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EMC TEST REPORT

Dates of Tests: April 22 - 26, 2019
 Test Report S/N: LR500122304C
 Test Site : LTA Co., Ltd.

Model No.

QND-6032R

APPLICANT

Hanwha Vision Co., Ltd

Equipment Name : NETWORK CAMERA
Manufacturer : Hanwha Vision Co., Ltd
Model name : QND-6032R
Additional Model name : QND-6022R, QND-6012R, QND-6012R1, QND-6022R1,
 QND-6032R1
Test Device Serial No.: : Identification
Directive : Electromagnetic Compatibility Directive 2014/30/EU,
 Regulations 2016/1091
Rule Part(s) : EN 55032:2015/A11:2020
 EN 50130-4:2011
 EN 61000-3-3:2013
 EN 61000-3-2:2014
Data of reissue : April 13,2023

This test report is issued under the authority of:

The test was supervised by:

Young Kyu Shin, Technical Manager

Jong chae Kim, Test Engineer

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 TESTING NVLAP LAB CODE 200723-0

Revision	Date of issue	Test report No.	Description
0	26.04.2019	LR500121904AZ	Initial
1	10.08.2021	LR500122108E	Rule Update, Delete China Factory, Add Additional Models (QND-6012R1, QND-6022R1, QND-6032R1),
2	13.04.2023	LR500122304C	Change company name and manufacturer name



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1. General information's

1-1 Test Performed

Company name : **LTA Co., Ltd**
 Address : 4, Songju-ro 236beon-gil, Yangji-myeon, Cheoin-gu, Yongin-si, Gyeonggi-do, 17159, Korea
 Web site : <http://www.ltalab.com>
 E-mail : chahn@ltalab.com
 Telephone : +82-31-323-6008
 Facsimile : +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the “General requirements for the competents of calibration and testing laboratory”.

1-2 Accredited agencies

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

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2019-09-30	ECT accredited Lab.
RRA	KOREA	KR0049	-	EMC accredited Lab.
FCC	U.S.A	649054	2021-04-11	FCC CAB
VCCI	JAPAN	C-4948,	2020-09-10	VCCI registration
		T-2416,	2020-09-10	
		R-4483(10 m),	2020-10-15	
		G-10847	2019-01-22	
IC	CANADA	5799A-2	2019-03-15	IC filing
KOLAS	KOREA	NO.551	2021-08-20	KOLAS accredited Lab.

2. Information's about test item

2-1 Client/ Manufacturer

Company name : Hanwha Vision Co., Ltd
 Address : 6, Pangyo-ro 319 Beon-gil, Bundang-gu, Seongnam-si, Gyeonggi-do, 13488,
 : KOREA
 Telephone / Facsimile : +82-31-723-5205 / +82-31-723-5108

Factory #1

Company name : HANWHA VISION VIETNAM COMPANY LIMITED
 Address : Lot O-2, Que Vo Industrial Zone extended area ,Nam Son commune, Bac Ninh
 city,Bac Ninh province, Vietnam

Factory #2

Company name : D-TECH CO.,LTD.
 Address : 173-25, Saneop-ro, Gwonseon-gu, Suwon-si, Gyeonggi-do, Korea
 (Suwon Industrial Complex)

2-2 Equipment Under Test (EUT)

Class : A
 Equipment Name : NETWORK CAMERA
 Model name : QND-6032R
 Additional Model name : QND-6022R, QND-6012R, QND-6012R1, QND-6022R1, QND-6032R1
 Additional Model is different only lens specification.
 Serial number : Identification
 Date of receipt : April 09, 2019
 EUT condition : Pre-production, not damaged
 Interface ports : DC IN, LAN, Alarm IN, Alarm OUT, Alarm Ground, Micro SD Card
 Video OUT Port is a management Port.
 Power rating : DC 12 V (Adapter), DC 48 V (POE)

2-3 Modification

-NONE

2-4 Model Specification

-NONE

2-5 Test conditions

Temp. / Humid. / Pressure : +(20 - 23) °C / (31 - 38) % R.H. / (100.0 – 100.1) kPa
 Tested Model : QND-6032R
 Test mode : REC mode (DC), REC mode (POE)
 Tested Voltage : AC 230 V, 50 Hz (Adapter, POE)

2-5 EUT

Equipment	Model No.	Serial No.	Manufacturer
NETWORK CAMERA	QND-6032R	N/A	Hanwha Vision Co., Ltd

2-6 Accessory / REC mode (DC)

Equipment	Model No.	Serial No.	Manufacturer
Alarm	N/A	N/A	N/A
Sensor	SPL-0030	N/A	SECOM
Notebook PC	TFG13	N/A	HANSUNG
Notebook PC Adapter	A13-040N3A	F186921708004182	Chicony
SD Card	KTJD8K9	N/A	N/A
NETWORK CAMERA Adapter	KSASB0241200200M2	N/A	Kuantech (Belhai) CO., Ltd

/ REC mode (POE)

Equipment	Model No.	Serial No.	Manufacturer
POE Injector	PSE305	N/A	Gigabit
Alarm	N/A	N/A	N/A
Sensor	SPL-0030	N/A	SECOM
Notebook PC	TFG13	N/A	HANSUNG
Notebook PC Adapter	A13-040N3A	F186921708004182	Chicony
SD Card	KTJD8K9	N/A	N/A

2-7 Cable List / REC mode (DC)

From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	DC IN	NETWORK CAMERA Adapter	DC OUT	1.2	NO	Plastic
	LAN	Notebook PC	LAN	3.0	NO	Plastic
	Alarm IN	Alarm	Alarm OUT	1.0	NO	Plastic
	Alarm OUT	Sensor	Sensor OUT	1.0	NO	Plastic
	Alarm Ground	Alarm	Alarm Ground	1.0	NO	Plastic
	Alarm Ground	Sensor	Sensor Ground	1.0	NO	Plastic
	SD Card	SD Card	-	-	-	-
Notebook PC	DC IN	Notebook PC Adapter	DC OUT	1.8	NO	Plastic

/ REC mode (POE)

From		To		Length (m)	Shielding	
Type	I/O Port	Type	I/O Port		Cable	backshell
EUT	DC IN	POE Injector	DC OUT	1.2	NO	Plastic
	LAN	Notebook PC	LAN	3.0	NO	Plastic
	Alarm IN	Alarm	Alarm OUT	1.0	NO	Plastic
	Alarm OUT	Sensor	Sensor OUT	1.0	NO	Plastic
	Alarm Ground	Alarm	Alarm Ground	1.0	NO	Plastic
	Alarm Ground	Sensor	Sensor Ground	1.0	NO	Plastic
	SD Card	SD Card	-	-	-	-
Notebook PC	LAN	POE Injector	Data/IN	1.5	NO	Plastic
	DC IN	Notebook PC Adapter	DC OUT	1.8	NO	Plastic

3. Test Report

3.1 Summary of tests

Parameter	Applied Standard	Status
I. Emission		
Radiated Emission	EN 55032:2012/AC2013	C
Conducted Emission	EN 55032:2012/AC2013	C
Harmonic Current Emission	EN 61000-3-2:2014	C
Voltage Fluctuations and Flicker	EN 61000-3-3:2013	C
II. Immunity		
Electrostatic Discharge	EN 61000-4-2:2009	C
RF Electromagnetic field	EN 61000-4-3:2006/A1:2008/A2:2010	C
Fast Transients Common mode	EN 61000-4-4:2012	C
Surges, line to line and line to ground	EN 61000-4-5:2014/A1:2017	C
RF common mode	EN 61000-4-6:2014/AC:2015	C
Voltage dips and Interruptions	EN 61000-4-11:2004/A1:2017	C
Main supply voltage variations	EN 50130-4:2011/A1:2014	C

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

Note 2: The data in this test report are traceable to the national or international standards.

Note 3: We did not test EN61000-3-2 (Harmonic current emissions) for the QND-6032R because equipment whose rated power is less or equal 75W don't need to be tested.

3.2 EMISSION

3.2.1 Conducted emissions

Definition:

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

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

Measurement Frequency range	: 150 kHz – 30 MHz
Test method	: EN 55032:2012/AC2013
Measurement RBW	: 9 kHz
Test mode	: REC mode (DC), REC mode (POE)
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

A sample calculation:

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

Emission Level= meter reading + COR.F

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

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	79 dBuV	66 dBuV
(0.5 – 30) MHz	73 dBuV	60 dBuV

Note: The limits will decrease with the frequency logarithmically within 0.15MHz to 0.5MHz

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

Frequency Range	Quasi-peak	Average
(0.15 – 0.5) MHz	(66 – 56) dBuV	(56 - 46) dBuV
(0.5 – 5) MHz	56 dBuV	46 dBuV
(5 – 30) MHz	60 dBuV	50 dBuV

Note: The limits will decrease with the frequency logarithmically within 0.15 MHz to 0.5 MHz

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

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

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

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

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

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

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

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

Conducted emissions (LINE) / REC mode (DC)



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EUT /Model No. : QND-6032R

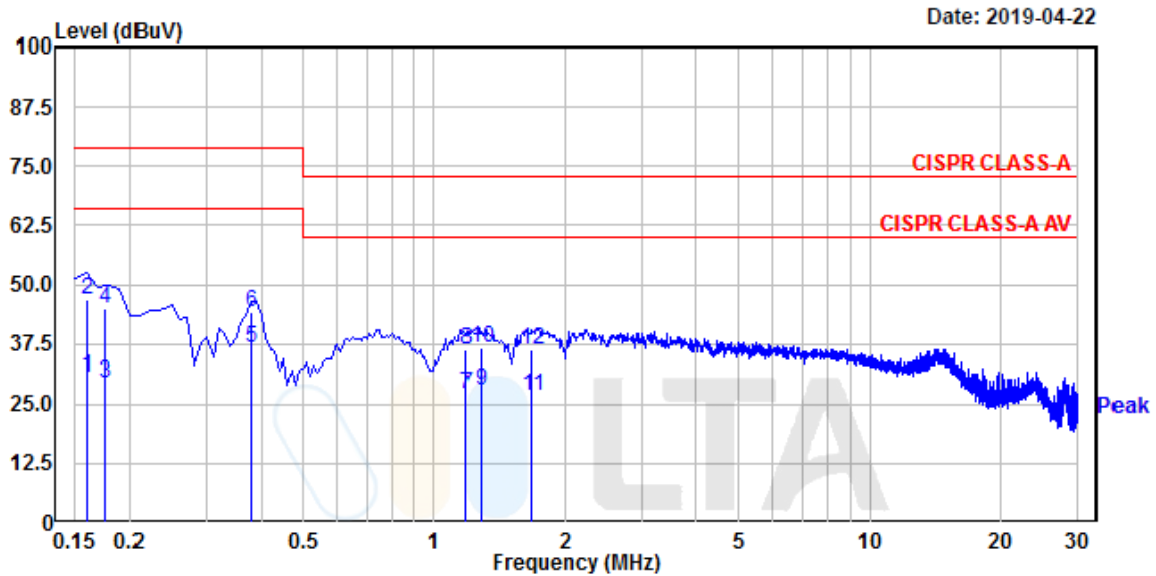
Phase : LINE

Test Mode : REC mode (DC)

Test Power : 230 / 50

Temp./ Humi. : 21°C / 35% R.H.

Test Engineer : PARK J H



Trace: 1

Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
0.160	27.32	11.28	19.43	46.75	30.71	79.00	66.00	32.25	35.29
0.175	25.65	10.11	19.43	45.08	29.54	79.00	66.00	33.92	36.46
0.381	24.62	17.07	19.46	44.08	36.53	79.00	66.00	34.92	29.47
1.181	16.90	7.75	19.51	36.41	27.26	73.00	60.00	36.59	32.74
1.274	17.03	8.37	19.51	36.54	27.88	73.00	60.00	36.46	32.12
1.670	16.75	7.24	19.52	36.27	26.76	73.00	60.00	36.73	33.24

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

Conducted emissions (NEUTRAL) / REC mode (DC)



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EUT /Model No. : QND-6032R

Phase : NEUTRAL

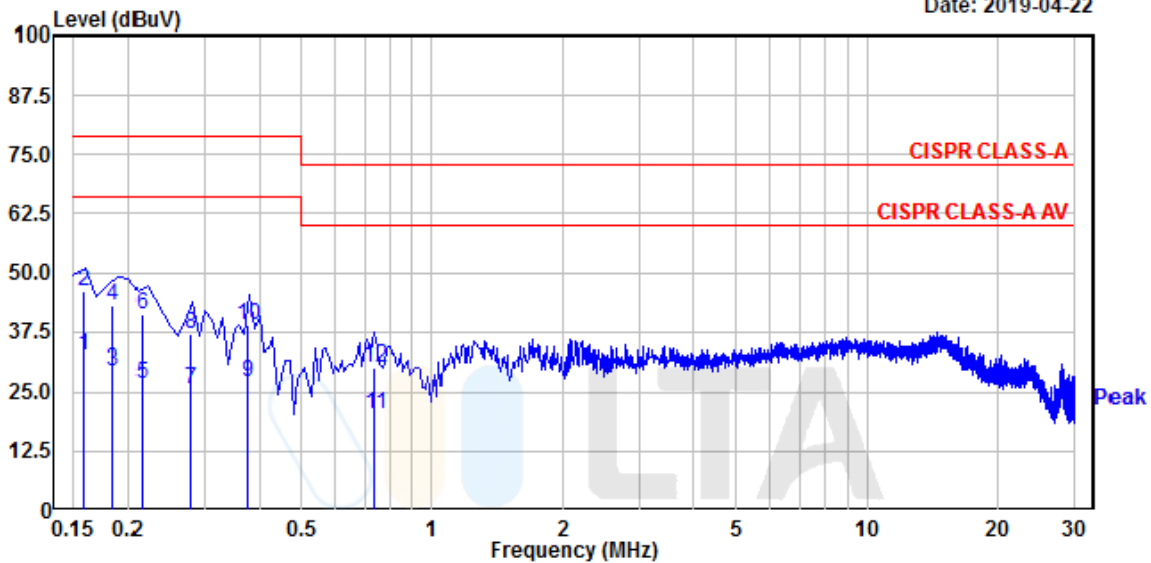
Test Mode : REC mode (DC)

Test Power : 230 / 50

Temp./ Humi. : 21'C / 35% R.H.

