



EMC TEST REPORT

For

Product Name:

IP Villa Door Station

Model Number:

**DH-VTO2101E-P;DHI-VTO2101E-P;VTO2101E-P;
DHI-VTO2101X-P;DH-VTO2101X-P;VTO2101X-P;
DHI-VTO2101E-P-S1; VTO2101E-P-S1**

REPORT NUMBER: 4789057775-3

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Prepared for

ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
--	12/28/2018	Initial Issue	N/A
V2.0	01/07/2019	Update product name :“Door” to “Door”	Terry Hou
4789 0577 75-3	06/24/2019	Add model no. of DHI-VTO2101E-P-S1、 VTO2101E-P-S1 and change the report no. from 4788791222-1V2.0 to 4789057775-3	Terry Hou



Test Summary

According to the specifications of the manufacture, the EUT must complies with the following standards' requirements:

EN 55032:2015

EN 61000-3-2:2014

EN 61000-3-3:2013

EN 50130-4:2011/A1:2014

EN 55024:2010/A1:2015

EN 55035:2017

Electromagnetic Interference (EMI)

Test Items	Test Method	Reference Clause	Result
Radiated Emission	EN 55032:2015	CISPR 16-2-1:2014	PASS
Conducted Emission (AC port and Telecommunication port)	EN 55032:2015	CISPR 16-2-3: 2010+A1:2010+A2:2 014	PASS
Harmonic Emission on AC, 50Hz to 2kHz	EN 61000-3-2:2014	EN 61000-3-2:2014	N/A
Flicker Emission on AC	EN 61000-3-3:2013	EN 61000-3-3:2013	PASS

Electromagnetic Susceptibility(EMS)

ESD	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-2:2009	PASS
Radiated Immunity	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4- 3:2006/A2:2010	PASS
Electrical Fast Transients (EFT)	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-4:2012	PASS
Surge Immunity	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-5:2014	PASS
Conducted Immunity	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-6:2014	PASS
Power Frequency Magnetic Field	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-8:2010	N/A
Voltage Dips and Interruptions	EN 55024:2010/A1:2015 EN 55035:2017 EN 50130-4:2011/A1:2014	EN 61000-4-11:2004	PASS

Remark :

- 1) N/A is an abbreviation for Not Applicable.
- 2) Pre-test with all Monitoring ranges of voltage and frequency then choose the worst case as final result.



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1 ATTESTATION OF TEST RESULTS

Applicant Information	
Company Name:	ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Address:	No.1199 Bin'an Road, Binjiang District, Hangzhou, P.R.China
Manufacturer Information	
Company Name:	ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Address:	No.1199 Bin'an Road, Binjiang District, Hangzhou, P.R.China
EUT Description	
Product Name	IP Villa Door Station
Model Name	DHI-VTO2101E-P
Additional Model No.	DH-VTO2101E-P;DHI-VTO2101E-P;VTO2101E-P; DHI-VTO2101X-P;DH-VTO2101X-P;VTO2101X-P; DHI-VTO2101E-P-S1; VTO2101E-P-S1
Serial Number	134724
Model Difference	Only sales areas and software features are different.
Date Tested	Dec 13, 2018-Dec 22 , 2018



APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
EN 55032:2015	PASS
EN 61000-3-3:2013	PASS
EN 61000-3-2:2014	PASS
EN 50130-4:2011/A1:2014	PASS
EN 55024:2010/A1:2015	PASS
EN 55035:2017	PASS

Tested By:

Sherry Jiang
Engineer Project Associate

Checked By:

Terry Hou
Project Engineer

Approved By:

Scholl Zhang

Laboratory Leader



2 TEST METHODOLOGY

All tests were performed in accordance with the procedures documented EN 55032:2015, EN 61000-3-2:2014, EN 61000-3-3:2013, EN 50130-4:2011/A1:2014, EN 55024:2010/A1:2015, EN 55035:2017.

3 FACILITIES AND ACCREDITATION

Test Location	UL-CCIC Company Limited
Address	No. 2, Chengwan Road, Suzhou Industrial Park, Suzhou 215122, China
Accreditation Certificate	The Laboratory has been assessed and proved to be in compliance with CNAS, The Certificate Registration Number is L2065.



4 CALIBRATION AND UNCERTAINTY

4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus

Test Item	Frequency Range	Measurement Uncertainty	U _{cispr}
Conducted Emission at mains port using AMN	9kHz-150kHz	3.6 dB	3.8 dB
Conducted Emission at mains port using AMN	150kHz-30MHz	3.2 dB	3.4 dB
Conducted Emission at mains port using VP	9kHz-30MHz	2.4 dB	2.9 dB
Conducted Emission at telecommunication port using AAN	150kHz-30MHz	3.0 dB	5.0 dB
Radiated Emission	30MHz-1000MHz	4.4 dB	6.3 dB
Radiated Emission	1GHz-18GHz	4.7 dB	5.2 dB (1GHz-6GHz)
			5.5 dB (6GHz-18GHz)
Remark: AMN – Artificial Mains Network VP – Voltage Probe ANN – Asymmetric Artificial Network			

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



5 EQUIPMENT UNDER TEST

5.1 DESCRIPTION FOR THE EUT

Product Name:	IP Villa Door Station
Model No.:	DHI-VTO2101E-P
Trade Mark:	----
Power Supply:	For EUT:DC 12V, 1A; For Adaptor(Supply by UL): Model:ADS-26SGP-12 Input:100-240V~,50/60Hz,0.7A Max Output:12.0V=2.0A
Test voltage:	AC 230V/50Hz
Cable Type:	DC input cable 1.5m 2pin Lan cable 1.5m N/A
Software:	--
Rated Power:	--



5.2 TEST MODE

Test Mode	Detail description of the Test mode
Monitoring Mode	Keep EUT Monitoring continuously.

5.3 DESCRIPTION OF TEST SETUP

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Laptop PC	ThinkPad	E550C
Adaptor	HONOR	ADS-26SGP-12



5.4 MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI Test Receiver	R&S	ESR3	126700	2018-12-13	2019-12-12
2	LISN	R&S	ENV432	127008	2018-12-13	2019-12-12
3	ISN	R&S	ENY81	126711	2018-12-13	2019-12-12

Radiated Emission

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMI test receiver	R&S	ESR26	126703	2018-12-13	2019-12-12
2	Broadband UHF-VHF ANTENNA	SCHWARZBEC K	VULB9163	126704	2018-10-17	2019-10-16
3	Amplifier	R&S	SCU03	134666	2018-02-07	2019-02-06
4	Horn Antenna	R&S	HF907	126705	2018-01-27	2019-01-26
5	Amplifier	R&S	SCU-18D	134667	2018-12-13	2019-12-12

Harmonic & Flicker

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Single phase Harmonic & Flicker test system	TESEQ	Proflin2105 -400-N	126719	2018-12-13	2019-12-12

Electrostatic Discharge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Electrostatic Discharge Simulator	TESEQ	NSG 437	137873	2018-09-12	2018-09-11

Radiated Immunity

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	Signal Generator	KEYSIGHT	N5171B	155387	2018-05-26	2019-05-25
2	Power Amplifier	BONN	BLWA0810- 200/100	137597	2018-05-26	2019-05-25
	Power Amplifier	AMETEK	AS102-001	155390	2018-05-26	2019-05-25
	Power Amplifier	AMETEK	AS1860-100	155391	2018-05-26	2019-05-25
	Power Meter	DARE	RPR2006C	138150	2018-05-26	2019-05-25
4	Isotropic Electric Field Probe	DARE	RSS1006A	137874	2018-06-06	2019-06-07
5	EMS Antenna	SCHWARZBEC K	STLP9128D	137599	2017-06-17	2020-06-16

**Electrical Fast Transients**

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMS test generator	TESEQ	NSG3060	137601	2018-05-26	2019-05-25
2	EMS test coupling network	TESEQ	CDN3061	137605	2018-05-26	2019-05-25
3	EUT supply power	TESEQ	VAR3005	137606	2018-05-26	2019-05-25
4	EFT coupling clamp	TESEQ	CDN 3425	137607	2018-05-26	2019-05-25

Surge

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMS test generator	TESEQ	NSG3060	137601	2018-05-26	2019-05-25
2	EMS test coupling network	TESEQ	CDN3061	137605	2018-05-26	2019-05-25
3	EUT supply power	TESEQ	VAR3005	137606	2018-05-26	2019-05-25

Conducted Immunity

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	CI test machine	TESEQ	NSG4070	137614	2018-05-26	2019-05-25
2	Coupling and Decoupling Network	TESEQ	CDN M016	137613	2018-05-26	2019-05-25
3	Attenuator	TESEQ	ATN 6050	137615	2018-05-26	2019-05-25
4	CI coupling clamp	TESEQ	KEMZ 801A	137612	2018-05-26	2019-05-25

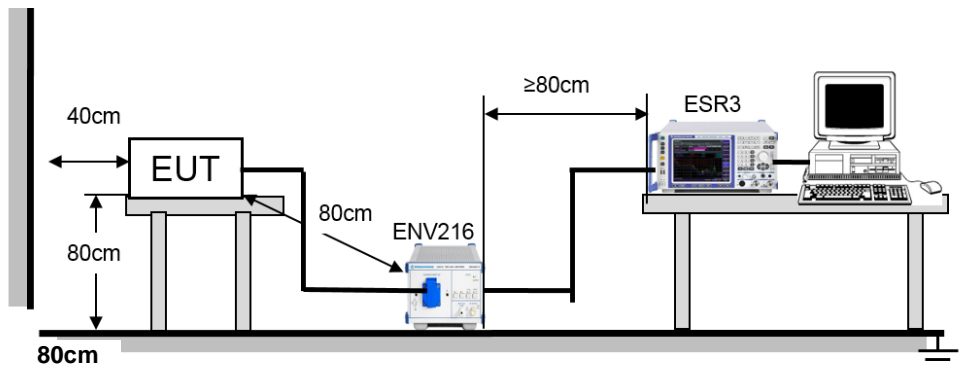
Voltage Dips and Interruptions

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date	Cal.Due date
1	EMS test generator	TESEQ	NSG3060	137601	2018-05-26	2019-05-25
2	EMS test coupling network	TESEQ	CDN3061	137605	2018-05-26	2019-05-25
3	EUT supply power	TESEQ	VAR3005	137606	2018-05-26	2019-05-25

6 ELECTROMAGNETIC COMPATIBILITY (EMC)

6.1 ELECTROMAGNETIC INTERFERENCE (EMI)

6.1.1 CONDUCTED EMISSION

Test Method:	EN 55032:2015			
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)			
	Quasi-Peak if maximized peak within 6dB of Quasi-Peak limit			
EUT Operation:				
Ambient:	Temp.: 23	°C	Humid.: 50	% Press.: 1012 mbar
Test Mode:	All mode			
Test Status:	Pre-scan was performed with peak detected on all ports, Quasi-peak & average measurements were performed at the frequencies at which maximum peak emission level were detected. Please see the attached Quasi-peak and Average test results.			
Limit:	Limits for conducted disturbance at the mains ports of class B			
	Frequency Range (MHz)		Class B Limit (dBuV)	
			Quasi-peak	Average
	0.15 to 0.50		66 to 56	56 to 46
	0.50 to 5		56	46
	5 to 30		60	50
	NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz. NOTE 2: The lower limit is applicable at the transition frequency.			
Test Setup:	Limits for conducted disturbance at the telecommunication ports of class B (ISN)			
	Frequency Range (MHz)		Class B Limit (dBuV)	
			Quasi-peak	Average
	0.15 to 0.50		84 to 74	74 to 64
	0.50 to 30		74	64
				
	Test Procedure:	1) The mains terminal disturbance voltage test was conducted in a shielded room.		

