EMC Technologies (NZ) Ltd

Test Report No **70706.1**
Report date: 20 July 2007

TEST REPORT

Fortronics Choker Tracking Transmitter

tested to

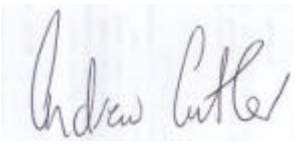
47 Code of Federal Regulations

Part 15 - Radio Frequency Devices

Subpart C – Intentional Radiators

for

Fortronics Ltd



This Test Report is issued with the authority of:

Andrew Cutler - General Manager

All tests reported herein have been performed in accordance with the laboratory's scope of accreditation

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1. STATEMENT OF COMPLIANCE

The **Fortronics Choker Tracking Transmitter** complies with FCC Part 15 Subpart C as an Intentional Radiator when the methods, as described in ANSI C63.4 - 2003, are applied.

2. RESULTS SUMMARY

Clause	Parameter	Result
15.201	Equipment authorisation requirement	Certification required.
15.203	Antenna requirement	Complies. Antenna is integral to the device.
15.204	External PA and antenna modifications	Not applicable. No external devices.
15.205	Restricted bands of operation	Complies. Device transmits on 417.950 MHz.
15.207	Conducted limits	Not applicable. Device is powered using an internal battery.
15.209	Radiated emission limits - Fundamental	Complies with a 5 dB margin at 417.950 MHz.
15.209	Radiated emission limits – Spurious emissions >30 MHz	Complies with an 8.0 dB margin at 835.900 MHz.

3. INTRODUCTION

This report describes the tests and measurements performed for the purpose of determining compliance with the specification.

The client selected the test sample.

This report relates only to the sample tested.

This report contains no corrections or erasures.

Measurement uncertainties with statistical confidence intervals of 95% are shown below test results. Both Class A and Class B uncertainties have been accounted for, as well as influence uncertainties where appropriate.

4. CLIENT INFORMATION

Company Name	Fortronics Ltd
Address	Unit 3, 78 Austin Street Onekawa
City	Napier
Country	New Zealand
Contact	Mr Ross Lumsden

5. DESCRIPTION OF TEST SAMPLE

Brand Name	Fortronics
Model Number	-
Product	Choker Tracking Transmitter
Manufacturer	Fortronics Ltd
Country of Origin	New Zealand
Serial Number	Not serialised
FCC ID	Not yet determined
Ancillary Equipment	Nil

This device is a low power transmitter operating on 418 MHz that is installed inside forestry devices that are called chokers.

A choker is used to secure wire ropes around logs that are being moved.

The transmitter is operated when the choker release mechanism is activated.

When activated the choker will fall to the ground and would not normally be recovered as it cannot be easily located.

In conjunction with a direction finding receiver this transmitter enables the released chokers to be located in areas where the terrain is rough and difficult.

6. RESULTS

Standard

The sample was tested in accordance with 47 CFR Part 15 Subpart C.

Methods and Procedures

The measurement methods and procedures as described in ANSI C63.4 - 2003 were used.

Section 15.201: Equipment authorisation requirement

Certification as detailed in Subpart J of Part 2 is required for this device.

Section 15.203: Antenna requirement

The antenna for this device is integral.

Result: Complies.

Section 15.204: External radio frequency power amplifiers and antenna modifications

From the attached photographs it can be seen that it is not possible to attach an external power amplifier to this transmitter.

Result: Complies.

Section 15.205: Restricted bands of operation

The transmitter transmits on 418 MHz.

This falls between the restricted bands of 399.9 – 410 MHz and 608 – 614 MHz.

Result: Complies.

Section 15.207: Conducted limits

This device is powered using internal batteries.

As it is not possible to operate this device from the AC mains conducted emissions testing has not been carried out.

Section 15.209: Radiated emission limits, general requirements

Radiated emissions testing was carried out over the frequency range of 30 MHz to 1000 MHz.

Testing was carried out at the laboratory's open area test site - located at Driving Creek, Orere Point, Auckland, New Zealand.

This site conforms to the requirements of CISPR 16, Part 1, Clause 16, and ANSI C63.4 - 2003.

The device was placed on the test tabletop, which is a total of 0.8 m above the test site ground plane.

When an emission is located, it is positively identified and its maximum level is found by rotating the automated turntable, and by varying the antenna height, where appropriate, with an automated antenna tower.

