TEST REPORT

Test Report No. : UL-RPT-RP10155013JD50A V2.0

Manufacturer	:	Satellite Tracking of People LLC
Model No.	:	Blu+
FCC ID	:	S5E0114BLU07
IC Certification No.	:	9086A-BLU07
Technology	:	GSM850 / PCS1900 / UMTS Band II / UMTS Band V / CDMA BC0 / CDMA BC1
Test Standard(s)	:	FCC Parts 22.913(a), 24.232(c)(d) & Industry Canada RSS-132 5.4, RSS-133 6.4, RSS Gen 4.8

1. This test report shall not be reproduced in full or partial, without the written approval of UL VS LTD.
2. The results in this report apply only to the sample(s) tested.
3. The 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 2.0 supersedes all previous versions.

Date of Issue: 08 September 2014

Checked by:

Ian Watch
Senior Engineer, Radio Laboratory

Issued by :

pp

John Newell
Quality Manager,
UL VS LTD

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

UL VS LTD

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1. Customer Information

Company Name:	Satellite Tracking of People LLC
Address:	1212 North Post Oak Rd, Suite 100, Houston, TX 77055 USA

2. Summary of Testing

2.1. General Information

Specification Reference:	47CFR22
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 22 Subpart H (Public Mobile Services)
Specification Reference:	47CFR24
Specification Title:	Code of Federal Regulations Volume 47 (Telecommunications): Part 24 Subpart E (Personal Communication Services)
Specification Reference:	RSS-Gen Issue 3, December 2010
Specification Title:	General Requirements and Information for the Certification of Radio Apparatus
Specification Reference:	RSS-132 Issue 3, January 2013
Specification Title:	Cellular Telephone Systems Operating in the Bands 824-849 MHz and 869-894 MHz
Specification Reference:	RSS-133 Issue 6, January 2013
Specification Title:	2 GHz Personal Communications Services
Site Registration:	FCC: 209735; IC: 3245B-2
Location of Testing:	UL VS LTD, Unit 3 Horizon, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, United Kingdom
Test Dates:	22 August 2014 to 03 September 2014

2.2. Summary of Test Results

FCC Reference (47CFR)	IC Reference	Measurement	Result
Part 22 & RSS-132			
Part 22.913(a)	N/A	Transmitter Output Power (ERP)	✓
N/A	RSS-132 5.4	Transmitter Output Power (EIRP)	✓
N/A	RSS-132 5.4	Transmitter Peak To Average Power Ratio	✓
Part 24 & RSS-133			
Part 24.232(c)	RSS-133 6.4	Transmitter Output Power (EIRP)	✓
Part 24.232(d)	RSS-133 6.4	Transmitter Peak To Average Power Ratio	✓
Key to Results ✓ = Complied ✗ = Did not comply			

2.3. Methods and Procedures

Reference:	FCC KDB 971168 D01 v02r01, 7 June 2013
Title:	Measurement Guidance for Certification of Licensed Digital Transmitters

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:	Blu+ V7
Model Name or Number:	Blu+
IMEI:	990002189946195
ESN:	80C627E1
Hardware Version Number:	KK37 V7
Software Version Number:	10.0.0
FCC ID:	S5E0114BLU07
Industry Canada Certification Number:	9086A-BLU07

3.2. Description of EUT

The Equipment Under Test was an offender body worn tracking device containing a GSM/UMTS/CDMA transceiver.

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		
FCC Part 22 Maximum Peak Power (ERP):	GPRS	35.5 dBm	
	EGPRS	31.8 dBm	
IC RSS-132 Maximum Average Power (EIRP):	GPRS	37.35 dBm	
	EGPRS	33.75 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		
FCC Part 24 Maximum Peak Power (EIRP):	GPRS	32.9 dBm	
	EGPRS	32.8 dBm	
IC RSS-133 Maximum Average Power (EIRP):	GPRS	32.8 dBm	
	EGPRS	32.7 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 (RMC, HSDPA & HSUPA)		
Modulation Type:	QPSK		
Channel Spacing:	5 MHz		
FCC Part 22 Maximum Peak Power (ERP):	RMC (12.2 kbit/s)	28.5 dBm	
	HSUPA Sub-Test 3	29.6 dBm	
IC RSS-132 Maximum Average Power (EIRP):	RMC (12.2 kbit/s)	22.85 dBm	
	HSUPA Sub-Test 3	22.15 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 (RMC, HSDPA & HSUPA)		
Modulation Type:	QPSK		
Channel Spacing:	5 MHz		
FCC Part 24 Maximum Peak Power (EIRP):	RMC (12.2 kbit/s)	27.3 dBm	
	HSUPA Sub-Test 3	30.6 dBm	
IC RSS-133 Maximum Average Power (EIRP):	RMC (12.2 kbit/s)	22.5 dBm	
	HSUPA Sub-Test 3	21.6 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

Additional Information Related to Testing (continued)

Technology Tested:	CDMA BC0		
Type of Radio Device:	Transceiver		
Mode:	1xRTT SO2 RC1/1		
Modulation Type:	O-QPSK		
Channel Spacing:	1.25 MHz		
FCC Part 22 Maximum Peak Power (ERP):	1xRTT	28.1 dBm	
IC RSS-132 Maximum Average Power (EIRP):	1xRTT	24.35 dBm	
Transmit Frequency Range:	824 to 849 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	1013	824.70
	Middle	384	836.52
	Top	777	848.31
Technology Tested:	CDMA BC1		
Type of Radio Device:	Transceiver		
Mode:	1xRTT SO2 RC1/1		
Modulation Type:	O-QPSK		
Channel Spacing:	1.25 MHz		
FCC Part 24 Maximum Peak Power (EIRP):	1xRTT	28.6 dBm	
IC RSS-133 Maximum Average Power (EIRP):	1xRTT	21.6 dBm	
Transmit Frequency Range:	1850 to 1910 MHz		
Transmit Channels Tested:	**Channel ID**	**Channel Number**	**Channel Frequency (MHz)**
	Bottom	25	1851.25
	Middle	600	1880.0
	Top	1175	1908.75

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.
- GSM: ERP/EIRP tests were performed with the EUT in GPRS/EGPRS Multislot Class 12 mode with the unit transmitting on one timeslot in the uplink. The EUT output power was initially checked when transmitting at maximum power on one, two, three and four timeslots. The highest power was observed when transmitting on one timeslot. EGPRS tests were performed with the EUT using MCS5 (8PSK modulation).
- UMTS: ERP/EIRP tests were performed with the EUT in RMC (12.2 kbit/s), HSDPA (Sub-tests 1 to 4) or HSUPA (Sub-tests 1 to 5) modes. The EUT output power was initially checked when transmitting at maximum power on all modes for HSDPA and HSUPA. The highest power was observed when transmitting on HSUPA sub test 3. Testing was carried out in this mode.
- CDMA: ERP/EIRP tests were performed with the EUT in Service Option 2 and Radio Configuration 1/1 mode. Preliminary checks showed the highest power in this mode.

