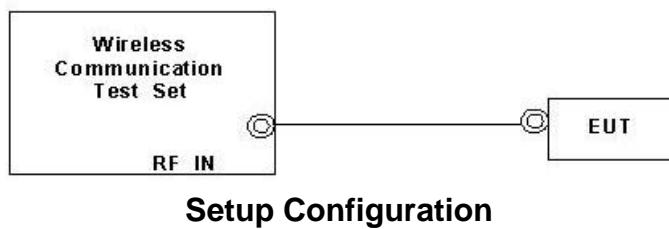


Appendix F. FCC 3G SAR Measurement Procedures

HSPA+ 3GPP release 7 (uplink category 7) 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.



**HSPA+ 3GPP release 7 (uplink category 7) 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 ChannelParms
 - 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 Δ_{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				CallParms
Channel (UARFCN) Info	UE Information				Cell Power -75.00 dBm/3.84 MHz
Cell Info	IMSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823(--) Detected PRACH Sig: 0				Channel Type HSPA
Generator Info	Called Party Number: UE Expected Open Loop Transmit Power Init PRACH TX Pow: -22.70 dBm Init DPCCH TX Pow: 17.99 dBm				Paging Service RB Test Mode
Uplink Parameters	Current Service Type None Uplink Parameters Value				HSPA Parameters
	PRACH Ramping Cycles(1MAX) 2 Available Subchannels (Bit Mask) 000000000001				3G.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				Channel (UARFCN)Parms
Close Menu	Maximum Uplink Transmit Power Level 21 dBm Uplink DPCCH Slot Format 1				1 of 3
	Background Active Cell Sys Type: UTRA FDD Idle Logging: No Conn				
2 of 6					

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				CallParms
Additional Gen Info Screens	Primary Scrambling Code: 0				Cell Power -75.00 dBm/3.84 MHz
HSDPA Conn DL Channel Levels	Channel Cell 1 DL Code Chan Info Cell 2 DL Code Chan Info				Channel Type HSPA
	Level (dB) Level (dB)				Paging Service RB Test Mode
	Channel Current Desired OVSF Chan Code Current Desired OVSF Chan Code				HSPA Parameters
	CPICH: -3.30 -3.30 256 0 Off -3.30 256 0				3G.121 Preset Call Configs
	P-CCPCH/SCH: -5.30 -5.30 256 1 Off -5.35 256 1				Channel (UARFCN)Parms
	S-CCPCH: -10.30 -10.30 64 7				1 of 3
HSDPA Conn DL Channel Levels	PICH: -8.30 -8.30 256 16				
	ATCH: -9.90 -9.90 256 10				
	HSPA Connected DL Channel Levels Value				
HSPA Conn DL Channel Levels	HSPA Cell 1 Connected CPICH Level -10.00 dB				
	HSPA Cell 1 Connected P-CCPCH/SCH Level -12.00 dB				
AUICH Power	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				
	HSPA Cell 1 Connected E-AGCH Level -20.00 dB				
	HSPA Cell 1 Connected E-HICH Level -20.00 dB				
Close Menu	HSPA Cell 1 Connected E-RGCH Level Off				
	Background Active Cell Sys Type: UTRA FDD Idle Logging: No Conn				

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									CallParms			
	Primary Scrambling Code: 0												
Additional Gen Info Screens	Channel	Cell 1 DL Code Chan Info			Cell 2 DL Code Chan Info			Level (dB)		Cell Power			
Conn S-CCPCH Cfg	Channel	Current	Desired	OVSF	Chan	Current	Desired	OVSF	Chan	-75.00			
On	Channel 1	CPICH:	-3.30	-3.30	256	0	Off	-3.30	256	0			
		P-CCPCH/SCH:	-5.30	-5.30	256	1	Off	-5.35	256	1			
HS-SCCH Configs	HS-SCCH	S-CCPCH:	-10.30	-10.30	64	7				HSPA			
	Config	PICH:	-8.30	-8.30	256	16				Paging Service			
HSDPA/HSPA OCNS Configs	HS-SCCH	ATICH:	-9.90	-9.90	256	10				RB Test Node			
	Config									HSPA Parameters			
DL Chan Code Preset Configs	HS-SCCH Conf States						Value			3G_121 Preset Call Configs			
	HS-SCCH 1	Channel Config State					On			▼			
Close	HS-SCCH 2	Channel Config State					Off			Channel (UARFCN) Params			
	HS-SCCH 3	Channel Config State					Off						
Menu	HS-SCCH 4	Channel Config State					Off						
	Background	Active Cell Idle				Sys Type: UTRA FDD							
		IntRef Offset				Logging: No Conn				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			
	UE Information			
	IMSI: 001010123456789	Power Class: 3		
	IMEI(SV):355791040039823(--)	Detected PRACH Sig: 0		
	Called Party Number:			
	UE Expected Open Loop Transmit Power			
	Init PRACH TX Pow: -22.70 dBm	Init DPCCH TX Pow: 17.99 dBm		
	Current Service Type			
	None			
	HSUPA RB Test Mode Settings			
	Value			
	RB Test Node E-RGCH Information State	Off		
	RB E-DPDCH Itax Channel Codes (12.2k + HSPA)	2SF4		
	RB E-DPDCH Itax Channel Codes (HSPA)	2SF2 + 2SF4		
	E-DCH RLC SDU Size	8808		
	RB Itax Number of HARQ Retransmissions	7		
Close Menu				
	Background	Active Cell		
		Idle		
		Sys Type: UTRA FDD		
		Logging: No Conn		
	IntRef	Offset		
	1 of 2			
HSUPA PMS				
HSUPA PS Data Setup				
HSUPA RB Test Node Setup				
Common HSUPA Parameters				
Serving Grant				
E-TFCI Recording				
Return				

