LTA
Laboratory for Test & Approval Co.,Ltd.

243 Jubug-ri, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do 449-822, Korea
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EMC TEST REPORT

Dates of Tests: November 08 – 14, 2017
Test Report S/N: LR500121711K
Test Site : LTA Co., Ltd.

Model No. **HE-1101**

APPLICANT **IDIS CO., LTD.**

Manufacturing Description	:	**Video Encoder**
Manufacturer	:	**IDIS CO., LTD.**
Model name	:	**HE-1101**
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	:	**November 16, 2017**

This test report is issued under the authority of:

Young Kyu Shin, Technical Manager

The test was supervised by:

Tae Won Kim, 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	16.11.2017	LR500121711K	Initial

TABLE OF CONTENTS

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	Updating	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2019-04-13	FCC CAB
VCCI	JAPAN	C-4948, T-2416, R-4483(10 m), G-847	2020-09-10 2020-09-10 2020-10-15 2018-12-13	VCCI registration
IC	CANADA	5799A-1	2019-11-07	IC filing
KOLAS	KOREA	NO.551	2021-08-20	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

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 Encoder
Model name	:	HE-1101
Additional Model Name	:	-
Serial number	:	Identification
Date of receipt	:	October 24, 2017
EUT condition	:	Pre-production, not damaged
Interface ports	:	DC IN, HDMI IN, HDMI OUT, D-Sub IN, D-Sub OUT, Audio IN, Audio OUT, LAN, USB-B
Power rating	:	DC 12 V (Used for Adapter)
Modulator	:	-
Crystal/Oscillator(s)	:	-
Firmware version	:	XXXX

2-3 Modification

-NONE

2-4 Model Specification

-NONE

2-5 Test conditions

Temp. / Humid. / Pressure	:	+(18 - 23) ℃ / (34 - 47) %RH / (99.9) kPa
Tested Model	:	HE-1101
Test mode	:	1 kHz + Operating mode (Adapter, PoE)
Power supply	:	AC 230 V / 50 Hz

2-6 Ancillary Equipment / 1 kHz + Operating mode (Adapter)

Equipment	Model No.	Serial No.	Manufacturer
Adapter	JP6004AS	SB1604000099	SEUNG BO ELECOM
NVR	N/A	N/A	N/A
Monitor #1	P2416D	N/A	DELL
Moniotr #2	U2412M	N/A	DELL
Mobile Phone	IM-A770K	N/A	SKY
Earphone	N/A	N/A	SAMSUNG

2-6 Ancillary Equipment / 1 kHz + Operating mode (PoE)

Equipment	Model No.	Serial No.	Manufacturer
PoE Adapter	PSE305	N/A	Gigabit
NVR	N/A	N/A	N/A
Monitor #1	P2416D	N/A	DELL
Moniotr #2	U2412M	N/A	DELL
Mobile Phone	IM-A770K	N/A	SKY
Earphone	N/A	N/A	SAMSUNG

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: The device is operated by DC Power.

Note 3: 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	:	1 kHz + Operating mode (Adapter, PoE)
Result	:	**Complies**

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

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		

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)

Conducted emissions / LINE _ 1 kHz + Operating mode (Adapter)

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EUT / Model No.	: HE-1101	Phase	: LINE
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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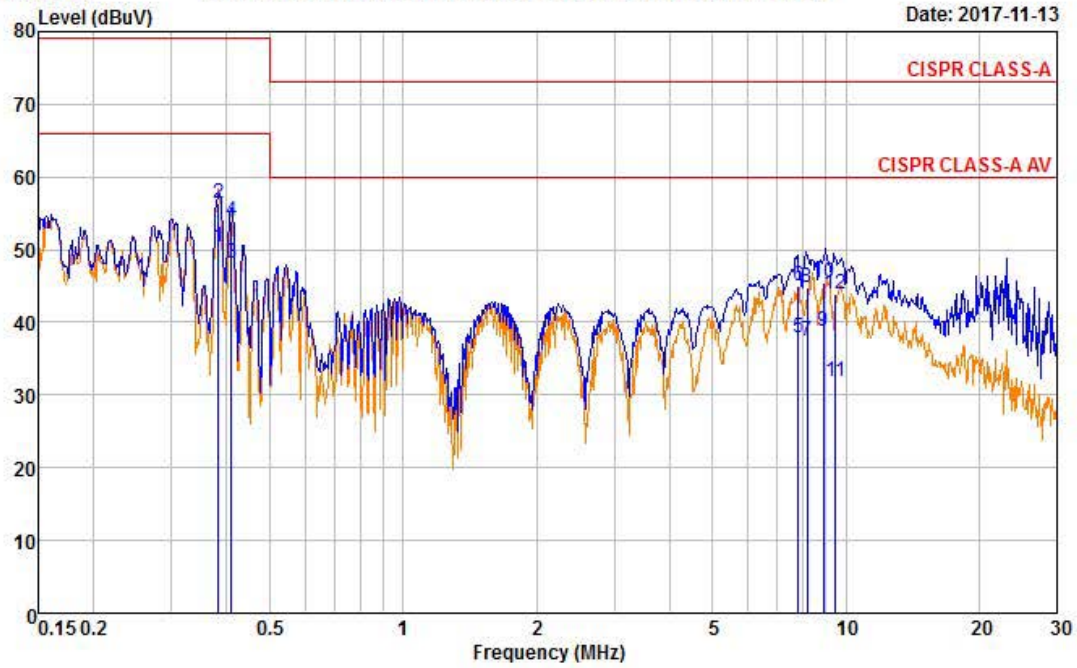

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.383	36.98	30.89	19.44	56.42	50.33	79.00	66.00	22.58	15.67
0.409	34.51	28.63	19.44	53.95	48.07	79.00	66.00	25.05	17.93
7.802	25.57	18.38	19.53	45.10	37.91	73.00	60.00	27.90	22.09
8.179	25.26	18.00	19.53	44.79	37.53	73.00	60.00	28.21	22.47
8.895	25.81	19.13	19.55	45.36	38.68	73.00	60.00	27.64	21.32
9.467	24.33	12.33	19.56	43.89	31.89	73.00	60.00	29.11	28.11

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

Conducted emissions / NEUTRAL _ 1 kHz + Operating mode (Adapter)

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EUT / Model No.	: HE-1101	Phase	: NEUTRAL
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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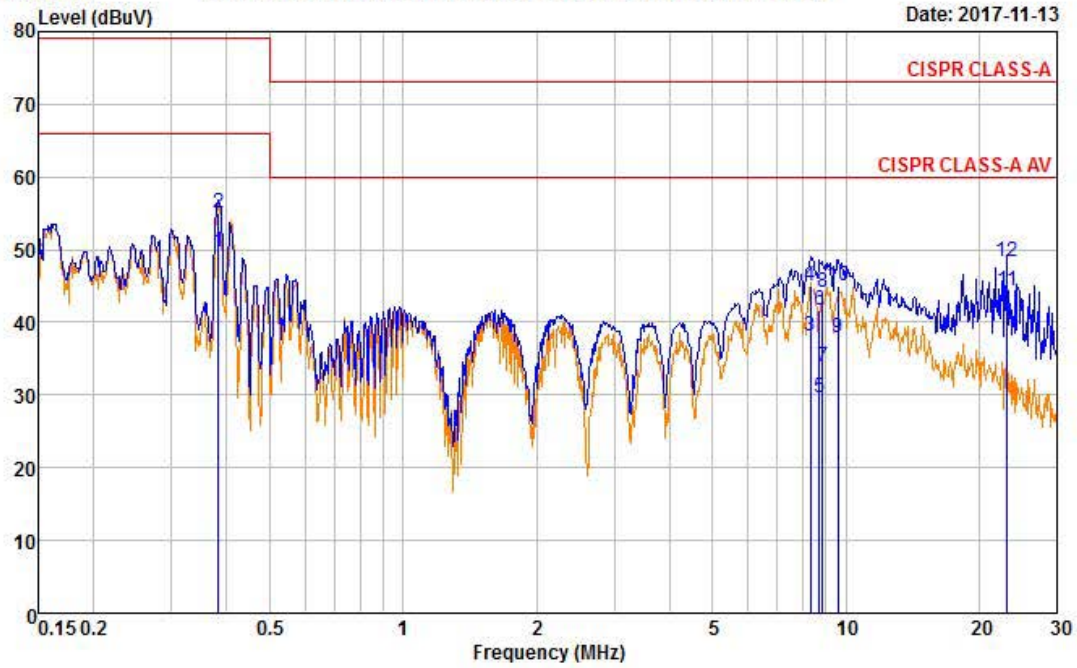

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.383	35.58	30.26	19.42	55.00	49.68	79.00	66.00	24.00	16.32
8.311	25.49	18.57	19.52	45.01	38.09	73.00	60.00	27.99	21.91
8.720	22.14	10.14	19.55	41.69	29.69	73.00	60.00	31.31	30.31
8.879	24.54	14.41	19.55	44.09	33.96	73.00	60.00	28.91	26.04
9.599	25.36	18.25	19.56	44.92	37.81	73.00	60.00	28.08	22.19
23.129	28.62	24.50	19.74	48.36	44.24	73.00	60.00	24.64	15.76

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

Conducted emissions / TEL_10 M _ 1 kHz + Operating mode (Adapter)

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EUT / Model No.	: HE-1101	Phase	: TEL_10M
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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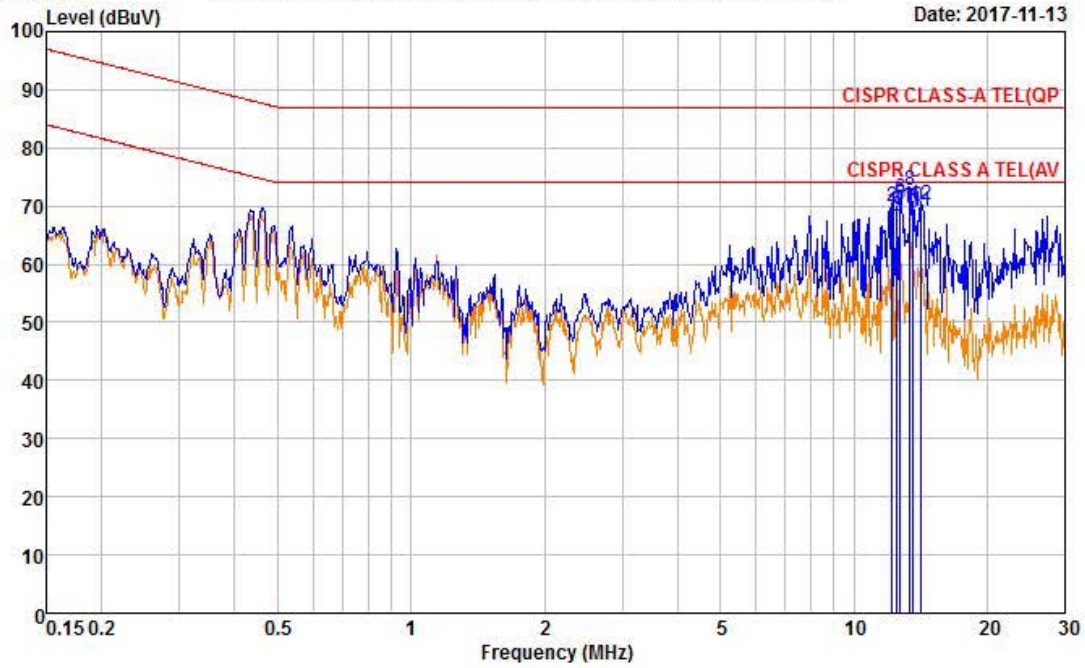

