FCC ID: E5XKB9112

EMC

TEST REPORT

REPORT NO. : F89080703
MODEL NO. : 9112
DATE OF TEST : August 9, 2000

PREPARED FOR: BEHAVIOR TECH COMPUTER CORP.

ADDRESS : 2F, NO.51, TUNG HSING. RD.,
TAIPEI, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

Accredited Laboratory

11F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

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1. CERTIFICATION

Issue Date: August 14, 2000

Product	:	KEYBOARD
Trade Name	:	BTC
Model No.	:	9112
Applicant	:	BEHAVIOR TECH COMPUTER CORP.
Standard	:	FCC Part 15, Subpart B, Class B CISPR 22:1993+A1: 1995+A2: 1996, Class B ANSI C63.4-1992

We hereby certify that one sample of the designation has been tested in our facility on August 9, 2000. The test record, data evaluation and Equipment Under Test (EUT) configurations represent herein are true and accurate representation of the measurements of the sample's EMC characteristics under the conditions herein specified.

The test results show that the EUT as described in this report is in compliance with the Class B limits of conducted and radiated emission of applicable standards

TESTED BY : Alan Chang , DATE: 8/14/2000
(Alan Chang)

CHECKED BY : Sharon Hsiung , DATE: 8/14/2000
(Sharon Hsiung)

APPROVED BY : Mike Su , DATE: 8/14/2000
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	KEYBOARD
Model No.	:	9112
Power Supply	:	DC 5V (from PC)
Data Cable	:	Shielded (1.8 m)

Note: For more detailed features description, please refer to manufacturer's specification or User's Manual.

2.2 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 are used to form representative test configuration during the tests.

FOR EMISSION TEST

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	IBM	2187-12W	1S218714ABNA0002	FCC DoC
2	COLOR MONITOR	HP	D2842A	KR93473118	BEJCB910
3	PRINTER	HP	2225C	2442S63076	BS46XU2225C
4	MODEM	ACEEX	1414	980020538	IFAXDM1414
5	SPEAKER	JAZZ	J-008	J790537	
6	MOUSE	LOGITECH	M-S43	LZE00703078	DZL211106

No.	Signal cable description
1	N/A
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w/o core.
3	1.2m braid shielded wire, terminated with DB25 and Centronic connector via metallic frame, w/o core.
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug , w/o core.
6	1.5 m foil shielded wire, terminated with PS2 connector via drain wire, w/o core.

Note: All power cords of the above support units are non shielded (1.8m).

2.3 TEST METHODOLOGY AND CONFIGURATION

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 1992. Radiated testing was performed at an antenna to EUT distance of 10 m on an open area test site.

Please refer to the photos of test configuration in Item 5.

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESHS30	828109/007	July 6, 2001
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 9, 2001
ROHDE & SCHWARZ 4-wire ISN	ENY41	835154/007	Apr. 26, 2001
EMCO-L.I.S.N.	3825/2	9204-1964	July 9, 2001
Shielded Room	Site 2	ADT-C02	NA

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMAS document NIS81.

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

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	8594E	3520A01861	Feb. 10, 2001
HP Preamplifier	8447D	2944A08118	Dec. 13, 2000
HP Preamplifier	8347A	3307A01088	Aug. 30, 2000
HP Preamplifier	8449B	3008A01201	Dec. 14, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESVS 10	840241/010	Sept. 9, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2000
ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Aug. 30, 2000
CHASE BILOG Antenna	CBL6111A	1501	July 17, 2001
EMCO Double Ridged Guide Antenna	3115	9312-4192	March 29, 2001
CHANCE Turn Table	U200	9701	NA
CHANCE Tower	AT-100	CM-A003	NA
Open Field Test Site	Site 3	ADT-R03	July 14, 2001

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMAS document NIS81.

