



# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CLASS B CERTIFICATION

**Test Report No.** : E05NR-007

**Applicant** : SEDO CO., LTD.  
**Address** : 6 FL. 64-3, Sangdaewon-Dong, Jungwon-Gu, Sunghnam-Si, Kyunggi-Do, Korea

**Manufacturer** : SEDO CO., LTD.  
**Address** : 6 FL. 64-3, Sangdaewon-Dong, Jungwon-Gu, Sunghnam-Si, Kyunggi-Do, Korea

**Type of Equipment** : 16 Channel Digital Video Recorder PCI Type (DVR)  
(Peripheral Device for Class B Computing Device)

**FCC ID** : QDZDF9400

**Model Name** : DF9400

**Multiple Model Name** : DF9200, DF9100

**Serial Number** : N/A

**Total page of Report** : 13 pages (including this page)

**Date of Incoming** : October 25, 2005

**Date of Issuing** : November 07, 2005

## SUMMARY

The equipment complies with the requirements of **FCC CFR 47 PART 15 SUBPART B, Class B.**

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

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## 1. VERIFICATION OF COMPLIANCE

- APPLICANT : SEDO CO., LTD.
- ADDRESS : 6 FL. 64-3, Sangdaewon-Dong, Jungwon-Gu, Sungnam-Si, Kyunggi-Do, Korea
- CONTACT PERSON : Mr. Hyoung-Moon, Choi / Assistant Manager
- TELEPHONE NO : +82-31-741-0303
- FCC ID : QDZDF9400
- MODEL NAME : DF9400
- BRAND NAME : Sedo
- SERIAL NUMBER : N/A
- DATE : November 07, 2005

DEVICE TYPE	Peripheral Device for Class B Computing Device - Unintentional Radiator
E.U.T. DESCRIPTION	16 Channel Digital Video Recorder PCI Type (DVR)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

- This device has shown compliance with the conducted emissions limits in 15.107 adopted under FCC 02-107 (ET Docket 98-80). The device may be marketed after July 11, 2005 affected by the 15.37(j) transition provisions.
- The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.



## 2. GENERAL INFORMATION

### 2.1 Product Description

The SEDO CO., LTD., Model DF9400 (referred to as the EUT in this report) is a 16 Channel Digital Video Recorder PCI Type (DVR) that is installed PCI slot of personal computer. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	P.C.B Type
LIST OF EACH OSC. or CRY. FREQ.(FREQ.>=1MHz)	8 MHz and 54 MHz on the main board
NUMBER OF LAYERS	6 Layers: Main Board, 2 Layers: Sensor Board 1, Sensor Board 2
EXTERNAL CONNECTOR	Video In/Out, Alarm

### 2.2 Model Differences:

- The difference(s) compared to the EUT is as follows:

	Model Name	Model Differences
Basic Model	DF9400	-
Multiple Model	DF9200, DF9100	Only type designation except for recoding frame.

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

- Original submittal only



## 2.4 Test System Details

The model numbers for all the equipments that were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
DF9400	SEDO CO., LTD.	QDZDF9400	16 Channel Digital Video Recorder PCI Type (DVR) (EUT)	PC
N/A	N/A	DoC	PC	-
E551	DELL Computer Corp	DoC	Monitor	PC
7800	BTC	DoC	Keyboard	PC
M-BE58	Logitech.	DoC	Mouse	PC
N/A	N/A	N/A	CCD Camera	EUT
PM-K5	KTV	N/A	CCTV Monitor	EUT
2225C	HP	DSI6XU2225	Printer	PC
020-0470	CARDINAL	GDE0196	Modem	PC

## 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

## 2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51, Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on April 04, 2003. (Registration Number: 340658)



### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	N/A	N/A
Sensor Board 1	N/A	N/A	N/A
Sensor Board 2	N/A	N/A	N/A

#### 3.2 EUT exercise Software

- The EUT was installed on PCI slot of PC and a CCD camera was connected to the video input port of the EUT, and then the captured images were continuously displayed on the screen of CCTV and PC monitors.

#### 3.3 Cable Description

	Power Cord Shielded (Y/N)	I/O cable Shielded (Y/N)	Length (M)
16 Channel Digital Video Recorder PCI Type (DVR) (EUT)	N/A	N/A	-
PC	N	-	1.5(P)
Monitor	N	Y	1.5(P), 1.5(D)
Keyboard	N/A	N	1.5(D)
Mouse	N/A	N	1.5(D)
CCD Camera	N	Y	1.5 (P), 1.5(D)
CCTV Monitor	N	Y	1.5 (P), 1.5(D)
Printer	N	Y	1.5(P), 1.5(D)
Modem	N	Y	1.5(P), 1.5(D)

\* The marked "(P)" means the Power Cable and "D" means the I/O Cable.



