FCC ID: E5XKB5122U

EMC

TEST REPORT

REPORT NO. : F88071604
MODEL NO. : 5122U, 5122UX
DATE OF TEST : July 19, 1999

PREPARED FOR: BEHAVIOR TECH COMPUTER CORP.

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

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION

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

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1. CERTIFICATION

Issue Date: July 28, 1999

Product	:	USB KEYBOARD
Trade Name	:	BTC
Model No.	:	5122U, 5122UX
Applicant	:	BEHAVIOR TECH COMPUTER CORP.
Standard	:	FCC Part 15, Subpart B, Class B
		ANSI C63.4-1992
		CISPR 22:1993+A1: 1995+A2: 1996, Class B

We hereby certify that one sample of the designation has been tested in our facility on July 19, 1999. 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 : Ken Liu , DATE: 7/28/99
(Ken Liu)

CHECKED BY : Yemmy , DATE: 7/28/99
(Yemmy Soong)

APPROVED BY : Mike Su , DATE: 7/28/99
(Mike Su)

ADVANCE DATA TECHNOLOGY CORPORATION

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2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Product	:	USB KEYBOARD
Model No.	:	5122U, 5122UX
Power Supply	:	DC 5V (from PC)
Data Cable	:	Shielded (1.8 m)

Note: The EUT is a USB keyboard with two model numbers which are identical to each other except for the following:

- Model: 5122U, with PS/2 port
- Model: 5122UX, without PS/2 port

From the above model numbers, Model: 5122U was selected as the representative model for the test, and its data is recorded in this report.

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.

No	Product	Brand	Model No.	FCC ID	I/O Cable
1	PERSONAL COMPUTER	NTI	PII-233T	FCC DoC Approved	Nonshielded Power (1.8m)
2	MONITOR	ADI	937G	BR8937G	Shielded Signal (1.5m) Nonshielded Power (1.8m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.2m) Nonshielded Power (1.2m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.2m) Nonshielded Power (1.2m)
5	MOUSE	HP	M-S34	DZL211029	Shielded Signal (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	ESH3	893495/006	July 7, 2000
ROHDE & SCHWARZ Spectrum Monitor	EZM	893787/013	July 8, 2000
ROHDE & SCHWARZ Artificial Mains Network	ESH3-Z5	839135/006	July 7, 2000
EMCO-L.I.S.N.	3825/2	9204-1964	July 7, 2000
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	8594A	3144A00308	Sept. 3, 1999
HP Preamplifier	8447D	2944A08119	Jan. 12, 2000
HP Preamplifier	8347A	3307A01088	Sept. 9, 1999
ROHDE & SCHWARZ TEST RECEIVER	ESVP	893496/030	July 13, 2000
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 25, 1999
CHASE Bilog Antenna	CBL6112A	2329	Sept. 19, 1999
EMCO Double Ridged Guide Antenna	3115	9312-4192	April 5, 2000
EMCO Turn Table	1060	1195	NA
EMCO Tower	1051	1163	NA
Open Field Test Site	Site 2	ADT-R02	Sept. 18, 1999

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
Temperature	:	25 ℃
Humidity	:	71 %
Atmospheric Pressure	:	982 mbar

TEST RESULT	Remarks
PASS	Minimum passing margin of conducted emission: -17.1 dB at 0.519 MHz Minimum passing margin of radiated emission: -2.9 dB at 120.02 MHz

