

Appendix F. FCC 3G SAR Measurement Procedures

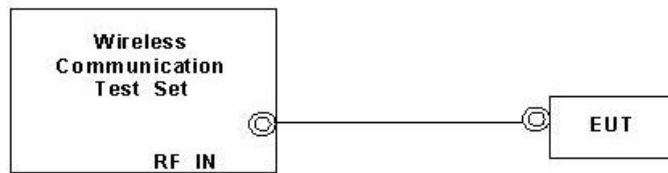
Conducted Output Power:

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 5 version supporting HSDPA Category 8. A detailed analysis of the output power for all WCDMA and HSDPA modes is provided in the tables below. 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							
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)
WCDMA	RMC 12.2Kbps	23.56	23.41	23.29	23.59	23.78	22.99
HSDPA	Subtest 1	23.53	23.39	23.27	23.58	23.74	22.94
	Subtest 2	23.41	23.34	23.19	23.55	23.77	22.85
	Subtest 3	22.45	22.31	22.19	22.77	22.94	22.29
	Subtest 4	22.41	22.27	22.18	22.61	22.68	21.87

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**

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 (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	β_c	β_d	β_d (SF)	β_c/β_d	β_{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: Δ_{ACK} , Δ_{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, Δ_{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 DPDCCH, 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 $\beta_c = 11/15$ and $\beta_d = 15/15$.

Setup Configuration

Call Setup Screen									
Call Control		Active Cell Operating Mode						Call Parms	
Channel (UARFCN) Info		<div>UE Information</div> <div> INSI: INEI: Power Class: </div>						<div>Cell Power</div> <div>-86.00</div> <div>dBm/3.84 MHz</div>	
Cell Parameters		<div>UE Expected Open Loop Transmit Power</div> <div> Initial PRACH TX Power: -11.70 dBm Initial DPCH TX Power: -0.56 dBm </div>						<div>Channel Type</div> <div>12.2k + HSPA</div>	
Generator Info		<div>Uplink Parameters</div> <div> PRACH Preambles: 64 PRACH Ramping Cycles(MAX): 2 Available Subchannels (Bit Mask): 000000000001 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 </div>						<div>Paging Service</div> <div>RB Test Mode</div>	
Uplink Parameters		Value						HSPA Parameters	
UE Rep Meas		<div>Uplink DPCH Scrambling Code</div> <div>0</div>						34.121 Preset Call Configs	
Close Menu		<div>Manual Uplink DPCH Bc</div> <div>11</div>						Channel (UARFCN) Parms	
		<div>Manual Uplink DPCH Bd</div> <div>15</div>							
		<div>Maximum Uplink Transmit Power Level</div> <div>21 dBm</div>							
		<div>Active Cell</div> <div>Idle</div>						Sys Type: UTRA FDD	
2 of 4		<div>IntRef</div> <div>Offset</div>						1 of 3	

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

Call Setup Screen									
Call Control		Active Cell Operating Mode						Serving Grant	
Additional Screens		<div>UE Information</div> <div> INSI: INEI: Power Class: </div>						<div>AG Mode</div> <div>Single Shot</div>	
Cell Parameters		<div>UE Expected Open Loop Transmit Power</div> <div> Initial PRACH TX Power: -11.70 dBm Initial DPCH TX Power: -0.56 dBm </div>						<div>Single Shot AG</div> <div>20: (119/15)^2</div>	
Generator Info		<div>Call Processing Status</div> <div> Current Service Type: None MM Status: Abs Single Shot AG GMM State: Index 15: (67/15)^2 Current DPCH: Index 16: (75/15)^2 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: ----- ACKs Received: ----- </div>						<div>Send Single Shot Absolute Grant</div>	
Uplink Parameters		<div>Information</div> <div> OSCH Cat: ---- Ratio: ---- % ----- kbps Transmitted: ---- </div>						<div>Send Relative Grant Up</div>	
UE Rep Meas								<div>Send Relative Grant Down</div>	
Trig Output Setup								Return	
Sys Frame Clock									
		<div>Active Cell</div> <div>Idle</div>						Sys Type: UTRA FDD	
2 of 4		<div>IntRef</div> <div>Offset</div>						1 of 2	

Example: AG – Index = 20 for HSPA subtest 1

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