Measurement Report

FCC ID: FKD46AK378

This report concerns (check one) : ■ **Original Grant** □ **Class II Change**

Issued Date	:	Apr. 07, 2004
Project No.	:	04E0146
Equipment	:	Keyboard
Model No.	:	K378
Applicant	:	MONTEREY INTERNATIONAL CORP. No. 28, Wu-Chun 6th Rd., Wu-Ku Ind, Park, Taipei Hsien, Taiwan R.O.C.

Tested by :
Neutron Engineering Inc. EMC Laboratory
Data of Test :
Mar. 10, 2004 ~ Apr. 02, 2004

Testing Engineer : Josh (Josh Hsiao)

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NVLAP Lab Code: 200145-0 | CNLA 0659 ILAC MRA | Nemko Aut No.ELA136 | VCCI R-1347 C-1410

Declaration

Neutron represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with the standards traceable to National Measurement Laboratory (**NML**) of **R.O.C**., or National Institute of Standards and Technology (**NIST**) of **U.S.A.**

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Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.

Assessment Authorities	Test Standard/Scope/Item Acceptance
NVLAP Lab Code: 200145-0	FCC Part 15 Subpart B IEC/CISPR22 AS/NZS CISPR 22 CNS 13438
CNLA 0659 ILAC MRA	FCC Part 15 Subpart B CISPR 22/EN 55022 AS/NZS CISPR 22 VCCI -Technical Requirement CNS 13438 SS IEC/CISPR 22 IEC/EN 61000-3-2 IEC/EN 61000-4-5 IEC/EN 61000-3-3 IEC/EN 61000-4-6 IEC/EN 61000-4-2 IEC/EN 61000-4-8 IEC/EN 61000-4-3 IEC/EN 61000-4-11 IEC/EN 61000-4-4
Nemko Aut No.ELA136	CISPR 22/EN 55022 IEC/EN 61000-3-2 IEC/EN 61000-4-5 IEC/EN 61000-3-3 IEC/EN 61000-4-6 IEC/EN 61000-4-2 IEC/EN 61000-4-8 IEC/EN 61000-4-3 IEC/EN 61000-4-11 IEC/EN 61000-4-4
VCCI R-1347 C-1410	VCCI -Technical Requirement

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1. General Information

1.1 Applicant

Name MONTEREY INTERNATIONAL CORP.

Address No. 28, Wu-Chun 6th Rd., Wu-Ku Ind, Park, Taipei Hsien, Taiwan R.O.C.

1.2 Manufacturer

Name N/A

Address N/A

1.3 Equipment Under Tested

Name: Keyboard

Trade Name: MONTEREY

Model No.: K378

1.4 OEM Brand/Model (if applicable)

OEM Brand(s)/Model(s) except the basic model in sub-clause 1.3 is(are) the follows:

OEM Brand: No-Brand; A-OPEN; Applied; ASCO; ASUS; BIGLOBE TW; BADTZ-MARU; DELTA; Doaremon; ECS; FIC; Genius; GENUINE; GENUIS; SOWIN; K. T Hello Kitty; LEMEL; LEO; P. N Pom PomPurin; Sunlink; Sysgration; SYNNEX; Tare panda; Tomnet; TATUNG; TWINHEAD; U-Stylish; X.OBAO

Model No.: N/A

1.5 Model Difference (Series, Versions, if any)

Except the basic model no. (model designation of the sample tested in this test report), additional model no. covered is(are) :

N/A

1.6 Product Descriptions(Application/Features/Specification)

The EUT is a Keyboard.

Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual

1.7 Connecting I/O Port(s)

Please refer to the User's Manual

1.8 Power Supplied

Power Source: Supplied from PC PS/2 Port.
Power Cord: N/A
Power Rating: N/A

1.9 Products Covered (if applicable)

The sample tested including the following sub-system/module/accessory :

Sub-system/ Module/ Accessory	Model/Type No.	Int. Inst./ Ext. Cont.
N/A	N/A	N/A

1.10 Description of Test Mode(s)

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

1.11 EUT Modifications (if applicable)

Not any modification required for the EUT to comply with the standards.

