



EMC Test Report



Page: 1 / 36

Report No.: DNT2412030036E5062-07046

Applicant Name: Dezhou Zhongying Automotive Supplies Sales Co., Ltd.

Address: No. 59 Yingbin Road, Decheng District, Dezhou City, Jinguyuan

The samples and sample information for the following tests are provided and confirmed by the applicant

Product Description: PLASTIC WELDER

Brand Name: /

Tested Model: XCER-110

Electrical Rating: AC 220V, 100W, 50/60Hz

Received Date: 2024-12-09

Tested Date: 2024-12-09 ~ 2024-12-12

Issued Date: 2024-12-13

Test Standards: EN IEC 55014-1:2021
EN IEC 55014-2:2021
EN IEC 61000-3-2:2019+A1:2021
EN 61000-3-3:2013+A1:2019+A2:2021

Test Result: PASS

Prepared By: Leo Lu (Test Engineer)

Reviewed By: mark m (Project Engineer)

Approved By: Heise Shan (Manager)

Note: If there is any objection to the results in this report, please submit a written inquiry to the company within 15 days from the date of receiving the report. The test report is effective only with both signature and specialized stamp, and is issued by the company in accordance with the requirements of the "Conditions of Issuance of Test Reports" printed in the attached page. Unless otherwise stated, the results presented in this report only apply to the samples tested this time. Partial reproduction of this report is not allowed unless approved by the company in writing.

Dongguan DN Testing Co., Ltd.

Add: No. 1, West Fourth Street, Xingfa South Road, Wusha Community, Chang 'an Town, Dongguan City, Guangdong P.R.China

Web: www.dn-testing.com

Tel: +86-769-88087383

E-mail: service@dn-testing.com





Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V2.0	/	2024-12-13	Original Report	/



TABLE OF CONTENTS

REPORT REVISE RECORD	2
1. GENERAL INFORMATION	5
1.1 PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	5
1.2 EUT OPERATION MODE AND TEST DETAILS	5
1.3 MEASUREMENT UNCERTAINTY	6
1.4 TEST FACILITY	6
1.5 TEST EQUIPMENT LIST AND DETAILS	6
1.6 PERFORMANCE CRITERIA FOR EMS	8
2. SUMMARY OF TEST RESULTS	9
3. GENERAL REMARKS	10
3.1 COMPLEMENTARY MATERIALS	10
3.2 RESULT LEVEL & OVER LIMIT CALCULATION	10
4. CONDUCTED EMISSIONS	11
4.1 CONDUCTED EMISSION LIMIT	11
4.2 BLOCK DIAGRAM OF TEST SETUP	11
4.3 TEST PROCEDURE	12
4.4 ENVIRONMENTAL CONDITIONS	12
4.5 TEST DATA AND RESULT	13
5. RADIATED EMISSIONS	15
5.1 RADIATED EMISSION LIMIT	15
5.2 BLOCK DIAGRAM OF TEST SETUP	15
5.3 TEST PROCEDURE	16
5.4 ENVIRONMENTAL CONDITIONS	16
5.5 TEST DATA AND RESULT	17
6. ELECTROSTATIC DISCHARGE	19
6.1 ESD IMMUNITY REQUIREMENTS	19
6.2 BLOCK DIAGRAM OF TEST SETUP	19
6.3 TEST PROCEDURE	19
6.4 ENVIRONMENTAL CONDITIONS	20
6.5 TEST DATA AND RESULT	20
7. RADIO FREQUENCY ELECTROMAGNETIC FIELD	21
7.1 RS IMMUNITY REQUIREMENTS	21
7.2 BLOCK DIAGRAM OF TEST SETUP	21
7.3 TEST PROCEDURE	21
7.4 ENVIRONMENTAL CONDITIONS	22
7.5 TEST DATA AND RESULT	22
8. ELECTRICAL FAST TRANSIENTS	23
8.1 EFT IMMUNITY REQUIREMENTS	23
8.2 BLOCK DIAGRAM OF TEST SETUP	23
8.3 TEST PROCEDURE	23
8.4 ENVIRONMENTAL CONDITIONS	24
8.5 TEST DATA AND RESULT	24
9. SURGES	25
9.1 SURGES IMMUNITY REQUIREMENTS	25
9.2 BLOCK DIAGRAM OF TEST SETUP	25
9.3 TEST PROCEDURE	25
9.4 ENVIRONMENTAL CONDITIONS	26
9.5 TEST DATA AND RESULT	26
10. RADIO-FREQUENCY CONTINUOUS CONDUCTED	27
10.1 CS IMMUNITY REQUIREMENTS	27
10.2 BLOCK DIAGRAM OF TEST SETUP	27
10.3 TEST PROCEDURE	27



Report No.: DNT2412030036E5062-07046

Date: December 13, 2024

Page: 4 / 36

10.4 ENVIRONMENTAL CONDITIONS	28
10.5 TEST DATA AND RESULT	28
11. VOLTAGE DIPS AND INTERRUPTIONS TEST RESULT	29
11.1 DIPS IMMUNITY REQUIREMENTS	29
11.2 BLOCK DIAGRAM OF TEST SETUP	29
11.3 TEST PROCEDURE	29
11.4 ENVIRONMENTAL CONDITIONS	29
11.5 TEST DATA AND RESULT	30
EXHIBIT A – PHOTOGRAPHS OF TEST SETUP	31
EXHIBIT B – PHOTOGRAPHS OF EUT	35
***** END OF REPORT *****	36



1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information	
Applicant:	Dezhou Zhongying Automotive Supplies Sales Co., Ltd.
Address of applicant:	No. 59 Yingbin Road, Decheng District, Dezhou City, Jinguyuan
Manufacturer:	Dezhou Zhongying Automotive Supplies Sales Co., Ltd.
Address of manufacturer:	No. 59 Yingbin Road, Decheng District, Dezhou City, Jinguyuan

General Description of EUT	
Product Name:	PLASTIC WELDER
Model No.:	XCER-110
Additional Model(s):	/
Difference description:	/
Rated Voltage:	AC 220V, 100W, 50/60Hz
Adapter Information:	/
Highest Clock Frequency:	Below 108MHz
Equipment Category according to EN 55014-2:	Category II

1.2 EUT Operation Mode and test details

Test Mode List		
Test Mode	Description	Remark
1	Normal working	N/A

Remark: Prescan all test mode, and performed the final measure on the mode of maximum emission and recorded the test data.

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/



1.3 Measurement Uncertainty

Parameter	Frequency	Measurement uncertainty
Conducted Emission (with AMN)	150kHz~30MHz	U= 2.7dB K=2
Disturbance Power	30MHz-300MHz	U= 5.0dB K=2
Radiated Emission	30MHz-1000MHz	U= 5.0dB K=2
Radiated Emission	Above 1000MHz	U= 5.4dB K=2

1.4 Test Facility

Test Site	Dongguan DN Testing Co., Ltd.
Test Location	No. 1, West Fourth Street, South Xinfa Road, Wusha Liwu, Chang 'an Town, Dongguan City, Guangdong P.R.China

1.5 Test Equipment List and Details

Test Equipment for Conducted Emission					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESCI3	101152	2024-10-23	2025-10-22
LISN	R&S	ENV216	102874	2024-10-23	2025-10-22
ISN	R&S	ENY81-CA6	0295	2024-10-23	2025-10-22
Test Equipment for Radiated Emission					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Receiver	R&S	ESR7	102497	2024-10-23	2025-10-22
RF Cable	ETS-LINDGREN	RFC-NMS-100- NMS-350-IN	/	2024-10-23	2025-10-22
Log periodic antenna	ETS-LINDGREN	VULB 9168	01475	2024-10-28	2025-10-27
Horn Antenna	ETS-LINDGREN	3117	00252566	2024-10-28	2025-10-27
Preamplifier	Schwarzbeck	BBV9743B	00423	2024-10-28	2025-10-27
Preamplifier	ETS-LINDGREN	3117-PA	00252566	2024-10-28	2025-10-27
Preamplifier	ETS-LINDGREN	3116C-PA	00251779	2024-10-28	2025-10-27
Test Equipment for ESD					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
ESD Gun	TESEQ	NSG437	1240	2024-10-23	2025-10-22
Test Equipment for EFT					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Signal Generator	3CTEST	EFT 500S	ES027000222 034	2024-10-23	2025-10-22
Dip Controller	TESEQ	INA 6502	2037	/	/



