FCC SAR TEST REPORT

Application No.:	SUCR2502000102AT
Applicant:	Askey Computer Corporation
Manufacturer:	Askey Computer Corporation
Product Name:	5G USB Dongle
Model No.(EUT):	NDQ2300
Trade Mark:	ASKEY, Dynalink
FCC ID:	H8NNDQ2300-1
Standards:	FCC 47CFR §2.1093
Date of Receipt:	2025-02-18
Date of Test:	2025-03-03 to 2025-03-05
Date of Issue:	2025-04-02
Test conclusion:	**PASS** *

* In the configuration tested, the EUT detailed in this report complied with the standards specified above.

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

Revision Record			
Version	**Description**	**Date**	**Remark**
01	Original	2025/04/02	/

Authorized for issue by:		
Prepared By		Leon Liu **Leon Liu/ Project Manager**
Approved By		Nick Hu **Nick Hu/ Technical Manager**

TEST SUMMARY

Frequency Band	Maximum Reported SAR (W/kg)
	Body 5mm
NR Band n48	1.00
NR Band n77 (n78)	1.13
SAR Limited(W/kg)	1.6

Note: According to TCB workshop October,2014 RF Exposure Procedures Update (Overlapping Bands): SAR for NR Band n78 (Frequency range: 3450 - 3550 MHz, 3700 - 3800 MHz) is respectively covered by NR Band n78 (Frequency range: 3450 - 3550 MHz, 3700 - 3980 MHz) due to similar frequency range, same maximum tune up limit and same channel bandwidth.
Because the frequency range is similar, the maximum tuning limit is the same, and the channel bandwidth and other operating parameters for the smaller band is fully supported by the larger band.

CONTENTS

1 DUT Antenna Locations

Note: ANT0: N48/77/78 TX
ANT1: N48/77/78 RX
ANT2: N48/77/78 TX
ANT4: N48/77/78 RX

2 General Information

2.1 Details of Client

Applicant:	Askey Computer Corporation
Address:	10F, No. 119, JianKang RD., Zhonghe Dist., New Taipei City, Taiwan
Manufacturer:	Askey Computer Corporation
Address:	10F, No. 119, JianKang RD., Zhonghe Dist., New Taipei City, Taiwan

2.2 Test Location

Company:	SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.
Address:	South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu) Pilot Free Trade Zone
Post code:	215000
Test Engineer:	Koller Chen; Leon-l Liu

2.3 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

- **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

- **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

2.4 General Description of EUT

Device Type :	portable device		
Exposure Category:	uncontrolled environment / general population		
Product Phase:	production unit		
IMEI:	355241830371192		
Hardware Version:	NDQ2300_V3		
Software Version:	NDQ2300_STD_V4.0.12.0_240926.1_m		
Device Operating Configurations :			
Modulation Mode:	**5G NR:** DFT-s-OFDM (PI/2 BPSK, QPSK, 16QAM, 64QAM, 256QAM), CP-OFDM (QPSK, 16QAM, 64QAM, 256QAM)		
Device Class:	B		
Frequency Bands:	Band	Tx (MHz)	Rx (MHz)
	NR Band n48	3550 - 3700	3550 - 3700
	NR Band n77	3450 - 3550	3450 - 3550
		3700 - 3980	3700 - 3980
	NR Band n78	3450 - 3550	3450 - 3550
		3700 - 3800	3700 - 3800
RF Cable:	☒ Provided by the aplicant ☐ Provided by the laboratory		

Note: *Since the above data and/or information is provided by the client relevant results or conclusions of this report are only made for these data and/or information, SGS is not responsible for the authenticity, integrity and results of the data and information and/or the validity of the conclusion.

