SAR EVALUATION REPORT

IEEE Std 1528-2013

For
Extremity, Cellular and GNSS enabled MPERS

FCC ID: 2AGPI-ANH0319
Model Name: ANH0319

Report Number: 12775491-S1V3
Issue Date: 9/30/2019

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
V1	6/14/2019	Initial Issue	--
V2	7/19/2019	Removed Permissive Change Appendix A: Updated Antenna Location Diagram	Coltyce Sanders
V3	9/30/2019	Section 2 and 9 – added references to C63.26	Dave Weaver

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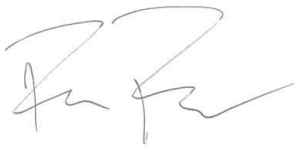
1. Attestation of Test Results

Applicant Name	Anelto Inc.	
FCC ID	2AGPI-ANH0319	
Model Name	ANH0319	
Applicable Standards	Published RF exposure KDB procedures IEEE Std 1528-2013	
Exposure Category	SAR Limits (W/Kg)	
	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)
General population / Uncontrolled exposure	1.6	4
RF Exposure Conditions	Equipment Class - Highest Reported SAR (W/kg)	
	PCF	
Next to Mouth	1.355	
Extremity	2.318	
Date Tested	5/10/2019 to 5/16/2019	
Test Results	Pass	

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.
The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. All samples tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise.
This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of the U.S. government.

Approved & Released By:	Prepared By:
	
Devin Chang Senior Test Engineer UL Verification Services Inc.	Remi Rodberg Laboratory Technician UL Verification Services Inc.

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with FCC 47 CFR § 2.1093, IEEE STD 1528-2013, ANSI C63.26-2015, and the following FCC Published RF exposure KDB procedures:

- 447498 D01 General RF Exposure Guidance v06
- 447498 D03 Supplement C Cross-Reference v01
- 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- 865664 D02 RF Exposure Reporting v01r02
- 941225 D01 3G SAR Procedures v03r01
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02

In addition to the above, the following information was used:

- TCB workshop October 2016; RF Exposure Procedures (DUT Holder Perturbations)
- TCB workshop May 2017; RF Exposure Procedures (Broadband Liquid Above 3 GHz)
- TCB workshop April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))

3. Facilities and Accreditation

The test sites and measurement facilities used to collect data are located at:

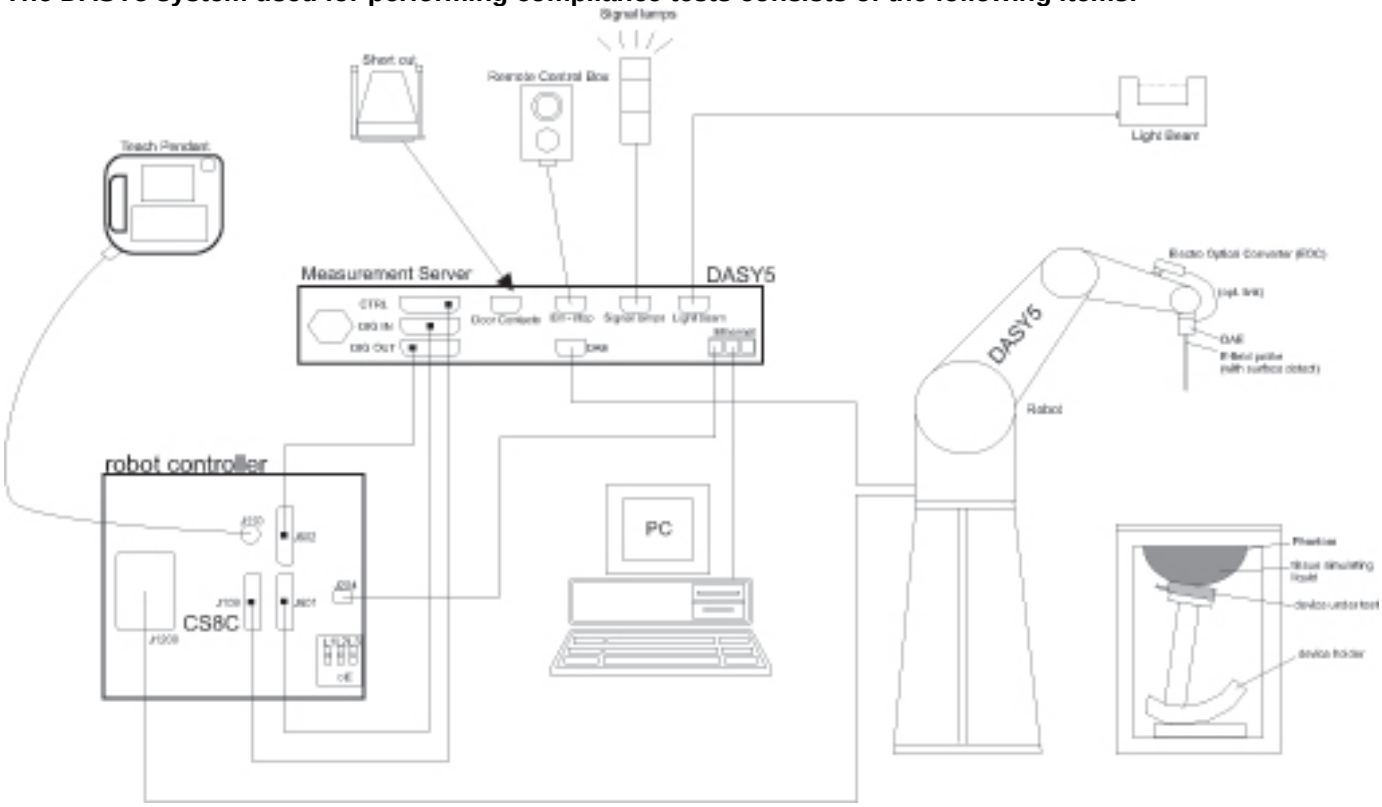
47173 Benicia Street	47266 Benicia Street
SAR Lab A	SAR Lab 1
SAR Lab B	SAR Lab 2
SAR Lab C	SAR Lab 3
SAR Lab D	SAR Lab 4
SAR Lab E	SAR Lab 5
SAR Lab F	SAR Lab 6
SAR Lab G	SAR Lab 7
SAR Lab H	SAR Lab 8

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY5 system used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running WinXP or Win7 and the DASY5 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in dB) is specified in the standards for compliance testing. For example, a 2 dB range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 dB is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ 1.5·$\Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* When zoom scan is required and the *reported* SAR from the *area scan based 1-g SAR estimation* procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

4.3. Test Equipment

The measuring equipment used to perform the tests documented in this report has been calibrated in accordance with the manufacturers' recommendations, and is traceable to recognized national standards.

Dielectric Property Measurements

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Vector Network Analyzer	Rhode & Schwarz	ZNLE6	101274-mn	3/7/2020
Dielectric Probe kit	SPEAG	DAK-3.5	1082	9/11/2019
Shorting Block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	2/6/2020
Thermometer	Keysight	Traceable	140562250	3/5/2020

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Signal Generator	Rhode & Schwarz	SMB100A	1890968-gX	2/14/2020
Power Sensor	Rhode & Schwarz	NRP18A	100995-hs	2/15/2020

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab 1)	SPEAG	EX3DV4	3885	9/18/2019
Data Acquisition Electronics (SAR Lab 1)	SPEAG	DAE4	1544	3/19/2020
System Validation Dipole	SPEAG	D750V3	1071	11/28/2019
System Validation Dipole	SPEAG	D835V2	4d002	11/28/2019
System Validation Dipole	SPEAG	D1750V2	1053	10/2/2019
System Validation Dipole	SPEAG	D1900V2	5d163	10/16/2019

Other

Name of Equipment	Manufacturer	Type/Model	T Number	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	T970	137875-DZ	2/21/2020
Base Station Simulator	R & S	CMW502	T960	135384-pJ	2/14/2020
Base Station Simulator	R & S	CMW503	T959	137873-WG	2/16/2020

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg and the measured 10-g SAR within a frequency band is < 3.75 W/kg. The expanded SAR measurement uncertainty must be ≤ 30%, for a confidence interval of k = 2. If these conditions are met, extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval.

