EMC TEST REPORT

Equipment	:	15.6” Healthcare Display
Model No.	:	TMD-25-15
Trade Name	:	TEGUAR
Applicant	:	Teguar Co
Address	:	2920 Whitehall Park Drive Charlotte, NC 28273 United States
Standard	:	EN 55011, EN 60601-1-2 EN IEC 61000-3-2, EN 61000-3-3

HEREBY CERTIFY THAT :

The sample was received on : Jul. 07, 2021

The testing was carried out on : Aug. 12, 2021 ~ Aug. 18, 2021

The test result refers exclusively to the test presented test model / sample. Without written approval of Cerpass Technology Corp., the test report shall not be reproduced except in full.

Approved by:

Kero Kuo / EMC/RF Manager

Contents

History of this test report

Report No.	Issue Date	Description	Version
21070038-TECE01	Apr. 08, 2022	Derivative Report	A

Report Type		Description
☐	Original report	NA
■	Derivative Report	This sample provided has been confirmed to be identical to the original report sample. The only difference are as listed below. As it doesn't affect the test result, the original report number: 21060266-TECE01 and content will be used. 1. Applicant information change. 2. Model No. change. 3. Trade Name change.

Summary of Test Results

1. Applicable Standards

The measurements shown in this test report were made in accordance with the procedures given in **EUROPEAN COUNCIL DIRECTIVE 2017/745.** The energy emitted by this equipment was **passed** both Radiated and Conducted Emissions Class **B** limits.

Test Item	Normative References	Test Result
Conducted Emission	EN 60601-1-2:2015/A1:2021 EN 55011:2016/A11:2020	PASS
Telecom Port Conducted Emissions	EN 60601-1-2:2015/A1:2021 EN 55011:2016/A11:2020	N/A
Radiated Emission	EN 60601-1-2:2015/A1:2021 EN 55011:2016/A11:2020	PASS
Harmonics	EN IEC 61000-3-2:2019	N/A
Voltage Fluctuations	EN 61000-3-3:2013+A1:2019	PASS
EN 60601-1-2:2015/A1:2021		
Electrostatic Discharge Immunity Test (ESD)	IEC 61000-4-2:2008	PASS
Radio Frequency Electromagnetic Field Immunity Test (RS)	IEC 61000-4-3:2006+A1:2007+A2:2010	PASS
Electrical Fast Transient/ Burst Immunity Test (EFT)	IEC 61000-4-4:2012	PASS
Surge Immunity Test	IEC 61000-4-5:2014/AMD1:2017	PASS
Conduction Disturbances induced by Radio-Frequency Fields	IEC 61000-4-6:2013	PASS
Power Frequency Magnetic Field Immunity Test	IEC 61000-4-8:2009	PASS
Voltage Dips and Voltage Interruptions Immunity Test	IEC 61000-4-11:2020	PASS

Note*: Pass criterion is defined by the applicant. The test report is to follow the applicant specification.

The lab has reduced the uncertainty risk factor from test equipment, environment and staff technicians which according to the standard on contract. Therefore, the test result will only be determined by standard requirement.

2. Immunity Testing Performance Criteria Definition

Pass	Under the test conditions specified in ___H6.2, the ME EQUIPMENT or ME SYSTEM shall be able to provide the BASIC SAFETY and ESSENTIAL PERFORMANCE. The following DEGRADATIONS, if associated with BASIC SAFETY and ESSENTIAL PERFORMANCE, shall not be allowed: – component failures; – changes in programmable parameters; – reset to factory defaults (MANUFACTURER'S presets); – false alarms; – cessation or interruption of any intended operation, even if accompanied by an alarm; – initiation of any unintended operation, including unintended or uncontrolled motion, even if accompanied by an alarm; – error of a displayed numerical value sufficiently large to affect diagnosis or treatment; – noise on a waveform in which the noise would interfere with diagnosis, treatment or monitoring; – failure of automatic diagnosis or treatment ME EQUIPMENT and ME SYSTEMS to diagnose or treat, even if accompanied by an alarm. For ME EQUIPMENT and ME SYSTEMS with multiple FUNCTIONS, the criteria apply to each FUNCTION, parameter and channel. The ME EQUIPMENT or ME SYSTEM may exhibit DEGRADATION of performance (e.g. deviation from MANUFACTURER'S specifications) that does not affect BASIC SAFETY or ESSENTIAL PERFORMANCE.
Pass	Under the test conditions specified in ___H6.2, the ME EQUIPMENT or ME SYSTEM shall be able to provide the BASIC SAFETY and ESSENTIAL PERFORMANCE. The following DEGRADATIONS, if associated with BASIC SAFETY and ESSENTIAL PERFORMANCE, shall be allowed: – change of operation mode; – artefact or distortion in an image in which the artefact would interfere with diagnosis, treatment or monitoring

3. General Description

3.1. Product Details

Please refer to the user's manual.

3.2. Accessories

Item	Brand \ Model No.
Adapter	EDAC \ EM10681B
Panel	BOE \ PV156FHM-N20

4. Test Configuration of Equipment under Test

4.1. Test Software

An executive program, "BurnIn Test" under WIN 10 was used as the test software.
The program was executed as follows:

a. Turn on the power of all equipment.
b. The PC reads the test program from the hard disk drive and runs it.
c. The executive program "ITU-R.BT471" was executed to play colorbar.
d. Repeat the steps from b to c.

At the same time, the following program was executed:
Executed "BurnIn Test" to play 1kHz audio.

4.2. Test Manner

a. During testing, the interface cables and equipment positions were varied according to Europe Standard EN 60601-1-2.
b. The test modes of EMC test as follow:

Conducted Emission for AC main power port	
Test Mode 1	HDMI: 1920 x 1080 @60Hz
Test Mode 2	VGA: 1020 x 1080 @60Hz
caused "Test Mode 1" generates the worst case, it was reported as the final data.	
Radiated Emission	
Test Mode 1	HDMI: 1920 x 1080 @60Hz
Test Mode 2	VGA: 1020 x 1080 @60Hz
caused "Test Mode 1" generates the worst case, it was reported as the final data.	
Harmonic, Flicker Emission and Immunity Test	
Test Mode 1	Working

c. The maximum operating frequency is above 108MHz, the test frequency range is from 30MHz to 6GHz.

4.3. Description of Support Unit

EMI				
No	**Device**	**Manufacturer**	**Model No.**	**Description**
For Local				
1	PC*2	DELL	XPS8700	Power Cable, Unshielding, 1.8m
2	Keyboard	DELL	KB216t	USB Cable, Shielding 1.85m
3	Mouse	DELL	MS1161	USB Cable, Shielding 1.85m
4	Printer	HP	P1102w	Power Cable, Unshielded 1.8m USB Cable, Shielding 1.6m
5	iPod	APPLE	A1320	USB Cable, Shielding 1.0m
Use Cable				
1	HDMI	N/A	N/A	Shielding 1.8m
2	VGA	N/A	N/A	Unshielding 1.8m
3	USB	N/A	N/A	Unshielding 1.8m
4	Audio	N/A	N/A	Unshielding, 1.8m

EMS				
No	**Device**	**Manufacturer**	**Model No.**	**Description**
For Local				
1	PC	DELL	D02M	Power Cable, Unshielding 1.8m
2	Keyboard	DELL	SK8115	USB Cable, Shielding 1.85m
3	Mouse	DELL	MS111-P	USB Cable, Shielding 1.85m
Use Cable				
1	HDMI	N/A	N/A	Shielding 1.8m
2	VGA	N/A	N/A	Shielding 1.8m
3	USB A to B	N/A	N/A	Shielding 1.8m
4	Audio	N/A	N/A	Unshielding, 1.8m

4.4. General Information of Test

Test Site	**Cerpass Technology Corporation Test Laboratory** Address: No.10, Ln. 2, Lianfu St., Luzhu Dist., Taoyuan City 33848, Taiwan (R.O.C.) Tel:+886-3-3226-888 Fax:+886-3-3226-881
	☒ Conducted emission test (CON01-NK) ☐ Conducted emission test (CON02-NK) ☒ Radiated emission test (10M01-NK) ☐ Radiated emission test (3M01-NK) ☐ Radiated emission test (3M02-NK) ☒ Radiated disturbance above 1GHz (10M01-NK) ☐ Radiated disturbance above 1GHz (3M01-NK) ☐ Radiated disturbance above 1GHz (3M02-NK)
Frequency Range Investigated:	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 6000MHz
Test Distance :	The test distance of radiated emission below 1GHz from antenna to EUT is 3 M. The test distance of radiated emission above 1GHz from antenna to EUT is 3 M.

5. Test of Conducted Emission

5.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 kHz and return leads of the EUT according to the methods defined in European Standard EN 55011. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 4.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position producing maximum conducted emissions.

Table 1 Conducted Emission Limits (dBμV):

Frequency range (MHz)	Class A Equipment				Class B Equipment	
	Rated input power of ≦ 20kVA		Rated input power of ＞ 20kVA			
	Quasi Peak	Avg.	Quasi Peak	Avg.	Quasi Peak	Avg.
0.15 to 0.50	79	66	100	90	66~56	56~46
0.50 to 5	73	60	86	76	56	46
5 to 30	73	60	90~73	80~60	60	50
Note 1: The limits decreasing linearly with logarithm of the frequency in the range 5 to 30MHz. Note 2: The lower limits shall apply at the transition frequencies.						

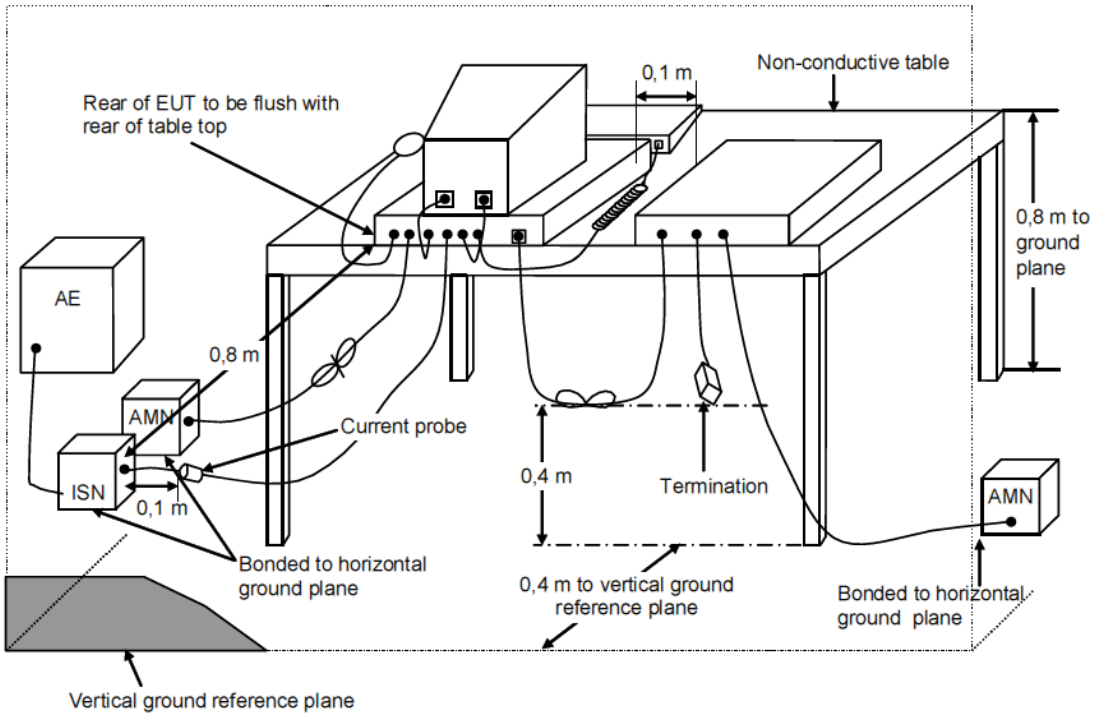
Table 2 - Limits of conducted common mode (asymmetric mode) disturbance at telecommunication ports in the frequency range 0.15 MHz to 30 MHz (dBμV).

