

EMI Test Report

Model Name: USB HUB
Model Number: DX-B4PORT
Brand Name: DYNEX
Trade Mark: DYNEX

FCC ID: XJIBLKDXB4PORT

Prepared for Belkin Electronics (Changzhou) Co., Ltd.

According to FCC Part 15, Class B

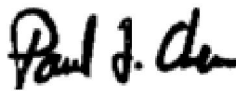
Test Report #: SHA-0909-8350-FCC

Prepared by: Cloud Feng

Reviewed by: Harry Zhao

QC Manager: Paul Chen

Test Report Released by:



Paul Chen

2009, July 13

Date

Test Location

Tests performed in a Certified ANSI Semi-Anechoic Chamber and Shielded Room performed testing.

Test Site Location: *ECMG Worldwide Certification
Solution, Inc. (China)
Building 2, 1298 Lian Xi Road,
Pu Dong New Area, Shanghai,
P.R. China 201204*

Tel: *86-21-51909300*
Fax: *86-21-51909333*
FCC Registration Number: *172634*

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Administrative Data

Test Sample : USB HUB

Model Tested : DX-B4PORT

Trade Mark : DYNEX

Serial Number : Engineering Sample

Date Tested : 2009, October 09th

*Applicant : Belkin Electronics (Changzhou) Co., Ltd.
Bldg 6C, No.8 Xi-Hu Road, Wujin Hi-Tech
Industrial Zone, Jiangsu*

Telephone : 86-519-86220991

Fax : 86-519-86226020

*Manufacturer : Belkin Electronics (Changzhou) Co., Ltd.
Bldg 6C, No.8 Xi-Hu Road, Wujin Hi-Tech
Industrial Zone, Jiangsu*

EUT Description

Belkin Electronics (Changzhou) Co., Ltd., models DX-B4PORT (referred to as the EUT in this report) is a USB HUB.

The highest frequency generated by the EUT is 480 MHz, so the frequency range tested is from 30MHz – 2000MHz.

Test Summary

The Electromagnetic Compatibility requirements on model DX-B4PORT for this test are stated below. All results listed in this report relate exclusively to this above-mentioned model as the Equipment under Test. This report confers no approval or endorsement upon any other component, host or subsystem used in the test set-up.

| <i>Emission Tests</i> | | | | |
|----------------------------------------------|---------------------------|-----------------------------------------------------------------------------------------|----------------------|---------------------|
| <i>Specifications</i> | <i>Description</i> | <i>Test Results</i> | <i>Test Point</i> | <i>Remark</i> |
| <i>FCC Part 15.107 (150kHz – 30MHz)</i> | <i>Conducted Emission</i> | <i>For DX-B4PORT: Passed by 11.85 dB of QP Passed by 12.94 dB of AVE</i> | <i>AC Input Port</i> | <i>Attachment 1</i> |
| <i>FCC Part 15.109 (30MHz – 2000MHz)</i> | <i>Radiated Emission</i> | <i>For DX-B4PORT: Passed by 2.06 dB of QP</i> | <i>Enclosure</i> | <i>Attachment 2</i> |

Test Mode Justification

This device complies with Part 15 Class B of the FCC rules. The system was tested in the Transmitting data mode.

The EUT connects one U-disk and the other ports connect with USB cables. Pursuant to section 6.1.3(4) of ANSI C63.4, Where there are multiple ports all of the same type, additional connecting cables or wires shall be added to the EUT to determine the effect these cables or wires have on both radiated and conducted emissions from the EUT. The number of additional cables or wires should be limited to the condition where the addition of another cable or wire does not significantly affect the emission level, i.e., varies less than 2 dB, provided, of course, that the EUT remains compliant. These additional cables or wires need not be terminated.

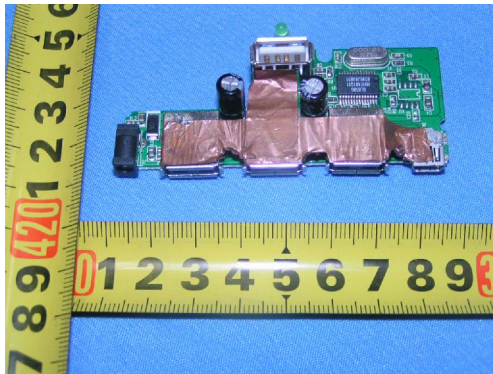
EUT Exercise Software

The software transmit.bat runs on windowsXP, which was used to exercise the EUT during testing. The files are copying and deleting continuously from the U-disk attached on the USB port of EUT to the PC.