Test Engineer : PARK J H

Date: 2019-04-22



Trace: 1

Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.158	26.61	13.19	19.44	46.05	32.63	79.00	66.00	32.95	33.37
0.185	23.55	9.99	19.44	42.99	29.43	79.00	66.00	36.01	36.57
0.216	21.56	7.19	19.44	41.00	26.63	79.00	66.00	38.00	39.37
0.277	17.40	6.17	19.46	36.86	25.63	79.00	66.00	42.14	40.37
0.375	19.52	7.72	19.46	38.98	27.18	79.00	66.00	40.02	38.82
0.740	10.57	0.94	19.47	30.04	20.41	73.00	60.00	42.96	39.59

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

Conducted emissions (TEL_100 M) / REC mode (DC)



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Tel:+82-31-3236008,9
Fax:+82-31-3236010

EUT /Model No. : QND-6032R

Phase : TEL_100M

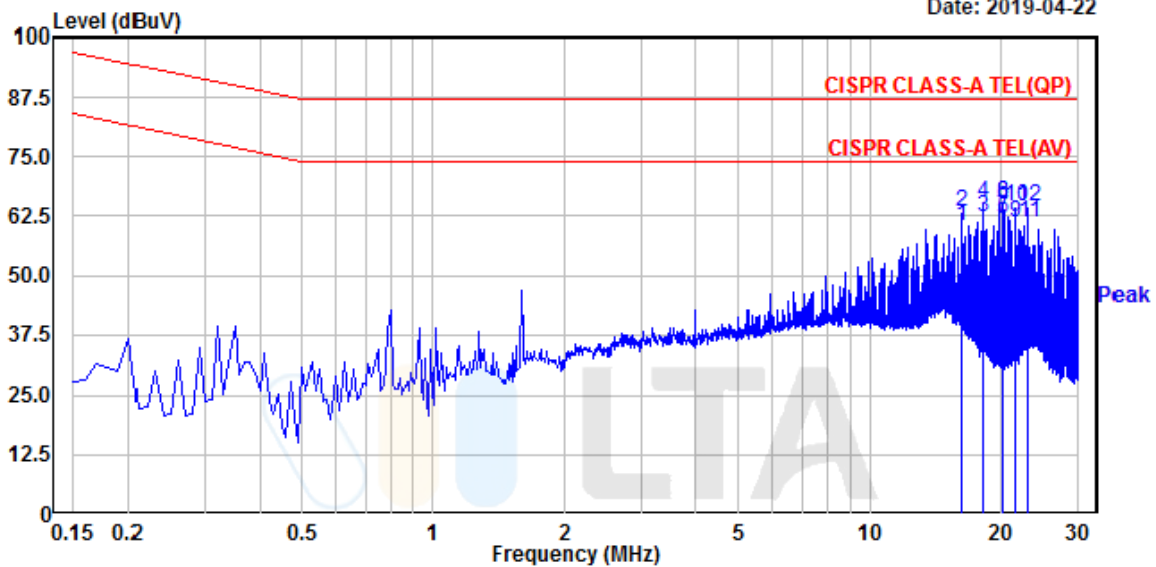
Test Mode : REC mode (DC)

Test Power : 230 / 50

Temp./ Humi. : 22'C / 36% R.H.

Test Engineer : PARK J H

Date: 2019-04-22



Trace: 1									
Freq	RD	RD	C.F	Result	Result	Limit	Limit	Margin	Margin
MHz	QP	AV	dB	QP	AV	QP	AV	QP	AV
	dBuV	dBuV		dBuV	dBuV	dBuV	dBuV	dB	dB
16.229	43.54	40.61	19.76	63.30	60.37	87.00	74.00	23.70	13.63
18.243	45.31	42.27	19.81	65.12	62.08	87.00	74.00	21.88	11.92
20.257	45.34	42.19	19.88	65.22	62.07	87.00	74.00	21.78	11.93
20.258	45.40	42.28	19.88	65.28	62.16	87.00	74.00	21.72	11.84
21.662	44.77	41.38	19.93	64.70	61.31	87.00	74.00	22.30	12.69
23.128	44.51	41.02	19.97	64.48	60.99	87.00	74.00	22.52	13.01

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

Conducted emissions (TEL_100 M) / REC mode (POE)



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EUT /Model No. : QND-6032R

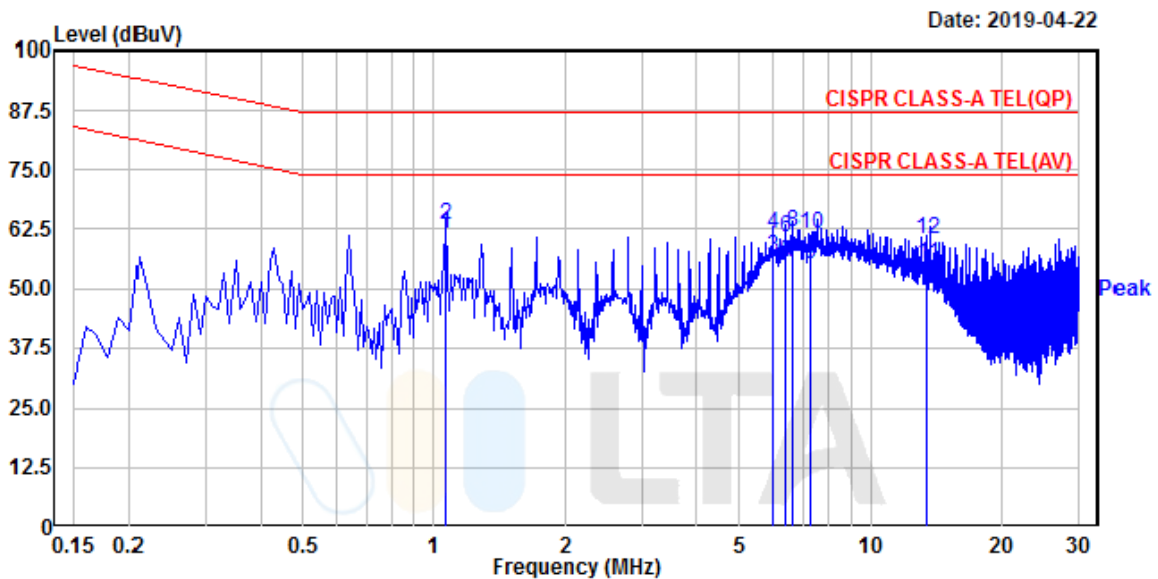
Phase : TEL_100M

Test Mode : REC mode (POE)

Test Power : 230 / 50

Temp./ Humi. : 22'C / 36% R.H.

Test Engineer : PARK J H



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
1.070	43.98	42.21	19.43	63.41	61.64	87.00	74.00	23.59	12.36
5.989	41.87	37.27	19.49	61.36	56.76	87.00	74.00	25.64	17.24
6.419	41.41	36.15	19.50	60.91	55.65	87.00	74.00	26.09	18.35
6.632	42.48	35.99	19.52	62.00	55.51	87.00	74.00	25.00	18.49
7.276	42.05	35.74	19.54	61.59	55.28	87.00	74.00	25.41	18.72
13.480	40.68	35.27	19.68	60.36	54.95	87.00	74.00	26.64	19.05

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

3.2.2 Radiated Emission

Definition:

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

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

Test method	: EN 55032:2012/AC2013
Measuring Distance	: 10 m for below 1 GHz / 3 m for above 1 GHz
Measurement Frequency range	: 30 MHz – 6 000 MHz
Measurement RBW	: 120 kHz @ 10 m / 1 MHz @ 3 m
Test mode	: REC mode (DC), REC mode (POE)
Result	: Complies

Measurement Data:

- Refer to the Next page (Maximum emission configuration)

- The highest internal source of an EUT is higher than 108 MHz, the measurement shall be made up to 6 GHz.

(The highest internal source of an EUT : higher than 108 MHz)

A sample calculation:

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

Emission Level= meter reading + COR.F

Limit of 10 m for below 1 GHz

CLASS A

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

CLASS B

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

Limit of 3m for above 1 GHz

CLASS A

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

CLASS B

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

Radiated Emission (Below 1 GHz) / V _ REC mode (DC)



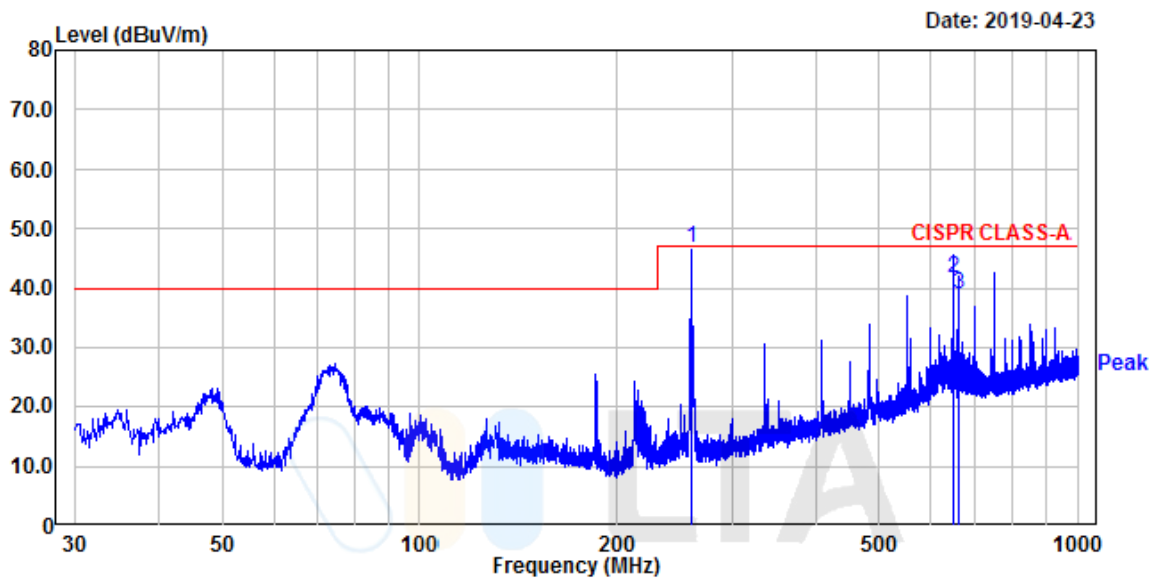
4, Songjuro 236Beon-gil, yanggi-myeon,
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www.ltalab.com

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(DC)

Tested by: PARK J H



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBuV/m	dBuV/m	dB	cm	deg	
259.89	59.20	-12.51	46.69	47.00	0.31	100	150	vertical
650.07	45.19	-3.46	41.73	47.00	5.27	282	351	vertical
660.02	42.15	-3.32	38.83	47.00	8.17	385	265	vertical

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

Radiated Emission (Below 1 GHz) / H _ REC mode (DC)



