



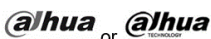
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 1 of 84

TEST REPORT

Application No.: KSEM2403000724AT
Applicant: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Address of Applicant: No.1399, Binxing Road, Binjiang District, Hangzhou, P.R.China
Manufacturer: ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.
Address of Manufacturer: No.1399, Binxing Road, Binjiang District, Hangzhou, P.R.China
Equipment Under Test (EUT):
EUT Name: NETWORK VIDEO RECORDER
Model No.: DHI-NVR58128H-XI,DHI-NVR5864H-XI,DHI-NVR5832H-XI,DHI-NVR5816H-XI,NVR58128H-XI,NVR5864H-XI,NVR5832H-XI,NVR5816H-XI,DHI-NVR58xxH-XI,NVR58xxH-XI(The "xx" can be 16,32 ,64 and 128 denote different software configuration); ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Trade Mark:  or 
Standard(s) : EN 55032: 2015+A11:2020+A1:2020
EN 61000-3-3: 2013+ A1:2019+A2:2021
EN IEC 61000-3-2: 2019+A1:2021
EN 50130-4: 2011 +A1:2014
EN 55035: 2017+A11:2020
Date of Receipt: 2024-03-26
Date of Test: 2024-04-08 to 2024-04-22
Date of Issue: 2024-04-24

Test Result:

Pass*

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

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx> and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at <http://www.sgs.com/en/Terms-and-Conditions/Terms-e-Document.aspx>. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 2 of 84

Revision Record			
Version	Description	Date	Remark
00	Original	2024-04-24	/

Authorized for issue by:				
Tested By				
		Kun_Gu/Project Engineer		
Approved By				
		Terry Hou /Reviewer		

2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Power Port (150kHz-30MHz)	EN 55032: 2015+A11:2020+A1:2020	EN 55032: 2015+A11:2020+A1:2020	Class A	Pass
Asymmetric Mode Conducted Emissions(150kHz-30MHz)		EN 55032: 2015+A11:2020+A1:2020	Class A	Pass
Radiated Emissions (30MHz-1GHz)		EN 55032: 2015+A11:2020+A1:2020	Class A	Pass
Radiated Emissions (Above 1GHz)		EN 55032: 2015+A11:2020+A1:2020	Class A	Pass
Voltage Fluctuations and Flicker	EN 61000-3-3: 2013+ A1:2019+A2:2021	EN 61000-3-3: 2013+ A1:2019+A2:2021	Clause 5	Pass
Harmonic Current Emission	EN IEC 61000-3-2: 2019+A1:2021	EN IEC 61000-3-2: 2019+A1:2021	Class A	Pass

Immunity Part				
Item	Standard	Method	Requirement	Result
Electrostatic Discharge	EN 50130-4: 2011 +A1:2014	EN 61000-4-2:2009	6kV Contact Discharge, 2,4,8kV Air Discharge	Pass
Radiated Immunity(80MHz-2.7GHz)		EN IEC 61000-4-3: 2020	10V/m, 80%, 1kHz sinusoidal Amp. Mod.	Pass
Electrical Fast Transients & Burst at AC Power Port		EN 61000-4-4:2012	2kV, 5/50ns Tr/Td, 100kHz Repetition Frequency	Pass
Electrical Fast Transients & Burst at Signal Port		EN 61000-4-4:2012	1kV, 5/50ns Tr/Td, 100kHz Repetition Frequency	Pass
Surge at AC Power Port		EN 61000-4-5:2014 +A1:2017	1.2/50µs Tr/Td, 0.5,1kV Line to Line, 0.5,1,2kV Line to Ground	Pass
Surge at Signal Port		EN 61000-4-5:2014 +A1:2017	1.2/50µs Tr/Td, 0.5,1kV line-to-ground	Pass
Conducted Immunity at Power Port (150kHz-100MHz)		EN 61000-4-6:2014	10Vrms (emf),80%,1kHz sinusoidal Amp. Mod.	Pass
Conducted Immunity at Signal Port (150kHz-100MHz)		EN 61000-4-6:2014	10Vrms (emf),80%,1kHz sinusoidal Amp. Mod	Pass
Mains Supply Voltage Variations		EN 50130-4:2011+A1:2014	Unom+10%, Unom-15%	Pass

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 4 of 84

Immunity Part				
Item	Standard	Method	Requirement	Result
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	80 % UT for 250per, 70 % UT for 25per, 40 % UT for 10per, 0 % UT for 250per	Pass
Electrostatic Discharge	EN 55035: 2017+A11:2020	EN 61000-4-2: 2009	±4kV Contact Discharge; ±2kV, ±4kV, ±8kV Air Discharge	Pass
Radiated Immunity (80MHz-1GHz, 1800MHz, 2600 MHz, 3500MHz, 5000 MHz)		EN IEC 61000-4-3: 2020	3V/m, 80%, 1kHz Amp. Mod.	Pass
Electrical Fast Transients & Burst at AC Power Port		EN 61000-4-4: 2012	1kV; 5/50ns Tr/Td; 5kHz Repetition Frequency	Pass
Electrical Fast Transients & Burst at Signal Port		EN 61000-4-4: 2012	0,5kV; 5/50ns Tr/Td; 5kHz Repetition Frequency	Pass
Surge at AC 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 Signal Port		EN 61000-4-5: 2014 +A1: 2017	1,2/50µs Tr/Td; 1 kV Lines to Ground	Pass
Conducted Immunity at AC Power Port (150kHz-80MHz)		EN 61000-4-6: 2014	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%, 1kHz Amp. Mod.	Pass
Conducted Immunity at Signal Port (150kHz-80MHz)		EN 61000-4-6: 2014	0,15 to 10MHz 3Vrms (emf), 10 to 30MHz 3V to 1Vrms(emf), 30 to 80MHz 1Vrms(emf), 80%, 1kHz Amp. Mod.	Pass
Power Frequency Magnetic Field		EN 61000-4-8: 2010	50 or 60Hz, 1 A/m	Pass
Voltage Dips and Interruptions		EN IEC 61000-4-11:2020	<5% residual voltage for 0,5cycle, 70% residual voltage for 25cycles, <5% residual voltage for 250cycles	Pass

Model No.: DHI-NVR58128H-XI, DHI-NVR5864H-XI, DHI-NVR5832H-XI, DHI-NVR5816H-XI, NVR58128H-XI, NVR5864H-XI, NVR5832H-XI, NVR5816H-XI, DHI-NVR58xxH-XI, NVR58xxH-XI (The "xx" can be 16, 32, 64 and 128 denote different software configuration);

Only the model DHI-NVR58128H-XI was tested.

There are series models mentioned in this report, and they are similar in electrical and electronic characters. Only the model DHI-NVR58128H-XI was tested since their differences are the model name and chassis (front panel), and the tested model interface for inspection is the most complete, including the interfaces of all other devices.

3 Contents

	Page
1 COVER PAGE	1
2 Test Summary	3
3 Contents.....	5
4 General Information	6
4.1 Details of E.U.T.	6
4.2 Description of Support Units.....	6
4.3 Measurement Uncertainty & Decision Rule.....	7
4.4 Test Location	8
4.5 Test Facility	8
4.6 Deviation from Standards.....	8
4.7 Abnormalities from Standard Conditions	8
5 Equipment List	9
6 Emission Test Results.....	18
6.1 Conducted Emissions at Mains Power Port (150kHz-30MHz)	18
6.2 Asymmetric Mode Conducted Emissions(150kHz-30MHz).....	21
6.3 Radiated Emissions (30MHz-1GHz).....	23
6.4 Radiated Emissions (Above 1GHz).....	27
6.5 Voltage Fluctuations and Flicker	30
6.6 Harmonic Current Emission.....	31
7 Immunity Test Results.....	34
7.1 Electrostatic Discharge.....	35
7.2 Radiated Immunity(80MHz-2.7GHz)	37
7.3 Electrical Fast Transients & Burst at AC Power Port.....	38
7.4 Electrical Fast Transients & Burst at Signal Port.....	39
7.5 Surge at AC Power Port	40
7.6 Surge at Signal Port	42
7.7 Conducted Immunity at Power Port (150kHz-100MHz).....	43
7.8 Conducted Immunity at Signal Port (150kHz-100MHz).....	44
7.9 Mains Supply Voltage Variations.....	45
7.10 Voltage Dips and Interruptions	46
7.11 Electrostatic Discharge.....	48
7.12 Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz).....	50
7.13 Electrical Fast Transients & Burst at AC Power Port.....	52
7.14 Electrical Fast Transients & Burst at Signal Port.....	53
7.15 Surge at AC Power Port	54
7.16 Surge at Signal Port	56
7.17 Conducted Immunity at AC Power Port (150kHz-80MHz).....	57
7.18 Conducted Immunity at Signal Port (150kHz-80MHz).....	58
7.19 Power Frequency Magnetic Field	59
7.20 Voltage Dips and Interruptions	60
8 Test Setup Photo.....	61
9 EUT Constructional Details (EUT Photos)	74

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 6 of 84

4 General Information**4.1 Details of E.U.T.**

Power supply:	AC100-240V,4A,50/60Hz Pre-test Voltage:AC 230V/50Hz&110V/60Hz Final-test Voltage:AC 230V/50Hz
---------------	---

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Displayer	ACER	S200HQL	/
Displayer	LENOVO	T2054pC	/
Earphone	EDIFIER	K800	/
Earphone	SENIC	ST-908	/
HDD	SAMSUNG	MU-PA500B	/
HDD	SEAGATE	SRD0VN1	/
Notebook	APPLE	Macbook 13Pro	/
Notebook	LENOVO	K27	/
Notebook	XIAOMI	Pro15	/

4.3 Measurement Uncertainty & Decision Rule

Measurement Uncertainty:

No.	Item	Measurement Uncertainty (U_{LAB}) *	U_{CISPR}
1	Conducted Emission at mains port using AMN	2.4dB (9kHz to 150kHz)	3.8dB (9kHz to 150kHz)
		2.2dB (150kHz to 30MHz)	3.4dB (150kHz to 30MHz)
2	Conducted Emission at telecommunication port using AAN	4.0 dB (150kHz to 30MHz)	5.0dB (150kHz to 30MHz)
3	Radiated Power	3.2dB	4.5dB (30MHz to 300MHz)
4	Radiated Emission (10m)	4.1 dB	6.3dB (30MHz-1GHz)
5	Radiated Emission (3m)	4.6 dB (30MHz-1GHz)	6.3dB (30MHz-1GHz)
		5.0dB (1GHz-6GHz)	5.2dB (1GHz-6GHz)
		5.2dB (6GHz-18GHz)	5.5dB (6GHz-18GHz)
		5.3dB (18GHz-40GHz)	N/A

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.
- For immunity testing no decision rule is applicable.

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 8 of 84

4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

Note:

- 1.SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working 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).
3. Sample source: sent by customer.

4.5 Test Facility

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

• A2LA

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• FCC

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• ISED

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

• VCCI

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 9 of 84

5 Equipment List

Conducted Emissions at Mains Power Port (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI TEST RECEIVER	R&S	ESCI	KS301101	03/19/2024	03/18/2025
TWO-LINE V-NETWORK	R&S	ENV216	KS301197	01/15/2024	01/14/2025
V (V-LISN)	SCHWARZBECK	NNLK 8129	KS301091	01/15/2024	01/14/2025
Pulse LIMITER	R&S	ESH3-Z2	KUS1902E001	01/15/2024	01/14/2025
Software	Faratronic	EZ EMC-v 3A1	N/A	N/A	N/A

Asymmetric Mode Conducted Emissions(150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI TEST RECEIVER	R&S	ESCI	KS301101	03/19/2024	03/18/2025
TWO-LINE V-NETWORK	R&S	ENV216	KS301197	01/15/2024	01/14/2025
V (V-LISN)	SCHWARZBECK	NNLK 8129	KS301091	01/15/2024	01/14/2025
Pulse LIMITER	R&S	ESH3-Z2	KUS1902E001	01/15/2024	01/14/2025
CISPR22 FOUR BALANCED TELECOM PARIS ISN	FCC	FCC-TLISN-T2-02	KS301144	10/20/2023	10/19/2024
COUPLING AND DECOUPLING NETWORK	TESEQ	ISN ST08	KS301171	01/15/2024	01/14/2025
IMPEDANCE STABILIZATION NETWORK	TESEQ	ISN T800	KS301185	10/20/2023	10/19/2024
IMPEDANCE STABILIZATION NETWORK	TESEQ	ISN T8-CAT6	KS301285	10/20/2023	10/19/2024
RF CURRENT PROBE	FCC	F-65A	CZ301012	01/15/2024	01/14/2025
Software	Faratronic	EZ EMC-v 3A1	N/A	N/A	N/A

Radiated Emissions (30MHz-1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMI Test Receiver	R&S	ESCI	KS301196	08/24/2023	08/23/2024
Antenna	TESEQ	CBL 6112D	KUS1806E006	03/23/2024	03/22/2025
Software	Faratronic	EZ EMC v 3A1	N/A	N/A	N/A

Radiated Emissions (Above 1GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Spectrum Analyzer	R&S	FSU26	KS301206	03/19/2024	03/18/2025
Preamplifier	PANSHAN TECHNOLOGY	LNA:1~18G	KSEM010-2	01/15/2024	01/14/2025



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 10 of 84

Horn-antenna	SCHWARZBECK	BBHA9120D	KS301079	03/19/2024	03/18/2025
Software	Faratronic	EZ_EMC-v 3A1	N/A	N/A	N/A

Voltage Fluctuations and Flicker

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Harmonic & Flicker Tester	SCHAFFNER	CCN 1000-1	KS301033	08/24/2023	08/23/2024
AC Power Source	SCHAFFNER	NSG 1007	KS301087	08/24/2023	08/23/2024
Software	TESEQ	CTS4-v 4.24.0	N/A	N/A	N/A
Harmonic/Flicker Analyzer	KIKUSUI	KHA3000	KUS2009M002-1	03/19/2024	03/18/2025
Line Impedance Network	KIKUSUI	SPEC71116	KUS2009M002-1	03/19/2024	03/18/2025
Switcher	KIKUSUI	SPEC71092	KUS2009M002-2	03/19/2024	03/18/2025
AC Power Supply(Master)	KIKUSUI	PCR24000WE 2	KUS2009M002-3	03/19/2024	03/18/2025
AC Power Supply(Slave)	KIKUSUI	PCR24000WE 2	KUS2009M002-4	03/19/2024	03/18/2025
Software	KIKUSUI	HarmoCapture 3-vv 2.5.2.00	N/A	N/A	N/A

Harmonic Current Emission

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Harmonic & Flicker Tester	SCHAFFNER	CCN 1000-1	KS301033	08/24/2023	08/23/2024
AC Power Source	SCHAFFNER	NSG 1007	KS301087	08/24/2023	08/23/2024
Software	TESEQ	CTS4-v 4.24.0	N/A	N/A	N/A
Harmonic/Flicker Analyzer	KIKUSUI	KHA3000	KUS2009M002-1	03/19/2024	03/18/2025
Line Impedance Network	KIKUSUI	SPEC71116	KUS2009M002-1	03/19/2024	03/18/2025
Switcher	KIKUSUI	SPEC71092	KUS2009M002-2	03/19/2024	03/18/2025
AC Power Supply(Master)	KIKUSUI	PCR24000WE 2	KUS2009M002-3	03/19/2024	03/18/2025
AC Power Supply(Slave)	KIKUSUI	PCR24000WE 2	KUS2009M002-4	03/19/2024	03/18/2025
Software	KIKUSUI	HarmoCapture 3-vv 2.5.2.00	N/A	N/A	N/A

Electrostatic Discharge

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
ESD Simulator	EM TEST	DITO 509030	KS301147	01/15/2024	01/14/2025

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 11 of 84

Radiated Immunity(80MHz-2.7GHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Synthesized Signal Generator	AGILENT	83732B	KS301183	01/15/2024	01/14/2025
Laser probe interface	AR Worldwide	FI7000	KS301193-2	03/19/2024	03/18/2025
E-Field Sensor	AR Worldwide	FL7006 100K-6G	KS301193-1	03/23/2024	03/22/2025
Amplifier Research (80~1000MHz 150w)	AR Worldwide	150W1000M1	KS301139	08/24/2023	08/23/2024
Amplifier Research (1~6GHz 50w)	AR Worldwide	50S1G6M1	KS301231	08/24/2023	08/23/2024
Dual Directional Coupler (1-11G)	AR Worldwide	C1-A47NFNF 35dB	KS301193-5	N.C.R	N.C.R
Dual Directional Coupler (80~1000MHz 400w)	AR Worldwide	DC6180	KS301193-6	N.C.R	N.C.R
RF POWER METER	BOONTON	4232A-01	KS301022	03/19/2024	03/18/2025
POWER SENSOR	BOONTON	51085	H3010235-1	03/19/2024	03/18/2025
POWER SENSOR	BOONTON	51085	H3010235-2	03/19/2024	03/18/2025
Antenna	AR Worldwide	TP1000A	CZ301029	N.C.R	N.C.R
Software	AR	emc ware-v 3.2.0.4	N/A	N/A	N/A

Electrical Fast Transients & Burst at AC Power Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	Transient2000	KS301188-1	08/24/2023	08/23/2024
Coupling Network	EMC PARTNER	CN-EFT1000	KS301188-3	08/24/2023	08/23/2024
Burst Generator	SANKI	EFT-0404S	KUS2009M002-7	12/24/2023	12/23/2024
Coupling and Decoupling Network	SANKI	CDN-4350	KUS2009M002-8	08/11/2023	08/10/2024

Electrical Fast Transients & Burst at Signal Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	Transient2000	KS301188-1	08/24/2023	08/23/2024
Coupling Network	EMC PARTNER	CN-EFT1000	KS301188-3	08/24/2023	08/23/2024
Burst Generator	SANKI	EFT-0404S	KUS2009M002-7	12/24/2023	12/23/2024
Coupling and Decoupling Network	SANKI	CDN-4350	KUS2009M002-8	08/11/2023	08/10/2024

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 12 of 84

Surge at AC Power Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Coupling and Decoupling Network	EMC PARTNER	CDN-UTP8	KS301188-2	08/24/2023	08/23/2024
Surge Generator	SANKI	LSG-0506S	KUS2009M002-5	08/11/2023	08/10/2024
Coupling and Decoupling Network	SANKI	CDN-5350	KUS2009M002-6	08/11/2023	08/10/2024

Surge at Signal Port					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Coupling and Decoupling Network	EMC PARTNER	CDN-UTP8	KS301188-2	08/24/2023	08/23/2024
Surge Generator	SANKI	LSG-0506S	KUS2009M002-5	08/11/2023	08/10/2024
Coupling and Decoupling Network	SANKI	CDN-5350	KUS2009M002-6	08/11/2023	08/10/2024

Conducted Immunity at Power Port (150kHz-100MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Test System for Conducted and Radiated Immunity	TESEQ	NSG 4070B	KSZ201705E003	01/15/2024	01/14/2025
Amplifier	TESEQ	SCCXE75	KSZ201705E004	01/15/2024	01/14/2025
EM-Koppelzange	SCHAFFNER	KEMZ 801	CZ301002	01/15/2024	01/14/2025
Attenuator	EURO MC	7860 ORGEVAL	CZ301084	03/19/2024	03/18/2025
Directional Coupler	HIGH POWER	C21A8	CZ750021	08/24/2023	08/23/2024
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M216	CZ301085	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M316	CZ301025	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	TESEQ	CDN S751	KS301184-2	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	TESEQ	CDN M116	KS301184-1	03/19/2024	03/18/2025
CDN	TESEQ	CDN T2-10S	KS301286	03/19/2024	03/18/2025
CDN	TESEQ	CDN T4-10S	KS301287	03/19/2024	03/18/2025
CDN	3Ctest	CDNRJ45	KS301288	08/11/2023	08/10/2024

