FCC 47 CFR PART 15 SUBPART C AND ANSI C63.4 : 2003

TEST REPORT (Class II Permissive Change Report)

For

Microsoft Office Communicator USB Dongle

Model : 1112

Trade Name : Microsoft

Issued for

Microsoft Corporation

One Microsoft Way, Redmond, WA 98052-6399, United States

Issued by

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1. TEST REPORT CERTIFICATION

Applicant	：Microsoft Corporation
Address	：One Microsoft Way, Redmond, WA 98052-6399, United States
Equipment Under Test	：Microsoft Office Communicator USB Dongle
Model	：1112
Trade Name	：Microsoft
Tested Date	：February 14 ~ March 01, 2007

APPLICABLE STANDARD	
STANDARD	**TEST RESULT**
FCC Part 15 Subpart C:2004 AND ANSI C63.4:2003	No non-compliance noted

Approved by: ***Reviewed by:***

S. B. Lu

S. B. Lu
Assistant Manager of Hsinchu Laboratory
Compliance Certification Services Inc.

Gundam Lin

Gundam Lin
Test Engineer of Hsinchu Laboratory
Compliance Certification Services Inc.

WE HEREBY CERTIFY THAT: The measurements shown in the attachment were made in accordance with the procedures indicated, and the energy emitted by the equipment was found to be within the limits applicable. We assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

2. EUT DESCRIPTION

2.1 DESCRIPTION OF EUT & POWER

Product Name	Microsoft Office Communicator USB Dongle
Model Number	1112
Frequency Range	2402MHz to 2480MHz f = 2402 + nMHz, n = 0, …..78
Transmit Power	3.64dBm
Channel Spacing	1MHz
Channel Number	79
Air Data Rate	GFSK (1Mbps)
Type of Modulation	Frequency Hopping Spread Spectrum
Frequency Selection	by software / firmware
Transmitter Classification	portable device
Antenna Type	PCB Antenna, Antenna Gain : 3.2dBi
Power Source	5VDC (From Notebook PC, Host Device or Power Adapter)
RF Exposure Evaluation	Since the EUT is classed portable device, and the maximum peak power is 3.64dBm (<13.6dBm), the MPE evaluation is not required and no SAR consideration applied.

Power Adapter :

No.	Manufacturer	Model No.	Power Input	Power Output
1	SWTTCHING	SYS1196-0605-W2	100-240VAC / 50~60Hz, 0.3A	5VDC, 0.5A

Remark:

1. The sample selected for test was engineering sample that approximated to production product and was provided by manufacturer.
2. This submittal(s) (test report) is intended for FCC ID: C3K1112 filing to comply with Section 15.207,15.209 and 15.247 of the FCC Part 15, Subpart C Rules.
3. For more details, please refer to the User's manual of the EUT.
4. This report is modified from 61116302-RP1.

2.2 DESCRIPTION OF CLASS II CHABNGE

The major change filed under this application are :
1. Remove original circuit board LED1 and alter LED2 position.
2. Add three color independent LEDs (LED1,LED3 ~ LED7).
3. SW1 changes into push switch, and move the position.
4. The matching circuit position on RF trace is moved.
5. Antenna position is moved outside. (The new circuit board is relatively long.)
6. Examined antenna gain bigger than originally by quantity.
7. Add one power adapter and dock.

3. DESCRIPTION OF TEST MODES

The EUT had been tested under operating condition.

There are three channels have been tested as following :

Channel	Frequency (MHz)
Low	2402
Middle	2441
High	2480

Radiated Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between EUT and available peripherals.

☒ Following modes were selected for the final test as listed below.

Tested Mode	Description Of Test Setup
USB Charging Mode	EUT & peripherals setup diagram is shown in appendix setup photos.
USB Wireless Mode	
AC / DC Charging Mode	
AC / DC Wireless Mode	
AC/DC Charging w/o Dock Mode	
AC/DC Wireless w/o Dock Mode	

Radiated Emission Test (Above 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Mid, High	FHSS	GFSK	DH1

Bandedge Measurement :

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, High	FHSS	GFSK	DH1

Antenna Port Conducted Measurement :

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

Tested Channel	Modulation Technology	Modulation Type	Packet Type
Low, Mid, High	FHSS	GFSK	DH1

Power Line Conducted Emission Test (Below 1 GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between EUT and available peripherals.

☒ Following modes were selected for the final test as listed below.

Tested Mode	Description Of Test Setup
AC / DC Charging Mode	EUT & peripherals setup diagram is shown in appendix setup photos.
AC / DC Wireless Mode	

Note：The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X,Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.

4. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 2.1046, 2046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, 15.207, 15.209 and 15.247.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at Rm.258, Bldg.17, NO.195 , Sec. 4, Chung Hsing Rd., Chu-Tung Chen. Hsin-Chu, Taiwan 310 R.O.C.
The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.
Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.
Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

5.3 LABORATORY ACCREDITATIONS LISTINGS

The test facilities used to perform radiated and conducted emissions tests are accredited by National Voluntary Laboratory Accreditation Program for the specific scope of accreditation under Lab Code: 200118-0 to perform Electromagnetic Interference tests according to FCC PART 15 AND CISPR 22 requirements. No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government. In addition, the test facilities are listed with Federal Communications Commission (registration no: 90585 and 90584).

