FCC 47 CFR PART 15 SUBPART B TEST REPORT

for

Keyboard

MODEL: 5105GU

Test Report Number:

80502002-D

Issued for

BEHAVIOR TECH COMPUTER CORP.
20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City,
Taipei County 22102, Taiwan(R.O.C.)

Issued By:

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Issued Date: June 9, 2008

Testing Laboratory
0363

ACCREDITED
TESTING CERT #0824.01

Revision History

Rev.		Issue Date		Revisions	Effect Page	Revised By
00		June 9, 2008		Initial Issue	ALL	Jessica Ho

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1 TEST RESULT CERTIFICATION

Product:	Keyboard
Model:	5105GU
Brand:	EMPREX, BTC
Applicant:	**BEHAVIOR TECH COMPUTER CORP.** 20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City, Taipei County 22102, Taiwan(R.O.C.)
Manufacturer:	**BEHAVIOR TECH COMPUTER CORP.** 20F-B, No. 98, Sec. 1, Sintai 5th Rd., Sijhih City, Taipei County 22102, Taiwan(R.O.C.)
Tested:	May 5 ~ 15, 2008
Test Voltage:	120VAC/60Hz

EMISSION			
Standard	**Item**	**Result**	**Remarks**
FCC 47 CFR Part 15 Subpart B (August 14, 2006), ICES-003 Issue 4 ANSI C63.4-2003	Conducted (Main Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

Note: 1. The test result judgment is decided by the limit of measurement standard
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Rex Lai
Section Manager

Reviewed by:

Amanda Wu
Section Manager

2 EUT DESCRIPTION

Product	Keyboard
Brand Name	EMPREX, BTC
Model	5105GU
Applicant	BEHAVIOR TECH COMPUTER CORP.
Housing material	Plastic
Serial Number	80502002
Received Date	May 2, 2008
EUT Power Rating	VDC from PC via USB device.

I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH
N/A	N/A	N/A

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

1. The following test mode was scanned during the preliminary test:

Pre-Test Mode
Mode 1: Operating

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission	**Mode 1**
	Radiated Emission	**Mode 1**

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

3.2. EUT SYSTEM OPERATION

1	The module device driver was exercised to play music.
2	Communication driver was loaded and executed to communicate with remote equipment.
3	EMI test program was loaded and executed in Windows XP mode.
4	Data was sent to the Panel of EUT and monitor and filling the screens with upper case of “H” patterns.
5	Test program sequentially exercised all related I/O’s of EUT and sent “H” patterns to all applicable output ports of EUT.
6	Repeat 2 to 5.

Note: Test program is self-repeating throughout the test.