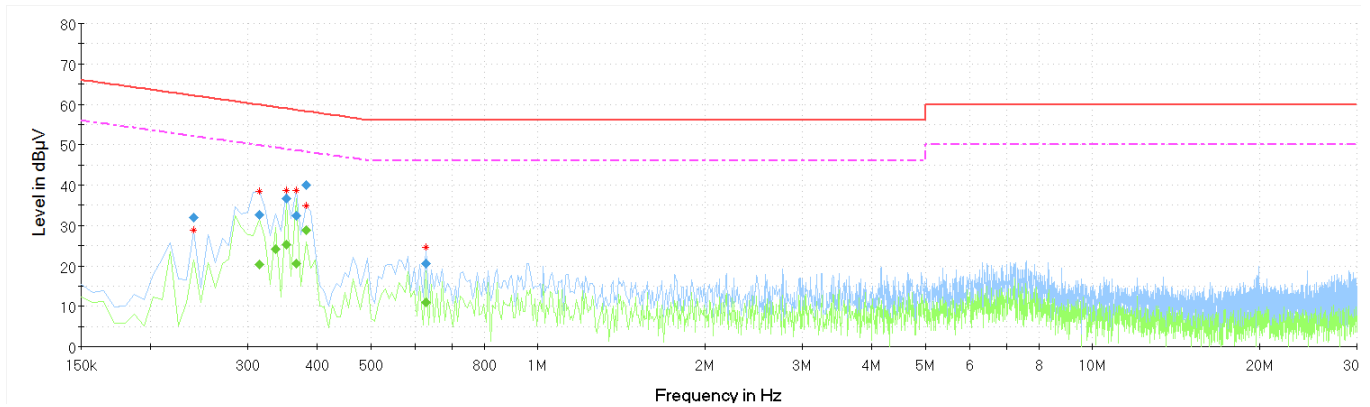


	<p>2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.</p> <p>3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.</p> <p>4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.</p>
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Measurement Data For Adaptor:

Test Mode :	Monitoring Mode		
Power :	AC 230V	Port:	N, L1
Model No :	DHI-VTO2101E-P		

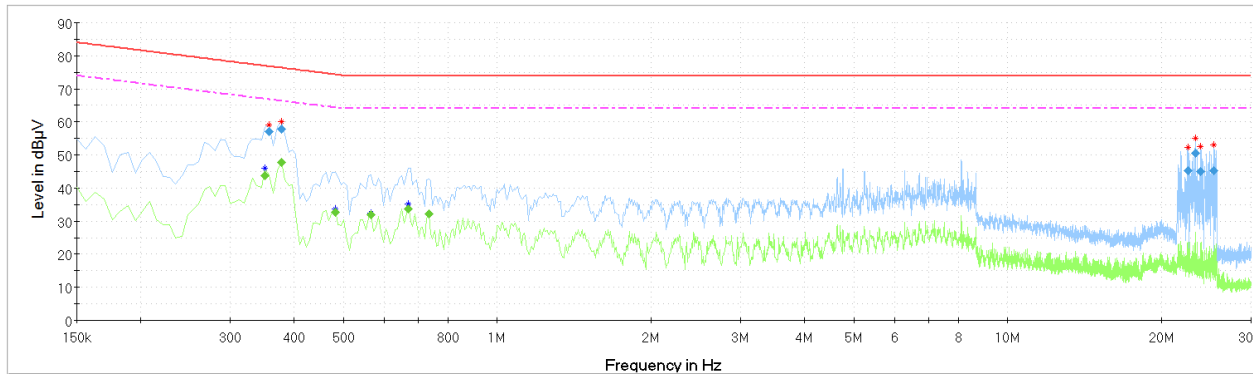


Name	Frequency	Process State	QuasiPeak	Average	Limit	Margin	Meas. Time	Bandwidth	Line	Filter	Corr.	Comment
Unit	MHz		dBµV	dBµV	dBµV	dB	ms	kHz			dB	
1	0.239550	FINAL	31.91	---	62.11	30.20	1000.0	9.000	L1	OFF	9.6	
2	0.314175	FINAL	---	20.24	49.86	29.62	1000.0	9.000	L1	OFF	9.6	
3	0.314175	FINAL	32.66	---	59.86	27.20	1000.0	9.000	L1	OFF	9.6	
4	0.336563	FINAL	---	24.12	49.29	25.16	1000.0	9.000	L1	OFF	9.6	
5	0.351488	FINAL	---	25.22	48.93	23.70	1000.0	9.000	L1	OFF	9.6	
6	0.351488	FINAL	36.70	---	58.93	22.22	1000.0	9.000	L1	OFF	9.6	
7	0.366413	FINAL	32.35	---	58.58	26.23	1000.0	9.000	L1	OFF	9.6	
8	0.366413	FINAL	---	20.66	48.58	27.92	1000.0	9.000	L1	OFF	9.6	
9	0.381338	FINAL	40.03	---	58.25	18.22	1000.0	9.000	L1	OFF	9.6	
10	0.381338	FINAL	---	28.82	48.25	19.43	1000.0	9.000	L1	OFF	9.6	
11	0.627600	FINAL	---	11.06	46.00	34.94	1000.0	9.000	L1	OFF	9.6	
12	0.627600	FINAL	20.54	---	56.00	35.46	1000.0	9.000	L1	OFF	9.6	



Measurement Data For Lan:

Test Mode :	Monitoring Mode		
Power :	AC 230V	Port :	Lan port
Model No :	DHI-VTO2101E-P		



Name	Frequency	Process State	QuasiPeak	CAverage	Limit	Margin	Meas. Time	Bandwidth	Line	Corr.	Comment
Unit	MHz		dBμV	dBμV	dBμV	dB	ms	kHz		dB	
1	0.351163	FINAL	---	43.65	66.94	23.29	50.0	9.000	Single I	9.8	16:31:59 - 2
2	0.357652	FINAL	57.17	---	76.78	19.61	50.0	9.000	Single I	9.8	16:31:39 - 2
3	0.377120	FINAL	---	47.75	66.34	18.59	50.0	9.000	Single I	9.8	16:32:02 - 2
4	0.377120	FINAL	57.86	---	76.34	18.48	50.0	9.000	Single I	9.8	16:31:42 - 2
5	0.480946	FINAL	---	32.77	64.32	31.55	50.0	9.000	Single I	9.8	16:32:05 - 2
6	0.565304	FINAL	---	31.91	64.00	32.09	50.0	9.000	Single I	9.8	16:32:09 - 2
7	0.669130	FINAL	---	33.65	64.00	30.35	50.0	9.000	Single I	9.7	16:32:12 - 2
8	0.734022	FINAL	---	32.07	64.00	31.93	50.0	9.000	Single I	9.7	16:32:15 - 2
9	22.537500	FINAL	45.13	---	74.00	28.87	50.0	9.000	Single I	10.0	16:31:45 - 2
10	23.329174	FINAL	50.56	---	74.00	23.44	50.0	9.000	Single I	10.1	16:31:49 - 2
11	23.880750	FINAL	45.02	---	74.00	28.98	50.0	9.000	Single I	10.1	16:31:52 - 2
12	25.347293	FINAL	45.37	---	74.00	28.63	50.0	9.000	Single I	10.2	16:31:56 - 2

6.1.2 RADIATED EMISSION

Test Method:	EN 55032:2015				
EUT Operation:					
Ambient:	Temp.: 23.0	°C	Humid.: 52	%	Press.: 1012 mbar
Test Mode:	All mode				
Test Status:	Pre-scan was performed with peak detected on all ports, Quasi-peak measurements was performed at the frequencies at which maximum peak emission level were detected..				
Receive Setup:	Frequency range (MHz)	Detector	RBW	VBW	
	30-1000	Quasi-peak	120kHz	300kHz	
	Above 1000	Peak	1MHz	3MHz	
Limit:	Frequency		Limit(@3m)		Remark
	30MHz-230MHz		40dBuV/m		QP value
	230MHz-1GHz		47dBuV/m		QP value
	1GHz-3GHz		50dBuV/m		Average value
			70dBuV/m		PK value
	3GHz-6GHz		54dBuV/m		Average value
			74dBuV/m		PK value
Test Setup:					

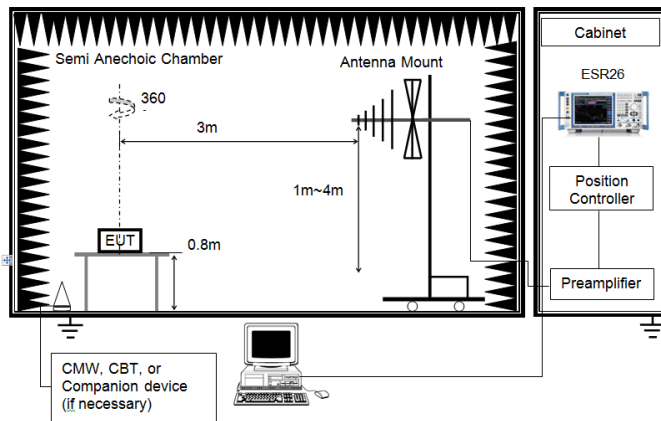


Figure 1. 30MHz to 1GHz

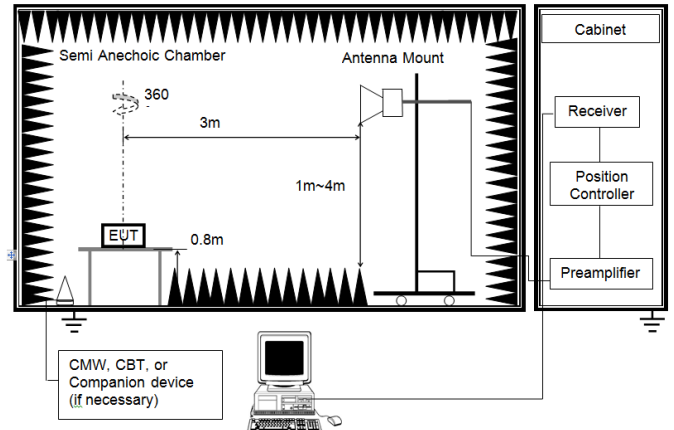


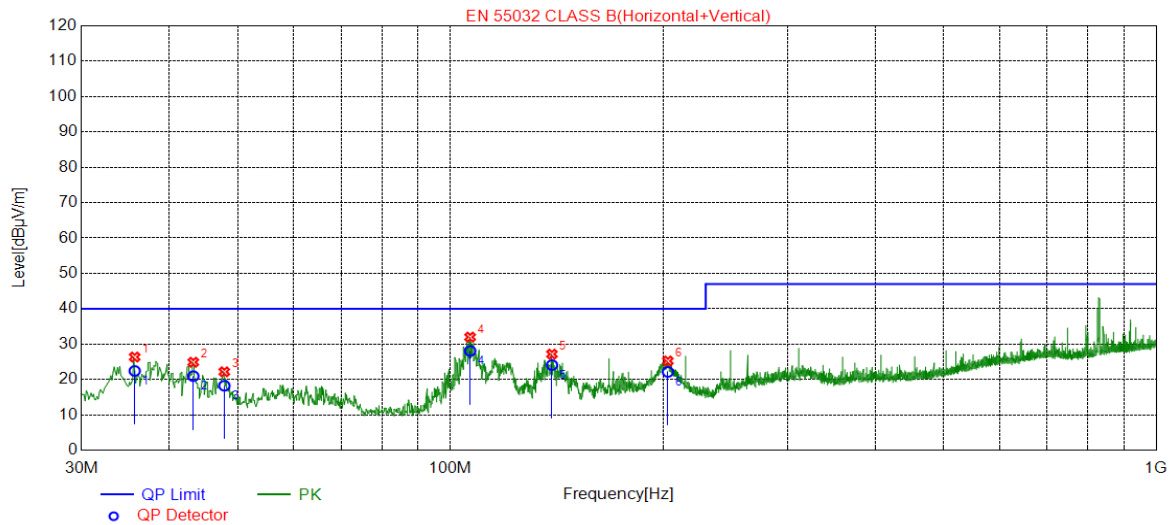
Figure 2. Above 1 GHz



Test Procedure:	<ol style="list-style-type: none">1. From 30 MHz to 1GHz test procedure as below:<ol style="list-style-type: none">1) The radiated emissions were tested in a semi-anechoic chamber.2) The EUT is placed on a turntable, which is 0.8m above ground plane.3) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.4) EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.5) Maximum procedure was performed on the six highest emissions to ensure EUT compliance.6) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.7) Repeat above procedures until the measurements for all frequencies are complete.2. Above 1GHz test procedure as below:<ol style="list-style-type: none">1) Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber.
------------------------	--

**Measurement Data:****30MHz ~ 1000MHz**

Test Mode :	Keep EUT Monitoring continuously.		
Power :	AC 230V	Ant. Polarization:	Horizontal/Vertical
Model No :	DHI-VTO2101E-P		

