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EMC TEST REPORT

APPLICANT

UNIMO Technology Co., Ltd.

MODEL NO.

UDR-204

Test Item : DVR
 Model No. : UDR-204
 Manufacturer : UNIMO Technology Co., Ltd.
 Directive : Electromagnetic Compatibility Directive 89/336/EEC
 Test Standard : EN50130-4: 1995+A1:1998
 EN55022 Class A: 1998+A1:2000
 EN61000-3-2:2000
 EN61000-3-3:1995+A1:2001
 Test Device Serial No.: : Identical prototype
 Dates of Tests : July 16 ~ 21, 2004
 Date of Issue : July 22, 2004
 Test Result : **Passed**

Tested by : S.U.HAN/Engineer

Reviewed by : C.H.AHN/Leader

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by NVLAP or any agency of the U.S.Government.

NVLAP LAB CODE 200559-0

>>TABLE OF CONTENTS<<

1. GENERAL REMARKS	4
2. TEST SITES	4
2.1 TEST FACILITIES	4
2.2 MEASUREMENT INSTRUMENTS	4
3. GENERAL PRODUCT INFORMATION	5
4. TEST SUMMARY	6
4.1 SUMMARY OF TESTS	6
5. TEST SET-UP AND OPERATION MODES	7
5.1 PRINCIPLE OF CONFIGURATION SELECTION	7
5.2 TEST OPERATION MODES	7
5.3 SUPPORT EQUIPMENT USED	7
5.4 SYSTEM CONFIGURATION DIAGRAM	7
6 TEST RESULTS EMISSION	8
6.1 CONDUCTED EMISSION	8
6.2 RADIATED EMISSION	10
7. Harmonic Current Emissions	12
8. Voltage fluctuations and Flicker	13
9. TEST RESULTS IMMUNITY	14
9.1 MAINS SUPPLY VOLTAGE DIPS, SHORT INTERRUPTIONS	14
9.2 ELECTROSTATIC DISCHARGE	15
9.3 RADIATED RADIO-FREQUENCY ELECTROMAGNETIC FIELD	17
9.4 CONDUCTED DISTURBANCES, INDUCED BY RADIO-FREQUENCY FIELDS	19
9.5 ELECTRICAL FAST TRANSIENT/BURST	21
9.6 SURGE	23
APPENDIX	
APPENDIX 1 MAINS TERMINAL CONTINUOUS DISTURVANCE VOLTAGE MEASUREMENT GRAPH	25
APPENDIX 2 MEASUREMENT UNCERTAINTY (CE/RE)	26
APPENDIX 3 VOLTAGE FLUCTUATIONS ON AC MAINS	27
APPENDIX 4 PHOTOGRAPHS	30

LIST OF TABLES

Table 1 : Conducted Test Data	9
Table 2 : Radiated Test Data	10
Table 3 : Voltage dips	14
Table 4 : Voltage variations	14
Table 5 : ESD, Positive / Negative Polarity	16
Table 6 : Radiated radio-frequency electromagnetic field	18
Table 7 : Immunity-input AC power ports	20
Table 8 : Immunity / Signal line ports	20
Table 9 : EFT, AC Power lines, Positive / Negative Polarity	22
Table 10 : Burst, Signal lines, Positive / Negative Polarity	22
Table 11 : Surge, AC Power lines, Positive/Negative Polarity	24
Table 12 : Surge, Signal lines, Positive/Negative Polarity	24

1. General Remarks

This Report describes the emission and immunity characteristics of the tested product.

If the product will be used with additional equipment other than those mentioned in this report or if the tested product will be used against the manufacture's specifications, the compliance with the relevant standards for the system has to be ensured.

2. Test Facility

2.1 Test Laboratory

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

This laboratory is accredited by NVLAP for NVLAP Lab. Code : 200559-0.

DIGITAL EMC CO., LTD.

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2.2 Measurement Instruments

Refer to each item.

3. General Product information

UDR-204

Kind of Equipment	DVR
Model Number	UDR-204
Serial No.	None
Type of Sample Tested	Pre-Production
Image System	PAL Selectable
Video Input	4CH Composite, 4CH LOOP Through, BNC
Video Output	1CH Composite, BNC, 1CH S-Video
Video Compression	MPEG-2
Recording Quality	4 Levels(Normal, Enhanced, Fine, Super Fine)
Playback Type	Quad/Mux
Playback Search	Date/Time, Event(Alarm, Motion)
Sensor Input	4(NO/NC Selectable)
Alarm Output	1(NO/NC)
Audio	1CH, mono
Network	10Base-T(DHCP, PPPoE, E-mail, &FTP)
Hard Disk	Removable + Internal
PTZ Control	RS-485
Power Source	Free Voltage(100VAC ~240VAC, 50/60Hz, 50W)
Dimension	433(W) X 385(D) X 88(H)
Tested Power Supply	1 Phase 230Vac , 50Hz
Applicant	UNIMO Technology Co., Ltd. 479-12 Bangbae-3Dong, Seocho-Gu, Seoul, KOREA 137-820
Manufacturer	UNIMO Technology Co., Ltd. 435-030, 626 Dangjeong-dong, Gunpo-si, Gyeonggi-do, Korea
Date of Receipt of Sample	2004-07-12

4. TEST SUMMARY

4.1 Summary of tests

The data collected shows that the **UNIMO Technology Co., Ltd. (Model NO.: UDR-204) DVR** complies with **EN50130-4**. The highest emission observed, with a minimum margin to the specifications, was at 0.194MHz for conducted emissions with a margin of 5.5dB, and at 479.97MHz for radiated emissions (Pol.: Horizontal, EUT Angle : 242.0 degree, Ant. Height : 100cm) with a margin of 4.0dB.

