

FCC TEST REPORT

Prepared for : Sharkoon Technologies GmbH
Address : Grüninger Weg 48, 35415 Pohlheim, Germany

Trade Name : Sharkoon
E.U.T : Switching Power Supply
Model Number : REBEL P10 550, REBEL P10 650,
REBEL P10 750, REBEL P10 850

Prepared by : Keyway Testing Technology (Guangdong) Co., Ltd.
Address : 21st Floor, Building 6, Dongyi Intelligent Equipment
New Energy Vehicle Park, No.30 of Tangxia District,
Dongshen Road, Tangxia Town, Dongguan City,
Guangdong province, China

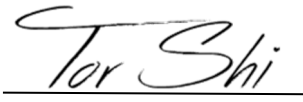
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Report No. : TR24090520-E-000
Date of Test : Oct. 08 ~ 15, 2024
Date of Report : Oct. 15, 2024

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Keyway Testing Technology (Guangdong) Co., Ltd.

Applicant:	Sharkoon Technologies GmbH		
Address:	Grüninger Weg 48, 35415 Pohlheim, Germany		
Manufacturer:	Sharkoon Technologies GmbH		
Address:	Grüninger Weg 48, 35415 Pohlheim, Germany		
E.U.T:	Switching Power Supply		
Model Number:	REBEL P10 550, REBEL P10 650, REBEL P10 750, REBEL P10 850		
Trade Name:	Sharkoon		
Date of Receipt:	Oct. 08, 2024	Date of Test:	Oct. 08 ~ 15, 2024
Test Specification:	FCC Part 15, Subpart B ANSI C63.4:2014 ANSI C63.4a-2017		
Test Result:	The equipment under test was found to be compliance with the requirements of the standards applied.		
		Issue Date: Oct. 16, 2024	
Tested by:	Reviewed by:	Approved by:	
 _____ Tor Shi / Engineer	 _____ Billy Zeng / Supervisor	 _____ Andy Gao / Manager	
Other Aspects:	None.		
<i>Abbreviations: OK/P=passed fail/F=failed N/A=not applicable E.U.T=equipment under tested</i>			
<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 Keyway Testing Technology (Guangdong) Co., Ltd.</i>			

1. GENERAL PRODUCT INFORMATION

1.1. Product Function

Refer to Technical Construction Form and User Manual.

1.2. Description of Device (EUT)

Description : Switching Power Supply
M/N : REBEL P10 550, REBEL P10 650, REBEL P10 750, REBEL P10 850
Power Input : Refer to model list.
Power : 850W Max.
Output : Refer to model list.
Operation frequency : <108MHz

Model list:

Model	Input	Output					
		+3.3V	+5V	+12V	-12V	+5VSB	Max. totalpower
REBEL P10 550	100-240V~, 8-4A, 50-60Hz	18A	18A	45.8A	0.3A	3A	550W
		100W		549.6W	3.6W	15W	
REBEL P10 650	100-240V~, 8-4A, 50-60Hz	18A	18A	54.1A	0.3A	3A	650W
		100W		649.2W	3.6W	15W	
REBEL P10 750	100-240V~, 9-4.5A, 50-60Hz	18A	18A	62.5A	0.3A	3A	750W
		100W		750W	3.6W	15W	
REBEL P10 850	100-240V~, 10-5A, 50-60Hz	18A	18A	70.8A	0.3A	3A	850W
		100W		849.6W	3.6W	15W	

1.3. Difference between Model Numbers

Note: All models are identical to each other except for model No, output ratings, some components rating, transformer secondary windings and ventilation holes size.

1.4. Independent Operation Modes

The basic operation mode is:

Pretest Mode	Description
Mode 1	Working

1.5. Test Supporting System

None.

1.6. The Main Test Models

Test Model	Sample serial number
REBEL P10 850	240923078

2. TEST SITES

2.1. Test Facilities

Lab Qualifications : 944 Shielded Room built by YIHENG ELECTRONIC
Date of completion: January 23, 2024

744 Shielded Room built by YIHENG ELECTRONIC
Date of completion: March 22, 2024

966 Chamber 1 built by YIHENG ELECTRONIC
Date of completion: January 17, 2024

966 Chamber 2 built by YIHENG ELECTRONIC
Date of completion: March 06, 2024

Certificated by UL, USA
Registration No.: 100567237
Date of registration: September 25, 2024

Certificated by VCCI
Member No.3498
R-20091:G-20277:966 Chamber 2 Below 1 G
G-20277:966 Chamber 2 above 1 G
C-20064:943 Shielding Room_Conducted Emissions at
Mains ports
T-20120:943 Shielding Room_Conducted Emissions at
Wired network port
Date of Valid until: Step. 19, 2027

Certificated by Nemko
Registration No.: ELA 814
Date of registration: September 25, 2024

Certificated by CMA China
Registration No.: 202319016955
Date of registration: July 23, 2024

Name of Firm : Keyway Testing Technology (Guangdong) Co., Ltd.

