

StacoSwitch Inc.

M777 Keyboard

March 16, 2005

Report No. STAC0002

Report Prepared By



www.nwemc.com
1-888-EMI-CERT

© 2005 Northwest EMC, Inc

EMC Test Report




22975 NW Evergreen Parkway
Suite 400
Hillsboro, Oregon 97124

Certificate of Test
Issue Date: March 16, 2005
StacoSwitch Inc.
Model: M777 Keyboard

Emissions			
Specification	Test Method	Pass	Fail
EN 55022 Class B:1998	CISPR 22:1997 Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.109(g) (CISPR 22:1997) Class B:2004	ANSI C63.4:2003 Radiated Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
EN 55022 Class B:1998	CISPR 22:1997 Conducted Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>
FCC 15.107 Class B:2004	ANSI C63.4:2003 Conducted Emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Modifications made to the product
See the Modifications section of this report

Approved By:

Dean Ghizzone, President

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

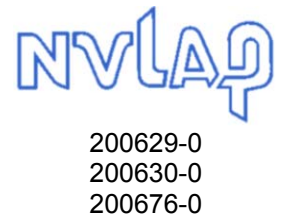
Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision Number	Description	Date	Page Number
00	None		

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities, have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.



NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement



TÜV Product Service: Included in TÜV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TÜV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TÜV's current Listing of CARAT Laboratories available from TÜV. A certificate was issued to represent that this laboratory continues to meet TÜV's CARAT Program requirements. Certificate No. USA0401C



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body. (NVLAP)



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (*Registration Nos. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761*)



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



SCOPE

For details on the Scopes of our Accreditations, please visit:

<http://www.nwemc.com/scope.asp>

What is measurement uncertainty?

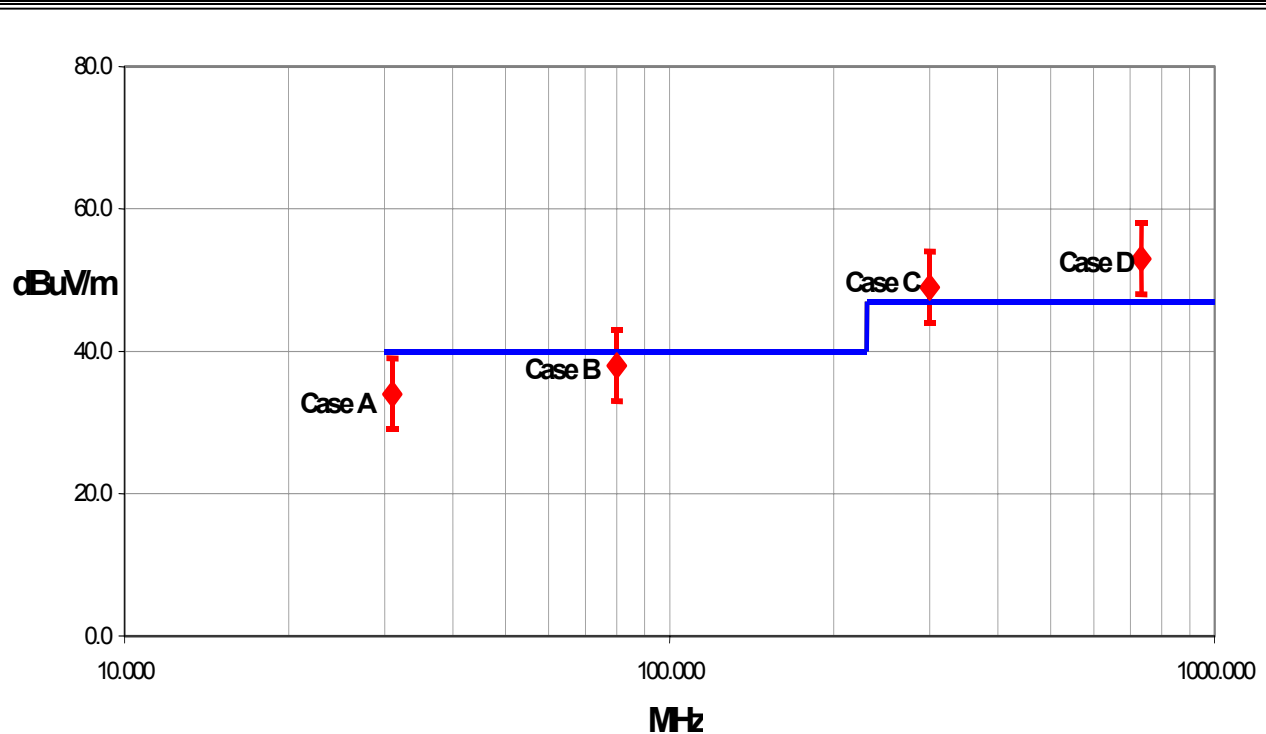
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its “true” value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- “ISO Guide to the Expression of Uncertainty in Measurements”, October 1993
- “NIS81: The Treatment of Uncertainty in EMC Measurements”, May 1994
- “IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques”, December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Radiated Emissions ≤ 1 GHz

Value (dB)

Test Distance	Probability Distribution	Biconical Antenna		Log Periodic Antenna		Dipole Antenna	
		3m	10m	3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
		- 3.77	- 3.73	- 2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz

Value (dB)

Test Distance	Probability Distribution	Without High Pass Filter		With High Pass Filter	
		3m	10m	3m	10m
Combined standard uncertainty $u_c(y)$	normal	+ 1.29	+ 1.25	+ 1.38	+ 1.35
		- 1.25	- 1.25	- 1.35	- 1.35
Expanded uncertainty U (level of confidence ≈ 95%)	normal (k=2)	+ 2.57	+ 2.51	+ 2.76	+ 2.70
		- 2.51	- 2.51	- 2.70	- 2.70

Conducted Emissions

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.48
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.97

Radiated Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.11

Conducted Immunity

	Probability Distribution	Value (+/- dB)
Combined standard uncertainty $u_c(y)$	normal	1.05
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.10

Legend

$u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

U = combined standard uncertainty multiplied by the coverage factor: k . This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $k=3$ (CL of 99.7%) can be used. Please note that with a coverage factor of one, $u_c(y)$ yields a confidence level of only 68%.

**California****Orange County Facility****Labs OC01 – OC13**

41 Tesla Ave.
Irvine, CA 92618
(888) 364-2378
FAX (503) 844-3826

**Oregon****Evergreen Facility****Labs EV01 – EV10**

22975 NW Evergreen Pkwy.,
Suite 400
Hillsboro, OR 97124
(503) 844-4066
FAX (503) 844-3826

**Oregon****Trails End Facility****Labs TE01 – TE03**

30475 NE Trails End Lane
Newberg, OR 97132
(503) 844-4066
FAX (503) 537-0735

**Washington****Sultan Facility****Labs SU01 – SU07**

14128 339th Ave. SE
Sultan, WA 98294
(888) 364-2378
FAX (360) 793-2536

Party Requesting the Test

Company Name:	StacoSwitch Inc.
Address:	1139 Baker Street
City, State, Zip:	Costa Mesa, CA 92626
Test Requested By:	Tim Reilly
Model:	M777 Keyboard
First Date of Test:	03-15-2005
Last Date of Test:	03-15-2005
Receipt Date of Samples:	03-15-2005
Equipment Design Stage:	Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators: Not provided.

Functional Description of the EUT (Equipment Under Test):

Keyboard/Mouse Device

Client Justification for EUT Selection:

Not Provided

Client Justification for Test Selection:

Not Provided

EUT Photo

Equipment modifications					
Item	Test	Date	Modification	Note	Disposition of EUT
1	Radiated Emissions	03/15/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.
2	Conducted Emissions	03/15/2005	No EMI suppression devices were added or modified during this test.	Same configuration as delivered.	EUT remained at Northwest EMC.

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:

USB Mode

PS2 Mode

Power Input Settings Investigated:

230 VAC, 50 Hz

120 VAC, 60 Hz

Input Power Setting used for Final Test:

230 VAC, 50 Hz

Frequency Range Investigated

Start Frequency	30 MHz	Stop Frequency	1 GHz
------------------------	--------	-----------------------	-------

Software\Firmware Applied During Test

Operating system	Windows	Version	XP
Exercise software	Unknown	Version	Unknown

Description

The system was tested using standard operating modes, which do not require software.