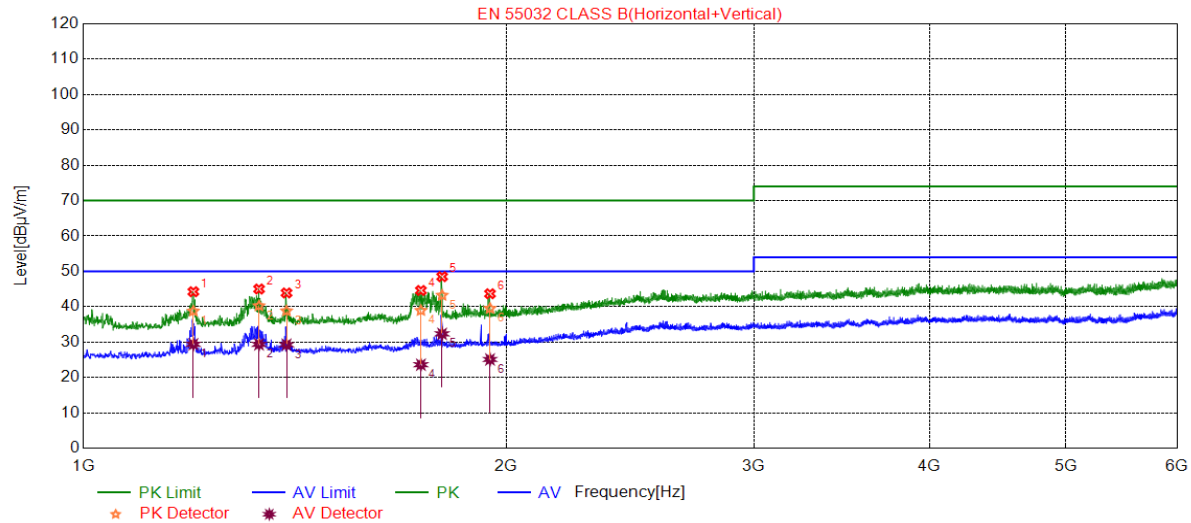
**Final Data List**

NO.	Freq. [MHz]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	35.6995	22.41	40.00	17.59	Vertical
2	43.2179	20.94	40.00	19.06	Vertical
3	47.8260	18.23	40.00	21.77	Vertical
4	106.6396	28.05	40.00	11.95	Vertical
5	139.2599	24.08	40.00	15.92	Horizontal
6	203.2879	22.14	40.00	17.86	Vertical



Above 1000MHz

Test Mode :	Keep EUT Monitoring continuously.		
Power :	AC 230V	Ant. Polarization:	Horizontal/Vertical
Model No :	DHI-VTO2101E-P		

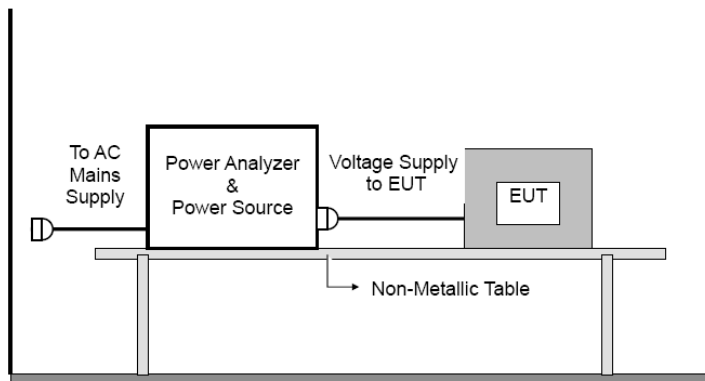
**PK Final Data List**

NO.	Freq. [MHz]	Factor [dB]	PK Value [dBμV/m]	PK Limit [dBμV/m]	PK Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1197.51	-4.33	38.77	70.00	31.23	200	257	Horizontal
2	1333.53	-4.13	40.26	70.00	29.74	100	186	Horizontal
3	1395.03	-3.82	38.82	70.00	31.18	100	136	Horizontal
4	1738.57	-2.65	38.94	70.00	31.06	100	194	Vertical
5	1800.08	-2.01	43.23	70.00	26.77	100	186	Horizontal
6	1947.09	-1.47	39.52	70.00	30.48	100	86	Horizontal

AV Final Data List

NO.	Freq. [MHz]	Factor [dB]	AV Value [dBμV/m]	AV Limit [dBμV/m]	AV Margin [dB]	Height [cm]	Angle [°]	Polarity
1	1197.51	-4.33	29.38	50.00	20.62	200	257	Horizontal
2	1333.53	-4.13	29.36	50.00	20.64	100	186	Horizontal
3	1395.03	-3.82	29.26	50.00	20.74	100	136	Horizontal
4	1738.57	-2.65	23.60	50.00	26.40	100	194	Vertical
5	1800.08	-2.01	32.33	50.00	17.67	100	186	Horizontal
6	1947.09	-1.47	25.09	50.00	24.91	100	86	Horizontal

6.1.3 FLICKER TEST

Test Method:		EN 61000-3-3:2013		
EUT Operation:				
Ambient:	Temp.: 20.0	°C	Humid.: 60	% Press.:1005 mbar
Test Mode:	All mode			
Limits:	Test items	Limits(EN61000-3-3)	Descriptions	
	P _{st}	≤1.0, T _p =10min	short-term flicker indicator	
	P _{lt}	≤0.65, T _p =2h	long-term flicker indicator	
	T _{max}	≤3.3%	relative voltage change characteristic	
	d _c	≤3.3%	relative steady-state voltage change	
	d _{max}	≤4%(or 6% ^{Note(1)} , 7% ^{Note(2)})	maximum relative voltage change:	
	d _(t)	≤3.3%, more than 500ms	relative voltage change characteristic	
Test Setup:	<div></div> <div><p>1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The Test voltage: was maintained within ±2 % of the nominal value. The frequency was 50 Hz ±0.5 %.</p><p>2. The voltage fluctuations and flicker were measured at the supply terminals of the EUT.</p><p>3. The observation period, T_p, for the assessment of flicker values by flicker measurement, flicker simulation, or analytical method was:</p><ul style="list-style-type: none">— for P_{st}, T_p = 10 min;— for P_{lt}, T_p = 2 h.<p>The observation period included that part of the whole operation cycle in which the EUT produces the most unfavorable sequence of voltage changes.</p></div>			



Measurement Data:

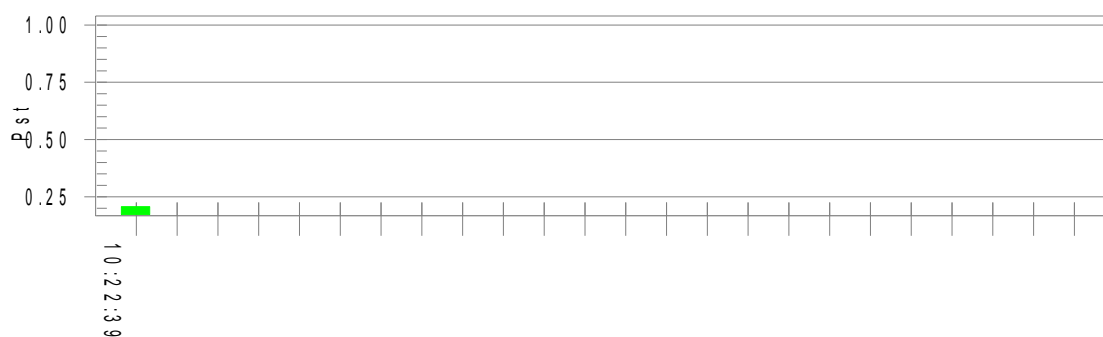
MODE :MONITORING MODE

Test Result: Pass

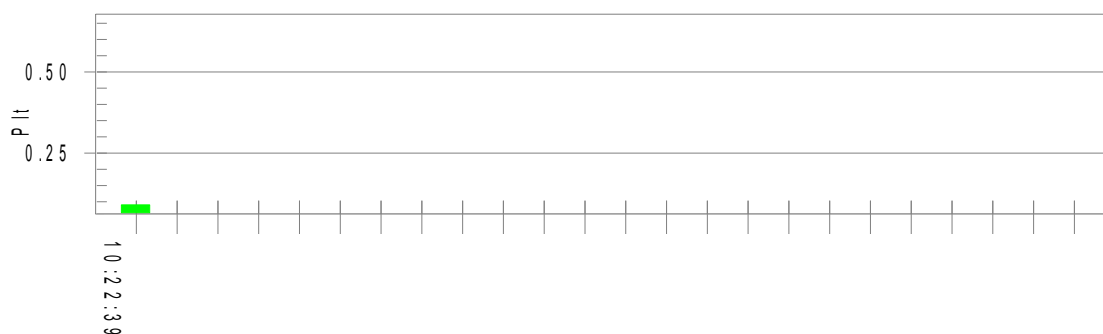
Status: Test Completed

Pst_i and limit line

European Limits



Plt and limit line





Parameter values recorded during the test:

Vrms at the end of test (Volt): 229.93

Highest dt (%): 0.00 Test limit (%): N/A N/A

T-max (mS): 0 Test limit (mS): 500.0 Pass

Highest dc (%): 0.00 Test limit (%): 3.30 Pass

Highest dmax (%): -0.04 Test limit (%): 4.00 Pass

Highest Pst (10 min. period): 0.207 Test limit: 1.000 Pass

Highest Plt (2 hr. period): 0.090 Test limit: 0.650 Pass

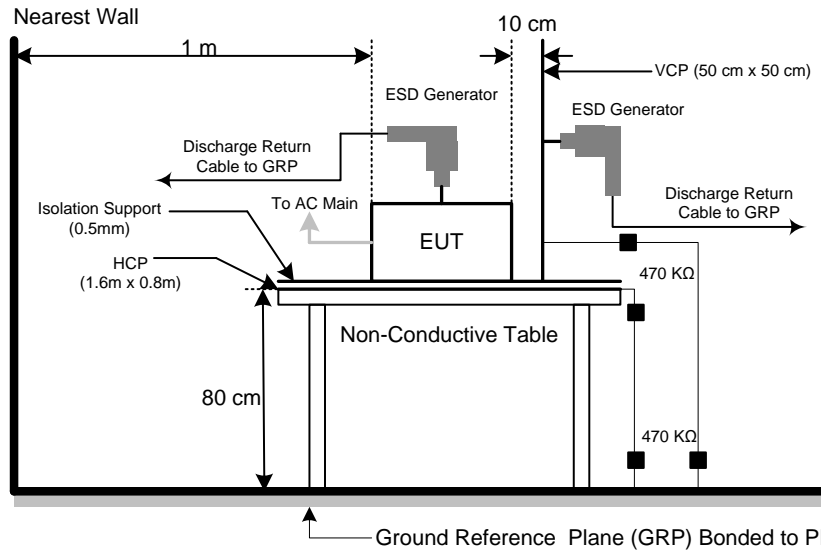


6.2 ELECTROMAGNETIC SUSCEPTIBILITY (IMMUNITY)

Performance Criteria Description

Criterion A:
The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Criterion B:
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual Monitoring state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.
Criterion C:
Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

6.2.1 ELECTROSTATIC DISCHARGE (ESD)

Test Method:	EN61000-4-2 :2009
EUT Operation:	
Ambient:	Temp.: 23.0 °C Humid.: 55 % Press.: 1012 mbar
Test Mode:	Keep EUT Monitoring continuously
Discharge Impedance:	330 Ω / 150 pF
Polarity:	Positive & Negative
Number of Discharge:	200 times (For EN 55024:2010/A1:2015;EN 55035:2017) Minimum 10 times at each test point (for EN 50130-4:2011/A1:2014)
Discharge Mode:	Single Discharge
Discharge Period:	1 second minimum
Equipment Used:	Refer to section 5 for details.
Test Setup:	 <p style="text-align: center;">Test set-up for tabletop equipment</p>
Test Procedure:	<ol style="list-style-type: none"> 1) Contact discharges to the conductive surfaces and to coupling planes: Air discharge at slots and apertures, and insulating surfaces: On those parts of the EUT where it was not possible to perform contact discharge testing, the equipment was investigated to identify user accessible points where breakdown may occur. This investigation was restricted to those areas normally handled by the user. The application of electrostatic discharges to the contacts of open connectors was not required by this standard. 2) The EUT was put on a 0.8m high wooden table for table-top equipment or 0.1m high for floor standing equipment standing on the ground reference plane (GRP). 3) A horizontal coupling plane(HCP) 1.6m by 0.8m in size was placed on the table, and the EUT with its cables were isolated from the HCP by an insulating support thick than 0.5mm. The VCP 0.5m by 0.5m in size & HCP



	<p>were constructed from the same material type & think mess as that of the GRP, and connected to the GRP via a 470kΩ resistor at each end. The distance between EUT and any of the other metallic surfaces excepted the GRP, HCP and VCP was greater than 1m.</p> <p>4) During the contact discharges, the tip of the discharge electrode was touch the EUT before the discharge switch is operated. During the air discharges, the round discharge tip of the discharge electrode was approached as fast as possible to touch the EUT.</p> <p>5) After each discharge, the ESD generator was removed from the EUT, the generator was then retriggered for a new single discharge. For ungrounded product, a discharge cable with two resistances was used after each discharge to remove remnant electrostatic voltage. 10 times of each polarity single discharge were applied to HCP and VCP.</p>
Test Results:	
Observations:	<p>Test Point:</p> <ol style="list-style-type: none">1. All insulated part of indicator lights and seams.2. All accessible metal parts of the enclosure.3. All sides.

