

TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: XT4 433 RC (part number 787453)

To: FCC Part 15.231: 2008

Test Report Serial No:
RFI/RPT5/RP74422JD01A

Supersedes Test Report Serial No:
RFI/RPT4/RP74422JD01A

This Test Report Is Issued Under The Authority Of Brian Watson, Operations Director	
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Test of: XT4 433 RC (part number 787453)

To: FCC Part 15.231: 2008

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Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

Table of Contents

1. Customer Information..... 4

2. Equipment Under Test (EUT) 5

3. Test Specification, Methods and Procedures..... 6

4. Deviations from the Test Specification 7

5. Operation of the EUT During Testing 8

6. Summary of Test Results 9

7. Measurements, Examinations and Derived Results 10

8. Measurement Uncertainty 18

Appendix 1. Test Equipment Used 19

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

1. Customer Information

Company Name:	FAAC Electronics Ltd
Address:	4055 Kingswood Avenue Citywest Business Campus Dublin 24 Ireland

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

2. Equipment Under Test (EUT)

2.1. Identification of Equipment Under Test (EUT)

Description:	XT4 433 RC
Brand Name:	FAAC Electronics Ltd.
Part Number:	787453
FCC ID Number:	OJQ-787453

2.2. Description of EUT

The equipment under test was a keyfob transmitter that operates in the 433 MHz band.

2.3. Modifications Incorporated in the EUT

During the course of testing the EUT was not modified.

2.4. Additional Information Related to Testing

Power Supply Requirement:	Internal Battery of 12 volts		
Type of Unit:	Transmitter		
Antenna Type:	Integral		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Single Channel	-	433.92

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

3. Test Specification, Methods and Procedures

3.1. Test Specifications

Reference:	FCC Part 15.231: 2008 Subpart C
Title:	Code of Federal Regulations, (47CFR15) Radio Frequency Devices.

3.2. Methods and Procedures

The methods and procedures used were as detailed in:

ANSI C63.2 (1987)

Title: American National Standard for Instrumentation - Electromagnetic noise and field strength.

ANSI C63.4 (2001)

Title: American National Standard Methods of Measurement of Electromagnetic Emissions from Low Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

ANSI C63.5 (1988)

Title: American National Standard for the Calibration of antennas used for Radiated Emission measurements in Electromagnetic Interference (EMI) control.

ANSI C63.7 (1988)

Title: American National Standard Guide for Construction of Open Area Test Sites for performing Radiated Emission Measurements.

CISPR 16-1: (1999)

Title: Specification For Radio Disturbance and Immunity Measuring Apparatus and Methods. Part 1: Radio Disturbance and Immunity Measuring Apparatus.

3.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the Methods & Procedures section above. Appendix 1 contains a list of the test equipment used.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

4. Deviations from the Test Specification

There were no deviations from the test specification.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

5. Operation of the EUT During Testing

5.1. Operating Modes

The EUT was tested in the following operating modes, unless otherwise stated:

- Transmit mode only

5.2. Configuration and Peripherals

The EUT was tested in the following configuration:

- Standalone – The sample was fixed into transmit mode by keeping the button depressed. The unit had a cycle time of approximately 30 seconds where upon the button required resetting. The transmitter ceased transmission once the button was released.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

6. Summary of Test Results

Range of Measurements	FCC Part 15	Port Type	Result
Transmitter Fundamental Fieldstrength	C.F.R. 47 FCC Part 15: Section 15.231(b)	Antenna	Complied
Transmitter 20 dB Bandwidth	C.F.R. 47 FCC Part 15: Section 15.231(c)	Antenna	Complied
Transmitter Timeout	C.F.R. 47 FCC Part 15: Section 15.231(a)	Antenna	Complied
Transmitter Radiated Spurious Emissions	C.F.R. 47 FCC Part 15: Sections 15.231(b) & 15.209	Antenna	Complied

6.1. Location of Tests

All the measurements described in this report were performed at the premises of RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH.

6.2. Site Registration Numbers

FCC: 209735

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

7. Measurements, Examinations and Derived Results

7.1. General Comments

7.1.1. This section contains test results only.

7.1.2. Measurement uncertainties are evaluated in accordance with current best practice. Our reported expanded uncertainties are based on standard uncertainties, which are multiplied by an appropriate coverage factor to provide a statistical confidence level of approximately 95%.