Test Equipment for DIPS					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Power failure simulator	3CTEST	PFS 2216S	ES049001322012	2024-10-23	2025-10-22
Test Equipment for CS					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Generator	TESEQ	NSG4070	59501	2024-10-23	2025-10-22
6dB attenuator	TESEQ	75-A-MFN-06	0063373	2024-10-23	2025-10-22
CDN	TESEQ	M016S	59085	2024-10-23	2025-10-22
Test Equipment for Harmonic/Flicker					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Harmonic&Flicker Module	APS	LFZ-1-16	20006	2024-04-03	2025-04-02
PACIFIC POWER SOURCE	APS	140AMX-UPC12/S	1792	2024-04-03	2025-04-02
Test Equipment for Surges					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Surge Generator	3CTEST	CWS 600	ES058001022005	2024-10-23	2025-10-22
Signal line coupling decoupling network	3CTEST	CDN 405T8	ES064004222004	2024-10-23	2025-10-22
Test Equipment for RS					
Description	Manufacturer	Model	Serial Number	Cal Date	Due Date
Stack log-periodic antennas	S&B	STLP-9129	00225	2024-10-23	2025-10-22
power amplifier 80MHz-1GHz	ETS-LINDGR EN	8000-002	00163152	2024-10-23	2025-10-22
power amplifier 1GHz-6GHz	ETS-LINDGR EN	8100-045	00163616	2024-10-23	2025-10-22



1.6 Performance Criteria for EMS

According to Clause 6 of EN IEC 55014-2:2021:

• Performance Criteria Description

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



2. SUMMARY OF TEST RESULTS

Emissions		
Test Standards	Description of Test Item	Result
EN IEC 55014-1:2021	Conducted Emissions	PASS
	Discontinuous Disturbances	/
	Radiated Emissions	PASS

Immunity		
Test Standards	Description of Test Item	Result
EN IEC 55014-2:2021	Electrostatic Discharge	PASS
	Continuous Radiated Disturbances	PASS
	Electrical Fast Transients	PASS
	Surges	PASS
	Continuous Conducted Disturbances	PASS
	Voltage Dips and Interruptions	PASS

EN IEC 61000-3-2:2019+A1:2021		
Rule	Description of Test Item	Result
EN IEC 61000-3-2:2019+A1:2021	Harmonic Current Emissions	N/A

EN 61000-3-3:2013+A1:2019+A2:2021		
Rule	Description of Test Item	Result
EN 61000-3-3:2013+A1:2019+A2:2021	Voltage Fluctuations & Flicker	N/A

*Note1: N/A means not applicable.



3. GENERAL REMARKS

When applying the basic standard in this test report, the latest amendment is always included.

3.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix 1: Test Result

3.2 Result Level & Over Limit Calculation

The Measurement (Result Level) is calculated by Reading Level adding the Correct Factor(maybe including LISN Factor and the Cable Factor etc.), The basic equation is as follows:

Measurement = Reading Level + Correct Factor(including LISN Factor ,Cable Factor etc.)

The “Over Limit” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a “Over Limit” of -6dB means the emission is 6dB below the maximum limit for device. The equation for “over limit” calculation is as follows:

Over Limit = Measurement(Result Level) –Limit



4. Conducted Emissions

4.1 Conducted Emission Limit

Limits for conducted emissions at the AC mains power ports

Frequency Range	Quasi Peak(dB μ V)	Average(dB μ V)
0.15 to 0.50	66-56	59-46
0.50 to 5	56	46
5 to 30	60	50

Note1 The lower limit shall apply at the transition frequencies.

Note2 The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

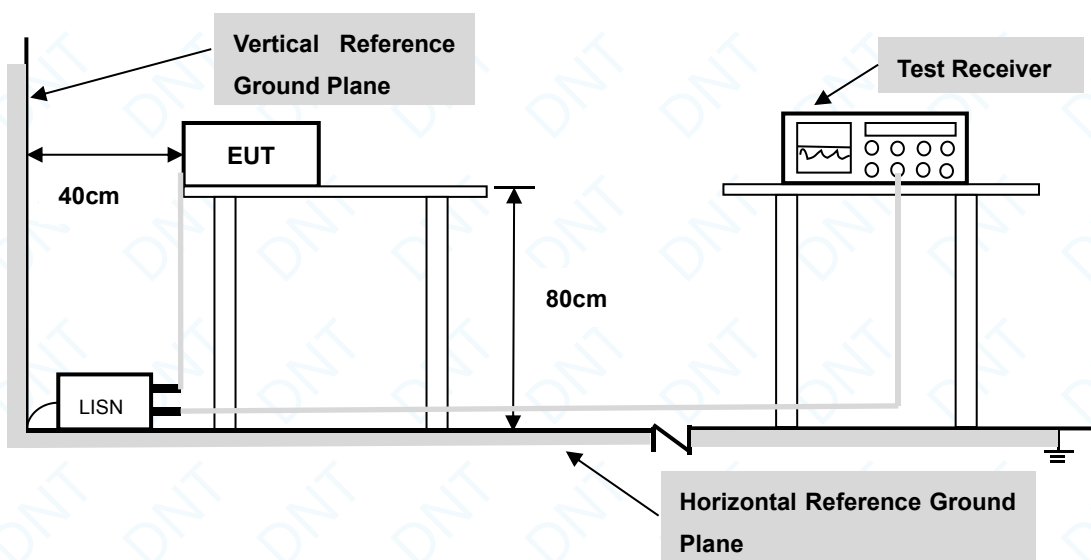
Limits for conducted emissions at additional ports

Frequency Range	Quasi Peak(dB μ V)	Average(dB μ V)
0.15 to 0.50	80	70
0.50 to 5	74	64
5 to 30	74	64

Note1 The lower limit shall apply at the transition frequencies.

Note2 The limit decreases linearly with the logarithm of the frequency in the range 0.15MHz to 0.50MHz.

4.2 Block Diagram of Test Setup





4.3 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 $50\Omega/50\mu H + 5\Omega$ 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.

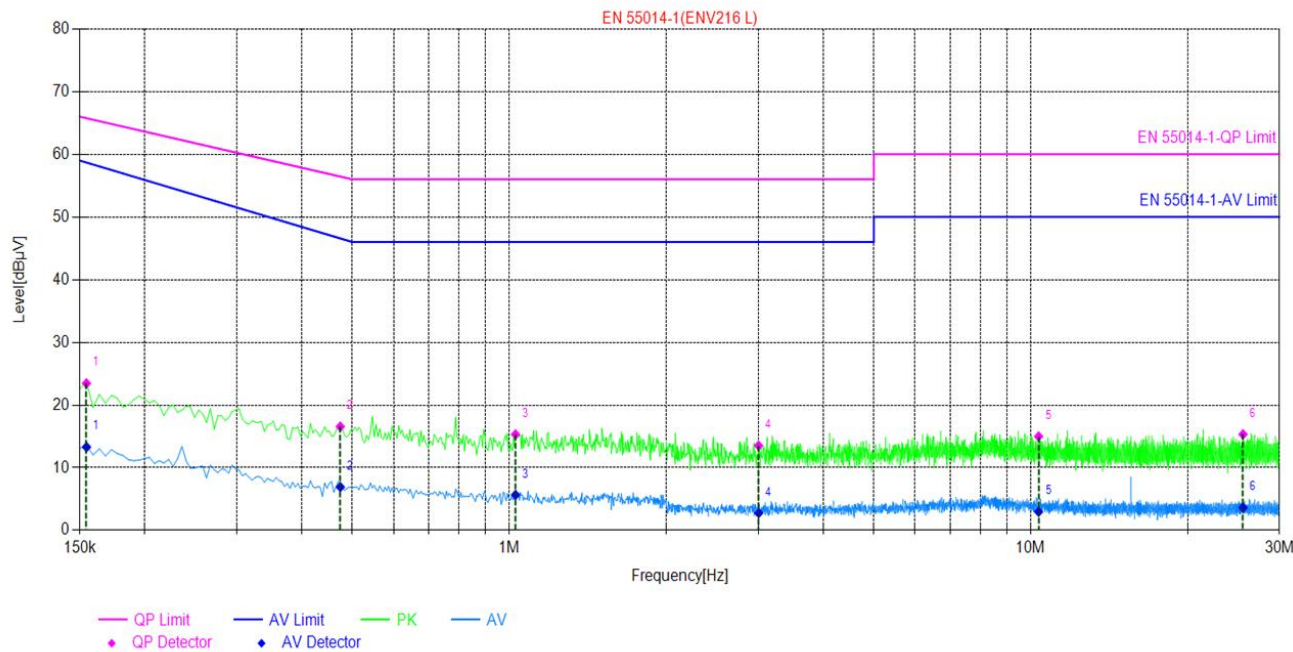
4.4 Environmental Conditions

Temperature:	25℃
Relative Humidity:	60%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Mode:	1
Test Date:	2024-12-10
Tested By:	Eric Huang