**Test Results:**

Test Mode: Keep EUT Monitoring continuously

Direct Application Test Results

For EN 50130-4:2011/A1:2014					
Direct Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Contact Discharge	Air Discharge
2,4,8	+/-	1	Monitoring	N/A	A
6	+/-	2		A	N/A
For EN 55024:2010/A1:2015& EN 55035:2017					
Direct Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Contact Discharge	Air Discharge
8	+/-	1	Monitoring	N/A	A
4	+/-	2		A	N/A

Indirect Application Test Results

For EN 50130-4:2011/A1:2014					
Indirect Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Horizontal Coupling	Vertical Coupling
6	+/-	3	Monitoring	A	A
For EN 55024:2010/A1:2015& EN 55035:2017					
Indirect Application				Test Results	
Discharge Level (kV)	Polarity (+/-)	Test Point	Test Mode	Horizontal Coupling	Vertical Coupling
4	+/-	3	Monitoring	A	A

Results: Pass

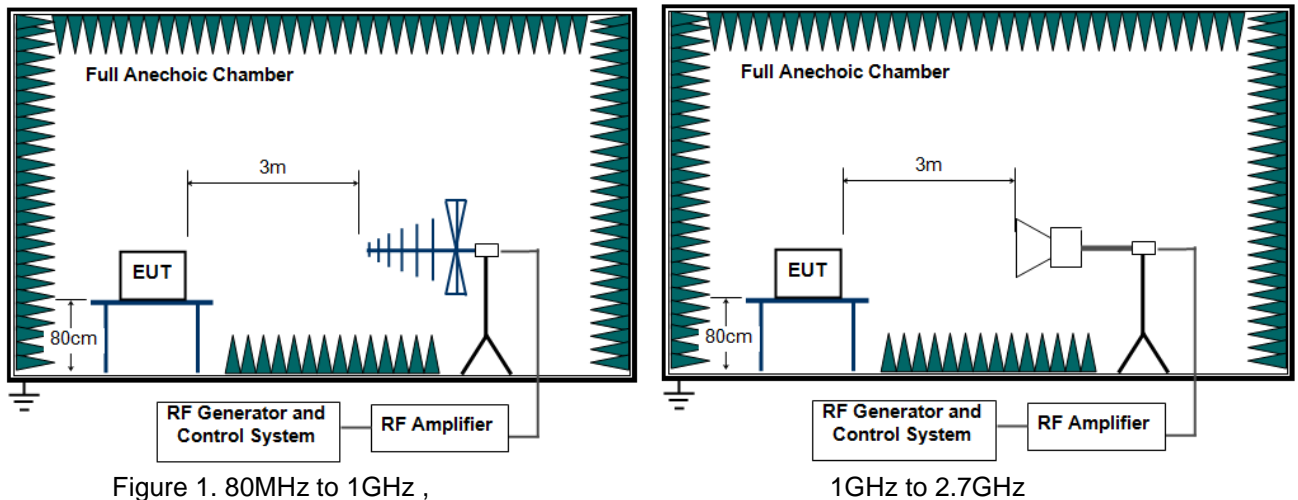
Test phenomenon description for the EUT:

1. The EUT working is normal, Before or after the conditioning.
2. When the air discharge is 8kV, the screen stops (Lasts for about 3-5 seconds) and can be restarted automatically.
3. No degradation in the performance of the EUT was observed, after the conditioning.

N/A:Not Applicable (not required by Standard).

6.2.2 RADIATED IMMUNITY

Test Method:	EN 61000-4-3 :2006/A2 :2010			
EUT Operation:				
Ambient:	Temp.: 23.0 °C	Humid.: 55 %	Press.:1012 mbar	
Test Mode:	Monitoring mode			
Criterion Required:	A			
Test Setup:				



Test Procedure:

- 1) For table-top equipment, the EUT was placed in the chamber on a non-conductive table 0.8m high. For arrangement of floor-standing equipment, the EUT was mounted on a non-conductive support 0.1m above the supporting plane. For human body-mounted equipment, the EUT may be tested in the same manner as table top items.
- 2) If possible, a minimum of 1 m of cable is exposed to the electromagnetic field. Excess length of cables interconnecting units of the EUT shall be bundled low-inductively in the approximate center of the cable to form a bundle 30 cm to 40 cm in length.
- 3) The EUT was initially placed with one face coincident with the calibration plane. The EUT face being illuminated was contained within the UFA (Uniform Field Area).
- 4) The frequency ranges to be considered were swept with the signal modulated and pausing to adjust the RF signal level or to switch oscillators and antennas as necessary. Where the frequency range was swept incrementally, the step size was not exceed 1% of the preceding frequency value.
- 5) The dwell time of the amplitude modulated carrier at each frequency was not be less than the time necessary for the EUT to be exercised and to



	<p>respond, and was not less than 0.5s.</p> <p>6) The test normally was performed with the generating antenna facing each side of the EUT.</p> <p>7) The polarization of the field generated by each antenna necessitates testing each selected side twice, once with the antenna positioned vertically and again with the antenna positioned horizontally.</p> <p>8) The EUT was performed in a configuration to actual installation conditions, a video camera, test data and/or an audio monitor were used to monitor the performance of the EUT.</p>
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**Test Results:**

For EN 50130-4:2011/A1:2014							
Frequency	Level	Modulation	Dwell Time	Test Mode	Antenna Polarization	EUT Face	Result / Observations
80MHz-2.7GHz	10 V/m	1 kHz, 80% AM. 1Hz(0.5sOn, 0.5sOff)PM 1 % increment	3s	Monitoring mode	V	Front	A
					H		A
					V	Rear	A
					H		A
					V	Left	A
					H		A
					V	Right	A
					H		A
					V	Top	A
					H		A
					V	Bottom	A
					H		A
For EN 55035 :2017 ;EN 55024:2010/A1:2015							
Frequency	Level	Modulation	Dwell Time	Test Mode	Antenna Polarization	EUT Face	Result / Observations
80MHz-1GHz,	3 V/m	1 kHz, 80% Amp. 1 % increment	3s	Monitoring mode	V	Front	A
					H		A
					V	Rear	A
					H		A
					V	Left	A
					H		A
(±1%) 1 800 MHz, 2 600 MHz, 3 500 MHz, 5 000 MHz					V	Right	A
					H		A
					V	Top	A
					H		A
					V	Bottom	A
					H		A



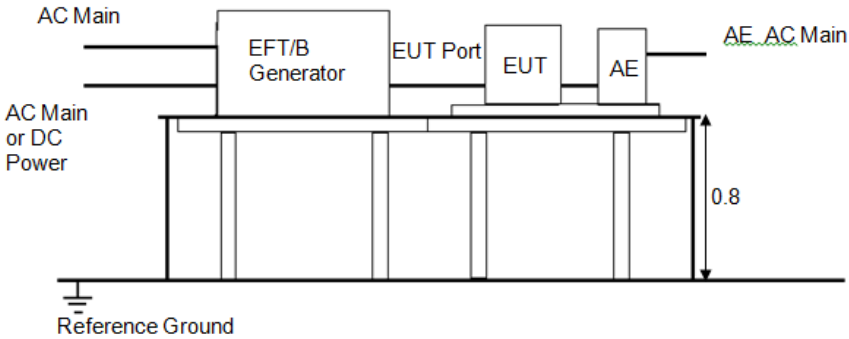
Results: Pass

Note:

Test phenomenon description for the EUT:

1. The EUT working is normal, Before the conditioning.
2. No any change in status of the EUT was observed, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

6.2.3 ELECTRICAL FAST TRANSIENTS (EFT)

Test Method:	EN 61000-4-4:2012			
Test Level:	$\pm 2.0\text{kV}$ on AC port (for EN 50130-4:2011/A1:2014) $\pm 1.0\text{kV}$ on AC port (for EN 55024:2010/A1:2015 ; EN 55035 :2017) $\pm 1.0\text{kV}$ on Signal port (for EN 50130-4:2011/A1:2014) $\pm 0.5\text{kV}$ on Signal port (for EN 55024:2010/A1:2015 ; EN 55035 :2017)			
Polarity:	Positive & Negative			
Repetition Frequency:	100kHz (for EN50130-4:2011/A1:2014) 5kHz (for EN 55024:2010/A1:2015 ; EN 55035 :2017)			
Burst Period:	300ms			
Test Duration:	2 minute per level & polarity			
EUT Operation:				
Ambient:	Temp.: 23.0 °C	Humid.:55 %	Press.: 1012 mbar	
Test Mode:	Keep EUT Monitoring continuously			
Test Setup:				
Test Procedure:	<ol style="list-style-type: none"> 1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. 2) The GRP shall project beyond the EUT and the clamp by at least 0.1m on all sides. The distance between the EUT and any other of the metallic surface except the GRP was greater than 0.5m. All cables to the EUT was placed on the insulation support 0.1m above GRP. A cable not subject to EFT was routed as far as possible from cable under test to minimize the coupling between the cables. 3) The length of signal and power cable between the EUT and EFT generator was 0.5m. If the cable is a non-detachable supply cable more than 0.5m, the excess length of this cable shall be folded to avoid a flat coil and situated at a distance of 0.1m above the GRP. 4) The EUT was conducted the below specified test voltages for line and neutral or line, neutral and earth simultaneously (for telecommunication, single, control and DC port line with capacitive coupling clamp), 120 seconds duration. If the equipment contains identical ports, only one was tested; multicomputer cables, such as a 50-pair telecommunication cable, were tested as a single cable. Cables did not be split or divided into 			



groups of conductors for this test; interface ports, which were intended by the manufacturer to be connected to data cables not longer than 3 m, did not be tested.

Test Results:

FOR EN50130-4:2011/A1:2014				
Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT Monitoring mode	Observations (Performance Criterion)
AC port	2.0	Direct	Monitoring	A
Lan line	1.0	Clamp	Monitoring	A
FOR EN 55035 :2017 ;EN 55024:2010/A1:2015				
Lead under Test	Level (±kV)	Coupling Direct/Clamp	EUT Monitoring mode	Observations (Performance Criterion)
AC port	1.0	Direct	Monitoring	A
Lan line	0.5	Clamp	Monitoring	A

Results: Pass

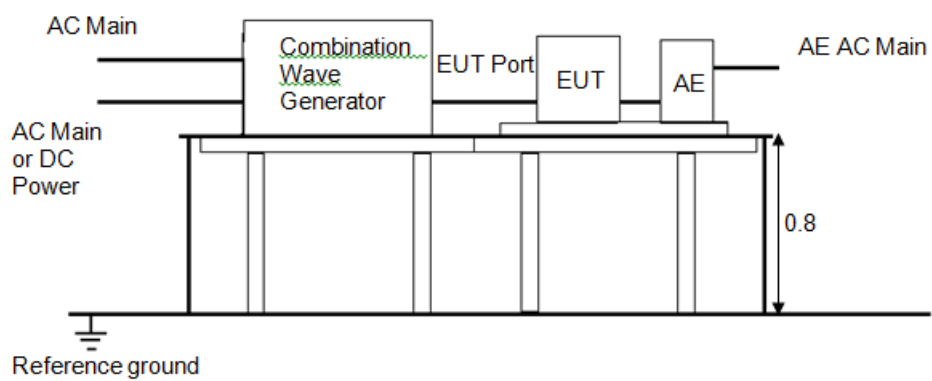
Note:

A: No loss of function.

