EMC TECHNICAL FILE

Product Name	**:**	**Serial Device Server**
Model Name	**:**	**1CH-RS485-ETH, 1CH-RS232/485/422-ETH, 2CH-RS485-ETH, 2CH-RS232/485/422-ETH, 4CH-RS485-ETH, 4CH-RS232/485/422-ETH, 8CH-RS485-ETH, 8CH-RS232/485/422-ETH, 16CH-RS232/485/422-ETH, 32CH-RS232/485/422-ETH, VT-LTE400, VT-LTE500, VT-DTU300, VT-DTU500, VT-DTU600, VT-WF100, VT-WF110, 4CH-IO-RS232/485, 4CH-IO-ETH, 8CH-IO-ETH, 8CH -IO-WF, 8CH-IO-LTE, 2CH-HUB-RS485, 4CH-HUB-RS485, 4CH-HUB-RS232/485, 8CH-HUB-RS485, RS232 TO RS485, VT-LR600, VT-LR601, VT-ZB700, VT-ZB701, VT -FB800, VT-FB810, VT-FB820, VT-SW100**

Prepared for:

Shanghai Valtoris Electronic Technology Co., Ltd.
1088 Fanghe Road, Minhang District, Shanghai, China (201109)

Prepared by:

Shanghai Global Testing Services Co., Ltd.
Floor 3rd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.

File Number	**:**	TESH26020482423
Date of File	**:**	January 25,2026 to February 05,2026
Date of Issue	**:**	February 05,2026

Notes：
The review results only relate to these samples which have been reviewed.
Partly using this file will not be admitted unless been allowed by GTS.
GTS is only responsible for the complete file with the fileed stamp of GTS.

Applicant:	Shanghai Valtoris Electronic Technology Co., Ltd.
	1088 Fanghe Road, Minhang District, Shanghai, China (201109)
Manufacturer:	Shanghai Valtoris Electronic Technology Co., Ltd.
	1088 Fanghe Road, Minhang District, Shanghai, China (201109)
Product Name:	Serial Device Server
Brand Name:	/
Model Name:	1CH-RS485-ETH, 1CH-RS232/485/422-ETH, 2CH-RS485-ETH, 2CH-RS232/485/422-ETH, 4CH-RS485-ETH, 4CH-RS232/485/422-ETH, 8CH-RS485-ETH, 8CH-RS232/485/422-ETH, 16CH-RS232/485/422-ETH, 32CH-RS232/485/422-ETH, VT-LTE400, VT-LTE500, VT-DTU300, VT-DTU500, VT-DTU600, VT-WF100, VT-WF110, 4CH-IO-RS232/485, 4CH-IO-ETH, 8CH-IO-ETH, 8CH-IO-WF, 8CH-IO-LTE, 2CH-HUB-RS485, 4CH-HUB-RS485, 4CH-HUB-RS232/485, 8CH-HUB-RS485, RS232 TO RS485, VT-LR600, VT-LR601, VT-ZB700, VT-ZB701, VT-FB800, VT-FB810, VT-FB820, VT-SW100
Main Model:	1CH-RS485-ETH
Rating:	DC 9-24V
Date of Receipt:	January 25,2026
Date of Review:	January 25,2026 to February 05,2026
Review Standard:	EN 55032:2015+A1:2020+A11:2020, EN 55035:2017+A11:2020, EN IEC 61000-3-2:2019+A1:2021+A2:2024, EN 61000-3-3:2013+A1:2019+A2:2021
Review Result:	PASS

Prepared by :

Approved by :

GLOBAL TESTING SERVICES CO.,LTD CERTIFICATION

TABLE OF CONTENTS

1. GENERAL INFORMATION

1.1 Description of EUT

Product Name:	Serial Device Server
Model Name:	1CH-RS485-ETH
Serial Number:	/
Power Supply:	24V
Applicant:	Shanghai Valtoris Electronic Technology Co., Ltd. 1088 Fanghe Road, Minhang District, Shanghai, China (201109)
Manufacturer:	Shanghai Valtoris Electronic Technology Co., Ltd. 1088 Fanghe Road, Minhang District, Shanghai, China (201109)

1.2 Description of Review Facility

Site Description: Shanghai Global Testing Services Co., Ltd.

Name of Firm: Shanghai Global Testing Services Co., Ltd.

Site Location: Floor 3rd, Building D-1, No. 128, Shenfu Road, Minhang District, Shanghai, China.

The site and apparatus are constructed in conformance with the requirements of ANSI C63.4, CISPR 16-1-1 and other equivalent standards.

1.3 Measurement Uncertainty

Conducted Emission Expanded Uncertainty : U = 1.76 dB
Radiated Emission Expanded Uncertainty : U = 3.02 dB

2. TECHNIACL SUMMARY

2.1 SUMMARY OF STANDARDS AND REVIEW RESULTS

The EUT have been reviewed according to the applicable standards as referenced below:

EMISSION (EN 55032:2015+A1:2020+A11:2020)			
review Item	**review Standard**	**Limits**	**Results**
Conducted Disturbance at mains terminals	EN 55032:2015+A1:2020+A11:2020	Class B	P
Conducted Disturbance at telecommunication ports	EN 55032:2015+A1:2020+A11:2020	N/A	N/A
Radiated Disturbance	EN 55032:2015+A1:2020+A11:2020	Class B	P
Harmonic Current Emissions	EN IEC 61000-3-2:2019+A1:2021+A2:2024	/	P
Voltage Fluctuations and Flicker	EN 61000-3-3:2013+A1:2019+A2:2021	/	P

IMMUNITY (EN 55035:2017+A11:2020)			
Review Item	**Basic Standard**	**Performance Criteria**	**Results**
Electrostatic discharge Immunity	EN IEC 61000-4-2:2008	B	P
RF Electromagnetic Field Immunity	EN IEC 61000-4-3:2020	A	P
Electrical Fast Transient/Burst Immunity	EN IEC 61000-4-4:2012	B	P
Surge Immunity	EN IEC 61000-4-5:2014+A1:2017	B	P
Continuous induced RF disturbances Immunity	EN IEC 61000-4-6:2013+Cor 1:2015	A	P
Power-frequency Magnetic Field Immunity	EN IEC 61000-4-8:2009	A	P
Voltage Dips: >95% reduction, 0.5 periods	EN IEC 61000-4-11:2020	/	P
Voltage Dips: 30% reduction, 25 periods		/	P
Voltage Interruptions: >95% reduction, 250 periods		/	P
Broadband impulse noise disturbances, repetitive	EN 55035:2017+A11:2020 4.2.7	N/A	N/A
Broadband impulse noise disturbances, isolated	EN 55035:2017+A11:2020 4.2.7	N/A	N/A

Note: P means pass, F means failure, N/A means not applicable

2.2 Description of Performance Criteria

The variety and the diversity of the apparatus within the scope of this standard make it difficult to define precise criteria for the evaluation of the immunity review results.
If, as result of the application of the reviews defined in this standard, the apparatus becomes dangerous or unsafe, the apparatus shall be deemed to have failed the review.
A functional description and a definition of performance criteria, during or as a consequence of the EMC reviewing, shall be provided by the manufacturer and noted in the review file, based on the following criteria:

2.2.1 Performance 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.

2.2.2 Performance 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 review.
After the review, 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.

