

# EMC TEST REPORT

## For CE-EMC

**Report No.** : SSP23030006E

**Prepared For** : Zhongshan Xiaolan Town Shenglangdi Electronic Factory

**Product Name** : Power Bank

**Model Name** : SLD-DY001

**Test Standard** : EN 55032 :2015+A11 :2020  
EN 55035 :2017+A11 :2020  
EN IEC 61000-3-2 :2019+A1 :2021  
EN 61000-3-3 :2013+A2 :2021

**Date of Issue** : 2023-03-09






**Prepared By** : Dongguan ZRLK Testing Technology Co., Ltd.

**Dongguan ZRLK Testing Technology Co., Ltd.**

Building 2, No. 1, Technology 10th Road, Songshan Lake Park, Dongguan City, Guangdong Province, China  
(Tel.: +86-0769-26621775 website: www.zrlklab.com)

This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Dongguan ZRLK Testing Technology Co., Ltd.

**Test Report Basic Information**

<b>Applicant</b> .....:	Zhongshan Xiaolan Town Shenglangdi Electronic Factory
Address of Applicant.....:	Floor 4, No. 69, Zhuyuan Road, Xiaolan Town, Zhongshan City
<b>Manufacturer</b> .....:	Huizhou Hecheng Electronic Technology Co., Ltd
Address of Manufacturer.....:	Gaobulong Tianlong Haomen Factory 3, Xinxu Town, Huiyang District, Huizhou City
<b>Product Name</b> .....:	Power Bank
<b>Brand Name</b> .....:	
<b>Main Model</b> .....:	SLD-DY001
<b>Series Models</b> .....:	See section 1.1(page 5)
<b>Test Standard</b> .....:	EN 55032 :2015+A11 :2020 EN 55035 :2017+A11 :2020 EN IEC 61000-3-2 :2019+A1 :2021 EN 61000-3-3 :2013+A2 :2021
<b>Date of Test</b> .....	2023-03-09
<b>Test Result</b> .....:	PASS
<b>Tested Engineer</b> .....	 (Choco Qiu)
<b>Project Manager</b> .....:	 (Lieber Ouyang)
<b>Authorized Signatory</b> .....:	 (Lahm Peng)
	
Note : This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by Dongguan ZRLK Testing Technology Co., Ltd.. All test data presented in this test report is only applicable to presented test sample.	

## CONTENTS


<b>1. General Information</b> .....	<b>5</b>
1.1 Product Information .....	5
1.2 Test Setup Information .....	5
1.3 Compliance Standards .....	7
1.4 Performance Criteria for EMS .....	8
1.5 Test Facilities .....	8
1.6 List of Measurement Instruments .....	9
1.7 Measurement Uncertainty .....	9
<b>2. Summary of Test Results</b> .....	<b>10</b>
<b>3. Conducted Emissions</b> .....	<b>11</b>
3.1 Standard and Limit .....	11
3.2 Test Procedure .....	12
3.3 Test Data and Results .....	12
<b>4. Radiated Disturbance</b> .....	<b>17</b>
4.1 Standard and Limit .....	17
4.2 Test Procedure .....	19
4.3 Test Data and Results .....	19
<b>5. Harmonic Current Emissions</b> .....	<b>24</b>
5.1 Standard and Limit .....	24
5.2 Test Procedure .....	24
5.3 Test Data and Results .....	24
<b>6. Voltage Fluctuation and Flicker</b> .....	<b>25</b>
6.1 Standard and Limit .....	25
6.2 Test Procedure .....	25
6.3 Test Data and Results .....	25
<b>7. Electrostatic Discharges (ESD)</b> .....	<b>26</b>
7.1 Standard and Limit .....	26
7.2 Test Procedure .....	26
7.3 Test Results .....	26
<b>8. Continuous Radiated Disturbances (RS)</b> .....	<b>27</b>
8.1 Standard and Limit .....	27
8.2 Test Procedure .....	27
8.3 Test Results .....	27
<b>9. Electrical Fast Transients (EFT)</b> .....	<b>28</b>
9.1 Standard and Limit .....	28
9.2 Test Procedure .....	28
9.3 Test Results .....	28
<b>10. Surges</b> .....	<b>29</b>
10.1 Standard and Limit .....	29
10.2 Test Procedure .....	29
10.3 Test Results .....	29
<b>11. Continuous Conducted Disturbances (CS)</b> .....	<b>30</b>
11.1 Standard and Limit .....	30
11.2 Test Procedure .....	30
11.3 Test Results .....	30
<b>12. Power Frequency Magnetic Fields (PFMF)</b> .....	<b>31</b>
12.1 Standard and Limit .....	31
12.2 Test Procedure .....	31
12.3 Test Results .....	31
<b>13. Voltage Dips and Interruptions</b> .....	<b>32</b>
13.1 Standard and Limit .....	32
13.2 Test Procedure .....	32
13.3 Test Results .....	32
<b>Annex A. Test Photos</b> .....	<b>33</b>
<b>Annex B. EUT Photos</b> .....	<b>37</b>

### Revision History

Revision	Issue Date	Description	Revised By
V1.0	2023-03-09	Initial Release	Lahm Peng

## 1. General Information

### 1.1 Product Information

Product Name:	Power Bank
Trade Name:	
Main Model:	SLD-DY001
Series Models:	SLD-DY001, SLD-DY002, SLD-DY003, SLD-DY004, SLD-DY005, SLD-DY006, SLD-DY007, SLD-DY008, SLD-DY009, SLD-DY010, SLD-DY011, SLD-DY012, SLD-DY013, SLD-DY014, SLD-DY015, SLD-DY016, SLD-DY017, SLD-DY018, SLD-DY019, SLD-DY020, SLD-DY021, SLD-DY022, SLD-DY023, SLD-DY024, SLD-DY025, SLD-DY026, SLD-DY027, SLD-DY028, SLD-DY029, SLD-DY030, SLD-DY031, SLD-DY032, SLD-DY033, SLD-DY034, SLD-DY035, SLD-DY036, SLD-DY037, SLD-DY038, SLD-DY039, SLD-DY040, SLD-DY041, SLD-DY042, SLD-DY043, SLD-DY044, SLD-DY045, SLD-DY046, SLD-DY047, SLD-DY048, SLD-DY049, SLD-DY050
Class of Equipment:	Class B
Highest Internal Frequency:	<108MHz
Rated Voltage:	Input: MICRO/Type-C: 5V/2A(Max) Output: USB1/2: DC 5V/2A Total Output: DC 5V/2A(Max)
Note 1: The test data is gathered from a production sample, provided by the manufacturer.	
Note 2: The color of appearance and model name of series models listed are different from the main model, but the circuit and the electronic construction are the same, declared by the manufacturer.	

### 1.2 Test Setup Information

List of Test Modes			
Test Mode	Description	Remark	
TM1	Micro Charging + Full Load	Micro Input: 5V/2A+ USB Output: 5V/2A	
TM2	Type-C Charging + Full Load	Type-C Input: 5V/2A+ USB Output: 5V/2A	
TM3	-	-	
List and Details of Auxiliary Cable			
Description	Length (cm)	Shielded/Unshielded	With/Without Ferrite
Type-C cable	30	Unshielded	Without Ferrite
-	-	-	-
List and Details of Auxiliary Equipment			
Description	Manufacturer	Model	Serial Number
Adapter	Huawei	HW-100225C00	HC78E2H6A23645
-	-	-	-
The equipment under test (EUT) was configured to measure its highest possible emission and immunity level. The test modes were adapted according to the operation manual for use.			



