



EN 55032
EN 55024
EN 50130-4
EN 61000-3-2
EN 61000-3-3

EMC TEST REPORT

For

VILLA STATION, Wi-Fi Villa Outdoor Station

**MODEL NUMBER: DHI-VTO2111D-WP, DHI-VTO2111D-WP(433), DHI-VTO2111D-WP(868),
DHI-VTO2111D-WP(915), VTO2111D-WP, VTO2111D-WP(433), VTO2111D-WP(868),
VTO2111D-WP(915), DHI-VTO2111D-W, DHI-VTO2111D-W(433), DHI-VTO2111D-W(868),
DHI-VTO2111D-W(915), VTO2111D-W, VTO2111D-W(433), VTO2111D-W(868),
VTO2111D-W(915), DHI-VTO2111D, DHI-VTO2111D(433), DHI-VTO2111D(868),
DHI-VTO2111D(915), VTO2111D, VTO2111D(433), VTO2111D(868), VTO2111D(915),
DH-VTO2111D, DH-VTO2111D(433), OEM-VTO2111D, OEM-VTO2111D(433),
DH-VTO2111D-W, DH-VTO2111D-W(433), OEM-VTO2111D-W, OEM-VTO2111D-W(433)
And
DHI-VTO2111D-WP(433)-S1, VTO2111D-WP(433)-S1, DHI-VTO2111D-WP-S1, VTO2111D-
WP-S1**

REPORT NUMBER: 4789057767-1

ISSUE DATE: June 26, 2019

Prepared for

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Revision History

<u>Rev.</u>	<u>Issue Date</u>	<u>Revisions</u>	<u>Revised By</u>
V0	6/26/2019	Initial Issue	



Test Summary

Electromagnetic Interference (EMI)

EN 55032: 2015

EN 61000-3-2:2014

EN 61000-3-3:2013

Test Items	Test Method	Reference Clause	Result
Radiated Emission	EN 55032: 2015	CISPR 16-2-1:2014	PASS
Conducted Emission	EN 55032: 2015	CISPR 16-2-3: 2010+A1:2010+A2:2 014	PASS
Harmonic Emission on AC	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)

EN 50130-4:2011/A1:2014

EN 55024:2010/A1:2015

ESD	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-2:2009	PASS
Radiated Immunity	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-3:2006 +A1:2008+A2:2010	PASS
Electrical Fast Transients (EFT) on AC	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-4:2012	PASS
Surge Immunity on AC	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-5:2014	PASS
Conducted Immunity on AC	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-6:2014	PASS
Power Frequency Magnetic Field	EN 55024:2010/A1:2015	EN 61000-4-8:2010	N/A
Voltage Dips and Interruptions on AC	EN 50130-4:2011/A1:2014 EN 55024:2010/A1:2015	EN 61000-4-11:2004	PASS

Note 1, N/A is an abbreviation for Not Applicable.

Note 2,

The model, DHI-VTO2111D-WP(433)-S1, VTO2111D-WP(433)-S1, DHI-VTO2111D-WP-S1, VTO2111D-WP-S1, according to the confirmation from the applicant, since the electrical circuit design, layout, components used and internal wiring were identical for the original models, only difference being the item numbers.

Except the model DHI-VTO2111D-WP(433)-S1, VTO2111D-WP(433)-S1, DHI-VTO2111D-WP-S1, VTO2111D-WP-S1, Others listing models in page 1 of this report, the detail test status, please refer the test report (report no.: 4788746763-137), which was issued on November 21, 2018.

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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 Information

EUT Name: VILLA STATION, Wi-Fi Villa Outdoor Station
Model: DHI-VTO2111D-WP, DHI-VTO2111D-WP(433), DHI-VTO2111D-WP(868), DHI-VTO2111D-WP(915), VTO2111D-WP, VTO2111D-WP(433), VTO2111D-WP(868), VTO2111D-WP(915), DHI-VTO2111D-W, DHI-VTO2111D-W(433), DHI-VTO2111D-W(868), DHI-VTO2111D-W(915), VTO2111D-W, VTO2111D-W(433), VTO2111D-W(868), VTO2111D-W(915), DHI-VTO2111D, DHI-VTO2111D(433), DHI-VTO2111D(868), DHI-VTO2111D(915), VTO2111D, VTO2111D(433), VTO2111D(868), VTO2111D(915), DH-VTO2111D, DH-VTO2111D(433), OEM-VTO2111D, OEM-VTO2111D(433), DH-VTO2111D-W, DH-VTO2111D-W(433), OEM-VTO2111D-W, OEM-VTO2111D-W(433)
And DHI-VTO2111D-WP(433)-S1, VTO2111D-WP(433)-S1, DHI-VTO2111D-WP-S1, VTO2111D-WP-S1

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



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2 TEST METHODOLOGY

All tests were performed in accordance with the standard EN 55032, EN 55024, EN 61000-3-2, EN 61000-3-3 and EN 50130-4.

3 ACCREDITATION

Accreditation Certificate	<p>A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p>FCC (FCC Recognized No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules</p> <p>IC(Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.</p>
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4 MEASURING EQUIPMENT AND SOFTWARE USED

All measuring equipment and software used are referred to the original report (report no.: 4788746763-137).

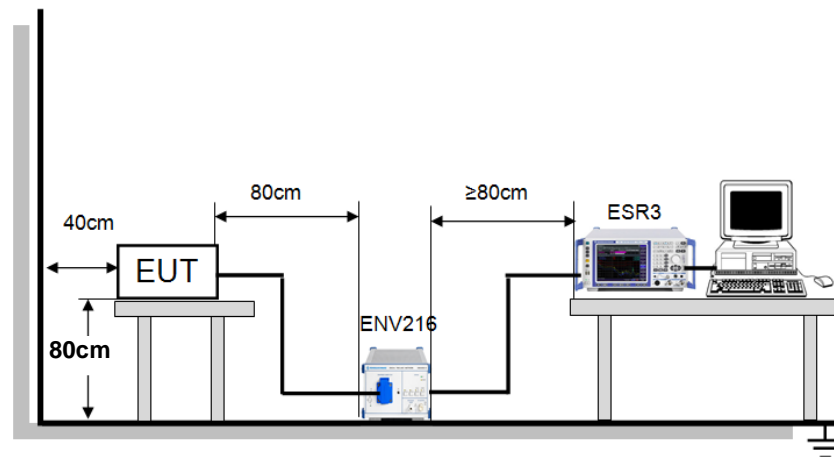


5 ELECTROMAGNETIC COMPATIBILITY (EMC)

5.1 ELECTROMAGNETIC INTERFERENCE (EMI)

5.1.1 CONDUCTED EMISSION

Test Method:	EN 55032																										
Detector:	Peak for pre-scan (9kHz Resolution Bandwidth)																										
	Quasi-Peak if maximized peak within 6dB of Quasi-Peak limit																										
Limit:	<p>Limits for conducted disturbance at the mains ports of class B</p> <table><tr><th rowspan="2">Frequency Range (MHz)</th><th colspan="2">Class B Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15 to 0.50</td><td>66 to 56</td><td>56 to 46</td></tr><tr><td>0.50 to 5</td><td>56</td><td>46</td></tr><tr><td>5 to 30</td><td>60</td><td>50</td></tr></table> <p>NOTE 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.</p> <p>NOTE 2: The lower limit is applicable at the transition frequency.</p> <p>Limits for conducted disturbance at the wired network ports of class B</p> <table><tr><th rowspan="2">Frequency Range (MHz)</th><th colspan="2">Class B Limit (dBuV)</th></tr><tr><th>Quasi-peak</th><th>Average</th></tr><tr><td>0.15 to 0.50</td><td>84 to 74</td><td>74 to 64</td></tr><tr><td>0.50 to 30</td><td>74</td><td>64</td></tr></table>		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	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
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																									
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 Setup:

Test Procedure:

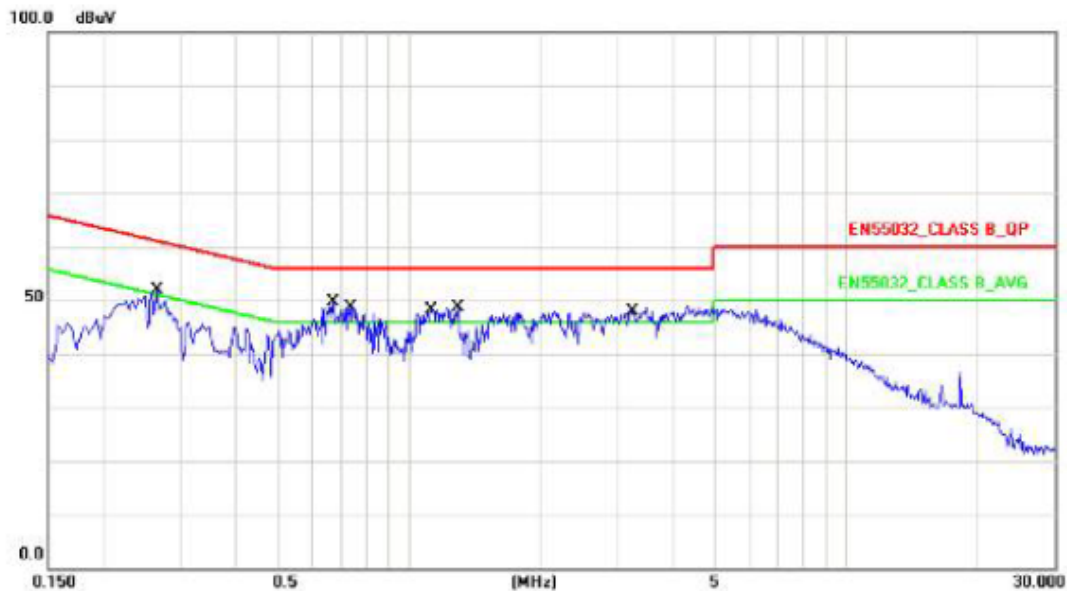
- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a $50\Omega/50\mu\text{H} + 5\Omega$ linear impedance. The power cables of all other units of the EUT 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.
- 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.
- 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 LISNs 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.



Measurement Data

Conducted Emission for Power Port Test Data

Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Phase :	LINE
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03

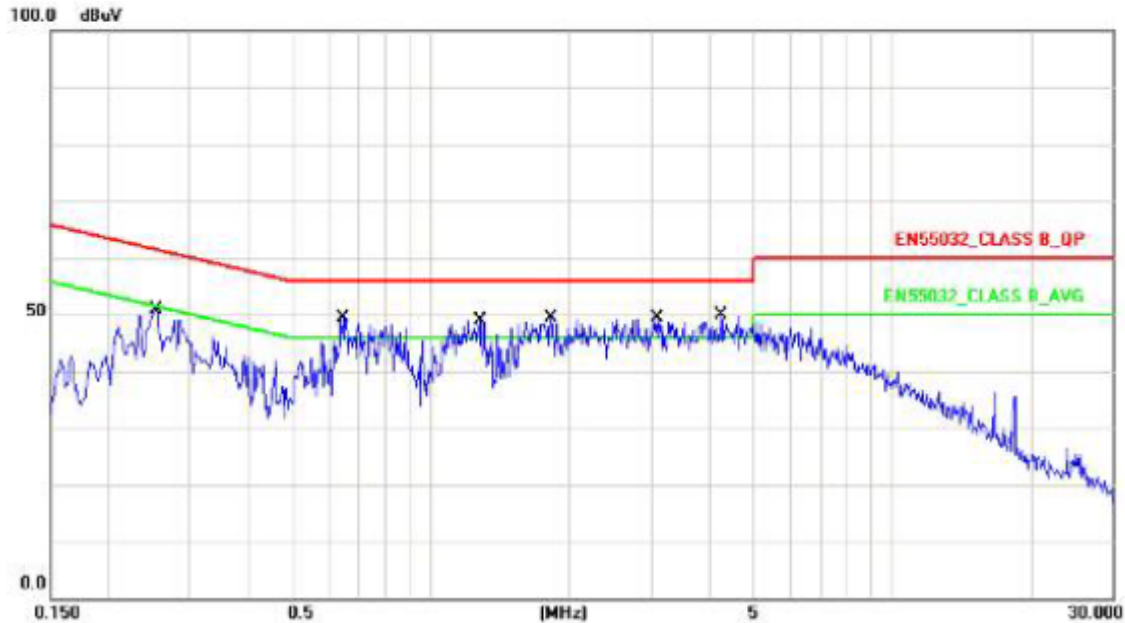


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2660	10.13	38.53	48.66	61.24	-12.58	QP
2	0.2660	10.13	28.85	38.98	51.24	-12.26	AVG
3	0.6740	10.15	37.14	47.29	56.00	-8.71	QP
4	0.6740	10.15	27.39	37.54	46.00	-8.46	AVG
5	0.7420	10.14	36.62	46.76	56.00	-9.24	QP
6	0.7420	10.14	27.13	37.27	46.00	-8.73	AVG
7	1.1260	10.16	36.36	46.52	56.00	-9.48	QP
8	1.1260	10.16	27.25	37.41	46.00	-8.59	AVG
9	1.3020	10.16	35.09	45.25	56.00	-10.75	QP
10	1.3020	10.16	26.24	36.40	46.00	-9.60	AVG
11	3.2460	10.19	34.62	44.81	56.00	-11.19	QP
12	3.2460	10.19	25.86	36.05	46.00	-9.95	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Phase :	NEUTRAL
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03

