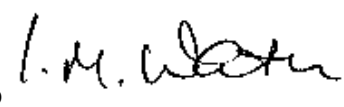



TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: SF51 Barcode reader

To: FCC Part 15.247(b)(1) & Industry Canada RSS-210 A8.4(2)

Test Report Serial No:
RFI-RPT-RP85074JD07A

| | |
|---|--|
| This Test Report Is Issued Under The Authority Of Chris Guy, Head of Global Approvals: | |
| |  pp |
| Checked By: | Ian Watch |
| Signature: |  |
| Date of Issue: | 26 March 2012 |

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1. Customer Information




| | |
|----------------------|---|
| Company Name: | Intermec Scanner Technology Center |
| Address: | Immeuble "Les Allées du Lac" Rue du Lac Boite Postale 38147 31681 Labège Cedex France |

2. Summary of Testing

2.1. General Information

| | |
|---------------------------------|--|
| Specification Reference: | 47CFR15.247 |
| Specification Title: | Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 15 Subpart C (Intentional Radiators) - Section 15.247 |
| Specification Reference: | RSS-210 Issue 8 December 2010 |
| Specification Title: | Licence-exempt Radio Apparatus (All Frequency Bands): Category I Equipment. |
| Site Registration: | FCC: 209735; Industry Canada: 3245B-2 |
| Location of Testing: | RFI Global Services Ltd, Wade Road, Basingstoke, Hampshire, RG24 8AH. |
| Test Date: | 08 March 2012 |

2.2. Summary of Test Results

| FCC Reference (47CFR) | IC Reference | Measurement | Result |
|--|--------------------------------|---------------------------------------|---|
| Part 15.247(b)(1) | RSS-Gen 4.8 RSS-210 A8.4(2) | Transmitter Maximum Peak Output Power |  |
| Key to Results  = Complied  = Did not comply | | | |

2.3. Methods and Procedures

| | |
|-------------------|---|
| Reference: | ANSI C63.4 (2009) |
| Title: | American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz |
| Reference: | ANSI C63.10 (2009) |
| Title: | American National Standard for Testing Unlicensed Wireless Devices |

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: | INTERMEC |
| Model Name or Number: | SF51 |
| Serial Number: | 29211144611 |
| Hardware Version Number: | 076016-000 |
| Software Version Number: | 2.0.5.1 |

3.2. Description of EUT

The equipment under test was a Barcode reader containing a Bluetooth module and integral antenna. Contains FCC ID: EHA-BTM312 and Industry Canada Certification No. 1223A-BTM312.

3.3. Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing.

3.4. Additional Information Related to Testing

| | | | |
|---------------------------------|----------------------|--------------------|-------------------------|
| Tested Technology: | Bluetooth | | |
| Power Supply Requirement: | Nominal | 3.3V | |
| Type of Unit: | Transceiver | | |
| Channel Spacing: | 1 MHz | | |
| Mode: | Basic Rate | Enhanced Data Rate | |
| Modulation: | GFSK | π/4-DQPSK | 8DQPSK |
| Packet Type: (Maximum Payload) | DH5 | 2DH5 | 3DH5 |
| Data Rate (Mbit/s): | 1 | 2 | 3 |
| Maximum Conducted Output Power: | 9.9 dBm | | |
| Antenna Gain | 2.0 dBi | | |
| Transmit Frequency Range: | 2402 MHz to 2480 MHz | | |
| Transmit Channels Tested: | Channel ID | Channel Number | Channel Frequency (MHz) |
| | Bottom | 0 | 2402 |
| | Middle | 39 | 2441 |
| | Top | 78 | 2480 |

3.5. Support Equipment

The following support equipment was used to exercise the EUT during testing:

| | |
|------------------------------|----------------------|
| Description: | Charging cradle |
| Brand Name: | INTERMEC |
| Model Name or Number: | SF51 charger |
| Serial Number: | Not marked or stated |

| | |
|------------------------------|----------------------|
| Description: | Power supply |
| Brand Name: | INTERMEC |
| Model Name or Number: | AE26 |
| Serial Number: | Not marked or stated |

4. Operation and Monitoring of the EUT during Testing

4.1. Operating Modes

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

- Continuously transmitting at maximum power on bottom, middle and top channels as required.

4.2. Configuration and Peripherals

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

- The EUT was placed into Bluetooth test mode following instruction supplied by the Customer. Barcodes were scanned by the EUT. This enabled Bluetooth test mode and allowed selection of the required channel, modulation type and data rates.

