TEST REPORT

Application No.:	SHEM2208006567TX
Applicant:	Ningbo Airtac Automatic Industrial Co., Ltd.
Address of Applicant:	No.88, Siming E.RD., High Tech Area of Fenghua City, Zhejiang, China
Manufacturer:	Ningbo Airtac Automatic Industrial Co., Ltd.
Address of Manufacturer:	No.88, Siming E.RD., High Tech Area of Fenghua City, Zhejiang, China
Equipment Under Test (EUT):	
EUT Name:	6V Series Solenoid Valve
Model No.:	6V110, 6V0510, 6V0520, 6V0530, 6V120, 6V130, 6V210, 6V220, 6V230, 6V310, 6V320, 6V330, 6TV0510, 6TV0520, 6TV110, 6TV120, 6TV210, 6TV220, 6TV310, 6TV320, 6HV0510, 6HV0520, 6HV0530, 6HV110, 6HV120, 6HV130; ♣
	♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) :	EN IEC 61000-6-4: 2019
	EN IEC 61000-6-2: 2019
Date of Receipt:	2022-08-17
Date of Test:	2022-08-22 to 2022-08-29
Date of Issue:	2022-08-31
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Parlam Zhan
Laboratory Manager

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
EEC EMC Lab

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Revision Record			
Version	**Description**	**Date**	**Remark**
00	Original	2022-08-31	/

Authorized for issue by:				
		Evan Yan **Evan Yan/Project Engineer**		
		Jim Xu **Jim Xu/Reviewer**		

2 Test Summary

Emission Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Emissions at AC Mains Power Port (150kHz-30MHz)	EN IEC 61000-6-4: 2019	CISPR 16-2-1	Table 4	Pass
Conducted Emissions at DC Power Port (150kHz-30MHz)		CISPR 16-2-1	Table A.1	Pass
Radiated Emissions (30MHz-1GHz)		CISPR 16-2-3	Table 3	Pass

Immunity Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Electrostatic Discharge	EN IEC 61000-6-2: 2019	EN 61000-4-2:2009	±4kV Contact Discharge, ±8kV Air Discharge	Pass
Radiated Immunity (80MHz to 1GHz, 1.4GHz to 6GHz)		EN IEC 61000-4-3: 2020	80MHz to 1GHz 10V/m, 80%, 1kHz Amp. Mod. 1.4 to 6GHz 3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients Burst at AC Mains Power Port		EN 61000-4-4:2012	2kV 5/50ns Tr/Td 5kHz 100kHz Repetition Frequency	Pass
Electrical Fast Transients Burst at DC Power Port		EN 61000-4-4:2012	1kV 5/50ns Tr/Td 5kHz or 100kHz Repetition Frequency	Pass
Surge at AC Mains Power Port		EN 61000-4-5:2014+A1:2017	1.2/50μs Tr/Td 1kV Line to Line 2kV Line to Ground	Pass
Surge at DC Power Port		EN 61000-4-5:2014+A1:2017	1.2/50μs Tr/Td , 0.5kV Line to Line , 1kV Line to Ground	Pass
Conducted Immunity at AC Mains Power Port (150kHz-80MHz)		EN 61000-4-6:2014	10Vrms (emf),80%,1kHz Amp. Mod.	Pass
Conducted Immunity at DC Power Port (150kHz-80MHz)		EN 61000-4-6:2014	10Vrms (emf),80%,1kHz Amp. Mod.	Pass
Power Frequency Magnetic Field		EN 61000-4-8:2010	50Hz/60Hz 30A/m	Pass
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	0 % UT for 1cycle 40 % UT for 10cycle 70 % UT for 25cycles 0 % UT for 250cycles UT is Supply Voltage	Pass

Note: There are series models mentioned in this report and they are the similar in electrical and electronic characters. Only the model 6V110 was tested since their differences were the model number, trade name and appearance.

3 Contents

4 General Information

4.1 Details of E.U.T.

Power supply:	DC 24V, DC 12V, AC 220V, AC 110V Maximum Clock Frequency: <108MHz

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty & Decision Rule

Measurement Uncertainty:

No.	Item	Measurement Uncertainty (U_{Lab})	U_{CISPR}
1	Conducted Emission at mains port using AMN	2.6dB (9kHz to 150kHz)	3.8dB (9kHz to 150kHz)
		2.4dB (150kHz to 30MHz)	3.4dB (150kHz to 30MHz)
2	Conducted Emission at mains port using VP	1.8dB (9kHz to 30MHz)	2.9dB (9kHz to 30MHz)
3	Conducted Emission at telecommunication port using AAN	4.2dB (150kHz to 30MHz)	5.0dB (150kHz to 30MHz)
4	Radiated Power	3.2dB (30MHz to 300MHz)	4.5dB (30MHz to 300MHz)
5	Radiated emission	4.5dB (30MHz-1GHz)	6.3dB (30MHz-1GHz)
		5.1dB (1GHz-6GHz)	5.2dB (1GHz-6GHz)
		5.4dB (6GHz-18GHz)	5.5dB (6GHz-18GHz)
6	Radiated disturbance (disturbance current in a LLAS)	2.4dB (9kHz to 30MHz)	3.3dB (9kHz to 30MHz)

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

Decision Rule:

• CISPR 16-4-2 for emission measurements is as below described.

Pass means the test result passed the test standard requirement, please find the detailed decision rule in the report relative section.

U_{LAB} less than U_{CISPR}, therefore:

- compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
- non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

4.4 Test Location

All tests were performed at:
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. E&E Lab
588 West Jindu Road, Xinqiao, Songjiang, 201612 Shanghai, China
Tel: +86 21 6191 5666 Fax: +86 21 6191 5678
No tests were sub-contracted.
Note:
1. SGS is not responsible for wrong test results due to incorrect information (e.g. max. clock frequency, highest internal frequency, antenna gain, cable loss, etc) is provided by the applicant. (if applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (if applicable).

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

• CNAS (No. CNAS L0599)

CNAS has accredited SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

• A2LA (Certificate No. 6332.01)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. is accredited by the American Association for Laboratory Accreditation(A2LA).

• FCC (Designation Number: CN1301)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been recognized as an accredited testing laboratory.

• ISED (CAB Identifier: CN0020)

SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. EMC Laboratory has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.
Company Number: 8617A

• VCCI (Member No.: 3061)

The 3m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-13868, C-14336, T-12221, G-10830 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

4.8 EMS Monitor

Visual: working status

5 Equipment List

Conducted Emissions at AC Mains Power Port (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2021/12/20	2022/12/19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2021/12/20	2022/12/19
Line impedance stabilization network	EMCO	3816_2	SHEM019-1	2021/12/20	2022/12/19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2021/12/20	2022/12/19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2020/12/20	2023/12/19
CE test Cable	/	/	SHEM172-1	2022/1/7	2023/1/6
Test Software	ESE	e3	Version: 6.111221a	N/A	N/A

Conducted Emissions at DC Power Port (150kHz-30MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESR7	SHEM162-1	2021/12/20	2022/12/19
Line impedance stabilization network	SCHWARZBECK	NSLK8127	SHEM061-1	2021/12/20	2022/12/19
Line impedance stabilization network	EMCO	3816_2	SHEM019-1	2021/12/20	2022/12/19
Pulse limiter	Rohde & Schwarz	ESH3-Z2	SHEM029-1	2021/12/20	2022/12/19
Shielding Room	ZHONGYU	8*4*3M	SHEM079-2	2020/12/20	2023/12/19
CE test Cable	/	/	SHEM172-1	2022/1/7	2023/1/6
Test Software	ESE	e3	Version: 6.111221a	N/A	N/A

Radiated Emissions (30MHz-1GHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
EMI test receiver	Rohde & Schwarz	ESU40	SHEM051-1	2021/12/20	2022/12/19
EMI test receiver	Rohde & Schwarz	ESR7	SHEM201-1	2022/8/02	2023/8/01
CONTROLLER	INNCO	CO2000	SHEM047-1	N/A	N/A
ANTENNA MAST	INNCO	MA400-EP	SHEM047-2	N/A	N/A
TURN DEVICE	INNCO	DE 3600-RH	SHEM047-3	N/A	N/A
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM048-1	2021/9/21	2023/9/20
Broadband UHF-VHF ANTENNA	SCHWARZBECK	VULB9168	SHEM202-1	2021/5/7	2023/5/6
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020/5/25	2023/5/24
Pre-amplifier	HP	8447D	SHEM236-1	2022/8/02	2023/8/01

Pre-amplifier	HP	8447D	SHEM143-1	2021/12/20	2022/12/19
RE test Cable	/	/	SHEM173-1&SHEM174-1	2022/1/7	2023/1/6
Test Software	ESE	e3	Version: 6.111221a	N/A	N/A

Electrostatic Discharge					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Electrostatic Discharge Simulator	TESEQ	NSG 437	SHEM041-2	2022/8/02	2023/8/01
Electrostatic Discharge Simulator	3CTEST	EDS20H	SHEM199-1	2021/12/20	2022/12/19

Radiated Immunity (80MHz to 1GHz, 1.4GHz to 6GHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Signal generator	Rohde & Schwarz	SMB100A	SHEM194-1	2021/12/20	2022/12/19
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2022/8/02	2023/8/01
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2022/8/02	2023/8/01
Antenna	SCHWARZBECK	STLP9128D	SHEM130-1	N/A	N/A
Antenna	SCHWARZBECK	STLP9149	SHEM131-1	N/A	N/A
Amplifier	MILMEGA	AS0840-55-55	SHEM133-1	2021/12/20	2022/12/19
Amplifier	MILMEGA	80RF1000-250	SHEM132-1	2021/12/20	2022/12/19
Amplifier	Rohde & Schwarz	BBA150-E60	SHEM171-1	2021/12/20	2022/12/19
Power meter sensor	Rohde & Schwarz	NRP-Z22	SHEM136-1	2022/8/02	2023/8/01
ElectroMagnetic Field Probe	ETS-Lindgren	HI-6105	SHEM134-1	2022/7/15	2023/7/14
Semi/Fully Anechoic	ST	11*6*6M	SHEM078-2	2020/5/25	2023/5/24
Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A

Electrical Fast Transients Burst at AC Mains Power Port					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2021/12/20	2022/12/19
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2022/8/02	2023/8/01
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2022/8/02	2023/8/01
EFT & Surge Generator	PRIMA	PRM61045TB	SHEM200-1	2020/8/13	2023/8/12
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2020/8/13	2023/8/12

Electrical Fast Transients Burst at DC Power Port					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2021/12/20	2022/12/19
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2022/8/02	2023/8/01
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2022/8/02	2023/8/01
EFT & Surge Generator	PRIMA	PRM61045TB	SHEM200-1	2020/8/13	2023/8/12
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2020/8/13	2023/8/12

Surge at AC Mains Power Port					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2021/12/20	2022/12/19
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2022/8/02	2023/8/01
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2022/8/02	2023/8/01
EFT & Surge Generator	PRIMA	PRM61045TB	SHEM200-1	2020/8/13	2023/8/12
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2020/8/13	2023/8/12
CDN for unsymmetrical interconnection lines (1.2/50us)	SCHAFFNER	CDN 117	SHEM224-5	2022/8/02	2023/8/01
CDN for symmetric datalines & Resistor network (Surge 1.2/50 or 10/700 us)	SCHAFFNER	CDN 118 & INA172	SHEM224-6 & SHEM224-7	2022/8/02	2023/8/01

Surge at DC Power Port					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2021/12/20	2022/12/19
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2022/8/02	2023/8/01
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2022/8/02	2023/8/01
EFT & Surge Generator	PRIMA	PRM61045TB	SHEM200-1	2020/8/13	2023/8/12
CDN for EFT & Surge	PRIMA	PRM-CDN	SHEM200-2	2020/8/13	2023/8/12
CDN for unsymmetrical interconnection lines (1.2/50us)	SCHAFFNER	CDN 117	SHEM224-5	2022/8/02	2023/8/01

CDN for symmetric datalines & Resistor network (Surge 1.2/50 or 10/700 us)	SCHAFFNER	CDN 118 & INA172	SHEM224-6 & SHEM224-7	2022/8/02	2023/8/01

Conducted Immunity at AC Mains Power Port (150kHz-80MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Signal generator	Rohde & Schwarz	SMB100A	SHEM194-1	2021/12/20	2022/12/19
Power Amplifier	HAEFFLY	PAMP250	SHEM023-1	2021/12/20	2022/12/19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2021/12/20	2022/12/19
Coupling clamp	LUTHI	EM 101	SHEM027-1	2021/12/20	2022/12/19
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2022/8/02	2023/8/01
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2022/8/02	2023/8/01
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M1	SHEM023-5	2021/12/20	2022/12/19
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M2/M3	SHEM023-6	2021/12/20	2022/12/19
Shielding Room	ZHONGYU	5*3*3M	SHEM079-6	2021/12/20	2024/12/19
Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2022/8/02	2023/8/01
RF Generator	SCHAFFNER	NSG 2070	SHEM221-1	2022/8/02	2023/8/01
Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A

Conducted Immunity at DC Power Port (150kHz-80MHz)					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Signal generator	Rohde & Schwarz	SMB100A	SHEM194-1	2021/12/20	2022/12/19
Power Amplifier	HAEFFLY	PAMP250	SHEM023-1	2021/12/20	2022/12/19
6dB Attenuator	HUAXIANG	DTS50-6dB-1G-A	SHEM123-2	2021/12/20	2022/12/19
Coupling clamp	LUTHI	EM 101	SHEM027-1	2021/12/20	2022/12/19
Power Meter	Rohde & Schwarz	NRP	SHEM057-1	2022/8/02	2023/8/01
Power meter sensor	Rohde & Schwarz	NRP-Z91	SHEM057-2	2022/8/02	2023/8/01
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M1	SHEM023-5	2021/12/20	2022/12/19
Coupling and Decoupling Network (CDN)	LUTHI	L-801 M2/M3	SHEM023-6	2021/12/20	2022/12/19
Shielding Room	ZHONGYU	5*3*3M	SHEM079-6	2021/12/20	2024/12/19

Coupling and Decoupling Network	Teseq	CDN M016	SHEM168-1	2022/8/02	2023/8/01
RF Generator	SCHAFFNER	NSG 2070	SHEM221-1	2022/8/02	2023/8/01
Test Software	Rohde & Schwarz	EMC32	Version: 10.20.01	N/A	N/A

Power Frequency Magnetic Field					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Compliance Test System	AMETEK	PACS-1	SHEM024-2	2022/8/02	2023/8/01
AC Power Source 5KVA	AMETEK	5001iX	SHEM025-2	2022/8/02	2023/8/01
Current transformer for magnetic field coil	EM TEST	MC2630	SHEM026-7	2021/12/20	2022/12/19
Current transformer for magnetic field coil	EM TEST	MC26100	SHEM026-8	2021/12/20	2022/12/19
Magnetic field coil	EM TEST	MS100	SHEM026-9	2021/12/20	2022/12/19

Voltage Dips and Interruptions					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Immunity Test System	EMC PARTNER	TRA3000 F-S-D-V	SHEM163-1	2021/12/20	2022/12/19
Test Software	EMC-PARTNER	GENECS	Version: 3.29	N/A	N/A
Immunity Test System	TESEQ	NSG 3060	SHEM224-1	2022/8/02	2023/8/01
Coupling / Decoupling Network (CDN)	TESEQ	CDN 3061	SHEM224-3	2022/8/02	2023/8/01
Manual step transformer	TESEQ	INA 6501	SHEM224-4	2022/8/02	2023/8/01

General used equipment					
Equipment	**Manufacturer**	**Model No**	**Inventory No**	**Cal Date**	**Cal Due Date**
Digital pressure meter	YONGZHI	DYM3-01	SHEM082-1	2021-01-22	2024-01-21
Temperature&humidity recorder	ShangHai weather meter work	ZJ 1-2B	SHEM042-1~6	2021-09-07	2022-09-06
Digital Multimeter	FLUKE	17B	SHEM043-3	2021-09-04	2022-09-03
Autoformer regulator	Guangzhou bao de	TDGC2-5KVA	SHEM150-1	N/A	N/A
Multi-purpose tong tester	FLUKE	316	SHEM001-1	2021-12-20	2022-12-19

6 Emission Test Results

6.1 Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Test Requirement: EN IEC 61000-6-4: 2019
Test Method: CISPR 16-2-1

Limit:

0.15MHz -0.5MHz	79dB(μV) quasi-peak, 66dB(μV) average
0.5MHz -30MHz	73dB(μV) quasi-peak, 60dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 150kHz to 30MHz
NOTE 1:	The lower limit is applicable at the transition frequency.

