

TEST REPORT FROM RFI GLOBAL SERVICES LTD

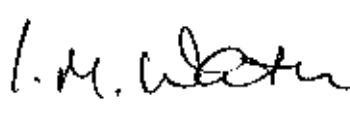
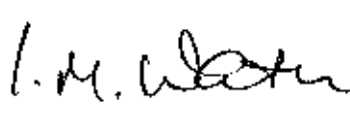
Test of: Thermo Fisher TruDefender FTi

FCC ID: Z4HTDFTI

To: FCC Part 22.913(a) & Part 24.232

Test Report Serial No:
RFI-RPT-RP81737JD11A V2.0

Version 2.0 Supersedes All Previous Versions

| | | |
|---|--|--|
| This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals: | |  |
| Checked By: | Ian Watch | |
| Signature: |  | |
| Date of Issue: | 07 October 2011 | |

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1. Customer Information





| | |
|----------------------|--|
| Company Name: | Connected Development LLC |
| Address: | 5020 Weston Parkway Suite 215 Cary, NC 27513 United States |

2. Summary of Testing

2.1. General Information

| | |
|---------------------------------|--|
| Specification Reference: | 47CFR22 |
| Specification Title: | Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 22 Subpart H (Public Mobile Services) – Section 22.913 |
| Specification Reference: | 47CFR24 |
| Specification Title: | Code of Federal Regulations Volume 47 (Telecommunications) 2010: Part 24 Subpart E (Personal Communication Services) – Section 24.232 |
| Site Registration: | FCC: 209735 |
| Location of Testing: | RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH |
| Test Dates: | 12 August 2011 to 16 August 2011 |

2.2. Summary of Test Results

| FCC Reference (47CFR) | Measurement | Result |
|---|---------------------------------|---|
| Part 22 | | |
| Part 22.913(a) | Transmitter Output Power (ERP) |  |
| Part 24 | | |
| Part 24.232 | Transmitter Output Power (EIRP) |  |
| Key to Results | | |
|  = Complied  = Did not comply | | |

2.3. Methods and Procedures

| | |
|-------------------|--|
| Reference: | ANSI/TIA-603-C-2004 |
| Title: | Land Mobile Communications Equipment, Measurements and performance Standards |

2.4. Deviations from the Test Specification

For the measurements contained within this test report, there were no deviations from, additions to, or exclusions from the test specification identified above.

3. Equipment Under Test (EUT)

3.1. Identification of Equipment Under Test (EUT)

| | |
|--------------------------|-----------------|
| Brand Name: | Thermo Fisher |
| Model Name or Number: | TruDefender FTi |
| IMEI: | 356265020562681 |
| Hardware Version Number: | 001 |
| Software Version Number: | 001 |
| FCC ID: | Z4HTDFTI |

3.2. Description of EUT

The equipment under test was a toxic-substance detector.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

| | | | |
|------------------------------|------------------|--------------------------|-------------------------|
| Type of Radio Device: | Transceiver | | |
| Mode: | GPRS/EGPRS | | |
| Power Supply Requirement(s): | Nominal | 3.7 V (internal battery) | |
| Technology Tested: | GSM850 | | |
| Maximum Output Power (ERP): | GPRS | 19.3 dBm | |
| | EGPRS | 19.3 dBm | |
| Transmit Frequency Range: | 824 to 849 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 128 | 824.2 |
| | Middle | 190 | 836.6 |
| | Top | 251 | 848.8 |
| Technology Tested: | PCS1900 | | |
| Maximum Output Power (EIRP): | GPRS | 29.5 dBm | |
| | EGPRS | 29.5 dBm | |
| Transmit Frequency Range: | 1850 to 1910 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 512 | 1850.2 |
| | Middle | 660 | 1879.8 |
| | Top | 810 | 1909.8 |
| Technology Tested: | UMTS Band V | | |
| Maximum Output Power (ERP): | Circuit Switched | 14.8 dBm | |
| Transmit Frequency Range: | 826 to 847 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 4132 | 826.4 |
| | Middle | 4183 | 836.6 |
| | Top | 4223 | 846.6 |
| Technology Tested: | UMTS Band II | | |
| Maximum Output Power (EIRP): | Circuit Switched | 27.0 dBm | |
| Transmit Frequency Range: | 1852 to 1908 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 9262 | 1852.4 |
| | Middle | 9400 | 1880.0 |
| | Top | 9538 | 1907.6 |

3.5. Support Equipment

No support equipment was used to exercise the EUT during testing.

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

The EUT was tested in the following operating mode(s):

- Constantly transmitting at full power on bottom, middle and top channels as required.

4.2. Configuration and Peripherals

The EUT was tested in the following configuration(s):

- Connected by an RF link to a GSM/UMTS system simulator operating in transceiver mode.

5. Measurements, Examinations and Derived Results

5.1. General Comments

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 6 Measurement uncertainty* for details.