4 SETUP OF EQUIPMENT UNDER TEST

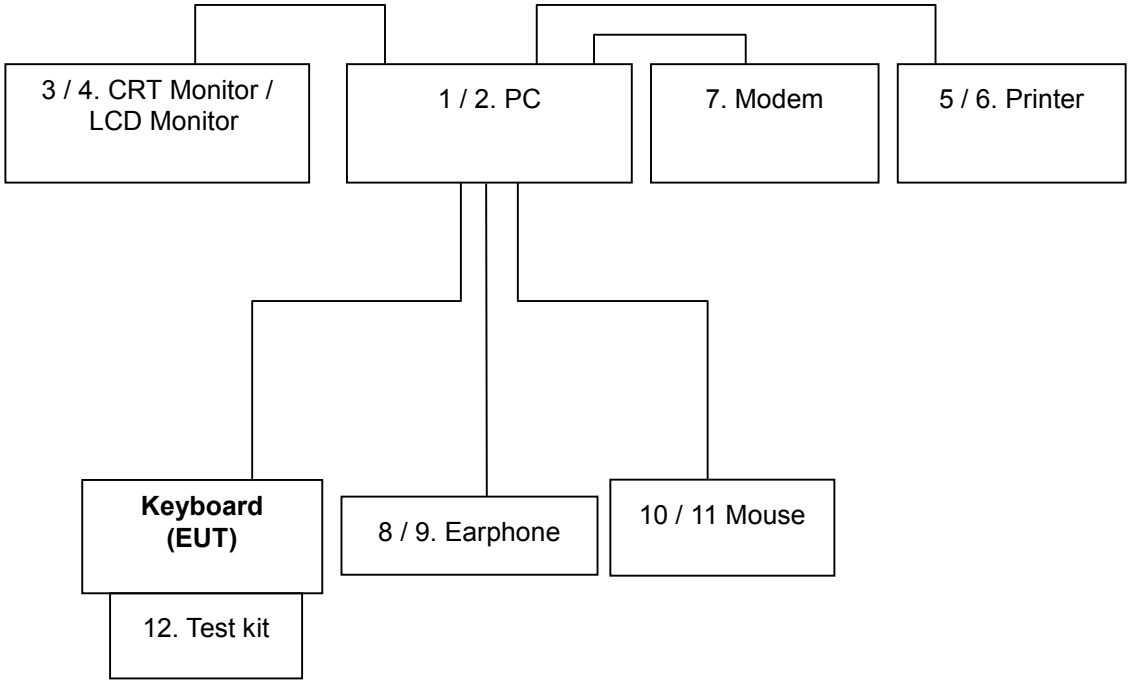
4.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Equipment	Model No.	Serial No.	FCC ID	Trade Name	Data Cable	Power Cord
1.	PC	PL926AV	SGH528048P	FCC DoC	HP	N/A	Unshielded, 1.8m
2.	PC	Dimemsion 4600	BRBV91S	FCC DoC	DELL	N/A	Unshielded, 1.8m
3.	CRT Monitor	P227F	Q76061400080	FCC DoC	ViewSonic	Shielded, 1.8m with 2 cores	Unshielded, 1.8m
4.	LCD Monitor	959NF	AQ19H2RT706139P	FCC DoC	Samsung	Shielded, 1.8m with 2 cores	AC I/P: Unshielded, 1.8m DC O/P: Unshielded, 1.8m with a core
5.	Printer	STYLUS C60	DR3K041515	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
6.	Printer	B241A	FAPY150357	FCC DoC	EPSON	Shielded, 1.8m	Unshielded, 1.8m
7.	Modem	DM-1414	211026193	IFAXDM1414	ACEEX	Shielded, 1.8m	Unshielded, 1.8m
8.	Multimedia Earphone	Axis-301	N/A	FCC DoC	Labtec	Unshielded, 1.8m*2	N/A
9.	Earphone	ET-E220	N/A	FCC DoC	Ergotech	Unshielded, 1.8m	N/A
10.	PS/2 Mouse	M-SBF69	HCA51604416	FCC DoC	Logitech	Shielded, 1.8m	N/A
11.	USB Mouse	M-UV69a	323617-001	FCC DoC	DELL	Shielded, 1.8m	N/A
12.	Test kit	N/A	N/A	N/A	N/A	N/A	N/A

Note: Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.

4.2. CONFIGURATION OF SYSTEM UNDER TEST



5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at:

☒ No. 81-1, Lane 210, Pa-De 2nd Rd., Luchu Hsiang, Taoyuan Shien, Taiwan.

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, A2LA
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA
Taiwan	TAF, BSMI, NCC

Copies of granted accreditation certificates are available for downloading from our web site, http:///www.ccsemc.com

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions # 1	9kHz~30MHz	+/-1.92 dB
Radiated emissions # 5	30~200MHz	+/-3.89 dB
	200~1000MHz	+/-3.86 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than U_{CISPR} which is 3.6dB and 5.2dB respectively. CCS values (called U_{Lab} in CISPR 16-4-2) is less than U_{CISPR} as shown in the table above. Therefore, MU need not be considered for compliance.

6 CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

Frequency (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.2. TEST INSTRUMENTS

Conducted Emission Room #1				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
EMI Test Receiver	SCHAFFNER	SCR 3501	410	12/16/2008
LISN	R&S	ESH3-Z5	848773/014	10/28/2008
LISN	FCC	FCC-LISN-50/250-16-2-07	06012	11/20/2008
Pulse Limiter	R&S	ESH3-Z2	100230	11/01/2008
Test S/W	LabVIEW 6.1 (CCS Conduction Test SW Version_01)			

NOTE: The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

6.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)

