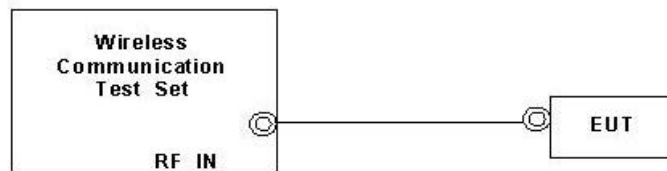


Appendix F. FCC 3G SAR Measurement Procedures

HSPA+ 16QAM 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 HSPA
 - ii. RMC Test Loop = Loop Mode 1
 - iii. Power Ctrl Mode = All Up bits
- d. The transmitted maximum output power was recorded.



Setup Configuration

HSPA 16QAM 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 = 5.2E:HSPA+:UL with 16QAM
 - 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, C11.1.4, quoted from the TS 34.121-1 s5.2E
 - iii. Set Channel Parmns
 - iv. Set Cell Power = -86 dBm
 - v. Set Channel Type = HSPA
 - vi. Set UE Target Power =21 dBm
 - vii. Power Ctrl Mode= All Up Bits
 - viii. Set Manual Uplink DPCH Bc/Bd = Manual
 - ix. Set Manual Uplink DPCH Bc and Bd=15,15(for 34.121-1 v8.10.0 tableC11.1.4 sub-test 1)
 - x. Set HSPA Conn DL Channel Levels
 - xi. Set HS-SCCH Configs
 - xii. Set RB Test Mode Setup
 - xiii. Set Common HSUPA Parameters
 - xiv. Set Serving Grant
 - xv. Confirm that E-TFCI is equal to the target E-TFCI of 105 for sub-test 1, and other subtest's E-TFCI
- d. The transmitted maximum output power was recorded.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

| Sub-test | β_c (Note3) | β_d | β_{HS} (Note1) | β_{ec} | β_{ed} (2xSF2) (Note 4) | β_{ed} (2xSF4) (Note 4) | CM (dB) (Note 2) | MPR (dB) (Note 2) | AG Index (Note 4) | E-TFCI (Note 5) | E-TFCI (boost) |
|----------|----------------------|-----------|-------------------------|--------------|--|--|------------------------|-------------------------|-------------------------|--------------------|-------------------|
| 1 | 1 | 0 | 30/15 | 30/15 | β_{ed1} : 30/15 β_{ed2} : 30/15 | β_{ed3} : 24/15 β_{ed4} : 24/15 | 3.5 | 2.5 | 14 | 105 | 105 |

Note 1: $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 30/15$ with $\beta_{BS} = 30/15 * \beta_c$.

Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).

Note 3: DPDCH is not configured, therefore the β_c is set to 1 and $\beta_d = 0$ by default.

Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Setup Configuration

Note: For details settings in the Agilent 8960 test equipment, please refer to the user guide “16QAM Measurement User Guide rev2”



| Call Setup Screen | | | | | | |
|-----------------------|--------------------------------------|------------------------------|-----------------------|--------------------|---------------------|--|
| Call Control | Active Cell Operating Mode | | | | Call Parm | |
| Channel (UARFCN) Info | UE Information | | | | Cell Power | |
| | INSI: 001010123456789 | Power Class: 3 | Detected PRACH Sig: 0 | | -75.00 dBm/3.84 MHz | |
| Cell Info | Called Party Number: | | | | Channel Type | |
| | UE Expected Open Loop Transmit Power | | | | HSPA | |
| Generator Info | Init PRACH TX Pou: -22.70 dBm | Init DPCCH TX Pou: 17.99 dBm | | Paging Service | | |
| | Current Service Type | | | | RB Test Mode | |
| Uplink Parameters | None | | | Value | | |
| | PRACH Ramping Cycles(MMAX) | | | 2 | | |
| | Available Subchannels (Bit Mask) | | | 000000000001 | | |
| | Uplink DPCCH Scrambling Code | | | 0 | | |
| | Uplink DPCCH Bc/Bd Control | | | Manual | | |
| | Manual Uplink DPCCH Bc | | | 15 | | |
| | Manual Uplink DPCCH Bd | | | 15 | | |
| Close Menu | Maximum Uplink Transmit Power Level | | | 21 dBm | | |
| | Uplink DPCCH Slot Format | | | 1 | | |
| Background | | Active Cell Idle | | Sys Type: UTRA FDD | | |
| | | | | Logging: No Conn | | |
| 2 of 6 | | IntRef Offset | | 1 of 3 | | |