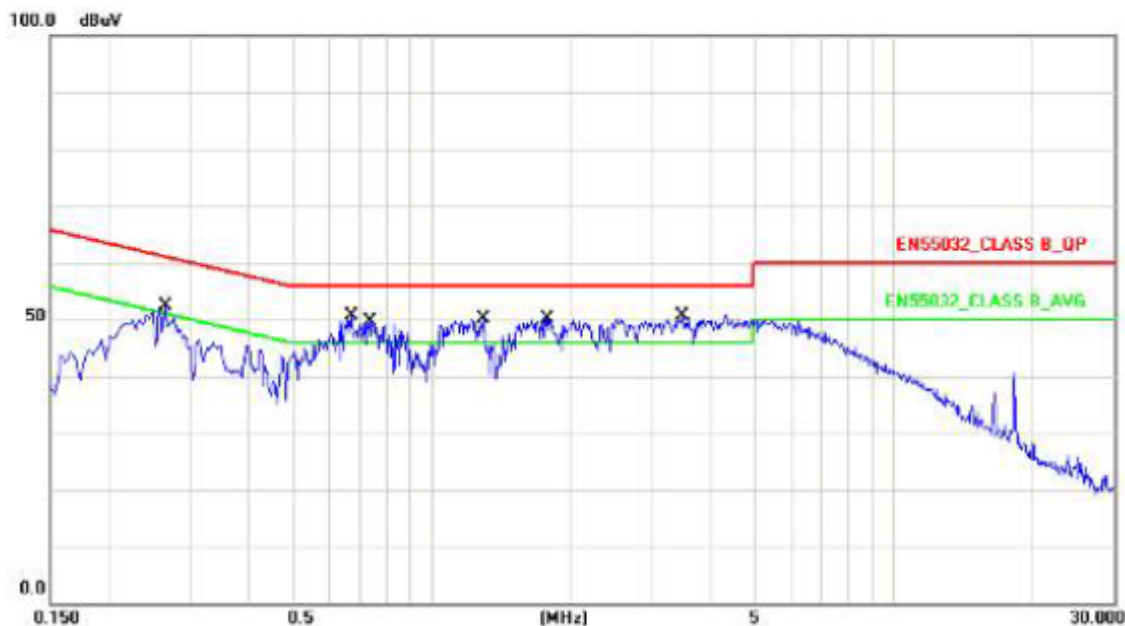


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2540	10.13	34.64	44.77	61.62	-16.85	QP
2	0.2540	10.13	23.61	33.74	51.62	-17.88	AVG
3	0.6460	10.16	33.04	43.20	56.00	-12.80	QP
4	0.6460	10.16	23.03	33.19	46.00	-12.81	AVG
5	1.2780	10.18	32.55	42.73	56.00	-13.27	QP
6	1.2780	10.18	22.39	32.57	46.00	-13.43	AVG
7	1.8260	10.18	30.93	41.11	56.00	-14.89	QP
8	1.8260	10.18	20.57	30.75	46.00	-15.25	AVG
9	3.0940	10.20	30.81	41.01	56.00	-14.99	QP
10	3.0940	10.20	21.92	32.12	46.00	-13.88	AVG
11	4.2619	10.24	30.48	40.72	56.00	-15.28	QP
12	4.2619	10.24	21.64	31.88	46.00	-14.12	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Phase :	LINE
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03

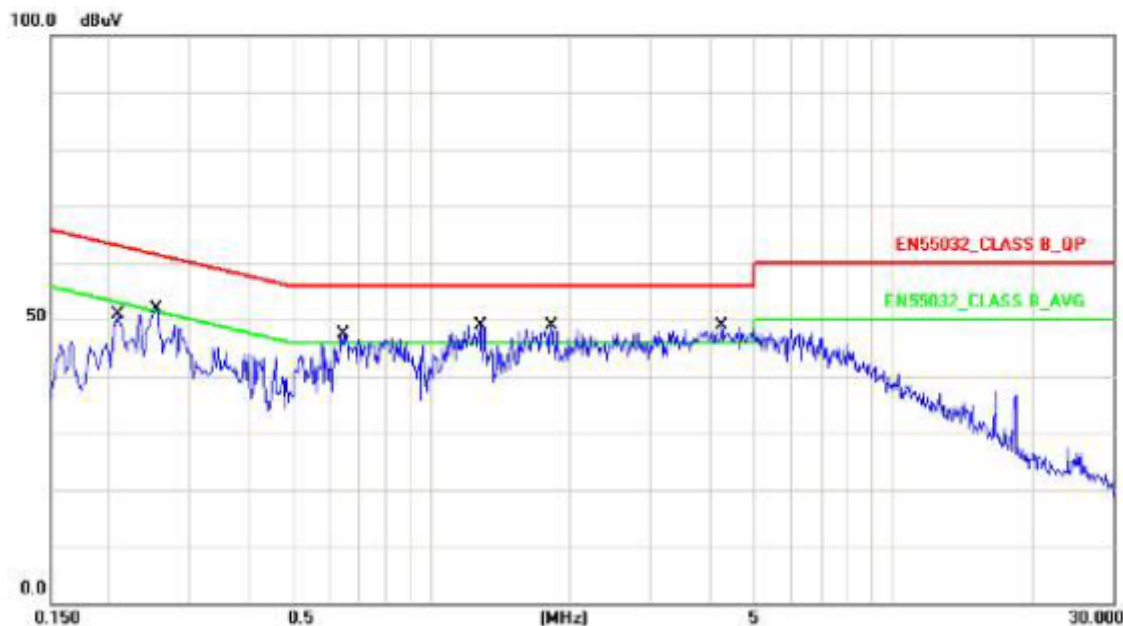


No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2660	10.13	38.33	48.46	61.24	-12.78	QP
2	0.2660	10.13	28.91	39.04	51.24	-12.20	AVG
3	0.6740	10.15	37.66	47.81	56.00	-8.19	QP
4	0.6740	10.15	27.54	37.69	46.00	-8.31	AVG
5	0.7420	10.14	36.03	46.17	56.00	-9.83	QP
6	0.7420	10.14	27.10	37.24	46.00	-8.76	AVG
7	1.3020	10.16	35.41	45.57	56.00	-10.43	QP
8	1.3020	10.16	26.27	36.43	46.00	-9.57	AVG
9	1.7900	10.17	34.76	44.93	56.00	-11.07	QP
10	1.7900	10.17	26.03	36.20	46.00	-9.80	AVG
11	3.5060	10.20	34.26	44.46	56.00	-11.54	QP
12	3.5060	10.20	25.62	35.82	46.00	-10.18	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Phase :	NEUTRAL
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2100	10.13	31.90	42.03	63.20	-21.17	QP
2	0.2100	10.13	21.64	31.77	53.20	-21.43	AVG
3	0.2540	10.13	34.70	44.83	61.62	-16.79	QP
4	0.2540	10.13	24.00	34.13	51.62	-17.49	AVG
5	0.6460	10.16	32.97	43.13	56.00	-12.87	QP
6	0.6460	10.16	23.02	33.18	46.00	-12.82	AVG
7	1.2780	10.18	32.56	42.74	56.00	-13.26	QP
8	1.2780	10.18	22.58	32.76	46.00	-13.24	AVG
9	1.8260	10.18	31.13	41.31	56.00	-14.69	QP
10	1.8260	10.18	20.29	30.47	46.00	-15.53	AVG
11	4.2619	10.24	30.22	40.46	56.00	-15.54	QP
12	4.2619	10.24	21.52	31.76	46.00	-14.24	AVG

Note: Measurement Level = Reading Level + Correct Factor



Conducted Emission for Telecommunication Port Test Data

Test Mode :	Mode 1: Normal Operation(LAN 100Mbps) (110V/60Hz)		
AC Power :	AC 110V/60Hz	Phase :	100Mbps
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26°C	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2500	19.62	34.62	54.24	79.75	-25.51	QP
2	0.2500	19.62	21.87	41.49	69.75	-28.26	AVG
3	0.6580	19.57	32.39	51.96	74.00	-22.04	QP
4	0.6580	19.57	21.51	41.08	64.00	-22.92	AVG
5	2.4700	19.28	31.08	50.36	74.00	-23.64	QP
6	2.4700	19.28	18.77	38.05	64.00	-25.95	AVG
7	5.4820	19.63	33.60	53.23	74.00	-20.77	QP
8	5.4820	19.63	25.14	44.77	64.00	-19.23	AVG
9	8.5340	19.53	30.32	49.85	74.00	-24.15	QP
10	8.5340	19.53	25.58	45.11	64.00	-18.89	AVG
11	16.2300	19.33	36.76	56.09	74.00	-17.91	QP
12	16.2300	19.33	31.50	50.83	64.00	-13.17	AVG

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(LAN 100Mbps) (230V/50Hz)		
AC Power :	AC 230V/50Hz	Phase :	100Mbps
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temperature :	26℃	Humidity :	54%
Pressure(mbar) :	1002	Date :	2016/08/03



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector
1	0.2980	19.62	33.26	52.88	78.30	-25.42	QP
2	0.2980	19.62	20.14	39.76	68.30	-28.54	AVG
3	0.5940	19.58	33.25	52.83	74.00	-21.17	QP
4	0.5940	19.58	21.74	41.32	64.00	-22.68	AVG
5	0.6740	19.57	36.91	56.48	74.00	-17.52	QP
6	0.6740	19.57	24.58	44.15	64.00	-19.85	AVG
7	5.7819	19.58	28.76	48.34	74.00	-25.66	QP
8	5.7819	19.58	22.31	41.89	64.00	-22.11	AVG
9	16.2260	19.33	36.12	55.45	74.00	-18.55	QP
10	16.2260	19.33	35.92	55.25	64.00	-8.75	AVG
11	23.1299	19.73	39.41	59.14	74.00	-14.86	QP
12	23.1299	19.73	31.07	50.80	64.00	-13.20	AVG

Note: Measurement Level = Reading Level + Correct Factor

5.1.2 RADIATED EMISSION

Test Method:	EN 55032		
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:

