

Appendix 5. 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	Body
De-Ionized Water	52.87	71.30
Polysorbate 20	46.10	28.00
Salt	1.03	0.70

Ingredient (% by weight)	Frequency 1800/1900 MHz	
	Head	Body
De-Ionized Water	55.40	71.50
Polysorbate 20	44.22	28.00
Salt	0.38	0.50

Ingredient (% by weight)	Frequency 2450/2600 MHz	
	Head	Body
De-Ionized Water	55.75 ⁽¹⁾	71.70
Polysorbate 20	45.25 ⁽¹⁾	28.00
Salt	0.00	0.30

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):

- 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 6. System Check and Dielectric Parameters

Dielectric Property Measurements: The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.

The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.

Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

System Performance 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 ±5% for the 900MHz, 1900MHz, 2450 MHz and 5.0 GHz dipoles.

The applicable verification normalised to 1 Watt.

System Check 900 Head								
Date: 23/06/2014								
Validation Dipole and Serial Number: D900V2 SN: 035								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	23.0°C	23.9°C	ϵ_r	41.50	42.95	3.49	5.00
				σ	0.97	0.97	0.21	5.00
				1g SAR	10.50	10.00	-4.76	5.00
				10g SAR	6.69	6.48	-3.14	5.00
Date: 23/06/2014								
Validation Dipole and Serial Number: D900V2 SN: 035								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	900	23.0°C	21.9°C	ϵ_r	41.50	41.51	0.02	5.00
				σ	0.97	0.94	-3.09	5.00
				1g SAR	10.50	10.04	-4.38	5.00
				10g SAR	6.69	6.52	-2.54	5.00

System Check 900 Body								
Date: 23/06/2014 Validation Dipole and Serial Number: D900V2 SN: 035								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	22.0°C	20.4°C	ϵ_r	55.00	54.44	-1.02	5.00
				σ	1.05	1.00	-4.62	5.00
				1g SAR	10.40	10.28	-1.15	5.00
				10g SAR	6.73	6.76	0.45	5.00
Date: 02/06/2014 Validation Dipole and Serial Number: D900V2 SN: 035								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	900	23.0°C	22.0°C	ϵ_r	55.00	52.88	-3.85	5.00
				σ	1.05	1.07	1.86	5.00
				1g SAR	10.40	10.60	1.92	5.00
				10g SAR	6.73	6.84	1.63	5.00

System Check 1900 Head								
Date: 23/06/2014 Validation Dipole and Serial Number: D1900V2 SN: 537								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1900	23.0°C	23.0°C	ϵ_r	40.00	39.26	-1.85	5.00
				σ	1.40	1.33	-4.77	5.00
				1g SAR	39.80	39.08	-1.81	5.00
				10g SAR	20.70	20.20	-2.42	5.00
Date: 25/06/2014 Validation Dipole and Serial Number :D1900V2 SN: 537								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	1900	23.0°C	22.0°C	ϵ_r	40.00	39.26	-1.85	5.00
				σ	1.40	1.33	-4.77	5.00
				1g SAR	39.80	39.20	-1.51	5.00
				10g SAR	20.70	20.32	-1.84	5.00

System Check 1900 Body								
Date: 23/06/2014 Validation Dipole and Serial Number: D1900V2 SN: 537								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	23.0°C	22.0°C	ϵ_r	53.30	52.75	-1.03	5.00
				σ	1.52	1.51	-0.42	5.00
				1g SAR	40.20	42.00	4.48	5.00
				10g SAR	21.1	22.08	4.64	5.00
Date: 26/06/2014 Validation Dipole and Serial Number: D1900V2 SN: 537								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	23.0°C	23.0°C	ϵ_r	53.30	41.62	0.29	5.00
				σ	1.52	1.50	-1.53	5.00
				1g SAR	40.20	42.00	4.48	5.00
				10g SAR	21.1	21.80	3.32	5.00

