



# TEST REPORT

**Test Report No. : UL-RPT-RP86493JD03A**

**Manufacturer** : Remote Diagnostic Technologies Ltd  
**Model No.** : Tempus Pro  
**Test Standard(s)** : FCC Parts 22.913(a), 24.232(c)(d) & Industry Canada RSS-132 5.4, RSS-133 6.4, SRSP-510 5.1.2

1. This report may not be reproduced other than in full, except with the prior written approval of UL.
2. The results in this report apply only to the sample(s) tested.
3. This sample tested is in compliance with the above standard(s).
4. The test results in this report are traceable to the national or international standards.
5. Version 1.0

**Date of Issue:** 26 March 2013

**Checked by:**

Ian Watch  
Senior Engineer, Radio Laboratory

**Issued by :**

pp  
John Newell  
Group Quality Manager, WiSE  
Basingstoke,  
UL Verification Services



This laboratory is accredited by UKAS.  
The tests reported herein have been  
performed in accordance with its' terms  
of accreditation.

---

**RFI Global Services Ltd trading as UL**

Pavilion A, Ashwood Park, Ashwood Way, Basingstoke, Hampshire, RG23 8BG, UK  
Telephone: +44 (0)1256 312000  
Facsimile: +44 (0)1256 312001

This page has been left intentionally blank.

**Table of Contents**

<b>1. Customer Information.....</b>	<b>4</b>
<b>2. Summary of Testing.....</b>	<b>5</b>
2.1. General Information	5
2.2. Summary of Test Results	5
2.3. Methods and Procedures	6
2.4. Deviations from the Test Specification	6
<b>3. Equipment Under Test (EUT) .....</b>	<b>7</b>
3.1. Identification of Equipment Under Test (EUT)	7
3.2. Description of EUT	7
3.3. Modifications Incorporated in the EUT	7
3.4. Additional Information Related to Testing	8
3.5. Support Equipment	10
<b>4. Operation and Monitoring of the EUT during Testing .....</b>	<b>11</b>
4.1. Operating Modes	11
4.2. Configuration and Peripherals	11
<b>5. Measurements, Examinations and Derived Results .....</b>	<b>12</b>
5.1. General Comments	12
5.2. Test Results	13
FCC Part 22 & Industry Canada RSS-132	13
5.2.1. Transmitter Output Power (ERP)	13
5.2.2. Transmitter Peak-To-Average Power Ratio (PAPR)	16
FCC Part 24 & Industry Canada RSS-133	25
5.2.3. Transmitter Output Power (EIRP)	25
5.2.4. Transmitter Peak-To-Average Power Ratio (PAPR)	28
<b>6. Measurement Uncertainty .....</b>	<b>37</b>
<b>7. Report Revision History .....</b>	<b>38</b>

**1. Customer Information**







<b>Company Name:</b>	Remote Diagnostic Technologies Ltd
<b>Address:</b>	The Old Coach House The Avenue Farleigh Wallop Hampshire RG25 2HT United Kingdom

## 2. Summary of Testing

### 2.1. General Information

<b>Specification Reference:</b>	47CFR22
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 22 Subpart H (Public Mobile Services)
<b>Specification Reference:</b>	47CFR24
<b>Specification Title:</b>	Code of Federal Regulations Volume 47 (Telecommunications) 2012: Part 24 Subpart E (Personal Communication Services)
<b>Specification Reference:</b>	RSS-132 Issue 3 Jan 2013
<b>Specification Title:</b>	Cellular Telephones Employing New Technologies Operating in the Bands 824-849 MHz and 869-894 MHz
<b>Specification Reference:</b>	RSS-133 Issue 6 January 2013
<b>Specification Title:</b>	2 GHz Personal Communications Services
<b>Specification Reference:</b>	SRSP-510 Issue 5, February 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 Dates:</b>	29 January 2013 to 28 February 2013

### 2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
<b>Part 22 &amp; RSS-132</b>			
Part 22.913(a)	RSS-132 5.4	Transmitter Output Power (ERP)	
-	RSS-132 5.4	Transmitter Peak To Average Power Ratio	
<b>Part 24 &amp; RSS-133</b>			
Part 24.232(c)	RSS-133 6.4 SRSP-510 5.1.2	Transmitter Output Power (EIRP)	
Part 24.232(d)	RSS-133 6.4	Transmitter Peak To Average Power Ratio	
<b>Key to Results</b>			
 = Complied  = Did not comply			

**2.3. Methods and Procedures**

<b>Reference:</b>	ANSI/TIA-603-C-2004
<b>Title:</b>	Land Mobile Communications Equipment, Measurements and performance Standards
<b>Reference:</b>	FCC KDB 971168 D01 Power Meas License Digital Systems v01
<b>Title:</b>	Procedures for Compliance Measurement of the Fundamental Emission Power of Licensed Wideband (> 1 MHz) Digital Transmission Systems Issue date: 11/30/2010

**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)**

<b>Brand Name:</b>	Tempus Pro
<b>Model Name or Number:</b>	00-1004
<b>IMEI</b>	354154040019652
<b>Hardware Version Number:</b>	AIS 23-2551 iss 1D and AIS 23-2554 iss 1C
<b>Software Version Number:</b>	V03

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

The equipment under test was a medical vital signs monitor.

Contains pre-approved module FCC ID: NCMOMO6012, Industry Canada Certification Number 2734A-MO6012.

#### **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:	GSM/GPRS/EGPRS		
Modulation Type:	GMSK/8PSK		
Channel Spacing:	200 kHz		
Technology Tested:	GSM850		
Maximum Output Power (ERP):	GSM	29.7 dBm	
	GPRS	29.9 dBm	
	EGPRS	29.8 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):	GSM	26.8 dBm	
	GPRS	26.4 dBm	
	EGPRS	25.2 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



**Additional Information Related to Testing (continued)**

Technology Tested:	UMTS850		
Type of Radio Device:	Transceiver		
Mode:	UMTS FDD V and 3GPP Rel. 5 HSDPA		
Modulation Type:	QPSK		
Channel Spacing:	5 MHz		
Maximum Output Power (ERP):	Voice (12.2 kbp/s)	24.6 dBm	
	HSDPA Sub-Test 1	25.0 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	Channel ID	Channel Number	Channel Frequency (MHz)
	Bottom	4132	826.4
	Middle	4183	836.6
	Top	4233	846.6
Technology Tested:	UMTS1900		
Type of Radio Device:	Transceiver		
Mode:	UMTS FDD II and 3GPP Rel. 5 HSDPA		
Modulation Type:	QPSK		
Channel Spacing:	5 MHz		
Maximum Output Power (EIRP):	Voice (12.2 kbps)	22.1 dBm	
	HSDPA Sub-Test 1	22.1 dBm	
Transmit Frequency Range:	1850 to 1910 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**

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

<b>Description:</b>	Laptop
<b>Brand Name:</b>	Dell
<b>Model Name or Number:</b>	Latitude D610
<b>Serial Number:</b>	None Stated

<b>Description:</b>	USB Keyboard
<b>Brand Name:</b>	None Stated
<b>Model Name or Number:</b>	None Stated
<b>Serial Number:</b>	None Stated

<b>Description:</b>	USB Mouse
<b>Brand Name:</b>	None Stated
<b>Model Name or Number:</b>	None Stated
<b>Serial Number:</b>	None 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):

- Connected to a GSM/GPRS/UMTS system simulator, operating in transceiver mode.
- A 120 VAC 60 Hz to 12 VDC power supply was used to provide the power.