EUT and Peripherals in Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
EUT - M777 Keyboard	Stacoswitch, Inc.	M777	N/A
Epson Stylus Color 740	Epson	P110A	A6R1452004
PC Tower	Dell, Inc.	DH8	11V2R41
Microsoft Sidewinder Game Pad Pro	Microsoft Corp	X04-63237	6323700623718
SyncMaster 793MB Monitor	Samsung, Inc.	793MBS	LE17HMAX612914J

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	PC Tower	AC Mains
AC Power	No	1.8	No	Epson Stylus Color 740	AC Mains
AC Power	No	2.0	No	SyncMaster 793MB Monitor	AC Mains
USB	No	2.0	Yes	Microsoft Sidewinder Game Pad Pro	PC Tower
Video	Yes	1.2	Yes	SyncMaster 793MB Monitor	PC Tower
USB	No	1.8	No	EUT - M777 Keyboard	PC Tower
PS/2	No	1.8	Yes	EUT - M777 Keyboard	PC Tower
Parallel	No	1.8	No	Epson Stylus Color 740	PC Tower

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQD	12/06/2004	13 mo
Spectrum Analyzer	Hewlett-Packard	8568B	AAI	12/06/2004	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AAID	12/06/2004	13 mo
Pre-Amplifier	Miteq	AM-1551	AOX	05/07/2004	13 mo
Antenna, Biconilog	EMCO	3142	AXK	05/21/2003	24 mo

Test Description

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

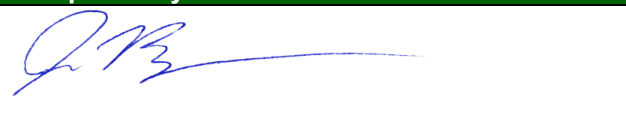
Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 1 meter, 3 meters, 5 meters, 10 meters, or 30 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

Completed by:


RADIATED EMISSIONS DATA SHEET

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC08

TEST SPECIFICATIONS

Specification:	EN 55022 Class B:1998 FCC 15.109(g) (CISPR 22:1997) Class B:2004	Method:	CISPR 22:1997 ANSI C63.4:2003
----------------	---	---------	----------------------------------

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

PS/2; Minimum PC configuration

EUT OPERATING MODES

Typical Operating Mode

DEVIATIONS FROM TEST STANDARD

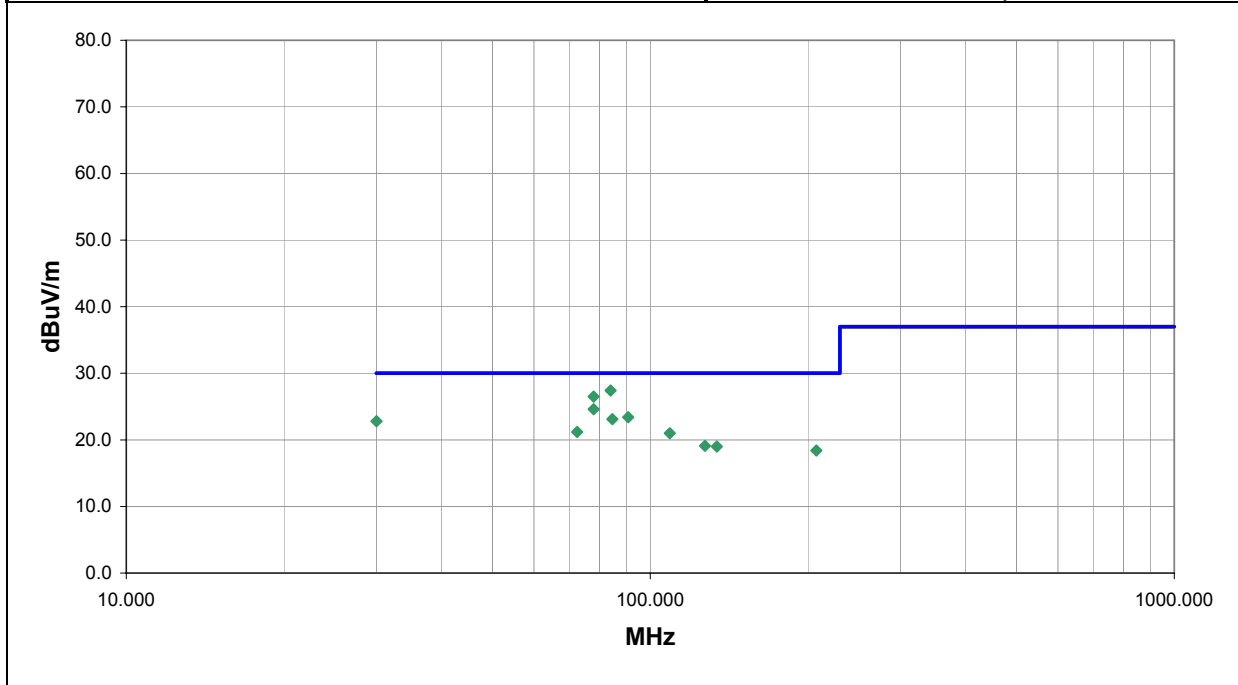
No deviations.

RESULTS

Pass	Run #	1
------	-------	---

Other

[Signature]
Tested By:



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
83.990	55.5	-28.1	268.0	3.9	10.0	0.0	H-Bilog	QP	0.0	27.4	30.0	-2.6
77.990	55.1	-28.6	267.0	3.5	10.0	0.0	H-Bilog	QP	0.0	26.5	30.0	-3.5
77.991	53.2	-28.6	198.0	1.2	10.0	0.0	V-Bilog	QP	0.0	24.6	30.0	-5.4
90.750	50.6	-27.2	248.0	3.7	10.0	0.0	H-Bilog	PK	0.0	23.4	30.0	-6.6
84.675	51.2	-28.1	188.0	1.4	10.0	0.0	V-Bilog	PK	0.0	23.1	30.0	-6.9
30.021	40.4	-17.6	308.0	1.0	10.0	0.0	V-Bilog	QP	0.0	22.8	30.0	-7.2
72.525	50.0	-28.8	244.0	4.0	10.0	0.0	H-Bilog	PK	0.0	21.2	30.0	-8.8
108.975	47.5	-26.5	232.0	2.5	10.0	0.0	H-Bilog	PK	0.0	21.0	30.0	-9.0
127.200	46.4	-27.3	307.0	2.8	10.0	0.0	H-Bilog	PK	0.0	19.1	30.0	-10.9
133.950	45.9	-26.9	127.0	2.8	10.0	0.0	H-Bilog	PK	0.0	19.0	30.0	-11.0
207.526	42.2	-23.8	95.0	3.2	10.0	0.0	H-Bilog	PK	0.0	18.4	30.0	-11.6

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC08

TEST SPECIFICATIONS

Specification:	EN 55022 Class B:1998 FCC 15.109(g) (CISPR 22:1997) Class B:2004	Method:	CISPR 22:1997 ANSI C63.4:2003
----------------	---	---------	----------------------------------

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

USB; Minimum PC configuration

EUT OPERATING MODES

Typical Operating Mode

DEVIATIONS FROM TEST STANDARD

No deviations.