### 1.3 Compliance Standards

Compliance Standards	
EN 55032:2015+A11:2020	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN 55035:2017+A11:2020	Electromagnetic compatibility of multimedia equipment - Immunity requirements
EN IEC 61000-3-2:2019/A1:2021	Electromagnetic compatibility (EMC) - Part 3-2: Limits -Limits for harmonic current emissions (equipment input current k 16 A per phase)
EN 61000-3-3:2013+A2:2021	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <- 16 A per phase and not subject to conditional connection
All measurements contained in this report were conducted with all above standards	
According to standards for test methodology	
EN 55032:2015+A11:2020	Electromagnetic compatibility of multimedia equipment - Emission requirements
EN 55035:2017+A11:2020	Electromagnetic compatibility of multimedia equipment - Immunity requirements
EN IEC 61000-3-2:2019/A1:2021	Electromagnetic compatibility (EMC) - Part 3-2: Limits -Limits for harmonic current emissions (equipment input current k 16 A per phase)
EN 61000-3-3:2013+A11:2021	Electromagnetic compatibility (EMC) - Part 3-3: Limits - Limitation of voltage changes, voltage fluctuations and flicker in public low-voltage supply systems, for equipment with rated current <- 16 A per phase and not subject to conditional connection
IEC 61000-4-2:2008	Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques - Electrostatic discharge immunity test
IEC 61000-4-3:2006+A2:2010	Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test
IEC 61000-4-4:2012	Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Electrical fast transient/burst immunity test
IEC 61000-4-5:2005	Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test
IEC 61000-4-6:2008	Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques - Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-4-8:2009	Electromagnetic compatibility (EMC) - Part 4-8: Testing and measurement techniques - Power frequency magnetic field immunity test
IEC 61000-4-11:2004	Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques - Voltage dips, short interruptions and voltage variations immunity tests
Maintenance of compliance is the responsibility of the manufacturer or applicant. Any modification of the product, which result is lowering the emission, should be checked to ensure compliance has been maintained.	

## 1.4 Performance Criteria for EMS

All the test data has been collected and analyzed within this report in accordance with Immunity requires the following as specific performance criteria:	
<b>A</b>	The apparatus shall continue to operate as intended during and after the test. The manufacturer specifies some minimum performance level. The performance level may be specified by the manufacturer as a permissible loss of performance.
<b>B</b>	The apparatus shall continue to operate as intended after the test. This indicates that the EUT does not need to function at normal performance levels during the test, but must recover. Again some minimal performance is defined by the manufacture. No change in operating state or loss or data is permitted.
<b>C</b>	Temporary loss of function is allowed. Operation of the EUT may stop as long as it is either automatically reset or can be manually restored by operation of the controls.

## 1.5 Test Facilities

Dongguan ZRLK Testing Technology Co., Ltd. Building 2, No. 1, Technology 10th Road, Songshan Lake Park, Dongguan City, Guangdong Province, China
All measurement facilities used to collect the measurement data are located at 1F, Building 35, Changxing Technology Industrial Park, Yutang Street, Guangming District, Shenzhen, Guangdong, China.



## 1.6 List of Measurement Instruments

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
AMN	ROHDE&SCHWARZ	ENV216	101097	2022-07-09	2023-07-08
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100242	2022-07-09	2023-07-08
EMI Test Receiver	ROHDE&SCHWARZ	ESPI	100154	2022-07-09	2023-07-08
Spectrum Analyzer	KEYSIGHT	N9020A	MY48030972	2022-07-09	2023-07-08
Amplifier	SCHWARZBECK	BBV 9743B	00251	2022-07-09	2023-07-08
Amplifier	Agilent	8449B	3008A01520	2022-07-09	2023-07-08
Broadband Antenna	SCHWARZBECK	VULB 9168	01320	2022-07-09	2023-07-08
Horn Antenna	SCHWARZBECK	BBHA 9120D	02553	2022-07-09	2023-07-08
Harmonic & Flicker	Laplace Instruments	C2000A	311370	2022-07-09	2023-07-08
AC Power Source	Laplace Instruments	C2000A	311370	2022-07-09	2023-07-08
ESD Generator	Shanghai LIONCEL	ESD-202B	0220104	2022-07-09	2023-07-08
CS Generator	Shanghai LIONCEL	RIS-6091	6091-0220601	2022-07-09	2023-07-08
Surges Test System	Shanghai LIONCEL	LCG-5411	5411-0220303	2022-07-09	2023-07-08
Voltage Regulator	Shanghai LIONCEL	MVR-16	--	2022-07-09	2023-07-08
PFMF Test System	Shanghai LIONCEL	PMF-801C-C	801C-C-0220201	2022-07-09	2023-07-08
PFMF Test System	Shanghai LIONCEL	PMF-801C-T	801C-T-0220202	2022-07-09	2023-07-08
PFMF Test Coil	Shanghai LIONCEL	PMF-801C-F	801C-F-0211103	2022-07-09	2023-07-08

## 1.7 Measurement Uncertainty

Parameter	Conditions	Uncertainty
Conducted Disturbance	9kHz ~30MHz	±2.75 dB
Radiated Disturbance	30MHz ~ 1GHz	±4.89 dB
Radiated Disturbance	1Hz ~ 6GHz	±4.93 dB

## 2. Summary of Test Results

Standards	Description of Test Items	Result
EN 55032:2015+A11:2020	Conducted Emissions	Passed
	Radiated Emissions	Passed
EN IEC 61000-3-2:2019+A1:2021	Harmonic Current Emission	N/A
EN 61000-3-3:2013+A2:2021	Voltage Fluctuation and Flicker	N/A
EN 55035:2017+A11:2020	Electrostatic Discharge Immunity	Passed
	Continuous Radiated Disturbances Immunity	Passed
	Electrical Fast Transient Immunity	Passed
	Surges Immunity	Passed
	Continuous Conducted Disturbances Immunity	Passed
	Power Frequency Magnetic Fields Immunity	Passed
	Voltage Dips and Interruptions Immunity	Passed
Passed: The EUT complies with the essential requirements in the standard Failed: The EUT does not comply with the essential requirements in the standard N/A: Not applicable		

### 3. Conducted Emissions

#### 3.1 Standard and Limit

According to the standard EN 55032, table A.9 and A.10, Limits for conducted emissions for AC mains power port as below:

**Table A.9 – Requirements for conducted emissions from the AC mains power ports of Class A equipment**

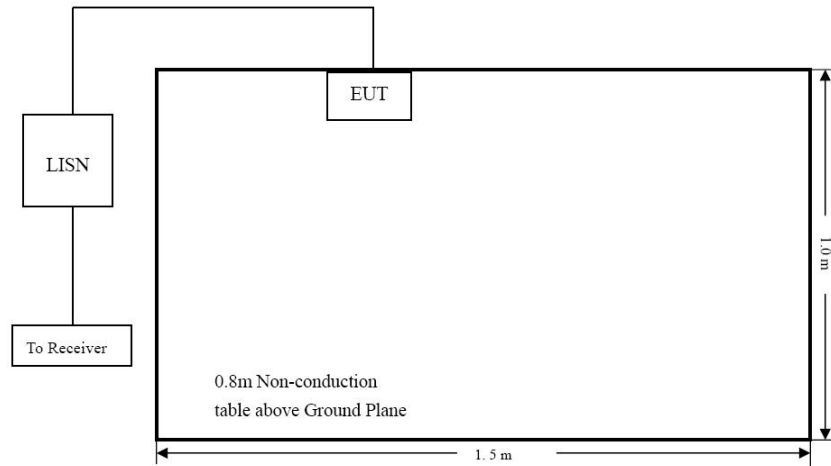
Applicable to				
1. AC mains power ports (3.1.1)				
Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class A limits dB( $\mu$ V)
A9.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	79
	0,5 to 30			73
A9.2	0,15 to 0,5	AMN	Average / 9 kHz	66
	0,5 to 30			60
Apply A9.1 and A9.2 across the entire frequency range.				

**Table A.10 – Requirements for conducted emissions from the AC mains power ports of Class B equipment**

Applicable to				
1. AC mains power ports (3.1.1)				
Table clause	Frequency range MHz	Coupling device (see Table A.8)	Detector type / bandwidth	Class B limits dB( $\mu$ V)
A10.1	0,15 to 0,5	AMN	Quasi Peak / 9 kHz	66 to 56
	0,5 to 5			56
	5 to 30			60
A10.2	0,15 to 0,5	AMN	Average / 9 kHz	56 to 46
	0,5 to 5			46
	5 to 30			50
Apply A10.1 and A10.2 across the entire frequency range.				

