

Appendix 5. System Check

Prior to the assessment, the system was verified in the flat region of the phantom, 900 MHz, 1900 MHz, 2450 MHz and 5.0 GHz dipoles were used. A forward power of 250 mW was applied to the 900 MHz, 1900 MHz, 2450 MHz dipoles and 100 mW was applied to 5.0 GHz dipole and the system was verified to a tolerance of $\pm 5\%$ for the 900MHz, 1900MHz, 2450 MHz and 5.0 GHz dipoles.

The applicable verification normalised to 1 Watt.

System Check 850/900 Head

Date: 22/10/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	24.0 °C	ϵ_r	41.50	41.00	-1.22	5.00
				σ	0.97	0.97	-0.41	5.00
				1g SAR	10.50	10.56	0.57	5.00
				10g SAR	6.74	6.80	0.89	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
128	Low	824.2	ϵ_r	41.40
			σ	0.92
190	Middle	836.6	ϵ_r	41.30
			σ	0.93
251	High	848.8	ϵ_r	41.30
			σ	0.94

Date: 23/10/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.0 °C	ϵ_r	41.50	41.00	-1.22	5.00
				σ	0.97	0.97	-0.41	5.00
				1g SAR	10.50	10.20	-2.86	5.00
				10g SAR	6.74	6.60	-2.08	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
128	Low	824.2	ϵ_r	41.40
			σ	0.92
190	Middle	836.6	ϵ_r	41.30
			σ	0.93
251	High	848.8	ϵ_r	41.30
			σ	0.94

System Check 850/900 Head (Continued):

Date: 24/10/2012
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.0 °C	ϵ_r	41.50	40.73	-1.86	5.00
				σ	0.97	0.95	-2.17	5.00
				1g SAR	10.50	10.72	2.10	5.00
				10g SAR	6.74	6.96	3.26	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
4132	Low	829	ϵ_r	41.10
			σ	0.90
4183	Middle	836.5	ϵ_r	41.00
			σ	0.91
4233	High	844	ϵ_r	40.90
			σ	0.92

Date: 26/11/2012
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.0 °C	ϵ_r	41.50	41.65	0.36	5.00
				σ	0.97	0.95	-2.16	5.00
				1g SAR	10.50	10.00	-4.76	5.00
				10g SAR	6.74	6.44	-4.45	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829.0	ϵ_r	42.14
			σ	0.90
20525	Middle	836.5	ϵ_r	42.08
			σ	0.91
20650	High	844.0	ϵ_r	42.03
			σ	0.91

System Check 850/900 Head (Continued):

Date: 27/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.0 °C	ϵ_r	41.50	41.65	0.36	5.00
				σ	0.97	0.95	-2.16	5.00
				1g SAR	10.50	10.12	-3.62	5.00
				10g SAR	6.74	6.56	-2.67	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829.0	ϵ_r	42.14
			σ	0.90
20525	Middle	836.5	ϵ_r	42.08
			σ	0.91
20650	High	844.0	ϵ_r	42.03
			σ	0.91

Date: 28/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.4 °C	ϵ_r	41.50	40.45	-2.52	5.00
				σ	0.97	0.92	-4.90	5.00
				1g SAR	10.50	10.56	0.57	5.00
				10g SAR	6.74	6.88	2.08	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20407	Low	824.7	ϵ_r	42.08
			σ	0.89
20525	Middle	836.5	ϵ_r	42.01
			σ	0.90
20643	High	848.3	ϵ_r	41.93
			σ	0.91

System Check 850/900 Head (Continued):

Date: 29/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.4 °C	ϵ_r	41.50	40.45	-2.52	5.00
				σ	0.97	0.92	-4.90	5.00
				1g SAR	10.50	10.40	-0.95	5.00
				10g SAR	6.74	6.72	-0.30	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20407	Low	824.7	ϵ_r	42.08
			σ	0.89
20525	Middle	836.5	ϵ_r	42.01
			σ	0.90
20643	High	848.3	ϵ_r	41.93
			σ	0.91

Date: 09/01/2013

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.5 °C	ϵ_r	41.50	40.24	-3.04	5.00
				σ	0.97	0.95	-1.96	5.00
				1g SAR	10.50	10.28	-2.10	5.00
				10g SAR	6.74	6.64	-1.48	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829.0	ϵ_r	40.70
			σ	0.90
20525	Middle	836.5	ϵ_r	40.60
			σ	0.91
20650	High	844.0	ϵ_r	40.60
			σ	0.91

System Check 850/900 Head (Continued):
Date: 10/01/2013
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	24.0 °C	22.5 °C	ϵ_r	41.50	40.24	-3.04	5.00
				σ	0.97	0.95	-1.96	5.00
				1g SAR	10.50	10.56	0.57	5.00
				10g SAR	6.74	6.80	0.89	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20407	Low	824.7	ϵ_r	40.70
			σ	0.90
20525	Middle	836.5	ϵ_r	40.60
			σ	0.91
20643	High	848.3	ϵ_r	40.60
			σ	0.91

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829.0	ϵ_r	40.70
			σ	0.90
20525	Middle	836.5	ϵ_r	40.60
			σ	0.91
20650	High	844.0	ϵ_r	40.60
			σ	0.91

System Check 850/900 Body

Date: 24/10/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	22.0 °C	ϵ_r	55.00	53.81	-2.15	5.00
				σ	1.05	1.01	-4.05	5.00
				1g SAR	10.80	10.64	-1.48	5.00
				10g SAR	6.96	7.00	0.57	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
128	Low	824.2	ϵ_r	54.00
			σ	0.96
190	Middle	836.6	ϵ_r	54.00
			σ	0.97
251	High	848.8	ϵ_r	53.90
			σ	0.98

Date: 20/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	22.5 °C	ϵ_r	55.00	56.56	2.83	5.00
				σ	1.05	1.02	-3.21	5.00
				1g SAR	10.80	10.84	0.37	5.00
				10g SAR	6.96	7.12	2.30	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829.0	ϵ_r	56.96
			σ	0.95
20525	Middle	836.5	ϵ_r	56.88
			σ	0.96
20650	High	844.0	ϵ_r	56.81
			σ	0.96

System Check 850/900 Body (Continued):

Date: 21/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0°C	22.5°C	ϵ_r	55.00	56.56	2.83	5.00
				σ	1.05	1.02	-3.21	5.00
				1g SAR	10.80	10.48	-2.96	5.00
				10g SAR	6.96	6.84	-1.72	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829	ϵ_r	56.96
			σ	0.95
20525	Middle	836.5	ϵ_r	56.88
			σ	0.96
20600	High	844	ϵ_r	56.81
			σ	0.96

Date: 22/11/2012

Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0°C	22.0°C	ϵ_r	55.00	56.22	2.22	5.00
				σ	1.05	1.02	-3.04	5.00
				1g SAR	10.80	10.60	-1.85	5.00
				10g SAR	6.96	6.96	0.00	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829	ϵ_r	56.61
			σ	0.96
20525	Middle	836.5	ϵ_r	56.54
			σ	0.96
20600	High	844	ϵ_r	56.47
			σ	0.96
Channel Number	Channel Description	Frequency (MHz)	Parameters	
20407	Low	824.7	ϵ_r	56.66
			σ	0.95
20525	Middle	836.5	ϵ_r	56.57
			σ	0.96
20643	High	848.3	ϵ_r	56.43
			σ	0.96

System Check 850/900 Body (Continued):
Date: 23/11/2012
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	22.0 °C	ϵ_r	55.00	56.22	2.22	5.00
				σ	1.05	1.02	-3.04	5.00
				1g SAR	10.80	10.72	-0.74	5.00
				10g SAR	6.96	7.04	1.15	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829	ϵ_r	56.61
			σ	0.96
20525	Middle	836.5	ϵ_r	56.54
			σ	0.96
20600	High	844	ϵ_r	56.47
			σ	0.96
Channel Number	Channel Description	Frequency (MHz)	Parameters	
20407	Low	824.7	ϵ_r	56.66
			σ	0.95
20525	Middle	836.5	ϵ_r	56.57
			σ	0.96
20643	High	848.3	ϵ_r	56.43
			σ	0.96