1.12 Summary of Test Results

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15, Subpart B CISPR 22:1997+A1:2000	Conducted Emission	Class B	PASS	
	Radiated Emission	Class B	PASS	

NOTE:

(1)” N/A” denotes test is not applicable in this Test Report

2. RFI Emissions Measurement

2.1Test Facility

The test facilities used to collect the test data in this report is OS02 at the location of No.132-1, Lane 329, Sec. 2, Palain Road, Shijr City, Taipei, Taiwan.

2.2 Standard Compliance

The test data contained in this report relate only to the item(s) listed below :

Limitation Class B

FCC Part15, Subpart B/CISPR 22:1997+A1:2000

2.3 Test Methodology

Both conducted and radiated testing were performed during the max. EMI emission evaluation.

Antenna to EUT distance is 10 m.

Test procedures according to the technical standards:
FCC Part15, Subpart B / ANSI C63.4: 2000.

2.4 Deviations from Standard Test Method

N/A

2.5 Sample(s) Tested

The representative sample tested in this reports is(are): K378

Test results in this test report relate only to the sample(s) tested.

The EUT has been tested according to the following environmental condition:

Input Power	120Vac/60Hz
Environmental Conditions	Please refer to the measurement data.

2.6 Measurement Instruments

Valid measurement instruments used in this report refer to **Table-1** enclosed.

2.7 Measurement Uncertainty

The reported uncertainty of measurement **y** ± **U**，where expended uncertainty **U** is based on a standard uncertainty multiplied by a coverage factor of **k=2**，providing a level of confidence of approximately **95** %。

A. Conducted Measurement :5.05dB

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	Ant. H / V	U，(dB)	NOTE
OS-01	ANSI	30MHz ~ 200MHz	H	4.59	
		30MHz ~ 200MHz	V	4.80	
		200MHz ~ 1,000MHz	H	4.47	
		200MHz ~ 1,000MHz	V	5.03	
OS-01	VCCI	30MHz ~ 200MHz	H	4.59	Only for VCCI Report
		30MHz ~ 200MHz	V	4.48	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.47	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.73	Only for VCCI Report
OS-02	ANSI	30MHz ~ 200MHz	H	4.34	
		30MHz ~ 200MHz	V	5.15	
		200MHz ~ 1,000MHz	H	5.28	
		200MHz ~ 1,000MHz	V	4.53	
OS-02	VCCI	30MHz ~ 200MHz	H	4.34	Only for VCCI Report
		30MHz ~ 200MHz	V	4.77	Only for VCCI Report
		200MHz ~ 1,000MHz	H	4.91	Only for VCCI Report
		200MHz ~ 1,000MHz	V	4.53	Only for VCCI Report

2.8 Tested System Set-Up/Configuration Details

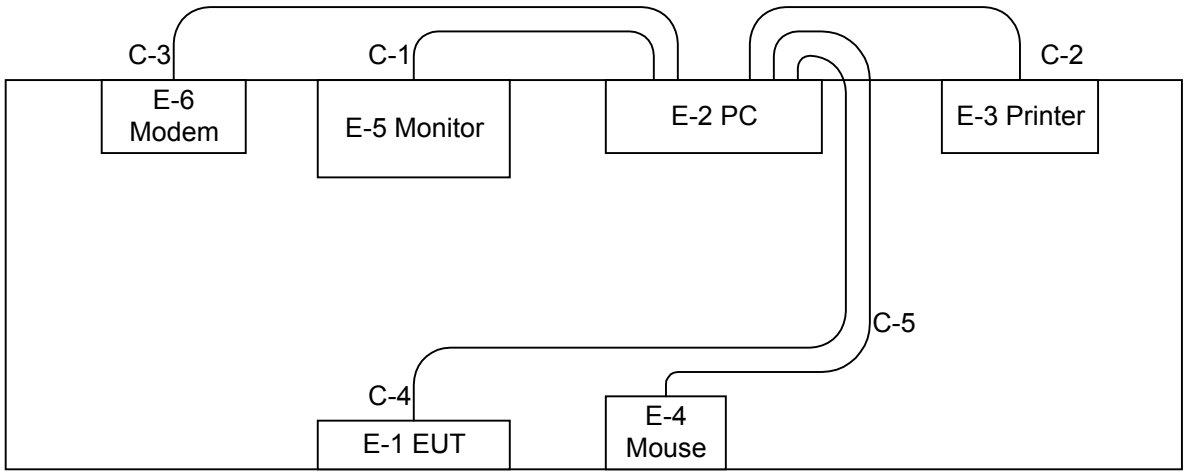
The system was configured for testing in a typical fashion (as a user would normally use) or in-accordance with the operating configuration specified in the user's manual. A Block Diagram(please refer to the Diagram - 1) and Photos(please refer to the attachment - **A**) showing the set-up/configuration of system tested. In addition, **Table-2** and **Table-3** provide a detail of all equipment items and cables information used in the system tested.

