

FCC SAR Test Report

Applicant: Run Segura LLC

EUT Description: Wearable Safety Device

Model: RunSegura3.1-1

Brand: N/A

FCC ID: 2BQLL-RUNSEGURA31-1

Standards: FCC 47CFR §2.1093

Date of Receipt: 2025/08/29

Date of Test: 2025/09/13 to 2025/09/15

Date of Issue: 2025/09/17

TOWE. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

the results documented in this report apply only the tested sample, under the conditions and modes of operation as described herein. It is the manufacturer's responsibility assure that additional production units of the model are manufactured with identical electrical and mechanical components. All sample tested were in good operating condition throughout the entire test program. Measurement Uncertainties are published for informational purposes only and were not taken into account unless noted otherwise. without written approval of TOWE, the test report shall not be reproduced except in full.



Jim Huang
Approved By:



Jack Li
Reviewed By:

Revision History

Rev.	Issue Date	Description	Revised by
01	2025/09/17	Original	Jack Li

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1 Summary of Test Results

Band	Highest SAR _{1g} (W/kg)
	Body 5mm
LTE Cat M1 Band 13	0.15
LTE Cat M1 Band 25/2	0.40
LTE Cat M1 Band 26/5	0.16
LTE Cat M1 Band 66/4	0.56
LTE Cat M1 Band 85/12	0.19
Highest Simultaneous Transmission SAR	0.83
SAR Limited(W/kg)	1.6

Remark:

Band 2/4/5/12 SAR test was covered by Band 25/66/26/85; according to April 2015 TCB workshop, SAR test for overlapping bands can be reduced if:

- the maximum output power, including tolerance, for the smaller band is $\leq$ the larger band to qualify for the SAR test exclusion.
- the channel bandwidth and other operating parameters for the smaller band are fully supported by the larger band.

2 Guidance Applied

FCC 47CFR §2.1093

ANSI/IEEE C95.1-1992

IEEE 1528-2013

FCC KDB 941225 D01 3G SAR Measurement Procedures v03r01

FCC KDB 941225 D05 SAR for LTE Devices v02r05

FCC KDB 447498 D01 General RF Exposure Guidance v06

FCC KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04

FCC KDB 865664 D02 RF Exposure Reporting v01r02

3 Lab Information

3.1 Testing Location

These measurements tests were conducted at the Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd. facility located at F401 and F101, Building E, Hongwei Industrial Zone, Liuxian 3rd Road, Bao'an District, Shenzhen, China. The measurement facility is compliant with the test site requirements specified in ANSI C63.4-2014

Tel.: +86-755-27212361

Contact Email: info@towewireless.com

3.2 Test Facility / Accreditations

A2LA (Certificate Number: 7088.01)

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 General requirements for the competence of testing and calibration laboratories. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

FCC Designation No.: CN1353

Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd. has been recognized as an accredited testing laboratory.

Designation Number: CN1353.

ISED CAB identifier: CN0152

Sushi TOWE Wireless Testing (Shenzhen) Co., Ltd. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0152

Company Number: 31000

3.3 Ambient Condition

Temperature: 18°C~25°C

Relative Humidity: 30%~75%

4 Client Information

4.1 Applicant

Applicant:	Run Segura LLC
Address:	1829 HWY 72 W Greenwood, SC 29649

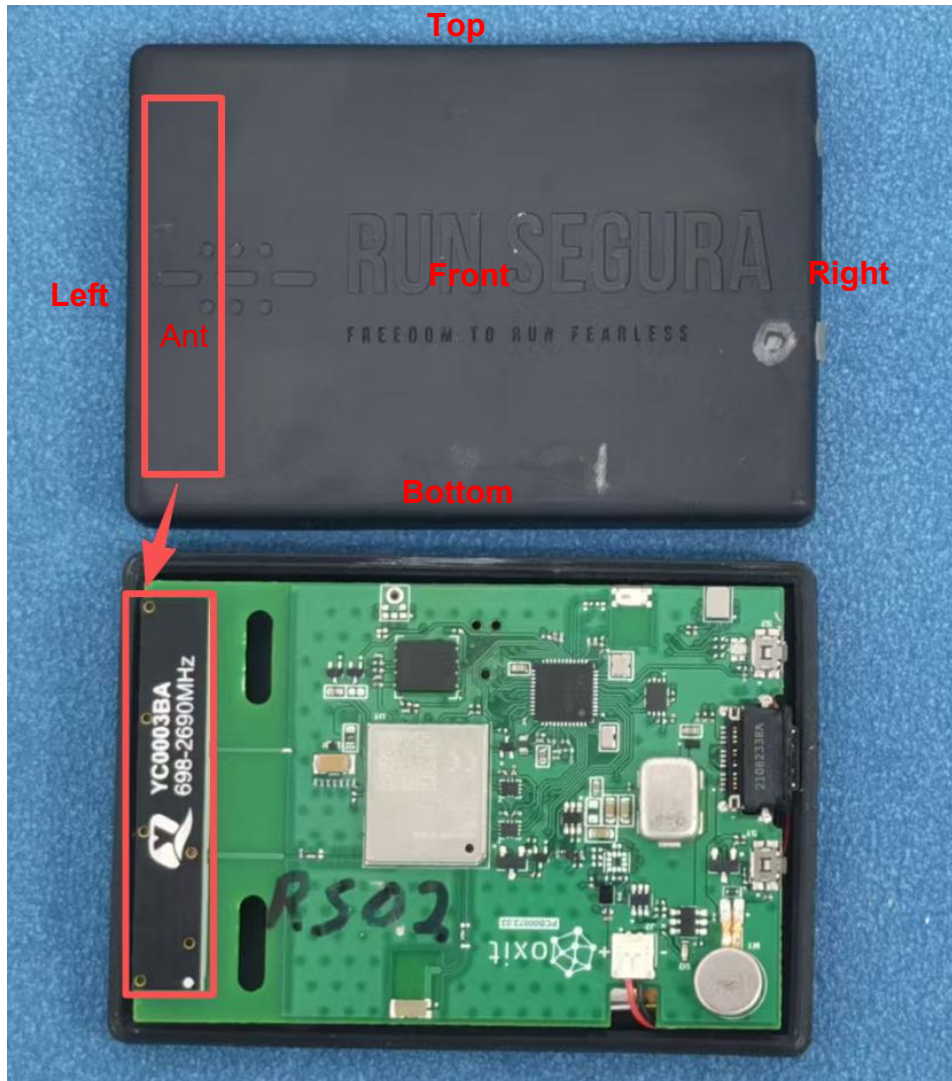
4.2 Manufacturer

Manufacturer:	Run Segura LLC
Address:	1829 HWY 72 W Greenwood, SC 29649

5 Product Information

EUT Description:	Wearable Safety Device	
Model No.:	RunSegura3.1-1	
Brand:	N/A	
Hardware Version:	3.1	
Software Version:	v2.5	
Device Capabilities:		
Band	Frequency Range (MHz)	Modulation Type
LTE Cat M1 Band 2	1850 ~1910	☒ QPSK ☒ 16QAM ☐ 64QAM ☐ 256QAM
LTE Cat M1 Band 4	1710~1755	
LTE Cat M1 Band 5	824~849	
LTE Cat M1 Band 12	699~716	
LTE Cat M1 Band 13	777~787	
LTE Cat M1 Band 25	1850~1915	
LTE Cat M1 Band 26	814~849	
LTE Cat M1 Band 66	1710~1780	
LTE Cat M1 Band 85	698~716	
Antenna Type	☐ External, ☒ Integrated	
Remark: The above EUT's information was declared by applicant, please refer to the specifications or user manual for more detailed description.		

5.1 Antenna Locations



6 RF Exposure Limits

Human Exposure	Uncontrolled Environment General Population (W/kg) or (mW/g)	Controlled Environment Occupational (W/kg) or (mW/g)
Spatial Peak SAR¹ (Brain/Trunk)	1.6	8.0
Spatial Average SAR² (Whole Body)	0.08	0.4
Spatial Peak SAR³ (Hands/Feet/Ankle/Wrist)	4.0	20.0

Note:

1, The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

2, The Spatial Average value of the SAR averaged over the whole body.

