EMC Bayswater Pty Ltd
18/88 Merrindale Drive Croydon South, Victoria, 3136, Australia
Telephone: +61 3 9761 5888
Facsimile: +61 3 8761 6547
Email: sales@emcbayswater.com.au
ABN: 49 112 221 333

RADIO CERTIFICATION REPORT
In accordance with:
CFR47 FCC Part 15, Subpart C – Section 15.231

Automatic Technology Australia Pty. Ltd.

PTX-10V1AM

Handheld / Wall Remote Controls

FCC ID: X4K-TX10V1ATAMLTI

REPORT: E2310-1692A-1 Rev2
DATE: December, 2024

This report replaces the previously issued report E2310-1692A-1 Rev1.
Please refer to section 2 of this report for details of any previously issued reports.

WORLD RECOGNISED ACCREDITATION

Accreditation Number: 18553
Accredited for compliance with ISO/IEC 17025 - Testing

Certificate of Compliance

EMC Bayswater Test Report: E2310-1692A-1 Rev2
Issue Date: December, 2024

Product(s):	Handheld / Wall Remote Controls
Model No:	PTX-10V1AM
Mode:	PTX-6AM Mode
Serial No:	Not stated
Variant:	PTX-10V1SM, WTX-10V1AM, WTX-10V1SM *The above listed variant (PTX-10V1AM) 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-TX10V1ATAMLTI
Customer Details:	Mr. Nikolai Klepikov Automatic Technology Australia Pty. Ltd. 6 – 8 Fiveways Boulevard Keysborough Victoria 3173, Australia Phone No: +61 3 9791 0200 e-mail: Nikolai.Klepikov@ata-aust.com.au
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):	12th to 31st of October, 2023
Test House (Issued By):	EMC Bayswater Pty Ltd 18/88 Merrindale Drive Croydon South Victoria 3136 Australia FCC Accredited Test Firm Registration number: 527798 FCC Accredited Test Firm Designation number: AU0004 Phone No: +61 3 9761 5888 e-mail: sales@emcbayswater.com.au Fax No: +61 3 8761 6547 Web: www.emcbayswater.com.au

This is to certify that the necessary measurements were made by EMC Bayswater Pty Ltd, and that the Automatic Technology Australia Pty. Ltd., PTX-10V1AM, Handheld / Wall Remote Controls, has been tested in accordance with requirements contained in the appropriate commission regulations.

Prepared & tested by:	Approved by:	
		17/12/2024 13:35
Adnan Zaman (EMC Test Engineer)	Neville Liyanapatabendige (Manager)	Date

Radio Certification Report
for
Automatic Technology Australia Pty. Ltd.

Contents

1. Introduction

Radio tests were performed on an Automatic Technology Australia Pty. Ltd., PTX-10V1AM, Handheld / Wall Remote Controls, in accordance with the requirements of CFR47 FCC Part 15, Subpart C – Section 15.231.

2. Test Report Revision History

ISSUE	DATE	Description	AUTHORISED BY
E2310-1692A-1	15-12-2023	Original	Neville Liyanapatabendige (Manager)
E2310-1692A-1 Rev1	18-11-2024	In the Appendix D – Customer Declaration of Product Variant, the model tested information in the table was incorrect. The customer supplied the 'Declaration of Product Variations' with the correct information and the Appendix D – Customer Declaration of Product Variant was updated.	Neville Liyanapatabendige (Manager)
E2310-1692A-1 Rev2	17-12-2024	As per the customer's request, block diagram of the EUT was removed from page 6.	Neville Liyanapatabendige (Manager)

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[#]
15.231(a)	Transmitter Deactivation	Complied
15.231(b)	Field strength of fundamental	Complied by 1.2dB[+]
15.231(b) 15.209	Field strength of spurious emissions	Complied Peak limit by > 20.0dB
		Complied Average limit by 15.6dB
15.231(c)	Emission Bandwidth	Complied

[+]Refer to appropriate section for measurement uncertainty statement.

[#]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 / Wall Remote Controls	
Model No:	PTX-10V1AM	
Serial No:	Not stated	
Mode:	PTX-6AM Mode	
Variant:	PTX-10V1SM, WTX-10V1AM, WTX-10V1SM*	
	**The customer (Automatic Technology Australia Pty. Ltd.) declared testing of one variant as a worst case representative sample and declared the worst case variant to be the PTX-10V1AM (refer to Appendix D within this report for the customer declaration of worst case variant). Please note other than the unit(s) listed as a) "Product" and b) "Model" no other products/models or variant were products/models tested.*	
Firmware:	Not stated	
Dimensions:	75x35x15mm (Length x Width x Height)	
Weight:	50 g	
EUT Type:	Tested as table-top	
Power Specifications:	3V Battery powered. CR2032	
Transmitter details:	Description:	Remote Control
	Type:	Handheld Remote Transmitter
	Max Transmit Power:	+11 dBm (conducted)
	Modulation Scheme:	FSK/OOK
	Channels:	3 channels: 433.47 MHz, 433.92 MHz, 434.37 MHz
	Antenna Details:	¼ wave Loop Antenna
	Antenna Gain:	-14.5dBi to -15.5dBi
	FCC ID:	X4K-TX10V1ATAMLTI

(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 as follows:

"The TX-10 is a range of remote transmitters, which is allows secure keyless access control for automatic gates and garage doors (open and close), and other ATA equipment, which require remote operations."

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 TX-10 series transmitter has 2 (two) operating modes: PTX-6AM and PTX-8.

(Customer supplied product operating mode information)

5.5. Product operating mode for testing

PTX-6AM Mode

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. Sample 2 was configured to normal operation and used for transmitter deactivation test. Sample 1 was operating continuously and was used for all other tests.