The data and results referenced in this document are true and accurate. The readers cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report accdg. NIS 81 / 5 1994.

Ref.	Parameter	Status (note 1)	
I. Emission			
5.0	Conducted emission	EN55022 Class A: 1998+A1:2000	C
6.0	Radiated emission	EN55022 Class A: 1998+A1:2000	C
7.1	Harmonic Current emission	EN61000-3-2: 2000	C
5	Voltage fluctuations and flicker	EN61000-3-3: 1995+A1: 2001	C
II. Immunity			
7.3	Main supply voltage variations	EN61000-4-11: 1994+A1: 2001	C
8.3	Mains supply voltage dips and short interruptions	EN61000-4-11: 1994+A1: 2001	C
9.3	Electrostatic discharge	EN61000-4-2: 1995+A1: 1998+A2:2001	C
10.3	Radiated, radio-frequency, electromagnetic field (80-1000MHz)	EN61000-4-3: 1996+A1: 1998+A2:2001	C
11.3	Conducted disturbances induced by radio-frequency field (0,15-100MHz)	EN61000-4-6: 1996	C
12.3	Electrical fast transient/burst	EN61000-4-4: 1995	C
13.3	Surge	EN61000-4-5: 1995+A1: 2001	C
Note 1: C=Conform NC=Not Conform NT=Not Tested NA=Not Applicable			

***The data in this test report are traceable to the national or international standards.**

5. Test Set-up and operation modes

5.1 Principle of Configuration Selection

Emission : The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Immunity : The equipment under test (EUT) was configured to have its highest possible susceptibility against the tested phenomena. The test modes were adapted accordingly in reference to the instructions for use.

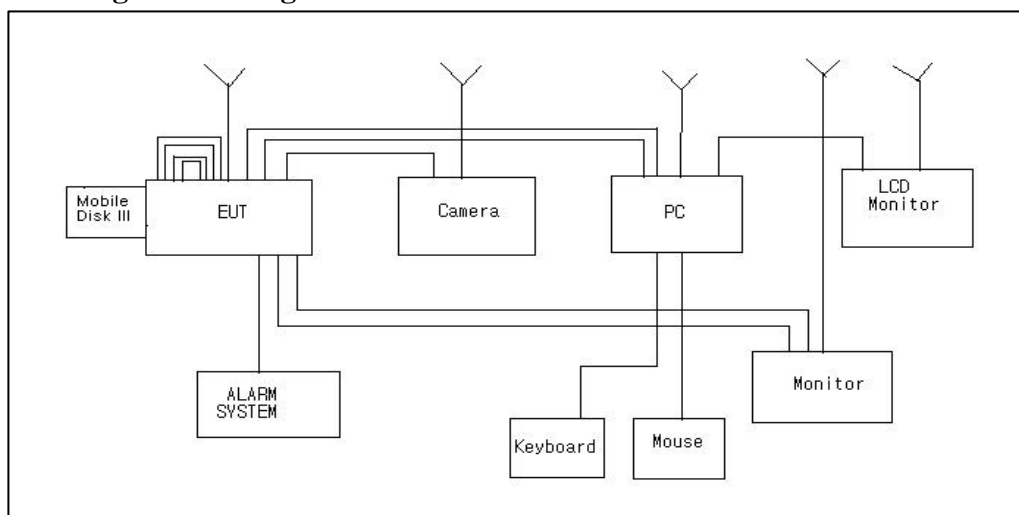
5.2 Test Operation modes

- Connected the Monitor with EUT by BNC cable, and Displayed to the image on the screen. The measurement was made of the maximized by; varying the mode of operation or resolution; moving the cable.

5.3 Support Equipment Used

TYPE	MANUF.	MODEL NO.	SERIAL NO.	Cable
Monitor	Hi-Tron	CVM0954	M2040008	Power : 1.8m, non-shield BNC Cable : 1.2m, shield
PC	LG	Y8Y	311KI19443	Power: 1.8m, non-shield
LCD Monitor	Comtec	CT-150	R20110001B	Power: 1.8m, non-shield DSUB : 1.6m, shield
Keyboard	B.T.C	7800	K21199157	I/F : 1.8m, shield
Mouse	CHIC TECHNOLOGY CORP.	SMOP5000WX	4010159128	I/F : 1.8m, shield
Camera	Unimo	CCP-132F	N/A	Power: 1.8,non-shield BNC Cable :1.0,Shield
Alarm system	N/A	N/A	N/A	-
Mobile Disk III	256MB-021	N/A	TwinMos	-