Equipment Modification

There is a copper cover the USB connector. This modification is made to the EUT to bring the EUT into compliance with the appropriate specifications, that the product will have all of the modification incorporated into the product when manufactured and placed on the market.

The copper's dimension is 62mm 25mm, Manufacturer: lairdcateron, Kunshan.*



There were no modifications installed by ECMG Worldwide Certification Solution, Inc (China) test personnel.

Test System Details

| <i>EUT</i> | |
|-----------------------|-------------------------------------------------|
| <i>Model Numbers:</i> | <i>DX-B4PORT</i> |
| <i>Trade Mark:</i> | <i>DYNEX</i> |
| <i>Input Voltage:</i> | <i>5V DC</i> |
| <i>Serial Number:</i> | <i>Engineering Sample</i> |
| <i>Description:</i> | <i>USB HUB</i> |
| <i>Manufacturer:</i> | <i>Belkin Electronics (Changzhou) Co., Ltd.</i> |

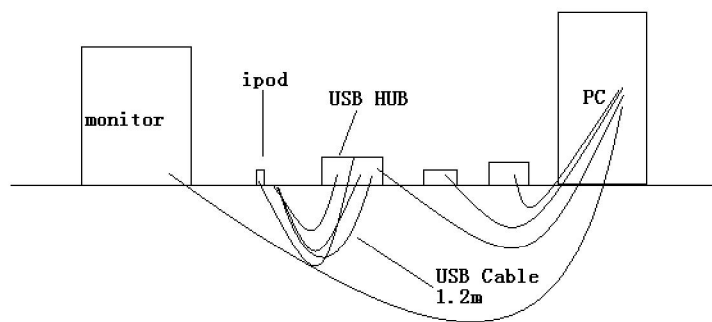
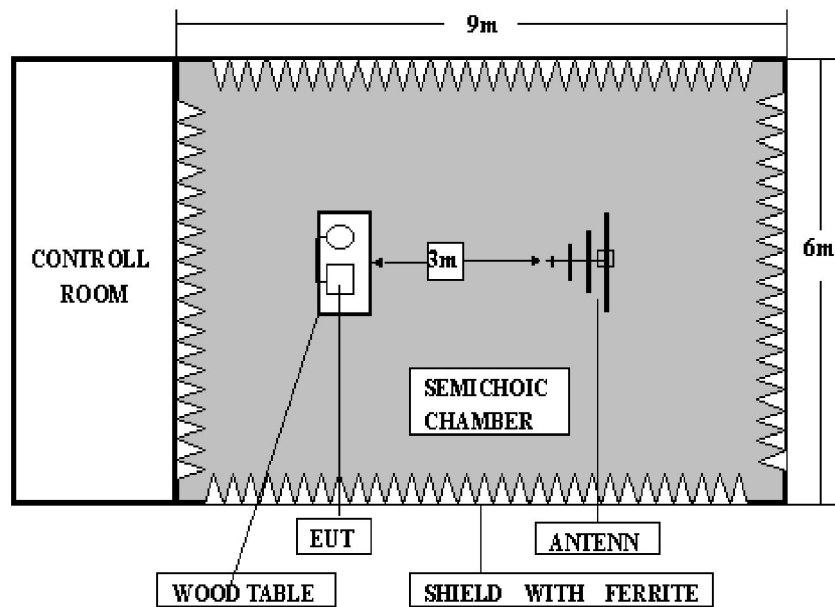
| <i>EUT Power Supply</i> | |
|-------------------------|------------------------------|
| <i>Model Numbers:</i> | <i>BLC150502600WU</i> |
| <i>Input:</i> | <i>100-240V 50/60Hz 0.3A</i> |
| <i>Output:</i> | <i>5V 2600MA</i> |