Site Location : 21st Floor, Building 6, Dongyi Intelligent Equipment New
Energy Vehicle Park, No.30 of Tangxia District,
Dongshen Road, Tangxia Town, Dongguan City,
Guangdong province, China

2.2. Test Summary

Test Item	Condition	Standard	Result
Conducted disturbance at mains terminals	150kHz to 30MHz	FCC Part 15, Subpart B ANSI C63.4:2014 ANSI C63.4a-2017	Pass
Radiated Emission (below 1 GHz)	30MHz to 1GHz	FCC Part 15, Subpart B ANSI C63.4:2014 ANSI C63.4a-2017	Pass
Radiated Emission (above 1 GHz)	Above 1GHz	FCC Part 15, Subpart B ANSI C63.4:2014 ANSI C63.4a-2017	N/A

Remark: 1. The symbol "N/A" in above table means Not Applicable.
 2. When determining the test results, measurement uncertainty of tests has been considered.

System Measurement Uncertainty	
Test Items	Extended Uncertainty
Uncertainty for Radiated Emission in 966 Chamber 1	3.8dB
Uncertainty for Radiated Emission in 966 Chamber 2	3.7dB
Uncertainty for Conducted Emission in 944 Chamber	3.0dB
Uncertainty for Conducted Emission in 744 Chamber	2.9dB

2.3. List of Test and Measurement Instruments

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
For conducted emission at the mains terminals and load port test_944 Chamber					<input checked="" type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESCI	101178	Apr. 12, 24	Apr. 11, 25
Artificial Mains Network	Rohde&Schwarz	ENV216	101315	Apr. 12, 24	Apr. 11, 25
Artificial Mains Network (AUX)	Rohde&Schwarz	ENV216	101314	Apr. 12, 24	Apr. 11, 25
RF Cable	FUJIKURA	3D-2W	944 Cable	Apr. 12, 24	Apr. 11, 25
ISN-CAT5	Schwarzbeck	CAT5 8158	#282	Apr. 12, 24	Apr. 11, 25
ISN-CAT6	Schwarzbeck	CAT6 8158	#284	Apr. 12, 24	Apr. 11, 25
Voltage probe	Schwarzbeck	TK9420	9420-528	Apr. 11, 24	Apr. 10, 25
For conducted emission at the mains terminals 744 Chamber					<input type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESPI	101868	May 15, 24	May 14, 25
RF Cable	Junkosha	MWX322-2m	1305G007	Apr. 13, 24	Apr. 12, 25
AMN	PMM	PMM L3-64	110ZZ20306	Apr. 12, 24	Apr. 11, 25
For radiated emission test (30MHz-1GHz)_966 Chamber 1					<input checked="" type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESCI	101394	Apr. 12,24	Apr. 11,25
TRILOG Broadband Antenna	Schwarzbeck	VULB 9163	520	Apr. 13, 24	Apr. 12, 25
3m Semi-anechoic Chamber	YIHENDIANZI	966	YH-KW-966-01	Jan. 18, 24	Jan. 17, 27
RF Cable	EMC Instruments	EMCCFD400-NM-NM-2000	240306	Apr. 12, 24	Apr. 11, 25
RF Cable	EMC Instruments	EMCCFD400-NM-NM-9000	240308	Apr. 12, 24	Apr. 11, 25
MULTI-DEVICE Controller	TUOPU	TPMDC	004240113020 1-01	N/A	N/A
Video Controller	TUOPU	TPHV-300C	033240116020 1-01	N/A	N/A
For radiated emission test (30MHz-1GHz)_966 Chamber 2					<input type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 12, 24	Apr. 11, 25
TRILOG Broadband Antenna	Schwarzbeck	VULB 9168	00829	Apr. 13, 24	Apr. 12, 25
3m Semi-anechoic Chamber	YIHENDIANZI	966	YH-KW-966-02	Mar. 07, 24	Mar. 06, 27
RF Cable	EMC Instruments	EMCCFD400-NM-NM-2000	240307	Apr. 12, 24	Apr. 11, 25
RF Cable	EMC Instruments	EMCCFD400-NM-NM-9000	240309	Apr. 12, 24	Apr. 11, 25
MULTI-DEVICE Controller	TUOPU	TPMDC	009240113020 1-01	N/A	N/A
Video Controller	TUOPU	TPHV-300C	033240116020 1-02	N/A	N/A

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
For radiated emission test (Above 1GHz)_966 Chamber 1					<input type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESCI	101394	Apr. 12,24	Apr. 11,25
Horn Antenna	DAZE	ZN30701	11003	Apr. 13, 24	Apr. 12, 25
Spectrum Analyzer	Keysight	N9020A	MY56070279	Apr. 12, 24	Apr. 11, 25
3m anechoic Chamber	YIHENDIANZI	966	YH-KW-966-01	Jan. 18, 24	Jan. 17, 27
Signal Amplifier	ZHINAN	ZN3380C	11001	Apr. 12, 24	Apr. 11, 25
RF Cable	EMC Instruments	EMC105-SM-SM-1000	240301	Apr. 13, 24	Apr. 12, 25
RF Cable	EMC Instruments	EMC105-SM-SM-2000	240302	Apr. 13, 24	Apr. 12, 25
RF Cable	EMC Instruments	EMC105-SM-SM-9000	240303	Apr. 13, 24	Apr. 12, 25
MULTI-DEVICE Controller	TUOPU	TPMDC	004240113020 1-01	N/A	N/A
Video Controller	TUOPU	TPHV-300C	033240116020 1-01	N/A	N/A
For radiated emission test (Above 1GHz)_966 Chamber 2					<input type="checkbox"/>
EMI Test Receiver	Rohde&Schwarz	ESCI	101156	Apr. 12, 24	Apr. 11, 25
Horn Antenna	DAZE	ZN30701	11003	Apr. 13, 24	Apr. 12, 25
Spectrum Analyzer	Keysight	N9020A	MY56070279	Apr. 12, 24	Apr. 11, 25
3m anechoic Chamber	YIHENDIANZI	966	YH-KW-966-02	Jan. 18, 24	Jan. 17, 27
Signal Amplifier	ZHINAN	ZN3380C	11001	Apr. 12, 24	Apr. 11, 25
RF Cable	EMC Instruments	EMC105-SM-SM-1000	240301	Apr. 13, 24	Apr. 12, 25
RF Cable	EMC Instruments	EMC105-SM-SM-2000	240302	Apr. 13, 24	Apr. 12, 25
RF Cable	EMC Instruments	EMC105-SM-SM-9000	240303	Apr. 13, 24	Apr. 12, 25
MULTI-DEVICE Controller	TUOPU	TPMDC	009240113020 1-01	N/A	N/A
Video Controller	TUOPU	TPHV-300C	033240116020 1-02	N/A	N/A
Note: <input checked="" type="checkbox"/> Used <input type="checkbox"/> Not Used					