Date: 24/11/2012
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	22.0 °C	ϵ_r	55.00	55.23	0.43	5.00
				σ	1.05	1.03	-1.79	5.00
				1g SAR	10.80	10.80	0.00	5.00
				10g SAR	6.96	7.04	1.15	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
20450	Low	829	ϵ_r	55.59
			σ	0.97
20525	Middle	836.5	ϵ_r	55.62
			σ	0.98
20600	High	844	ϵ_r	55.55
			σ	0.98

System Check 850/900 Body (Continued):
Date: 05/11/2012
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	22.3 °C	ϵ_r	55.00	52.77	-4.06	5.00
				σ	1.05	1.04	-1.32	5.00
				1g SAR	10.80	11.08	2.59	5.00
				10g SAR	6.96	7.20	3.45	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters
128	Low	824.2	ϵ_r 53.10
			σ 0.98
190	Middle	836.6	ϵ_r 53.10
			σ 0.99
251	High	848.8	ϵ_r 53.00
			σ 1.00

Date: 09/01/2013
Validation Dipole and Serial Number: D900V2; SN: 035

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	24.0 °C	23.3°C	ϵ_r	55.00	52.73	-4.13	5.00
				σ	1.05	1.04	-0.95	5.00
				1g SAR	10.80	11.16	3.33	5.00
				10g SAR	6.96	7.24	4.02	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters
20450	Low	829	ϵ_r 53.00
			σ 1.00
20525	Middle	836.5	ϵ_r 53.00
			σ 1.00
20600	High	844	ϵ_r 53.00
			σ 1.00
Channel Number	Channel Description	Frequency (MHz)	Parameters
20407	Low	824.7	ϵ_r 53.00
			σ 0.99
20525	Middle	836.5	ϵ_r 53.00
			σ 1.00
20643	High	848.3	ϵ_r 52.90
			σ 1.01

System Check 1900 Head

Date: 06/12/2012

Validation Dipole and Serial Number: D1900V2; SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1900	24.0 °C	24.0 °C	ϵ_r	40.00	39.49	-1.29	5.00
				σ	1.40	1.40	0.35	5.00
				1g SAR	40.30	40.80	1.24	5.00
				10g SAR	21.00	20.88	-0.57	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
512	Low	1850.2	ϵ_r	39.6
			σ	1.37
661	Middle	1880	ϵ_r	39.5
			σ	1.39
810	High	1909.8	ϵ_r	39.5
			σ	1.42

System Check 1900 Body

Date: 05/12/2012

Validation Dipole and Serial Number: D1900V2; SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0 °C	23.0 °C	ϵ_r	53.30	52.08	-2.29	5.00
				σ	1.52	1.52	0.30	5.00
				1g SAR	40.70	40.40	-0.74	5.00
				10g SAR	21.60	20.96	-2.96	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
512	Low	1850.2	ϵ_r	52.1
			σ	1.48
661	Middle	1880	ϵ_r	52.1
			σ	1.51
810	High	1909.8	ϵ_r	52.1
			σ	1.54

Date: 06/12/2012

Validation Dipole and Serial Number: D1900V2; SN: 540

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0 °C	23.0 °C	ϵ_r	53.30	52.08	-2.29	5.00
				σ	1.52	1.52	0.30	5.00
				1g SAR	40.70	40.40	-0.74	5.00
				10g SAR	21.60	20.96	-2.96	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
512	Low	1850.2	ϵ_r	52.1
			σ	1.48
661	Middle	1880	ϵ_r	52.1
			σ	1.51
810	High	1909.8	ϵ_r	52.1
			σ	1.54

System Check 2450 Head

Date: 21/11/2012

Validation Dipole and Serial Number: D2450V2; SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	2450	24.0 °C	22.7 °C	ϵ_r	39.20	38.80	-1.03	5.00
				σ	1.80	1.87	3.63	5.00
				1g SAR	52.90	54.40	2.84	5.00
				10g SAR	24.70	24.68	-0.08	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
1	Low	2412	ϵ_r	39.10
			σ	1.86
6	Middle	2437	ϵ_r	38.90
			σ	1.86
11	High	2463	ϵ_r	38.70
			σ	1.89

System Check 2450 Body

Date: 21/11/2012

Validation Dipole and Serial Number: D2450V2; SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0 °C	24.0 °C	ϵ_r	52.70	50.74	-3.73	5.00
				σ	1.95	2.03	4.16	5.00
				1g SAR	51.90	53.60	3.28	5.00
				10g SAR	24.10	24.48	1.58	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
1	Low	2412	ϵ_r	51.00
			σ	2.03
6	Middle	2437	ϵ_r	50.80
			σ	2.03
11	High	2463	ϵ_r	50.70
			σ	2.06

Date: 22/11/2012

Validation Dipole and Serial Number: D2450V2; SN: 725

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0 °C	24.0 °C	ϵ_r	52.70	50.74	-3.73	5.00
				σ	1.95	2.03	4.16	5.00
				1g SAR	51.90	53.20	2.50	5.00
				10g SAR	24.10	24.12	0.08	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
1	Low	2412	ϵ_r	51.00
			σ	2.03
6	Middle	2437	ϵ_r	50.80
			σ	2.03
11	High	2463	ϵ_r	50.70
			σ	2.06

System Check 5200/5500/5800 Head

Date: 26/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5200	24.0 °C	24.0 °C	ϵ_r	36.00	34.89	-3.08	10.00
				σ	4.66	4.79	2.72	5.00
				1g SAR	78.60	79.30	0.89	5.00
				10g SAR	22.50	22.80	1.33	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
36	Middle	5180	ϵ_r	34.9
			σ	4.77
64	Middle	5320	ϵ_r	34.7
			σ	4.93

Date: 27/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5200	24.0 °C	24.0 °C	ϵ_r	36.00	34.89	-3.08	10.00
				σ	4.66	4.79	2.72	5.00
				1g SAR	78.60	82.20	4.58	5.00
				10g SAR	22.50	23.30	3.56	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
38	Middle	5190	ϵ_r	34.9
			σ	4.78
54	Middle	5270	ϵ_r	34.8
			σ	4.88

System Check 5200/5500/5800 Head (Continued):

Date: 27/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5500	24.0 °C	24.0 °C	ϵ_r	35.60	34.24	-3.82	10.00
				σ	4.96	5.14	3.71	5.00
				1g SAR	84.50	88.40	4.62	5.00
				10g SAR	24.20	24.90	2.89	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
104	Middle	5520	ϵ_r	34.3
			σ	5.16
126	Middle	5630	ϵ_r	34.1
			σ	5.28
149	Middle	5745	ϵ_r	33.9
			σ	5.42
159	Middle	5795	ϵ_r	33.8
			σ	5.48

Date: 27/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	5800	24.0 °C	24.0 °C	ϵ_r	35.30	33.74	-4.41	10.00
				σ	5.27	5.48	4.07	5.00
				1g SAR	78.10	78.20	0.13	5.00
				10g SAR	22.30	21.80	-2.24	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
149	Middle	5745	ϵ_r	33.9
			σ	5.42
159	Middle	5795	ϵ_r	33.8
			σ	5.48

System Check 5200/5500/5800 Body (Continued):

Date: 28/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	5200	24.0 °C	24.0 °C	ϵ_r	49.00	48.35	-1.32	10.00
				σ	5.30	5.36	1.22	5.00
				1g SAR	76.70	73.70	-3.91	5.00
				10g SAR	21.20	21.00	-0.94	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
36	Middle	5180	ϵ_r	48.5
			σ	5.35
38	Middle	5190	ϵ_r	48.4
			σ	5.36

Date: 29/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	5200	24.0 °C	24.0 °C	ϵ_r	49.00	48.35	-1.32	10.00
				σ	5.30	5.36	1.22	5.00
				1g SAR	76.70	73.80	-3.78	5.00
				10g SAR	21.20	20.90	-1.42	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
54	Middle	5270	ϵ_r	48.2
			σ	5.46
64	Middle	5320	ϵ_r	48.1
			σ	5.52