## **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.

In accordance with UKAS requirements all the measurement equipment is on a calibration schedule. All equipment was within the calibration period on the date of testing.

**5.2. Test Results****FCC Part 22 & Industry Canada RSS-132****5.2.1. Transmitter Output Power (ERP)****Test Summary:**

<b>Test Engineers:</b>	David Doyle	<b>Test Dates:</b>	29 January 2013, 20 February 2013 & 28 February 2013
<b>Test Sample IMEI:</b>	354154040019652		

<b>FCC Reference:</b>	Part 22.913(a)
<b>Industry Canada Reference:</b>	RSS-132 Section 5.4
<b>Test Method Used:</b>	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 & CCDF function of a spectrum analyser

**Environmental Conditions:**

<b>Temperature (°C):</b>	24 to 25
<b>Relative Humidity (%):</b>	35 to 41

**Note(s):**

1. Industry Canada RSS-132 Section 5.4 states the limit as an EIRP value of 11.5 Watts (40.6 dBm) which equates to an ERP limit of 7 Watts (38.45 dBm).

**Transmitter Output Power (ERP) (continued)****Results: Peak / GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.7	38.45	8.75	Complied
Middle	836.6	Vertical	29.2	38.45	9.25	Complied
Top	848.8	Vertical	29.0	38.45	9.45	Complied

**Results: Average / GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.3	38.45	9.15	Complied
Middle	836.6	Vertical	28.6	38.45	9.85	Complied
Top	848.8	Vertical	28.4	38.45	10.05	Complied

**Results: Peak / GPRS**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.9	38.45	8.55	Complied
Middle	836.6	Vertical	29.1	38.45	9.35	Complied
Top	848.8	Vertical	29.2	38.45	9.25	Complied

**Results: Average / GPRS**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.3	38.45	9.15	Complied
Middle	836.6	Vertical	28.6	38.45	9.85	Complied
Top	848.8	Vertical	28.7	38.45	9.75	Complied

**Results: Peak / EGPRS**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.8	38.45	8.65	Complied
Middle	836.6	Vertical	29.0	38.45	9.45	Complied
Top	848.8	Vertical	29.0	38.45	9.45	Complied

**Results: Average / EGPRS**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	29.4	38.45	9.05	Complied
Middle	836.6	Vertical	28.6	38.45	9.85	Complied
Top	848.8	Vertical	28.5	38.45	9.95	Complied

**Transmitter Output Power (ERP) (continued)****Results: Peak / UMTS Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	24.5	38.45	13.95	Complied
Middle	836.6	Vertical	24.6	38.45	13.85	Complied
Top	846.6	Vertical	23.0	38.45	15.45	Complied

**Results: Average / UMTS Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	20.2	38.45	18.25	Complied
Middle	836.6	Vertical	20.5	38.45	17.95	Complied
Top	846.6	Vertical	18.4	38.45	20.05	Complied

**Results: Peak / HSDPA Sub-Test 1**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	24.3	38.45	14.15	Complied
Middle	836.6	Vertical	25.0	38.45	13.45	Complied
Top	846.6	Vertical	22.7	38.45	15.75	Complied

**Results: Average / HSDPA Sub-Test 1**

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	19.7	38.45	18.75	Complied
Middle	836.6	Vertical	20.0	38.45	18.45	Complied
Top	846.6	Vertical	17.7	38.45	20.75	Complied

**Test Equipment Used:**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
A288	Antenna	Chase	CBL6111A	1589	15 Aug 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
M1021	Signal Generator	Rohde & Schwarz	SMP02	833286/004	05 Feb 2014	12
A1936	Antenna	Schwarzbeck	UBAA 9114	9114-223	05 Apr 2013	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12

**5.2.2. Transmitter Peak-To-Average Power Ratio (PAPR)****Test Summary:**

<b>Test Engineer:</b>	David Doyle	<b>Test Dates:</b>	20 February 2013 & 28 February 2013
<b>Test Sample IMEI:</b>	354154040019652		

<b>Industry Canada Reference:</b>	RSS-132 Section 5.4
<b>Test Method Used:</b>	Spectrum analyser measuring maximized peak and average trace amplitudes using marker and delta marker for GSM. FCC KDB 971168 D01 Section 6.0 for UMTS

**Environmental Conditions:**

<b>Temperature (°C):</b>	23 to 24
<b>Relative Humidity (%):</b>	29 to 32

**Note(s):**

1. GSM: Measurements were performed with the spectrum analyser measurement bandwidth wider than the emission bandwidth. The measured average power was subtracted from the measured peak power to obtain the PAPR.
2. UMTS: The CCDF function of a spectrum analyser was used to measure PAPR when the EUT was transmitting in UMTS circuit switched and HSDPA modes. Maximum PAPR levels associated with a probability of 0.1% were recorded.
3. Industry Canada Certification and Engineering Bureau confirmed the measurement methods are acceptable.