3. TEST SET-UP AND OPERATION MODES

3.1. Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the Operating Instructions.

3.2. Block Diagram of Test Set-up

System Diagram of Connections between EUT and Simulators



(EUT: Switching Power Supply)

3.3. Test Operation Mode and Test Software

Refer to Test Setup in clause 4 & 5.

3.4. Special Accessories and Auxiliary Equipment

None.

3.5. Countermeasures to Achieve EMC Compliance

None.

4. TEST RESULTS

4.1. Conducted Emission at the Mains Terminals Test

Result : **Pass**
Test Site : 944 Shielded Room
Limits : FCC Part 15B Class B

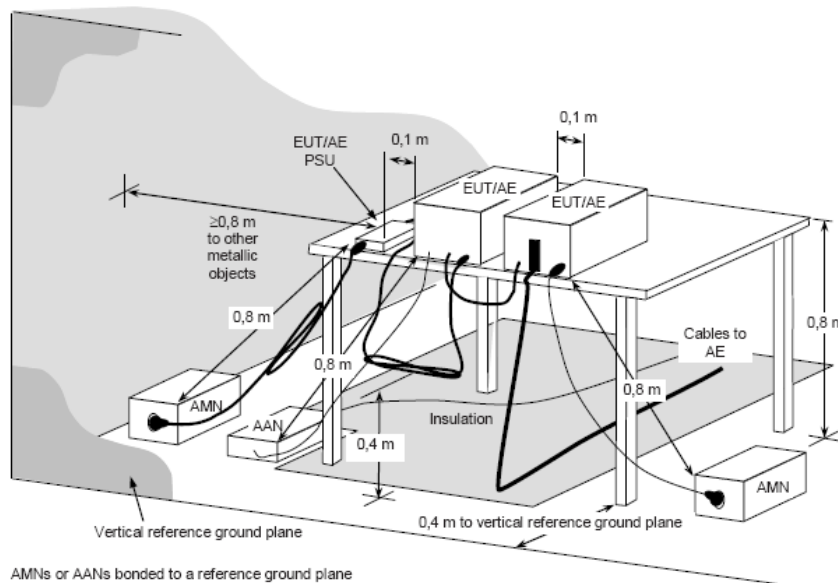
Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50

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 0,15 MHz to 0,50 MHz.

