

EU Declaration of Conformity

According to

EMC Directive 2014/30/EU

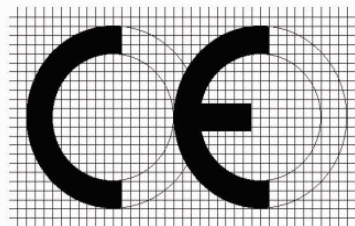
For the following

Product : Network Camera
Model Name : NC-A650-3MXH
Variant Model Nams : MNC-5540BR, DC-T3533HRX

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

IDIS CO., LTD.

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

Date of issue: December 20, 2016

(Name and signature of authorized person)

TEST REPORT

KCTL Inc.

65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR16-SEC0129-A

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KCTL

1. Client

- Name : IDIS CO., LTD.
- Address : 8-10, TECHNO 3-RO, YUSEONG-GU
DAEJEON, KOREA
- Date of Receipt : 2016-09-09

2. Use of Report : -

3. Name of Product and Model : Network Camera / NC-A650-3MXH

4. Manufacturer and Country of Origin : IDIS CO., LTD. / Korea

5. Date of Test : 2016-09-24 to 2016-10-04

6. Test method used : EN 55032:2015, Class A EN 50130-4:2011/A1:2014 EN 61000-3-2:2014 EN 61000-3-3:2013

7. Test Results Refer to the test result in the test report

Affirmation	Tested by	Technical Manager
	 Name : Mincheol Baek (Signature)	 Name : Gunsu Park (Signature)

2016-12-20

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2016-10-10	Originally issued	-
2016-12-20	Change the basic model name & variant model name	-

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1. Applicant information

Applicant: IDIS CO., LTD.
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Manufacturer: IDIS CO., LTD.
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2. Laboratory information

Address

KCTL Inc. (Suwon Lab.)

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

Telephone Number: 82 31 285 0894

Facsimile Number: 82 505 299 8311

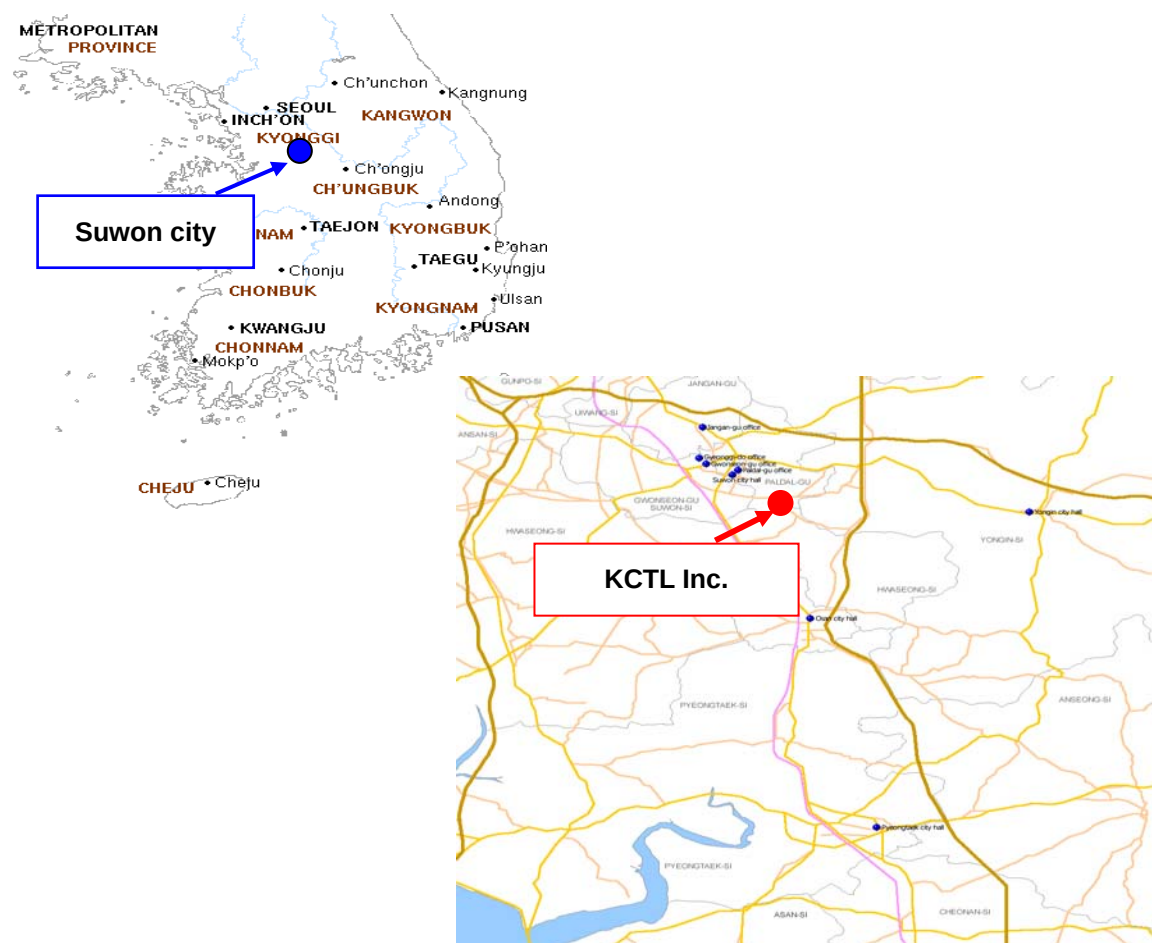
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

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(RE)	22.5 °C	46.5 % R.H.	-
Shielded room(CE)	24.5 °C	44.5 % R.H.	-
Shielded room(ESD)	26.3 °C	46.1 % R.H.	100.9 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
Voltage fluctuations and flickers	EMI Test area
Electrostatic discharge	Shielded Room
Radiated RF immunity	6F Fully anechoic chamber (3 m)
Electric 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 (Confidence level about 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 (Confidence level about 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 (Confidence level about 95 %, $k = 2$)		
1.85 dB		
Disturbance Power Electromagnetic Fields (Confidence level about 95 %, $k = 2$)		
3.20 dB		

3.3 Measurement Program

These test items were performed by software programs;

Test item	Measurement Program		Used
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, 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 EUT

4.1 General information

Video	
Image Sensor	1/1.8" CMOS(IMX178)
SoC	HI3516A
Max. Resolution	2592 x 1944
Scanning Mode	Progressive Scan
Lens	Motorized Vari-focal (f = 3.6~10mm, F1.8)
IRIS Control	P-IRIS
Angular Field of View	Wide ~ Tele (H) : 90° ~ 37°
Min. Illumination	COLOR : 0.175 Lux (U30+HORIZON) B/W : 0 Lux (IR LED on)
S/N Ratio	more than 45dB
Dynamic Range	64.4dB
Electronic Shutter Speed	Auto / Manual (1/30 ~ 1/10000), Anti-Flicker, Slow Shutter(1/1 ~ 1/5, 1/7.5, 1/15)
True Day & Night	Yes (ICR)
IR Distance (LEDs)	30 m (10 ea)
Video Quality Compensation	Auto Expose, Auto White Balance, Digital Noise Reduction, Backlight Compensation
Image Stabilizer	NO
Defog	YES
ROI	TBD
Privacy Masking	8 Zones
Intelligent Video	Video Motion Detection, Active Tampering Alarm, Trip Zone
Video Out	BNC

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Network		
	DirectIP™ Mode	Compatibility Mode
Video Compression	H.265/H.264(MP), M-JPEG	
Bitrate Control	H.265/H.264 - CBR / VBR	
Max. Frame Rate	30fps : 2592 x 1944	
Audio Compression	G.726, G.711	
Two-way Audio	YES	
IP Camera Protocol	DirectIP	IDIS ONVIF Profile S
supports Resolution	2592 x 1944, 1280 x 960, 640 x 480, 320 x 240	2592 x 1944, 1280 x 960, 640 x 480, 320 x 240
Multi-Video Streaming	Quadruple streaming	Quadruple streaming
Network Protocols	Direct IP Protocol	RTP/RTSP/TCP, RTP/RTSP/HTTP/TCP, RTP/UDP RTSP/TCP, HTTP, HTTPS, FTP, SNMP, SMTP, FEN, mDNS, uPNP
Security	SSL Encryption	Multi-User Authority, IEEE 802.1x IP Filtering, HTTPS, SSL Encryption
Remote Access Client	DirectIP™ NVR connection	IDIS Web, IDIS Mobile, IDIS Solution Suite
Ethernet	RJ45(10/100/1000BASE-T)	
Edge Storage	micro SD/SDHC/SDXC	
Alarm & Event		
Trigger Event	Motion Detection, Tampering, TripZone	
Event Buffering (Pre & Post)	yes (up to 100 MB)	
Event Notification	Remote S/W, Email (with Image)	
Audio In/ Out	1(Line in)/1(Line out)	
Alarm In/ Out	1/1	
Environmental		
Vandal-proof Casing	YES	
Out-door Ready	YES	
Operating Temperature	-40°C ~ 50°C(Starting up at above -20°C)	
Operating Humidity	0% ~ 90%	
Electrical		
Power Source	(PoE(IEEE802.3af class 3), DC12V	
Power Consumption	PoE : 9.6W (With IR&MFZ) 12VDC : 11.4W (With IR&MFZ)	
Approval	FCC, CE(50130-4), KC	
Mechanical		
Unit Dimensions Ø x H (mm)	90 mm x 311.1 mm	
Unit Weight (Kg)	1.4kg	

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KCTL-TIT004-005/0

4.2 Product description

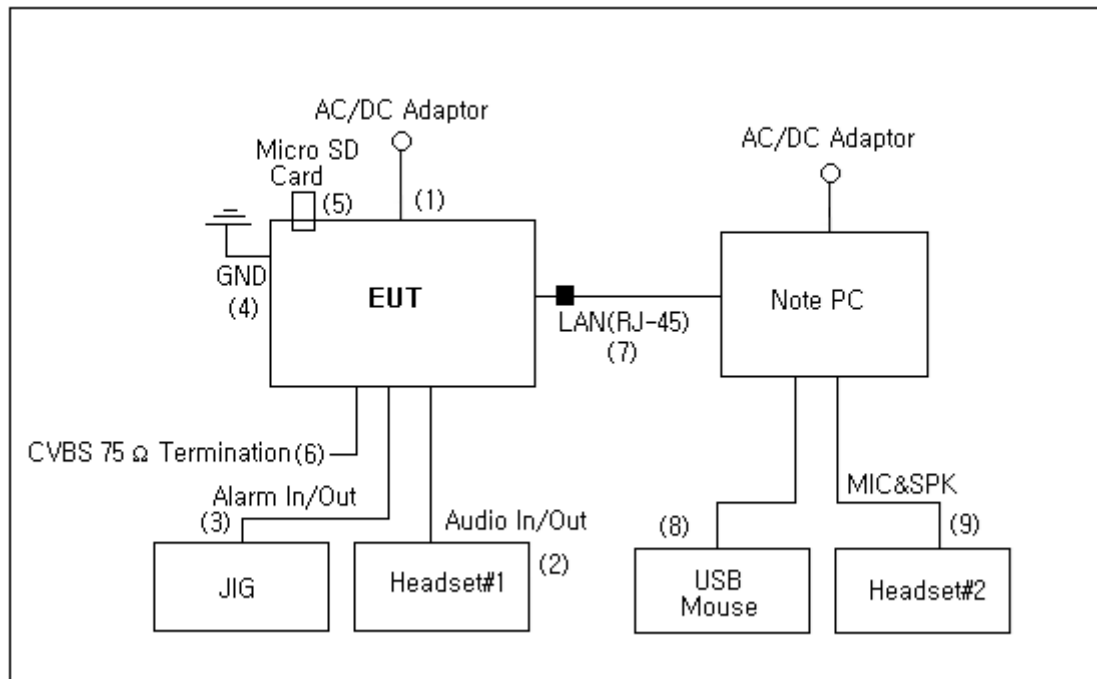
Type of product	Network Camera
Model name (Basic)	NC-A650-3MXH
Model name (Variant)	MNC-5540BR, DC-T3533HRX
Difference	-
Serial no	-
Testing voltage	EMI Test: 230 V, 50 Hz, PoE EMS Test: DC 12 V, PoE
Input rating	EMI Test: 230 V, 50 Hz, PoE EMS Test: DC 12 V, PoE
Internal clock frequency	600 MHz
Note	AC/DC Adaptor was not provided by the manufacturer. PoE Switch was not provided by the manufacturer. CVBS Port is installations Port.