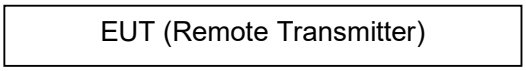


Figure 1: EUT configuration diagram for Transmitter Testing

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

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:

$\delta(dB) = 20\log(\Delta)$

where

δ = The duty cycle correction factor (dB)
Δ = 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 to 15 in Appendix C)

Duty Cycle calculation:

Type of Pulse	Pulse time	Number of Pulses in a period	Time
Short Pulse 1	1.45ms	1	1.45ms
Short Pulse 2	5.22ms	1	5.22ms
Medium Pulse	6.78ms	1	6.78ms
Long Pulse	14.22ms	1	14.22ms
		Total ON time	27.67ms
		Pulse Period	100ms

Duty Cycle = (27.67/100) = 0.2767
Duty Cycle Correction Factor = 20*Log(0.2767) = -11.2dB

Measured Duty Cycle	Correction Factor (dB)
0.2767	-11.2

Table 2: Measured Duty Cycle

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 duty cycle for customer supplied sample is 0.2767 (27.67%).

The duty cycle correction factor for 0.2767 duty cycle is -11.2dB.

Assessment: All Peak measurements of the transmission fundamental and associated harmonics can be reduced by 11.2dB.

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 (µV/m)
40.66 to 40.70	2,250 *(67 dBµV/m)*
70 to 130	1,250 *(61.9 dBµV/m)*
130 to 174	[1]1,250 to 3,750 *(61.9 to 71.5 dBµV/m)*
174 to 260	3,750 *(71.5 dBµV/m)*
260 to 470	[1]3,750 to 12,500 *(71.5 to 81.9 dBµV/m)*
Above 470	12,500 *(81.9 dBµV/m)*

[1]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	Z	433.481	88.5	-11.2	77.3	80.8	-3.5+
		433.948	88.3	-11.2	77.1	80.8	-3.7+
		434.338	88.2	-11.2	77.0	80.8	-3.8+
Vertical	X	433.429	90.8	-11.2	79.6	80.8	**-1.2+***
		433.896	90.8	-11.2	79.6	80.8	**-1.2+***
		434.338	90.6	-11.2	79.4	80.8	-1.4+

**Worst-case emissions, +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:	18.3 to 18.4°C
Humidity:	51%
Atmospheric pressure:	1014.5 to 1014.6hPa

Table 5: Climatic conditions

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

E (Peak) = V_{pk} + AF + L_C
E(Average) = E(Peak) – Duty Cycle Correction Factor
Where:
E = E-field in dBμV/m
$V_{QP/PK/AV}$ = Measured Voltage (Peak) in dBμV
AF = Antenna Factor in dB(/m)
L_C = Cable and attenuator Loss in dB

Example calculation:
E (Peak) = V_{PK} + AF + L_C
E (Peak) = 30dBμV + 12dB/m + 2.3dB
E (Peak) = 44.3 dBμV/m
E (Average) = E(Peak) – Duty Cycle Correction Factor
E (Average) = 44.3 – 6 = 38.3 dBμV/m

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 (µV/m)	Field strength of spurious emissions (µV/m)
40.66 to 40.70	2,250 *(67 dBµV/m)*	225 *(47 dBµV/m)*
70 to 130	1,250 *(61.9 dBµV/m)*	125 *(41.9 dBµV/m)*
130 to 174	[1]1,250 to 3,750 *(61.9 to 71.5 dBµV/m)*	[1]125 to 375 *(41.9 to 51.5 dBµV/m)*
174 to 260	3,750 *(71.5 dBµV/m)*	375 *(51.5 dBµV/m)*
260 to 470	[1]3,750 to 12,500 *(71.5 to 81.9 dBµV/m)*	[1]375 to 1,250 *(51.5 to 61.9 dBµV/m)*
Above 470	12,500 *(81.9 dBµV/m)*	1,250 *(61.9 dBµV/m)*

[1]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 (dBµV/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 (dBµV/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 (dBµV/m)	Limit Quasi-peak/ Average (dBµV/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	Z	866.890	53.7	-11.2	42.5	60.8	-18.3
		867.920	54.0	-11.2	42.8	60.8	-18.0
		868.790	54.2	-11.2	43.0	60.8	**-17.8***
Vertical	X	866.980	51.4	-11.2	40.2	60.8	-20.6
		867.770	51.6	-11.2	40.4	60.8	-20.4
		868.670	51.4	-11.2	40.2	60.8	-20.6

**Worst-case emissions*

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)
Z	1300.040	48.5	-11.2	37.3	74.0	54.0	-25.5	-16.7
	1301.600	49.6	-11.2	38.4	74.0	54.0	**-24.4***	**-15.6***
	1302.900	49.2	-11.2	38.0	74.0	54.0	-24.8	-16.0
	1734.240	48.5	-11.2	37.3	80.8	60.8	-32.3	-23.5
	1735.540	49.9	-11.2	38.7	80.8	60.8	-30.9	-22.1
	1737.100	48.8	-11.2	37.6	80.8	60.8	-32.0	-23.2
	2167.140	50.3	-11.2	39.1	80.8	60.8	-30.5	-21.7
	2169.740	50.1	-11.2	38.9	80.8	60.8	-30.7	-21.9
	2171.820	49.5	-11.2	38.3	80.8	60.8	-31.3	-22.5
	2603.420	46.0	-11.2	34.8	80.8	60.8	-34.8	-26.0
	3033.980	47.4	-11.2	36.2	80.8	60.8	-33.4	-24.6
	3475.200	48.9	-11.2	37.7	80.8	60.8	-31.9	-23.1
	3901.410	46.7	-11.2	35.5	74.0	54.0	-27.3	-18.5