5.4 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	NVLAP	EN 55014-1, AS/NZS 1044, CNS 13783-1, IEC/CISPR 14-1, IEC/CISPR 22, EN 55022, EN 61000-3-2, EN 61000-3-3, ANSI C63.4, AS/NZS CISPR 22, AS/NZS 3548, IEC 61000-4-2/3/4/5/6/8/11	200118-0
USA	FCC	3/10 meter Open Area Test Sites to perform FCC Part 15/18 measurements	90585, 90584
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	R-1229/1189 C-1250/1294
Taiwan	TAF	FCC Method-47 CFR Part 15 Subpart C,D,E CISPR 11, FCC METHOD-47 CFR Part 18, EN 55011, CNS 13803, CISPR 13, CNS 13439, FCC Method-47 CFR Part 15 Subpart B, CISPR 14-1, EN 55014-1, CNS 13783-1, EN 55015, CNS 14115, CISPR 22, EN 55022, VCCI CNS 13438, EN 61000-4-2/3/4/5/6/8/11	Testing Laboratory 0240
Taiwan	BSMI	CNS 13803, CNS 13438, CNS 13439, CNS 13783-1, CNS 14115	SL2-IS-E-0002 SL2-IN-E-0002 SL2-A1-E-0002 SL2-R1-E-0002 SL2-R2-E-0002 SL2-L1-E-0002
Canada	Industry Canada	RSS212, Issue 1	IC 4417-1

** No part of this report may be used to claim or imply product endorsement by NVLAP or any agency of the US Government.*

6. CALIBRATION AND UNCERTAINTY

6.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

6.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 1000 MHz	+/- 3.2 dB
Radiated Emission, 1 to 26.5GHz	+/- 3.2 dB
Power Line Conducted Emission	+/- 2.1 dB

Uncertainty figures are valid to a confidence level of 95%

7. SETUP OF EQUIPMENT UNDER TEST

SUPPORT EQUIPMENT

No.	Product	Manufacturer	Model No.	Serial No.	FCC ID
1	Notebook PC	DELL	Latitude D610	CN-0C4708-48643-625-5565	E2K24BNHM
2	Printer	HP	Deskjet 948c	CN19T6S011	FCC DoC
3	Mouse	Logitech	M-BJ58	LNA14607307	FCC DoC
4	Modem	ZyXEL	Omni 56k	S1Z4107727	I880MNI56K
5	Microsoft Office Communicator USB Earbud	Microsoft	1107	----------	C3K1107

SETUP DIAGRAM FOR TESTS

EUT & peripherals setup diagram is shown in appendix setup photos.

EUT OPERATING CONDITION

Above 1GHz :

1. Setup all computers like the setup diagram.
2. Run CSR Blue Test software (ver1.22).
3. Select the following settings,
   Transport type: USB
   USB Device:csr0
4. TX mode (GFSK)
   TXSTART
   LO Freq: 2402, 2441, 2480
   Power (EXT, Int): 255,58
   Modulation Freq:0
   CFG PKT, Packet Type: 4
   Packet Size: 27
5. RX mode (GFSK)
   RXSTART1
   LO Freq: 2402, 2441, 2480
   RX Attenuation 0
   CFG PKT, Packet Type: 4
   Packet Size: 27
6. All of the function are under run.
7. Start test.

Below 1GHz :

1. Setup all computers like the setup diagram.
2. All of the function are under run.
3. Start test.

8. APPLICABLE LIMITS AND TEST RESULTS

8.1 RADIATED EMISSIONS

8.1.1 TRANSMITTER RADIATED SUPURIOUS EMSSIONS

LIMITS

§ 15.205 (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
[1]0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 -1710	10.6 -12.7
6.26775 - 6.26825	108 -121.94	1718.8 - 1722.2	13.25 -13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 – 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 -16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3338	36.43 - 36.5
12.57675 - 12.57725	322 -335.4	3600 - 4400	([2])
13.36 - 13.41			

[1] Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

[2] Above 38.6

§ 15.205 (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown is Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§ 15.209 (a) Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table :

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
30 - 88	100 **	3
88 - 216	150 **	3
216 - 960	200 **	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz, However, operation within these frequency bands is permitted under other sections of this Part, e-g, Sections 15.231 and 15.241.

§ 15.209 (b) In the emission table above, the tighter limit applies at the band edges.

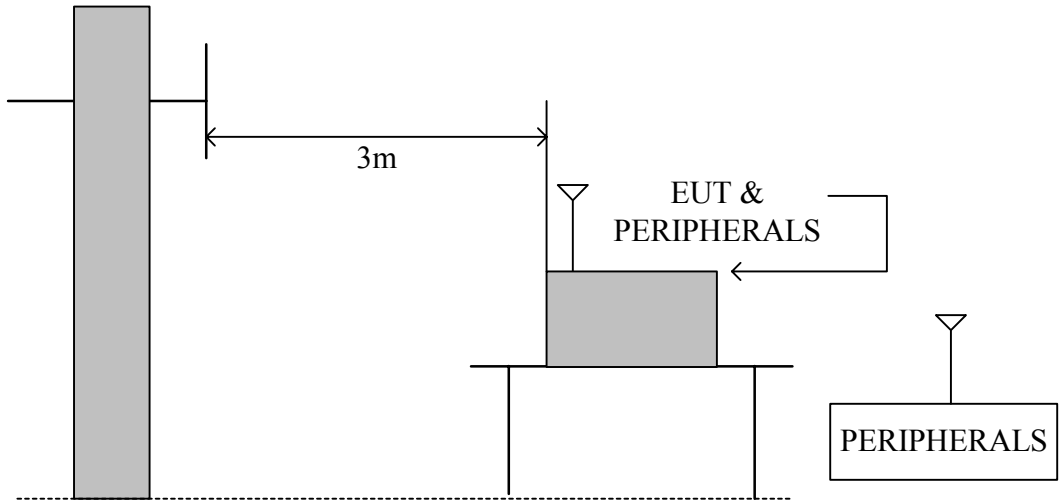
TEST EQUIPMENTS

The following test equipments are utilized in making the measurements contained in this report.

