

### **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
	Body
De-Ionized Water	71.30
Polysorbate 20	28.00
Salt	0.70

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

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

## **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  $\pm 2^\circ\text{C}$  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 to 4 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 and 2450 MHz dipoles were used. A forward power of 250 mW was applied to the 900 MHz, 1900 MHz and 2450 MHz, and the system was verified to a tolerance of  $\pm 5\%$  for the 900MHz, 1900MHz and 2450 MHz dipoles.

The applicable verification normalised to 1 Watt.

**Site 56**

System Check 900 Body

Date: 11/08/2014

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	23.0	$\epsilon_r$	55.00	55.90	1.64	5.00
				$\sigma$	1.05	1.03	-1.71	5.00
				$\epsilon_r$	10.40	10.44	-2.69	5.00
				$\sigma$	6.73	6.72	-0.15	5.00

Channel Number	Band	Frequency (MHz)	Parameters
128	GSM850	824.2	$\epsilon_r$ 56.30
			$\sigma$ 0.98
190		836.6	$\epsilon_r$ 56.20
			$\sigma$ 0.99
251		848.8	$\epsilon_r$ 56.2
			$\sigma$ 1.00

Date: 14/08/2014

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	24.0	$\epsilon_r$	55.00	55.57	1.04	5.00
				$\sigma$	1.05	1.03	-2.33	5.00
				$\epsilon_r$	10.40	10.24	-1.54	5.00
				$\sigma$	6.73	6.84	1.63	5.00

Channel Number	Band	Frequency (MHz)	Parameters
128	GSM850	824.2	$\epsilon_r$ 55.91
			$\sigma$ 0.98
190		836.6	$\epsilon_r$ 55.90
			$\sigma$ 0.98
251		848.8	$\epsilon_r$ 55.81
			$\sigma$ 0.99
4132	WCDMA FDD 5	826.4	$\epsilon_r$ 55.90
			$\sigma$ 0.98
4183		836.6	$\epsilon_r$ 55.90
			$\sigma$ 0.98
4233		846.6	$\epsilon_r$ 55.82
			$\sigma$ 0.99

**Site 56 (Continued)**

Date: 18/08/2014

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	24.0	$\epsilon_r$	55.00	54.90	-0.18	5.00
				$\epsilon_r$	1.05	1.00	4.48	5.00
				$\epsilon_r$	10.40	10.12	2.69	5.00
				$\epsilon_r$	6.73	6.72	-0.15	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
4132	WCDMA FDD 5	826.4	$\epsilon_r$	55.24
			$\sigma$	0.96
4183		836.6	$\epsilon_r$	55.20
			$\sigma$	0.97
4233		846.6	$\epsilon_r$	55.16
			$\sigma$	0.97

System Check 1900 Body

Date: 14/08/2014

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	24.0	$\epsilon_r$	53.30	51.96	-2.51	5.00
				$\sigma$	1.52	1.47	-3.13	5.00
				1g SAR	40.20	40.00	-0.50	5.00
				10g SAR	21.10	21.52	1.99	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
512	PCS1900	1850.2	$\epsilon_r$	54.06
			$\sigma$	1.46
661		1880.0	$\epsilon_r$	54.00
			$\sigma$	1.49
810		1909.8	$\epsilon_r$	53.94
			$\sigma$	1.43
9262	WCDMA FDD 2	1852.4	$\epsilon_r$	54.14
			$\sigma$	1.45
9400		1880.0	$\epsilon_r$	52.70
			$\sigma$	1.53
9538		1907.6	$\epsilon_r$	54.01
			$\sigma$	1.49

**Site 57**

System Check 900 Body

Date: 30/06/2014

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	22.6	$\epsilon_r$	55.00	53.42	-2.87	5.00
				$\sigma$	1.05	1.01	-3.62	5.00
				1g SAR	10.40	10.52	1.15	5.00
				10g SAR	6.73	6.88	2.23	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
4132	WCDMA FDD 5	826.4	$\epsilon_r$	53.60
			$\sigma$	0.97
4183		836.6	$\epsilon_r$	53.60
			$\sigma$	0.98
4233		846.6	$\epsilon_r$	53.50
			$\sigma$	0.98

