SAR EVALUATION REPORT

IEEE Std 1528-2013

For
Gateway and Sensor

FCC ID: 2AHLC01856 (Gateway), 2AHLC01857 (Sensor)
Model Name: Ventrilink Kardia III

Report Number: 14275554-S1V2
Issue Date: 11/21/2023

Prepared for
InfoBionic, Inc.
400 Totten Pond Rd Ste 315
Waltham, MA 02451, United States

Prepared by
UL LLC
12 LABORATORY DR
RTP, NC 27709, U.S.A.
TEL: (919) 549-1400

CERT #0751.06

Revision History

Rev.	Date	Revisions	Revised By
V1	8/28/2023	Initial Issue	--
V2	11/21/2023	1. Changed DSS -> DTS, §1 and §12 2. Added equipment calibration dates, §4.3 3. Corrected cell formatting §12.3 and updated §12.2 to match formatting	Sarah Kuhaneck

Table of Contents

1. Attestation of Test Results

Applicant Name		InfoBionic, Inc.	
FCC ID		2AHLC01856 (Gateway), 2AHLC01857 (Sensor)	
Model Name		Ventrilink Kardia III (Gateway + Sensor system)	
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)	
		PCE	DTS
Gateway (FCC ID: 2AHLC01856)	Body-worn*	1.430	0.001
	Simultaneous TX	1.432	1.432
Sensor (FCC ID: 2AHLC01857)	Body-worn*	N/A	0.022
	Simultaneous Tx	N/A	1.432
Date Tested		3/13/2023 to 8/23/2023	
Test Results		Pass	

***Note:** The Body-worn minimum separation distance is 0 mm for both the Sensor alone and the Gateway + Sensor configuration tested in the belt clip accessory.

UL LLC tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested can demonstrate compliance with the requirements as documented in this report.

This report contains data provided by the customer which can impact the validity of results. UL LLC is only responsible for the validity of results after the integration of the data provided by the customer.

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 considered unless noted otherwise.

This document may not be altered or revised in any way unless done so by UL LLC and all revisions are noted in the revisions section. Any alteration of this document not carried out by UL LLC 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 A2LA, NIST, or any agency of the U.S. Government.

Approved & Released By:	Prepared By:
	
Richard Jankovics Operations Leader UL LLC	Lindsay Ryan Engineer UL LLC

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:

- 447498 D04 General RF Exposure Guidance 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 2014; RF Exposure Procedures (Other LTE Considerations)
- TCB Workshop April 2015; RF Exposure Procedures (Overlapping LTE Bands)
- TCB Workshop October 2015; RF Exposure Procedures (KDB 941225 D05A)
- TCB Workshop October 2016; RF Exposure Procedures (Bluetooth Duty Factor)
- TCB Workshop October 2016; RF Exposure Procedures (DUT Holder Perturbations)
- TCB Workshop April 2019; RF Exposure Procedures (Tissue Simulating Liquids (TSL))

3. Facilities and Accreditation

UL LLC is accredited by A2LA, cert. # 0751.06 for all testing performed within the scope of this report. Testing was performed at the locations noted below.

The test sites and measurement facilities used to collect data are located at 2800 Perimeter Park Dr, Morrisville, NC, USA.

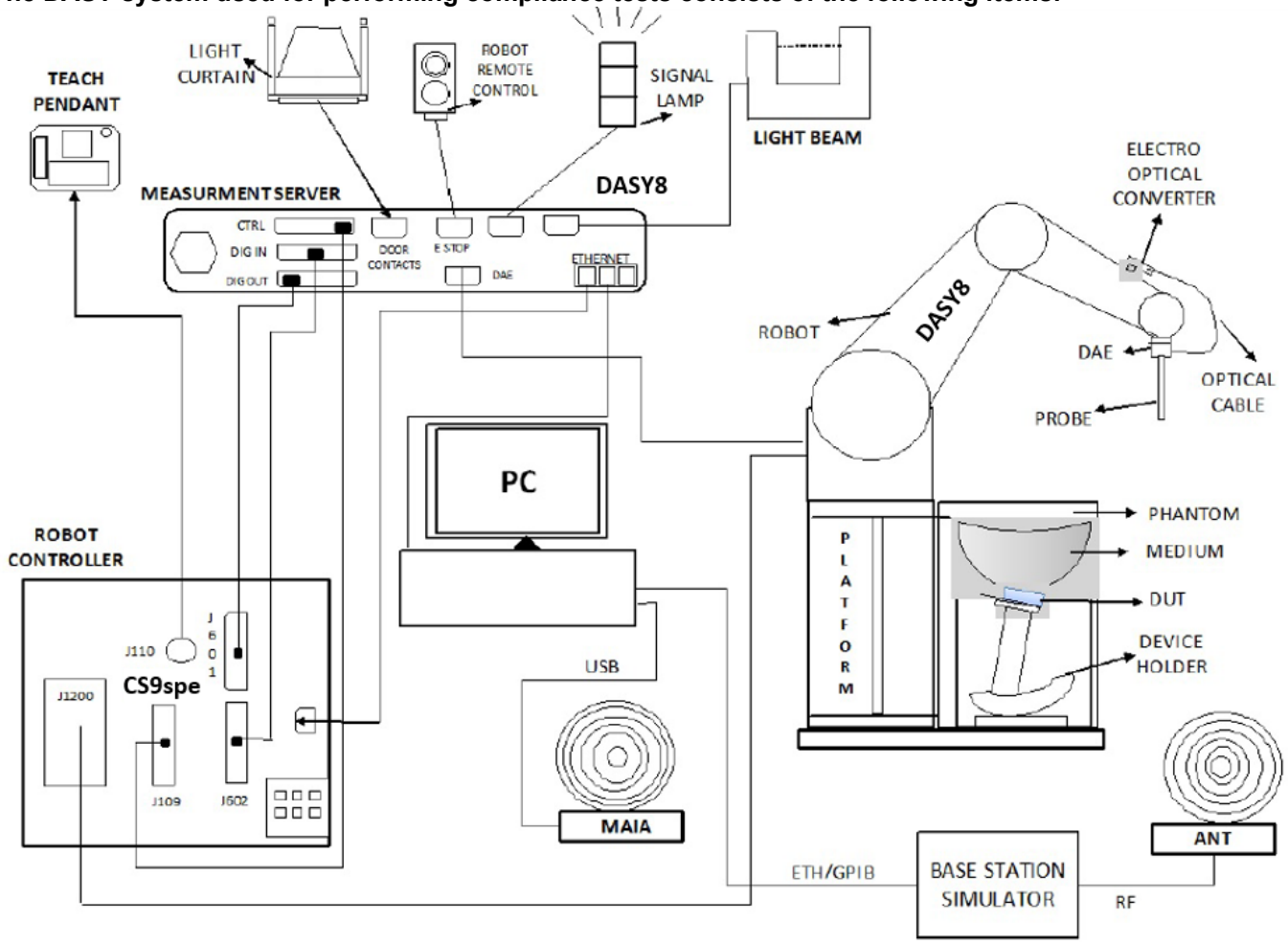
- SAR Lab 1A
- SAR Lab 2A
- SAR Lab 2B

	Address	ISED CABID	ISED Company Number	FCC Registration
☐	Building: 12 Laboratory Dr RTP, NC 27709, U.S.A	US0067	2180C	825374
☒	Building: 2800 Perimeter Park Dr. Suite B Morrisville, NC 27560, U.S.A	US0067	27265	825374

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY 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 Win10 and the DASY8[1] 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.

[1] DASY8 software used: DASY16.2.2.1588 and older generations.

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 IEC/IEEE 62209-1528, 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. Date	Cal. Due Date
Network Analyzer	Keysight	E5063A	MY54100681	9/30/2022	9/30/2023
Dielectric Probe	SPEAG	DAKS-3.5	1051	10/17/2022	10/17/2023
Shorting Block	SPEAG	DAK-3.5 Short	SMDAK 200 DA	10/17/2022	10/17/2023
Thermometer[1]	Fisher Scientific	15-078-181	210204689	3/13/2021	3/31/2023
Thermometer[2]	Fisher Scientific	15-078-181	181705017	3/30/2023	3/30/2024

Notes:

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment re-calibrated during the course of testing.

System Check

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Date	Cal. Due Date
Signal Generator[2]	Keysight	N5181A	MY50140788	8/3/2023	8/3/2024
3-Path Diode Power Sensor[1]	Rhode & Schwarz	NRP8S	112236	5/31/2022	5/31/2023
3-Path Diode Power Sensor[1]	Rhode & Schwarz	NRP8S	112237	5/31/2022	5/31/2023
Power Meter	Keysight	N1912A	MY55116004	9/2/2022	9/02/2023
Power Sensor [1]	Keysight	N1921A	MY55090023	4/3/2022	4/03/2023
Power Sensor[1]	Keysight	E9323A	MY55110007	6/14/2022	6/14/2023
Power Sensor	Keysight	N1921A	MY55090047	2/2/2023	2/02/2024
3-Path Diode Power Sensor[2]	Rohde & Schwarz	NRP8S	112236	6/2/2023	6/02/2024
3-Path Diode Power Sensor[2]	Rohde & Schwarz	NRP8S	112237	6/2/2024	6/02/2024
RF Power Source[2]	Speag	PowerSource1	4278	6/13/2023	6/13/2024

Notes:

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment re-calibrated during the course of testing.