3, The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

Uncontrolled Environments are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

Controlled Environments are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. The exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

7 Introduction

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.1 SAR Definition

The SAR definition is the time derivative (rate) of the incremental energy (dW) absorbed by (dissipated in) an incremental mass (dm) contained in a volume element (dv) of a given density (ρ). The equation description is as below:

$$SAR = \frac{d}{dt} \left(\frac{dW}{dm} \right) = \frac{d}{dt} \left(\frac{dW}{\rho dv} \right)$$

SAR is expressed in units of Watts per kilogram (W/kg):

$$SAR = \frac{\sigma E^2}{\rho}$$

Where:

σ is the conductivity of the tissue material (S/m)

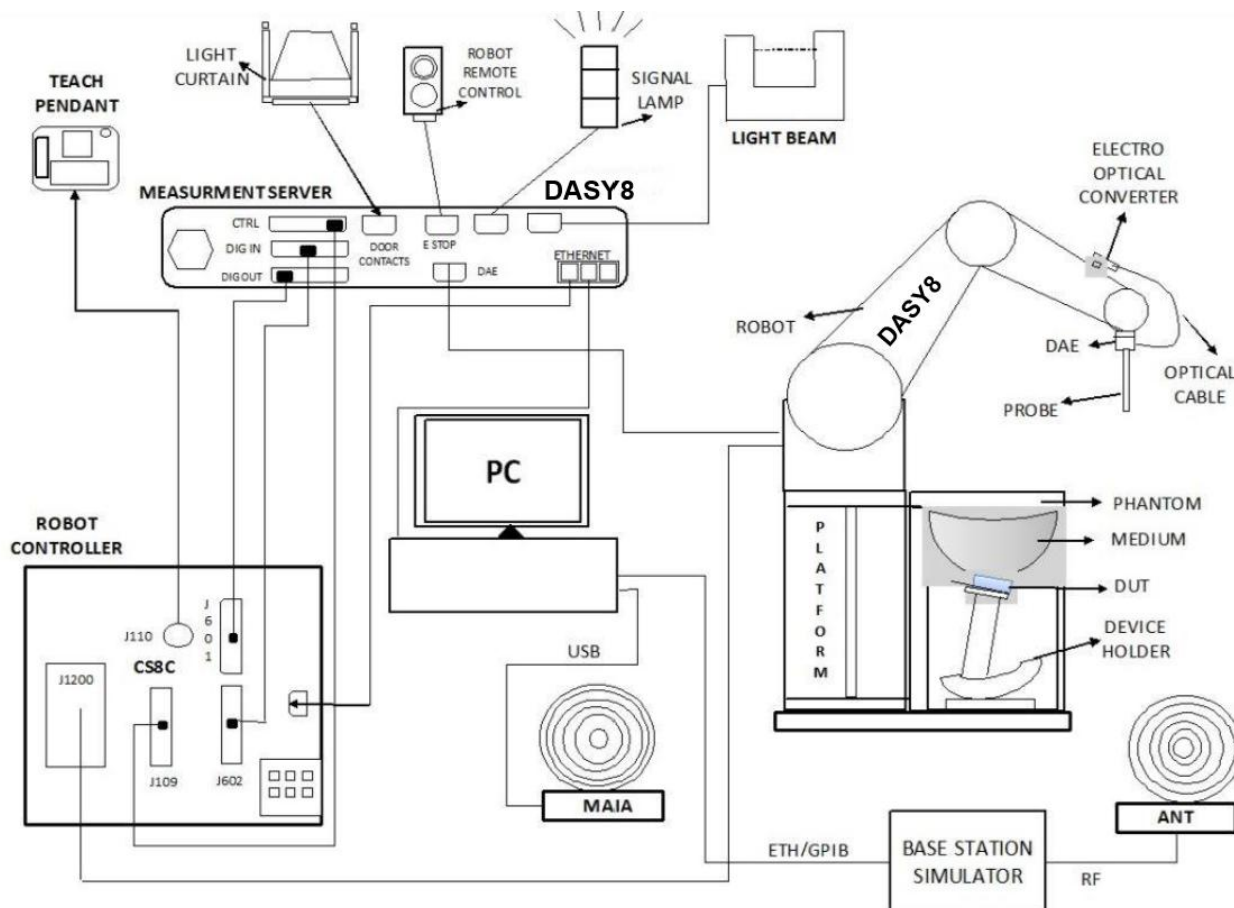
ρ is the mass density of the tissue material (kg/m³)

E is the RMS electrical field strength (V/m)

8 SAR Measurements System

8.1 The SAR Measurement Set-up

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 Windows 11 and the DASY8 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.

8.2 Measurement procedure

8.2.1 Power reference measurement

The Power Reference Measurement and Power Drift Measurement jobs are useful jobs 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. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

8.2.2 Area scan

Measurement procedures for evaluating SAR from wireless handsets typically start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. In addition, identify the positions of any local maxima with SAR values within 2 dB of the maximum value, and that will not be within the zoom scan of other peaks. Additional zoom scans shall be measured for such peaks only when the primary peak is within 2 dB of the SAR compliance limit.

Area scan parameters SAR measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the measured points (geometric centre of the sensors) and the inner phantom surface (z_{M1} in Figure 20 in mm)	5 ± 1	$\delta \ln(2)/2 \pm 0,5^a$
Maximum spacing between adjacent measured points in mm (see O.8.3.1) ^b	20, or half of the corresponding zoom scan length, whichever is smaller	$60/f$, or half of the corresponding zoom scan length, whichever is smaller
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20) ^c	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space. ^b See Clause O.8 on how Δx and Δy may be selected for individual area scan requirements. ^c The probe angle relative to the phantom surface normal is restricted due to the degradation in the measurement accuracy in fields with steep spatial gradients. The measurement accuracy decreases with increasing probe angle and increasing frequency. This is the reason for the tighter probe angle restriction at frequencies above 3 GHz.		

8.2.3 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 SAR measurement as below:

Parameter	DUT transmit frequency being tested	
	$f \leq 3 \text{ GHz}$	$3 \text{ GHz} < f \leq 10 \text{ GHz}$
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 20 and Table 3, in mm)	5	$\delta \ln(2)/2^a$
Maximum angle between the probe axis and the phantom surface normal (α in Figure 20)	5° (flat phantom only) 30° (other phantoms)	5° (flat phantom only) 20° (other phantoms)
Maximum spacing between measured points in the x - and y -directions (Δx and Δy , in mm)	8	$24/f^b$
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 20, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 20)	1,5	1,5
Minimum edge length of the zoom scan volume in the x - and y -directions (L_z in O.8.3.2, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in O.8.3.2 in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space.		
^b This is the maximum spacing allowed, which might not work for all circumstances.		

8.2.4 Power Drift Measurement

The Power Drift Measurement job measures the field at the same location as the most recent power reference measurement job 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. Several drift measurements are possible for one reference measurement. This allows a user to monitor the power drift of the device under test that must remain within a maximum variation of $\pm 5\%$. Detail power drift measurement refer to appendix B.

9 Test Equipment list

Manufacturer	Equipment Name	Model	Serial Number	Calibration Date	Due Date of calibration
SPEAG	Twin Phantom	SAM	2168	NCR	NCR
SPEAG	E-Field Probe	EX3DV4	3624	2025/01/15	2026/01/14
SPEAG	E-Field Probe	EX3DV4	7383	2025/03/14	2026/03/13
SPEAG	Data Acquisition Electronics	DAE4	1846	2024/12/10	2025/12/09
SPEAG	System Validation Kits	D750V3	1231	2023/05/04	2026/05/03
SPEAG	System Validation Kits	D835V2	4d302	2023/02/06	2026/02/05
SPEAG	System Validation Kits	D1750V2	1115	2023/03/23	2026/03/22
SPEAG	System Validation Kits	D1900V2	512	2023/03/24	2026/03/23
SPEAG	Dielectric parameter probes	DAK3.5	1341	2025/07/14	2026/07/13
Agilent	Network Analyzer	E5071B	MY42302220	2025/03/11	2026/03/10
Anritsu	Radio Communication Analyzer	MT8821C	6262170463	2025/03/11	2026/03/10
R&S	Signal Generator	SMR20	100648	2025/03/11	2026/03/10
R&S	AVG Power Sensor	NRP-Z21	101651	2025/03/11	2026/03/10
R&S	AVG Power Sensor	NRP-Z21	104189	2025/03/11	2026/03/10
HAISIDIKE	Thermometer	TP300	TOWE-EQ-SR-023	2025/03/12	2026/03/11
BingYu	Temperature and Humidity Indicator	HTC-1	TOWE-EQ-SR-024	2025/03/13	2026/03/12

Note:

1. Referring to KDB 865664 D01v01r04, the dipole calibration interval can be extended to 3 years with justification. The dipoles are also not physically damaged or repaired during the interval.
2. The justification data of dipole can be found in Appendix C. The return loss is < -20dB, within 20% of prior calibration, the impedance is within 5 ohm of prior calibration.

10 SAR measurement variability

SAR measurement variability must be assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue equivalent medium.