**Worst-case emissions*

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

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	1300.300	49.4	-11.2	38.2	74.0	54.0	**-24.6***	**-15.8***
	1301.860	49.1	-11.2	37.9	74.0	54.0	-24.9	-16.1
	1302.900	48.8	-11.2	37.6	74.0	54.0	-25.2	-16.4
	1733.720	48.3	-11.2	37.1	80.8	60.8	-32.5	-23.7
	1735.800	48.2	-11.2	37.0	80.8	60.8	-32.6	-23.8
	1737.360	48.8	-11.2	37.6	80.8	60.8	-32.0	-23.2
	2167.400	49.7	-11.2	38.5	80.8	60.8	-31.1	-22.3
	2170.000	49.4	-11.2	38.2	80.8	60.8	-31.4	-22.6
	2171.820	49.8	-11.2	38.6	80.8	60.8	-31.0	-22.2
	2600.560	46.2	-11.2	35.0	80.8	60.8	-34.6	-25.8
	3034.240	44.7	-11.2	33.5	80.8	60.8	-36.1	-27.3
	3471.300	47.1	-11.2	35.9	80.8	60.8	-33.7	-24.9
	3904.920	48.1	-11.2	36.9	74.0	54.0	-25.9	-17.1

**Worst-case emissions*

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	±4.33dB
30MHz to 1GHz	±4.65dB
1GHz to 6GHz	±4.83dB

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:	18.3 to 18.7°C
Humidity:	48 to 51%
Atmospheric pressure:	1005.5 to 1014.6hPa

Table 13: Climatic conditions

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

$$E\ (Peak) = V_{pk} + AF + L_C$$

$$E(Average) = E(Peak) - \text{Duty Cycle Correction Factor}$$

Where:

E = E-field in dBµV/m

$V_{QP/PK/AV}$ = Measured Voltage (Peak) in dBµV

AF = Antenna Factor in dB(/m)

L_C = Cable and attenuator Loss in dB

Example calculation:

E (Peak) = V_{pk} + AF + L_C
E (Peak) = 30dBμV + 12dB/m + 2.3dB
E (Peak) = 44.3 dBμV/m
E (Average) = E(Peak) – Duty Cycle Correction Factor
E (Average) = 44.3 – 6 = 38.3 dBμV/m

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: 433.916MHz

12.3. Test Results

Emission Bandwidth measurements are tabulated below:

(Refer to graph 16 in Appendix C)

Transmit center frequency (MHz)	Measured 20dB Bandwidth	Percentage of Measured Bandwidth with respect to Centre Frequency	Limit	Comment
433.916	1.04MHz	0.239%	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:	18.3 to 18.4°C
Humidity:	51%
Atmospheric pressure:	1014.5 to 1014.6hPa

Table 15: Climatic conditions

Notes: The 20dB bandwidth of the emission was contained within 0.25% of 433.916MHz 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 17 in Appendix C)

Measured Transmitter deactivation time (s)	Required Transmitter deactivation time (s)	Comment
0.463	≤ 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 for some time when the button was held. When the button was released all transmission stopped within 463ms.

The Customer supplied a normally operated sample for Transmitter deactivation testing.

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-10V1AM, Handheld / Wall Remote Controls 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	Jun-24	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	May-25	E
0718	ATTENUATOR, 6dB	JFW	50FPE-006	-	1 year	Jan-24	I
1145	CABLE, Coax, Sucoflex 104PA	Huber + Suhner	84279564	SN MY056/4PA	1 year	Jan-24	I
0989	CABLE, Coax, Sucoflex 104A	Huber+Suhner	44454/4A	C357	1 year	Jan-24	I
0843	ATTENUATOR, 10dB	JFW	50HF-010N		3 years	Dec-24	I
1155	Hygrometer, Temp, Humidity	DigiTech	QM7312	-	2 years	Jul-25	I
0666	Enclosure, Semi-Anechoic, No 1	RFI Industries	S800 iOATS	1229	3 years	Aug-25	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	Jun-24	E
0935	ANTENNA, Biconilog	Sunol Sciences	JB5	A071106	2 years	May-25	E
0718	ATTENUATOR, 6dB	JFW	50FPE-006	-	1 year	Jan-24	I
0633	ANTENNA, Double Ridge Horn	EMCO	3115	9712-5369	3 years	Aug-24	I
0559	PRE-AMP, Microwave, 18GHz	Miteq	AFS8	605305	1 year	Apr-24	I
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
0989	CABLE, Coax, Sucoflex 104A	Huber+Suhner	44454/4A	C357	1 year	Jan-24	I
1145	CABLE, Coax, Sucoflex 104PA	Huber + Suhner	84279564	SN MY056/4PA	1 year	Jan-24	I
1238	CABLE, Coax, Sucoflex 126 E	Huber + Suhner	10422876	SN 8000495/126E	1 year	Jan-24	I
0024	ANTENNA, Active Loop	EMCO	6502	2620	2 years	Sep-25	I
0745	FILTER, Hi-Pass, 800MHz	MiniCircuits	NHP-800	10447	2 years	May-24	I
1155	Hygrometer, Temp, Humidity	DigiTech	QM7312	-	2 years	Jul-25	I
0666	Enclosure, Semi-Anechoic, No 1	RFI Industries	S800 iOATS	1229	3 years	Aug-25	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	Jun-24	E
1205	CABLE, Coax, Sucoflex 126 E	Huber+ Suhner	84383918	SN MY1006/26EA	1 year	Jan-24	I
1155	Hygrometer, Temp, Humidity	DigiTech	QM7312	-	2 years	Jul-25	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	3 years	Aug-25	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 – External Views
A	2	
A	3	
A	4	
A	5	
A	6	
B	1	EUT – 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	Transmitter battery
C	1	EUT X orientation
C	2	EUT Z orientation
C	3	Field strength of fundamental, Duty cycle and Emission Bandwidth – Test configuration
C	4	Field strength of spurious emissions – Test configuration – 30MHz to 1GHz
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	

EUT External Photographs	-	EMC Bayswater Test Report E2310-1692A-1 Annex A
EUT Internal Photographs	-	EMC Bayswater Test Report E2310-1692A-1 Annex B
EUT Test Configurations Photographs	-	EMC Bayswater Test Report E2310-1692A-1 Annex C

