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FCC MPE Report

Report Number: M18429-8A

Test Sample:	Laserforce Battlesuit
Model Number:	LF900
Tested For:	Laserforce International Pty Ltd
Date of Issue:	3 April 2019

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SAR EXEPTION CERTIFICATE

Device under Test:	Laserforce Battlesuit
Model Number:	LF900
Manufacturer:	Laserforce International Pty Ltd
Tested for:	Laserforce International Pty Ltd
Address:	55 Ipswich Road, Brisbane QLD 4102 Australia
Contact:	Paul McGougan
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Standards:	**FCC KDB 447498 D01 General RF Exposure Guidance v6** Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.
Result:	SAR evaluation is not required in accordance with FCC KDB 447498 D01 clause 4.3.1
Test Dates:	12th September 2018

Test Engineers: Emad Mansour
EME/EMR test Engineer
EMC TECHNOLOGIES PTY. LTD.

Authorised Signatory: Chris Zombolas
Technical Director
EMC TECHNOLOGIES PTY. LTD.

1 INTRODUCTION

This report shows the SAR exclusion on the Laserforce Battlesuit, Model No. LF900, in accordance with FCC KDB 447498 D01 clause 4.3.1,

The test sample was provided by the Client. The conclusion herein is based on the information provided by the client.

2 GENERAL INFORMATION

(Information supplied by the Client)

The Equipment Under Test (EUT) was identified as follows:

Test Sample:	Laserforce Battlesuit
Model Name:	LF900
Manufacturer:	Laserforce International Pty Ltd
Power Supply:	Internal DC Battery
Radio Module:	Nordic nRF52832
Operating Band:	2.4 GHz
Modulation:	GFSK
Antenna type:	PCB trace antenna
Peak Output Power	2.84 dBm (1.9 mW) EIRP

Note1: For peak output power refer to Report M180429-5 (issued by EMC Technologies Pty Ltd).

3 TEST SAMPLE DESCRIPTION

(Information supplied by the Client)

A laser tag vest (including phaser gun) worn by player that communicates wirelessly with the base station unit

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

Table1: SAR test exclusion threshold 100 MHz- 6GHz

Frequency (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	
435	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	

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

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

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 less than 5 mm,

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 less than ($5mm$):
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):
Time-averaged maximum conducted output power

$$\frac{\text{max. power of channel, including tune} - \text{up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} = \frac{1.9mW}{5mm} * \sqrt{2.45\ GHz}$$
$$= 0.6 \leq 3.0$$

As the transmitted power is 2.84 dBm (1.9 mW) less than 10 mW indicated in table 1) and the result of the above condition is 0.6 (less than 3), hence this transmitter exempted from SAR evaluation

6 CONCLUSION

The EUT is exempted from SAR evaluation based on the test exclusion guidance in FCC KDP 447498 D01 clause 4.3.1