2.2.3 Performance 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.

3. REVIEW EQUIPMENT LIST

Conducted Disturbance at mains terminals				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
Shielding Room	CHENGYU	5m×4m×3m	CR	Sep 13, 2026
EMI review Receiver	R&S	ESCI7	100787	Feb 24, 2026
Artificial Mains Network	TESEQ	NNB 51	33285	Feb 24, 2026

Radiated Disturbance Review				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
3m Semi-anechoic Chamber	CHENGYU	9.2×6.25×6.15m	SAR	Sep 13, 2026
EMI review Receiver	R&S	ESCI7	100787	Feb 24, 2026
EMC Shielding room	Changzhou FeiTe	8 x 5 x 3 mm	Nil	Dec 24, 2026
Broadband Log Antenna	Schwarzbeck	VULB 9163	9163-561	Jul 24, 2026

Electrostatic Discharge Immunity review				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
ESD Generator	SCHAFFNER	NSG 438	849	Feb 24, 2026

RF Electromagnetic Field Immunity				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
Radiated Immunity review System	TESEQ	ITS 6006	37546	Oct 20, 2026
Power Meter	TESEQ	PMR 6006	73819	Oct 20, 2026
Power Amplifier	MILMEGA	AS1860-50	1066592	Oct 20, 2026
Log Periodic Antenna	Schwarzbeck	STLP 9128 D	9128 D 048	Oct 24, 2026
Field Probe	ETS-Lindgren	HI-6105	00161798	Dec 06, 2026

Electrical Fast Transient/Burst Immunity Review				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
EFT/SURGE Generator	TESEQ	NSG 3060	1468	Feb 24, 2026
Single Phase Coupling/decoupling Network	TESEQ	CDN 3061	1404	Feb 24, 2026

Surge Immunity Review				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
EFT/SURGE Generator	TESEQ	NSG 3060	1468	Feb 24, 2026
Single Phase Coupling/decoupling Network	TESEQ	CDN 3061	1404	Feb 24, 2026

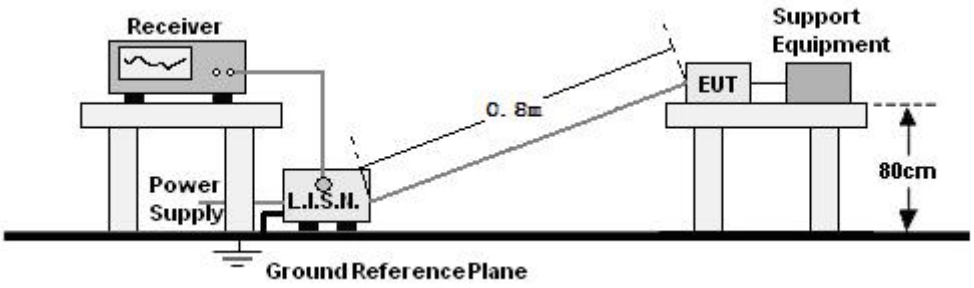
Continuous induced RF disturbances Immunity				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
Conducted Immunity review System	TESEQ	NSG 4070	25795	Feb 24, 2026
Coupling/Decoupling Network	TESEQ	CDN M116S	35371	Feb 24, 2026

Power-frequency Magnetic Field Immunity Review				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Next Cal.**
P-f Magnetic Field Loop	FCC	F-1000-4-8/9/10-1M	13	Feb 24, 2026
Power Magnetic Field Generator	SANKI	SKS-0805	/	Feb 24, 2026

The measuring equipment utilized to perform the reviews documented in this file has been calibrated once a year or in accordance with the manufacturer's recommendations, and has been calibrated by accredited calibration laboratories.

4. CONDUCTED DISTURBANCE AT MAINS TERMINALS

4.1 DIAGRAM OF REVIEW SETUP



4.2 APPLICABLE STANDARD

EN 55032:2015+A1:2020+A11:2020 (Class B)

4.3 LIMITS FOR CONDUCTED DISTURBANCE

Frequency Range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0.15 ～ 0.5	66 to 56	56 to 46
0.5 ～ 5	56	46
5 ～ 30	60	50

NOTE – 1.The lower limit shall apply at the transition frequencies.

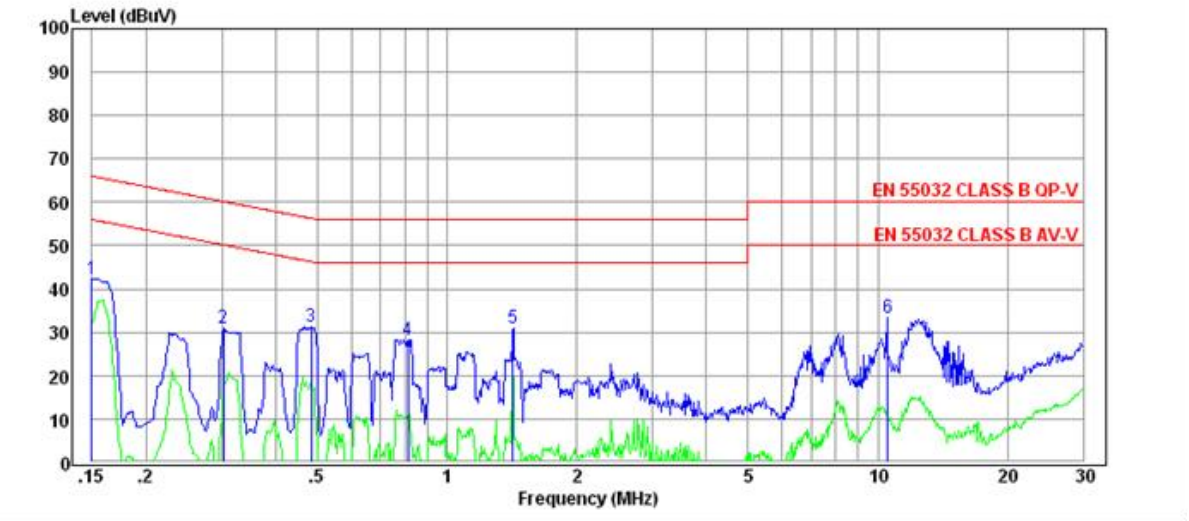
2. The limit decreases linearly with the logarithm of the frequency

In the range 0.15MHz to 0.50MHz.

