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RF Exposure Compliance Report

Report No.: M2404009-2v2

TESTED FOR:	**ISSUED BY:**
REDARC Electronics Pty Ltd	EMC Technologies Pty. Ltd.
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Product Name:	TOW-PRO LINK™ Electric Trailer Brake Controller Main Unit
Model:	EBRHX-MU-NA
FCC ID:	2BAH6-EBRHXMUNA
Assessment Date:	27 May 2024
Issue Date:	17 July 2024
Specification(s):	• **447498 D01 General RF Exposure Guidance v06** *RF exposure procedures and equipment authorization policies for mobile and portable devices.*

Based on an assessment of the documentation provided, the TOW-PRO LINK™ Electric Trailer Brake Controller Main Unit, model: EBRHX-MU-NA is exempted from SAR evaluation.

Test Engineers:

Ashish Nath

Authorized Signatory:

Digitally signed by Shabbir Ahmed
Date: 2024.07.17 14:53:55 +10'00'

Shabbir Ahmed

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Revision History

Version	Issue Date	Reason / Comments
1	16 July 2024	Initial issue
2	17 July 2024	Correction made to the applicant's address

General Remarks

EMC Technologies Pty Ltd hereby certify that the device(s) described herein were tested as described in this report and that the data included is that which was obtained during such testing.

EMC Technologies Pty Ltd reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. EMC Technologies Pty Ltd shall have no liability for any deductions, inferences or generalisations drawn by the customer or others from EMC Technologies Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Technologies Pty Ltd.

Content

1 Project Overview

1.1 Introduction

The transmitter was assessed against FCC KDB 447498 D01 General RF Exposure Guidance v6.

This report shows the SAR exclusion in accordance with FCC KDB 447498 D01 clause 4.3.1,

The product sample and device information were provided by the customer

1.2 Test Facility

Measurements were performed at the following location:

☒ Melbourne Laboratory 176 Harrick Road, Keilor Park, Vic 3042

☐ Sydney Laboratory Unit 3/87 Station Road, Seven Hills, NSW 2147

EMC Technologies Pty. Ltd. is an independently owned Australian company that is NATA accredited to ISO 17025 for both testing and calibration and ISO 17020 for Inspection. – **Accreditation Number 5292**.

Country	Assessment Body	Lab Code / Member No.
Australia	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001/AU0002
Canada	ISED Canada	CAB Identifier Number: AU0001/AU0002
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

1.3 Standards Applied

Unless otherwise noted, only the cited edition applies.

447498 D01 General RF Exposure Guidance v06
RF exposure procedures and equipment authorization policies for mobile and portable devices

*Latest version of the standard applied.

1.4 Device Details

(Information supplied by the Client)

The device is Electric Trailer Brake Controller Main unit.

Manufacturer:	REDARC Electronics Pty Ltd
Test Sample:	TOW-PRO LINK™ Electric Trailer Brake Controller Main Unit
Sample Number:	S01467
PCB Version:	PCB3360-3
Model Number:	EBRHX-MU-NA
Distance From human body in normal use:	Greater than 20 cm

1.5 Transmitters Details

Transmitter parameters were provided by the customer and are shown below:

RF Evaluation by Calculation: above 30MHz transmitting frequency.

Transmitter #1	
Wireless Interface 1:	Nordic Semiconductor nRF52833 – BLE (REDARC assembled)
Operating Frequency:	2402-2480 MHz
Max RF Output Power (EIRP)	6.66 dBm (4.63mW)
Antenna Type:	Molex 479480001 (2.4GHz SMT MID Chip Antenna)
Max Antenna gain:	3.7 dBi
RF Output Power at Antenna terminal:	2.96 dBm (1.98 mW)

2 SAR TEST EXCLUSION THRESHOLD FOR 100 MHz to 6 GHz and ≤50mm

Table1: SAR test exclusion threshold 100 MHz- 6GHz

MHz	5	10	15	20	25	mm
150	39	77	116	155	194	*SAR Test Exclusion Threshold* (mW)
300	27	55	82	110	137	
450	22	45	67	89	112	
835	16	33	49	66	82	
900	16	32	47	63	79	
1500	12	24	37	49	61	
1900	11	22	33	44	54	
2450	10	19	29	38	48	
3600	8	16	24	32	40	
5200	7	13	20	26	33	
5400	6	13	19	26	32	
5800	6	12	19	25	31	
MHz	30	35	40	45	50	mm
150	232	271	310	349	387	*SAR Test Exclusion Threshold* (mW)
300	164	192	219	246	274	
450	134	157	179	201	224	
835	98	115	131	148	164	
900	95	111	126	142	158	
1500	73	86	98	110	122	
1900	65	76	87	98	109	
2450	57	67	77	86	96	
3600	47	55	63	71	79	
5200	39	46	53	59	66	
5400	39	45	52	58	65	
5800	37	44	50	56	62	

Note: 10-g Extremity SAR Test Exclusion Power Thresholds are 2.5 times higher than the 1-g *SAR Test Exclusion Thresholds* indicated above. These thresholds do not apply, by extrapolation or other means, to occupational exposure limits.

The 1-g Body SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\frac{\text{max. power of channel, including tuneup tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} \leq 3.0$$

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.
- The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz.
- The minimum test separation distance is 5mm.

3 Uncertainty

EMC Technologies has evaluated the tools and methods used to perform Radiated Electromagnetic Field predictions.

The estimated measurement uncertainties shown within this report are as follows:

Electromagnetic Modelling

30 MHz to 100GHz ±2.8 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95%.

4 Assumptions in the Assessment

This assessment does not include accumulated RF fields from nearby sites/antennas or possible radio signal reflections or attenuation due to buildings or the general environment.

Antenna Parameters and power settings were supplied by the customer.

The aperture of the radiating element assumed to be a point source in free space and far field conditions.

5 Evaluation Result

The standalone transmitter is exempted from SAR if the below condition satisfied in conjunction with threshold power condition in table 1.

$$\frac{\text{max. power of channel, including tune} - \text{up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} \leq 3.0$$

Where

Minimum test separation distance (mm): 5

The minimum test separation distance is determined by the smallest distance from the antenna (radiating structures) to the outer surface of the device.

Maximum power of channel (mW): 2 (1.98 mW rounded off to 2 mW)

Time-averaged maximum conducted output power.

$$\frac{\text{max. power of channel, including tune} - \text{up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} = \frac{2\ mW}{5mm} * \sqrt{2.45\ GHz}$$

$$= \mathbf{0.6} < \mathbf{3.0}$$

As the transmitted power is **4.63 mW** (6.66 dBm), less than 10 mW indicated in table (1) and the result of the above condition is **0.6** (less than 3), this transmitter exempted from SAR evaluation for FCC compliance purposes.

Appendix A

Referenced Documents

Document	Comments
EMCT radio test report no:M2404009-4	Transmitter RF power and Antenna gain

-- END OF REPORT --