4.3 Auxiliary equipments

Type	Model / Part #	S/N	Manufacturer
Note PC	NT271B5E	JGFE919DB00025Z	SAMSUNG
USB Mouse	MBZ96C	-	Logitech
Headset#1	TGH-2000	-	TG
Headset#2	SHS-100V/B	-	SAMSUNG
JIG	-	-	-
Micro SD Card (4 GB)	-	-	SanDisk
PoE Switch	PSE802G	CN3BBX4046	HP
AC/DC Adaptor	DSA-42PFB121 120350	-	DVE
DC Power Supply	E3632A	MY40004594	Agilent

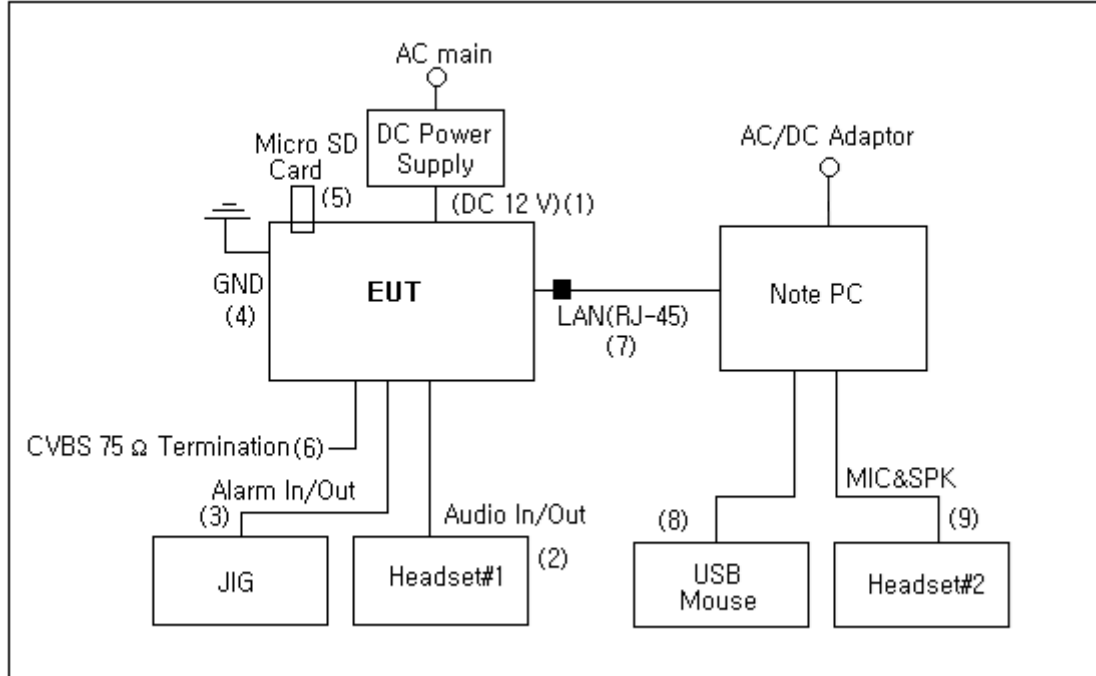
4.4 Test configuration

[Test #1]_EMI



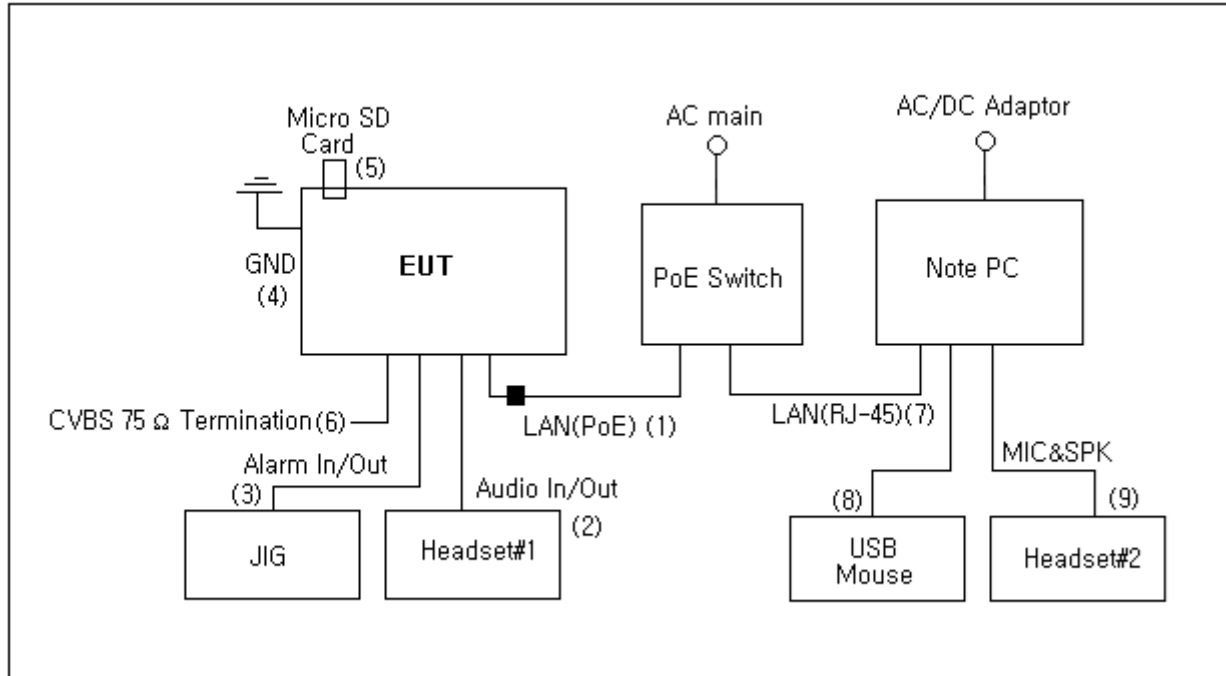
Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT	Power	AC/DC Adaptor	Power	1.5	Unshield	-
2		Audio In/Out	Headset#1	Audio In/Out	3.0	Unshield	Out-door
3		Alarm In/Out	JIG	Alarm In/Out	3.0	Unshield	Out-door
4		GND	GND	GND	1.5	Unshield	-
5		Micro SD	Micro SD Card	Micro SD	Direct	-	-
6		CVBS	75 Ω Termination	-	3.0	Shield	-
7		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Unshield (Core)	Out-door
8	Note PC	USB	USB Mouse	USB	1.8	Shield	-
9		MIC&SPK	Headset#2	MIC&SPK	1.8	Unshield	-

[Test #1]_EMS



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT	Power	DC Power Supply	Power	1.5	Unshield	-
2		Audio In/Out	Headset#1	Audio In/Out	3.0	Unshield	Out-door
3		Alarm In/Out	JIG	Alarm In/Out	3.0	Unshield	Out-door
4		GND	GND	GND	1.5	Unshield	-
5		Micro SD	Micro SD Card	Micro SD	Direct	-	-
6		CVBS	75 Ω Termination	-	3.0	Shield	-
7		LAN(RJ-45)	Note PC	LAN(RJ-45)	3.0	Unshield (Core)	Out-door
8	Note PC	USB	USB Mouse	USB	1.8	Shield	-
9		MIC&SPK	Headset#2	MIC&SPK	1.8	Unshield	-

[Test #2]



Power supplied from PoE Switch

Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT	LAN(PoE)	PoE Switch	LAN(PoE)	3.0	Unshield (Core)	Out-door
2		Audio In/Out	Headset#1	Audio In/Out	3.0	Unshield	Out-door
3		Alarm In/Out	JIG	Alarm In/Out	3.0	Unshield	Out-door
4		GND	GND	GND	1.5	Unshield	-
5		Micro SD	Micro SD Card	Micro SD	Direct	-	-
6		CVBS	75 Ω Termination	-	3.0	Shield	-
7	Note PC	LAN(RJ-45)	PoE Switch	LAN(RJ-45)	1.5	Unshield	-
8		USB	USB Mouse	USB	1.8	Shield	-
9		MIC&SPK	Headset#2	MIC&SPK	1.8	Unshield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
Test #1, Test #2	Web viewer monitoring test using the Note PC.
	Ping Test.
	Alarm In/Out test using the JIG.
	Audio In/Out test using the Headset #1.

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/A1:2014	N/A

This product complies with the requirements of the EMC Directive 2014/30/EU.

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 $U_0 = 130 \text{ dB}\mu\text{V}$.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at $U_0 = 140 \text{ dB}\mu\text{V}$, 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 $U_0 = 130 \text{ dB}\mu\text{V}$, 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 $U_0 = 120 \text{ dB}\mu\text{V}$.

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	2016-09-25		
Temperature (°C)	24.5 °C	Humidity (% R.H.)	44.5 % 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 [MHz]	Resolution Bandwidth [kHz]	Class A (dB(μ V))		Class B (dB(μ V))	
		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 [MHz]	Resolution Bandwidth [kHz]	Class A Limits (dB(μ V))		Current Limits (dB(μ V))	
		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 [MHz]	Resolution Bandwidth [kHz]	Class B Limits (dB(μ V))		Current Limits (dB(μ V))	
		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 equipments

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
EMI TEST RECEIVER	ESCI	100710	R&S	2017.02.26	☒
TWO-LINE V-NETWORK	ENV216	101358	R&S	2017.08.11	☒
TWO-LINE V-NETWORK	ESH3-Z5	100267	R&S	2017.08.11	☒
8-WIRE ISN CAT5	NTFM 8158 ISN CAT5	CAT5 8158 #138	SCHWARZBECK	2017.05.19	☒

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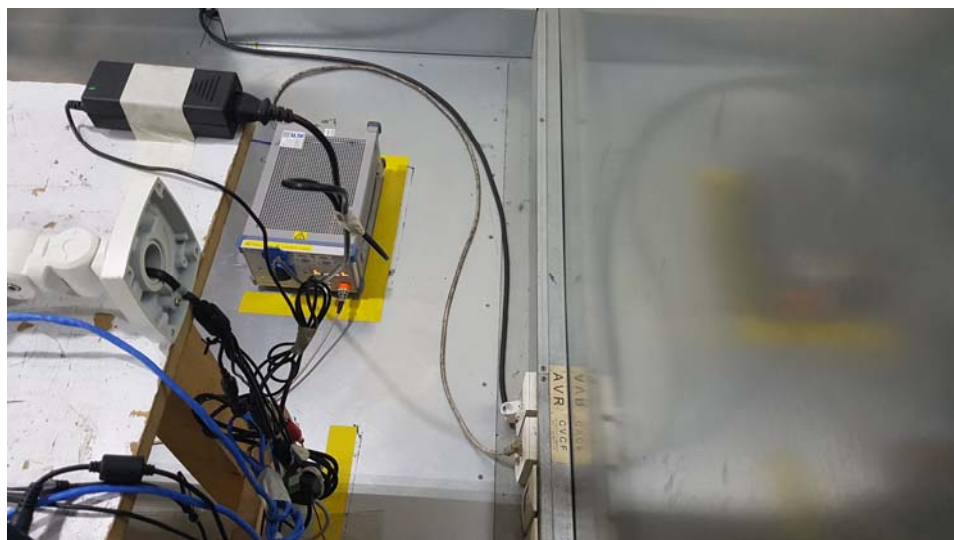
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6.1.4 Photographs of test setup

AC Main [Test #1]



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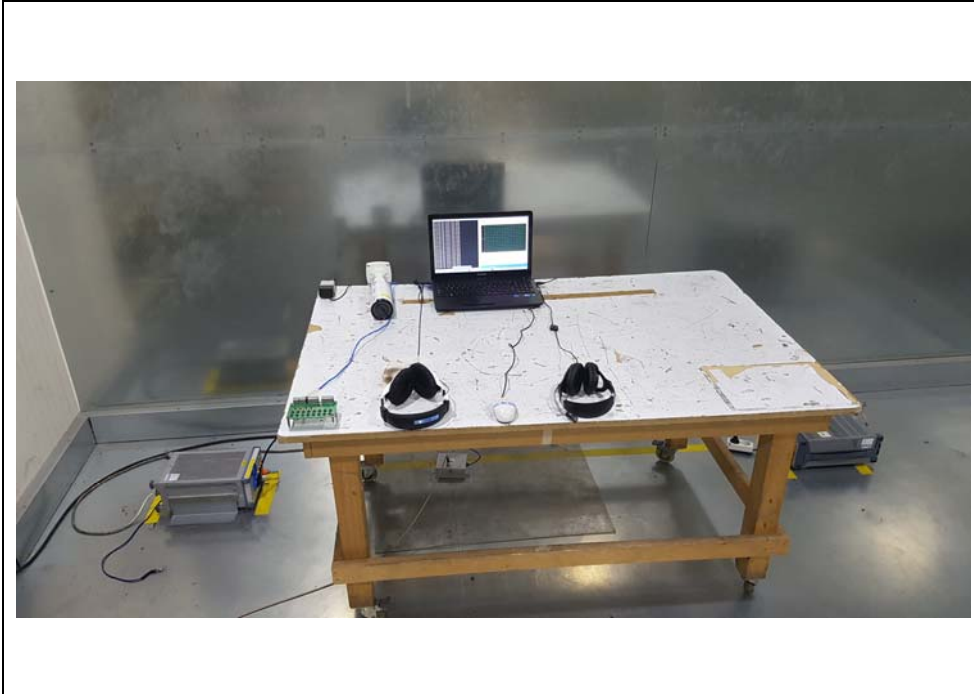
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Telecommunication [Test #1]



Telecommunication [Test #2]



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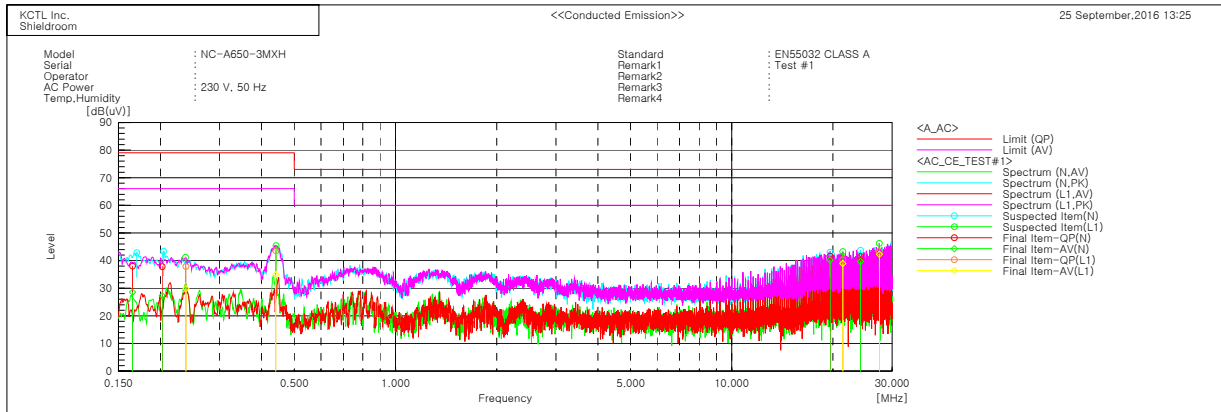
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6.1.5 Conducted emission measurement result

AC Main



Final Result

--- N Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f. [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.16519	28.0	18.6	10.0	38.0	28.6	79.0	66.0	41.0	37.4
2	0.20228	27.9	17.4	9.9	37.8	27.3	79.0	66.0	41.2	38.7
3	19.63277	31.5	30.0	10.1	41.6	40.1	73.0	60.0	31.4	19.9
4	24.14649	31.4	29.6	10.1	41.5	39.7	73.0	60.0	31.5	20.3

--- L1 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f. [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.23826	28.2	20.2	9.7	37.9	29.9	79.0	66.0	41.1	36.1
2	0.44067	33.7	24.8	9.9	43.6	34.7	79.0	66.0	35.4	31.3
3	21.39938	30.1	28.7	10.2	40.3	38.9	73.0	60.0	32.7	21.1
4	27.48432	33.1	32.2	10.1	43.2	42.3	73.0	60.0	29.8	17.7

