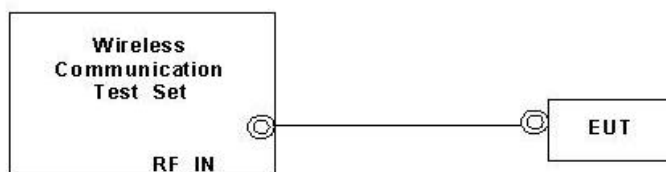


Appendix F. FCC 3G SAR Measurement Procedures

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 Params
 - 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: Δ_{ACK} , Δ_{NACK} and $\Delta_{CQI} = 30/15$ with $\beta_{hs} = 30/15 * \beta_c$.

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			-75.00		
Cell Info	IMEI(SV):355791040039823 (--)			Detected PRACH Sig: 0			dBm/3.84 MHz		
	Called Party Number:						Channel Type		
Generator Info	UE Expected Open Loop Transmit Power						HSPA		
	Init PRACH TX Pou: -22.70 dBm			Init DPCH TX Pou: 17.99 dBm			Paging Service		
Uplink Parameters	Current Service Type						RB Test Mode		
	None								
Close Menu	Uplink Parameters			Value					
	PRACH Ramping Cycles(MMAX)			2			HSPA Parameters		
	Available Subchannels (Bit Mask)			000000000001			34.121 Preset Call Configs		
	Uplink DPCH Scrambling Code			0					
	Uplink DPCH Bc/Bd Control			Manual					
	Manual Uplink DPCH Bc			15					
	Manual Uplink DPCH Bd			15					
	Maximum Uplink Transmit Power Level			21 dBm			Channel (UARFCN) Parm		
	Uplink DPCH Slot Format			1					
	Background			Active Cell Idle			Sys Type: UTRA FDD		
2 of 6				Logging: No Conn					
	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)			dBm/3.84 MHz		
	Current Desired QVSF			Current Desired QVSF			Channel Type		
HSDPA Conn DL Channel Levels	Chan Code			Chan Code			HSPA		
	CPICH: -3.30 -3.30 256 0			Off -3.30 256 0			Paging Service		
HSDPA Conn DL Channel Levels	P-CCPCH/SCH: -5.30 -5.30 256 1			Off -5.35 256 1			RB Test Mode		
	S-CCPCH: -10.30 -10.30 64 7								
HSDPA Conn DL Channel Levels	PICH: -8.30 -8.30 256 16								
	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		
AUGN Power	HSPA Cell 1 Connected P-CCPCH/SCH Level						-12.00 dB		
	HSPA Cell 1 Connected S-CCPCH Level						Off		
Off	HSPA Cell 1 Connected PICH Level						-15.00 dB		
	HSPA Cell 1 Connected (F-)DPCH Level						-10.00 dB		
Close Menu	HSPA Cell 1 Connected E-AGCH Level						-20.00 dB		
	HSPA Cell 1 Connected E-HICH Level						-20.00 dB		
	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 Params
Additional Gen Info Screens	Primary Scrambling Code: 0								Cell Power
									-75.00
Conn S-CCPCH Cfg	Channel								dBm/3.84 MHz
									Channel Type
On	CPICH: -3.30 -3.30 256 0								HSPA
HS-SCCH Configs	P-CCPCH/SCH: -5.30 -5.30 256 1								Paging Service
	S-CCPCH: -10.30 -10.30 64 7								
	PICH: -8.30 -8.30 256 16								
	ATICH: -8.90 -8.90 256 10								
HSDPA/HSPA OCNS Configs	HS-SCCH Conf States								HSPA Parameters
	Value								
	HS-SCCH 1 Channel Config State								
	HS-SCCH 2 Channel Config State								
	HS-SCCH 3 Channel Config State								
DL Chan Code Preset Configs	HS-SCCH 4 Channel Config State								34,121 Preset Call Configs
Close Menu									Channel (UARFCN) Params
		Background		Active Cell		Sys Type: UTRA FDD		1 of 3	
				Idle		Logging: No Conn			
				IntRef		Offset			

