

**EXHIBIT 4**  
**RFI/EMI TEST REPORT**



# EMC

## TEST REPORT

REPORT NO. : F87091809  
MODEL NO. : 6511-PA, 6512-PA, 6513-PA  
6514-PA, 6516-PA  
DATE OF TEST : Sept. 23, 1998

PREPARED FOR : ACER PERIPHERALS, INC.

ADDRESS : 157, SHAN-YING ROAD, KWEISHAN,  
TAOYUAN 333, TAIWAN, R.O.C.

PREPARED BY: ADVANCE DATA TECHNOLOGY CORPORATION



Accredited Laboratory

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TAIPEI, TAIWAN, R.O.C.

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## 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
6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT.....	14



1.

**CERTIFICATION**

Issue date: Sept. 24, 1998

Product : KEYBOARD  
 Trade Name : ACER  
 Model No. : 6511-PA, 6512-PA, 6513-PA, 6514-PA, 6516-PA  
 Applicant : ACER PERIPHERALS, INC.  
 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 Sept. 23, 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 VCCI Class B ITE limits of mains terminal interference voltage and radiated interference field strength of applicable standards.

TESTED BY: Johnny Liu, DATE: 9/24/98  
( Johnny Liu )

CHECKED BY: Yenny Soong, DATE: 9/24/98  
( Yenny Soong )

APPROVED BY: Mike Su, DATE: 9/24/98  
( Mike Su )

ADVANCE DATA TECHNOLOGY CORPORATION

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## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product	:	KEYBOARD
Model No.	:	6511-PA, 6512-PA, 6513-PA, 6514-PA, 6516-PA
Power Supply	:	DC 5V
Data Cable	:	Shielded (1.8m)

Note: The EUT has five model names , which are identical to each other, except for the following:

- Model: 6511-PA (104 Key)
- Model: 6512-PA (105 Key)
- Model: 6513-PA (106 Key)
- Model: 6514-PA (107 Key)
- Model: 6516-PA (109 Key)

From the above model names, model: 6511-PA was selected as representative model for the test, and its data is recorded in this report.

For more detailed features description, please refer to ATTACHMENT I - DESCRIPTION OF EUT 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	HP	VL SERIES 4 5/100	B94VECTRA500T	Nonshielded Power (1.8m)
2	MONITOR	ADI	PD-959	FCC DoC Approved	Shielded Signal (1.2m) Nonshielded Power (1.8m)
3	PRINTER	HP	2225C+	DSI6XU2225	Shielded Signal (1.5m) Nonshielded Power (2.0m)
4	MODEM	ACEEX	1414	IFAXDM1414	Shielded Signal (1.4m) Nonshielded Power (2.0m)
5	MOUSE	DEXIN	A2P800A	NIYA2P800A	Shielded Signal (1.5m)
6	VGA CARD	GORDIA	DSV3365	LUT-DSV3365	N/A

## 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)

##### RADIATED EMISSION MEASUREMENT

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
HP Spectrum Analyzer	E4411A	US37360834	Sept. 28, 1998
CHASE Preamplifier	CPA9231A/4	3215	Oct. 31, 1998
ROHDE & SCHWARZ TEST RECEIVER	ESVS 30	841977/002	Jan. 08, 1999
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 28, 1998
CHASE BILOG Antenna	CBL6112	2074	Dec. 25, 1998
CHANCE Turn Table & Tower Controller	ACS-I	N/A	N/A
Open Field Test Site	Site 6	ADT-R06	Dec. 23, 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	ESHS30	828109/007	July 22, 1999
ROHDE & SCHWARZ Artificial Mains Network	ESH2-Z5	892107/003	July 20, 1999
EMCO L.I.S.N.	3825/2	9504-2359	July 20, 1999
Shielded Room	Site 3	ADT-C03	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 : 27 °C