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
12.198	50.26	49.22	19.73	69.99	68.95	87.00	74.00	17.01	5.05
12.504	49.46	48.46	19.74	69.20	68.20	87.00	74.00	17.80	5.80
12.748	51.56	50.55	19.75	71.31	70.30	87.00	74.00	15.69	3.70
13.420	52.83	49.79	19.76	72.59	69.55	87.00	74.00	14.41	4.45
13.603	50.22	49.16	19.77	69.99	68.93	87.00	74.00	17.01	5.07
14.213	50.30	49.26	19.79	70.09	69.05	87.00	74.00	16.91	4.95

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

Conducted emissions / TEL_100 M _ 1 kHz + Operating mode (Adapter)

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EUT / Model No.	: HE-1101	Phase	: TEL_100M
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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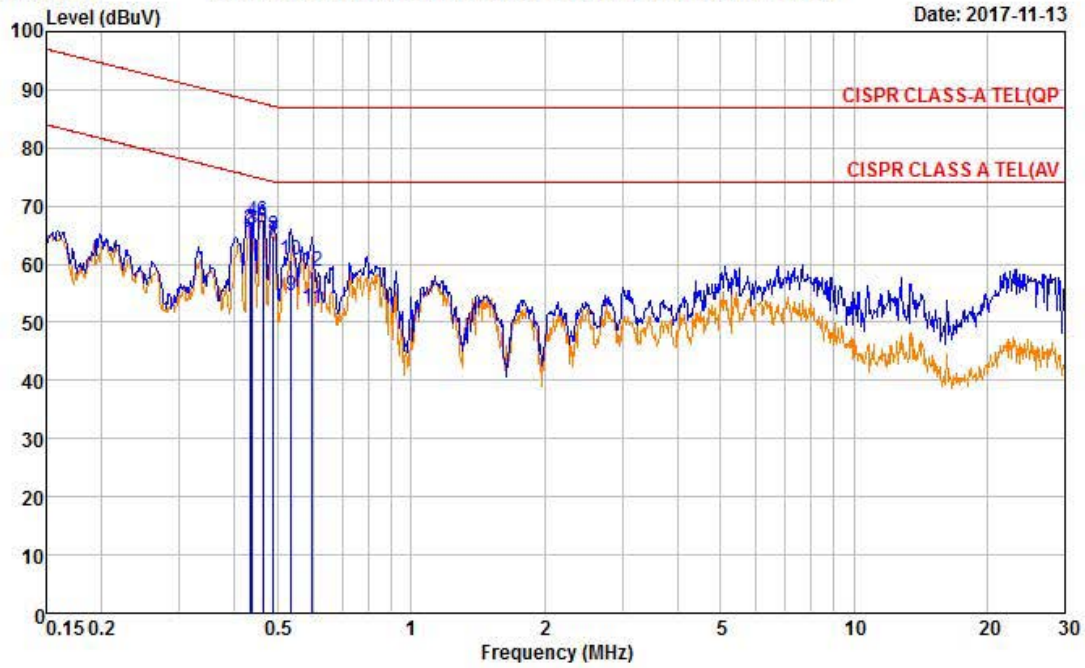

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.433	46.43	44.21	19.70	66.13	63.91	88.20	75.20	22.07	11.29
0.438	47.68	46.43	19.69	67.37	66.12	88.11	75.11	20.74	8.99
0.462	47.73	46.71	19.68	67.41	66.39	87.66	74.66	20.25	8.27
0.488	45.11	44.53	19.67	64.78	64.20	87.20	74.20	22.42	10.00
0.537	41.11	34.93	19.66	60.77	54.59	87.00	74.00	26.23	19.41
0.598	39.08	32.83	19.63	58.71	52.46	87.00	74.00	28.29	21.54

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

Conducted emissions / TEL_10 M _ 1 kHz + Operating mode (PoE)

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EUT / Model No.	: HE-1101	Phase	: TEL_10M
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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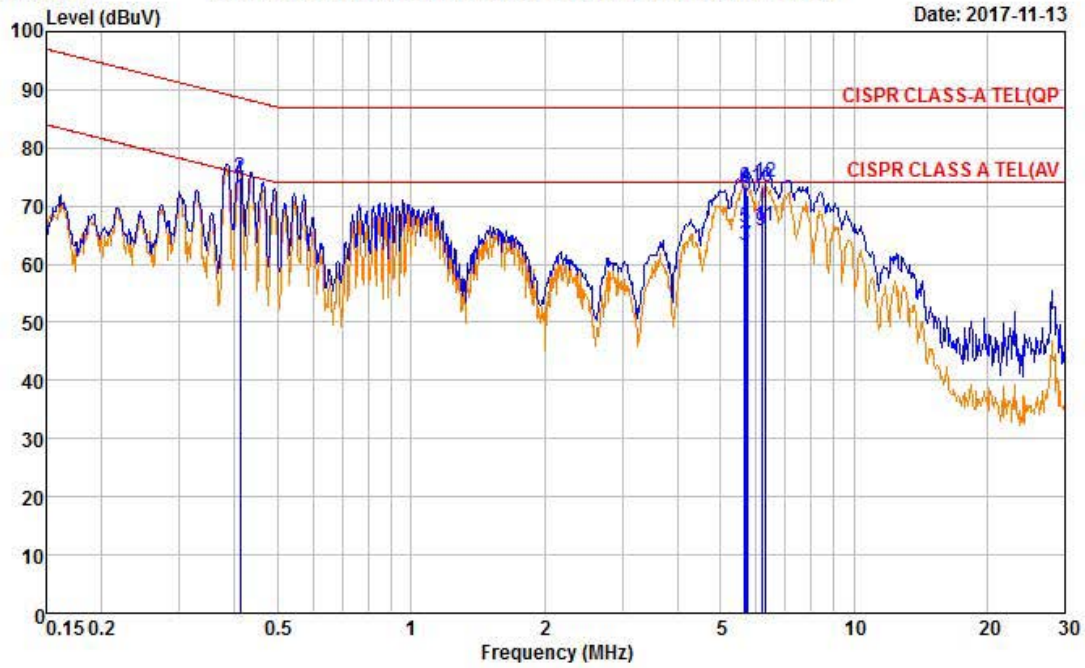

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.411	55.21	51.52	19.72	74.93	71.24	88.63	75.63	13.70	4.39
5.676	53.84	43.68	19.54	73.38	63.22	87.00	74.00	13.62	10.78
5.694	53.84	46.65	19.54	73.38	66.19	87.00	74.00	13.62	7.81
5.755	52.28	43.78	19.54	71.82	63.32	87.00	74.00	15.18	10.68
6.190	53.82	46.22	19.55	73.37	65.77	87.00	74.00	13.63	8.23
6.293	54.41	47.01	19.56	73.97	66.57	87.00	74.00	13.03	7.43

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

Conducted emissions / TEL_100 M _ 1 kHz + Operating mode (PoE)

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EUT / Model No.	: HE-1101	Phase	: TEL_100M
Test Mode	: 1kHz + Operating mode	Test Power	: 230 / 50
Temp. / Humi.	: 20 / 41	Test Engineer	: KIM T W

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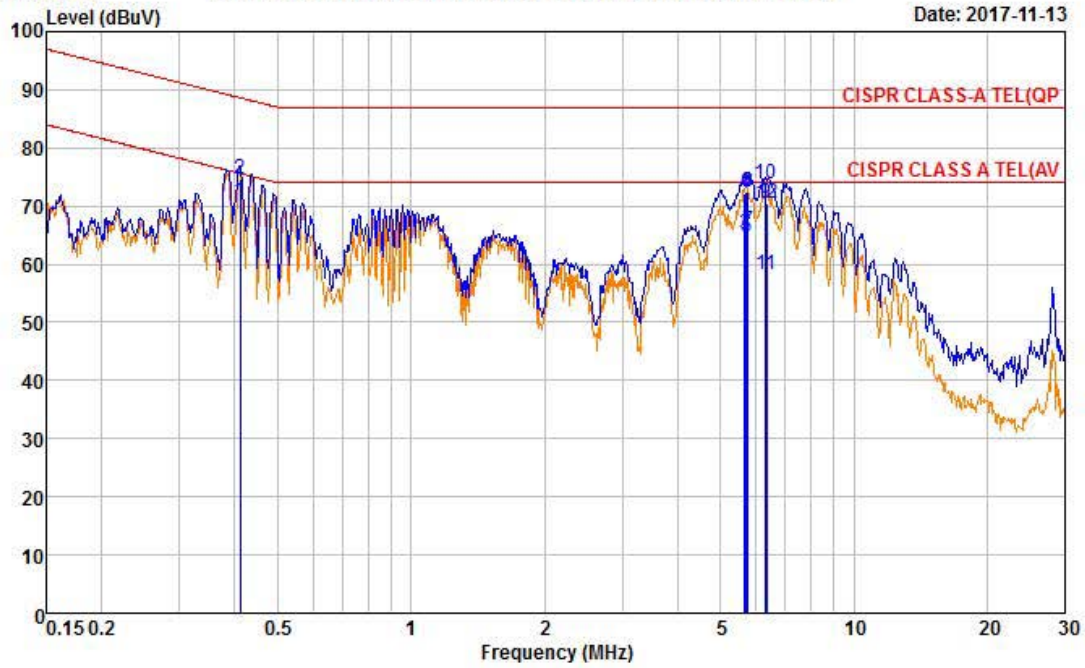

Freq	RD QP	RD AV	C.F	Result QP	Result AV	Limit QP	Limit AV	Margin QP	Margin AV
MHz	dBuV	dBuV	dB	dBuV	dBuV	dBuV	dBuV	dB	dB
0.410	55.05	51.09	19.71	74.76	70.80	88.64	75.64	13.88	4.84
5.682	52.64	45.59	19.53	72.17	65.12	87.00	74.00	14.83	8.88
5.711	52.87	45.00	19.53	72.40	64.53	87.00	74.00	14.60	9.47
5.766	52.86	46.09	19.53	72.39	65.62	87.00	74.00	14.61	8.38
6.340	54.13	50.96	19.55	73.68	70.51	87.00	74.00	13.32	3.49
6.351	50.87	38.77	19.55	70.42	58.32	87.00	74.00	16.58	15.68

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 – 6 000 MHz
Measurement RBW	:	120 kHz
Test mode	:	1 kHz + Operating mode (Adapter, PoE)
Result	:	**Complies**

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

A sample calculation:

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

Emission Level= meter reading + COR.F

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.	

