

RF Exposure Report

Report No.: SA180716D06

FCC ID: RWO-RC30025903

Test Model: RC30-025903

Received Date: Jul. 16, 2018

Test Date: Sep. 4 ~ 7, 2018

Issued Date: Sep. 18, 2018

Applicant: Razer Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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**FCC Registration /
Designation Number:** 198487 / TW2021



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Release Control Record

Issue No.	Description	Date Issued
SA180716D06	Original release.	Sep. 18, 2018

1 Certificate of Conformity

Product: Wireless Charger

Brand: Razer

Test Model: RC30-025903

Sample Status: Engineering sample

Applicant: Razer Inc.

Test Date: Sep. 4 ~ 7, 2018

Standards: FCC Part 1 (Section 1.1307(b), 1.1310)

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by :



Date: Sep. 18, 2018

Jessica Cheng / Senior Specialist

Approved by :



Date: Sep. 18, 2018

Rex Lai / Associate Technical Manager

2 General Information

2.1 General Description of EUT

Product	Wireless Charger
Brand	Razer
Test Model	RC30-025903
Status of EUT	Engineering sample
Nominal Voltage	5Vdc
Modulation Type	Load Modulation
Operating Frequency	120kHz ~ 148kHz
Tested Frequency	122kHz, 146.5kHz
Antenna Type	Loop antenna
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A
Maximum power output from the charging coil	Less than 11W

Note:

1. Device include three Loop antenns can only transmitter at the same frequency and the same time charging for one client device. This design for increase coverage area, definition by Wireless Power Consortium of Qi specification.

2. The EUT uses following adapter.

Brand	Razer
Model	RC30-021501
Input Power	100-240Vac 50-60Hz 0.8A
Output Power	5Vdc 3A, 9Vdc 2.67A, 12Vdc 2A
Power Line	Shielded USB cable (1.0m)

3. The EUT was pre-tested with the following modes:

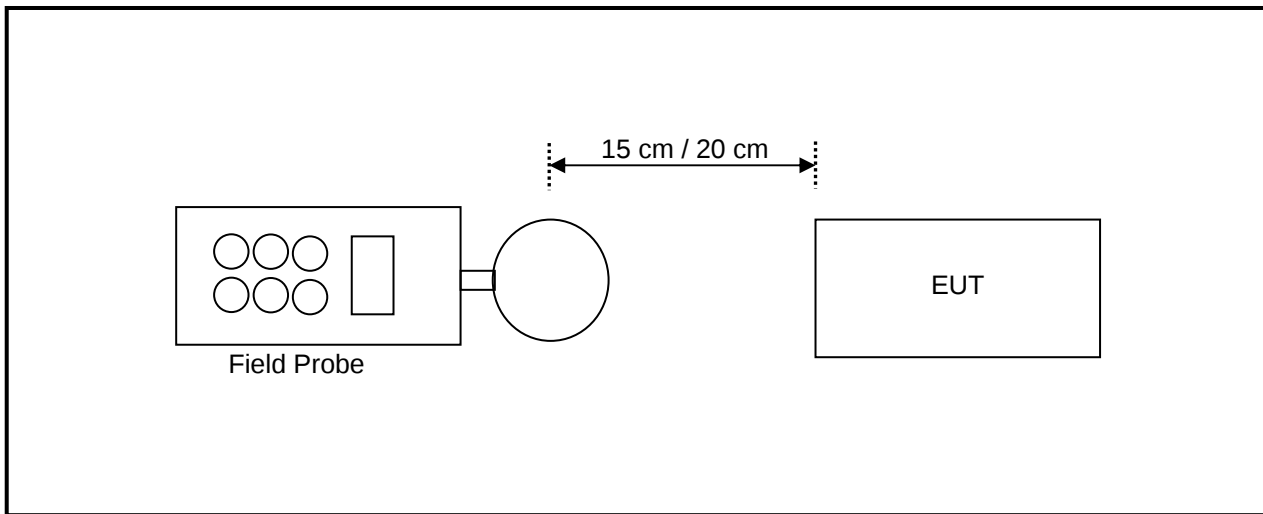
- ✧ EUT Operating + power from Notebook
- ✧ EUT Operating + power from Adapter

The worst emission level was found when the EUT tested under **EUT Operating + power from Adapter.**

4. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3 RF Exposure

3.1 Test Setup



Note: Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm or 20 cm measured from the center of the probe(s) to the edge of the device.

3.2 Test Instruments

Description	Brand	Model No.	Frequency Range	Calibrated Date	Calibrated Until
Broadband Field Meter	NARDA	NBM-550	-	Mar. 28, 2018	Mar. 27, 2020
Magnetic Field Meter	NARDA	ELT-400	1 – 400kHz	Apr. 12, 2018	Apr. 11, 2020
Magnetic Probe	NARDA	HF-3061	300kHz – 30MHz	Apr. 16, 2018	Apr. 15, 2020
Magnetic Probe	NARDA	HF-0191	27 – 1000MHz	Apr. 17, 2018	Apr. 16, 2020
Broadband Field Meter	NARDA	NBM-550	-	Mar. 28, 2018	Mar. 27, 2020
Electric Field Meter	COMBINOVA	EFM 200	5Hz – 400kHz	Dec. 6, 2017	Dec. 5, 2019
E-Field Probe	NARDA	EF-0391	100kHz – 3GHz	Mar. 28, 2018	Mar. 27, 2020
E-Field Probe	NARDA	EF-6091	100MHz – 60GHz	Mar. 29, 2018	Mar. 28, 2020

NOTE: 1. The calibration interval of the above test instruments is 12/24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Chia Pau RF Chamber

3.3 Limits For Maximum Permissible Exposure (MPE)

§ 1.1310 The criteria listed in table 1 shall be used to evaluate the environmental impact of human exposure to radiofrequency(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.