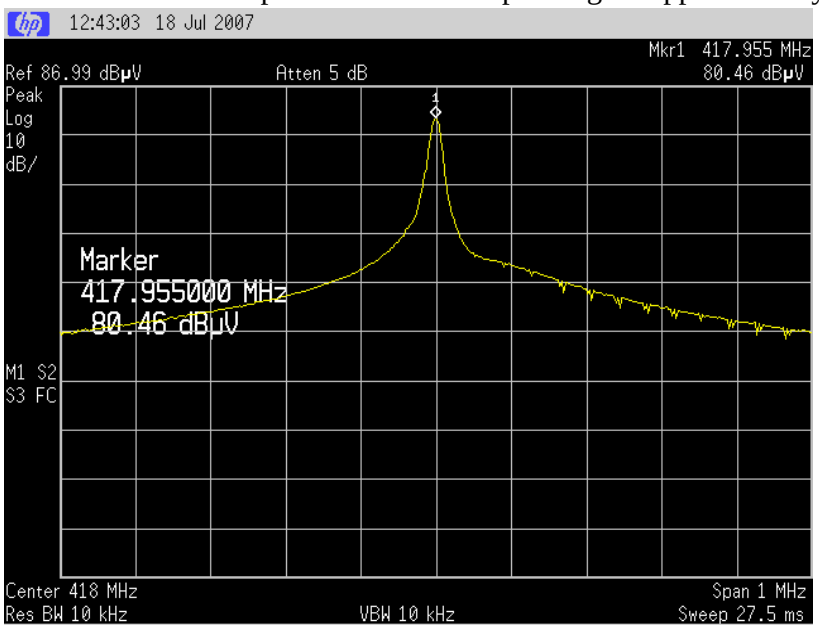
The emission is measured in both vertical and horizontal antenna polarisations, where appropriate.

The emission level was determined in field strength by taking the following into consideration:

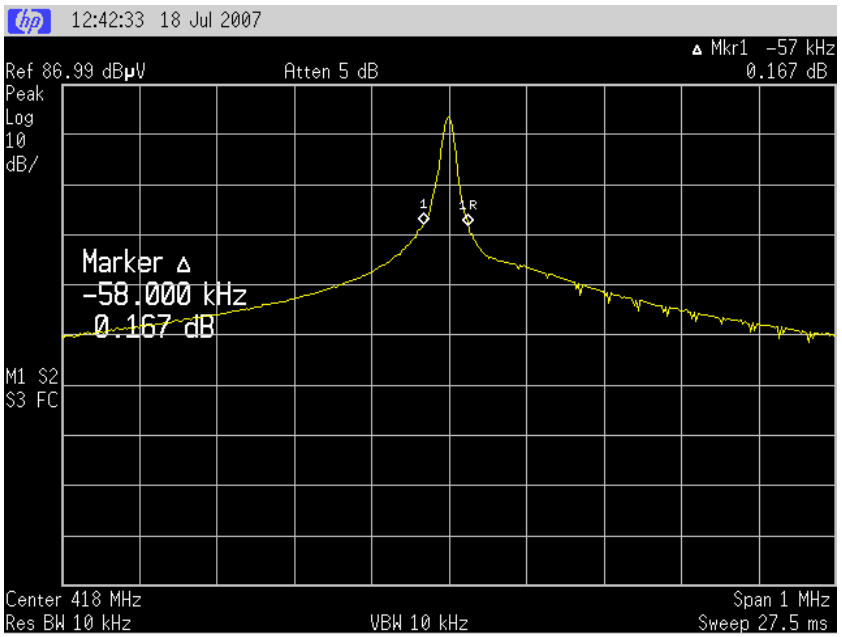
> Level (dBµV/m) = Receiver Reading (dBµV) + Antenna Factor (dB) + Coax Loss (dB)

Section 15.209: Emissions (above 30 MHz)

