

TEST REPORT

Test Report No.: 1-4254/12-63-02



Testing Laboratory

CETECOM ICT Services GmbH
 Untertürkheimer Straße 6 – 10
 66117 Saarbrücken/Germany
 Phone: + 49 681 5 98 - 0
 Fax: + 49 681 5 98 - 9075
 Internet: <http://www.cetecom.com>
 e-mail: ict@cetecom.com

Accredited Test Laboratory:
 The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2005) by the Deutsche Akkreditierungsstelle GmbH (DAkkS)
 The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number: D-PL-12076-01-01

Applicant

Sony Mobile Communications AB
 Nya Vattentornet
 22188 Lund/SWEDEN

Phone: +46 46 19 30 00

Contact: Håkan Sjöberg
 e-mail: hakan.sjoberg@sonymobile.com
 Phone: +46 46 19 35 59
 Fax: +46 46 19 32 95

Manufacturer

Sony Mobile Communications AB
 Nya Vattentornet
 22188 Lund/SWEDEN

Test Standard/s

IEEE 1528-2003	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
OET Bulletin 65 Supplement C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
RSS-102 Issue 4	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)

For further applied test standards please refer to section 3 of this test report.

Test Item

Kind of test item:	Mobile Phone
Device type:	portable device
Model name:	PM-0030-BV
S/N serial number:	CB511ZXHQ0 / CB511ZY9K9 (WLAN)
FCC-ID:	PY7PM-0030
IC:	4170B-PM0030
IMEI-Number:	00440214-5722256
Hardware status:	AP1.2
Software status:	7.0.A.1.68 / atp_mint_0_0_52
Frequency:	see technical details
Antenna:	integrated antenna
Battery option:	Integrated battery
Accessories:	Stereo headset
Test sample status:	identical prototype
Exposure category:	general population / uncontrolled environment

Note: this test report is an addendum to test report 1-4254/12-18-02-A for PCII of HSDPA category change from 14 to 24.

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Test Report authorised:



2012-11-09 Thomas Vogler
 Senior Testing Manager

Test performed:



2012-11-09 Oleksandr Hnatovskiy
 Testing Manager

1	Table of contents	
1	Table of contents.....	2
2	General information	3
2.1	Notes and disclaimer	3
2.2	Application details	3
2.3	Technical details.....	4
3	Test standards/ procedures references.....	5
4	Summary of Measurement Results	6
5	Test Environment	6
6	Test Results	7
6.1	Conducted power measurements.....	7
6.1.1	Conducted power measurements 3GPP UMTS FDD V (850 MHz).....	7
6.1.2	Conducted power measurements 3GPP UMTS FDD IV (1700 MHz).....	7
6.1.3	Conducted power measurements 3GPP UMTS FDD II (1900 MHz)	8
6.1.4	Test-set-up information for WCDMA / HSPDA / DC-HSDPA	9
7	Test equipment and ancillaries used for tests.....	12

2 General information

2.1 Notes and disclaimer

The test results of this test report relate exclusively to the test item specified in this test report. CETECOM ICT Services GmbH does not assume responsibility for any conclusions and generalisations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM ICT Services GmbH.

This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

The testing service provided by CETECOM ICT Services GmbH has been rendered under the current "General Terms and Conditions for CETECOM ICT Services GmbH".

CETECOM ICT Services GmbH will not be liable for any loss or damage resulting from false, inaccurate, inappropriate or incomplete product information provided by the customer.

Under no circumstances does the CETECOM ICT Services GmbH test report include any endorsement or warranty regarding the functionality, quality or performance of any other product or service provided.

Under no circumstances does the CETECOM ICT Services GmbH test report include or imply any product or service warranties from CETECOM ICT Services GmbH, including, without limitation, any implied warranties of merchantability, fitness for purpose, or non-infringement, all of which are expressly disclaimed by CETECOM ICT Services GmbH.

All rights and remedies regarding vendor's products and services for which CETECOM ICT Services GmbH has prepared this test report shall be provided by the party offering such products or services and not by CETECOM ICT Services GmbH.

In no case this test report can be considered as a Letter of Approval.