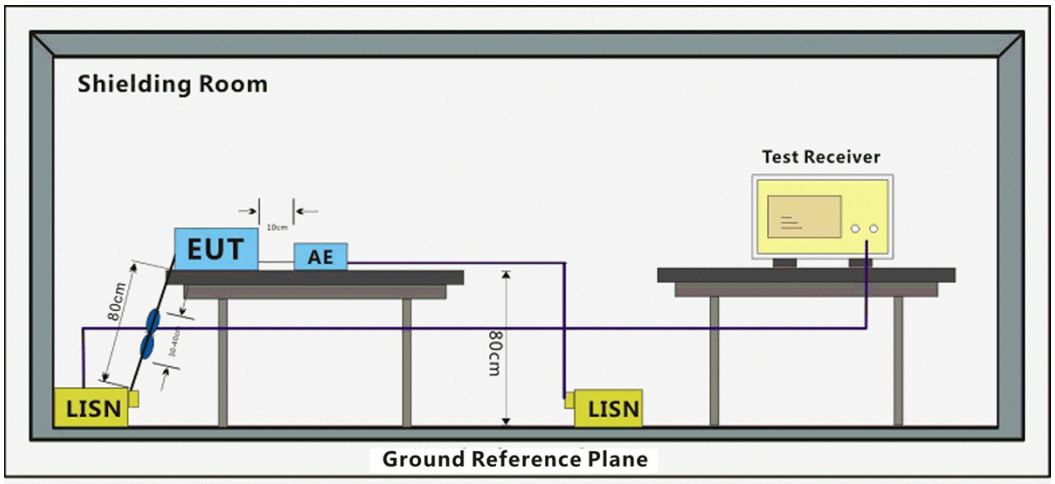
6.1.1 E.U.T. Operation

Operating Environment:
Temperature: 25.8 °C Humidity: 50.3 % RH Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

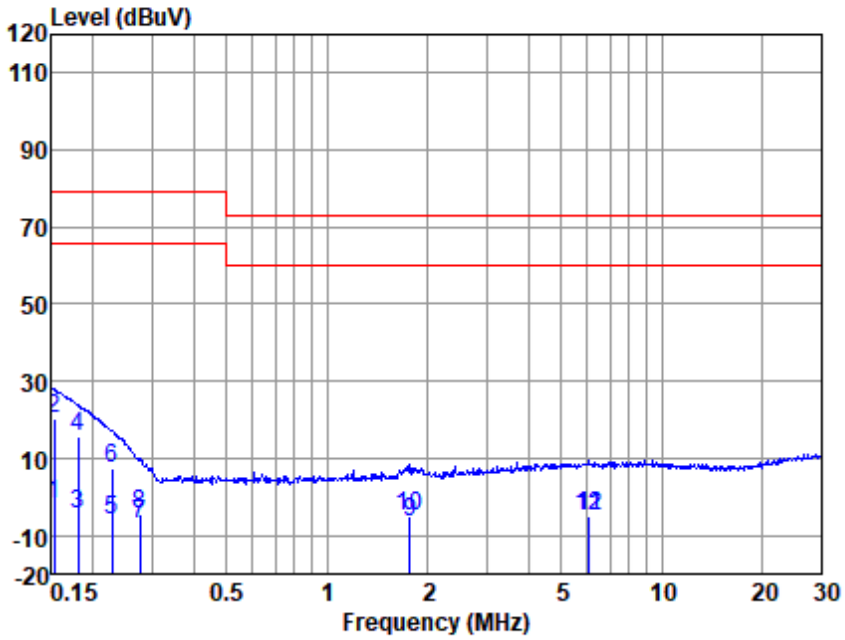
Frequency range: 150KHz-30MHz

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + LISN Factor

Test Mode: 02; Line: Live line

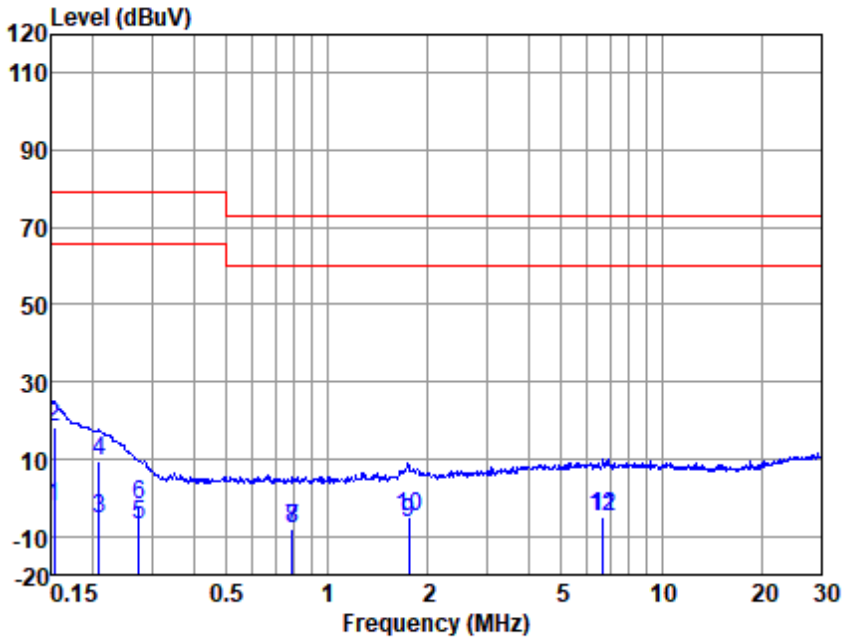


LISN : LINE
EUT/Project No : 06567TX
Test Mode : 02

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	-11.98	0.14	10.01	-1.83	66.00	-67.83	Average
2	0.15	10.33	0.14	10.01	20.48	79.00	-58.52	QP
3	0.18	-14.41	0.11	10.02	-4.28	66.00	-70.28	Average
4	0.18	5.27	0.11	10.02	15.40	79.00	-63.60	QP
5	0.23	-16.13	0.10	10.04	-5.99	66.00	-71.99	Average
6	0.23	-2.64	0.10	10.04	7.50	79.00	-71.50	QP
7	0.28	-17.48	0.10	10.05	-7.33	66.00	-73.33	Average
8	0.28	-14.74	0.10	10.05	-4.59	79.00	-83.59	QP
9	1.77	-16.61	0.10	10.16	-6.35	60.00	-66.35	Average
10	1.77	-15.53	0.10	10.16	-5.27	73.00	-78.27	QP
11	6.09	-15.42	0.20	10.26	-4.96	60.00	-64.96	Average
12	6.09	-15.69	0.20	10.26	-5.23	73.00	-78.23	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 02; Line: Neutral Line

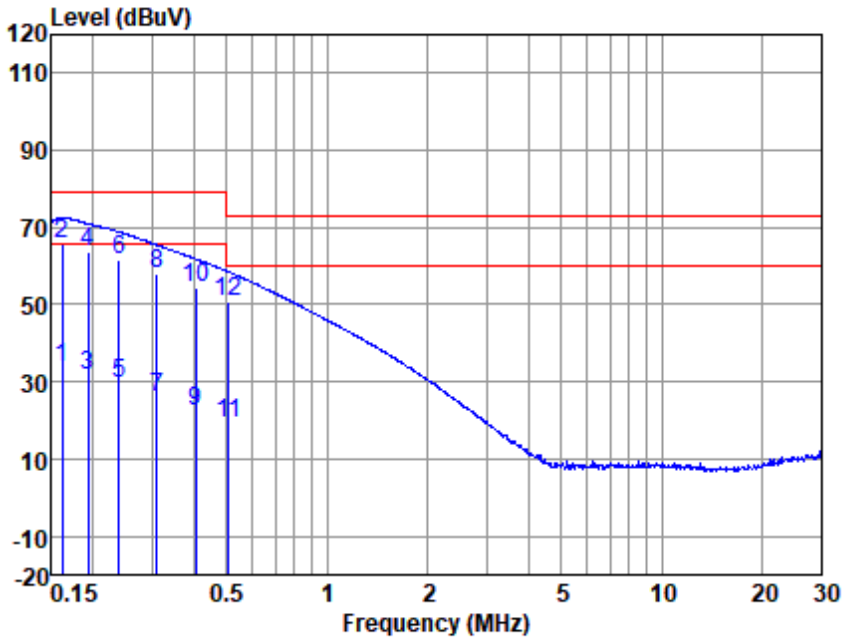


LISN : NEUTRAL
EUT/Project No : 06567TX
Test Mode : 02

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.15	-12.62	0.10	10.01	-2.51	66.00	-68.51	Average
2	0.15	8.04	0.10	10.01	18.15	79.00	-60.85	QP
3	0.21	-15.70	0.10	10.03	-5.57	66.00	-71.57	Average
4	0.21	-0.77	0.10	10.03	9.36	79.00	-69.64	QP
5	0.27	-17.20	0.10	10.05	-7.05	66.00	-73.05	Average
6	0.27	-11.99	0.10	10.05	-1.84	79.00	-80.84	QP
7	0.79	-18.12	0.10	10.09	-7.93	60.00	-67.93	Average
8	0.79	-18.28	0.10	10.09	-8.09	73.00	-81.09	QP
9	1.76	-16.68	0.10	10.16	-6.42	60.00	-66.42	Average
10	1.76	-15.23	0.10	10.16	-4.97	73.00	-77.97	QP
11	6.70	-15.61	0.19	10.27	-5.15	60.00	-65.15	Average
12	6.70	-15.45	0.19	10.27	-4.99	73.00	-77.99	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 03; Line: Live line

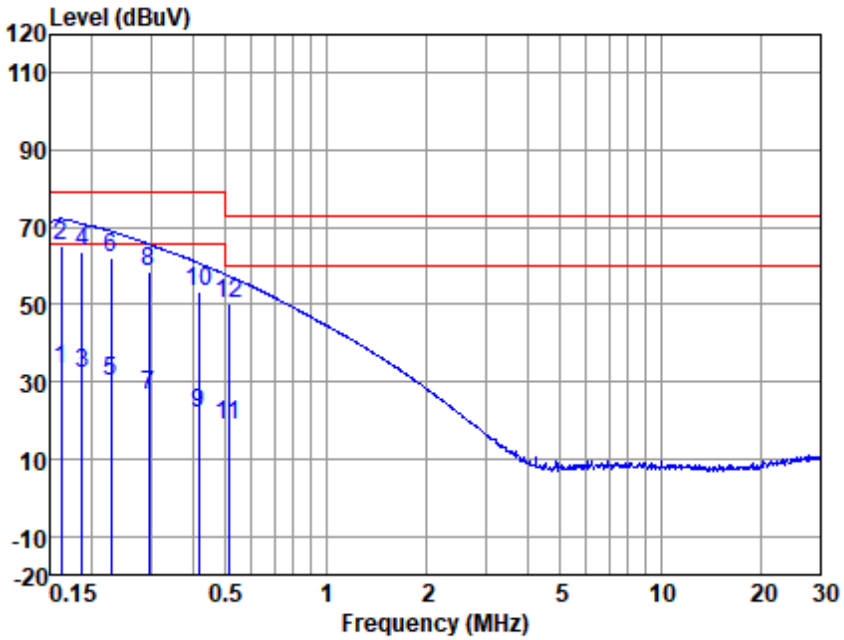


LISN : LINE
EUT/Project No : 06567TX
Test Mode : 03

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.16	23.52	0.13	10.02	33.67	66.00	-32.33	Average
2	0.16	55.36	0.13	10.02	65.51	79.00	-13.49	QP
3	0.19	21.72	0.10	10.03	31.85	66.00	-34.15	Average
4	0.19	53.57	0.10	10.03	63.70	79.00	-15.30	QP
5	0.24	19.53	0.10	10.04	29.67	66.00	-36.33	Average
6	0.24	51.38	0.10	10.04	61.52	79.00	-17.48	QP
7	0.31	16.07	0.10	10.05	26.22	66.00	-39.78	Average
8	0.31	47.89	0.10	10.05	58.04	79.00	-20.96	QP
9	0.41	12.41	0.10	10.07	22.58	66.00	-43.42	Average
10	0.41	44.18	0.10	10.07	54.35	79.00	-24.65	QP
11	0.51	9.09	0.10	10.08	19.27	60.00	-40.73	Average
12	0.51	40.66	0.10	10.08	50.84	73.00	-22.16	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 03; Line: Neutral Line



LISN : NEUTRAL
EUT/Project No : 06567TX
Test Mode : 03

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.16	23.30	0.10	10.02	33.42	66.00	-32.58	Average
2	0.16	55.12	0.10	10.02	65.24	79.00	-13.76	QP
3	0.19	21.80	0.10	10.02	31.92	66.00	-34.08	Average
4	0.19	53.69	0.10	10.02	63.81	79.00	-15.19	QP
5	0.23	19.90	0.10	10.04	30.04	66.00	-35.96	Average
6	0.23	51.77	0.10	10.04	61.91	79.00	-17.09	QP
7	0.30	16.44	0.10	10.05	26.59	66.00	-39.41	Average
8	0.30	48.23	0.10	10.05	58.38	79.00	-20.62	QP
9	0.42	11.69	0.10	10.07	21.86	66.00	-44.14	Average
10	0.42	43.41	0.10	10.07	53.58	79.00	-25.42	QP
11	0.51	8.58	0.10	10.08	18.76	60.00	-41.24	Average
12	0.51	40.20	0.10	10.08	50.38	73.00	-22.62	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

6.2 Conducted Emissions at DC Power Port (150kHz-30MHz)

Test Requirement: EN IEC 61000-6-4: 2019
Test Method: CISPR 16-2-1

Limit:

0.15MHz -0.5MHz	89dB(μV) quasi-peak, 76dB(μV) average
0.5MHz -30MHz	83dB(μV) quasi-peak, 70dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 150kHz to 30MHz
NOTE 1:	The lower limit is applicable at the transition frequency.

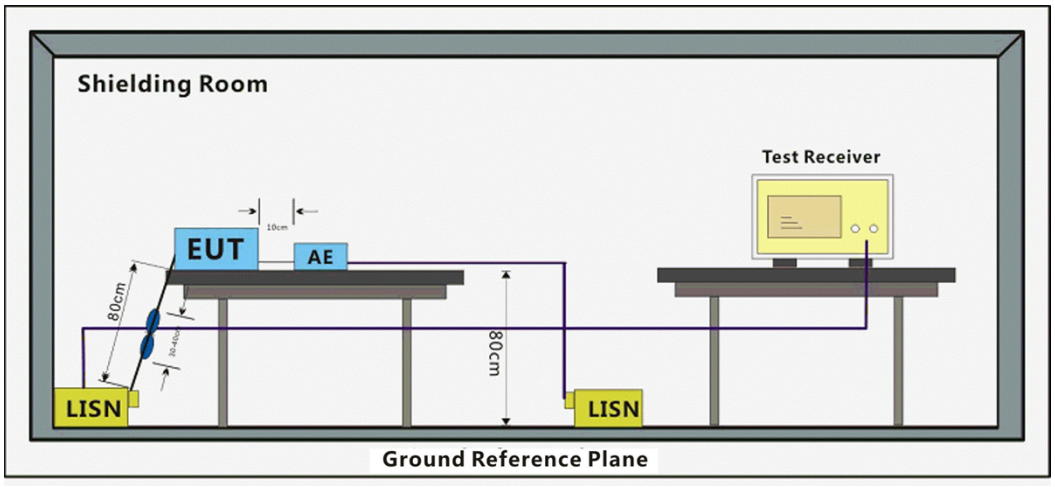
6.2.1 E.U.T. Operation

Operating Environment:
Temperature: 25.8 °C Humidity: 50.3 % RH Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

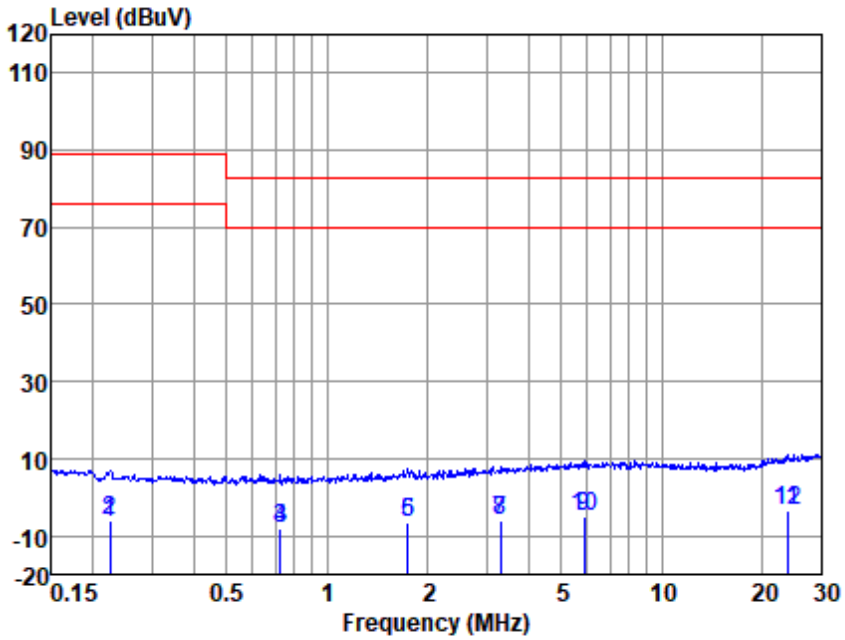
Frequency range: 150KHz-30MHz

An initial pre-scan was performed with peak detector.Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

The red line show in graphic is the limit in standard used in this section.