Date: 10/07/2014

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	22.0	$\epsilon_r$	55.00	52.60	-4.36	5.00
				$\epsilon_r$	1.05	1.01	-3.48	5.00
				$\epsilon_r$	10.40	10.28	-1.15	5.00
				$\epsilon_r$	6.73	6.88	2.23	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
4132	WCDMA FDD 5	826.4	$\epsilon_r$	52.93
			$\sigma$	0.97
4183		836.6	$\epsilon_r$	52.90
			$\sigma$	0.98
4233		846.6	$\epsilon_r$	52.84
			$\sigma$	0.98

**Site 57 (Continued)**

Date: 06/08/2014

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	23.0	$\epsilon_r$	55.00	53.34	-3.02	5.00
				$\epsilon_r$	1.05	1.02	-3.19	5.00
				$\epsilon_r$	10.40	10.12	-2.69	5.00
				$\epsilon_r$	6.73	6.72	-0.15	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
4132	WCDMA FDD 5	826.4	$\epsilon_r$	54.00
			$\sigma$	0.97
4183		836.6	$\epsilon_r$	53.95
			$\sigma$	0.97
4233		846.6	$\epsilon_r$	53.90
			$\sigma$	0.98

**Site 60**

**System Check 2450 Body**

**Date: 15/07/2014**

**Validation Dipole and Serial Number: D2440V2 SN: 701**

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	2450	24.0	24.0	$\epsilon_r$	52.70	52.43	-0.51	5.00
				$\sigma$	1.95	2.03	3.93	5.00
				1g SAR	51.40	50.40	-1.95	5.00
				10g SAR	23.90	23.80	-0.42	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
1	WiFi 2.4 GHz	2412.0	$\epsilon_r$	52.45
			$\sigma$	1.97
6		2437.0	$\epsilon_r$	52.44
			$\sigma$	2.01
11		2462.0	$\epsilon_r$	52.41
			$\sigma$	2.04

**Site 61**

**System Check 1900 Body**

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	23.2	23.4	$\epsilon_r$	53.30	54.23	1.74	5.00
				$\sigma$	1.52	1.53	0.69	5.00
				1g SAR	40.20	42.00	4.48	5.00
				10g SAR	21.10	21.80	3.32	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
9262	WCDMA FDD 2	1852.4	$\epsilon_r$	54.35
			$\sigma$	1.48
9400		1880.0	$\epsilon_r$	54.28
			$\sigma$	1.51
9538		1907.6	$\epsilon_r$	54.21
			$\sigma$	1.54

Date: 07/07/2014

Validation Dipole and Serial Number: D1900V2 SN: 537

Simulant	Frequency (MHz)	Room Temp	Liquid Temp	Parameters	Target Value	Measured Value	Deviation (%)	Limit (%)
Body	1900	24.0	24.0	$\epsilon_r$	53.30	51.97	-2.50	5.00
				$\sigma$	1.52	1.51	-0.56	5.00
				1g SAR	40.20	39.08	-2.79	5.00
				10g SAR	21.10	20.52	-2.75	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
9262	WCDMA FDD 2	1852.4	$\epsilon_r$	52.25
			$\sigma$	1.44
9400		1880.0	$\epsilon_r$	52.45
			$\sigma$	1.44
9538		1907.6	$\epsilon_r$	54.00
			$\sigma$	1.49

**Site 61 (Continued)**

Date: 10/07/2014

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	24.0	$\epsilon_r$	53.30	52.36	-1.76	5.00
				$\sigma$	1.52	1.45	-4.51	5.00
				1g SAR	40.20	39.44	-1.89	5.00
				10g SAR	21.10	20.36	-3.51	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
9262	WCDMA FDD 2	1852.4	$\epsilon_r$	52.58
			$\sigma$	1.42
9400		1880.0	$\epsilon_r$	52.45
			$\sigma$	1.44
9538		1907.6	$\epsilon_r$	52.35
			$\sigma$	1.46

