

ATTESTATION

of conformity

with European Directives

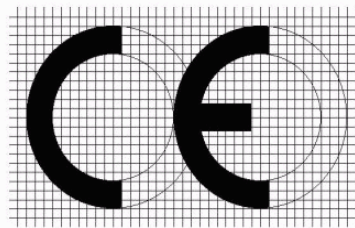
For the following

Product : Network Video Recorder
Model Name : DR-8364D

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: August 17, 2016

IDIS CO., LTD.

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

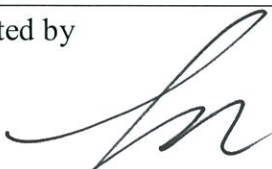
(Name and signature of authorized person)

TEST REPORT

KCTL Inc. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82 70 5008 1021 FAX: 82 505 299 8311	Report No.: KR16-SEC0045 Page(1) / (82) Pages	 http://www.kctl.co.kr
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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 : Network Video Recorder
Model Name : DR-8364D
Date of Receipt : July 15, 2016
Date of Test : July 22 ~ August 01, 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: Junhee Lee	Technical Manager  Name: Gunsu Park
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2016. 08. 17

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1. Applicant information

Applicant: IDIS CO., LTD.
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E-mail: jjungdoo@idis.co.kr
Contact name: **Jungdoo Jang**

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

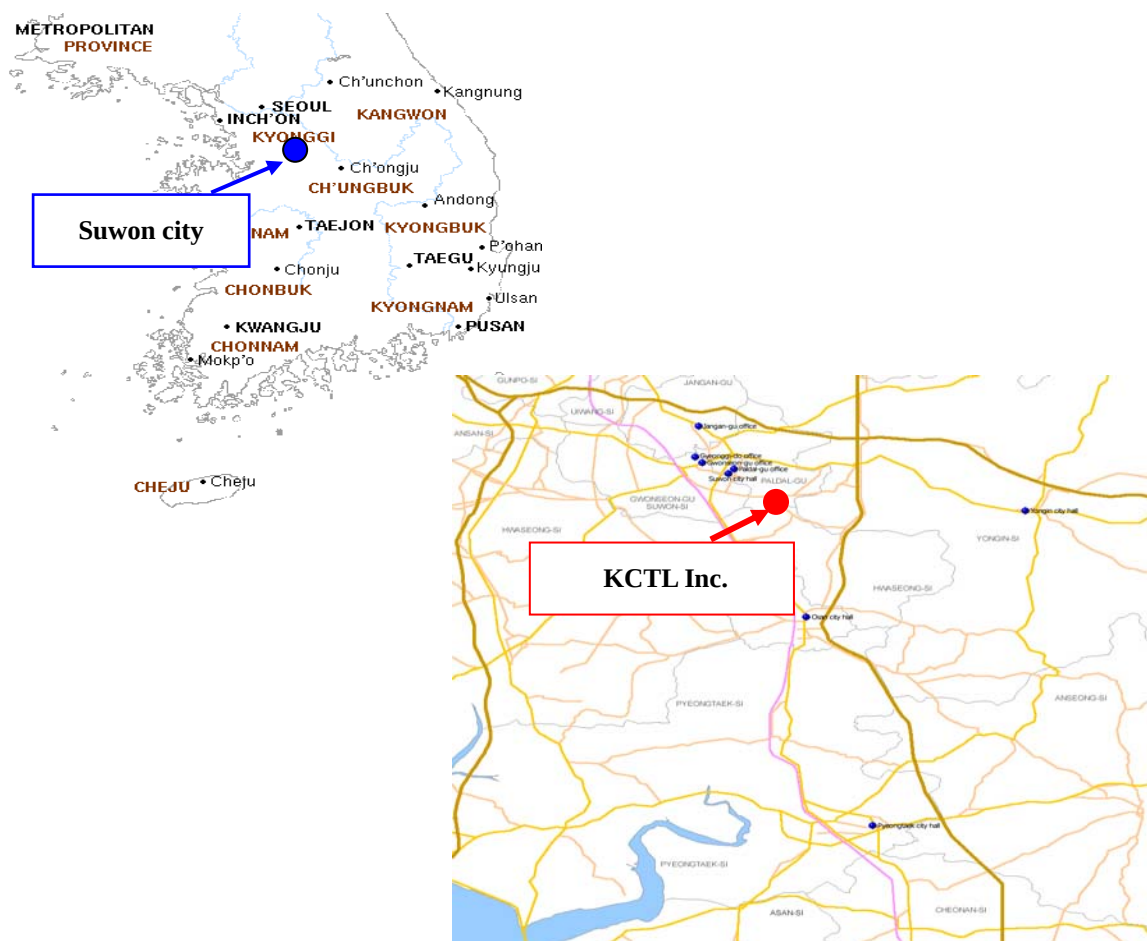
FCC Site Designation No: KR0040, FCC Site Registration No: 687132

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)	: 17.0 °C	64.7 % R.H.	-
Shielded room(CE)	: 25.0 °C	52.5 % R.H.	-
Shielded room(ESD)	: 24.0 °C	56.8 % 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

VIDEO	
Video Inputs	64 IP channels
Video Outputs	1 HDMI, 1 VGA
Display Resolution	3840x2160, 1920 x 1200 , 1920 x 1080, 1680 x 1050, 1600 x 1200
Display Speed	Up to 1920ips

* If more than 16 cameras from video encoders are registered on the NVR, video may not be displayed smoothly in a remote program.

RECORDING	
Max. Throughput	400Mbps, 1920ips @ Full HD
Compression	H.264, * H.265
Recording Mode	Time-Lapse, Event, Pre-Event, Panic

* H.265 compression function will be supported in firmware update later.

PLAYBACK	
Performance	16ch Full HD synchronous playback *4ch 4K playback
Search Mode	Time-lapse, Event log, Thumbnail, Motion, Text-in

* 4K camera compatibility will be supported in firmware update later.

STORAGE	
HDD	SATA x 8, eSATA x4,(Up to 4TB capacity for each disk), RAID 1, 5, 10 supported
Total Capacity	144TB=6TB x (8(Internal) + 4x4(External))
Data Export Device	USB HDD, USB Stick

NETWORK	
Client Connection	Gigabit Ethernet(Client) x1
Video In Connection	Gigabit Ethernet(Video In) x3, SFP(Video In) x 2
Transmission Speed	400Mbps / 500Mbps(BRP Mode)
Event Notification	Email (attach clip (.cbf) .MP4), Callback to Remote S/W, Push notification (IDIS Mobile), SNS (Twitter)

INTERFACE	
Audio In / Out	Local(NVR) : 1 RCA / 1RCA + 1HDMI IP Camera : 64 / 64 (Depending on IP Camera)
NVR Alarm Spec- In	4 TTL, NC/NO programmable, 2.4V (NC) or 0.3V (NO) threshold, 5V DC
NVR Alarm Spec- Out	1 relay output, NC/NO, 2A@125V AC, 1A@30V DC
NVR Alarm Spec - Reset IN	1 TTL, terminal block
Internal Buzzer	Yes
Serial Interface	RS232 (Terminal Block), RS485 (Terminal Block)
USB	USB 2.0 x 2, USB 3.0 x 1

GENERAL	
Operating System	Embedded Linux
Unit Dimensions (W x H x D)	482.6mm x 88mm x 523.3mm (19"x3.5"x20.6")
Unit Weight	9.9kg (21.8lb) (without HDD)
Working Temperature	0°C to 40°C
Operating Humidity	0% ~ 90%
Power	AC 100-240 V, 50/60Hz, 2.0 - 1.0A
Power input	AC 100-240 V, 50/60Hz, 2.0 - 1.0A
Power Consumption	Max. 120W(with 8HDDs)

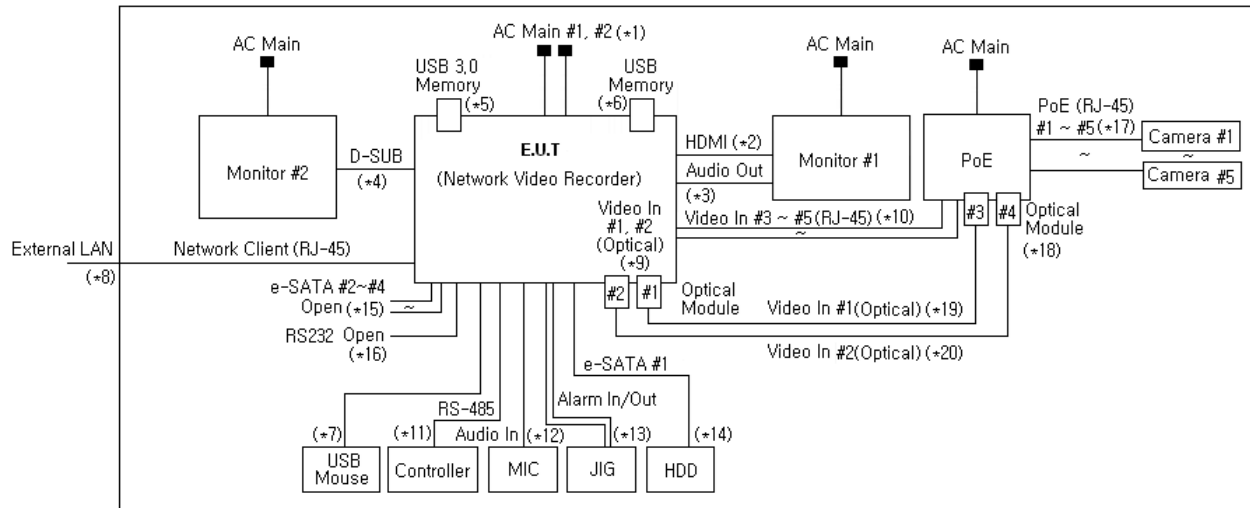
4.2 Product description

Type of product	Network Video Recorder
Model name (Basic)	DR-8364D
Model name (Variant)	-
Difference	-
Trade name	-
Serial no	-
Testing Voltage	230 V, 50 Hz
Input range	AC 100 - 240 V, 50/60 Hz
Internal clock frequency	6 GHz
Note	* RS232 Port is a Manager port.

4.3 Auxiliary equipments

Type	Model / Part #	Serial number	Manufacturer
Monitor #1	LT24B350	ZWP0HMCD101859R	SAMSUNG
Monitor #2	P2214Hb	-	DELL
PoE	-	-	IDIS
Camera #1 ~ #5	MNC321BR	-	IDIS
USB Mouse	HM5061A	-	-
Controller	SCC-1000	EW089028913	SAMSUNG
MIC	-	-	-
JIG	-	-	-
HDD	IT-734	-	IT-CEO
Optical Module #1 ~ #4	APS31123CDL10	-	RoHS
USB Memory (8 GB)	-	-	HP
USB 3.0 Memory (8 GB)	-	-	Verbatim

4.4 Test configuration



Note	Start		End		Cable		
	Name	I/O port	Name	I/O port	Length (m)	Spec.	Cable
1	EUT (Network Video Recorder)	Power #1, #2	AC Main #1, #2	Power #1, #2	1.9	Unshield	-
2		HDMI	Monitor #1	HDMI	1.9	Shield	-
3		Audio Out	Monitor #1	Audio In	3.0	Shield	Out-door
4		D-SUB	Monitor #2	D-SUB	1.9	Shield	-
5		USB 3.0	USB 3.0 Memory	USB 3.0	Direct	-	-
6		USB	USB Memory	USB	Direct	-	-
7		USB	USB Mouse	USB	1.7	Shield	-
8		Network Client (RJ-45)	External LAN	Network Client (RJ-45)	3.0	Unshield	Out-door
9		Video In #1, #2 (Optical)	Optical Module #1, #2	Video Out #1, #2 (Optical)	Direct	-	-
10		Video In #3 ~ #5 (RJ-45)	PoE	Video Out #3 ~ #5 (RJ-45)	3.0	Unshield	Out-door
11		RS-485	Controller	RS-485	3.0	Unshield	Out-door
12		Audio In	MIC	Audio Out	3.0	Shield	Out-door
13		Alarm In/Out	JIG	Alarm In/Out	3.0	Unshield	Out-door

14		e-SATA #1	HDD	e-SATA	1.2	Shield	-
15		e-SATA #2~#4	Open	-	1.2	Shield	-
16		RS232	Open	-	2.0	Unshield	-
17	PoE	PoE (RJ-45) #1 ~ #5	Camera #1 ~ #5	PoE (RJ-45) #1 ~ #5	3.0	Unshield	-
18		Optical #1, #2	Optical Module #3, #4	Optical #1, #2	Direct	-	-
19	Optical Module #1	Video In #1 (Optical)	Optical Module #3	Video Out #3 (Optical)	3.0	Unshield	-
20	Optical Module #2	Video In #2 (Optical)	Optical Module #4	Video Out #4 (Optical)	3.0	Unshield	-

4.5 Operating conditions

The EUT was configured as normal intended use.