**Transmitter Peak-To-Average Power Ratio (continued)****Results: GSM / Circuit Switched**

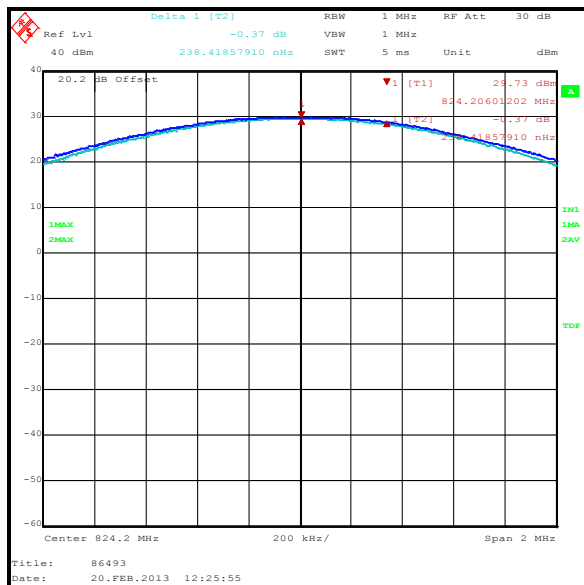
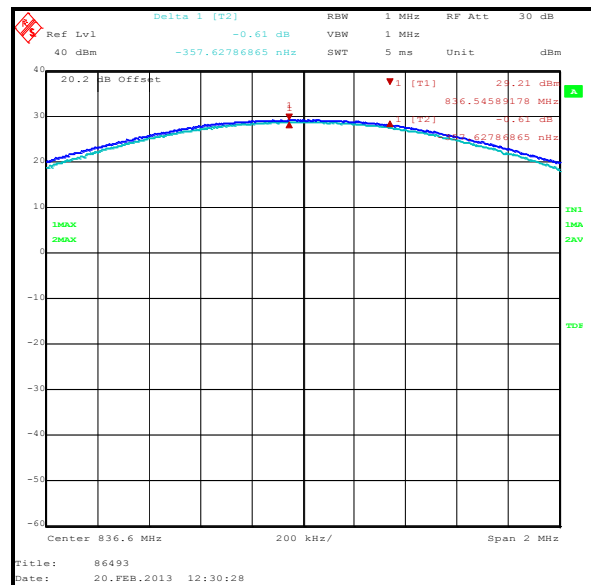
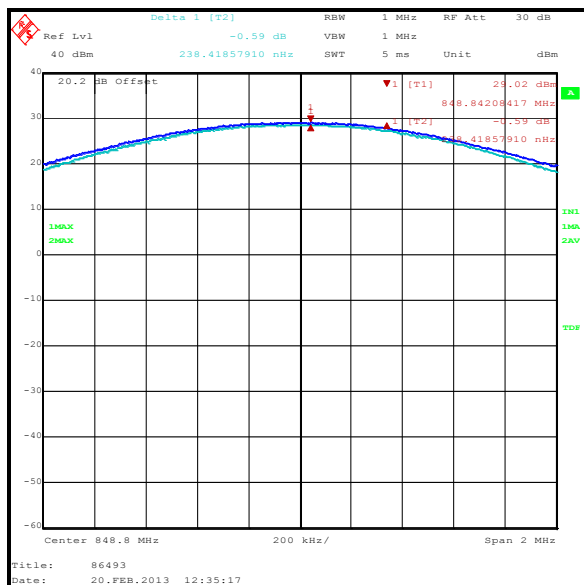
Channel	Frequency (MHz)	ERP Peak (dBm)	ERP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	824.2	29.7	29.3	0.4	13.0	12.6	Complied
Middle	836.6	29.2	28.6	0.6	13.0	12.4	Complied
Top	848.8	29.0	28.4	0.6	13.0	12.4	Complied

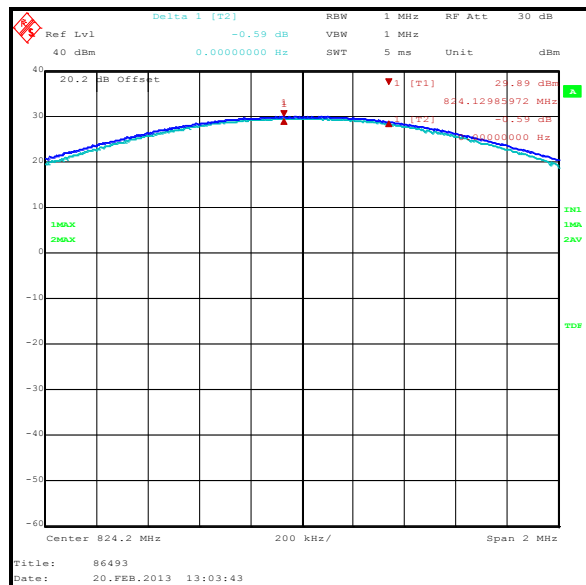
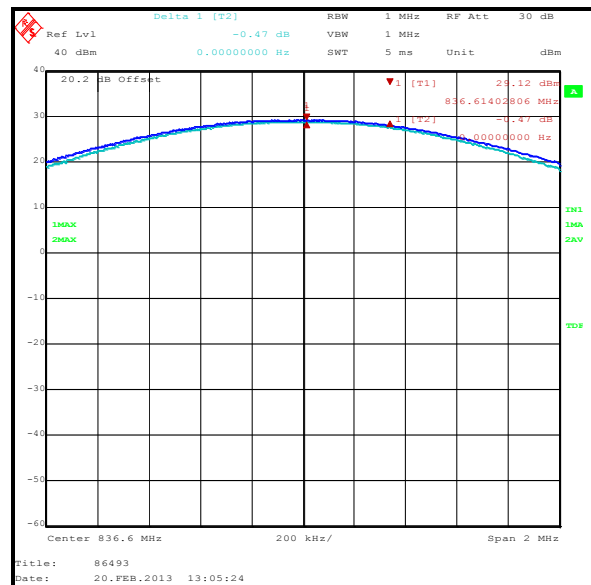
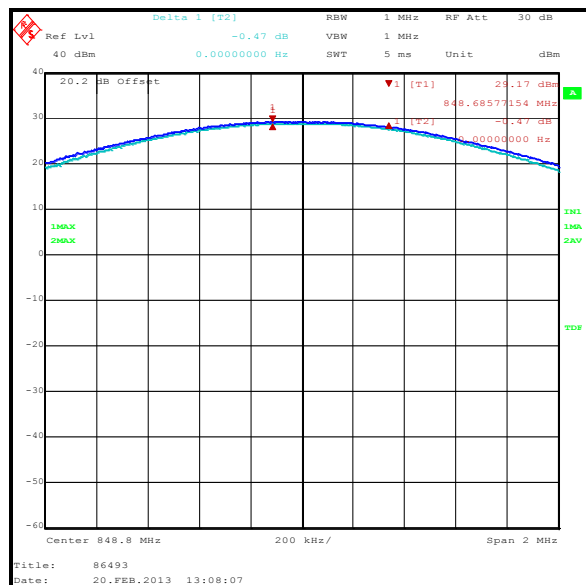
**Results: GPRS**

Channel	Frequency (MHz)	ERP Peak (dBm)	ERP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	824.2	29.9	29.3	0.6	13.0	12.4	Complied
Middle	836.6	29.1	28.6	0.5	13.0	12.5	Complied
Top	848.8	29.2	28.7	0.5	13.0	12.5	Complied

**Results: EGPRS**

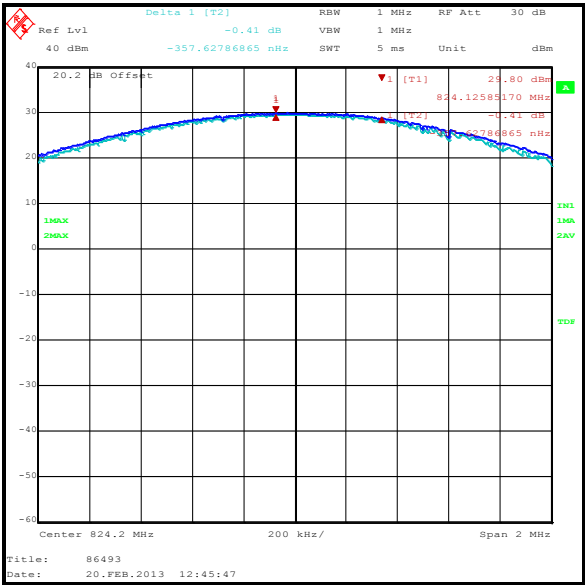
Channel	Frequency (MHz)	ERP Peak (dBm)	ERP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	824.2	29.8	29.4	0.4	13.0	12.6	Complied
Middle	836.6	29.0	28.6	0.4	13.0	12.6	Complied
Top	848.8	29.0	28.5	0.5	13.0	12.5	Complied

