

AQ6-2745



EXHIBIT D

CKC TEST REPORT



Testing the Future
LABORATORIES, INC.

406-27K15



CERTIFICATION TEST REPORT
FOR THE
KEYBOARD, RT27XXXXX & RT29XXXXX
FCC/CISPR 22/85
CLASS B COMPLIANCE

DATE OF ISSUE: OCTOBER 22, 1998

PREPARED FOR:

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Report No: **FB98-146**

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Date of test: September 30, 1998 &
October 1, 1998

APPROVED BY:



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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: September 30, 1998 & October 1, 1998

PURPOSE OF TEST: To demonstrate the compliance of the
Keyboard, RT27XXXXX & RT29XXXXX,
with the requirements for FCC/CISPR 22/85
Class B devices.

MANUFACTURER: NMB Technologies Inc.
9730 Independence Avenue
Chatsworth, CA 91311

REPRESENTATIVE: Bob Dickerman

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

TEST PERSONNEL: Stu Yamamoto & Eddie Wong

TEST METHOD: ANSI C63.4 1992

FREQUENCY RANGE TESTED: 150kHz - 1000MHz

EQUIPMENT UNDER TEST: Keyboard
Manuf: NMB Technologies, Inc
Model: RT27XXXXX
Serial:

SUMMARY OF RESULTS

The NMB Technologies Inc. Keyboard, RT27XXXXX & RT29XXXXX 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. The difference between models RT27XXXXX and RT29XXXXX is only external cosmetics to the plastics. There is no difference in functionality.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a +4dB 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: BFJ9D9 6802US

Modem

Manuf: Hayes
Model: 6802US
Serial: A00768023303
FCC ID: BFJ9D9 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, RT27XXXXX & RT29XXXXX. 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 dB μ V	CORRECTION FACTORS				CORRECTED READING dB μ V/m	SPEC LIMIT dB μ V/m	MARGIN dB	NOTES
		Ant dB	Amp dB	Cable dB	Dist DB				
41.780	38.8	14.8	-28.1	1.2		26.7	30.0	-3.3	HQ
50.070	41.9	11.0	-27.9	1.4		26.4	30.0	-3.6	VQ
58.484	50.3	3.8	-28.1	1.7		27.7	30.0	-2.3	VDQ
66.781	45.8	7.6	-28.0	1.9		27.3	30.0	-2.7	VQ
75.059	48.1	6.1	-28.1	1.9		28.0	30.0	-2.0	VDQ
83.548	44.7	8.1	-28.2	1.8		26.4	30.0	-3.6	VQ

Test Method: ANSI C63.4 1992
Spec Limit : CISPR 22 Class B
Test Distance: 10 Meters

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

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: 20°C Humidity: 54%.

Table 2: Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBμV	CORRECTION FACTORS				CORRECTED READING dBμV	SPEC LIMIT dBμV	MARGIN dB	NOTES
		Lisn dB							
3.031766	40.9	0.0				40.9	46.0	-5.1	W
3.135687	40.8	0.0				40.8	46.0	-5.2	B
3.239608	40.1	0.0				40.1	46.0	-5.9	W
5.173690	44.4	0.0				44.4	50.0	-5.6	W
7.515134	44.7	0.0				44.7	50.0	-5.3	W
7.931895	44.5	0.0				44.5	50.0	-5.5	B

Test Method: ANSI C63.4 1992
Spec Limit : CISPR 22 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 120VAC 60 Hz. Temperature: 21°C Humidity: 64%.

TABLE A

LIST OF TEST EQUIPMENT

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. Horn Antenna, Emco, Model No. 3115, S/N 4683.
7. Power Analyzer, Voltech, Model PM3000A v2.11, S/N 1730.
8. Magnetic Loop Antenna, Electro Metrics, Model No. ALR-25M, S/N 5369.
9. LISN, Solar Electronics, Model No. 50 uH, S/N Brea #2.
10. 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 on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT is located, has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the Host CPU was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test. Conducted emissions tests required the use of the LISN's listed in Table A.

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, RT27XXXXX & RT29XXXXX. 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, RT27XXXXXX & RT29XXXXXX.

