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## FCC SAR EXEMPTION REPORT

**REPORT NUMBER: M2012010-9**

**TEST STANDARD: FCC KDB 447498 D01**

**CLIENT: PLANET INNOVATION**

**ON BEHALF OF PINE TREES  
HEALTH**

**DEVICE: PINE TREES HEALTH  
READER**

**MODEL: 10**

**DATE OF ISSUE: 29 JUNE 2021**

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## REVISION TABLE

Version	Sec/Para Changed	Change Made	Date
1		Initial issue of document	29/06/2021



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## CONTENTS

1	Introduction.....	5
1.1	Laboratory Overview.....	5
1.2	Test Laboratory/Accreditations.....	5
2	Device Details.....	5
3	SAR Test Exclusion Threshold for 100MHz to 6GHz and $\leq 50\text{mm}$ .....	6
4	Uncertainty .....	6
5	Assumptions in this Assessment.....	6
6	Calculations .....	7
6.1	EIRP Calculation.....	7
6.2	Limit Calculation .....	7
7	Evaluation Result.....	7
7.1	Test Exclusion Threshold Evaluation .....	7
8	Conclusion.....	8
	Appendix A .....	9



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## FCC SAR EXEMPTION REPORT

**Device:** Pine Trees Health Reader  
**Model Number:** 10  
**Serial Number:** 23

**FCC ID:** FCC ID: 2AYYC-2232021

**Manufacturer:** Pine Trees Health  
LabCentral Inc. – Cambridge, MA 02139 USA

**Inspected for:** Planet Innovation on behalf of Pine Trees Health  
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**Standards:** **FCC KDB 447498 D01 General RF Exposure Guidance**


Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

**Result:** Based on an assessment of the documentation provided the Pine Trees Health Reader, model 10 is exempt from SAR evaluation. Refer to Report M2012010-9 for full details

**Assessment Date:** 25 June 2021

**Issue Date:** 29 June 2021

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## 1 INTRODUCTION

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

This report shows the SAR exclusion on the Pine Trees Health Reader, Model 10, 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.

### 1.1 Laboratory Overview

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.**

### 1.2 Test Laboratory/Accreditations

Inspection was performed at EMC Technologies' laboratory in Keilor Park, Victoria Australia.

Table 1-1: *Accreditations for Conformity Assessment*

Country/Region	Body	
Australia/New Zealand	NATA	Accreditation Number: 5292
Europe	European Union	Notified Body Number: 0819
USA	FCC	Designation Number: AU0001 (Melb) Designation Number: AU0002 (Syd)
Canada	ISED Canada	Company Number: 3569B(Melb) Company Number: 4207A (Syd)
Japan	VCCI	Company Number: 785
Taiwan	BSMI	Lab Code SL2-IN-E-5001R

## 2 DEVICE DETAILS

(Information supplied by the Client)

Pine Trees Health Reader is a point-of-care device that performs a COVID-19 test which is a rapid molecular *in vitro* diagnostic test utilizing isothermal nucleic acid amplification technology and detection of the resulting amplicon using CRISPR-mediated collateral reporter unlocking. Intended for the qualitative detection of nucleic acid from SARS-Cov-2 viral RNA in nasal swabs from individuals who are suspected of COVID-19 infection by a healthcare professional.

**Manufacturer:** Pine Trees Health  
**Test Sample:** Pine Trees Health Reader  
**Model Number:** 10  
**Serial Number:** 23

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

<b>Wireless Interface 1:</b>	Bluetooth Transceiver
<b>Operating Frequency:</b>	2402 – 2480MHz
<b>RF Output Power Level:</b>	+6.0 ± 0.4dBm (0.4dBm tune-up tolerance)
<b>Antenna Type:</b>	Inverted F - PCB antenna
<b>Max Antenna gain:</b>	+2dBi

### 3 SAR TEST EXCLUSION THRESHOLD FOR 100MHZ TO 6GHZ AND ≤50MM

Table 2: 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	

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 10-g SAR (extremity) test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

$$\frac{\text{max. power of channel, including tune – up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(\text{GHz})} \leq 7.5$$

Where:

- 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.

### 4 UNCERTAINTY

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

The estimated inspection uncertainties for the test 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%.

### 5 ASSUMPTIONS IN THIS 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.

A 100% duty cycle is assumed.

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

## 6 CALCULATIONS

The standalone transmitter is exempt from SAR evaluation if the test exclusion threshold condition is satisfied in conjunction with threshold power condition in Table 1.

### 6.1 EIRP Calculation

The EIRP was calculated to determine whether the device is exempt from SAR evaluation by comparing the device EIRP against the applicable exemption limits in table 3-1.

The following formula was used to calculate the EIRP:

$$EIRP = 10^{\frac{P(dBm)+G(dBi)}{10}} \quad (mW)$$

$$EIRP = 10^{\frac{P(6.4)+G(2)}{10}} = 6.9 \quad (mW)$$

Where:

(EIRP): EIRP (mW)

(P): Output power at antenna terminal (dBm)

(G): Gain (dBi)

### 6.2 Limit Calculation

As the separation distances were measured from the antenna to the fingertip, the limits were multiplied by the 2.5 limb-worn factor.

$$Limit = 10mW * 2.5 = 25mW$$

## 7 EVALUATION RESULT

The standalone transmitter is exempted from SAR if the condition test exclusion threshold is satisfied in conjunction with threshold power condition in Table 1.

### 7.1 Test Exclusion Threshold Evaluation

$$\frac{\text{max. power of channel, including tune – up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} \leq 7.5$$

Where:

Minimum test separation distance (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

$$\frac{\text{max. power of channel, including tune – up tolerance (mW)}}{\text{min. test separation distance (mm)}} * \sqrt{f(GHz)} = \frac{6.9mW}{5mm} * \sqrt{2.45 GHz}$$

$$= 2.1 \leq 7.5$$

As the transmitted power does not exceed the 25mW 10-g extremity SAR threshold indicated in Table 1, and the result of the Test Exclusion Threshold is less than 7.5, the transmitter is exempt from SAR evaluation.

## 8 CONCLUSION

Based on an assessment of the documentation provided the Pine Trees Health Reader, model 10 is exempt from SAR evaluation based on the test exclusion guidance in FCC KDP 447498 D01 clause 4.3.1.



## APPENDIX A

### *Referenced Documents*

Document	Comments
Form 005 Customer Information Sheet_PI	Module, antenna, and peak power details
stm32wb55rg Datasheet	peak power and tune-up details



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