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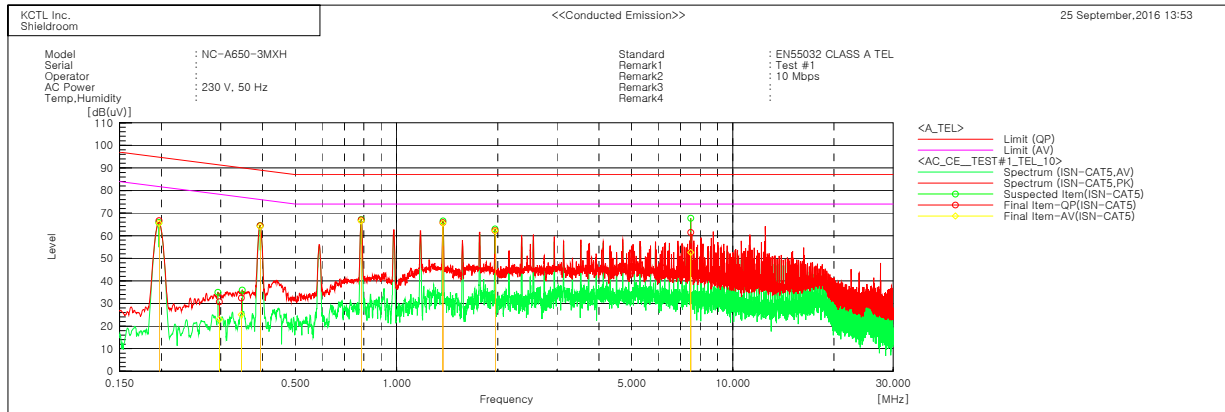
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Telecommunication port



Final Result

--- ISN-CAT5 Phase ---

No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.19668	56.9	55.7	9.8	66.7	65.5	94.7	81.7	28.0	16.2
2	0.29732	21.0	13.3	9.7	30.7	23.0	91.3	78.3	60.6	55.3
3	0.34565	22.8	15.4	9.7	32.5	25.1	90.1	77.1	57.6	52.0
4	0.39296	54.7	54.4	9.7	64.4	64.1	89.0	76.0	24.6	11.9
5	0.78497	57.3	56.9	9.6	66.9	66.5	87.0	74.0	20.1	7.5
6	1.37432	56.3	56.1	9.5	65.8	65.6	87.0	74.0	21.2	8.4
7	1.9636	52.9	52.8	9.4	62.3	62.2	87.0	74.0	24.7	11.8
8	7.50033	51.9	43.0	9.6	61.5	52.6	87.0	74.0	25.5	21.4

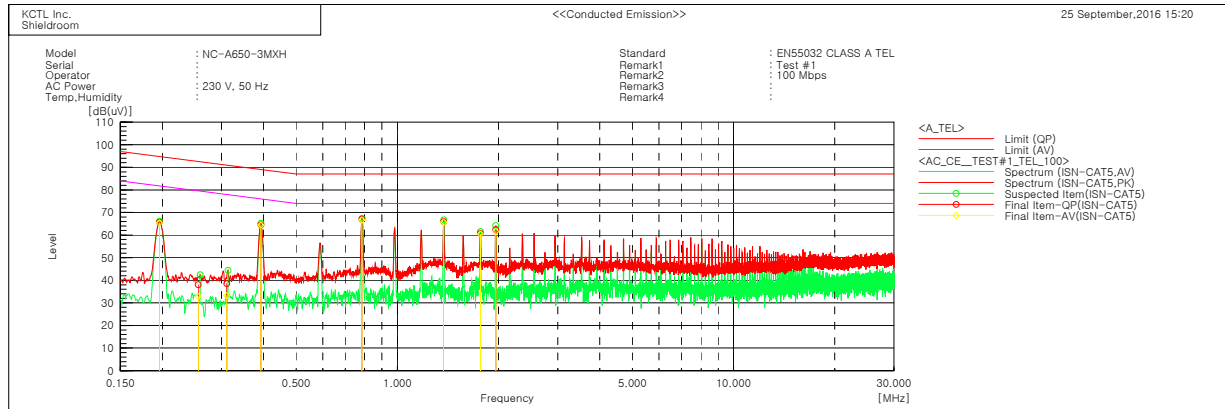
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Final Result

--- ISN-CAT5 Phase ---

No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19602	55.9	55.6	9.8	65.7	65.4	94.8	81.8	29.1	16.4
2	0.2556	28.3	23.1	9.7	38.0	32.8	92.6	79.6	54.6	46.8
3	0.31106	28.9	23.5	9.7	38.6	33.2	90.9	77.9	52.3	44.7
4	0.39281	54.9	54.7	9.7	64.6	64.4	89.0	76.0	24.4	11.6
5	0.7851	57.4	57.1	9.6	67.0	66.7	87.0	74.0	20.0	7.3
6	1.37408	56.5	56.2	9.5	66.0	65.7	87.0	74.0	21.0	8.3
7	1.76785	51.2	51.0	9.5	60.7	60.5	87.0	74.0	26.3	13.5
8	1.96263	53.1	52.1	9.4	62.5	61.5	87.0	74.0	24.5	12.5

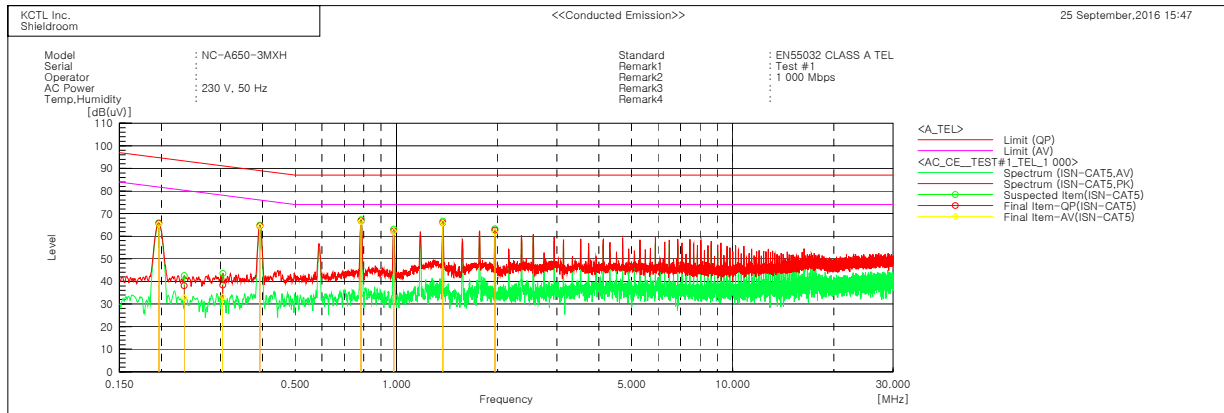
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Final Result

--- ISN-CAT5 Phase ---									
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(μV)]	[dB(μV)]		[dB(μV)]	[dB(μV)]	[dB(μV)]	[dB(μV)]	QP CAV
									[dB] [dB]
1	0.19665	55.9	55.6	9.8	65.7	65.4	94.8	81.8	29.1 16.4
2	0.23366	28.3	23.0	9.8	38.1	32.8	93.3	80.3	55.2 47.5
3	0.30438	28.6	23.4	9.7	38.3	33.1	91.1	78.1	52.8 45.0
4	0.39251	54.9	54.7	9.7	64.6	64.4	89.0	76.0	24.4 11.6
5	0.78446	57.2	56.9	9.6	66.8	66.5	87.0	74.0	20.2 7.5
6	0.98174	52.8	52.6	9.5	62.3	62.1	87.0	74.0	24.7 11.9
7	1.3738	56.5	56.3	9.5	66.0	65.8	87.0	74.0	21.0 8.2
8	1.96314	53.3	52.3	9.4	62.7	61.7	87.0	74.0	24.3 12.3

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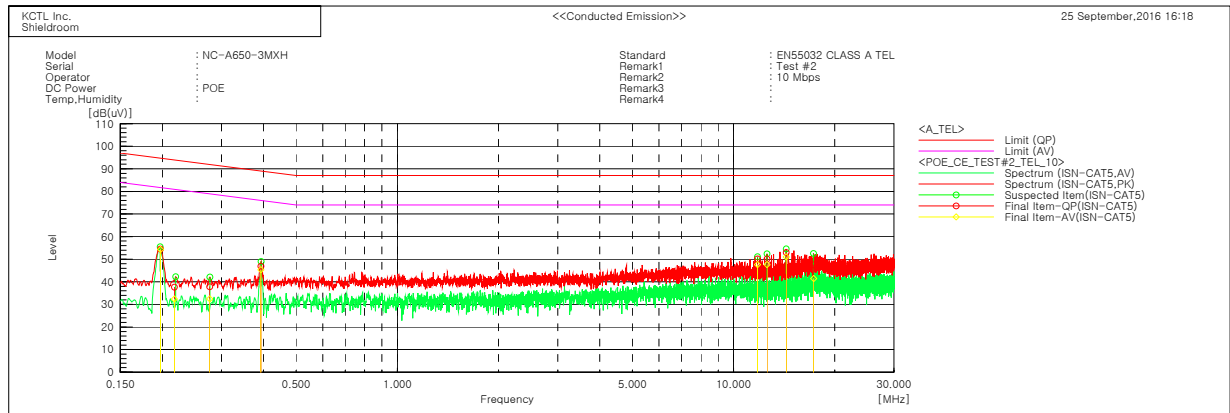
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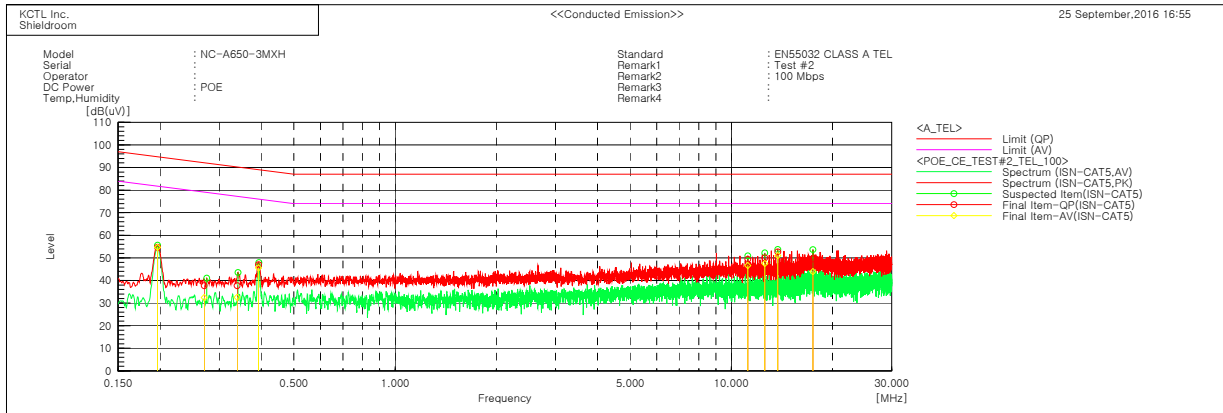
Final Result

--- ISN-CAT5 Phase ---										
No.	Frequency [MHz]	Reading QP [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB]	Result QP [dB(μV)]	Result CAV [dB(μV)]	Limit QP [dB(μV)]	Limit AV [dB(μV)]	Margin QP [dB]	Margin CAV [dB]
1	0.19751	44.7	44.5	9.8	54.5	54.3	94.7	81.7	40.2	27.4
2	0.21746	27.9	22.6	9.8	37.7	32.4	93.9	80.9	56.2	48.5
3	0.27671	28.1	22.8	9.7	37.8	32.5	91.9	78.9	54.1	46.4
4	0.39286	37.2	35.6	9.7	46.9	45.3	89.0	76.0	42.1	30.7
5	11.78589	40.5	38.0	9.6	50.1	47.6	87.0	74.0	36.9	26.4
6	12.57158	40.5	38.0	9.6	50.1	47.6	87.0	74.0	36.9	26.4
7	14.33812	43.3	41.4	9.6	52.9	51.0	87.0	74.0	34.1	23.0
8	17.30008	37.8	31.8	9.7	47.5	41.5	87.0	74.0	39.5	32.5

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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	0.19665	44.9	44.8	9.8	54.7	54.6	94.8	81.8	40.1	27.2
2	0.27066	28.0	22.7	9.7	37.7	32.4	92.1	79.1	54.4	46.7
3	0.33903	28.1	22.8	9.7	37.8	32.5	90.2	77.2	52.4	44.7
4	0.39258	37.4	35.9	9.7	47.1	45.6	89.0	76.0	41.9	30.4
5	11.19564	39.8	37.0	9.6	49.4	46.6	87.0	74.0	37.6	27.4
6	12.57168	40.5	37.9	9.6	50.1	47.5	87.0	74.0	36.9	26.5
7	13.75036	43.1	41.4	9.6	52.7	51.0	87.0	74.0	34.3	23.0
8	17.4829	39.8	34.2	9.7	49.5	43.9	87.0	74.0	37.5	30.1

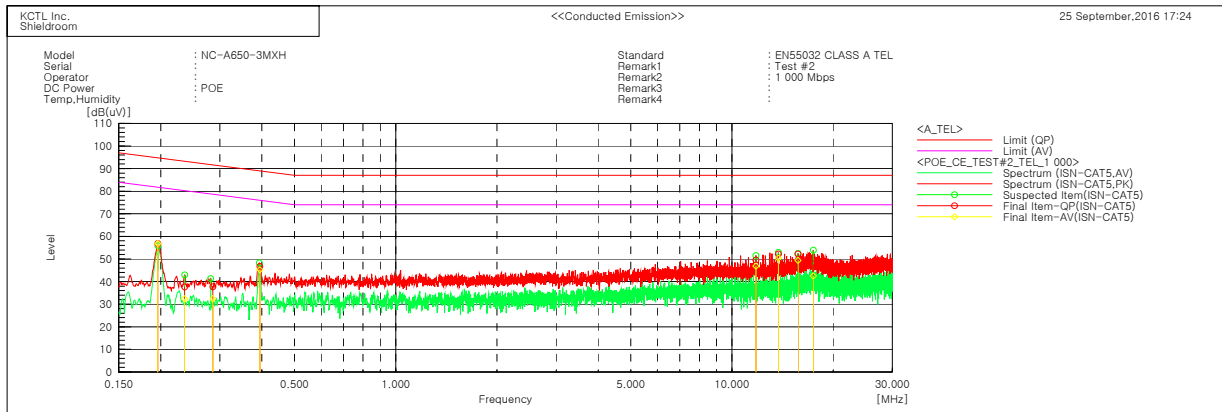
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Final Result

--- ISN-CAT5 Phase ---										
No.	Frequency	Reading QP	Reading CAV	c.f	Result QP	Result CAV	Limit QP	Limit AV	Margin QP	Margin CAV
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.19612	47.0	47.0	9.8	56.8	56.8	94.8	81.8	38.0	25.0
2	0.23578	27.9	22.6	9.8	37.7	32.4	93.2	80.2	55.5	47.8
3	0.28585	28.0	22.8	9.7	37.7	32.5	91.6	78.6	53.9	46.1
4	0.39436	37.0	35.5	9.7	46.7	45.2	89.0	76.0	42.3	30.8
5	11.78808	39.9	37.2	9.6	49.5	46.8	87.0	74.0	37.5	27.2
6	13.74882	42.6	40.7	9.6	52.2	50.3	87.0	74.0	34.8	23.7
7	15.71517	42.5	39.7	9.7	52.2	49.4	87.0	74.0	34.8	24.6
8	17.45581	38.1	32.8	9.7	47.8	42.5	87.0	74.0	39.2	31.5

6.2 Radiated Emission

Test specification	EN 55032:2015, Class A		
Testing voltage	230 V, 50 Hz, PoE		
Test facility	10 m Chamber (4F)		
Test distance	10 m, 3 m		
Date	2016-09-24		
Temperature (°C)	22.5 °C	Humidity (% R.H.)	46.5 % 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 GHz

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

☒ Limits above 1 GHz

Frequency [GHz]	Resolution Bandwidth [kHz]	Class A @ 3 m		Class B @ 3 m	
		Average limit (dB(μ V/m))	Peak limit (dB(μ V/m))	Average limit (dB(μ V/m))	Peak limit (dB(μ V/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
EMI TEST RECEIVER	ESR	101078	R&S	2017.08.25	☒
Bilog Antenna	VULB 9168	583	SCHWARZBECK	2018.06.10	☒
AMPLIFIER	310N	293004	SONOMA INSTRUMENT	2017.08.25	☒
COAXIAL FIXED ATTENUATOR	8491B-003	2708A18758	HP	2017.06.10	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒
Preamplifier	8449B	3008A01802	AGILENT	2017.04.07	☒
Horn ANT	3115	00155772	ETS	2016.11.12	☒
Spectrum Analyzer	FSV40	100988	R&S	2017.01.07	☐

6.2.3 Sample calculation

The field strength is calculated adding the antenna Factor, cable loss and, Antenna pad adding, subtracting the amplifier gain from the measured reading.

