EU Declaration of Conformity

ATTESTATION

of conformity

with European Directives

For the following

Product	**:**	**Video Analytics Box**
Model Name	**:**	**DV-1104**
Manufactured at	**:**	**IDIS CO., LTD.**
Address	**:**	**8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA**

The submitted sample of the above equipment has been tested for CE marking according to following European Directive and standards:
- Electromagnetic Compatibility Directive 2014/30/EU

The referred test report(s) show that the product complies with standard(s) recognized as giving presumption of compliance with the essential requirements in the specified European Directive.
This verification does not imply assessment of the production of the product.
The CE marking may be affixed if all relevant and effective European Directives with CE are applicable.

The standards relevant for the evaluation of EMC requirements are as follows:

Test Standards	**:**	**EN 55032:2015, Class A**
		EN 50130-4:2011/A1:2014
		EN 61000-3-2:2014
		EN 61000-3-3:2013

Date of issue: June 30, 2016

IDIS CO., LTD.

8-10, TECHNO 3-RO, YUSEONG-GU,
DAEJEON, KOREA

(Name and signature of authorized person)

TEST REPORT

KCTL Inc.
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82 70 5008 1021
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http://www.kctl.co.kr

Applicant	:	IDIS CO., LTD. 8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA
Manufacturer	:	IDIS CO., LTD. 8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA
Type of equipment	:	Video Analytics Box
Model Name	:	DV-1104
Date of Receipt	:	June 13, 2016
Date of Test	:	June 22 ~ June 25, 2016
Test method used	:	EN 55032:2015, Class A EN 50130-4:2011/A1:2014 EN 61000-3-2:2014 EN 61000-3-3:2013
Test Results	:	Complied

This product complies with the requirements of the EMC Directive 2014/30/EU.
The results in this report apply only to the sample tested.
This Test Report cannot be reproduced, except in full, without the written approval of KCTL Laboratory.

Affirmation	Tested by Name: Min-Cheol, Baek	Technical Manager Name: Gun-Su, Park

2016. 06. 30

Contents

1. Applicant information

Applicant:	IDIS CO., LTD.
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Telephone:	+82-31-723-5205
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E-mail:	jjungdoo@idis.co.kr
Contact name:	**Jang Jung Doo**

Manufacturer:	IDIS CO., LTD.
Address:	8-10, TECHNO 3-RO, YUSEONG-GU, DAEJEON, KOREA
Telephone:	+82-31-723-5205
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E-mail:	jjungdoo@idis.co.kr
Contact name:	**Jang Jung Doo**

2. Laboratory information

Address

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea

Telephone Number: 82 70 5008 1021

Facsimile Number: 82 505 299 8311

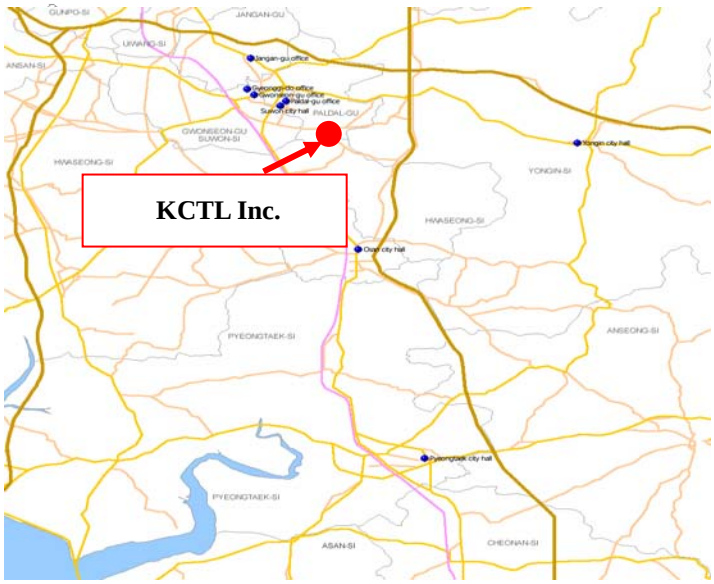
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

VCCI Registration No. : R-3327, G-198, C-3706, T-1849

Industry Canada Registration No. : 8035A

KOLAS NO.: KT231

SITE MAP



3. Test system configuration

3.1 Operation environment

		Temperature	Humidity	Pressure
Chamber(10 m)	:	21.2 °C	50.6 % R.H.	-
Shielded room(CE)	:	23.4 °C	42.9 % R.H.	-
Shielded room(ESD)	:	24.3 °C	47.5 % R.H.	99.7 kPa

Test site

These testing items were performed following locations;

Test item	Test site
Conducted Emission	Shielded Room
Radiated Emission	10 m Chamber
Harmonics current	EMI Test area(6F)
Voltage fluctuations and flickers	EMI Test area(6F)
Electrostatic discharge	Shielded Room
Radiated RF immunity	6F Fully anechoic chamber (3 m)
Electrical Fast Transient/BURST	Shielded Room
Surge	Shielded Room
Conducted RF immunity	Shielded Room
Voltage dip/interruption	Shielded Room
Mains supply voltage variations	Shielded Room

3.2 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC.
The factors contributing to uncertainties are test receiver, cable loss, antenna factor calibration, Antenna directivity, antenna factor variation with height, antenna phase center variation, antenna frequency interpolation, measurement distance variation, site imperfection, mismatch, and system repeatability.
Based on CISPR 16-4-2, the measurement uncertainty level with a 95 % confidence level was applied.

Conducted emission measurement (C.L.: Approx 95 %, k = 2)		
Shielded Room (CE#1)	9 kHz ~ 150 kHz: 3.80 dB 150 kHz ~ 30 MHz: 3.42 dB	
Shielded Room (CE#2)	9 kHz ~ 150 kHz: 3.82 dB 150 kHz ~ 30 MHz: 3.40 dB	
Radiated Emission measurement (C.L.: Approx 95 %, k = 2)		
10 m Chamber (4F)	30 MHz ~ 300 MHz	3 m: 5.48 dB 10 m: 5.48 dB
	300 MHz ~ 1 000 MHz	3 m: 5.60 dB 10 m: 5.48 dB
	1 GHz ~ 6 GHz	3 m: 6.00 dB
10 m Chamber (2F)	30 MHz ~ 300 MHz	3 m: 5.04 dB 10 m: 5.04 dB
	300 MHz ~ 1 000 MHz	3 m: 5.16 dB 10 m: 5.04 dB
	1 GHz ~ 6 GHz	3 m: 6.10 dB
Radio Frequency Electromagnetic Fields (C.L.: Approx 95 %, k = 2)		
1.85 dB		
Disturbance power Electromagnetic Fields (C.L.: Approx 95 %, k = 2)		
3.20 dB		

3.3 Measurement Program

These test items were performed by software programs;

Test item	Measurement Program	
Conducted Emission	EP5CE_V 5.4.0(TOYO)	
Radiated Emission	EP5RE_V 4.6.0(TOYO)	
Harmonics current, Voltage fluctuations and flickers	CTS 4_V 4.6.2 (AMETEK)	
Radiated RF immunity	3F	EMC32_V 9.01.0 (ROHDE & SCHWARZ)
	6F	EMC32_V 8.53.0 (ROHDE & SCHWARZ)
Electrical Fast Transient/BURST, Surge, Magnetic field immunity, Voltage dip/interruption	6F(#1)	ISMIEC_V 4.08(EM TEST)
	6F(#2)	ISMIEC_V 4.07(EM TEST)
	3F(#3)	IEC_V 5.2.9(EM TEST)
Conducted RF immunity	6F(#1)	EMC32_V 9.25.00 (ROHDE & SCHWARZ)
	3F(#2)	ICD_V 5.3.4(EM TEST)

4. Description of E.U.T.

4.1 General information

Model Name	DV-1104
Key Feature for catalog	**· Supports DirectIP™ NVR · Up to 4ch Video Anaysis · Supports people count · Supports Heatmap · Supports Queue management**
VA-box	
Video Compression	H.264
Video Inputs	4ch IP
Supported Devices	DirectIP NVR
Max. network throughput	20Mbps
Newtork Connection	Gigabit Ethernet x1
VA Support	People Counting Heatmap Queue Management (Max. 3 queues)
General	
Dimension (W x H x D)	200mm x 44mm x 153mm (7.9" x 1.7" x 6.0")
Unit Weight	0.72kg (1.6lb)
Operation Temperature	0°C to 40°C (32°F ~ 104°F)
Shipping Weight	1.1kg
PoE(class)	Yes(IEEE 802.3af Class 3)
Power source	12VDC, PoE
Power Consumption	6.6W

4.2 Product description

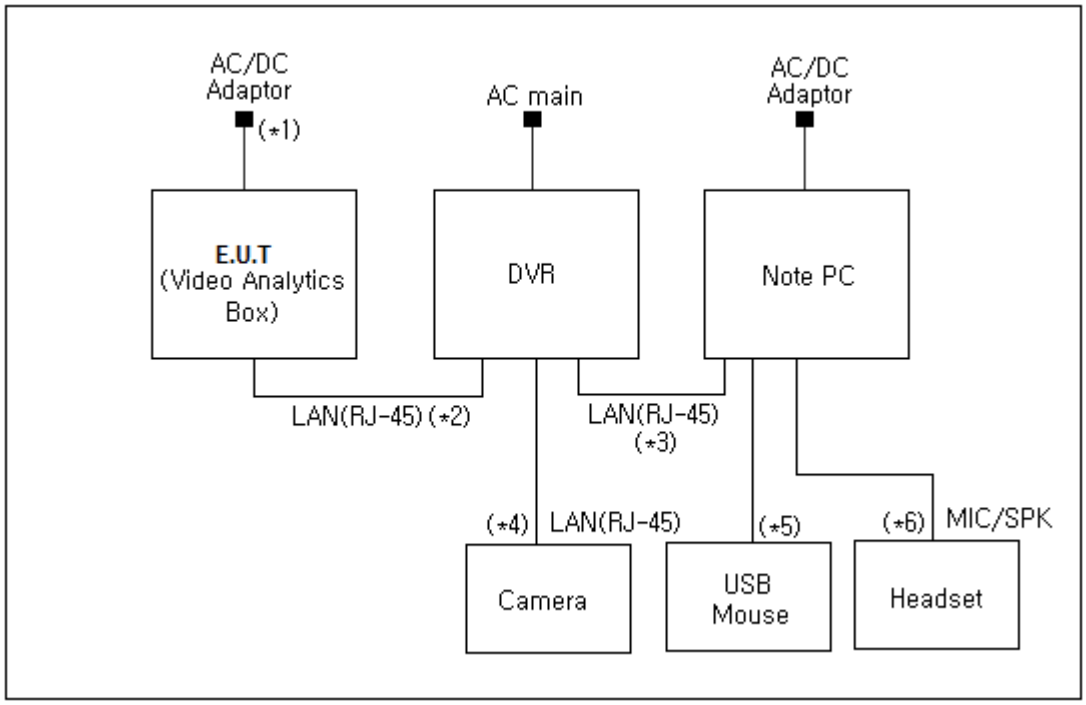
Type of product	Video Analytics Box
Model name (Basic)	DV-1104
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing Voltage	EMI: 230 V, 50 Hz, PoE EMS: DC 12 V, PoE
Input range	EMI: 230 V, 50 Hz, PoE EMS: DC 12 V, PoE
Internal clock frequency	1400 MHz
Note	* AC/DC Adaptor was not provided by the manufacturer. * PoE Switch was not provided by the manufacturer.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Note PC	NT271B5E	JGFE919DB00025Z	SAMSUNG
USB Mouse	1088	8165900112728	Microsoft
Headset	SHS-250V	-	SAMSUNG
DVR	DR-6316PS-S	-	IDIS
Camera	-	-	IDIS
AC/DC Adaptor	DSA-42PFB-121120300	-	DVE
PoE Switch	V1910-24G-POE	-	HP
DC Power Supply	E3632A	MY40004594	Agilent