4.5 Test Data and Result

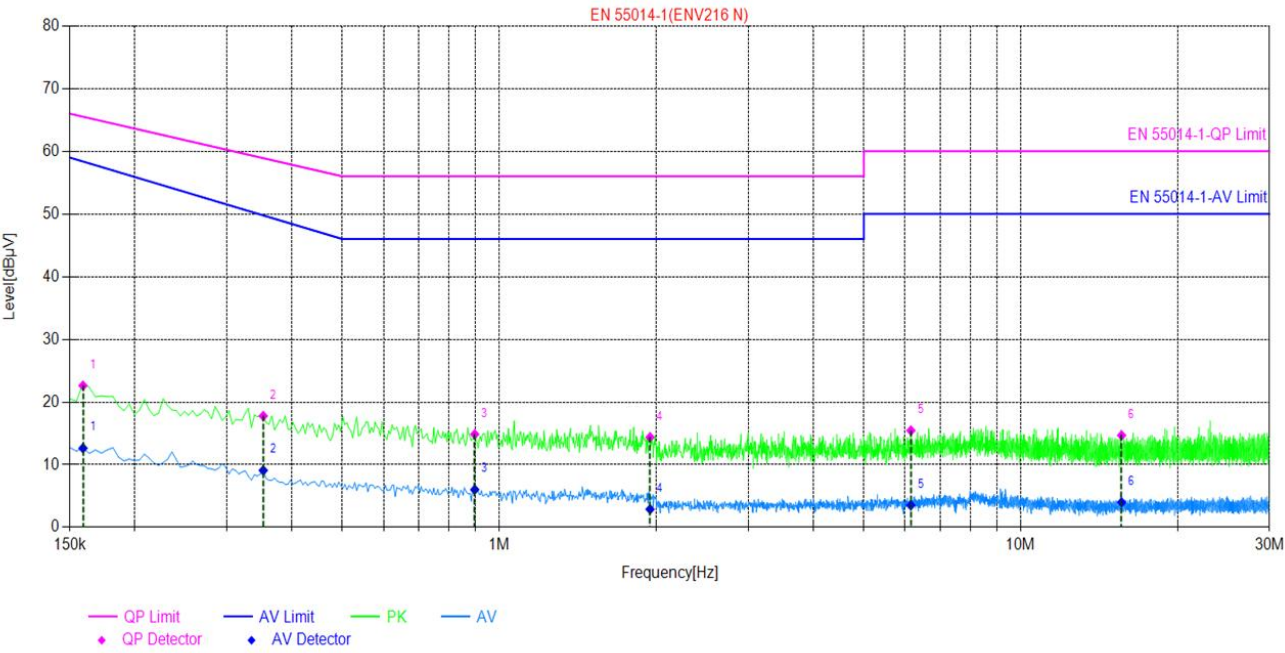
L:



Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.1545	9.90	23.46	65.75	42.29	13.30	58.68	45.38	PASS
2	0.474	9.85	16.56	56.44	39.88	6.92	46.58	39.66	PASS
3	1.0275	9.72	15.31	56.00	40.69	5.66	46.00	40.34	PASS
4	3.0075	9.74	13.51	56.00	42.49	2.76	46.00	43.24	PASS
5	10.356	9.87	14.99	60.00	45.01	2.97	50.00	47.03	PASS
6	25.5435	10.22	15.32	60.00	44.68	3.62	50.00	46.38	PASS



N:



Final Data List									
NO.	Freq. [MHz]	Factor [dB]	QP Value [dBμV]	QP Limit [dBμV]	QP Margin [dB]	AV Value [dBμV]	AV Limit [dBμV]	AV Margin [dB]	Verdict
1	0.159	9.80	22.61	65.52	42.91	12.63	58.37	45.74	PASS
2	0.3525	9.88	17.77	58.90	41.13	9.09	49.77	40.68	PASS
3	0.897	9.74	14.85	56.00	41.15	6.03	46.00	39.97	PASS
4	1.9455	9.77	14.38	56.00	41.62	2.89	46.00	43.11	PASS
5	6.1575	9.98	15.45	60.00	44.55	3.54	50.00	46.46	PASS
6	15.6165	9.95	14.68	60.00	45.32	3.99	50.00	46.01	PASS



5. Radiated Emissions

5.1 Radiated Emission Limit

Limits for radiated emissions at frequencies up to 1GHz

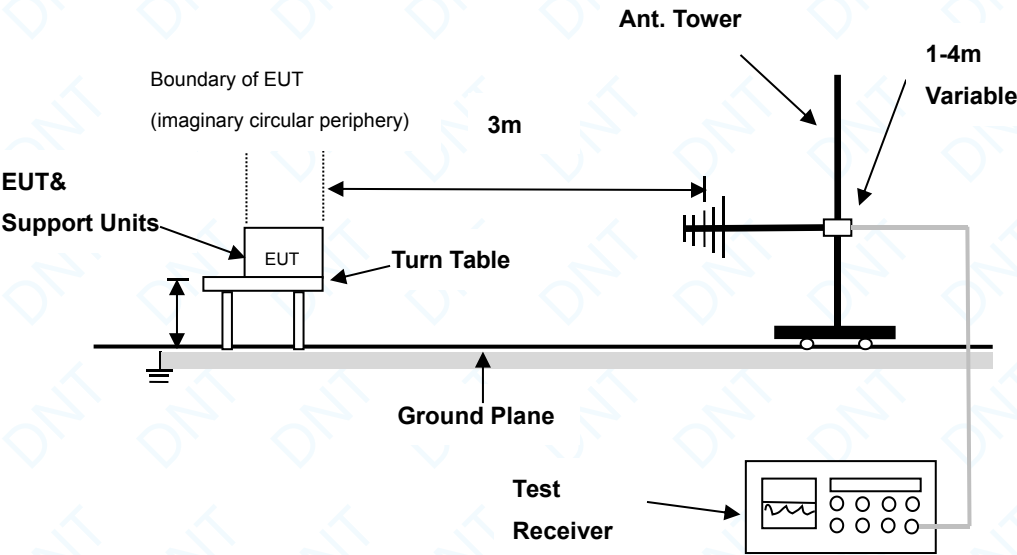
Frequency range (MHz)	Measurement		Class B limits dB(μV/m)
	Distance (m)	Detector type/bandwidth	
30 ~ 230	3	Quasi Peak/120kHz	40
230 ~ 1000			47

Limits for radiated emissions at frequencies above 1GHz

Frequency range (MHz)	Measurement		Class B limits dB(μV/m)
	Distance (m)	Detector type/bandwidth	
1000 ~ 3000	3	Average/1MHz	50
3000 ~ 6000			54
1000 ~ 3000	3	Peak/1MHz	70
3000 ~ 6000			74