### 3.2 Test Procedure

Test is conducting under the description of EN55032, conducted emissions of annex C and annex D.



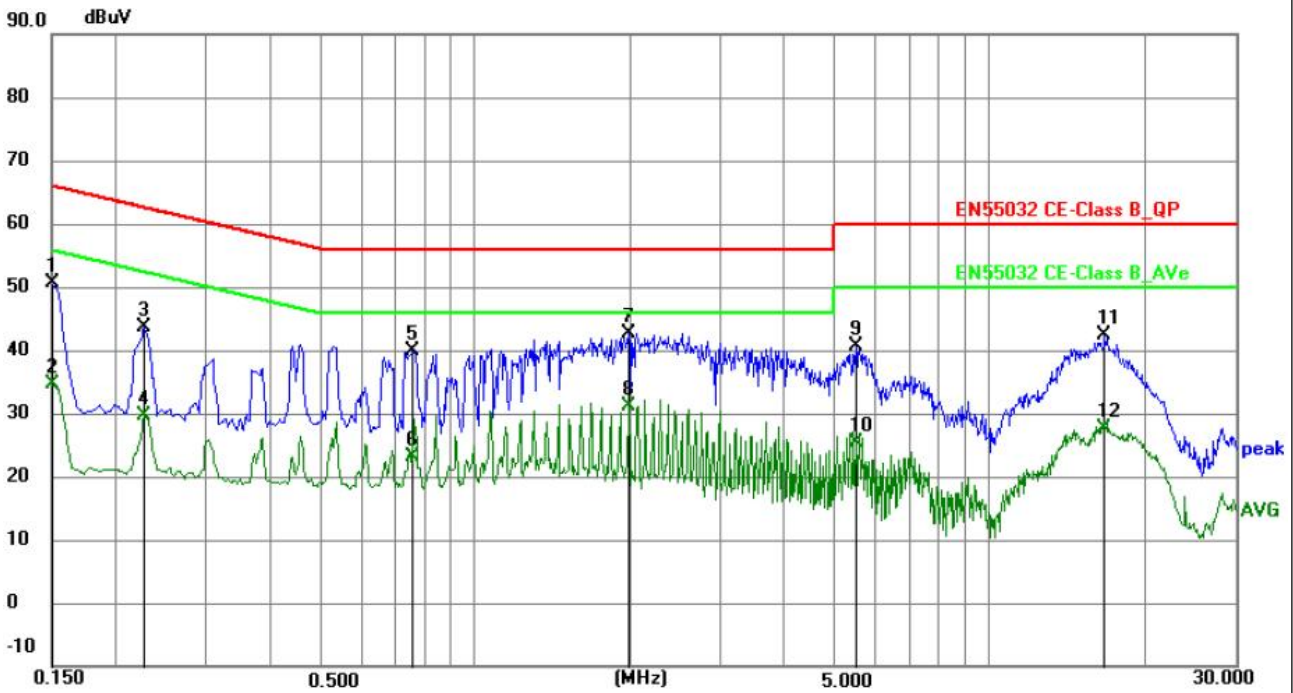
Test Setup Block Diagram

### 3.3 Test Data and Results

Based on all tested data, the EUT complied with the EN 55032 standard limit for a Class B device, and with the worst case as below:

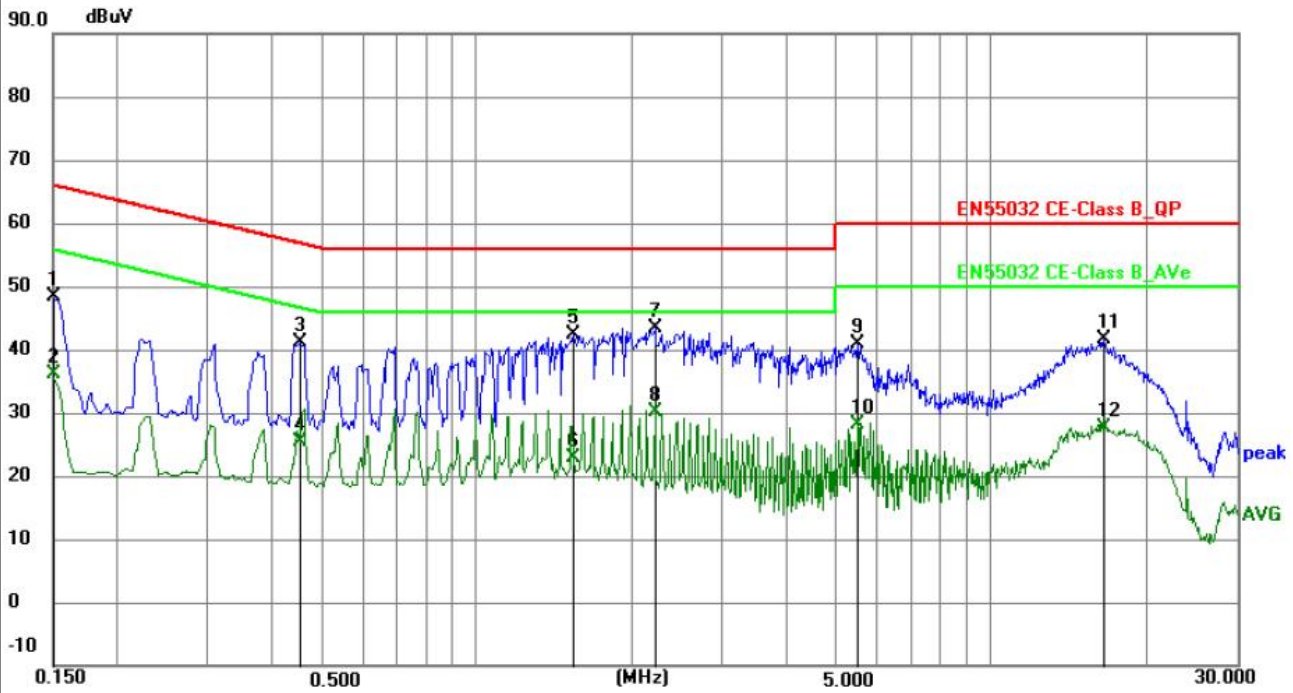
Remark: Level = Reading + Factor; Margin = Level - Limit

Test Plots and Data of Conducted Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM1
Test Voltage:	230V/50Hz
Test Power Line:	Neutral
Remark:	



