

FCC DoC TEST REPORT

for

Mobile 4 Channel DVR

MODEL: xxxxAVR-3000-xxxxxxx

Test Report Number: 71120204-F

Issued to:

AAEON Technology Inc.

5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C.

Issued by:

Compliance Certification Services Inc.

Sindian BU

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Revision History

Rev.	Issue Date	Revisions	Effect Page	Revised By
00		Initial Issue	ALL	

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1 TEST RESULT CERTIFICATION

Product:	Mobile 4 Channel DVR
Brand:	AAEON
Model:	xxxxxAVR-3000-xxxxxxx (Where x is 0-9, A-Z, - or blank) for marketing purpose
Applicant:	AAEON Technology Inc.
	5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C.
Manufacturer:	AAEON Technology Inc. 5F, No. 135, Lane 235, Pao Chiao Rd., Hsin-Tien City, Taipei, Taiwan, R.O.C.
Tested:	November 20, 2007 & December 3, 2007

EMISSION						
Standard	Item	Result	Remarks			
FCC 4/ CFR Part 15 Subpart B,	Conducted (Main Port)	PASS	Meet Class A limit			
ICES-003 Issue 4 ANSI C63.4-2003	Radiated	PASS	Meet Class A limit			

Note: 1. The test result judgment is decided by the limit of measurement standard.
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard

None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Approved by:

Pacia Wang

David Wang Manager of Sindian BU

Reviewed by:

Som Hu tor

Vince Chiang Assistant Manager of Sindian BU

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EUT DESCRIPTION 2

Product	Mobile 4 Channel DVR
Brand Name	AAEON
Model	xxxxAVR-3000-xxxxxxx (Where x is 0-9, A-Z, - or blank) for marketing purpose
Applicant	AAEON Technology Inc.
Housing material	Metal case
Serial Number	N/A
Received Date	November 20, 2007
EUT Power Rating	19VDC
AC Power During Test	120VAC / 60Hz to AC Adaptor
AC Adaptor Manufacturer	FSP
AC Adaptor Model Number	FSP120-AAB
Power Adaptor Power Rating	100-240VAC, 120Watt
DC Power Cord Type	Unshielded, 1.8m (Non-detachable, with a core) to AC Adaptor
EUT I/O Cable Type	Unshielded, 1.8m (Detachable)
OSC/Clock Frequencies	14.31818MHz; 25MHz; 32.768KHz

I/O PORT

I/O PORT TYPES	Q'TY	TESTED WITH
1) PIO Port	1	1
2) SIO Port	5	5
3) PS/2 Keyboard Port	1	1
4) PS/2 Mouse Port	1	1
5) Audio In Port	2	2
6) Audio Out Port	1	1
7) D-SUB Port	2	2
8) LAN Port	1	1
9) USB Port	4	4

Note: Client consigns only one model sample to test (Model Number: AVR-3000).

3 TEST METHODOLOGY

3.1. DECISION OF FINAL TEST MODE

The EUT was tested together with the above additional components, and a configuration, which produced the worst emission levels, was selected and recorded in this report.

The test configuration/ mode is as the following:

Conduction Mode:

1. Normal Mode

Radiation Mode:

1.	Normal Mode
	Normal Mode / 1-6.5GHz

Conduction: Mode 1

Radiation: Mode 1

3.2. EUT SYSTEM OPERATION

1. Turn on the EUT power switch, then get into the Linux to test.

Note: Test program is self-repeating throughout the test.

