



Aerospace Testing Technology (Shenzhen) Co., Ltd.

101, Block A4, No. 5, 8th Road, Shapu Yangyong Industrial Park,
Songgang Street, Bao'an District, Shenzhen, Guangdong, China

FCC TEST REPORT

Report No : AST2206302008

Product Name : Dual M.2 SSD to PCIe x4 adapter card

Product Model : SST-ECM28

Applied Standard : FCC Part15B

Test Result : PASS

Issue Date : Jul. 05, 2022

Product Name	: Dual M.2 SSD to PCIe x4 adapter card
Tested Model	: SST-ECM28
Attached Model	: /
Trademark	: /
Applicant	: SilverStone Technology Co.,, Ltd.
Address	: 12F, No. 168, Jiankang Rd., Zhonghe Dist, New Taipwi City, 23585 Taiwan R.O.C.
Manufacturer	: SilverStone Technology Co.,, Ltd.
Address	: 12F, No. 168, Jiankang Rd., Zhonghe Dist, New Taipwi City, 23585 Taiwan R.O.C.
Factory	: AdapterunitIndustry CO., LTD
Address	: 1F., NO. 8, LN. 21, CHANGSHOU ST., SHULIN DIST., NEW TAIPEI CITY 23872, TAIWAN (R.O.C.)
Test date	: Jun. 28, 2022 to Jul. 04, 2022
Remark:	<i>This test report is based on a single evaluation of one sample of above mentioned products. It is not permitted to be duplicated in extracts without written approval of Aerospace Testing Technology (Shenzhen) Co., Ltd.</i>

Prepared by

Reviewed by

Approved by



Mason

Jul. 05, 2022



Lucas

Jul. 05, 2022



Nero

Jul. 05, 2022



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1. Test Laboratory

Test Site1	
Name	: Aerospace Testing Technology (Shenzhen) Co., Ltd.
Address	: 3/F, Block A1, No. 5, 8th Road, Shapu Yangyong Industrial Park, Songgang Street, Bao'an District, Shenzhen, Guangdong, China
Phone	: + 086 0755-27781492
E-mail	: ast@hangtianjc.com
Test Site2	
Name	: Shenzhen Supersonic Measurement And Control Technology Co.,Ltd.
Address	: B2 Building 101, Jinweiyuan Industrial Plant Area, Julongshan District, Longtian Street Industrial Zone, Pingshan District, Shenzhen, Guangdong, China.
Phone	: + 086 0755-84636042
E-mail	: ranguangfu@supersonic-mc.com
Test Site3	
Name	: Shenzhen Academy of Metrology & Quality Inspection
Address	: No.4 Tongfa Road Xili Street Nanshan District, Shenzhen, Guangdong, China.
Phone	: +86 0755-26001833
E-mail	: qiubo@smq.com.cn
Test Report Form	: ASTCX-31-JL03-FCC Part15/18 EMC Test Report Ver.1.0
TRF Originator	: Aerospace Testing Technology (Shenzhen) Co., Ltd.
Master TRF	: Jul.1,2021

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2. Summary of test result

Test Items	Test site	Result
<u>Radiated Emissions (RE) 30MHz-1000MHz</u> <input checked="" type="checkbox"/> Enclosure Port	Site 1	Pass
<u>Radiated Emissions (RE)1000MHz-6000MHz</u> <input type="checkbox"/> Enclosure Port	Site 1	N/A
<u>Conducted Emission (CE)</u> <input type="checkbox"/> Mains port <input type="checkbox"/> Auxiliary ports <input type="checkbox"/> Wired network ports <input type="checkbox"/> Mains port of motor operated tools	Site 1	N/A
<u>Electrostatic Discharge (ESD)</u> <input type="checkbox"/> Enclosure Port	Site 2	N/A
<u>RF Electromagnetic Field (RS)</u> <input type="checkbox"/> Enclosure Port	Site 2	N/A
<u>Power frequency magnetic fields (PMF)</u> <input type="checkbox"/> Enclosure Port	Site 2	N/A
<u>Fast Transients Common mode (EFT)</u> <input type="checkbox"/> AC Power ports <input type="checkbox"/> DC Power ports <input type="checkbox"/> Signal and control lines	Site 2	N/A
<u>RF Common mode (CS)</u> <input type="checkbox"/> AC Power ports <input type="checkbox"/> DC Power ports <input type="checkbox"/> Signal and control lines	Site 2	N/A
<u>Surges</u> <input type="checkbox"/> AC Power ports	Site 2	N/A
<u>Voltage Dips and Interruptions (AC DIP)</u> <input type="checkbox"/> AC Power ports	Site 2	N/A

Note:

