



UL Korea, Ltd

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Project: 10CA05635
File: TC8389
Report: 10CA05635-FCC
Date: March 10, 2010
Model: FireCR (Basic) and VetCR

FCC Certification Report

For

Computed Radiography Scanner

3D Imaging & Simulations Corp.
49-3, Moonpyung-Dong, Daedeok-Gu, Daejeon, Korea

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33rd Fl. Gangnam finance Center, 737 Yeoksam-Dong, Kangnam-Gu, Seoul, 135-984, Korea
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Project Number: 10CA05635 File Number TC8389 Test Report No: 10CA05635-FCC
Model Number: FireCR Date of Issue: March 10, 2010

TEST REPORT DETAILS

Test report No: 10CA05635-FCC

Tests Performed By: UL Korea Ltd.
33rd FL. Gangnam Finance Center, 737 Yeoksam-dong,
Kangnam-ku, Seoul, 135-984, Korea

Test site: ESTECH
97-1, Hoeok-Ri, Majang-Myun, Icheon-City, kyonggi-do, Korea
Registration No: 100749

The test facility was deemed to have the environment and capabilities necessary to perform the tests included in the test package

Applicant: 3D Imaging & Simulation Corp.
49-3, Moonpyung-Dong, Daedeok-Gu, Daejeon, Korea

Manufacturer: 3D Imaging & Simulation Corp.
49-3, Moonpyung-Dong, Daedeok-Gu, Daejeon, Korea

Factory: 3D Imaging & Simulation Corp.
49-3, Moonpyung-Dong, Daedeok-Gu, Daejeon, Korea

Applicant Contact: Jungkook, Kim

Title: General Manager

Phone: +82-42-931-2100

E-mail: jkkim@3-disc.com

Product Type: Computed Radiography Scanner

Trademark: 
3D Imaging & Simulations

Model Number: FireCR (Basic) and VetCR

FCC ID: X68CRSCANNER

Product standards: FCC Part 15 Subpart B Class B

Sample Serial Number: None (Proto type)

Sample Receive Date: March 2, 2010

Testing Start Date: March 2, 2010

Date Testing Complete: March 10, 2010

Overall Results: PASS

UL Korea Ltd. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. UL Korea Ltd. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from UL Korea Ltd. issued reports.

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TEST SUMMARY

TEST RESULT

Requirement – Test	Reference standards	Verdict
A.C. Power line Conducted Emission Test	47CFR Part 15.107(a) / 47CFR Part 15.109(g)	Complied
Radiated Emission Test		Complied


The tests listed in the Summary of Testing section of this report have been performed and the results recorded by UL Korea, Ltd. in accordance with the procedures stated in each test requirement and specification. The applicant determined the list of tests performed were applicable to the Equipment Under Test. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification. The test results relate only to the items tested.

The equipment under test has

- ☒ Met the technical requirements
☐ Not met the technical requirements



Tested by
Sung Hoon, Baek, Project Engineer
Conformity Assessment Services - 3014ASEO
UL Korea Ltd.
March 10, 2010



Reviewed by
Jeawoon, Choi, Senior Project Engineer
Conformity Assessment Services – 3014ASEO
UL Korea Ltd.
March 11, 2010

REPORT DIRECTORY

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1. EQUIPMENT UNDER TEST (EUT)

1.1 Report Revision history

Revision Date	Description	Remarks	Revision reviewed By
Original	-	-	-

1.2 Equipment Description

Description:
This device is a Computed Radiography System and intended for use in producing digital X-Ray images for general radiography purposes. It comprises of scanner, cassette with reusable imaging plate and workstation software. It scans X-Ray exposed image plate and produces X-Ray image in digital form. Then, digital image is transferred to workstation for further processing and routing

1.3 Details of Test Equipment (EUT)

Equipment Configuration:				
No.	Product Type	Manufacturer	Model	Comments
1	Computed Radiography Scanner	3D Imaging & Simulation Corp.	FireCR (Basic)	VetCR (Model Number multiple)
Note: Description of variant model names. The manufacturer has declared to all the multiple model names into the basic model without any further evaluation by UL. The details model name differences are shown in the section 6.				

