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## **Certification Application**

**Y Soft Americas, Inc.  
US Code Title 47, Part 15, Subpart C, Section 15.225  
Y Soft Americas, Inc.  
SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031**

**April 8, 2009**

**Number of Pages in this report: 47**

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US Tech

Report Number:

Customer:

EUT:

FCC ID: W79SQ3P0011031

09-0025

Y Soft Americas, Inc.

SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031

## MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **Y Soft Americas, Inc.**

MODEL: **SafeQ Terminal Professional HID I Class**

**M/N: YSQ3P-001-1031**

FCC ID: **W79SQ3P0011031**

DATE: **April 8, 2009**

This report concerns (check one): Original grant X  
Class II change \_\_\_\_\_

Equipment type: Transceiver

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes \_\_\_\_\_ No X

If yes, defer until: \_\_\_\_\_  
date

N.A. agrees to notify the Commission by N.A.  
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

US Tech  
3505 Francis Circle  
Alpharetta, GA 30004

Phone Number: (770) 740-0717

Fax Number: (770) 740-1508

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## 1. General Information

The information contained in this report is presented for the FCC Equipment Authorization of Certification for the EUT.

### 1.1 Product Description

The Equipment under Test (EUT) is Y Soft Americas, Inc.'s, SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031. The EUT is an ID terminal for printers, copiers, and multifunction devices.

### 1.2 Related Submittal(s)/Grant(s)

The EUT will be used with part of a system to send/receive data. The transmitter presented in this report will be used with an ID tag which has been submitted under a separate authorization.

### 1.3 The EUT is subject to the following authorizations:

- a) Certification of the transmitter part of a transceiver
- b) Verification as a Digital Device.

## 2 Tests and Measurements

### 2.1 Configuration of Tested System

The Test sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (2003). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. A block diagram of the tested system is shown in Figure 1. Test configuration photographs for fundamental and harmonic emissions are shown in Figure 2.

The sample used for testing was received by US Tech on February 13, 2008 in good condition.

### 2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and registered with the FCC, under designation number US5117. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number 2982A-1.

### 2.3 Test Equipment

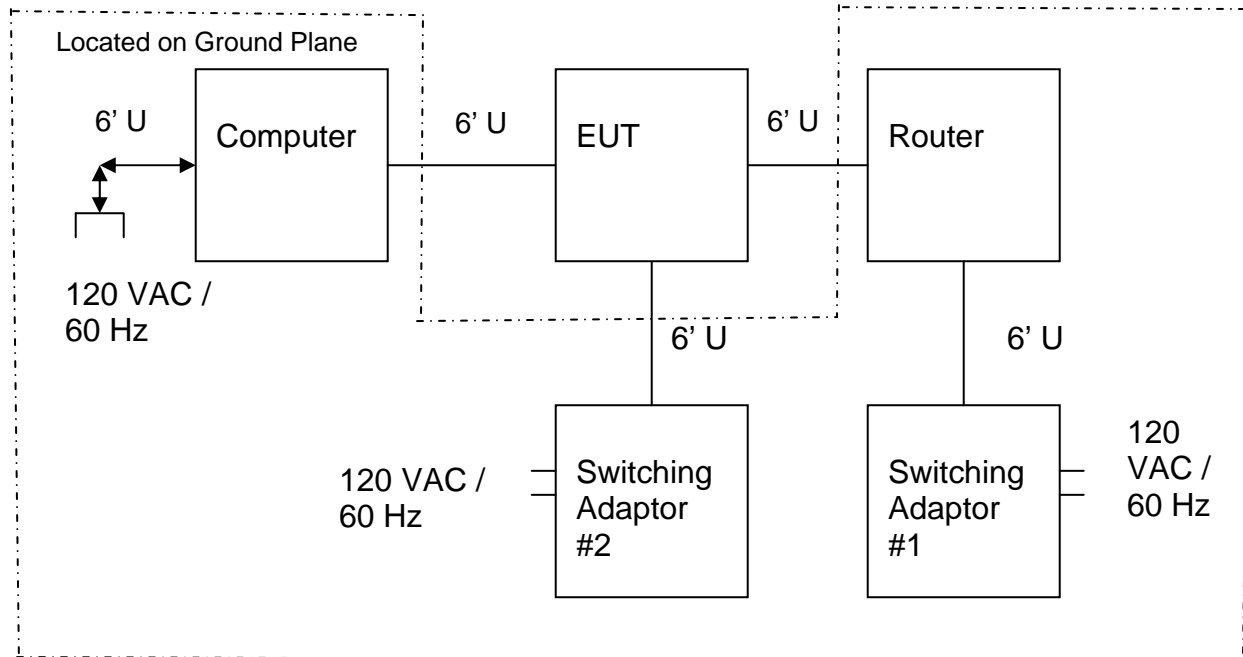
Table 2 describes test equipment used to evaluate this product.