- test case does not apply to the test object.....: N/A
- test object does meet the requirement.....: Pass
- test object does not meet the requirement: Fail

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3. Equipment Under Test information

Rating Voltage	: Input:12V $\overline{\text{---}}$ 2A Output: 3.3V $\overline{\text{---}}$ 3A
Rating Current	: /
Test Voltage	: 12Vdc
The difference of the models	: /

Table 3-1 Test Mode List

Test Mode	Describe
TM1	Normal Working
/	/
/	/



Figure 1-1 Test configuration

Table 3-2 Associated Equipment used during test

Name	Model	Manufacturer	S/N	Cal Due Date
Mainframe computers	/	Lab provided	/	/

4. Test Condition

4.1 Environmental conditions

- Temperature : 23°C
- Relative humidity: 60%

4.2 Measurement uncertainty

The reported uncertainty of measurement $y \pm U$, where expanded uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately 95%.

Table 4-1 measurement uncertainty

Test Site	Measurement Frequency Range	U (dB)
SR843-1	150 kHz ~ 30MHz	3.2
SAC966-1	9 kHz ~ 30MHz	3.1
	30MHz ~ 1000MHz	3.4
	1000MHz ~ 6000MHz	3.2

5. Electromagnetic Interference (EMI)

5.1 Radiated Disturbance 30MHz to 1000MHz

5.1.1 Test procedure

The EUT was configured as described in section 1 for this test. The enclosure port was tested.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 and CISPR 16-1-4. The test distance was 3m for 30~1GHz.

The set-up and test methods were according to CISPR 16-2-3.

A preliminary scan and a final scan of the emissions were made from 30MHz to 1GHz by using test script of software; the emissions were measured using Quasi-Peak Detector. The maximal emission value was acquired by adjusting the antenna height, polarization and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

5.1.2 Test method

- a) According as the EUT information, Configured the ports and powered the EUT with the normal voltage.
- b) The EUT was placed on the top of a table 0.8 meters above the ground at 3-meter SAC as figure 5-2 or 0.12m above the ground at 3-meter SAC as figure 5-3.
- c) The measuring distance of at 3m shall be used for measurements at frequency up to 1GHz.
- d) The polarizations of the antenna were set to horizontal.
- e) The height of the test antenna was 1m.
- f) The turn table was rotating from 0° to 360° and the test receiver pre-scan.
- g) Change the height of the test antenna from 1m to 4m, then repeated f) and recorded and save the maximum value.
- h) Select six points have little margin from limit and finally reading.
- i) Recording the maximum value, and the deg. and the height of the test antenna.
- j) Change the polarizations to vertical and repeated the e) to i).

5.1.3 Test setup

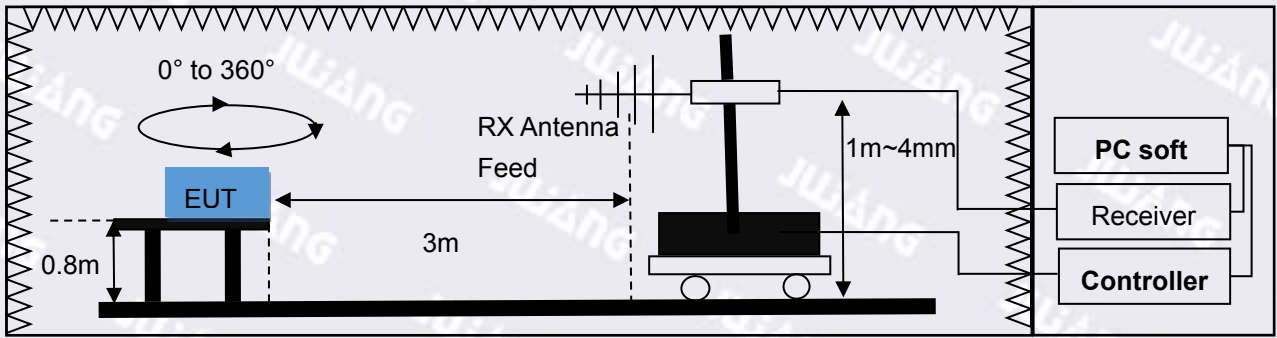


Figure 5-1 Test set-up of radiated disturbance(30MHz-1GHz)

