

AQ6-7DR15

EXHIBIT D

CKC TEST REPORT



CERTIFICATION TEST REPORT

FOR THE

KEYBOARD, RT7D5JTW

FCC/CISPR 22/85

CLASS B COMPLIANCE

DATE OF ISSUE: AUGUST 31, 1998

PREPARED FOR:

NMB Technologies
9730 Independence Ave
Chatsworth, CA 91311

P.O. No: Q010979
W.O. No: 69806

Report No: **FB98-118**

DOCUMENTATION CONTROL:

Tracy Phillips
Documentation Control Supervisor
CKC Laboratories, Inc.

PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: August 25 & 26, 1998

APPROVED BY:

Dennis Ward
Director of Laboratories
CKC Laboratories, Inc.

This report contains a total of 29 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc.

TABLE OF CONTENTS

Administrative Information	3
Summary Of Results	4
Equipment Under Test (EUT) Description	4
Measurement Uncertainty	4
Peripheral Devices	4
Report Of Measurements	5
Table 1: Six Highest Radiated Emission Levels	5
Table 2: Six Highest Conducted Emission Levels	6
Table A : List Of Test Equipment	7
EUT Setup	8
Test Instrumentation And Analyzer Settings	9
Table B : Analyzer Bandwidth Settings Per Frequency Range	9
Spectrum Analyzer Detector Functions	10
Peak	10
Quasi-Peak	10
Average	10
Test Methods	11
Radiated Emissions Testing	11
Conducted Emissions Testing	12
Sample Calculations	12
Appendix A : Information About The Equipment Under Test	13
I/O Ports	14
Crystal Oscillators	14
Printed Circuit Boards	14
Required EUT Changes To Comply	14
Cable Information	14
Equipment Configuration Block Diagram	15
Photograph Showing Radiated Emissions	16
Photograph Showing Radiated Emissions	17
Photograph Showing Conducted Emissions	18
Photograph Showing Conducted Emissions	19
Appendix B : Measurement Data Sheets	20

CKC Laboratories, Inc. has Certificates of Accreditation from the following agencies:

DATEch (Germany); A2LA (USA); FCC (USA); VCCI (Japan); BCIQ (Taiwan); HOKLAS (Hong Kong).

CKC Laboratories, Inc. has Letters of Acceptance through an MRA for the following agencies:

ACA/NATA (Australia); SABS (South Africa); SWEDAC (Sweden); TUV Rheinland-Germany; TUV Rheinland-Korea; TUV Rheinland-Russia; Radio Communication Agency (RA); NEMKO (Norway).

ADMINISTRATIVE INFORMATION

DATE OF TEST: August 25 & 26, 1998

PURPOSE OF TEST: To demonstrate the compliance of the Keyboard, RT7D5JTW, with the requirements for FCC/CISPR 22/85 Class B devices.

MANUFACTURER: NMB Technologies
9730 Independence Ave
Chatsworth, CA 91311

REPRESENTATIVE: Bob Dickerman

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92621

TEST PERSONNEL: Stu Yamamoto

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 150kHz – 1000MHz

EQUIPMENT UNDER TEST: Keyboard
Manuf: NMB Technologies, Inc
Model: RT7D5JTW
Serial:
FCC ID:

SUMMARY OF RESULTS

The NMB Technologies Keyboard, RT7D5JTW was tested in accordance with ANSI C63.4 (1992) for compliance with the Class B requirements of the FCC/CISPR 22/85 Rules.