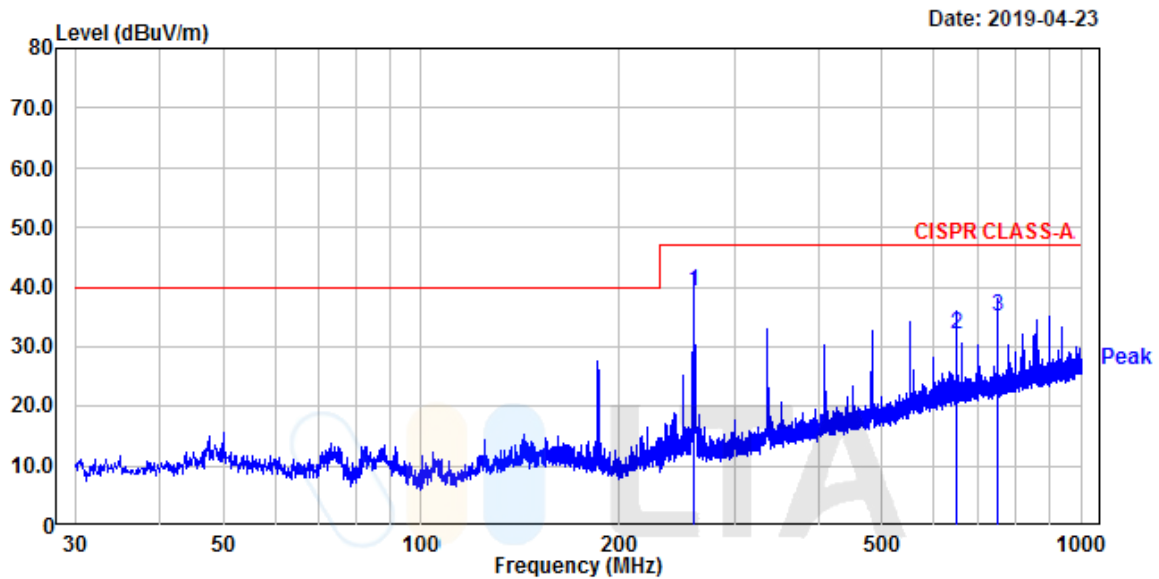
4, Songjuro 236Beon-gil, yanggi-myeon,
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www.ltalab.com

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(DC)

Tested by: PARK J H



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBUV/m	dBUV/m	dB	cm	deg	
259.89	51.86	-12.51	39.35	47.00	7.65	395	51	horizontal
650.07	35.47	-3.46	32.01	47.00	14.99	374	125	horizontal
749.98	36.85	-1.81	35.04	47.00	11.96	386	114	horizontal

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

Radiated Emission (Below 1 GHz) / V _ REC mode (POE)



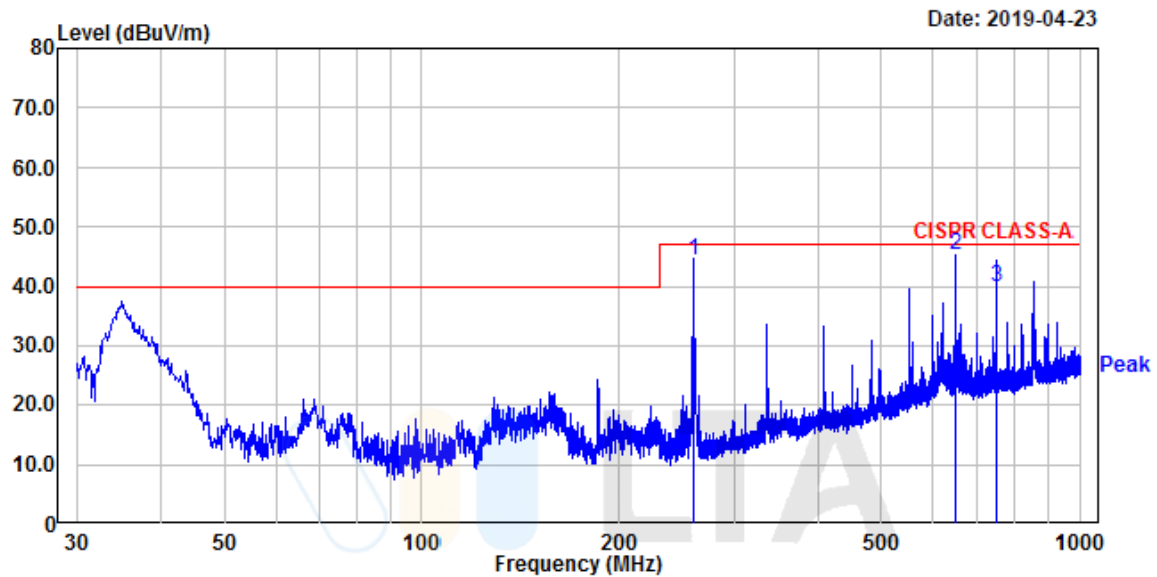
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www.ltalab.com

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(POE)

Tested by: PARK J H



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBuV/m	dBuV/m	dB	cm	deg	
259.87	56.80	-12.51	44.29	47.00	2.71	100	112	vertical
649.99	48.91	-3.48	45.43	47.00	1.57	268	359	vertical
750.00	41.71	-1.81	39.90	47.00	7.10	137	351	vertical

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

Radiated Emission (Below 1 GHz) / H _ REC mode (POE)



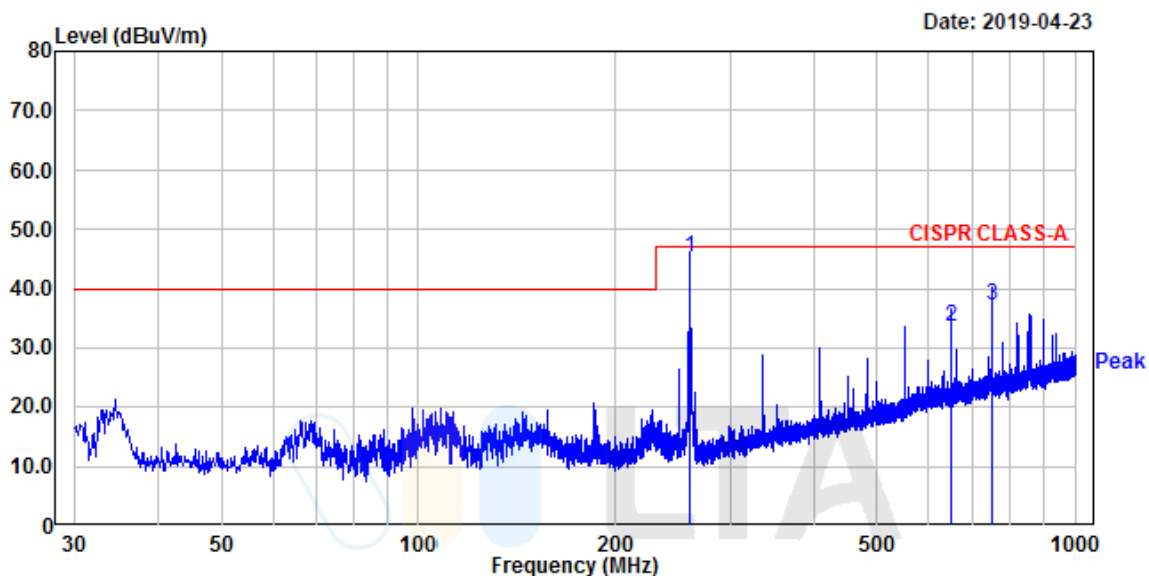
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Tel : +82-31-3236008,9
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www.ltalab.com

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(POE)

Tested by: PARK J H



Freq	Reading	C.F	Result	Limit	Margin	Height	Angle	Polarity
MHz	dBuV	dB	QP dBUV/m	dBUV/m	dB	cm	deg	
259.89	57.90	-12.51	45.39	47.00	1.61	341	354	horizontal
650.07	36.94	-3.46	33.48	47.00	13.52	384	24	horizontal
749.98	38.83	-1.81	37.02	47.00	9.98	374	131	horizontal

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

Radiated Emission / REC mode (DC)

(Above 1 GHz) / H

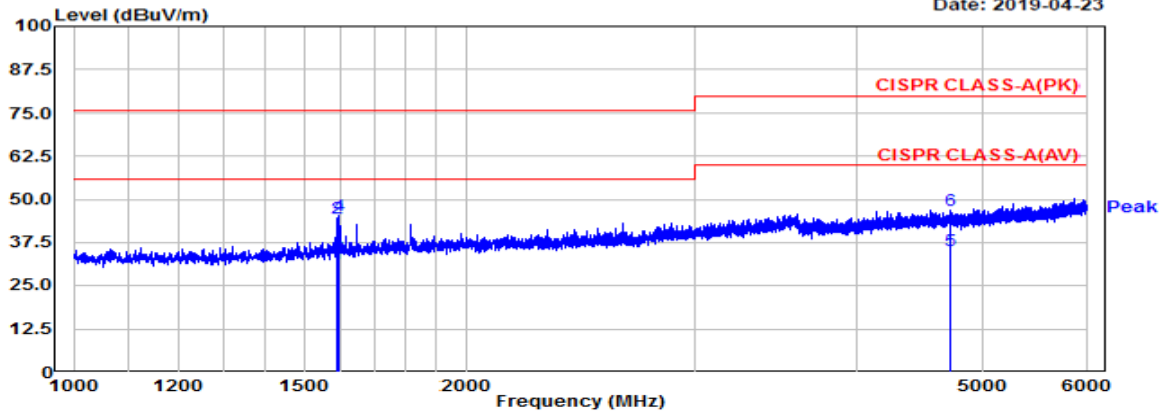
EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(DC)

Tested by: PARK J H

Date: 2019-04-23



(Above 1 GHz) / V

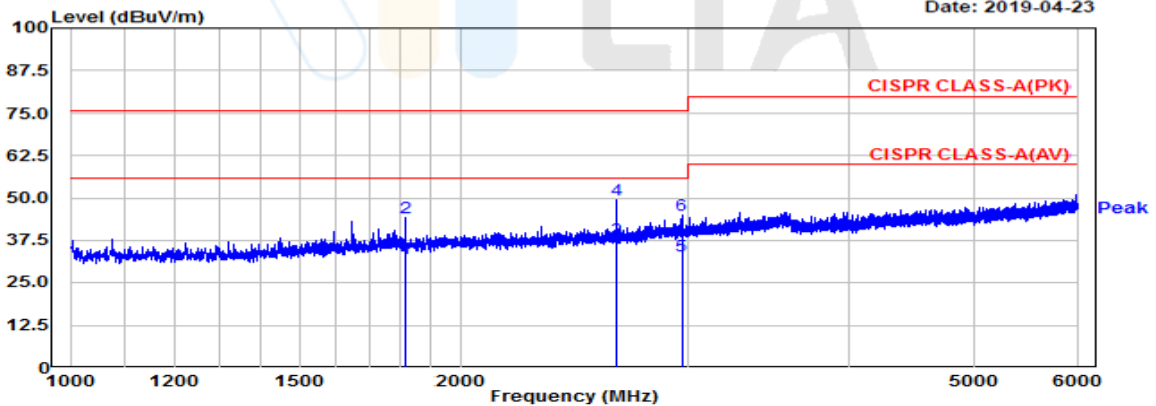
EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(DC)

Tested by: PARK J H

Date: 2019-04-23



Manufacture : Hanwha Techwin (Tianjin) Co., Ltd.

Test Date

Temp.:
[°C]Humidity:
[%]Distance
(m)

Model : QND-6032R

2019-04-23

23

31

3.8

TEST mode : REC mode(DC)

Freq.(MHz)	Reading(PK)	Reading(AV)	C.F	Result(PK)	Result(AV)	Limit(PK)	Limit(AV)	Margin(PK)	Margin(AV)	Height	Angle	Polarity
MHz	dBuV	dBuV	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	cm	deg	Hor/Ver
1592.50	49.7	36.7	-3.14	46.53	33.53	76.0	56.0	29.47	22.47	100	87	H
1598.75	50.4	38.4	-3.08	47.27	35.27	76.0	56.0	28.73	20.73	100	15	H
4726.25	36.7	24.7	12.31	48.98	36.98	80.0	60.0	31.02	23.02	100	340	H
1814.38	47.4	35.4	-1.19	46.16	34.16	76.0	56.0	29.84	21.84	100	117	V
2640.00	48.8	36.8	2.87	51.62	39.62	76.0	56.0	24.38	16.38	100	278	V
2969.38	42.4	30.4	4.55	46.93	34.93	76.0	56.0	29.07	21.07	100	291	V

Radiated Emission / REC mode (POE)

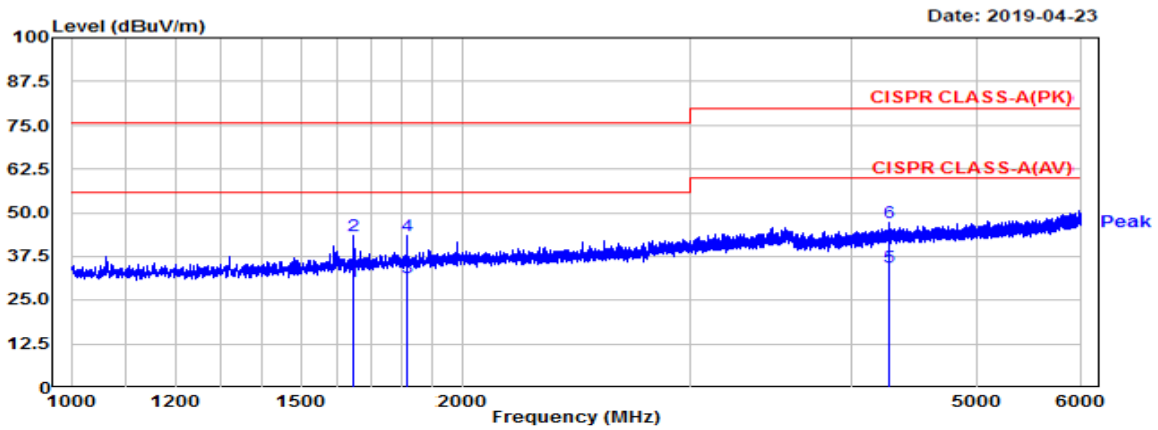
(Above 1 GHz) / H

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(POE)