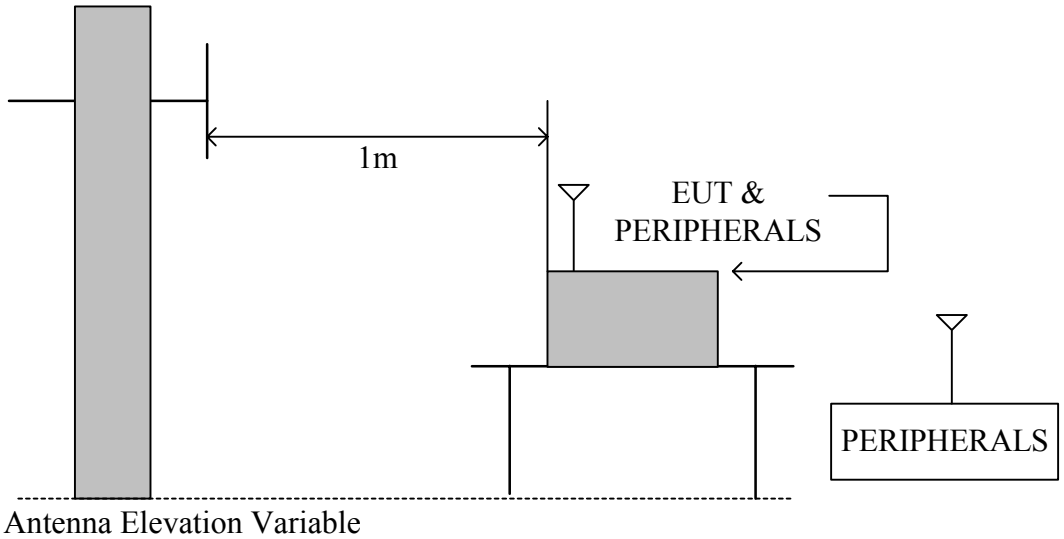
Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
CHASE BI-LOG ANTENNA	CBL6112B	2817	August 28, 2006	1 Year	FINAL
R/S SPECTRUM ANALYZER	FSEK30	835253/002	October 18, 2006	1 Year	FINAL
AGILENT SPECTRUM ANALYZER	E4446A	MY433601.32	March 22, 2006	1 Year	FINAL
R/S EMI TEST RECEIVER	ESCS30	835418/008	September 02, 2006	1 Year	FINAL
OPEN SITE	----------	No.2	May 07, 2006	1 Year	FINAL
N TYPE COAXIAL CABLE	9913-30M	001	August 21, 2006	1 Year	FINAL
Horn Antenna	AH-118	10089	August 30, 2006	1 Year	FINAL
Horn Antenna	AH-840	03077	February 25, 2006	1 Year	FINAL
Agilent Pre-amplifier	8449B	3008A01471	December 25, 2006	1 Year	FINAL
HP Amplifier	8447D	1937A02748	December 25, 2006	1 Year	FINAL
HP High pass filter	84300/80038	002	CAL. ON USE	1 Year	FINAL
HP High pass filter	84300/80039	003	CAL. ON USE	1 Year	FINAL
Loop Antenna ETS-LINDGREN	6502	2356	June 15, 2006	1 Year	FINAL

TEST SETUP

The diagram below shows the test setup that is utilized to make the measurements for emission from 30 to 1GHz.



The diagram below shows the test setup that is utilized to make the measurements for emission above 1GHz.



TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. White measuring the radiated emission below 1GHz, the EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. White measuring the radiated emission above 1GHz, the EUT was set 1 meters away from the interference-receiving antenna

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarization of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

Note：

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.

2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection and frequency above 1GHz.

3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

TEST RESULTS

No non-compliance noted

8.1.2 WORST-CASE RADIATED EMISSION BELOW 1 GHz

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	USB Charging Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
219.99	11.08	2.02	11.20	10.70	46.00	24.30	23.80
239.99	12.16	2.11	16.50	15.90	46.00	30.77	30.17
249.99	12.70	2.15	18.20	16.70	46.00	33.05	31.55
335.99	14.91	2.53	10.60	6.30	46.00	28.04	23.74
399.99	16.70	2.81	14.80	11.20	46.00	34.31	30.71
599.98	18.90	3.55	6.30	6.60	46.00	28.75	29.05
749.99	20.20	4.05	8.00	5.50	46.00	32.25	29.75
799.98	20.70	4.23	8.60	5.20	46.00	33.53	30.13

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	USB Wireless Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
194.56	9.92	1.91	8.80	9.90	43.50	20.63	21.73
216.30	10.88	2.00	13.50	14.60	46.00	26.38	27.48
250.00	12.70	2.16	21.20	14.70	46.00	36.06	29.56
335.99	14.91	2.53	10.80	5.50	46.00	28.24	22.94
399.99	16.70	2.81	13.90	12.50	46.00	33.41	32.01
601.36	18.91	3.55	6.10	6.30	46.00	28.57	28.77
749.99	20.20	4.05	6.90	7.00	46.00	31.15	31.25
799.98	20.70	4.23	8.80	7.80	46.00	33.73	32.73

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	AC / DC Charging Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
194.56	9.92	1.91	8.00	9.50	43.50	19.83	21.33
216.30	10.88	2.00	10.80	15.20	46.00	23.68	28.08
250.00	12.70	2.16	15.90	14.20	46.00	30.76	29.06
375.00	16.00	2.70	8.80	8.90	46.00	27.50	27.60
399.99	16.70	2.81	14.90	12.10	46.00	34.41	31.61
601.36	18.91	3.55	5.50	6.30	46.00	27.97	28.77
749.99	20.20	4.05	6.60	5.20	46.00	30.85	29.45
799.98	20.70	4.23	8.60	7.70	46.00	33.53	32.63

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	AC / DC Wireless Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
194.56	9.92	1.91	7.50	9.20	43.50	19.33	21.03
216.30	10.88	2.00	11.90	15.50	46.00	24.78	28.38
250.00	12.70	2.16	16.70	15.70	46.00	31.56	30.56
375.00	16.00	2.70	8.90	10.20	46.00	27.60	28.90
399.99	16.70	2.81	15.10	12.80	46.00	34.61	32.31
601.36	18.91	3.55	6.20	5.70	46.00	28.67	28.17
749.99	20.20	4.05	8.60	6.20	46.00	32.85	30.45
799.98	20.70	4.23	9.80	6.50	46.00	34.73	31.43

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	AC/DC Charging w/o Dock Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
194.56	9.92	1.91	8.70	10.30	43.50	20.53	22.13
216.30	10.88	2.00	17.80	17.10	46.00	30.68	29.98
250.00	12.70	2.16	20.10	17.50	46.00	34.96	32.36
375.00	16.00	2.70	10.90	9.80	46.00	29.60	28.50
399.99	16.70	2.81	16.00	12.50	46.00	35.51	32.01
500.00	17.80	3.16	6.60	9.70	46.00	27.56	30.66
749.99	20.20	4.05	9.10	7.50	46.00	33.35	31.75
799.98	20.70	4.23	10.70	8.60	46.00	35.63	33.53

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/28
Model Name	1112	**Test By**	Gundam Lin
Test Mode	AC/DC Wireless w/o Dock Mode	**TEMP & Humidity**	23°C, 68%