Test mode	Normal operating
1	Monitoring test using the Camera.(D-SUB, HDMI: 1 920 x 1 080)
	Recording test using the Camera.
	Audio Out test using the Monitor#1.
	Audio In test using the MIC.
	RS-485 test using the Controller.
	Alarm In/Out test using the JIG.
	Web Viewer test using the External LAN.
	Ping test.

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	Pass
☒	Mains supply voltage variations	EN 50130-4:2011/A1:2014	Pass

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		
Test facility	Shielded room (CE#2)		
Date	2016. 07. 25		
Temperature (°C)	25.0 °C	Humidity (% R.H.)	52.5 % 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 Limits (dB(μV))		Class B Limits (dB(μV))	
		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(μV))		Current Limits (dB(μA))	
		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(μV))		Current Limits (dB(μA))	
		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

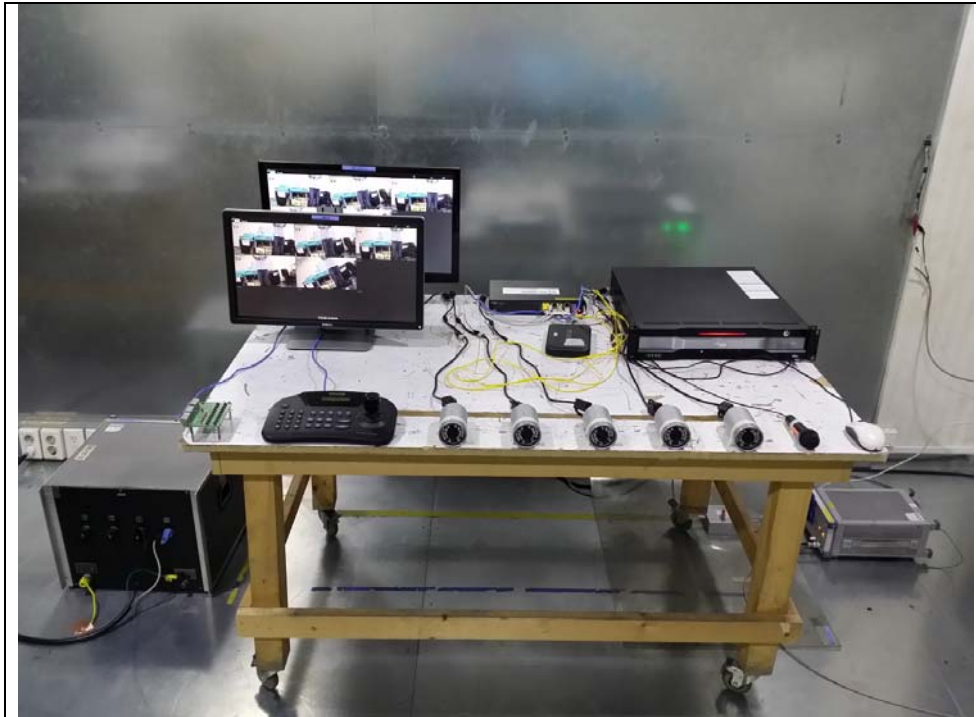
If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 seconds at each measurement frequency, the highest reading shall be recorded, with the exception of any brief isolated high reading (which shall be ignored).

6.1.2 Used equipment

Equipment	Model	Serial No.	Makers	Next Cal. Date	Used
Test Receiver	ESCI	100710	R&S	2017.02.26	☒
TWO-LINE V-NETWORK	ENV216	101352	R&S	2016.09.02	☒
TWO-LINE V-NETWORK	NNLK8121	8121-472	SCHWARZBECK	2017.06.16	☒
8-WIRE ISN CAT5	NTFM 8158 ISN CAT5	CAT5 8158 #138	SCHWARZBECK	2017.05.19	☒

6.1.3 Photographs of test setup

* AC main

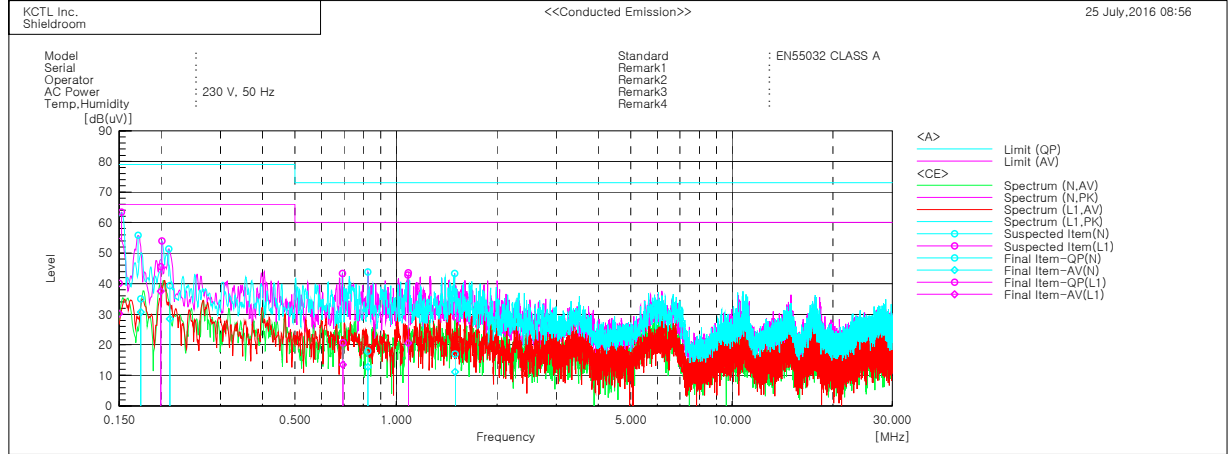


* Telecommunication



6.1.4 Conducted emission measurement result

* AC main (DR-8364D)(Power#1, Power#2 simultaneously implementation)

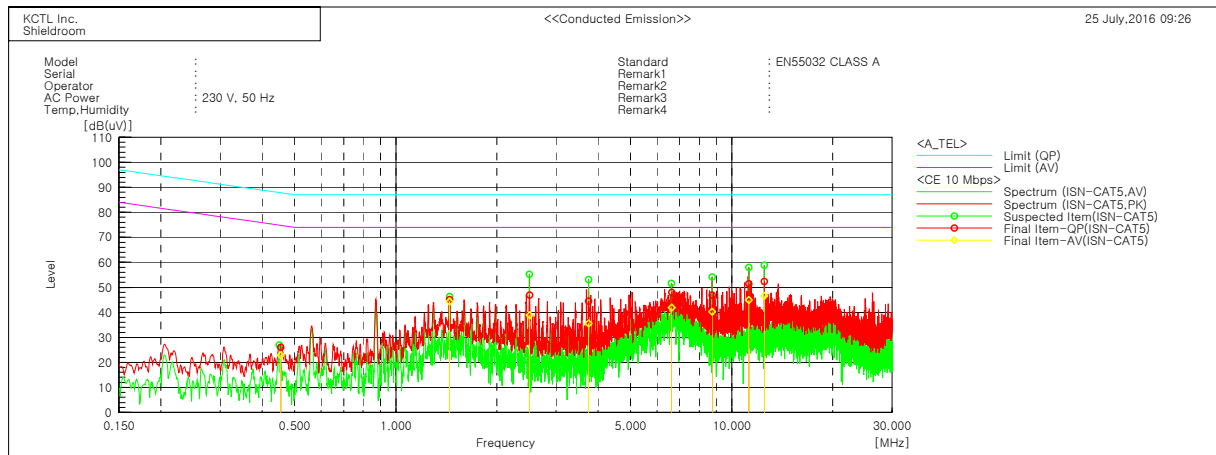


Final Result

--- 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	0.17398	25.3	20.9	9.8	35.1	30.7	79.0	66.0	43.9	35.3
2	0.21247	29.6	18.6	9.8	39.4	28.4	79.0	66.0	39.6	37.6
3	0.82358	8.3	3.0	9.7	18.0	12.7	73.0	60.0	55.0	47.3
4	1.49944	7.2	1.4	9.7	16.9	11.1	73.0	60.0	56.1	48.9
--- 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	0.15008	30.4	20.5	9.7	40.1	30.2	79.0	66.0	38.9	35.8
2	0.1993	35.7	27.8	9.8	45.5	37.6	79.0	66.0	33.5	28.4
3	0.69415	11.0	3.8	9.7	20.7	13.5	73.0	60.0	52.3	46.5
4	1.08777	33.9	10.8	9.7	43.6	20.5	73.0	60.0	29.4	39.5

* Telecommunication port

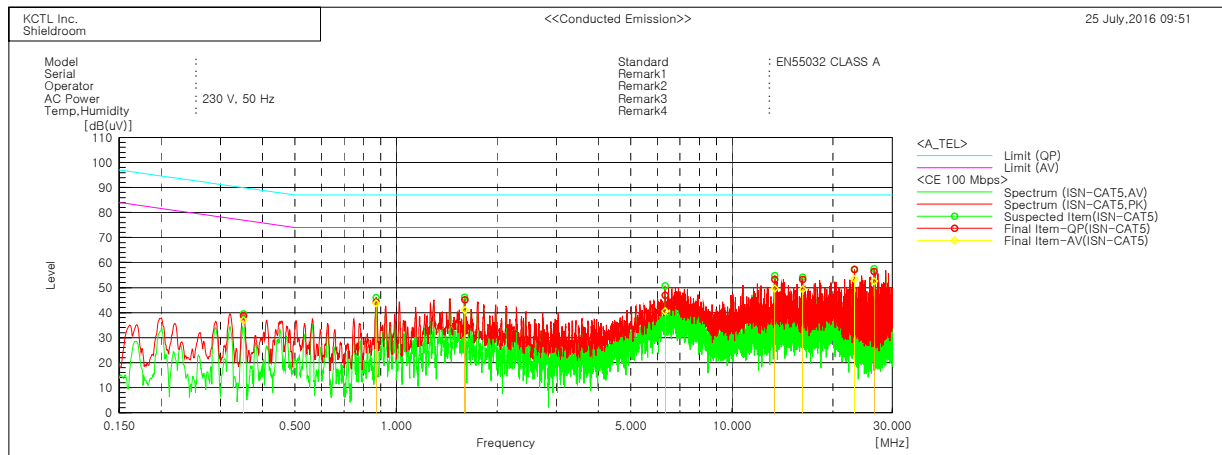
LAN Port (LCL 65 dB)_10 Mbps (DR-8364D)