4.2. Configuration and Peripherals

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

- Connected to a Rohde & Schwarz CMW 500 Universal Radio Communications Tester operating in transceiver mode.
- Powered using a fully charged 3.7 VDC internal battery.

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

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	22 August 2014, 26 August 2014 & 03 September 2014
Test Sample IMEI:	990002189946195		
Test Sample ESN:	80C627E1		

FCC Reference:	Part 22.913(a)
Industry Canada Reference:	RSS-Gen 4.8 / RSS-132 5.4
Test Method Used:	As detailed in KDB 971168 Section 5.1.1 and 5.2.1

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	42 to 48

Note(s):

1. Industry Canada measurements are average power measured in accordance with FCC KDB 971168 D01 Section 5.2.1.
2. All tests were performed as radiated measurements.

Transmitter Output Power (continued)

Results: Peak / GPRS / ERP

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	34.1	38.45	4.35	Complied
Middle	836.6	Vertical	34.6	38.45	3.85	Complied
Top	848.8	Vertical	35.5	38.45	2.95	Complied

Results: Peak / EGPRS / ERP

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	31.4	38.45	7.05	Complied
Middle	836.6	Vertical	31.6	38.45	6.85	Complied
Top	848.8	Vertical	31.8	38.45	6.65	Complied

Results: Average / GPRS / EIRP

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	35.95	40.6	4.65	Complied
Middle	836.6	Vertical	36.55	40.6	4.05	Complied
Top	848.8	Vertical	37.35	40.6	3.25	Complied

Results: Average / EGPRS / EIRP

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	824.2	Vertical	33.35	40.6	7.25	Complied
Middle	836.6	Vertical	33.55	40.6	7.05	Complied
Top	848.8	Vertical	33.75	40.6	6.85	Complied

Transmitter Output Power (continued)

Results: Peak / UMTS RMC 12.2 kbit/s / ERP

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	27.4	38.45	11.05	Complied
Middle	836.6	Vertical	28.1	38.45	10.35	Complied
Top	846.6	Vertical	28.5	38.45	9.95	Complied

Results: Peak / HSUPA Sub-Test 3 / ERP

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	28.2	38.45	10.25	Complied
Middle	836.6	Vertical	29.0	38.45	9.45	Complied
Top	846.6	Vertical	29.6	38.45	8.85	Complied

Results: Average / UMTS RMC 12.2 kbit/s / EIRP

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	22.35	40.6	18.25	Complied
Middle	836.6	Vertical	22.85	40.6	17.75	Complied
Top	846.6	Vertical	22.75	40.6	17.85	Complied

Results: Average / HSUPA Sub-Test 3 / EIRP

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	826.4	Vertical	21.85	40.6	18.75	Complied
Middle	836.6	Vertical	22.15	40.6	18.45	Complied
Top	846.6	Vertical	22.15	40.6	18.45	Complied

Transmitter Output Power (continued)

Results: Peak / CDMA 1xRTT / ERP

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	824.70	Vertical	28.1	38.45	10.35	Complied
Middle	836.52	Vertical	27.1	38.45	11.35	Complied
Top	848.31	Vertical	27.8	38.45	10.65	Complied

Results: Average / CDMA 1xRTT / EIRP

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	Result
Bottom	824.70	Vertical	22.65	40.6	17.95	Complied
Middle	836.52	Vertical	23.65	40.6	16.95	Complied
Top	848.31	Vertical	24.35	40.6	16.25	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
A259	Antenna	Chase	CBL6111	1513	01 Apr 2015	12
A288	Antenna	Chase	CBL6111A	1589	21 Aug 2015	12
M1874	Test Receiver	Rohde & Schwarz	ESU 26	100553	13 May 2015	12
M1873	Test Receiver	Rohde & Schwarz	FSV 30	103074	15 May 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12

5.2.2. Transmitter Peak-To-Average Power Ratio (PAPR)

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	22 August 2014, 26 August 2014 & 03 September 2014
Test Sample IMEI:	990002189946195		
Test Sample ESN:	80C627E1		

Industry Canada Reference:	RSS-132 Section 5.4
Test Method Used:	FCC KDB 971168 D01 Section 5.7.2 for GSM FCC KDB 971168 D01 Section 5.7.1 for UMTS and CDMA

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	42 to 48

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. CDMA: The CCDF function of a spectrum analyser was used to measure PAPR when the EUT was transmitting in 1xRTT mode. Maximum PAPR levels associated with a probability of 0.1% were recorded.
4. All tests were performed as radiated measurements.
5. Power measurement results are ERP.

Transmitter Peak-To-Average Power Ratio (continued)

Results: GPRS

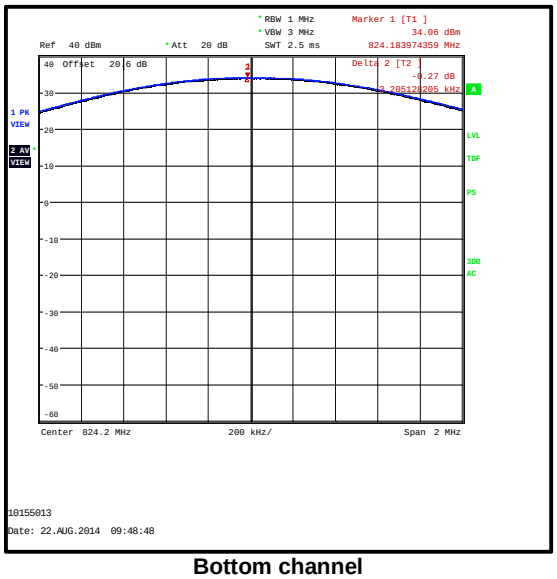
Channel	Frequency (MHz)	ERP Peak (dBm)	ERP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	824.2	34.1	33.8	0.3	13.0	12.7	Complied
Middle	836.6	34.6	34.4	0.2	13.0	12.8	Complied
Top	848.8	35.5	35.2	0.3	13.0	12.7	Complied

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	31.4	31.2	0.2	13.0	12.8	Complied
Middle	836.6	31.6	31.4	0.2	13.0	12.8	Complied
Top	848.8	31.8	31.6	0.2	13.0	12.8	Complied