The sample calculation is as follow:

$$\text{Result} = \text{M.R} + \text{C.F}(\text{A.F} + \text{C.L} + 6 \text{ dB Att} - \text{A.G})$$

M.R = Meter Reading

C.F = Correction Factor

A.F = Antenna Factor

C.L = Cable Loss

A.G = Amplifier Gain

6 dB Att = 6 dB Attenuator

If M.R is 30 dB, A.F 12 dB, C.L 5 dB, 6 dB, A.G 35 dB

The result is $30 + 12 + 5 + 6 - 35 = 18 \text{ dB}(\mu\text{V/m})$

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6.2.5 Photographs of test setup

30 MHz ~ 1 GHz [Test #1]



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1 GHz ~ 6 GHz [Test #1]



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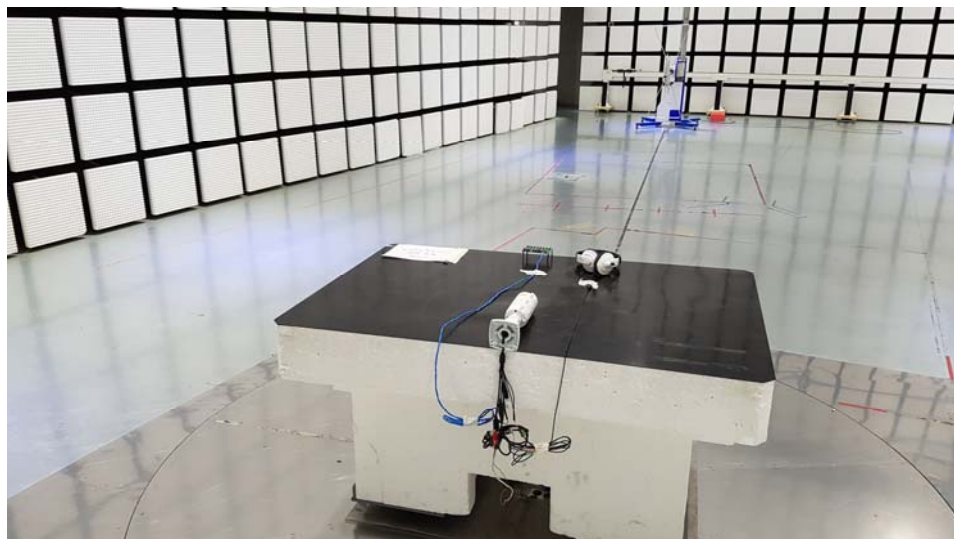
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30 MHz ~ 1 GHz [Test #2]



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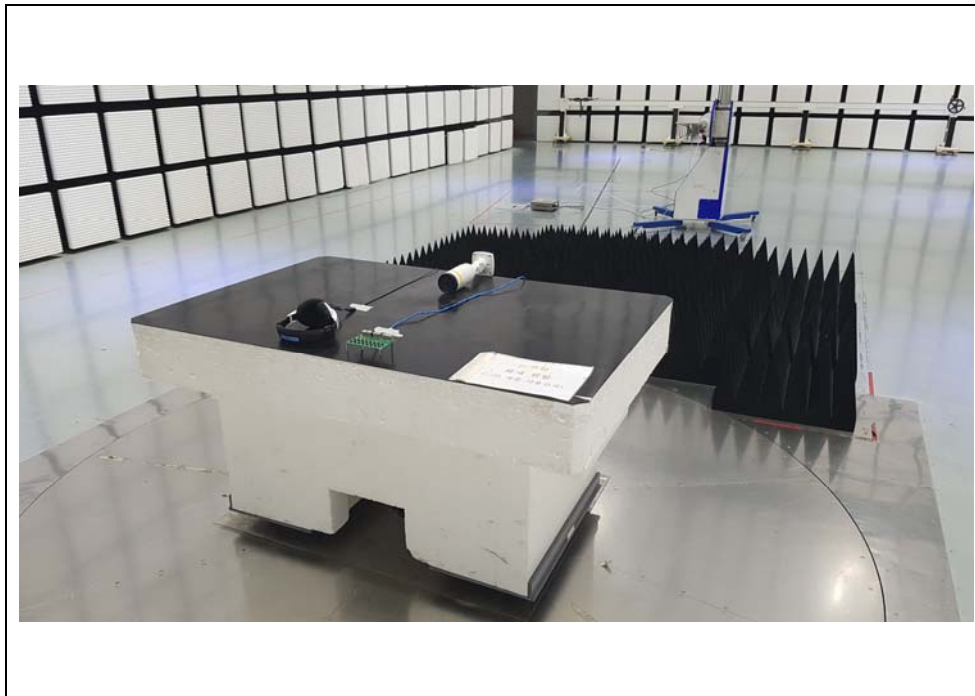
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1 GHz ~ 6 GHz [Test #2]



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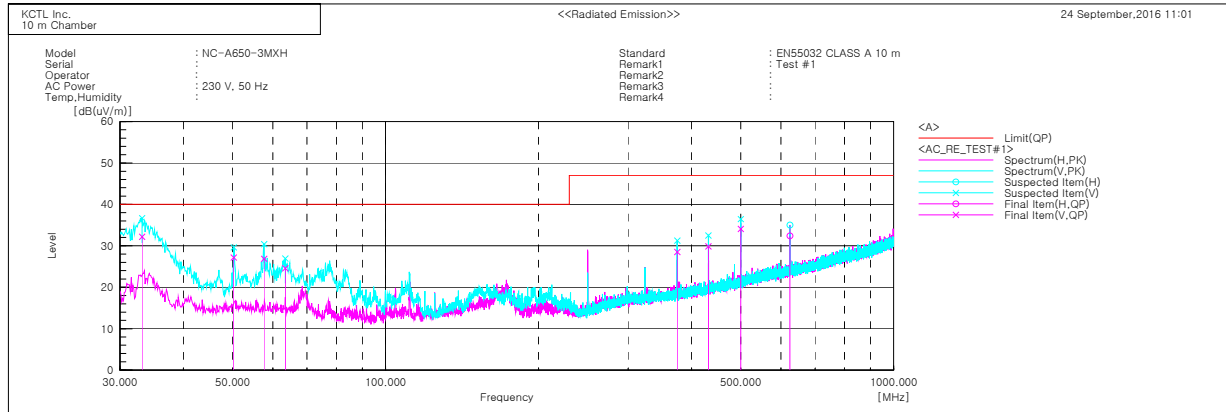
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6.2.6 Radiated emission measurement result

30 MHz ~ 1 GHz



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(μV)]	c.f [dB(1/m)]	Result QP [dB(μV/m)]	Limit QP [dB(μV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	33.153	V	44.7	-12.5	32.2	40.0	7.8	310.0	337.5
2	50.249	V	38.4	-11.2	27.2	40.0	12.8	100.0	240.4
3	57.645	V	38.1	-11.2	26.9	40.0	13.1	110.0	152.2
4	63.465	V	36.3	-11.7	24.6	40.0	15.4	200.0	345.8
5	375.078	V	35.3	-6.8	28.5	47.0	18.5	400.0	320.7
6	431.944	V	35.3	-5.4	29.9	47.0	17.1	120.0	187.2
7	499.965	V	37.5	-3.4	34.1	47.0	12.9	100.0	10.8
8	625.095	H	33.0	-0.6	32.4	47.0	14.6	200.0	225.3

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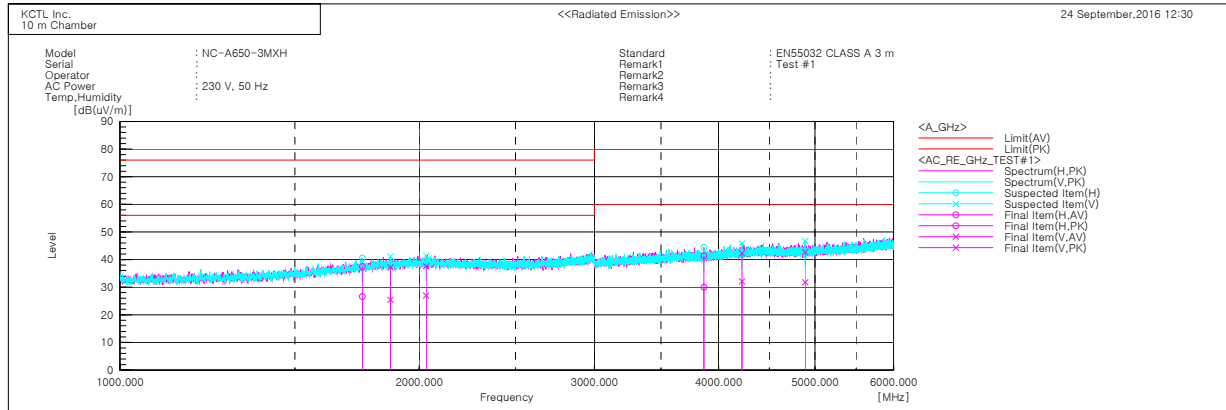
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1 GHz ~ 6 GHz



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	1753.125	H	33.8	44.7	-7.2	26.6	37.5	56.0	76.0	29.4	38.5	100.0	347.5
2	1870.625	V	31.5	43.2	-6.0	25.5	37.2	56.0	76.0	30.5	38.8	100.0	346.7
3	2032.500	V	32.4	43.0	-5.4	27.0	37.6	56.0	76.0	29.0	38.4	100.0	171.4
4	3866.875	H	30.1	41.4	-0.1	30.0	41.3	60.0	80.0	30.0	38.7	100.0	347.5
5	4223.125	V	30.9	41.1	1.2	32.1	42.3	60.0	80.0	27.9	37.7	100.0	162.3
6	4888.125	V	29.6	40.5	2.2	31.8	42.7	60.0	80.0	28.2	37.3	100.0	45.0

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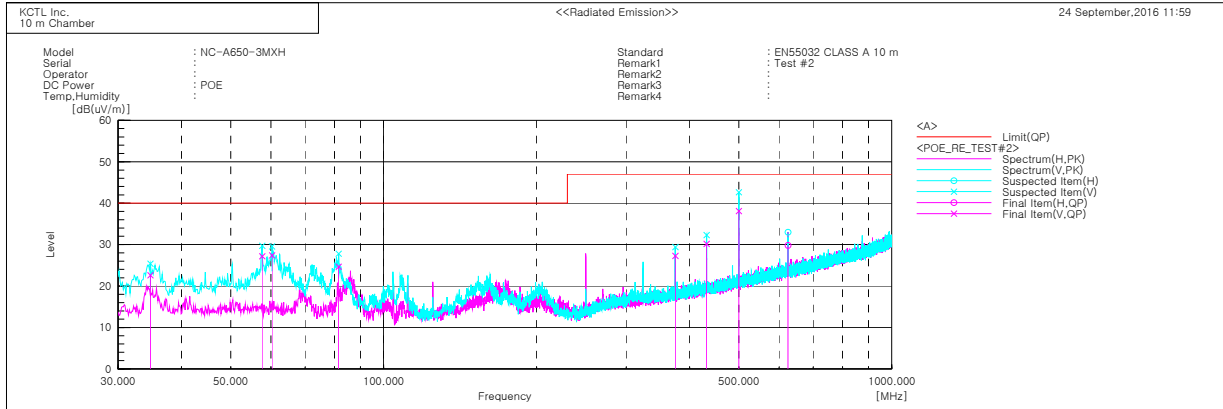
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30 MHz ~ 1 GHz



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	34.729	V	35.0	-12.4	22.6	40.0	17.4	100.0	100.4
2	57.645	V	38.4	-11.2	27.2	40.0	12.8	200.0	353.4
3	60.313	V	38.8	-11.4	27.4	40.0	12.6	210.0	271.9
4	81.531	V	40.1	-15.4	24.7	40.0	15.3	300.0	359.6
5	375.078	V	34.1	-6.8	27.3	47.0	19.7	110.0	313.4
6	432.065	V	35.5	-5.3	30.2	47.0	16.8	120.0	54.6
7	499.965	V	41.5	-3.4	38.1	47.0	8.9	100.0	209.6
8	625.095	H	30.4	-0.6	29.8	47.0	17.2	210.0	280.1