Example for HSPA Subtest 1, and other subtests following table, C11.1.4 (Gain Factors ($\beta_c = 15$ and $\beta_d = 15$))

| Call Setup Screen | | | | | | |
|------------------------------|---|---------------|--------------------------|------------------|--------------------------|----------------|
| Conn DL Lvl | Generator Information | | | | Call Parm | |
| Additional Gen Info Screens | Primary Scrambling Code: 0 | | | | Cell Power | |
| | Channel | | Cell 1 DL Code Chan Info | | Cell 2 DL Code Chan Info | |
| HSDPA Conn DL Channel Levels | Level (dB) | | Level (dB) | | -75.00 dBm/3.84 MHz | |
| | Channel | Current | Desired | OVSF | Chan Code | Channel Type |
| | CPICH: | -3.30 | -3.30 | 256 | 0 | HSPA |
| | P-CCPCH/SCH: | -5.30 | -5.30 | 256 | 1 | |
| HSDPA Conn DL Channel Levels | S-CCPCH: | -10.30 | -10.30 | 64 | 7 | Paging Service |
| | PICH: | -8.30 | -8.30 | 256 | 16 | RB Test Mode |
| | AGCH: | -9.90 | -9.90 | 256 | 10 | |
| HSPA Conn DL Channel Levels | HSPA Connected DL Channel Levels | | | Value | | |
| | HSPA Cell 1 Connected CPICH Level | | | -10.00 dB | | |
| | HSPA Cell 1 Connected P-CCPCH/SCH Level | | | -12.00 dB | | |
| | HSPA Cell 1 Connected S-CCPCH Level | | | Off | | |
| | HSPA Cell 1 Connected PICH Level | | | -15.00 dB | | |
| | HSPA Cell 1 Connected (F-)DPCH Level | | | -10.00 dB | | |
| | HSPA Cell 1 Connected E-AGCH Level | | | -20.00 dB | | |
| AUGN Power Off | HSPA Cell 1 Connected E-HICH Level | | | -20.00 dB | | |
| | HSPA Cell 1 Connected E-RGCH Level | | | Off | | |
| Close Menu | HSPA Cell 1 Connected E-RGCH Level | | | Off | | |
| | Background | | Active Cell Idle | | Sys Type: UTRA FDD | |
| | | | | Logging: No Conn | | |
| | | IntRef Offset | | 1 of 3 | | |

Set HSPA Conn DL Channel Levels : CPICH =10dBm , P-CCPCH/SCH=-12dBm , PICH=15 , (F-)DPCH=-10 , E-AGCH=-20 , E-HICH=-20 , E-RGCH=off , HS-PDSCHs=-3dBm , HS-SCCH 1=-8dBm