4.4 REVIEW RESULT

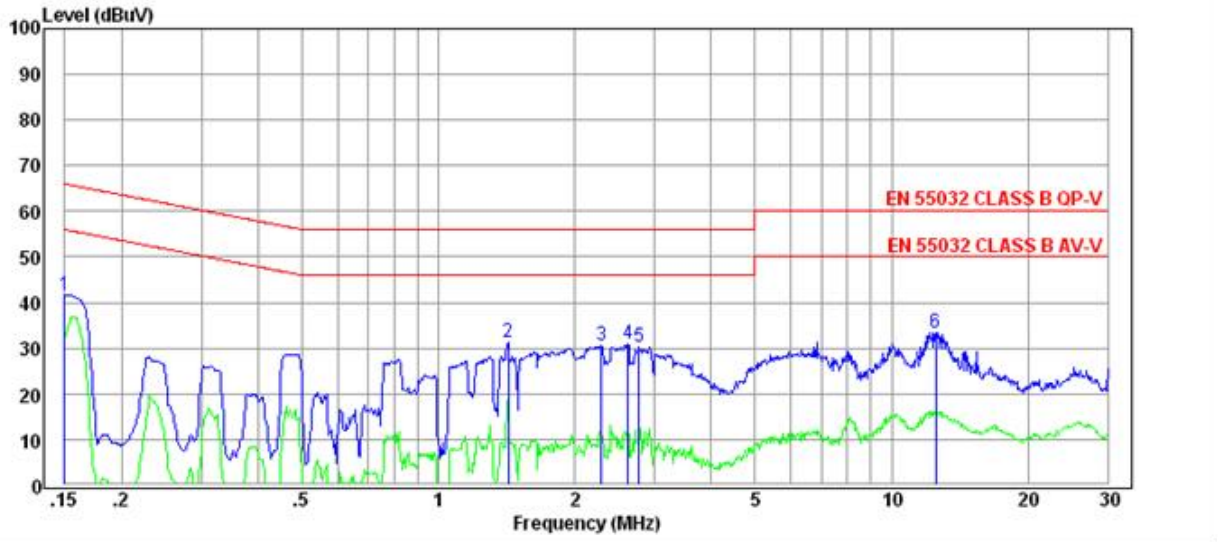
Temperature : 25℃ Humidity : 53%

review Model : Operating Power Supply: 24V



Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector
0.15	32.71	9.64	42.35	66.00	23.65	Peak
0.30	21.35	9.67	31.02	60.16	29.14	Peak
0.48	21.48	9.67	31.15	56.26	25.11	Peak
0.81	18.62	9.69	28.31	56.00	27.69	Peak
1.42	21.19	9.71	30.90	56.00	25.10	Peak
10.54	23.19	10.09	33.28	60.00	26.72	Peak

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



N：

Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector
0.15	32.07	9.64	41.71	66.00	24.29	Peak
1.43	21.57	9.71	31.28	56.00	24.72	Peak
2.30	20.79	9.84	30.63	56.00	25.37	Peak
2.62	20.89	9.89	30.78	56.00	25.22	Peak
2.78	20.29	9.90	30.19	56.00	25.81	Peak
12.52	23.31	10.08	33.39	60.00	26.61	Peak

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

4.5 REVIEW CONCLUSION

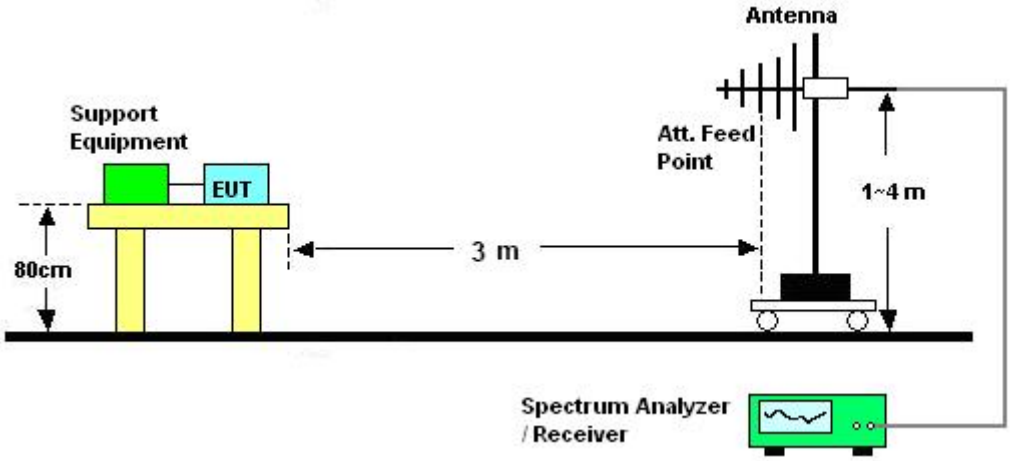
PASS

5. CONDUCTED DISTURBANCE AT TELECOMMUNICATION PORTS

N/A （NO TELECOMMUNICATION PORTS）

6. RADIATED DISTURBANCE REVIEW

6.1 DIAGRAM OF REVIEW SETUP



6.2 APPLICABLE STANDARD

EN 55032:2015+A1:2020+A11:2020(Class B)

6.3 LIMITS FOR RADIATED DISTURBANC

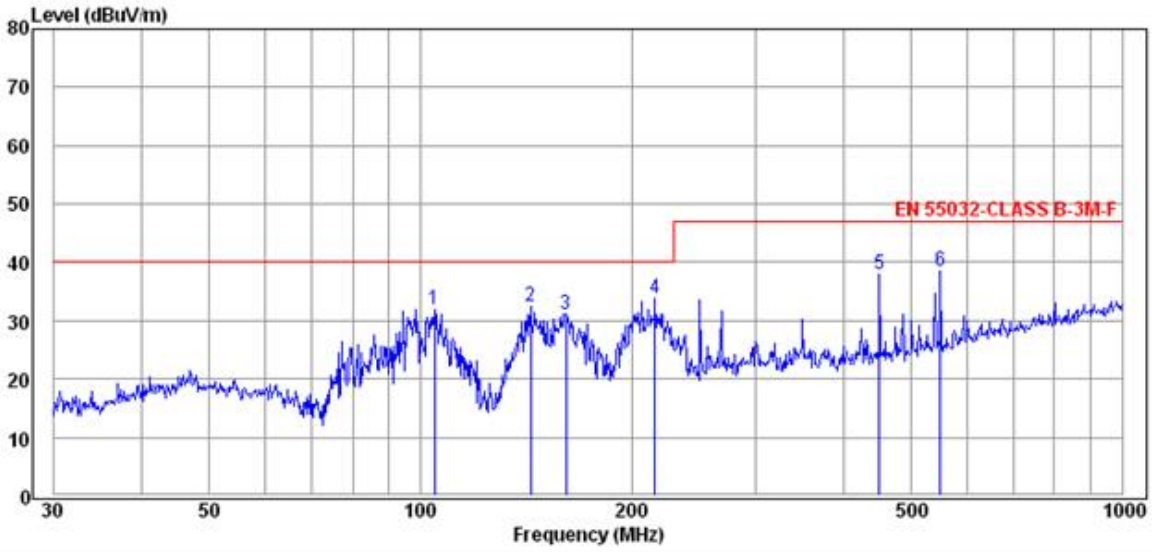
Below 1GHz

Frequency (MHz)	Distance (m)	Field Strength Limits dB(V/m)	Converted Field Strength Limits By 3 Meters Measuring Distance dB(V/m)
30 ~ 230	10	30	40
230 ~ 1000	10	37	47
NOTE 1 - The lower limit shall apply at the transition frequency. NOTE 2 – Additional provisions may be required for cases where interference occurs.			