Lab Equipment

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Date	Cal. Due Date
E-Field Probe[1]	SPEAG	EX3DV4	7587	4/27/2022	4/27/2023
E-Field Probe	SPEAG	EX3DV4	7709	12/12/2022	12/12/2023
E-Field Probe	SPEAG	EX3DV4	7710	2/3/2023	2/3/2024
E-Field Probe[2]	SPEAG	EX3DV4	7711	3/30/2023	3/29/2024
Data Acquisition Electronics	SPEAG	DAE4	1673	9/15/2022	9/15/2023
Data Acquisition Electronics	SPEAG	DAE4	1714	11/23/2022	11/23/2023
Data Acquisition Electronics	SPEAG	DAE4	1715	1/23/2023	1/23/2024
Data Acquisition Electronics	SPEAG	DAE4	1716	3/16/2023	3/16/2024
System Validation Dipole	SPEAG	D750V3	1139	10/12/2022	10/12/2023
System Validation Dipole	SPEAG	D900V2	1d180	10/12/2022	10/12/2023
System Validation Dipole	SPEAG	D1750V2	1136	10/17/2022	10/17/2023
System Validation Dipole	SPEAG	D1900V2	5d202	10/12/2022	10/12/2023
System Validation Dipole	SPEAG	D2450V2	963	10/18/2022	10/18/2023
Environmental Indicator[1]	Fisher Scientific	Traceable	160938893	3/17/2022	3/17/2023
Environmental Indicator	Control Company	06-662-4	200037610	2/24/2023	2/24/2024
Environmental Indicator	Control Company	06-662-4	200037635	2/24/2023	2/24/2024

Notes:

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment re-calibrated during the course of testing.

Other

Name of Equipment	Manufacturer	Type/Model	Serial No.	Cal. Date	Cal. Due Date
RF Power Meter[1]	Keysight	N1911a	MY55116001	7/7/2022	7/07/2023
RF Power Meter	Keysight	N1911a	MY55116003	9/10/2022	9/10/2023
RF Power Sensor	Keysight	N1921a	MY55090047	2/2/2023	2/2/2024
Base Station Simulator	R & S	CMW 500	170733	12/14/2022	12/14/2023
Base Station Simulator	R & S	CMW 500	170193	1/6/2023	1/6/2024
Base Station Simulator[1]	Anritsu	MT8821C	6262116751	5/14/2022	5/14/2023
Base Station Simulator[2]	Anritsu	MT8821C	6262116751	6/5/2023	6/5/2024

Notes:

1. Equipment not used for calibrated measurements past calibration due date.
2. Equipment re-calibrated during the course of testing.

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 IEC/IEEE 62209-1528 is not required in SAR reports submitted for equipment approval.

Therefore, the measurement uncertainty is not required.

6. Device Under Test (DUT) Information

6.1. DUT Description

Gateway – FCC ID: 2AHLC01856			
Device Dimension	Overall (Length x Width x Depth): 123.18 mm x 70.98 mm x 26.78 mm Overall Diagonal: 142.18 mm This is a belt clip-worn device		
Back Cover	The Back Cover is not removable		
Battery Options	The rechargeable battery is not user accessible.		
Accessory	Sensor, Holster, and Belt Clip (always used for body-worn conditions)		
Test sample information	**S/N**	**IMEI**	**Notes**
	MIB2008	352176533772077	Conducted
	MIA03142	354874603052184	Radiated/Conducted (Tuned to match MIB2008 in Conducted)
Hardware Version	K3G001 Rev C		
Software Version	V00.1353		

Sensor – FCC ID: 2AHLC01857			
Device Dimension	Overall (Length x Width): 123.18 mm x 70.98 mm Overall Diagonal: 69.97 mm This is a small wearable device		
Back Cover	The Back Cover is not removable		
Battery Options	The rechargeable battery is not user accessible.		
Accessory	Gateway and ECG pads for leads		
Bluetooth Tethering (Hotspot)	BT Tethering mode permits the device to share its cellular data connection with other devices. ☒ BT Tethering (Bluetooth 2.4 GHz)		
Test sample information	**S/N**	**IMEI**	**Notes**
	SIA2008	N/A	Conducted
	SIA03142	N/A	Radiated
Hardware Version	K3S001 Rev C		
Software Version	V00.1355		

6.2. Wireless Technologies

Gateway

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 5 FDD Band 12 FDD Band 13 FDD Band 14 FDD Band 66 FDD Band 71	QPSK 16QAM Rel. 10 Does not support Carrier Aggregation (CA)	100% (FDD) Refer to §6.4
	Does this device support SV-LTE (1xRTT-LTE)? ☐ Yes ☒ No		
Bluetooth	2.4 GHz	LE	100%[1]

Notes:

1. Refer to Section 9.3 for Duty Cycle Measurement

Sensor Standalone

Wireless technologies	Frequency bands	Operating mode	Duty Cycle used for SAR testing
Bluetooth	2.4 GHz	LE	100%[1]

Notes:

1. Refer to Section 9.3 for Duty Cycle Measurement

6.3. General LTE SAR Test and Reporting Considerations

Item	Description						
Frequency range, Channel Bandwidth, Numbers and Frequencies	Band 2	Frequency range: 1850 - 1910 MHz (BW = 60 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	**18700 /1860**	18675/ 1857.5	18650/ 1855	18625/ 1852.5	18615/ 1851.5	18607/ 1850.7
	Mid	**18900/ 1880**	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880	18900/ 1880
	High	**19100/ 1900**	19125/ 1902.5	19150/ 1905	19175/ 1907.5	19185/ 1908.5	19193/ 1909.3
	Band 4	Frequency range: 1710 - 1755 MHz (BW = 45 MHz)					
		Channel Bandwidth					
		20 MHz [1]	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Low	20050/ 1720	20025/ 1717.5	20000/ 1715	19975/ 1712.5	19965/ 1711.5	19957/ 1710.7
	Mid	**20175/ 1732.5**	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5	20175/ 1732.5
	High	20300/ 1745	20325/ 1747.5	20350/ 1750	20375/ 1752.5	20385/ 1753.5	20393/ 1754.3
	Band 5	Frequency range: 824 - 849 MHz (BW = 25 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz	3 MHz	1.4 MHz
	Low			20450/ 829	20425/ 826.5	20415/ 825.5	20407/ 824.7
	Mid			**20525/ 836.5**	20525/ 836.5	20525/ 836.5	20525/ 836.5
	High			20600/ 844	20625/ 846.5	20635/ 847.5	20643/ 848.3
	Band 12	Frequency range: 699 – 716 MHz (BW = 17 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz	3 MHz	1.4 MHz
	Low			23060/ 704	23035/ 701.5	23025/ 700.5	23017/ 699.7
	Mid			**23095/ 707.5**	23095/ 707.5	23095/ 707.5	23095/ 707.5
	High			23130/ 711	23155/ 713.5	23165/ 714.5	23173/ 715.3
	Band 13	Frequency range: 777 - 787 MHz (BW = 10 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
	Low				23205/ 779.5		
	Mid			**23230/ 782**	23230/ 782		
	High				23255/ 784.5		
	Band 14	Frequency range: 788 - 798 MHz (BW = 10 MHz)					
		Channel Bandwidth					
		20 MHz	15 MHz	10 MHz [1]	5 MHz [1]	3 MHz	1.4 MHz
	Low				23305/ 790.5		
	Mid			**23330/ 793**	23330/ 793		
	High				23355/ 795.5		

<table>
<tr><td rowspan="10">Frequency range, Channel Bandwidth, Numbers and Frequencies</td><td rowspan="2">Band 66</td><td colspan="6">Frequency range: 1710 - 1780 MHz (BW = 70 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><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>132072/ 1720</td><td>132047/ 1717.5</td><td>132022/ 1715</td><td>131997/ 1712.5</td><td>131987/ 1711.5</td><td>131979/ 1710.7</td></tr>
<tr><td>Mid</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td><td>132322/ 1745</td></tr>
<tr><td>High</td><td>132572/ 1770</td><td>132597/ 1772.5</td><td>132622/ 1775</td><td>132647/ 1777.5</td><td>132657/ 1778.5</td><td>132665/ 1779.3</td></tr>
<tr><td rowspan="2">Band 71</td><td colspan="6">Frequency range: 663 - 698 MHz (BW = 35 MHz)</td></tr>
<tr><td colspan="6">Channel Bandwidth</td></tr>
<tr><td></td><td>20 MHz [1]</td><td>15 MHz [1]</td><td>10 MHz</td><td>5 MHz</td><td>3 MHz</td><td>1.4 MHz</td></tr>
<tr><td>Low</td><td>133222/ 673</td><td>133197/ 670.5</td><td>133172/ 668</td><td>133147/ 665.5</td><td></td><td></td></tr>
<tr><td>Mid</td><td>133297/ 680.5</td><td>133297/ 680.5</td><td>133297/ 680.5</td><td>133297/ 680.5</td><td></td><td></td></tr>
<tr><td>High</td><td>133372/ 688</td><td>133397/ 690.5</td><td>133422/ 693</td><td>133447/ 695.5</td><td></td><td></td></tr>
<tr><td>LTE transmitter and antenna implementation</td><td colspan="7">Refer to Appendix A.</td></tr>
<tr><td>Maximum power reduction (MPR)</td><td colspan="7">
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 colspan="7">No</td></tr>
<tr><td>Spectrum plots for RB configurations</td><td colspan="7">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. Maximum bandwidth 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.

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.

7.1. Testing Rationale

The data covered in this report is comprised of two pieces of equipment: Gateway (FCC ID: 2AHLC01856) and Sensor (FCC ID: 2AHLC01857). The Sensor can be body worn on its own with a separation distance of 0 mm, or the Sensor can be body worn while docked in the Gateway and body-worn with belt clip. There is no portable use-case for the Gateway standalone, and it is therefore, not covered within the scope of this report.

SAR was performed on the Sensor Standalone and on the Gateway (with Sensor Docked).