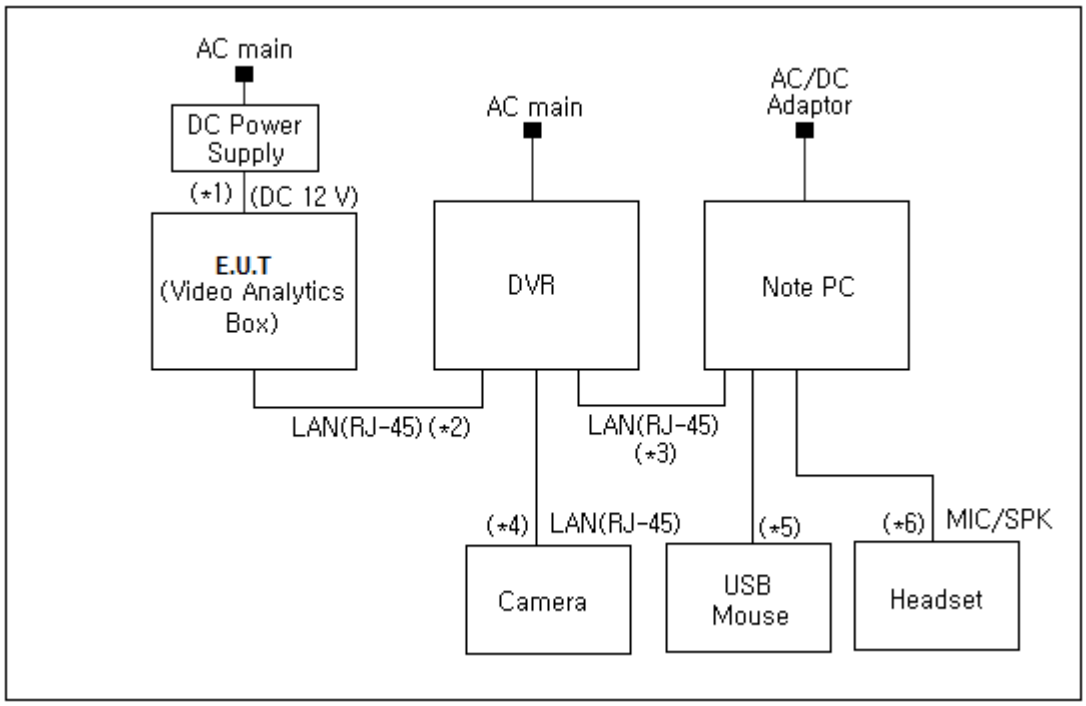
4.4 Test configuration

#1- DC 12 V(EMI)



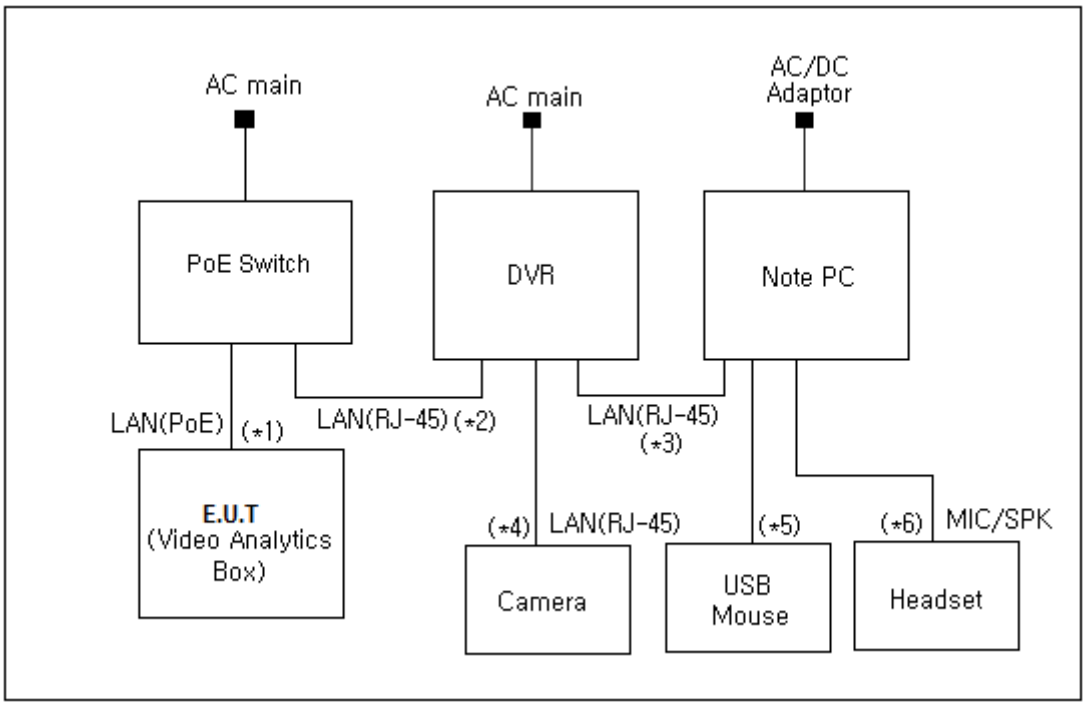
Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (Video Analytics Box)	Power	AC/DC Adaptor	Power	1.2	Unshield	-
2		LAN(RJ-45)	DVR	LAN(RJ-45)	3.0	Unshield	Out-door
3	DVR	LAN(RJ-45)	Note PC	LAN(RJ-45)	1.5	Unshield	-
4		LAN(RJ-45)	Camera	LAN(RJ-45)	1.5	Unshield	-
5	Note PC	USB	USB Mouse	USB	1.5	Shield	-
6		MIC/SPK	Headset	MIC/SPK	1.8	Unshield	-

#1- DC 12 V(EMS)



Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	**EUT** (Video Analytics Box)	Power	DC Power Supply	Power	1.2	Unshield	-
2		LAN(RJ-45)	DVR	LAN(RJ-45)	3.0	Unshield	Out-door
3	DVR	LAN(RJ-45)	Note PC	LAN(RJ-45)	1.5	Unshield	-
4		LAN(RJ-45)	Camera	LAN(RJ-45)	1.5	Unshield	-
5	Note PC	USB	USB Mouse	USB	1.5	Shield	-
6		MIC/SPK	Headset	MIC/SPK	1.8	Unshield	-

#2- PoE



* Power supplied from PoE Switch

Note	Start		End		Cable		
*	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (Video Analytics Box)	LAN(PoE)	PoE Switch	LAN(PoE)	3.0	Unshield	Out-door
2	PoE Switch	LAN(RJ-45)	DVR	LAN(RJ-45)	1.5	Unshield	-
3	DVR	LAN(RJ-45)	Note PC	LAN(RJ-45)	1.5	Unshield	-
4		LAN(RJ-45)	Camera	LAN(RJ-45)	1.5	Unshield	-
5	Note PC	USB	USB Mouse	USB	1.5	Shield	-
6		MIC/SPK	Headset	MIC/SPK	1.8	Unshield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
#1-DC 12 V, #2-PoE	Check the operation of the temperature change of the camera image and the test proceeds. (Used program: iRas)

* Note: 2 types of powers are available for the product, that are DC 12 V, PoE.

Therefore, tests were performed for 2 different types of powers.

5. Summary of test results

5.1 Summary of EMI emission test results

Applied	Test items	Test method	Result
☒	Conducted Emission	EN 55032:2015	Pass
☒	Radiated Emission	EN 55032:2015	Pass
☒	Harmonics current	EN 61000-3-2:2014	Pass
☒	Voltage fluctuations and flickers	EN 61000-3-3:2013	Pass

5.2 Summary of immunity test results

Applied	Test items	Test method	Result
* **EN 50130-4:2011/A1:2014**			
☒	Electrostatic discharge	EN 61000-4-2:2009	Pass
☒	Radiated RF immunity	EN 61000-4-3:2006+A2:2010	Pass
☒	Electrical Fast Transient/BURST	EN 61000-4-4:2012	Pass
☒	Surge	EN 61000-4-5:2014	Pass
☒	Conducted RF immunity	EN 61000-4-6:2014	Pass
☐	Voltage dip/interruption	EN 61000-4-11:2004	N/A
☐	Mains supply voltage variations	EN 50130-4:2011	N/A

5.3 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 U_0 = 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 U_0 = 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 U_0 = 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 U_0 = 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.

6. Test results

6.1 Conducted Emission

Test specification	EN 55032:2015, Class A		
Testing voltage	230 V, 50 Hz, PoE		
Test facility	Shielded room (CE#1)		
Date	2016. 06. 22		
Temperature (°C)	23.4 °C	Humidity (% R.H.)	42.9 % R.H.
Remarks	Pass		

Both conducted lines are measured in Quasi-Peak and C/Average mode, including the worst-case data points for each tested configuration. The EUT measured in accordance with the methods described in standards.

6.1.1 Limits of conducted emission measurement

☒ AC main

Frequency [㎒]	Resolution Bandwidth [㎑]	Class A (dB(㎶))		Class B (dB(㎶))	
		Quasi-peak	Average	Quasi-peak	Average
0.15 ~ 0.5	9	79	66	66 ~ 56 *	56 ~ 46*
0.5 ~ 5	9	73	60	56	46
5 ~ 30	9	73	60	60	50

☒ Telecommunication

Frequency [㎒]	Resolution Bandwidth [㎑]	Class A Limits (dB(㎶))		Current Limits (dB(㎂))	
		Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	9	97 to 87	84 to 74	53 to 43	40 to 30
0.5 ~ 30	9	87	74	43	30
Frequency [㎒]	Resolution Bandwidth [㎑]	Class B Limits (dB(㎶))		Current Limits (dB(㎂))	
		Quasi-Peak	Average	Quasi-Peak	Average
0.15 ~ 0.5	9	84 to 74	74 to 64	40 to 30	30 to 20
0.5 ~ 30	9	74	64	30	20

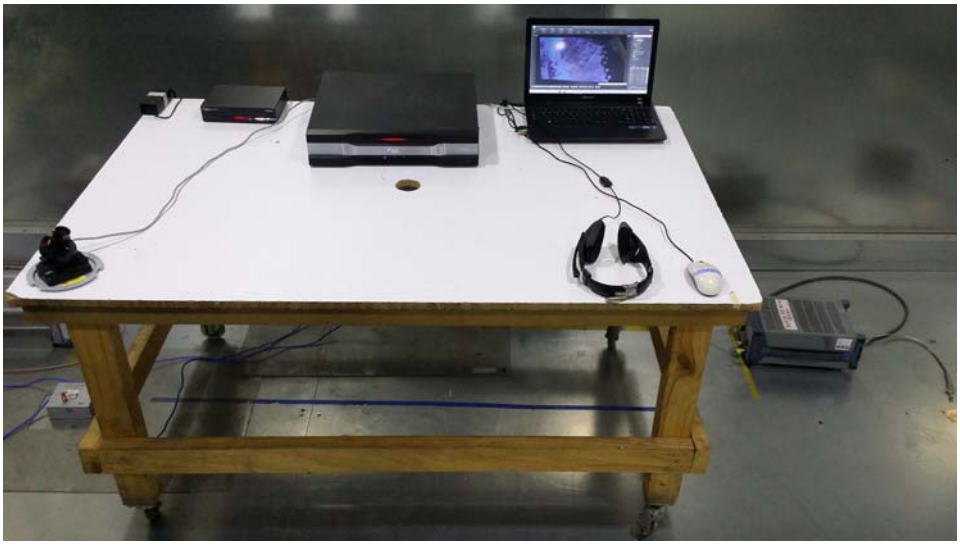
If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 seconds at each measurement frequency, the highest reading shall be recorded, with the exception of any brief isolated high reading (which shall be ignored).