| <i>Support Equipment</i> | | | | |
|---------------------------|---------------------|----------------------------------|---------------------|--------------------------------|
| <i>Description</i> | <i>Model Number</i> | <i>Serial Number</i> | <i>Manufacturer</i> | <i>Power Cable Description</i> |
| <i>PC</i> | <i>OPTIPLEX 330</i> | <i>HBSF92X</i> | <i>DELL</i> | <i>1.8m unshielded</i> |
| <i>Monitor</i> | <i>E178FPC</i> | <i>CNOWR979641 807CA7L4C</i> | <i>DELL</i> | <i>1.8m unshielded</i> |
| <i>Keyboard</i> | <i>L100</i> | <i>CNORH656658 907C401F9</i> | <i>DELL</i> | <i>N/A</i> |
| <i>Mouse</i> | <i>MOC5UO</i> | <i>G1D02BPQ</i> | <i>DELL</i> | <i>N/A</i> |
| <i>Printer converter</i> | <i>45CV</i> | <i>961217</i> | <i>INTEL LIGENT</i> | <i>N/A</i> |
| <i>Remote control box</i> | <i>IT-251B</i> | <i>N/A</i> | <i>N/A</i> | <i>N/A</i> |

Continue on to the next page...

| | | | | | |
|---------------------------|-------------------------------|---------------|----------------------------|----------------------------|----------------------|
| <i>U disk</i> | <i>iPod shuffle MB683</i> | <i>03285</i> | <i>Apple</i> | <i>1.2m unshielded</i> | |
| <i>Cable Description</i> | | | | | |
| <i>Description</i> | <i>From</i> | <i>To</i> | <i>Length (Meters)</i> | <i>Shielded (Y/N)</i> | <i>Ferrite (Y/N)</i> |
| <i>Power Cable</i> | <i>Adaptor</i> | <i>EUT</i> | <i>1.5m</i> | <i>N</i> | <i>N</i> |
| <i>USB Cable</i> | <i>EUT</i> | <i>PC</i> | <i>1.2m</i> | <i>Y</i> | <i>N</i> |
| <i>Parallel Cable</i> | <i>Converter</i> | <i>PC</i> | <i>0.5m</i> | <i>N</i> | <i>N</i> |
| <i>Serial Cable</i> | <i>Remote box</i> | <i>PC</i> | <i>1.5m</i> | <i>N</i> | <i>N</i> |
| <i>USB Cable</i> | <i>EUT</i> | <i>U Disk</i> | <i>1.2m</i> | <i>Y</i> | <i>N</i> |
| <i>USB CableX3</i> | <i>EUT</i> | | <i>1.2m</i> | <i>N</i> | <i>N</i> |