**Transmitter Peak-To-Average Power Ratio (continued)****Results: GSM / Circuit Switched****Bottom channel****Middle channel****Top channel**

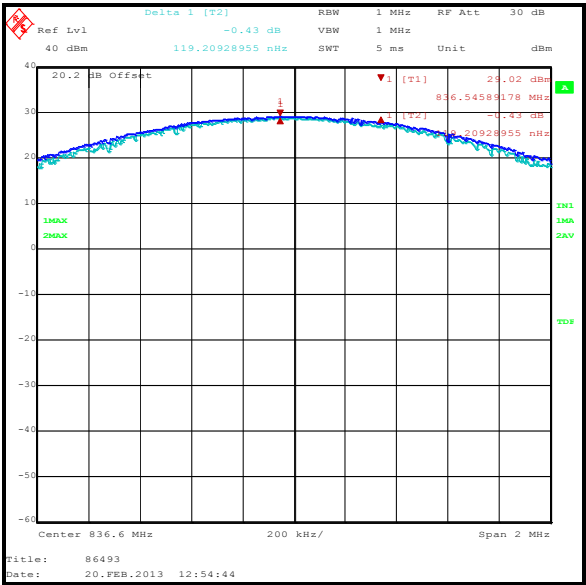
**Transmitter Peak-To-Average Power Ratio (continued)****Results: GPRS****Bottom channel****Middle channel****Top channel**

Transmitter Peak-To-Average Power Ratio (continued)

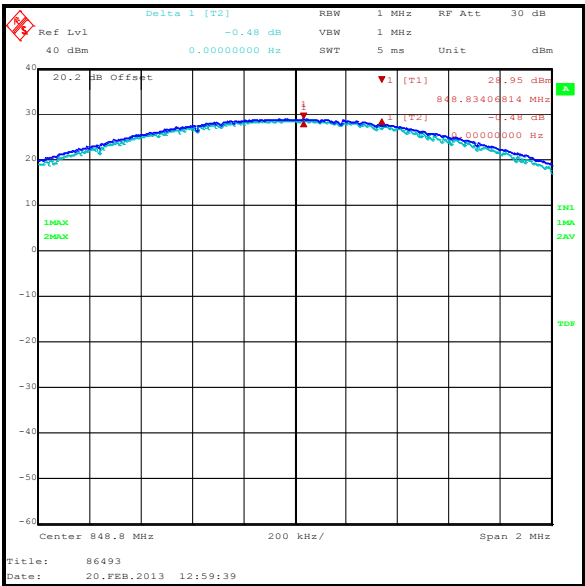
Results: EGPRS



Bottom channel



Middle channel



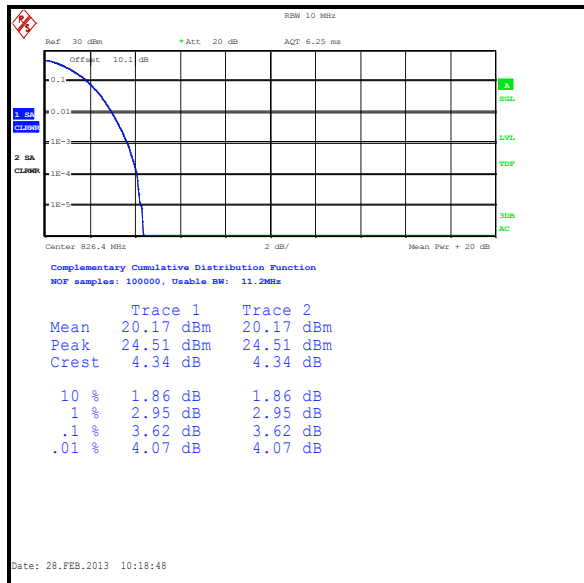
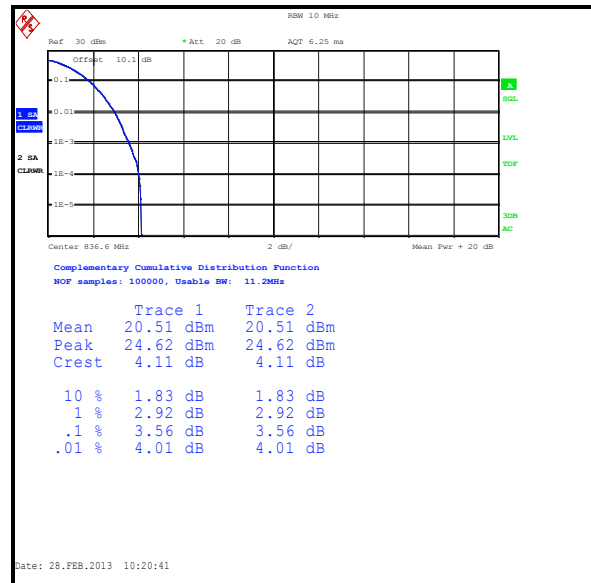
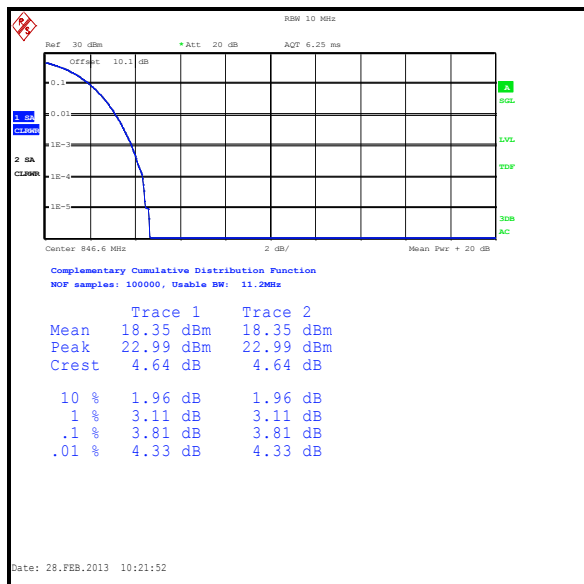
Top channel