Date: 08/08/2014

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	23.2	$\epsilon_r$	53.30	51.48	-3.41	5.00
				$\sigma$	1.52	1.53	0.42	5.00
				1g SAR	40.20	40.40	0.50	5.00
				10g SAR	21.10	21.00	-0.47	5.00

Channel Number	Band	Frequency (MHz)	Parameters	
9262	WCDMA FDD 2	1852.4	$\epsilon_r$	52.58
			$\sigma$	1.42
9400		1880.0	$\epsilon_r$	52.45
			$\sigma$	1.44
9538		1907.6	$\epsilon_r$	54.00
			$\sigma$	1.49

## Appendix 7. Measurement Uncertainty Table

Measurement uncertainty tables for technologies tested.

### A.7.1. GSM / GPRS / EDGE 850 / WCDMA FDD 5 Body Configuration 1g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> OR U <sub>eff</sub>
							+ 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.7.2. PCS / GPRS / EDGE 1900 / WCDMA FDD 2 Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ 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.7.3. WiFi 2450 MHz Body Configuration 1g**

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C <sub>i</sub> (1g)	Standard Uncertainty		U <sub>i</sub> or U <sub>eff</sub>
							+ 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



Call Setup Screen						
Call Control	Active Cell Operating Mode				HSDPA Parms	
Close Menu	UE Information				HSDPA RB Test Mode Setup	
	INSI: INEI(SU): (--) Power Class:					
	UE Expected Open Loop Transmit Power				UE Category Parameters ▾	
	Initial PRACH TX Power: -60.00 dBm Initial DPCH TX Power: -11.55 dBm					
	HSDPA Uplink Parameters			Value		MAC-(e)hs Parameters ▾
	DeltaACK			8		
	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	UE Information				All Ones	
Originate Call	INSI: INEI(SU): (--) Power Class:					
	UE Expected Open Loop Transmit Power				RLC Reestablish Auto	
	Initial PRACH TX Power: -60.00 dBm Initial DPCH TX Power: -11.55 dBm					
Paging Parameters ▾	Call Processing Status				Call Limit State	
	Current Service Type: None MM Status: None GMM State: None Current DPCH Offset: 0 chips				Off	
					Call Drop Timer	
Handovers	HSUPA Information		HSDPA Information		SRB Parameters ▾	
	Rep EDCH Cat/Ext: Unrep/Unrep		Cur UE HS-DSCH Cat: ----			
	Last received E-TFCI: ----		Block Error Ratio: ---- %			
Clear UE Info	Throughput: ---- kbps		Throughput: ---- kbps			
	Acks Transmitted: ----		Blocks Transmitted: ----			
			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		
Close Menu	UE Information						UE Target Power		
	IMSI: 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

6. 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 Parm		
Additional Screens	UE Information						Cell Power		
	IMSI: IMEI(SU): (---) Power Class:						-35.00		
	UE Expected Open Loop Transmit Power						dBm/3.84 MHz		
	Initial PRACH TX Power: -60.00 dBm Initial DPCCH TX Power: -11.55 dBm						Channel Type		
	Cell Parameters			Value			12.2k RMC		
	BCCH Update Page			Inhibit			Paging Service		
	PS Domain Information			Absent			RB Test Mode		
	NCC (Mobile Country Code)			1			HSPA Parameters		
	NMC (Mobile Network Code)			1			34,121 Preset Call Configs		
	NMC (Mobile Network Code) Length			Auto			Channel (UARFCN) Parm		
LAC (Local Area Code)			1						
RAC (Routing Area Code)			1						
Cell Identity			1						
			Active Cell Idle			Sys Type: UTRA FDD			
			IntRef			1 of 3			

Figure 5: Cell Parameters

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

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 Parmns	
	UE Information				Cell Power	
	IMSI: IMEI(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 DPCCCH TX Power: -11.55 dBm				12.2k RMC	
Voice Call	RB Test Mode Settings			Value		
	Uplink DTCH RMC CRC Presence			Present		
	Uplink Dummy DCCH Data			Off		
	UE Loopback Type			Type 1		
Close Menu	Asymmetric RMC Loopback Messaging			Close/Open		
	Asymmetric RMC CN Domain			CS Domain		
Active Cell			Sys Type: UTRA FDD			HSPA Parameters
Idle						
3 of 5	IntRef				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**