Test phenomenon description for the EUT:

1. The EUT working is normal, Before the conditioning.
2. No any change in status of the EUT was observed, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

6.2.4 SURGE IMMUNITY

Test Method:	EN 61000-4-5 :2014
Test Level:	FOR EN50130-4:2011/A1:2014 ± 0.5/1.0 kV Line to Line, ± 0.5/1.0 kV Signal port FOR EN 55035 :2017 ;EN 55024:2010/A1:2015 ±1 kV Line-to-Line ± 0.5/1.0 kV Signal port
Polarity:	Positive & Negative
Interval:	60s between each surge
No. of Surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.
EUT Operation:	
Ambient:	Temp.: 23.0 °C Humid.: 55 % Press.: 1012 mbar
Test Mode:	Keep EUT Monitoring continuously
Test Setup:	 <p style="text-align: center;">For AC port</p>
Test Procedure:	<ol style="list-style-type: none"> 1) The EUT was placed on a ground reference plane(GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. 2) The 1.2/50 μs surge was to be applied to the EUT power supply terminals via the capacitive coupling network. Decoupling networks were required in order to avoid possible adverse effects on equipment not under test that may be powered by the same lines and to provide sufficient decoupling impedance to the surge wave so that the specified wave may be applied on the lines under test. 3) The power cord between the EUT and the coupling/decoupling network was not exceed 2 m in length. The interconnection line between the EUT and the coupling/ decoupling network shall not exceed 2 m in length. 4) The EUT was conducted 0.5 kV and 1 kV test voltage for line to line and line to neutral and conducted 0.5 kV, 1 kV and 2 kV test voltage for line to earth and neutral to earth, five positive pulses and five negative pulses each at 0°, 90°, 180° and 270° for a.c. power ports and five positive pulses and five negative surge pulses for d.c. power ports (for telecommunication port, It was



	0.5 kV for indoor cable longer than 10m line to ground and 0.5kV,1kV test voltage for Door cable line to ground, five positive pulses and five negative surge pulses), The test levels were applied on the EUT with a 2 Ω generator source impedance for power supply terminals and 40 Ω output impedance for interconnection lines. The tests were done at repetition rate one per minute.
--	---

**Test Results:**

For mains port:

Pulse No	Line-Line	Level (kV)	Surge Interval	Phase (deg)	Test Mode	Observation (Performance Criterion)
1-5	L-N	+0.5, 1.0	60 s	0°	Monitoring mode	A
6-10	L-N	-0.5, 1.0	60 s	0°		A
11-15	L-N	+0.5, 1.0	60 s	90°		A
16-20	L-N	-0.5, 1.0	60 s	90°		A
21-25	L-N	+0.5, 1.0	60 s	180°		A
26-30	L-N	-0.5, 1.0	60 s	180°		A
31-35	L-N	+0.5, 1.0	60 s	270°		A
36-40	L-N	-0.5, 1.0	60 s	270°		A
41-45	Lan line	-0.5, 1.0	60 s	--		A
46-50	Lan line	+0.5, 1.0	60 s	--		A

For telecommunication port:

Pulse No	Line-Line	Level (kV)	Surge Interval	Test Mode	Observation (Performance Criterion)
1-5	LAN port;	+0.5, 1.0	60 s	Monitoring mode	A
6-10		-0.5, 1.0	60 s		A

Results: Pass

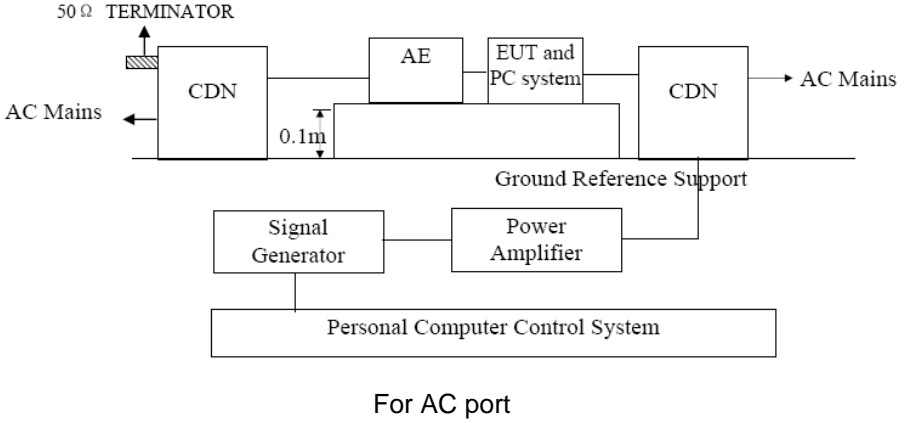
Note:

A: No loss of function.

Test phenomenon description for the EUT:

1. The EUT working is normal, Before the conditioning.
2. No any change in status of the EUT was observed, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

6.2.5 CONDUCTED IMMUNITY

Test Method:	EN 61000-4-6:2014			
Criterion Required:	A			
EUT Operation:				
Ambient:	Temp.:23.0	°C	Humid.: 55	% Press.: 1012 mbar
Test Mode:	Keep EUT Monitoring continuously			
Test Setup:	 <p style="text-align: center;">For AC port</p>			
Test Procedure:	<ol style="list-style-type: none"> 1) The EUT was placed on an insulating support of 0.1m height above a ground reference Plane, arranged and connected to satisfy its functional requirement. All cables exiting the EUT was supported at a height of at least 30 mm above the ground reference plane. 2) The coupling and decoupling devices were required; they were located between 0.1m and 0.3m from the EUT. This distance was to be measured horizontally from the projection of the EUT on to the ground reference plane to the coupling and decoupling device. 3) Each AE, used with clamp injection, shall be placed on an insulating support 0.1m above the ground reference plane. A decoupling network shall be installed on each cable between the EUT and AE except the cable under test. All cables connected to each AE, other than those being connected to the EUT, shall be provided with decoupling networks. The decoupling networks connected to each AE (except those on cables between the EUT and AE) shall be applied no further than 0.3m from the AE. The cable(s) between the AE and the decoupling network (s) or in between the AE and the injection clamp shall not be bundled nor wrapped and shall be kept between 30mm and 50mm above the ground reference plane. 4) The frequency range was swept from 150 kHz to 80MHz, using the signal levels established during the setting process, and with the disturbance signal 80 % amplitude modulated with a 1 kHz sine wave, pausing to adjust the RF signal level or to change coupling devices as necessary. Where the frequency was swept incrementally, the step size does not exceed 1% of the preceding frequency value. The dwell time of the amplitude modulated carrier at each frequency was not less than the time necessary for the EUT to be exercised and to respond, and was not less than 0.5 s. 			

**Test Results:**

For EN 50130-4:2011/A1:2014							
Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Test Mode	Observation (Performance Criterion)
150 kHz to 100 MHz	Main port/Signal port	10V	80%, 1 kHz AM; 1 Hz PM	1%	3s	Keep EUT Monitoring continuously	A/Pass
For EN 55024:2010/A1:2015							
Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Test Mode	Observation (Performance Criterion)
150 kHz to 80 MHz	Main port/Signal port	3V	80%, 1 kHz AM	1%	3s	Keep EUT Monitoring continuously	A/Pass
For EN 55035 :2017							
Frequency	Line	Test Level	Modulation	Step Size	Dwell Time	Test Mode	Observation (Performance Criterion)
150 kHz to 10 MHz	Main port/Signal port	3V	80%, 1 kHz AM	1%	3s	Keep EUT Monitoring continuously	A/Pass
10MHz to 30 MHz	Main port/Signal port	3V	80%, 1 kHz AM	1%	3s	Keep EUT Monitoring continuously	A/Pass
30MHz to 80 MHz	Main port/Signal port	1V	80%, 1 kHz AM	1%	3s	Keep EUT Monitoring continuously	A/Pass

Results: Pass

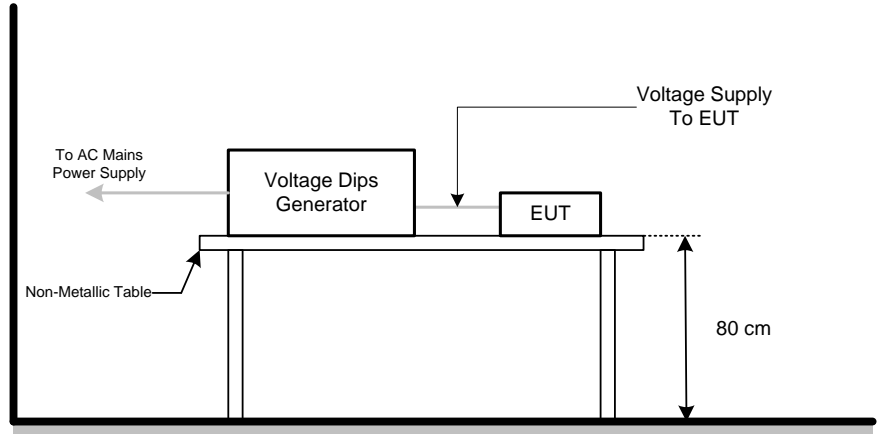
Note:

A: No loss of function.

Test phenomenon description for the EUT:

1. The EUT working is normal, Before the conditioning.
2. No any change in status of the EUT was observed, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

6.2.6 VOLTAGE DIPS AND INTERRUPTIONS

Test Method:	EN 61000-4-11 :2004			
Test Level:	EN 50130-4:2011/A1:2014 80% for 250 Periods 70 % for 25 Periods 40 % for 10 Periods 0% for 250 Periods For EN 55024:2010/A1:2015& EN 55035 :2017 >95 % for 0.5 Periods 30 % for 25 Periods >95 % for 250 Periods			
No. of Dips / Interruptions:	3 per Level			
EUT Operation:				
Ambient:	Temp.: 23.0	°C	Humid.: 55	% Press.:1012 mbar
Test Mode:	Keep EUT Monitoring continuously			
Test Setup:	 <p>The diagram illustrates the test setup. A 'Voltage Dips Generator' is connected to the 'To AC Mains Power Supply' and the 'EUT'. The 'EUT' is placed on a 'Non-Metallic Table' which is 80 cm high. The 'Voltage Supply To EUT' is also shown.</p>			
Test Procedure:	<ol style="list-style-type: none"> 1) The EUT was placed on a ground reference plane (GRP) insulated by an insulating support 0.1 m thick and the GRP was placed on a 0.8m high wooden table for table-top equipment. For floor standing equipment, the EUT was placed on a 0.1m high wooden support above the GRP. 2) The test was performed with the EUT connected to the test generator with the shortest power supply cable as specified by the EUT manufacturer. 3) The EUT was tested for each selected combination of test level and duration with a sequence of three dips /interruptions with intervals of 10 s minimum. Each representative mode of operation was tested. 4) For EUT with more than one power cord, each power cord was tested individually. 			

**Test Results:**

For EN 50130-4:2011/A1:2014						
U _T = AC 100V/60Hz, 240V/50Hz						
Test Level % U _T	Phase	Duration of drop out in Periods	No. of drop out	Time between drop out	Test Mode	Observations (Performance Criterion)
80	0°,180°	250/300	3	10s	Keep EUT Monitoring continuously	A
70	0°,180°	25/30	3	10s		A
40	0°,180°	10	3	10s		A
0	0°,180°	250/300	3	10s		C
For EN 55024:2010/A1:2015& EN 55035 :2017						
U _T = AC 100V/60Hz, 240V/50Hz						
Test Level % U _T	Phase	Duration of drop out in Periods	No. of drop out	Time between drop out	Test Mode	Observations (Performance Criterion)
0	0°,180°	0.5	3	10s	Keep EUT Monitoring continuously	A
70	0°,180°	25/30	3	10s		A
0	0°,180°	250/300	3	10s		C

Not: The EUT powered off and restarted.

Results: Pass

Note:

A: No loss of function.

