EMC Technologies (NZ) Ltd

Test Report No **60227.3**
Report date: 28 March 2006

TEST REPORT

EDiT iD Palm Reader Module
RFID Reader

tested to

47 Code of Federal Regulations

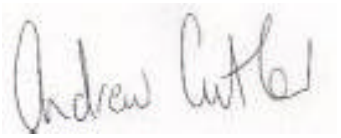
Part 15 - Radio Frequency Devices

Subpart C – Intentional Radiators

for

EDiT iD 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 **EDiT iD Palm Reader Module, RFID Reader** 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 connector unique.
15.204	External PA and antenna modifications	Not applicable. No external devices.
15.205	Restricted bands of operation	Complies. Device transmits on 125.0 kHz and 134.2 kHz
15.207	Conducted limits	Complies with a 8.3 dB margin at 0.5425 MHz (average).
15.209	Radiated emission limits - Fundamental	Complies with a 30.9 dB margin at 125.4 kHz.
15.209	Radiated emission limits - Spurious emissions <30 MHz	Complies. No emissions detected.
15.209	Radiated emission limits – Spurious emissions >30 MHz	Complies with a 15.9 dB margin at 398.0 MHz and 430.9 MHz.

3. INTRODUCTION

This report describes the tests and measurements performed on the **EDiT iD Palm Reader Module, RFID Reader** 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	EDiT iD Ltd
Address	PO Box 11017 Ellerslie
City	Auckland
Country	New Zealand
Contact	Mr Chris Anderson

5. DESCRIPTION OF TEST SAMPLE

Brand Name	EDiT iD
Model Number	Palm Reader Module
Product	RFID Reader, Mobile
Manufacturer	EDiT iD Ltd
Country of Origin	New Zealand
Serial Number	0F-326-009 (134 kHz), 0G-052-001 (125 kHz)

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 - 1992 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

As can be seen from the attached photographs the device has an integral antenna that is permanently attached.

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 can transmit on 125.0 kHz and 134.2 kHz.

This falls between the restricted bands of 90 –110 kHz and 495 – 505 kHz.

Result: Complies.

Section 15.207: Conducted limits

This device is normally operated using internal dc batteries.

Provision has been made for the internal batteries to be re-charged using an external 110 Vac battery charger.

Conducted emission testing has been carried out using a sample AC adaptor to charge the batteries while the device was transmitting continuously.

Conducted emissions testing was carried out over the frequency range of 150 kHz to 30 MHz at the Laboratory's MacKelvie Street premises in a 2.4 m x 2.4 m x 2.4 m screened room.

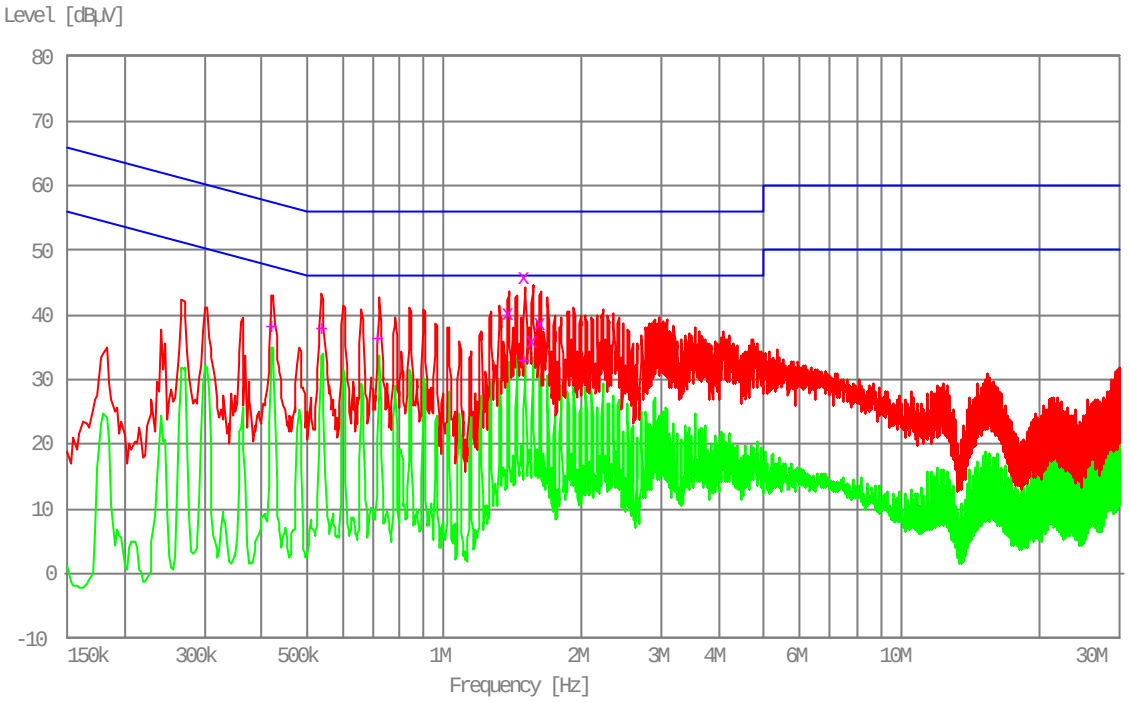
Measurements on both the phase and neutral lines were made using either a Quasi Peak or an Average detector with a 9 kHz bandwidth.