1.4 Equipment Specification

Specifications		
Sampling Pixel Pitch	Standard	200um
	High	100um
Pixel Matrix	Standard	1750 x 2150
	High	3500 x 4300
Scanning Time	Standard	19 sec
	High	38 sec
Accepted Cassette Size		14 " x 17"
Gray Scale Resolution		16 bit
Eraser		Embedded
Erasing Time		30 sec (User Settable)
Scanning & Erasing Cycle Time	Standard	49 sec
	High	78 sec

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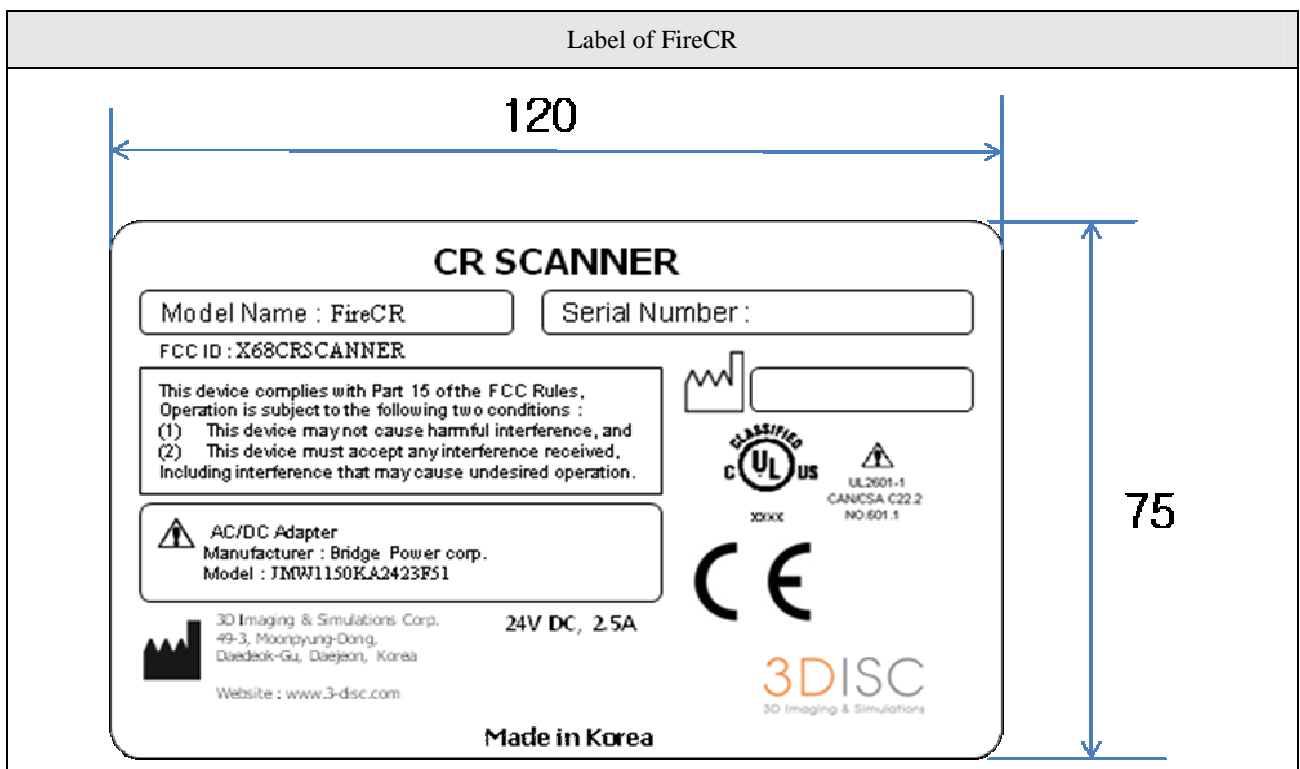
Computer Interface	USB 2.0
Dimensions	120 (H) x 460 (W) x 703 (D) mm 4.8 (H) x 18.3 (W) x 27.7 (D) inch
Weight	30kg (65lbs)
Power Requirement	100 ~ 240V / 50 ~ 60Hz
System Configuration	Tabletop
Application Software	Included
Image File Format	DICOM 3.0

1.5 Technical descriptions and documents:

No.	Document Title and Description
1	FireCR User Manual and specification

Note: The manufacturer provided the following document.