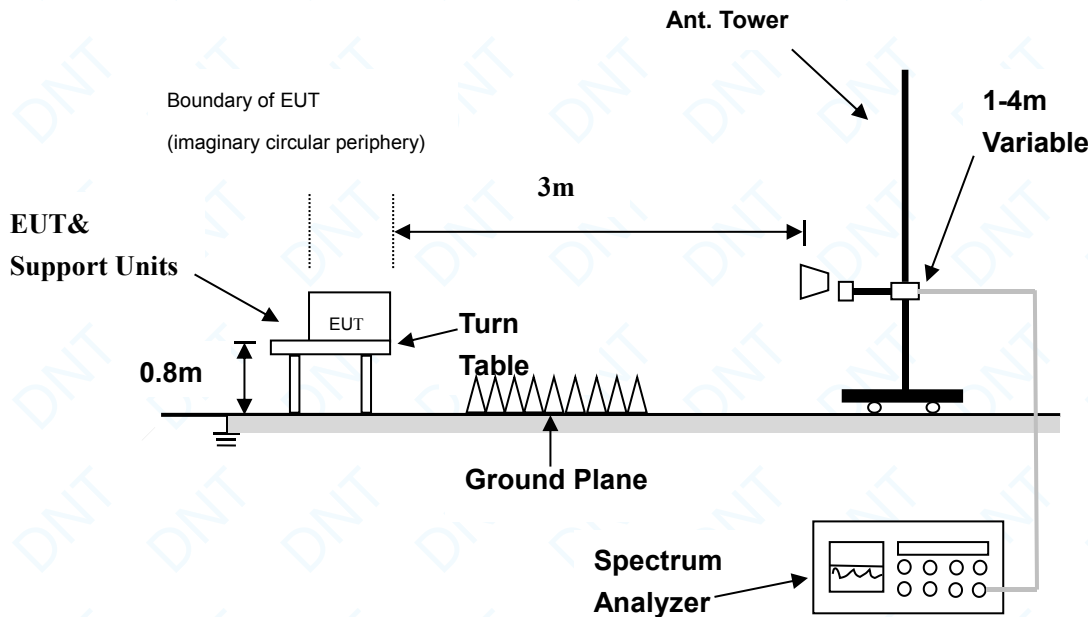
5.2 Block Diagram of Test Setup

Radiated Emissions Frequency:30MHz to 1000MHz:





Radiated Emissions Frequency: 1000MHz to 6000MHz:



5.3 Test Procedure

From 30 MHz to 1GHz test procedure as below:

- (1) The radiated emissions were tested in a semi-anechoic chamber.
- (2) The EUT is placed on a turntable, which is 0.8m above ground plane.
- (3) The EUT is placed on a turntable, which is 0.8 meter high above the ground. The turntable can rotate 360 degrees to determine the position of the maximum emission level. The EUT is set 3 meters away from the receiving antenna, which is mounted on an antenna tower. Emissions were scanned and measured rotating the EUT to 360 degrees and positioning the antenna 1 to 4 meters above the ground plane, in both the vertical and the horizontal polarization, to maximize the emission reading level.
- (4) And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- (5) Repeat above procedures until the measurements for all frequencies are complete.

5.4 Environmental Conditions

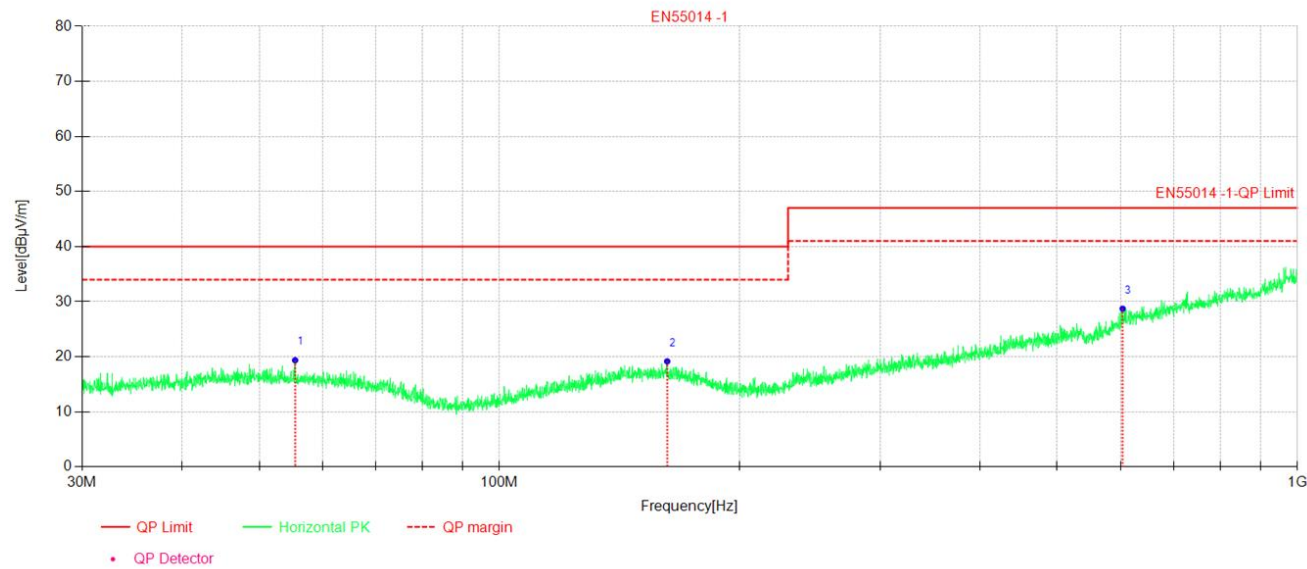
Temperature:	25°C
Relative Humidity:	60%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Mode:	1
Test Date:	2024-12-11
Tested By:	Leo Lu



5.5 Test Data and Result

Below 1GHz

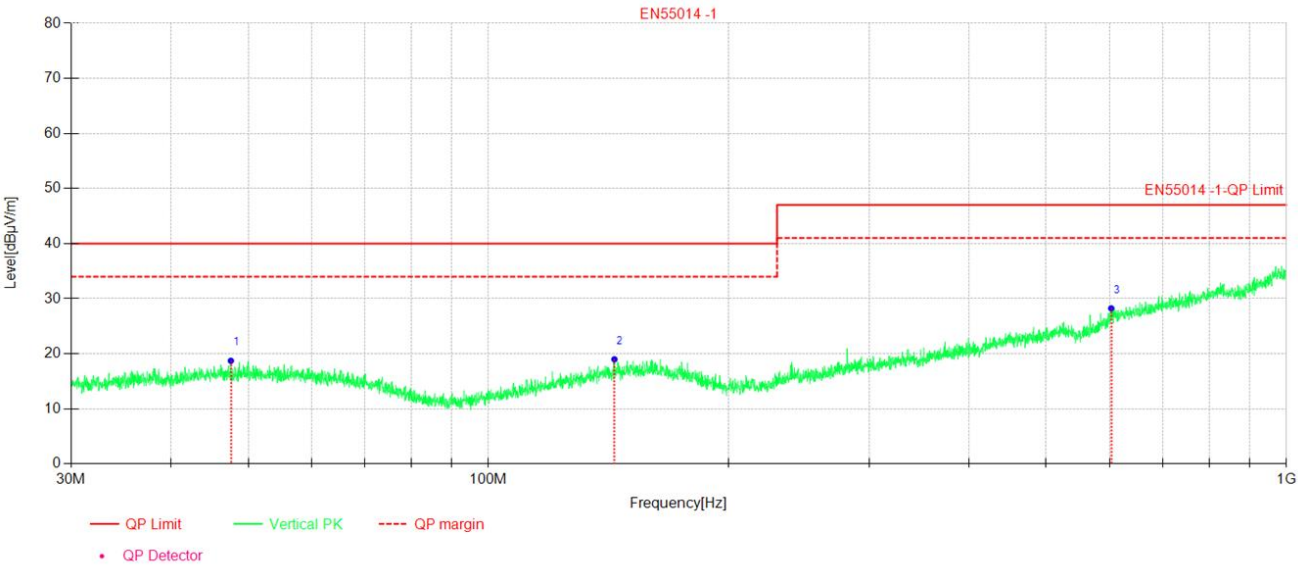
Horizontal:



Suspected Data List										
NO.	Freq. [MHz]	Level [dBμV/m]	Factor[d B]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity	Verdict
1	55.453	19.37	-8.31	40.00	20.63	100	103	PK	Horizontal	PASS
2	162.26	19.17	-7.86	40.00	20.83	100	232	PK	Horizontal	PASS
3	603.96	28.73	0.91	47.00	18.27	100	155	PK	Horizontal	PASS



Vertical:



Suspected Data List

NO.	Freq. [MHz]	Level [dBμV/m]	Factor[d B]	Limit [dBμV/m]	Margin [dB]	Height [cm]	Angle [°]	Trace	Polarity	Verdict
1	47.558	18.72	-8.08	40.00	21.28	100	11	PK	Vertical	PASS
2	143.82	19.00	-8.23	40.00	21.00	100	130	PK	Vertical	PASS
3	603.11	28.25	0.76	47.00	18.75	100	271	PK	Vertical	PASS