5.4 System Configuration Diagram



NOTE

- See "APPENDIX 4 photographs" for actual system test setup

6. Test Results EMISSION

6.1 Conducted emission

Result : PASS

6.1.1 Measurement Procedure

In the range of 0.15MHz to 30MHz the Mains Terminal Continuous Disturbance Voltage was measured in accordance with **EN55022 1998+A1:2000 Class A**. A 1m. x 1.5m. wooden table 80cm. high is placed 40cm. away from the vertical wall and 1.5m away from the side wall of the shielded room. Kyoritsu Model KNW-407 and KNW-242(10kHz-30MHz) 50 /50uH Line-Impedance Stabilization Networks(LISNs) are bonded to the shielded room. The EUT is powered from the KNW-242 LISN and the support equipment is powered from the KNW-407 LISN. By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission. For further description of the configuration refer to the picture of the test set-up.

6.1.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
Spectrum Analyzer	8591E	3649A05889	HP	2005.07
RFI/Field intensity Meter	KNW-2402	4N-170-3	Kyoritsu Electrical Works	2005.07
LISN	KNW-407	8-317-8	Kyoritsu Electrical Works	2004.08
LISN	KNW-242	8-654-15	Kyoritsu Electrical Works	2004.08

6.2 Radiated emission

Result : PASS

6.2.1 Measurement Procedure

In the range of 30MHz to 1GHz the Electric Field strength was measured in accordance with **EN55022 1998+A1:2000 Class A.**

on an open test site, which allows a 10m distance measurement. The EUT was placed in the center of a wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization (high:1-4m)..

The turntable has been fully rotated. The highest radiation of the equipment has been recorded. By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission. For further description of the configuration refer to the picture of the test set-up

6.2.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
RFI/Field intensity Meter	KNM-504D	4N-161-4	Kyoritsu Electrical Work	2005.07
Frequency Converter	KCV-604C	4-230-3	Kyoritsu Electrical Work	2005.07
Spectrum Analyzer	8563E	3551A04634	HP	2004.09
BICONICAL ANT.	VHA9103	VHA91031946	SCHWARZBECK	2004.11
LOG-PERIODIC ANT.	UHALP9108A1	1098	SCHWARZBECK	2004.11
Double Ridged Horn Antenna	3115	6419	EMCO	2005.04
Amplifier (25dB)	8447D	2944A10144	Agilent	2005.06
Position Controller	5901T	14173	TOKIN	N/A
DRIVER	5902T2	14174	TOKIN	N/A
Radiated Emission (ANECHOIC CHAMBER-PRE TESTING)				
Spectrum Analyzer	E4411B	US41062735	Agilent	2005.07
Amplifier (25dB)	8447D	2944A10144	Agilent	2005.06
BILOG ANTENNA	CBL6111C	2661	SCHAFFNER	2005.04
CONTROLLER	5900	N/A	TOKIN	N/A

9. Test Results IMMUNITY

9.1 Voltage dips, short interruptions and voltage variations

Result : PASS

9.1.1 Measurement Procedure

Mains supply voltage dips, short interruptions immunity tests and it's test setup were carried out in accordance with **EN61000-4-11: 1994+A1:2001**. The dips/interruption test is only applicable to AC mains. The dips/interruptions were applied at zero crossing. The presence of a reference plane and the configuration of EUT are not critical for this test. The dips were applied with a 70% dip(down to 30% of rated voltage of EUT). EUT was given a 10Sec interval between each dip to receiver. 3 dips were applied at each phase angle step. The interruptions are a 100% dip-type (down to 0% of rated voltage of EUT). EUT was given a 10Sec interval between each interruption to receiver. 3 interruptions were applied at each phase angle step.

9.1.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
BEST EMC	BEST EMCV2.7	200122-043SC	SCHAFFNER	2004.09
PC	MF05	A6982GT500558	SAMSUNG	N/A

9.1.3 Test Result

1) Test Data: July 20, 2004 Humidity: 63 %
 Temperature: 27 Barometric: 986 mbar

2) Uncertainty (95% confidence) : ±5%

“It has been demonstrated that the Voltage dips generator meets the specified requirements in the standard with at least 95% confidence”

3) Result

Test Level %Ut	Voltage dip and short interruptions %Ut	Duration of Reduction (periods)	Remarks
40	60	0.5	No deterioration of the picture
		1	No deterioration of the picture
		5	Any deterioration of the picture
		10	Any deterioration of the picture
0	100	0.5	No deterioration of the picture
		1	Any deterioration of the picture
		5	Any deterioration of the picture

Table 3 : Voltage dips

Supply voltage	Duration of Reduction (periods)	Result
Umax 2)	250	No deterioration of the picture
Umin 3)	250	No deterioration of the picture

Table 4 : Voltage variations

NOTE:

- 1) Unom = Nominal mains voltage (230V)
- 2) Umax = Unom + 10%
- 3) Umin = Unom – 15%

Changes to occur at 0 degree crossover point of the voltage waveform..

9.3 Radiated, radio-frequency, electromagnetic field

Result : PASS

9.3.1 Measurement Procedure

The immunity against radio-frequency electromagnetic fields in the frequency range between 80 and 1000MHz was tested in accordance to **EN50130-4: 1995+A1:1998**.

