GTS Global United Technology Services Co., Ltd.

Report No.: GTS2023120237F04

TEST REPORT

Applicant:	Xiamen Topstar Co., Ltd.				
Address of Applicant:	No.696 Meixi Road, Tongan District Xiamen City, Fujian Province, P.R.China				
Manufacturer:	Xiamen Topstar Co., Ltd.				
Address of Manufacturer:	No.696 Meixi Road, Tongan District Xiamen City, Fujian Province, P.R.China				
Factory:	Xiamen Topstar Lighting Co., Ltd				
Address of Factory:	676 Meixi Avenue, Tong'an District, Xiamen, China				
Equipment Under Test (E	UT)				
Product Name:	Electric Vehicle supply equipment				
Model No.:	See section 5.1				
FCC ID:	2A9FM-TSEB240VT				
Applicable standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.225				
Date of sample receipt:	November 24, 2023				
Date of Test:	November 24, 2023-January 08, 2024				
Date of report issued:	January 09, 2024				
Test Result :	PASS				

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

Authorized Signature:



Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.



2 Version

Version No.	Date	Description
00	January 09, 2024	Original

Prepared By:

hantly

Date:

Date:

January 09, 2024

January 09, 2024

Project Engineer

Check By:

opinson (m)

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Field Strength of Fundamental Emissions and Mask Measurement	15.225(a)(b)(c)	Pass
Radiated Emission	15.225(d)&15.209	Pass
20dB Emission Bandwidth	15.225&15.215	Pass
Frequency Stability Measurement	15.225(e)	Pass

Remark:

1. Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)
Note (1): The measurement unce	ertainty is for coverage factor of k	=2 and a level of confidence of 9	95%.



5 General Information

5.1 General Description of EUT

Product Name:	Electric Vehicle supply equipment			
Model No.:	TSEB240V/48AUS-TRE-C, TSEB240V/40AUS-TRE-C,			
	TSEB240V/32AUS-TRE-C, TSEB240V/40AUS-TRE-P-C,			
	TSEB240V/32AUS-TRE-P-C, TSEB240V/48AUS-TRE-H,			
	TSEB240V/40AUS-TRE-H, TSEB240V/32AUS-TRE-H,			
	TSEB240V/40AUS-TRE-P-H, TSEB240V/32AUS-TRE-P-H			
Test Model No:	TSEB240V/48AUS-TRE-C			
The EUT is Electric Vehicle A Same components used in the Home Edition model: TSEB240V/48AUS-TRE-H: 20	C Charger with RFID,433MHz,WIFI and Bluetooth Function, ose models except for output current. 08-240VAC, 60Hz, 48A			
TSEB240V/40AUS-TRE-H: 20 TSEB240V/32AUS-TRE-H,:20 TSEB240V/40AUS-TRE-P-H: TSEB240V/42AUS-TRE-P-H:	08-240VAC, 60Hz, 40A 08-240VAC, 60Hz, 32A with WIFI, BLE, RFID,433MHz 208-240VAC, 60Hz, 40A 208-240VAC, 60Hz, 32A with Plug, WIEL BLE, PEID,433MHz			
TSEB240V/32AUS-TRE-P-R, Business Edition model: TSEB240V/48AUS-TRE-C: 20 TSEB240V/40AUS-TRE-C: 20 TSEB240V/32AUS-TRE-C: 20 TSEB240V/40AUS-TRE-P-C:	208-240VAC, 60Hz, 48A 08-240VAC, 60Hz, 48A 08-240VAC, 60Hz, 40A 08-240VAC, 60Hz, 32A with WIFI, BLE, RFID,433MHz; 208-240VAC, 60Hz, 40A 209-240VAC, 60Hz, 40A			
So choose TSEB240V/48AUS	-TRE-C to test as representative			
S/N:	92184044			
Test sample(s) ID:	GTS2023120237-1			
Sample(s) Status	Engineered sample			
Operation Frequency:	13.56MHz			
Channel Number:	iel Number: 1			
Modulation:	ASK			
Antenna type:	Integral Antenna			
Antenna gain:	2dBi(Declared by applicant)			
Power supply:	AC 208-240V, 60Hz			

Remark:

1. Antenna gain information provided by the customer

2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.



5.2 Test mode

	Transmitter mode	Keep the EUT in continuously transmitting.					
ł	Pre-test mode.						
(GTS has verified the construction and function in typical operation, The EUT was placed on three different polar directions; i.e. X axis, Y axis, Z axis. which was shown in this test report and defined as follows:						
	Axis X Y Z						
	Field Strength(dBuV/m)	51.46	51.87	50.61			
ł	Final Test Mode:						
According to ANSI C63.4 standards, the test results are both the "worst case" and "worst setup": Y axis							
	(see the test setup photo)						



5.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: • FCC —Registration No.: 381383 Designation Number: CN5029 Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files. • ISED —Registration No.: 9079A

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of ISED for radio equipment testing.

