DASTEK EMC Lab

204, Chuge-Ri, Yangji-Myeon, Yongin -Shi, Kyunggi-Do, Korea
Tel : 82-31-335-9341 Fax : 82-31-335-9343

Verificate of Compliance

Hudson Tech, Inc.
1330-13, Seocho-dong, Seocho-ku,
Seoul, Korea.

Date of Test: Oct 31, 2000.
Report No: 00DAC-0700

APPLICANT	Hudson Tech, Inc
Rule Part(s):	FCC Part 15 Subpart B
Equipment Class:	Class B Digital Device
EUT Type:	USB Camera
Model Name:	Snail Poto
Serial No:	N/A

This device has been shown to be capable of compliance with the applicable technical standard as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992 with the following remarks (Note codes): (#37)

I attest to the accuracy of data and all measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Young-Sik, Choi
EMC Dept Manager.

Chang-hun, Lee.
EMC Dept Engineer.

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Scope

Measurement and determination of electromagnetic emissions (EMI) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

Company Name : **Hudson Tech, Inc.**

1330-13, Seocho-dong,Seocho-ku,
Seoul, Korea.

Attention:

FCC ID:	N/A
Class:	Class B Digital Device
EUT Type:	USB Camera
Model:	Snail Poto
Serial No: N/A	
Rule Part(s):	FCC Part 15 Subpart B
Test Procedure:	ANSI C-63.4 (1992)
Date of Test(s):	Oct 31, 2000.
Place of Tests:	DASTEK EMC Lab. in Korea.
Test Report No:	00DAC-0700

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Introduction

These measurement tests were conducted at *DASTEK EMC Laboratory* facility in Korea. The site address is 204 Chege-Ri, Yangji-Myeon, Yongin-City, Kunggi-Do, Korea. *DASTEK CORPORATION* is a company that has started the July of 1981, for manufacturing of EMI noise filters and EMI Test and diverging service.

The area of test site is located at 54 Kilometers (33miles) southeast from seoul International Airport, 42 Kilometers (26miles) south-southeast from central seoul where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing devices manufacturers. The detailed description of the measurement facility was found to be in compliance with the requirements of section 2.948 according to ANSI C63.4 on October 9, 1997.

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Product Information

Equipment Description

The Equipment under Test (EUT) is the USB Camera of Hudson Tech, Inc.

Model: Snail Poto Serial No: N/A

Sensor	CMOS sensor
Resolution	VGA(640 x 480),QVGA(320 x 240),PC Camera QCIP(320 x 240), QSIF(160 x 120),SQCIF(128 x96)
Memory	8MB SDRAM (26frames/VGA)(99+8frames/QVGA)
Exposure	AUTO
Interface	USB Interface
Power	AAA x 4, USB Interface Power supply
Power Consumption	Low current consumption (500), continuous 12 hours use, 3 hours' use after exchange warning signal
LCD	2 x 7 seg LCD
Frame rate	15fps(QVGA), 75fps(VGA)

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Radiated Emissions

Preliminary measurements were made indoors at 1 meter using broadband antennas, broadband amplifier, and spectrum analyzer to determine the frequency producing the maximum EMI Appropriate precaution was taken to ensure that all EMI from the EUT were maximized and investigated. The system configurations, clock speed, mode of operation or video resolution, turntable azimuth with respect to the antenna were noted for each Frequency, found. The spectrum was scanned from 30 to 200 MHz using biconical antenna and 200 to 1000 MHz using log-periodic antenna.

Final measurements were made outdoors at 3-meter test range using biconical and log periodic antennas. The test equipment was placed on a wooden and plastic bench situated on a 1.5 x 2-meter area adjacent to the measurement area. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined and investigated using Quasi Peak Adapter. The detector function was set to CISPR quasi peak mode and the bandwidth of the receiver was set to 100KHz or 1MHz depending on the frequency or type of signal.

The antenna was turned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8 meter high nonmetallic 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EMI emission. The turntable containing the system was rotated: the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the

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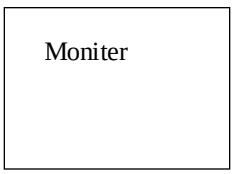
maximum emission. Each emission was maximized by: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in Appendix C.

Support Equipment Used

1. USB Camera Model : Snail Poto S/N: N/A
2. Monitor Model : CPG17P S/N: PO60H2JKA01862
3. Printer Model 2225C S/N 3121S96895
4 Keyboard Model 82G2383 S/N N/A
5 Mouse Model WIN-200 S/N 6M0000892
6 PS/2 Mouse Mouse 13H6690 S/N 106324