System Check 2450 Head								
Date: 23/06/2014 Validation Dipole and Serial Number: D2450V2 SN: 701								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Head	2450	23.0°C	22.0°C	ϵ_r	39.20	39.05	-0.38	5.00
				σ	1.80	1.83	1.48	5.00
				1g SAR	53.40	53.20	-0.37	5.00
				10g SAR	24.7	24.64	-0.24	5.00

System Check 2450 Body								
Date: 23/06/2014 Validation Dipole and Serial Number: D2440V2 SN: 701								
Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	23.0°C	22.0°C	ϵ_r	52.70	51.99	-1.35	5.00
				σ	1.95	2.02	3.44	5.00
				1g SAR	51.40	52.00	1.17	5.00
				10g SAR	23.90	23.84	-0.25	5.00

System Check 5200 Head								
Date: 24/06/2014 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	35.99	35.16	-2.31	5.00
				σ	4.66	4.78	2.47	5.00
				1g SAR	77.40	78.00	0.78	5.00
				10g SAR	22.3	22.30	0.00	5.00
System Check 5500 Head								
Date: 24/06/2014 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	34.68	-2.58	5.00
				σ	4.96	5.07	2.20	5.00
				1g SAR	84.80	84.00	-0.94	5.00
				10g SAR	24.1	23.50	-2.49	5.00
System Check 5800 Head								
Date: 24/06/2014 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	34.18	-3.17	5.00
				σ	5.27	5.38	2.05	5.00
				1g SAR	76.90	79.90	3.90	5.00
				10g SAR	22.00	22.40	1.82	5.00

System Check 5200 Body								
Date: 23/06/2014 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	23.0°C	ϵ_r	49.01	49.35	0.69	5.00
				σ	5.30	5.31	0.18	5.00
				1g SAR	73.10	70.30	-3.83	5.00
				10g SAR	20.40	20.30	-0.49	5.00
System Check 5500 Body								
Date: 23/06/2014 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	22.0°C	ϵ_r	48.60	48.31	-0.60	5.00
				σ	5.65	5.71	1.13	5.00
				1g SAR	79.00	81.50	3.16	5.00
				10g SAR	21.9	22.80	4.11	5.00
System Check 5800 Body								
Date: 23/06/2014 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	47.55	-1.35	5.00
				σ	6.00	6.17	2.90	5.00
				1g SAR	73.20	72.30	-1.23	5.00
				10g SAR	20.20	20.00	-0.99	5.00

Appendix 7. measurement Uncertainty Table

Measurement uncertainty tables for technologies tested.

A.7.1. Uncertainty -GSM 850 / UMTS FDD 5 / LTE Band 17 Head Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		u _i or u _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.510	2.510	normal (k=1)	1.0000	1.0000	2.510	2.510	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.950	2.950	normal (k=1)	1.0000	0.6400	1.888	1.888	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.840	2.840	normal (k=1)	1.0000	0.6000	1.704	1.704	5
	Combined standard uncertainty			t-distribution			9.58	9.58	>500
	Expanded uncertainty			k = 1.96			18.77	18.77	>500

A.7.2. Uncertainty Rate-GSM / GPRS / EDGE 850 / UMTS FDD 5 / LTE Band 17 Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration /Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.510	2.510	normal (k=1)	1.0000	1.0000	2.510	2.510	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.000	2.000	normal (k=1)	1.0000	0.6400	1.280	1.280	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	1.560	1.560	normal (k=1)	1.0000	0.6000	0.936	0.936	5
	Combined standard uncertainty			t-distribution			9.37	9.37	>500
	Expanded uncertainty			k = 1.96			18.36	18.36	>500

A.7.3. Uncertainty -PCS 1900 / UMTS FDD 2 Head Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with Regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.490	2.490	normal (k=1)	1.0000	1.0000	2.490	2.490	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	3.560	3.560	normal (k=1)	1.0000	0.6400	2.278	2.278	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.620	2.620	normal (k=1)	1.0000	0.6000	1.572	1.572	5
	Combined standard uncertainty			t-distribution			9.63	9.63	>500
	Expanded uncertainty			k = 1.96			18.88	18.88	>500