Transmitter Peak-To-Average Power Ratio (continued)

Results: GPRS



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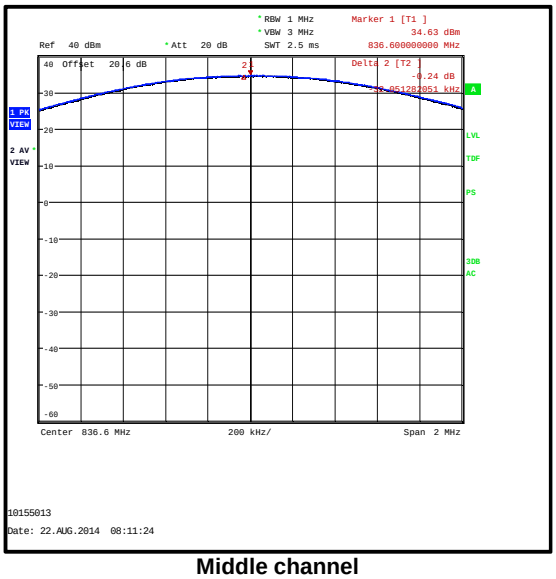

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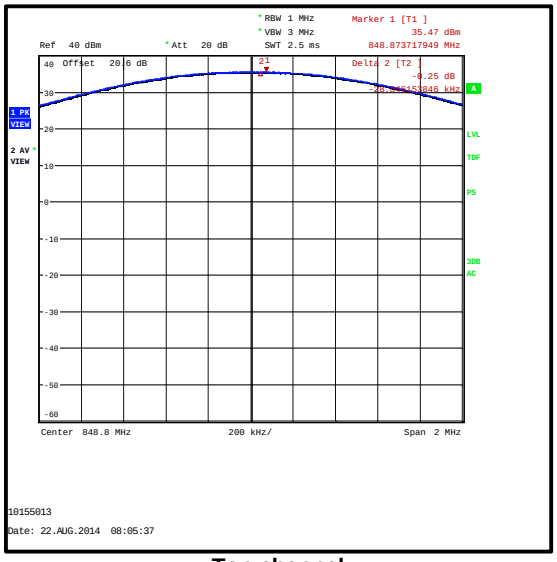
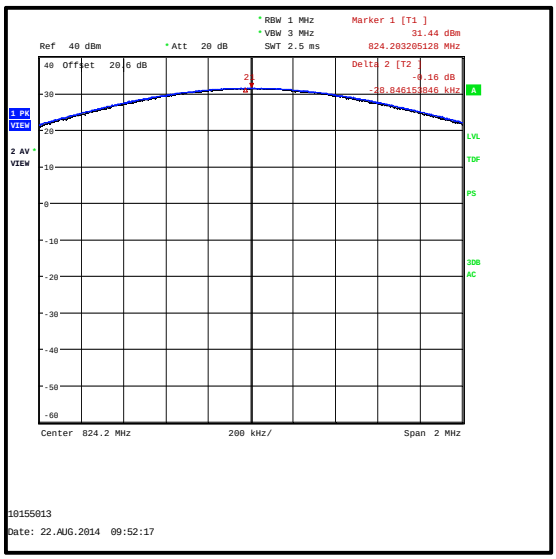


Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Results: EGPRS



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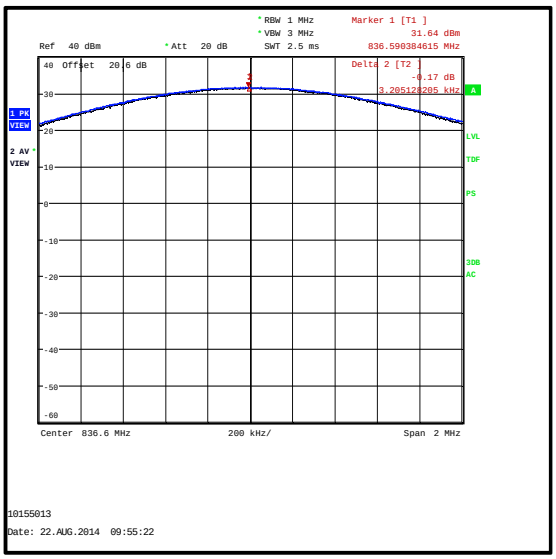

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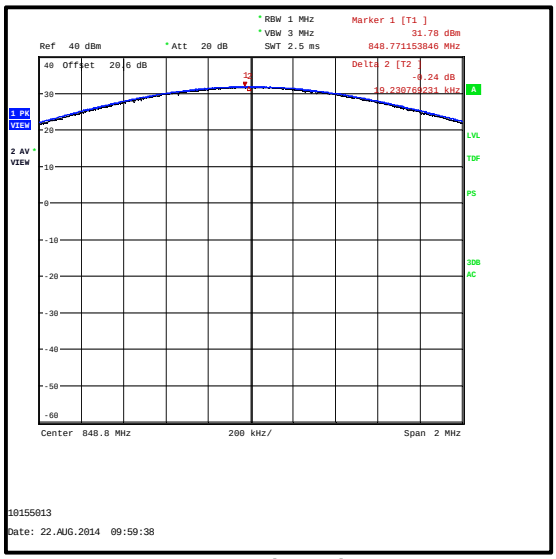


Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Results: UMTS RMC 12.2 kbit/s

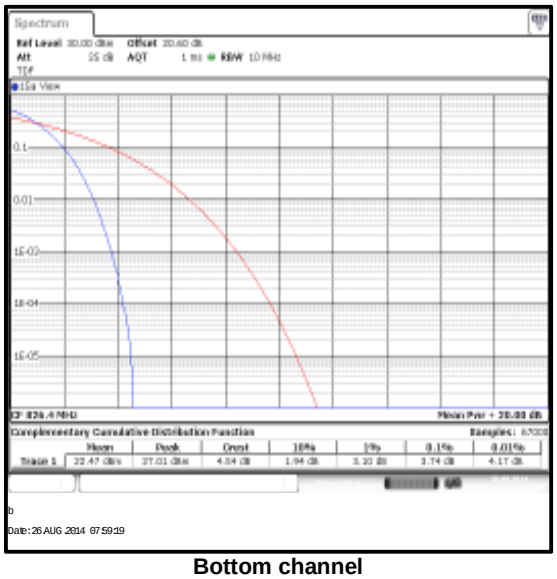
Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	826.4	3.7	13.0	9.3	Complied
Middle	836.6	3.5	13.0	9.5	Complied
Top	846.6	3.7	13.0	9.3	Complied