During the level 100% and duration of 250Periods, the EUT will restart

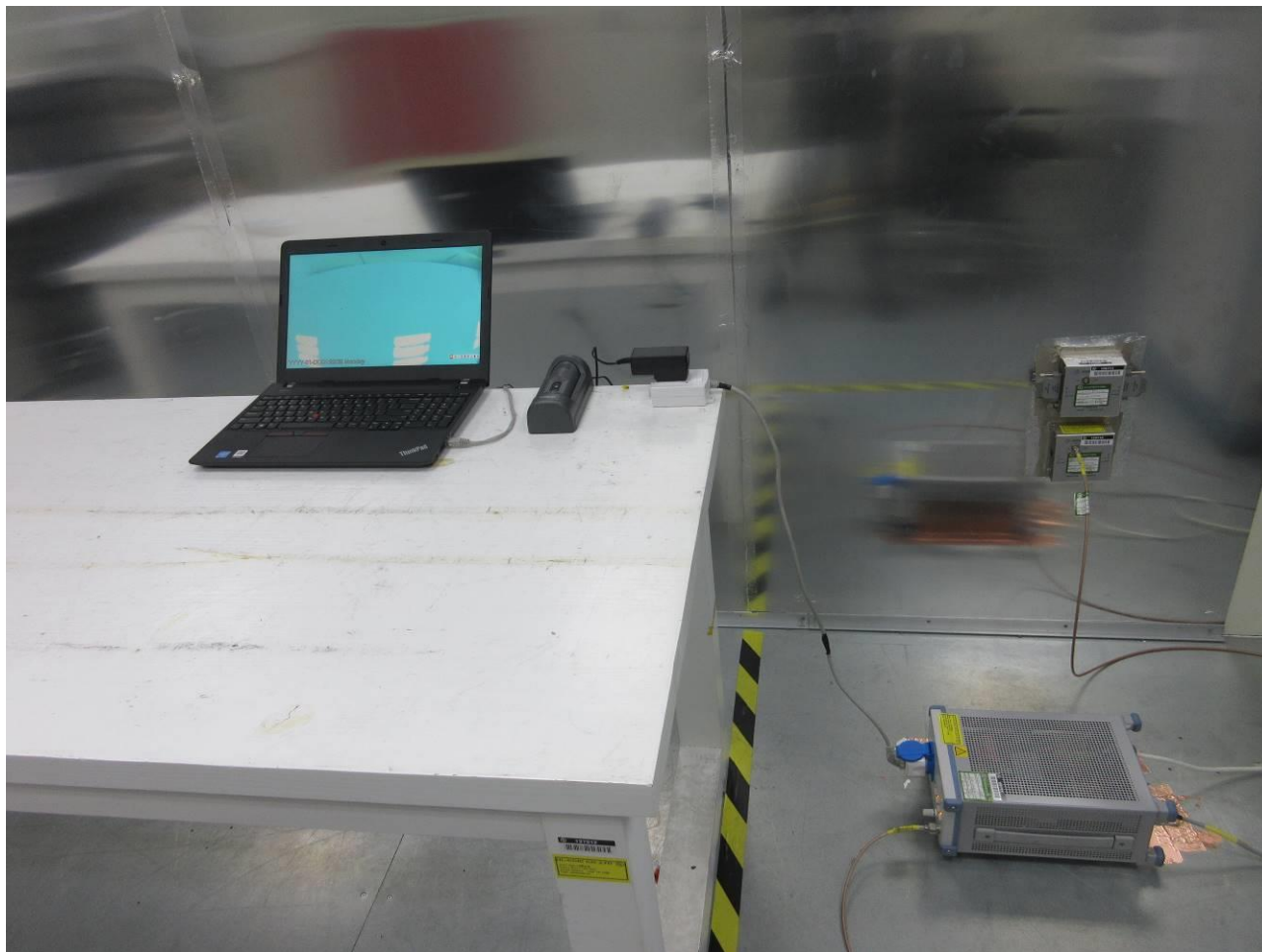
Test phenomenon description for the EUT:

1. The EUT working is normal, Before the conditioning.
2. No any change in status of the EUT was observed, during the conditioning.
3. No degradation in the performance of the EUT was observed, after the conditioning.

