



# Appendix E. FCC 3G SAR Measurement Procedures

# **Conducted Output Power:**

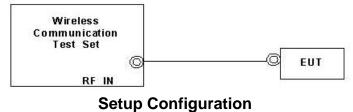
The EUT was tested according to the requirements of the FCC 3G procedures and the TS 34.121. The EUT's WCDMA and HSPA function is Release 6 version supporting HSDPA Category 10, and HSUPA Category 6. A detailed analysis of the output power for all WCDMA, HSPDA, and HSPA (HSUPA & HSDPA) modes is provided 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 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 configurations in WCDMA.

WCDMA SAR Test mode - Conducted Power						
		Cell band (850)				
Mode	Setup	CH1312	CH1413	CH1513		
		1712.4 (MHz)	1732.6 (MHz)	1752.6 (MHz)		
WCDMA	RMC 12.2Kbps	23.46	23.49	23.53		
	Subtest 1	22.85	22.99	22.92		
HSDPA	Subtest 2	22.86	22.98	22.96		
HODFA	Subtest 3	22.60	22.68	22.64		
	Subtest 4	22.63	22.67	22.62		
	Subtest 1	21.88	21.93	22.20		
	Subtest 2	21.37	21.39	21.38		
HSUPA	Subtest 3	21.67	21.69	21.63		
	Subtest 4	21.78	21.80	21.67		
	Subtest 5	21.81	21.92	22.34		



# 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.





### **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 Gain Factors ( $\beta_c$  and  $\beta_d$ ) 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

= 15/15.

d. The transmitted maximum output power was recorded.

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

Sub-test	βc	βa	βα (SF)	βc/βd	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	15/15	64	12/15	24/15	1.0	0.0
	(Note 4)	(Note 4)		(Note 4)			
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 2:	e 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 $eta_{hs}$ = 24/15 * $eta_c$ .						
Note 3:	bte 3: CM = 1 for $\beta_0/\beta_d = 12/15$ , $\beta_{ns}/\beta_c = 24/15$ . 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 $\beta_d$						

#### **Setup Configuration**



## 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 \* :
  - i. Call Configs = 5.2B, 5.9B, 5.10B, and 5.13.2B with QPSK
  - ii. 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
  - 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 44 4 0.0	the new later share standard as to stand with UC DDCCU and E DCU.	
Table C.11.1.3: B values for	r transmitter characteristics tests with HS-DPCCH and E-DCH	

Sub- test	βc	βd	β <sub>d</sub> (SF)	βc/βd	βнs (Note1)	β <sub>ec</sub>	β <sub>ed</sub> (Note 5) (Note 6)	β <sub>ed</sub> (SF)	β <sub>ed</sub> (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 <sub>ed</sub> 1: 47/15 β <sub>ed</sub> 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 <sub>ACK</sub> ,	ANACK and	d Δ <sub>CQI</sub> =	= 30/15 w	vith $eta_{\scriptscriptstyle hs}$	= 30/15 *	$\beta_c$ .						
Note 2:							her combinatio CM difference		DPDCH, [	OPCCH,	HS- DPC	CCH, E-D	PDCH
Note 3	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.												

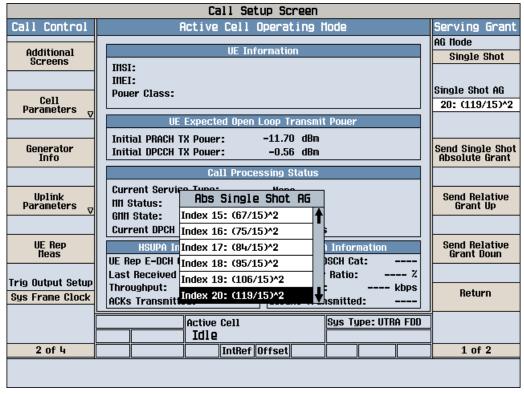
### **Setup Configuration**

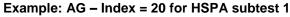
Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide "HSUPA Measurement Guide with 8960 V7.5.0 Release 7 (2007-06) Ver.: v.02.18"



	Call Setup Screen				
Call Control	Active Cell Operating Mo	Call Parms			
Channel (UARFCN) Info	UE Information	Се11 Роцег -86.00 dBm/3.84 11H;			
Cell Parameters <sub>⊽</sub>	UE Expected Open Loop Transmit (	Channel Type 12.2k + HSPA			
Generator Info	Initial PRACH TX Pouer: -11.70 dBm Initial DPCCH TX Pouer: -0.56 dBm	Paging Service RB Test Node			
	Uplink Parameters	1			
Uplink	PRACH Preambles	64 4	HSPA		
	PRACH Ramping Cycles(IIIAX)	2	Parameters		
	Available Subchannels (Bit Nask)	000000000001			
UE Rep	Uplink DPCH Scrambling Code	0	34.121 Preset		
fleas	Uplink DPCH Bc/Bd Control	llanual	Call Configs		
	Manual Uplink DPCH Bc				
Close	Manual Uplink DPCH Bd	15	Channel		
llenu					
	Active Cell S	Sys Type: UTRA FDD			
2 of 4	IntRef Offset		1 of 3		

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





**SPORTON INTERNATIONAL INC.** TEL : 886-3-327-3456 FAX : 886-3-328-4978 FCC ID : NM8PG58100



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

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



### **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