A.7.4. Uncertainty -PCS / GPRS / EDGE 1900 / UMTS FDD 2 Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	1.730	1.730	Rectangular	1.7321	1.0000	0.999	0.999	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	1.860	1.860	normal (k=1)	1.0000	1.0000	1.860	1.860	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.610	2.610	normal (k=1)	1.0000	0.6400	1.670	1.670	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.140	2.140	normal (k=1)	1.0000	0.6000	1.284	1.284	5
	Combined standard uncertainty			t-distribution			9.32	9.32	>500
	Expanded uncertainty			k = 1.96			18.26	18.26	>500

A.7.5. Uncertainty –Wi-Fi 2450 MHz Head Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		u _i or u _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.180	2.180	normal (k=1)	1.0000	1.0000	2.180	2.180	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	1.840	1.840	normal (k=1)	1.0000	0.6400	1.178	1.178	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.030	2.030	normal (k=1)	1.0000	0.6000	1.218	1.218	5
	Combined standard uncertainty			t-distribution			9.25	9.25	>500
	Expanded uncertainty			k = 1.96			18.13	18.13	>500

A.7.6. Uncertainty – Wi-Fi 2450 MHz Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		U _i or U _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.000	6.000	normal (k=1)	1.0000	1.0000	6.000	6.000	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.440	2.440	normal (k=1)	1.0000	1.0000	2.440	2.440	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	2.260	2.260	normal (k=1)	1.0000	0.6400	1.446	1.446	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	2.150	2.150	normal (k=1)	1.0000	0.6000	1.290	1.290	5
	Combined standard uncertainty			t-distribution			9.36	9.36	>500
	Expanded uncertainty			k = 1.96			18.35	18.35	>500

A.7.7. Uncertainty -Wi-Fi 5GHz Head Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		v _i or v _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.550	6.550	normal (k=1)	1.0000	1.0000	6.550	6.550	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	2.380	2.380	normal (k=1)	1.0000	1.0000	2.380	2.380	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	5.000	5.000	normal (k=1)	1.0000	0.6400	3.200	3.200	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	5.000	5.000	normal (k=1)	1.0000	0.6000	3.000	3.000	5
	Combined standard uncertainty			t-distribution			10.48	10.48	>250
	Expanded uncertainty			k = 1.96			20.53	20.53	>250

A.7.8. Uncertainty -Wi-Fi 5GHz Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (1g)	Standard Uncertainty		u _i or u _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	6.550	6.550	normal (k=1)	1.0000	1.0000	6.550	6.550	∞
B	Axial Isotropy	0.250	0.250	normal (k=1)	1.0000	1.0000	0.250	0.250	∞
B	Hemispherical Isotropy	1.300	1.300	normal (k=1)	1.0000	1.0000	1.300	1.300	∞
B	Spatial Resolution	0.500	0.500	Rectangular	1.7321	1.0000	0.289	0.289	∞
B	Boundary Effect	0.769	0.769	Rectangular	1.7321	1.0000	0.444	0.444	∞
B	Linearity	0.600	0.600	Rectangular	1.7321	1.0000	0.346	0.346	∞
B	Detection Limits	0.200	0.200	Rectangular	1.7321	1.0000	0.115	0.115	∞
B	Readout Electronics	0.160	0.160	normal (k=1)	1.0000	1.0000	0.160	0.160	∞
B	Response Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	Integration Time	0.000	0.000	Rectangular	1.7321	1.0000	0.000	0.000	∞
B	RF Ambient conditions	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Positioner Mechanical Restrictions	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Probe Positioning with regard to Phantom Shell	2.850	2.850	Rectangular	1.7321	1.0000	1.645	1.645	∞
B	Extrapolation and integration / Maximum SAR evaluation	5.080	5.080	Rectangular	1.7321	1.0000	2.933	2.933	∞
A	Test Sample Positioning	1.960	1.960	normal (k=1)	1.0000	1.0000	1.960	1.960	10
A	Device Holder uncertainty	0.154	0.154	normal (k=1)	1.0000	1.0000	0.154	0.154	10
B	Phantom Uncertainty	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
B	Liquid Conductivity (target value)	5.000	5.000	Rectangular	1.7321	0.6400	1.848	1.848	∞
A	Liquid Conductivity (measured value)	4.370	4.370	normal (k=1)	1.0000	0.6400	2.797	2.797	5
B	Liquid Permittivity (target value)	5.000	5.000	Rectangular	1.7321	0.6000	1.732	1.732	∞
A	Liquid Permittivity (measured value)	4.270	4.270	normal (k=1)	1.0000	0.6000	2.562	2.562	5
	Combined standard uncertainty			t-distribution			10.15	10.15	>450
	Expanded uncertainty			k = 1.96			19.90	19.90	>450