System Check 5200/5500/5800 Body (Continued):

Date: 29/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	5500	24.0 °C	24.0 °C	ϵ_r	48.60	47.44	-2.38	10.00
				σ	5.65	5.81	2.77	5.00
				1g SAR	82.80	83.60	-0.97	5.00
				10g SAR	22.80	23.30	2.19	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
126	Low	5630	ϵ_r	47.4
			σ	5.97
159	Middle	5795	ϵ_r	47.0
			σ	6.25

Date: 29/11/2012

Validation Dipole and Serial Number: D5GHzV2; SN: 1016

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	5800	24.0 °C	24.0 °C	ϵ_r	48.20	47.04	-2.40	10.00
				σ	6.00	6.26	4.27	5.00
				1g SAR	71.70	68.60	-4.32	5.00
				10g SAR	19.70	19.20	-2.54	5.00

Dielectrics for Frequencies Tested

Channel Number	Channel Description	Frequency (MHz)	Parameters	
126	Low	5630	ϵ_r	47.4
			σ	5.97
159	Middle	5795	ϵ_r	47.0
			σ	6.25

Appendix 6. Simulated Tissues

The body mixture consists of water, Polysorbate (Tween 20) and salt. Visual inspection is made to ensure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the tissue.

Ingredient (% by weight)	Frequency
	750/835/850/900 MHz Head
De-Ionized Water	52.87
Polysorbate 20	46.10
Salt	1.03

Ingredient (% by weight)	Frequency
	750/835/850/900 MHz Body
De-Ionized Water	71.30
Polysorbate 20	28.00
Salt	0.70

Ingredient (% by weight)	Frequency
	1800/1900 MHz Head
De-Ionized Water	55.40
Polysorbate 20	44.22
Salt	0.38

Ingredient (% by weight)	Frequency
	1800/1900 MHz Body
De-Ionized Water	71.50
Polysorbate 20	28.00
Salt	0.50

Ingredient (% by weight)	Frequency
	2450 MHz Head
De-Ionized Water	55.75 ¹
Polysorbate 20	45.25 ¹

Ingredient (% by weight)	Frequency
	2450 MHz Body
De-Ionized Water	71.70
Polysorbate 20	28.00
Salt	0.30

Simulated Tissues (Continued)

Stimulating Liquid for 3700 MHz to 5800 MHz are supplied and manufactured by SPEAG

Ingredient (% by weight)	Frequency
	3700 - 5800 MHz Head / Body
De-Ionized Water	~78.00
Mineral Oil	~11.00
Emulsifiers	~9.00
Additives and Salt	~2.00

Note(s):

1. As per the recipe provided by National Physical Laboratory, the 2450 MHz Head Fluid recipe is mixed to the total percentage of weight is by 101.0 %.

Appendix 7. DASY4 SAR Measurement System

A.7.1. DASY4 SAR Measurement System

UL Global Services Ltd, SAR measurement facility utilises the Dosimetric Assessment System (DASY™) manufactured by Schmid & Partner Engineering AG (SPEAG™) of Zurich, Switzerland. The DASY4 system is coPower Back offised of the robot controller, computer, near-field probe, probe alignment sensor, and the SAM phantom containing brain or muscle equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF). A cell controller system contains the power supply, robot controller; teach pendant (Joystick), and remote control. This is used to drive the robot motors. The Staubli robot is connected to the cell controller to allow software manipulation of the robot. The data acquisition electronics (DAE) performs signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection etc. The DAE is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card. The DAE3 utilises a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching mulitplexer, a fast 16-bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe-mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer.

A.7.2. DASY4 SAR System Specifications

Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of Axis:	6
Serial Number:	F00/SD89A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+

Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: RX90L
Repeatability:	0.025 mm
No. of Axis:	6
Serial Number:	F01/5J86A1/A/01
Reach:	1185 mm
Payload:	3.5 kg
Control Unit:	CS7
Programming Language:	V+

Robot System

Positioner:	Stäubli Unimation Corp. Robot Model: TX60L
Repeatability:	±0.030 mm
No. of Axis:	6
Serial Number:	F12/5MZ7A1/A/01
Reach:	920 mm
Payload:	2.0 kg
Control Unit:	CS8C
Programming Language:	V+

Data Acquisition Electronic (DAE) System

Serial Number:	DAE3 SN:394
Serial Number:	DAE3 SN:432
Serial Number:	DAE3 SN:431

DASY4 SAR System Specifications (Continued)	
PC Controller	
PC:	Dell Precision 340
Operating System:	Windows 2000
Data Card:	DASY4 Measurement Server
Serial Number:	1080
Data Converter	
Features:	Signal Amplifier, multiplexer, A/D converted and control logic.
Software:	DASY4 Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.
PC Interface Card	
Function:	24 bit (64 MHz) DSP for real time processing Link to DAE3 16 nit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.

DASY4 SAR System Specifications (Continued)

E-Field Probe

Model:	EX3DV4
Serial No:	3814
Construction:	Triangular core
Frequency:	10 MHz to >6 GHz
Linearity:	±0.2 dB (30 MHz to 6 GHz)
Probe Length (mm):	330
Probe Diameter (mm):	12
Tip Length (mm):	20
Tip Diameter (mm):	2.5
Sensor X Offset (mm):	1
Sensor Y Offset (mm):	1
Sensor Z Offset (mm):	1

E-Field Probe

Model:	ES3DV3
Serial No:	3304
Construction:	Triangular core
Frequency:	10 MHz to >4 GHz
Linearity:	±0.2 dB (30 MHz to 4 GHz)
Probe Length (mm):	337
Probe Diameter (mm):	10
Tip Length (mm):	10
Tip Diameter (mm):	4
Sensor X Offset (mm):	2
Sensor Y Offset (mm):	2
Sensor Z Offset (mm):	2

DASY4 SAR System Specifications (Continued)	
E-Field Probe	
Model:	ET3DV6
Serial No:	1528
Construction:	Triangular core
Frequency:	10 MHz to 2.55GHz
Linearity:	±0.2 dB (30 MHz to 2.55GHz)
Probe Length (mm):	337
Probe Diameter (mm):	10
Tip Length (mm):	10
Tip Diameter (mm):	6.8
Sensor X Offset (mm):	2.7
Sensor Y Offset (mm):	2.7
Sensor Z Offset (mm):	2.7
E-Field Probe	
Model:	ET3DV6
Serial No:	1587
Construction:	Triangular core
Frequency:	10 MHz to 2.55GHz
Linearity:	±0.2 dB (30 MHz to 2.55GHz)
Probe Length (mm):	337
Probe Diameter (mm):	10
Tip Length (mm):	10
Tip Diameter (mm):	6.8
Sensor X Offset (mm):	2.7
Sensor Y Offset (mm):	2.7
Sensor Z Offset (mm):	2.7
Phantom	
Phantom:	SAM Phantom, Eli Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

Appendix 8. 3G Test set-up

3G (12.K RMC / HSDPA / HSUPA) setup

To switch from 2G to 3G, on the system config screen choose Format Switch and select WCDMA. The Call Setup Screen as shown in figure 1 pops up.

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Parms	
Operating Mode	UE Information				Cell Power	
Active Cell	INSI: INEI(SU): (--) Power Class:				-35.00 dBm/3.84 MHz	
	UE Expected Open Loop Transmit Power				Channel Type	
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm				12.2k RMC	
Originate Call	Call Processing Status				Paging Service	
	Current Service Type: None MN Status: None GMM State: None Current DPCH Offset: 0 chips				RB Test Mode	
Paging Parameters	HSUPA Information				HSPA Parameters	
	Rep EDCH Cat/Ext: Unrep/Unrep Last received E-TFCI: ---- Throughput: ---- kbps Acks Transmitted: ----		HSDPA Information Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----		34,121 Preset Call Configs	
Handovers	Active Cell				Channel (UARFCN) Parms	
	Idle				Sys Type: UTRA FDD	
Clear UE Info	IntRef				1 of 3	
1 of 5						

Figure 1: 3G Call Setup Screen

For a 12.2k RMC call follow the steps below.