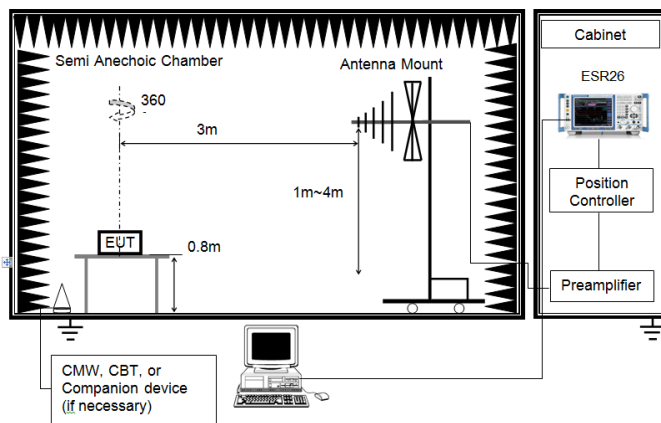


Figure 1. 30MHz to 1GHz

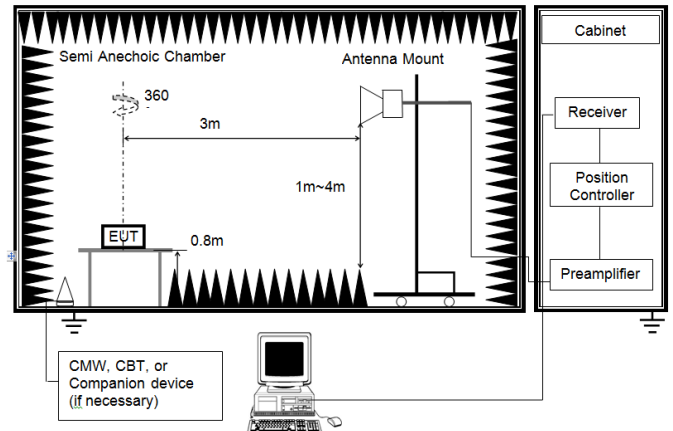


Figure 2. Above 1 GHz

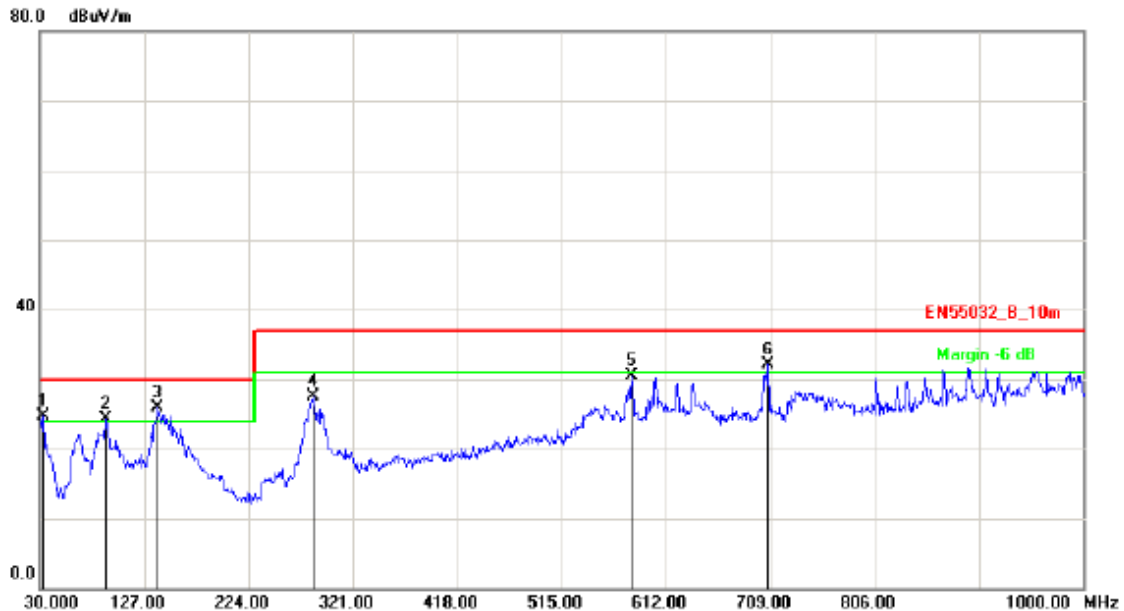
Test Procedure:

- From 30 MHz to 1GHz test procedure as below:
 - The radiated emissions were tested in a semi-anechoic chamber.
 - The EUT is placed on a turntable, which is 0.8m above ground plane.
 - The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
 - EUT is set 3m away from the receiving antenna, which is moved from 1m to 4m to find out the maximum emissions.
 - Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
 - And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
 - Repeat above procedures until the measurements for all frequencies are complete.
- Above 1GHz test procedure as below:
 - Different between above is the test site, change from Semi- Anechoic Chamber to fully Anechoic Chamber.

Measurement Data:

30MHz ~ 1000MHz

Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Horizontal
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16

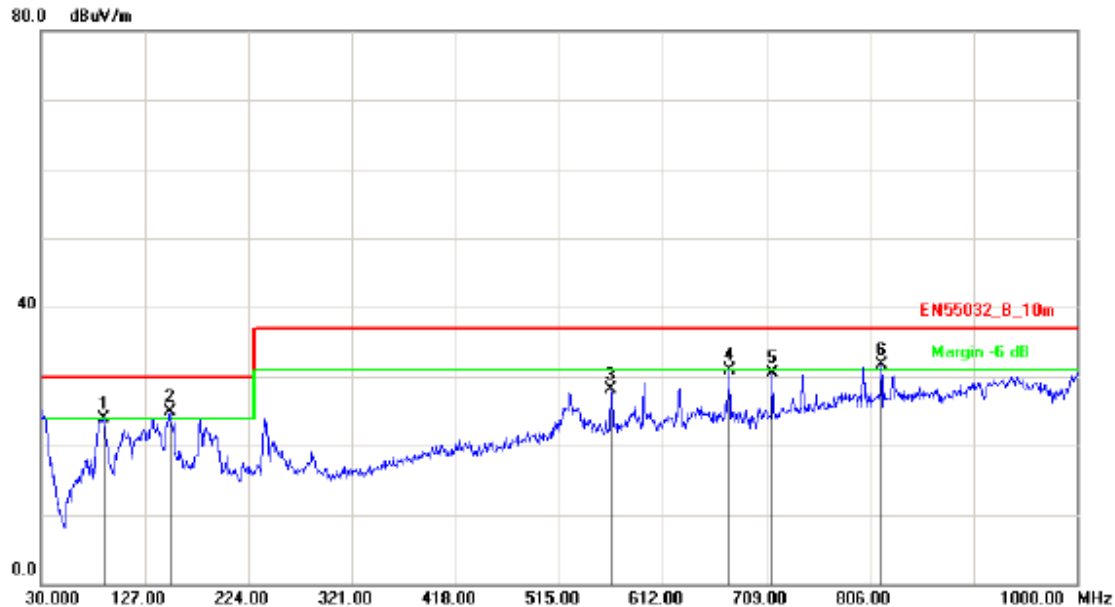


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	32.9099	-5.36	30.08	24.72	30.00	-5.28	QP	100	27
2	91.1099	-16.03	40.27	24.24	30.00	-5.76	QP	400	128
3	139.6100	-10.40	36.40	26.00	30.00	-4.00	QP	100	0
4	284.1399	-8.82	36.37	27.55	37.00	-9.45	QP	400	248
5	579.9900	-1.52	32.00	30.48	37.00	-6.52	QP	100	51
6	707.0599	0.00	32.10	32.10	37.00	-4.90	QP	400	336

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Vertical
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	89.1700	-16.30	40.15	23.85	30.00	-6.15	QP	100	214
2	150.2800	-10.65	35.57	24.92	30.00	-5.08	QP	400	95
3	563.5000	-1.81	29.90	28.09	37.00	-8.91	QP	100	336
4	675.0498	-0.13	31.07	30.94	37.00	-6.06	QP	100	2
5	714.8200	0.20	30.27	30.47	37.00	-6.53	QP	400	157
6	816.6698	2.29	29.47	31.76	37.00	-5.24	QP	100	1

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Horizontal
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16

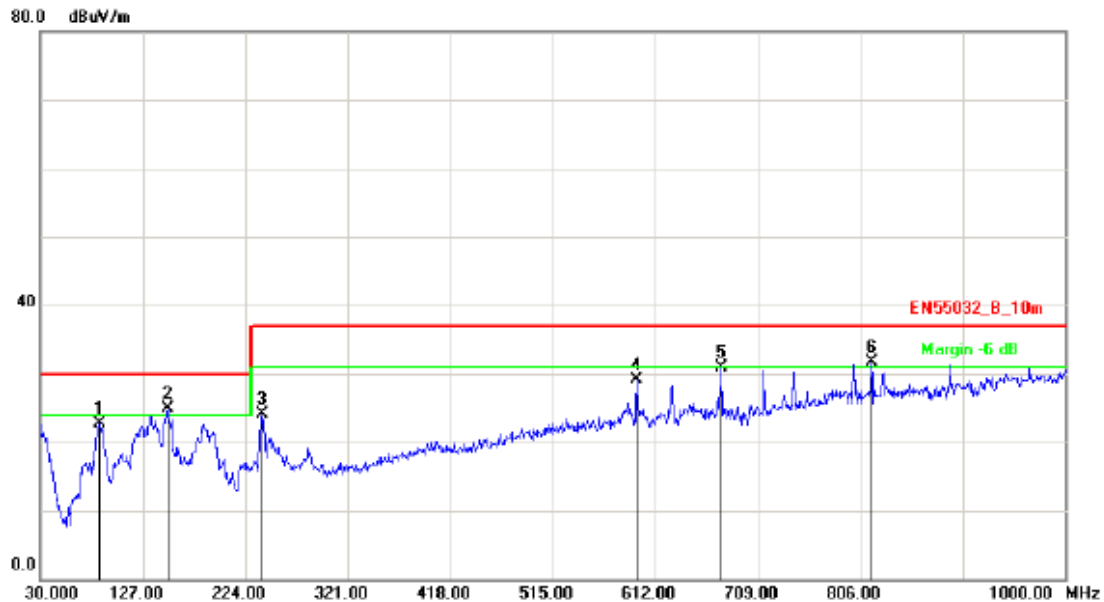


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	32.9099	-5.36	29.08	23.72	30.00	-6.28	QP	100	329
2	144.4600	-10.52	37.52	27.00	30.00	-3.00	QP	100	116
3	284.1399	-8.82	33.37	24.55	37.00	-12.45	QP	400	246
4	602.2998	-1.21	30.99	29.78	37.00	-7.22	QP	100	245
5	893.2999	3.36	28.75	32.11	37.00	-4.89	QP	100	2
6	909.7898	3.61	28.39	32.00	37.00	-5.00	QP	400	1

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Vertical
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16