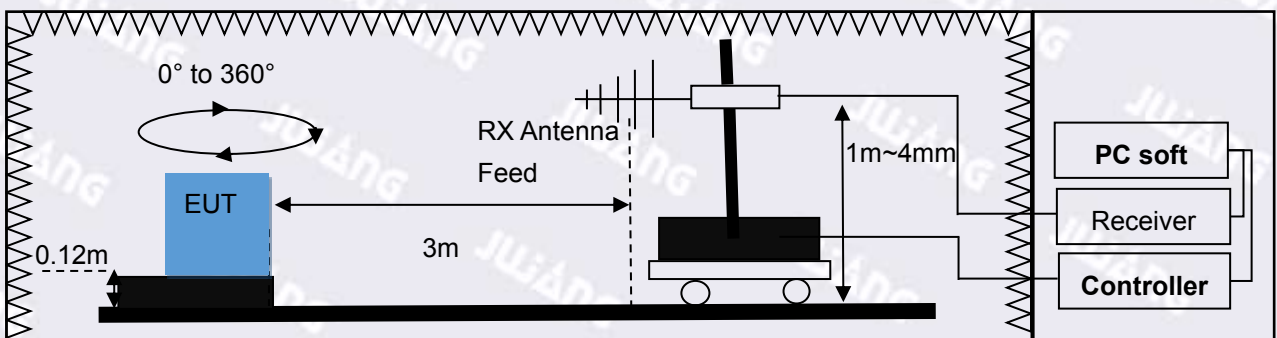


Figure 5-2 Test set-up of radiated disturbance(30MHz-1GHz)

5.1.4 Test limits

Table 5-1 RE test limits 30MHz to 1000MHz

Frequency (MHz)	Class A Quasi-peak dB μ V/m
30 to 88	20
88 to 216	21.8
216 to 960	23
960 to 1000	27

Note 1: Test distance is 3m.
 Note 2: The lower limit shall apply at the transition frequency.

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5.1.5 Test results

The EUT has met requirements for Radiated disturbance. The test data as follow:

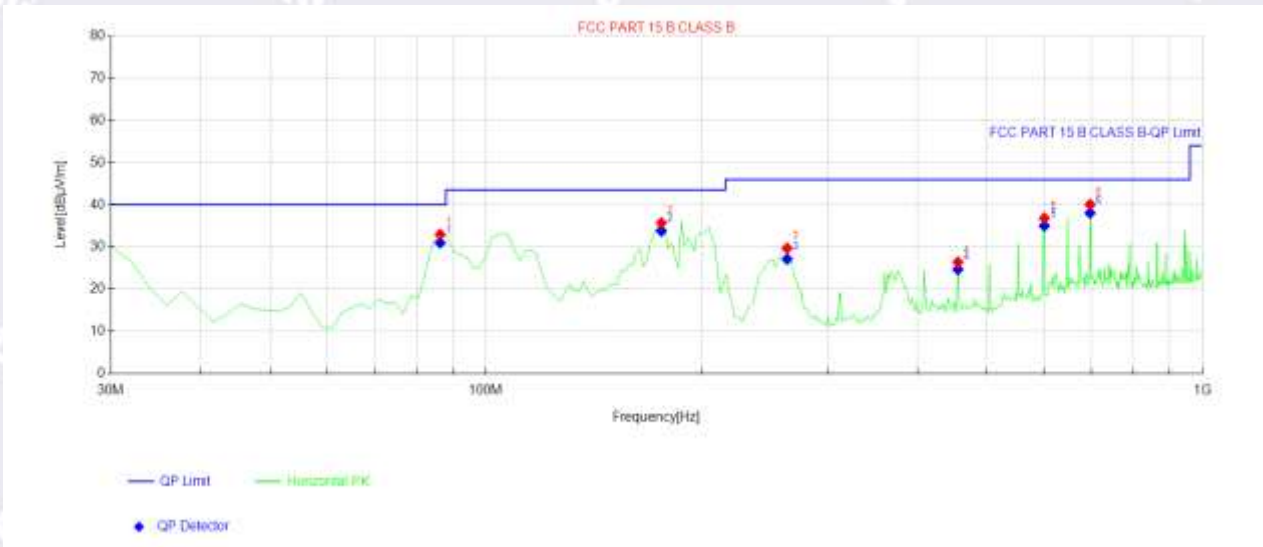
Remark:

Level= Reading Level + Factor,

Factor= Cable Loss +Antenna Factor – Amplifier,

(The Level is recorded by software which is not shown in the sheet).

Margin=Limit – Level.



