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## RADIO CERTIFICATION REPORT

*In accordance with:*

CFR47 FCC Part 15, Subpart C – Section 15.231

Automatic Technology Australia Pty. Ltd.

PTX-6V2AM

Handheld Remote Control

REPORT: E2006-1302-1

DATE: August, 2020



WORLD RECOGNISED  
**ACCREDITATION**

Accreditation Number: 18553

Accredited for compliance with ISO/IEC 17025

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## Certificate of Compliance

EMC Bayswater Test Report: E2006-1302-1  
Issue Date: August, 2020

**Product(s):** Handheld Remote Control  
**Model No:** PTX-6V2AM  
**Serial No:** Sample 1: Not stated Sample 2: Not stated  
**Variant:** PTX-6V2, TB6V2  
*The above listed variant (PTX-6V2AM) was tested by EMC Bayswater Pty Ltd as a representative model and the results and conclusions within this report do not necessarily reflect compliance for other models. Please refer to section 5 of this report for variant information and the customer variant declaration.*

**FCC ID:** X4K-PAPTX7V100

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**Test Specification:** CFR47 FCC Part 15, Subpart C – Section 15.231

**Results Summary:** FCC 15.203 - Antenna Requirement **Complied**  
FCC 15.231(a) - Transmitter Deactivation **Complied**  
FCC 15.231(b) - Field strength of fundamental **Complied**  
FCC 15.231(b), 15.209 - Field strength of spurious emissions **Complied**  
FCC 15.231(c) - Emission Bandwidth **Complied**

**Test Date(s):** 2<sup>nd</sup> and 3<sup>rd</sup> of June, 2020

**Test House  
(Issued By):** EMC Bayswater Pty Ltd  
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This is to certify that the necessary measurements were made by EMC Bayswater Pty Ltd, and that the Automatic Technology Australia Pty. Ltd., PTX-6V2AM, Handheld Remote Control, has been tested in accordance with requirements contained in the appropriate commission regulations.

Prepared & tested by:

Approved by:



10/08/2020 10:45

Adnan Zaman  
(EMC Test Engineer)

Neville Liyanapatabendige  
(Manager)

Date

## Radio Certification Report *for* Automatic Technology Australia Pty. Ltd.

### Contents

|                                                                                          |           |
|------------------------------------------------------------------------------------------|-----------|
| <b>1. Introduction .....</b>                                                             | <b>4</b>  |
| <b>2. Test Report Revision History.....</b>                                              | <b>4</b>  |
| <b>3. Report Information .....</b>                                                       | <b>4</b>  |
| <b>4. Summary of Results .....</b>                                                       | <b>4</b>  |
| <b>5. Product Sample, Configuration &amp; Modifications .....</b>                        | <b>5</b>  |
| 5.1. Product Sample Details .....                                                        | 5         |
| 5.2. Product description .....                                                           | 5         |
| 5.3. Support Equipment.....                                                              | 6         |
| 5.4. Product operating modes.....                                                        | 6         |
| 5.5. Product operating mode for testing .....                                            | 6         |
| 5.6. Configuration .....                                                                 | 6         |
| 5.7. Modifications.....                                                                  | 6         |
| 5.8. Test Facility .....                                                                 | 7         |
| 5.9. Test Equipment .....                                                                | 7         |
| <b>6. Referenced Standards.....</b>                                                      | <b>7</b>  |
| <b>7. Referenced Documents.....</b>                                                      | <b>7</b>  |
| <b>8. Antenna Requirement – FCC Part 15.203.....</b>                                     | <b>8</b>  |
| 8.1. Requirements .....                                                                  | 8         |
| 8.2. Result .....                                                                        | 8         |
| <b>9. Duty cycle correction factor .....</b>                                             | <b>9</b>  |
| 9.1. Test Procedure .....                                                                | 9         |
| 9.2. Test Results.....                                                                   | 9         |
| <b>10. Field strength of fundamental – FCC Part 15.231(b) .....</b>                      | <b>11</b> |
| 10.1. Test Procedure .....                                                               | 11        |
| 10.2. Limits .....                                                                       | 11        |
| 10.3. Test Results.....                                                                  | 12        |
| <b>11. Field strength of spurious emissions – FCC Part 15.231(b) .....</b>               | <b>14</b> |
| 11.1. Test Procedure .....                                                               | 14        |
| 11.2. Limits .....                                                                       | 15        |
| 11.3. Test Results.....                                                                  | 16        |
| <b>12. Emission Bandwidth – FCC Part 15.231(c) .....</b>                                 | <b>20</b> |
| 12.1. Test Procedure .....                                                               | 20        |
| 12.2. Requirements .....                                                                 | 20        |
| 12.3. Test Results.....                                                                  | 20        |
| <b>13. Transmitter Deactivation – FCC Part 15.231(a).....</b>                            | <b>22</b> |
| 13.1. Test Procedure .....                                                               | 22        |
| 13.2. Test Results.....                                                                  | 22        |
| <b>14. Conclusion.....</b>                                                               | <b>22</b> |
| <b>Appendix A – Test Equipment.....</b>                                                  | <b>23</b> |
| <b>Appendix B – Photographs.....</b>                                                     | <b>24</b> |
| <b>Appendix C – Measurement Graphs .....</b>                                             | <b>26</b> |
| <b>Appendix D – Exposure of Humans to RF fields (Radio Frequency Hazard) information</b> |           |
| 35                                                                                       |           |
| <b>Appendix E – Customer Declaration of Product Variant .....</b>                        | <b>37</b> |

## 1. Introduction

Radio tests were performed on an Automatic Technology Australia Pty. Ltd., PTX-6V2AM, Handheld Remote Control, in accordance with the requirements of CFR47 FCC Part 15, Subpart C – Section 15.231.

## 2. Test Report Revision History

None

## 3. Report Information

EMC Bayswater Pty Ltd reports apply only to the specific samples tested under the stated test conditions. All samples tested were in good operating condition throughout the entire test program unless otherwise stated. EMC Bayswater Pty Ltd does not in any way guarantee the later performance of the product/equipment. It is the manufacturer's responsibility to ensure that additional production units of the tested model are manufactured with identical electrical and mechanical components. EMC Bayswater Pty Ltd shall have no liability for any deductions, inference or generalisations drawn by the clients or others from EMC Bayswater Pty Ltd issued reports. This report shall not be used to claim, constitute or imply product endorsement by EMC Bayswater Pty Ltd. This report shall not be reproduced except in full (with the exception of the certificate on page 2) without the written approval of EMC Bayswater Pty Ltd. This document may be altered or revised by EMC Bayswater Pty Ltd personnel only, and shall be noted in the revision section of the document. Any alteration of this document not carried out by EMC Bayswater Pty Ltd will nullify the document.

## 4. Summary of Results

The EUT complied with applicable requirements of CFR47 FCC Part 15, Subpart C – Section 15.231. Worst-case results are tabled as follows:

| FCC sections | Test                                 | Result                                       |
|--------------|--------------------------------------|----------------------------------------------|
| 15.203       | Antenna Requirement                  | Complied <sup>#</sup>                        |
| 15.231(a)    | Transmitter Deactivation             | Complied                                     |
| 15.231(b)    | Field strength of fundamental        | Complied by 0.8dB <sup>+</sup>               |
| 15.231(b)    | Field strength of spurious emissions | Complied Peak limit by 9.9dB                 |
| 15.209       |                                      | Complied Average limit by 1.0dB <sup>+</sup> |
| 15.231(c)    | Emission Bandwidth                   | Complied                                     |

<sup>+</sup>Refer to appropriate section for measurement uncertainty statement.

<sup>#</sup>The Antenna is permanently attached, internal to the device.

Table 1: Summary of test results

## 5. Product Sample, Configuration & Modifications

### 5.1. Product Sample Details

The EUT (Equipment Under Test), as supplied by the client, is described as follows:

|                      |                                                                                                                                                                                                                                                                                                                                                                                                                    |            |           |            |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------|------------|
| Product:             | Handheld Remote Control                                                                                                                                                                                                                                                                                                                                                                                            |            |           |            |
| Model No:            | PTX-6V2AM                                                                                                                                                                                                                                                                                                                                                                                                          |            |           |            |
| Variant:             | PTX-6V2, TB6V2*                                                                                                                                                                                                                                                                                                                                                                                                    |            |           |            |
|                      | *The customer (Automatic Technology Australia Pty. Ltd.) declared testing of one variant as a worst case representative sample and declared that to be the "PTX-6V2AM" (refer to Appendix E within this report for the customer declaration of worst case variant used for testing). Please note other than the unit(s) listed as a) "Product" and b) "Model", no other products/models or variant(s) were tested. |            |           |            |
| Serial No:           | Sample 1:                                                                                                                                                                                                                                                                                                                                                                                                          | Not Stated | Sample 2: | Not Stated |
| Firmware:            | Not Stated                                                                                                                                                                                                                                                                                                                                                                                                         |            |           |            |
| Software:            | Not Stated                                                                                                                                                                                                                                                                                                                                                                                                         |            |           |            |
| Hardware Version:    | PTX7-1.00                                                                                                                                                                                                                                                                                                                                                                                                          |            |           |            |
| Power Specification: | CR2032 3V Battery powered                                                                                                                                                                                                                                                                                                                                                                                          |            |           |            |
| EUT Type:            | Remote Control (Handheld)                                                                                                                                                                                                                                                                                                                                                                                          |            |           |            |
| Orientation:         | Single typical orientation                                                                                                                                                                                                                                                                                                                                                                                         |            |           |            |
| Dimensions:          | 75 x 35 x 15 mm (Length x Width x Height)                                                                                                                                                                                                                                                                                                                                                                          |            |           |            |
| Weight:              | 35 g                                                                                                                                                                                                                                                                                                                                                                                                               |            |           |            |

#### Transmitter details:

|              |                                                |
|--------------|------------------------------------------------|
| Description: | Remote Control                                 |
| Type:        | Key Fob Transmitter                            |
| Channels:    | 3 channels: 433.47 MHz, 433.92 MHz, 434.37 MHz |
| Modulation:  | FSK/OOK                                        |
| Antenna:     | ¼ wave Loop Antenna                            |
| FCC ID:      | X4K-PAPTX7V100                                 |
| CE mark:     | No                                             |
| RCM Logo:    | Yes                                            |

*(Customer supplied product information)*

*(Refer to Photographs in Appendix B for views of the EUT)*

### 5.2. Product description

The EUT (Equipment Under Test) has been described by the customer as follows:

"The Equipment Under Test (EUT) is the Handheld Remote Control PTX-6V2(AM) supplied by the CR2032 battery. Remote Control is used to control (open and close) Garage Door Openers, Gate Openers, and other ATA equipment, which require remote operations."

*(Customer supplied product description information)*

The highest fundamental frequency generated or used within the EUT, or the highest frequency at which it operates as specified by the customer is 434.37MHz.

### 5.3. Support Equipment

None

### 5.4. Product operating modes

The customer described the products normal operation modes as the following:

“In the 1<sup>st</sup> sample: press one of the four buttons to start the transmission; press any other button to stop transmission.”

Second sample: normal operation with button activation.

### 5.5. Product operating mode for testing

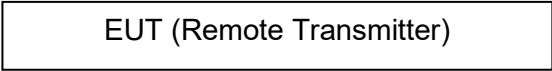
“The first sample: The Remote Control Transmitter was configured to transmit continuously for measure spurious emission and radiated power and other parameters.

The second sample is configured to normal operation.”

### 5.6. Configuration

The EUT was either configured by the customer or configured using the customer's instructions:

Standalone product, powered via internal 3VDC button battery (CR 2032). A new battery was used for all testing. The transmitter was tested in its enclosure and orientated when required to find the worst case orientation. Sample 2 was used for transmitter deactivation test. Sample 1 was used for all other tests.

A rectangular box with a black border containing the text "EUT (Remote Transmitter)".

EUT (Remote Transmitter)

Figure 1: EUT configuration diagram for Transmitter Testing

### 5.7. Modifications

EMC Bayswater Pty Ltd did not modify the EUT.

### 5.8. Test Facility

Field strength of fundamental, Duty Cycle Correction Factor, Field strength of spurious emissions, Transmitter Deactivation and 20dB Emission Bandwidth Measurements were taken in the indoor Open Area Test Site (iOATS) facility at EMC Bayswater Pty Ltd, located at 18/88 Merrindale Drive, Croydon South, Victoria, 3136, Australia.

EMC Bayswater Pty Ltd's FCC Accredited Test Firm Registration number: 527798.

EMC Bayswater Pty Ltd's FCC Test Firm Designation number is AU0004.

### 5.9. Test Equipment

Refer to Appendix A for the measurement instrument list.