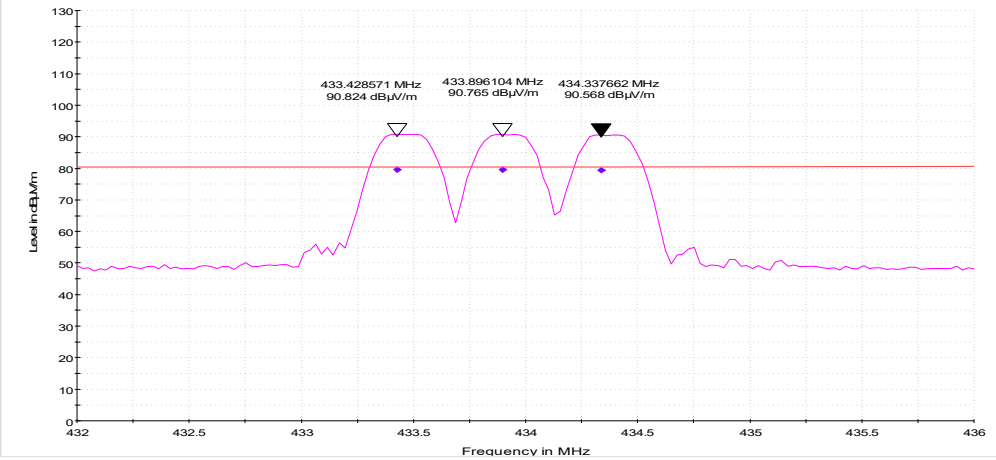
Appendix C – Measurement Graphs

No.	Test	Graph Description
1	Field strength of fundamental	Antenna Vertical – EUT X orientation
2		Antenna Horizontal – EUT Z 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		Vertical Antenna Polarisation – EUT X orientation – 30MHz to 800MHz
7		Vertical Antenna Polarisation – EUT X orientation – 800MHz to 1GHz
8		Vertical Antenna Polarisation – EUT X orientation – 1GHz to 4.5GHz
9		Horizontal Antenna Polarisation – EUT Z orientation – 30MHz to 800MHz
10		Horizontal Antenna Polarisation – EUT Z orientation – 800MHz to 1GHz
11		Horizontal Antenna Polarisation – EUT Z orientation – 1GHz to 4.5GHz
12	Duty Cycle Correction Factor	Duration of Partial Short pulse
13		Duration of Short pulse
14		Duration of Medium pulse
15		Duration of Long pulse
16	Emissions Bandwidth	
17	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-10V1AM - Handheld / Wall Remote Controls
Antenna Vertical – EUT X orientation

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

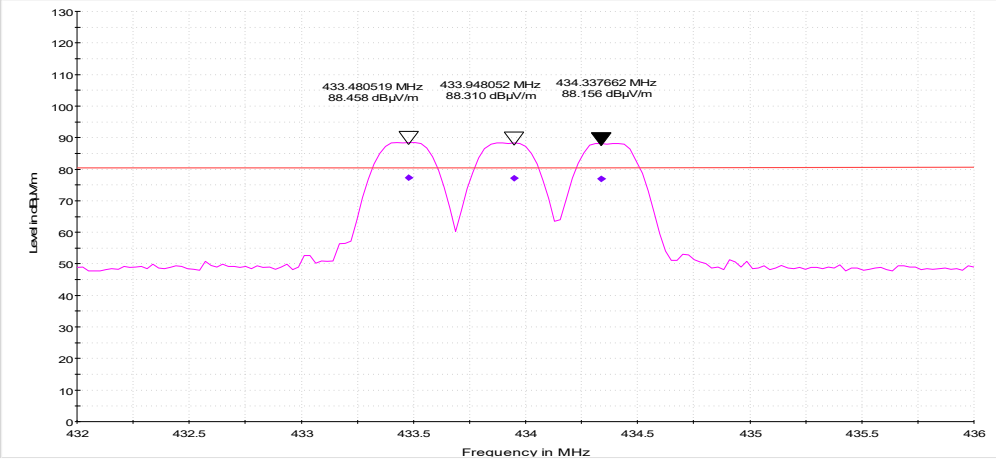


Graph 1

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C – Section 15.231 – Field strength of fundamental
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Horizontal – EUT Z orientation

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

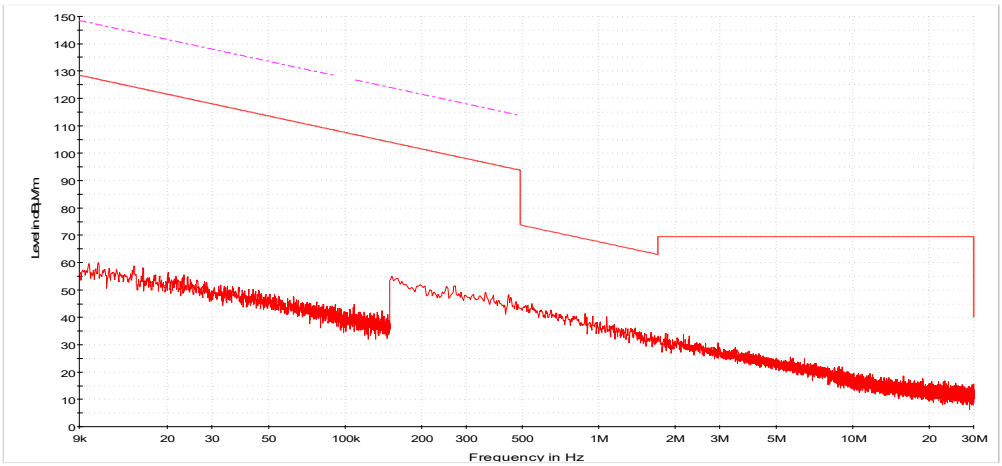


Graph 2

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.209 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna X – EUT X orientation – 9kHz to 30MHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