4.2 EUT 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. Repeat steps 3-8.

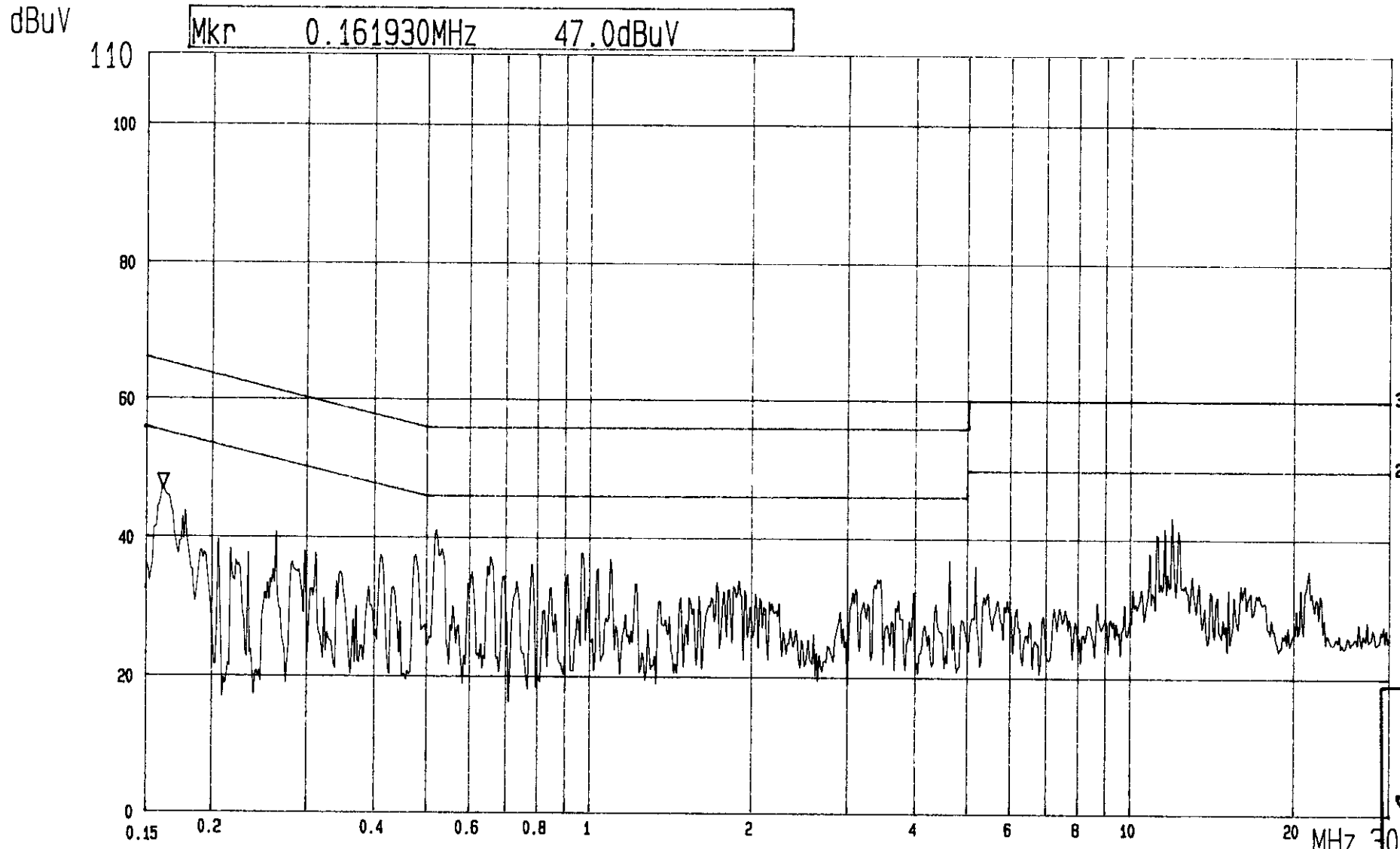
4.3 TEST DATA OF CONDUCTED EMISSION

EUT: **USB KEYBOARD** MODEL: **5122U**

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.
0.161	0.1	42.0	-	42.1	-	65.4	55.4	-23.3	-
0.262	0.2	35.7	-	35.9	-	61.4	51.4	-25.5	-
0.519	0.2	35.9	-	36.1	-	56.0	46.0	-19.9	-
0.969	0.2	32.6	-	32.8	-	56.0	46.0	-23.2	-
11.904	0.7	38.1	-	38.8	-	60.0	50.0	-21.2	-
21.322	1.2	30.4	-	31.6	-	60.0	50.0	-28.4	-

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.



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CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL: 5122U LISN: L