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 30 MHz 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, RT27XXXXXX & RT29XXXXXX, 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 $\text{dB}\mu\text{V}/\text{m}$, the spectrum analyzer reading in $\text{dB}\mu\text{V}$ 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 μH 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:

I/O PORTS

Type	#
Serial, Keyboard	1

CRYSTAL OSCILLATORS

Type	Freq In MHz
RC Resonator (Clock)	4

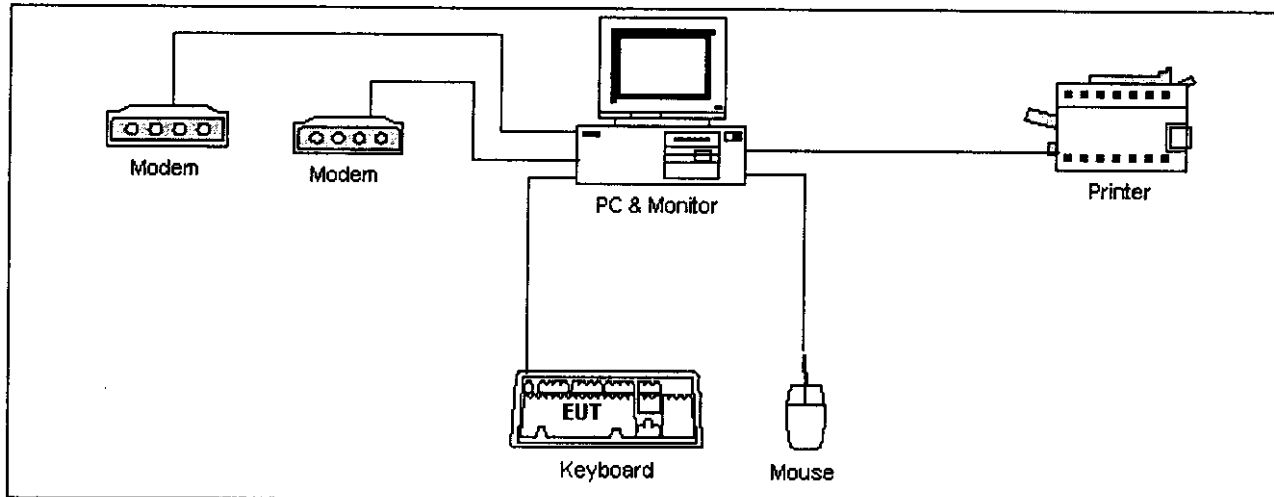
PRINTED CIRCUIT BOARDS

Function	Model & Rev	Clocks, MHz	Layers	Location
Logic Z86K15 MPU	3058 3066 Rev. D	4	1	Inside K/B

CABLE INFORMATION

Cable #: 1	Cable(s) of this type: 1
Cable Type: Serial	Shield Type: Foil
Construction: Round	Length In Meters: 1.0 meter
Connected To End (1): Mini Din	Connected To End (2): PCB
Connector At End (1):	Connector At End (2):
Shield Grounded At (1): Chassis Ground	Shield Grounded At (2): Chassis Ground
Part Number:	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.
Specification: CISPR 22 B RADIATED
Test Type: Maximized Emissions
Equipment: Keyboard
Manufacturer: NMB Technologies, Inc
Model: RT27XXXXX
S/N:

Date: Sep-30-98
Time: 15:28
Sequence#: 1
Tested By: Stu Yamamoto

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT27XXXXX	

Support Devices:

Function	Manufacturer	Model #	S/N
Computer	Intel	SI00EDZ8FLC	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 is being displayed on the monitor. Voltage to computer is 120 VAC 60 Hz. Temperature: 20°C Humidity: 54%.

Measurement Data:

Sorted by Margin

Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV					Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	75.059	48.1	+1.6	+0.3	-28.1	+6.1	+0.0	28.0	30.0	-2.0	Vert
	Dipole QP		+0.0								
	Keyboard										
2	58.484	50.3	+1.4	+0.3	+3.8	-28.1	+0.0	27.7	30.0	-2.3	Vert
	Dipole QP		+0.0								
	Keyboard										
3	66.781	45.8	+1.6	+0.3	-28.0	+7.6	+0.0	27.3	30.0	-2.7	Vert
	Quasi Peak		+0.0								
	Keyboard										
4	41.780	38.8	+1.1	+0.1	-28.1	+14.8	+0.0	26.7	30.0	-3.3	Horiz
	Quasi Peak		+0.0								
	Keyboard										
5	50.070	41.9	+1.2	+0.2	-27.9	+11.0	+0.0	26.4	30.0	-3.6	Vert
	Quasi Peak		+0.0								
	Keyboard										