## 6. Referenced Standards

CFR47 FCC Part 15, Subpart C

CFR47 FCC Part 15, Subpart B

ANSI C63.10 - 2013

American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

ANSI C63.4 - 2014

American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

## 7. Referenced Documents

Test-Plan

Not supplied

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## 8. Antenna Requirement – FCC Part 15.203

### 8.1. Requirements

As per section 15.203 of CFR47 FCC Part 15, Subpart C:

- An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

### 8.2. Result

The EUT uses permanent, internally attached antenna which is etched in to the PCB. Therefore the EUT complied with the antenna requirements of CFR47 FCC Part 15, Subpart C – Section 15.203.

## 9. Duty cycle correction factor

As per section 7.5 of ANSI C63.10 - 2013 & FCC Part 15.35(c):

Unless otherwise specified, when the radiated emission limits are expressed in terms of the average value of the emission, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 s (100 ms). In cases where the pulse train exceeds 0.1 s, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value. The following procedure is an example of how the average value may be determined. The average field strength may be found by measuring the peak pulse amplitude (in log equivalent units) and determining the duty cycle correction factor (in dB) associated with the pulse modulation as shown in following equation:

$$\delta(\text{dB}) = 20\log(\Delta)$$

where

$\delta$  = The duty cycle correction factor (dB)

$\Delta$  = The duty cycle (dimension less)

Duty Cycle = Total on time (ms)/Period (ms)

### 9.1. Test Procedure

The Duty cycle correction factor determination was performed in accordance with the section 7.5 of ANSI C63.10 - 2013.

### 9.2. Test Results

(Refer to graphs 12 & 13 in Appendix C)

Duty Cycle calculation:

| Type of Pulse | Pulse time | Number of Pulses in a period | Time    |
|---------------|------------|------------------------------|---------|
| Short Pulse   | 5.26ms     | 4                            | 21.04ms |
| Long Pulse    | 6.8ms      | 1                            | 6.8ms   |
| Total ON time |            |                              | 27.84ms |
| Pulse Period  |            |                              | 100ms   |

$$\text{Duty Cycle} = (27.84/100) = 0.2784$$

$$\text{Duty Cycle Correction Factor} = 20 \times \log(0.2784) = -11.1\text{dB}$$

| Measured Duty Cycle | Correction Factor (dB) |
|---------------------|------------------------|
| 0.2784              | -11.1                  |

Table 2: Measured Duty Cycle

The measurement uncertainty was calculated as follows:

| Measurement Parameter | Calculated measurement uncertainty |
|-----------------------|------------------------------------|
| Time                  | $\pm 0.2\%$                        |

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $k=2$  which gives a level of confidence of approximately 95%.

**Notes:** The measured duty cycle for customer supplied sample is 0.2784 (27.84%).

The duty cycle correction factor for 0.2784 duty cycle is -11.1dB.

**Assessment:** All Peak measurements of the transmission fundamental and associated harmonics can be reduced by 11.1dB.

## 10. Field strength of fundamental – FCC Part 15.231(b)

### 10.1. Test Procedure

The EUT was tested for Field strength of fundamental in accordance with FCC 47 CFR Part 15 Subpart C Radio frequency devices (Intentional Radiators).

Field strength of fundamental were measured 3 metres away from the EUT in the iOATS (indoor Open Area Test Site) facility, which is an ANSI C63.4 compliant semi-anechoic chamber with ground plane. The EUT was placed on a non-conductive support at a height of 0.8m above the ground plane.

For both horizontal and vertical antenna polarizations, the peak detector was set to MAX-HOLD and the range selected continuously scanned with 120kHz RBW and 300kHz VBW. The antenna height was varied from 1 to 4 metres and the turntable slowly rotated. The EUT was orientated in each of the X, Y and Z-axis, in-turn, to find the worst case emissions. The maximum emissions were recorded.

Plots of the accumulated measurement data for both horizontal and vertical antenna polarizations, including all transducer and other measuring system correction factors were produced using commercially available compliant software (as listed in the test equipment list of this report)

*(Refer to photographs in Annex C for views of the test configuration)*

### 10.2. Limits

The EUT shall meet the limits in the following table:

| Fundamental frequency (MHz) | Field strength of fundamental ( $\mu\text{V/m}$ )               |
|-----------------------------|-----------------------------------------------------------------|
| 40.66 to 40.70              | 2,250 (67 dB $\mu\text{V/m}$ )                                  |
| 70 to 130                   | 1,250 (61.9 dB $\mu\text{V/m}$ )                                |
| 130 to 174                  | <sup>1</sup> 1,250 to 3,750 (61.9 to 71.5 dB $\mu\text{V/m}$ )  |
| 174 to 260                  | 3,750 (71.5 dB $\mu\text{V/m}$ )                                |
| 260 to 470                  | <sup>1</sup> 3,750 to 12,500 (71.5 to 81.9 dB $\mu\text{V/m}$ ) |
| Above 470                   | 12,500 (81.9 dB $\mu\text{V/m}$ )                               |

<sup>1</sup>Linear interpolations.

Table 3: Limits for Field strength of fundamental at 3m distance

### 10.3. Test Results

Field strength of fundamental measurements are tabulated below:

(Refer to graphs 1 & 2 in Appendix C)

| Measurement Antenna Polarisation | EUT Orientation | Frequency (MHz) | Peak Electric Field Strength (3m) (dBμV/m) | Duty Cycle Factor (dB) | Average Electric Field Strength (3m) (dBμV/m) | Limit Electric Field Strength (3m) (dBμV/m) | Delta Limit (dB)         |
|----------------------------------|-----------------|-----------------|--------------------------------------------|------------------------|-----------------------------------------------|---------------------------------------------|--------------------------|
| Horizontal                       | X               | 433.506         | 90.1                                       | -11.1                  | 79.0                                          | 80.8                                        | -1.8 <sup>+</sup>        |
|                                  |                 | 433.922         | 90.0                                       | -11.1                  | 78.9                                          | 80.8                                        | -1.9 <sup>+</sup>        |
|                                  |                 | 434.390         | 89.8                                       | -11.1                  | 78.7                                          | 80.8                                        | -2.1 <sup>+</sup>        |
| Vertical                         | Y               | 433.481         | 90.9                                       | -11.1                  | 79.8                                          | 80.8                                        | -1.0 <sup>+</sup>        |
|                                  |                 | 433.896         | 91.1                                       | -11.1                  | 80.0                                          | 80.8                                        | <b>-0.8<sup>++</sup></b> |
|                                  |                 | 434.390         | 90.8                                       | -11.1                  | 79.7                                          | 80.8                                        | -1.1 <sup>+</sup>        |

<sup>+</sup>Worst-case emissions, <sup>++</sup>refer to measurement uncertainty statement

Table 4: Field strength of fundamental measurements

The measurement uncertainty was calculated as follows:

| Measurement frequency range | Calculated measurement uncertainty |
|-----------------------------|------------------------------------|
| 30MHz to 1000MHz            | ±4.65dB                            |

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $k=2$  which gives a level of confidence of approximately 95%. The referenced uncertainty standard specifies that determination of compliance shall be based on measurements without taking into account measurement uncertainty. However, the measurement uncertainty shall appear in the test report.

| Climatic Conditions   |                     |
|-----------------------|---------------------|
| Temperature:          | 16 to 17°C          |
| Humidity:             | 56 to 57%           |
| Atmospheric pressure: | 1018.8 to 1019.2hPa |

Table 5: Climatic conditions

**Calculation:** The above results are based upon the following calculation:

$$\begin{aligned} E(\text{Peak}) &= V_{pk} + AF + L_C \\ E(\text{Average}) &= E(\text{Peak}) - \text{Duty Cycle Correction Factor} \end{aligned}$$

Where:

$$\begin{aligned} E &= \text{E-field in dB}\mu\text{V/m} \\ V_{QP/PK/AV} &= \text{Measured Voltage (Peak) in dB}\mu\text{V} \\ AF &= \text{Antenna Factor in dB(/m)} \\ L_C &= \text{Cable and attenuator Loss in dB} \end{aligned}$$

Example calculation:

$$\begin{aligned} E(\text{Peak}) &= V_{PK} + AF + L_C \\ E(\text{Peak}) &= 30\text{dB}\mu\text{V} + 12\text{dB/m} + 2.3\text{dB} \\ E(\text{Peak}) &= 44.3 \text{ dB}\mu\text{V/m} \\ E(\text{Average}) &= E(\text{Peak}) - \text{Duty Cycle Correction Factor} \\ E(\text{Average}) &= 44.3 - 6 = 38.3 \text{ dB}\mu\text{V/m} \end{aligned}$$

**Notes:** The Field strength of fundamental measurements were below the specified limit.

**Assessment:** The EUT complied with the Field strength of fundamental requirements of CFR47 FCC Part 15, Subpart C – Section 15.231.

## 11. Field strength of spurious emissions – FCC Part 15.231(b)

### 11.1. Test Procedure

The Radiated Emissions were performed in accordance with the ANSI C63.10 - 2013.

Radiated Emissions were measured 3 metres (from 9kHz to 1GHz) away from the EUT in the iOATS (indoor Open Area Test Site) facility, which is an ANSI C63.4 compliant semi-anechoic chamber with ground plane. The EUT was placed on a non-conductive support at a height of 0.8m above the ground plane.

In the frequency range of 9kHz to 30MHz, an Active loop antenna was used. For X (parallel), Y (perpendicular) and Z (ground-parallel) antenna polarizations, the peak detector was set to MAX-HOLD and the range selected continuously scanned. The measuring antenna was positioned at 1m fixed height and the turntable slowly rotated. The peak preview measurements were performed with a resolution bandwidth of 200 Hz (9kHz to 150kHz), 9kHz (150kHz to 30MHz) and a video bandwidth of 30 kHz. Peak emissions that exceeded the limit or were close to the applicable limit were investigated further. The frequency of each emissions was then accurately determined. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees to find the worst-case emission arrangement. Quasi peak measurements were then performed using a measuring time of no less than 15 seconds. The final quasi-peak measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 200 Hz (9kHz to 150kHz) and 9kHz (150kHz to 30MHz).

In the frequency range of 30MHz to 1GHz, a Biconilog antenna was used. For both horizontal and vertical antenna polarizations, the peak detector was set to MAX-HOLD and the range selected continuously scanned. The measuring antenna was positioned at 4 different fixed height positions and the turntable slowly rotated. The peak preview measurements were performed with a resolution bandwidth of 120 kHz and a video bandwidth of 300 kHz. Peak emissions that exceeded the limit or were close to the applicable limit were investigated further. The frequency of each emissions was then accurately determined. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees and varying the height of the antenna between 1 and 4 metres to find the worst-case emission arrangement. Quasi peak measurements were then performed using a measuring time of no less than 15 seconds. The final quasi-peak measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 120 kHz.

In the frequency range 1.0GHz to 4.5GHz a Horn antenna was used and an area of 3m x 3m was covered between the antenna and the EUT using RF absorbing material with a rated attenuation more than 20dB over the frequency range. The height of the horn antenna was varied using the antenna bore-sighting technique and the turntable slowly rotated to maximise the emissions. For both horizontal and vertical antenna polarizations, the Peak and Average preview measurements were performed with a resolution bandwidth of 1 MHz and a video bandwidth of 3MHz. Peak and average emissions that exceeded the applicable limit or were close to the applicable limit were investigated further. Each emission of interest was then in-turn maximised by using the turntable to rotate the EUT through 360 degrees and the antenna height varied (if applicable, using the antenna bore-sighting technique) to find the worst-case emission arrangement. Peak and CISPR Average measurements were then performed using a

measuring time of no less than 15 seconds, the maximum emission level in the observed duration was recorded as the final result. The final peak and CISPR Average measurements were performed using a receiver bandwidth of 6dB and a resolution bandwidth of 1 MHz. Peak and Average measurements were performed at spot frequencies where the peak or average emission was close to, or exceeded the applicable limit line with the EUT rotation and antenna height varied (if applicable, using the antenna bore-sighting technique) to produce the highest emission.

Plots of the accumulated measurement data for both horizontal and vertical antenna polarizations, including all transducer and other measuring system correction factors were produced using commercially available compliant software (as listed in the test equipment list of this report).

*(Refer to photographs in Annex C for views of the test configuration)*

## 11.2. Limits

CFR47 FCC Part 15, Subpart C – Section 15.231 (b) is applicable as the EUT periodic operation rate does not exceed the rate specified in paragraph (a) of 15.231.