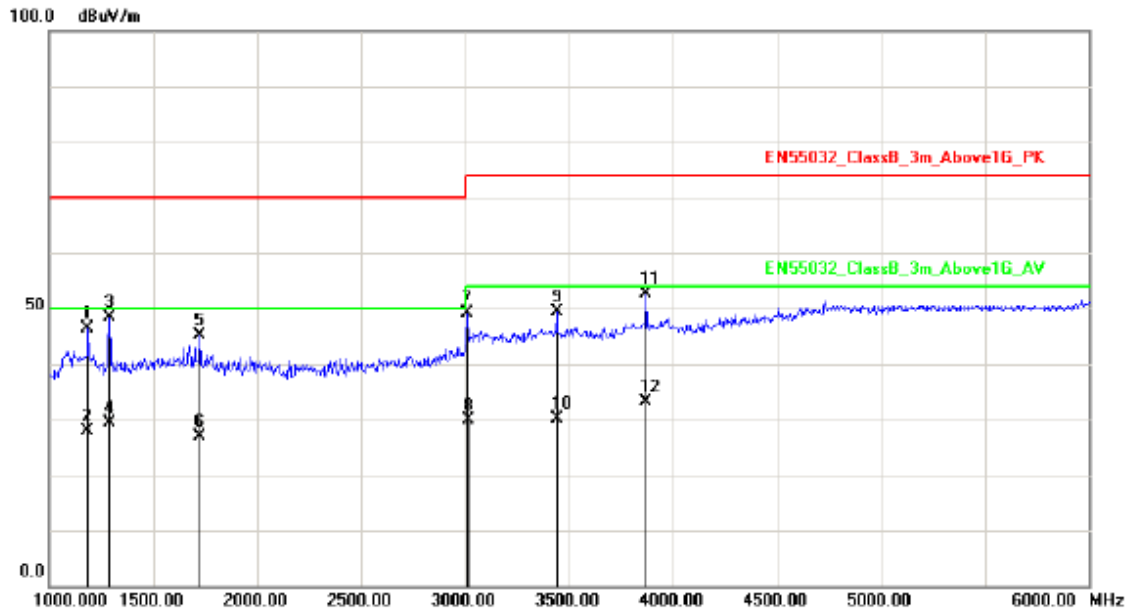
No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	86.2600	-16.28	38.90	22.62	30.00	-7.38	QP	400	347
2	150.2800	-10.65	35.57	24.92	30.00	-5.08	QP	100	259
3	239.5200	-10.88	34.94	24.06	37.00	-12.94	QP	100	46
4	594.5398	-1.32	30.52	29.20	37.00	-7.80	QP	400	227
5	675.0498	-0.13	31.07	30.94	37.00	-6.06	QP	400	1
6	816.6698	2.29	29.47	31.76	37.00	-5.24	QP	400	45

Note: Measurement Level = Reading Level + Correct Factor



Above 1000MHz

Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Horizontal
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25℃	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16

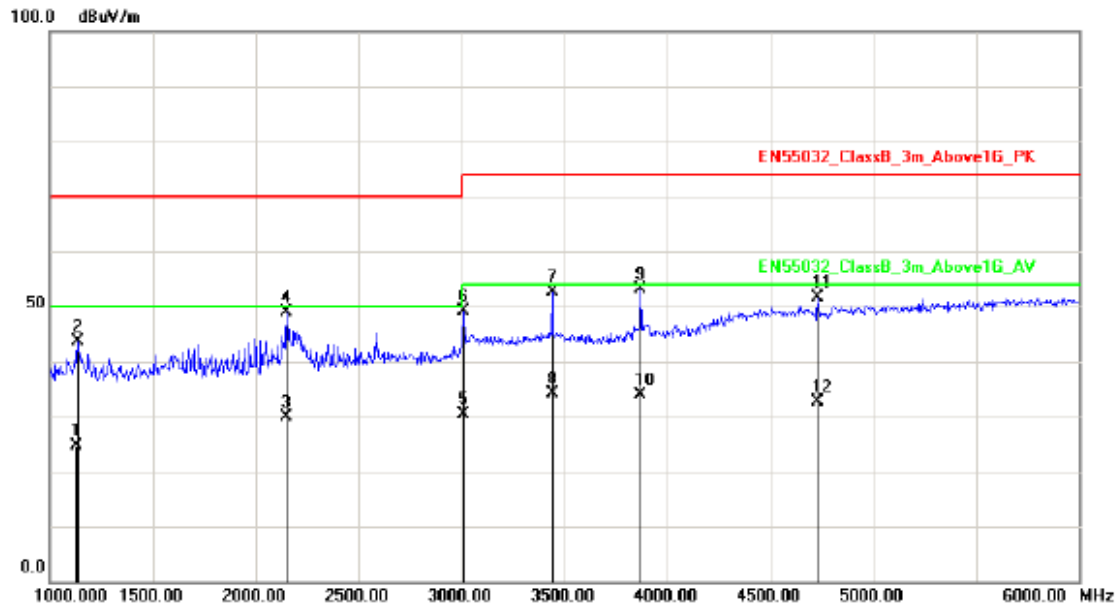


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1185.000	-4.74	51.03	46.29	70.00	-23.71	peak	200	35
2	1186.000	-4.74	32.56	27.82	50.00	-22.18	AVG	200	35
3	1290.000	-4.04	52.45	48.41	70.00	-21.59	peak	100	269
4	1293.000	-4.02	33.41	29.39	50.00	-20.61	AVG	100	269
5	1720.000	-2.01	47.13	45.12	70.00	-24.88	peak	200	84
6	1721.000	-2.00	28.79	26.79	50.00	-23.21	AVG	200	84
7	3010.000	4.15	44.98	49.13	74.00	-24.87	peak	200	187
8	3018.000	4.18	25.61	29.79	54.00	-24.21	AVG	200	187
9	3440.000	5.48	43.99	49.47	74.00	-24.53	peak	200	51
10	3441.000	5.48	24.73	30.21	54.00	-23.79	AVG	200	51
11	3870.000	6.93	45.62	52.55	74.00	-21.45	peak	200	203
12	3872.000	6.93	26.30	33.23	54.00	-20.77	AVG	200	203

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 1: Normal Operation(110V/60Hz)		
AC Power :	AC 110V/60Hz	Ant. Polarization:	Vertical
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16

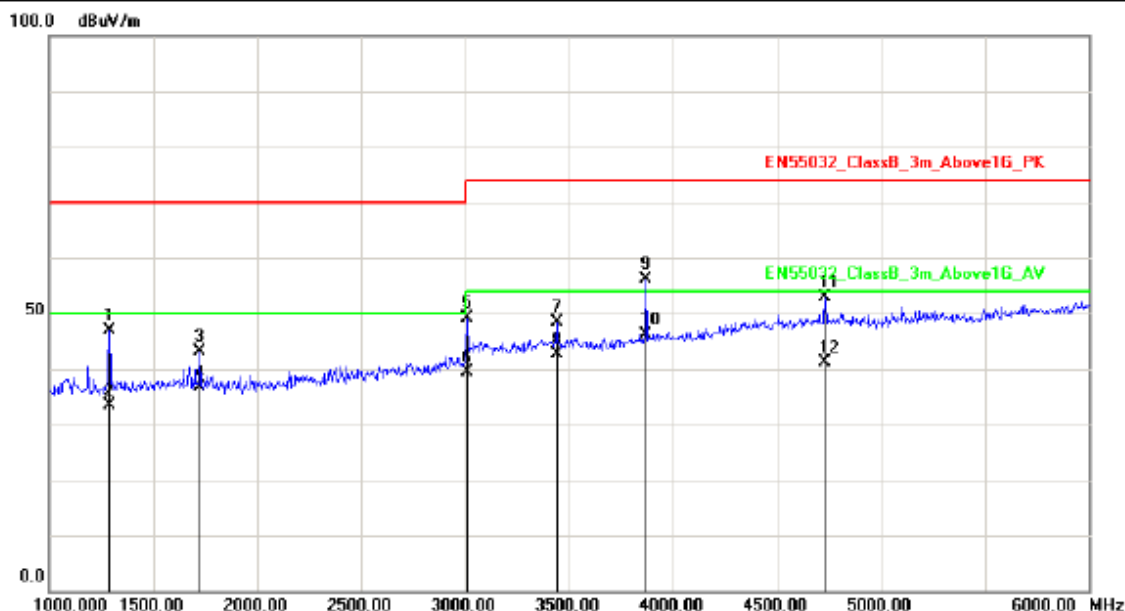


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1133.000	-5.09	29.68	24.59	50.00	-25.41	AVG	100	66
2	1135.000	-5.08	48.71	43.63	70.00	-26.37	peak	100	66
3	2149.000	-0.44	30.41	29.97	50.00	-20.03	AVG	200	329
4	2150.000	-0.43	49.42	48.99	70.00	-21.01	peak	200	329
5	3008.000	4.14	26.34	30.48	54.00	-23.52	AVG	100	8
6	3010.000	4.15	44.99	49.14	74.00	-24.86	peak	100	8
7	3440.000	5.48	47.24	52.72	74.00	-21.28	peak	200	110
8	3442.000	5.48	28.70	34.18	54.00	-19.82	AVG	200	110
9	3870.000	6.93	46.24	53.17	74.00	-20.83	peak	200	341
10	3872.000	6.93	26.83	33.76	54.00	-20.24	AVG	200	341
11	4730.000	10.56	41.18	51.74	74.00	-22.26	peak	100	5
12	4731.000	10.57	22.18	32.75	54.00	-21.25	AVG	100	5

Note: Measurement Level = Reading Level + Correct Factor



Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Horizontal
Equipment :	VILLA STATION	Model No :	DHI-VTO2111D-WP
Temp :	25℃	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16

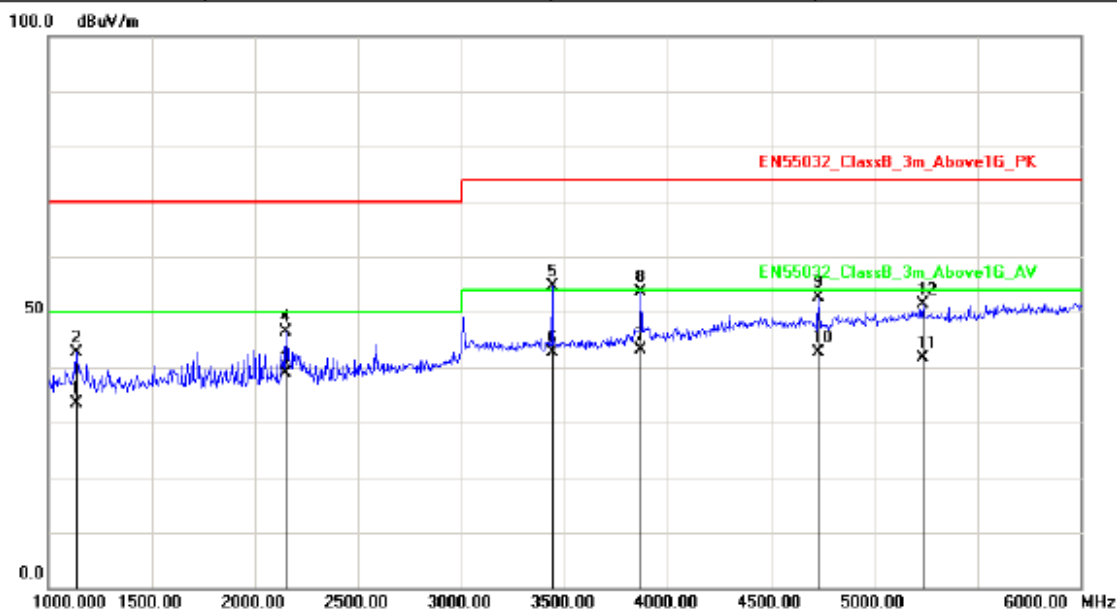


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1290.000	-4.04	50.95	46.91	70.00	-23.09	peak	100	245
2	1291.350	-4.03	37.45	33.42	50.00	-16.58	AVG	100	263
3	1720.000	-2.01	45.13	43.12	70.00	-26.88	peak	100	31
4	1722.150	-2.00	38.62	36.62	50.00	-13.38	AVG	100	21
5	3010.000	4.15	44.98	49.13	74.00	-24.87	peak	200	125
6	3012.800	4.16	35.12	39.28	54.00	-14.72	AVG	200	193
7	3440.000	5.48	42.99	48.47	74.00	-25.53	peak	100	346
8	3441.260	5.48	37.12	42.60	54.00	-11.40	AVG	100	310
9	3870.000	6.93	49.12	56.05	74.00	-17.95	peak	200	228
10	3872.020	6.93	39.10	46.03	54.00	-7.97	AVG	200	265
11	4730.000	10.56	42.26	52.82	74.00	-21.18	peak	100	14
12	4731.020	10.57	30.60	41.17	54.00	-12.83	AVG	100	0

