

SAR EVALUATION REPORT

FCC 47 CFR § 2.1093 IEEE Std 1528-2013

For Body worn, Cellular and GNSS enabled MPERS

FCC ID: 2AGPI-EC21A Model Names: MA01 and ANH0318-01

Report Number: 12040492-S1V3 Issue Date: 6/28/2018

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Revision History

Rev.	Date	Revisions	Revised By
V1	6/19/2018	Initial Issue	
V2	6/26/2018	Section 1 – Corrected equipment class	Dave Weaver
V3	6/28/2018	Section 6.3 – Corrected 'Appendix 1' to 'Appendix A'	Dave Weaver

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1. Attestation of Test Results

Applicant Name	Anelto Inc.					
FCC ID	2AGPI-EC21A					
Model Name	MA01 and ANH031	3-01				
Applicable Standards	FCC 47 CFR § 2.1093 Published RF exposure KDB procedures IEEE Std 1528-2013					
		SAR Limi	its (W/Kg)			
Exposure Category	Peak spatial-average(1g of tissue) Extremities (hands, wrists, ankles, etc.) (10g of tissue)					
General population / Uncontrolled exposure	1.	6		1		
PE Expectite Conditions	Equipment Class - Highest Reported SAR (W/kg)					
RF Exposure Conditions	PCB	DTS	NII	DSS		
Next to Mouth	0.376					
Body-worn	1.393 N/A		N/A	N/A		
Simultaneous TX	N/A					
Date Tested	5/14/2018 to 5/19/2018					
Test Results	Pass					

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. 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 any government (NIST Handbook 150, Annex A). This report is written to support regulatory compliance of the applicable standards stated above.

Approved & Released By:	Prepared By:
All.	Celles Sund
Dave Weaver	Coltyce Sanders
Operations Leader	Test Engineer
UL Verification Services Inc.	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, the following FCC Published RF exposure KDB procedures:

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

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 F	
SAR Lab G	
SAR Lab H	

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

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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, ADconversion, 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
		•	

	\leq 3 GHz	> 3 GHz		
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	$5 \pm 1 \text{ mm}$	$\frac{1}{2} \cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$		
Maximum probe angle from probe axis to phantom surface normal at the measurement location	$30^{\circ}\pm1^{\circ}$	$20^\circ\pm1^\circ$		
	\leq 2 GHz: \leq 15 mm 2 - 3 GHz: \leq 12 mm	$\begin{array}{l} 3-4 \ \mathrm{GHz:} \leq 12 \ \mathrm{mm} \\ 4-6 \ \mathrm{GHz:} \leq 10 \ \mathrm{mm} \end{array}$		
Maximum area scan spatial resolution: Δx_{Area} , Δy_{Area}	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 \leq 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 t	from KDB	865664	D01	SAR I	Measurement	100	MHz to 6	3 GHz
--	------	------	------------	-------------	----------	--------	-----	-------	-------------	-----	----------	-------

			\leq 3 GHz	\leq 3 GHz > 3 GHz		
Maximum zoom scan spatial resolution: Δx_{Zoom} , Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 - 3 GHz: ≤ 5 mm [*]	$3 - 4 \text{ GHz:} \le 5 \text{ mm}^*$ $4 - 6 \text{ GHz:} \le 4 \text{ mm}^*$		
	uniform grid: $\Delta z_{Zoom}(n)$		\leq 5 mm	$3 - 4$ GHz: ≤ 4 mm $4 - 5$ GHz: ≤ 3 mm $5 - 6$ GHz: ≤ 2 mm		
Maximum zoom scan spatial resolution, normal to phantom surface	graded	$\Delta z_{Zoom}(1)$: between 1 st two points closest to phantom surface	\leq 4 mm	$3 - 4$ GHz: ≤ 3 mm $4 - 5$ GHz: ≤ 2.5 mm $5 - 6$ GHz: ≤ 2 mm		
	grid ∆ b p	∆z _{Zoom} (n>1): between subsequent points	$\leq 1.5 \cdot \Delta z_{\text{Zoom}}(n-1)$			
Minimum zoom scan volume x, y, z			\geq 30 mm	$3 - 4$ GHz: ≥ 28 mm $4 - 5$ GHz: ≥ 25 mm $5 - 6$ GHz: ≥ 22 mm		
			an na lo la la la			

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 <u>reported</u> SAR from the area scan based 1-g SAR estimation procedures of KDB 447498 is \leq 1.4 W/kg, \leq 8 mm, \leq 7 mm and \leq 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.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be larger than the step size in Z-direction.

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
Network Analyzer	Agilent	8753ES	MY40001647	9/15/2018
Dielectric Probe kit	SPEAG	DAK-3.5	1087	11/14/2018
Shorting block	SPEAG	DAK-3.5 Short	SM DAK 200 BA	11/14/2018
Thermometer	Traceable Calibration Control Co.	4242	122529162	12/8/2018

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
Synthesized Signal Generator	Agilent	N5181A	MY50140610	5/31/2018
Power Meter	Agilent	N1912A	MY5519600	7/14/2018
Power Sensor	Agilent	N1912A	MY52260009	1/8/2019
Power Sensor	Agilent	N1912A	MY53020038	4/23/2019
Amplifier	MITEQ	AMF-4D-00400600-50-30P	1795093	N/A
Directional coupler	Werlatone	C8060-102	2149	N/A
DC Power Supply	HP	6296A	2841A-05955	N/A

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
E-Field Probe (SAR Lab G)	SPEAG	EX3DV4	3871	8/23/2018
Data Acquisition Electronics (SAR Lab G)	SPEAG	DAE4	1359	2/9/2019
System Validation Dipole	SPEAG	D750V3	1019	3/16/2019
System Validation Dipole	SPEAG	D835V2	4d142	10/12/2018
System Validation Dipole	SPEAG	D1750V2	1077	10/5/2018
System Validation Dipole	SPEAG	D1900V2	5d163	10/5/2018

Other					
Name of Equipment	Manufacturer	Type/Model	T Number	Serial No.	Cal. Due Date
Base Station Simulator	R & S	CMW500	T1871	165411-Ci	2/19/2019

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 \leq 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

	MA01		ANH0318-01	
Device Dimension	(Length x Width x Heig mm	ht): 74 mm x 47.5 mm x 21.5	(Length x Width x Height): 73 mm x 47 mm x 18 mm	
Back Cover	Normal Battery Cover			
Battery Options	🛛 Standard – Lithium-p	oolymer battery, Rating 3.7Vdc, 2.8	Wh	
Wireless Router (Hotspot)	Not Supported			
Wi-Fi Direct	Not Supported			
	S/N	IMEI	Notes	
Test sample information	SMS000106	861108033412825	Conducted Unit	
	Photon	N/A	Radiated Unit	
Hardware Version	Rev 2			
Software Version	V5.10			

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. 9)	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)
	Does this device support SV-L	TE (1xRTT-LTE)? □ Yes ⊠ No	

6.3. Test Rational

The DUT is available in two models: MA01 and ANH0318-01. Each model uses the same PCB assembly and antenna. The only difference between the models is the plastic enclosure. The overall dimensions of ANH0318-01 are smaller than MA01. The MA01 is slightly narrower at one end but this is at the opposite end to the antenna location. SAR testing was performed only on ANH0318-01 as this was deemed to be the worst case scenario. Refer to Appendix A for images of the devices.