2.2 Application details

Date of receipt of order:	2012-07-03
Date of receipt of test item:	2012-07-03
Start of test:	2012-10-31
End of test:	2012-10-31
Person(s) present during the test:	

2.3 Technical details

Band tested for this test report	Technology	Frequency band	Lowest transmit frequency/MHz	Highest transmit frequency/MHz	Lowest receive Frequency/MHz	Highest receive Frequency/MHz	Kind of modulation	Power Class	Tested power control level	GPRS/EGPRS mobile station class	GPRS/EGPRS multislot class	(E)GPRS voice mode or DTM	Test channel low	Test channel middle	Test channel high	Maximum output power/dBm)*
<input type="checkbox"/>	GSM	GSM	880.2	914.8	925.2	959.8	GMSK 8-PSK	4 E2	5	B	12	no	975	37	124	33.8
<input type="checkbox"/>	GSM	DCS	1710.2	1784.8	1805.2	1879.8	GMSK 8-PSK	1 E2	0	B	12	no	512	698	885	30.7
<input checked="" type="checkbox"/>	GSM	cellular	824.2	848.8	869.2	893.8	GMSK 8-PSK	4 E2	5	B	12	no	128	190	251	33.1
<input checked="" type="checkbox"/>	GSM	PCS	1850.2	1909.8	1930.2	1989.8	GMSK 8-PSK	1 E2	0	B	12	no	512	661	810	30.8
<input type="checkbox"/>	UMTS	FDD I	1922.4	1977.6	2112.4	2167.6	QPSK	3	max	--	--	--	9612	9750	9888	24.0
<input checked="" type="checkbox"/>	UMTS	FDD II	1852.4	1907.6	1982.4	1987.6	QPSK	3	max	--	--	--	9262	9400	9538	24.8
<input checked="" type="checkbox"/>	UMTS	FDD IV	1712.4	1752.6	1807.4	1877.6	QPSK	3	max	--	--	--	1312	1412	1513	24.8
<input checked="" type="checkbox"/>	UMTS	FDD V	826.4	846.6	871.4	891.6	QPSK	3	max	--	--	--	4132	4182	4233	25.0
<input type="checkbox"/>	UMTS	FDD VIII	882.4	912.6	927.4	957.6	QPSK	3	max	--	--	--	2712	2787	2863	25.0
<input type="checkbox"/>	WLAN	ISM	2412	2472	2412	2472	CCK OFDM	--	max	--	--	--	1	7	13	18.0
<input checked="" type="checkbox"/>	WLAN US	ISM	2412	2462	2412	2462	CCK OFDM	--	max	--	--	--	1	6	11	18.0
<input checked="" type="checkbox"/>	WLAN	ISM	5180	5240	5180	5240	OFDM	--	max	--	--	--	--	40	--	13.96
<input checked="" type="checkbox"/>	WLAN	ISM	5260	5320	5260	5320	OFDM	--	max	--	--	--	--	56	--	14.01
<input checked="" type="checkbox"/>	WLAN	ISM	5500	5700	5500	5700	OFDM	--	max	--	--	--	--	140	--	14.03
<input checked="" type="checkbox"/>	WLAN	ISM	5745	5825	5745	5825	OFDM	--	max	--	--	--	149	--	--	13.91
<input type="checkbox"/>	BT	ISM	2402	2480	2402	2480	GFSK	3	max	--	--	--	0	39	78	8.7

)*: slotted peak power for GSM, averaged max. RMS power for UMTS, WLAN and BT.

3 Test standards/ procedures references

Test Standard	Version	Test Standard Description
IEEE 1528-2003	2003-04	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
OET Bulletin 65 Supplement C	1997-01 2001-01	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields
RSS-102 Issue 4	2010-03	Radio Frequency Exposure Compliance of Radiocommunication Apparatus (All Frequency Bands)
Canada's Safety Code No. 6	99-EHD-237	Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz
IEEE Std. C95-3	2002	IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave
IEEE Std. C95-1	1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.
IEC 62209-2	2010	Human exposure to radio frequency fields from hand-held and bodymounted wireless communication devices. Human models, instrumentation, and procedures. Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz)

FCC KDBs:

KDB248227D01v01 FCC OET SAR Measurement Procedures for 802.11 a/b/g Transmitters, May, 2007.

KDB648474D04v01 FCC OET SAR Evaluation Considerations for Handsets with Multiple Transmitters & Antennas, September, 2008.