### 2.4 Modifications

No modifications were necessary to bring the EUT into compliance with the FCC Part 15.207 conducted emissions limits for an intentional radiator, and general Radiated Emissions Limits of 15.209.

### 2.5 Test Procedure

The EUT was configured as shown in the following block diagram(s) and photograph(s). The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992) following US Tech's procedures paragraph 7 for conducted and paragraph 8 for radiated. Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter on the spectrum analyzer was OFF throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. The EUT was rotated 360 degrees with the turntable to maximize emissions. Due to not being a hand-held portable device the EUT was tested in the position that is going to be used most likely in the field, as shown in the photos.



**Figure 1**  
**Test Configuration**

**Table 1.****EUT and Peripherals**

PERIPHERAL AND MANUFACTUR ER	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
YSoft SafeQ SmartCard (EUT)	Terminal Professional HID I Class YSQ3P-001- 1031	None		6' U
Netgear router	WGR614	--	--	6' U
Switching Adaptor #1 Netgear	DSA-12R- 12Aus	--	--	6' U Power Cord
Desktop P.C Compaq Presario	ED865AA- ABA	CNN53912 54	---	6' U Power Cord
AC Switching Power Adaptor #2 Y Soft	Sys-1357- 2412	G08 100305786 2	None	6' U Power Cord

**P = Power   D = data   S = Shielded   U = Unshielded**



**Table 2.****Test Instruments**

TYPE	MANUFACTURER	MODEL	SN.	Cal Date.
SPECTRUM ANALYZER	HEWLETT-PACKARD	8593E	3205A00124	9/9/08
RF PREAMP 10 to 1000 MHz	HEWLETT-PACKARD	8447D	1937A03355	9/12/08
Active Loop Antenna 10 kHz to 30 MHz	A. H. Systems	SAS-200/562	142	11/12/08
BICONICAL ANTENNA 25 MHz to 200 MHz	EMCO	3110	9307-1431	1/22/09
LOG PERIODIC ANTENNA 100MHz to 1000 MHz	EMCO	3146	9110-3632	11/21/07 2 Yr.
LOOP ANTENNA	A.H. SYSTEMS	SAS-200/562	142	11/12/08
LISN	SOLAR ELE.	8028	910495 & 910494	1/19/09

Calibration interval is 1 year unless stated otherwise

## 2.6 EUT Antenna Description (FCC Sec. 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

Y Soft America's SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031 incorporates a permanently attached antenna.

Manufacturer: HID Corporation  
9292 Jeronimo Road  
Irvine, CA 92618-1905

Type: Coiled loop etched in pwb

Model Number: 3101A

Gain: --

Connector: Permanently attached

## 2.7 Field Strength of Fundamental (47 CFR 15.225(a))

The results of the measurements for peak fundamental emissions are given in Table 3 and Figure 5. The EUT emissions were measured by setting up the Active Loop Antenna in the vertical orientation at a distance of 3 meters from the EUT and at a height of 1.0 meters above the ground. The EUT major axis was set to face the measuring antenna so that it intercepted the plane formed by the loop at right angles. When a signal was detected, the loop was slowly rotated about its axis in an attempt to maximize the emission. The antenna was left in the orientation where the emission was maximized and the signal was measured and recorded.