TABLE 1—LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

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

f = frequency in MHz

* = Plane-wave equivalent power density

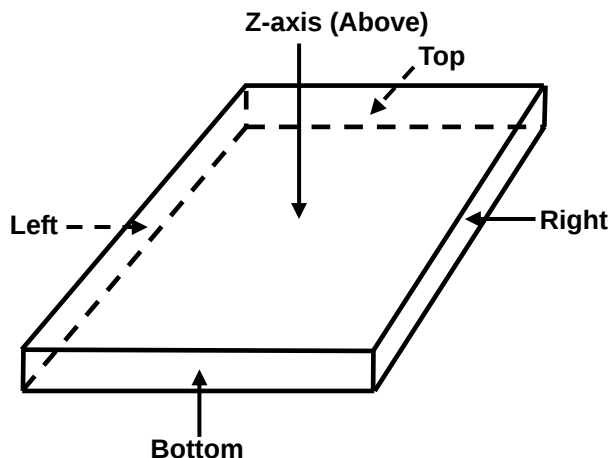
NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

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The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

3.4 Test Point Description



4 Calculation Result Of Maximum Conducted Power

122kHz Charging Mode with Load Charge 10%

E-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max E-field (V/m)	1.5100	1.5000	1.6800	0.8900	2.7400
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-612.4900	-612.5000	-612.3200	-613.1100	-611.2600
50 % Limit (V/m)	307	307	307	307	307
50 % Margin (V/m)	-305.4900	-305.5000	-305.3200	-306.1100	-304.2600

H-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max H-field (uT)	0.0850	0.1010	0.0860	0.0870	0.1320
Max H-field (A/m)	0.0680	0.0808	0.0688	0.0696	0.1056
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5620	-1.5492	-1.5612	-1.5604	-1.5244
50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815
50 % Margin (A/m)	-0.7470	-0.7342	-0.7462	-0.7454	-0.7094

Measurements were made from all sides and the top of the primary/client pair, with the 15 cm or 20 cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

122kHz Charging Mode with Load Charge 50%

E-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max E-field (V/m)	1.4600	1.4200	1.5200	1.6200	2.6100
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-612.5400	-612.5800	-612.4800	-612.3800	-611.3900
50 % Limit (V/m)	307	307	307	307	307
50 % Margin (V/m)	-305.5400	-305.5800	-305.4800	-305.3800	-304.3900

H-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max H-field (uT)	0.0970	0.1170	0.1030	0.0910	0.1320
Max H-field (A/m)	0.0776	0.0936	0.0824	0.0728	0.1056
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5524	-1.5364	-1.5476	-1.5572	-1.5244
50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815
50 % Margin (A/m)	-0.7374	-0.7214	-0.7326	-0.7422	-0.7094

Measurements were made from all sides and the top of the primary/client pair, with the 15 cm or 20 cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

122kHz Charging Mode with Load Charge 90%

E-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max E-field (V/m)	1.2200	1.1700	1.4500	1.3800	2.4800
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-612.7800	-612.8300	-612.5500	-612.6200	-611.5200
50 % Limit (V/m)	307	307	307	307	307
50 % Margin (V/m)	-305.7800	-305.8300	-305.5500	-305.6200	-304.5200

H-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max H-field (uT)	0.1020	0.1150	0.0960	0.0960	0.1910
Max H-field (A/m)	0.0816	0.0920	0.0768	0.0768	0.1528
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5484	-1.5380	-1.5532	-1.5532	-1.4772
50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815
50 % Margin (A/m)	-0.7334	-0.7230	-0.7382	-0.7382	-0.6622

Measurements were made from all sides and the top of the primary/client pair, with the 15 cm or 20 cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

146.5kHz Standby Mode

E-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max E-field (V/m)	0.2900	0.2400	0.2700	0.2900	0.3900
Limit (V/m)	614	614	614	614	614
Margin (V/m)	-613.7100	-613.7600	-613.7300	-613.7100	-613.6100
50 % Limit (V/m)	307	307	307	307	307
50 % Margin (V/m)	-306.7100	-306.7600	-306.7300	-306.7100	-306.6100

H-Field Measurement					
Distance	15cm				20cm
EUT Side	Left	Right	Top	Bottom	Z-axis
Max H-field (uT)	0.1010	0.0980	0.0890	0.0850	0.2440
Max H-field (A/m)	0.0808	0.0784	0.0712	0.0680	0.1952
Limit (A/m)	1.63	1.63	1.63	1.63	1.63
Margin (A/m)	-1.5492	-1.5516	-1.5588	-1.5620	-1.4348
50 % Limit (A/m)	0.815	0.815	0.815	0.815	0.815
50 % Margin (A/m)	-0.7342	-0.7366	-0.7438	-0.7470	-0.6198

Measurements were made from all sides and the top of the primary/client pair, with the 15 cm or 20 cm measured from the center of the probe(s) to the edge of the device. The highest emission level was recorded.

5 Photographs of the Test Configuration

Please refer to the attached file (Test Setup Photo).

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