7.2. Required Test Configurations

The table below identifies the standalone test configurations required for this device according to the findings in Section 7.1:

Antenna	Test Configurations	RF Exposure Condition	Back	Front[1]	Edge Top[1]	Edge Right[1]	Edge Bottom[1]	Edge Left[1]
Gateway (with Sensor Docked)								
WWAN	W-CDMA Band 2 Full Power	Body - Belt-worn with belt clip	Yes	No	No	No	No	No
	W-CDMA Band 4 Full Power		Yes	No	No	No	No	No
	W-CDMA Band 5 Full Power		Yes	No	No	No	No	No
	LTE Band 2 Full Power		Yes	No	No	No	No	No
	LTE Band 5 Full Power		Yes	No	No	No	No	No
	LTE Band 12 Full Power		Yes	No	No	No	No	No
	LTE Band 13 Full Power		Yes	No	No	No	No	No
	LTE Band 14 Full Power		Yes	No	No	No	No	No
	LTE Band 66 Full Power		Yes	No	No	No	No	No
	LTE Band 71 Full Power		Yes	No	No	No	No	No
BT	Bluetooth		Yes	No	No	No	No	No
Sensor Docked in Gateway								
Main	Bluetooth	Body	Yes	Yes	No	No	No	No
Sensor Standalone								
Main	Bluetooth	Body	Yes	Yes	No	No	No	No

Note(s):

Yes = Testing is required.
No = Testing is not required.

1. Test configuration not required as the gateway is always in a belt clip for body-worn conditions.

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 IEC/IEEE 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		Body	
	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

IEC/IEEE 62209-1528

Table 2 – Dielectric properties of the tissue-equivalent medium

Frequency MHz	Real part of the complex relative permittivity, ε_r'	Conductivity, σ S/m	Penetration depth (E-field), δ mm
4	*55,0*	*0,75*	293,0
13	*55,0*	*0,75*	165,5
30	55,0	0,75	112,8
150	52,3	0,76	62,0
300	45,3	0,87	46,1
450	43,5	0,87	43,0
750	*41,9*	*0,89*	39,8
835	41,5	0,90	39,0
900	41,5	0,97	36,2
1 450	40,5	1,20	28,6
1 800	40,0	1,40	24,3
1 900	40,0	1,40	24,3
1 950	40,0	1,40	24,3
2 000	40,0	1,40	24,3
2 100	*39,8*	*1,49*	22,8
2 450	39,2	1,80	18,7
2 600	*39,0*	*1,96*	17,2
3 000	38,5	2,40	14,0
3 500	*37,9*	*2,91*	11,4
4 000	*37,4*	*3,43*	10,0
4 500	*36,8*	*3,94*	9,7
5 000	*36,2*	*4,45*	1,5
5 200	*36,0*	*4,66*	8,4
5 400	*35,8*	*4,86*	8,1
5 600	*35,5*	*5,07*	7,5
5 800	35,3	5,27	7,3
6 000	*35,1*	*5,48*	7,0
6 500	*34,5*	*6,07*	6,7
7 000	*33,9*	*6,65*	6,4
7 500	*33,3*	*7,24*	6,1
8 000	*32,7*	*7,84*	5,9
8 500	*32,1*	*8,46*	5,3
9 000	*31,6*	*9,08*	4,8
9 500	*31,0*	*9,71*	4,4
10 000	*30,4*	*10,40*	4,0

NOTE For convenience, permittivity and conductivity values are linearly interpolated for frequencies that are not a part of the original data from Drossos et al. [2]. They are shown in italics in Table 2. The italicized values are linearly interpolated (below 5800 MHz) or extrapolated (above 5800 MHz) from the non-italicized values that are immediately above and below these values.

Dielectric Property Measurement Results

SAR Lab	Date	Band (MHz)	Tissue Type	Frequency (MHz)	Relative Permittivity (εr)			Conductivity (σ)		
					Measured	Target	Delta (%)	Measured	Target	Delta (%)
1A	3/14/2023	750	Head	750	43.4	42.0	3.38	0.89	0.89	-0.62
				660	43.6	42.4	2.87	0.86	0.89	-3.43
				800	43.2	41.7	3.66	0.90	0.90	0.38
1A	3/17/2023	750	Head	750	42.9	42.0	2.14	0.88	0.89	-1.92
				660	43.1	42.4	1.67	0.84	0.89	-4.66
				800	42.7	41.7	2.48	0.89	0.90	-0.88
1A	3/20/2023	1750	Head	1750	40.5	40.1	1.04	1.34	1.37	-2.12
				1710	40.5	40.1	0.96	1.32	1.35	-2.33
				1755	40.5	40.1	1.03	1.34	1.37	-2.10
1A	3/20/2023	1900	Head	1900	40.3	40.0	0.65	1.43	1.40	2.43
				1850	40.4	40.0	0.88	1.40	1.40	0.00
				1920	40.3	40.0	0.63	1.45	1.40	3.43
2A	3/13/2023	900	Head	900	43.5	41.5	4.72	0.93	0.97	-4.20
				820	43.7	41.6	4.97	0.90	0.90	-0.10
				915	43.4	41.5	4.63	0.94	0.98	-4.29
2A	8/1/2023	1750	Head	1750	38.5	40.1	-4.03	1.33	1.37	-3.07
				1710	38.5	40.2	-4.10	1.30	1.35	-3.15
				1785	38.4	40.0	-4.02	1.35	1.39	-3.00
2A	8/1/2023	1900	Head	1900	38.2	40.0	-4.50	1.42	1.40	1.07
				1850	38.3	40.0	-4.25	1.38	1.40	-1.14
				1980	38.0	40.0	-5.00	1.46	1.40	3.93
2A	8/14/2023	1900	Head	1900	39.3	40.0	-1.78	1.45	1.40	3.36
				1850	39.4	40.0	-1.60	1.41	1.40	1.00
				1920	39.3	40.0	-1.82	1.46	1.40	4.14
2A	8/22/2023	2450	Head	2450	37.5	39.2	-4.46	1.76	1.80	-2.44
				2400	37.5	39.3	-4.52	1.72	1.75	-1.81
				2480	37.4	39.2	-4.42	1.78	1.83	-3.08
2B	3/13/2023	1750	Head	1750	41.7	40.1	3.91	1.41	1.37	3.29
				1705	41.7	40.2	3.88	1.38	1.34	3.01
				1755	41.6	40.1	3.90	1.42	1.37	3.22
2B	3/16/2023	1900	Head	1900	38.5	40.0	-3.87	1.43	1.40	2.00
				1845	38.5	40.0	-3.70	1.39	1.40	-0.79
				1970	38.3	40.0	-4.22	1.47	1.40	5.00

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.
- 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.
- The dipole input power (forward power) was recorded and the results were 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	Dipole Power (dBm)	Measured Results for 1g SAR				Measured Results for 10g SAR				Plot No.
						Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	Zoom Scan	Normalize to 1 W	Target (Ref. Value)	Delta ±10 %	
1A	3/14/2023	Head	D750V3 SN: 1139	10/12/2023	17.0	0.417	8.32	8.12	2.47	0.274	5.47	5.41	1.05	1
1A	3/17/2023	Head	D750V3 SN: 1139	10/12/2023	17.0	0.412	8.22	8.12	1.24	0.272	5.43	5.41	0.32	
1A	3/20/2023	Head	D1750V2 SN: 1136	10/17/2023	17.0	1.800	35.91	34.44	4.28	0.955	19.05	18.63	2.28	2
1A	3/20/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.0	2.060	41.10	37.86	8.56	1.060	21.15	20.26	4.39	3
2A	3/13/2023	Head	D900V2 SN: 1d180	10/12/2023	17.0	0.518	10.34	10.63	-2.77	0.338	6.74	6.97	-3.24	4
2A	8/1/2023	Head	D1750V2 SN: 1136	10/17/2023	17.0	1.790	35.72	36.10	-1.07	0.956	19.07	19.10	-0.13	5
2A	8/1/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.0	2.010	40.10	39.20	2.31	1.050	20.95	20.40	2.70	
2A	8/14/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.0	2.060	41.10	37.86	8.56	1.070	21.35	20.26	5.38	6
2A	8/22/2023	Head	D2450V2 SN: 963	10/18/2023	17.0	2.410	48.09	52.40	-8.23	1.130	22.55	24.50	-7.97	7
2B	3/13/2023	Head	D1750V2 SN: 1136	10/17/2023	17.0	1.850	36.91	34.44	7.18	0.982	19.59	18.63	5.17	8
2B	3/16/2023	Head	D1900V2 SN: 5d202	10/12/2023	17.0	1.990	39.71	39.20	1.29	1.020	20.35	20.40	-0.24	9

9. Conducted Output Power Measurements

Tune-Up Power Limits provided by the manufacturer are used to scale measured SAR values.

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. A summary of these settings is illustrated below:

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 procedures in table C.10.1.4 of 3GPP TS 34.121-1
A summary of these settings is illustrated below:

Table C.10.1.4: β values for transmitter characteristics tests with HS-DPCCH

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1, Note 2)	CM (dB) (Note 3)	MPR (dB) (Note 3)
1	2/15	15/15	64	2/15	4/15	0.0	0.0
2	12/15 (Note 4)	15/15 (Note 4)	64	12/15 (Note 4)	24/15	1.0	0.0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c.

Note 2: For the HS-DPCCH power mask requirement test in clause 5.2C, 5.7A, and the Error Vector Magnitude (EVM) with HS-DPCCH test in clause 5.13.1A, and HSDPA EVM with phase discontinuity in clause 5.13.1AA, Δ_{ACK} and Δ_{NACK} = 30/15 with β_{hs} = 30/15 * β_c, and Δ_{CQI} = 24/15 with β_{hs} = 24/15 * β_c.