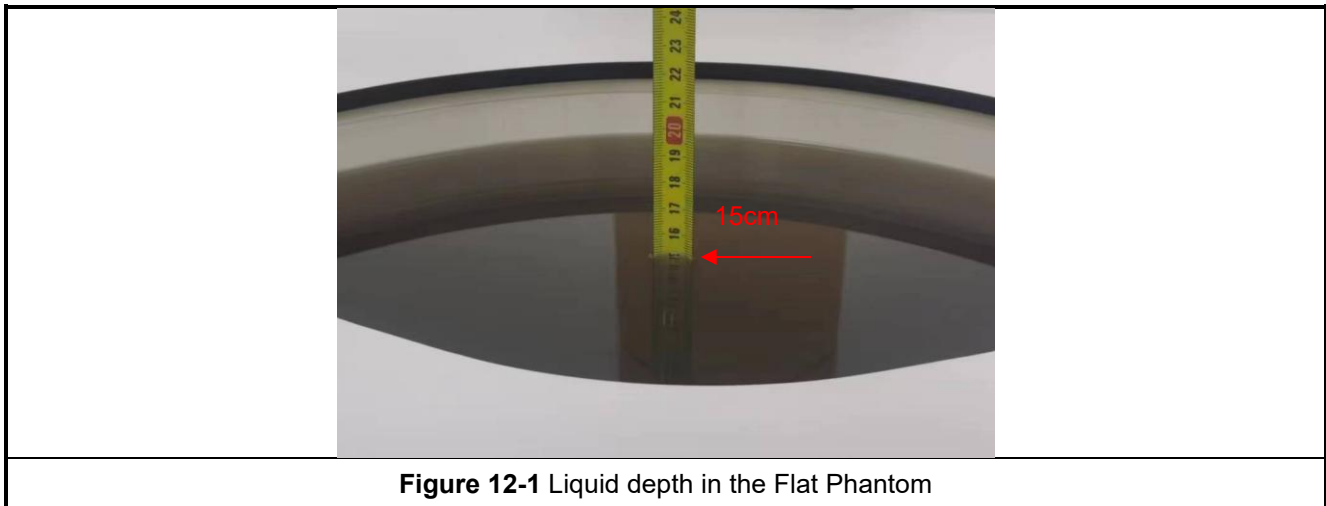
The following procedures are applied to determine if repeated measurements are required.

- 1) Repeated measurement is not required when the original highest measured SAR is < 0.80 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 ≥ 0.80 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 ($\sim 10\%$ 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 .

11 System Verification

11.1 Tissue Verification

The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. The temperature variation of the Tissue Simulate Liquids was $22\pm 2^{\circ}\text{C}$, the liquid depth of the ear reference point or the flat phantom was at least 15 cm (which is shown in Figure 12-1).



Frequency (MHz)	Tissue Type	Liquid Temp. ($^{\circ}\text{C}$)	Target Tissue		Measured Tissue		Deviation (Limit $\pm 5\%$)		Date
			Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	Permittivity ϵ_r	Conductivity $\sigma(\text{S/m})$	$\Delta\epsilon_r$	$\Delta\sigma$	
750	Head	21.9	41.90	0.89	42.400	0.895	1.19%	0.56%	2025/09/13
835	Head	22.1	41.50	0.90	41.700	0.920	0.48%	2.22%	2025/09/15
1750	Head	22.1	40.10	1.37	40.000	1.380	-0.25%	0.73%	2025/09/15
1900	Head	22.1	40.00	1.40	40.100	1.420	0.25%	1.43%	2025/09/15

Table 1: Measurement Tissue Parameters

11.2 SAR System Check

Prior to SAR assessment, a SAR system Check measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. The System Performance Check Setup in Figure 12-3.

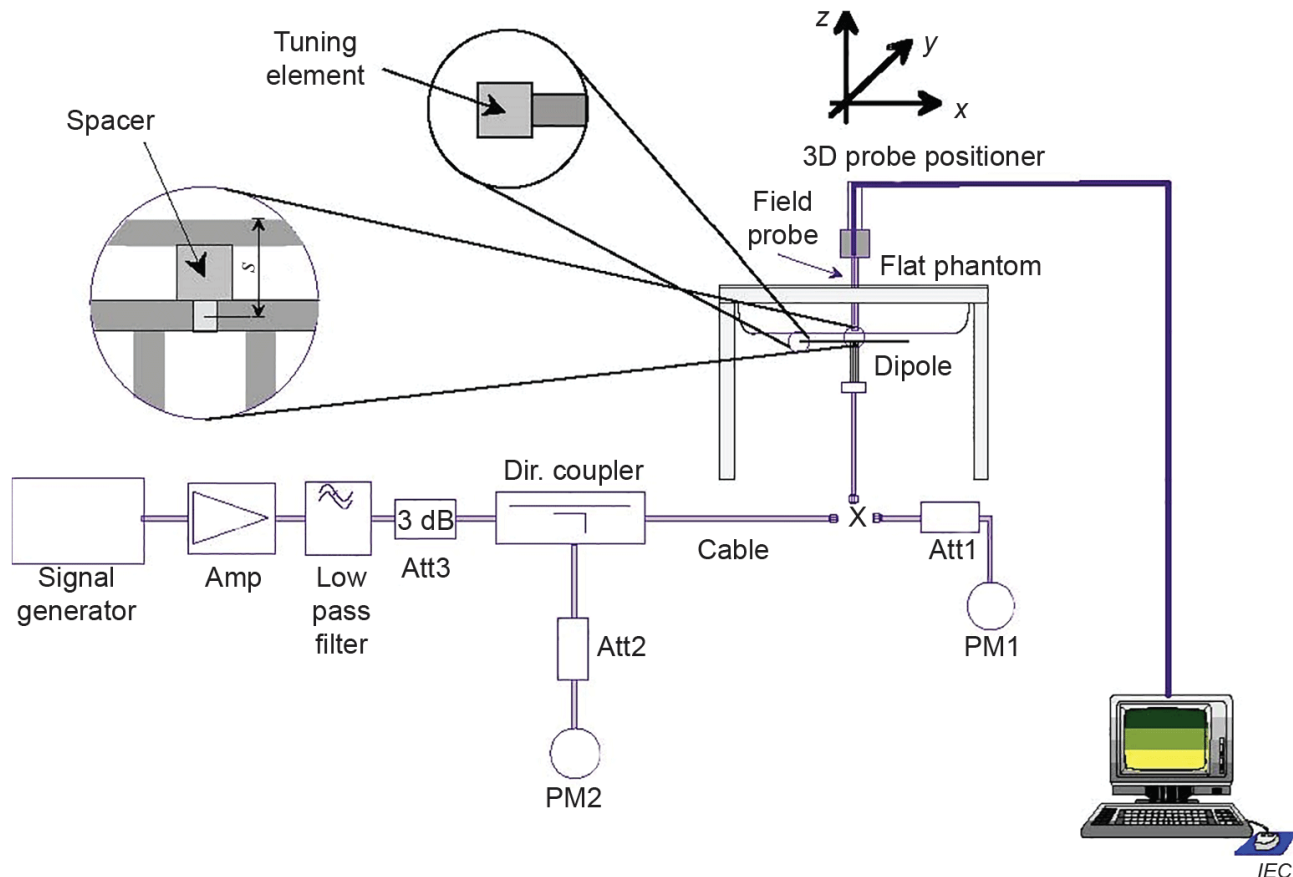


Figure 12-3 System Performance Check Setup

11.2.1 System Check Result

Frequency (MHz)	Tissue Type	Dipole	S/N	Target SAR (1W)		Measured SAR (100mW)		Measured SAR (normalized to 1W)		Deviation (Limit $\pm 10\%$)		Date
				1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	$\Delta 1g$	$\Delta 10g$	
750	Head	D750V3	1231	8.67	5.67	0.882	0.581	8.82	5.81	1.73%	2.47%	2025/09/13
835	Head	D835V2	4d302	9.78	6.37	0.983	0.639	9.83	6.39	0.51%	0.31%	2025/09/15
1750	Head	D1750V2	1115	36.90	19.50	3.520	1.890	35.20	18.90	-4.61%	-3.08%	2025/09/15
1900	Head	D1900V2	512	39.40	20.50	3.820	1.980	38.20	19.80	-3.05%	-3.41%	2025/09/15

Table 2: SAR System Check Result

11.2.2 Detailed System Check Result

Please see Appendix A

12 SAR General Measurement Procedures

12.1 SAR Measurement Conditions for LTE Cat M1

LTE modes are tested according to FCC KDB 941225 D05 publication. Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR [4]. The R&S CMW500 or Anritsu MT8820C/MT8821C simulators are used for LTE output power measurements and SAR testing. Closed loop power control was used so the UE transmits with maximum output power during SAR testing. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames (maximum TTI).

12.1.1 Spectrum Plots for RB Configurations

A properly configured base station simulator was used for SAR tests and power measurements. Therefore, spectrum plots for RB configurations were not required to be included in this report.

12.1.2 Largest channel bandwidth standalone SAR test requirements

A. QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 2.0 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 3.625 W/kg, SAR is required for all three RB offset configurations for that required test channel.