6.4 REVIEW RESULT

Temperature : 25℃ Humidity : 53%

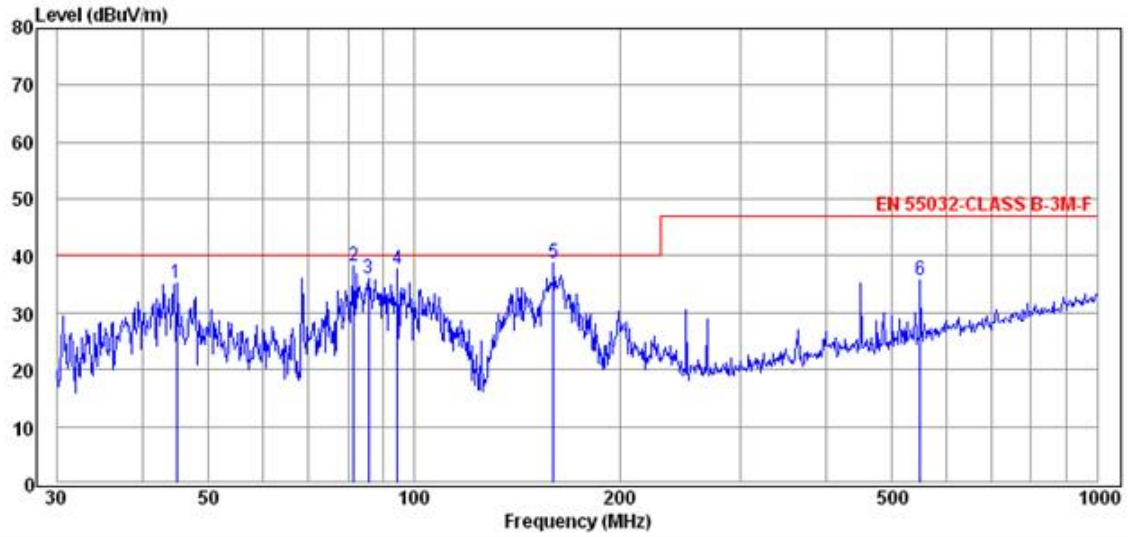
review Model : Operating Power Supply: 24V



HORIZONTAL:

Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector
104.54	17.21	14.66	31.87	40.00	8.13	QP
143.33	21.52	10.87	32.39	40.00	7.61	QP
160.91	19.53	11.61	31.14	40.00	8.86	QP
216.02	19.44	14.31	33.75	40.00	6.25	QP
451.14	17.57	20.25	37.82	47.00	9.18	QP
550.95	16.00	22.40	38.40	47.00	8.60	QP

Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain



VERTICAL:

Freq MHz	Reading dBuV	C.F dB/m	Result dBuV/m	Limit dBuV/m	Margin dB	Detector
44.90	19.29	15.90	35.19	40.00	4.81	QP
81.50	27.76	10.36	38.12	40.00	1.88	QP
85.60	25.19	10.95	36.14	40.00	3.86	QP
94.43	23.27	14.26	37.53	40.00	2.47	QP
159.78	27.28	11.51	38.79	40.00	1.21	QP
550.95	13.28	22.40	35.68	47.00	11.32	QP

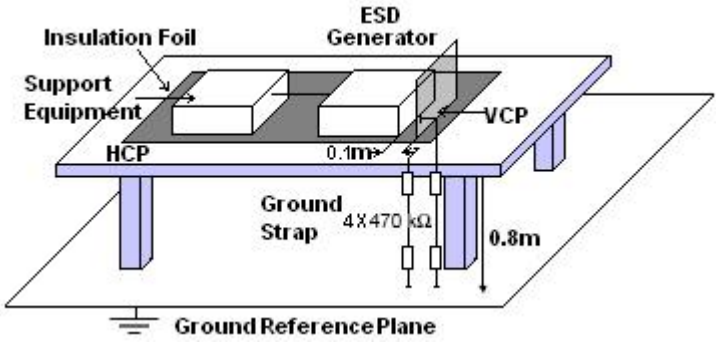
Remarks: C.F (Correction Factor) = Antenna factor + Cable loss - Preamp gain

6.5 REVIEW CONCLUSION

PASS

7. ELECTROSTATIC DISCHARGE IMMUNITY REVIEW

7.1 DIAGRAM OF REVIEW SETUP



7.2 APPLICABLE STANDARD

IEC 61000-4-2:2008, Contact Discharge: 2kV, 4kV;
Air Discharge: 2kV, 4kV, 8kV

7.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

7.3.1 Severity levels

Level	review Voltage	
	Contact Discharge (kV)	Air Discharge (kV)
1.	2	2
2.	4	4
3.	6	8
4.	8	15
X	Special	Special

7.3.2 Performance criterion: B

7.4 REVIEW RESULT

Temperature : 25℃ Humidity : 45%
review Model : Operating Power Supply : 24V

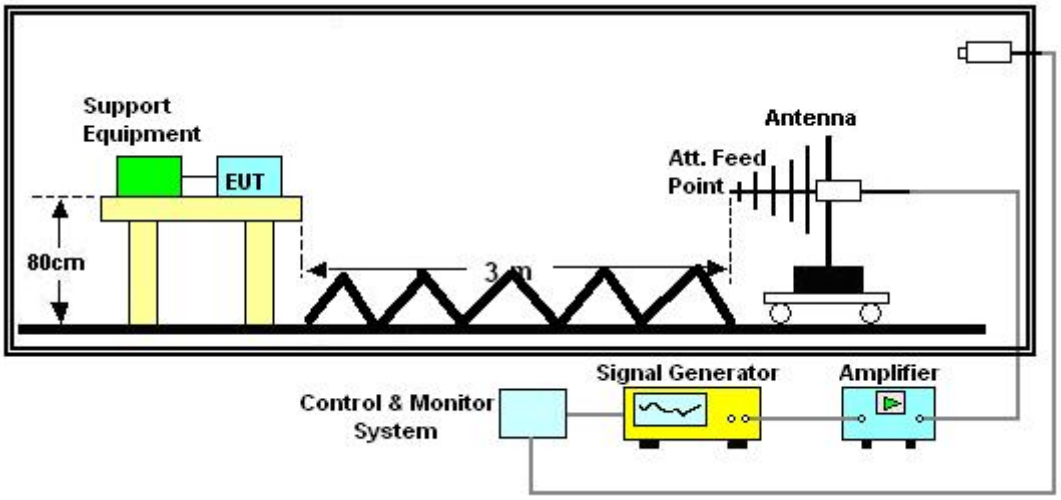
Air Discharge Voltage: ±2kV, ±4kV, ±8kV Contact Discharge Voltage: ±2kV, ±4kV Contact Discharge: For each point positive 25 times and negative 25 times discharge Air Discharge: For each point positive 10 times and negative 10 times discharge			
Location	**Point**	**Kind**	**Result**
Around the EUT	4	C (VCP)	P
Around the EUT	4	C (HCP)	P
Metal part of EUT	16	C	P
Gap	/	A	P
NOTE 1 – C (Contact Discharge), A(Air Discharge); NOTE 2 – HCP (Horizontal Coupling Plane), VCP (Vertical Coupling Plane).			