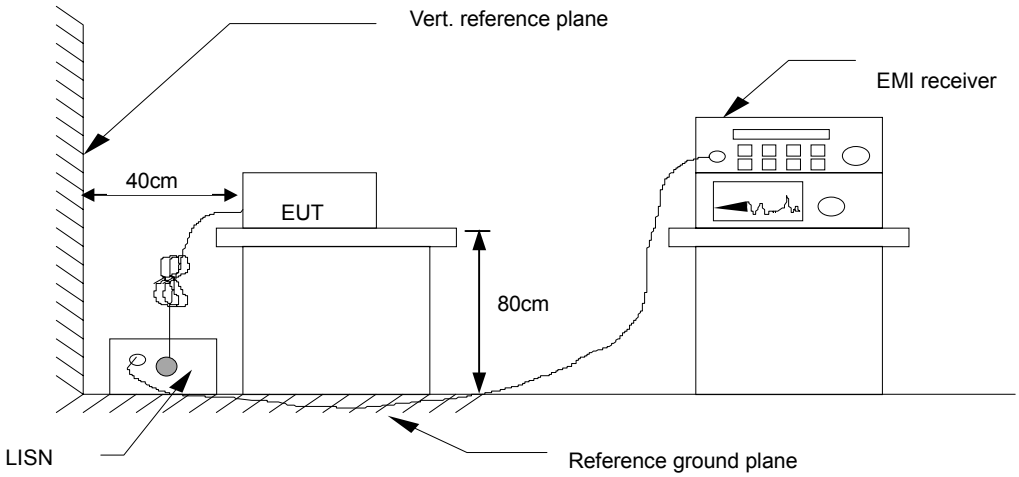
Procedure of Preliminary Test

- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.5. DATA SAMPLE

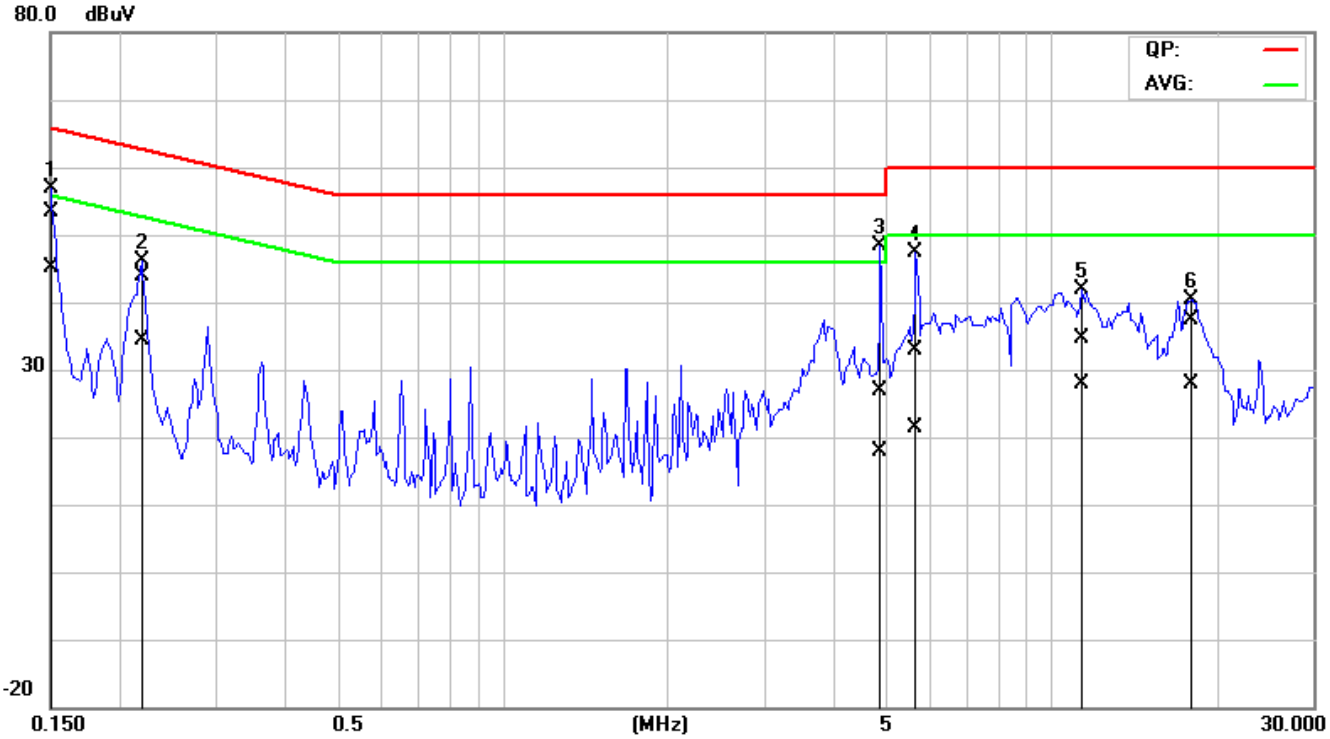
Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correctrion factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak. limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
x.xx	43.95	33.00	10.00	53.95	43.00	56.00	46.00	-2.05	-3.00	Pass