Radiated Emission (Below 1 GHz) / V _ 1 kHz + Operating mode (Adapter)

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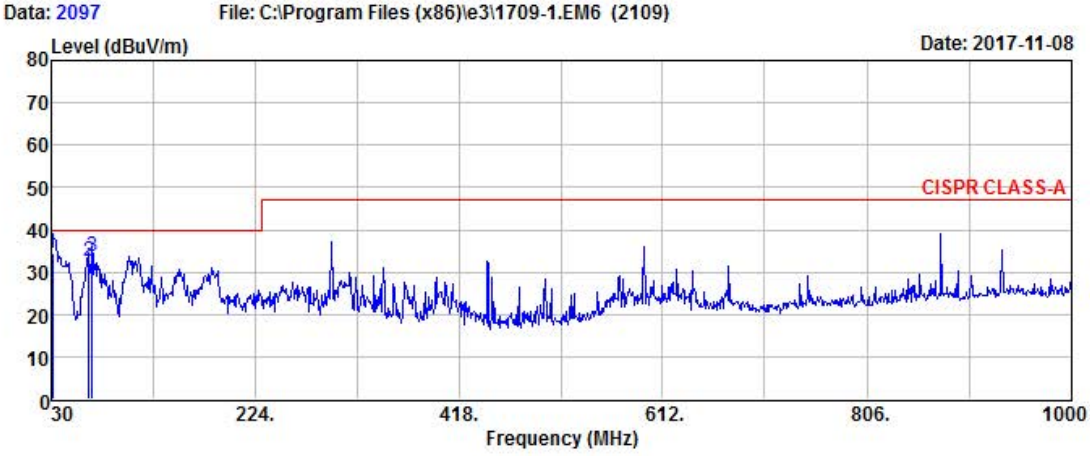
EUT/Model No.: HE-1101 Temp/Humi: 21 / 47

Test Mode : 1kHz + Operating mode Tested by: KIM T W



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
30.97	49.42	-15.13	34.29	40.00	5.71	101	231	VERTICAL
65.89	47.86	-15.32	32.54	40.00	7.46	114	164	VERTICAL
68.80	49.47	-15.64	33.83	40.00	6.17	105	204	VERTICAL

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

Radiated Emission (Below 1 GHz) / H _ 1 kHz + Operating mode (Adapter)

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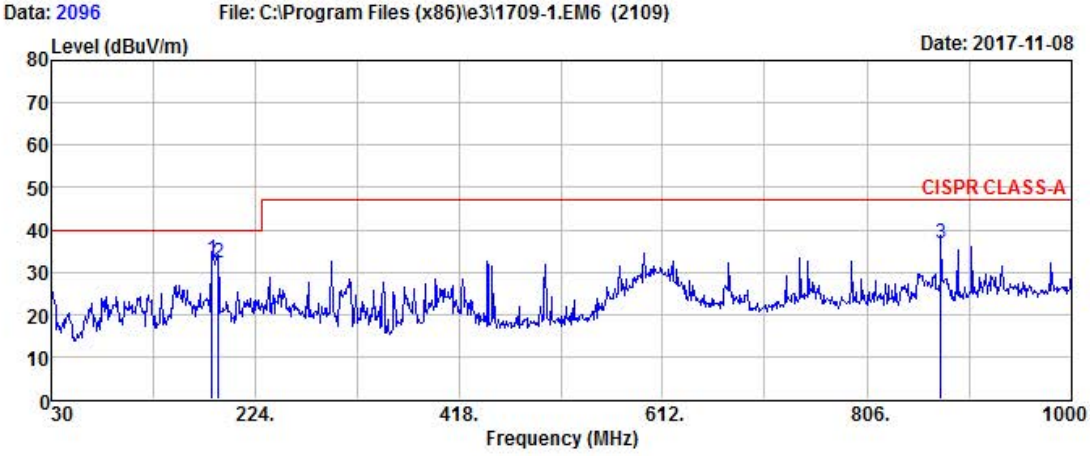
www.ltalab.com

EUT/Model No.: HE-1101 Temp/Humi: 21 / 47

Test Mode : 1kHz + Operating mode Tested by: KIM T W



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
183.26	46.54	-13.68	32.86	40.00	7.14	387	148	HORIZONTAL
189.08	46.27	-14.25	32.02	40.00	7.98	396	177	HORIZONTAL
875.84	36.48	0.15	36.63	47.00	10.37	381	184	HORIZONTAL

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

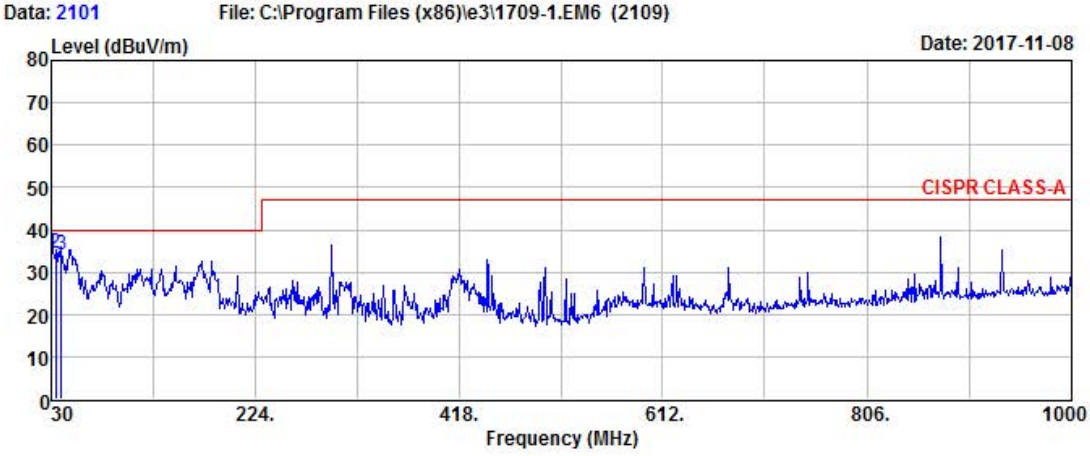
Radiated Emission (Below 1 GHz) / V _ 1 kHz + Operating mode (PoE)

LTA
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.: HE-1101 (PoE) Temp/Humi: 21 / 47

Test Mode : 1kHz + Operating mode Tested by: KIM T W



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
30.00	49.53	-15.23	34.30	40.00	5.70	100	152	VERTICAL
33.88	49.22	-14.84	34.38	40.00	5.62	105	164	VERTICAL
39.70	48.18	-14.26	33.92	40.00	6.08	114	211	VERTICAL

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

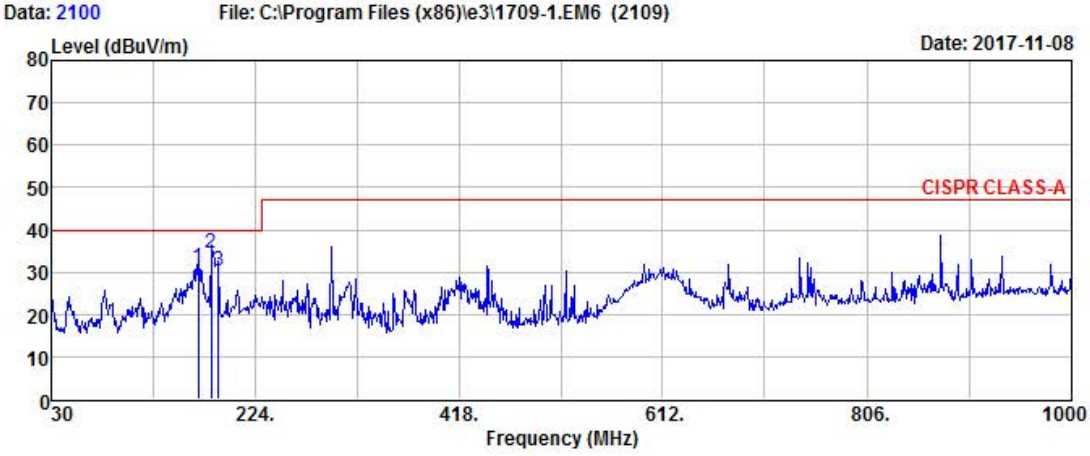
Radiated Emission (Below 1 GHz) / H _ 1 kHz + Operating mode (PoE)

LTA
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.: HE-1101 (PoE) Temp/Humi: 21 / 47

Test Mode : 1kHz + Operating mode Tested by: KIM T W



Freq	Reading	C.F	Result QP	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	deg	
169.68	43.31	-12.33	30.98	40.00	9.02	388	194	HORIZONTAL
182.29	47.92	-13.58	34.34	40.00	5.66	391	184	HORIZONTAL
189.08	44.61	-14.25	30.36	40.00	9.64	392	166	HORIZONTAL

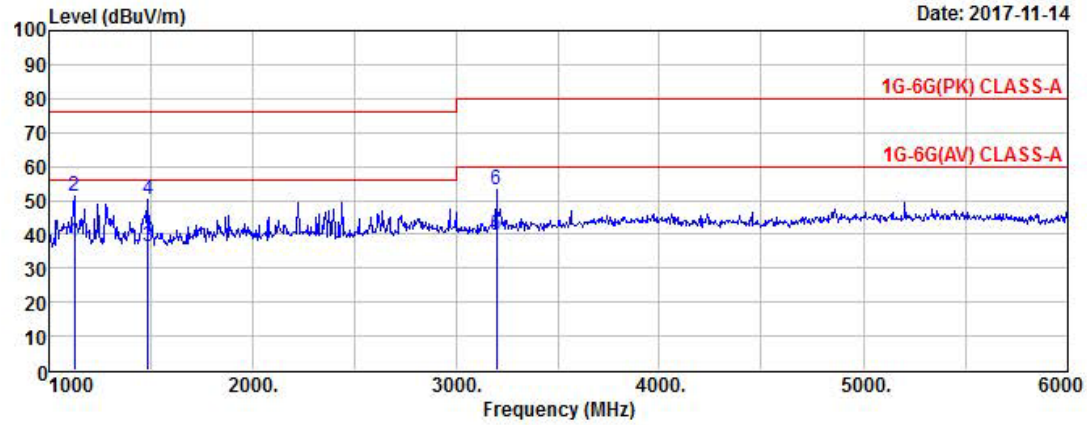
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

Radiated Emission (Above 1 GHz) / 1 kHz + Operating mode (Adapter)

EUT/Model No.: HE-1101 Temp/Humi: 18 / 34

Test Mode : 1kHz + Operating mode Tested by: KIM T W

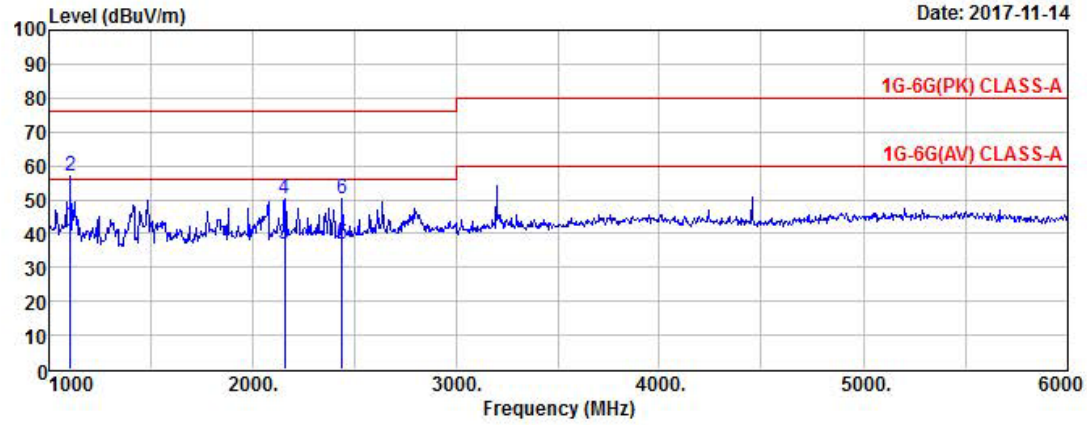
Data: 749 File: C:\Program Files (x86)\e3\1711-1.EM6 (1004)



EUT/Model No.: HE-1101 Temp/Humi: 18 / 34

Test Mode : 1kHz + Operating mode Tested by: KIM T W

Data: 750 File: C:\Program Files (x86)\e3\1711-1.EM6 (811)