As received, the above equipment was found to be fully compliant with the Class B limits of FCC/CISPR 22/85 for both radiated and conducted emissions.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Keyboard, Computer HID serial input device.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ± 4 dB measurement uncertainty.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral devices:

Computer

Manuf: Intel
Model: S100EDZ8FLC
Serial: A05721230
FCC ID: EJMBATTAHITI

Modem

Manuf: Hayes
Model: 6802US
Serial: B10068023649
FCC ID: BFI9D9 6802US

Modem

Manuf: Hayes
Model: 6802US
Serial: A00768023303
FCC ID: BFI9D9 6802US

Monitor

Manuf: HP
Model: D2806B
Serial: KR54366896
FCC ID: CSYSC-528UXH

Printer

Manuf: HP
Model: C2184A
Serial: CN5B21R1DM
FCC ID: B94C2184X

Mouse

Manuf: Microsoft
Model: MUS9J
Serial: 0003468
FCC ID: EMJMUSJP

REPORT OF MEASUREMENTS

The following Tables 1 and 2 report the six highest radiated and conducted emissions levels recorded during the tests performed on the Keyboard, RT7D5JTW. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV/m	SPEC LIMIT dBμV/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist dB				
49.929	42.4	11.0	-27.9	1.4		26.9	30.0	-3.1	VQ
74.897	47.6	6.2	-28.1	1.9		✓ 27.6	30.0	-2.4	HDQ
110.592	37.4	14.0	-27.8	2.2		25.8	30.0	-4.2	HQ
119.981	34.4	15.7	-27.7	2.4		24.8	30.0	-5.2	HQ
166.180	32.5	17.5	-28.0	2.9		24.9	30.0	-5.1	VQ
731.231	30.3	22.6	-27.2	7.1		32.8	37.0	-4.2	HQ

Test Method:
Spec Limit :
Test Distance:

ANSI C63.4 1992
FCC Class B
10 Meters

NOTES:

H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

11
47.6
6.2
1.9
55.7
-28.1
27.6

COMMENTS: The EUT is a keyboard and is connected to the host computer. The computer also has a monitor, mouse, printer, and two modems connected. The EUT is continually sending H's to the computer and the H's are being displayed on the monitor. Voltage to computer is 120 VAC, 60 Hz. Temperature: 23°C Humidity: 53%.

Table 2: Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V	SPEC LIMIT dB μ V	MARGIN dB	NOTES
		Lisn dB							
0.203283	44.8	0.0				44.8	53.5	-8.7	B
0.398209	35.9	0.0				35.9	47.9	-12.0	B
0.469279	37.3	0.0				37.3	46.5	-9.2	B
0.593652	36.4	0.0				36.4	46.0	-9.6	B
1.191820	34.5	0.0				34.5	46.0	-11.5	W
3.135687	34.1	0.0				34.1	46.0	-11.9	W

Test Method: ANSI C63.4 1992
Spec Limit : FCC Class B
Test Distance: No Distance

NOTES: Q = Quasi Peak Reading
A = Average Reading
B = Black Lead
W = White Lead

COMMENTS: The EUT is a keyboard and is connected to the host computer. The computer also has a monitor, mouse, printer, and two modems connected. The EUT is continually sending H's to the computer and the H's are being displayed on the monitor. Voltage to computer is 120 VAC 60 Hz. Temperature: 23°C Humidity: 53%.

TABLE A

LIST OF TEST EQUIPMENT

VCCI Acceptance No. R-301 & C-314

1. Spectrum Analyzer, Hewlett Packard, Model No. 8568A, S/N 2049A01287. Display
85680A S/N 2106A02109.
2. Preamp, Hewlett Packard, Model No. 8447D, S/N 1937A02548.
3. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N – 3303A01884.
4. Biconical Antenna, A & H Systems, Model No. SAS-200/540, S/N 220.
5. Log Periodic Antenna, A & H Systems, Model No. SAS-200/516, S/N 331.
6. Power Analyzer, Voltech, Model PM3000A v2.11, S/N 1730.
7. LISN, Solar Electronics, Model No. 50 uH, S/N Brea #2.
8. Test software, EMI Test 2.91.

EUT SETUP

The equipment under test (EUT) and the peripherals listed were setup in a manner that represented their normal use, as shown in the setup photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Table 1 for radiated emissions, and Table 2 for conducted emissions. Additionally, a complete description of all the ports and I/O cables is included on the information sheets contained in Appendix A.

During radiated emissions testing, the EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of table top devices.

