Appendix F. WCDMA Measurement Procedures

Conducted Output Power:

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 12, 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. Device was tested according to procedure KDB941225 - section Release 6 HSPA Data Devices as documented/evaluated in the following table.

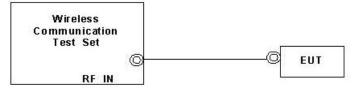
WCDMA SAR Test mode - Conducted Power										
		Се	Cell band (850)			PCS band (1900)				
Mode	Setup	CH4132 CH4182 (CH4233	CH9262 CH9400 C		CH9538			
		826.4	836.4	846.6	1852.4	1880.0	1907.6			
		(MHz)	(MHz)	(MHz)	(MHz)	(MHz)	(MHz)			
WCDMA	RMC 12.2Kbps	23.61	23.85	23.76	23.41	23.43	23.47			
	Subtest 1	23.60	23.84	23.70	23.45	23.29	23.46			
HSDPA	Subtest 2	23.47	23.65	23.48	23.34	23.29	23.36			
порга	Subtest 3	23.02	23.26	23.49	23.00	22.89	23.01			
	Subtest 4	22.81	23.16	23.04	22.80	22.84	22.93			
	Subtest 1	22.44	23.17	22.42	22.50	23.11	23.23			
	Subtest 2	21.72	22.00	21.30	21.56	21.37	21.29			
HSUPA	Subtest 3	21.90	22.05	22.06	22.04	21.82	22.27			
	Subtest 4	21.71	22.07	22.33	21.71	21.72	21.67			
	Subtest 5	22.51	23.63	23.00	22.48	23.18	23.16			

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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
 - ii. RMC Test Loop = Loop Mode 1
 - iii. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.



Setup Configuration

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HSDPA Setup Configuration:

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

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- 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 Gain Factors (β_c and β_d) and parameters were set according to each
 - ii. Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121
 - iii. Set RMC12.2Kbps + HSDPA mode.
 - iv. Set Cell Power = -86 dBm
 - v. Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
 - vi. Select HSDPA Uplink Parameters
 - vii. Set DeltaACK, DeltaNACK and DeltaCQI = 8
 - viii. Set Ack-Nack Repetition Factor to 3
 - ix. Set CQI Feedback Cycle (k) to 4 ms
 - x. Set CQI Repetition Factor to 2
 - xi. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.

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

Sub-test	βε	β _d	β _d (SF)	βε/βα	βнs (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 HSDPCCH 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

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HSPA (HSUPA & HSPDA) 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 *:
 - Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
 - ii. Set the Gain Factors (β_c and β_d) and parameters (AG Index) were set according to each specific sub-test in the following table, C11.1.3, quoted from the TS 34.121

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- iii. Set Cell Power = -86 dBm
- iv. Set Channel Type = 12.2k + HSPA
- v. Set UE Target Power
- vi. Power Ctrl Mode= Alternating bits
- vii. Set and observe the E-TFCI
- viii. Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtest's E-TFCI
- 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	βε	β _d	β _d (SF)	βc/βd	βнs (Note1)	βec	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	209/2 25	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, $\beta_h s/\beta_c$ =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.

Setup Configuration

Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide "HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18"

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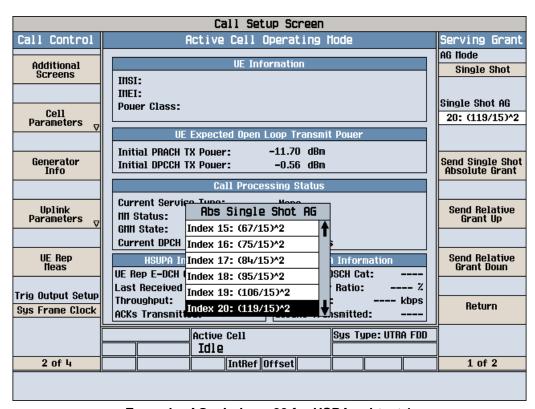
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Call Setup Screen Call Control Active Cell Operating Mode Call Parms Cell Pouer **UE Information** Channel (UARFCN) Info -86.00 IHSI: dBm/3.84 HHz THET: Channel Type Pouer Class: Cell Parameters 12.2k + HSPA UE Expected Open Loop Transmit Power -11.70 dBm Paging Service Initial PRACH TX Pouer: Generator Info Initial DPCCH TX Pouer: -0.56 dBm **RB Test flode Uplink Parameters** Value PRACH Preambles Uplink Parameters HSPA Parameters PRACH Ramping Cycles(MMAX) 000000000001 Available Subchannels (Bit Mask) Uplink DPCH Scrambling Code UE Rep Neas 34.121 Preset Call Configs Uplink DPCH Bc/Bd Control Manual Manual Uplink DPCH Bc 11 Manual Uplink DPCH Bd 15 Close Henu Channel (UARFCN) Parms Maximum Uplink Transmit Pouer Level 21 dBm Active Cell Sys Type: UTRA FDD Idle 2 of 4 IntRef Offset 1 of 3

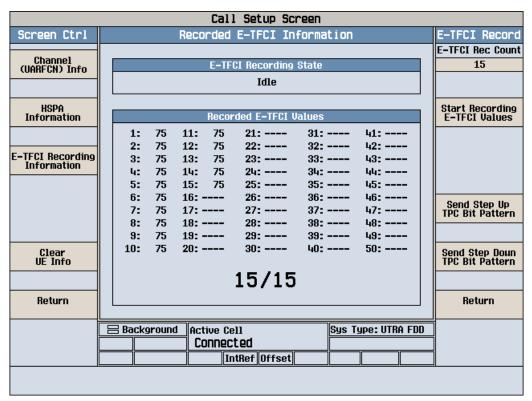
Example for HSPA Subtest 1, and other subtests following table, C11.1.3 (Gain Factors (β_c = 11 and β_d = 15))



Example: AG - Index = 20 for HSPA subtest 1

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Example: Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1

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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.] HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18

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