Remark:
As above information is provided and confirmed by the applicant. SGS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

2.5 Test Specification

Identity	Document Title
FCC 47CFR §2.1093	Radiofrequency Radiation Exposure Evaluation: Portable Devices
ANSI/IEEE C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz – 300 GHz.
IEEE 1528-2013	Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
KDB 941225 D05	SAR for LTE Devices v02r05
KDB 941225 D05A	LTE Rel.10 KDB Inquiry Sheet v01r02
KDB 447498 D01	General RF Exposure Guidance v06
KDB 447498 D02	D02 SAR Procedures for Dongle Xmtr v02r01
KDB 865664 D01	SAR Measurement 100 MHz to 6 GHz v01r04
KDB 865664 D02	RF Exposure Reporting v01r02
KDB 690783 D01	SAR Listings on Grants v01r03

2.6 RF exposure limits

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain*Trunk)	**1.60 mW/g**	8.00 mW/g
Spatial Average SAR** (Whole Body)	0.08 mW/g	0.40 mW/g
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

Notes:

* 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

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

*** 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.

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.)

2.6.1 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.

The detailed power reduction information can be referred to section 9.1.

3 Laboratory Environment

Temperature	Min. = 18°C, Max. = 25 °C
Relative humidity	Min. = 30%, Max. = 70%
Ambient noise is checked and found very low and in compliance with requirement of standards. Reflection of surrounding objects is minimized and in compliance with requirement of standards.	

Table 1：The Ambient Conditions

4 SAR Measurements System Configuration

4.1 The SAR Measurement System

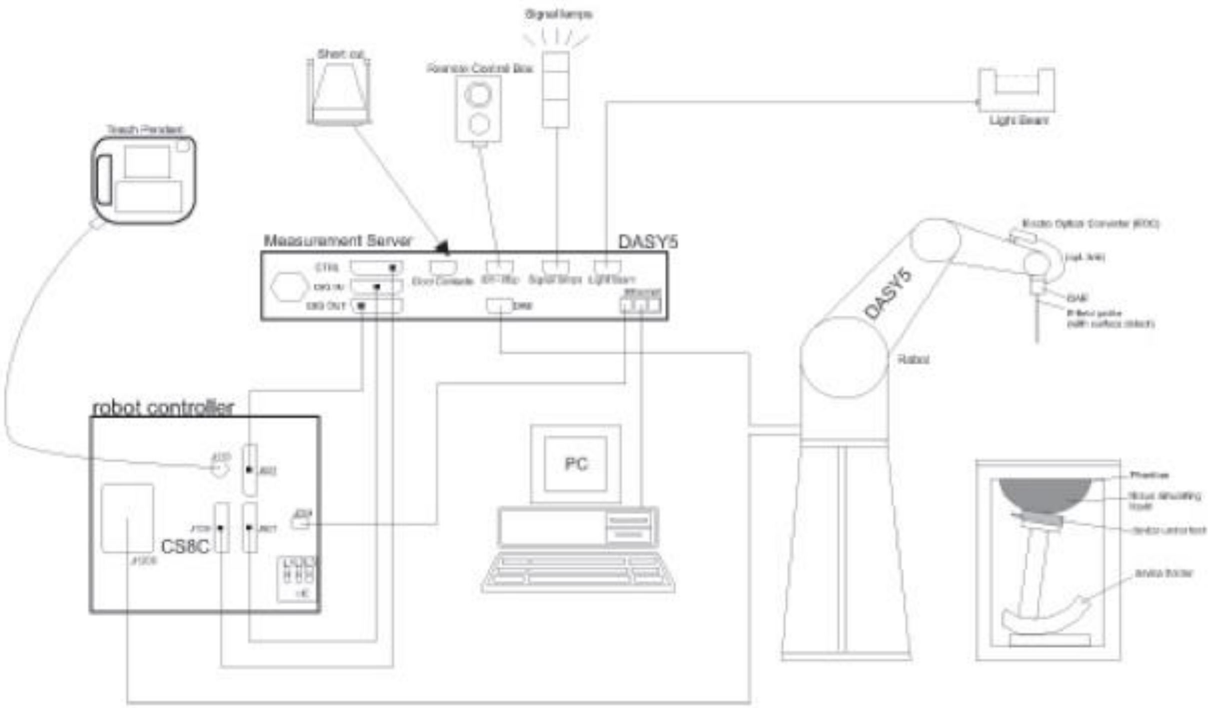
This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY5 professional system). A E-field probe is used to determine the internal electric fields. The SAR can be obtained from the equation SAR= σ (|Ei|2)/ ρ where σ and ρ are the conductivity and mass density of the tissue-Simulate.

