

SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Application
For
Certification
(FCC ID: YGB-DC016)

Computer Peripheral

Prepared and Checked by:	Approved by:
Sign on file	
Chris Chen Engineer	Billy Li Team Leader Date: 25 June, 2012

- The test results reported in this test report shall refer only to the sample actually tested and shall not refer or be deemed to refer to bulk from which such a sample may be said to have been obtained.
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MEASUREMENT / TECHNICAL REPORT

SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd. MODEL: DC016 FCC ID: YGB-DC016

25 June, 2012

This report concerns (check one:)	Original Grant X Cla	ss II Change
Equipment Type: <u>JBP-Class B Computin</u>	g Device Peripheral	
Deferred grant requested per 47 CFR 0.4	457(d)(1)(ii)? Yes	NoX
	If yes, defer until:	date
Company Name agrees to notify the Cor	nmission by:	
. , , , , , , , , , , , , , , , , , , ,	date	
of the intended date of announcement of that date.	of the product so that the gran	nt can be issued on
Transition Pulse Request per 15 272		
Transition Rules Request per 15.37?	Yes	No <u>X</u>
If no, assumed Part 15, Subpart C for Edition] provision.		
If no, assumed Part 15, Subpart C for		

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List of attached file

Exhibit Type	File Description	Filename
Test Report	Test Report	report.pdf
Test Setup Photo	Radiated photos	radiated photos.pdf
Test Setup Photo	Conducted photos	conducted photos.pdf
External Photo	External Photos	external photos.pdf
Internal Photo	Internal Photos	internal photos.pdf
Block Diagram	Block Diagram	block.pdf
ID Label / Location	Label Artwork and Location	label.pdf
User Manual	User Manual	manual.pdf
Cover Letter	Letter of Agency	agency.pdf
Cover Letter	Certification Agreement	agreement.pdf

EXHIBIT 1 GENERAL DESCRIPTION

1.0 **General Description**

1.1 Product Description

The Equipment Under Test (EUT) is a Digital Camera. The device can be used to transfer data connecting PC by USB port. The EUT is powered by DC 6.0V (4 x 1.5V"AA") batteries or PC USB port.

1.2 Related Submittal(s) Grants

This is an application for certification of a computer peripheral.

1.3 Test Methodology

Both AC mains line-conducted and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). Radiated emission measurement was performed in Semi-anechoic chamber and conducted emission measurement was performed in shield room. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the "Justification Section" of this Application.

1.4 Test Facility

The Semi-anechoic chamber and shielding room used to collect the radiated data and conducted data are **Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch** and located at 6F, D Block, Huahan Building, Langshan Road, Nanshan District, Shenzhen, P. R. China. This test facility and site measurement data have been fully placed on file with the FCC (Registration Number: 242492).

EXHIBIT 2 SYSTEM TEST CONFIGURATION

2.0 **System Test Configuration**

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device is powered by DC 6.0V (4 x 1.5V"AA") new batteries or PC USB port during the test. The worst case data was reported in this report.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. The step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was placed on turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

The frequency range from 30MHz to 2GHz was searched for spurious emissions from the device. Only those emissions reported were detected. All other emissions were at least 20 dB below the applicable limits.

2.2 EUT Exercising Software

There is a CD attached to exercise the device.

2.3 Special Accessories

N/A

2.4 Equipment Modification

Any modifications installed previous to testing by SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd. will be incorporated in each production model sold / leased in the United States.

No modifications were installed by Intertek Testing Services Shenzhen Ltd. Kejiyuan Branch.

2.5 Measurement Uncertainty

When determining the test conclusion, the Measurement Uncertainty of test has been considered.

2.6 Support Equipment List and Description

This product was tested in the following configuration:

Refer List:

Description	Manufacturer	Model No.
Laptop	Lenovo	T61
Hard Disk	Smart.drive	HD-003
1394 Cable	Smart.drive	Unshielded, Length 180cm
USB Cable	Smart.drive	Unshielded, Length 155cm
USB Cable	Shuoying	Unshielded, Length 80cm

EXHIBIT 3

EMISSION RESULTS

3.0 **Emission Results**

Data is included worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the reading on the Spectrum Analyzer to the factors associated with preamplifiers (if any), antennas, cables, pulse desensitization and average factors (when specified limit is in average and measurements are made with peak detectors). A sample calculation is included below.