Configuration of Tested System

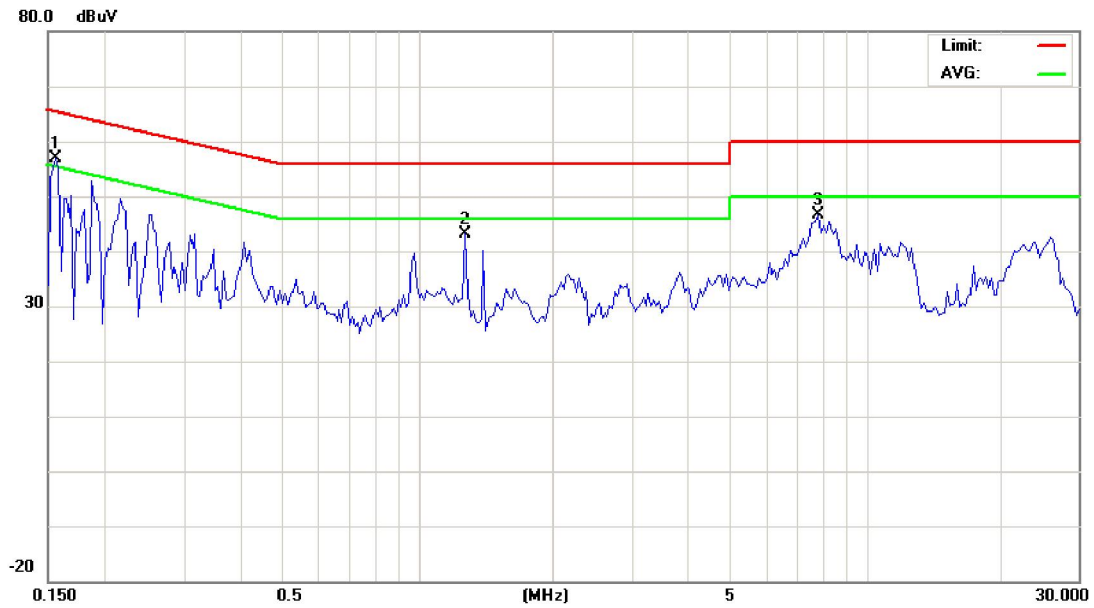


EUT arrangements Layout View

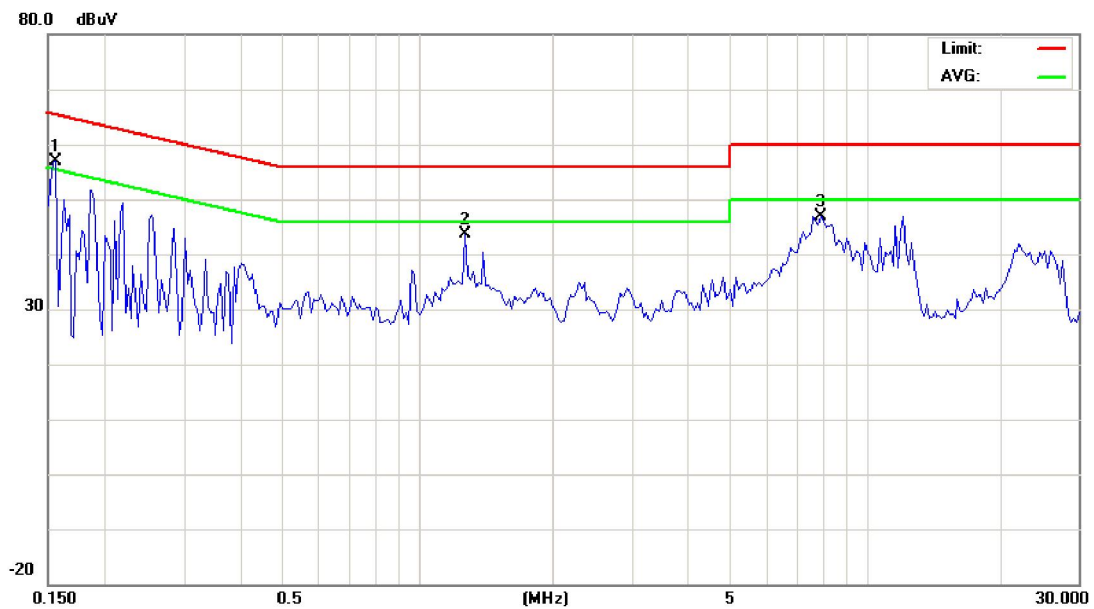
ATTACHMENT 1 - CONDUCTED EMISSION TEST RESULTS

| | | | |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|----------------------------------|
| CLIENT: | Belkin Electronics (Changzhou) Co., Ltd. | TEST REFERENCE: | FCC Part 15 subpart B Class B |
| MODEL NUMBER: | DX-B4PORT | PRODUCT: | USB HUB |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | ITE equipment |
| TEMPERATURE: | 25°C | HUMIDITY: | 52% |
| ATM PRESSURE: | 101.7Pa | GROUNDING: | Grounding through USB |
| TESTED BY: | Cloud Feng | DATE OF TEST: | 2009, October 09 |
| SETUP METHOD: | ANSI C63.4-2003 | | |
| TEST PROCEDURE: | <p>a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.</p> <p>b. Connect EUT to the power mains through a line impedance stabilization network(LISN)</p> <p>c. The LISN provides 50ohm coupling impedance for the measuring instrument</p> <p>d. Both sides of AC line were checked for maximum conducted interference.</p> <p>e. The frequency range from 150KHz to 30MHz was searched..</p> <p>f. Set the test-receiver system to Peak Detect Function and Specified bandwidth.</p> <p>g. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> | | |
| TESTED RANGE: | 150kHz to 30MHz | | |
| TEST VOLTAGE: | 120VAC/60Hz | | |
| RESULTS: | <p>For DX-B4PORT:</p> <p>The EUT meets the requirements of test reference for Conducted Emissions on line L by 11.85 dB of Quasi-Peak detector and by 12.94 dB of Average detector.</p> <p>The test results relate only to the equipment under test provided by client.</p> | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by ECMG Worldwide Certification Solution, Inc (China) test personnel. | | |
| M. UNCERTAINTY: | Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB | | |

For DX-B4PORT:



Line L Conducted Emission Graph



Line N Conducted Emission Graph

| Line L (Hot Lead) | | | | | | | | |
|----------------------------------------------------------------------------------------------------------|-----------------|---------------------------|------------------|----------------|-----------------|----------------------------|-------------------|-----------------|
| Signal | Frequency (MHz) | Corrected QP Level (dBuV) | Limits QP (dBuV) | Margin QP (dB) | Frequency (MHz) | Corrected AVE Level (dBuV) | Limits AVE (dBuV) | Margin AVE (dB) |
| 1 | 0.156 | 53.82 | 65.67 | -11.85 | 0.156 | 40.64 | 55.67 | -15.03 |
| 2 | 1.282 | 43.15 | 56.00 | -12.85 | 1.282 | 33.06 | 46.00 | -12.94 |
| 3 | 7.872 | 46.69 | 60.00 | -13.31 | 7.872 | 30.25 | 50.00 | -19.75 |
| Line N (Neutral Lead) | | | | | | | | |
| Signal | Frequency (MHz) | Corrected QP Level (dBuV) | Limits QP (dBuV) | Margin QP (dB) | Frequency (MHz) | Corrected AVE Level (dBuV) | Limits AVE (dBuV) | Margin AVE (dB) |
| 1 | 0.156 | 53.77 | 65.67 | -11.90 | 0.156 | 40.06 | 55.67 | -15.61 |
| 2 | 1.282 | 43.54 | 56.00 | -12.46 | 1.282 | 32.16 | 46.00 | -13.84 |
| 3 | 7.977 | 46.91 | 60.00 | -13.09 | 7.977 | 31.92 | 50.00 | -18.08 |
| Note: All readings are using a bandwidth of 9 kHz, with a 30 ms sweep time. A video filter was not used. | | | | | | | | |

| Test Equipment | Manufacturer | Model | Serial No. | Last Cal. | Cal. Due Date |
|--------------------------------------------------------------------------------------------------------------------|--------------|---------|------------|-----------|---------------|
| EMI Receiver | HP | 85462A | 3650A00363 | 11/29/08 | 11/28/09 |
| LISN 1 | R&S | ESH3-Z5 | 844249/018 | 12/04/08 | 12/03/09 |
| LISN 2 | EMCO | 3816/2 | 00084033 | 12/04/08 | 12/03/09 |
| Note: All testing were performed using internationally recognized standards. All test instruments were calibrated. | | | | | |

SIGNED BY:

Cloud Feng

ENGINEER

REVIEWED BY :

Hongzhan

SENIOR ENGINEER

EMC Test Report #: BEL-0909-8349-FCC

Prepared for Belkin Electronics (Changzhou) Co., Ltd.