Measured Level = Read level + Cable Loss + LISN Factor

Test Mode: 00; Line: Live line

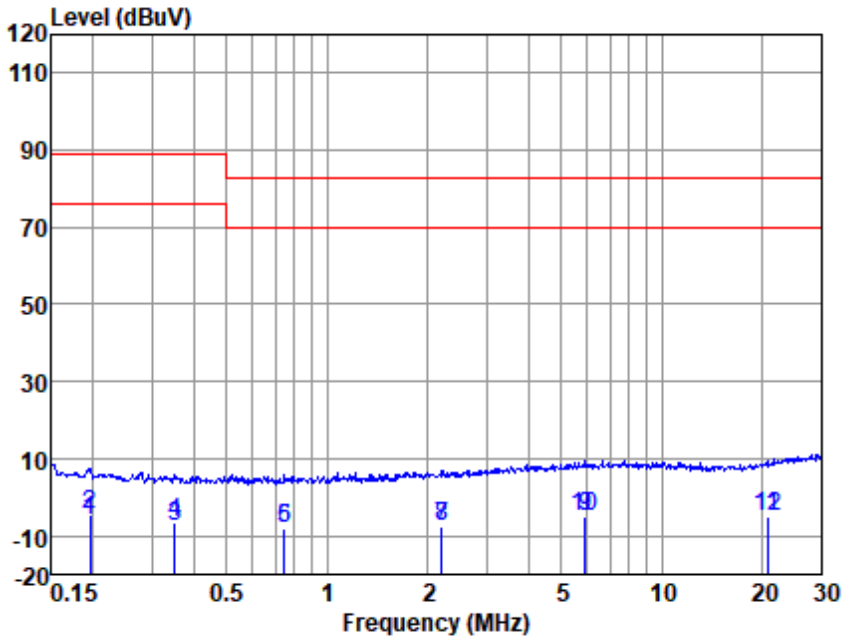


LISN : LINE
EUT/Project No : 06567TX
Test Mode : 00

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.22	-16.82	0.10	10.03	-6.69	76.00	-82.69	Average
2	0.22	-15.92	0.10	10.03	-5.79	89.00	-94.79	QP
3	0.73	-18.13	0.10	10.09	-7.94	70.00	-77.94	Average
4	0.73	-18.42	0.10	10.09	-8.23	83.00	-91.23	QP
5	1.74	-17.07	0.10	10.16	-6.81	70.00	-76.81	Average
6	1.74	-16.67	0.10	10.16	-6.41	83.00	-89.41	QP
7	3.29	-16.47	0.15	10.20	-6.12	70.00	-76.12	Average
8	3.29	-16.60	0.15	10.20	-6.25	83.00	-89.25	QP
9	5.87	-15.50	0.20	10.25	-5.05	70.00	-75.05	Average
10	5.87	-15.56	0.20	10.25	-5.11	83.00	-88.11	QP
11	23.76	-14.66	0.90	10.39	-3.37	70.00	-73.37	Average
12	23.76	-14.52	0.90	10.39	-3.23	83.00	-86.23	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 00; Line: Neutral Line

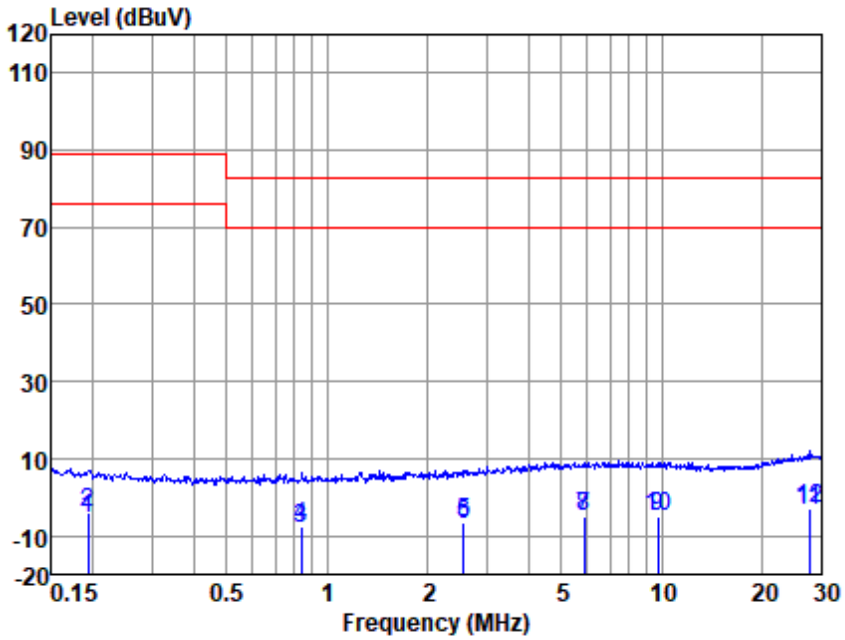


LISN : NEUTRAL
EUT/Project No : 06567TX
Test Mode : 00

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.20	-16.18	0.10	10.03	-6.05	76.00	-82.05	Average
2	0.20	-14.67	0.10	10.03	-4.54	89.00	-93.54	QP
3	0.35	-17.69	0.10	10.06	-7.53	76.00	-83.53	Average
4	0.35	-16.52	0.10	10.06	-6.36	89.00	-95.36	QP
5	0.75	-18.26	0.10	10.09	-8.07	70.00	-78.07	Average
6	0.75	-18.18	0.10	10.09	-7.99	83.00	-90.99	QP
7	2.20	-17.77	0.10	10.17	-7.50	70.00	-77.50	Average
8	2.20	-17.63	0.10	10.17	-7.36	83.00	-90.36	QP
9	5.93	-15.60	0.15	10.25	-5.20	70.00	-75.20	Average
10	5.93	-15.58	0.15	10.25	-5.18	83.00	-88.18	QP
11	20.70	-15.90	0.54	10.37	-4.99	70.00	-74.99	Average
12	20.70	-15.94	0.54	10.37	-5.03	83.00	-88.03	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 01; Line: Live line

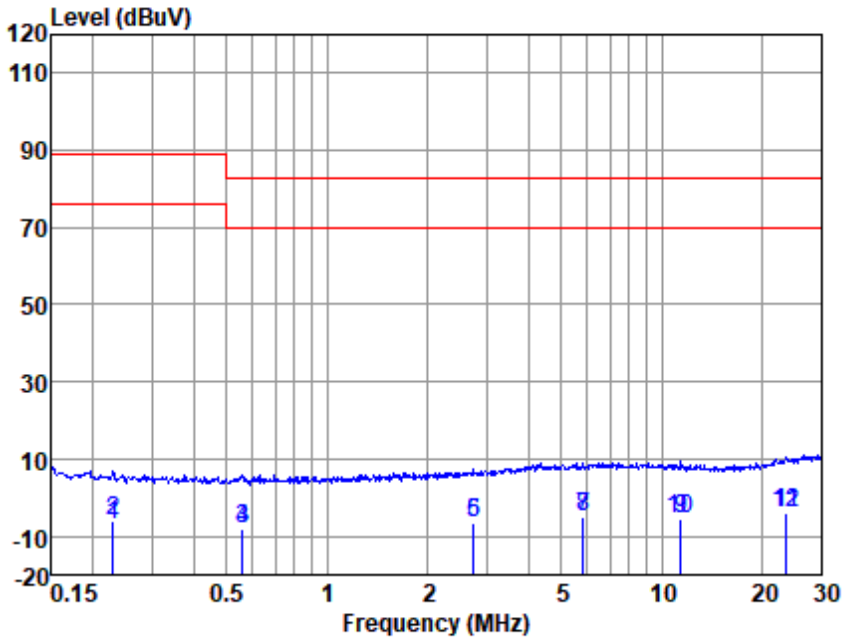


LISN : LINE
EUT/Project No : 06567TX
Test Mode : 01

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.19	-15.92	0.10	10.03	-5.79	76.00	-81.79	Average
2	0.19	-14.27	0.10	10.03	-4.14	89.00	-93.14	QP
3	0.84	-18.41	0.10	10.09	-8.22	70.00	-78.22	Average
4	0.84	-17.62	0.10	10.09	-7.43	83.00	-90.43	QP
5	2.55	-17.08	0.13	10.18	-6.77	70.00	-76.77	Average
6	2.55	-17.30	0.13	10.18	-6.99	83.00	-89.99	QP
7	5.87	-15.58	0.20	10.25	-5.13	70.00	-75.13	Average
8	5.87	-15.48	0.20	10.25	-5.03	83.00	-88.03	QP
9	9.76	-15.65	0.29	10.31	-5.05	70.00	-75.05	Average
10	9.76	-15.51	0.29	10.31	-4.91	83.00	-87.91	QP
11	27.71	-14.85	1.11	10.41	-3.33	70.00	-73.33	Average
12	27.71	-14.39	1.11	10.41	-2.87	83.00	-85.87	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

Test Mode: 01; Line: Neutral Line



LISN : NEUTRAL
EUT/Project No : 06567TX
Test Mode : 01

	Freq (MHz)	Read level (dBuV)	LISN Factor (dB)	Cable Loss (dB)	Emission Level (dBuV)	Limit (dBuV)	Over Limit (dB)	Remark
1	0.23	-17.26	0.10	10.04	-7.12	76.00	-83.12	Average
2	0.23	-16.05	0.10	10.04	-5.91	89.00	-94.91	QP
3	0.56	-18.13	0.10	10.09	-7.94	70.00	-77.94	Average
4	0.56	-18.20	0.10	10.09	-8.01	83.00	-91.01	QP
5	2.74	-17.02	0.10	10.19	-6.73	70.00	-76.73	Average
6	2.74	-17.09	0.10	10.19	-6.80	83.00	-89.80	QP
7	5.84	-15.67	0.15	10.25	-5.27	70.00	-75.27	Average
8	5.84	-15.58	0.15	10.25	-5.18	83.00	-88.18	QP
9	11.44	-16.08	0.26	10.32	-5.50	70.00	-75.50	Average
10	11.44	-15.87	0.26	10.32	-5.29	83.00	-88.29	QP
11	23.64	-15.15	0.73	10.39	-4.03	70.00	-74.03	Average
12	23.64	-14.98	0.73	10.39	-3.86	83.00	-86.86	QP

Notes: Emission Level = Read Level +LISN Factor + Cable loss

6.3 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN IEC 61000-6-4: 2019
Test Method: CISPR 16-2-3

Limit:

Test Distance:	10m
30MHz-230MHz	40 dB(μV/m) quasi-peak
230MHz-1GHz	47 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz
Test Distance:	3m
30MHz-230MHz	50 dB(μV/m) quasi-peak
230MHz-1GHz	57 dB(μV/m) quasi-peak
Detector:	Peak for pre-scan (120kHz resolution bandwidth) 30M to 1000MHz

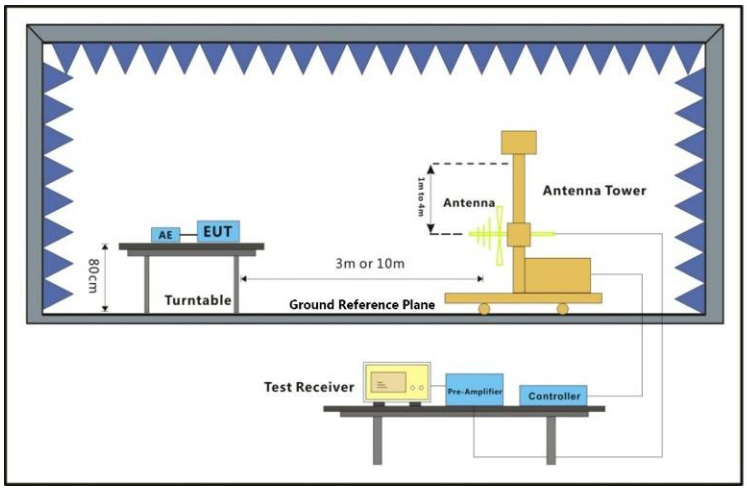
6.3.1 E.U.T. Operation

Operating Environment:
Temperature: 25.3 °C Humidity: 61.1 % RH Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

6.3.3 Test Setup Diagram



6.3.4 Measurement Procedure and Data

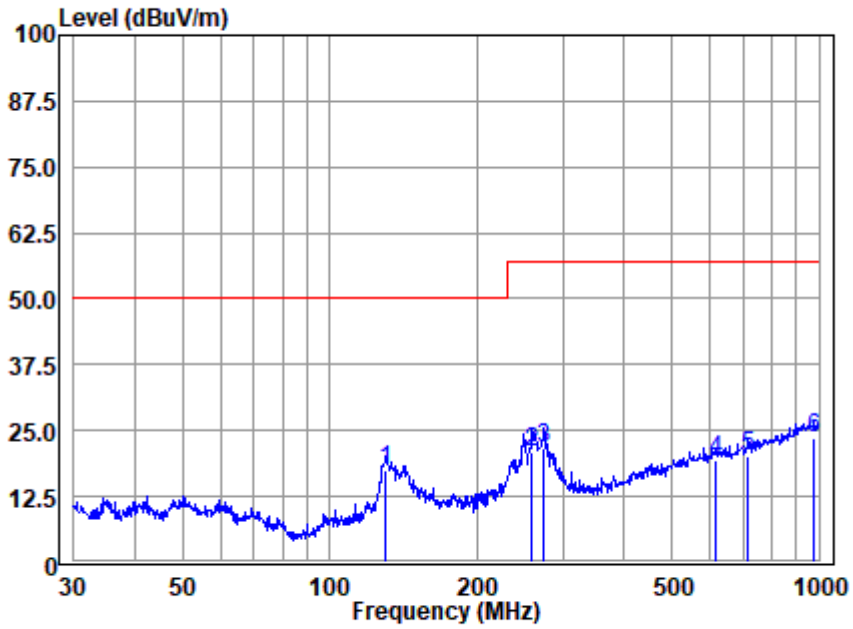
Frequency range: 30MHz-1GHz

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by broadband antenna with 2 orthogonal polarities.

The red line show in graphic is the limit in standard used in this section.

Level=Read Level + Antenna Factor + Cable Loss - Preamp Factor

Test Mode: 00; Polarity: Horizontal

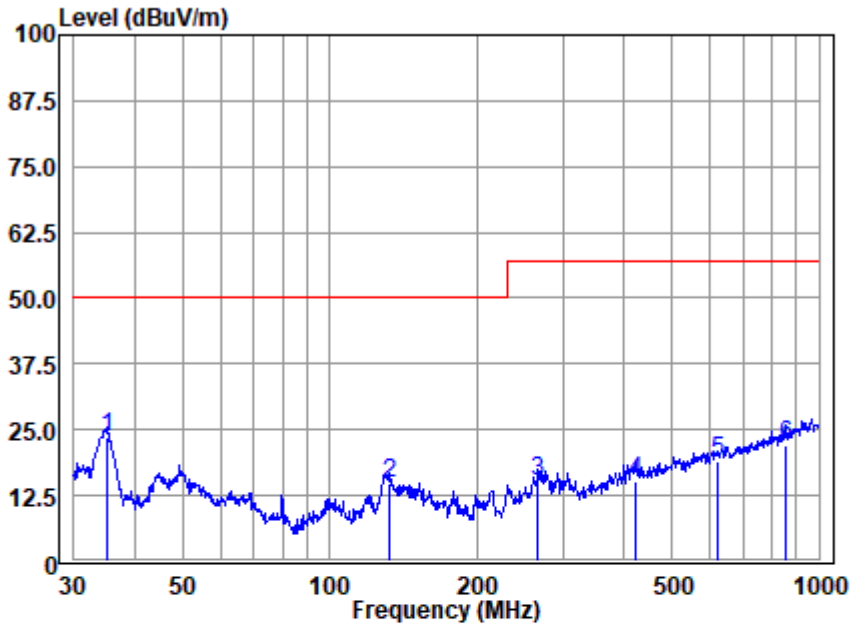


Antenna Polarity :Horizontal
EUT/Project :06567TX
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	130.38	34.59	12.00	2.63	31.90	17.32	50.00	-32.68	QP
2	259.23	37.49	12.05	4.09	32.58	21.05	57.00	-35.95	QP
3	274.19	37.40	12.77	4.20	32.87	21.50	57.00	-35.50	QP
4	616.37	25.19	20.23	6.31	32.35	19.38	57.00	-37.62	QP
5	716.68	23.51	21.34	6.62	31.18	20.29	57.00	-36.71	QP
6	979.18	21.80	23.85	7.84	29.80	23.69	57.00	-33.31	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 00; Polarity: Vertical