Measurement uncertainty with a confidence interval of 95% is:
- Mains terminal tests (0.15 - 30 MHz) ± 2.2 dB

Result: Complies.

Conducted Emissions

Comments:	Device tested when powered at 110 Vac while transmitting continuously.



Quasi-Peak Measurements

Frequency MHz	Level dBmV	Limit dBmV	Margin dB	Exceed	Phase	Rechecks dBmV
1.387500	40.38	56.00	15.62		L1	
1.502500	45.85	56.00	10.15		L1	
1.567500	36.02	56.00	19.98		L1	
1.625000	38.80	56.00	17.20		L1	

Average Measurements

Frequency MHz	Level dBmV	Limit dBmV	Margin dB	Exceed	Phase	Rechecks dBmV
0.420000	38.00	47.45	9.45		L1	
0.542500	37.68	46.00	8.32		L1	
0.722500	36.34	46.00	9.66		L1	
1.505000	32.74	46.00	13.26		L1	

Section 15.209: Radiated emission limits, general requirements

Radiated emissions testing was carried out over the frequency range of 100 kHz 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)

Fundamental emission:

Measurements on this device were carried out while it was operating continuously while being powered using the internal DC battery supply.

Measurements were made 125 kHz and 134 kHz using a magnetic loop antenna and a receiver with an average detector and a 9 kHz bandwidth.

As allowed by section 15.31(f)(2) measurements were made at 10 metres with the 300 metre limit being extrapolated using a factor of 40 dB per decade.

Frequency (kHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
125.400	54.1	85.0	30.9
134.300	53.3	85.0	31.7

Result: Complies with a 30.9 dB margin at 125.4 kHz.

Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (100 kHz – 30 MHz) ± 4.8 dB

Section 15.209: Spurious Emissions (below 30 MHz)

Transmitting on 125.4 kHz

Frequency kHz	Level dBuV/m	Limit dBuV/m	Margin dB	Result
250.800	< 50.4	79.0	> 28.6	Pass
376.200	< 44.4	75.5	> 31.1	Pass
501.600	< 41.0	53.0	> 12.0	Pass
627.000	< 39.6	51.1	> 11.5	Pass
752.400	< 39.5	49.5	> 10.0	Pass
877.800	< 36.8	48.1	> 11.3	Pass
1003.200	< 35.2	47.0	>11.8	Pass
1128.600	< 33.5	46.0	> 12.5	Pass
1254.000	< 50.4	79.0	> 28.6	Pass

Transmitting on 134.3 kHz

Frequency kHz	Level dBuV/m	Limit dBuV/m	Margin dB	Result
268.480	< 50.4	79.0	> 28.6	Pass
402.720	< 44.4	75.5	> 31.1	Pass
536.960	< 41.0	53.0	> 12.0	Pass
671.200	< 39.6	51.1	> 11.5	Pass
805.440	< 39.5	49.5	> 10.0	Pass
939.680	< 36.8	48.1	> 11.3	Pass
1073.920	< 35.2	47.0	>11.8	Pass
1208.160	< 33.5	46.0	> 12.5	Pass
1342.400	> 33.5	45.0	< 11.5	Pass

No emissions were detected from the device.

Magnetic loop measurements were made at a distance of 10 metres due to the presence of many high ambient emissions (AM broadcast stations).