Humidity : 65 %

Atmospheric Pressure : 998 mbar

TEST RESULT	Remarks
<b>PASS</b>	Minimum passing margin of conducted emission: -13.9 dB at 0.333 MHz Minimum passing margin of radiated emission: -6.2 dB at 203.13 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: **KEYBOARD**MODEL: **6511-PA**

6 dB Band Width: 10 kHz

TEST PERSONNEL: *Johnny Xiu*

Freq. [MHz]	L Level		N Level		Limit		Margin [dB (μV)]			
	[dB (μV)]		[dB (μV)]		[dB (μV)]		L		N	
	QP	AV	QP	AV	QP	AV	QP	AV	QP	AV
0.243	47.30	-	43.00	-	61.99	51.99	-14.7	-	-19.0	-
0.333	44.40	-	45.50	-	59.38	49.38	-15.0	-	-13.9	-
0.525	26.20	-	31.90	-	56.00	46.00	-29.8	-	-24.1	-
0.753	20.20	-	28.30	-	56.00	46.00	-35.8	-	-27.7	-
9.608	33.10	-	31.90	-	60.00	50.00	-26.9	-	-28.1	-
13.037	37.30	-	35.00	-	60.00	50.00	-22.7	-	-25.0	-

- 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.



### 4.1.3 TEST DATA OF RADIATED EMISSION

EUT: **KEYBOARD**MODEL: **6511-PA**

ANTENNA: CHASE BILOG CBL6112

POLARITY: Horizontal

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL: *Johnny Liu*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data (dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
71.40	8.3	12.4	20.7	30.0	-9.3
75.60	9.2	14.2	23.4	30.0	-6.6
132.63	14.0	9.0	23.0	30.0	-7.0
145.95	12.5	.8	13.3	30.0	-16.7
190.00	10.6	5.8	16.4	30.0	-13.6
203.13	10.7	4.6	15.3	30.0	-14.7
210.65	11.4	3.4	14.8	30.0	-15.2

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.



## TEST DATA OF RADIATED EMISSION

EUT: **KEYBOARD**MODEL: **6511-PA**

ANTENNA: CHASE BILOG CBL6112

POLARITY: Vertical

DETECTOR FUNCTION: Quasi-peak

6 dB BANDWIDTH: 120 kHz

FREQUENCY RANGE: 30-1000 MHz

MEASURED DISTANCE: 10 M

TEST PERSONNEL:

*Johnny Liu*

Frequency (MHz)	Correction Factor (dB/m)	Reading Data dBuV)	Emission Level (dBuV/m)	Limits (dBuV/m)	Margin (dB)
68.31	7.3	16.4	23.7	30.0	-6.3
75.80	7.5	12.4	19.9	30.0	-10.1
124.59	14.1	8.7	22.8	30.0	-7.2
151.34	12.7	6.8	19.5	30.0	-10.5
169.99	11.0	8.1	19.1	30.0	-10.9
180.58	9.7	7.1	16.8	30.0	-13.2
190.00	10.7	7.6	18.3	30.0	-11.7
203.13	12.0	11.8	23.8	30.0	-6.2
210.65	12.3	8.1	20.4	30.0	-9.6

- 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.



## 6. ATTACHMENT 1 - TECHNICAL DESCRIPTION OF EUT

### Specifications:

<b>PIN:</b>	<b>SIGNAL NAME:</b>
1.	+KBD DATA
2.	Reserved
3.	Ground
4.	+5.0 Vdc
5.	+KBD CLK
6.	Reserved
	Shield Frame Ground

