

# FCC PART 15B

## MEASUREMENT AND TEST REPORT

### FOR

**SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD**

**1-3 Floor, Building B, No. 49, Shangxia Street, Henggang Road, Longgang**

**District, Shenzhen, China.**

**FCC ID: ZAY8**

<b>Report Concerns:</b> Original Report	<b>Equipment Type:</b> BT Dongle
<b>Model:</b>	<u>W88DG</u>
<b>Report No.:</b>	<u>STR11128164I-2</u>
<b>Test Date:</b>	<u>2011-12-12 to 2011-12-19</u>
<b>Issue Date:</b>	<u>2011-12-21</u>
<b>Tested By:</b>	<u>Silin Chen / Engineer</u> <i>Silin chen</i>
<b>Reviewed By:</b>	<u>Lahm Peng / EMC Manager</u> <i>Lahm peng</i>
<b>Approved &amp; Authorized By:</b>	<u>Jandy so / PSQ Manager</u> <i>Jandyso</i>
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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd.

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## 1. GENERAL INFORMATION

### 1.1 Product Description for Equipment Under Test (EUT)

#### Client Information

Applicant: SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD  
Address of applicant: 1-3 Floor, Building B, No. 49, Shangxia Street, Henggang Road, Longgang District, Shenzhen, China.

Manufacturer: SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD  
Address of manufacturer: 1-3 Floor, Building B, No. 49, Shangxia Street, Henggang Road, Longgang District, Shenzhen, China.

#### General Description of E.U.T

Items	Description
EUT Description:	BT Dongle
Trade Name:	/
Model No.:	W88DG
Rated Voltage:	DC 5V
Type of Antenna:	Integral Antenna
For more information refer to the circuit diagram form and the user's manual.	

*The test data is gathered from a production sample, provided by the manufacturer.*

### 1.2 Test Standards

The following report is prepared on behalf of the SHENZHEN ZONOKI DIGITAL TECHNOLOGY CO., LTD in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15.107, and 15.109 rules.

**Maintenance of compliance** is the responsibility of the manufacturer. Any modification of the product, which results in lowering the emission/immunity, should be checked to ensure compliance has been maintained.

### 1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

The equipment under test (EUT) was configured to measure its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the Operating Instructions.

## 1.4 Test Facility

- **FCC – Registration No.: 994117**

SEM.Test Compliance Services Co., Ltd. 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 and the Registration is 994117.

- **Industry Canada (IC) Registration No.: 7673A**

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

- **CNAS Registration No.: L4062**

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

## 1.5 EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the system components. The test software, provided by the customer, is started while the EUT is on to simulate the normal work. under the Windows XP terminal.

## 1.6 Accessories Equipment List and Details

Description	Manufacturer	Model	Serial Number
IBM	Notebook	1843	/

## 1.7 EUT Cable List and Details

Cable Description	Length (M)	Shielded/Unshielded	With Core/Without Core
N/A	N/A	N/A	N/A

2. SUMMARY OF TEST RESULTS

Description of Test	Result
§15.107 (a) Conducted Emission	Compliant
§15.109(a) Radiated Emission	Compliant

### 3. §15.107 (a)- CONDUCTED EMISSION

#### 3.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is  $\pm 2.88$  dB.

#### 3.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2010-12-20	2011-12-19
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2010-12-20	2011-12-19
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2010-12-20	2011-12-19