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

Set RB Test Mode Setup : E-RGCH Information State to Off , Set RB E-DPDCH 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		
Close Menu	UE Information INSI: 001010123456789 Power Class: 3 IMEI(SV):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 PS Data Setup HSUPA RB Test Mode Setup Common HSUPA Parameters		
	HSUPA Common Service Parameters						Value		
	E-DCH TTI						2 ms		
	E-DCH 16QAM State						On		
	E-DPCCH/DPCCH Power Offset (DeltaE-DPCCH)						8		
	Happy Bit Delay Condition						100 ms		
	Happy Bit Averaging Period						1.000 s		
	E-TFCI Table Index (10 ms TTI)						0		
	E-TFCI Table Index (2 ms TTI)						0		
	E-TFCI Table Index (2 ms TTI with 16QAM)						2		
	Background						Active Cell		
	Idle						Sys Type: UTRA FDD		
	IntRef						Offset		
	Logging: No Conn						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		
Close Menu	UE Information INSI: 001010123456789 Power Class: 3 IMEI(SV):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 PS Data Setup HSUPA RB Test Mode Setup Common HSUPA Parameters		
	HSUPA Common Service Parameters						Value		
	E-DCH Minimum Set E-TFCI Information State						On		
	E-DCH Minimum Set E-TFCI (10ms TTI)						9		
	E-DCH Minimum Set E-TFCI (2ms TTI)						10		
	Reference E-TFCI Power Offset Control						Predefined		
	Reference E-TFCI Power Offsets						Def 34.121-04		
	Scheduling Information Periodicity (No Grant)						No Report		
	Scheduling Information Periodicity (Grant)						No Report		
	E-HICH Behavior						Active		
	Background						Active Cell		
	Idle						Sys Type: UTRA FDD		
	IntRef						Offset		
	Logging: No Conn						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										
Call Control	Active Cell Operating Mode						HSUPA Parms			
	UE Information INSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823 (--) Detected PRACH Sig: 0 Called Party Number:						HSUPA PS Data Setup HSUPA RB Test Mode Setup Common HSUPA Parameters			
	UE Expected Open Loop Transmit Power Init PRACH TX Pou: -22.70 dBm Init DPCH TX Pou: 17.99 dBm									
	Current Service Type None									
	HSUPA Common Service Parameters Value									
	Scheduling Information Periodicity (Grant)						No Report			
	E-HICH Behavior						Active			
	SRB Mac-d Flow Transmission Grant						Non Scheduled			
	E-TFCI Boost Information State						On			
	E-TFCI Boost Value						105			
	DeltaT2TP						2			
	BetaEd Gain E-AGCH Table Selection						1			
	E-DPDCH Power Calculation Formula						Extrapolation			
	Close Menu	Background		Active Cell		Sys Type: UTRA FDD				
				Idle		Logging: No Conn				
		IntRef Offset				1 of 2				

Set Common HSUPA Parameters : E-TFCI Boost Information State to On ,
 E-TFCI Boost Value to 105 , DeltaT2TP to 2 ,
 BetaEd Gain E-AGCH Table Selection to 1
 E-DPDCH Power Calculation Formula to Extrapolation

Call Setup Screen									
Call Control	Active Cell Operating Mode						Serving Grant		
	Operating Mode Active Cell						AG Mode		
	UE Information INSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823 (--) Detected PRACH Sig: 0 Called Party Number:						Single Shot Single Shot AG 14: (75/15)*2		
	UE Expected Open Loop Transmit Power Init PRACH TX Pou: -11.70 dBm Init DPCH TX Pou: -0.01 dBm								
	Current Service Type None						Send Single Shot Absolute Grant RB Setup AG		
	Call Processing Status RRC State: Absolute Grant Mode MM Status: Single Shot GM State: Pattern						17: (75/15)*2 AG Pattern Parameters		
	HSUPA Information Rep EDCH Cat/ Last Happy Bit Throughput: ACKs Transmitt						OSCH Cat: 14 Ratio: 0 % 533 kbps 11000		
	Background Active Cell Idle						Sys Type: UTRA FDD Logging: No Conn		
	1 of 6						1 of 2		

Set Serving Grant : AG Mode= Single Shot , Set RB Setup AG=74(75/15)

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:----					Send Step Up TPC Bit Pattern			
Clear UE Info						Send Step Down TPC Bit Pattern			
Return	0/15					Return			
Background		Active Cell Idle			Sys Type: UTRA FDD				
		IntRef Offset			Logging: No Conn				

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