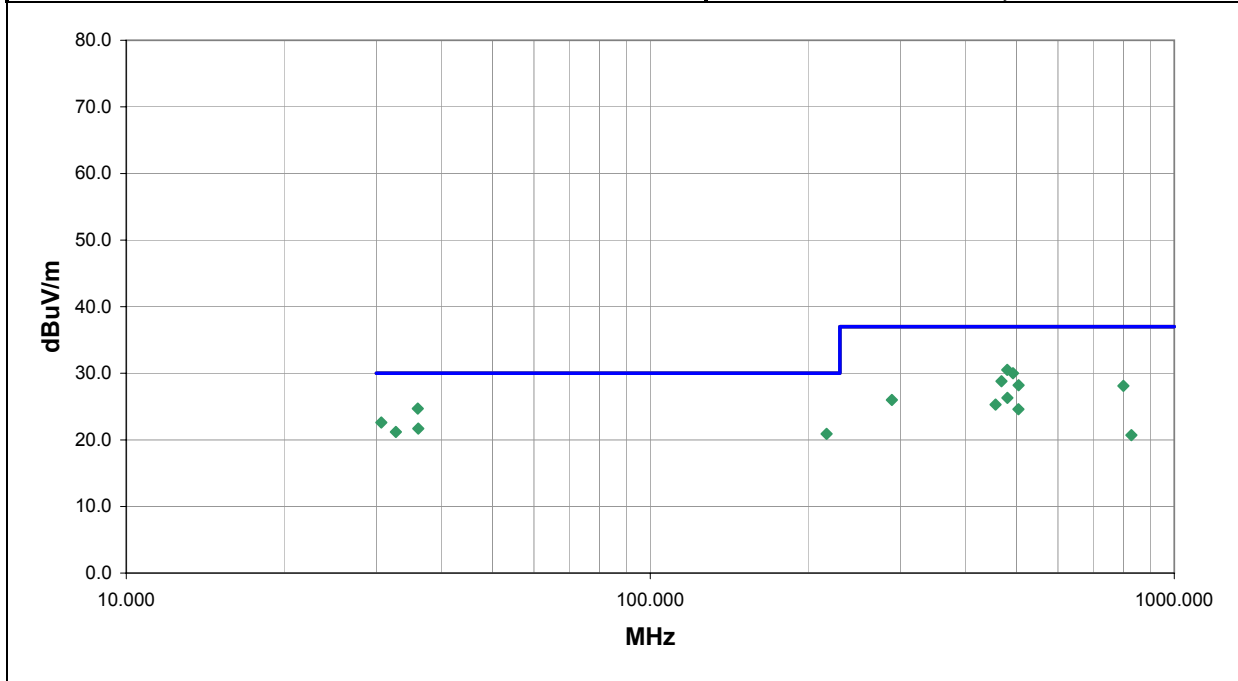
RESULTS

Pass	Run #	2
------	-------	---

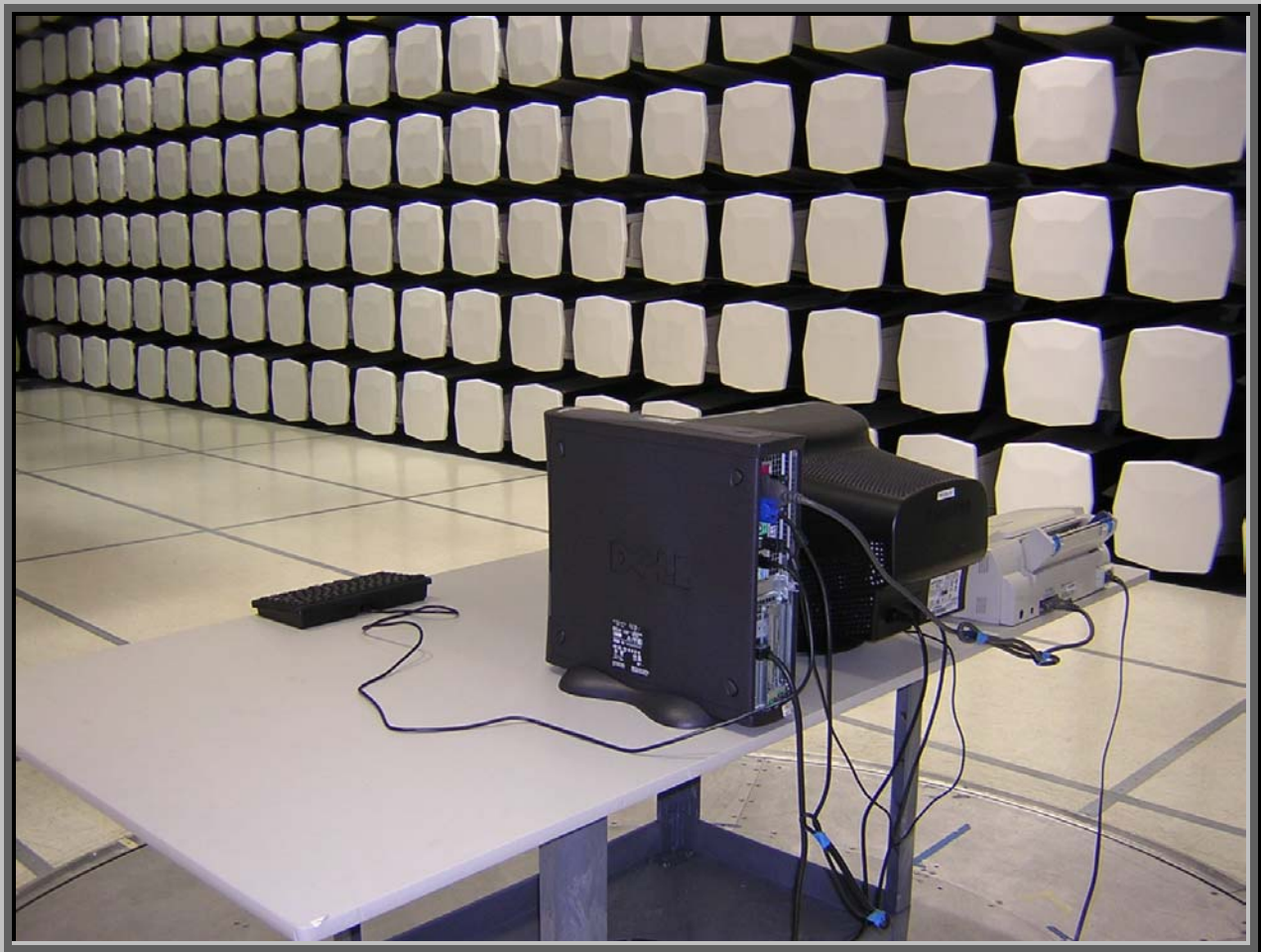
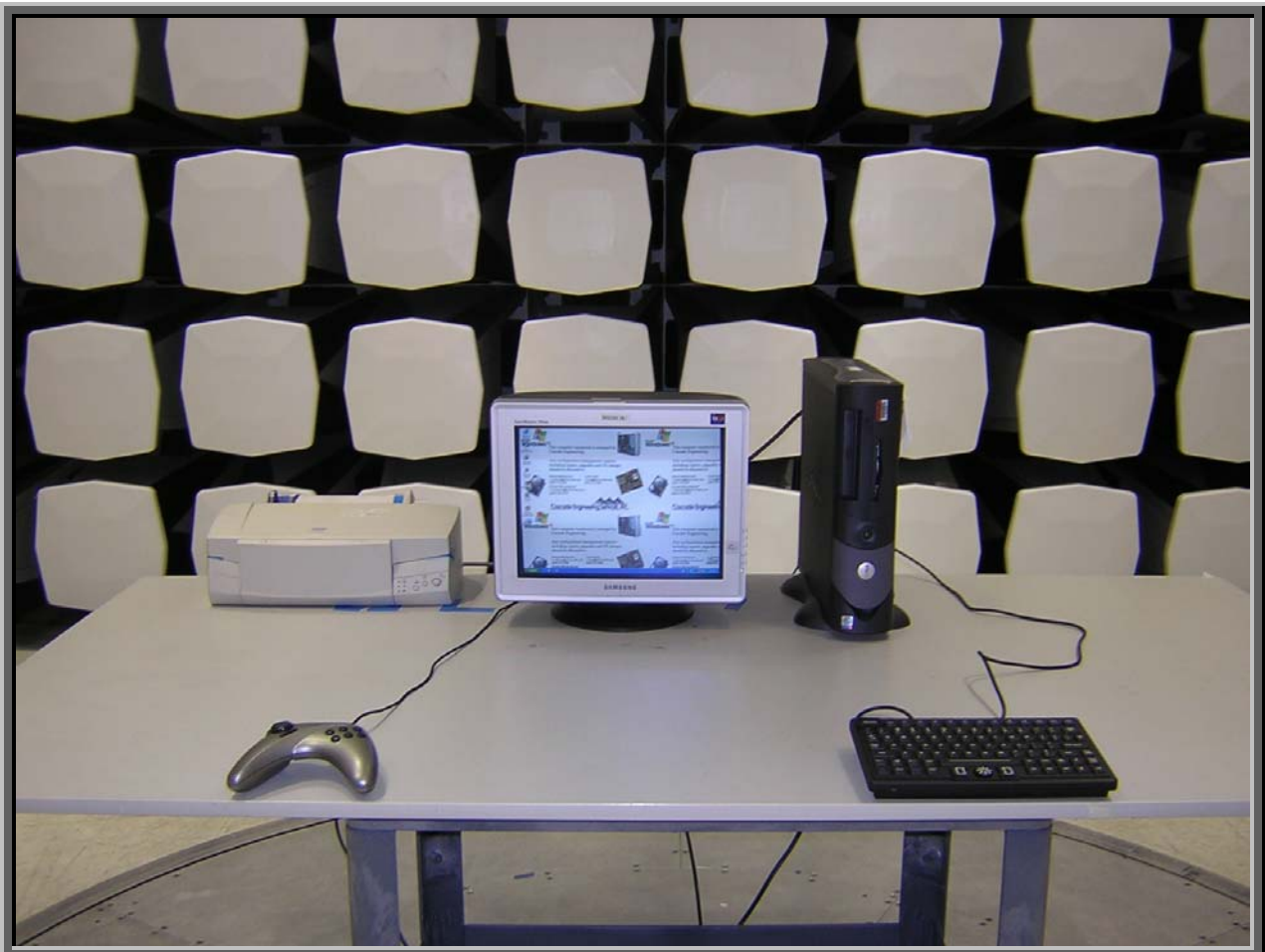
Other



Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Azimuth (degrees)	Height (meters)	Distance (meters)	External Attenuation (dB)	Polarity	Detector	Distance Adjustment (dB)	Adjusted dBuV/m	Spec. Limit dBuV/m	Compared to Spec. (dB)
36.012	45.6	-20.9	273.0	1.0	10.0	0.0	V-Bilog	QP	0.0	24.7	30.0	-5.3
480.059	45.9	-15.4	118.0	1.5	10.0	0.0	H-Bilog	QP	0.0	30.5	37.0	-6.5
492.421	45.4	-15.4	336.0	3.4	10.0	0.0	V-Bilog	PK	0.0	30.0	37.0	-7.0
30.675	40.6	-18.0	163.0	3.4	10.0	0.0	H-Bilog	PK	0.0	22.6	30.0	-7.4
467.909	44.5	-15.7	355.0	3.1	10.0	0.0	V-Bilog	PK	0.0	28.8	37.0	-8.2
36.075	42.6	-20.9	324.0	3.4	10.0	0.0	H-Bilog	PK	0.0	21.7	30.0	-8.3
32.708	40.3	-19.1	360.0	1.0	10.0	0.0	V-Bilog	QP	0.0	21.2	30.0	-8.8
504.427	43.4	-15.2	342.0	2.8	10.0	0.0	V-Bilog	PK	0.0	28.2	37.0	-8.8
799.567	39.2	-11.1	64.0	1.0	10.0	0.0	H-Bilog	PK	0.0	28.1	37.0	-8.9
216.976	44.1	-23.2	322.0	2.7	10.0	0.0	H-Bilog	PK	0.0	20.9	30.0	-9.1
480.415	41.7	-15.4	101.0	2.8	10.0	0.0	V-Bilog	PK	0.0	26.3	37.0	-10.7
289.200	46.8	-20.8	295.0	2.7	10.0	0.0	H-Bilog	PK	0.0	26.0	37.0	-11.0
456.069	41.6	-16.3	147.0	1.4	10.0	0.0	H-Bilog	QP	0.0	25.3	37.0	-11.7
504.072	39.8	-15.2	161.0	2.1	10.0	0.0	H-Bilog	QP	0.0	24.6	37.0	-12.4
828.066	31.5	-10.8	346.0	3.5	10.0	0.0	H-Bilog	QP	0.0	20.7	37.0	-16.3



Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:

USB Mode

PS2 Mode

Power Input Settings Investigated:

230 VAC, 50 Hz

120 VAC, 60 Hz

Software\Firmware Applied During Test

Operating system	Windows	Version	XP
Exercise software	Unknown	Version	Unknown
Description			
The system was tested using standard operating modes, which do not require software.			

EUT and Peripherals in Test Setup Boundary

Description	Manufacturer	Model/Part Number	Serial Number
EUT - M777 Keyboard	Stacoswitch, Inc.	M777	N/A
Epson Stylus Color 740	Epson	P110A	A6R1452004
PC Tower	Dell, Inc.	DH8	11V2R41
Microsoft Sidewinder Game Pad Pro	Microsoft Corp	X04-63237	6323700623718
SyncMaster 793MB Monitor	Samsung, Inc.	793MBS	LE17HMAX612914J

Cables

Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	2.0	No	PC Tower	AC Mains
AC Power	No	1.8	No	Epson Stylus Color 740	AC Mains
AC Power	No	2.0	No	SyncMaster 793MB Monitor	AC Mains
USB	No	2.0	Yes	Microsoft Sidewinder Game Pad Pro	PC Tower
Video	Yes	1.2	Yes	SyncMaster 793MB Monitor	PC Tower
USB	No	1.8	No	EUT - M777 Keyboard	PC Tower
PS/2	No	1.8	Yes	EUT - M777 Keyboard	PC Tower
Parallel	No	1.8	No	Epson Stylus Color 740	PC Tower

PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.

Measurement Equipment

Description	Manufacturer	Model	Identifier	Last Cal	Interval
LISN	Solar	9252-50-24-BNC	LIB	02/16/2005	13 mo
LISN	Solar	9252-50-R-24-BNC	LIC	02/16/2005	13 mo
Spectrum Analyzer	Hewlett Packard	8593E	AAP	12/07/2004	13 mo
Receiver	Schaffner	SCR 3101	ARC	04/28/2003	24 mo

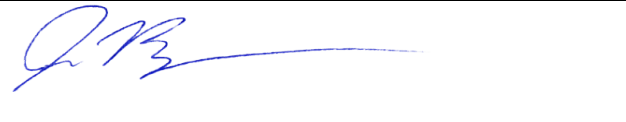
Test Description

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

Measurement Bandwidths

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 – 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

Measurements were made using the bandwidths and detectors specified. No video filter was used.

Completed by:


EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	EN 55022 Class B:1998
Method:	CISPR 22:1997

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 PS/2; Minimum PC configuration

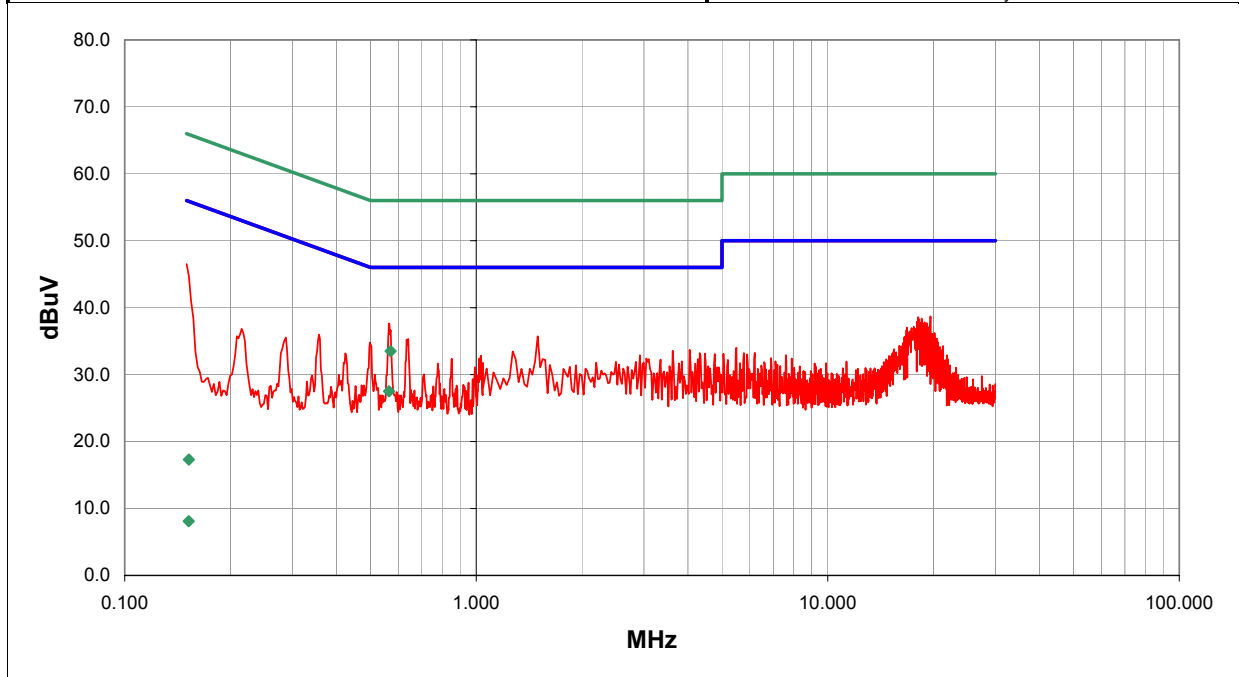
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	L1	1