| Call Setup Screen | | | | | | | | | | |
|-----------------------------|--------------------------------|-------------|--------------------------|-----------|--------------------|--------------------------|-------|-----------|----------------------------|----------------|
| DL Config | Generator Information | | | | | | | | Call Parm | |
| Additional Gen Info Screens | Primary Scrambling Code: 0 | | | | | | | | Cell Power | |
| | Channel | | Cell 1 DL Code Chan Info | | | Cell 2 DL Code Chan Info | | | -75.00 | |
| Conn S-CCPCH Cfg | Level (dB) | | Level (dB) | | | Level (dB) | | | dBm/3.84 MHz | |
| | Current | Desired | QVSF | Chan Code | Current | Desired | QVSF | Chan Code | Channel Type | |
| On | CPICH: | -3.30 | -3.30 | 256 | 0 | Off | -3.30 | 256 | 0 | HSPA |
| HS-SCCH Configs | P-CCPCH/SCH: | -5.30 | -5.30 | 256 | 1 | Off | -5.35 | 256 | 1 | Paging Service |
| | S-CCPCH: | -10.30 | -10.30 | 64 | 7 | | | | | |
| | PICH: | -8.30 | -8.30 | 256 | 16 | | | | | |
| | ATC: | -9.90 | -9.90 | 256 | 10 | | | | | |
| HS-SCCH Conf States | | | | | Value | | | | | |
| HSDPA/HSPA OCNS Configs | HS-SCCH 1 Channel Config State | | | | On | | | | | |
| | HS-SCCH 2 Channel Config State | | | | Off | | | | | |
| | HS-SCCH 3 Channel Config State | | | | Off | | | | | |
| | HS-SCCH 4 Channel Config State | | | | Off | | | | | |
| DL Chan Code Preset Configs | | | | | | | | | 34,121 Preset Call Configs | |
| Close Menu | | | | | | | | | Channel (UARFCH) Params | |
| Background | | Active Cell | | | Sys Type: UTRA FDD | | | | | |
| | | Idle | | | Logging: No Conn | | | | | |
| | | IntRef | Offset | | | | | | | |
| 1 of 3 | | | | | | | | | | |

Set HS-SCCH Configs : HS-SCCH 2=off , HS-SCCH 3=off , HS-SCCH 4=off

| Call Setup Screen | | | | | | | | | |
|--|---------------------------------------|-------------|--------|--|-------------------------------|-------|--|--------|--------------------------|
| Call Control | Active Cell Operating Mode | | | | | | | | HSUPA Parm |
| Close Menu | UE Information | | | | | | | | HSUPA PS Data Setup |
| | INSI: 001010123456789 | | | | Power Class: 3 | | | | HSUPA RB Test Mode Setup |
| | INEI(SU):355791040039823(--) | | | | Detected PRACH Sig: 0 | | | | |
| | Called Party Number: | | | | | | | | Common HSUPA Parameters |
| | UE Expected Open Loop Transmit Power | | | | | | | | |
| | Init PRACH TX Pou: -22.70 dBm | | | | Init DPCCCH TX Pou: 17.99 dBm | | | | Serving Grant |
| | Current Service Type | | | | | | | | |
| | None | | | | | | | | E-TFCI Recording |
| | HSUPA RB Test Mode Settings | | | | | Value | | | |
| | RB Test Mode E-RGCH Information State | | | | | Off | | | |
| RB E-DPDCCH Max Channel Codes (12.2k + HSPA) | | | | | 2SF4 | | | | |
| RB E-DPDCCH Max Channel Codes (HSPA) | | | | | 2SF2 + 2SF4 | | | Return | |
| E-DCH RLC SDU Size | | | | | 8808 | | | | |
| RB Max Number of HARQ Retransmissions | | | | | 7 | | | | |
| Background | | Active Cell | | | Sys Type: UTRA FDD | | | | |
| | | Idle | | | Logging: No Conn | | | | |
| | | IntRef | Offset | | | | | | |
| 1 of 2 | | | | | | | | | |

Set RB Test Mode Setup : E-RGCH Information State to Off , Set RB E-DPDCCH Max Channel Codes (HSPA) to 2SF2 + 2SF4 , Set E-DCH RLC SDU Size to 8808



| Call Setup Screen | | |
|---|---|------------------------------|
| Call Control | Active Cell Operating Mode | HSUPA Parm |
| | UE Information | |
| | INSI: 001010123456789 | Power Class: 3 |
| | IMEI(SU):355791040039823 (--) | Detected PRACH Sig: 0 |
| | Called Party Number: | |
| | UE Expected Open Loop Transmit Power | |
| | Init PRACH TX Pou: -22.70 dBm | Init DPCCH TX Pou: 17.99 dBm |
| | Current Service Type | |
| | None | |
| | HSUPA Common Service Parameters | |
| | Value | |
| E-DCH TTI | 2 ms | Serving Grant |
| E-DCH 16QAM State | On | |
| E-DPCCH/DPCCH Power Offset (DeltaE-DPCCH) | 8 | E-TFCI Recording |
| Happy Bit Delay Condition | 100 ms | |
| Happy Bit Averaging Period | 1.000 s | Return |
| E-TFCI Table Index (10 ms TTI) | 0 | |
| E-TFCI Table Index (2 ms TTI) | 0 | Return |
| E-TFCI Table Index (2 ms TTI with 16QAM) | 2 | |
| Close Menu | Background | |
| | Active Cell | |
| | Idle | |
| | Sys Type: UTRA FDD | |
| | Logging: No Conn | |
| | IntRef | Offset |
| | | |
| | 1 of 2 | |