KDB941225D03v01 FCC OET SAR Test Reduction Procedure for GSM/GPRS/EDGE, December, 2008.

FCC OET SAR Probe Calibration and System Verification Considerations for Measurements at 150 MHz – 3 GHz, January, 2007.

FCC OET RF Exposure Procedures for Mobile and Portable Devices, and Equipment Authorization Policies, November, 2009.

KDB941225D01v02 FCC OET SAR Measurements Procedures for 3G Devices, October, 2007.

FCC OET Dipole Requirements for SAR System Validation and Verification, November, 2009.

KDB865664D01v01 FCC OET SAR measurement 100 MHz to 6 GHz DR01 RF Exposure Compliance Reporting and Documentation Considerations, April 20, 2012

4 Summary of Measurement Results

<input checked="" type="checkbox"/>	No deviations from the technical specifications ascertained
<input type="checkbox"/>	Deviations from the technical specifications ascertained

5 Test Environment

Ambient temperature:	20 – 24 °C
Tissue Simulating liquid:	20 – 24 °C
Relative humidity content:	40 – 50 %
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

6 Test Results

6.1 Conducted power measurements

For the measurements a Rohde & Schwarz Radio Communication Tester CMW 500 was used. The output power was measured using an integrated RF connector and attached RF cable.

Note: The following overview contains DC-HSDPA conducted power measurement results in comparison to RMC test results.

6.1.1 Conducted power measurements 3GPP UMTS FDD V (850 MHz)

mode	Max. RMS output power 850 MHz (FDD V) / dBm		
	4132 / 826.4 MHz	4182 / 836.6 MHz	4233 / 846.6 MHz
WCDMA RMC 12.2 kbit/s	25.0	25.0	25.0
DC-HSDPA Sub test 1	25.0	25.0	25.0
DC-HSDPA Sub test 2	25.0	25.0	25.0
DC-HSDPA Sub test 3	24.5	24.5	24.5
DC-HSDPA Sub test 4	24.5	24.5	24.5

Table 1: Test results conducted power measurement 3GPP UMTS FDD V 850MHz

6.1.2 Conducted power measurements 3GPP UMTS FDD IV (1700 MHz)

mode	Max. RMS output power FDD IV (1700MHz) / dBm		
	1312 / 1712.4 MHz	1412 / 1732.4 MHz	1513 / 1752.6 MHz
WCDMA RMC 12.2 kbit/s	24.6	24.5	24.8
DC-HSDPA Sub test 1	24.5	24.4	24.7
DC-HSDPA Sub test 2	24.5	24.4	24.7
DC-HSDPA Sub test 3	23.9	23.9	24.2
DC-HSDPA Sub test 4	24.1	24.0	24.2

Table 2: Test results conducted power measurement 3GPP UMTS FDD IV 1700MHz

mode	Max. RMS output power FDD IV with power back off (1700MHz) / dBm		
	1312 / 1712.4 MHz	1412 / 1732.4 MHz	1513 / 1752.6 MHz
WCDMA RMC 12.2 kbit/s	22.6	22.5	22.8
DC-HSDPA Sub test 1	22.5	22.4	22.7

Table 3: Test results conducted power measurement 3GPP UMTS FDD IV 1700MHz with power back off

6.1.3 Conducted power measurements 3GPP UMTS FDD II (1900 MHz)

Max. RMS output power 1900 MHz (FDD II) / dBm			
mode	Channel / frequency		
	9262 / 1852.4 MHz	9400 / 1880.0 MHz	9538 / 1907.6 MHz
WCDMA RMC 12.2 kbit/s	24.8	24.7	24.5
DC-HSDPA Sub test 1	24.7	24.6	24.5
DC-HSDPA Sub test 2	24.7	24.6	24.5
DC-HSDPA Sub test 3	24.2	24.1	24.0
DC-HSDPA Sub test 4	24.2	24.1	23.9

Table 4: Test results conducted power measurement 3GPP UMTS FDD II 1900MHz

Max. RMS output power 1900 MHz with power back off (FDD II) / dBm			
mode	Channel / frequency		
	9262 / 1852.4 MHz	9400 / 1880.0 MHz	9538 / 1907.6 MHz
WCDMA RMC 12.2 kbit/s	22.8	22.8	22.7
DC-HSDPA Sub test 1	22.7	22.7	22.6

Table 5: Test results conducted power measurement 3GPP UMTS FDD II 1900MHz with power back off

Remark: None of the DC-HSDPA settings leads to conducted power values exceeding the conducted power in RMC mode by more than 0.25 dB, therefore no additional SAR measurements were performed in DC-HSDPA mode.

