LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do 449-822, Korea
Tel: +82-31-323-6008 Fax: +82-31-323-6010
http://www.ltalab.com

EMC TEST REPORT

Dates of Tests: May 15-17, 2017
Test Report S/N: LR500121705AC
Test Site : LTA Co., Ltd.

Model No. **DD-1216**

APPLICANT **IDIS CO., LTD.**

Manufacturing Description	:	**Video Decoder**
Manufacturer	:	**IDIS CO., LTD.**
Model name	:	**DD-1216**
Additional model name	:	**-**
Test Device Serial No.:	:	**Identification**
Directive	:	**Electromagnetic Compatibility Directive 2014/30/EU**
Rule Part(s)	:	**EN 55032:2015**
		EN 50130-4:2011+A1:2014
		EN 61000-3-2:2014
		EN 61000-3-3:2013
Data of reissue	:	**May 17, 2017**

This test report is issued under the authority of:

Young Man Song, Technical Manager

The test was supervised by:

Soo Ho Lee, Test Engineer

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. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.

NVLAP LAB CODE 200723-0

Revision	Date of issue	Test report No.	Description
0	05.17.2017	LR500121705AC	Initial

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1. General information's

1-1 Test Performed

Company name : **LTA Co., Ltd.**

Address : 243, Jubug-ri,Yangji-Myeon,Yongin-Si, Kyunggi-Do, Korea. 449-822

Web site : http://www.ltalab.com

E-mail : chahn@ltalab.com

Telephone : +82-31-323-6008

Facsimile +82-31-323-6010

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".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2017-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2019-04-13	FCC CAB
VCCI	JAPAN	R-2133(10 m), C-2307	2017-06-21	VCCI registration
VCCI	JAPAN	T-2009	2017-12-23	VCCI registration
VCCI	JAPAN	G-847	2018-12-13	VCCI registration
IC	CANADA	5799A-1	2019-11-07	IC filing
KOLAS	KOREA	NO.551	2017-01-08	KOLAS accredited Lab.

2. Information's about test item

2-1 Client/ Manufacturer

Company name	:	IDIS CO., LTD.
Address	:	8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA
Telephone / Facsimile	:	+82-31-723-5205 / +82-31-723-5108

Factory 1

Company name		IDIS CO., LTD.
Address		8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA

2-2 Equipment Under Test (EUT)

Class	:	A
Category	:	Video Decoder
Model name	:	-
Additional Model Name	:	-
Serial number	:	Identification
Date of receipt	:	April 25, 2017
EUT condition	:	Pre-production, not damaged
Interface ports	:	DC IN, USB, LAN, VGA, HDMI, CVBS
Power rating	:	DC 12 V
Modulator	:	-
Crystal/Oscillator(s)	:	-
Firmware version	:	XXXX

2-3 Modification

-NONE

2-4 Model Specification

-NONE

2-5 Test conditions

Temp. / Humid. / Pressure	:	+(21) ℃ / (36) %RH / (100) kPa
Tested Model	:	DD-1216
Test mode	:	Capture mode
Power supply	:	AC 230 V / 50 Hz

2-6 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
Monitor #1	LG24MA53D	N/A	LG
Monitor #2	EX1901N	N/A	eSys Distribution
Mouse	N/A	N/A	N/A
USB Memory Stick	N/A	N/A	N/A
CCTV	N/A	N/A	N/A
TV	N/A	N/A	Samsung
Direct IP Gigabit PoE Switch	DR-632Ps-S	N/A	IDIS CO., LTD.
Adapter	PA-2061-81	N/A	N/A

3. Test Report

3.1 Summary of tests

Parameter	Applied Standard	Status
I. Emission		
Radiated Emission	EN 55032:2015	C
Conducted Emission	EN 55032:2015	C
Harmonic Current Emission	EN 61000-3-2:2014	C
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	C
II. Immunity		
Electrostatic Discharge	EN 61000-4-2:2009	C
RF Electromagnetic field	EN 61000-4-3:2006/A2:2010	C
Fast Transients Common mode	EN 61000-4-4:2012	C
Surges, line to line and line to ground	EN 61000-4-5:2014	C
RF common mode	EN 61000-4-6:2014	C
Voltage dips and Interruptions	EN 61000-4-11:2004	C
Main supply voltage variations	EN 50130-4:2011	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: We did not test EN61000-3-2 (Harmonic current emissions) for the **XXXX** because equipment whose rated power is less or equal 75W don't need to be tested.

Note 3: We did not test EN 61000-3-3 (Flicker) for the **XXXX** because of clause 6.1, this standard Predicate as follows: "Devices which produce no significant voltage dips or flicker with a certain probability have not to be tested."

Note 4: The device is operated by battery.

Note 5: The data in this test report are traceable to the national or international standards.

3.2 EMISSION

3.2.1 Conducted emissions

Definition:

The test assesses the ability of the EUT to limit its internal noise from being present on the AC mains Power In/Output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Measurement Frequency range	:	150 kHz - 30MHz
Test method	:	EN 55032:2015
Measurement RBW	:	9 kHz
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Refer to the Next page (Maximum emission configuration)
- No other emissions were detected at a level greater than 20 dB below limit

A sample calculation:

COR. F (correction factor)= LISN Insertion loss + Cable loss

Emission Level= meter reading + COR.F

Limits for conducted disturbance at the mains ports of class A ITE

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	79 dBuV	66 dBuV
(0.5 – 30) MHz	73 dBuV	60 dBuV
Note: The limits will decrease with the frequency logarithmically within 0.15MHz to 0.5MHz		

Limits for conducted disturbance at the mains ports of class B ITE

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	(66 – 56) dBuV	(56 - 46) dBuV
(0.5 – 5) MHz	56 dBuV	46 dBuV
(5 – 30) MHz	60 dBuV	50 dBuV
Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz		

TEST EQUIPMENT USED: 01, 02, 03, 07, 08, 09, 10

Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class A equipment

Frequency Range	Voltage limits		Current limits	
	Quasi-peak	Average	Quasi-peak	Average
(0.15 – 0.5) MHz	(97 − 87) dBuV	(84 − 74) dBuV	(53 − 43) dBuV	(40 − 30) dBuV
(0.5 – 30) MHz	87 dBuV	74 dBuV	43 dBuV	30 dBuV

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I= 44 dB)

Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz for class B equipment

Frequency Range	Voltage limits		Current limits	
	Quasi-peak	Average	Quasi-peak	Average
(0.15 – 0.5) MHz	(84 − 74) dBuV	(74 − 64) dBuV	(40 − 30) dBuV	(30 − 20) dBuV
(0.5 – 30) MHz	74 dBuV	64 dBuV	30 dBuV	20 dBuV

Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150Ω to the telecommunication port under test (conversion factor is 20 $\log_{10}$ 150/I= 44 dB)

TEST EQUIPMENT USED: 01, 02, 03, 07, 08, 09, 10

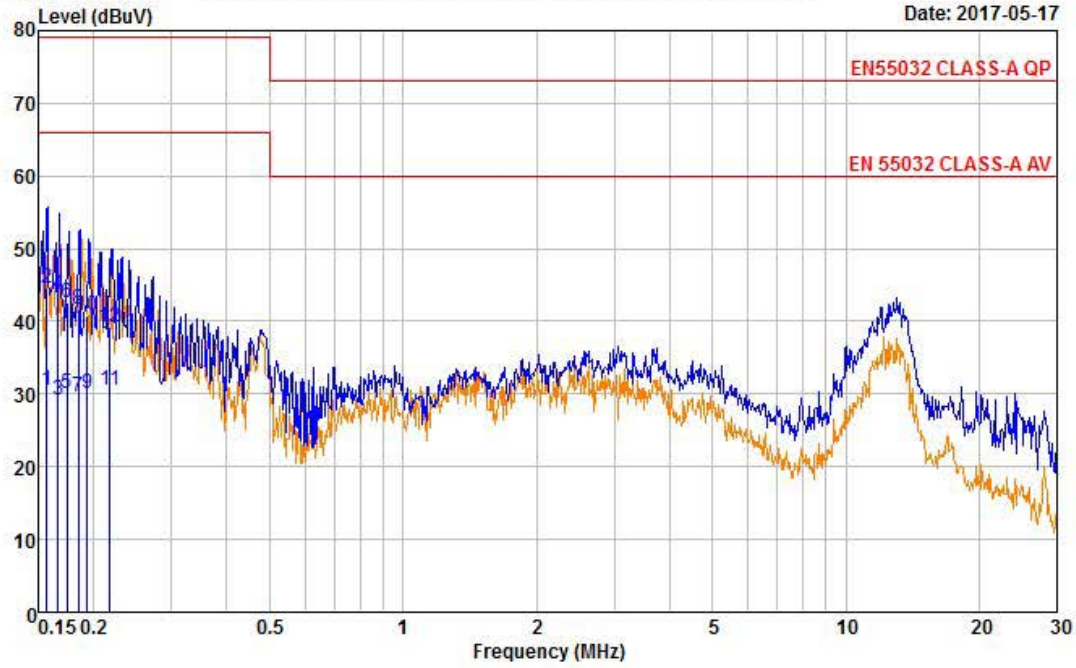
Conducted emissions (LINE)

LTA
Laboratory for Test & Approval Co.,Ltd.