Tested by: PARK J H



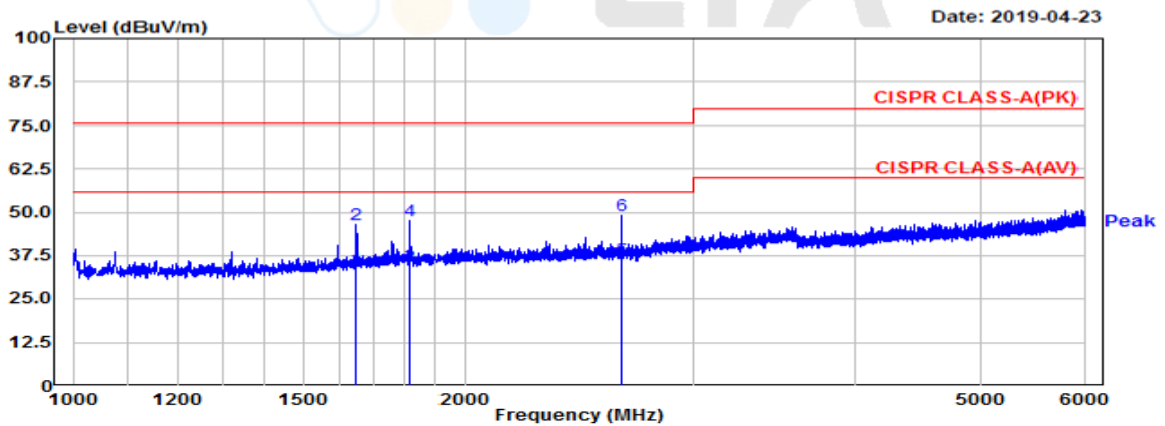
(Above 1 GHz) / V

EUT/Model No.: QND-6032R

Temp/Humi: 23 / 31

Test Mode : REC mode(POE)

Tested by: PARK J H



Manufacture : Hanwha Techwin (Tianjin) Co., Ltd.

Test Date

Temp.:
[°C]Humidity:
[%]Distance
(m)

Model : QND-6032R

2019-04-23

23

31

3.8

TEST mode : REC mode(POE)

Freq.(MHz)	Reading(PK)	Reading(AV)	C.F	Result(PK)	Result(AV)	Limit(PK)	Limit(AV)	Margin(PK)	Margin(AV)	Height	Angle	Polarity
MHz	dBuV	dBuV	dB	dBuV/m	dBuV/m	dBuV/m	dBuV/m	dB	dB	cm	deg	Hor/Ver
1650.00	48.0	35.0	-2.64	45.40	32.40	76.0	56.0	30.60	23.60	100	58	H
1815.00	46.6	34.6	-1.19	45.44	33.44	76.0	56.0	30.56	22.56	100	152	H
4278.75	38.4	25.4	10.79	49.21	36.21	80.0	60.0	30.79	23.79	100	248	H
1650.00	51.3	38.3	-2.64	48.62	35.62	76.0	56.0	27.38	20.38	100	334	V
1814.38	50.6	37.6	-1.19	49.43	36.43	76.0	56.0	26.57	19.57	100	93	V
2640.00	48.3	35.3	2.87	51.13	38.13	76.0	56.0	24.87	17.87	100	334	V

3.2.3 Harmonic Current (AC power input port)

Definition:

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

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

Test method	: EN 61000-3-2:2014
Test mode	: REC mode (DC)
Rated power	: 2.920 W
Result	: Not Applicable

Measurement Data:

- We did not test EN61000-3-2 (Harmonic current emissions) for the QND-6032R because equipment whose rated power is less or equal 75W don't need to be tested.



Harmonic Current (AC power input port) / REC mode (DC)

25th April 2019 - 10:38:23		Page 1/1	IECSoft v2_5a
		IEC61000-3-2:2014 Fluctuating Harmonics	
Instrument Details			
Instrument Model	PPA5511		
Serial Number	162-04957		
Firmware Version	2.168		
N4L Calibration Date	18th September 2017		
Instrument Version	Standard		
Test Settings			
Class	Class A		
Mode	Measured		
Equipment Under Test			
Brand	Hanwha Techwin Co., Ltd.		
Model	QND-6032R		
Serial	N/A		
Impedance Network ID	N/A		
Test Conditions			
	User Entered	Measured	
Rated Voltage	N/A	230.727V	
Rated Current	N/A	38.475mA	
Rated Frequency	N/A	50.000Hz	
Rated Power	N/A	2.920W	
Additional Test Information			
Measured Power Factor	0.329		
Max Current THD	385.03%		
Max THC	46.960mA		
Max Power	2.959W		
Max F.Current	13.562mA		
Average F.Current	12.707mA		
Minimum Current	100A		
Test Duration	2.5 minutes		
Additional Test Details			
Operator	PARK J H		
Lab Name	N/A		
Location	N/A		
Notes			
Signature			
Results		Test - N/A. Rated Power < 75W	

Test not applicable

With the exception of lighting equipment section 7 of the IEC61000-3-2:2014 standard declares that no Harmonic current limits are specified for equipment with a rated power of

3.2.4 Voltage Variation and Flicking (AC power input port)

Definition:

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

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

Test method : EN 61000-3-3:2013

Test mode : REC mode (DC)

Result : **Complies**

Measurement Data:

- Refer to the Next page



Voltage Variation and Flicking (AC power input port) / REC mode (DC)

25th April 2019 - 13:12:48		Page 1/2	IECSOft v2_5a
		IEC61000-3-3:2013 Ed.3.0 Flickermeter	
			
Instrument Details			
Instrument Model	PPA5511		
Serial Number	162-04957		
Firmware Version	2.168		
N4L Calibration Date	18th September 2017		
Instrument Version	Standard		
Test Settings			
Class	Voltage		
Mode	Normal (4%)		
Minimum Current	10A		
PST	10.00 minutes		
PLT	12 PSTs		
Equipment Under Test			
Brand	Hanwha Techwin Co., Ltd.		
Model	QND-6032R		
Serial	N/A		
Impedance Network ID	N/A		
Test Conditions			
	User Entered	Measured	
Rated Voltage	N/A	230.723V	
Rated Current	N/A	N/A	
Rated Frequency	N/A	50.000Hz	
Rated Power	N/A	N/A	
D max	0.0671% (Limit: 4.0%)		
T max	0.0000 s (Limit: 0.5 s)		
DC max	0.0012% (Limit: 3.3%)		
Additional Test Details			
Operator	PARK J H		
Lab Name	N/A		
Location	N/A		
Notes			
Signature			
Results	Phase1: PASS		

25th April 2019 - 11:12:48		Ph:1 Page 2/2		IECSoft v2_5a				
IEC61000-3-3:2013 Ed.3.0 Flickermeter								
Instrument Details								
Instrument Model		PPA5511						
Instrument Serial		162-04957						
Instrument Firmware		2.168						
Equipment Under Test								
Brand		Hanwha Techwin Co., Ltd						
Model		QND-6032R						
Serial		N/A						
Flicker Test Results								
PST no.	Status	DC (%)	Dmax (%)	Tmax (s)	PST	PST Lim	PLT	PLT Lim
1	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
2	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
3	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
4	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
5	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
6	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
7	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
8	Phase1: PASS	0.001	0.06441	0	0.082	1.00	N/A	N/A
9	Phase1: PASS	0.001	0.06707	0	0.082	1.00	N/A	N/A
10	Phase1: PASS	0.001	0.06707	0	0.082	1.00	N/A	N/A
11	Phase1: PASS	0.001	0.06707	0	0.082	1.00	N/A	N/A
12	Phase1: PASS	0.001	0.06707	0	0.082	1.00	N/A	N/A



3.3 IMMUNITY

3.3.1 Electrostatic Discharge

Definition:

The test assesses the ability of the EUT to operate as intended in the event of an electrostatic discharge.

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

Test date	: 2019.04.25.
Test method	: EN 61000-4-2 :2009
Temperature / Humidity / Pressure	: 20 °C / 37 % R.H. / 100.0 kPa
Discharge Impedance	: (330 ±10%)Ω / (150 ±10%) pF
Type of Discharge (air discharge)	: ± 2kV, ± 4 kV, ± 8 kV
Type of Discharge (contact discharge)	: ± 6 kV
Number of discharges at each point	: 10 of each polarity
Discharge Repetition on Rate	: 1 / sec
Test mode	: REC mode (DC), REC mode (POE)
Result	: Complies

Measurement Data:

MODE : REC mode (DC)

1-1. Indirect Discharge

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

1-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure	Air	Complies	No reaction recognized
2	DC IN	Air	Complies	No reaction recognized
3	Alarm	Air	Complies	No reaction recognized
4	LAN	Air	Complies	No reaction recognized
5	Lens	Air	Complies	No reaction recognized

MODE : REC mode (POE)

2-1. Indirect Discharge

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

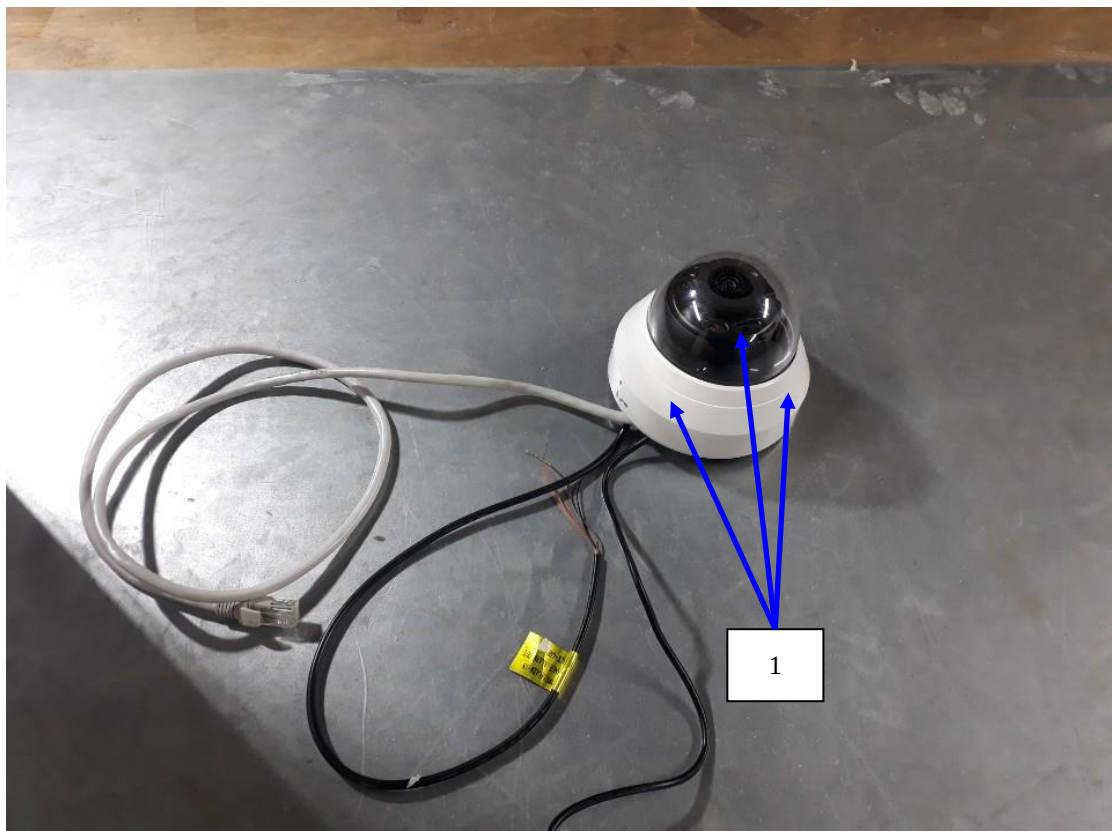
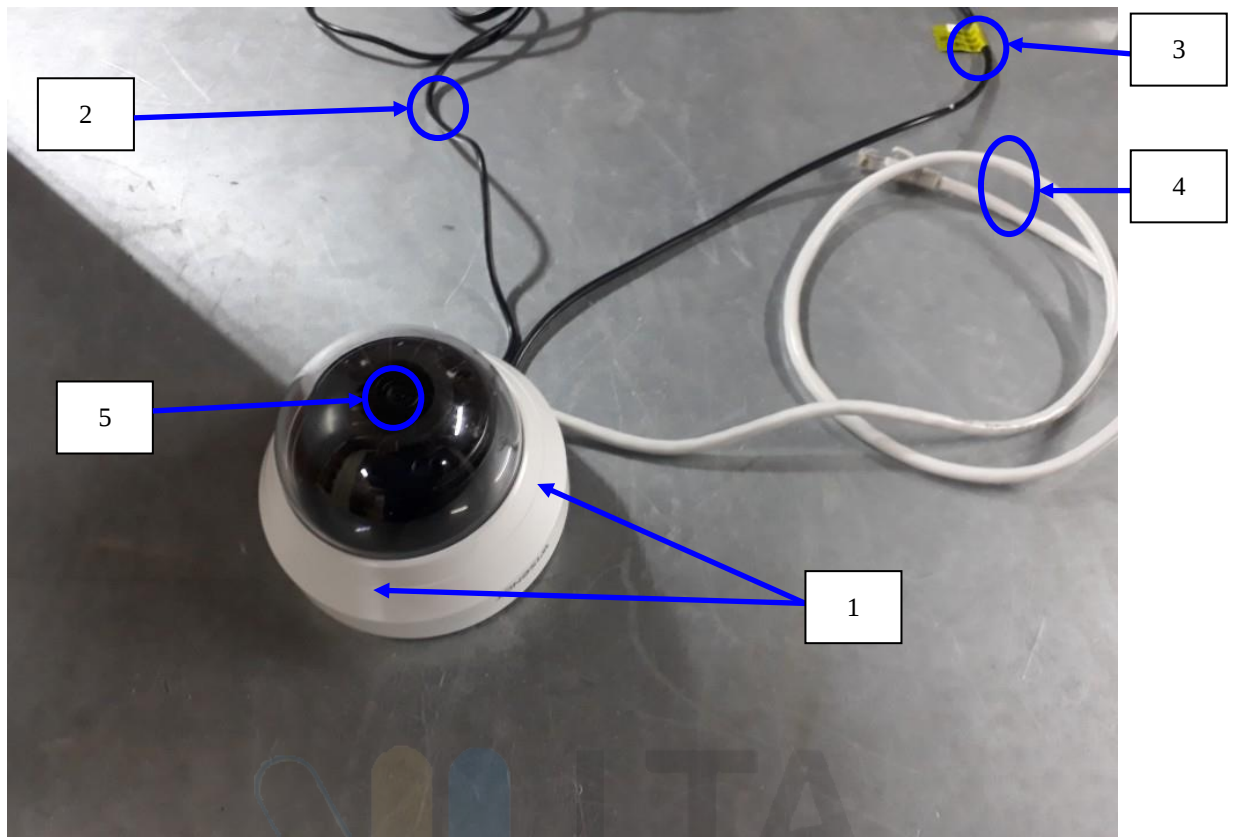
2-2. Direct Discharge