4 SETUP OF EQUIPMENT UNDER TEST

4.1. DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

EUT Devices:

No.	Equipment	Model No.	Trade Name
1.	CPU(1.3GHz)	Celeron M	Intel
2.	Hard Disk (20GB)	HDD2187	TOSHIBA
3.	Memory (256MB / DDR333)	D5116AFTA-6B-E	ELPIDA
4.	CCD IR Camera X4	VDI-2001CIH	VDI
5.	Capture Card	DVC-3110-SW-A	Softwell

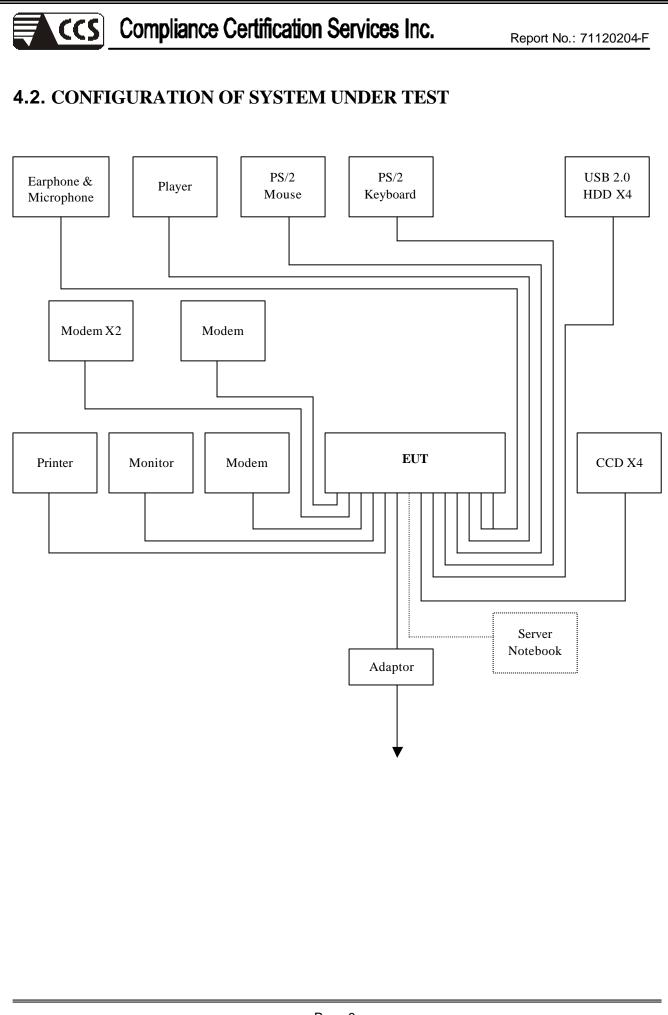
Peripherals Devices:

No.	Equipment	Model No.	Serial No.	FCC ID / BSMI ID	Trade Name	Data Cable	Power Cord
1	Earphone & Microphone	MSB301	N/A	N/A	e-Sense	Unshielded, 1.8m	N/A
2	Player	RQ-L11LT	N/A	BSMI ID: 3912A162	Panasonic	Unshielded, 1.5m	N/A
3	PS/2 Mouse	M071KC	443029438	DoC BSMI: R41108	DELL	Shielded, 1.8m	N/A
4	PS/2 Keyboard	SK-8110	N/A	DoC BSMI: T3A002	DELL	Shielded, 1.8m	N/A
5-8	USB 2.0 HDD X4	F12-U	N/A	BSMI ID: 4912A002	Terasys	Shielded, 1.8m	N/A
9	Printer	C20SX	N/A	BSMI ID: 3902E004	EPSON	Shielded, 1.8m	Unshielded, 1.8m
10	Monitor	710V	GS17H9NXA05853A	DOC BSMI: R33475	SAMSUNG	Shielded, 1.8m with two cores	Unshielded, 1.8m
11-12	Modem X2	5JEG4033MKO	N/A	5RJTAI-35500-M5-E	TOP - SOLUTION	Shielded, 1.8m	Unshielded, 1.8m
13-14	Modem X2	1414	N/A	IFAXDM1414	ACEEX	Shielded, 1.8m	Unshielded, 1.8m
15	Server Notebook	M623	N/A	N/A	Fox	Unshielded, 20m	Unshielded, 1.8m with a core

Note:

1) All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2) Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



5 FACILITIES AND ACCREDITATIONS

5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at CCS Taiwan Sindian BU at No.163-1, Jhongsheng Rd., Sindian City, Taipei County 23151, Taiwan.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4 and CISPR 16-1-5.