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT / Model No.	: DD-1216	Phase	: LINE
Test Mode	: Capture mode	Test Power	: 230 / 50
Temp. / Humi.	: 21 / 36	Test Engineer	: LEE S H

Data: 860 File: D:\Conducted Data\2017\LTA_Conduction_2017_05.EM6 (1241)



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.157	34.38	20.49	10.10	44.48	30.59	79.00	66.00	34.52	35.41
0.166	33.50	19.13	10.10	43.60	29.23	79.00	66.00	35.40	36.77
0.174	32.37	20.01	10.10	42.47	30.11	79.00	66.00	36.53	35.89
0.185	31.50	19.54	10.09	41.59	29.63	79.00	66.00	37.41	36.37
0.194	30.67	19.99	10.09	40.76	30.08	79.00	66.00	38.24	35.92
0.217	29.11	20.35	10.10	39.21	30.45	79.00	66.00	39.79	35.55

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

Conducted emissions (NEUTRAL)

LTA
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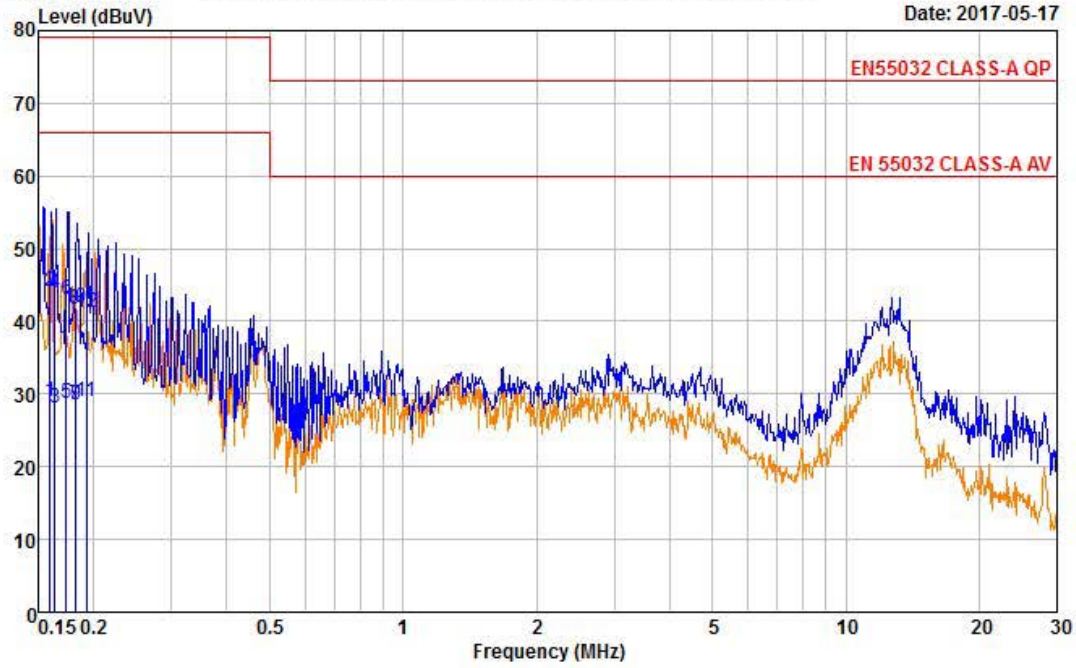
4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT / Model No.	: DD-1216	Phase	: NEUTRAL
Test Mode	: Capture mode	Test Power	: 230 / 50
Temp. / Humi.	: 21 / 36	Test Engineer	: LEE S H

Data: 857 File: D:\Conducted Data\2017\LTA_Conduction_2017_05.EM6 (1241)



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.160	34.04	18.72	10.15	44.19	28.87	79.00	66.00	34.81	37.13
0.163	33.73	17.90	10.15	43.88	28.05	79.00	66.00	35.12	37.95
0.173	32.75	18.62	10.16	42.91	28.78	79.00	66.00	36.09	37.22
0.182	31.42	18.36	10.16	41.58	28.52	79.00	66.00	37.42	37.48
0.183	31.78	18.33	10.16	41.94	28.49	79.00	66.00	37.06	37.51
0.193	30.98	18.77	10.16	41.14	28.93	79.00	66.00	37.86	37.07

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

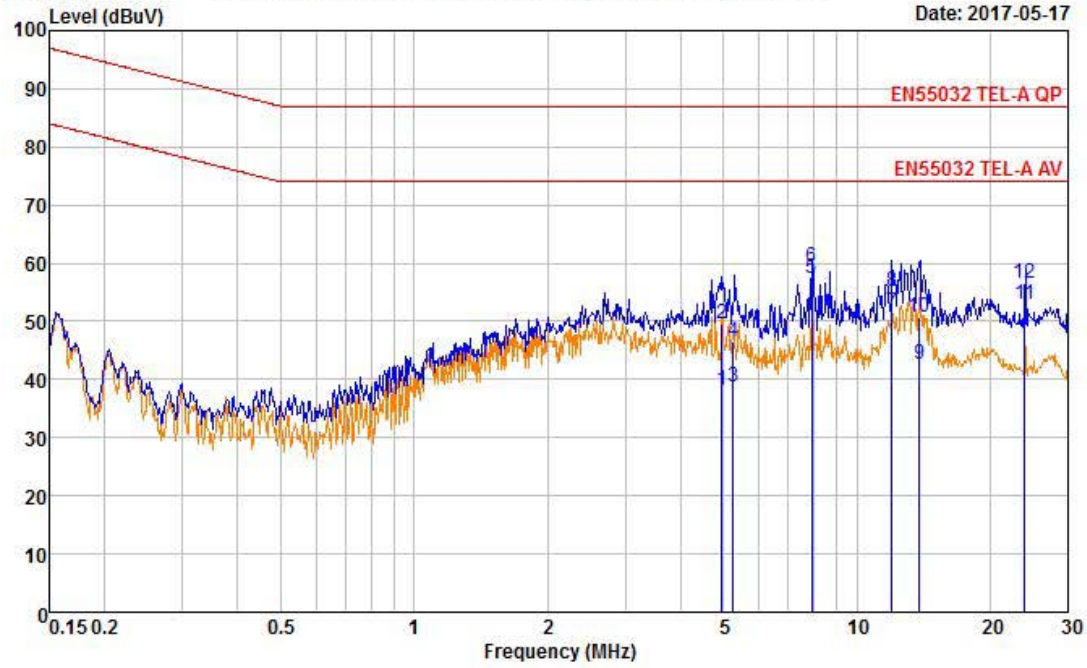
Conducted emissions (TEL_10 M) / LAN

LTA
Laboratory for Test & Approval Co.,Ltd.

4, Songjuro 236 Beon-gil, Yangji-myeon
Cheoin-gu, Youngin-si, Gyeonggi-do
449-822 Korea
Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT / Model No.	: DD-1216	Phase	: TEL_10M
Test Mode	: Capture mode	Test Power	: 230 / 50
Temp. / Humi.	: 21 / 36	Test Engineer	: LEE S H

Data: 884 File: D:\Conducted Data\2017\LTA_Conduction_2017_05.EM6 (1241)



Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
4.953	29.78	18.41	19.66	49.44	38.07	87.00	74.00	37.56	35.93
5.256	26.92	19.03	19.66	46.58	38.69	87.00	74.00	40.42	35.31
7.923	39.53	37.63	19.75	59.28	57.38	87.00	74.00	27.72	16.62
12.002	35.33	31.62	19.88	55.21	51.50	87.00	74.00	31.79	22.50
13.826	30.86	22.66	19.93	50.79	42.59	87.00	74.00	36.21	31.41
23.998	36.28	32.62	20.28	56.56	52.90	87.00	74.00	30.44	21.10

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss + Pulse Limiter

3.2.2 Radiated Emission

Definition:

The test assesses the ability of ancillary equipment to limit their internal noise from being radiated from the enclosure.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 55032:2015
Measuring Distance	:	10m
Measurement Frequency range	:	30 MHz – 1 000 MHz
Measurement RBW	:	120 kHz
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Refer to the Next page (Maximum emission configuration)
- No other emissions were detected at a level greater than 20 dB below limit

A sample calculation:

COR. F (correction factor)= Antenna factor + Cable loss- Amp.gain- Distance correction

Emission Level= meter reading + COR.F

TEST EQUIPMENT USED: 13, 14, 15, 19, 21, 22, 23

Limit of 10 m for below 1 GHz

CLASS A

Frequency Range	Quasi-peak
(30 – 230) MHz	40 dBuV/m
(230 – 1 000) MHz	47 dBuV/m

CLASS B

Frequency Range	Quasi-peak
(30 – 230) MHz	30 dBuV/m
(230 – 1 000) MHz	37 dBuV/m

Limit of 3m for above 1 GHz

CLASS A

Frequency Range	Average Limit @ 3m (dBµV/m)	Peak limit @ 3m (dBµV/m)
(1 000 – 3 000) MHz	56	76
(3 000 – 6 000) MHz	60	80
NOTE:	The lower limit applies at the transition frequency.	

CLASS B

Frequency Range	Average Limit @ 3m (dBµV/m)	Peak limit @ 3m (dBµV/m)
(1 000 – 3 000) MHz	50	70
(3 000 – 6 000) MHz	54	74
NOTE:	The lower limit applies at the transition frequency.	