Final Test Data								
NO.	Freq. [MHz]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Result
1	86.3727	30.98	40.00	9.02	300	129	Horizontal	PASS
2	175.7916	33.78	43.50	9.72	300	349	Horizontal	PASS
3	263.2665	27.12	46.00	18.88	100	83	Horizontal	PASS
4	455.7114	24.67	46.00	21.33	300	64	Horizontal	PASS
5	601.503	34.99	46.00	11.01	100	336	Horizontal	PASS
6	696.7535	38.05	46.00	7.95	100	17	Horizontal	PASS

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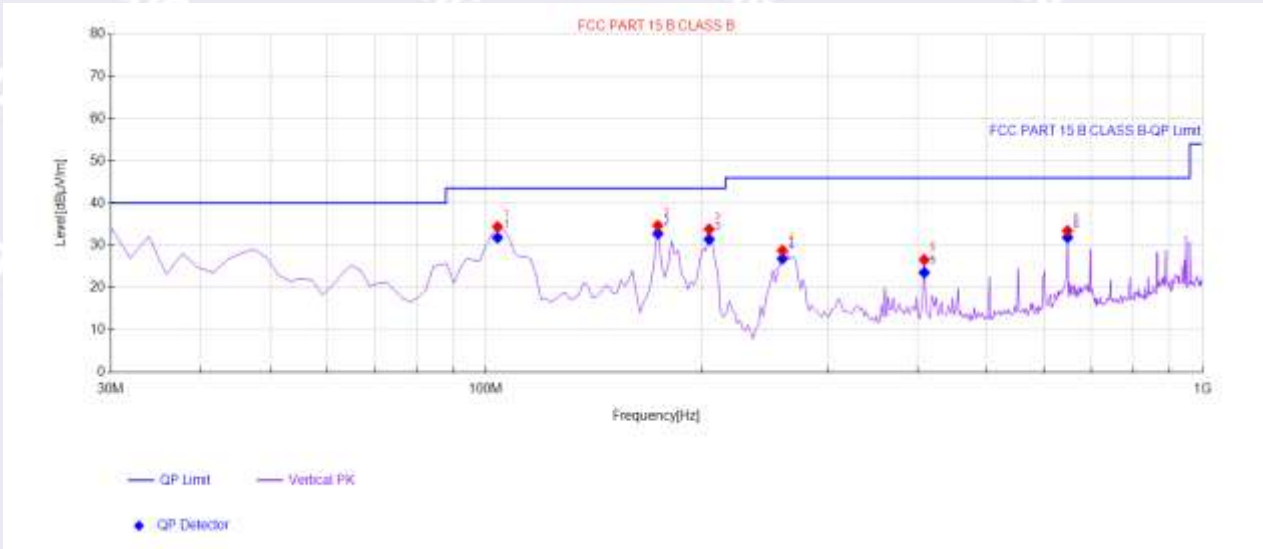
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Final Test Data								
NO.	Freq. [MHz]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity	Result
1	103.8677	31.83	43.50	11.67	100	176	Vertical	PASS
2	173.8477	32.78	43.50	10.72	100	200	Vertical	PASS
3	204.9499	31.44	43.50	12.06	100	162	Vertical	PASS
4	259.3788	26.85	46.00	19.15	100	124	Vertical	PASS
5	409.0581	23.57	46.00	22.43	100	176	Vertical	PASS
6	648.1563	31.86	46.00	14.14	100	172	Vertical	PASS

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5.2 Radiated Disturbance 1000MHz to 6000MHz

5.2.1 Test procedure

The EUT was configured as described in section 1 for this test. The enclosure port was tested.

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4 and CISPR 16-1-4. The test distance was 3m for 1000MHz~6000MHz.

The set-up and test methods were according to CISPR 16-2-3.

A preliminary scan and a final scan of the emissions were made from 1000MHz to 6000MHz by using test script of software; the emissions were measured using Quasi-Peak Detector. The maximal emission value was acquired by adjusting the antenna height, polarization and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m, the azimuth range of turntable was 0° to 360°, The receive antenna has two polarizations V and H.

5.2.2 Test method

- a) According as the EUT information, Configured the ports and powered the EUT with the normal voltage.
- b) The EUT was placed on the top of a table 0.8 meters above the ground at 3-meter SAC as figure 5-4 or 0.12m above the ground at 3-meter SAC as figure 5-5.
- c) The measuring distance of at 3m shall be used for measurements at frequency 1000MHz-6000MHz.
- d) The polarizations of the antenna were set to horizontal.
- e) The height of the test antenna was 1m.
- f) The turn table was rotating from 0° to 360° and the test receiver pre-scan.
- g) Change the height of the test antenna from 1m to 4m, then repeated f) and recorded and save the maximum value.
- h) Select six points have little margin from limit and finally reading.
- i) Recording the maximum value, and the deg. and the height of the test antenna.
- j) Change the polarizations to vertical and repeated the e) to i).