The test set-up was made according to **EN61000-4-3: 1996+A1:1998+A2:2001** in semi-anechoic chamber. The EUT has been placed in center of a wooden turntable. The height of this table was 0.8m. The field strength was monitored by an isotropic sensor during the complete test.

The isotropic sensor was located beside the equipment. The antenna has been orientated for both horizontal and vertical polarization. The distance between antenna the equipment under testing was at least 3m. The tests have been performed with the antenna facing each of the four side of the EUT.

Severity level	: 3
Field strength	: 1V/m, 3V/m, 10V/m
Frequency range	: 80MHz -1 GHz
Amplitude Modulation	: AM, 80%,1kHz sine-wave
Pulse Modulation	: 1Hz (0.5s ON : 0.5s OFF)
Step size	: 1% of fundamental
Sweep capability	: 1.5x10 ⁻³ decade/s

9.3.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
Control computer	Pentium 750MHz	956592FT202860	SAMSUNG	-
Software	TEMTO-RS	Ver.4.3en	TSJ	-
Electric Field Sensor (~5GHz,~800V/m)	HI-6005	107823	Holaday	2005.06
Signal Generator(3.3GHz)	SML03	100647	Rohde & Schwarz	2005.03
Power Meter	NRVD	100403	Rohde & Schwarz	2005.03
RF Switch Matrix (~12GHz,500W)	RFM-S3A2CIL	2075	TSJ	2005.04
Antenna(75M~1.5GHz ,1kW)	VULP9118E	754	Schwarzbeck	2005.05
Horn Antenna (0.7G~6GHz)	BBHA9120A	322	Schwarzbeck	2005.05
RF Power Amplifier (~1GHz,250W)	CMC250	F044-0602	IFI	2005.04
RF Power Amplifier (1-3GHz,25W)	5055R	1007	Ophir RF	2005.04

9.4 Conducted disturbances, induced by radio-frequency fields

Result : PASS

9.4.1 Measurement Procedure

The immunity against conducted radio frequency disturbance in the frequency range between 0.15 and 100MHz was tested in accordance to **EN50130-4: 1995+A1:1998**. Test set-up was made according to **EN61000-4-6: 1996**. The EUT has been placed on a wooden table 0.1m above the reference ground plane.

The reference ground plane exceeded the projected geometry of the EUT and the Coupling/Decoupling Network(CND)by more than 20cm. The CDN has been placed directly on the reference ground plane. The ground terminal of the CDN has been connected directly with the reference ground plane. The cable between CDN and EUT has a length of 20cm.

The distance between this cable and the reference ground plane was kept between 3 and 5cm as long as possible. The EUT has no dedicated ground terminal.

The coupling specified frequency range has and the CDN have been recorded before the test. The specified frequency range has been manual with a sweep rate smaller than 1.5×10^{-3} decade/sec.

Severity level	: 3
Applied voltage	: 120dBuV, 130dBuV, 140dBuV
Frequency range	: 150kHz~100MHz
Amplitude Modulation	: AM, 80%,1kHz sine-wave
Pulse Modulation	: 1Hz (0.5s ON : 0.5s OFF)
Step size	: 1% of fundamental
Sweep capability	: 1.5×10^{-3} decade/s

9.4.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
Control computer	Pentium 800MHz	N/A	SAMSUNG	-
Software	TEMTO-CS	Ver.2.5en	TSJ	-
Signal Generator(3.3GHz)	SML03	100647	Rohde & Schwarz	2005.03
Power Meter	NRVD	100403	Rohde & Schwarz	2005.03
RF Switch Matrix (~12GHz,500W)	RFM-S3A2CIL	2075	TSJ	2005.03
RF Power Amplifier (~230MHz,75W)	FLL75	0072	Frankonia	2005.04
EM Clamp	TSIC-23	401	TSJ	2005.04
CDN	M-Type T-Type	-	TSJ	2005.03
Decoupling Clamp	TSIC-23-DCN	150	TSJ	2005.04

9.4.3 Test Result

1) Test Data: July 16, 2004 Humidity: 63 %
 Temperature: 27 Barometric : 986 mbar

2) Uncertainty(95% confidence, k=2): ± 1.39dB

3) Result

Port	Result	Remarks
AC power	120dBuV PASS	No deterioration of the picture
	130dBuV PASS	No deterioration of the picture
	140dBuV PASS	No deterioration of the picture

Table 7 : Immunity-input AC power ports

Port	Result	Remarks
BNC Cable	120dBuV PASS	No deterioration of the picture
	130dBuV PASS	No deterioration of the picture
	140dBuV PASS	No deterioration of the picture
LAN	120dBuV PASS	No deterioration of the picture
	130dBuV PASS	No deterioration of the picture
	140dBuV PASS	No deterioration of the picture
ALARM	120dBuV PASS	No deterioration of the picture
	130dBuV PASS	No deterioration of the picture
	140dBuV PASS	No deterioration of the picture

Table 8 : Immunity / Signal line ports

9.5 Electrical fast transient / burst

Result : PASS

9.5.1 Measurement Procedure

The immunity against fast transients was tested in accordance to **EN50130-4: 1995+A1:1998**, on all lines which length may exceed 3m according to the manufacturers specification. Test set-up with capacitive clamp and fast transient noise generator was according to **EN61000-4-4: 1995**.