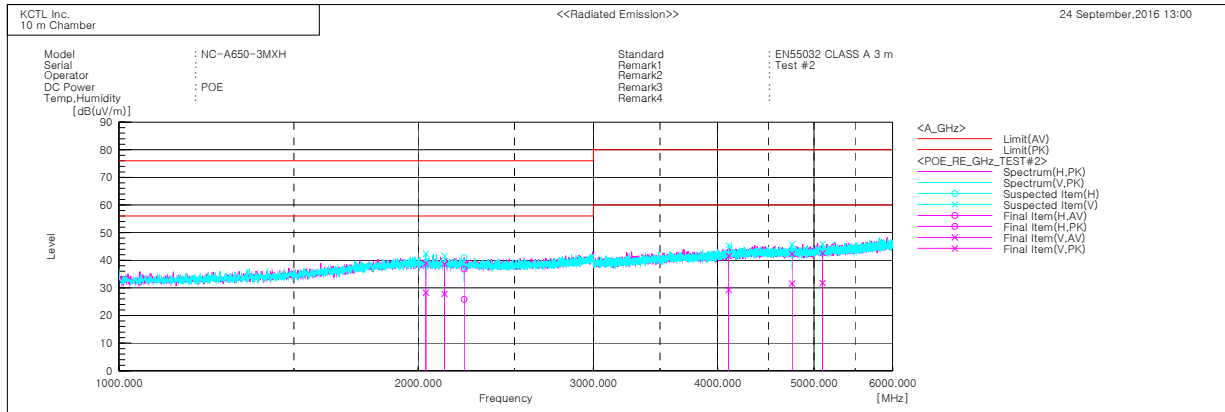
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1 GHz ~ 6 GHz



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	2035.625	V	33.7	44.3	-5.4	28.3	38.9	56.0	76.0	27.7	37.1	100.0	80.1
2	2125.625	V	33.2	44.0	-5.4	27.8	38.6	56.0	76.0	28.2	37.4	100.0	334.6
3	2224.375	H	31.4	42.4	-5.6	25.8	36.8	56.0	76.0	30.2	39.2	100.0	60.6
4	4104.375	V	28.5	40.8	0.8	29.3	41.6	60.0	80.0	30.7	38.4	100.0	261.8
5	4753.750	V	29.6	40.3	2.0	31.6	42.3	60.0	80.0	28.4	37.7	100.0	312.4
6	5101.875	V	29.2	40.0	2.6	31.8	42.6	60.0	80.0	28.2	37.4	100.0	47.7

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6.3 Harmonics

Test specification	EN 61000-3-2:2014				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2016-09-26				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	47.4 % R.H.	Pressure (kPa)	100.8 kPa
Remarks	Pass				

6.3.1 Measurement procedure

The equipment is supplied in series with shunt(s) R_m 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

[Test #1]



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6.3.4 Measurement result

[Test #1]

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

EUT: NC-A650-3MXH

Test category: Class-A per Ed. 4.0 (2014) (European limits)

Test date: 26/09/2016

Test duration (min): 2.5

Comment: Comment

Customer: IDIS.,LTD.

Tested by:

Test Margin: 100

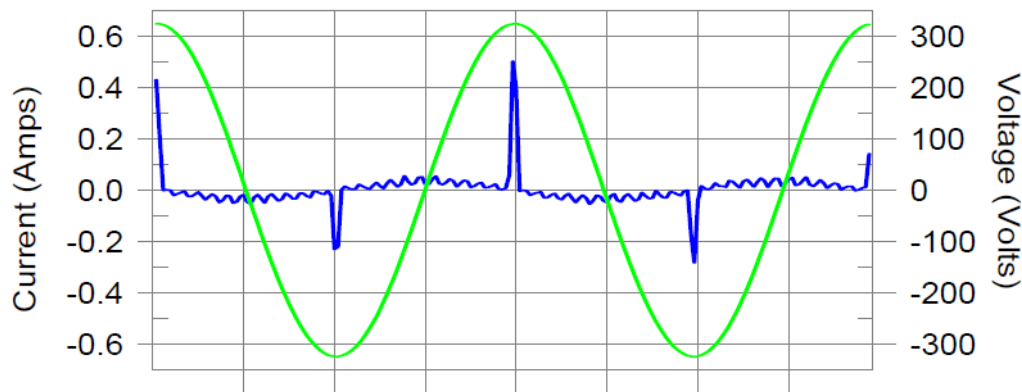
End time: 06:49:54

Start time: 06:47:02

Data file name: H-000035.cts_data

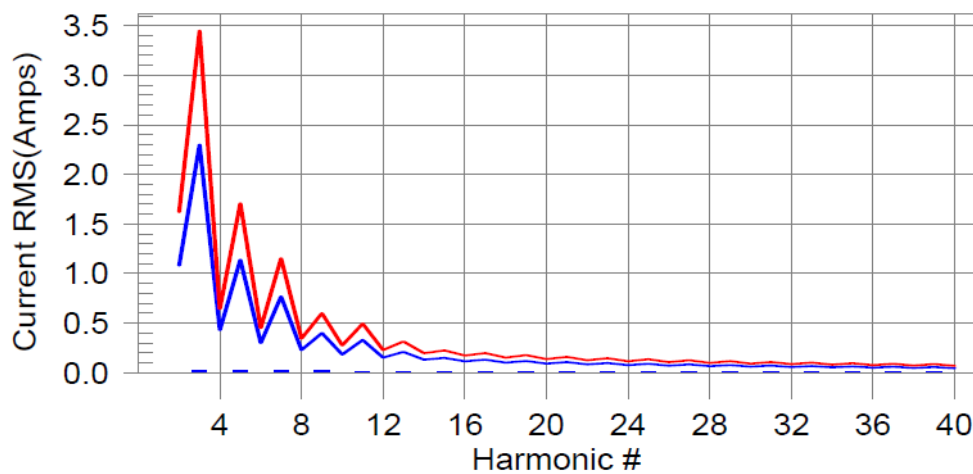
Test Result: Pass Source qualification: Normal

Current & voltage waveforms



Harmonics and Class A limit line

European Limits



Test result: Pass Worst harmonic was #25 with 12.6% of the limit.

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Current Test Result Summary (Run time)

EUT: NC-A650-3MXH

Test category: Class-A per Ed. 4.0 (2014) (European limits)

Test date: 26/09/2016

Test duration (min): 2.5

Comment: Comment

Customer: IDIS.,LTD.

Tested by: Tested by

Test Margin: 100

End time: 06:49:54

Start time: 06:47:02

Data file name: H-000035.cts_data

Test Result: Pass

Source qualification: Normal

THC(A): 0.058

I-THD(%): 196.5

POHC(A): 0.030

POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts): 229.51

I_Peak (Amps): 0.550

I_Fund (Amps): 0.030

Power (Watts): 4.2

Frequency(Hz): 50.00

I_RMS (Amps): 0.068

Crest Factor: 8.212

Power Factor: 0.272

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.002	1.080	N/A	0.003	1.620	N/A	Pass
3	0.018	2.300	0.8	0.018	3.450	0.5	Pass
4	0.002	0.430	N/A	0.003	0.645	N/A	Pass
5	0.018	1.140	1.6	0.018	1.710	1.0	Pass
6	0.002	0.300	N/A	0.003	0.450	N/A	Pass
7	0.017	0.770	2.3	0.018	1.155	1.5	Pass
8	0.002	0.230	N/A	0.003	0.345	N/A	Pass
9	0.017	0.400	4.3	0.017	0.600	2.9	Pass
10	0.002	0.184	N/A	0.003	0.276	N/A	Pass
11	0.017	0.330	5.0	0.017	0.495	3.4	Pass
12	0.002	0.153	N/A	0.003	0.230	N/A	Pass
13	0.016	0.210	7.6	0.016	0.315	5.1	Pass
14	0.002	0.131	N/A	0.002	0.197	N/A	Pass
15	0.015	0.150	10.3	0.015	0.225	6.9	Pass
16	0.002	0.115	N/A	0.002	0.173	N/A	Pass
17	0.015	0.132	11.1	0.015	0.198	7.5	Pass
18	0.002	0.102	N/A	0.002	0.153	N/A	Pass
19	0.014	0.118	11.8	0.014	0.178	7.9	Pass
20	0.002	0.092	N/A	0.002	0.138	N/A	Pass
21	0.013	0.107	12.2	0.013	0.161	8.2	Pass
22	0.002	0.084	N/A	0.002	0.125	N/A	Pass
23	0.012	0.098	12.5	0.012	0.147	8.4	Pass
24	0.002	0.077	N/A	0.002	0.115	N/A	Pass
25	0.011	0.090	12.6	0.011	0.135	8.5	Pass
26	0.002	0.071	N/A	0.002	0.107	N/A	Pass
27	0.010	0.083	12.6	0.011	0.125	8.5	Pass
28	0.001	0.066	N/A	0.002	0.099	N/A	Pass
29	0.010	0.078	12.3	0.010	0.116	8.3	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.009	0.073	11.9	0.009	0.109	8.1	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.008	0.068	11.4	0.008	0.102	7.7	Pass
34	0.001	0.054	N/A	0.001	0.081	N/A	Pass
35	0.007	0.064	10.7	0.007	0.096	7.3	Pass
36	0.001	0.051	N/A	0.001	0.077	N/A	Pass
37	0.006	0.061	9.9	0.006	0.091	6.8	Pass
38	0.001	0.048	N/A	0.001	0.073	N/A	Pass
39	0.005	0.058	9.0	0.005	0.087	6.2	Pass
40	0.001	0.046	N/A	0.001	0.069	N/A	Pass

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Voltage Source Verification Data (Run time)

EUT: NC-A650-3MXH

Test category: Class-A per Ed. 4.0 (2014) (European limits)

Test date: 26/09/2016

Test duration (min): 2.5

Comment: Comment

Customer: IDIS.,LTD.

Tested by: Tested by

Test Margin: 100

End time: 06:49:54

Start time: 06:47:02

Data file name: H-000035.cts_data

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 229.51

I_Peak (Amps): 0.550

I_Fund (Amps): 0.030

Power (Watts): 4.2

Frequency(Hz): 50.00

I_RMS (Amps): 0.068

Crest Factor: 8.212

Power Factor: 0.272

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.102	0.459	22.12	OK
3	0.511	2.066	24.73	OK
4	0.022	0.459	4.84	OK
5	0.018	0.918	2.01	OK
6	0.026	0.459	5.63	OK
7	0.012	0.689	1.81	OK
8	0.019	0.459	4.18	OK
9	0.018	0.459	3.90	OK
10	0.005	0.459	1.13	OK
11	0.018	0.230	7.72	OK
12	0.024	0.230	10.37	OK
13	0.027	0.230	11.61	OK
14	0.007	0.230	2.92	OK
15	0.010	0.230	4.27	OK
16	0.014	0.230	5.88	OK
17	0.016	0.230	6.94	OK
18	0.011	0.230	4.80	OK
19	0.016	0.230	6.94	OK
20	0.006	0.230	2.73	OK
21	0.016	0.230	7.08	OK
22	0.004	0.230	1.72	OK
23	0.013	0.230	5.69	OK
24	0.010	0.230	4.56	OK
25	0.021	0.230	8.96	OK
26	0.006	0.230	2.70	OK
27	0.019	0.230	8.13	OK
28	0.012	0.230	5.06	OK
29	0.024	0.230	10.64	OK
30	0.008	0.230	3.52	OK
31	0.023	0.230	10.08	OK
32	0.007	0.230	2.84	OK
33	0.025	0.230	10.95	OK
34	0.008	0.230	3.44	OK
35	0.024	0.230	10.36	OK
36	0.008	0.230	3.59	OK
37	0.025	0.230	11.07	OK
38	0.005	0.230	2.13	OK
39	0.015	0.230	6.38	OK
40	0.007	0.230	3.19	OK

6.4 Flicker

Test specification	EN 61000-3-3:2013				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2016-09-26				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	47.4 % R.H.	Pressure (kPa)	100.8 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.

$$P_{It} = 2 \text{ h}$$

$$P_{st} = 10 \text{ min}$$

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

[Test #1]



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6.4.4 Measurement result

[Test #1]

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

EUT: NC-A650-3MXH

Test category: All parameters (European limits)

Test date: 26/09/2016

Test duration (min): 10

Comment: Comment

Customer: IDIS.,LTD.

Tested by:

Test Margin: 100

End time: 06:43:01

Start time: 06:32:29

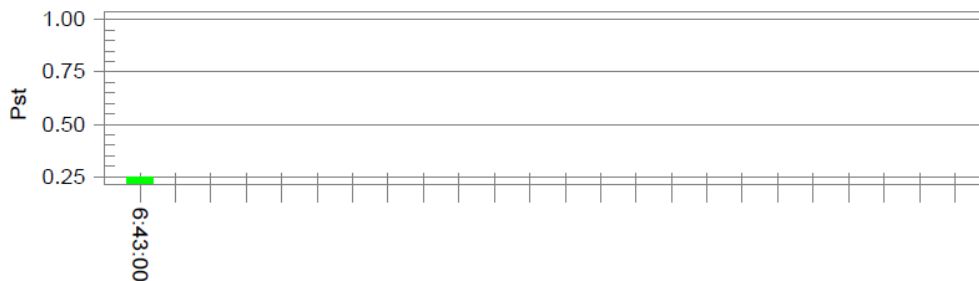
Data file name: F-000034.cts_data

Test Result: Pass

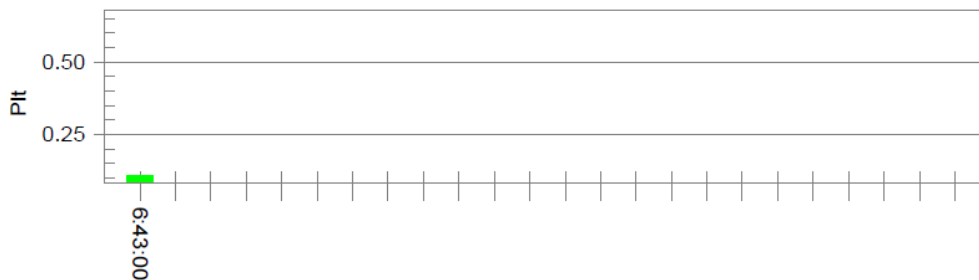
Status: Test Completed

Pst and limit line

European Limits



Plt and limit line



Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.49

Highest dt (%): 0.00

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): -0.01

Highest Pst (10 min. period): 0.250

Highest Plt (2 hr. period): 0.109

Test limit (%):

N/A

N/A

Test limit (mS):

500.0

Pass

Test limit (%):

3.30

Pass

Test limit (%):

4.00

Pass

Test limit:

1.000

Pass

Test limit:

0.650

Pass

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6.5 Electrostatic Discharge

Test specification	EN 61000-4-2:2009				
Test level	☒ Contact: ± 6 kV ☒ Air: ± 2 kV, ± 4 kV, ± 8 kV ☐ HCP: ± 6 kV ☒ VCP: ± 6 kV				
Discharge impedance	330 Ω / 150 pF				
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	2016-09-26				
Temperature(°C)	26.3 °C	Humidity (% R.H.)	46.1 % R.H.	Pressure (kPa)	100.9 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.				