B. QPSK with 50% RB allocation

The procedures required for 1 RB allocation in A are applied to measure the SAR for QPSK with 50% RB allocation.

C. QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in A and B are ≤ 2.0 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 3.625 W/kg, the remaining required test channels must also be tested.

D. Higher order modulations

For each modulation besides QPSK, e.g., 16-QAM, BPSK, apply the QPSK procedures in A, B, and C to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is $> \frac{1}{2}$ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 3.625 W/kg.

12.1.3 Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in 13.4.4 to determine the channels and RB configurations that need SAR testing, then only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is $> \frac{1}{2}$ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration, or the reported SAR of a configuration for the largest channel bandwidth is > 3.625 W/kg.

13 Conducted Power

13.1 Conducted Power of LTE Cat M1

LTE Cat M1 Band 2				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18607	18900	19193	
1.4MHz	QPSK	1	0	20.68	20.68	20.73	22.00
		1	2	20.70	20.60	20.69	22.00
		1	5	20.40	20.57	20.68	22.00
		3	0	20.60	20.57	20.70	22.00
		3	2	20.60	20.65	20.82	22.00
		3	3	20.52	20.62	20.59	22.00
		6	0	20.48	20.91	20.91	22.00
	16QAM	1	0	21.06	21.01	21.00	22.00
		1	2	20.95	20.97	21.07	22.00
		1	5	20.83	20.93	20.98	22.00
		3	0	20.72	20.84	20.87	22.00
		3	2	20.80	20.79	20.88	22.00
		3	3	20.63	20.76	20.75	22.00
		5	0	20.75	20.76	20.91	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18615	18900	19185	
3MHz	QPSK	1	0	20.61	20.77	20.80	22.00
		1	2	20.62	20.55	20.77	22.00
		1	5	20.44	20.43	20.55	22.00
		3	0	20.66	20.70	20.73	22.00
		3	2	20.61	20.62	20.74	22.00
		3	3	20.49	20.63	20.62	22.00
		6	0	20.48	20.86	20.98	22.00
	16QAM	1	0	21.06	21.06	21.02	22.00
		1	2	21.06	20.98	21.16	22.00
		1	5	20.84	20.85	21.04	22.00
		3	0	20.76	20.79	20.86	22.00
		3	2	20.71	20.76	20.78	22.00
		3	3	20.55	20.76	20.73	22.00
		5	0	20.84	20.88	20.90	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18625	18900	19175	
5MHz	QPSK	1	0	20.56	20.74	20.89	22.00
		1	2	20.65	20.71	20.78	22.00
		1	5	20.41	20.59	20.60	22.00
		3	0	20.70	20.67	20.79	22.00
		3	2	20.50	20.59	20.76	22.00
		3	3	20.53	20.51	20.65	22.00
		6	0	20.63	20.99	21.00	22.00
	16QAM	1	0	21.04	21.06	21.00	22.00
		1	2	20.93	20.94	21.12	22.00
		1	5	20.75	20.80	20.92	22.00
		3	0	20.83	20.75	20.90	22.00
		3	2	20.65	20.69	20.76	22.00
		3	3	20.60	20.70	20.82	22.00
		5	0	20.86	20.86	20.87	22.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18650	18900	19150	
10MHz	QPSK	1	0	20.59	20.69	20.89	22.00
		1	2	20.75	20.69	20.70	22.00
		1	5	20.50	20.49	20.59	22.00
		3	0	20.68	20.58	20.71	22.00
		3	2	20.53	20.57	20.71	22.00
		3	3	20.55	20.53	20.66	22.00
		6	0	20.48	20.93	20.98	22.00
	16QAM	1	0	20.98	20.97	21.12	22.00
		1	2	20.98	21.10	21.07	22.00
		1	5	20.74	20.80	21.07	22.00
		3	0	20.85	20.87	20.79	22.00
		3	2	20.72	20.73	20.87	22.00
		3	3	20.59	20.78	20.79	22.00
		5	0	20.86	20.74	20.77	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18675	18900	19125	
15MHz	QPSK	1	0	20.57	20.69	20.73	22.00
		1	2	20.70	20.68	20.65	22.00
		1	5	20.56	20.54	20.70	22.00
		3	0	20.70	20.62	20.76	22.00
		3	2	20.60	20.69	20.72	22.00
		3	3	20.53	20.63	20.73	22.00
		6	0	20.49	20.85	20.95	22.00
	16QAM	1	0	20.99	21.01	21.02	22.00
		1	2	21.00	21.00	21.03	22.00
		1	5	20.86	20.89	21.05	22.00
		3	0	20.69	20.81	20.82	22.00
		3	2	20.64	20.68	20.75	22.00
		3	3	20.57	20.79	20.78	22.00
		5	0	20.76	20.89	20.92	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				18700	18900	19100	
20MHz	QPSK	1	0	20.68	20.72	20.84	22.00
		1	2	20.71	20.66	20.76	22.00
		1	5	20.52	20.55	20.66	22.00
		3	0	20.68	20.69	20.79	22.00
		3	2	20.61	20.67	20.80	22.00
		3	3	20.60	20.61	20.71	22.00
		6	0	20.59	20.95	21.01	22.00
	16QAM	1	0	21.06	21.01	21.12	22.00
		1	2	21.05	21.06	21.13	22.00
		1	5	20.84	20.88	21.04	22.00
		3	0	20.80	20.84	20.89	22.00
		3	2	20.75	20.79	20.86	22.00
		3	3	20.66	20.75	20.79	22.00
		5	0	20.83	20.86	20.88	22.00

LTE Cat M1 Band 4				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19957	20175	20393	
1.4MHz	QPSK	1	0	21.15	20.87	20.95	22.00
		1	2	21.16	20.89	20.96	22.00
		1	5	20.97	20.81	20.91	22.00
		3	0	21.10	20.94	21.06	22.00
		3	2	21.15	21.00	21.04	22.00
		3	3	21.15	20.96	20.93	22.00
		6	0	21.14	20.87	21.11	22.00
	16QAM	1	0	21.54	21.52	21.57	22.00
		1	2	21.54	21.47	21.51	22.00
		1	5	21.47	21.36	21.49	22.00
		3	0	21.33	21.25	21.25	22.00
		3	2	21.26	21.17	21.31	22.00
		3	3	21.26	21.18	21.23	22.00
		5	0	21.46	21.13	21.32	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19965	20175	20385	
3MHz	QPSK	1	0	21.01	20.88	20.97	22.00
		1	2	21.28	21.00	21.02	22.00
		1	5	21.00	20.76	20.83	22.00
		3	0	21.09	21.06	21.11	22.00
		3	2	21.02	20.89	21.07	22.00
		3	3	21.11	20.84	20.91	22.00
		6	0	21.15	20.88	21.10	22.00
	16QAM	1	0	21.49	21.48	21.45	22.00
		1	2	21.56	21.44	21.41	22.00
		1	5	21.48	21.31	21.49	22.00
		3	0	21.34	21.16	21.23	22.00
		3	2	21.22	21.08	21.19	22.00
		3	3	21.22	21.07	21.17	22.00
		5	0	21.32	21.28	21.29	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				19975	20175	20375	
5MHz	QPSK	1	0	21.00	21.00	21.08	22.00
		1	2	21.26	20.92	20.94	22.00
		1	5	20.94	20.85	20.96	22.00
		3	0	20.95	20.98	21.15	22.00
		3	2	21.14	20.96	20.99	22.00
		3	3	20.98	20.97	20.99	22.00
		6	0	21.16	20.97	21.04	22.00
	16QAM	1	0	21.53	21.50	21.54	22.00
		1	2	21.54	21.50	21.49	22.00
		1	5	21.45	21.36	21.43	22.00
		3	0	21.34	21.24	21.26	22.00
		3	2	21.32	21.20	21.17	22.00
		3	3	21.27	21.13	21.15	22.00
		5	0	21.33	21.21	21.36	22.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20000	20175	20350	
10MHz	QPSK	1	0	21.05	20.99	20.94	22.00
		1	2	21.28	21.04	20.97	22.00
		1	5	20.94	20.75	20.83	22.00
		3	0	20.93	21.07	21.00	22.00
		3	2	21.15	20.87	20.97	22.00
		3	3	21.10	20.93	21.03	22.00
		6	0	21.14	21.01	20.99	22.00
	16QAM	1	0	21.40	21.51	21.55	22.00
		1	2	21.48	21.33	21.55	22.00
		1	5	21.58	21.34	21.40	22.00
		3	0	21.29	21.21	21.25	22.00
		3	2	21.33	21.11	21.17	22.00
		3	3	21.32	21.04	21.24	22.00
		5	0	21.38	21.14	21.27	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20025	20175	20325	
15MHz	QPSK	1	0	21.00	20.88	21.08	22.00
		1	2	21.25	21.05	21.04	22.00
		1	5	20.93	20.80	20.95	22.00
		3	0	21.06	21.02	21.02	22.00
		3	2	21.16	20.89	21.13	22.00
		3	3	21.06	20.86	21.06	22.00
		6	0	21.00	20.87	21.12	22.00
	16QAM	1	0	21.57	21.41	21.43	22.00
		1	2	21.49	21.36	21.47	22.00
		1	5	21.61	21.30	21.37	22.00
		3	0	21.25	21.09	21.27	22.00
		3	2	21.33	21.12	21.19	22.00
		3	3	21.27	21.02	21.13	22.00
		5	0	21.47	21.20	21.33	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20050	20175	20300	
20MHz	QPSK	1	0	21.11	20.99	21.06	22.00
		1	2	21.23	21.01	21.05	22.00
		1	5	20.96	20.86	20.94	22.00
		3	0	21.05	21.02	21.11	22.00
		3	2	21.13	20.99	21.09	22.00
		3	3	21.10	20.95	21.03	22.00
		6	0	21.12	20.96	21.08	22.00
	16QAM	1	0	21.52	21.48	21.52	22.00
		1	2	21.60	21.45	21.53	22.00
		1	5	21.57	21.36	21.46	22.00
		3	0	21.29	21.20	21.29	22.00
		3	2	21.32	21.19	21.27	22.00
		3	3	21.28	21.14	21.20	22.00
		5	0	21.42	21.23	21.35	22.00