Please refer to Section 8 for details of measurement uncertainties.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

7.2. Test Results

7.2.1. Transmitter Fundamental Fieldstrength: Section 15.231(b)

Ambient Temperature: 22°C

Relative Humidity: 45%

Channel	Field Strength (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Result
Single Channel	79.6	80.8	1.2	Complied

As the transmission was continuous i.e. not pulsed the provisions in 15.35 for average pulsed emissions were not applied.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

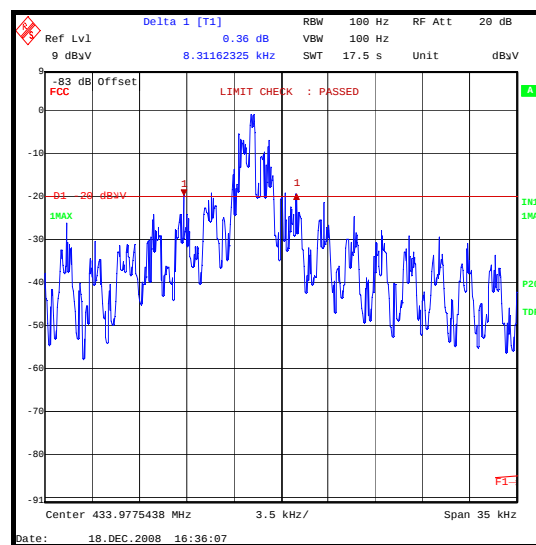
7.2.2. Transmitter 20 dB Bandwidth: Section 15.231(c)

Ambient Temperature: 22°C

Relative Humidity: 29%

Transmitter 20 dB Bandwidth (kHz)	Limit (MHz)	Margin (MHz)	Result
8.311	1.0848*	1.076	Complied

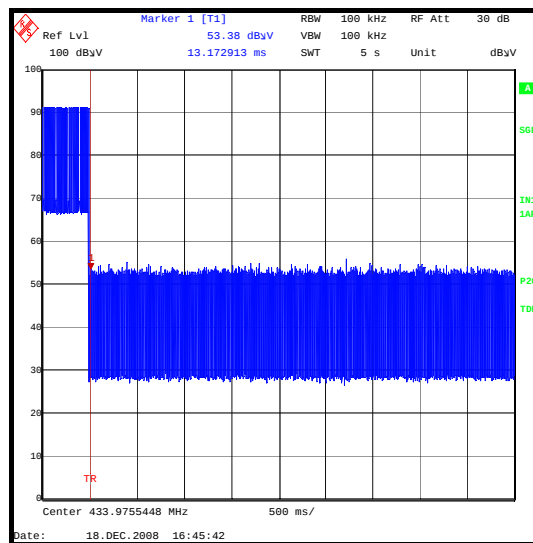
Note: * Calculated based on a fundamental frequency of 433.92 MHz



7.3.Transmitter Timeout: Section 15.231(a)

Relative Humidity: 29%

Deactivation Time (seconds)	Limit (seconds)
0.013	5



Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

7.3.1. Transmitter Radiated Emissions: Section 15.231 (b)

Ambient Temperature: 22°C

Relative Humidity: 45%

7.3.2. Electric Field Strength Measurements 30 MHz to 1 GHz
(emissions outside the restricted bands)

Frequency (MHz)	Antenna Polarity	Peak Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
867.960	Vertical	54.7	60.8	6.1	Complied

The peak emission level was compared to the average limit stated in the table above and was compliant therefore average measurements were not performed as the peak emission is below the average limit. As the transmission was continuous i.e. not pulsed the provisions in 15.35 for average pulsed emissions were not applied.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

7.3.3. Transmitter Radiated Emissions: Section 15.231(b) (continued)

Ambient Temperature: 22°C

Relative Humidity: 45%

7.3.3.1. Tests were performed in accordance with C63.4 Section 8 and relevant annexes.

7.3.4. Electric Field Strength Measurements 1 GHz to 4.4 GHz
(emissions inside the restricted bands)**Highest Peak Level:**

Frequency (GHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1301.940	Vertical	64.7	-10.8	53.9	74.0	20.1	Complied
3905.820	Vertical	53.6	-1.5	52.1	74.0	21.9	Complied
4339.800	Vertical	65.8	-12.3	53.5	74.0	21.3	Complied

Highest Average Level:

Frequency (GHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1301.940	Vertical	64.7	-10.8	53.9	54.0	0.1	Complied
3905.820	Vertical	53.6	-1.5	52.1	54.0	1.9	Complied
4339.800	Vertical	65.8	-12.3	53.5	54.0	1.3	Complied