The EUT has been placed on a wooden table 0.8m above the reference ground plane.

The reference ground plane exceeded the projected geometry of the EUT and the capacitive clamp by more than 20cm. The clamp has placed directly on the reference ground plane.

The un-used signal connector of the clamp has been terminated with a 50 resistor.

The distance between the EUT and all other conductive structures. Except the ground plane beneath the EUT was more than 0.5m. The distance between clamp and EUT was about 30cm.

Severity level	: 2 (AC Power port)
Severity level	: 3 (Signal port)
Test voltage	: 0.25, 0.5, 1,2 (kV)
Polarity	: Negative/ positive
Repetition frequency	: 5kHz

9.5.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
BEST EMC	BEST EMCV2.7	200122-043SC	SCHAFFNER	2004.09
PC	MF05	A6982GT500558	SAMSUNG	N/A
Coupling Clamp	CDN8014	17332	SCHAFFNER	2005.07

9.5.3 Test Result

1) Test Data: July 19, 2004 Humidity: 63 %
 Temperature: 28 Barometric: 986 mbar

2) Uncertainty(95% confidence): ±10%

“It has been demonstrated that the EFT/BURST generator meets the specified requirements in the standard with at least 95% confidence”

3) Result (AC Power Line)

Line	Result	Remarks
L1	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
L2	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
PE	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
L1-L2	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
L1-PE	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
L2-PE	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture
L1-L2-PE	0.5KV PASS 1KV PASS 2KV PASS	No deterioration of the picture

Table 9 : EFT,AC Power lines, Positive/Negative Polarity

Line	Result	Remarks
BNC Cable	0.25KV PASS	No deterioration of the picture
	0.5KV PASS	No deterioration of the picture
	1 KV PASS	Flickering of an indicator during the test
LAN	0.25KV PASS	No deterioration of the picture
	0.5KV PASS	No deterioration of the picture
	1 KV PASS	Flickering of an indicator during the test
ALARM	0.25KV PASS	No deterioration of the picture
	0.5KV PASS	No deterioration of the picture
	1 KV PASS	Flickering of an indicator during the test

Table 10 : Burst, Signal Line, Positive/ Negative Polarity

9.6 Surge

Result : PASS

9.6.1 Measurement Procedure

The immunity against surge was tested in accordance with **EN50130-4: 1995+A1:1998**.

The Combination Wave Test Generator. The Coupling/Decoupling Network and the test set-up are in accordance with **EN61000-4-5: 1995**.

The test consists of the injection of slow high energy transients in the a. c. mains supply lines in both line-to-line and line-to-ground coupling mode, and into the signal and extra low voltage supply lines in-to-ground coupling mode.

The impedance of the transient generator (effectively 2) is characterized by the shape of the open-circuit voltage and the circuit current pulses. To simulate typical installation impedances, 40 is inserted when the generator when extra low voltage and signal lines are tested, and 10 is inserted when the line-to-ground test is conducted on the a. c. mains lines. The test pulses are coupled into the leads to be tested by means of appropriate coupling networks, which maintain the test pulses within their specification.

The EUT has been placed on a wooden table 10cm above the reference ground plane.

The reference ground plane exceeded the projected geometry of the EUT and the back filler by more than 20cm. The back filler has been placed directly on a separated reference ground plane. Both ground planes were connected together. The ground terminal of the back filler has been connected directly with its reference ground plane.