7.5 REVIEW CONCLUSION

PASS

8. RF ELECTROMAGNETIC FIELD IMMUNITY REVIEW

8.1 Diagram of review Setup



8.2 Applicable Standard

IEC 61000-4-3:2020
Swept Frequency Range: 80 - 1000 MHz, Field Strength: 3 V/m, Unmodulation, 80% AM 1kHz
Spot Frequency: 1800MHz, 2600MHz, 3500MHz, 5000MHz, Field Strength: 3 V/m, Unmodulation, 80% AM 1kHz

8.3 Severity Levels and Performance Criterion

8.3.1 Severity levels

Level	Field Strength V/m
1	1
2	3
3	10
X	Special

8.3.2 Performance criterion: A

8.4 review Result

Temperature	:	24℃	Humidity	:	55%
review Model	:	Operating	Power Supply	:	24V

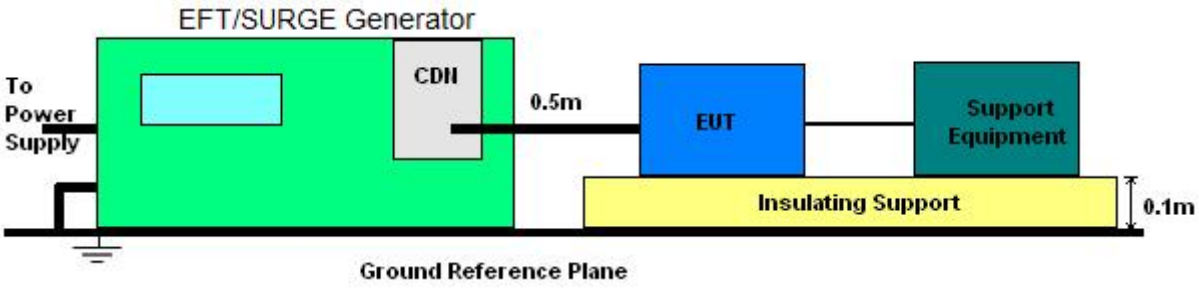
Swept Frequency Range		80 MHz to 1000 MHz		/	
Spot Frequency		/		1800MHz,2600MHz, 3500MHz,5000MHz	
Modulation		80% AM 1 kHz		80% AM 1 kHz	
Steps		1 %		1 %	
Dwell Time		3 s		3 s	
Field Strength		3V/m		3V/m	
Antenna Polarization		Horizontal	Vertical	Horizontal	Vertical
EUT Position	Front	P	P	P	P
	Rear	P	P	P	P
	Right	P	P	P	P
	Left	P	P	P	P
	Floor	——	——	——	——
	Top	——	——	——	——

8.5 review CONCLUSION

PASS

9. ELECTRICAL FAST TRANSIENT/BURST IMMUNITY REVIEW

9.1 DIAGRAM OF REVIEW SETUP



9.2 APPLICABLE STANDARD

IEC 61000-4-4:2012
Analogue/Digital Data Ports：±0.5 kV, 5/50ns, 5kHz
DC Network Power Ports：±0.5 kV, 5/50ns, 5kHz
AC Mains Power Ports：±1 kV, 5/50ns, 5kHz

9.3 EVERITY LEVELS AND PERFORMANCE CRITERION

9.3.1 SEVERITY LEVELS

Open circuit output review voltage and repetition rate of the impulses				
Level	On power port, PE		On I/O (input/output) signal, data and control ports	
	Voltage peak kV	Repetition rate kHz	Voltage peak kV	Repetition rate kHz
1.	0.5	5 or 100	0.25	5 or 100
2.	1	5 or 100	0.5	5 or 100
3.	2	5 or 100	1	5 or 100
4.	4	5 or 100	2	5 or 100
Xa	Special	Special	Special	Special
Note 1: Use of 5kHz repetition rates is traditional; however, 100kHz is closer to reality. Product committees should determine which frequencies are relevant for specific products or product types. Note 2: With some products, there may be no clear distinction between power ports and I/O ports, in which case it is up to product committees to make this determination for review purposes.				
“Xa” is an open level. The level has to be specified in the dedicated equipment specification.				

9.3.2 PERFORMANCE CRITERION: B

9.4 REVIEW RESULTS

Temperature : 24℃ Humidity : 55%

review Model : Operating Power Supply : 24V

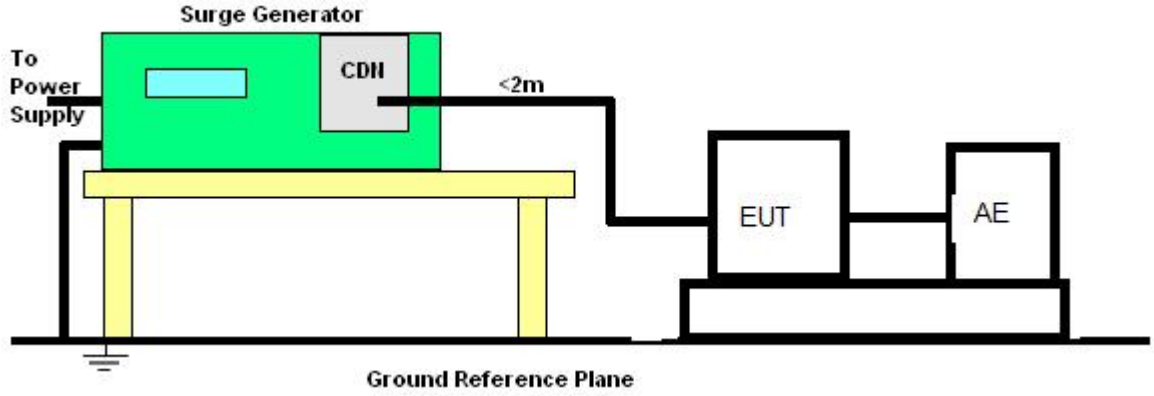
Inject Line	Voltage kV	Repetition rate kHz	Duration of review (seconds)	Result
AC Mains Power Ports or DC Mains Power Ports（AC /DC）	±1	5	120	P
Analogue/Digital Data Ports	--	--	--	--
DC Network Power Ports	--	--	--	--
NOTE – “--” means the item is no applicable.				

