TEST REPORT

FCC PART 15B

Report Reference No.....:	**TZ230804740-E**
Compiled by (position+printed name+signature)..:	File administrators Nancy Li
Name of the organization performing the tests (position+printed name+signature)..:	Technique principal Hugo Chen
Approved by (position+printed name+signature)..:	Manager Andy Zhang
Date of issue.....:	07 August 2023
Representative Laboratory Name ....:	Shenzhen Tongzhou Testing Co.,Ltd
Address.....:	1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China
Applicant's name.....:	**SHENZHEN TRANSCHAN TECHNOLOGY LIMITED**
Address.....:	Room 03,23F,Unit B Building,No 9,Shenzhen Bay Eco-Technology Park,Yuehai Street, Nanshan District City Shenzhen
Test specification:	
Standard .....:	**FCC Part 15B**
TRF Originator.....:	Shenzhen Tongzhou Testing Co.,Ltd
Master TRF.....:	Dated 2012-06

Test item description ..... :	CPE
Trade Mark .....:	VIMOQ
Model/Type reference.....:	TR251
Listed Models .....:	N/A
Manufacturer .....:	SHENZHEN TRANSCHAN TECHNOLOGY LIMITED
Power Supply.....:	DC 12V by Adapter
Result.....:	**Pass**

TEST REPORT

Test Report No. :	TZ230804740-E	07 August 2023 Date of issue

Equipment under Test	:	CPE
Model /Type	:	TR251
Listed Models	:	N/A
Applicant	:	**SHENZHEN TRANSCHAN TECHNOLOGY LIMITED**
Address	:	Room 03,23F,Unit B Building,No 9,Shenzhen Bay Eco-Technology Park,Yuehai Street, Nanshan District City Shenzhen
Manufacturer	:	**SHENZHEN TRANSCHAN TECHNOLOGY LIMITED**
Address	:	Room 03,23F,Unit B Building,No 9,Shenzhen Bay Eco-Technology Park,Yuehai Street, Nanshan District City Shenzhen

Test Result according to the standards on page 4:	**Pass**

The test report merely corresponds to the test sample.
It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

Contents

1. TEST STANDARDS

The tests were performed according to following standards:

FCC Rules Part 15 Subpart B
Unintentional Radiators

ANSI C63.4-2014
American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2. SUMMARY

2.1. General Remarks

Date of receipt of test sample	:	07 August 2023
Testing commenced on	:	07 August 2023
Testing concluded on	:	02 August 2023

2.2. Equipment Under Test

Power supply system utilised

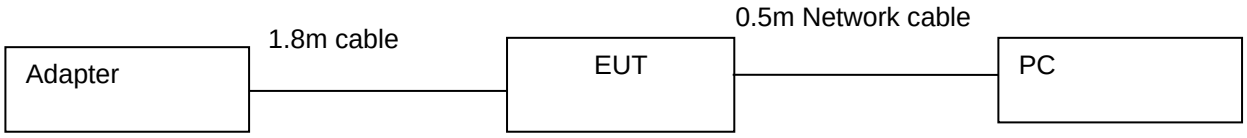
●	Adapter	Model:	KA2401A-1202000US
		Input:	100-240V-50/60Hz 0.65A Max
		Output:	12V⎓2000A

2.3. Short description of the Equipment under Test (EUT)

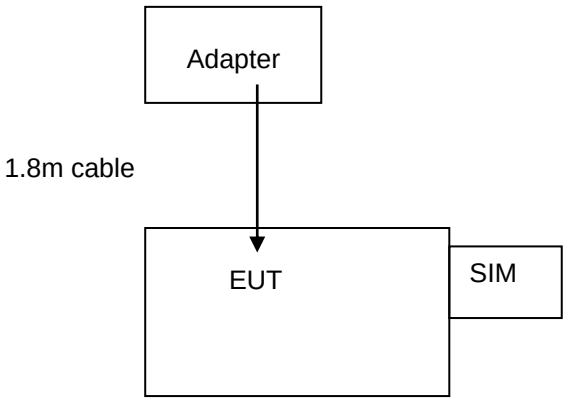
CPE
For more details, refer to the user's manual of the EUT.