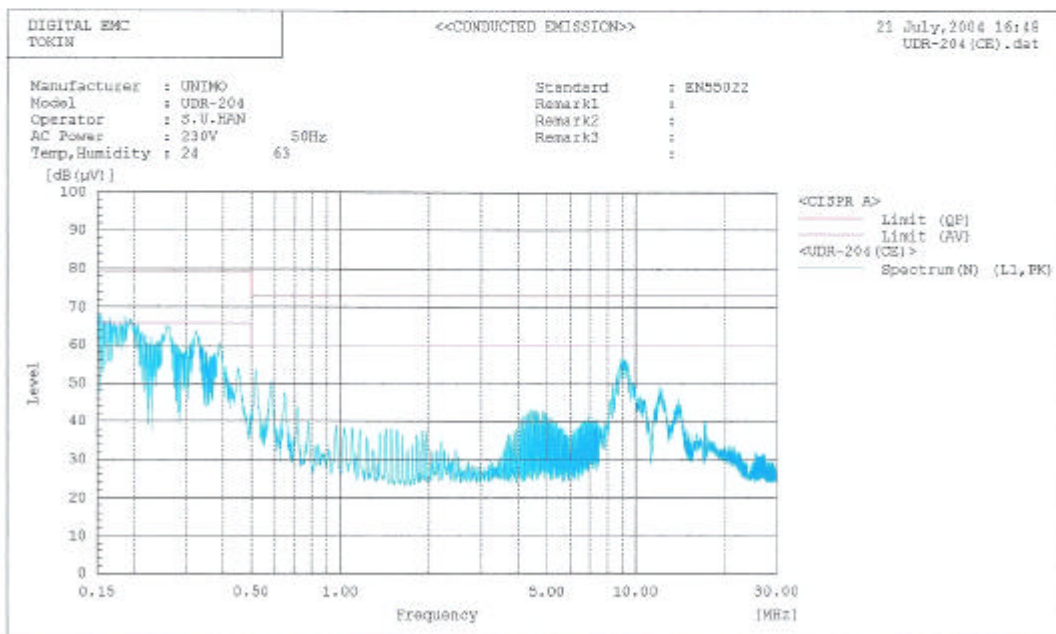
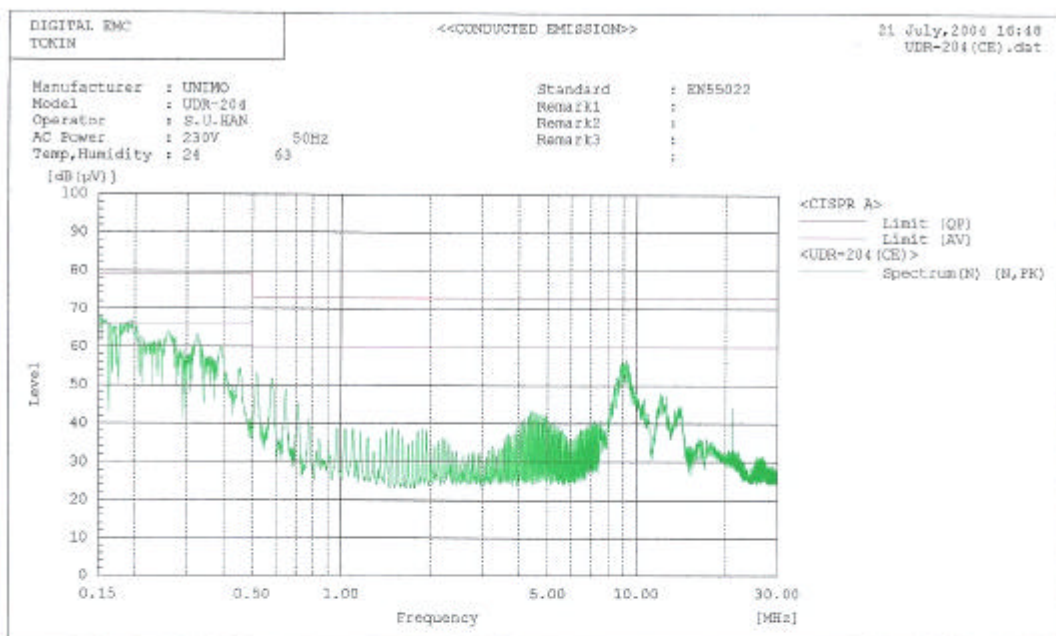
Severity level	: 2 (AC power port)
Severity level	: 2 (signal line)
Test voltage	: 0.5, 1 (kV)
Waveshape, open circuit voltage	: Risetime 1.2us/ Duration 50us
Waveshape, short circuit current	: Risetime 8us/ Duration 20us
Polarity	: negative/positive
Number of surges	: 5

9.6.2 List of Test and Measurement Instruments

Name of Instrument	Model No	Serial No	Manufacturer	Next Cal. Date
BEST EMC	BEST EMCV2.7	200122-043SC	SCHAFFNER	2004.09
PC	MF05	A6982GT500558	SAMSUNG	N/A
SIGNAL LINE COUPLING NETWORK	CDN 117	17375	SCHAFFNER	2004.09
SIGNAL LINE COUPLING NETWORK FOR UNSHIELDED SYMMETRICALLY OPERATED LINES	CDN 118	SL 400-187	SCHAFFNER	2004.09
COUPLING ACCESSORY	INA 172	SL 403-109	SCHAFFNER	-
COUPLING ACCESSORY	INA 175	SL 403-474	SCHAFFNER	-

APPENDIX 1

MAINS TERMINAL CONTINUOUS DISTURBANCE VOLTAGE MEASUREMENT GRAPH



APPENDIX 2 Measurement Uncertainty(CE/RE)

Input Quantity	Probability Distribution	Probability Distribution (dB)	Standard
		9kHz~30MHz	
Cable loss(RG214)	Standard Deviation(SD)	± 0.08	10 th measurement
Receiver corrections; -Voltage accuracy -Attenuation accuracy -Absolute pulse response	Rectangular (3) Rectangular (3) Rectangular (3)	± 0.27 ± 0.1 ± 1.5	Cal. Report Cal. Report Cal. Report (CISPR16-3)
LISN corrections (KNW-242) ; -Voltage division factor	Normal (k=2)	± 0.8	Cal. Report
Mismatch; - Receiver VRC* : i = 0.2 -LISN VRC : g = 0.2(150kHz) = 0.04(30MHz) - Uncertainty : 20log(1 ± i g)	U-type (2)	+0.34 -0.35	Cal. Report Cal. Report
System Repeatability	Standard Deviation(SD)	± 0.46	10 th measurement
Combined measurement uncertainty Uc(y)	Normal	+ 1.1 - 1.1	
Expanded measurement uncertainty (95%,Confidence level,k=2)dB	Normal(k=2)	+ 2.20 - 2.21	

