

RF EXPOSURE REPORT



Applicant: INVENTEC CORPORATION
No.66, Hougang street, ShihLin District, Taipei City, Taiwan.
Product Name: All-In-One PC
Brand Name: HP
Model No.: TPC-I051-32
Model Difference: N/A
Report Number: ER/2021/80015
FCC ID DGI-TPC-I051-3202
Issue Date: September 15, 2021
Date of Test: August 12, 2021
Date of EUT Received: August 4, 2021

Approved By

John Yeh

We hereby certify that:

The above equipment was verified by SGS Taiwan Ltd. The evaluation in this report is in compliance with FCC Rule Part §2.1091.

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

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Revision History

Report Number	Revision	Description	Issue Date	Revised By
ER/2021/80015	00	Original	September 15, 2021	Yuri Tsai

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1 DESCRIPTION OF EQUIPMENT UNDER TEST (EUT)

1.1 Product Description

Product Name:	All-In-One PC
Brand Name:	HP
Model No.:	TPC-I051-32
Model Difference:	N/A
Hardware Version:	N/A
Firmware Version:	N/A
EUT Series No.:	0001760BM6
Power Supply:	12.58Vdc from Switching Power Supply

1.2 Test Facility

Laboratory	Test Site Address		FCC Designation number
SGS Taiwan Ltd. Central RF Lab. (TAF code 3702)	☒	No.134, Wu Kung Road, New Taipei Industrial Park, Wuku District, New Taipei City, Taiwan.	TW0027
	☐	No.2, Keji 1st Rd., Guishan District, Taoyuan City, Taiwan 333	TW0028

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2 MAXIMUM PERMISSIBLE EXPOSURE (MPE)

2.1 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.

2.2 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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2.3 The Worst Charging Condition:

Ancillary Equipment	Charging Condition	Verdict
Load	Full Loading	PASS
Load	99% Loading	PASS
Load	50% 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.		

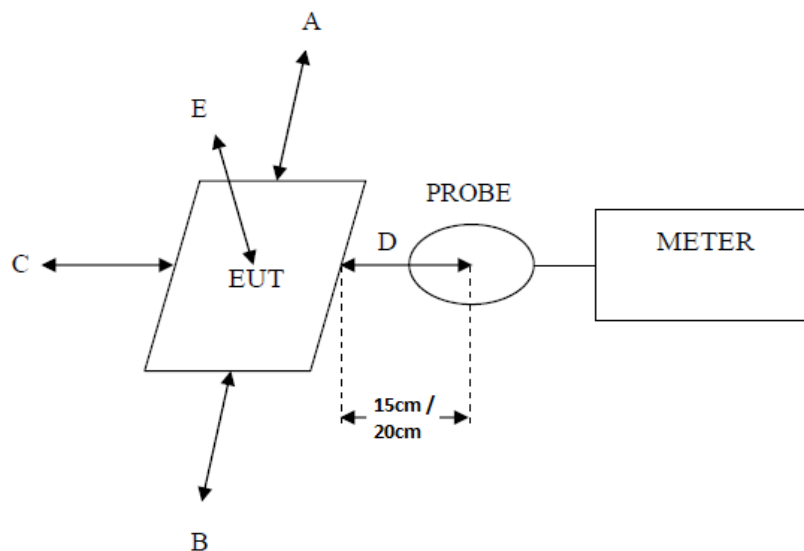
2.4 Measurement Procedure:

For devices designed for typical desktop applications, such a wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance. 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 proper distances measured from the center of the probe(s) to the edge of the device as per KDB 680106 D01.

2.5 Measurement Equipment Used:

EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.
Probe-Analyzer	Narda	EHP 200AC	180ZX00635	01/26/2021	01/25/2022

2.6 Test Set-up:



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2.7 Maximum Permissible Exposure (MPE) Evaluation:

Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.51	0.3651
Back	10 cm	0.44	0.2972
Left	10 cm	0.33	0.1661
Right	10 cm	0.45	0.1661
Top	10 cm	0.50	0.1434
Bottom	10 cm	0.46	0.1919
Limit		614	0.815

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.45	0.4043
Back	10 cm	0.40	0.2743
Left	10 cm	0.46	0.2236
Right	10 cm	0.46	0.2652
Top	10 cm	0.39	0.1583
Bottom	10 cm	0.46	0.2667
Limit		614	0.815