6	83.548	44.7	+1.6 +0.0	+0.2	-28.2	+8.1	+0.0	26.4	30.0	-3.6	Vert
	Quasi Peak Keyboard										
7	166.195	33.6	+2.4 +0.0	+0.5	-28.0	+17.5	+0.0	26.0	30.0	-4.0	Vert
	Quasi Peak non-keyboard										
8	110.586	37.4	+1.9 +0.0	+0.3	-27.8	+14.0	+0.0	25.8	30.0	-4.2	Vert
	Quasi Peak non-keyboard										
9	110.592	37.3	+1.9 +0.0	+0.3	-27.8	+14.0	+0.0	25.7	30.0	-4.3	Horiz
	Quasi Peak non-keyboard										
10	83.540	43.8	+1.6 +0.0	+0.2	-28.2	+8.1	+0.0	25.5	30.0	-4.5	Horiz
	Keyboard										
11	41.689	37.3	+1.1 +0.0	+0.1	-28.1	+14.9	+0.0	25.3	30.0	-4.7	Vert
	Quasi Peak Keyboard										
12	731.227	29.4	+6.0 +22.6	+1.1	-27.2	+0.0	+0.0	31.9	37.0	-5.1	Horiz
	Quasi Peak non-keyboard										
13	58.516	42.7	+1.4 +0.0	+0.3	-28.1	+8.6	+0.0	24.9	30.0	-5.1	Horiz
	Keyboard										
14	120.008	34.4	+2.0 +0.0	+0.4	-27.7	+15.7	+0.0	24.8	30.0	-5.2	Horiz
	Quasi Peak non-keyboard										
15	191.998	32.4	+2.7 +0.0	+0.6	-28.0	+16.9	+0.0	24.6	30.0	-5.4	Horiz
	non-keyboard										
16	179.999	32.1	+2.6 +0.0	+0.5	-27.9	+17.3	+0.0	24.6	30.0	-5.4	Vert
	non-keyboard										
17	209.980	32.1	+2.8 +0.0	+0.6	-28.1	+17.0	+0.0	24.4	30.0	-5.6	Vert
	Quasi Peak non-keyboard										
18	91.879	40.7	+1.7 +0.0	+0.1	-28.1	+9.9	+0.0	24.3	30.0	-5.7	Horiz
	Quasi Peak Keyboard										
^	91.898	41.9	+1.7 +0.0	+0.1	-28.1	+9.9	+0.0	25.5	30.0	-4.5	Horiz
	Keyboard										
20	33.380	33.3	+1.0 +0.0	+0.2	-28.2	+18.0	+0.0	24.3	30.0	-5.7	Vert
	Keyboard										
21	222.003	31.5	+2.8 +0.0	+0.4	-28.0	+17.5	+0.0	24.2	30.0	-5.8	Vert
	non-keyboard										
22	168.003	31.8	+2.4 +0.0	+0.5	-28.0	+17.5	+0.0	24.2	30.0	-5.8	Vert
	Quasi Peak non-keyboard										

23	75.205	42.9	+1.6 +0.0	+0.3	-28.1	+7.4	+0.0	24.1	30.0	-5.9	Horiz
Keyboard											
24	221.999	31.3	+2.8 +0.0	+0.4	-28.0	+17.5	+0.0	24.0	30.0	-6.0	Horiz
Quasi Peak											
25	731.220	28.1	+6.0 +22.6	+1.1	-27.2	+0.0	+0.0	30.6	37.0	-6.4	Vert
Quasi Peak											
26	66.841	42.1	+1.6 +0.0	+0.3	-28.0	+7.6	+0.0	23.6	30.0	-6.4	Horiz
27	330.005	33.4	+3.6 +21.0	+0.5	-28.0	+0.0	+0.0	30.5	37.0	-6.5	Horiz
28	432.096	37.4	+4.4 +16.1	+0.8	-28.2	+0.0	+0.0	30.5	37.0	-6.5	Horiz
29	129.049	32.3	+2.1 +0.0	+0.4	-27.8	+16.4	+0.0	23.5	30.0	-6.6	Horiz
Quasi Peak											
30	631.477	31.2	+5.4 +20.4	+0.9	-27.6	+0.0	+0.0	30.3	37.0	-6.7	Vert
Quasi Peak											
31	598.266	32.9	+5.1 +19.1	+0.8	-27.7	+0.0	+0.0	30.2	37.0	-6.8	Horiz
Quasi Peak											
32	198.003	31.1	+2.8 +0.0	+0.7	-28.1	+16.7	+0.0	23.2	30.0	-6.8	Vert
33	50.153	38.5	+1.2 +0.0	+0.2	-27.9	+11.0	+0.0	23.0	30.0	-7.0	Horiz
34	87.748	40.2	+1.7 +0.0	+0.1	-28.1	+9.0	+0.0	22.9	30.0	-7.1	Horiz
35	631.508	30.6	+5.4 +20.4	+0.9	-27.6	+0.0	+0.0	29.7	37.0	-7.3	Horiz
Quasi Peak											
36	269.992	33.2	+3.3 +0.0	+0.7	-28.0	+20.5	+0.0	29.7	37.0	-7.3	Vert
Quasi Peak											
37	150.025	30.1	+2.3 +0.0	+0.6	-28.1	+17.6	+0.0	22.5	30.0	-7.5	Horiz
Quasi Peak											
38	200.002	30.3	+2.8 +0.0	+0.7	-28.1	+16.6	+0.0	22.3	30.0	-7.7	Horiz
39	191.999	30.1	+2.7 +0.0	+0.6	-28.0	+16.9	+0.0	22.3	30.0	-7.7	Vert
40	112.995	33.5	+1.9 +0.0	+0.3	-27.8	+14.4	+0.0	22.3	30.0	-7.7	Vert
Quasi Peak											
41	179.992	29.4	+2.6 +0.0	+0.5	-27.9	+17.3	+0.0	21.9	30.0	-8.1	Horiz
Quasi Peak											
42	281.996	31.3	+3.3 +0.0	+0.6	-28.0	+21.6	+0.0	28.8	37.0	-8.2	Vert
Quasi Peak											
43	329.994	31.6	+3.6 +21.0	+0.5	-28.0	+0.0	+0.0	28.7	37.0	-8.3	Vert