9.5 REVIEW CONCLUSION

PASS

10 SURGE IMMUNITY REVIEW

10.1 Diagram of review Setup



10.2 Applicable Standard

IEC 61000-4-5:2014+A1:2017
Analogue/Digital Data Ports
Port type: unshielded symmetrical Apply: lines to grund （Apply where primary protection is intended）：1 and 4 KV 10/700(5/320) us
Port type: unshielded symmetrical Apply: lines to grund （Apply where primary protection is not intended）：1 and 4 KV 10/700(5/320) us
Port type: coaxial or shielded Apply: shield to ground: 0.5KV 1.2/50(8/20) us
DC Network Power Ports: line to reference ground for each individual line 0.5KV 1.2/50(8/20) us
AC Mains Power Ports: Line to line: 1.0kV 1.2/50(8/20) us; Line to earth: 2.0kV 1.2/50(8/20) us

10.3 Severity Levels and Performance Criterion

10.3.1 Severity levels

review Level	Power Supply Coupling Mode	
	Line to Line kV	Line to Earth kV
1	NA	0.5
2	0.5	1.0
3	1.0	2.0
4	2.0	4.0
X	Special	Special

10.3.2 Performance criterion:

Analogue/Digital Data Ports
Port type: unshielded symmetrical Apply: lines to grund （Apply where primary protection is intended: C
Port type: unshielded symmetrical Apply: lines to grund （Apply where primary protection is not intended: B
DC Network Power Ports: B
AC Mains Power Ports: B

10.4 review Result

Temperature : 24℃ Humidity : 55%
review Model : Operating Power Supply : 24V

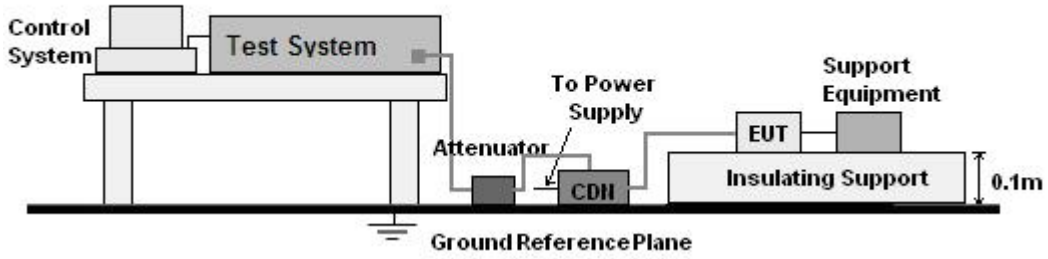
Inject Line	Voltage kV	Phase Angle	No. of Pulse	Result
AC Mains Power Ports or DC Mains Power Ports（AC /DC）	±1	--	10	P
Analogue/Digital Data Ports	--	--	--	--
DC Network Power Ports	--	--	--	--
NOTE – “--” means the item is no applicable.				

10.5 review CONCLUSION

PASS

11 CONTINUOUS INDUCED RF DISTURBANCES IMMUNITY REVIEW

11.1 Diagram of review Setup



11.2 APPLICABLE STANDARD

EN IEC 61000-4-6:2013+Cor 1:2015
Analogue/Digital Data Ports& DC Network Power Ports& AC Mains Power Ports：
0.15-10MHz, 3V Unmodulation, 80%AM (1kHz)
10-30MHz, 3V to 1V Unmodulation, 80%AM (1kHz)
30-80MHz, 1V Unmodulation, 80%AM (1kHz)

11.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

11.3.1 Severity levels

Frequency Range 0.15 MHz – 80 MHz		
Level	Voltage Level (e.m.f.)	
	U0 dB(μV)	U0 (V)
1.	120	1
2.	130	3
3.	140	10
Xa	Special	
Xa is an open level.		

11.3.2 Performance criterion: A

11.4 REVIEW RESULTS

Temperature : 24℃ Humidity : 55%
review Model: Operating Power Supply : 24V

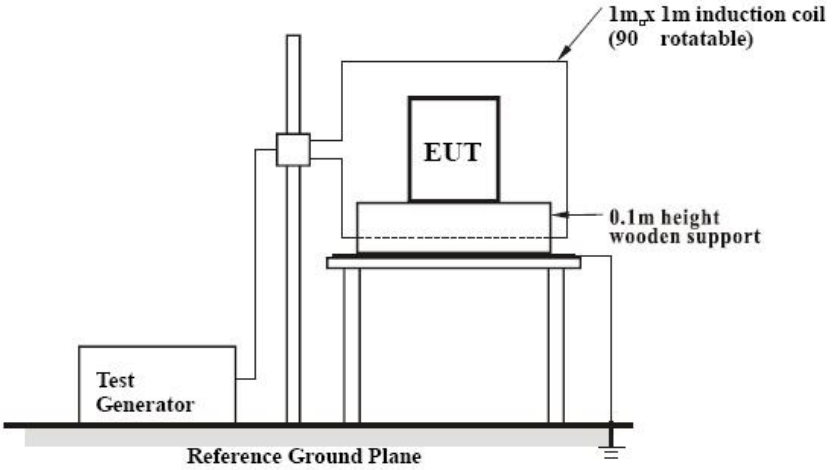
Injected Position	Frequency Range(MHz)	Strength	Criterion	Results
AC Mains Power Ports or DC Mains Power Ports（AC/DC）	0.15 ~ 10	3V(r.m.s.)	A	P
AC Mains Power Ports or DC Mains Power Ports（AC/DC）	10 ~ 30	3V to 1V(r.m.s.)	A	P
AC Mains Power Ports or DC Mains Power Ports（AC/DC）	30 ~ 80	1V(r.m.s.)	A	P
Analogue/Digital Data Ports	--	--	--	--
DC Network Power Ports	--	--	--	--
NOTE – “--” means the item is no applicable.				