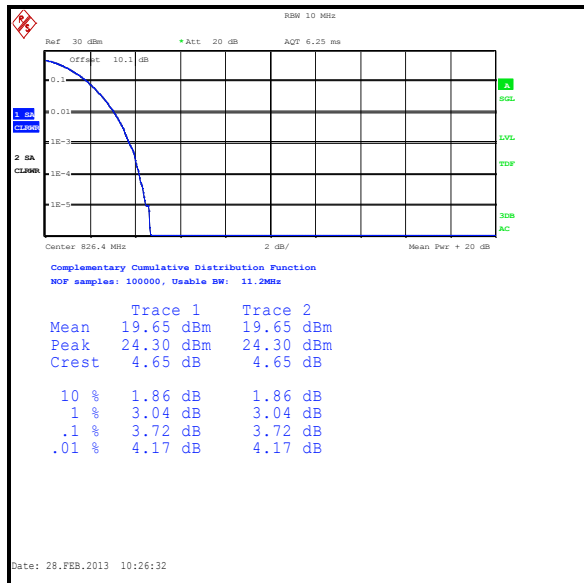
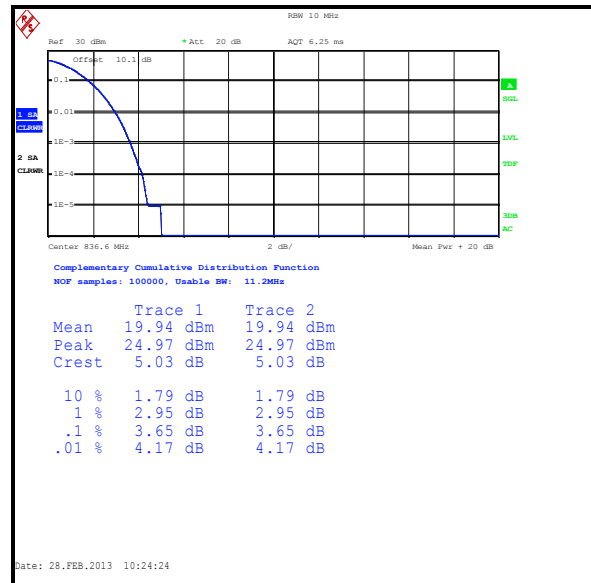
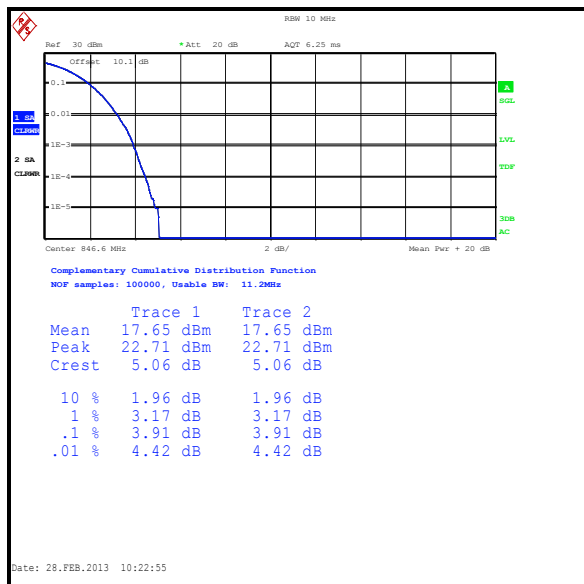
**Transmitter Peak-To-Average Power Ratio (continued)****Results: UMTS Circuit Switched / RMC 12.2 kbps**

Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	824.2	3.6	13.0	9.4	Complied
Middle	836.6	3.6	13.0	9.4	Complied
Top	848.8	3.8	13.0	9.2	Complied

**Results: HSDPA Sub-Test 1**

Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	824.2	3.7	13.0	9.3	Complied
Middle	836.6	3.7	13.0	9.3	Complied
Top	848.8	3.9	13.0	9.1	Complied

**Transmitter Peak-To-Average Power Ratio (continued)****Results: UMTS Circuit Switched****Bottom channel****Middle channel****Top channel**

**Transmitter Peak-To-Average Power Ratio (continued)****Results: HSDPA Sub-Test 1****Bottom channel****Middle channel****Top channel**

**Transmitter Peak-To-Average Power Ratio (continued)****Test Equipment Used:**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
A288	Antenna	Chase	CBL6111A	1589	15 Aug 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
M1021	Signal Generator	Rohde & Schwarz	SMP02	833286/004	05 Feb 2014	12
A1936	Antenna	Schwarzbeck	UBAA 9114	9114-223	05 Apr 2013	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12



**FCC Part 24 & Industry Canada RSS-133****5.2.3. Transmitter Output Power (EIRP)****Test Summary:**

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	28 February 2013
<b>Test Sample IMEI:</b>	354154040019652		

<b>FCC Part:</b>	24.232(c)
<b>Industry Canada Reference:</b>	RSS-133 6.4 / SRSP-510 5.1.2
<b>Test Method Used:</b>	As detailed in ANSI TIA-603-C-2004 Section 2.2.17.2 & CCDF function of a spectrum analyser

**Environmental Conditions:**

<b>Temperature (°C):</b>	23 to 24
<b>Relative Humidity (%):</b>	29 to 32

**Transmitter Output Power (EIRP) (continued)****Results: Peak / GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	24.9	33.0	8.1	Complied
Middle	1879.8	Vertical	25.6	33.0	7.4	Complied
Top	1909.8	Vertical	26.8	33.0	6.2	Complied

**Results: Average / GSM Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	24.8	33.0	8.2	Complied
Middle	1879.8	Vertical	25.5	33.0	7.5	Complied
Top	1909.8	Vertical	26.2	33.0	6.8	Complied

**Results: Peak / GPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	24.1	33.0	8.9	Complied
Middle	1879.8	Vertical	25.4	33.0	7.6	Complied
Top	1909.8	Vertical	26.4	33.0	6.6	Complied

**Results: Average / GPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	24.0	33.0	9.0	Complied
Middle	1879.8	Vertical	25.3	33.0	7.7	Complied
Top	1909.8	Vertical	26.0	33.0	7.0	Complied

**Results: Peak / EGPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	23.9	33.0	9.1	Complied
Middle	1879.8	Vertical	25.0	33.0	8.0	Complied
Top	1909.8	Vertical	25.2	33.0	7.8	Complied

**Results: Average / EGPRS**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	23.8	33.0	9.2	Complied
Middle	1879.8	Vertical	25.0	33.0	8.0	Complied
Top	1909.8	Vertical	25.1	33.0	7.9	Complied

**Transmitter Output Power (EIRP) (continued)****Results: Peak / UMTS Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	20.8	33.0	12.2	Complied
Middle	1880.0	Vertical	21.5	33.0	11.5	Complied
Top	1907.6	Vertical	22.1	33.0	10.9	Complied

**Results: Average / UMTS Circuit Switched**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	17.6	33.0	15.4	Complied
Middle	1880.0	Vertical	17.9	33.0	15.1	Complied
Top	1907.6	Vertical	18.4	33.0	14.6	Complied

**Results: Peak / HSDPA Sub-Test 1**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	20.3	33.0	12.7	Complied
Middle	1880.0	Vertical	21.1	33.0	11.9	Complied
Top	1907.6	Vertical	22.1	33.0	10.9	Complied

**Results: Average / HSDPA Sub Test 1**

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	17.1	33.0	15.9	Complied
Middle	1880.0	Vertical	17.3	33.0	15.7	Complied
Top	1907.6	Vertical	17.8	33.0	15.2	Complied

**Test Equipment Used:**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
M1021	Signal Generator	Rohde & Schwarz	SMP02	833286/004	05 Feb 2014	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A032	Antenna	EMCO	3115	2874	12 Mar 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12