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	0.45398	16.5	13.3	9.5	26.0	22.8	87.8	74.8	61.8	52.0
2	1.44705	35.7	35.0	9.4	45.1	44.4	87.0	74.0	41.9	29.6
3	2.50048	37.5	29.5	9.4	46.9	38.9	87.0	74.0	40.1	35.1
4	3.75018	35.2	26.2	9.4	44.6	35.6	87.0	74.0	42.4	36.4
5	6.62314	38.6	32.5	9.4	49.0	41.9	87.0	74.0	39.0	32.1
6	8.74996	37.4	30.7	9.5	46.9	40.2	87.0	74.0	40.1	33.8
7	11.25087	41.8	35.3	9.6	51.4	44.9	87.0	74.0	35.6	29.1
8	12.50124	42.7	37.0	9.6	52.3	46.6	87.0	74.0	34.7	27.4

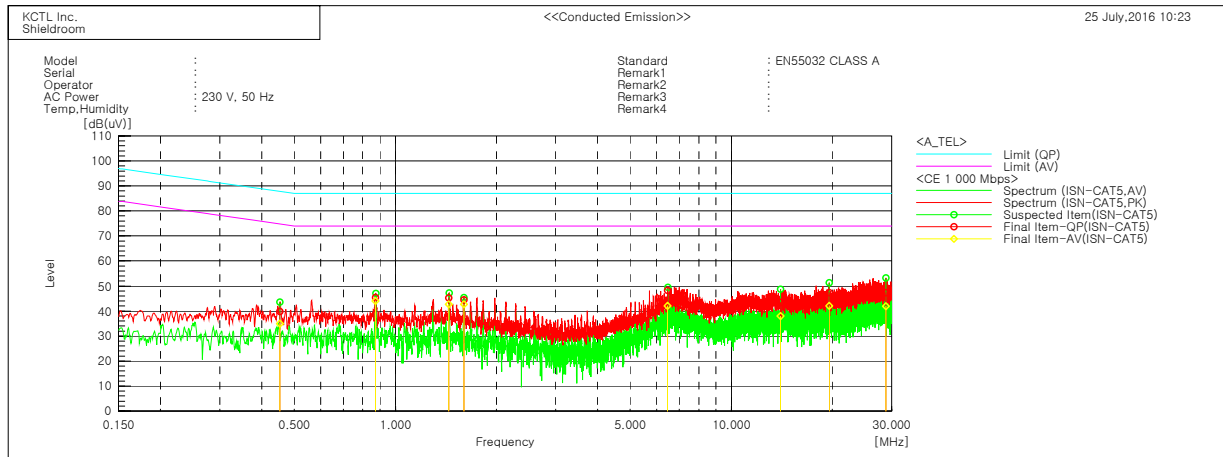
LAN Port (LCL 65 dB)_100 Mbps (DR-8364D)



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(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB]	[dB]
1	0.35138	29.2	27.3	9.6	38.8	36.9	89.9	76.9	51.1	40.0
2	0.87301	34.7	34.3	9.4	44.1	43.7	87.0	74.0	42.9	30.3
3	1.60191	35.6	31.6	9.4	45.0	41.0	87.0	74.0	42.0	33.0
4	6.3229	37.5	31.2	9.4	46.9	40.6	87.0	74.0	40.1	33.4
5	13.42024	43.7	40.0	9.6	53.3	49.6	87.0	74.0	33.7	24.4
6	16.23068	43.7	39.7	9.6	53.3	49.3	87.0	74.0	33.7	24.7
7	23.1299	47.7	43.9	9.5	57.2	53.4	87.0	74.0	29.8	20.6
8	26.48821	47.0	43.0	9.5	56.5	52.5	87.0	74.0	30.5	21.5

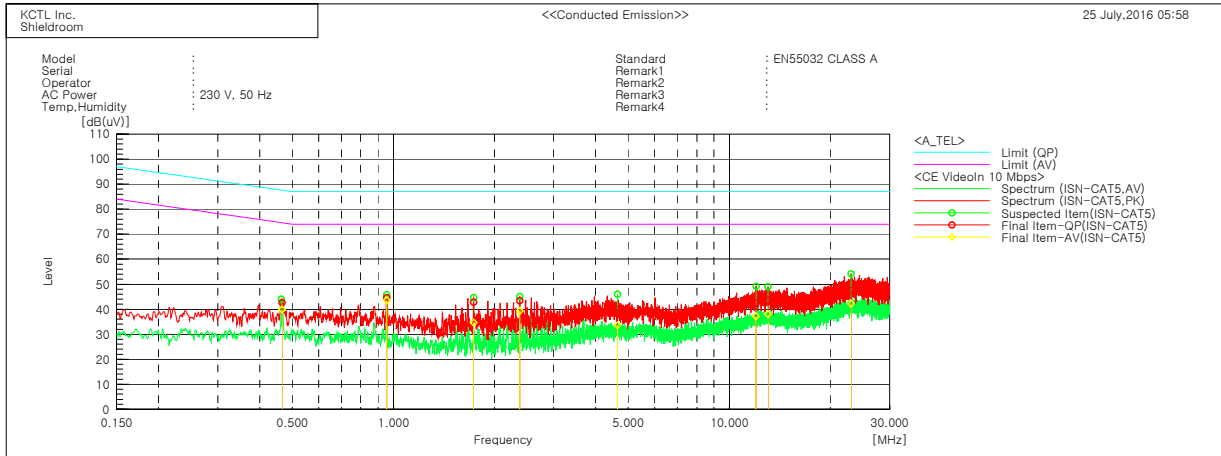
LAN Port (LCL 65 dB)_1 000 Mbps (DR-8364D)



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]
1	0.45281	30.3	25.4	9.5	39.8	34.9	87.8	74.8	48.0
2	0.87209	36.0	34.7	9.4	45.4	44.1	87.0	74.0	41.6
3	1.44354	35.8	33.3	9.4	45.2	42.7	87.0	74.0	41.8
4	1.59965	35.1	33.3	9.4	44.5	42.7	87.0	74.0	42.5
5	6.46717	38.9	32.6	9.4	48.3	42.0	87.0	74.0	38.7
6	13.9951	33.8	28.4	9.6	43.4	38.0	87.0	74.0	43.6
7	19.58634	37.7	32.5	9.6	47.3	42.1	87.0	74.0	39.7
8	28.87038	37.8	32.4	9.5	47.3	41.9	87.0	74.0	39.7

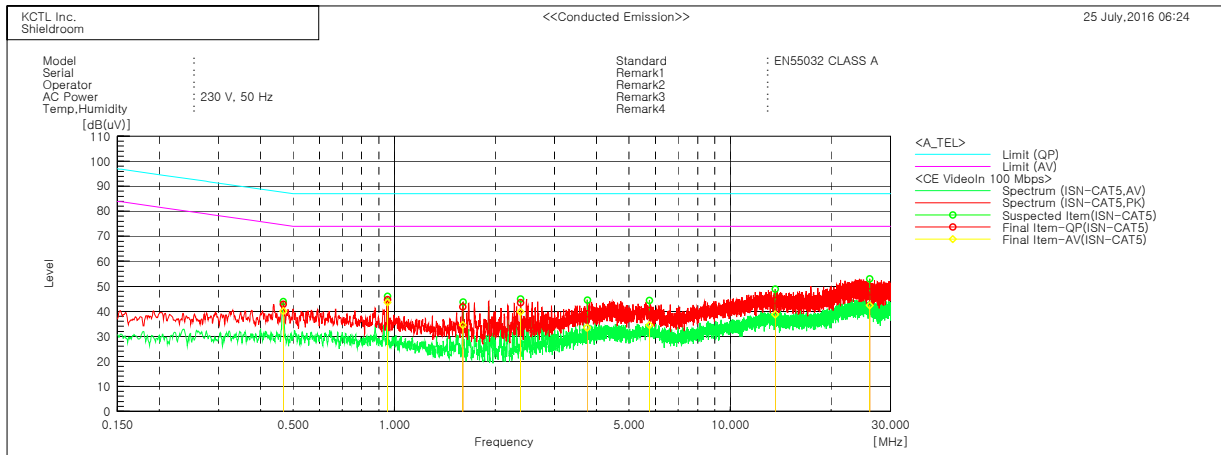
Video In(RJ-45) Port (LCL 65 dB)_10 Mbps (DR-8364D)



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]
1	0.46666	33.0	30.3	9.6	42.6	39.9	87.6	74.6	45.0
2	0.95618	35.2	34.0	9.5	44.7	43.5	87.0	74.0	42.3
3	1.73227	33.3	25.1	9.5	42.8	34.6	87.0	74.0	44.2
4	2.37915	34.0	29.9	9.4	43.4	39.3	87.0	74.0	43.6
5	4.64943	30.3	24.1	9.5	39.8	33.6	87.0	74.0	47.2
6	12.00941	33.0	27.7	9.6	42.6	37.3	87.0	74.0	44.4
7	13.03892	33.8	28.4	9.6	43.4	38.0	87.0	74.0	43.6
8	23.01859	38.0	32.6	9.6	47.6	42.2	87.0	74.0	39.4
									31.8

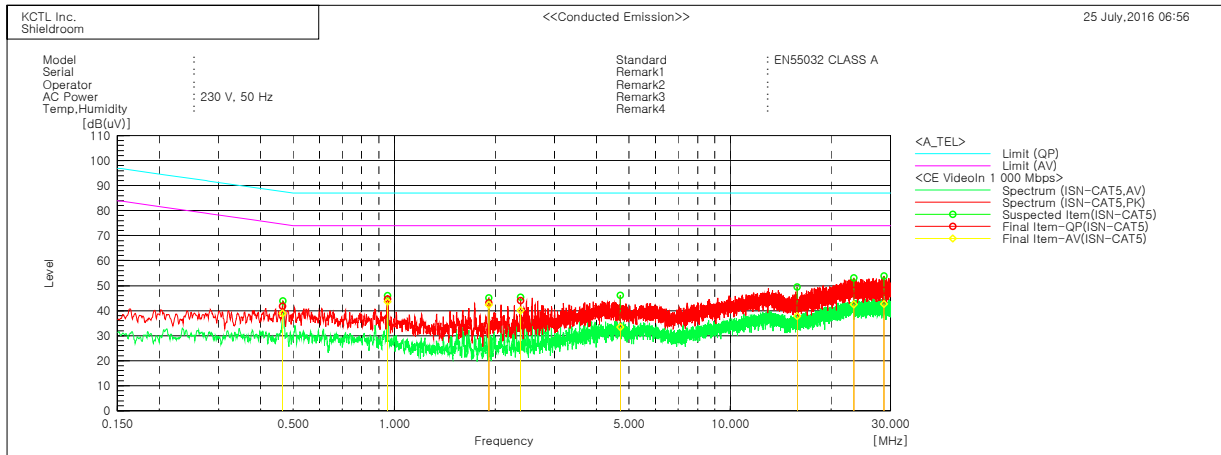
Video In(RJ-45) Port (LCL 65 dB)_100 Mbps (DR-8364D)



Final Result

--- ISN-CAT5 Phase ---									
No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	QP CAV
1	0.46731	33.2	30.6	9.6	42.8	40.2	87.6	74.6	44.8 34.4
2	0.95576	35.2	34.1	9.5	44.7	43.6	87.0	74.0	42.3 30.4
3	1.59963	32.2	24.9	9.5	41.7	34.4	87.0	74.0	45.3 39.6
4	2.37821	34.0	30.3	9.4	43.4	39.7	87.0	74.0	43.6 34.3
5	3.75098	29.7	24.1	9.4	39.1	33.5	87.0	74.0	47.9 40.5
6	5.75508	30.7	25.0	9.5	40.2	34.5	87.0	74.0	46.8 39.5
7	13.60313	34.7	29.2	9.6	44.3	38.8	87.0	74.0	42.7 35.2
8	25.99966	38.3	32.9	9.5	47.8	42.4	87.0	74.0	39.2 31.6