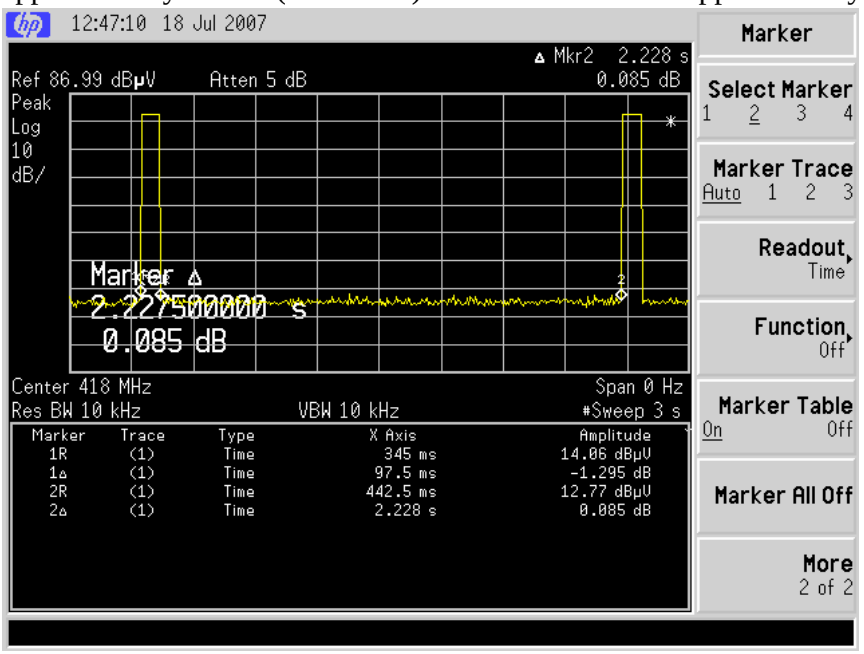
This device is a low power transmitter operating on approximately 418 MHz.



It has a 20 dB bandwidth of 58 kHz.



The transmitter does not operate continuously but has been measured to be on for approximately 98 mS (ie 100 mS) and it is then off for approximately 2.228 seconds.



Measurements between 30 –1000 MHz have been made at a distance of 3 metres.

A receiver with a quasi peak detector with a 120 kHz bandwidth was used between 30 – 1000 MHz.

All spurious emissions observed have levels less than the fundamental level.

The limits as described in Section 15.209 have been applied as follows:

30.0 – 88.0 MHz	100 uV/m	40 dBuV/m
88.0 – 216.0 MHz	150 uV/m	43.5 dBuV/m
216.9 – 960.0 MHz	200 uV/m	46.0 dBuV/m

Result: Complies with an 5.0 dB margin at 417.950 MHz.

Measurement uncertainty with a confidence interval of 95% is:

- Free radiation tests (30 – 1000 MHz) ± 4.1 dB

Results

Frequency MHz	Vertical dBuV/m	Hort dBuV/m	Limit dBuV/m	Margin dB	Result	Antenna	Detector
417.950	41.0	36.7	46.0	5.0	Pass	Vertical	Quasi Peak
835.900	38.0	30.3	46.0	8.0	Pass	Vertical	Quasi Peak
1253.850	24.2	23.8	54.0	29.8	Pass	Vertical	Average
1671.800	25.6	25.1	54.0	28.4	Pass	Vertical	Average
2089.750	-	-	54.0	-	Pass	-	Average
2507.700	-	-	54.0	-	Pass	-	Average
2925.650	-	-	54.0	-	Pass	-	Average
3343.600	-	-	54.0	-	Pass	-	Average
3761.550	-	-	54.0	-	Pass	-	Average
4179.500	-	-	54.0	-	Pass	-	Average

No other emissions detected within 20 dB of the applicable limit.

7. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref	Cal Due
Aerial Controller	EMCO	1090	9112-1062	RFS 3710	Not applicable
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708	Not applicable
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612	7 Feb 2009
Receiver	R & S	ESCS 30	847124/020	E1595	21 Dec 2007
Log Periodic	Schwarzbeck	VUSLP 9111	9111-228	3785	7 Feb 2009
Horn Antenna	Electrometrics	RGA-60	6234	E1494	7 Feb 2009
Spectrum Analsyer	Hewlett Pakard	E7405A	US39150142	3776	11 April 2008
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709	Not applicable
VHF Balun	Schwarzbeck	VHA 9103	-	RFS 3603	7 Feb 2009

8. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies Ltd registration with the Federal Communications Commission as a listed facility, registration number: 90838, which was updated on January 23rd, 2007.