44	531.808	32.8	+4.9 +17.8	+0.7	-27.9	+0.0	+0.0	28.3	37.0	-8.7	Vert
45	258.011	32.5	+3.2 +0.0	+0.6	-27.8	+19.4	+0.0	27.9	37.0	-9.1	Vert
46	432.072	34.2	+4.4 +16.1	+0.8	-28.2	+0.0	+0.0	27.3	37.0	-9.7	Vert
47	91.910 Quasi Peak	36.3	+1.7 +0.0	+0.1	-28.1	+9.9	+0.0	19.9	30.0	-10.1	Vert

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

Customer: NMB Technologies Inc. Date: Oct-01-98
 Specification: CISPR22 B COND [AVE] Time: 16:29
 Test Type: Conducted Emissions Sequence#: 9
 Equipment: Keyboard
 Manufacturer: NMB Technologies, Inc Tested By: Eddie Wong
 Model: RT27XXXXX
 S/N:

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT27XXXXX	

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 is being displayed on the monitor. Voltage to computer is 120VAC 60 Hz. Temperature: 21°C Humidity: 64%.

Measurement Data:

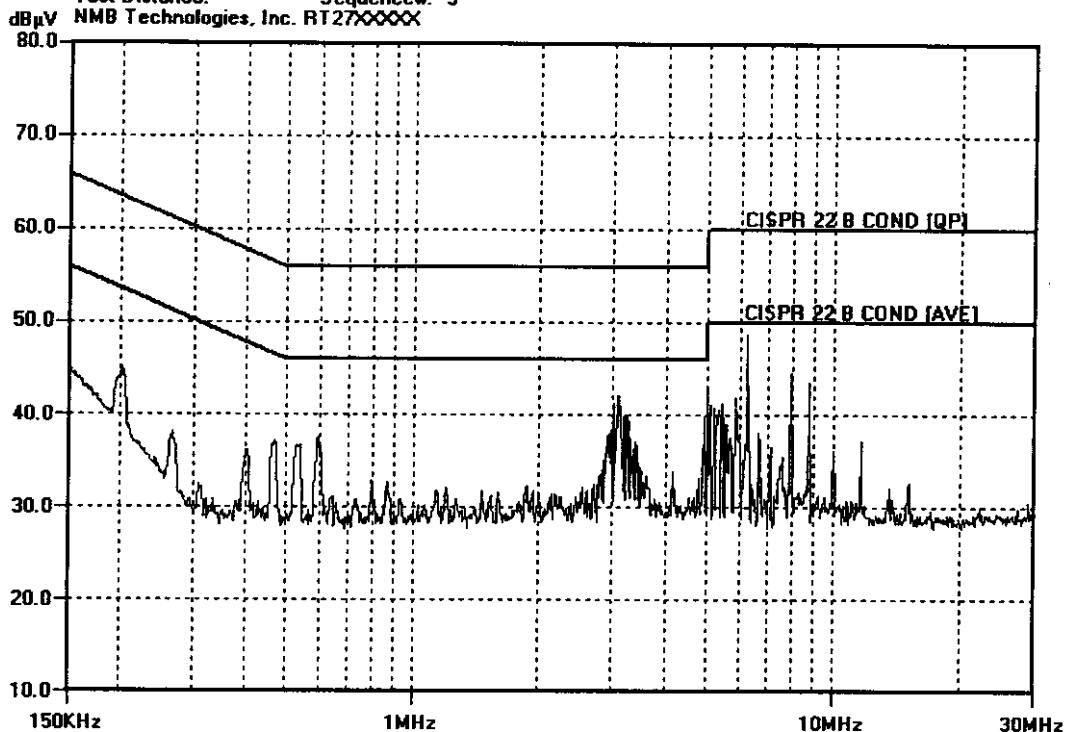
Sorted by Margin

Test Lead: Black

#	Freq MHz	Rdng dB μ V	dB	dB	dB	dB	Dist dB	Corr DB μ V/m	Spec dB μ V/m	Margin dB	Polar
1	3.136	40.8					+0.0	40.8	46.0	-5.2	Black
2	7.932	44.5					+0.0	44.5	50.0	-5.5	Black
3	3.205	40.0					+0.0	40.0	46.0	-6.0	Black
4	4.954	39.9					+0.0	39.9	46.0	-6.1	Black
5	3.240	39.9					+0.0	39.9	46.0	-6.1	Black
6	3.170	39.9					+0.0	39.9	46.0	-6.1	Black
7	8.765	43.5					+0.0	43.5	50.0	-6.5	Black
8	3.274	39.3					+0.0	39.3	46.0	-6.7	Black

9	2.997	39.3	+0.0	39.3	46.0	-6.7	Black
10	5.018	42.7	+0.0	42.7	50.0	-7.3	Black
11	3.065	38.7	+0.0	38.7	46.0	-7.3	Black
Average							
^	3.064	42.1	+0.0	42.1	46.0	-3.9	Black
13	2.962	38.3	+0.0	38.3	46.0	-7.7	Black
14	2.928	37.9	+0.0	37.9	46.0	-8.1	Black
15	3.029	37.2	+0.0	37.2	46.0	-8.8	Black
Average							
^	3.032	41.3	+0.0	41.3	46.0	-4.7	Black