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.565	7.5	0.0	0.0	20.0	AV	27.5	46.0	-18.5
0.571	13.5	0.0	0.0	20.0	QP	33.5	56.0	-22.5
0.152	-11.9	0.0	0.0	20.0	AV	8.1	55.9	-47.8
0.152	-2.7	0.0	0.0	20.0	QP	17.3	65.9	-48.6
0.566	17.4	0.0	0.2	20.0		37.6	46.0	-8.4
0.150	26.4	0.0	0.1	20.0		46.5	56.0	-9.5
1.495	15.3	0.0	0.4	20.0		35.7	46.0	-10.3
0.640	15.1	0.0	0.2	20.0		35.3	46.0	-10.7
0.499	14.6	0.0	0.2	20.0		34.8	46.0	-11.2
19.590	17.5	0.0	1.2	20.0		38.7	50.0	-11.3
18.090	17.4	0.0	1.2	20.0		38.6	50.0	-11.4
18.510	17.2	0.0	1.2	20.0		38.4	50.0	-11.6
18.150	17.1	0.0	1.2	20.0		38.3	50.0	-11.7
18.000	16.8	0.0	1.2	20.0		38.0	50.0	-12.0
17.940	16.7	0.0	1.2	20.0		37.9	50.0	-12.1
18.870	16.6	0.0	1.2	20.0		37.8	50.0	-12.2
18.450	16.6	0.0	1.2	20.0		37.8	50.0	-12.2
4.047	13.1	0.0	0.6	20.0		33.7	46.0	-12.3
19.138	16.5	0.0	1.2	20.0		37.7	50.0	-12.3

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	EN 55022 Class B:1998
Method:	CISPR 22:1997

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 PS/2; Minimum PC configuration

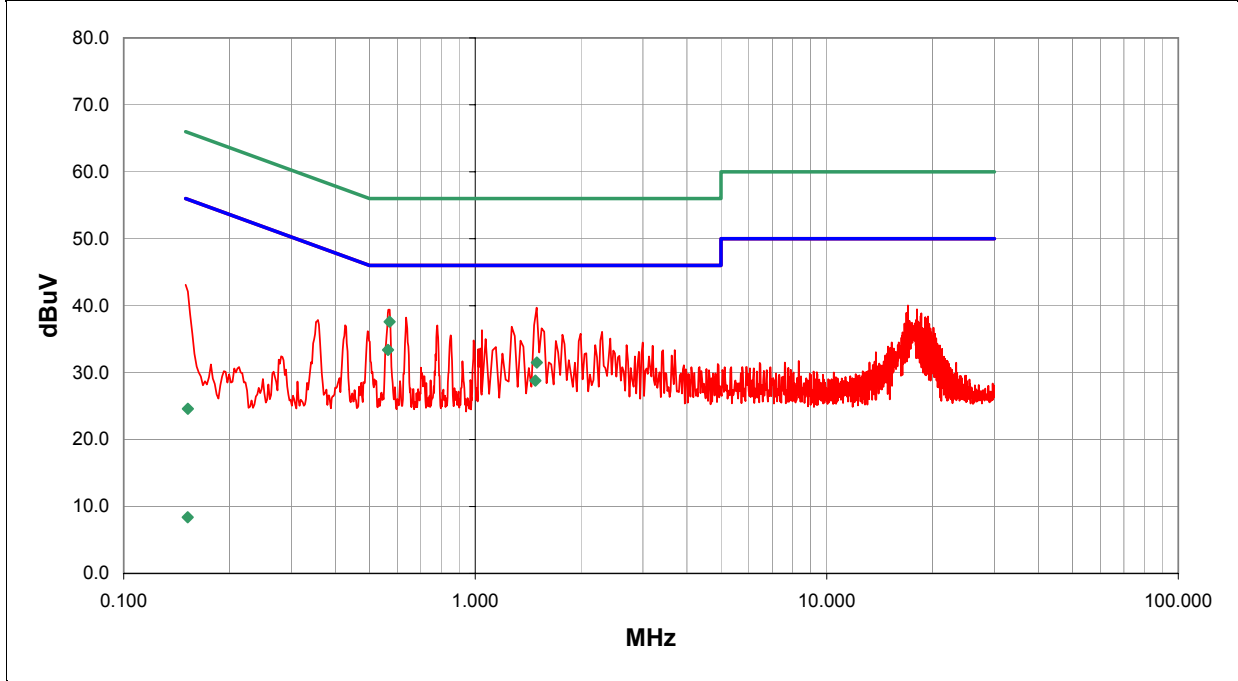
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	N	2

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.565	13.4	0.0	0.0	20.0	AV	33.4	46.0	-12.6
1.483	8.4	0.0	0.4	20.0	AV	28.8	46.0	-17.2
0.571	17.6	0.0	0.0	20.0	QP	37.6	56.0	-18.4
1.497	11.1	0.0	0.4	20.0	QP	31.5	56.0	-24.5
0.152	4.6	0.0	0.0	20.0	QP	24.6	65.9	-41.3
0.152	-11.6	0.0	0.0	20.0	AV	8.4	55.9	-47.5
1.495	19.3	0.0	0.4	20.0		39.7	46.0	-6.3
0.571	19.2	0.0	0.2	20.0		39.4	46.0	-6.6
0.636	18.0	0.0	0.2	20.0		38.2	46.0	-7.8
0.780	16.8	0.0	0.3	20.0		37.1	46.0	-8.9
1.270	16.5	0.0	0.4	20.0		36.9	46.0	-9.1
1.545	16.2	0.0	0.4	20.0		36.6	46.0	-9.4
1.045	16.0	0.0	0.3	20.0		36.3	46.0	-9.7
0.494	16.0	0.0	0.2	20.0		36.2	46.1	-9.9
2.296	15.6	0.0	0.5	20.0		36.1	46.0	-9.9
17.010	18.9	0.0	1.1	20.0		40.0	50.0	-10.0
1.996	15.3	0.0	0.5	20.0		35.8	46.0	-10.2
0.427	16.9	0.0	0.2	20.0		37.1	47.3	-10.2
1.770	15.2	0.0	0.5	20.0		35.7	46.0	-10.3

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC10

TEST SPECIFICATIONS

Specification:	EN 55022 Class B:1998	Method:	CISPR 22:1997
----------------	-----------------------	---------	---------------

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS

USB; Minimum PC configuration

EUT OPERATING MODES

Typical Operating Mode

DEVIATIONS FROM TEST STANDARD

No deviations.

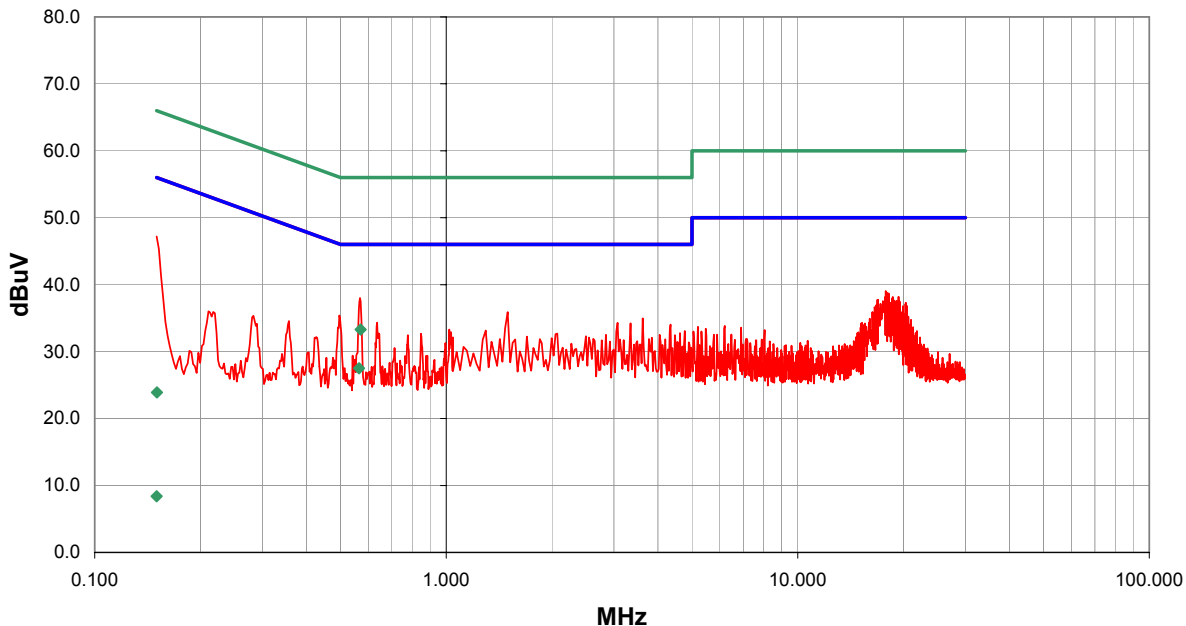
RESULTS

Pass	Line	Run #
	L1	3

Other



Tested By:



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.565	7.5	0.0	0.0	20.0	AV	27.5	46.0	-18.5
0.571	13.3	0.0	0.0	20.0	QP	33.3	56.0	-22.7
0.150	3.9	0.0	0.0	20.0	QP	23.9	66.0	-42.1
0.150	-11.6	0.0	0.0	20.0	AV	8.4	56.0	-47.6
0.568	17.8	0.0	0.2	20.0		38.0	46.0	-8.0
0.150	27.1	0.0	0.1	20.0		47.2	56.0	-8.8
1.495	15.5	0.0	0.4	20.0		35.9	46.0	-10.1
0.496	15.2	0.0	0.2	20.0		35.4	46.1	-10.7
17.790	17.9	0.0	1.2	20.0		39.1	50.0	-10.9
3.621	14.4	0.0	0.6	20.0		35.0	46.0	-11.0
18.000	17.6	0.0	1.2	20.0		38.8	50.0	-11.2
18.150	17.5	0.0	1.2	20.0		38.7	50.0	-11.3
0.636	14.1	0.0	0.2	20.0		34.3	46.0	-11.7
3.071	13.8	0.0	0.5	20.0		34.3	46.0	-11.7
3.346	13.7	0.0	0.5	20.0		34.2	46.0	-11.8
19.350	17.0	0.0	1.2	20.0		38.2	50.0	-11.8
18.630	17.0	0.0	1.2	20.0		38.2	50.0	-11.8
17.850	17.0	0.0	1.2	20.0		38.2	50.0	-11.8
17.700	17.0	0.0	1.2	20.0		38.2	50.0	-11.8

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	230VAC/50Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	EN 55022 Class B:1998
Method:	CISPR 22:1997

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 USB; Minimum PC configuration

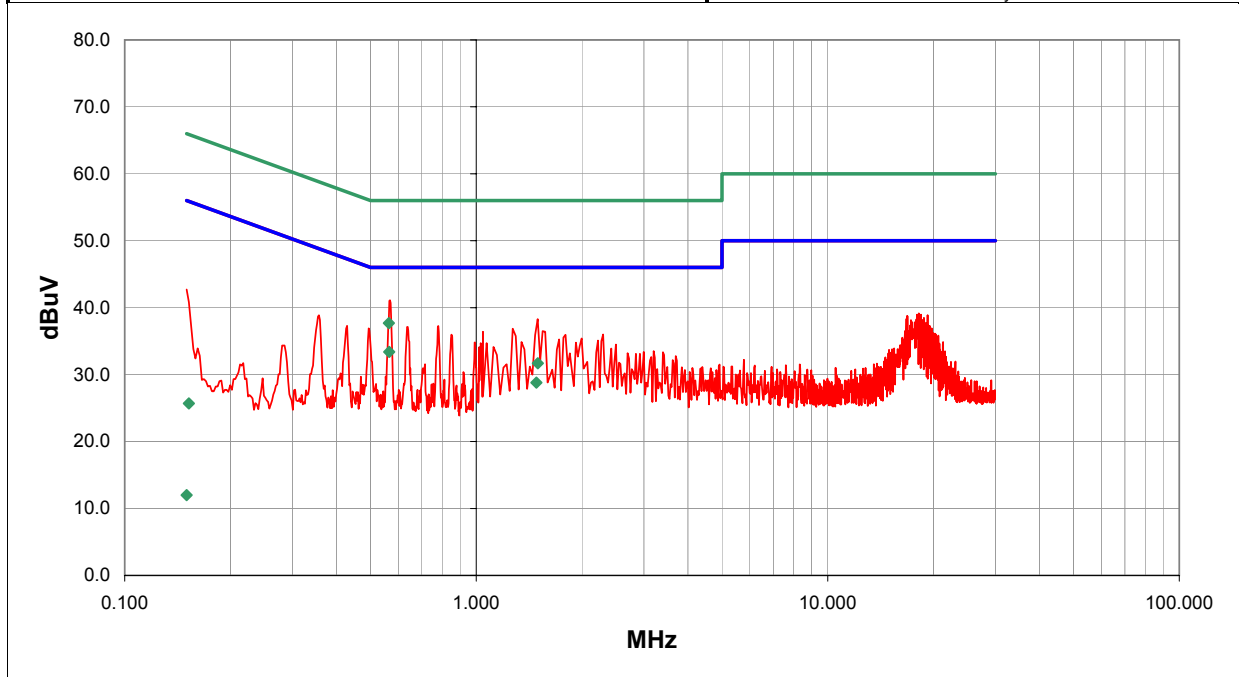
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	N	4

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.565	13.4	0.0	0.0	20.0	AV	33.4	46.0	-12.6
1.483	8.4	0.0	0.4	20.0	AV	28.8	46.0	-17.2
0.564	17.7	0.0	0.0	20.0	QP	37.7	56.0	-18.3
1.497	11.3	0.0	0.4	20.0	QP	31.7	56.0	-24.3
0.152	5.7	0.0	0.0	20.0	QP	25.7	65.9	-40.2
0.150	-8.0	0.0	0.0	20.0	AV	12.0	56.0	-44.0
0.568	20.9	0.0	0.2	20.0		41.1	46.0	-4.9
1.495	17.9	0.0	0.4	20.0		38.3	46.0	-7.7
0.780	17.0	0.0	0.3	20.0		37.3	46.0	-8.7
0.638	16.9	0.0	0.2	20.0		37.1	46.0	-8.9
1.270	16.5	0.0	0.4	20.0		36.9	46.0	-9.1
0.494	16.7	0.0	0.2	20.0		36.9	46.1	-9.2
1.545	16.1	0.0	0.4	20.0		36.5	46.0	-9.5
1.045	16.1	0.0	0.3	20.0		36.4	46.0	-9.6
0.357	18.7	0.0	0.2	20.0		38.9	48.8	-9.9
0.429	17.1	0.0	0.2	20.0		37.3	47.3	-10.0
2.296	15.5	0.0	0.5	20.0		36.0	46.0	-10.0
0.850	15.7	0.0	0.3	20.0		36.0	46.0	-10.0
1.795	15.5	0.0	0.5	20.0		36.0	46.0	-10.0

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	120VAC/60Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	FCC 15.107 Class B:2004
Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 USB; Minimum PC configuration

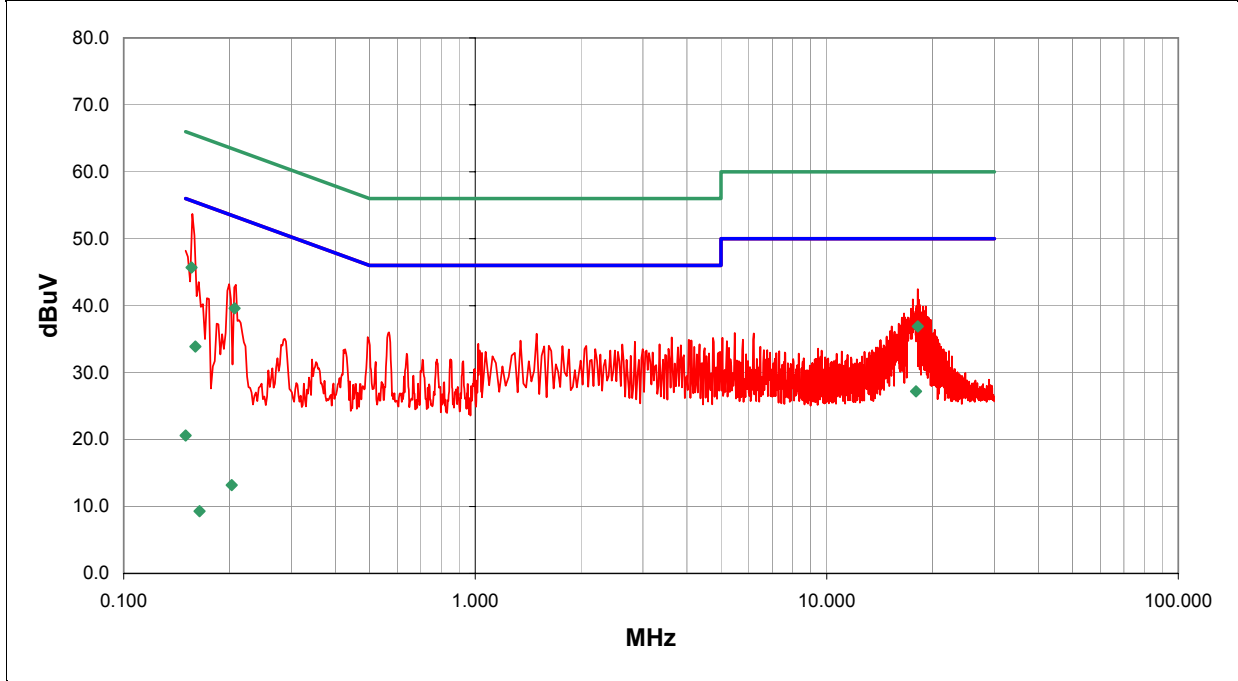
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	L1	5