6. Device Under Test (DUT) Information

6.1. DUT Description

Device Dimension	Overall (Length x Width): 88 mm x 46.5 mm Overall Diagonal: 95 mm This is a Small device (When the factor is smaller than 9 cm × 5 cm)		
Back Cover	Normal Battery Cover		
Battery Options	Standard – Lithium-ion battery, Rating 3.7Vdc, 3.7Wh		
Wireless Router (Hotspot)	Not Supported		
Test sample information	**S/N**	**IMEI**	**Notes**
	MPA18C110000278	861108031890402	190405 (Radiated: SN3)
	MPA18C110000275	861108031890378	190405 (Radiated: SN2)
	MPA18AI26000672	861108036028388	190411 (Conducted: SN1)
Hardware Version	EC21AFAR05A04M4G		
Software Version	EC21AFAR05A04M4G		

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating Mode	Duty Cycle used for SAR testing
W-CDMA (UMTS)	Band II Band IV Band V	UMTS Rel. 99 (Voice & Data) HSDPA (Rel. 5) HSUPA (Rel. 6) DC-HSDPA (Rel. 8)	100%
LTE	FDD Band 2 FDD Band 4 FDD Band 12	QPSK UE Category 1 16QAM UE Category 1 Rel. 10 Does not support Carrier Aggregation (CA)	100% (FDD)
ISM band	915 MHz	Proprietary	NA[1]

[1] The 915 MHz transmitter is excluded from SAR testing due to low output power. See section 10.7

6.3. General LTE SAR Test and Reporting Considerations

<table>
<tr><th>Item</th><th>Description</th></tr>
<tr><td>Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td>
<table>
<tr><td rowspan="3">Band 2</td><td colspan="6">Frequency range: 1850 - 1910 MHz (BW = 60 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>18700 /1860</td><td>18675/ 1857.5</td><td>18650/ 1855</td><td>18625/ 1852.5</td><td>18615/ 1851.5</td><td>18607/ 1850.7</td></tr>
<tr><td>Mid</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td><td>18900/ 1880</td></tr>
<tr><td>High</td><td>19100/ 1900</td><td>19125/ 1902.5</td><td>19150/ 1905</td><td>19175/ 1907.5</td><td>19185/ 1908.5</td><td>19193/ 1909.3</td></tr>
<tr><td rowspan="3">Band 4</td><td colspan="6">Frequency range: 1710 - 1755 MHz (BW = 45 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz [1]</td><td>15 MHz</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>20050/ 1720</td><td>20025/ 1717.5</td><td>20000/ 1715</td><td>19975/ 1712.5</td><td>19965/ 1711.5</td><td>19957/ 1710.7</td></tr>
<tr><td>Mid</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td><td>20175/ 1732.5</td></tr>
<tr><td>High</td><td>20300/ 1745</td><td>20325/ 1747.5</td><td>20350/ 1750</td><td>20375/ 1752.5</td><td>20385/ 1753.5</td><td>20393/ 1754.3</td></tr>
<tr><td rowspan="3">Band 12</td><td colspan="6">Frequency range: 699 – 716 MHz (BW = 17 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td>20 MHz</td><td>15 MHz</td><td>10 MHz [1]</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td></td><td></td><td>23060/ 704</td><td>23035/ 701.5</td><td>23025/ 700.5</td><td>23017/ 699.7</td></tr>
<tr><td>Mid</td><td></td><td></td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td><td>23095/ 707.5</td></tr>
<tr><td>High</td><td></td><td></td><td>23130/ 711</td><td>23155/ 713.5</td><td>23165/ 714.5</td><td>23173/ 715.3</td></tr>
</table>
</td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td>Refer to Appendix A.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td>
Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3
<table>
<tr><th rowspan="2">Modulation</th><th colspan="6">Channel bandwidth / Transmission bandwidth (N_{RB})</th><th rowspan="2">MPR (dB)</th></tr>
<tr><th>1.4 MHz</th><th>3.0 MHz</th><th>5 MHz</th><th>10 MHz</th><th>15 MHz</th><th>20 MHz</th></tr>
<tr><td>QPSK</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 1</td></tr>
<tr><td>16 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>≤ 5</td><td>≤ 4</td><td>≤ 8</td><td>≤ 12</td><td>≤ 16</td><td>≤ 18</td><td>≤ 2</td></tr>
<tr><td>64 QAM</td><td>> 5</td><td>> 4</td><td>> 8</td><td>> 12</td><td>> 16</td><td>> 18</td><td>≤ 3</td></tr>
<tr><td>256 QAM</td><td colspan="6">≥ 1</td><td>≤ 5</td></tr>
</table>
MPR Built-in by design
The manufacturer MPR values are always within the 3GPP maximum MPR allowance but may not follow the default MPR values.
A-MPR (additional MPR) was disabled during SAR testing
</td></tr>
<tr><td>Power reduction</td><td>No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td>A properly configured base station simulator was used for the SAR and power measurements; therefore, spectrum plots for each RB allocation and offset configuration are not included in the SAR report.</td></tr>
</table>

Notes:

1. SAR Testing for LTE was performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).
2. LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna-to-antenna and antenna-to-edge(s) distances.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to-edge/surface	SAR Required	Note
WWAN	Next to Mouth	10 mm	Front	N/A	Yes	
	Extremity	0 mm	Rear	N/A	Yes	
			Front	N/A	Yes	
			Edge 1 (Top)	> 25 mm	No	1
			Edge 2 (Right)	< 25 mm	Yes	
			Edge 3 (Bottom)	< 25 mm	Yes	
			Edge 4 (Left)	< 25 mm	Yes	

Notes:

1. SAR is not required per KDB 447498 D01 §4.2.3).
2. This device does not support users using lanyards and straps. Please refer to the manufacturer user manual.

8. Dielectric Property Measurements & System Check

8.1. 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 – 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.
The dielectric constant (εr) and conductivity (σ) of typical tissue-equivalent media recipes are expected to be within ± 5% of the required target values; but for SAR measurement systems that have implemented the SAR error compensation algorithms documented in IEEE Std 1528-2013, to automatically compensate the measured SAR results for deviations between the measured and required tissue dielectric parameters, the tolerance for εr and σ may be relaxed to ± 10%. This is limited to frequencies ≤ 3 GHz.