TEST EQUIPMENT USED: 13, 14, 15, 19, 21, 22, 23

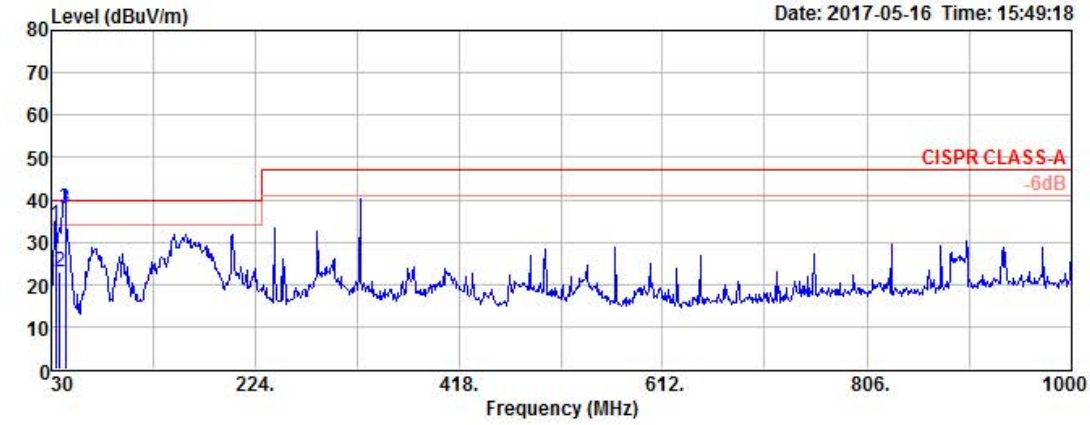
Radiated Emission (Below 1 GHz) / V

Laboratory for Test & Approval Co.,Ltd.
4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

EUT/Model No.: DD-1216 Temp/Humi: 21 / 36

Test Mode : capture mode Tested by: LEE S H

Data: 2205 File: C:\Program Files (x86)\e3\e3.EM6 (2411)



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
33.96	52.81	-18.90	33.91	40.00	6.09	147	78	VERTICAL
37.73	41.47	-18.48	22.99	40.00	17.01	264	277	VERTICAL
43.78	55.53	-17.75	37.78	40.00	2.22	332	6	VERTICAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emission (Below 1 GHz) / H

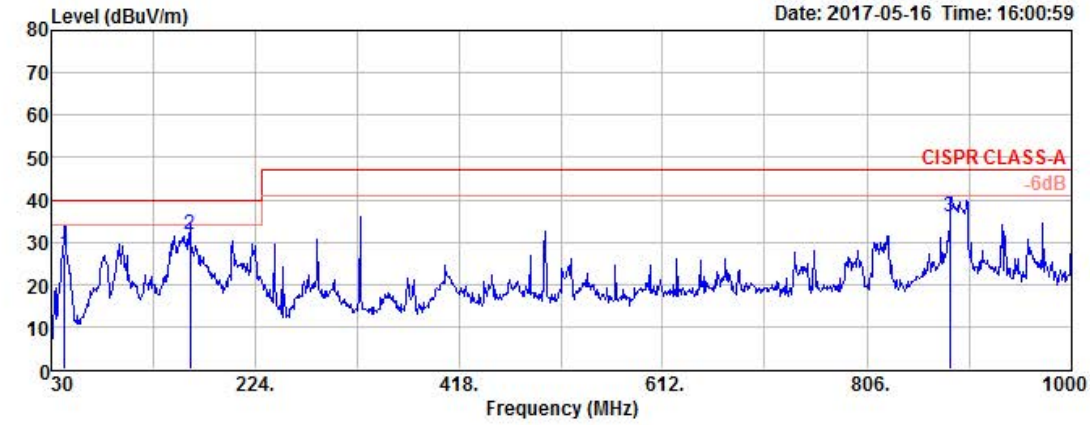
Laboratory for Test & Approval Co.,Ltd.

4, Songjuro 236Beon-gil, yanggi-myeon,
Yongin-si, Gyeonggi-do, Korea
Tel : +82-31-3236008,9
Fax : +82-31-3236010
www.ltalab.com

EUT/Model No.: DD-1216 Temp/Humi: 21 / 36

Test Mode : capture mode Tested by: LEE S H

Data: 2207 File: C:\Program Files (x86)\e3\e3.EM6 (2411)



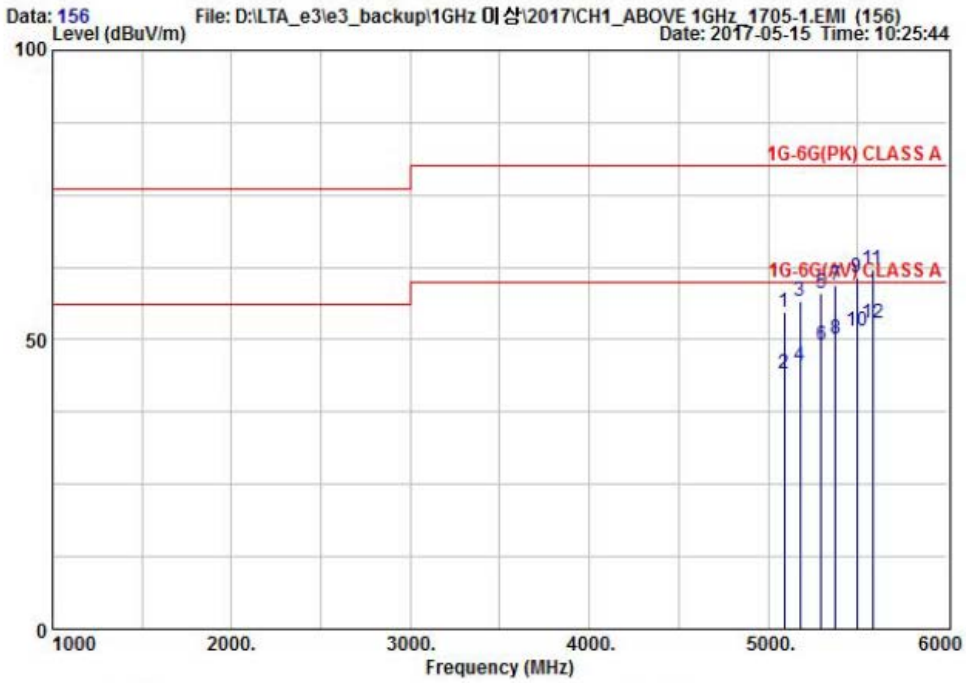
Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
42.79	44.90	-17.88	27.02	40.00	12.98	389	288	HORIZONTAL
162.02	48.38	-16.72	31.66	40.00	8.34	387	74	HORIZONTAL
883.99	39.76	-3.95	35.81	47.00	11.19	306	172	HORIZONTAL

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emission (Above 1 GHz)

EUT/Model No.: DD-1216 Test Mode: Capture mode

Tested by : LEE S H Temp/Humi: 21 / 36



Manufacture : IDIS CO., LTD.

Model : DD-1216

TEST mode : Captue mode

Test Date	Temp.: [℃]	Humidity: [%]	Barometric [mbar]
2017/5/15	21	36	

Freq.(MHz)	Reading(PK)	Reading(AV)	C.F	Result(PK)	Result(AV)	Limit(PK)	Limit(AV)	Margin(PK)	Margin(AV)	Height	Angle	Polarity
MHz	dBuV	dBuV	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	cm	deg	Hor/Ver
5087.6	38.3	27.6	16.59	54.89	44.19	80.0	60.0	25.11	15.81	100	147	V
5179.7	39.8	28.7	16.93	56.73	45.63			23.27	14.37	100	135	V
5298.3	40.8	31.8	17.37	58.17	49.17			21.83	10.83	100	341	V
5375.0	41.7	32.4	17.65	59.35	50.05			20.65	9.95	100	218	V
5497.1	42.6	33.4	18.11	60.71	51.51			19.29	8.49	100	174	V
5583.5	43.5	34.3	18.64	62.14	52.94			17.86	7.06	100	267	V

3.2.3 Harmonic Current (AC power input port)

Definition:

This part deals with the Limitation of harmonic currents injected into the public supply system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-3-2:2014
Test mode	:	Capture mode
Rated power	:	6.3173 W
Result	:	**Complies**

Measurement Data:

- Uncertainty(HAR) = +/- 2.24 % (with a 95 % confidence level, k=2)

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

TEST EQUIPMENT USED: 25, 26

Product:	DD-1216	2017 May 17 2:50pm
Serial no:	N/A	Page 1 of 1
Description:	Capture mode	
Test Date:	2017 May 17 2:45pm	
Result Name:	DD-1216_PASS	

