FCC SAR Test Report

Applicant:	Tri Cascade Inc.
EUT Description:	VOS 5G Dongle
Model:	VOS5-GF-2
Model Covered:	VOS5-NA-1, VOS5-NA-2, GC54310R-1
Brand:	TRI CASCADE VOS
FCC ID:	2ACARVOS5G
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2024/05/13
Date of Test:	2024/05/15 to 2024/06/23
Date of Issue:	2024/08/02

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.

Huang Kun	**Li Wei**
Approved By:	**Reviewed By:**

Revision History

Rev.	Issue Date	Description	Revised by
01	2024/07/09	Original	Li Wei
02	2024/08/02	Add a description of TX Ant on page 8, update test equipment list on page 17 and add Simultaneous Transmission Analysis on page 65.	Li Wei

Table of Contents

1 Summary of Test Results

Band	Highest SAR(W/kg)
	Body 5mm
LTE Band 2	0.78
LTE Band 5	0.70
LTE Band 12	0.67
LTE Band 13	0.70
LTE Band 30	0.53
LTE Band 41	0.59
LTE Band 48	0.48
LTE Band 66/4	0.68
LTE Band 71	0.72
NR Band n2	0.77
NR Band n5	0.68
NR Band n12	0.71
NR Band n14	0.73
NR Band n25	0.73
NR Band n30	0.77
NR Band n41	0.77
NR Band n48	**0.87**
NR Band n66	0.61
NR Band n70	0.61
NR Band n71	0.75
NR Band n77	0.79
SAR Limited(W/kg)	1.6

Remark:
LTE band 4 SAR test was covered by Band 66; according to April 2015 TCB workshop, SAR test for overlapping LTE bands can be reduced if:
a. the maximum output power, including tolerance, for the smaller band is ≤ the larger band to qualify for the SAR test exclusion.
b. 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 941225 D05A LTE Rel.10 KDB Inquiry Sheet v01r02
FCC KDB 447498 D01 General RF Exposure Guidance v06
FCC KDB 447498 D02 SAR Procedures for Dongle Xmtr v02r01
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:	Tri Cascade Inc.
Address:	19200 Von Karman Ave, Ste 400, Irvine, CA 92612

4.2 Manufacturer

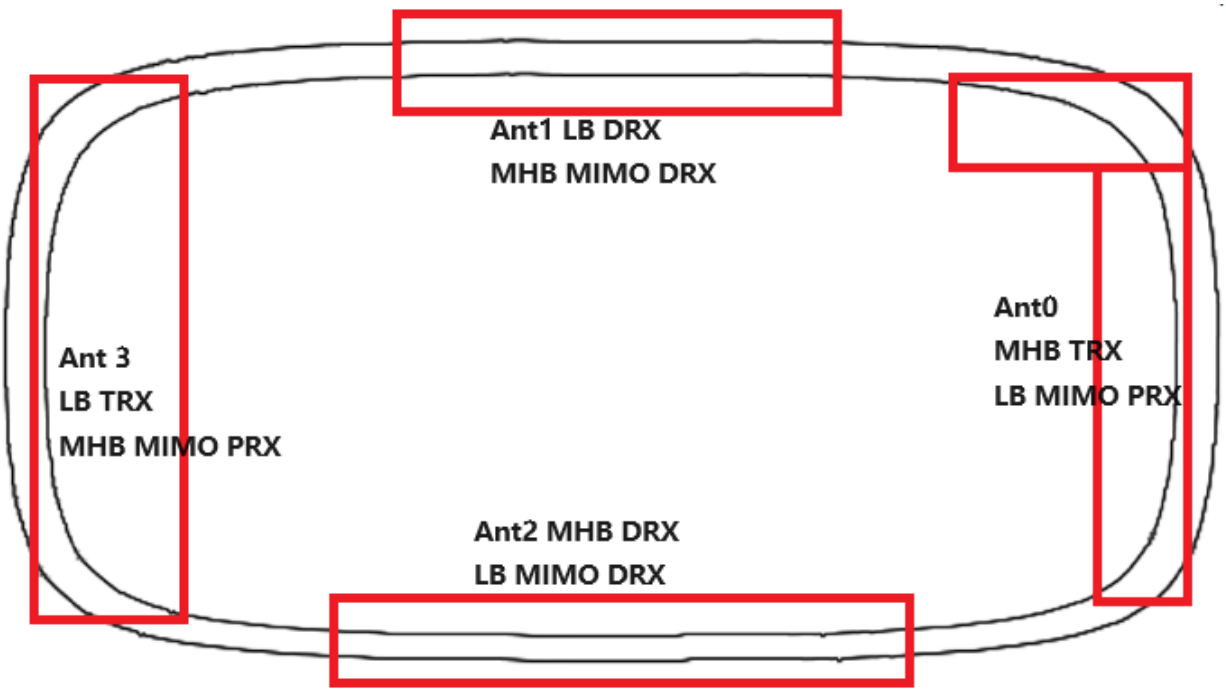
Manufacturer:	Tri Cascade Inc.
Address:	19200 Von Karman Ave, Ste 400, Irvine, CA 92612

5 Product Information

EUT Description	VOS 5G Dongle	
Model	VOS5-GF-2	
Model Covered	VOS5-NA-1, VOS5-NA-2, GC54310R-1	
Brand	TRI CASCADE VOS	
Hardware Version	V1.1	
Software Version	FG19_V01.15b01	
IMEI	962513050034031	
Device Capabilities:		
Band	Frequency Range (MHz)	Modulation Type
LTE Band 2	1850 ~1910	☒ QPSK ☒ 16QAM ☒ 64QAM ☒ 256QAM
LTE Band 4	1710~1755	
LTE Band 5	824~849	
LTE Band 12	699~716	
LTE Band 13	777~787	
LTE Band 29	Downlink only	
LTE Band 30	2305~2315	
LTE Band 41 (Class 2/3)	2496~2690	
LTE Band 46	Downlink only	
LTE Band 48	3550~3700	
LTE Band 66	1710~1780	
LTE Band 71	663~698	
5G NR n2	1850~1910	☒ DFT-s-OFDM: (PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM). ☒ CP-OFDM: (QPSK, 16QAM, 64QAM, 256QAM)
5G NR n5	824~849	
5G NR n12	699 ~ 716	
5G NR n14	788~798	
5G NR n25	1850 ~ 1915	
5G NR n30	2305 ~ 2315	
5G NR n41 (Class 2/3)	2496~2690	
5G NR n48	3550 ~ 3700	
5G NR n66	1710~1780	
5G NR n70	1695 ~ 1710	
5G NR n71	663~698	
5G NR n77	3450~3550 3700~3980	
Antenna Type	☐ External, ☒ Integrated	

Remark:
1. The above EUT's information was declared by applicant, please refer to the specifications or user manual for more detailed description.
2. Reference applicant Model Confirmation Letter:
   Their electrical circuit design, layout, components used and internal wiring are identical, Only the combinations of device color and logo color are different.
   VOS5-NA-1 White/Light Grey,
   VOS5-GF-2 White/Dark Grey,
   GC54310R-1 Light Grey W/RGB logo,
   VOS5-NA-2 Dark Grey.
   According to the difference description above, only the VOS5-GF-2 model is tested, and other models share the same test data of VOS5-GF-2.

5.1 Antenna Locations



Note:
Ant0: LTE B2/4/30/41/48/66, n2/25/30/41/48/66/70/77
Ant3: LTE B5/12/13/71, n5/12/14/41/71/77

5.2 Power reduction specification

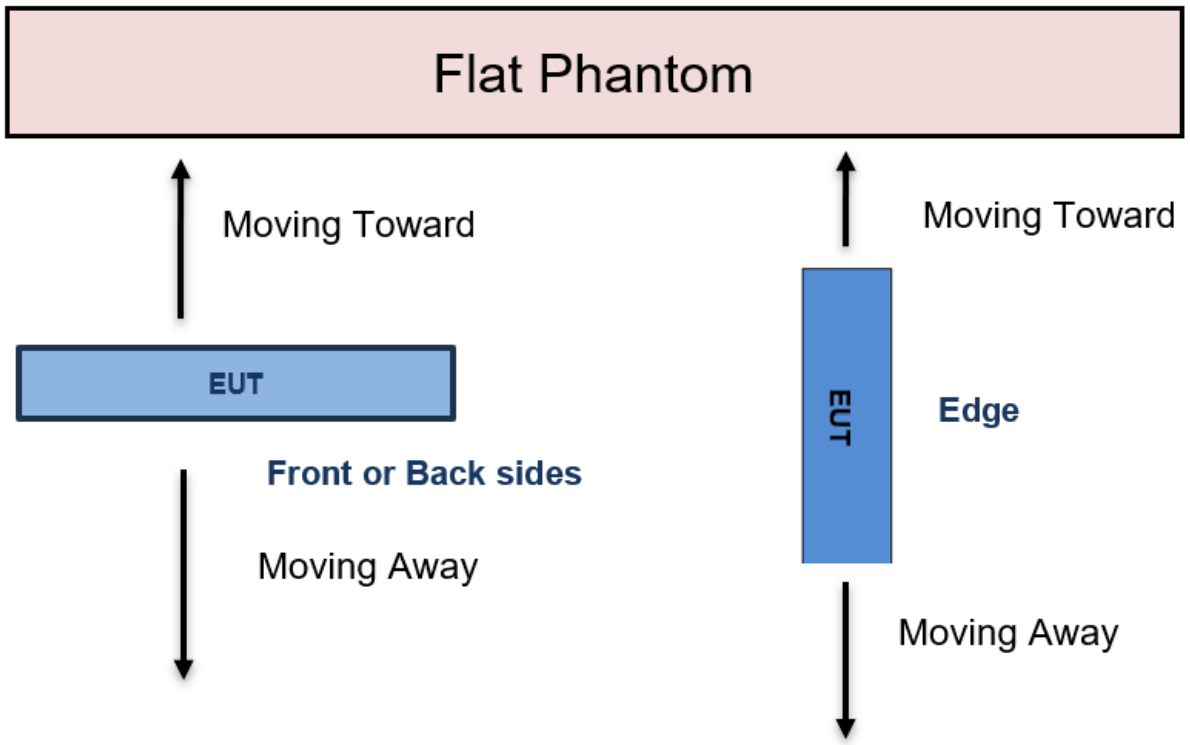
This device uses a single fixed level of power reduction through static table look-up for SAR compliance and it is triggered by a single event or operation.

1) The proximity sensor is used to indicate when the device is held close to a user's body exposure condition. It utilizes the proximity sensor to reduce the output power in specific wireless and operating modes of main antenna to ensure SAR compliance (Refer to section 5.4 for detailed proximity Sensor information and validation data per KDB 616217).

The detailed power reduction information can refer to Conducted RF Output Power.

5.2.1 Proximity Sensor Triggering Test

Proximity sensor triggering distances:
Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed, and the tissue-equivalent medium was used for proximity sensor triggering testing.



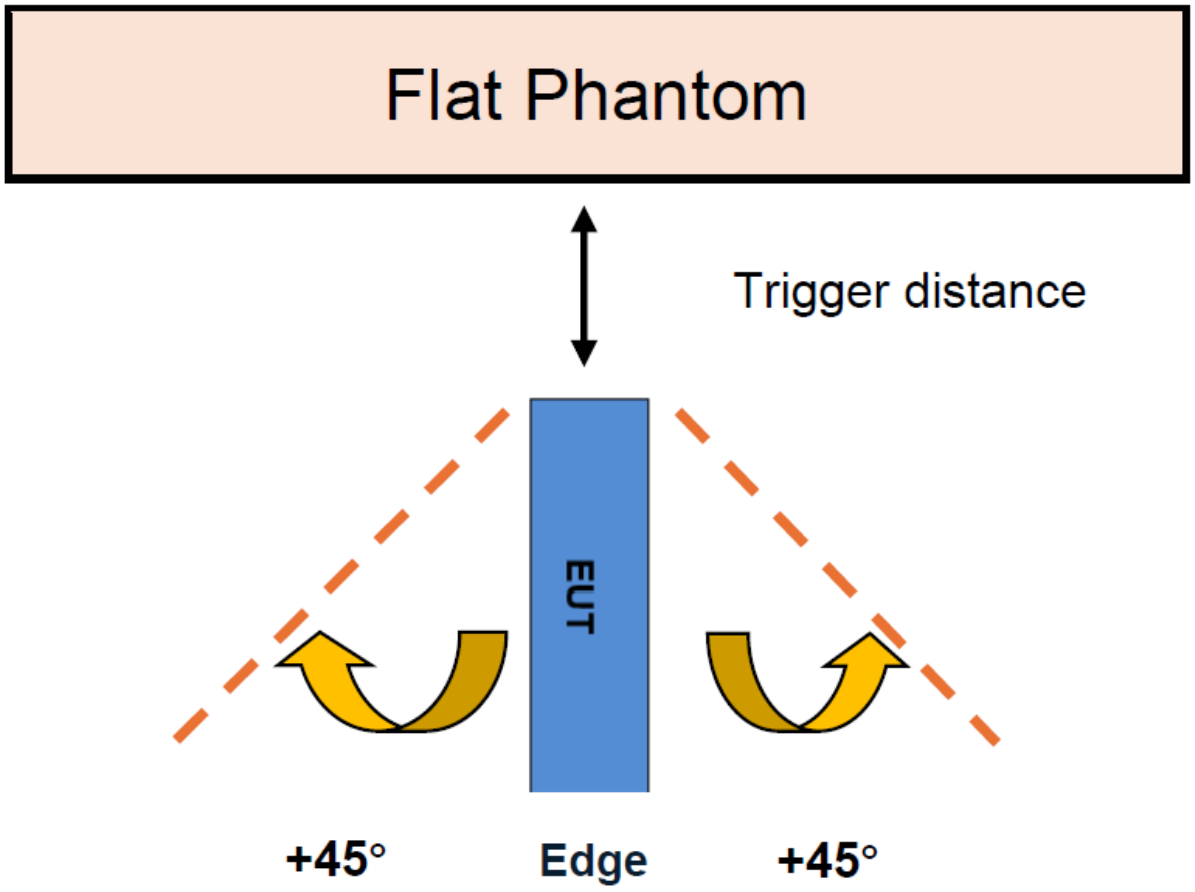
Proximity Sensor Triggering Distance(mm)					
Position	Front	Back	Left	Right	Top
Minimum	20	20	20	20	20
SAR Test *	19	19	19	19	19

* For verification of compliance of power reduction scheme, additional SAR testing with EUT transmitting at full RF power at a conservative trigger distance -1mm was performed.

Device tilt angle influences on proximity sensor triggering:

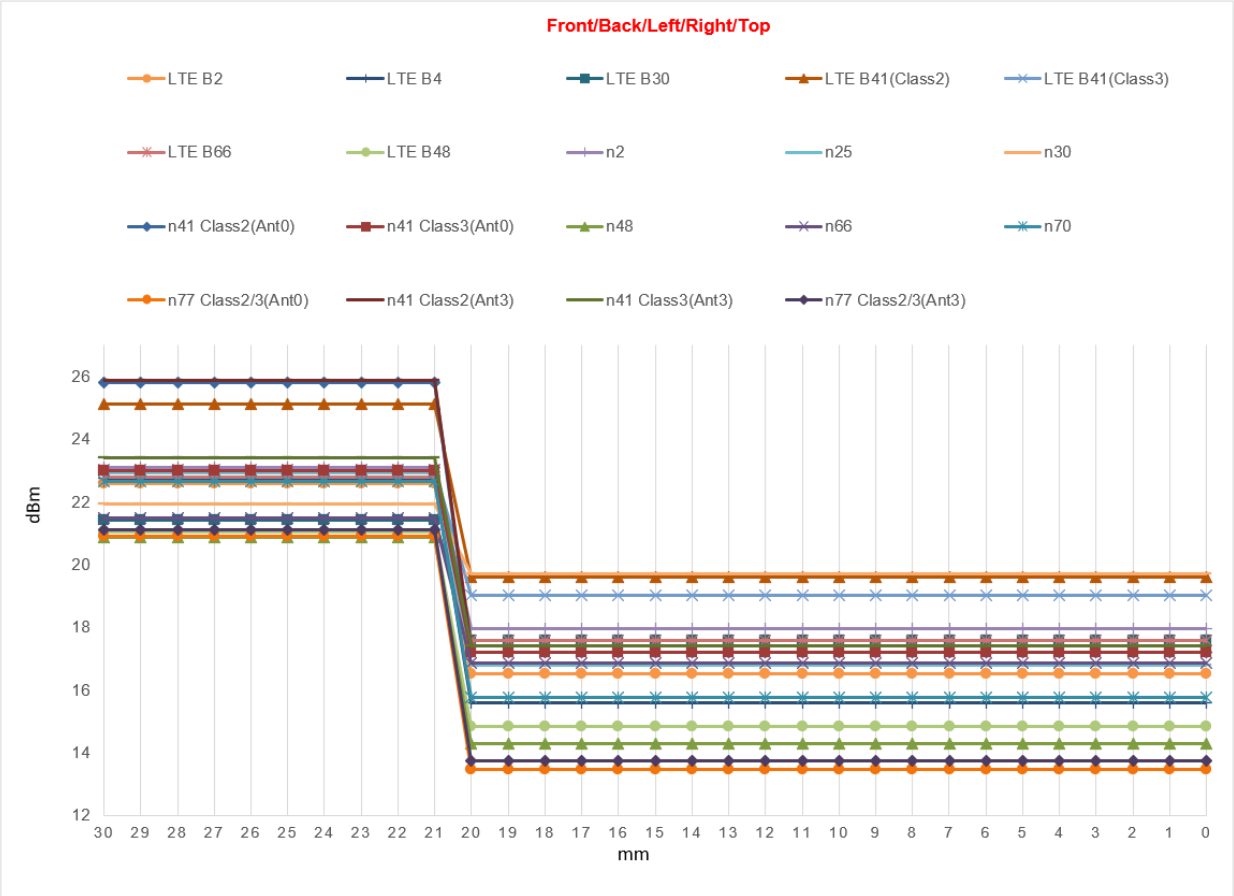
The influence of device tilt angles to proximity sensor triggering was determined by positioning each tablet edge that contains a transmitting antenna, perpendicular to the flat phantom.