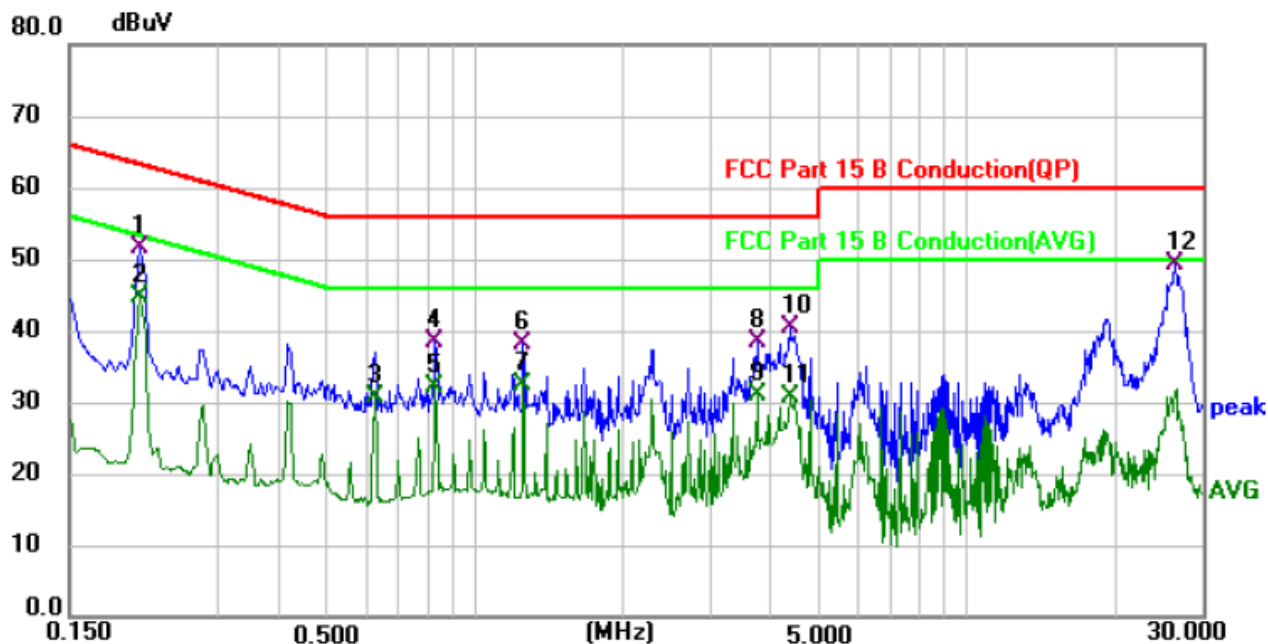
Test Specification

- 1.The EUT was put on a wooden table which was 0.8 m high above the ground and connected to the AC mains through the Artificial Mains Network (AMN). Where the mains cable supplied by the manufacture was longer than 1 m, the excess was folded back and forth parallel to the cable at the centre so as to form a bundle no longer than 0.4 m.
- 2.The EUT was kept 0.4 m from any other earthed conducting surface. Both sides of AC line were checked to find out the maximum conducted emission levels according to the test procedure during the conducted emission test.
- 3.The bandwidth of the test receiver was set at 9 kHz.
- 4.The worst test data was reported on the following page.

Test Set-up

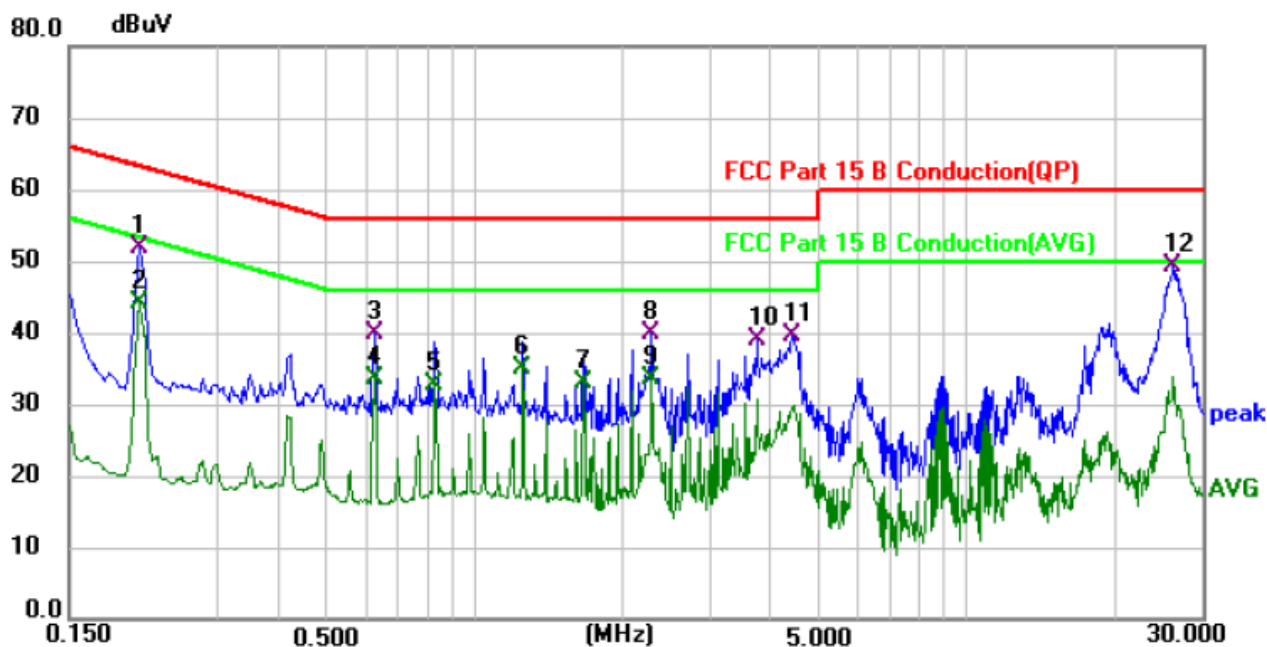


M/N : REBEL P10 850
 Operation Mode : Mode 1
 Test Voltage : AC 120V/60Hz
 Test Specification : Power Line; Line
 Temperature (°C) : 24.2 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.208	41.42	10.18	51.60	63.28	-11.68	QP	P
2 *	0.208	34.54	10.18	44.72	53.28	-8.56	AVG	P
3	0.627	20.33	10.34	30.67	46.00	-15.33	AVG	P
4	0.834	28.18	10.22	38.40	56.00	-17.60	QP	P
5	0.834	21.82	10.22	32.04	46.00	-13.96	AVG	P
6	1.252	27.93	10.28	38.21	56.00	-17.79	QP	P
7	1.252	22.18	10.28	32.46	46.00	-13.54	AVG	P
8	3.754	28.20	10.13	38.33	56.00	-17.67	QP	P
9	3.754	20.99	10.13	31.12	46.00	-14.88	AVG	P
10	4.375	30.19	10.17	40.36	56.00	-15.64	QP	P
11	4.375	20.65	10.17	30.82	46.00	-15.18	AVG	P
12	26.300	38.71	10.58	49.29	60.00	-10.71	QP	P