As per section 15.231 (b), in addition to the provisions of 15.205, the field strength of emissions from intentional radiators operated under this section shall not exceed the following.

| Fundamental frequency (MHz) | Field strength of fundamental ( $\mu\text{V/m}$ )                  | Field strength of spurious emissions ( $\mu\text{V/m}$ )        |
|-----------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| 40.66 to 40.70              | 2,250 (67 dB $\mu\text{V/m}$ )                                     | 225 (47 dB $\mu\text{V/m}$ )                                    |
| 70 to 130                   | 1,250 (61.9 dB $\mu\text{V/m}$ )                                   | 125 (41.9 dB $\mu\text{V/m}$ )                                  |
| 130 to 174                  | <sup>1</sup> 1,250 to 3,750<br>(61.9 to 71.5 dB $\mu\text{V/m}$ )  | <sup>1</sup> 125 to 375<br>(41.9 to 51.5 dB $\mu\text{V/m}$ )   |
| 174 to 260                  | 3,750 (71.5 dB $\mu\text{V/m}$ )                                   | 375 (51.5 dB $\mu\text{V/m}$ )                                  |
| 260 to 470                  | <sup>1</sup> 3,750 to 12,500<br>(71.5 to 81.9 dB $\mu\text{V/m}$ ) | <sup>1</sup> 375 to 1,250<br>(51.5 to 61.9 dB $\mu\text{V/m}$ ) |
| Above 470                   | 12,500<br>(81.9 dB $\mu\text{V/m}$ )                               | 1,250<br>(61.9 dB $\mu\text{V/m}$ )                             |

<sup>1</sup>Linear interpolations.

Table 6: Limits for Radiated Spurious Emissions at distance of 3m – 15.231(b)

As per section 15.231(b)(3), the limits on the field strength of the spurious emissions in the below table are based on the fundamental frequency of the intentional radiator. Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in above table 6 or to the general limits shown in 15.209, whichever limit permits a higher field strength.

| Frequency Range (MHz)                                          | Limits at 3m (dB $\mu$ V/m) |
|----------------------------------------------------------------|-----------------------------|
| 0.009 to 0.490                                                 | 128.5 to 93.8               |
| 0.490 to 1.705                                                 | 73.8 to 62.9                |
| 1.705 to 30.0                                                  | 69.5                        |
| 30.0 to 88.0                                                   | 40.0                        |
| 88.0 to 216.0                                                  | 43.5                        |
| 216.0 to 960.0                                                 | 46.0                        |
| Above 960                                                      | 54.0                        |
| NOTE: The lower limit shall apply at the transition frequency. |                             |

Table 7: Limits for Radiated Spurious Emissions at distance of 3m – 15.209

| Frequency Range (MHz)                                          | Limits at 3m (dB $\mu$ V/m) |
|----------------------------------------------------------------|-----------------------------|
| 30.0 to 4500.0                                                 | 60.8                        |
| NOTE: The lower limit shall apply at the transition frequency. |                             |

Table 8: Limits for Radiated Spurious Emissions at distance of 3m – 15.231(b) -20dB Field strength of Fundamental

### 11.3. Test Results

Radiated Emissions measurements are tabulated below. For below 1GHz measurements, Quasi-peak or Average measurements were performed at spot frequencies where the peak emission was close to, or exceeded the applicable limit line. For above 1GHz measurements, Peak or Average measurements were performed at spot frequencies where the peak or average emission was close to, or exceeded the applicable limit line.

(Refer to graphs 3 to 11 in Appendix C)

| Measurement Antenna Polarisation | Frequency (MHz)                                                                                     | Result peak (dB $\mu$ V/m) | Limit Quasi-peak/ Average (dB $\mu$ V/m) | Delta limit (dB) |
|----------------------------------|-----------------------------------------------------------------------------------------------------|----------------------------|------------------------------------------|------------------|
| X                                | Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed |                            |                                          |                  |
| Y                                | Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed |                            |                                          |                  |
| Z                                | Peak preview emissions >20dB below limit or no significant emissions above the noise floor observed |                            |                                          |                  |

Table 9: Field strength of spurious emissions – 9kHz to 30MHz

| Measurement Antenna Polarisation | EUT Orientation | Frequency (MHz) | Peak Electric Field Strength (3m) (dBµV/m) | Duty Cycle Factor (dB) | Average Electric Field Strength (3m) (dBµV/m) | Limit Electric Field Strength (3m) (dBµV/m) | Delta Limit (dB)  |
|----------------------------------|-----------------|-----------------|--------------------------------------------|------------------------|-----------------------------------------------|---------------------------------------------|-------------------|
| Horizontal                       | X               | 866.910         | 67.7                                       | -11.1                  | 56.6                                          | 60.8                                        | -4.2 <sup>+</sup> |
|                                  |                 | 867.820         | 67.5                                       | -11.1                  | 56.4                                          | 60.8                                        | -4.4 <sup>+</sup> |
|                                  |                 | 868.710         | 67.3                                       | -11.1                  | 56.2                                          | 60.8                                        | -4.6 <sup>+</sup> |
| Vertical                         | Y               | 867.030         | 63.7                                       | -11.1                  | 52.6                                          | 60.8                                        | -8.2              |
|                                  |                 | 867.800         | 63.4                                       | -11.1                  | 52.3                                          | 60.8                                        | -8.5              |
|                                  |                 | 868.710         | 63.2                                       | -11.1                  | 52.1                                          | 60.8                                        | -8.7              |

*\*Worst-case emissions, \*refer to measurement uncertainty statement*

Table 10: Field strength of spurious emissions – 30MHz to 1GHz

| EUT Orientation | Frequency (MHz) | Peak Result (dBµV/m) | Duty Cycle Factor (dB) | Average Result (dBµV/m) | Peak Limit (dBµV/m) | Average Limit (dBµV/m) | Peak Delta Limit (dB) | Average Delta Limit (dB) |
|-----------------|-----------------|----------------------|------------------------|-------------------------|---------------------|------------------------|-----------------------|--------------------------|
| X               | 1300.040        | 64.0                 | -11.1                  | 52.9                    | 74.0                | 54.0                   | -10.0                 | -1.1 <sup>+</sup>        |
|                 | 1301.600        | 64.1                 | -11.1                  | 53.0                    | 74.0                | 54.0                   | -9.9                  | -1.0 <sup>++</sup>       |
|                 | 1302.900        | 63.8                 | -11.1                  | 52.7                    | 74.0                | 54.0                   | -10.2                 | -1.3 <sup>+</sup>        |
|                 | 1733.720        | 60.4                 | -11.1                  | 49.3                    | 80.8                | 60.8                   | -20.4                 | -11.5                    |
|                 | 1736.060        | 60.3                 | -11.1                  | 49.2                    | 80.8                | 60.8                   | -20.5                 | -11.6                    |
|                 | 1737.620        | 60.5                 | -11.1                  | 49.4                    | 80.8                | 60.8                   | -20.3                 | -11.4                    |
|                 | 2172.080        | 55.8                 | -11.1                  | 44.7                    | 80.8                | 60.8                   | -25.0                 | -16.1                    |
|                 | 2601.080        | 53.8                 | -11.1                  | 42.7                    | 80.8                | 60.8                   | -27.0                 | -18.1                    |
|                 | 3034.760        | 62.3                 | -11.1                  | 51.2                    | 80.8                | 60.8                   | -18.5                 | -9.6                     |
|                 | 3037.620        | 62.7                 | -11.1                  | 51.6                    | 80.8                | 60.8                   | -18.1                 | -9.2                     |
|                 | 3040.740        | 63.3                 | -11.1                  | 52.2                    | 80.8                | 60.8                   | -17.5                 | -8.6                     |
|                 | 3471.820        | 54.6                 | -11.1                  | 43.5                    | 80.8                | 60.8                   | -26.2                 | -17.3                    |
|                 | 3901.500        | 53.1                 | -11.1                  | 42.0                    | 74.0                | 54.0                   | -20.9                 | -12.0                    |
|                 | 3905.640        | 53.2                 | -11.1                  | 42.1                    | 74.0                | 54.0                   | -20.8                 | -11.9                    |
|                 | 3908.970        | 53.7                 | -11.1                  | 42.6                    | 74.0                | 54.0                   | -20.3                 | -11.4                    |
|                 | 4335.480        | 62.0                 | -11.1                  | 50.9                    | 74.0                | 54.0                   | -12.0                 | -3.1 <sup>+</sup>        |
|                 | 4339.980        | 63.6                 | -11.1                  | 52.5                    | 74.0                | 54.0                   | -10.4                 | -1.5 <sup>+</sup>        |
|                 | 4343.760        | 64.1                 | -11.1                  | 53.0                    | 74.0                | 54.0                   | -9.9 <sup>*</sup>     | -1.0 <sup>++</sup>       |

*\*Worst-case emissions, \*refer to measurement uncertainty statement*

Table 11: Field strength of spurious emissions – Horizontal Antenna Polarization – 1GHz to 4.5GHz

| EUT Orientation | Frequency (MHz) | Peak Result (dB $\mu$ V/m) | Duty Cycle Factor (dB) | Average Result (dB $\mu$ V/m) | Peak Limit (dB $\mu$ V/m) | Average Limit (dB $\mu$ V/m) | Peak Delta Limit (dB) | Average Delta Limit (dB) |
|-----------------|-----------------|----------------------------|------------------------|-------------------------------|---------------------------|------------------------------|-----------------------|--------------------------|
| Y               | 1300.560        | 62.5                       | -11.1                  | 51.4                          | 74.0                      | 54.0                         | -11.5*                | -2.6**                   |
|                 | 1301.600        | 62.2                       | -11.1                  | 51.1                          | 74.0                      | 54.0                         | -11.8                 | -2.9 <sup>+</sup>        |
|                 | 1303.160        | 61.8                       | -11.1                  | 50.7                          | 74.0                      | 54.0                         | -12.2                 | -3.3 <sup>+</sup>        |
|                 | 1733.720        | 54.3                       | -11.1                  | 43.2                          | 80.8                      | 60.8                         | -26.5                 | -17.6                    |
|                 | 2171.820        | 58.6                       | -11.1                  | 47.5                          | 80.8                      | 60.8                         | -22.2                 | -13.3                    |
|                 | 2606.020        | 55.3                       | -11.1                  | 44.2                          | 80.8                      | 60.8                         | -25.5                 | -16.6                    |
|                 | 3034.760        | 64.6                       | -11.1                  | 53.5                          | 80.8                      | 60.8                         | -16.2                 | -7.3                     |
|                 | 3037.360        | 65.3                       | -11.1                  | 54.2                          | 80.8                      | 60.8                         | -15.5                 | -6.6                     |
|                 | 3041.000        | 65.2                       | -11.1                  | 54.1                          | 80.8                      | 60.8                         | -15.6                 | -6.7                     |
|                 | 3474.940        | 51.9                       | -11.1                  | 40.8                          | 80.8                      | 60.8                         | -28.9                 | -20.0                    |
|                 | 3901.230        | 56.7                       | -11.1                  | 45.6                          | 74.0                      | 54.0                         | -17.3                 | -8.4                     |
|                 | 3905.010        | 55.7                       | -11.1                  | 44.6                          | 74.0                      | 54.0                         | -18.3                 | -9.4                     |
|                 | 3909.870        | 57.3                       | -11.1                  | 46.2                          | 74.0                      | 54.0                         | -16.7                 | -7.8                     |
|                 | 4335.300        | 60.1                       | -11.1                  | 49.0                          | 74.0                      | 54.0                         | -13.9                 | -5.0                     |
|                 | 4339.620        | 61.5                       | -11.1                  | 50.4                          | 74.0                      | 54.0                         | -12.5                 | -3.6 <sup>+</sup>        |
|                 | 4343.490        | 62.1                       | -11.1                  | 51.0                          | 74.0                      | 54.0                         | -11.9                 | -3.0 <sup>+</sup>        |

\*Worst-case emissions, \*\*refer to measurement uncertainty statement

Table 12: Field strength of spurious emissions – Vertical Antenna Polarization – 1GHz to 4.5GHz

The measurement uncertainty was calculated as follows:

| Measurement frequency range | Calculated measurement uncertainty |
|-----------------------------|------------------------------------|
| 0.009MHz to 30MHz           | $\pm 4.33$ dB                      |
| 30MHz to 1GHz               | $\pm 4.65$ dB                      |
| 1GHz to 6GHz                | $\pm 4.83$ dB                      |

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $k=2$  which gives a level of confidence of approximately 95%. The referenced uncertainty standard specifies that determination of compliance shall be based on measurements without taking into account measurement uncertainty. However, the measurement uncertainty shall appear in the test report.

| Climatic Conditions   |                     |
|-----------------------|---------------------|
| Temperature:          | 15 to 17°C          |
| Humidity:             | 56 to 60%           |
| Atmospheric pressure: | 1018.8 to 1030.6hPa |

Table 13: Climatic conditions

**Calculation:** The above results are based upon the following calculation:

$$\begin{aligned} E(\text{Peak}) &= V_{pk} + AF + L_C \\ E(\text{Average}) &= E(\text{Peak}) - \text{Duty Cycle Correction Factor} \end{aligned}$$

Where:

$$\begin{aligned} E &= \text{E-field in dB}\mu\text{V/m} \\ V_{QP/PK/AV} &= \text{Measured Voltage (Peak) in dB}\mu\text{V} \\ AF &= \text{Antenna Factor in dB/(m)} \\ L_C &= \text{Cable and attenuator Loss in dB} \end{aligned}$$

Example calculation:

$$\begin{aligned} E(\text{Peak}) &= V_{pk} + AF + L_C \\ E(\text{Peak}) &= 30\text{dB}\mu\text{V} + 12\text{dB/m} + 2.3\text{dB} \\ E(\text{Peak}) &= 44.3 \text{ dB}\mu\text{V/m} \\ E(\text{Average}) &= E(\text{Peak}) - \text{Duty Cycle Correction Factor} \\ E(\text{Average}) &= 44.3 - 6 = 38.3 \text{ dB}\mu\text{V/m} \end{aligned}$$

**Notes:** All Spurious Emissions measurements were below the permissible Spurious and general intentional radiator limits for the Average/Quasi peak detector and the peak detector emissions were below the peak limit.