Video In(RJ-45) Port (LCL 65 dB)_1 000 Mbps (DR-8364D)



Final Result

--- ISN-CAT5 Phase ---									
No.	Frequency	Reading QP	Reading CAV	c. f	Result QP	Result CAV	Limit QP	Limit AV	Margin
	[MHz]	[dB(uV)]	[dB(uV)]	[dB]	[dB(uV)]	[dB(uV)]	[dB(uV)]	[dB(uV)]	QP CAV
1	0.46481	32.2	29.3	9.6	41.8	38.9	87.6	74.6	45.8 35.7
2	0.95631	35.2	34.1	9.5	44.7	43.6	87.0	74.0	42.3 30.4
3	1.91155	33.8	33.0	9.4	43.2	42.4	87.0	74.0	43.8 31.6
4	2.37628	34.6	30.7	9.4	44.0	40.1	87.0	74.0	43.0 33.9
5	4.7039	30.0	23.9	9.5	39.5	33.4	87.0	74.0	47.5 40.6
6	15.84139	33.6	28.2	9.7	43.3	37.9	87.0	74.0	43.7 36.1
7	23.35724	38.5	32.9	9.6	48.1	42.5	87.0	74.0	38.9 31.5
8	28.73953	38.6	33.1	9.5	48.1	42.6	87.0	74.0	38.9 31.4

6.2 Radiated Emission

Test specification	EN 55032:2015, Class A		
Testing voltage	230 V, 50 Hz		
Test facility	10 m Chamber (4F)		
Test distance	10 m, 3 m		
Date	2016. 07. 23		
Temperature (°C)	17.0 °C	Humidity (% R.H.)	64.7 % 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 Limits (dB(μ V/m)) @ 10 m	Class B Limits (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 [MHz]	Class A @ 3 m		Class B @ 3 m	
		Average limits (dB(μ V/m))	Peak limits (dB(μ V/m))	Average limits (dB(μ V/m))	Peak limits (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

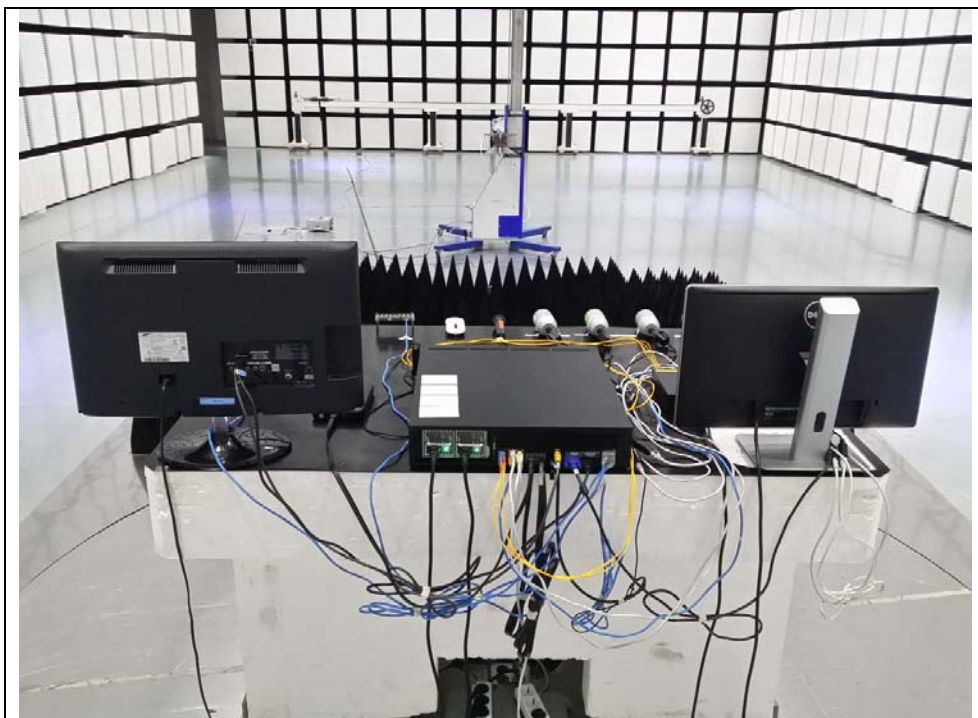
Equipment	Model no.	Serial no.	Makers	Next Cal. Date	Used
Test Receiver	ESR	101078	R&S	2017.02.26	☒
Bilog Antenna	VULB 9168	375	SCHWARZBECK	2016.09.18	☒
Amplifier	317	321041	SONOMA INSTRUMENT	2017.03.05	☒
COAXIAL FIXED ATTENUATOR	8491A	16861	HP	2017.04.07	☒
Antenna Mast	AM4.0	079/3440509	MATURO	-	☒
Turn Table	CO2000-SOFT	-	MATURO	-	☒
Preamplifier	8449B	3008A01802	AGILENT	2017.04.07	☒
Horn ANT	3115	00086706	ETS	2016.09.02	☒
Spectrum Analyzer	FSV40	100988	R&S	2017.01.07	☐

6.2.3 Photographs of test setup

* 30 MHz ~ 1 GHz



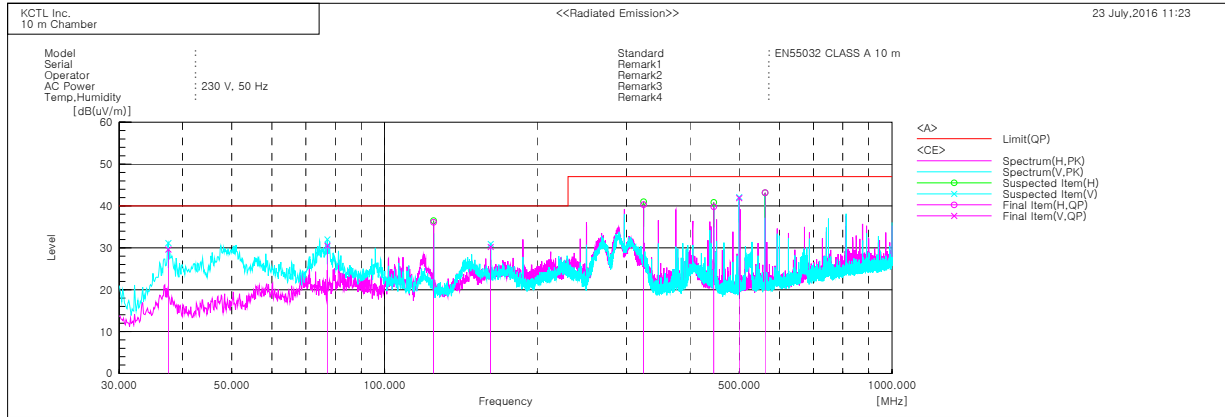
* 1 GHz ~ 6 GHz



6.2.4 Radiated emission measurement result

* Graph and Data

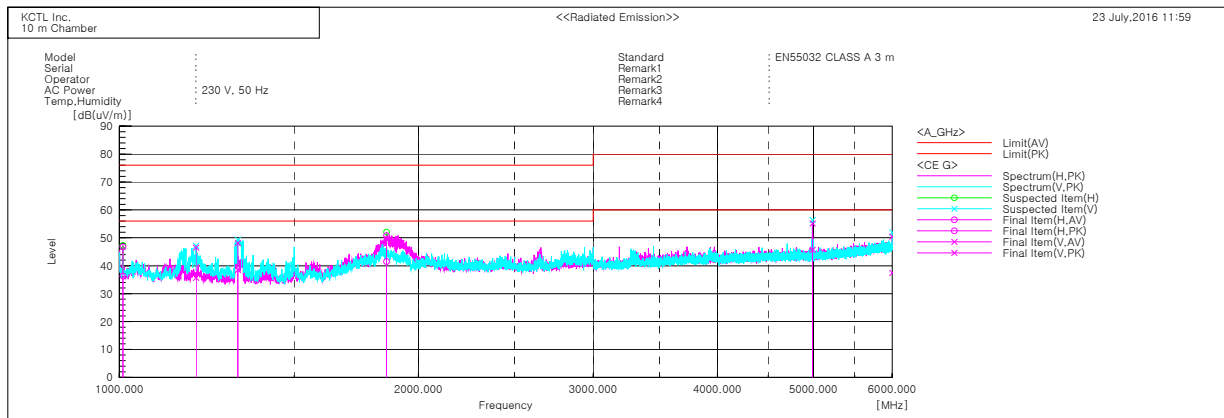
* 30 MHz ~ 1 GHz (DR-8364D)(Power#1, Power#2 simultaneously implementation)



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	37.518	V	50.8	-21.2	29.6	40.0	10.4	202.0	100.7
2	77.166	V	54.0	-23.5	30.5	40.0	9.5	100.0	37.5
3	124.939	H	57.4	-21.3	36.1	40.0	3.9	400.0	284.2
4	161.920	V	49.5	-19.3	30.2	40.0	9.8	100.0	22.2
5	324.031	H	57.8	-17.5	40.3	47.0	6.7	301.0	349.5
6	445.524	H	53.8	-14.0	39.8	47.0	7.2	202.0	202.5
7	499.965	V	54.5	-12.6	41.9	47.0	5.1	100.0	200.7
8	562.530	H	54.1	-10.9	43.2	47.0	3.8	202.0	263.7

* 1 GHz ~ 6 GHz (DR-8364D)(Power#1, Power#2 simultaneously implementation)



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	1008.125	H	49.1	59.6	-12.8	36.3	46.8	56.0	76.0	19.7	29.2	100.0	216.6
2	1195.000	V	47.9	58.7	-12.2	35.7	46.5	56.0	76.0	20.3	29.5	100.0	191.1
3	1316.250	V	50.1	59.7	-11.6	38.5	48.1	56.0	76.0	17.5	27.9	100.0	191.1
4	1858.125	H	48.4	57.7	-6.9	41.5	50.8	56.0	76.0	14.5	25.2	100.0	131.2
5	4988.750	V	42.8	52.3	2.9	45.7	55.2	60.0	80.0	14.3	24.8	100.0	158.8
6	5999.000	V	31.4	44.4	6.0	37.4	50.4	60.0	80.0	22.6	29.6	100.0	41.5

6.3 Harmonics

Test specification	EN 61000-3-2:2014				
Testing voltage	230 V, 50 Hz				
Test facility	EMI Test area(6F)				
Date	2016. 07. 22				
Temperature(°C)	27.1 °C	Humidity (% R.H.)	41.8 % R.H.	Pressure (kPa)	100.3 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