LTE Cat M1 Band 5				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20407	20525	20643	
1.4MHz	QPSK	1	0	20.28	20.36	20.42	21.50
		1	2	20.26	20.34	20.37	21.50
		1	5	20.26	20.25	20.45	21.50
		3	0	20.24	20.34	20.58	21.50
		3	2	20.28	20.45	20.36	21.50
		3	3	20.23	20.37	20.43	21.50
		6	0	19.66	19.79	19.81	21.50
	16QAM	1	0	20.68	20.77	20.73	21.50
		1	2	20.67	20.83	20.86	21.50
		1	5	20.49	20.68	20.80	21.50
		3	0	20.38	20.52	20.73	21.50
		3	2	20.34	20.39	20.64	21.50
		3	3	20.26	20.49	20.63	21.50
		5	0	20.50	20.46	20.69	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20415	20525	20635	
3MHz	QPSK	1	0	20.25	20.46	20.42	21.50
		1	2	20.14	20.35	20.49	21.50
		1	5	20.18	20.19	20.39	21.50
		3	0	20.27	20.36	20.53	21.50
		3	2	20.30	20.34	20.48	21.50
		3	3	20.13	20.36	20.49	21.50
		6	0	19.79	19.86	19.82	21.50
	16QAM	1	0	20.72	20.68	20.77	21.50
		1	2	20.65	20.76	20.92	21.50
		1	5	20.34	20.67	20.79	21.50
		3	0	20.33	20.42	20.67	21.50
		3	2	20.33	20.50	20.61	21.50
		3	3	20.26	20.48	20.62	21.50
		5	0	20.41	20.55	20.71	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20425	20525	20625	
5MHz	QPSK	1	0	20.24	20.40	20.48	21.50
		1	2	20.22	20.46	20.50	21.50
		1	5	20.22	20.34	20.40	21.50
		3	0	20.23	20.48	20.60	21.50
		3	2	20.25	20.33	20.41	21.50
		3	3	20.18	20.24	20.43	21.50
		6	0	19.67	19.78	19.78	21.50
	16QAM	1	0	20.68	20.64	20.76	21.50
		1	2	20.72	20.74	20.84	21.50
		1	5	20.47	20.52	20.73	21.50
		3	0	20.40	20.49	20.61	21.50
		3	2	20.32	20.46	20.53	21.50
		3	3	20.30	20.50	20.53	21.50
		5	0	20.41	20.42	20.68	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				20450	20525	20600	
10MHz	QPSK	1	0	20.30	20.44	20.51	21.50
		1	2	20.26	20.42	20.48	21.50
		1	5	20.23	20.31	20.41	21.50
		3	0	20.31	20.46	20.58	21.50
		3	2	20.26	20.44	20.47	21.50
		3	3	20.21	20.33	20.44	21.50
		6	0	19.75	19.85	19.88	21.50
	16QAM	1	0	20.68	20.73	20.85	21.50
		1	2	20.71	20.79	20.90	21.50
		1	5	20.46	20.64	20.81	21.50
		3	0	20.40	20.51	20.72	21.50
		3	2	20.35	20.47	20.61	21.50
		3	3	20.26	20.46	20.60	21.50
		5	0	20.47	20.51	20.66	21.50

LTE Cat M1 Band 12				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23017	23095	23173	
1.4MHz	QPSK	1	0	21.01	20.96	21.14	22.00
		1	2	21.11	20.93	21.01	22.00
		1	5	21.06	20.96	21.01	22.00
		3	0	21.01	21.07	21.30	22.00
		3	2	21.08	21.05	21.24	22.00
		3	3	20.90	20.84	20.89	22.00
		6	0	20.48	20.37	20.57	22.00
	16QAM	1	0	21.31	21.28	21.33	22.00
		1	2	21.40	21.30	21.45	22.00
		1	5	21.29	21.20	21.24	22.00
		3	0	21.06	20.96	21.07	22.00
		3	2	20.98	20.99	21.06	22.00
		3	3	21.02	20.99	21.23	22.00
		5	0	20.99	21.06	21.21	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23025	23095	23165	
3MHz	QPSK	1	0	21.09	21.00	21.03	22.00
		1	2	21.02	20.96	20.92	22.00
		1	5	21.04	20.85	20.89	22.00
		3	0	21.08	21.04	21.22	22.00
		3	2	21.09	20.99	21.12	22.00
		3	3	20.88	20.98	20.96	22.00
		6	0	20.47	20.42	20.49	22.00
	16QAM	1	0	21.45	21.23	21.43	22.00
		1	2	21.42	21.24	21.52	22.00
		1	5	21.30	21.25	21.21	22.00
		3	0	21.11	21.04	21.02	22.00
		3	2	21.12	20.99	21.16	22.00
		3	3	21.05	21.02	21.27	22.00
		5	0	21.08	21.04	21.22	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23035	23095	23155	
5MHz	QPSK	1	0	21.01	20.95	21.17	22.00
		1	2	21.09	20.88	21.04	22.00
		1	5	20.91	20.94	20.88	22.00
		3	0	20.98	21.07	21.17	22.00
		3	2	21.09	20.94	21.15	22.00
		3	3	20.86	20.93	21.00	22.00
		6	0	20.38	20.43	20.45	22.00
	16QAM	1	0	21.42	21.23	21.37	22.00
		1	2	21.43	21.35	21.37	22.00
		1	5	21.23	21.12	21.21	22.00
		3	0	21.10	21.01	21.01	22.00
		3	2	21.05	21.02	21.06	22.00
		3	3	20.94	20.96	21.28	22.00
		5	0	21.11	21.01	21.31	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23060	23095	23130	
10MHz	QPSK	1	0	21.11	21.02	21.14	22.00
		1	2	21.12	20.98	21.04	22.00
		1	5	21.03	20.92	20.97	22.00
		3	0	21.05	21.03	21.25	22.00
		3	2	21.04	21.05	21.19	22.00
		3	3	20.98	20.93	21.01	22.00
		6	0	20.50	20.42	20.55	22.00
	16QAM	1	0	21.40	21.35	21.45	22.00
		1	2	21.45	21.33	21.47	22.00
		1	5	21.25	21.22	21.25	22.00
		3	0	21.09	21.06	21.11	22.00
		3	2	21.10	21.05	21.17	22.00
		3	3	21.06	21.01	21.23	22.00
		5	0	21.08	21.02	21.26	22.00

LTE Cat M1 Band 13				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				23205	23230	23255	
5MHz	QPSK	1	0	20.91	21.00	21.01	21.50
		1	2	20.92	20.83	20.90	21.50
		1	5	20.84	20.80	20.71	21.50
		3	0	20.90	20.99	20.94	21.50
		3	2	20.82	20.80	20.85	21.50
		3	3	20.73	20.75	20.79	21.50
		6	0	20.22	20.15	20.18	21.50
	16QAM	1	0	21.21	21.26	21.20	21.50
		1	2	21.16	21.18	21.23	21.50
		1	5	21.08	21.15	21.07	21.50
		3	0	20.92	21.04	20.92	21.50
		3	2	20.93	21.01	20.98	21.50
		3	3	20.87	20.94	20.89	21.50
		5	0	20.89	20.91	20.98	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
10MHz	QPSK	1	0	/	23230	/	21.50
		1	2	/	21.01	/	21.50
		1	5	/	20.95	/	21.50
		3	0	/	20.83	/	21.50
		3	2	/	20.96	/	21.50
		3	3	/	20.91	/	21.50
		6	0	/	20.85	/	21.50
	16QAM	1	0	/	20.25	/	21.50
		1	2	/	21.30	/	21.50
		1	5	/	21.26	/	21.50
		1	5	/	21.14	/	21.50
		3	0	/	21.01	/	21.50
		3	2	/	20.98	/	21.50
		3	3	/	20.91	/	21.50
		5	0	/	21.01	/	21.50

