



# TEST REPORT FROM RFI GLOBAL SERVICES LTD

Test of: GSM2378



FCC ID: MIVGSM2378

Industry Canada Certification Number: 4160A-GSM2378

To: FCC Part 22.913(a), Part 24.232 & Industry Canada RSS 132 4.4,  
RSS-133 6.4

**Test Report Serial No.:**  
UL-RPT-RP87848JD10A

**Version 2.0 supersedes all previous versions**

<b>This Test Report Is Issued Under The Authority Of John Newell, Group Quality Manager:</b>		
<b>Checked By:</b>	Ian Watch	
<b>Signature:</b>	pp	
<b>Date of Issue:</b>	18 December 2012	

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**1. Customer Information**





<b>Company Name:</b>	Enfora Inc.
<b>Address:</b>	251 Renner Parkway Richardson TEXAS 75080 United States

## **2. Summary of Testing**

### **2.1. General Information**

<b>Specification Reference:</b>	47CFR22
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 22 Subpart H (Public Mobile Services)
<b>Specification Reference:</b>	47CFR24
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2011: Part 24 Subpart E (Personal Communication Services)
<b>Specification Reference:</b>	RSS-132 Issue 2 Sep 2005
<b>Specification Title:</b>	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz
<b>Specification Reference:</b>	SRSP-503 Issue 7 Sep 2008
<b>Specification Title:</b>	Technical Requirements for Cellular Radiotelephone Systems Operating in the Bands 824 – 849 MHz and 869 – 894 MHz
<b>Specification Reference:</b>	RSS-133 Issue 5 Feb 2009
<b>Specification Title:</b>	2 GHz Personal Communications Services
<b>Specification Reference:</b>	SRSP-510 Issue 5 Feb 2009
<b>Specification Title:</b>	Technical Requirements for Personal Communications Services (PCS) in the Bands 1850-1915 MHz and 1930-1995 MHz
<b>Site Registration:</b>	FCC: 209735; Industry Canada: 3245B-2
<b>Location of Testing:</b>	RFI Global Services Ltd trading as UL, Wade Road, Basingstoke, Hampshire, RG24 8AH
<b>Test Date:</b>	11 September 2012

**Summary of Test Results**

FCC Reference (47CFR)	IC Reference	Measurement	Result
<b>Part 22 &amp; RSS-132</b>			
Part 22.913(a)	RSS-132 4.4 SRSP-503 5.1.3	Transmitter Output Power (ERP)	
<b>Part 24 &amp; RSS-133</b>			
Part 24.232	RSS-133 6.4 SRSP-510 5.1.2	Transmitter Output Power (EIRP)	
<b>Key to Results</b>			
 = Complied  = Did not comply			

**2.2. Methods and Procedures**

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

**2.3. 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)**

<b>Brand Name:</b>	MT 3050
<b>Model Name or Number:</b>	GSM2378
<b>IMEI:</b>	012589006991002
<b>Hardware Version Number:</b>	1
<b>Software Version Number:</b>	1.1.6
<b>FCC ID:</b>	MIVGSM2378
<b>Industry Canada Certification Number:</b>	4160A-GSM2378

#### **3.2. Description of EUT**

The equipment under test was a mobile tracker OBD, which contains GSM and GPS technologies.

#### **3.3. Modifications Incorporated in the EUT**

No modifications were applied to the EUT during testing.

**3.4. Additional Information Related to Testing**

<b>Type of Radio Device:</b>	Transceiver		
<b>Mode:</b>	GSM/GPRS		
<b>Modulation Type:</b>	GMSK		
<b>Channel Spacing:</b>	200 kHz		
<b>Power Supply Requirement(s):</b>	Nominal	12.0 V	
<b>Technology Tested:</b>	GSM850		
<b>Maximum ERP:</b>	GPRS	30.6 dBm	
<b>Transmit Frequency Range:</b>	824 to 849 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	128	824.2
	Middle	190	836.6
	Top	251	848.8
<b>Receive Frequency Range:</b>	869 to 894 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	128	869.2
	Middle	190	881.6
	Top	251	893.8
<b>Technology Tested:</b>	PCS1900		
<b>Maximum EIRP:</b>	GPRS	27.5 dBm	
<b>Transmit Frequency Range:</b>	1850 to 1910 MHz		
<b>Transmit Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	512	1850.2
	Middle	660	1879.8
	Top	810	1909.8
<b>Receive Frequency Range:</b>	1930 to 1990 MHz		
<b>Receive Channels Tested:</b>	<b>Channel ID</b>	<b>Channel Number</b>	<b>Channel Frequency (MHz)</b>
	Bottom	512	1930.2
	Middle	660	1959.8
	Top	810	1989.8



