Prüfbericht-Nr.: *Test report no.:*	**CN2226VJ 002**	**Auftrags-Nr.:** *Order no.*:	**168376943**	Seite 1 von **08** *Page 1 of 08*
Kunden-Referenz-Nr.: *Client reference no.:*	**N/A**	**Auftragsdatum:** *Order date:*	2022-06-13	
Auftraggeber: *Client:*	**Suzhou BLUE STONE New Power Co., Ltd.** Building 11 #No.58, Weixin Road, Suzhou Industrial Park, 215000 Jiangsu Province, P.R. China			
Prüfgegenstand: *Test item:*	VEHICLE CONTROL UNIT			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	BST-V1204GBXBLACSA			
Auftrags-Inhalt: *Order content*:	EMF Report			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 2: Section 2.1091 CFR47 FCC Part 1: Section 1.1310 FCC KDB Publication 447498 v06, section 7			

Wareneingangsdatum: *Date of sample receipt:*	2022-08-26	Please refer to Photo Document
Prüfmuster-Nr.: *Test sample no:*	N/A	
Prüfzeitraum: *Testing period:*	N/A	
Ort der Prüfung: *Place of testing:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.	
Prüfergebnis*: *Test result*:*	Pass	

geprüft von: *tested by:*	Jonathan Li	**genehmigt von:** *authorized by:*	Winnie Hou
Datum: *Date:* 2022-11-07		**Ausstellungsdatum:** *Issue date:* 2022-11-07	
Stellung / *Position:*	Sachverständige(r) / Expert	**Stellung** / *Position:*	Sachverständige(r) / Expert
Sonstiges / *Other:*	FCC ID: 2A8GZ4008023 Contains FCC ID: 2AK9DL508		

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery:*	Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
** Legend:*	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

CONTENTS

1. GENERAL REMARKS

1.1 COMPLEMENTARY MATERIALS

All attachments are integral parts of this test report. This applies especially to the following appendix: N/A

2. TEST SITES

2.1 TEST FACILITIES

TÜV Rheinland (Shenzhen) Co., Ltd.

Address: No. 362, Huanguan Road Middle, Longhua District, Shenzhen 518110, P.R. China

CNAS accreditation certification number: L3080

A2LA accreditation certification number: 5162.01

3. GENERAL PRODUCT INFORMATION

3.1 GENERAL DESCRIPTION

The EUT is a VEHICLE CONTROL UNIT. It supports Bluetooth and GSM/WCDMA/LTE functions for vehicle use.

For details, refer to the User Manual, Technical Description and Circuit Diagram.

3.2 TECHNICAL DATA

Table 1: Rating of EUT

General Information of EUT	Description
Kind of Equipment	VEHICLE CONTROL UNIT
Type Designation	BST-V1204GBXBLACSA
FCC ID	2A8GZ4008023
Operating Voltage	DC 9~16V
Test Voltage	DC 12V
Operating Temperature Range:	-40°C ~ +85°C

Table 2: Technical Specification of EUT

Wireless Access	
GSM Note 1	GSM850, PCS900
WCDMA Note 1	WCDMA Band II/IV/V
LTE Note 1	LTE Band 2/4/5/7/66
Note 1: The certified module(L508) Integrated in the device have been granted by FCC ID: 2AK9DL508.	

Antenna informattion:

Operation Mode	Antenna type	Antenna Gain (dBi)	Remark
Bluetooth(BLE)	PCB antenna	4.08	/
GSM850	PIFA antenna	-3.49	/
PCS1900	PIFA antenna	4.14	/
WCDMA Band2	PIFA antenna	4.14	/
WCDMA Band4	PIFA antenna	4.06	/
WCDMA Band5	PIFA antenna	-3.49	/
LTE Band2	PIFA antenna	4.14	/
LTE Band4	PIFA antenna	4.06	/
LTE Band5	PIFA antenna	-3.49	/
LTE Band7	PIFA antenna	1.34	/
LTE Band66	PIFA antenna	4.06	/

Table 3: GSM/PCS Operating Frequency Range and Channel Bandwidth

Frequency Band(s)	Frequency Range						Channel Bandwidth (MHz)
	Transmitting f_{UL} (MHz)			Receiving f_{DL} (MHz)			
GSM850	824	~	850	869	~	894	0.2
PCS1900	1850	~	1910	1930	~	1990	0.2

Table 4: WCDMA Operating Frequency Range and Channel Bandwidth

Frequency Band(s)	Frequency Range						Channel Bandwidth (MHz)
	Transmitting f_{UL} (MHz)			Receiving f_{DL} (MHz)			
Band II	1850	~	1910	1930	~	1980	5
Band IV	1710	~	1755	2110	~	2155	5
Band V	824	~	849	869	~	894	5

Table 5: LTE Operating Frequency Range and Channel Bandwidth

Frequency Band(s)	Frequency Range						Channel Bandwidth (MHz)
	Transmitting f_{UL} (MHz)			Receiving f_{DL} (MHz)			
Band 2	1850	~	1910	1930	~	1980	1.4, 3, 5, 10, 15, 20
Band 4	1710	~	1755	2110	~	2155	1.4, 3, 5, 10, 15, 20
Band 5	824	~	849	869	~	894	1.4, 3, 5, 10
Band 7	2500	~	2570	2620	~	2690	5, 10, 15, 20
Band 66	1710	~	1780	2110	~	2200	1.4, 3, 5, 10, 15, 20