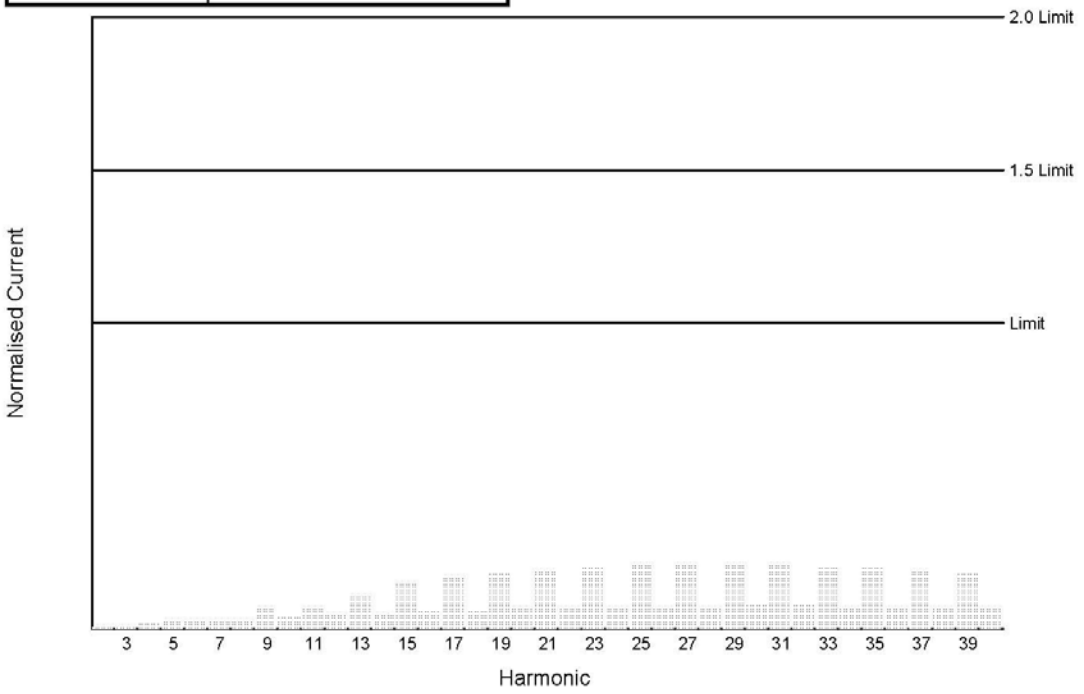
Type of Test:	EN61000:2006 Harmonics inc. interharmonics to EN61000-4-7:2002
Limits:	Class A
Power Analyzer:	Voltech PM6000 SN: 100006700108 Firmware version: v1.22.07RC6
	Channel(s):
	1. SN: 090015500547, 21 Adjusted Date: 7 FEB 2007. 2. SN:None Adjusted Date:None
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
	Shunt(s):
	1. SN: 091024300314, 4 Adjusted Date: 6 FEB 2007. 2. SN:None Adjusted Date:None
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None
AC Source:	Mains / Manual Source

Harmonic Results Against Chosen Limits:	**Notes:**
N/A	Minimum power is greater than maximum

Test Parameter Details	**User Entered**	**Measured**
Operating Frequency:	50	50.0320
Operating Voltage:	230	230.2343
Specified Power:	0.0000	6.3173
Fundamental Current:	0.0000	0.0357
Power Factor:	0.0000	0.2673
Average Input Current:		0.1017
Maximum POHC:		0.0504
POHC Limit:		0.2514
Maximum THC:		0.0922
Minimum Power:	75	
Class Multiplier:	1.0000	
Test Duration:	00:02:30	

Product:	DD-1216	2017 May 17 2:51pm
Serial no:	N/A	Page 1 of 1
Description:	Capture mode	
Result Name:	DD-1216_PASS	
Voltech IEC61000-3 Windows Software 1.24.12		Test Date: 2017 May 17 2:45pm
Type of Test:	Fluctuating Harmonics Test - Normalised Worst Case Bar Chart (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700108 Firmware version: v1.22.07RC6	
	Channel(s):	
	1. SN: 090015500547, 21 Adjusted Date: 7 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300314, 4 Adjusted Date: 6 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **N/A**		

Class	Class A
Class Multiplier	1



Product:	DD-1216	2017 May 17 2:51pm
Serial no:	N/A	Page 1 of 1
Description:	Capture mode	
Result Name:	DD-1216_PASS	
Voltech IEC61000-3 Windows Software 1.24.12		Test Date: 2017 May 17 2:45pm
Type of Test:	Fluctuating Harmonics Test - Worst Case Table (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700108 Firmware version: v1.22.07RC6	
	Channel(s):	
	1. SN: 090015500547, 21 Adjusted Date: 7 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300314, 4 Adjusted Date: 6 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **N/A**		

Class	Class A
Class Multiplier	1

Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL	Harm	Limit 1	Limit 2	Average Reading	<L1 <L2	Max Reading	<L2	Pass FAIL
2	1.0800A	1.6200A	6.972mA	✓ ✓	7.270mA	✓	N/A	3	2.3000A	3.4500A	26.08mA	✓ ✓	26.17mA	✓	N/A
4	430.0mA	645.0mA	6.913mA	✓ ✓	7.200mA	✓	N/A	5	1.1400A	1.7100A	25.90mA	✓ ✓	25.99mA	✓	N/A
6	300.0mA	450.0mA	6.865mA	✓ ✓	7.148mA	✓	N/A	7	770.0mA	1.1550A	25.56mA	✓ ✓	25.66mA	✓	N/A
8	230.0mA	345.0mA	6.794mA	✓ ✓	7.068mA	✓	N/A	9	400.0mA	600.0mA	25.11mA	✓ ✓	25.21mA	✓	N/A
10	184.0mA	276.0mA	6.690mA	✓ ✓	6.954mA	✓	N/A	11	330.0mA	495.0mA	24.55mA	✓ ✓	24.65mA	✓	N/A
12	153.3mA	230.0mA	6.551mA	✓ ✓	6.810mA	✓	N/A	13	210.0mA	315.0mA	23.90mA	✓ ✓	24.00mA	✓	N/A
14	131.4mA	197.1mA	6.388mA	✓ ✓	6.627mA	✓	N/A	15	150.0mA	225.0mA	23.15mA	✓ ✓	23.24mA	✓	N/A
16	115.0mA	172.5mA	6.202mA	✓ ✓	6.431mA	✓	N/A	17	132.3mA	198.5mA	22.32mA	✓ ✓	22.43mA	✓	N/A
18	102.2mA	153.3mA	5.995mA	✓ ✓	6.210mA	✓	N/A	19	118.4mA	177.6mA	21.41mA	✓ ✓	21.51mA	✓	N/A
20	92.00mA	138.0mA	5.771mA	✓ ✓	5.973mA	✓	N/A	21	107.1mA	160.7mA	20.44mA	✓ ✓	20.55mA	✓	N/A
22	83.63mA	125.4mA	5.526mA	✓ ✓	5.731mA	✓	N/A	23	97.82mA	146.7mA	19.42mA	✓ ✓	19.53mA	✓	N/A
24	76.66mA	115.0mA	5.273mA	✓ ✓	5.492mA	✓	N/A	25	90.00mA	135.0mA	18.34mA	✓ ✓	18.46mA	✓	N/A
26	70.76mA	106.1mA	5.004mA	✓ ✓	5.213mA	✓	N/A	27	83.33mA	125.0mA	17.22mA	✓ ✓	17.33mA	✓	N/A
28	65.71mA	98.57mA	4.714mA	N/A	4.934mA	N/A	N/A	29	77.58mA	116.3mA	16.09mA	✓ ✓	16.21mA	✓	N/A
30	61.33mA	92.00mA	4.417mA	N/A	4.644mA	N/A	N/A	31	72.58mA	108.8mA	14.94mA	✓ ✓	15.06mA	✓	N/A
32	57.50mA	86.25mA	4.130mA	N/A	4.355mA	N/A	N/A	33	68.18mA	102.2mA	13.77mA	✓ ✓	13.89mA	✓	N/A
34	54.11mA	81.17mA	3.835mA	N/A	4.058mA	N/A	N/A	35	64.28mA	96.42mA	12.61mA	✓ ✓	12.73mA	✓	N/A
36	51.11mA	76.66mA	3.512mA	N/A	3.742mA	N/A	N/A	37	60.81mA	91.21mA	11.48mA	✓ ✓	11.61mA	✓	N/A
38	48.42mA	72.63mA	3.227mA	N/A	3.444mA	N/A	N/A	39	57.69mA	86.53mA	10.36mA	✓ ✓	10.47mA	✓	N/A
40	46.00mA	69.00mA	2.918mA	N/A	3.119mA	N/A	N/A								

<L1 : Reading is below limit 1.
<L2 : Reading is below limit 2.
N/A : Overall Result is N/A

Product:	DD-1216	2017 May 17 2:51pm
Serial no:	N/A	Page 1 of 1
Description:	Capture mode	
Result Name:	DD-1216_PASS	
Voltech IEC61000-3 Windows Software 1.24.12		Test Date: 2017 May 17 2:45pm
Type of Test:	Fluctuating Harmonics Test - Source Qualification (2006)	
Power Analyzer:	Voltech PM6000 SN: 100006700108 Firmware version: v1.22.07RC6	
	Channel(s):	
	1. SN: 090015500547, 21 Adjusted Date: 7 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
	Shunt(s):	
	1. SN: 091024300314, 4 Adjusted Date: 6 FEB 2007. 2. SN:None Adjusted Date:None	
	3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None	
	5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **N/A**		

	Nominal	Measured	Deviation	Allowed Deviation	Result
Supply Voltage	230.00V	230.23V	0.23V	4.60V	Pass
Supply Frequency	50.00Hz	50.03Hz	0.03Hz	0.25Hz	Pass
Crest Factor	1.4100	1.4185	0.0085	+/- 0.01	Pass