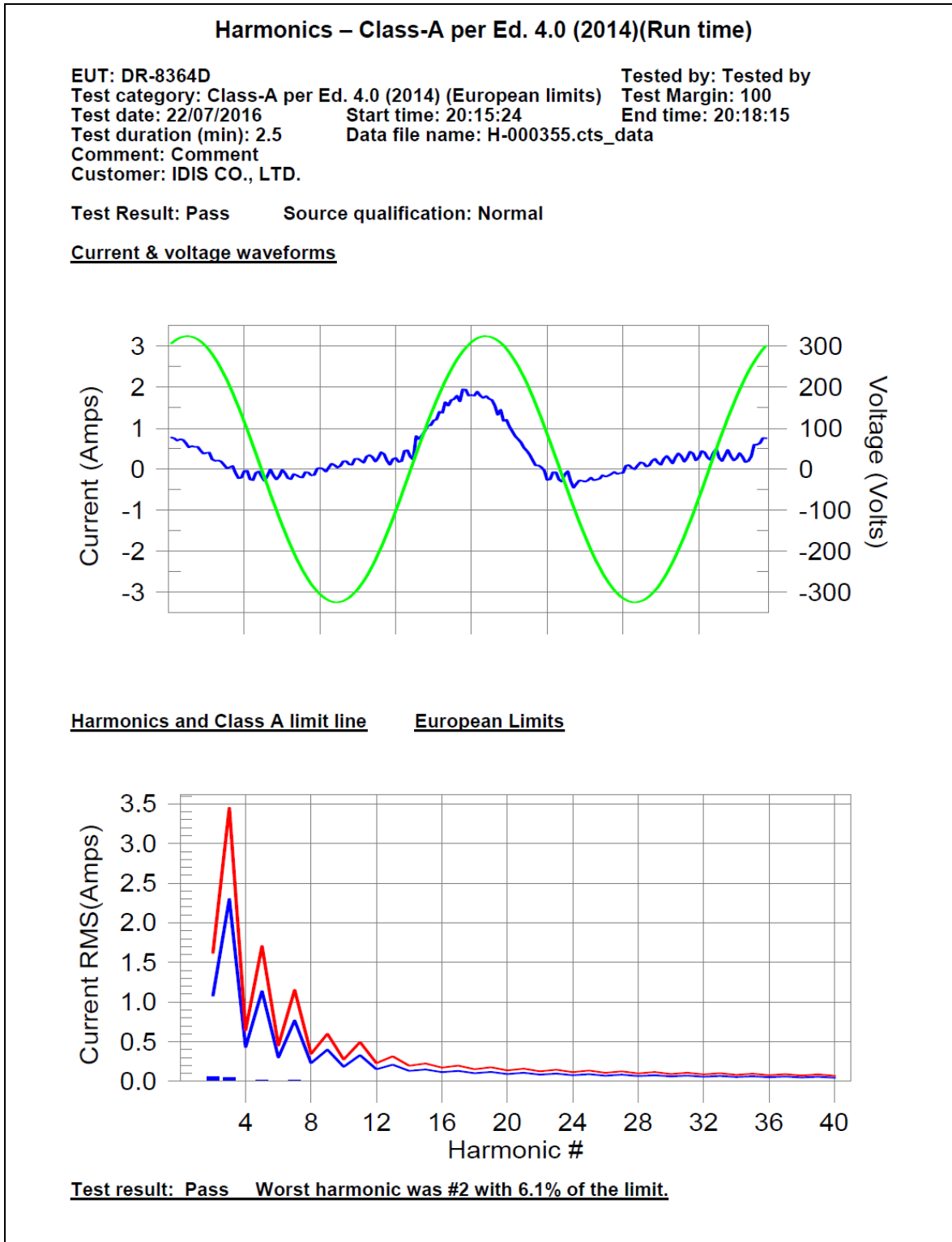
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter (AC POWER SOURCE)	5001x-CTS -400-413	54894	C.I.	2017.03.16	☒
Harmonics/Flicker meter (Analyzer)	PACS-1	72072	C.I.	2017.03.16	☒

6.3.3 Photographs of test setup



6.3.4 Measurement result

(Power#1, Power#2 simultaneously implementation)



Current Test Result Summary (Run time)

EUT: DR-8364D
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 22/07/2016
Test duration (min): 2.5
Comment: Comment
Customer: IDIS CO., LTD.

Tested by: Tested by
Test Margin: 100
End time: 20:18:15
Data file name: H-000355.cts_data

Test Result: Pass Source qualification: Normal
THC(A): 0.081 I-THD(%): 16.5 POHC(A): 0.000 POHC Limit(A): 0.251
Highest parameter values during test:

V_RMS (Volts): 229.50
I_Peak (Amps): 2.084
I_Fund (Amps): 0.506
Power (Watts): 99.2
Frequency(Hz): 50.00
I_RMS (Amps): 0.639
Crest Factor: 3.604
Power Factor: 0.804

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.059	1.080	5.4	0.099	1.620	6.1	Pass
3	0.050	2.300	2.2	0.056	3.450	1.6	Pass
4	0.007	0.430	1.6	0.011	0.645	1.7	Pass
5	0.010	1.140	0.9	0.014	1.710	0.8	Pass
6	0.005	0.300	N/A	0.007	0.450	N/A	Pass
7	0.011	0.770	1.4	0.012	1.155	1.1	Pass
8	0.004	0.230	N/A	0.006	0.345	N/A	Pass
9	0.008	0.400	2.1	0.009	0.600	1.6	Pass
10	0.003	0.184	N/A	0.004	0.276	N/A	Pass
11	0.007	0.330	2.1	0.010	0.495	2.1	Pass
12	0.003	0.153	N/A	0.004	0.230	N/A	Pass
13	0.006	0.210	2.7	0.008	0.315	2.5	Pass
14	0.002	0.131	N/A	0.003	0.197	N/A	Pass
15	0.004	0.150	N/A	0.005	0.225	N/A	Pass
16	0.002	0.115	N/A	0.003	0.173	N/A	Pass
17	0.002	0.132	N/A	0.005	0.198	N/A	Pass
18	0.002	0.102	N/A	0.003	0.153	N/A	Pass
19	0.002	0.118	N/A	0.003	0.178	N/A	Pass
20	0.002	0.092	N/A	0.003	0.138	N/A	Pass
21	0.003	0.107	N/A	0.004	0.161	N/A	Pass
22	0.002	0.084	N/A	0.004	0.125	N/A	Pass
23	0.003	0.098	N/A	0.004	0.147	N/A	Pass
24	0.002	0.077	N/A	0.003	0.115	N/A	Pass
25	0.002	0.090	N/A	0.003	0.135	N/A	Pass
26	0.001	0.071	N/A	0.002	0.107	N/A	Pass
27	0.002	0.083	N/A	0.003	0.125	N/A	Pass
28	0.002	0.066	N/A	0.002	0.099	N/A	Pass
29	0.002	0.078	N/A	0.004	0.116	N/A	Pass
30	0.001	0.061	N/A	0.002	0.092	N/A	Pass
31	0.003	0.073	N/A	0.003	0.109	N/A	Pass
32	0.002	0.058	N/A	0.002	0.086	N/A	Pass
33	0.001	0.068	N/A	0.002	0.102	N/A	Pass
34	0.001	0.054	N/A	0.002	0.081	N/A	Pass
35	0.001	0.064	N/A	0.002	0.096	N/A	Pass
36	0.001	0.051	N/A	0.002	0.077	N/A	Pass
37	0.003	0.061	N/A	0.003	0.091	N/A	Pass
38	0.001	0.048	N/A	0.002	0.073	N/A	Pass
39	0.001	0.058	N/A	0.002	0.087	N/A	Pass
40	0.001	0.046	N/A	0.002	0.069	N/A	Pass

Voltage Source Verification Data (Run time)

EUT: DR-8364D
Test category: Class-A per Ed. 4.0 (2014) (European limits)
Test date: 22/07/2016
Test duration (min): 2.5
Comment: Comment
Customer: IDIS CO., LTD.

Tested by: Tested by
Test Margin: 100
Start time: 20:15:24
End time: 20:18:15
Data file name: H-000355.cts_data

Test Result: Pass Source qualification: Normal

Highest parameter values during test:

Voltage (Vrms): 229.50	Frequency(Hz): 50.00
I_Peak (Amps): 2.084	I_RMS (Amps): 0.639
I_Fund (Amps): 0.506	Crest Factor: 3.604
Power (Watts): 99.2	Power Factor: 0.804

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.111	0.459	24.12	OK
3	0.523	2.065	25.30	OK
4	0.024	0.459	5.17	OK
5	0.019	0.918	2.04	OK
6	0.027	0.459	5.93	OK
7	0.023	0.688	3.40	OK
8	0.019	0.459	4.15	OK
9	0.017	0.459	3.76	OK
10	0.011	0.459	2.40	OK
11	0.026	0.229	11.15	OK
12	0.020	0.229	8.88	OK
13	0.021	0.229	9.31	OK
14	0.011	0.229	4.92	OK
15	0.013	0.229	5.70	OK
16	0.012	0.229	5.13	OK
17	0.010	0.229	4.49	OK
18	0.017	0.229	7.19	OK
19	0.006	0.229	2.81	OK
20	0.006	0.229	2.46	OK
21	0.006	0.229	2.79	OK
22	0.008	0.229	3.51	OK
23	0.007	0.229	2.96	OK
24	0.010	0.229	4.35	OK
25	0.010	0.229	4.38	OK
26	0.008	0.229	3.55	OK
27	0.004	0.229	1.69	OK
28	0.010	0.229	4.57	OK
29	0.009	0.229	3.86	OK
30	0.010	0.229	4.17	OK
31	0.006	0.229	2.68	OK
32	0.006	0.229	2.77	OK
33	0.004	0.229	1.62	OK
34	0.010	0.229	4.47	OK
35	0.005	0.229	2.37	OK
36	0.007	0.229	3.08	OK
37	0.008	0.229	3.32	OK
38	0.007	0.229	2.96	OK
39	0.013	0.229	5.53	OK
40	0.010	0.229	4.57	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. 07. 22				
Temperature(°C)	27.1 °C	Humidity (% R.H.)	41.8 % R.H.	Pressure (kPa)	100.3 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

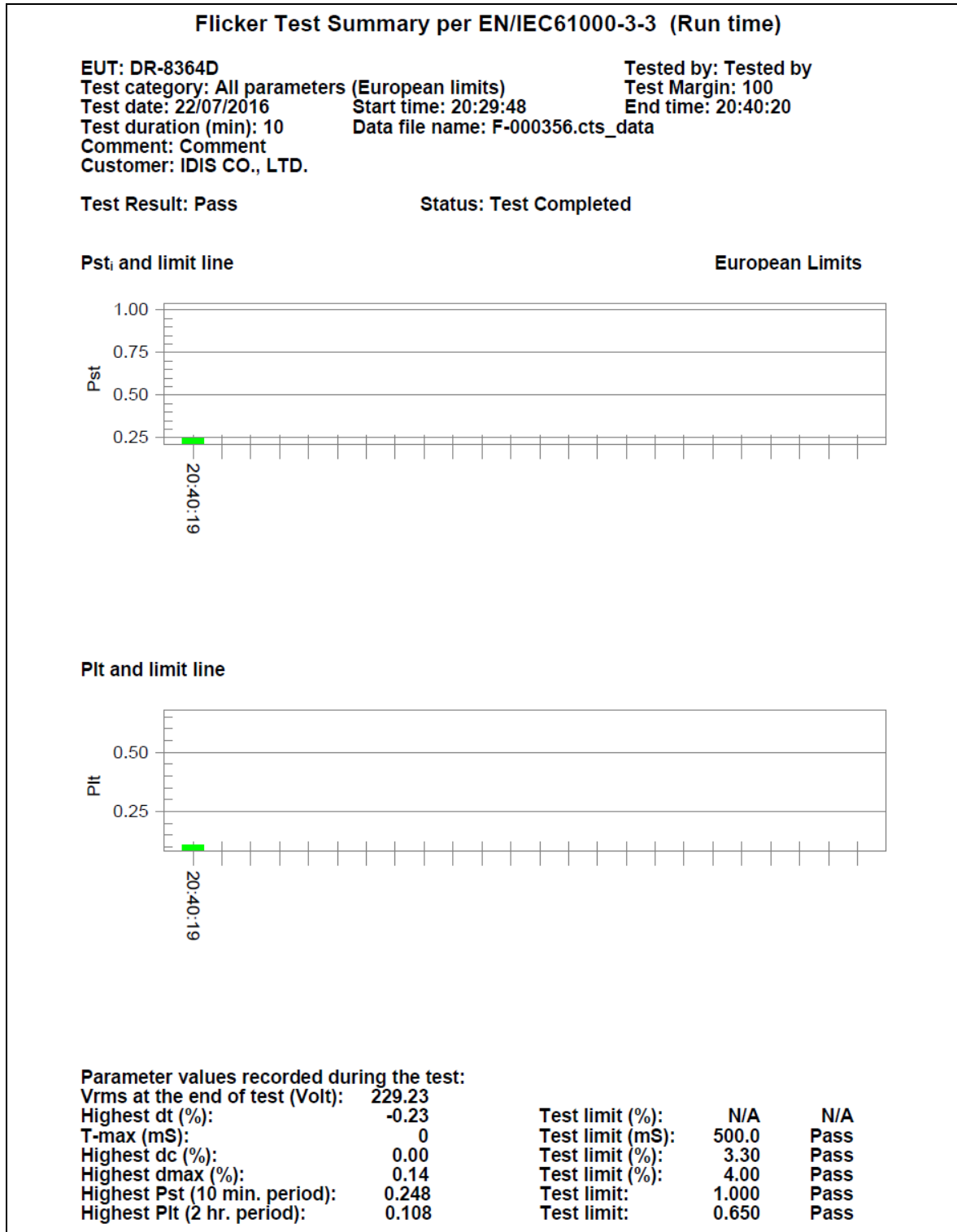
Equipment	Model no.	Serial no.	Makers	Next Cal. date	Used
Harmonics/Flicker meter (AC POWER SOURCE)	5001x-CTS -400-413	54894	C.I.	2017.03.16	☒
Harmonics/Flicker meter (Analyzer)	PACS-1	72072	C.I.	2017.03.16	☒