Note: Measurement Level = Reading Level + Correct Factor



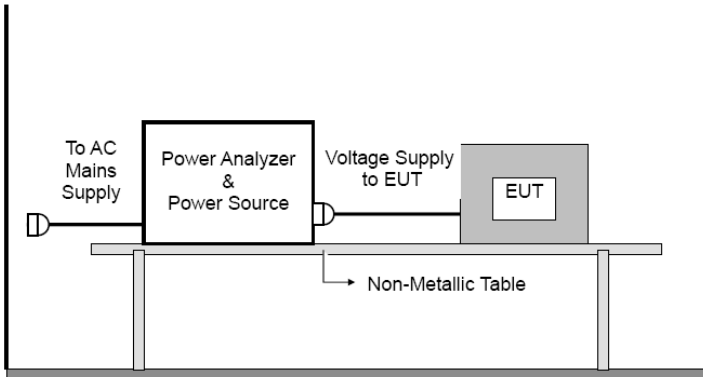
Test Mode :	Mode 2: Normal Operation(230V/50Hz)		
AC Power :	AC 230V/50Hz	Ant. Polarization:	Vertical
Equipment :	VILLA STATION	Model No :	DHI-VT02111D-WP
Temp :	25°C	Humidity :	52%
Pressure(mbar) :	1002	Date :	2016/08/16



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Det.	Height (cm)	Azimuth (deg)
1	1134.920	-5.08	38.45	33.37	50.00	-16.63	AVG	100	287
2	1135.000	-5.08	47.71	42.63	70.00	-27.37	peak	100	246
3	2149.620	-0.44	39.26	38.82	50.00	-11.18	AVG	200	132
4	2150.000	-0.43	46.92	46.49	70.00	-23.51	peak	200	198
5	3440.000	5.48	49.24	54.72	74.00	-19.28	peak	100	228
6	3441.020	5.48	37.10	42.58	54.00	-11.42	AVG	100	247
7	3868.120	6.92	36.10	43.02	54.00	-10.98	AVG	100	0
8	3870.000	6.93	46.74	53.67	74.00	-20.33	peak	100	10
9	4730.000	10.56	42.18	52.74	74.00	-21.26	peak	200	358
10	4731.002	10.57	32.10	42.67	54.00	-11.33	AVG	200	360
11	5234.190	11.61	30.10	41.71	54.00	-12.29	AVG	100	210
12	5235.000	11.61	39.74	51.35	74.00	-22.65	peak	100	245

Note: Measurement Level = Reading Level + Correct Factor

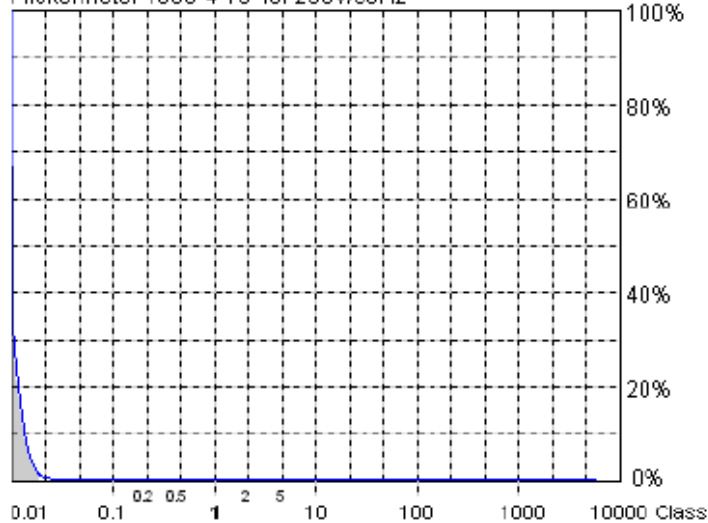
5.1.3 FLICKER TEST

Test Method:	EN 61000-3-3		
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
	d_c	$\leq 3.3\%$	relative steady-state voltage change
	d_{max}	$\leq 4\%$ (or 6% ^{Note(1)} , 7% ^{Note(2)})	maximum relative voltage change:
	d_(t)	$\leq 3.3\%$, more than 500ms	relative voltage change characteristic
Test Setup:	 <p>1. The test supply voltage (open-circuit voltage) was the rated voltage of the EUT. The Test voltage: was maintained within $\pm 2\%$ of the nominal value. The frequency was 50 Hz $\pm 0.5\%$.</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>		



Measurement Data:

Flickermeter 1000-4-15 for 230V/50Hz



Flicker Emission - IEC 61000-3-3, EN 61000-3-3, (EN60555-3)

Urms = 231.1 V P = 3.203 W
Irms = 0.039 A pf = 0.353

Actual Flicker (Fli): 0.02
Short-term Flicker (Pst): 0.09
Limit (Pst): 1.00
Long-term Flicker (Plt): 0.09
Limit (Plt): 0.65
Maximum Relative Volt. Change (dmax): 0.00%
Limit (dmax): 4.00%
Relative Steady-state Voltage Change (dc): 0.11%
Limit (dc): 3.30%
Maximum Interval exceeding 3.30% (dt): 0.00ms
Limit (dt>Lim): 500ms

2016-9-23 15:57:13 harmonic.hsu

Range: 0.5 A
V-nom: 230 V
TestTime: 10 min (100%)

Test completed, Result: PASSED

HAR-1000 EMC-Partner

Full Bar : Actual Values

Empty Bar : Maximum Values

Circles : Average Values

Blue : Current , Green : Voltage , Red : Failed

Urms = 231.1V Freq = 49.987 Range: 0.5 A
Irms = 0.039A Ipk = 0.220A cf = 5.609
P = 3.203W S = 9.083VA pf = 0.353

Test - Time : 1 x 10min = 10min (100 %)

LIN (Line Impedance Network) : No LIN

Limits: Plt : 0.65 Pst : 1.00
dmax : 4.00 % dc : 3.30 %
dtLim: 3.30 % dt>Lim: 500ms

Test completed, Result: PASSED

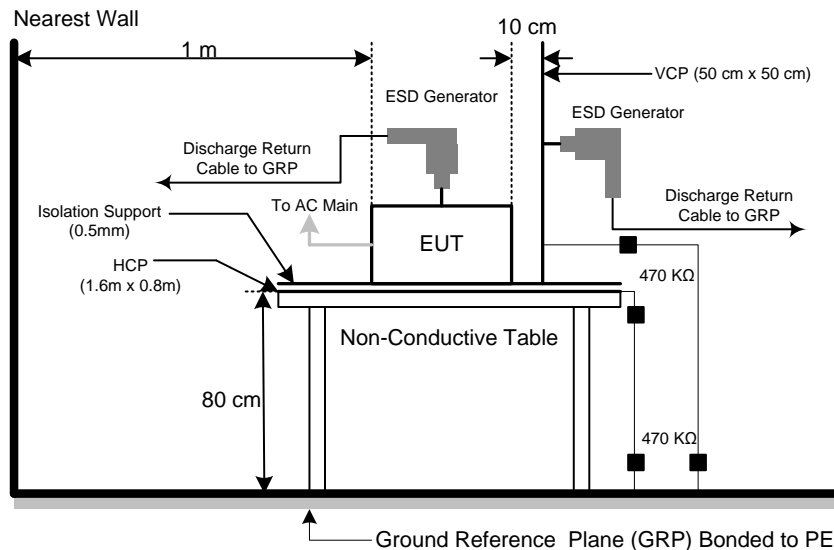


5.2 ELECTROMAGNETIC SUSCEPTIBILITY (IMMUNITY)

Performance Criteria Description

Criterion A:
<p>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.</p>
Criterion B:
<p>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 operating 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.</p>
Criterion C:
<p>Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.</p>

5.2.1 ELECTROSTATIC DISCHARGE (ESD)

Test Method:	EN61000-4-2
Criterion Required:	B
Discharge Impedance:	330 Ω / 150 pF
Polarity:	Positive & Negative
Number of Discharge:	Minimum 10 times at each test point (for EN50130-4) At least 200 discharges and 100 each for polarity (for EN55024)
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. A minimum of 10 single air discharges were applied to the selected test point for each such area. 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 were constructed from the same material type & think mess as that of the



	<p>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 retrigged 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:

Test Mode 1:

For EN 55024: 2010

Test Voltage: AC 230V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
HCP	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---
1.2.3.4.5.6.7. 16	A	A	A	A	---	---	---	---	---	---	---	---	---	---	---	---
8-15	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
17-23	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1.2.3.4.5.6.7. 16	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
8-15	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
17-23	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---



Test Voltage: AC 195.5V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1.2.3.4.5.6.7. 16	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
8-15	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
17-23	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---

Test Voltage: AC 253V/50Hz																
	Contact Discharge								Air Discharge							
	25 times / each								10 times / each							
Voltage	2 kV		4 kV		6 kV		8 kV		2 kV		4 kV		8 kV		10 kV	
Point\Polarity	+	—	+	—	+	—	+	—	+	—	+	—	+	—	+	—
HCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
VCP	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
1.2.3.4.5.6.7.16	A	A	A	A	A	A	---	---	---	---	---	---	---	---	---	---
8-15	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---
17-23	---	---	---	---	---	---	---	---	A	A	A	A	A	A	---	---

5.2.2 RADIATED IMMUNITY

Test Method:	EN 61000-4-3
Criterion Required:	A
Test Setup:	

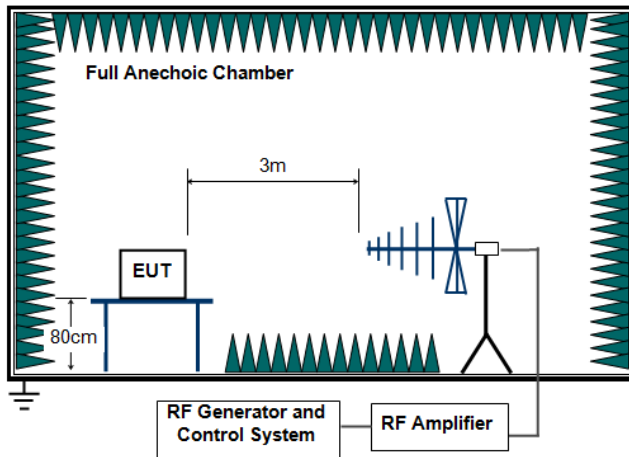


Figure 1. 80MHz to 1GHz ,

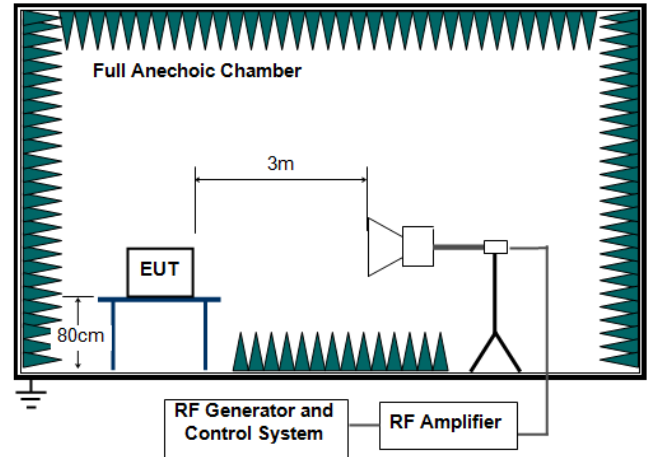


Figure 2 1GHz to 2.7GHz

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 respond, and was not less than 0.5s.
- 6) The test normally was performed with the generating antenna facing each side of the EUT.