Table -1 Measurement Instruments List

Item	Instruments	Mfr/Brand	Model/Type No.	Serial No.	Calibrated Date	Next Cali. Date	Note
1	LISN	EMCO	3825/2	9605-2539	2003-06-10	2004-06-09	✓
2	LISN	Rolf Heine	NNB-2/16Z	98083	2003-11-01	2004-10-30	
3	LISN	Rolf Heine	NNB-2/16Z	98053	2003-11-14	2004-11-13	✓
4	LISN	EMCO	4825/2	00028234	2003-10-01	2004-09-30	
5	Pulse Limiter	Electro-Metrics	EM-7600	112644	2003-12-08	2004-12-07	✓
6	50Ω Terminator	N/A	N/A	N/A	2003-05-09	2004-05-08	✓
7	Test Cable	N/A	C01	N/A	2003-12-09	2004-12-08	✓
8	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3058	2003-10-21	2004-10-20	
9	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3060	2003-10-21	2004-10-20	✓
10	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9160	3115	2003-04-17	2004-04-16	
11	Log-Bicon Antenna	MESS-ELEKTRONIK	VULB 9161	4022	2003-07-14	2004-07-13	
12	Test Cable	N/A	10M_OS01	N/A	2003-12-09	2004-12-08	
13	Test Cable	N/A	OS01-1/-2	N/A	2003-12-09	2004-12-08	
14	Test Cable	N/A	10M_OS02	N/A	2003-12-09	2004-12-08	✓
15	Test Cable	N/A	OS02-1/-2/-3	N/A	2003-12-09	2004-12-08	✓
16	RF Switch	Anritsu	MP59B	M65982	2003-12-08	2005-12-07	
17	Quasi-Peak Adapter	HP	85650A	2521A00844	2003-10-20	2004-04-19	
18	RF Pre-Selector	HP	85685A	2648A00417	2003-10-20	2004-04-19	
19	Spectrum Analyzer	HP	85680B	2634A03025	2003-10-20	2004-04-19	
20	Spectrum Monitor	HP	85662B	2648A13616	2003-10-20	2004-04-19	
21	Pre-Amplifier	Anritsu	MH648A	M09961	2003-12-08	2004-12-07	✓
22	Spectrum Analyzer	ADVAN TEST	R3261C	81720298	2003-08-13	2004-08-12	✓
23	Test Receiver	R&S	ESH3	860156/018	2003-10-21	2004-10-20	
24	Test Receiver	R&S	ESVP	860687/009	2003-12-05	2004-12-04	
25	Test Receiver	MEB	SMV41	130	2003-12-05	2004-12-04	✓
26	Test Receiver	PMM	PMM 9000	4310J01002	2003-10-03	2004-10-02	
27	Horn Antenna	EMCO	3115	9605-4803	2003-05-23	2004-05-22	
28	Test Receiver	R&S	ESMI	843977/005	2004-01-12	2005-01-11	
29	Pre-Amplifier	R&S	ESMI-Z7	1045.5020.9801 (612.278 041 00)	2003-05-19	2004-05-18	
30	Absorbing Clamp	R&S	MDS-21	841077/011	2003-08-14	2004-08-13	
31	Voltage Probe	R&S	ESH2-Z3	841.800/023	2003-08-26	2004-08-25	
32	Signal Generator	HP	8648A	3426A01034	2002-10-11	2004-10-08	
33	Antenna Mast	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓
34	Turn Table	Chance Most	CMTB-1.5	N/A	N/A	N/A	✓

Remark :
(1)" ✓" indicates the instrument used in Test Report.
(2)" N/A" denotes No Model No. / Serial No. and No Calibration specified.