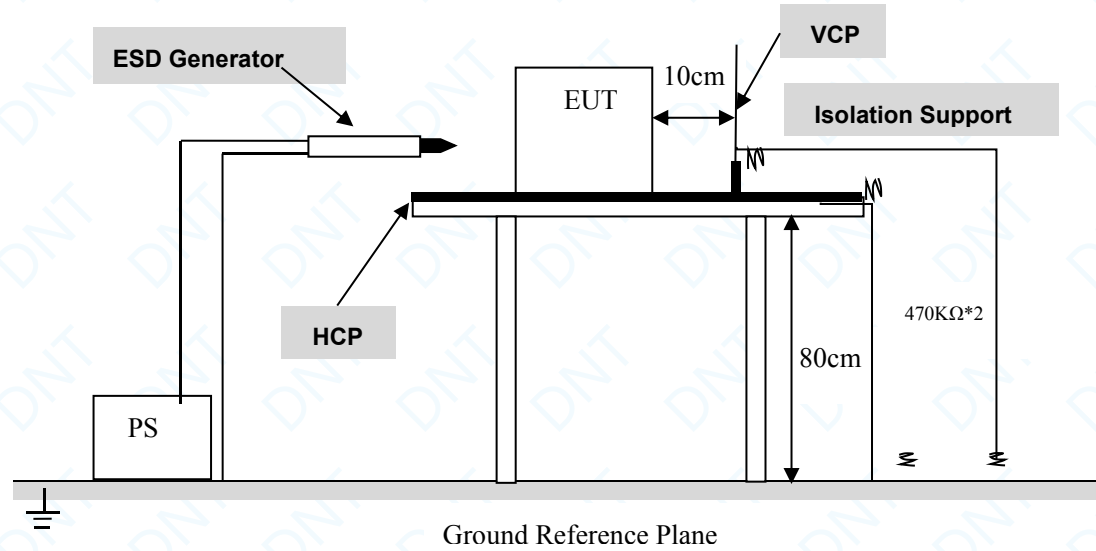


6. Electrostatic Discharge

6.1 ESD Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Electrostatic discharge	Enclosure port	$\pm 4\text{kV}$ (Contact Discharge)	EN 61000-4-2	B
		$\pm 8\text{kV}$ (Air Discharge)		

6.2 Block Diagram of Test Setup



6.3 Test Procedure

Air Discharges:

This test is done on a non-conductive surface. The round Discharges tip of the Discharges electrode shall be approached as fast as possible to touch the EUT. After each Discharge, the Discharges electrode shall be removed from the EUT. The generator is then re-triggered for a new single Discharge and repeated 10 times for each pre-selected test point. This procedure shall be repeated until all the air Discharges completed.

Contact Discharges:

All the procedure shall be same as Section 8.3.1 of EN 61000-4-2, except that the tip of the Discharges electrode shall touch the EUT before the Discharges switch is operated.

Indirect Discharges for HCP

At least 20 single Discharges shall be applied to the horizontal coupling plane, at points on each side of the EUT. The Discharges electrode positions vertically at a distance of 0.1 m from the EUT and with the Discharges electrode touching the coupling plane.

**Indirect Discharges for VCP**

At least 20 single Discharges shall be applied to the center of one vertical edge of the coupling plane. The coupling plane, of dimensions 0.5m X 0.5m, is placed parallel to, and positioned at a distance of 0.1m from the EUT. Discharges shall be applied to the coupling plane, with this plane in sufficient different positions that the four faces of the EUT are completely illuminated

6.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang

6.5 Test Data and Result

EN 61000-4-2 Test Points	Test Levels (kV)			
	-4	+4	-8	+8
Air Discharge				
Shell non-metallic gaps	A	A	A	A

EN 61000-4-2 Test Points	Test Levels (kV)			
	-4	+4	-8	+8
Contact Discharge				
/	/	/	/	/

EN 61000-4-2 Test Points	Test Levels (kV)			
	Indirect Contact Discharge (HCP)		Indirect Contact Discharge (VCP)	
	-4	+4	-4	+4
Front Side	A	A	A	A
Back Side	A	A	A	A
Left Side	A	A	A	A
Right Side	A	A	A	A

Remark:

A:No degradation was found.

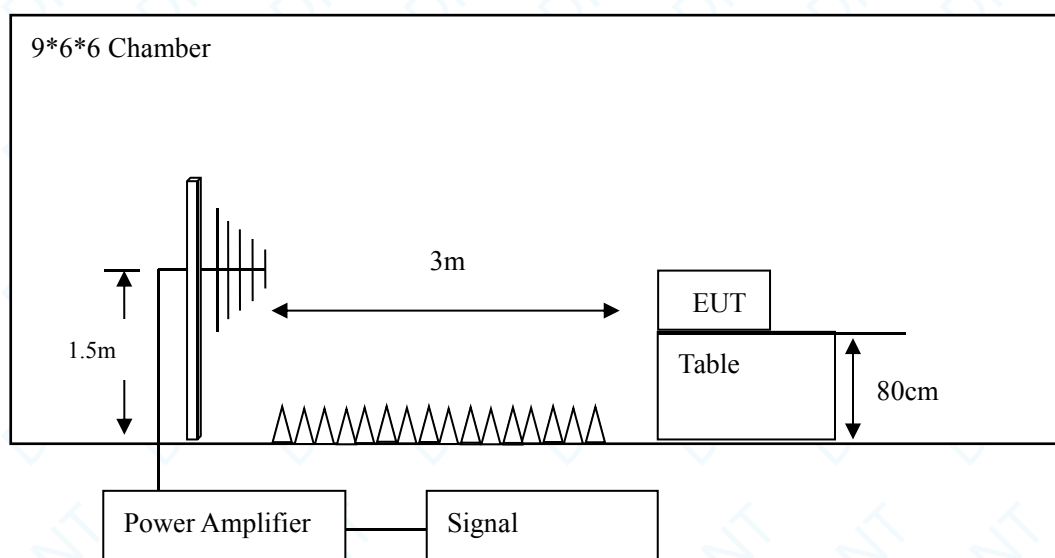


7. Radio Frequency Electromagnetic Field

7.1 RS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Radio-frequency electromagnetic field Amplitude modulated	Enclosure port	3V/m(unmodulated, r.m.s) 80% AM(1kHz)	EN 61000-4-3	A

7.2 Block Diagram of Test Setup



7.3 Test Procedure

a) Test is conducting under the description of EN 61000-4-3.

- (1)The EUT was switched on and allowed to warm up to its normal operating condition.
- (2)The EUT was exercised and monitored in the manner specified by the customer.
- (3)All test instruments were PC controlled, via their IEEE 488.2 bus interfaces, and the test conducted in the following manner:
The testing frequencies were swept over the required frequency range, with a step frequency equal to 1% of fundamental. The sweep rate was 1.0×10^{-3} decades/s. For each frequency tested, the signal generator output level was adjusted automatically until the unmodulated field strength registered by the field monitor reached the desired level. This level was held constant for the specified dwell time.
- (4)The EUT was continuously monitored during the test in accordance with the Pass / Fail criteria declared by the customer.
- (5)The test was done in both horizontal and vertical antenna polarizations, and for all necessary sides of the EUT.



b) For Display and display output functions

The display quality evaluated by direct observation.

For display output function evaluation, a suitable display device shall be connected. This device shall meet the immunity requirements for displays specified in this document. The screen size shall be typical for the display output. the diagonal screen size shall be at least 0,50 m.

The display shall be observed under normal viewing conditions including viewing distance using a reduced ambient light level preferably in the range 15 lx to 20 lx. The viewing distance or settings of the video camera monitoring system shall be sufficient to provide visibility of the whole display. In the case of direct observation the selected viewing distance shall be recorded in the test report.

7.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang

7.5 Test Data and Result

Field Strength: 3V/m
Frequency step: 1% of fundamental
Dwell time: 1 second
Modulation: AM by 1kHz sine wave with 80% modulation depth

Frequency Range(MHz)	Field (V/m)	Front		Rear		Left Side		Right Side	
		VERT	HORI	VERT	HORI	VERT	HORI	VERT	HORI
80-1000	3	A	A	A	A	A	A	A	A

Remark:
A:No degradation was found.