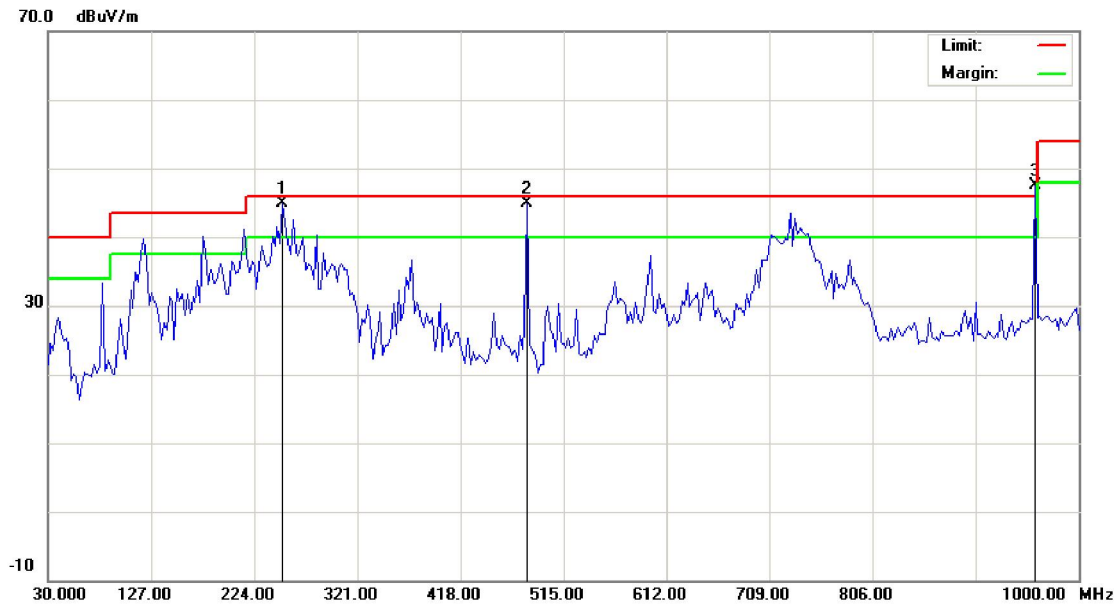
Prepared by ECMG Worldwide Certification Solution, Inc.

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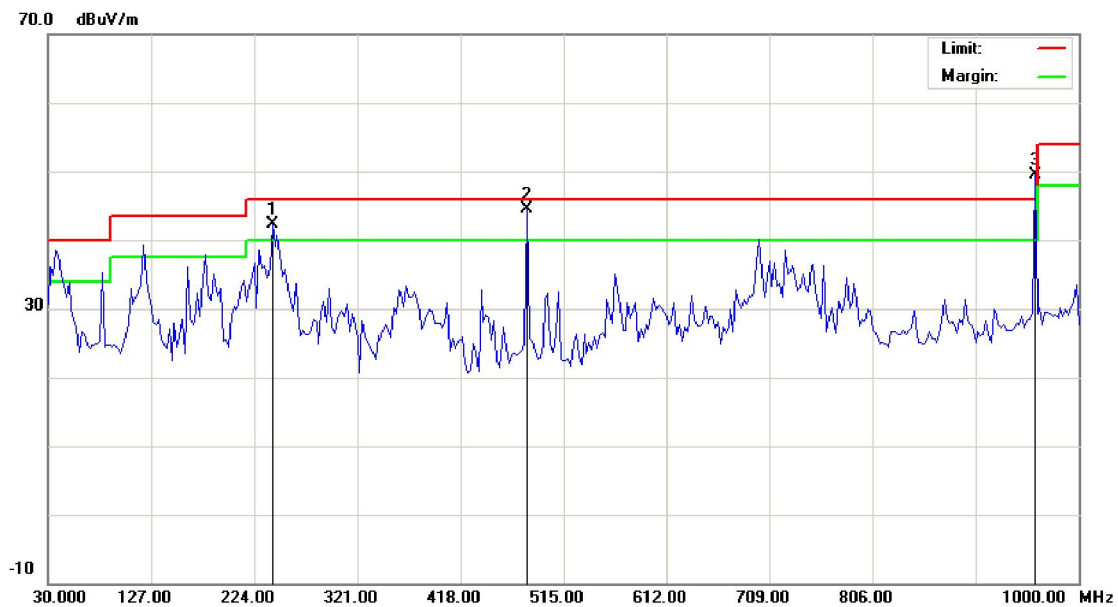
ATTACHMENT 2 - RADIATED EMISSION TEST RESULTS