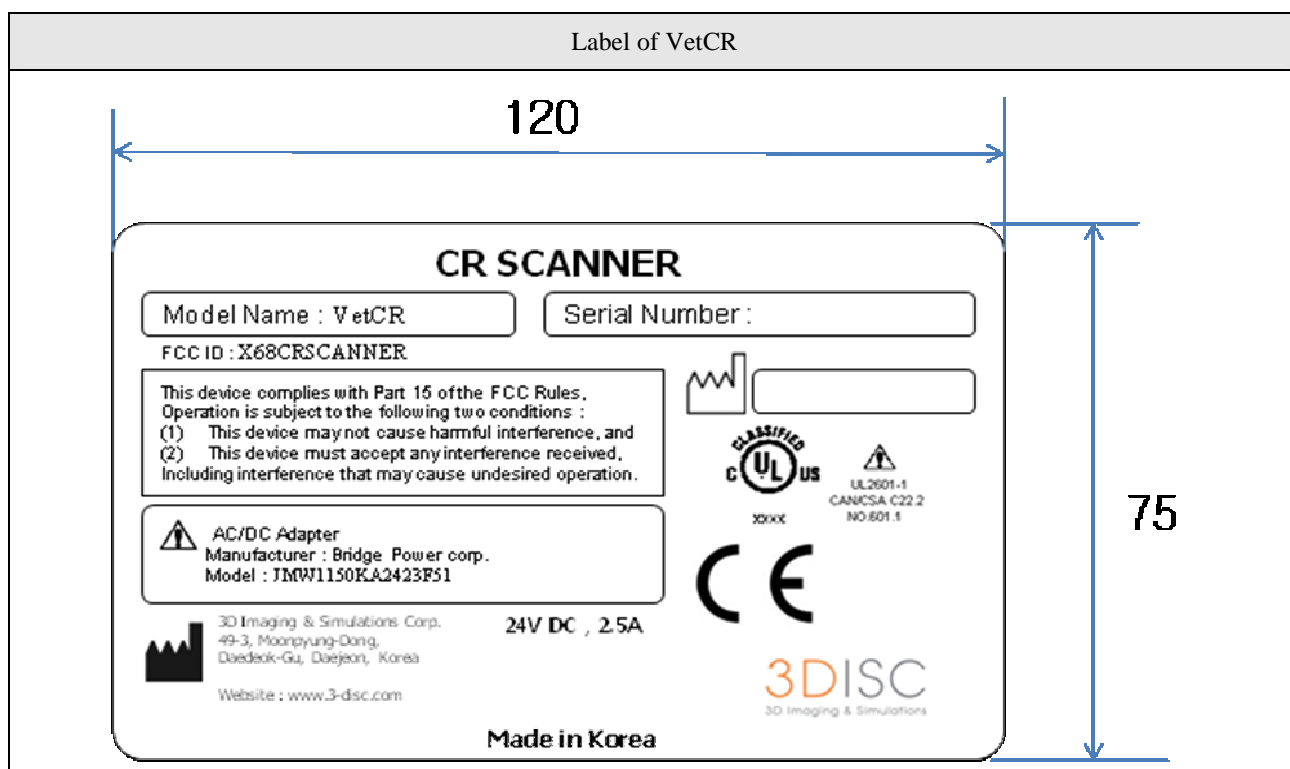
1.6 Equipment Marking Plate



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1.7 Equipment Used During Test

Use*	Product Type	Manufacturer	Model	Comments
EUT	Computed Radiography Scanner	3D Imaging & Simulation Corp.	FireCR	-
EUT	A.C. to D.C. Adapter	AULT KOREA Corp.	JMW1150KA2423F51	-
AE	PC	SMASUNG ELECTRONICS INC.	DM-Z69	SN: BY3696BQ800836W
AE	LCD monitor	DELL INC	E228WFPc	SN: E228WFPc
AE	Mouse	PRIMAX Electronics Inc.	MOARUO	SN: MS-S5-AR03-01
AE	Keyboard	MONTEREY INTERNATIONAL CORP	K6712MB	SN: 87A4532
* Note: EUT - Equipment Under Test, AE - Auxiliary/Associated Equipment, SIM - Simulator (Not Subjected to Test)				

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1.8 EUT Input/Output Ports

Port #	Name	Type*	Cable Max. >3m	Cable Shielded	Comments
1	Mains	AC	1.0m	Unshielded	-
2	USB	I/O	1.5m	Shielded	Connected with PC
Note: *AC = AC Power Port , DC = DC Power Port, N/E = Non-Electrical I/O = Signal Input or Output Port (Not Involved in Process Control), TP= Telecommunication Ports					