8.1. Steps for 12.2k RMC

1. Ensure that the Operating Mode of the cell is off before setting up the instrument.
2. On the Call Setup Screen, under Call Parameters, press the button against Cell Power. The Cell Power value is set to about -35dBm to account for all the losses and ensure sufficient signal strength to the EUT.
3. The Channel Type is selected to 12.2k RMC. Press button against Channel (UARFCN) Parms select the correct Downlink Channel for the required UMTS FDD Band.
4. On the Call Setup Screen, under Call Parameters, press the button against HSPA Parameters. Under HSDPA Parameters on page 1, press HSDPA Uplink parameters and set the Delta ACK, Delta NACK, Delta CQI values to 8. Under HSDPA Parms itself, press HSDPA RB Test Mode Setup button and then the HSDPA RB Test Mode Settings and change HS-DSCH Data Pattern to All Ones.

Call Setup Screen										
Call Control	Active Cell Operating Mode						HSDPA Parms			
Close Menu	UE Information						HSDPA RB Test Node Setup	UE Category Parameters	HSDPA Uplink Parameters	Value
	IMSI: IMEI(SV): (---) Power Class:									
	UE Expected Open Loop Transmit Power						HSDPA Uplink Parameters	Value	Return	1 of 2
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm									
	DeltaACK						8	HSDPA Uplink Parameters	Return	1 of 2
	DeltaNACK						8			
	DeltaCQI						8	HSDPA Uplink Parameters	Return	1 of 2
	Ack-Nack Repetition Factor						1			
	CQI Feedback Cycle (k)						2 ms	HSDPA Uplink Parameters	Return	1 of 2
	CQI Repetition Factor						1			
Active Cell						Sys Type: UTRA FDD		Return	1 of 2	
Idle										
IntRef								Return	1 of 2	

Figure 2: HSDPA Parameters

- On the Call Setup Screen, under Call Parameters, on page 2, check if the DL DTCH Data is set to All Ones. On page 3, ensure that the Receiver is set to Manual. On page 3 itself, under UL CL Power Ctrl Parameters, UL CL Power Ctrl Mode is set to All Up Bits.

Call Setup Screen										
Call Control	Active Cell Operating Mode						Call Parms			
Operating Mode	UE Information						DL DTCH Data			
Active Cell	IMSI: IMEI(SV): (---) Power Class:						All Ones			
Originate Call	UE Expected Open Loop Transmit Power						RLC Reestablish	Auto	Call Limit State	Off
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm									
Paging Parameters	Call Processing Status						Call Drop Timer	On	SRB Parameters	2 of 3
	Current Service Type: None IMI Status: None GMM State: None Current DPCCH Offset: 0 chips									
Handovers	HSUPA Information			HSDPA Information			SRB Parameters	2 of 3	2 of 3	
	Rep EDCH Cat/Ext: Unrep/Unrep Last received E-TFCI: ---- Throughput: ---- kbps Acks Transmitted: ----			Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----						
Clear UE Info	Active Cell						Sys Type: UTRA FDD		Return	2 of 3
Idle										
IntRef								Return	2 of 3	

Figure 3: DL DTCH Data Parms

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Params	
Close Menu	UE Information				UE Target Power	
	INSI: IMEI(SU): (--) Power Class:				-5 dBm	
	UE Expected Open Loop Transmit Power				UL CL Power Ctrl Parameters	
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm					
	UL CL Power Ctrl Parameters			Value		
	UL CL Power Ctrl Mode			All Up bits		Send Step Up TPC Bit Pattern
	UL CL Power Ctrl Algorithm			Two		
	UL CL Power Ctrl Stepsize			1 dB		Send Step Down TPC Bit Pattern
						Receiver Control
		Active Cell Idle		Sys Type: UTRA FDD		
		IntRef				
				3 of 3		

Figure 4: UL CL Power Ctrl Parameters

- On the Call Setup Screen, under Call Control, page 2, Cell Parameters, it is ensured that PS Domain information is kept as Absent for RMC.

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Params	
Additional Screens	UE Information				Cell Power	
Cell Parameters	INSI: IMEI(SU): (--) Power Class:				-35.00	
	UE Expected Open Loop Transmit Power				dBm/3.84 MHz	
Generator Info	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm				Channel Type	
					12.2k RMC	
Uplink Parameters	Cell Parameters			Value		Paging Service
	BCCH Update Page			Inhibit		RB Test Mode
	PS Domain Information			Absent		HSPA Parameters
	MCC (Mobile Country Code)			1		
	MNC (Mobile Network Code)			1		34,121 Preset Call Configs
	MNC (Mobile Network Code) Length			Auto		
	LAC (Local Area Code)			1		
Close Menu	RAC (Routing Area Code)			1		Channel (UARFCN) Params
	Cell Identity			1		
		Active Cell Idle		Sys Type: UTRA FDD		
		IntRef				
2 of 5				1 of 3		

Figure 5: Cell Parameters

- On the same page under Uplink Parameters the maximum Uplink Transmit Power is made 24dBm. Uplink DPCH Bc/Bd Control Settings are kept at Auto for RMC. These vary according for HSDPA and HSPA as per the values given in KDB 941225 D01 SAR test for 3G devices v02.

Call Setup Screen																								
Call Control	Active Cell Operating Mode				Call Parm																			
Additional Screens	<table border="1"> <thead> <tr> <th colspan="2">UE Information</th> </tr> </thead> <tbody> <tr> <td>INSI:</td> <td></td> </tr> <tr> <td>INEI(SU):</td> <td>(--)</td> </tr> <tr> <td>Power Class:</td> <td></td> </tr> </tbody> </table>				UE Information		INSI:		INEI(SU):	(--)	Power Class:		Cell Power	-35.00										
	UE Information																							
INSI:																								
INEI(SU):	(--)																							
Power Class:																								
Cell Parameters	<table border="1"> <thead> <tr> <th colspan="2">UE Expected Open Loop Transmit Power</th> </tr> </thead> <tbody> <tr> <td>Initial PRACH TX Power:</td> <td>-60.00 dBm</td> </tr> <tr> <td>Initial DPCCH TX Power:</td> <td>-11.55 dBm</td> </tr> </tbody> </table>				UE Expected Open Loop Transmit Power		Initial PRACH TX Power:	-60.00 dBm	Initial DPCCH TX Power:	-11.55 dBm	dBm/3.84 MHz													
	UE Expected Open Loop Transmit Power																							
Initial PRACH TX Power:	-60.00 dBm																							
Initial DPCCH TX Power:	-11.55 dBm																							
Generator Info	<table border="1"> <thead> <tr> <th>Uplink Parameters</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>PRACH Preambles</td> <td>64</td> </tr> <tr> <td>PRACH Ramping Cycles(MMAX)</td> <td>2</td> </tr> <tr> <td>Available Subchannels (Bit Mask)</td> <td>000000000001</td> </tr> <tr> <td>Uplink DPCCH Scrambling Code</td> <td>0</td> </tr> <tr> <td>Uplink DPCCH Bc/Bd Control</td> <td>Auto</td> </tr> <tr> <td>Manual Uplink DPCCH Bc</td> <td>8</td> </tr> <tr> <td>Manual Uplink DPCCH Bd</td> <td>15</td> </tr> <tr> <td>Maximum Uplink Transmit Power Level</td> <td>24 dBm</td> </tr> </tbody> </table>				Uplink Parameters	Value	PRACH Preambles	64	PRACH Ramping Cycles(MMAX)	2	Available Subchannels (Bit Mask)	000000000001	Uplink DPCCH Scrambling Code	0	Uplink DPCCH Bc/Bd Control	Auto	Manual Uplink DPCCH Bc	8	Manual Uplink DPCCH Bd	15	Maximum Uplink Transmit Power Level	24 dBm	Channel Type	12.2k RNC
	Uplink Parameters	Value																						
PRACH Preambles	64																							
PRACH Ramping Cycles(MMAX)	2																							
Available Subchannels (Bit Mask)	000000000001																							
Uplink DPCCH Scrambling Code	0																							
Uplink DPCCH Bc/Bd Control	Auto																							
Manual Uplink DPCCH Bc	8																							
Manual Uplink DPCCH Bd	15																							
Maximum Uplink Transmit Power Level	24 dBm																							
Uplink Parameters					Paging Service	RB Test Mode																		
					HSPA Parameters																			
UE Rep Mes					34,121 Preset Call Configs	Channel (UARFCN) Parm																		
Close Menu					<table border="1"> <tr> <td>Active Cell</td> <td>Idle</td> <td>Sys Type: UTRA FDD</td> </tr> </table>		Active Cell	Idle	Sys Type: UTRA FDD															
	Active Cell	Idle	Sys Type: UTRA FDD																					
2 of 5	<table border="1"> <tr> <td>IntRef</td> <td></td> <td></td> <td></td> </tr> </table>				IntRef				1 of 3															
IntRef																								

Figure 6: Uplink Parameters

- On page 3 under Call Control, for the RB Test Mode setup, Asymmetric RMC CN Domain is ensured to be in CS Domain for RMC call.