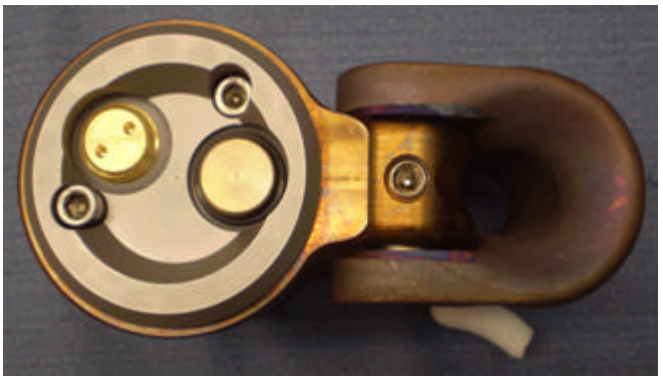
All testing was carried out in accordance with the terms of EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

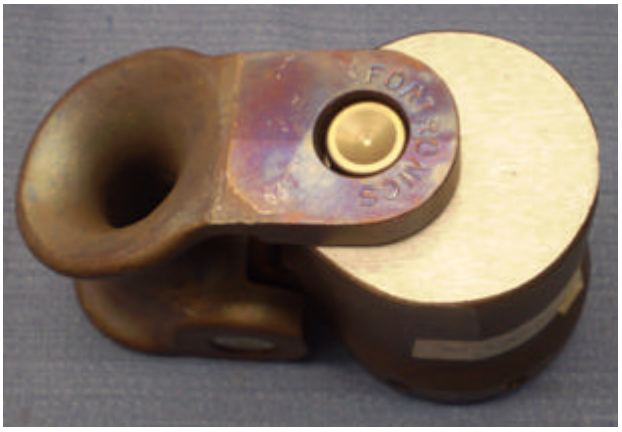
All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025, 2005.

International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with 46 accreditation bodies in 34 economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

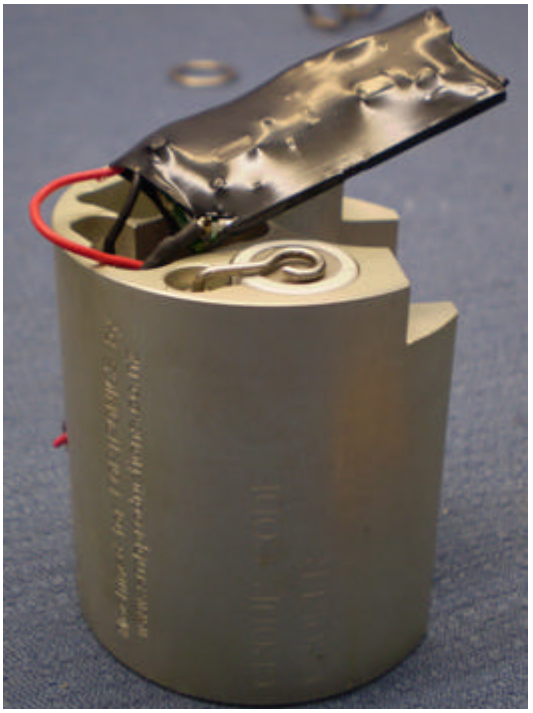
9. PHOTOGRAPH (S)