1.9 EUT Internal Operating Frequencies

Frequency (MHz)	Description	Frequency (MHz)	Description
50.00 MHz	System reference Clock	83.00 MHz	System Clock
83.00 MHz	Memory Clock	-	-

1.10 Power Interface

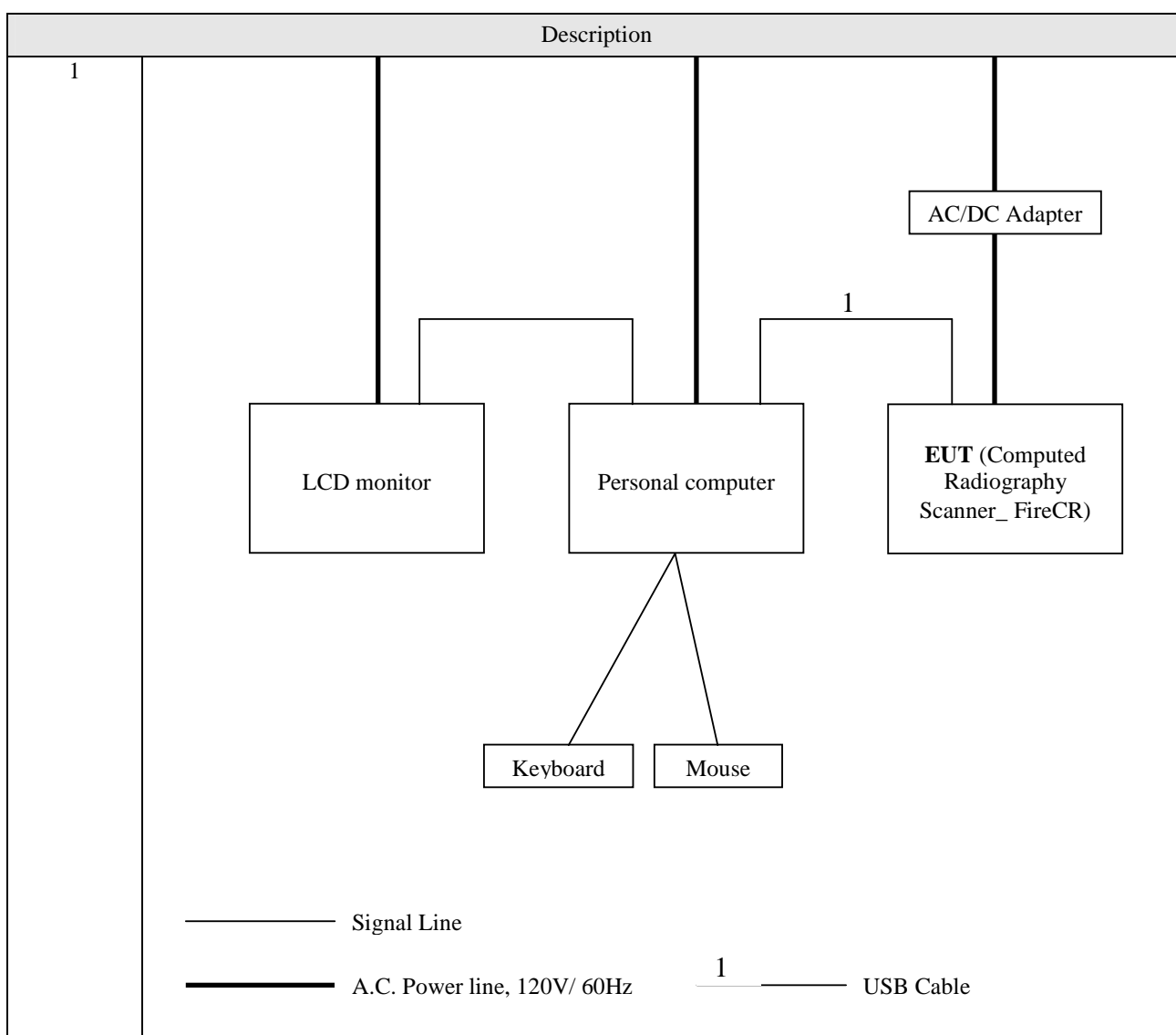
Mode #	Voltage (V)	Current (A)	Power (W)	Frequency (DC/AC-Hz)	Comments
Rated	100-240Vac	3.0A	-	50-60Hz	Rated of A.C. to D.C. Adapter
1	120 V	-	-	60 Hz	-