Note 3: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 4: For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 11/15 and β_d = 15/15.

HSUPA Setup Procedures used to establish the test signals

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

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

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (Note 4) (Note 5)	β_{ed} (SF)	β_{ed} (Codes)	CM (dB) (Note 2)	MPR (dB) (Note 2) (Note 6)	AG Index (Note 5)	E-TFCI
1	11/15 (Note 3)	15/15 (Note 3)	64	11/15 (Note 3)	22/15	209/225	1309/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	$\beta_{ed}1$: 47/15 $\beta_{ed}2$: 47/15	4 4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15	0	-	-	5/15	5/15	47/15	4	1	1.0	0.0	12	67

Note 1: For sub-test 1 to 4, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with β_{hs} = 30/15 * β_c. For sub-test 5, Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 5/15 with β_{hs} = 5/15 * β_c.

Note 2: CM = 1 for β_c/β_d =12/15, β_{hs}/β_c=24/15. For all other combinations of DPDCH, DPCCH, HS- DPCCH, E-DPDCH and E-DPCCH the MPR is based on the relative CM difference.

Note 3: For subtest 1 the β_c/β_d ratio of 11/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to β_c = 10/15 and β_d = 15/15.

Note 4: In case of testing by UE using E-DPDCH Physical Layer category 1, Sub-test 3 is omitted according to TS25.306 Table 5.1g.

Note 5: β_{ed} can not be set directly; it is set by Absolute Grant Value.

Note 6: For subtests 2, 3 and 4, UE may perform E-DPDCH power scaling at max power which could results in slightly smaller MPR values.

DC-HSDPA Setup Procedures used to establish the test signals

The following 4 Sub-tests for DC-HSDPA were completed according to procedures in table C08.1.12 of 3GPP TS 34.121-1. A summary of subtest settings is illustrated below:

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	Proces ses	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.

Maximum Output Power (Tune-up Limit) for W-CDMA

SAR measurement is not required for the HSDPA, HSUPA, DC-HSDPA. When primary mode and the adjusted SAR is ≤ 1.2 W/kg and secondary mode is ≤ ¼ dB higher than the primary mode

RF Air interface	Mode	Tune-up Power Limit (dBm)
		WWAN Antenna
		Maximum
W-CDMA Band 2	R99	22.4
	HSDPA	22.4
	HSUPA	22.4
	DC-HSDPA	22.4
W-CDMA Band 4	R99	23.8
	HSDPA	23.8
	HSUPA	23.8
	DC-HSDPA	23.8
W-CDMA Band 5	R99	25.0
	HSDPA	25.0
	HSUPA	25.0
	DC-HSDPA	25.0

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	22.4	N/A	22.4
		9400	1880.0	22.4		
		9538	1907.6	22.3		
HSDPA	Subtest 1	9262	1852.4	22.1	0	22.4
		9400	1880.0	22.2		
		9538	1907.6	22.0		
	Subtest 2	9262	1852.4	22.1	0	22.4
		9400	1880.0	22.2		
		9538	1907.6	22.0		
	Subtest 3	9262	1852.4	21.6	0.5	21.9
		9400	1880.0	21.6		
		9538	1907.6	21.4		
	Subtest 4	9262	1852.4	21.5	0.5	21.9
		9400	1880.0	21.5		
		9538	1907.6	21.4		
HSUPA	Subtest 1	9262	1852.4	21.7	0	22.4
		9400	1880.0	21.1		
		9538	1907.6	21.5		
	Subtest 2	9262	1852.4	20.2	2	20.4
		9400	1880.0	20.0		
		9538	1907.6	20.1		
	Subtest 3	9262	1852.4	20.4	1	21.4
		9400	1880.0	20.7		
		9538	1907.6	20.4		
	Subtest 4	9262	1852.4	20.3	2	20.4
		9400	1880.0	20.4		
		9538	1907.6	20.4		
	Subtest 5	9262	1852.4	21.4	0	22.4
		9400	1880.0	21.5		
		9538	1907.6	21.5		
DC-HSDPA	Subtest 1	9262	1852.4	21.7	0	22.4
		9400	1880.0	21.8		
		9538	1907.6	21.7		
	Subtest 2	9262	1852.4	21.8	0	22.4
		9400	1880.0	22.0		
		9538	1907.6	21.9		
	Subtest 3	9262	1852.4	21.4	0.5	21.9
		9400	1880.0	21.5		
		9538	1907.6	21.4		
	Subtest 4	9262	1852.4	21.4	0.5	21.9
		9400	1880.0	21.5		
		9538	1907.6	21.4		

Notes:

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 3dB more than specified by 3GPP, but also as low as 0dB according to the chipset implementation in this model.

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	23.4	N/A	23.8
		1413	1732.6	23.7		
		1513	1752.6	23.6		
HSDPA	Subtest 1	1312	1712.4	22.1	0	23.8
		1413	1732.6	22.2		
		1513	1752.6	22.1		
	Subtest 2	1312	1712.4	22.2	0	23.8
		1413	1732.6	22.4		
		1513	1752.6	22.3		
	Subtest 3	1312	1712.4	21.7	0.5	23.3
		1413	1732.6	21.9		
		1513	1752.6	21.7		
	Subtest 4	1312	1712.4	21.7	0.5	23.3
		1413	1732.6	21.8		
		1513	1752.6	21.7		
HSUPA	Subtest 1	1312	1712.4	21.8	0	23.8
		1413	1732.6	21.9		
		1513	1752.6	21.9		
	Subtest 2	1312	1712.4	21.2	2	21.8
		1413	1732.6	21.2		
		1513	1752.6	20.7		
	Subtest 3	1312	1712.4	21.1	1	22.8
		1413	1732.6	20.9		
		1513	1752.6	21.1		
	Subtest 4	1312	1712.4	21.6	2	21.8
		1413	1732.6	21.6		
		1513	1752.6	21.0		
	Subtest 5	1312	1712.4	21.9	0	23.8
		1413	1732.6	22.1		
		1513	1752.6	21.8		
DC-HSDPA	Subtest 1	1312	1712.4	22.2	0	23.8
		1413	1732.6	22.2		
		1513	1752.6	22.2		
	Subtest 2	1312	1712.4	22.2	0	23.8
		1413	1732.6	22.3		
		1513	1752.6	22.2		
	Subtest 3	1312	1712.4	21.7	0.5	23.3
		1413	1732.6	21.8		
		1513	1752.6	21.8		
	Subtest 4	1312	1712.4	21.8	0.5	23.3
		1413	1732.6	21.8		
		1513	1752.6	21.7		

Notes:

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 3dB more than specified by3GPP, but also as low as 0dB according to the chipset implementation in this model.

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	23.2	N/A	25.0
		4183	836.6	23.2		
		4233	846.6	23.2		
HSDPA	Subtest 1	4132	826.4	21.7	0	25.0
		4183	836.6	21.8		
		4233	846.6	21.7		
	Subtest 2	4132	826.4	21.8	0	25.0
		4183	836.6	21.9		
		4233	846.6	21.7		
	Subtest 3	4132	826.4	21.3	0.5	24.5
		4183	836.6	21.3		
		4233	846.6	21.2		
	Subtest 4	4132	826.4	21.3	0.5	24.5
		4183	836.6	21.3		
		4233	846.6	21.2		
HSUPA	Subtest 1	4132	826.4	21.1	0	25.0
		4183	836.6	21.7		
		4233	846.6	21.2		
	Subtest 2	4132	826.4	20.8	2	23.0
		4183	836.6	20.5		
		4233	846.6	20.6		
	Subtest 3	4132	826.4	20.4	1	24.0
		4183	836.6	20.6		
		4233	846.6	20.4		
	Subtest 4	4132	826.4	20.9	2	23.0
		4183	836.6	20.7		
		4233	846.6	21.0		
	Subtest 5	4132	826.4	21.4	0	25.0
		4183	836.6	21.4		
		4233	846.6	21.3		
DC-HSDPA	Subtest 1	4132	826.4	21.7	0	25.0
		4183	836.6	21.8		
		4233	846.6	21.7		
	Subtest 2	4132	826.4	21.8	0	25.0
		4183	836.6	21.9		
		4233	846.6	21.7		
	Subtest 3	4132	826.4	21.2	0.5	24.5
		4183	836.6	21.3		
		4233	846.6	21.2		
	Subtest 4	4132	826.4	21.3	0.5	24.5
		4183	836.6	21.4		
		4233	846.6	21.3		

Notes:

It is expected by the manufacturer that MPR for some HSPA subtests may be up to 3dB more than specified by3GPP, but also as low as 0dB according to the chipset implementation in this model.

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

Maximum Output Power (Tune-up Limit) for LTE

According to April 2015 TCB workshop, SAR test exclusion can be applied for testing overlapping LTE bands as follows:

a) The maximum output power, including tolerance, for the smaller band must be ≤ the larger band to qualify for the SAR test exclusion.
b) The channel bandwidth and other operating parameters for the smaller band must be fully supported by the larger band.
   - LTE Band 4 (1710-1755 MHz) is covered by LTE Band 66 (1710-1780 MHz)

For some LTE Bands, certain channel bandwidths do not support at least three non-overlapping channels. When a device supports overlapping channel assignments 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. Please refer to section 6.3. for a detailed list of LTE test channels.

- LTE Band 5 (824-849 MHz)
- LTE Band 12 (699-716 MHz)
- LTE Band 13 (777-787 MHz)
- LTE Band 14 (788-798 MHz)
- LTE Band 71 (663-698 MHz)

LTE QPSK configuration has the highest maximum average output power per 3GPP standard.

