Maximum Permissible Exposure (Nerve Stimulation)

FCC ID	:	**UZ7HFDOCK**
Equipment	:	**EMA DOCK NFC READER BOARD**
Brand Name	:	**ZEBRA**
Model Name	:	**HFDOCK**
Applicant/ Manufacturer	:	**Zebra Technologies Corporation** **1 Zebra Plaza, Holtsville, NY 11742**
Standard	:	**47 CFR Part 2.1091**

The product was received on Oct. 31, 2019, and testing was started from Dec. 06, 2019 and completed on Dec. 11, 2019. We, SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory, would like to declare that the tested sample has been evaluated in accordance with the procedures given in KDB680106 D01 RF Exposure Wireless Charging Apps v03 and shown compliance with the applicable technical standards.

The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any agency of United States government.

The test 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: Allen Lin

SPORTON INTERNATIONAL INC. EMC & Wireless Communications Laboratory

No. 52, Huaya 1st Rd., Guishan Dist., Taoyuan City, Taiwan (R.O.C.)

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History of this test report

Report No.	Version	Description	Issued Date
FA9O3018	01	Initial issue of report	Dec. 16, 2019

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
1.5	-	Maximum Permissible Exposure	PASS	-

Declaration of Conformity:
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits or requirements declared by manufacturers.
Comments and Explanations:
None.

Reviewed by: Sam Tsai

Report Producer: Kate Lo

1 Human Exposure Assessment

1.1 Maximum Permissible Exposure

1.1.1 Limit of Maximum Permissible Exposure

Limits for Occupational / Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
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
Limits for General Population / Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/ cm²)**	**Averaging Time |E|²,|H|² or S (minutes)**
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
Note 1: f = frequency in MHz ; *Plane-wave equivalent power density Note 2: For the applicable limit, see FCC 1.1310				

1.2 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR Part 2.1091

1.3 Testing Location Information

Testing Location					
☒	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.			
		TEL : 886-3-327-3456 FAX : 886-3-327-0973			
Test site Designation No. TW1190 with FCC.					
Test Condition	**Test Site No.**	**Test Engineer**	**Test Environment**	**Test Date**	
RF Conducted	TH06-HY	Raven	22.5~23.7°C / 58~64%	06/Dec/2019	

1.4 Support Equipment

Support Equipment				
No.	**Equipment**	**Brand Name**	**Model Name**	**FCC ID**
1	DC Power Source	GW	APS-9102	-
2	EMA DOCKING STATION CONTROLLER BOARD	HannStar	K MV-4 E89382 94V-0	-
3	EMA_DM_NFC_READER_CABLE	ZEBRA	1414-0CTY000	-

