# EMC Technologies (NZ) Ltd

Test Report No **61121.2a**

Report date: 11 December 2006

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# TEST REPORT

## 4RF Aprisa XE 400-025-vv
## QJET Point-to-Point Digital Radio

*tested to the*

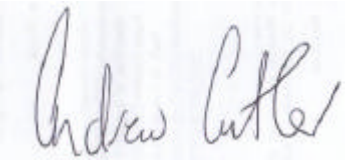
## Code of Federal Regulations (CFR) 47

## Part 15 – Radio Frequency Device

*for*

## 4RF Communications 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

laboratory

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## 1. CLIENT INFORMATION

| | |
|---|---|
| **Company Name** | 4RF Communications Ltd |
| **Address** | PO Box 13-506 |
| **City** | Wellington |
| **Country** | New Zealand |
| **Contact** | Mr Alan Turner |

## 2. DESCRIPTION OF TEST SAMPLE

| | |
|---|---|
| **Brand Name** | 4RF |
| **Model Number** | Aprisa XE 400-025-vv QJET |
| **Product** | Point-to-Point Digital Radio |
| **Manufacturer** | 4RF Communications Ltd |
| **Manufactured in** | New Zealand |
| **Serial Number** | 21804360 |
| **FCC ID** | UIPN0400025A0200A |

This report replaces report number 61121.2 in order to show additional receiver measurements.

# 3. COMPLIANCE STATEMENT AND RESULT SUMMARY

The **4RF Aprisa XE 400-025-vv QJET Point-to-Point Digital Radio** complies with the limits defined in 47CFR 15 and 47 CFR Part 2 when tested in-accordance with the test methods described in 47 CFR Part 2 and ANSI C63.4 – 2003 where appropriate.

| CLAUSE | TEST PERFORMED | RESULT |
|---|---|---|
| 15.111 | Antenna conducted power measurement | Complies |

# 4. TEST SAMPLE DESCRIPTION

The receiver tested has the following specifications:

Receiver modulation modes

16QAM 32QAM 64QAM

Receiver frequency range

421 – 512 MHz

Test frequency

Receive: 421.000 MHz, 466.500 MHz, 478.500 MHz, 509.000 MHz

FCC Bands

Part 90: 421 – 512 MHz

Channel Spacing

6.25 kHz

Power Supply

External 48 Vdc supply.

# 5. TEST CONDITIONS

Standard Temperature and Humidity

Temperature: +25°C ± 4° maintained.
Relative Humidity: 60% ± 10% observed.

Standard Test Power Source

Standard Test Voltage: 48 Vdc.

# 6. ATTESTATION

The **4RF Aprisa XE 400-025-vv QJET Point to Point Digital Radio** complies with the Code of Federal Regulations (CFR) 47 Part 90 –Private Land Mobile Services and 47 Part 15 – Radio Frequency Devices.

This report describes the tests and measurements performed for the purpose of determining compliance with the specification with the following conditions:

**The client selected the test sample.**

**The report relates only to the sample tested.**

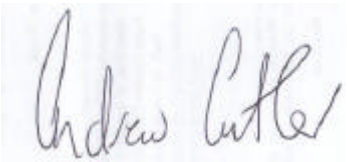
**This report does not contain corrections or erasures.**

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.

In addition this equipment has been tested in accordance with the requirements contained in the appropriate Commission regulations.

To the best of my knowledge, these tests were performed using measurement procedures that are consistent with industry or Commission standards and demonstrate that the equipment complies with the appropriate standards.

I further certify that the necessary measurements were made by EMC Technologies NZ Ltd, 47 MacKelvie Street, Grey Lynn, Auckland, New Zealand.



Andrew Cutler
General Manager
EMC Technologies NZ Ltd

# 7. TEST RESULTS

**Receiver Spurious emissions at antenna terminals**

| Receive Frequency (MHz) | Emission Frequency (MHz) | Level (dBm) | Limit (dBm) |
|---|---|---|---|
| 509.000 | 439.000 | - | -57.0 |
| 478.500 | 408.500 | - | -57.0 |
| 466.500 | 396.500 | - | -57.0 |
| 421.000 | 351.000 | - | -57.0 |

As allowed for in Section 15.109(f) measurements have been attempted at the antenna terminals in accordance with Section 15.111(a) as the receiver has an antenna terminal.

As specified in Section 15.31(m) measurements were attempted on frequencies near the top, middle and bottom of the tuning range as the tuning range exceeds 10 MHz.

The receiver has an IF of 70 MHz using low side local oscillator injection.

Measurements were carried out with the transmitter not powered and at each of the local oscillator frequencies in particular.

Additional measurements between 100 kHz – 5 GHz were also attempted at the antenna terminal at each receiver frequency however no emissions were observed.

Any emissions were therefore less than approximately than –100.0 dBm.