2.0 TEST CONDITION

2.1 Test mode

Mode #	Description
Test Mode	The measurement has been performed in the representative operation mode Computed Radiography Scanner (EUT) was powered by A.C. to D.C. adapter and Computed Radiography Scanner (EUT) has been performed under continuous scanning and the image in the memory of the Computed Radiography Scanner (EUT) is sending to the PC by using the software through the USB cable.

2.2 Test configuration



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3.0 A.C. POWER LINE CONDUCTED EMISSION TEST

TEST: Limits of mains terminal disturbance voltage				
Method	Measurements were made on a ground plane that extends 1-meter minimum beyond all sides of the system under test. All power was connected to the system through Artificial Mains Network (AMN). Conducted voltage measurements on mains lines were made at the output of the AMN.			
Parameters recorded during the test		Laboratory Ambient Temperature		16 °C
		Relative Humidity		40 %
-		Frequency range on each side of line		Measurement Point
Fully configured sample scanned over the following frequency range		150 kHz to 30 MHz		A.C. power ports of A.C. to D.C. Adapter
Limits – Class B				
Frequency (MHz)	Limit (dBµV)			
	Quasi-Peak	Results	Average	Results
0.15 to 0.50	66 to 56	Pass	56 to 46	Pass
0.50 to 5	56	Pass	46	Pass
5 to 30	60	Pass	50	Pass
Conducted Emissions EUT Configuration Settings				
Power Interface Mode # (See Section 1.10)		EUT Operation Mode # (See Section 2.1)		EUT Configurations Mode # (See Section 2.2)
1		1		1
Test Equipment Used				
Description	Manufacturer	Model	Identifier	Cal. Due
LISN	Rohde & Schwarz	ESH3-Z5	838979/010	2011.02.01
TEST Receive	Rohde & Schwarz	ESPI7	100185	2011.02.01
Pulse Limiter	Rohde & Schwarz	ESH3Z2	None	2011.02.01
LISN	Rohde & Schwarz	ESH3-Z5	838979/010	2011.02.01

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Figure 1. Conducted Emission Test Setup