M/N : REBEL P10 850
 Operation Mode : Mode 1
 Test Voltage : AC 120V/60Hz
 Test Specification : Power Line; Neutral
 Temperature (°C) : 24.9 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F
1	0.208	41.61	10.12	51.73	63.28	-11.55	QP	P
2 *	0.208	33.97	10.12	44.09	53.28	-9.19	AVG	P
3	0.627	29.69	10.14	39.83	56.00	-16.17	QP	P
4	0.627	23.39	10.14	33.53	46.00	-12.47	AVG	P
5	0.834	22.39	10.33	32.72	46.00	-13.28	AVG	P
6	1.252	24.84	10.25	35.09	46.00	-10.91	AVG	P
7	1.666	22.72	10.22	32.94	46.00	-13.06	AVG	P
8	2.296	29.62	10.22	39.84	56.00	-16.16	QP	P
9	2.296	23.46	10.22	33.68	46.00	-12.32	AVG	P
10	3.754	28.89	10.18	39.07	56.00	-16.93	QP	P
11	4.429	29.53	10.12	39.65	56.00	-16.35	QP	P
12	26.225	38.70	10.48	49.18	60.00	-10.82	QP	P

4.2. Radiated Emission Test (below 1 GHz)

Result : **Pass**

Test Site : 966 Chamber

Limits : FCC Part 15B Class B

Frequency range MHz	Quasi-peak limits 3m dB(μ V/m)
30-88	40
88-216	43.5
216-960	46
960-1000	54

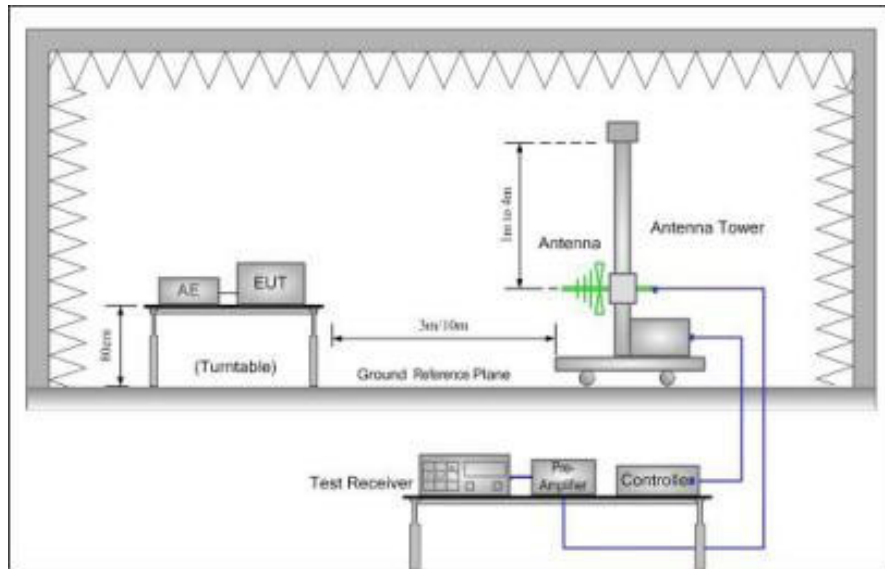
Note: 1.The lower limit shall apply at the transition frequency.

2.Additional provisions may be required for cases where interference occurs.