No.	Position	Kind of Discharge	Result	Remarks
1	Enclosure	Air	Complies	No reaction recognized
2	Alarm	Air	Complies	No reaction recognized
3	LAN	Air	Complies	No reaction recognized
4	Lens	Air	Complies	No reaction recognized

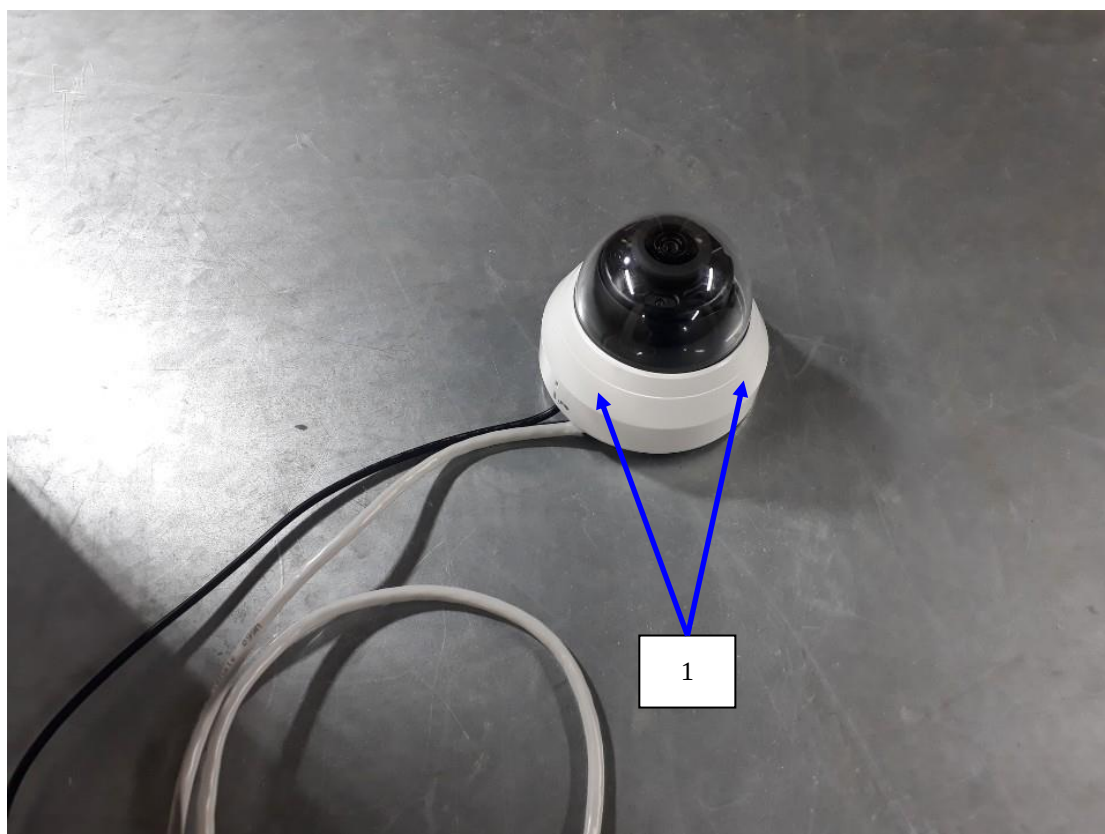
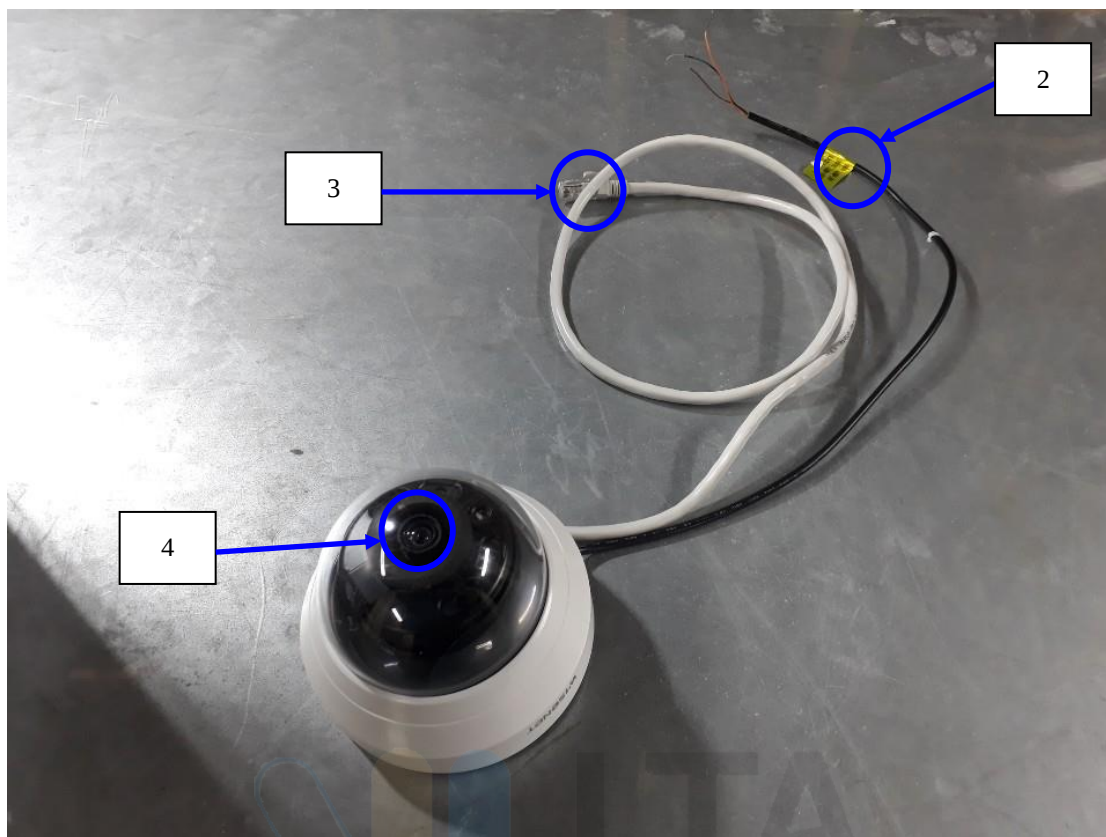
※ Results are complies in each test mode.



- ← Air discharge
← Contact discharge

ESD TEST POINT / REC mode (DC)

← Air discharge
← Contact discharge

ESD TEST POINT / REC mode (POE)

3.3.2 RF Electromagnetic Field

Definition:

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

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

Test date	:	2019.04.26.
Test method	:	EN 61000-4-3:2006/A1:2008/A2:2010
Temperature / Humidity / Pressure	:	21 °C / 38 % R.H. / 100.1 kPa
Frequency range	:	80 MHz to 2,700 MHz
Test level	:	10 V/m (measured unmodulated)
Amplitude Modulation	:	AM, 80 %, 1 kHz Sinusoidal PM, 1 Hz (0.5s ON : 0.5s OFF)
Step size	:	1 % of fundamental
Dwell Time	:	3 s
Test mode	:	REC mode (DC), REC mode (POE)
Result	:	Complies

Measurement Data:

MODE : REC mode (DC)

Port	Side	Result	Remarks
Horizontal	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized
Vertical	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized

MODE : REC mode (POE)

Port	Side	Result	Remarks
Horizontal	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized
Vertical	Front	Complies	No reaction recognized
	Left	Complies	No reaction recognized
	Rear	Complies	No reaction recognized
	Right	Complies	No reaction recognized

※ Results are complies in each test mode.



3.3.3 Electrical fast transients

Definition:

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

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

Test date : 2019.04.25.
 Test method : EN 61000-4-4:2012
 Temperature / Humidity / Pressure : 22 °C / 36 % R.H. / 100.0 kPa
 Cable length : > 3 m
 Test level : 2.0 kV (AC power input port)
 1.0 kV (Signal port)
 Polarity : Negative/ positive
 Repetition frequency : 100 kHz
 Test mode : REC mode (DC), REC mode (POE)
 Result : **Complies**

Measurement Data:

MODE : REC mode (DC)

Power Line	Test level	Result	Remarks
L – N	± 2 kV	Complies	No reaction recognized

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

MODE : REC mode (POE)

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

※ Results are complies in each test mode.

3.3.4 Surge

Definition:

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

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

Test date	:	2019.04.25.
Test method	:	EN 61000-4-5:2014/A1:2017
Temperature / Humidity / Pressure	:	23 °C / 36 % R.H. / 100.1 kPa
Test level	:	± 0.5 kV, ±1 kV (line to line) ± 0.5 kV, ± 1 kV, ± 2 kV (line to ground), ± 0.5 kV, ± 1 kV (signal line)
Polarity	:	Negative/ positive
Wave shape	:	1.2/ 50 µs pulse
Number of surges	:	5 (at each phase)
Test mode	:	REC mode (DC), REC mode (POE)
Result	:	Complies

Measurement Data:

MODE : REC mode (DC)

Phase	Line	level	Result	Remark
0°	Line(L) to line(N)	± 0.5, 1.0 kV	Complies	No reaction recognized
90°	Line(L) to line(N)	± 0.5, 1.0 kV	Complies	No reaction recognized
180°	Line(L) to line(N)	± 0.5, 1.0 kV	Complies	No reaction recognized
270°	Line(L) to line(N)	± 0.5, 1.0 kV	Complies	No reaction recognized

Signal Line	Test level	Result	Remarks
LAN	± 0.5, 1.0 kV	Complies	No reaction recognized

MODE : REC mode (POE)

Signal Line	Test level	Result	Remarks
LAN	± 0.5, 1.0 kV	Complies	No reaction recognized

※ Results are complies in each test mode.

3.3.5 Conducted disturbances, induced by radio-frequency fields

Definition:

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

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

Test date	:	2019.04.25.
Test method	:	EN 61000-4-6:2014/AC:2015
Temperature / Humidity / Pressure	:	21 °C / 36 % R.H. / 100.0 kPa
Frequency range	:	0.15MHz – 100 MHz
Test level	:	10 Vrms unmodulated
Amplitude Modulation	:	AM, 80 %, 1 kHz Sinusoidal PM, 1 Hz (0.5s ON : 0.5s OFF)
Step size	:	1 % of fundamental.
Test mode	:	REC mode (DC), REC mode (POE)
Result	:	Complies

Measurement Data:

MODE : REC mode (DC)

Power Port	Result	Remarks
Power	Complies	No reaction recognized

Signal Port	Result	Remarks
LAN	Complies	No reaction recognized

MODE : REC mode (POE)

Signal Port	Result	Remarks
LAN	Complies	No reaction recognized

※ Results are complies in each test mode.