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 13 of 84

Current Clamp	TESEQ	IP-DR250	KS201703E00 1	01/15/2024	01/14/2025
CDN	TESEQ	CDN M432	KUS2003M001 -1	01/15/2024	01/14/2025
CDN	TESEQ	CDN M432- 3LN	KUS2003M001 -2	01/15/2024	01/14/2025
CDN	TESEQ	CDN M532	KUS2003M001 -3	01/15/2024	01/14/2025
CDN	TESEQ	CDN M232	KSZ201706E0 01	03/19/2024	03/18/2025
CDN	TESEQ	CDN M332	KSZ201706E0 02	03/19/2024	03/18/2025
Software	TESEQ	NSG 4070-v 1.3.0.1	N/A	N/A	N/A

Conducted Immunity at Signal Port (150kHz-100MHz)

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Test System for Conducted and Radiated Immunity	TESEQ	NSG 4070B	KSZ201705E0 03	01/15/2024	01/14/2025
Amplifier	TESEQ	SCCXE75	KSZ201705E0 04	01/15/2024	01/14/2025
EM-Koppelzange	SCHAFFNER	KEMZ 801	CZ301002	01/15/2024	01/14/2025
Attenuator	EURO MC	7860 ORGEVAL	CZ301084	03/19/2024	03/18/2025
Directional Coupler	HIGH POWER	C21A8	CZ750021	08/24/2023	08/23/2024
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M216	CZ301085	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M316	CZ301025	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	TESEQ	CDN S751	KS301184-2	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	TESEQ	CDN M116	KS301184-1	03/19/2024	03/18/2025
CDN	TESEQ	CDN T2-10S	KS301286	03/19/2024	03/18/2025
CDN	TESEQ	CDN T4-10S	KS301287	03/19/2024	03/18/2025
CDN	3Ctest	CDNRJ45	KS301288	08/11/2023	08/10/2024
Current Clamp	TESEQ	IP-DR250	KS201703E00 1	01/15/2024	01/14/2025
CDN	TESEQ	CDN M432	KUS2003M001 -1	01/15/2024	01/14/2025
CDN	TESEQ	CDN M432- 3LN	KUS2003M001 -2	01/15/2024	01/14/2025
CDN	TESEQ	CDN M532	KUS2003M001 -3	01/15/2024	01/14/2025
CDN	TESEQ	CDN M232	KSZ201706E0 01	03/19/2024	03/18/2025
CDN	TESEQ	CDN M332	KSZ201706E0 02	03/19/2024	03/18/2025

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 14 of 84

Software	TESEQ	NSG 4070-v 1.3.0.1	N/A	N/A	N/A
----------	-------	-----------------------	-----	-----	-----

Mains Supply Voltage Variations

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Switcher	KIKUSUI	SPEC71092	KUS2009M002 -2	03/19/2024	03/18/2025
AC Power Supply(Master)	KIKUSUI	PCR24000WE 2	KUS2009M002 -3	03/19/2024	03/18/2025
AC Power Supply(Slave)	KIKUSUI	PCR24000WE 2	KUS2009M002 -4	03/19/2024	03/18/2025
Software	KIKUSUI	Quick Immunity Sequencer 2-v 4.0.3.02	N/A	N/A	N/A

Voltage Dips and Interruptions

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Switcher	KIKUSUI	SPEC71092	KUS2009M002 -2	03/19/2024	03/18/2025
AC Power Supply(Master)	KIKUSUI	PCR24000WE 2	KUS2009M002 -3	03/19/2024	03/18/2025
AC Power Supply(Slave)	KIKUSUI	PCR24000WE 2	KUS2009M002 -4	03/19/2024	03/18/2025
Software	KIKUSUI	Quick Immunity Sequencer 2-v 4.0.3.02	N/A	N/A	N/A

Electrostatic Discharge

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
ESD Simulator	EM TEST	DITO 509030	KS301147	01/15/2024	01/14/2025

Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz)

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Synthesized Signal Generator	AGILENT	83732B	KS301183	01/15/2024	01/14/2025
Laser probe interface	AR Worldwide	FI7000	KS301193-2	03/19/2024	03/18/2025
E-Field Sensor	AR Worldwide	FL7006 100K-6G	KS301193-1	03/23/2024	03/22/2025
Amplifier Research (80~1000MHz 150w)	AR Worldwide	150W1000M1	KS301139	08/24/2023	08/23/2024
Amplifier Research (1~6GHz 50w)	AR Worldwide	50S1G6M1	KS301231	08/24/2023	08/23/2024
Dual Directional Coupler (1-11G)	AR Worldwide	C1-A47NFNF 35dB	KS301193-5	N.C.R	N.C.R
Dual Directional Coupler	AR Worldwide	DC6180	KS301193-6	N.C.R	N.C.R

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 15 of 84

(80~1000MHz 400w)					
RF POWER METER	BOONTON	4232A-01	KS301022	03/19/2024	03/18/2025
POWER SENSOR	BOONTON	51085	H3010235-1	03/19/2024	03/18/2025
POWER SENSOR	BOONTON	51085	H3010235-2	03/19/2024	03/18/2025
Antenna	AR Worldwide	TP1000A	CZ301029	N.C.R	N.C.R
Software	AR	emc ware-v 3.2.0.4	N/A	N/A	N/A

Electrical Fast Transients & Burst at AC Power Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	Transient2000	KS301188-1	08/24/2023	08/23/2024
Burst Generator	SANKI	EFT-0404S	KUS2009M002-7	12/24/2023	12/23/2024
Coupling and Decoupling Network	SANKI	CDN-4350	KUS2009M002-8	08/11/2023	08/10/2024

Electrical Fast Transients & Burst at Signal Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	Transient2000	KS301188-1	08/24/2023	08/23/2024
Coupling Network	EMC PARTNER	CN-EFT1000	KS301188-3	08/24/2023	08/23/2024
Burst Generator	SANKI	EFT-0404S	KUS2009M002-7	12/24/2023	12/23/2024
Coupling and Decoupling Network	SANKI	CDN-4350	KUS2009M002-8	08/11/2023	08/10/2024

Surge at AC Power Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Surge Generator	SANKI	LSG-0506S	KUS2009M002-5	08/11/2023	08/10/2024
Coupling and Decoupling Network	SANKI	CDN-5350	KUS2009M002-6	08/11/2023	08/10/2024

Surge at Signal Port

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Coupling and Decoupling Network	EMC PARTNER	CDN-UTP8	KS301188-2	08/24/2023	08/23/2024
Surge Generator	SANKI	LSG-0506S	KUS2009M002-5	08/11/2023	08/10/2024
Coupling and Decoupling Network	SANKI	CDN-5350	KUS2009M002-6	08/11/2023	08/10/2024

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 16 of 84

Conducted Immunity at AC Power Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Test System for Conducted and Radiated Immunity	TESEQ	NSG 4070B	KSZ201705E003	01/15/2024	01/14/2025
Amplifier	TESEQ	SCCXE75	KSZ201705E004	01/15/2024	01/14/2025
EM-Koppelzange	SCHAFFNER	KEMZ 801	CZ301002	01/15/2024	01/14/2025
Attenuator	EURO MC	7860 ORGEVAL	CZ301084	03/19/2024	03/18/2025
Directional Coupler	HIGH POWER	C21A8	CZ750021	08/24/2023	08/23/2024
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M216	CZ301085	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	SCHAFFNER	CDN M316	CZ301025	03/19/2024	03/18/2025
CDN (Coupling and Decoupling Network)	TESEQ	CDN M116	KS301184-1	03/19/2024	03/18/2025
CDN	TESEQ	CDN M432	KUS2003M001-1	01/15/2024	01/14/2025
CDN	TESEQ	CDN M432-3LN	KUS2003M001-2	01/15/2024	01/14/2025
CDN	TESEQ	CDN M532	KUS2003M001-3	01/15/2024	01/14/2025
CDN	TESEQ	CDN M232	KSZ201706E001	03/19/2024	03/18/2025
CDN	TESEQ	CDN M332	KSZ201706E002	03/19/2024	03/18/2025
Software	TESEQ	NSG 4070-v 1.3.0.1	N/A	N/A	N/A

Conducted Immunity at Signal Port (150kHz-80MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Test System for Conducted and Radiated Immunity	TESEQ	NSG 4070B	KSZ201705E003	01/15/2024	01/14/2025
Amplifier	TESEQ	SCCXE75	KSZ201705E004	01/15/2024	01/14/2025
EM-Koppelzange	SCHAFFNER	KEMZ 801	CZ301002	01/15/2024	01/14/2025
Attenuator	EURO MC	7860 ORGEVAL	CZ301084	03/19/2024	03/18/2025
Directional Coupler	HIGH POWER	C21A8	CZ750021	08/24/2023	08/23/2024
CDN	TESEQ	CDN T2-10S	KS301286	03/19/2024	03/18/2025
CDN	TESEQ	CDN T4-10S	KS301287	03/19/2024	03/18/2025
CDN	3Ctest	CDNRJ45	KS301288	08/11/2023	08/10/2024
Current Clamp	TESEQ	IP-DR250	KS201703E001	01/15/2024	01/14/2025
Software	TESEQ	NSG 4070-v 1.3.0.1	N/A	N/A	N/A

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 17 of 84

Power Frequency Magnetic Field					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Inductive Standard Coil	EMC PARTNER	MF1000-1	KS301188-4	08/24/2023	08/23/2024

Voltage Dips and Interruptions					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
EMC Immunity Tester	EMC PARTNER	TRA2006	KS301188-1	08/24/2023	08/23/2024
Switcher	KIKUSUI	SPEC71092	KUS2009M002-2	03/19/2024	03/18/2025
AC Power Supply(Master)	KIKUSUI	PCR24000WE2	KUS2009M002-3	03/19/2024	03/18/2025
AC Power Supply(Slave)	KIKUSUI	PCR24000WE2	KUS2009M002-4	03/19/2024	03/18/2025
Software	KIKUSUI	Quick Immunity Sequencer 2-v 4.0.3.02	N/A	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Digital Pressure Meter	Mengde	DYM3	CZ750023	01/15/2024	01/14/2025
Temperature & Humidity Recorder	JDRK	RS-WS-N01-6J	KSEM024-1 KSEM024-2 KSEM024-3 KSEM024-6 KSEM024-7 KSEM024--8 KSEM024--9	03/19/2024	03/18/2025

6 Emission Test Results

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

Test Requirement: EN 55032: 2015+A11:2020+A1:2020

Test Method: EN 55032: 2015+A11:2020+A1:2020

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) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

Temperature: 21.8 °C

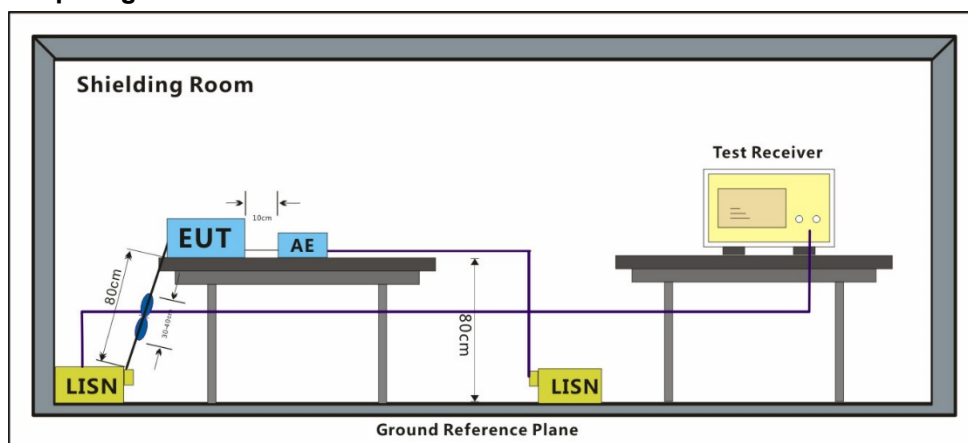
Humidity: 49.6 % RH

Atmospheric Pressure: 1010 mbar

6.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.1.3 Test Setup Diagram



6.1.4 Measurement Procedure and Data

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.

Remark: Level= Read Level+ Cable Loss+ LISN Factor

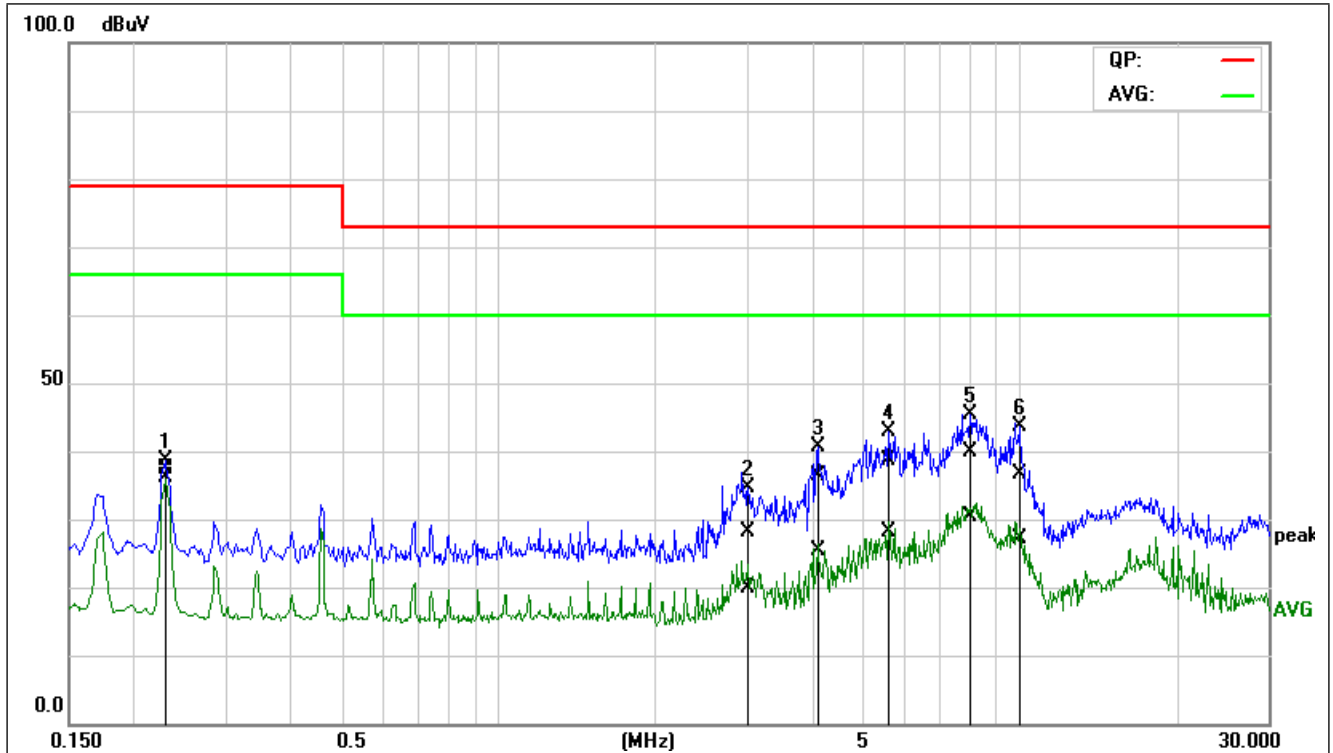
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 19 of 84

Test Mode: 00; Line: Live line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	0.2288	17.45	16.09	20.03	37.48	36.12	79.00	66.00	-41.52	-29.88	Pass
2	2.9625	8.12	-0.05	19.99	28.11	19.94	73.00	60.00	-44.89	-40.06	Pass
3	4.1127	16.40	5.31	19.96	36.36	25.27	73.00	60.00	-36.64	-34.73	Pass
4	5.6117	18.62	8.12	20.00	38.62	28.12	73.00	60.00	-34.38	-31.88	Pass
5*	8.0293	19.93	10.21	20.07	40.00	30.28	73.00	60.00	-33.00	-29.72	Pass
6	9.8727	16.54	7.16	20.00	36.54	27.16	73.00	60.00	-36.46	-32.84	Pass

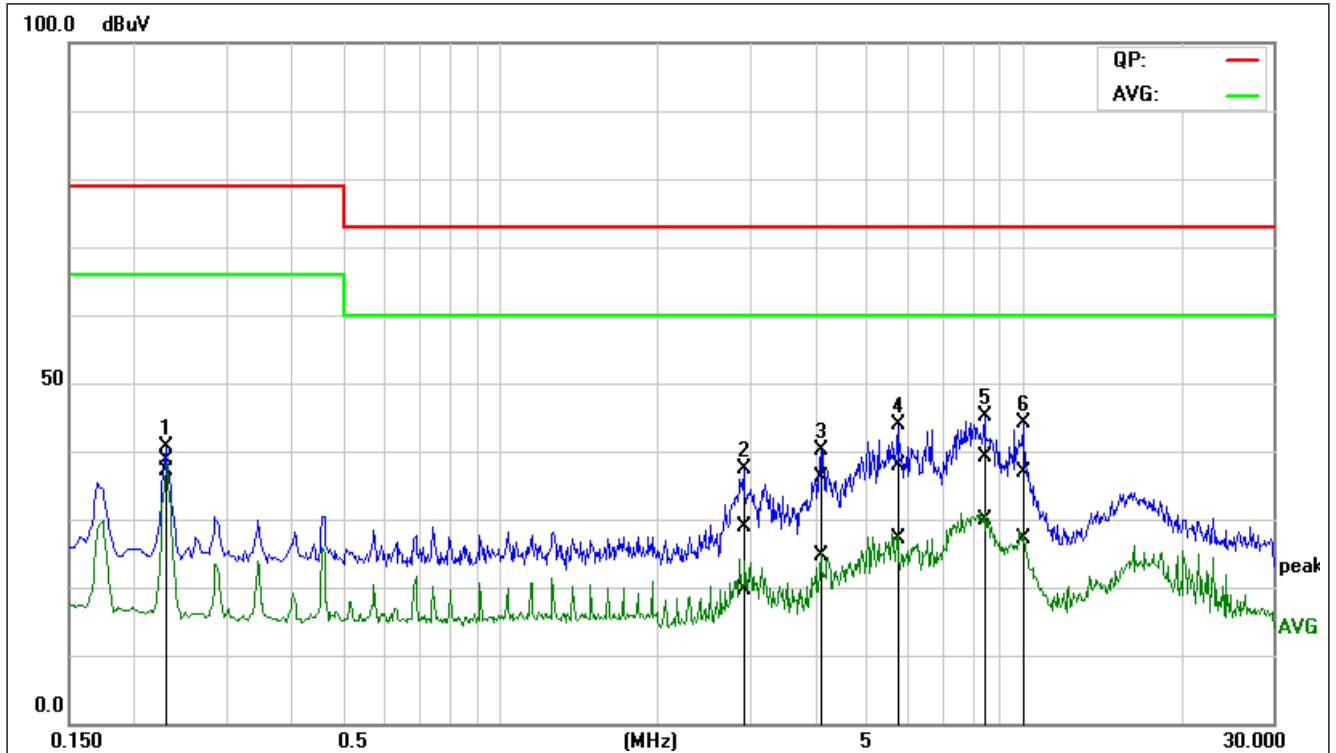
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 20 of 84

Test Mode: 00; Line: Neutral Line



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1*	0.2287	18.48	17.06	20.15	38.63	37.21	79.00	66.00	-40.37	-28.79	Pass
2	2.9224	8.78	-0.35	19.99	28.77	19.64	73.00	60.00	-44.23	-40.36	Pass
3	4.1043	16.26	4.77	19.93	36.19	24.70	73.00	60.00	-36.81	-35.30	Pass
4	5.7428	17.86	7.15	19.94	37.80	27.09	73.00	60.00	-35.20	-32.91	Pass
5	8.4363	19.18	9.83	19.99	39.17	29.82	73.00	60.00	-33.83	-30.18	Pass
6	9.9829	16.98	7.20	19.97	36.95	27.17	73.00	60.00	-36.05	-32.83	Pass

6.2 Asymmetric Mode Conducted Emissions(150kHz-30MHz)

Test Requirement: EN 55032: 2015+A11:2020+A1:2020

Test Method: EN 55032: 2015+A11:2020+A1:2020

Limit:

0.15MHz – 0.5MHz 97dB(μV)-87dB(μV) quasi-peak, 84(μV)-74dB(μV) average

0.5MHz – 30MHz 87dB(μV) quasi-peak, 74dB(μV) average

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.2.1 E.U.T. Operation

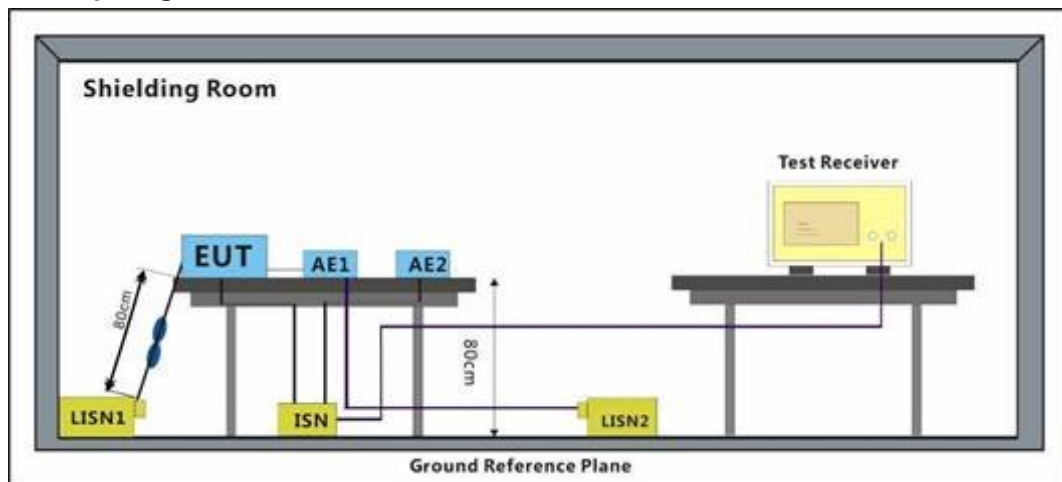
Operating Environment:

Temperature: 21.8 °C Humidity: 49.5 % RH Atmospheric Pressure: 1010 mbar

6.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.2.3 Test Setup Diagram



6.2.4 Measurement Procedure and Data

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.