| | | | |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------|-----------------------|
| CLIENT: | Belkin Electronics (Changzhou) Co., Ltd. | TEST REFERENCE: | FCC Part 15, Class B |
| MODEL TESTED: | DX-B4PORT | PRODUCT: | USB HUB |
| SERIAL NO.: | Engineering Sample | EUT DESIGNATION: | ITE equipment |
| TEMPERATURE: | 25°C | HUMIDITY: | 52% |
| ATM PRESSURE: | 101.7Pa | GROUNDING: | Grounding through USB |
| TESTED BY: | Cloud Feng | DATE OF TEST: | 2009, October 09 |
| SETUP METHOD: | ANSI C63.4-2003 | | |
| TEST PROCEDURE: | <p>a. The EUT was placed on a rotatable table with 0.8 meters above ground.</p> <p>b. The EUT was set 3 meters from the interference-receiving antenna, which was mounted on the top of a variable height antenna tower.</p> <p>c. For each suspected emission the EUT was arranged to its worst case and turn table (from 0 degree to 360 degree) to find the maximum reading.</p> <p>d. If the emission level of the EUT in peak mode was 20 dB lower than the specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be tested using the quasi-peak method in about six maximal points and the results will be reported.</p> <p>Explanation of the Correction Factor are given as follows:</p> $FS = RA + AF + CF - AG$ <p>Where: FS = Field Strength RA = Receiver Amplitude AF = Antenna Factor CF = Cable Attenuation Factor AG = Amplifier Gain</p> | | |
| TESTED RANGE: | 30MHz to 2000MHz | | |
| TEST VOLTAGE: | 120VAC / 60Hz | | |
| RESULTS: | <p>For DX-B4PORT: The EUT meets the requirements of test reference for Radiated Emissions on Horizontal polarization by 2.06 dB at 480.059 MHz.</p> <p>The test results relate only to the equipment under test provided by client.</p> | | |
| CHANGES OR MODIFICATIONS: | There were no modifications installed by ECMG Worldwide Certification Solution, Inc (China) test personnel. | | |
| M. UNCERTAINTY: | Freq. $\pm 2 \times 10^{-7}$ x Center Freq., Amp ± 2.6 dB | | |

*For DX-B4PORT:
30MHz-1000MHz*



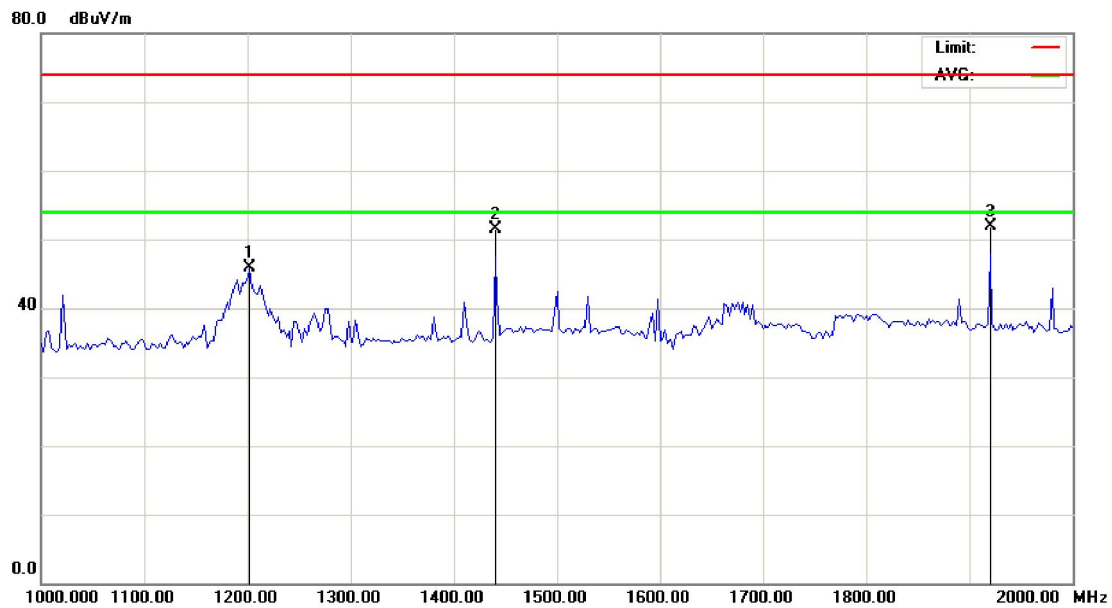
Field strength Emission Plot (Peak, Max Hold Mode Horizontal)