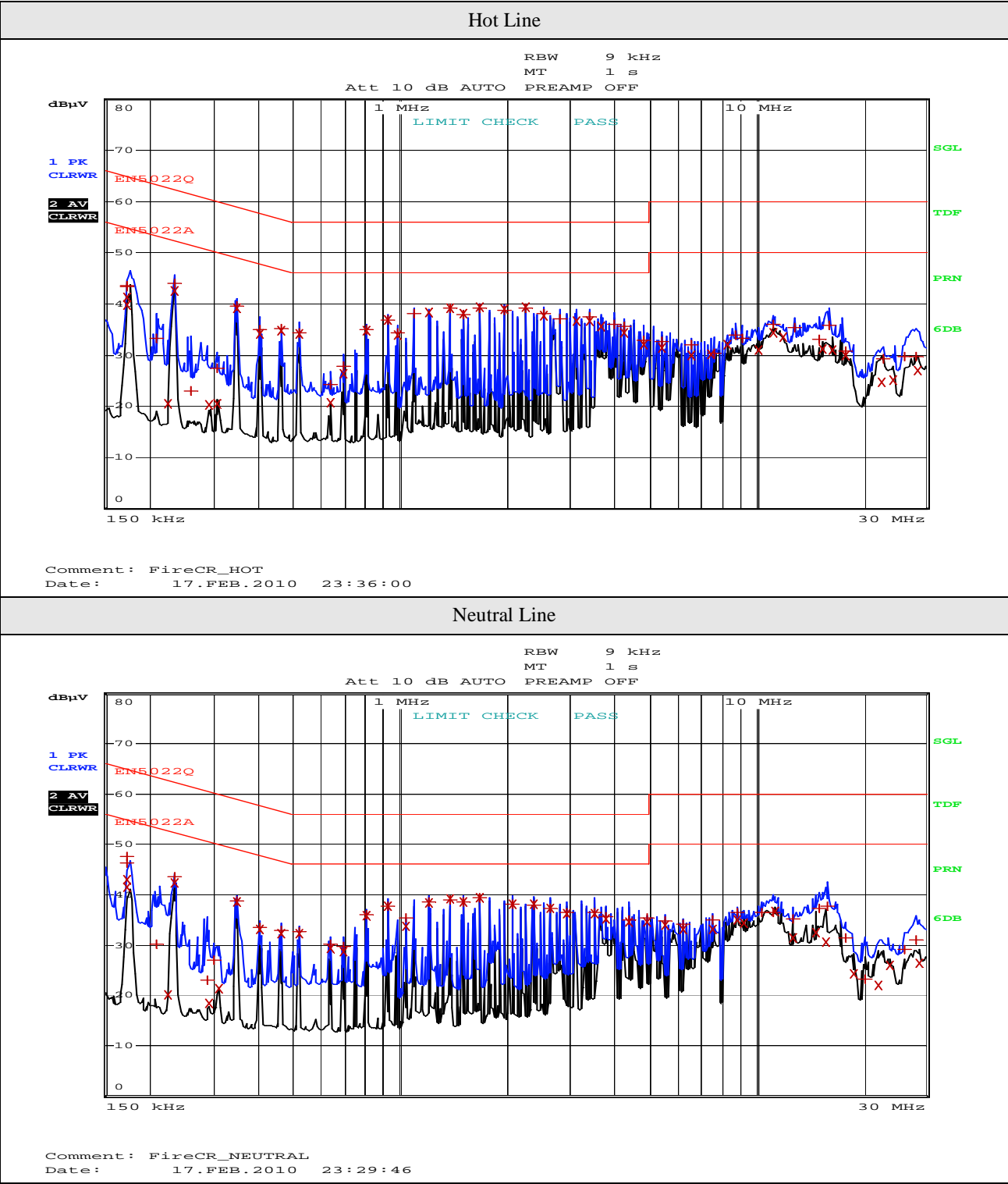


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Figure 2. Graphical representation



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Table 1. Test data for conducted emission

Test Frequency (MHz)	Correction Factor		Reading value (dBuV)		Line	Level (dBuV)		Limit (dBuV)		Margin (dB)	
	Cable	LISN	QP	AV		QP	AV	QP	AV	QP	AV
0.17	0.3	0.09	47.62	42.89	N	47.96	43.23	64.77	54.77	16.81	11.54
0.23	0.3	0.09	43.92	42.53	H	44.26	42.87	62.41	52.41	18.15	9.54
0.35	0.3	0.09	39.65	39.25	H	40.02	39.62	59.01	49.01	18.99	9.39
1.39	0.5	0.12	39.17	39.09	H	39.78	39.70	56.00	46.00	16.22	6.30
1.50	0.5	0.13	38.46	38.44	N	39.06	39.04	56.00	46.00	16.94	6.96
1.68	0.5	0.13	39.43	39.32	N	40.02	39.91	56.00	46.00	15.98	6.09
2.25	0.4	0.15	39.26	39.23	H	39.86	39.83	56.00	46.00	16.14	6.17
11.21	0.9	0.44	36.10	34.43	H	37.48	35.81	60.00	50.00	22.52	14.19
15.94	1.0	0.71	37.79	30.47	N	39.52	32.20	60.00	50.00	20.48	17.80
Note: 1. Margin (dB)= Limit (dBuV) - Level (dBuV) 2. If no frequencies are specified in the tables, no measurement for quasi-peak or average was necessary.											