The DASY5 system for performing compliance tests consists of the following items:
A standard high precision 6-axis robot (Stabile RX family) with controller, teach pendant and software .An arm extension for accommodation the data acquisition electronics (DAE).

A dosimetric probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.

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 between optical and electrical of the signals for the digital communication to DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.



F-1. SAR Measurement System Configuration

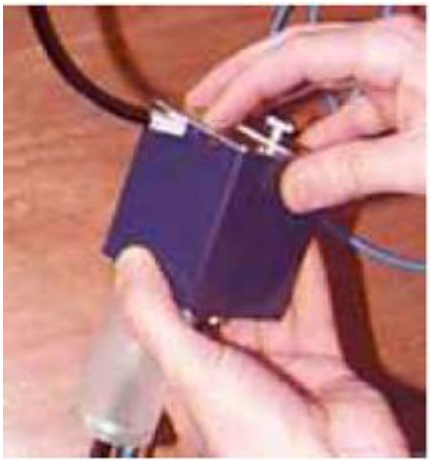
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows 7.
- DASY5 software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand, right-hand and Body Worn usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Validation dipole kits allowing to validating the proper functioning of the system.

4.2 Isotropic E-field Probe EX3DV4

	Symmetrical design with triangular core Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	ISO/IEC 17025 calibration service available.
Frequency	10 MHz to > 6 GHz Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	± 0.3 dB in TSL (rotation around probe axis) ± 0.5 dB in TSL (rotation normal to probe axis)
Dynamic Range	10 μW/g to > 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 μW/g)
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm
Application	High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields); the only probe that enables compliance testing for frequencies up to 6 GHz with precision of better 30%.
Compatibility	DASY52 SAR and higher, EASY4/MRI

4.3 Data Acquisition Electronics (DAE)

Model	DAE
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY4/5 embedded system (fully remote controlled). Two step probe touch detector for mechanical surface detection and emergency robot stop.
Measurement Range	-100 to +300 mV (16 bit resolution and two range settings: 4mV,400mV)
Input Offset Voltage	< 5μV (with auto zero)
Input Bias Current	< 50 f A
Dimensions	60 x 60 x 68 mm



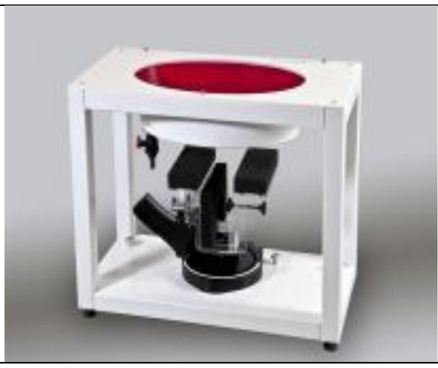
4.4 SAM Twin Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)
Dimensions (incl. Wooden Support)	Length: 1000 mm Width: 500 mm Height: adjustable feet
Filling Volume	approx. 25 liters
Wooden Support	SPEAG standard phantom table

The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.

Twin SAM V5.0 has the same shell geometry and is manufactured from the same material as Twin SAM V4.0, but has reinforced top structure.

4.5 ELI Phantom

Material	Vinylester, glass fiber reinforced (VE-GF)	
Liquid Compatibility	Compatible with all SPEAG tissue simulating liquids (incl. DGBE type)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	
Wooden Support	SPEAG standard phantom table	

The ELI phantom is used for compliance testing of handheld and body-mounted wireless devices in the frequency range of 4 MHz to 10 GHz. ELI is fully compatible with the IEC/IEEE 62209-1528 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all of SPEAG's dosimetric probes and dipoles.
ELI V5.0 and higher has the same shell geometry and is manufactured from the same material as ELI V4.0 but has a reinforced top structure.

4.6 Device Holder for Transmitters

F-2. **Device Holder for Transmitters**

- The DASY device holder is designed to cope with different positions given in the standard. It has two scales for the device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear reference points). The rotation centres for both scales are the ear reference point (ERP). Thus the device needs no repositioning when changing the angles.
- The DASY device holder has been made out of low-loss POM material having the following dielectric parameters: relative permittivity ε=3 and loss tangent δ=0.02. The amount of dielectric material has been reduced in the closest vicinity of the device, since measurements have suggested that the influence of the clamp on the test results could thus be lowered.

