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Prepared for:

Controlled Electronic Management Systems Ltd

By

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FCC EQUIPMENT AUTHORISATION

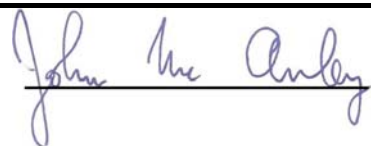
Test Report

EUT Description

RFID Reader module

Authorised :

John McAuley

A handwritten signature in blue ink, reading 'John McAuley', written over a horizontal line.

1.0 Introduction

Summary

The EUT will be co-locating with another device (Getac PS336) but the RF exposure contribution from the EUT will be negligible.

The detailed SAR calculations for the EUT are shown in Appendix 1 below.

2.0 SAR Evaluation

Description of EUT transmitters

The EUT contains 2 transmitters at 13.56MHz and 125KHz which do not operate at the same time.

The SAR estimates in Appendix 1 below consider the peak power from each transmitter without averaging.

SAR Exclusion Limits

Excerpt from 447498 KDB (47498 D01 General RF Exposure Guidance v05r02)

Section 4.3.1 Standalone SAR Test exclusion considerations

4.3.1. Standalone SAR test exclusion considerations

- 1) 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:

$$[(\text{max. power of channel, including tune-up tolerance, mW})/(\text{min. test separation distance, mm})] \cdot [\sqrt{f_{\text{(GHz)}}}] \leq 3.0 \text{ for 1-g SAR and } \leq 7.5 \text{ for 10-g extremity SAR,}^{25} \text{ where}$$

- $f_{\text{(GHz)}}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation²⁶
- The result is rounded to one decimal place for comparison
- 3.0 and 7.5 are referred to as the numeric thresholds in the step 2 below

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. When the minimum *test separation distance* is < 5 mm, a distance of 5 mm according to 5) in section 4.1 is applied to determine SAR test exclusion.

- 2) At 100 MHz to 6 GHz and for *test separation distances* > 50 mm, the SAR test exclusion threshold is determined according to the following, and as illustrated in Appendix B:²⁷
 - a) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · ($f_{\text{(MHz)}/150}$)] mW, at 100 MHz to 1500 MHz
 - b) [Power allowed at numeric threshold for 50 mm in step 1) + (test separation distance - 50 mm) · 10] mW at > 1500 MHz and ≤ 6 GHz
- 3) At frequencies below 100 MHz, the following may be considered for SAR test exclusion, and as illustrated in Appendix C:²⁸
 - a) The power threshold at the corresponding test separation distance at 100 MHz in step 2) is multiplied by $[1 + \log(100/f_{\text{(MHz)}})]$ for *test separation distances* > 50 mm and < 200 mm
 - b) The power threshold determined by the equation in a) for 50 mm and 100 MHz is multiplied by $\frac{1}{2}$ for *test separation distances* ≤ 50 mm
 - c) SAR measurement procedures are not established below 100 MHz. When SAR test exclusion cannot be applied, a KDB inquiry is required to determine SAR evaluation requirements for any test results to be acceptable.

Appendix 1**Head and Body SAR for 13.56MHz transmitter**

Prediction frequency:	f	0.01356	GHz
Maximum power of channel :	P	0	mW
Minimum separation distance:	D	5	mm
Power Limit for 1g SAR		443	mW
Numeric Threshold for 1g SAR		3	
SAR Test not required			
Calculated SAR Value	$[0/443]*0.4$	0	W/Kg

Extremity SAR for 13.56MHz transmitter

Prediction frequency:	f	0.01356	GHz
Maximum power of channel :	P	0	mW
Minimum separation distance:	D	5	mm
Power Limit for 10g SAR		1107	mW
Numeric Threshold for 10g SAR		7.5	
SAR Test not required			
Calculated SAR Value	$[0/1107]*0.4$	0	W/Kg

Head and Body SAR for 125KHz transmitter

Prediction frequency:	f	0.000125	GHz
Maximum power of channel :	P	0	mW
Minimum separation distance:	D	5	mm
Power Limit for 1g SAR		926	mW
Numeric Threshold for 1g SAR		3	
SAR Test not required			
Calculated SAR Value	$[0/926]*0.4$	0	W/Kg

Extremity SAR for 125KHz transmitter

Prediction frequency:	f	0.000125	GHz
Maximum power of channel :	P	0	mW
Minimum separation distance:	D	5	mm
Power Limit for 10g SAR		2314	mW
Numeric Threshold for 10g SAR		7.5	
SAR Test not required			
Calculated SAR Value	$[0/2314]*0.4$	0	W/Kg