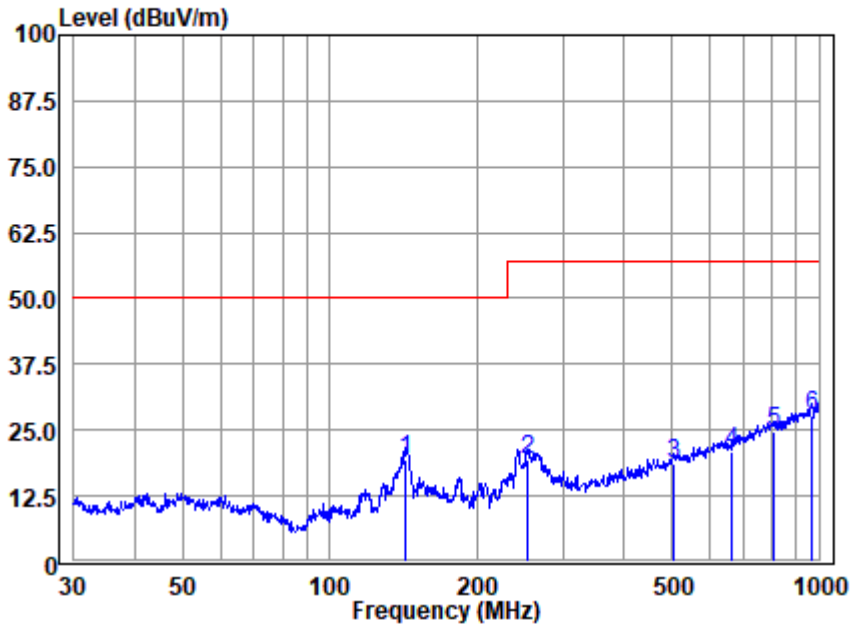


Antenna Polarity :Vertical
EUT/Project :06567TX
Test mode :00

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	35.00	41.09	12.50	1.51	31.70	23.40	50.00	-26.60	QP
2	132.22	31.76	12.17	2.66	31.90	14.69	50.00	-35.31	QP
3	265.68	31.60	12.35	4.15	32.78	15.32	57.00	-41.68	QP
4	422.06	27.34	16.25	5.17	33.59	15.17	57.00	-41.83	QP
5	618.54	24.65	20.28	6.31	32.30	18.94	57.00	-38.06	QP
6	857.02	22.04	22.88	7.31	30.20	22.03	57.00	-34.97	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Horizontal

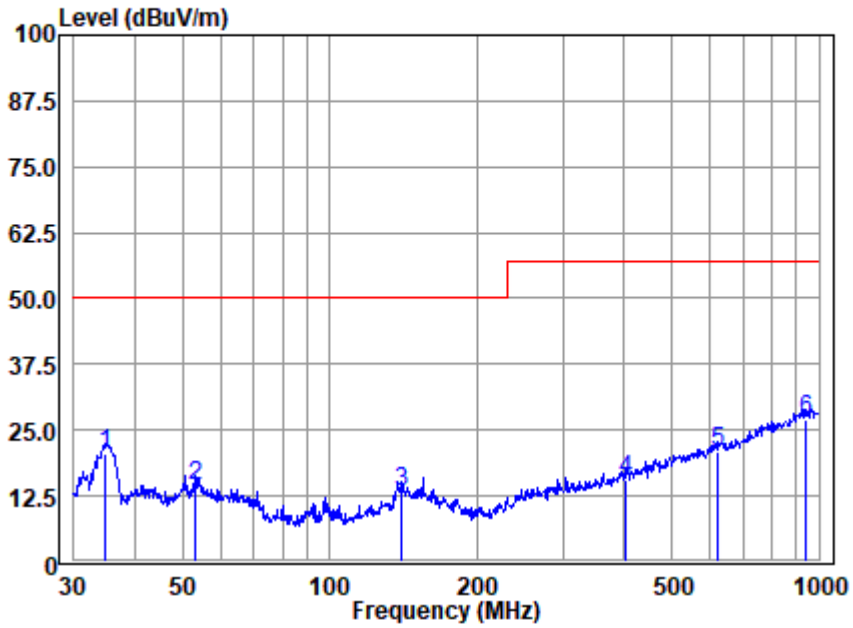


Antenna Polarity :Horizontal
EUT/Project :06567TX
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	143.33	35.48	13.08	2.87	31.91	19.52	50.00	-30.48	QP
2	253.84	35.83	11.93	3.99	32.45	19.30	57.00	-37.70	QP
3	506.48	28.52	17.96	5.64	33.54	18.58	57.00	-38.42	QP
4	663.47	25.82	20.57	6.51	31.91	20.99	57.00	-36.01	QP
5	810.27	25.36	22.43	7.09	30.11	24.77	57.00	-32.23	QP
6	965.54	26.08	23.78	7.78	29.73	27.91	57.00	-29.09	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 01; Polarity: Vertical

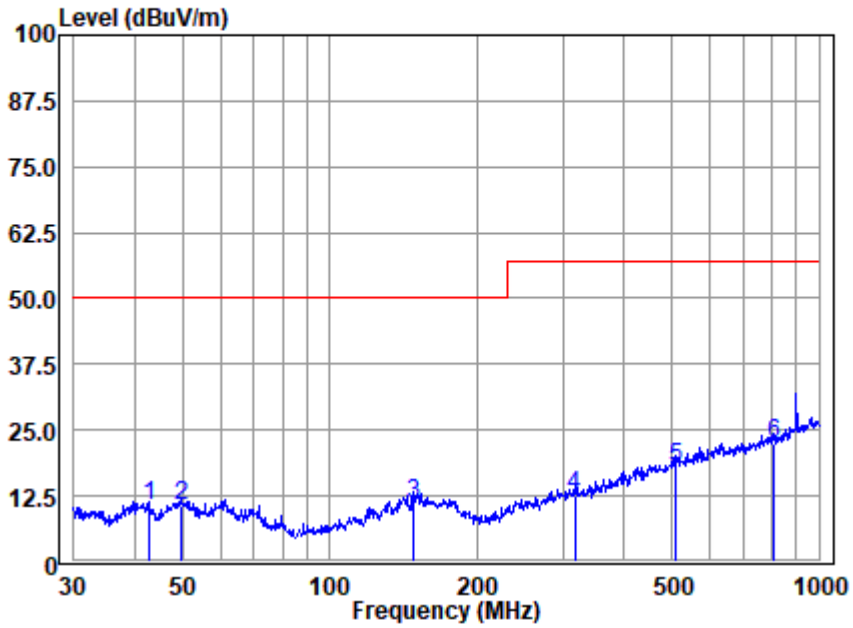


Antenna Polarity :Vertical
EUT/Project :06567TX
Test mode :01

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	34.88	38.13	12.48	1.51	31.70	20.42	50.00	-29.58	QP
2	53.13	30.95	13.65	1.75	32.00	14.35	50.00	-35.65	QP
3	139.85	29.54	12.88	2.82	31.90	13.34	50.00	-36.66	QP
4	403.25	28.40	15.67	5.04	33.35	15.76	57.00	-41.24	QP
5	620.71	26.65	20.34	6.31	32.32	20.98	57.00	-36.02	QP
6	938.83	25.34	23.75	7.69	29.74	27.04	57.00	-29.96	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 02; Polarity: Horizontal

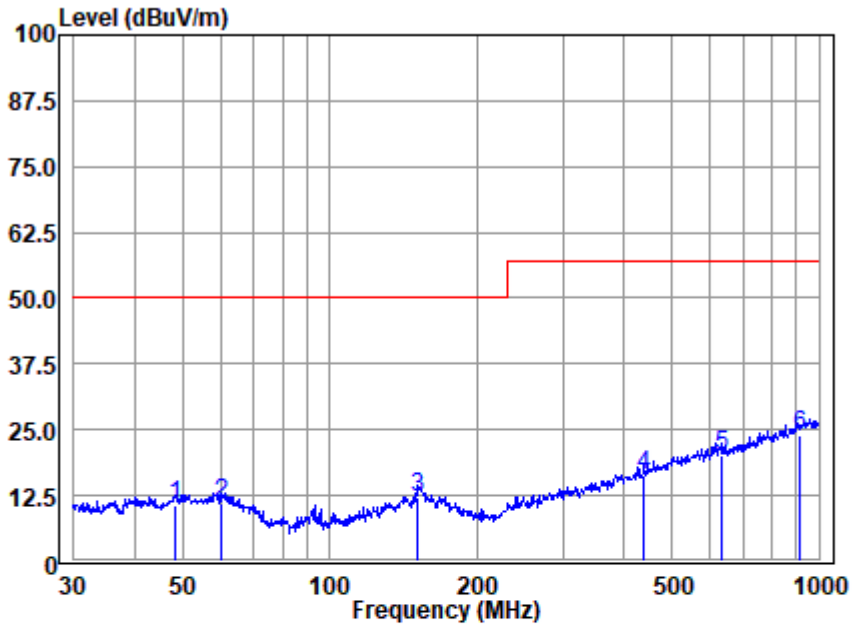


Antenna Polarity :Horizontal
EUT/Project :06567TX
Test mode :02

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	42.90	26.96	13.65	1.69	31.83	10.47	50.00	-39.53	QP
2	49.88	27.20	13.82	1.67	32.00	10.69	50.00	-39.31	QP
3	148.96	26.85	13.41	2.95	32.07	11.14	50.00	-38.86	QP
4	316.59	27.20	13.97	4.59	33.02	12.74	57.00	-44.26	QP
5	508.26	27.83	17.99	5.66	33.50	17.98	57.00	-39.02	QP
6	807.43	22.87	22.43	7.07	30.10	22.27	57.00	-34.73	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 02; Polarity: Vertical

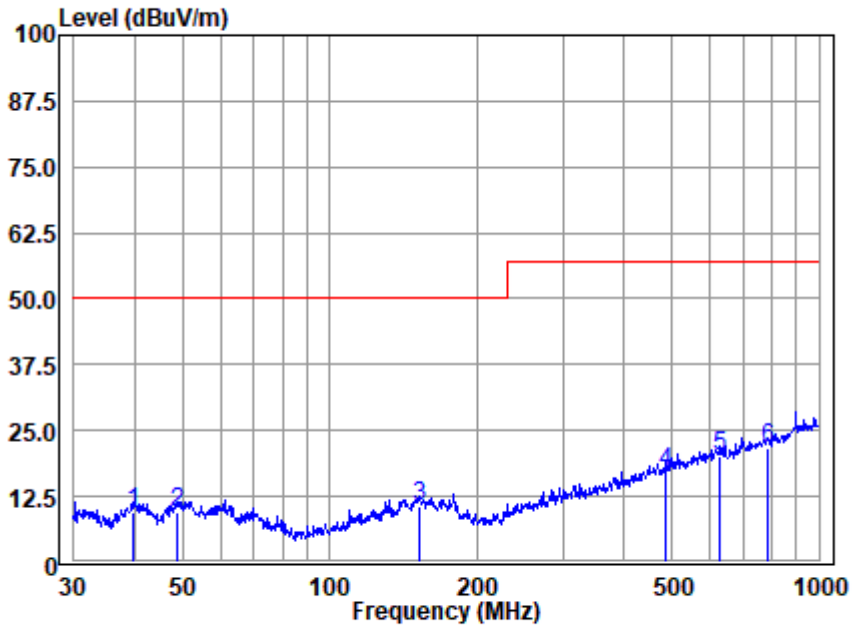


Antenna Polarity :Vertical
EUT/Project :06567TX
Test mode :02

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	48.33	26.95	13.99	1.64	31.98	10.60	50.00	-39.40	QP
2	59.86	28.05	13.13	1.90	31.98	11.10	50.00	-38.90	QP
3	151.07	27.94	13.46	2.98	32.11	12.27	50.00	-37.73	QP
4	438.66	28.19	16.87	5.20	33.99	16.27	57.00	-40.73	QP
5	633.91	25.72	20.66	6.31	32.40	20.29	57.00	-36.71	QP
6	916.07	22.56	23.75	7.57	29.79	24.09	57.00	-32.91	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 03; Polarity: Horizontal

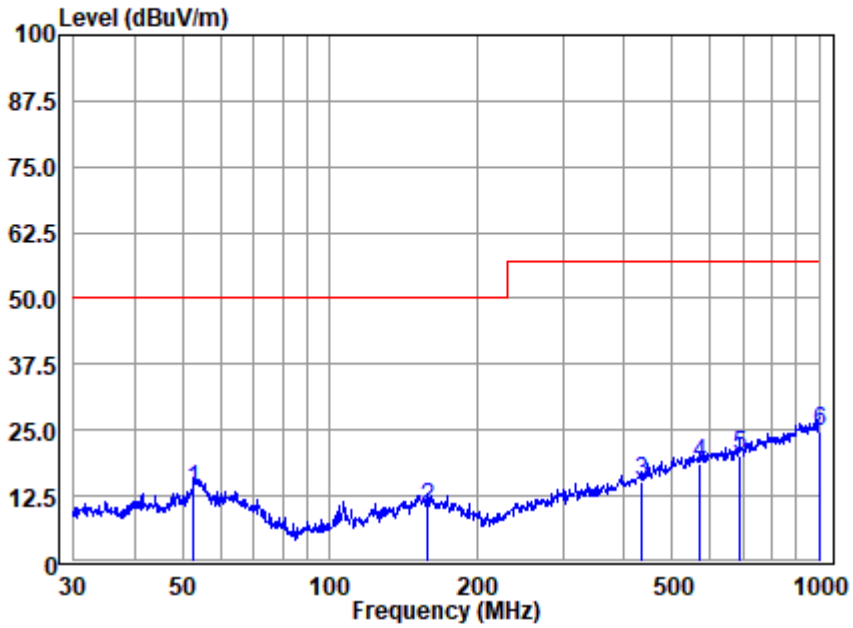


Antenna Polarity :Horizontal
EUT/Project :06567TX
Test mode :03

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	39.71	26.29	13.16	1.69	31.80	9.34	50.00	-40.66	QP
2	48.67	25.82	13.96	1.63	31.99	9.42	50.00	-40.58	QP
3	153.20	26.31	13.44	3.01	32.14	10.62	50.00	-39.38	QP
4	487.32	27.81	17.65	5.54	34.02	16.98	57.00	-40.02	QP
5	629.48	25.48	20.60	6.29	32.38	19.99	57.00	-37.01	QP
6	787.85	22.37	22.41	6.95	30.01	21.72	57.00	-35.28	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

Test Mode: 03; Polarity: Vertical



Antenna Polarity :Vertical
EUT/Project :06567TX
Test mode :03

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Emission Level	Limit Line	Over Limit	Remark
	MHz	dBuv	dB/m	dB	dB	dBuv/m	dBuv/m	dB	
1	52.76	30.35	13.68	1.75	32.00	13.78	50.00	-36.22	QP
2	158.67	25.83	13.39	3.08	32.21	10.09	50.00	-39.91	QP
3	432.55	27.14	16.66	5.21	33.84	15.17	57.00	-41.83	QP
4	572.61	26.95	19.09	6.02	33.29	18.77	57.00	-38.23	QP
5	689.56	23.93	20.79	6.65	31.20	20.17	57.00	-36.83	QP
6	1000.00	22.79	24.10	7.82	29.90	24.81	57.00	-32.19	QP

Note: Emission Level=Read Level+Antenna Factor+Cable loss-Preamp Factor

7 Immunity Test Results

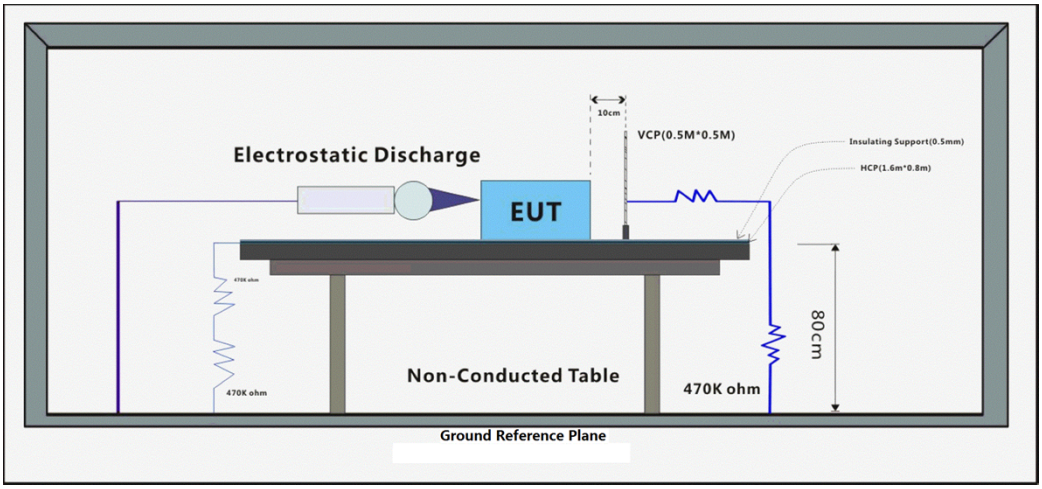
Performance Criteria Description in EN IEC 61000-6-2:2019

Criterion A	The EUT 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 EUT is used as intended. If the performance level is not specified by the manufacturer, this may be derived from the product description and documentation and what the user may reasonably expect from the equipment if used as intended.
Criterion B	The EUT 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 EUT is used as intended. The performance level may be replaced by a permissible loss of performance. However, during the test degradation of performance is allowed but 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 equipment if used as intended.
Criterion C	Temporary loss of function is allowed during the test, provided the function is self-recoverable or can be restored by the operation of the controls.