SAR measurement is not required for the 16QAM. When the highest maximum output power for 16QAM, is ≤ ½ dB higher than the QPSK or when the reported SAR for the QPSK configuration is ≤ 1.45 W/kg.

RF Air interface	Mode	Tune-up Power Limit (dBm)
		WWAN Antenna
		Maximum
LTE Band 2	QPSK	22.1
LTE Band 4	QPSK	25.0
LTE Band 5	QPSK	25.0
LTE Band 12	QPSK	25.0
LTE Band 13	QPSK	25.0
LTE Band 14	QPSK	25.0
LTE Band 66	QPSK	25.0
LTE Band 71	QPSK	25.0

LTE Band 2 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18700	18900	19100		
				1860 MHz	1880 MHz	1900 MHz		
20 MHz	QPSK	1	0	21.3	21.3	21.6	0	22.1
		1	49	21.8	21.8	22.0	0	22.1
		1	99	21.4	21.2	21.2	0	22.1
		50	0	20.4	20.7	20.4	1	21.1
		50	24	20.5	20.7	20.5	1	21.1
		50	50	20.6	20.5	20.4	1	21.1
		100	0	20.6	20.7	20.5	1	21.1
	16QAM	1	0	19.9	20.2	19.9	1	21.1
		1	49	20.0	19.9	20.2	1	21.1
		1	99	19.9	19.6	19.5	1	21.1
		12	0	19.7	20.1	20.1	2	20.1
		12	44	20.1	20.0	20.1	2	20.1
		12	88	20.0	20.0	19.8	2	20.1
		27	0	18.7	19.1	19.5	2	20.1
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18675	18900	19125		
				1857.5 MHz	1880 MHz	1902.5 MHz		
15 MHz	QPSK	1	0	21.6	21.5	21.5	0	22.1
		1	37	21.9	22.1	21.6	0	22.1
		1	74	21.7	21.4	21.3	0	22.1
		36	0	20.6	20.6	20.4	1	21.1
		36	20	20.6	20.6	20.4	1	21.1
		36	39	20.6	20.4	20.3	1	21.1
		75	0	20.5	20.6	20.3	1	21.1
	16QAM	1	0	20.5	20.2	19.8	1	21.1
		1	37	20.6	20.1	20.2	1	21.1
		1	74	20.8	20.1	19.6	1	21.1
		12	0	19.7	20.0	20.0	2	20.1
		12	31	19.9	20.0	20.0	2	20.1
		12	63	20.0	19.9	20.0	2	20.1
		27	0	18.9	19.1	19.2	2	20.1
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18650	18900	19150		
				1855 MHz	1880 MHz	1905 MHz		
10 MHz	QPSK	1	0	21.5	21.6	21.3	0	22.1
		1	25	21.7	21.9	21.3	0	22.1
		1	49	21.6	21.6	21.2	0	22.1
		25	0	20.4	20.7	20.4	1	21.1
		25	12	20.5	20.7	20.4	1	21.1
		25	25	20.5	20.5	20.3	1	21.1
		50	0	20.4	20.6	20.3	1	21.1
	16QAM	1	0	19.9	20.0	20.1	1	21.1
		1	25	20.0	20.6	20.1	1	21.1
		1	49	19.8	20.0	19.6	1	21.1
		12	0	19.8	20.0	20.1	2	20.1
		12	19	20.0	20.1	20.1	2	20.1
		12	38	20.1	20.1	19.9	2	20.1
		27	0	19.0	19.3	19.0	2	20.1

LTE Band 2 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18625	18900	19175		
				1852.5 MHz	1880 MHz	1907.5 MHz		
5 MHz	QPSK	1	0	21.1	21.6	21.5	0	22.1
		1	12	21.2	21.7	21.5	0	22.1
		1	24	21.1	21.4	21.4	0	22.1
		12	0	20.4	20.8	20.5	1	21.1
		12	7	20.5	20.7	20.5	1	21.1
		12	13	20.5	20.7	20.7	1	21.1
		25	0	20.4	20.7	20.6	1	21.1
	16QAM	1	0	19.8	19.9	20.0	1	21.1
		1	12	19.7	19.6	19.8	1	21.1
		1	24	19.7	19.6	19.6	1	21.1
		12	0	18.7	19.0	18.8	2	20.1
		12	7	18.8	18.9	18.8	2	20.1
		12	13	18.8	18.8	18.9	2	20.1
		25	0	18.9	19.1	19.1	2	20.1
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18615	18900	19185		
				1851.5 MHz	1880 MHz	1908.5 MHz		
3 MHz	QPSK	1	0	21.3	21.5	21.0	0	22.1
		1	8	21.3	21.4	21.1	0	22.1
		1	14	21.4	21.5	20.8	0	22.1
		8	0	20.4	20.7	20.1	1	21.1
		8	4	20.5	20.6	20.2	1	21.1
		8	7	20.4	20.5	20.2	1	21.1
		15	0	20.4	20.5	20.1	1	21.1
	16QAM	1	0	19.9	20.1	20.0	1	21.1
		1	8	20.2	19.9	20.0	1	21.1
		1	14	20.0	20.1	19.7	1	21.1
		8	0	19.0	18.8	19.0	2	20.1
		8	4	18.9	18.9	19.0	2	20.1
		8	7	19.1	19.1	19.1	2	20.1
		15	0	18.8	19.2	19.0	2	20.1
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				18607	18900	19193		
				1850.7 MHz	1880 MHz	1909.3 MHz		
1.4 MHz	QPSK	1	0	21.7	21.7	21.5	0	22.1
		1	3	21.5	21.7	21.6	0	22.1
		1	5	21.4	21.7	21.3	0	22.1
		3	0	21.5	21.7	21.4	0	22.1
		3	1	21.4	21.8	21.5	0	22.1
		3	3	21.6	21.7	21.6	0	22.1
		6	0	20.5	20.7	20.4	1	21.1
	16QAM	1	0	19.9	19.9	19.6	1	21.1
		1	3	20.3	20.2	19.6	1	21.1
		1	5	20.1	19.8	19.4	1	21.1
		3	0	20.1	19.8	19.7	1	21.1
		3	1	20.3	20.2	19.6	1	21.1
		3	3	20.4	20.3	19.6	1	21.1
		6	0	18.7	19.0	19.1	2	20.1

LTE Band 5 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	20525	[redacted]		
					836.5 MHz			
10 MHz	QPSK	1	0		23.4		0	25
		1	25		23.3		0	25
		1	49		23.5		0	25
		25	0		22.4		1	24
		25	12		22.5		1	24
		25	25		22.6		1	24
		50	0		22.3		1	24
	16QAM	1	0		22.4		1	24
		1	25		22.3		1	24
		1	49		22.4		1	24
		12	0		22.1		2	23
		12	12		22.5		2	23
		12	25		22.5		2	23
		27	0		21.4		2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20425	20525	20625		
				826.5 MHz	836.5 MHz	846.5 MHz		
5 MHz	QPSK	1	0	23.1	23.7	23.4	0	25
		1	12	24.0	23.6	23.6	0	25
		1	24	23.4	23.5	23.1	0	25
		12	0	22.5	22.5	22.5	1	24
		12	7	22.6	22.6	22.4	1	24
		12	13	22.6	22.5	22.4	1	24
		25	0	22.5	22.4	22.3	1	24
	16QAM	1	0	22.1	22.1	23.1	1	24
		1	12	22.7	22.3	23.0	1	24
		1	24	22.5	22.2	22.8	1	24
		12	0	21.3	21.3	21.3	2	23
		12	7	21.5	21.4	21.3	2	23
		12	13	21.5	21.5	21.2	2	23
		25	0	21.5	21.3	21.3	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20415	20525	20635		
				825.5 MHz	836.5 MHz	847.5 MHz		
3 MHz	QPSK	1	0	23.5	23.5	23.5	0	25
		1	8	23.5	23.3	23.3	0	25
		1	14	23.5	23.2	23.4	0	25
		8	0	22.4	22.3	22.5	1	24
		8	4	22.5	22.2	22.4	1	24
		8	7	22.5	22.3	22.3	1	24
		15	0	22.5	22.3	22.4	1	24
	16QAM	1	0	22.2	22.1	22.8	1	24
		1	8	22.8	22.0	22.7	1	24
		1	14	22.8	22.1	22.7	1	24
		8	0	21.3	21.1	21.9	2	23
		8	4	21.6	21.1	21.5	2	23
		8	7	21.3	21.2	21.5	2	23
		15	0	21.4	21.1	21.4	2	23

LTE Band 5 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				20407	20525	20643		
				824.7 MHz	836.5 MHz	848.3 MHz		
1.4 MHz	QPSK	1	0	23.6	23.1	23.3	0	25
		1	3	23.7	23.1	23.1	0	25
		1	5	23.5	23.2	23.1	0	25
		3	0	23.4	23.1	23.3	0	25
		3	1	23.4	23.1	23.2	0	25
		3	3	23.4	23.0	23.3	0	25
		6	0	22.6	22.0	22.2	1	24
	16QAM	1	0	22.1	22.3	22.9	1	24
		1	3	22.5	22.4	22.7	1	24
		1	5	22.3	22.2	22.8	1	24
		3	0	22.5	22.1	22.6	1	24
		3	1	22.6	22.0	22.2	1	24
		3	3	22.7	22.0	22.1	1	24
		6	0	21.5	21.1	21.4	2	23