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

3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION

LIMIT OF RADIATED EMISSION OF CISPR 22

FREQUENCY (MHz)	Class A (at 10m) * dBuV/m	Class B (at 10m) * dBuV/m
30 - 230	40	30
230 - 1000	47	37

* Detector Function: Quasi-Peak

LIMIT OF RADIATED EMISSION OF FCC PART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

FREQUENCY (MHz)	Class A (dBuV/m) (at 3m)		Class B (dBuV/m) (at 3m)	
	Peak	Average	Peak	Average
Above 1000	80.0	60.0	74.0	54.0

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

LIMIT OF CONDUCTED EMISSION OF CISPR 22

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 linearly with the logarithm of the frequency in the range 0.15 to 0.50 MHz
(3) All emanation 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.

4. TEST RESULTS (EMISSION)

4.1 RADIO DISTURBANCE

Frequency Range	:	0.15 - 30 MHz (Conducted Emission)
		30 - 1000 MHz (Radiated Emission)
Input Voltage	:	120 Vac, 60 Hz (from PC)
Temperature	:	25Degree C
Humidity	:	65 %
Atmospheric Pressure	:	1000 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -2.3 dB at 0.205 MHz Minimum passing margin of radiated emission: -3.1 dB at 64.35 MHz

4.2EUT OPERATION CONDITION

1. Turn on the power of all equipment.
2. PC runs a test program to enable all functions.
3. PC reads and writes messages from FDD and HDD.
4. EUT sends "H" character to PC.
5. PC sends "H" messages to monitor and monitor displays "H" patterns on screen.
6. PC sends "H" messages to modem.
7. PC sends "H" messages to printer, and the printer prints them on paper.
8. PC sends audio messages to speaker.
9. Repeat steps 3-9.

4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **KEYBOARD** MODEL: **9112**

6 dB Bandwidth: 10 kHz PHASE: LINE (L)

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.205	0.2	54.1	50.9	54.3	51.1	63.4	53.4	-9.1	-2.3
0.409	0.2	43.9	-	44.1	-	57.7	47.7	-13.6	-
0.516	0.2	41.0	-	41.2	-	56.0	46.0	-14.8	-
1.544	0.2	36.0	-	36.2	-	56.0	46.0	-19.8	-
13.591	0.8	27.4	-	28.2	-	60.0	50.0	-31.8	-
22.755	1.2	26.1	-	27.3	-	60.0	50.0	-32.7	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.

TEST DATA OF CONDUCTED EMISSION

EUT: **KEYBOARD** MODEL: **9112**

6 dB Bandwidth: 10 kHz PHASE: NEUTRAL (N)

Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
		Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
0.205	0.2	51.4	-	51.6	-	63.4	53.4	-11.8	-
0.409	0.2	45.6	-	45.8	-	57.7	47.7	-11.9	-
0.516	0.2	43.2	-	43.4	-	56.0	46.0	-12.6	-
1.544	0.2	35.1	-	35.3	-	56.0	46.0	-20.7	-
13.591	0.7	23.6	-	24.3	-	60.0	50.0	-35.7	-
22.755	1.1	26.3	-	27.4	-	60.0	50.0	-32.6	-

Remarks:
1. "*": Undetectable
2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
3. "-": The Quasi-peak emission level also meets average limit and measurement with the average detector is unnecessary.
4. The emission levels of other frequencies were very low against the limit.
5. Margin value = Emission level - Limit value
6. Emission Level = Correction Factor + Reading Value.

4.4 TEST DATA OF RADIATED EMISSION

EUT: **KEYBOARD** MODEL: **9112**

ANT. POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
58.35	6.8	11.9	18.7	30.0	-11.3	400	276
64.23	6.2	13.7	19.9	30.0	-10.1	400	46
71.95	6.7	13.4	20.1	30.0	-9.9	400	303
83.67	8.4	13.0	21.4	30.0	-8.6	400	151
133.60	12.5	11.1	23.6	30.0	-6.4	400	320
175.85	10.1	10.3	20.4	30.0	-9.6	400	20
199.58	10.0	10.3	20.3	30.0	-9.7	400	333
499.73	20.4	9.4	29.8	37.0	-7.2	361	123

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

TEST DATA OF RADIATED EMISSION

EUT: **KEYBOARD** MODEL: **9112**

ANT. POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak 6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz MEASURED DISTANCE: 10 M