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 Parm
Operating Mode	UE Information		Cell Power
Active Cell	INSI: INEI(SU): (--) Power Class:		-35.00
	UE Expected Open Loop Transmit Power		dBm/3.84 MHz
	Initial PRACH TX Power: -60.00 dBm Initial DPCCCH TX Power: -11.55 dBm		Channel Type
Originate Call	Call Processing Status		12.2k RMC
	Current Service Type: None IMI Status: None GMM State: None Current DPCH Offset: 0 chips		Paging Service
Paging Parameters	HSUPA Information Rep EDCH Cat/Ext: Unrep/Unrep Last received E-TFCI: ---- Throughput: ---- kbps Acks Transmitted: ----		RB Test Mode
	HSDPA Information Cur UE HS-DSCH Cat: ---- Block Error Ratio: ---- % Throughput: ---- kbps Blocks Transmitted: ----		HSPA Parameters
Handovers	Active Cell		34.121 Preset Call Configs
	Idle		
Clear UE Info	Sys Type: UTRA FDD		Channel (UARFCN) Parm
1 of 5	IntRef		1 of 3

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 (VARFCN) Parm 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 Parm 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	<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:		HSDPA RB Test Mode Setup	
	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	UE Category Parameters ▾			
	UE Expected Open Loop Transmit Power																
	Initial PRACH TX Power:	-60.00 dBm															
	Initial DPCCH TX Power:	-11.55 dBm															
	HSDPA Uplink Parameters					Value											
DeltaACK					8		MAC-(e)hs Parameters ▾										
DeltaNACK					8												
DeltaCQI					8												
Ack-Nack Repetition Factor					1		HSDPA Uplink Parameters ▾										
CQI Feedback Cycle (k)					2 ms												
CQI Repetition Factor					1												
							Return										
			Active Cell Idle			Sys Type: UTRA FDD											
			IntRef					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								DL DTCH Data																					
Active Cell	<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:		All Ones													
UE Information																													
INSI:																													
INEI(SU):	(--)																												
Power Class:																													
Originate Call	<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	RLC Reestablish Auto															
	UE Expected Open Loop Transmit Power																												
Initial PRACH TX Power:	-60.00 dBm																												
Initial DPCCH TX Power:	-11.55 dBm																												
Paging Parameters ▾	<table border="1"> <thead> <tr> <th colspan="2">Call Processing Status</th> </tr> </thead> <tbody> <tr> <td>Current Service Type:</td> <td>None</td> </tr> <tr> <td>RN Status:</td> <td>None</td> </tr> <tr> <td>GMN State:</td> <td>None</td> </tr> <tr> <td>Current DPCCH Offset:</td> <td>0 chips</td> </tr> </tbody> </table>							Call Processing Status		Current Service Type:	None	RN Status:	None	GMN State:	None	Current DPCCH Offset:	0 chips	Call Limit State Off											
	Call Processing Status																												
Current Service Type:	None																												
RN Status:	None																												
GMN State:	None																												
Current DPCCH Offset:	0 chips																												
Handovers	<table border="1"> <thead> <tr> <th colspan="2">HSUPA Information</th> </tr> </thead> <tbody> <tr> <td>Rep EDCH Cat/Ext: Unrep/Unrep</td> <td></td> </tr> <tr> <td>Last received E-TFCI: ----</td> <td></td> </tr> <tr> <td>Throughput: ---- kbps</td> <td></td> </tr> <tr> <td>Acks Transmitted: ----</td> <td></td> </tr> </tbody> </table>			HSUPA Information		Rep EDCH Cat/Ext: Unrep/Unrep		Last received E-TFCI: ----		Throughput: ---- kbps		Acks Transmitted: ----		<table border="1"> <thead> <tr> <th colspan="2">HSDPA Information</th> </tr> </thead> <tbody> <tr> <td>Cur UE HS-DSCH Cat: ----</td> <td></td> </tr> <tr> <td>Block Error Ratio: ---- %</td> <td></td> </tr> <tr> <td>Throughput: ---- kbps</td> <td></td> </tr> <tr> <td>Blocks Transmitted: ----</td> <td></td> </tr> </tbody> </table>				HSDPA Information		Cur UE HS-DSCH Cat: ----		Block Error Ratio: ---- %		Throughput: ---- kbps		Blocks Transmitted: ----		Call Drop Timer On	
	HSUPA Information																												
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: ----																													
Clear UE Info								SRB Parameters ▾																					
			Active Cell Idle			Sys Type: UTRA FDD																							
			IntRef					2 of 3																					
								1 of 5																					