General LTE SAR Test and Reporting Considerations 6.4.

Item	Description											
			Fre	quency ran	ge: 1850 - 1	910 M	lHz					
	Band 2			Chann	el Bandwidt	h						
		20 MHz	15 MHz	10 MHz	5 MH	lz	3 MHz	1.4 MHz				
	1	18700	18675/	18650/	1862	5/	18615/	18607/				
	LOW	/1860	1857.5	1855	1852	.5	1851.5	1850.7				
	Mid	18900/	18900/	18900/	1890	0/	18900/	18900/				
	IVIIG	1880	1880	1880	1880	0	1880	1880				
	High	19100/	19125/	19150/	1917	5/	19185/	19193/				
	Tiigit	1900	1902.5	1905	1907	.5	1908.5	1909.3				
			Fre	quency ran	ge: 1710 - 1	755 N	IHz					
	Band 4	Channel Bandwidth										
		20 MHz	15 MHz	10 MHz	5 MH	lz	3 MHz	1.4 MHz				
Frequency range, Channel Bandwidth,	Low	20050/	20025/	20000/	1997	5/	19965/	19957/				
Numbers and Frequencies	LOW	1720	1717.5	1715	1712	.5	1711.5	1710.7				
	Mid	20175/	20175/	20175/	2017	5/	20175/	20175/				
		1732.5	1732.5	1732.5	1732	.5	1732.5	1732.5				
	Hiah	20300/	20325/	20350/	2037	5/	20385/	20393/				
	3	1745	1/4/.5	1750	1/52	.5	1753.5	1754.3				
	-	Frequency range: 699 – 716 MHz										
	Band 12			Chann	Channel Bandwidth							
		20 MHz	15 MHz	10 MHz	5 MH	IZ	3 MHz	1.4 MHz				
	Low			23060/	2303	5/	23025/	23017/				
				/04	/01.	5	700.5	699.7				
	Mid			23095/	2309	5/	23095/	23095/				
				707.5	707.	5	707.5	707.5				
	High			23130/	2315	5/ 5	23165/	23173/				
				1 1 1	715.	5	714.5	715.5				
	Refer to App	endix A.										
implementation												
	Table	6.2.3-1: Maxi	mum Power l	Reduction	MPR) for P	ower	Class 1, 2 a	nd 3				
	Modulati	ion C	hannel handwi	dth / Tranen	vission hand	width	(Npp)					
	Woddiad	1.4	3.0	5	10	15	20					
		MHz	MHz	MHz	MHz N	MHz	MHz					
	QPSK	> 5	> 4	> 8	> 12 >	> 16	> 18	≤ 1				
	16 QA	/1 ≤ 5	≤ 4	≤ 8	<u>≤ 12</u> ≤	≤ 16 . 16	≤ <u>18</u>	≤ 1 < 2				
Maximum power reduction (MPR)	64 QA	// <u>>5</u> ∕/ ≤5	<pre>>4 <4</pre>	<u><8</u>	< 12 < 4 < 12 <	< 16 < 16	<u>> 10</u> ≤ 18	≤ 2 ≤ 2				
	64 QAN	A > 5	> 4	> 8	> 12 >	> 16	> 18	≤ 3				
	256 QA	M		≥ 1				≤ <mark>5</mark>				
	MDD Duilt in	by docian										
					2000							
	The manufa	cturer MPR va	iues are aiway	s within the	3GPP max	imum	MPR allowar	ice but may				
	not follow the	e default MPR	values.									
	A-MPR (add	itional MPR) w	vas disabled d	uring SAR t	esting							
Power reduction	No											
	A properly c	onfigured base	e station simul	ator was us	ed for the S/	AR an	d power mea	surements;				
Spectrum plots for RB configurations	therefore, sp	ectrum plots f	or each RB all	ocation and	offset confi	guratio	on are not inc	luded in the				
	SAR report					-						
L												

Notes:

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

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7. RF Exposure Conditions (Test Configurations)

Refer to Appendix A for the specific details of the antenna location.

Wireless technologies	RF Exposure Conditions	DUT-to-User Separation	Test Position	Antenna-to- edge/surface	SAR Required	Note
	Next to Mouth	10 mm	Front	N/A	Yes	
			Rear	N/A	Yes	
			Front	N/A	Yes	
WWAN	Rody worp	0 mm	Edge 1 (Top)	> 25 mm	No	1
	Body-worn	0 mm	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 §4.2.2 c).

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 $\pm 2^{\circ}$ 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 (ϵ r) and conductivity (σ) of typical tissue-equivalent media recipes are expected to

be within \pm 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 ϵ r and σ may be relaxed to \pm 10%. This is limited to frequencies \leq 3 GHz.

Tissue Dielectric Parameters

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Н	ead	Body		
raiger requeitcy (Mirz)	ε _r	σ (S/m)	ε _r	σ (S/m)	
150	52.3	0.76	61.9	0.80	
300	45.3	0.87	58.2	0.92	
450	43.5	0.87	56.7	0.94	
835	41.5	0.90	55.2	0.97	
900	41.5	0.97	55.0	1.05	
915	41.5	0.98	55.0	1.06	
1450	40.5	1.20	54.0	1.30	
1610	40.3	1.29	53.8	1.40	
1800 – 2000	40.0	1.40	53.3	1.52	
2450	39.2	1.80	52.7	1.95	
3000	38.5	2.40	52.0	2.73	
5000	36.2	4.45	49.3	5.07	
5100	36.1	4.55	49.1	5.18	
5200	36.0	4.66	49.0	5.30	
5300	35.9	4.76	48.9	5.42	
5400	35.8	4.86	48.7	5.53	
5500	35.6	4.96	48.6	5.65	
5600	35.5	5.07	48.5	5.77	
5700	35.4	5.17	48.3	5.88	
5800	35.3	5.27	48.2	6.00	