ADT CO. Shielded Room 3  
CISPR 22 CLASS B

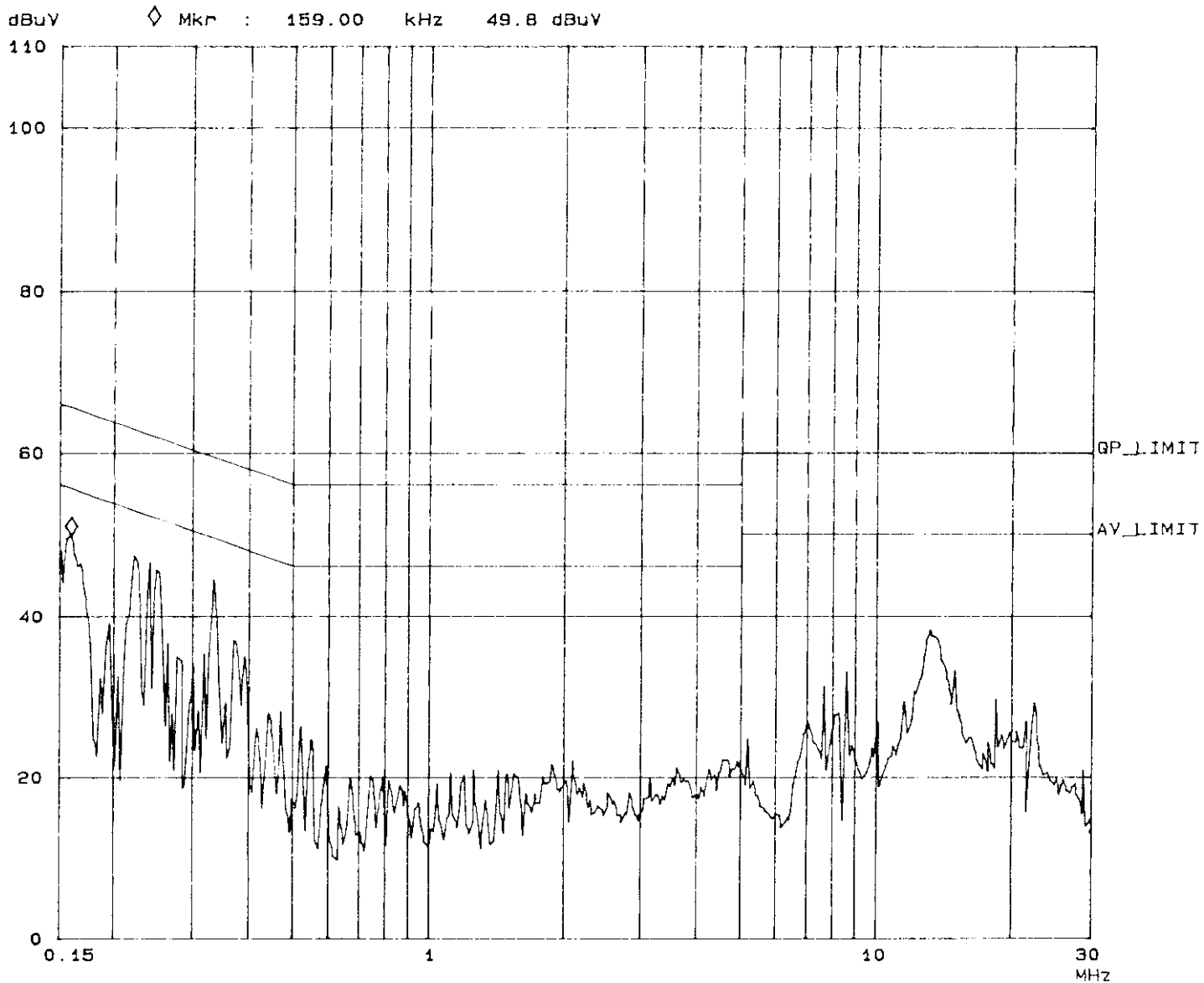
23. Sep 98 15:24

EUT: 6511-PA  
Test Spec: LISN : L

Report No. F87091809  
Page 9-1  
Tested by Johnny Liu

Fast Scan Settings (3 Ranges)

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



ADT CO. Shielded Room 3  
CISPR 22 CLASS B

23. Sep 98 14:57

EUT: 6511-PA  
Test Spec: LISN : N

Report No. F87091809  
Page 9-2  
Tested by Johnny Liu

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