Frequency (MHz)	Antenna Factor (dB/m)	Cable Loss (dB)	Meter Reading at 3m(dBμV)		Limits (dBμV/m)	Emission Level at 3m(dBμV/m)	
			Horizontal	Vertical		Horizontal	Vertical
194.56	9.92	1.91	9.60	11.10	43.50	21.43	22.93
216.30	10.88	2.00	14.10	15.70	46.00	26.98	28.58
250.00	12.70	2.16	17.60	16.00	46.00	32.46	30.86
375.00	16.00	2.70	9.30	10.50	46.00	28.00	29.20
399.99	16.70	2.81	15.30	12.20	46.00	34.81	31.71
601.36	18.91	3.55	5.80	5.50	46.00	28.27	27.97
749.99	20.20	4.05	9.20	6.30	46.00	33.45	30.55
799.98	20.70	4.23	9.90	7.80	46.00	34.83	32.73

Remark: *Emission level (dBμV/m) =Antenna Factor (dB/m) + Cable loss (dB) + Meter Reading (dBμV).*

8.1.3 TRANSMITTER RADIATED EMISSION ABOVE 1 GHz

Product Name	Microsoft Office Communicator USB Dongle	**Test Date**	2007/02/14
Model Name	1112	**Test By**	Gundam Lin
Test Mode	CH Low TX	**TEMP & Humidity**	19°C, 67%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1601.95	49.25	27.30	3.76	35.24	9.50	0.00	35.57	74.00	-38.43	P	1.00
1601.95	39.57	27.30	3.76	35.24	9.50	0.00	25.89	54.00	-28.11	A	1.00
4804.05	60.46	34.49	6.32	35.46	9.50	0.37	56.67	74.00	-17.33	P	1.00
4804.05	40.85	34.49	6.32	35.46	9.50	0.37	37.06	54.00	-16.94	A	1.00
7206.00	46.22	39.51	8.26	35.64	9.50	0.93	49.77	74.00	-24.23	P	1.00
7206.00	32.81	39.51	8.26	35.64	9.50	0.93	36.36	54.00	-17.64	A	1.00
12010.00	46.70	41.72	10.58	35.49	9.50	0.45	54.45	74.00	-19.55	P	1.00
12010.00	33.39	41.72	10.58	35.49	9.50	0.45	41.14	54.00	-12.86	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1602.08	50.55	27.30	3.76	35.24	9.50	0.00	36.87	74.00	-37.13	P	1.00
1602.08	42.57	27.30	3.76	35.24	9.50	0.00	28.89	54.00	-25.11	A	1.00
4803.97	57.18	34.49	6.32	35.46	9.50	0.37	53.39	74.00	-20.61	P	1.00
4803.97	39.70	34.49	6.32	35.46	9.50	0.37	35.91	54.00	-18.09	A	1.00
7206.00	46.35	39.51	8.26	35.64	9.50	0.93	49.90	74.00	-24.10	P	1.00
7206.00	33.25	39.51	8.26	35.64	9.50	0.93	36.80	54.00	-17.20	A	1.00
12010.00	46.75	41.72	10.58	35.49	9.50	0.45	54.50	74.00	-19.50	P	1.00
12010.00	33.56	41.72	10.58	35.49	9.50	0.45	41.31	54.00	-12.69	A	1.00

Remark:

1. The measurement was searched to 10^{th} harmonic.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
5. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
6. The other emission levels were 20dB below the limit
7. The test limit distance is 3M limit.

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/14
Model Name	1112	Test By	Gundam Lin
Test Mode	CH Middle TX	TEMP & Humidity	19°C, 67%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1627.82	47.79	27.50	3.80	35.22	9.50	0.00	34.37	74.00	-39.63	P	1.00
1627.82	38.16	27.50	3.80	35.22	9.50	0.00	24.74	54.00	-29.26	A	1.00
4881.90	58.31	34.61	6.32	35.48	9.50	0.29	54.55	74.00	-19.45	P	1.00
4881.90	40.05	34.61	6.32	35.48	9.50	0.29	36.29	54.00	-17.71	A	1.00
7323.00	45.87	39.62	8.30	35.66	9.50	0.82	49.45	74.00	-24.55	P	1.00
7323.00	33.17	39.62	8.30	35.66	9.50	0.82	36.75	54.00	-17.25	A	1.00
12205.00	46.08	42.03	10.52	35.34	9.50	0.38	54.17	74.00	-19.83	P	1.00
12205.00	33.06	42.03	10.52	35.34	9.50	0.38	41.15	54.00	-12.85	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1628.32	52.76	27.50	3.80	35.22	9.50	0.00	39.34	74.00	-34.66	P	1.00
1628.32	41.58	27.50	3.80	35.22	9.50	0.00	28.16	54.00	-25.84	A	1.00
4882.15	55.55	34.61	6.32	35.48	9.50	0.29	51.79	74.00	-22.21	P	1.00
4882.15	39.12	34.61	6.32	35.48	9.50	0.29	35.36	54.00	-18.64	A	1.00
7323.00	46.68	39.62	8.30	35.66	9.50	0.82	50.26	74.00	-23.74	P	1.00
7323.00	33.15	39.62	8.30	35.66	9.50	0.82	36.73	54.00	-17.27	A	1.00
12205.00	46.45	42.03	10.52	35.34	9.50	0.38	54.54	74.00	-19.46	P	1.00
12205.00	33.03	42.03	10.52	35.34	9.50	0.38	41.12	54.00	-12.88	A	1.00

Remark:

1. The measurement was searched to 10th harmonic.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
5. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
6. The other emission levels were 20dB below the limit
7. The test limit distance is 3M limit.