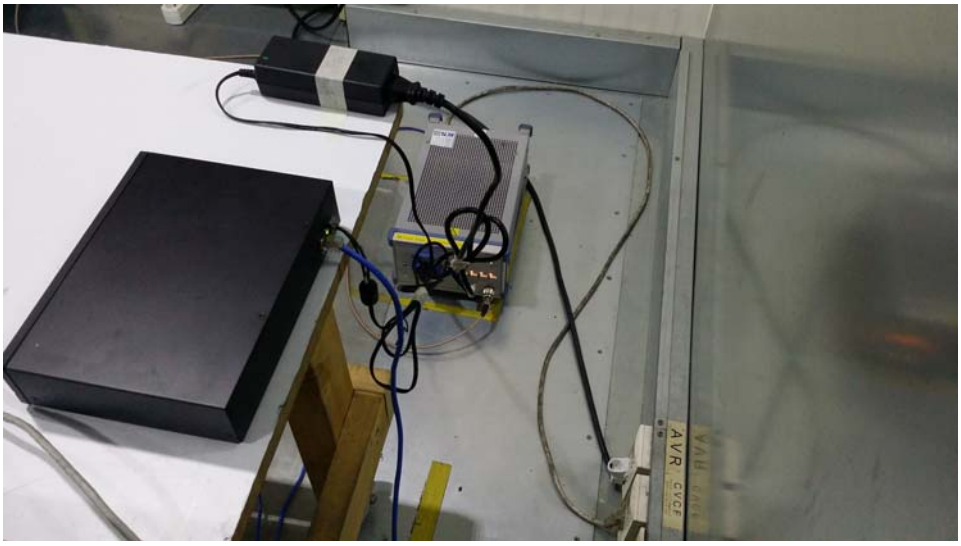
6.1.2 Used equipment

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESCI	100001	R&S	2017.02.26	☒
TWO-LINE V-NETWORK	ENV216	101358	R&S	2016.09.03	☒
TWO-LINE V-NETWORK	ESH3-Z5	100267	R&S	2017.04.07	☒
8-WIRE ISN CAT5	NTFM 8158 ISN CAT5	CAT5 8158 #138	SCHWARZBECK	2017.05.19	☒

6.1.3 Photographs of test setup

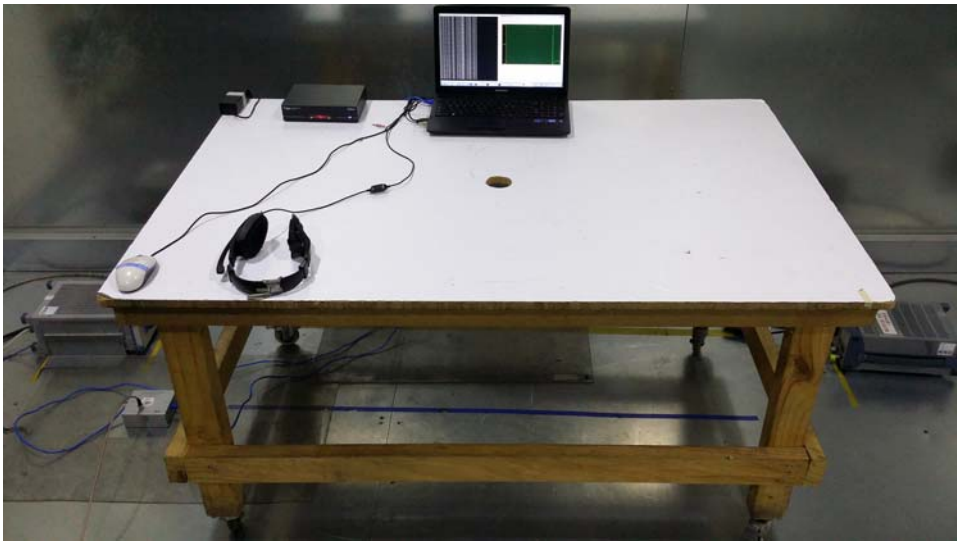
* AC main (#1- DC 12 V)





* Telecommunication

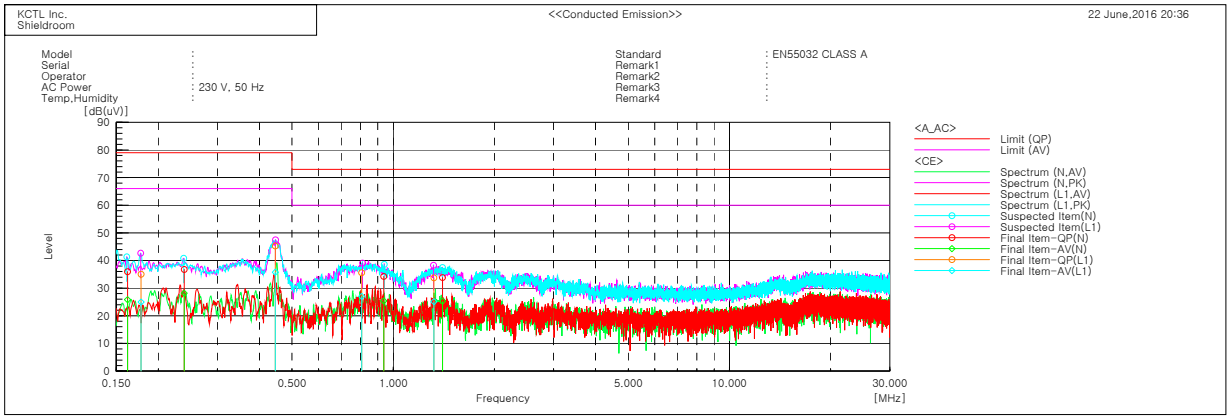
#1- DC 12 V



#2- PoE

6.1.4 Conducted emission measurement result

* AC main (DV-1104)_#1- DC 12 V



Final Result

--- N Phase ---

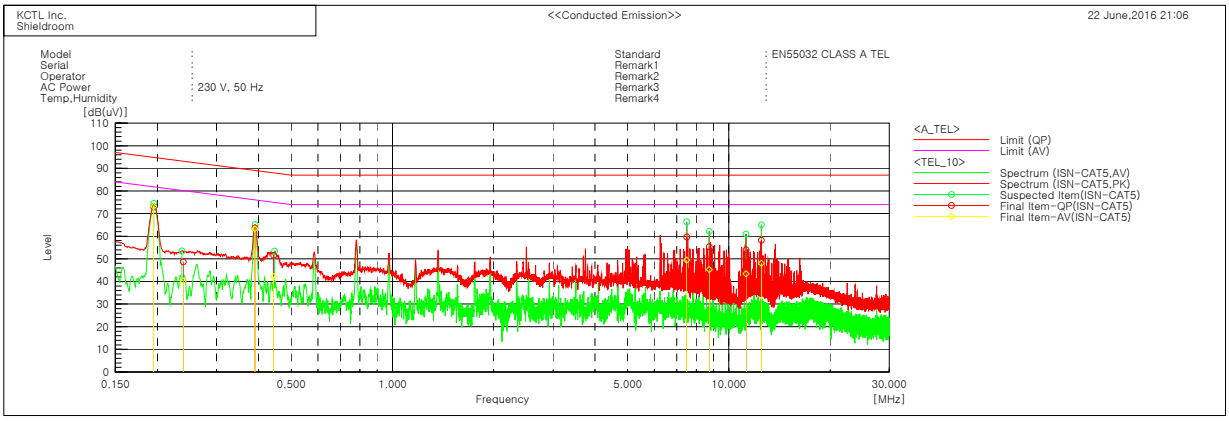
No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.16209	26.0	16.0	9.9	35.9	25.9	79.0	66.0	43.1	40.1
2	0.23911	27.0	18.3	9.8	36.8	28.1	79.0	66.0	42.2	37.9
3	0.9376	24.3	15.5	9.9	34.2	25.4	73.0	60.0	38.8	34.6
4	1.40207	24.0	15.5	9.8	33.8	25.3	73.0	60.0	39.2	34.7

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17792	25.0	15.0	10.0	35.0	25.0	79.0	66.0	44.0	41.0
2	0.44629	35.3	25.9	9.9	45.2	35.8	79.0	66.0	33.8	30.2
3	0.80581	25.7	17.1	9.9	35.6	27.0	73.0	60.0	37.4	33.0
4	1.32152	23.9	15.3	9.8	33.7	25.1	73.0	60.0	39.3	34.9

* Telecommunication port

LAN Port (LCL 65 dB)_10 Mbps (DV-1104)_#1- DC 12 V

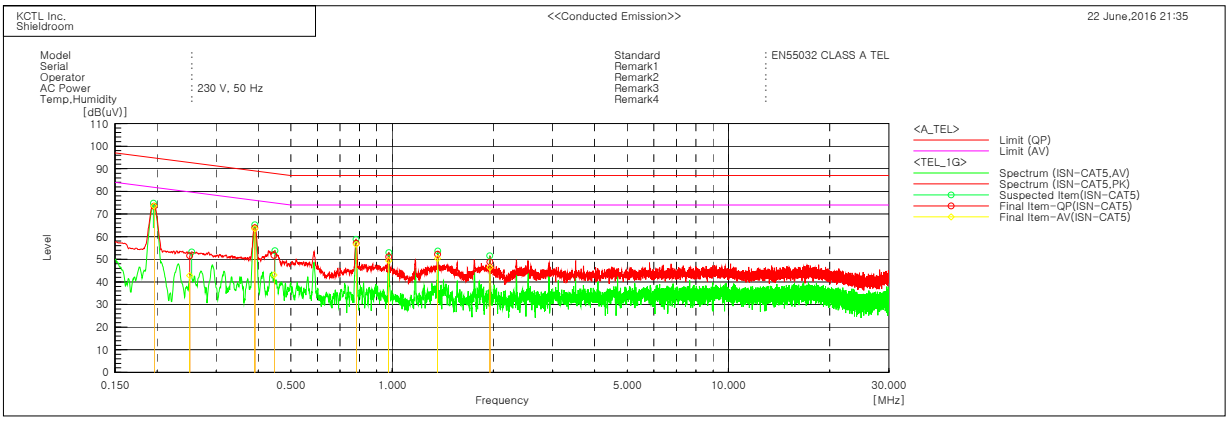


Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.195	63.2	63.4	9.8	73.0	73.2	94.8	81.8	21.8	8.6
2	0.23873	38.8	30.5	9.8	48.6	40.3	93.1	80.1	44.5	39.8
3	0.39017	53.9	53.6	9.7	63.6	63.3	89.1	76.1	25.5	12.8
4	0.44333	41.9	32.4	9.7	51.6	42.1	88.0	75.0	36.4	32.9
5	7.50074	50.0	39.9	9.6	59.6	49.5	87.0	74.0	27.4	24.5
6	8.75033	45.8	35.7	9.6	55.4	45.3	87.0	74.0	31.6	28.7
7	11.25028	44.4	33.8	9.6	54.0	43.4	87.0	74.0	33.0	30.6
8	12.50054	48.6	38.4	9.6	58.2	48.0	87.0	74.0	28.8	26.0

LAN Port (LCL 65 dB)_1000 Mbps (DV-1104)_#1- DC 12 V

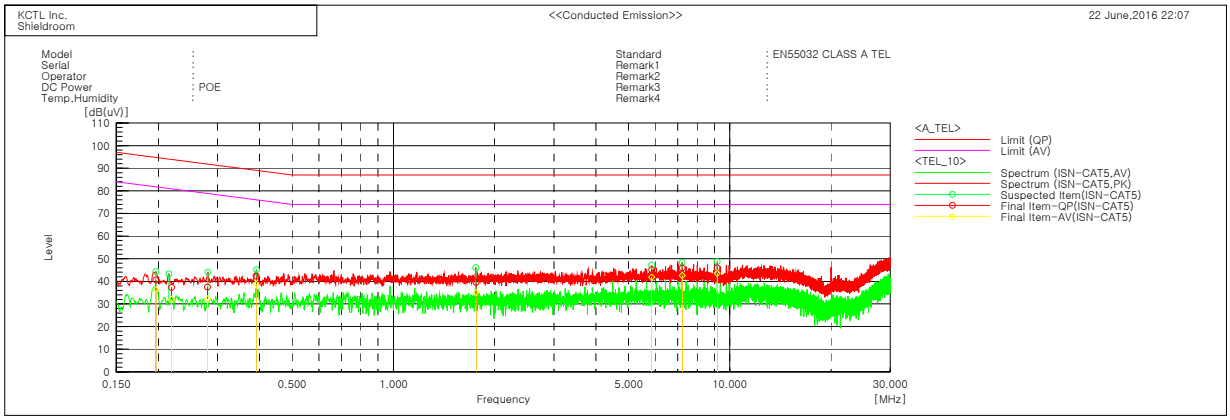


Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19583	63.7	63.8	9.8	73.5	73.6	94.8	81.8	21.3	8.2
2	0.25002	41.8	33.0	9.8	51.6	42.8	92.8	79.8	41.2	37.0
3	0.39069	54.2	53.8	9.7	63.9	63.5	89.0	76.0	25.1	12.5
4	0.44537	42.1	33.4	9.7	51.8	43.1	88.0	75.0	36.2	31.9
5	0.78138	47.6	47.0	9.6	57.2	56.6	87.0	74.0	29.8	17.4
6	0.9769	41.5	39.8	9.6	51.1	49.4	87.0	74.0	35.9	24.6
7	1.36566	42.7	40.8	9.5	52.2	50.3	87.0	74.0	34.8	23.7
8	1.95191	39.3	36.9	9.5	48.8	46.4	87.0	74.0	38.2	27.6

