FCC 3G SAR Measurement Procedures

The EUT was tested according to the requirements of the FCC 3G procedures and the TS 34.121. The EUT's WCDMA and HSPA function is Release 6 version supporting HSDPA Category 8, and HSUPA Category 5. A detailed analysis of the output power for all WCDMA, HSPDA, and HSPA(HSUPA&HSDPA) modes is provided in the tables below. According to the FCC 3G procedures, handsets with both HSDPA and HSUPA should be tested according to Release 6 HSPA test procedures, and the EUT does not support VOIP function over the HSPA function. The HSPA output levels are less than ¼ dB higher than the basic 12.2 kbps RMC configurations in WCDMA, as required by FCC 3G SAR procedures, and then the PBA is fulfilled.

Conducted Output Power

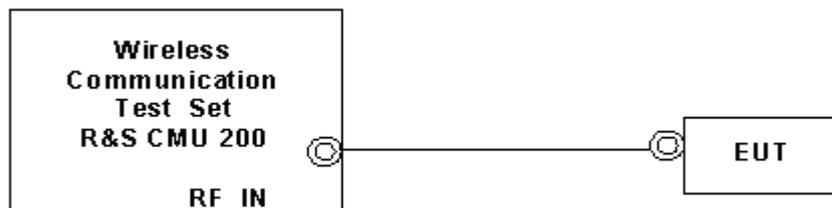| Mode	Setup	Cell band (850)			PCS band (1900)		
		CH4132	CH4182	CH4233	CH9262	CH9400	CH9538
		826.4 (MHz)	836.4 (MHz)	846.6 (MHz)	1852.4 (MHz)	1880.0 (MHz)	1907.6 (MHz)
R99- WCDMA	RMC 12.2Kbps	23.58	23.55	23.59	23.18	23.32	23.11
	RMC 64Kbps	23.57	23.53	23.56	23.32	23.4	23.12
	RMC 144Kbps	23.53	23.54	23.59	23.29	23.28	23.05
	RMC 384Kbps	23.51	23.48	23.49	23.29	23.29	23.10
	AMR 12.2kbps	23.35	23.34	23.27	23.04	23.12	22.92
R6-HSDPA Only	HSDPA - subtest 1	23.03	23.1	23.24	23.13	23.19	22.95
	HSDPA - subtest 2	23.02	23.08	23.2	22.56	22.65	22.57
	HSDPA - subtest 3	21.96	21.03	21.06	22.67	22.78	22.59
	HSDPA - subtest 4	21.39	21.51	21.66	22.24	22.33	22.12
R6- HSPA (HSUPA&HSDPA)	HSUPA - subtest 1	22.76	22.73	22.8	22.63	22.67	22.42
	HSUPA - subtest 2	23.33	23.43	23.4	23.06	23.11	23.00
	HSUPA - subtest 3	22.5	22.57	22.62	22.48	22.52	22.38
	HSUPA - subtest 4	23.35	23.31	23.35	23.24	23.4	23.15
	HSUPA - subtest 5	22.72	22.78	22.77	22.71	22.75	22.56

WCDMA SAR Test mode - Conducted Power

Test Records for Body SAR Test

The channel 4182 in Cell band and the channel 9262, 9400 and 9583 in PCS band of HSPA subtest 4 were additionally performed for verification, and those SAR values of HSUPA met the FCC limit , please refer it at the page 36 of 37 of SAR test report for details.

PDA	Battery	Battery Cover	Ear-phone	EUT Slide	Position	Band	Ch.	Mode	Freq. (MHz)	SAR$_{1g}$	SAR$_{10g}$	Power Drift
B	**2**	**1**	**2**	Off	**Bottom With 1.5cm Gap**	**WCDMA850**	**4182**	**12.2K**	**836.4**	**0.347**	0.249	**-0.157**
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA850	4182	HSDPA	836.4	0.278	0.201	0.067
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA850	4182	HSUPA	836.4	0.273	0.197	-0.082
B	2	1	2	Off	Face With 1.5cm Gap	WCDMA850	4182	12.2K	836.4	0.092	0.069	-0.176
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA850	4132	12.2K	826.4	0.311	0.223	-0.114
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA850	4233	12.2K	846.6	0.334	0.237	-0.081
B	**2**	**1**	**2**	Off	**Bottom With 1.5cm Gap**	**WCDMA1900**	**9400**	**12.2K**	**1880**	**0.922**	0.524	**0.119**
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9400	HSDPA	1880	0.803	0.456	-0.14
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9400	HSUPA	1880	0.812	0.464	0.063
B	2	1	2	Off	Face With 1.5cm Gap	WCDMA1900	9400	12.2K	1880	0.404	0.251	0.12
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9262	12.2K	1852	0.779	0.446	0.121
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9538	12.2K	1908	0.817	0.466	0.021
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9262	HSDPA	1852	0.706	0.404	-0.023
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9538	HSDPA	1908	0.695	0.397	-0.131
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9262	HSUPA	1852	0.673	0.386	0.123
B	2	1	2	Off	Bottom With 1.5cm Gap	WCDMA1900	9538	HSUPA	1908	0.62	0.355	-0.084

WCDMA Setup Configuration:

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.

b. The RF path losses were compensated into the measurements.

c. A call was established between EUT and Base Station with following setting

    i. Data rates: Varied from RMC 12.2Kbps to 384Kbps for each measurement.

    ii. RMC Test Loop=Loop Mode 1 RLC TM

    iii. TPC with All Up.

d. The transmitted maximum output power was recorded.

```
+-------------------+
|   Wireless        |
| Communication     |
|   Test Set        |
| R&S CMU 200    (O)--------------(O)  +-------+
|                   |                 |  EUT  |
|         RF IN     |                 +-------+
+-------------------+
```

Setup Configuration

HSDPA Setup Configuration

a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.

b. The RF path losses were compensated into the measurements.

c. A call was established between EUT and Base Station with following setting:

   i. Set RMC12.2Kbps with HSDPA mode.

   ii. RMC Test Loop=Loop Mode 1 RLC TM

   iii. TPC with All Up

   iv. Channel Configuration Type=FRC with H-set 1 (QPSK)

   v. CQI Feedback Cycle=4ms, CQI Repetition Factor=2

   vi. RV Coding Sequence {0.2.5.6}

   vii. Gain Factors(βc, and βd) and parameters were set according to each specific sub-test in the following table, C10.1.4, quoted from the TS 34.121.

d. The transmitted maximum output power was recorded.