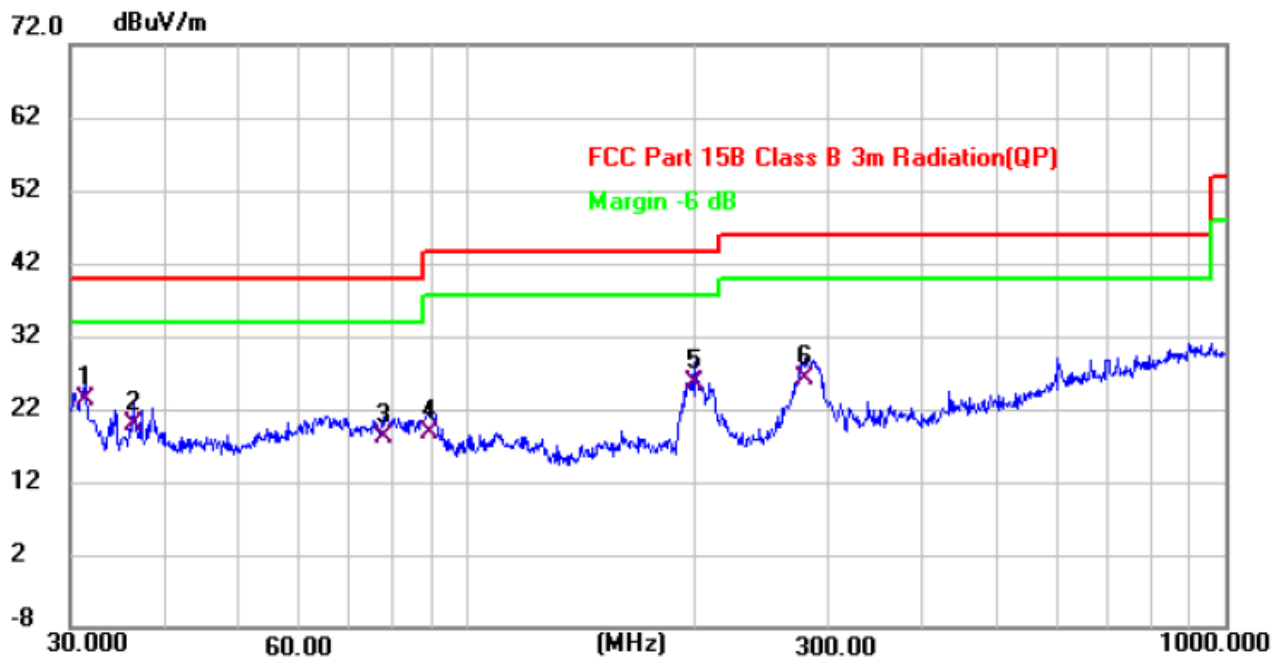
Conditional testing procedure

- 1.The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.
- 2.The highest frequency of the internal sources of the EUT is less than 108 MHz, the measurement shall only be made up to 1 GHz.
- 3.The EUT was tested in the Chamber Site. It was pre-scanned with a Peak detector from the spectrum, and all the final readings from the test receiver were measured with the Quasi-Peak detector.
- 4.The bandwidth setting on the test receiver was 120 kHz.
- 5.The worst test data were reported on the following page.
- 6.Emission Level = Antenna Factor + Cable Loss + Meter Reading.

Test Set-up

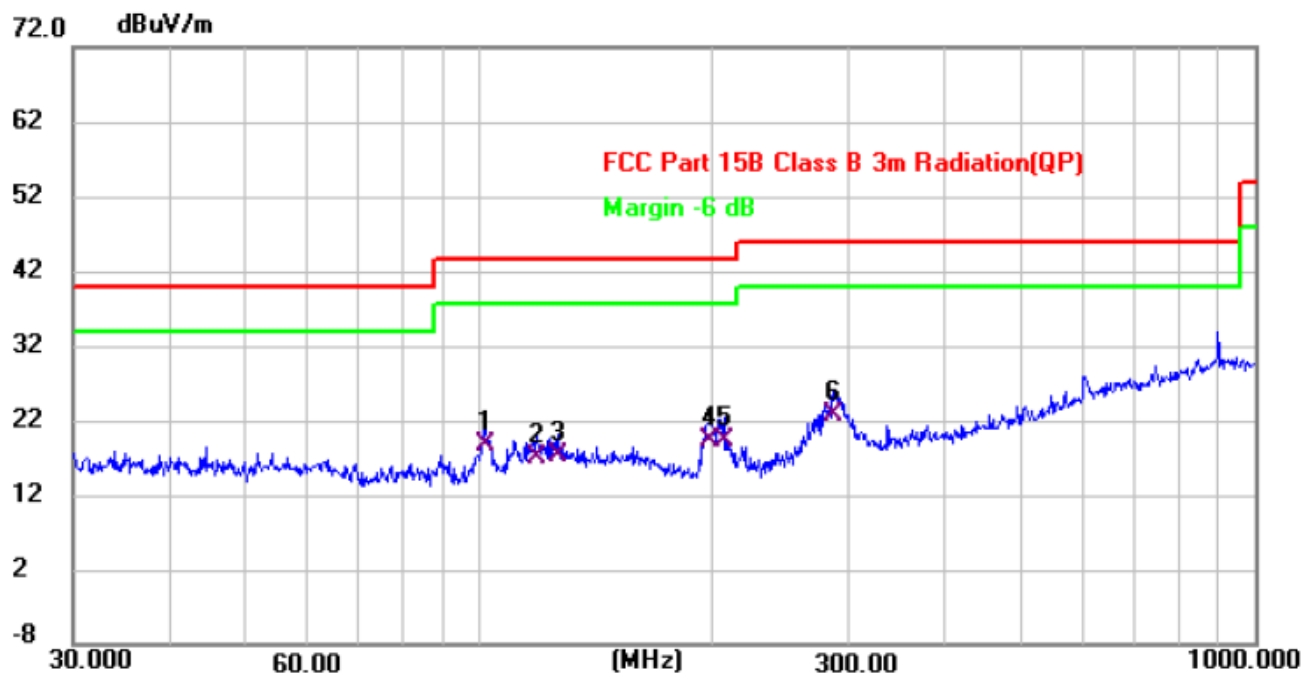


M/N : REBEL P10 850
 Operation Mode : Mode 1
 Test Voltage : AC 120V/60Hz
 Test Specification : Vertical
 Temperature (°C) : 24.9 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1 *	31.399	10.60	12.58	23.18	40.00	-16.82	QP
2	36.381	6.91	12.84	19.75	40.00	-20.25	QP
3	77.593	1.59	16.51	18.10	40.00	-21.90	QP
4	89.276	4.57	14.13	18.70	43.50	-24.80	QP
5	199.986	15.05	10.40	25.45	43.50	-18.05	QP
6	280.024	12.68	13.37	26.05	46.00	-19.95	QP

M/N : REBEL P10 850
 Operation Mode : Mode 1
 Test Voltage : AC 120V/60Hz
 Test Specification : Horizontal
 Temperature (°C) : 24.9 Relative Humidity (%) : 56 Atmospheric Pressure(mbar) : 1015



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
1	102.001	7.34	11.32	18.66	43.50	-24.84	QP
2	118.601	3.10	13.76	16.86	43.50	-26.64	QP
3	126.329	3.59	13.68	17.27	43.50	-26.23	QP
4	198.588	8.77	10.49	19.26	43.50	-24.24	QP
5	207.123	8.79	10.63	19.42	43.50	-24.08	QP
6 *	285.978	9.29	13.44	22.73	46.00	-23.27	QP