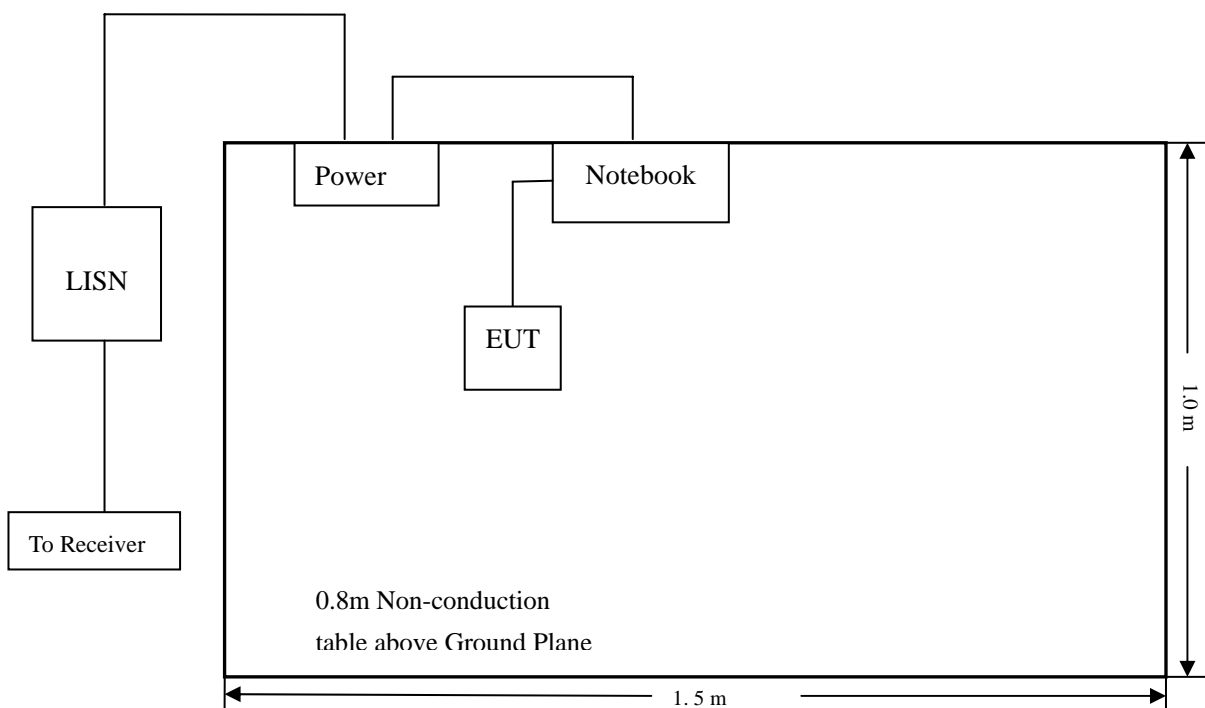
#### 3.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.107 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

#### 3.4 Basic Test Setup Block Diagram



### 3.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

### 3.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency ..... 150 kHz  
Stop Frequency..... 30 MHz  
Sweep Speed ..... Auto  
IF Bandwidth..... 10 kHz  
Quasi-Peak Adapter Bandwidth ..... 9 kHz  
Quasi-Peak Adapter Mode ..... Normal

### 3.7 Summary of Test Results/Plots

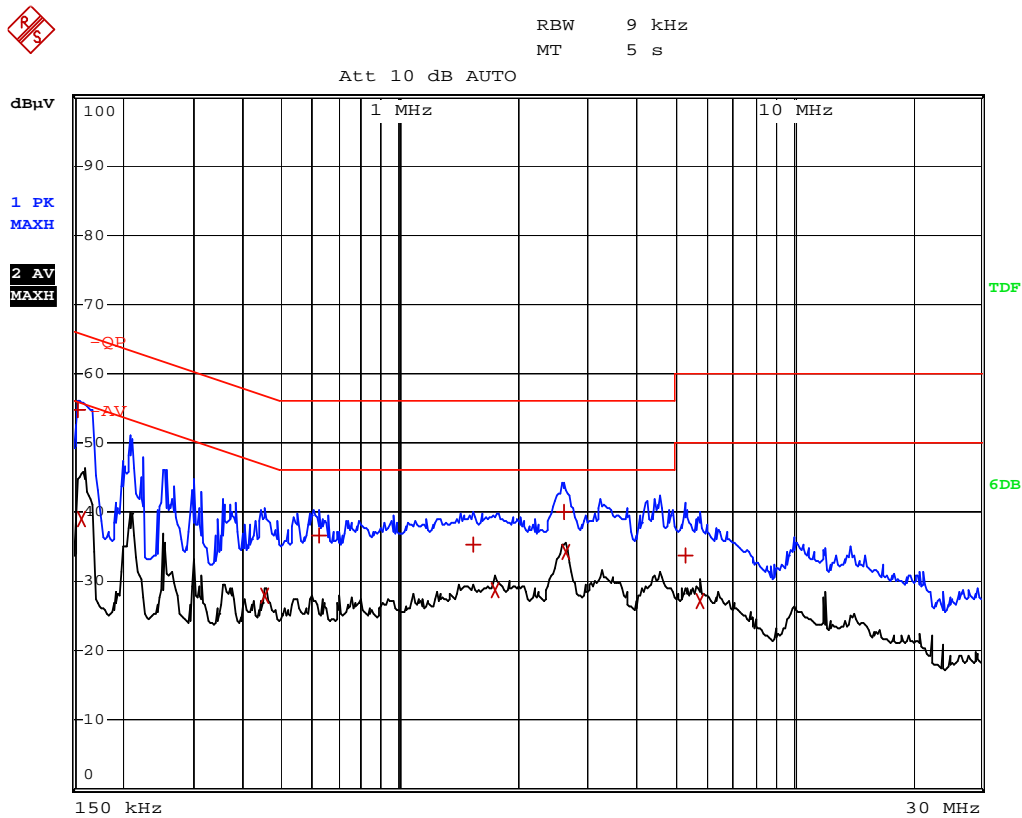
According to the data in section 3.8, the EUT complied with the FCC Part 15B Conducted margin for a Class B device, with the *worst* margin reading of:

**-9.28 dB $\mu$ V at 2.634 MHz in the Line mode, Average detector, 0.15-30MHz**

### 3.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

Conducted Disturbance  
EUT: BT Dongle  
M/N: W88DG  
Operating Condition: Operating  
Test Specification: N  
Comment: AC 120V/60Hz USB DC 5V

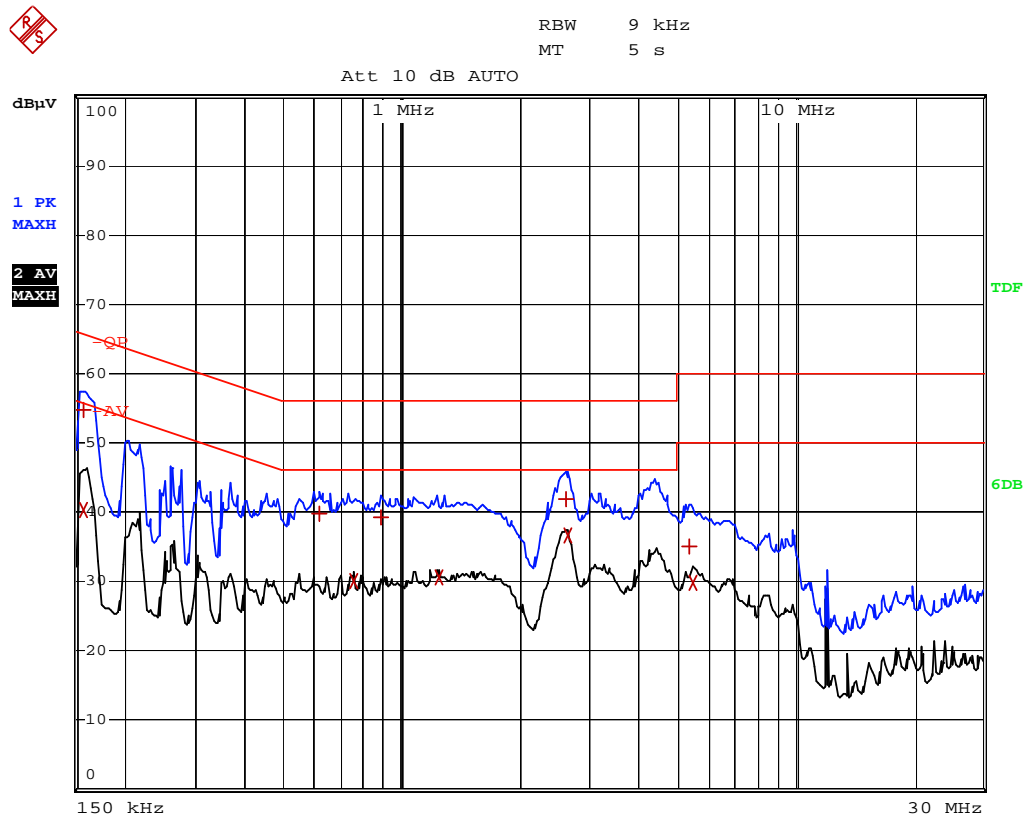


EDIT PEAK LIST (Final Measurement Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBμV	DELTA LIMIT dB
1 Quasi Peak	154 kHz	54.62	-11.15
2 Average	158 kHz	39.00	-16.56
2 Average	450 kHz	28.00	-18.87
1 Quasi Peak	622 kHz	36.66	-19.33
1 Quasi Peak	1.546 MHz	35.42	-20.57
2 Average	1.754 MHz	28.73	-17.26
1 Quasi Peak	2.606 MHz	40.08	-15.91
2 Average	2.65 MHz	34.32	-11.67
1 Quasi Peak	5.338 MHz	33.70	-26.29
2 Average	5.83 MHz	27.26	-22.73