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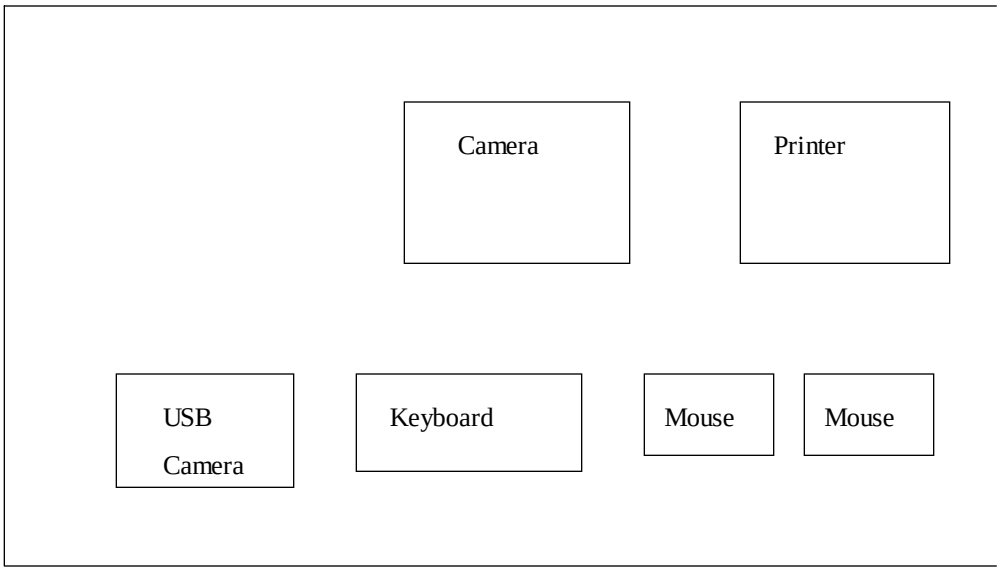

Conducted Emissions Test Data

Frequency (MHz)	Level (dBuv)	Line (H/N)	Limit (dBuV)	Margin (dBuV)		
0.45	31.4	N	48.0	16.6		
0.52	32.0	N	48.0	18.0		
4.37	31.0	H	48.0	17.0		

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9.87	30.0	H	48.0	18.0

Line Conducted Emissions Data

Notes:

1. All mode of operation were investigated and the worst-case emissions are reported.
2. The limit for Class A Digital device is 68dBuV from 450KHz to 30MHz.
3. Line: H :Hot, N :Neutral.

Conducted Emission graphic Data (N/L)

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Radiated Test Data

Radiated Emissions

Distant: 3m

Frequency (MHz)	Level (dBuV)	Pole H/V	Factors(dBuV) Ant.	Cable	Emission Level(dBuV)	Limit (dBuV)	Margin (dBuV)		
72.01	27.00	H	5.37	1.94	34.31	40.00	5.13		

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120.01	22.20	H	11.91	2.55	36.66	43.50	6.84
144.01	19.50	H	14.07	2.63	36.20	43.50	7.30
192.01	16.90	H	16.87	3.46	37.23	43.50	6.27
280.01	24.80	H	13.50	4.76	43.06	46.00	2.94
288.01	21.30	V	13.98	4.85	40.13	46.00	5.87

Radiated Emissions Data

Notes:
1. All modes of operation were investigated and the worst-case emissions are reported.
2. Pole : H :Horizontal, V :Vertical.

Radiated Emission Data

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Sample Calculations

dBuV = 20 log $_{10}$(uV/m)

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$$uV = 10^{(dBuV/20)}$$

EX 1.

@ 190.79 MHz Class B limit = 43.50 dBuV (Distant 10m)

Emission Level (dBuV) = Level + Factors [Ant + Cable] (dBuV)

37.79 (dBuV) = 17.56 + 16.81 + 3.42 (dBuV)

Margin (dBuV) = Limit - Emission Level (dBuV)

5.71 (dBuV) = 43.50 – 37.79

Test Equipment

Test Equipment	Model

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Test Receiver (9KHz-30MHz)	Rhode & Schwarz ESH2
Test Receiver (20-1000MHz)	Rhode & Schwarz ESV
Spectrum Analyzer	Hewlett-Packard 8568B
Spectrum Analyzer	Hewlett-Packard 8591A
Quasi Peak Adapter	Hewlett-Packard 85605A
RF Preselector	Hewlett-Packard 85685A
RF Amplifier	Hewlett-Packard 8447D
Controller	Hewlett-Packard 98580bB
Signal Generator	Hewlett-Packard 8657A
Color Plotter	Hewlett-Packard 7440A
Color Plotter	Hewlett-Packard 7550B
Printer	Hewlett-Packard 2235D
Printer	Hewlett-Packard 2225D
Absorbing Clamp	Rhode & Schwarz MDS-21
Biconical Antenna (30-200MHz)	EMCO 3104
Biconical Antenna (30-300MHz)	Schwarzbeck BBA-9106
Log Periodic Antenna (200-1GHz)	EMCO 3146
Log Periodic Antenna (300-1GHz)	Schwarzbeck UHALP-9107
VHF Dipole Antenna	Schwarzbeck VHA 9103
UHF Dipole Antenna	Schwarzbeck UHA 9105
VHF Precision Dipole Antenna	Schwarzbeck VHAP
UHF Precision Dipole Antenna	Schwarzbeck UHAP
Passive Loop Antenna (1K-30MHz)	EMCO 6509
Active Loop Antenna (1K-30MHz)	EMCO 6507
Passive Rod Antenna (1K-30MHz)	EMCO 3303
Active Rod Antenna (30Hz-50MHz)	EMCO 3301B
LISN	Rhode & Schwarz ESH2-Z5
LISN	Rhode & Schwarz ESH3-Z5

Sample Label

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Labeling Requirements per section 2.925&15.19

The label shown shall be permanently affixed at a conspicuous location on the device and be readily visible to the user at the time of purchase.

[Photograph of the physical location of the label]

Block Diagram/Schematics

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Test Photographs

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These **Conducted Test Pictures** shows the worst-case configuration and cable placement.

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[Conducted Emission Test Picture]

Test Photographs

These **Radiated Test Pictures** shows the worst-case configuration and cable placement.

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[Radiated Emission Test Picture]

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EUT Photographs

- FRONT and REAR

Appendix E - User's Manual

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