Distance : 4.5 m

Ver Data: 749 **Hor Data: 750**

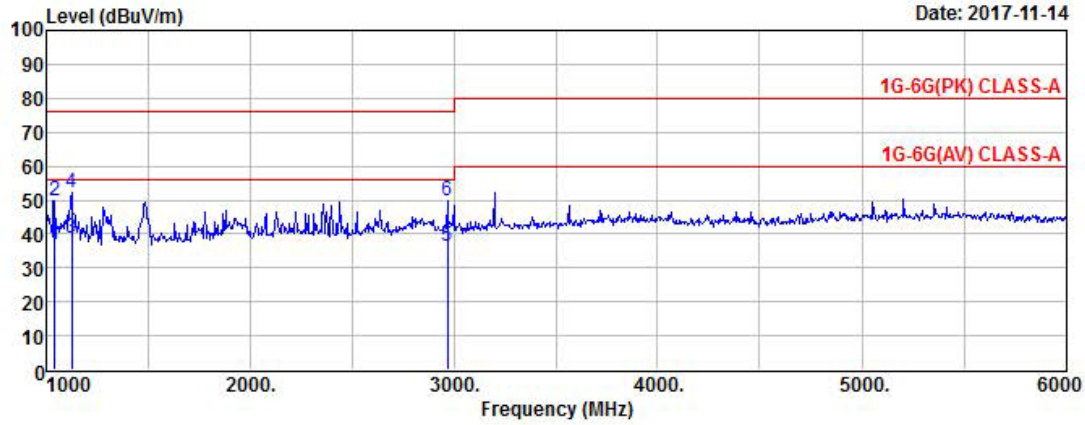
Freq.(MHz)	Reading(PK)	Reading(AV)	C.F	Result(PK)	Result(AV)	Limit(PK)	Limit(AV)	Margin(PK)	Margin(AV)	Height	Angle	Polarity
MHz	dBuV	dBuV	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	cm	deg	Hor/Ver
1105.0	67.0	52.5	-6.49	60.49	45.96	76.0	56.0	15.51	10.04	100	198	H
2160.0	53.4	40.0	0.2	53.62	40.15	76.0	56.0	22.38	15.85	100	201	H
2440.0	52.5	38.8	1.44	53.92	40.20	76.0	56.0	22.08	15.80	100	184	H
1125.0	61.0	47.7	-6.25	54.75	41.42	76.0	56.0	21.25	14.58	100	172	V
1485.0	58.2	44.8	-4.72	53.52	40.05	76.0	56.0	22.48	15.95	100	166	V
3200.0	50.6	37.3	6	56.61	43.33	80.0	60.0	23.39	16.67	100	194	V

Radiated Emission (Above 1 GHz) / 1 kHz + Operating mode (PoE)

EUT/Model No.: HE-1101 Temp/Humi: 18 / 34

Test Mode : 1kHz + Operating mode Tested by: KIM T W

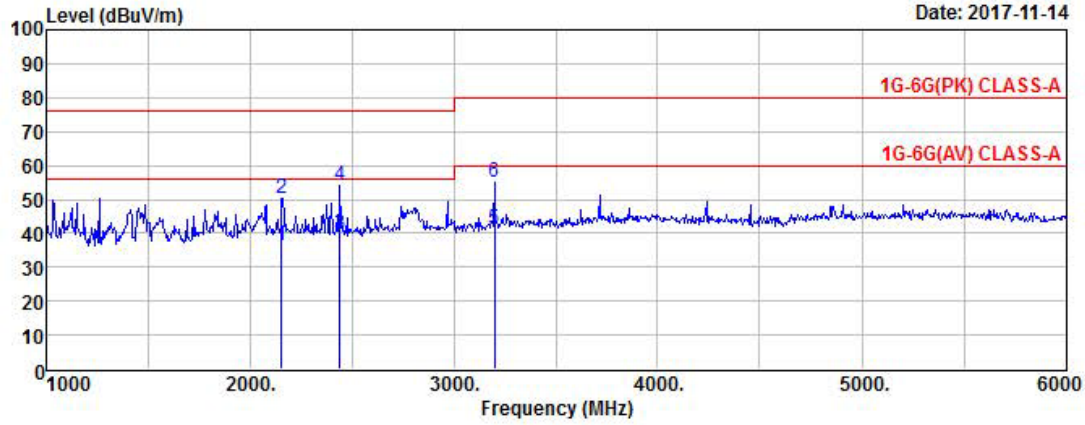
Data: 869 File: C:\Program Files (x86)\e3\1711-1.EM6 (877)



EUT/Model No.: HE-1101 Temp/Humi: 18 / 34

Test Mode : 1kHz + Operating mode Tested by: KIM T W

Data: 868 File: C:\Program Files (x86)\e3\1711-1.EM6 (877)



Distance : 4.5 m

Ver Data: 869 **Hor Data: 868**

Freq.(MHz) MHz	Reading(PK) dBuV	Reading(AV) dBuV	C.F dB	Result(PK) dBuV/m	Result(AV) dBuV/m	Limit(PK) dBuV/m	Limit(AV) dBuV/m	Margin(PK) dB	Margin(AV) dB	Height cm	Angle deg	Polarity Hor/Ver
2155.0	53.7	39.7	0.21	53.86	39.87	76.0	56.0	22.14	16.13	100	157	H
2440.0	56.2	42.0	1.44	57.65	43.47	76.0	56.0	18.35	12.53	100	182	H
3200.0	52.8	38.7	6	58.77	44.66	80.0	60.0	21.23	15.34	100	173	H
1040.0	60.3	47.1	-6.96	53.34	40.13	76.0	56.0	22.66	15.87	100	194	V
1125.0	61.7	48.6	-6.25	55.49	42.39	76.0	56.0	20.51	13.61	100	172	V
2970.0	49.2	35.7	4.08	53.24	39.73	76.0	56.0	22.76	16.27	100	176	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	:	1 kHz + Operating mode (Adapter)
Rated power	:	6.709 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.”

Harmonic Current (AC power input port) / 1 kHz + Operating mode (Adapter)

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BSEN61000-3-2:2014
Fluctuating Harmonics

Instrument Details		
Instrument Model	PPA5511	
Serial Number	162-04957	
Firmware Version	2.168	
N4L Calibration Date	18th September 2017	
Instrument Version	Standard	
Test Settings		
Class	Class A	
Mode	Measured	
Equipment Under Test		
Brand	IDIS CO., LTD.	
Model	HE-1101	
Serial	N/A	
Impedance Network ID	N/A	
Test Conditions		
	User Entered	**Measured**
Rated Voltage	230	230.674V
Rated Current	N/A	78.049mA
Rated Frequency	50	50.000Hz
Rated Power	N/A	6.709W
Additional Test Information		
Measured Power Factor	0.373	
Max Current THD	171.53%	
Max THC	72.267mA	
Max Power	6.754W	
Max F.Current	43.664mA	
Average F.Current	42.780mA	
Minimum Current	100A	
Test Duration	2.5 minutes	
Additional Test Details		
Operator	KIM T W	
Lab Name	LTA	
Location	N/A	
Notes		
Signature		

Results	**Test - N/A. Rated Power < 75W**

Test not applicable

With the exception of lighting equipment section 7 of the BSEN61000-3-2:2014 standard declares that no Harmonic current limits are specified for equipment with a rated power of

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BSEN61000-3-2:2014 Fluctuating Harmonics

Instrument Details

Instrument Model	PPA5511
Instrument Serial	162-04957
Instrument Firmware	2.168

Equipment Under Test

Brand	IDIS CO., LTD.
Model	HE-1101
Serial	N/A

Extra Test Information

	Average	Peak	Limit
THC	71.092mA	72.267mA	N/A
POHC	19.877mA	20.665mA	251.375mA
Voltage Crest Factor	1.40521	1.40626	1.40 to 1.42
Current Crest Factor	10.231	13.685	N/A

Harmonics Results 1/1

Harmonic	Status	Avg (A)	Avg L(A)	Avg %ofL	Peak (A)	Peak L(A)	Peak %ofL
1	N/A	0.04278	N/A	N/A	0.04366	N/A	N/A
2	N/A	0.00513	N/A	N/A	0.00575	N/A	N/A
3	N/A	0.02758	N/A	N/A	0.02823	N/A	N/A
4	N/A	0.00503	N/A	N/A	0.0056	N/A	N/A
5	N/A	0.02673	N/A	N/A	0.02764	N/A	N/A
6	N/A	0.00496	N/A	N/A	0.00571	N/A	N/A
7	N/A	0.02545	N/A	N/A	0.02634	N/A	N/A
8	N/A	0.00495	N/A	N/A	0.00543	N/A	N/A
9	N/A	0.02373	N/A	N/A	0.02459	N/A	N/A
10	N/A	0.00494	N/A	N/A	0.00546	N/A	N/A
11	N/A	0.02163	N/A	N/A	0.0225	N/A	N/A
12	N/A	0.0049	N/A	N/A	0.00541	N/A	N/A
13	N/A	0.01941	N/A	N/A	0.02029	N/A	N/A
14	N/A	0.00483	N/A	N/A	0.00545	N/A	N/A
15	N/A	0.01706	N/A	N/A	0.01787	N/A	N/A
16	N/A	0.00483	N/A	N/A	0.00535	N/A	N/A
17	N/A	0.01463	N/A	N/A	0.0156	N/A	N/A
18	N/A	0.00479	N/A	N/A	0.00528	N/A	N/A
19	N/A	0.01229	N/A	N/A	0.013	N/A	N/A
20	N/A	0.00477	N/A	N/A	0.00545	N/A	N/A
21	N/A	0.01013	N/A	N/A	0.01101	N/A	N/A
22	N/A	0.00474	N/A	N/A	0.00541	N/A	N/A
23	N/A	0.00815	N/A	N/A	0.00898	N/A	N/A
24	N/A	0.00478	N/A	N/A	0.00528	N/A	N/A
25	N/A	0.0066	N/A	N/A	0.00727	N/A	N/A
26	N/A	0.00478	N/A	N/A	0.00521	N/A	N/A
27	N/A	0.00549	N/A	N/A	0.00611	N/A	N/A
28	N/A	0.00479	N/A	N/A	0.00532	N/A	N/A
29	N/A	0.00493	N/A	N/A	0.00578	N/A	N/A
30	N/A	0.00478	N/A	N/A	0.00527	N/A	N/A
31	N/A	0.0048	N/A	N/A	0.00528	N/A	N/A
32	N/A	0.0048	N/A	N/A	0.00535	N/A	N/A
33	N/A	0.00489	N/A	N/A	0.00541	N/A	N/A
34	N/A	0.00476	N/A	N/A	0.00536	N/A	N/A
35	N/A	0.00511	N/A	N/A	0.00561	N/A	N/A
36	N/A	0.00479	N/A	N/A	0.00532	N/A	N/A
37	N/A	0.0052	N/A	N/A	0.00572	N/A	N/A
38	N/A	0.00477	N/A	N/A	0.00524	N/A	N/A
39	N/A	0.00525	N/A	N/A	0.00597	N/A	N/A
40	N/A	0.00477	N/A	N/A	0.00541	N/A	N/A

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BSEN61000-3-2:2014 Fluctuating Harmonics		
Instrument Details		
Instrument Model	PPA5511	
Instrument Serial	162-04957	
Instrument Firmware	2.168	
Equipment Under Test		
Brand	IDIS CO., LTD.	
Model	HE-1101	
Serial	N/A	

Source Results 1/1

Harmonic	Status	Peak (V)	Average (V)	Limit (V)
1	PASS	230.65	230.64	No Limit
2	PASS	0.1312	0.12111	0.46135
3	PASS	0.07261	0.06541	2.0761
4	PASS	0.02871	0.02416	0.46135
5	PASS	0.03126	0.0242	0.9227
6	PASS	0.02813	0.02317	0.46135
7	PASS	0.02891	0.02407	0.69203
8	PASS	0.02751	0.02226	0.46135
9	PASS	0.02789	0.02306	0.46135
10	PASS	0.02656	0.02224	0.46135
11	PASS	0.02793	0.02319	0.23068
12	PASS	0.02765	0.02299	0.23068
13	PASS	0.02847	0.02335	0.23068
14	PASS	0.02597	0.02218	0.23068
15	PASS	0.0317	0.02563	0.23068
16	PASS	0.02719	0.02219	0.23068
17	PASS	0.02742	0.02227	0.23068
18	PASS	0.0296	0.02272	0.23068
19	PASS	0.02738	0.02334	0.23068
20	PASS	0.02766	0.02238	0.23068
21	PASS	0.02743	0.02196	0.23068
22	PASS	0.02746	0.02191	0.23068
23	PASS	0.03026	0.02453	0.23068
24	PASS	0.02718	0.02271	0.23068
25	PASS	0.02674	0.02253	0.23068
26	PASS	0.02891	0.02312	0.23068
27	PASS	0.02836	0.02319	0.23068
28	PASS	0.02624	0.02176	0.23068
29	PASS	0.02674	0.02197	0.23068
30	PASS	0.02687	0.02246	0.23068
31	PASS	0.02869	0.02304	0.23068
32	PASS	0.02815	0.02237	0.23068
33	PASS	0.02851	0.02249	0.23068
34	PASS	0.02773	0.02234	0.23068
35	PASS	0.02893	0.02218	0.23068
36	PASS	0.02759	0.02255	0.23068
37	PASS	0.02864	0.0233	0.23068
38	PASS	0.02978	0.02277	0.23068
39	PASS	0.02958	0.02266	0.23068
40	PASS	0.02695	0.02251	0.23068

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	:	1 kHz + Operating mode (Adapter)
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.”