## 2.8 Operation in the Band 13.110 MHz to 14.010 MHz (CFR15.225 (b), (c))

This frequency band is subdivided into four sub ranges as follows:

Frequency (MHz)	Limit @ 30m (linear)	Limit @ 30m (logarithmic)
13.110 to 13.410	106 uV/m	40.5 dBuV/m
13.410 to 13.553	334 uV/m	50.5 dBuV/m
13.567 to 13.710	334 uV/m	50.5 dBuV/m
13.710 to 14.010	106 uV/m	40.5 dBuV/m

There are no signals to measure in the frequency band of 13.110 MHz to 13.410 MHz and 13.567 MHz to 14.010 MHz. In the frequency band of 13.410 MHz to 13.553 MHz, the Fundamental occupies this band, but at levels less than the limit of 50.5 dBuV/m

**Table 3.**  
**Field Strength of Fundamental Emission Peak**

Peak Radiated Emissions of Fundamental							
Test By:  DA	Test: FCC Part 15.225			Client: Y Soft Americas, Inc.			
	Project: 09-0025			15.225(a) Limits	Model: SafeQ Terminal Professional HID I Class		
Frequency (MHz)	Measured Test Data (dBuV)	AF+ CA – AMP+DC (dB/m)	Results (dBuV/m)	Limits (dBuV/m)	Distance / Polarization	Margin (dB)	Detector PK/QP/AVG
13.5593	40.15	6.98	47.13	124.0	3m/O	76.9	PK

**SAMPLE CALCULATIONS:**

**RESULTS @ 13.5593 MHz = (40.15 + 6.98) = 47.13dBuV/m @ 3m**

**NOTE: Conversion from 3 meter to 30 meters =  $40 \log (3/30) = -40\text{dB}$**

**Limit @ 30m distance is 84dBuV/m. Therefore limit @ 3m =  $84 - (-40) = 124\text{dBuV}$**

**February 17, 2009**

**Test Results  
Reviewed By:**

*Daniel Aparaschivei*

**Name: Daniel Aparaschivei**

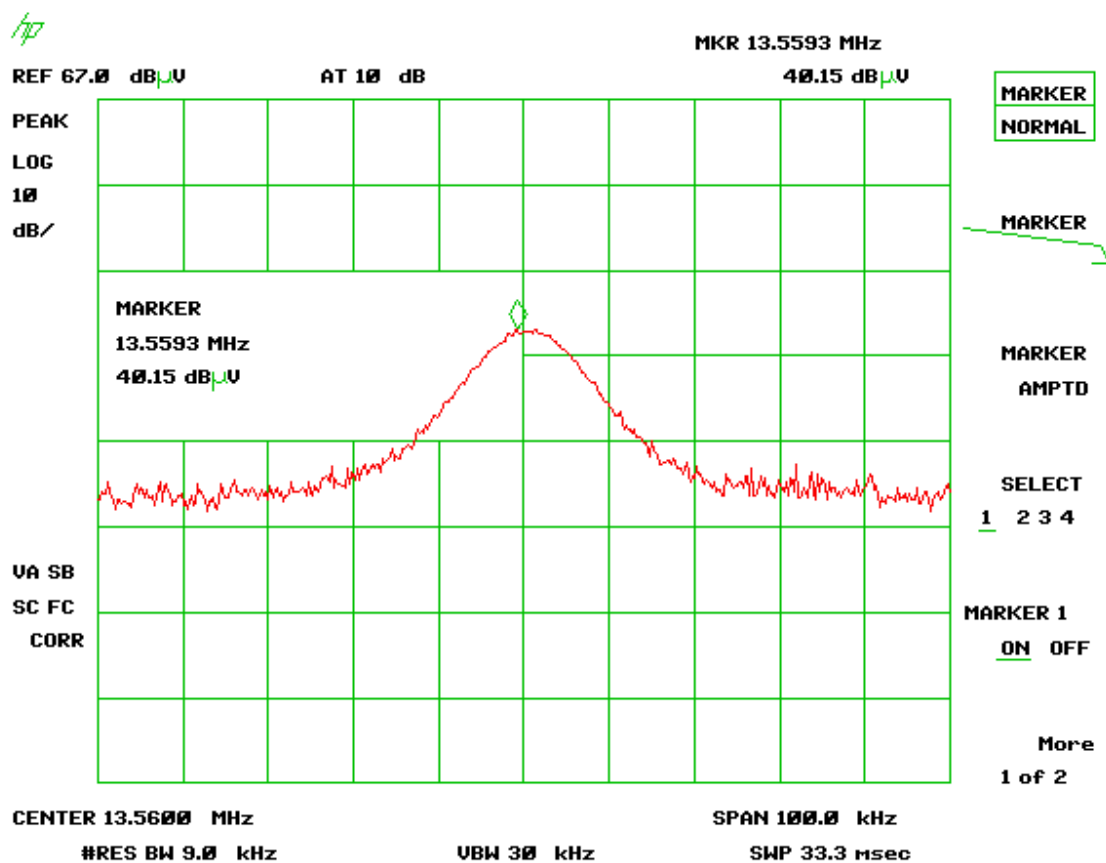


Figure 5

Fundamental Frequency 13.5593 MHz

## **2.9 Peak Radiated Spurious Emissions in the Frequency Range 14.01 MHz -1,000 MHz (FCC Section 15.205, 15.209 and 15.225)**