Input Quantity	Probability Distribution	Measurement Uncertainty(dB)		Standard
		3m	10m	
		Bi-Log	Bi-Log	
Antenna Factor(CBL6112B)	Normal(K=2)	30M~1G: ± 1.5 1G~2G: ± 1.2	30M~1G: ± 1.5 1G~2G: ± 1.2	ANT Cal. uncertainty
Cable loss(RG214/U,HFC12D)	Standard Deviation(SD)	±0.14	±0.14	5 th measurement
Receiver corrections; -Voltage accuracy -Attenuation accuracy -Absolute pulse response	3	±0.19 ±0.15 ±0.19	±0.19 ±0.15 ±0.19	Cal. Report
Antenna Directivity	Rectangular (3)	+1.0/-0	+1.0/-0	CISPR16-4
AF height deviations	Rectangular (3)	± 0	± 0	CISPR16-4
Phase center location	Rectangular (3)	± 0	± 0	CISPR16-4
Separation distance	Rectangular (3)	± 0.3	± 0.1	CISPR16-4
Uncertainty of Site	Rectangular (3)	+2.3/-3.17	+2.0/-3.1	NSA
Mismatch -Receiver VRC*: i=0.2 -ANT.VRC : g=0.33 - Uncertainty 20log(1 ± i g=0.33)	U-type 2	+0.56 -0.59	+0.56 -0.59	Manual
Pre-amp.	K=2	± 0.18	± 0.18	Cal. Report
System Repeatability	Standard Deviation(SD)	± 0.11	± 0.71	5 th repeated measurement
Combined measurement uncertainty Uc(y)	Normal(k=1)	+ 1.7342 - 2.0682	+ 1.7328 - 2.1346	
Expanded measurement uncertainty (95%,Confidence level,k=2)dB	K=2	30M~1GHz +3.47 -4.14	30M~1GHz +3.47 -4.27	

APPENDIX 3 VOLTAGE FLUCTUATIONS ON AC MAINS

IEC1000-3-3 ANALYSIS REPORT

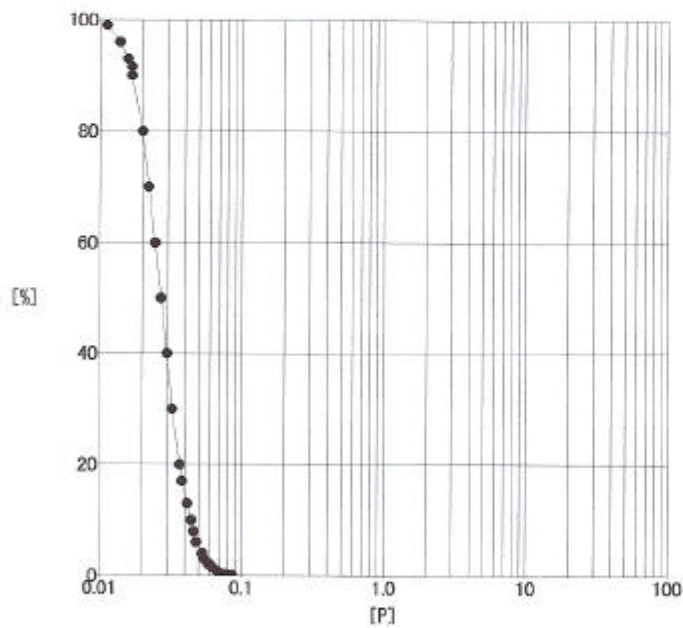
Date : 2004-07-21
 Start Time : 12:03:46
 Unit Under Test : UDR-204
 Operator : S. U. HAN
 File Name : UDR-204.DB3

Comment 1 :
 Comment 2 :

Channel : CHA
 Use Plt&Pst : YES
 Analysis Time : 30min
 Step Time : 10sec

Num of Data : 181

Measurement Time: 12:35:31



UPDATED

Pst : 0.155
 dt [%] : -0.026
 dmax [%] : 0.232
 dc [%] : -0.002
 Ut [V] : 231.871

MAXIMUM

Plt : 0.098 < 0.65
 Pst : 0.156 < 1.0
 dt > 3% [ms] : 0.0 < 200
 dmax [%] : 0.255 < 4
 dcm : -0.011 < 3

Result PASS

IEC1000-3-3 ANALYSIS REPORT

```

Date           : 2004-07-21      Channel         : CHA
Start Time    : 12:03:46        Use Plt&Pst    : YES
Unit Under Test : UDR-204       Analysis Time   : 30min
Operator      : S. U. HAN       Step Time      : 10sec
File Name     : UDR-204.DB3

Comment 1     :
Comment 2     :
    
```

```

Num of Data   : 181
Measurement Time: 12:35:31
    
```

