

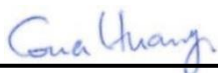


WPT Evaluation Report

FCC ID : UZ7CR6080SA
Equipment : 4D Cup
Brand Name : Zebra
Model Name : CR6080-SA
Applicant : Zebra Technologies Corporation
1 Zebra Plaza, Holtsville, NY 11742
Standard : FCC CFR 47 part 1, 1.1307(b) and 1.1310
KDB 680106 D01v03

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Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FA050617-02	Rev. 01	Initial Report	Sep. 06, 2020

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

Product Feature & Specification	
EUT Type	4D Cup
Brand Name	Zebra
Model Name	CR6080-SA
FCC ID	UZ7CR6080SA
Frequency Range	WPC/WPT: 111 KHz ~ 205 KHz
HW Version	21
SW Version	21
MFD	29JUL20
DUT Stage	Engineering sample
Test Date	Sep.03, 2020

2. RF Exposure Limit Introduction

§ 1.1310 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 § 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of § 2.1093 of this chapter.

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 Exposure				
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
300-1,500			f/300	6
1,500-100,000			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
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

(1) Occupational/controlled exposure limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when a person is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure. The phrase fully aware in the context of applying these exposure limits means that an exposed person has received written and/or verbal information fully explaining the potential for RF exposure resulting from his or her employment. With the exception of transient persons, this phrase also means that an exposed person has received appropriate training regarding work practices relating to controlling or mitigating his or her exposure. Such training is not required for transient persons, but they must receive written and/or verbal information and notification (for example, using signs) concerning their exposure potential and appropriate means available to mitigate their exposure. The phrase exercise control means that an exposed person is allowed to and knows how to reduce or avoid exposure by administrative or engineering controls and work practices, such as use of personal protective equipment or time averaging of exposure.

(2) General population/uncontrolled exposure limits apply in situations in which the general public may be exposed, or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

3. Measurement Equipment

General Note:

1. The test equipment is a 3-axis isotropic probe and the manufacturer is confirm the anisotropy is less than 1dB.
2. For the test probe antenna length is less than 11.5cm, list as below spec.

Instrument	Manufacturer	Model No.	Serial No.	Freq Rang	Last Cal.	Due Date
Electric and Magnetic field Probe-Analyzey	Narda S.T.S / PMM	EHP 200AC	170WX80309	3KHz~30MHz	Jul. 17, 2020	Jul. 16, 2021

Technical specifications of the EHP-200AC Electric and Magnetic Field Analyzer				
	Electric Field	Magnetic Field Mode A	Magnetic Field Mode B	AUX Input
Frequency range	(3) 3 kHz + 30 MHz	3 kHz + 300 kHz	30 kHz + 10 (30) MHz	(3) 9 kHz + 30 MHz
Measurement range				
@10kHz RBW	0,1 + 1000 V/m	0,1 A/m + 1 kA/m	30 mA/m + 300 A/m	-80 + 0 dBm
with preamplifier ON	0,02 + 200 V/m	20 mA/m + 200 A/m	6 mA/m + 60 A/m	-94 + -14 dBm
Dynamic range	> 80 dB			
Measurement range	> 94 dB			
Resolution	0.01 V/m	1 mA/m	0.1 mA/m	0.01 dB
Sensitivity @10kHz RBW (*)	0.1 V/m	0.1 A/m	30 mA/m	-80 dBm
with preamplifier ON	0.02 V/m	20 mA/m	6 mA/m	-94 dBm
Flatness	0,5 dB 100 kHz – 27 MHz @ 20 V/m	0,8 dB 5 kHz – 300 kHz @ 1 A/m	0,8 dB 30 kHz – 10 MHz @ 166 mA/m	0,4 dB 9 kHz + 30 MHz @ -20dBm
Anisotropy @ 300 kHz	0.8 dB			---
Linearity @ 300 kHz	0,5 dB from FS to -60 dBFS			
SPAN	0 to FULL SPAN			
RBW	1 kHz – 3 kHz – 10 kHz – 30 kHz – 100 kHz – 300 kHz			
Rejection to E fields	---	> 20 dB		---
Rejection to H fields	> 20 dB	---		---
Calibration	internal E ² PROM			
Temperature error	0,02 dB/°C			
Dimensions	92 x 92 x 109 mm			
Weight	550 g			
Environmental protection	IP42			
Preamplifier	selectable ON/OFF, 14dB			
Units	V/m, A/m, uT, mW/cm ² , W/m ²			
Internal battery	3,7 V – 5,55 Ah Li-Ion, rechargeable			
Operation	> 12 hours			
Recharging time	< 8 hours			
External supply	10 + 15 VDC, I = approx. 560 mA			
Optical fiber connection	up to 40 m (USB-OC) up to 80 m (8053-OC)			
Firmware updating	through the optical link			
Self test	automatic at power on			
Operating temperature	-10 to +50°C			
Storage temperature	-20 to +70°C			



4. Test Mode

This device has been tested in the following charging conditions as below:

Test Mode	Test Setup Configuration	Charging Current Condition
TM1	Test w/ Client Device installed	< 1% Battery status
TM2	Test w/ Client Device installed	50% Battery status
TM3	Test w/ Client Device installed	Near 100% Battery status

5. RF Exposure Evaluation

General Note:

1. The device power transfer frequency is less than 1MHz
2. The output power from the coil is less than 15W
3. The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
4. Client device is placed directly in contact with the transmitter.
5. The device is as a desktop WPT as mobile exposure condition, the test guidance is according to KDB 680106
6. The equipment under test was placed on a wooden desk inside of shield room. The isotropic field probe was used to measure the field strength for 6 EUT surfaces, and during measurement a separation of 10cm is maintained between EUT surface and the center of the field probe and the test result is less than 50% limit. The detail setup photo please refer to Appendix A.
7. Per KDB 680106 D01v03, RF exposure evaluation should be conducted assuming a user separation distance of 10 cm. H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 10 cm measured from the center. of the probe(s) to the edge of the device. Emissions between 50 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 1.63 A/m and aggregate leakage fields at 10 cm surrounding the device from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Position (Distance 10cm)	H-Field Measurement (A/m)						50% of limit
	A	B	C	D	E	F	
TM1	0.3707	0.4724	0.3624	0.3912	0.4020	0.3664	0.815
TM2	0.3701	0.4573	0.3602	0.3911	0.3981	0.3651	
TM3	0.3689	0.4325	0.3611	0.3893	0.3995	0.3623	

Conclusion:

The field strength limit refers to Part 1.1310 and the test result of exposure evaluation is compliant with 50% of the MPE limit. (H-field: 0.815A/m).