Tissue Dielectric Parameters
FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Head	
	ε_r	σ (S/m)
150	52.3	0.76
300	45.3	0.87
450	43.5	0.87
835	41.5	0.90
900	41.5	0.97
915	41.5	0.98
1450	40.5	1.20
1610	40.3	1.29
1800 – 2000	40.0	1.40
2450	39.2	1.80
3000	38.5	2.40
5000	36.2	4.45
5100	36.1	4.55
5200	36.0	4.66
5300	35.9	4.76
5400	35.8	4.86
5500	35.6	4.96
5600	35.5	5.07
5700	35.4	5.17
5800	35.3	5.27

IEEE Std 1528-2013
Refer to Table 3 within the IEEE Std 1528-2013

IEC 62209-1
Refer to Table A.3 within the IEC 62209-1

Dielectric Property Measurements Results:

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
1	5/10/2019	1900	Head	1900	39.50	40.00	-1.25	1.42	1.40	1.57
				1850	39.55	40.00	-1.13	1.39	1.40	-0.43
				1920	39.50	40.00	-1.25	1.44	1.40	2.71
1	5/14/2019	750	Head	750	40.17	41.96	-4.27	0.88	0.89	-1.09
				660	40.56	42.42	-4.39	0.85	0.89	-3.58
				800	40.00	41.71	-4.09	0.90	0.90	0.45
1	5/14/2019	835	Head	835	39.88	41.50	-3.90	0.91	0.90	1.44
				805	39.97	41.68	-4.10	0.90	0.90	0.65
				850	39.82	41.50	-4.05	0.92	0.92	0.27
1	5/14/2019	1750	Head	1750	38.23	40.08	-4.63	1.33	1.37	-2.85
				1710	38.26	40.15	-4.70	1.31	1.35	-2.93
				1755	38.21	40.08	-4.66	1.33	1.37	-2.83

8.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10 mm (above 1 GHz) and 15 mm (below 1 GHz) from dipole center to the simulating liquid surface.
- The coarse grid with a grid spacing of 15 mm was aligned with the dipole.
  For 5 GHz band - The coarse grid with a grid spacing of 10 mm was aligned with the dipole.
- Special 7x7x7 (below 3 GHz) and/or 8x8x7 (above 3 GHz) fine cube was chosen for the cube.
- Distance between probe sensors and phantom surface was set to 3 mm.
  For 5 GHz band - Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was 100 mW.
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within ±10% of the manufacturer calibrated dipole SAR target. Refer to Appendix B for the SAR System Check Plots.

SAR Lab	Date	Tissue Type	Dipole Type _Serial #	Dipole Cal. Due Data	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
					Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan to 100 mW	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
1	5/10/2019	Head	D1900V2 SN:5d163	10/16/2019	4.010	40.10	42.19	-4.95	2.060	20.60	21.73	-5.20	1,2
1	5/14/2019	Head	D750V3 SN:1071	11/28/2019	0.851	8.51	8.59	-0.93	0.559	5.59	5.73	-2.44	3,4
1	5/14/2019	Head	D835V2 SN:4d002	11/28/2019	1.100	11.00	10.27	7.11	0.678	6.78	6.76	0.30	5,6
1	5/14/2019	Head	D1750V2 SN:1053	10/2/2019	3.700	37.00	39.45	-6.21	1.960	19.60	20.82	-5.86	7,8

9. Conducted Output Power Measurements

All conducted power measurements were performed in accordance with C63.26.

9.1. W-CDMA

Per KDB 941225 D01 3G SAR Procedures for W-CDMA:

Maximum output power is verified on the high, middle and low channels and using the appropriate 12.2 kbps RMC with TPC (transmit power control) set to all "1's"

Release 99 Setup Procedures used to establish the test signals

The following tests were completed according to the test requirements outlined in section 5.2 of the 3GPP TS34.121-1 specification. The DUT supports power Class 3, which has a nominal maximum output power of 24 dBm (+1.7/-3.7).

Mode	Subtest	Rel99
WCDMA General Settings	Loopback Mode	Test Mode 2
	Rel99 RMC	12.2kbps RMC
	Power Control Algorithm	Algorithm2
	βc/βd	8/15

HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests were completed according to Release 5 procedures in section 5.2 of 3GPP TS34.121. A summary of these settings are illustrated below:

Table C.10.2.4: β values for transmitter characteristics tests with HS-DPCCH

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
W-CDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm 2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	Bd (SF)	64			
	βc/βd	2/15	11/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	D_{ACK}	8			
	D_{NAK}	8			
	DCQI	8			
	Ack-Nack repetition factor	3			
	CQI Feedback (Table 5.2B.4)	4ms			
	CQI Repetition Factor (Table 5.2B.4)	2			
	Ahs=βhs/βc	30/15			

HSPA (HSDPA & HSUPA) Setup Procedures used to establish the test signals

The following 5 Sub-tests were completed according to Release 6 procedures in table C,11.1.3 of 3GPP TS 34.121-1
A summary of these settings are illustrated below:

Table C.11.1.3: β values for transmitter characteristics tests with HS-DPCCH and E-DCH

	Mode	HSPA				
	Subtest	1	2	3	4	5
WCDMA General Settings	Loopback Mode	Test Mode 1				
	Rel99 RMC	12.2 kbps RMC				
	HSDPA FRC	H-Set 1				
	HSUPA Test	HSPA				
	Power Control Algorithm	Algorithm 2				Algorithm 1
	βc	11/15	6/15	15/15	2/15	15/15
	βd	15/15	15/15	9/15	15/15	0
	βec	209/225	12/15	30/15	2/15	5/15
	βc/βd	11/15	6/15	15/9	2/15	-
	βhs	22/15	12/15	30/15	4/15	5/15
	βed	1309/225	94/75	47/15	56/75	47/15
	CM (dB)	1	3	2	3	1
	MPR (dB)	0	2	1	2	0
HSDPA Specific Settings	DACK	8				0
	DNAK	8				0
	DCQI	8				0
	Ack-Nack repetition factor	3				
	CQI Feedback (Table 5.2B.4)	4ms				
	CQI Repetition Factor (Table 5.2B.4)	2				
	Ahs = βhs/βc	30/15				
HSUPA Specific Settings	E-DPDCCH	6	8	8	5	0
	DHARQ	0	0	0	0	0
	AG Index	20	12	15	17	12
	ETFCI (from 34.121 Table C.11.1.3)	75	67	92	71	67
	Associated Max UL Data Rate kbps	242.1	174.9	482.8	205.8	308.9
	Reference E-TFCIs	5	5	2	5	1
	Reference E-TFCI	11	11	11	11	67
	Reference E-TFCI PO	4	4	4	4	18
	Reference E-TFCI	67	67	92	67	67
	Reference E-TFCI PO	18	18	18	18	18
	Reference E-TFCI	71	71	71	71	71
	Reference E-TFCI PO	23	23	23	23	23
	Reference E-TFCI	75	75	75	75	75
	Reference E-TFCI PO	26	26	26	26	26
	Reference E-TFCI	81	81	81	81	81
	Reference E-TFCI PO	27	27	27	27	27
	Maximum Channelization Codes	2xSF2				SF4

DC-HSDPA Setup Procedures used to establish the test signals

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS34.108. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1

Table E.5.0: Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

Table C.8.1.12: Fixed Reference Channel H-Set 12

Parameter	Unit	Value
Nominal Avg. Inf. Bit Rate	kbps	60
Inter-TTI Distance	TTI's	1
Number of HARQ Processes	Processes	6
Information Bit Payload (N_{INF})	Bits	120
Number Code Blocks	Blocks	1
Binary Channel Bits Per TTI	Bits	960
Total Available SML's in UE	SML's	19200
Number of SML's per HARQ Proc.	SML's	3200
Coding Rate		0.15
Number of Physical Channel Codes	Codes	1
Modulation		QPSK
Note 1: The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table.		
Note 2: Maximum number of transmission is limited to 1, i.e., retransmission is not allowed. The redundancy and constellation version 0 shall be used.		