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/14
Model Name	1112	Test By	Gundam Lin
Test Mode	CH High TX	TEMP & Humidity	19°C, 67%

Measurement Distance at 1m Horizontal polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1653.91	47.10	27.70	3.84	35.21	9.50	0.00	33.94	74.00	-40.06	P	1.00
1653.91	36.34	27.70	3.84	35.21	9.50	0.00	23.18	54.00	-30.82	A	1.00
4960.13	57.93	34.74	6.32	35.49	9.50	0.21	54.20	74.00	-19.80	P	1.00
4960.13	39.72	34.74	6.32	35.49	9.50	0.21	35.99	54.00	-18.01	A	1.00
7440.00	46.54	39.74	8.35	35.69	9.50	0.72	50.15	74.00	-23.85	P	1.00
7440.00	32.94	39.74	8.35	35.69	9.50	0.72	36.55	54.00	-17.45	A	1.00
12400.00	47.72	42.34	10.46	35.18	9.50	0.32	56.16	74.00	-17.84	P	1.00
12400.00	33.73	42.34	10.46	35.18	9.50	0.32	42.17	54.00	-11.83	A	1.00

Measurement Distance at 1m Vertical polarity											
Freq. (MHz)	Reading (dBμV)	AF (dBμV)	Cable (dB)	Pre-amp (dB)	Dist (dB)	Filter (dB)	Level 1m (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Mark (P/Q/A)	Height (Meter)
1653.83	50.65	27.70	3.84	35.21	9.50	0.00	37.49	74.00	-36.51	P	1.00
1653.83	39.85	27.70	3.84	35.21	9.50	0.00	26.69	54.00	-27.31	A	1.00
4959.93	54.63	34.74	6.32	35.49	9.50	0.21	50.90	74.00	-23.10	P	1.00
4959.93	38.42	34.74	6.32	35.49	9.50	0.21	34.69	54.00	-19.31	A	1.00
7440.00	46.62	39.74	8.35	35.69	9.50	0.72	50.23	74.00	-23.77	P	1.00
7440.00	33.08	39.74	8.35	35.69	9.50	0.72	36.69	54.00	-17.31	A	1.00
12400.00	47.11	42.34	10.46	35.18	9.50	0.32	55.55	74.00	-18.45	P	1.00
12400.00	33.77	42.34	10.46	35.18	9.50	0.32	42.21	54.00	-11.79	A	1.00

Remark:

1. The measurement was searched to 10th harmonic.
2. AF: Antenna Factor, Cable: Cable Loss, Pre-Amp: Preamplifier gain, Filter: High Pass Filter Insertion Loss (3.5GHz)
3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=1MHz, A(Average): RBW=1MHz, VBW=10Hz
4. Dist : correction to extra plate reading to 3m specification distance 1m measurement distance = -9.5dB
5. The result basic equation calculation is as follow:
Level = Reading + AF + Cable – Preamp + Filter – Dist, Margin = Level-Limit
6. The other emission levels were 20dB below the limit
7. The test limit distance is 3M limit.

8.2 POWERLINE CONDUCTED EMISSIONS

LIMITS

§ 15.207 (a) Except as shown in paragraph (b) and (c) this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

The lower limit applies at the boundary between the frequency ranges.

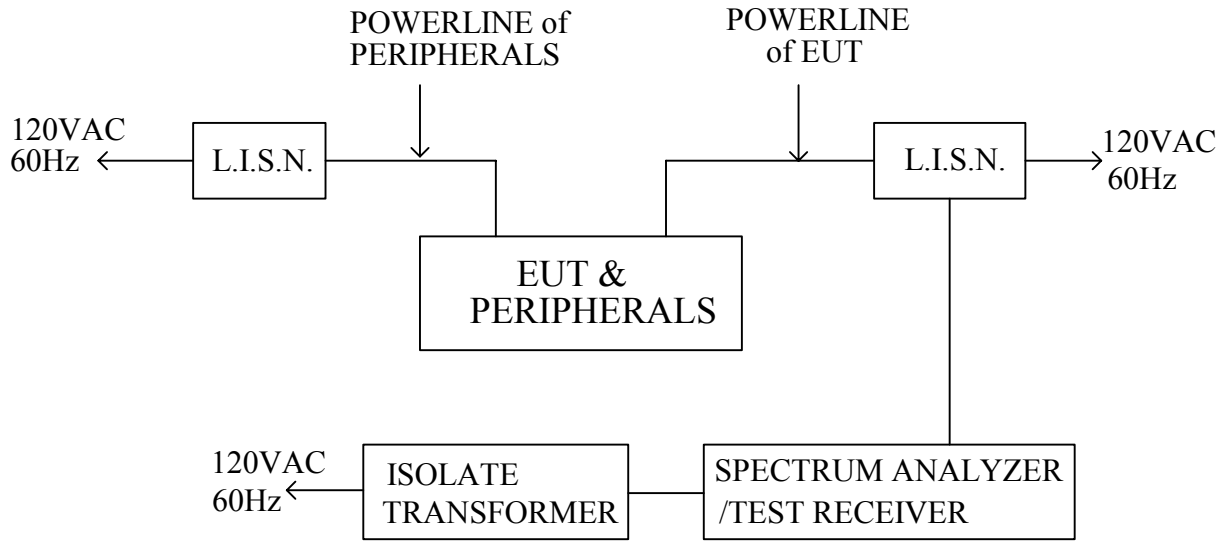
Frequency of Emission (MHz)	Conducted limit (dBμv)	
	Quasi-peak	Average
0.15 - 0.5	66 to 56	56 to 46
0.5 - 5	56	46
5 - 30	60	50

TEST EQUIPMENTS

The following test equipments are used during the conducted powerline tests：

Manufacturer or Type	Model No.	Serial No.	Date of Calibration	Calibration Period	Remark
EMCO L.I.S.N.	3850/2	9311-1025	January 26, 2007	1 Year	FINAL
CHASE L.I.S.N	NNLK 8129	8129118	January 26, 2007	1 Year	FINAL
R & S TEST RECEIVER	ESHS30	838550/003	January 31, 2007	1 Year	FINAL
KEENE SHIELDED ROOM	5983	No.1	N/A	N/A	FINAL
R & S PULSE LIMIT	EHS3Z2	357.8810.52	July 10, 2006	1 Year	FINAL
N TYPE COAXIAL CABLE	---------	----------	August 21, 2006	1 Year	FINAL
50Ω TERMINATOR	---------	----------	July 10, 2006	1 Year	FINAL

TEST SETUP



TEST PROCEDURE

The EUT is placed on a non-conducting table 40 cm from the vertical ground plane and 80cm above the horizontal ground plane. The EUT IS CONFIGURED IN ACCORDANCE WITH ANSI C63.4.