2.4. EUT operation mode

The EUT has been tested under typical operating condition.
Mode 1:



Mode 2



(EUT: CPE)

I/O Port of EUT			
I/O Port Type	**Q'TY**	**Cable**	**Tested with**
Power	1	1.8m cable, unshielded	1
Network cable	1	0.5m Network cable	1

Test Item	
EMI	
Mode 1	SIM Card Playing
Mode 2	Connect to PC+SIM to transfer data (the worst case)

2.5. EUT configuration

The following peripheral devices and interface cables were connected during the measurement:

o - supplied by the manufacturer

● - supplied by the lab

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
1	PC	DELL	KB522		

2.6. Related Submittal(s) / Grant (s)

This test report is intended for CPE filing to comply with the FCC Part 15, Subpart B Rules.

2.7. Modifications

No modifications were implemented to meet testing criteria.

2.8. Test Result Summary

Test Item	Test Requirement	Standard Paragrph	Result
Radiated Emission	FCC PART 15	Section 15.109	PASS
Conducted Emission	FCC PART 15	Section 15.107	PASS

Remark: The measurement uncertainty is not included in the test result.

3. TEST ENVIRONMENT

3.1. Address of the test laboratory

Shenzhen Tongzhou Testing Co.,Ltd

1th Floor, Building 1, Haomai High-tech Park, Huating Road 387, Dalang Street, Longhua, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2014) and CISPR Publication 22.

3.2. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 ° C
Humidity:	30-60 %
Atmospheric pressure:	950-1050mbar

3.3. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen Tongzhou Testing Co.,Ltd quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen Tongzhou Testing Co.,Ltd is reported:

Test Item		Frequency Range	Uncertainty	Note
Radiation Uncertainty		30MHz~1000MHz	±3.92dB	(1)
		1GHz~40GHz	±4.28dB	(1)
Conduction Uncertainty	:	150kHz~30MHz	±2.71dB	(1)

(1). This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

3.4. Equipments Used during the Test

Conducted emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	EMI Test Receiver	ROHDE & SCHWARZ	ESCI-7	100849/003	2022/12/28	2023/12/27
2	Artificial Mains	ROHDE & SCHWARZ	ENV 216	101333-IP	2022/12/28	2023/12/27
3	EMI Test Software	ROHDE & SCHWARZ	ESK1	V1.71	N/A	N/A

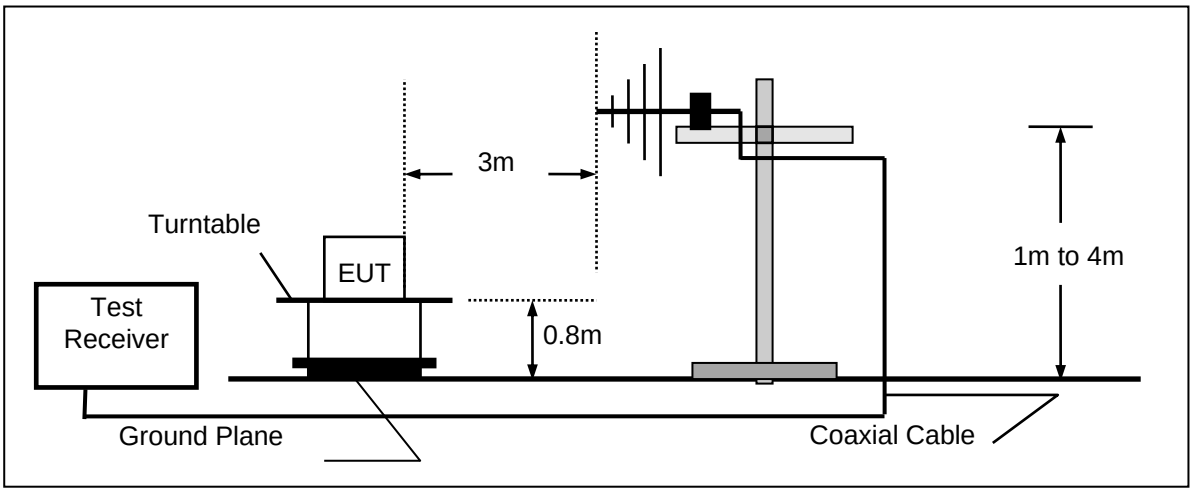
Radiated emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Due
1	Test Receiver	R&S	ESCI-7	100849/003	2022/12/28	2023/12/27
2	wideband Antenna	Schwarzbeck	VULB 9163	958	2022/11/13	2025/11/12
3	Horn Antenna	Schwarzbeck	BBHA 9120D	01989	2022/11/13	2025/11/12
4	Amplifier	Schwarzbeck	BBV 9743	209	2022/12/28	2023/12/27
5	Amplifier	Tonscend	TSAMP-0518SE	--	2022/12/28	2023/12/27
6	Postional Controller	MF	MF7802	--	--	--
7	RE test software	Tonscend	JS32-RE	V2.0.2.0	--	--