A preliminary scan was performed on the EUT to determine spurious frequencies that were caused by the transmitter portion of the product. Significant emissions that fell within restricted bands were then measured on an OATS site. Radiated measurements below 1 GHz were tested with a RBW = 120 kHz. The results of all peak radiated spurious emissions including those falling in the restricted bands are given in Table 4 and in Figure 6.

US Tech  
Report Number:  
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EUT:

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09-0025  
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SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031

**Table 4. Peak Radiated Spurious Emissions**

<b>Test By:</b>	<b>Test:</b> FCC Part 15.109, 15.209, 15.225			<b>Client:</b> Y Soft Americas, Inc.			
<b>D.A.</b>	<b>Project:</b> 09-0025	<b>Class: B</b>		<b>Model:</b> SafeQ Terminal Professional HID I Class			
Frequency (MHz)	Test Data (dBuV)	AF+CL -PA (dB)	Results (uV/m)	Limits (uV/m)	Distance / Polarization	Margin (dB)	Detector PK/QP /AVG
27.1200	18.95	12.84	31.79	69.5	3m./O	37.7	PK
40.6700	19.57	11.91	31.48	40.0	3m./VERT	8.5	QP

**SAMPLE CALCULATIONS:**

**RESULTS:** At 27.12 MHz = 18.95 + 12.84= 31.79

**February 17, 2009**

**Test Results  
Reviewed By:**

*Daniel Aparaschivei*

**Name:** Daniel Aparaschivei

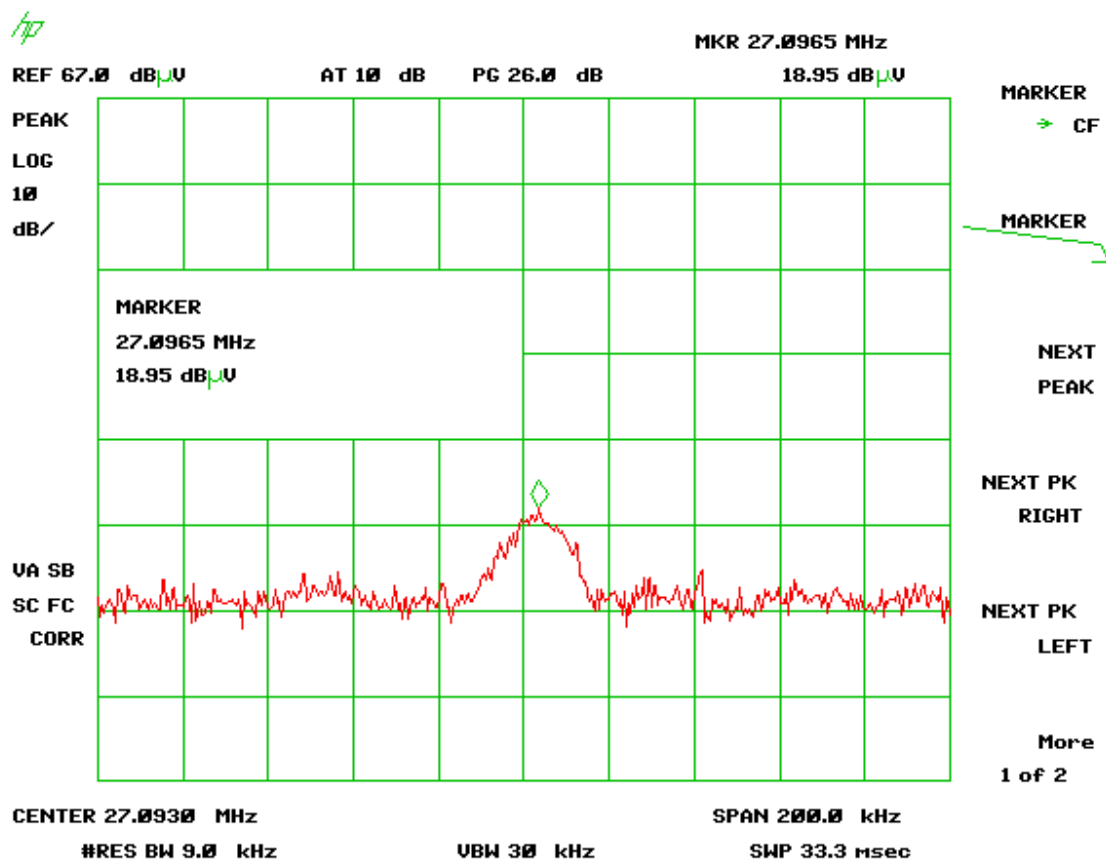


Figure 6.

Peak Radiated Spurious Emission  
2<sup>nd</sup> Harmonic



## 2.10 Frequency Tolerance

The EUT temperature stability was measured over the temperature range of -20° C to 50° C as well as supply voltage variations of 85% to 115% at the temperature of 20° C. The results of this measurement are recorded in Table 5 below.

**Table 5. Frequency Variation with Temperature and Supply Voltage.**

Voltage - Volts	Temperature °C		
	-20	20	50
Frequency @ 102	NR	13.55972 MHz	NR
Frequency @ 120	13.55988 MHz	13.55984 MHz	13.55986 MHz
Frequency @ 138	NR	13.55980 MHz	NR
85 % of 120VAC = 102 VAC			
115 % of 120VAC= 138VAC			

NR = Not Required

For the frequency 13.55984 MHz,  $0.01\% = 0.0001 \times 1355984 \text{ MHz} = .001355984 \text{ MHz} = 1,355.984 \text{ Hz}$

All of the measured values lie between the upper and lower 0.01% bounds.

**Test Date: March 5, 2008**

Tested by  
Signature:

*Daniel Aparaschivei*

Name: Daniel Aparaschivei

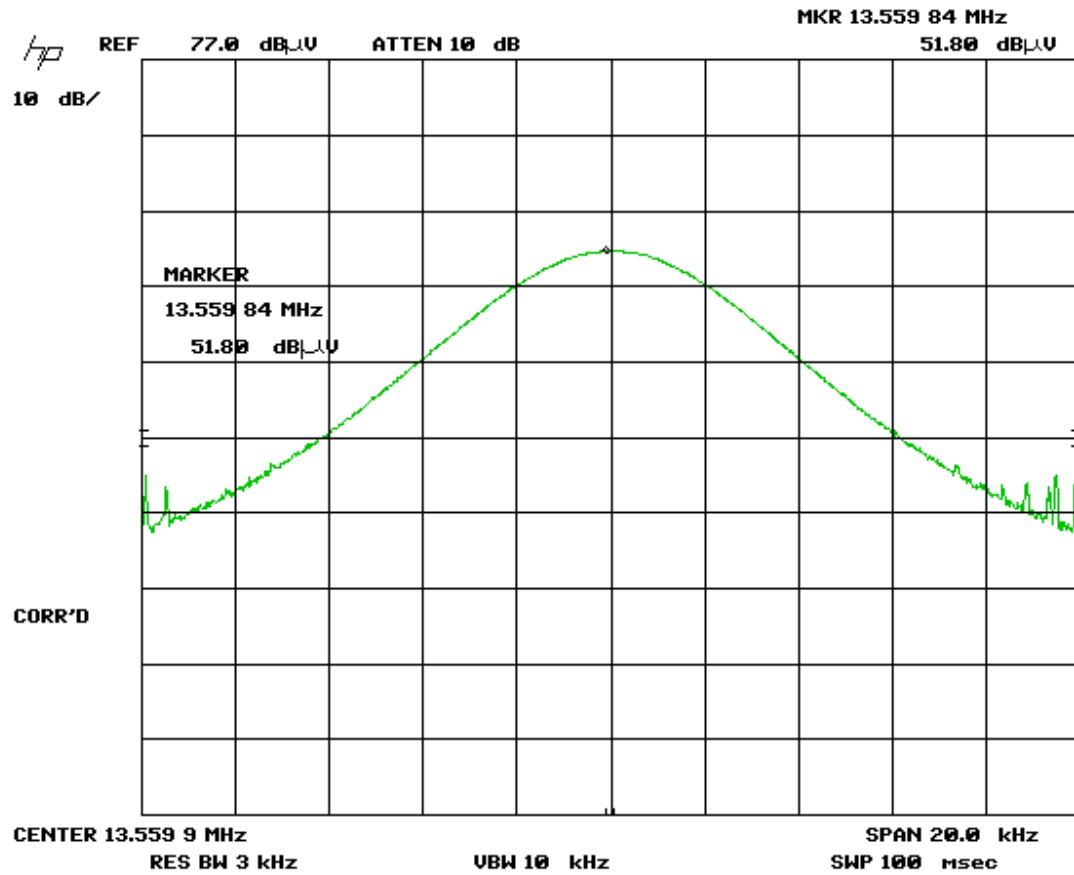


Figure 7. Data Plot 120.0 VAC, +20°C

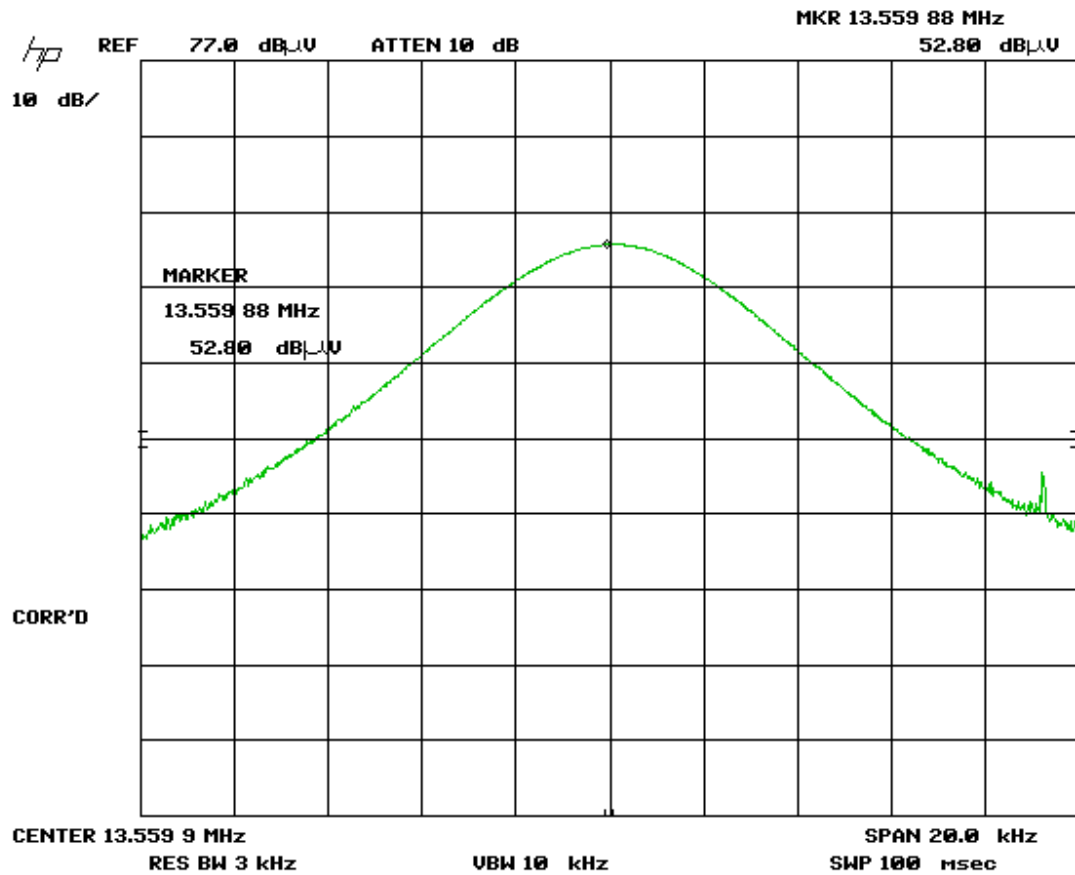


Figure 8. Data Plot, 120.0 VAC, -20 °C

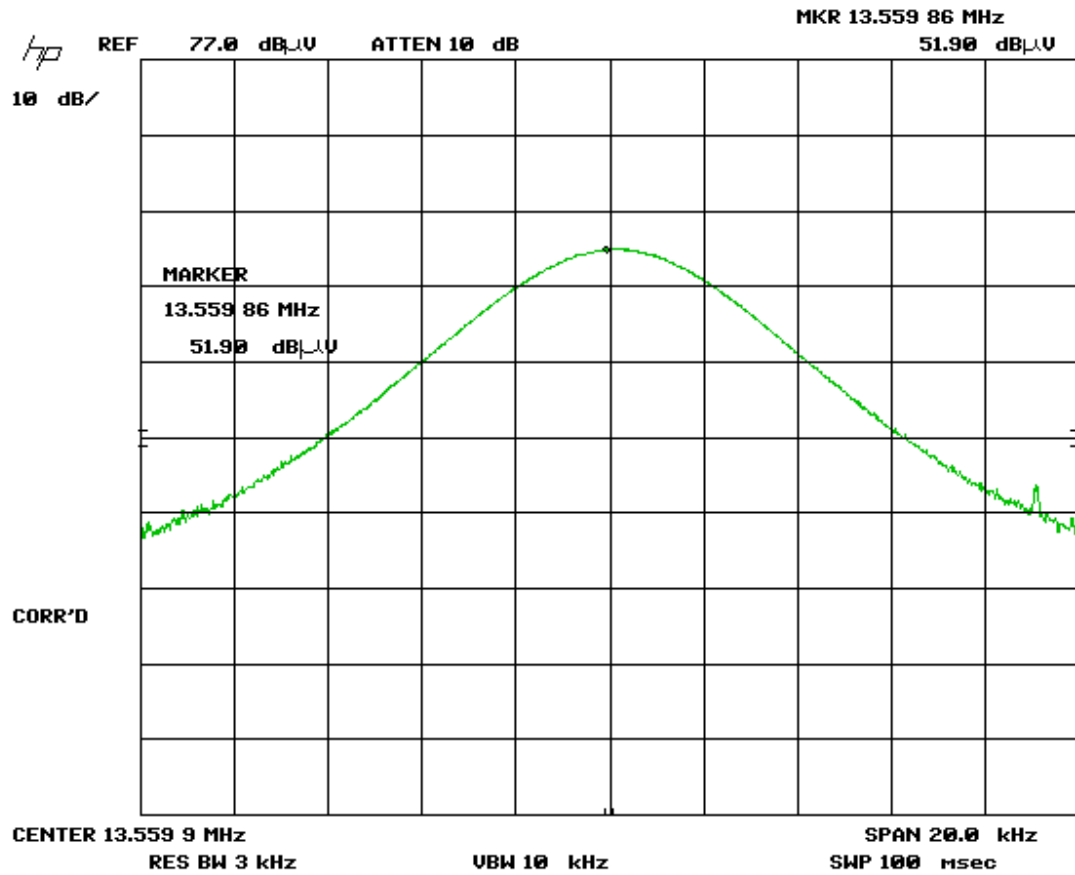


Figure 9. Data Plot 120 VAC, +50 °C



**Figure 10**  
**Frequency Tolerance Photographs**

**2.11. Power Line Conducted Emissions for Transmitter and Receiver/Digital Apparatus.(47 CFR 15.107&15.207)**

The conducted voltage measurements have been carried out in accordance with FCC Sections 15.107 and 15.207 per the procedures of ANSI C63.4 paragraph 7, utilizing a spectrum analyzer connected to an LISN and with the EUT placed into a continuous mode of transmit for the transmitter portion of the test and the transmitter disabled for the Receiver/Digital part of the test. Conducted data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz.

