RF Exposure Evaluation Report
KDB 447498 D01v06

Product Name : Mobility Scooter

Model No. : BBR-Q40-01/ BBR-Q40-02/
BBR-Q40-05/ BBR-Q40-06

FCC ID : 2BPS2BBR-Q40

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1. General Information

1.1. EUT Description

Product Name	Mobility Scooter
Brand Name	ROBOOTER
Model No.	BBR-Q40-01/ BBR-Q40-02/ BBR-Q40-05/ BBR-Q40-06
EUT Voltage	100-240V AC/ 50-60Hz for internal battery charger 24V DC for internal battery
Frequency Range	13.56 MHz
Channel Number	1
Type of Modulation	ASK
Mode	Reader
Antenna Type	PCB
Peak Antenna Gain	3.1dBi

Remark:

Description of model differences: All tests use BBR-Q40-01 test results to cover series models.

All models are identical in major electrical aspects including the same software parameter and hardware design (i.e., circuit design, PCB Layout, RF module/circuit, antenna type(s) and antenna location, components on PCB, etc,), the only difference is the battery capacity difference (BBR-Q40-01, BBR-Q40-05:10AH, BBR-Q40-02, BBR-Q40-06:20AH);

All models are identical in major mechanical structure and design (including product enclosure, materials, etc.), the only difference is the tiller folding method (BBR-Q40-01, BBR-Q40-02: rotate knob. BBR-Q40-05, BBR-Q40-06: Gas spring).

The detailed differences are as shown in the following table.

Model	BBR-Q40-01	BBR-Q40-02	BBR-Q40-05	BBR-Q40-06
Battery capacity	10AH	20AH	10AH	20AH
Tiller folding method	rotate knob	rotate knob	Gas spring	Gas spring
NFC	Yes	Yes	Yes	Yes
Picture	rotate knob		Gas spring	

1.2. Working Frequency of Each Channel:

NFC Working Frequency:13.56MHz

1.3. Antenna information

Antenna Manufacturer	Jiangsu Jianwei Technology Co., LTD					
Antenna Delivery	☒	1*TX+1*RX	☐	2*TX+2*RX	☐	3*TX+3*RX
Antenna Technology	☒	SISO				
	☐	MIMO	☐	Basic		
			☐	Sectorized antenna systems		
			☐	Cross-polarized antennas		
			☐	Unequal antenna gains, with equal transmit powers		
			☐	Spatial Multiplexing		
			☐	CDD		
			☐	Beam-forming		
Antenna Type	☐	External	☐	Dipole		
	☒	Internal	☐	PIFA		
			☒	PCB		
			☐	Ceramic Chip Antenna		
			☐	Metal plate type F antenna		
			☐	Cross-polarize Antenna		
Antenna Gain	3.1dBi					

1.4. Mode of Operation by antenna

Antenna Technology	SISO
Test mode	ANT 1
NFC reader	√

1.5. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Equipment	Type / Version	Manufacturer	Supplied by
NFC card	N/A	N/A	N/A
BATTERY CHARGER	FY-2942800	Zhejlang Fudian Intelligent Technology Co.,Ltd.	N/A
software	Type / Version	Manufacturer	Supplied by
/	/	/	/

The ancillary equipment, NFC card, is used to make the EUT (NFC) continuously transmitting signal (Power Level: Default) at 13.56MHz and is placed around 5mm gap to the EUT.