**Limit:**
In accordance with CFR 47 Part 15, section 15.111 the power of any emission at the antenna terminal should not exceed 2 nW (–57.0 dBm).

**Result:** Complies
**Measurement Uncertainty:** ±3.3 dB

# 8. TEST EQUIPMENT USED

| Instrument | Manufacturer | Model | Serial # | Asset |
|---|---|---|---|---|
| Measurement Receiver | Rohde & Schwarz | ESCS 30 | 847124/020 | E1595 |
| Coax Cable | Sucoflex | 104P | 29861/4P | - |
| Power Supply | Hewlett Packard | 6032A | 2743A-02859 | E1069 |
| Spectrum Analyzer | Hewlett Packard | E7405A | US39150142 | 3776 |
| Thermal chamber | Contherm | M180F | 86025 | E1129 |
| Thermometer | DSIR | RT200 | 035 | E1049 |

# 9. ACCREDITATIONS

Testing was carried out in accordance with EMC Technologies NZ Ltd registration with the Federal Communications Commission as a listed facility, Registration Number: 90838, which was last updated on February 17th, 2004.

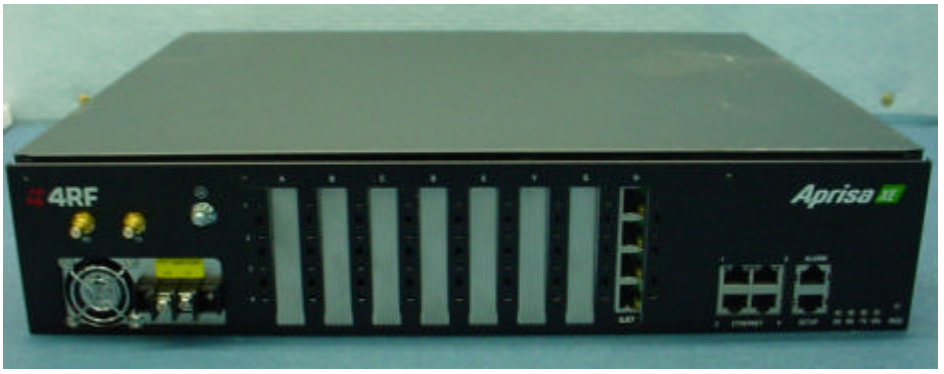
All testing has been carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to ISO/IEC 17025.

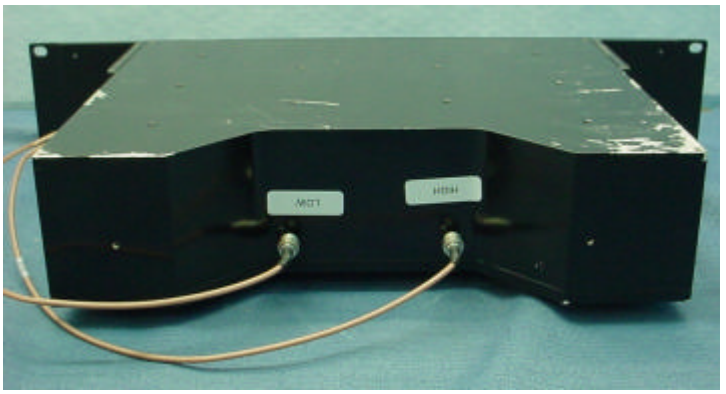
All measurement equipment has been calibrated in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to ISO/IEC 17025.

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.