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.47	0.3938
Back	10 cm	0.49	0.3338
Left	10 cm	0.46	0.2258
Right	10 cm	0.42	0.2388
Top	10 cm	0.37	0.2524
Bottom	10 cm	0.40	0.2662
Limit		614	0.815

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.50	0.4438
Back	10 cm	0.45	0.2693
Left	10 cm	0.48	0.2732
Right	10 cm	0.46	0.2450
Top	10 cm	0.46	0.2164
Bottom	10 cm	0.48	0.2742
Limit		614	0.815

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.49	0.4571
Back	10 cm	0.48	0.2633
Left	10 cm	0.36	0.2140
Right	10 cm	0.49	0.2524
Top	10 cm	0.50	0.2468
Bottom	10 cm	0.49	0.2289
Limit		614	0.815

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	10 cm	0.49	0.4044
Back	10 cm	0.41	0.2652
Left	10 cm	0.40	0.2578
Right	10 cm	0.46	0.2559
Top	10 cm	0.47	0.2446
Bottom	10 cm	0.53	0.2461
Limit		614	0.815

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Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.59	0.1621
Back	15 cm	0.29	0.1645
Left	15 cm	0.39	0.5400
Right	15 cm	0.38	0.2540
Top	15 cm	0.35	0.1791
Bottom	15 cm	0.34	0.1645
Limit		614	0.815

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.55	0.1621
Back	15 cm	0.27	0.2096
Left	15 cm	0.38	0.2427
Right	15 cm	0.31	0.1851
Top	15 cm	0.33	0.1627
Bottom	15 cm	0.39	0.2461
Limit		614	0.815

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.63	0.2189
Back	15 cm	0.29	0.2111
Left	15 cm	0.38	0.1306
Right	15 cm	0.32	0.1431
Top	15 cm	0.34	0.1645
Bottom	15 cm	0.30	0.1905
Limit		614	0.815

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.65	0.1394
Back	15 cm	0.27	0.1842
Left	15 cm	0.39	0.2559
Right	15 cm	0.24	0.1406
Top	15 cm	0.38	0.1645
Bottom	15 cm	0.35	0.1546
Limit		614	0.815

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.61	0.1587
Back	15 cm	0.30	0.1711
Left	15 cm	0.35	0.1661
Right	15 cm	0.39	0.2540
Top	15 cm	0.38	0.1529
Bottom	15 cm	0.29	0.1574
Limit		614	0.815

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	15 cm	0.58	0.1954
Back	15 cm	0.27	0.1672
Left	15 cm	0.41	0.1309
Right	15 cm	0.36	0.2552
Top	15 cm	0.39	0.1791
Bottom	15 cm	0.42	0.2844
Limit		614	0.815

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Full Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.42	0.1523
Back	20 cm	0.29	0.1645
Left	20 cm	0.40	0.1538
Right	20 cm	0.43	0.1629
Top	20 cm	0.38	0.2461
Bottom	20 cm	0.21	0.1629
Limit		614	0.815

99% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.40	0.1711
Back	20 cm	0.31	0.1464
Left	20 cm	0.34	0.1870
Right	20 cm	0.38	0.2503
Top	20 cm	0.42	0.1870
Bottom	20 cm	0.41	0.2505
Limit		614	0.815

90% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.37	0.1532
Back	20 cm	0.31	0.1627
Left	20 cm	0.41	0.2468
Right	20 cm	0.35	0.1605
Top	20 cm	0.38	0.2552
Bottom	20 cm	0.33	0.1607
Limit		614	0.815

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50% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.36	0.1672
Back	20 cm	0.26	0.1503
Left	20 cm	0.47	0.2622
Right	20 cm	0.43	0.2123
Top	20 cm	0.39	0.2505
Bottom	20 cm	0.35	0.1605
Limit		614	0.815

10% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.37	0.1962
Back	20 cm	0.28	0.1645
Left	20 cm	0.38	0.2552
Right	20 cm	0.34	0.1700
Top	20 cm	0.25	0.2512
Bottom	20 cm	0.39	0.1479
Limit		614	0.815

1% Loading

Maximum Permissible Exposure			
Probe from EUT Side	Test Distance	V/m	A/m
Front	20 cm	0.40	0.1546
Back	20 cm	0.26	0.1546
Left	20 cm	0.37	0.1862
Right	20 cm	0.32	0.2137
Top	20 cm	0.40	0.2531
Bottom	20 cm	0.44	0.1892
Limit		614	0.815

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