Harmonic	Reading	Limit	Result	Harmonic	Reading	Limit	Result
2	0.13%	0.20%	Pass	3	0.06%	0.90%	Pass
4	0.04%	0.20%	Pass	5	0.03%	0.40%	Pass
6	0.03%	0.20%	Pass	7	0.03%	0.30%	Pass
8	0.03%	0.20%	Pass	9	0.02%	0.20%	Pass
10	0.02%	0.20%	Pass	11	0.02%	0.10%	Pass
12	0.01%	0.10%	Pass	13	0.01%	0.10%	Pass
14	0.01%	0.10%	Pass	15	0.01%	0.10%	Pass
16	0.01%	0.10%	Pass	17	0.01%	0.10%	Pass
18	0.01%	0.10%	Pass	19	0.01%	0.10%	Pass
20	0.01%	0.10%	Pass	21	0.01%	0.10%	Pass
22	0.01%	0.10%	Pass	23	0.01%	0.10%	Pass
24	0.01%	0.10%	Pass	25	0.01%	0.10%	Pass
26	0.01%	0.10%	Pass	27	0.01%	0.10%	Pass
28	0.01%	0.10%	Pass	29	0.01%	0.10%	Pass
30	0.01%	0.10%	Pass	31	0.01%	0.10%	Pass
32	0.01%	0.10%	Pass	33	0.01%	0.10%	Pass
34	0.01%	0.10%	Pass	35	0.01%	0.10%	Pass
36	0.01%	0.10%	Pass	37	0.01%	0.10%	Pass
38	0.01%	0.10%	Pass	39	0.01%	0.10%	Pass
40	0.01%	0.10%	Pass				

3.2.4 Voltage Variation and Flicking (AC power input port)

Definition:

This section is concerned with the limitation of voltage fluctuations and flicker impressed on the public low-voltage system.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-3-3:2013
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty(FLK) = +/- 9.94 % (with a 95 % confidence level, k=2)

"It has been demonstrated that the FLK generator meets the specified requirements in the standard with at least 95 % confidence."

Product:	DD-1216	2017 May 17 3:11pm
Serial no:	N/A	Page 1 of 1
Description:	Capture mode	
Result Name:	DD-1216_PASS	
Voltech IEC61000-3 Windows Software 1.24.12		Test Date: 2017 May 17 2:54pm
Type of Test:	Flickermeter Test - Table	
Power Analyzer:	Voltech PM6000 SN: 100006700108 Firmware Version: v1.22.07RC6 Channel(s): 1. SN: 090015500547, 21 Adjusted Date: 7 FEB 2007. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None Shunt(s): 1. SN: 091024300314, 4 Adjusted Date: 6 FEB 2007. 2. SN:None Adjusted Date:None 3. SN:None Adjusted Date:None 4. SN:None Adjusted Date:None 5. SN:None Adjusted Date:None 6. SN:None Adjusted Date:None	
AC Source:	Mains / Manual Source	
Overall Result: **PASS**	Notes: Measurement method - Voltage Source frequency lower than nominal	

	Pst	dc (%)	dmax (%)	d(t) > 3.3%(ms)
Limit	1.000	3.300	4.000	500
Reading 1	0.071	0.000	0.000	0

TEST EQUIPMENT USED: 25, 26

3.3 IMMUNITY

3.3.1 Electrostatic Discharge

Definition:

The test assesses the ability of the EUT to operate as intended in the event of an electrostatic discharge.
We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-2 :2009
Temperature / Humidity / Pressure	:	21 ℃ / 36 %RH / 100 kPa
Discharge Impedance	:	(330 ±10%)Ω / (150 ±10%) pF
Type of Discharge (air discharge)	:	± 2kV, ± 4 kV, ± 8 kV
Type of Discharge (contact discharge)	:	± 6 kV
Number of discharges at each point	:	10 of each polarity
Discharge Repetition on Rate	:	1 / sec
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty(ESD) = +/- 5 % (with a 95 % confidence level, k=2)

"It has been demonstrated that the ESD generator meets the specified requirements in the standard with at least 95 % confidence."

- Refer to the next page

Criteria for compliance:

- There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

1-2. **Indirect Discharge**

No.	Position	Kind of Discharge	Results	Remarks
①	HCP	Contact	Complies	No reaction recognized
②	VCP	Contact	Complies	No reaction recognized

1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure	Contact	Complies	No reaction recognized
2	USB #1, USB #2	Air	Complies	No reaction recognized
3	HDMI	Air	Complies	No reaction recognized
4	VGA	Air	Complies	No reaction recognized
5	CVBS	Air	Complies	No reaction recognized
6	LAN	Air	Complies	No reaction recognized
7	DC IN	Air	Complies	No reaction recognized

TEST EQUIPMENT USED: 27, 28, 03

3.3.2 RF Electromagnetic Field

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic field disturbance.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-3:2006/A2:2010
Frequency range	:	80 ㎒ to 27000 ㎒
Test level	:	10 V/m (measured unmodulated)
Amplitude Modulation	:	AM, 80 %, 1 ㎑ Sinusoidal
		PM, 1 ㎐ (0.5s ON : 0.5s OFF)
Step size	:	1 % of fundamental
Dwell Time	:	3 s
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty = +/- 1.6dB (with a 95 % confidence level, k=2.28)

"It has been demonstrated that the RS generator meets the specified requirements in the standard with at least 95 % confidence."

Port	Test level (V/m)	Result		Remark
		Horizontal	Vertical	
Enclosure	10	Complies	Complies	No reaction recognized

Criteria for compliance:

- There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicatiors occurs at a field strength of 3 V/m.
- For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m.

a) There is no permanent damage or change to the EUT.

b) At 3 V/m, any deterioration of the picture is so minor that the system could still be used.

c) There is no observable deterioration of the picture at 1 V/m

TEST EQUIPMENT USED: 29, 30, 31, 32, 33, 34, 35, 03, 28, 38, 39

3.3.3 Electrical fast transients

Definition:

The test assesses the ability of the EUT to operate as intended in the event of fast transients presence on one of the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-4:2012
Cable length	:	< 3 m
Test level	:	2.0 kV (AC power input port)
		1.0 kV (Signal port)
Polarity	:	Negative/ positive
Repetition frequency	:	100 kHz
Test mode		Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty = +/- 10 % (with a 95 % confidence level, k=2)

"It has been demonstrated that the EFT/Burst generator meets the specified requirements in the standard with at least 95 % confidence."

- Refer to the next page

Criteria for compliance:

- There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

power Line	Test level	Result	Remarks
L – N	+ 2 kV	Complies	No reaction recognized
	- 2 kV	Complies	No reaction recognized

Signal Line	Test level	Result	Remarks
LAN	+ 1 kV	Complies	No reaction recognized
	- 1 kV	Complies	No reaction recognized

TEST EQUIPMENT USED: 40, 28, 03, 41

3.3.4 Surge

Definition:

The test assesses the ability of the EUT to operate as intended in the event of surge presence on the AC main power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-5:2014
Test level	:	± 0.5 kV, ±1 kV (line to line) ± 0.5 kV, ± 1 kV, ± 2 kV (line to ground), ± 0.5 kV, ± 1 kV (signal line)
Polarity	:	Negative/ positive
Wave shape	:	1.2/ 50 μs pulse
Number of surges	:	5 (at each phase)
Test mode		Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty = +/- 10 % (with a 95 % confidence level, k=2)

"It has been demonstrated that the Surge generator meets the specified requirements in the standard with at least 95 % confidence."

- Refer to the next page

Criteria for compliance:

- There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

TEST EQUIPMENT USED: 42, 28, 03

Measurement Data:

Phase	Line	level	Result	Phase	Line	level	Result
0°	Line(L) to line(N)	+ 0.5, +1 kV	Complies	90°	Line(L) to line(N)	+ 0.5, +1 kV	Complies
		- 0.5, -1 kV	Complies			- 0.5, -1 kV	Complies
	Line(L) to ground(PE)	+ 1, +2 kV	Complies		Line(L) to ground(PE)	+ 1, +2 kV	Complies
		- 1, - 2 kV	Complies			- 1, - 2 kV	Complies
	Line(N) to ground(PE)	+ 1, +2 kV	Complies		Line(N) to ground(PE)	+ 1, +2 kV	Complies
		- 1, - 2 kV	Complies			- 1, - 2 kV	Complies
180°	Line(L) to line(N)	+ 0.5, +1 kV	Complies	270°	Line(L) to line(N)	+ 0.5, +1 kV	Complies
		- 0.5, -1 kV	Complies			- 0.5, -1 kV	Complies
	Line(L) to ground(PE)	+ 1, +2 kV	Complies		Line(L) to ground(PE)	+ 1, +2 kV	Complies
		- 1, - 2 kV	Complies			- 1, - 2 kV	Complies
	Line(N) to ground(PE)	+ 1, +2 kV	Complies		Line(N) to ground(PE)	+ 1, +2 kV	Complies
		- 1, - 2 kV	Complies			- 1, - 2 kV	Complies

Phase	Line	level	Result
–	-	–	-
		–	-

TEST EQUIPMENT USED: 42, 28, 03

3.3.5 Conducted disturbances, induced by radio-frequency fields

Definition:

The test assesses the ability of the EUT to operate as intended in the presence of a radio frequency electromagnetic disturbance on the input/output ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-6:2014
Frequency range	:	0.15㎒ – 100 ㎒
Test level	:	10 Vrms unmodulated
Amplitude Modulation	:	AM, 80 %, 1 ㎑ Sinusoidal
Step size	:	1 % of fundamental.
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty = +/-1.25 dB (with a 95 % confidence level, k=2)

Port	Test level (Vrms)	Result	Remarks
Power Line	10	Complies	No reaction recognized

Port	Test level (Vrms)	Result	Remarks
LAN	10	Complies	No reaction recognized

Criteria for compliance:

- There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at U_0 = 130 dBuV.
- For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at U_0 = 140 dBuV.

  a) There is no permanent damage or change to the EUT.

  b) At U_0 = 130 dBuV, any deterioration of the picture is so minor that the system could still be used.

  c) There is no observable deterioration of the picture at U_0 = 120 dBuV

TEST EQUIPMENT USED: 46, 47, 48, 03, 28, 49, 51

3.3.6 Mains supply voltage dips, short interruptions

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage dips and interruptions present on the AC mains power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 61000-4-11:2004
Ut	:	230 Vac
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

- Uncertainty = +/- 5 % (with a 95 % confidence level, k=2)

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

Test Level %Ut	Voltage droop and interruptions %Ut	Duration of Reduction (period)	Result	Remarks
80	20	250	Complies	No reaction recognized
70	30	25	Complies	No reaction recognized
40	60	10	Complies	No reaction recognized
0	100	250	Complies	EUT took off during the test. After the test, EUT operated normally.