## 10. PHOTOGRAPH (S)

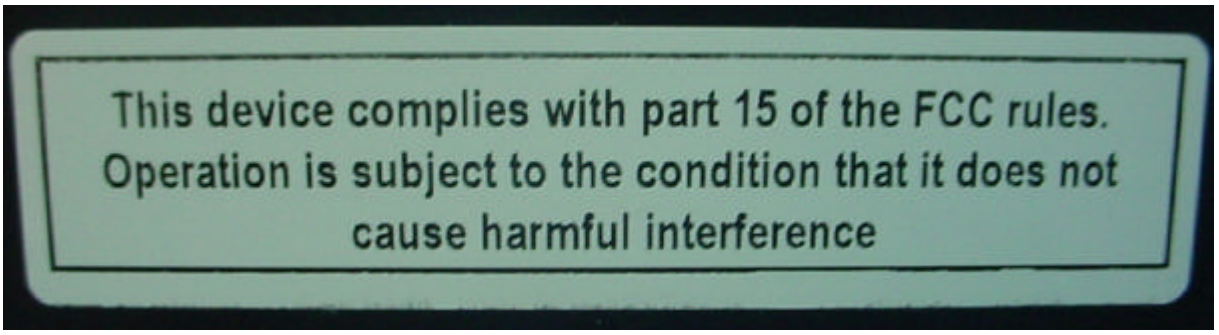
**External views**

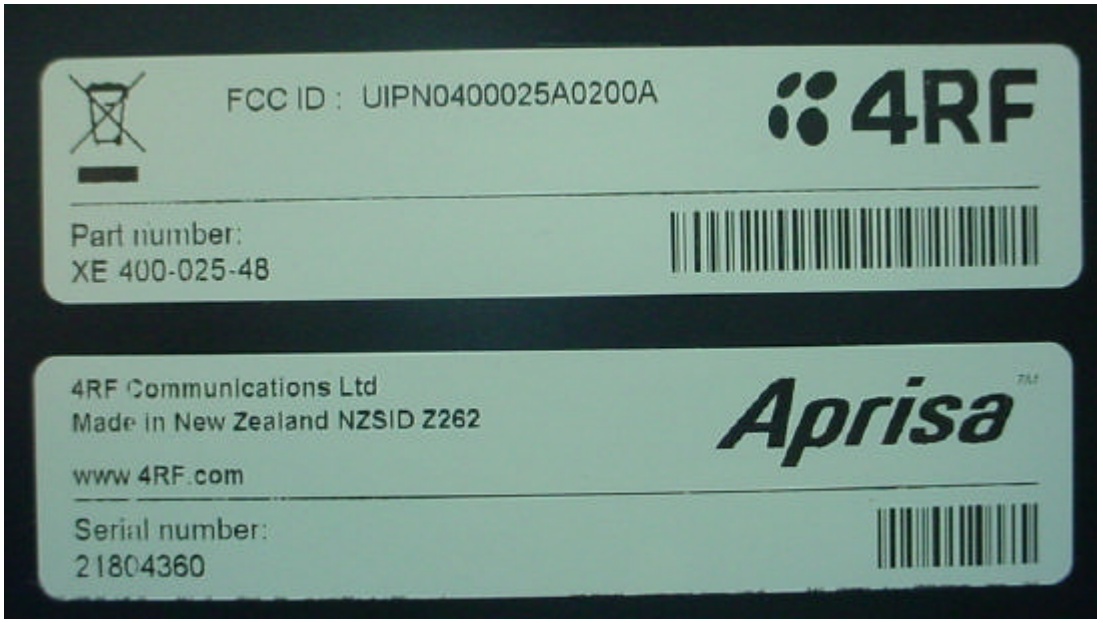




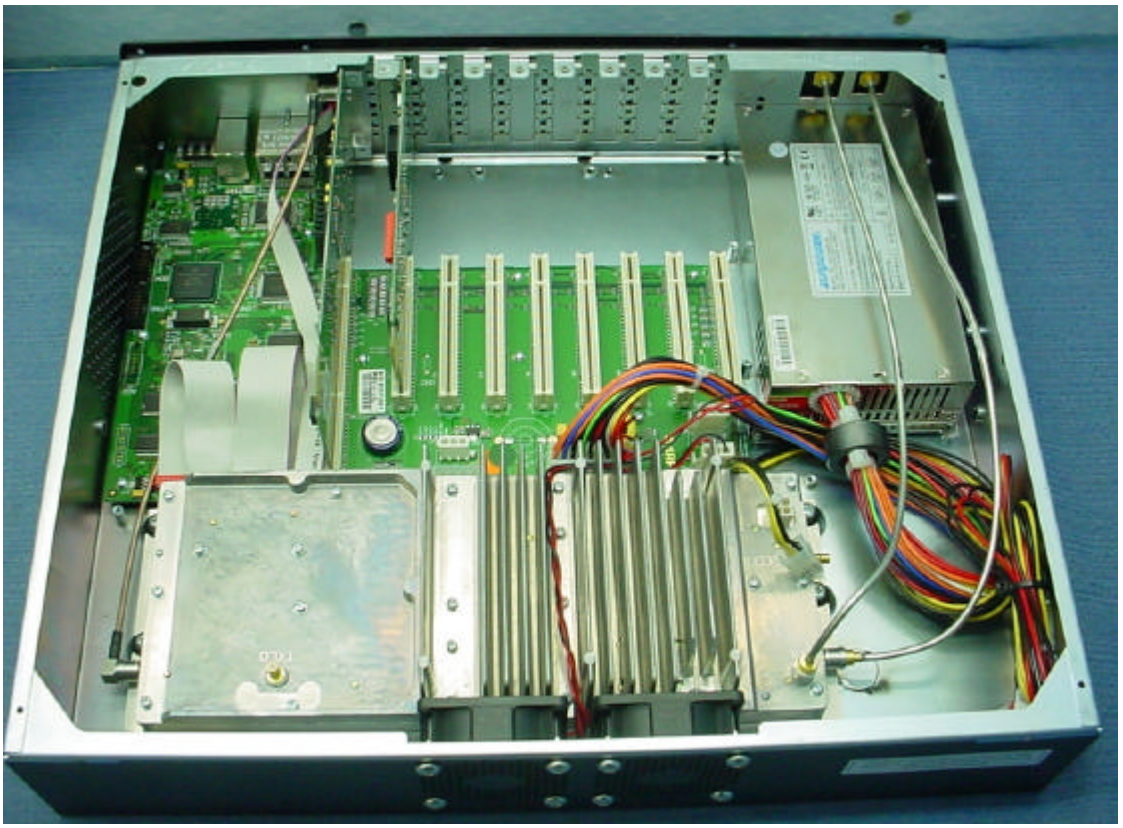
## Label

4RF
Aprisa

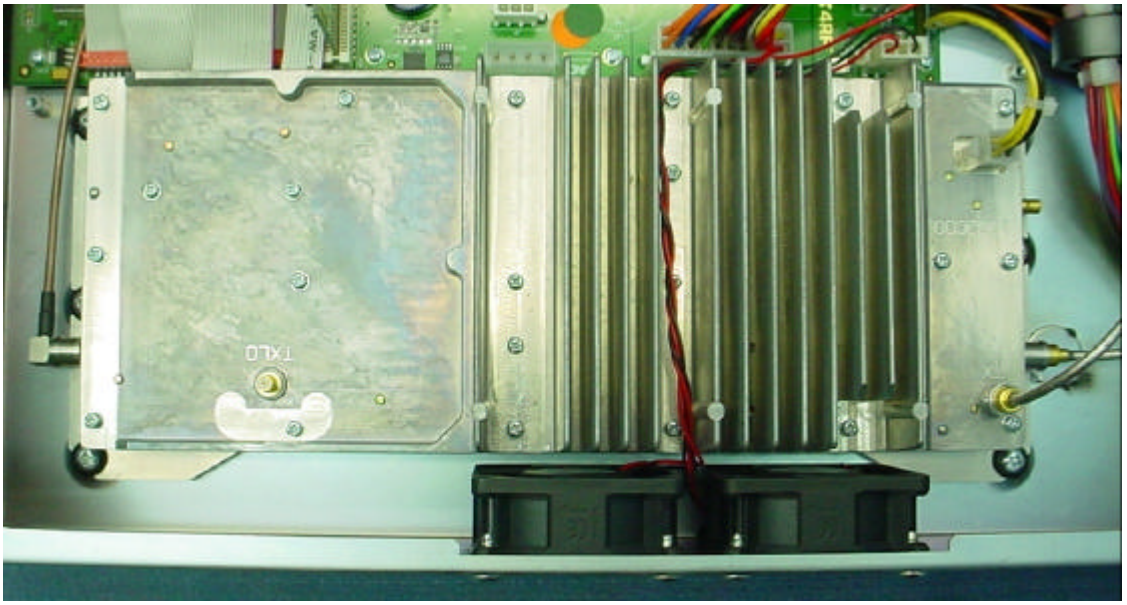

This device complies with part 15 of the FCC rules.
Operation is subject to the condition that it does not
cause harmful interference


FCC ID : UIPN0400025A0200A
4RF
Part number:
XE 400-025-48
4RF Communications Ltd
Made in New Zealand NZSID Z262
www 4RF.com
Aprisa
Serial number:
21804360