3.3.6 Mains supply voltage dips, short interruptions

Definition:

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

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

Test date : 2019.04.25.
 Test method : EN 61000-4-11:2004/A1:2017
 Temperature / Humidity / Pressure : 22 °C / 37 % R.H. / 100.0 kPa
 Ut : 230 Vac
 Test mode : REC mode (DC)
 Result : **Complies**

Measurement Data:

MODE : REC mode (DC)

Test Level %Ut	Voltage droop and interruptions %Ut	Duration of Reduction (period)	Result	Remarks
80	20	250	Complies	No reaction recognized
70	30	25	Complies	No reaction recognized
40	60	10	Complies	No reaction recognized
0	100	250	Complies	Screen disconnected during the test. Automatic replay without user's control. After the test, EUT was operated normally.

3.3.7 Mains supply voltage variations

Definition:

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

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

Test date	:	2019.04.25.
Test method	:	EN 50130-4:2011/A1:2014
Temperature / Humidity / Pressure	:	22 °C / 37 % R.H. / 100.0 kPa
Supply Voltage maximum	:	$U_{nom} + 10 \%$
Supply Voltage minimum	:	$U_{nom} - 15 \%$
Ut	:	230 Vac
Test mode	:	REC mode (DC)
Result	:	Complies

Measurement Data:

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

2 Mains supply voltage variations

MODE : REC mode (DC) / 230 V, 50 Hz

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

APPENDIX A

TEST EQUIPMENT AND ANCILLARIES USED FOR TESTS



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

Conducted emissions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESR	Rohde & Schwarz	101499	2019.07.11	1 year
☒	Pulse Limiter	ESH3-Z2	Rohde & Schwarz	100710	2020.03.16	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	100378	2019.09.07	1 year
☐	LISN	ESH3-Z6	Rohde & Schwarz	101468	2019.09.07	1 year
☒	LISN(main)	ENV216	Rohde & Schwarz	100408	2019.10.10	1 year
☒	LISN(sub)	LT32C/10	AFJ	32031518210	2019.09.06	1 year
☒	TEST PROGRAM	e3_ce 20181212a (V9)	AUDIX	-	-	-
☒	ISN	ISN T800	TESEQ	27109	2019.09.12	1 year
☐	ISN	ENY81-CA6	Rohde & Schwarz	101565	2019.09.12	1 year
☐	CURRENT PROBE	EZ-17	Rohde & Schwarz	100508	2019.09.06	1 year

Radiated Emission – Below 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2019.09.06	1 year
☒	Amplifier (25 dB)	8447D	HP	2944A07684	2019.09.06	1 year
☒	BILOG Antenna	VULB9168	SCHWARZBECK	775	2020.03.16 (KOLAS)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Radiated Emission – Above 1 GHz

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	EMI TEST Receiver	ESU	Rohde & Schwarz	100092	2019.09.06	1 year
☒	Amplifier	8449B	HP	3008A00671	2019.09.06	1 year
☒	HORN ANTENNA	3115	ETS	114105	2019.11.03 (KOLAS)	2 year
☒	TEST PROGRAM	e3 20181212a (V9)	AUDIX	-	-	-

Harmonic Current / Voltage Variation and Flicking

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Precision Power Analyzer	PPA5511	Newtons4th Ltd	162-04957	2019.09.10	1 year
☒	Reference Impedance Network	ES4152	NF Corp.	9074424	2019.09.07	1 year

Electrostatic Discharge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	ESD Simulator	ESS-2000	NOISEKEN	8000C03241	2019.09.11	1 year
☒	ESD GUN	TC-815R	NOISEKEN	ESS0564361	2019.09.11	1 year

RF Electromagnetic Field

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal Generator	E4432B	Agilent	MY41310632	2020.03.16	1 year
☒	Power Meter	E4419B	Agilent	GB38410133	2020.03.16	1 year
☒	Power Sensor	E9300A	Agilent	MY41497992	2020.03.16	1 year
☒	Power Sensor	E9300A	Agilent	MY41497618	2020.03.16	1 year
☒	RF POWER AMPLIFIER	ITA0300KL-300	INFINITECH	0300KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA2000KL-120	INFINITECH	200KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA4500KL-70	INFINITECH	4500KL 1507 001	-	-
☒	RF POWER AMPLIFIER	ITA0750KL-300	INFINITECH	0750KL 1507 001	-	-
☒	Log.-Per.Antenna (80 MHz ~ 3 GHz)	K9128	RAPA	NONE	-	-

Electrical fast transients

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2019.09.06	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2019.09.06	1 year
☒	Capacitive Coupling Clamp	CCI	EMTEST	P1744207071	2019.09.06	1 year

Surge

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2019.09.06	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2019.09.06	1 year
☒	CDN	CNV 508T5	EMTEST	P1742204978	2019.09.07	1 year
☐	CDN	CNV 508N1	EMTEST	P1742204940	2019.09.07	1 year

Conducted disturbances, induced by radio-frequency fields

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Signal generator	SML03	R&S	103026/0013	2020.03.16	1 year
☒	POWER METER	NRVD	R&S	101689	2020.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100755	2020.03.16	1 year
☒	POWER Sensor	URV5-Z2	R&S	100756	2020.03.16	1 year
☒	RF Power Amplifier	FLL75A	FRANKONIA	1033	-	-
☒	EM INJECTION CLAMP	TSIC-23	F.C.C	529	2020.03.25	1 year
☐	CDN (M1)	TSCDN-M1-16A	F.C.C	07004	2020.03.16	1 year
☒	CDN (M2) (main)	TSCDN-M2-16A	F.C.C	07008	2019.09.06	1 year
☐	CDN (M2)	TSCDN-M2-16A	F.C.C	07009	2020.03.16	1 year
☐	CDN (M3)	TSCDN-M3-16A	F.C.C	07016	2020.03.16	1 year
☒	CDN (M3) (sub)	TSCDN-M3-16A	F.C.C	07017	2019.09.06	1 year

Mains supply voltage dips, short interruptions

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2019.09.06	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2019.09.06	1 year

Mains supply voltage variations

	Item	Model Name	Manufacturer	Serial No.	Next Cal.	Interval
☒	Compact Generator	Compact NX	EMTEST	P1725200196	2019.09.06	1 year
☒	AC Power Source	Variac NX	EMTEST	P1745207276	2019.09.06	1 year

APPENDIX B

PERFORMANCE CRITERIA



Performance criteria

The variety and the diversity of the apparatus within the scope of this document makes it difficult to define precise criteria for the evaluation of the immunity test results.

If as a result of the application of the tests defined in this standard, the apparatus becomes dangerous or unsafe then the apparatus shall be deemed to have failed the test.

A functional description and a definition of performance by the manufacture and noted in the test report, based on the following criteria:

Electrostatic discharge

There shall be no damage, malfunction or change of status due to the conditioning.

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

Radiated electromagnetic fields

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at a field strength of 3 V/m.

For components of CCTV systems, where the status is monitored by observing the TV picture, then deterioration of the picture is allowed at 10 V/m, providing.

(a) there is no permanent damage or change to the EUT

(e.g. no corruption of memory or changes to programmable setting etc.)

(b) at 3 V/m, any deterioration of the picture is so minor that the system could still be used; and

(c) there is no observable deterioration of the picture at 1 V/m.

The EUT shall meet the acceptance criteria for the functional test (see Clause 6), after the conditioning.

Fast transient burst / slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

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

Slow high energy voltage surge

There shall be no damage, malfunction or change of status due to the conditioning.

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

Conducted RF immunity

There shall be no damage, malfunction or change of status due to the conditioning.

Flickering of an indicator during the conditioning is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change, and no such flickering of indicators occurs at $U_0 = 130 \text{ dB}\mu\text{V}$.

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

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.

It is permitted to use ancillary equipment (e.g. A UPS) to meet the requirements of this clause. This shall be detailed in the test report and the manufacturer's installation manual.

Signaling a mains fault during the 100 % voltage reduction test is permitted.

Mains supply voltage variations

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

APPENDIX C

PHOTOGRAPHS



Conducted emission (Maximum emission configuration) / REC mode (DC)



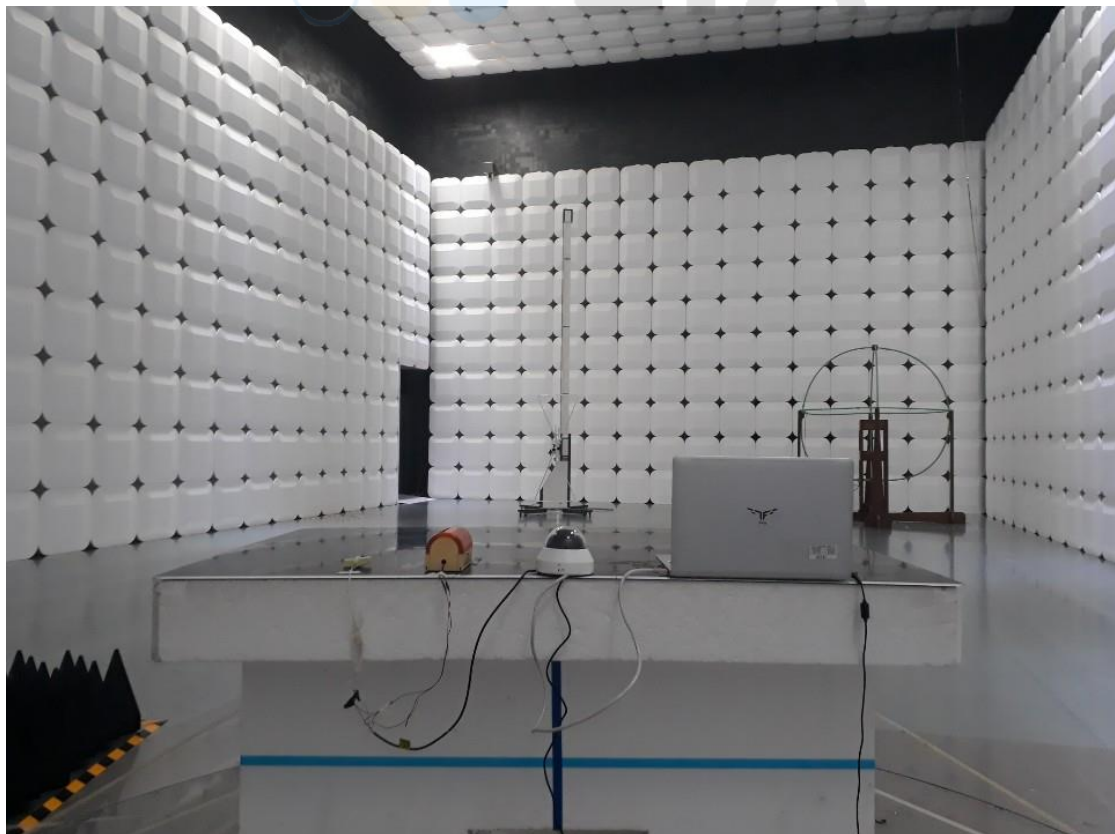
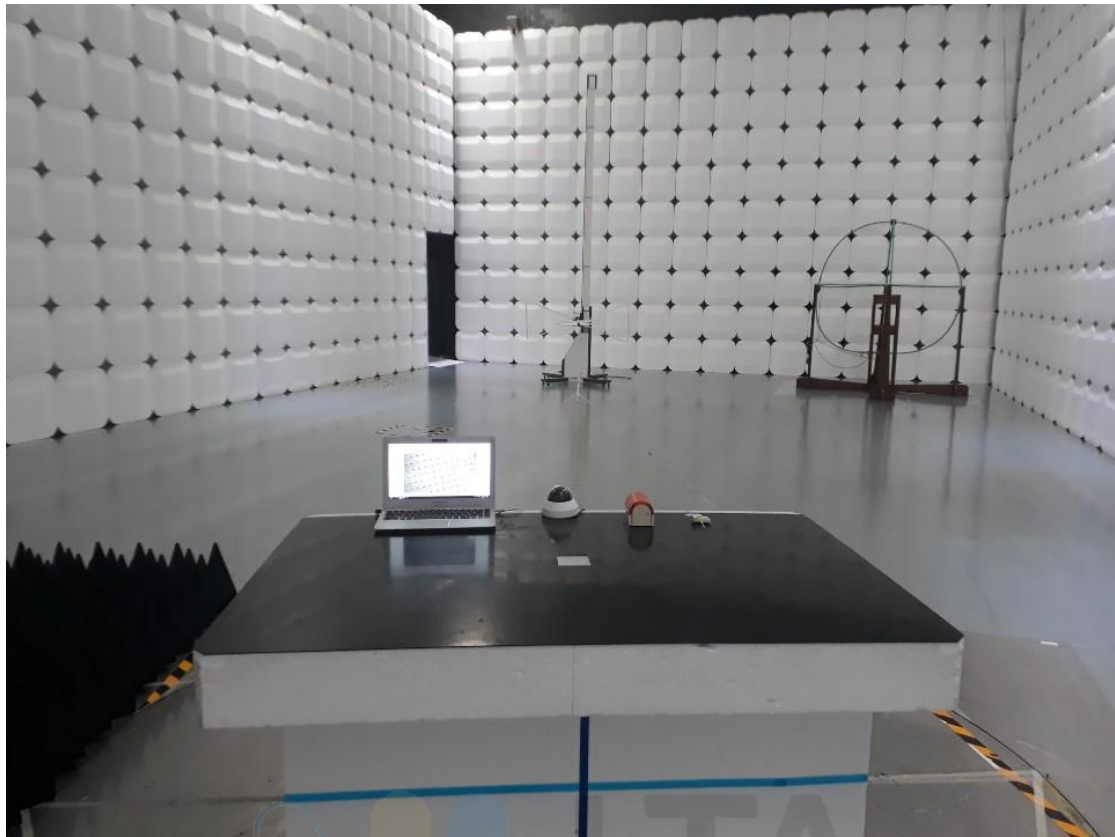
Conducted emission (Maximum emission configuration) / TEL _ REC mode (DC)