I/O cables were connected to the EUT and peripherals in the manner required for normal operation of the system. Excess cabling was bundled in the center in a serpentine fashion using 30-40 centimeter lengths.

During conducted emissions testing, the EUT was located 80 centimeters above the conducting ground plane on the same nonconducting table as was used for radiated testing. The metal plane was grounded to the earth through the green wire safety ground. Power to the Host PC was provided via 3 meters of shielded power cable from a filter grounded to the metal plane to a LISN. The LISN was also grounded to the plane and attached to the LISN was a 4 ganged grounded outlet whose source was also shielded and 60 cm in length. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the Keyboard, RT7D5JTW. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. All antennas were located at a distance of 10 meters from the edge of the EUT. Conducted emissions tests required the use of the FCC type LISN's.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, a reference level of 100 dB μ V and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB μ V, and a vertical scale of 10 dB per division.

TABLE B : ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1 and 2 indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in Table 1 or Table 2. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Keyboard. RT7D5JTW.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP 85650A Quasi-Peak Adapter for the HP 8568B Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

For frequencies below 30MHz and exceeding 1 GHz, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

TEST METHODS

The radiated and conducted emissions data of the Keyboard, RT7D5JTW, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC/CISPR 22/85 Class B emissions limits to determine compliance.

Preliminary and final measurements were taken in order to better ensure that all emissions from the EUT were found and maximized.

Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode, with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 88 MHz was then scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks which were at or near the limit were recorded. The frequency range of 100 - 300 MHz was scanned in the same manner, using the biconical antenna, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

For the final radiated scan, the equipment was again positioned with its I/O and power cables facing the antenna. A thorough scan of all frequencies was manually made using a small frequency span, rotating the turntable as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximized the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

Conducted Emissions Testing

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the six highest emissions readings in Tables 1 and 2. For radiated emissions in dB μ V/m, the spectrum analyzer reading in dB μ V was corrected by using the following formula:

$$\begin{aligned} & \text{Meter reading (dB}\mu\text{V)} \\ & + \text{Antenna Factor (dB)} \\ & + \text{Cable Loss (dB)} \\ & - \text{Distance Correction (dB)} \\ & - \text{Pre-amplifier Gain (dB)} \\ & = \text{Corrected Reading (dB}\mu\text{V/m)} \end{aligned}$$

This reading was then compared to the applicable specification limit to determine compliance. For conducted emissions, no correction factors were needed when 50 μ H LISN's were used.

APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

Test Software/Firmware:	
CRT was displaying:	Scrolling "H's"
Power Supply Manufacturer:	
Power Supply Part Number:	
AC Line Filter Manufacturer:	
AC Line Filter Part Number:	
Line voltage used during testing:	120V 60Hz

I/O PORTS

Type	#
Serial, Keyboard	1

CRYSTAL OSCILLATORS

Type	Freq In MHz
RC Resonator (Clock)	4

PRINTED CIRCUIT BOARDS

Function	Model & Rev	Clocks, MHz	Layers	Location
Logic Z86K15 MPU	123452 Rev. A	4	1	Inside K/B