7.1 Electrostatic Discharge

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-2:2009

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.1.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.1.4 Test Condition and Results:

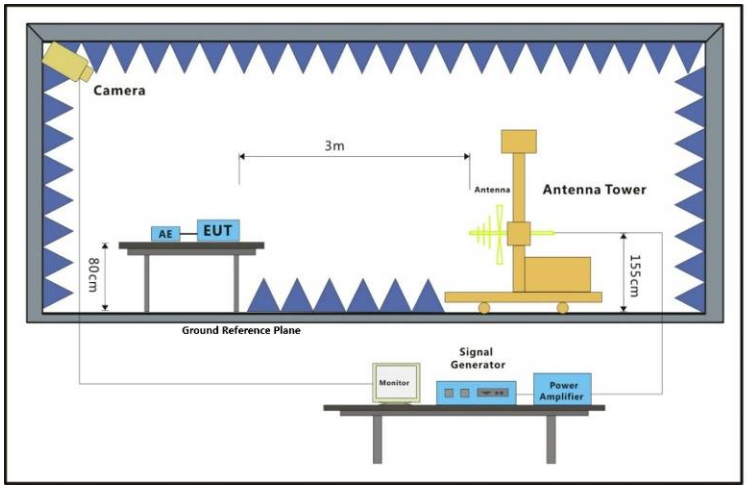
Performance Criterion: B
Discharge Impedance: 330 Ω/150pF
Number of Discharge: Minimum 10 times at each test point
Discharge Mode: Single Discharge
Discharge Period: 1 second minimum
Test Point 1: All insulated enclosure & seams.
Test Point 2: All accessible metal parts of the enclosure.
Test Point 3: All sides.

Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	4	+	2	A
Contact Discharge	4	-	2	A
Horizontal Coupling	4	+	3	A
Horizontal Coupling	4	-	3	A
Vertical Coupling	4	+	3	A
Vertical Coupling	4	-	3	A
A: No degradation in the performance of the EUT was observed				

7.2 Radiated Immunity (80MHz to 1GHz, 1.4GHz to 6GHz)

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN IEC 61000-4-3: 2020

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.2.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.2.4 Test Condition and Results:

Performance Criterion: A

Antenna Polarisation: Vertical and Horizontal

Modulation: 1kHz,80% Amp. Mod,1% increment

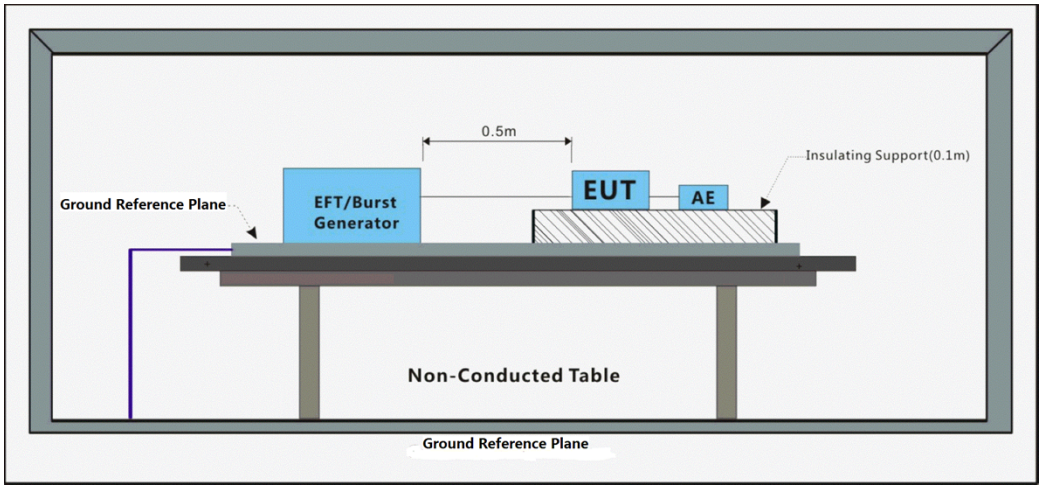
Frequency Range: 80MHz to 1GHz, 1.4GHz to 6GHz

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	10	Front	3s	A
80MHz-1GHz	10	Back	3s	A
80MHz-1GHz	10	Left	3s	A
80MHz-1GHz	10	Right	3s	A
80MHz-1GHz	10	Top	3s	A
80MHz-1GHz	10	Underside	3s	A
1.4GHz-6GHz	3	Front	3s	A
1.4GHz-6GHz	3	Back	3s	A
1.4GHz-6GHz	3	Left	3s	A
1.4GHz-6GHz	3	Right	3s	A
1.4GHz-6GHz	3	Top	3s	A
1.4GHz-6GHz	3	Underside	3s	A
A: No degradation in the performance of the EUT was observed				

7.3 Electrical Fast Transients Burst at AC Mains Power Port

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-4:2012

7.3.1 Test Setup Diagram



7.3.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.3.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.3.4 Test Condition and Results:

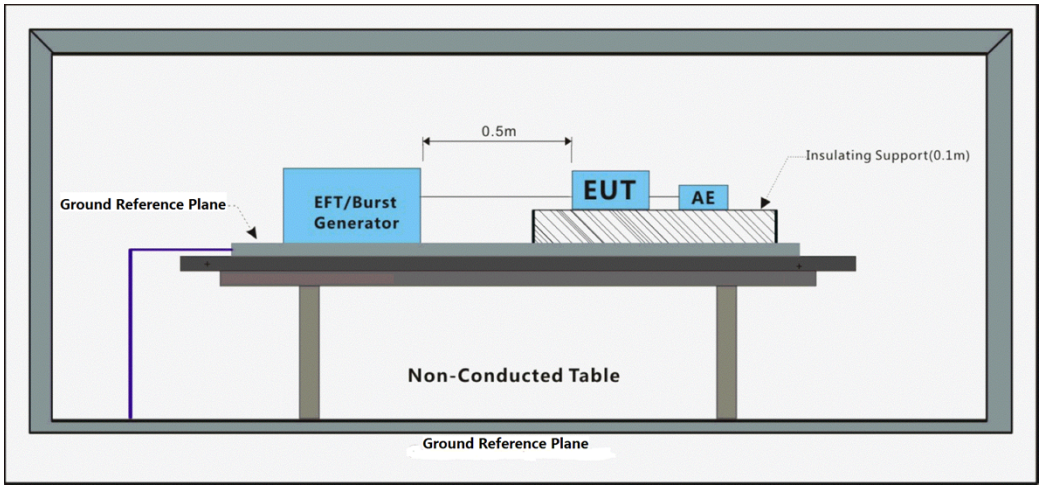
Performance Criterion: B
Repetition Frequency: 5kHz or 100kHz
Burst Period: 300ms
Test Duration: 2 minute per level & polarity

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC mains power port	2	+	CDN	A
AC mains power port	2	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.4 Electrical Fast Transients Burst at DC Power Port

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-4:2012

7.4.1 Test Setup Diagram



7.4.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.4.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.

7.4.4 Test Condition and Results:

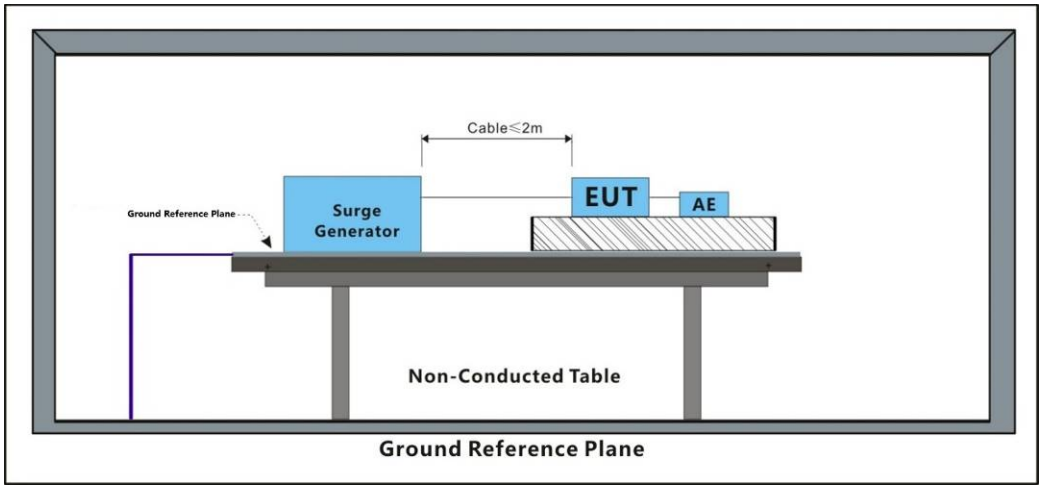
Performance Criterion: B
Repetition Frequency: 5kHz or 100kHz
Burst Period: 300ms
Test Duration: 2 minute per level & polarity

Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
DC Port	1	+	CDN	A
DC Port	1	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.5 Surge at AC Mains Power Port

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-5:2014+A1:2017

7.5.1 Test Setup Diagram



7.5.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.5.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.5.4 Test Condition and Results:

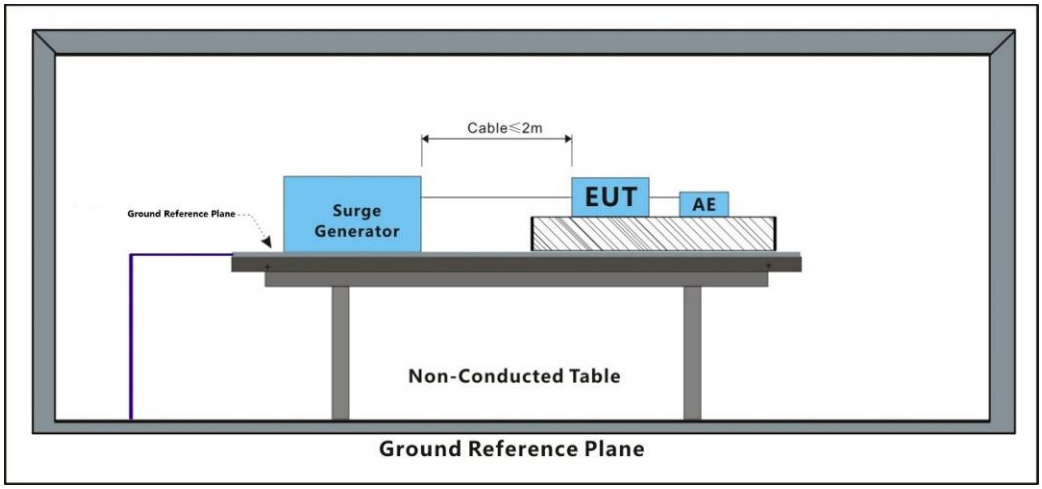
Performance Criterion: B
Interval: 60s between each surge
Generator source impedance: 2Ω
CDN coupling impedance(Line-to-ground):10Ω
No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	0°	A
L-N	1	-	0°	A
L-N	1	+	90°	A
L-N	1	-	90°	A
L-N	1	+	180°	A
L-N	1	-	180°	A
L-N	1	+	270°	A
L-N	1	-	270°	A
A: No degradation in the performance of the EUT was observed				

7.6 Surge at DC Power Port

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-5:2014+A1:2017

7.6.1 Test Setup Diagram



7.6.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.6.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.

7.6.4 Test Condition and Results:

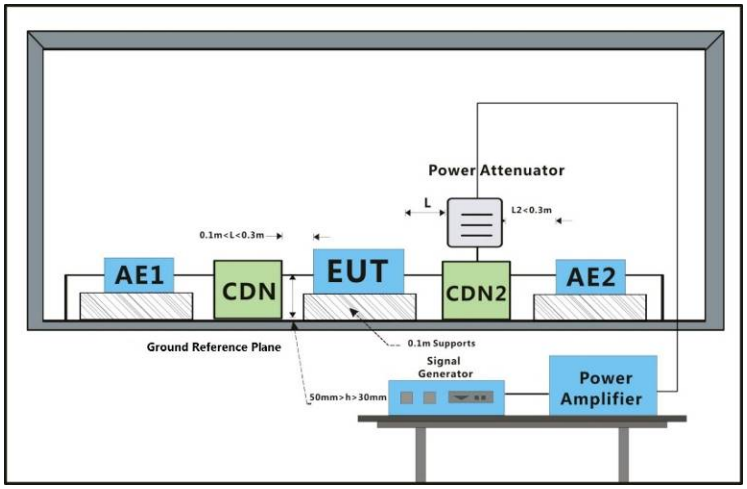
Performance Criterion: B
Interval: 60s between each surge
Generator source impedance: 2Ω
CDN coupling impedance(Line-to-ground):10Ω
No. of surges: 5 positive, 5 negative at 0°, 90°, 180°, 270°.

Test Line	Level (kV)	Polarity	Result / Observations
P-N	0.5	+	A
P-N	0.5	-	A
P-G	1	+	A
P-G	1	-	A
N-G	1	+	A
N-G	1	-	A
A: No degradation in the performance of the EUT was observed			

7.7 Conducted Immunity at AC Mains Power Port (150kHz-80MHz)

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-6:2014

7.7.1 Test Setup Diagram



7.7.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

7.7.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.7.4 Test Condition and Results:

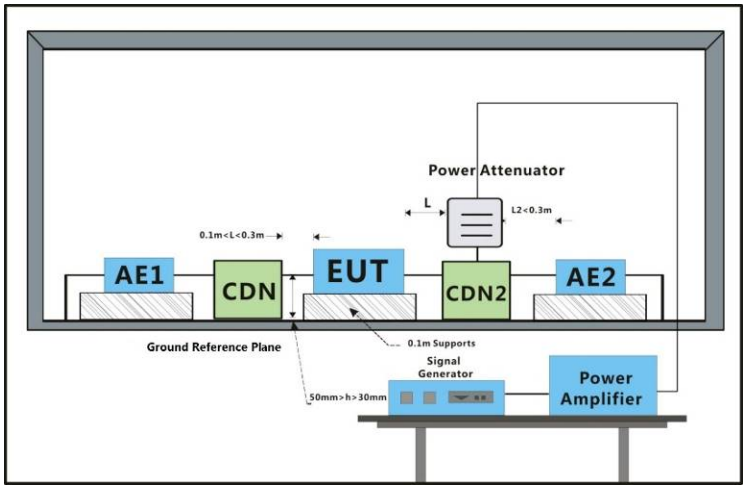
Performance Criterion: A
Frequency Range: 0.15MHz to 80MHz
Modulation: 80%, 1kHz Amplitude Modulation
Step Size 1%

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	10	CDN	3s	A
A: No degradation in the performance of the EUT was observed				

7.8 Conducted Immunity at DC Power Port (150kHz-80MHz)

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-6:2014

7.8.1 Test Setup Diagram



7.8.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1020 mbar

7.8.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.