Rotating the tablet around the edge next to the phantom in ≤ 10° increments until the tablet is ± 45° from the vertical position at 0°, and the maximum output power remains in the reduced mode.

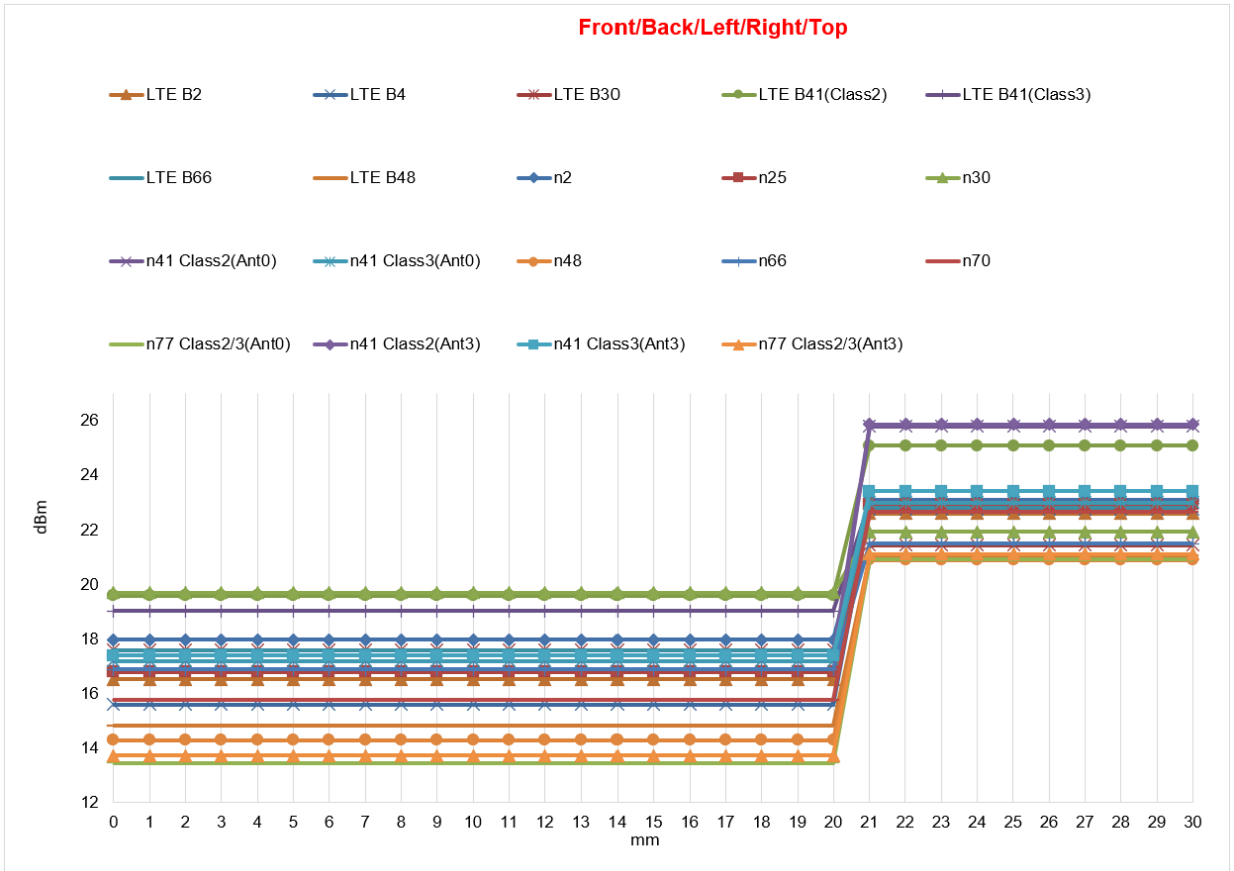


Summary of Tablet Tilt Angle Influence on Proximity Sensor Triggering for Edge Side											
Minimum trigger distance Per KDB616217§6.2	Minimum trigger distance at which power reduction was maintained over ±45°	Power Reduction Status									
		-45°	-35°	-25°	-15°	-5°	0°	5°	15°	25°	35°	45°
Front side: 20mm Back side: 20mm Left side: 10mm Right side: 20mm Top side: 20mm	Front side: 20mm Back side: 20mm Left side: 10mm Right side: 20mm Top side: 20mm	on	on	on	on	on	on	on	on	on	on	on

DUT Moving Toward the Phantom:



DUT Moving Away from the Phantom:



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 SAR[1] (Brain/Trunk)	1.6	8.0
Spatial Average SAR[2] (Whole Body)	0.08	0.4
Spatial Peak SAR[3] (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):

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

Where:

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

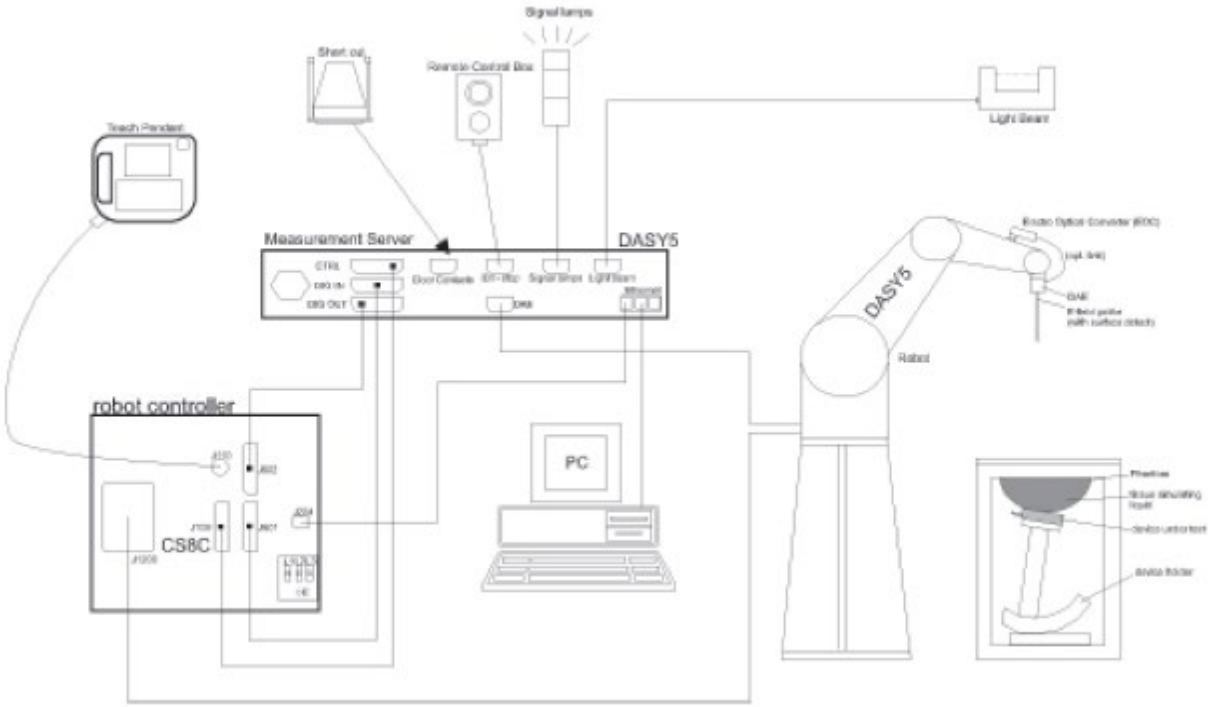
ρ is the mass density of the tissue material (kg/m^3)

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

8 SAR Measurements System

8.1 The SAR Measurement Set-up

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



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

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 extracted from FCC 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.	

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 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	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

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 ±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	1473	NCR	NCR
SPEAG	Twin Phantom	SAM	2168	NCR	NCR
SPEAG	E-Field Probe	EX3DV4	3624	2023/05/17	2024/05/16
SPEAG	E-Field Probe	EX3DV4	7858	2024/01/09	2025/01/08
SPEAG	E-Field Probe	EX3DV4	7733	2024/02/21	2025/02/20
SPEAG	Data Acquisition Electronics	DAE4	1846	2023/11/29	2024/11/28
SPEAG	Data Acquisition Electronics	DAE4	1847	2024/01/04	2025/01/03
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	System Validation Kits	D2300V2	1137	2023/05/05	2026/05/04
SPEAG	System Validation Kits	D2600V2	1094	2023/03/23	2026/03/22
SPEAG	System Validation Kits	D3500V2	1150	2023/05/15	2026/05/14
SPEAG	System Validation Kits	D3700V2	1127	2023/05/10	2026/05/09
SPEAG	System Validation Kits	D3900V2	1099	2023/05/15	2026/05/14
SPEAG	Dielectric parameter probes	DAKS-3.5	1001	2024/01/22	2025/01/21
SPEAG	Vector Network Analyzer	DAKS_VNA R140	0140417	2024/01/16	2025/01/15
Anritsu	Radio Communication Analyzer	MT8821C	6262170463	2024/03/25	2025/03/24
Anritsu	Radio Communication Analyzer	MT8821C	6261991091	2024/03/25	2025/03/24
R&S	Signal Generator	SMR20	100621	2024/03/25	2025/03/24
R&S	AVG Power Sensor	NRP-Z21	101651	2024/03/25	2025/03/24
R&S	AVG Power Sensor	NRP-Z21	104189	2024/03/25	2025/03/24
HAISIDIKE	Thermometer	TP300	TOWE-EQ-SR-023	2024/03/27	2025/03/26
BingYu	Temperature and Humidity Indicator	HTC-1	TOWE-EQ-SR-024	2024/03/26	2025/03/25
Talent Microwave	Directional Coupler	TC-05180-10S	220420003	NCR	NCR
QiJi	Amplifier	YX28982301	TOWE-EQ-SR-020	NCR	NCR
QiJi	Amplifier	YX28982302	TOWE-EQ-SR-021	NCR	NCR

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); steps2) 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 3.6W/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

11 Description of Test Position

11.1 Body exposure conditions

Per FCC KDB 447498 D02, for USB dongle transmitters with internal antennas, test all USB orientations (see figure below) with a device-to-phantom separation distance of 5 mm or less. These test orientations are intended for the exposure conditions found in typical laptop/notebook/netbook or tablet computers with either horizontal or vertical USB connector configurations at various locations in the keyboard section of the computer.

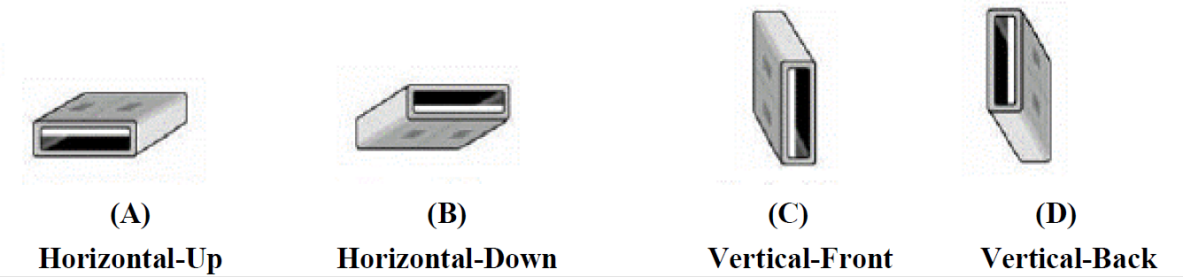


Figure: USB Connector Orientations Implemented on Laptop Computers

12 System Verification

12.1 Tissue Verification

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

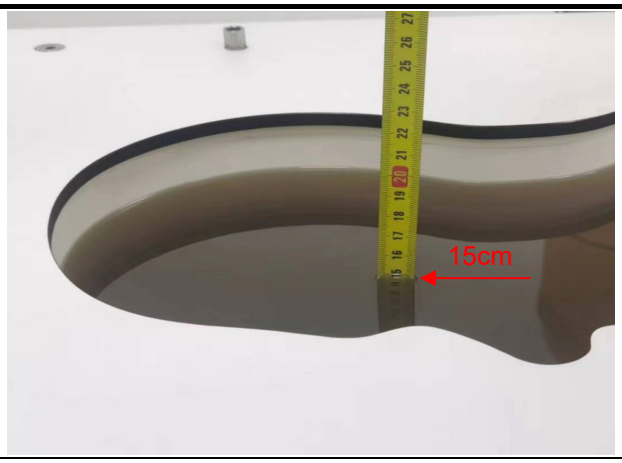


Figure 12-1 Liquid depth in the Head Phantom

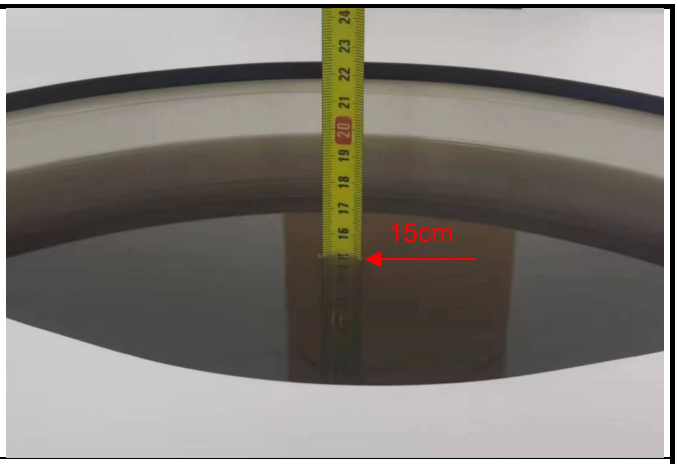


Figure 12-2 Liquid depth in the Flat Phantom

Frequency (MHz)	Tissue Type	Liquid Temp. (℃)	Target Tissue		Measured Tissue		Deviation (Limit ±5%)		Date
			Permittivity ε_r	Conductivity σ(S/m)	Permittivity ε_r	Conductivity σ(S/m)	$\Delta\varepsilon_r$	Δσ	
750	Head	22.7	41.90	0.89	42.052	0.894	0.36%	0.44%	2024/05/15
750	Head	21.3	41.90	0.89	42.500	0.901	1.43%	1.24%	2024/05/22
835	Head	21.6	41.50	0.90	41.900	0.915	0.96%	1.67%	2024/05/21
1750	Head	21.7	40.10	1.37	39.800	1.370	-0.75%	0.00%	2024/06/05
1750	Head	22.3	40.10	1.37	39.900	1.380	-0.50%	0.73%	2024/06/07
1900	Head	21.4	40.00	1.40	39.900	1.410	-0.25%	0.71%	2024/06/06
2300	Head	22.5	39.50	1.67	39.600	1.690	0.25%	1.20%	2024/06/18
2600	Head	21.5	39.00	1.96	38.700	1.990	-0.77%	1.53%	2024/06/06
2600	Head	21.9	39.00	1.96	38.900	1.980	-0.26%	1.02%	2024/06/17
2600	Head	22.9	39.00	1.96	39.700	1.970	1.79%	0.51%	2024/06/21
3500	Head	22.5	37.90	2.91	38.200	2.890	0.79%	-0.69%	2024/06/13
3500	Head	22.8	37.90	2.91	38.400	2.910	1.32%	0.00%	2024/06/15
3500	Head	22.7	37.90	2.91	38.500	2.940	1.58%	1.03%	2024/06/23
3700	Head	22.3	37.70	3.12	38.100	3.100	1.06%	-0.64%	2024/06/13
3700	Head	22.6	37.70	3.12	38.200	3.110	1.33%	-0.32%	2024/06/15
3700	Head	22.6	37.70	3.12	38.400	3.140	1.86%	0.64%	2024/06/23
3900	Head	22.7	37.50	3.32	37.900	3.300	1.07%	-0.60%	2024/06/23