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB
Correction Factor (dB) = LISN Factor + Cable loss
Result (dBuV) = Raw reading converted to dBuV and CF added
Limit (dBuV) = Limit stated in standard
Margin (dB) = Result (dBuV) – Limit (dBuV)

6.6. TEST RESULTS

Conduction 1

Job No.:	80502002	**Line:**	L1
Standard:	CISPR 22 Class B		
Test Item:	Conduction Emission	**Date:**	2008/5/5
Temp.(°C)/Hum.(%RH):	22°C/45%RH	**Time:**	AM 10:57:39
Company:	BEHAVIOR TECH COMPUTER CORP.	**Tested By:**	Eddy Cheng
Model:	5105GU	**Test Mode:**	Mode 1

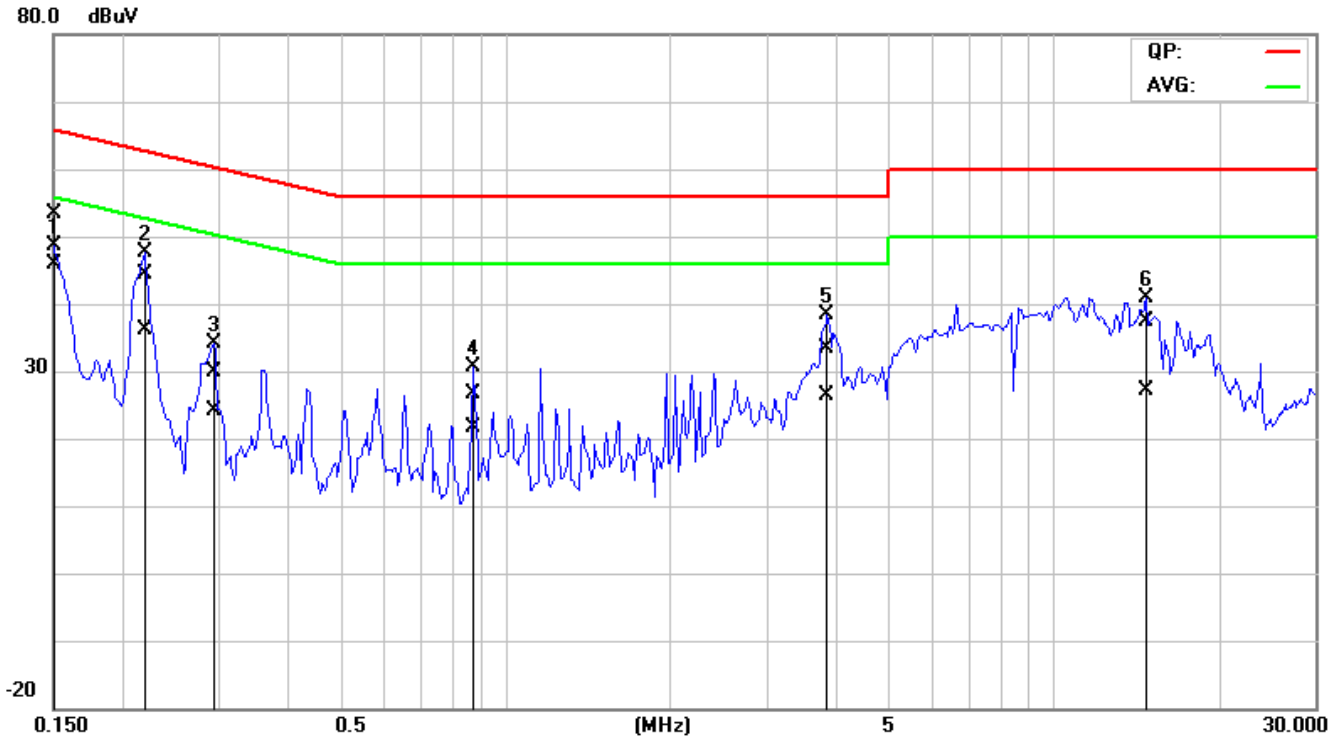


NO.	Frequency	Quasi Peak reading	Average reading	Correction factor	Quasi Peak result	Average result	Quasi Peak limit	Average limit	Quasi Peak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1	0.1500	53.24	44.94	0.16	53.40	45.10	66.00	56.00	-12.60	-10.90	Pass
2	0.2200	43.70	34.40	0.10	43.80	34.50	62.82	52.82	-19.02	-18.32	Pass
3	4.8850	26.70	17.70	0.10	26.80	17.80	56.00	46.00	-29.20	-28.20	Pass
4	5.6650	32.87	21.27	0.13	33.00	21.40	60.00	50.00	-27.00	-28.60	Pass
5	11.3650	34.37	27.47	0.33	34.70	27.80	60.00	50.00	-25.30	-22.20	Pass
6	18.0350	36.84	27.54	0.46	37.30	28.00	60.00	50.00	-22.70	-22.00	Pass

REMARKS: L1 = Line One (Live Line)

Conduction 1

Job No.:	80502002	**Line:**	L2
Standard:	CISPR 22 Class B		
Test Item:	Conduction Emission	**Date:**	2008/5/5
Temp.(°C)/Hum.(%RH):	22°C/45%RH	**Time:**	AM 10:57:39
Company:	BEHAVIOR TECH COMPUTER CORP.	**Tested By:**	Eddy Cheng
Model:	5105GU	**Test Mode:**	Mode 1



NO.	Frequency	Quasi Peak reading	Average reading	Correction factor	Quasi Peak result	Average result	Quasi Peak limit	Average limit	Quasi Peak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	(Pass/Fail)
1	0.1500	53.15	45.85	0.15	53.30	46.00	66.00	56.00	-12.70	-10.00	Pass