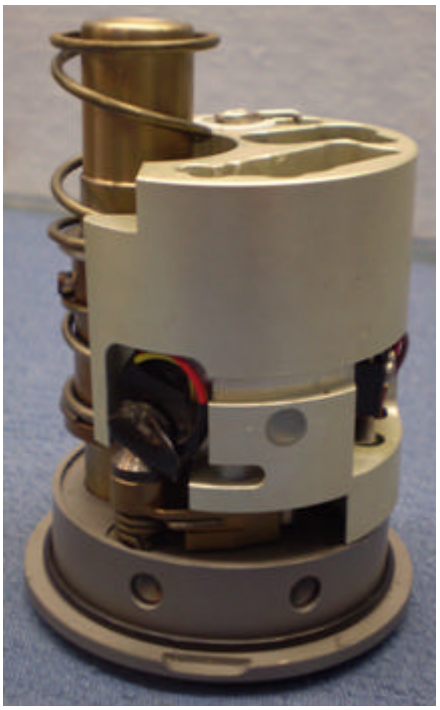
External Views



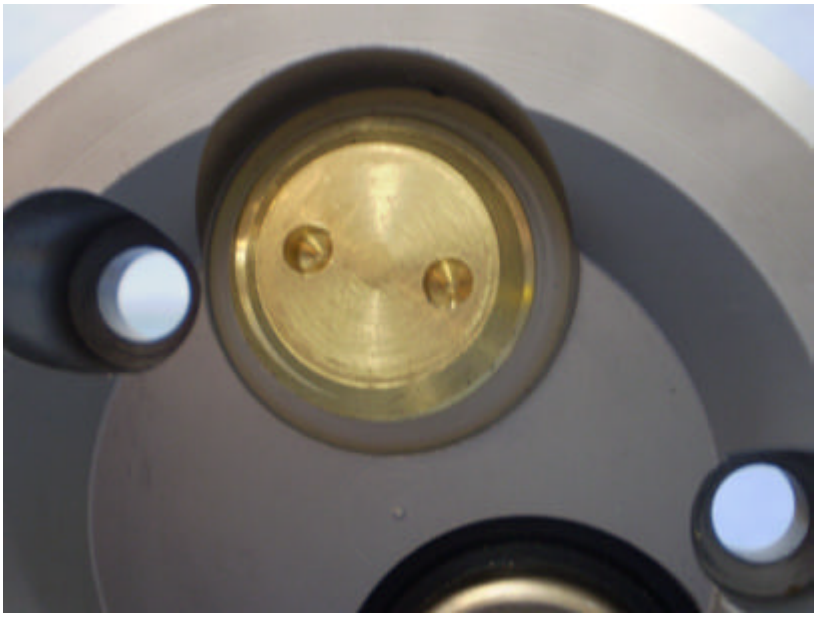


Internal Views

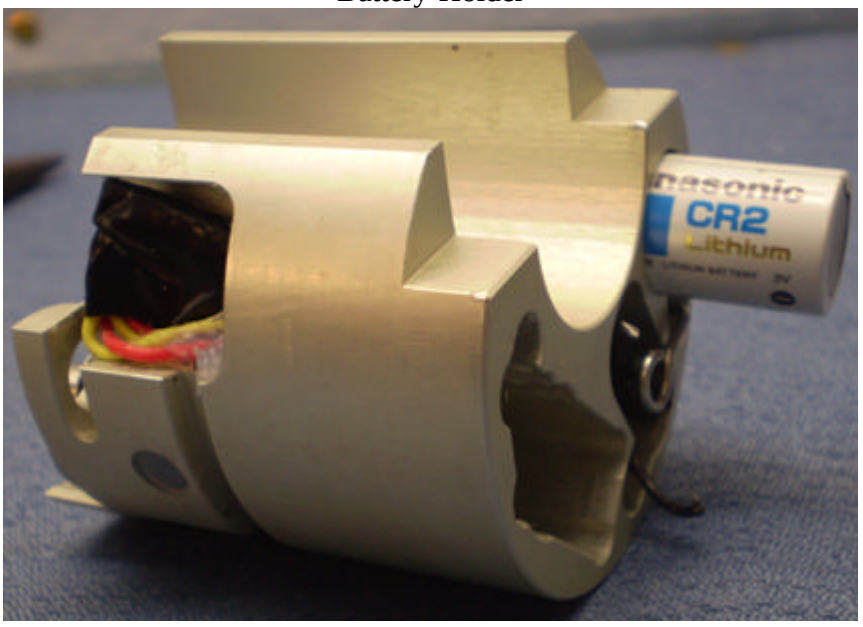