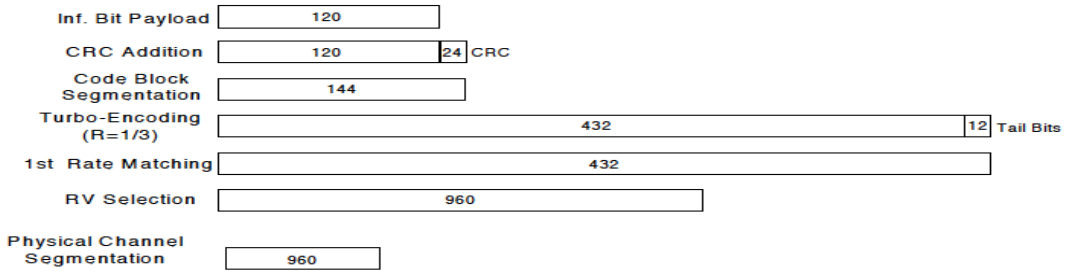


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 8 procedures in section 5.2 of 3GPP TS34.121.
A summary of subtest settings are illustrated below:

	Mode	HSDPA	HSDPA	HSDPA	HSDPA
	Subtest	1	2	3	4
WCDMA General Settings	Loopback Mode	Test Mode 1			
	Rel99 RMC	12.2kbps RMC			
	HSDPA FRC	H-Set 1			
	Power Control Algorithm	Algorithm2			
	βc	2/15	11/15	15/15	15/15
	βd	15/15	15/15	8/15	4/15
	βd (SF)	64			
	βc/βd	2/15	12/15	15/8	15/4
	βhs	4/15	24/15	30/15	30/15
	MPR (dB)	0	0	0.5	0.5
HSDPA Specific Settings	DACK	8			
	DNAK	8			
	DCQI	8			
	Ack-Nack Repetition factor	3			
	CQI Feedback	4ms			
	CQI Repetition Factor	2			
	Ahs = βhs/ βc	30/15			

W-CDMA Band II Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	9262	1852.4	20.7	N/A	22.0
		9400	1880.0	20.7		
		9538	1907.6	20.8		
HSDPA	Subtest 1	9262	1852.4	19.7	0.0	22.0
		9400	1880.0	19.6		
		9538	1907.6	19.6		
	Subtest 2	9262	1852.4	19.1	0.0	22.0
		9400	1880.0	19.2		
		9538	1907.6	19.1		
	Subtest 3	9262	1852.4	18.7	0.5	21.5
		9400	1880.0	18.9		
		9538	1907.6	18.8		
	Subtest 4	9262	1852.4	18.5	0.5	21.5
		9400	1880.0	18.5		
		9538	1907.6	18.7		
HSUPA	Subtest 1	9262	1852.4	19.6	0.0	22.0
		9400	1880.0	19.7		
		9538	1907.6	19.3		
	Subtest 2	9262	1852.4	18.6	2.0	20.0
		9400	1880.0	18.6		
		9538	1907.6	18.4		
	Subtest 3	9262	1852.4	18.6	1.0	21.0
		9400	1880.0	18.0		
		9538	1907.6	18.3		
	Subtest 4	9262	1852.4	19.1	2.0	20.0
		9400	1880.0	19.1		
		9538	1907.6	18.8		
	Subtest 5	9262	1852.4	19.7	0.0	22.0
		9400	1880.0	19.7		
		9538	1907.6	19.7		
DC-HSDPA	Subtest 1	9262	1852.4	19.6	0.0	22.0
		9400	1880.0	19.7		
		9538	1907.6	19.6		
	Subtest 2	9262	1852.4	19.6	0.0	22.0
		9400	1880.0	19.7		
		9538	1907.6	19.7		
	Subtest 3	9262	1852.4	19.2	0.5	21.5
		9400	1880.0	19.1		
		9538	1907.6	19.2		
	Subtest 4	9262	1852.4	19.1	0.5	21.5
		9400	1880.0	19.1		
		9538	1907.6	19.2		

W-CDMA Band IV Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	1312	1712.4	21.6	N/A	23.0
		1413	1732.6	21.9		
		1513	1752.6	21.5		
HSDPA	Subtest 1	1312	1712.4	21.0	0.0	23.0
		1413	1732.6	21.0		
		1513	1752.6	21.0		
	Subtest 2	1312	1712.4	21.0	0.0	23.0
		1413	1732.6	21.2		
		1513	1752.6	21.1		
	Subtest 3	1312	1712.4	21.1	0.5	22.5
		1413	1732.6	21.0		
		1513	1752.6	21.1		
	Subtest 4	1312	1712.4	21.0	0.5	22.5
		1413	1732.6	21.2		
		1513	1752.6	21.2		
HSUPA	Subtest 1	1312	1712.4	20.5	0.0	23.0
		1413	1732.6	20.6		
		1513	1752.6	20.5		
	Subtest 2	1312	1712.4	20.1	2.0	21.0
		1413	1732.6	20.0		
		1513	1752.6	20.1		
	Subtest 3	1312	1712.4	20.0	1.0	22.0
		1413	1732.6	20.0		
		1513	1752.6	20.0		
	Subtest 4	1312	1712.4	20.4	2.0	21.0
		1413	1732.6	20.4		
		1513	1752.6	20.5		
	Subtest 5	1312	1712.4	21.0	0.0	23.0
		1413	1732.6	21.0		
		1513	1752.6	21.1		
DC-HSDPA	Subtest 1	1312	1712.4	21.1	0.0	23.0
		1413	1732.6	21.2		
		1513	1752.6	21.0		
	Subtest 2	1312	1712.4	21.0	0.0	23.0
		1413	1732.6	21.2		
		1513	1752.6	21.0		
	Subtest 3	1312	1712.4	21.1	0.5	22.5
		1413	1732.6	21.1		
		1513	1752.6	21.1		
	Subtest 4	1312	1712.4	21.2	0.5	22.5
		1413	1732.6	21.2		
		1513	1752.6	21.2		

W-CDMA Band V Measured Results

Mode		UL Ch No.	Freq. (MHz)	Maximum Average Power (dBm)		
				Measured Pwr	MPR	Tune-up Limit
Release 99	Rel 99 (RMC, 12.2 kbps)	4132	826.4	23.1	N/A	24.0
		4183	836.6	23.1		
		4233	846.6	23.1		
HSDPA	Subtest 1	4132	826.4	22.4	0.0	24.0
		4183	836.6	22.4		
		4233	846.6	22.4		
	Subtest 2	4132	826.4	21.6	0.0	24.0
		4183	836.6	21.6		
		4233	846.6	21.6		
	Subtest 3	4132	826.4	20.8	0.5	23.5
		4183	836.6	20.6		
		4233	846.6	20.7		
	Subtest 4	4132	826.4	20.5	0.5	23.5
		4183	836.6	20.5		
		4233	846.6	20.5		
HSUPA	Subtest 1	4132	826.4	22.0	0.0	24.0
		4183	836.6	22.3		
		4233	846.6	22.0		
	Subtest 2	4132	826.4	21.2	2.0	22.0
		4183	836.6	21.2		
		4233	846.6	21.3		
	Subtest 3	4132	826.4	21.2	1.0	23.0
		4183	836.6	21.2		
		4233	846.6	21.2		
	Subtest 4	4132	826.4	21.5	2.0	22.0
		4183	836.6	21.9		
		4233	846.6	21.4		
	Subtest 5	4132	826.4	22.5	0.0	24.0
		4183	836.6	22.5		
		4233	846.6	22.3		
DC-HSDPA	Subtest 1	4132	826.4	22.4	0.0	24.0
		4183	836.6	22.5		
		4233	846.6	22.4		
	Subtest 2	4132	826.4	21.7	0.0	24.0
		4183	836.6	21.6		
		4233	846.6	21.7		
	Subtest 3	4132	826.4	20.8	0.5	23.5
		4183	836.6	20.6		
		4233	846.6	20.7		
	Subtest 4	4132	826.4	20.4	0.5	23.5
		4183	836.6	20.4		
		4233	846.6	20.4		

9.2. LTE

The following tests were conducted according to the test requirements outlined in section 6.2 of the 3GPP TS36.101 specification.