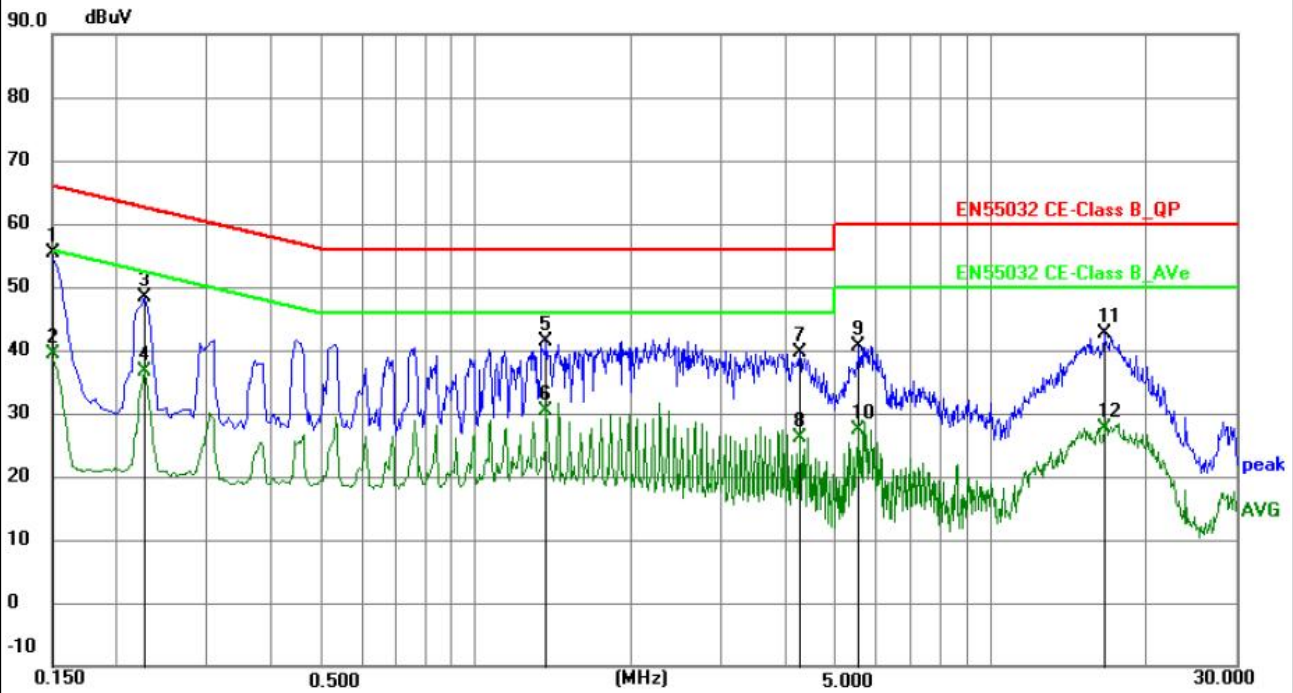
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	40.80	9.75	50.55	66.00	-15.45	peak	P	
2	0.1500	24.84	9.75	34.59	56.00	-21.41	AVG	P	
3	0.2265	33.75	9.85	43.60	62.58	-18.98	peak	P	
4	0.2265	19.76	9.85	29.61	52.58	-22.97	AVG	P	
5	0.7575	30.16	9.69	39.85	56.00	-16.15	peak	P	
6	0.7575	13.47	9.69	23.16	46.00	-22.84	AVG	P	
7 *	1.9860	32.63	10.07	42.70	56.00	-13.30	peak	P	
8	1.9860	20.97	10.07	31.04	46.00	-14.96	AVG	P	
9	5.4960	30.38	10.14	40.52	60.00	-19.48	peak	P	
10	5.4960	15.27	10.14	25.41	50.00	-24.59	AVG	P	
11	16.7460	32.29	10.18	42.47	60.00	-17.53	peak	P	
12	16.7460	17.41	10.18	27.59	50.00	-22.41	AVG	P	

Test Plots and Data of Conducted Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM1
Test Voltage:	230V/50Hz
Test Power Line:	Live
Remark:	



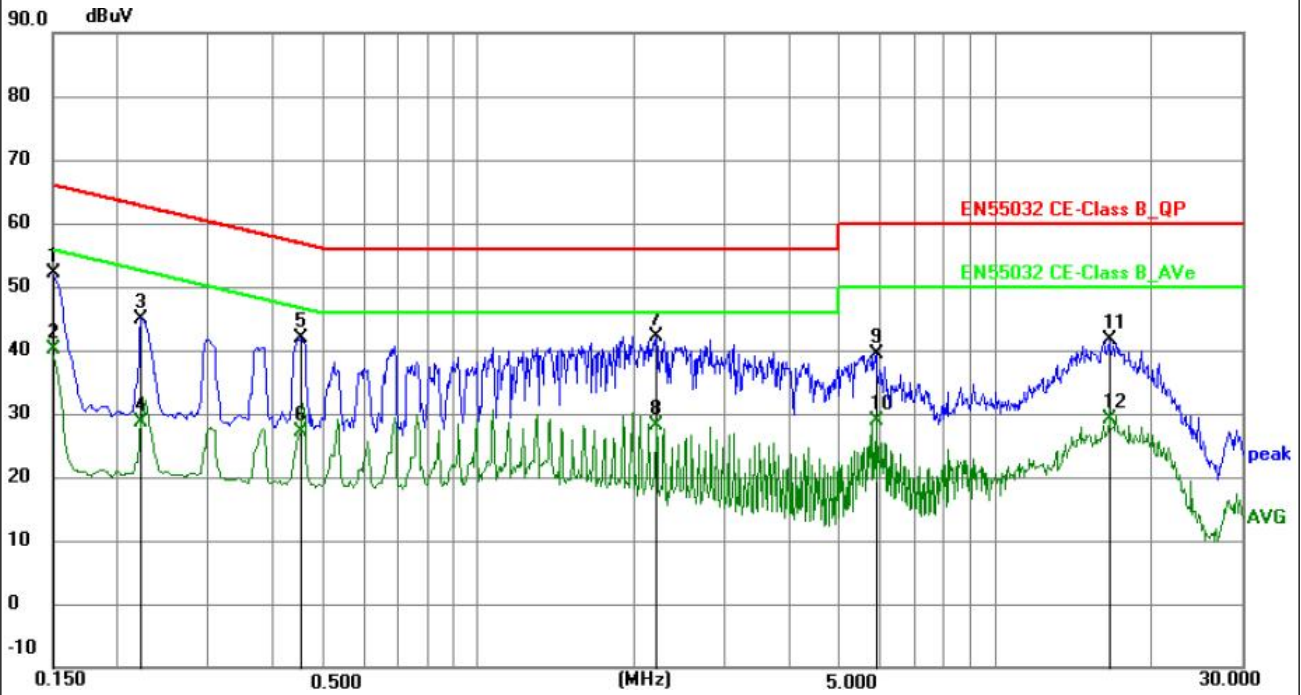
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.1500	38.87	9.51	48.38	66.00	-17.62	peak	P	
2	0.1500	26.67	9.51	36.18	56.00	-19.82	AVG	P	
3	0.4515	31.20	10.03	41.23	56.85	-15.62	peak	P	
4	0.4515	15.39	10.03	25.42	46.85	-21.43	AVG	P	
5	1.5360	32.36	10.07	42.43	56.00	-13.57	peak	P	
6	1.5360	12.93	10.07	23.00	46.00	-23.00	AVG	P	
7 *	2.2200	33.31	10.07	43.38	56.00	-12.62	peak	P	
8	2.2200	20.10	10.07	30.17	46.00	-15.83	AVG	P	
9	5.5050	30.79	10.16	40.95	60.00	-19.05	peak	P	
10	5.5050	17.99	10.16	28.15	50.00	-21.85	AVG	P	
11	16.5120	31.13	10.38	41.51	60.00	-18.49	peak	P	
12	16.5120	17.32	10.38	27.70	50.00	-22.30	AVG	P	

Test Plots and Data of Conducted Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM2
Test Voltage:	230V/50Hz
Test Power Line:	Neutral
Remark:	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1500	45.55	9.75	55.30	66.00	-10.70	peak	P	
2	0.1500	29.65	9.75	39.40	56.00	-16.60	AVG	P	
3	0.2265	38.56	9.85	48.41	62.58	-14.17	peak	P	
4	0.2265	26.74	9.85	36.59	52.58	-15.99	AVG	P	
5	1.3695	31.36	10.07	41.43	56.00	-14.57	peak	P	
6	1.3695	20.22	10.07	30.29	46.00	-15.71	AVG	P	
7	4.2630	29.64	10.11	39.75	56.00	-16.25	peak	P	
8	4.2630	15.90	10.11	26.01	46.00	-19.99	AVG	P	
9	5.5590	30.59	10.14	40.73	60.00	-19.27	peak	P	
10	5.5590	17.15	10.14	27.29	50.00	-22.71	AVG	P	
11	16.6470	32.35	10.18	42.53	60.00	-17.47	peak	P	
12	16.6470	17.49	10.18	27.67	50.00	-22.33	AVG	P	