Measurements were made while the device was being powered using an internal battery.

A receiver with an average detector and a 9 kHz bandwidth was used between 125 – 490 kHz and a quasi peak detector with a 9 kHz bandwidth was used between 490 kHz – 30.0 MHz.

The 300 metre limit between 125 – 490 kHz has been scaled by a factor of 60 dB per decade, as per section 15.31 (f) (2) and the 30 metre limit between 490 kHz – 30.0 MHz has been scaled by a factor of 40 dB per decade, as per section 15.31 (f) (2).

The spurious emissions observed do not exceed the level of the fundament emission.

Result: Complies.

Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (100 kHz – 30 MHz) ± 4.8 dB

Section 15.209: Spurious Emissions (above 30 MHz)

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

Measurements were made while the device was being powered using an internal battery and while the device was transmitter continuously.

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

Measurements were carried out as the device contains a digital device.

The limits as described in Section 15.209 have been applied.

The levels observed did not vary when the transmitter was switched from 125 kHz to 134 kHz operations.

Result: Complies with a 15.9 dB margin at 398.0 MHz and 430.9 MHz.

Measurement uncertainty with a confidence interval of 95% is:
- Free radiation tests (30 – 1000 MHz) ± 4.1 dB

Radiated Emission Levels

Frequency	Level		Limit	Margin	Result	Worst Case
	Vertical	Hort				Antenna
MHz	dBuV/m	dBuV/m	dBuV/m	dB		
57.000	12.0		40.0	28.0	Pass	Vertical
71.000	10.0		40.0	30.0	Pass	Vertical
75.000	14.0		40.0	26.0	Pass	Vertical
83.000	12.8		40.0	27.2	Pass	Vertical
271.000	24.5		46.0	21.5	Pass	Vertical
300.000	25.1		46.0	20.9	Pass	Vertical
351.000	25.3		46.0	20.7	Pass	Vertical
365.000	27.1		46.0	18.9	Pass	Vertical
384.000	27.0		46.0	19.0	Pass	Vertical
398.000	30.1		46.0	15.9	Pass	Vertical
430.900	34.7		46.0	15.9	Pass	Vertical

7. TEST EQUIPMENT USED

Instrument	Manufacturer	Model	Serial No	Asset Ref
Aerial Controller	EMCO	1090	9112-1062	RFS 3710
Aerial Mast	EMCO	1070-1	9203-1661	RFS 3708
Biconical Antenna	Schwarzbeck	BBA 9106	-	RFS 3612
Log Periodic Antenna	Schwarzbeck	VUSLP 9111	9111-228	RFS 3785
Measurement Receiver	Rohde & Schwarz	ESCS 30	847124/020	E1595
Measurement Receiver	Rohde & Schwarz	ESHS 10	828404/005	RFS 3728
Magnetic Loop	EMCO	6502	9311-2801	A-231
Artificial Mains Network	Rohde & Schwarz	ESH2-Z5	881362/034	RFS 3628
Variac	General Radio	1592	-	RFS 3690
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709
VHF Balun Antenna	Schwarzbeck	VHA 9103		RFS 3603

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 February 17th, 2004.

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 17025.1999.

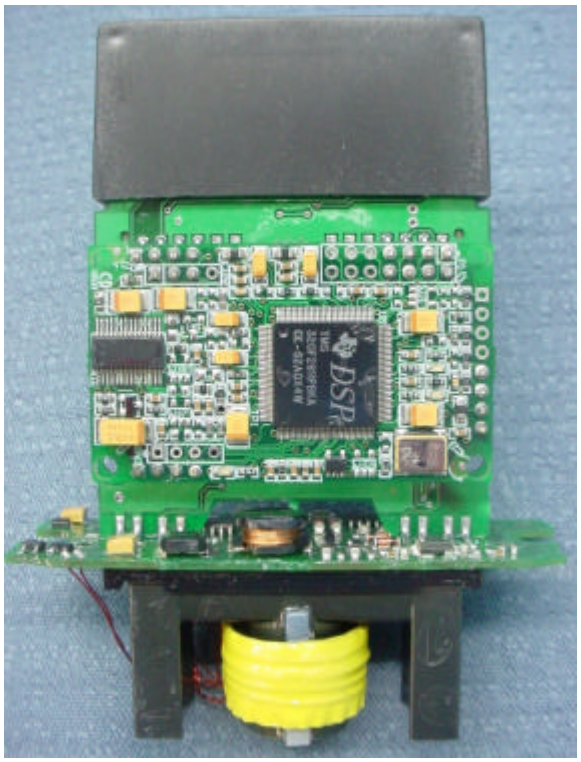
All measurement equipment has been calibrated in accordance with the terms of the EMC Technologies (NZ) Ltd International Accreditation New Zealand (IANZ) Accreditation to NZS/ISO/IEC 17025.1999.