Call Setup Screen																		
Call Control	Active Cell Operating Mode				Call Parm													
	<table border="1"> <thead> <tr> <th colspan="2">UE Information</th> </tr> </thead> <tbody> <tr> <td>INSI:</td> <td></td> </tr> <tr> <td>INEI(SU):</td> <td>(--)</td> </tr> <tr> <td>Power Class:</td> <td></td> </tr> </tbody> </table>				UE Information		INSI:		INEI(SU):	(--)	Power Class:		Cell Power	-35.00				
	UE Information																	
INSI:																		
INEI(SU):	(--)																	
Power Class:																		
	<table border="1"> <thead> <tr> <th colspan="2">UE Expected Open Loop Transmit Power</th> </tr> </thead> <tbody> <tr> <td>Initial PRACH TX Power:</td> <td>-60.00 dBm</td> </tr> <tr> <td>Initial DPCCH TX Power:</td> <td>-11.55 dBm</td> </tr> </tbody> </table>				UE Expected Open Loop Transmit Power		Initial PRACH TX Power:	-60.00 dBm	Initial DPCCH TX Power:	-11.55 dBm	dBm/3.84 MHz							
	UE Expected Open Loop Transmit Power																	
Initial PRACH TX Power:	-60.00 dBm																	
Initial DPCCH TX Power:	-11.55 dBm																	
	<table border="1"> <thead> <tr> <th>RB Test Mode Settings</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Uplink DTCH RNC CRC Presence</td> <td>Present</td> </tr> <tr> <td>Uplink Dummy DCCH Data</td> <td>Off</td> </tr> <tr> <td>UE Loopback Type</td> <td>Type 1</td> </tr> <tr> <td>Asymmetric RNC Loopback Messaging</td> <td>Close/Open</td> </tr> <tr> <td>Asymmetric RNC CN Domain</td> <td>CS Domain</td> </tr> </tbody> </table>				RB Test Mode Settings	Value	Uplink DTCH RNC CRC Presence	Present	Uplink Dummy DCCH Data	Off	UE Loopback Type	Type 1	Asymmetric RNC Loopback Messaging	Close/Open	Asymmetric RNC CN Domain	CS Domain	Channel Type	12.2k RNC
	RB Test Mode Settings	Value																
Uplink DTCH RNC CRC Presence	Present																	
Uplink Dummy DCCH Data	Off																	
UE Loopback Type	Type 1																	
Asymmetric RNC Loopback Messaging	Close/Open																	
Asymmetric RNC CN Domain	CS Domain																	
Voice Call					Paging Service	RB Test Mode												
					HSPA Parameters													
Close Menu					34,121 Preset Call Configs	Channel (UARFCN) Parm												
					<table border="1"> <tr> <td>Active Cell</td> <td>Idle</td> <td>Sys Type: UTRA FDD</td> </tr> </table>		Active Cell	Idle	Sys Type: UTRA FDD									
	Active Cell	Idle	Sys Type: UTRA FDD															
3 of 5	<table border="1"> <tr> <td>IntRef</td> <td></td> <td></td> <td></td> </tr> </table>				IntRef				1 of 3									
IntRef																		

Figure 7: RB Test Mode Settings

- After the test set has been set up, change the cell Operating Mode to Active Cell and originate a call.

8.2. Steps for 12.2k RMC + HSDPA/HSPA

1. Most of the steps to be followed are as in the case of 12.2k RMC however, some of the settings need to be changed. The Channel Type is changed to 12.2k RMC+HSDPA or 12.2k RMC+HSPA as required.
2. For HSDPA and HSPA, the settings remain same as the case for RMC but the PS Domain is made Present for Cell Parameters (Figure 5) and RB Test Mode Setup (Figure 7).
3. The following tables taken from FCC 3G SAR procedures (KDB 941225 D01 SAR test for 3G devices v02) below were applied to the Agilent 8960 series 10 wireless communications test set which supports 3G / HSDPA release 5 / HSPA release 6.

Sub-test 1 Setup for Release 5 HSDPA

Sub-test	β_c	β_d	B_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	SM (dB) ⁽²⁾
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 ⁽³⁾	15/15 ⁽³⁾	64	12/15 ⁽³⁾	24/15	1.0
3	15/15	8/15	64	15/8	30/15	1.5
4	15/15	4/15	64	15/4	30/15	1.5

Note 1: Δ_{ACK} , Δ_{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 $\beta_c/\beta_d = 12/15$, $B_{hs}/\beta_c = 24/15$

Note 3: 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 $\beta_c = 11/15$ and $\beta_d = 15/15$

Sub-test 5 Setup for Release 6 HSPA

Sub-test	β_c	β_d	B_d (SF)	β_c/β_d	$\beta_{hs}^{(1)}$	B_{oc}	B_{od}	B_{od} (SF)	B_{od} (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	31/15	B_{a11} : 47/15 B_{a12} : 47/15	4	1	2.0	1.0	15	92
4	2/15	15/15	64	2/15	2/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 ⁽⁴⁾	15/15 ⁽⁴⁾	64	15/15 ⁽⁴⁾	24/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ_{ACK} , Δ_{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 $\beta_c/\beta_d = 12/15$, $B_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH, DPCCH, HS-DPCCH, E-DPDCH AND E-DPCCH for 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 $\beta_c = 10/15$ 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 signalled 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 Tavle 5.1g.

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

Call Setup Screen						
Call Control	Active Cell Operating Mode				Serving Grant	
Operating Mode	UE Information				AG Node	
Active Cell	INSI: INEI(SV): (---) Power Class:				Single Shot	
Originate Call	UE Expected Open Loop Transmit Power				Single Shot AG	
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm				21: (134/15)^2	
Paging Parameters	Call Processing Status				Send Single Shot Absolute Grant	
	Current Service Type: None MM Status: Abs Single Shot AG GSM State: Index 18: (95/15)^2 Current DPCH: Index 19: (106/15)^2				RB Setup AG	
Handovers	HSUPA Information				AG Pattern Parameters	
	Rep EDCH Cat: Index 20: (119/15)^2 Last received: Index 21: (134/15)^2 Throughput: Index 22: (150/15)^2 Acks Transmitted: Index 23: (168/15)^2				33: 4(134/15)^2	
Clear UE Info	Active Cell Idle				Return	
1 of 5	Sys Type: UTRA FDD				1 of 2	

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Parms	
Additional Screens	UE Information				Cell Power	
Cell Parameters	INSI: INEI(SV): (---) Power Class:				-35.00	
	UE Expected Open Loop Transmit Power				dBm/3.84 MHz	
Generator Info	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -22.58 dBm				Channel Type	
	Uplink Parameters				12.2k + HSDPA	
Uplink Parameters	Value				Paging Service	
	PRACH Preambles: 64				RB Test Mode	
UE Rep Params	PRACH Ramping Cycles(MMAX): 2				HSPA Parameters	
	Available Subchannels (Bit Mask): 000000000001				34,121 Preset Call Configs	
Close Menu	Uplink DPCH Scrambling Code: 0				Channel (UARFCH) Parms	
	Uplink DPCH Bc/Bd Control: Manual				1 of 3	
2 of 5	Manual Uplink DPCH Bc: 2					
	Manual Uplink DPCH Bd: 15					
	Maximum Uplink Transmit Power Level: 24 dBm					
	Cell Off				Sys Type: UTRA FDD	

- For HSPA the Serving Grant Parameter needs to be set. On the Call Setup Screen, under Call Parameters, press the button against HSPA Parameters. On the new screen that pops up, press HSUPA and Serving Grant. The Serving Grant is set according to the table for HSPA in the KDB (AG Index). The correct AG is chosen from the Single Shot AG. Consecutively, the RG Setup AG is set as per the ratio set on Single Shot AG.