Remark: Level= Read Level+ Cable Loss+ LISN Factor

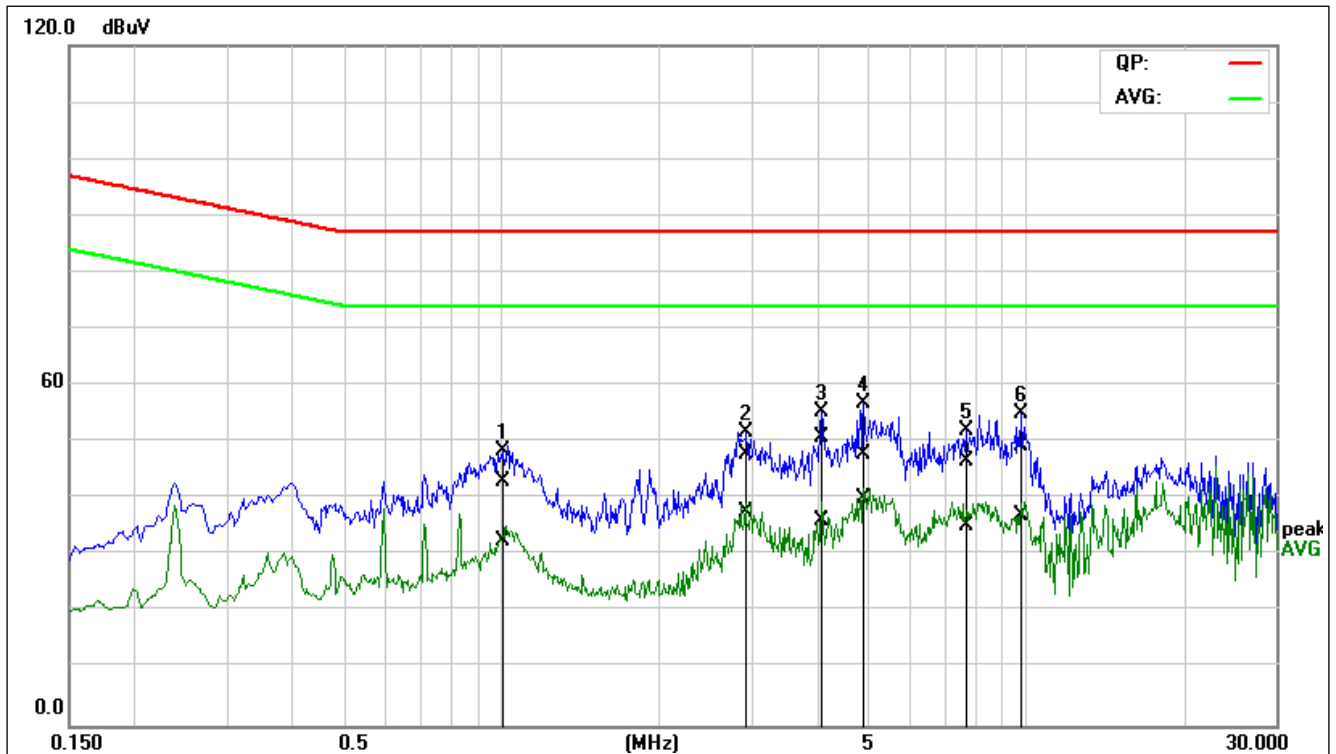
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 22 of 84

Test Mode:00



No.	Frequency	QuasiPeak reading	Average reading	Correction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin	Remark
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)	
1	1.0072	23.02	12.63	19.98	43.00	32.61	87.00	74.00	-44.00	-41.39	Pass
2	2.9285	27.85	17.57	20.10	47.95	37.67	87.00	74.00	-39.05	-36.33	Pass
3	4.0908	30.83	16.13	20.09	50.92	36.22	87.00	74.00	-36.08	-37.78	Pass
4*	4.9254	27.61	20.09	20.09	47.70	40.18	87.00	74.00	-39.30	-33.82	Pass
5	7.7352	26.46	15.12	20.19	46.65	35.31	87.00	74.00	-40.35	-38.69	Pass
6	9.8207	29.31	16.88	20.10	49.41	36.98	87.00	74.00	-37.59	-37.02	Pass

6.3 Radiated Emissions (30MHz-1GHz)

Test Requirement: EN 55032: 2015+A11:2020+A1:2020

Test Method: EN 55032: 2015+A11:2020+A1:2020

Limit:

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

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
 Highest internal frequency (F_x): F_x ≤ 108MHz
 Highest measured frequency: 1GHz

6.3.1 E.U.T. Operation

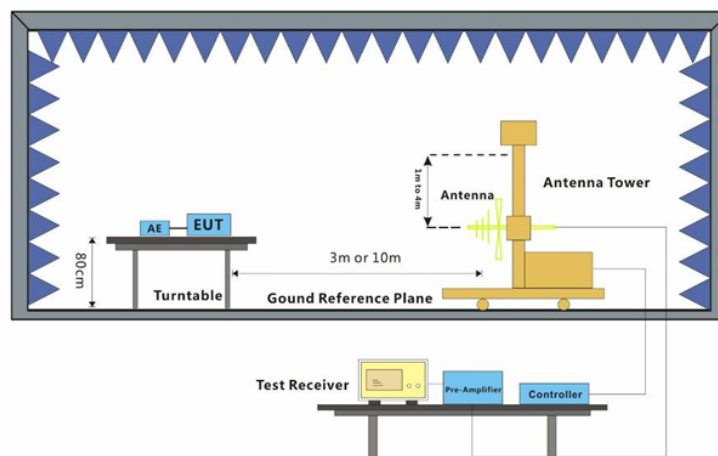
Operating Environment:

Temperature: 20.8 °C Humidity: 53.1 % RH Atmospheric Pressure: 1010 mbar

6.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.3.3 Test Setup Diagram





Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 24 of 84

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 BiConiLog antenna with 2 orthogonal polarities.

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

$\text{Level} = \text{Read Level} + \text{Antenna Factor} + \text{Cable Loss} - \text{Preamp Factor}$

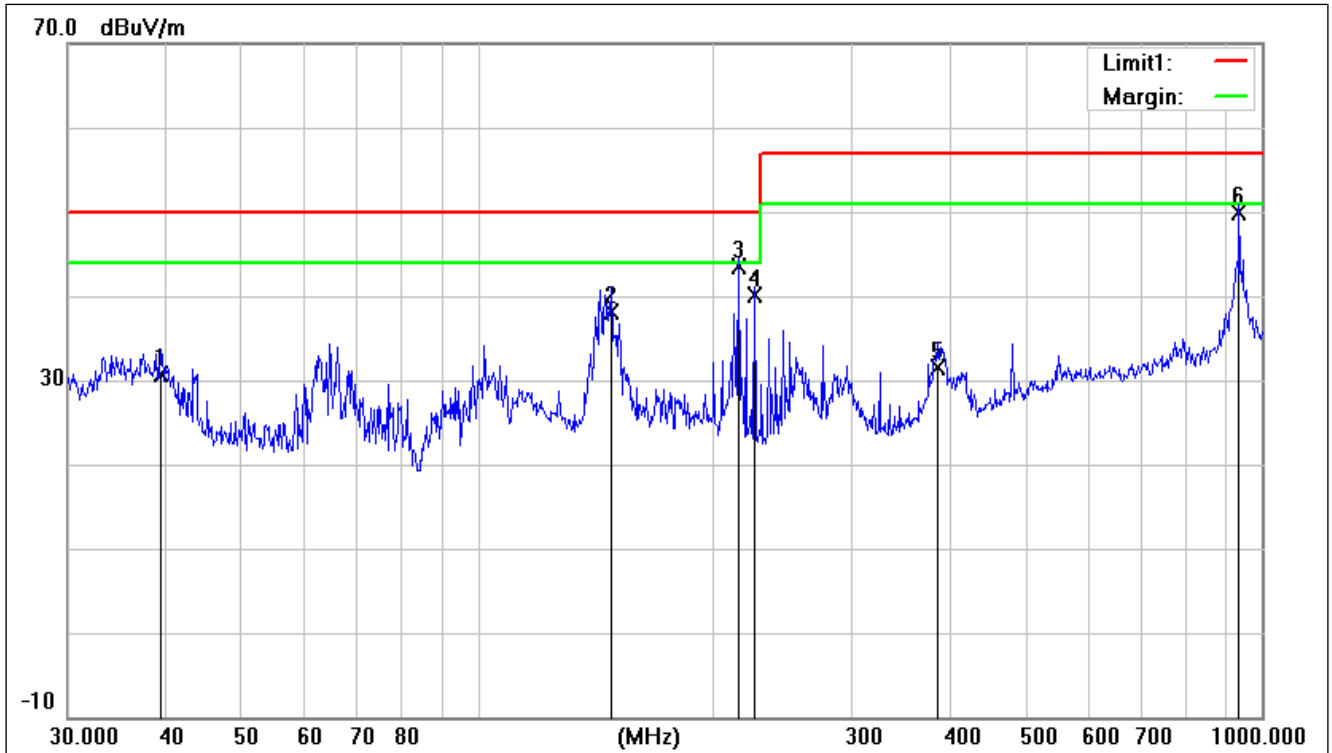
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 25 of 84

Test Mode: 00; Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	39.4372	8.19	22.49	30.68	50.00	-19.32	100	153	QP
2	147.9214	20.19	17.93	38.12	50.00	-11.88	300	180	QP
3	215.2678	26.84	16.64	43.48	50.00	-6.52	200	80	QP
4	225.3080	22.98	17.07	40.05	50.00	-9.95	100	74	QP
5	385.2805	8.81	22.67	31.48	57.00	-25.52	100	218	QP
6	935.5463	20.81	29.14	49.95	57.00	-7.05	100	37	QP

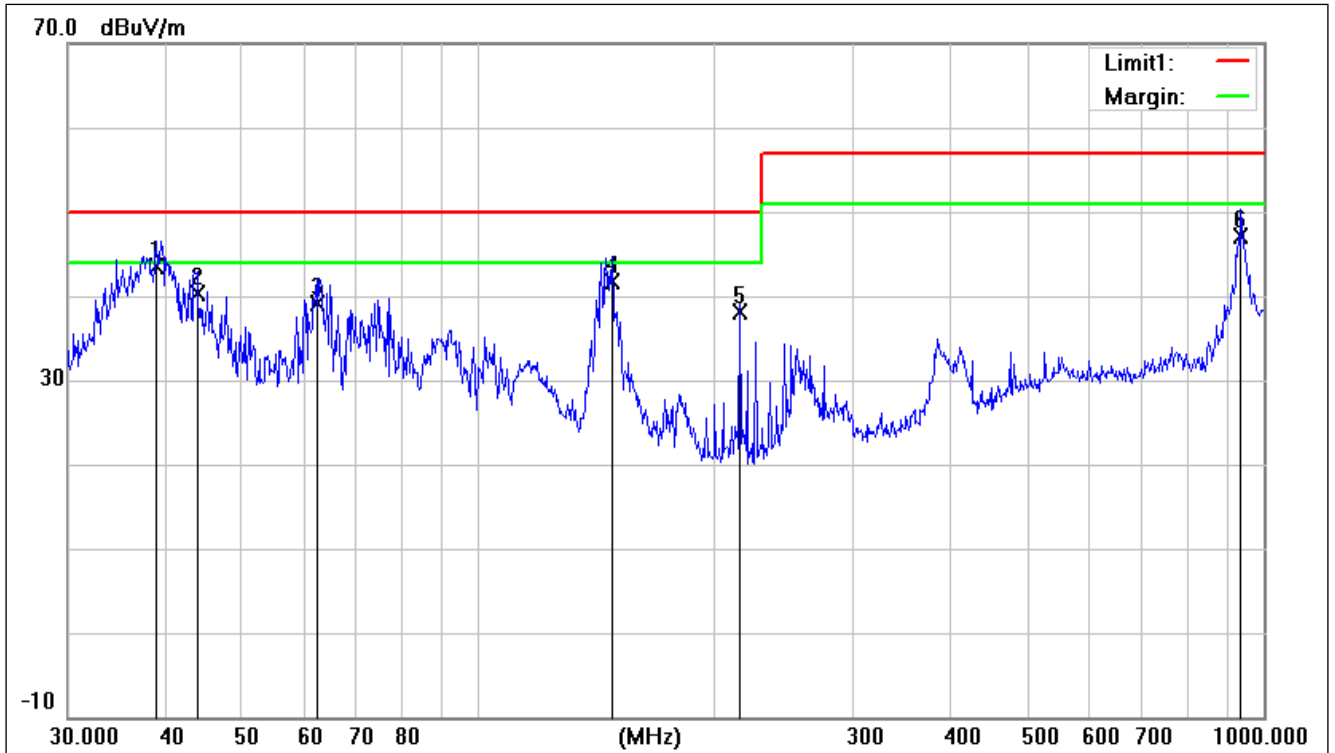
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 26 of 84

Test Mode: 00; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	38.8879	20.76	22.71	43.47	50.00	-6.53	100	89	QP
2	43.8119	20.08	20.32	40.40	50.00	-9.60	200	279	QP
3	62.2128	24.34	14.74	39.08	50.00	-10.92	100	292	QP
4	147.9214	23.74	17.93	41.67	50.00	-8.33	300	360	QP
5	215.2678	21.45	16.64	38.09	50.00	-11.91	100	340	QP
6	935.5463	18.06	29.14	47.20	57.00	-9.80	200	360	QP

6.4 Radiated Emissions (Above 1GHz)

Test Requirement: EN 55032: 2015+A11:2020+A1:2020

Test Method: EN 55032: 2015+A11:2020+A1:2020

Limit:

1000MHz-6000MHz: 80 dB(μV/m) peak; 60 dB(μV/m) average

Detector: Peak for pre-scan (1000kHz resolution bandwidth) 1000MHz to 6000MHz

Highest internal
frequency (Fx):

Highest measured frequency:

$F_x \leq 108\text{MHz}$ 1GHz

$108\text{MHz} < F_x \leq 500\text{MHz}$ 2GHz

$500\text{MHz} < F_x \leq 1\text{GHz}$ 5GHz

$F_x > 1\text{GHz}$ $5 \times F_x$ up to a maximum of 6GHz

6.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

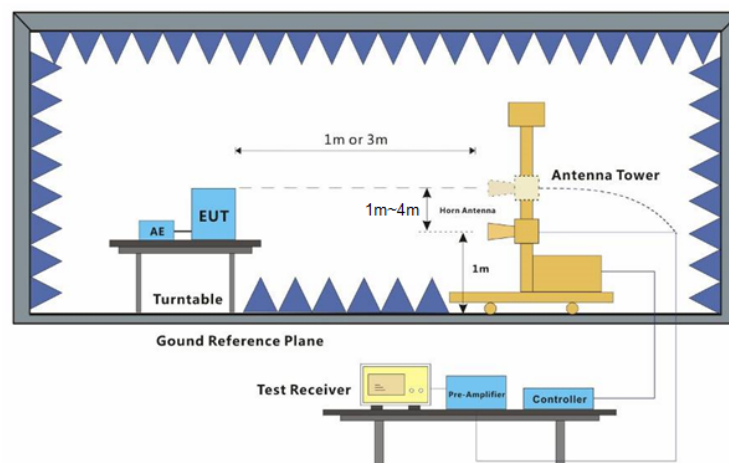
Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar

6.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.4.3 Test Setup Diagram



6.4.4 Measurement Procedure and Data

Frequency range: Above 1GHz

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Average measurements were conducted based on the peak sweep graph. The EUT was measured by Horn 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

