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Shenzhen Branch

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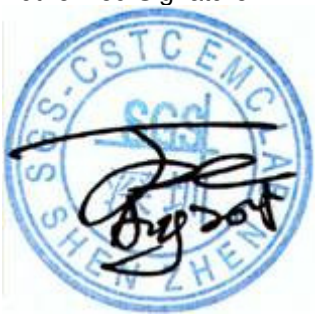
RF Exposure Evaluation Report

Application No:	SZEM1507004224CR
Applicant:	Zhuhai Pantum Electronics Co.,Ltd.
Manufacturer/Factory:	Zhuhai Pantum Electronics Co.,Ltd.
Product Name:	Monochrome Laser Printer
Model No.(EUT):	P3500DWT
Add Model No.:	P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D, P3500DN, P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN, P3500DW, P3502DW, P3505DW, P3500DNT
Trade Mark:	PANTUM
FCC ID:	2AEGOPANTUM-3
Standards:	47 CFR Part 1.1307 (2014) 47 CFR Part 1.1310 (2014)
Date of Receipt:	2015-07-16
Date of Test:	2015-07-22 to 2015-07-27
Date of Issue:	2015-08-14
Test Result :	**PASS***

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:



Jack Zhang
EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.
The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

2 Version

Revision Record				
Version	**Chapter**	**Date**	**Modifier**	**Remark**
00		2015-08-14		Original

Authorized for issue by:				
Tested By		Eric Fu **(Eric Fu) /Project Engineer**		2015-07-27 **Date**
Prepared By		Vivi Zhou **(Vivi Zhou) /Clerk**		2015-08-14 **Date**
Checked By		Owen Zhou **(Owen Zhou) /Reviewer**		2015-08-14 **Date**

3 Contents

4 General Information

4.1 Client Information

Applicant:	Zhuhai Pantum Electronics Co.,Ltd.
Address of Applicant:	Area A,3rd floor,Building No.1, No.3883, ZhuhaiAvenue, Zhuhai, Guangdong, China
Manufacturer:	Zhuhai Pantum Electronics Co.,Ltd.
Address of Manufacturer:	Area A,3rd floor,Building No.1, No.3883, ZhuhaiAvenue, Zhuhai, Guangdong, China
Factory:	Zhuhai Pantum Electronics Co.,Ltd.
Address of Factory:	Area A,3rd floor,Building No.1, No.3883, ZhuhaiAvenue, Zhuhai, Guangdong, China

4.2 General Description of EUT

Product Name:	Monochrome Laser Printer
Model No.:	P3500DWT
Trade Mark:	PANTUM
Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Modulation Type:	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n(HT20) : OFDM (64QAM, 16QAM,QPSK,BPSK)
Sample Type:	Fixed production
Test Power Grade:	802.11b: 17 ±1.5 dBm; 802.11g: 14±1.5 dBm; 802.11n(20MHz): 12±1.5dBm
Antenna Type and Gain:	Type: Integral antenna Gain:2dBi
Power Supply:	AC 120V 60Hz

Remark:
Model No.: P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D, P3500DN, P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN, P3500DW, P3502DW, P3505DW, P3500DWT, P3500DNT

Only the model P3500DWT was tested, since the electrical circuit design, layout, components used and internal wiring were identical for the above models, only different on detail information as below:

Item	Model No.	Speed	Appearance	Interface	Voltage
1	P3500D	33PPM	Different on color	USB	A1: AC 220-240V, 50Hz/60Hz,4.0A; A2: AC 110-127V, 50Hz/60Hz,8.0A; A3: AC 100-127V, 50Hz/60Hz,8.0A;
2	P3502D				
3	P3505D				
4	P3506D				
5	P3507D				
6	P3508D				
7	P3509D				
8	P3500DN			USB+NET	
9	P3502DN				
10	P3505DN				
11	P3506DN				
12	P3507DN				
13	P3508DN				
14	P3509DN				
15	P3500DW			USB+NET+WIFI	
16	P3502DW				
17	P3505DW				
18	P3500DNT			USB+NET+ Optional paper box	
19	P3500DWT			USB+WIFI+NET+ Optional paper box	

4.3 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab

No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594

No tests were sub-contracted.

4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L2929)**

  CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **VCCI**

  The 10m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

- **FCC – Registration No.: 556682**

  SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

  Two 3m Semi-anechoic chambers of SGS-CSTC Standards Technical Services Co., Ltd. have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-2.

4.5 Deviation from Standards

None.

4.6 Abnormalities from Standard Conditions

None.

4.7 Other Information Requested by the Customer

None.

5 RF Exposure Evaluation

5.1 RF Exposure Compliance Requirement

5.1.1 Limits

According to FCC Part1.1310: The criteria listed in the following table shall be used to evaluate the environment impact of human exposure to radio frequency (RF) radiation as specified in part1.1307(b)

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

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4* Pi * R 2)

Where

Pd = power density in mW/cm2

Pout = output power to antenna in mW

G = gain of antenna in linear scale

Pi = 3.1416

R = distance between observation point and center of the radiator in cm

Pd id the limit of MPE, 1 mW/cm2 . If we know the maximum gain of the antenna and the total power input to the antenna, through the calculation, we will know the distance r where the MPE limit is reached.

5.1.2 Test Procedure

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

5.1.3 EUT RF Exposure Evaluation

Antenna Gain: 2dBi

Antenna Gain: The maximum Gain measured in fully anechoic chamber is 1.5849 in linear scale.

Output Power Into Antenna & RF Exposure Evaluation Distance:

802.11b mode:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
Highest	2462	18.96	78.70	0.0248	1.0	PASS

802.11g mode:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
Highest	2462	20.28	106.66	0.0336	1.0	PASS

802.11n(HT20)mode:

Channel	Frequency (MHz)	Max Conducted Peak Output Power (dBm)	Output Power to Antenna (mW)	Power Density at R = 20 cm (mW/cm^2)	Limit	Result
Highest	2462	20.28	106.66	0.0336	1.0	PASS

Note: Refer to report No. SZEM150700422401 for EUT test Max Conducted Peak Output Power value.

The distancer (4th column) calculated from the Fries transmission formula is far greater than 20 cm separation requirement.