**5.2.4. Transmitter Peak-To-Average Power Ratio (PAPR)****Test Summary:**

<b>Test Engineer:</b>	David Doyle	<b>Test Date:</b>	28 February 2013
<b>Test Sample IMEI:</b>	354154040019652		

<b>FCC Reference:</b>	Part 24.232(c)
<b>Industry Canada Reference:</b>	RSS-133 6.4
<b>Test Method Used:</b>	Spectrum analyser measuring maximized peak and average trace amplitudes using marker and delta marker for GSM. FCC KDB 971168 D01 Section 6.0 for UMTS

**Environmental Conditions:**

<b>Temperature (°C):</b>	23
<b>Relative Humidity (%):</b>	29

**Note(s):**

1. GSM: Measurements were performed with the spectrum analyser measurement bandwidth wider than the emission bandwidth. The measured average power was subtracted from the measured peak power to obtain the PAPR.
2. UMTS: The CCDF function of a spectrum analyser was used to measure PAPR when the EUT was transmitting in UMTS circuit switched and HSDPA modes. Maximum PAPR levels associated with a probability of 0.1% were recorded.
3. Industry Canada Certification and Engineering Bureau confirmed the measurement methods are acceptable.

**Transmitter Peak-To-Average Power Ratio (continued)****Results: GSM / Circuit Switched**

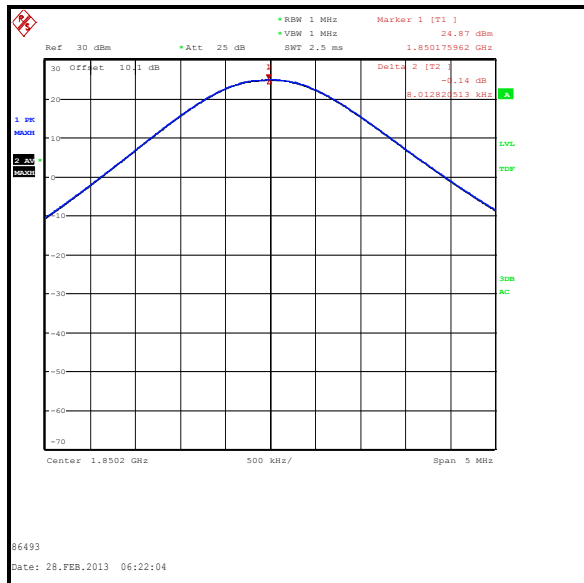
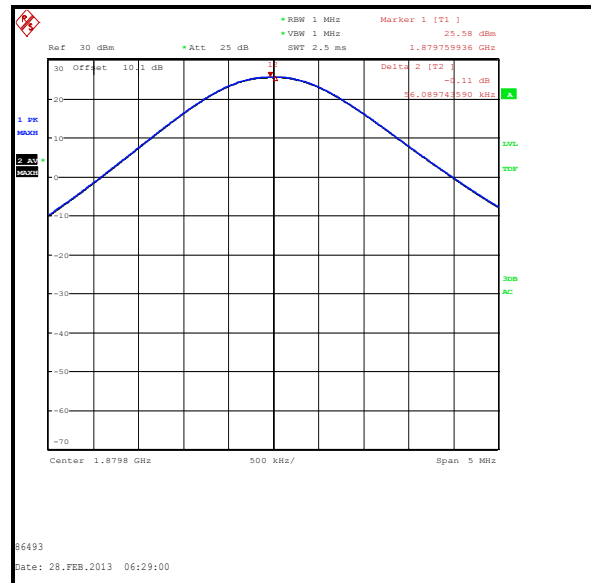
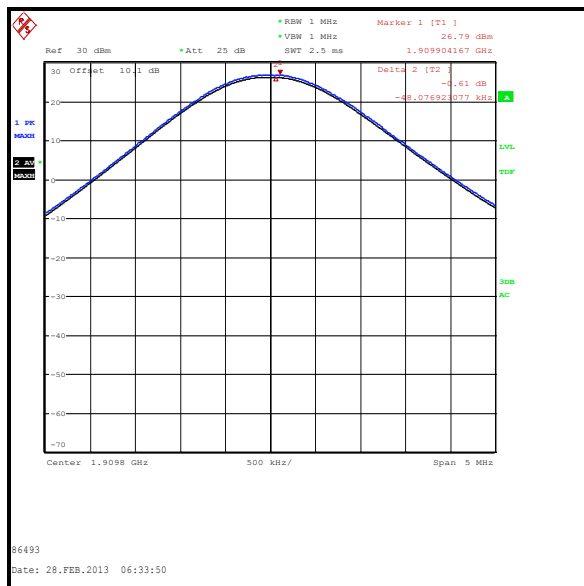
Channel	Frequency (MHz)	EIRP Peak (dBm)	EIRP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	1850.2	24.9	24.8	0.1	13.0	12.9	Complied
Middle	1879.8	25.6	25.5	0.1	13.0	12.9	Complied
Top	1909.8	26.8	26.2	0.6	13.0	12.4	Complied

**Results: GPRS**

Channel	Frequency (MHz)	EIRP Peak (dBm)	EIRP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	1850.2	24.1	24.0	0.1	13.0	12.9	Complied
Middle	1879.8	25.4	25.3	0.1	13.0	12.9	Complied
Top	1909.8	26.4	26.0	0.4	13.0	12.6	Complied

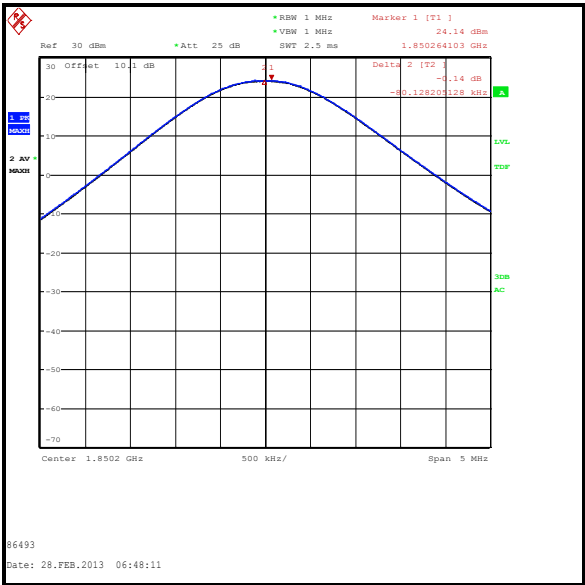
**Results: EGPRS**

Channel	Frequency (MHz)	EIRP Peak (dBm)	EIRP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	1850.2	23.9	23.8	0.1	13.0	12.9	Complied
Middle	1879.8	25.0	25.0	0.0	13.0	13.0	Complied
Top	1909.8	25.2	25.1	0.1	13.0	12.9	Complied