Table 1： Measurement Tissue Parameters

12.2 SAR System Check

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

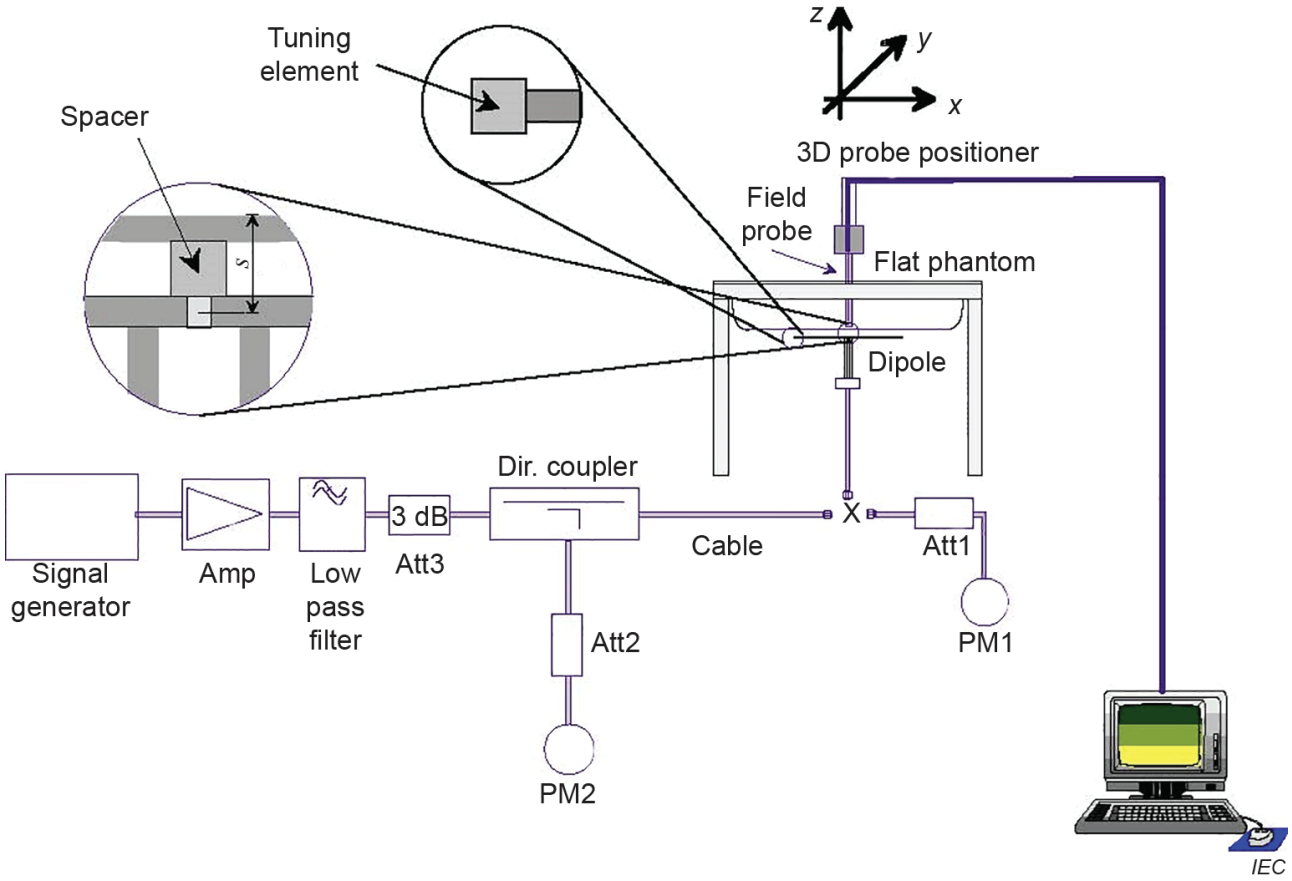


Figure 12-3 System Performance Check Setup

12.2.1 System Check Result

Frequency (MHz)	Tissue Type	Dipole	S/N	Target SAR (1W)		Measured SAR (250mW)		Measured SAR (normalized to 1W)		Deviation (Limit ±10%)		Date
				1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	Δ1g	Δ10g	
750	Head	D750V3	1231	8.67	5.67	2.08	1.34	8.32	5.36	-4.04%	-5.47%	2024/05/15
750	Head	D750V3	1231	8.67	5.67	2.19	1.46	8.76	5.84	1.04%	3.00%	2024/05/22
835	Head	D835V2	4d302	9.78	6.37	2.50	1.65	10.00	6.60	2.25%	3.61%	2024/05/21
1750	Head	D1750V2	1115	36.90	19.50	9.15	4.92	36.60	19.68	-0.81%	0.92%	2024/06/05
1750	Head	D1750V2	1115	36.90	19.50	9.25	4.97	37.00	19.88	0.27%	1.95%	2024/06/07
1900	Head	D1900V2	512	39.40	20.50	10.50	5.49	42.00	21.96	6.60%	7.12%	2024/06/06
2300	Head	D2300V2	1137	49.3	24.00	11.90	5.75	47.60	23.00	-3.45%	-4.17%	2024/06/18
2600	Head	D2600V2	1094	56.30	25.00	14.40	6.55	57.60	26.20	2.31%	4.80%	2024/06/06
2600	Head	D2600V2	1094	56.30	25.00	14.10	6.42	56.40	25.68	0.18%	2.72%	2024/06/17
2600	Head	D2600V2	1094	56.30	25.00	14.00	6.36	56.00	25.44	-0.53%	1.76%	2024/06/21
Frequency (MHz)	Tissue Type	Dipole	S/N	Target SAR (1W)		Measured SAR (100mW)		Measured SAR (normalized to 1W)		Deviation (Limit ±10%)		Date
				1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	Δ1g	Δ10g	
3500	Head	D3500V2	1150	66.30	25.10	6.71	2.60	67.10	26.00	1.21%	3.59%	2024/06/13
3500	Head	D3500V2	1150	66.30	25.10	6.70	2.59	67.00	25.90	1.06%	3.19%	2024/06/15
3500	Head	D3500V2	1150	66.30	25.10	6.70	2.60	67.00	26.00	1.06%	3.59%	2024/06/23
3700	Head	D3700V2	1127	66.60	24.10	6.77	2.54	67.70	25.40	1.65%	5.39%	2024/06/13
3700	Head	D3700V2	1127	66.60	24.10	6.96	2.61	69.60	26.10	4.50%	8.30%	2024/06/15
3700	Head	D3700V2	1127	66.60	24.10	6.79	2.55	67.90	25.50	1.95%	5.81%	2024/06/23
3900	Head	D3900V2	1099	68.40	23.60	7.18	2.57	71.80	25.70	4.97%	8.90%	2024/06/23

Table 2： SAR System Check Result

12.2.2 Detailed System Check Result

Please see the Appendix A

13 SAR General Measurement Procedures

13.1 3G SAR Test Reduction Procedure

In FCC KDB Publication 941225 D01, certain transmission modes within a frequency band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is ≤ 0.25 dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is ≤ 1.2 W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

13.2 SAR Measurement Conditions for LTE

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).

13.2.1 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.

13.2.2 MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS36.101 Section 6.2.3 – 6.2.5 under Table 6.2.3-1.

Modulation	Channel bandwidth/Transmission bandwidth						MPR (dB)
	1.4 MHz	3 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	0
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	1
16QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	1
16QAM	> 5	> 4	> 8	> 12	> 16	> 18	2
64QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	2
64QAM	> 5	> 4	> 8	> 12	> 16	> 18	3
256QAM	≥1						5

13.2.3 A-MPR

A-MPR (Additional MPR) has been disabled for all SAR tests by setting NS=01 on the base station simulator.

13.2.4 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 ≤ 0.8 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 > 1.45 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 ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

D. Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, 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 > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

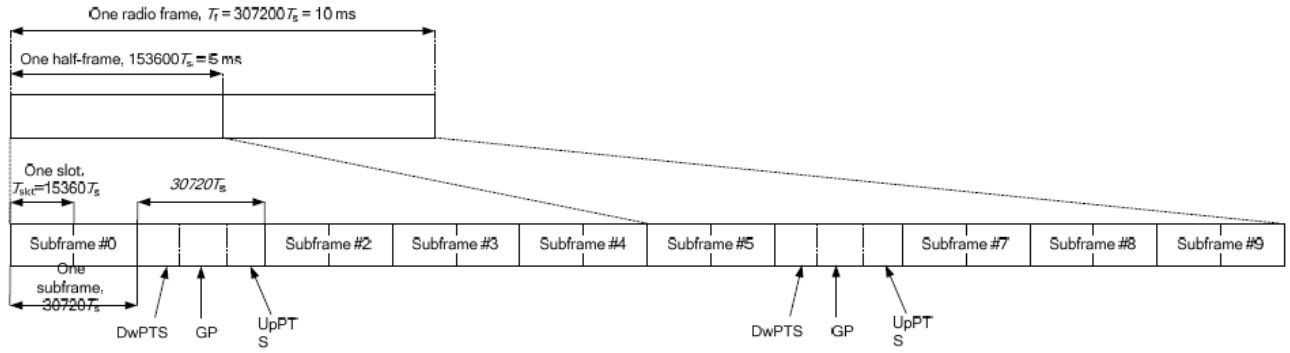
13.2.5 Other channel bandwidth standalone SAR test requirements

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 > ½ 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 > 1.45 W/kg.

13.2.6 LTE TDD Considerations

For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.
SAR was tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7.
LTE TDD Band support 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Frame structure type 2:



Uplink-downlink configurations

Uplink-downlink configuration	Downlink-to-Uplink Switch-point periodicity	Subframe number									
		0	1	2	3	4	5	6	7	8	9
0	5 ms	D	S	U	U	U	D	S	U	U	U
1	5 ms	D	S	U	U	D	D	S	U	U	D
2	5 ms	D	S	U	D	D	D	S	U	D	D
3	10 ms	D	S	U	U	U	D	D	D	D	D
4	10 ms	D	S	U	U	D	D	D	D	D	D
5	10 ms	D	S	U	D	D	D	D	D	D	D
6	5 ms	D	S	U	U	U	D	S	U	U	D

Configuration of special subframe (lengths of DwPTS/GP/UpPTS).

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	6592. T_s	2192.T_s	2560.T_s	7680.T_s	2192.T_s	2560.T_s
1	19760.T_s			20480.T_s		
2	21952.T_s			23040.T_s		
3	24144.T_s			25600.T_s		
4	26336.T_s			7680.T_s	4384.T_s	5120.T_s
5	6592.T_s	4384.T_s	5120.T_s	20480.T_s		
6	19760.T_s			23040.T_s		
7	21952.T_s			25600.T_s		
8	24144.T_s			-	-	-
9	13168.T_s			-	-	-

Calculated Duty Cycle=[Extended cyclic prefix in uplink x (Ts) x # of S + # of U]/10ms

Uplink-Downlink Configuration	Downlink-to- Uplink Switch-point Periodicity	Subframe Number										Calculated Duty Cycle (%)
		0	1	2	3	4	5	6	7	8	9	
0	5 ms	D	S	U	U	U	D	S	U	U	U	63.33
1	5 ms	D	S	U	U	D	D	S	U	U	D	43.33
2	5 ms	D	S	U	D	D	D	S	U	D	D	23.33
3	10 ms	D	S	U	U	U	D	D	D	D	D	31.67
4	10 ms	D	S	U	U	D	D	D	D	D	D	21.67
5	10 ms	D	S	U	D	D	D	D	D	D	D	11.67
6	5 ms	D	S	U	U	U	D	S	U	U	D	53.33

Example for calculated Duty Cycle for Uplink-Downlink Configuration 0:
Calculated Duty Cycle = (5120 x (1/(15000 x 2048)) x 2 + 0.006)/0.01 = 63.33 %
Where
Ts = 1/(15000 x 2048) seconds
HPUE:
Calculated Duty Cycle for Uplink-Downlink Configuration 1:
Calculated Duty Cycle =5120*(1/(15000*2048))*2+0.004)/0.01 = 43.33 %

13.3 SAR Measurement Conditions for NR

<5G NR Information>

Band	SCS (kHz)	Bandwidth (MHz)	Duty Cycle (%)
n2	15	20,15,10,5	100
n5	15	20,15,10,5	100
n12	15	15,10,5	100
n14	15	10,5	100
n25	15	40,30,25,20,15,10,5	100
n30	15	10,5	100
n41	30	100,90,80,70,60,50,40,30,20	100
n48	30	40,20,15,10,5	100
n66	15	40,30,20,15,10,5	100
n70	15	15,10,5	100
n71	15	20,15,10,5	100
n77	30	100,90,80,70,60,50,40,30,20,15,10	100

<EN-DC Configuration>

n2	LTE B5/12/30/66
n5	LTE B2/12/13/30/48/66
n25	LTE B12/48/66
n30	LTE B2/5/12/66
n41	LTE B2/66
n66	LTE B2/5/12/13/30/48
n71	LTE B2/66
n77	LTE B2/5/12/13/66

13.3.1 5G NR test procedure

For 5G NR test procedure was following step similar FCC KDB 941225 D05:

A. For DFT-OFDM and CP-OFDM output power measurement reduction, according to 3GPP 38.101 maximum power reduction for power class 3, the CP-OFDM mode will not higher than DFT-OFDM mode, therefore, similar FCC KDB 941225 D05 procedure for other modulation output power for each RB allocation configuration is > not ½ dB higher than the same configuration in DFT-QPSK and the reported SAR for the DFT-QPSK configuration is ≤ 1.45 W/kg; CP-OFDM testing is not required.

B. For DFT-OFDM output power measurement reduction, according to 38.101 maximum power reduction for power class 3, for PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will spot check largest channel bandwidth worst RB configuration to ensure the PI/2 BPSK/16QAM/64QMA/256QAM and smaller bandwidth output power will not ½ dB higher than the same configuration in the largest supported bandwidth.

C. SAR testing start with the largest SCS and 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.

D. 50% RB allocation for QPSK SAR testing follows 1RB QPSK allocation procedure.

E. 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 are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel; and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

F. PI/2 BPSK/16QAM/64QAM/256QAM output powers according to 3GPP MPR will not ½ dB higher than the same configuration in QPSK, also reported SAR for the QPSK configuration is less than 1.45 W/kg, PI/2 BPSK/16QAM/64QAM/256QAM SAR testing are not required.

G. Smaller SCS/bandwidth output power for each RB allocation configuration for this device will not ½ dB higher than the same configuration in the largest supported bandwidth, and the reported SAR for the largest supported bandwidth is ≤ 1.45 W/kg, smaller bandwidth SAR testing is not required for this device.

H. MPR

MPR is permanently implemented for this device by the manufacturer. The specific manufacturer target MPR is indicated alongside the SAR results. MPR is enabled for this device, according to 3GPP TS 38.101-1 Section 6.2.2 under Table 6.2.2 -1.

Modulation		MPR (dB)		
		Edge RB allocations	Outer RB allocations	Inner RB allocations
DFT-s-OFDM	PI/2 BPSK	≤ 3.5[1]	≤ 1.2[1]	≤ 0.2[1]
		≤ 0.5[2]	≤ 0.5[2]	0[2]
	QPSK	≤ 1		0
	16 QAM	≤ 2		≤ 1
	64 QAM	≤ 2.5		
	256 QAM	≤ 4.5		
CP-OFDM	QPSK	≤ 3		≤ 1.5
	16 QAM	≤ 3		≤ 2
	64 QAM	≤ 3.5		
	256 QAM	≤ 6.5		

NOTE 1: Applicable for UE operating in TDD mode with Pi/2 BPSK modulation and UE indicates support for UE capability powerBoosting-pi2BPSK and if the IE powerBoostPi2BPSK is set to 1 and 40 % or less slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79. The reference power of 0 dB MPR is 26dBm.

NOTE 2: Applicable for UE operating in FDD mode, or in TDD mode in bands other than n40, n41, n77, n78 and n79 with Pi/2 BPSK modulation and if the IE powerBoostPi2BPSK is set to 0 and if more than 40 % of slots in radio frame are used for UL transmission for bands n40, n41, n77, n78 and n79.

I. For 5G NR test, using FTM (Factory Test Mode) to perform SAR with default 100% transmission.

J. For 5G NR SAR Test as below:

For 5G NR NSA mode with the same UL EN_DC combination but different DL EN_DC combinations, e.g.: EN_DC configuration: UL DC_5A_n4 (UL two bands) with DL DC_5C_n4 (DL two bands):

a) The UL EN_DC configuration, including the Tx antenna configuration, RF path, the channel bandwidth and other operating parameters are the same.

b) The maximum output power, including tolerance, for the UL EN_DC configuration with DL two or more bands must be ≤ the same UL EN_DC configuration with DL two bands only to qualify for the SAR test exclusion.

K. For EN_DC SAR, as the existing SAR test system cannot test the multiple different frequency bands simultaneous Transmission SAR at the same time, we suggest that the conservative “max + max” multi-Tx and SAR scaling method can be used to evaluate the inter-band Uplink EN_DC SAR from standalone SAR test results of each LTE and NR EN_DC component band and the conservative “max + max” multi-Tx method to combine the scaled SAR value from each EN_DC component band as the inter-band Uplink EN_DC SAR. All Simultaneous Transmission Scenarios will be evaluated independently in the final SAR report.

L. For this device, 5G NR n41/77 SA mode support UL 2*2 MIMO and 5G NR NSA mode does not support UL 2*2 MIMO. For the MIMO SAR, each antenna SAR will be evaluated independently. Then the conservative “max + max” multi-Tx method should be used to combine the scaled SAR value of each antenna as the UL 2*2 MIMO SAR.

14 Conducted Power

14.1 Conducted Power of LTE

Detail output power measurement refer to appendix E.