2	0.2200	44.21	36.11	0.09	44.30	36.20	62.82	52.82	-18.52	-16.62	Pass
3	0.2950	29.83	24.03	0.07	29.90	24.10	60.38	50.38	-30.48	-26.28	Pass
4	0.8750	26.60	21.70	0.00	26.60	21.70	56.00	46.00	-29.40	-24.30	Pass
5	3.8700	33.33	26.43	0.07	33.40	26.50	56.00	46.00	-22.60	-19.50	Pass
6	14.8250	36.98	26.68	0.42	37.40	27.10	60.00	50.00	-22.60	-22.90	Pass

REMARKS: L2 = Line Two (Neutral Line)

7 RADIATED EMISSION MEASUREMENT

7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

Maximum permissible level of Radiated Emission measured at 10 meter

Frequency (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

Frequency (MHz)	Class A (dBuV/m) (At 10m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 960	59.5	79.5	54	74

NOTE: (1) The lower limit shall apply at the transition frequencies.
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).

Maximum permissible level of Radiated Emission measured at 3 meter

Frequency (MHz)	Class A (dBuV/m)		Class B (dBuV/m)	
	Average	Peak	Average	Peak
Above 1000	59.3	79.3	54	74

Remark: *The lower limit shall apply at the transition frequency.*

Frequency (MHz)	Field Strength (μV/m at 3-meter) Average	Field Strength (dBμV/m at 3-meter) Average
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

7.2. TEST INSTRUMENTS

Open Area Test Site # 5				
Name of Equipment	**Manufacturer**	**Model**	**Serial Number**	**Calibration Due**
Spectrum Analyzer	ADVANTEST	R3132	91700456	N.C.R
EMI Test Receiver	R&S	ESVS10	846285/016	05/31/2009
Bilog Antenna	TESEQ	CBL 6112D	23190	07/13/2008
Pre-Amplifier	WIRELESS	FPA-6592G	60010	08/26/2008
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	04	N.C.R
RF Switch	ANRITSU	MP59B	10877	N.C.R
Site NSA	CCS	N/A	N/A	11/23/2008
Test S/W	LabVIEW 6.1 (CCS OATS EMI SW V2.6)			

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. N.C.R = No Calibration Request.