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4.0 RADIATED EMISSION TEST

TEST: Limits for radiated disturbance				
Method	Measurements were made at Open area test site that complies to CISPR 16/ANSI C63.4. Preliminary (peak) measurements were performed at an antenna to EUT separation distance of 3-meter. The EUT was rotated 360° about its azimuth with the receive antenna located at 1, 2, 3 and 4 meter heights in both horizontal and vertical polarities. Final measurements (quasi-peak or average as noted) were then performed by rotating the EUT 360° and adjusting the receive antenna height from 1 to 4-meters. All frequencies were investigated in both horizontal and vertical antenna polarity, where applicable.			
Parameters recorded during the test		Laboratory Ambient Temperature	17 °C	
		Relative Humidity	38 %	
-	Frequency range		Measurement Point	
Fully configured sample scanned over the following frequency range		30 MHz – 1.0 GHz	3 meter measurement distance	
Limits - Class B				
Frequency (MHz)		Limit (dBµV/m)		Results
30 to 88		40		Pass
88 to 216		43.5		Pass
216 to 960		46		Pass
Above 960		54		Pass
Radiated Emissions EUT Configuration Settings				
Power Interface Mode # (See Section 1.10)		EUT Operation Mode # (See Section 2.1)		EUT Configurations Mode # (See Section 2.2)
1		1		1
Test Equipment Used				
Description	Manufacturer	Model	Identifier	Cal. Due
Receiver	Rohde & Schwarz	ESVS10	838562/002	2011.01.29
Spectrum Analyzer	ADVANTEST	R3273	110600592	2011.02.01
Logbicon Antenna	Schwarzbeck	VULB 9160	3142	2010.05.13
Amplifier	HP	8447F	2805A02972	2011.02.01

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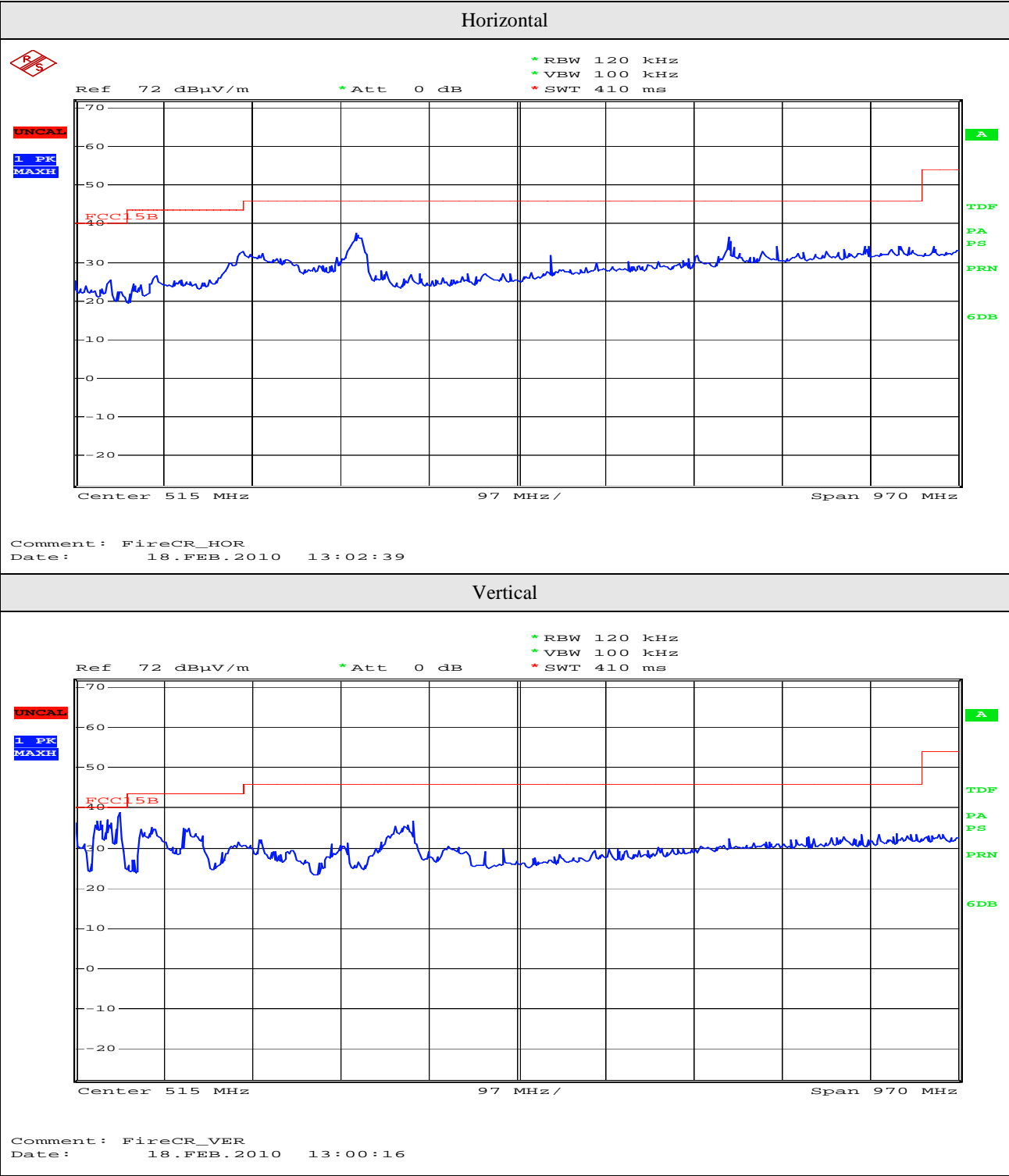
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Figure 3. Photo of Radiated emission test setup