Frequency range (MHz)	Class A Equipment				Class B Equipment			
	Voltage		Current		Voltage		Current	
	Quasi Peak	Avg.	Quasi Peak	Avg.	Quasi Peak	Avg.	Quasi Peak	Avg.
0.15 to 0.5	97~ 87	84~74	53~43	40~30	84~74	74~64	40~30	30~20
0.5 to 5	87	74	43	30	74	64	30	20
5 to 30	87	74	43	30	74	64	30	20
Note 1: The limits decrease linearly with the logarithm of the frequency in the range 0.15 to 0.5 MHz. Note 2: The current and voltage disturbance limits are derived for use with an impedance stabilization network (ISN) which presents a common mode (asymmetric mode) impedance of 150Ω to the telecommunication under test (conversion factor is 20 $\log_{10}$ 150/1 = 44dB).								

5.2. Test Procedures

a. The EUT was placed on a desk 0.8 meters height from the metal ground plane and 0.4 meter from the conducting wall of the shielding room and it was kept at least 0.8 meters from any other grounded conducting surface.
b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
c. All the support units are connecting to the other LISN.
d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
e. The CISPR states that a 50 ohm, 50 micro-Henry LISN should be used.
f. Both sides of AC line were checked for maximum conducted interference.
g. The frequency range from 150 kHz to 30 MHz was searched
h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

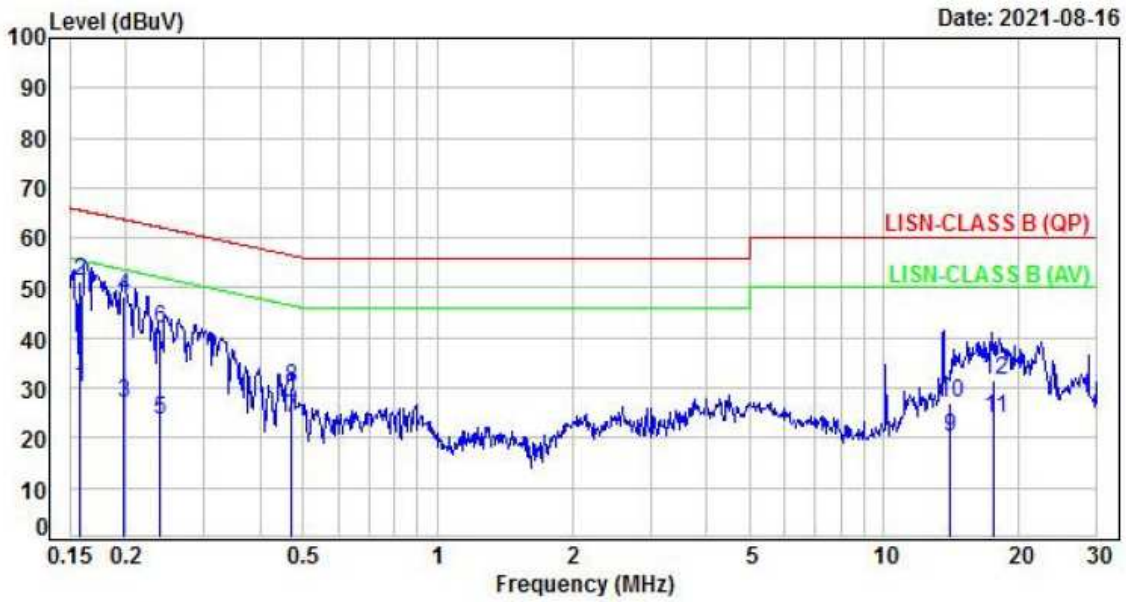
5.3. Typical Test Setup



5.4. Test Result and Data of Power Port

Test Mode	Mode 1	Pol/Phase	LINE
Test Frequency	0.15 MHz ~ 30 MHz	Test Voltage	AC 230V
Test Date	Aug. 16, 2021	Test Engineer	Richard
Temperature	26°C	Relative Humidity	54%

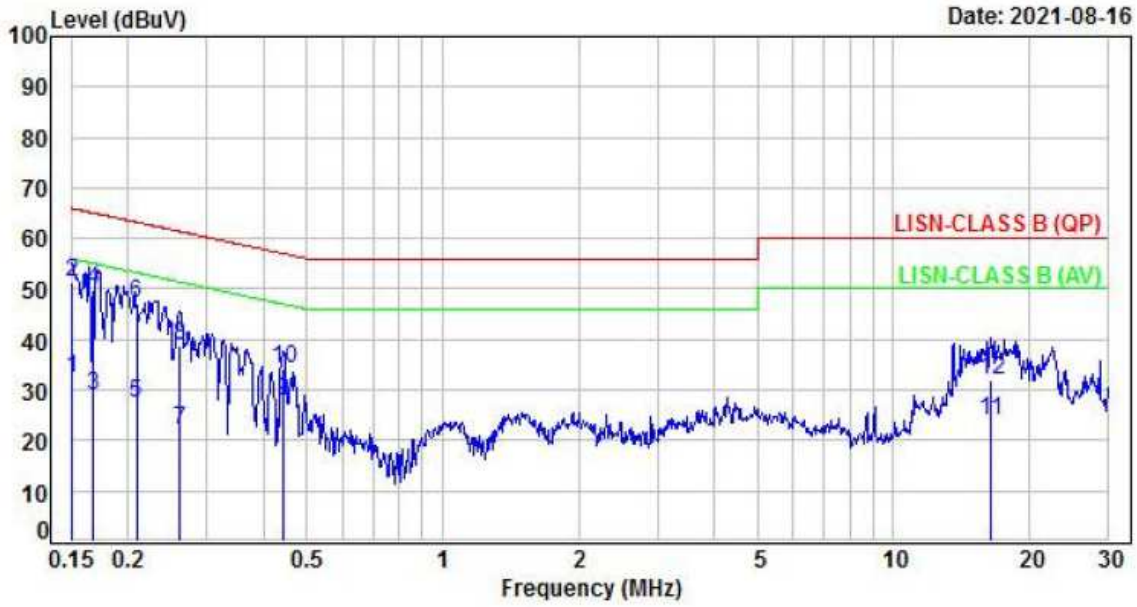
Note : Level = Reading + Factor
Margin = Level – Limit
Factor= (LISN or PLC or Current Probe) Factor + Cable Loss + Attenuator



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.16	9.96	19.89	29.85	55.59	-25.74	Average	P
2	0.16	9.96	41.29	51.25	65.59	-14.34	QP	P
3	0.20	9.96	17.17	27.13	53.68	-26.55	Average	P
4	0.20	9.96	38.44	48.40	63.68	-15.28	QP	P
5	0.24	9.96	13.75	23.71	52.16	-28.45	Average	P
6	0.24	9.96	31.89	41.85	62.16	-20.31	QP	P
7	0.47	9.98	13.93	23.91	46.52	-22.61	Average	P
8	0.47	9.98	20.04	30.02	56.52	-26.50	QP	P
9	14.02	10.92	9.35	20.27	50.00	-29.73	Average	P
10	14.02	10.92	15.96	26.88	60.00	-33.12	QP	P
11	17.67	11.16	12.88	24.04	50.00	-25.96	Average	P
12	17.67	11.16	20.50	31.66	60.00	-28.34	QP	P

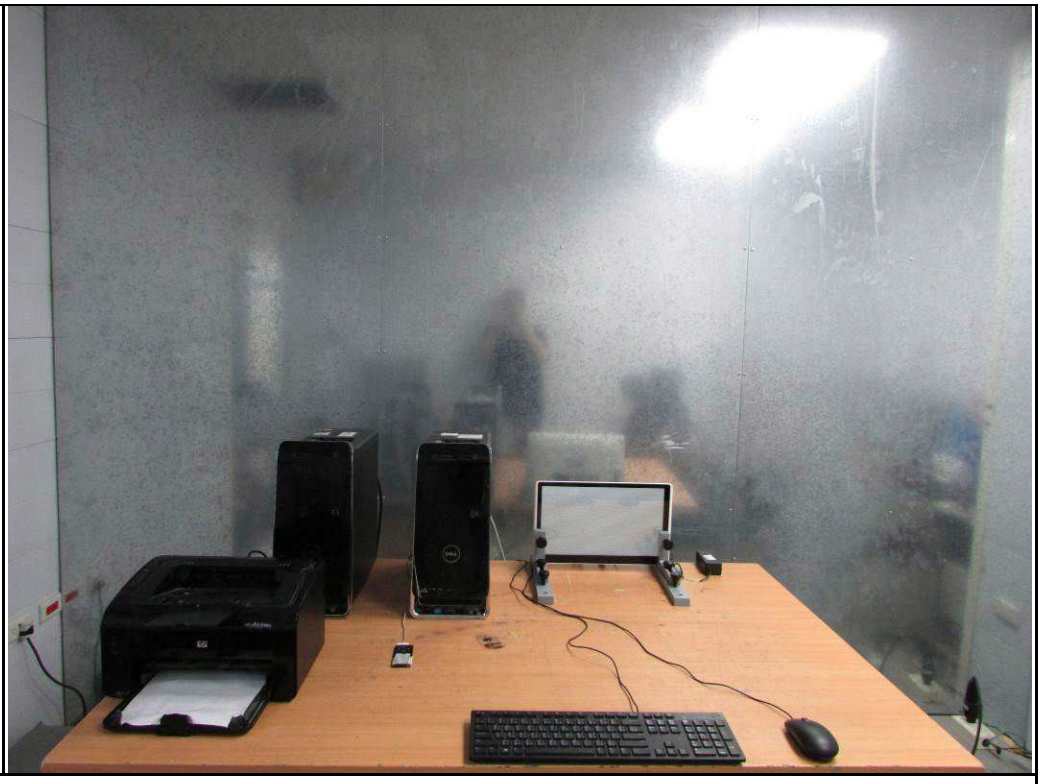
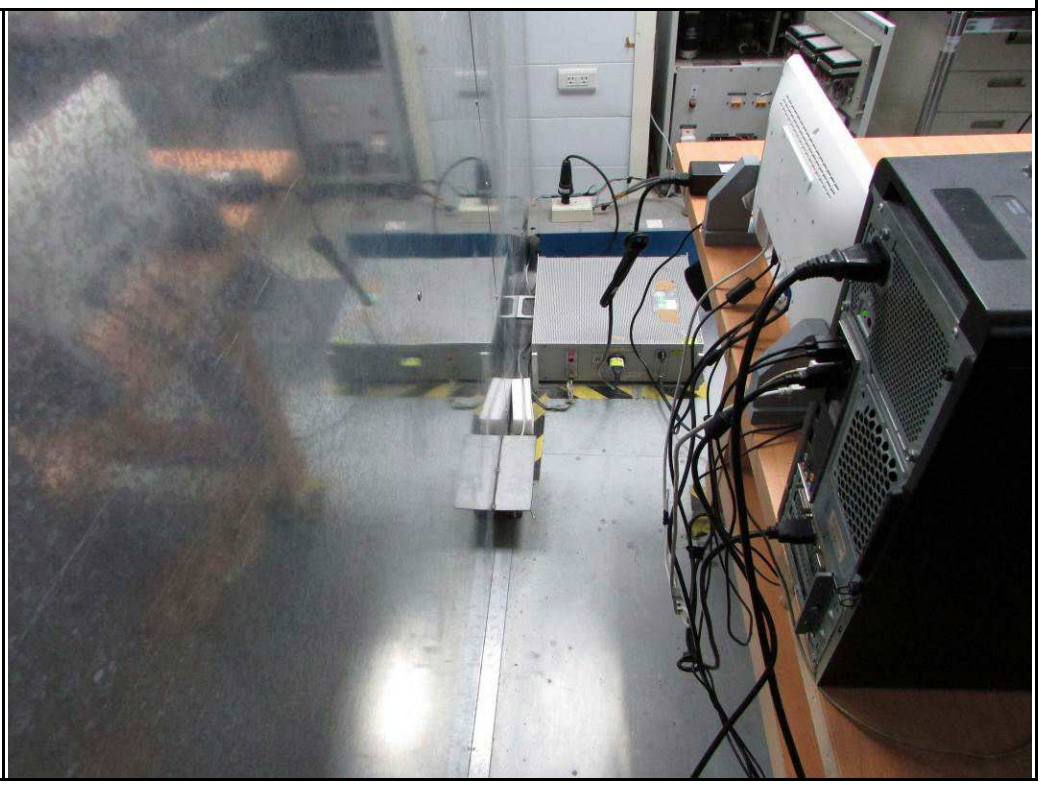
Test Mode	Mode 1	Pol/Phase	NEUTRAL
Test Frequency	0.15 MHz ~ 30 MHz	Test Voltage	AC 230V
Test Date	Aug. 16, 2021	Test Engineer	Richard
Temperature	26°C	Relative Humidity	54%