7.3. TEST PROCEDURE (please refer to measurement standard or CCS SOP PA-031)

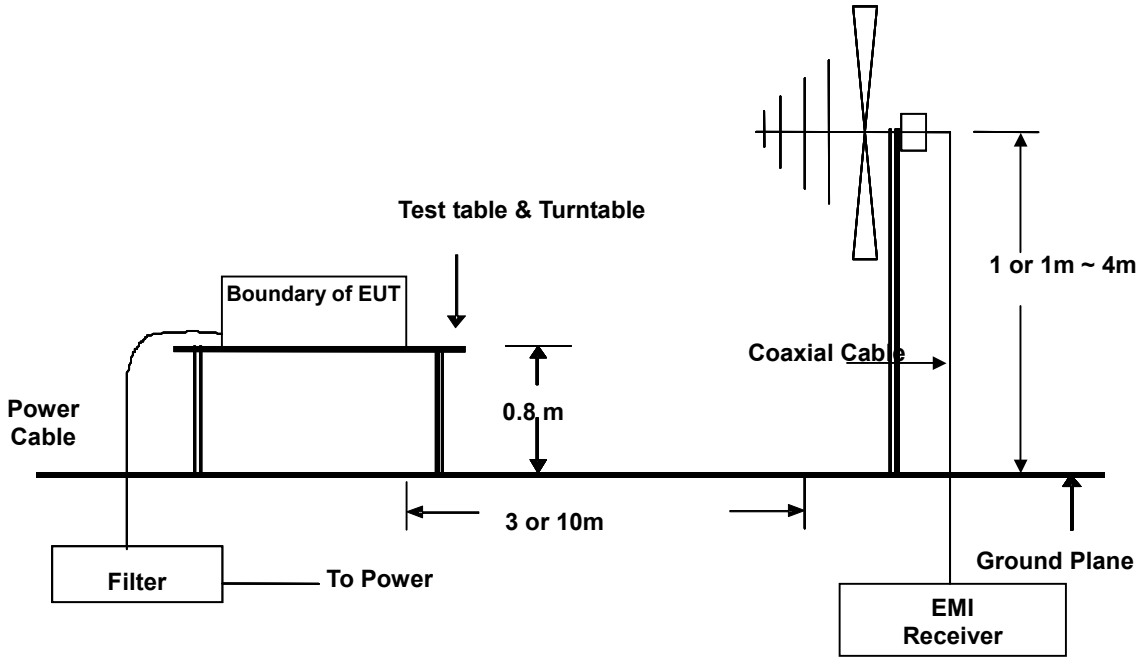
Procedure of Preliminary Test

- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 3 or 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 40GHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 40GHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 or 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recording at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

7.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.5. DATA SAMPLE

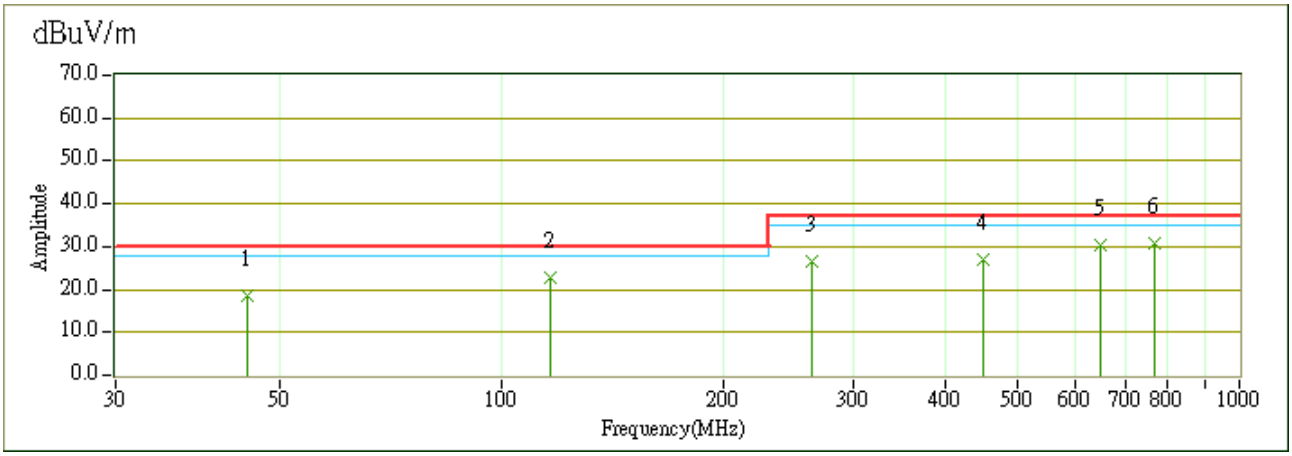
Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Degree (◦)	Height (cm)	Remark
xx.xx	16.49	9.86	26.35	30.00	-3.65	116.00	101.00	QP