Test Plots and Data of Conducted Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM2
Test Voltage:	230V/50Hz
Test Power Line:	Live
Remark:	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1 *	0.1500	42.71	9.51	52.22	66.00	-13.78	peak	P	
2	0.1500	30.60	9.51	40.11	56.00	-15.89	AVG	P	
3	0.2220	35.57	9.43	45.00	62.74	-17.74	peak	P	
4	0.2220	19.16	9.43	28.59	52.74	-24.15	AVG	P	
5	0.4515	31.79	10.03	41.82	56.85	-15.03	peak	P	
6	0.4515	17.12	10.03	27.15	46.85	-19.70	AVG	P	
7	2.2110	32.13	10.07	42.20	56.00	-13.80	peak	P	
8	2.2110	18.09	10.07	28.16	46.00	-17.84	AVG	P	
9	5.8695	29.27	10.17	39.44	60.00	-20.56	peak	P	
10	5.8695	18.63	10.17	28.80	50.00	-21.20	AVG	P	
11	16.6470	31.21	10.38	41.59	60.00	-18.41	peak	P	
12	16.6470	18.82	10.38	29.20	50.00	-20.80	AVG	P	



## 4. Radiated Disturbance

### 4.1 Standard and Limit

According to the standard EN 55032, table A.2, A.3, A.4, A.5, A.6, limit for radiated emissions as below:

**Table A.2 – Requirements for radiated emissions at frequencies up to 1 GHz for class A equipment**

Table clause	Frequency range MHz	Measurement			Class A limits dB( $\mu$ V/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A2.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	40
	230 to 1 000				47
A2.2	30 to 230	OATS/SAC	3		50
	230 to 1 000				57
A2.3	30 to 230	FAR	10	42 to 35	
	230 to 1 000			42	
A2.4	30 to 230	FAR	3	52 to 45	
	230 to 1 000			52	

Apply only A2.1 or A2.2 or A2.3 or A2.4 across the entire frequency range.

**Table A.3 – Requirements for radiated emissions at frequencies above 1 GHz for class A equipment**

Table clause	Frequency range MHz	Measurement			Class A limits dB( $\mu$ V/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A3.1	1 000 to 3 000	FSOATS	3	Average / 1 MHz	56
	3 000 to 6 000				60
A3.2	1 000 to 3 000			Peak / 1 MHz	76
	3 000 to 6 000				80

Apply A3.1 and A3.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.

**Table A.4 – Requirements for radiated emissions at frequencies up to 1 GHz for class B equipment**

Table clause	Frequency range MHz	Measurement			Class B limits dB( $\mu$ V/m)
		Facility (see Table A.1)	Distance m	Detector type / bandwidth	
A4.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	30
	230 to 1 000				37
A4.2	30 to 230	OATS/SAC	3		40
	230 to 1 000				47
A4.3	30 to 230	FAR	10	32 to 25	
	230 to 1 000			32	
A4.4	30 to 230	FAR	3	42 to 35	
	230 to 1 000			42	

Apply only table clause A4.1 or A4.2 or A4.3 or A4.4 across the entire frequency range.

These requirements are not applicable to the local oscillator and harmonics frequencies of equipment covered by Table A.6.

**Table A.5 – Requirements for radiated emissions at frequencies above 1 GHz for class B equipment**

Table clause	Frequency range MHz	Measurement			Class B limits dB( $\mu$ V/m)
		Facility (see Table A.1)	Distance m	Detector type/ bandwidth	
A5.1	1 000 to 3 000	FSOATS	3	Average/ 1 MHz	50
	3 000 to 6 000				54
A5.2	1 000 to 3 000			Peak/ 1 MHz	70
	3 000 to 6 000				74

Apply A5.1 and A5.2 across the frequency range from 1 000 MHz to the highest required frequency of measurement derived from Table 1.

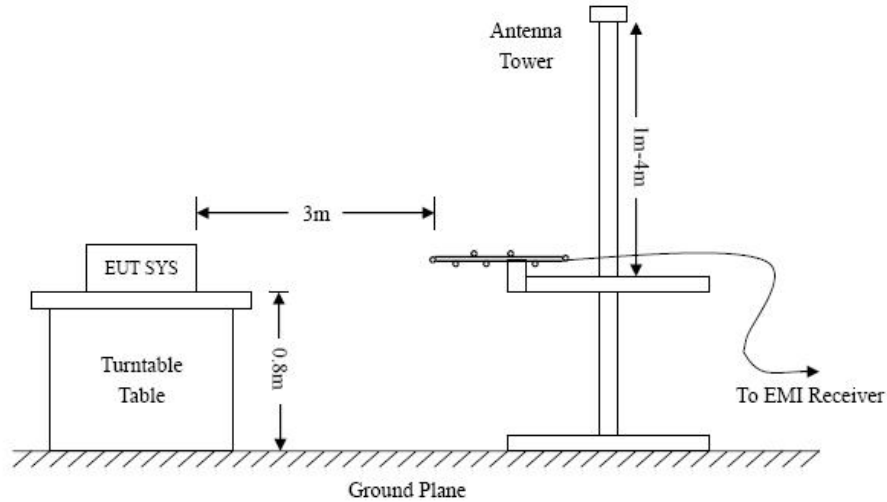
**Table A.6 – Requirements for radiated emissions from FM receivers**

Table Clause	Frequency Range MHz	Measurement			Class B Limit dB( $\mu$ V/m)			
		Facility (see Table A.1)	Distance m	Detector type / Bandwidth	Fundamental	Harmonics		
A6.1	30 to 230	OATS/SAC	10	Quasi Peak / 120 kHz	50	42		
	230 to 300					42		
	300 to 1 000					46		
A6.2	30 to 230	OATS/SAC	3		Quasi Peak / 120 kHz	60	52	
	230 to 300						52	
	300 to 1 000						56	
A6.3	30 to 230	FAR	10	Quasi Peak / 120 kHz		52 to 45	44 to 37	
	230 to 300						45	37
	300 to 1 000						45	41
A6.4	30 to 230	FAR	3		Quasi Peak / 120 kHz	62 to 55	54 to 47	
	230 to 300						55	47
	300 to 1 000						55	51

Apply only A6.1 or A6.2 or A6.3 or A6.4 across the entire frequency range.  
These relaxed limits apply only to emissions at the fundamental and harmonic frequencies of the LO. Signals at all other frequencies shall be compliant with the limits given in Table A.4.

## 4.2 Test Procedure

Test is conducting under the description of EN 55032, radiation emission of annex C and annex D.



Test Setup Block Diagram

## 4.3 Test Data and Results

Based on all tested data, the EUT complied with the EN 55032 standard limit for a Class B device, and with the worst case as below:

Remark: Level = Reading + Factor, Margin = Level - Limit

Test Plots and Data of Radiated Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM1
Test Voltage:	230V/50Hz
Test Antenna Polarization:	Horizontal
Remark:	