5.2.3 Test setup

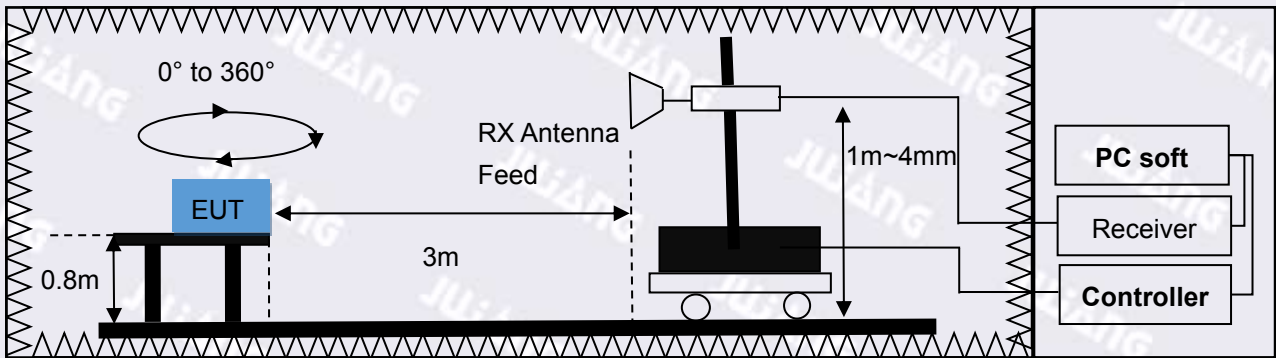


Figure 5-3 Test set-up of radiated disturbance(1000MHz-6000MHz)

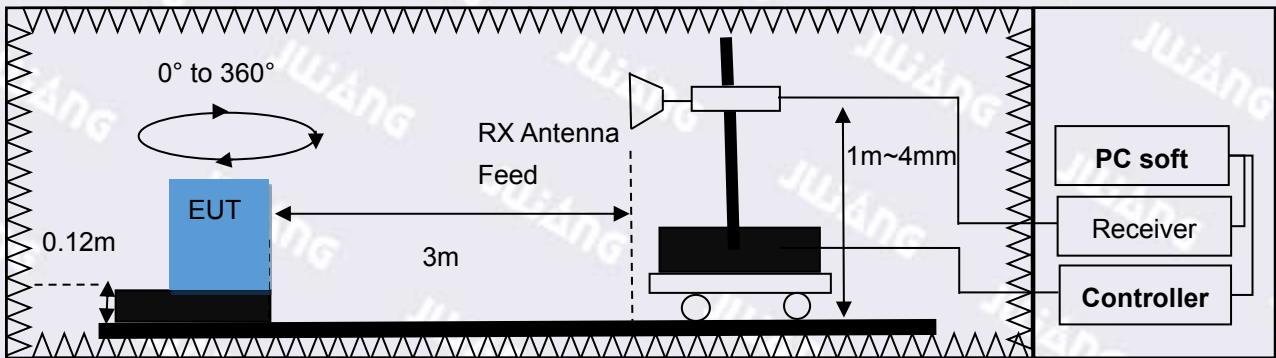


Figure 5-4 Test set-up of radiated disturbance(1000MHz-6000MHz)

5.2.4 Test limits

Table 5-2 RE test limits 1000MHz to 6000MHz

Frequency (MHz)	Class A dB μ V/m		Class B dB μ V/m	
	Peak	Average	Peak	Average
1000~3000	76	56	66	46
3000~6000	80	60	70	50

Note 1: Test distance is 3m.
 Note 2: The lower limit shall apply at the transition frequency.

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5.2.5 Test results

The EUT has met requirements for Radiated disturbance. The test data as follow:

Remark:

Level= Reading Level + Factor,

Factor= Cable Loss +Antenna Factor – Amplifier,

(The Level is recorded by software which is not shown in the sheet).

Margin=Limit – Level.

N/A

5.3 Conducted Disturbance 150 kHz to 30MHz

5.3.1 Test procedure

The EUT was configured as described in section 1 for this test. The mains cable of the EUT being measured shall be connected to LISN, The LISN shall be placed 0.8m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

All telecommunication and signal ports must be correctly terminated using either appropriate associated equipment or a representative termination during the measurement of the conducted disturbances at the mains.

Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1m.

The set-up and test methods were according to CISPR 16-2-3.