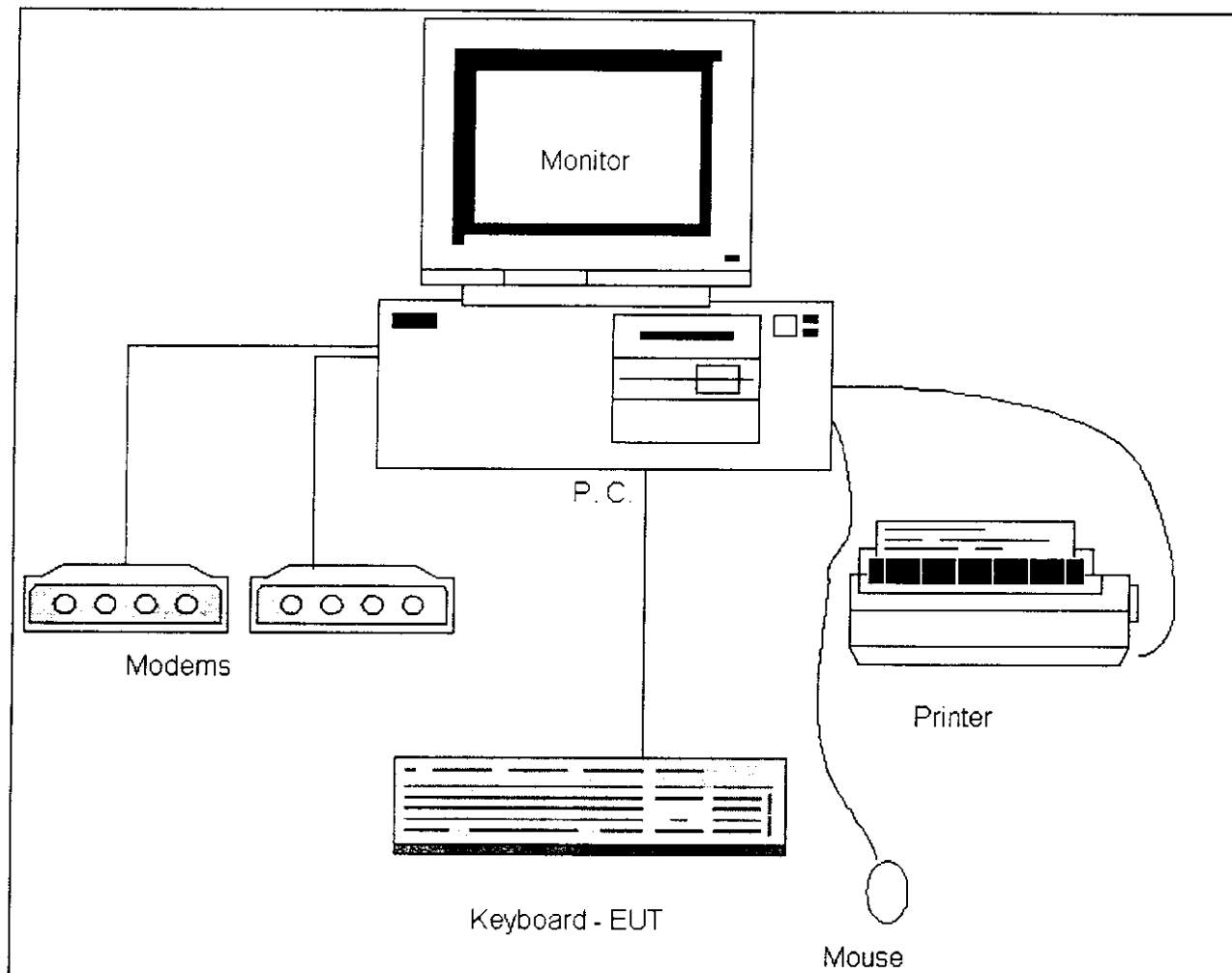
REQUIRED EUT CHANGES TO COMPLY:

C1 = 100pF

CABLE INFORMATION

Cable #: 1	Cable(s) of this type: 1
Cable Type: Serial Construction: Round Connected To End (1): Mini Din Connector At End (1): Shield Grounded At (1): Chassis Ground Part Number:	Shield Type: Foil Length In Meters: 2.3 Connected To End (2): PCB Connector At End (2): Shield Grounded At (2): Chassis Ground Number of Conductors: 4
Notes:	

EQUIPMENT CONFIGURATION BLOCK DIAGRAM



Block Diagram

NOTES:

APPENDIX B
MEASUREMENT DATA SHEETS

Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: NMB Technologies Inc. Date: Aug-25-98
 Specification: CISPR 22 B RADIATED Time: 18:36
 Test Type: Maximized Emissions Sequence#: 2
 Equipment: Keyboard
 Manufacturer: NMB Technologies, Inc Tested By: Stu Yamamoto
 Model: RT7D5JTW
 S/N:

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT7D5JTW	

Support Devices:

Function	Manufacturer	Model #	S/N
Computer	Intel	S100EDZ8FLC	A05721230
Modem	Hayes	6802US	B10068023649
Modem	Hayes	6802US	A00768023303
Monitor	HP	D2806B	KR54366896
Printer	HP	C2184A	CN5B21R1DM
Mouse	Microsoft	MUS9J	0003468

Test Conditions / Notes:

The EUT is a keyboard and is connected to the host computer. The computer also has a monitor, mouse, printer, and two modems connected. The EUT is continually sending H's to the computer and the H's are being displayed on the monitor. Voltage to computer is 120 VAC 60 Hz. Temperature: 23°C Humidity: 53%.

Measurement Data: Sorted by Margin Test Distance: 10 Meters

#	Freq MHz	Rdng dBμV	BICON dB	Cable dB	Cable dB	LOG dB	Dist DB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar
1	74.897	47.6	+0.0	+1.6	+0.3	+0.0	+0.0	27.6	30.0	-2.4	Horiz
			-28.1	+6.2							
^	74.897	46.5	+7.4	+1.6	+0.3	+0.0	+0.0	27.7	30.0	-2.3	Horiz
			-28.1	+0.0							
3	74.902	46.9	+0.0	+1.6	+0.3	+0.0	+0.0	26.9	30.0	-3.1	Vert
			-28.1	+6.2							
^	74.902	45.9	+7.4	+1.6	+0.3	+0.0	+0.0	27.1	30.0	-2.9	Vert
			-28.1	+0.0							
5	49.929	42.4	+11.0	+1.2	+0.2	+0.0	+0.0	26.9	30.0	-3.1	Vert
			-27.9	+0.0							

6	731.231	30.3	+0.0	+6.0	+1.1	+22.6	+0.0	32.8	37.0	-4.2	Horiz
	Quasi Peak		-27.2	+0.0							
	non keyboard										
7	110.592	37.4	+14.0	+1.9	+0.3	+0.0	+0.0	25.8	30.0	-4.2	Horiz
	Quasi Peak		-27.8	+0.0							
	non keyboard										
8	110.591	36.6	+14.0	+1.9	+0.3	+0.0	+0.0	25.0	30.0	-5.0	Vert
	Quasi Peak		-27.8	+0.0							
	non keyboard										
9	166.180	32.5	+17.5	+2.4	+0.5	+0.0	+0.0	24.9	30.0	-5.1	Vert
	Quasi Peak		-28.0	+0.0							
	non keyboard										
10	119.981	34.4	+15.7	+2.0	+0.4	+0.0	+0.0	24.8	30.0	-5.2	Horiz
	Quasi Peak		-27.7	+0.0							
	non keyboard										
11	150.024	32.3	+17.6	+2.3	+0.6	+0.0	+0.0	24.7	30.0	-5.3	Horiz
	Quasi Peak		-28.1	+0.0							
	non keyboard										
12	197.996	31.9	+16.7	+2.8	+0.7	+0.0	+0.0	24.0	30.0	-6.0	Vert
	Quasi Peak		-28.1	+0.0							
13	70.717	42.5	+7.3	+1.7	+0.3	+0.0	+0.0	23.9	30.0	-6.1	Vert
			-27.9	+0.0							
14	631.523	31.7	+0.0	+5.4	+0.9	+20.4	+0.0	30.8	37.0	-6.2	Vert
			-27.6	+0.0							
15	83.254	42.0	+8.1	+1.6	+0.2	+0.0	+0.0	23.7	30.0	-6.3	Horiz
	Quasi Peak		-28.2	+0.0							
16	598.272	33.3	+0.0	+5.1	+0.8	+19.1	+0.0	30.6	37.0	-6.4	Horiz
	Quasi Peak		-27.7	+0.0							
17	330.010	33.5	+0.0	+3.6	+0.5	+21.0	+0.0	30.6	37.0	-6.4	Horiz
			-28.0	+0.0							
18	49.886	39.0	+11.0	+1.2	+0.2	+0.0	+0.0	23.5	30.0	-6.5	Horiz
			-27.9	+0.0							
19	167.982	31.0	+17.5	+2.4	+0.5	+0.0	+0.0	23.4	30.0	-6.6	Vert
	Quasi Peak		-28.0	+0.0							
20	269.969	33.9	+20.5	+3.3	+0.7	+0.0	+0.0	30.4	37.0	-6.6	Vert
			-28.0	+0.0							
21	432.074	37.1	+0.0	+4.4	+0.8	+16.1	+0.0	30.2	37.0	-6.8	Horiz
	Quasi Peak		-28.2	+0.0							
22	221.995	30.5	+17.5	+2.8	+0.4	+0.0	+0.0	23.2	30.0	-6.8	Horiz
			-28.0	+0.0							
23	282.012	32.7	+21.6	+3.3	+0.6	+0.0	+0.0	30.2	37.0	-6.8	Vert
			-28.0	+0.0							
24	54.138	39.8	+9.8	+1.3	+0.2	+0.0	+0.0	23.1	30.0	-6.9	Horiz
			-28.0	+0.0							
25	166.170	30.4	+17.5	+2.4	+0.5	+0.0	+0.0	22.8	30.0	-7.2	Horiz
	Quasi Peak		-28.0	+0.0							
26	209.992	30.4	+17.0	+2.8	+0.6	+0.0	+0.0	22.7	30.0	-7.3	Horiz
	Quasi Peak		-28.1	+0.0							
27	209.996	30.4	+17.0	+2.8	+0.6	+0.0	+0.0	22.7	30.0	-7.3	Vert
	Quasi Peak		-28.1	+0.0							