UE Power Class: 3 (23 +/- 2dBm). The allowed Maximum Power Reduction (MPR) for the maximum output power due to higher order modulation and transmit bandwidth configuration (resource blocks) is specified in Table 6.2.3-1 of the 3GPP TS36.101.

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 1, 2 and 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2
64 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 2
64 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 3
256 QAM	≥ 1						≤ 5

The allowed A-MPR values specified below in Table 6.2.4.-1 of 3GPP TS36.101 are in addition to the allowed MPR requirements. All the measurements below were performed with A-MPR disabled, by using Network Signaling Value of "NS_01".

Table 6.2.4-1: Additional Maximum Power Reduction (A-MPR)

Network Signalling value	Requirements (subclause)	E-UTRA Band	Channel bandwidth (MHz)	Resources Blocks (N_{RB})	A-MPR (dB)
NS_01	6.6.2.1.1	Table 5.5-1	1.4, 3, 5, 10, 15, 20	Table 5.6-1	N/A
NS_03	6.6.2.2.1	2, 4,10, 23, 25, 35, 36, 66, 70	3	>5	≤ 1
			5	>6	≤ 1
			10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.2.2.2, 6.6.3.3.19	41	5, 10, 15, 20	Table 6.2.4-4, Table 6.2.4-4a	
NS_05	6.6.3.3.1	1	10,15,20	≥ 50 (NOTE1)	≤ 1 (NOTE1)
			15, 20	Table 6.2.4-18 (NOTE2)	
		65 (NOTE 3)	10,15,20	≥ 50	≤ 1 (NOTE 1)
			15,20	Table 6.2.4-18 (NOTE 2)	
NS_06	6.6.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 5.6-1	N/A
NS_07	6.6.2.2.3 6.6.3.3.2	13	10	Table 6.2.4-2	
NS_08	6.6.3.3.3	19	10, 15	> 44	≤ 3
NS_09	6.6.3.3.4	21	10, 15	> 40	≤ 1
				> 55	≤ 2
NS_10		20	15, 20	Table 6.2.4-3	
NS_11	6.6.2.2.1 6.6.3.3.13	23	1.4, 3, 5, 10, 15, 20	Table 6.2.4-5	
NS_12	6.6.3.3.5	26	1.4, 3, 5, 10, 15	Table 6.2.4-6	
NS_13	6.6.3.3.6	26	5	Table 6.2.4-7	
NS_14	6.6.3.3.7	26	10, 15	Table 6.2.4-8	
NS_15	6.6.3.3.8	26	1.4, 3, 5, 10, 15	Table 6.2.4-9 Table 6.2.4-10	
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11, Table 6.2.4-12, Table 6.2.4-13	
NS_17	6.6.3.3.10	28	5, 10	Table 5.6-1	N/A
NS_18	6.6.3.3.11	28	5	≥ 2	≤ 1
			10, 15, 20	≥ 1	≤ 4
NS_19	6.6.3.3.12	44	10, 15, 20	Table 6.2.4-14	
NS_20	6.2.2 6.6.2.2.1 6.6.3.3.14	23	5, 10, 15, 20	Table 6.2.4-15	
NS_21	6.6.2.2.1 6.6.3.3.15	30	5, 10	Table 6.2.4-16	
NS_22	6.6.3.3.16	42, 43	5, 10, 15, 20	Table 6.2.4-17	
NS_23	6.6.3.3.17	42, 43	5, 10, 15, 20	N/A	
NS_24	6.6.3.3.20	65 (NOTE 4)	5, 10, 15, 20	Table 6.2.4-19	
NS_25	6.6.3.3.21	65 (NOTE 4)	5, 10, 15, 20	Table 6.2.4-20	
NS_26	6.6.3.3.22	68	10, 15	Table 6.2.4-21	
NS_27	6.6.2.2.5, 6.6.3.3.23	48	5, 10, 15, 20	Table 6.2.4-22	
NS_28	6.2.2A, 6.6.3.3.24	46 (NOTE 5)	20	Table 6.2.4-23	
NS_29	6.2.2A, 6.6.2.3.1a, 6.6.3.3.25	46 (NOTE 5)	20	Table 6.2.4-24	
NS_30	6.2.2A, 6.6.3.3.26	46 (NOTE 5)	20	Table 6.2.4-25	
NS_31	6.2.2A, 6.6.3.3.27	46 (NOTE 5)	20	Table 6.2.4-26	
NS_32	-	-	-	-	-

NOTE 1: Applicable when the lower edge of the assigned E-UTRA UL channel bandwidth frequency is larger than or equal to the upper edge of PHS band (1915.7 MHz) + 4 MHz + the channel BW assigned, where channel BW is as defined in subclause 5.6. A-MPR for

LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				18700	18900	19100	MPR	Tune-up Limit
				1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	21.0	20.8	20.7	0.0	21.5
		1	49	20.7	20.8	20.7	0.0	21.5
		1	99	20.6	21.0	20.8	0.0	21.5
		50	0	19.8	19.7	19.7	1.0	20.5
		50	24	19.7	19.8	19.7	1.0	20.5
		50	50	19.6	19.9	19.6	1.0	20.5
		100	0	19.8	19.7	19.7	1.0	20.5
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				18675.0	18900.0	19125.0	MPR	Tune-up Limit
				1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	21.0	21.2	21.0	0.0	21.5
		1	37	21.0	21.1	21.0	0.0	21.5
		1	74	20.9	21.1	21.0	0.0	21.5
		36	0	20.0	20.2	19.9	1.0	20.5
		36	20	20.0	20.2	19.8	1.0	20.5
		36	39	19.9	20.2	20.0	1.0	20.5
		75	0	20.1	20.2	19.9	1.0	20.5
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)				
				18650.0	18900.0	19150.0	MPR	Tune-up Limit
				1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	21.2	21.1	21.0	0.0	21.5
		1	25	21.2	21.3	20.9	0.0	21.5
		1	49	21.1	21.4	21.3	0.0	21.5
		25	0	20.2	20.0	19.9	1.0	20.5
		25	12	20.2	20.1	19.9	1.0	20.5
		25	25	20.1	20.1	19.9	1.0	20.5
		50	0	20.1	20.0	20.0	1.0	20.5

Note(s):

Device supports LTE UE Category 1 only. Therefore, 16QAM only supports channel bandwidths up to 5MHz per Table A.2.2.1.2-1 of 3GPP TS 36.101.