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.156	25.7	0.0	0.0	20.0	QP	45.7	65.7	-20.0
17.939	6.0	0.0	1.2	20.0	AV	27.2	50.0	-22.8
18.147	15.7	0.0	1.2	20.0	QP	36.9	60.0	-23.1
0.207	19.6	0.0	0.0	20.0	QP	39.6	63.3	-23.7
0.160	13.9	0.0	0.0	20.0	QP	33.9	65.5	-31.6
0.150	0.6	0.0	0.0	20.0	AV	20.6	56.0	-35.4
0.203	-6.8	0.0	0.0	20.0	AV	13.2	53.5	-40.3
0.164	-10.7	0.0	0.0	20.0	AV	9.3	55.2	-45.9
0.157	33.6	0.0	0.1	20.0		53.7	55.6	-1.9
18.150	21.3	0.0	1.2	20.0		42.5	50.0	-7.5
0.150	28.1	0.0	0.1	20.0		48.2	56.0	-7.8
17.580	19.8	0.0	1.2	20.0		41.0	50.0	-9.0
18.300	19.7	0.0	1.2	20.0		40.9	50.0	-9.1
18.360	19.0	0.0	1.2	20.0		40.2	50.0	-9.8
0.568	15.8	0.0	0.2	20.0		36.0	46.0	-10.0
18.000	18.8	0.0	1.2	20.0		40.0	50.0	-10.0
19.140	18.7	0.0	1.2	20.0		39.9	50.0	-10.1
18.780	18.7	0.0	1.2	20.0		39.9	50.0	-10.1
0.209	23.0	0.0	0.1	20.0		43.1	53.3	-10.1

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	120VAC/60Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	FCC 15.107 Class B:2004
Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 USB; Minimum PC configuration

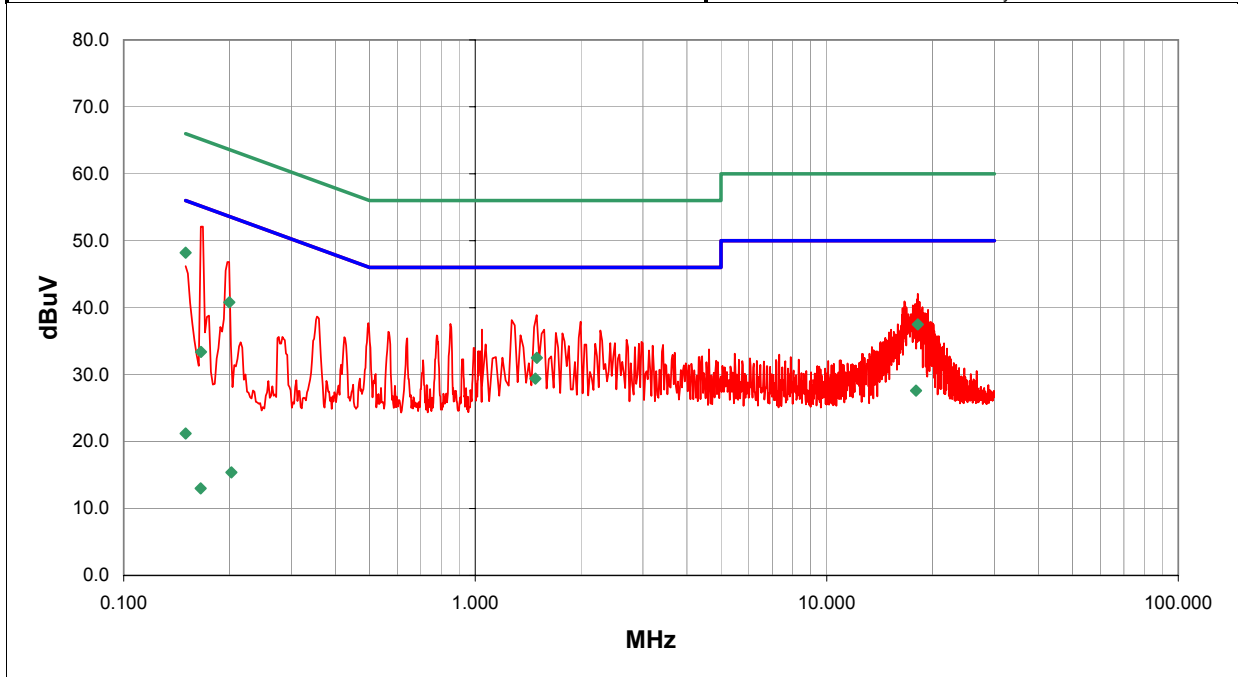
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	N	6

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
1.483	9.0	0.0	0.4	20.0	AV	29.4	46.0	-16.6
0.150	28.2	0.0	0.0	20.0	QP	48.2	66.0	-17.8
17.939	6.4	0.0	1.2	20.0	AV	27.6	50.0	-22.4
18.153	16.3	0.0	1.2	20.0	QP	37.5	60.0	-22.5
0.200	20.8	0.0	0.0	20.0	QP	40.8	63.6	-22.8
1.497	12.1	0.0	0.4	20.0	QP	32.5	56.0	-23.5
0.166	13.4	0.0	0.0	20.0	QP	33.4	65.2	-31.8
0.150	1.2	0.0	0.0	20.0	AV	21.2	56.0	-34.8
0.202	-4.6	0.0	0.0	20.0	AV	15.4	53.5	-38.1
0.166	-7.0	0.0	0.0	20.0	AV	13.0	55.2	-42.2
0.168	32.0	0.0	0.1	20.0		52.1	55.1	-2.9
0.200	26.7	0.0	0.1	20.0		46.8	53.6	-6.8
1.495	18.5	0.0	0.4	20.0		38.9	46.0	-7.1
1.270	17.8	0.0	0.4	20.0		38.2	46.0	-7.8
18.150	20.9	0.0	1.2	20.0		42.1	50.0	-7.9
1.996	17.4	0.0	0.5	20.0		37.9	46.0	-8.1
0.496	17.5	0.0	0.2	20.0		37.7	46.1	-8.4
0.850	17.3	0.0	0.3	20.0		37.6	46.0	-8.4
18.060	20.1	0.0	1.2	20.0		41.3	50.0	-8.7

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	120VAC/60Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	FCC 15.107 Class B:2004
Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 PS/2; Minimum PC configuration

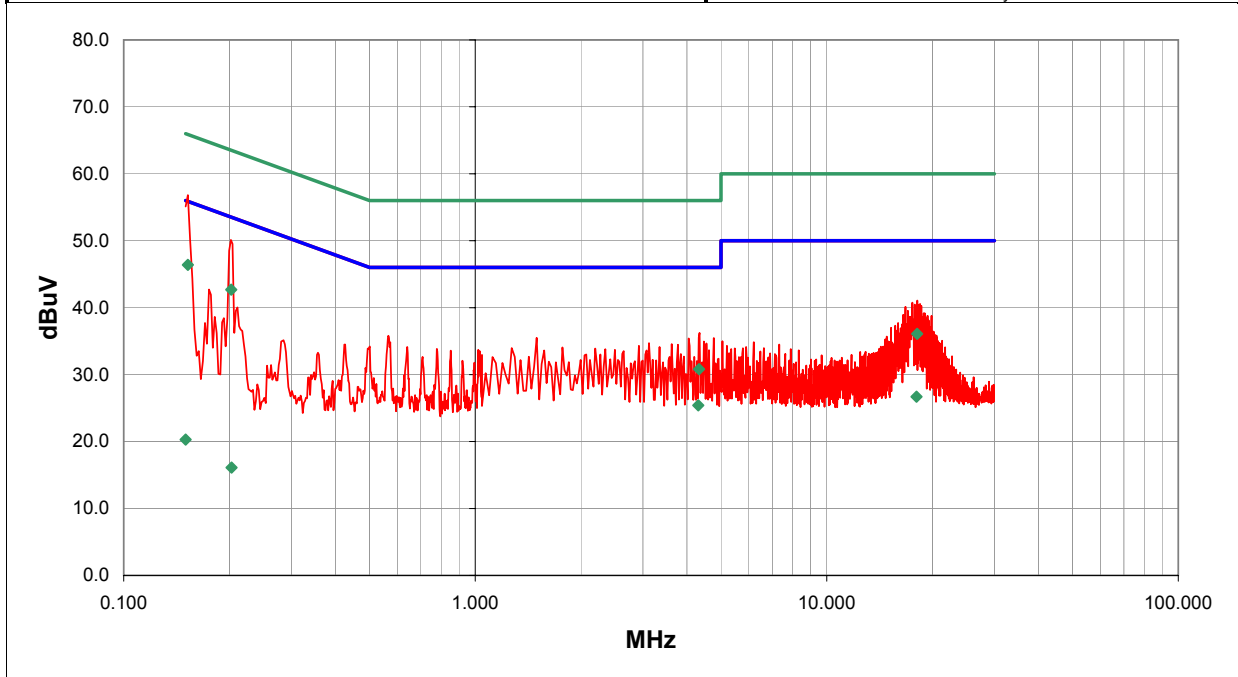
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	L1	7