Table 6: RF Channel and Frequency of Bluetooth Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
00	**2402.00**	10	2422.00	20	2442.00	30	2462.00
01	2404.00	11	2424.00	21	2444.00	31	2464.00
02	2406.00	12	2426.00	22	2446.00	32	2466.00
03	2408.00	13	2428.00	23	2448.00	33	2468.00
04	2410.00	14	2430.00	24	2450.00	34	2470.00
05	2412.00	15	2432.00	25	2452.00	35	2472.00
06	2414.00	16	2434.00	26	2454.00	36	2474.00
07	2416.00	17	2436.00	27	2456.00	37	2476.00
08	2418.00	18	2438.00	28	2458.00	38	2478.00
09	2420.00	**19**	**2440.00**	29	2460.00	**39**	**2480.00**

3.3 INDEPENDENT OPERATION MODES

The basic operation modes are:

A. On, Transmitting

3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS

Refer to the Circuit Diagram.

3.5 SUBMITTED DOCUMENTS

☒ User Manual
☒ Circuit Diagram
☒ Block Diagram
☒ Schematics
☒ Model Difference Letter
☒ Rating Label
☒ PCB Layout
☒ Photo Document
☒ Parts List

4. TEST SET-UP AND OPERATION MODES

4.1 PRINCIPLE OF CONFIGURATION SELECTION

N/A

4.2 TEST OPERATION AND TEST SOFTWARE

N/A

4.3 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE

The test sample, which has been tested, contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

5. TEST RESULTS

5.1 SAFETY HUMAN EXPOSURE

5.1.1 Radio Frequency Exposure Compliance

5.1.1.1 Electromagnetic Fields

RESULT: **Pass**

Test Specification
Test standard : CFR47 FCC Part 2: Section 2.1091
CFR47 FCC Part 1: Section 1.1310
FCC KDB Publication 447498 v06, section 7

- **FCC requirements**

FCC requirement: Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure. In accordance with 47 CFR FCC Part 2 Subpart J, section 2.1091 this device has been defined as a mobile device whereby a distance of 20cm normally can be maintained between the user and the device.

Below sets forth limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields according to FCC Part 1.1310.

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(i) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*(100)	≤6
3.0-30	1842/f	4.89/f	*(900/f^2)	<6
30-300	61.4	0.163	1.0	<6
300-1,500			f/300	<6
1,500-100,000			5	<6
(ii) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*(100)	<30
1.34-30	824/f	2.19/f	*(180/f^2)	<30
30-300	27.5	0.073	0.2	<30
300-1,500			f/1500	<30
1,500-100,000			1.0	<30

Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is ≤ 1.0, according to calculated/estimated, numerically modeled, or measured field strengths or power density.The MPE ratio of each antenna is determined at the minimum test separation distance required by the operating configurations and exposure conditions of the host device, according to the ratio of field strengths or power density to the MPE limit at the test frequency.

MPE Calculation Method according to KDB 447498 v06

Power Density: $S_{(mW/cm^2)}$= PG/4πR² or EIRP/4πR²

Where:

S = power density (mW/cm²)

P = power input to the antenna (mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna (cm)

a) EUT RF Exposure Evaluation standalone operations

Test Mode	Maximum Output Power		Antenna Gain (dBi)	Maximum e.i.r.p		$S_{(mW/cm^2)}$= PG/4πR²	Limit $_{(mW/cm^2)}$
	(dBm)	(mW)		(dBm)	(mW)		
Bluetooth(BLE)	3.89	2.45	4.08	7.97	6.27	0.0012	1.00
GSM850	25.97	395.37	-3.49	22.48	177.01	0.0352	0.55
PCS1900	25.97	395.37	4.14	30.11	1025.65	0.2042	1.00
WCDMA Band II	25.0	316.23	4.14	29.14	820.35	0.1633	1.00
WCDMA Band IV	25.0	316.23	4.06	29.06	805.38	0.1603	1.00
WCDMA Band V	25.0	316.23	-3.49	21.51	141.58	0.0282	0.55
LTE Band 2	25.7	371.54	4.14	29.84	963.83	0.1918	1.00
LTE Band 4	25.7	371.54	4.06	29.76	946.24	0.1883	1.00
LTE Band 5	25.7	371.54	-3.49	22.21	166.34	0.0331	0.55
LTE Band 7	25.7	371.54	1.34	27.04	505.82	0.1007	1.00
LTE Band 66	25.7	371.54	4.06	29.76	946.24	0.1883	1.00

Note: Frame-averager output power is considered during GSM 850 and PCS1900 evaluation result, the division factor is -9.03.

b) EUT RF Exposure Evaluation simultaneous transmission operations

Simultaneous transmission mode	MPE ratios	Limit	Result
Bluetooth + GSM	0.2054	≤ 0.55	Pass
Bluetooth + WCDMA	0.1645	≤ 0.55	Pass
Bluetooth + LTE	0.1930	≤ 0.55	Pass

"RF Radiation Exposure Statement Caution: This Transmitter must be installed to provide a separation distance of at least 20 cm from all persons."

========== END OF REPORT ==========