6.4.3 Photographs of test setup



6.4.4 Measurement result

(Power#1, Power#2 simultaneously implementation)



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	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Date	2016. 07. 28				
Temperature (°C)	24.0 °C	Humidity (% R.H.)	56.8 % 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 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



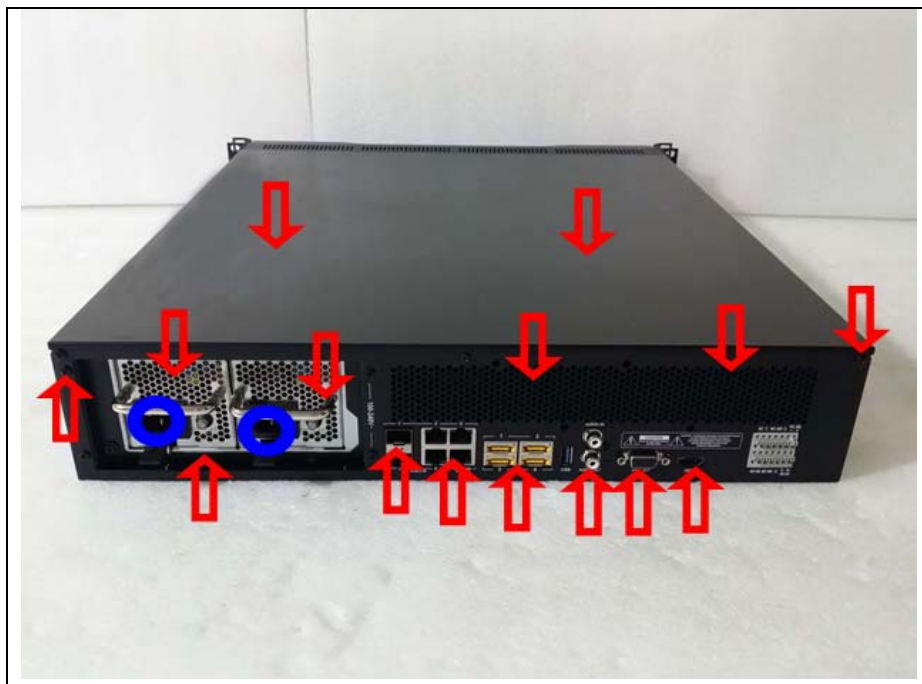
6.5.4 Measurement result

Electrostatic Discharge (Test Point)

Air discharge



Contact discharge





HCP/VCP discharge

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

Contact discharge

Location(EUT)	Applied level ($\pm$)	Result
Front	± 6 kV	Pass
Rear	± 6 kV	Pass
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	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 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: 0.5 s OFF))				
Frequency Step	1 % step				
Dwell time	1 s				
Distance	3 m from EUT to tip of antenna				
Testing voltage	230 V, 50 Hz				
Test facility	6F Fully anechoic chamber (3 m)				
Date	2016. 08. 01				
Temperature (°C)	26.1 °C	Humidity (% R.H.)	44.1 % 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.				

6.6.1 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



6.6.4 Measurement result

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	☒ AC main ☒ Signal / Control: Clamp ☒ Telecommunication: Clamp				
Test level	☒ AC main: ± 2 kV Peak ☒ Signal / Control: ± 1 kV Peak ☒ Telecommunication: ± 1 kV Peak				
Repetition frequency	100 kHz, Tr/Th = 5 / 50 ns				
Coupling time (Minimum)	60 s				
Testing voltage	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Date	2016. 07. 29				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	52.4 % 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.				

6.7.1 Measurement procedure

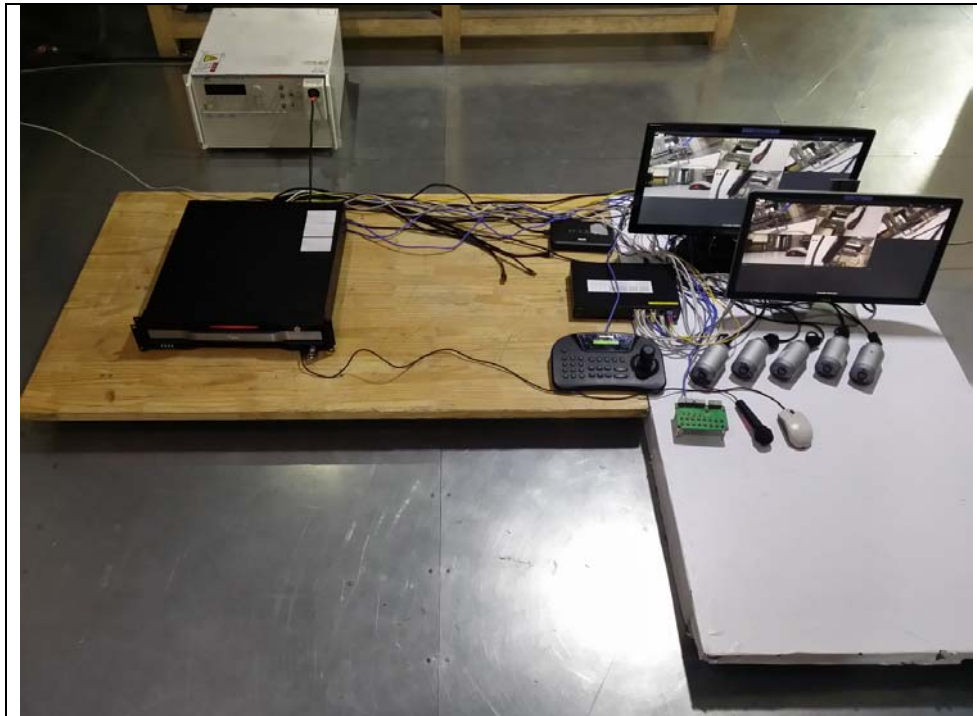
A ground reference plane was located on the floor.
 EFT generator was connected to reference ground plane via low impedance connection.
 For floor standing equipment, EUT was placed on a 0.1 m wooden table.
 For tabletop equipment, EUT was placed on a 0.1 m above the ground reference plane.
 Test generator 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.

6.5.2 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

(Power#1, Power#2)



6.7.4 Measurement result

* AC main (Power#1, Power#2)

Coupling point	(+)	(-)	Result
L+N+PE	+ 2 kV	- 2 kV	Pass

* Signal / Control

Coupling point	(+)	(-)	Result
RS-485	+ 1 kV	- 1 kV	Pass
Audio In/Out	+ 1 kV	- 1 kV	Pass
Alarm In/Out	+ 1 kV	- 1 kV	Pass

* Telecommunication

Coupling point	(+)	(-)	Result
Network Client (RJ-45)	+ 1 kV	- 1 kV	Pass
Video In(RJ-45)	+ 1 kV	- 1 kV	Pass

6.8 Surge

Test specification	EN 61000-4-5:2014				
Coupling	☒ AC main: Direct ☒ Signal / Control: CDN ☒ Telecommunication: CDN				
Test level	☒ AC main: $\pm 0.5 \text{ kV}, \pm 1 \text{ kV}, \pm 2 \text{ kV}$ ☒ Signal: $\pm 0.5 \text{ kV}, \pm 1 \text{ kV}$ ☒ Telecommunication: $\pm 0.5 \text{ kV}, \pm 1 \text{ kV}$				
Coupling Impedance	☒ Differential mode: $18 \mu\text{F}$ ☒ Common mode: $10 \Omega + 9 \mu\text{F}$ ☒ $40 \Omega + 0.5 \mu\text{F}$ ☐ Direct				
Surge pulse shape	Tr/Th = 1.2 / 50 μs				
Angles	0 °, 90 °, 180 °, 270 °				
Number of surge	5				
Coupling time	30 s				
Testing voltage	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Date	2016. 07. 29				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	52.4 % 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

(Power#1, Power#2)



6.8.4 Measurement result

* AC main (Power#1, Power#2)

Coupling point	(+)	(-)	Result
L-N	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass
L-PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Pass
N-PE	+ 0.5 kV, + 1 kV, + 2 kV	- 0.5 kV, - 1 kV, - 2 kV	Pass

* Signal / Control

Coupling point	(+)	(-)	Result
RS-485	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass
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

Coupling point	(+)	(-)	Result
Network Client (RJ-45)	+ 0.5 kV, + 1 kV	- 0.5 kV, - 1 kV	Pass
Video In(RJ-45)	+ 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, 3 V, 10 V, 80 % Amplitude Modulation (1 kHz) 1 V, 3 V, 10 V, Pulse Modulation (1 Hz (0.5 s ON: 0.5 s OFF))				
Frequency Step	1 % step				
Dwell time	1 s				
Coupling method	☒ AC main: CDN(M3) ☒ Signal / Control: Clamp, CDN(S1/75) ☒ Telecommunication: CDN(T8-RJ45)				
Testing voltage	230 V, 50 Hz				
Test facility	Shielded room (6F)				
Date	2016. 07. 27				
Temperature(°C)	25.2 °C	Humidity (% R.H.)	57.0 % R.H.	Pressure (kPa)	100.5 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	2017.02.15	☒
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	2017.08.02	☒
COAXIAL FIXED ATTENUATOR	MU918	73-6-34	MCE/WEINSCHEL	2017.08.02	☒
BROADBAND AMPLIFIER	BBA150	101937	R&S	2017.02.15	☒
CDN	CDN S1/75	0410-28	EM TEST	2017.02.29	☒
CDN	CDN-T8-RJ45	0113-22	EM TEST	2016.09.03	☒
EM Clamp	KEMZ 801	17643	Schaffner	2017.04.08	☒

6.9.3 Photographs of test setup

(Power#1, Power#2)





6.9.4 Measurement result

* AC main (Power#1, Power#2)

Coupling point	Coupling method	Result
Power	CDN(M3)	Pass

* Signal / Control

Coupling point	Coupling method	Result
RS-485	Clamp	Pass
Audio In/Out	CDN(S1/75)	Pass
Alarm In/Out	Clamp	Pass

* Telecommunication

Coupling point	Coupling method	Result
Network Client (RJ-45)	CDN(T8-RJ45)	Pass
Video In(RJ-45)	CDN(T8-RJ45)	Pass

6.10 Dips and Interruptions

Test specification	EN 61000-4-11:2004				
Number of dips	3 T				
Duration	10 s				
Phase	Zero crossing (0 °)				
Testing voltage	100 V, 50/60 Hz / 240 V, 50/60 Hz				
Test facility	Shielded room (6F)				
Date	2016. 07. 29				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	52.4 % 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.				