Note : Level = Reading + Factor
Margin = Level – Limit
Factor= (LISN or PLC or Current Probe) Factor + Cable Loss + Attenuator



No.	Frequency (MHz)	Factor (dB)	Reading (dBuV)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.15	9.97	22.37	32.34	55.96	-23.62	Average	P
2	0.15	9.97	41.53	51.50	65.96	-14.46	QP	P
3	0.17	9.97	19.02	28.99	55.10	-26.11	Average	P
4	0.17	9.97	39.80	49.77	65.10	-15.33	QP	P
5	0.21	9.97	17.56	27.53	53.25	-25.72	Average	P
6	0.21	9.97	37.06	47.03	63.25	-16.22	QP	P
7	0.26	9.97	11.92	21.89	51.42	-29.53	Average	P
8	0.26	9.97	28.95	38.92	61.42	-22.50	QP	P
9	0.44	9.98	17.60	27.58	46.98	-19.40	Average	P
10	0.44	9.98	24.11	34.09	56.98	-22.89	QP	P
11	16.41	10.92	13.18	24.10	50.00	-25.90	Average	P
12	16.41	10.92	20.84	31.76	60.00	-28.24	QP	P

5.5. Test Photographs of Power Port

Front View	
Rear View	

6. Test of Radiated Emission

6.1. Test Limit

The EUT shall meet the limits of below Table when measured at the measuring distance R in accordance with the methods described in European Standard EN 55011 Clause 6. If the reading on the measuring receiver shows fluctuations close to the limit, the reading shall be observed for at least 15 s at each measurement frequency; the highest reading shall be recorded, with the exception of any brief isolated high reading, which shall be ignored.

Table 1 – Limits for radiated disturbance at a measuring distance of 10 m (dB(μV/m))

Frequency range(MHz)	Class A Equipment	Class B Equipment
	Quasi-peak	Quasi-peak
30 to 230	40	30
230 to 1000	47	37
NOTE 1 The lower limit shall apply at the transition frequency. NOTE 2 Additional provisions may be required for cases where interference occurs.		

The EUT shall meet the limits of below Table when measured in accordance with the method described in European Standard EN 55022 Clause 10 and the conditional testing procedure described below.

Table 2 – Limits for radiated disturbance at a measuring distance of 3 m (dB (μV/m))

Frequency range (GHz)	Class A Equipment		Class B Equipment	
	Avg.	Peak	Avg.	Peak
1 to 3	56	76	50	70
3 to 6	60	80	54	74
NOTE The lower limit applies at the transition frequency.				

• Conditional testing procedure:

The highest internal source of an EUT is defined as the highest frequency generated or used within the EUT or on which the EUT operates or tunes.

If the highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.

If the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.

If the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.

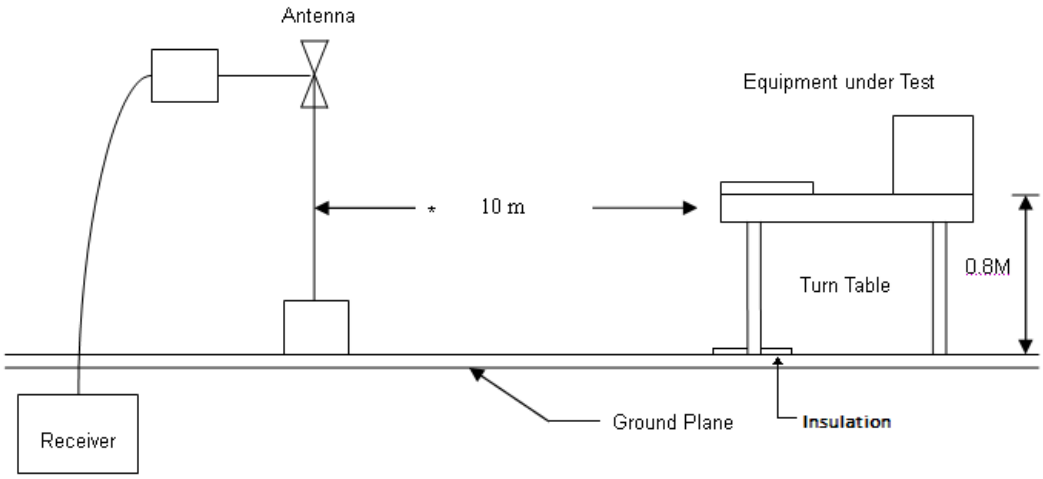
If the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 6 GHz, whichever is less.

6.2. Test Procedures

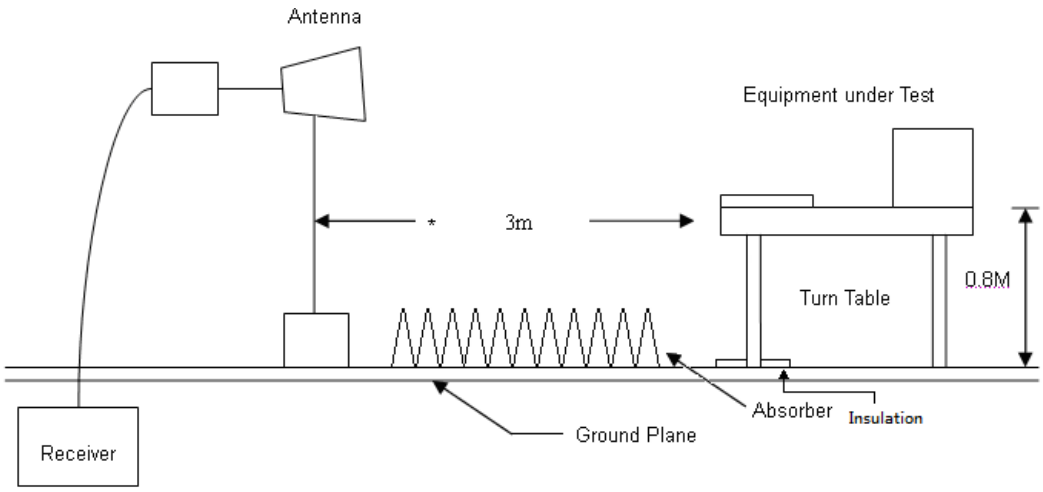
a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 3/10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
c. The table was rotated 360 degrees to determine the position of the highest radiation.
d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. Typical Test Setup

Below 1GHz Test Setup



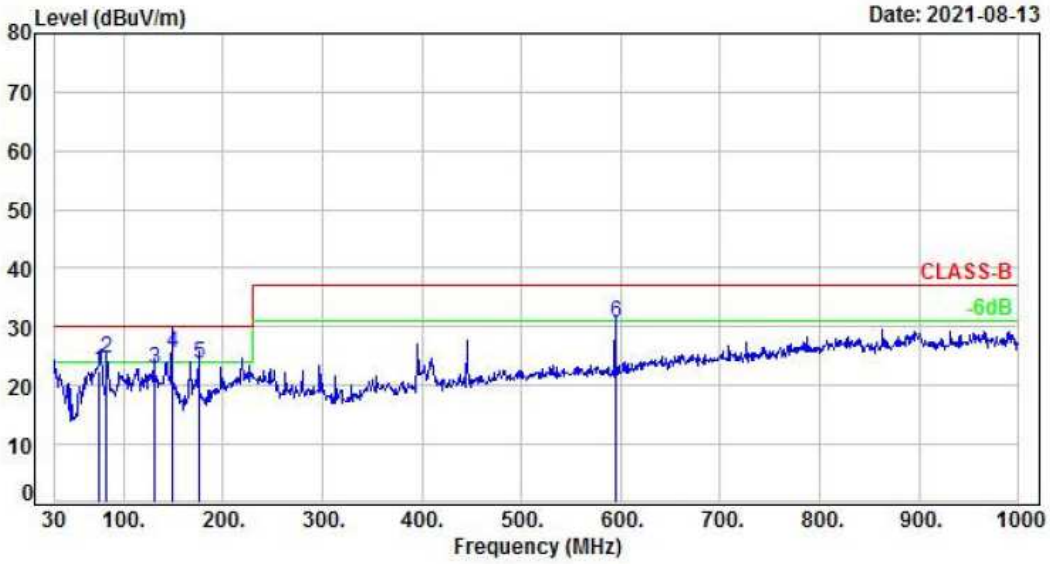
Above 1GHz Test Setup



6.4. Test Result and Data (30MHz ~ 1GHz)

Test Mode	Mode 1	Pol/Phase	VERTICAL
Test Frequency	30 MHz ~ 1 GHz	Test Voltage	AC 230V
Test Date	Aug. 13, 2021	Test Engineer	Tien
Temperature	22 °C	Relative Humidity	55 %