Set Common HSUPA Parameters : E-DCH TTI to 2 ms , E-DCH 16QAM State to On , E-DPCCH/DPCCH Power Offset (DeltaE-DPCCH)=8 , E-TFCI Table Index=2ms

| Call Setup Screen | | |
|---|---|------------------------------|
| Call Control | Active Cell Operating Mode | HSUPA Parm |
| | UE Information | |
| | INSI: 001010123456789 | Power Class: 3 |
| | IMEI(SU):355791040039823 (--) | Detected PRACH Sig: 0 |
| | Called Party Number: | |
| | UE Expected Open Loop Transmit Power | |
| | Init PRACH TX Pou: -22.70 dBm | Init DPCCH TX Pou: 17.99 dBm |
| | Current Service Type | |
| | None | |
| | HSUPA Common Service Parameters | |
| | Value | |
| E-DCH Minimum Set E-TFCI Information State | On | Serving Grant |
| E-DCH Minimum Set E-TFCI (10ms TTI) | 9 | |
| E-DCH Minimum Set E-TFCI (2ms TTI) | 10 | E-TFCI Recording |
| Reference E-TFCI Power Offset Control | Predefined | |
| Reference E-TFCI Power Offsets | Def 34.121-04 | Return |
| Scheduling Information Periodicity (No Grant) | No Report | |
| Scheduling Information Periodicity (Grant) | No Report | Return |
| E-HICH Behavior | Active | |
| Close Menu | Background | |
| | Active Cell | |
| | Idle | |
| | Sys Type: UTRA FDD | |
| | Logging: No Conn | |
| | IntRef | Offset |
| | | |
| | 1 of 2 | |

Set Common HSUPA Parameters : Reference E-TFCI Power Offset Control to Predefined Reference E-TFCI Power Offsets to Definition 34.121-04



| Call Setup Screen | | | | | | |
|------------------------------|--------------------------------|-------------|---------|--------------------|---------|--------------------------------|
| Screen Ctrl | Recorded E-TFCI Information | | | | | E-TFCI Record |
| Channel (UARFCN) Info | E-TFCI Recording State Idle | | | | | E-TFCI Recording Parameters ▾ |
| HSPA Information | Current E-TFCI Boost 105 | | | | | Start Recording E-TFCI Values |
| E-TFCI Recording Information | Recorded E-TFCI Values | | | | | |
| | 1:---- | 11:---- | 21:---- | 31:---- | 41:---- | |
| | 2:---- | 12:---- | 22:---- | 32:---- | 42:---- | |
| | 3:---- | 13:---- | 23:---- | 33:---- | 43:---- | |
| | 4:---- | 14:---- | 24:---- | 34:---- | 44:---- | |
| | 5:---- | 15:---- | 25:---- | 35:---- | 45:---- | |
| | 6:---- | 16:---- | 26:---- | 36:---- | 46:---- | |
| | 7:---- | 17:---- | 27:---- | 37:---- | 47:---- | |
| | 8:---- | 18:---- | 28:---- | 38:---- | 48:---- | |
| | 9:---- | 19:---- | 29:---- | 39:---- | 49:---- | |
| | 10:---- | 20:---- | 30:---- | 40:---- | 50:---- | |
| Clear UE Info | 0/15 | | | | | Send Step Up TPC Bit Pattern |
| Return | | | | | | Send Step Down TPC Bit Pattern |
| | | | | | | Return |
| | Background | Active Cell | | Sys Type: UTRA FDD | | |
| | | Idle | | Logging: No Conn | | |
| | | IntRef | Offset | | | |

Example: Confirm that E-TFCI is equal to the target E-TFCI of 105 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