Probability[%]	Class[P]
0.1	0.0858
0.2	0.0791
0.5	0.0706
0.7	0.0685
1.0	0.0665
1.5	0.0625
2.0	0.0587
2.2	0.0587
3.0	0.0549
4.0	0.0531
6.0	0.0479
8.0	0.0462
10.0	0.0445
13.0	0.0413
17.0	0.0381
20.0	0.0366
30.0	0.0323
40.0	0.0295
50.0	0.0269
60.0	0.0244
70.0	0.0220
80.0	0.0198
90.0	0.0166
91.5	0.0166
93.0	0.0156
96.0	0.0137
99.0	0.0111

UPDATED

```

Pst           : 0.155
dt[%]        : -0.026
dmax[%]      : 0.232
dc[%]        : -0.002
Ut[V]        : 231.871
    
```

MAXIMUM

```

Plt           : 0.098 < 0.65
Pst           : 0.156 < 1.0
dt>3%[ms]    : 0.0 < 200
dmax[%]      : 0.255 < 4
dcm          : -0.011 < 3
    
```

Result PASS

IEC1000-3-3 ANALYSIS REPORT

Date : 2004-07-21
 Start Time : 12:03:46
 Unit Under Test : UDR-204
 Operator : S. U. HAN
 File Name : UDR-204.DB3

Comment 1 :
 Comment 2 :

Channel : CHA
 Use Plt&Pst : YES
 Analysis Time : 30min
 Step Time : 10sec

Pst,Plt Evaluation

Pst(max) : 0.156 < 1.0
 Plt : 0.098 < 0.65

Voltage change Evaluation

dt>3%[ms] : 0.0 < 200
 dmax[%] : 0.255 < 4
 dc[%] : -0.011 < 3

Time	Pst
00:10	0.156
00:20	0.156
00:30	0.155
00:40	0
00:50	0
01:00	0
01:10	0
01:20	0
01:30	0
01:40	0
01:50	0
02:00	0

Result PASS

APPENDIX 4 Test Setup photographs

- 1. Conducted emission**
- 2. Radiated emission**
- 3. Harmonics on AC Mains**
- 4. Voltage dips, short interruptions and voltage variations**
- 5. Electrostatic discharge**
- 6. Radiated radio-frequency electromagnetic field**
- 7. Conducted disturbances, induced by radio-frequency fields**
- 8. Electrical fast transient / burst**
- 9. Surge**
- 10. EUT**

Conducted emission



Radiated emission



Set up for Harmonics on AC Mains



Voltage dips, short interruptions and voltage variations



Electrostatic discharge



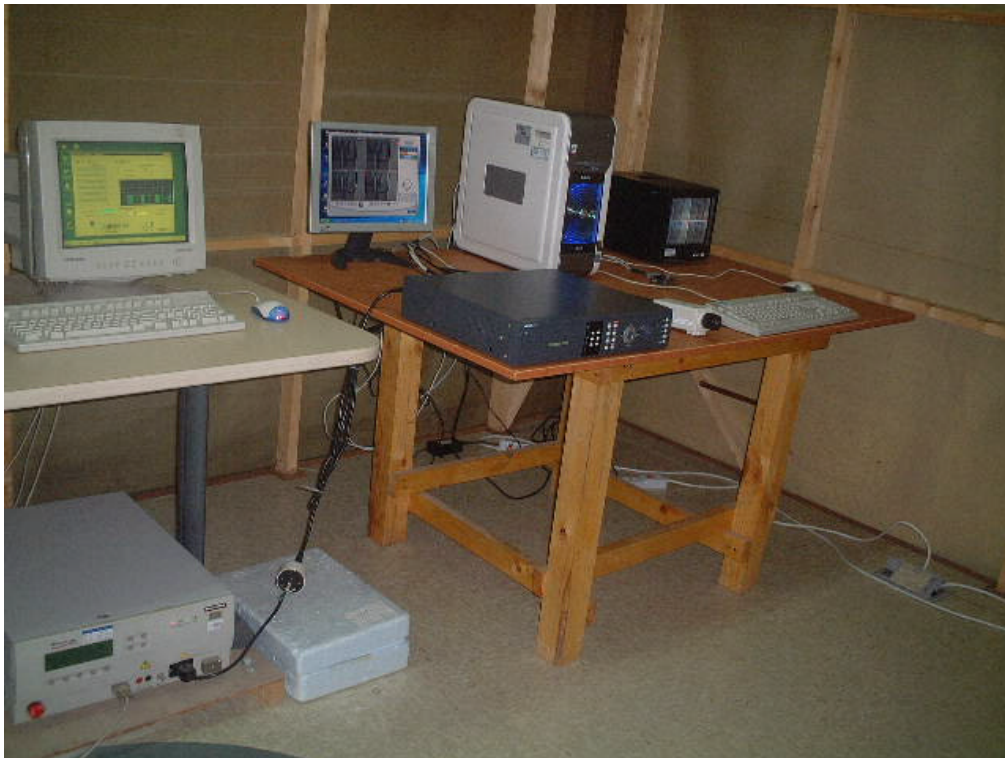
Radiated radio-frequency electromagnetic field



Conducted disturbances, induced by radio-frequency fields



Electrical fast transient / burst



Surge