- 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	$\beta_c$	$\beta_d$	$B_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	SM (dB) <sup>(2)</sup>
1	2/15	15/15	64	2/15	4/15	0.0
2	12/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	12/15 <sup>(3)</sup>	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:  $\Delta_{ACK}$ ,  $\Delta_{NACK}$  and  $\Delta_{CQI} = 8 \Leftrightarrow A_{hs} = \beta_{hs}/\beta_c = 30/15 \Leftrightarrow \beta_{hs} = 30/15 * \beta_c$

Note 2: CM = 1 for  $\beta_c/\beta_d = 12/15$ ,  $B_{hs}/\beta_c = 24/15$

Note 3: For subtest 2 the  $\beta_c/\beta_d$  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	$\beta_c$	$\beta_d$	$B_d$ (SF)	$\beta_c/\beta_d$	$\beta_{hs}^{(1)}$	$B_{oc}$	$B_{od}$	$B_{od}$ (SF)	$B_{od}$ (codes)	CM <sup>(2)</sup> (dB)	MPR (dB)	AG <sup>(4)</sup> Index	E-TFCI
1	11/15 <sup>(3)</sup>	15/15 <sup>(3)</sup>	64	11/15 <sup>(3)</sup>	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	$B_{dl1}: 47/15$ $B_{dl2}: 47/15$	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 <sup>(4)</sup>	15/15 <sup>(4)</sup>	64	15/15 <sup>(4)</sup>	24/15	24/15	134/15	4	1	1.0	0.0	21	81

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

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

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																					
UE Information																																				
INSI:	(--)																																			
INEI(SU):	(--)																																			
Power Class:																																				
Cell Parameters							-35.00																													
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	dBm/3.84 MHz																							
	UE Expected Open Loop Transmit Power																																			
Initial PRACH TX Power:	-60.00 dBm																																			
Initial DPCCH TX Power:	-22.58 dBm																																			
							Channel Type																													
Uplink Parameters	<table border="1"> <thead> <tr> <th colspan="2">Uplink Parameters</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>PRACH Preambles</td> <td></td> <td>64</td> </tr> <tr> <td>PRACH Ramping Cycles(MMAX)</td> <td></td> <td>2</td> </tr> <tr> <td>Available Subchannels (Bit Mask)</td> <td></td> <td>000000000001</td> </tr> <tr> <td>Uplink DPCH Scrambling Code</td> <td></td> <td>0</td> </tr> <tr> <td>Uplink DPCH Bc/Bd Control</td> <td></td> <td>Manual</td> </tr> <tr> <td>Manual Uplink DPCH Bc</td> <td></td> <td>2</td> </tr> <tr> <td>Manual Uplink DPCH Bd</td> <td></td> <td>15</td> </tr> <tr> <td>Maximum Uplink Transmit Power Level</td> <td></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		Manual	Manual Uplink DPCH Bc		2	Manual Uplink DPCH Bd		15	Maximum Uplink Transmit Power Level		24 dBm	12.2k + HSDPA		
	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		Manual																																		
Manual Uplink DPCH Bc		2																																		
Manual Uplink DPCH Bd		15																																		
Maximum Uplink Transmit Power Level		24 dBm																																		
UE Rep Params							Paging Service																													
Close Menu							RB Test Mode																													
	<table border="1"> <thead> <tr> <th colspan="2">Cell Off</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>						Cell Off				HSPA Parameters																									
Cell Off																																				
2 of 5	IntRef						34,121 Preset Call Configs																													
							Channel (UARFCH) Parm																													
	Sys Type: UTRA FDD						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		IMSI: IMEI(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 MN Status: None MN 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				
		Acks Transmitted: ----			Blocks Transmitted: ----			Return	
		Active Cell				Sys Type: UTRA FDD			
		Idle							
1 of 5			IntRef					1 of 2	

Figure 8: Serving Grant Example