Figure 3: DL DTCH Data Parms

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

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

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/HSUPA

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+HSUPA as required.
2. For HSDPA and HSUPA, 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 / HSUPA 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 $\Delta_{CQI} = 8 \Rightarrow A_{HS} = \beta_{hs}/\beta_c = 30/15 \Rightarrow \beta_{hs} = 30/15 * \beta_c$

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 HSUPA

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-TFCl
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	$B_{d11}: 47/15$ $B_{d12}: 47/15$	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 $\Delta_{CQI} = 8 \Rightarrow A_{HS} = \beta_{hs}/\beta_c = 30/15 \Rightarrow \beta_{hs} = 30/15 * \beta_c$

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	<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:		AG Mode											
UE Information																								
INSI:																								
INEI(SU):	(--)																							
Power Class:																								
Active Cell					Single Shot																			
					Single Shot AG																			
					21: (134/15)^2																			
Originate Call	<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	Send Single Shot Absolute Grant													
UE Expected Open Loop Transmit Power																								
Initial PRACH TX Power:	-60.00 dBm																							
Initial DPCCH TX Power:	-11.55 dBm																							
					RB Setup AG																			
Paging Parameters	<table border="1"> <thead> <tr> <th colspan="2">Call Processing Status</th> </tr> </thead> <tbody> <tr> <td>Current Service Type:</td> <td>None</td> </tr> <tr> <td>MM Status:</td> <td>Abs Single Shot AG</td> </tr> <tr> <td>GMM State:</td> <td>Index 18: (95/15)^2</td> </tr> <tr> <td>Current DPCCH</td> <td>Index 19: (106/15)^2</td> </tr> <tr> <td></td> <td>Index 20: (119/15)^2</td> </tr> <tr> <td></td> <td>Index 21: (134/15)^2</td> </tr> <tr> <td></td> <td>Index 22: (150/15)^2</td> </tr> <tr> <td></td> <td>Index 23: (168/15)^2</td> </tr> </tbody> </table>				Call Processing Status		Current Service Type:	None	MM Status:	Abs Single Shot AG	GMM State:	Index 18: (95/15)^2	Current DPCCH	Index 19: (106/15)^2		Index 20: (119/15)^2		Index 21: (134/15)^2		Index 22: (150/15)^2		Index 23: (168/15)^2	33: 4(134/15)^2	
Call Processing Status																								
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	Index 23: (168/15)^2																							
Handovers	<table border="1"> <thead> <tr> <th colspan="2">HSUPA Information</th> </tr> </thead> <tbody> <tr> <td>Rep EDCH Cat/B</td> <td></td> </tr> <tr> <td>Last received</td> <td></td> </tr> <tr> <td>Throughput:</td> <td></td> </tr> <tr> <td>Acks Transmitt</td> <td></td> </tr> </tbody> </table>				HSUPA Information		Rep EDCH Cat/B		Last received		Throughput:		Acks Transmitt		AG Pattern Parameters									