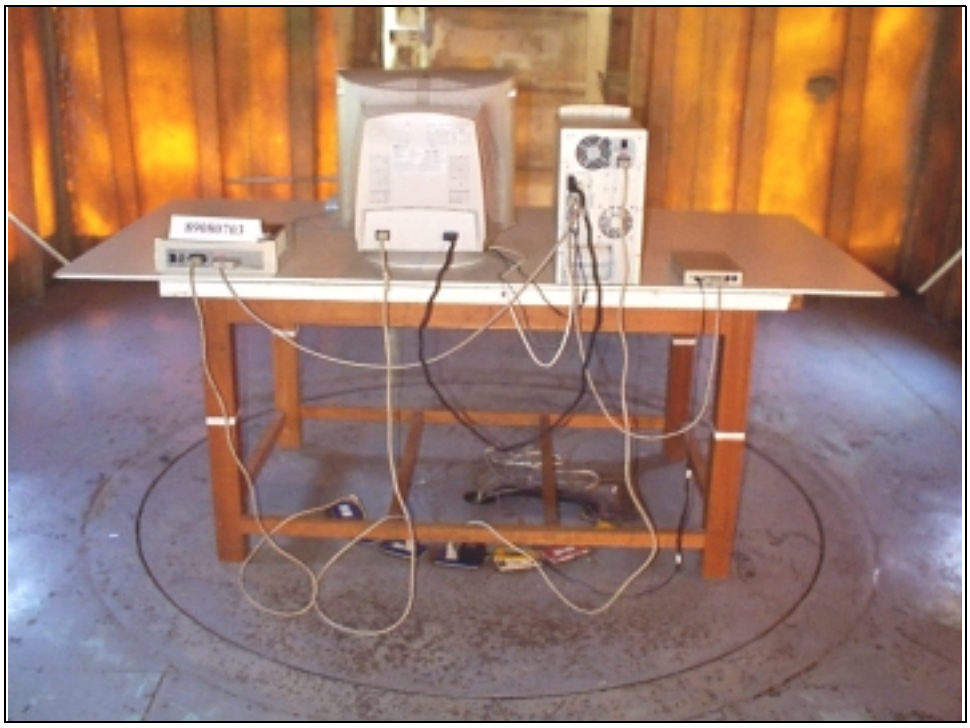
Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)
48.28	10.7	15.0	25.7	30.0	-4.3	100	26
64.35	6.2	20.7	26.9	30.0	-3.1	163	16
78.03	7.5	17.5	25.0	30.0	-5.0	100	323
83.50	8.4	16.1	24.5	30.0	-5.5	100	104
111.35	12.0	10.5	22.5	30.0	-7.5	100	257
133.68	12.5	11.8	24.3	30.0	-5.7	100	207
144.88	12.1	11.7	23.8	30.0	-6.2	100	0
181.65	9.9	9.9	19.8	30.0	-10.2	100	0
199.78	10.0	12.7	22.7	30.0	-7.3	100	6
499.63	20.4	12.6	33.0	37.0	-4.0	100	133
699.58	23.7	9.0	32.7	37.0	-4.3	366	325

REMARKS:
1. Emission level (dBuV/m) = Correction Factor (dB) + Reading value (dBuV).
2. Correction Factor (dB) = Ant. Factor (dB)+Cable loss (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level - Limit value

5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



6. APPENDIX - INFORMATION OF THE TESTING LABORATORY

Information of the testing laboratory

We, ADT Corp., are founded in 1988, to provide our best service in EMC and Safety consultation. Our laboratory is accredited by the following approval agencies according to ISO/IEC Guide 25 or EN 45001:

● USA	FCC, UL, NVLAP
● Germany	TUV Rheinland
	TUV Product Service
● Japan	VCCI
● New Zealand	RFS
● Norway	NEMKO, DNV
● U.K.	INCHCAPE
● R.O.C.	BSMI

Enclosed please find some certificates of our laboratory obtained from approval agencies. If you have any comments, please feel free to contact us with the following:

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