Results: HSUPA Sub-Test 3

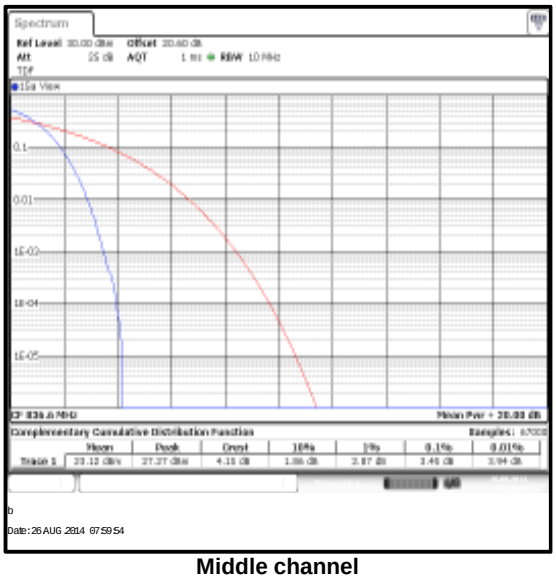
Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	826.4	4.5	13.0	8.5	Complied
Middle	836.6	4.1	13.0	8.9	Complied
Top	846.6	4.5	13.0	8.5	Complied

Transmitter Peak-To-Average Power Ratio (continued)

Results: UMTS RMC 12.2 kbit/s



Bottom channel



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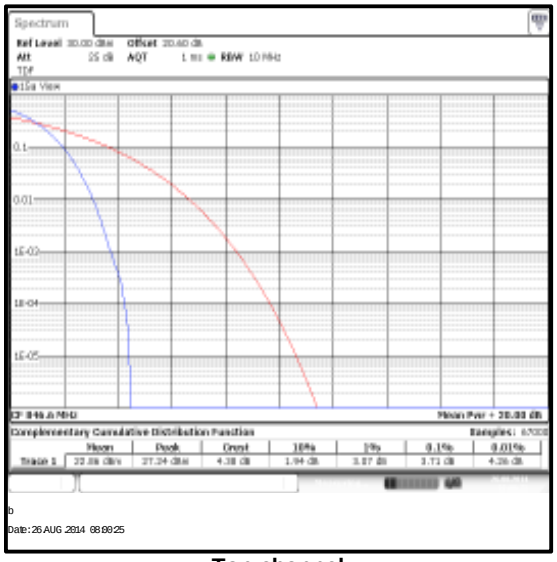
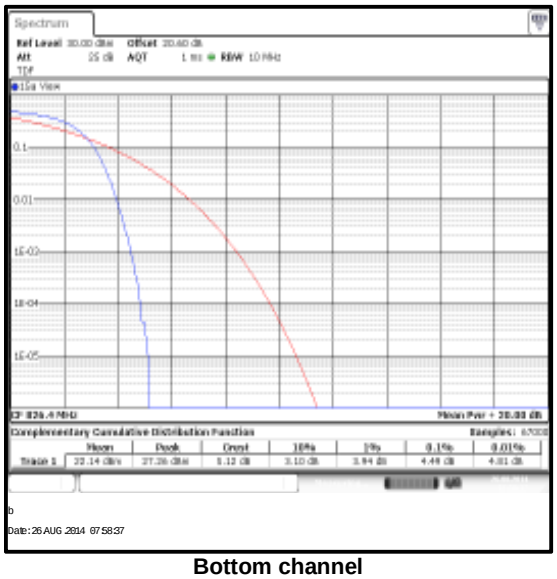


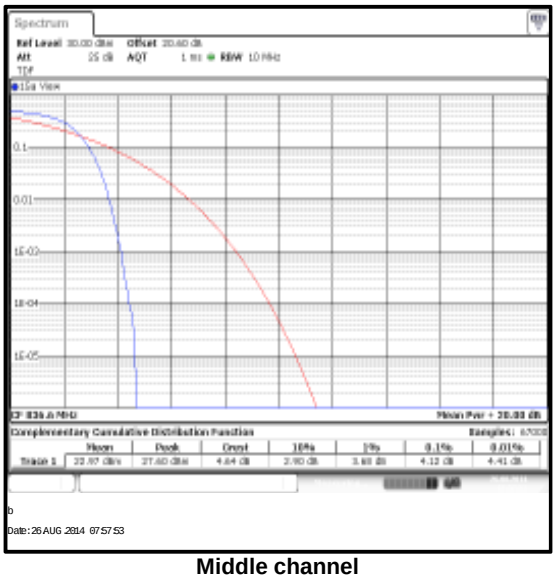
Top channel

Transmitter Peak-To-Average Power Ratio (continued)

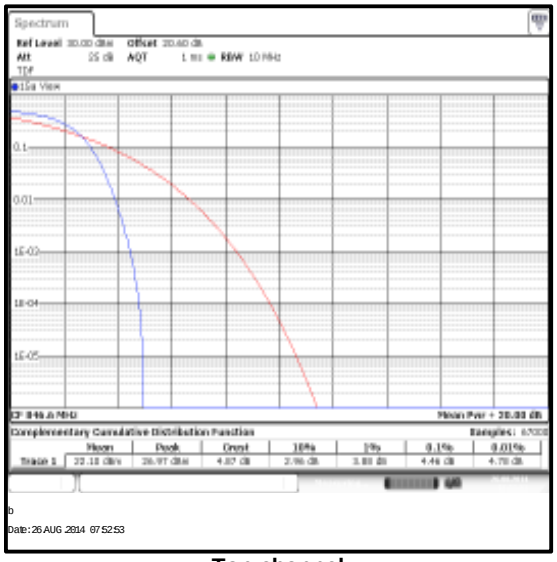
Results: HSUPA Sub-Test 3



Bottom channel



Middle channel

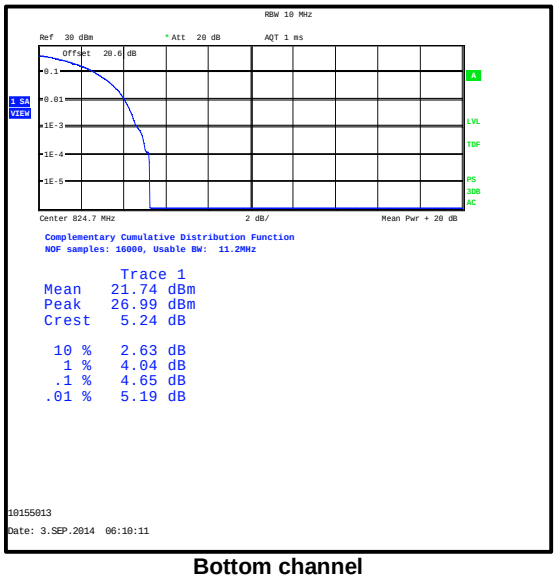


Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Results: CDMA 1xRTT

Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	824.70	4.7	13.0	8.3	Complied
Middle	836.52	3.7	13.0	9.3	Complied
Top	848.31	3.5	13.0	9.5	Complied