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
0.152	26.4	0.0	0.0	20.0	QP	46.4	65.9	-19.5
4.308	4.8	0.0	0.6	20.0	AV	25.4	46.0	-20.6
0.202	22.7	0.0	0.0	20.0	QP	42.7	63.5	-20.8
18.011	5.5	0.0	1.2	20.0	AV	26.7	50.0	-23.3
18.069	14.9	0.0	1.2	20.0	QP	36.1	60.0	-23.9
4.334	10.2	0.0	0.6	20.0	QP	30.8	56.0	-25.2
0.150	0.3	0.0	0.0	20.0	AV	20.3	56.0	-35.7
0.203	-3.9	0.0	0.0	20.0	AV	16.1	53.5	-37.4
0.152	36.7	0.0	0.1	20.0		56.8	55.9	0.9
0.202	30.0	0.0	0.1	20.0		50.1	53.5	-3.4
18.090	19.9	0.0	1.2	20.0		41.1	50.0	-8.9
17.520	19.6	0.0	1.2	20.0		40.8	50.0	-9.2
18.420	19.4	0.0	1.2	20.0		40.6	50.0	-9.4
18.150	19.3	0.0	1.2	20.0		40.5	50.0	-9.5
17.790	19.3	0.0	1.2	20.0		40.5	50.0	-9.5
18.570	19.1	0.0	1.2	20.0		40.3	50.0	-9.7
4.347	15.6	0.0	0.6	20.0		36.2	46.0	-9.8
16.740	19.0	0.0	1.1	20.0		40.1	50.0	-9.9
0.566	15.6	0.0	0.2	20.0		35.8	46.0	-10.2

EUT:	M777 Keyboard	Work Order:	STAC0002
Serial Number:		Date:	03/15/05
Customer:	StacoSwitch Inc.	Temperature:	20
Attendees:	None	Humidity:	32%
Cust. Ref. No.:		Barometric Pressure:	30.04
Tested by:	Jonathan Peng	Power:	120VAC/60Hz
		Job Site:	OC10

TEST SPECIFICATIONS	
Specification:	FCC 15.107 Class B:2004
Method:	ANSI C63.4:2003

SAMPLE CALCULATIONS
 Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation
 Conducted Emissions: Adjusted Level = Measured Level + Transducer Factor + Cable Attenuation Factor + External Attenuator

COMMENTS
 PS/2; Minimum PC configuration

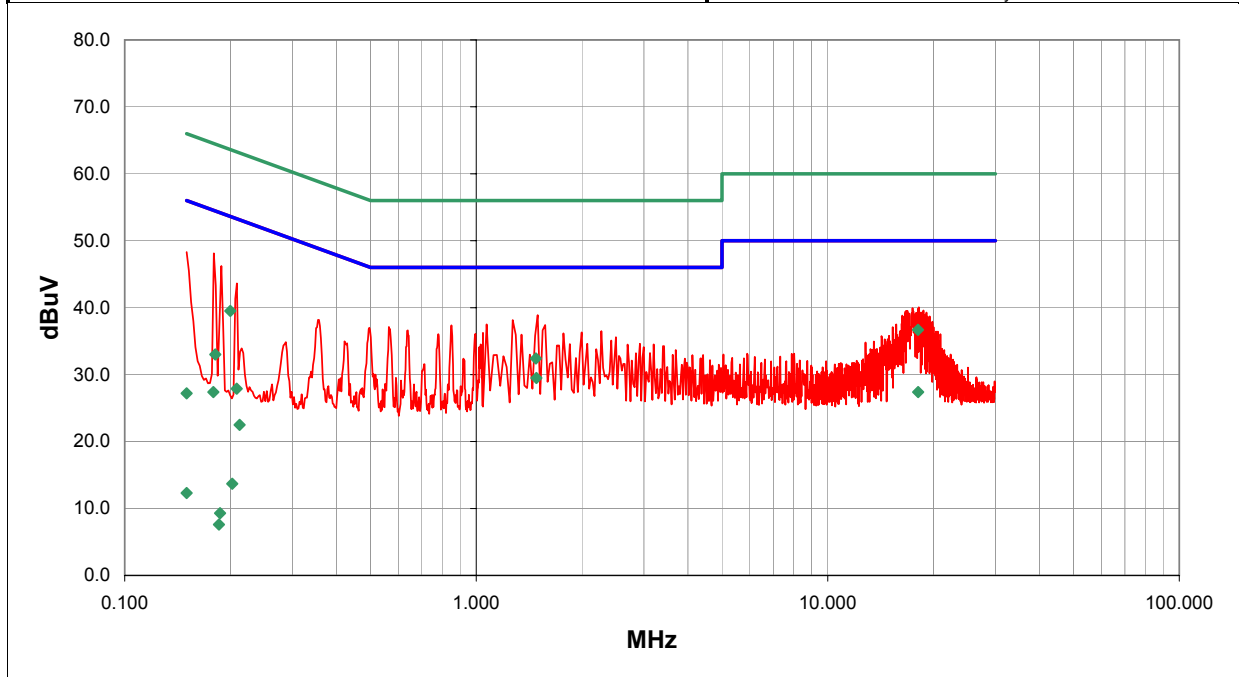
EUT OPERATING MODES
 Typical Operating Mode

DEVIATIONS FROM TEST STANDARD
 No deviations.

RESULTS	Line	Run #
Pass	N	8

Other


 Tested By: _____



Freq (MHz)	Amplitude (dBuV)	Transducer (dB)	Cable (dB)	External Attenuation (dB)	Detector (blank equal peaks [PK] from scan)	Adjusted dBuV	Spec. Limit dBuV	Compared to Spec. (dB)
1.484	9.1	0.0	0.4	20.0	AV	29.5	46.0	-16.5
18.082	6.2	0.0	1.2	20.0	AV	27.4	50.0	-22.6
18.066	15.5	0.0	1.2	20.0	QP	36.7	60.0	-23.3
1.479	12.0	0.0	0.4	20.0	QP	32.4	56.0	-23.6
0.200	19.5	0.0	0.0	20.0	QP	39.5	63.6	-24.1
0.212	2.5	0.0	0.0	20.0	AV	22.5	53.1	-30.6
0.181	13.0	0.0	0.0	20.0	QP	33.0	64.4	-31.4
0.208	7.9	0.0	0.0	20.0	QP	27.9	63.3	-35.4
0.179	7.4	0.0	0.0	20.0	QP	27.4	64.5	-37.1
0.150	7.2	0.0	0.0	20.0	QP	27.2	66.0	-38.8
0.202	-6.3	0.0	0.0	20.0	AV	13.7	53.5	-39.8
0.150	-7.7	0.0	0.0	20.0	AV	12.3	56.0	-43.7
0.187	-10.7	0.0	0.0	20.0	AV	9.3	54.2	-44.9
0.185	-12.4	0.0	0.0	20.0	AV	7.6	54.2	-46.6
0.179	28.0	0.0	0.1	20.0		48.1	54.5	-6.4
1.495	18.5	0.0	0.4	20.0		38.9	46.0	-7.1
0.150	28.2	0.0	0.1	20.0		48.3	56.0	-7.7
1.270	17.8	0.0	0.4	20.0		38.2	46.0	-7.8
0.188	26.1	0.0	0.1	20.0		46.2	54.1	-7.9