Criteria for compliance:

- Mains supply voltage variations

There shall be no damage, malfunction or change of status due to the different supply voltage conditions.

- Mains supply voltage dips and short interruptions

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

During the 250 period power loss, in accordance with the standard, a UPS was used to maintain full operation of the unit.

TEST EQUIPMENT USED: 55, 16, 28, 03

3.3.7 Mains supply voltage variations

Definition:

The test assesses the ability of the EUT to operate as intended in the event of voltage variations present on the AC mains power input ports.

We were performed the test according to LTA procedure LTA-QI-04.

Test method	:	EN 50130-4 Clause 7
Supply Voltage maximum	:	*U*nom + 10 %
Supply Voltage minimum		*U*nom – 15 %
Ut	:	230 Vac
Test mode	:	Capture mode
Result	:	**Complies**

Measurement Data:

*U*nom = Nominal mains voltage. Where provision is made to adapt the equipment to suit a number of nominal supply voltages (e.g. by transformer tap changing), the above conditioning severity shall be applied for each nominal voltage, with the equipment suitably adapted. For equipment which is claimed to be suitable for a range of nominal mains voltages (e.g. 220/240 V) without adaptation, *U*max = (Maximum *U*nom) + 10 %, and *U*min = (Minimum *U*nom) p 15 %. In any case the range of *U*nom must include the European nominal mains voltage of 230 V.

2 **Mains supply voltage variations**

230 V, 50 Hz

Test LevelCondition		Test Level (V)	Result	Remarks
Unom	+10%	253	Complies	No reaction recognized
Unom	-15%	195.5	Complies	No reaction recognized

TEST EQUIPMENT USED: 55, 16, 28, 03

APPENDIX A

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment are identified by the Test Laboratory.

	Description	Model No.	Serial No.	Manufacturer	Interval	LAST Cal.
1	EMI TEST Receiver	ESR	101499	Rohde & Schwarz	1 year	Jul-16
2	Pulse Limiter	ESH3-Z2	100710	Rohde & Schwarz	1 year	Mar-17
3	DIGITAL THERMO HYGROMETER	TH-611	NONE	BODYCOM	1 year	Sep-16
4	DTV Signal Generator	MFG-100	15M2002	MFLO	1 year	Mar-17
5	Color TV Pattern Generator	PM-5518-TX	LO5333	Philips	-	-
6	LISN	ESH3-Z6	100378	Rohde & Schwarz	1 year	Sep-16
7	LISN(main)	ESH3-Z5	893045/017	Rohde & Schwarz	1 year	Mar-17
8	LISN(sub)	ENV216	100408	Rohde & Schwarz	1 year	Sep-16
9	ISN	ISN T800	27109	TESEQ	1 year	Jan-17
10	ISN	ENY81-CA6	101565	Rohde & Schwarz	1 year	Jan-17
11	CURRENT PROBE	EZ-17	100508	Rohde & Schwarz	1 year	Jan-17
12	LISN	ESH3-Z6	100378	Rohde & Schwarz	1 year	Sep-16
13	EMI TEST Receiver	ESCI7	100772	Rohde & Schwarz	1 year	Sep-16
14	Amplifier (25 ㏈)	8447D	2944A07684	HP	1 year	Sep-16
15	DIGITAL THERMO HYGROMETER	TESTEK-303A	TAEGUANG	-	1 year	Mar-17
16	STEP TRANSFORMER	INA6502	34270	SCHAFFNER	1 year	Sep-16
17	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	2 year	Apr-17
18	Biconical Antenna	VHA 9103	VHA 9103-2315	SCHWARZBECK	2 year	Apr-17
19	TRILOG Antenna	VULB9160	9160-3237	SCHWARZBECK	2 year	Jul-16
20	TRILOG Antenna	VULB9160	9160-3242	SCHWARZBECK	2 year	Jul-16
21	Amplifier (25 ㏈)	8449B	3008A00337	HP	1 year	Mar-17
22	Spectrum Analyzer (~ 26.5 ㎓)	E4407B	MY45108946	Agilent	1 year	Mar-17
23	HORN ANTENNA	3115	114105	ETS	2 year	May-16
24	HORN ANTENNA	3115	114105	ETS	2 year	Jul-16
25	Universal Power Analyzer	PM6000	1E+11	Voltech Instruments	1 year	Mar-17
26	Reference Impedance Network	ES4152	9074424	NF Corp.	1 year	Sep-16
27	ESD Slimulator	ESS-2000	8000C03241	NOISEKEN	1 year	Dec-16
28	Hygro-Thermograph	THB-36	0041557-01	ISUZU	1 year	Dec-16
29	Signal Generator	E4432B	MY41310632	Agilent	1 year	May-16
30	Power Meter	E4419B	GB38410133	Agilent	1 year	Jun-16
31	RF POWER AMPLIFIER	ITA0300KL-300	0300KL 1507 001	INFINITECH	1 year	Aug-16
32	RF POWER AMPLIFIER	ITA2000KL-120	200KL 1507 001	INFINITECH	1 year	Aug-16
33	RF POWER AMPLIFIER	ITA4500KL-70	4500KL 1507 001	INFINITECH	1 year	Aug-16
34	RF POWER AMPLIFIER	ITA0750KL-300	0750KL 1507 001	INFINITECH	1 year	Aug-16

	Description	Model No.	Serial No.	Manufacturer	Interval	LAST Cal.
35	Log.-Per.Antenna (80 ㎒ ~3 ㎓)	K9128	NONE	RAPA	-	-
36	Microphone	MP201	530147	BSWA	1 year	Nov-16
37	Sound Acoustic Tester	TST-1000	15065-A	TESTEK	1 year	Nov-16
38	Horn Antenna	3115A	114105	ETS	2 year	Jul-16
39	Signal Generator	SMB 100A	177621	R&S	1 year	May-17
40	EFT Simulator	FNS-AX2	4000B01332	NoiseKen	1 year	Sep-16
41	Capacitive Coupling Clamp	CDN 8015	21240	SCHAFFNER	1 year	Sep-16
42	LIGHTNING SURGE SIMULATOR	LSS-6030	LSS02X0153	NOISEKEN	1 year	Sep-16
43	R-BOX (4x100O HM)	INA 172	SL403-109	SCHAFFNER	1 year	-
44	CDN	CDN 117	20985	SCHAFFNER	1 year	-
45	CDN	CDN 118	20082	SCHAFFNER	1 year	-
46	Signal generator	SML03	103026/0013	R&S	1 year	Mar-17
47	POWER METER	NRVD	101689	R&S	1 year	Mar-17
48	RF Power Amplifier	FLL75A	1033	FRANKONIA	1 year	Dec-16
49	EM INJECTION CLAMP	TSIC-23	529	F.C.C	1 year	Jun-16
50	CDN (M1)	TSCDN-M1-16A	7004	F.C.C	1 year	Sep-16
51	CDN (M2)	TSCDN-M2-16A	7008	F.C.C	1 year	Sep-16
52	CDN (M3)	TSCDN-M3-16A	7017	F.C.C	1 year	Sep-16
53	Coil	INA 702	132	SCHAFFNER	6 month	Apr-17
54	Magnetic Field Generator	MFO6502	34267	SCHAFFNER	6 month	Apr-17
55	Modula System	MODULA6100	34395	SCHAFFNER	1 year	Sep-16

APPENDIX B

PERFORMANCE CRITERIA

Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.
If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.
A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of discharge is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test
(see Clause 6), after the conditioning.

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m.
For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing.
(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable setting etc.)
(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and
(c) there is no observable deterioration of the picture at 1 V/m.
The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of the bursts is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test
(see Clause 6), after the conditioning.

Slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the application of the surges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test
(see Clause 6), after the conditioning.

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at U0 = 130 dBμV.
For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at U0 = 140 dBμV, providing

(a) there is no permanent damage or change to the EUT
(e.g. no corruption of memory or changes to programmable settings, etc.)
(b) at U0 = 130 dBμV, any deterioration of the picture is so minor that the system could still be used, and
(c) there is no observable deterioration of the picture at U0 = 120 dBμV.
The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

Voltage dip/interruption / Voltage variation

There shall be no damage, malfunction or change of status due to the conditioning.
Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change. The EUT shall meet the acceptance criteria for the functional test(see Clause 6), after the conditioning.