Call Setup Screen						
Call Control	Active Cell Operating Mode				Serving Grant	
Operating Mode	UE Information				AG Mode	
Active Cell	INSI: INEI(SU): (--) Power Class:				Single Shot	
Originate Call	UE Expected Open Loop Transmit Power				Single Shot AG	
	Initial PRACH TX Power: -60.00 dBm Initial DPCH TX Power: -11.55 dBm				31: 6(168/15)^2	
Paging Parameters	Call Processing Status				Send Single Shot Absolute Grant	
	Current Service Type: None IM Status: None GMM State: None Current DPCH Offset: 0 chips				RB Setup AG	
Handovers	HSUPA Information		HSDPA Information		AG Pattern Parameters	
	Rep EDCH Cat/Ext: Unrep/Unrep Last received E-TFCI: ---- Throughput: ---- kbps Acks Transmitted: ----		Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----		37: 6(168/15)^2	
Clear UE Info	Active Cell				Return	
	Idle				Sys Type: UTRA FDD	
1 of 5	IntRef				1 of 2	

Figure 8: Serving Grant Example

Appendix 9. CAT24 Test set-up

A.9.1. Establish a DC-HSDPA RB Test Mode Connection with DL 42Mbps

RB (radio bearer) test mode is a special, defined-channel configuration designed to simplify the testing environment. Since W-CDMA is an incredibly flexible system, defined radio bearers, called RMCs (reference measurement channels) simplify which configurations need to be tested for RF performance.

RB test mode provides the ability to set up a standalone channel configuration originating from the 8960 via call-processing. The direction of the call setup is always from the 8960 to the UE. This is the typical RF test that is used throughout the lifecycle of a device's design process. Using RB test mode is attractive to device manufacturers because it does not require extra software to control the UE. In this type of call connection, the radio bearer (within the 8960) essentially controls the UE during test.

A.9.1.1 Configure 8960

1. Press **Operating Mode (F1)**, select **Cell Off** operating mode.

Call Setup Screen			
Call Control	Active Cell Operating Mode		Call Parm
Operating Mode	UE Information		Cell Power
Cell Off	IMSI:	Power Class:	-75.00
	IMEI(SV):	Detected PRACH Sig: ----	dBm/3.84 MHz
	Called Party Number:		Channel Type
	UE Expected Open Loop Transmit Power		12.2k RMC
	Init PRACH TX Pou: -22.70 dBm	Init DPCCH TX Pou: -11.55 dBm	Paging Service
Originate Call	Current Service Type		RB Test Mode
	None		
Paging Parameters	Call Processing Status		HSPA Parameters
	RRC State:	Operating Mode	Power State: Off
	IM Status:	Active Cell	Mode State: Off
	GM State:	FDD Test	Offset: 0 chips
Handovers	HSUPA In CU		34.121 Preset Call Configs
	UE Rep E-DCH	Cell Off	DSCH Cat: 14
	Last Happy Bit		Ratio: ---- %
Clear UE Info	Throughput:		---- kbps
	ACKs Transmitt		Transmitted: ----
	Background	Cell Off	Sys Type: UTRA FDD
			Logging: No Conn
1 of 5		IntRef Offset	1 of 3

2. Set the **Channel type** to **12.2k + HSDPA**.
3. Set the downlink channel code. In order to achieve the 42 Mbps maximum downlink throughput, you have to set up 15 HS-PDSCHs which will possibly cause a code collision. To easily configure the downlink 15 HS-PDSCH for a maximum throughput, use the code preset to configure the code channels for both the serving cell and the secondary serving cell. Select **Call Control 2 of 6 -> Generator Info (F3) -> Downlink Channel Configs (F4) -> DL Channel Code Preset Configs (F5)**, choose **34.121 Tables E.6.2.3,4 (HSDPA 15 HS-PDSCHs)**. Set the **Conn S-CCPCH Cfg** to **Off** to avoid the code collision. To see the channel code allocation for the serving cell and the secondary serving cell, select **Additional Gen Info Screens (F1) -> DC-HSDPA DL Code Chan Info (F4)**.

Call Setup Screen										
Screen Ctrl	DC-HSDPA DL Code Channel Information								Call Parm	
DL Code Channel Info Screen	Serving Cell Primary Scrambling Code: 0								Cell Power	
	Secondary Serving Cell Primary Scrambling Code: 2								-75.00	
Generated Power Info Screen	Channel				Serving Cell DL Chan Info			Sec Cell DL Chan Info		
	Channel	Level (dB)		Chan Code	Level (dB)		Chan Code	Level (dB)		Chan Code
OCNS Info Screen	CPICH:	Off	-3.30	256	0	Off	Off	256	0	Channel Type 12.2k + HSDPA
	P-CCPCH/SCH:	Off	-5.30	256	1	Off	Off	256	1	
DC-HSDPA DL Code Chan Info	S-CCPCH:	Off	-10.30	64	2	Off	Off	256	2	Paging Service RB Test Mode
	PICH:	Off	-8.30	256	2					
Return	AICH:	Off	-9.90	256	3	Off	Off	256	2	HSPA Parameters
	(F-)DPCH:	Off	Off	128	7					
Return	E-RGCH:	Off	Off	256	42	Off	Off	128	2	34.121 Preset Call Configs
	E-HICH:	Off	Off	128	22					
Return	E-RGCH:	Off	Off	128	22	Off	Off	128	3	Channel (UARFCN) Parm
	HS-SCCH 1:	Off	Off	128	2					
Return	HS-SCCH 2:	Off	Off	128	3	Off	Off	128	3	1 of 3
	HS-SCCH 3:	Off	Off	128	2					
Return	HS-SCCH 4:	Off	Off	128	3	Off	Off	16	1-15	Cell Off
	HS-PDSCHs:	Off	Off	16	1-15					
Return	Comp OCNS:	Off	Off	128	WCDMA	Off	Off	128	HSDPA	Sys Type: UTRA FDD
		DBUS-INT		IntRef	Offset					

4. Configure DC-HSDPA parameters to achieve the Maximum Downlink Data Rate:
First of all, you must know the maximum data rate of the device under test according to its category and the key factors to achieve the maximum data rate. In this lab, you use a category 24 device whose maximum data rate is 42 Mbps when DC-HSDPA is configured.
a) Set up the HSDPA RB Test Mode Parameters

Path: Call Parm 1 of 3 -> HSPA Parameters (F10) -> HSDPA Parameters (F10) -> HSDPA RB Test Mode Setup (F8) -> HSDPA RB Test Mode Settings (F8).