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**5.2.1. Transmitter Maximum Peak Output Power****Test Summary:**

| | | | |
|-------------------------------|----------------|-------------------|---------------|
| Test Engineer: | Andrew Edwards | Test Date: | 08 March 2012 |
| Test Sample Serial No: | 29211144611 | | |

| | |
|--------------------------|--|
| FCC Part: | 15.247(b)(1) |
| Test Method Used: | As detailed in ANSI C63.10 Section 6.10.1 and Sections 6.3 and 6.6 referencing ANSI C63.4 (see note below) |

Environmental Conditions:

| | |
|-------------------------------|----|
| Temperature (°C): | 23 |
| Relative Humidity (%): | 21 |

Results: DH5

| Channel | Conducted Peak Power (dBm) | Conducted Peak Power Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|----------------------------------|-------------|----------|
| Bottom | 6.5 | 30.0 | 23.5 | Complied |
| Middle | 9.9 | 30.0 | 20.1 | Complied |
| Top | 8.1 | 30.0 | 21.9 | Complied |

| Channel | Conducted Peak Power (dBm) | Declared Antenna Gain (dBi) | EIRP (dBm) | De Facto EIRP Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|-----------------------------|------------|---------------------------|-------------|----------|
| Bottom | 6.5 | 2.0 | 8.5 | 36.0 | 27.5 | Complied |
| Middle | 9.9 | 2.0 | 11.9 | 36.0 | 24.1 | Complied |
| Top | 8.1 | 2.0 | 10.1 | 36.0 | 25.9 | Complied |

Transmitter Maximum Peak Output Power (continued)**Results: 2DH5**

| Channel | Conducted Peak Power (dBm) | Conducted Peak Power Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|----------------------------------|-------------|----------|
| Bottom | 6.1 | 21.0 | 14.9 | Complied |
| Middle | 8.8 | 21.0 | 12.2 | Complied |
| Top | 7.1 | 21.0 | 13.9 | Complied |

| Channel | Conducted Peak Power (dBm) | Declared Antenna Gain (dBi) | EIRP (dBm) | De Facto EIRP Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|-----------------------------|------------|---------------------------|-------------|----------|
| Bottom | 6.1 | 2.0 | 8.1 | 27.0 | 18.9 | Complied |
| Middle | 8.8 | 2.0 | 10.8 | 27.0 | 16.2 | Complied |
| Top | 7.1 | 2.0 | 9.1 | 27.0 | 17.9 | Complied |

Results: 3DH5

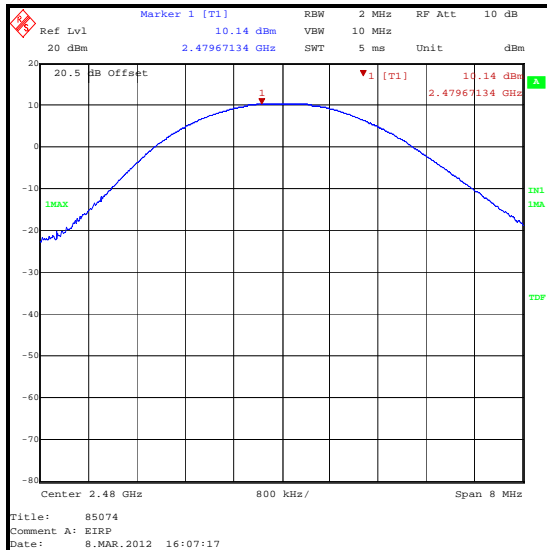
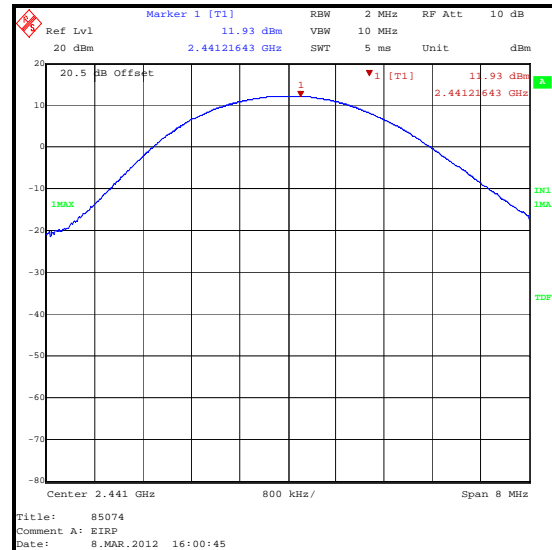
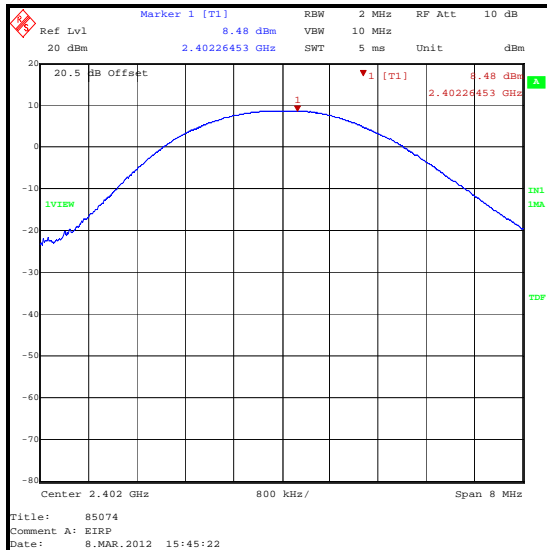
| Channel | Conducted Peak Power (dBm) | Conducted Peak Power Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|----------------------------------|-------------|----------|
| Bottom | 6.7 | 21.0 | 14.3 | Complied |
| Middle | 9.4 | 21.0 | 11.6 | Complied |
| Top | 7.9 | 21.0 | 13.1 | Complied |