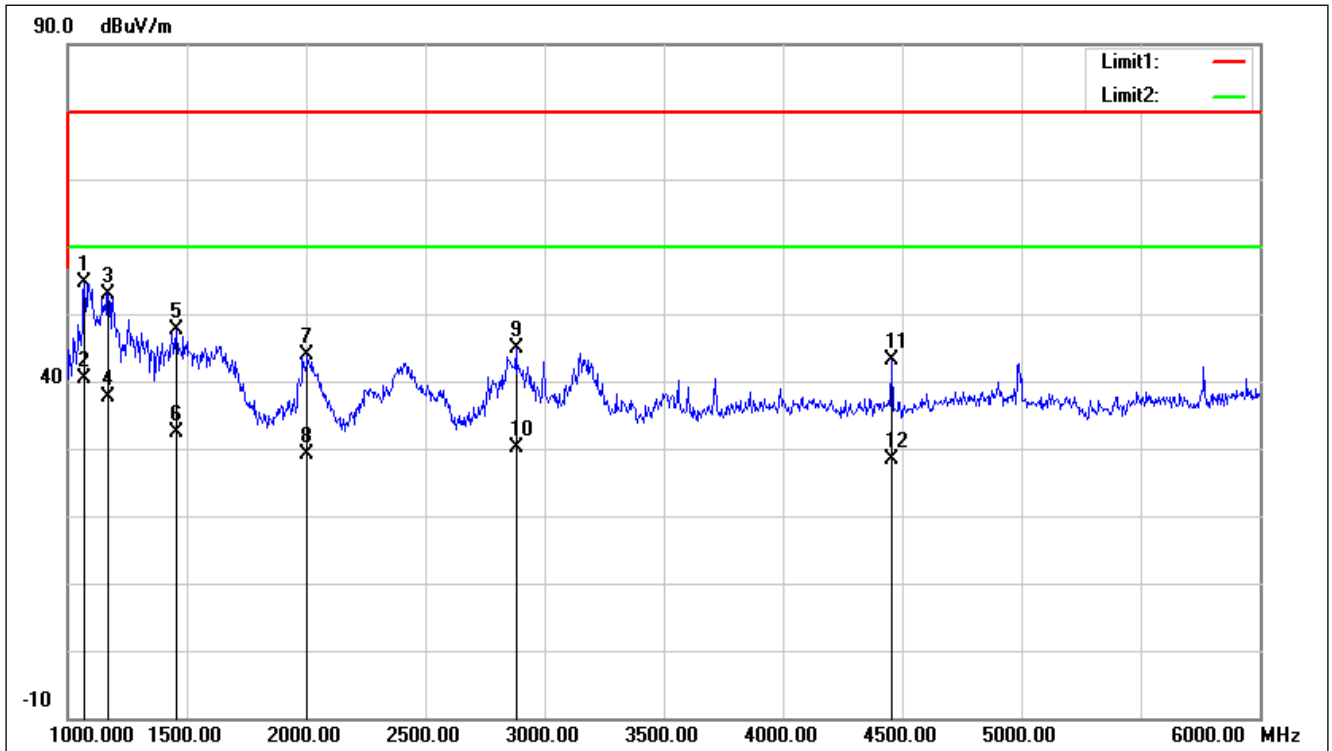
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 28 of 84

Test Mode: 00; Polarity: Horizontal



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	1070.000	77.32	-22.68	54.64	80.00	-25.36	200	34	peak
2	1070.000	62.96	-22.68	40.28	60.00	-19.72	200	34	AVG
3	1170.000	75.01	-22.13	52.88	80.00	-27.12	200	45	peak
4	1170.000	59.66	-22.13	37.53	60.00	-22.47	200	45	AVG
5	1455.000	69.46	-21.87	47.59	80.00	-32.41	200	31	peak
6	1455.000	54.35	-21.87	32.48	60.00	-27.52	200	31	AVG
7	2005.000	64.81	-21.03	43.78	80.00	-36.22	100	8	peak
8	2005.000	50.16	-21.03	29.13	60.00	-30.87	100	8	AVG
9	2880.000	62.57	-17.75	44.82	80.00	-35.18	100	100	peak
10	2880.000	47.81	-17.75	30.06	60.00	-29.94	100	100	AVG
11	4455.000	57.22	-13.99	43.23	80.00	-36.77	200	339	peak
12	4455.000	42.32	-13.99	28.33	60.00	-31.67	200	339	AVG

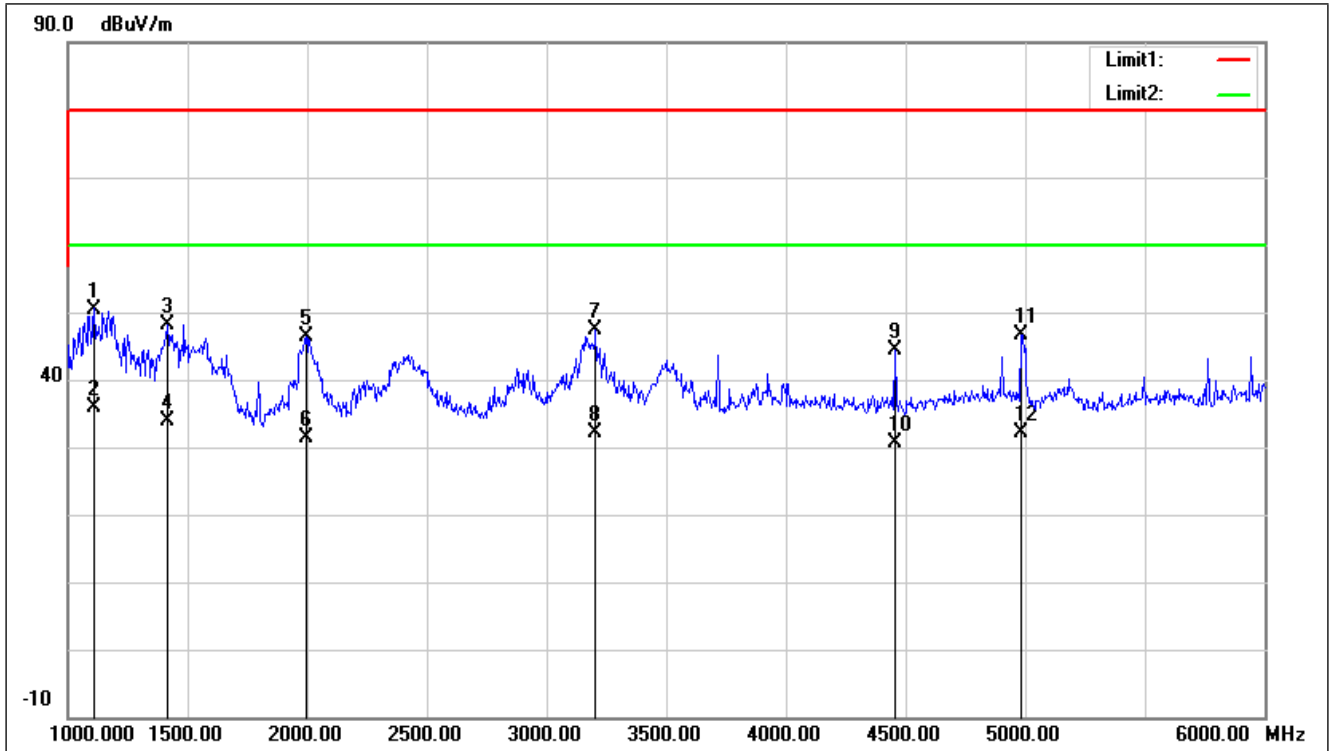
Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 29 of 84

Test Mode: 00; Polarity: Vertical



No.	Frequency (MHz)	Reading (dBuV)	Correct Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (deg.)	Remark
1	1110.000	73.06	-22.56	50.50	80.00	-29.50	100	13	peak
2	1110.000	58.45	-22.56	35.89	60.00	-24.11	100	13	AVG
3	1415.000	69.84	-21.76	48.08	80.00	-31.92	200	345	peak
4	1415.000	55.72	-21.76	33.96	60.00	-26.04	200	345	AVG
5	1995.000	67.37	-21.06	46.31	80.00	-33.69	100	72	peak
6	1995.000	52.49	-21.06	31.43	60.00	-28.57	100	72	AVG
7	3205.000	64.26	-17.00	47.26	80.00	-32.74	200	79	peak
8	3205.000	49.09	-17.00	32.09	60.00	-27.91	200	79	AVG
9	4455.000	58.26	-13.99	44.27	80.00	-35.73	100	16	peak
10	4455.000	44.50	-13.99	30.51	60.00	-29.49	100	16	AVG
11	4980.000	59.59	-12.90	46.69	80.00	-33.31	100	113	peak
12	4980.000	45.08	-12.90	32.18	60.00	-27.82	100	113	AVG

6.5 Voltage Fluctuations and Flicker

Test Requirement: EN 61000-3-3: 2013+ A1:2019+A2:2021

Test Method: EN 61000-3-3: 2013+ A1:2019+A2:2021

6.5.1 E.U.T. Operation

Operating Environment:

Temperature: 21.8 °C

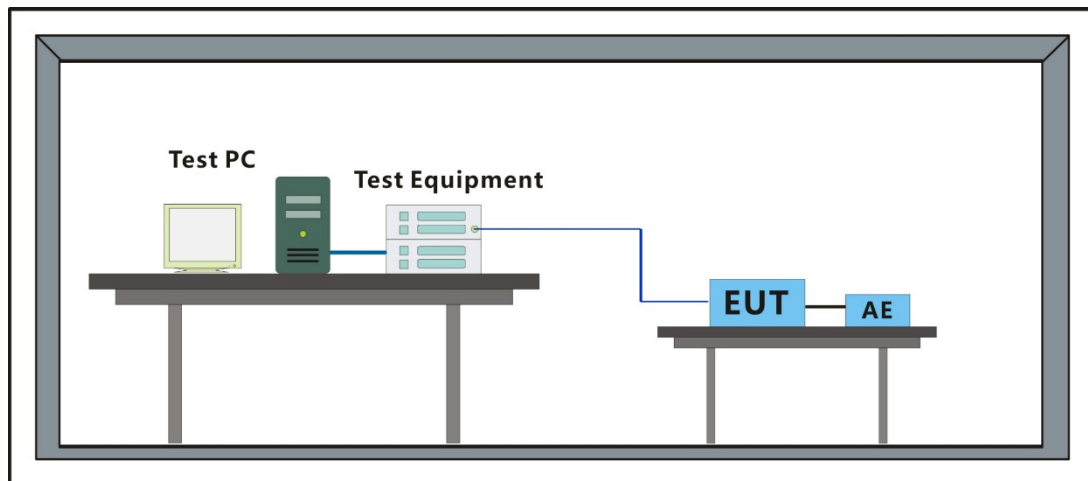
Humidity: 49.8 % RH

Atmospheric Pressure: 1010 mbar

6.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.5.3 Test Setup Diagram



6.5.4 Measurement Procedure and Data

Parameter values recorded during the test:

Vrms at the end of test (Volt): 230.18

Highest dt (%):

T-max (mS): 0

Highest dc (%): 0.00

Highest dmax (%): 0.00

Highest Pst (10 min. period): 0.273

Highest Plt (2 hr. period): 0.119

Test limit (%):

Test limit (mS): 500.0 Pass

Test limit (%): 3.30 Pass

Test limit (%): 4.00 Pass

Test limit: 1.000 Pass

Test limit: 0.650 Pass

6.6 Harmonic Current Emission

Test Requirement: EN IEC 61000-3-2: 2019+A1:2021

Test Method: EN IEC 61000-3-2: 2019+A1:2021

6.6.1 E.U.T. Operation

Operating Environment:

Temperature: 21.8 °C

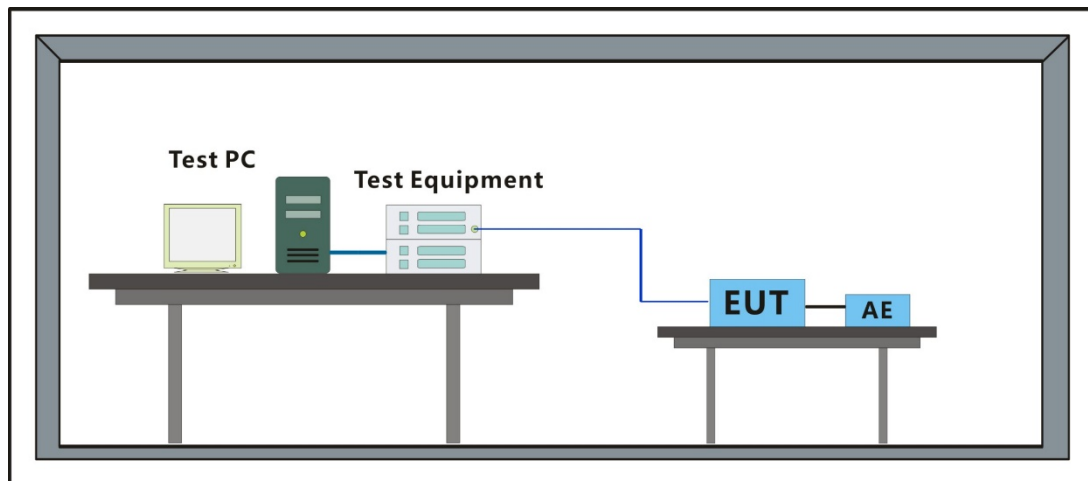
Humidity: 49.8 % RH

Atmospheric Pressure: 1010 mbar

6.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

6.6.3 Test Setup Diagram



6.6.4 Measurement Procedure and Data

Frequency Range: 100Hz to 2kHz



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 32 of 84

Test Mode: 00

Test Result: Pass Source qualification: Normal
THC(A): 0.030 I-THD(%): 25.6 POHC(A): 0.005 POHC Limit(A): 0.251

Highest parameter values during test:

V_RMS (Volts):	230.20	Frequency(Hz):	50.00
I_Peak (Amps):	0.417	I_RMS (Amps):	0.180
I_Fund (Amps):	0.119	Crest Factor:	2.341
Power (Watts):	12.8	Power Factor:	0.323

Harm#	Harms(avg)	100%Limit	%of Limit	Harms(max)	150%Limit	%of Limit	Status
2	0.001	1.080	N/A	0.001	1.620	N/A	Pass
3	0.027	2.300	1.2	0.028	3.450	0.8	Pass
4	0.001	0.430	N/A	0.001	0.645	N/A	Pass
5	0.008	1.140	0.7	0.008	1.710	0.5	Pass
6	0.001	0.300	N/A	0.001	0.450	N/A	Pass
7	0.007	0.770	0.9	0.008	1.155	0.7	Pass
8	0.000	0.230	N/A	0.000	0.345	N/A	Pass
9	0.005	0.400	1.3	0.006	0.600	0.9	Pass
10	0.000	0.184	N/A	0.001	0.276	N/A	Pass
11	0.004	0.330	N/A	0.004	0.495	N/A	Pass
12	0.000	0.153	N/A	0.000	0.230	N/A	Pass
13	0.004	0.210	N/A	0.004	0.315	N/A	Pass
14	0.000	0.131	N/A	0.000	0.197	N/A	Pass
15	0.003	0.150	N/A	0.003	0.225	N/A	Pass
16	0.000	0.115	N/A	0.000	0.173	N/A	Pass
17	0.003	0.132	N/A	0.003	0.198	N/A	Pass
18	0.000	0.102	N/A	0.000	0.153	N/A	Pass
19	0.002	0.118	N/A	0.002	0.178	N/A	Pass
20	0.000	0.092	N/A	0.000	0.138	N/A	Pass
21	0.002	0.107	N/A	0.002	0.161	N/A	Pass
22	0.000	0.084	N/A	0.000	0.125	N/A	Pass
23	0.002	0.098	N/A	0.002	0.147	N/A	Pass
24	0.000	0.077	N/A	0.000	0.115	N/A	Pass
25	0.002	0.090	N/A	0.002	0.135	N/A	Pass
26	0.000	0.071	N/A	0.001	0.107	N/A	Pass
27	0.002	0.083	N/A	0.002	0.125	N/A	Pass
28	0.001	0.066	N/A	0.001	0.099	N/A	Pass
29	0.001	0.078	N/A	0.002	0.116	N/A	Pass
30	0.001	0.061	N/A	0.001	0.092	N/A	Pass
31	0.001	0.073	N/A	0.002	0.109	N/A	Pass
32	0.001	0.058	N/A	0.001	0.086	N/A	Pass
33	0.001	0.068	N/A	0.002	0.102	N/A	Pass
34	0.000	0.054	N/A	0.001	0.081	N/A	Pass
35	0.001	0.064	N/A	0.001	0.096	N/A	Pass
36	0.000	0.051	N/A	0.001	0.077	N/A	Pass
37	0.001	0.061	N/A	0.001	0.091	N/A	Pass
38	0.000	0.048	N/A	0.001	0.073	N/A	Pass
39	0.001	0.058	N/A	0.001	0.087	N/A	Pass
40	0.000	0.046	N/A	0.001	0.069	N/A	Pass



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 33 of 84

Test Mode: 00

Harm#	Harmonics V-rms	Limit V-rms	% of Limit	Status
2	0.164	0.460	35.73	OK
3	0.437	2.072	21.10	OK
4	0.034	0.460	7.32	OK
5	0.039	0.921	4.25	OK
6	0.088	0.460	19.13	OK
7	0.050	0.691	7.27	OK
8	0.042	0.460	9.19	OK
9	0.029	0.460	6.40	OK
10	0.029	0.460	6.29	OK
11	0.016	0.230	7.12	OK
12	0.019	0.230	8.37	OK
13	0.016	0.230	6.78	OK
14	0.014	0.230	6.10	OK
15	0.011	0.230	4.73	OK
16	0.013	0.230	5.58	OK
17	0.013	0.230	5.76	OK
18	0.017	0.230	7.47	OK
19	0.009	0.230	3.93	OK
20	0.008	0.230	3.55	OK
21	0.009	0.230	3.84	OK
22	0.007	0.230	3.18	OK
23	0.006	0.230	2.67	OK
24	0.006	0.230	2.45	OK
25	0.006	0.230	2.67	OK
26	0.010	0.230	4.37	OK
27	0.005	0.230	2.03	OK
28	0.008	0.230	3.46	OK
29	0.006	0.230	2.44	OK
30	0.006	0.230	2.49	OK
31	0.005	0.230	2.11	OK
32	0.006	0.230	2.43	OK
33	0.006	0.230	2.55	OK
34	0.004	0.230	1.58	OK
35	0.003	0.230	1.46	OK
36	0.003	0.230	1.42	OK
37	0.005	0.230	1.99	OK
38	0.003	0.230	1.47	OK
39	0.003	0.230	1.47	OK
40	0.005	0.230	2.33	OK

7 Immunity Test Results

Performance Criteria Description in EN 50130-4:2011 +A1:2014

There shall be no damage, malfunction or change of status due to the conditioning. Flickering of an indicator during the application of the discharges is permissible, providing that there is no residual change in the EUT or any change in outputs, which could be interpreted by associated equipment as a change.

For further details, please refer to Clause 7.4, 8.4, 9.4, 10.4, 11.4, 12.4 and 13.4, of EN 50130-4.

General Performance Criteria Description in EN 55035: 2017+A11:2020

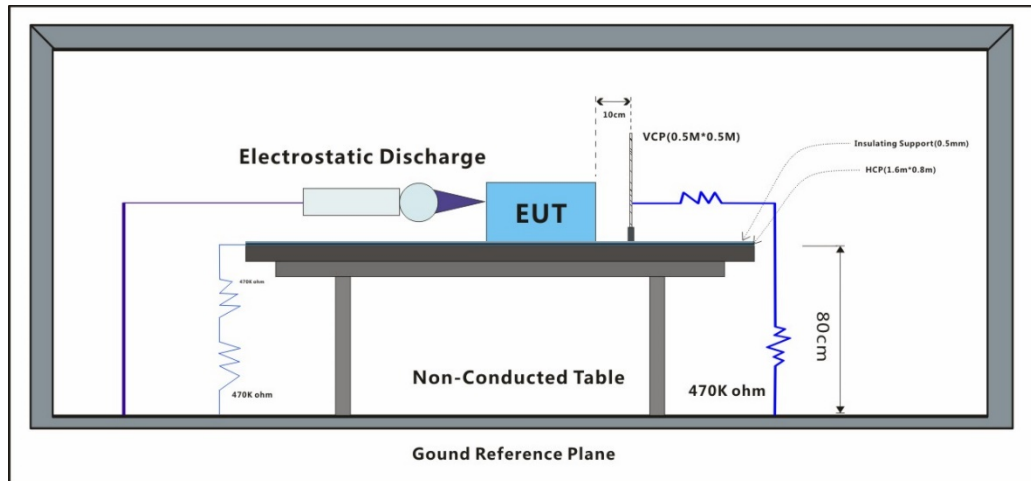
- | | |
|-------------|--|
| Criterion A | The equipment shall continue to operate as intended without operator intervention. No degradation of performance, loss of function or change of operating state is allowed below a performance level specified by the manufacturer when the equipment is used as intended. 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, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended. |
| Criterion B | During the application of the disturbance, degradation of performance is allowed. However, no unintended change of actual operating state or stored data is allowed to persist after the test.
After the test, the equipment shall continue to operate as intended without operator intervention; no degradation of performance or loss of function is allowed, below a performance level specified by the manufacturer, when the equipment 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), or recovery time, is not specified by the manufacturer, then either of these may be derived from the product description and documentation, and by what the user may reasonably expect from the equipment if used as intended. |
| Criterion C | Loss of function is allowed, provided the function is self-recoverable, or can be restored by the operation of the controls by the user in accordance with the manufacturer's instructions. A reboot or re-start operation is allowed.
Information stored in non-volatile memory, or protected by a battery backup, shall not be lost. |

7.1 Electrostatic Discharge

Test Requirement: EN 50130-4: 2011 +A1:2014

Test Method: EN 61000-4-2:2009

7.1.1 Test Setup Diagram



7.1.2 E.U.T. Operation

Operating Environment:

Temperature: 24.5 °C

Humidity: 51.2 % RH

Atmospheric Pressure: 1010 mbar

7.1.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 36 of 84

7.1.4 Test Condition and Results:

Number of Discharge: Minimum 10 times at each test point for Air Discharge; Minimum 50 times at each test point for Contact or VCP & HCP Discharge

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.