Mains supply voltage variations

There shall be no damage, malfunction or change of status due to the different supply voltage conditions. The EUT shall meet the acceptance criteria for the functional test(see Clause 6), during the conditioning.

APPENDIX C

Measurement Uncertainty

1. Conducted Emission
2. Radiated Emission

1. Conducted Emission

Input Quantity	Probability Distribution	Probability Distribution (dB)	Standard
		9 kHz – 30 MHz	
Cable loss(RG400)	Standard Deviation(SD)	± 0.061	10th measurement
Receiver corrections; -Sine wave voltage -Pulse amplitude response -Pulse repetition rate response	 Rectangular (√ 3) Rectangular (√ 3) Rectangular (√ 3)	 ± 0.17 ± 0.02 ± 0.58	 Cal. Report Cal. Report Cal. Report
LISN corrections (ENV216) ; -Voltage division factor	Normal (k = 2)	± 0.09	Cal. Report
Mismatch ; - Receiver VRC* : Γi = 0.09 -LISN VRC :Γg = 0.14(150kHz) = 0.05(30MHz) - Uncertainty: 20log(1± Γi Γg)	U-type(√ 2)	± 0.89	Cal. Report
System Repeatability	Standard Deviation(SD)	± 0.28	10th measurement
Combined measurement uncertainty Uc(y)	Normal	+ 0.73 - 0.73	
Expended measurement uncertainty (95.%,Confidence level,k = 2)dB	Normal(k = 2)	+ 1.46 - 1.46	

2. Below 1 GHz Radiated Emission

Input Quantity	Probability Distribution	Probability Distribution (dB)		Standard
		Trilog		
		3m	10m	
Antenna Factor (VULB 9160)	Normal (k = 2)	30 MHz – 1 GHz ± 2.00	30 MHz – 1 GHz ± 2.00	ANT Cal. uncertainty
Cable loss (HFB-5010/HFC12D)	Standard Deviation(SD)	± 0.14	± 0.14	10th measurement
Receiver corrections; -Sine Wave Voltage -Pulse amplitude response -Pulse repetition rate response	 Normal (k = 2) Normal (k = 2) Rectangular(√ 3)	 ± 0.17 ± 0.58 ± 1.50	 ± 0.17 ± 0.58 ± 1.50	 Cal. Report Cal. Report CISPR16-4-2
Antenna Directivity	Rectangular(√ 3)	± 1.00	± 1.00	CISPR16-4-2
AF Height Dependence	Rectangular(√ 3)	± 0.10	± 0.10	CISPR16-4-2
Phase Center Location	Rectangular(√ 3)	± 0.20	± 0.20	CISPR16-4-2
Separation Distance	Rectangular(√ 3)	± 0.30	± 0.30	CISPR16-4-2
Uncertainty of Site	Triangular(√ 6)	± 2.97	± 2.97	NSA
Mismatch ; - Receiver VRC* : Γi = 0.09 -ANT. VRC : Γg = 0.09 - Uncertainty: 20log(1± Γi Γg)	U-type (√ 2)	± 0.54	± 0.54	CISPR16-4-2
Pre-amp.	Normal (k = 2)	± 0.14	± 0.14	Cal. Report
System Repeatability	Standard Deviation(SD)	± 0.60	± 0.60	10th measurement
Combined measurement uncertainty Uc(y)	Normal	+ 1.97 - 1.97	+ 1.97 - 1.97	
Expended measurement uncertainty (95%,Confidence level,k=2)dB	Normal(k = 2)	30 MHz – 1 GHz + 3.94 - 3.94	30 MHz – 1 GHz + 3.94 - 3.94	

Note:VRC(Voltage Reflection Coefficient)

3. Above 1 GHz Radiated Emission

Input Quantity	Probability Distribution	Probability Distribution (dB)	Standard
		HORN	
Antenna Factor (ETS 3115)	Normal (k=2) (normal)	1 GHz - 6 GHz ± 1.00	ANT Cal. uncertainty
Cable loss (SUHNER MULTIFLEX microwave cables)	Standard Deviation(SD)	± 0.32	10th measurement
Receiver corrections; -Sine Wave Voltage -Pulse amplitude response -Pulse repetition rate response	 Normal (k = 2) Normal (k = 2) Rectangular(√ 3)	 ± 0.17 ± 0.58 ± 1.50	 Cal. Report Cal. Report CISPR16-4-2
Antenna Directivity	Rectangular(√ 3)	± 1.00	CISPR16-4-2
AF Height Dependence	Rectangular(√ 3)	± 0.10	CISPR16-4-2
Phase Center Location	Rectangular(√ 3)	± 0.20	CISPR16-4-2
Separation Distance	Rectangular(√ 3)	± 0.30	CISPR16-4-2
Uncertainty of Site	Standard Deviation(SD)	± 0.13	SVSWR 10th measurement
Mismatch ; - Receiver VRC* : Γi = 0.09 -ANT. VRC : Γg = 0.09 - Uncertainty: 20log(1± Γi Γg)	U-type (√ 2)	± 0.54	CISPR16-4-2
Pre-amp.	Normal (k = 2)	± 0.60	Cal. Report
System Repeatability	Standard Deviation(SD)	± 0.34	10th measurement
Combined measurement uncertainty Uc(y)	Normal	+ 1.73 - 1.73	
Expended measurement uncertainty (95%,Confidence level,k=2)dB	Normal(k = 2)	1 GHz - 6 GHz + 3.46 - 3.46	

Note:VRC(Voltage Reflection Coefficient)