The resolution bandwidth is set to 9 kHz for both quasi-peak detection and average detection measurements.

Line conducted data is recorded for both NEUTRAL and LINE.

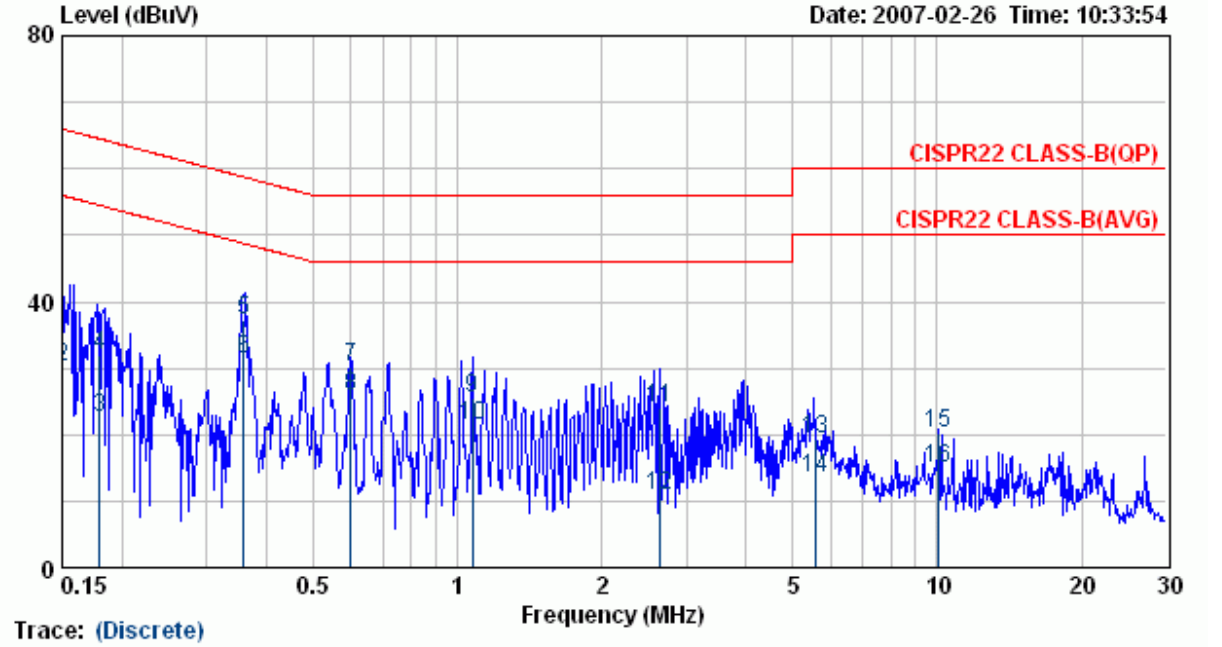
TEST RESULTS

No non-compliance noted

CONDUCTED RF VOLTAGE MEASUREMENT

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/26
Model	1112	Test By	Gundam Lin
Test Mode	AC / DC Charging Mode	TEMP & Humidity	24.3°C, 67%

LINE



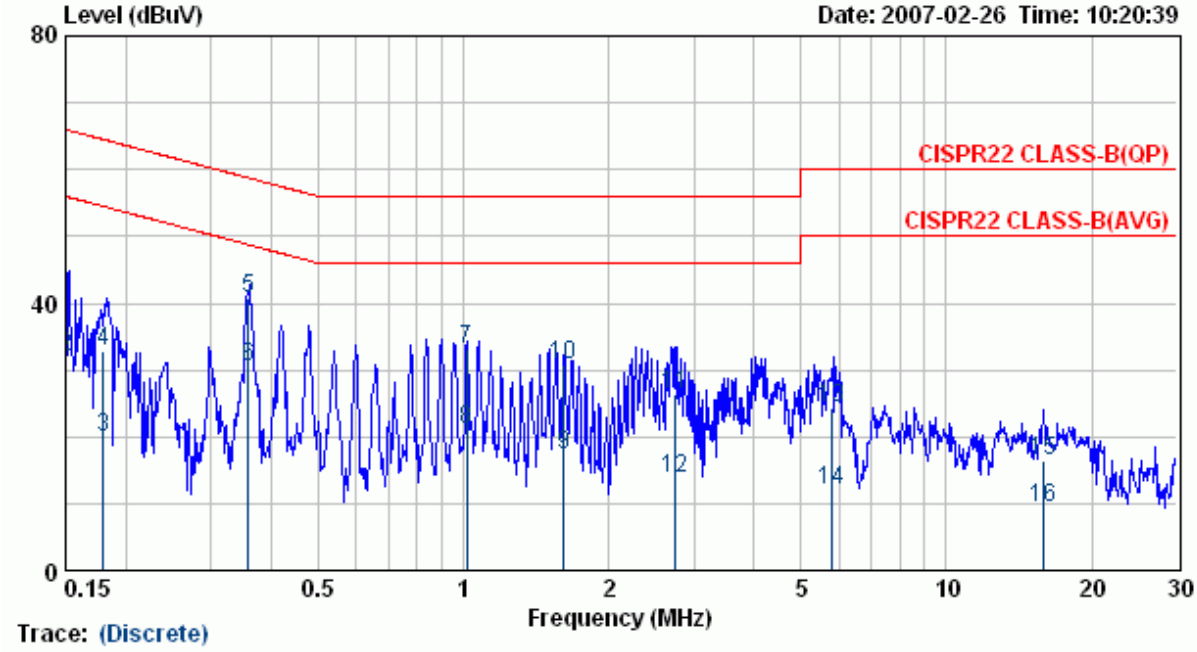
Freq.	Corr. Factor	Reading Value dBuV		Emission Level dBuV		Limit dBuV		Margin dBuV	
MHz	dB	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.	Q.P.	Ave.
0.150	0.12	35.31	30.15	35.43	30.27	66.00	56.00	-30.57	-25.73
0.180	0.12	31.68	22.50	31.80	22.62	64.49	54.49	-32.69	-31.87
0.359	0.05	37.25	31.44	37.30	31.49	58.76	48.76	-21.46	-17.27
0.600	0.03	30.19	25.64	30.22	25.67	56.00	46.00	-25.78	-20.33
1.077	0.04	25.51	21.46	25.55	21.50	56.00	46.00	-30.45	-24.50
2.632	0.08	23.92	10.89	24.00	10.97	56.00	46.00	-32.00	-35.03
5.562	0.13	19.09	13.49	19.22	13.62	60.00	50.00	-40.78	-36.38
10.060	0.24	19.91	14.65	20.15	14.89	60.00	50.00	-39.85	-35.11