LAN Port (LCL 65 dB)_10 Mbps (DV-1104)_#2- PoE

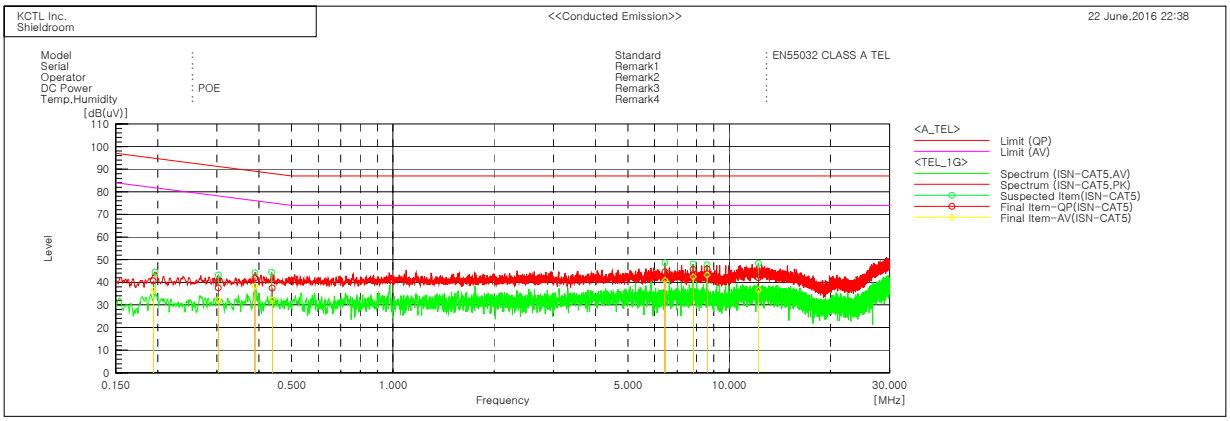


Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19662	30.8	26.5	9.8	40.6	36.3	94.8	81.8	54.2	45.5
2	0.21907	27.5	22.2	9.8	37.3	32.0	93.9	80.9	56.6	48.9
3	0.28002	27.7	22.5	9.7	37.4	32.2	91.8	78.8	54.4	46.6
4	0.39045	32.6	29.1	9.7	42.3	38.8	89.1	76.1	46.8	37.3
5	1.7612	30.0	25.4	9.5	39.5	34.9	87.0	74.0	47.5	39.1
6	5.85657	35.7	32.3	9.5	45.2	41.8	87.0	74.0	41.8	32.2
7	7.2238	36.3	33.0	9.6	45.9	42.6	87.0	74.0	41.1	31.4
8	9.17598	36.4	33.9	9.6	46.0	43.5	87.0	74.0	41.0	30.5

LAN Port (LCL 65 dB)_1000 Mbps (DV-1104)_#2- PoE



Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1938	30.8	26.6	9.8	40.6	36.4	94.9	81.9	54.3	45.5
2	0.30258	27.9	22.5	9.7	37.6	32.2	91.2	78.2	53.6	46.0
3	0.38923	32.3	28.6	9.7	42.0	38.3	89.1	76.1	47.1	37.8
4	0.43756	27.8	22.5	9.7	37.5	32.2	88.1	75.1	50.6	42.9
5	6.4416	35.1	31.4	9.5	44.6	40.9	87.0	74.0	42.4	33.1
6	7.80978	36.1	32.8	9.6	45.7	42.4	87.0	74.0	41.3	31.6
7	8.58987	36.4	33.7	9.6	46.0	43.3	87.0	74.0	41.0	30.7
8	12.216	32.4	27.0	9.6	42.0	36.6	87.0	74.0	45.0	37.4

6.2 Radiated Emission

Test specification	EN 55032:2015, Class A		
Testing voltage	230 V, 50 Hz, PoE		
Test facility	10 m Chamber (2F)		
Test distance	10 m, 3 m		
Date	2016. 06. 22		
Temperature (°C)	21.2 °C	Humidity (% R.H.)	50.6 % R.H.
Remarks	Pass		

Of those emissions above (L – 20 dB), where L is the limit level in logarithmic units, record at least the emission levels and the frequencies of the six highest emissions.
The following data lists the significant emission frequencies, measured levels, correction factors (for antenna and cables), orientation of table, polarization and height of antenna, the corrected reading, the limit, and the amount of margin. All measurements were taken utilizing quasi-peak detection unless stated otherwise.
Measurements were performed at an antenna to EUT distance of 10 or 3 meters and elevated between 1 and 4 meters. Both vertical and horizontal antenna polarizations were measured.

Below 1 GHz, peak detector function mode for prescan was used with resolution bandwidth of 120 kHz and a video bandwidth of 300 kHz and sweep method.
The sweep time for prescan set below 200 ms up and final measurement with quasi-peak detector evaluated for suspected frequencies points, which are detected from prescan measurement.

Final measurements consisted of 3 steps.
First step, frequency fine tuning to find exact emission frequency.
Second step, rechecking to search for maximum height and azimuth for interference from EUT
In final step, there are conducted measuring with quasi-peak detector for points which are detected from 1st step & 2nd step.

6.2.1 Limits of radiated emission measurement

☒ Limits below 1 ㎓

Frequency [㎒]	Resolution Bandwidth [㎑]	Class A (dB(㎶/m)) @ 10 m	Class B (dB(㎶/m)) @ 10 m
30 ~ 230	120	40	30
230 ~ 1 000	120	47	37

☒ Limits above 1 ㎓

Frequency [㎓]	Resolution Bandwidth [㎒]	Class A @ 3 m		Class B @ 3 m	
		Average limit (dB(㎶/m))	Peak limit (dB(㎶/m))	Average limit (dB(㎶/m))	Peak limit (dB(㎶/m))
1 ~ 3	1	56	76	50	70
3 ~ 6	1	60	80	54	74
Note - The lower limit applies at the transition frequency.					

Measurements within 20 dB of the limit were then maximized by adjusting turntable position.

Final measurements were made using an C/Average detector.

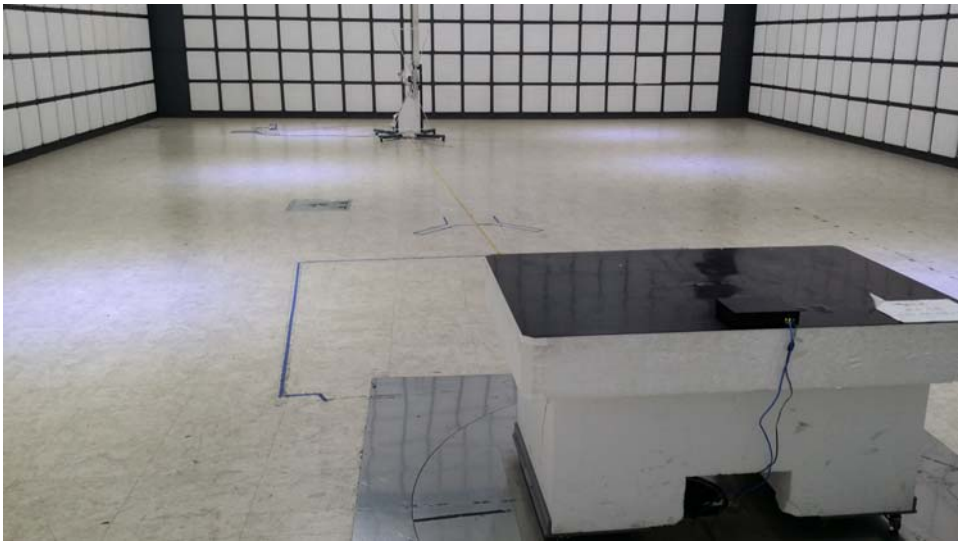
Results checked manually and points close to the limit line were re-measured.

6.2.2 Used equipments

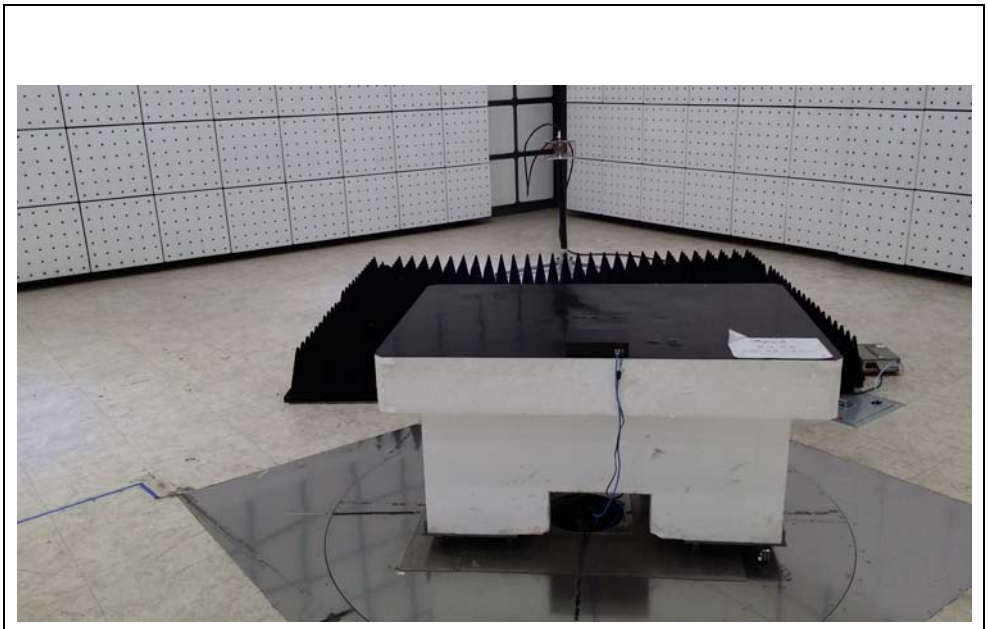
Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESCI7	100732	R&S	2017.02.26	☒
Bi-Log Antenna	VULB 9168	440	SCHWARZBECK	2017.10.23	☒
Amplifier	310N	344922	SONOMA INSTRUMENT	2016.09.02	☒
3 dB Attenuator	8491B	22981	HP	2016.09.01	☒
Antenna Mast	MA4000-EP	303	Innco Systems	-	☒
Turn Table	DT2000S-1t	079	Innco Systems	-	☒
Preamplifier	8449B	3008A02343	AGILENT	2016.09.02	☒
Horn ANT	3115	00155772	ETS	2016.11.12	☒
Spectrum Analyzer	FSV40	100988	R&S	2017.01.07	☐