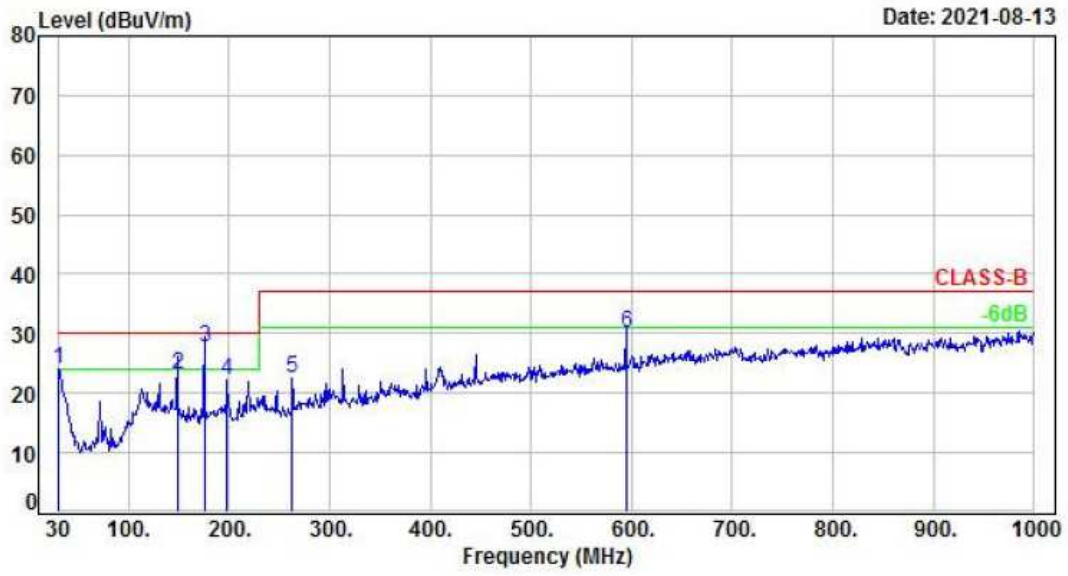
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	75.59	-21.06	43.71	22.65	30.00	-7.35	QP	200	328	P
2	83.35	-21.56	46.15	24.59	30.00	-5.41	QP	200	314	P
3	130.88	-14.68	37.41	22.73	30.00	-7.27	QP	100	296	P
4	148.34	-15.85	41.31	25.46	30.00	-4.54	QP	100	96	P
5	175.50	-16.71	40.52	23.81	30.00	-6.19	QP	100	233	P
6	594.54	-7.99	38.70	30.71	37.00	-6.29	QP	300	2	P

Test Mode	Mode 1	Pol/Phase	HORIZONTAL
Test Frequency	30 MHz ~ 1 GHz	Test Voltage	AC 230V
Test Date	Aug. 13, 2021	Test Engineer	Tien
Temperature	22 °C	Relative Humidity	55 %

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor

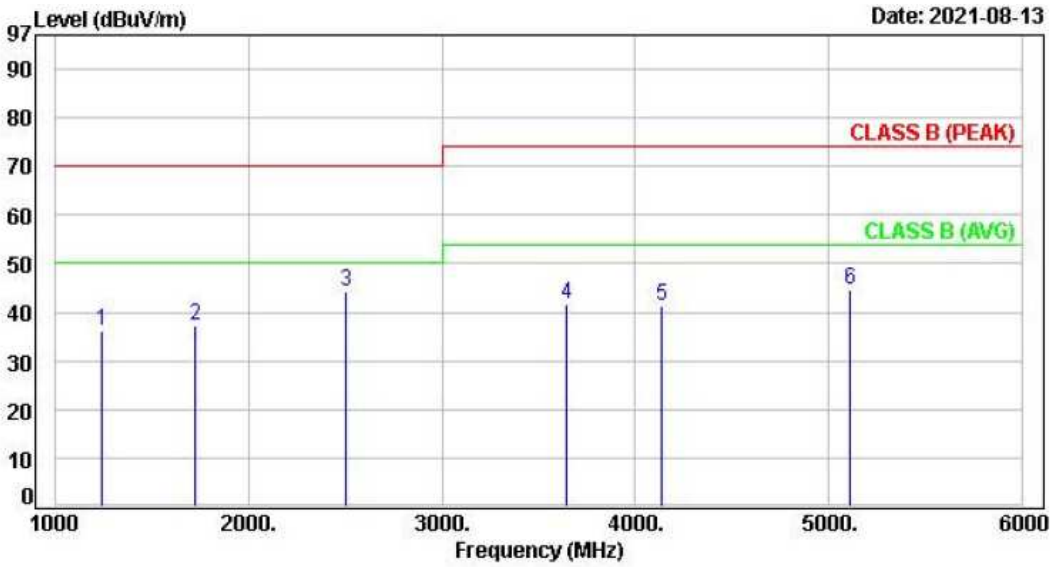


No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	30.00	-2.51	26.46	23.95	30.00	-6.05	Peak	100	206	P
2	148.34	-9.91	33.00	23.09	30.00	-6.91	QP	300	228	P
3	175.50	-10.69	38.27	27.58	30.00	-2.42	QP	400	352	P
4	197.81	-9.68	31.97	22.29	30.00	-7.71	Peak	300	290	P
5	262.80	-9.17	31.82	22.65	37.00	-14.35	Peak	400	176	P
6	594.54	-0.48	30.50	30.02	37.00	-6.98	Peak	200	239	P

6.5. Test Result and Data (1GHz ~ 6GHz)

Test Mode	Mode 1	Pol/Phase	VERTICAL
Test Frequency	1 GHz ~ 6 GHz	Test Voltage	AC 230V
Test Date	Aug. 13, 2021	Test Engineer	Tien
Temperature	22 °C	Relative Humidity	55 %

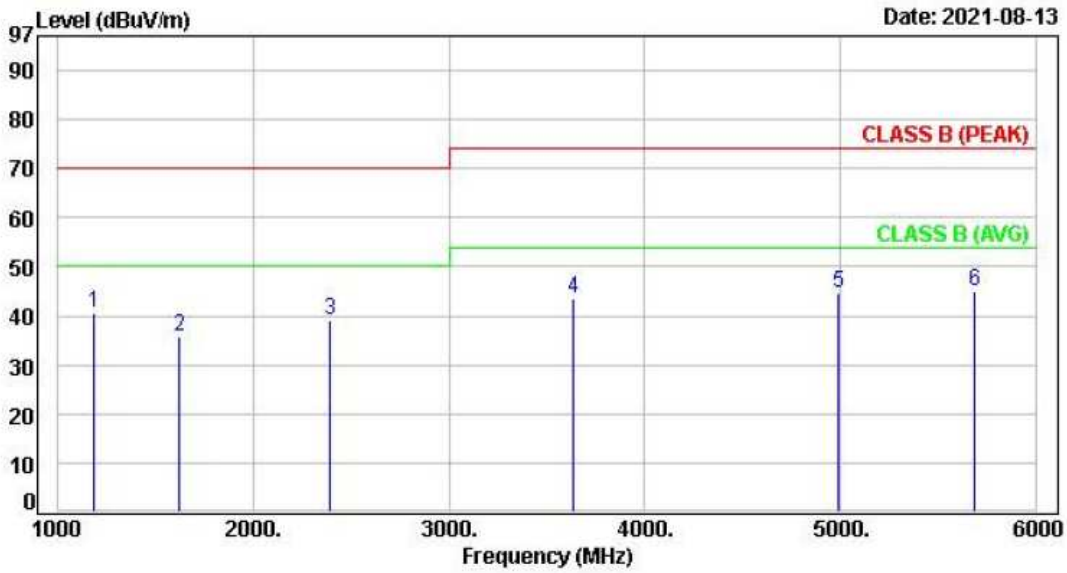
Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1245.00	-17.17	53.45	36.28	70.00	-33.72	Peak	100	0	P
2	1725.00	-17.01	54.34	37.33	70.00	-32.67	Peak	100	0	P
3	2500.00	-13.56	57.64	44.08	70.00	-25.92	Peak	100	0	P
4	3645.00	-10.24	51.96	41.72	74.00	-32.28	Peak	100	0	P
5	4135.00	-9.01	50.25	41.24	74.00	-32.76	Peak	100	0	P
6	5110.00	-5.86	50.37	44.51	74.00	-29.49	Peak	100	0	P

Test Mode	Mode 1	Pol/Phase	HORIZONTAL
Test Frequency	1 GHz ~ 6 GHz	Test Voltage	AC 230V
Test Date	Aug. 13, 2021	Test Engineer	Tien
Temperature	22 °C	Relative Humidity	55 %

Note : Level = Reading + Factor
Margin = Level – Limit
Factor = Antenna Factor + Cable Loss – Amplifier Factor



No.	Frequency (MHz)	Factor (dB/m)	Reading (dBuV)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg)	P/F
1	1190.00	-17.40	57.87	40.47	70.00	-29.53	Peak	400	0	P
2	1620.00	-17.31	53.20	35.89	70.00	-34.11	Peak	400	0	P
3	2395.00	-13.48	52.47	38.99	70.00	-31.01	Peak	400	0	P
4	3635.00	-10.27	53.86	43.59	74.00	-30.41	Peak	400	0	P
5	4990.00	-6.44	50.91	44.47	74.00	-29.53	Peak	400	0	P
6	5685.00	-5.39	50.51	45.12	74.00	-28.88	Peak	400	0	P

6.6. Test Photographs (30MHz ~ 1GHz)

Front View	
Rear View	

6.7. Test Photographs (1GHz ~ 6GHz)

Front View	
Rear View	

7. Harmonics Test

7.1. Limits of Harmonics Current Measurement

Limits for Class A equipment	
Harmonics Order n	Max. Permissible Harmonics current A
Odd Harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15×15/n
Even Harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23×8/n

Limits for Class D equipment		
Harmonics Order n	Max. Permissible Harmonics current per Watt mA/W	Max. Permissible Harmonics current A
Odd Harmonics only		
3	3.4	2.30
5	1.9	1.14
7	1.0	0.77
9	0.5	0.40
11	0.35	0.33
13	0.30	0.21
15<=n<=39	3.85/n	0.15 x15/n

NOTE:

1. Class A and Class D are classified according to item section 5 of EN IEC 61000-3-2:2019.
2. According to section 7 of EN IEC 61000-3-2:2019, the above limits for all equipment except for lighting equipment are for all applications having an active input power > 75 W and no limits apply for equipment with an active input power up to and including 75 W.

7.2. Test Requirement :

The repeatability of the average value for the individual harmonic currents over the entire test observation period shall be better than ±5 % of the applicable limit, when the following conditions are met:
– the same equipment under test (EUT) (not another of the same type, however similar);
– identical test conditions;
– the same test system;
– identical climatic conditions, if relevant.
NOTE
This repeatability requirement serves the purpose of defining the necessary observation period, see 6.2.4.
It is not intended to serve as a pass/fail criterion for the assessment of compliance with the requirements of this standard.

7.3. Test Result and Data

The limits are not specified for equipment with a rated power of 75W or less.
The EUT meets the above condition, so it conforms to EN IEC 61000-3-2.