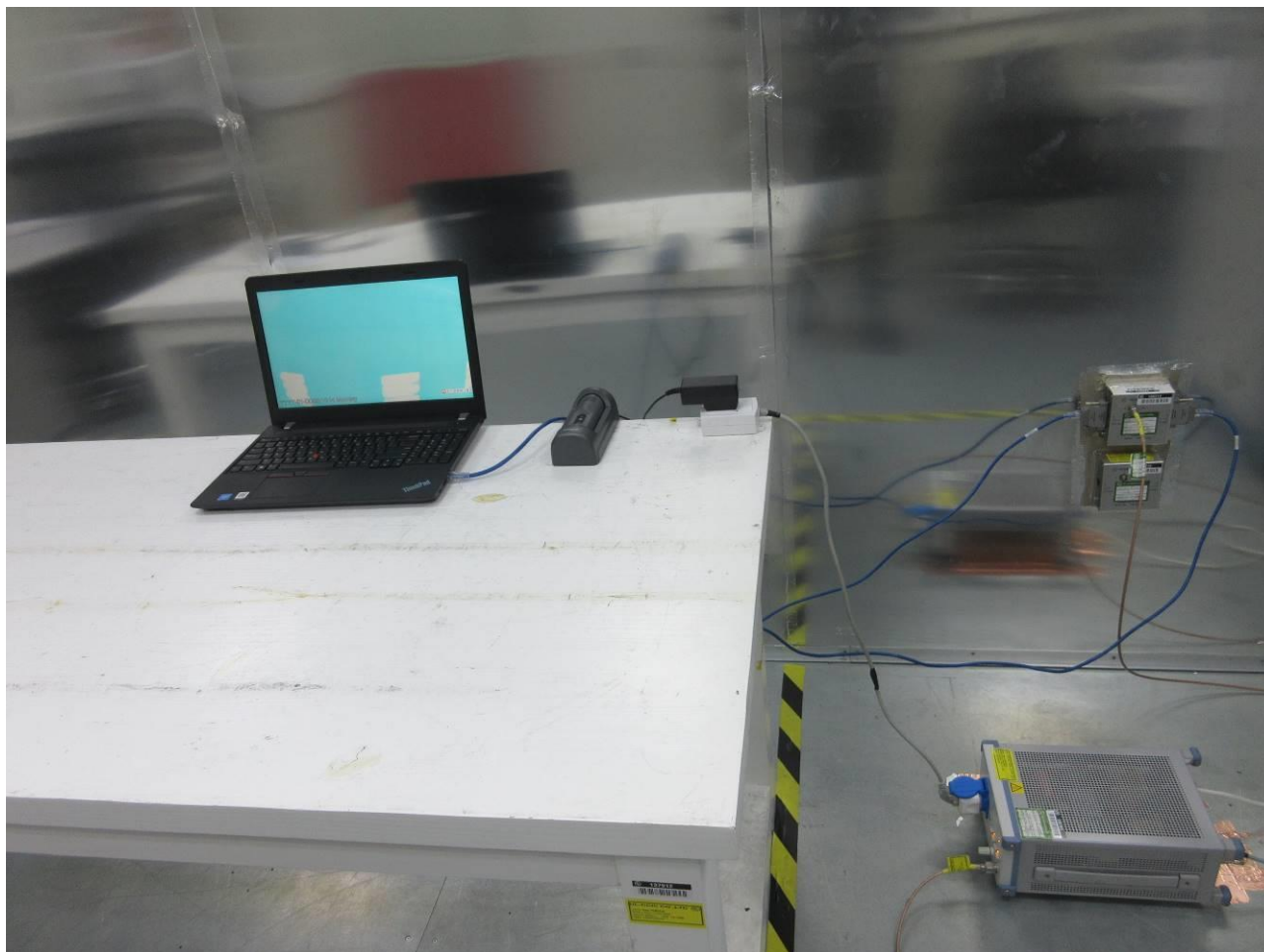
7 PHOTOGRAPHS OF EMC TEST CONFIGURATION

7.1 CONDUCTED EMISSION TEST SETUP

Main port

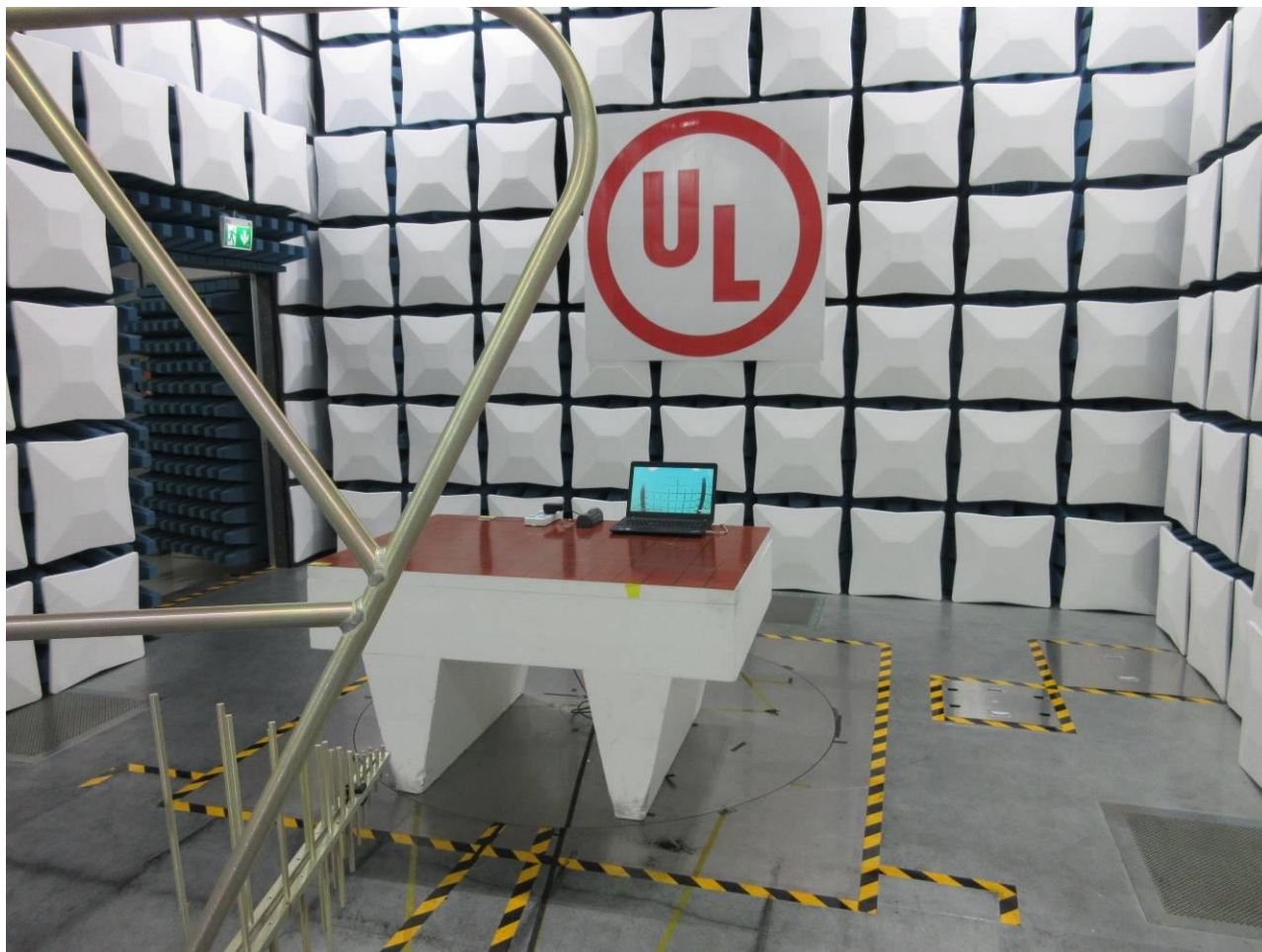


Lan port

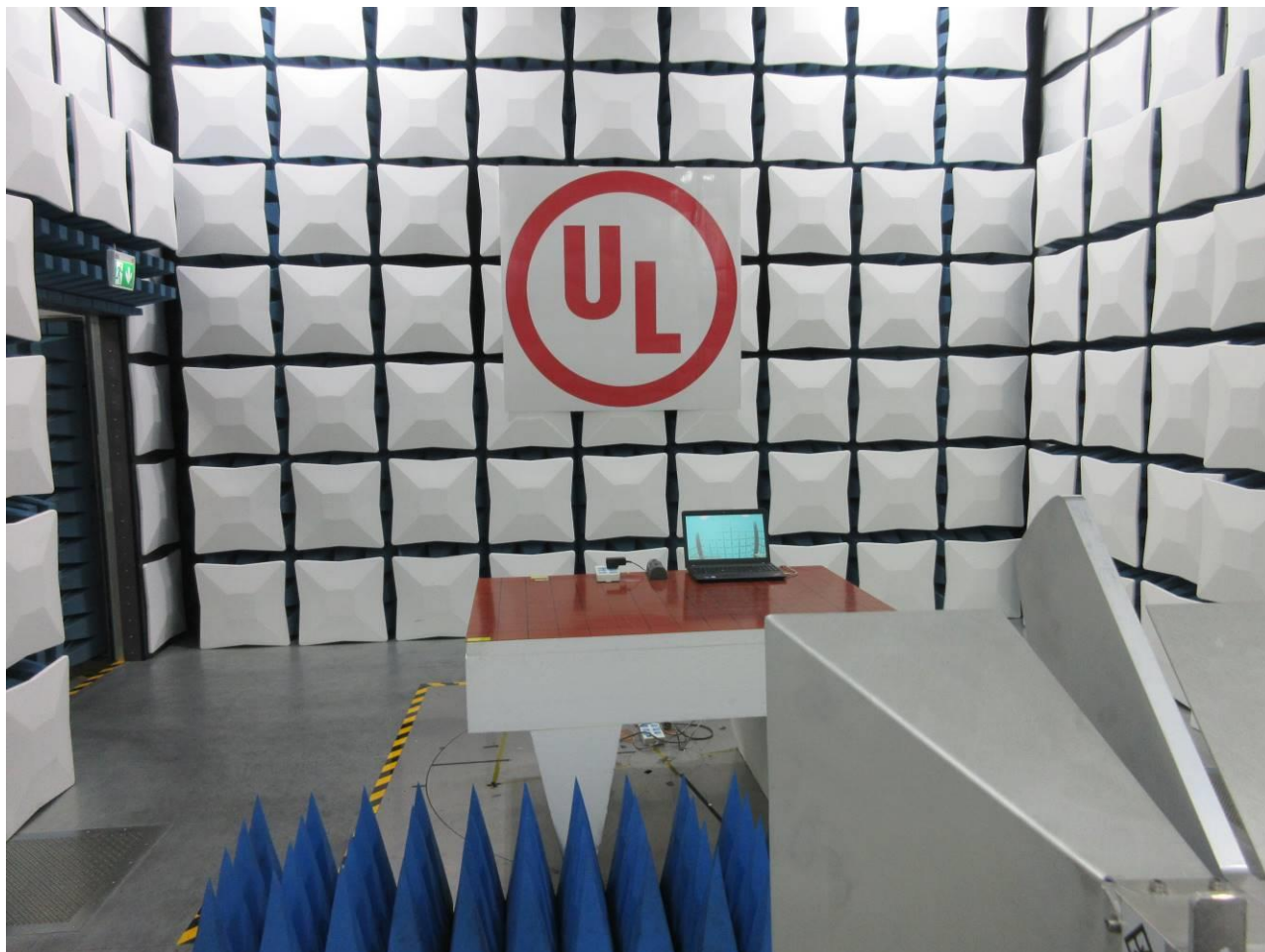


7.2 RADIATED EMISSION TEST SETUP

30MHz ~ 1000MHz



Above 1000MHz



7.3 HARMONIC CURRENT & VOLTAGE FLUCTUATION AND FLICK MEASUREMENT

Flicker



7.4 ESD

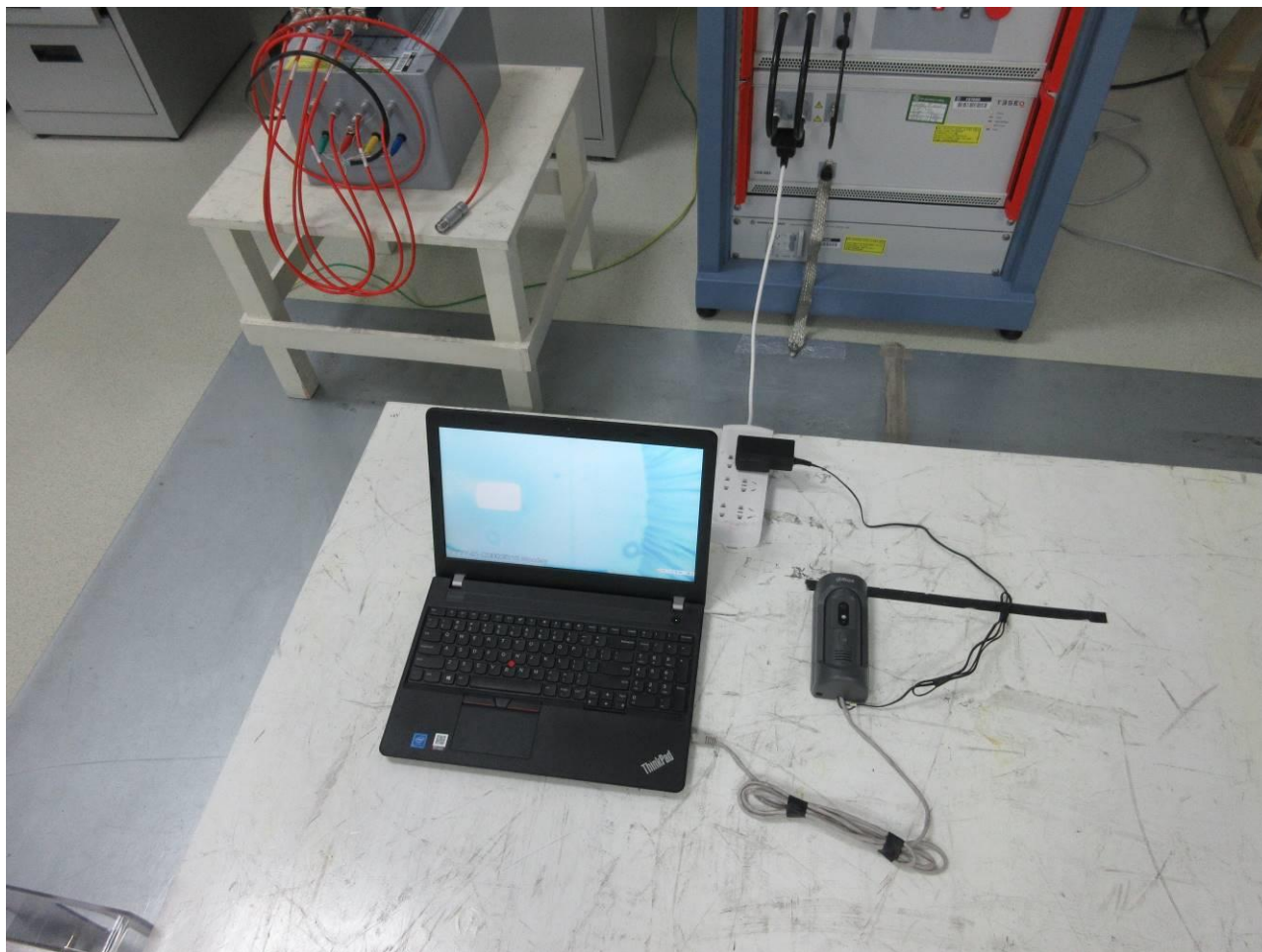


7.5 RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY

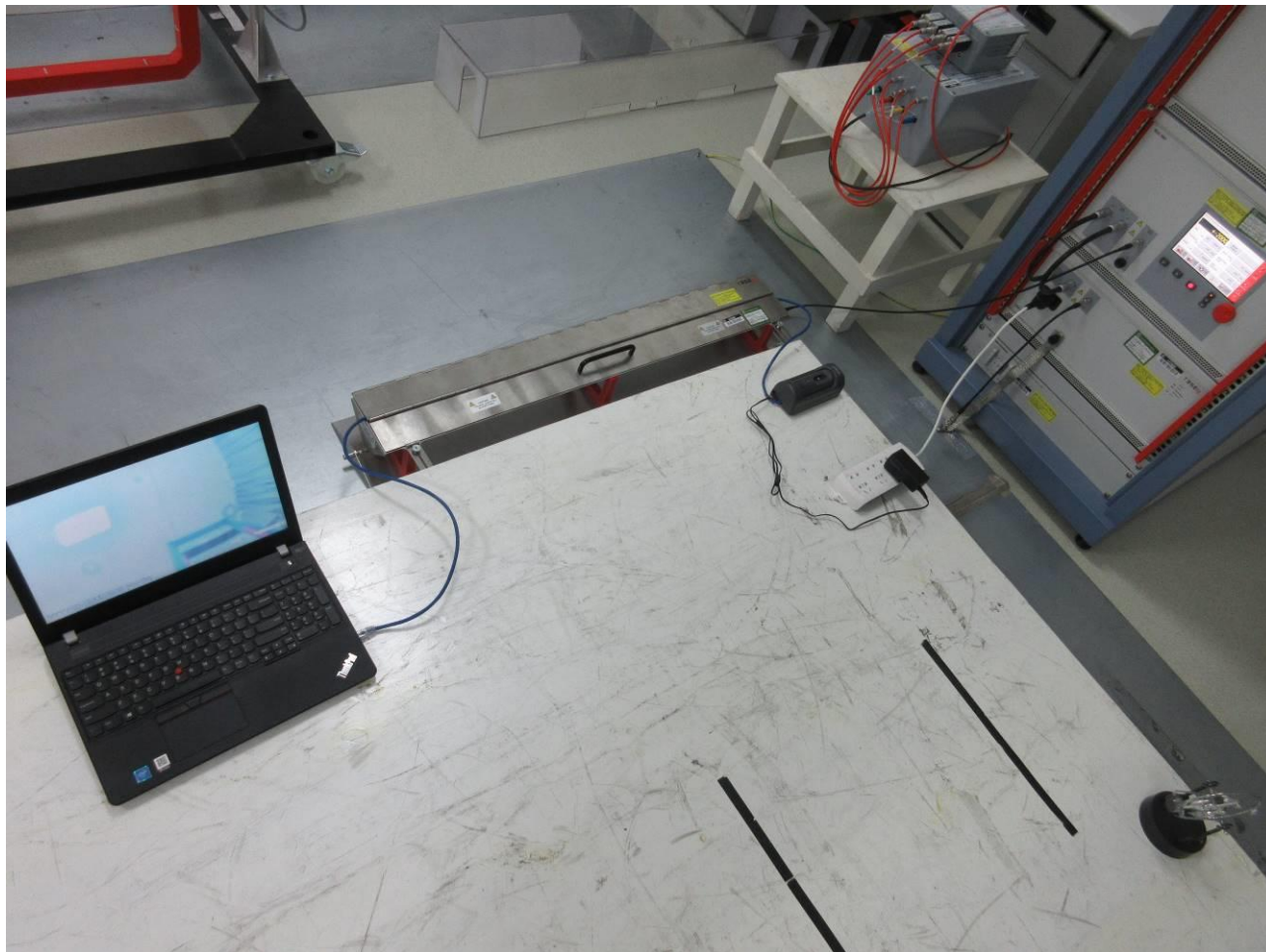


7.6 ELECTRICAL FAST TRANSIENT/BURST

AC Port