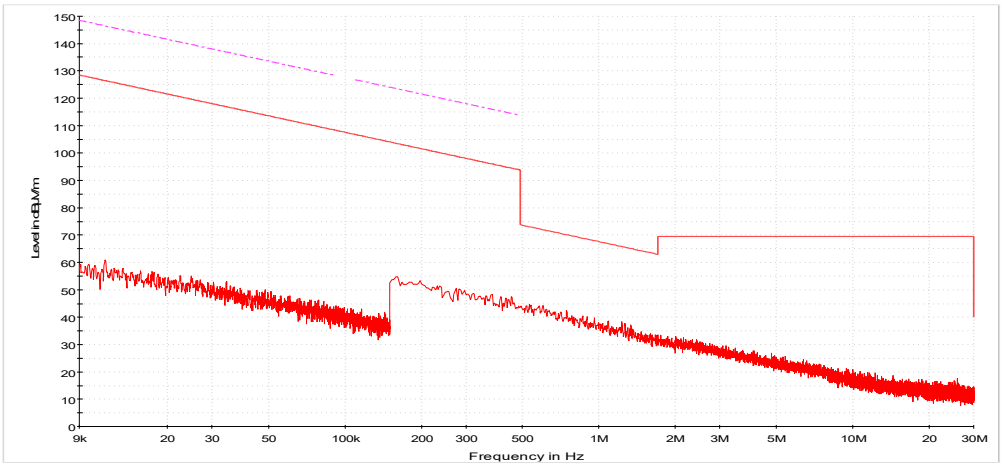


Graph 3

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.209 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Y – EUT X orientation – 9kHz to 30MHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

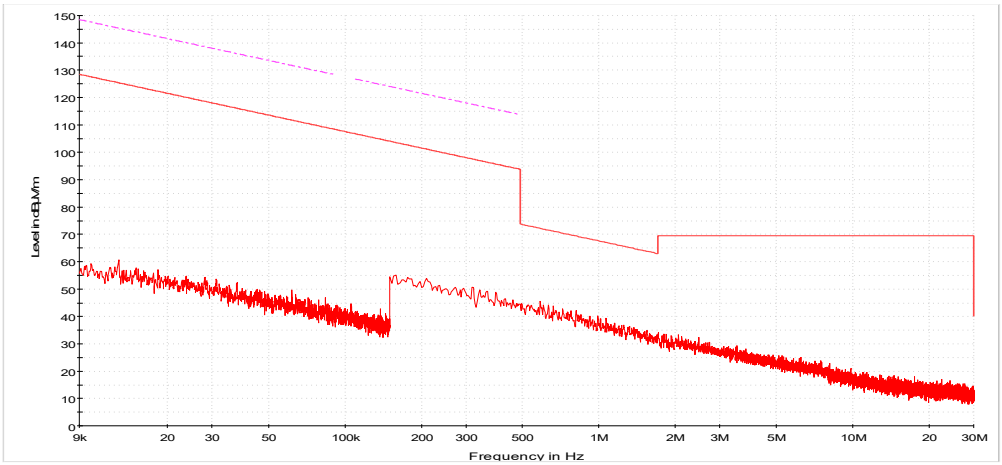


Graph 4

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.209 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Z – EUT X orientation – 9kHz to 30MHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

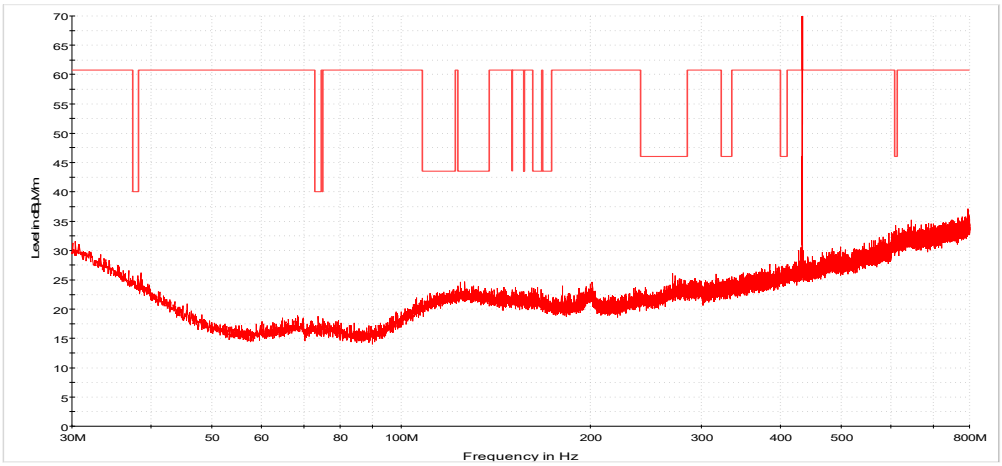


Graph 5

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Vertical – EUT X orientation – 30MHz to 800MHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

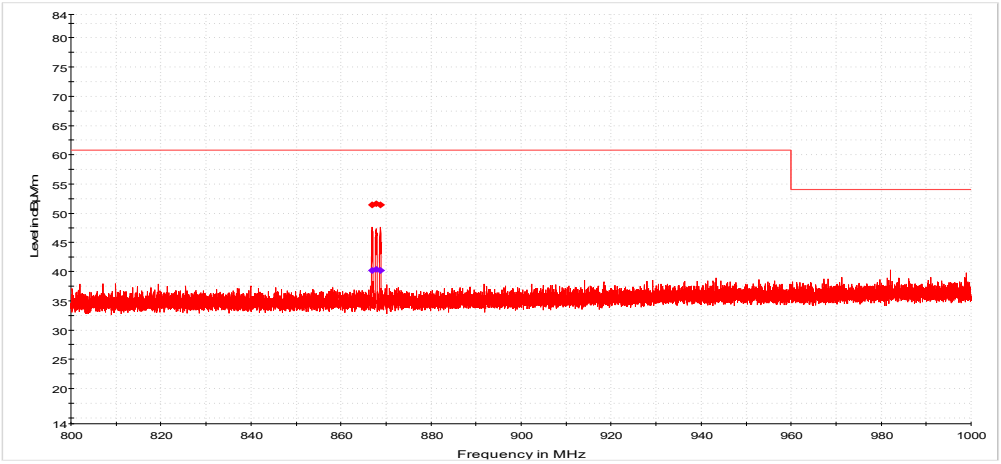


Graph 6

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Vertical – EUT X orientation – 800MHz to 1GHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