8. Voltage Fluctuations Test

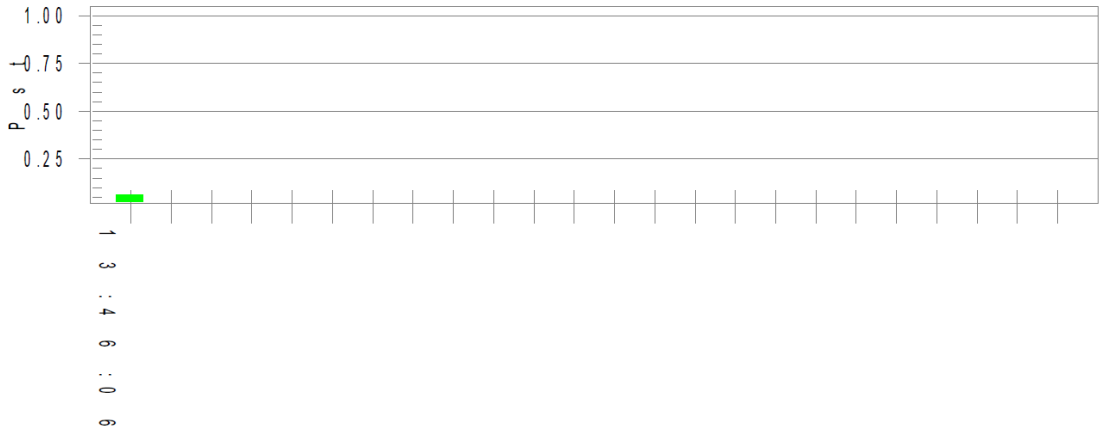
8.1. Test Procedure

The equipment shall be tested under the conditions of **Clause 5.**
The total impedance of the test circuit, excluding the appliance under test, but including the internal impedance of the supply source, shall be equal to the reference impedance.
The stability and tolerance of the reference impedance shall be adequate to ensure that the overall accuracy of ±8% is achieved during the whole assessment procedure.

8.2. Test Result and Data

Test Mode	Mode 1	Final Test Result	Pass
Basic Standard	EN 61000-3-3	Test Voltage	AC 230V
Test Date	Aug. 16, 2021	Test Engineer	Ken
Temperature	27°C	Relative Humidity	56%

Pst_i and limit line **European Limits**



Plt and limit line

Parameter values recorded during the test:

Vrms at the end of test (Volt):	230.25			
T-max (mS):	0	Test limit (mS):	500.0	Pass
Highest dc (%):	0.00	Test limit (%):	3.30	Pass
Highest dmax (%):	0.00	Test limit (%):	4.00	Pass
Highest Pst (10 min. period):	0.064	Test limit:	1.000	Pass
Highest Plt (2 hr. period):	0.028	Test limit:	0.650	Pass

8.3. Test Photographs

Front View	

9. Electrostatic Discharge Immunity Test

9.1. Test Procedure

a. In the case of air discharge testing the climatic conditions shall be within the following ranges:
- ambient temperature: 15℃ to 35℃;
- relative humidity : 30% to 60%;
- atmospheric pressure : 86 KPa (860 mbar) to 106 KPa (1060 mbar).

b. Test programs and software shall be chosen so as to exercise all normal modes of operation of the EUT. The use of special exercising software is encouraged, but permitted only where it can be shown that the EUT is being comprehensively exercised.

c. The test voltage shall be increased from the minimum to the selected test severity level, in order to determine any threshold of failure. The final severity level should not exceed the product specification value in order to avoid damage to the equipment.

d. The test shall be performed with both air discharge and contact discharge. On reselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on air discharge. On reselected points at least 10 single discharges (in the most sensitive polarity) shall be applied on contact discharge.

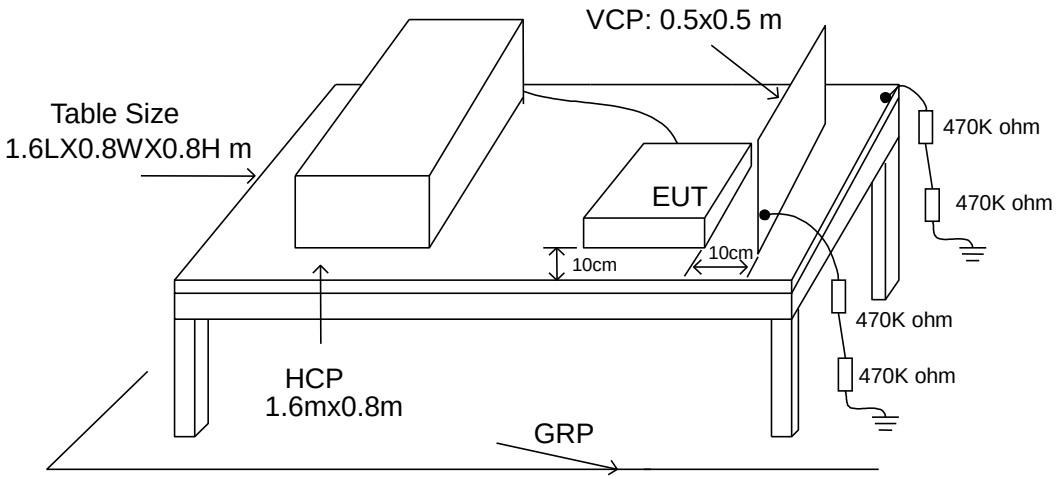
e. For the time interval between successive single discharges an initial value of one second is recommended. Longer intervals may be necessary to determine whether a system failure has occurred.

f. In the case of contact discharges, the tip of the discharge electrode shall touch the EUT before the discharge switch is operated.

g. In the case of painted surface covering a conducting substrate, the following procedure shall be adopted :
- If the coating is not declared to be an insulating coating by the equipment manufacturer, then the pointed tip of the generator shall penetrate the coating so as to make contact with the conducting substrate.
- Coating declared as insulating by the manufacturer shall only be submitted to the air discharge.
- The contact discharge test shall not be applied to such surfaces.

h. In the case of air discharges, the round discharge tip of the discharge electrode shall be approached as fast as possible (without causing mechanical damage) to touch the EUT . After each discharge, the ESD generator (discharge electrode) shall be removed from the EUT. The generator is then retriggered for a new single discharge. This procedure shall be repeated until the discharges are completed. In the case of an air discharge test, the discharge switch, which is used for contact discharge, shall be closed.

9.2. Test Setup for Tests Performed in Laboratory



The test setup consists of the test generator, EUT and auxiliary instrumentation necessary to perform DIRECT and INDIRECT application of discharges to the EUT as applicable, in the follow manner :

a. Contact Discharge to the conductive surfaces and to coupling plane;
b. Air Discharge at insulating surfaces.

The preferred test method is that of type tests performed in laboratories and the only accepted method of demonstrating conformance with this standard. The EUT was arranged as closely as possible to arrangement in final installed conditions.

A ground reference plane was provided on the floor of the test site. It was a metallic sheet (copper or aluminum) of 0.25 mm, minimum thickness; other metallic may be used but they shall have at least 0.65 mm thickness. In the Cerpass Technology Corp., we provided 1 mm thickness stainless steel ground reference plane. The minimum size of the ground reference plane is 2.5 m x 2.5 m, the exact size depending on the dimensions of the EUT. It was connected to the protective grounding system.

The EUT was arranged and connected according to its functional requirements. A distance of 1m minimum was provided between the EUT and the wall of the lab. and any other metallic structure. In cases where this length exceeds the length necessary to apply the discharges to the selected points, the excess length shall, where possible, be placed non-inductively off the ground reference plane and shall not come closer than 0.2m to other conductive parts in the test setup.

Where the EUT is installed on a metal table, the table was connected to the reference plane via a cable with a 470k ohm resister located at each end, to prevent a build-up of charge. The test setup was consist a wooden table, 0.8m high, standing on the ground reference plane. A HCP, 1.6 m x 0.8 m, was placed on the table. The EUT and cables was isolated from the HCP by an insulating support 0.5 mm thick. The VCP size, 0.5 m x 0.5 m.

9.3. Test Severity Levels

Contact Discharge		Air Discharge	
Level	**Test Voltage (KV) of Contact discharge**	**Level**	**Test Voltage (KV) of Air Discharge**
1	±2	1	±2
2	±4	2	±4
3	±6	3	±8
4	±8	4	±15
X	Specified	X	Specified
Remark: “X” is an open level.			

9.4. Test Result and Data

Test Mode	Mode 1	Final Test Result	Pass
Test Date	Aug. 18, 2021	Test Engineer	Ted
Temperature	23 °C	Relative Humidity	43 %
Atmospheric Pressure	1010 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-2
Product Standard	EN 60601-1-2
Test Voltage	±2 / ±4 / ±8/ ±12/ ±15 KV for air discharge, ±2 / ±4/ ±6/ ±8 KV for contact discharge

	Contact Discharge							
	10 times / each							
Voltage	2 KV		4 KV		6 KV		8 KV	
No\ Point\Polarity	+	—	+	—	+	—	+	—
HCP Front	P	P	P	P	P	P	P	P
HCP Right	P	P	P	P	P	P	P	P
HCP Left	P	P	P	P	P	P	P	P
HCP Back	P	P	P	P	P	P	P	P
VCP Front	P	P	P	P	P	P	P	P
VCP Right	P	P	P	P	P	P	P	P
VCP Left	P	P	P	P	P	P	P	P
VCP Back	P	P	P	P	P	P	P	P
12	P	P	P	P	P*	P*	P*	P*
13	P	P	P*	P*	P*	P*	P*	P*
14	P	P	P	P	P*	P*	P*	P*
15~26	P	P	P*	P*	P*	P*	P*	P*
27	P	P	P	P	P*	P*	P*	P*
28~31	P	P	P*	P*	P*	P*	P*	P*
32	P	P	P	P	P*	P*	P*	P*
37	P	P	P*	P*	P*	P*	P*	P*