4. TEST CONDITIONS AND RESULTS

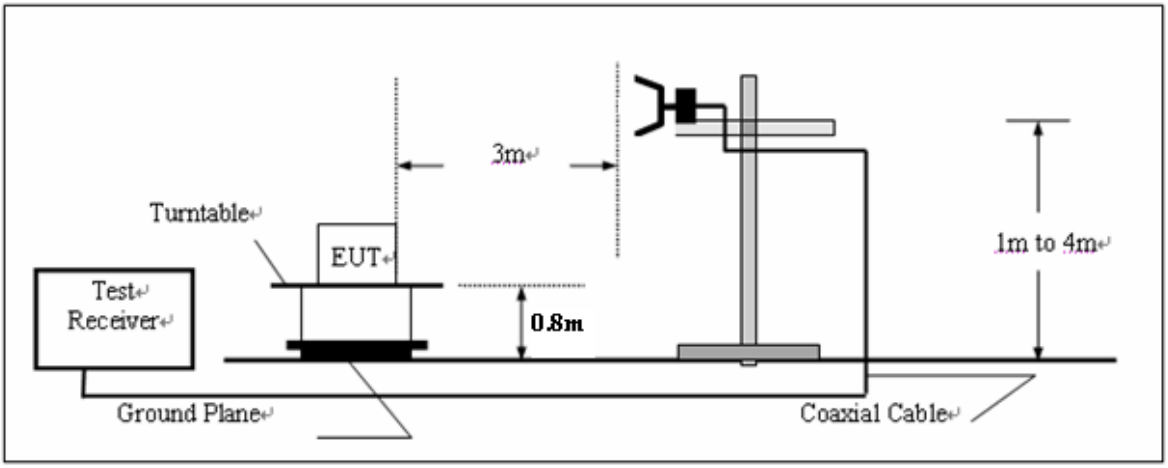
4.1. Radiated Emission Test

TEST CONFIGURATION

(A) Radiated Emission Test Set-Up, Frequency below 1000MHz



(B) Radiated Emission Test Set-Up, Frequency above 1000MHz



Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values：

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

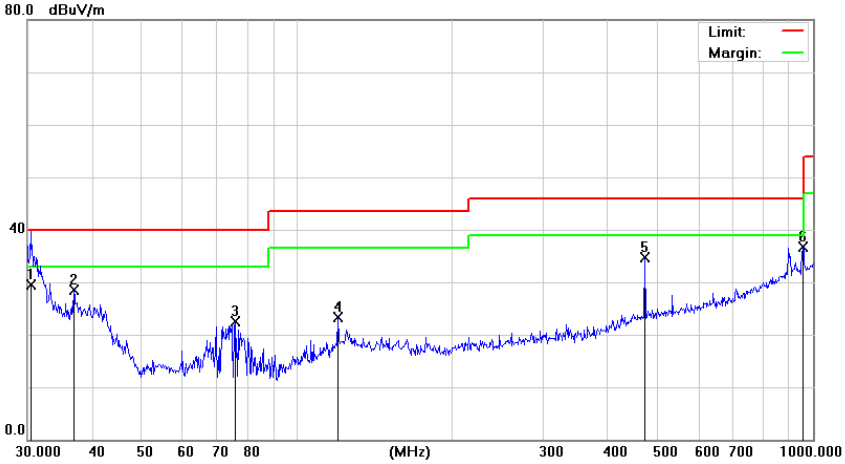
For intentional device, according to § 15.209(a), the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the above table.