6.5.1 Measurement procedure

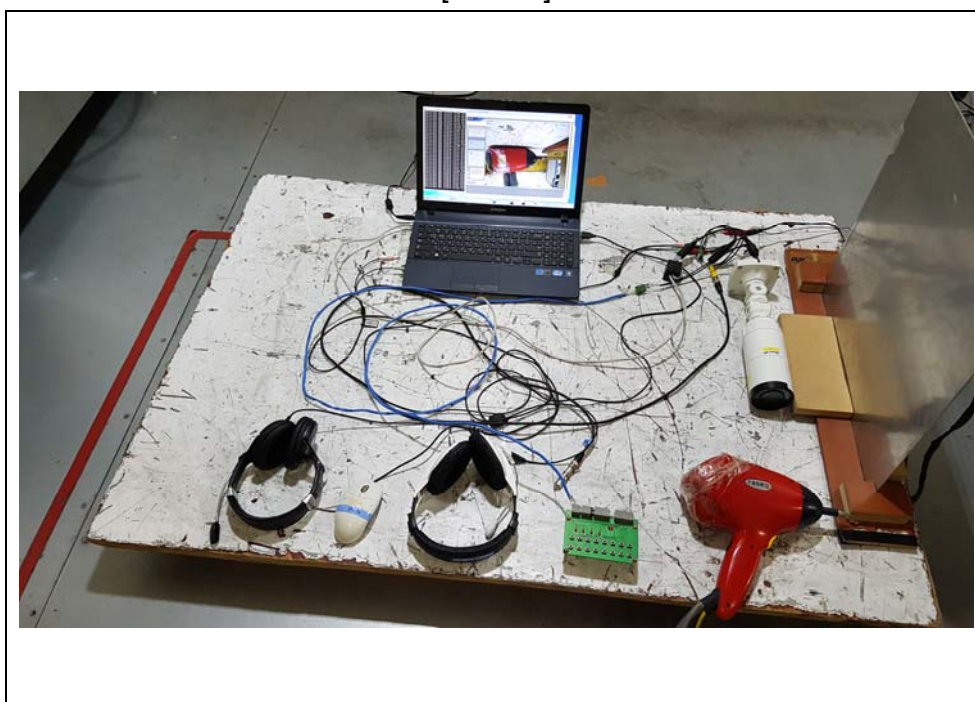
A ground reference plane was located on the floor, and connected to earth via a low Impedance connection. The return cable of the ESD generator was connected to the reference plane. In case of floor standing equipment, EUT was placed on the reference plane on 0.1 m of insulating Support. In case of table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

[Test #1]



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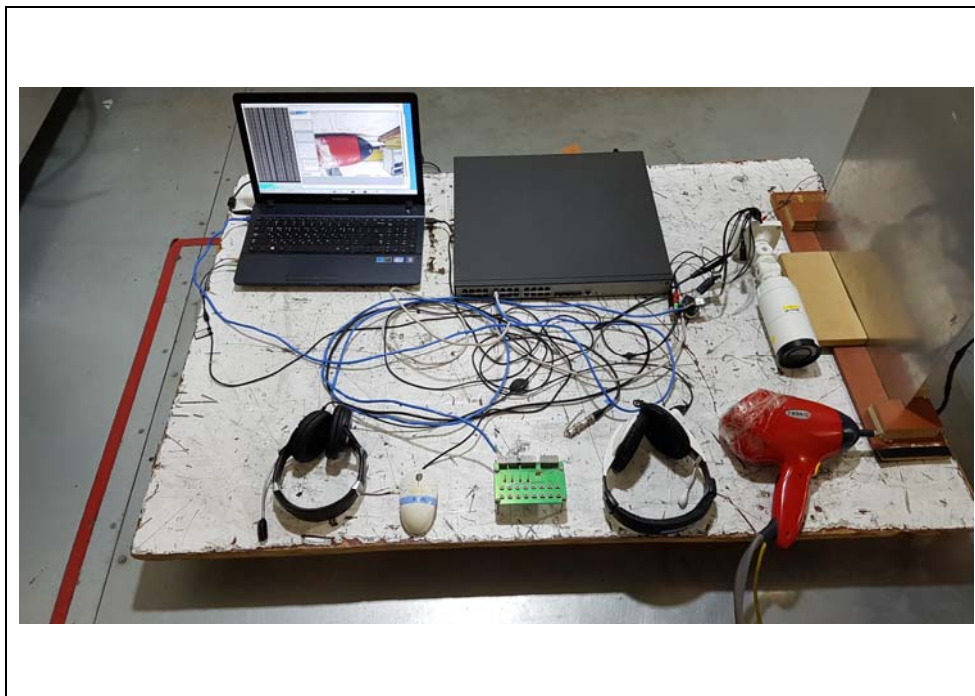
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[Test #2]



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6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge



Contact discharge



[Test #1, Test #2]



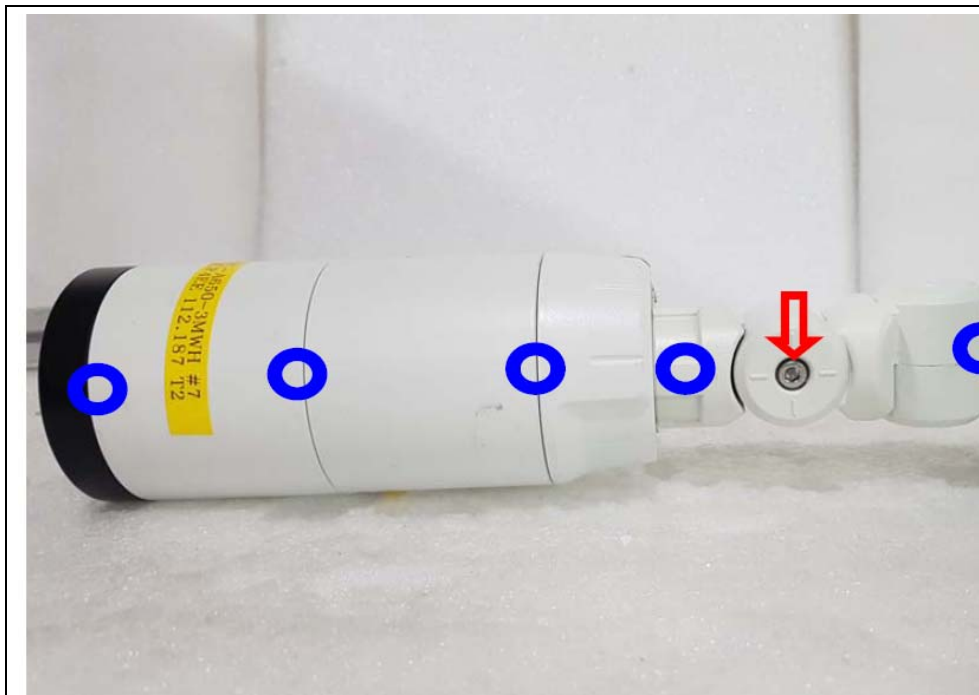
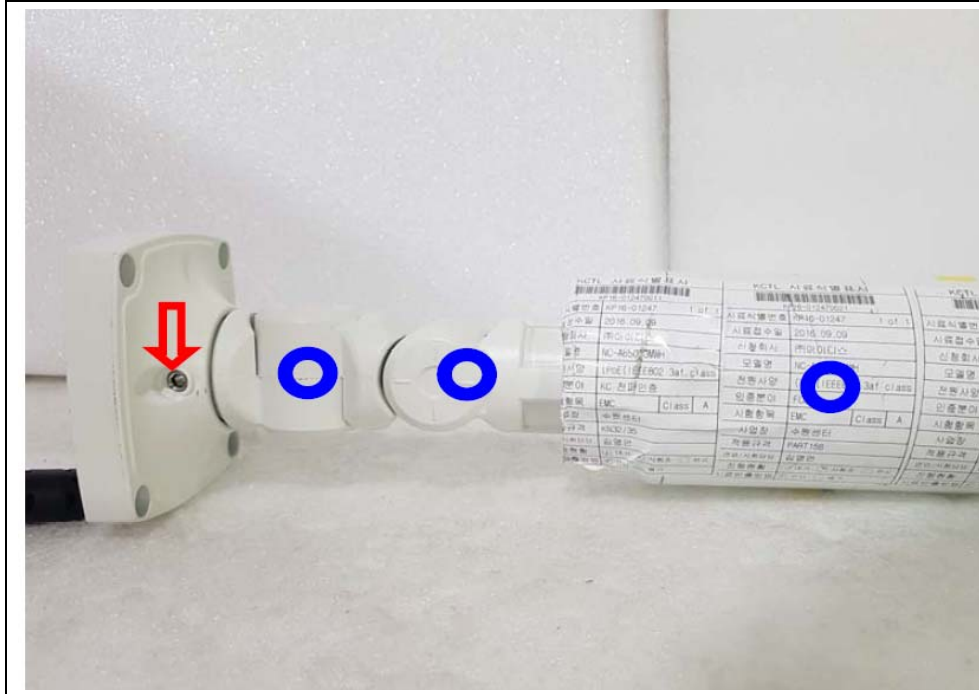
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[Test #1, Test #2]

VCP discharge

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

Contact discharge

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

Air discharge

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

6.6 Radio Frequency Electromagnetic Fields

Test specification	EN 61000-4-3:2006/A2:2010				
Tested frequency	80 MHz ~ 1 GHz, 1 GHz ~ 2.7 GHz				
Test level & Modulation	1 V/m, 3 V/m, 10 V/m, 80 % Amplitude Modulation (1 kHz) 1 V/m, 3 V/m, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5s 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	2016-10-04				
Temperature(°C)	26.5 °C	Humidity (% R.H.)	40.8 % R.H.	Pressure (kPa)	100.9 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	2017.08.26	☒
POWER SENSOR	PH2000	303224	AR	2017.08.26	☒
POWER SENSOR	PH2000	311217	AR	2017.08.26	☒
DUAL DIRECTIOAL COUPLER	DC6180	303976	AR	2017.08.26	☒
DUAL DIRECTIOAL COUPLER	DC7144M1	320279	AR	2017.08.26	☒
ESG SERIES SIGNAL GENERATOR	E4421B	GB40052295	AGILENT	2017.08.26	☒
BROADBAND AMPLIFIER	BBA 100	100996-1	R&S	-	☒
RF AMPLIFIER	60S1G3M2	320444	AR	-	☒
Broadband Ant.	LPDA-0803	130269	ETS-LINDGREN	-	☒
Antenna master	-	-	ETS-LINDGREN	-	☒

6.6.3 Photographs of test setup

[Test #1]



[Test #2]



6.6.4 Measurement result

[Test #1, Test #2]

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 Electric 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 kV Peak ☒ Signal: ± 1 kV Peak ☒ Telecommunication: ± 1 kV Peak				
Repetition frequency	100 kHz, Tr/Th = 5 / 50 ns				
Coupling time (Minimum)	60 s				
Testing voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016-09-27				
Temperature(°C)	22.5 °C	Humidity (% R.H.)	47.1 % R.H.	Pressure (kPa)	100.8 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				

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 m wooden table.

For tabletop equipment, EUT was placed on a 0.1 m above the ground reference plane.

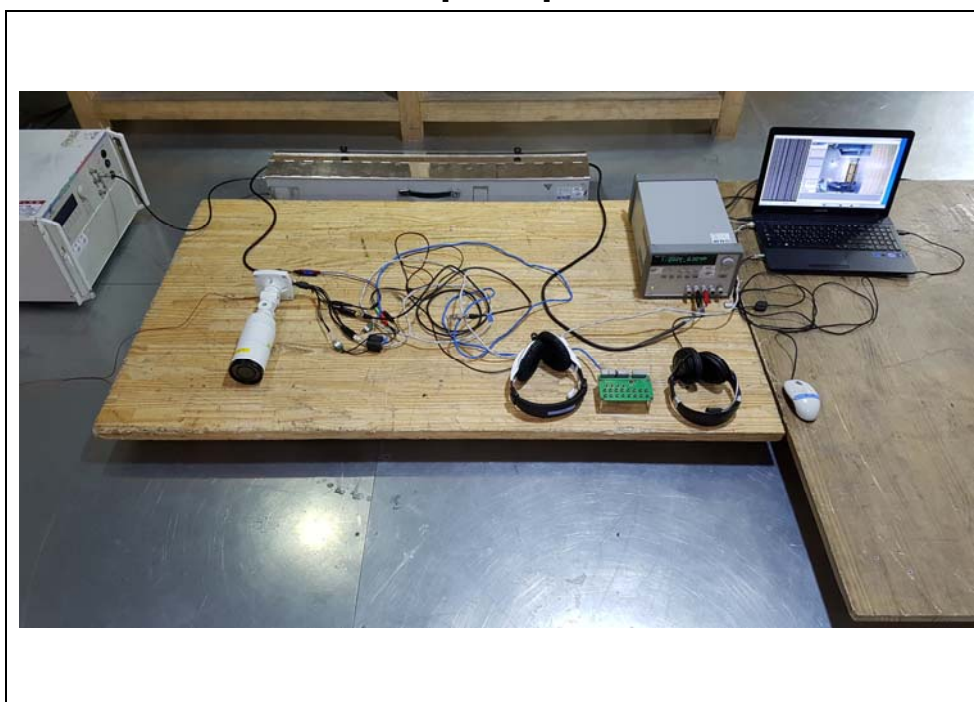
Test generator and coupling/decoupling network was placed on, and bounded to, the ground reference plane. When using the coupling clamp, the minimum distance between the coupling plates and all other conductive surfaces, except the ground reference plane beneath the coupling clamp, Shall be 0.5 m.