IEEE Std 1528-2013

Refer to Table 3 within the IEEE Std 1528-2013

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Dielectric	Dielectric Property Measurements Results:										
SAR		Band	Tissue	Frequency	Relati	ive Permittivi	ty (єr)	С	onductivity (ס)	
Lab	Date	(MHz)	Туре	(MHz)	Measured	Target	Delta (%)	Measured	Target	Delta (%)	
				1900	40.44	40.00	1.10	1.45	1.40	3.79	
G	5/14/2018	1900	Head	1710	40.73	40.15	1.45	1.33	1.35	-1.59	
				1920	40.42	40.00	1.05	1.46	1.40	4.43	
				1900	53.63	53.30	0.62	1.57	1.52	3.42	
G	5/14/2018	1900	Body	1710	53.79	53.54	0.46	1.42	1.46	-2.57	
		l		1920	53.60	53.30	0.56	1.58	1.52	4.01	
				835	42.85	41.50	3.25	0.94	0.90	4.03	
G	5/14/2018	835	Head	695	43.25	42.24	2.38	0.89	0.89	-0.28	
				905	42.60	41.50	2.65	0.96	0.97	-1.08	
				835	54.66	55.20	-0.98	0.98	0.97	0.74	
G	5/14/2018	835	Body	695	55.05	55.76	-1.27	0.92	0.96	-3.91	
				905	54.51	55.00	-0.89	1.00	1.05	-4.61	
				1900	39.91	40.00	-0.23	1.43	1.40	2.43	
G	5/17/2018	1900	Head	1710	40.17	40.15	0.06	1.31	1.35	-3.08	
				1920	40.00	40.00	0.00	1.45	1.40	3.29	
				1900	52.19	53.30	-2.08	1.57	1.52	3.09	
G	5/17/2018	1900	Body	1710	52.28	53.54	-2.36	1.42	1.46	-3.12	
				1920	52.20	53.30	-2.06	1.57	1.52	3.55	
				835	42.09	41.50	1.42	0.92	0.90	2.24	
G	5/17/2018	835	Head	695	42.63	42.24	0.91	0.87	0.89	-1.77	
				905	41.91	41.50	0.99	0.94	0.97	-3.44	
				835	53.18	55.20	-3.66	1.02	0.97	4.95	
G	5/17/2018	835	Body	695	53.78	55.76	-3.55	0.96	0.96	-0.08	
				905	53.08	55.00	-3.49	1.04	1.05	-1.00	
				750	53.56	55.55	-3.58	0.98	0.96	1.83	
G	5/17/2018	750	Body	695	53.78	55.76	-3.55	0.96	0.96	-0.08	
				790	53.30	55.39	-3.78	0.99	0.97	2.35	
				750	42.37	41.96	0.97	0.89	0.89	-0.05	
G	5/18/2018	750	Head	695	42.63	42.24	0.91	0.87	0.89	-1.77	
				790	42.13	41.76	0.89	0.90	0.90	0.75	

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.

SAR	Dete	Tissue	Dipole Type	Dipole	Me	Measured Results for 1g SAR			Measured Results for 10g SAR				
Lab	Date	Туре	_Serial #	Cal. Due Data	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 %	No.
G	5/14/2018	Head	D750V3 SN:1019	3/16/2019	0.843	8.43	8.22	2.55	0.561	5.61	5.39	4.08	
G	5/14/2018	Body	D750V3 SN:1019	3/16/2019	0.835	8.35	8.76	-4.68	0.560	5.60	5.80	-3.45	
G	5/14/2018	Head	D835V2 SN:4d142	10/12/2018	1.010	10.10	9.64	4.77	0.670	6.70	6.22	7.72	1,2
G	5/14/2018	Body	D835V2 SN:4d142	10/12/2018	0.954	9.54	9.63	-0.93	0.635	6.35	6.27	1.28	
G	5/14/2018	Head	D1750V2 SN:1077	10/5/2018	3.650	36.50	36.26	0.66	1.970	19.70	19.34	1.86	
G	5/14/2018	Body	D1750V2 SN:1077	10/5/2018	3.650	36.50	37.34	-2.25	1.950	19.50	19.98	-2.40	3,4
G	5/14/2018	Head	D1900V2 SN:5d163	10/5/2018	4.020	40.20	38.77	3.69	2.110	21.10	20.10	4.98	
G	5/14/2018	Body	D1900V2 SN:5d163	10/5/2018	4.040	40.40	42.99	-6.02	2.110	21.10	21.97	-3.96	5,6
G	5/17/2018	Head	D750V3 SN:1019	3/16/2019	0.771	7.71	8.22	-6.20	0.512	5.12	5.39	-5.01	7,8
G	5/17/2018	Body	D750V3 SN:1019	3/16/2019	0.877	8.77	8.76	0.11	0.587	5.87	5.80	1.21	
G	5/17/2018	Head	D1750V2 SN:1077	10/5/2018	3.570	35.70	36.26	-1.54	1.920	19.20	19.34	-0.72	
G	5/17/2018	Body	D1750V2 SN:1077	10/5/2018	3.690	36.90	37.34	-1.18	1.960	19.60	19.98	-1.90	
G	5/17/2018	Head	D1900V2 SN:5d163	10/5/2018	3.860	38.60	38.77	-0.44	2.010	20.10	20.10	0.00	
G	5/17/2018	Body	D1900V2 SN:5d163	10/5/2018	4.510	45.10	42.99	4.91	2.340	23.40	21.97	6.51	
G	5/17/2018	Body	D835V2 SN:4d142	10/12/2018	0.978	9.78	9.63	1.56	0.648	6.48	6.27	3.35	

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9. Conducted Output Power Measurements

9.1. W-CDMA

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
	Loopback Mode	Test Mode 2
WCDMA Conorol Sottings	Rel99 RMC	12.2kbps RMC
WCDMA General Settings	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		
	Loopback Mode	Test Mode 1					
	Rel99 RMC	12.2kbps RMC					
	HSDPA FRC	H-Set 1					
	Power Control Algorithm	Algorithm 2					
VV-CDIVIA	βc	2/15	11/15	15/15	15/15		
General	βd	15/15	15/15	8/15	4/15		
Settings	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		
	D _{ACK}	8		·			
	D _{NAK}	8					
HSDPA	DCQI	8					
Specific	Ack-Nack repetition factor	3					
Settings	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			
	Loopback Mode	Test Mode 1							
	Rel99 RMC	12.2 kbps RM	12.2 kbps RMC						
	HSDPA FRC	H-Set 1							
	HSUPA Test	HSPA							
	Power Control Algorithm	Algorithm 2				Algorithm 1			
WCDMA	βc	11/15	6/15	15/15	2/15	15/15			
General	βd	15/15	15/15	9/15	15/15	0			
Settings	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			
	DACK	8				0			
	DNAK	8				0			
HSDPA	DCQI	8							
Specific	Ack-Nack repetition factor 3								
Settings	CQI Feedback (Table 5.2B.4)	back (Table 5.2B.4) 4ms							
	CQI Repetition Factor (Table 5.2B.4)	2							
	Ahs = β hs/ β c	30/15							
	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			
HSUPA	Reference E-TFCI PO	4	4	4	4	18			
Specific	Reference E-TFCI	67	67	92	67	67			
Settings	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/lor	dB	-10							
P-CCPCH and SCH_Ec/lor	dB	-12							
PICH _Ec/lor	dB	-15							
HS-PDSCH	dB	off							
HS-SCCH_1	dB	off							
DPCH_Ec/lor	dB	-5							
OCNS_Ec/lor	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.