The average measurements were determined from Peak detector measurements by applying the duty cycle correction factor.

**Assessment:** The EUT complied with the Radiated Spurious Emissions requirements of CFR47 FCC Part 15, Subpart C – Section 15.231.

## 12. Emission Bandwidth – FCC Part 15.231(c)

### 12.1. Test Procedure

The 20dB Emission Bandwidth was performed in accordance with the section 6.9 of ANSI C63.10 - 2013.

The EUT was placed on a polystyrene support at a height of 0.8m above the ground reference plane. The measuring antenna was located at a distance of 3m from the EUT, using the spectrum analyser. The worst-case transmitter orientation, measurement antenna polarization were used for each measurement. The spectrum analyzer centre frequency was tuned to the fundamental (transmit frequency) of the transmitter with span range between two times and five times the OBW (-20dB bandwidth). The nominal IF filter bandwidth (RBW) was set to 1% to 5% of the OBW and video bandwidth (VBW) was set to three times the RBW. The peak detector was used with trace mode to max hold. The resultant bandwidth measurement was recorded.

*(Refer to photographs in Annex C for views of the test configuration)*

### 12.2. Requirements

As per CFR47 FCC Part 15, Subpart C – Section 15.231:

- The bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70 MHz and below 900 MHz. For devices operating above 900 MHz, the emission shall be no wider than 0.5% of the center frequency. Bandwidth is determined at the points 20 dB down from the modulated carrier.

Center Frequency: 433.925MHz

### 12.3. Test Results

Emission Bandwidth measurements are tabulated below:

*(Refer to graph 14 in Appendix C)*

| Transmit center frequency (MHz) | Measured 20dB Bandwidth | Percentage of Measured Bandwidth with respect to Centre Frequency | Limit | Comment  |
|---------------------------------|-------------------------|-------------------------------------------------------------------|-------|----------|
| 433.925                         | 1.0248MHz               | 0.236%                                                            | 0.25% | Complied |

Table 14: Results for 20dB Bandwidth

The measurement uncertainty was calculated as follows:

| Measurement Parameter | Calculated measurement uncertainty |
|-----------------------|------------------------------------|
| Operating Frequency   | ±10.5kHz                           |
| Bandwidth             | ±14.96kHz                          |

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $k=2$  which gives a level of confidence of approximately 95%. The referenced uncertainty standard specifies that determination of compliance shall be based on measurements without taking into account measurement uncertainty. However, the measurement uncertainty shall appear in the test report.

| Climatic Conditions   |                     |
|-----------------------|---------------------|
| Temperature:          | 16 to 17°C          |
| Humidity:             | 56 to 57%           |
| Atmospheric pressure: | 1018.8 to 1019.2hPa |

Table 15: Climatic conditions

**Notes:** The 20dB bandwidth of the emission was contained within 0.25% of 433.925MHz center frequency.

**Assessment:** The EUT complied with the Emission Bandwidth requirements of CFR47 FCC Part 15, Subpart C – Section 15.231(c).

## 13. Transmitter Deactivation – FCC Part 15.231(a)

### 13.1. Test Procedure

The transmitter signal was coupled to the spectrum analyser via a coaxial cable and a near-field probe. The centre frequency of the spectrum analyser was adjusted to the centre of the transmitter frequency. The attenuation and reference levels were adjusted to achieve maximum dynamic range without overloading the spectrum analyser input. The span of the spectrum analyser was set to zero (0Hz), and the sweep time adjusted to 5s. The trigger level was adjusted to allow the greatest amount of “on time” for a pulse train.

### 13.2. Test Results

(Refer to graph 15 in Appendix C)

| Measured Transmitter deactivation time (s) | Required Transmitter deactivation time (s) | Comment  |
|--------------------------------------------|--------------------------------------------|----------|
| 0.4245                                     | ≤ 5                                        | Complied |

Table 16: Results for transmitter deactivation test

The measurement uncertainty was calculated as follows:

| Measurement Parameter | Calculated measurement uncertainty |
|-----------------------|------------------------------------|
| Time                  | ±0.2%                              |

The reported uncertainty is an expanded uncertainty calculated using a coverage factor of  $k=2$  which gives a level of confidence of approximately 95%.

**Notes:** The measured transmitter deactivation time was less than 5s.

The device only transmitted when a button was pressed manually. The device transmitted packets repeatedly when the button was held. When the button was released all transmission stopped within 424ms.

**Assessment:** The EUT complied with the Transmitter Deactivation requirements of CFR47 FCC Part 15, Subpart C – Section 15.231(a).

## 14. Conclusion

The Automatic Technology Australia Pty. Ltd., PTX-6V2AM, Handheld Remote Control complied with the requirements of CFR47 FCC Part 15, Subpart C – Section 15.231.

## Appendix A – Test Equipment

| Inv.  | Equipment                                                       | Make              | Model No.  | Serial No.      | Calibration |        |      |
|-------|-----------------------------------------------------------------|-------------------|------------|-----------------|-------------|--------|------|
|       |                                                                 |                   |            |                 | Interval    | Due    | Type |
|       | Field strength of fundamental, Duty Cycle & Emissions Bandwidth |                   |            |                 |             |        |      |
| 1217  | ANALYSER, EMI Receiver                                          | Rohde & Schwarz   | ESU40      | 100182          | 1 year      | May-21 | E    |
| 0932  | CONTROLLER, Position                                            | Sunol Sciences    | SC104V-3   | 081006-1        | N/A         | N/A    | V    |
| 0933  | TURNTABLE                                                       | Sunol Sciences    | SM46C      | 081006-2        | N/A         | N/A    | V    |
| 0934  | MAST, Antenna                                                   | Sunol Sciences    | TLT2       | 081006-5        | N/A         | N/A    | V    |
| 0935  | ANTENNA, Biconilog                                              | Sunol Sciences    | JB5        | A071106         | 2 years     | Feb-21 | E    |
| 0718  | ATTENUATOR, 6dB                                                 | JFW               | 50FPE-006  | -               | 2 years     | Jan-22 | I    |
| 1143  | CABLE, Coax, Sucoflex 104PA                                     | Huber + Suhner    | 84287041   | SN MY058/4PA    | 1 year      | Dec-20 | I    |
| 1145  | CABLE, Coax, Sucoflex 104PA                                     | Huber + Suhner    | 84279564   | SN MY056/4PA    | 1 year      | Dec-20 | I    |
| 1248  | HYGROMETER, Temp, Humidity                                      | Thomas Scientific | 6066N53    | 181037404       | 2 years     | Feb-22 | I    |
| 0666  | Enclosure, Semi-Anechoic, No 1                                  | RFI Industries    | S800 iOATS | 1229            | 2 years     | Jan-22 | I    |
| SW007 | EMC Measurement Software                                        | Rohde & Schwarz   | EMC 32     | Version 8.53.0  | N/A         | N/A    | N/A  |
|       | Field strength of spurious emissions 9kHz to 4500MHz            |                   |            |                 |             |        |      |
| 1217  | ANALYSER, EMI Receiver                                          | Rohde & Schwarz   | ESU40      | 100182          | 1 year      | May-21 | E    |
| 0932  | CONTROLLER, Position                                            | Sunol Sciences    | SC104V-3   | 081006-1        | N/A         | N/A    | V    |
| 0933  | TURNTABLE                                                       | Sunol Sciences    | SM46C      | 081006-2        | N/A         | N/A    | V    |
| 0934  | MAST, Antenna                                                   | Sunol Sciences    | TLT2       | 081006-5        | N/A         | N/A    | V    |
| 0024  | ANTENNA, Active Loop                                            | EMCO              | 6502       | 2620            | 2 years     | Jun-21 | I    |
| 0935  | ANTENNA, Biconilog                                              | Sunol Sciences    | JB5        | A071106         | 2 years     | Feb-21 | E    |
| 0718  | ATTENUATOR, 6dB                                                 | JFW               | 50FPE-006  | -               | 2 years     | Jan-22 | I    |
| 1143  | CABLE, Coax, Sucoflex 104PA                                     | Huber + Suhner    | 84287041   | SN MY058/4PA    | 1 year      | Dec-20 | I    |
| 1145  | CABLE, Coax, Sucoflex 104PA                                     | Huber + Suhner    | 84279564   | SN MY056/4PA    | 1 year      | Dec-20 | I    |
| 1238  | CABLE, Coax, Sucoflex 126 E                                     | Huber + Suhner    | 10422876   | SN 8000495/126E | 1 year      | Jan-21 | I    |
| 0745  | FILTER, Hi-Pass, 800MHz                                         | MiniCircuits      | NHP-800    | 10447           | 2 years     | Jun-22 | I    |
| 0559  | PRE-AMP, Microwave, 18GHz                                       | Miteq             | AFS8       | 605305          | 1 year      | Nov-20 | I    |
| 0633  | ANTENNA, Double Ridge Horn                                      | EMCO              | 3115       | 9712-5369       | 3 years     | Aug-21 | I    |
| 1248  | HYGROMETER, Temp, Humidity                                      | Thomas Scientific | 6066N53    | 181037404       | 2 years     | Feb-22 | I    |
| 0666  | Enclosure, Semi-Anechoic, No 1                                  | RFI Industries    | S800 iOATS | 1229            | 2 years     | Jan-22 | I    |
| SW007 | EMC Measurement Software                                        | Rohde & Schwarz   | EMC 32     | Version 8.53.0  | N/A         | N/A    | N/A  |
|       | Transmitter Deactivation                                        |                   |            |                 |             |        |      |
| 1217  | ANALYSER, EMI Receiver                                          | Rohde & Schwarz   | ESU40      | 100182          | 1 year      | May-21 | E    |
| 1205  | CABLE, Coax, Sucoflex 126 E                                     | Huber+ Suhner     | 84383918   | SN MY1006/26EA  | 1 year      | Dec-20 | I    |
| 1248  | HYGROMETER, Temp, Humidity                                      | Thomas Scientific | 6066N53    | 181037404       | 2 years     | Feb-22 | I    |
| 0697  | PROBE, Near-field, E&H, set                                     | ETS Lindgren      | 7405       | 4747            | N/A         | N/A    | V    |
| 0666  | Enclosure, Semi-Anechoic, No 1                                  | RFI Industries    | S800 iOATS | 1229            | 2 years     | Jan-22 | I    |

*V: Verification of operation against an internal reference*  
*I: Internal calibration against a traceable standard*  
*E: External calibration by a NATA or MRA equivalent endorsed facility*  
*N/A: Not Applicable*

## Appendix B – Photographs

| Annex | Number | Photograph Description                                                                                                                                             |
|-------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A     | 1      | EUT Sample 1 – External Views                                                                                                                                      |
| A     | 2      |                                                                                                                                                                    |
| A     | 3      |                                                                                                                                                                    |
| A     | 4      |                                                                                                                                                                    |
| A     | 5      |                                                                                                                                                                    |
| A     | 6      |                                                                                                                                                                    |
| A     | 7      | EUT Sample 2 – External Views                                                                                                                                      |
| A     | 8      |                                                                                                                                                                    |
| A     | 9      |                                                                                                                                                                    |
| A     | 10     |                                                                                                                                                                    |
| A     | 11     |                                                                                                                                                                    |
| A     | 12     |                                                                                                                                                                    |
| A     | 13     | Variants                                                                                                                                                           |
| A     | 14     |                                                                                                                                                                    |
| B     | 1      | EUT Sample 1 – Internal Views                                                                                                                                      |
| B     | 2      |                                                                                                                                                                    |
| B     | 3      |                                                                                                                                                                    |
| B     | 4      |                                                                                                                                                                    |
| B     | 5      |                                                                                                                                                                    |
| B     | 6      |                                                                                                                                                                    |
| B     | 7      |                                                                                                                                                                    |
| B     | 8      |                                                                                                                                                                    |
| B     | 9      |                                                                                                                                                                    |
| B     | 10     |                                                                                                                                                                    |
| B     | 11     |                                                                                                                                                                    |
| B     | 12     |                                                                                                                                                                    |
| B     | 13     | EUT Sample 2 – Internal Views                                                                                                                                      |
| B     | 14     |                                                                                                                                                                    |
| B     | 15     |                                                                                                                                                                    |
| B     | 16     |                                                                                                                                                                    |
| B     | 17     |                                                                                                                                                                    |
| B     | 18     |                                                                                                                                                                    |
| B     | 19     |                                                                                                                                                                    |
| B     | 20     |                                                                                                                                                                    |
| B     | 21     |                                                                                                                                                                    |
| B     | 22     |                                                                                                                                                                    |
| B     | 23     |                                                                                                                                                                    |
| B     | 24     |                                                                                                                                                                    |
| B     | 25     |                                                                                                                                                                    |
| B     | 26     | Transmitter battery                                                                                                                                                |
| C     | 1      | Field strength of fundamental, Duty cycle and Emission Bandwidth – Test configuration<br>Field strength of spurious emissions – Test configuration – 30MHz to 1GHz |
| C     | 2      |                                                                                                                                                                    |
| C     | 3      |                                                                                                                                                                    |
| C     | 4      |                                                                                                                                                                    |
| C     | 5      | Field strength of spurious emissions – Test configuration – 9kHz to 30MHz                                                                                          |
| C     | 6      |                                                                                                                                                                    |
| C     | 7      |                                                                                                                                                                    |
| C     | 8      | Field strength of spurious emissions – Test configuration – 1GHz to 4.5GHz                                                                                         |
| C     | 9      |                                                                                                                                                                    |