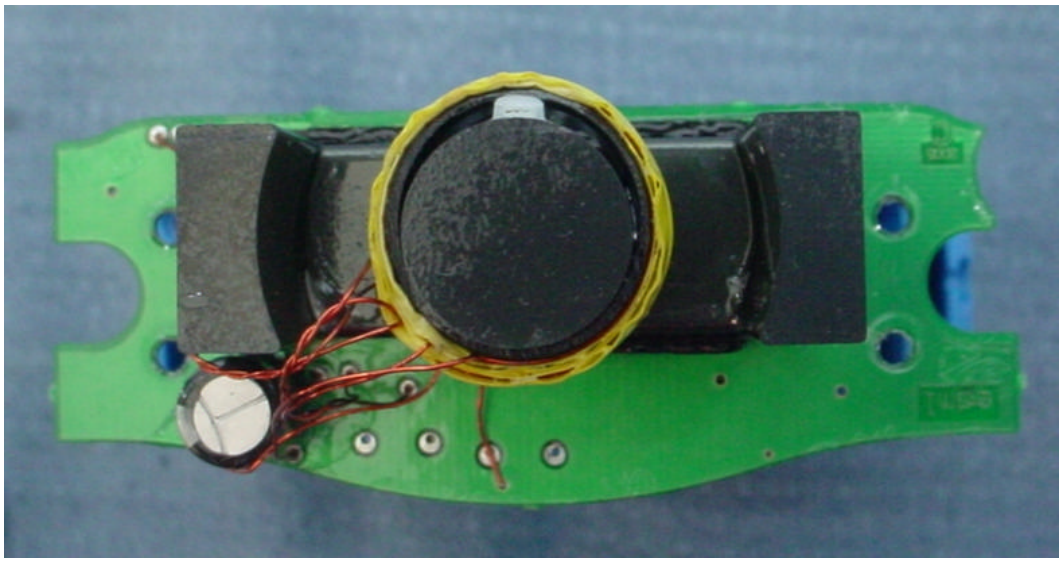
International Accreditation New Zealand has Mutual Recognition Arrangements for testing and calibration with 46 accreditation bodies in 34 economies. This includes NATA (Australia), UKAS (UK), SANAS (South Africa), NVLAP (USA), A2LA (USA), SWEDAC (Sweden). Further details can be supplied on request.

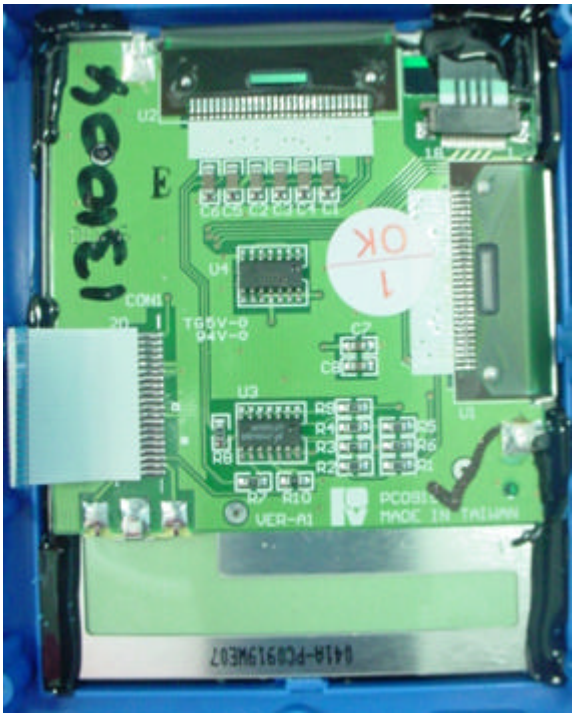
9. PHOTOGRAPH (S)

External Views

Internal Views







Radiated emissions test setups