

EMC/IMMUNITY TEST REPORT

TEST REPORT

REPORT NO. : F87081803

MODEL NO. : 8112

DATE OF TEST : Aug. 19, 1998



誠信科技股份有限公司

ADVANCE DATA TECHNOLOGY CORP.



EMC

TEST REPORT

REPORT NO. : F87081803

MODEL NO. : 8112

DATE OF TEST : Aug. 19, 1998

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

12F, NO.1, SEC.4, NAN-KING EAST RD.,
TAIPEI, TAIWAN, R.O.C.

This test report consists of 13 pages in total. It may be duplicated completely for legal use with the allowance of the applicant. It shall not be reproduced except in full, without the written approval of our laboratory. It should not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. government. The test result in the report only applies to the tested sample.



TABLE OF CONTENTS

1. CERTIFICATION.....	3
2. GENERAL INFORMATION	4
2.1 GENERAL DESCRIPTION OF EUT	4
2.2 DESCRIPTION OF SUPPORT UNITS	5
2.3 TEST METHODOLOGY AND CONFIGURATION.....	5
3. TEST INSTRUMENTS	6
3.1 TEST INSTRUMENTS (EMISSION).....	6
3.2 LIMITS OF CONDUCTED AND RADIATED EMISSION.....	7
4. TEST RESULTS (EMISSION)	8
4.1 RADIO DISTURBANCE	8
4.1.1 EUT OPERATION CONDITION	8
4.1.2 TEST DATA OF CONDUCTED EMISSION	9
4.1.3 TEST DATA OF RADIATED EMISSION.....	10
5. PHOTOGRAPHS OF THE TEST CONFIGURATION WITH MINIMUM MARGIN.....	12



1.

CERTIFICATION

Issue Date: Aug. 31, 1998

Product : USB KEYBOARD
Trade Name : BTC
Model No. : 8112
Applicant : BEHAVIOR TECH COMPUTER CORP.
Standard : FCC Part 15, Subpart B, Class B
ANSI C63.4-1992
CISPR 22: 1993 +A1+A2

We hereby certify that one sample of the designation has been tested in our facility on Aug. 19, 1998. 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: San Lin , DATE: 8/31/98
(San Lin)

CHECKED BY: Sharon Hsiung , DATE: 8/31/98
(Sharon Hsiung)

APPROVED BY: Mike Su , DATE: 8/31/98
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION**NVLAP[®]**

Accredited Laboratory

3. TEST INSTRUMENTS

3.1 TEST INSTRUMENTS (EMISSION)

RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated until
HP Spectrum Analyzer	8590L	3544A00941	Dec. 14, 1998
HP Pre-Amplifier	8447D	2944A08312	Sept. 10, 1998
R&S Receiver	ESVS10	844591/010	Sept. 23, 1998
SCHWARZBECK Tunable Dipole Antenna	VHA 9103	E101051	Nov. 28, 1998
CHASE BILOG Antenna	CBL6111A	E101055	Sept. 12, 1998
EMCO Turn Table	1060-04	1196	N/A
EMCO Tower	1051	1264	N/A
Open Field Test Site	Site 1	ADT-R01	Sept. 5, 1998

Note: 1. The measurement uncertainty is less than +/- 3dB, which is calculated as per NAMA's 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.

CONDUCTED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ROHDE & SCHWARZ Test Receiver	ESH3	893495/006	July 15, 1999
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 16, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 14, 1999
EMCO-L.T.S.N. Shielded Room	3825/2	9204-1964	July 14, 1999
Site 2	ADT-C02	N/A	N/A

Note: 1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per NAMA's 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)	Class B (at 10m)
	dBuV/m	dBuV/m
30 - 230	40	30
230 - 1000	47	37

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

FREQUENCY (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	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
Temperature : 28 °C
Humidity : 50 %
Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -12.10 dB at 20.110 MHz Minimum passing margin of radiated emission: -4.4 dB at 232.70 MHz

4.1.1 EUT OPERATION CONDITION

1. Turn on the power of all equipments.
2. PC reads a test program to enable all functions.
3. PC sends "H" messages to monitor and monitor display "H" patterns on screen.
4. PC sends "H" messages to modem.
5. PC sends "H" messages to printer, and the printer prints them on paper.
6. Repeat steps 3-6.