LTE Band 2 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18625.0	18900.0	19175.0		
				1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	20.7	20.8	20.8	0.0	21.5
		1	12	20.7	21.0	21.1	0.0	21.5
		1	24	20.8	21.1	21.0	0.0	21.5
		12	0	19.9	19.9	19.8	1.0	20.5
		12	7	19.9	20.0	19.9	1.0	20.5
		12	13	20.0	20.1	20.0	1.0	20.5
		25	0	20.1	20.1	19.8	1.0	20.5
	16QAM	1	0	19.9	19.6	19.4	1.0	20.5
		1	12	20.0	19.9	19.5	1.0	20.5
		1	24	20.1	19.7	20.0	1.0	20.5
		12	0	18.9	18.9	18.8	2.0	19.5
		12	7	18.9	18.9	18.8	2.0	19.5
		12	13	18.8	18.9	18.9	2.0	19.5
		25	0	18.9	18.9	18.9	2.0	19.5
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18615.0	18900.0	19185.0		
				1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	21.1	21.0	21.1	0.0	21.5
		1	8	21.0	21.1	21.1	0.0	21.5
		1	14	21.0	21.1	21.1	0.0	21.5
		8	0	20.0	20.1	20.0	1.0	20.5
		8	4	19.9	20.1	20.0	1.0	20.5
		8	7	20.0	20.1	19.9	1.0	20.5
		15	0	20.0	20.1	19.9	1.0	20.5
	16QAM	1	0	19.8	20.1	20.0	1.0	20.5
		1	8	20.2	20.2	19.9	1.0	20.5
		1	14	19.9	19.8	20.0	1.0	20.5
		8	0	18.9	18.7	18.9	2.0	19.5
		8	4	19.0	18.7	18.9	2.0	19.5
		8	7	19.2	18.7	19.0	2.0	19.5
		15	0	19.0	18.8	19.0	2.0	19.5
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18607.0	18900.0	19193.0		
				1850.7 MHz	1880 MHz	1909.3 MHz		
1.4 MHz	QPSK	1	0	21.2	21.1	21.1	0.0	21.5
		1	3	21.3	21.2	21.2	0.0	21.5
		1	5	21.1	21.2	21.1	0.0	21.5
		3	0	21.2	21.1	21.1	0.0	21.5
		3	1	21.2	21.2	21.1	0.0	21.5
		3	3	21.2	21.3	21.0	0.0	21.5
		6	0	20.2	20.2	20.0	1.0	20.5
	16QAM	1	0	20.0	20.0	19.9	1.0	20.5
		1	3	20.0	20.1	20.3	1.0	20.5
		1	5	19.9	20.1	19.9	1.0	20.5
		3	0	20.1	20.5	20.2	1.0	20.5
		3	1	20.0	20.5	20.2	1.0	20.5
		3	3	20.1	20.5	20.3	1.0	20.5
		6	0	19.0	19.3	19.1	2.0	19.5

LTE Band 4 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	20175	[redacted]		
					1732.5 MHz			
20 MHz	QPSK	1	0		22.6		0.0	23.5
		1	49		22.5		0.0	23.5
		1	99		22.1		0.0	23.5
		50	0		21.3		1.0	22.5
		50	24		21.2		1.0	22.5
		50	50		21.1		1.0	22.5
		100	0		21.6		1.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20025.0	20175.0	20325.0		
				1717.5 MHz	1732.5 MHz	1747.5 MHz		
15 MHz	QPSK	1	0	21.6	22.4	22.3	0.0	23.5
		1	37	21.8	22.3	22.2	0.0	23.5
		1	74	22.0	22.0	22.4	0.0	23.5
		36	0	20.6	21.0	20.8	1.0	22.5
		36	20	20.7	20.9	20.8	1.0	22.5
		36	39	20.7	20.9	20.9	1.0	22.5
		75	0	20.7	20.8	20.8	1.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20000.0	20175.0	20350.0		
				1715 MHz	1732.5 MHz	1750 MHz		
10 MHz	QPSK	1	0	22.0	22.1	22.0	0.0	23.5
		1	25	22.0	22.1	22.2	0.0	23.5
		1	49	22.1	22.0	22.4	0.0	23.5
		25	0	20.8	20.8	20.9	1.0	22.5
		25	12	20.7	20.8	21.0	1.0	22.5
		25	25	20.8	20.8	21.0	1.0	22.5
		50	0	20.8	20.9	20.9	1.0	22.5

Note(s):

1. 20 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.
2. Device supports LTE UE Category 1 only. Therefore, 16QAM only supports channel bandwidths up to 5MHz per Table A.2.2.1.2-1 of 3GPP TS 36.101.

LTE Band 4 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				19975.0	20175.0	20375.0		
				1712.5 MHz	1732.5 MHz	1752.5 MHz		
5 MHz	QPSK	1	0	21.5	21.7	22.1	0.0	23.5
		1	12	21.7	21.9	22.0	0.0	23.5
		1	24	21.6	21.9	22.3	0.0	23.5
		12	0	20.7	20.9	20.8	1.0	22.5
		12	7	20.7	20.9	21.0	1.0	22.5
		12	13	20.7	20.9	21.1	1.0	22.5
		25	0	20.7	20.9	20.8	1.0	22.5
	16QAM	1	0	20.6	20.6	20.5	1.0	22.5
		1	12	20.5	20.5	20.5	1.0	22.5
		1	24	20.7	20.6	21.1	1.0	22.5
		12	0	19.6	19.8	19.7	2.0	21.5
		12	7	19.6	19.9	19.7	2.0	21.5
		12	13	19.8	19.9	19.9	2.0	21.5
		25	0	19.9	19.9	20.0	2.0	21.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				19965.0	20175.0	20385.0		
				1711.5 MHz	1732.5 MHz	1753.5 MHz		
3 MHz	QPSK	1	0	22.0	21.9	21.8	0.0	23.5
		1	8	21.7	21.9	21.9	0.0	23.5
		1	14	22.0	21.8	22.1	0.0	23.5
		8	0	20.6	20.8	20.8	1.0	22.5
		8	4	20.6	20.8	20.8	1.0	22.5
		8	7	20.7	20.8	20.9	1.0	22.5
		15	0	20.7	21.0	21.0	1.0	22.5
	16QAM	1	0	20.5	20.8	20.8	1.0	22.5
		1	8	20.9	20.6	20.7	1.0	22.5
		1	14	20.5	20.5	20.8	1.0	22.5
		8	0	19.8	20.1	19.7	2.0	21.5
		8	4	19.9	19.9	19.8	2.0	21.5
		8	7	19.8	19.8	20.0	2.0	21.5
		15	0	19.8	20.0	19.9	2.0	21.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				19957.0	20175.0	20393.0		
				1710.7 MHz	1732.5 MHz	1754.3 MHz		
1.4 MHz	QPSK	1	0	21.9	22.0	22.0	0.0	23.5
		1	3	22.0	22.1	22.0	0.0	23.5
		1	5	21.8	21.9	22.1	0.0	23.5
		3	0	21.9	21.9	22.1	0.0	23.5
		3	1	21.9	22.0	22.1	0.0	23.5
		3	3	21.9	22.1	22.1	0.0	23.5
		6	0	20.7	20.9	21.0	1.0	22.5
	16QAM	1	0	20.8	21.1	20.8	1.0	22.5
		1	3	20.8	21.2	20.9	1.0	22.5
		1	5	20.8	21.0	20.8	1.0	22.5
		3	0	21.0	21.2	20.7	1.0	22.5
		3	1	20.9	21.2	20.8	1.0	22.5
		3	3	20.9	21.0	20.9	1.0	22.5
		6	0	19.9	20.3	19.8	2.0	21.5