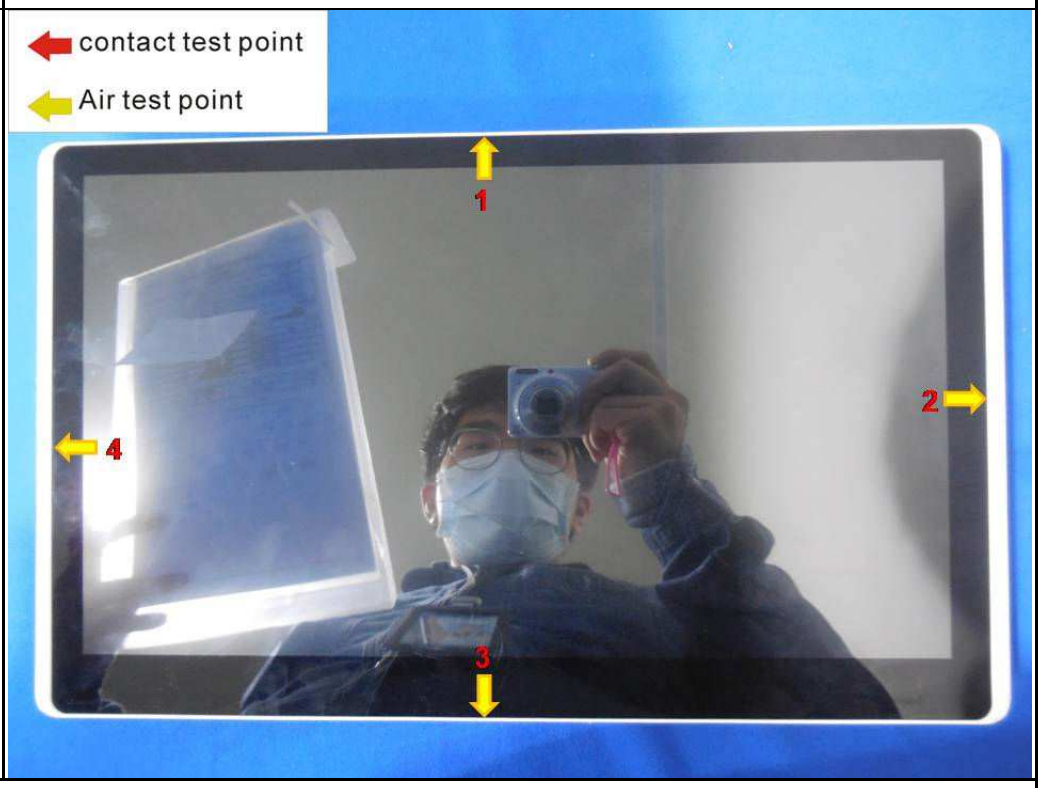
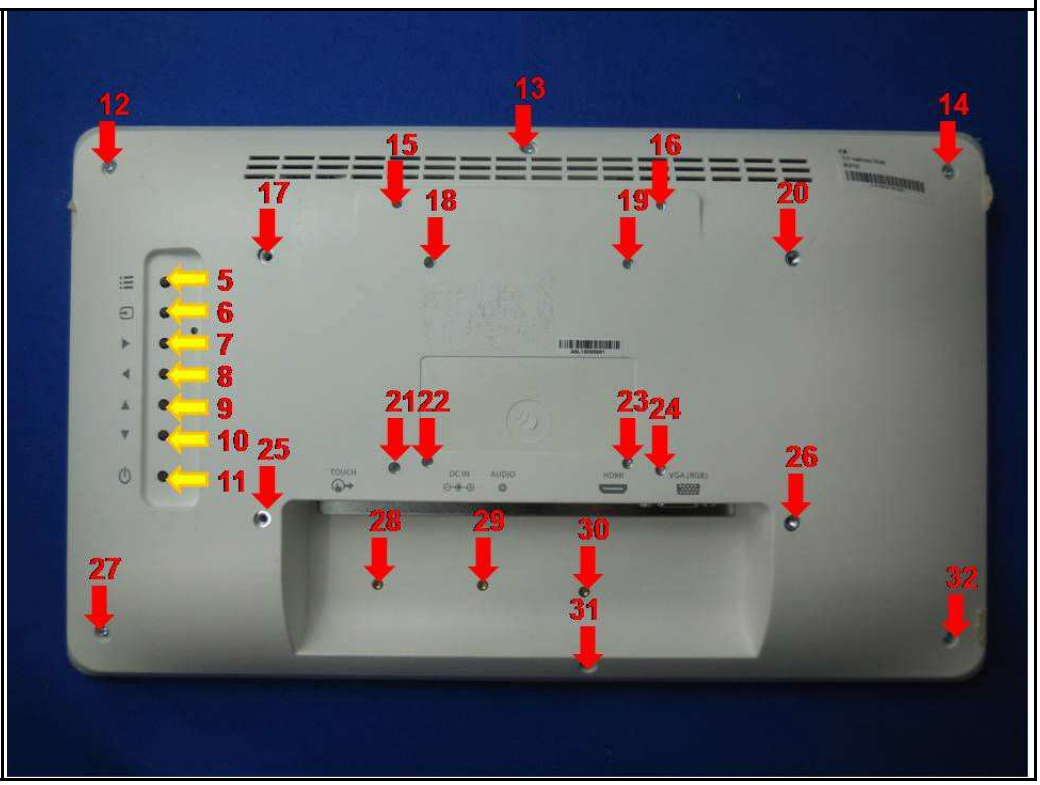
	Air Discharge									
	10 times / each									
Voltage	2 KV		4 KV		8 KV		10 KV		15 KV	
No\ Point\Polarity	+	—	+	—	+	—	+	—	+	—
1~11	P	P	P	P	P*	P*	P*	P*	P*	P*
33~36	P	P	P	P	P*	P*	P*	P*	P*	P*
38~41	P	P	P	P	P	P	P	P	P	P

Note: “P” means pass, the EUT function is normal working during the test.
“P*” means the EUT function is affect during the test, but it can be recover automatically, after a while.

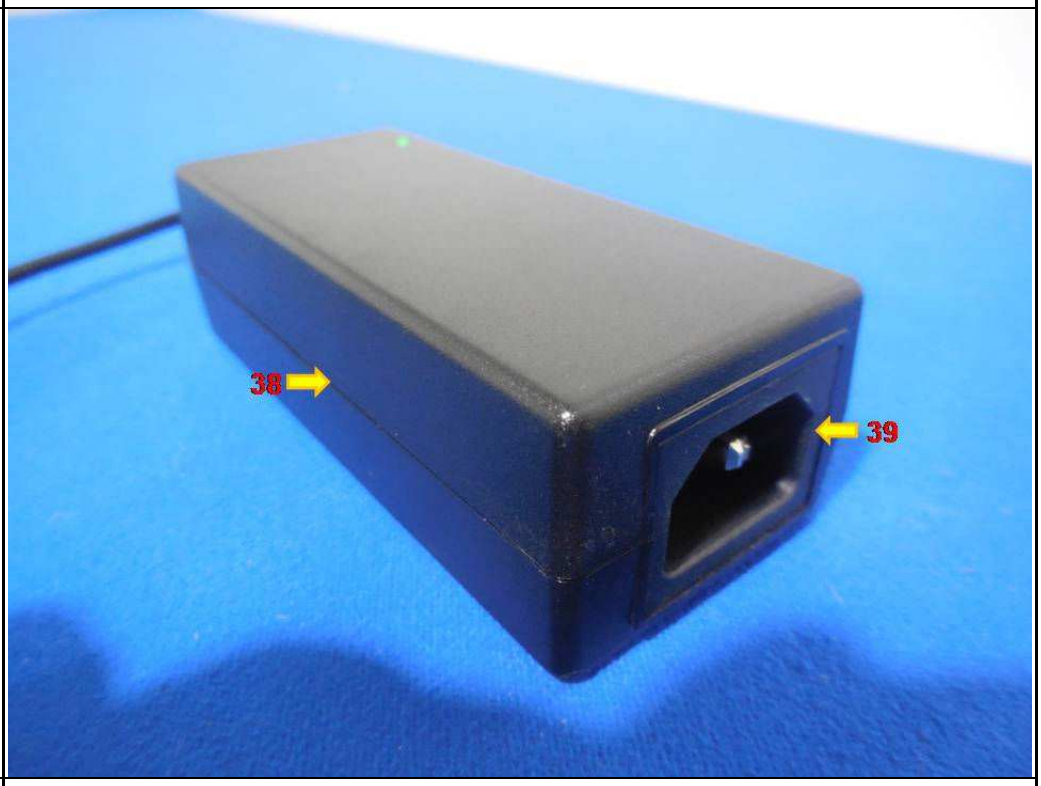
9.5. Test Photographs

Front View	

9.6. Test Points

Top View	
Bottom View	

I/O View	
I/O View	

Side View	
Side View	

10. Radio Frequency Electromagnetic Field Immunity Test

10.1.Test Procedure

a. The equipment to be tested is placed in the center of the enclosure on a wooden table. The equipment is then connected to power and signal leads according to pertinent installation instructions.
b. The antenna which is enabling the complete frequency range of 80-5800 MHz is placed 3m away from the equipment. The required field strength is determined by placing the field strength meter(s) on top of or directly alongside the equipment under test and monitoring the field strength meter via a remote field strength indicator outside the enclosure while adjusting the continuous-wave to the applicable antennae.
c. The test is normally performed with the antenna facing the most sensitive side of the EUT. The polarization of the field generated by the bucolical antenna necessitates testing each position twice, once with the antenna positioned vertically and again with the antenna positioned horizontally. The circular polarization of the field from the log-spiral antenna makes a change of position of the antenna unnecessary.
d. At each of the above conditions, the frequency range is swept 80-5800 MHz, pausing to adjust the R.F. signal level or to switch oscillators and antenna. The rate of sweep is in the order of 1.5*10-3 decades/s. The sensitive frequencies or frequencies of dominant interest may be discretely analyzed.

10.2.Test Severity Levels

Frequency Band : 80-5800 MHz	
Level	**Test field strength (V/m)**
1	1
2	3
3	10
X	Specified
Remark: “X” is an open class.	

10.3.Test Result and Data

Test Mode	Mode 1	Final Test Result	Pass
Test Date	Aug. 12, 2021	Test Engineer	Hank
Temperature	23 °C	Relative Humidity	49 %
Atmospheric Pressure	1002 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-3
Product Standard	EN 60601-1-2
Frequency Range	80~2700 MHz
Modulation	AM 80%, 1KHz sine wave
Dwell Time	3 S
Frequency Step Size	1 %

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

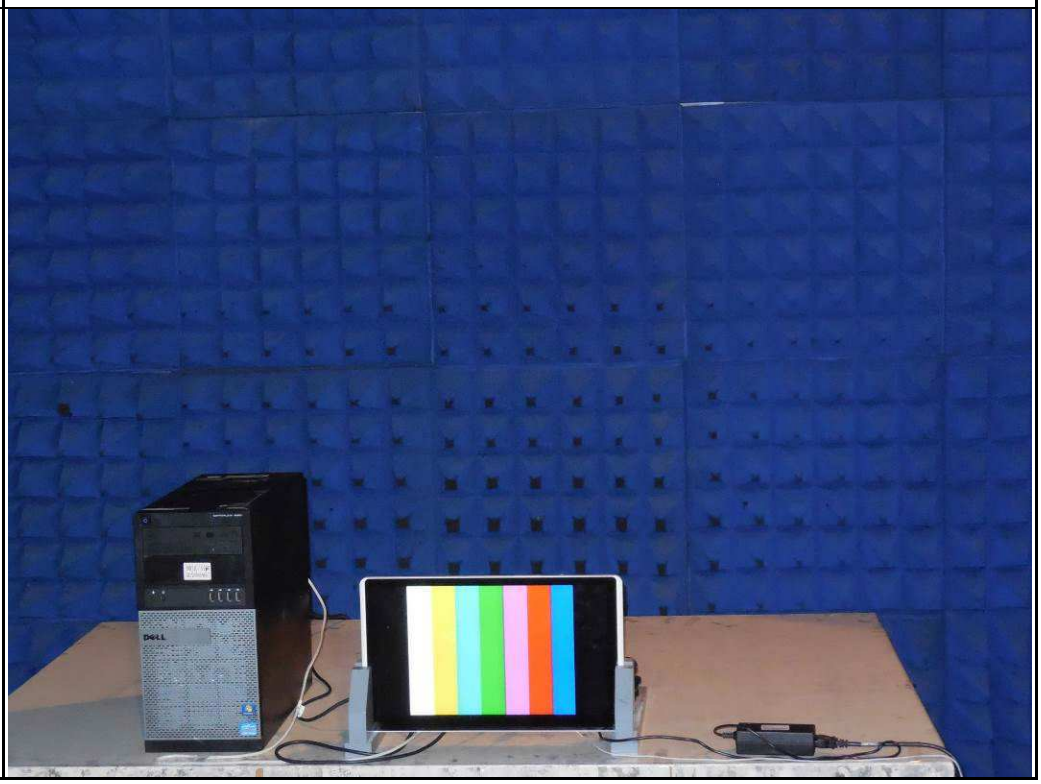
Note: “P” means pass, the EUT function is normal working during the test.