Voltage Variation and Flicking (AC power input port)

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IEC61000-3-3:2013 Ed.3.0
Flickermeter

Instrument Details	
Instrument Model	PPA5511
Serial Number	162-04957
Firmware Version	2.168
N4L Calibration Date	18th September 2017
Instrument Version	Standard
Test Settings	
Class	Voltage
Mode	Normal (4%)
Minimum Current	10A
PST	10.00 minutes
PLT	1 PSTs
Equipment Under Test	
Brand	IDIS CO., LTD.
Model	HE-1101
Serial	N/A
Impedance Network ID	N/A

Test Conditions		
	User Entered	Measured
Rated Voltage	230	231.149V
Rated Current	N/A	N/A
Rated Frequency	50	50.000Hz
Rated Power	N/A	N/A
D max	0.0595% (Limit: 4.0%)	
T max	0.0000 s (Limit: 0.5 s)	
DC max	0.0018% (Limit: 3.3%)	

Additional Test Details	
Operator	KIM T W
Lab Name	LTA
Location	N/A
Notes	
Signature	
Results	**Phase1: PASS**

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IEC61000-3-3:2013 Ed.3.0 Flickermeter		
Instrument Details		
Instrument Model	PPA5511	
Instrument Serial	162-04957	
Instrument Firmware	2.168	
Equipment Under Test		
Brand	IDIS CO., LTD.	
Model	HE-1101	
Serial	N/A	

Flicker Test Results

PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase1: PASS	0.002	0.05954	0	0.082	1.00	N/A	N/A

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	:	22 ℃ / 41 %RH / 99.9 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	:	1 kHz + Operating mode (Adapter, PoE)
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."

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	EUT Screen disconnected during the test. After the test, EUT was operated normally.
2	VCP	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.

1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure #1	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
2	Enclosure #2	Air	Complies	No reaction recognized
3	DC IN	Air	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
4	LAN	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
5	USB-B	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
6	Audio IN	Air	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
7	Audio OUT	Air	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
8	HDMI IN	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
9	HDMI OUT	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
10	D-Sub IN	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.
11	D-Sub OUT	Contact	Complies	EUT Screen disconnected during the test. After the test, EUT was operated normally.

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 2 700 ㎒
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	:	1 kHz + Operating mode (Adapter, PoE)
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."

MODE : 1 kHz + Operating mode (Adapter)

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

MODE : 1 kHz + Operating mode (PoE)

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

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		1 kHz + Operating mode (Adapter, PoE)
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."

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.

MODE : 1 kHz + Operating mode (Adapter)

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

MODE : 1 kHz + Operating mode (PoE)

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

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		1 kHz + Operating mode (Adapter, PoE)
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.”

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.

MODE : 1 kHz + Operating mode (Adapter)

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

MODE : 1 kHz + Operating mode (PoE)

Signal Line	Test level	Result	Remarks
PoE	+0.5, 1 kV	Complies	No reaction recognized
	-0.5, 1 kV	Complies	No reaction recognized

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	:	1 kHz + Operating mode (Adapter, PoE)
Result	:	**Complies**

Measurement Data:

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

MODE : 1 kHz + Operating mode (Adapter)

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

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

MODE : 1 kHz + Operating mode (PoE)

Signal Line	Test level (Vrms)	Result	Remarks
POE	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

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	:	1 kHz + Operating mode (Adapter)
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	EUT OFF During the test. Automatic repaly without user's control. After the test, EUT was operated normally.
70	30	25	Complies	No reaction recognized
40	60	10	Complies	No reaction recognized
0	100	250	Complies	EUT OFF During the test. Automatic repaly without user's control. After the test, EUT was 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.

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	:	1 kHz + Operating mode (Adapter)
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

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.

Conducted emissions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESR	Rohde & Schwarz	101499	2018.07.11	1 year
☒	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2018.03.20	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	100378	2018.09.07	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	100408	2018.09.07	1 year
☒	LISN(sub)	KNW-407	Kyoritsu	8-1430-1	2018.09.07	1 year
☒	TEST PROGRAM	e3_Ver: 5.5.201a	AUDIX	-	-	-
☒	ISN	ISN T800	TESEQ	27109	2018.01.25	1 year
☐	ISN	ENY81-CA6	Rohde & Schwarz	101565	2018.01.25	1 year
☐	CURRENT PROBE	EZ-17	Rohde & Schwarz	100508	2018.01.25	1 year

Radiated Emission – Below 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESCI7	Rohde & Schwarz	100772	2018.09.07	1 year
☒	Amplifier (25 dB)	8447D	HP	2944A07974	2018.09.07	1 year
☒	TRILOG Antenna	VULB9160	SCHWARZBECK	9160-3237	2019.05.16	2 year
☒	TEST PROGRAM	e3_Ver: 6.2009-10-12a	AUDIX	-	-	-

Radiated Emission – Above 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESCI7	Rohde & Schwarz	100772	2018.09.07	1 year
☒	Amplifier (25 dB)	8449B	HP	3008A00337	2018.03.20	1 year
☒	HORN ANTENNA	3115	ETS	00055005	2019.05.16	2 year
☒	TEST PROGRAM	e3_Ver: 6.2009-10-12a	AUDIX	-	-	-

Harmonic Current / Voltage Variation and Flicking

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Precision Power Analyzer	PPA551	Newtons4th Ltd	162-04957	2018.09.18	1 year
☒	Reference Impedance Network	ES4152	NF Corp.	9074424	2018.09.07	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	ESD Slimulator	ESS-2000	NOISEKEN	ESS0625187	2018.04.04	1 year

RF Electromagnetic Field

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal Generator	E4432B	Agilent	MY41310632	2018.05.22	1 year
☒	Power Meter	E4419B	Agilent	GB38410133	2018.06.09	1 year
☒	RF POWER AMPLIFIER	ITA0300KL-300	INFINITECH	0300KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA2000KL-120	INFINITECH	200KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA4500KL-70	INFINITECH	4500KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA0750KL-300	INFINITECH	0750KL 1507 001	-	-
☒	Log.-Per.Antenna (80 ㎒ ~ 3 ㎓)	K9128	RAPA	NONE	-	-
☐	Microphone	MP201	BSWA	530147	2017.11.25	1 year
☐	Sound Acoustic Tester	TST-1000	TESTEK	15065-A	2017.11.28	1 year

Electrical fast transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	NX5	EMTEST	P1640185038	2018.03.21	1 year
☒	AC Power Source	Variac NX1-260-16	EMTEST	P1648188071	2018.03.21	1 year
☒	Capacitive Coupling Clamp	CCI	EMTEST	P1703190739	2018.03.21	1 year

Surge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	NX5	EMTEST	P1640185038	2018.03.21	1 year
☒	AC Power Source	Variac NX1-260-16	EMTEST	P1648188071	2018.03.21	1 year
☒	Capacitive Coupling Clamp	CCI	EMTEST	P1703190739	2018.03.21	1 year
☒	CDN	CNV508N1	EMTEST	P1623180335	2018.03.21	1 year

Conducted disturbances, induced by radio-frequency fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal generator	SML03	R&S	103026/0013	2018.03.20	1 year
☒	POWER METER	NRVD	R&S	101689	2018.03.20	1 year
☒	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
☐	Sound Acoustic Tester	TST-1000	TESTEK	15065-A	2017.11.28	1 year
☐	Microphone	MP201	BSWA	530147	2017.11.25	1 year
☒	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2018.06.12	1 year
☐	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2018.09.07	1 year
☒	CDN (M2)	TSCDN-M2-16A	F.C.C	07008	2018.09.07	1 year
☒	CDN (M3)	TSCDN-M3-16A	F.C.C	07017	2018.09.07	1 year

Mains supply voltage dips, short interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	NX5	EMTEST	P1640185038	2018.03.21	1 year
☒	AC Power Source	Variac NX1-260-16	EMTEST	P1648188071	2018.03.21	1 year

Mains supply voltage variations

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	NX5	EMTEST	P1640185038	2018.03.21	1 year
☒	AC Power Source	Variac NX1-260-16	EMTEST	P1648188071	2018.03.21	1 year

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	

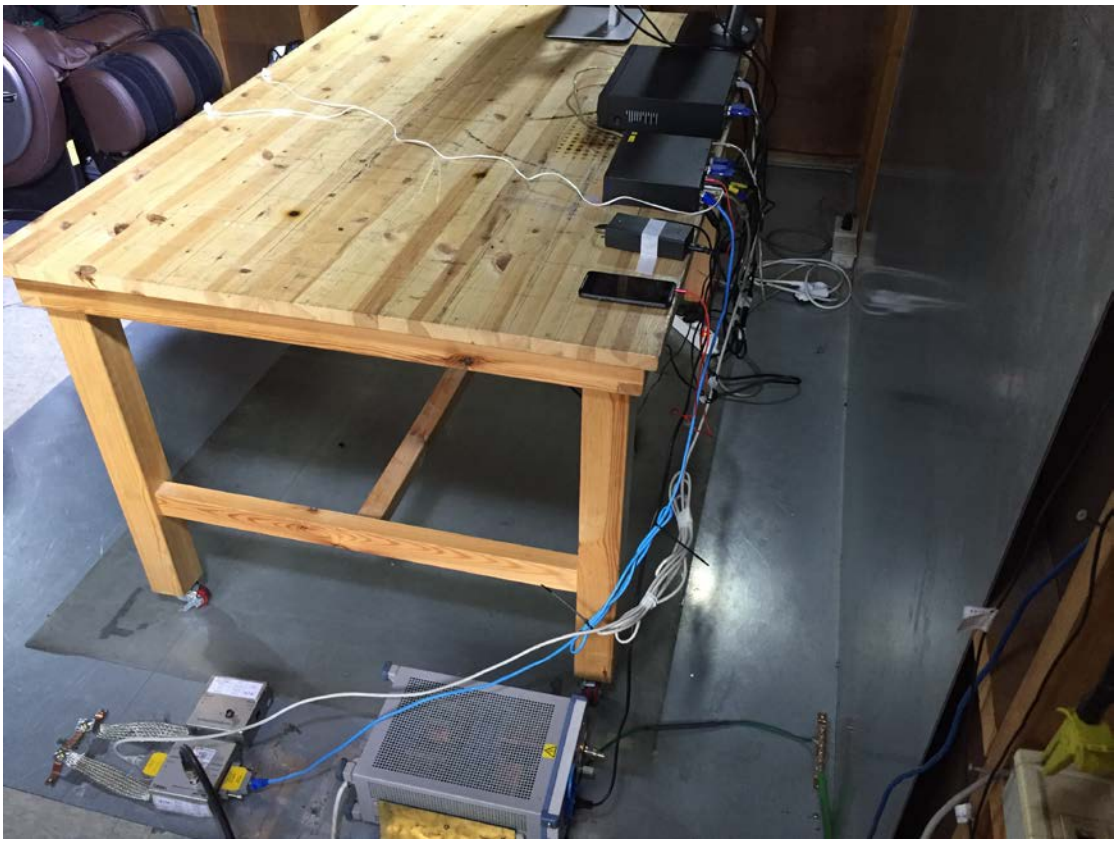
Note:VRC(Voltage Reflection Coefficient)