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|                                     |   |                                                |
|-------------------------------------|---|------------------------------------------------|
| EUT External Photographs            | - | EMC Bayswater Test Report E2006-1302-1 Annex A |
| EUT Internal Photographs            | - | EMC Bayswater Test Report E2006-1302-1 Annex B |
| EUT Test Configurations Photographs | - | EMC Bayswater Test Report E2006-1302-1 Annex C |

### Appendix C – Measurement Graphs

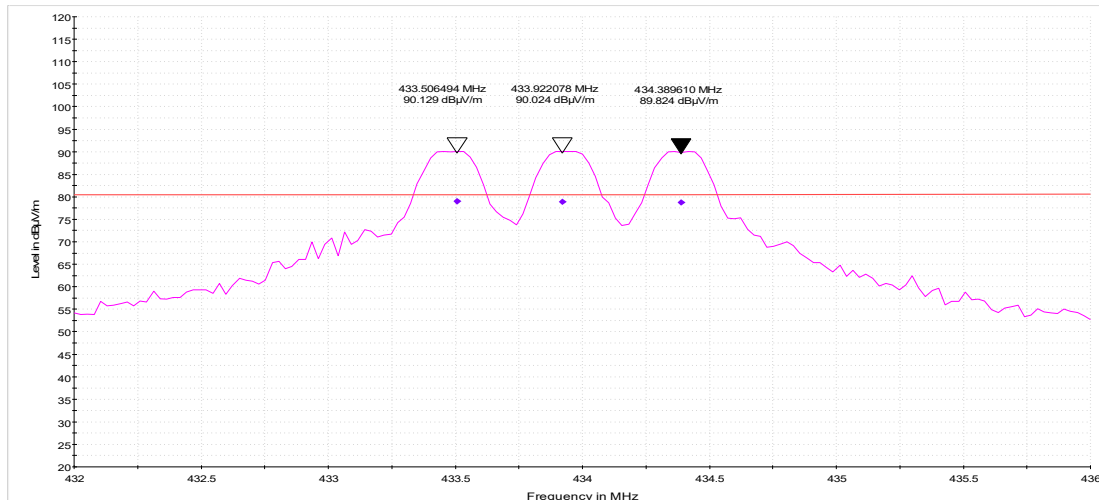
| No. | Test                                 | Graph Description                                                     |
|-----|--------------------------------------|-----------------------------------------------------------------------|
| 1   | Field strength of fundamental        | Antenna Horizontal – EUT X orientation                                |
| 2   |                                      | Antenna Vertical – EUT Y orientation                                  |
| 3   | Field strength of spurious emissions | Antenna X – EUT X orientation – 9kHz to 30MHz                         |
| 4   |                                      | Antenna Y – EUT X orientation – 9kHz to 30MHz                         |
| 5   |                                      | Antenna Z – EUT X orientation – 9kHz to 30MHz                         |
| 6   |                                      | Horizontal Antenna Polarisation – EUT X orientation – 30MHz to 800MHz |
| 7   |                                      | Horizontal Antenna Polarisation – EUT X orientation – 800MHz to 1GHz  |
| 8   |                                      | Horizontal Antenna Polarisation – EUT X orientation – 1GHz to 4.5GHz  |
| 9   |                                      | Vertical Antenna Polarisation – EUT Y orientation – 30MHz to 800MHz   |
| 10  |                                      | Vertical Antenna Polarisation – EUT Y orientation – 800MHz to 1GHz    |
| 11  |                                      | Vertical Antenna Polarisation – EUT Y orientation – 1GHz to 4.5GHz    |
| 12  | Duty Cycle Correction Factor         | Duration of Long pulse                                                |
| 13  |                                      | Duration of Short pulse                                               |
| 14  | Emissions Bandwidth                  |                                                                       |
| 15  | Transmitter Deactivation             |                                                                       |



### EMC Bayswater Pty. Ltd.

**CFR47 FCC Part 15, Subpart C – Section 15.231 – Field strength of fundamental**  
**Automatic Technology Australia Pty. Ltd. - PTX-6V2AM - Handheld Remote Control**  
**Antenna Horizontal – EUT X orientation**

Job Number: E2006-1302-1  
Test Engineer: AZ



MaxPeak-MaxHold-PK+ AV FCC Part 15.231 3m Field strength of fundamental Limit

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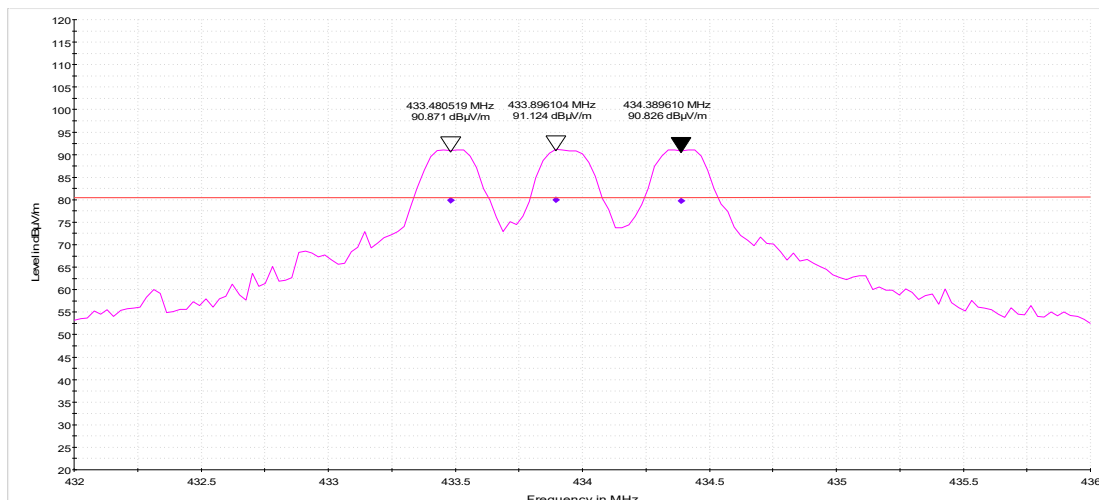
Graph 1



### EMC Bayswater Pty. Ltd.

**CFR47 FCC Part 15, Subpart C – Section 15.231 – Field strength of fundamental**  
**Automatic Technology Australia Pty. Ltd. - PTX-6V2AM - Handheld Remote Control**  
**Antenna Vertical – EUT Y orientation**

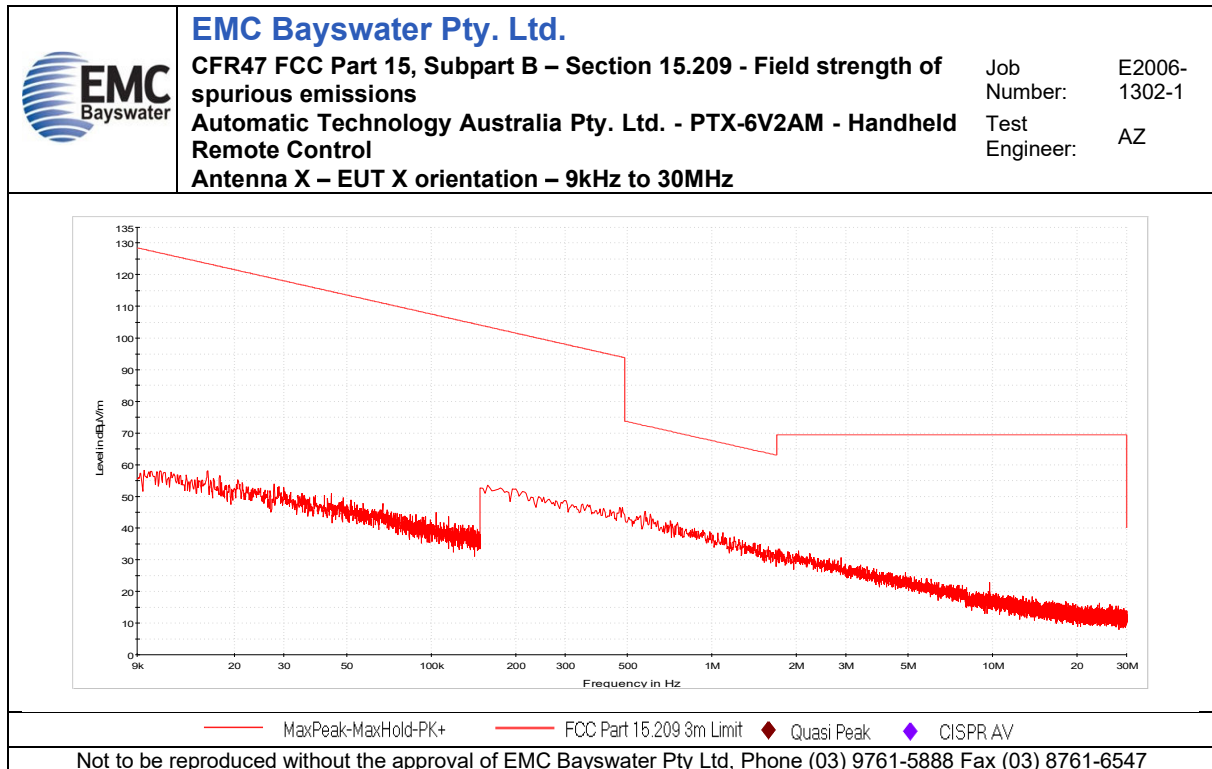
Job Number: E2006-1302-1  
Test Engineer: AZ



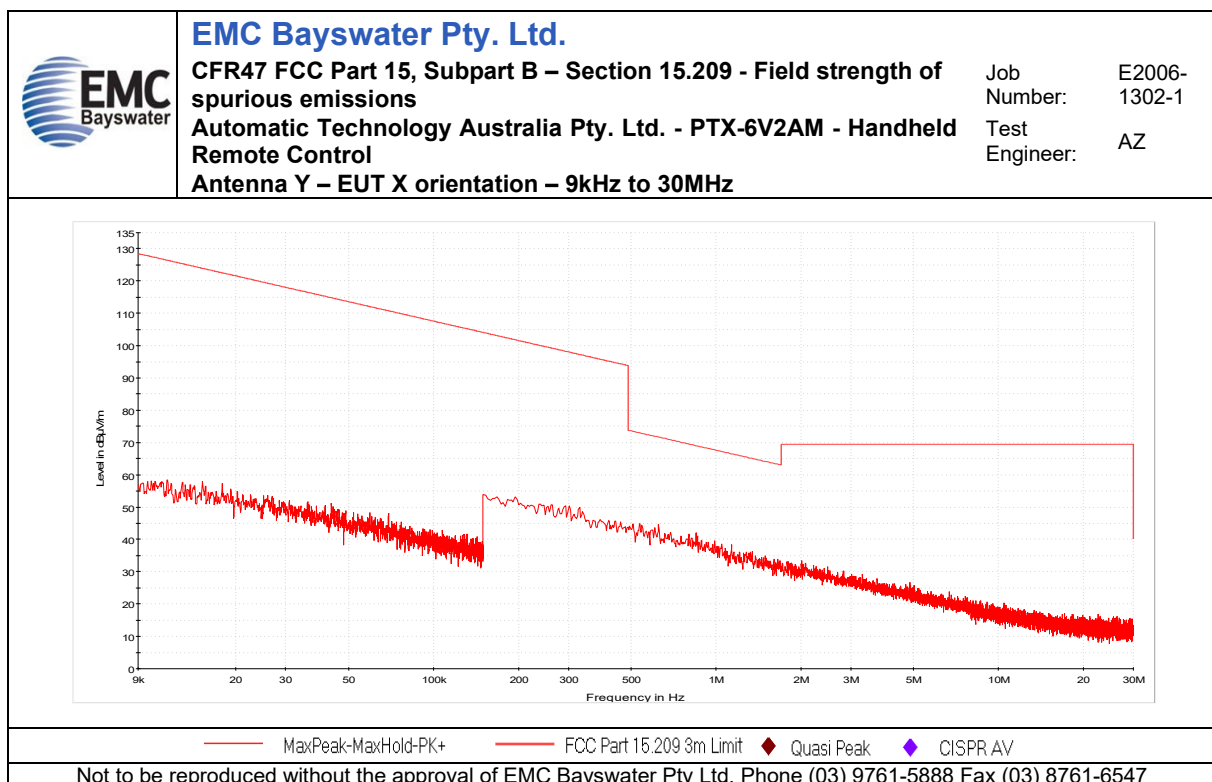
MaxPeak-MaxHold-PK+ AV FCC Part 15.231 3m Field strength of fundamental Limit