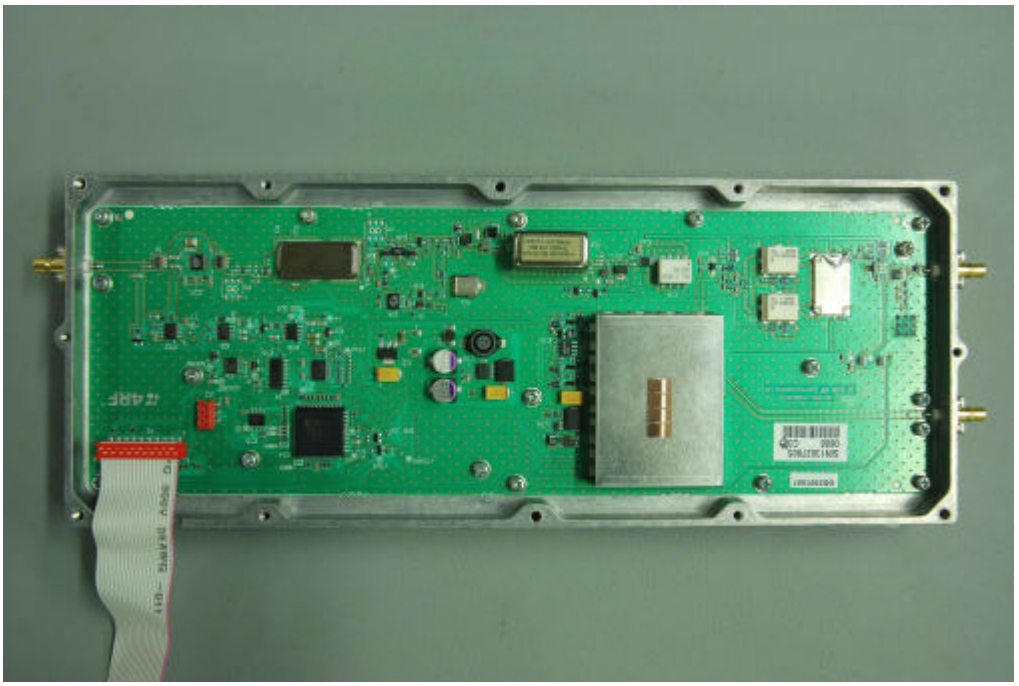
## Overall Internal View



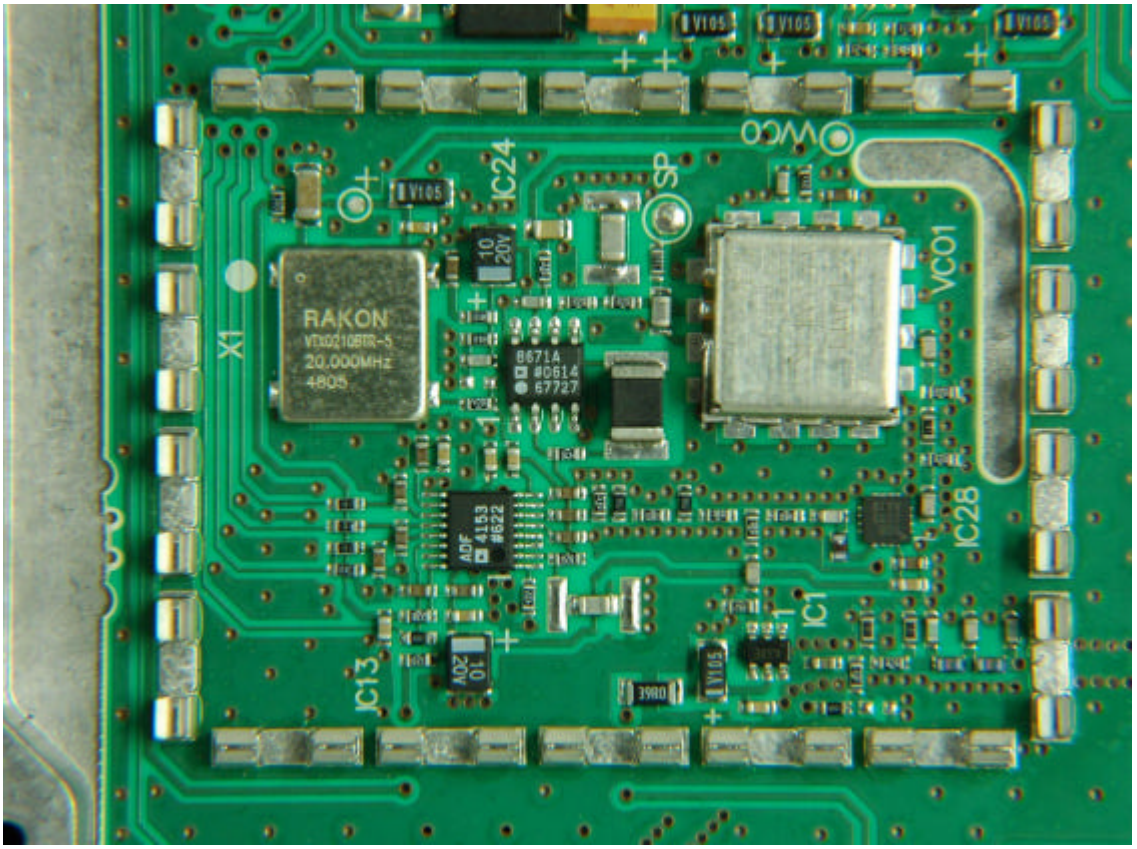
## Receiver and Transmitter Modules