14.1.1 Conducted Power of LTE CA

The device supports downlink and intra-band contiguous uplink LTE Carrier Aggregation (CA). When carrier aggregation applies, implementation and measurement details for the following are necessary.
a) Intra-band carrier aggregation requirements for uplink.
b) Intra-band and inter-band carrier aggregation requirements for downlink
c) The device supports Inter-band uplink LTE CA for CA_12A-66A, CA_13A-66A, CA_2A-12A, CA_2A-13A, CA_4A-13A,with two component carriers in the uplink.

The possible downlink and uplink LTE CA combinations supported by this device are as below tables per 3GPP TS 36.101. The conducted power measurement results of downlink and uplink LTE CA are provided in Section 8 of this report per 3GPP TS 36.521-1. The downlink LTE CA SAR test is not required since the maximum output power for downlink LTE CA was not more than 0.25dB higher than the maximum output power for without downlink LTE CA.

SAR test procedure for intra-band contiguous UL LTE CA is as below:
1) Maximum output power is measured for each UL CA configuration for the required test channels described in KDB 941225 D05
- UL PCC configuration is determined by the required test channel
- SCC and subsequent CCs are added alternatively to either side of the PCC or within the transmission band for channels at the ends of a frequency band.
2) SAR for UL CA is required in each exposure condition and frequency band combination.
3) For this device, as the maximum output for Intra-band uplink LTE CA is ≤ standalone LTE mode (without CA),
- PCC is configured according to the highest standalone SAR configuration tested.
- SCC and subsequent CCs are configured according to procedures used for power measurement and parameters (BW, RB etc.) like that used for the PCC
4) When the reported SAR for UL CA configuration, described above, is > 1.2 W/kg, UL CA SAR is also required for all required test channels (PCC based)
5) UL CA SAR is also required for standalone SAR configurations > 1.2 W/kg when they are scaled to the UL CA power level.

Intra-band contiguous CA operating bands：

E-UTRA CA Band	E-UTRA Band	Uplink (UL) operating band BS receive / UE transmit F_{UL_low} – F_{UL_high}			Downlink (DL) operating band BS transmit / UE receive F_{DL_low} – F_{DL_high}			Duplex Mode
CA_41C	41	2496 MHz	–	2690 MHz	2496 MHz	–	2690 MHz	TDD

The power of the Intra-band CA is as follows:

Class3

Combination	Modulation	PCC						SCC					Sensor off		Sensor on	
		Band	BW (MHz)	UL Channel	UL# RB	UL RB Offset	DL Channel	Band	BW (MHz)	UL Channel	UL# RB	UL RB Offset	Power	tune-up(dBm)	Power	tune-up(dBm)
CA_41C	QPSK	41	20	39750	1	99	39750	41	20	39948	1	0	23.32	24.50	19.53	20.50
CA_41C	QPSK	41	20	40185	1	99	40185	41	20	40383	1	0	23.40	24.50	19.54	20.50
CA_41C	QPSK	41	20	40620	1	99	40620	41	20	40818	1	0	23.68	24.50	19.62	20.50
CA_41C	QPSK	41	20	41055	1	99	41055	41	20	41253	1	0	23.52	24.50	19.61	20.50
CA_41C	QPSK	41	20	41490	1	0	41490	41	20	41292	1	99	23.65	24.50	19.68	20.50

Class2

Combination	Modulation	PCC						SCC					Sensor off		Sensor on	
		Band	BW (MHz)	UL Channel	UL# RB	UL RB Offset	DL Channel	Band	BW (MHz)	UL Channel	UL# RB	UL RB Offset	Power	tune-up(dBm)	Power	tune-up(dBm)
CA_41C	QPSK	41	20	39750	1	99	39750	41	20	39948	1	0	25.47	26.50	19.55	20.50
CA_41C	QPSK	41	20	40185	1	99	40185	41	20	40383	1	0	25.41	26.50	19.56	20.50
CA_41C	QPSK	41	20	40620	1	99	40620	41	20	40818	1	0	25.48	26.50	19.72	20.50
CA_41C	QPSK	41	20	41055	1	99	41055	41	20	41253	1	0	25.45	26.50	19.66	20.50
CA_41C	QPSK	41	20	41490	1	0	41490	41	20	41292	1	99	25.55	26.50	19.71	20.50

The possible downlink LTE CA combinations supported by this device are as below tables. The following conducted power measurement results of downlink LTE carrier aggregation are provided to quantify downlink only carrier aggregation SAR test exclusion per KDB 941225 D05A.Uplink maximum output power is measured with downlink carrier aggregation active, using the channel with highest measured maximum output power when downlink carrier aggregation is inactive, to confirm that when downlink carrier aggregation is active uplink maximum output power remains within the specified tune-up tolerance limits and not more than ¼ dB higher than the maximum output power measured when downlink carrier aggregation inactive, therefore SAR evaluation with downlink carrier aggregation can be excluded.

DL CA as below:

Number	2CC Combination
1	CA_2A-4A
2	CA_2A-5A
3	CA_2A-66A
4	CA_2A-71A
5	CA_2C
6	CA_30A-66A
7	CA_41A-41A
8	CA_41C
9	CA_46A-66A
10	CA_48A-48A
11	CA_48A-66A
12	CA_48C
13	CA_4A_12A
14	CA_4A_13A
15	CA_4A_29A
16	CA_4A_30A
17	CA_4A_66A
18	CA_4A_48A
19	CA_4A_4A
20	CA_4A_5A
21	CA_4A_71A
22	CA_5A_13A
23	CA_5A_30A
24	CA_5A_5A
25	CA_5A_66A
26	CA_66A_66A
27	CA_66A_71A
28	CA_66B
29	CA_66C
30	CA_2A-48A
31	CA_14A-30A
32	CA_14A-66A
33	CA_2A-14A

DL CA Combination	PCC							SCC				Sensor off(dBm)			Sensor on(dBm)		
	LTE Band	BW (MHz)	Modulation	UL Channel	UL Freq. (MHz)	UL# RB	UL RB Offset	LTE Band	BW (MHz)	DL Channel	DL Freq. (MHz)	With CA Tx.Power (dBm)	Without CA Tx.Power (dBm)	Tune-up	With CA Tx.Power (dBm)	Without CA Tx.Power (dBm)	Tune-up
CA_2A-4A	B2	20M	QPSK	18900	1880	1	50	B4	20M	2175	2132.5	22.56	22.61	24.00	16.44	16.52	18.00
	B4	20M	QPSK	20175	1732.5	1	50	B2	20M	900	1960	22.72	22.77	24.50	15.58	15.60	17.00
CA_2A-5A	B2	20M	QPSK	18900	1880	1	50	B5	10M	2525	881.5	22.59	22.61	24.00	16.44	16.52	18.00
	B5	10M	QPSK	20525	836.5	1	25	B2	20M	900	1960	23.16	23.25	24.50	/	/	/
CA_2A-66A	B2	20M	QPSK	18900	1880	1	50	B66	20M	66786	2145	22.49	22.61	24.00	16.42	16.52	18.00
	B66	20M	QPSK	132322	1745	1	50	B2	20M	900	1960	22.77	22.82	24.50	17.55	17.60	19.00
CA_2A-71A	B2	20M	QPSK	18900	1880	1	50	B71	20M	68786	637	22.56	22.61	24.00	16.48	16.52	18.00
	B71	20M	QPSK	133322	683	1	50	B2	20M	900	1960	23.06	23.11	24.50	/	/	/
CA_2C	B2	20M	QPSK	18700	1860	1	50	B2	20M	898	1959.8	22.42	22.44	24.00	16.41	16.47	18.00
CA_30A-66A	B30	10M	QPSK	27710	2310	1	25	B66	20M	66786	2145	21.43	21.45	23.00	17.52	17.60	19.00
	B66	20M	QPSK	132322	1745	1	50	B30	10M	9820	2355	22.79	22.82	24.50	17.49	17.60	19.00
CA_41A-41A	B41	20M	QPSK	39750	2506	1	50	B41	20M	41490	2680	22.80	22.83	24.50	18.88	18.92	20.50
CA_41C	B41	20M	QPSK	39750	2506	1	50	B41	20M	39948	2525.8	22.76	22.83	24.50	18.84	18.92	20.50
CA_46A-66A	B66	20M	QPSK	132322	1745	1	50	B46	20M	50690	5540	22.77	22.82	24.50	17.55	17.60	19.00
CA_48A-48A	B48	20M	QPSK	56640	3690	1	50	B48	20M	55340	3560	21.00	21.05	22.50	14.76	14.82	16.00
CA_48A-66A	B48	20M	QPSK	56640	3690	1	50	B66	20M	66786	2145	21.03	21.05	22.50	17.80	14.82	16.00
	B66	20M	QPSK	132322	1745	1	50	B48	20M	55990	3625	22.81	22.82	24.50	17.56	17.60	19.00
CA_48C	B48	20M	QPSK	56640	3690	1	50	B48	20M	56442	3670.2	21.00	21.05	22.50	14.76	14.82	16.00
CA_4A_12A	B4	20M	QPSK	20175	1732.5	1	50	B12	10M	5095	737.5	22.69	22.77	24.50	15.55	15.60	17.00
	B12	10M	QPSK	23095	707.5	1	25	B4	20M	2175	2132.5	23.40	23.48	24.50	/	/	/
CA_4A_13A	B4	20M	QPSK	20175	1732.5	1	50	B13	10M	5230	751	22.68	22.77	24.50	15.43	15.60	17.00
	B13	10M	QPSK	23230	782	1	25	B4	20M	2175	2132.5	23.35	23.41	24.50	/	/	/
CA_4A_29A	B4	20M	QPSK	20175	1732.5	1	50	B29	10M	9715	722.5	22.70	22.77	24.50	15.52	15.60	17.00
CA_4A_30A	B4	20M	QPSK	20175	1732.5	1	50	B30	10M	9820	2355	22.68	22.77	24.50	15.59	15.60	17.00
	B30	10M	QPSK	27710	2310	1	25	B4	20M	2175	2132.5	21.40	21.45	23.00	17.53	17.60	19.00
CA_4A_66A	B4	20M	QPSK	20175	1732.5	1	50	B66	20M	66786	2145	22.70	22.77	24.50	15.55	15.60	17.00
	B66	20M	QPSK	132322	1745	1	50	B4	20M	2175	2132.5	22.81	22.82	24.50	17.59	17.60	19.00
CA_4A_48A	B4	20M	QPSK	20175	1732.5	1	50	B48	20M	55990	3625	22.66	22.77	24.50	15.48	15.60	17.00
	B48	20M	QPSK	56640	3690	1	50	B4	20M	2175	2132.5	21.03	21.05	22.50	14.73	14.82	16.00
CA_4A_4A	B4	20M	QPSK	20050	1720	1	50	B4	20M	2300	2145	22.65	22.75	24.50	15.44	15.52	17.00
CA_4A_5A	B4	20M	QPSK	20175	1732.5	1	50	B5	10M	2525	881.5	22.63	22.77	24.50	15.53	15.60	17.00
	B5	10M	QPSK	20525	836.5	1	25	B4	20M	2175	2132.5	23.14	23.25	24.50	/	/	/
CA_4A_71A	B4	20M	QPSK	20175	1732.5	1	50	B71	20M	68786	637	22.62	22.77	24.50	15.57	15.60	17.00
	B71	20M	QPSK	133322	683	1	50	B4	20M	2175	2132.5	23.02	23.11	24.50	/	/	/
CA_5A_13A	B5	10M	QPSK	20525	836.5	1	25	B13	10M	5230	751	23.13	23.25	24.50	/	/	/
	B13	10M	QPSK	23230	782	1	25	B5	10M	2525	881.5	23.26	23.41	24.50	/	/	/
CA_5A_30A	B5	10M	QPSK	20525	836.5	1	25	B30	10M	9820	2355	23.15	23.25	24.50	/	/	/
	B30	10M	QPSK	27710	2310	1	25	B5	10M	2525	881.5	21.40	21.45	23.00	17.51	17.60	19.00
CA_5A_5A	B5	10M	QPSK	20600	844	1	25	B5	10M	2450	874	23.03	23.13	24.50	/	/	/
CA_5A_66A	B5	10M	QPSK	20525	836.5	1	25	B66	20M	66786	2145	23.14	23.25	24.50	/	/	/
	B66	20M	QPSK	132322	1745	1	50	B5	10M	2525	881.5	22.77	22.82	24.50	17.49	17.60	19.00
CA_66A_66A	B66	10M	QPSK	132022	1715	1	25	B66	10M	66585	2124.9	22.66	22.76	24.50	17.58	17.63	19.00
CA_66A_71A	B66	20M	QPSK	132322	1745	1	50	B71	20M	68786	637	22.69	22.82	24.50	17.55	17.60	19.00
	B71	20M	QPSK	133322	683	1	50	B66	20M	66786	2145	23.03	23.11	24.50	/	/	/
CA_66B	B66	10M	QPSK	132022	1715	1	25	B66	10M	66585	2124.9	22.71	22.76	24.50	17.56	17.63	19.00
CA_66C	B66	20M	QPSK	132072	1720	1	50	B66	20M	66734	2139.8	22.66	22.79	24.50	17.50	17.58	19.00
CA_2A-48A	B2	20M	QPSK	18900	1880	1	50	B48	20M	55990	3625	22.55	22.61	24.00	16.48	16.52	18.00
	B48	20M	QPSK	56640	3690	1	50	B2	20M	900	1960	21.00	21.05	22.50	14.73	14.82	16.00

Note:
The downlink LTE CA SAR test is not required since the maximum output power for downlink LTE CA was not more than 0.25dB higher than the maximum output power for without downlink LTE CA.

14.2 Conducted Power of 5G NR

Detail output power measurement refer to appendix E.

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:

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

15.1 SAR Measurement Result of LTE Band 2

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	20	QPSK 1_50	18900/1880	0.343	0.203	16.52	18.00	1.406	0.482
Back side	20	QPSK 1_50	18900/1880	0.358	0.188	16.52	18.00	1.406	0.503
Right side	20	QPSK 1_50	18900/1880	0.242	0.144	16.52	18.00	1.406	0.340
Body 5mm(50%RB) Sensor On									
Front side	20	QPSK 50_25	18900/1880	0.324	0.184	16.53	18.00	1.403	0.455
Back side	20	QPSK 50_25	18900/1880	0.332	0.184	16.53	18.00	1.403	0.466
Right side	20	QPSK 50_25	18900/1880	0.168	0.100	16.53	18.00	1.403	0.236
Body (1RB) Sensor Off									
Front side 19mm	20	QPSK 1_50	18900/1880	0.505	0.314	22.61	24.00	1.377	0.695
Back side 19mm	20	QPSK 1_50	18900/1880	0.204	0.123	22.61	24.00	1.377	0.281
Left side 5mm	20	QPSK 1_50	18900/1880	0.200	0.117	22.61	24.00	1.377	0.275
Right side 19mm	20	QPSK 1_50	18900/1880	0.254	0.156	22.61	24.00	1.377	0.350
Top side 5mm	20	QPSK 1_50	18900/1880	0.160	0.099	22.61	24.00	1.377	0.220
Front side 19mm	20	QPSK 1_50	18700/1860	0.463	0.288	22.44	24.00	1.432	0.663
Front side 19mm	20	QPSK 1_50	19100/1900	0.540	0.332	22.41	24.00	1.442	**0.779**
Body (50%RB) Sensor Off									
Front side 19mm	20	QPSK 50_25	18900/1880	0.405	0.253	21.59	23.00	1.384	0.560
Back side 19mm	20	QPSK 50_25	18900/1880	0.161	0.096	21.59	23.00	1.384	0.223
Left side 5mm	20	QPSK 50_25	18900/1880	0.158	0.092	21.59	23.00	1.384	0.219
Right side 19mm	20	QPSK 50_25	18900/1880	0.201	0.123	21.59	23.00	1.384	0.278
Top side 5mm	20	QPSK 50_25	18900/1880	0.158	0.096	21.59	23.00	1.384	0.219

Table 3： SAR of LTE Band 2.

15.2 SAR Measurement Result of LTE Band 5

Ant 3 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB)									
Front side	10	QPSK 1_25	20525/836.5	0.528	0.300	23.25	24.50	1.334	**0.704**
Back side	10	QPSK 1_25	20525/836.5	0.262	0.186	23.25	24.50	1.334	0.349
Left side	10	QPSK 1_25	20525/836.5	0.234	0.144	23.25	24.50	1.334	0.312
Right side	10	QPSK 1_25	20525/836.5	0.098	0.069	23.25	24.50	1.334	0.131
Top side	10	QPSK 1_25	20525/836.5	0.207	0.136	23.25	24.50	1.334	0.276
Body 5mm (50%RB)									
Front side	10	QPSK 25_13	20525/836.5	0.414	0.237	22.25	23.50	1.334	0.552
Back side	10	QPSK 25_13	20525/836.5	0.206	0.147	22.25	23.50	1.334	0.275
Left side	10	QPSK 25_13	20525/836.5	0.185	0.114	22.25	23.50	1.334	0.247
Right side	10	QPSK 25_13	20525/836.5	0.085	0.057	22.25	23.50	1.334	0.113
Top side	10	QPSK 25_13	20525/836.5	0.156	0.104	22.25	23.50	1.334	0.208

Table 4： SAR of LTE Band 5.