5.2. Test Results- Part 22**5.2.1. Transmitter Output Power (ERP)****Test Summary:**

| | | | |
|-------------------|-----------------|------------|----------------|
| Test Engineer: | Andrew Edwards | Test Date: | 16 August 2011 |
| Test Sample IMEI: | 356265020562681 | | |

| | |
|-------------------|---|
| FCC Part: | 22.913(a) |
| Test Method Used: | As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 |

Environmental Conditions:

| | |
|------------------------|----|
| Temperature (°C): | 28 |
| Relative Humidity (%): | 30 |

Results: GPRS850

| Channel | Frequency (MHz) | Antenna Polarity | ERP (dBm) | ERP Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------|-----------|-----------------|-------------|----------|
| Bottom | 824.2 | Vertical | 17.6 | 38.0 | 20.4 | Complied |
| Middle | 836.6 | Vertical | 18.1 | 38.0 | 19.9 | Complied |
| Top | 848.8 | Vertical | 19.3 | 38.0 | 18.7 | Complied |

Results: EGPRS850

| Channel | Frequency (MHz) | Antenna Polarity | ERP (dBm) | ERP Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------|-----------|-----------------|-------------|----------|
| Bottom | 824.2 | Vertical | 17.6 | 38.0 | 20.4 | Complied |
| Middle | 836.6 | Vertical | 18.3 | 38.0 | 19.7 | Complied |
| Top | 848.8 | Vertical | 19.3 | 38.0 | 18.7 | Complied |

Transmitter Output Power (ERP)(continued)**Test Summary:**

| | | | |
|--------------------------|-----------------|-------------------|----------------|
| Test Engineer: | Andrew Edwards | Test Date: | 12 August 2011 |
| Test Sample IMEI: | 356265020562681 | | |

| | |
|--------------------------|---|
| FCC Part: | 22.913(a) |
| Test Method Used: | As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 28 |
| Relative Humidity (%): | 29 |

Results: UMTS Band V / 850

| Channel | Channel No. | Antenna Polarity | Peak ERP (dBm) | ERP Limit (dBm) | Margin (dB) | Result |
|---------|-------------|------------------|----------------|-----------------|-------------|----------|
| Bottom | 4132 | Horizontal | 13.1 | 38.0 | 24.9 | Complied |
| Middle | 4183 | Horizontal | 13.1 | 38.0 | 24.9 | Complied |
| Top | 4233 | Horizontal | 14.8 | 38.0 | 23.2 | Complied |

5.3. Test Results - Part 24**5.3.1. Transmitter Output Power (EIRP)****Test Summary:**

| | | | |
|--------------------------|-----------------|-------------------|----------------|
| Test Engineer: | Andrew Edwards | Test Date: | 16 August 2011 |
| Test Sample IMEI: | 356265020562681 | | |

| | |
|--------------------------|---|
| FCC Part: | 24.232 |
| Test Method Used: | As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 29 |
| Relative Humidity (%): | 29 |

Results: GPRS1900

| Channel | Frequency (MHz) | Antenna Polarity | EIRP (dBm) | Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------|------------|-------------|-------------|----------|
| Bottom | 1850.2 | Vertical | 29.5 | 33.0 | 3.5 | Complied |
| Middle | 1879.8 | Vertical | 27.8 | 33.0 | 5.2 | Complied |
| Top | 1909.8 | Vertical | 28.9 | 33.0 | 4.1 | Complied |

Results: EGPRS1900

| Channel | Frequency (MHz) | Antenna Polarity | EIRP (dBm) | Limit (dBm) | Margin (dB) | Result |
|---------|-----------------|------------------|------------|-------------|-------------|----------|
| Bottom | 1850.2 | Vertical | 29.5 | 33.0 | 3.5 | Complied |
| Middle | 1879.8 | Vertical | 27.8 | 33.0 | 5.2 | Complied |
| Top | 1909.8 | Vertical | 28.9 | 33.0 | 4.1 | Complied |

Transmitter Output Power (ERP)(continued)**Test Summary:**

| | | | |
|--------------------------|-----------------|-------------------|----------------|
| Test Engineer: | Andrew Edwards | Test Date: | 16 August 2011 |
| Test Sample IMEI: | 356265020562681 | | |

| | |
|--------------------------|---|
| FCC Part: | 24.232 |
| Test Method Used: | As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 29 |
| Relative Humidity (%): | 29 |

Results: UMTS Band II / 1900

| Channel | Channel No. | Antenna Polarity | Peak EIRP (dBm) | EIRP Limit (dBm) | Margin (dB) | Result |
|---------|-------------|------------------|-----------------|------------------|-------------|----------|
| Bottom | 9262 | Horizontal | 27.0 | 33.0 | 6.0 | Complied |
| Middle | 9400 | Horizontal | 24.3 | 33.0 | 8.7 | Complied |
| Top | 9538 | Horizontal | 23.2 | 33.0 | 9.8 | Complied |

6. 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 |
|---|------------------|----------------------|------------------------|
| Effective Radiated Power (ERP) | 824 to 849 MHz | 95% | ±2.94 dB |
| Effective Isotropic Radiated Power (EIRP) | 1850 to 1910 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.

Appendix 1. Test Equipment Used

| RFI No. | Instrument | Manufacturer | Type No. | Serial No. | Date Calibration Due | Cal. Interval (Months) |
|---------|-------------------|-----------------|----------|------------|----------------------|------------------------|
| A1393 | Attenuator | Huber & Suhner | 757456 | 6820.17.B | 08 Jul 2012 | 12 |
| A1534 | Pre Amplifier | Hewlett Packard | 8449B | 3008A00405 | 20 Jun 2012 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 05 Sep 2011 | 12 |
| A288 | Antenna | Chase | CBL6111A | 1589 | 05 Sep 2011 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 05 Sep 2011 | 12 |
| L1021 | Comms. Tester | Rohde & Schwarz | CMU 200 | 111379 | 11 Jan 2012 | 12 |
| M1124 | Spectrum Analyser | Rohde & Schwarz | ESI26 | 100046K | 29 Jun 2012 | 12 |

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