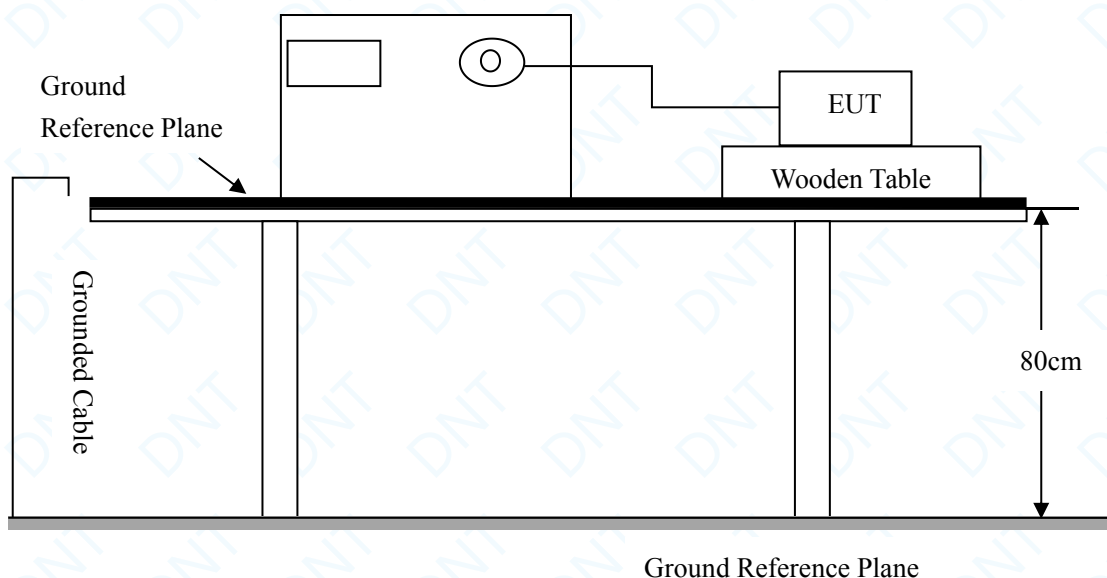


8. Electrical fast transients

8.1 EFT Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Electrical fast transients	a.c. power. ports	$\pm 1\text{kV}(\text{peak})$ Tr/Th:5/50ns Repetition frequency:5kHz	EN 61000-4-4	B
	I/O Signal & Control Line	$\pm 0.5\text{kV}(\text{peak})$ Tr/Th:5/50ns Repetition frequency:5kHz		B

8.2 Block Diagram of Test Setup



8.3 Test Procedure

(1) The EUT was switched on and allowed to warm up to its normal operating condition.

(2) D.C./A.C. Power Line Test

The EFT/B test system has a built-in coupling/decoupling network which couples the generated EFT bursts into the EUT power supply lines connected to it. The EFT bursts were coupled to the selected lines (one at a time) of the EUT.

(3) I/O Signal & Control Line Test

The interference impulses were capacitively coupled to the EUT's signal cables.

(4) The EUT was monitored during the test in accordance with the Pass /Fail criteria declared by the customer.

(5) The test was performed with EFT bursts in the positive and negative polarities and repeated on all necessary lines.



8.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang

8.5 Test Data and Result

IEC61000-4-4		Test Levels(kV)					
Test Points		+0.5	-0.5	+1.0	-1.0	+2.0	-2.0
AC mains power input port	L	A	A	A	A	/	/
	N	A	A	A	A	/	/
	PE	/	/	/	/	/	/
	L+N	A	A	A	A	/	/
	L+PE	/	/	/	/	/	/
	N+PE	/	/	/	/	/	/
	L+N+PE	/	/	/	/	/	/

Remark:

A:No degradation was found.

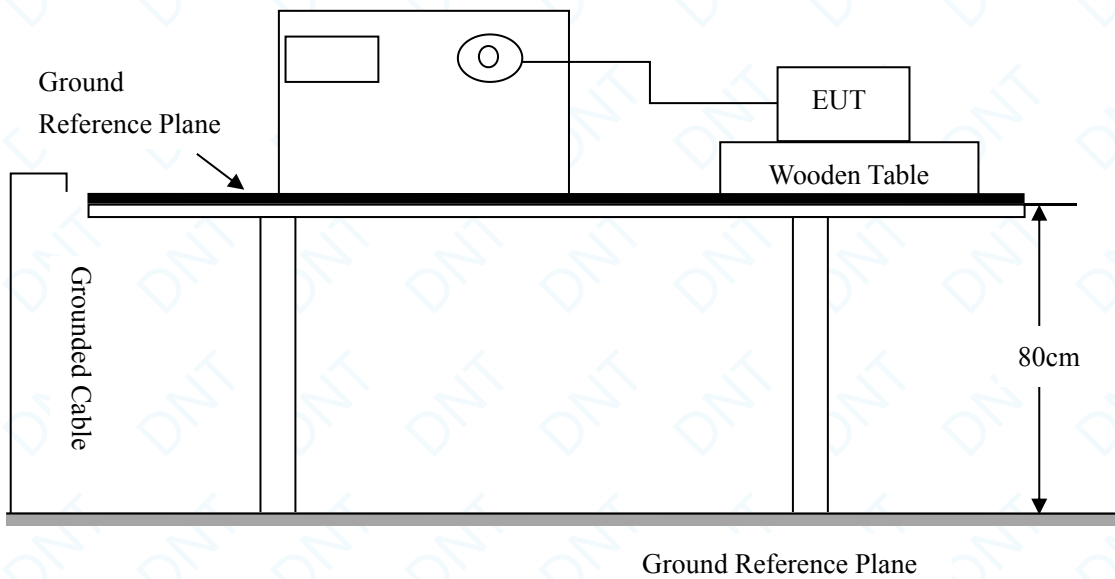


9. Surges

9.1 Surges Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Surges	a.c. power ports	Tr/Th:1,2/50μs ±1kV (line to line) ±2kV(line to earth)	EN 61000-4-5	B

9.2 Block Diagram of Test Setup



9.3 Test Procedure

- (1)The power supply to EUT was switched on and allowed to warm up to its normal operating condition.
- (2)The surge generator phase shifter was set to different angle.
- (3)The correct open-circuit test level was set with the surge generator disconnected from the coupling network.
- (4)The output of the generator was then reconnected back to the coupling network.
- (5)Five discharges, generated by the voltage surge generator, were made on each relevant line, for each polarity, at each test level, with the relevant discharge interval.
- (6)The EUT was observed during, and checked after the test to determine the result.



9.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang

9.5 Test Data and Result

Phase Voltage / Mode / Polarity / Result			0°	90°	180°	270°
1.0 kV	L-N	+	/	A	/	A
		-	/	A	/	A
2.0 kV	L-PE	+	/	/	/	/
		-	/	/	/	/
2.0 kV	N-PE	+	/	/	/	/
		-	/	/	/	/

Remark:
A:No degradation was found.

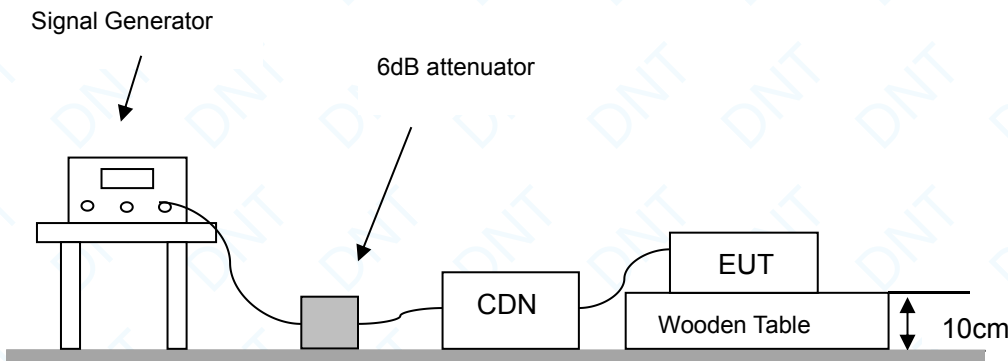


10. Radio-Frequency Continuous Conducted

10.1 CS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Radio-frequency continuous conducted	Input a.c. power ports	0.15~230MHz, 3V	EN 61000-4-6	A

10.2 Block Diagram of Test Setup



10.3 Test Procedure

- (1)The EUT was switched on and allowed to warm up to its normal operating condition.
- (2)The EUT are placed on an insulating support 0.1 m high above a ground reference plane. CDN(coupling and decoupling device) is placed on the ground plane about 0.3 m from EUT. Cables between CDN and EUT are as short as possible, and their height above the ground reference plane shall be between 30 and 50 mm (where possible).
- (3)The frequency range is swept from 150 kHz to 230 MHz using 3V signal level, and with the disturbance signal 80% amplitude modulated with a 1 kHz sine wave.
- (4)The rate of sweep shall not exceed 1.5×10^{-3} decades/s. Where the frequency is swept incrementally, the step size shall not exceed 1% of the start and thereafter 1% of the preceding frequency value. Recording the EUT operating situation during compliance testing and decide the EUT immunity criterion.
- (5)The EUT was continuously monitored during the test in accordance with the PASS/FAIL criteria declared by the customer.