$$FS = RA + AF + CF - AG + PD + AV$$

where FS = Field Strength in $dB\mu V/m$

RA = Receiver Amplitude (including preamplifier) in $dB\mu V$

CF = Cable Attenuation Factor in dB

AF = Antenna Factor in dB AG = Amplifier Gain in dB

PD = Pulse Desensitization in dB

AV = Average Factor in -dB

In the radiated emission table which follows, the reading shown on the data table may reflect the preamplifier gain. An example of the calculations, where the reading does not reflect the preamplifier gain, follows:

$$FS = RA + AF + CF - AG + PD + AV$$

3.1 Field Strength Calculation (cont'd)

Example

Assume a receiver reading of $62.0dB\mu V$ is obtained. The antenna factor of 7.4dB and cable factor of 1.6dB is added. The amplifier gain of 29dB is subtracted. The pulse desensitization factor of the spectrum analyzer was 0dB, and the resultant average factor was -10dB. The net field strength for comparison to the appropriate emission limit is $32dB\mu V/m$. This value in $dB\mu V/m$ was converted to its corresponding level in $\mu V/m$.

 $RA = 62.0 dB \mu V$

AF = 7.4dB

CF = 1.6dB

AG = 29.0dB

PD = 0dB

AV = -10dB

 $FS = 62 + 7.4 + 1.6 - 29 + 0 + (-10) = 32dB\mu V/m$

Level in $\mu V/m$ = Common Antilogarithm [(32dB $\mu V/m$)/20] = 39.8 $\mu V/m$

TRF No.: FCC 15C_PC_b FCC ID: YGB-DC016 Report No.: SZ12050490-1

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3.2 Radiated Emission Configuration Photograph

Worst Case Radiated Emission At 720.071MHz (PC Download Mode)

For electronic filing, the worst case radiated emission configuration photograph is saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgement: Passed by 1.5dB margin (PC Download Mode)

TEST PERSONNEL:	
Sign on file	
Chris Chen, Engineer Typed/Printed Name	
25 June, 2012	

Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Operating Mode: Video Record

Table 1
Radiated Emissions

Polarization	Frequency	Reading	Pre-	Antenna	Net	Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	240.005	40.4	20.0	11.9	32.3	46.0	-13.7
Horizontal	300.338	46.6	20.0	13.2	39.8	46.0	-6.2
Horizontal	420.036	44.7	20.0	15.8	40.5	46.0	-5.5
Vertical	241.045	36.4	20.0	11.9	28.3	46.0	-17.7
Vertical	480.080	33.6	20.0	18.7	32.3	46.0	-13.7
Vertical	998.520	37.0	20.0	24.2	41.2	46.0	-4.8
Vertical	1580.260	37.3	20.0	26.8	44.1	54.0	-9.9

NOTES:

- 1. Quasi-Peak detector is used for frequency up to 1GHz and PEAK detector is used for frequency from 1-2GHz.
- 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Chris Chen

Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Worst Case Operating Mode: Playback

Table 2
Radiated Emissions

Polarization	Frequency	Reading	Pre-	Antenna	Net	Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	232.023	36.9	20.0	11.8	28.7	46.0	-17.3
Horizontal	475.588	35.3	20.0	18.8	34.1	46.0	-11.9
Horizontal	982.450	35.9	20.0	24.2	40.1	46.0	-5.9
Vertical	225.460	38.9	20.0	11.9	30.8	46.0	-15.2
Vertical	321.530	44.6	20.0	15.9	40.5	46.0	-5.5
Vertical	413.528	45.3	20.0	16.0	41.3	46.0	-4.7
Vertical	1524.450	34.6	20.0	28.2	42.8	54.0	-11.2

NOTES:

- 1. Quasi-Peak detector is used for frequency up to 1GHz and PEAK detector is used for frequency from 1-2GHz.
- 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Chris Chen

Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Operating Mode: Webcam operating

Table 3
Radiated Emissions

Polarization	Frequency	Reading	Pre-	Antenna	Net	Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	300.308	49.3	20.0	13.2	42.5	46.0	-3.5
Horizontal	420.049	48.1	20.0	15.8	43.9	46.0	-2.1
Horizontal	480.007	39.9	20.0	18.7	38.6	46.0	-7.4
Vertical	418.970	37.6	20.0	15.9	33.5	46.0	-12.5
Vertical	481.250	37.4	20.0	18.7	36.1	46.0	-9.9
Vertical	600.360	32.4	20.0	20.8	33.2	46.0	-12.8
Vertical	1486.539	35.0	20.0	26.9	41.9	54.0	-12.1

