DC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V90W1WW (Spec PD-007876-01)
Indoor AC-DC PSU	Brand Name	ZEBRA	Model Name	PWR-BGA24V78W3WW (Spec PD-007877-01)
PoE adaptor	Brand Name	ZEBRA	Model Name	PD-9001GR/AT/AC
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN480
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN650
External RFID Antenna	Brand Name	ZEBRA	Model Name	SR5502
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN510
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN520
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN610
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN620
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN720
External RFID Antenna	Brand Name	ZEBRA	Model Name	AN440
External RFID Antenna	Brand Name	ZEBRA	Model Name	SP5504
AN650 Antenna cable(5ft/1524mm)	Brand Name	ZEBRA	Model Name	CBLRD-1C4000600R
AN650 Antenna cable(20ft/6096mm)	Brand Name	ZEBRA	Model Name	CBLRD-1C4002400R
AN650 Antenna cable(15ft/4572mm)	Brand Name	ZEBRA	Model Name	CBLRD-1C4001800R
AN650 Antenna cable(30ft/9144mm)	Brand Name	ZEBRA	Model Name	CBLRD-1C4003600R
AN650 Antenna cable(10ft/3048mm)	Brand Name	ZEBRA	Model Name	CBLRD-1C4001200R

2. Maximum RF average output power among production units

Frequency(MHz)	Data Rate
	RFID
902.75 MHz	27.50
914.75 MHz	27.50
927.25 MHz	27.50

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. Collocated 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)
RFID	7.20	27.50	34.70	2.95	2951.21	0.587	0.601

Conclusion:

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