6.2.3 Photographs of test setup

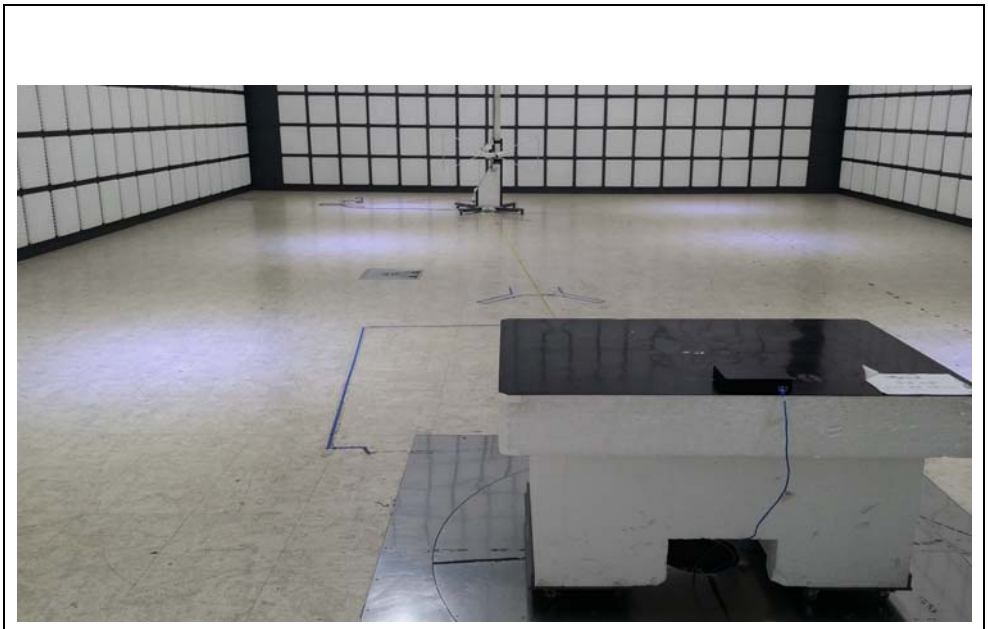
* 30 ㎒ ~ 1 ㎓ (#1- DC 12 V)



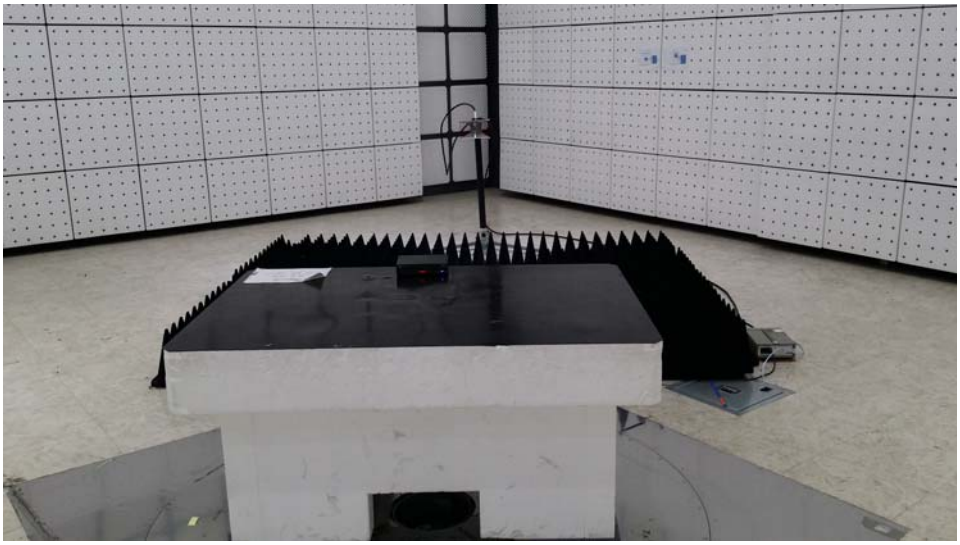
* 1 ㎓ ~ 6 ㎓ (#1- DC 12 V)

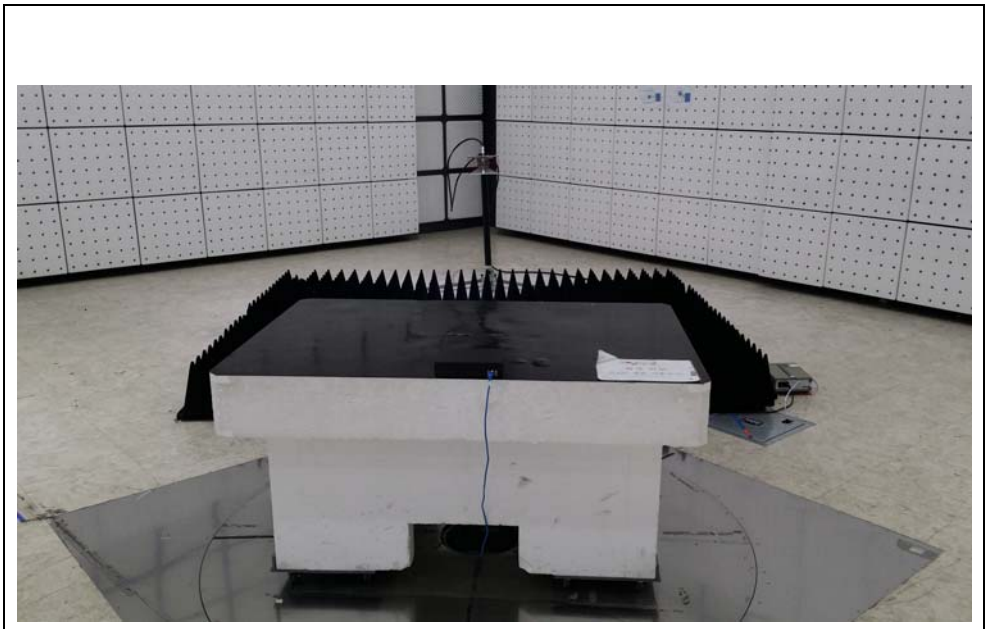


* 30 ㎒ ~ 1 ㎓ (#2- PoE)



* 1 ㎓ ~ 6 ㎓ (#2- PoE)

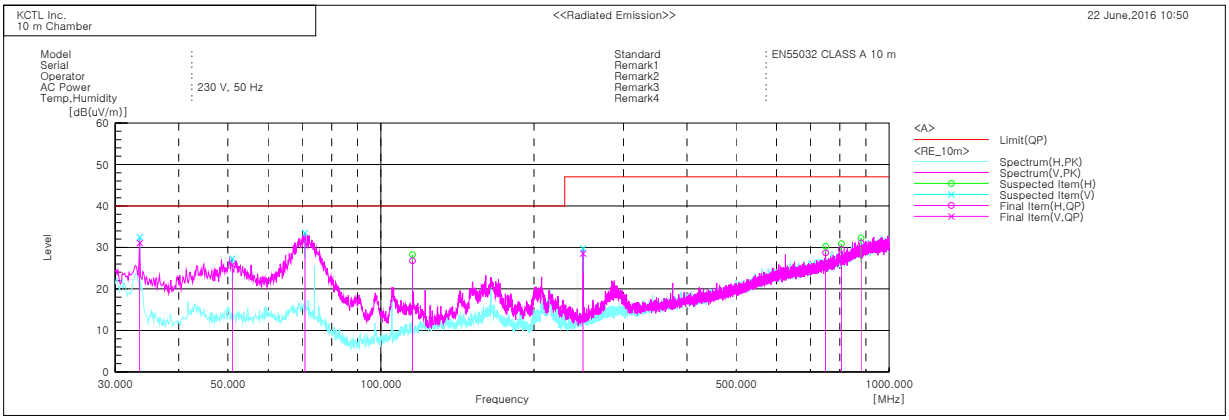




6.2.4 Radiated emission measurement result

*** Graph and Data**

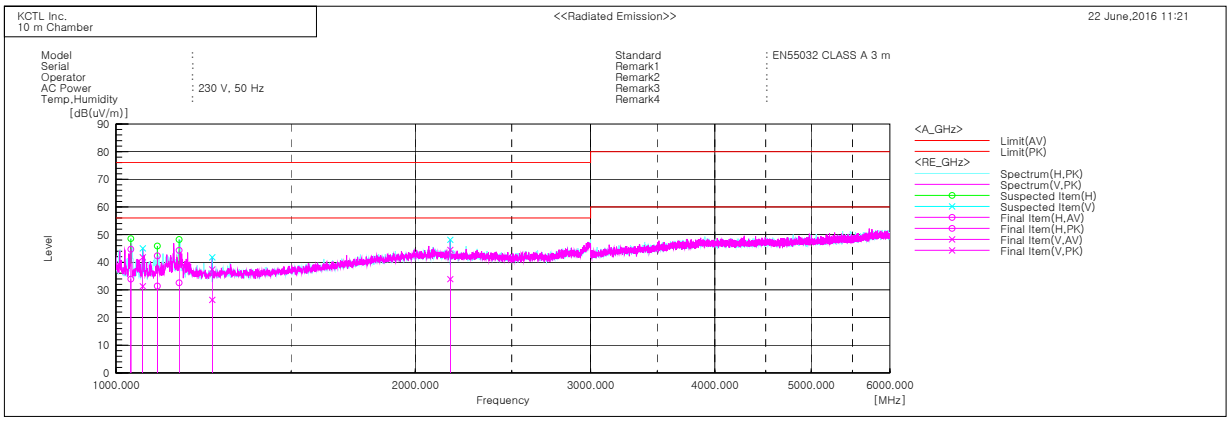
* 30 ㎒ ~ 1 ㎓ (DV-1104)_#1- DC 12 V



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	33.516	V	45.8	-14.7	31.1	40.0	8.9	400.0	110.5
2	50.976	V	39.0	-13.2	25.8	40.0	14.2	100.0	13.2
3	70.861	V	47.2	-15.0	32.2	40.0	7.8	100.0	200.1
4	115.360	H	42.0	-15.2	26.8	40.0	13.2	100.0	348.0
5	249.947	V	41.3	-12.8	28.5	47.0	18.5	100.0	61.0
6	749.983	H	27.4	1.3	28.7	47.0	18.3	200.0	44.6
7	805.636	H	26.8	2.7	29.5	47.0	17.5	400.0	202.5
8	880.569	H	26.8	4.3	31.1	47.0	15.9	100.0	55.1

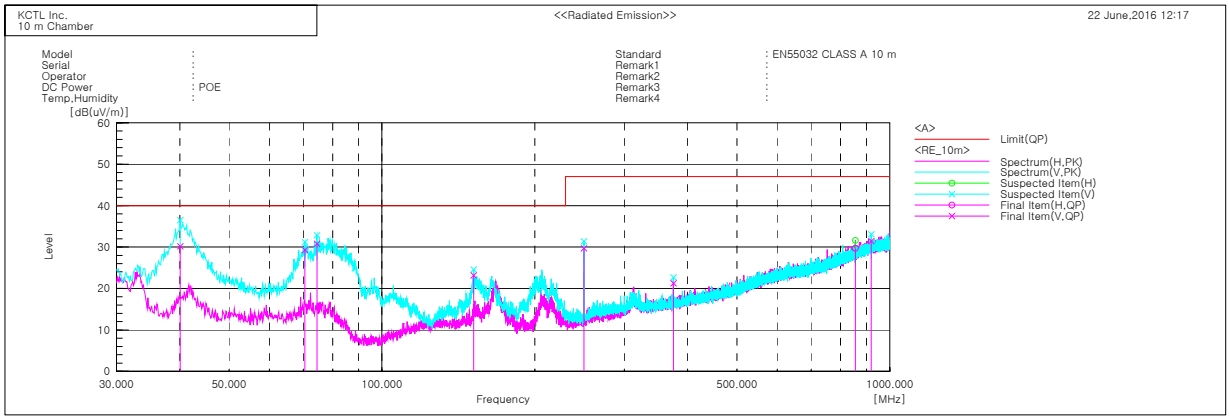
* 1 ㎓ ~ 6 ㎓ (DV-1104)_#1- DC 12 V



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1035.000	H	40.2	51.0	-6.3	33.9	44.7	56.0	76.0	22.1	31.3	100.0	287.2
2	1063.750	V	37.5	48.0	-6.2	31.3	41.8	56.0	76.0	24.7	34.2	100.0	321.3
3	1100.625	H	37.6	48.5	-6.2	31.4	42.3	56.0	76.0	24.6	33.7	100.0	296.3
4	1157.500	H	38.6	50.3	-6.0	32.6	44.3	56.0	76.0	23.4	31.7	100.0	164.7
5	1249.375	V	32.1	43.1	-5.7	26.4	37.4	56.0	76.0	29.6	38.6	100.0	331.8
6	2168.125	V	31.6	42.2	2.3	33.9	44.5	56.0	76.0	22.1	31.5	100.0	141.3

