



## Appendix F - FCC 3G SAR Measurement Procedures

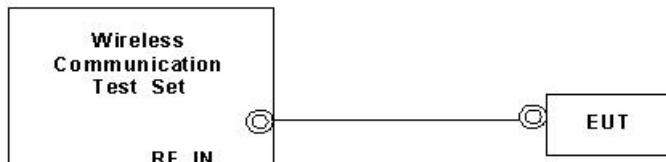
### Conducted Output Power:

The PBA is fulfilled. 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. Device was tested according to procedure KDB941225 - section Release 6 HSPA Data Devices as documented/evaluated in the following table. Power values for HSPA are less than 1/4 dB higher than the basic 12.2 kbps RMC configurations in WCDMA.

WCDMA SAR Test mode - Conducted 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	21.27	21.29	21.25	22.01	21.50	21.37
R5-HSDPA	HSDPA - subtest 1	21.22	21.27	21.21	21.95	21.48	21.35
	HSDPA - subtest 2	20.74	20.77	20.77	21.08	20.66	20.55
	HSDPA - subtest 3	20.80	20.84	20.78	21.07	20.73	20.59
	HSDPA - subtest 4	20.15	20.17	20.16	20.92	20.48	20.50
R6- HSPA (HSUPA&HSDPA)	HSUPA - subtest 1	20.95	21.20	21.08	21.40	21.16	21.18
	HSUPA - subtest 2	19.03	19.11	19.10	19.66	19.15	19.14
	HSUPA - subtest 3	19.60	19.79	19.73	20.44	19.97	19.90
	HSUPA - subtest 4	19.01	19.16	19.18	19.71	19.20	19.14
	HSUPA - subtest 5	20.89	20.92	21.11	21.35	21.13	21.16

### WCDMA Setup Configuration:

- The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- The RF path losses were compensated into the measurements.
- A call was established between EUT and Base Station with following setting
  - Data rates: Varied from RMC 12.2Kbps.
  - RMC Test Loop=Loop Mode 1
  - Power Ctrl Mode= All Up bits.
- The transmitted maximum output power was recorded.



**Setup Configuration**

### HSDPA Setup Configuration:

- The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- The RF path losses were compensated into the measurements.
- A call was established between EUT and Base Station with following setting:
  - Set Gain Factors( $\beta_c$  and  $\beta_d$ ) and parameters were set according to each
  - Specific sub-test in the following table, C10.1.4, quoted from the TS 34.121.
  - Set RMC12.2Kbps + HSDPA mode.
  - Set Cell Power = -86 dBm
  - Set HS-DSCH Configuration Type to FRC (H-set 1, QPSK)
  - Select HSDPA Uplink Parameters.
  - Set DeltaACK , DeltaNACK and DeltaCQI =8.
  - Set Ack-Nack Repetition Factor to 3
  - Set CQI Feedback Cycle (k) to 4 ms
  - Set CQI Repetition Factor to 2 .
  - Power Ctrl Mode= All Up bits.
- The transmitted maximum output power was recorded.

Table C.10.1.4:  $\beta$  values for transmitter characteristics tests with HS-DPCCH

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}$ (Note 1, 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:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$  .  
 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,  $\Delta_{ACK}$  and  $\Delta_{NACK} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$  , and  $\Delta_{CQI} = 24/15$  with  $\beta_{hs} = 24/15 * \beta_c$  .  
 Note 3: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . 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  $\beta_c/\beta_d$  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  $\beta_d = 15/15$ .

**Setup Configuration**

**HSPA (HSUPA & HSPDA) Setup Configuration:**

- The EUT was connected to Base Station referred to the drawing of Setup Configuration.
- The RF path losses were compensated into the measurements.
- 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
  - Set the Gain Factors ( $\beta_c$  and  $\beta_d$ ) 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.
  - Set Cell Power = -86 dBm
  - Set Channel Type = 12.2k + HSPA
  - Set UE Target Power
  - Power Ctrl Mode= Alternating bits.
  - Set and observe the E-TFCI
  - Confirm that E-TFCI is equal to the target E-TFCI of 75 for sub-test 1, and other subtests' E-TFCI.
- The transmitted maximum output power was recorded.

**Table C.11.1.3:  $\beta$  values for transmitter characteristics tests with HS-DPCCH and E-DCH**

Sub-test	$\beta_c$	$\beta_d$	$\beta_d$ (SF)	$\beta_c/\beta_d$	$\beta_{HS}$ (Note 1)	$\beta_{ec}$	$\beta_{ed}$ (Note 5) (Note 6)	$\beta_{ed}$ (SF)	$\beta_{ed}$ (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	209/25	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	$\beta_{ed1}: 47/15$ $\beta_{ed2}: 47/15$	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:  $\Delta_{ACK}, \Delta_{NACK}$  and  $\Delta_{CQI} = 30/15$  with  $\beta_{hs} = 30/15 * \beta_c$ .Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $\beta_{hs}/\beta_c = 24/15$ . 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  $\beta_c/\beta_d$  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  $\beta_c = 10/15$  and  $\beta_d = 15/15$ .Note 4: For subtest 5 the  $\beta_c/\beta_d$  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  $\beta_c = 14/15$  and  $\beta_d = 15/15$ .