5.3.2 Test setup

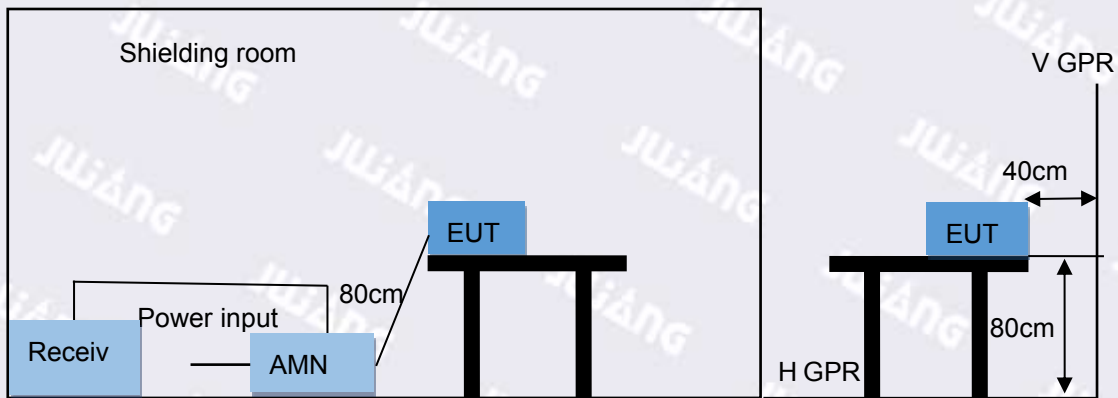


Figure 5-5 Test set-up of conducted disturbance for power port

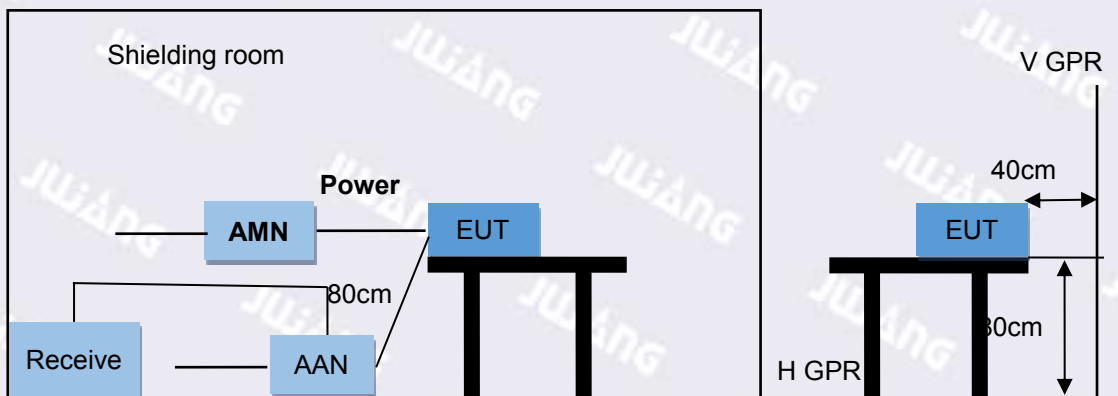


Figure 5-6 Test set-up of conducted disturbance for wired network ports

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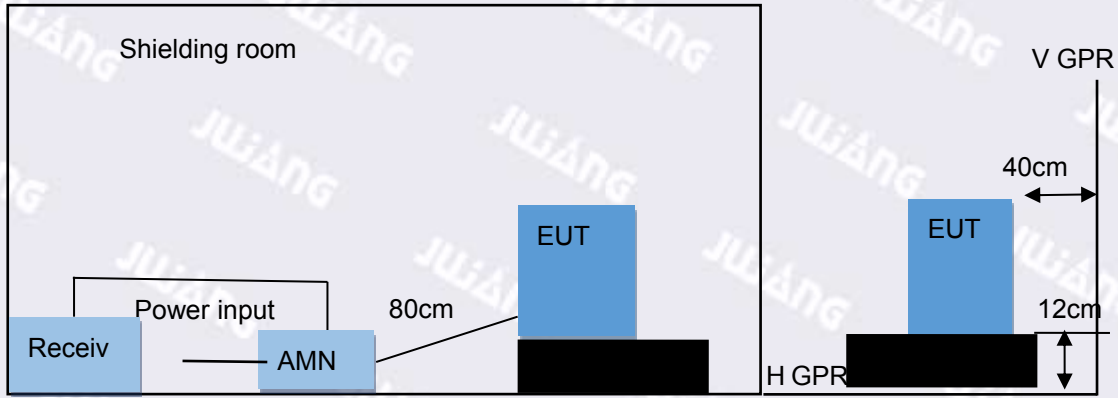