4.1.2 TEST DATA OF CONDUCTED EMISSION

EUT: **USB KEYBOARD**MODEL: **8112**

6 dB Bandwidth: 10 kHz

TEST PERSONNEL: *San lin*

Freq.	L Level		N Level		Limit		Margin [dB (μV)]			
[MHz]	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.225	41.90	-	41.70	-	62.63	52.63	-20.7	-	-20.9	-
3.132	31.90	-	32.30	-	56.00	46.00	-24.1	-	-23.7	-
3.860	21.60	-	22.10	-	56.00	46.00	-34.4	-	-33.9	-
6.341	29.00	-	29.60	-	60.00	50.00	-31.0	-	-30.4	-
9.780	34.20	-	35.00	-	60.00	50.00	-25.8	-	-25.0	-
20.110	45.30	-	47.90	-	60.00	50.00	-14.7	-	-12.1	-

- Remarks:
1. "*": Undetectable
 2. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 3. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 4. The emission level of other frequencies were very low against the limit.

ADT CO. Shielded Room 2
CISPR 22 CLASS B

18. Aug 98 18:45

EUT: 8112
Test Spec: LISN : L

Report No. F87081803

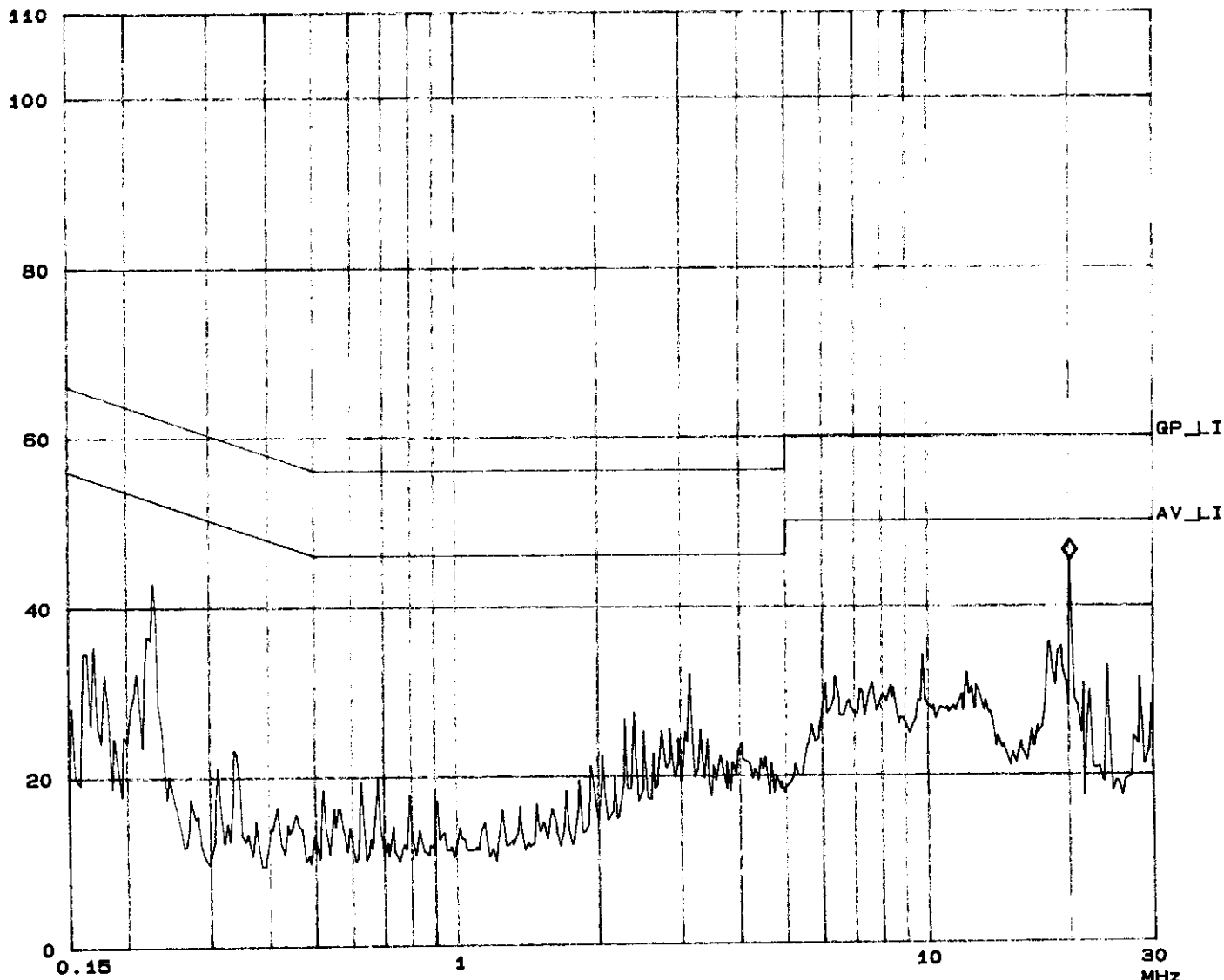
Page 9-1

Tested by San lin

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB	
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB	
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB	

