



3G SAR Measurement Procedures

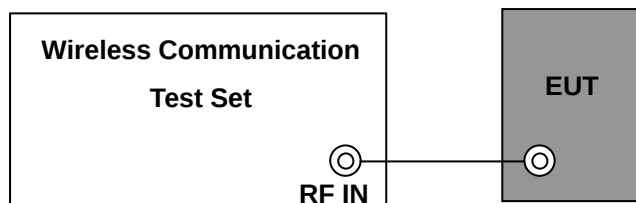
Conducted Output Power

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 Release6 version supporting HSDPA and HSUPA. A detailed analysis of the output power for all WCDMA, HSDPA and HSUPA mode is provided in the table below. According to the FCC 3G procedures, handsets with both HSDPA and HSUPA should be tested according to release 6 HSPA test procedures, and EUT does not support VOIP function over the HSPA function. The HSPA output levels are less than 1/4dB higher than the basic 12.2kbps RMC configurations in WCDMA, as required by FCC 3G SAR procedures and the PBA is fulfilled.



WCDMA Setup Configuration

1. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
2. The RF path losses were compensated into measurements.
3. A call was established between EUT and Base Station with following setting
 - a 、 set Cell Power = -60dBm
 - b 、 set RMC 12.2K
 - c 、 set UE Target Power = 24dBm
 - d 、 set Power Ctrl Mode = All Up bit
4. The transmitted maximum output power was recorded.



Call Setup Screen									
Call Control		Active Cell Operating Mode						Call Parm	
Operating Mode		UE Information						Cell Power	
Active Cell		INSI: INEI: Power Class:						-60.00	
		UE Expected Open Loop Transmit Power						dBm/3.84 MHz	
		Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 6.42 dBm						Channel Type	
Originate Call		Call Processing Status						12.2k RMC	
		Current Service Type: None MM Status: None GMM State: None Current DPCCH Offset: 0 chips						Paging Service	
Paging Parameters		HSUPA Information UE Rep E-DCH Cat: Unreported Last Received E-TFCI: ---- Throughput: ---- kbps ACKs Transmitted: ---- HSDPA Information Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----						RB Test Mode	
Handovers		Active Cell Idle						HSPA Parameters	
Clear UE Info		IntRef						34,121 Preset Call Configs	
		Sys Type: UTRA FDD						Channel (UARFCN) Parm	
1 of 4								1 of 3	

WCDMA Setup Configuration : Step 3 – a & b



Call Setup Screen									
Call Control		Active Cell Operating Mode					Call Parm		
		UE Information INSI: INEI: Power Class:					UE Target Power 24 dBm		
		UE Expected Open Loop Transmit Power Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 17.45 dBm					UL CL Power Ctrl Parameters		
		UL CL Power Ctrl Parameters Value					UL CL Power Ctrl Parameters		
		UL CL Power Ctrl Mode All Up bits					Send Step Up TPC Bit Pattern		
		UL CL Power Ctrl Algorithm Tuo					Send Step Down TPC Bit Pattern		
		UL CL Power Ctrl Stepsize 1 dB					Receiver Control		
Close Menu									
		Active Cell Idle			Sys Type: UTRA FDD				
		IntRef						3 of 3	

WCDMA Setup Configuration : Step 3 – c & d

HSDPA Setup Configuration

1. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
2. The RF path losses were compensated into measurements.
3. A call was established between EUT and Base Station with following setting
 - a、Set Gain Factors (β_c and β_d) and parameters were set according to each specific sub-test in the following table quoted from the TS 34.121.
 - b、Set Cell Power = -60dBm
 - c、Set RMC 12.2K+HSDPA
 - d、Set HS-DSCH Configuration Type to FRC(H-set 1,QPSK)
 - e、Set UE Target Power = 24dBm
 - f、Set Power Ctrl Mode = All Up bit
 - g、Select Uplink Parameter
 - h、Set Gain Factor(β_c and β_d) Parameters were set according to each
 - i、Ex. Sub-test 1 : $\beta_c=2, \beta_d=15$
 - j、Set PS Domain
4. The transmitted maximum output power was recorded.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1,2)}$	CM (dB) ⁽³⁾	MRP (dB) ⁽³⁾
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	12/15 ⁽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. $\Delta_{ACK}, \Delta_{NACK}$ and $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$
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 $\beta_{hs} = 24/15 * \beta_c$
3. CM = 1 for $\beta_c/\beta_d = 12/15, \beta_{hs}/\beta_c = 24/15$. 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.
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 signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$.