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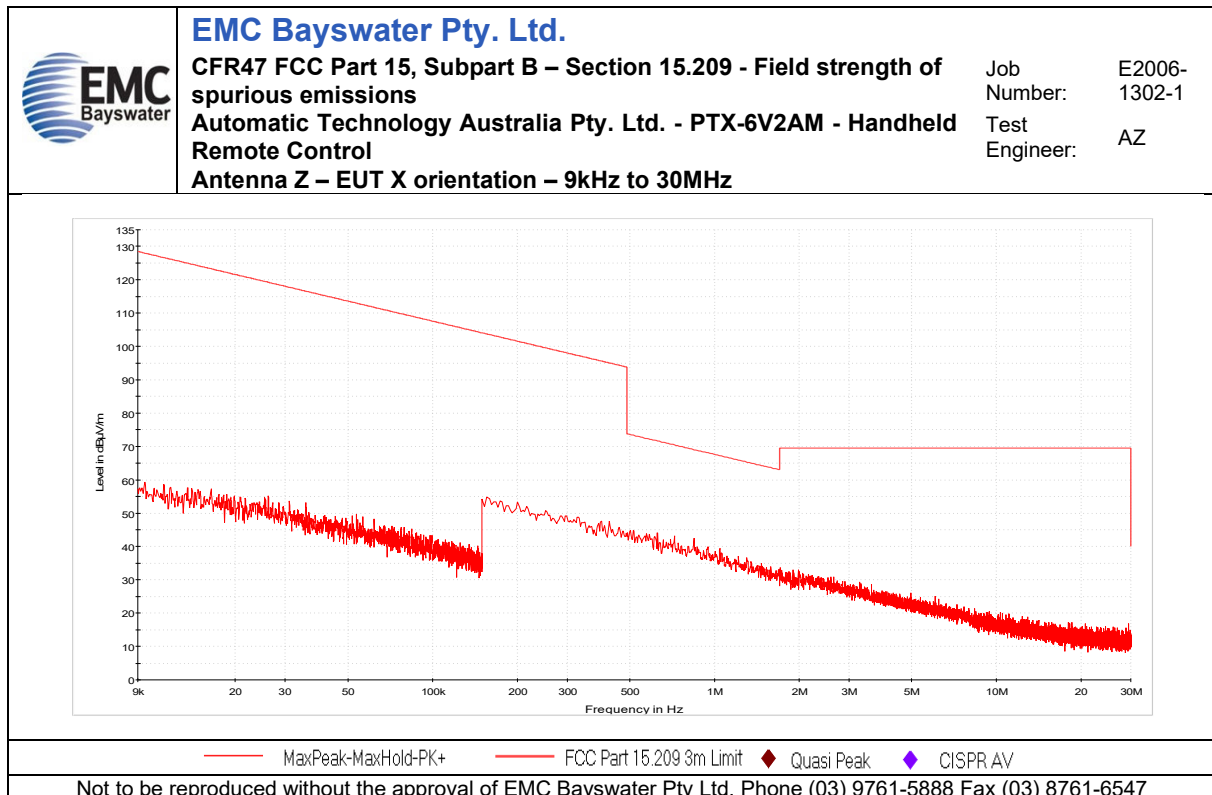
Graph 2