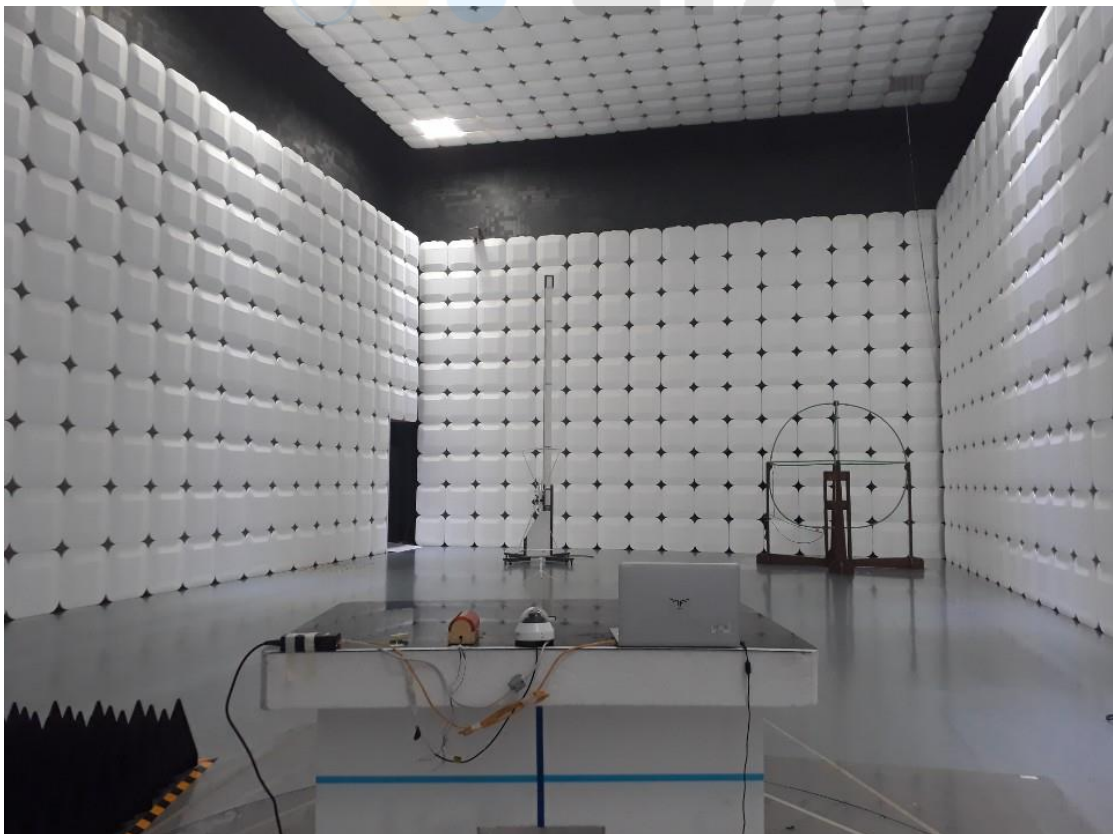
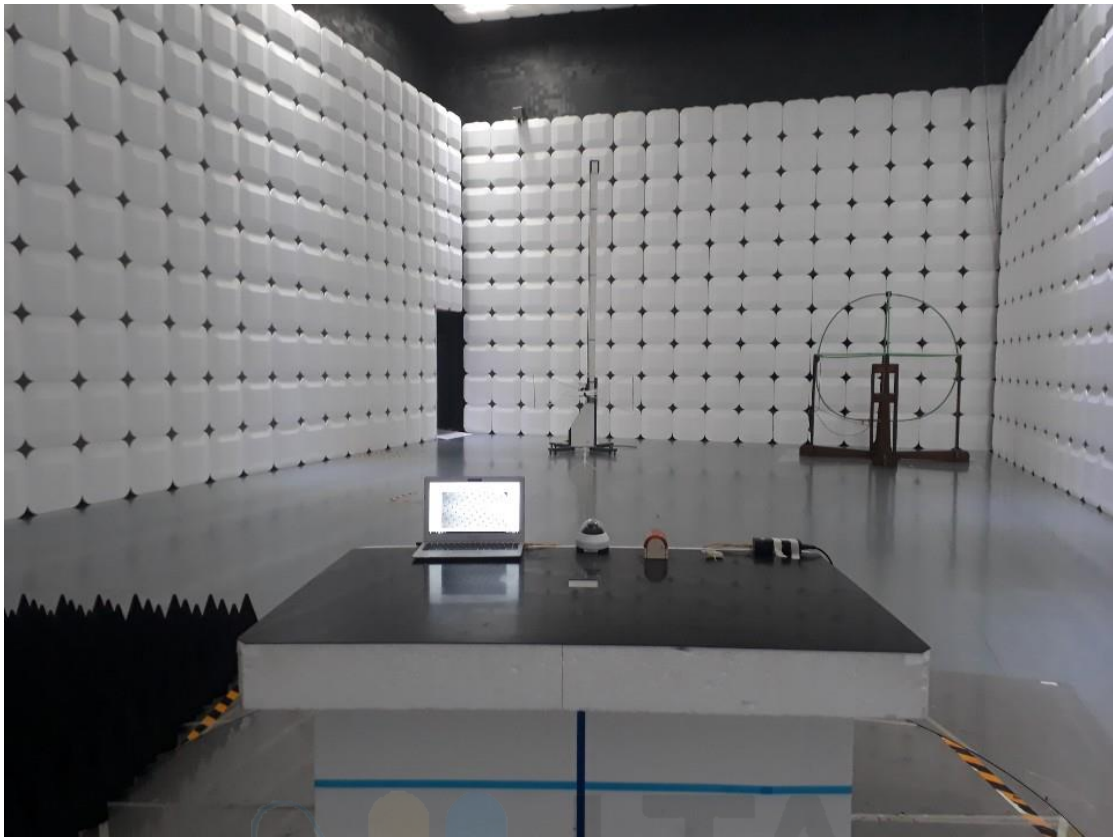
Conducted emission (Maximum emission configuration) / TEL _ REC mode (POE)



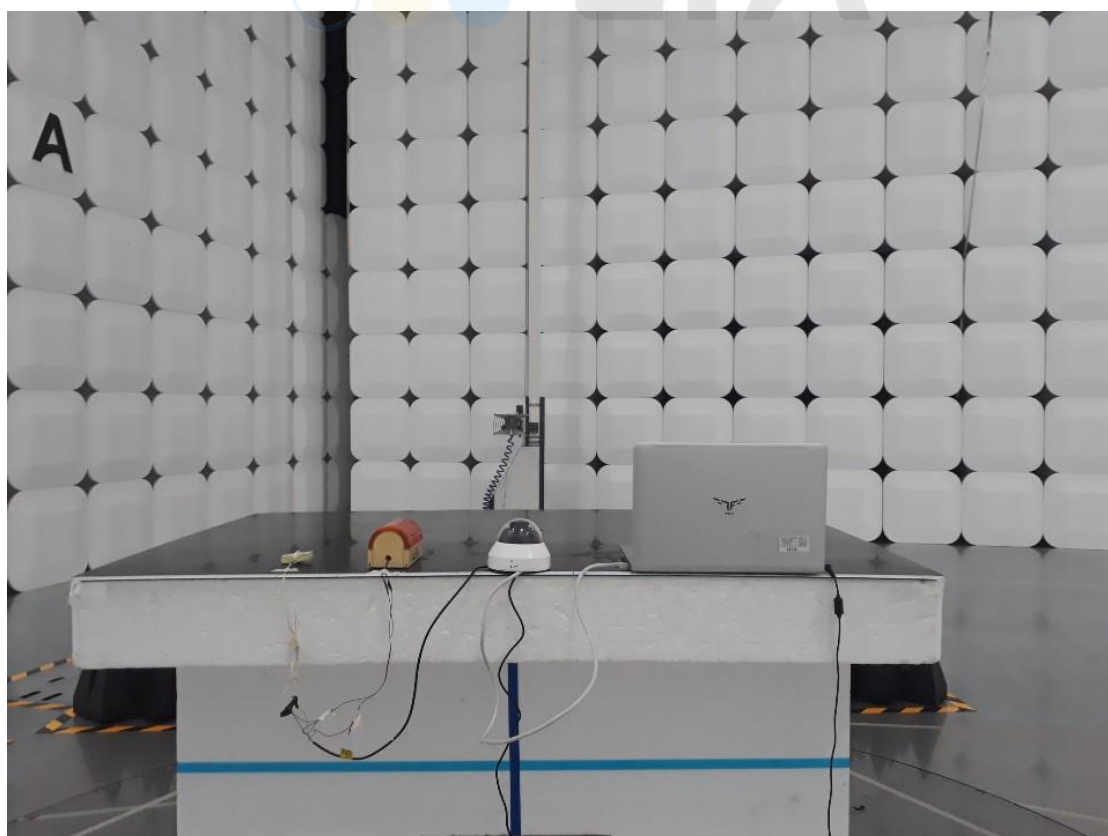
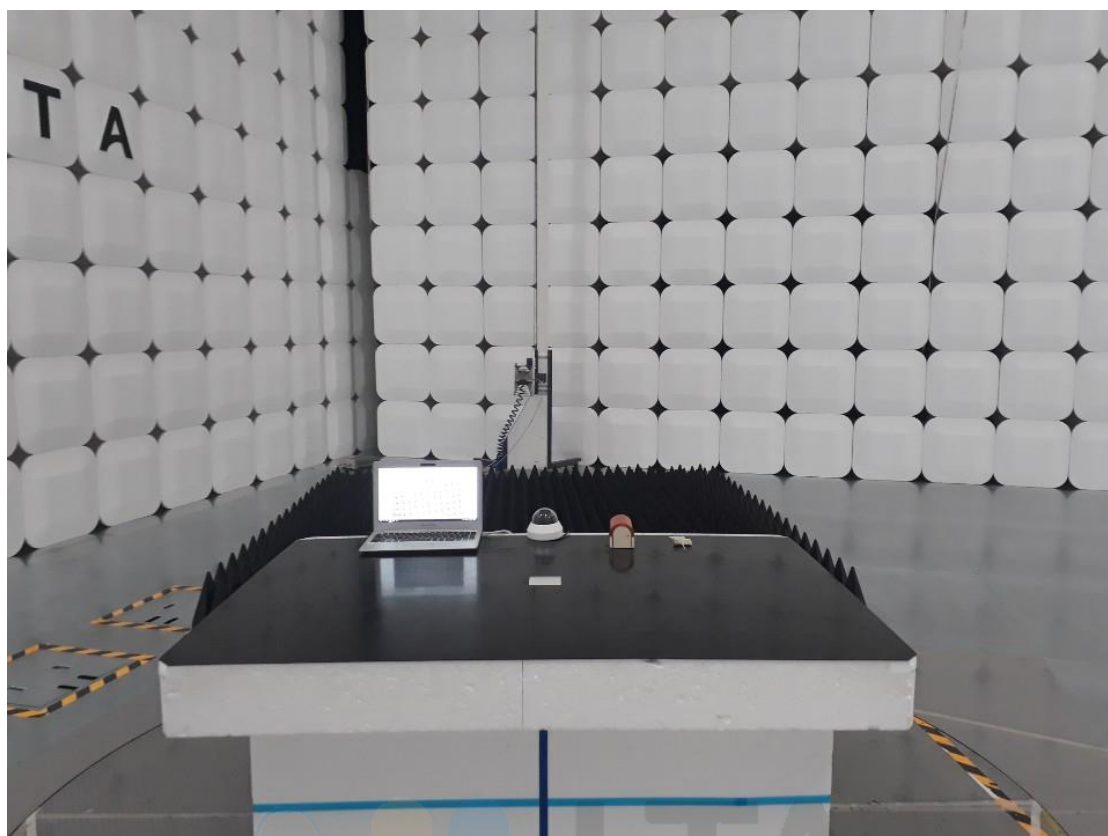
Radiated emission (Maximum emission configuration)-Below 1 GHz / REC mode (DC)