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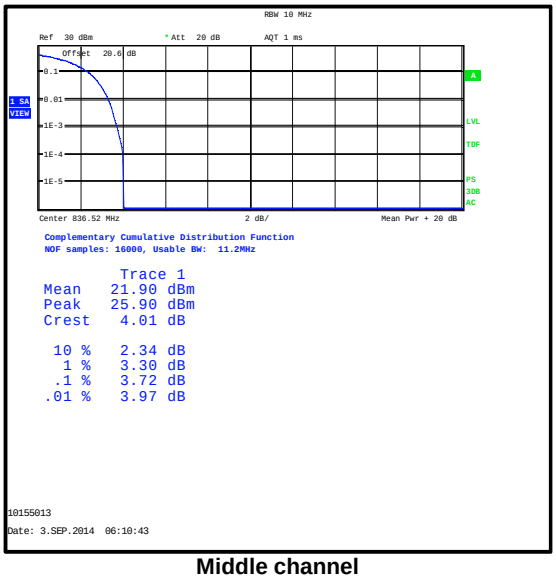
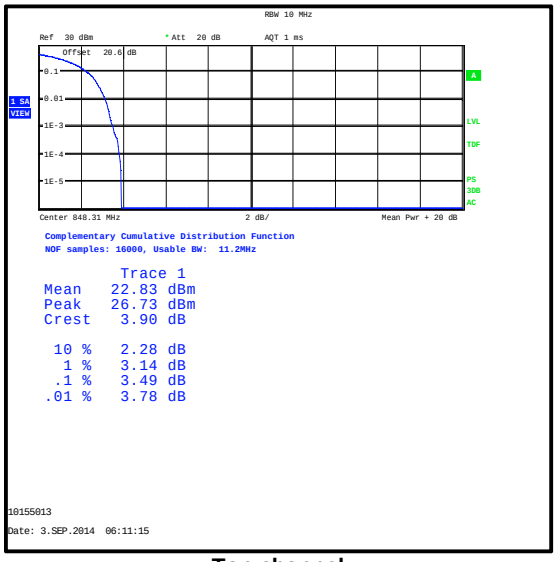


Middle channel



Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
A259	Antenna	Chase	CBL6111	1513	01 Apr 2015	12
A288	Antenna	Chase	CBL6111A	1589	21 Aug 2015	12
M1874	Test Receiver	Rohde & Schwarz	ESU 26	100553	13 May 2015	12
M1873	Test Receiver	Rohde & Schwarz	FSV 30	103074	15 May 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12

FCC Part 24 & Industry Canada RSS-133

5.2.3. Transmitter Output Power

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	22 August 2014 & 03 September 2014
Test Sample IMEI:	990002189946195		
Test Sample ESN:	80C627E1		

FCC Part:	24.232(c)
Industry Canada Reference:	RSS-Gen 4.8 / RSS-133 6.4
Test Method Used:	As detailed in KDB 971168 Section 5.1.1 and 5.2.1

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	42 to 43

Note(s):

1. Industry Canada measurements are average power measured in accordance with FCC KDB 971168 D01 Section 5.2.1.
2. All tests were performed as radiated measurements.

Transmitter Output Power (continued)

Results: Peak / GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	31.3	33.0	1.7	Complied
Middle	1879.8	Vertical	32.7	33.0	0.3	Complied
Top	1909.8	Vertical	32.9	33.0	0.1	Complied

Results: Peak / EGPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	30.7	33.0	2.3	Complied
Middle	1879.8	Vertical	31.5	33.0	1.5	Complied
Top	1909.8	Vertical	32.8	33.0	0.2	Complied

Results: Average / GPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	31.2	33.0	1.8	Complied
Middle	1879.8	Vertical	32.6	33.0	0.4	Complied
Top	1909.8	Vertical	32.8	33.0	0.2	Complied

Results: Average / EGPRS

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1850.2	Vertical	30.5	33.0	2.5	Complied
Middle	1879.8	Vertical	31.2	33.0	1.8	Complied
Top	1909.8	Vertical	32.7	33.0	0.3	Complied

Transmitter Output Power (continued)

Results: Peak / UMTS RMC 12.2 kbit/s

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	26.6	33.0	6.4	Complied
Middle	1880.0	Vertical	26.9	33.0	6.1	Complied
Top	1907.6	Vertical	27.3	33.0	5.7	Complied

Results: Peak / HSUPA Sub-Test 3

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	28.0	33.0	5.0	Complied
Middle	1880.0	Vertical	28.5	33.0	4.5	Complied
Top	1907.6	Vertical	30.6	33.0	2.4	Complied

Results: Average / UMTS RMC 12.2 kbit/s

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	20.2	33.0	12.8	Complied
Middle	1880.0	Vertical	20.1	33.0	12.9	Complied
Top	1907.6	Vertical	22.5	33.0	10.5	Complied

Results: Average / HSUPA Sub Test 3

Channel	Frequency (MHz)	Antenna Polarity	EIRP (dBm)	Limit (dBm)	Margin (dB)	Result
Bottom	1852.4	Vertical	21.2	33.0	11.8	Complied
Middle	1880.0	Vertical	20.5	33.0	12.5	Complied
Top	1907.6	Vertical	21.6	33.0	11.4	Complied

Transmitter Output Power (continued)

Results: Peak / CDMA 1xRTT

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	1851.25	Vertical	27.5	33.0	5.5	Complied
Middle	1880.0	Vertical	28.6	33.0	4.4	Complied
Top	1908.75	Vertical	28.6	33.0	4.4	Complied

Results: Average / CDMA 1xRTT

Channel	Frequency (MHz)	Antenna Polarity	ERP (dBm)	ERP Limit (dBm)	Margin (dB)	Result
Bottom	1851.25	Vertical	22.7	33.0	10.3	Complied
Middle	1880.0	Vertical	22.2	33.0	10.8	Complied
Top	1908.75	Vertical	24.1	33.0	8.9	Complied

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU 26	100553	13 May 2015	12
M1873	Test Receiver	Rohde & Schwarz	FSV 30	103074	15 May 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	12

5.2.4. Transmitter Peak-To-Average Power Ratio (PAPR)

Test Summary:

Test Engineer:	David Doyle	**Test Dates:**	26 August 2014 & 03 September 2014
Test Sample IMEI:	990002189946195		
Test Sample ESN:	80C627E1		

Industry Canada Reference:	RSS-133 6.4
Test Method Used:	Spectrum analyser measuring maximized peak and average trace amplitudes using marker and delta marker for GSM. FCC KDB 971168 D01 Section 5.7.1 for UMTS and CDMA

Environmental Conditions:

Temperature (°C):	23 to 24
Relative Humidity (%):	42 to 43

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. CDMA: The CCDF function of a spectrum analyser was used to measure PAPR when the EUT was transmitting in 1xRTT mode. Maximum PAPR levels associated with a probability of 0.1% were recorded.
4. All tests were performed as radiated measurements.