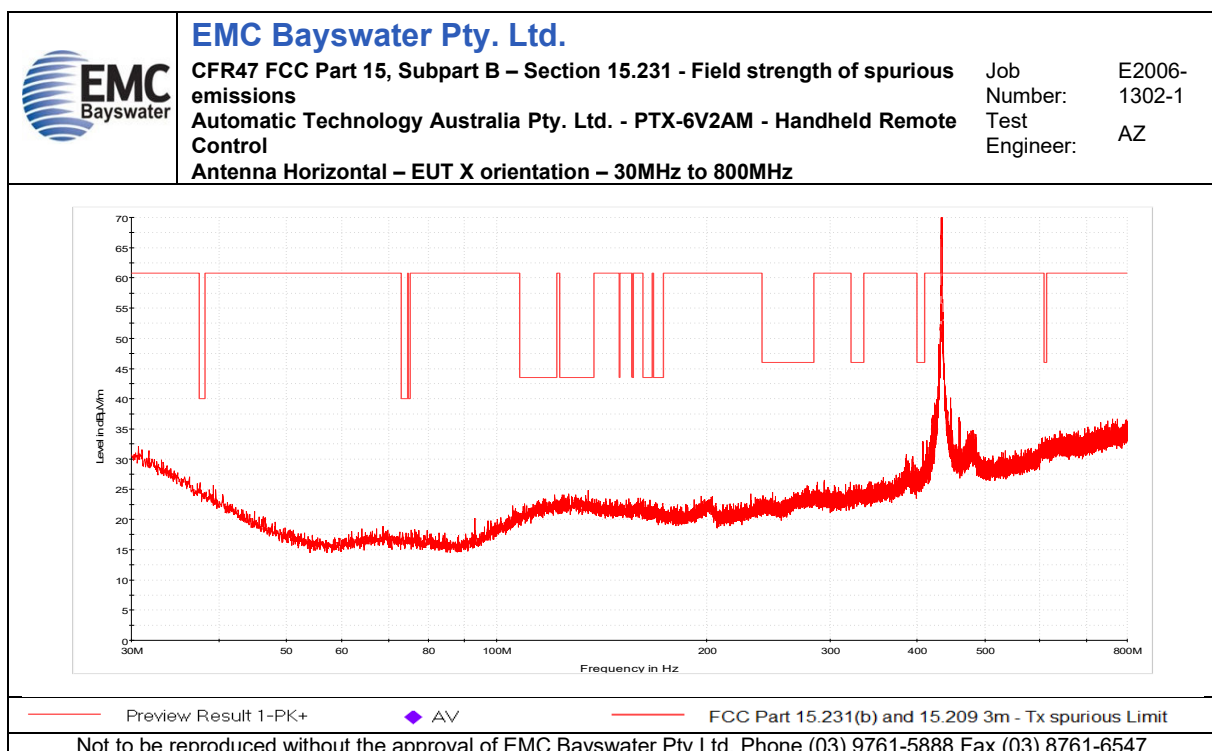
Graph 3



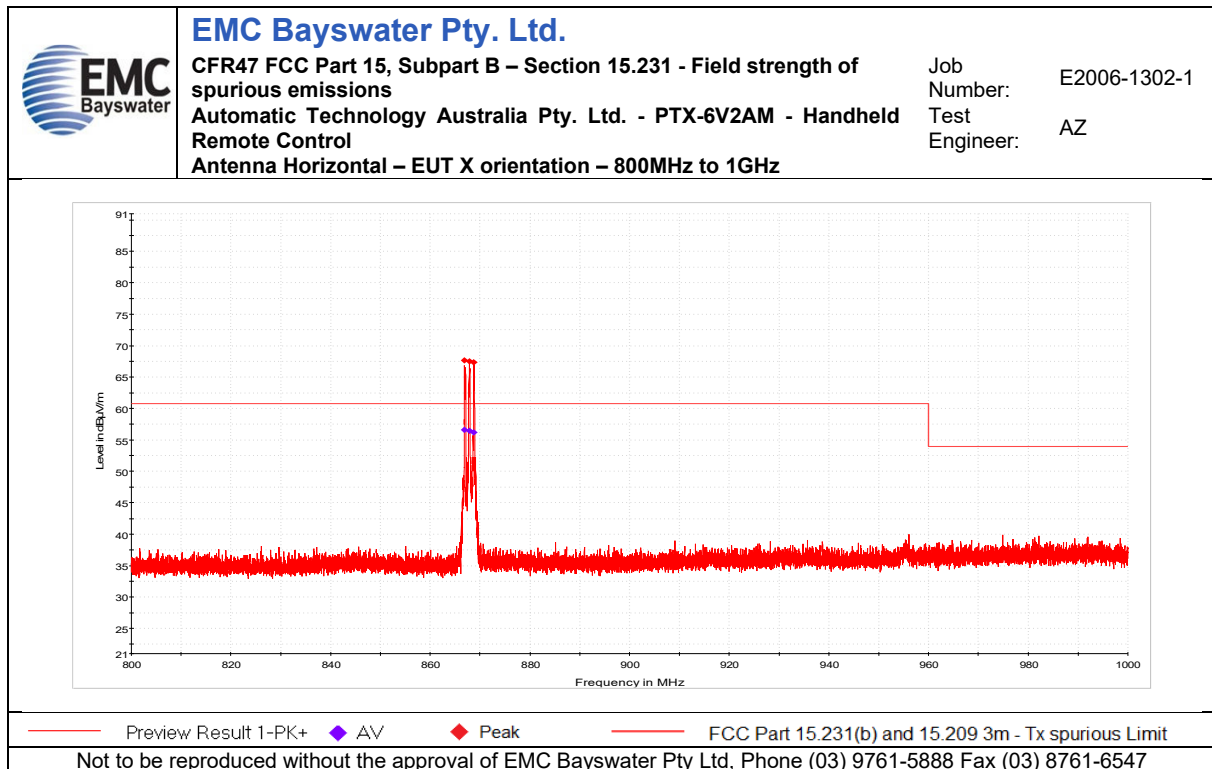
Graph 4



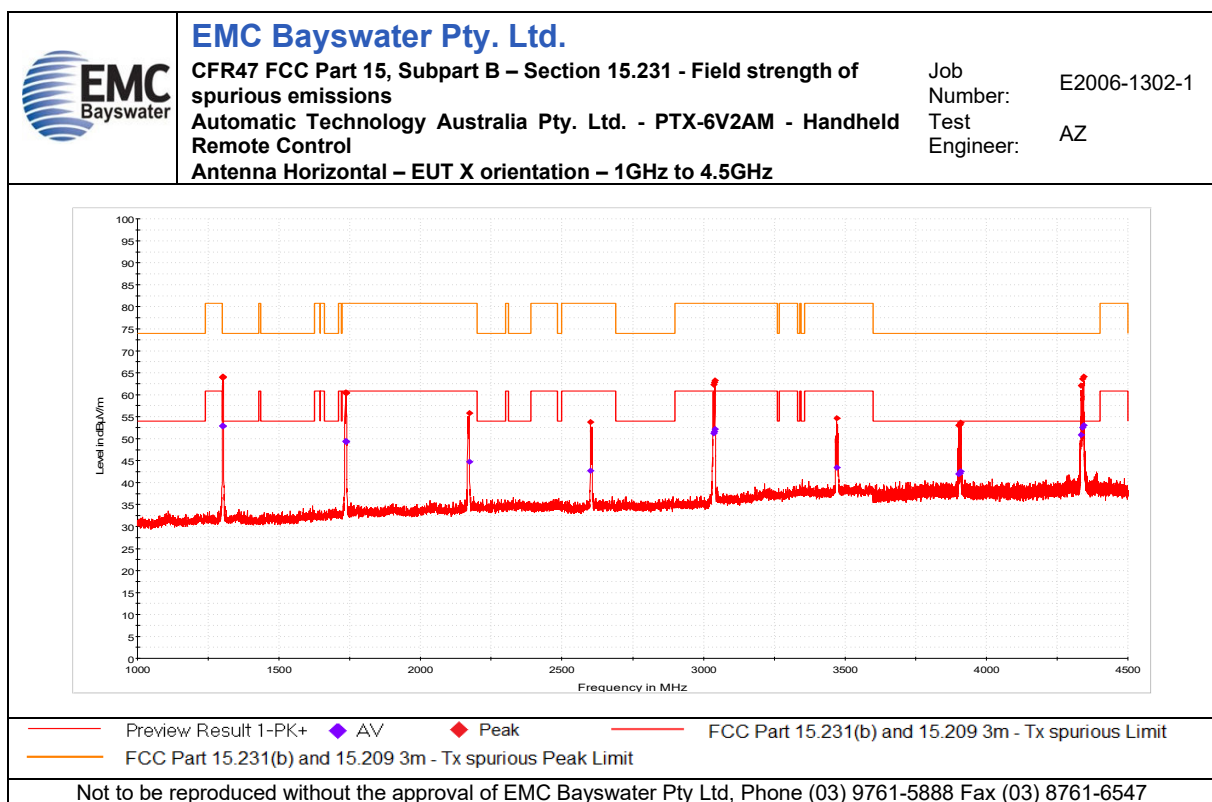
Graph 5



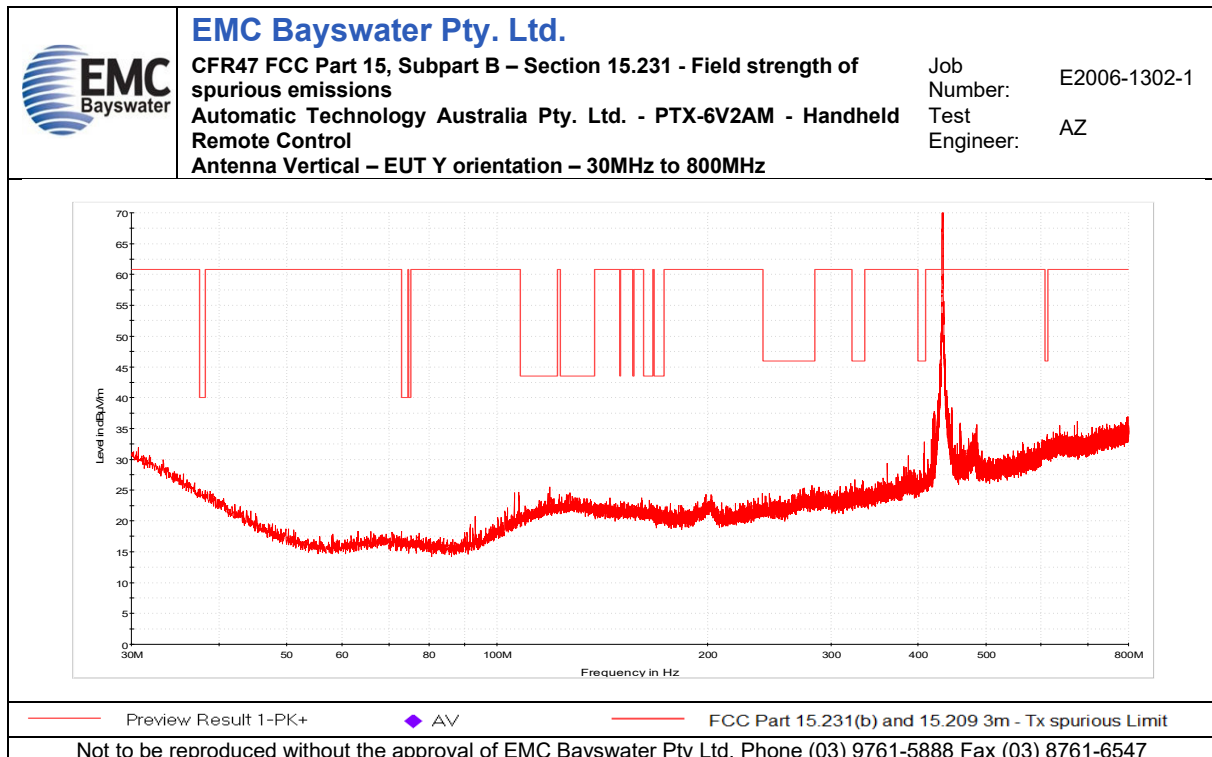
Graph 6



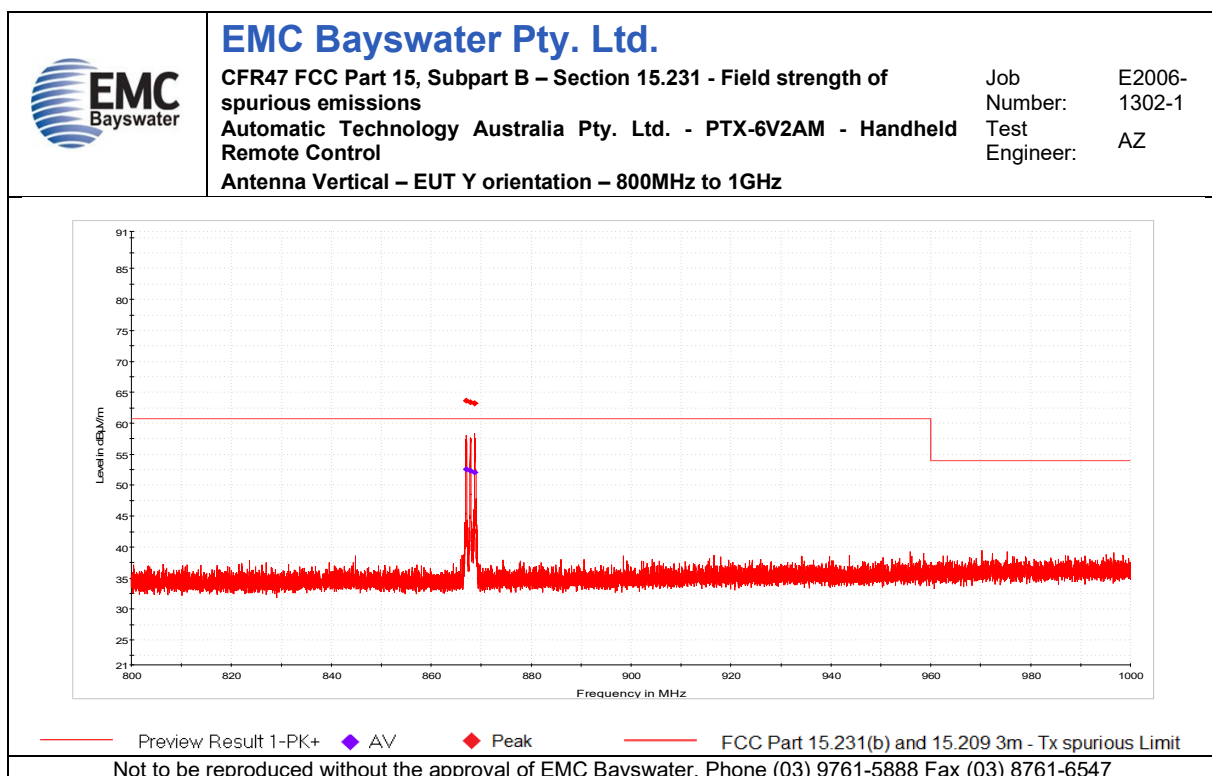
Graph 7



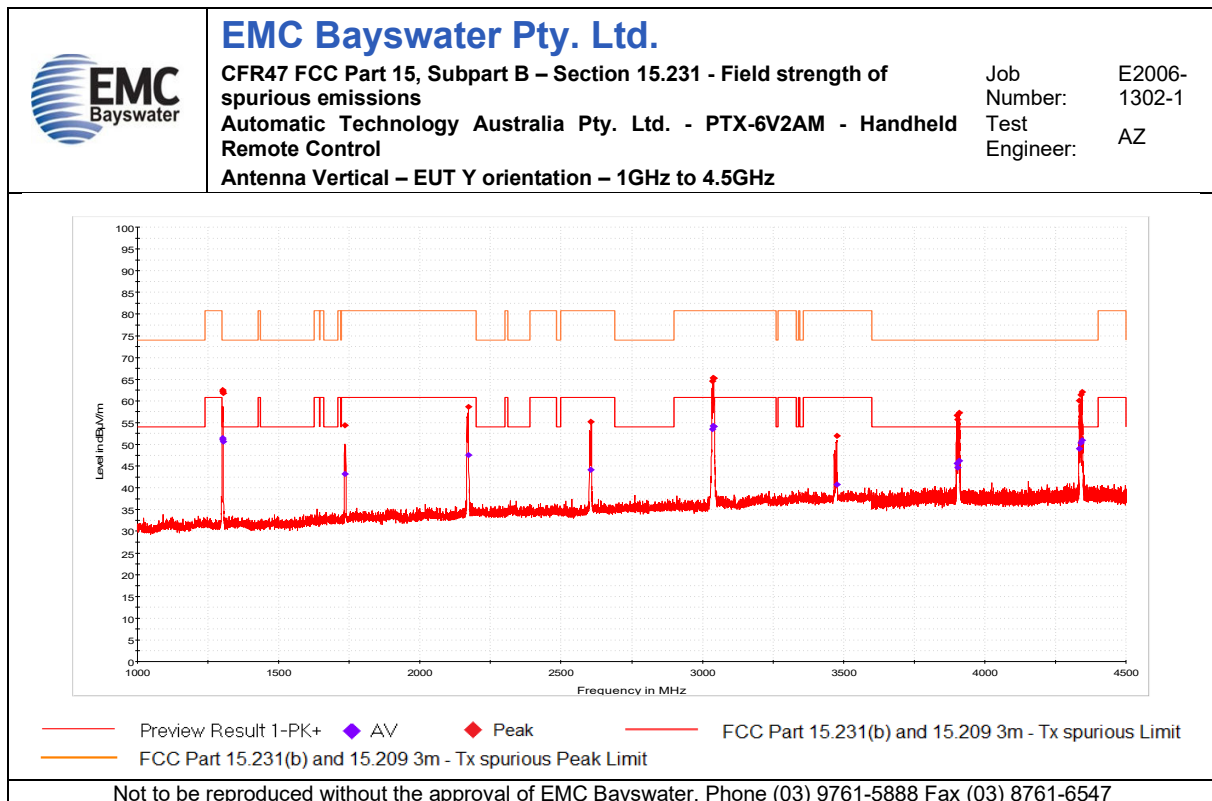
Graph 8



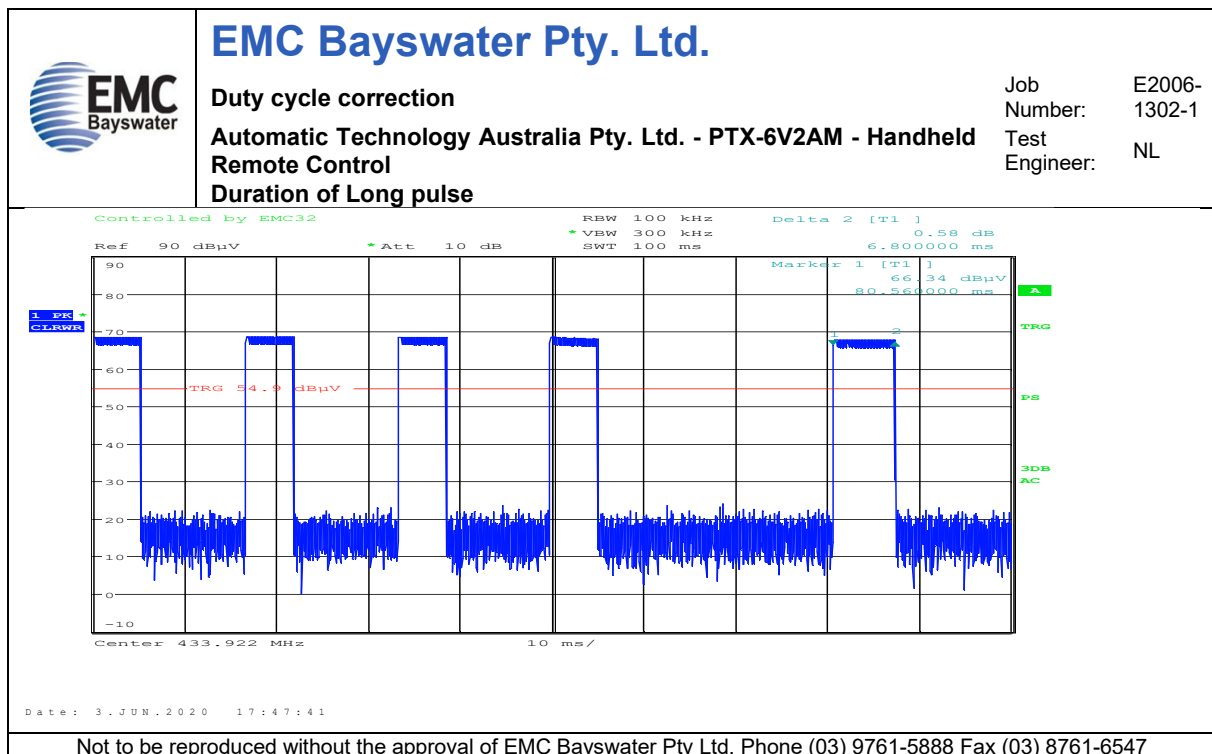
Graph 9



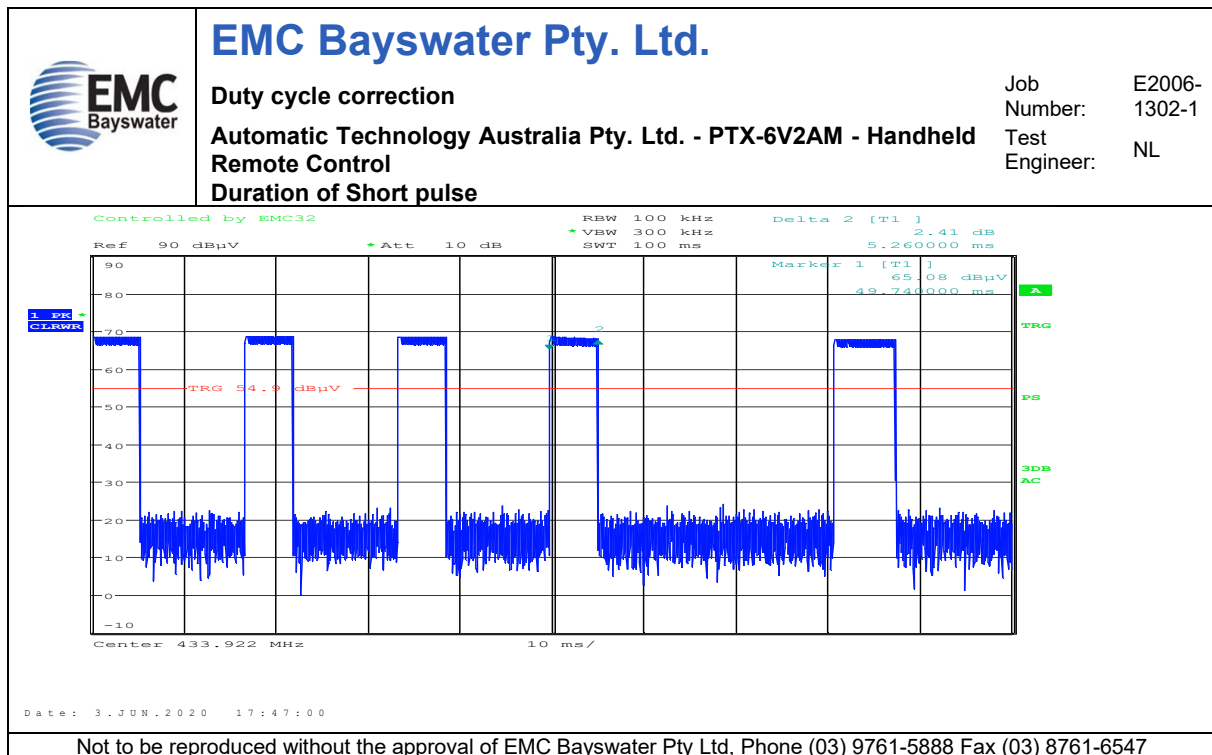
Graph 10



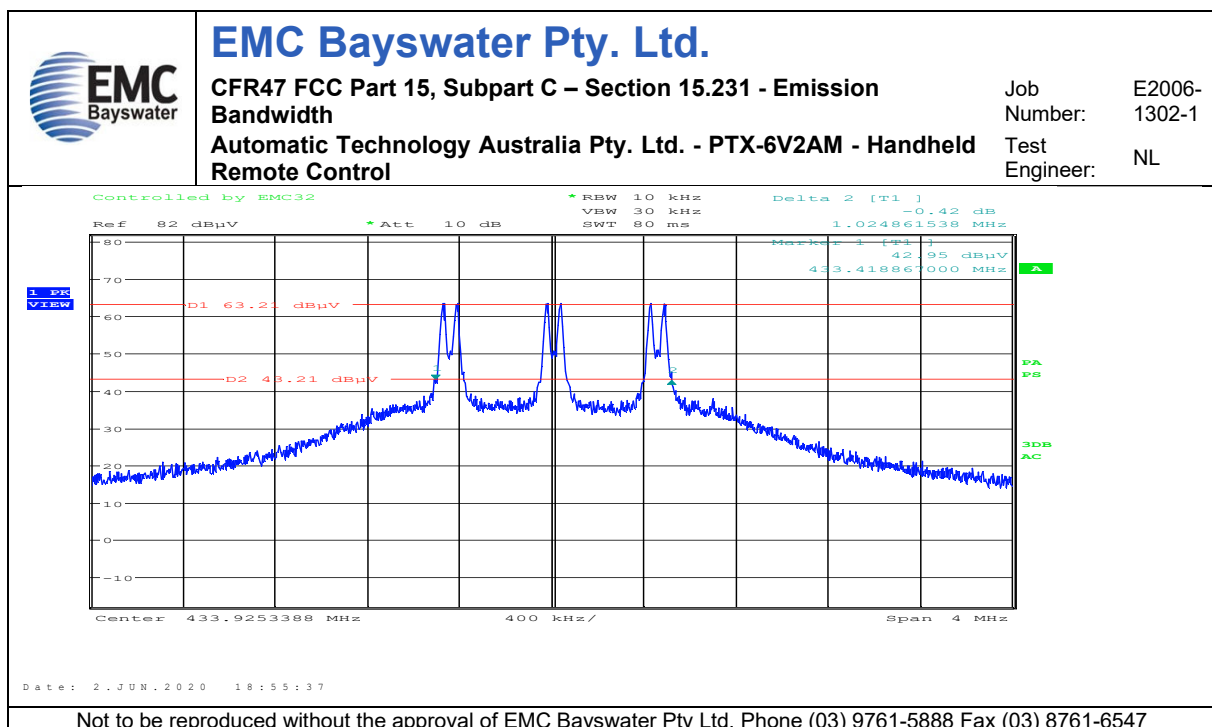
Graph 11



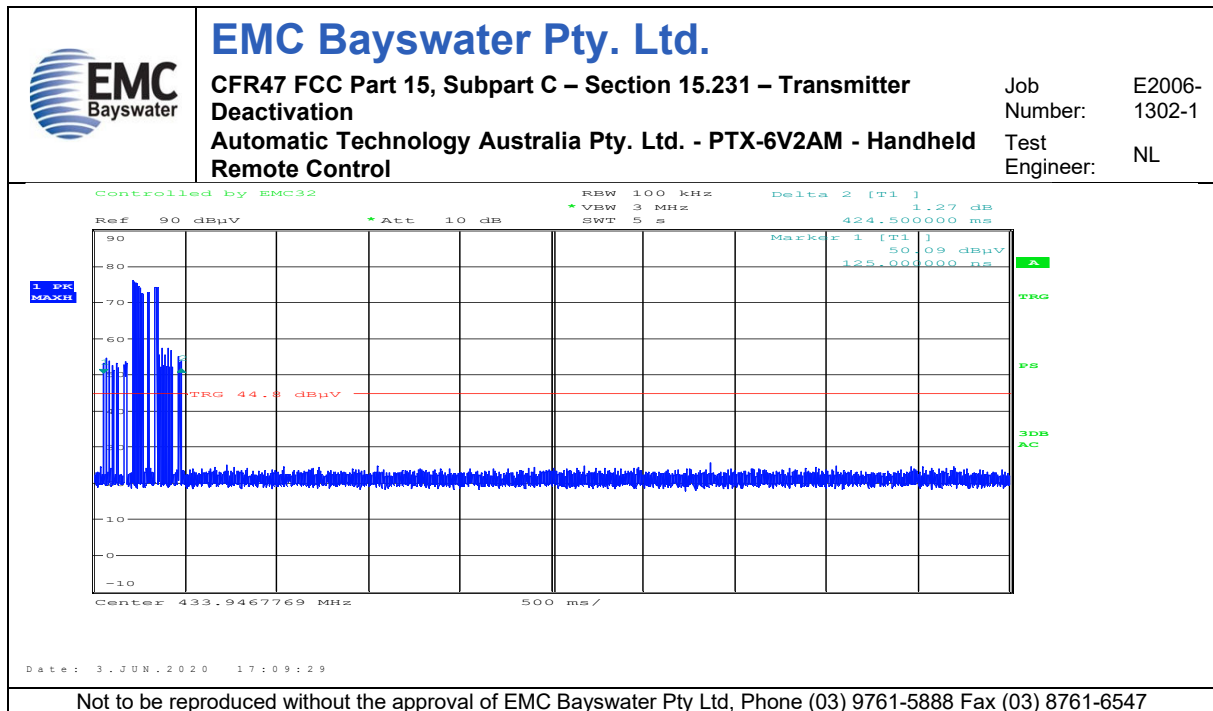
Graph 12



Graph 13



Graph 14



Graph 15

## Appendix D – Exposure of Humans to RF fields (Radio Frequency Hazard) information

### SAR and RF Exposure exception evaluation

#### SAR exception evaluation

As per Appendix A of KDB 447498 D01 General RF Exposure Guidance v06

#### ***SAR Test Exclusion Thresholds for 100 MHz – 6 GHz and ≤ 50 mm***

Approximate SAR Test Exclusion Power Thresholds at Selected Frequencies and Test Separation Distances are illustrated in the following Table. The equation and threshold in 4.3.1 must be applied to determine SAR test exclusion.

| MHz  | 5  | 10 | 15  | 20  | 25  | mm                                      |
|------|----|----|-----|-----|-----|-----------------------------------------|
| 150  | 39 | 77 | 116 | 155 | 194 | SAR Test<br>Exclusion<br>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  |                                         |

SAR test exclusion threshold for 433MHz transmitter is 22.5mW for 5mm distance.

The Measured EIRP is 0.386mW (Worst-case, Without Duty Cycle correction factor).

#### Calculation Example

Measured maximum ,Electric field at 3m distance = 91.1 dBμV/m

Therefore Maximum e.i.r.p calculated from following equation

Maximum e.i.r.p = (Field Strength(V/m) \* Distance(m))<sup>2</sup>/30

Therefore Maximum e.i.r.p = 0.386mW

## RF Exposure Evaluation

As per section 1.1310 of CFR 47 following Maximum Permissible Exposure (MPE) limits are applicable.

| Frequency range (MHz)                                          | Electric field strength (V/m) | Magnetic field strength (A/m) | Power density (mW/cm <sup>2</sup> ) | Averaging time (minutes) |
|----------------------------------------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------|
| <b>(A) Limits for Occupational/Controlled Exposure</b>         |                               |                               |                                     |                          |
| 0.3-3.0                                                        | 614                           | 1.63                          | *100                                | 6                        |
| 3.0-30                                                         | 1842/f                        | 4.89/f                        | *900/f <sup>2</sup>                 | 6                        |
| 30-300                                                         | 61.4                          | 0.163                         | 1.0                                 | 6                        |
| 300-1,500                                                      |                               |                               | f/300                               | 6                        |
| 1,500-100,000                                                  |                               |                               | 5                                   | 6                        |