28	179.980	30.1	+17.3 -27.9	+2.6 +0.0	+0.5	+0.0	+0.0	22.6	30.0	-7.4	Vert
29	191.980	30.3	+16.9 -28.0	+2.7 +0.0	+0.6	+0.0	+0.0	22.5	30.0	-7.5	Vert
30	54.070	39.2	+9.8 -28.0	+1.3 +0.0	+0.2	+0.0	+0.0	22.5	30.0	-7.5	Vert
31	192.010	29.8	+16.9 -28.0	+2.7 +0.0	+0.6	+0.0	+0.0	22.0	30.0	-8.0	Horiz
	Quasi Peak										
32	731.234	26.4	+0.0 -27.2	+6.0 +0.0	+1.1	+22.6	+0.0	28.9	37.0	-8.1	Vert
	Quasi Peak										
33	83.239	40.1	+8.1 -28.2	+1.6 +0.0	+0.2	+0.0	+0.0	21.8	30.0	-8.2	Vert
34	179.997	29.2	+17.3 -27.9	+2.6 +0.0	+0.5	+0.0	+0.0	21.7	30.0	-8.3	Horiz
	Quasi Peak										
35	221.995	28.9	+17.5 -28.0	+2.8 +0.0	+0.4	+0.0	+0.0	21.6	30.0	-8.4	Vert
	Quasi Peak										
36	70.751	40.2	+7.3 -27.9	+1.7 +0.0	+0.3	+0.0	+0.0	21.6	30.0	-8.4	Horiz
37	129.005	30.5	+16.4 -27.8	+2.1 +0.0	+0.4	+0.0	+0.0	21.6	30.0	-8.4	Horiz
	Quasi Peak										
38	258.015	32.9	+19.4 -27.8	+3.2 +0.0	+0.6	+0.0	+0.0	28.3	37.0	-8.7	Vert
39	66.550	38.9	+7.6 -28.0	+1.6 +0.0	+0.3	+0.0	+0.0	20.4	30.0	-9.6	Vert
40	531.797	31.7	+0.0 -27.9	+4.9 +0.0	+0.7	+17.8	+0.0	27.2	37.0	-9.8	Vert
	Quasi Peak										
41	66.588	38.7	+7.6 -28.0	+1.6 +0.0	+0.3	+0.0	+0.0	20.2	30.0	-9.8	Horiz
42	111.977	30.8	+14.2 -27.8	+1.9 +0.0	+0.3	+0.0	+0.0	19.4	30.0	-10.6	Vert
	Quasi Peak										

Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: NMB Technologies Inc.
Specification: CISPR22 B COND [AVE]
Test Type: Conducted Emissions
Equipment: Keyboard
Manufacturer: NMB Technologies, Inc
Model: RT7D5JTW
S/N:

Date: Aug-25-98
Time: 19:02
Sequence#: 3
Tested By: Stu Yamamoto

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT7D5JTW	

Support Devices:

Function	Manufacturer	Model #	S/N
Computer	Intel	S100EDZ8FLC	A05721230
Modem	Hayes	6802US	B10068023649
Modem	Hayes	6802US	A00768023303
Monitor	HP	D2806B	KR54366896
Printer	HP	C2184A	CN5B21R1DM
Mouse	Microsoft	MUS9J	0003468

Test Conditions / Notes:

The EUT is a keyboard and is connected to the host computer. The computer also has a monitor, mouse, printer, and two modems connected. The EUT is continually sending H's to the computer and the H's are being displayed on the monitor. Voltage to computer is 120 VAC 60 Hz. Temperature: 23°C Humidity: 53%.

Measurement Data:

Sorted by Margin

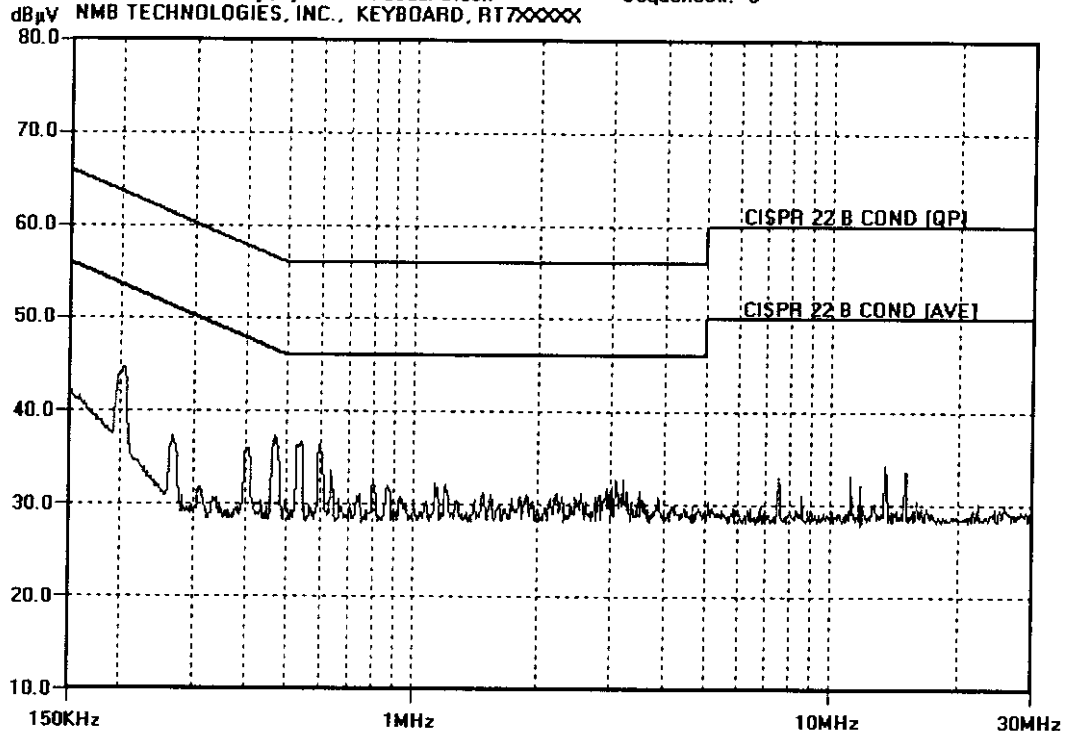
Test Lead: Black

#	Freq	Rdng dB μ V	dB	dB	dB	dB	Dist dB	Corr dB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	203.283k	44.8					+0.0	44.8	53.5	-8.7	Black
2	469.279k	37.3					+0.0	37.3	46.5	-9.2	Black
3	538.375k	36.6					+0.0	36.6	46.0	-9.4	Black
4	593.652k	36.4					+0.0	36.4	46.0	-9.6	Black
5	398.209k	35.9					+0.0	35.9	47.9	-12.0	Black
6	637.742k	33.5					+0.0	33.5	46.0	-12.5	Black
7	3.205M	32.6					+0.0	32.6	46.0	-13.4	Black
8	3.064M	32.6					+0.0	32.6	46.0	-13.4	Black

Page: 24 of 29
Report No: FB98-118

9	806.367k	32.5	+0.0	32.5	46.0	-13.5	Black
10	1.132M	32.3	+0.0	32.3	46.0	-13.7	Black
11	151.276k	42.1	+0.0	42.1	55.9	-13.8	Black
12	1.195M	32.1	+0.0	32.1	46.0	-13.9	Black
13	266.777k	37.3	+0.0	37.3	51.2	-13.9	Black
14	866.085k	32.0	+0.0	32.0	46.0	-14.0	Black
15	3.032M	31.9	+0.0	31.9	46.0	-14.1	Black

CKC LABORATORIES INC Date: Tue Aug-25-1998 Time: 19:02:01 WO#: 69806