15.3 SAR Measurement Result of LTE Band 12

Ant 3 Test Results									
Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm (1RB)									
Front side	10	QPSK 1_25	23095/707.5	0.505	0.321	23.48	24.50	1.265	0.639
Back side	10	QPSK 1_25	23095/707.5	0.527	0.357	23.48	24.50	1.265	**0.667**
Left side	10	QPSK 1_25	23095/707.5	0.506	0.333	23.48	24.50	1.265	0.640
Right side	10	QPSK 1_25	23095/707.5	0.187	0.125	23.48	24.50	1.265	0.237
Top side	10	QPSK 1_25	23095/707.5	0.365	0.211	23.48	24.50	1.265	0.462
Body 5mm (50%RB)									
Front side	10	QPSK 25_13	23095/707.5	0.434	0.283	22.34	23.50	1.306	0.567
Back side	10	QPSK 25_13	23095/707.5	0.429	0.294	22.34	23.50	1.306	0.560
Left side	10	QPSK 25_13	23095/707.5	0.388	0.254	22.34	23.50	1.306	0.507
Right side	10	QPSK 25_13	23095/707.5	0.142	0.095	22.34	23.50	1.306	0.185
Top side	10	QPSK 25_13	23095/707.5	0.282	0.165	22.34	23.50	1.306	0.368

Table 5： SAR of LTE Band 12.

15.4 SAR Measurement Result of LTE Band 13

Ant 3 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB)									
Front side	10	QPSK 1_25	23230/782	0.547	0.333	23.41	24.50	1.285	**0.703**
Back side	10	QPSK 1_25	23230/782	0.402	0.277	23.41	24.50	1.285	0.517
Left side	10	QPSK 1_25	23230/782	0.350	0.233	23.41	24.50	1.285	0.450
Right side	10	QPSK 1_25	23230/782	0.131	0.090	23.41	24.50	1.285	0.168
Top side	10	QPSK 1_25	23230/782	0.288	0.187	23.41	24.50	1.285	0.370
Body 5mm (50%RB)									
Front side	10	QPSK 25_13	23230/782	0.400	0.261	22.23	23.50	1.340	0.536
Back side	10	QPSK 25_13	23230/782	0.331	0.224	22.23	23.50	1.340	0.443
Left side	10	QPSK 25_13	23230/782	0.269	0.179	22.23	23.50	1.340	0.360
Right side	10	QPSK 25_13	23230/782	0.107	0.071	22.23	23.50	1.340	0.143
Top side	10	QPSK 25_13	23230/782	0.232	0.149	22.23	23.50	1.340	0.311

Table 6： SAR of LTE Band 13.

15.5 SAR Measurement Result of LTE Band 30

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	10	QPSK 1_25	27710/2310	0.231	0.120	17.60	19.00	1.380	0.319
Back side	10	QPSK 1_25	27710/2310	0.383	0.188	17.60	19.00	1.380	**0.529**
Right side	10	QPSK 1_25	27710/2310	0.196	0.108	17.60	19.00	1.380	0.271
Body 5mm(50%RB) Sensor On									
Front side	10	QPSK 25_13	27710/2310	0.229	0.118	17.44	19.00	1.432	0.328
Back side	10	QPSK 25_13	27710/2310	0.367	0.182	17.44	19.00	1.432	0.526
Right side	10	QPSK 25_13	27710/2310	0.192	0.106	17.44	19.00	1.432	0.275
Body (1RB) Sensor Off									
Front side 19mm	10	QPSK 1_25	27710/2310	0.144	0.083	21.45	23.00	1.429	0.206
Back side 19mm	10	QPSK 1_25	27710/2310	0.119	0.062	21.45	23.00	1.429	0.170
Left side 5mm	10	QPSK 1_25	27710/2310	0.056	0.025	21.45	23.00	1.429	0.080
Right side 19mm	10	QPSK 1_25	27710/2310	0.130	0.075	21.45	23.00	1.429	0.186
Top side 5mm	10	QPSK 1_25	27710/2310	0.067	0.035	21.45	23.00	1.429	0.096
Body (50%RB) Sensor Off									
Front side 19mm	10	QPSK 25_13	27710/2310	0.113	0.066	20.35	22.00	1.462	0.165
Back side 19mm	10	QPSK 25_13	27710/2310	0.092	0.052	20.35	22.00	1.462	0.135
Left side 5mm	10	QPSK 25_13	27710/2310	0.055	0.023	20.35	22.00	1.462	0.080
Right side 19mm	10	QPSK 25_13	27710/2310	0.104	0.061	20.35	22.00	1.462	0.152
Top side 5mm	10	QPSK 25_13	27710/2310	0.066	0.031	20.35	22.00	1.462	0.097

Table 7： SAR of LTE Band 30.

15.6 SAR Measurement Result of LTE Band 41

Ant 0 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	20	QPSK 1_50	1:1.58	40620/2593	0.287	0.155	19.03	20.50	1.403	0.403
Back side	20	QPSK 1_50	1:1.58	40620/2593	0.420	0.209	19.03	20.50	1.403	**0.589**
Back side class2	20	QPSK 1_50	1:2.31	40620/2593	0.352	0.182	19.60	20.50	1.230	0.433
Back side	20	PCC 1_99	1:1.58	40620/2593	0.412	0.206	19.62	20.50	1.225	0.505
		SCC 1_0	1:1.58	40818/2612.8						
Right side	20	QPSK 1_50	1:1.58	40620/2593	0.312	0.148	19.03	20.50	1.403	0.438
Body 5mm(50%RB) Sensor On										
Front side	20	QPSK 50_25	1:1.58	40620/2593	0.288	0.156	18.96	20.50	1.426	0.411
Back side	20	QPSK 50_25	1:1.58	40620/2593	0.412	0.136	18.96	20.50	1.426	0.587
Right side	20	QPSK 50_25	1:1.58	40620/2593	0.309	0.148	18.96	20.50	1.426	0.441
Body(1RB) Sensor Off										
Front side 19mm	20	QPSK 1_50	1:1.58	40620/2593	0.221	0.125	23.05	24.50	1.396	0.309
Back side 19mm	20	QPSK 1_50	1:1.58	40620/2593	0.178	0.099	23.05	24.50	1.396	0.249
Left side 5mm	20	QPSK 1_50	1:1.58	40620/2593	0.123	0.065	23.05	24.50	1.396	0.172
Right side 19mm	20	QPSK 1_50	1:1.58	40620/2593	0.203	0.114	23.05	24.50	1.396	0.283
Top side 5mm	20	QPSK 1_50	1:1.58	40620/2593	0.097	0.052	23.05	24.50	1.396	0.135
Body(50%RB) Sensor Off										
Front side 19mm	20	QPSK 50_25	1:1.58	40620/2593	0.179	0.101	22.03	23.50	1.403	0.251
Back side 19mm	20	QPSK 50_25	1:1.58	40620/2593	0.144	0.080	22.03	23.50	1.403	0.202
Left side 5mm	20	QPSK 50_25	1:1.58	40620/2593	0.099	0.052	22.03	23.50	1.403	0.139
Right side 19mm	20	QPSK 50_25	1:1.58	40620/2593	0.163	0.092	22.03	23.50	1.403	0.229
Top side 5mm	20	QPSK 50_25	1:1.58	40620/2593	0.080	0.043	22.03	23.50	1.403	0.112

Table 8： SAR of LTE Band 41.

LTE Band 41 Power Class 2 and Power Class 3 Linearity:
This device supports Power Class 2 and Power Class 3 operations for LTE Band 41. The highest available duty cycle for Power Class 2 operations is 43.3 % using UL-DL configuration 1. Per May 2017 TCB Workshop Notes based on the device behavior, all SAR tests were performed using Power Class 3. SAR with Power Class 2 at the highest power and available duty factor was additionally performed for the Power Class 3 configuration with the highest SAR for each exposure condition. The linearity between the Power Class 2 and Power Class 3 SAR results and the respective frame averaged powers was calculated to determine that the results were linear.

Per May 2017 TCB Workshop, no additional SAR measurements were required since the linearity between power classes was < 10% and all reported SAR values were < 1.4 W/kg for 1g and < 3.5 W/kg for 10g.

LTE Band 41 SAR testing with power class 2 at the highest power and available duty factor was additionally performed for the power class 3 configuration with the highest SAR for each exposure condition.
LTE Band 41 Linearity Data:

	Power Class 3	Power Class 2
Tune-up(dBm)	20.50	20.50
Measured power(dBm)	19.03	19.60
Measured SAR(W/kg)	0.420	0.352
Measured power(mw)	79.98	91.20
Duty Cycle	63.3%	43.3%
Frame Average power(mw)	50.63	39.49
% deviation from expected linearity		7.45%

15.7 SAR Measurement Result of LTE Band 48

Ant 0 Test Results										
Test position	**BW. (MHz)**	**Mode**	**Duty Cycle**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm(1RB) Sensor On										
Front side	20	QPSK 1_50	1:1.58	56640/3690	0.265	0.097	14.82	16.00	1.312	0.348
Back side	20	QPSK 1_50	1:1.58	56640/3690	0.033	0.016	14.82	16.00	1.312	0.043
Right side	20	QPSK 1_50	1:1.58	56640/3690	0.315	0.109	14.82	16.00	1.312	0.413
Body 5mm(50%RB) Sensor On										
Front side	20	QPSK 50_25	1:1.58	56640/3690	0.270	0.098	14.50	16.00	1.413	0.381
Back side	20	QPSK 50_25	1:1.58	56640/3690	0.037	0.017	14.50	16.00	1.413	0.052
Right side	20	QPSK 50_25	1:1.58	56640/3690	0.317	0.111	14.50	16.00	1.413	0.448
Body(1RB) Sensor Off										
Front side 19mm	20	QPSK 1_50	1:1.58	56640/3690	0.346	0.166	21.05	22.50	1.396	**0.483**
Back side 19mm	20	QPSK 1_50	1:1.58	56640/3690	0.060	0.030	21.05	22.50	1.396	0.084
Left side 5mm	20	QPSK 1_50	1:1.58	56640/3690	0.042	0.018	21.05	22.50	1.396	0.059
Right side 19mm	20	QPSK 1_50	1:1.58	56640/3690	0.247	0.114	21.05	22.50	1.396	0.345
Top side 5mm	20	QPSK 1_50	1:1.58	56640/3690	0.047	0.022	21.05	22.50	1.396	0.066
Body(50%RB) Sensor Off										
Front side 19mm	20	QPSK 50_25	1:1.58	56640/3690	0.262	0.129	20.10	21.50	1.380	0.362
Back side 19mm	20	QPSK 50_25	1:1.58	56640/3690	0.049	0.024	20.10	21.50	1.380	0.068
Left side 5mm	20	QPSK 50_25	1:1.58	56640/3690	0.036	0.014	20.10	21.50	1.380	0.050
Right side 19mm	20	QPSK 50_25	1:1.58	56640/3690	0.202	0.094	20.10	21.50	1.380	0.279
Top side 5mm	20	QPSK 50_25	1:1.58	56640/3690	0.033	0.016	20.10	21.50	1.380	0.046

Table 9： SAR of LTE Band 48.

15.8 SAR Measurement Result of LTE Band 66

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	20	QPSK 1_50	132322/1745	0.492	0.300	17.60	19.00	1.380	**0.679**
Back side	20	QPSK 1_50	132322/1745	0.484	0.261	17.60	19.00	1.380	0.668
Right side	20	QPSK 1_50	132322/1745	0.285	0.160	17.60	19.00	1.380	0.393
Body 5mm (50%RB) Sensor On									
Front side	20	QPSK 50_25	132322/1745	0.478	0.291	17.54	19.00	1.400	0.669
Back side	20	QPSK 50_25	132322/1745	0.468	0.251	17.54	19.00	1.400	0.655
Right side	20	QPSK 50_25	132322/1745	0.242	0.144	17.54	19.00	1.400	0.339
Body (1RB) Sensor Off									
Front side 19mm	20	QPSK 1_50	132322/1745	0.458	0.293	22.82	23.00	1.042	0.477
Back side 19mm	20	QPSK 1_50	132322/1745	0.277	0.174	22.82	23.00	1.042	0.289
Left side 5mm	20	QPSK 1_50	132322/1745	0.239	0.143	22.82	23.00	1.042	0.249
Right side 19mm	20	QPSK 1_50	132322/1745	0.226	0.141	22.82	23.00	1.042	0.236
Top side 5mm	20	QPSK 1_50	132322/1745	0.204	0.126	22.82	23.00	1.042	0.213
Body(50%RB) Sensor Off									
Front side 19mm	20	QPSK 50_25	132322/1745	0.338	0.210	21.73	22.00	1.064	0.360
Back side 19mm	20	QPSK 50_25	132322/1745	0.212	0.133	21.73	22.00	1.064	0.226
Left side 5mm	20	QPSK 50_25	132322/1745	0.188	0.111	21.73	22.00	1.064	0.200
Right side 19mm	20	QPSK 50_25	132322/1745	0.173	0.108	21.73	22.00	1.064	0.184
Top side 5mm	20	QPSK 50_25	132322/1745	0.160	0.099	21.73	22.00	1.064	0.170

Table 10：SAR of LTE Band 66.

15.9 SAR Measurement Result of LTE Band 71

Ant 3 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB)									
Front side	20	QPSK 1_50	133322/683	0.524	0.309	23.11	24.50	1.377	**0.722**
Back side	20	QPSK 1_50	133322/683	0.514	0.349	23.11	24.50	1.377	0.708
Left side	20	QPSK 1_50	133322/683	0.368	0.243	23.11	24.50	1.377	0.507
Right side	20	QPSK 1_50	133322/683	0.249	0.167	23.11	24.50	1.377	0.343
Top side	20	QPSK 1_50	133322/683	0.296	0.146	23.11	24.50	1.377	0.408
Body 5mm (50%RB)									
Front side	20	QPSK 50_25	133322/683	0.480	0.265	22.10	23.50	1.380	0.663
Back side	20	QPSK 50_25	133322/683	0.417	0.290	22.10	23.50	1.380	0.576
Left side	20	QPSK 50_25	133322/683	0.320	0.203	22.10	23.50	1.380	0.442
Right side	20	QPSK 50_25	133322/683	0.192	0.128	22.10	23.50	1.380	0.265
Top side	20	QPSK 50_25	133322/683	0.229	0.114	22.10	23.50	1.380	0.316

Table 11：SAR of LTE Band 71.

15.10 SAR Measurement Result of 5G NR n2

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	20	QPSK 1_53	376000/1880	0.475	0.282	17.98	19.50	1.419	0.674
Back side	20	QPSK 1_53	376000/1880	0.541	0.256	17.98	19.50	1.419	**0.768**
Right side	20	QPSK 1_53	376000/1880	0.249	0.144	17.98	19.50	1.419	0.353
Body 5mm (50%RB) Sensor On									
Front side	20	QPSK 50_28	376000/1880	0.432	0.253	17.65	19.50	1.531	0.661
Back side	20	QPSK 50_28	376000/1880	0.447	0.246	17.65	19.50	1.531	0.684
Right side	20	QPSK 50_28	376000/1880	0.248	0.144	17.65	19.50	1.531	0.380
Body (1RB) Sensor Off									
Front side 19mm	20	QPSK 1_53	376000/1880	0.522	0.326	23.12	24.50	1.374	0.717
Back side 19mm	20	QPSK 1_53	376000/1880	0.224	0.131	23.12	24.50	1.374	0.308
Left side 5mm	20	QPSK 1_53	376000/1880	0.174	0.103	23.12	24.50	1.374	0.239
Right side 19mm	20	QPSK 1_53	376000/1880	0.269	0.165	23.12	24.50	1.374	0.370
Top side 5mm	20	QPSK 1_53	376000/1880	0.192	0.160	23.12	24.50	1.374	0.264
Body (50%RB) Sensor Off									
Front side 19mm	20	QPSK 50_28	376000/1880	0.480	0.290	23.00	24.50	1.413	0.678
Back side 19mm	20	QPSK 50_28	376000/1880	0.168	0.102	23.00	24.50	1.413	0.237
Left side 5mm	20	QPSK 50_28	376000/1880	0.149	0.088	23.00	24.50	1.413	0.210
Right side 19mm	20	QPSK 50_28	376000/1880	0.241	0.148	23.00	24.50	1.413	0.340
Top side 5mm	20	QPSK 50_28	376000/1880	0.178	0.110	23.00	24.50	1.413	0.251

Table 12：SAR of 5G NR n2.

15.11 SAR Measurement Result of 5G NR n5

Ant 3 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB)									
Front side	20	QPSK 1_1	167300/836.5	0.538	0.311	23.48	24.50	1.265	**0.680**
Back side	20	QPSK 1_1	167300/836.5	0.305	0.217	23.48	24.50	1.265	0.386
Left side	20	QPSK 1_1	167300/836.5	0.219	0.149	23.48	24.50	1.265	0.277
Right side	20	QPSK 1_1	167300/836.5	0.083	0.058	23.48	24.50	1.265	0.105
Top side	20	QPSK 1_1	167300/836.5	0.157	0.105	23.48	24.50	1.265	0.199
Body 5mm (50%RB)									
Front side	20	QPSK 50_28	167300/836.5	0.352	0.223	23.40	24.50	1.288	0.453
Back side	20	QPSK 50_28	167300/836.5	0.209	0.143	23.40	24.50	1.288	0.269
Left side	20	QPSK 50_28	167300/836.5	0.179	0.118	23.40	24.50	1.288	0.231
Right side	20	QPSK 50_28	167300/836.5	0.065	0.045	23.40	24.50	1.288	0.084
Top side	20	QPSK 50_28	167300/836.5	0.300	0.087	23.40	24.50	1.288	0.386

Table 13：SAR of 5G NR n5.