Test Procedure

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

Radiation Test Results

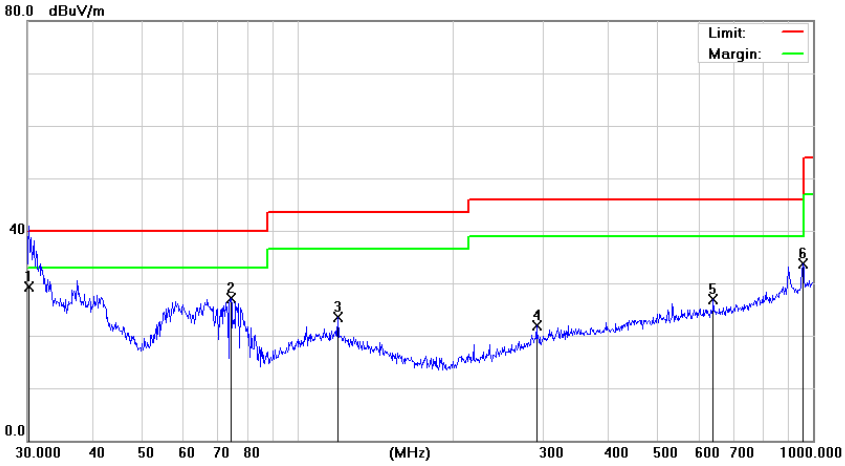
Below 1000MHz((Worst Case: Mode 2 with AC 120 V/60 Hz)
Polarization: Horizontal



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1		30.4238	24.34	5.12	29.46	40.00	-10.54	QP
2		36.8953	27.69	0.78	28.47	40.00	-11.53	QP
3		75.7114	31.74	-9.17	22.57	40.00	-17.43	QP
4		119.8556	27.37	-4.06	23.31	43.50	-20.19	QP
5		472.1760	33.36	1.34	34.70	46.00	-11.30	QP
6	*	955.4381	25.88	10.90	36.78	46.00	-9.22	QP

***Note:
1. Level [dBμV/m] = Reading [dBμV] + Factor [dB/m]
2. Margin [dB] = Limit [dBμV/m] - Level [dBμV/m].

Polarization: Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector
1	*	30.2111	23.95	5.31	29.26	40.00	-10.74	QP
2		74.3955	33.60	-6.58	27.02	40.00	-12.98	QP
3		119.8556	26.09	-2.53	23.56	43.50	-19.94	QP
4		291.0360	24.43	-2.48	21.95	46.00	-24.05	QP
5		640.6110	24.84	2.07	26.91	46.00	-19.09	QP
6		955.4381	26.54	7.22	33.76	46.00	-12.24	QP

***Note:
1. Level [dBμV/m] = Reading [dBμV] + Factor [dB/m]
2. Margin [dB] = Limit [dBμV/m] - Level [dBμV/m].

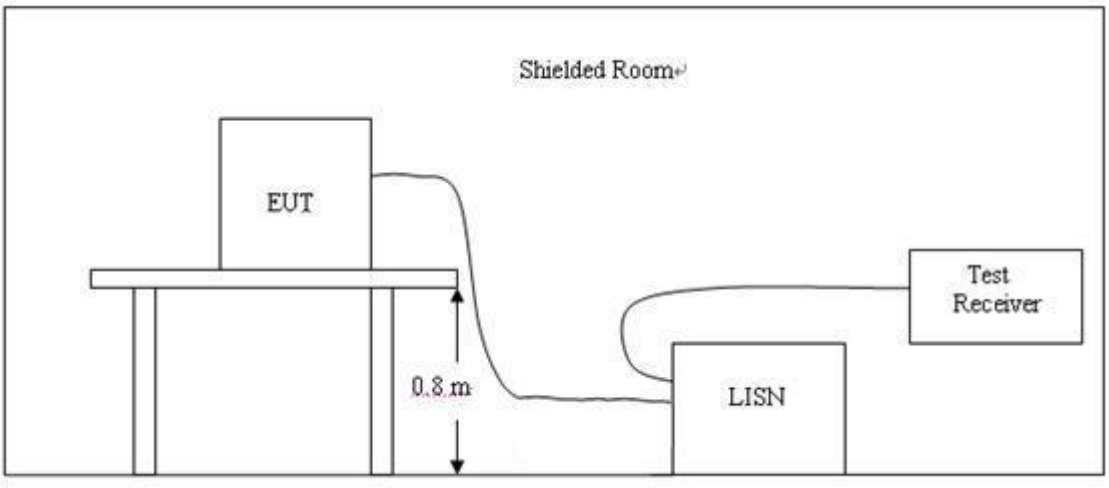
Above 1000MHz((Worst Case: Mode 2 with AC 120 V/60 Hz worst case)