APPENDIX D

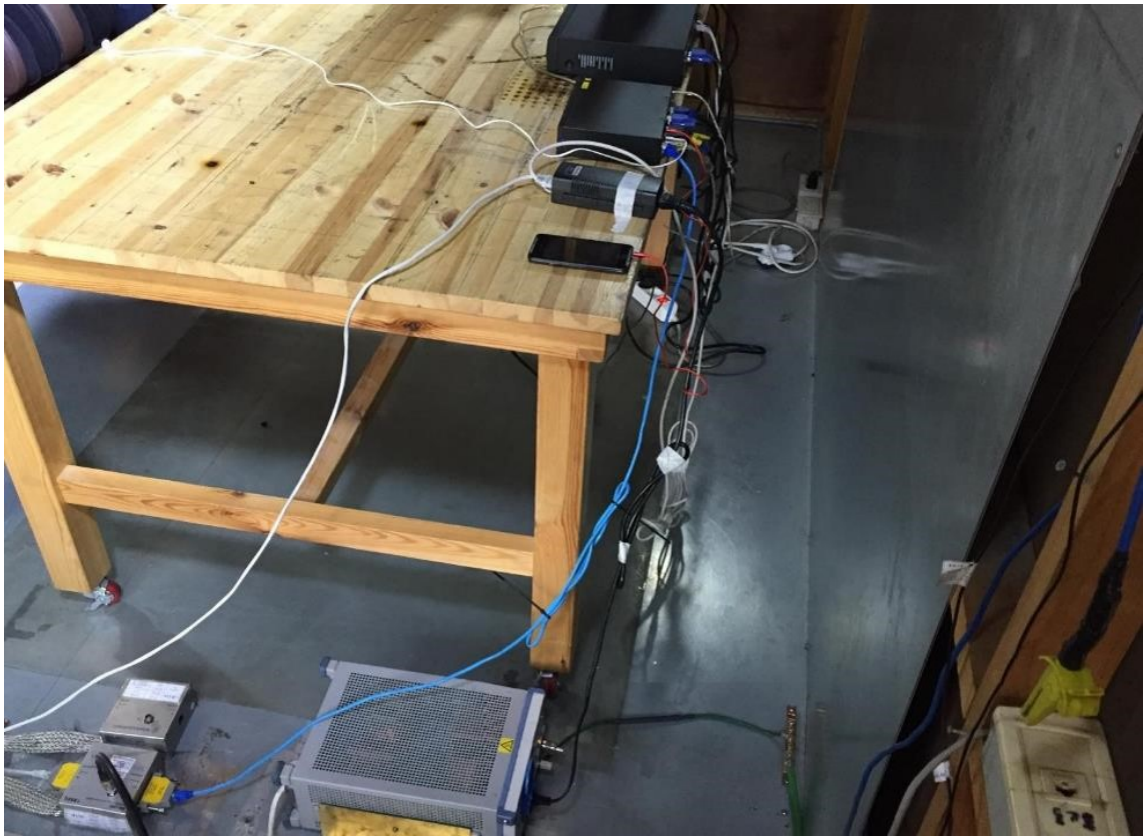
PHOTOGRAPHS

Conducted emission (Maximum emission configuration) / 1 kHz + Operating mode (Adapter)

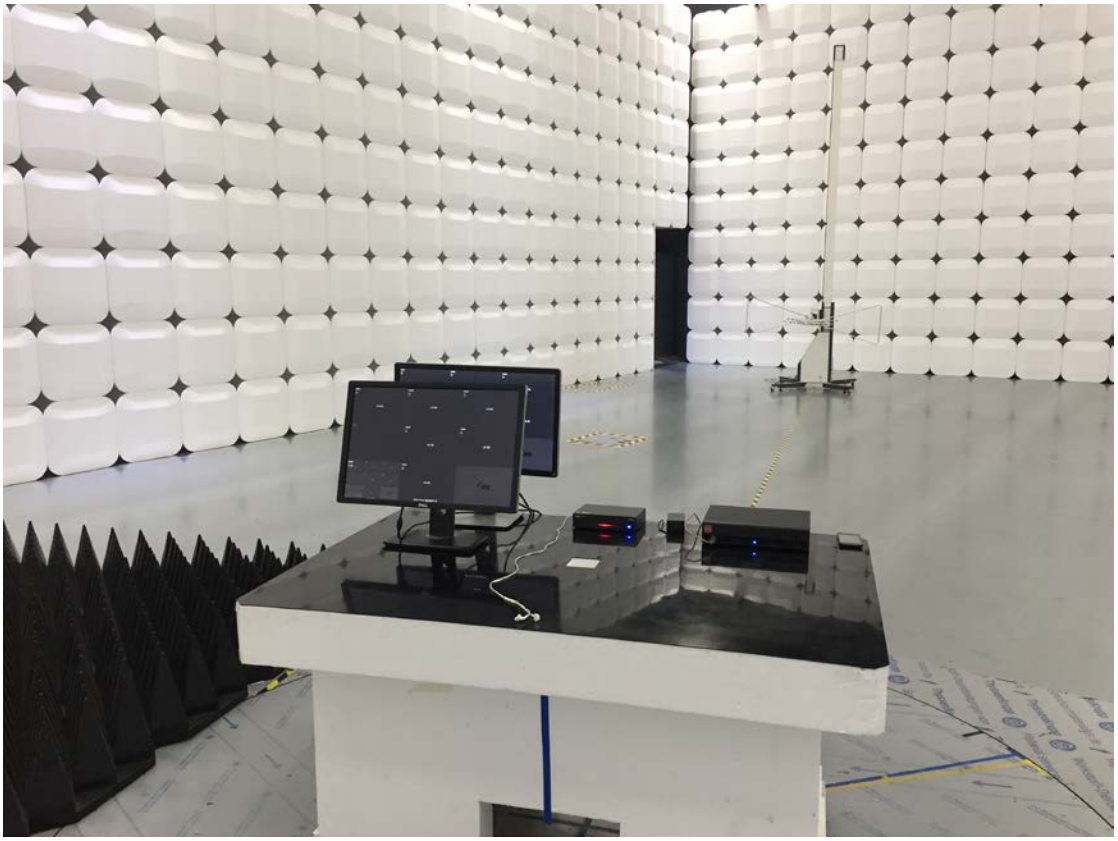
Conducted emission (Maximum emission configuration) / TEL _ 1 kHz + Operating mode (Adapter)

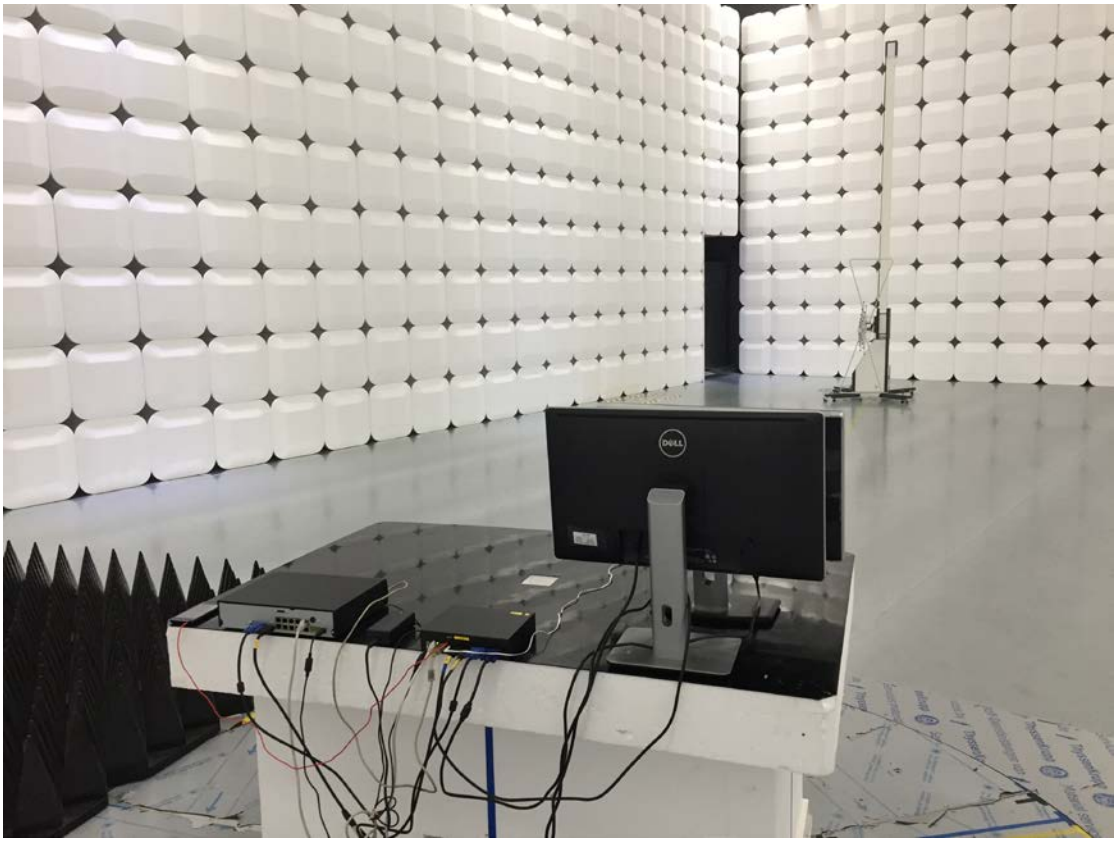


Conducted emission (Maximum emission configuration) / TEL _ 1 kHz + Operating mode (PoE)