### 3.4 Noise Suppression Parts on Cable

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
16 Channel Digital Video Recorder PCI Type (DVR) (EUT)	N	N/A	Y	BOTH END
PC	-	-	-	-
Monitor	N	N/A	Y	BOTH END
Keyboard	N	N/A	Y	PC END
Mouse	N	N/A	Y	PC END
CCD Camera	Y	EUT END	Y	BOTH END
CCTV Monitor	Y	EUT END	Y	BOTH END
Printer	N	N/A	Y	BOTH END
Modem	N	N/A	Y	BOTH END

### 3.5 Equipment Modifications

To achieve compliance to CLASS B levels, the following change(s) was made by ONETECH Corp. during compliance testing:

“There were no Modified items during EMI test”

### 3.6 Configuration of Test System

**Line Conducted Test** : The EUT was installed on PCI slot of PC and the power cord of the PC was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 to determine the worse operating conditions.

**Radiated Emission Test** : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 meters open area test site.



**4. PRELIMINARY TEST**

**4.1 AC Power line Conducted Emission Test**

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
The captured images were displayed continuously on the screen of CCTV and PC monitors.	X

**4.2 Radiated Emission Test**

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
The captured images were displayed continuously on the screen of CCTV and PC monitors.	X



## 5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

### 5.1 Conducted Emission Test

Humidity Level : 39 % Temperature: 20 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -13.30 dB at 0.21 MHz

EUT : 16 Channel Digital Video Recorder PCI Type (DVR)  
 Operating Condition : The captured images were displayed continuously on the screen of a CCTV and PC monitors.  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.16	N	44.22	65.46	-21.24
0.21	N	49.91	63.21	-13.30
0.42	N	32.25	57.45	-25.20
8.99	H	36.18	60.00	-23.82
19.55	N	41.01	60.00	-18.99
24.00	H	45.94	60.00	-14.06
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
-				
-				

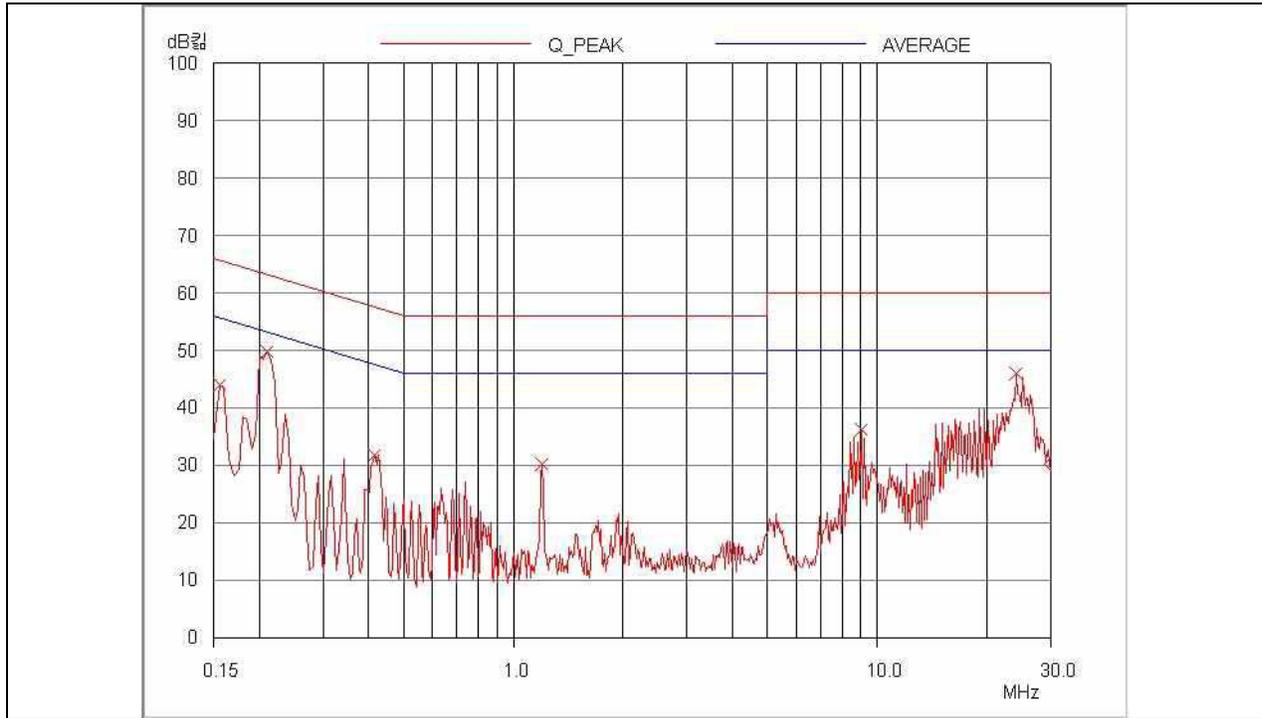
Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