7.8.4 Test Condition and Results:

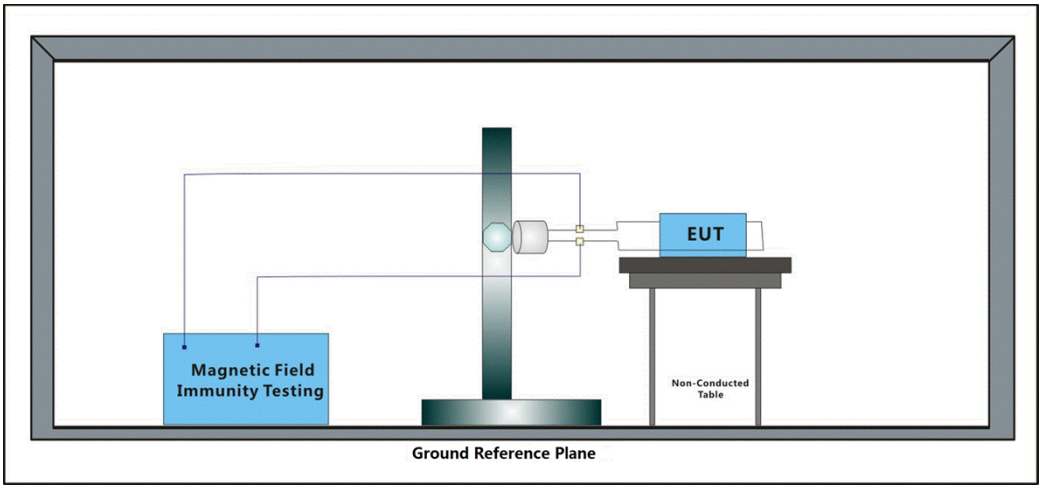
Performance Criterion: A
Frequency Range: 0.15MHz to 80MHz
Modulation: 80%, 1kHz Amplitude Modulation
Step Size 1%

Port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
DC Port	10V	CDN	3s	A
A: No degradation in the performance of the EUT was observed				

7.9 Power Frequency Magnetic Field

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN 61000-4-8:2010

7.9.1 Test Setup Diagram



7.9.2 E.U.T. Operation

Operating Environment:
Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.9.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep 6V110 (DC 24V) working normally by DC 24V support.
Final test	01	Keep 6V110 (DC 12V) working normally by DC 12V support.
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.9.4 Test Condition and Results:

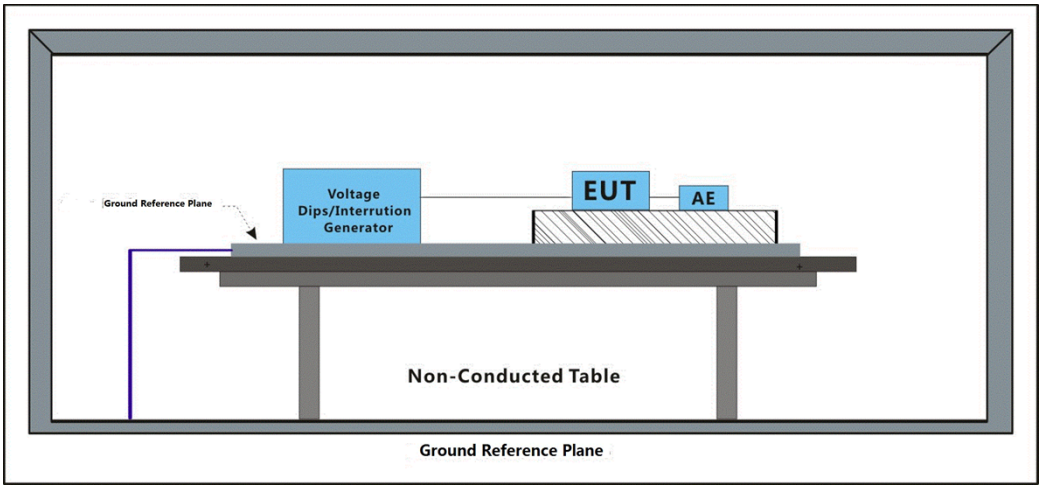
Performance Criterion:A

Frequency	Level (A/m)	Axial	Magnetic Field Type	Result / Observations
50 Hz	30	X	Continue	A
50 Hz	30	Y	Continue	A
50 Hz	30	Z	Continue	A
A: No degradation in the performance of the EUT was observed				

7.10 Voltage Dips and Interruptions

Test Requirement: EN IEC 61000-6-2: 2019
Test Method: EN IEC 61000-4-11:2020

7.10.1 Test Setup Diagram



7.10.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C Humidity: 50 % RH Atmospheric Pressure: 1010 mbar

7.10.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	Keep 6V110 (AC 220V) working normally by AC 220V support.
Final test	03	Keep 6V110 (AC 110V) working normally by AC 110V support.

7.10.4 Test Condition and Results:

Performance Criterion: 0% of UT (Supply Voltage) for 0.5 Cycle:B; 0% of UT for 1 Cycle:B; 0% of UT for 250 Cycles:C; 70% of UT for 25 Cycles:C;

No. of Dips / Interruptions: 3 per Level

Time between dropout 10s

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
0	0°	1 Cycles	3	A
0	180°	1 Cycles	3	A
40	0°	10 Cycles	3	A
40	180°	10 Cycles	3	A
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A
0	0°	250 Cycles	3	B
0	180°	250 Cycles	3	B
A: No degradation in the performance of the EUT was observed. B: During test, EUT stop work. After test, the EUT restarted automatically.				

8 Test Setup Photo

Conducted Emissions at AC Mains Power Port (150kHz-30MHz)

Conducted Emissions at DC Power Port (150kHz-30MHz)

Radiated Emissions (30MHz-1GHz)

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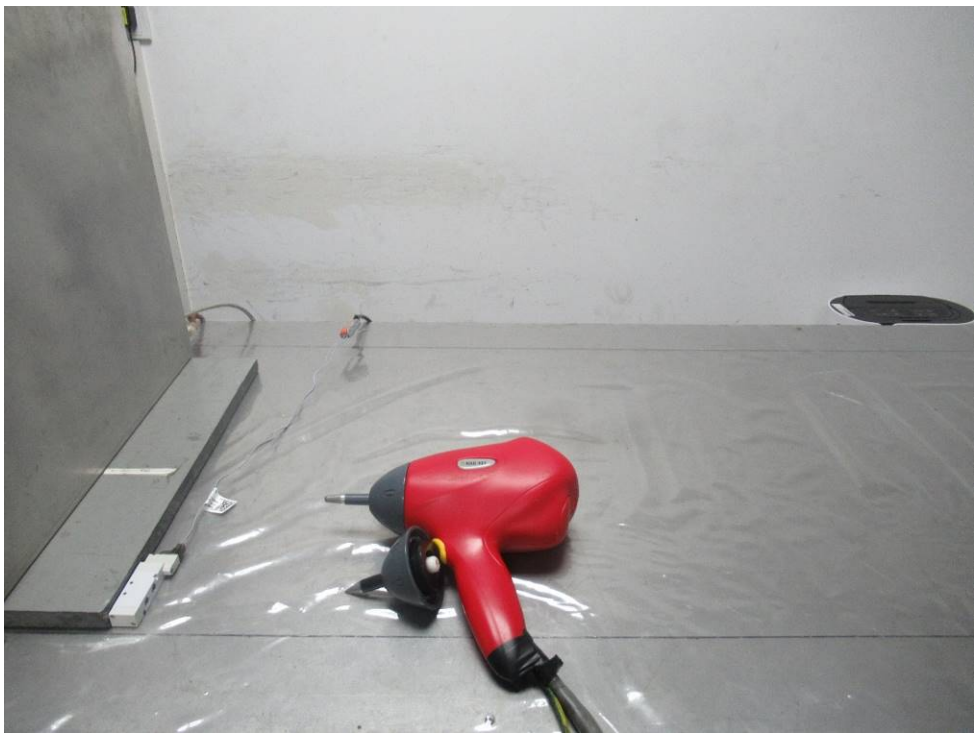
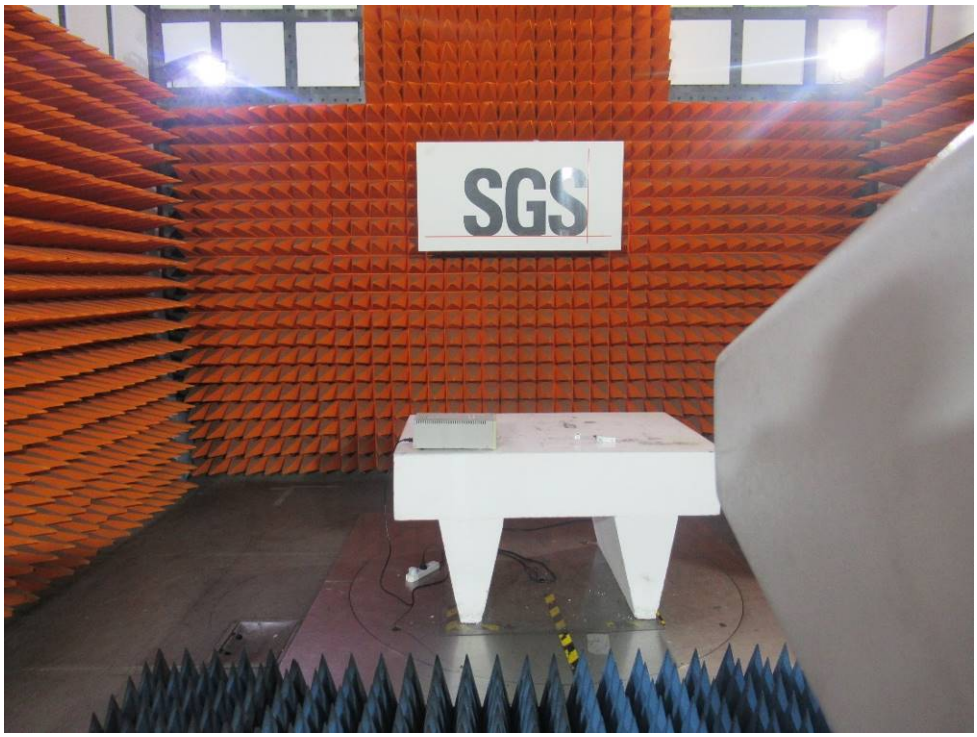
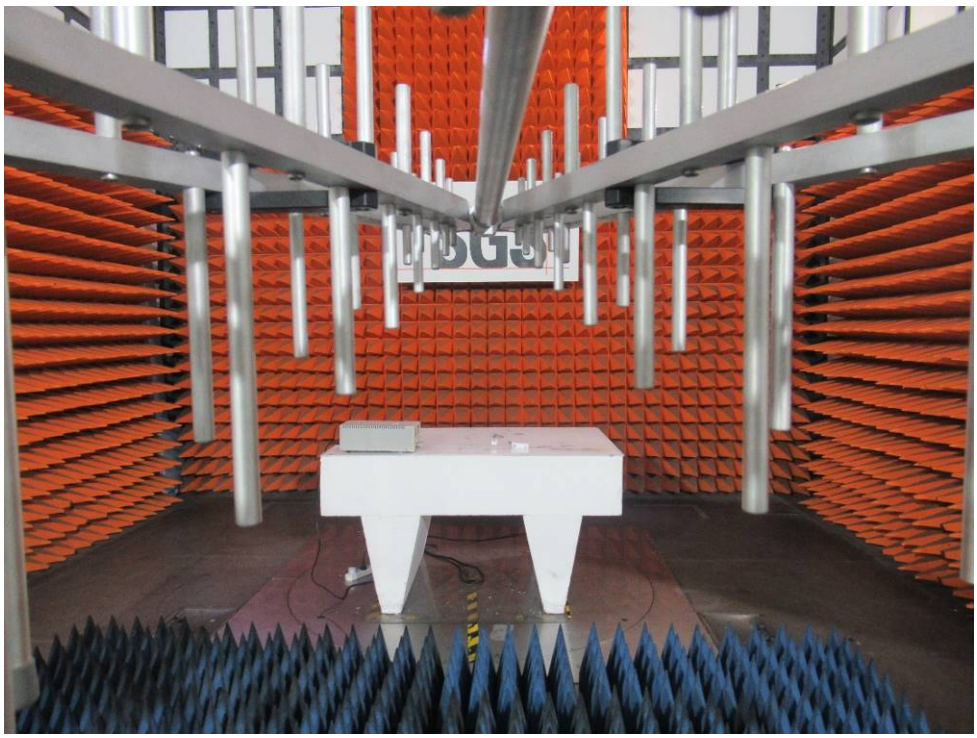
中国・上海・松江区金都西路588号 邮编: 201612 t (86-21) 61915666 f (86-21) 61915678 sgs.china@sgs.com

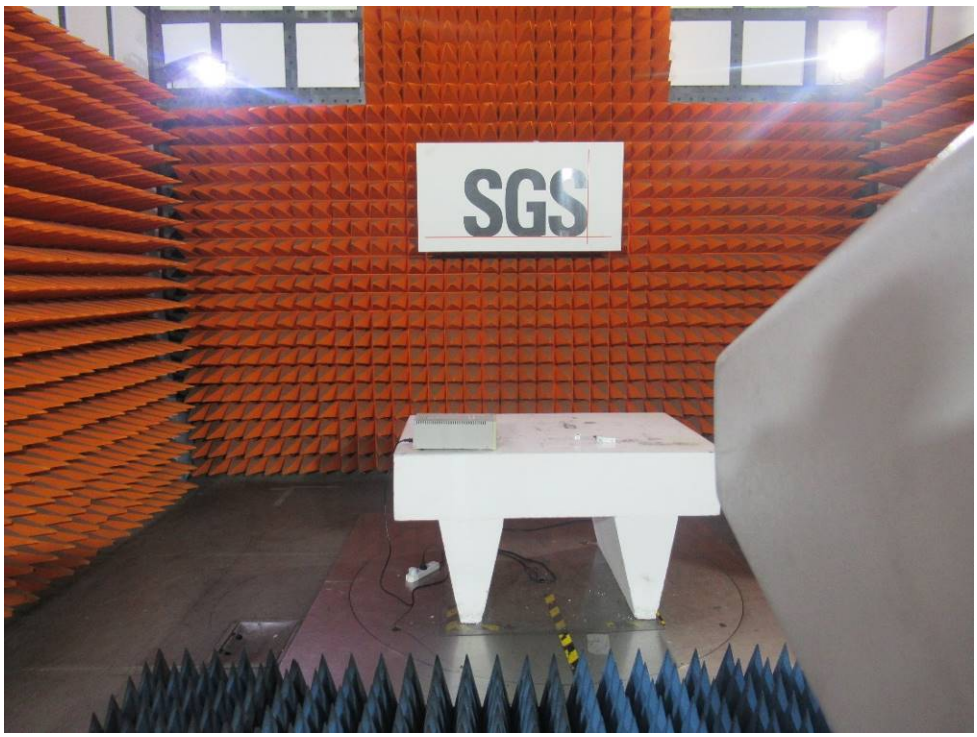
Electrostatic Discharge

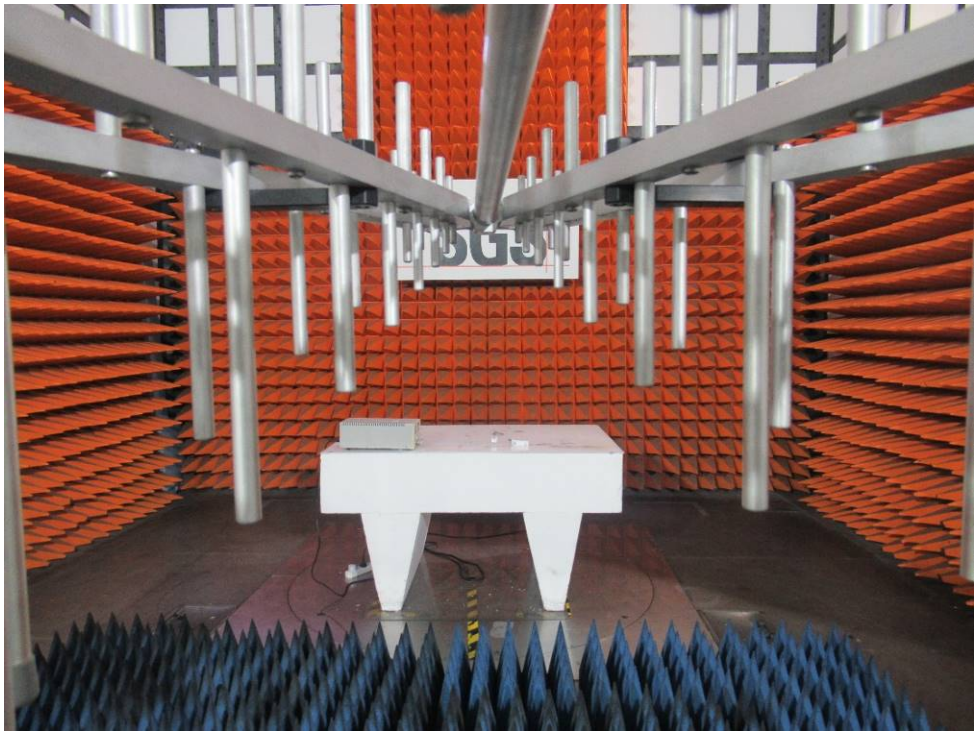


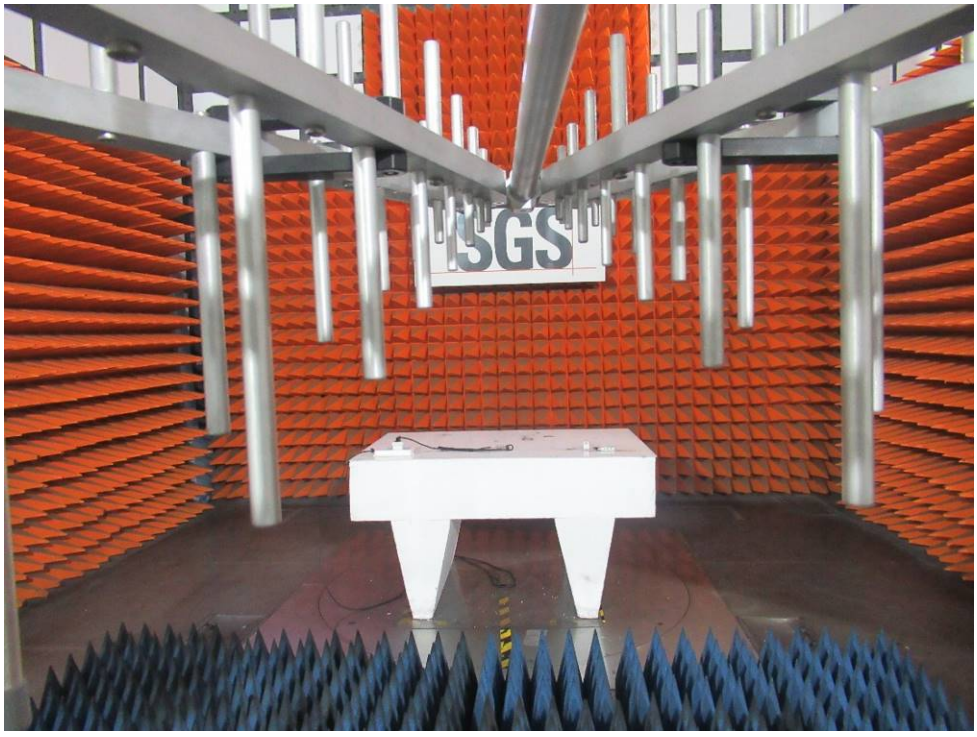
Radiated Immunity (80MHz to 1GHz, 1.4GHz to 6GHz)