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		23.9		0	25
		1	25		23.8		0	25
		1	49		23.9		0	25
		25	0		22.8		1	24
		25	12		22.8		1	24
		25	25		22.8		1	24
		50	0		22.8		1	24
	16QAM	1	0		23.0		1	24
		1	25		22.5		1	24
		1	49		22.5		1	24
		12	0		22.7		2	23
		12	12		22.5		2	23
		12	25		22.8		2	23
		27	0		21.8		2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23035	23095	23155		
				701.5 MHz	707.5 MHz	713.5 MHz		
5 MHz	QPSK	1	0	23.2	23.5	23.4	0	25
		1	12	23.4	23.8	23.5	0	25
		1	24	23.3	23.3	23.3	0	25
		12	0	22.3	22.5	22.5	1	24
		12	7	22.3	22.6	22.6	1	24
		12	13	22.4	22.4	22.5	1	24
		25	0	22.3	22.5	22.6	1	24
	16QAM	1	0	22.2	22.5	22.2	1	24
		1	12	22.3	22.5	22.6	1	24
		1	24	22.1	22.3	22.2	1	24
		12	0	21.2	21.3	21.6	2	23
		12	7	21.3	21.6	21.8	2	23
		12	13	21.3	21.3	21.8	2	23
		25	0	21.3	21.5	21.7	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23025	23095	23165		
				700.5 MHz	707.5 MHz	714.5 MHz		
3 MHz	QPSK	1	0	23.0	23.5	23.8	0	25
		1	8	23.0	23.4	23.7	0	25
		1	14	23.1	23.5	23.5	0	25
		8	0	22.2	22.5	22.7	1	24
		8	4	22.2	22.5	22.6	1	24
		8	7	22.3	22.6	22.6	1	24
		15	0	22.1	22.5	22.7	1	24
	16QAM	1	0	22.7	23.0	23.1	1	24
		1	8	23.3	22.9	23.1	1	24
		1	14	23.4	22.3	22.9	1	24
		8	0	21.0	21.4	22.1	2	23
		8	4	21.0	21.3	22.1	2	23
		8	7	21.1	21.2	22.1	2	23
		15	0	21.2	21.6	21.9	2	23

LTE Band 12 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				23017	23095	23173		
				699.7 MHz	707.5 MHz	715.3 MHz		
1.4 MHz	QPSK	1	0	24.0	23.5	23.6	0	25
		1	3	23.8	23.6	23.7	0	25
		1	5	23.8	23.7	23.5	0	25
		3	0	23.5	23.5	23.6	0	25
		3	1	23.4	23.8	23.8	0	25
		3	3	23.5	23.6	23.7	0	25
		6	0	22.5	22.5	22.7	1	24
	16QAM	1	0	22.5	22.3	23.4	1	24
		1	3	22.4	22.6	23.1	1	24
		1	5	22.5	22.4	22.8	1	24
		3	0	22.3	22.7	22.7	1	24
		3	1	22.6	22.8	22.6	1	24
		3	3	22.4	22.7	22.4	1	24
		6	0	21.4	21.5	21.7	2	23

LTE Band 13 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)		MPR	Tune-up Limit
				[redacted]	23230 / 782 MHz		
10 MHz	QPSK	1	0		23.1	0	25
		1	25		23.7	0	25
		1	49		23.4	0	25
		25	0		22.4	1	24
		25	12		22.6	1	24
		25	25		22.7	1	24
		50	0		22.7	1	24
	16QAM	1	0		22.6	1	24
		1	25		23.7	1	24
		1	49		23.1	1	24
		12	0		22.5	2	23
		12	12		22.8	2	23
		12	25		22.8	2	23
		27	0		21.5	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)		MPR	Tune-up Limit
				[redacted]	23230 / 782 MHz		
5 MHz	QPSK	1	0		23.1	0	25
		1	12		23.7	0	25
		1	24		23.5	0	25
		12	0		22.4	1	24
		12	7		22.6	1	24
		12	13		22.6	1	24
		25	0		22.6	1	24
	16QAM	1	0		23.0	1	24
		1	12		23.3	1	24
		1	24		23.4	1	24
		12	0		21.5	2	23
		12	7		21.6	2	23
		12	13		21.5	2	23
		25	0		21.7	2	23

LTE Band 14 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23330 / 793 MHz	[redacted]		
10 MHz	QPSK	1	0	[redacted]	23.1	[redacted]	0	25
		1	25	[redacted]	23.1	[redacted]	0	25
		1	49	[redacted]	23.2	[redacted]	0	25
		25	0	[redacted]	22.3	[redacted]	1	24
		25	12	[redacted]	22.4	[redacted]	1	24
		25	25	[redacted]	22.3	[redacted]	1	24
		50	0	[redacted]	22.3	[redacted]	1	24
	16QAM	1	0	[redacted]	23.0	[redacted]	1	24
		1	25	[redacted]	22.0	[redacted]	1	24
		1	49	[redacted]	22.8	[redacted]	1	24
		12	0	[redacted]	22.4	[redacted]	2	23
		12	12	[redacted]	22.5	[redacted]	2	23
		12	25	[redacted]	22.3	[redacted]	2	23
		27	0	[redacted]	21.6	[redacted]	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	23330 / 793 MHz	[redacted]		
5 MHz	QPSK	1	0	[redacted]	23.7	[redacted]	0	25
		1	12	[redacted]	24.1	[redacted]	0	25
		1	24	[redacted]	23.6	[redacted]	0	25
		12	0	[redacted]	22.8	[redacted]	1	24
		12	7	[redacted]	22.6	[redacted]	1	24
		12	13	[redacted]	22.6	[redacted]	1	24
		25	0	[redacted]	22.5	[redacted]	1	24
	16QAM	1	0	[redacted]	22.3	[redacted]	1	24
		1	12	[redacted]	22.5	[redacted]	1	24
		1	24	[redacted]	22.3	[redacted]	1	24
		12	0	[redacted]	21.8	[redacted]	2	23
		12	7	[redacted]	21.7	[redacted]	2	23
		12	13	[redacted]	21.6	[redacted]	2	23
		25	0	[redacted]	21.6	[redacted]	2	23

LTE Band 66 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132072	132322	132572		
				1720 MHz	1745 MHz	1770 MHz		
20 MHz	QPSK	1	0	23.4	23.9	23.8	0	25
		1	49	23.3	24.0	23.5	0	25
		1	99	23.1	23.7	23.3	0	25
		50	0	22.3	22.9	22.8	1	24
		50	24	22.2	22.6	22.1	1	24
		50	50	22.3	22.7	22.6	1	24
		100	0	22.2	22.6	22.4	1	24
	16QAM	1	0	22.8	23.1	23.2	1	24
		1	49	23.0	23.6	23.3	1	24
		1	99	22.7	23.1	22.8	1	24
		12	0	22.4	22.5	22.2	2	23
		12	24	22.3	22.6	21.9	2	23
		12	50	22.3	22.4	21.8	2	23
		27	0	21.4	21.6	21.2	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132047	132322	132597		
				1717.5 MHz	1745 MHz	1772.5 MHz		
15 MHz	QPSK	1	0	23.6	24.1	23.3	0	25
		1	37	23.8	24.6	23.2	0	25
		1	74	23.4	24.3	23.8	0	25
		36	0	22.4	23.2	22.6	1	24
		36	20	22.5	23.1	22.6	1	24
		36	39	22.4	23.0	22.5	1	24
		75	0	22.4	23.0	22.4	1	24
	16QAM	1	0	22.7	23.4	22.7	1	24
		1	37	23.7	23.1	22.9	1	24
		1	74	22.9	23.0	22.3	1	24
		12	0	22.6	22.9	22.4	2	23
		12	20	22.6	22.9	22.4	2	23
		12	39	22.8	22.9	22.3	2	23
		27	0	21.8	21.8	21.5	2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				132022	132322	132622		
				1715 MHz	1745 MHz	1775 MHz		
10 MHz	QPSK	1	0	23.1	23.2	23.7	0	25
		1	25	23.3	23.3	23.6	0	25
		1	49	23.1	23.3	23.4	0	25
		25	0	22.2	22.5	22.4	1	24
		25	12	22.2	22.3	22.4	1	24
		25	25	22.1	22.2	22.3	1	24
		50	0	22.1	22.3	22.3	1	24
	16QAM	1	0	22.7	22.7	22.5	1	24
		1	25	23.3	23.2	23.0	1	24
		1	49	22.8	22.7	22.2	1	24
		12	0	22.2	22.5	22.3	2	23
		12	12	22.3	22.5	22.2	2	23
		12	25	22.3	22.3	22.2	2	23
		27	0	21.5	21.4	21.3	2	23

LTE Band 66 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131997	132322	132647		
				1712.5 MHz	1745 MHz	1777.5 MHz		
5 MHz	QPSK	1	0	23.4	23.3	23.6	0	25
		1	12	23.6	23.2	23.6	0	25
		1	24	23.3	23.1	23.2	0	25
		12	0	22.5	22.3	22.3	1	24
		12	7	22.4	22.3	22.3	1	24
		12	13	22.3	22.4	22.2	1	24
		25	0	22.4	22.3	22.2	1	24
	16QAM	1	0	22.7	22.7	22.7	1	24
		1	12	22.5	22.6	22.8	1	24
		1	24	22.6	22.5	22.6	1	24
		12	0	21.4	21.6	21.1	2	23
		12	7	21.4	21.8	21.1	2	23
		12	13	21.3	21.6	21.0	2	23
		25	0	21.5	21.6	21.1	2	23
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131987	132322	132657		
				1711.5 MHz	1745 MHz	1778.5 MHz		
3 MHz	QPSK	1	0	23.2	23.3	23.3	0	25
		1	8	23.1	23.1	23.3	0	25
		1	14	23.0	23.2	23.1	0	25
		8	0	22.1	22.3	22.2	1	24
		8	4	22.2	22.3	22.2	1	24
		8	7	22.2	22.3	22.3	1	24
		15	0	22.1	22.4	22.2	1	24
	16QAM	1	0	22.7	22.8	22.4	1	24
		1	8	22.7	22.6	22.6	1	24
		1	14	22.6	22.5	22.3	1	24
		8	0	21.3	21.2	21.2	2	23
		8	4	21.2	21.7	21.2	2	23
		8	7	21.2	21.3	21.2	2	23
		15	0	21.2	21.3	21.1	2	23
BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				131979	132322	132665		
				1710.7 MHz	1745 MHz	1779.3 MHz		
1.4 MHz	QPSK	1	0	23.5	23.5	23.3	0	25
		1	3	23.4	23.5	23.1	0	25
		1	5	23.3	23.6	23.1	0	25
		3	0	23.4	23.2	23.3	0	25
		3	1	23.4	23.3	23.1	0	25
		3	3	23.5	23.3	23.0	0	25
		6	0	22.4	22.4	22.3	1	24
	16QAM	1	0	23.0	22.7	22.7	1	24
		1	3	22.9	22.5	22.6	1	24
		1	5	22.9	22.3	22.5	1	24
		3	0	22.6	22.5	22.3	1	24
		3	1	22.2	22.6	22.1	1	24
		3	3	22.7	22.4	22.2	1	24
		6	0	21.1	21.2	21.4	2	23