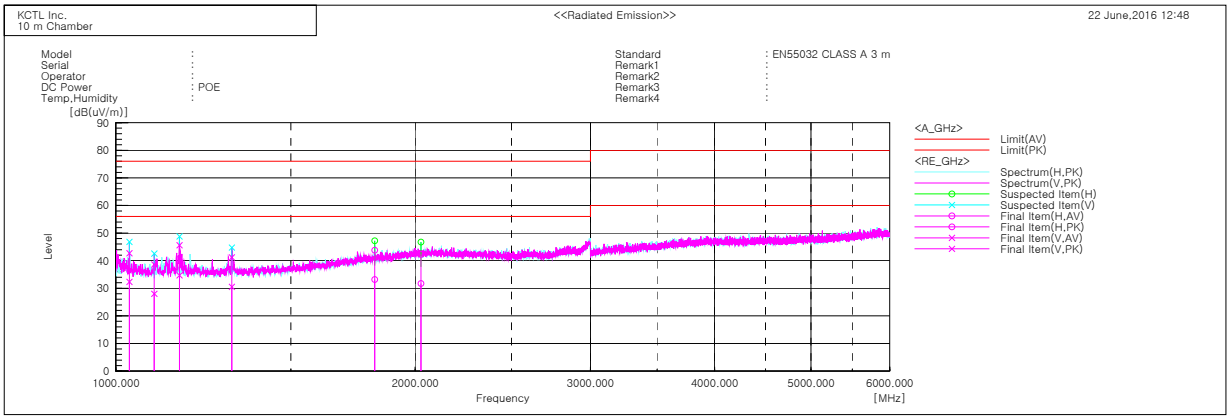
* 30 ㎒ ~ 1 ㎓ (DV-1104)_#2- PoE



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	40.064	V	44.0	-13.8	30.2	40.0	9.8	100.0	201.5
2	70.498	V	44.3	-15.0	29.3	40.0	10.7	100.0	246.9
3	74.499	V	46.7	-15.9	30.8	40.0	9.2	100.0	14.8
4	151.614	V	36.6	-13.4	23.2	40.0	16.8	100.0	142.6
5	249.947	V	42.5	-12.8	29.7	47.0	17.3	100.0	286.1
6	374.956	V	29.3	-8.0	21.3	47.0	25.7	100.0	275.5
7	855.349	H	25.9	3.8	29.7	47.0	17.3	100.0	292.7
8	919.854	V	26.5	5.0	31.5	47.0	15.5	400.0	217.2

* 1 ㎓ ~ 6 ㎓ (DV-1104)_#2- PoE



Final Result

No.	Frequency [MHz]	(P)	Reading AV [dB(uV)]	Reading PK [dB(uV)]	c.f [dB(1/m)]	Result AV [dB(uV/m)]	Result PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Limit PK [dB(uV/m)]	Margin AV [dB]	Margin PK [dB]	Height [cm]	Angle [deg]
1	1031.875	V	38.6	49.0	-6.3	32.3	42.7	56.0	76.0	23.7	33.3	100.0	325.8
2	1093.125	V	34.2	44.9	-6.2	28.0	38.7	56.0	76.0	28.0	37.3	100.0	294.2
3	1158.750	V	40.7	51.6	-6.0	34.7	45.6	56.0	76.0	21.3	30.4	100.0	93.9
4	1308.125	V	35.9	46.6	-5.4	30.5	41.2	56.0	76.0	25.5	34.8	100.0	139.1
5	1820.625	H	32.6	43.2	0.6	33.2	43.8	56.0	76.0	22.8	32.2	100.0	128.2
6	2026.875	H	29.5	40.1	2.2	31.7	42.3	56.0	76.0	24.3	33.7	100.0	149.3

6.3 Harmonics

Test specification	EN 61000-3-2:2014				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2016. 06. 22				
Temperature(°C)	26.3 °C	Humidity (% R.H.)	45.7 % R.H.	Pressure (kPa)	99.9 kPa
Remarks	Pass				

6.3.1 Measurement procedure

The equipment is supplied in series with shunt(s) Rm or current transformer(s) from a source having the same nominal voltage and frequency as the rated supply voltage and frequency of the equipment. Measurements shall be made under normal load, or conditions for adequate heat discharge, and under normal operating conditions. User's operation controls or automatic programmers shall be set to produce the maximum harmonic component, for each successive harmonic component in turn. For the purpose of harmonic current limitation, equipment is classified as follows :

Class A : Equipment not specified in one of the three other Classes shall be considered as Class A equipment.

- Balanced three-phase equipment;
- Household appliances, excluding equipment identified as Class D;
- Tools, excluding portable tools;
- Dimmers for incandescent lamps;
- Audio equipment.

Class B : Portable tools; Arc welding equipment which is not professional equipment.

Class C : Lighting equipment.

Class D : Equipment having a specified power according to 6.2.2 less than or equal to 600 w, of the following types:

- Personal computers and personal computer monitors;
- Television receivers.
- Refrigerators and freezers having one or more variable-speed drives to control compressor motor(s).

6.3.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter (AC POWER SOURCE)	5001x-CTS -400-413	54894	C.I.	2017.03.16	☒
Harmonics/Flicker meter (Analyzer)	PACS-1	72072	C.I.	2017.03.16	☒

6.3.3 Photographs of test setup

#1- DC 12 V

6.3.4 Measurement result

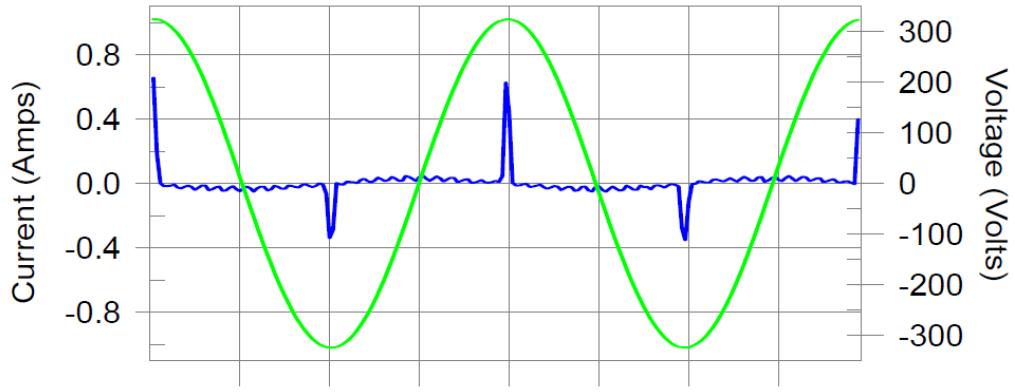
#1- DC 12 V

Harmonics – Class-A per Ed. 4.0 (2014)(Run time) incl. inter-harmonics

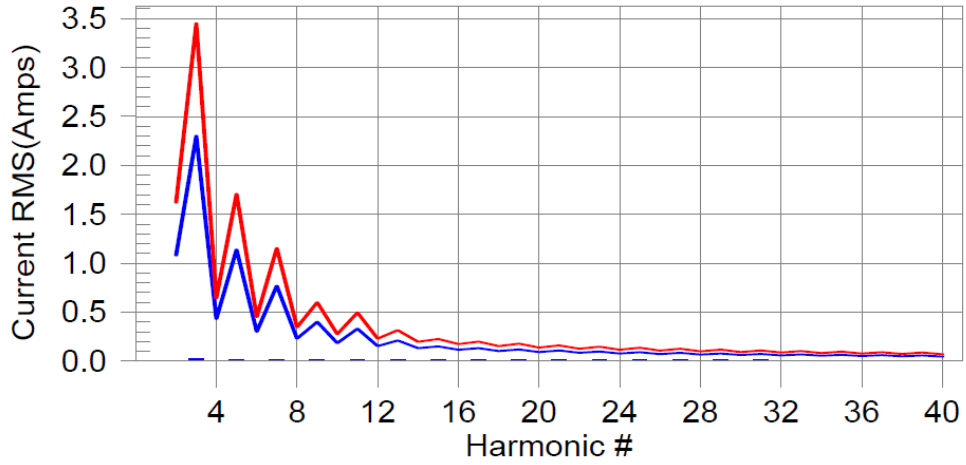
EUT: DV-1104 **Tested by: Tested by**
Test category: Class-A per Ed. 4.0 (2014) (European limits) **Test Margin: 100**
Test date: 22/06/2016 **Start time: 19:45:10** **End time: 19:48:32**
Test duration (min): 2.5 **Data file name: H-000085.cts_data**
Comment: Comment
Customer: IDIS CO., LTD.

Test Result: Pass **Source qualification: Normal**

Current & voltage waveforms



Harmonics and Class A limit line **European Limits**



Test result: Pass Worst harmonic was #25 with 14.2% of the limit.

Current Test Result Summary (Run time)

EUT: DV-1104 Tested by: Tested by
Test category: Class-A per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 25/06/2016 Start time: 19:45:10 End time: 19:48:32
Test duration (min): 2.5 Data file name: H-000085.cts_data
Comment: Comment
Customer: IDIS CO., LTD.

Test Result: Pass Source qualification: Normal
THC(A): 0.067 I-THD(%): 217.7 POHC(A): 0.034 POHC Limit(A): 0.251
Highest parameter values during test:

V_RMS (Volts):	229.46	Frequency(Hz):	50.00
I_Peak (Amps):	0.692	I_RMS (Amps):	0.083
I_Fund (Amps):	0.032	Crest Factor:	9.110
Power (Watts):	5.0	Power Factor:	0.273

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.005	1.080	N/A	0.005	1.620	N/A	Pass
3	0.020	2.300	0.9	0.022	3.450	0.6	Pass
4	0.005	0.430	N/A	0.005	0.645	N/A	Pass
5	0.019	1.140	1.7	0.022	1.710	1.3	Pass
6	0.005	0.300	N/A	0.005	0.450	N/A	Pass
7	0.019	0.770	2.5	0.021	1.155	1.9	Pass
8	0.005	0.230	N/A	0.005	0.345	N/A	Pass
9	0.019	0.400	4.7	0.021	0.600	3.5	Pass
10	0.005	0.184	N/A	0.005	0.276	N/A	Pass
11	0.018	0.330	5.5	0.020	0.495	4.1	Pass
12	0.005	0.153	N/A	0.005	0.230	N/A	Pass
13	0.018	0.210	8.4	0.020	0.315	6.4	Pass
14	0.005	0.131	N/A	0.005	0.197	N/A	Pass
15	0.017	0.150	11.3	0.019	0.225	8.4	Pass
16	0.005	0.115	N/A	0.005	0.173	N/A	Pass
17	0.016	0.132	12.3	0.018	0.198	9.1	Pass
18	0.005	0.102	N/A	0.005	0.153	N/A	Pass
19	0.015	0.118	13.0	0.017	0.178	9.6	Pass
20	0.005	0.092	N/A	0.005	0.138	N/A	Pass
21	0.015	0.107	13.6	0.016	0.161	10.0	Pass
22	0.004	0.084	N/A	0.005	0.125	N/A	Pass
23	0.014	0.098	14.0	0.015	0.147	10.3	Pass
24	0.004	0.077	N/A	0.005	0.115	N/A	Pass
25	0.013	0.090	14.2	0.014	0.135	10.4	Pass
26	0.004	0.071	N/A	0.005	0.107	N/A	Pass
27	0.012	0.083	14.2	0.013	0.125	10.3	Pass
28	0.004	0.066	N/A	0.005	0.099	N/A	Pass
29	0.011	0.078	14.0	0.012	0.116	10.2	Pass
30	0.004	0.061	N/A	0.005	0.092	N/A	Pass
31	0.010	0.073	13.6	0.011	0.109	9.9	Pass
32	0.004	0.058	N/A	0.004	0.086	N/A	Pass
33	0.009	0.068	13.1	0.010	0.102	9.4	Pass
34	0.004	0.054	N/A	0.004	0.081	N/A	Pass
35	0.008	0.064	12.4	0.009	0.096	8.9	Pass
36	0.004	0.051	N/A	0.004	0.077	N/A	Pass
37	0.007	0.061	11.6	0.008	0.091	8.2	Pass
38	0.003	0.048	N/A	0.004	0.073	N/A	Pass
39	0.006	0.058	10.6	0.006	0.087	7.5	Pass
40	0.003	0.046	N/A	0.003	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

EUT: DV-1104 Tested by: Tested by
Test category: Class-A per Ed. 4.0 (2014) (European limits) Test Margin: 100
Test date: 25/06/2016 Start time: 19:45:10 End time: 19:48:32
Test duration (min): 2.5 Data file name: H-000085.cts_data
Comment: Comment
Customer: IDIS CO., LTD.