LTE Cat M1 Band 25				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26047	26365	26683	
1.4MHz	QPSK	1	0	20.61	20.66	21.01	22.00
		1	2	20.62	20.73	21.04	22.00
		1	5	20.64	20.60	20.95	22.00
		3	0	20.71	20.73	21.09	22.00
		3	2	20.58	20.73	20.99	22.00
		3	3	20.62	20.77	20.91	22.00
		6	0	20.78	20.85	20.94	22.00
	16QAM	1	0	21.02	21.03	21.05	22.00
		1	2	21.06	21.06	21.04	22.00
		1	5	20.95	20.95	21.05	22.00
		3	0	20.70	20.90	20.89	22.00
		3	2	20.89	20.83	20.98	22.00
		3	3	20.70	20.70	20.85	22.00
		5	0	20.89	20.78	21.03	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
3MHz	QPSK	1	0	26055	26365	26675	22.00
		1	2	20.62	20.66	21.09	22.00
		1	5	20.63	20.71	20.96	22.00
		3	0	20.63	20.65	20.95	22.00
		3	2	20.69	20.86	21.03	22.00
		3	3	20.70	20.70	21.13	22.00
		6	0	20.60	20.71	20.86	22.00
	16QAM	1	0	20.77	20.86	20.87	22.00
		1	2	21.00	21.13	21.07	22.00
		1	5	21.06	21.08	21.07	22.00
		3	0	20.95	20.99	21.00	22.00
		3	2	20.67	20.93	20.95	22.00
		3	3	20.76	20.76	20.85	22.00
		5	0	20.57	20.73	20.82	22.00
		5	0	20.77	20.83	21.01	22.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26065	26365	26665	
5MHz	QPSK	1	0	20.60	20.86	21.02	22.00
		1	2	20.66	20.80	21.12	22.00
		1	5	20.63	20.59	20.86	22.00
		3	0	20.74	20.88	21.03	22.00
		3	2	20.66	20.77	20.99	22.00
		3	3	20.61	20.76	20.88	22.00
		6	0	20.62	20.77	20.94	22.00
	16QAM	1	0	20.89	21.17	21.08	22.00
		1	2	21.05	20.98	21.15	22.00
		1	5	20.82	21.00	21.12	22.00
		3	0	20.80	20.95	20.91	22.00
		3	2	20.84	20.84	20.80	22.00
		3	3	20.77	20.66	20.72	22.00
		5	0	20.83	20.81	21.00	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26090	26365	26640	
10MHz	QPSK	1	0	20.61	20.68	21.06	22.00
		1	2	20.64	20.77	21.03	22.00
		1	5	20.50	20.69	20.93	22.00
		3	0	20.63	20.73	21.16	22.00
		3	2	20.65	20.80	21.13	22.00
		3	3	20.62	20.77	20.77	22.00
		6	0	20.62	20.73	20.90	22.00
	16QAM	1	0	21.00	21.13	21.09	22.00
		1	2	20.97	20.99	21.07	22.00
		1	5	20.90	20.91	20.97	22.00
		3	0	20.69	20.97	21.00	22.00
		3	2	20.72	20.85	20.82	22.00
		3	3	20.64	20.84	20.76	22.00
		5	0	20.86	20.88	20.95	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26115	26365	26615	
15MHz	QPSK	1	0	20.62	20.85	21.03	22.00
		1	2	20.65	20.80	21.08	22.00
		1	5	20.59	20.74	21.00	22.00
		3	0	20.81	20.71	21.14	22.00
		3	2	20.63	20.66	20.95	22.00
		3	3	20.73	20.83	20.80	22.00
		6	0	20.72	20.82	21.02	22.00
	16QAM	1	0	20.92	21.18	21.22	22.00
		1	2	20.97	21.06	21.01	22.00
		1	5	20.89	20.96	21.09	22.00
		3	0	20.81	20.79	20.90	22.00
		3	2	20.71	20.86	20.95	22.00
		3	3	20.77	20.67	20.88	22.00
		5	0	20.81	20.84	20.88	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26140	26365	26590	
20MHz	QPSK	1	0	20.73	20.81	21.14	22.00
		1	2	20.69	20.79	21.08	22.00
		1	5	20.63	20.73	21.01	22.00
		3	0	20.78	20.86	21.11	22.00
		3	2	20.71	20.81	21.08	22.00
		3	3	20.68	20.84	20.89	22.00
		6	0	20.74	20.82	21.02	22.00
	16QAM	1	0	21.03	21.15	21.18	22.00
		1	2	21.02	21.09	21.14	22.00
		1	5	20.96	21.04	21.07	22.00
		3	0	20.81	20.92	20.95	22.00
		3	2	20.84	20.88	20.93	22.00
		3	3	20.72	20.79	20.87	22.00
		5	0	20.85	20.87	21.02	22.00

LTE Cat M1 Band 26				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26697	26865	27033	
1.4MHz	QPSK	1	0	19.97	20.11	19.89	21.50
		1	2	19.89	20.11	19.82	21.50
		1	5	19.92	19.97	19.84	21.50
		3	0	19.88	20.19	19.94	21.50
		3	2	19.85	20.09	19.99	21.50
		3	3	19.88	20.01	19.83	21.50
		6	0	19.51	19.52	19.57	21.50
	16QAM	1	0	20.33	20.43	20.36	21.50
		1	2	20.14	20.35	20.17	21.50
		1	5	20.17	20.43	20.16	21.50
		3	0	20.17	20.23	20.14	21.50
		3	2	20.08	20.26	19.94	21.50
		3	3	19.82	19.96	19.89	21.50
		5	0	19.88	20.17	20.10	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26705	26865	27025	
3MHz	QPSK	1	0	19.97	20.20	19.88	21.50
		1	2	19.85	20.10	19.87	21.50
		1	5	19.89	20.03	19.78	21.50
		3	0	19.83	20.24	20.05	21.50
		3	2	19.90	20.18	19.91	21.50
		3	3	19.87	20.15	19.81	21.50
		6	0	19.53	19.55	19.53	21.50
	16QAM	1	0	20.29	20.29	20.20	21.50
		1	2	20.26	20.52	20.20	21.50
		1	5	20.11	20.49	20.21	21.50
		3	0	20.12	20.22	20.08	21.50
		3	2	20.05	20.22	20.05	21.50
		3	3	19.91	20.14	19.86	21.50
		5	0	19.84	20.04	20.04	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26715	26865	27015	
5MHz	QPSK	1	0	20.01	20.07	20.05	21.50
		1	2	19.92	20.04	19.86	21.50
		1	5	19.99	20.09	19.88	21.50
		3	0	19.97	20.25	19.97	21.50
		3	2	19.85	20.21	19.82	21.50
		3	3	19.90	20.20	19.85	21.50
		6	0	19.52	19.51	19.56	21.50
	16QAM	1	0	20.26	20.44	20.39	21.50
		1	2	20.22	20.35	20.33	21.50
		1	5	20.21	20.36	20.14	21.50
		3	0	20.06	20.24	20.07	21.50
		3	2	20.06	20.13	20.01	21.50
		3	3	19.80	20.14	19.88	21.50
		5	0	19.86	20.19	20.18	21.50

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26740	26865	26990	
10MHz	QPSK	1	0	19.88	20.17	19.99	21.50
		1	2	20.03	20.20	19.94	21.50
		1	5	19.90	19.90	19.88	21.50
		3	0	19.97	20.08	19.91	21.50
		3	2	19.95	20.10	19.98	21.50
		3	3	19.84	20.09	19.78	21.50
		6	0	19.56	19.57	19.52	21.50
	16QAM	1	0	20.34	20.25	20.30	21.50
		1	2	20.25	20.34	20.26	21.50
		1	5	20.09	20.47	20.25	21.50
		3	0	20.16	20.10	20.07	21.50
		3	2	20.04	20.17	20.01	21.50
		3	3	19.96	20.13	19.97	21.50
		6	0	19.80	20.08	20.02	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				26765	26865	26965	
15MHz	QPSK	1	0	20.01	20.21	20.02	21.50
		1	2	20.00	20.15	19.97	21.50
		1	5	19.95	20.05	19.86	21.50
		3	0	19.95	20.22	20.04	21.50
		3	2	19.94	20.16	19.97	21.50
		3	3	19.86	20.15	19.93	21.50
		6	0	19.51	19.53	19.53	21.50
	16QAM	1	0	20.33	20.39	20.34	21.50
		1	2	20.26	20.48	20.31	21.50
		1	5	20.18	20.44	20.21	21.50
		3	0	20.15	20.25	20.10	21.50
		3	2	20.11	20.25	20.08	21.50
		3	3	19.95	20.11	20.01	21.50
		5	0	19.95	20.14	20.13	21.50