| <b>(B) Limits for General Population/Uncontrolled Exposure</b> |                               |                               |                                     |                          |
| 0.3-1.34                                                       | 614                           | 1.63                          | *100                                | 30                       |
| 1.34-30                                                        | 824/f                         | 2.19/f                        | *180/f <sup>2</sup>                 | 30                       |
| 30-300                                                         | 27.5                          | 0.073                         | 0.2                                 | 30                       |
| 300-1,500                                                      |                               |                               | f/1500                              | 30                       |
| 1,500-100,000                                                  |                               |                               | 1.0                                 | 30                       |

f = frequency in MHz \* = Plane-wave equivalent power density

Limits for Maximum Permissible Exposure (MPE) to radiofrequency electromagnetic fields for 433MHz as per Table 1 of Section 15.1310 is 0.28 mW/cm<sup>2</sup> (General Population/Un-controlled).

Using equation

$$S = PG / 4\pi R^2$$

where: S = Power density  
P = Power input to the antenna  
G = Antenna gain  
R = Distance to the center of radiation of the antenna

Prediction Worst case:

Maximum EIRP: 0.386mW (Worst-case, Without Duty Cycle correction factor)

Distance: 20cm

Calculated Power Density= 0.0000768 mW/cm<sup>2</sup>

MPE limit for General Population/Un-controlled exposure: 0.28 mW/cm<sup>2</sup>

**Result:** The measured EIRP is below the SAR exception threshold and the calculated power density level at a distance of 20cm are below the maximum levels allowed by regulations.

## Appendix E – Customer Declaration of Product Variant



Automatic Technology (Australia) Pty Ltd  
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ABN: 11 007 125 328  
Date: 11/06/2020

### Declaration of Product Variations

We of Automatic Technology (Australia) Pty Ltd  
6-8 Fiveways Boulevard, Keysborough, VIC 3173

hereby declare that:

Equipment Key Fob Transmitter  
Model number PTX6V2AM

to be the worst case variant used for EMC testing of a product range consisting of other variants along with the justification declared in the table below. Automatic Technology (Australia) Pty Ltd accepts all responsibility for any adverse effects with respect to the EMC performance of the variant products listed in the table with regards to the performance observed whilst testing the declared worst case model.

| Model tested | Variants models | Justification                                                         |
|--------------|-----------------|-----------------------------------------------------------------------|
| PTX6V2       | PTX6V2          | The same hardware, different case                                     |
|              | TB6V2           | The same hardware, different case                                     |
|              | PTX6V2AM        | The same hardware and case as PTX6V2. For use in Canada and USA only. |
|              |                 |                                                                       |

Signed by:   
Name: Nikolai Klepikov  
Position: Senior Electronics Engineer  
Date signed: 11/06/2020