10.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang

10.5 Test Data and Result

EN 61000-4-6 Test Point	Frequency Range (MHz)	Strength (Vrms)	Modulation	Result
Power Line	0.15~230	3	AM	A

Remark:

A:No degradation was found.

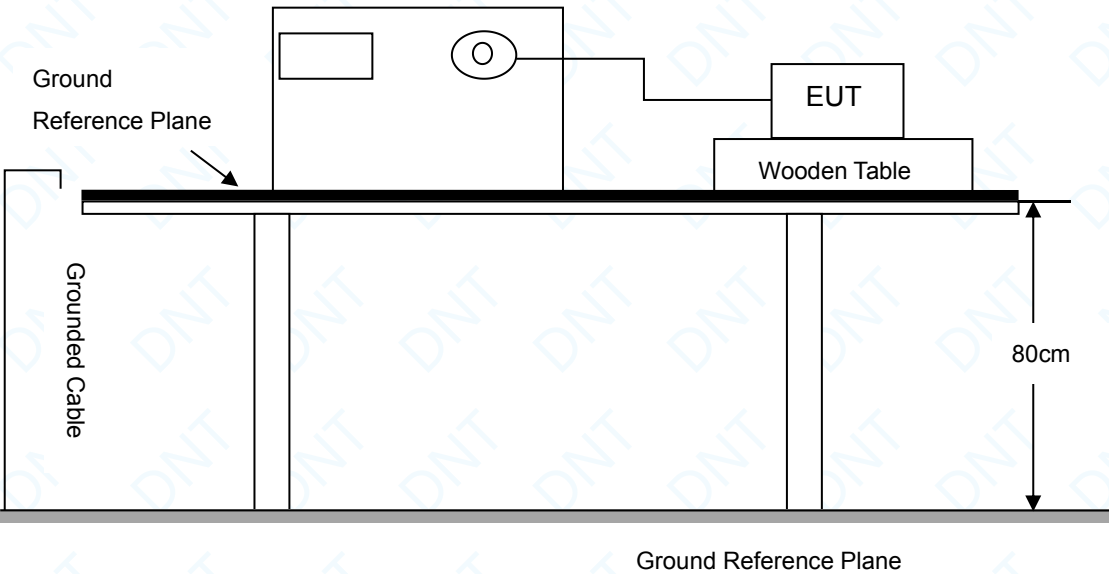


11. Voltage Dips and Interruptions Test Result

11.1 DIPS Immunity Requirements

Environmental Phenomenon	Port	Test Specification	Basic Standard	Performance criterion
Voltage Dips	Input a.c. power port	>95% reduction 0.5 period	EN 61000-4-11	C
		30% reduction 25 period		C
		60% reduction 10 period		C

11.2 Block Diagram of Test Setup



11.3 Test Procedure

- (1)The interruption is introduced at selected phase angles with specified duration.
- (2)Record any degradation of performance.

11.4 Environmental Conditions

Temperature:	23.5℃
Relative Humidity:	50%
Atmospheric Pressure:	101.3KPa
Test Voltage:	AC 230V/50Hz
Test Date:	2024-12-11
Tested By:	Eric Huang



11.5 Test Data and Result

Environmental Phenomenon	Test Level %U _T	Reduction (%)	Duration (periods)	Result
Voltage Dips	<5	>95	0.5	A
	70	30	25	C
	40	60	10	C

Remark:

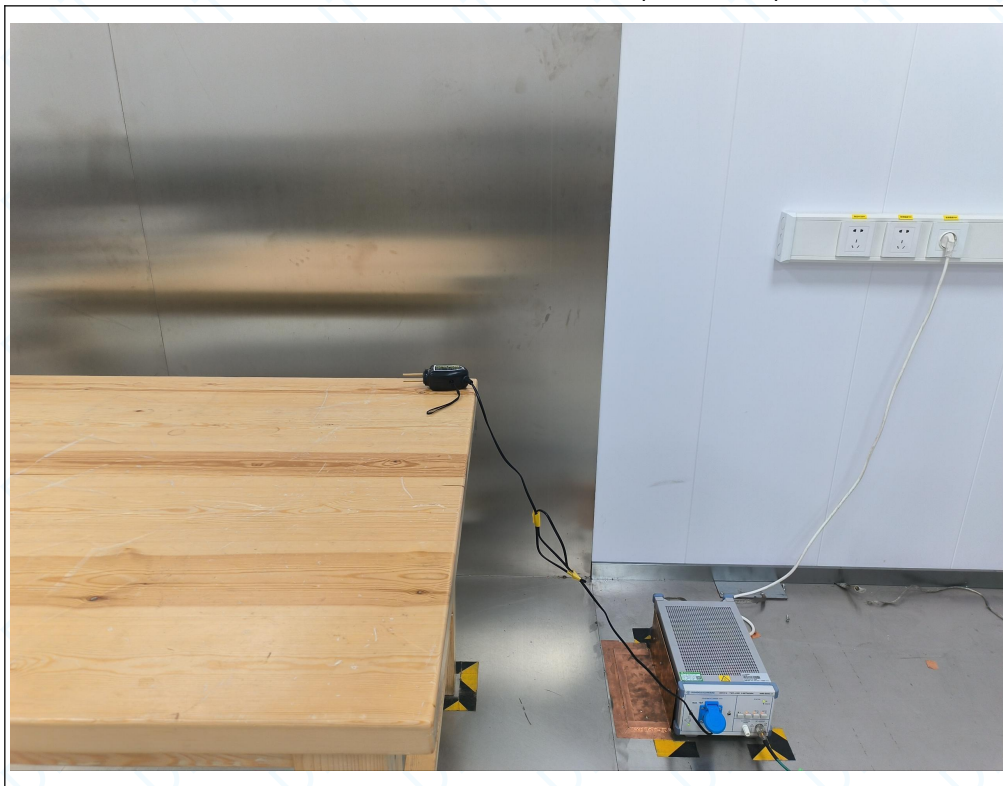
A:No degradation was found.

C: Conformance to Requirements

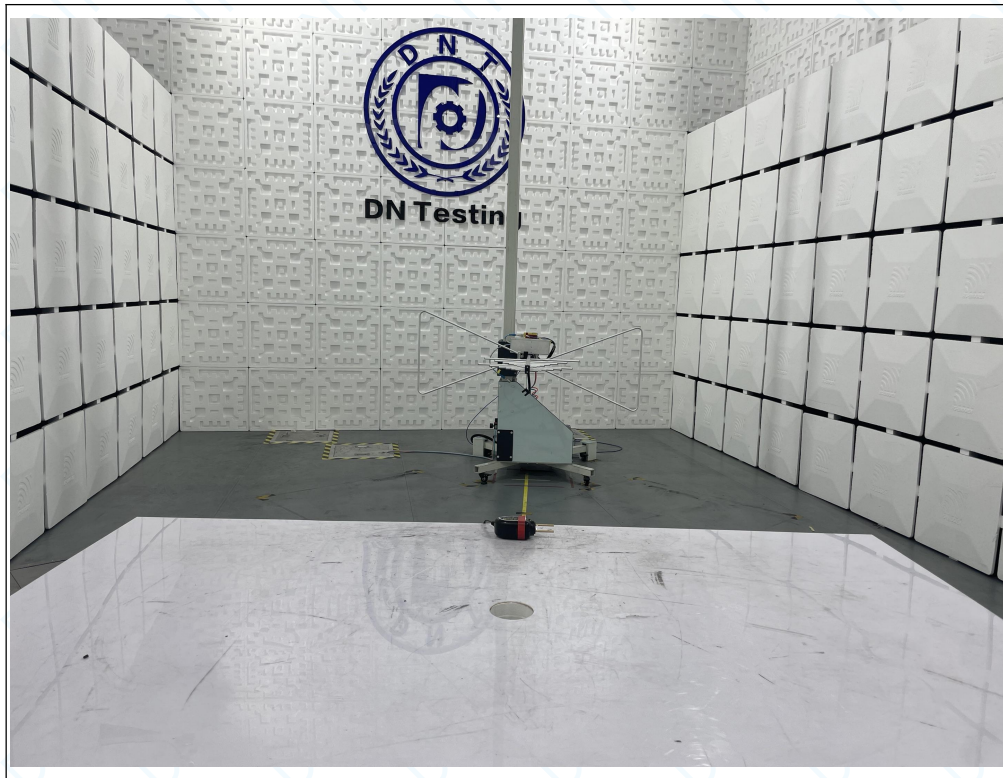


EXHIBIT A – PHOTOGRAPHS OF TEST SETUP

Conducted Emission Test View(AC Mains)



