

RF EXPOSURE REPORT

OF

Applicant: INVENTEC CORPORATION
66 Hou-Kang st., Shih-Lin District, Taipei, Taiwan, R.O.C

Product Name: All-in-One PC

Brand Name: HP

Model No.: TPC-I040-27

Model Difference: N/A

Report Number: E2/2019/C0033

FCC ID DGI-TPC-I040-2701

FCC Rule Part Part 2.1091

Issue Date: Dec. 20, 2019

Date of Test: Dec. 06, 2019 ~ Dec. 18, 2019

Date of EUT Received: Dec. 06, 2019

We hereby certify that:

The above equipment was tested by SGS Taiwan Ltd. The test data, data evaluation in this report is in compliance with FCC Rules Part 2.

The test results of this report relate only to the tested sample identified in this report.

Approved By:

John Teh

John Yeh / Asst. Manager

Testing Laboratory

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Revision History

Revision	Description	Issue Date	Remark
Rev.00	Original.	Dec. 20, 2019	Revised By: Karen Huang

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1 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

1.1 Standard Applicable

According to KDB 680106 D01 RF Exposure Wireless Charging App v03

RF exposure potential to users and bystanders is expected to vary according to factors inherent to the design of individual systems, which generally requires different evaluation considerations to show compliance.

When exposure concerns arise; for example, due to evolving products and operations, RF exposure evaluation may be requested under the provisions of Sections 1.1307 (c) and (d) to determine compliance. Because of significant variations in design and operating characteristics, the procedures required to evaluate RF exposure compliance for wireless power transfer are considered according to the exposure potentials of individual implementations

The RF exposure requirements must be determined in conjunction with the device operating characteristics, according to the mobile and portable exposure requirements in Sections 2.1091 and 2.1093 of the rules. SAR and MPE limits do not cover the frequency range for wireless power transfer applications which operate below 100 kHz and 300 kHz respectively; therefore, RF exposure compliance needs to be determined with respect to Sections 1.1307 (c) and (d) of the FCC rules.

1.2 Limits for Maximum Permissible Exposure (MPE)

Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

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 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

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1.3 The Worst Charging Condition:

Ancillary Equipment	Charging Condition	Verdict
Load	Full Loading	PASS
Load	99% Loading	PASS
Load	90% Loading	PASS
Load	50% Loading	PASS
Load	10% Loading	PASS
Load	1% Loading	PASS
Note: For Wireless Power Consortium Qi specification, a lower operating frequency or high duty cycle result in the transfer of a higher amount of power and charging current.		

1.4 Measurement Procedure:

For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 10cm, 15 cm and 20 cm. E and 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 10cm, 15 cm and 20 cm measured from the center of the probe(s) to the edge of the device.

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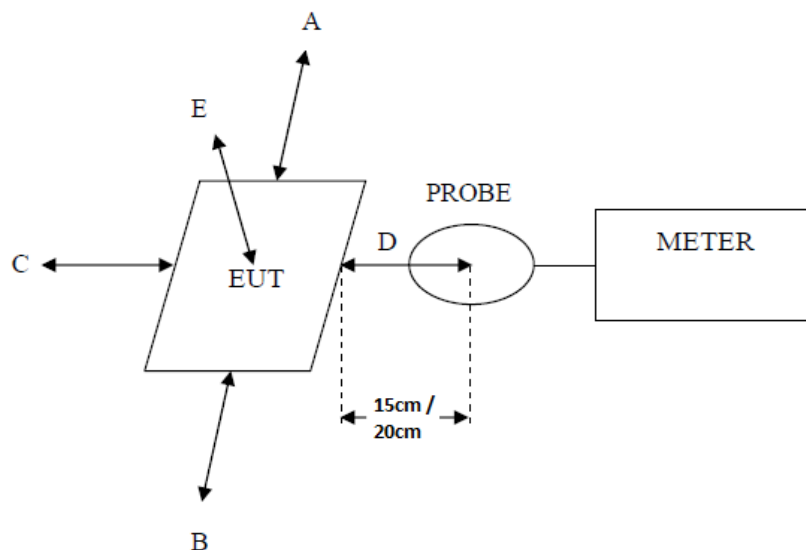
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1.5 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Broadband Field Merer	NARDA	NBM-550	F-0375	08/13/2019	08/12/2020

1.6 Test Set-up:



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1.7 Maximum Permissible Exposure (MPE) Evaluation:

Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.04	0.0030
Back	10 cm	0.75	0.0018
Left	10 cm	1.08	0.0033
Right	10 cm	0.85	0.0028
Top	10 cm	2.29	0.0068
Bottom	10 cm	0.54	0.0025
Limit		614	0.8150