Freq. (MHz)	Ant. Pol. H/V	Emission Level(dBuV)		Limit 3m(dBuV/m)		Over(dB)	
		PK	AV	PK	AV	PK	AV
1781.06	V	58.76	41.96	74	54	-15.24	-12.04
2444.90	V	58.20	39.99	74	54	-15.80	-14.01
1772.51	H	59.42	39.38	74	54	-14.58	-14.62
2438.34	H	59.63	40.63	74	54	-14.37	-13.37

Remark:
All emissions not reported were more than 20dB below the specified limit or in the noise floor.
Freq. = Emission frequency in MHz
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
Over= Emission Level - Limit.
All the x/y/z orientation has been investigated, and only worst case is presented in this report.

4.2. Conducted Emissions Test

TEST CONFIGURATION



TEST PROCEDURE

1 The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4.
2 Support equipment, if needed, was placed as per ANSI C63.4.
3 All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
4 The EUT received power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5 All support equipments received AC power from a second LISN, if any.
6 The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7 Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8 During the above scans, the emissions were maximized by cable manipulation.

Conducted Power Line Emission Limit

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following：

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

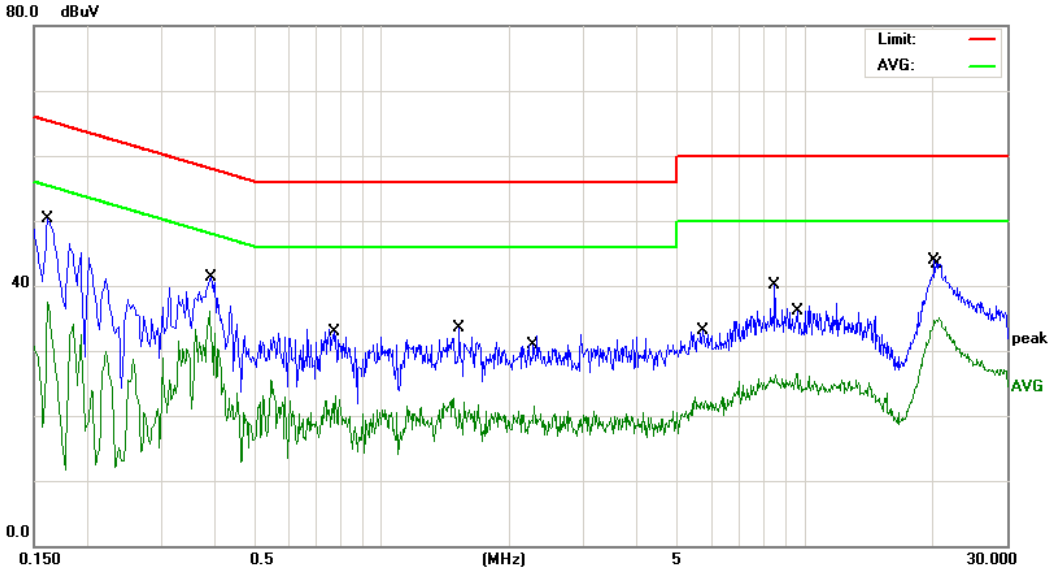
* Decreasing linearly with the logarithm of the frequency

For intentional device, according to §15.207(a) Line Conducted Emission Limit is same as above table.