4.7 Measurement procedure

4.7.1 Scanning procedure

Step 1: Power reference measurement

The “reference” and “drift” measurements are located at the beginning and end of the batch process. They measure the field drift at one single point in the liquid over the complete procedure.

Step 2: *Area scan*

The SAR distribution at the exposed side of the head was measured at a distance of 4mm from the inner surface of the shell. The area covered the entire dimension of the head and the horizontal grid spacing was 15mm*15mm or 12mm*12mm or 10mm*10mm.Based on the area scan data, the area of the maximum absorption was determined by spline interpolation.

Step 3: *Zoom scan*

Around this point, a volume of 32mm*32mm*30mm (f≤2GHz), 30mm*30mm*30mm (f for 2-3GHz) and 24mm*24mm*22mm (f for 5-6GHz) was assessed by measuring 5x5x7 points (f≤2GHz), 7x7x7 points (f for 2-3GHz) and 7x7x12 points (f for 5-6GHz). On this basis of this data set, the spatial peak SAR value was evaluated with the following procedure:

The data at the surface was extrapolated, since the centre of the dipoles is 2.0mm away from the tip of the probe and the distance between the surface and the lowest measuring point is 1.2mm. (This can be variable. Refer to the probe specification).The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1g or 10g) were computed using the 3D-Spline interpolation algorithm. The volume was integrated with the trapezoidal algorithm. One thousand points were interpolated to calculate the average. All neighbouring volumes were evaluated until no neighboring volume with a higher average value was found.

The area and zoom scan resolutions specified in the table below must be applied to the SAR measurements Probe boundary effect error compensation is required for measurements with the probe tip closer than half a probe tip diameter to the phantom surface. Both the probe tip diameter and sensor offset distance must satisfy measurement protocols; to ensure probe boundary effect errors are minimized and the higher fields closest to the phantom surface can be correctly measured and extrapolated to the phantom surface for computing 1-g SAR. Tolerances of the post-processing algorithms must be verified by the test laboratory for the scan resolutions used in the SAR measurements, according to the reference distribution functions specified in IEEE Std. 1528-2013.

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

Step 4: Power reference measurement (drift)

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 indicated drift is mainly the variation of the DUT's output power and should vary max. ± 5 %

4.7.2 Data Storage

The DASY software stores the acquired data from the data acquisition electronics as raw data (in microvolt readings from the probe sensors), together with all necessary software parameters for the data evaluation (probe calibration data, liquid parameters and device frequency and modulation data) in measurement files with the extension ".DAE4". The software evaluates the desired unit and format for output each time the data is visualized or exported. This allows verification of the complete software setup even after the measurement and allows correction of incorrect parameter settings. For example, if a measurement has been performed with a wrong crest factor parameter in the device setup, the parameter can be corrected afterwards and the data can be re-evaluated. The measured data can be visualized or exported in different units or formats, depending on the selected probe type ([V/m], [A/m], [°C], [m W/g], [m W/cm²], [dBrel], etc.). Some of these units are not available in certain situations or show meaningless results, e.g., a SAR output in a lossless media will always be zero. Raw data can also be exported to perform the evaluation with other software packages.

4.7.3 Data Evaluation by SEMCAD

The SEMCAD software automatically executes the following procedures to calculate the field units from the microvolt readings at the probe connector. The parameters used in the evaluation are stored in the configuration modules of the software:

Probe parameters: - Sensitivity Normi, ai0, ai1, ai2
- Conversion factor ConvFi
- Diode compression point Dcpi
Device parameters: - Frequency f
- Crest factor cf
Media parameters: - Conductivity ε
- Density ρ

These parameters must be set correctly in the software. They can be found in the component documents or they can be imported into the software from the configuration files issued for the DASY components. In the direct measuring mode of the multimeter option, the parameters of the actual system setup are used. In the scan visualization and export modes, the parameters stored in the corresponding document files are used.

The first step of the evaluation is a linearization of the filtered input signal to account for the compression characteristics of the detector diode. The compensation depends on the input signal, the diode type and the DC-transmission factor from the diode to the evaluation electronics.