Diagram - 1
Block diagram showing the configuration of system tested



C-1 Video Cable
C-2 Centronic Cable
C-3 Interface Cable
C-4 Keyboard Cable
C-5 Mouse Cable

Table - 2 Equipments Used in Tested System

Item	Equipment	Mfr/Brand	Model/Type No.	FCC ID	Series No.	Note
E-1	Keyboard	MONTEREY	K378	DOC	N/A	EUT
E-2	PC	HP	Pavilion 8801	DOC	SG12460765	
E-3	Printer	SII	DPU-414	DOC	1045105A	
E-4	PS/2 Mouse	HP	P8131	DOC	5185-1212	
E-5	Monitor	HITACHI	CM753ET	DOC	T8L000003	
E-6	Modem	ACEEX	DM-1414V	DOC	8041708	

Note:

(1) Unless otherwise denoted as EUT in『Remark』column , device(s) used in tested system is a support equipment.
(2) Unless otherwise marked as ※ in『Remark』column, Neutron consigns the support equipment to the tested system.
(3) The support equipment was authorized by Declaration of Confirmation.

Table - 3 Information of Interface Cable

Item	Shielded Type	Ferrite Core	Length	Note
C-1	YES	YES	1.8M	
C-2	YES	NO	1.8M	
C-3	YES	NO	1.5M	
C-4	YES	NO	1.5M	※
C-5	YES	NO	1.5M	

Note:

(1) Unless otherwise marked as ※ in『Remark』column, Neutron consigns the support equipment to the tested system.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.9 EUT Operating Conditions

(a) Both conducted and radiated testing were performed during the max. EMI emission evaluation.

(b) The system was configured for testing in a typical fashion (as a customer would normally use it). The EUT was connected to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard, modem and printer were contained in this system in order to comply with the CISPR22 Rules requirement. The PC operated in the default 640 x 480 / 31.5 KHz VGA Graphic mode. This operating condition was tested and used to collect the included data.

(c) The EUT exercise program used during radiated and/or conducted emission measurement was designed to exercise the various system components in a manner similar to a typical use. The program contained on a PC hard disk and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:
1. Read (write) from (to) mass storage device (Disk).
2. Send "H" pattern to video port device (Monitor).
3. Send " H " pattern to parallel port device (Printer).
4. Send " H " pattern to serial port device (Modem).
5. EUT sent messages to PC
6. Repeated from 2 to 5 continuously.

3. Justification

3.1 Limitations

3.1.1 Power Line Conducted Emission (Frequency Range 150KHz-30MHz)

Measurement Frequency Range (MHz)	Mains Terminal Class A Limits (dBuV)		Mains Terminals Class B Limits (dBuV)		Note CISPR FCC Std.
	QP Mode	AV Mode	QP Mode	AV Mode	
0.15 - 0.50	79.00	66.00	66 - 56 *	56 - 46 *	CISPR
0.50 - 5.00	73.00	60.00	56.00	46.00	CISPR
5.00 - 30.0	73.00	60.00	60.00	50.00	CISPR
0.45-1.705	60.00	N/A	48.00	N/A	FCC
1.705-30.0	69.50	N/A	48.00	N/A	FCC

Notes:

(1). The tighter limit applies at the band edges.

(2). The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

3.1.2 Radiated Emission Limits (Frequency Range 30MHz-1000MHz)

Measurement Frequency Range (MHz)	Quasi-Peak Mode Class A Limits (dBuV/m)		Quasi-Peak Mode Class B Limits (dBuV/m)		Note CISPR FCC Std.
	10m	30m	10m	3m	
30.00 -230.00	40.00	30.00	30.00	40.00	CISPR
230.0 -1000.0	47.00	37.00	37.00	47.00	CISPR
30.00 - 88.00	39.00	N/A	30.00	40.00	FCC
88.00 - 216.0	43.50	N/A	33.50	43.50	FCC
216.0 -960.0	46.00	N/A	36.00	46.00	FCC
above 960.0	49.50	N/A	46.00	54.00	FCC

Notes:

(1). The tighter limit applies at the band edges.

(2). Emission level (dBuV/m)=20log Emission level (uV/m).

(3). A measuring distance 0f 10m is a primary used. However, either 3m or 10m (instead of 10m) distance my be allowed. If the distance is 3m, add 10dB to the QP-limit above. If the distance is 10m, subtract 10dB from the QP-limit above.

3.2 Measurement Justification

3.2.1 Conducted Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and these signals are then Quasi Peak detector mode and Average detector mode re-measured.