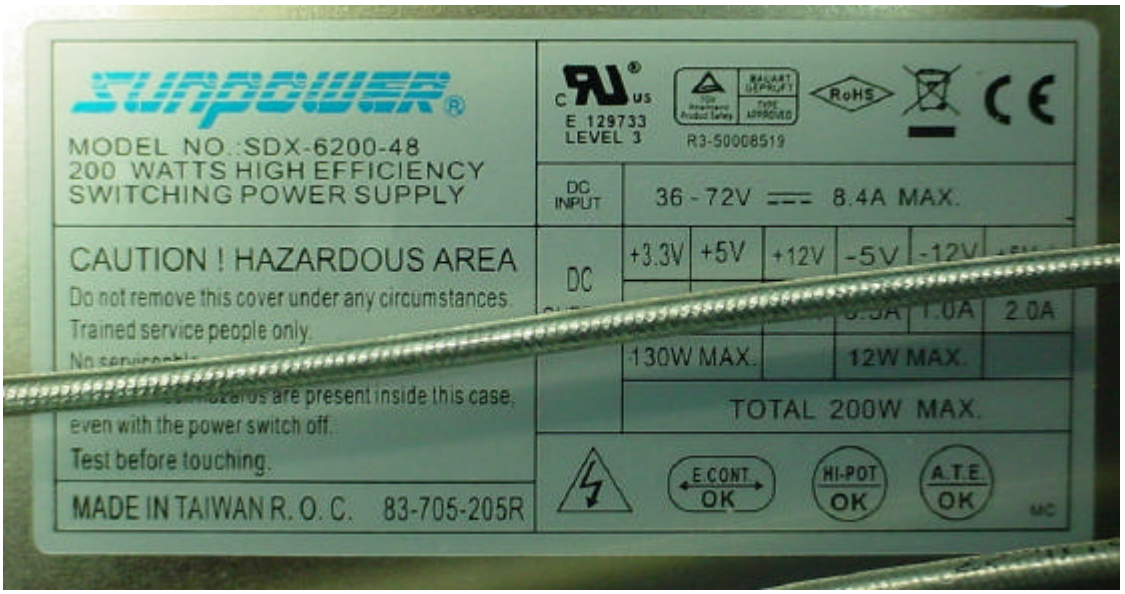
## Receiver Board



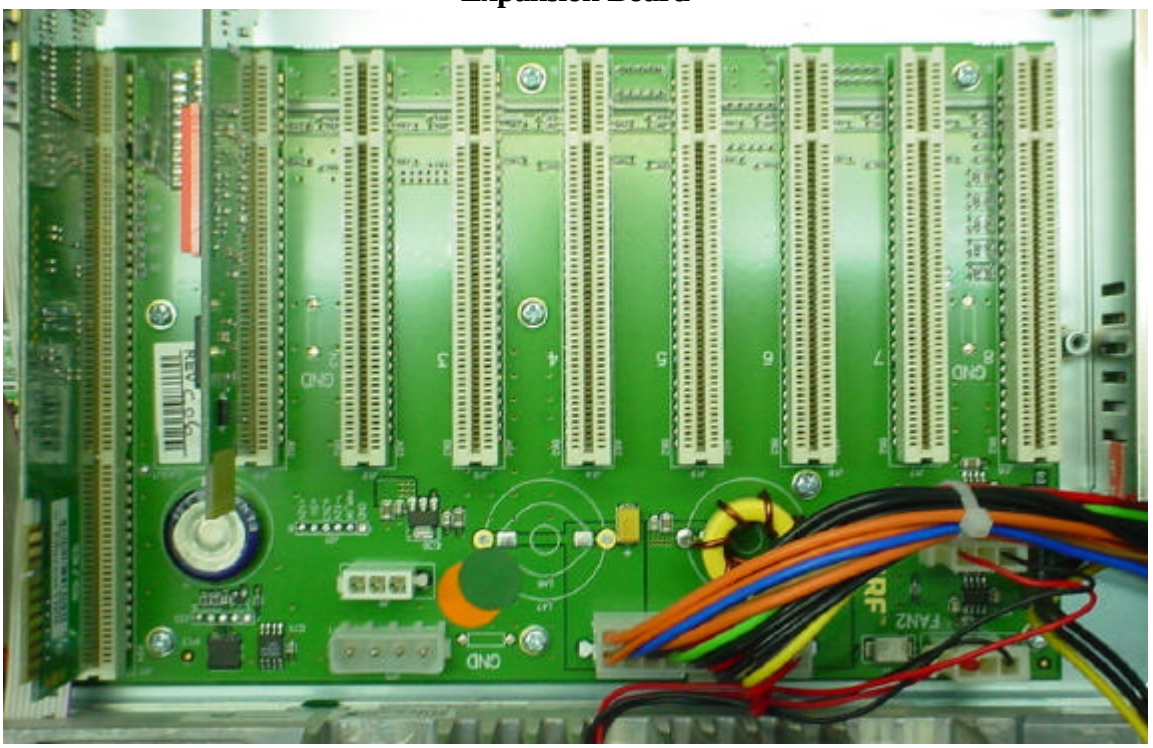
## Under the RF Shield on the Receiver Board