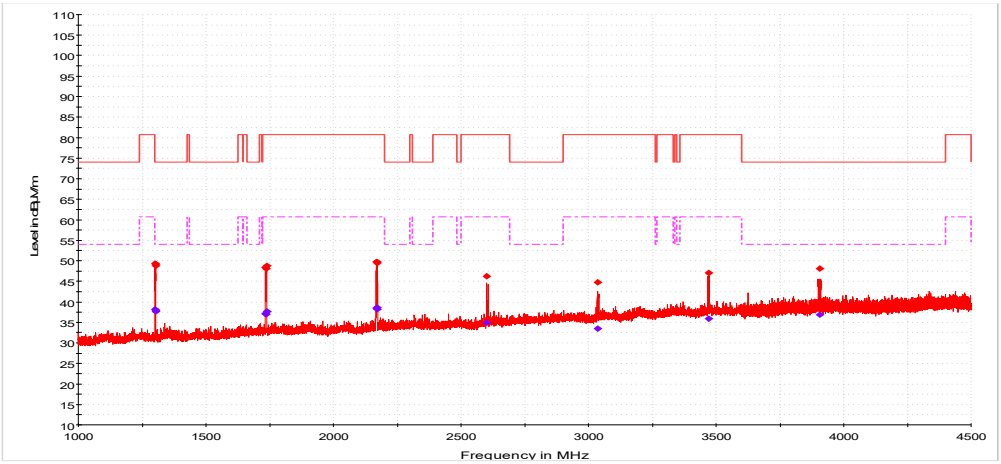


Graph 7

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Vertical – EUT X orientation – 1GHz to 4.5GHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

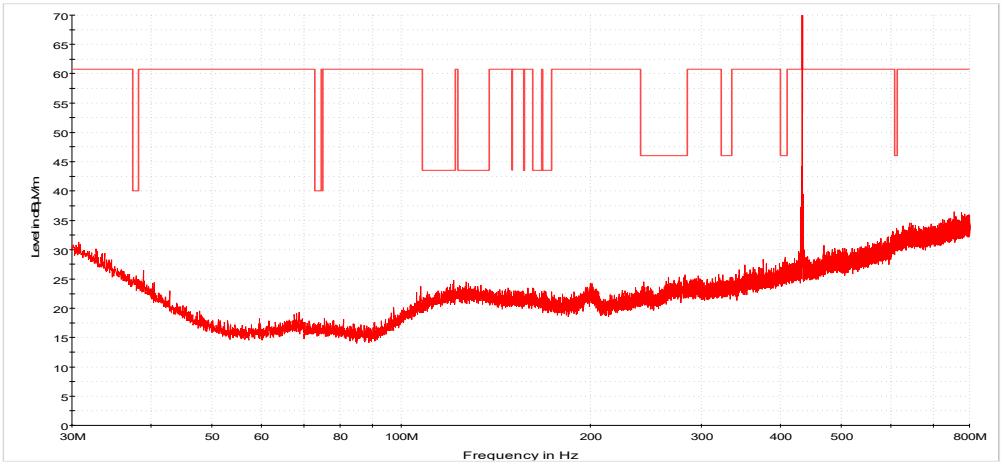


Graph 8

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Horizontal – EUT Z orientation – 30MHz to 800MHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

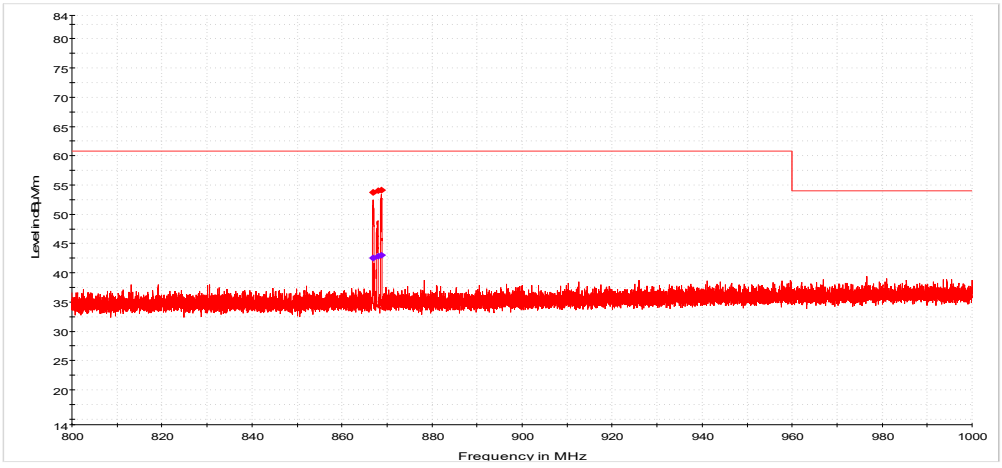


Graph 9

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Horizontal – EUT Z orientation – 800MHz to 1GHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