	<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>
--	---

Test Results:

Test Mode 1:

For EN 55024: 2010

Test Voltage: AC 230V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~1000	Horizontal & Vertical	Front	3 V/m	A
80~1000	Horizontal & Vertical	Rear	3 V/m	A
80~1000	Horizontal & Vertical	Left	3 V/m	A
80~1000	Horizontal & Vertical	Right	3 V/m	A

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal & Vertical	Front	10 V/m	A
80~2700	Horizontal & Vertical	Rear	10 V/m	A
80~2700	Horizontal & Vertical	Left	10 V/m	A
80~2700	Horizontal & Vertical	Right	10 V/m	A



Test Voltage: AC 195.5V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal & Vertical	Front	10 V/m	A
80~2700	Horizontal & Vertical	Rear	10 V/m	A
80~2700	Horizontal & Vertical	Left	10 V/m	A
80~2700	Horizontal & Vertical	Right	10 V/m	A

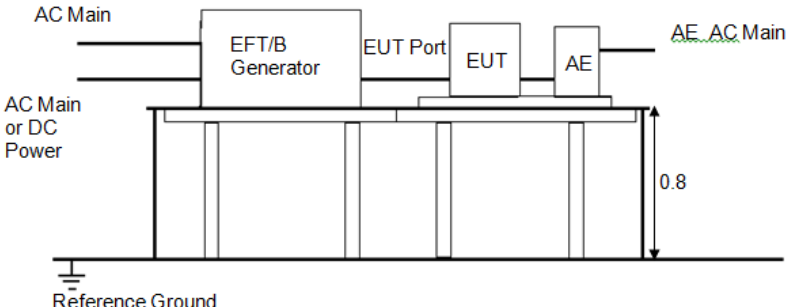
Test Voltage: AC 253V/50Hz

Modulation : AM 80% , 1KHz sine wave , Dwell time: 3.0 S

Frequency Step Size : 1 % of preceding frequency value

Frequency (MHz)	Antenna Polarization	face	Field strength (V/m)	Result
80~2700	Horizontal & Vertical	Front	10 V/m	A
80~2700	Horizontal & Vertical	Rear	10 V/m	A
80~2700	Horizontal & Vertical	Left	10 V/m	A
80~2700	Horizontal & Vertical	Right	10 V/m	A

**5.2.3 ELECTRICAL FAST TRANSIENTS (EFT)**

Test Method:	EN 61000-4-4
Test Level:	$\pm 2.0\text{kV}$ on AC port (for EN50130-4) $\pm 1.0\text{kV}$ on AC port (for EN55024) $\pm 1.0\text{kV}$ on Signal port (for EN50130-4) $\pm 0.5\text{kV}$ on Signal port (for EN55024)
Polarity:	Positive & Negative
Repetition Frequency:	100kHz (for EN50130-4) 5kHz (for EN55024)
Burst Period:	300ms
Test Duration:	2 minute per level & polarity
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:

Test Mode 1:

For EN 55024: 2010

Pulse : 5/50 ns		Repetition Rate: 5 kHz			
Burst : 15m/300ms		Test time : 1 min/each condition			
Voltage/ Mode/ Polarity/ Result/ Phase		0.5 kV		1.0 kV	
		+	—	+	—
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45	A	A	---	---

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

Pulse : 5/50 ns		Repetition Rate: 5/100 kHz			
Burst : 15m/300ms		Test time : 1 min/each condition			
Voltage/ Mode/ Polarity/ Result/ Phase		1 kV		2.0 kV	
		+	—	+	—
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45	A	A	---	---



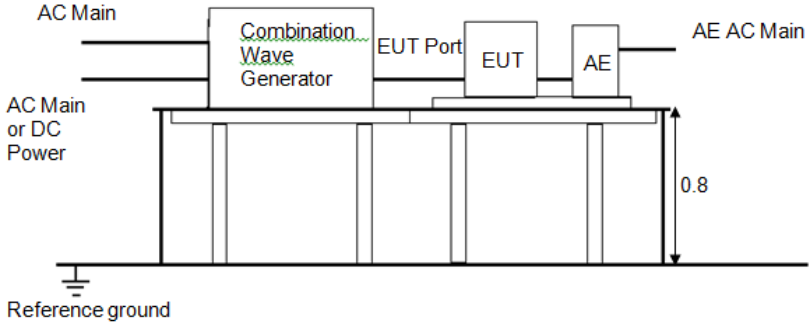
Test Voltage: AC 195.5V/50Hz

Pulse : 5/50 ns		Repetition Rate: 5/100 kHz			
Burst : 15m/300ms		Test time : 1 min/each condition			
Voltage/ Mode/ Polarity/ Result/ Phase		1 kV		2.0 kV	
		+	—	+	—
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45	A	A	---	---

Test Voltage: AC 253V/50Hz

Pulse : 5/50 ns		Repetition Rate: 5/100 kHz			
Burst : 15m/300ms		Test time : 1 min/each condition			
Voltage/ Mode/ Polarity/ Result/ Phase		1 kV		2.0 kV	
		+	—	+	—
Power Line	L	---	---	A	A
	N	---	---	A	A
	L-N	---	---	A	A
Signal Line	RJ45	A	A	---	---

5.2.4 SURGE IMMUNITY

Test Method:	EN 61000-4-5	
Test Level:	FOR EN50130-4:2011/A1:2014 ± 0.5/1.0 kV Line to Line, ± 0.5/1.0 kV Signal port	For EN55024: ±1 kV Line-to-Line ± 0.5/1.0 kV Signal port
Criterion Required:	B	
Polarity:	Positive & Negative	
Interval:	60s between each surge	
No. of Surges:	5 positive, 5 negative at 0°, 90°, 180°, 270°.	
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 outdoor 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 40Ω output impedance for interconnection lines. The tests were done at repetition rate one per minute. 	



Test Results:

Test Mode 1:

For EN 55024: 2010

Power Port

Test Voltage: AC 230V/50Hz						
Waveform : 1.2/50 μ s(8/20 μ s) Repetition rate : 60 sec Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0</u> kV	L-N	+	A	A	A	A
		—	A	A	A	A

Signal Port

Waveform :10/700 μ s Repetition rate : 60 sec Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1</u> kV	
Mode / Polarity / Result	+	—	+	—
RJ45	A	A	A	A



For EN 50130-4: 2011

Power Port

Test Voltage: AC 230V/50Hz						
Waveform : 1.2/50 μ s(8/20 μ s) Repetition rate : 60 sec Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0 kV</u>	L-N	+	A	A	A	A
		—	A	A	A	A

Signal Port

Waveform : 1.2/50μs(8/20μs) Repetition rate : 60 sec Time : 5 time/each condition					
Voltage		0.5 kV		1 kV	
Mode / Polarity / Result		+	—	+	—
RJ45		A	A	A	A

Waveform : 10/700μs Repetition rate : 60 sec Time : 5 time/each condition					
Voltage		0.5 kV		1 kV	
Mode / Polarity / Result		+	—	+	—
RJ45		A	A	A	A

Power Port

Test Voltage: AC 195.5V/50Hz						
Waveform : 1.2/50 μ s(8/20 μ s) Repetition rate : 60 sec Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0 kV</u>	L-N	+	A	A	A	A
		—	A	A	A	A

**Signal Port**

Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1</u> kV	
Mode / Polarity / Result	+	—	+	—
RJ45	A	A	A	A

Waveform : 10/700µs Repetition rate : 60 sec Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1</u> kV	
Mode / Polarity / Result	+	—	+	—
RJ45	A	A	A	A

Power Port

Test Voltage: AC 253V/50Hz						
Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 20 time/each condition						
/Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
<u>0.5/1.0</u> kV	L-N	+	A	A	A	A
		—	A	A	A	A

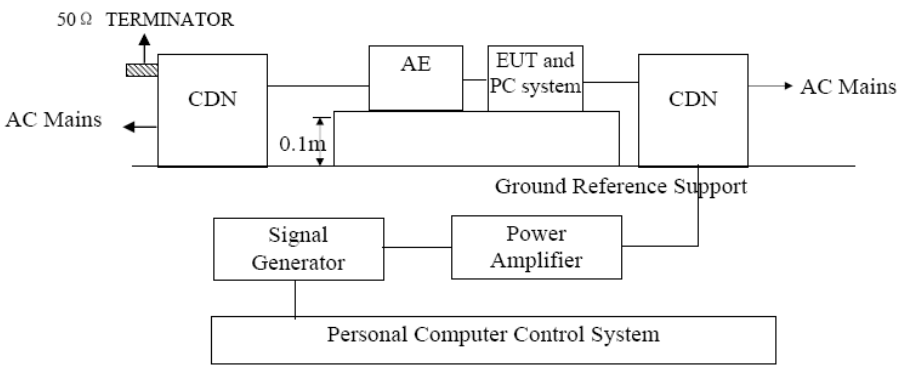
Signal Port

Waveform : 1.2/50µs(8/20µs) Repetition rate : 60 sec Time : 5 time/each condition				
Voltage	<u>0.5</u> kV		<u>1</u> kV	
Mode / Polarity / Result	+	—	+	—
RJ45	A	A	A	A



Waveform : 10/700μs Repetition rate : 60 sec Time : 5 time/each condition				
Voltage	0.5 kV		1 kV	
Mode / Polarity / Result	+	—	+	—
RJ45	A	A	A	A

5.2.5 CONDUCTED IMMUNITY

Test Method:	EN 61000-4-6
Criterion Required:	A
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:**

Test Mode 1:

For EN 55024: 2010

Test Voltage: AC 230V/50Hz

Frequency : 0.15~80MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 80MHz	Power(M2)	3	A
0.15 ~ 80MHz	RJ45	3	A

For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45	10	A



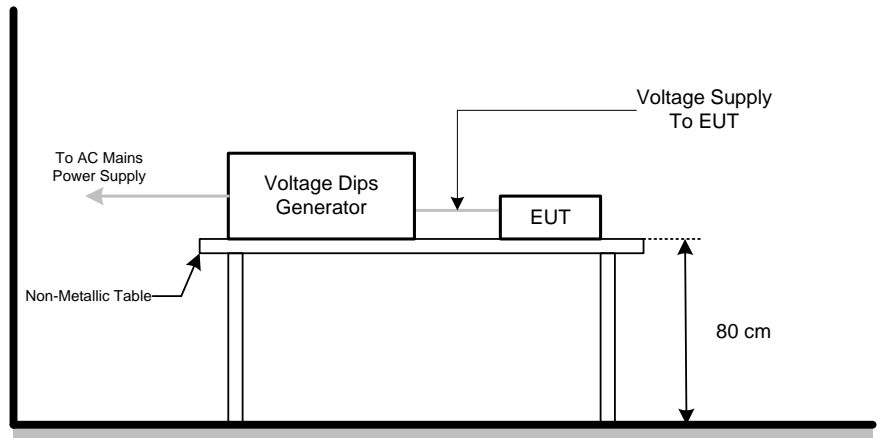
Test Voltage: AC 195.5V/50Hz			
Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s			
Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45	10	A

Test Voltage: AC 253V/50Hz

Frequency : 0.15~100MHz, Modulation : AM 80%,1KHz sine wave, Dwell time: 3.0s			
Frequency Step Size : 1 % of preceding frequency value			
Frequency	Test mode	Voltage(V)	Result
0.15 ~ 100MHz	Power(M2)	10	A
0.15 ~ 100MHz	RJ45	10	A



5.2.6 Voltage Dips and Interruptions

Test Method:	EN 61000-4-11
Test Level:	For EN50130-4: 80% for 250 Periods 70 % for 25 Periods 40 % for 10 Periods 0% for 250 Periods For EN55024: >95 % for 0.5 Periods 30 % for 25 Periods >95 % for 250 Periods
No. of Dips / Interruptions:	3 per Level
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 0.1 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:

Test Mode 1:

For EN 55024: 2010

Voltage(UT): AC 100V/50 Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms)	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	>95%	250	C	C	C	C	C	C	C	C
Voltage dips	30%	25	B	B	B	B	B	B	B	B
	>95%	0.5	B	B	B	B	B	B	B	B

Voltage(UT): AC 230V/240 V/50 Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms)	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	>95%	250	C	C	C	C	C	C	C	C
Voltage dips	30%	25	A	A	A	A	A	A	A	A
	>95%	0.5	A	A	A	A	A	A	A	A



For EN 50130-4: 2011

Test Voltage: AC 230V/50Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms)	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

100% and 20% is permitted to UPS to meet the requirements of Result A.