		arameter	Unit	value	1
	Nominal Avg. Inf.	Bit Rate	kbps	60	
	Inter-TTI Distance	e	TTI's	1	
	Number of HARG	Processes	Proces	6	
			ses	v	
	Information Bit Pa	ayload (N _{INF})	Bits	120	
	Number Code Blo	ocks	Blocks	1	
	Binary Channel B	lits Per TTI	Bits	960	
	Total Available SI	ML's in UE	SML's	19200	
	Number of SML's	per HARQ Proc.	SML's	3200	
	Coding Rate			0.15	
	Number of Physic	cal Channel Codes	Codes	1	
	Modulation			QPSK	
	Note 1: The R	MC is intended to be used for	or DC-HSD	PA	
	mode	and both cells shall transmit	with identi	Ical	
	param	eters as listed in the table.	-		
	Note 2: Maxim	um number of transmission	is limited t	0 1, I.e.,	
	retrans	smission is not allowed. The	redundan	icy and	
	conste	liation version o shall be use	ea.		1
г					
Inf. Bit Payload	120				
	120	24 CPC			
	120	24 010			
Code Block	144				
Segmentation	144				
Turbo-Encoding					
(R=1/3)		432			12 Tail Bits
(
1st Rate Matching		432			
_					
RV Selection		960			
E					
Physical Channel					
Segmentation	960				

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:

Í	Mode	HSDPA	HSDPA	HSDPA	HSDPA				
	Subtest	1	2	3	4				
	Loopback Mode	Test Mode 1	Test Mode 1						
	Rel99 RMC	12.2kbps RMC	12.2kbps RMC						
	HSDPA FRC	H-Set 1	H-Set 1						
	Power Control Algorithm	Algorithm2	gorithm2						
Gonoral	βc	2/15	11/15	15/15	15/15				
Sottings	βd	15/15	15/15	8/15	4/15				
Settings	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				
	DACK	8							
	DNAK	8							
HSDPA	DCQI	8							
Specific	Ack-Nack Repetition factor	3							
Settings	CQI Feedback	4ms							
	CQI Repetition Factor	2							
	Ahs = β hs/ β c	30/15							

W-CDMA Band II Measured Results

Mc	Mode		Freq.	Maximum Average Power (dBm)			
Mode		OL CITNO.	(MHz)	Measured Pwr	MPR	Tune-up Limit	
	Rel 99	9262	1852.4	18.07			
Release 99	(RMC, 12.2	9400	1880.0	18.10	N/A	18.50	
	kbps)	9538	1907.6	18.10			
		9262	1852.4	17.10			
	Subtest 1	9400	1880.0	17.10	0	18.50	
		9538	1907.6	17.20			
		9262	1852.4	17.10			
	Subtest 2	9400	1880.0	17.10	0	18.50	
		9538	1907.6	17.20			
HSDPA		9262	1852.4	16.60			
	Subtest 3	9400	1880.0	16.60	0.5	18.00	
		9538	1907.6	16.60			
		9262	1852.4	16.60			
	Subtest 4	9400	1880.0	16.60	0.5	18.00	
		9538	1907.6	16.70			
		9262	1852.4	17.01		18.50	
	Subtest 1	9400	1880.0	17.10	0		
		9538	1907.6	17.28			
		9262	1852.4	15.12			
	Subtest 2	9400	1880.0	15.55	2	16.50	
		9538	1907.6	15.82			
	Subtest 3	9262	1852.4	16.46			
HSUPA		9400	1880.0	16.00	1	17.50	
		9538	1907.6	16.50			
	Subtest 4	9262	1852.4	15.12			
		9400	1880.0	15.55	2	16.50	
		9538	1907.6	15.82			
		9262	1852.4	17.01			
	Subtest 5	9400	1880.0	17.10	0	18.50	
		9538	1907.6	17.28			
		9262	1852.4	17.10			
	Subtest 1	9400	1880.0	17.20	0	18.50	
		9538	1907.6	17.10			
		9262	1852.4	17.10			
	Subtest 2	9400	1880.0	17.20	0	18.50	
		9538	1907.6	17.10			
		9262	1852.4	16.60			
	Subtest 3	9400	1880.0	16.70	0.5	18.00	
		9538	1907.6	16.70			
		9262	1852.4	16.60			
	Subtest 4	9400	1880.0	16.70	0.5	18.00	
		9538	1907.6	16.70			

W-CDMA Band IV Measured Results

			Freq	Maximum Average Power (dBm)		e Power	
Mo	ode	UL Ch No.	(MHz)	Measured Pwr	MPR	Tune-up Limit	
	[1010	1710.1				
	Rel 99	1312	1/12.4	17.87			
Release 99	(RMC, 12.2	1413	1/32.6	17.91	N/A	19.00	
	Корој	1513	1752.6	17.97			
		1312	1712.4	17.00	_		
	Subtest 1	1413	1732.6	17.00	0	19.00	
		1513	1752.6	17.10			
		1312	1712.4	17.00			
	Subtest 2	1413	1732.6	17.00	0	19.00	
HSDPA		1513	1752.6	17.10			
		1312	1712.4	16.50			
	Subtest 3	1413	1732.6	16.50	0.5	18.50	
		1513	1752.6	16.50			
		1312	1712.4	16.50			
	Subtest 4	1413	1732.6	16.50	0.5	18.50	
		1513	1752.6	16.60			
		1312	1712.4	16.97		19.00	
	Subtest 1	1413	1732.6	16.94	0		
		1513	1752.6	17.00			
		1312	1712.4	15.43			
	Subtest 2	1413	1732.6	15.49	2	17.00	
		1513	1752.6	15.47			
	Subtest 3	1312	1712.4	16.26			
HSUPA		1413	1732.6	16.23	1	18.00	
		1513	1752.6	16.48			
	Subtest 4	1312	1712.4	15.43			
		1413	1732.6	15.49	2	17.00	
		1513	1752.6	15.47			
		1312	1712.4	16.97			
	Subtest 5	1413	1732.6	16.94	0	19.00	
		1513	1752.6	17.00			
		1312	1712.4	17.00			
	Subtest 1	1413	1732.6	17.00	0	19.00	
		1513	1752.6	17.10			
		1312	1712.4	17.00			
	Subtest 2	1413	1732.6	17.00	0	19.00	
DO LIGDD (1513	1752.6	17.10			
DC-HSDPA		1312	1712.4	16.50			
	Subtest 3	1413	1732.6	16.50	0.5	18.50	
		1513	1752.6	16.50	1		
		1312	1712.4	16.50			
	Subtest 4	1413	1732.6	16.50	0.5	18.50	
		1513	1752.6	16.60			