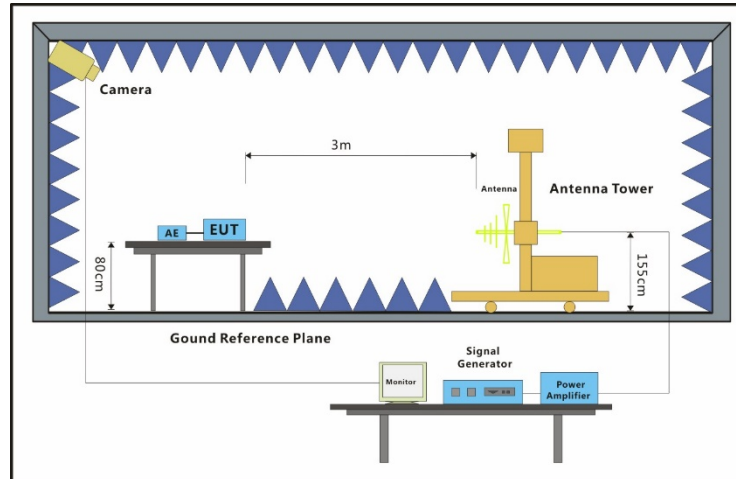
Discharge type	Level (kV)	Polarity	Test Point	Result / Observations
Air Discharge	2,4,8	+	1	A
Air Discharge	2,4,8	-	1	A
Contact Discharge	6	+	2	A
Contact Discharge	6	-	2	A
Horizontal Coupling	6	+	3	A
Horizontal Coupling	6	-	3	A
Vertical Coupling	6	+	3	A
Vertical Coupling	6	-	3	A
A: No degradation in the performance of the EUT was observed				

7.2 Radiated Immunity(80MHz-2.7GHz)

Test Requirement: EN 50130-4: 2011 +A1:2014

Test Method: EN IEC 61000-4-3: 2020

7.2.1 Test Setup Diagram



7.2.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar

7.2.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.2.4 Test Condition and Results:

Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

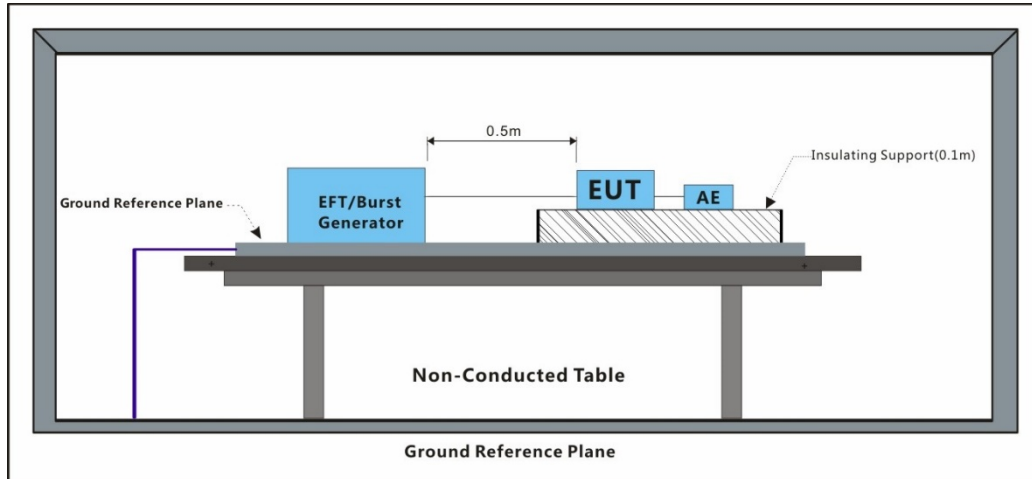
Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-2.7GHz	10	Front	3s	A
80MHz-2.7GHz	10	Back	3s	A
80MHz-2.7GHz	10	Left	3s	A
80MHz-2.7GHz	10	Right	3s	A
80MHz-2.7GHz	10	Top	3s	A
80MHz-2.7GHz	10	Underside	3s	A
A: No degradation in the performance of the EUT was observed				

7.3 Electrical Fast Transients & Burst at AC Power Port

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 51 % RH

Atmospheric Pressure: 1010 mbar

7.3.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.3.4 Test Condition and Results:

Repetition Frequency: 100kHz

Burst Period: 300ms

Test Duration: 1 minute per level & polarity

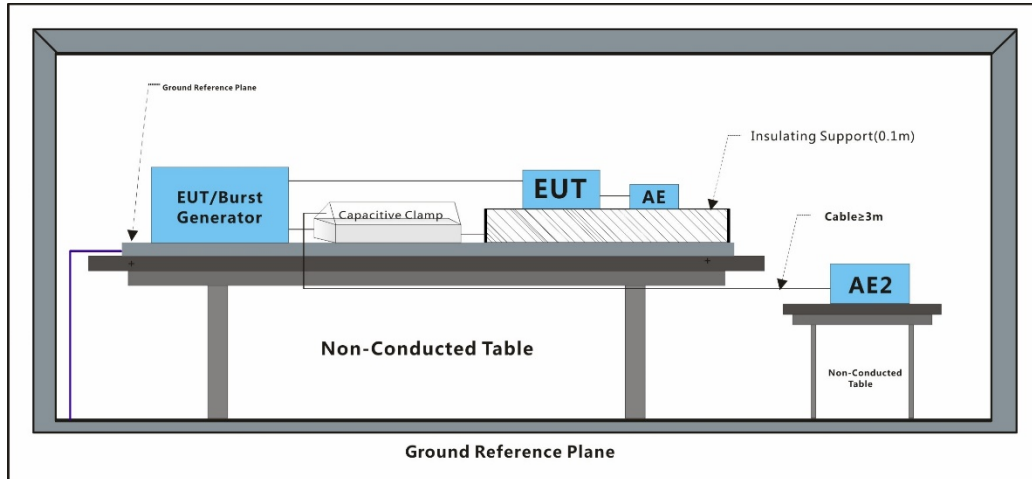
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	2	+	CDN	A
AC power port	2	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.4 Electrical Fast Transients & Burst at Signal Port

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 51 % RH

Atmospheric Pressure: 1010 mbar

7.4.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.4.4 Test Condition and Results:

Repetition Frequency: 100kHz

Burst Period: 300ms

Test Duration: 1 minute per level & polarity

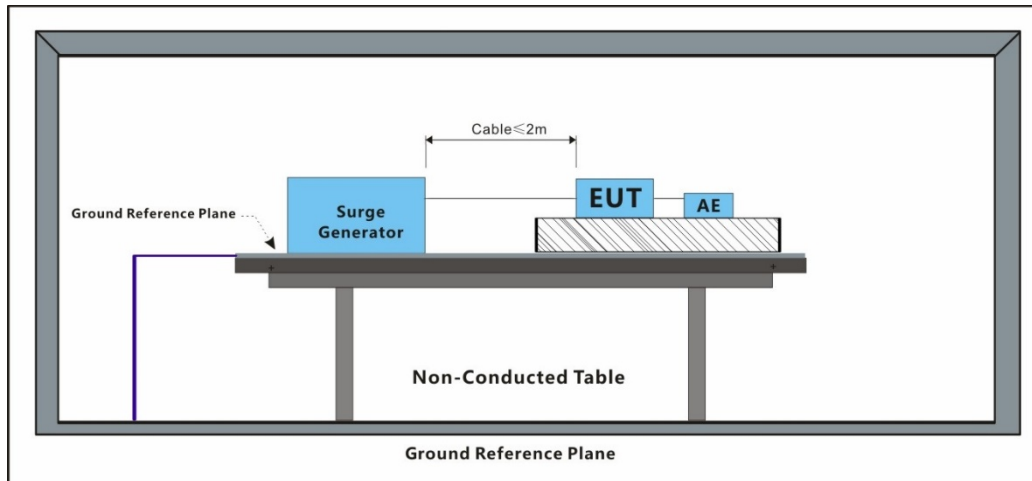
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
Signal Port	1	+	Clamp	A
Signal Port	1	-	Clamp	A
A: No degradation in the performance of the EUT was observed				

7.5 Surge at AC Power Port

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 52 % RH

Atmospheric Pressure: 1010 mbar

7.5.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 41 of 84

7.5.4 Test Condition and Results:

Interval: 60s between each surge

No. of surges: 5 positive, 5 negative

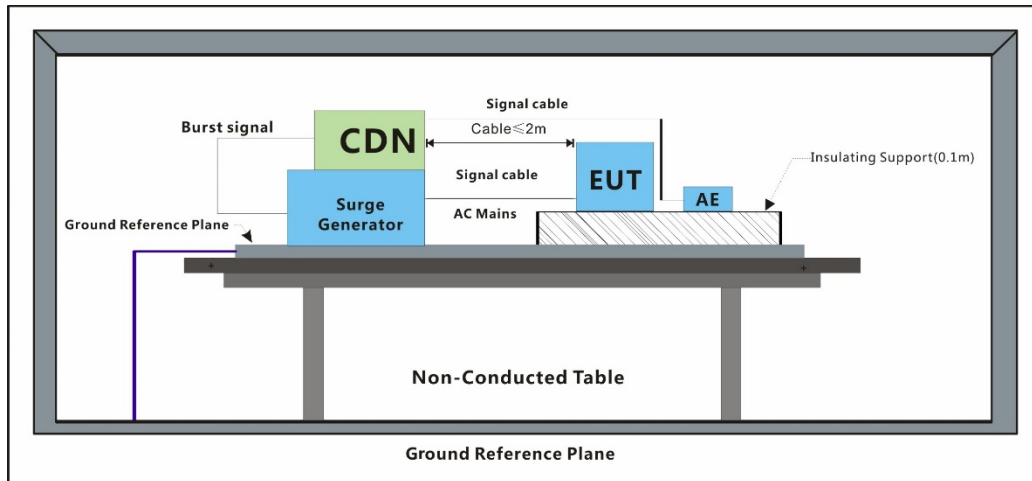
Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	0.5,1	+	0°	A
L-N	0.5,1	-	0°	A
L-N	0.5,1	+	90°	A
L-N	0.5,1	-	90°	A
L-N	0.5,1	+	180°	A
L-N	0.5,1	-	180°	A
L-N	0.5,1	+	270°	A
L-N	0.5,1	-	270°	A
L-PE	0.5,1,2	+	0°	A
L-PE	0.5,1,2	-	0°	A
L-PE	0.5,1,2	+	90°	A
L-PE	0.5,1,2	-	90°	A
L-PE	0.5,1,2	+	180°	A
L-PE	0.5,1,2	-	180°	A
L-PE	0.5,1,2	+	270°	A
L-PE	0.5,1,2	-	270°	A
N-PE	0.5,1,2	+	0°	A
N-PE	0.5,1,2	-	0°	A
N-PE	0.5,1,2	+	90°	A
N-PE	0.5,1,2	-	90°	A
N-PE	0.5,1,2	+	180°	A
N-PE	0.5,1,2	-	180°	A
N-PE	0.5,1,2	+	270°	A
N-PE	0.5,1,2	-	270°	A
A: No degradation in the performance of the EUT was observed				

7.6 Surge at Signal Port

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 51 % RH

Atmospheric Pressure: 1010 mbar

7.6.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.6.4 Test Condition and Results:

Interval: 60s between each surge

No. of surges: 5 positive, 5 negative.

Port	Line	Level (kV)	Polarity	Result / Observations
Signal port	Line-Ground	0.5	+	A
Signal port	Line-Ground	0.5	-	A
Signal port	Line-Ground	1	+	A
Signal port	Line-Ground	1	-	A

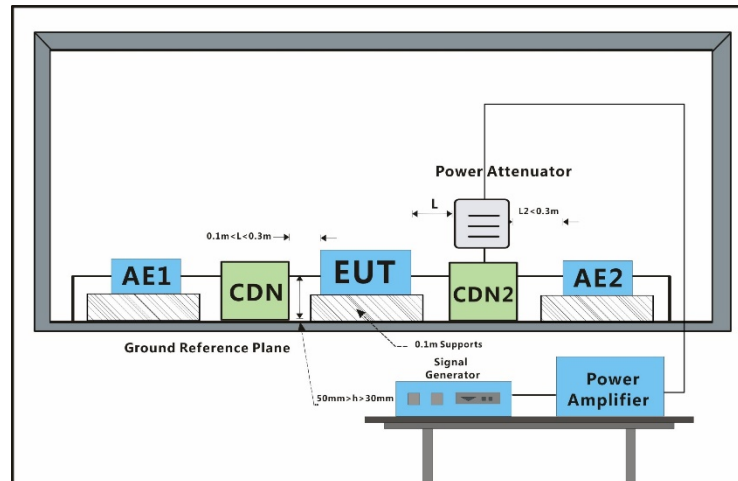
A: No degradation in the performance of the EUT was observed

7.7 Conducted Immunity at Power Port (150kHz-100MHz)

Test Requirement: EN 50130-4: 2011 +A1:2014

Test Method: EN 61000-4-6:2014

7.7.1 Test Setup Diagram



7.7.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 55 % RH

Atmospheric Pressure: 1010 mbar

7.7.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.7.4 Test Condition and Results:

Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

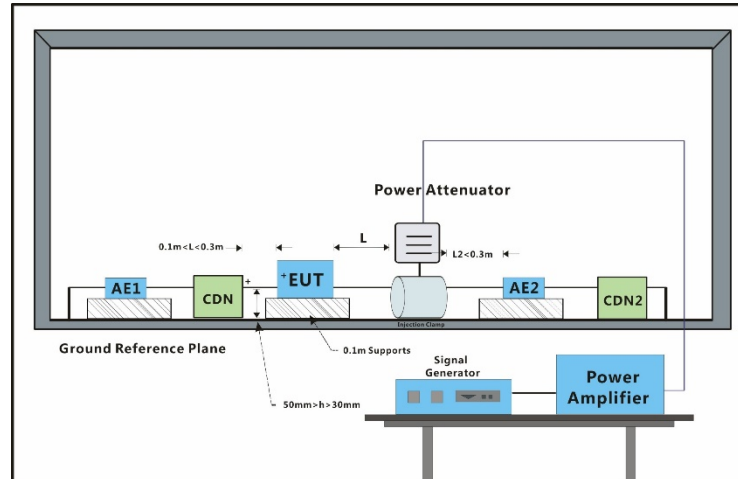
Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	10	CDN	3s	A
A: No degradation in the performance of the EUT was observed				

7.8 Conducted Immunity at Signal Port (150kHz-100MHz)

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 51 % RH

Atmospheric Pressure: 1010 mbar

7.8.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.8.4 Test Condition and Results:

Modulation: 80%, 1 kHz Amplitude Modulation & 0.5s ON 0.5s OFF Pulse Modulation

Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
Signal or Control port	10	CDN	3s	A

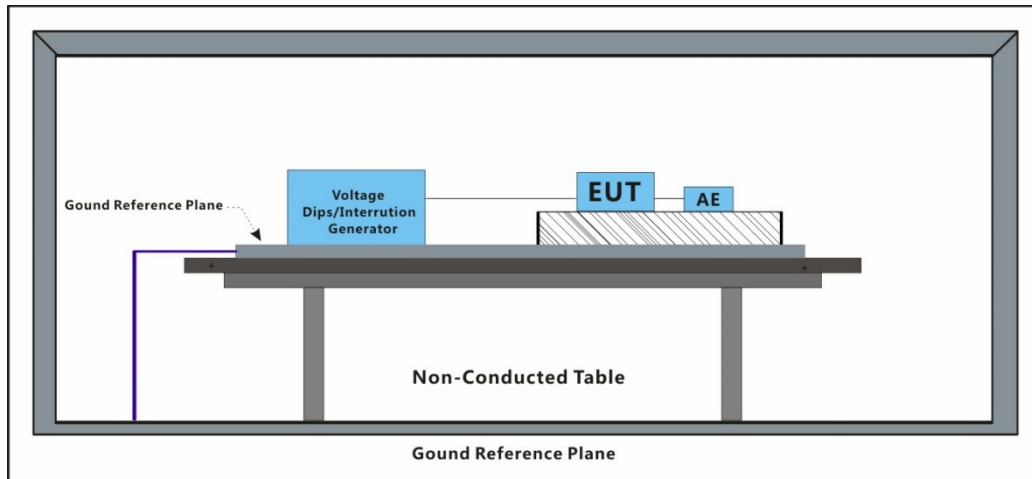
A: No degradation in the performance of the EUT was observed

7.9 Mains Supply Voltage Variations

Test Requirement: EN 50130-4: 2011 +A1:2014

Test Method: EN 50130-4:2011+A1:2014

7.9.1 Test Setup Diagram



7.9.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

7.9.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.9.4 Test Condition and Results:

Voltage max.: AC 264V (Umax: Unom + 10%)

Voltage min.: AC 85V (Umin: Unom - 15%)

Unom Voltage: AC 100-240V

Test phenomenon description for the EUT:

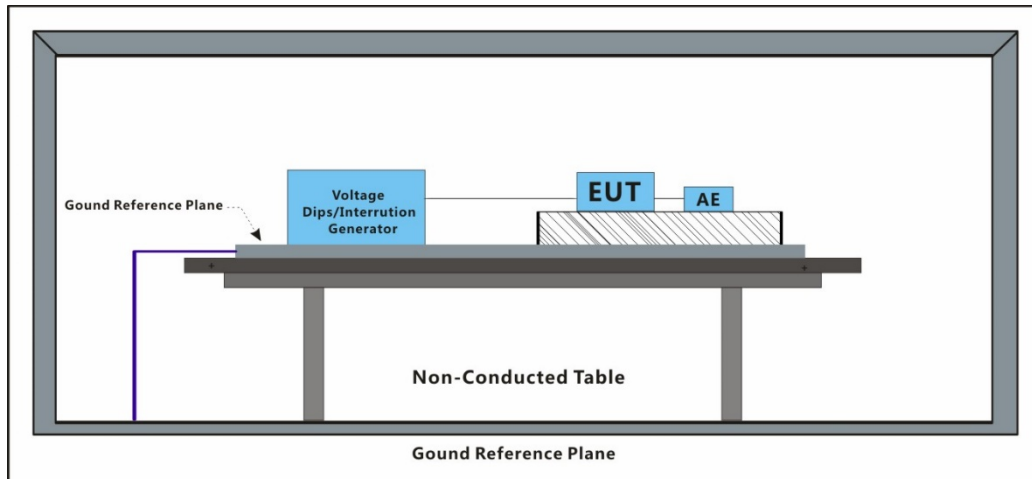
1. The EUT working normal, before the conditioning.
 2. Monitor the EUT during the conditioning period and detected no any changes in states, during the conditioning.
 3. No degradation in the performance of the EUT was observed, after the conditioning.
- A: No degradation in the performance of the EUT was observed