NOTES:

- 1. Quasi-Peak detector is used for frequency up to 1GHz and PEAK detector is used for frequency from 1-2GHz.
- 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Chris Chen

Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Operating Mode: PC Download

Table 4
Radiated Emissions

Polarization	Frequency	Reading	Pre-	Antenna	Net	Limit	Margin
	(MHz)	(dBµV)	Amp	Factor	at 3m	at 3m	(dB)
			Gain	(dB)	(dBµV/m)	(dBµV/m)	
			(dB)				
Horizontal	360.030	46.9	20.0	16.1	43.0	46.0	-3.0
Horizontal	480.080	38.0	20.0	18.7	36.7	46.0	-9.3
Horizontal	720.071	42.1	20.0	22.4	44.5	46.0	-1.5
Vertical	359.800	37.4	20.0	16.1	33.5	46.0	-12.5
Vertical	481.250	45.6	20.0	18.5	44.1	46.0	-1.9
Vertical	600.035	37.0	20.0	20.8	37.8	46.0	-8.2
Vertical	1582.540	35.3	20.0	26.8	42.1	54.0	-11.9

NOTES:

- 1. Quasi-Peak detector is used for frequency up to 1GHz and PEAK detector is used for frequency from 1-2GHz.
- 2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3 meter distances were measured at 0.3- meter and an inverse proportional extrapolation was performed to compare the signal level to the 3 meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
- 3. Negative value in the margin column shows emission below limit.
- 4. All emissions up to 1GHz are below the QP limit and all emissions between 1-2GHz are below the AV limit.

Test Engineer: Chris Chen

3.4 Conducted Emission Configuration Photograph

Worst Case Neutral-Conducted Configuration at 0.182 MHz

For electronic filing, the worst case conducted emission configuration photograph is saved with filename: conducted photos.pdf.

3.5 Conducted Emission Data

Judgement: Passed by 14.5 dB margin

TEST PERSONNEL:

Sign on file

Chris Chen, Engineer
Typed/Printed Name

25 June, 2012 Date

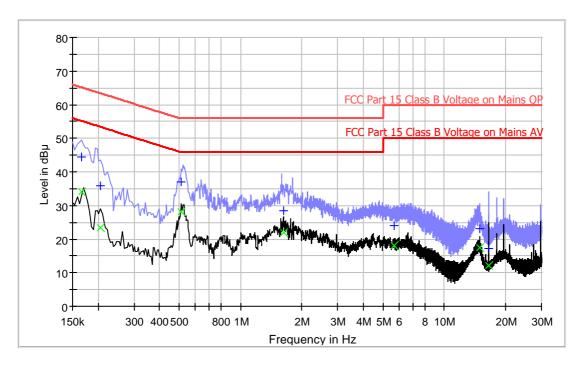
Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Worst Case Operating Mode: PC Download

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.166	44.4	L1	9.6	20.8	65.2
0.206	35.8	L1	9.6	27.6	63.4
0.514	37.1	L1	9.6	18.9	56.0
1.622	28.5	L1	9.7	27.5	56.0
5.654	24.0	L1	9.8	36.0	60.0
15.006	23.3	L1	10.3	36.8	60.0

Result Table AV

Frequency	Average	Line	Corr.	Margin	Limit
(MHz)	(dB µ V)		(dB)	(dB)	(dB µ V)
0.166	34.2	L1	9.6	21.0	55.2
0.206	23.4	L1	9.6	30.0	53.4
0.514	28.2	L1	9.6	17.8	46.0
1.622	21.9	L1	9.7	24.1	46.0
5.654	18.2	L1	9.8	31.8	50.0
15.006	17.5	L1	10.3	32.5	50.0

Test Engineer: Chris Chen

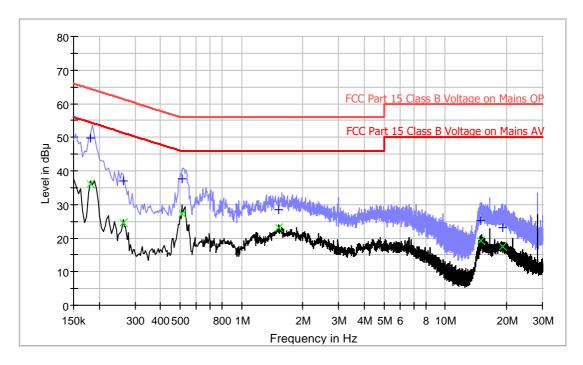
Company: SHUOYING DIGITAL SCIENCE&TECHNOLOGY (CHINA) Co., Ltd.