15.12 SAR Measurement Result of 5G NR n12

Ant 3 Test Results									
Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm (1RB)									
Front side	15	QPSK 1_40	141500/707.5	0.556	0.355	23.48	24.50	1.265	0.703
Back side	15	QPSK 1_40	141500/707.5	0.552	0.376	23.48	24.50	1.265	0.698
Left side	15	QPSK 1_40	141500/707.5	0.482	0.318	23.48	24.50	1.265	0.610
Right side	15	QPSK 1_40	141500/707.5	0.187	0.128	23.48	24.50	1.265	0.237
Top side	15	QPSK 1_40	141500/707.5	0.371	0.209	23.48	24.50	1.265	0.469
Body 5mm (50%RB)									
Front side	15	QPSK 36_22	141500/707.5	0.551	0.339	23.41	24.50	1.285	**0.708**
Back side	15	QPSK 36_22	141500/707.5	0.547	0.372	23.41	24.50	1.285	0.703
Left side	15	QPSK 36_22	141500/707.5	0.456	0.301	23.41	24.50	1.285	0.586
Right side	15	QPSK 36_22	141500/707.5	0.189	0.128	23.41	24.50	1.285	0.243
Top side	15	QPSK 36_22	141500/707.5	0.379	0.214	23.41	24.50	1.285	0.487

Table 14：SAR of 5G NR n12.

15.13 SAR Measurement Result of 5G NR n14

Ant 3 Test Results									
Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm (1RB)									
Front side	10	QPSK 1_1	158600/793	0.601	0.362	23.68	24.50	1.208	**0.726**
Back side	10	QPSK 1_1	158600/793	0.419	0.287	23.68	24.50	1.208	0.506
Left side	10	QPSK 1_1	158600/793	0.326	0.223	23.68	24.50	1.208	0.394
Right side	10	QPSK 1_1	158600/793	0.154	0.106	23.68	24.50	1.208	0.186
Top side	10	QPSK 1_1	158600/793	0.231	0.152	23.68	24.50	1.208	0.279
Body 5mm (50%RB)									
Front side	10	QPSK 25_14	158600/793	0.520	0.335	23.42	24.50	1.282	0.667
Back side	10	QPSK 25_14	158600/793	0.341	0.233	23.42	24.50	1.282	0.437
Left side	10	QPSK 25_14	158600/793	0.287	0.195	23.42	24.50	1.282	0.368
Right side	10	QPSK 25_14	158600/793	0.136	0.094	23.42	24.50	1.282	0.174
Top side	10	QPSK 25_14	158600/793	0.218	0.144	23.42	24.50	1.282	0.280

Table 15：SAR of 5G NR n14.

15.14 SAR Measurement Result of 5G NR n25

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	40	QPSK 1_1	376500/1882.5	0.350	0.207	16.80	18.50	1.479	0.518
Back side	40	QPSK 1_1	376500/1882.5	0.399	0.209	16.80	18.50	1.479	0.590
Right side	40	QPSK 1_1	376500/1882.5	0.191	0.111	16.80	18.50	1.479	0.283
Body 5mm (50%RB) Sensor On									
Front side	40	QPSK 108_54	376500/1882.5	0.343	0.199	16.78	18.50	1.486	0.510
Back side	40	QPSK 108_54	376500/1882.5	0.367	0.201	16.78	18.50	1.486	0.545
Right side	40	QPSK 108_54	376500/1882.5	0.190	0.110	16.78	18.50	1.486	0.282
Body (1RB) Sensor Off									
Front side 19mm	40	QPSK 1_1	376500/1882.5	0.512	0.319	22.95	24.50	1.429	**0.732**
Back side 19mm	40	QPSK 1_1	376500/1882.5	0.223	0.132	22.95	24.50	1.429	0.319
Left side 5mm	40	QPSK 1_1	376500/1882.5	0.169	0.101	22.95	24.50	1.429	0.241
Right side 19mm	40	QPSK 1_1	376500/1882.5	0.274	0.168	22.95	24.50	1.429	0.392
Top side 5mm	40	QPSK 1_1	376500/1882.5	0.188	0.150	22.95	24.50	1.429	0.269
Body (50%RB) Sensor Off									
Front side 19mm	40	QPSK 108_54	376500/1882.5	0.487	0.295	22.88	24.50	1.452	0.707
Back side 19mm	40	QPSK 108_54	376500/1882.5	0.195	0.116	22.88	24.50	1.452	0.283
Left side 5mm	40	QPSK 108_54	376500/1882.5	0.198	0.148	22.88	24.50	1.452	0.288
Right side 19mm	40	QPSK 108_54	376500/1882.5	0.265	0.163	22.88	24.50	1.452	0.385
Top side 5mm	40	QPSK 108_54	376500/1882.5	0.172	0.106	22.88	24.50	1.452	0.250

Table 16：SAR of 5G NR n25.

15.15 SAR Measurement Result of 5G NR n30

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	10	QPSK 1_26	462000/2310	0.488	0.248	19.71	20.50	1.199	0.585
Back side	10	QPSK 1_26	462000/2310	0.645	0.334	19.71	20.50	1.199	**0.774**
Right side	10	QPSK 1_26	462000/2310	0.429	0.216	19.71	20.50	1.199	0.515
Body 5mm(50%RB) Sensor On									
Front side	10	QPSK 25_14	462000/2310	0.531	0.279	19.55	20.50	1.245	0.661
Back side	10	QPSK 25_14	462000/2310	0.606	0.313	19.55	20.50	1.245	0.754
Right side	10	QPSK 25_14	462000/2310	0.416	0.211	19.55	20.50	1.245	0.518
Body (1RB) Sensor Off									
Front side 19mm	10	QPSK 1_26	462000/2310	0.091	0.054	21.94	23.00	1.276	0.116
Back side 19mm	10	QPSK 1_26	462000/2310	0.121	0.069	21.94	23.00	1.276	0.154
Left side 5mm	10	QPSK 1_26	462000/2310	0.043	0.020	21.94	23.00	1.276	0.055
Right side 19mm	10	QPSK 1_26	462000/2310	0.087	0.050	21.94	23.00	1.276	0.111
Top side 5mm	10	QPSK 1_26	462000/2310	0.070	0.037	21.94	23.00	1.276	0.089
Body (50%RB) Sensor Off									
Front side 19mm	10	QPSK 25_14	462000/2310	0.094	0.056	21.92	23.00	1.282	0.121
Back side 19mm	10	QPSK 25_14	462000/2310	0.110	0.063	21.92	23.00	1.282	0.141
Left side 5mm	10	QPSK 25_14	462000/2310	0.037	0.018	21.92	23.00	1.282	0.047
Right side 19mm	10	QPSK 25_14	462000/2310	0.085	0.048	21.92	23.00	1.282	0.109
Top side 5mm	10	QPSK 25_14	462000/2310	0.043	0.020	21.92	23.00	1.282	0.055

Table 17：SAR of 5G NR n30.

15.16 SAR Measurement Result of 5G NR n41

Ant 0 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_137	100%	518598/2592.99	0.400	0.202	17.20	18.50	1.349	0.540
Back side	100	QPSK 1_137	100%	518598/2592.99	0.496	0.244	17.20	18.50	1.349	0.669
Right side	100	QPSK 1_137	100%	518598/2592.99	0.376	0.167	17.20	18.50	1.349	0.507
Back side	100	QPSK 1_137	100%	509202/2546.01	0.324	0.163	17.05	18.50	1.396	0.452
Back side	100	QPSK 1_137	100%	513900/2569.5	0.468	0.233	16.90	18.50	1.445	0.676
Back side	100	QPSK 1_137	100%	523302/2616.51	0.530	0.257	16.92	18.50	1.439	0.763
Back side	100	QPSK 1_137	100%	528000/2640	0.565	0.273	17.15	18.50	1.365	**0.771**
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_69	100%	518598/2592.99	0.303	0.155	17.10	18.50	1.380	0.418
Back side	100	QPSK 135_69	100%	518598/2592.99	0.442	0.222	17.10	18.50	1.380	0.610
Right side	100	QPSK 135_69	100%	518598/2592.99	0.307	0.139	17.10	18.50	1.380	0.424
Back side	100	QPSK 135_69	100%	509202/2546.01	0.269	0.134	17.04	18.50	1.400	0.376
Back side	100	QPSK 135_69	100%	513900/2569.5	0.431	0.213	16.93	18.50	1.435	0.619
Back side	100	QPSK 135_69	100%	523302/2616.51	0.448	0.221	16.66	18.50	1.528	0.684
Back side	100	QPSK 135_69	100%	528000/2640	0.480	0.234	16.86	18.50	1.459	0.700
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.315	0.176	25.80	27.50	1.479	0.466
Back side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.168	0.082	25.80	27.50	1.479	0.248
Left side 5mm	100	QPSK 1_137	100%	518598/2592.99	0.170	0.074	25.80	27.50	1.479	0.251
Right side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.244	0.092	25.80	27.50	1.479	0.361
Top side 5mm	100	QPSK 1_137	100%	518598/2592.99	0.089	0.050	25.80	27.50	1.479	0.132
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.369	0.203	25.65	27.00	1.365	0.504
Back side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.319	0.170	25.65	27.50	1.531	0.488
Left side 5mm	100	QPSK 135_69	100%	518598/2592.99	0.151	0.070	25.65	27.50	1.531	0.231
Right side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.145	0.038	25.65	27.50	1.531	0.222
Top side 5mm	100	QPSK 135_69	100%	518598/2592.99	0.117	0.060	25.65	27.50	1.531	0.179
Ant 3 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_137	100%	518598/2592.99	0.366	0.182	17.40	18.50	1.288	**0.471**
Back side	100	QPSK 1_137	100%	518598/2592.99	0.129	0.069	17.40	18.50	1.288	0.166
Right side	100	QPSK 1_137	100%	518598/2592.99	0.133	0.064	17.40	18.50	1.288	0.171
Top side	100	QPSK 1_137	100%	518598/2592.99	0.130	0.065	17.40	18.50	1.288	0.167
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_69	100%	518598/2592.99	0.304	0.142	17.35	18.50	1.303	0.396
Back side	100	QPSK 135_69	100%	518598/2592.99	0.141	0.077	17.35	18.50	1.303	0.184
Right side	100	QPSK 135_69	100%	518598/2592.99	0.149	0.070	17.35	18.50	1.303	0.194
Top side	100	QPSK 135_69	100%	518598/2592.99	0.162	0.075	17.35	18.50	1.303	0.211
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.319	0.166	25.87	27.50	1.455	0.464
Back side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.155	0.084	25.87	27.50	1.455	0.226
Left side 5mm	100	QPSK 1_137	100%	518598/2592.99	0.080	0.044	25.87	27.50	1.455	0.116
Right side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.140	0.077	25.87	27.50	1.455	0.204
Top side 19mm	100	QPSK 1_137	100%	518598/2592.99	0.117	0.063	25.87	27.50	1.455	0.170
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.274	0.144	25.82	27.50	1.472	0.403
Back side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.267	0.142	25.82	27.50	1.472	0.393
Left side 5mm	100	QPSK 135_69	100%	518598/2592.99	0.258	0.129	25.82	27.50	1.472	0.380
Right side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.222	0.121	25.82	27.50	1.472	0.327
Top side 19mm	100	QPSK 135_69	100%	518598/2592.99	0.125	0.069	25.82	27.50	1.472	0.184

MIMO (Ant0+Ant 3) Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Front side	100	QPSK	100%	/	/	/	/	/	/	1.011
Back side	100	QPSK	100%	/	/	/	/	/	/	1.062
Left side	100	QPSK	100%	/	/	/	/	/	/	0.380
Right side	100	QPSK	100%	/	/	/	/	/	/	0.834
Top side	100	QPSK	100%	/	/	/	/	/	/	0.390

Table 18：SAR of 5G NR n41.

Note:

For the MIMO SAR, each antenna SAR will be evaluated independently. Then the conservative “max + max” multi-Tx method should be used to combine the scaled SAR value of each antenna as the UL 2*2 MIMO SAR.

15.17 SAR Measurement Result of 5G NR n48

Ant 0 Test Results											
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)	Date
Body 5mm(1RB) Sensor On											
Front side	40	QPSK 1_1	100%	642888/3643.32	0.490	0.178	14.29	15.50	1.321	0.647	2024/6/15
Back side	40	QPSK 1_1	100%	642888/3643.32	0.059	0.026	14.29	15.50	1.321	0.078	2024/6/15
Right side	40	QPSK 1_1	100%	642888/3643.32	0.484	0.169	14.29	15.50	1.321	0.640	2024/6/15
Front side	40	QPSK 1_1	100%	638000/3570	0.512	0.188	14.14	15.50	1.368	0.700	2024/6/15
Front side	40	QPSK 1_1	100%	640446/3606.69	0.554	0.212	14.22	15.50	1.343	0.744	2024/6/15
Front side	40	QPSK 1_1	100%	645332/3679.98	0.439	0.179	14.12	15.50	1.374	0.603	2024/6/15
Right side	40	QPSK 1_1	100%	638000/3570	0.602	0.205	14.14	15.50	1.368	0.823	2024/6/15
Right side	40	QPSK 1_1	100%	640446/3606.69	0.625	0.214	14.22	15.50	1.343	0.839	2024/6/15
Right side	40	QPSK 1_1	100%	645332/3679.98	0.614	0.211	14.12	15.50	1.374	0.844	2024/6/15
Body 5mm(50%RB) Sensor On											
Front side	40	QPSK 108_54	100%	642888/3643.32	0.507	0.184	14.27	15.50	1.327	0.673	2024/6/15
Back side	40	QPSK 108_54	100%	642888/3643.32	0.075	0.032	14.27	15.50	1.327	0.100	2024/6/15
Right side	40	QPSK 108_54	100%	642888/3643.32	0.556	0.182	14.27	15.50	1.327	0.738	2024/6/15
Front side	40	QPSK 108_54	100%	638000/3570	0.544	0.207	14.21	15.50	1.346	0.732	2024/6/15
Front side	40	QPSK 108_54	100%	640446/3606.69	0.598	0.203	14.11	15.50	1.377	0.824	2024/6/15
Front side	40	QPSK 108_54	100%	645332/3679.98	0.576	0.207	14.11	15.50	1.377	0.793	2024/6/15
Right side	40	QPSK 108_54	100%	638000/3570	0.586	0.215	14.21	15.50	1.346	0.789	2024/6/15
Front side	40	QPSK 108_54	100%	640446/3606.69	0.634	0.220	14.11	15.50	1.377	**0.873**	2024/6/15
Right side	40	QPSK 108_54	100%	645332/3679.98	0.621	0.212	14.11	15.50	1.377	0.855	2024/6/15
Body 5mm(100%RB) Sensor On											
Front side	40	QPSK 216_0	100%	642888/3643.32	0.365	0.144	13.12	14.50	1.374	0.502	2024/6/15
Right side	40	QPSK 216_0	100%	642888/3643.32	0.449	0.166	13.12	14.50	1.374	0.617	2024/6/15
Body(1RB) Sensor Off											
Front side 19mm	40	QPSK 1_1	100%	642888/3643.32	0.577	0.274	20.90	22.50	1.445	0.834	2024/6/15
Back side 19mm	40	QPSK 1_1	100%	642888/3643.32	0.101	0.049	20.90	22.50	1.445	0.146	2024/6/15
Left side 5mm	40	QPSK 1_1	100%	642888/3643.32	0.037	0.016	20.90	22.50	1.445	0.053	2024/6/15
Right side 19mm	40	QPSK 1_1	100%	642888/3643.32	0.542	0.244	20.90	22.50	1.445	0.783	2024/6/15
Top side 5mm	40	QPSK 1_1	100%	642888/3643.32	0.105	0.044	20.90	22.50	1.445	0.152	2024/6/15
Front side 19mm	40	QPSK 1_1	100%	638000/3570	0.566	0.271	20.84	22.50	1.466	0.830	2024/6/15
Front side 19mm	40	QPSK 1_1	100%	640446/3606.69	0.602	0.261	20.89	22.50	1.449	0.872	2024/6/15
Front side 19mm	40	QPSK 1_1	100%	645332/3679.98	0.588	0.259	20.83	22.50	1.469	0.864	2024/6/15
Right side 19mm	40	QPSK 1_1	100%	638000/3570	0.501	0.227	20.84	22.50	1.466	0.734	2024/6/15
Right side 19mm	40	QPSK 1_1	100%	640446/3606.69	0.523	0.236	20.89	22.50	1.449	0.758	2024/6/15
Right side 19mm	40	QPSK 1_1	100%	645332/3679.98	0.463	0.210	20.83	22.50	1.469	0.680	2024/6/15
Body(50%RB) Sensor Off											
Front side 19mm	40	QPSK 108_54	100%	642888/3643.32	0.494	0.233	20.20	22.00	1.514	0.748	2024/6/15
Back side 19mm	40	QPSK 108_54	100%	642888/3643.32	0.098	0.047	20.20	22.00	1.514	0.148	2024/6/15
Left side 5mm	40	QPSK 108_54	100%	642888/3643.32	0.039	0.015	20.20	22.00	1.514	0.059	2024/6/15
Rightt side 19mm	40	QPSK 108_54	100%	642888/3643.32	0.432	0.194	20.20	22.00	1.514	0.654	2024/6/15
Top side 5mm	40	QPSK 108_54	100%	642888/3643.32	0.073	0.032	20.20	22.00	1.514	0.110	2024/6/15
Front side 19mm	40	QPSK 108_54	100%	638000/3570	0.520	0.247	20.17	22.00	1.524	0.793	2024/6/15
Front side 19mm	40	QPSK 108_54	100%	640446/3606.69	0.529	0.250	20.18	22.00	1.521	0.804	2024/6/15
Front side 19mm	40	QPSK 108_54	100%	645332/3679.98	0.486	0.235	20.15	22.00	1.531	0.744	2024/6/15
Right side 19mm	40	QPSK 108_54	100%	638000/3570	0.471	0.212	20.17	22.00	1.524	0.718	2024/6/15
Right side 19mm	40	QPSK 108_54	100%	640446/3606.69	0.453	0.204	20.18	22.00	1.521	0.689	2024/6/15
Right side 19mm	40	QPSK 108_54	100%	645332/3679.98	0.411	0.181	20.15	22.00	1.531	0.629	2024/6/15
Body(100%RB) Sensor Off											
Front side 19mm	40	QPSK 216_0	100%	642888/3643.32	0.372	0.179	19.02	20.50	1.406	0.523	2024/6/15
Right side 19mm	40	QPSK 216_0	100%	642888/3643.32	0.298	0.139	19.02	20.50	1.406	0.419	2024/6/15

Table 19：SAR of 5G NR n48.