- RB Test HS-DSCH Configuration Type = User Defined
- RB Test User Defined HS-DSCH MAC entity = MAC-ehs (Note 1)
- RB Test User Defined HARQ Processes = 6 (Note 2)
- RB Test User Defined UE IR Buffer Allocation = Implicit
- RB Test User Defined DC-HSDPA State = On
- RB Test Mode DC-HSDPA DPCH Loopback State = On

Note 1: DC-HSDPA requires MAC-ehs. You must set the MAC entity to MAC-ehs before setting the DC-HSDPA state)

Note 2: To restrict the amount of soft memory that can be allocated to a single HARQ process (and thus limit the amount of data that has to be transferred across the UE's internal data buses) the specifications require that when setting up a DC-HSDPA call with the implicit HARQ memory partitioning the network must configure 6, 7, or 8 HARQ processes per cell. For the explicit HARQ memory partitioning case, the number of HARQ processes can be 1 through 8, but the memory size for each HARQ process cannot be greater than the number of soft channel bits for an implicit memory partitioning with 6 processes per HS-DSCH channel.

b) Set up the Serving Cell Parameters

Path: F10

- RB Test User Defined 64QAM State =On
- RB Test User Defined Active HS-PDSCHs =15
- RB Test User Def Transport Block Size Index =62
- RB Test User Defined Modulation Type =64QAM
- RB Test User Defined Inter-TTI Interval =1

c) Set up the Secondary Serving Cell Parameters

Path: **F11**

- **RB Test User Def Secondary Cell 64QAM State =On**
- **RBTM User Def Sec Cell Active HS-PDSCHs = 15**
- **RBTM User Def Sec Cell TB Size Index = 62**
- **RBTM User Def Sec Cell Modulation Type =64QAM**
- **RBTM User Def Sec Cell Inter-TTI Interval = 1**

d) Set the **Secondary Serving Cell Power (dBm/3.84 MHz) to -25 dBm/3.84 MHz**

Path: Return (**F12**) -> HSDPA Parms 2 of 2 -> Secondary Serv Cell Parms (**F10**)

e) Set the **Cell power to -25 dBm/3.84 MHz**

Path: **CALL SETUP -> F7**

f) Set the HSDPA Conn DL Channel Levels

Path: **CALL SETUP -> Call Control 2 of 6 -> Generator Info (F3) ->Downlink Channel Levels (F3) ->**

Connected DL Channel Levels (F3) -> F3

- **HSDPA Cell 1 Connected CPICH Level = -8**
- **HSDPA Cell 1 Connected P-CCPCH/SCH Level = -20**
- **HSDPA Cell 1 Connected PICH Level = off**
- **HSDPA Cell 1 Connected DPCH Level = -30**
- **HSDPA Cell 1 Connected HS-PDSCH Level (Sum) = -1 dBm**
- **HSDPA Cell 1 Connected HS-SCCH 1 to 4 Level = -20,-20,off,off**
- **Secondary Cell HSDPA Conn CPICH Level = -8**
- **Secondary Cell HSDPA Conn PCCPCH/SCH Level = -20**
- **Secondary Cell HSDPA Conn PICH Level = off**
- **Secondary Cell HSDPA Conn HS-PDSCHs Lvl (Sum) = -1 dBm**
- **Secondary Cell HSDPA Conn HS-SCCH 1 to 4 Level = -20,-20,off,off**

5. Set the **Operating Mode (F1) to Active Cell.**

A.9.1.2. Power on the UE and Set up the Connection

Power on the device, and then wait for it to camp on 8960. You should be able to see the following screen.

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Parm	
Operating Mode	UE Information				Cell Power	
Active Cell	INSI: 001012345678901 Power Class: 4 IMEI(SV):352358040214948(--) Detected PRACH Sig: 0 Called Party Number:				-25.00	
	UE Expected Open Loop Transmit Power Init PRACH TX Pou: -60.00 dBm Init DPCCH TX Pou: -11.55 dBm				dBm/3.84 MHz	
	Current Service Type				Channel Type	
Originate Call	None				12.2k + HSDPA	
	Call Processing Status				Paging Service	
Paging Parameters	RRC State: Idle Soft Handover State: Off MM Status: None Compressed Mode State: Off GMM State: Attached Cur DPCH Offset: 0 chips				RB Test Node	
	HSUPA Information		HSDPA Information		HSPA Parameters	
Handovers	Rep EDCH Cat/Ext: 6/Unrep		Cur UE HS-DSCH Cat: 24		34,121 Preset Call Configs	
	Last Happy Bit: None		Block Error Ratio: ---- %			
	Throughput: ---- kbps		Throughput: ---- kbps			
Clear UE Info	ACKs Transmitted: ----		Blocks Transmitted: ----		Channel (UARFCN) Parm	
	Active Cell			Sys Type: UTRA FDD		
	Idle			Logging: No Conn		
1 of 6	DBUS-INT	IntRef	Offset		1 of 3	

The UE reports HSDPA categories to 8960, which represents its maximum data rate capability. DC-HSDPA requires UE categories 21 to 24.

The GMM state must be **Attached**, otherwise you cannot establish a HSDPA connection.

2. Originate the Connection

a) Now, Originate an RB Test call with DC-HSDPA by pressing „F3“ from the main Call Setup screen.

b) After a connection is set up, you will be able to see the throughput from the HSDPA Information window. Press the **Measurement Reset** key to reset the calculation.

Call Setup Screen						
Call Control	Active Cell Operating Mode				Call Parm	
Operating Mode	UE Information				Cell Power	
Active Cell	INSI: 001012345678901 Power Class: 4 IMEI(SV):352358040214948(--) Detected PRACH Sig: 0 Called Party Number:				-25.00	
	UE Expected Open Loop Transmit Power Init PRACH TX Pou: -60.00 dBm Init DPCCH TX Pou: -11.55 dBm				dBm/3.84 MHz	
	Current Service Type				Channel Type	
End Call	RB Test Node - HSDPA				12.2k + HSDPA	
	Call Processing Status				Paging Service	
Paging Parameters	RRC State: CELL_DCH Soft Handover State: Off MM Status: None Compressed Mode State: Off GMM State: Attached Cur DPCH Offset: 0 chips				RB Test Node	
	HSUPA Information		HSDPA Information		HSPA Parameters	
Handovers	Rep EDCH Cat/Ext: 6/Unrep		Cur UE HS-DSCH Cat: 24		34,121 Preset Call Configs	
	Last Happy Bit: None		Block Error Ratio: 0 %			
	Throughput: ---- kbps		Throughput: 42101 kbps			
Clear UE Info	ACKs Transmitted: ----		Blocks Transmitted: 115500		Channel (UARFCN) Parm	
	Active Cell			Sys Type: UTRA FDD		
	Connected			Logging: No Conn		
1 of 6	DBUS-INT	IntRef	Offset		1 of 3	

Now you can also check the connected DC-HSDPA downlink channel levels.

Path: CALL SETUP->Call Control 2 of 6 -> Generator Info (F3) -> Additional Gen Info Screens (F1) ->DC-HSDPA DL Code Chan Info (F4).

Call Setup Screen										
Screen Ctrl	DC-HSDPA DL Code Channel Information								Call Parms	
DL Code Channel Info Screen	Serving Cell Primary Scrambling Code: 0								Cell Power	
	Secondary Serving Cell Primary Scrambling Code: 2								-25.00	
Generated Power Info Screen	Channel	Serving Cell DL Chan Info				Sec Cell DL Chan Info				dBm/3.84 MHz
	Channel	Level (dB)		Chan		Level (dB)		Chan		Channel Type
OCNS Info Screen	CPICH:	-8.00	-8.00	256	0	-8.00	-8.00	256	0	12.2k + HSDPA
	P-CCPCH/SCH:	-20.00	-20.00	256	1	-20.00	-20.00	256	1	Paging Service
DC-HSDPA DL Code Chan Info	S-CCPCH:	Off	Off	64	2					RB Test Mode
	PICH:	Off	Off	256	2	Off	Off	256	2	
Return	(F-)DPCH:	-30.00	-30.00	128	7					HSPA Parameters
	E-AGCH:	Off	Off	256	42					
	E-HICH:	Off	Off	128	22					
	E-RGCH:	Off	Off	128	22					
	HS-SCCH 1:	-20.00	-20.00	128	2	-20.00	-20.00	128	2	34,121 Preset Call Configs
	HS-SCCH 2:	-20.00	-20.00	128	3	-20.00	-20.00	128	3	
	HS-SCCH 3:									
	HS-SCCH 4:									
	HS-PDSCHs:	-1.00	-1.00	16	1-15	-1.00	-1.00	16	1-15	Channel (UARFCN) Parms
	Comp OCNS:	-17.91	-17.91	128	HSDPA	-17.65	-17.65	128	HSDPA	
				Active Cell Connected				Sys Type: UTRA FDD		
								Logging: No Conn		
		DBUS-INT		IntRef	Offset					1 of 3

A.9.2. Activate/ Deactivate the Secondary Serving Cell

Once a DC-HSDPA connection is established, 8960 can control the UE to start or stop monitoring the secondary serving cell using HS-SCCH orders. The HS-SCCH orders can be sent on either the serving or secondary serving cell.