6.10.1 Measurement procedure

The dips/interruption test is only applicable to AC mains.

The dips/interruptions were applied at zero crossing.

6.10.2 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	☒

6.10.3 Photographs of test setup



6.10.4 Measurement result

* 100 V, 50/60 Hz / 240 V, 50/60 Hz (Power#1, Power#2 simultaneously implementation)

Test Level (%UT)	Dip/Int. (%UT)	Duration /Period	Phase (°)	Count number	Result
80 %	20%	250/300 Period ⁽¹⁾	0	3T	Pass
70 %	30 %	25/30 Period	0	3T	Pass
40 %	60 %	10/12 Period	0	3T	Pass
0%	100 %	250/300 Period ⁽²⁾	0	3T	Note*

Comment:

- There was no change of operation status during above testing.

(250/300 Period⁽¹⁾, 25/30 Period, 10/12 Period)

- Note* (250/300 Period⁽²⁾)

The power of EUT is off during the test. After the test, EUT is getting back to normal operation.

It fully recorded using ancillary Power source equipment to content with Manufacturer's set up manual. During the 250 period power loss, in accordance with the standard, a UPS was used to maintain full operation of the unit.

(Power#1, Power#2 simultaneously implementation)

6.11 Mains supply voltage variations

Test specification	EN 50130-4:2011/A1:2014				
Supply voltage	$U_{nom} + 10 \%$, $U_{nom} - 15 \%$				
Testing Voltage	100 V, 50/60 Hz / 240 V, 50/60 Hz				
Date	2016. 07. 29				
Temperature(°C)	25.3 °C	Humidity (% R.H.)	52.4 % R.H.	Pressure (kPa)	100.2 kPa
Remarks	Pass				

6.11.1 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	☒

6.11.2 Measurement result

* 100 V, 50/60 Hz

Supply voltage		Result
+ 10 %	110 V	Pass
- 15 %	85 V	Pass

* 240 V, 50/60 Hz

Supply voltage		Result
+ 10 %	264 V	Pass
- 15 %	204 V	Pass

Comment:

- There was no change of operation status during above testing.

7. E.U.T. photographs

Front View



Rear View



Left View



Right View



Top View



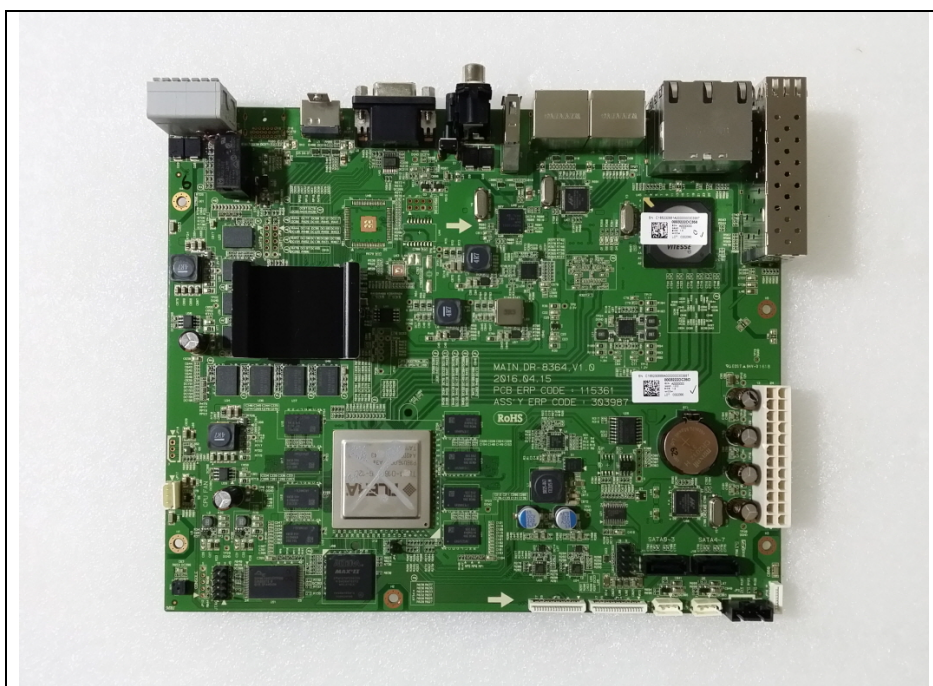
Bottom View

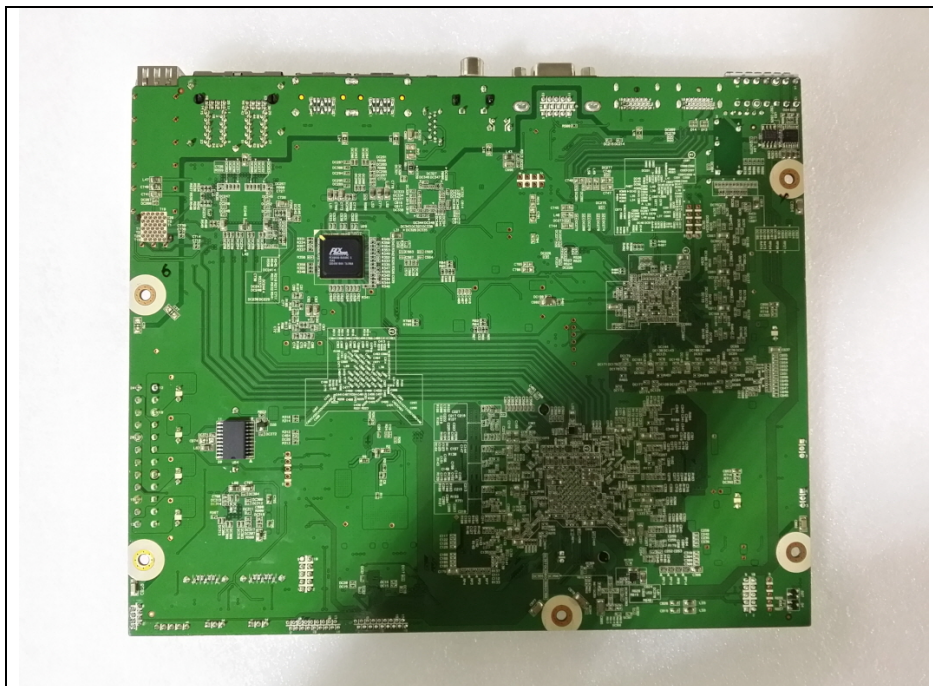


Inside

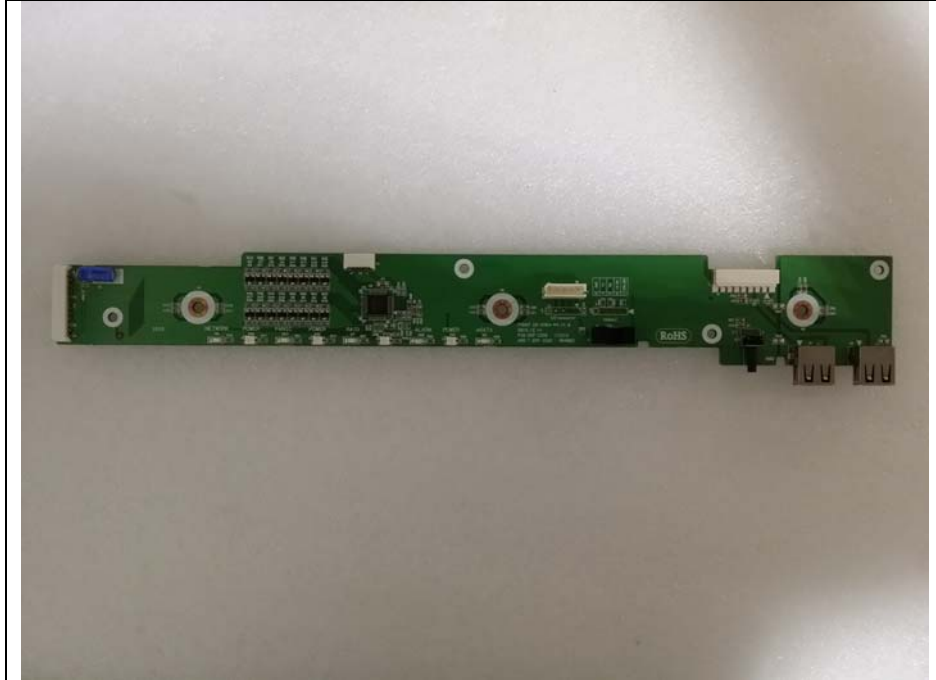


Main Board

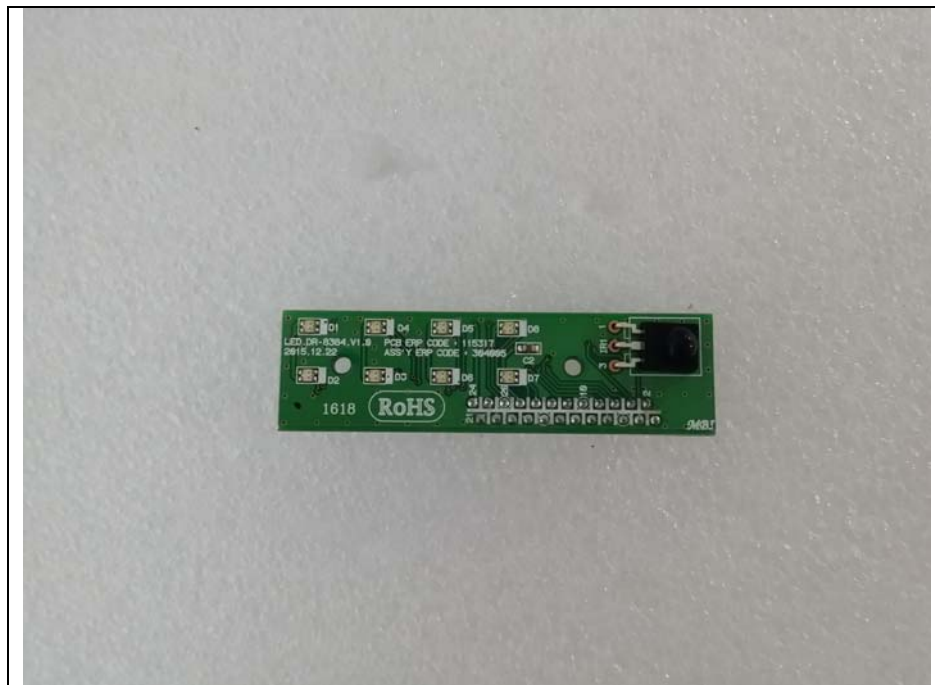




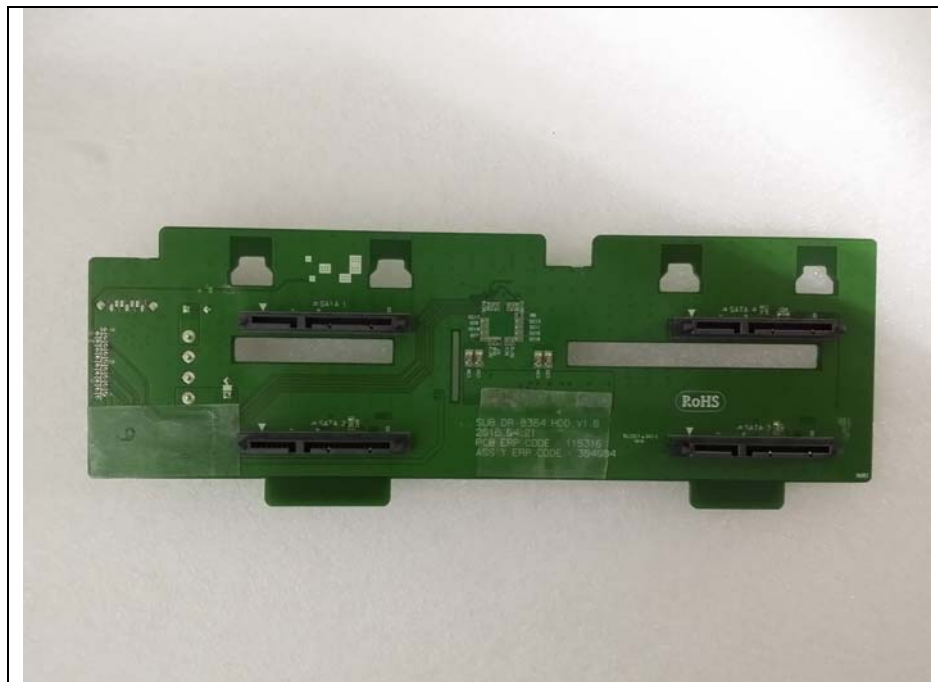
Front Board



LED Board



HDD Board(2 EA)