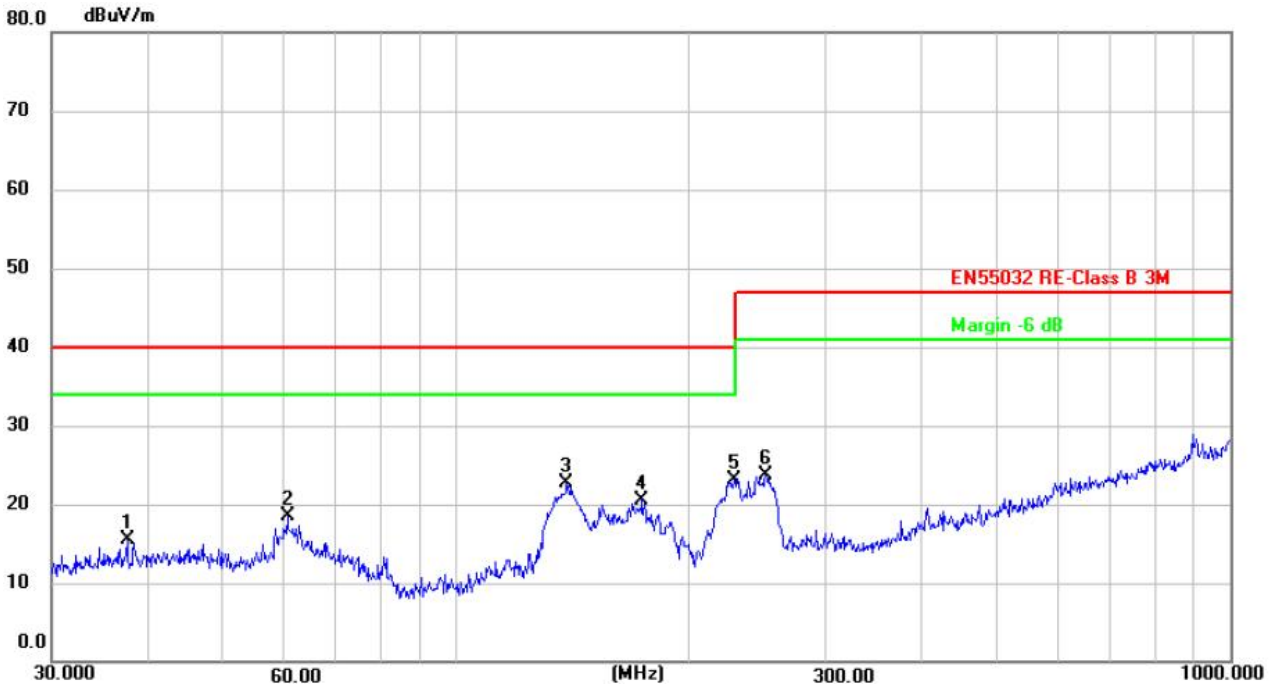
No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	61.1316	27.33	-10.14	17.19	40.00	-22.81	peak	100	295	P	
2 *	140.3421	32.32	-9.49	22.83	40.00	-17.17	peak	100	235	P	
3	171.9946	31.40	-10.01	21.39	40.00	-18.61	peak	100	225	P	
4	227.6906	29.68	-10.95	18.73	40.00	-21.27	peak	100	265	P	
5	247.6819	28.43	-10.00	18.43	47.00	-28.57	peak	100	245	P	
6	275.1570	27.42	-9.18	18.24	47.00	-28.76	peak	100	82	P	

Test Plots and Data of Radiated Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM1
Test Voltage:	230V/50Hz
Test Antenna Polarization:	Vertical
Remark:	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	60.4919	30.10	-10.07	20.03	40.00	-19.97	peak	100	208	P	
2 *	138.8735	33.87	-9.58	24.29	40.00	-15.71	peak	100	349	P	
3	152.6641	29.32	-8.99	20.33	40.00	-19.67	peak	100	299	P	
4	174.4241	26.96	-10.27	16.69	40.00	-23.31	peak	100	217	P	
5	227.6906	29.19	-10.95	18.24	40.00	-21.76	peak	100	227	P	
6	252.9482	26.25	-9.90	16.35	47.00	-30.65	peak	100	208	P	

Test Plots and Data of Radiated Emissions	
Tested Model:	SLD-DY001
Tested Mode:	TM2
Test Voltage:	230V/50Hz
Test Antenna Polarization:	Horizontal
Remark:	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1	37.5479	24.10	-8.64	15.46	40.00	-24.54	peak	100	329	P	
2	60.4919	28.50	-10.07	18.43	40.00	-21.57	peak	100	298	P	
3	138.8735	32.22	-9.58	22.64	40.00	-17.36	peak	100	248	P	
4	173.8135	30.80	-10.20	20.60	40.00	-19.40	peak	100	176	P	
5 *	228.4904	33.93	-10.89	23.04	40.00	-16.96	peak	100	156	P	
6	251.1804	33.63	-9.92	23.71	47.00	-23.29	peak	100	156	P	

**Test Plots and Data of Radiated Emissions**

Tested Model:	SLD-DY001
Tested Mode:	TM2
Test Voltage:	230V/50Hz
Test Antenna Polarization:	Vertical
Remark:	



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	62.4314	32.17	-10.27	21.90	40.00	-18.10	peak	100	216	P	
2	138.3873	31.35	-9.61	21.74	40.00	-18.26	peak	100	307	P	
3	152.1297	29.30	-8.97	20.33	40.00	-19.67	peak	100	286	P	
4	173.8135	28.27	-10.20	18.07	40.00	-21.93	peak	100	216	P	
5	227.6906	29.26	-10.95	18.31	40.00	-21.69	peak	100	155	P	
6	396.2415	23.56	-6.18	17.38	47.00	-29.62	peak	100	93	P	

## **5. Harmonic Current Emissions**

---

### **5.1 Standard and Limit**

According to the standard EN IEC 61000-3-2 Clause 7.1, limits for class B equipment.

### **5.2 Test Procedure**

Test is conducting under the description of EN IEC 61000-3-2.

### **5.3 Test Data and Results**

N/A



## **6. Voltage Fluctuation and Flicker**

---

### **6.1 Standard and Limit**

According to the standard EN 61000-3-3 Clause 5.

### **6.2 Test Procedure**

Test is conducting under the description of EN 61000-3-3.

### **6.3 Test Data and Results**

N/A

## 7. Electrostatic Discharges (ESD)

### 7.1 Standard and Limit

According to the standard EN 55035 Clause 5, Table clause 1.4 , Limit as below:

Test Specifications	Test Level	Performance Criterion
Air Discharge	8kV	B
Contact Discharge	4kV	B

### 7.2 Test Procedure

According to the standard EN 55035 Clause 4.2.1, Test is conducting under the description of IEC 61000-4-2.

### 7.3 Test Results

Air Discharge	Test Level (kV)							
Test Points	-2	+2	-4	+4	-8	+8	-15	+15
Buttons	A	A	A	A	A	A	-	-
LED	A	A	A	A	A	A	-	-
Surface	A	A	A	A	A	A	-	-
Contact Discharge	Test Level (kV)							
Test Points	-2	+2	-4	+4	-6	+6	-8	+8
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-

## 8. Continuous Radiated Disturbances (RS)

### 8.1 Standard and Limit

According to the standard EN 55035 Clause 5, Table clause 1.2 and 1.3 , Limit as below:

Test Specifications	Test Level	Performance Criterion
80MHz-1000MHz	3V/m	A
1.8GHz/2.6GHz/3.5GHz/5GHz	3V/m	A

### 8.2 Test Procedure

According to the standard EN 55035 Clause 4.2.2.2, Test is conducting under the description of IEC 61000-4-3.

### 8.3 Test Results

Frequency step: 1% of fundamental

Dwell time: 1 second

Modulation: AM by 1kHz sine wave with 80% modulation depth

Frequency Range	EM Field	Polarization	Front	Rear	Left	Right
80MHz-1GHz	3V/m	Horizontal	A	A	A	A
80MHz-1GHz	3V/m	Vertical	A	A	A	A
1.8GHz	3V/m	Horizontal	A	A	A	A
1.8GHz	3V/m	Vertical	A	A	A	A
2.6GHz	3V/m	Horizontal	A	A	A	A
2.6GHz	3V/m	Vertical	A	A	A	A
3.5GHz	3V/m	Horizontal	A	A	A	A
3.5GHz	3V/m	Vertical	A	A	A	A
5GHz	3V/m	Horizontal	A	A	A	A
5GHz	3V/m	Vertical	A	A	A	A

## 9. Electrical Fast Transients (EFT)

### 9.1 Standard and Limit

According to the standard EN 55035 Clause 4.2, Table clause 3.3 and 4.5, Limit as below:

Test Specifications	Test Level (5/50ns)	Performance Criterion
AC Power Port	1kV	B
DC Power Port	0.5kV	B

### 9.2 Test Procedure

According to the standard EN 55035 Clause 4.2.4, Test is conducting under the description of IEC 61000-4-4.