17	6.253	19.3	+0.0	19.3	50.0	-30.8	Black
Average							
^	6.253	48.7	+0.0	48.7	50.0	-1.3	Black

CKC LABORATORIES INC Date: Thu Oct-01-1998 Time: 16:29:37 WO#: 70017
 Test Distance: Sequence#: 9
 NMB Technologies, Inc. RT27XXXXXX



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: RT27XXXXX
S/N:

Date: Oct-01-98
Time: 16:35
Sequence#: 10
Tested By: Eddie Wong

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Keyboard*	NMB Technologies, Inc	RT27XXXXX	

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 is being displayed on the monitor. Voltage to computer is 120VAC 60 Hz. Temperature: 21°C Humidity: 64%.

Measurement Data:

Sorted by Margin

Test Lead: White

#	Freq MHz	Rdng dBμV	dB	dB	dB	dB	Dist dB	Corr dBμV/m	Spec dBμV/m	Margin dB	Polar
1	3.032	40.9					+0.0	40.9	46.0	-5.1	White
2	3.136	40.8					+0.0	40.8	46.0	-5.2	White
3	7.515	44.7					+0.0	44.7	50.0	-5.3	White
4	5.174	44.4					+0.0	44.4	50.0	-5.6	White
5	3.240	40.1					+0.0	40.1	46.0	-5.9	White
6	2.997	39.9					+0.0	39.9	46.0	-6.1	White
7	3.274	39.4					+0.0	39.4	46.0	-6.6	White
8	3.170	39.4					+0.0	39.4	46.0	-6.6	White

9	5.658	43.3	+0.0	43.3	50.0	-6.7	White
10	5.503	43.3	+0.0	43.3	50.0	-6.7	White
11	3.205	39.3	+0.0	39.3	46.0	-6.7	White
12	2.922	38.9	+0.0	38.9	46.0	-7.1	White
13	3.101	38.8	+0.0	38.8	46.0	-7.2	White
Average							
^	3.101	42.0	+0.0	42.0	46.0	-4.0	White
15	2.957	38.8	+0.0	38.8	46.0	-7.2	White
16	5.000	22.6	+0.0	22.6	46.0	-23.4	White
Average							
^	5.000	49.2	+0.0	49.2	50.0	-0.8	White

CKC LABORATORIES INC Date: Thu Oct-01-1998 Time: 16:35:11 WO#: 70017
 CISPR 22 B COND [QP] Test Lead: White Sequence#: 10
 NMB Technologies, Inc. RT27XXXXX