15.18 SAR Measurement Result of 5G NR n66

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	40	QPSK 1_214	352000/1760	0.408	0.250	16.88	18.50	1.452	0.592
Back side	40	QPSK 1_214	352000/1760	0.396	0.229	16.88	18.50	1.452	0.575
Right side	40	QPSK 1_214	352000/1760	0.196	0.118	16.88	18.50	1.452	0.285
Body 5mm (50%RB) Sensor On									
Front side	40	QPSK 108_54	352000/1760	0.401	0.237	16.85	18.50	1.462	0.586
Back side	40	QPSK 108_54	352000/1760	0.404	0.235	16.85	18.50	1.462	0.591
Right side	40	QPSK 108_54	352000/1760	0.190	0.114	16.85	18.50	1.462	0.278
Body (1RB) Sensor Off									
Front side 19mm	40	QPSK 1_214	352000/1760	0.435	0.276	21.50	23.00	1.413	**0.614**
Back side 19mm	40	QPSK 1_214	352000/1760	0.222	0.140	21.50	23.00	1.413	0.314
Left side 5mm	40	QPSK 1_214	352000/1760	0.248	0.148	21.50	23.00	1.413	0.350
Right side 19mm	40	QPSK 1_214	352000/1760	0.242	0.150	21.50	23.00	1.413	0.342
Top side 5mm	40	QPSK 1_214	352000/1760	0.205	0.128	21.50	23.00	1.413	0.290
Body (50%RB) Sensor Off									
Front side 19mm	40	QPSK 108_54	352000/1760	0.354	0.217	21.45	23.00	1.429	0.506
Back side 19mm	40	QPSK 108_54	352000/1760	0.207	0.131	21.45	23.00	1.429	0.296
Left side 5mm	40	QPSK 108_54	352000/1760	0.191	0.112	21.45	23.00	1.429	0.273
Right side 19mm	40	QPSK 108_54	352000/1760	0.167	0.103	21.45	23.00	1.429	0.239
Top side 5mm	40	QPSK 108_54	352000/1760	0.165	0.111	21.45	23.00	1.429	0.236

Table 20：SAR of 5G NR n66.

15.19 SAR Measurement Result of 5G NR n70

Ant 0 Test Results									
Test position	**BW. (MHz)**	**Mode**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm (1RB) Sensor On									
Front side	15	QPSK 1_1	340500/1702.5	0.383	0.237	15.76	17.50	1.493	0.572
Back side	15	QPSK 1_1	340500/1702.5	0.307	0.165	15.76	17.50	1.493	0.458
Right side	15	QPSK 1_1	340500/1702.5	0.153	0.093	15.76	17.50	1.493	0.228
Body 5mm (50%RB) Sensor On									
Front side	15	QPSK 36_22	340500/1702.5	0.406	0.249	15.72	17.50	1.507	**0.612**
Back side	15	QPSK 36_22	340500/1702.5	0.297	0.172	15.72	17.50	1.507	0.447
Right side	15	QPSK 36_22	340500/1702.5	0.156	0.095	15.72	17.50	1.507	0.235
Body (1RB) Sensor Off									
Front side 19mm	15	QPSK 1_1	340500/1702.5	0.356	0.218	22.66	24.50	1.528	0.544
Back side 19mm	15	QPSK 1_1	340500/1702.5	0.225	0.142	22.66	24.50	1.528	0.344
Left side 5mm	15	QPSK 1_1	340500/1702.5	0.163	0.097	22.66	24.50	1.528	0.249
Right side 19mm	15	QPSK 1_1	340500/1702.5	0.231	0.119	22.66	24.50	1.528	0.353
Top side 5mm	15	QPSK 1_1	340500/1702.5	0.182	0.103	22.66	24.50	1.528	0.278
Body (50%RB) Sensor Off									
Front side 19mm	15	QPSK 36_22	340500/1702.5	0.381	0.234	22.55	24.50	1.567	0.597
Back side 19mm	15	QPSK 36_22	340500/1702.5	0.259	0.164	22.55	24.50	1.567	0.406
Left side 5mm	15	QPSK 36_22	340500/1702.5	0.182	0.109	22.55	24.50	1.567	0.285
Right side 19mm	15	QPSK 36_22	340500/1702.5	0.192	0.119	22.55	24.50	1.567	0.301
Top side 5mm	15	QPSK 36_22	340500/1702.5	0.153	0.068	22.55	24.50	1.567	0.240

Table 21：SAR of 5G NR n70.

15.20 SAR Measurement Result of 5G NR n71

Ant 3 Test Results									
Test position	BW. (MHz)	Mode	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm (1RB)									
Front side	20	QPSK 1_1	137600/688	0.601	0.364	23.56	24.50	1.242	**0.746**
Back side	20	QPSK 1_1	137600/688	0.588	0.405	23.56	24.50	1.242	0.730
Left side	20	QPSK 1_1	137600/688	0.389	0.242	23.56	24.50	1.242	0.483
Right side	20	QPSK 1_1	137600/688	0.234	0.157	23.56	24.50	1.242	0.291
Top side	20	QPSK 1_1	137600/688	0.395	0.220	23.56	24.50	1.242	0.490
Body 5mm (50%RB)									
Front side	20	QPSK 50_28	137600/688	0.561	0.369	23.38	24.50	1.294	0.726
Back side	20	QPSK 50_28	137600/688	0.568	0.389	23.38	24.50	1.294	0.735
Left side	20	QPSK 50_28	137600/688	0.285	0.188	23.38	24.50	1.294	0.369
Right side	20	QPSK 50_28	137600/688	0.212	0.141	23.38	24.50	1.294	0.274
Top side	20	QPSK 50_28	137600/688	0.401	0.222	23.38	24.50	1.294	0.519

Table 22：SAR of 5G NR n71.

15.21 SAR Measurement Result of 5G NR n77

Ant 0 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_271	100%	633334/3500.01	0.457	0.167	13.05	14.50	1.396	0.638
Back side	100	QPSK 1_271	100%	633334/3500.01	0.062	0.026	13.05	14.50	1.396	0.087
Right side	100	QPSK 1_271	100%	633334/3500.01	0.544	0.191	13.05	14.50	1.396	**0.760**
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_138	100%	633334/3500.01	0.460	0.165	13.00	14.50	1.413	0.650
Back side	100	QPSK 135_138	100%	633334/3500.01	0.051	0.022	13.00	14.50	1.413	0.072
Right side	100	QPSK 135_138	100%	633334/3500.01	0.509	0.183	13.00	14.50	1.413	0.719
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.518	0.251	20.51	22.00	1.409	0.730
Back side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.100	0.051	20.51	22.00	1.409	0.141
Left side 5mm	100	QPSK 1_271	100%	633334/3500.01	0.054	0.025	20.51	22.00	1.409	0.076
Right side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.463	0.217	20.51	22.00	1.409	0.653
Top side 5mm	100	QPSK 1_271	100%	633334/3500.01	0.077	0.034	20.51	22.00	1.409	0.109
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.499	0.237	20.30	22.00	1.479	0.738
Back side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.070	0.046	20.30	22.00	1.479	0.104
Left side 5mm	100	QPSK 135_138	100%	633334/3500.01	0.060	0.030	20.30	22.00	1.479	0.089
Right side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.428	0.195	20.30	22.00	1.479	0.633
Top side 5mm	100	QPSK 135_138	100%	633334/3500.01	0.061	0.026	20.30	22.00	1.479	0.090
Ant 3 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_271	100%	633334/3500.01	0.108	0.047	13.46	14.50	1.271	0.137
Back side	100	QPSK 1_271	100%	633334/3500.01	0.135	0.057	13.46	14.50	1.271	0.172
Right side	100	QPSK 1_271	100%	633334/3500.01	0.038	0.017	13.46	14.50	1.271	0.048
Top side	100	QPSK 1_271	100%	633334/3500.01	0.090	0.031	13.46	14.50	1.271	0.114
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_138	100%	633334/3500.01	0.092	0.040	13.28	14.50	1.324	0.122
Back side	100	QPSK 135_138	100%	633334/3500.01	0.167	0.070	13.28	14.50	1.324	0.221
Right side	100	QPSK 135_138	100%	633334/3500.01	0.030	0.014	13.28	14.50	1.324	0.040
Top side	100	QPSK 135_138	100%	633334/3500.01	0.073	0.027	13.28	14.50	1.324	0.097
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.218	0.106	20.85	22.00	1.303	0.284
Back side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.251	0.114	20.85	22.00	1.303	**0.327**
Left side 5mm	100	QPSK 1_271	100%	633334/3500.01	0.089	0.045	20.85	22.00	1.303	0.116
Right side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.072	0.038	20.85	22.00	1.303	0.094
Top side 19mm	100	QPSK 1_271	100%	633334/3500.01	0.090	0.043	20.85	22.00	1.303	0.117
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.167	0.079	20.75	22.00	1.334	0.223
Back side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.241	0.114	20.75	22.00	1.334	0.321
Left side 5mm	100	QPSK 135_138	100%	633334/3500.01	0.077	0.038	20.75	22.00	1.334	0.103
Right side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.061	0.029	20.75	22.00	1.334	0.081
Top side 19mm	100	QPSK 135_138	100%	633334/3500.01	0.079	0.037	20.75	22.00	1.334	0.105
MIMO (Ant0+Ant 3) Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Front side	100	QPSK	100%	/	/	/	/	/	/	1.022
Back side	100	QPSK	100%	/	/	/	/	/	/	0.468
Left side	100	QPSK	100%	/	/	/	/	/	/	0.205
Right side	100	QPSK	100%	/	/	/	/	/	/	0.854
Top side	100	QPSK	100%	/	/	/	/	/	/	0.226

Table 23：SAR of 5G NR n77(3450~3550MHz).

Note:

For the MIMO SAR, each antenna SAR will be evaluated independently. Then the conservative “max + max” multi-Tx method should be used to combine the scaled SAR value of each antenna as the UL 2*2 MIMO SAR.

Ant 0 Test Results										
Test position	BW. (MHz)	Mode	Duty Cycle	Ch./Freq. (MHz)	SAR (W/kg) 1-g	SAR (W/kg) 10-g	Conducted Power(dBm)	Tune up Limit(dBm)	Scaling Factor	Reported 1g SAR (W/kg)
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_271	100%	654800/3822	0.426	0.173	13.45	14.50	1.274	0.543
Back side	100	QPSK 1_271	100%	654800/3822	0.072	0.030	13.45	14.50	1.274	0.092
Right side	100	QPSK 1_271	100%	654800/3822	0.536	0.172	13.45	14.50	1.274	0.683
Front side	100	QPSK 1_271	100%	650000/3750	0.484	0.173	13.41	14.50	1.285	0.622
Front side	100	QPSK 1_271	100%	652400/3786	0.451	0.166	13.34	14.50	1.306	0.589
Front side	100	QPSK 1_271	100%	657200/3858	0.451	0.164	13.38	14.50	1.294	0.584
Front side	100	QPSK 1_271	100%	659600/3894	0.511	0.179	13.26	14.50	1.330	0.680
Front side	100	QPSK 1_271	100%	662000/3930	0.471	0.160	13.20	14.50	1.349	0.635
Right side	100	QPSK 1_271	100%	650000/3750	0.493	0.169	13.41	14.50	1.285	0.634
Right side	100	QPSK 1_271	100%	652400/3786	0.509	0.168	13.34	14.50	1.306	0.665
Right side	100	QPSK 1_271	100%	657200/3858	0.503	0.179	13.38	14.50	1.294	0.651
Right side	100	QPSK 1_271	100%	659600/3894	0.539	0.173	13.26	14.50	1.330	0.717
Right side	100	QPSK 1_271	100%	662000/3930	0.504	0.171	13.20	14.50	1.349	0.680
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_138	100%	654800/3822	0.385	0.148	13.14	14.50	1.368	0.527
Back side	100	QPSK 135_138	100%	654800/3822	0.075	0.023	13.14	14.50	1.368	0.103
Right side	100	QPSK 135_138	100%	654800/3822	0.518	0.173	13.14	14.50	1.368	0.708
Front side	100	QPSK 135_138	100%	650000/3750	0.471	0.169	13.10	14.50	1.380	0.650
Front side	100	QPSK 135_138	100%	652400/3786	0.442	0.156	13.02	14.50	1.406	0.621
Front side	100	QPSK 135_138	100%	657200/3858	0.440	0.152	12.98	14.50	1.419	0.624
Front side	100	QPSK 135_138	100%	659600/3894	0.502	0.170	12.91	14.50	1.442	0.724
Front side	100	QPSK 135_138	100%	662000/3930	0.462	0.154	12.88	14.50	1.452	0.671
Right side	100	QPSK 135_138	100%	650000/3750	0.482	0.152	13.10	14.50	1.380	0.665
Right side	100	QPSK 135_138	100%	652400/3786	0.478	0.153	13.02	14.50	1.406	0.672
Right side	100	QPSK 135_138	100%	657200/3858	0.469	0.149	12.98	14.50	1.419	0.666
Right side	100	QPSK 135_138	100%	659600/3894	0.521	0.165	12.91	14.50	1.442	0.751
Right side	100	QPSK 135_138	100%	662000/3930	0.495	0.162	12.88	14.50	1.452	0.719
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_271	100%	654800/3822	0.482	0.220	20.92	22.00	1.282	0.618
Back side 19mm	100	QPSK 1_271	100%	654800/3822	0.115	0.058	20.92	22.00	1.282	0.147
Left side 5mm	100	QPSK 1_271	100%	654800/3822	0.059	0.027	20.92	22.00	1.282	0.076
Right side 19mm	100	QPSK 1_271	100%	654800/3822	0.514	0.232	20.92	22.00	1.282	0.659
Top side 5mm	100	QPSK 1_271	100%	654800/3822	0.095	0.043	20.92	22.00	1.282	0.122
Front side 19mm	100	QPSK 1_271	100%	650000/3750	0.457	0.213	20.90	22.00	1.288	0.589
Front side 19mm	100	QPSK 1_271	100%	652400/3786	0.463	0.213	20.84	22.00	1.306	0.605
Front side 19mm	100	QPSK 1_271	100%	657200/3858	0.500	0.227	20.80	22.00	1.318	0.659
Front side 19mm	100	QPSK 1_271	100%	659600/3894	0.502	0.230	20.82	22.00	1.312	0.659
Front side 19mm	100	QPSK 1_271	100%	662000/3930	0.532	0.245	20.90	22.00	1.288	0.685
Right side 19mm	100	QPSK 1_271	100%	650000/3750	0.481	0.221	20.90	22.00	1.288	0.620
Right side 19mm	100	QPSK 1_271	100%	652400/3786	0.504	0.223	20.84	22.00	1.306	0.658
Right side 19mm	100	QPSK 1_271	100%	657200/3858	0.546	0.246	20.80	22.00	1.318	0.720
Right side 19mm	100	QPSK 1_271	100%	659600/3894	0.522	0.236	20.82	22.00	1.312	0.685
Right side 19mm	100	QPSK 1_271	100%	662000/3930	0.609	0.277	20.90	22.00	1.288	**0.785**
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_138	100%	654800/3822	0.479	0.223	20.82	22.00	1.312	0.629
Back side 19mm	100	QPSK 135_138	100%	654800/3822	0.098	0.047	20.82	22.00	1.312	0.129
Left side 5mm	100	QPSK 135_138	100%	654800/3822	0.058	0.027	20.82	22.00	1.312	0.076
Right side 19mm	100	QPSK 135_138	100%	654800/3822	0.457	0.205	20.82	22.00	1.312	0.600
Top side 5mm	100	QPSK 135_138	100%	654800/3822	0.114	0.053	20.82	22.00	1.312	0.150
Front side 19mm	100	QPSK 135_138	100%	650000/3750	0.443	0.204	20.50	22.00	1.413	0.626
Front side 19mm	100	QPSK 135_138	100%	652400/3786	0.451	0.203	20.60	22.00	1.380	0.623
Front side 19mm	100	QPSK 135_138	100%	657200/3858	0.485	0.215	20.67	22.00	1.358	0.659
Front side 19mm	100	QPSK 135_138	100%	659600/3894	0.478	0.219	20.64	22.00	1.368	0.654
Front side 19mm	100	QPSK 135_138	100%	662000/3930	0.513	0.239	20.80	22.00	1.318	0.676
Right side 19mm	100	QPSK 135_138	100%	650000/3750	0.471	0.216	20.50	22.00	1.413	0.665
Right side 19mm	100	QPSK 135_138	100%	652400/3786	0.488	0.214	20.60	22.00	1.380	0.674
Right side 19mm	100	QPSK 135_138	100%	657200/3858	0.524	0.227	20.67	22.00	1.358	0.712
Right side 19mm	100	QPSK 135_138	100%	659600/3894	0.514	0.229	20.64	22.00	1.368	0.703
Right side 19mm	100	QPSK 135_138	100%	662000/3930	0.584	0.266	20.80	22.00	1.318	0.770