• NVLAP (LAB CODE:600179-0)

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.4 Test Location

All tests were performed at: Global United Technology Services Co., Ltd. Address: No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102 Tel: 0755-27798480 Fax: 0755-27798960

5.5 Description of Support Units

Manufacturer	Description	Model	Serial Number
JHJTKJ	Load Box	JH-RYF-42KW00380AC220-W11A	N/A



6 Test Instruments list

Radia	ted Emission:					
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	June 23, 2021	June 22, 2024
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	April 14, 2023	April 13, 2024
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	March 19, 2023	March 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	April 17, 2023	April 16, 2025
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	April 14, 2023	April 13, 2024
8	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov. 13, 2023	Nov.12, 2024
9	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	April 14, 2023	April 13, 2024
10	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	April 14, 2023	April 13, 2024
11	Horn Antenna (18- 26.5GHz)	/	UG-598A/U	GTS664	Oct. 29, 2023	Oct. 28, 2024
12	Horn Antenna (26.5-40GHz)	A.H Systems	SAS-573	GTS665	Oct. 29, 2023	Oct. 28, 2024
13	FSV-Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	March 13, 2023	March 12, 2024
14	Amplifier	/	LNA-1000-30S	GTS650	April 14, 2023	April 13, 2024
15	CDNE M2+M3-16A	НСТ	30MHz-300MHz	GTS692	Nov. 08, 2023	Nov.07, 2024
16	Wideband Amplifier	1	WDA-01004000-15P35	GTS602	April 14, 2023	April 13, 2024
17	Thermo meter	JINCHUANG	GSP-8A	GTS643	April 19, 2023	April 18, 2024
18	RE cable 1	GTS	N/A	GTS675	July 31. 2023	July 30. 2024
19	RE cable 2	GTS	N/A	GTS676	July 31. 2023	July 30. 2024
20	RE cable 3	GTS	N/A	GTS677	July 31. 2023	July 30. 2024
21	RE cable 4	GTS	N/A	GTS678	July 31. 2023	July 30. 2024
22	RE cable 5	GTS	N/A	GTS679	July 31. 2023	July 30. 2024
23	RE cable 6	GTS	N/A	GTS680	July 31. 2023	July 30. 2024
24	RE cable 7	GTS	N/A	GTS681	July 31. 2023	July 30. 2024
25	RE cable 8	GTS	N/A	GTS682	July 31. 2023	July 30. 2024



RF C	RF Conducted Test:							
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)		
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	April 14, 2023	April 13, 2024		
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024		
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	April 14, 2023	April 13, 2024		
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	April 14, 2023	April 13, 2024		
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	April 14, 2023	April 13, 2024		
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	April 14, 2023	April 13, 2024		
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	April 14, 2023	April 13, 2024		
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	April 14, 2023	April 13, 2024		
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	April 19, 2023	April 18, 2024		

Cond	Conducted Emission					
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	July 12, 2022	July 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	April 14, 2023	April 13, 2024
3	3 LISN ROHDE & SCHWARZ		ENV216	GTS226	April 14, 2023	April 13, 2024
4 Coaxial Cable GTS		GTS	N/A	GTS227	N/A	N/A
5	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
6	Thermo meter	JINCHUANG	GSP-8A	GTS642	April 19, 2023	April 18, 2024
7	Absorbing clamp	Elektronik- Feinmechanik	MDS21	GTS229	April 14, 2023	April 13, 2024
8	8 ISN SCHWARZBECK		NTFM 8158	GTS565	April 14, 2023	April 13, 2024
9	High voltage probe	SCHWARZBECK	TK9420	GTS537	April 14, 2023	April 13, 2024
10	Antenna end assembly	Weinschel	1870A	GTS560	April 14, 2023	April 13, 2024
11	LISN	SCHWARZBECK	NSLK 8127	GTS711	April 14, 2023	April 13, 2024

Gen	General used equipment:						
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)	
1	Barometer	KUMAO	SF132	GTS647	April 19, 2023	April 18, 2024	



7 Test results and Measurement Data

7.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203					
15.203 requirement:						
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.						
EUT Antenna:						
The antenna is PCB antenna, reference to the appendix II for details						



7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Receiver setup:	RBW=9KHz, VBW=30KHz,	Sweep time=auto				
Limit:	Frequency range (MHz)					
		Average				
	0.15-0.5	66 to 56*	56 to 46*			
	0.5-5	56	46			
	5-30	60	50			
	* Decreases with the logarith	nm of the frequency.				
Test setup:	Reference Pla	ne				
	40cm 40cm LISN 40cm B0cm LISN Filter AC power Filter AC power Test table/Insulation plane EMI Receiver Remark: EUT: Equipment Under Test LISN LisN LisN Line Impedence Stabilization Network Test table height=0.8m					
Test procedure:	 The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63 10:2013 on conducted measurement. 					
Test Instruments:	Refer to section 6.0 for deta	ils				
Test mode:	Refer to section 5.2 for deta	ils				
Test environment:	Temp.: 25 °C Hu	umid.: 52%	Press.: 1012mbar			
Test voltage:	AC 240V, 60Hz					
Test results:	Pass					



Measurement data:



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Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.