Table 1. Setup for Release 5 HSDPA



Call Setup Screen									
Call Control	Active Cell Operating Mode						Call Parm's		
Operating Mode	UE Information INSI: IMEI: Power Class:						Cell Power		
Active Cell							-60.00		
Originate Call	UE Expected Open Loop Transmit Power Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 17.45 dBm						dBm/3.84 MHz		
							Channel Type		
Paging Parameters	Call Processing Status Current Service Type: None MM Status: None GMM State: None Current DPCCH Offset: 0 chips						12.2k + HSDPA		
							Paging Service		
Handovers	HSUPA Information UE Rep E-DCH Cat: Unreported Last Received E-TFCI: ---- Throughput: ---- kbps ACKs Transmitted: ----						RB Test Node		
							HSPA Parameters		
Clear UE Info	HSDPA Information Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----						34,121 Preset Call Configs		
							Channel (UARFCN) Parm's		
		Active Cell				Sys Type: UTRA FDD			
		Idle							
1 of 4		IntRef				1 of 3			

HSDPA Setup Configuration : Step 3 – b & c

Call Setup Screen									
Call Control	Active Cell Operating Mode						HSDPA Parm's		
Close Menu	UE Information INSI: IMEI: Power Class:						HSDPA RB Test Mode Setup		
	UE Expected Open Loop Transmit Power Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 17.45 dBm						MAC-hs Parameters		
	Value								
	HS-DSCH Configuration Type						FRC		
	FRC Type						H-Set 1 QPSK		
	FRC MAC-d PDU Size						Maximize		
	User Defined Number of Active HS-DSCHs						5		
	User Defined Transport Block Size Index						62		
User Defined Modulation Type						QPSK			
User Defined Inter-TTI Interval						3			
User Defined Number of HARQ Processes						2			
		Active Cell				Sys Type: UTRA FDD			
		Idle							
		IntRef				1 of 2			

HSDPA Setup Configuration : Step 3 - d



Call Setup Screen									
Call Control	Active Cell Operating Mode						Call Parm		
Channel (UARFCN) Info	UE Information						Cell Power		
	INSI: INEI: Power Class:						-60.00		
Cell Parameters	UE Expected Open Loop Transmit Power						dBm/3.84 MHz		
	Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 6.42 dBm						Channel Type		
Generator Info							12.2k + HSDPA		
							Paging Service		
Uplink Parameters	Uplink Parameters					Value	RB Test Node		
	PRACH Preambles					64	HSPA Parameters		
UE Rep Meas	PRACH Ramping Cycles(MAX)					2	34,121 Preset Call Configs		
	Available Subchannels (Bit Mask)					000000000001			
Close Menu	Uplink DPCCH Scrambling Code					0			
	Uplink DPCCH Bc/Bd Control					Manual			
	Manual Uplink DPCCH Bc					2			
	Manual Uplink DPCCH Bd					15			
	Maximum Uplink Transmit Power Level					33 dBm	Channel (UARFCN) Parm		
		Active Cell				Sys Type: UTRA FDD			
		Idle							
2 of 4		IntRef						1 of 3	

HSDPA Setup Configuration : Step 3 – i

Call Setup Screen									
Call Control	Active Cell Operating Mode						HSDPA Parm		
	UE Information						HSDPA PS Data Setup		
	INSI: INEI(SU): (--) Power Class: Detected PRACH Sig: ----								
	Called Party Number:						HSDPA RB Test Node Setup		
	UE Expected Open Loop Transmit Power						UE Category Parameters		
	Init PRACH TX Pou: -22.70 dBm Init DPCCH TX Pou: -11.55 dBm								
	Current Service Type								
	None								
	HSDPA RB Test Mode Settings					Value	MAC-hs Parameters		
	HSDPA Test User Def HSDPA Test User Def HSDPA Test User Def CN Domain Uplink Ok DTCH f Uplink 64k DTCH HS-DSCH Data Pa RLC Header on HS-DSCH					2 Implicit 10200 PS Domain Off Off CCITT PRBS15 Present	HSDPA Uplink Parameters		
Close Menu							Return		
		Active Cell				Sys Type: UTRA FDD			
		Idle				Logging: No Conn			
		DBUS-INT				IntRef Offset		1 of 2	