Ant 3 Test Results										
Test position	**BW. (MHz)**	**Mode**	**Duty Cycle**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Body 5mm(1RB) Sensor On										
Front side	100	QPSK 1_271	100%	654800/3822	0.259	0.098	13.73	14.50	1.194	0.309
Back side	100	QPSK 1_271	100%	654800/3822	0.128	0.052	13.73	14.50	1.194	0.153
Right side	100	QPSK 1_271	100%	654800/3822	0.073	0.031	13.73	14.50	1.194	0.087
Top side	100	QPSK 1_271	100%	654800/3822	0.066	0.030	13.73	14.50	1.194	0.079
Body 5mm(50%RB) Sensor On										
Front side	100	QPSK 135_138	100%	654800/3822	0.223	0.086	13.65	14.50	1.216	0.271
Back side	100	QPSK 135_138	100%	654800/3822	0.119	0.049	13.65	14.50	1.216	0.145
Right side	100	QPSK 135_138	100%	654800/3822	0.050	0.020	13.65	14.50	1.216	0.061
Top side	100	QPSK 135_138	100%	654800/3822	0.065	0.025	13.65	14.50	1.216	0.079
Body(1RB) Sensor Off										
Front side 19mm	100	QPSK 1_271	100%	654800/3822	0.372	0.172	21.12	22.00	1.225	**0.456**
Back side 19mm	100	QPSK 1_271	100%	654800/3822	0.098	0.048	21.12	22.00	1.225	0.120
Left side 5mm	100	QPSK 1_271	100%	654800/3822	0.056	0.027	21.12	22.00	1.225	0.069
Right side 19mm	100	QPSK 1_271	100%	654800/3822	0.111	0.054	21.12	22.00	1.225	0.136
Top side 19mm	100	QPSK 1_271	100%	654800/3822	0.071	0.036	21.12	22.00	1.225	0.087
Front side 19mm	100	QPSK 1_271	100%	650000/3750	0.358	0.155	21.02	22.00	1.253	0.449
Front side 19mm	100	QPSK 1_271	100%	652400/3786	0.316	0.144	21.04	22.00	1.247	0.394
Front side 19mm	100	QPSK 1_271	100%	657200/3858	0.240	0.110	21.06	22.00	1.242	0.298
Front side 19mm	100	QPSK 1_271	100%	659600/3894	0.214	0.890	20.97	22.00	1.268	0.271
Front side 19mm	100	QPSK 1_271	100%	662000/3930	0.232	0.092	21.06	22.00	1.242	0.288
Body(50%RB) Sensor Off										
Front side 19mm	100	QPSK 135_138	100%	654800/3822	0.335	0.152	21.09	22.00	1.233	0.413
Back side 19mm	100	QPSK 135_138	100%	654800/3822	0.111	0.053	21.09	22.00	1.233	0.137
Left side 5mm	100	QPSK 135_138	100%	654800/3822	0.050	0.023	21.09	22.00	1.233	0.062
Right side 19mm	100	QPSK 135_138	100%	654800/3822	0.094	0.046	21.09	22.00	1.233	0.116
Top side 19mm	100	QPSK 135_138	100%	654800/3822	0.099	0.047	21.09	22.00	1.233	0.122
Front side 19mm	100	QPSK 135_138	100%	650000/3750	0.352	0.154	20.94	22.00	1.276	0.449
Front side 19mm	100	QPSK 135_138	100%	652400/3786	0.317	0.135	21.01	22.00	1.256	0.398
Front side 19mm	100	QPSK 135_138	100%	657200/3858	0.278	0.127	21.03	22.00	1.250	0.348
Front side 19mm	100	QPSK 135_138	100%	659600/3894	0.253	0.104	20.95	22.00	1.274	0.322
Front side 19mm	100	QPSK 135_138	100%	662000/3930	0.221	0.102	21.00	22.00	1.259	0.278
MIMO (Ant0+Ant 3) Test Results										
Test position	**BW. (MHz)**	**Mode**	**Duty Cycle**	**Ch./Freq. (MHz)**	**SAR (W/kg) 1-g**	**SAR (W/kg) 10-g**	**Conducted Power(dBm)**	**Tune up Limit(dBm)**	**Scaling Factor**	**Reported 1g SAR (W/kg)**
Front side	100	QPSK	100%	/	/	/	/	/	/	1.180
Back side	100	QPSK	100%	/	/	/	/	/	/	0.300
Left side	100	QPSK	100%	/	/	/	/	/	/	0.145
Right side	100	QPSK	100%	/	/	/	/	/	/	0.921
Top side	100	QPSK	100%	/	/	/	/	/	/	0.272

Table 24：SAR of 5G NR n77(3700~3980MHz).

Note:

For the MIMO SAR, each antenna SAR will be evaluated independently. Then the conservative “max + max” multi-Tx method should be used to combine the scaled SAR value of each antenna as the UL 2*2 MIMO SAR.

15.22 EN_DC and Inter-band UL CA SAR Summary

EN_DC SAR:

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n2		EN-DC SAR
				Ant0	Ant3	
Band 5	Front	/	0.704	0.717	/	1.421
	Back	/	0.349	0.768	/	1.117
	Left	/	0.312	0.239	/	0.551
	Right	/	0.131	0.380	/	0.511
	Top	/	0.276	0.264	/	0.540
	Bottom	/	/	/	/	/
Band 12	Front	/	0.639	0.717	/	1.356
	Back	/	0.667	0.768	/	1.435
	Left	/	0.640	0.239	/	0.879
	Right	/	0.237	0.380	/	0.617
	Top	/	0.462	0.264	/	0.726
	Bottom	/	/	/	/	/
Band 13	Front	/	0.703	0.717	/	1.420
	Back	/	0.517	0.768	/	1.285
	Left	/	0.450	0.239	/	0.689
	Right	/	0.168	0.380	/	0.548
	Top	/	0.370	0.264	/	0.634
	Bottom	/	/	/	/	/
Band 30	Front	0.328	/	0.717	/	1.045
	Back	0.529	/	0.768	/	1.297
	Left	0.080	/	0.239	/	0.319
	Right	0.275	/	0.380	/	0.655
	Top	0.097	/	0.264	/	0.361
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	0.717	/	1.396
	Back	0.668	/	0.768	/	1.436
	Left	0.249	/	0.239	/	0.488
	Right	0.393	/	0.380	/	0.773
	Top	0.213	/	0.264	/	0.477
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n5		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	/	0.680	1.375
	Back	0.503	/	/	0.386	0.889
	Left	0.275	/	/	0.277	0.552
	Right	0.350	/	/	0.105	0.455
	Top	0.220	/	/	0.386	0.606
	Bottom	/	/	/	/	/
Band 12	Front	/	0.639	/	0.680	1.319
	Back	/	0.667	/	0.386	1.053
	Left	/	0.640	/	0.277	0.917
	Right	/	0.237	/	0.105	0.342
	Top	/	0.462	/	0.386	0.848
	Bottom	/	/	/	/	/

Band 13	Front	/	0.703	/	0.680	1.383
	Back	/	0.517	/	0.386	0.903
	Left	/	0.450	/	0.277	0.727
	Right	/	0.168	/	0.105	0.273
	Top	/	0.370	/	0.386	0.756
	Bottom	/	/	/	/	/
Band 30	Front	0.328	/	/	0.680	1.008
	Back	0.529	/	/	0.386	0.915
	Left	0.080	/	/	0.277	0.357
	Right	0.275	/	/	0.105	0.380
	Top	0.097	/	/	0.386	0.483
	Bottom	/	/	/	/	/
Band 48	Front	0.483	/	/	0.680	1.163
	Back	0.084	/	/	0.386	0.470
	Left	0.059	/	/	0.277	0.336
	Right	0.448	/	/	0.105	0.553
	Top	0.066	/	/	0.386	0.452
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	/	0.680	1.359
	Back	0.668	/	/	0.386	1.054
	Left	0.249	/	/	0.277	0.526
	Right	0.393	/	/	0.105	0.498
	Top	0.213	/	/	0.386	0.599
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n41		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	0.540	0.471	1.235
	Back	0.503	/	0.771	0.393	1.274
	Left	0.275	/	0.251	0.380	0.655
	Right	0.350	/	0.507	0.327	0.857
	Top	0.220	/	0.179	0.211	0.431
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	0.540	0.471	1.219
	Back	0.668	/	0.771	0.393	1.439
	Left	0.249	/	0.251	0.380	0.629
	Right	0.393	/	0.507	0.327	0.900
	Top	0.213	/	0.179	0.211	0.424
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n71		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	/	0.746	1.441
	Back	0.503	/	/	0.735	1.238
	Left	0.275	/	/	0.483	0.758
	Right	0.350	/	/	0.291	0.641
	Top	0.220	/	/	0.519	0.739
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	/	0.746	1.425
	Back	0.668	/	/	0.735	1.403
	Left	0.249	/	/	0.483	0.732
	Right	0.393	/	/	0.291	0.684
	Top	0.213	/	/	0.519	0.732
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n25		EN-DC SAR
				Ant0	Ant3	
Band 12	Front	/	0.639	0.732	/	1.371
	Back	/	0.667	0.590	/	1.257
	Left	/	0.640	0.288	/	0.928
	Right	/	0.237	0.392	/	0.629
	Top	/	0.462	0.269	/	0.731
	Bottom	/	/	/	/	/
Band 48	Front	0.483	/	0.732	/	1.215
	Back	0.084	/	0.590	/	0.674
	Left	0.059	/	0.288	/	0.347
	Right	0.448	/	0.392	/	0.840
	Top	0.066	/	0.269	/	0.335
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	0.732	/	1.411
	Back	0.668	/	0.590	/	1.258
	Left	0.249	/	0.288	/	0.537
	Right	0.393	/	0.392	/	0.785
	Top	0.213	/	0.269	/	0.482
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n30		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	0.661	/	1.356
	Back	0.503	/	0.774	/	1.277
	Left	0.275	/	0.055	/	0.330
	Right	0.350	/	0.518	/	0.868
	Top	0.220	/	0.089	/	0.309
	Bottom	/	/	/	/	/
Band 5	Front	/	0.704	0.661	/	1.365
	Back	/	0.349	0.774	/	1.123
	Left	/	0.312	0.055	/	0.367
	Right	/	0.131	0.518	/	0.649
	Top	/	0.276	0.089	/	0.365
	Bottom	/	/	/	/	/
Band 12	Front	/	0.639	0.661	/	1.300

	Back	/	0.667	0.774	/	1.441
	Left	/	0.640	0.055	/	0.695
	Right	/	0.237	0.518	/	0.755
	Top	/	0.462	0.089	/	0.551
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	0.661	/	1.340
	Back	0.668	/	0.774	/	1.442
	Left	0.249	/	0.055	/	0.304
	Right	0.393	/	0.518	/	0.911
	Top	0.213	/	0.089	/	0.302
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n66		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	0.614	/	1.309
	Back	0.503	/	0.591	/	1.094
	Left	0.275	/	0.350	/	0.625
	Right	0.350	/	0.342	/	0.692
	Top	0.220	/	0.290	/	0.510
	Bottom	/	/	/	/	/
Band 5	Front	/	0.704	0.614	/	1.318
	Back	/	0.349	0.591	/	0.940
	Left	/	0.312	0.350	/	0.662
	Right	/	0.131	0.342	/	0.473
	Top	/	0.276	0.290	/	0.566
	Bottom	/	/	/	/	/
Band 12	Front	/	0.639	0.614	/	1.253
	Back	/	0.667	0.591	/	1.258
	Left	/	0.640	0.350	/	0.990
	Right	/	0.237	0.342	/	0.579
	Top	/	0.462	0.290	/	0.752
	Bottom	/	/	/	/	/
Band 13	Front	/	0.703	0.614	/	1.317
	Back	/	0.517	0.591	/	1.108
	Left	/	0.450	0.350	/	0.800
	Right	/	0.168	0.342	/	0.510
	Top	/	0.370	0.290	/	0.660
	Bottom	/	/	/	/	/
Band 30	Front	0.328	/	0.614	/	0.942
	Back	0.529	/	0.591	/	1.120
	Left	0.080	/	0.350	/	0.430
	Right	0.275	/	0.342	/	0.617
	Top	0.097	/	0.290	/	0.387
	Bottom	/	/	/	/	/
Band 48	Front	0.483	/	0.614	/	1.097
	Back	0.084	/	0.591	/	0.675
	Left	0.059	/	0.350	/	0.409
	Right	0.448	/	0.342	/	0.790
	Top	0.066	/	0.290	/	0.356
	Bottom	/	/	/	/	/

LTE Band (EN-DC)	Exposure position	Ant0	Ant3	n77		EN-DC SAR
				Ant0	Ant3	
Band 2	Front	0.695	/	0.738	0.456	1.433
	Back	0.503	/	0.147	0.327	0.830
	Left	0.275	/	0.089	0.116	0.391
	Right	0.350	/	0.785	0.136	1.135
	Top	0.220	/	0.150	0.122	0.370
	Bottom	/	/	/	/	/
Band 5	Front	/	0.704	0.738	0.456	1.442
	Back	/	0.349	0.147	0.327	0.676
	Left	/	0.312	0.089	0.116	0.428
	Right	/	0.131	0.785	0.136	0.916
	Top	/	0.276	0.150	0.122	0.426
	Bottom	/	/	/	/	/
Band 12	Front	/	0.639	0.738	0.456	1.377
	Back	/	0.667	0.147	0.327	0.994
	Left	/	0.640	0.089	0.116	0.756
	Right	/	0.237	0.785	0.136	1.022
	Top	/	0.462	0.150	0.122	0.612
	Bottom	/	/	/	/	/
Band 13	Front	/	0.703	0.738	0.456	1.441
	Back	/	0.517	0.147	0.327	0.844
	Left	/	0.450	0.089	0.116	0.566
	Right	/	0.168	0.785	0.136	0.953
	Top	/	0.370	0.150	0.122	0.520
	Bottom	/	/	/	/	/
Band 66	Front	0.679	/	0.738	0.456	1.417
	Back	0.668	/	0.147	0.327	0.995
	Left	0.249	/	0.089	0.116	0.365
	Right	0.393	/	0.785	0.136	1.178
	Top	0.213	/	0.150	0.122	0.363
	Bottom	/	/	/	/	/

Inter-band UL CA SAR:

Exposure position	LTE B12 Ant3	LTE B66 Ant0	Inter-band SAR
Front	0.639	0.679	1.318
Back	0.667	0.668	1.335
Left	0.640	0.249	0.889
Right	0.237	0.393	0.630
Top	0.462	0.213	0.675
Bottom	/	/	/

Exposure position	LTE B13 Ant3	LTE B66 Ant0	Inter-band SAR
Front	0.703	0.679	1.382
Back	0.517	0.668	1.185
Left	0.450	0.249	0.699
Right	0.168	0.393	0.561
Top	0.370	0.213	0.583
Bottom	/	/	/

Exposure position	LTE B2 Ant0	LTE B12 Ant3	Inter-band SAR
Front	0.695	0.639	1.334
Back	0.503	0.667	1.170
Left	0.275	0.640	0.915
Right	0.350	0.237	0.587
Top	0.220	0.462	0.682
Bottom	/	/	/

Exposure position	LTE B2 Ant0	LTE B13 Ant3	Inter-band SAR
Front	0.695	0.703	1.398
Back	0.503	0.517	1.020
Left	0.275	0.450	0.725
Right	0.350	0.168	0.518
Top	0.220	0.370	0.590
Bottom	/	/	/

Exposure position	LTE B4 Ant0	LTE B13 Ant3	Inter-band SAR
Front	0.679	0.703	1.382
Back	0.668	0.517	1.185
Left	0.352	0.450	0.802
Right	0.393	0.168	0.561
Top	0.300	0.370	0.670
Bottom	/	/	/

16 Simultaneous Transmission Analysis

This device does not have any simultaneous transmission other than support for EN_DC and UL CA (see section 15.22).

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 ≤ 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

Appendix E: Conducted Output Power Table

--- The End ---