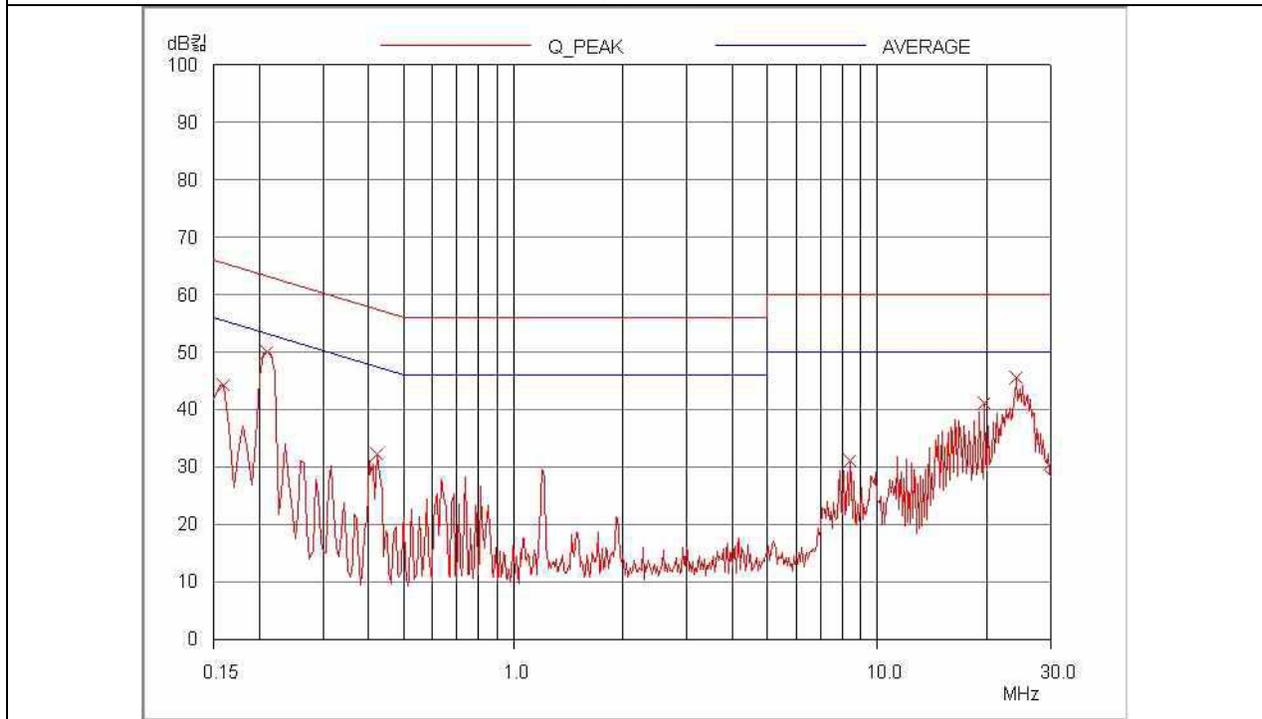
Average mode was not measured, because peak values were under the Average limit.

See next page for an overview sweep performed with peak detector.

**Tested by: Eung-Chan, Kim / Test Engineer**



### HOT LINE



### NEUTRAL LINE



## 5.2 Radiated Emission Test

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

Humidity Level : 41 % Temperature: 19 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)  
 Type of Test : CLASS B  
 Result : PASSED BY -3.68 dB at 840.00 MHz

EUT : 16 Channel Digital Video Recorder PCI Type (DVR)  
 Operating Condition : The captured images were displayed continuously on the screen of a CCTV and PC monitors.  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter

Radiated Emissions		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
80.10	21.10	V	6.80	1.70	29.60	40.00	-10.40
142.40	18.10	V	14.83	2.38	35.31	43.52	-8.21
242.60	20.60	H	16.81	3.28	40.69	46.02	-5.33
539.00	18.30	V	18.19	5.34	41.83	46.02	-4.19
702.05	11.20	H	20.57	6.42	38.19	46.02	-7.83
840.00	13.10	H	22.12	7.12	42.34	46.02	-3.68

Radiated Emissions Tabulated Data

Tested by: Eung-Chan, Kim / Test Engineer



## 6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

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= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)



## 7. LIST OF TEST EQUIPMENT

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS10	827864/005	DEC/04	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/05	12MONTH	
4.	Spectrum analyzer	HP	85680B	3001A04955	APR/05	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/05	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/05	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	APR/05	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/05	12MONTH	
		Schwarzbeck	VHA9103	91031852	JAN/05		■
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/05	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/05		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/05	12MONTH	
				9109-1869	JUL/05		■
		Schwarzbeck	NSLK 8128	8128-216	JUN/05		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■