LTE Band 71 Measured Results

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	133297	[redacted]		
				[redacted]	680.5 MHz	[redacted]		
20 MHz	QPSK	1	0		23.2		0	25
		1	49		23.6		0	25
		1	99		23.2		0	25
		50	0		22.5		1	24
		50	24		22.5		1	24
		50	50		22.5		1	24
		100	0		22.5		1	24
	16QAM	1	0		22.6		1	24
		1	49		23.1		1	24
		1	99		22.7		1	24
		12	0		22.6		2	23
		12	24		22.7		2	23
		12	50		22.4		2	23
		27	0		21.6		2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				[redacted]	133297	[redacted]		
				[redacted]	680.5 MHz	[redacted]		
15 MHz	QPSK	1	0		23.1		0	25
		1	37		23.3		0	25
		1	74		23.1		0	25
		36	0		22.3		1	24
		36	20		22.1		1	24
		36	39		22.0		1	24
		75	0		22.2		1	24
	16QAM	1	0		22.3		1	24
		1	37		22.2		1	24
		1	74		22.3		1	24
		12	0		22.2		2	23
		12	20		22.2		2	23
		12	39		21.9		2	23
		27	0		21.3		2	23

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				133172	133297	133422		
				668 MHz	680.5 MHz	693 MHz		
10 MHz	QPSK	1	0	23.1	23.2	23.0	0	25
		1	25	23.0	23.1	23.4	0	25
		1	49	23.1	23.0	23.0	0	25
		25	0	22.1	22.1	22.0	1	24
		25	12	22.1	22.0	22.1	1	24
		25	25	22.2	22.1	22.1	1	24
		50	0	22.2	22.1	22.1	1	24
	16QAM	1	0	22.7	22.5	22.3	1	24
		1	25	23.3	22.5	22.9	1	24
		1	49	23.1	22.6	22.1	1	24
		12	0	22.2	22.2	22.3	2	23
		12	12	21.9	22.2	22.4	2	23
		12	25	22.1	21.9	22.3	2	23
		27	0	21.0	21.1	21.3	2	23

LTE Band 71 Measured Results (continued)

BW (MHz)	Mode	RB Allocation	RB offset	Maximum Average Power (dBm)			MPR	Tune-up Limit
				133147	133297	133447		
				665.5 MHz	680.5 MHz	695.5 MHz		
5 MHz	QPSK	1	0	23.1	23.1	23.3	0	25
		1	12	23.1	23.0	23.2	0	25
		1	24	23.1	23.0	23.1	0	25
		12	0	22.2	22.2	22.2	1	24
		12	7	22.2	22.2	22.1	1	24
		12	13	22.1	22.1	22.1	1	24
		25	0	22.1	22.2	22.2	1	24
	16QAM	1	0	22.8	22.7	22.2	1	24
		1	12	22.9	22.7	22.2	1	24
		1	24	22.7	22.5	22.1	1	24
		12	0	21.0	21.0	21.1	2	23
		12	7	21.1	21.1	21.2	2	23
		12	13	21.0	21.2	21.0	2	23
		25	0	21.1	21.2	21.1	2	23

9.3. Bluetooth

Maximum Output Power (Tune-up Limit) for Bluetooth

SAR measurement is required for Bluetooth LE for both the gateway and the sensor since it is the sole supported mode.

Band	Mode	Channel	Frequency (MHz)	Tune-up Power Limit (dBm) BT Antenna Maximum
Bluetooth 2.4 GHz	LE	0	2402	4.0
		19	2440	4.0
		39	2480	4.0

Note:
The above tune-up applies to both the gateway and sensor.

Bluetooth Measured Results - Gateway

Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
Bluetooth 2.4 GHz	LE 1Mbps, GFSK	0	2402	2.8	4.0	Yes
		19	2440	2.7	4.0	
		39	2480	2.7	4.0	
	LE 2Mbps, GFSK	0	2402	2.7	4.0	No
		19	2440	2.7	4.0	
		39	2480	2.7	4.0	

Bluetooth Measured Results - Sensor

Band	Mode	Ch #	Freq. (MHz)	Maximum Average Power (dBm)		
				Meas Pwr	Tune-up	SAR Test (Yes/No)
Bluetooth 2.4 GHz	LE 1Mbps, GFSK	0	2402	3.1	4.0	Yes
		19	2440	2.6	4.0	
		39	2480	2.2	4.0	
	LE 2Mbps, GFSK	0	2402	3.0	4.0	No
		19	2440	2.6	4.0	
		39	2480	2.1	4.0	

Duty Factor Measured Results - Gateway

Mode	Rate	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	1Mbps	100	100	100%	1.00

Note(s):
Duty Cycle = (T on / period) * 100%

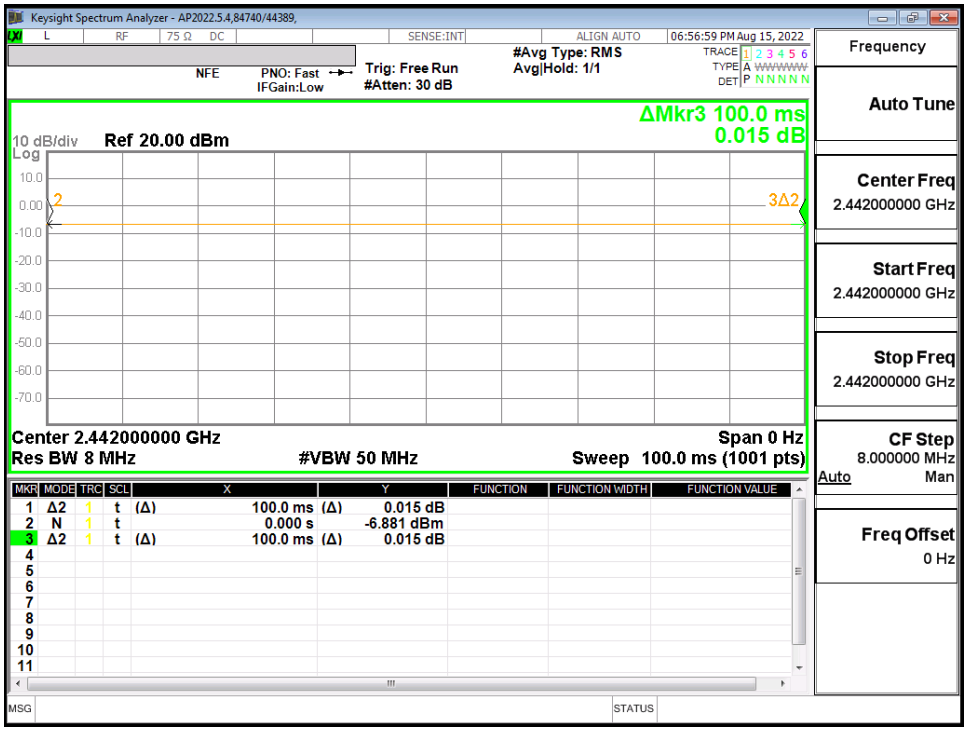
Duty Factor Measured Results - Sensor

Mode	Rate	T on (ms)	Period (ms)	Duty Cycle	Crest Factor (1/duty cycle)
GFSK	1Mbps	100	100	100%	1.00

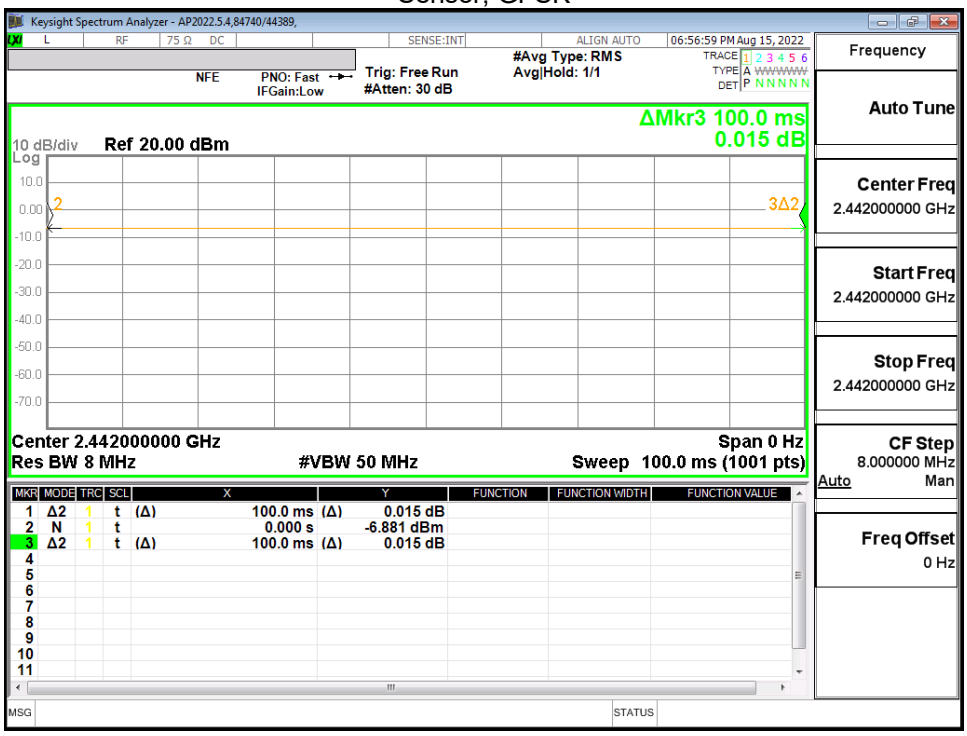
Note(s):
Duty Cycle = (T on / period) * 100%

