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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*

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.

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



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2 Version

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

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

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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;
rest rower drade.	802.11n(20MHz): 12±1.5dBm
Antenna Type and Gain:	Type: Integral antenna
	Gain:2dBi
Power Supply:	AC 120V 60Hz



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Remark:

Model No.: P3500D, P3502D, P3505D, P3506D, P3507D, P3508D, P3509D, P3500DN, P3502DN, P3505DN, P3506DN, P3507DN, P3508DN, P3509DN, P3500DWT, P3500DWT, P3500DWT 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				
2	P3502D				
3	P3505D				
4	P3506D			USB	
5	P3507D				
6	P3508D				
7	P3509D				
8	P3500DN				A4. AO 000 040V
9	P3502DN			A1: AC 220-240V,	
10	P3505DN		Different on		50Hz/60Hz,4.0A;
11	P3506DN	33PPM Different on color	USB+NET	A2: AC 110-127V,	
12	P3507DN		COIOI		50Hz/60Hz,8.0A; A3: AC 100-127V,
13	P3508DN				50Hz/60Hz,8.0A;
14	P3509DN		30Hz/6	50HZ/60HZ,6.0A,	
15	P3500DW				
16	P3502DW			USB+NET+WIFI	
17	P3505DW				
10	DOEOODNIT			USB+NET+ Optional	
18	P3500DNT			paper box	
19	DOEOODWIT			USB+WIFI+NET+	
19	P3500DWT			Optional paper box	



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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.



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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.



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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/cm²)	Averaging time (minutes)				
(A) Lim	(A) Limits for Occupational/Controlled Exposures							
0.3–3.0 3.0–30 30–300 300–1500 1500–100,000	614 1842/f 61.4	1.63 4.89/f 0.163	*(100) *(900/f²) 1.0 f/300 5	6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6				
(B) Limits	for General Populati	ion/Uncontrolled Exp	oosure					
0.3–1.34	614 824/f 27.5	1.63 2.19/f 0.073	*(100) *(180/f²) 0.2 f/1500 1.0	30 30 30 30 30				

F= Frequency in MHz

Friis Formula

Friis transmission formula: Pd = (Pout*G)/(4*Pi*R2)

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 highest channel individually.

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

802.11g mode:

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

802.11n(HT20)mode:

Channel	Frequency	Max Conducted	Output Power	Power Density	Limit	Result
	(MHz)	Peak Output	to Antenna	at R = 20 cm		
		Power (dBm)	(mW)	(mW/cm ²)		
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.