When Hotspot mode is activated, an automatic RF power reduction is activated and reduces the maximum output RF power level of UMTS Band 2 [1850 - 1910 MHz] and UMTS Band 4 [1710 - 1755 MHz] by 2 dB. When WiFi Hotspot mode is deactivated, the RF output power levels return to their normal RF power level.

6.1.4 Test-set-up information for WCDMA / HSPDA / DC-HSDPA

a) WCDMA RMC

In RMC (reference measurement channel) mode the conducted power at 4 different bit rates was measured. They correspond with the used spreading factors as follows:

Bit rate	12.2 kbit/s	64 kbit/s	144 kbit/s	384 kbit/s
Spreading factor (SF)	64	16	8	4

In RMC mode only DPCCH and DPDCH are active. As bit rate changes do not influence the relative power of any code channel the measured RMS output power remains on the same level which is set to maximum by TPC (Transmit power control) pattern type 'All 1'.

b) HSDPA

HSDPA adds the HS-DPCCH in uplink as a control channel for high speed data transfer in downlink. In HSDPA mode 4 sub-tests are defined by 3GPP 34.121 according to the following table:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	CM(dB)⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: $\Delta_{ACK}, \Delta_{NACK}, \Delta_{CQI} = 8 \iff A_{hs} = \beta_{hs}/\beta_c = 30/15 \iff \beta_{hs} = 30/15 * \beta_c$

Note 2 : CM = 1 for $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$

Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

Table 6: Sub-tests for 3GPP UMTS Release 5 HSDPA

The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the above table, β_{hs} for HS-DPCCH is set automatically to the correct value when $\Delta_{ACK}, \Delta_{NACK}, \Delta_{CQI} = 8$. The variation of the β_c/β_d ratio causes a power reduction at sub-tests 2 - 4.

The measurements were performed with a Fixed Reference Channel(FRC) and H-Set 1 QPSK.

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI's
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

Table 7: settings of required H-Set 1 QPSK acc. to 3GPP 34.121

c) DC-HSDPA (3GPP UMTS Release 8)

Dual Cell – HSDPA has been signalized using the following settings for connection setup:

Parameter During Connection Setup	Value
P-CPICH_Ec/Ior	-10 dB
P-CCPCH	-12
SCH_Ec/Ior	-12
PICH_Ec/Ior	-15
HS-PDSCH	off
HS-SCCH_1	off
DPCH_Ec/Ior	-5
OCNS_Ec/Ior	-3.1

Table 8: Downlink Physical Channels according to 3GPP 34.121 Table E.5.0

The fixed reference channel has been set to H-set 12 according to 3GPP TS 34.121 Table C.8.1.12:

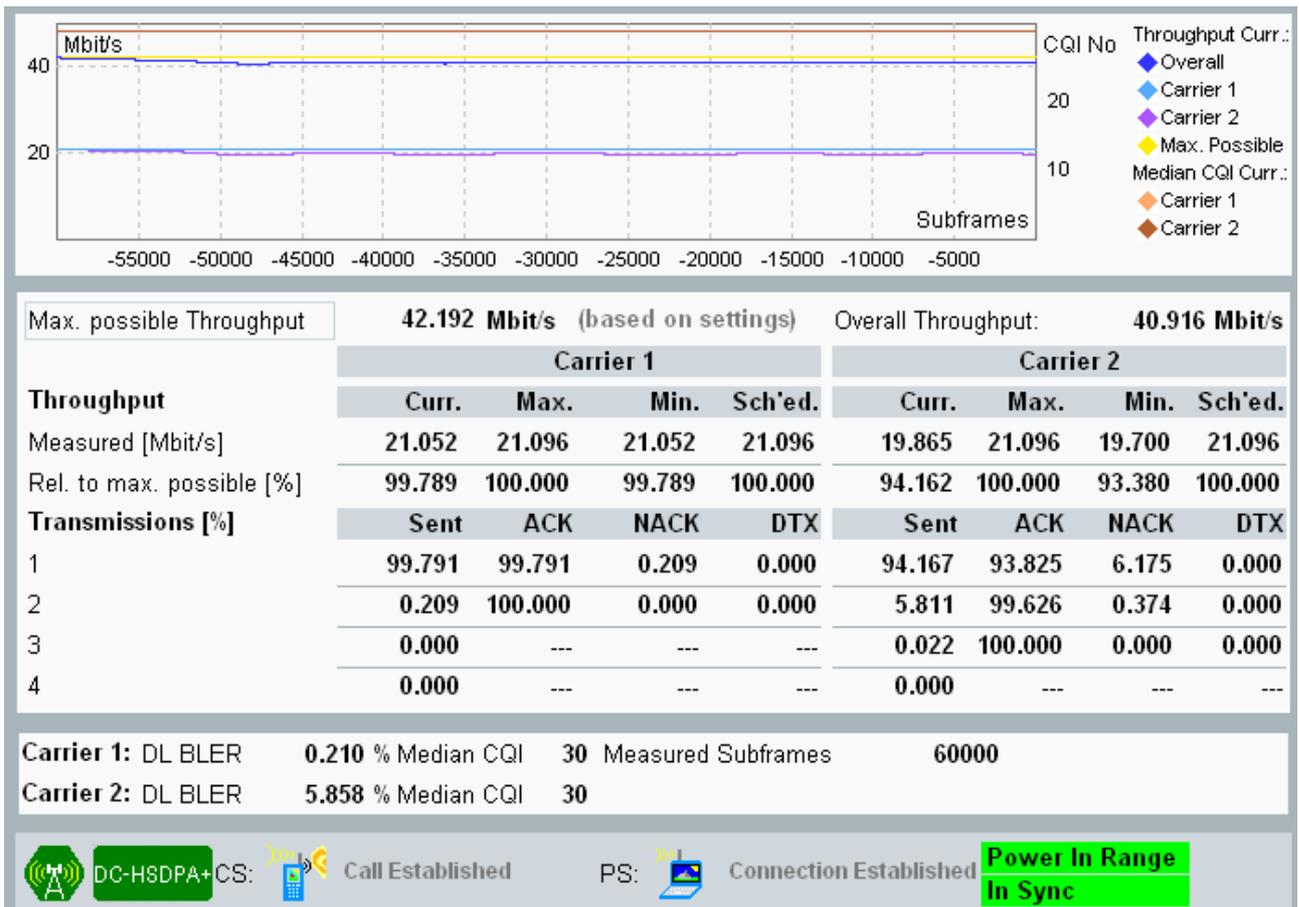
Parameter	Unit	Value
Nominal Average Inf. Bit Rate	kbit/s	60
Inter-TTI Distance	TTI's	1
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Process	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codecs	Codecs	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table. Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

Table 9: H-Set 12 QPSK configuration

The same Sub-test settings as for Release 5 HSDPA (see table 6) were used for the tests.

Device set-up with CMW500 for DC-HSDPA:

- configure the settings for HSDPA Rel.5
- change scenario from 'standard cell' to 'dual cell'
- H-set 12 becomes available in H-set selection drop down list box
- select H-set 12 QPSK for activation of dual cell mode with 64QAM in downlink
- set beta factors and Δ_{ACK} , Δ_{NACK} , Δ_{CQI} according to table 6
- set-up connection
- DC-HSDPA+ should light up
- check dual cell operation in HSDPA ACK table for maximum throughput (2x 21 Mbits):



- measure conducted power in uplink and observe if CM is 0 dB for sub-tests 1 and 2 and 0.5 dB for sub-tests 3 and 4

7 Test equipment and ancillaries used for tests

To simplify the identification of the test equipment and/or ancillaries which were used, the reporting of the relevant test cases only refer to the test item number as specified in the table below.

used	Equipment	Type	Manufacturer	Serial No.	Last Calibration	Frequency (months)
<input checked="" type="checkbox"/>	Universal Radio Communication Tester	CMW500	Rohde & Schwarz	102375	January 4, 2011	24