5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

FCC, A2LA
TUV Rheinland
VCCI
NEMKO
INDUSTRY CANADA
TAF, BSMI

Copies of granted accreditation certificates are available for downloading from our web site, <u>http://www.ccsemc.com.tw</u>

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	± 1.7366
Radiated emissions	30MHz ~ 200MHz	± 3.8792
Radiated emissions	200MHz ~1000MHz	± 3.8914

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Consistent with industry standard (e.g. CISPR 22: 2006, clause 11, Measurement Uncertainty) determining compliance with the limits shall be base on the results of the compliance measurement. Consequently the measure emissions being less than the maximum allowed emission result in this be a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is base on conducted and radiated emissions being less than UCISPR which is 3.6dB and 5.2dB respectively. CCS values (called ULab in CISPR 16-4-2) is less than UCISPR as shown in the table above. Therefore, MU need not be considered for compliance.

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6 CONDUCTED EMISSION MEASUREMENT

6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A	(dBuV)	Class B (dBuV)		
FREQUENCE (IVITIZ)	Quasi-peak	Average	Quasi-peak	Average	
0.15 - 0.5	79	66	66 - 56	56 - 46	
0.50 - 5.0	73	60	56	46	
5.0 - 30.0	73	60	60	50	

NOTE:

(1) The lower limit shall apply at the transition frequencies.

(2) The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

(3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

6.2. TEST INSTRUMENTS

Conducted Emission Room # B								
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due				
TEST RECEIVER	R&S	ESHS10	843743/015	03/28/2008				
LISN (EUT)	ЕМСО	3825/2	9106-1810	01/03/2008				
LISN	ЕМСО	3825/2	1382	01/03/2008				
BNC CABLE	MIYAZAKI	5D-FB	BNC B1	07/12/2008				
Pulse Limiter	R&S	ESH3-Z2	100374	08/23/2008				
THERMO- HYGRO METER	ТОР	HA-202	9303-3	02/04/2008				
Test S/W	EMI 32.exe							

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.



6.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA -031)

Procedure of Preliminary Test

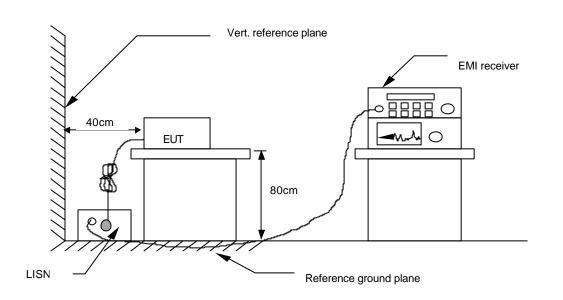
- The EUT and Support equipment, if needed, was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed received AC main power, through a Line Impedance Stabilization Network (LISN), which supplied power source and was grounded to the ground plane.
- All support equipment power received from a second LISN.
- The EUT test program was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT configuration and cable configuration of the above highest emission levels were recorded for reference of the final test.

Procedure of Final Test

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.

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6.4. TEST SETUP



• For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

6.5. DATA SAMPLE

Freq. MHz	Read Level dBuV	Factor dB	Level dBuV	Limit dBuV	Over Limit dB	Reading Type (P/Q/A)	Line (L1/L2)
X.XX	42.95	0.55	43.50	73	-29.50	Q	L1

Freq. = Emission frequency in MHz

Read Level = Uncorrected Analyzer/Receiver reading

- Factor = Insertion loss of LISN + Cable Loss
- Level = Read Level + Factor
- Limit = Limit stated in standard
- Over Limit = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- A = Average Reading
- L1 = Hot side
- L2 = Neutral side

Calculation Formula

Over Limit (dB) = Level (dBuV) - Limit (dBuV)

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6.6. TEST RESULTS

Model No.		6dB Bandwidth	10 KHz
Environmental Conditions	20°C, 55% RH, 1010mbar	Test Mode	Mode 1
Tested by	JEFFERY CHU		

(The chart below shows the highest readings taken from the final data.)