dBuV ◇ Mkr : 20.11700MHz 45.3 dBuV



ADT CO. Shielded Room 2
CISPR 22 CLASS B

18. Aug 98 18:53

EUT: 8112
Test Spec: LISN : N

Report No. F87081803

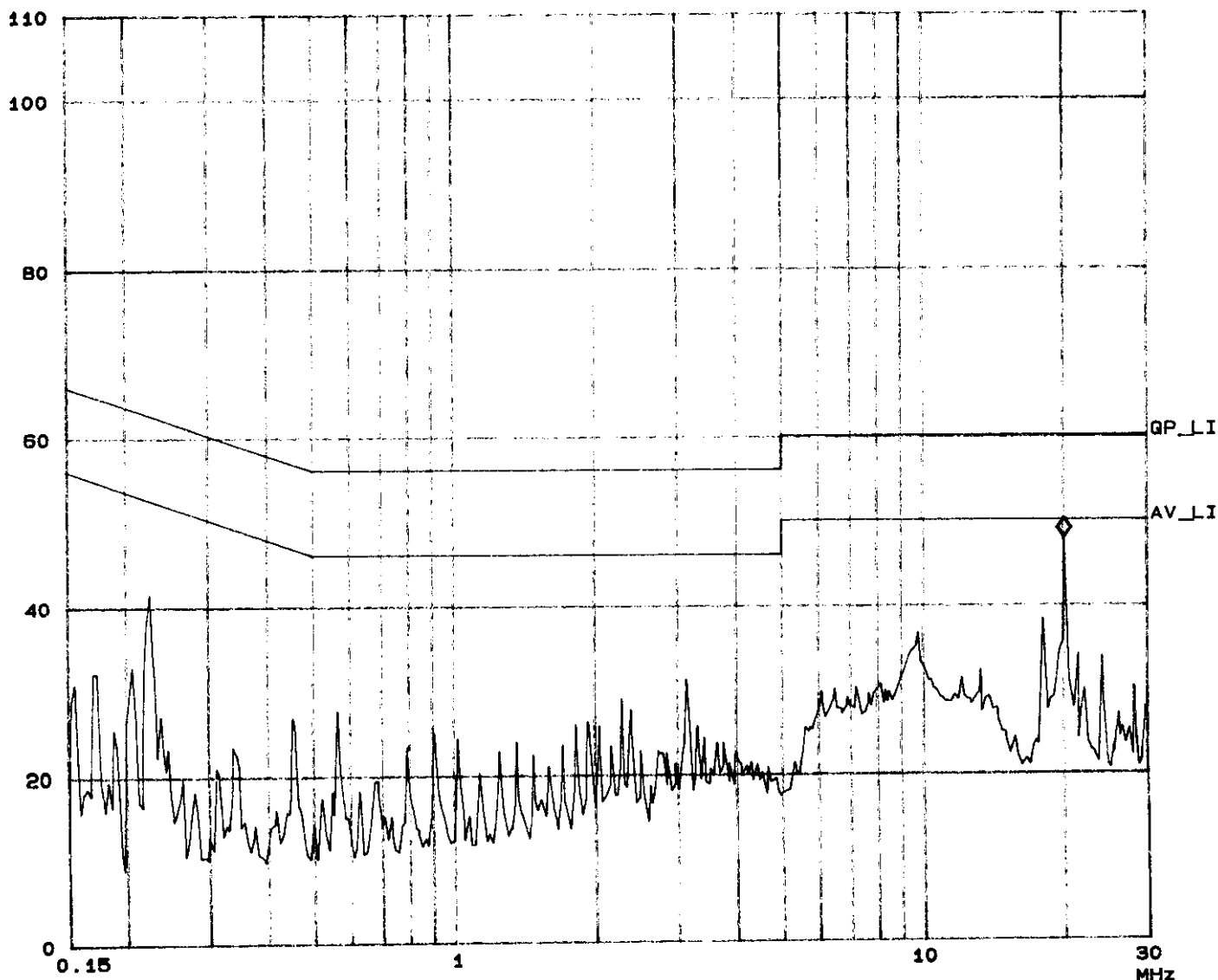
Page 9-2

Tested by San Lin

Fast Scan Settings (3 Ranges)

Frequencies			Receiver Settings						
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge	
150k	450k	3k	10k	PK	1ms	10dBLN	OFF	60dB	
450k	5M	3k	10k	PK	1ms	10dBLN	OFF	60dB	
5M	30M	3k	10k	PK	1ms	10dBLN	OFF	60dB	

dBuV ◇ Mkr : 20.11400MHz 47.9 dBuV





4.1.3 TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD**MODEL: **8112**

ANTENNA: CHASE BILOG CBL6111A

POLARITY: HorizontalDETECTOR FUNCTION: Quasi-peak6 dB BANDWIDTH: 120 kHzFREQUENCY RANGE: 30-1000 MHzMEASURED DISTANCE: 10 MTEST PERSONNEL: San lin

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
72.49	8.3	10.5	18.8	30.0	-11.2
132.95	14.7	5.4	20.1	30.0	-9.9
144.97	14.1	4.6	18.7	30.0	-11.3
193.81	12.5	10.8	23.3	30.0	-6.7
200.51	12.7	4.9	17.6	30.0	-12.4
218.03	14.3	7.1	21.4	30.0	-8.6
232.70	15.8	16.8	32.6	37.0	-4.4
240.05	16.5	9.7	26.2	37.0	-10.8
299.16	17.7	6.6	24.3	37.0	-12.7

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

實驗室地址：台北縣林口鄉嘉寶村14鄰47號 TEL:(02)6032180 FAX:(02)6022943

公 司 地 址：台北市南京東路四段1號12樓

OFFICE ADDRESS: 12F, NO.1, SEC.4, NANKING EAST RD. TAIPEI R.O.C.

LAB, ADDRESS: NO.47, 14 LING, CHIA PAU TSUEN, LIN KOU HSIANG, TEL:(02)6032180
TAIPEI HSIEN, TAIWAN, R.O.C. FAX:(02)6022943