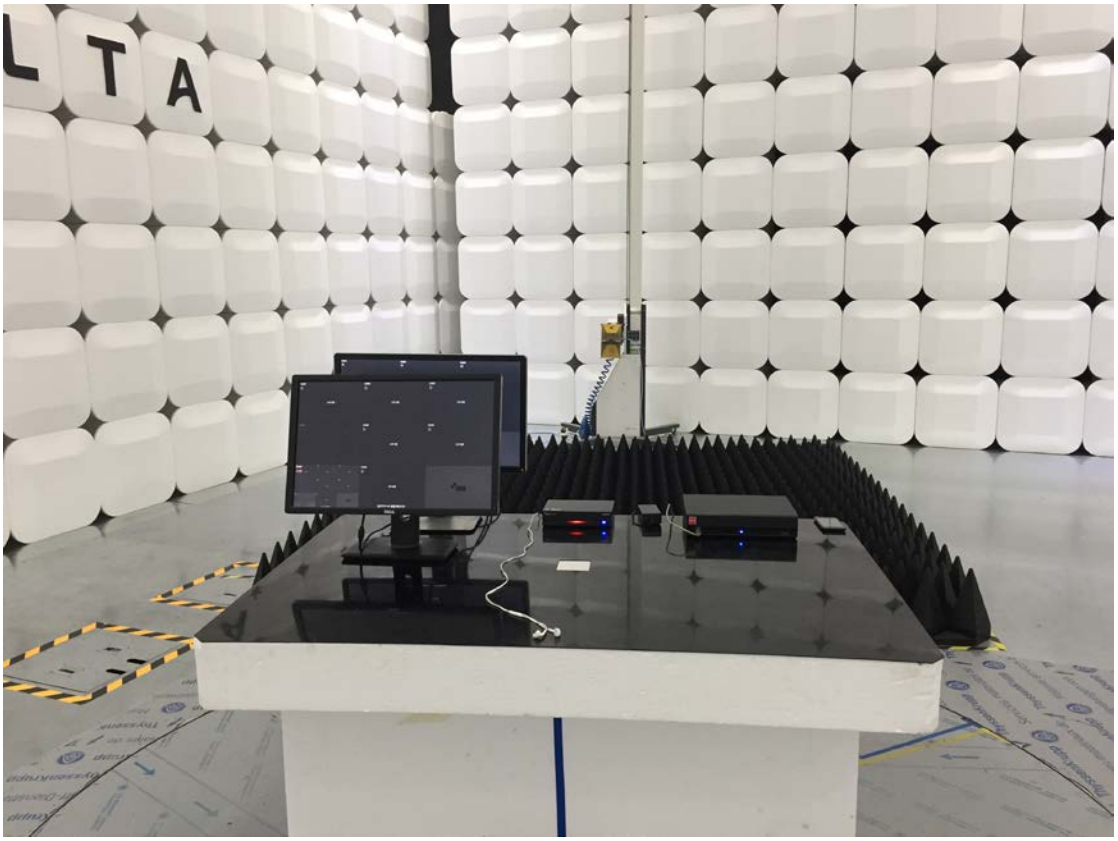


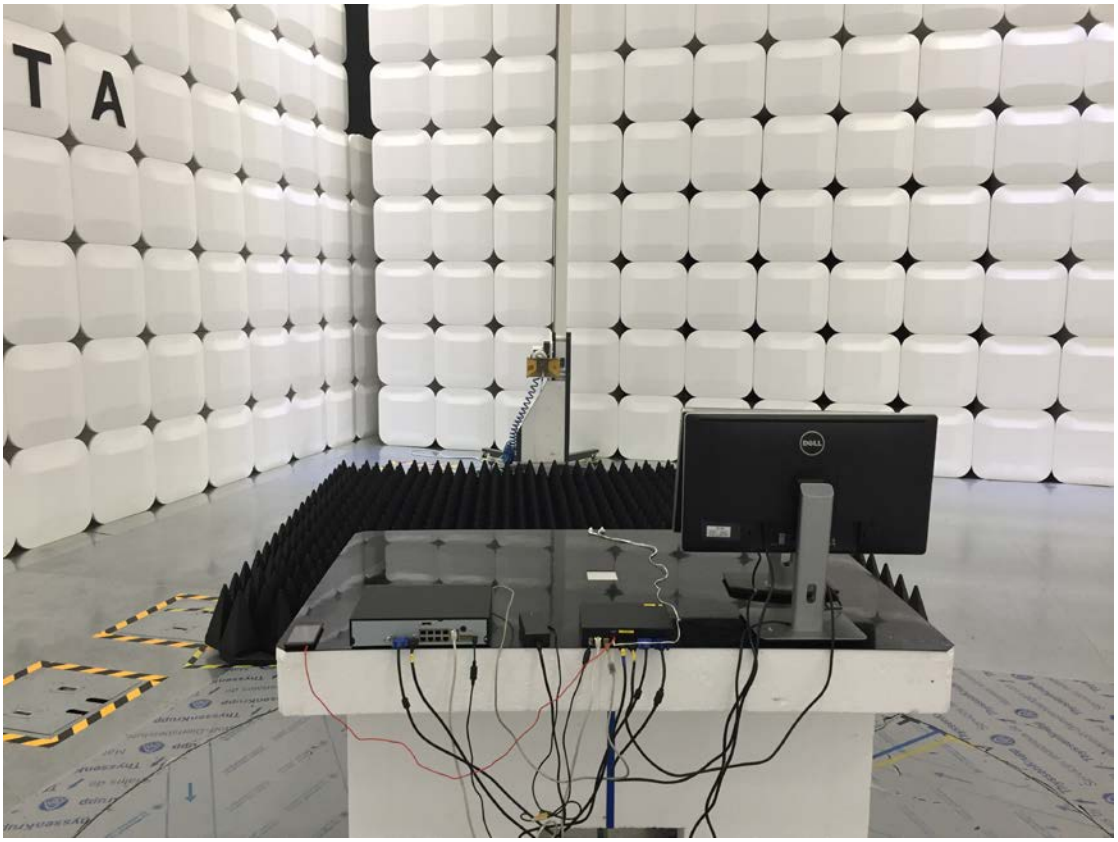
Radiated emission (Maximum emission configuration)-Below 1 GHz / 1 kHz + Operating mode (Adapter)



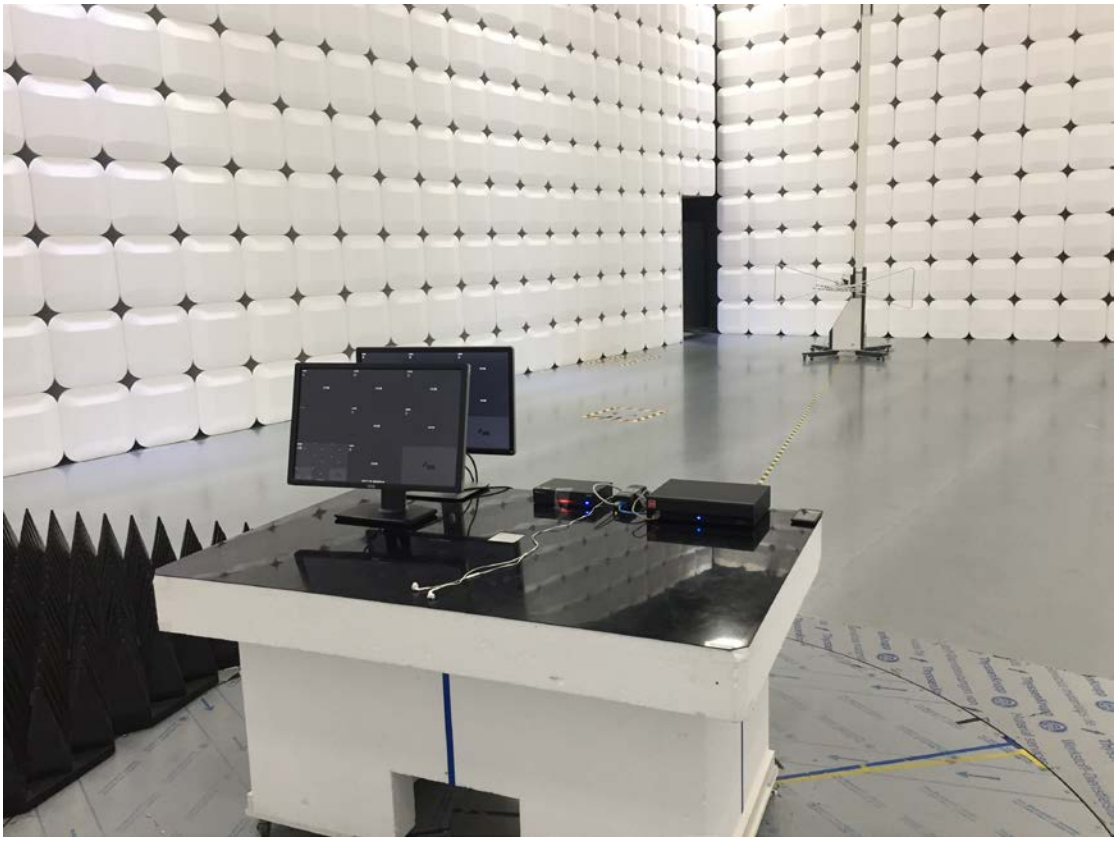


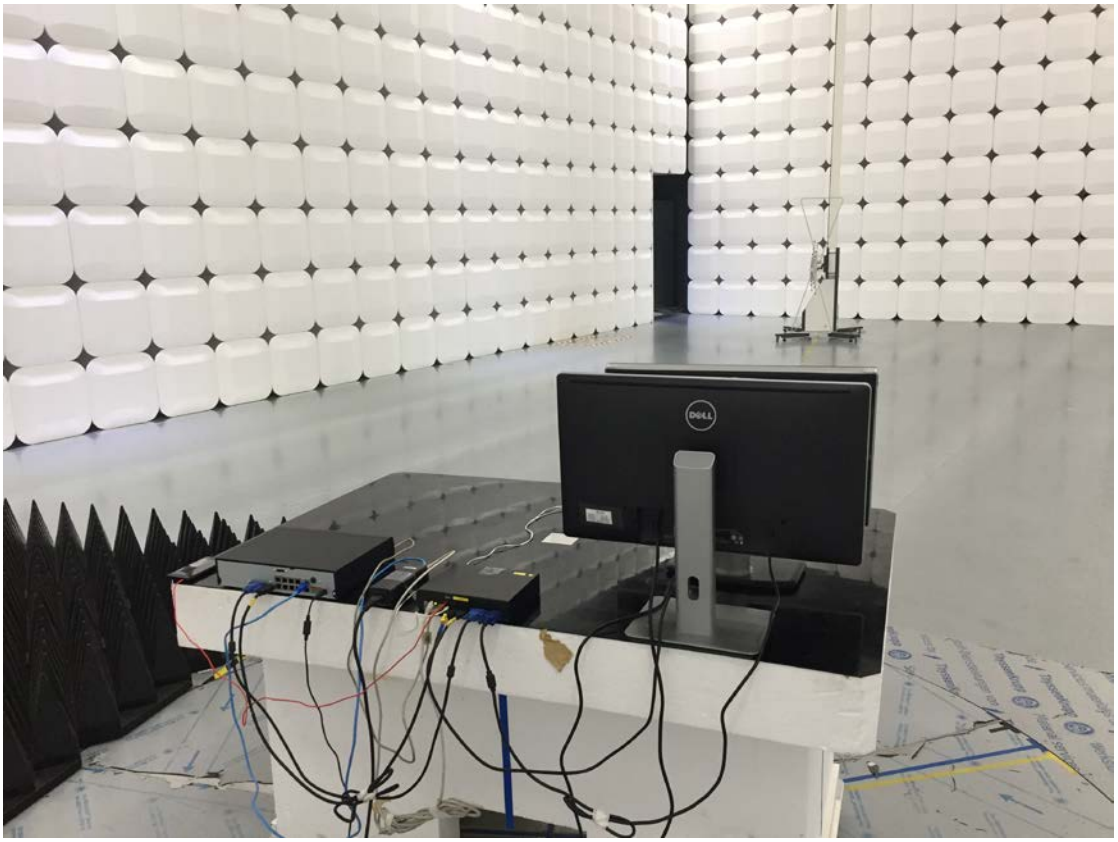
Radiated emission (Maximum emission configuration)-Above 1 GHz / 1 kHz + Operating mode (Adapter)