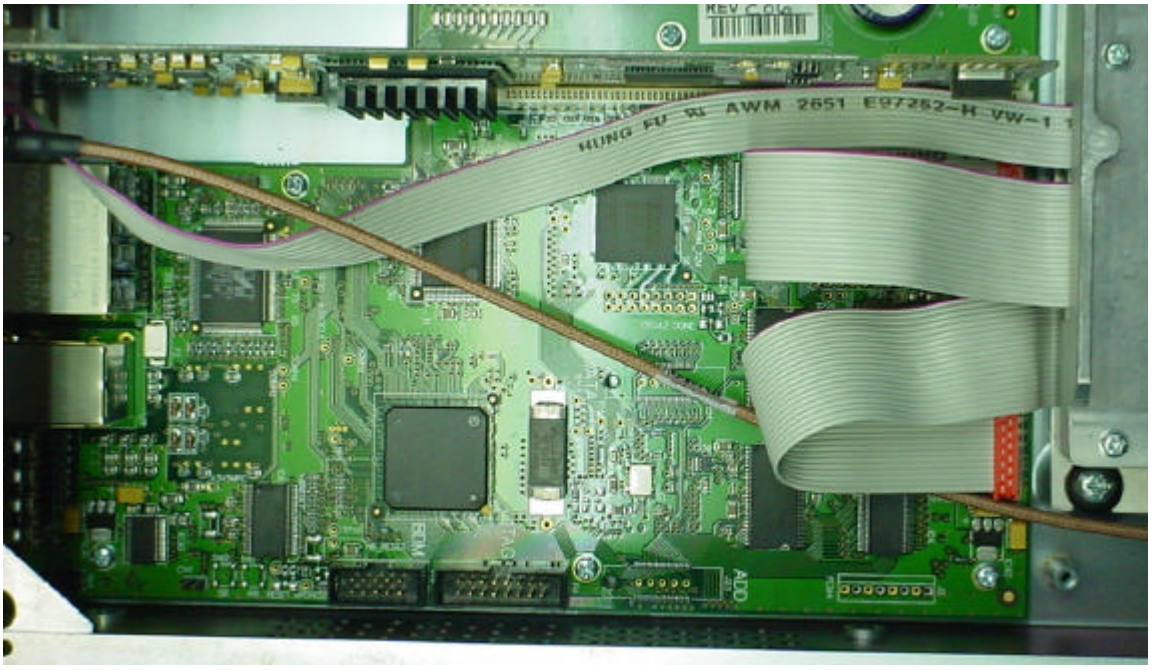
## Power Supply



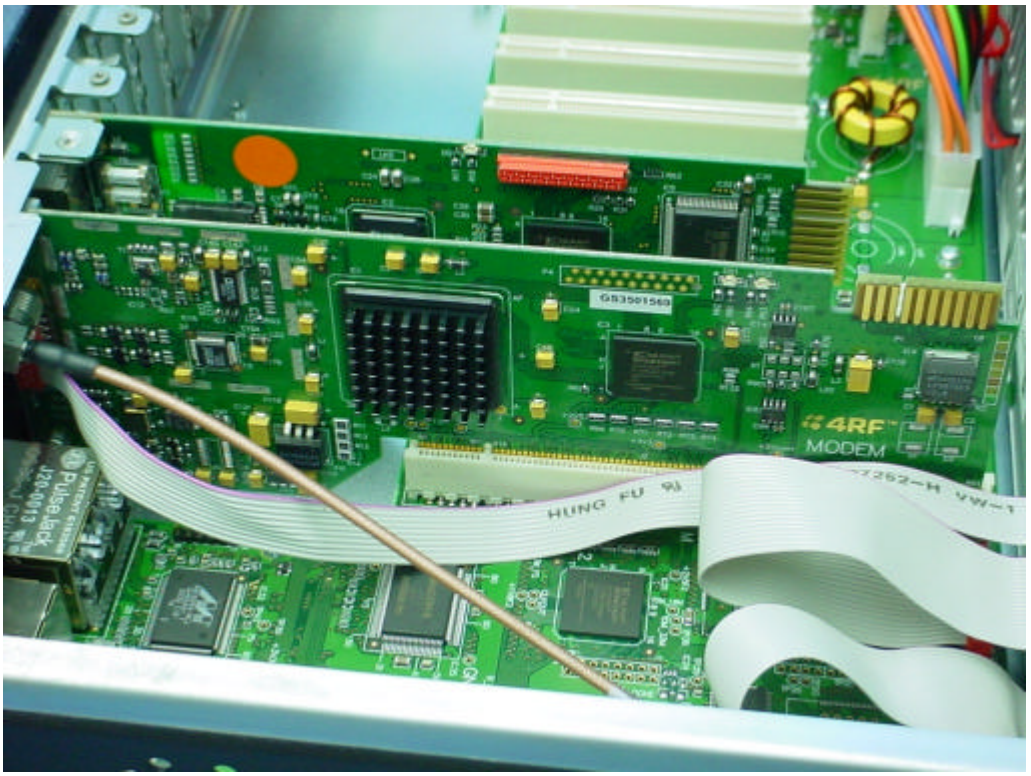
## Expansion Board

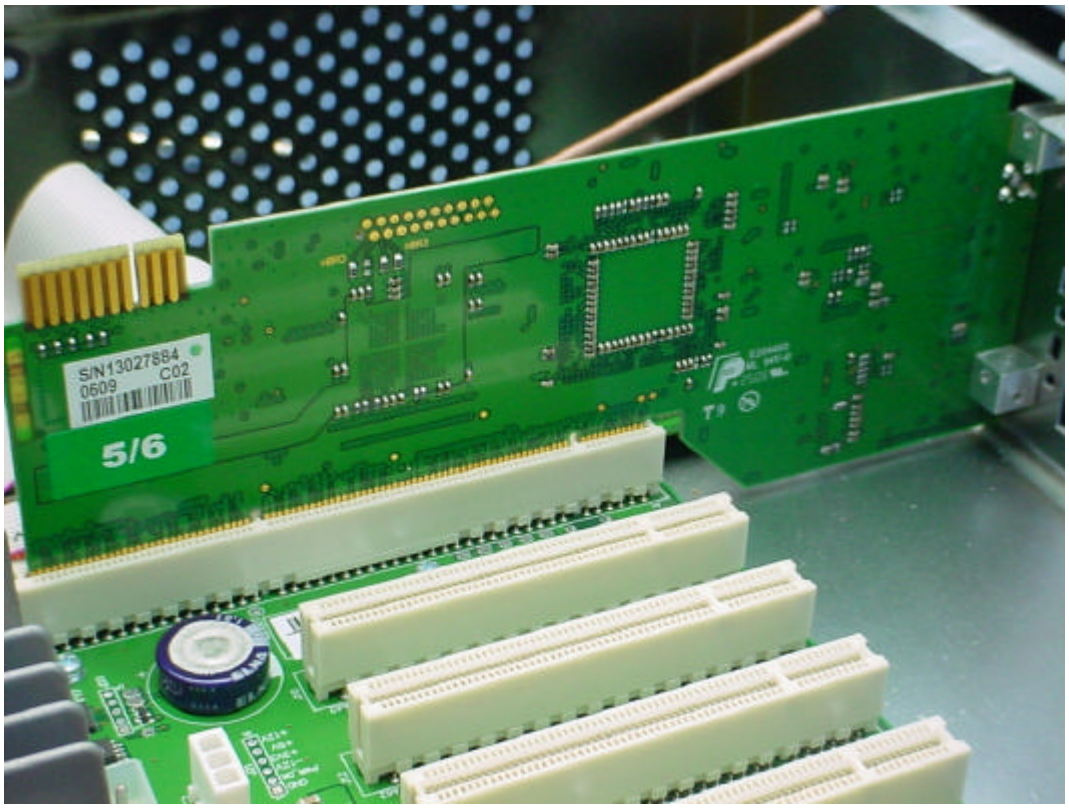


## Processor Board

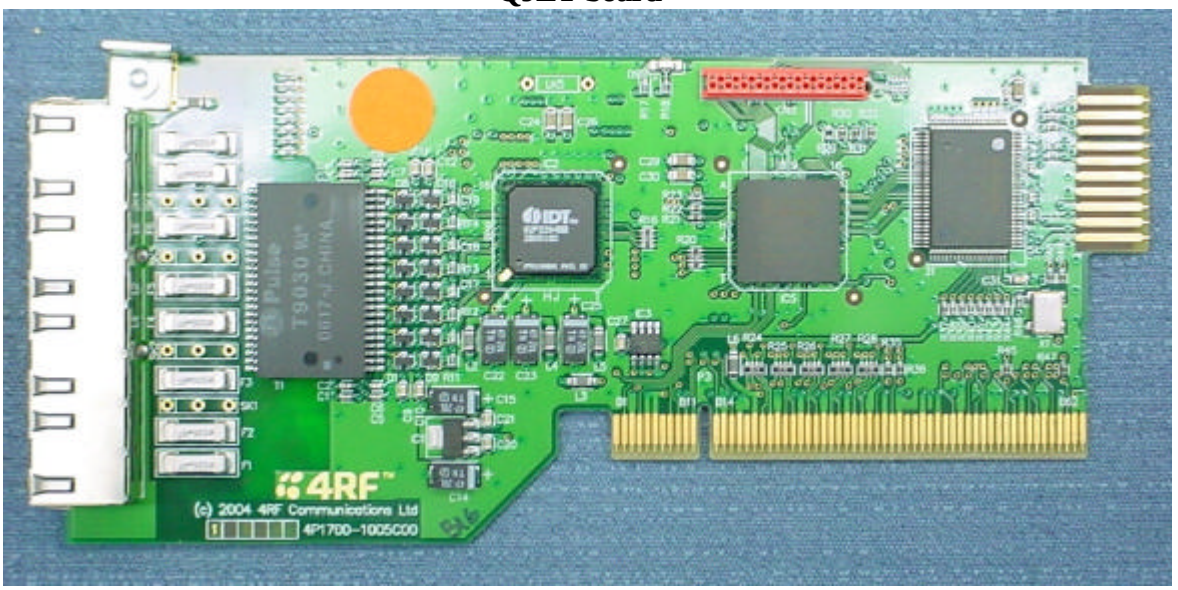


## Modem board



**QJET board**


4RF
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4P1700-1005C00

QJET
S/N 33112031
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