4.3. Radiated Emission Test (above 1 GHz)

Result : **N/A**

Test Site : 966 Chamber

Limits : FCC Part 15B Class B

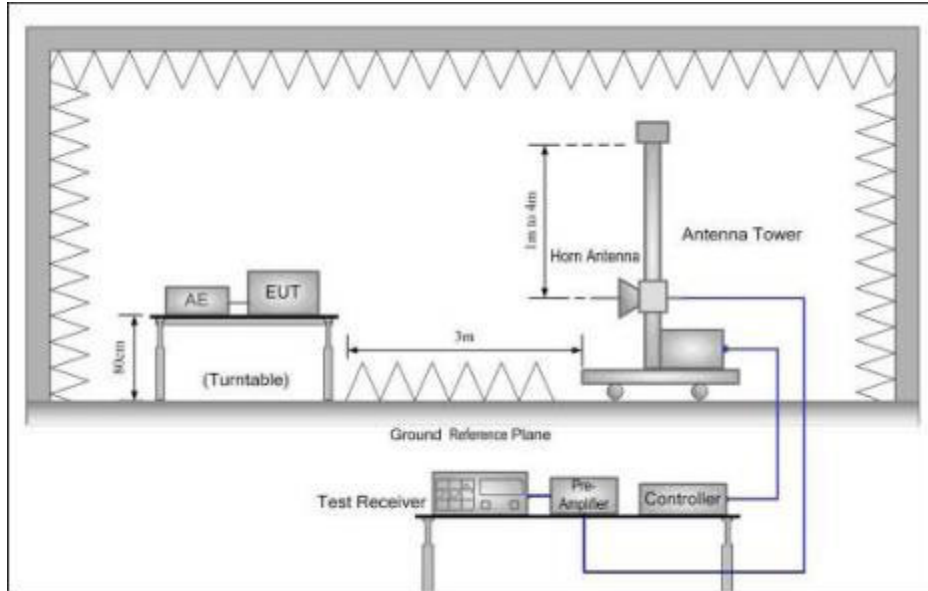
Frequency range GHz	Average limit dB(μ V/m)	Peak limit dB(μ V/m)
1-6	54	74

Note: The lower limit applies at the transition frequency

Conditional testing procedure

- 1.The EUT was placed on a turn table which was 0.8 m above the ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was set 3 m away from the receiving antenna which was mounted on an antenna tower. The measuring antenna moved up and down to find out the maximum emission level. It moved from 1 m to 4 m for both horizontal and vertical polarizations.
- 2.The EUT was tested in the 3m Chamber Site. It was pre-scanned with a Peak detector from the spectrum.
- 3.The bandwidth setting on the test receiver was 1 MHz..
4. Emission Level = Antenna Factor + Cable Loss + Meter Reading.
 - the highest frequency of the internal sources of the EUT is between 108 MHz and 500 MHz, the measurement shall only be made up to 2 GHz.
 - the highest frequency of the internal sources of the EUT is between 500 MHz and 1 GHz, the measurement shall only be made up to 5 GHz.
 - the highest frequency of the internal sources of the EUT is above 1 GHz, the measurement shall be made up to 5 times the highest frequency or 40 GHz, whichever is lower.