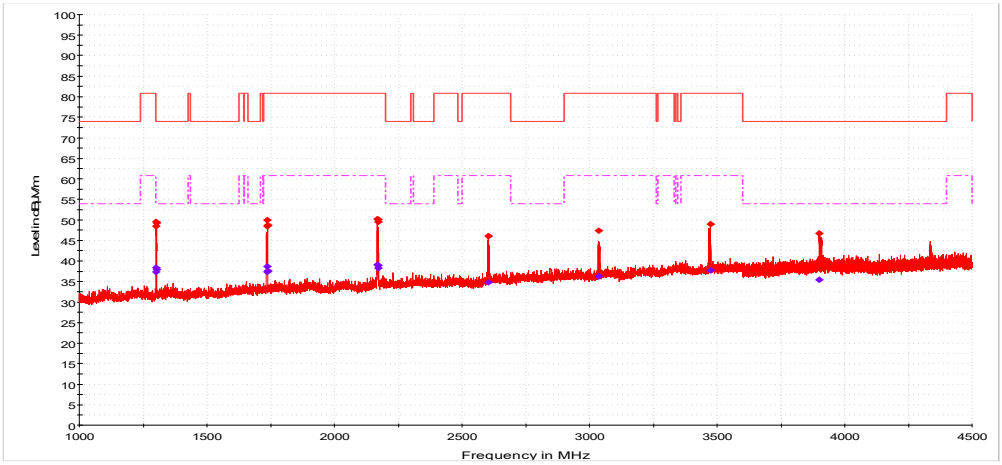


Graph 10

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart B – Section 15.231 - Field strength of spurious emissions
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Antenna Horizontal – EUT Z orientation – 1GHz to 4.5GHz

Job Number: E2310-1692A-1 Rev2
Test Engineer: AZ

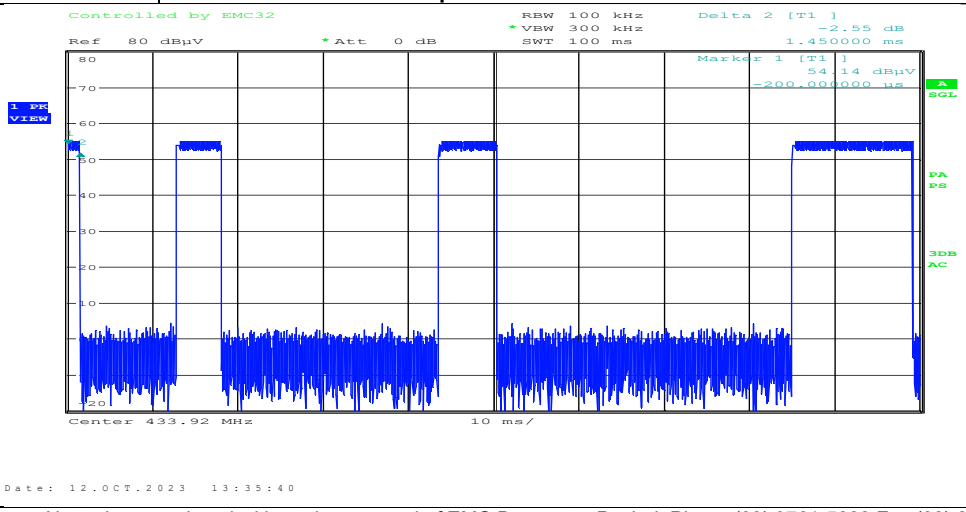


Graph 11

EMC Bayswater Pty. Ltd.

Duty cycle correction
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Duration of Partial Short pulse

Job Number: E2310-1692A-1 Rev2
Test Engineer: NL



Graph 12

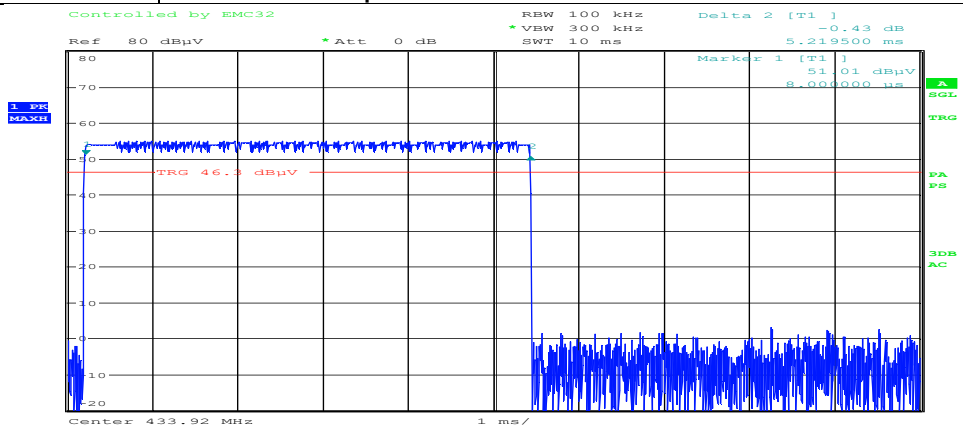
EMC Bayswater Pty. Ltd.

Duty cycle correction

Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Duration of Short pulse

Job Number: E2310-1692A-1 Rev2

Test Engineer: NL



Graph 13

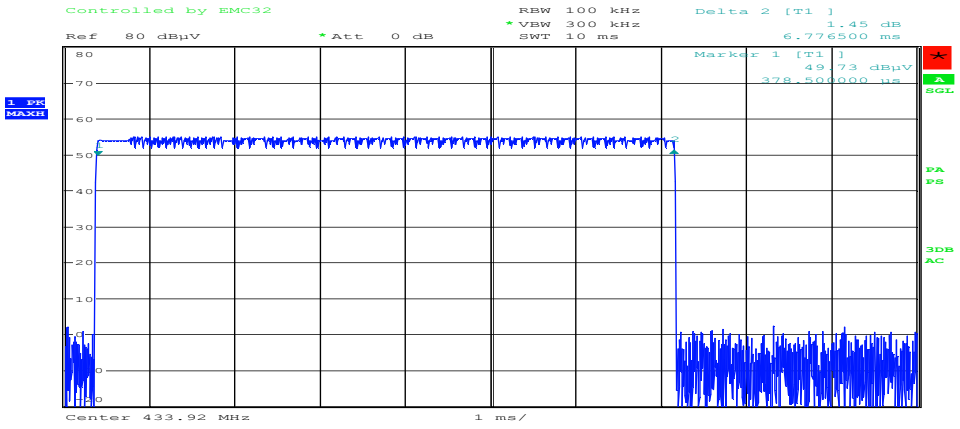
EMC Bayswater Pty. Ltd.