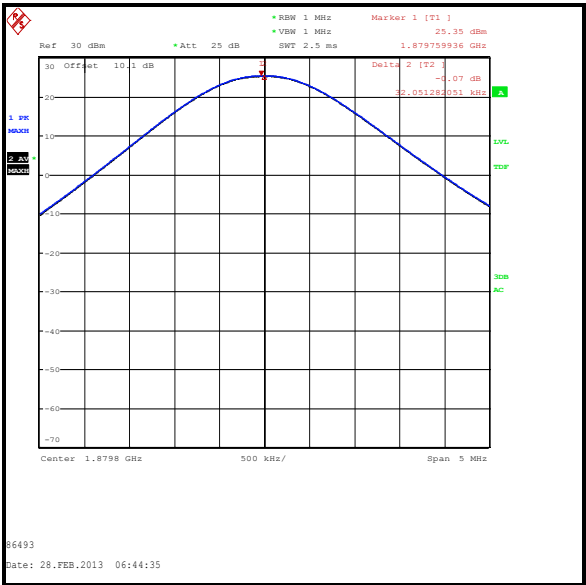
**Transmitter Peak-To-Average Power Ratio (continued)****Results: GSM / Circuit Switched****Bottom channel****Middle channel****Top channel**

Transmitter Peak-To-Average Power Ratio (continued)

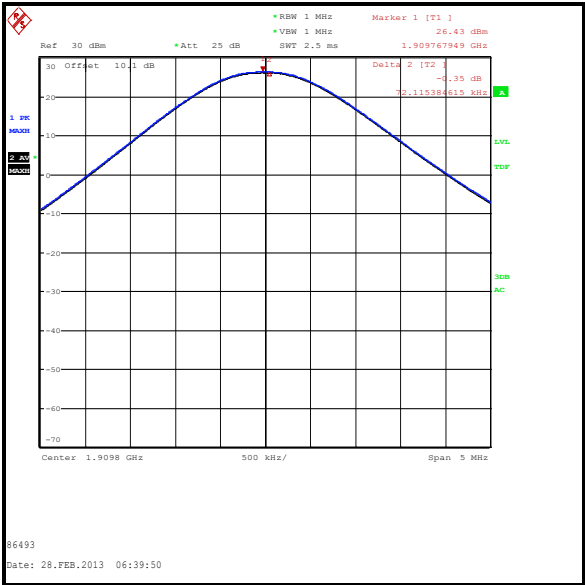
Results: GPRS



Bottom channel



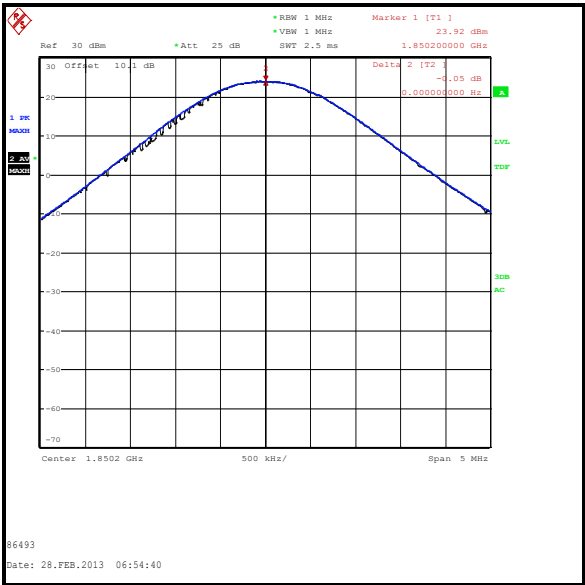
Middle channel



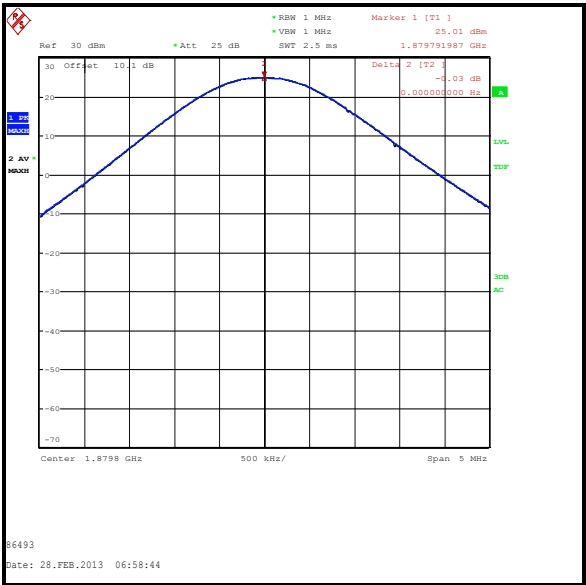
Top channel

Transmitter Peak-To-Average Power Ratio (continued)