Test Set-up

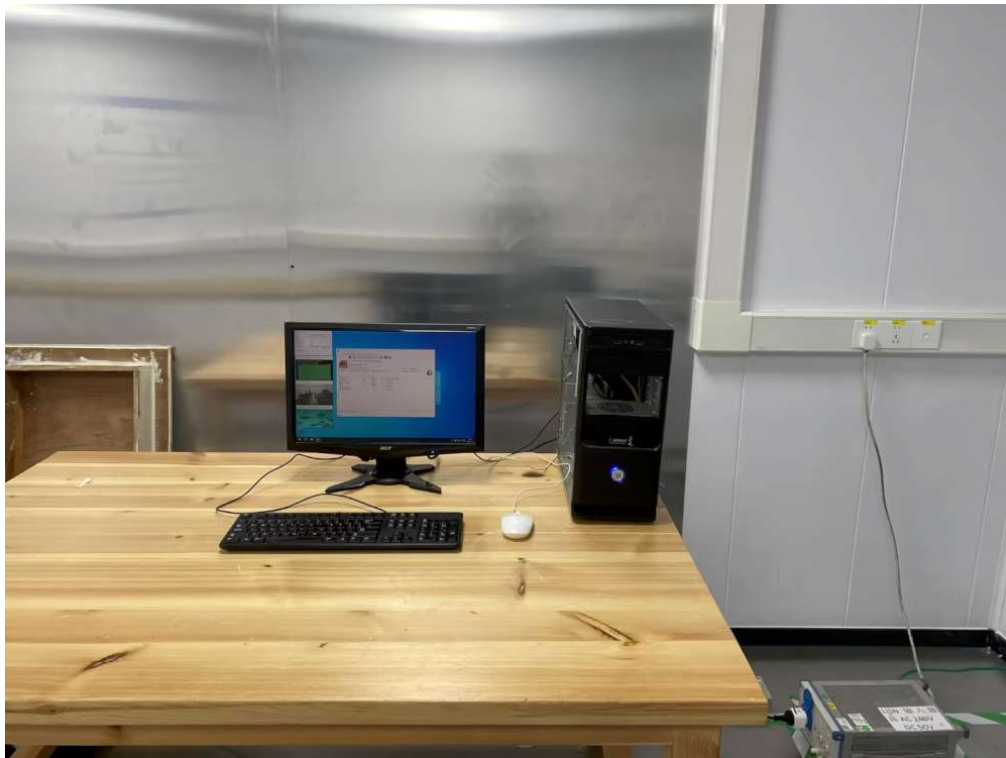


5. PHOTOGRAPHS OF TEST SET-UP

Radiated Emission Test

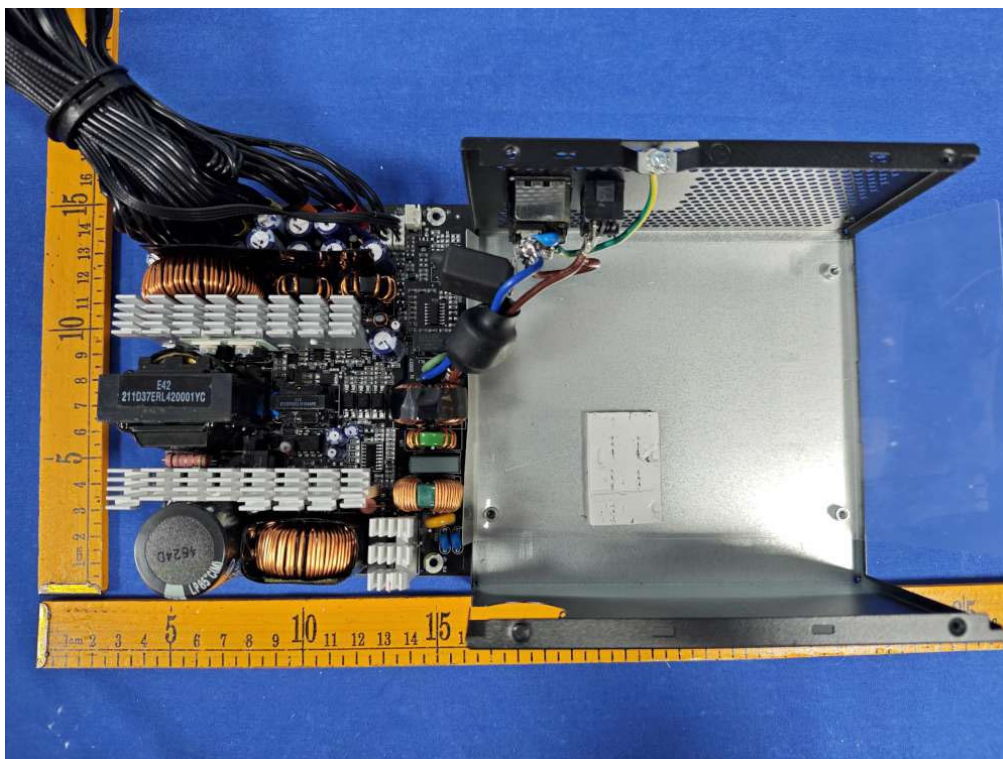


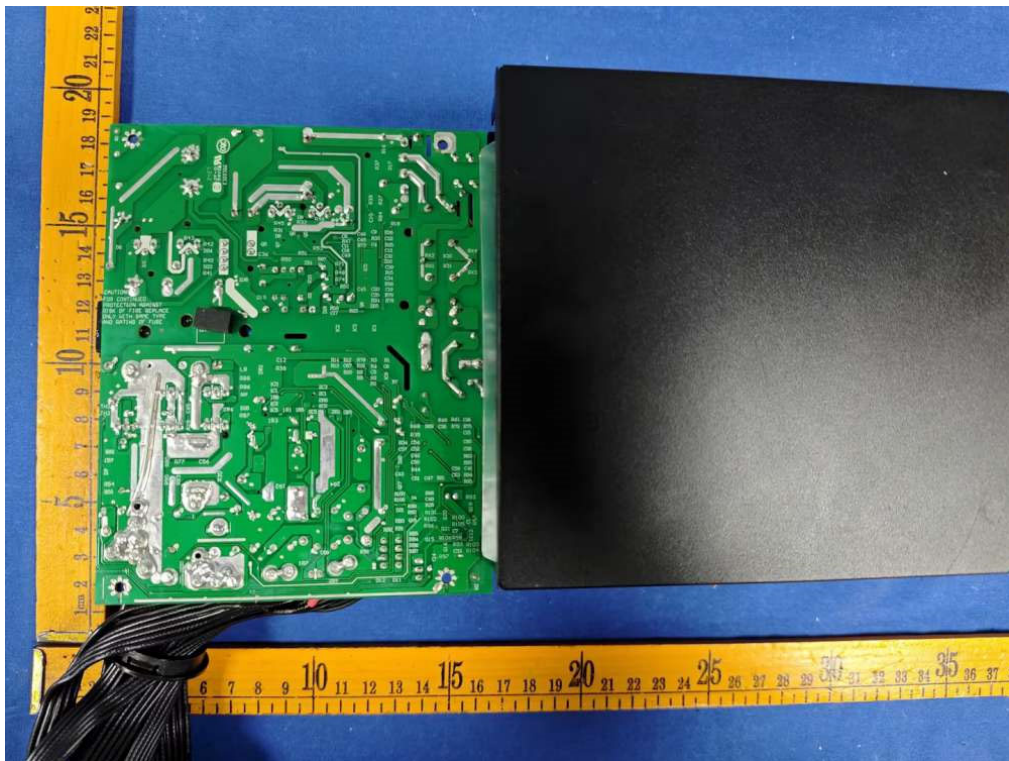
Conducted Emission at the Mains Terminals Test



6. PHOTOGRAPHS OF THE EUT







*** the end of report ***