Test Voltage: AC 195.5V/50Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms)	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

100% and 20% is permitted to UPS to meet the requirements of Result A.

Test Voltage: AC 253V/50Hz Interval(s) : 10s Times : 3										
Test mod	Test level UT %	Durations (period / ms)	Phase / Result							
			0	45	90	135	180	225	270	315
Voltage interruptions	100%	250	A	A	A	A	A	A	A	A
Voltage dips	20%	250	A	A	A	A	A	A	A	A
	30%	25	A	A	A	A	A	A	A	A
	60%	10	A	A	A	A	A	A	A	A

100% and 20% is permitted to UPS to meet the requirements of Result A.

6 PHOTOGRAPHS OF EMC TEST CONFIGURATION

6.1 CONDUCTED EMISSION TEST SETUP

Power Port

Front View



Rear View



Telecommunication Port

Front View



Rear View



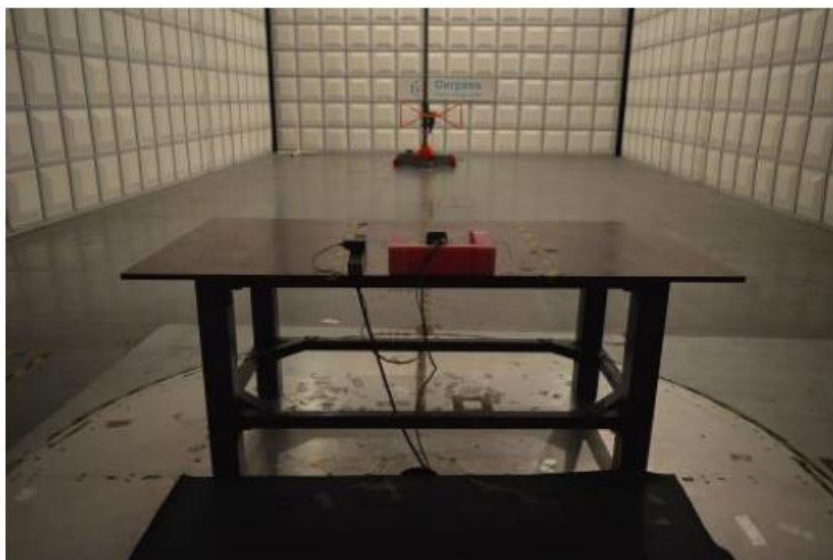
6.2 RADIATED EMISSION TEST SETUP

30MHz ~ 1000MHz

Front View



Rear View

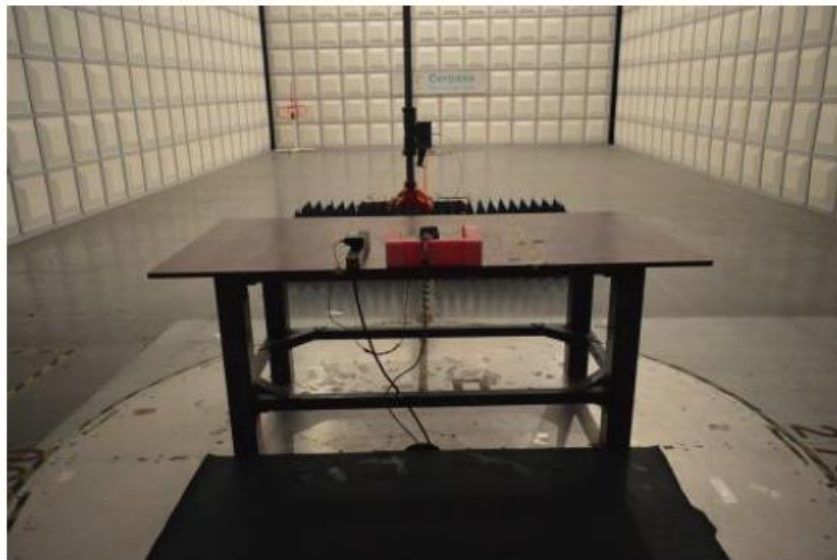


Above 1000MHz

Front View

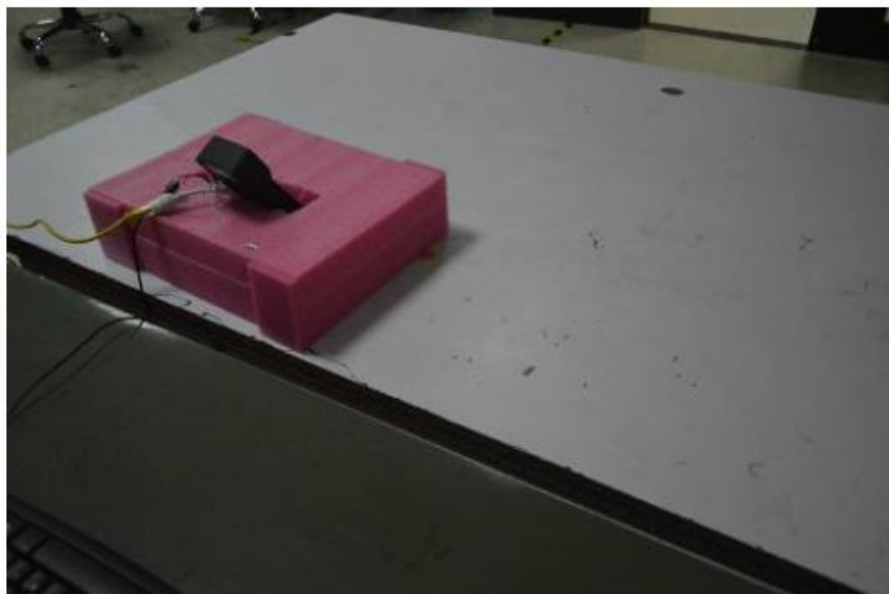


ear View



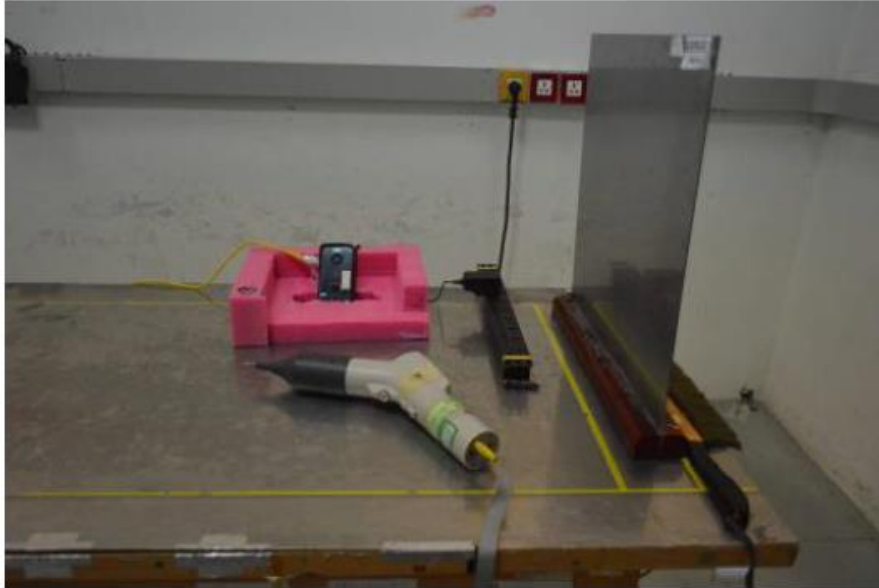
6.3 VOLTAGE FLUCTUATION AND FLICK MEASUREMENT

Flicker

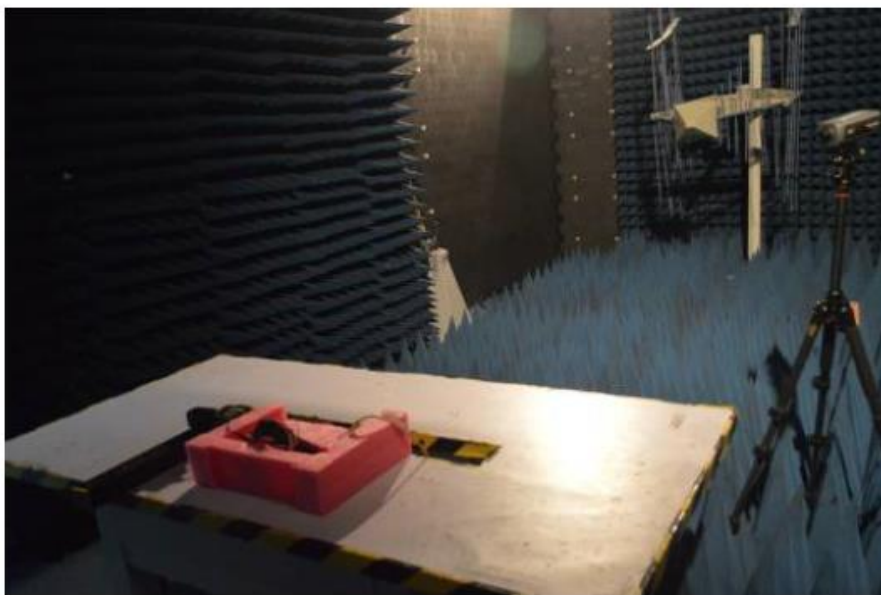
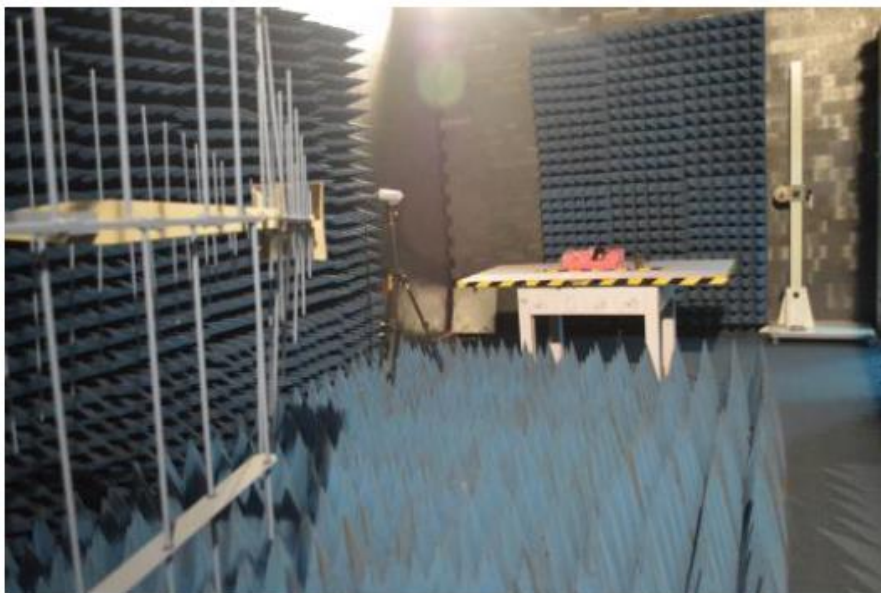