Field strength Emission Plot (Peak, Max Hold Mode Vertical)

| 30MHz-1000MHz | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------------------|-------------------------|-------------|--------------------------|----------------------|
| Horizontal | | | | | | | |
| Signal | Frequency (MHz) | Factor (dB) | Corrected QP Level dB(uV/m) | 3 Meter Limits dB(uV/m) | Margin (dB) | Angle of Turner (degree) | Height of Tower (cm) |
| 1 | 250.681 | 14.61 | 43.91 | 46.00 | -2.09 | 125 | 194 |
| 2 | 480.059 | 19.64 | 43.94 | 46.00 | -2.06 | 214 | 155 |
| 3 | 960.777 | 25.87 | 43.57 | 46.00 | -2.43 | 330 | 158 |
| Vertical | | | | | | | |
| Signal | Frequency (MHz) | Factor (dB) | Corrected QP Level dB(uV/m) | 3 Meter Limits dB(uV/m) | Margin (dB) | Angle of Turner (degree) | Height of Tower (cm) |
| 1 | 240.983 | 14.42 | 42.28 | 46.00 | -3.72 | 354 | 125 |
| 2 | 480.058 | 19.64 | 43.46 | 46.00 | -2.54 | 219 | 102 |
| 3 | 960.784 | 25.87 | 49.48 | 46.00 | 3.48 | 321 | 108 |
| Set-up/Configuration: ANSI C63.4-2003 | | | | | | | |
| Comments: None | | | | | | | |
| Note: All readings are quasi-peak unless stated otherwise, using a QPA bandwidth of 120kHz, with a 30 ms sweep time. A video filter was not used. | | | | | | | |

1000MHz- 2000MHz



Horizontal Radiated Emission Plot (Peak, Max Hold Mode)



Vertical Radiated Emission Plot (Peak, Max Hold Mode)

| 1000MHz-2000MHz | | | | | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------|-----------------------------|-----------------------------|-------------|-----------------------------|----------------------------|-------------|
| Horizontal | | | | | | | | |
| Signal | Frequency (MHz) | Factor (dB) | Corrected PK Level (dBuV/m) | 3 Meter PK Limits (dB uV/m) | Margin (dB) | Corrected AV Level (dBuV/m) | 3 Meter AV Limits (dBuV/m) | Margin (dB) |
| 1 | 1020.2 | 23.13 | 46.25 | 74.00 | -27.75 | 26.92 | 54.00 | -27.08 |
| 2 | 1440.3 | 25.77 | 50.24 | 74.00 | -23.76 | 26.36 | 54.00 | -27.64 |
| 3 | 1920.2 | 28.80 | 50.40 | 74.00 | -23.60 | 26.25 | 54.00 | -27.75 |
| Vertical | | | | | | | | |
| Signal | Frequency (MHz) | Factor (dB) | Corrected PK Level (dBuV/m) | 3 Meter PK Limits (dB uV/m) | Margin (dB) | Corrected AV Level (dBuV/m) | 3 Meter AV Limits (dBuV/m) | Margin (dB) |
| 1 | 1022.5 | 23.14 | 44.39 | 74.00 | -29.61 | 25.16 | 54.00 | -28.84 |
| 2 | 1200.5 | 24.26 | 50.18 | 74.00 | -23.82 | 26.34 | 54.00 | -27.66 |
| 3 | 1440.3 | 25.77 | 50.82 | 74.00 | -23.18 | 26.33 | 54.00 | -27.67 |
| Note: All readings are peak and average unless stated otherwise, using a bandwidth of 1000kHz, with a 30 ms sweep time. A video filter was not used. | | | | | | | | |

| Test Equipment | Manufacturer | Model | Serial No. | Last Cal. | Cal. Due Date |
|--------------------------------------------------------------------------------------------------------------------|--------------|-----------|------------|-----------|---------------|
| EMI Receiver | HP | 85462A | 3650A00363 | 11/29/08 | 11/28/09 |
| Broadband Antenna | Sunol | JB5 | A110503 | 11/29/08 | 11/28/09 |
| Broadband Horn Antenna | Schwarzbek | BBHA9120D | 430 | 11/29/08 | 11/28/09 |
| Note: All testing were performed using internationally recognized standards. All test instruments were calibrated. | | | | | |

SIGNED BY: Chou Feng
ENGINEER

REVIEWED BY: Hangzhou
SENIOR ENGINEER