HSUPA Information																								
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Throughput:																								
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Clear UE Info	<table border="1"> <thead> <tr> <th colspan="2">Information</th> </tr> </thead> <tbody> <tr> <td>DPCCH Cat:</td> <td>----</td> </tr> <tr> <td>Ratio:</td> <td>---- %</td> </tr> <tr> <td>:</td> <td>---- kbps</td> </tr> <tr> <td>Transmitted:</td> <td>----</td> </tr> </tbody> </table>				Information		DPCCH Cat:	----	Ratio:	---- %	:	---- kbps	Transmitted:	----	Return									
Information																								
DPCCH Cat:	----																							
Ratio:	---- %																							
:	---- kbps																							
Transmitted:	----																							
	Active Cell		Sys Type: UTRA FDD																					
	Idle																							
1 of 5	IntRef				1 of 2																			

Call Setup Screen														
Call Control	Active Cell Operating Mode				Call Parms									
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	
UE Information														
INSI:														
INEI(SU):	(--)													
Power Class:														
Cell Parameters					-35.00									
					dBm/3.84 MHz									
Generator Info	<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>-22.58 dBm</td> </tr> </tbody> </table>				UE Expected Open Loop Transmit Power		Initial PRACH TX Power:	-60.00 dBm	Initial DPCCH TX Power:	-22.58 dBm	Channel Type			
UE Expected Open Loop Transmit Power														
Initial PRACH TX Power:	-60.00 dBm													
Initial DPCCH TX Power:	-22.58 dBm													
					12.2k + HSDPA									
					Paging Service									
					RB Test Mode									
	Uplink Parameters		Value											
Uplink Parameters	PRACH Preambles		64		HSPA Parameters									
	PRACH Ramping Cycles(MAX)		2											
	Available Subchannels (Bit Mask)		000000000001											
UE Rep Params	Uplink DPCCH Scrambling Code		0		34.121 Preset Call Configs									
	Uplink DPCCH Bc/Bd Control		Manual											
	Manual Uplink DPCCH Bc		2											
Close Menu	Manual Uplink DPCCH Bd		15		Channel (UARFCN) Params									
	Maximum Uplink Transmit Power Level		24 dBm											
	Cell Off		Sys Type: UTRA FDD											
2 of 5	IntRef				1 of 3									

- For HSUPA 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	
	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	
Originate Call	Call Processing Status				Send Single Shot Absolute Grant	
	Current Service Type: None M1 Status: None GMM State: None Current DPCH Offset: 0 chips				RB Setup AG	
Paging Parameters	HSUPA Information		HSDPA Information		37: 6(168/15)^2	
	Rep EDCH Cat/Ext: Unrep/Unrep		Cur UE HS-DSCH Cat: ----		AG Pattern Parameters	
	Last received E-TFCI: ----		Block Error Ratio: ---- %			
	Throughput: ---- kbps		Throughput: ---- kbps			
Clear UE Info	Acks Transmitted: ----		Blocks Transmitted: ----		Return	
	Active Cell			Sys Type: UTRA FDD		
	Idle					
1 of 5			IntRef			1 of 2

Figure 8: Serving Grant Example