7.10 Voltage Dips and Interruptions

Test Requirement: EN 50130-4: 2011 +A1:2014

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: 51 % RH

Atmospheric Pressure: 1010 mbar

7.10.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 47 of 84

7.10.4 Test Condition and Results:

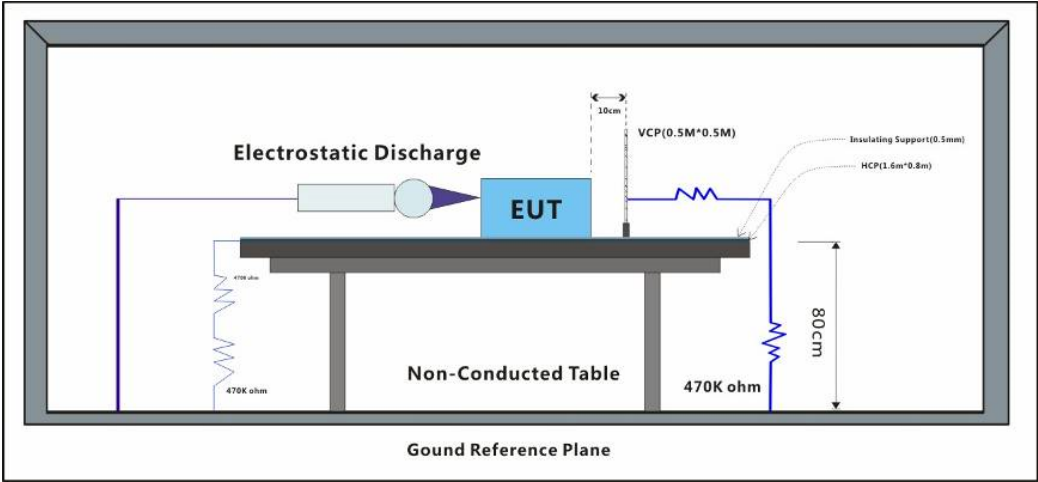
Performance Criterion:
 0% of UT (Supply Voltage) for 250 Periods;
 40% of UT for 10 Periods;
 70% of UT for 25 Periods; 80% of UT for 250 Periods;
 No. of Dips / Interruptions: 3 per Level
 Time between dropout 10s

Level % UT	Phase (deg)	Duration	No. of Dips / Interruptions	Result / Observations
80	0°	250 Cycles	3	A
80	180°	250 Cycles	3	A
70	0°	25 Cycles	3	A
70	180°	25 Cycles	3	A
40	0°	10 Cycles	3	A
40	180°	10 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 the test,the EUT working abnormally. After the test,the EUT automatically recovering working normally.				

7.11 Electrostatic Discharge

Test Requirement: EN 55035: 2017+A11:2020
 Test Method: EN 61000-4-2: 2009

7.11.1 Test Setup Diagram



7.11.2 E.U.T. Operation

Operating Environment:
 Temperature: 24.5 °C Humidity: 51.2 % RH Atmospheric Pressure: 1010 mbar

7.11.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 49 of 84

7.11.4 Test Condition and Results:

Performance Criterion: B

Discharge Impedance: 330Ω/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

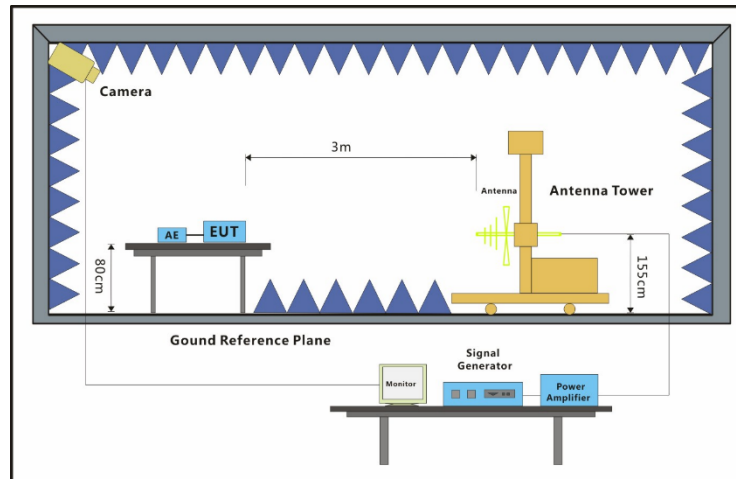
A: No degradation in the performance of the EUT was observed

7.12 Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz)

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN IEC 61000-4-3: 2020

7.12.1 Test Setup Diagram



7.12.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 48 % RH

Atmospheric Pressure: 1010 mbar

7.12.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 51 of 84

7.12.4 Test Condition and Results:

Performance Criterion: A

Frequency Range: 80MHz to 1GHz, 1800MHz, 2600MHz, 3500MHz, 5000MHz

Antenna Polarisation: Vertical and Horizontal

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

Test Distance:3m

Frequency	Level (V/m)	EUT Face	Dwell time	Result / Observations
80MHz-1GHz	3	Front	3s	A
80MHz-1GHz	3	Back	3s	A
80MHz-1GHz	3	Left	3s	A
80MHz-1GHz	3	Right	3s	A
80MHz-1GHz	3	Top	3s	A
80MHz-1GHz	3	Underside	3s	A
1800MHz	3	Front	3s	A
1800MHz	3	Back	3s	A
1800MHz	3	Left	3s	A
1800MHz	3	Right	3s	A
1800MHz	3	Top	3s	A
1800MHz	3	Underside	3s	A
2600MHz	3	Front	3s	A
2600MHz	3	Back	3s	A
2600MHz	3	Left	3s	A
2600MHz	3	Right	3s	A
2600MHz	3	Top	3s	A
2600MHz	3	Underside	3s	A
3500MHz	3	Front	3s	A
3500MHz	3	Back	3s	A
3500MHz	3	Left	3s	A
3500MHz	3	Right	3s	A
3500MHz	3	Top	3s	A
3500MHz	3	Underside	3s	A
5000MHz	3	Front	3s	A
5000MHz	3	Back	3s	A
5000MHz	3	Left	3s	A
5000MHz	3	Right	3s	A
5000MHz	3	Top	3s	A
5000MHz	3	Underside	3s	A

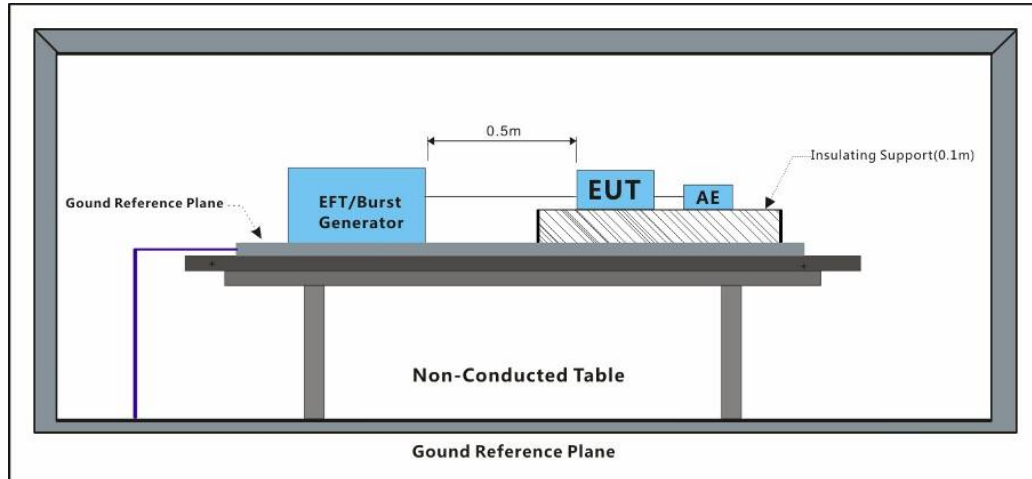
A: No degradation in the performance of the EUT was observed

7.13 Electrical Fast Transients & Burst at AC Power Port

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-4: 2012

7.13.1 Test Setup Diagram



7.13.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

Humidity: 55 % RH

Atmospheric Pressure: 1010 mbar

7.13.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.13.4 Test Condition and Results:

Performance Criterion: B

Repetition Frequency: 5kHz

Burst Period: 300ms

Test Duration: 2 minute per level & polarity

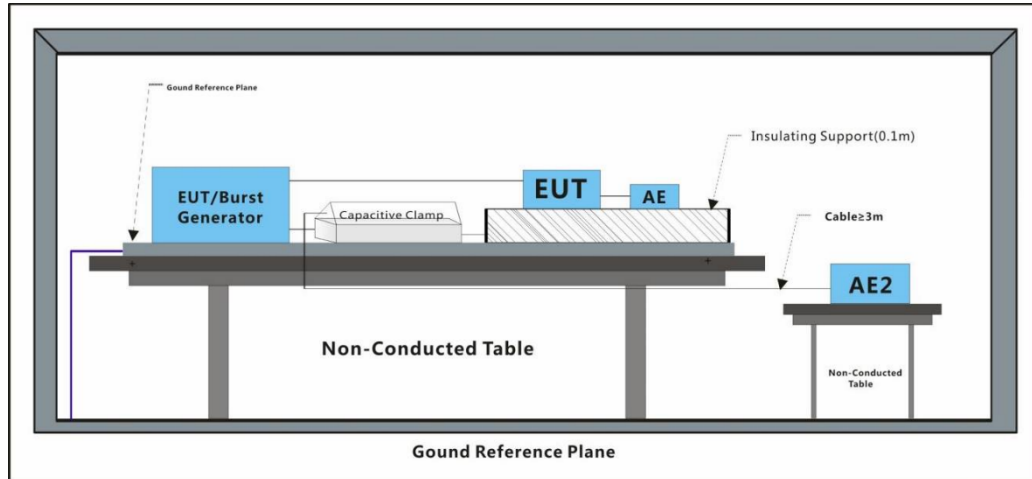
Test Line	Level (kV)	Polarity	CDN/Clamp	Result / Observations
AC power port	1	+	CDN	A
AC power port	1	-	CDN	A
A: No degradation in the performance of the EUT was observed				

7.14 Electrical Fast Transients & Burst at Signal Port

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-4: 2012

7.14.1 Test Setup Diagram



7.14.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

7.14.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.14.4 Test Condition and Results:

Performance Criterion: B

Repetition Frequency: 5kHz

Burst Period: 300ms

Test Duration: 2 minute per level & polarity

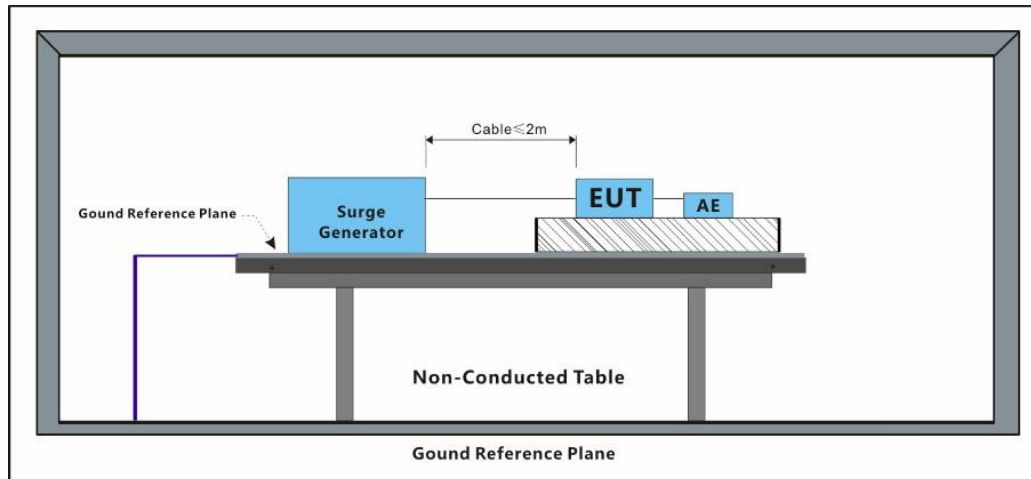
Port	Level (kV)	Polarity	CDN/Clamp	Result / Observations
Signal port	0.5	+	Clamp	A
Signal port	0.5	-	Clamp	A
A: No degradation in the performance of the EUT was observed				

7.15 Surge at AC Power Port

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-5: 2014 +A1: 2017

7.15.1 Test Setup Diagram



7.15.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

7.15.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 55 of 84

7.15.4 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:

Five positive pulses line-to-neutral at 90° phase

Five negative pulses line-to-neutral at 270° phase

Five positive pulses line-to-earth at 90° phase

Five negative pulses line-to-earth at 270° phase

Five negative pulses neutral-to-earth at 90° phase

Five positive pulses neutral-to-earth at 270° phase

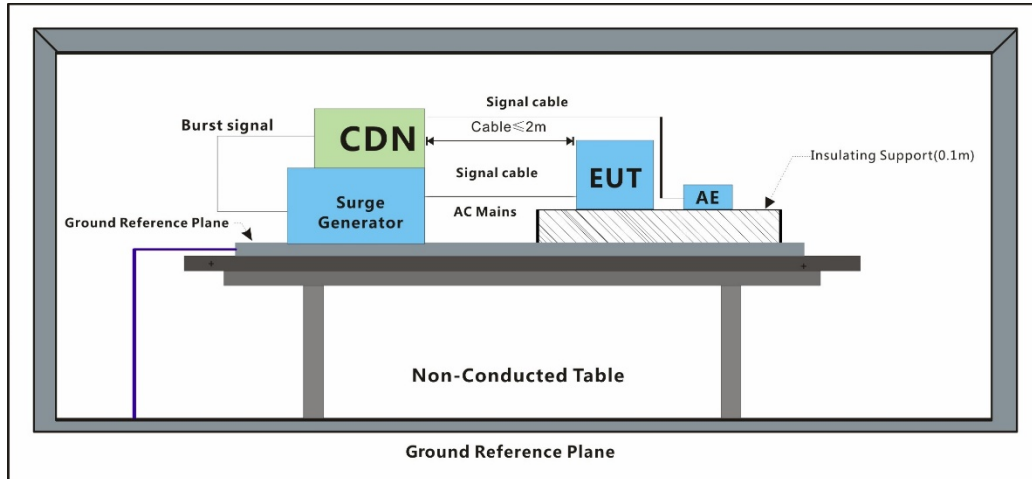
Test Line	Level (kV)	Polarity	Phase (deg)	Result / Observations
L-N	1	+	90°	A
L-N	1	-	270°	A
L-PE	2	+	90°	A
L-PE	2	-	270°	A
N-PE	2	-	90°	A
N-PE	2	+	270°	A
A: No degradation in the performance of the EUT was observed				

7.16 Surge at Signal Port

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-5: 2014 +A1: 2017

7.16.1 Test Setup Diagram



7.16.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 53 % RH

Atmospheric Pressure: 1010 mbar

7.16.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.16.4 Test Condition and Results:

Performance Criterion: B

Interval: 60s between each surge

Generator source impedance: 2Ω

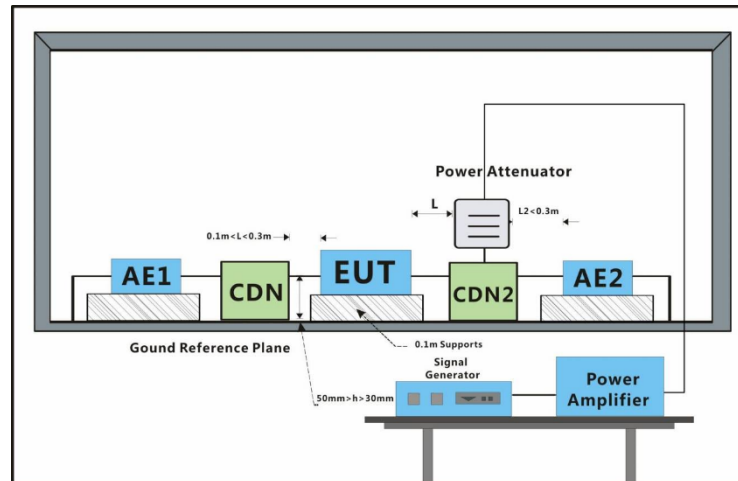
Port	Line	Waveform(μs)	Level (kV)	Polarity	Result / Observations
Signal port	Line-Ground	1,2/50 (8/20)	0.5, 1	+	A
Signal port	Line-Ground	1,2/50 (8/20)	0.5, 1	-	A
A: No degradation in the performance of the EUT was observed					

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

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-6: 2014

7.17.1 Test Setup Diagram



7.17.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

7.17.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.17.4 Test Condition and Results:

Performance Criterion: A

Frequency Range: 0.15MHz to 80MHz

Modulation: 80%, 1kHz Amplitude Modulation

Step Size: 1%

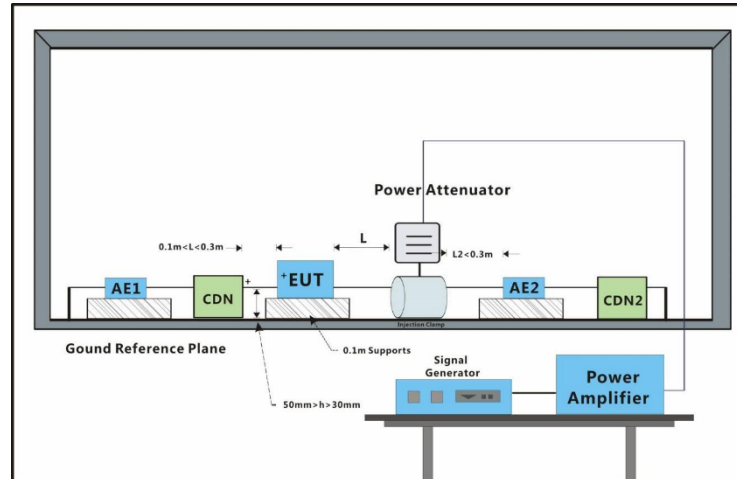
Cable port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
AC power port	3(0.15MHz-10MHz)	CDN	3s	A
AC power port	3 to 1(10MHz-30MHz, Lines)	CDN	3s	A
AC power port	1(30MHz-80MHz)	CDN	3s	A
A: No degradation in the performance of the EUT was observed				

7.18 Conducted Immunity at Signal Port (150kHz-80MHz)

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-6: 2014

7.18.1 Test Setup Diagram



7.18.2 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

Humidity: 52 % RH

Atmospheric Pressure: 1010 mbar

7.18.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.18.4 Test Condition and Results:

Performance Criterion: A

Frequency Range: 0.15MHz to 80MHz

Modulation: 80%, 1kHz Amplitude Modulation

Step Size: 1%

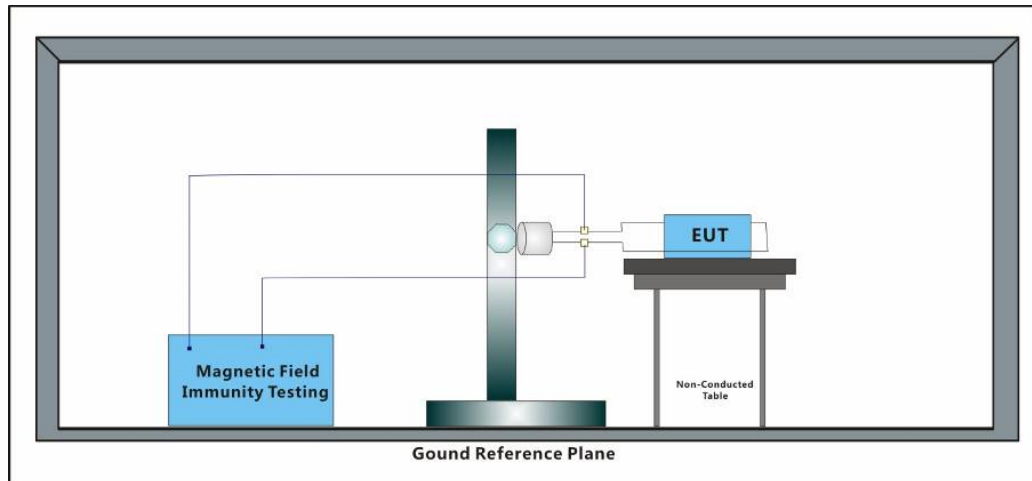
Port	Level (Vrms)	CDN/Clamp	Dwell time	Result / Observations
Signal port	3(0.15MHz-10MHz)	Clamp	3s	A
Signal port	3 to 1(10MHz-30MHz, Lines)	Clamp	3s	A
Signal port	1(30MHz-80MHz)	Clamp	3s	A
A: No degradation in the performance of the EUT was observed				

7.19 Power Frequency Magnetic Field

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN 61000-4-8: 2010

7.19.1 Test Setup Diagram



7.19.2 E.U.T. Operation

Operating Environment:

Temperature: 22 °C

Humidity: 51 % RH

Atmospheric Pressure: 1010 mbar

7.19.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.19.4 Test Condition and Results:

Performance Criterion: A

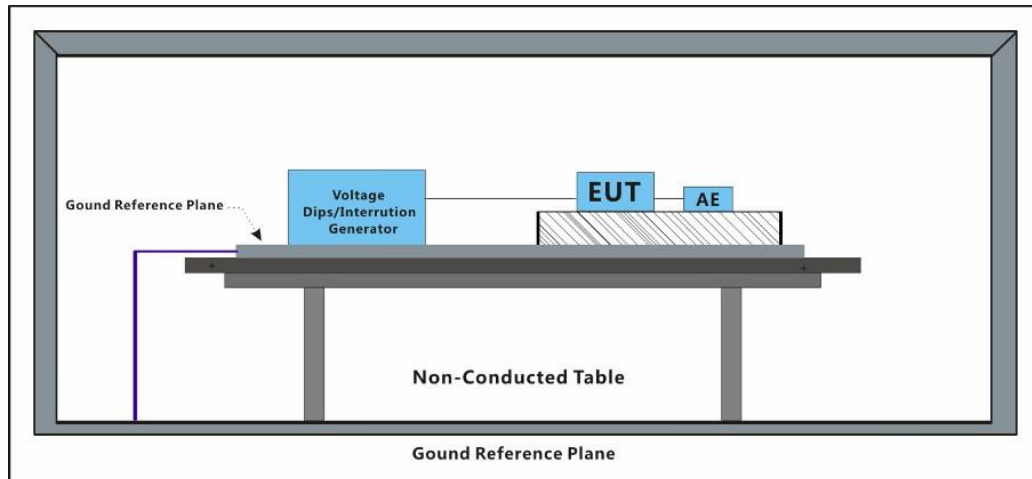
Frequency	Level (A/m)	Axial	Magnetic Field Type	Result / Observations
50Hz	1	X	Continuous filed	A
50Hz	1	Y	Continuous filed	A
50Hz	1	Z	Continuous filed	A
A: No degradation in the performance of the EUT was observed				

7.20 Voltage Dips and Interruptions

Test Requirement: EN 55035: 2017+A11:2020

Test Method: EN IEC 61000-4-11:2020

7.20.1 Test Setup Diagram



7.20.2 E.U.T. Operation

Operating Environment:

Temperature: 24 °C

Humidity: 55 % RH

Atmospheric Pressure: 1010 mbar

7.20.3 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	Keep EUT working normally with Auxiliary Equipment

7.20.4 Test Condition and Results:

Performance Criterion:

<5% residual voltage for 0.5 Cycle: B

70% residual voltage for 25 Cycles: C

<5% residual voltage for 250 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°	0.5 Cycles	3	A
0	0°	250 Cycles	3	C
70	0°	25 Cycles	3	A

A: No degradation in the performance of the EUT was observed

C: During the test EUT stop working when power supply drop,

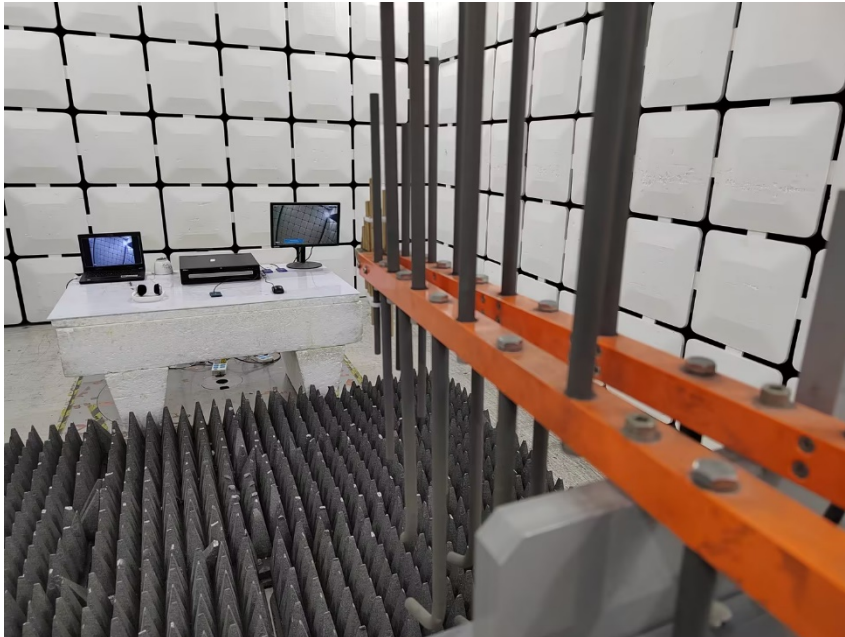
After the test by manual operation can work normally.

8 Test Setup Photo

Electrostatic Discharge



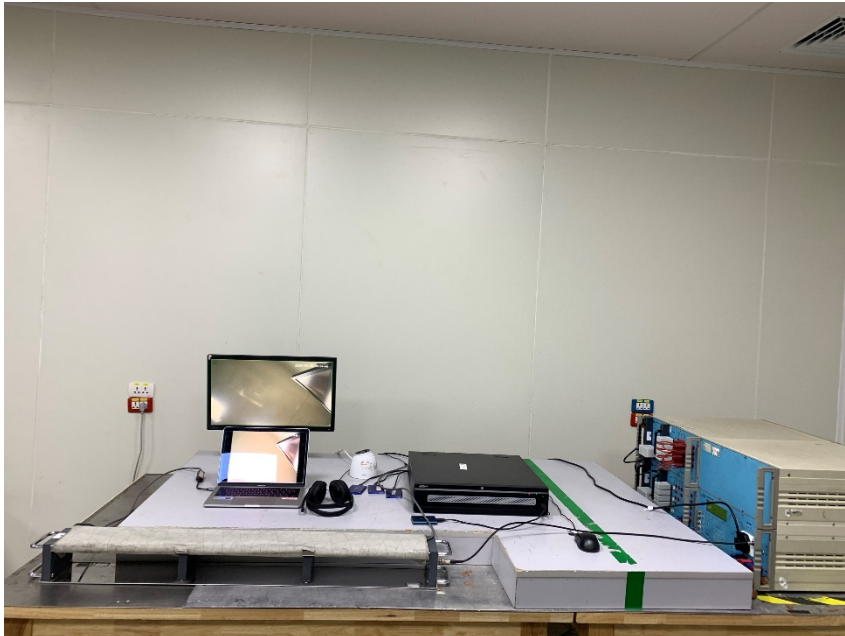
Radiated Immunity(80MHz-2.7GHz)



Electrical Fast Transients & Burst at AC Power Port



Electrical Fast Transients & Burst at Signal Port



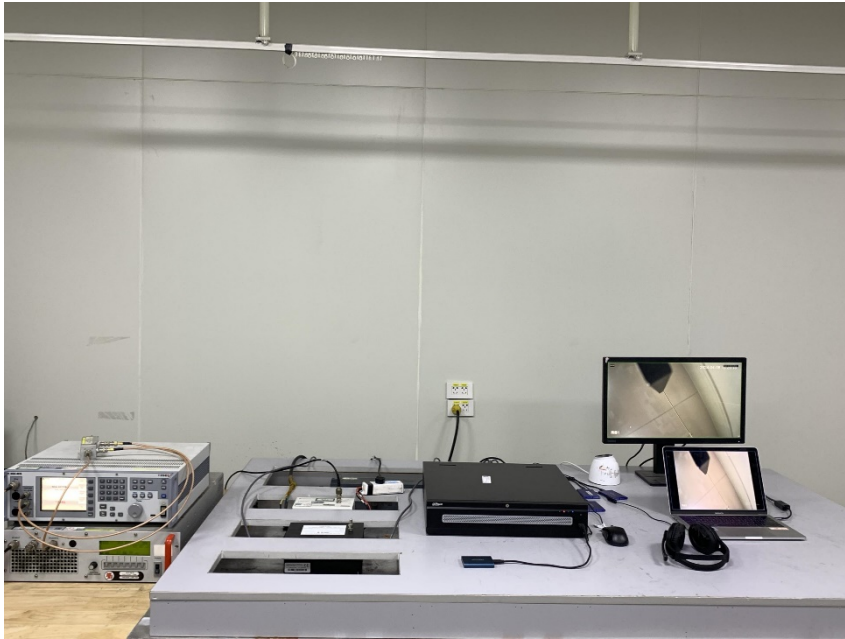
Surge at AC Power Port



Surge at Signal Port



Conducted Immunity at Power Port (150kHz-100MHz)



Conducted Immunity at Signal Port (150kHz-100MHz)



Mains Supply Voltage Variations



Voltage Dips and Interruptions



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



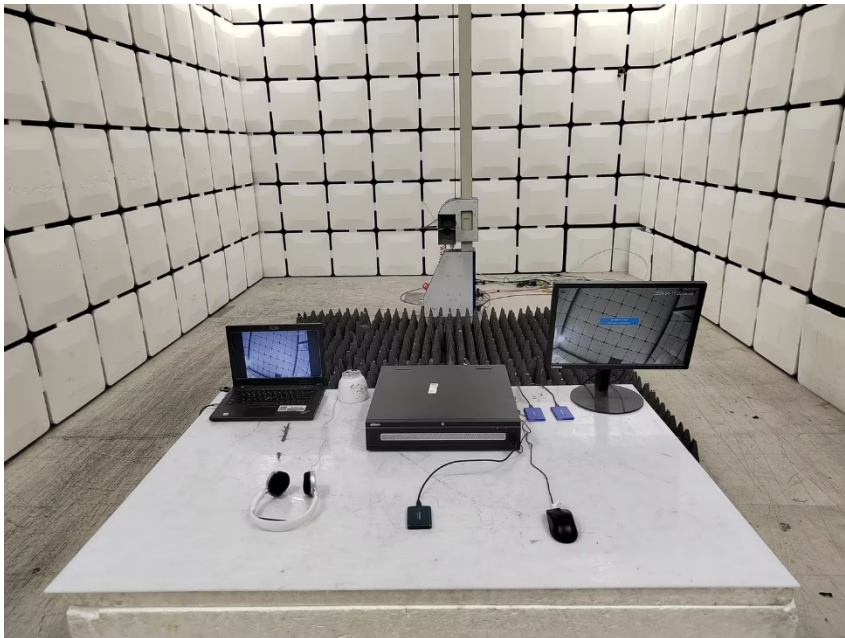
Asymmetric Mode Conducted Emissions(150kHz-30MHz)



Radiated Emissions (30MHz-1GHz)



Radiated Emissions (Above 1GHz)



Voltage Fluctuations and Flicker



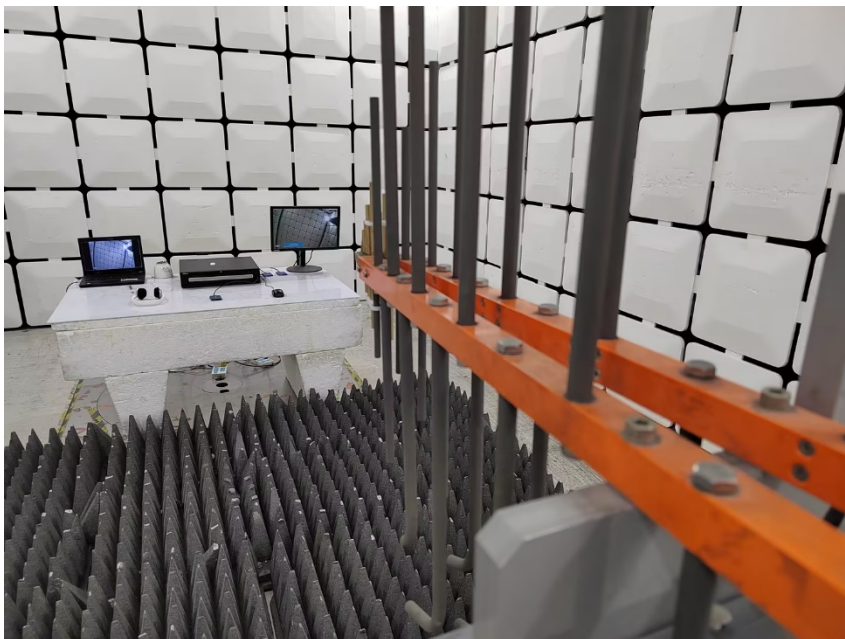
Harmonic Current Emission



Electrostatic Discharge



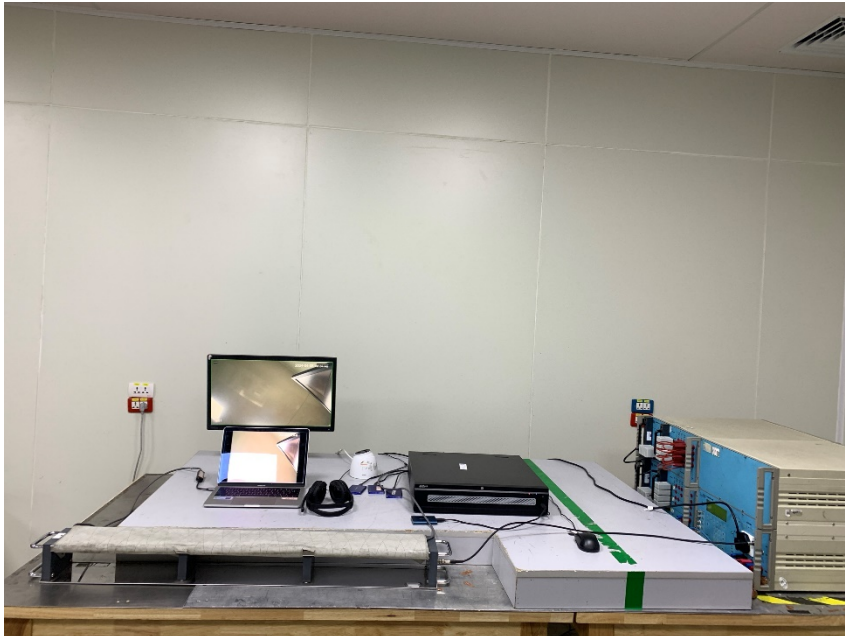
Radiated Immunity (80MHz-1GHz,1800MHz,2600MHz,3500MHz,5000MHz)



Electrical Fast Transients & Burst at AC Power Port



Electrical Fast Transients & Burst at Signal Port



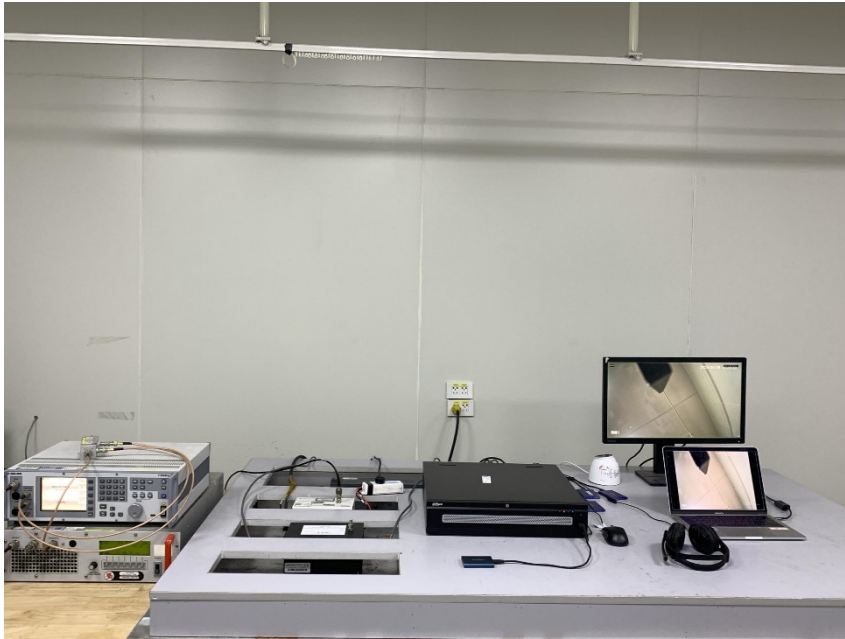
Surge at AC Power Port



Surge at Signal Port



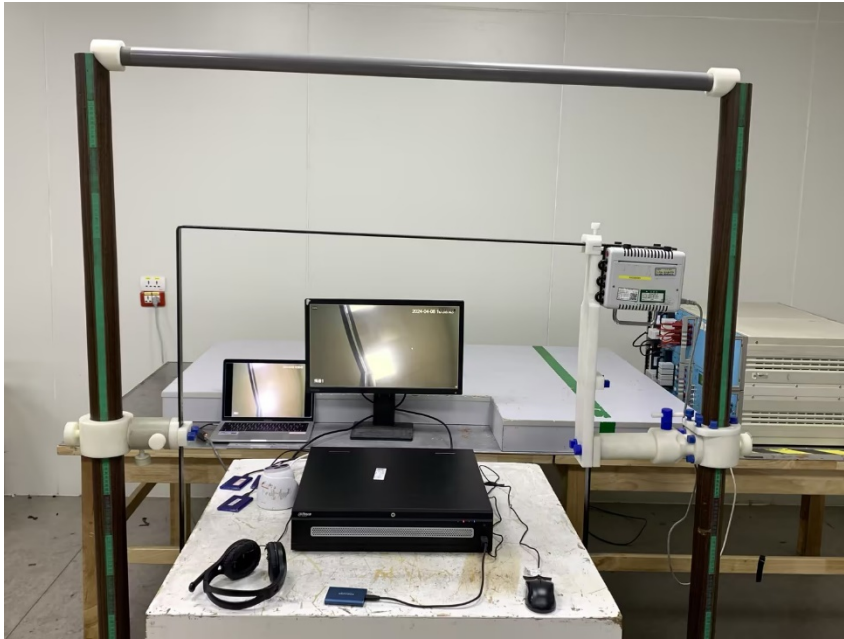
Conducted Immunity at AC Power Port (150kHz-80MHz)



Conducted Immunity at Signal Port (150kHz-80MHz)