LTE Cat M1 Band 66				Conducted Power(dBm)			Tune up
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	
				131979	132322	132665	
1.4MHz	QPSK	1	0	20.87	21.21	21.15	22.00
		1	2	20.82	21.06	21.20	22.00
		1	5	20.56	21.05	21.00	22.00
		3	0	20.88	21.17	21.24	22.00
		3	2	20.75	21.22	21.06	22.00
		3	3	20.69	21.09	21.16	22.00
		6	0	20.86	21.14	21.15	22.00
	16QAM	1	0	21.19	21.69	21.58	22.00
		1	2	21.25	21.62	21.60	22.00
		1	5	21.11	21.43	21.47	22.00
		3	0	20.97	21.44	21.35	22.00
		3	2	20.91	21.34	21.25	22.00
		3	3	21.04	21.24	21.27	22.00
		5	0	21.16	21.39	21.26	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				131987	132322	132657	
3MHz	QPSK	1	0	20.86	21.19	21.22	22.00
		1	2	20.75	21.22	21.13	22.00
		1	5	20.76	21.03	21.12	22.00
		3	0	20.79	21.28	21.20	22.00
		3	2	20.81	21.10	21.16	22.00
		3	3	20.75	21.00	21.05	22.00
		6	0	20.86	21.03	21.18	22.00
	16QAM	1	0	21.30	21.57	21.49	22.00
		1	2	21.16	21.54	21.59	22.00
		1	5	21.03	21.52	21.42	22.00
		3	0	20.89	21.49	21.31	22.00
		3	2	20.99	21.45	21.31	22.00
		3	3	21.05	21.27	21.13	22.00
		5	0	21.03	21.34	21.31	22.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				131997	132322	132647	
5MHz	QPSK	1	0	20.82	21.22	21.08	22.00
		1	2	20.69	21.25	21.18	22.00
		1	5	20.60	21.02	20.99	22.00
		3	0	20.75	21.19	21.15	22.00
		3	2	20.79	21.22	21.06	22.00
		3	3	20.76	20.96	21.09	22.00
		6	0	20.84	21.06	21.15	22.00
	16QAM	1	0	21.10	21.63	21.40	22.00
		1	2	21.13	21.69	21.48	22.00
		1	5	21.09	21.47	21.32	22.00
		3	0	20.91	21.34	21.35	22.00
		3	2	20.95	21.44	21.16	22.00
		3	3	20.98	21.26	21.26	22.00
		5	0	21.10	21.41	21.24	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132022	132322	132622	
10MHz	QPSK	1	0	20.72	21.30	21.25	22.00
		1	2	20.83	21.24	21.13	22.00
		1	5	20.59	21.12	20.98	22.00
		3	0	20.68	21.33	21.15	22.00
		3	2	20.79	21.17	21.22	22.00
		3	3	20.69	21.04	21.14	22.00
		6	0	20.85	21.03	21.13	22.00
	16QAM	1	0	21.17	21.56	21.51	22.00
		1	2	21.18	21.68	21.56	22.00
		1	5	21.13	21.49	21.46	22.00
		3	0	20.79	21.43	21.19	22.00
		3	2	20.92	21.40	21.34	22.00
		3	3	20.87	21.39	21.16	22.00
		5	0	21.20	21.35	21.21	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132047	132322	132597	
15MHz	QPSK	1	0	20.70	21.19	21.14	22.00
		1	2	20.78	21.13	21.15	22.00
		1	5	20.71	21.14	21.06	22.00
		3	0	20.74	21.19	21.12	22.00
		3	2	20.66	21.11	21.16	22.00
		3	3	20.65	21.03	21.09	22.00
		6	0	20.98	21.10	21.22	22.00
	16QAM	1	0	21.29	21.62	21.40	22.00
		1	2	21.23	21.69	21.62	22.00
		1	5	21.02	21.53	21.32	22.00
		3	0	20.97	21.42	21.20	22.00
		3	2	20.92	21.33	21.18	22.00
		3	3	21.05	21.35	21.25	22.00
		5	0	21.13	21.42	21.27	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				132072	132322	132572	
20MHz	QPSK	1	0	20.82	21.29	21.20	22.00
		1	2	20.79	21.21	21.15	22.00
		1	5	20.71	21.11	21.07	22.00
		3	0	20.83	21.28	21.22	22.00
		3	2	20.80	21.25	21.20	22.00
		3	3	20.78	21.11	21.14	22.00
		6	0	20.93	21.18	21.22	22.00
	16QAM	1	0	21.25	21.69	21.53	22.00
		1	2	21.23	21.64	21.58	22.00
		1	5	21.14	21.54	21.46	22.00
		3	0	20.94	21.48	21.33	22.00
		3	2	20.96	21.40	21.30	22.00
		3	3	21.02	21.35	21.23	22.00
		5	0	21.16	21.48	21.36	22.00

LTE Cat M1 Band 85				Conducted Power(dBm)			
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				134027	134092	134157	
5MHz	QPSK	1	0	21.10	21.11	21.12	22.00
		1	2	21.05	21.05	21.02	22.00
		1	5	20.98	20.93	20.94	22.00
		3	0	21.15	21.15	21.00	22.00
		3	2	21.07	21.08	20.97	22.00
		3	3	21.15	20.96	20.92	22.00
		6	0	20.51	20.45	20.44	22.00
	16QAM	1	0	21.49	21.50	21.47	22.00
		1	2	21.36	21.41	21.45	22.00
		1	5	21.30	21.23	21.23	22.00
		3	0	21.24	21.07	20.97	22.00
		3	2	21.10	21.24	21.00	22.00
		3	3	21.13	21.17	20.85	22.00
		5	0	21.19	21.01	21.17	22.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				134052	134092	134132	
10MHz	QPSK	1	0	21.24	21.25	21.08	22.00
		1	2	21.18	21.16	21.07	22.00
		1	5	21.08	21.05	20.96	22.00
		3	0	21.19	21.20	21.10	22.00
		3	2	21.18	21.14	21.09	22.00
		3	3	21.14	21.08	21.03	22.00
		6	0	20.61	20.52	20.48	22.00
	16QAM	1	0	21.47	21.45	21.46	22.00
		1	2	21.49	21.50	21.42	22.00
		1	5	21.42	21.32	21.36	22.00
		3	0	21.31	21.17	21.11	22.00
		3	2	21.25	21.24	21.03	22.00
		3	3	21.16	21.15	21.00	22.00
		5	0	21.25	21.15	21.16	22.00

13.2 Conducted Power of BLE

BLE		Average Conducted Power(dBm)			Tune up (dBm)
Band	Channel	0	19	39	
BLE 1M	GFSK	7.74	7.69	7.65	8.00
BLE 2M	GFSK	7.68	7.63	7.60	8.00

14 Stand-alone SAR test evaluation

Unless specifically required by the published RF exposure KDB procedures, standalone 1-g head or body and Product specific 10g SAR evaluation for general population exposure conditions, by measurement or numerical simulation, is not required when the corresponding SAR Test Exclusion Threshold condition is satisfied. These test exclusion conditions are based on source-based time-averaged maximum conducted output power of the RF channel requiring evaluation, adjusted for tune-up tolerance, and the minimum test separation distance required for the exposure conditions.

Band	Frequency (GHz)	Max Average Power		Test Separation (mm)	Calculate Value	Exclusion Threshold	Exclusion (Y/N)
		dBm	mW				
BLE	2.4835	8.0	6.31	5	1.99	3	Y

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

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where

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

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

Estimated SAR:

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

- $(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm}) \cdot [\sqrt{f(\text{GHz})} / x]$ W/kg for test separation distances ≤ 50 mm;

Where $x = 7.5$ for 1-g SAR, and $x = 18.75$ for 10-g SAR.

When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test exclusion.

Estimated SAR Result					
Band	Frequency (GHz)	Test Position	Max. power (dBm)	Test Separation (mm)	Estimated
					SAR (W/kg)
BLE	2.4835	Body	8.0	5	0.265

15 SAR Data Summary

General Notes:

- 1) The Highest Reported SAR Plot refer to Appendix B.
- 2) Per KDB 447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1g or 10g SAR for the mid-band or highest output power channel is:
 - $\leq 0.8\text{W/kg}$ for 1g or 2.0W/kg for 10g respectively, when the transmission band is $\leq 100\text{MHz}$.
 - $\leq 0.6\text{ W/kg}$ or 1.5 W/kg , for 1g or 10g respectively, when the transmission band is between 100 MHz and 200MHz.
 - $\leq 0.4\text{ W/kg}$ or 1.0 W/kg , for 1g or 10g respectively, when the transmission band is $\geq 200\text{MHz}$.