11.5 REVIEW CONCLUSION

PASS

12 POWER-FREQUENCY MAGNETIC FIELD IMMUNITY REVIEW

12.1 DIAGRAM OF review SETUP



12.2 APPLICABLE STANDARD

IEC 61000-4-8:2009, Magnetic field strength: 1A/m

12.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

12.3.1 Severity level:

review Level	Magnetic field strength A/m
1	1
2	3
3	10
4	30
5	100
X	Special

12.3.2 Performance criterion: A

12.4 REVIEW RESULTS

Temperature : 24℃ Humidity : 55%
review Model : Operating Power Supply : 24V

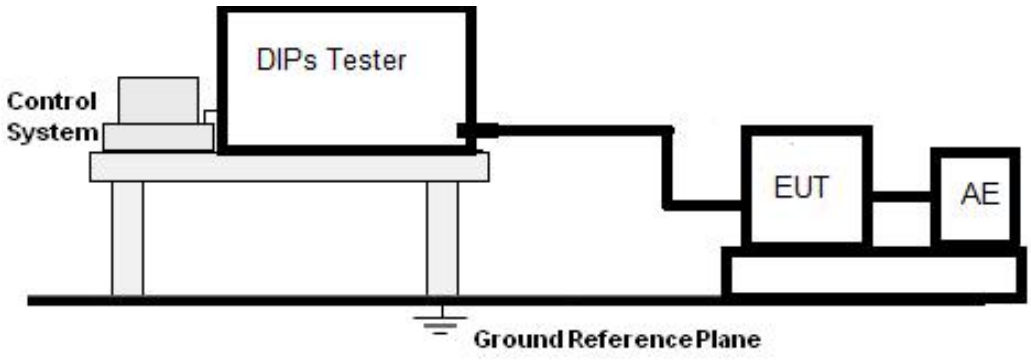
review Level (A/m)	reviewing Duration (in second)	Coil Orientation	Criterion	Result
1	120	Axis-X	A	P
1	120	Axis-Y	A	P
1	120	Axis-Z	A	P

12.5 REVIEW CONCLUSION

PASS

13 VOLTAGE DIPS AND SHORT INTERRUPTIONS IMMUNITY REVIEW

13.1 DIAGRAM OF review SETUP



13.2 APPLICABLE STANDARD

IEC 61000-4-11:2020, review Value：Voltage dips : Dips ﹥95% reduction: 0.5 period; Dips 30% reduction: 25 period; Voltage interruptions ﹥95% reduction: 250period

13.3 SEVERITY LEVELS AND PERFORMANCE CRITERION

13.3.1 Preferred severity levels and durations for voltage dips

Class[a]	review level and durations for voltage dips (ts) (50Hz/60Hz)				
Class 1	Case-by-case according to the equipment requirements				
Class 2	0% during ½ cycle	0% during 1 cycle	70% during 25/30c cycles		
Class 3	0% during ½ cycle	0% during 1 cycle	40% during 10/12[c] cycles	70% during 25/30[c] cycles	80% during 250/300[c] cycles
Class X[b]	X	X	X	X	X

a Classes as per IEC 61000-2-4.
b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2.
c “25/30 cycles” means “25 cycles for 50Hz review” and “30 cycles for 60Hz review”.

13.3.2 Preferred severity levels and durations for short interruptions:

Class[a]	review level and durations for short interruptions (ts) (50Hz/60Hz)
Class 1	Case-by-case according to the equipment requirements
Class 2	0% during 250/300[c] cycles
Class 3	80% during 250/300[c] cycles
Class X[b]	X
a Classes as per IEC 61000-2-4. b To be defined by product committee. For equipment connected directly or indirectly to the public network, the levels must not be less severe than Class 2. c "250/300 cycles" means "250 cycles for 50Hz review" and "300 cycles for 60Hz review".	

13.3.3 Performance criterion:

Voltage Dips 〉95%Reduction 0.5 period: B
Voltage Dips 30% Reduction 25 period: C
Voltage interruptions 〉95% Reduction 250 period: C

13.4 REVIEW RESULTS

Pass

13.5 REVIEW CONCLUSION

PASS

14 BROADBAND IMPULSE NOISE DISTURBANCES, REPETITIVE

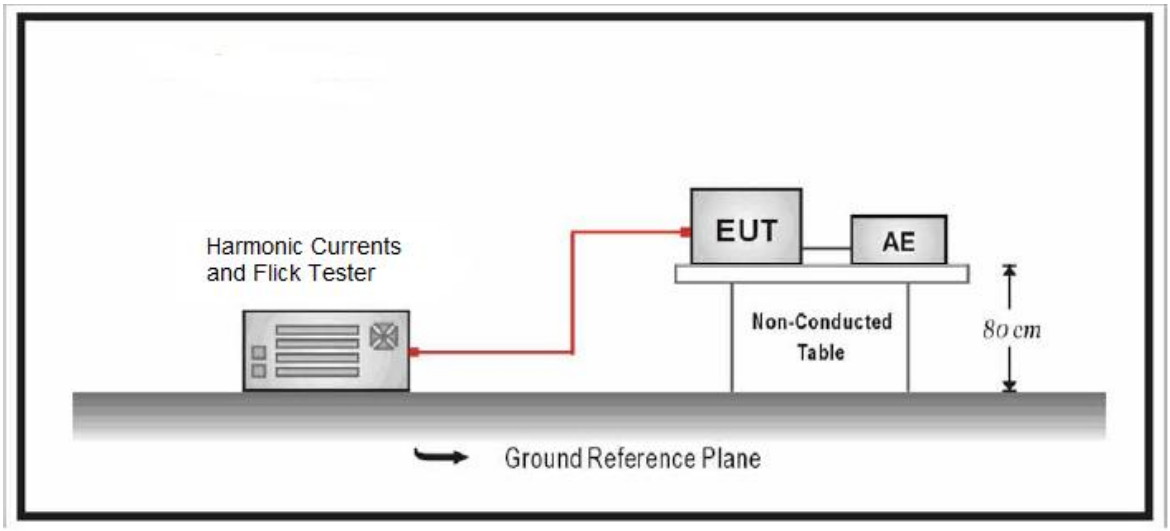
N/A

15 BROADBAND IMPULSE NOISE DISTURBANCES, ISOLATED

N/A

16HARMONIC CURRENT EMISSION TEST

16.1 DIAGRAM OF TEST SETUP



16.2 APPLICABLE STANDARD

EN IEC 61000-3-2:2019+A1:2021+A2:2024 (Class A)

16.3 HARMONIC CURRENT LIMITS

Limits for Class A equipment	
Harmonics Order n	Max. permissible harmonics current A
Odd harmonics	
3	2.30
5	1.14
7	0.77
9	0.40
11	0.33
13	0.21
15<=n<=39	0.15x15/n