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/26
Model	1112	Test By	Gundam Lin
Test Mode	AC / DC Charging Mode	TEMP & Humidity	24.3°C, 67%

NEUTRAL



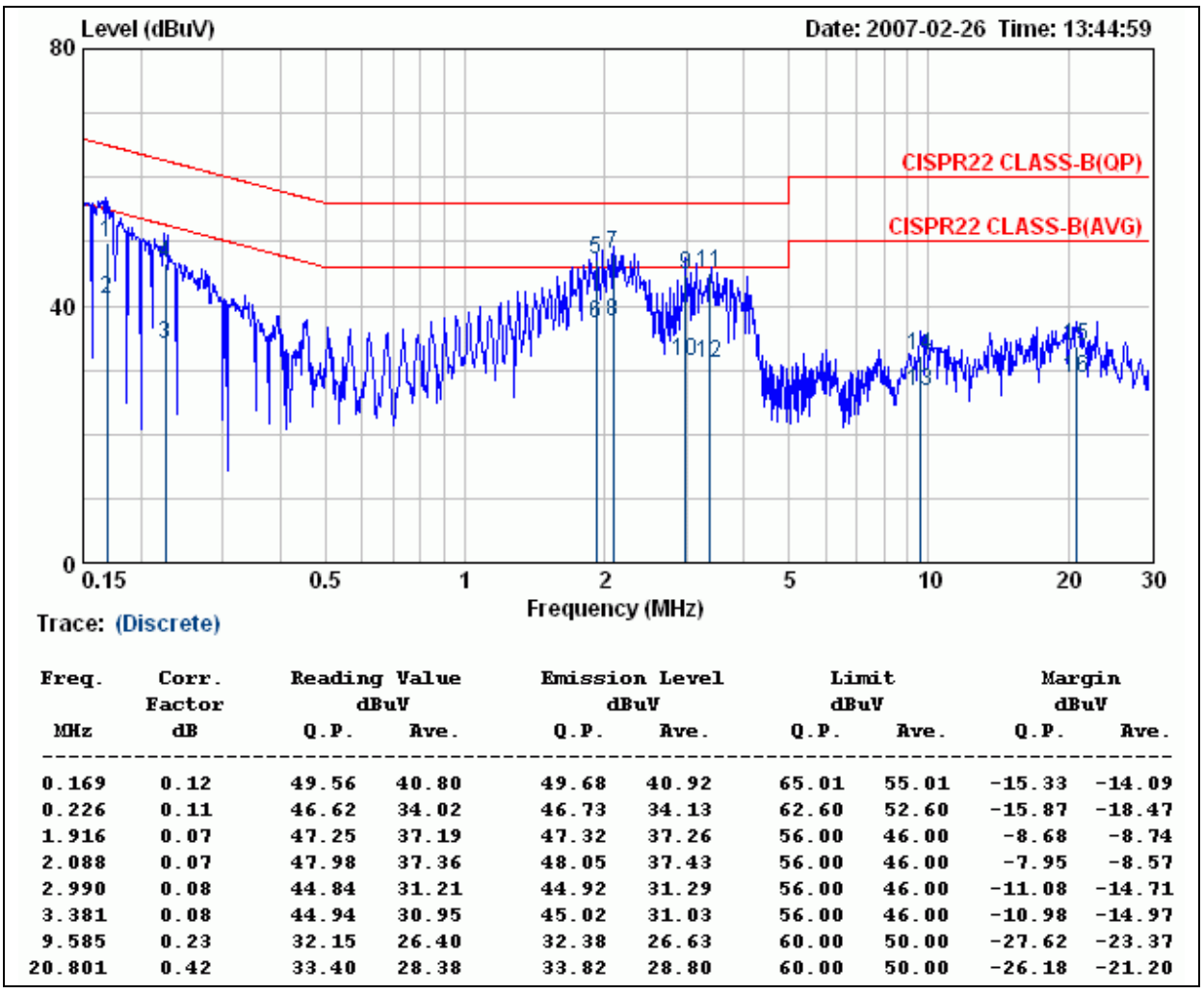
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV Ave.	Emission Level dBuV Q.P.	Emission Level dBuV Ave.	Limit dBuV Q.P.	Limit dBuV Ave.	Margin dBuV Q.P.	Margin dBuV Ave.
0.150	0.17	31.84	26.41	32.01	26.58	65.99	55.99	-33.98	-29.41
0.180	0.15	32.62	19.81	32.77	19.96	64.51	54.51	-31.74	-34.55
0.359	0.13	40.68	30.42	40.81	30.55	58.75	48.75	-17.95	-18.21
1.017	0.14	32.98	21.08	33.12	21.22	56.00	46.00	-22.88	-24.78
1.615	0.16	30.62	17.24	30.78	17.40	56.00	46.00	-25.22	-28.60
2.751	0.18	26.10	13.67	26.28	13.85	56.00	46.00	-29.72	-32.15
5.807	0.21	24.13	11.78	24.34	11.99	60.00	50.00	-35.66	-38.01
15.866	0.38	16.06	9.13	16.44	9.51	60.00	50.00	-43.56	-40.49

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/26
Model	1112	Test By	Gundam Lin
Test Mode	AC / DC Wireless Mode	TEMP & Humidity	24.3°C, 67%