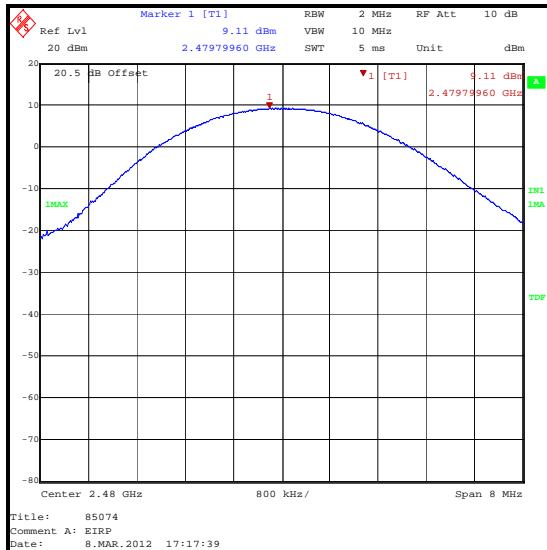
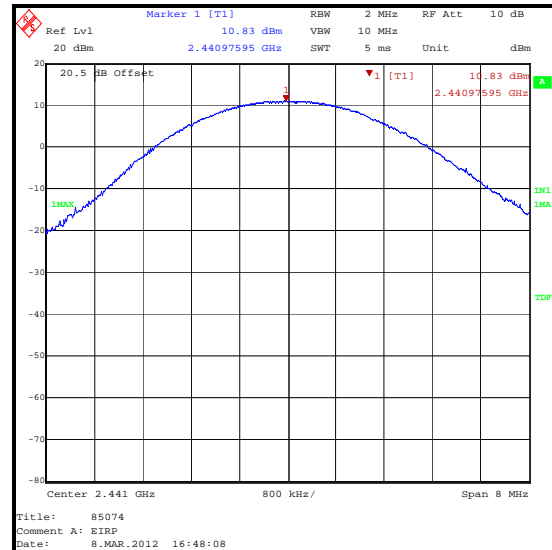
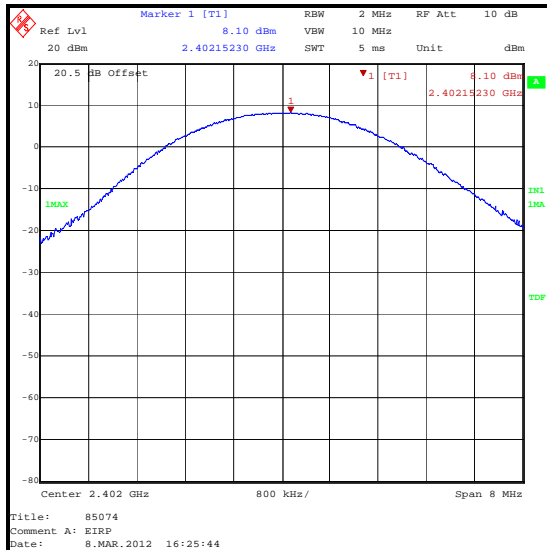
| Channel | Conducted Peak Power (dBm) | Declared Antenna Gain (dBi) | EIRP (dBm) | De Facto EIRP Limit (dBm) | Margin (dB) | Result |
|---------|----------------------------|-----------------------------|------------|---------------------------|-------------|----------|
| Bottom | 6.7 | 2.0 | 8.7 | 27.0 | 18.3 | Complied |
| Middle | 9.4 | 2.0 | 11.4 | 27.0 | 15.6 | Complied |
| Top | 7.9 | 2.0 | 9.9 | 27.0 | 19.1 | Complied |