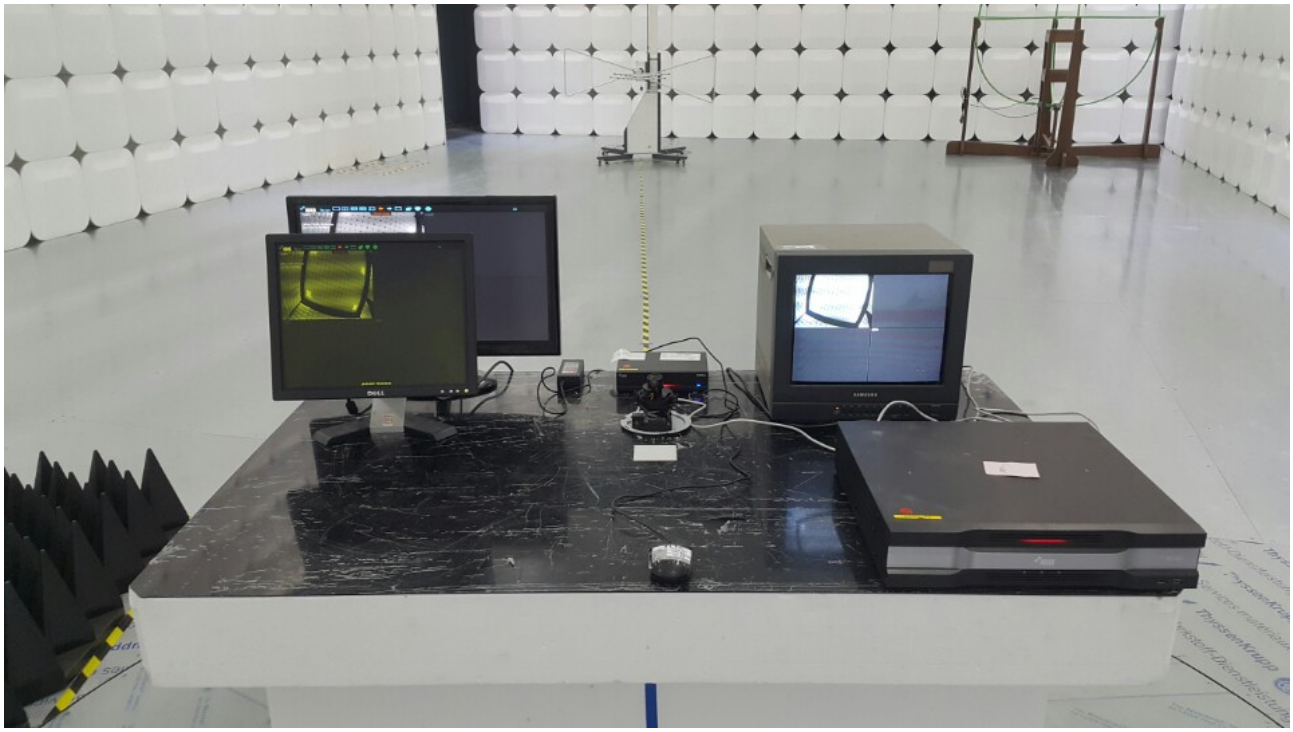
APPENDIX D

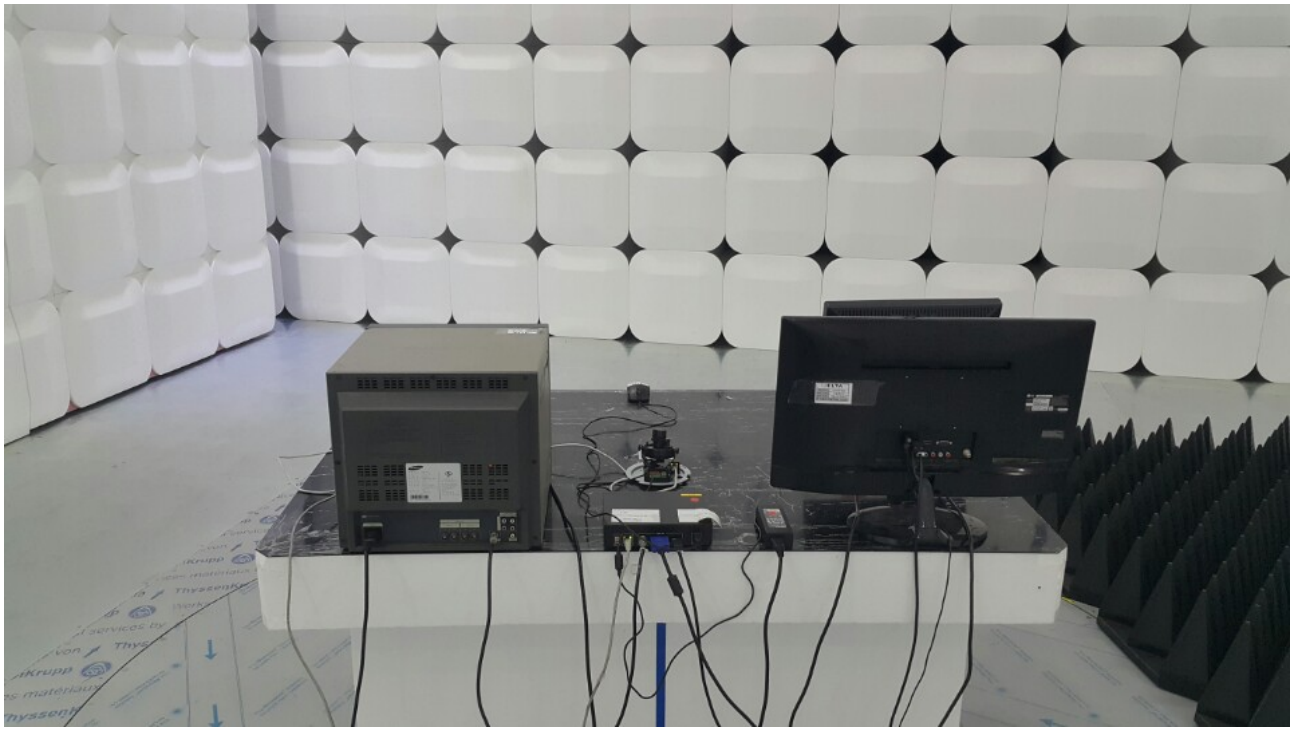
PHOTOGRAPHS

Conducted emission (Maximum emission configuration)

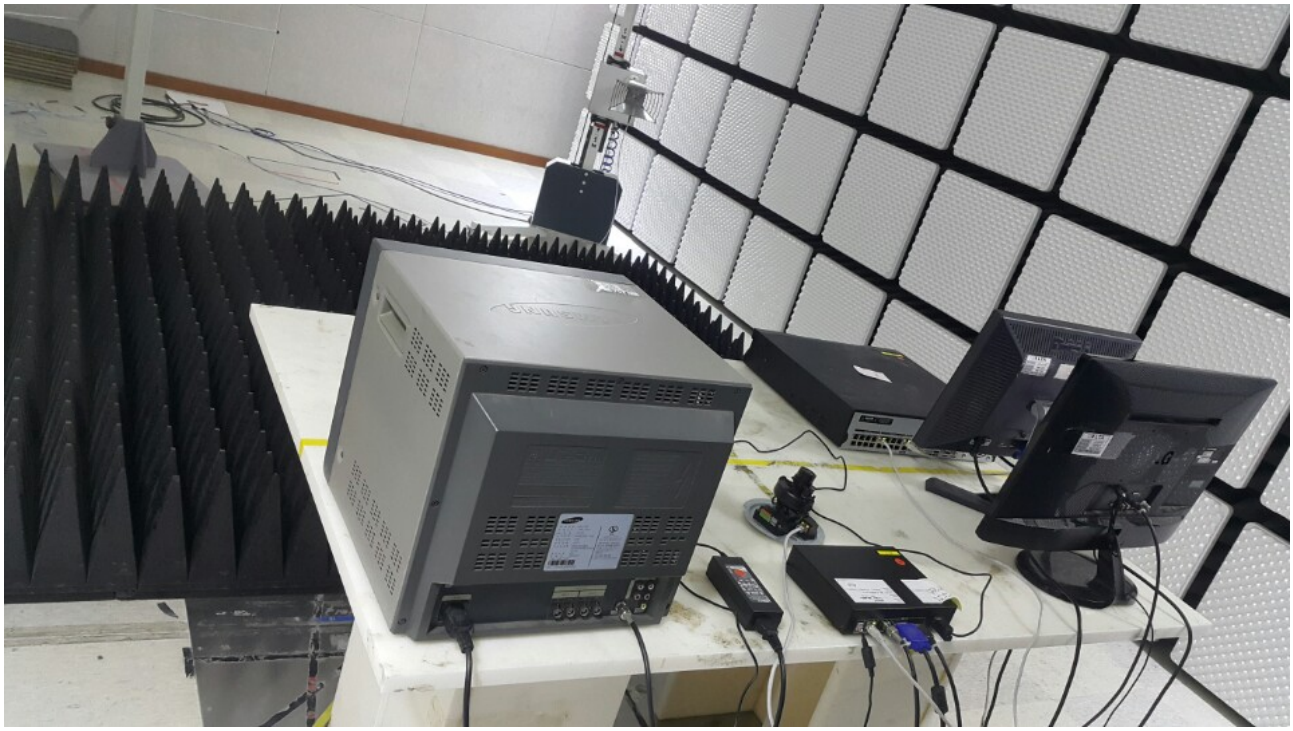
Conducted emission (Maximum emission configuration) _ TEL

Radiated emission (Maximum emission configuration)-Below 1 GHz



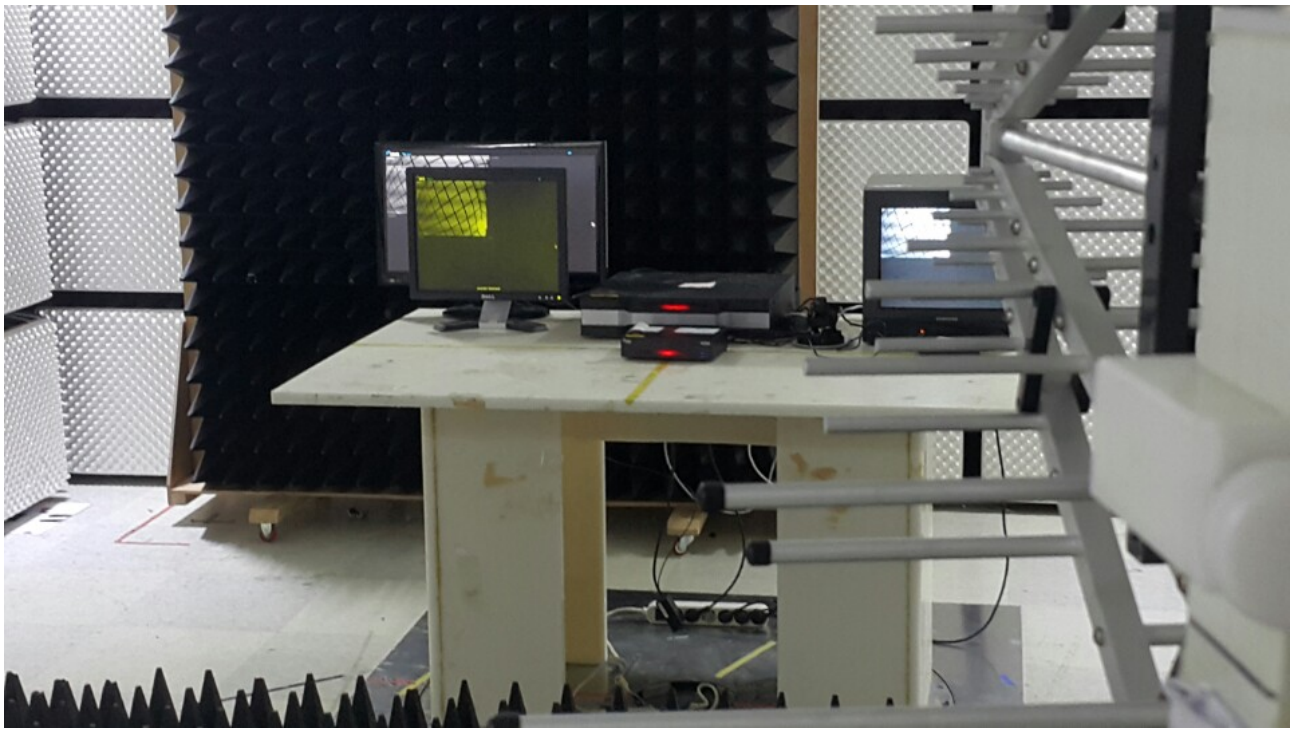


Radiated emission (Maximum emission configuration) – Above 1GHz



Electrostatic discharge

RF Electromagnetic Field



Electrical fast transients

Surge

Main supply voltage dips, short interruptions

EUT

EUT

EUT


Client :
Product :
Video Decoder
Model :
DD-1216
Receipt :
Certification :
Project No. :
Process :
Stand by
Proceeding
Completion
Comment
4/25
LTA CO., LTD.
EUT
#17