HDD(4 TB)(8 EA)



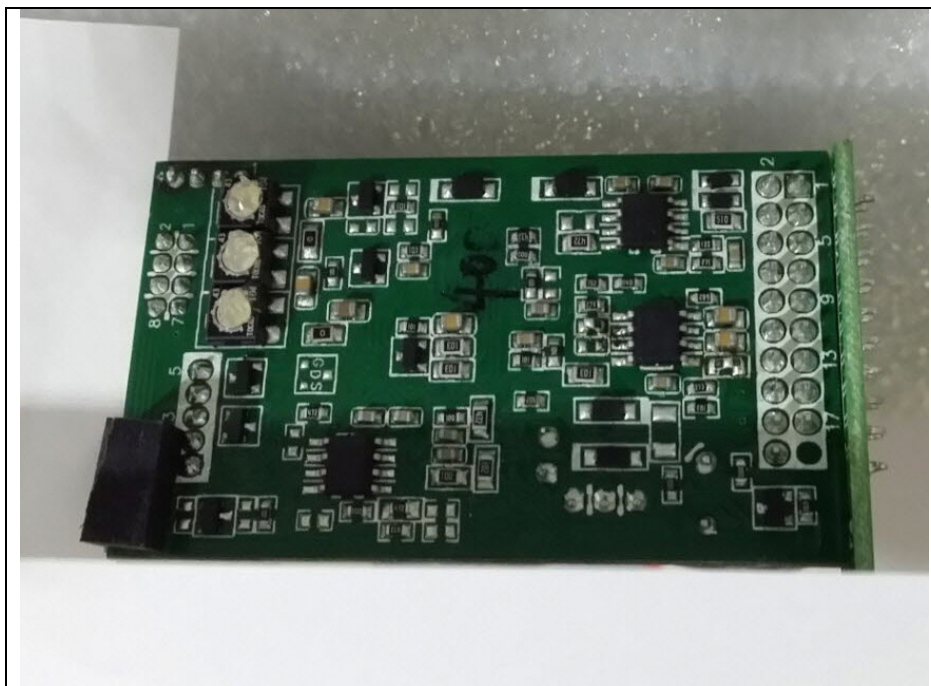


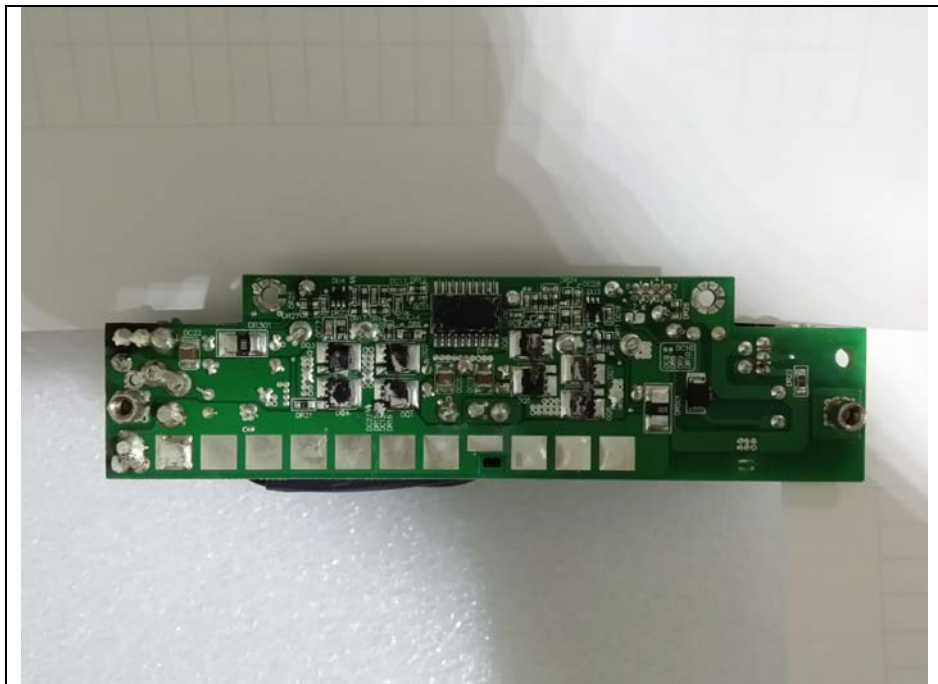
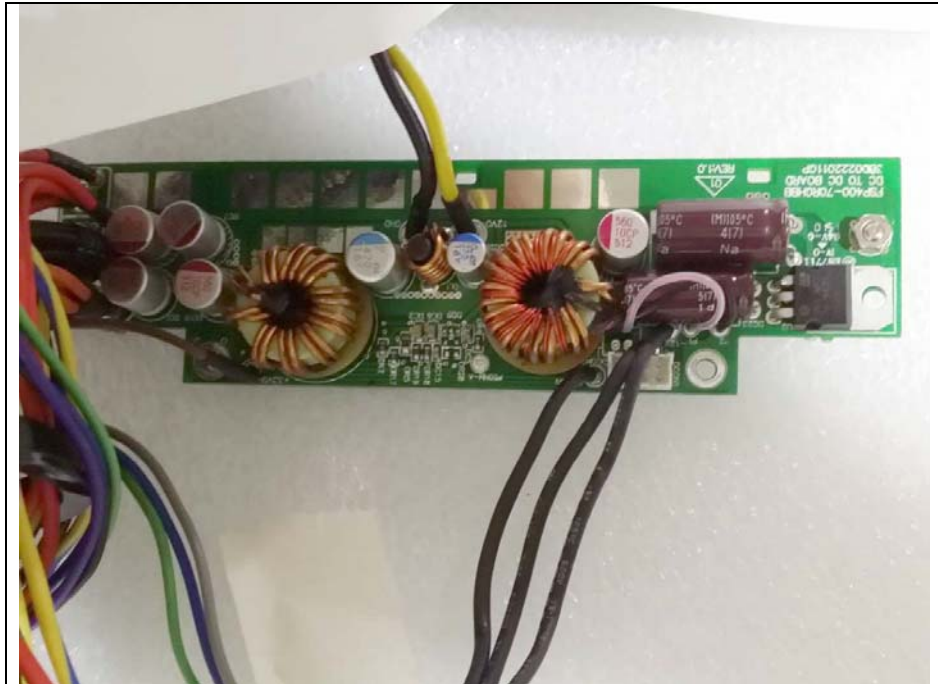


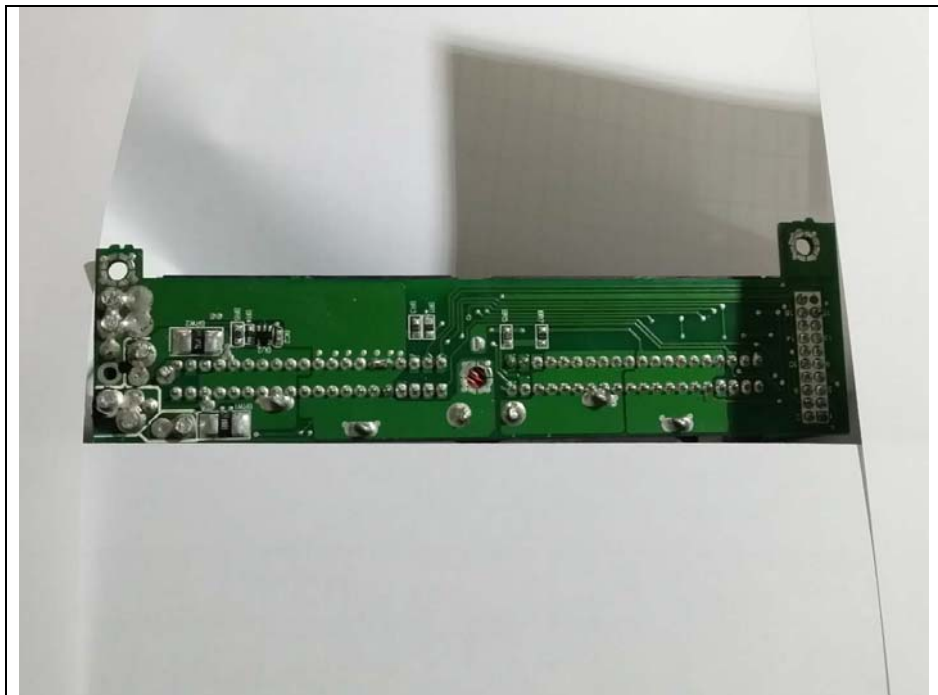
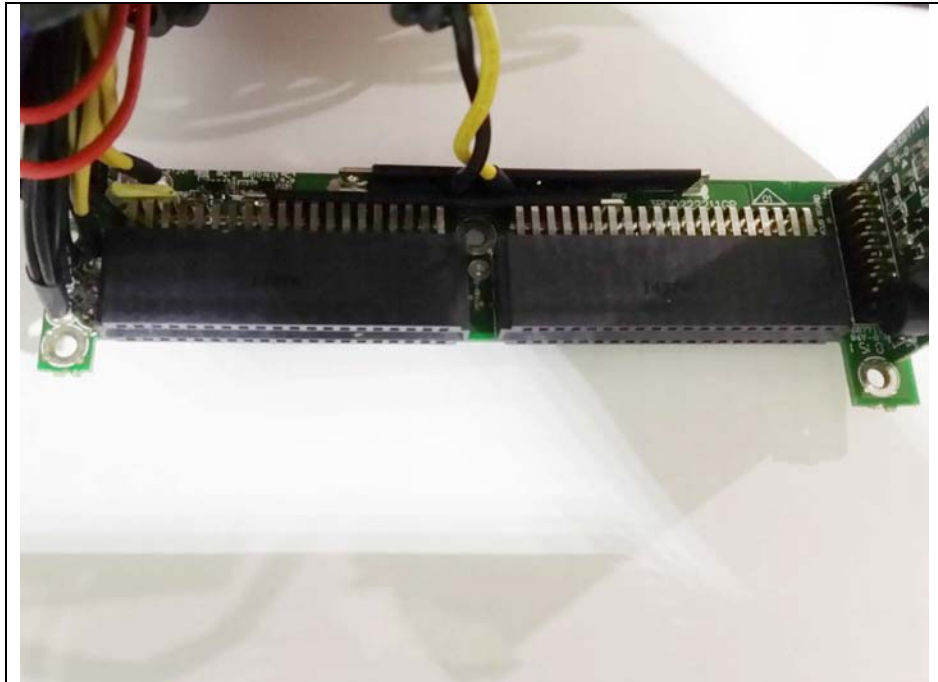
SMPS(Whole)











SMPS(2 EA)