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms):	229.46	Frequency(Hz):	50.00
I_Peak (Amps):	0.692	I_RMS (Amps):	0.083
I_Fund (Amps):	0.032	Crest Factor:	9.110
Power (Watts):	5.0	Power Factor:	0.273

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.098	0.459	21.28	OK
3	0.513	2.065	24.84	OK
4	0.024	0.459	5.31	OK
5	0.020	0.918	2.16	OK
6	0.030	0.459	6.60	OK
7	0.015	0.688	2.22	OK
8	0.021	0.459	4.56	OK
9	0.021	0.459	4.58	OK
10	0.007	0.459	1.59	OK
11	0.018	0.229	8.03	OK
12	0.030	0.229	13.03	OK
13	0.033	0.229	14.38	OK
14	0.006	0.229	2.54	OK
15	0.013	0.229	5.66	OK
16	0.019	0.229	8.17	OK
17	0.017	0.229	7.41	OK
18	0.012	0.229	5.41	OK
19	0.023	0.229	10.18	OK
20	0.009	0.229	3.94	OK
21	0.019	0.229	8.16	OK
22	0.010	0.229	4.31	OK
23	0.015	0.229	6.38	OK
24	0.017	0.229	7.38	OK
25	0.023	0.229	9.93	OK
26	0.017	0.229	7.53	OK
27	0.015	0.229	6.43	OK
28	0.010	0.229	4.37	OK
29	0.019	0.229	8.11	OK
30	0.019	0.229	8.35	OK
31	0.019	0.229	8.35	OK
32	0.011	0.229	4.69	OK
33	0.016	0.229	7.01	OK
34	0.013	0.229	5.55	OK
35	0.020	0.229	8.61	OK
36	0.012	0.229	5.35	OK
37	0.017	0.229	7.61	OK
38	0.009	0.229	4.01	OK
39	0.004	0.229	1.81	OK
40	0.014	0.229	6.20	OK

6.4 Flicker

Test specification	EN 61000-3-3:2013				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2016. 06. 22				
Temperature(°C)	26.3 °C	Humidity (% R.H.)	45.7 % R.H.	Pressure (kPa)	99.9 kPa
Remarks	Pass				

6.4.1 Measurement procedure

EUT was connected to the power analyzer system.

Measurement was performed to obtain the desired flicker parameters.

The measuring time depends on which parameters are to be measured.

P_{lt} = 2 h

P_{st} = 10 min

Controls and automatic programs shall be set to produce the most unfavorable sequence of voltage changes, using only those combinations of controls and programs are mentioned by the manufacturer in the instruction manual.

6.4.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter (AC POWER SOURCE)	5001x-CTS -400-413	54894	C.I.	2017.03.16	☒
Harmonics/Flicker meter (Analyzer)	PACS-1	72072	C.I.	2017.03.16	☒

6.4.3 Photographs of test setup

#1- DC 12 V

6.4.4 Measurement result

#1- DC 12 V

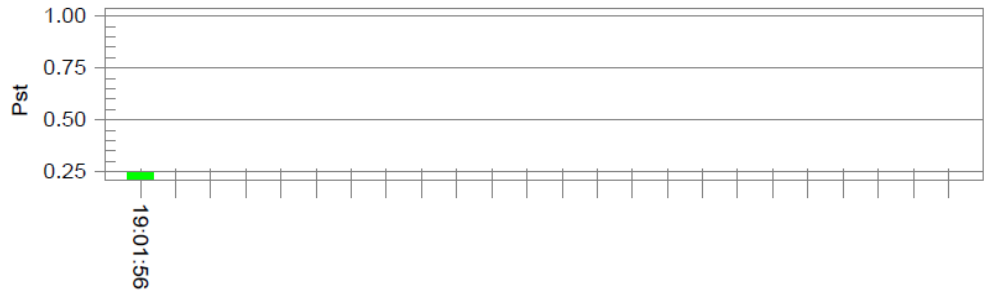
Flicker Test Summary per EN/IEC61000-3-3 (Run time)

EUT: DV-1104
Test category: All parameters (European limits)
Test date: 22/06/2016 Start time: 18:51:26 End time: 19:01:57
Test duration (min): 10 Data file name: F-000084.cts_data
Comment: Comment
Customer: IDIS CO., LTD.

Tested by: Tested by
Test Margin: 100

Test Result: Pass Status: Test Completed

Pst_i and limit line European Limits



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	229.43			
Highest dt (%):	0.00	Test limit (%):	N/A	N/A
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.02	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.248	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.108	Test limit:	0.650	Pass

6.5 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	☒ Contact: ± 6 ㎸ ☒ Air: ± 2 ㎸, ± 4 ㎸, ± 8 ㎸ ☒ HCP: ± 6 ㎸ ☒ VCP: ± 6 ㎸				
Discharge impedance	330 Ω / 150 ㎊				
Number of discharge (Each polarity)	☒ Contact: 10 ☒ Air: 10 ☒ HCP / VCP: 10				
Interval between discharges	1 s				
Testing voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016. 06. 22				
Temperature (°C)	24.3 °C	Humidity (% R.H.)	47.5 % R.H.	Pressure (kPa)	99.7 kPa
Remarks	Pass -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.				

6.5.1 Measurement procedure

A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane.
In case of floor standing equipment, EUT was placed on the reference plane on 0.1 ㎝ of insulating Support. In case of table top equipment, EUT was placed on a wooden table 0.8 ㎝ above the reference grounded floor. A horizontal coupling plane (HCP) was placed on the table, and Connected to the reference plane via a 470 ㏀ resistor located in each end (0.5 ㎜ insulating support between EUT and HCP). In both cases a vertical coupling plane(VCP) OF 0.5 X 0.5 ㎝ was located 0.1 ㎝ from the EUT's sides. The VCP was connected to the reference plane in the same matter as the HCP.

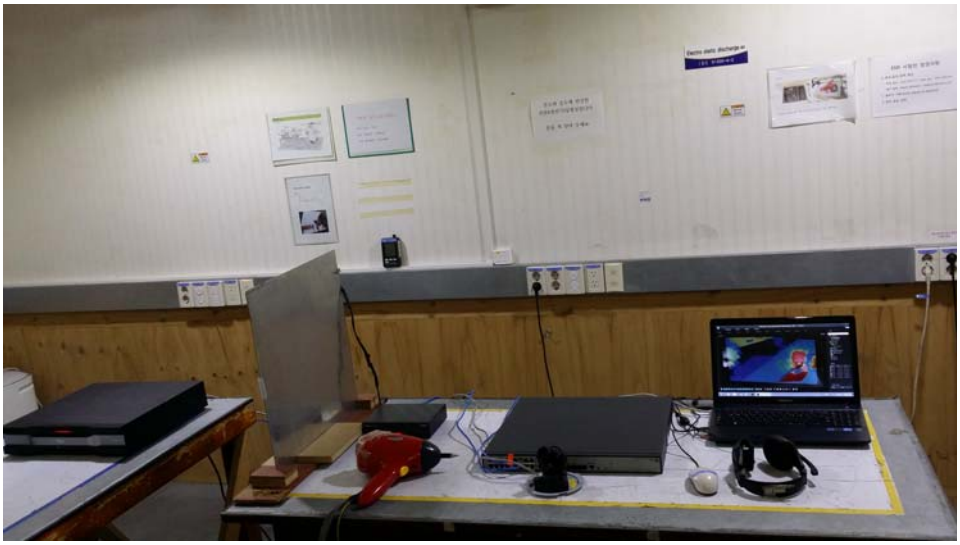
6.5.2 Used equipments

Equipment	Model No.	Serial No.	Makers	Next Cal. Date	Used
ESD Tester	PESD-1600	H011 309	HAEFELY	2017.05.10	☐
ESD Tester	NSG 437	182	TESEQ	2017.04.26	☒
HCP	-	-	-	-	☒
VCP	-	-	-	-	☒

6.5.3 Photographs of test setup

#1- DC 12 V

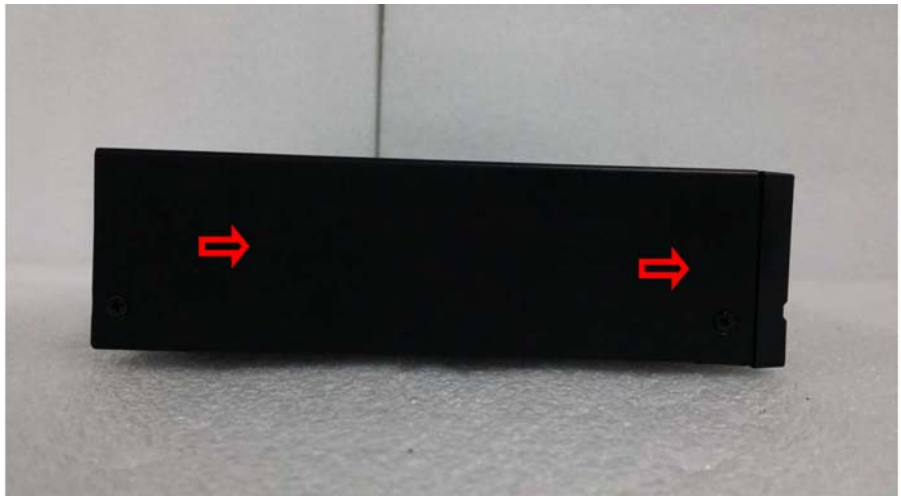
#2- PoE

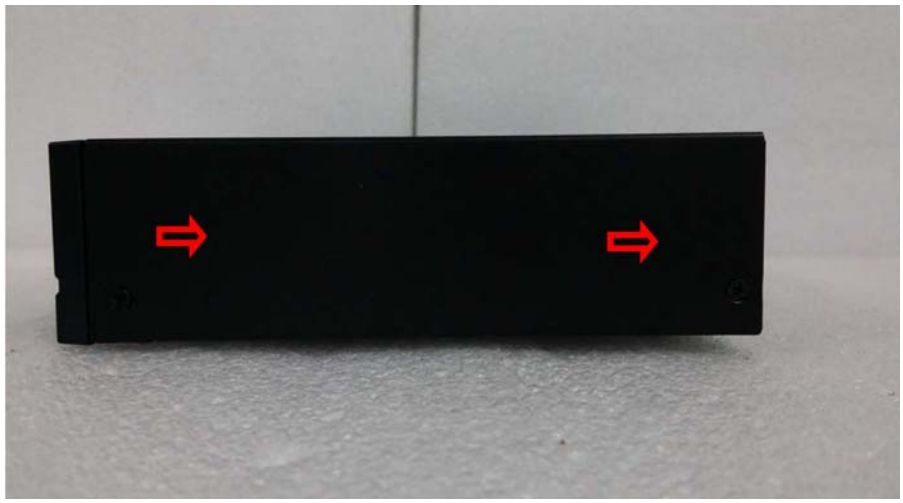


6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge	○
Contact discharge	⇨





(#1- DC 12 V, #2- PoE)

HCP/VCP discharge

Location(EUT)	Applied level (±)	Result
HCP (All 4 sides)	± 6 kV	Pass
VCP (All 4 sides)	± 6 kV	Pass

Contact discharge

Location(EUT)	Applied level (±)	Result
Front	± 6 kV	-
Rear	± 6 kV	Pass
Left	± 6 kV	Pass
Right	± 6 kV	Pass

Air discharge

Location(EUT)	Applied level (±)	Result
Front	± 2 kV, ± 4 kV, ± 8 kV	Pass
Rear	± 2 kV, ± 4 kV, ± 8 kV	Pass
Left	± 2 kV, ± 4 kV, ± 8 kV	-
Right	± 2 kV, ± 4 kV, ± 8 kV	-

6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006+A2:2010				
Tested frequency	80 ㎒ ~ 1 ㎓, 1 ㎓ ~ 2.7 ㎓				
Test level & Modulation	1 ㎷/m, 3 ㎷/m, 10 ㎷/m, 80 % Amplitude Modulation (1 ㎑) 1 ㎷/m, 3 ㎷/m, 10 ㎷/m, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Frequency Step	1 % step				
Dwell time	1 s				
Distance	3 m from EUT to tip of antenna				
Testing Voltage	DC 12 V, PoE				
Test facility	6F Fully anechoic chamber (3 m)				
Date	2016. 06. 23				
Temperature (°C)	26.0 °C	Humidity (% R.H.)	48.5 % R.H.	Pressure (kPa)	99.9 kPa
Remarks	Pass -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.				