Even harmonics	
2	1.08
4	0.43
6	0.30
8<=n<=40	0.23x8/n

16.4 TEST RESULTS

Temperature : 22℃ Humidity : 50%

Test Model : Operating Power Supply : 24V

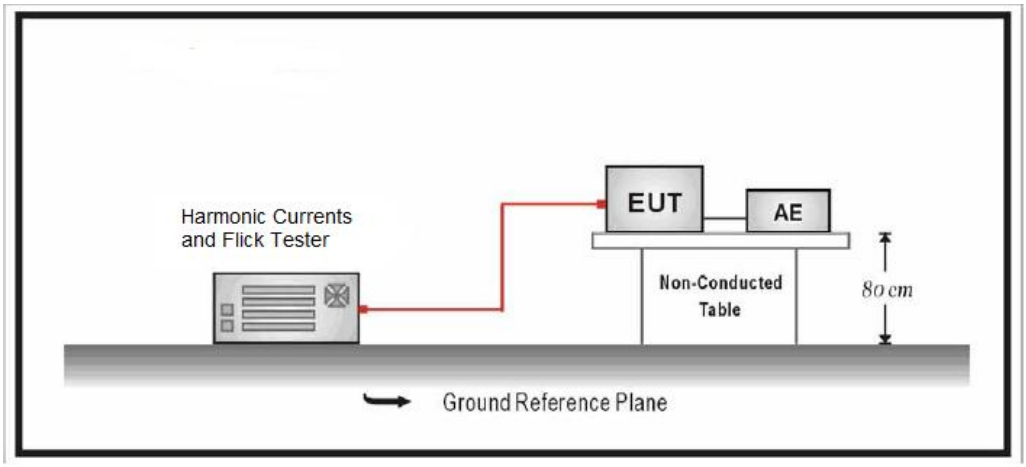
Harmonics Results							
Harmonic	Status	Avg (A)	Avg L(A)	Avg %ofL	Peak (A)	Peak L(A)	Peak %ofL
1	PASS	0.19846	No Limit	N/A	0.24107	No Limit	N/A
2	PASS	2E-06	1.08	0.000195	0.00012	1.62	0.007393
3	PASS	0.18353	2.3	7.979566	0.22356	3.45	6.48
4	PASS	2E-06	0.43	0.000579	0.00012	0.645	0.018673
5	PASS	0.1706	1.14	14.96491	0.20503	1.71	11.99006
6	PASS	2E-06	0.3	0.000659	0.00012	0.45	0.026856
7	PASS	0.15255	0.77	19.81169	0.1794	1.155	15.53247
8	PASS	1E-06	0.23	0.000407	6.4E-05	0.345	0.018518
9	PASS	0.13059	0.4	32.6475	0.14887	0.6	24.81167
10	PASS	1E-06	0.184	0.000679	0.00017	0.276	0.061888
11	PASS	0.10641	0.33	32.24545	0.1162	0.495	23.47475
12	PASS	0	0.15333	0.000223	6.4E-05	0.23	0.027959
13	PASS	0.08159	0.21	38.85143	0.08483	0.315	26.92857
14	PASS	0	0.13143	0.000326	6.4E-05	0.19715	0.03263
15	PASS	0.05777	0.15	38.516	0.05873	0.225	26.10133
16	PASS	0	0.115	0.000151	6.5E-05	0.1725	0.037701
17	PASS	0.03649	0.13235	27.57084	0.03824	0.19853	19.26055
18	PASS	0	0.10222	0.000168	6.4E-05	0.15333	0.041951
19	PASS	0.01926	0.11842	16.26246	0.02214	0.17763	12.46636
20	PASS	0	0.092	0	0	0.138	0
21	PASS	0.00935	0.10714	8.724939	0.01265	0.16071	7.871943
22	PASS	0	0.08364	0	0	0.12545	0
23	PASS	0.01044	0.09783	10.66997	0.01845	0.14674	12.57539
24	PASS	0	0.07667	0	0	0.115	0
25	PASS	0.01455	0.09	16.17111	0.02036	0.135	15.07778
26	PASS	0	0.07077	0	0	0.10615	0
27	PASS	0.01623	0.08333	19.47488	0.01879	0.125	15.03286
28	PASS	0	0.06571	0	0	0.09857	0
29	PASS	0.01522	0.07759	19.61952	0.01595	0.11638	13.70522
30	PASS	0	0.06133	0	0	0.092	0
31	PASS	0.01234	0.07258	17.00307	0.01293	0.10887	11.88006
32	PASS	0	0.0575	0	0	0.08625	0
33	PASS	0.00846	0.06818	12.40195	0.00997	0.10227	9.745387
34	PASS	0	0.05412	0	0	0.08118	0
35	PASS	0.00482	0.06429	7.495411	0.00647	0.09643	6.706385
36	PASS	0	0.05111	0	0	0.07667	0
37	PASS	0.00301	0.06081	4.945322	0.00643	0.09122	7.047189
38	PASS	0	0.04842	0	0	0.07263	0
39	PASS	0.00385	0.05769	6.674582	0.00766	0.08654	8.855069
40	PASS	0	0.046	0	0	0.069	0

16.5 TEST CONCLUSION

PASS

17 VOLTAGE FLUCTUATIONS AND FLICKER TEST

17.1 DIAGRAM OF TEST SETUP



17.2 APPLICABLE STANDARD

EN IEC 61000-3-3:2013+A1:2019+A2:2021

17.3 VOLTAGE FLUCTUATIONS AND FLICKER EMISSION LIMITS

Test Item	Limit	Note
P_{st}	1.0	Short-term flicker indicator
P_{lt}	0.65	Long-term flicker indicator
T_{dt}(ms)	500	Maximum time that dt exceeds 3%
d_{max}(%)	4%	Maximum relative voltage change
d_c(%)	3.3%	Relative steady-state voltage change

17.4 TEST RESULTS

Temperature : 22℃ Humidity : 53%
Test Model : Operating Power Supply : 24V

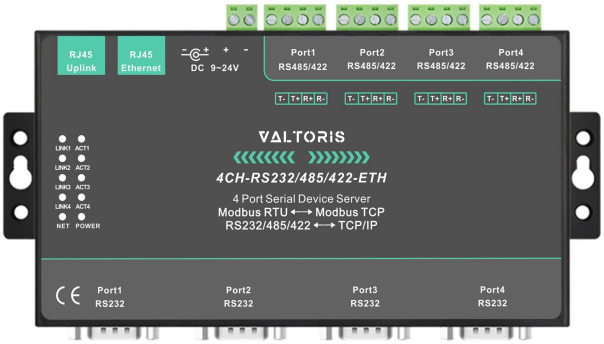
Test Parameter	Limit	Measurement Value	Verdict
P_{st}	1.0	0.0823	Pass
P_{lt}	0.65	0.040	Pass
T_{dt}	0.5	0.000	Pass
D_{max}（%）	4%	0.0525%	Pass
D_c（%）	3.3%	0.0121%	Pass

17.5 TEST CONCLUSION

Photo documentation:

Type of equipment:	Serial Device Server

Details of:	
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

Details of:	
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

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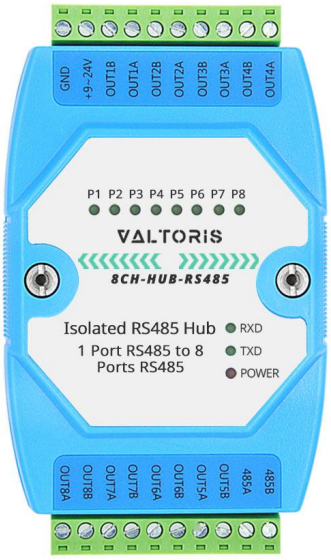
View: [X] general [ ] front [ ] rear [ ] right [ ] left [ ] top [ ] bottom	

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