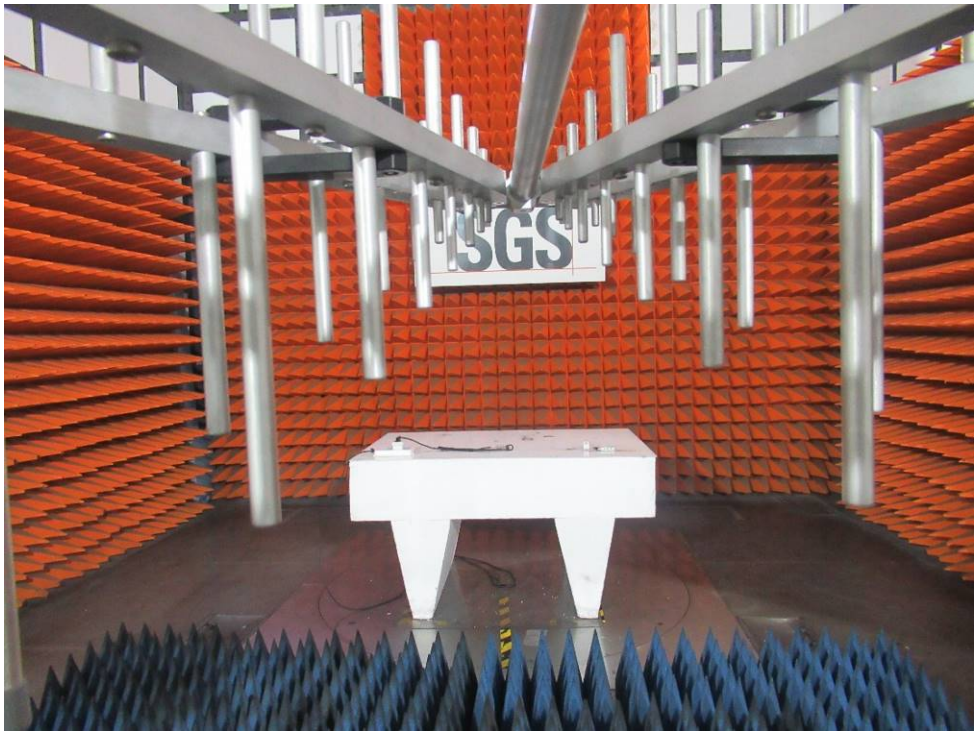






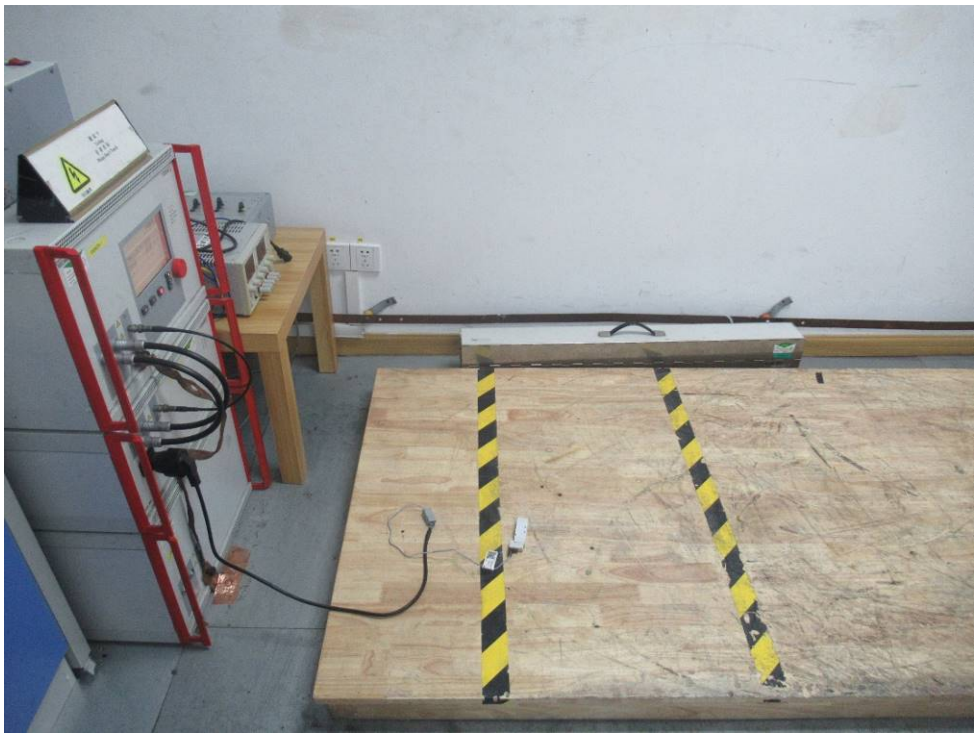






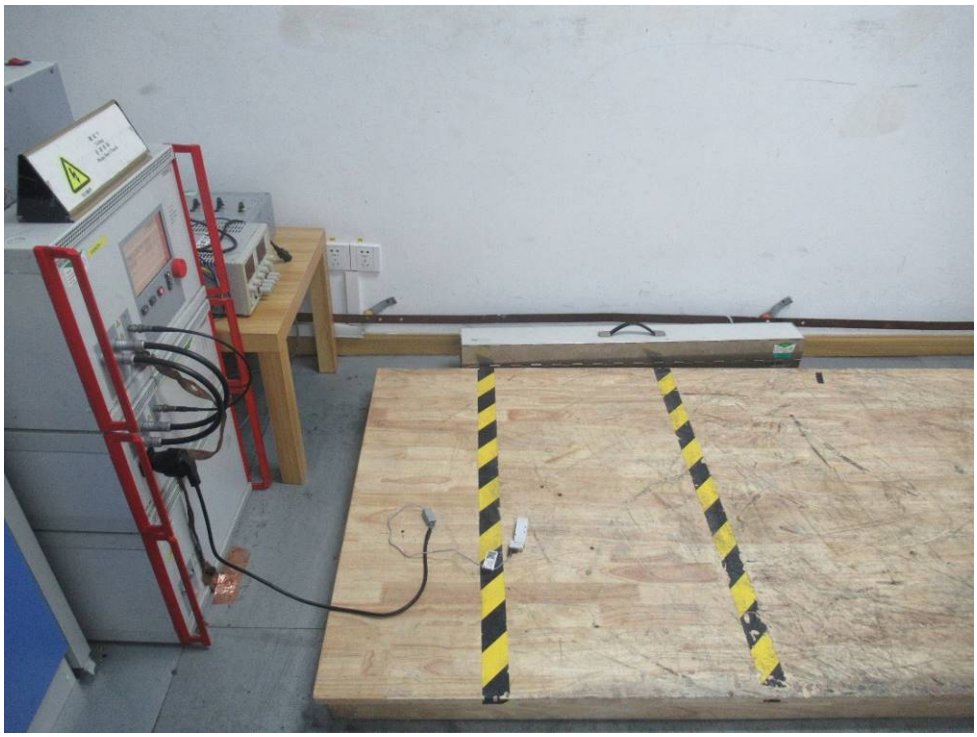
Electrical Fast Transients Burst at AC Mains Power Port

Electrical Fast Transients Burst at DC Power Port



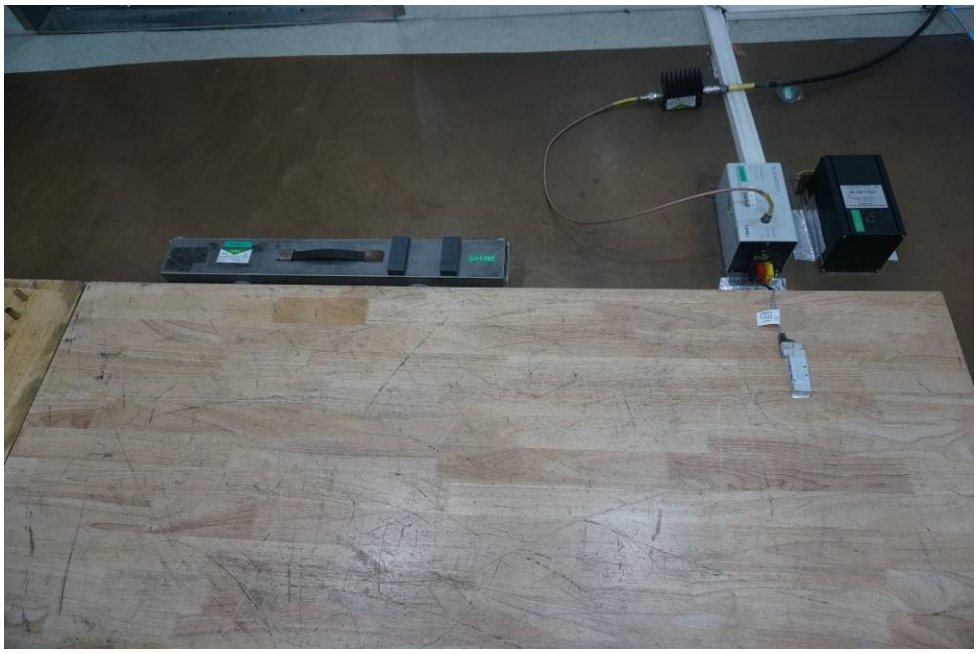
Surge at AC Mains Power Port

Surge at DC Power Port

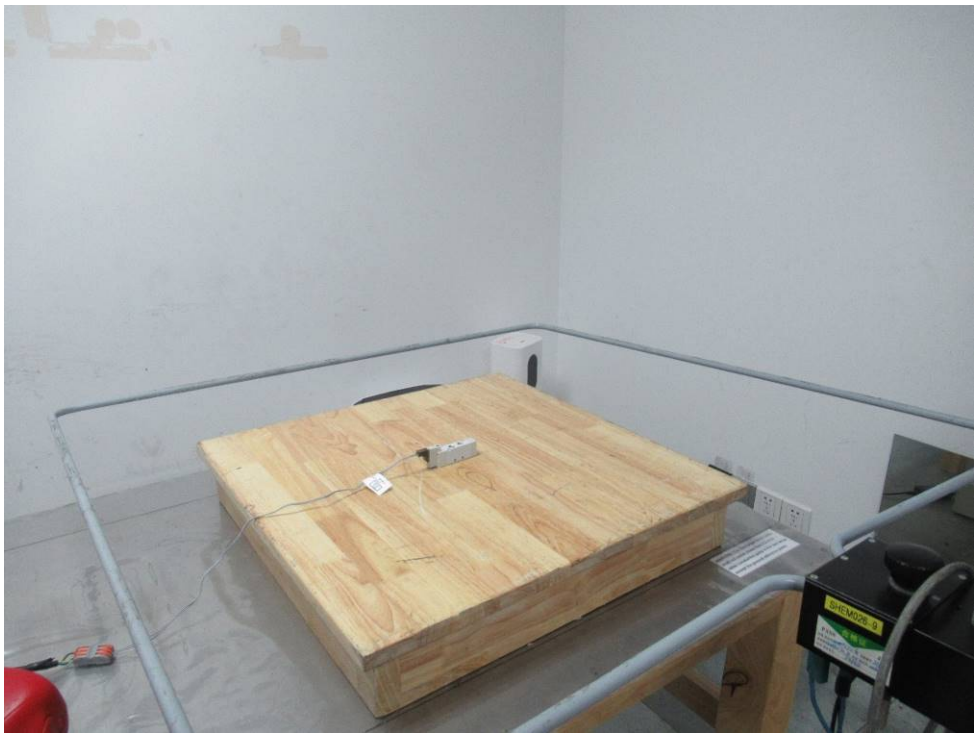


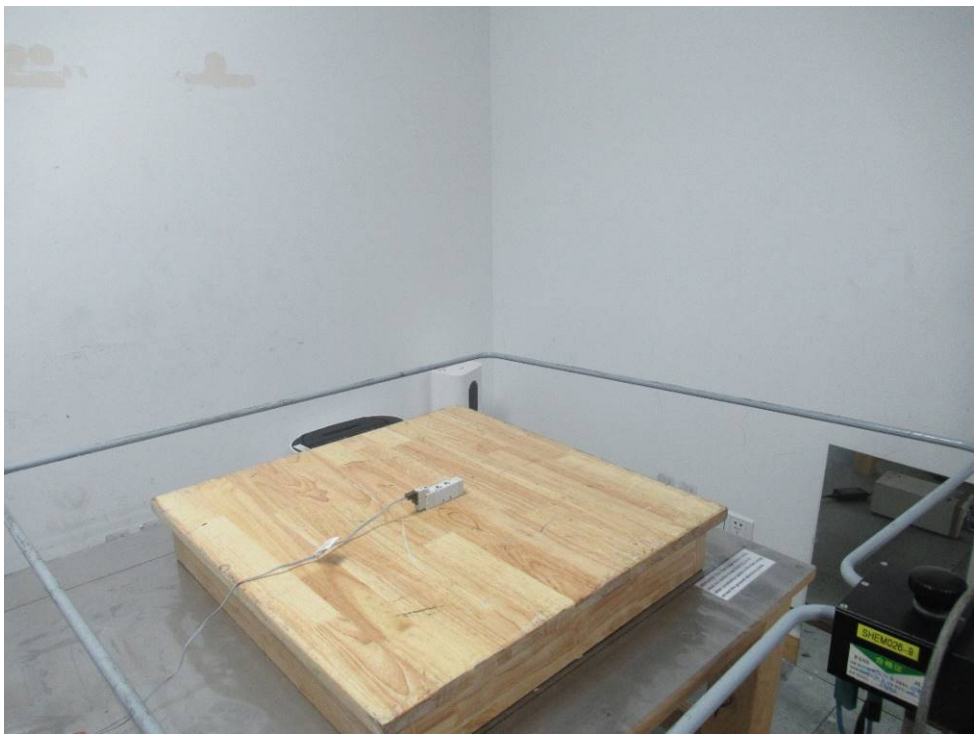
Conducted Immunity at AC Mains Power Port (150kHz-80MHz)

Conducted Immunity at DC Power Port (150kHz-80MHz)