6.7.2 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	2017.08.25	☒
Capacitive coupling clamp	-	0001	EM TEST	2017.08.26	☒

6.7.3 Photographs of test setup

[Test #1]



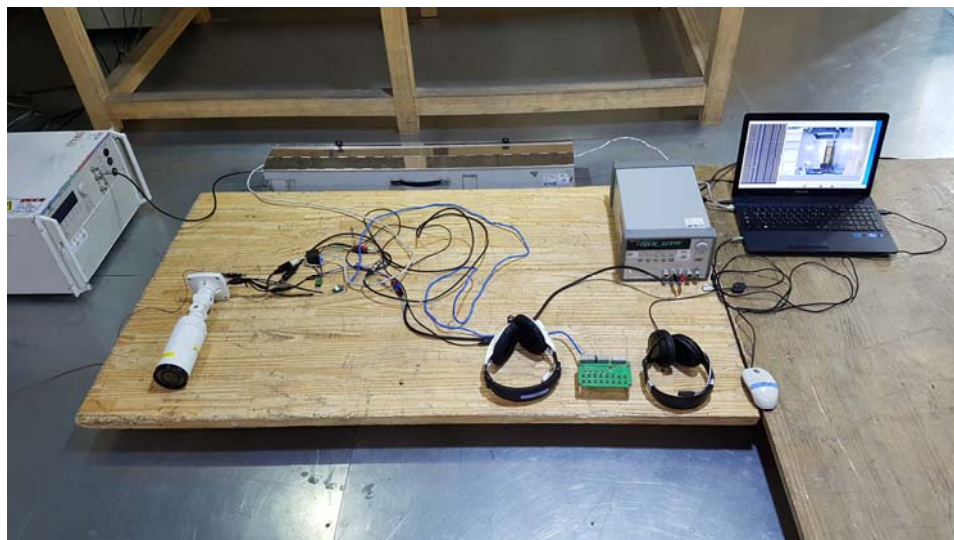
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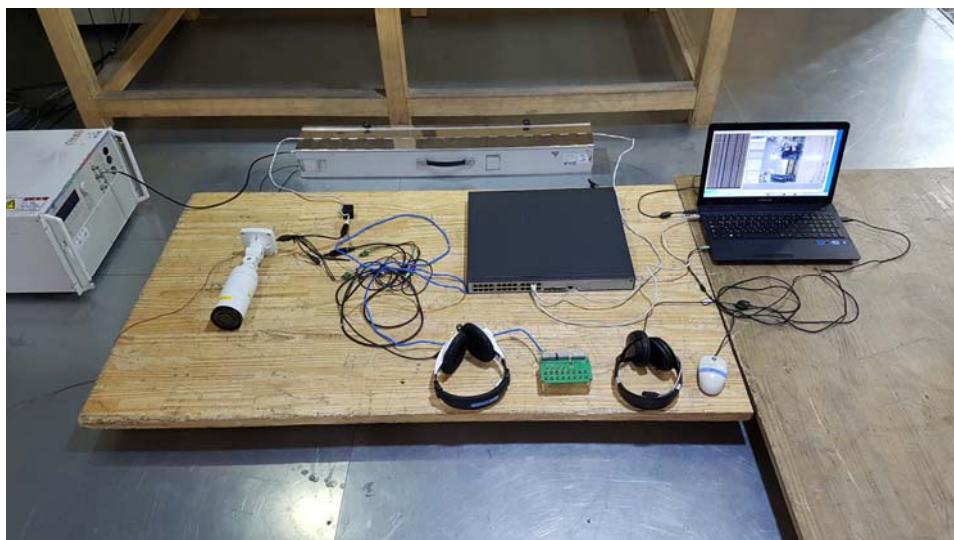
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[Test #2]



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6.7.4 Measurement result

DC Line [Test #1]

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

Signal [Test #1, Test #2]

Coupling point	(+)	(-)	Result
Audio In/Out	+ 1 kV	- 1 kV	Pass
Alarm In/Out	+ 1 kV	- 1 kV	Pass

Telecommunication [Test #1, Test #2]

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, Criteria : B				
Coupling	☒ DC 12 V: CDN ☒ Signal: CDN ☒ Telecommunication: CDN				
Test level	☒ DC 12 V: ± 0.5 kV, ± 1 kV ☒ Signal: ± 0.5 kV, ± 1 kV ☒ Telecommunication: ± 0.5 kV, ± 1 kV				
Coupling Impedance	☐ Differential mode: $18 \mu F$ ☒ $40 \Omega + 0.5 \mu F$ ☐ Common mode: $10 \Omega + 9 \mu F$ ☐ Direct				
Surge pulse shape	Tr/Th = $1.2 / 50 \mu s$				
Number of surge	5				
Coupling time	30 s				
Testing voltage	DC 12 V, PoE				
Test facility	Shielded room (6F)				
Date	2016-09-27				
Temperature(°C)	22.7 °C	Humidity (% R.H.)	47.3 % R.H.	Pressure (kPa)	100.9 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.				

6.8.1 Measurement procedure

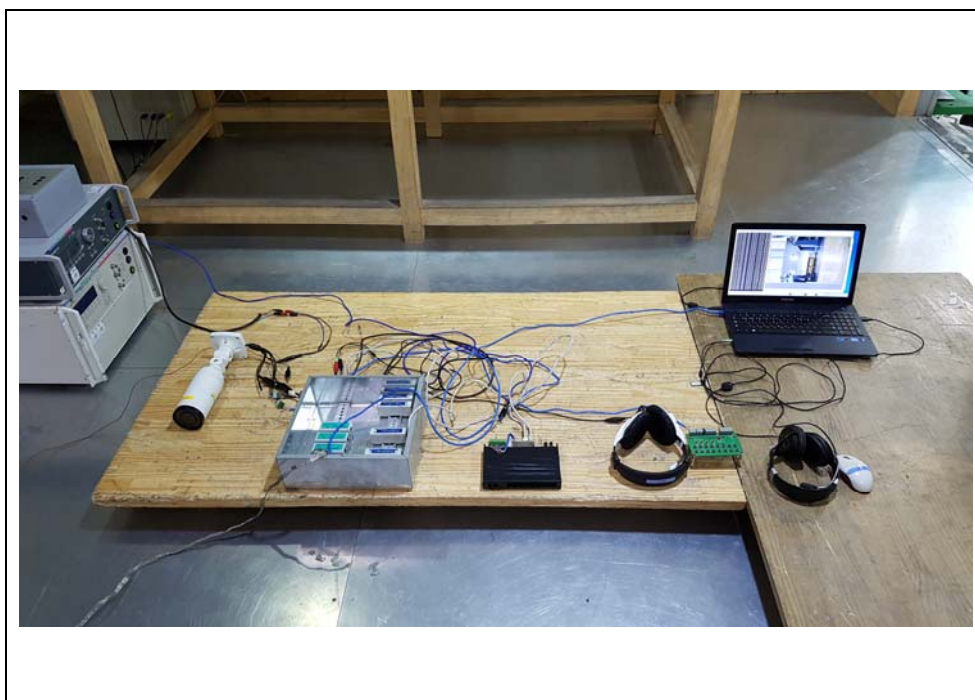
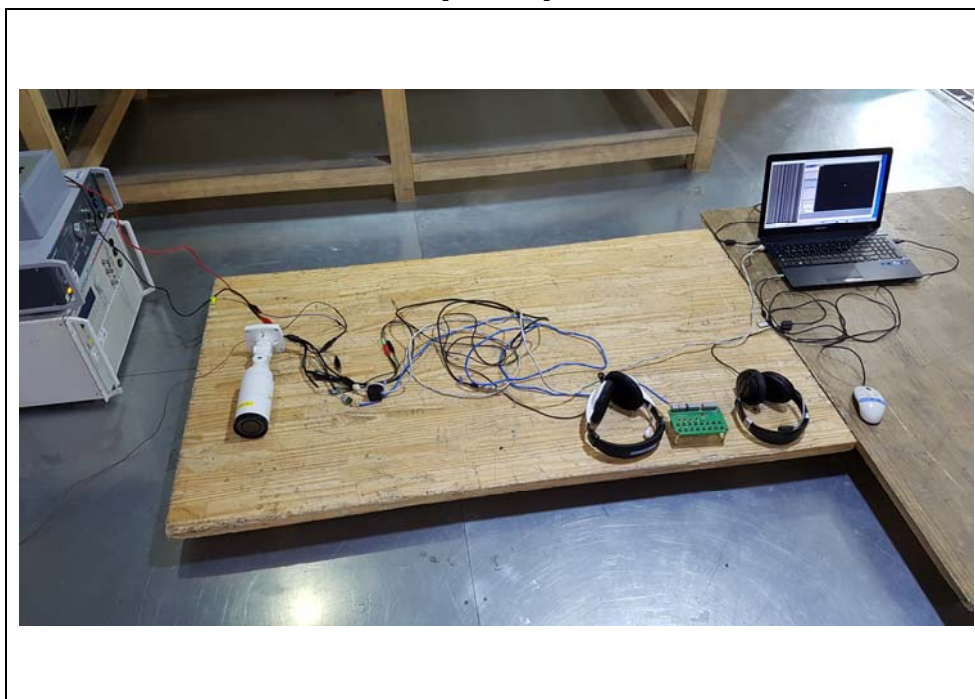
A ground reference plane was located on the floor. SURGE generator was connected to reference ground plane via low impedance connection. For floor standing equipment & table top equipment, EUT was placed on a wooden table.

6.8.2 Used equipments

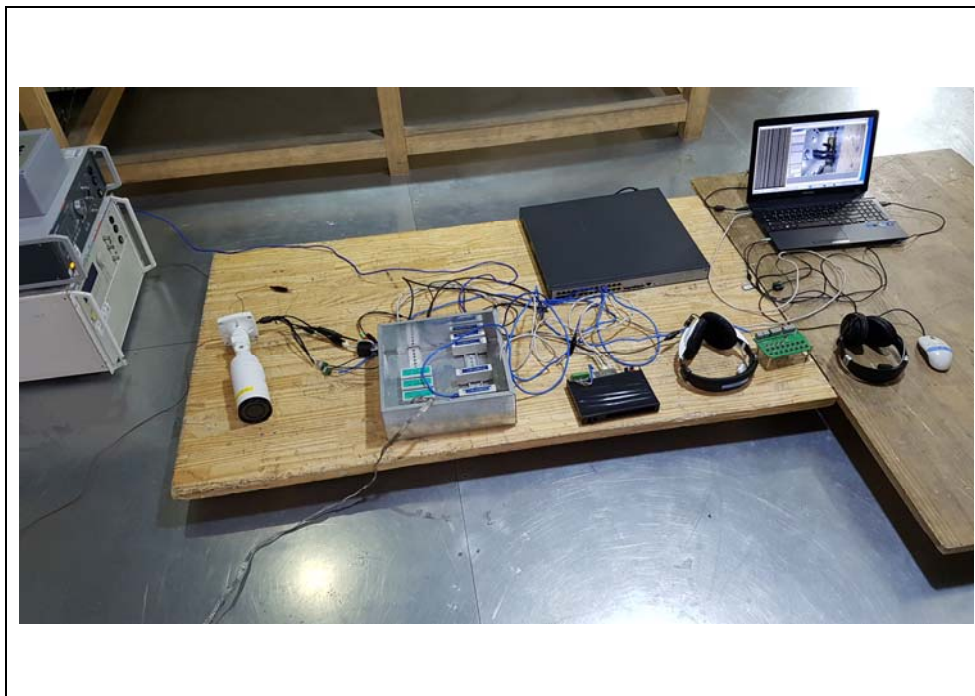
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Ultra compact simulator	UCS 500-M6BS1	V0545100858	EM TEST	2017.04.07	☐
Ultra compact simulator	UCS500M	0701-03	EM TEST	2017.08.25	☐
Ultra compact simulator	UCS 500N5V	P1429136861	EM TEST	2017.08.26	☒
CDN	CNV 508 N1	V1108108861	EM TEST	2017.08.26	☒

6.8.3 Photographs of test setup

[Test #1]



[Test #2]



6.8.4 Measurement result

DC Line [Test #1]

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

Signal [Test #1, Test #2]

Coupling point	(+)	(-)	Result
Audio In/Out	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass
Alarm In/Out	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass

Telecommunication [Test #1, Test #2]

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 MHz ~ 100 MHz				
Test level & Modulation	1 V/m, 3 V/m, 10 V/m, 80 % Amplitude Modulation (1 kHz) 1 V/m, 3 V/m, 10 V/m, Pulse Modulation (1 Hz (0.5 s ON: 0.5s 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	2016-09-26				
Temperature(°C)	26.5 °C	Humidity (% R.H.)	47.2 % R.H.	Pressure(kPa)	100.9 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.				

6.9.1 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 MHz to 80 MHz. This frequency range was Modulated with 1 kHz sine wave at 80 %.

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

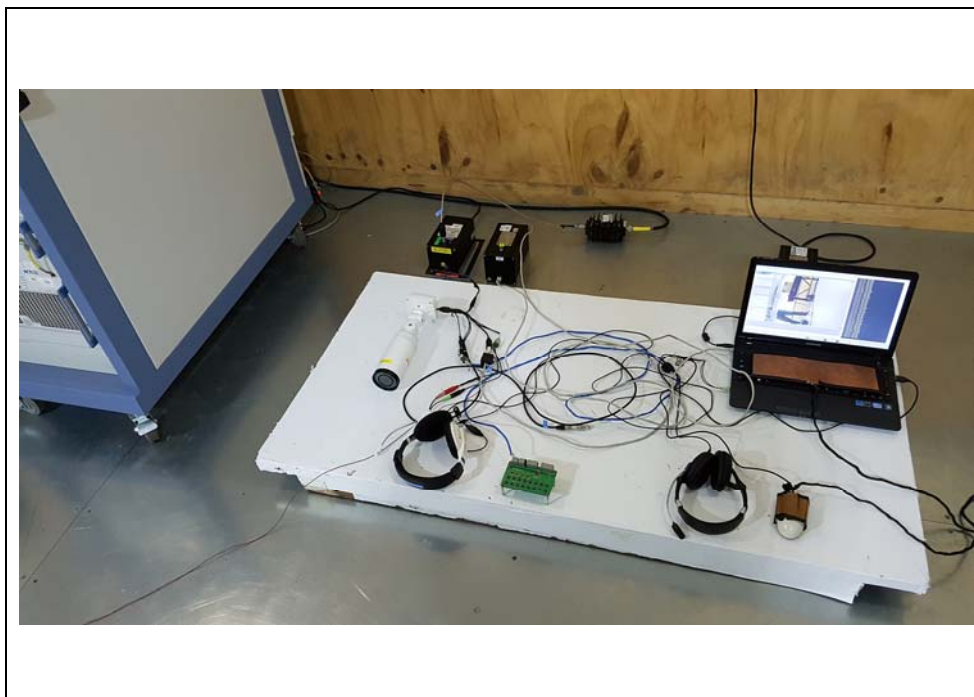
The power and all network cable, I/O cables longer than 3 m length were tested.