 CISPR 22 B COND (QP) Test Lead: Black Sequence#: 3
 NMB TECHNOLOGIES, INC., KEYBOARD, RT7XXXXX



Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: NMB Technologies Inc.
 Specification: CISPR22 B COND [AVE]
 Test Type: Conducted Emissions
 Equipment: Keyboard
 Manufacturer: NMB Technologies, Inc
 Model: RT7D5JTW
 S/N:

Date: Aug-25-98
 Time: 19:05
 Sequence#: 4
 Tested By: Stu Yamamoto

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT7D5JTW	

Support Devices:

Function	Manufacturer	Model #	S/N
Computer	Intel	S100EDZ8FLC	A05721230
Modem	Hayes	6802US	B10068023649
Modem	Hayes	6802US	A00768023303
Monitor	HP	D2806B	KR54366896
Printer	HP	C2184A	CN5B21R1DM
Mouse	Microsoft	MUS9J	0003468

Test Conditions / Notes:

The EUT is a keyboard and is connected to the host computer. The computer also has a monitor, mouse, printer, and two modems connected. The EUT is continually sending H's to the computer and the H's are being displayed on the monitor. Voltage to computer is 120 VAC 60 Hz. Temperature: 23°C Humidity: 53%.

Measurement Data:

Sorted by Margin

Test Lead: White

#	Freq	Rdng dBμV	dB	dB	dB	dB	Dist dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar
1	205.198k	42.8					+0.0	42.8	53.4	-10.6	White
2	469.279k	35.3					+0.0	35.3	46.5	-11.2	White
3	1.192M	34.5					+0.0	34.5	46.0	-11.5	White
4	594.968k	34.5					+0.0	34.5	46.0	-11.5	White
5	638.071k	34.4					+0.0	34.4	46.0	-11.6	White
6	3.136M	34.1					+0.0	34.1	46.0	-11.9	White
7	531.795k	34.1					+0.0	34.1	46.0	-11.9	White
8	538.375k	33.9					+0.0	33.9	46.0	-12.1	White

9	3.205M	33.0	+0.0	33.0	46.0	-13.0	White
10	402.157k	34.8	+0.0	34.8	47.8	-13.0	White
11	3.098M	32.7	+0.0	32.7	46.0	-13.3	White
12	410.054k	34.2	+0.0	34.2	47.6	-13.4	White
13	806.367k	32.5	+0.0	32.5	46.0	-13.5	White
14	874.228k	32.4	+0.0	32.4	46.0	-13.6	White
15	2.928M	32.3	+0.0	32.3	46.0	-13.7	White