6.6.1 Measurement procedure

The test was performed at 3 m full anechoic chamber.

For floor standing equipment, the EUT was standing on the floor.

For tabletop equipment, the EUT was located on a wooden table 0.8 m above the floor.

The EUT was tested all sides, horizontal and vertical polarization.

6.6.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Power meter	PM2002	302852	AR	2016.09.03	☒
Power sensor	PH2000	303224	AR	2016.09.03	☒
Power sensor	PH2000	311217	AR	2016.09.03	☒
Directional coupler	DC6180	303976	AR	2016.09.03	☒
Directional coupler	DC7144M1	320279	AR	2016.09.03	☒
Signal generator	E4421B	GB40052295	AGILENT	2016.09.03	☒
Broadband Amplifier	BBA100	100996-1	R&S	-	☒
Amplifier	60S1G3M2	320444	AR	-	☒
Log Periodic Dipole Antenna	LPDA-0803	130269	ETS	-	☒
Antenna master	-	-	ETS	-	☒

6.6.3 Photographs of test setup

#1- DC 12 V

#2- PoE

6.6.4 Measurement result

(#1- DC 12 V, #2- PoE)

Location(EUT)	Antenna polarization	Result
Front side	Horizontal	Pass
	Vertical	Pass
Rear side	Horizontal	Pass
	Vertical	Pass
Left side	Horizontal	Pass
	Vertical	Pass
Right side	Horizontal	Pass
	Vertical	Pass

6.7 Electrical Fast Transient/BURST

Test specification	EN 61000-4-4:2012				
Coupling	☒ DC 12 V: Clamp ☐ Signal: Clamp ☒ Telecommunication: Clamp				
Test level	☒ DC 12 V: ± 1 ㎸ Peak ☐ Signal: ± 1 ㎸ Peak ☒ Telecommunication: ± 1 ㎸ Peak				
Repetition frequency	100 ㎑, Tr/Th = 5 / 50 ㎱				
Coupling time (Minimum)	60 s				
Testing Voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016. 06. 24				
Temperature(°C)	23.7 °C	Humidity (% R.H.)	48.3 % R.H.	Pressure (kPa)	100.1 kPa
Remarks	Pass -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. * DC port: Clamp apply (DC ports, which are not intended to be connected to a DC distribution network, e.g. outputs for Sounders, are treated as signal ports.)				

6.7.1 Measurement procedure

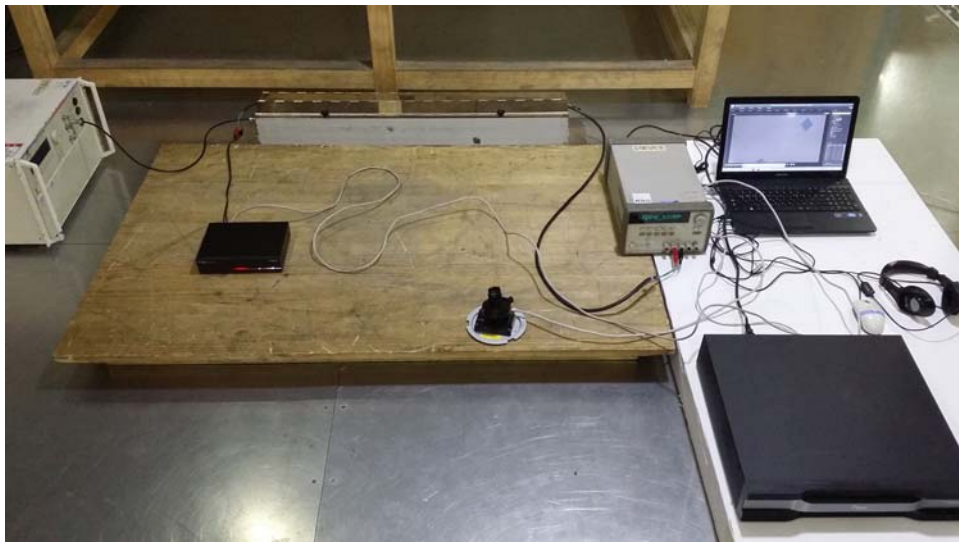
A ground reference plane was located on the floor.
EFT generator was connected to reference ground plane via low impedance connection.
For floor standing equipment, EUT was placed on a 0.1 ㎝ wooden table.
For tabletop equipment, EUT was placed on a 0.1 ㎝ above the ground reference plane.
Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 ㎝.

6.5.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M6BS1	V0545100858	EM TEST	2017.04.07	☐
Ultra compact simulator	UCS500M	0701-03	EM TEST	2016.09.01	☒
Capacitive coupling clamp	-	0001	EM TEST	2016.09.03	☒

6.7.3 Photographs of test setup

#1- DC 12 V



#2- PoE

6.7.4 Measurement result

* DC Line (#1- DC 12 V)

Coupling point	(+)	(-)	Result
DC 12 V	+ 1 kV	- 1 kV	Pass

* Signal

Coupling point	(+)	(-)	Result
-	-	-	-

* Telecommunication (#1- DC 12 V, #2- PoE)

Coupling point	(+)	(-)	Result
LAN(RJ-45)	+ 1 kV	- 1 kV	Pass
LAN(PoE)	+ 1 kV	- 1 kV	Pass

6.8 Surge

Test specification	EN 61000-4-5:2014				
Coupling	☒ DC 12 V: CDN ☐ Signal: Direct ☒ Telecommunication: CDN				
Test level	☒ DC 12 V: ± 0.5 ㎸, ± 1 ㎸ ☐ Signal: ± 0.5 ㎸, ± 1 ㎸ ☒ Telecommunication: ± 0.5 ㎸, ± 1 ㎸				
Coupling Impedance	☒ Differential mode: 18 ㎌ ☐ Common mode: 10 Ω + 9 ㎌ ☒ 40 Ω + 0.5 ㎌ ☐ Direct				
Surge pulse shape	Tr/Th = 1.2 / 50 ㎲				
Number of surge	5				
Coupling time	30 s				
Testing Voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016. 06. 24				
Temperature(°C)	24.2 °C	Humidity (% R.H.)	47.8 % R.H.	Pressure (kPa)	100.2 kPa
Remarks	Pass -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.				

6.8.1 Measurement procedure

A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

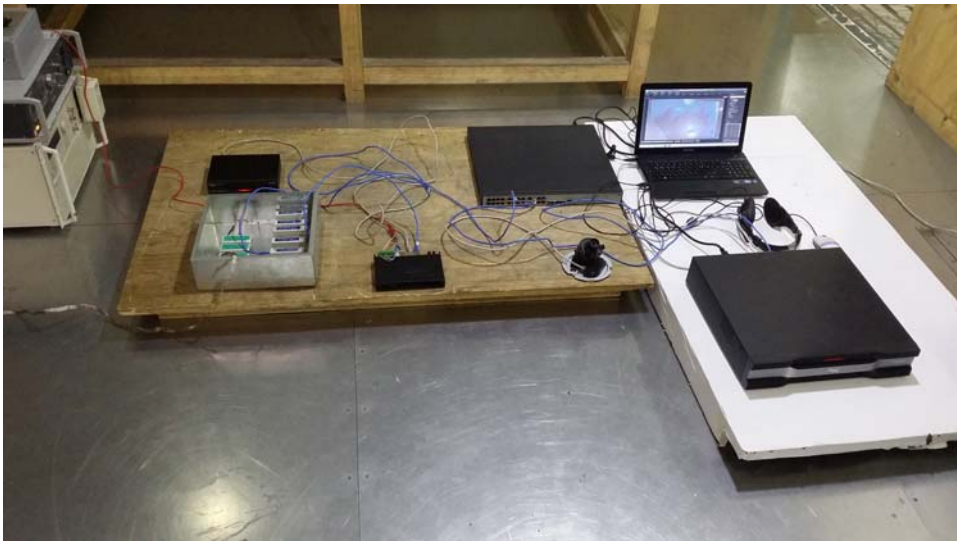
6.8.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500N5V	P1429136861	EM TEST	2016.09.03	☒
CDN	CNV 508 N1	V1108108861	EM TEST	2016.09.02	☒

6.8.3 Photographs of test setup

#1- DC 12 V

#2- PoE



6.8.4 Measurement result

* DC Line (#1- DC 12 V)

Coupling point	(+)	(-)	Result
DC 12 V	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass

* Signal

Coupling point	(+)	(-)	Result
-	-	-	-

* Telecommunication (#1- DC 12 V, #2- PoE)

Coupling point	(+)	(-)	Result
LAN(RJ-45)	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass
LAN(PoE)	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass

6.9 Conducted Immunity

Test specification	EN 61000-4-6:2014				
Tested frequency	0.15 ㎒ ~ 100 ㎒				
Test level & Modulation	1 Ⅴ, 3 Ⅴ, 10 Ⅴ, 80 % Amplitude Modulation (1 ㎑) 1 Ⅴ, 3 Ⅴ, 10 Ⅴ, Pulse Modulation (1 ㎐ (0.5 s ON: 0.5 s OFF))				
Frequency Step	1 % step				
Dwell time	1 s				
Coupling method	☒ DC 12 V: CDN(M2) ☐ Signal: Clamp ☒ Telecommunication: CDN(T8-RJ45)				
Testing Voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016. 06. 24				
Temperature(°C)	23.2 °C	Humidity (% R.H.)	38.9 % R.H.	Pressure (kPa)	99.7 kPa
Remarks	Pass -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.				

6.9.1 Measurement procedure

A ground reference plane was located on the floor.

The test was performed on a ground reference plane on a 0.1 m wooden table. This test were Performed using CDN for mains, clamp for signal and injection probe. The frequency range was swept from 0.15 ㎒ to 80 ㎒. This frequency range was Modulated with 1 ㎑ sine wave at 80 %.

The signal generators provided the modulated frequency at a 1 % step size.

The power and all network cable, I/O cables longer than 3 m length were tested.

6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
POWER SENSOR	NRP-Z91	103183	R&S	2017.02.15	☒
POWER SENSOR	NRP-Z91	103184	R&S	2017.02.15	☒
CDN	CDN L-801 M2 / M3	2936	EM TEST	2016.09.03	☒
CDN	CDN M2/M3	0906-12	EM TEST	2016.09.03	☒
SIGNAL GENERATOR	SMC100A	105221	R&S	2017.02.16	☒
COAXIAL FIXED ATTENUATOR	MU918	73-6-34	MCE/ WEINSCHEL	2016.09.03	☒
BROADBAND AMPLFIER	BBA150	101937	R&S	2017.02.15	☒
CDN	CDN-T8-RJ45	0113-22	EM TEST	2016.09.03	☒

6.9.3 Photographs of test setup

#1- DC 12 V

#2- PoE

6.9.4 Measurement result

* AC main (#1-DC 12 V)

Coupling point	Coupling method	Result
Power	CDN(M2)	Pass

* Signal

Coupling point	Coupling method	Result
-	-	-

* Telecommunication (#1-DC 12 V, #2- PoE)

Coupling point	Coupling method	Result
LAN(RJ-45)	CDN(T8-RJ45)	Pass
LAN(PoE)	CDN(T8-RJ45)	Pass

7. E.U.T. photographs

Front View

Rear View

Left View

Right View

Top View

Bottom View

Inside

Main Board