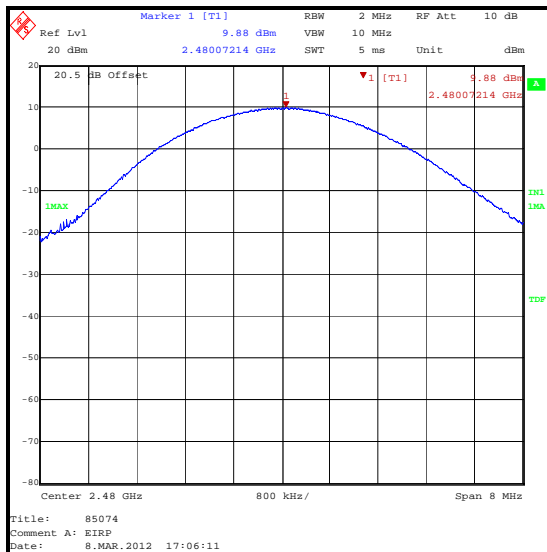
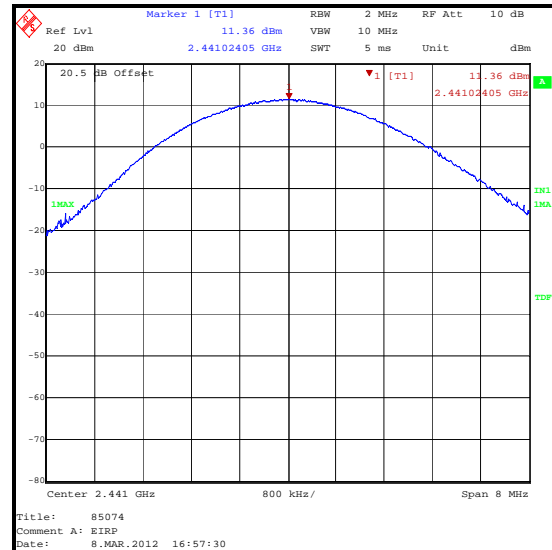
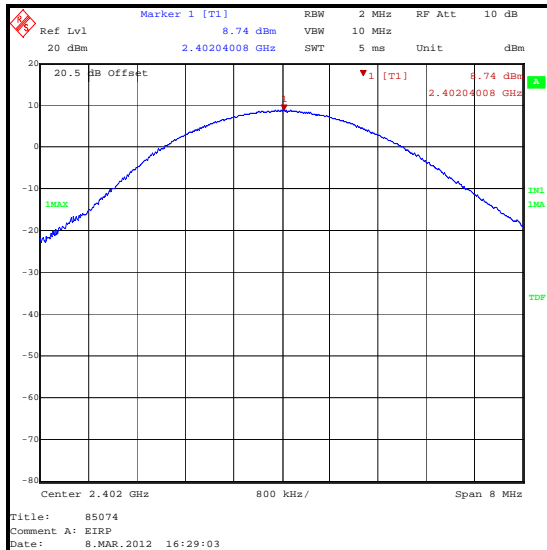
Note(s):

- Tests were performed using a combination of the conducted test method described in ANSI C63.10 Section 6.10.1 and the test methods for radiated emissions measurements described in Sections 6.3 and 6.6. The reason for this being that the measurements were performed radiated as the EUT has an integral antenna and does not have an external antenna port.
- EIRP was measured and the conducted power calculated by subtracting the antenna gain.

$$\text{Conducted Power} = \text{EIRP (dBm)} - \text{Antenna Gain (dBi)}$$

Transmitter Maximum Peak Output Power (continued)**Results: DH5**

Transmitter Maximum Peak Output Power (continued)**Results: 2DH5**

Transmitter Maximum Peak Output Power (continued)**Results: 3DH5**

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 |
|------------------------------------|-----------------------|----------------------|------------------------|
| Radiated Maximum Peak Output Power | 2.4 GHz to 2.4835 GHz | 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 | 09 Oct 2012 | 12 |
| A1818 | Antenna | EMCO | 3115 | 00075692 | 09 Oct 2012 | 12 |
| K0002 | 3m RSE Chamber | Rainford EMC | N/A | N/A | 09 Oct 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.