Figure 5-7 Test set-up of conducted disturbance for power port

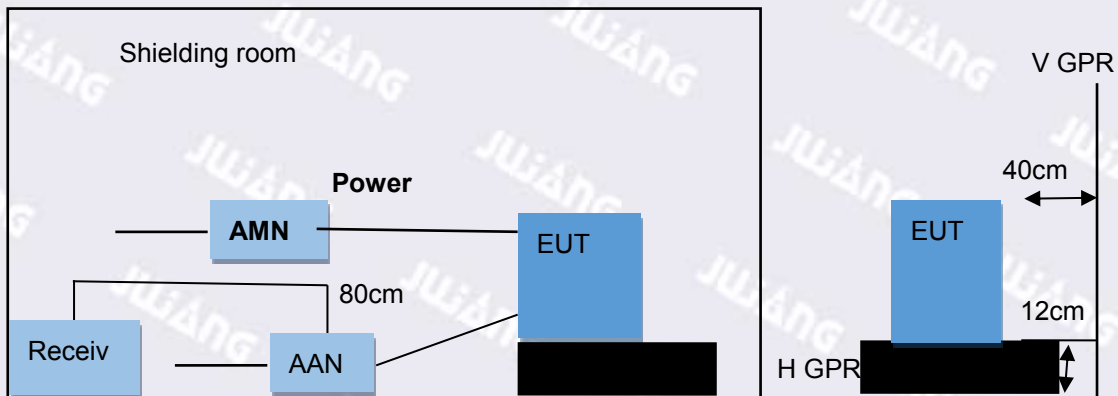


Figure 5-8 Test set-up of conducted disturbance for wired network ports

5.3.3 Test limits

Table 5-3 Test Limit of AC mains port

Frequency range	Class A dB μ V		Class B dB μ V	
	Quasi Peak	Average	Quasi Peak	Average
0.45MHz~1.705MHz	30	66	66 to 56	56 to 46
1.705MHz~30MHz	34.7	60	56	46

5.3.4 Test results

Remark:

Level= Reading Level + Correction Factor

Factor= Cable Loss + Factor

(The Reading Level is recorded by software which is not shown in the sheet)

Margin=Limit – Level.

N/A

6. Measurement Instruments

Table 7-1 RE instruments

Item	Kind of Equipment	Manufacturer	Type No.	Calibrated until
1	EMI Test Receiver	R&S	ESU8	Aug. 24, 2022
2	Bilog Antenna	SCHWARZBECK	VULB 9163	Aug. 24, 2022
3	Horn Antenna	SCHWARZBECK	BBHA9120D	Aug. 24, 2022
4	Amplifier	Tonscend	TAP-9E6343	Aug. 24, 2022
5	Amplifier	Tonscend	TAP-051841	Aug. 24, 2022
6	Triple-Loop Antenna	Daze	ZN30401	Aug. 24, 2022

Table 7-2 CE instruments

Item	Kind of Equipment	Manufacturer	Type No.	Calibrated until
1	EMI Test Receiver	R&S	ESRP3	Aug. 24, 2022
2	LISN	Schwarzbeck	NNLK 8121	Aug. 24, 2022
3	Amplitude limiter	Schwarzbeck	VTSD 9561 F	Aug. 24, 2022

Table 7-3 ESD instruments

Item	Kind of Equipment	Manufacturer	Type No.	Calibrated until
1	ESD TEST GENERATOR	3CTest	EDS 30V	Aug. 24, 2022

Table 7-4 RS instruments

Item	Kind of Equipment	Manufacturer	Type No.	Calibrated until
1	Signal Generator	Keysight	N5181A	Aug. 24, 2022
2	Power Amplifier	Mic-top	MPA-80-1000-1000	Aug. 24, 2022
3	Power meter	Keysight	E4419A	Aug. 24, 2022
3	Power probe	Keysight	E9304A	Aug. 24, 2022
4	Power Amplifier	AR	25S1G4A	Aug. 24, 2022
5	Antenna	Schwarzbeck	STLP9149	Aug. 24, 2022

Table 7-5 EFT, AC-DIP and SURGE instruments

Item	Kind of Equipment	Manufacturer	Type No.	Calibrated until
1	Immunity test	3CTest	CCS 600	Aug. 24, 2022
2	Coupling clamp	3CTest	CCC100	Aug. 24, 2022
3	CDN	3CTest	SEPN3832T	Aug. 24, 2022
4	Voltage regulator	3CTest	VVT2216	Aug. 24, 2022