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: 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 β_c = 11/15 and β_d = 15/15.

HSPA(HSPDA&HSUPA) Setup Configuration

   a. The EUT was connected to Base Station referred to the drawing of Setup Configuration.

   b. The RF path losses were compensated into the measurements.

   c. A call was established between EUT and Base Station with following setting:

     i. Set HSUPA mode.

     ii. RMC Test Loop=Loop Mode 1 RLC TM

     iii. Power control algorithm 2

     iv. HS-DSCH Channel Configuration Type=FRC with H-set 1 (QPSK)

     v. Gain Factors (βc,and βd)and parameters were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121.

   d. The transmitted maximum output power was recorded.

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 5)(Note 6)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 6)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed}1: 47/15 β_{ed}2: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (Note 4)	15/15 (Note 4)	64	15/15 (Note 4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c .

Note 2:   CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3:   For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4:   For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 14/15 and β_d = 15/15.

Note 5:   In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly, it is set by Absolute Grant Value.
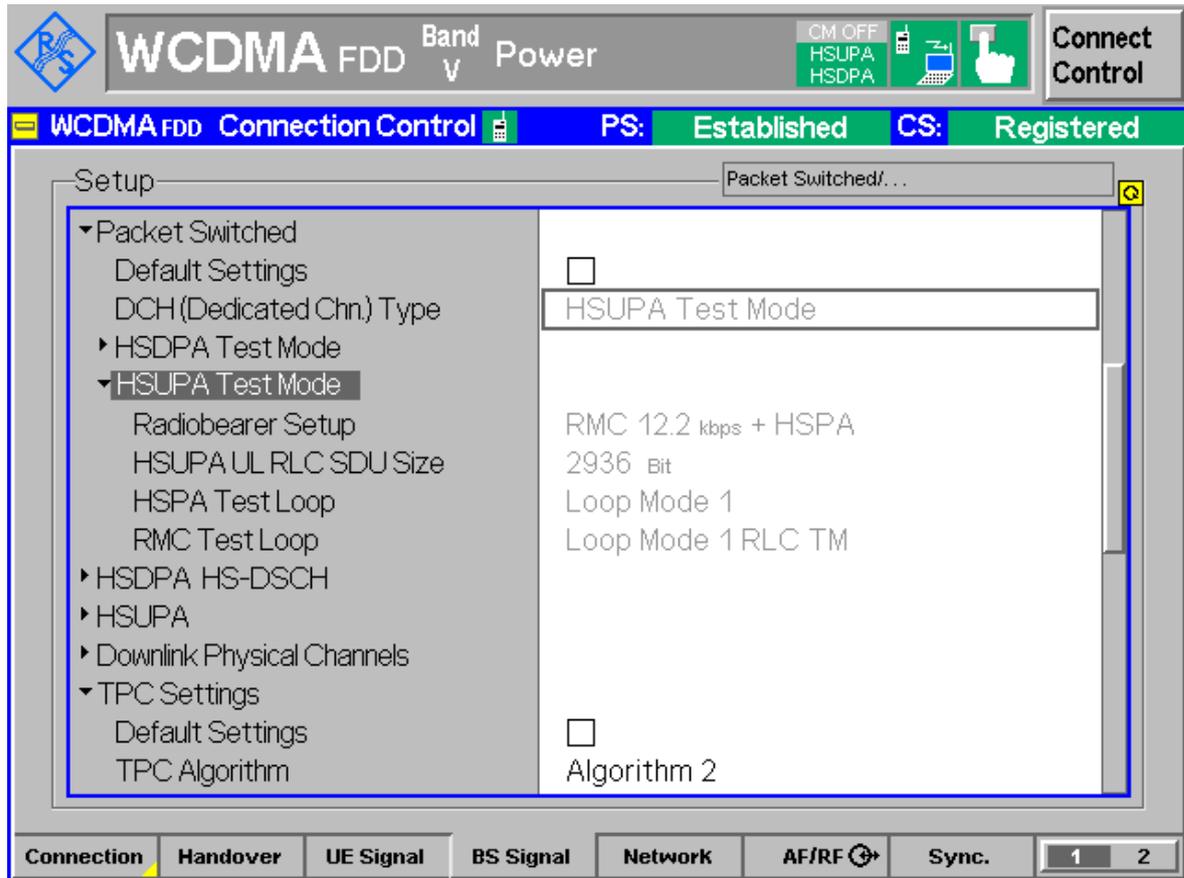
HSUPA function

Reference:

[1.] 941225 D01 SAR test for 3G devices v02, SAR Measurement Procedures for 3G Devices CDMA 2000/Ev-Do/WCDMA/HSDPA/HSPA Oct. 2007 Laboratory Division Office of Engineering and Technology Federal Communications Commission

[2.] TS 34.121 Universal Mobile Telecommunications System (UMTS); Terminal Conformance Specification, Radio Transmission and Reception (FDD)

[3.] Operation Guide for HSUPA Test Set-up According to 3GPP TS 34.121 written by Rohde & Schwarz RCS-07 12-0053