LTE Band 12 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23095	[redacted]		
					707.5 MHz			
10 MHz	QPSK	1	0		22.6		0.0	23.5
		1	25		22.9		0.0	23.5
		1	49		22.6		0.0	23.5
		25	0		21.7		1.0	22.5
		25	12		21.7		1.0	22.5
		25	25		21.7		1.0	22.5
		50	0		21.8		1.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23035.0	23095.0	23155.0		
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	22.4	22.8	22.5	0.0	23.5
		1	12	22.5	23.1	22.6	0.0	23.5
		1	24	22.4	22.7	22.5	0.0	23.5
		12	0	21.8	21.7	21.6	1.0	22.5
		12	7	21.6	21.8	21.6	1.0	22.5
		12	13	21.4	21.8	21.7	1.0	22.5
		25	0	21.6	21.8	21.7	1.0	22.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23025.0	23095.0	23165.0		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	22.7	22.7	22.5	0.0	23.5
		1	8	22.8	22.7	22.5	0.0	23.5
		1	14	22.6	22.6	22.8	0.0	23.5
		8	0	21.6	21.7	21.6	1.0	22.5
		8	4	21.7	21.7	21.5	1.0	22.5
		8	7	21.5	21.6	21.6	1.0	22.5
		15	0	21.6	21.7	21.6	1.0	22.5
	16QAM	1	0	21.7	21.8	21.4	1.0	22.5
		1	8	21.8	21.9	21.1	1.0	22.5
		1	14	21.5	21.7	21.4	1.0	22.5
		8	0	21.0	21.0	20.6	2.0	21.5
		8	4	21.0	21.0	20.6	2.0	21.5
		8	7	20.8	21.0	20.7	2.0	21.5
		15	0	20.8	20.7	20.6	2.0	21.5

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23017.0	23095.0	23173.0		
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	22.6	22.6	22.4	0.0	23.5
		1	3	22.6	22.6	22.8	0.0	23.5
		1	5	22.6	22.6	22.7	0.0	23.5
		3	0	22.6	22.5	22.6	0.0	23.5
		3	1	22.6	22.6	22.7	0.0	23.5
		3	3	22.6	22.5	22.6	0.0	23.5
		6	0	21.7	21.6	21.7	1.0	22.5
	16QAM	1	0	21.3	21.9	21.4	1.0	22.5
		1	3	21.6	22.1	21.6	1.0	22.5
		1	5	21.4	22.0	21.7	1.0	22.5
		3	0	21.2	21.9	21.7	1.0	22.5
		3	1	21.3	21.9	21.8	1.0	22.5
		3	3	21.4	21.9	21.8	1.0	22.5
		6	0	20.7	20.9	20.7	2.0	21.5

Note(s):

1. 10 MHz Bandwidths does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing per KDB 941225 D05 SAR for LTE Devices.
2. Device supports LTE UE Category 1 only. Therefore, 16QAM only supports channel bandwidths up to 5MHz per Table A.2.2.1.2-1 of 3GPP TS 36.101.

10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN = Measured SAR *Tune-up Scaling Factor

KDB 447498 D01 General RF Exposure Guidance:

Testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:

- ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
- ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz
- ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 941225 D01 SAR test for 3G devices:

When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the secondary mode

KDB 941225 D05 SAR for LTE Devices:

SAR test reduction is applied using the following criteria:

- Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB, and 50% RB allocation, using the RB offset and required test channel combination with the highest maximum output power among RB offsets at the upper edge, middle and lower edge of each required test channel.
- When the reported SAR is > 0.8 W/kg, testing for other Channels is performed at the highest output power level for 1RB, and 50% RB configuration for that channel.
- Testing for 100% RB configuration is performed at the highest output power level for 100% RB configuration across the Low, Mid and High Channel when the highest reported SAR for 1 RB and 50% RB are > 0.8 W/kg. Testing for the remaining required channels is not needed because the reported SAR for 100% RB Allocation < 1.45 W/kg.
- Testing for 16-QAM modulation is not required because the reported SAR for QPSK is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of QPSK.
- Testing for the other channel bandwidths is not required because the reported SAR for the highest channel bandwidth is < 1.45 W/Kg and its output power is not more than 0.5 dB higher than that of the highest channel bandwidth.
- For LTE bands that do not support at least three non-overlapping channels in certain channel bandwidths, test the available non-overlapping channels instead. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing; therefore, the requirement for H, M and L channels may not fully apply.

10.1. W-CDMA Band II

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN2)	Next to Mouth	Rel 99 RMC 12.2 kbps	10	Front	9262	1852.4	22.0	20.7	0.915	**1.229**	1
REV 2 (SN2)					9400	1880.0	22.0	20.7	0.779	1.051	
REV 2 (SN2)					9538	1907.6	22.0	20.8	0.701	0.924	

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN2)	Extremity	Rel 99 RMC 12.2 kbps	0	Rear	9400	1880.0	22.0	20.7	1.090	1.470	
REV 2 (SN2)				Front	9400	1880.0	22.0	20.7	1.310	**1.767**	2
REV 2 (SN2)				Edge 2	9400	1880.0	22.0	20.7	1.030	1.389	
REV 2 (SN2)				Edge 3	9400	1880.0	22.0	20.7	0.143	0.193	
REV 2 (SN2)				Edge 4	9400	1880.0	22.0	20.7	0.988	1.333	

10.2. WCDMA Band IV

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Next to Mouth	Rel 99 RMC 12.2 kbps	10	Front	1312	1712.4	23.0	21.6	0.664	0.919	
REV 2 (SN3)					1413	1732.6	23.0	21.9	0.738	0.957	
REV 2 (SN3)					1513	1752.6	23.0	21.5	0.844	**1.200**	3

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Extremity	Rel 99 RMC 12.2 kbps	0	Rear	1312	1712.4	23.0	21.6	1.330	1.840	
REV 2 (SN3)					1413	1732.6	23.0	21.9	1.500	1.946	
REV 2 (SN3)					1513	1752.6	23.0	21.5	1.630	**2.318**	4
REV 2 (SN3)				Front	1413	1732.6	23.0	21.9	1.140	1.479	
REV 2 (SN3)				Edge 2	1413	1732.6	23.0	21.9	0.936	1.214	
REV 2 (SN3)				Edge 3	1413	1732.6	23.0	21.9	0.101	0.131	
REV 2 (SN3)				Edge 4	1413	1732.6	23.0	21.9	1.180	1.531	

10.3. WCDMA Band V

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Next to Mouth	Rel 99 RMC 12.2 kbps	10	Front	4132	926.4	24.0	23.1	0.737	0.907	
REV 2 (SN3)					4183	836.6	24.0	23.1	0.870	**1.080**	5
REV 2 (SN3)					4233	846.6	24.0	23.1	0.773	0.953	

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		10-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Extremity	Rel 99 RMC 12.2 kbps	0	Rear	4183	836.6	24.0	23.1	0.861	1.069	
REV 2 (SN3)				Front	4183	836.6	24.0	23.1	1.090	**1.353**	6
REV 2 (SN3)				Edge 2	4183	836.6	24.0	23.1	0.632	0.785	
REV 2 (SN3)				Edge 3	4183	836.6	24.0	23.1	0.444	0.551	
REV 2 (SN3)				Edge 4	4183	836.6	24.0	23.1	0.310	0.385	

10.4. LTE Band 2 (20MHz Bandwidth)

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Next to Mouth	QPSK	10	Front	18700	1860.0	1	0	21.5	21.0	1.210	**1.355**	7
REV 2 (SN3)							50	0	20.5	19.8	0.890	1.050	
REV 2 (SN3)							100	0	20.5	19.8	0.864	1.027	
REV 2 (SN2)					18900	1880.0	1	99	21.5	21.0	0.914	1.033	
REV 2 (SN2)							50	50	20.5	19.9	0.725	0.829	
REV 2 (SN3)					19100	1900.0	1	99	21.5	20.8	0.802	0.940	
REV 2 (SN3)							50	0	20.5	19.7	0.730	0.876	