15.1 SAR Measurement Result of LTE Cat M1 Band 13

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB)								
Front side	10	QPSK 1_0	23230/782	0.121	21.01	21.50	1.119	0.135
Back side	10	QPSK 1_0	23230/782	0.107	21.01	21.50	1.119	0.120
Left side	10	QPSK 1_0	23230/782	0.029	21.01	21.50	1.119	0.032
Right side	10	QPSK 1_0	23230/782	0.007	21.01	21.50	1.119	0.008
Top side	10	QPSK 1_0	23230/782	0.049	21.01	21.50	1.119	0.055
Bottom side	10	QPSK 1_0	23230/782	0.050	21.01	21.50	1.119	0.056
Body 5mm(50%RB)								
Front side	10	QPSK 3_0	23230/782	0.129	20.96	21.50	1.132	0.146
Back side	10	QPSK 3_0	23230/782	0.106	20.96	21.50	1.132	0.120
Left side	10	QPSK 3_0	23230/782	0.029	20.96	21.50	1.132	0.033
Right side	10	QPSK 3_0	23230/782	0.007	20.96	21.50	1.132	0.008
Top side	10	QPSK 3_0	23230/782	0.049	20.96	21.50	1.132	0.055
Bottom side	10	QPSK 3_0	23230/782	0.050	20.96	21.50	1.132	0.057

Table 1: SAR of LTE Cat M1 Band 13.

15.2 SAR Measurement Result of LTE Cat M1 Band 25

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB)								
Front side	20	QPSK 1_0	26590/1905	0.282	21.14	22.00	1.219	0.344
Back side	20	QPSK 1_0	26590/1905	0.327	21.14	22.00	1.219	0.399
Left side	20	QPSK 1_0	26590/1905	0.062	21.14	22.00	1.219	0.076
Right side	20	QPSK 1_0	26590/1905	0.037	21.14	22.00	1.219	0.045
Top side	20	QPSK 1_0	26590/1905	0.143	21.14	22.00	1.219	0.174
Bottom side	20	QPSK 1_0	26590/1905	0.138	21.14	22.00	1.219	0.168
Body 5mm(50%RB)								
Front side	20	QPSK 3_0	26590/1905	0.278	21.11	22.00	1.227	0.341
Back side	20	QPSK 3_0	26590/1905	0.312	21.11	22.00	1.227	0.383
Left side	20	QPSK 3_0	26590/1905	0.048	21.11	22.00	1.227	0.059
Right side	20	QPSK 3_0	26590/1905	0.036	21.11	22.00	1.227	0.044
Top side	20	QPSK 3_0	26590/1905	0.141	21.11	22.00	1.227	0.173
Bottom side	20	QPSK 3_0	26590/1905	0.137	21.11	22.00	1.227	0.168

Table 2: SAR of LTE Cat M1 Band 25.

15.3 SAR Measurement Result of LTE Cat M1 Band 26

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB)								
Front side	15	QPSK 1_0	26865/831.5	0.116	20.21	21.50	1.346	0.156
Back side	15	QPSK 1_0	26865/831.5	0.090	20.21	21.50	1.346	0.121
Left side	15	QPSK 1_0	26865/831.5	0.016	20.21	21.50	1.346	0.022
Right side	15	QPSK 1_0	26865/831.5	0.006	20.21	21.50	1.346	0.008
Top side	15	QPSK 1_0	26865/831.5	0.033	20.21	21.50	1.346	0.044
Bottom side	15	QPSK 1_0	26865/831.5	0.030	20.21	21.50	1.346	0.040
Body 5mm(50%RB)								
Front side	15	QPSK 3_0	26865/831.5	0.110	20.22	21.50	1.343	0.148
Back side	15	QPSK 3_0	26865/831.5	0.087	20.22	21.50	1.343	0.117
Left side	15	QPSK 3_0	26865/831.5	0.015	20.22	21.50	1.343	0.020
Right side	15	QPSK 3_0	26865/831.5	0.005	20.22	21.50	1.343	0.007
Top side	15	QPSK 3_0	26865/831.5	0.030	20.22	21.50	1.343	0.040
Bottom side	15	QPSK 3_0	26865/831.5	0.030	20.22	21.50	1.343	0.040

Table 3: SAR of LTE Cat M1 Band 26.

15.4 SAR Measurement Result of LTE Cat M1 Band 66

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB)								
Front side	20	QPSK 1_0	132322/1745	0.316	21.29	22.00	1.178	0.372
Back side	20	QPSK 1_0	132322/1745	0.479	21.29	22.00	1.178	0.564
Left side	20	QPSK 1_0	132322/1745	0.035	21.29	22.00	1.178	0.041
Right side	20	QPSK 1_0	132322/1745	0.030	21.29	22.00	1.178	0.035
Top side	20	QPSK 1_0	132322/1745	0.205	21.29	22.00	1.178	0.241
Bottom side	20	QPSK 1_0	132322/1745	0.209	21.29	22.00	1.178	0.246
Body 5mm(50%RB)								
Front side	20	QPSK 3_0	132322/1745	0.321	21.28	22.00	1.180	0.379
Back side	20	QPSK 3_0	132322/1745	0.337	21.28	22.00	1.180	0.398
Left side	20	QPSK 3_0	132322/1745	0.034	21.28	22.00	1.180	0.040
Right side	20	QPSK 3_0	132322/1745	0.031	21.28	22.00	1.180	0.037
Top side	20	QPSK 3_0	132322/1745	0.206	21.28	22.00	1.180	0.243
Bottom side	20	QPSK 3_0	132322/1745	0.211	21.28	22.00	1.180	0.249

Table 4: SAR of LTE Cat M1 Band 66.

15.5 SAR Measurement Result of LTE Cat M1 Band 85

Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB)								
Front side	10	QPSK 1_0	134092/707	0.163	21.25	22.00	1.189	0.194
Back side	10	QPSK 1_0	134092/707	0.127	21.25	22.00	1.189	0.151
Left side	10	QPSK 1_0	134092/707	0.029	21.25	22.00	1.189	0.034
Right side	10	QPSK 1_0	134092/707	0.011	21.25	22.00	1.189	0.013
Top side	10	QPSK 1_0	134092/707	0.044	21.25	22.00	1.189	0.052
Bottom side	10	QPSK 1_0	134092/707	0.041	21.25	22.00	1.189	0.049
Body 5mm(50%RB)								
Front side	10	QPSK 3_0	134092/707	0.159	21.20	22.00	1.202	0.191
Back side	10	QPSK 3_0	134092/707	0.127	21.20	22.00	1.202	0.153
Left side	10	QPSK 3_0	134092/707	0.029	21.20	22.00	1.202	0.035
Right side	10	QPSK 3_0	134092/707	0.011	21.20	22.00	1.202	0.013
Top side	10	QPSK 3_0	134092/707	0.045	21.20	22.00	1.202	0.054
Bottom side	10	QPSK 3_0	134092/707	0.040	21.20	22.00	1.202	0.048

Table 5: SAR of LTE Cat M1 Band 85.

16 Simultaneous Transmission Analysis

The Simultaneous Transmission Possibilities of this device are as below:

NO.	Simultaneous Tx Combination	Body
1	LTE Cat M + BLE	Y

Test position		SAR _{max} (W/kg)						Summed SAR _{max}
		LTE Cat M1 Band 13	LTE Cat M1 Band 25/2	LTE Cat M1 Band 26/5	LTE Cat M1 Band 66/4	LTE Cat M1 Band 85/12	BLE	
		1					2	
Body 5mm	Front side	0.146	0.344	0.156	0.379	0.194	0.265	0.644
	Back side	0.120	0.399	0.121	0.564	0.153	0.265	0.829
	Left side	0.033	0.076	0.022	0.041	0.035	0.265	0.341
	Right side	0.008	0.045	0.008	0.037	0.013	0.265	0.310
	Top side	0.055	0.174	0.044	0.243	0.054	0.265	0.508
	Bottom side	0.057	0.168	0.040	0.249	0.049	0.265	0.514

17 Measurement Uncertainty

Per KDB 865664 D01 SAR measurement 100MHz to 6GHz, 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.

18 Calibration Certificate

Please see the Appendix C

19 Test Setup Photos

Please see the Appendix D

Appendix A: System Check Plots

Appendix B: SAR Test Plots

Appendix C: Calibration certificate

Appendix D: Test Setup Photos

--- The End ---