Date of Test: 25 June, 2012

Model: DC016

Worst Case Operating Mode: PC Download

Conducted Emission Test - FCC



Result Table QP

Frequency (MHz)	QuasiPeak	Line	Corr.	Margin	Limit
(IVITZ)	(dB μ V)		(dB)	(dB)	(dB µ V)
0.182	49.9	N	9.6	14.5	64.4
0.262	36.9	N	9.6	24.5	61.4
0.510	37.5	N	9.6	18.5	56.0
1.514	28.4	N	9.8	27.6	56.0
14.914	25.3	N	10.2	34.7	60.0
19.094	23.1	N	10.6	36.9	60.0

Result Table AV

Frequency (MHz)	Average (dB µ V)	Line	Corr. (dB)	Margin (dB)	Limit (dB µ V)
0.182	36.1	N	9.6	18.3	54.4
0.262	24.6	N	9.6	26.8	51.4
0.510	27.2	N	9.6	18.8	46.0
1.514	23.1	N	9.8	22.9	46.0
14.914	19.3	N	10.2	30.7	50.0
19.094	17.5	N	10.6	32.5	50.0

Test Engineer: Chris Chen

EXHIBIT 4 EQUIPMENT PHOTOGRAPHS

4.0 **Equipment Photographs**

For electronic filing, photographs of the tested EUT are saved with filename: external photos.pdf and internal photos.pdf.

EXHIBIT 5 PRODUCT LABELLING

5.0 **Product Labelling**

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

EXHIBIT 6 TECHNICAL SPECIFICATIONS

6.0 <u>Technical Specifications</u>

For electronic filing, the block diagram of the tested EUT is saved with filename: block.pdf.

EXHIBIT 7 INSTRUCTION MANUAL

7.0 **Instruction Manual**

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold / leased in the United States.

EXHIBIT 8

MISCELLANEOUS INFORMATION

8.0 <u>Miscellaneous Information</u>

This miscellaneous information includes emission measuring procedure.

8.1 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services in the measurements of computer peripheral operating under Part 15, Subpart B rules.

The test set-up and procedures described below are designed to meet the requirements of ANSI C63.4 – 2009.

The computer peripheral equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The antenna height and polarization are varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions are in QP mode from the frequency band 30MHz to 1GHz with RBW setting 120kHz and in PK & AV mode from frequency band 1GHz to 2GHz with RBW setting 1MHz. Detector function for conducted emissions are in QP & AV mode and IFBW setting is 9kHz from the frequency band 150kHz to 30MHz.

For radiated emission, the frequency range scanned is 30MHz to 2GHz. For line-conducted emissions, the range scanned is 150kHz to 30MHz.

8.1 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

Conducted measurements are made as described in ANSI C63.4 – 2009.

EXHIBIT 9 TEST EQUIPMENT LIST

9.0 <u>Test Equipment List</u>

Equipment No.	Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Due Date
SZ061-03	BiConiLog Antenna	ETS	3142C	00066460	02-Jul-11	02-Jan-13
SZ185-01	EMI Receiver	R&S	ESCI	100547	11-Mar-12	11-Mar-13
SZ061-08	Horn Antenna	ETS	3115	00092346	15-Oct-11	15-Oct-12
SZ061-06	Active Loop Antenna	Electro- Metrics	EM-6876	217	11-Mar-12	11-Mar-13
SZ188-01	Anechoic Chamber	ETS	RFD-F/A- 100	4102	03-Mar-12	03-Mar-13
SZ062-04	RF Cable	RADIALL	RG 213U		11-Mar-12	11-Mar-13
SZ062-06	RF Cable	RADIALL	0.04- 26.5GHz	083388	11-Mar-12	11-Mar-13
SZ185-02	EMI Test Receiver	R&S	ESCI	100692	12-Nov-11	12-Nov-12
SZ187-01	Two-Line V- Network	R&S	ENV216	100072	12-Nov-11	12-Nov-12
SZ188-03	Shielding Room	ETS	RFD-100	4100	16-Sep-11	16-Sep-12