Duty cycle correction

Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Duration of Medium pulse

Job Number: E2310-1692A-1 Rev2

Test Engineer: NL



Graph 14

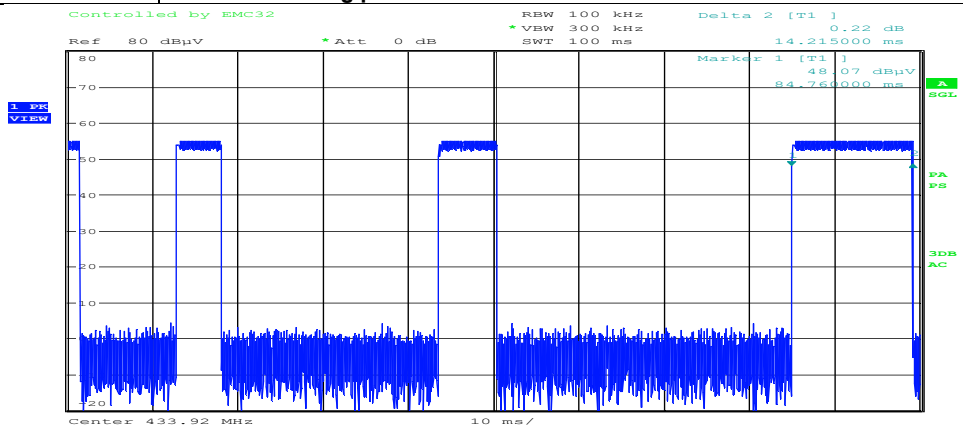
EMC Bayswater Pty. Ltd.

Duty cycle correction

Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls
Duration of Long pulse

Job Number: E2310-1692A-1 Rev2

Test Engineer: NL



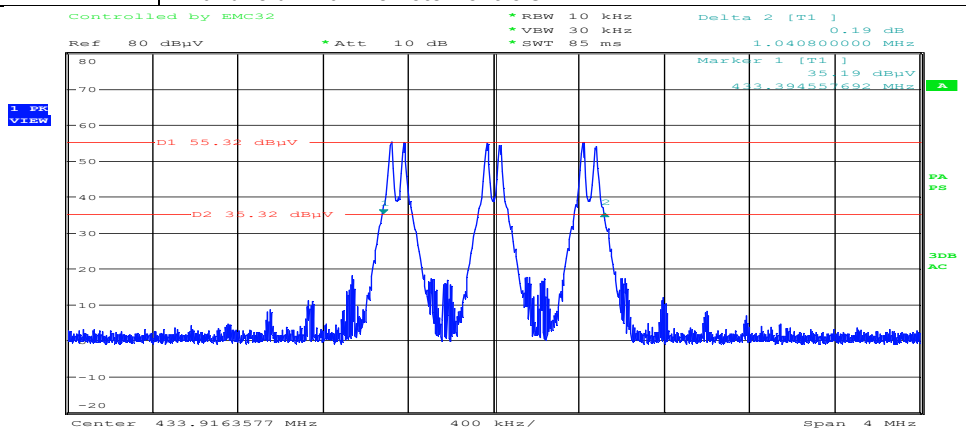
Graph 15

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C – Section 15.231 - Emission Bandwidth
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls

Job Number: E2310-1692A-1 Rev2

Test Engineer: NL



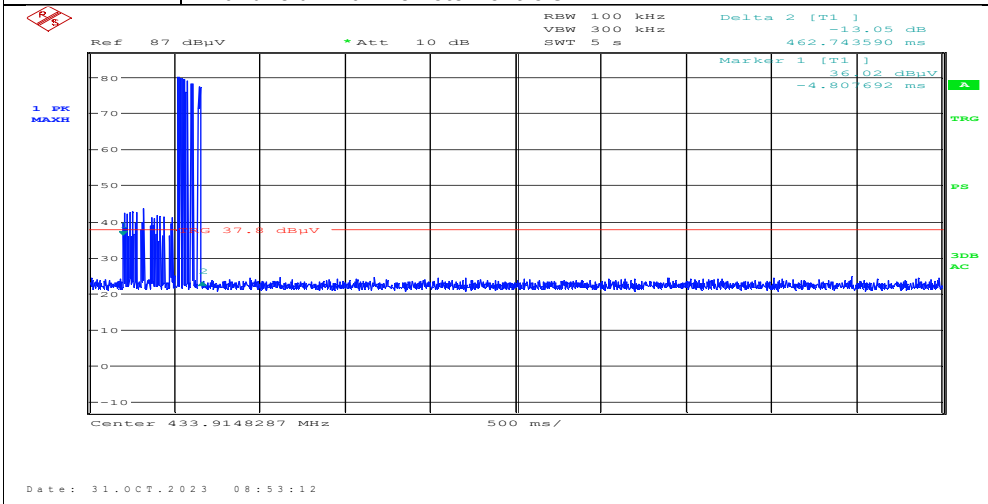
Graph 16

EMC Bayswater Pty. Ltd.

CFR47 FCC Part 15, Subpart C – Section 15.231 – Transmitter Deactivation
Automatic Technology Australia Pty. Ltd. - PTX-10V1AM - Handheld / Wall Remote Controls

Job Number: E2310-1692A-1 Rev2

Test Engineer: NL



Graph 17

Appendix D – Customer Declaration of Product Variant

automatic TECHNOLOGY

Automatic Technology (Australia) Pty Ltd
6-8 Fiveways Boulevard, Keysborough, VIC 3173
T +61 3 9791 0200
F +61 3 9791 0250
www.ata-aust.com.au
ABN : 11 007 125 328

Date: 13/11/2023

Declaration of Product Variations

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

hereby declare that:

Equipment Remote Control Transmitter

Model number PTX-10V1AM

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
PTX-10V1AM	WTX-10V1AM	The same hardware, different case
	PTX-10V1SM	The same hardware, different case colour
	WTX-10V1SM	The same hardware, different case

Signed by: .....
Name: Nikolai Klepikov
Position: Senior Electronics Engineer
Date signed: 13/11/2023