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

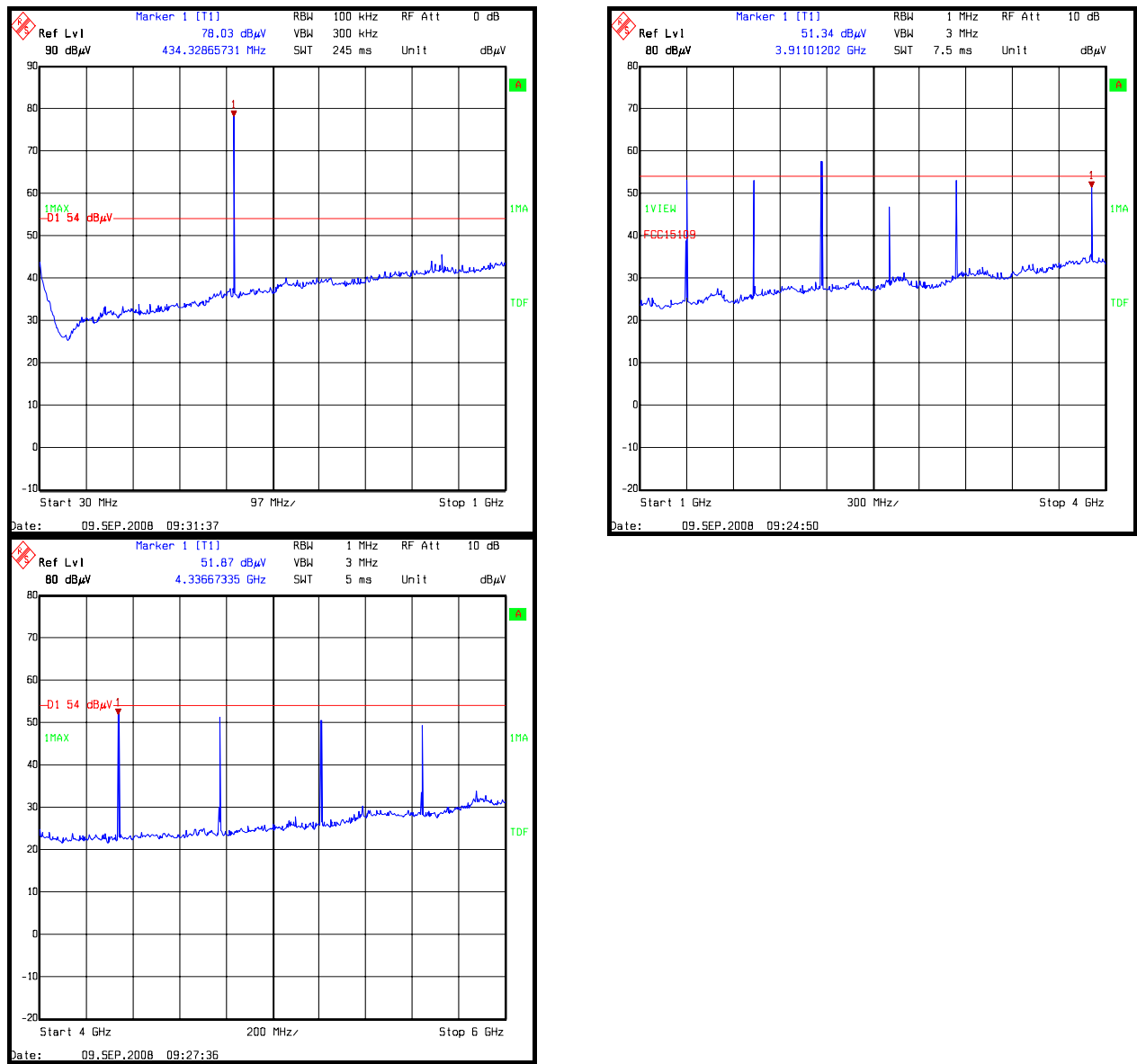
Transmitter Radiated Emissions: Section 15.231(b) (Continued)**Electric Field Strength Measurements 1 GHz to 4.4 GHz**
(emissions outside the restricted bands)**Highest Peak Level:**

Frequency (GHz)	Antenna Polarity	Detector Level (dB μ V)	Transducer Factor (dB)	Actual Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Result
1735.920	Vertical	63.2	-10.2	53.0	60.8	7.8	Complied
2169.900	Vertical	66.3	-8.4	57.9	60.8	2.9	Complied
2603.880	Horizontal	53.9	-6.9	47.0	60.8	13.8	Complied
3037.860	Vertical	59.6	-5.9	53.7	60.8	7.1	Complied

The peak emission level was compared to the average limit stated in the table above and was compliant therefore average measurements were not performed as the peak emission is below the average limit. As the transmission was continuous i.e. not pulsed the provisions in 15.35 for average pulsed emissions were not applied.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

Transmitter Radiated Emissions: Section 15.231(b) - (Continued)



Note: These plots are for pre-scans and for indication purposes only. For final measurements, see accompanying tables.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

8. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Measurement Type	Range	Confidence Level (%)	Calculated Uncertainty
Transmitter Fundamental Fieldstrength	N/A	95%	±2.94 dB
Transmitter 20dB Bandwidth	N/A	95%	±11.7ppm
Transmitter Timeout	N/A	95%	±3%
Radiated Spurious Emissions	30 MHz to 5000 MHz	95%	±2.94 dB

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

Test of: XT4 433 RC (part number 787453)
To: FCC Part 15.231: 2008

Appendix 1. Test Equipment Used

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Last Calibrated	Cal. Interval (Months)
A1299	Antenna	Schaffner	CBL6143	5094	28 Jul 2008	12
A1818	Antenna	EMCO	3115	00075692	25 Oct 2008	12
K0002	3M RSE chamber	Rainford EMC	N/A	N/A	26 Aug 2008	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESIB26	100046K	19 Feb 2008	12
M166	Thermometer	EuroCom	None	None	18 Jun 2008	12

NB In accordance with UKAS requirements, all the measurement equipment is on a calibration schedule.