HSDPA Setup Configuration : Step 3 - j



HSUPA Setup Configuration

1. The EUT was connected to Base Station referred to the drawing of Setup Configuration.
2. The RF path losses were compensated into measurements.
3. A call was established between EUT and Base Station with following setting
 - a、 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 quoted from the TS 34.121.
 - b、 Set Cell Power = -75dBm
 - c、 Set RMC 12.2K+HSPA
 - d、 Set HS-DSCH Configuration Type to FRC(H-set 1,QPSK)
 - e、 Set UE Target Power = 24dBm
 - f、 Set Power Ctrl Mode = Alternating bits
 - g、 Select Uplink Parameter
 - h、 Set Gain Factor(β_c ,and β_d) Parameters were set according to each
 - i、 Ex. Sub-test 1 : $\beta_c=11, \beta_d=15$
 - j、 Set AG Ex. Sub-test 1 :AG =20
 - k、 Set E-TFCI Ex. Sub-test 1 : 75
 - l、 Set PS Domain
4. The transmitted maximum output power was recorded.

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	β_{ec}	β_{ed}	Bed (SF)	Bed (codes)	CM ⁽²⁾ (dB)	MPR (dB)	AG ⁽⁴⁾ Index	E-TFCI
1	11/15 ⁽³⁾	15/15 ⁽³⁾	64	11/15 ⁽³⁾	22/15	209/225	1039/225	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_{ed1} : 47/15 β_{ed2} : 47/15	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 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: ΔACK , $\Delta NACK$ and $\Delta CQI = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$.

Note 2: CM = 1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. 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 signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 10/15$ and $\beta_d = 15/15$.

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 signaled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5: Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Table 2. Setup for Release 6 HSUPA



Call Setup Screen									
Call Control	Active Cell Operating Mode						Call Parm		
Operating Mode	UE Information INSI: INEI(SU): (--) Power Class: Detected PRACH Sig: ---- Called Party Number:						Cell Power -75.00 dBm/3.84 MHz		
Active Cell	UE Expected Open Loop Transmit Power Init PRACH TX Pou: -22.70 dBm Init DPCCH TX Pou: -11.55 dBm						Channel Type 12.2k RNC		
Originate Call	Current Service Type None						Paging Service RB Test Node		
Paging Parameters	Call Processing Status RRC State: MM Status: GMN State: Channel Type 12.2k UL / 144k DL AM RNC 12.2k UL / 384k DL AM RNC 64k UL / 384k DL AM RNC Power State: Off Node State: Off Offset: 0 chips						HSPA Parameters		
Handovers	HSUPA Information UE Rep E-DCH: 12.2k RNC + HSDPA Last Happy Bit: 12.2k RNC + HSPA Throughput: HSPA ACKs Transmitted:						34,121 Preset Call Configs		
Clear UE Info	Active Cell Idle						Sys Type: UTRA FDD Logging: No Conn		
1 of 5	DBUS-INT IntRef Offset						1 of 3		

HSUPA Setup Configuration : Step 3 – b & c

Call Setup Screen									
Call Control	Active Cell Operating Mode						HSDPA Parm		
Close Menu	UE Information INSI: INEI: Power Class:						HSDPA RB Test Mode Setup		
	UE Expected Open Loop Transmit Power Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 17.45 dBm						UE Category Parameters		
	HSDPA RB Test Mode Settings HS-DSCH Configuration Type FRC Type FRC MAC-d PDU Size User Defined Number of Active HS-PSCHs User Defined Transport Block Size Index User Defined Modulation Type User Defined Inter-TTI Interval User Defined Number of HARQ Processes FRC H-Set 1 QPSK Maximize 5 62 QPSK 3 2						MAC-hs Parameters		
							HSDPA Uplink Parameters		
							Return		
Active Cell Idle						Sys Type: UTRA FDD			
IntRef						1 of 2			