W-CDMA Band V Measured Results

Marta		Freq.		Maximum Average Power (dBm)			
Widde		UL Ch No.	(MHz)	Measured Pwr	MPR	Tune-up Limit	
	Rel 99	4132	826.4	24.22			
Release 99	(RMC, 12.2	4183	836.6	24.23	N/A	25.00	
	kbps)	4233	846.6	24.23			
		4132	826.4	23.40			
	Subtest 1	4183	836.6	23.40	0	25.00	
		4233	846.6	23.40			
		4132	826.4	23.40			
	Subtest 2	4183	836.6	23.40	0	25.00	
HSDPA		4233	846.6	23.40			
HSDPA		4132	826.4	22.80			
	Subtest 3	4183	836.6	22.70	0.5	24.50	
		4233	846.6	22.90			
		4132	826.4	22.80			
	Subtest 4	4183	836.6	22.70	0.5	24.50	
		4233	846.6	22.90			
		4132	826.4	22.71		25.00	
	Subtest 1	4183	836.6	22.49	0		
		4233	846.6	22.80			
		4132	826.4	21.40			
	Subtest 2	4183	836.6	21.41	2	23.00	
		4233	846.6	21.79			
	Subtest 3	4132	826.4	21.30			
HSUPA		4183	836.6	21.82	1	24.00	
		4233	846.6	21.00			
	Subtest 4	4132	826.4	22.00			
		4183	836.6	21.90	2	23.00	
		4233	846.6	21.81			
		4132	826.4	22.58			
	Subtest 5	4183	836.6	22.76	0	25.00	
		4233	846.6	22.91			
		4132	826.4	23.40			
	Subtest 1	4183	836.6	23.40	0	25.00	
		4233	846.6	23.40			
		4132	826.4	23.40			
	Subtest 2	4183	836.6	23.40	0	25.00	
		4233	846.6	23.40			
DUTIODEA		4132	826.4	22.80			
	Subtest 3	4183	836.6	22.70	0.5	24.50	
		4233	846.6	22.90			
		4132	826.4	22.80			
	Subtest 4	4183	836.6	22.70	0.5	24.50	
		4233	846.6	22.90			

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.

Modulation	Cha	MPR (dB)							
	1.4	3.0	5	10	15	20			
	MHz	MHz	MHz	MHz	MHz	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							

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

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".

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
			3	>5	≤ 1
		2 4 10 23 25	5	>6	≤ 1
NS_03	6.6.2.2.1	35, 36, 66, 70	10	>6	≤ 1
			15	>8	≤ 1
			20	>10	≤ 1
NS_04	6.6.3.3.19	41	5, 10, 15, 20	Table 6.2.4-4,	Table 6.2.4-4a
		1	10,15,20	≥ 50 (NOTE1)	≤ 1 (NOTE1)
NS_05	6.6.3.3.1		15, 20	Table 6.2.4	-18 (NOTE2)
		65 (NOTE 3)	10,15,20	≥ 50	≤ 1 (NOTE 1)
NC 08		10 10 14 17	15,20	Table 6.2.4	-18 (NOTE 2)
NS UO	0.0.2.2.3	12, 13, 14, 17	1.4, 3, 5, 10	Table 0.0-1	N/A
NS_07	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	6.6.3.3.13	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,	Table Table	6.2.4-9 8.2.4-10
NS_16	6.6.3.3.9	27	3, 5, 10	Table 6.2.4-11 Table	, Table 6.2.4-12, 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	≤ 1 < 4
NS 19	663312	44	10,15,20	Table	824-14
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	30	5, 10	Table	8.2.4-16
NG 22	0.0.3.3.10	42.42	5 10 15 20	Table	8 2 4 17
NS 22	883317	42,43	5, 10, 15, 20	Table	U.2.4-17
NS 24	663320	65 (NOTE 4)	5 10 15 20	Table	824-19
NS 25	663321	65 (NOTE 4)	5, 10, 15, 20	Table	6 2 4-20
NS 26	6.6.3.3.22	68	10, 15	Table	8.2.4-21
NS_27	6.6.2.2.5,	48	5, 10, 15, 20	Table	8.2.4-22
NS_28	6.2.2A,	46 (NOTE 5)	20	Table	8.2.4-23
NC 20	6.2.2A, 8.8.2.2.1a	48 (NOTE 5)	20	Table	8 2 4 24
NO_28	6.6.3.3.25	40 (NOTE 5)	20	Table	0.2.4-24
NS_30	6.6.3.3.26	46 (NOTE 5)	20	Table	8.2.4-25
NS_31	6.2.2A, 6.6.3.3.27	46 (NOTE 5)	20	Table	6.2.4-26
NS 32	-	-	-	-	-
fre th	equency is larger the equency is larger the e channel BW assi	iower edge of the as ian or equal to the up gned, where channe	pper edge of PH BW is as defin	IS band (1915.7 ed in subclause	MHz) + 4 MHz + 5.6. A-MPR for

Table	6.2.4-1:	Additional	Maximum	Power	Reduction (A-M	PR)
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LTE Band 2 Measured Results

					Maximum Ave	erage Power (dBi	m)		
BW (MHz)	Mode	RB Allocation	RB	18700	18900	19100	MDD	Tune-up	
(11112)		Allocation	onoor	1860 MHz	1880 MHz	1900 MHz	MPR	Limit	
		1	0	16.90	16.77	17.03	0	17.5	
		1	49	17.25	16.78	17.26	0	17.5	
		1	99	16.90	16.67	16.92	0	17.5	
20 MHz	QPSK	50	0	16.10	16.13	16.39	1	16.5	
		50	24	16.20	16.10	16.22	1	16.5	
		50	50	16.13	16.14	16.10	1	16.5	
		100	0	16.21	16.22	16.17	1	16.5	
DW					Maximum Ave	erage Power (dBi	m)		
(MHz)	Mode	RB Allocation	RB offset	18675	18900	19125	MDD	Tune-up	
(11112)		7 moodion	011001	1857.5 MHz	1880 MHz	1902.5 MHz	IVIPR	Limit	
			1	0	17.00	16.90	17.20	0	17.5
		1	37	17.30	17.10	17.10	0	17.5	
		1	74	16.90	17.30	17.00	0	17.5	
15 MHz	QPSK	36	0	16.10	16.10	16.30	1	16.5	
		36	20	16.10	16.20	16.20	1	16.5	
		36	39	16.10	16.20	16.10	1	16.5	
		75	0	16.10	16.20	16.20	1	16.5	
DW		DD			Maximum Ave	erage Power (dBi	m)		
(MHz)	Mode	Allocation	offset	18650	18900	19150	MDD	Tune-up	
(1855 MHz	1880 MHz	1905 MHz	IVIF IX	Limit	
		1	0	17.00	17.00	17.10	0	17.5	
		1	25	17.30	17.30	17.50	0	17.5	
		1	49	17.10	17.20	17.40	0	17.5	
10 MHz	QPSK	25	0	16.10	16.10	16.10	1	16.5	
		25	12	16.10	16.10	16.10	1	16.5	
		25	25	16.10	16.20	16.00	1	16.5	
		50	0	16.10	16.10	16.20	1	16.5	

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 version 13.2.1 Release 13.