Duty Cycle plots

Gateway, GFSK



Sensor, GFSK



10. Measured and Reported (Scaled) SAR Results

SAR Test Reduction criteria are as follows:

- Reported SAR(W/kg) for WWAN and Bluetooth = 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 Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	Rel 99 RMC 12.2 kbps	WWAN	0	Back	Left	9262	1852.4	22.4	22.4	1.430	**1.430**	1
						9400	1880.0	22.4	22.4	1.190	1.190	
						9538	1907.6	22.4	22.3	1.220	1.248	
					Right	9262	1852.4	22.4	22.4	1.190	1.190	
						9400	1880.0	22.4	22.4	1.250	1.250	
						9538	1907.6	22.4	22.3	1.270	1.300	

10.2. W-CDMA Band IV Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	Rel 99 RMC 12.2 kbps	WWAN	0	Back	Left	1312	1712.4	23.8	23.4	1.060	1.162	2
						1413	1732.6	23.8	23.7	1.090	1.115	
						1513	1752.6	23.8	23.6	1.090	1.141	
					Right	1312	1712.4	23.8	23.4	0.954	1.046	
						1413	1732.6	23.8	23.7	1.060	1.085	
						1513	1752.6	23.8	23.6	1.070	1.120	

10.3. W-CDMA Band V Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	Rel 99 RMC 12.2 kbps	WWAN	0	Back	Left	4183	836.6	25.0	23.2	0.255	0.386	3
					Right	4183	836.6	25.0	23.2	0.241	0.365	

10.4. LTE Band 2 (20MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	18700	1860.0	1	49	22.1	21.8	0.945	1.013	
								50	50	21.1	20.6	0.890	0.999	
						18900	1880.0	1	49	22.1	21.8	0.985	1.055	
								50	0	21.1	20.7	0.946	1.037	
								100	0	21.1	20.7	0.862	0.945	
						19100	1900.0	1	49	22.1	22.0	0.998	1.021	
								50	24	21.1	20.5	0.957	1.099	
					Right	18700	1860.0	1	49	22.1	21.8	1.180	1.264	
								50	50	21.1	20.6	0.822	0.922	
						18900	1880.0	1	49	22.1	21.8	1.260	1.350	4
								50	0	21.1	20.7	0.835	0.916	
								100	0	21.1	20.7	0.891	0.977	
						19100	1900.0	1	49	22.1	22.0	1.220	1.248	
								50	24	21.1	20.5	0.942	1.082	

10.5. LTE Band 5 (10MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	20525	836.5	1	49	25.0	23.5	0.312	0.441	5
								25	25	24.0	22.6	0.211	0.291	
					Right	20525	836.5	1	49	25.0	23.5	0.298	0.421	
								25	25	24.0	22.6	0.232	0.320	

10.6. LTE Band 12 (10MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	23095	707.5	1	0	25.0	23.9	0.516	0.665	6
								25	0	24.0	22.8	0.414	0.546	
					Right	23095	707.5	1	0	25.0	23.9	0.449	0.578	
								25	0	24.0	22.8	0.377	0.497	

10.7. LTE Band 13 (10MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	23230	782.0	1	25	25.0	23.7	0.477	0.643	7
								25	25	24.0	22.7	0.407	0.549	
					Right	23230	782.0	1	25	25.0	23.7	0.444	0.599	
								25	25	24.0	22.7	0.353	0.476	

10.8. LTE Band 14 (10MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	23330	793.0	1	49	25.0	23.2	0.473	0.716	8
								25	12	24.0	22.4	0.389	0.562	
					Right	23330	793.0	1	49	25.0	23.2	0.424	0.642	
								25	12	24.0	22.4	0.343	0.496	

10.9. LTE Band 66 (20MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	132072	1720.0	1	0	25.0	23.4	0.738	1.067	
								50	0	24.0	22.3	0.592	0.876	
						132322	1745.0	1	49	25.0	24.0	0.978	1.231	
								50	0	24.0	22.9	0.749	0.965	
								100	0	24.0	22.6	0.771	1.064	
						132572	1770.0	1	0	25.0	23.8	1.030	1.358	9
								50	0	24.0	22.8	0.805	1.061	
					Right	132072	1720.0	1	0	25.0	23.4	0.827	1.195	
								50	0	24.0	22.3	0.630	0.932	
						132322	1745.0	1	49	25.0	24.0	0.885	1.114	
								50	0	24.0	22.9	0.680	0.876	
								100	0	24.0	22.6	0.765	1.056	
						132572	1770.0	1	0	25.0	23.8	0.937	1.235	
								50	0	24.0	22.8	0.792	1.044	

10.10. LTE Band 71 (20MHz Bandwidth) Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	RB Allocation	RB offest	Power (dBm)		1-g SAR (W/kg)		Plot No.
										Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	QPSK	WWAN	0	Back	Left	133297	680.5	1	49	25.0	23.6	0.419	0.578	10
								50	0	24.0	22.5	0.322	0.455	
					Right	133297	680.5	1	49	25.0	23.6	0.387	0.534	
								50	0	24.0	22.5	0.296	0.418	

10.11. Bluetooth

Gateway (with Sensor Docked)

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	LE 1Mbps GFSK	BT	0	Back	Left	0	2402	4.0	2.8	<0.001	**<0.001**	11
					Right	0	2402	4.0	2.8	<0.001	<0.001	

Sensor Docked in Gateway

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Sensor Cable Direction	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
								Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	LE 1Mbps GFSK	Main	0	Back	Left	0	2402	4.0	3.1	<0.001	<0.001	12
					Right	0	2402	4.0	3.1	<0.001	<0.001	

Sensor Standalone

RF Exposure Conditions	Mode	Antenna	Dist. (mm)	Test Position	Ch #.	Freq. (MHz)	Power (dBm)		1-g SAR (W/kg)		Plot No.
							Tune-up Limit	Meas.	Meas.	Scaled	
Body-worn	LE 1Mbps GFSK	Main	0	Back	0	2402	4.0	3.1	0.016	0.020	
				Front	0	2402	4.0	3.1	0.018	**0.022**	13

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 Repeated		Second Repeated		Third Repeated
						Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)	Largest to Smallest SAR Ratio	Measured SAR (W/kg)
Gateway (with Sensor Docked)										
1700	WCDMA Band IV	Body-worn	Back	Yes	1.090	1.120	1.03	N/A	N/A	N/A
	LTE Band 66	Body-worn	Back	Yes	1.030	1.020	1.01	N/A	N/A	N/A
1900	WCDMA Band II	Body-worn	Back	Yes	1.430	1.270	1.13	N/A	N/A	N/A
	LTE Band 2	Body-worn	Back	Yes	1.260	1.190	1.06	N/A	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

Gateway (with Sensor Docked)

RF Exposure Condition	Item	Capable Transmit Configurations				
		Gateway				Sensor
Body-worn	1	PCE	+	DTS	+	DTS
Notes: 1. RF Exposure from Gateway only when worn with sensor. Otherwise RF Exposure > 20 cm.						

12.1. Simultaneous transmission SAR test exclusion considerations

KDB 447498 D01 General RF Exposure Guidance provides two procedures for determining simultaneous transmission SAR test exclusion: Sum of SAR and SAR to Peak Location Ratio (SPLSR)

Sum of SAR

To qualify for simultaneous transmission SAR test exclusion based upon Sum of SAR the sum of the reported standalone SARs for all simultaneously transmitting antennas shall be below the applicable standalone SAR limit. If the sum of the SARs is above the applicable limit then simultaneous transmission SAR test exclusion may still apply if the requirements of the SAR to Peak Location Ratio (SPLSR) evaluation are met.

12.2. Sum of the SAR for W-CDMA Band II & Bluetooth

RF Exposure conditions	Test Position	Standalone SAR (W/kg)			∑ 1-g SAR (W/kg)
		Gateway (with Sensor Docked)		Sensor Docked in Gateway	Gateway + Sensor
		WWAN	DTS	DTS	WWAN + DTS
		WWAN 1	BT 2	Main 3	1 + 2 + 3
Body-Worn	Back	1.430	0.001	0.001	**1.432**

12.3. Total Exposure Ratio of WPT and Bluetooth

Test Position		Field (A/m)	SAR (W/kg)		Total Exposure Ratio
		WPT 1	Gateway (with Sensor Docked) BLE 2	Sensor Docked in Gateway 3	1 + 2 + 3
Back	Measured	1.115	0.001	0.001	
	Limit	1.630	1.600	1.600	
	Ratio	0.684	0.001	0.001	**0.686**

Note(s):

1. Total Exposure Ratio must not exceed 1.0
2. WPT field value is referenced from R14275554-E10

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