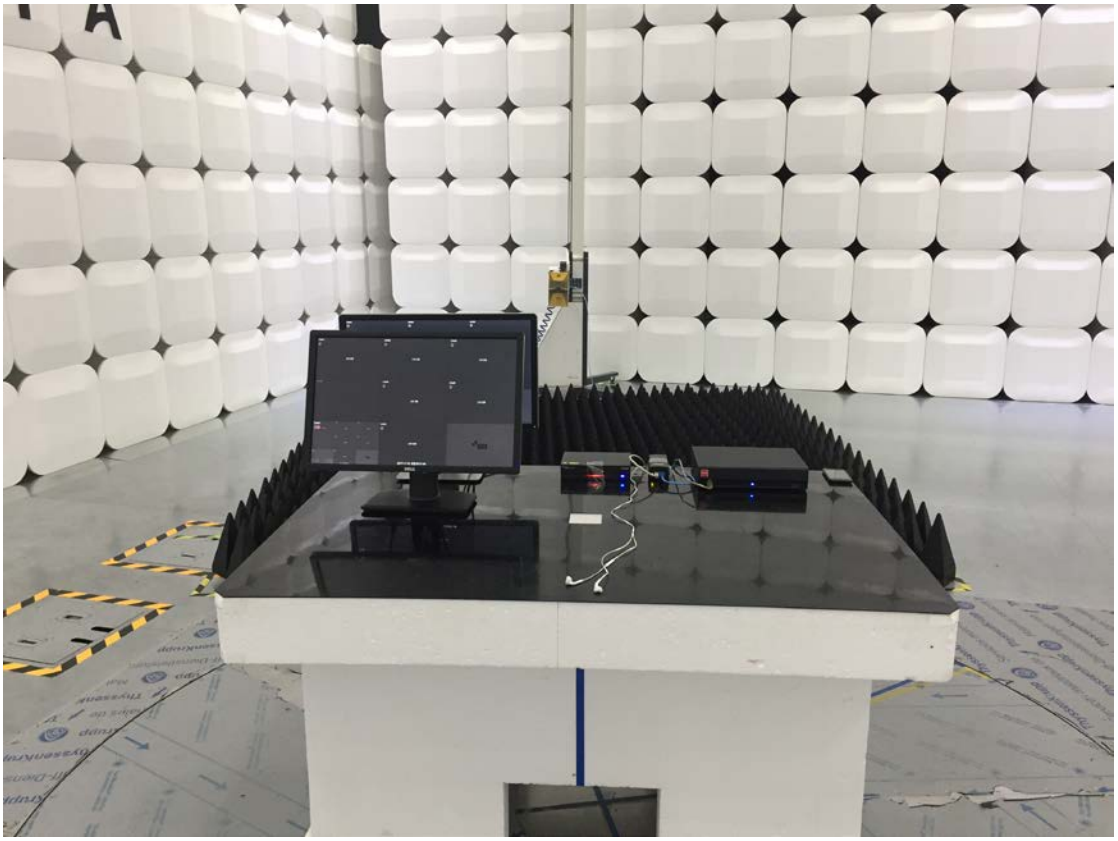


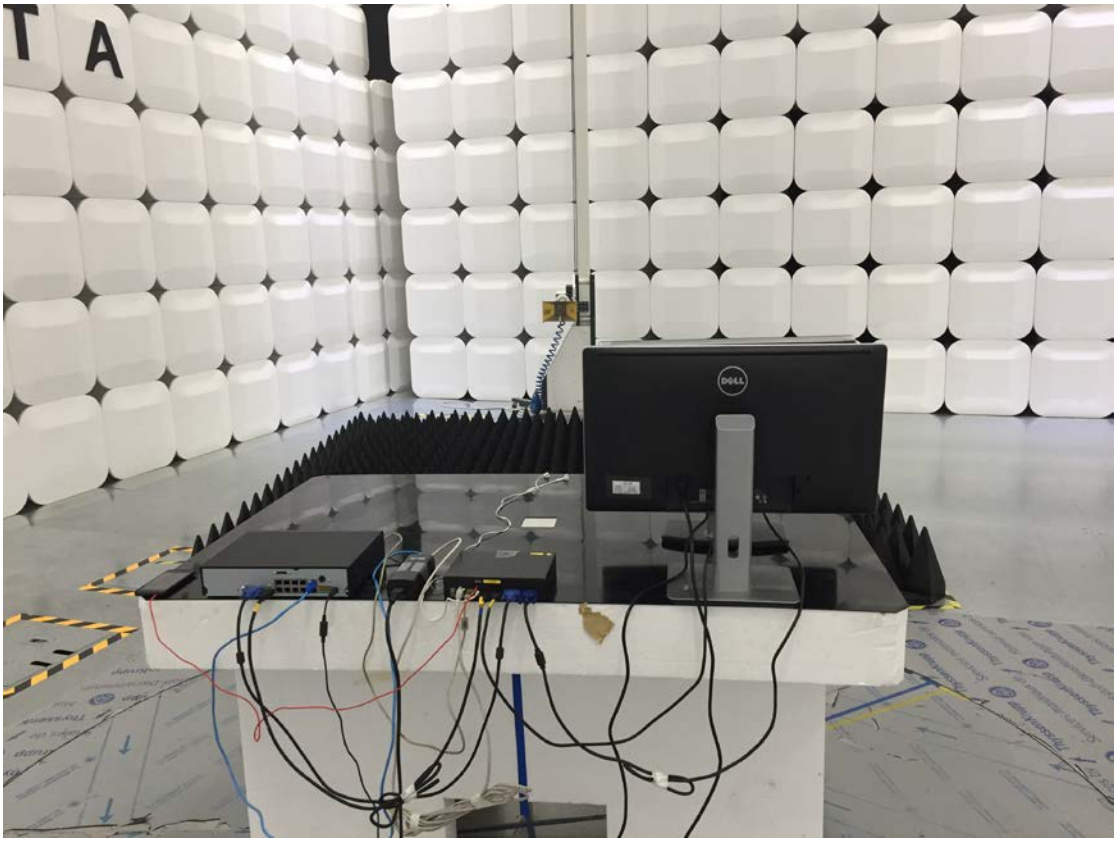
Radiated emission (Maximum emission configuration)-Below 1 GHz / 1 kHz + Operating mode (PoE)





Radiated emission (Maximum emission configuration)-Above 1 GHz / 1 kHz + Operating mode (PoE)



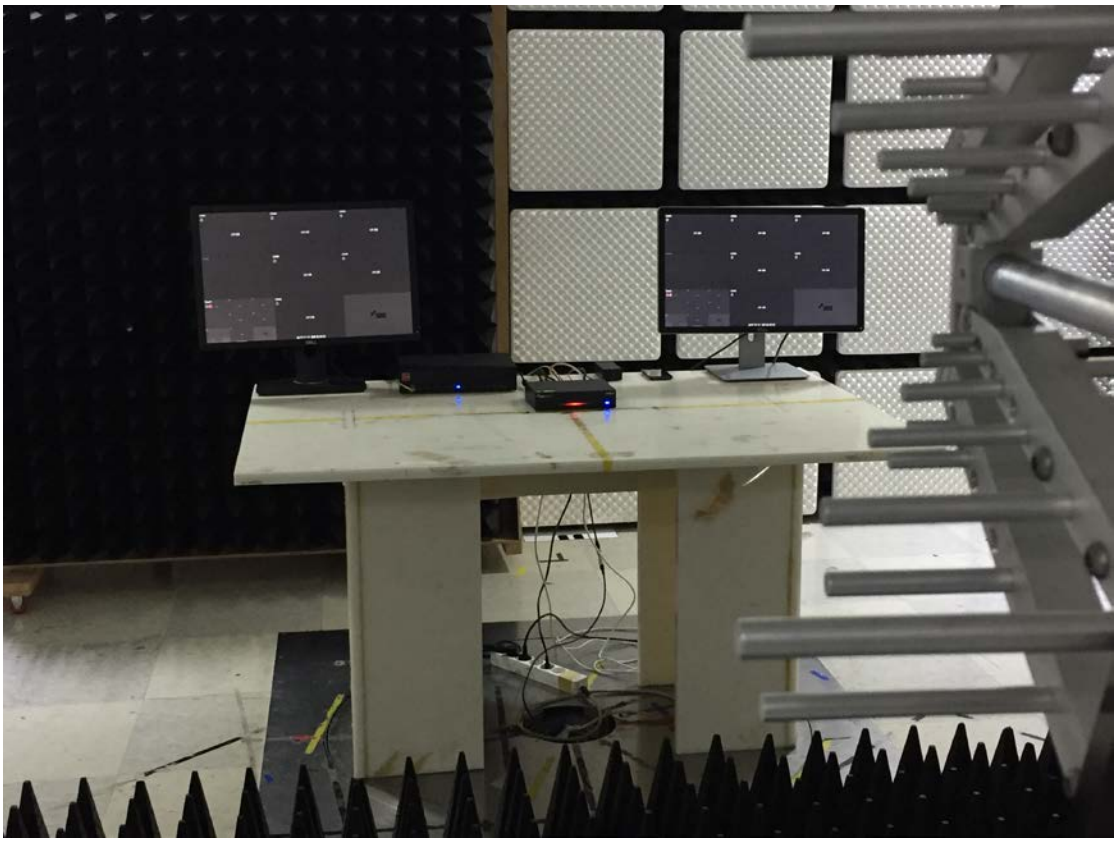


Harmonic Current / 1 kHz + Operating mode (Adapter)

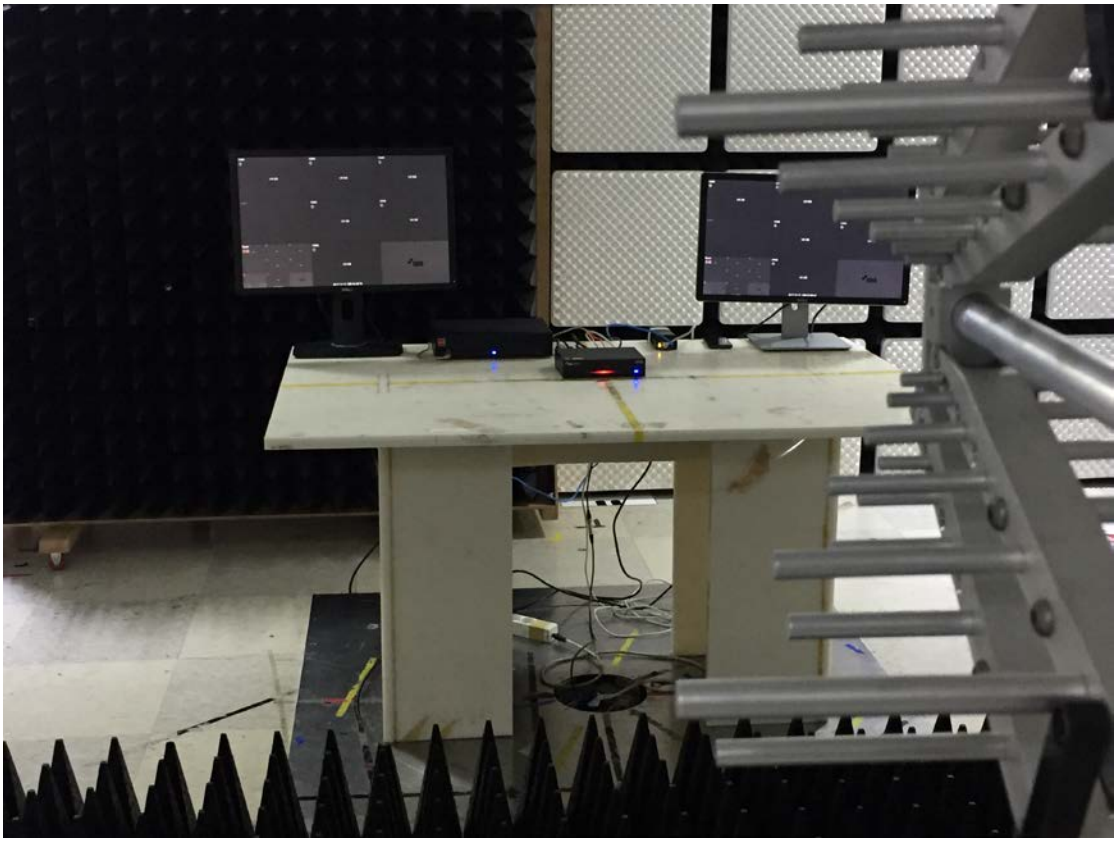
Electrostatic discharge / 1 kHz + Operating mode (Adapter)

Electrostatic discharge / 1 kHz + Operating mode (PoE)

RF Electromagnetic Field / 1 kHz + Operating mode (Adapter)



RF Electromagnetic Field / 1 kHz + Operating mode (PoE)



Electrical fast transients / 1 kHz + Operating mode (Adapter)

Electrical fast transients / 1 kHz + Operating mode (PoE)

Surge / 1 kHz + Operating mode (Adapter)

Surge / 1 kHz + Operating mode (PoE)

Conducted Disturbances, Induced by Radio-Frequency Fields / 1 kHz + Operating mode (Adapter)

Conducted Disturbances, Induced by Radio-Frequency Fields / 1 kHz + Operating mode (PoE)

Main supply voltage dips, short interruptions / 1 kHz + Operating mode (Adapter)

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DE-1104
Direct IP


AUDIO IN
VPSS
DC12V GND
LAN / PoE
USB-B
AUDIO OUT
HDMI IN
HDMI OUT
VGA IN
VGA OUT

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IDIS
Direct IP


VPSS
AUDIO IN
AUDIO OUT
HDMI IN
HDMI OUT
VGA IN
VGA OUT