**Table 6. Conducted Emissions Test Data for Transmitter and Receiver/Digital Devices, 15.107 and 15.207 Limits**

Conducted Emissions						
Test By:  DA	Test: FCC Part 15.107 and 15.207 Class B			Client: Y Soft Americas, Inc.		
	Project: 09-0025			Model: YSoft SafeQ Terminal Professional V3 HID I Class		
Frequency (MHz)	Test Data (dBuV)	IL+CA-AMP (dB)	Results (dBuV)	Limits (dBuV)	Margin (dB)	Detector
Phase						
0.1730	50.69	-0.30	50.39	54.8	4.4	PK
0.6360	32.56	-0.01	32.55	46.0	13.4	PK
3.2900	35.04	0.16	35.20	46.0	10.8	PK
7.0900	35.45	0.33	35.78	50.0	14.2	PK
13.5800	37.69	0.19	37.88	50.0	12.1	PK
22.5500	27.47	0.40	27.87	50.0	22.1	PK
Neutral						
0.1750	50.85	-0.33	50.52	54.7	4.2	PK
0.6250	34.54	-0.11	34.43	46.0	11.6	PK
1.1300	36.12	-0.03	36.09	46.0	9.9	PK
5.8800	34.43	0.21	34.64	50.0	15.4	PK
13.5500	37.35	0.09	37.44	50.0	12.6	PK
20.2500	32.35	0.42	32.77	50.0	17.2	PK

No signals are harmonically related to EUT, therefore are all unintentional radiator signals. Limits are from 15.107.

**SAMPLE CALCULATIONS: At 0.1730 MHz, level = 50.69 dBuV + (- 0.30)dB = 50.39 dBuV.**

February 16, 2009

Test Results  
Reviewed By:

*Daniel Aparaschivei*

Name: Daniel Aparaschivei

## 2.12 Radiated Emissions (47 CFR 15.109(a))

Radiated emissions were evaluated from 30 MHz to 1 GHz. Measurements were made with the analyzer's bandwidth set to 120 kHz for measurements made below 1 GHz and 1 MHz for measurements made at 1 GHz and higher. Results are shown in Table 7.



US Tech  
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09-0025  
Y Soft Americas, Inc.  
SafeQ Terminal Professional HID I Class Model: YSQ3P-001-1031

**Table 7. Radiated Emissions Data for Digital Device, Class B**

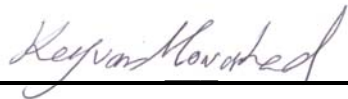
30 MHz – 1 GHz							
<b>Test By:</b>  <b>KM</b>	<b>Test:</b> FCC Part 15.109, 15.209, 15.225		<b>Client:</b> Y Soft Americas, Inc.				
	<b>Project:</b> 08-0025	<b>Class: B</b>		<b>Model:</b> YSoft SafeQ Terminal Professional HID I Class			
Frequency (MHz)	Test Data (dBuV)	AF+CL -PA (dB)	Results (uV/m)	Limits (uV/m)	Distance / Polarization	Margin (dB)	Detector PK/QP /AVG
40.6800	25.77	11.91	37.68	40.0	3m./VERT	2.3	<b>QP</b>
151.0000	23.78	15.66	39.44	43.5	3m./VERT	4.1	<b>PK</b>
224.0000	21.05	19.79	40.84	46.0	3m./VERT	5.2	<b>QP</b>
250.0000	24.13	15.78	39.91	46.0	3m./VERT	6.1	<b>PK</b>
275.0000	24.10	17.17	41.27	46.0	3m./HORZ	4.7	<b>QP</b>
325.0000	25.81	18.16	43.97	46.0	3m./HORZ	2.0	<b>QP</b>
333.0000	25.10	18.34	43.44	46.0	3m./HORZ	2.6	<b>QP</b>
374.0000	23.02	18.81	41.83	46.0	3m./VERT	4.2	<b>PK</b>
800.0000	16.49	26.75	43.24	46.0	3m./VERT	2.8	<b>PK</b>
999.0000	17.84	30.06	47.90	54.0	3m./VERT	6.1	<b>PK</b>

**SAMPLE CALCULATIONS:**

RESULTS: At 40.6800 MHz = 25.77+ 11.91= 37.68

February 13, 2009

Test Results  
Reviewed By:



Name: Keyvan Muvahhed

## **5      Photographs**

### Photos of the Tested EUT

- 5.1 EUT, Front View
- 5.2 EUT, Bottom View
- 5.3 EUT, Bottom View Ethernet Connections Area Cover Removed
- 5.4 EUT, Cover Removed
- 5.5 EUT, Host board Component Side
- 5.6 EUT, Host board Solder Side
- 5.7 EUT, Interface board with Transmitter and Antenna Boards
- 5.8 EUT, Interface board Component Side
- 5.9 EUT, Interface board Solder Side
- 5.10 EUT, Transmitter board Component Side Antenna Removed
- 5.11 EUT, Transmitter board Solder Side
- 5.12 EUT, Antenna board Component Side
- 5.13 EUT, Antenna board Solder Side