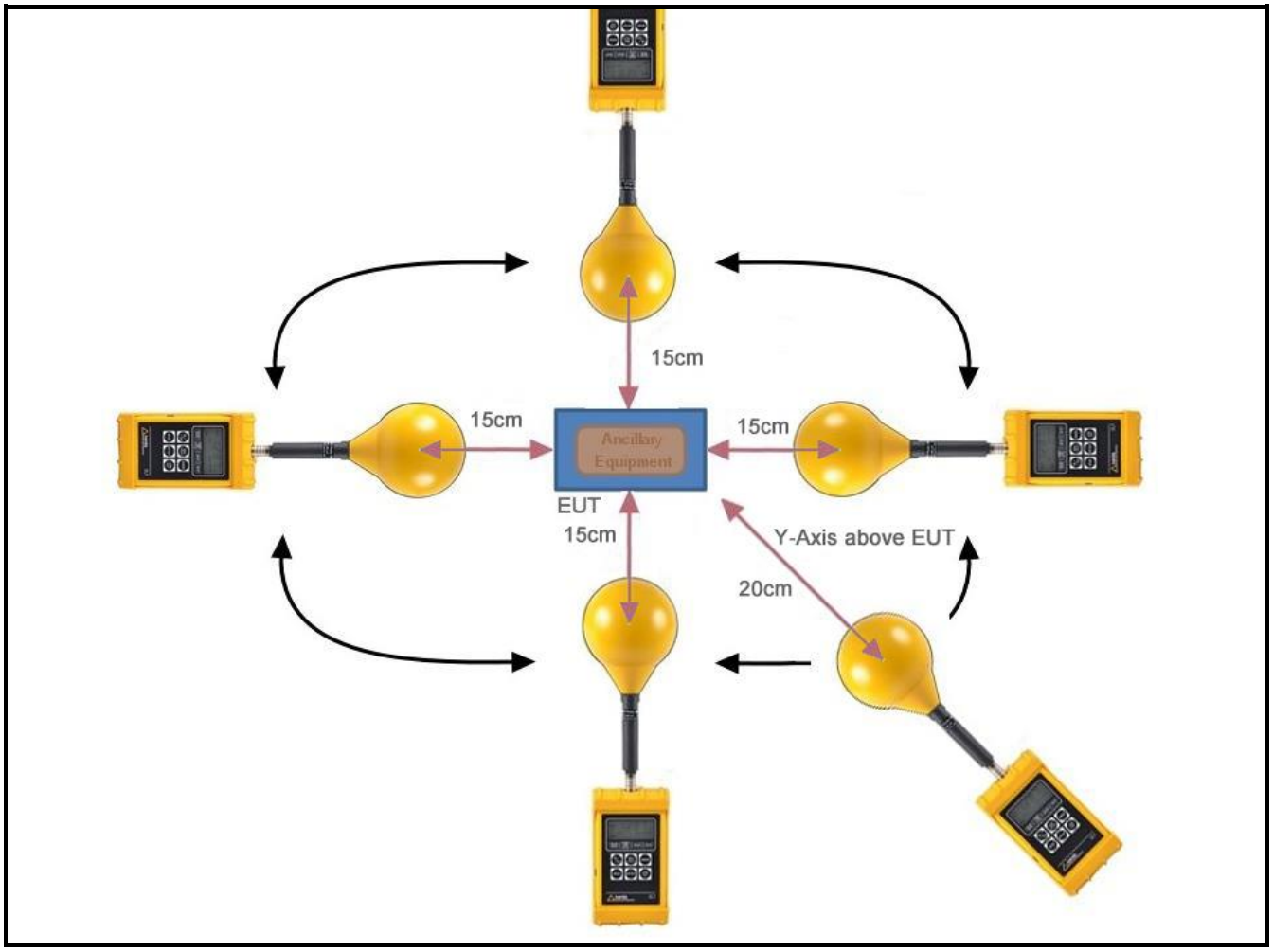
1.5 The Worst Condition

Ancillary Equipment	Condition	Worst Condition
EMA DOCKING STATION CONTROLLER BOARD	Low power	Low power<25%

1.5.1 Test Method

Test Method	
☒	Performed aggregate both leakage E-field and H-field at surrounding the device from all simultaneous transmitting coils.
☒	During testing, the EUT was placed on a non-conductive table top and the ancillary equipment (e.g., mobile phone) was placed on the EUT for charging. Maximum E-field and H-field measurements were tested 10cm from each side of the EUT. Along the side of the EUT to center of E-field probe and H-field probe were positioned at the location to search maximum field strength.
☒	E-field transfer to H-field
-	E-field = Z_0 × H-field H-field = E-field ÷ Z_0 Where Z_0 = Free Space Impedance = 377Ω

1.5.2 Test Setup



Note1 : find worst position for each axis.
Note2 : This shall be measured as the distance from the edge of the device to the center of the measurement probe.

1.5.3 Result of Maximum Permissible Exposure

Maximum Permissible Exposure				
Condition	**Separation**	**Probe from EUT Side**	**E-field (V/m)**	**H-field (A/m)**
Low power<25%	15cm	Left	0.64	0.002
Low power<25%	15cm	Right	0.5	0.001
Low power<25%	15cm	Top	0.7	0.002
Low power<25%	15cm	Bottom	0.44	0.001
Low power<25%	20cm	Y-axis above EUT	0.58	0.002
Limit			60.767	0.16
Margin Limit (%)			1.15%	1.16%

2 Test Equipment and Calibration Data

Instrument for Conducted Test

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Calibration Due Date
Spectrum Analyzer	R&S	FSV 40	101013	10Hz~40GHz	13/Mar/2019	12/Mar/2020
Loop Antenna	TESEQ	HLA 6120	31244	9kHz~30MHz	15/Mar/2019	14/Mar/2020
Temp. and Humidity Chamber	Giant Force	GTH-225-20-SP-SD	MAA1112-007	-20~100℃	21/May/2019	20/May/2020