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN2)	Extremity	QPSK	0	Rear	18900	1880.0	1	99	21.5	21.0	1.050	1.186	
REV 2 (SN2)							50	50	20.5	19.9	0.874	0.999	
REV 2 (SN2)				Front	18900	1880.0	1	99	21.5	21.0	1.210	**1.367**	8
REV 2 (SN2)							50	50	20.5	19.9	1.040	1.189	
REV 2 (SN2)				Edge 2	18900	1880.0	1	99	21.5	21.0	0.830	0.938	
REV 2 (SN2)							50	50	20.5	19.9	0.674	0.770	
REV 2 (SN2)				Edge 3	18900	1880.0	1	99	21.5	21.0	0.145	0.164	
REV 2 (SN2)							50	50	20.5	19.9	0.112	0.128	
REV 2 (SN3)				Edge 4	18900	1880.0	1	99	21.5	21.0	0.974	1.100	
REV 2 (SN2)							50	50	20.5	19.9	0.781	0.893	

10.5. LTE Band 4 (20MHz Bandwidth)

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Next to Mouth	QPSK	10	Front	20175	1732.5	1	0	23.5	22.6	0.806	**0.989**	9
REV 2 (SN3)							50	0	22.5	21.3	0.660	0.862	
REV 2 (SN3)							100	0	22.5	21.6	0.629	0.769	

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Extremity	QPSK	0	Rear	20175	1732.5	1	0	23.5	22.6	1.380	**1.694**	10
REV 2 (SN3)							50	0	22.5	21.3	1.150	1.502	
REV 2 (SN3)				Front	20175	1732.5	1	0	23.5	22.6	1.310	1.608	
REV 2 (SN3)							50	0	22.5	21.3	1.090	1.424	
REV 2 (SN3)				Edge 2	20175	1732.5	1	0	23.5	22.6	1.120	1.375	
REV 2 (SN3)							50	0	22.5	21.3	0.874	1.142	
REV 2 (SN3)				Edge 3	20175	1732.5	1	0	23.5	22.6	0.103	0.126	
REV 2 (SN3)							50	0	22.5	21.3	0.076	0.099	
REV 2 (SN3)				Edge 4	20175	1732.5	1	0	23.5	22.6	1.320	1.620	
REV 2 (SN3)							50	0	22.5	21.3	1.060	1.385	

10.6. LTE Band 12 (10MHz Bandwidth)

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN2)	Next to Mouth	QPSK	10	Front	23095	707.5	1	25	23.5	22.6	0.759	**0.927**	11
REV 2 (SN2)							25	12	22.5	21.7	0.559	0.667	

Sample No.	RF Exposure Conditions	Mode	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		10-g SAR (W/kg)		Plot No.
									Tune-up Limit	Meas.	Meas.	Scaled	
REV 2 (SN3)	Extremity	QPSK	0	Rear	23095	707.5	1	25	23.5	22.6	1.020	1.246	
REV 2 (SN3)							25	12	22.5	21.7	0.808	0.965	
REV 2 (SN3)				Front	23095	707.5	1	25	23.5	22.6	1.060	1.295	
REV 2 (SN3)							25	12	22.5	21.7	0.780	0.931	
REV 2 (SN3)				Edge 2	23095	707.5	1	25	23.5	22.6	0.753	0.920	
REV 2 (SN3)							25	12	22.5	21.7	0.549	0.655	
REV 2 (SN3)				Edge 3	23095	707.5	1	25	23.5	22.6	0.426	0.520	
REV 2 (SN3)							25	12	22.5	21.7	0.321	0.383	
REV 2 (SN3)				Edge 4	23095	707.5	1	25	23.5	22.6	1.140	**1.393**	12
REV 2 (SN3)							25	12	22.5	21.7	0.957	1.143	

10.7. Standalone SAR Test Exclusion Considerations & Estimated SAR

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:

[(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√f(GHz)] ≤ 3.0, for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

- $f_{(GHz)}$ is the RF channel transmit frequency in GHz
- Power and distance are rounded to the nearest mW and mm before calculation
- The result is rounded to one decimal place for comparison

The test exclusions are applicable only when the minimum test separation distance is ≤ 50 mm and for transmission frequencies between 100 MHz and 6 GHz. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

When the standalone SAR test exclusion is applied to an antenna that transmits simultaneously with other antennas, the standalone SAR must be estimated according to following to determine simultaneous transmission SAR test exclusion:

- *(max. power of channel, including tune-up tolerance, mW) / (min. test separation distance, mm)]·[√$f_{(GHz)}$/x]* W/kg for test separation distances ≤ 50 mm;
  where x = 7.5 for 1-g SAR, and x = 18.75 for 10-g SAR.
- 0.4 W/kg for 1-g SAR and 1.0 W/kg for 10-g SAR, when the test separation distances is > 50 mm.

RF Air interface	RF Exposure Conditions	Frequency (GHz)	Max. tune-up tolerance Power		Min. test separation distance (mm)	SAR test exclusion Result*
			(dBm)	(mW)		
ISM	Head	0.915	0.0	1	10	0.1
ISM	Handheld	0.915	0.0	1	5	0.2

Conclusion:

*: The computed head value is ≤ 3; therefore, this qualifies for Standalone SAR test exclusion.

*: The computed handheld value is ≤ 7.5; therefore, this qualifies for Standalone SAR test exclusion.

11. SAR Measurement Variability

In accordance with published RF Exposure KDB 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is <0.8 or 2 W/kg (1-g or 10-g respectively); steps 2) through 4) do not apply.
2) When the original highest measured SAR is ≥ 0.8 or 2 W/kg (1-g or 10-g respectively), repeat that measurement once.
3) Perform a second repeated measurement only if the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20 or when the original or repeated measurement is ≥ 1.45 or 3.6 W/kg (~ 10% from the 1-g or 10-g respective SAR limit).
4) Perform a third repeated measurement only if the original, first, or second repeated measurement is ≥ 1.5 or 3.75 W/kg (1-g or 10-g respectively) and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

Frequency Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	Repeated SAR (Yes/No)	Highest Measured SAR (W/kg)	First	
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio
700	LTE Band 12	Next to Mouth	Front	No	0.759	N/A	N/A
850	WCDMA Band V	Next to Mouth	Front	Yes	0.870	0.867	1.00
1700	LTE Band 4	Next to Mouth	Front	No	0.806	N/A	N/A
	WCDMA Band IV	Next to Mouth	Front	Yes	0.844	0.807	1.05
1900	LTE Band 2	Next to Mouth	Front	Yes	1.210	1.150	1.05
	WCDMA Band II	Next to Mouth	Front	No	0.915	N/A	N/A

Note(s):
Second Repeated Measurement is not required since the ratio of the largest to smallest SAR for the original and first repeated measurement is < 1.20.

12. Simultaneous Transmission Conditions

The DUT does not support simultaneous transmission.

Appendixes

Refer to separated files for the following appendixes.

Appendix A: SAR Setup Photos

Appendix B: SAR System Check Plots

Appendix C: SAR Highest Test Plots

Appendix D: SAR Tissue Ingredients

Appendix E: SAR Probe Certificates

Appendix F: SAR Dipole Certificates

END OF REPORT