Figure 4. Graphical representation



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Table 2. Radiated emission Test data

Frequency Reading (MHz)	Reading (dBuV/m)	Polarization	Ant. Factor (dB)	Cable Loss (dB)	Limit (dBuV/m)	Emission Level (dBuV/m)	Margin (dB)
30.00	21.30	V	10.94	0.9	40.0	33.12	6.88
40.47	10.20	H	11.85	1.0	40.0	23.02	16.98
80.21	21.40	V	8.47	1.4	40.0	31.25	8.75
108.01	21.30	H	10.17	1.6	43.5	33.06	10.44
117.87	14.50	H	11.07	1.7	43.5	27.30	16.20
220.15	10.40	V	10.46	2.5	46.00	23.39	22.61
312.00	10.30	V	13.45	3.3	46.00	27.06	18.94
360.03	7.00	H	14.42	3.7	46.00	25.11	20.89
400.10	9.00	H	15.43	4.0	46.00	28.43	17.57
480.08	18.20	V	17.10	4.6	46.00	39.89	6.11
516.84	8.50	V	17.71	4.9	46.00	31.10	14.90
620.31	7.20	V	20.02	5.5	46.00	32.77	13.23
851.89	3.10	H	23.06	7.3	46.00	33.47	12.53
Supplementary information: -. The correction value has been included the Emission level measured value with offset -. Correction = Cable loss + Antenna Factor							

5.0 MEASUREMENT UNCERTAINTY

Measurement Uncertainty	
<p>All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability. Based on CISPR 16-4-2, the measurement uncertainty level with a 95% confidence level was applied.</p>	
Conducted emission measurement :(k=2, 95%)	
Frequency	dB
9kHz-150 kHz	± 3.05 [dBuV]
150kHz-30 MHz	± 2.53 [dBuV]
Radiated Emission measurement :(k=2, 95%)	
30-300 MHz	3 m: ±3.53 [dBuV/m], 10 m: ± 3.52 [dBuV/m]
300-1000 MHz	3 m: ±3.70 [dBuV/m], 10 m: ± 3.69 [dBuV/m]

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6.0 AFFIDAVIT FOR MULTILISTING MODEL DESCRIPTION

 3DISC 3D IMAGING & SIMULATIONS CORP.	49-3, Moonpyung-Dong, Daedeok-Gu, Daejeon, Korea Tel : +82-42-931-2100 Fax : +82-42-931-2299 Homepage : www.3-disc.com e-mail : jiinjung@3-disc.com
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AFFIDAVIT FOR MULTILISTING MODEL DESCRIPTION

We hereby confirm that the Computed radiography system, model FireCR manufactured by 3D Imaging & Simulations Corp. as a basic application. The Computed radiography system has several mutilating models as described below and these mutilating models are the same as basic model except the model name designation and are the same characteristic and construction in electronically and mechanically. So, we declare that these mutilating models to be added on the basic application could be applied without any further engineering investigation and evaluation.

Basic model : FireCR

Model Name Designation	Definition of model name differentiation
FireCR	
VetCR	
Both products are identical, only difference is the model name printed on the enclosure.	

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Sincerely,



Signature

Typed Name : Sungwoon, Lee
Title : CEO
Department :
Company : 3D IMAGING & SIMULATIONS CORP
Tel : +82-42-931-2100
E-mail : swlee@3-disc.com

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7.0 ACCREDITATIONS AND AUTHORIZATIONS



MIC: Designated as a testing laboratory by Radio Research Laboratory in accordance with the Regulation on Designation of Testing Laboratory for Information and Communication Equipment. Registration No. : KR0033



FCC: Filed Laboratory at Federal Communications Commission (reference no : 100749)



VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE (reference no : C-1872, R-1757)