A.9.2.1 Deactivate the Secondary Serving Cell

1. Setup the Deactivate Secondary Cell Parameter

Path: CALL SETUP->Call Control 6 of 6 -> HS-SCCH Order (F3) -> Deactivate Secondary Cell (F2)
In this lab you set it to deactivate the secondary serving cell from the serving cell.

- Deactivate Secondary Cell HS-SCCH Order From = Serving Cell

Press **Send Deactivate Secondary Cell (F5)**

Press Measurement Reset key and see the throughput has dropped to 21 Mbps or so, like the figure below:

Call Setup Screen									
Call Control	Active Cell Operating Mode						Call Parm		
Operating Mode	UE Information						Cell Power		
Active Cell	IMSI: 001012345678901		Power Class: 4		Detected PRACH Sig: 0		-25.00 dBm/3.84 MHz		
	Called Party Number:						Channel Type		
	UE Expected Open Loop Transmit Power						12.2k + HSDPA		
	Init PRACH TX Pow: -60.00 dBm			Init DPCH TX Pow: -11.55 dBm			Paging Service		
End Call	Current Service Type						RB Test Node		
	RB Test Node - HSDPA								
Paging Parameters	Call Processing Status						HSPA Parameters		
	RRC State: CELL_DCH		Soft Handover State: Off		Compressed Mode State: Off				
	MM Status: None		Cur DPCH Offset: 0 chips		GMM State: Attached				
Handovers	HSUPA Information			HSDPA Information			34,121 Preset Call Configs		
	Rep EDCH Cat/Ext: 6/Unrep		Cur UE HS-DSCH Cat: 24		Block Error Ratio: 0 %				
	Last Happy Bit: None		Throughput: 21088 kbps		Throughput: 21088 kbps				
Clear UE Info	Throughput: ---- kbps		Blocks Transmitted: 35000		ACKs Transmitted: ----		Channel (UARFCN) Parm		
			Active Cell Connected		Sys Type: UTRA FDD				
					Logging: No Conn				
1 of 6		DBUS-INT		IntRef	Offset				1 of 3

You can see more on the DC-HSDPA Information screen.
Path: CALL SETUP->Call Control 2 of 6 -> Additional Screens (F1) -> HSDPA Information (F4) -> DC-HSDPA Information (F4).

Call Setup Screen									
Screen Ctrl	DC-HSDPA Information						Call Parm		
Channel (UARFCN) Info	Secondary Serving Cell Status						Cell Power		
	Current Secondary Serving Cell Status: Configured-Inactive						-25.00 dBm/3.84 MHz		
HSPA Information	DC-HSDPA Information						Channel Type		
			Summary		Serving Cell		Secondary Serving Cell		12.2k + HSDPA
E-TFCI Recording Information	Block Error Ratio:		0 %		0 %		---- %		Paging Service
	Throughput (kbps):		21082		21082		0		RB Test Node
	Blocks Transmitted:		66000		66000		0		
	ACKs Received:		65958		65958		0		
HSDPA Information	NACKs Received:		42		42		0		HSPA Parameters
	statDTXs Received:		0		0		0		
	Count of Rep CQI Lim:		----		----		----		
	Last Received CQI:				30		30		
Clear UE Info	Max Allowed CQI:		----		----		----		34,121 Preset Call Configs
	Test Node User Def TBS:				42192		42192		
	PS Data User Def TBS:				7298		7298		
Return	Last Sig Meas Pur Offs (dB):				6.0		6.0		Channel (UARFCN) Parm
			Active Cell Connected		Sys Type: UTRA FDD				
					Logging: No Conn				
1 of 2		DBUS-INT		IntRef	Offset				1 of 3

A.9.2.2 Re-activate the Secondary Serving Cell

Now you can activate the secondary serving cell by pressing back to the HS-SCCH Order menu.

Path: CALL SETUP->Call Control 6 of 6 -> HS-SCCH Order (F3)

Press **Send Activate Secondary Cell (F1)**.

Press the Measurement Reset key and see the throughput has increased to 42 Mbps. When you look at the DC-HSDPA Information screen, you can see the secondary serving cell is set up again.

Call Setup Screen																																																												
Screen Ctrl	DC-HSDPA Information						Call Parm																																																					
Channel (UARFCN) Info	Secondary Serving Cell Status						Cell Power																																																					
	Current Secondary Serving Cell Status: Configured-Active						-25.00																																																					
HSPA Information	DC-HSDPA Information						dBm/3.84 MHz																																																					
	<table border="1"> <thead> <tr> <th></th> <th>Summary</th> <th>Serving Cell</th> <th>Secondary Serving Cell</th> </tr> </thead> <tbody> <tr> <td>Block Error Ratio:</td> <td>0 %</td> <td>0 %</td> <td>0 %</td> </tr> <tr> <td>Throughput (kbps):</td> <td>41996</td> <td>21064</td> <td>20941</td> </tr> <tr> <td>Blocks Transmitted:</td> <td>11000</td> <td>6000</td> <td>6000</td> </tr> <tr> <td>ACKs Received:</td> <td>10949</td> <td>5991</td> <td>5956</td> </tr> <tr> <td>NACKs Received:</td> <td>51</td> <td>9</td> <td>44</td> </tr> <tr> <td>statDTXs Received:</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>Count of Rep CQI Lim:</td> <td>----</td> <td>----</td> <td>----</td> </tr> <tr> <td>Last Received CQI:</td> <td></td> <td>30</td> <td>30</td> </tr> <tr> <td>Max Allowed CQI:</td> <td></td> <td>----</td> <td>----</td> </tr> <tr> <td>Test Mode User Def TBS:</td> <td></td> <td>42192</td> <td>42192</td> </tr> <tr> <td>PS Data User Def TBS:</td> <td></td> <td>7298</td> <td>7298</td> </tr> <tr> <td>Last Sig Meas Pur Offs (dB):</td> <td></td> <td>6.0</td> <td>6.0</td> </tr> </tbody> </table>							Summary	Serving Cell	Secondary Serving Cell	Block Error Ratio:	0 %	0 %	0 %	Throughput (kbps):	41996	21064	20941	Blocks Transmitted:	11000	6000	6000	ACKs Received:	10949	5991	5956	NACKs Received:	51	9	44	statDTXs Received:	0	0	0	Count of Rep CQI Lim:	----	----	----	Last Received CQI:		30	30	Max Allowed CQI:		----	----	Test Mode User Def TBS:		42192	42192	PS Data User Def TBS:		7298	7298	Last Sig Meas Pur Offs (dB):		6.0	6.0	Channel Type	
	Summary	Serving Cell	Secondary Serving Cell																																																									
Block Error Ratio:	0 %	0 %	0 %																																																									
Throughput (kbps):	41996	21064	20941																																																									
Blocks Transmitted:	11000	6000	6000																																																									
ACKs Received:	10949	5991	5956																																																									
NACKs Received:	51	9	44																																																									
statDTXs Received:	0	0	0																																																									
Count of Rep CQI Lim:	----	----	----																																																									
Last Received CQI:		30	30																																																									
Max Allowed CQI:		----	----																																																									
Test Mode User Def TBS:		42192	42192																																																									
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							RB Test Mode																																																					
Clear UE Info							HSPA Parameters																																																					
							34.121 Preset Call Configs ▾																																																					
Return							Channel (UARFCN) Parm																																																					
	Active Cell				Sys Type: UTRA FDD																																																							
	Connected				Logging: No Conn																																																							
1 of 2	DBUS-INT	IntRef	Offset						1 of 3																																																			

When DC-HSDPA is active, the HBLER measurement can also be used to perform receiver testing. 3GPP TS 34.121-1 sections 6.3C and 6.3D are supported and can be set up and tested as described in an appendix in another document, DC-HSDPA User Guide.