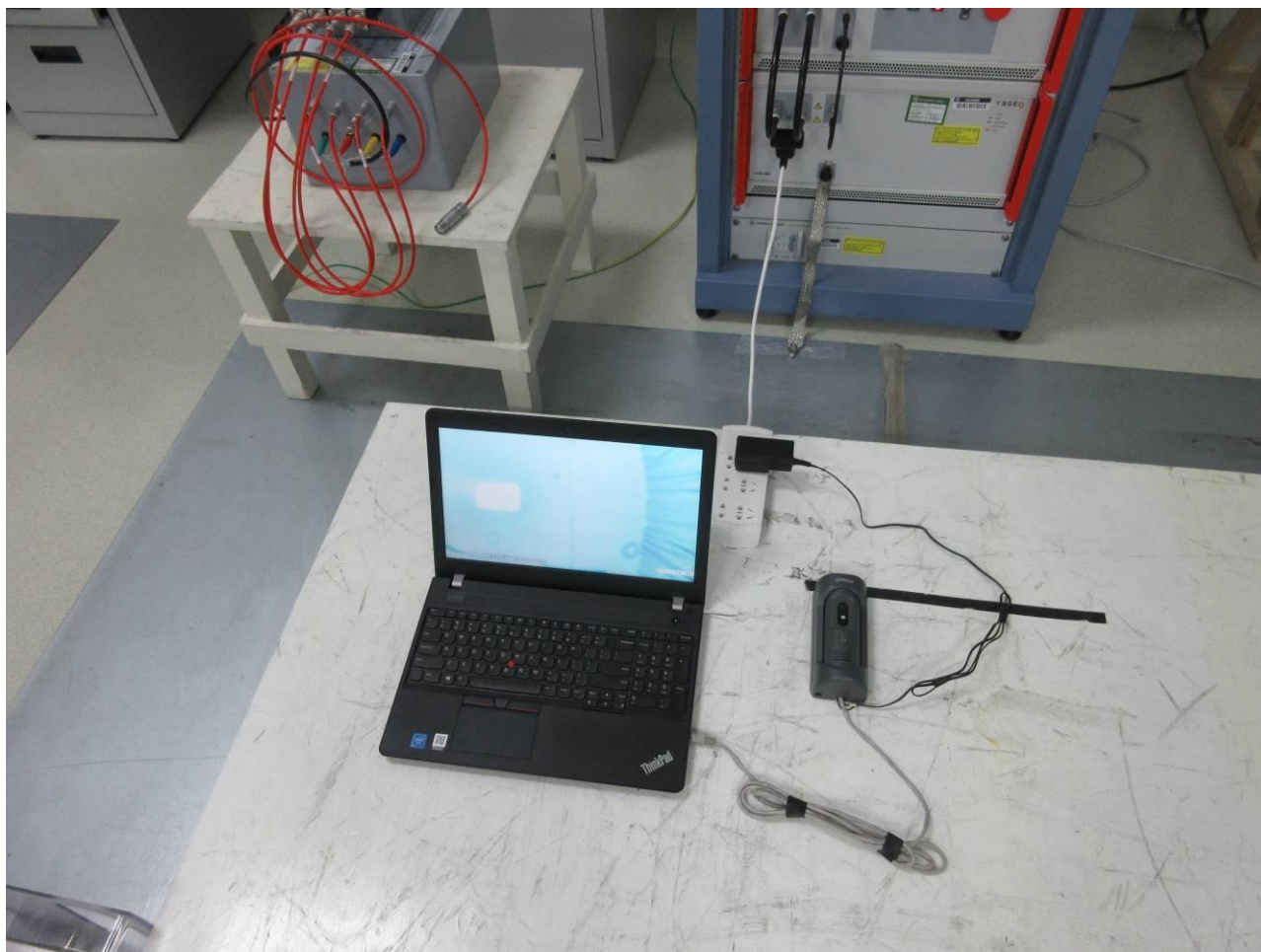


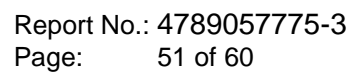
LAN Port



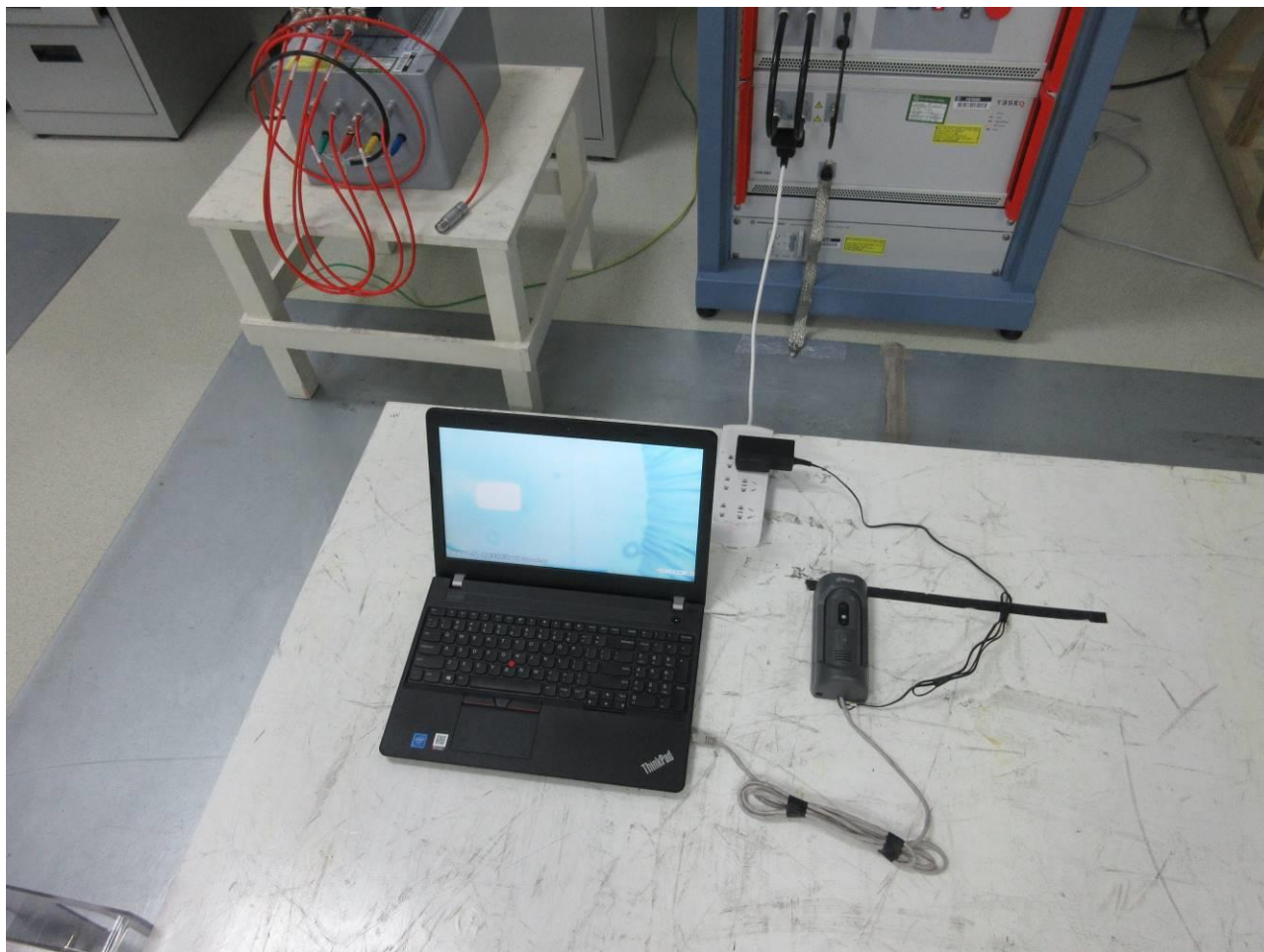
7.7 SURGE IMMUNITY

AC Port





7.8 VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY



7.9 CONDUCTED IMMUNITY

AC Port



Lan Port



8 Photographs of the EUT

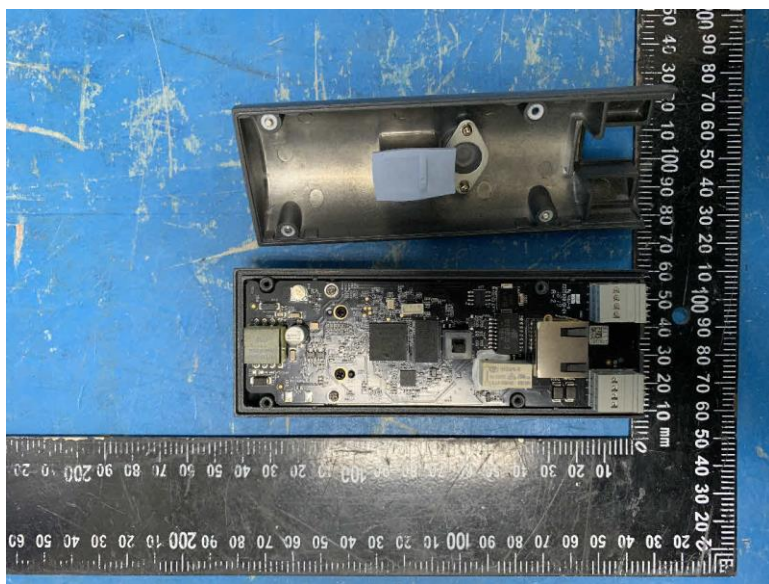
Appearance photo

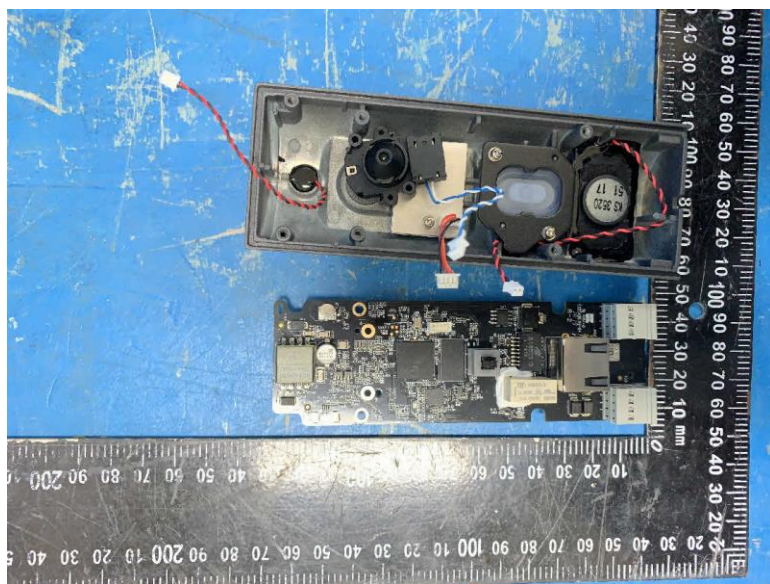
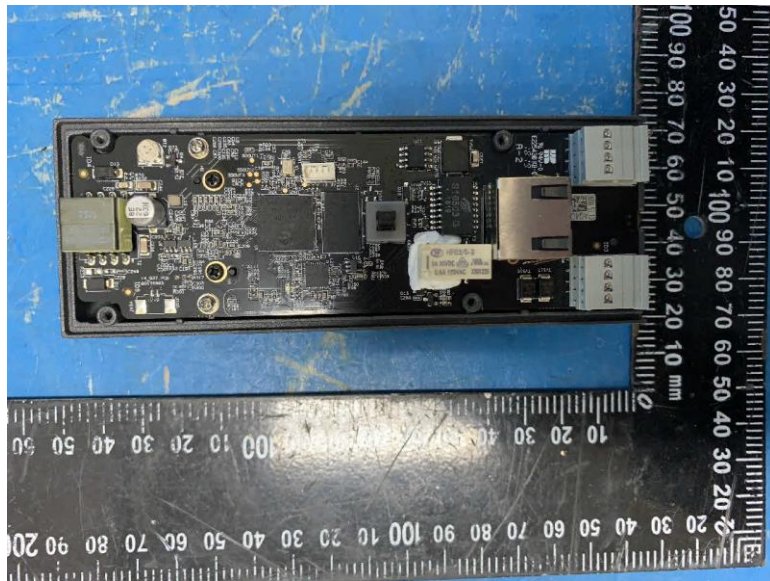


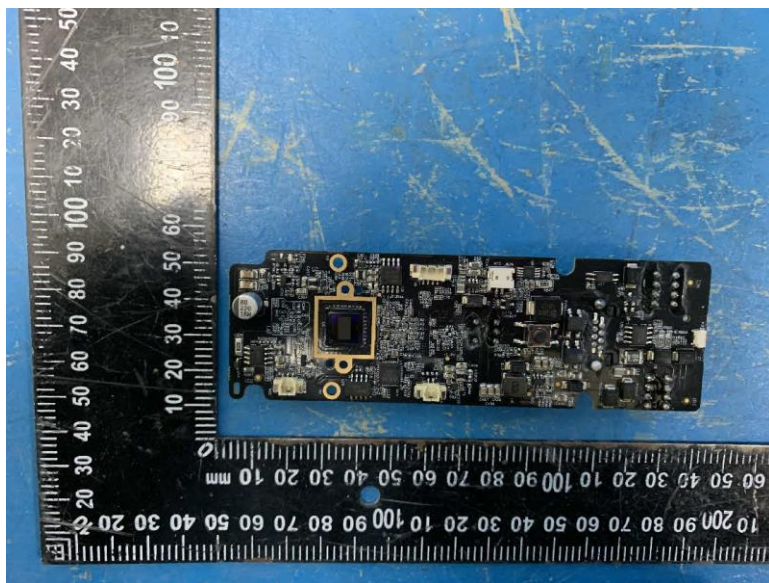
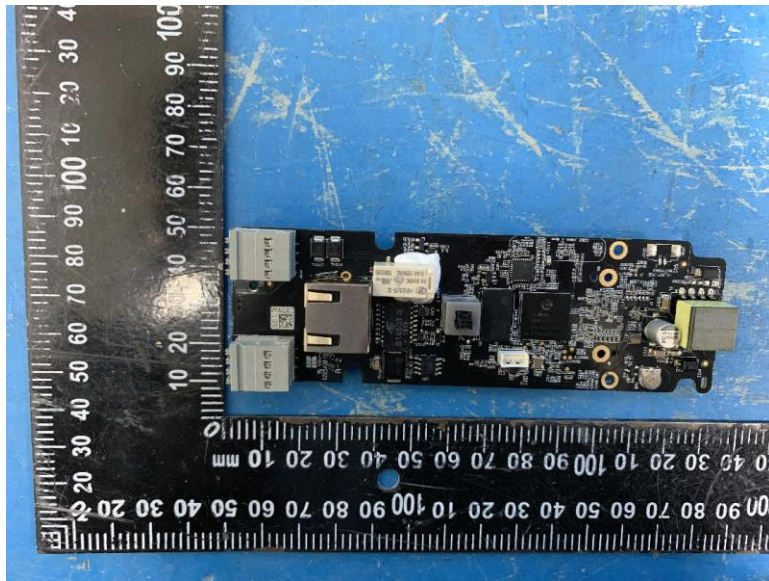


Internal photo









END OF REPORT