Transmitter Peak-To-Average Power Ratio (continued)

Results: GPRS

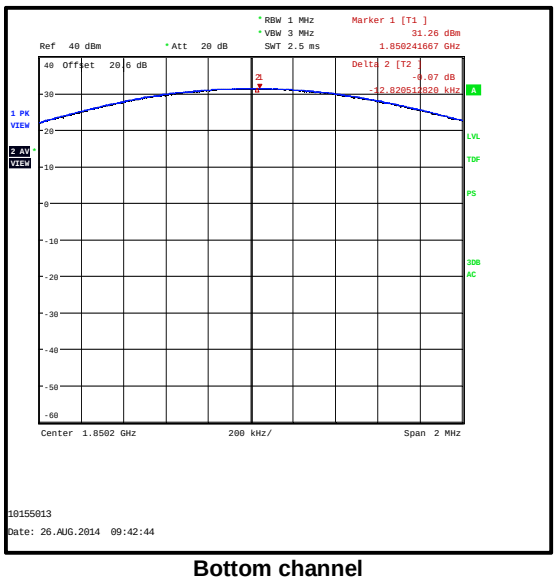
Channel	Frequency (MHz)	EIRP Peak (dBm)	EIRP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	1850.2	31.3	31.2	0.1	13.0	12.9	Complied
Middle	1879.8	32.7	32.6	0.1	13.0	12.9	Complied
Top	1909.8	32.9	32.8	0.1	13.0	12.9	Complied

Results: EGPRS

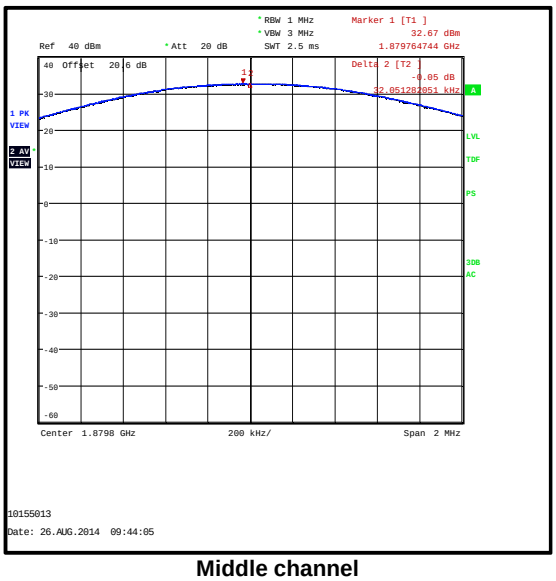
Channel	Frequency (MHz)	EIRP Peak (dBm)	EIRP Average (dBm)	Peak to Average Ratio (dB)	Ratio Limit (dB)	Margin (dB)	Result
Bottom	1850.2	30.7	30.5	0.2	13.0	12.8	Complied
Middle	1879.8	31.5	31.2	0.3	13.0	12.7	Complied
Top	1909.8	32.8	32.7	0.1	13.0	12.9	Complied

Transmitter Peak-To-Average Power Ratio (continued)

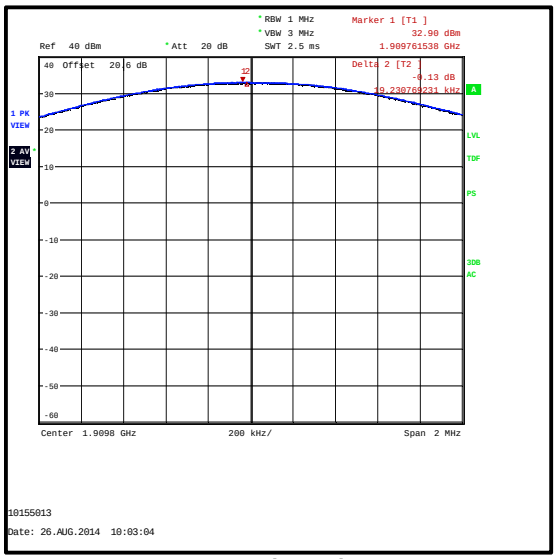
Results: GPRS



Bottom channel



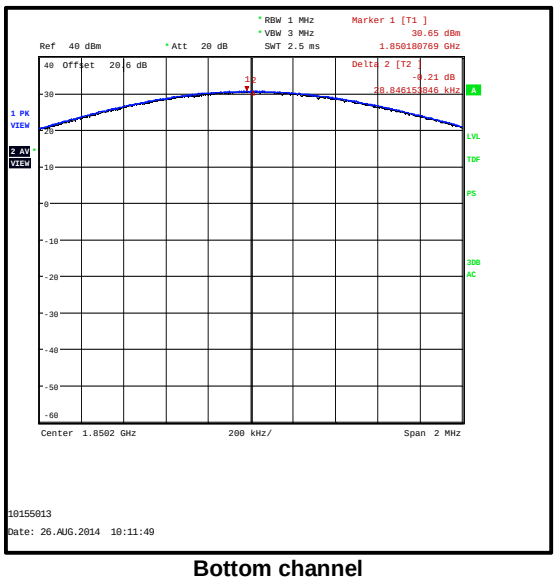
Middle channel



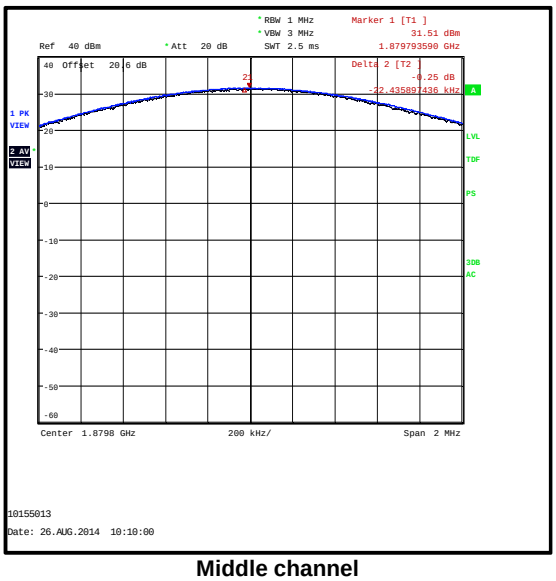
Top channel

Transmitter Peak-To-Average Power Ratio (continued)