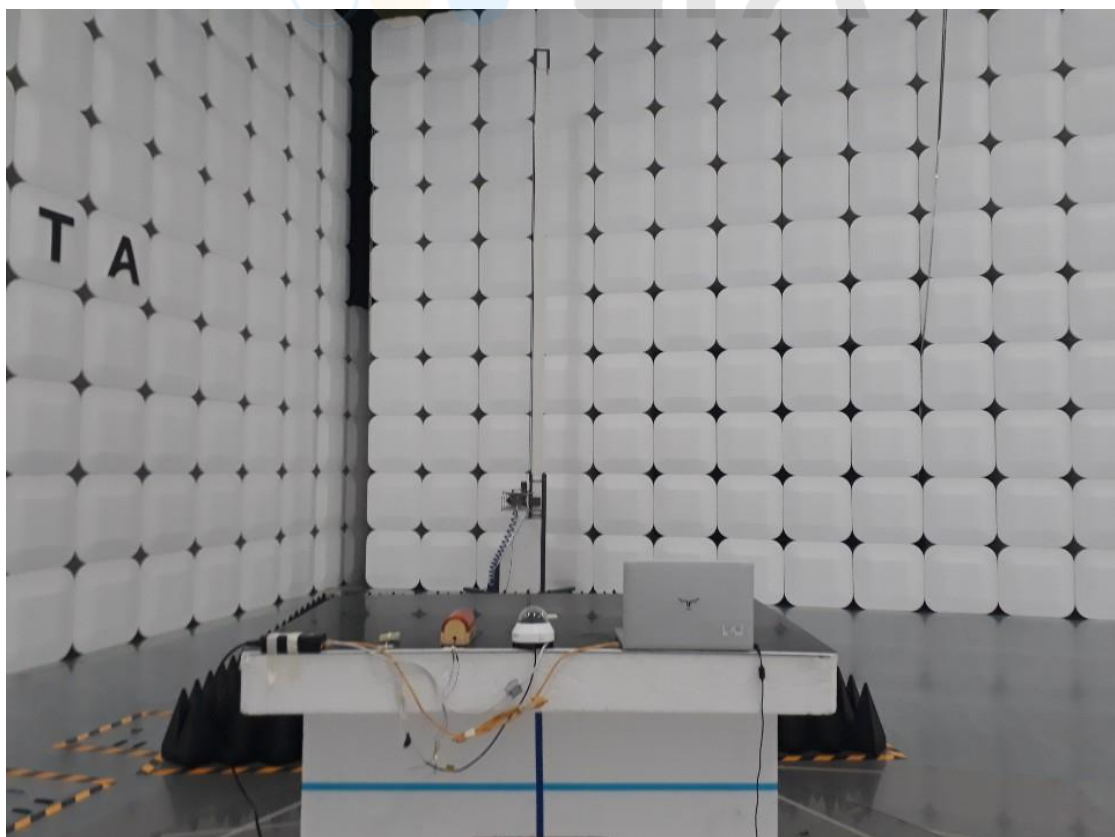
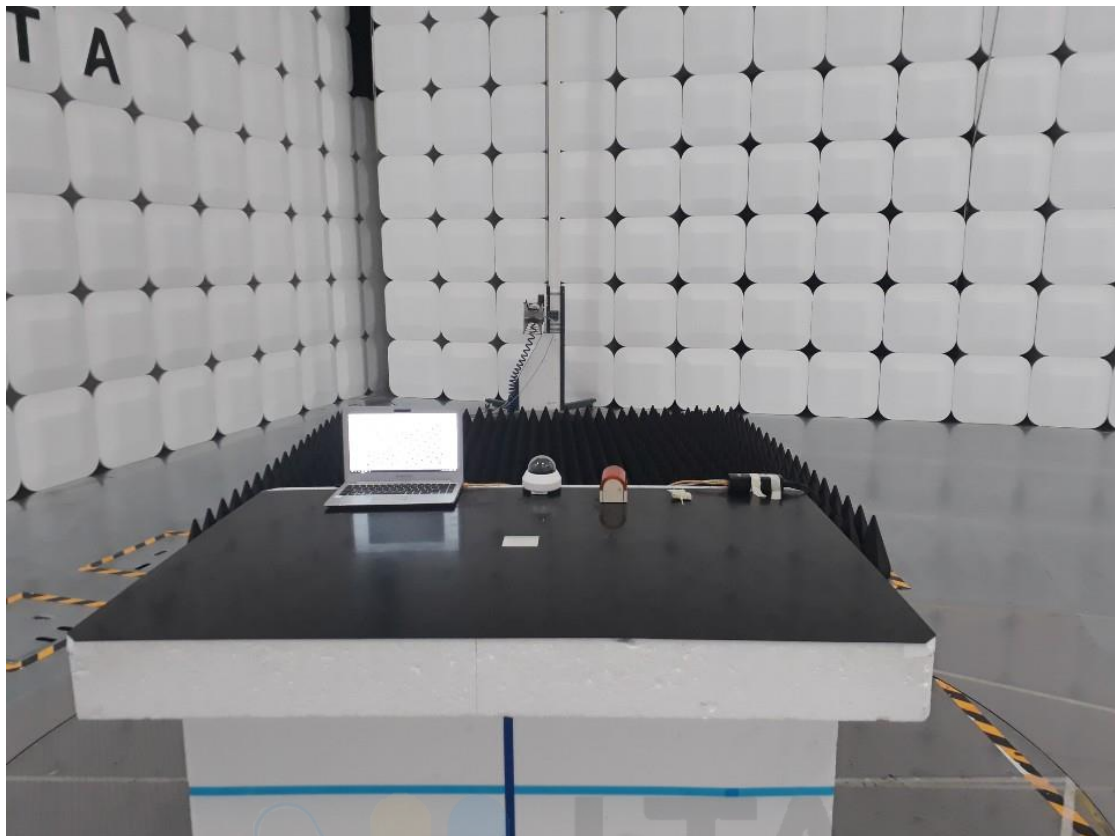
Radiated emission (Maximum emission configuration)-Below 1 GHz / REC mode (POE)



Radiated emission (Maximum emission configuration) – Above 1GHz / REC mode (DC)



Radiated emission (Maximum emission configuration) – Above 1GHz / REC mode (POE)



Harmonic Current / REC mode (DC)



Voltage Variation and Flicking / REC mode (DC)



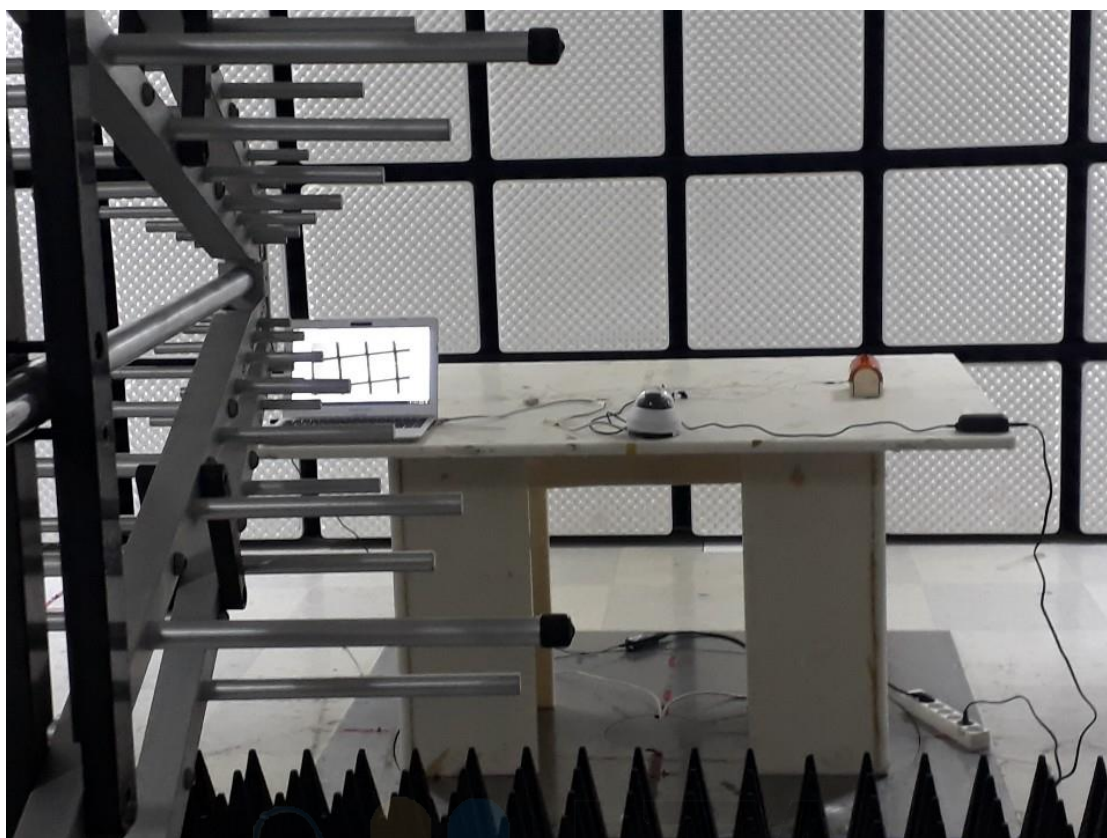
Electrostatic discharge / REC mode (DC)



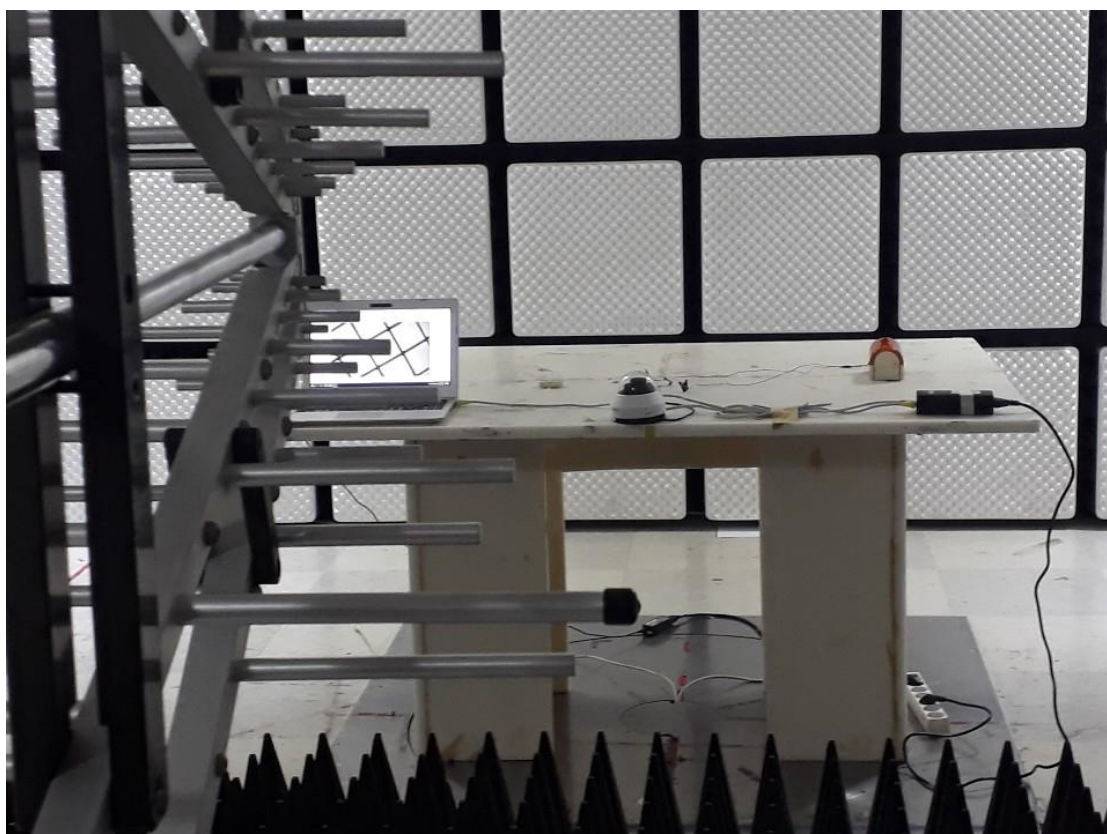
Electrostatic discharge / REC mode (POE)



RF Electromagnetic Field / REC mode (DC)



RF Electromagnetic Field / REC mode (POE)



Electrical fast transients / REC mode (DC)



Electrical fast transients / REC mode (POE)



Surge / REC mode (DC)



Surge / REC mode (POE)



Conducted Disturbances, Induced by Radio-Frequency Fields / REC mode (DC)



Conducted Disturbances, Induced by Radio-Frequency Fields / REC mode (POE)



Main supply voltage (dips, variations) short interruptions / REC mode (DC)



EUT



EUT