Frequency (MHz) = Emission frequency in MHz
Reading (dBuV) = Uncorrected Analyzer / Receiver reading
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)
Limit (dBuV/m) = Limit stated in standard
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)
Q.P. = Quasi-Peak

7.6. TEST RESULTS

CCS Radiated Test OATS 5

Job No.:	80502002	**Ant. Polar.:**	Ver.
Standard:	CISPR 22 Class B	**Tested Distance:**	10m
Test Item:	Radiated Emission	**Date:**	2008/5/15
Temp.(°C)/Hum.(%RH):	26C/44%RH	**Time:**	PM 12:21
Company:	BEHAVIOR TECH COMPUTER CORP.	**Tested By:**	Eddy Cheng
Model:	5105GU	**Test Mode:**	Mode 1

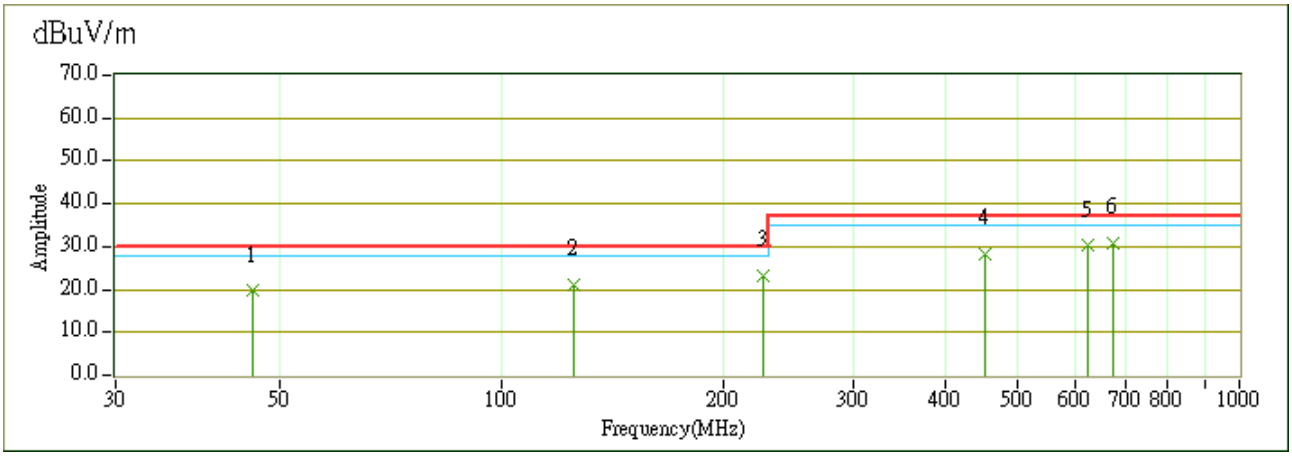


No.	Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	45.20	6.90	11.75	18.65	30.00	-11.35	QP
2	116.50	8.90	13.88	22.78	30.00	-7.22	QP
3	263.20	9.60	17.11	26.71	37.00	-10.29	QP
4	450.20	5.20	21.95	27.15	37.00	-9.85	QP
5	648.20	4.00	26.56	30.56	37.00	-6.44	QP
6	768.30	3.10	27.72	30.82	37.00	-6.18	QP

REMARKS: The other emission levels were very low against the limit.

CCS Radiated Test OATS 5

Job No.:	80502002	**Ant. Polar.:**	Hor.
Standard:	CISPR 22 Class B	**Tested Distance:**	10m
Test Item:	Radiated Emission	**Date:**	2008/5/15
Temp.(°C)/Hum.(%RH):	26C/44%RH	**Time:**	PM 12:16
Company:	BEHAVIOR TECH COMPUTER CORP.	**Tested By:**	Eddy Cheng
Model:	5105GU	**Test Mode:**	Mode 1



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	45.90	8.20	11.41	19.61	30.00	-10.39	QP
2	125.60	7.20	13.99	21.19	30.00	-8.81	QP
3	226.20	6.50	16.75	23.25	30.00	-6.75	QP
4	451.00	6.40	21.97	28.37	37.00	-8.63	QP
5	624.20	4.20	25.95	30.15	37.00	-6.85	QP
6	675.00	3.20	27.45	30.65	37.00	-6.35	QP

REMARKS: The other emission levels were very low against the limit.