6.4 ESD

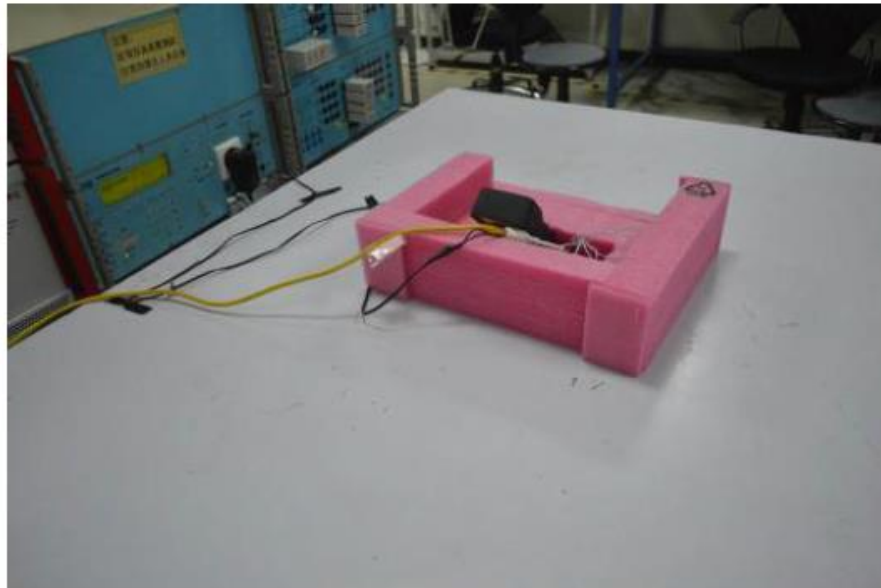
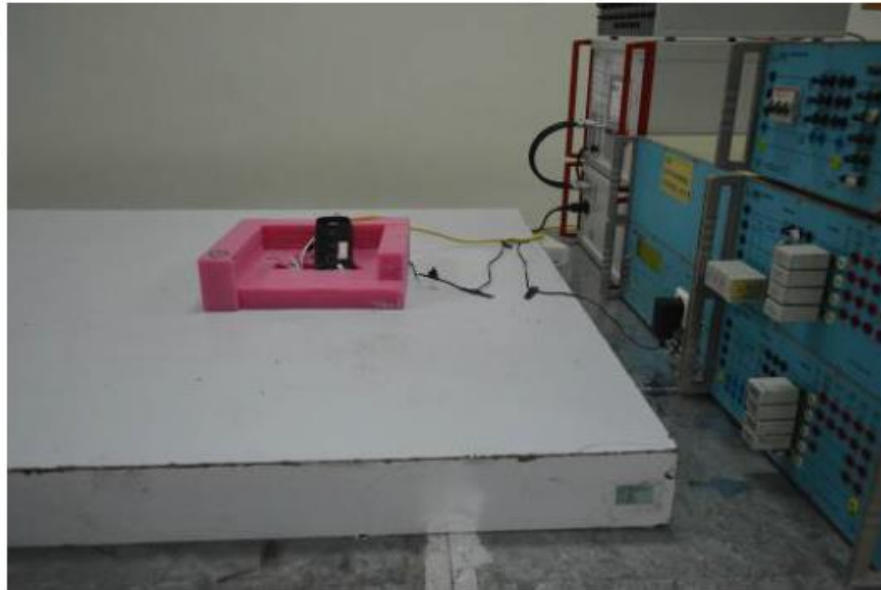


6.5 RADIO FREQUENCY ELECTROMAGNETIC FIELD IMMUNITY

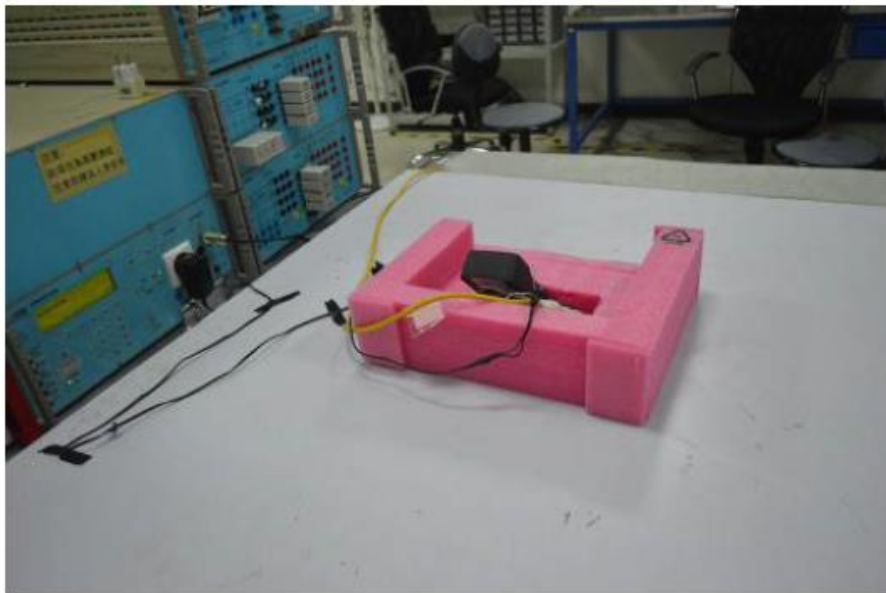
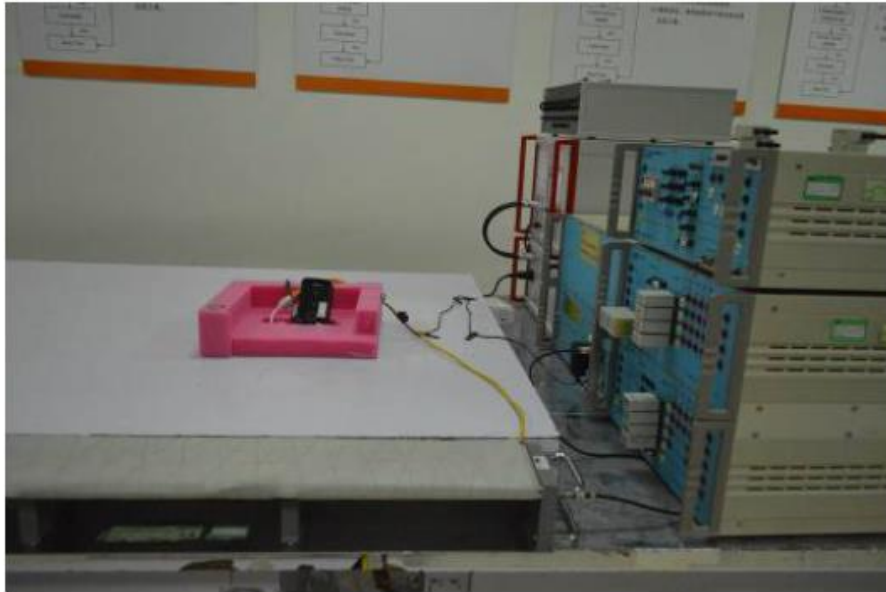


6.6 ELECTRICAL FAST TRANSIENT/BURST / SURGE IMMUNITY / VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY

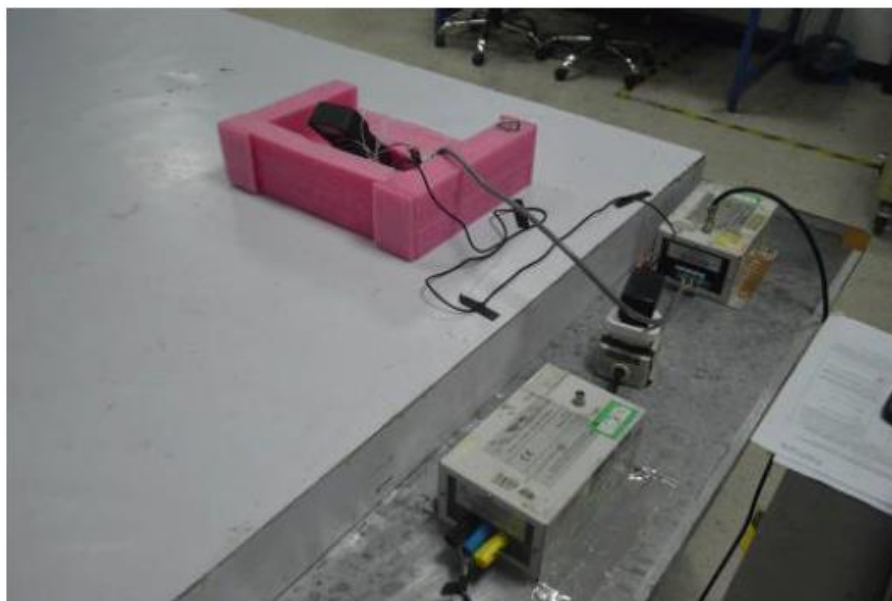
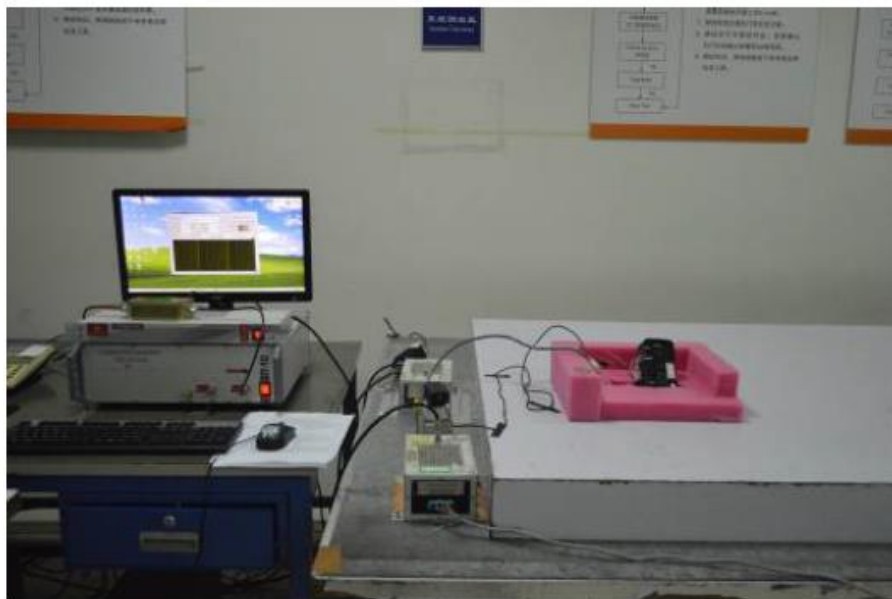
Main



LAN



6.7 CONDUCTED IMMUNITY



7 Photographs of the EUT

1) EUT Photo



2) EUT Photo



3) EUT Photo



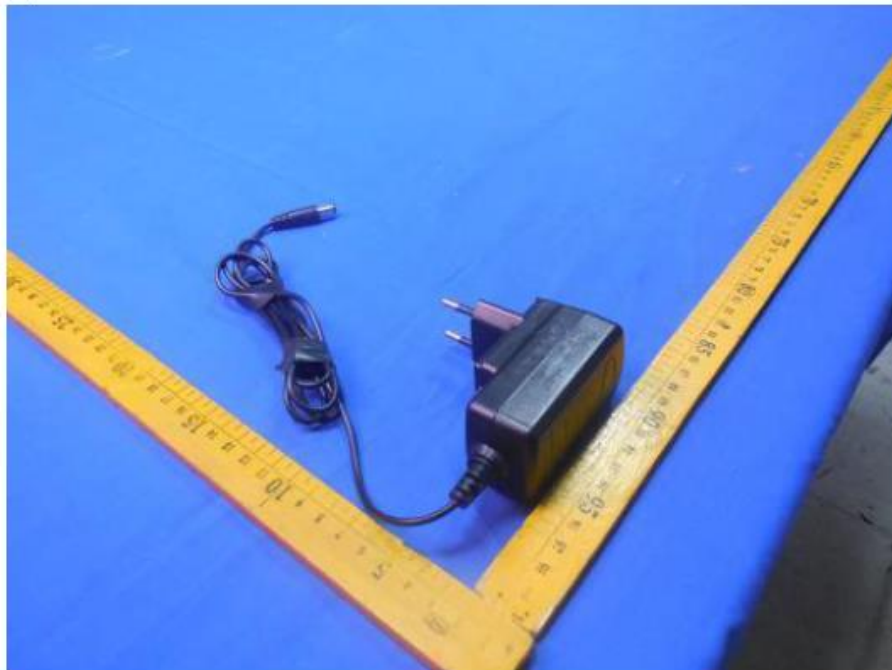
4) EUT Photo



5) EUT Photo



6) EUT Photo



7) EUT Photo



8) EUT Photo



END OF REPORT