	Six Highest Conducted Emission Readings								
Frequency Range Investigated				150 KHz to	30 MHz				
Freq (MHz)	Read Level (dBuV)	Factor (dB)	Level (dBuV)	Limit Line (dBuV)	Over Limit (dB)	Reading Type (P/Q/A)	Line (L1/L2)		
11.498	46.77	10.13	56.90	73.00	-16.10	Р	L1		
12.784	44.41	10.15	54.56	73.00	-18.44	Р	L1		
8.729	42.72	10.17	52.89	73.00	-20.11	Р	L2		
11.257	48.43	10.25	58.68	73.00	-14.32	Р	L2		
12.253	47.74	10.29	58.03	73.00	-14.97	Р	L2		
17.109	42.55	10.39	52.94	73.00	-20.06	Р	L2		

NOTE: 1. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line).

2. The emission level was or more than 2dB below the Average limit, so no re-check anymore.

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7 RADIATED EMISSION MEASUREMENT

7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	dBuV/m (At 10m)			
FREQUENCE (MILZ)	Class A	Class B		
30 ~ 230	40	30		
230 ~ 1000	47	37		

NOTE: (1) The lower limit shall apply at the transition frequencies.

(2) Emission level $(dBuV/m) = 20 \log Emission level (uV/m)$.

7.2. TEST INSTRUMENTS

	Open Area Test Site # I							
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due				
SITE NSA	CCS	I Site	N/A	09/28/2008				
MEASURE RECEIVER	SCHAFFNER	SCR3501	338	07/03/2008				
SPECTRUM ANALYZER	ADVANTEST	R3132	120900008	No Calibration Required				
ANTENNA	SCHAFFNER	CBL 6112B	2809	09/21/2008				
AMPLIFIER	SCHAFFNER	CPA9231A	3626	10/10/2008				
CABLE	BELDEN	9913	N-TYPE #I2	02/25/2008				
ATTENUATOR	MCL	UNAT-6	AT06-3	10/10/2008				
THERMO- HYGRO METER	TFA	N/A	NO.1	12/24/2007				
Test S/W		Lab VIE	W 7.1					
	Abo	ve 1GHz Used						
EMC ANALYZER (100Hz-22GHz)	HP	8566B	2937A06102	07/29/2008				
ANTENNA (1-18GHz)	EMCO	3115	00022256	01/16/2008				
AMPLIFIER (1-18GHz)	HP	8449B	3008A01266	02/11/2008				
CABLE (1-18GHz)	JYEBAO	LL142	SMA#RS1	02/01/2008				
CABLE (1-18GHz)	HUBER +SUHNER	SUCOFLEX 104	SMA#RS3	02/01/2008				
CABLE (1-18GHz)	JYEBAO	LL142	SMA#C1	02/01/2008				

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.

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7.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA -031)

Procedure of Preliminary Test

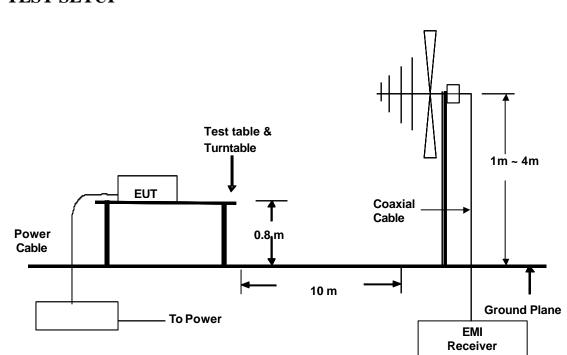
- The equipment was set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden turntable with a height of 0.8 meters is used which is placed on the ground plane. When the EUT is a floor standing equipment, it is placed on the ground plane which has a 3-12 mm non-conductive covering to insulate the EUT from the ground plane.
- Support equipment, if needed, was placed as per ANSI C63.4.
- All I/O cables were positioned to simulate typical usage as per ANSI C63.4.
- The EUT received AC power source from the outlet socket under the turntable. All support equipment power received from another socket under the turntable.
- The antenna was placed at 10 meter away from the EUT as stated in ANSI C63.4. The antenna connected to the Spectrum Analyzer via a cable and at times a pre-amplifier would be used.
- The Analyzer / Receiver quickly scanned from 30MHz to 6500MHz. The EUT test program was started. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test:
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The EUT and cable configuration, antenna position, polarization and turntable position of the above highest emission level were recorded for the final test.