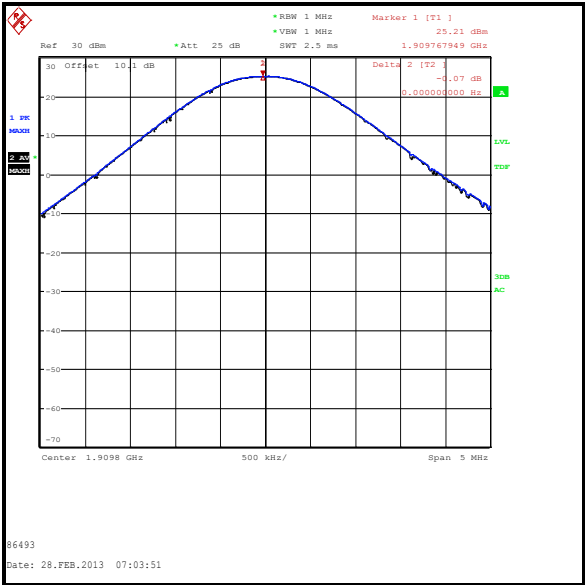
Results: EGPRS



Bottom channel



Middle channel



Top channel

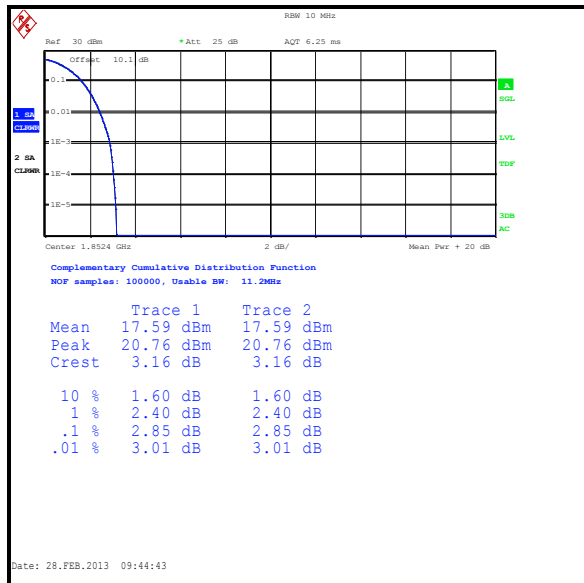
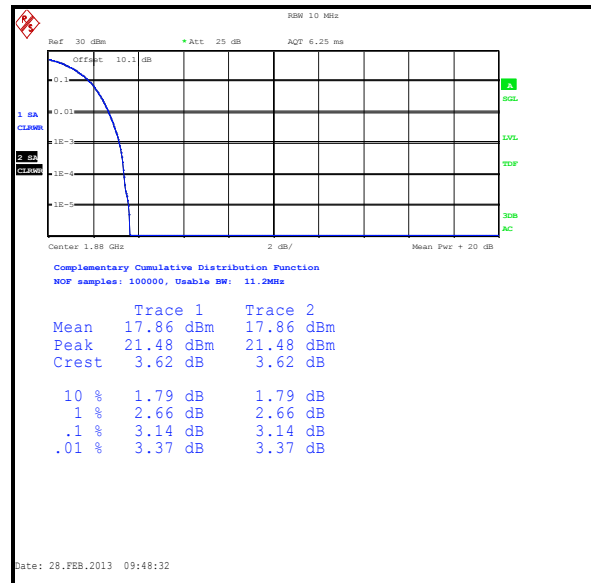
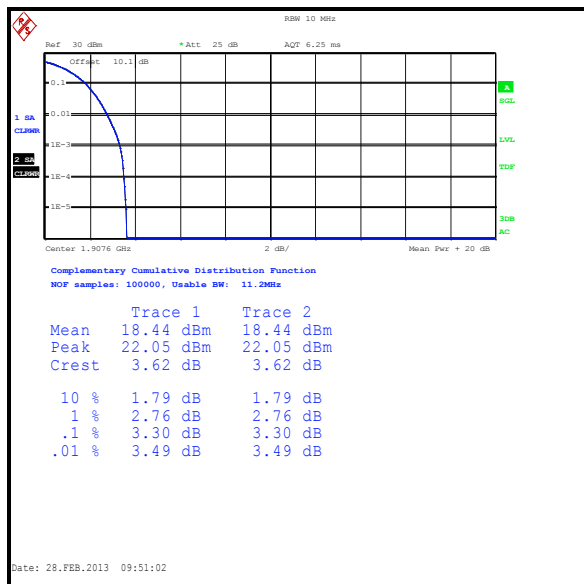


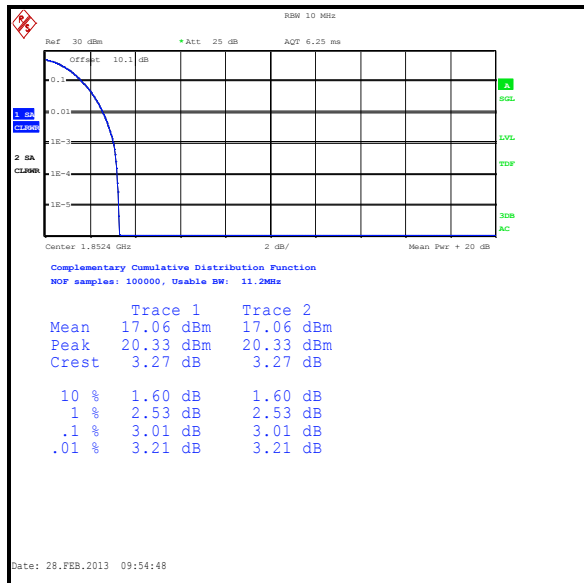
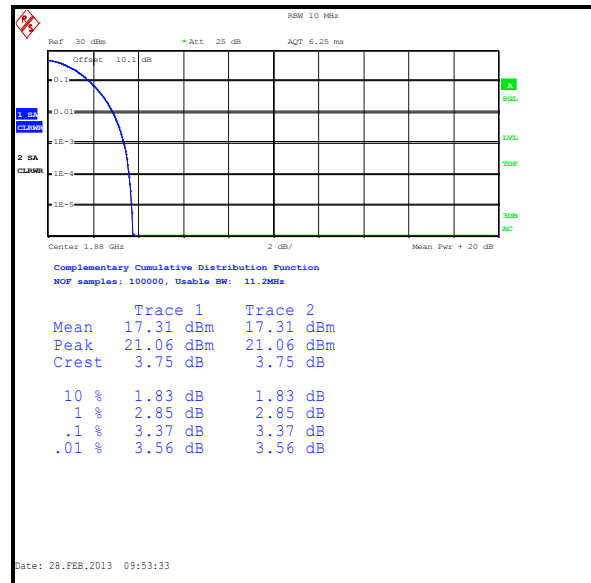
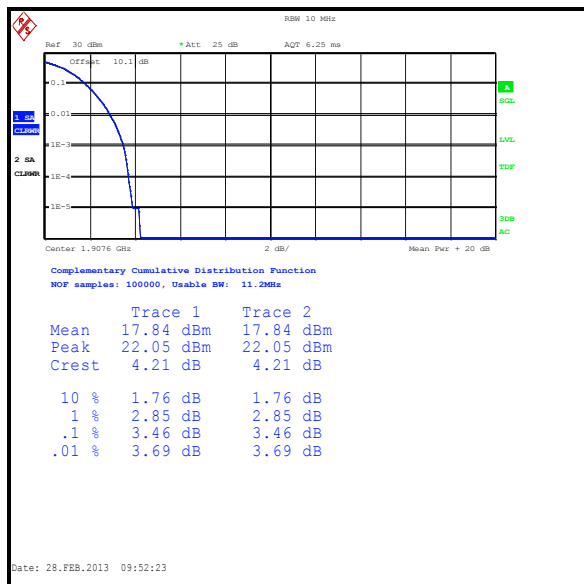
**Transmitter Peak-To-Average Power Ratio (continued)****Results: UMTS Circuit Switched**

Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	1852.4	2.9	13.0	10.1	Complied
Middle	1880.0	3.1	13.0	9.9	Complied
Top	1907.6	3.3	13.0	9.7	Complied

**Results: HSDPA Sub-Test 1**

Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	1852.4	3.0	13.0	10.0	Complied
Middle	1880.0	3.4	13.0	9.6	Complied
Top	1907.6	3.5	13.0	9.5	Complied

**Transmitter Peak-To-Average Power Ratio (continued)****Results: UMTS Circuit Switched****Bottom channel****Middle channel****Top channel**

**Transmitter Peak-To-Average Power Ratio (continued)****Results: HSDPA Sub-Test 1****Bottom channel****Middle channel****Top channel**

**Transmitter Peak-To-Average Power Ratio (continued)****Test Equipment Used:**

RFI No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	04 Nov 2013	12
A1818	Antenna	EMCO	3115	00075692	04 Nov 2013	12
M1124	Test Receiver	Rohde & Schwarz	ESIB 26	100046K	14 Aug 2013	12
M1021	Signal Generator	Rohde & Schwarz	SMP02	833286/004	05 Feb 2014	12
A1534	Pre Amplifier	Hewlett Packard	8449B	3008A00405	04 Nov 2013	12
A032	Antenna	EMCO	3115	2874	12 Mar 2016	12
M1630	Test Receiver	Rohde & Schwarz	ESU40	100233	07 Feb 2014	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	06 Jul 2013	12

## **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.

## **7. Report Revision History**

Version Number	Revision Details		
	Page No(s)	Clause	Details
1.0	-	-	Initial Version