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:  $\beta_{ed}$  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"



Call Control		Active Cell Operating Mode							Call Params	
Channel (UARFCN) Info		UE Information							Cell Power	-86.00
Cell Parameters	▼	IMSI: IMEI: Power Class:							dBm/3.84 MHz	dBm/3.84 MHz
Generator Info		UE Expected Open Loop Transmit Power							Channel Type	12.2k + HSPA
Uplink Parameters	▼	Initial PRACH TX Power: -11.70 dBm Initial DPCCH TX Power: -0.56 dBm							Paging Service	RB Test Mode
UE Rep. Meas		Uplink Parameters							HSPA Parameters	34.121 Preset Call Configs ▼
Close Menu		PRACH Preambles 64 PRACH Ramping Cycles(MMAX) 2 Available Subchannels (Bit Mask) 00000000000001 Uplink DPCH Scrambling Code 0 Uplink DPCH Bc/Bd Control Manual Manual Uplink DPCH Bc 11 Manual Uplink DPCH Bd 15 Maximum Uplink Transmit Power Level 21 dBm							Channel (UARFCN) Params	1 of 3
2 of 4		Active Cell Idle							IntRef	Offset

**Example for HSPA Subtest 1, and other subtests following table, C11.1.3  
(Gain Factors ( $\beta_c = 11$  and  $\beta_d = 15$ ))**

Call Control		Active Cell Operating Mode						Serving Grant				
Additional Screens		UE Information						AG Node				
		IMSI:						Single Shot				
Cell Parameters		IMEI:						Single Shot AG				
		Power Class:						20: (119/15)^2				
Generator Info		UE Expected Open Loop Transmit Power						Send Single Shot Absolute Grant				
		Initial PRACH TX Power:			-11.70 dBm			Send Relative Grant Up				
Uplink Parameters		Initial DPCCH TX Power:			-0.56 dBm			Send Relative Grant Down				
UE Rep Meas		Call Processing Status						Return				
Trig Output Setup		Current Service Type: <b>Abs Single Shot AG</b>						1 of 2				
Sys Frame Clock		GMM Status: Index 15: (67/15)^2						2 of 4				
		GMM State: Index 16: (75/15)^2						3 of 4				
		Current DPCH						4 of 4				
HSUPA In		Index 17: (84/15)^2										
UE Rep E-DCH		Index 18: (95/15)^2										
Last Received		Index 19: (106/15)^2										
Throughput:		Index 20: (119/15)^2										
ACKs Transmitted		Information										
		DSCH Cat: -----										
		Ratio: ----- %										
		----- kbps										
		Transmitted: -----										
		Active Cell										
		Idle										
		Sys Type: UTRA FDD										
		IntRef										
		Offset										

### Example: AG – Index = 20 for HSPA subtest 1



Call Setup Screen		Recorded E-TFCI Information		E-TFCI Record	
Screen Ctrl		Recorded E-TFCI Information		E-TFCI Record	
Channel (UARFCN) Info			E-TFCI Recording State		E-TFCI Rec Count
HSPA Information			Idle		15
E-TFCI Recording Information		Recorded E-TFCI Values		Start Recording E-TFCI Values	
Clear UE Info		1: 75 11: 75 21: ---- 31: ---- 41: ---- 2: 75 12: 75 22: ---- 32: ---- 42: ---- 3: 75 13: 75 23: ---- 33: ---- 43: ---- 4: 75 14: 75 24: ---- 34: ---- 44: ---- 5: 75 15: 75 25: ---- 35: ---- 45: ---- 6: 75 16: ---- 26: ---- 36: ---- 46: ---- 7: 75 17: ---- 27: ---- 37: ---- 47: ---- 8: 75 18: ---- 28: ---- 38: ---- 48: ---- 9: 75 19: ---- 29: ---- 39: ---- 49: ---- 10: 75 20: ---- 30: ---- 40: ---- 50: ----		Send Step Up TPC Bit Pattern	
Return		15/15		Send Step Down TPC Bit Pattern	
		Background Active Cell Sys Type: UTRA FDD Connected IntRef Offset		Return	

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

## Reference:

- [1] KDB 941225 D01 v02, "SAR Measurement Procedures for 3G Devices - CDMA 2000 / Ev-Do – WCDMA / HSDPA / HSPA", Oct. 2007
- [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