TEST RESULTS

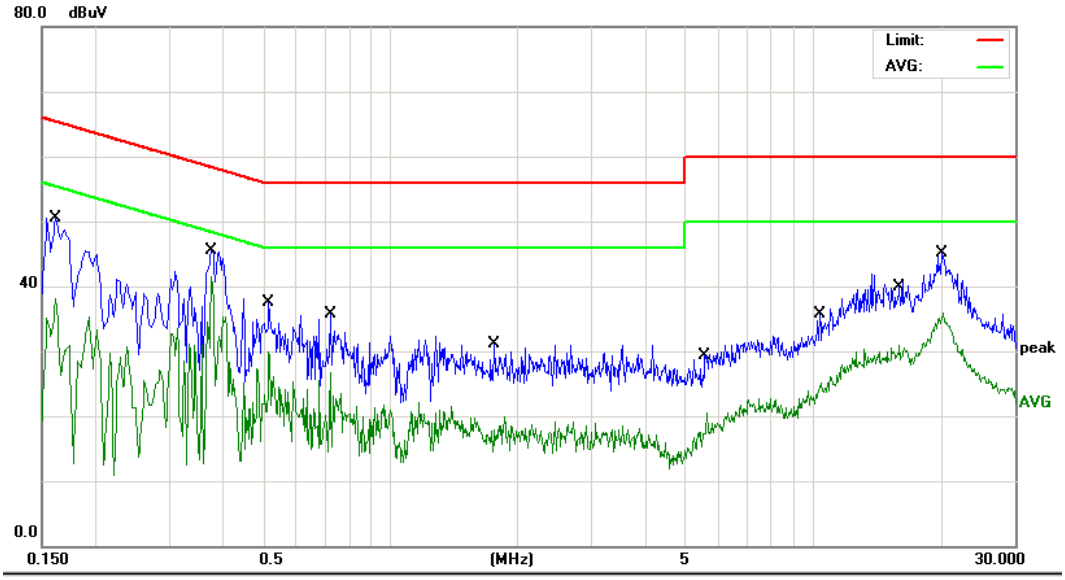
Temperature	20 ℃	Relative Humidity	48%
Pressure	1010 hPa	Test Mode	Mode 2(the worst case)

Conducted Emission on Line Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1620	39.83	10.45	50.28	65.36	-15.08	QP
2		0.1620	27.09	10.45	37.54	55.36	-17.82	AVG
3	*	0.3899	25.55	10.49	36.04	48.06	-12.02	AVG
4		0.3940	30.80	10.50	41.30	57.98	-16.68	QP
5		0.7780	12.65	10.54	23.19	46.00	-22.81	AVG
6		1.5220	22.95	10.63	33.58	56.00	-22.42	QP
7		2.2900	10.76	10.71	21.47	46.00	-24.53	AVG
8		5.7260	22.31	10.75	33.06	60.00	-26.94	QP
9		8.4660	29.30	10.80	40.10	60.00	-19.90	QP
10		9.5219	15.69	10.82	26.51	50.00	-23.49	AVG
11		20.2580	32.85	11.05	43.90	60.00	-16.10	QP
12		20.7540	23.95	11.06	35.01	50.00	-14.99	AVG

Conducted Emission on Neutral Terminal of the power line (150 kHz to 30MHz)



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Over	
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector
1		0.1620	40.04	10.45	50.49	65.36	-14.87	QP
2		0.1620	27.68	10.45	38.13	55.36	-17.23	AVG
3		0.3780	35.00	10.49	45.49	58.32	-12.83	QP
4	*	0.3780	31.03	10.49	41.52	48.32	-6.80	AVG
5		0.5180	19.43	10.52	29.95	46.00	-16.05	AVG
6		0.7220	25.26	10.53	35.79	56.00	-20.21	QP
7		1.7700	20.35	10.67	31.02	56.00	-24.98	QP
8		5.6020	9.76	10.75	20.51	50.00	-29.49	AVG
9		10.3500	24.76	10.86	35.62	60.00	-24.38	QP
10		16.0220	19.72	11.17	30.89	50.00	-19.11	AVG
11		20.0660	34.14	11.05	45.19	60.00	-14.81	QP
12		20.3380	24.85	11.05	35.90	50.00	-14.10	AVG

Note1:

Freq. = Emission frequency in MHz

Reading level (dBμV) = Receiver reading

Corr. Factor (dB) = Antenna factor + Cable loss

Measurement (dBμV) = Reading level (dBμV) + Corr. Factor (dB)

Limit (dBμV) = Limit stated in standard

Margin (dB) = Measurement (dBμV) – Limits (dBμV)

Q.P. =Quasi-Peak AVG =average

** is meaning the worst frequency has been tested in the frequency range 150 kHz to 30MHz.*

5. Test Setup Photos of the EUT

Please refer to separated files for Test Setup Photos of the EUT.

6. External and Internal Photos of the EUT

Please refer to separated files for External and Internal Photos of the EUT.

.....End of Report.....