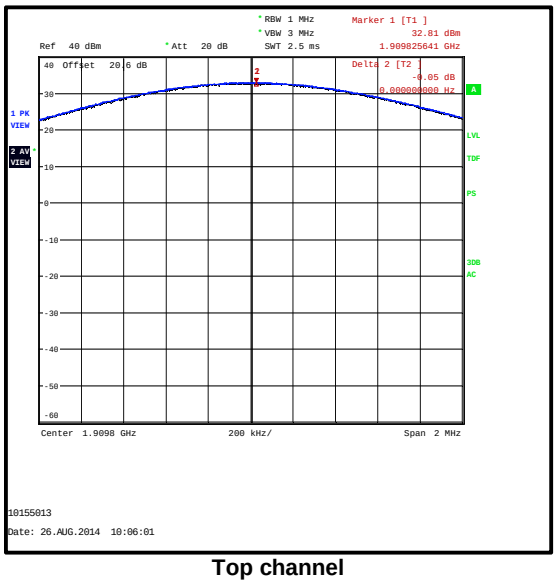
Results: EGPRS



Bottom channel



Middle channel



Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Results: UMTS RMC 12.2 kbit/s

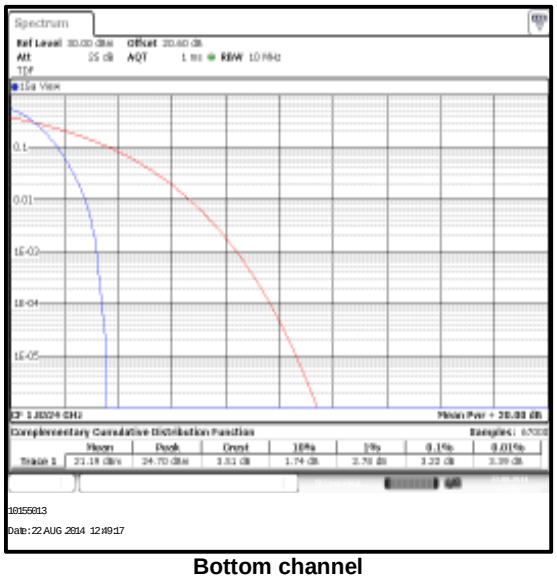
Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	1852.4	3.2	13.0	9.8	Complied
Middle	1880.0	3.4	13.0	9.6	Complied
Top	1907.6	3.3	13.0	9.7	Complied

Results: HSUPA Sub-Test 3

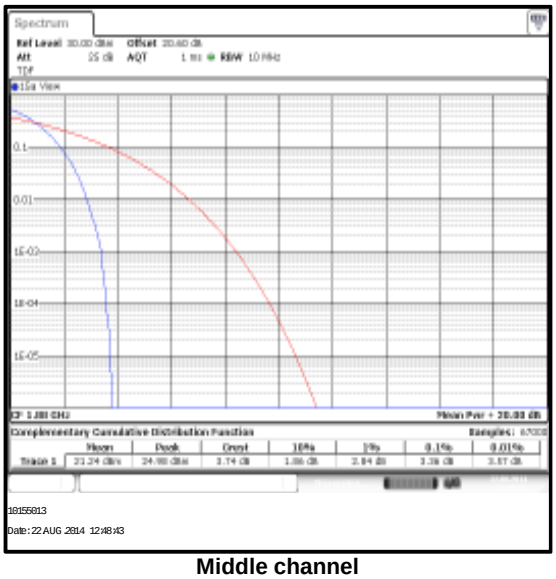
Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	1852.4	3.7	13.0	9.3	Complied
Middle	1880.0	4.2	13.0	8.8	Complied
Top	1907.6	3.8	13.0	9.2	Complied

Transmitter Peak-To-Average Power Ratio (continued)

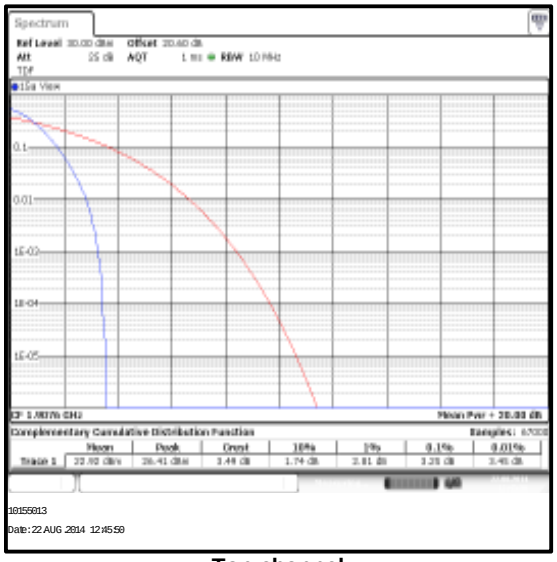
Results: UMTS RMC 12.2 kbit/s



Bottom channel



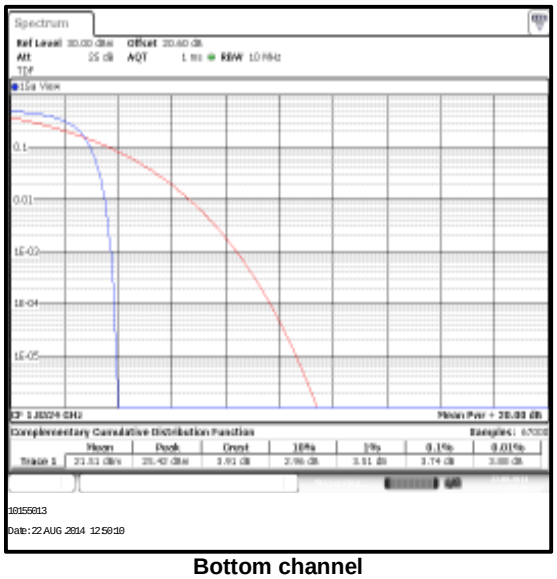
Middle channel



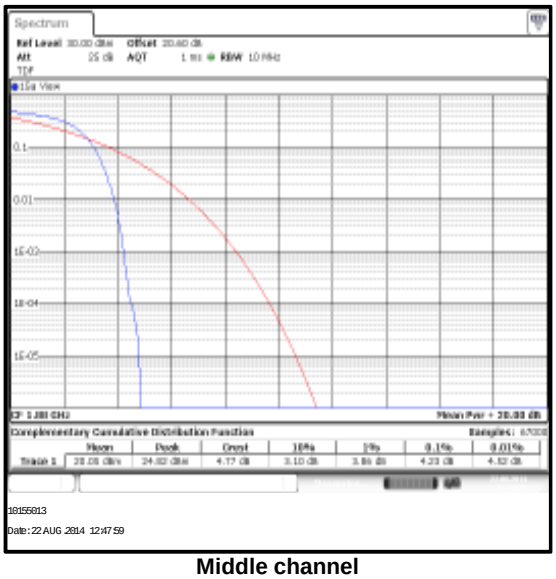
Top channel

Transmitter Peak-To-Average Power Ratio (continued)