Plot of Conducted Emissions Test Data

Conducted Disturbance  
EUT: BT Dongle  
M/N: W88DG  
Operating Condition: Operating  
Test Specification: L  
Comment: AC 120V/60Hz USB DC 5V



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	-QP		
Trace2:	-AV		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
1 Quasi Peak	158 kHz	54.61	-10.95
2 Average	158 kHz	40.39	-15.17
1 Quasi Peak	614 kHz	39.81	-16.18
2 Average	754 kHz	30.12	-15.87
1 Quasi Peak	890 kHz	39.20	-16.79
2 Average	1.242 MHz	30.61	-15.38
1 Quasi Peak	2.622 MHz	41.81	-14.18
2 Average	2.634 MHz	36.71	-9.28
1 Quasi Peak	5.358 MHz	35.13	-24.86
2 Average	5.474 MHz	29.80	-20.20

## 4. §15.109(a)- RADIATED EMISSION

### 4.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any radiation emissions measurement is  $\pm 5.10$  dB.

### 4.2 Test Equipment List and Details

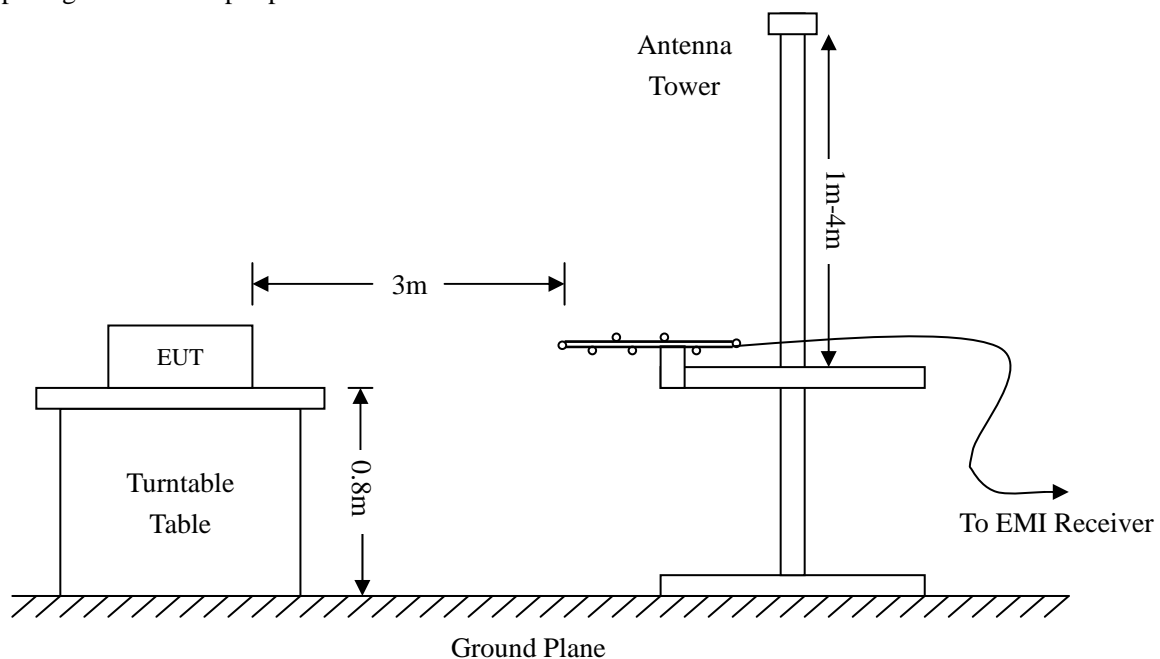
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2010-12-20	2011-12-19
EMI Test Receiver	R&S	ESVB	825471/005	2010-12-20	2011-12-19
Positioning Controller	C&C	CC-C-1F	N/A	2010-12-20	2011-12-19
RF Switch	EM	EMSW18	SW060023	2010-12-20	2011-12-19
Pre-amplifier	Agilent	8447F	3113A06717	2010-12-20	2011-12-19
Pre-amplifier	Compliance Direction	PAP-0118	24002	2010-12-20	2011-12-19
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2011-01-09	2012-01-08
Horn Antenna	ETS	3117	00086197	2011-01-09	2012-01-08
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2011-01-09	2012-01-08

### 4.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 and FCC Part 15.109 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.