6.9.2 Used equipments

Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
POWER SENSOR	NRP-Z91	103183	R&S	2017.08.26	☒
POWER SENSOR	NRP-Z91	103184	R&S	2017.08.26	☒
C.D.N	CDN L-801 M2/M3	2936	EM TEST	2017.08.25	☒
C.D.N	CDN M2/M3N	0111-04	EM TEST	2017.08.25	☒
SIGNAL GENERATOR	SMC100A	105221	R&S	2017.08.02	☒
COAXIAL FIXED ATTENUATOR	MU918	73-6-34	MCE/ WEINSCHEL	2017.08.02	☒
BROADBAND AMPLIFIER	BBA150	101937	R&S	2017.08.26	☒
EM Clamp	KEMZ 801	17643	SCHAFFNER	2017.04.08	☒
C.D.N	CDN-T8-RJ45	0113-22	EM TEST	2017.08.25	☒

6.9.3 Photographs of test setup

[Test #1]



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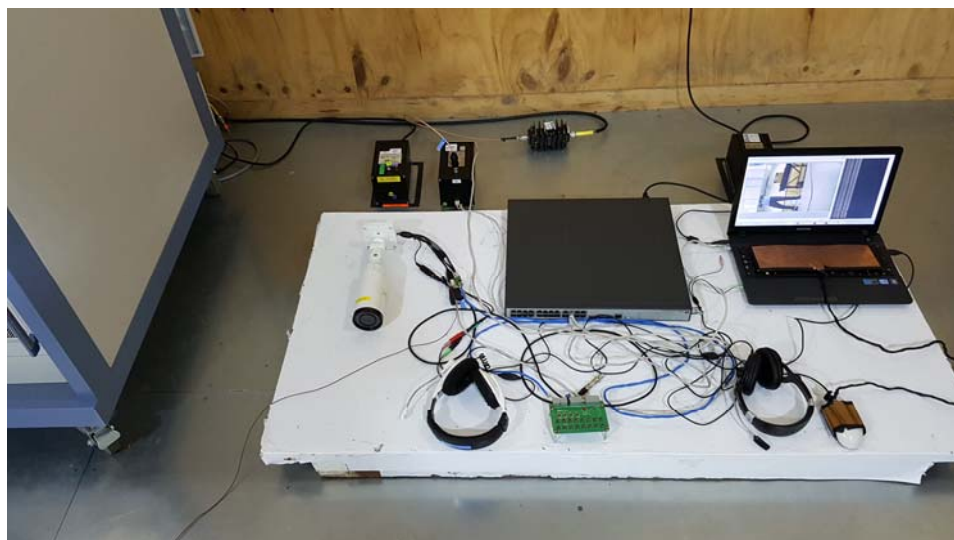
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[Test #2]



6.9.4 Measurement result

DC Line [Test #1]

Coupling point	Coupling method	Result
Power	CDN(M2)	Pass

Signal [Test #1, Test #2]

Coupling point	Coupling method	Result
Audio In/Out	Clamp	Pass
Alarm In/Out	Clamp	Pass

Telecommunication [Test #1, Test #2]

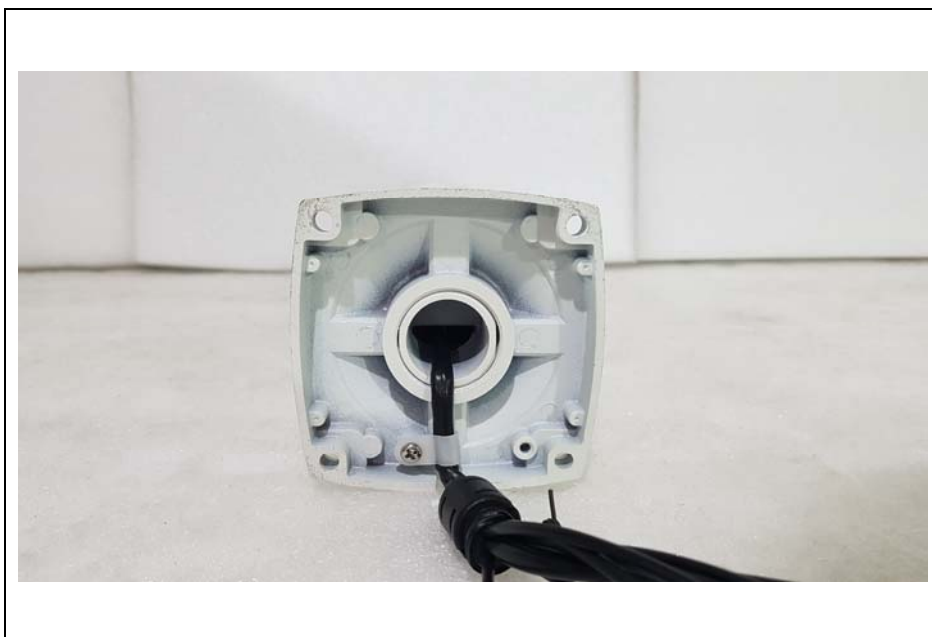
Coupling point	Coupling method	Result
LAN(RJ-45)	CDN(T8-RJ45)	Pass
LAN(PoE)	CDN(T8-RJ45)	Pass

7. EUT photographs

Front View



Rear View



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Left View



Right View



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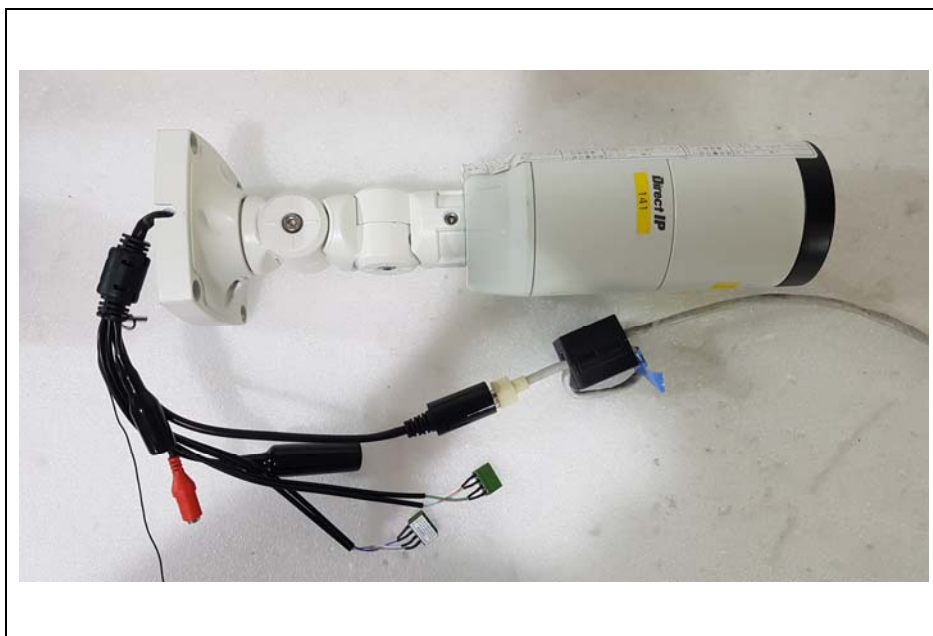
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Bottom View

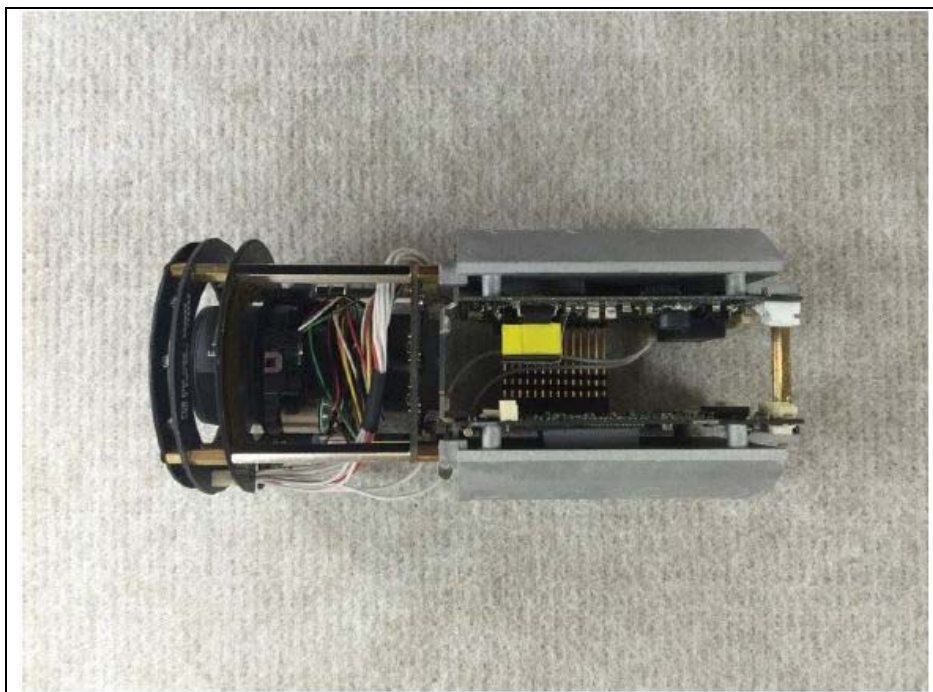


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Main Board



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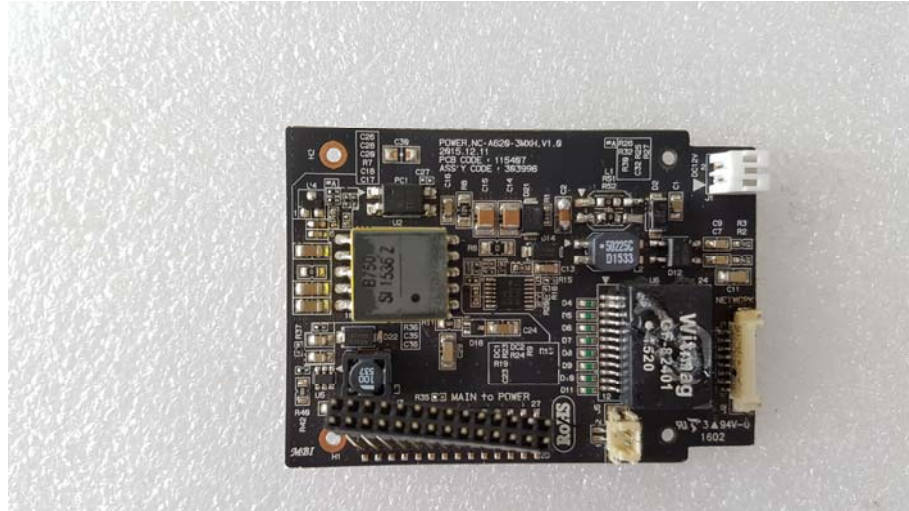
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SUB Board



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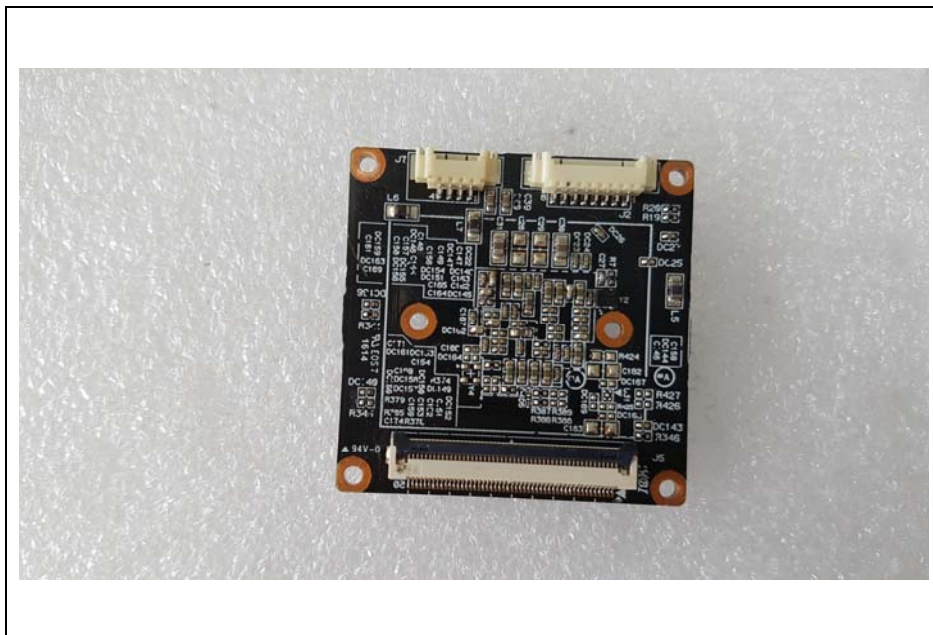
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CCD Board

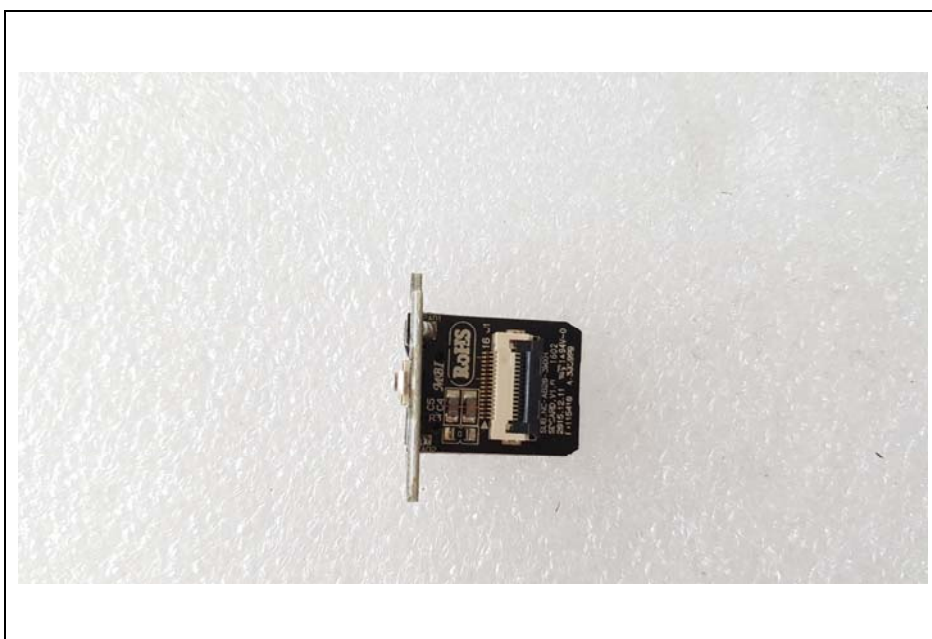


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KCTLMicro SD Card Board

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KCTLLAN Cable