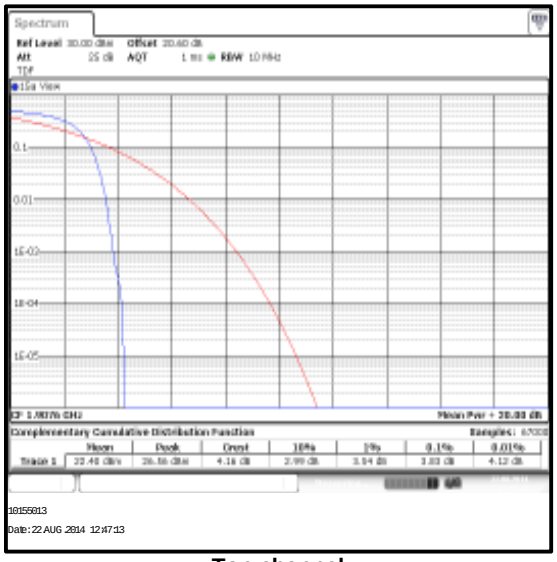
Results: HSUPA Sub-Test 3



Bottom channel



Middle channel

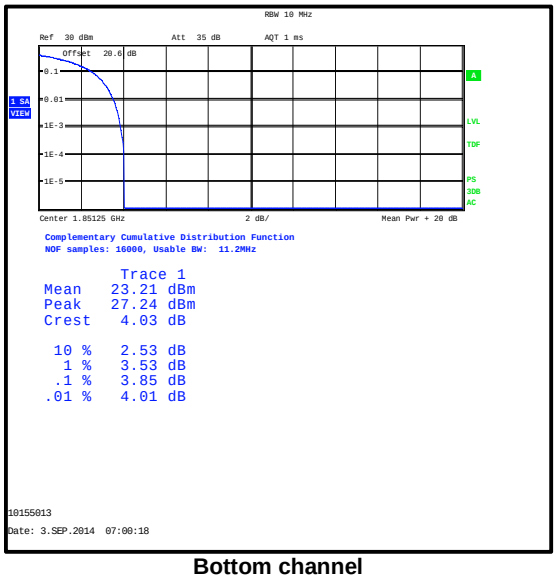


Top channel

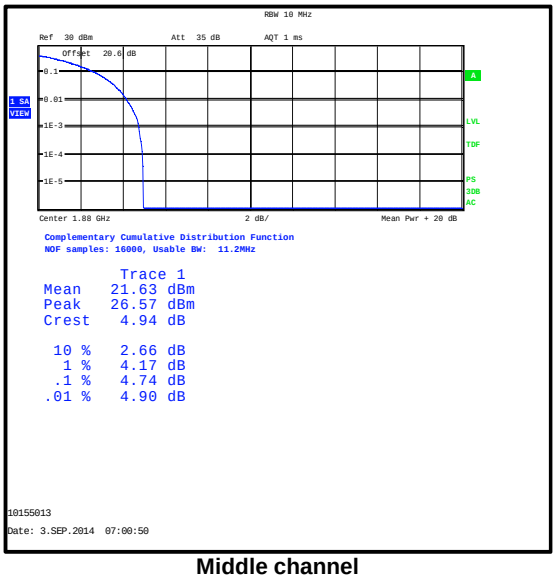
Transmitter Peak-To-Average Power Ratio (continued)

Results: CDMA 1xRTT

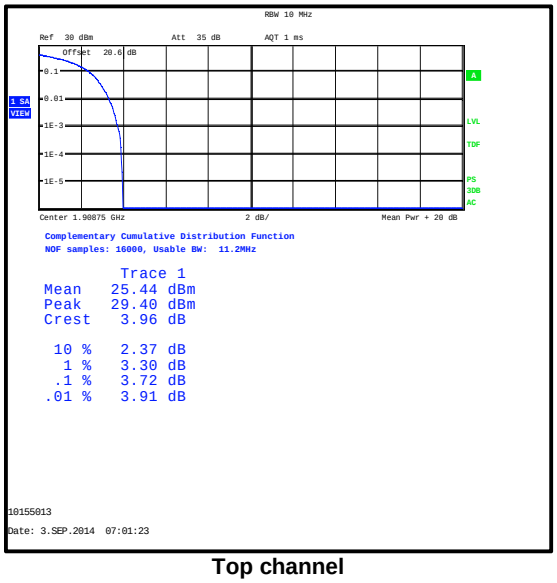
Channel	Frequency (MHz)	Maximum PAPR level (dB)	PAPR Limit (dB)	Margin (dB)	Result
Bottom	1851.25	3.9	13.0	9.1	Complied
Middle	1880.0	4.7	13.0	8.3	Complied
Top	1908.75	3.7	13.0	9.3	Complied



Bottom channel



Middle channel



Top channel

Transmitter Peak-To-Average Power Ratio (continued)

Test Equipment Used:

Asset No.	Instrument	Manufacturer	Type No.	Serial No.	Date Calibration Due	Cal. Interval (Months)
K0002	RSE Chamber	Rainford EMC	N/A	N/A	14 Nov 2014	12
A1818	Antenna	EMCO	3115	00075692	14 Nov 2014	12
M1874	Test Receiver	Rohde & Schwarz	ESU 26	100553	13 May 2015	12
M1873	Test Receiver	Rohde & Schwarz	FSV 30	103074	15 May 2015	12
A1393	Attenuator	Huber & Suhner	6820.17.B	757456	02 May 2015	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
2.0	-	-	All changes made at the request of the TCB
	5	-	Updated Summary of Test Results table
	8 to 10	-	Updated Additional Information Related to Testing tables with IC references and maximum average power
	14 to 16	-	Removed ERP/Average results. Grouped ERP and EIRP result tables
	17	-	Added Note 5
	27 & 28	-	Grouped peak and average result tables

--- END OF REPORT ---