### 9.3 Test Results

Test Port		Test Level (kV)					
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
Power Port (AC Power Supply)	L (Live)	A	A	A	A	-	-
	N (Neutral)	A	A	A	A	-	-
	G (Ground)	-	-	-	-	-	-
	L + N	A	A	A	A	-	-
	L + G	-	-	-	-	-	-
	N + G	-	-	-	-	-	-
	L + N + G	-	-	-	-	-	-
Power Port (DC Power Supply)	P (Positive)	-	-	-	-	-	-
	N (Negative)	-	-	-	-	-	-
	P + N	-	-	-	-	-	-

## 10. Surges

### 10.1 Standard and Limit

According to the standard EN 55035 Clause 4.2, Table clause 3.2 and 4.4, Limit as below:

Test Specifications	Test Level (1.2/50us)	Performance Criterion
Line to Line	1kV	B
Line to Ground	2kV	B
DC Power Ports	0.5kV	B

### 10.2 Test Procedure

According to the standard EN 55035 Clause 4.2.5, Test is conducting under the description of IEC 61000-4-5.

### 10.3 Test Results

Surges Test Port		Test Level (kV)					
		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
AC Power Port	L – N	A	A	A	A	-	-
	L – G	-	-	-	-	-	-
	N – G	-	-	-	-	-	-
DC Power Port	P – N	-	-	-	-	-	-

## 11. Continuous Conducted Disturbances (CS)

### 11.1 Standard and Limit

According to the standard EN 55035 Clause 5, Table clause 3.1 and 4.1, Limit as below:

Test Port	Test Specifications	Test Level	Performance Criterion
DC Port	0.15MHz-10MHz	3V	A
	10MHz-30MHz	3V-1V	A
	30MHz-80MHz	3V	A
AC Port	0.15MHz-10MHz	3V	A
	10MHz-30MHz	3V-1V	A
	30MHz-80MHz	3V	A

### 11.2 Test Procedure

According to the standard EN 55035 Clause 4.2.2.3, Test is conducting under the description of IEC 61000-4-6.

### 11.3 Test Results

Sweep frequency range: 150 kHz ~ 80 MHz

Frequency step: 1% of fundamental

Dwell time: 1 second

Test Port	Test Level	Modulation	Result
AC Power Port	3V	AM 80%, 1kHz sinewave	A
DC Power Port	3V	AM 80%, 1kHz sinewave	-

## 12. Power Frequency Magnetic Fields (PFMF)

### 12.1 Standard and Limit

According to the standard EN 55035 Clause 4.2, Table clause 1.1, Limit as below:

Test Specifications	Test Level	Performance Criterion
50Hz	1A/m	A

### 12.2 Test Procedure

According to the standard EN 55035 Clause 4.2.3, Test is conducting under the description of IEC 61000-4-8.

### 12.3 Test Results

Magnetic Field Strength	Frequency	Position of Induction Coil	Result
1A/m	50Hz	X	A
1A/m	50Hz	Y	A
1A/m	50Hz	Z	A

## 13. Voltage Dips and Interruptions

### 13.1 Standard and Limit

According to the standard EN 55035 Clause 5, Table clause 4.2 and 4.3, Limit as below:

Residual Voltage	Number of Cycles for 50Hz	Performance Criterion
<5%	0.5	B
70%	25	C
<5%	250	C

### 13.2 Test Procedure

According to the standard EN 55035 Clause 4.2.6, Test is conducting under the description of IEC 61000-4-11.

### 13.3 Test Results

U: Voltage dips in %  $U_T$  ( $U_T$  is rated voltage for the EUT)

T: Test duration

Dips Test Level	U	T	Phase Angle	Result
1	100%	10ms	0/90/180/270	A
2	30%	500ms	0/90/180/270	B
3	100%	5000ms	0/90/180/270	C