2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission. Final Level =Receiver Read level + LISN Factor + Cable Loss



7.3 Field Strength of Fundamental Emissions and Mask Measurement

Test Requirement:	FCC Part15 C Section 15.225(a)(b)(c)					
Test Method:	ANSI C63.10:2013 & ANSI C63.4: 2014					
Test site:	Measurement Distance:	3m				
Receiver setup:	RBW=9KHz, VBW=30KI	Hz, Sweep time=Auto				
limit:	FCC Part 15.225 & 15.2	09				
	Frequencies(MHz)	Limit at 30m(dBuV/m)	Limit at 3m(dBuV/m)			
	13.110-13.410	40.50	80.50			
	13.410-13.553	50.50	90.50			
	13.553-13.567	84.00	124.00			
	13.567-13.710	50.50	90.50			
	13.710-14.010	40.50	80.50			
Test setup:	13.7 10-14.010 40.50 80.50 40.50 80.50 Image: Solution of the second s					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for c	Refer to section 5.2 for details				
Test results:	Pass					

Measurement data:

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
13.56	30.69	20.57	0.51	51.87	124	-72.13	PK



7.4 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.225(d) and 15.209					
Test Method:	ANSI C63.10: 2013 & ANSI C63.4: 2014					
Test Frequency Range:	9KHz to 1000MHz					
Test site:	Measurement Dis	tance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark	
	9kHz-150kHz	Quasi-peak	200Hz	300Hz	Quasi-peak Value	
	150kHz-30MHz	Quasi-peak	9kHz	10kHz	Quasi-peak Value	
	30MHz-1GHz	Quasi-peak	120KHz	300KHz	Quasi-peak Value	
FCC Limit:	Frequency (MHz)Field strength (microvolts/meter)Measurement distance (meters)0.009-0.4902400/F(kHz)3000.490-1.70524000/F(kHz)301.705-30.0303030-88100**388-216150**3216-960200**3Above 9605003The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector					
Test setup:	Below 30MHz	< 3m	l> Im Receiver	Test Antenna		
	ADOVE JUIVIHZ					

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	< 3m > Test Antennau < 1m 4m >u < 80cm > i Tum Tableu Receivery Dreamplifiery					
Test Instruments:	Refer to see	ction 6.0 for c	letails		CAN STATE	
Test mode:	Refer to see	ction 5.2 for c	letails			
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 240V					
Test results:	Pass					
	The second second second	L'ALTALTA ALTA	The second second	and the second second	AL TALTALTA	A CONTRACTOR OF THE

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Measurement data:

■ 9kHz~30MHz

the radiation emission more than 20dB below the limit.





■ 30MHz~1GHz

Horizontal:



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Vertical:



Remarks:

1. Final Level = Receiver Read level + Antenna Factor + Cable Loss - Preamplifier Factor



7.5 Channel Bandwidth

Test Requirement:	FCC Part15 C Section 15.225 and 15.215				
Test Method:	ANSI C63.10:2013				
Limit:	N/A				
Test Procedure:	 According to the follow Test-setup, keep the relative position between the artificial antenna and the EUT. Set the EUT to proper test channel. Max hold the radiated emissions, mark the peak power frequency point and the -20dB upper and lower frequency points. Read 20dB bandwidth & 99%bandwidth. 				
	Ground Reference Plane				
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test results:	Pass				



Measurement Data

Test frequency (MHz)	20dB bandwidth(KHz)	Result
13.56	28.688	Pass

Test plot as follows:





Test Requirement:	FCC Part15 C Section 15.225 (e)				
Test Method:	ANSI C63.10: 2013				
Receiver setup:	RBW=1KHz, VBW=1KHz, Sweep time=Auto				
Limit:	The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency				
	over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage,				
	for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.				
	For battery operated equipment, the equipment tests shall be performed using a new battery.				
Test setup:	Spectrum Analyzer				
Test Instruments:	Refer to section 6.0 for details				
Test mode:	Refer to section 5.2 for details				
Test results:	Pass				

7.6 Frequency Stability Measurement



Measurement data:

Reference Frequency: 13.56MHz						
Dewer supplied ()/cs)	Tomporature ($^{\circ}$)	Frequer	ncy error	1 : :4	Daavik	
Power supplied (vac)	Temperature (C)	Hz	%	Limit	Result	
	-20	90	90 0.0003			
	-10	80	0.0004			
120	0	79	0.0005	+/- 0.01%	Pass	
	10	58	0.0004			
	20	48	0.0005			
	30	55	0.0005			
	40	46	0.0004			
	50	79	0.0005			

Reference Frequency: 13.56MHz							
Temperature (°C)	Power supplied (Vac)	Freque	ncy error	Limit	Result		
	Tower supplied (vac)	Hz	Ppm	Link			
30	90	185	0.0012	./ 0.010/	Daga		
20	110	120	0.0008	+/- 0.01%	Pass		

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8 Test Setup Photo

Reference to the appendix I for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

----- End -----