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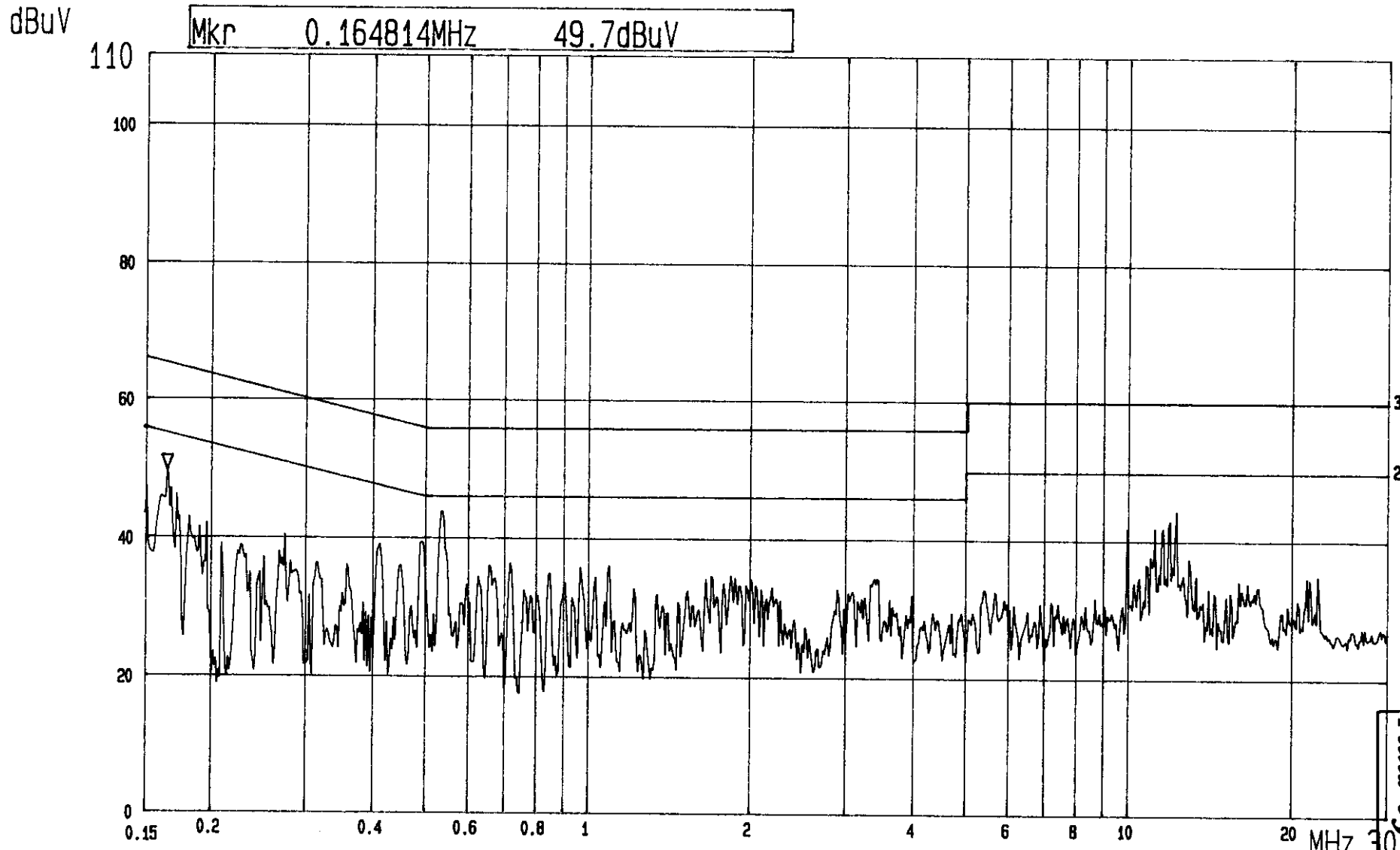
TEST DATA OF CONDUCTED EMISSION

EUT: **USB KEYBOARD** MODEL: **5122U**

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.
0.161	0.1	44.7	-	44.8	-	65.4	55.4	-20.6	-
0.262	0.2	33.7	-	33.9	-	61.4	51.4	-27.5	-
0.519	0.2	38.7	-	38.9	-	56.0	46.0	-17.1	-
0.969	0.2	30.7	-	30.9	-	56.0	46.0	-25.1	-
11.904	0.7	39.2	-	39.9	-	60.0	50.0	-20.1	-
21.322	1.1	30.6	-	31.7	-	60.0	50.0	-28.3	-

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.



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CISPR 22 CLASS B CONDUCTION TEST (PEAK VALUE) ADT CORP.
MODEL: 5122U LISN: N

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4.4 TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD** MODEL: **5122U**

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)
72.00	7.7	14.0	21.7	30.0	-8.3	385	266
120.02	14.4	9.8	24.2	30.0	-5.8	400	220
144.02	13.2	11.4	24.6	30.0	-5.4	400	141
168.04	11.4	10.6	22.0	30.0	-8.0	400	297
192.04	11.7	10.6	22.3	30.0	-7.7	400	94
216.05	13.0	10.9	23.9	30.0	-6.1	400	130
227.97	13.9	8.7	22.6	30.0	-7.4	400	256
240.04	14.8	15.2	30.0	37.0	-7.0	400	40
264.04	16.6	14.5	31.1	37.0	-5.9	400	32

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

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TEST DATA OF RADIATED EMISSION

EUT: **USB KEYBOARD** MODEL: **5122U**

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)
72.03	6.7	18.6	25.3	30.0	-4.7	173	219
120.02	14.4	12.7	27.1	30.0	-2.9	100	10
144.02	13.6	12.3	25.9	30.0	-4.1	100	274
168.03	11.5	11.7	23.2	30.0	-6.8	100	180
192.02	12.1	12.7	24.8	30.0	-5.2	100	288
240.05	14.5	16.9	31.4	37.0	-5.6	100	153
264.00	16.1	17.9	34.0	37.0	-3.0	100	79
288.06	16.0	17.9	33.9	37.0	-3.1	100	8
312.05	16.6	14.4	31.0	37.0	-6.0	100	358

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

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, SGS
● 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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