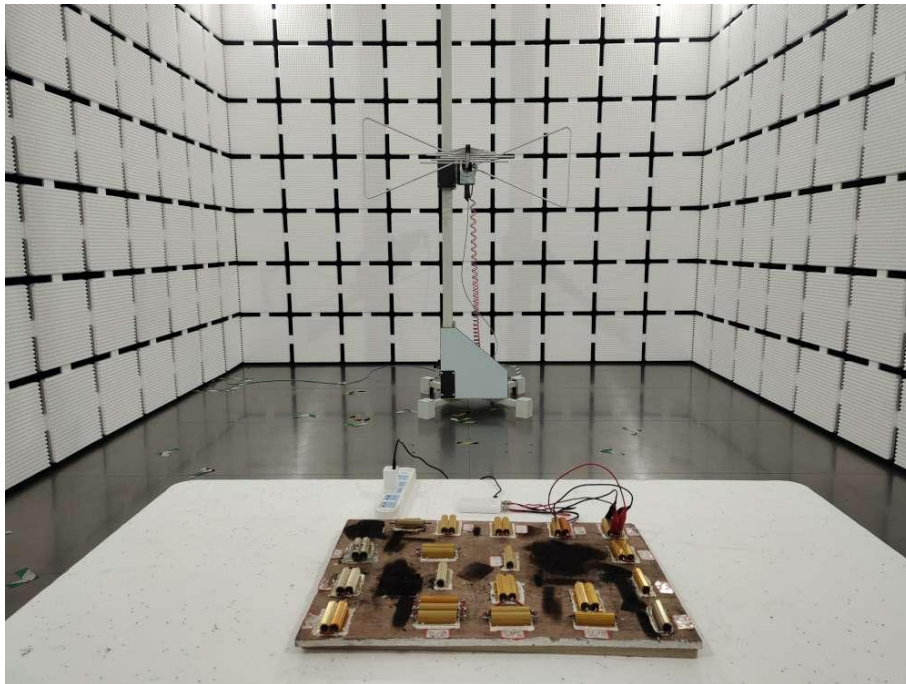


## Annex A. Test Photos

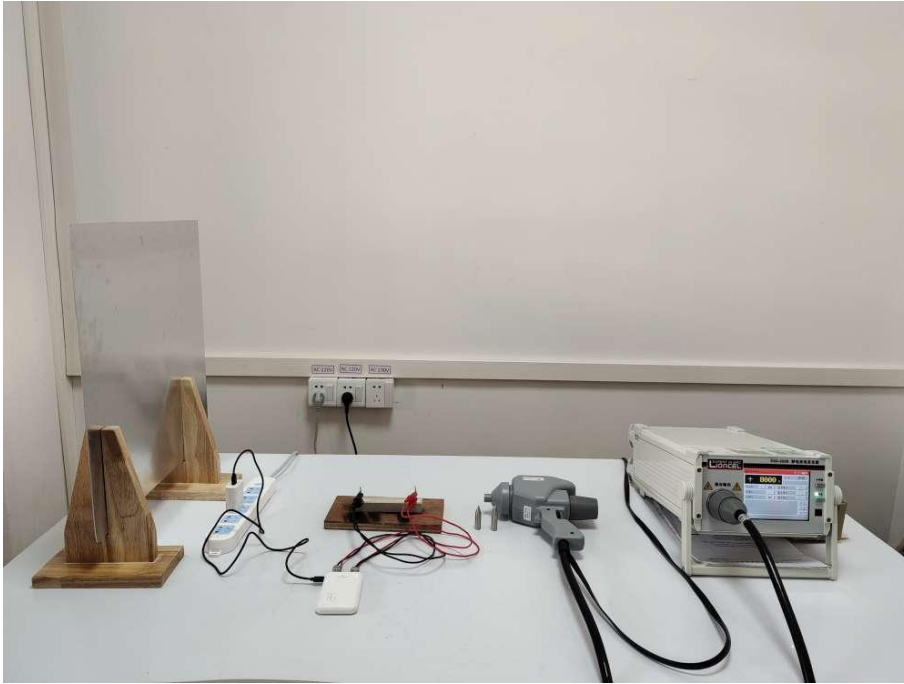
### Conducted Emission Test View



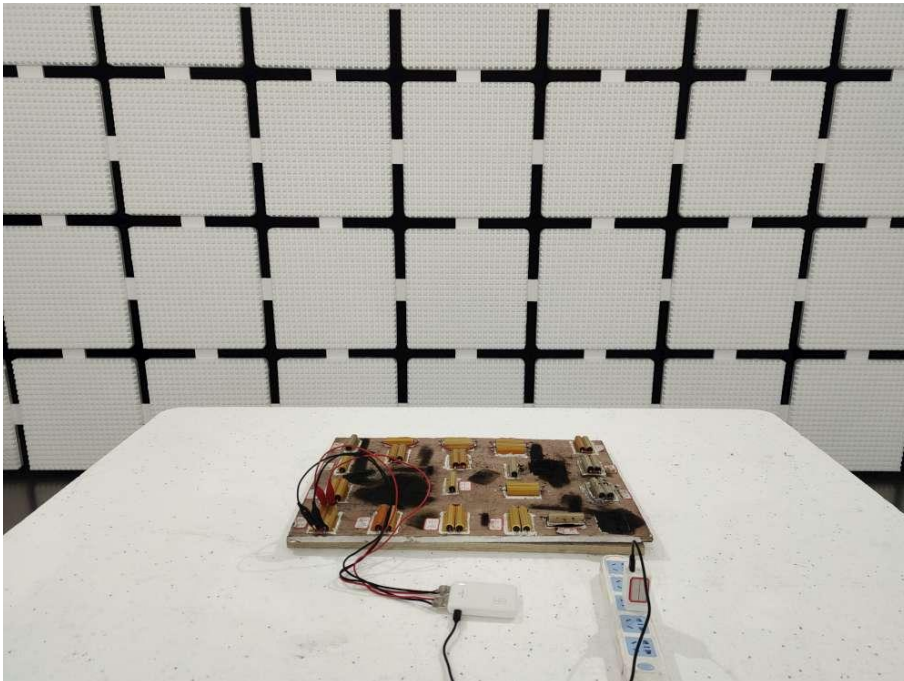
### Radiated Emission Test View



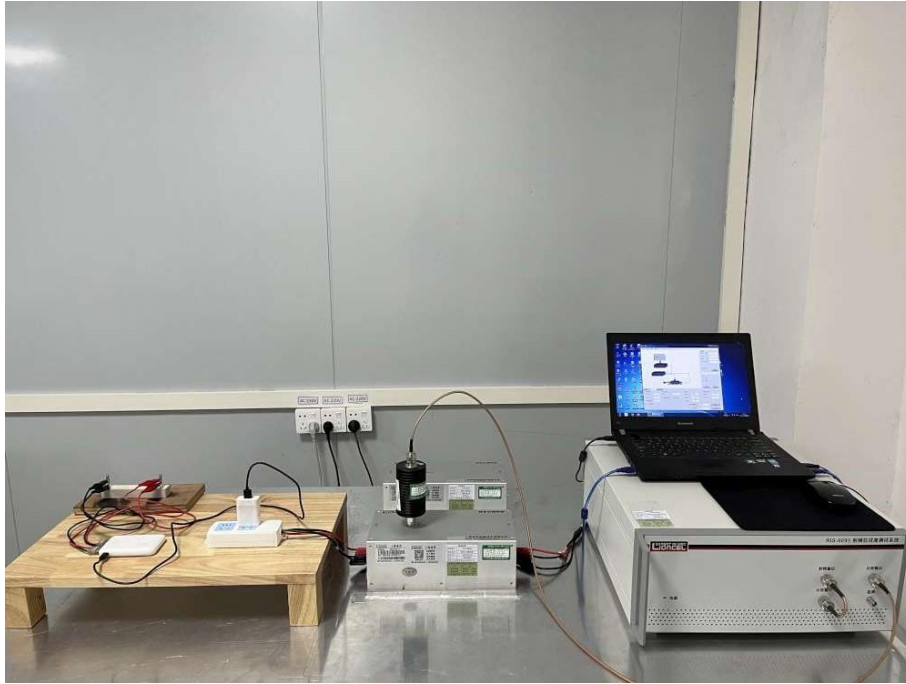
**ESD Test View**



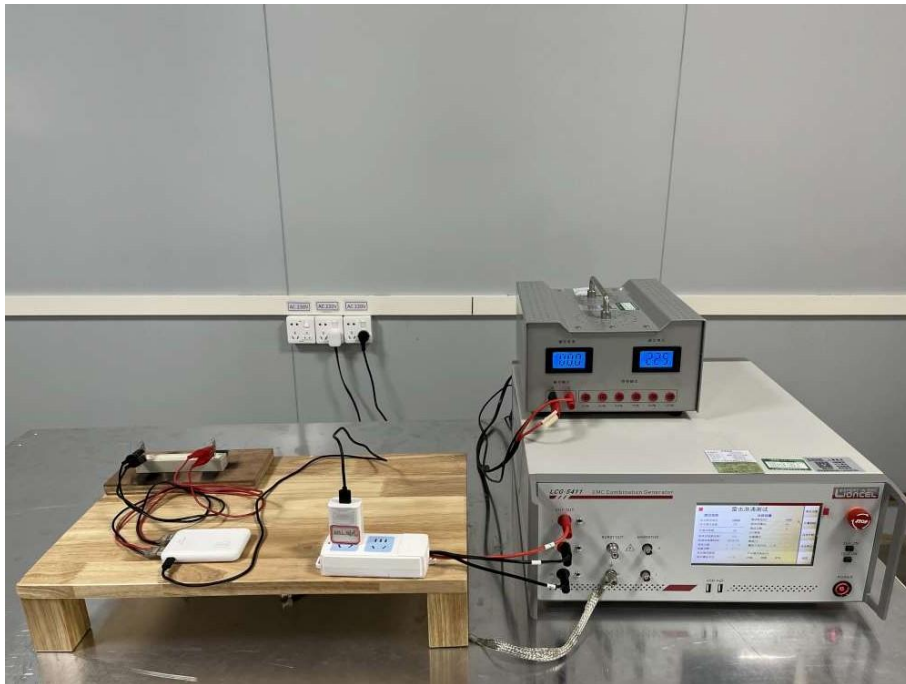
**RS Test View**



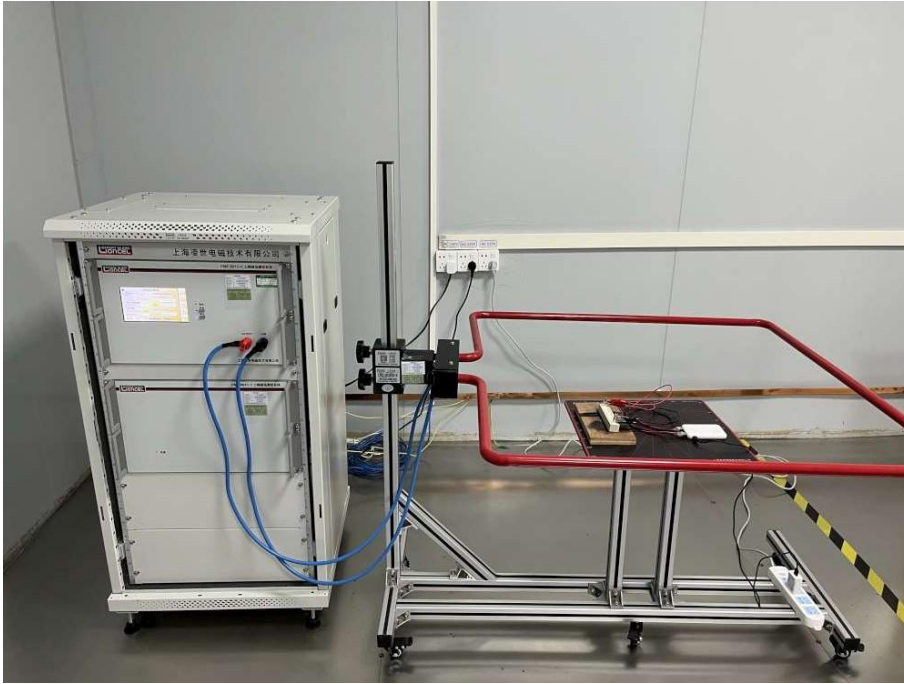
**CS Test View**



**EFT/Surges/Dips Test View**



**PFMF Test View**



## Annex B. EUT Photos

EUT View 1



EUT View 2



EUT View 3



EUT View 4



\*\*\*\*\* END OF REPORT \*\*\*\*\*