LTE Band 2 Measured Results (continued)

					Maximum Ave	erage Power (dBi	m)	
(MHz)	Mode	RB	RB	18625	18900	19175	MDD	Tune-up
(11112)		/ moodform	Onoot	1852.5 MHz	1880 MHz	1907.5 MHz	WIPK	Limit
		1	0	16.80	16.90	16.80	0	17.5
		1	12	17.10	16.20	17.10	0	17.5
		1	24	17.00	17.20	16.90	0	17.5
	QPSK	12	0	16.10	16.20	16.10	1	16.5
		12	7	16.10	16.20	16.10	1	16.5
		12	13	16.10	16.20	16.10	1	16.5
5 MHz		25	0	16.10	16.10	16.10	1	16.5
5 11112		1	0	15.50	15.60	15.50	1	16.5
		1	12	15.30	15.60	15.40	1	16.5
		1	24	15.60	15.70	15.50	1	16.5
	16QAM	12	0	14.90	15.00	15.10	2	15.5
		12	7	15.00	15.00	15.00	2	15.5
		12	13	15.00	15.10	15.10	2	15.5
		25	0	15.30	15.30	15.20	2	15.5
DW		DD	DD		Maximum Ave	erage Power (dB	m)	
(MHz)	Mode	Allocation	offset	18615	18900	19185	MPR	Tune-up
· · ·				1851.5 MHz	1880 MHz	1908.5 MHz		Limit
		1	0	17.00	17.10	17.20	0	17.5
		1	8	17.00	16.90	17.20	0	17.5
		1	14	16.90	17.10	17.20	0	17.5
	QPSK	8	0	16.10	16.10	16.10	1	16.5
		8	4	16.10	16.10	16.10	1	16.5
		8	7	16.00	16.10	16.10	1	16.5
3 MHz		15	0	16.10	16.00	16.00	1	16.5
5 11112		1	0	16.20	15.70	15.80	1	16.5
		1	8	16.10	15.60	15.80	1	16.5
		1	14	16.00	15.80	15.80	1	16.5
	16QAM	8	0	14.90	14.70	14.90	2	15.5
		8	4	14.90	14.80	15.00	2	15.5
		8	7	14.80	14.80	15.20	2	15.5
		15	0	15.10	15.00	15.10	2	15.5
BW		RB	RB		Maximum Ave	erage Power (dB	m)	
(MHz)	Mode	Allocation	offset	18607	18900	19193	MPR	Tune-up
				1850.7 MHz	1880 MHz	1909.3 MHz		Limit
		1	0	16.80	17.00	16.90	0	17.5
		1	3	16.90	17.30	17.00	0	17.5
		1	5	16.90	17.10	17.00	0	17.5
	QPSK	3	0	16.20	16.20	16.10	0	17.5
		3	1	16.10	16.20	16.30	0	17.5
		3	3	16.20	16.10	16.10	0	17.5
1.4 MHz		6	0	16.10	16.10	16.00	1	16.5
		1	0	16.00	16.10	15.80	1	16.5
		1	3	15.70	16.20	15.80	1	16.5
		1	5	15.70	16.20	15.80	1	16.5
	16QAM	3	0	15.20	14.90	14.90	1	16.5
		3	1	15.00	15.10	15.00	1	16.5
		3	3	14.90	15.00	15.20	1	16.5
		6	0	14.80	15.40	15.10	2	15.5

LTE Band 4 Measured Results

				Maximum Average Power (dBm)						
BW (MHz)	Mode	RB	RB	20050	20175	20300	MDD	Tune-up		
(11112)		Allocation	01301	1720 MHz	1732.5 MHz	1745 MHz	MPR	Limit		
		1	0		16.31		0	17.5		
		1	49		16.58		0	17.5		
		1	99		16.38		0	17.5		
20 MHz	QPSK	50	0		15.71		1	16.5		
		50	24		15.67		1	16.5		
		50	50		15.70		1	16.5		
		100	0		15.63		1	16.5		
DW					Maximum Ave	erage Power (dBi	m)			
(MHz)	Mode	RB Allocation	RB offset	20025	20175	20325	MDD	Tune-up		
(11112)		7 moodilon	01000	1717.5 MHz	1732.5 MHz	1747.5 MHz	IVIPR	Limit		
		1	0	16.30	16.20	16.40	0	17.5		
		1	37	16.60	16.40	16.80	0	17.5		
	15 MHz QPSK	1	74	16.70	16.50	16.50	0	17.5		
15 MHz	QPSK	36	0	15.30	15.40	15.40	1	16.5		
		36	20	15.40	15.40	15.30	1	16.5		
		36	39	15.40	15.40	15.30	1	16.5		
		75	0	15.30	15.40	15.20	1	16.5		
DW		DD			Maximum Ave	erage Power (dBi	m)			
(MHz)	Mode	Allocation	offset	20000	20175	20350	MPR	Tune-up		
· · ·				1715 MHz	1732.5 MHz	1750 MHz		Limit		
		1	0	16.20	16.20	16.40	0	17.5		
		1	25	16.60	16.60	16.50	0	17.5		
		1	49	16.60	16.30	16.50	0	17.5		
10 MHz	QPSK	25	0	15.30	15.40	15.30	1	16.5		
		25	12	15.40	15.40	15.40	1	16.5		
		25	25	15.40	15.40	15.40	1	16.5		
		50	0	15.40	15.50	15.30	1	16.5		

Note(s):

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 1. selected for testing per KDB 941225 D05 SAR for LTE Devices. 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

2. TS 36.101 version 13.2.1 Release 13.

LTE Band 4 Measured Results (continued)

					Maximum Ave	erage Power (dBi	m)	
(MHz)	Mode	RB Allocation	RB	19975	20175	20375	MDD	Tune-up
(11112)		7 moodion	011001	1712.5 MHz	1732.5 MHz	1752.5 MHz	WIPK	Limit
		1	0	16.20	16.60	16.30	0	17.5
		1	12	16.70	16.60	16.90	0	17.5
		1	24	16.20	16.60	16.60	0	17.5
	QPSK	12	0	15.30	15.50	15.30	1	16.5
		12	7	15.40	15.50	15.30	1	16.5
		12	13	15.40	15.60	15.50	1	16.5
5 MHz		25	0	15.40	15.60	15.40	1	16.5
5 10112		1	0	15.20	15.20	15.00	1	16.5
		1	12	15.10	15.00	14.60	1	16.5
		1	24	15.40	15.10	15.10	1	16.5
	16QAM	12	0	14.40	14.50	14.40	2	15.5
		12	7	14.40	14.50	14.30	2	15.5
		12	13	14.30	14.50	14.60	2	15.5
		25	0	14.60	14.50	14.40	2	15.5
D\M		DD	DD		Maximum Ave	erage Power (dB	m)	
(MHz)	Mode	Allocation	offset	19965	20175	20385	MPR	Tune-up
				1711.5 MHz	1732.5 MHz	1753.5 MHz		Limit
		1	0	16.30	16.40	16.00	0	17.5
		1	8	16.50	16.60	16.20	0	17.5
		1	14	16.70	16.60	16.30	0	17.5
	QPSK	8	0	15.20	15.70	15.20	1	16.5
		8	4	15.20	15.60	15.20	1	16.5
		8	7	15.20	15.60	15.30	1	16.5
3 MHz		15	0	15.20	15.60	15.20	1	16.5
0 111 12		1	0	15.10	15.50	14.80	1	16.5
		1	8	14.90	15.40	14.90	1	16.5
		1	14	15.00	15.40	14.90	1	16.5
	16QAM	8	0	14.30	14.50	14.00	2	15.5
		8	4	14.40	14.60	14.00	2	15.5
		8	7	14.50	14.60	14.00	2	15.5
		15	0	14.40	14.50	14.30	2	15.5
BW		RB	RB		Maximum Ave	erage Power (dB	m)	
(MHz)	Mode	Allocation	offset	19957	20175	20393	MPR	Tune-up
				1710.7 MHz	1732.5 MHz	1754.3 MHz		Limit
		1	0	16.40	16.40	16.30	0	17.5
		1	3	16.50	16.70	16.40	0	17.5
		1	5	16.50	16.50	16.40	0	17.5
	QPSK	3	0	16.30	16.50	16.30	0	17.5
		3	1	16.50	16.50	16.20	0	17.5
		3	3	16.40	16.50	16.40	0	17.5
1.4 MHz		6	0	15.30	15.40	15.30	1	16.5
		1	0	14.90	15.10	14.80	1	16.5
		1	3	15.00	15.00	14.80	1	16.5
		1	5	15.00	15.00	15.00	1	16.5
	16QAM	3	0	15.40	15.20	15.00	1	16.5
		3	1	15.30	15.50	15.10	1	16.5
		3	3	15.10	15.50	15.10	1	16.5
		6	0	14.30	14.80	14.20	2	15.5