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.06	0.0036
Back	10 cm	0.74	0.0024
Left	10 cm	1.08	0.0035
Right	10 cm	0.89	0.0030
Top	10 cm	2.30	0.0074
Bottom	10 cm	0.53	0.0015
Limit		614	0.8150

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.04	0.0032
Back	10 cm	0.76	0.0018
Left	10 cm	1.11	0.0023
Right	10 cm	0.89	0.0024
Top	10 cm	2.27	0.0074
Bottom	10 cm	0.57	0.0017
Limit		614	0.8150

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.08	0.0040
Back	10 cm	0.78	0.0020
Left	10 cm	1.12	0.0033
Right	10 cm	0.87	0.0018
Top	10 cm	2.32	0.0064
Bottom	10 cm	0.58	0.0027
Limit		614	0.8150

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.06	0.0024
Back	10 cm	0.74	0.0028
Left	10 cm	1.08	0.0033
Right	10 cm	0.82	0.0036
Top	10 cm	2.27	0.0060
Bottom	10 cm	0.56	0.0031
Limit		614	0.8150

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	1.03	0.0028
Back	10 cm	0.78	0.0020
Left	10 cm	1.08	0.0031
Right	10 cm	0.85	0.0018
Top	10 cm	2.29	0.0068
Bottom	10 cm	0.56	0.0035
Limit		614	0.8150

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Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.53	0.0017
Back	15 cm	0.62	0.0015
Left	15 cm	0.86	0.0020
Right	15 cm	0.76	0.0025
Top	15 cm	1.56	0.0045
Bottom	15 cm	0.42	0.0017
Limit		614	0.8150

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.55	0.0007
Back	15 cm	0.59	0.0021
Left	15 cm	0.87	0.0018
Right	15 cm	0.77	0.0027
Top	15 cm	1.58	0.0037
Bottom	15 cm	0.38	0.0013
Limit		614	0.8150

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.54	0.0017
Back	15 cm	0.63	0.0015
Left	15 cm	0.83	0.0016
Right	15 cm	0.76	0.0035
Top	15 cm	1.53	0.0051
Bottom	15 cm	0.41	0.0027
Limit		614	0.8150

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.50	0.0023
Back	15 cm	0.62	0.0007
Left	15 cm	0.87	0.0010
Right	15 cm	0.79	0.0029
Top	15 cm	1.59	0.0055
Bottom	15 cm	0.43	0.0025
Limit		614	0.8150

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.53	0.0015
Back	15 cm	0.64	0.0007
Left	15 cm	0.90	0.0028
Right	15 cm	0.74	0.0019
Top	15 cm	1.52	0.0039
Bottom	15 cm	0.40	0.0009
Limit		614	0.8150

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.55	0.0021
Back	15 cm	0.59	0.0021
Left	15 cm	0.90	0.0022
Right	15 cm	0.80	0.0029
Top	15 cm	1.55	0.0051
Bottom	15 cm	0.42	0.0011
Limit		614	0.8150

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Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.44	0.0012
Back	20 cm	0.48	0.0012
Left	20 cm	0.74	0.0016
Right	20 cm	0.64	0.0020
Top	20 cm	1.38	0.0036
Bottom	20 cm	0.35	0.0011
Limit		614	0.8150

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.40	0.0006
Back	20 cm	0.51	0.0014
Left	20 cm	0.75	0.0020
Right	20 cm	0.64	0.0030
Top	20 cm	1.38	0.0040
Bottom	20 cm	0.37	0.0003
Limit		614	0.8150

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.45	0.0002
Back	20 cm	0.47	0.0018
Left	20 cm	0.74	0.0010
Right	20 cm	0.66	0.0024
Top	20 cm	1.35	0.0040
Bottom	20 cm	0.38	0.0001
Limit		614	0.8150

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.45	0.0018
Back	20 cm	0.44	0.0006
Left	20 cm	0.71	0.0008
Right	20 cm	0.66	0.0026
Top	20 cm	1.35	0.0028
Bottom	20 cm	0.35	0.0009
Limit		614	0.8150

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.44	0.0012
Back	20 cm	0.45	0.0018
Left	20 cm	0.78	0.0024
Right	20 cm	0.60	0.0026
Top	20 cm	1.37	0.0042
Bottom	20 cm	0.37	0.0001
Limit		614	0.8150

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.44	0.0020
Back	20 cm	0.50	0.0008
Left	20 cm	0.70	0.0016
Right	20 cm	0.68	0.0024
Top	20 cm	1.39	0.0036
Bottom	20 cm	0.37	0.0013
Limit		614	0.8150

~ End of Report ~

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