HSUPA Setup Configuration : Step 3 - d



Call Setup Screen									
Call Control		Active Cell Operating Mode						Call Parm	
Channel (UARFCN) Info Cell Info Generator Info Uplink Parameters Close Menu		UE Information INSI: INEI: Power Class:						UE Target Power 24 dBm	
		UE Expected Open Loop Transmit Power Initial PRACH TX Power: -37.70 dBm Initial DPCCH TX Power: 6.42 dBm						UL CL Power Ctrl Parameters	
		UL CL Power Ctrl Parameters UL CL Power Ctrl Mode: Alternating bits UL CL Power Ctrl Algorithm: Two UL CL Power Ctrl Stepsize: 1 dB						Send Step Up TPC Bit Pattern	
								Send Step Down TPC Bit Pattern	
								Receiver Control	
		Active Cell Idle				Sys Type: UTRA FDD			
		IntRef						3 of 3	

HSUPA Setup Configuration : Step 3 – e & f

Call Setup Screen									
Call Control		Active Cell Operating Mode						Call Parm	
Channel (UARFCN) Info Cell Info Generator Info Uplink Parameters Close Menu		UE Information INSI: 001012345678901 Power Class: 3 INEI(SU):354217010002710 (--) Detected PRACH Sig: 0						Cell Power -75.00 dBm/3.84 MHz	
		Called Party Number:						Channel Type 12.2k + HSDPA	
		UE Expected Open Loop Transmit Power Init PRACH TX Pou: -22.70 dBm Init DPCCH TX Pou: -9.56 dBm						Paging Service RB Test Mode	
		Current Service Type None							
		Uplink Parameters PRACH Preambles: 64 PRACH Ramping Cycles(MINAX): 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						HSPA Parameters	
								34.121 Preset Call Configs	
								Channel (UARFCN) Parm	
		Active Cell Idle				Sys Type: UTRA FDD			
		DBUS-INT				Logging: No Conn			
2 of 5		IntRef						1 of 3	

HSUPA Setup Configuration : Step 3 – i



Call Setup Screen									
Call Control		Active Cell Operating Mode						Serving Grant	
Operating Mode		UE Information INSI: 001012345678901 Power Class: 3 INEI(SV):354217010002710(--) Detected PRACH Sig: 0 Called Party Number: UE Expected Open Loop Transmit Power Init PRACH TX Pou: -22.70 dBm Init DPCH TX Pou: -9.56 dBm Current Service Type None						AG Mode	
Active Cell								Single Shot	
								Single Shot AG	
								20: (119/15)^2	
Originate Call								Send Single Shot Absolute Grant	
Paging Parameters		Call Processing Status RRC State: Abs Single Shot AG Power State: Off MM Status: Index 18: (95/15)^2 Node State: Off GMM State: Index 19: (106/15)^2 Offset: 1536 chips						Send Relative Grant Up	
Handovers		HSUPA Information Index 20: (119/15)^2 Index 21: (134/15)^2 Index 22: (150/15)^2 Index 23: (168/15)^2						Send Relative Grant Down	
Clear UE Info								Return	
		Active Cell				Sys Type: UTRA FDD			
		Idle				Logging: No Conn			
1 of 5		DBUS-INT		IntRef Offset				1 of 2	

HSUPA Setup Configuration : Step 3 – j

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		Recorded E-TFCI Values 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	
E-TFCI Recording Information									
								Send Step Up TPC Bit Pattern	
Clear UE Info								Send Step Down TPC Bit Pattern	
Return								Return	
		Active Cell				Sys Type: UTRA FDD			
		Connected				Logging: No Conn			
		DBUS-INT		IntRef Offset					

HSUPA Setup Configuration : Step 3 – k



Call Setup Screen									
Call Control		Active Cell Operating Mode					HSDPA Parms		
Close Menu		UE Information INSI: INEI(SU): (--) Power Class: Detected PRACH Sig: ---- Called Party Number:					HSDPA PS Data Setup		
		UE Expected Open Loop Transmit Power Init PRACH TX Pou: -22.70 dBm Init DPCCH TX Pou: -11.55 dBm					HSDPA RB Test Mode Setup		
		Current Service Type None					UE Category Parameters		
		HSDPA RB Test Mode Settings CN Domain PS Domain CS Domain CS/PS Domain Uplink Ok DTCH f Uplink 64k DTCH HS-DSCH Data Pa RLC Header on HS-Down 2 Explicit 10200 PS Domain Off Off CCITT PRBS15 Present					NAC-hs Parameters		
							HSDPA Uplink Parameters		
							Return		
		Active Cell			Sys Type: UTRA FDD				
		Idle			Logging: No Conn				
		DBUS-INT	IntRef	Offset				1 of 2	

HSUPA Setup Configuration : Step 3 – I