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7. Photos of the EUT

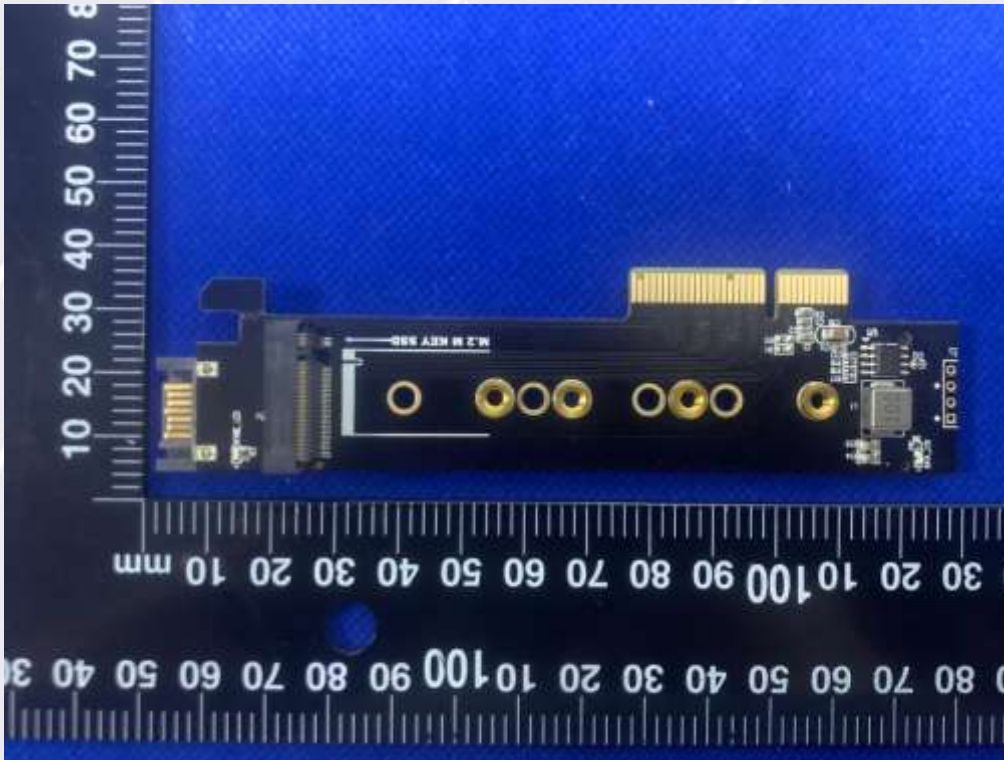


Figure 7-1 EUT

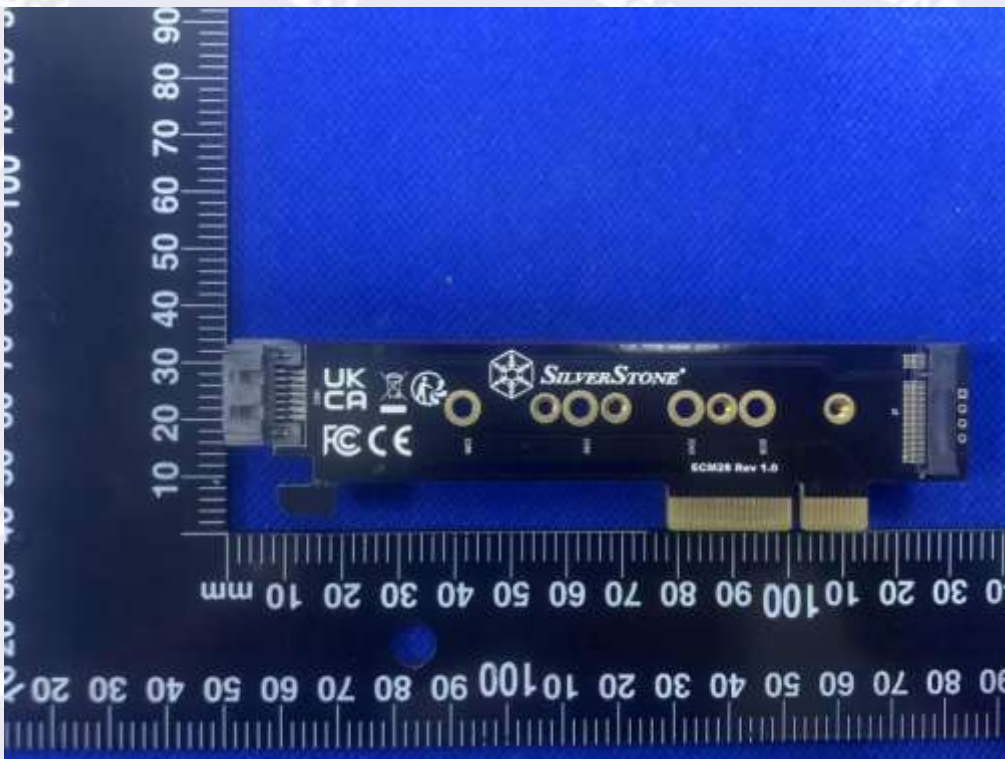


Figure 7-2 EUT

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8. Photos of test setup



Figure 8-1 RE test setup

----- The End of Report -----