Data of **Table - 4**. lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP or AV in column of " Remark ".

If the Peak Mode measured value lower than both QP Mode and AV Mode Limit, EUT shall be deemed to compliance with both QP & AV Limits and then no additional QP Mode or AV Mode measurement performed.

If additional QP or AV Mode measurement needed, and if the QP Mode measured value compliance with the QP Mode Limit and lower than AV Mode Limit, the EUT shall be deemed to meet both QP & AV Limits and then only QP Mode was measured, but AV Mode was not performed。

3.2.2 Radiated Emission

The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Data of **Table - 5**. lists the significant emission frequencies, measured levels, limits and safe margins. All readings are Peak Mode measured unless otherwise stated as QP in column of " Remark ".

If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.

3.3 Measurement Data

Table - 4. Conducted Emission Data

Table - 5. Radiated Emission Data

Table 4 Conducted Emission Data

EUT： Keyboard Model/Type No. ： K378

Temperature： 18.5 ℃ Relative Humidity： 70 % Pressure： 1016.2 hPa

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Freq.	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins	
(MHz)	L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.19	Line	54.00	48.45	63.99	53.99	-5.54	(AV)
0.26	Line	52.61	43.78	61.37	51.37	-7.59	(AV)
0.34	Line	45.31	*	59.23	49.23	-13.92	(QP)
0.49	Line	40.91	*	56.15	46.15	-15.24	(QP)
0.64	Line	44.11	39.75	56.00	46.00	-6.25	(AV)
0.72	Line	42.61	*	56.00	46.00	-13.39	(QP)
0.19	Neutral	53.20	47.57	64.21	54.21	-6.64	(AV)
0.26	**Neutral**	**51.51**	**46.38**	**61.43**	**51.43**	**-5.05**	**(AV)**
0.31	Neutral	44.61	*	59.92	49.92	-15.31	(QP)
0.49	Neutral	40.21	*	56.15	46.15	-15.94	(QP)
0.64	Neutral	43.11	*	56.00	46.00	-12.89	(QP)
0.72	Neutral	41.91	*	56.00	46.00	-14.09	(QP)

Remark：

(1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz；SPA setting in RBW=10KHz,VBW =10KHz, Swp. Time = 0.3 sec./MHz。 Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz,VBW=10Hz, Swp. Time =0.3 sec./MHz。

(2) All readings are QP Mode value unless otherwise stated AVG in column of『Note』. If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform。In this case, a " * " marked in AVG Mode column of Interference Voltage Measured。

(3) Measuring frequency range from 150KHz to 30MHz。

Table 5 Radiated Emission Data

EUT： Keyboard Model/Type No. ：K378

Temperature： 23 ℃ Relative Humidity： 60 % Pressure：1016.2 hPa

Special Notes：(EUT Operation Mode or Test Configuration Mode, if applicable)

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
35.44	**V**	**44.20**	**- 16.22**	**27.98**	**30.00**	**- 2.02**	
48.60	H	36.70	- 15.98	20.72	30.00	- 9.28	
70.16	V	40.40	- 18.56	21.84	30.00	- 8.16	
120.84	H	35.90	- 15.92	19.98	30.00	- 10.02	
127.40	V	37.62	- 15.56	22.06	30.00	- 7.94	
137.98	H	35.31	- 15.02	20.29	30.00	- 9.71	
203.76	V	39.80	- 17.68	22.12	30.00	- 7.88	
205.27	H	32.80	- 17.72	15.08	30.00	- 14.92	
216.04	H	33.70	- 17.58	16.12	30.00	- 13.88	
229.14	H	33.40	- 16.99	16.41	30.00	- 13.59	
263.87	V	37.45	- 15.73	21.72	37.00	- 15.28	
299.90	V	37.10	- 14.28	22.82	37.00	- 14.18	

Remark：

(1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz；SPA setting in RBW=120KHz, VBW =120KHz, Swp. Time = 0.3 sec./MHz。

(2) All readings are Peak unless otherwise stated QP in column of 『Note』. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment didn't perform。

(3) Measuring frequency range from 30MHz to 1000MHz。

(4) If the peak scan value lower limit more than 20dB, then this signal data does not how in table。

Attachment

Table Contents

Attachment - A.

EUT Test Photos

1. **Conducted Measurement Photos**
2. **Radiated Measurement Photos**