1.6. Configuration of Tested System

Test setup Diagram- Radiated Emission
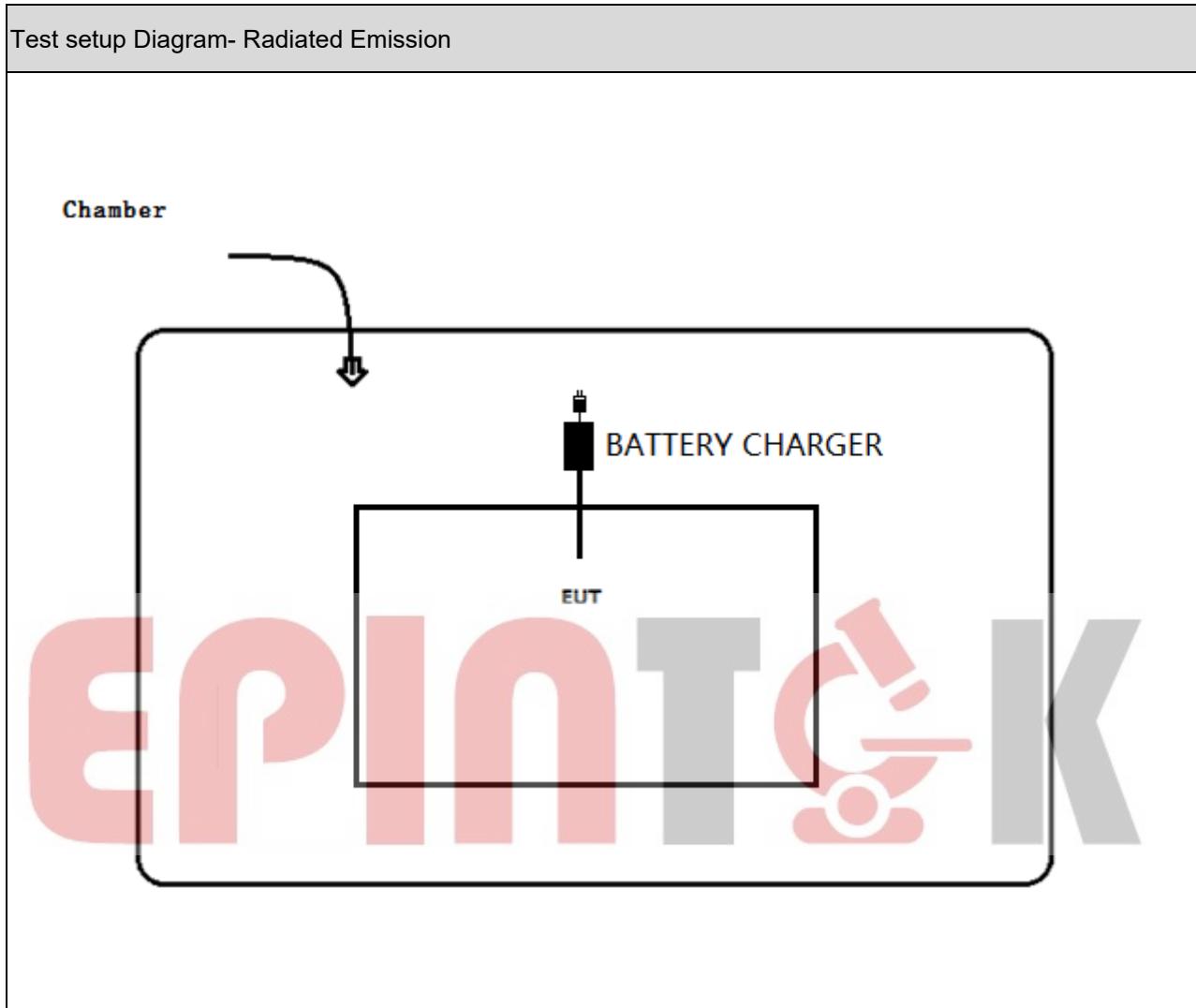
1.7. EUT Exercise Software

1	Setup the EUT as shown in Section 2.3.
2	Execute the power on the EUT.
3	Verify that the EUT works properly.
4	Use the NFC card make the EUT (NFC) continuously transmitting signal.

1.8. Mode of Operation

During the tests the following operating mode(s) has(have) been used.

Test Mode	Mode 1: Transmit by NFC

1.9. Product Category for RF Exposure

Product Category for using: Portable.

Note: The NFC component in the control panel recognizes the information of the paired NFC card when it is brought close to the control panel, thereby controlling the locking and unlocking of the Mobility Scooter.

1.10. Limits

According to KDB 447498 D01 General RF Exposure Guidance v06

a) For 100 MHz to 6 GHz and test separation distances ≤ 50 mm, the 1-g and 10-g SAR test exclusion thresholds are determined by the following: [(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)] · [$\sqrt{f(GHz)}$] ≤ 3.0 for 1-g SAR, and ≤ 7.5 for 10-g extremity SAR, where

• f(GHz) is the RF channel transmit frequency in GHz
• Power and distance are rounded to the nearest mW and mm before calculation
• The result is rounded to one decimal place for comparison

b) For 100 MHz to 6 GHz and test separation distances > 50 mm, the 1-g and 10-g SAR test exclusion

thresholds are determined by the following (also illustrated in Appendix B):32

    1) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50 mm)·(f(MHz)/150)]} mW, for 100 MHz to 1500 MHz

    2) {[Power allowed at numeric threshold for 50 mm in step a)] + [(test separation distance – 50

mm)·10]} mW, for > 1500 MHz and ≤ 6 GHz

c) For frequencies below 100 MHz, the following may be considered for SAR test exclusion

    1) For test separation distances > 50 mm and < 200 mm, the power threshold at the corresponding

test separation distance at 100 MHz in step b) is multiplied by $[1 + \log(100/f(MHz))]$

2) For test separation distances $\leq$ 50 mm, the power threshold determined by the equation in c) 1) for 50 mm and 100 MHz is multiplied by ½

3) SAR measurement procedures are not established below 100 MHz.

1.11. Test Procedure

The ancillary equipment, NFC card, is used to make the EUT (NFC) continuously transmitting signal (Power Level: Default) at 13.56MHz and is placed around 5mm gap to the EUT.

The temperature and related humidity: 24℃ and 53% RH.

1.12. Test Result of RF Exposure Evaluation

Product	:	Mobility Scooter
Test Item	:	RF Exposure Evaluation
Test Site	:	Shielding Room 1

● Antenna Gain:

No.	Peak Gain	Gain in Linear
Antenna 1	3.1dBi	1

RF Exposure Evaluation

The Output Power into Antenna

Mode	Test Frequency (MHz)	Measurement Power Output (dBm)	Power (mW)
1	13.56	-46.6	0.000022

For the worst: the RF power: [13.56 MHz, -46.6 dBm, 0.000022 mW) output power]: $(0.000022/5) \cdot [\sqrt{0.01356(GHz)}] \cdot \frac{1}{2} = 0.256184 \cdot 10^{-6} < 3.0$ for 1-g SAR

Then SAR evaluation is not required.

———————————————— The End ————————————————