Radiated Emission Test View(Below 1GHz)

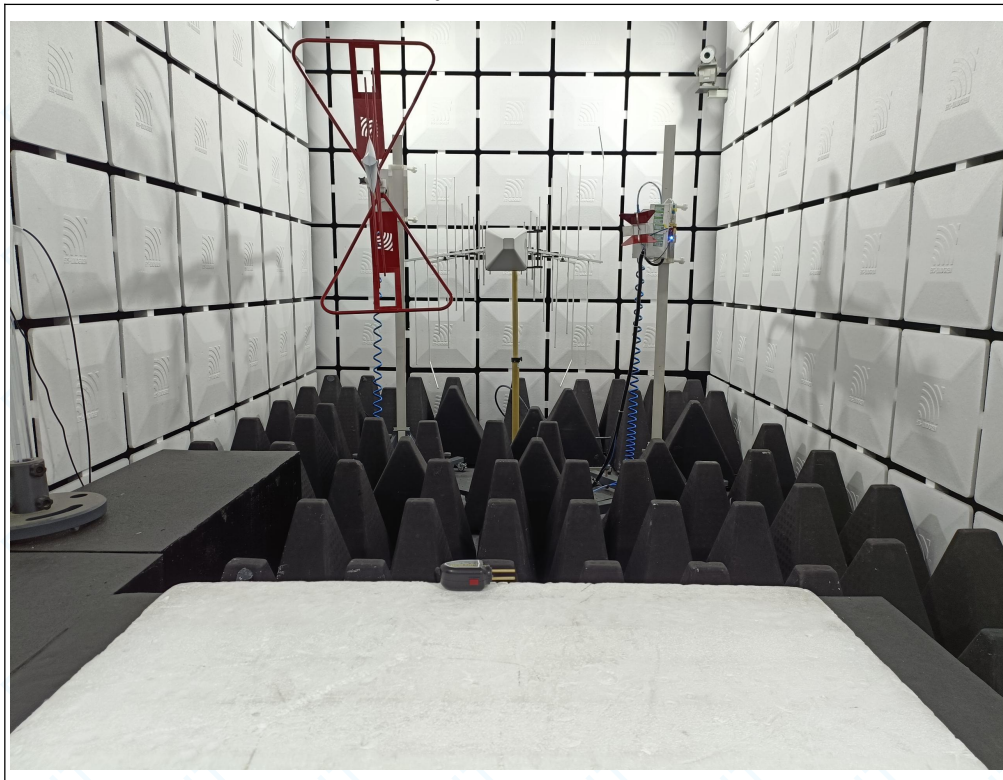




ESD Immunity Test View

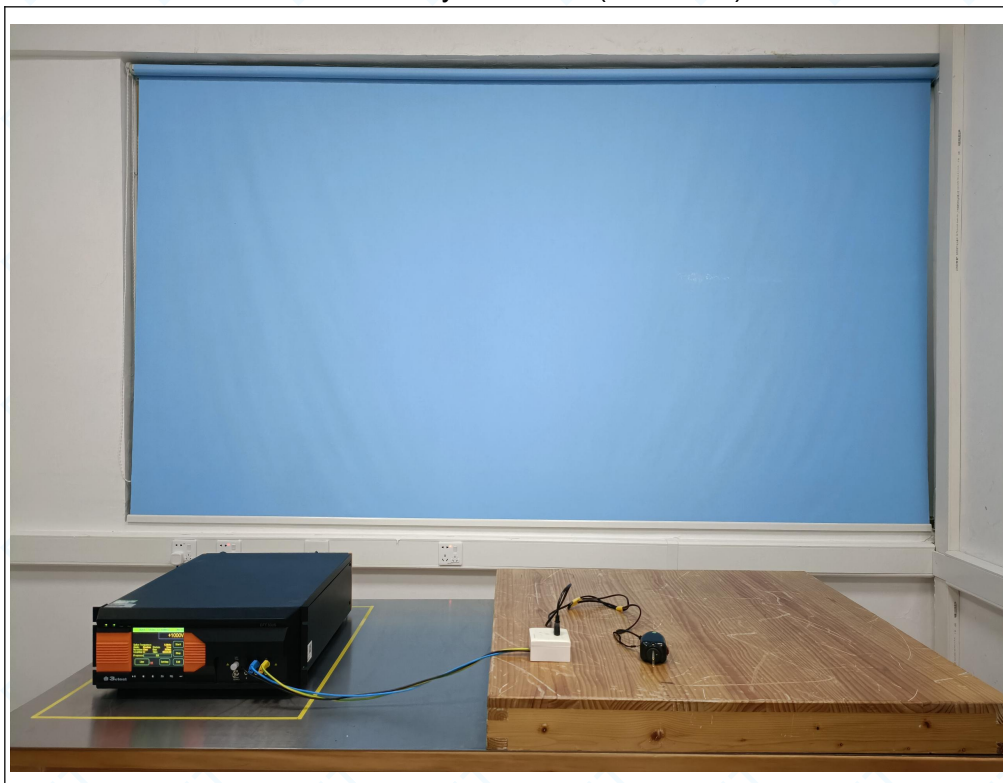


RS Immunity Test View (AC mains)





EFT Immunity Test View (AC mains)

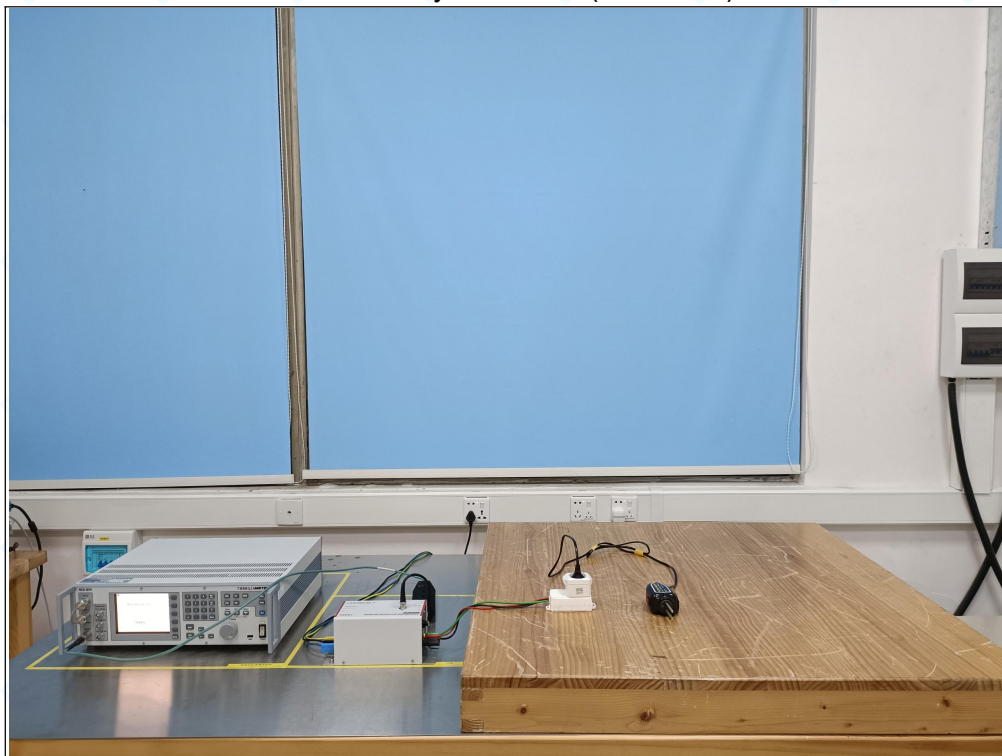


Surge Immunity Test View (AC mains)





CS Immunity Test View (AC mains)



Voltage Dips and Interruption Immunity Test View





EXHIBIT B – PHOTOGRAPHS OF EUT





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