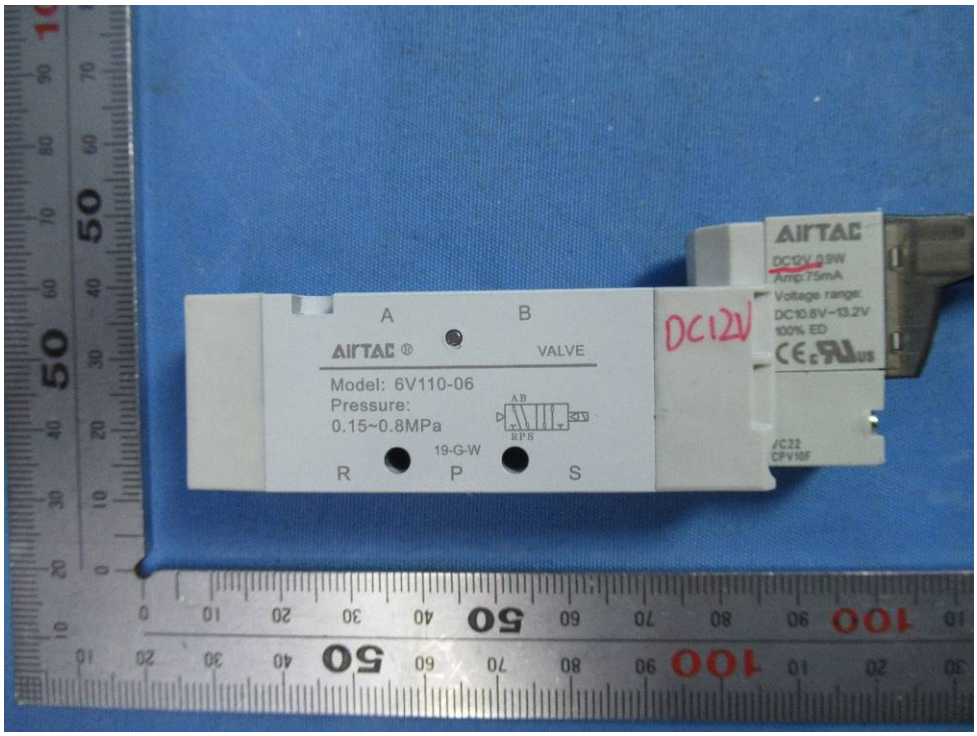
Power Frequency Magnetic Field

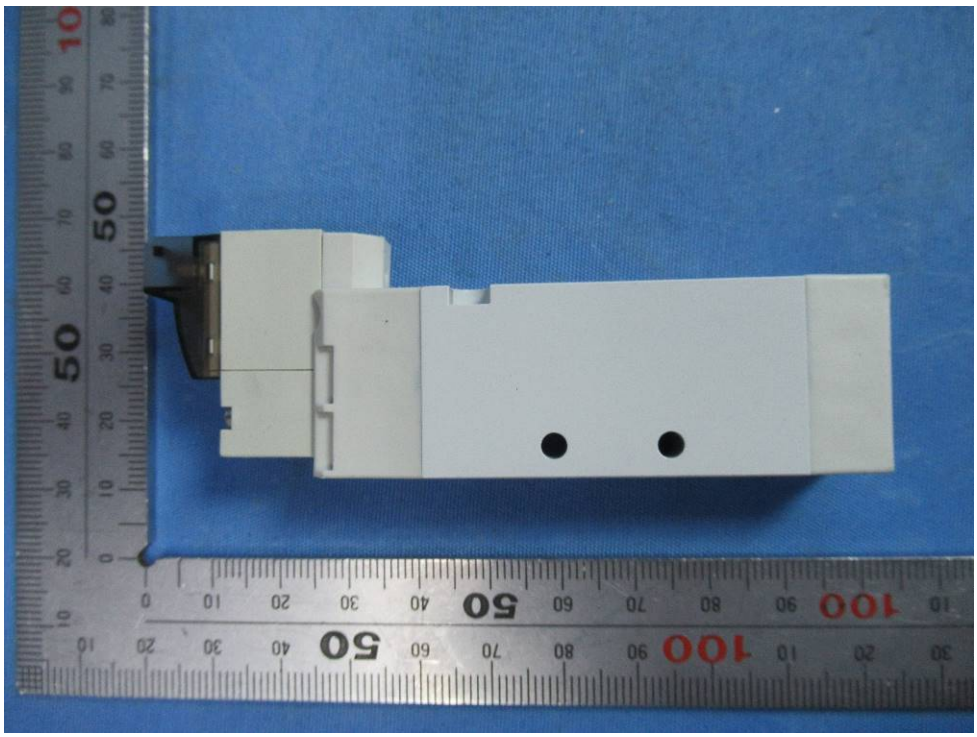


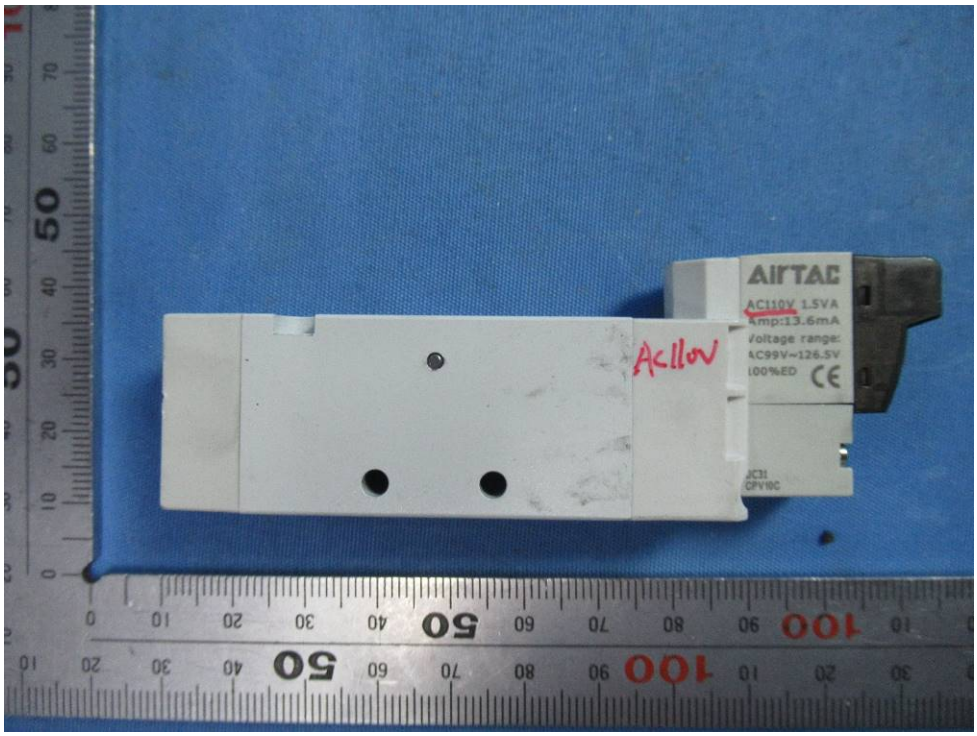


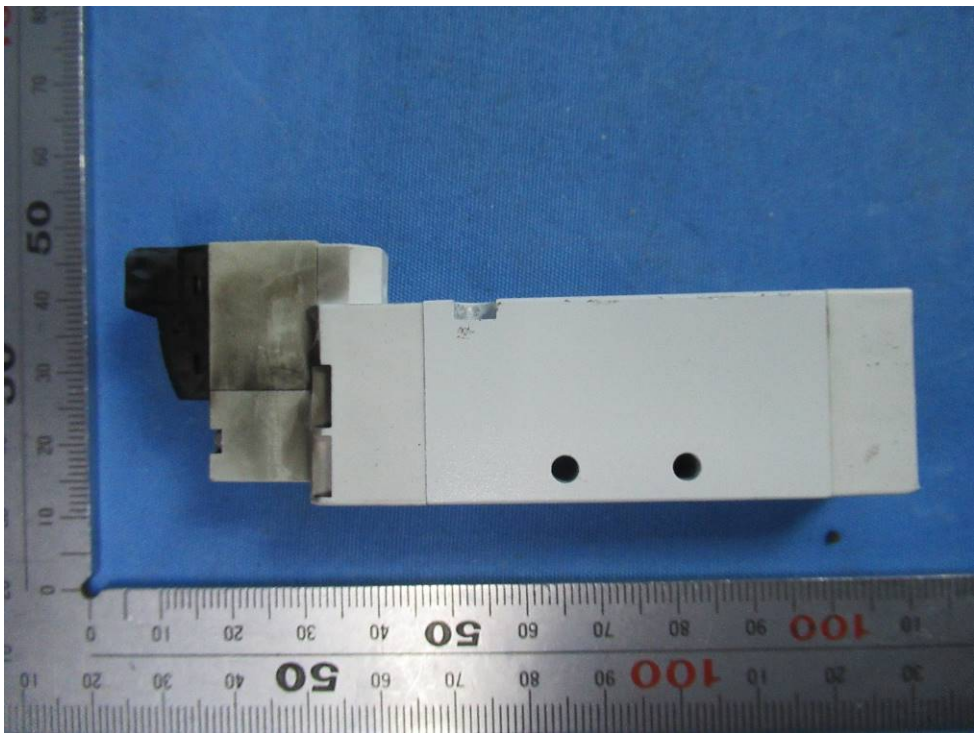
Voltage Dips and Interruptions

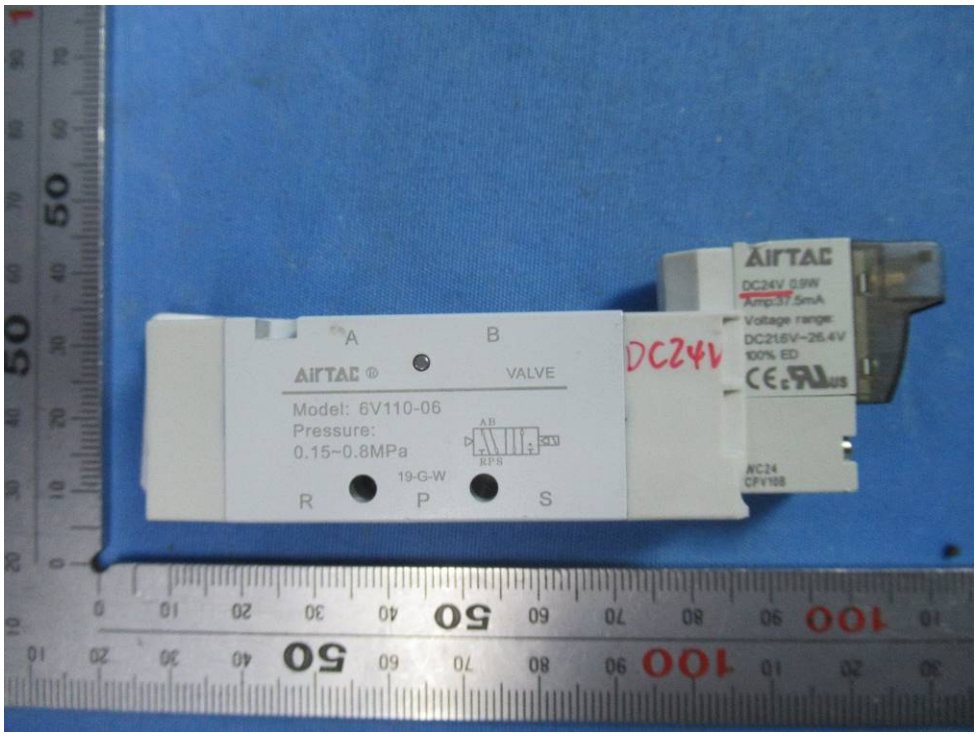
9 EUT Constructional Details (EUT Photos)

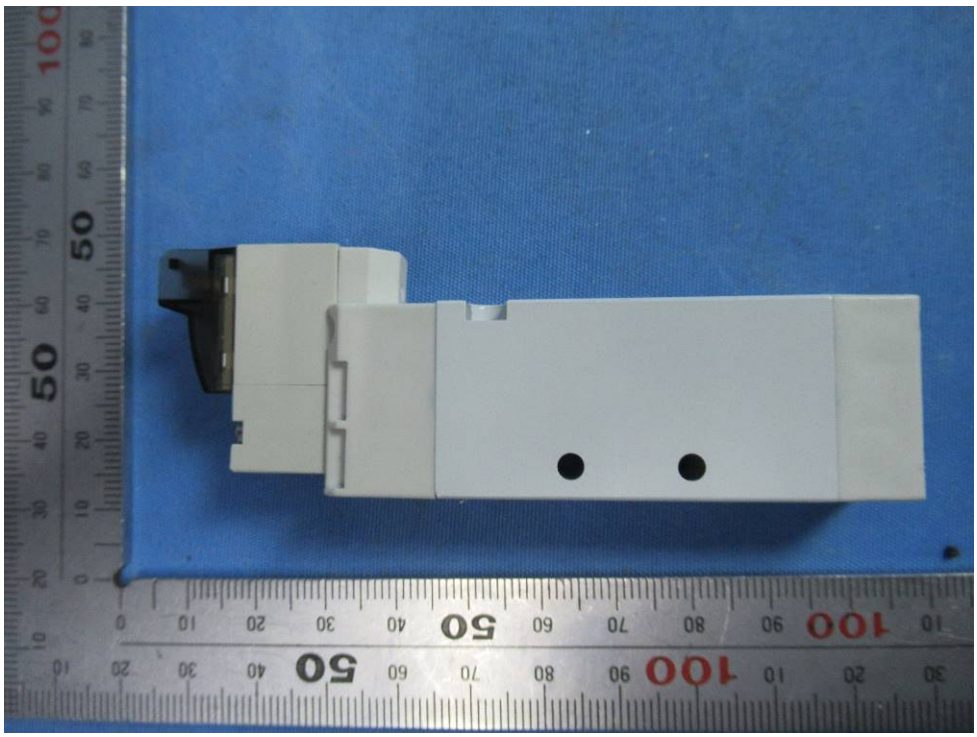


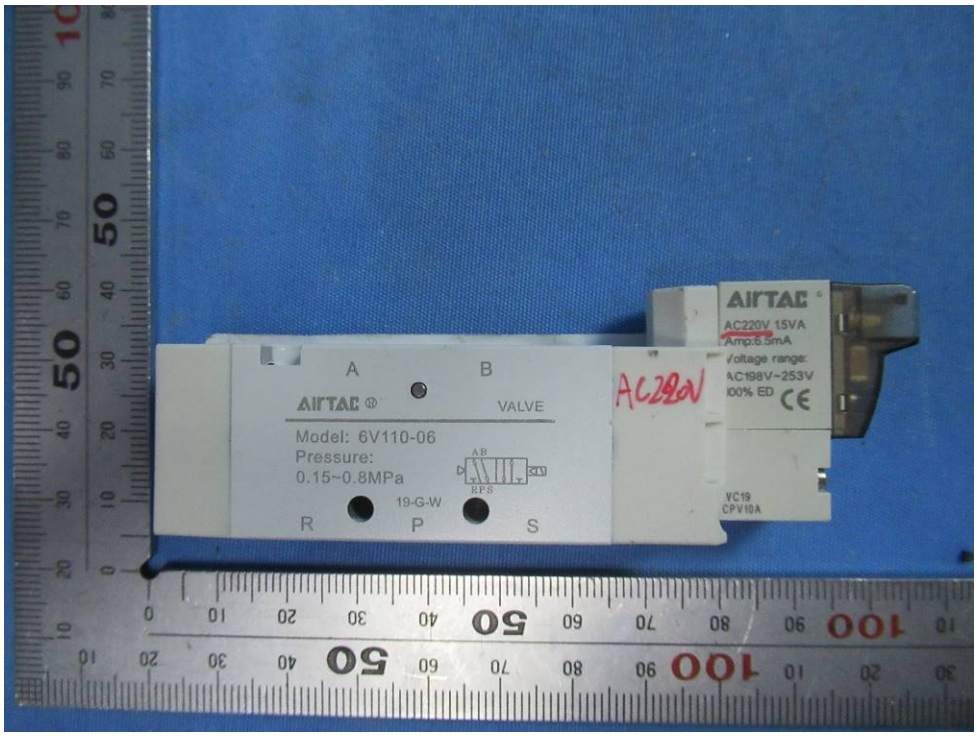


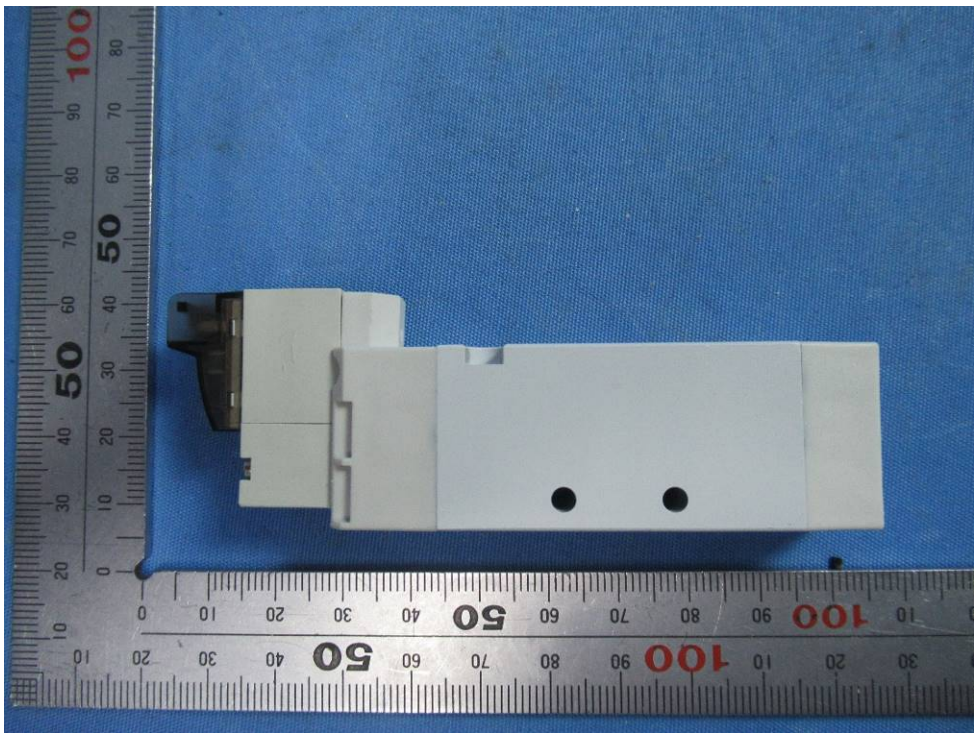












-- End of the Report --