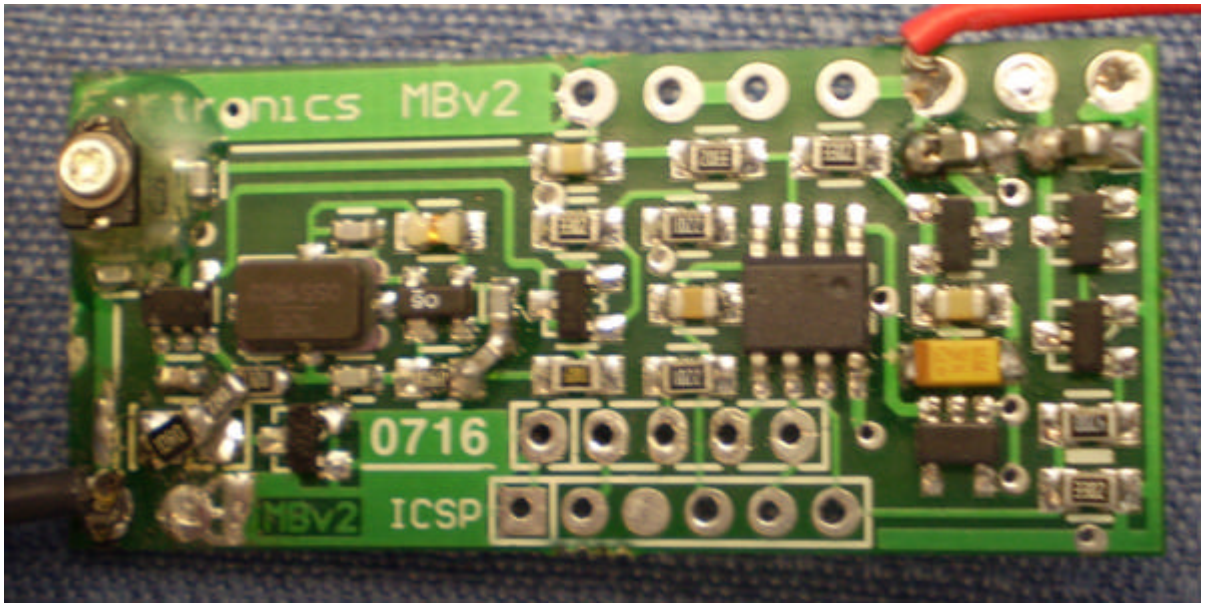
Antenna

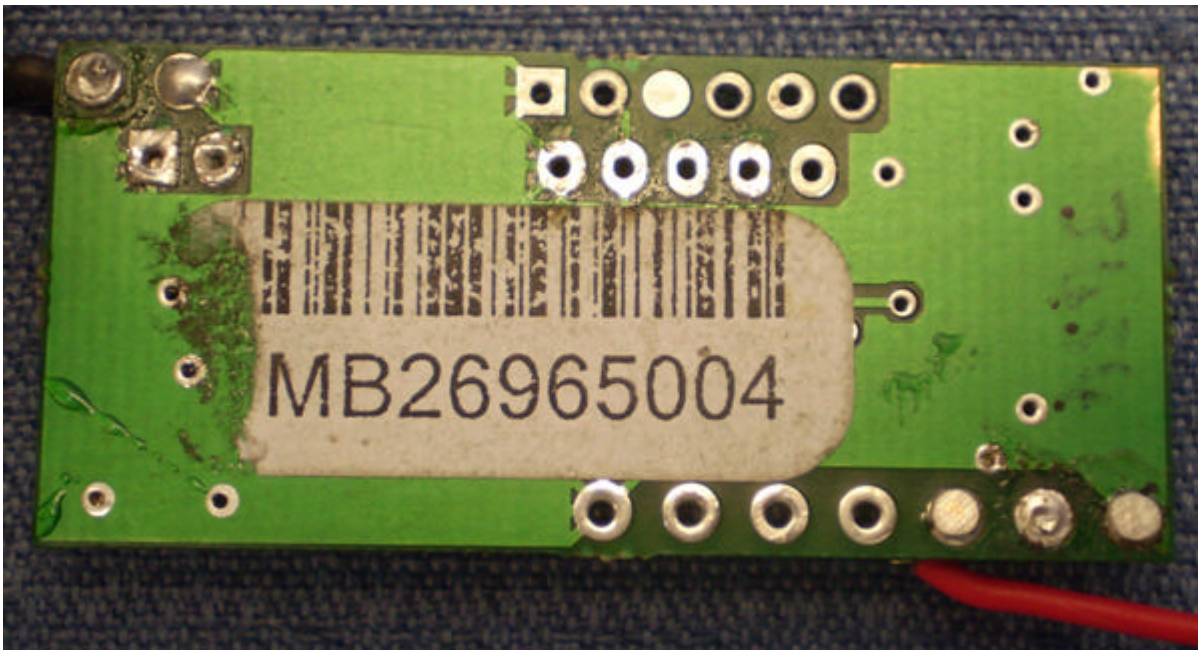


Battery Holder



Circuit Board





Radiated emissions test set up