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-3
Product Standard	EN 60601-1-2
Frequency Range	Refer to the below test data

Frequency (MHz)	Bend (MHz)	Modulation	Immunity (V/m)	Result
385	380-390	Pulse 18Hz	27	P
450	430-470	FM 5kHz deviation 1kHz sine	28	P
710	704-787	Pulse 217Hz	9	P
745				
780				
810	800-960	Pulse 18Hz	28	P
870				
930				
1720	1700-1990	Pulse 217Hz	28	P
1845				
1970				
2450	2400-2570	Pulse 217Hz	28	P
5240	5100-5800	Pulse 217Hz	9	P
5500				
5785				

Note: “P” means pass, the EUT function is normal working during the test.

10.4.Test Photographs

Front View	

11. Electrical Fast Transient/ Burst Immunity Test

11.1. Test Procedure

a. In order to minimize the effect of environmental parameters on test results, the climatic conditions when test is carrying out shall comply with the following requirements:
- ambient temperature: 15℃ to 35℃;
- relative humidity : 45% to 75%;
- Atmospheric pressure: 86 Kpa (860 mbar) to 106 Kpa (1060 mbar).

b. In order to minimize the effect of environmental parameters on test results, the electromagnetic environment of the laboratory shall not influence the test results.

c. The variety and diversity of equipment and systems to be tested make it difficult to establish general criteria for the evaluation of the effects of fast transients/bursts on equipment and systems.

d. Test on Power Line:
- The EFT/B-generator was located on the GRP.
  For floor standing equipment 1,0 m
  For table top equipment 0,5 m
- The EFT/B-generator provides the ability to apply the test voltage in a non-symmetrical condition to the power supply input terminals of the EUT.

e. Test on Communication Lines
- The coupling clamp is composed of a clamp unit for housing the cable (length more than 3 m), and was placed on the GRP.
- The coupling clamp provides the ability of coupling the fast transient/bursts to the cable under test.

f. The test results may be classified on the basic of the operating conditions and the functional specification of the equipment under test, according to the following performance criteria :
- Normal performance within the specification limits.
- Temporary degradation or loss of function or performance which is self-recoverable.
- Temporary degradation or loss of function or performance which requires operator intervention or system reset.
- Degradation or loss of function which is not recoverable due to damage of equipment (components).

11.2. Test Severity Levels

The following test severity levels are recommended for the fast transient/burst test:

Open circuit output test voltage ± 10%		
Level	**On Power Supply**	**On I/O signal, data and control line**
1	0.5 KV	0.25 KV
2	1.0 KV	0.50 KV
3	2.0 KV	1.00 KV
4	4.0 KV	2.00 KV
X	Specified	Specified

Remark : " X " is an open level. The level is subject to negotiation between the user and manufacturer or is specified by the manufacturer.

11.3. Test Result and Data

Test Mode	Mode 1	Final Test Result	Pass
Test Date	Aug. 16, 2021	Test Engineer	Ted
Temperature	27 °C	Relative Humidity	56 %
Atmospheric Pressure	1004 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-4
Product Standard	EN 60601-1-2
Test Voltage	On Power Port -- ±0.5 KV, ±1.0 KV, ±2.0 KV On Telecommunication Port -- N/A
Pulse	5/50 ns
Burst	0.75ms/300ms
Repetition Rate	100 kHz
Test time	1 min/each condition

For input power port						
Phase	0.5 kV		1.0 kV		2.0 kV	
	+	–	+	–	+	–
L	P	P	P	P	P*	P*
N	P	P	P	P	P*	P*
L-N	P	P	P	P	P*	P*
PE	P	P	P	P	P*	P*
L-PE	P	P	P	P	P*	P*
N-PE	P	P	P	P	P*	P*
L-N-PE	P	P	P	P	P*	P*

Note: “P” means pass, the EUT function is normal working during the test.
“P*” means the EUT function is affect during the test, but it can be recover automatically, after a while.

For Telecommunication port				
Test port	0.5 kV		1.0 kV	
	+	–	+	–
RJ45 LAN	--	--	--	--

11.4. Test Photographs

Front View	

12. Surge Immunity Test

12.1. Test Procedure

a. Climatic conditions
The climatic conditions shall comply with the following requirements :
- ambient temperature : 15 ℃ to 35 ℃
- relative humidity : 10 % to 75 %
- atmospheric pressure : 86 kPa to 106 kPa (860 mbar to 1060 mbar)

b. Electromagnetic conditions
the electromagnetic environment of the laboratory shall not influence the test results.

c. The test shall be performed according the test plan that shall specify the test set-up with
- generator and other equipment utilized;
- test level (voltage/current);
- generator source impedance;
- internal or external generator trigger;
- number of tests : at least five positive and five negative at the selected points;
- repetition rate : maximum 1/min.
- inputs and outputs to be tested;
- representative operating conditions of the EUT;
- sequence of application of the surge to the circuit;
- phase angle in the case of AC. power supply;
- actual installation conditions, for example :
  AC : neutral earthed,
  DC : (+) or (-) earthed to simulated the actual earthing conditions.

d. If not otherwise specified the surges have to be applied synchronized to the voltage phase at the zero-crossing and the peak value of the AC. voltage wave (positive and negative).

e. The surges have to be applied line to line and line(s) and earth. When testing line to earth, the test voltage has to be applied successively between each of the lines and earth, if there is no other specification.

f. The test procedure shall also consider the non-linear current-voltage characteristics of the equipment under test. Therefore the test voltage has to be increased by steps up to the test level specified in the product standard or test plan.

g. All lower levels including the selected test level shall be satisfied. For testing the secondary protection, the output voltage of the generator shall be increased up to the worst-case voltage breakdown level (let-through level) of the primary protection.

h. If the actual operating signal sources are not available, that may be simulated. Under no circumstances may the test level exceed the product specification. The test shall be carried out according to a test plan.

i. To find all critical points of the duty cycle of the equipment, a sufficient number of positive and negative test pulses shall be applied. For acceptance test previously unstressed equipment shall be used to the protection devices shall be replaced.

12.2. Test Severity Level

Level	Open-circuit test voltage (kV)	
	Line-to-line	Line-to-ground [b]
1	---	0.5
2	0.5	1.0
3	1.0	2.0
4	2.0	4.0
X [a]	Special	Special

[a] “X” and be any level, above, below or in between the others. The level shall be specified in the dedicated equipment specification.
[b] For symmetrical interconnection lines the test can be applied to multiple lines simultaneously with respect to ground, i.e. “lines to ground”.

12.3. Test Result and Data

Test Mode	Mode 1	**Final Test Result**	Pass
Test Date	Aug. 16, 2021	**Test Engineer**	Ted
Temperature	27 °C	**Relative Humidity**	56 %
Atmospheric Pressure	1004 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-5
Product Standard	EN 60601-1-2
Test Voltage	On Power Port -- ± 0.5kV, ± 1.0kV, ± 2.0kV
Waveform	On Power Port --1.2/50μs(8/20μs)
Repetition Rate	60 sec
Test Time	5 time/each condition

Voltage	Phase	Polarity	0°	90°	180°	270°
0.5kV, 1.0kV	L-N	+	P	P	P	P
		—	P	P	P	P
0.5kV, 1.0kV, 2.0kV	L-PE	+	P	P	P	P
		—	P	P	P	P
0.5kV, 1.0kV, 2.0kV	N-PE	+	P	P	P	P
		—	P	P	P	P

Note: “P” means pass, the EUT function is normal working during the test.

12.4. Test Photographs

Front View	

13. Conduction Disturbances induced by Radio-Frequency Fields

13.1. Test Procedure

a. The EUT shall be operated within its intended climatic conditions. The temperature and relative humidity should be recorded.
b. This test method test can be performed without using a sell shielded enclosure. This is because the disturbance levels applied and the geometry of the setups are not likely to radiated a high amount of energy, especially at the lower frequencies. If under certain circumstances the radiated energy is too high, a shielded enclosure has to be used.
c. The test shall be performed with the test generator connected to each of the coupling and decoupling devices in turn while the other non-excited RF-input ports of the coupling devices are terminated by a 50 ohm load resistor.
d. The frequency range is swept from 150 KHz to 80 MHz, using the signal levels established during the setting process, and with the disturbance signal 80% amplitude modulated with a 1KHz sign wave, pausing to adjust the RF-signal level or to switch coupling devices as necessary. The rate of sweep shall no exceed 1.5 x 10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall no exceed 1% of the start and thereafter 1% of the preceding frequency value.
e. The dwell time at each frequency shall not be less than the time necessary for the EUT to be exercised, and able to respond. Sensitive frequencies e.g. clock frequency (ies) and harmonics or frequencies of dominant interest shall be analyzed separately.
f. An alternative test procedure may be adopted, wherein the frequency range is swept incrementally, with a step size not exceeding 4% of the start ad thereafter 4% of the preceding frequency value. The test level should be at least twice the value of the specified test level.
g. In cases of dispute, the test procedure using a step size not exceeding 1% of the start and thereafter 1% of preceding frequency value shall take precedence.
h. Attempts should be made to fully exercise the EUT during testing, and to fully interrogate all exercise modes selected for susceptibility.
i. The use of special exercising programs is recommended.
j. Testing shall be performed according to a Test Plan, which shall be included in the test report.
k. It may be necessary to carry out some investigatory testing in order to establish some aspects of the test plan.

13.2.Test Severity Levels

Level	Voltage Level (e.m.f.)
1	1 V
2	3 V
3	10 V
x	Specified
NOTE - x is an open class. This level can be specified in the product specification.	

13.3. Test Result and Data

Test Mode	Mode 1	Final Test Result	Pass
Test Date	Aug. 12, 2021	Test Engineer	Hank
Temperature	25 °C	Relative Humidity	48 %
Atmospheric Pressure	1002 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-6
Product Standard	EN 60601-1-2
Frequency Range	0.15~80MHz
Modulation	AM 80%, 1KHz sine wave
Dwell Time	3 S
Frequency Step Size	1 %
Coupling Mode	CDN-M016M3 for power ports

Frequency (MHz)	Test Mode	Voltage (V)	Result
0.15 ~ 80	Power (M3)	3	P
0.15 ~ 80	RJ45 LAN	--	--
ISM Bands	Power (M3)	6	P
ISM Bands	RJ45 LAN	--	--

Note: ISM Bands: 6.765~6.795MHz, 13.553~13.567MHz, 26.957~27.283MHz, 40.66~40.70MHz

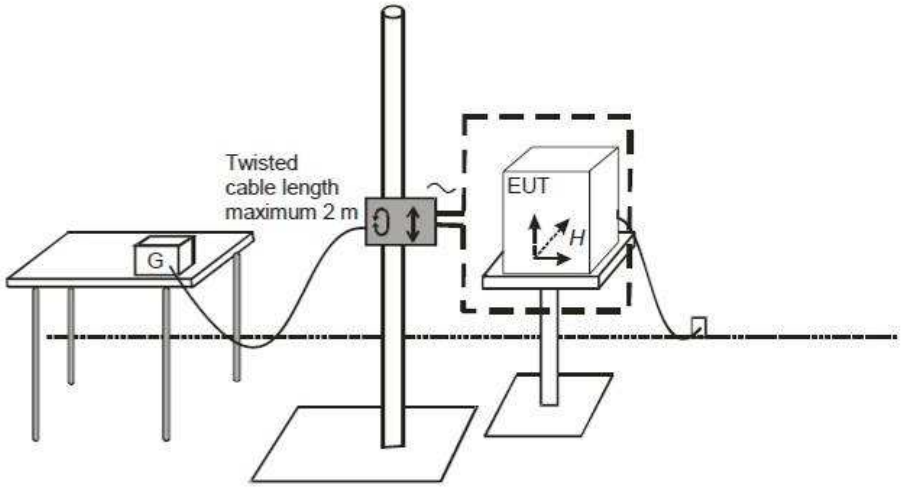
Note: “P” means pass, the EUT function is normal working during the test.