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		HSUPAParms
	UE Information		HSUPA PS Data Setup
	IMSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823(--) Detected PRACH Sig: 0		
	Called Party Number:		HSUPA RB Test Node Setup
	UE Expected Open Loop Transmit Power		Common HSUPA Parameters
	Init PRACH TX Pow: -22.70 dBm Init DPCCH TX Pow: 17.99 dBm		
	Current Service Type		Serving Grant
	None		E-TFCI Recording
	HSUPA Common Service Parameters		Return
	E-DCH TTI 2 ms		1 of 2
	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		
Close Menu	Background	Active Cell	Sys Type: UTRA FDD
		Idle	Logging: No Conn
	IntRef	Offset	

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		HSUPAParms
	UE Information		HSUPA PS Data Setup
	IMSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823(--) Detected PRACH Sig: 0		
	Called Party Number:		HSUPA RB Test Node Setup
	UE Expected Open Loop Transmit Power		Common HSUPA Parameters
	Init PRACH TX Pow: -22.70 dBm Init DPCCH TX Pow: 17.99 dBm		
	Current Service Type		Serving Grant
	None		E-TFCI Recording
	HSUPA Common Service Parameters		Return
	E-DCH Minimum Set E-TFCI Information State On		1 of 2
	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 34121-04		
	Scheduling Information Periodicity (No Grant) No Report		
	Scheduling Information Periodicity (Grant) No Report		
	E-HICH Behavior Active		
Close Menu	Background	Active Cell	Sys Type: UTRA FDD
		Idle	Logging: No Conn
	IntRef	Offset	

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		HSUPAParms
	UE Information		HSUPA PS Data Setup
	IMSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823(--) Detected PRACH Sig: 0		
	Called Party Number:		HSUPA RB Test Node Setup
	UE Expected Open Loop Transmit Power		Common HSUPA Parameters
	Init PRACH TX Pow: -22.70 dBm Init DPCCH TX Pow: 17.99 dBm		
	Current Service Type		Serving Grant
	None		
	HSUPA Common Service Parameters		E-TFCI Recording
	Scheduling Information Periodicity (Grant) No Report		Return
	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		
Close Menu	BetaEd Gain E-AGCH Table Selection 1	Extrapolation	
	E-DPDCH Power Calculation Formula		
	Background Active Cell Sys Type: UTRA FDD	Idle Logging: No Conn	
	Idle		
	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 Node	UE Information		AG Mode
Active Cell	IMSI: 001010123456789 Power Class: 3 IMEI(SV):355791040039823(--) Detected PRACH Sig: 0		Single Shot
	Called Party Number:		Single Shot AG
	UE Expected Open Loop Transmit Power		14: (75/15)^2
	Init PRACH TX Pow: -11.70 dBm Init DPCCH TX Pow: -0.01 dBm		
	Current Service Type		Send Single Shot Absolute Grant
	None		
	Call Processing Status		RB Setup AG
	RRC State: Absolute Grant Mode RRC State: Off		17: (75/15)^2
	RRI Status: Single Shot RRI Status: Off		
	GMR Status: Pattern GMR Status: Off		
	HSUPA Information		AG Pattern Parameters
	Rep EOCCH Cat/14 DSCH Cat: 14		Return
	Last Happy Bit Ratio: 0 %		
	Throughput: 533 kbps		
	ACKs Transmitted: 11000		
	Background Active Cell Sys Type: UTRA FDD	Idle Logging: No Conn	
	Idle		
1 of 6	IntRef Offset		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	
	E-TFCI Recording State						
	Idle						
	Current E-TFCI Boost						
	105						
	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:----		
	0/15						
	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