LINE



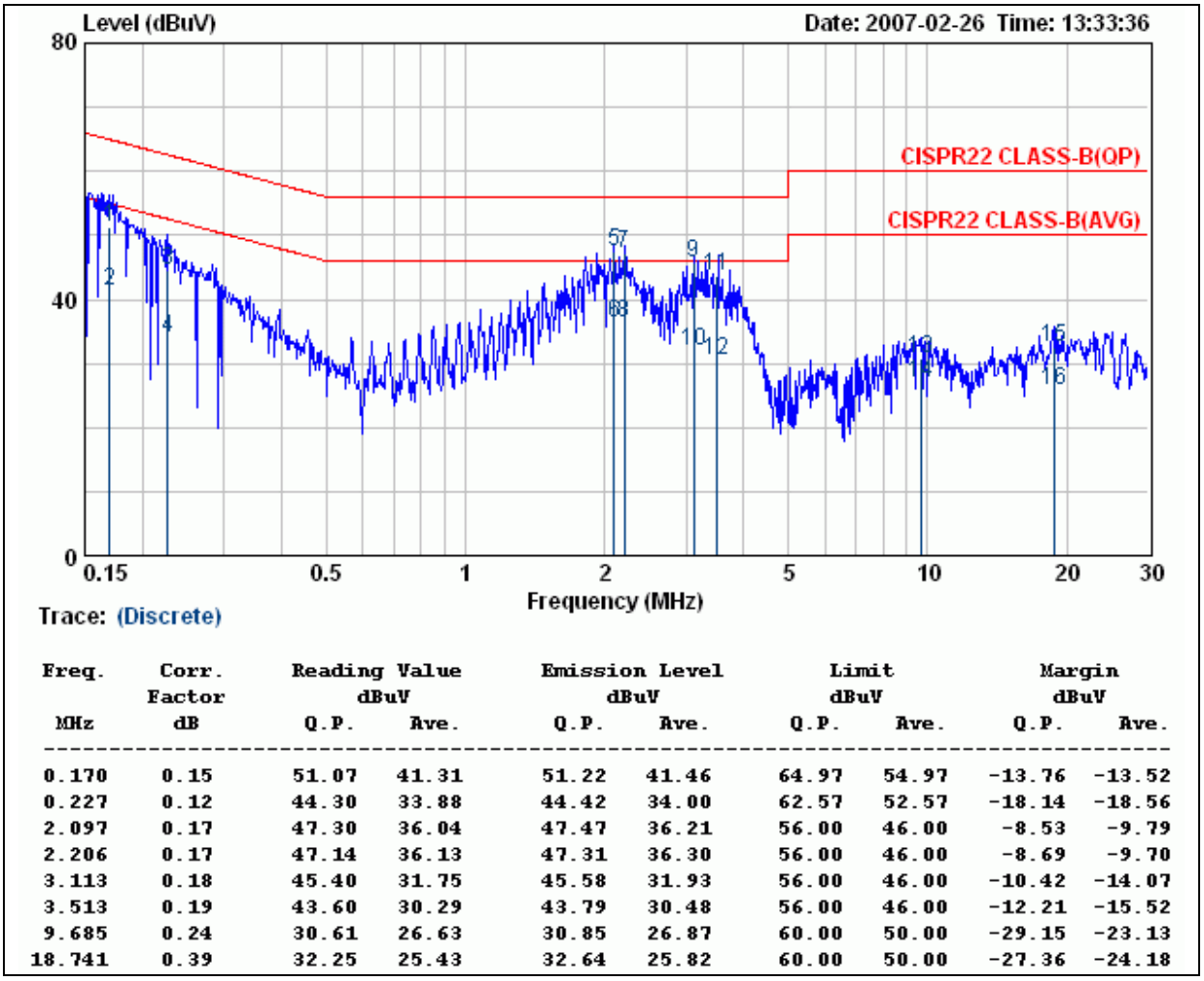
Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV Ave.	Emission Level dBuV Q.P.	Emission Level dBuV Ave.	Limit dBuV Q.P.	Limit dBuV Ave.	Margin dBuV Q.P.	Margin dBuV Ave.
0.169	0.12	49.56	40.80	49.68	40.92	65.01	55.01	-15.33	-14.09
0.226	0.11	46.62	34.02	46.73	34.13	62.60	52.60	-15.87	-18.47
1.916	0.07	47.25	37.19	47.32	37.26	56.00	46.00	-8.68	-8.74
2.088	0.07	47.98	37.36	48.05	37.43	56.00	46.00	-7.95	-8.57
2.990	0.08	44.84	31.21	44.92	31.29	56.00	46.00	-11.08	-14.71
3.381	0.08	44.94	30.95	45.02	31.03	56.00	46.00	-10.98	-14.97
9.585	0.23	32.15	26.40	32.38	26.63	60.00	50.00	-27.62	-23.37
20.801	0.42	33.40	28.38	33.82	28.80	60.00	50.00	-26.18	-21.20

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

Product Name	Microsoft Office Communicator USB Dongle	Test Date	2007/02/26
Model	1112	Test By	Gundam Lin
Test Mode	AC / DC Wireless Mode	TEMP & Humidity	24.3°C, 67%

NEUTRAL



Freq. MHz	Corr. Factor dB	Reading Value dBuV Q.P.	Reading Value dBuV Ave.	Emission Level dBuV Q.P.	Emission Level dBuV Ave.	Limit dBuV Q.P.	Limit dBuV Ave.	Margin dBuV Q.P.	Margin dBuV Ave.
0.170	0.15	51.07	41.31	51.22	41.46	64.97	54.97	-13.76	-13.52
0.227	0.12	44.30	33.88	44.42	34.00	62.57	52.57	-18.14	-18.56
2.097	0.17	47.30	36.04	47.47	36.21	56.00	46.00	-8.53	-9.79
2.206	0.17	47.14	36.13	47.31	36.30	56.00	46.00	-8.69	-9.70
3.113	0.18	45.40	31.75	45.58	31.93	56.00	46.00	-10.42	-14.07
3.513	0.19	43.60	30.29	43.79	30.48	56.00	46.00	-12.21	-15.52
9.685	0.24	30.61	26.63	30.85	26.87	60.00	50.00	-29.15	-23.13
18.741	0.39	32.25	25.43	32.64	25.82	60.00	50.00	-27.36	-24.18

Remark:

1. Correction Factor = Insertion loss + cable loss
2. Margin value = Emission level – Limit value

9. ANTENNA REQUIREMENT

9.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is PCB antenna. The maximum Gain of the antenna only 3.2dBi.