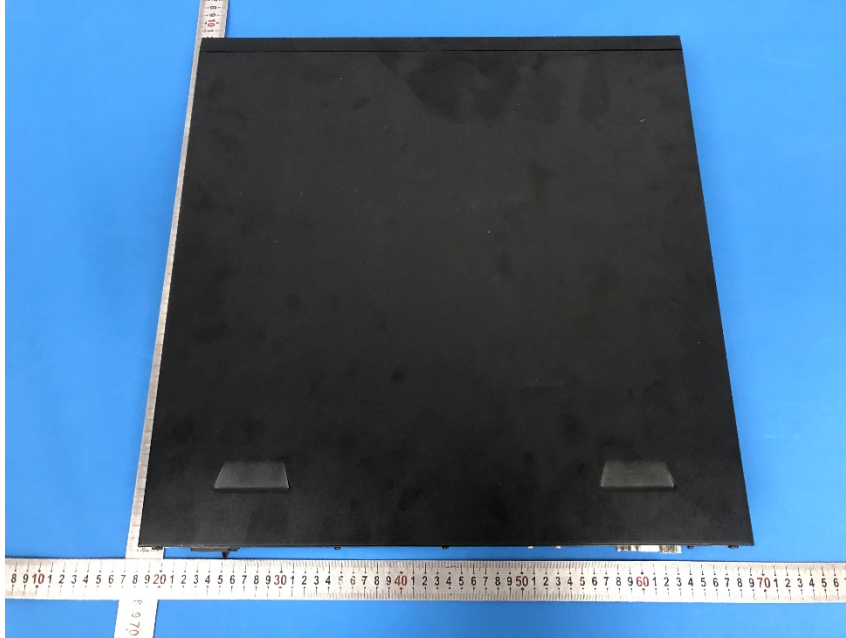
Power Frequency Magnetic Field



Voltage Dips and Interruptions



9 EUT Constructional Details (EUT Photos)





Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 76 of 84

NETWORK VIDEO RECORDER

DHI-NVR58128H-XI

100-240V ~ ,4A,50/60Hz

P/N: 1.0.01.23.16071



S/N: AAODOEFYAZ54B11

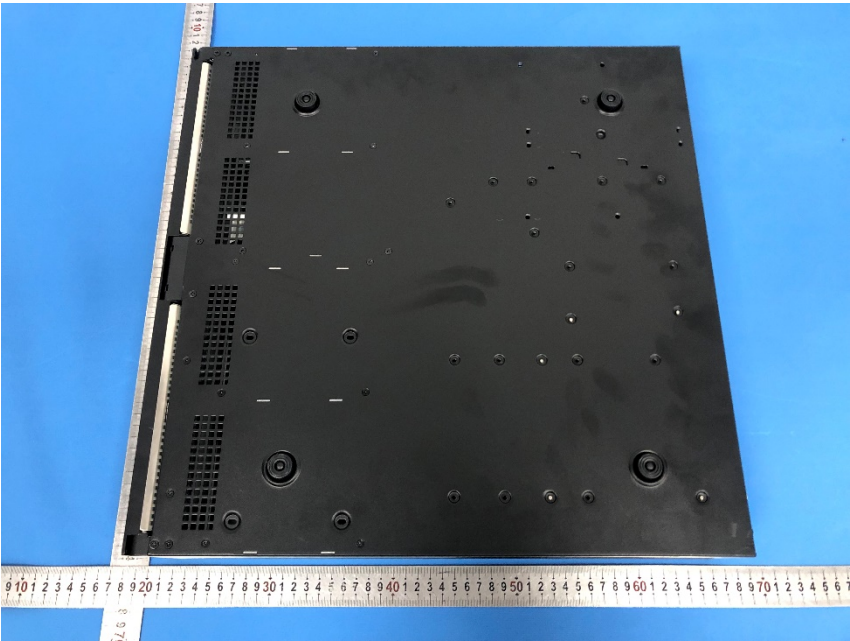
MADE IN CHINA

ZHEJIANG DAHUA VISION TECHNOLOGY CO.,LTD.

No.1399, Binxing Road, Binjiang District, Hangzhou, P.R. China







Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 77 of 84

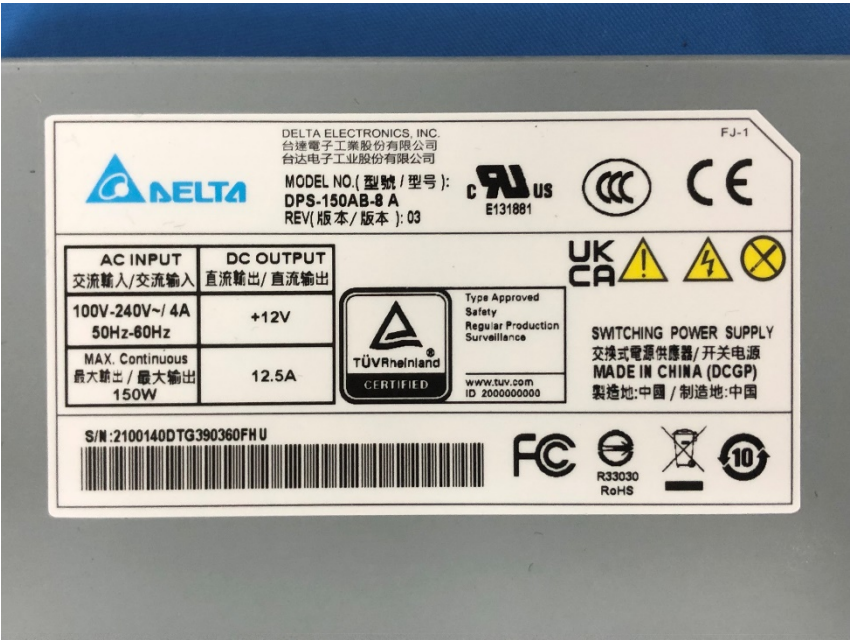
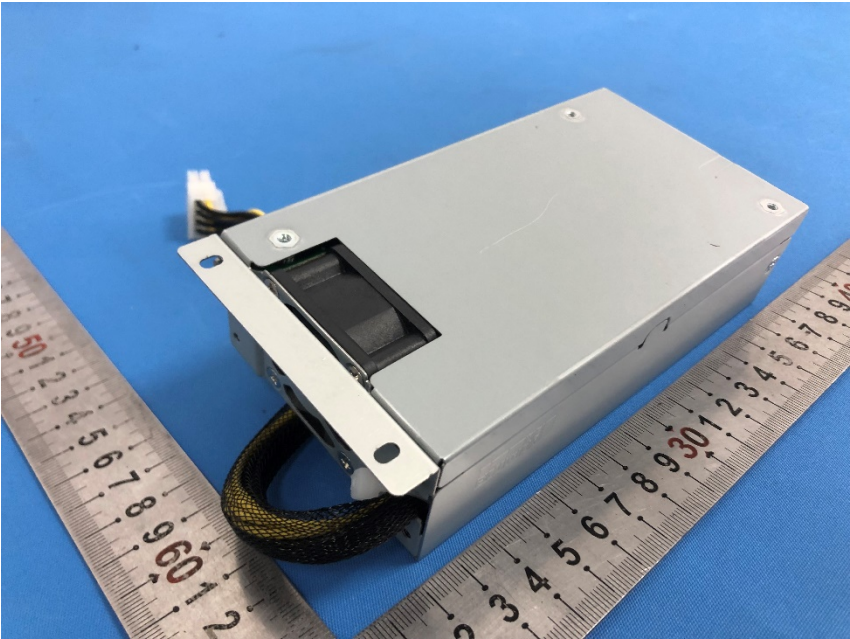


Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 78 of 84

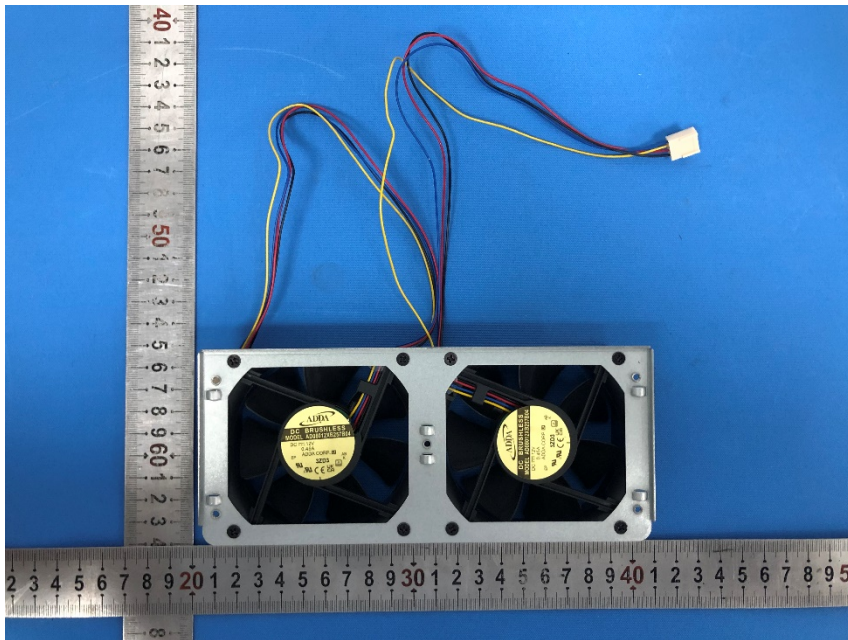


Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 79 of 84

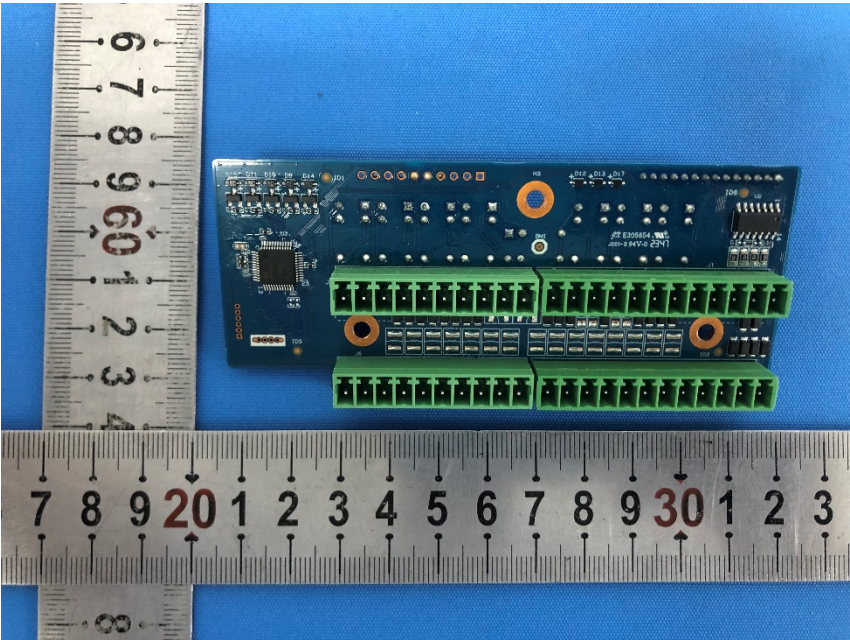
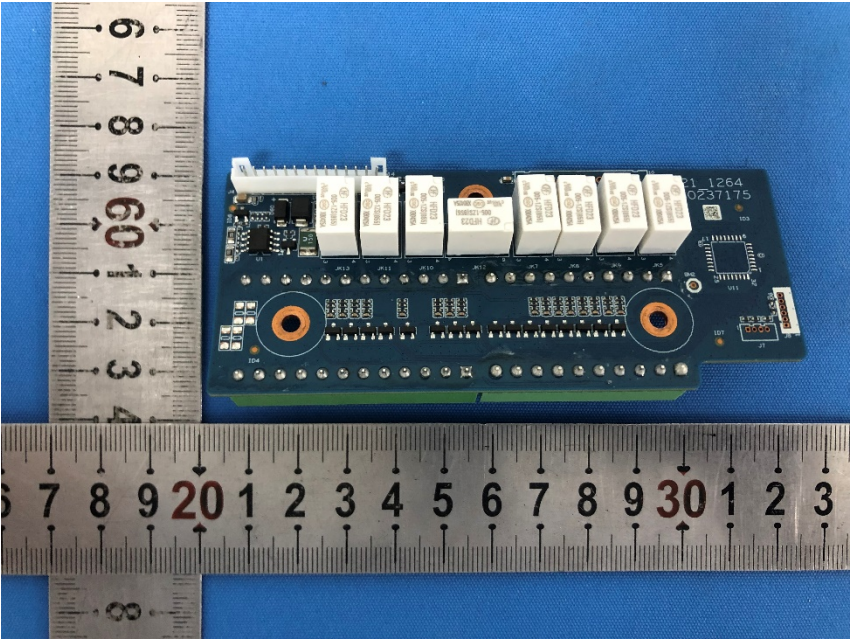


Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 80 of 84



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 81 of 84

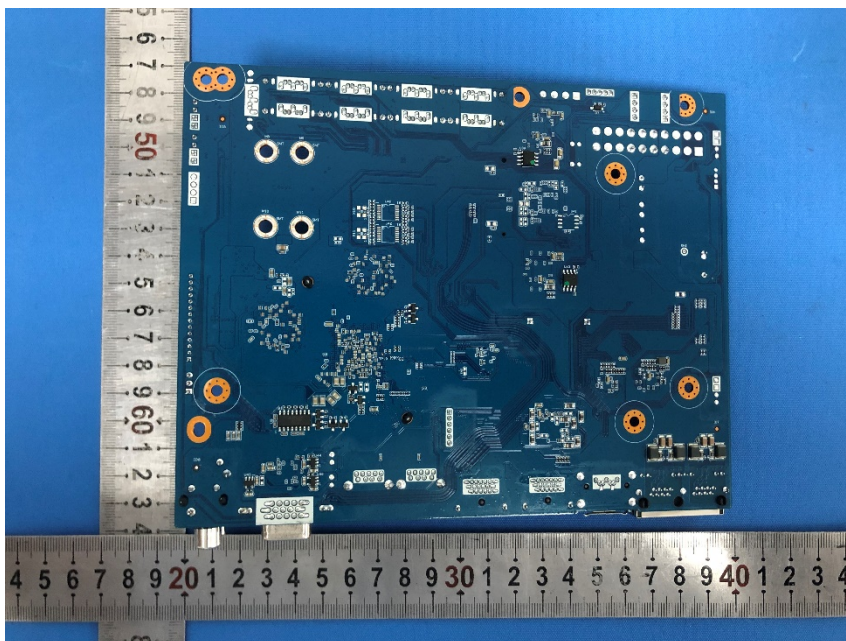
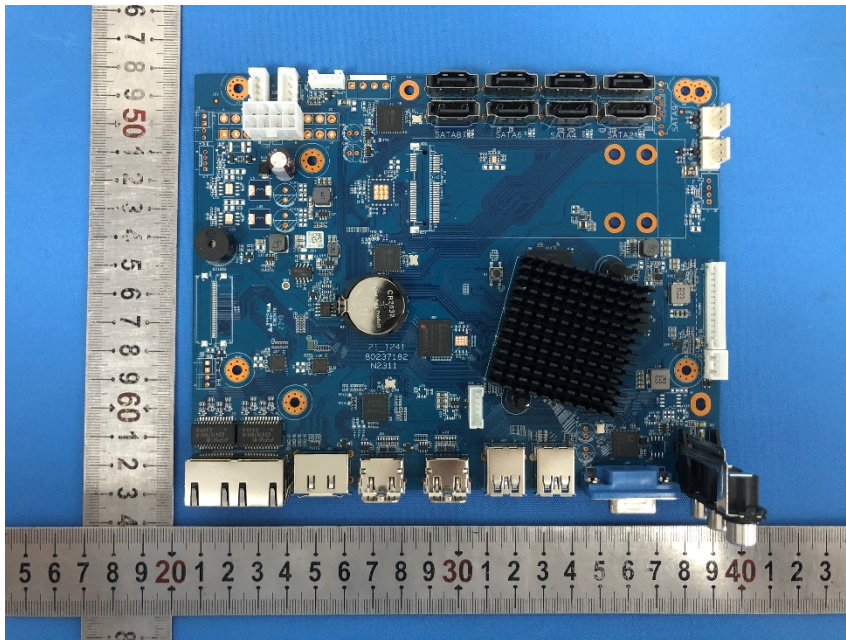


Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 82 of 84

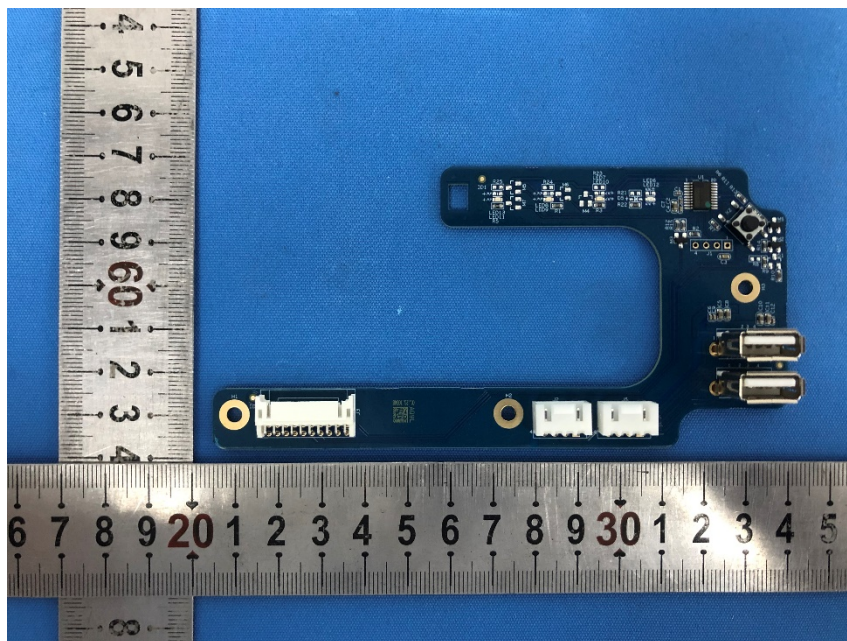
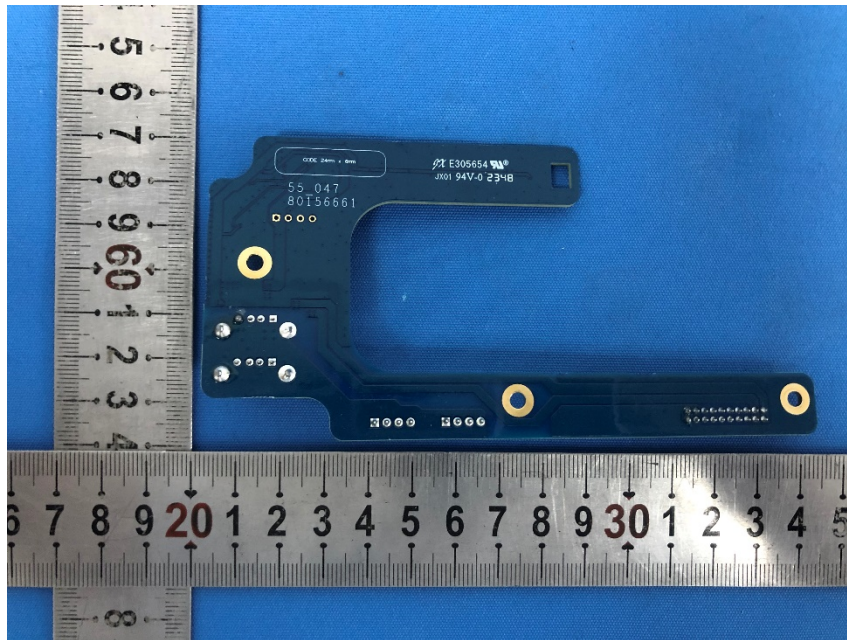


Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSEM240300072401

Page: 83 of 84





- End of the Report -