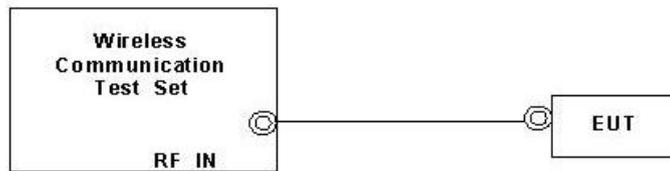## Appendix E.   FCC 3G SAR Measurement Procedures

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				
Mode	**Setup**	**PCS band (1700)**		
		CH1312	**CH1413**	**CH1513**
		1712.4 (MHz)	**1732.6 (MHz)**	**1752.6 (MHz)**
WCDMA	**RMC 12.2Kbps**	23.23	23.55	23.33
HSDPA	**Subtest 1**	22.84	23.08	23.17
	Subtest 2	22.86	23.05	23.04
	Subtest 3	22.38	22.68	22.62
	Subtest 4	21.98	22.69	22.33
HSUPA	**Subtest 1**	22.13	22.52	22.68
	Subtest 2	21.24	21.44	21.51
	Subtest 3	21.74	21.61	21.82
	Subtest 4	21.48	21.81	21.91
	Subtest 5	22.83	22.34	22.81

SPORTON INTERNATIONAL INC.
TEL : 886-3-327-3456
FAX : 886-3-328-4978
FCC ID : NM8 PG58100

Page Number   : E1 of E7
Report Issued Date : Apr. 18, 2011
Report Version   : Rev. 01

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

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : NM8 PG58100

Page Number   : E2 of E7

Report Issued Date : Apr. 18, 2011

Report Version   : Rev. 01

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} (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.

Setup Configuration

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : NM8 PG58100

Page Number   : E3 of E7

Report Issued Date : Apr. 18, 2011

Report Version   : Rev. 01

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 (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

   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	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.

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"

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

Example: AG – Index = 20 for HSPA subtest 1

SPORTON INTERNATIONAL INC.

TEL : 886-3-327-3456

FAX : 886-3-328-4978

FCC ID : NM8 PG58100

Page Number   : E5 of E7

Report Issued Date : Apr. 18, 2011

Report Version   : Rev. 01

```
                    Call Setup Screen
┌──────────────┬──────────────────────────────┬──────────────┐
│ Screen Ctrl  │  Recorded E-TFCI Information  │ E-TFCI Record│
│              │                               │ E-TFCI Rec Count│
│  Channel     │ ┌──────────────────────────┐  │      15      │
│ (UARFCN) Info│ │  E-TFCI Recording State  │  │              │
│              │ │          Idle            │  │              │
│              │ └──────────────────────────┘  │ Start Recording│
│    HSPA      │                               │ E-TFCI Values │
│ Information   │ ┌──────────────────────────┐  │              │
│              │ │  Recorded E-TFCI Values  │  │              │
│              │ │  1:  75  11:  75  21: ----  31: ----  41: ---- │
│E-TFCI Recording│ 2:  75  12:  75  22: ----  32: ----  42: ---- │
│ Information  │ │  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: ----│Send Step Up │
│              │ │  7:  75  17: ----  27: ----  37: ----  47: ----│TPC Bit Pattern│
│              │ │  8:  75  18: ----  28: ----  38: ----  48: ----│
│              │ │  9:  75  19: ----  29: ----  39: ----  49: ----│
│   Clear      │ │ 10:  75  20: ----  30: ----  40: ----  50: ----│Send Step Down│
│  UE Info     │ │                               │TPC Bit Pattern│
│              │ │          15/15            │  │              │
│   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