#### 4.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} - \text{Corr. Factor}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Part 15B Limit}$$

*The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.*

#### 4.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

#### 4.6 Summary of Test Results/Plots

According to the data, the EUT complied with the FCC Part 15B Class B standards, and had the worst margin of:

**-3.73 dBμV at 63.1857MHz in the Vertical polarization, 30 MHz to 1 GHz, 3Meters**

Plot of Radiation Emissions Test Data

Radiated Disturbance

EUT: BT Dongle

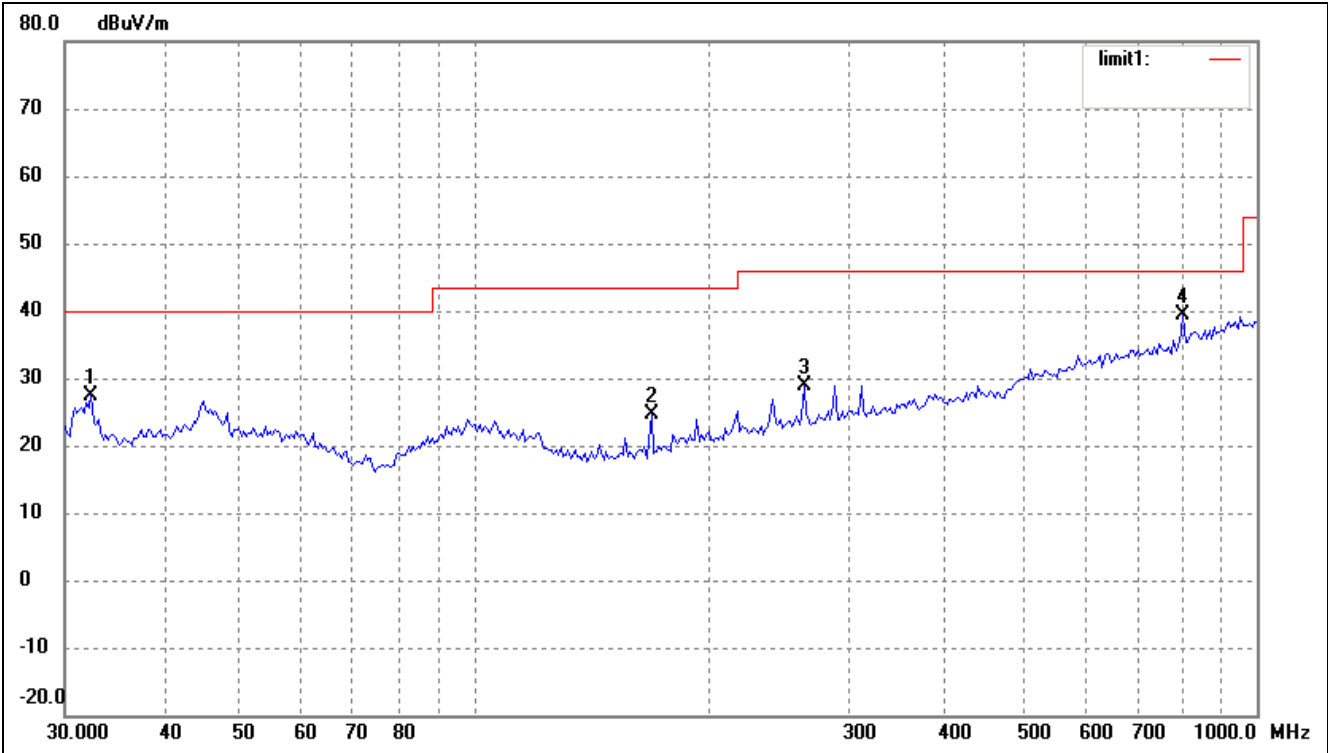
M/N: W88DG

Operating Condition: Operating

Test Specification: Horizontal & Vertical

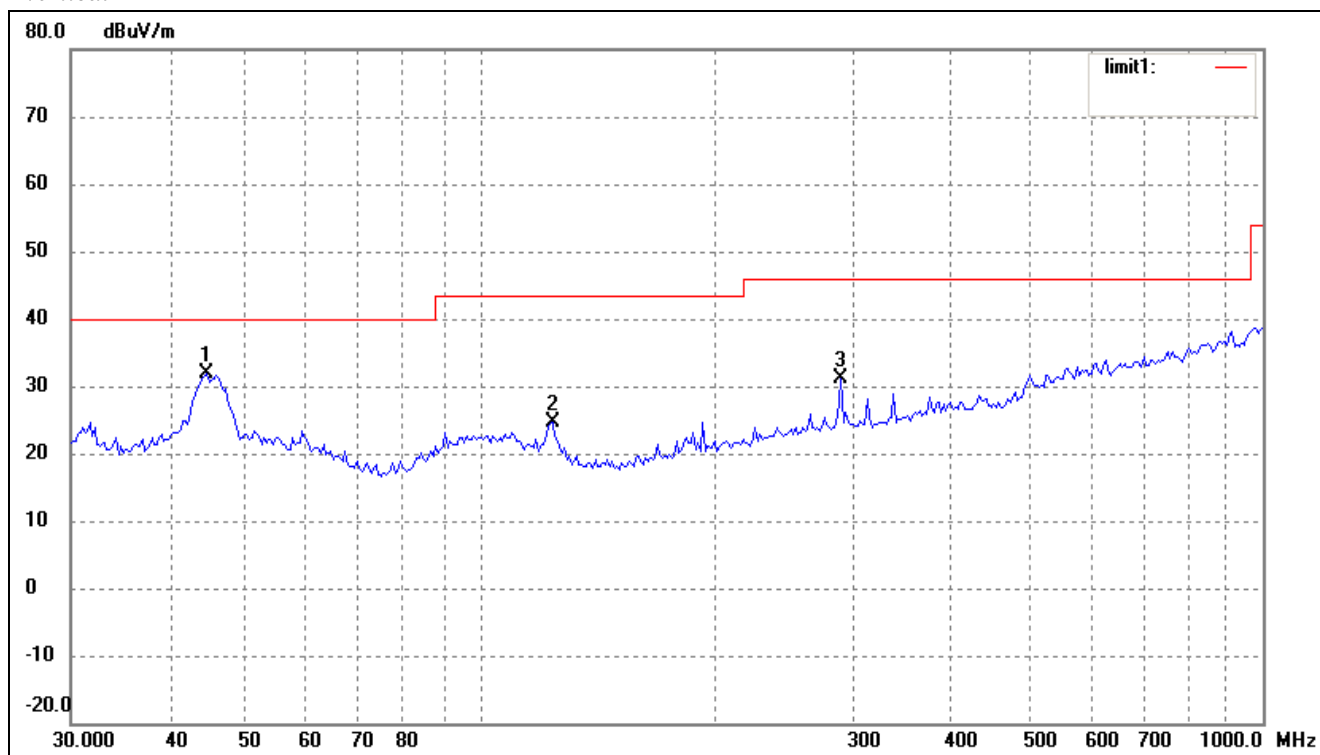
Comment: AC 120V/60Hz USB DC 5V

Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	( ° )	(cm)	
1	32.4059	20.73	6.77	27.50	40.00	-12.50	360	100	peak
2	168.4138	19.77	4.84	24.61	43.50	-18.89	360	100	peak
3	263.8190	19.91	9.06	28.97	46.00	-17.03	360	100	peak
4	804.6028	20.23	19.10	39.33	46.00	-6.67	360	100	peak

Vertical



No.	Frequency (MHz)	Reading (dBuV/m)	Correct Factor(dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree ( ° )	Height (cm)	Remark
1	44.7433	23.61	8.22	31.83	40.00	-8.17	360	100	peak
2	123.6985	19.10	5.44	24.54	43.50	-18.96	360	100	peak
3	289.0021	21.51	9.63	31.14	46.00	-14.86	360	100	peak

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5<sup>th</sup> Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4.  
The measurements greater than 20dB below the limit from 9kHz to 30MHz..

\*\*\*\*\* END OF REPORT \*\*\*\*\*