LTE Band 12 Measured Results

					Maximum Ave	n Average Power (dBm)							
BW	Mode	RB	RB	23060	23095	23130		Tune-up					
		Allocation	onset	704 MHz	707.5 MHz	711 MHz	MPR	Limit					
		1	0		23.40		0	24					
		1	25		23.80		0	24					
		1	49		23.80		0	24					
10 MHz	QPSK	25	0		22.58		1	23					
		25	12		22.68		1	23					
		25	25		22.67		1	23					
		50	0		22.56		1	23					
					Maximum Ave	erage Power (dBi	m)						
BW (MHz)	Mode	RB	RB	23035	23095	23155		Tune-up					
		Allocation	Unset	701.5 MHz	707.5 MHz	713.5 MHz	MPR	Limit					
		1	0	23.50	23.50	23.40	0	24					
		1	12	23.80	23.80	23.80	0	24					
		1	24	23.30	23.70	23.40	0	24					
5 MHz	QPSK	12	0	22.60	22.60	22.40	1	23					
		12	7	22.60	22.50	22.50	1	23					
		12	13	22.40	22.40	22.50	1	23					
		25	0	22.60	22.50	22.50	1	23					
					Maximum Ave	erage Power (dBi	m)						
BW (MH-)	Mode	RB	RB offect	23025	23095	23165		Tune-up					
		Allocation	Unset	700.5 MHz	707.5 MHz	714.5 MHz	MPR	Limit					
		1	0	23.90	23.40	23.50	0	24					
		1	8	23.90	23.70	23.50	0	24					
		1	14	23.70	23.60	23.50	0	24					
	QPSK	8	0	22.50	22.60	22.50	1	23					
		8	4	22.50	22.50	22.50	1	23					
							8	7	22.40	22.50	22.50	1	23
		15	0	22.50	22.50	22.50	1	23					
3 IVIHZ		1	0	22.40	22.20	22.20	1	23					
		1	8	22.10	22.30	22.10	1	23					
		1	14	22.10	22.30	22.10	1	23					
	16QAM	8	0	21.90	22.00	21.30	2	22					
		8	4	21.80	21.90	21.20	2	22					
		8	7	21.50	21.90	21.80	2	22					
		15	0	21.40	21.50	21.60	2	22					
DW					Maximum Ave	erage Power (dBi	m)						
(MHz)	Mode	Allocation	offset	23017	23095	23173	MPR	Tune-up					
(/ moodiform	0	699.7 MHz	707.5 MHz	715.3 MHz		Limit					
		1	0	23.50	23.80	23.50	0	24					
		1	3	23.60	23.60	23.90	0	24					
		1	5	23.50	23.70	23.70	0	24					
	QPSK	3	0	23.00	23.00	23.00	0	24					
		3	1	23.00	23.00	23.00	0	24					
		3	3	23.00	23.00	23.00	0	24					
1 4 MHz		6	0	22.40	22.60	22.40	1	23					
		1	0	22.30	22.20	22.10	1	23					
		1	3	22.20	22.70	22.30	1	23					
		1	5	22.40	22.50	22.30	1	23					
	16QAM	3	0	22.00	22.00	21.90	1	23					
100		3	1	22.00	22.00	22.00	1	23					
		3	3	21.90	22.00	22.00	1	23					
		6	0	21.57	21.65	21.85	2	22					

Note(s):

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.

 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 version 13.2.1 Release 13.

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 Reported SAR(W/kg) for Wi-Fi and Bluetooth= Measured SAR * Tune-up scaling factor * Duty Cycle 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 $\leq \frac{1}{4}$ 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.

10.2. W-CDMA Band II

RF Exposure		Dist.		Freq.	Power	(dBm)	1-g SAF	R (W/kg)	Plot	
Conditions	Mode	(mm)	Test Position	Ch #.	(MHz)	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	Rel 99 RMC	10	Front	9400	1880.0	18.5	18.1	0.226	0.248	1
				9262	1852.4	18.5	18.1	1.140	1.259	
			Rear	9400	1880.0	18.5	18.1	1.270	1.393	2
				9538	1907.6	18.5	18.1	1.180	1.294	
				9262	1852.4	18.5	18.1	0.833	0.920	
			Front	9400	1880.0	18.5	18.1	0.866	0.950	
				9538	1907.6	18.5	18.1	0.889	0.975	
Body-worn	Rel 99 RMC	0	Edge 2	9400	1880.0	18.5	18.1	0.197	0.216	
				9262	1852.4	18.5	18.1	0.849	0.937	
			Edge 3	9400	1880.0	18.5	18.1	0.887	0.973	
				9538	1907.6	18.5	18.1	0.875	0.959	
				9262	1852.4	18.5	18.1	0.762	0.841	
			Edge 4	9400	1880.0	18.5	18.1	0.757	0.830	
				9538	1907.6	18.5	18.1	0.690	0.757	

10.3. W-CDMA Band IV

RE Exposure		Dist	t. Test Desition Ob # Freq. Power (dBm) 1-g SAF	R (W/kg)	Plot					
Conditions	Mode	(mm)	Test Position	Ch #.	(MHz)	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	Rel 99 RMC	10	Front	1413	1732.6	19.0	17.9	0.175	0.225	3
				1312	1712.4	19.0	17.9	0.910	1.180	4
			Rear	1413	1732.6	19.0	17.9	0.913	1.173	
				1513	1752.6	19.0	18.0	0.922	1.169	
				1312	1712.4	19.0	17.9	0.715	0.927	
			Front	1413	1732.6	19.0	17.9	0.691	0.888	
Body-worn	Rel 99 RMC	0		1513	1752.6	19.0	18.0	0.759	0.962	
			Edge 2	1413	1732.6	19.0	17.9	0.096	0.123	
				1312	1712.4	19.0	17.9	0.857	1.112	
			Edge 3	1413	1732.6	19.0	17.9	0.878	1.128	
				1513	1752.6	19.0	18.0	0.844	1.070	
			Edge 4	1413	1732.6	19.0	17.9	0.552	0.709	