### **3.5. Support Equipment**

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

<b>Description:</b>	Test Jig
<b>Brand Name:</b>	Not stated
<b>Model Name or Number:</b>	Not stated
<b>Serial Number:</b>	Not stated

## **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):

- The EUT was placed into a test jig and power leads connected to a DC power supply.
- Connected to a GSM/GPRS system simulator, operating in transceiver mode. The EUT automatically connected to the network once power was applied and the data call was initiated by the system simulator. A test SIM was not required for connection to the system simulator.

## **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 & RSS-132****5.2.1. Transmitter Output Power (ERP)****Test Summary:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	11 September 2012
<b>Test Sample IMEI:</b>	012589006991002		

<b>FCC Part:</b>	22.913(a)
<b>Test Method Used:</b>	ANSI TIA-603-C-2004 Section 2.2.17.2

**Environmental Conditions:**

<b>Temperature (°C):</b>	24
<b>Relative Humidity (%):</b>	36

**Results: GPRS**

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Antenna Polarity</b>	<b>ERP (dBm)</b>	<b>ERP Limit (dBm)</b>	<b>Margin (Db)</b>	<b>Result</b>
Bottom	824.2	Horizontal	30.0	38.45	8.45	Complied
Middle	836.6	Horizontal	30.6	38.45	7.85	Complied
Top	848.8	Horizontal	30.0	38.45	8.45	Complied

**5.3. Test Results - Part 24 & RSS-133****5.3.1. Transmitter Output Power (EIRP)****Test Summary:**

<b>Test Engineer:</b>	Nick Steele	<b>Test Date:</b>	11 September 2012
<b>Test Sample IMEI:</b>	012589006991002		

<b>FCC Part:</b>	24.232
<b>Test Method Used:</b>	ANSI TIA-603-C-2004 Section 2.2.17.2

**Environmental Conditions:**

<b>Temperature (°C):</b>	25
<b>Relative Humidity (%):</b>	36

**Results: GPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (Db)	Result
Bottom	1850.2	Horizontal	27.5	33.0	5.5	Complied
Middle	1879.8	Horizontal	25.5	33.0	7.5	Complied
Top	1909.8	Horizontal	25.5	33.0	7.5	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”.

<b>Measurement Type</b>	<b>Range</b>	<b>Confidence Level (%)</b>	<b>Calculated Uncertainty</b>
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.

## **7. Report Revision History**

<b>Version Number</b>	<b>Revision Details</b>		
	<b>Page No(s)</b>	<b>Clause</b>	<b>Details</b>
1.0	-	-	Initial Version
2.0	16	-	Amendment to equipment list

## **Appendix 1. Test Equipment Used**

<b>RFI No.</b>	<b>Instrument</b>	<b>Manufacturer</b>	<b>Type No.</b>	<b>Serial No.</b>	<b>Date Calibration Due</b>	<b>Cal. Interval (months)</b>
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12
A1534	Preamplifier	HP	8449B	3008A00405	09 Oct 2012	12
A1936	Antenna	Schwarzbeck	UBAA 9114	9114-223	05 Apr 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
A239	Attenuator	Schaffner	6806-17-B	NONE	22 Nov 2012	12
A288	Antenna	Chase	CBL6111A	1589	15 Aug 2013	12
K0001	5m RSE Chamber	Rainford EMC	N/A	N/A	30 Sep 2012	12
K0002	3m RSE Chamber	Rainford EMC	N/A	N/A	09 Oct 2012	12
M1124	Spectrum Analyser	Rohde & Schwarz	ESI26	100046K	14 Aug 2013	12
M1267	Power Sensor	Rohde & Schwarz	NRV-Z52	100155	07 Jun 2013	12
M199	Power Meter	Rohde & Schwarz	NRVS	827023/075	07 Jun 2013	12
M260	Signal Generator	Rohde & Schwarz	SMP02	829076/008	14 Jun 2013	12

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