Procedure of Final Test

- EUT and support equipment were set up on the turntable as per the configuration with highest emission level in the preliminary test.
- The Analyzer / Receiver scanned from 30MHz to 6500MHz. Emissions were scanned and measured rotating the EUT to 360 degrees, varying cable placement and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- Recorded at least the six highest emissions. Emission frequency, amplitude, antenna position, polarization and turntable position were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit and only Q.P. reading is presented.
- The test data of the worst-case condition(s) was recorded.

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7.4. TEST SETUP



• For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

7.5. DATA SAMPLE

Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Reading Type (P/Q/A)	Pol. (H/V)
X.XX	14.0	12.2	26.2	40	-13.8	Q	Н

Freq. = Emission frequency in MHz

Reading = Uncorrected Analyzer/Receiver reading

Factor = Antenna Factor + Cable Loss + Attenuator (3/6/10dB) – Amplifier Gain

Amptd = Uncorrected Analyzer/Receiver reading + Factor

- Limit = Limit stated in standard
- Margin = Reading in reference to limit
- P = Peak Reading
- Q = Quasi-peak Reading
- A = Average Reading
- H = Antenna Polarization: Horizontal
- V = Antenna Polarization: Vertical

Calculation Formula

Margin (dB) = Amptd (dBuV/m) – Limit (dBuV/m)

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7.6. TEST RESULTS

Model No.	AVR-3000	Test Mode	Mode 1
Environmental Conditions	19°C, 70% RH, 1003mbar	6dB Bandwidth	120 KHz
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	JOHN YEN

(The chart below shows the highest readings taken from the final data.)

Six Highest Radiated Emission Readings							
Frequency Range Investigated			30 M	Hz to 1000	MHz at 10	m	
Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Reading Type (P/Q/A)	Pol. (H/V)
315.033	51.50	-6.52	44.98	47.00	-2.02	Q	V
372.330	47.94	-4.46	43.48	47.00	-3.52	Q	V
515.508	46.60	-1.66	44.94	47.00	-2.06	Q	V
572.783	43.26	0.40	43.66	47.00	-3.34	Q	V
606.550	42.00	1.11	43.11	47.00	-3.89	Q	V
716.010	40.69	2.31	43.00	47.00	-4.00	Q	V

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 / EN 55022 standard.

2. The other emission levels were very low against the limit.

3. P= Peak Reading; Q= Quasi-peak Reading A= Average Reading.



Model No.	AVR-3000	Test Mode	Mode 1
Environmental Conditions	119° C /0% RH 1003mbar	6dB Bandwidth	120 KHz
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	JOHN YEN

(The chart below shows the highest readings taken from the final data.)

	Six Highest Radiated Emission Readings								
Frequency Range Investigated			30 M	IHz to 1000	MHz at 1	0m			
Freq. MHz	Read Level dBuV	Factor dB/m	Level dBuV/m	Limit dBuV/m	Over Limit dB	Reading Type (P/Q/A)	Pol. (H/V)		
165.740	47.00	-10.78	36.22	40.00	-3.78	Q	Η		
171.840	46.85	-11.05	35.80	40.00	-4.20	Q	Н		
315.034	50.30	-6.52	43.78	47.00	-3.22	Q	Н		
399.994	46.00	-1.83	44.17	47.00	-2.83	Q	Н		
458.226	45.60	-2.77	42.83	47.00	-4.17	Q	Н		
572.790	44.23	0.40	44.63	47.00	-2.37	Q	Η		

REMARKS: 1. 30MHz to 1000MHz test is Applicable CISPR 22 / EN 55022 standard.

2. The other emission levels were very low against the limit.

3. P= Peak Reading; Q= Quasi-peak Reading A= Average Reading.

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8 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST







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