10.4. W-CDMA Band V

RE Exposure		Dist			Freq	Power	(dBm)	1-g SAR (W/kg)		Plot
Conditions	Mode	(mm)	Test Position	Ch #.	(MHz)	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	Rel 99 RMC	10	Front	4183	836.6	25.0	24.2	0.315	0.376	5
				4132	826.4	25.0	24.2	0.862	1.032	
			Rear	4183	836.6	25.0	24.2	0.827	0.987	
				4233	846.6	25.0	24.2	0.884	1.055	
				4132	826.4	25.0	24.2	0.909	1.088	
Body-worn	Rel 99 RMC	0	Front	4183	836.6	25.0	24.2	0.951	1.135	6
				4233	846.6	25.0	24.2	0.912	1.089	
			Edge 2	4183	836.6	25.0	24.2	0.487	0.581	
			Edge 3	4183	836.6	25.0	24.2	0.590	0.704	
			Edge 4	4183	836.6	25.0	24.2	0.307	0.367	

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10.5. LTE Band 2 (20MHz Bandwidth)

RE Exposure		Dist	Test		Freq	RB	RB	Power	(dBm)	1-g SAF	R (W/kg)	Plot
Conditions	Mode	(mm)	Position	Ch #.	(MHz)	Allocation	offset	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	OPSK	10	Front	18900	1880.0	1	49	17.5	16.8	0.196	0.231	7
Next to Mouth		10	TION	10300	1000.0	50	50	16.5	16.1	0.143	0.155	
				18700	1860.0	1	49	17.5	17.3	1.130	1.197	
				10700	1000.0	50	24	16.5	16.2	0.867	0.929	
						1	49	17.5	16.8	1.170	1.381	8
			Rear	18900	1880.0	50	50	16.5	16.1	0.898	0.976	
						100	0	16.5	16.2	0.849	0.906	
				10100	1000.0	1	49	17.5	17.3	1.090	1.152	
				19100	1900.0	50	0	16.5	16.4	7.3 1.090 1.152 6.4 0.877 0.899 7.3 0.774 0.820		
				18700	1860.0	1	49	17.5	17.3	0.774	0.820	
Body-worn	QPSK	0	Front	18000	1990.0	1	49	17.5	16.8	0.757	0.894	
			TION	10900	1000.0	50	50	16.5	16.1	0.602	0.654	
				19100	1900.0	1	49	17.5	16.2	0.732	0.983	
			Edgo 2	19000	1000.0	1	49	17.5	16.8	0.104	0.123	
			Euge 2	10900	1000.0	50	50	16.5	16.1	0.082	0.089	
			Edgo 3	18000	1990.0	1	49	17.5	16.8	0.649	0.766	
			Luge 3	10900	1000.0	50	50	16.5	16.1	0.600	0.652	
			Edgo 4	18000	1990.0	1	49	17.5	16.8	0.477	0.563	
			Luge 4	10900	1000.0	50	50	16.5	16.1	0.390	0.424	

10.6. LTE Band 4 (20MHz Bandwidth)

RE Exposure		Dist	Test		Freq	RB	RB	Power	(dBm)	1-g SAF	R (W/kg)	Plot
Conditions	Mode	(mm)	Position	Ch #.	(MHz)	Allocation	offset	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	OPSK	10	Front	20175	1732 5	1	49	17.5	16.6	0.109	0.135	9
Next to Mouth		10	TIOIR	20175	1732.5	50	0	16.5	15.7	0.086	0.103	
						1	49	17.5	16.6	0.763	0.943	
			Rear	20175	1732.5	50	0	16.5	15.7	0.649	0.778	
						100	0	16.5	15.6	0.817	0.998	10
						1	49	17.5	16.6	0.610	0.754	
			Front	20175	1732.5	50	0	16.5	15.7	0.480	0.576	
						100	0	16.5	15.6	0.493	0.602	
Body-worn	QPSK	0	Edgo 2	20175	1732.5	1	49	17.5	16.6	0.061	0.075	
			Luge 2	20173	1752.5	50	0	16.5	15.7	0.051	0.061	
						1	49	17.5	16.6	0.666	0.823	
			Edge 3	20175	1732.5	50	0	16.5	15.7	0.551	0.661	
						100	0	16.5	15.6	0.561	0.685	
			Edge 4	20175	1732 5	1	49	17.5	16.6	0.472	0.583	
			Luge 4	20175	1732.5	50	0	16.5	15.7	0.371	0.445	

10.7. LTE Band 12 (10MHz Bandwidth)

RE Exposure		Dist	Test		Freq	RB	RB	Power	(dBm)	1-g SAF	R (W/kg)	Plot
Conditions	Mode	(mm)	Position	Ch #.	(MHz)	Allocation	offset	Tune-up limit	Meas.	Meas.	Scaled	No.
Next to Mouth	OPSK	10	Front	23005	707 5	1	49	24.0	23.8	0.338	0.354	11
Next to Mouth		10	TION	20000	101.5	25	12	23.0	22.7	0.252	0.271	
						1	49	24.0	23.8	0.794	0.831	
			Rear	23095	707.5	25	12	23.0	22.7	0.667	0.718	
						50	0	23.0	22.6	0.638	0.706	
						1	49	24.0	23.8	0.902	0.945	12
			Front	23095	707.5	25	12	23.0	22.7	0.756	0.814	
Body worn	OBSK	0				50	0	23.0	22.6	0.740	0.819	
Body-worn	QF OK	0	Edgo 2	22005	707 5	1	49	24.0	23.8	0.581	0.608	
			Euge 2	23095	707.5	25	12	23.0	22.7	0.511	0.550	
			Edgo 2	22005	707 5	1	49	24.0	23.8	0.525	0.550	
			Euge 3	23095	707.5	25	12	23.0	22.7	0.462	0.497	
			Edge 4	22005	707.5	1	49	24.0	23.8	0.387	0.405	
			Luge 4	20090	101.5	25	12	23.0	22.7	0.367	0.395	

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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				Repeated	Highest	Fir	st
Band (MHz)	Air Interface	RF Exposure Conditions	Test Position	SAR (Yes/No)	Measured SAR (W/kg)	Measured SAR (W/kq)	Largest to Smallest SAR Ratio
700	LTE Band 12	Body	Front	Yes	0.902	0.867	1.04
850	WCDMA Band V	Body	Front	Yes	0.951	0.921	1.03
1700	WCDMA Band IV	Body	Rear	Yes	0.922	0.905	1.02
1700	LTE Band 4	Body	Rear	No	0.817	0.802	1.02
1900	WCDMA Band II	Body	Rear	Yes	1.270	1.250	1.02
1300	LTE Band 2	Body	Rear	No	1.170	1.160	1.01

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 SAR Analysis

The DUT does not support simultaneous transmission.

Appendixes

Refer to separated files for the following appendixes.

12040492-S1V1 Appendix A: SAR Setup Photos

12040492-S1V1 Appendix B: SAR System Check Plots

12040492-S1V1 Appendix C: Highest SAR Test Plots

12040492-S1V1 Appendix D: SAR Liquid Tissue Ingredients

12040492-S1V1 Appendix E: SAR Probe Calibration Certificate

12040492-S1V1 Appendix F: SAR Dipole Calibration Certificates

END OF REPORT