13.4. Test Photographs

Front View	

14. Power Frequency Magnetic Field Immunity Test

14.1. Test Setup



14.2. Test Severity Levels

Level	Magnetic field strength (A/m)
1	1
2	3
3	10
4	30
5	100
X[1)]	special
NOTE 1 “X” is an open level. This level can be given in the product specification.	

14.3.Test Result and Data

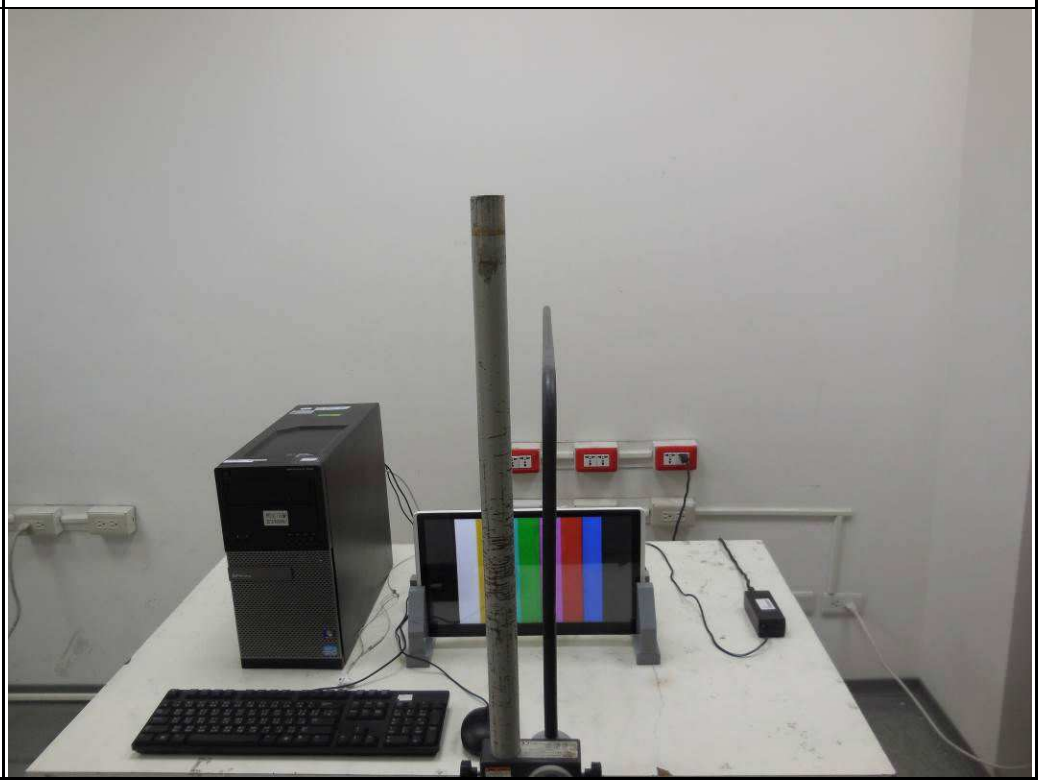
Test Mode	Mode 1	Final Test Result	Pass
Test Date	Aug. 12, 2021	Test Engineer	Hank
Temperature	27 °C	Relative Humidity	54 %
Atmospheric Pressure	1002 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-8
Product Standard	EN 60601-1-2
Power Frequency Magnetic Field	50/60 Hz, 30 A/m

Coil Orientation	Testing Duration	Results
X-axis	1.0 Min	P
Y-axis	1.0 Min	P
Z-axis	1.0 Min	P

Note: “P” means pass, the EUT function is normal working during the test.

14.4.Test Photographs

Front View	

15. Voltage Dips and Voltage Interruptions Immunity Test Setup

15.1. Test Conditions

1. Source voltage and frequency: AC 100/240V, 50Hz, Single phase.
2. Test of interval: 10 sec.
3. Level and duration: Sequence of 3 dips/interrupts.
4. Voltage rise (and fall) time: 1 ~ 5 μs.
5. Test severity:

Voltage Dips and Voltage interruptions (%)	Test Duration (period)	Required Performance criteria
0%	0.5	Pass
0%	1	Pass
70%	25/30	Pass
0%	250/300	Pass

15.2. Test Result and Data

Test Mode	Mode 1	**Final Test Result**	Pass
Test Date	Aug. 16, 2021	**Test Engineer**	Ted
Temperature	27 °C	**Relative Humidity**	56 %
Atmospheric Pressure	1004 hPa		

Pass Performance Criteria	A
Basic Standard	IEC 61000-4-11
Product Standard	EN 60601-1-2
Voltage(UT)	AC 100/240V, 50Hz
Interval(s)	10s
Times	3

Test Mode	**Test level Residual %**	**Durations (period)**	**Phase / Result**							
			0	**45**	**90**	**135**	**180**	**225**	**270**	**315**
Voltage dips	0%	0.5	P	P	P	P	P	P	P	P
	0%	1	P	P	P	P	P	P	P	P
	70%	25/30	P	P	P	P	P	P	P	P
Voltage interruptions	0%	250/300	P*	P*	P*	P*	P*	P*	P*	P*

Note: “P” means pass, the EUT function is normal working during the test.

“P*” means the power of EUT is off during the test, and it can be recover by manual resetting.

15.3. Test Photographs

Front View	

16. Measurement Uncertainty

Measurement Item	Measurement Frequency	Polarization	Uncertainty
Conducted Emission	150 kHz ~ 30 MHz	LINE / NEUTRAL	±3.63 dB
Conducted Emission (Telecommunication Port)	150 kHz ~ 30 MHz	N/A	±3.53 dB
Radiated Emission	30 MHz ~ 1,000 MHz	Vertical / Horizontal	±4.52 dB
	1,000 MHz ~ 6,000 MHz	Vertical / Horizontal	±4.92 dB
	6,000 MHz ~ 18,000 MHz	Vertical / Horizontal	±5.11 dB

The measurement uncertainty will be considered, when test result margin to the limit.

17. List of Measuring Equipment

Conducted Emission (Test date: 2021/08/16)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMI Receiver	R&S	ESCI	100821	2020/09/11	2021/09/10
LISN	Schwarzbeck	NSLK 8127	8127-516	2020/09/26	2021/09/25
Pulse Limiter	R&S	ESH3-Z2	101933	2020/09/17	2021/09/16
Cable-6m (9kHz~300MHz)	N/A	EMC5D-BM-BM-6	130605	2020/09/18	2021/09/17
Software	AUDIX	E3	Version: V8.2014-8-6	N/A	N/A

Radiated Emission below 1GHz (Test date: 2021/08/13)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Bilog Antenna(H)	Sunol	JB1	A020514-1	2021/03/18	2022/03/17
Bilog Antenna(V)	Sunol	JB1	A020514-2	2021/05/06	2022/05/05
EMI Receiver(V)	R&S	ESCI	100443	2021/05/20	2022/05/19
EMI Receiver(H)	R&S	ESCI	101402	2021/03/12	2022/03/11
Preamplifier(H)	EM Electronics corp.	EM330	60610	2021/03/09	2022/03/08
Preamplifier(V)	EM Electronics corp.	EM01M06G	60686	2020/10/20	2021/10/19
Cable-16m (30MHz-1GHz)(H)	HUBER SUHNER	RG-214	01110M	2021/03/26	2022/03/25
Cable-4m (30MHz-1GHz)(H)	HUBER SUHNER	RG-214	02951M	2021/03/26	2022/03/25
Cable-1m (30MHz-1GHz)(H)	HUBER SUHNER	RG-214	01098M	2021/03/26	2022/03/25
Cable-10m (30MHz-1GHz)(V)	HUBER SUHNER	RG-214	01126M	2021/04/22	2022/04/21
Cable-4m (30MHz-1GHz)(V)	HUBER SUHNER	RG-214	02953M	2021/04/22	2022/04/21
Cable-1m (30MHz-1GHz)(V)	HUBER SUHNER	RG-214	01099M	2021/04/22	2022/04/21
Software	AUDIX	E3	Version: V8.2014-8-6	N/A	N/A

Radiated Emission above 1GHz (Test date: 2021/08/13)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Horn Antenna	Schwarzbeck	BBHA 9120 D	9120D-1785	2020/10/16	2021/10/15
Spectrum Analyzer	R&S	FSV3044	101149	2021/06/04	2022/06/03
Preamplifier	EM Electronics corp.	EM01G18G	60831	2021/06/25	2022/06/24
Cable-0.5m (30MHz-40GHz)	HUBER SUHNER	SUCOFLEX 102	36270/2	2021/03/10	2022/03/09
Cable-3m (1GHz-26.5GHz)	HUBER SUHNER	SUCOFLEX 102	28417/2	2021/03/10	2022/03/09
Software	AUDIX	E3	Version: V8.2014-8-6	N/A	N/A

Harmonic and Flicker Emissions (Test date: 2021/08/16)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Power & Harmonics Analyzer	Teseq	NSG1007, CCN 1000-1	1422A00918	2021/04/28	2022/04/27

ESD (Test date: 2021/08/18)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
ESD Simulator	AMETEK	DITO	P1404129910	2021/03/05	2022/03/04

RS (Test date: 2021/08/12)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Signal Generator	KEYSIGHT	N5171B	MY53051326	2020/09/09	2021/09/08
Power Meter	Boonton	4231A-01	115902	N/A	N/A
Power Sensor	Boonton	51075A	36586	N/A	N/A
Antenna (80-1000MHz)	AR	ALT80M1G	348540	N/A	N/A
Amplifier (80-1000MHz)	METEK	80RF 1000-300	1077169	N/A	N/A
Log.-Per Antenna (1-6GHz)	Schwarzbeck	STLP 9149	9149-483	N/A	N/A
Amplifier (1-6GHz)	MILMEGA	AS0860B-50-50	1079233	N/A	N/A

EFT (Test date: 2021/08/16)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMC Test System	Teseq	NSG3060	1385	2020/11/11	2021/11/10

SURGE (Test date: 2021/08/16)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMC Test System	Teseq	NSG3060	1385	2020/11/11	2021/11/10

CS (Test date: 2021/08/12)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
CDN (M2+M3)	Schaffner	CDN M016	37392	2020/09/18	2021/09/17
CS Test system	Teseq GmbH	NSG 4070B-35	41159	2020/09/07	2021/09/06

PFMF (Test date: 2021/08/12)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
Magnetic Field Generator	KeyTek	F-1000-4-8-G-125A F-1000-4-8/9/10-L-1M	03019 03016	2020/09/04	2021/09/03

DIP (Test date: 2021/08/16)					
Instrument	Manufacturer	Model No.	Serial No.	Calibration Date	Valid Date
EMC Test System	Teseq	NSG3060	1385	2020/11/11	2021/11/10