If the exciting field is pulsed, the crest factor of the signal must be known to correctly compensate for peak power. The formula for each channel can be given as:

$$V_i = U_i + U_i^2 \cdot cf / dcp_i$$

With Vi = compensated signal of channel i (i = x, y, z)
Ui = input signal of channel i (i = x, y, z)
cf = crest factor of exciting field (DASY parameter)
dcp i = diode compression point (DASY parameter)

From the compensated input signals the primary field data for each channel can be evaluated:
E-field probes:

$$E_i = (V_i / Norm_i \cdot ConvF)^{1/2}$$

H-field probes:

$$H_i = (V_i)^{1/2} \cdot (a_{i0} + a_{i1} f + a_{i2} f^2) / f$$

With Vi = compensated signal of channel i (i = x, y, z)
Normi = sensor sensitivity of channel I (i = x, y, z)
[mV/(V/m)2] for E-field Probes
ConvF = sensitivity enhancement in solution
aij = sensor sensitivity factors for H-field probes
f = carrier frequency [GHz]
Ei = electric field strength of channel i in V/m
Hi = magnetic field strength of channel i in A/m

The RSS value of the field components gives the total field strength (Hermitian magnitude):

$$E_{tot} = (E_x^2 + E_Y^2 + E_z^2)^{1/2}$$

The primary field data are used to calculate the derived field units.

$$SAR = (Etot^2 \cdot \sigma) / (\varepsilon \cdot 1000)$$

with SAR = local specific absorption rate in mW/g
Etot = total field strength in V/m
σ= conductivity in [mho/m] or [Siemens/m]
ε= equivalent tissue density in g/cm3

Note that the density is normally set to 1 (or 1.06), to account for actual brain density rather than the density of the simulation liquid. The power flow density is calculated assuming the excitation field to be a free space field.

$$P_{pwe} = E_{tot}{}^2{}_2 / 3770 \quad \text{or} \quad P_{pwe} = H_{tot}{}^2 \cdot 37.7$$

with Ppwe = equivalent power density of a plane wave in mW/cm2
Etot = total electric field strength in V/m
Htot = total magnetic field strength in A/m

5 SAR measurement variability and uncertainty

5.1 SAR measurement variability

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz v01r04, 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. The additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

1) Repeated measurement is not required when the original highest measured SAR is < 0.80 W/kg; steps 2) through 4) do not apply.

2) When the original highest measured SAR is ⩾ 0.80 W/kg, 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 W/kg (~ 10% from the 1-g SAR limit).

4) Perform a third repeated measurement only if the original, first or second repeated measurement is ⩾1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.

The same procedures should be adapted for measurements according to extremity and occupational exposure limits by applying a factor of 2.5 for extremity exposure and a factor of 5 for occupational exposure to the corresponding SAR thresholds.

5.2 SAR measurement uncertainty

Per KDB865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6 Description of Test Position

6.1 Body Exposure Condition

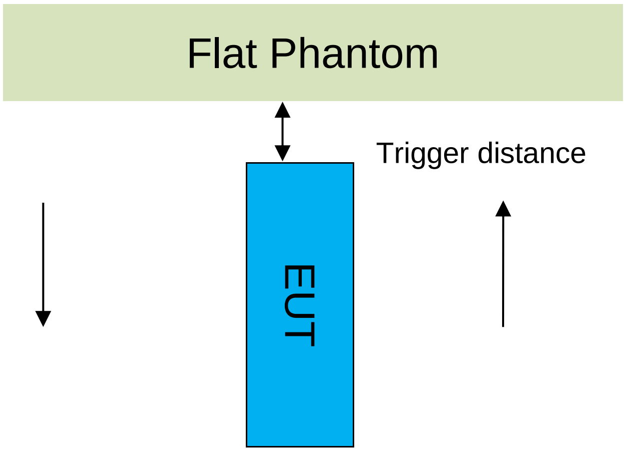
6.1.1 Dongle exposure conditions

The FCC has provided instructions in FCC KDB Publication 447498 D02 v02r01, which includes the aspects to be considered for SAR testing of dongles. In accordance with the stipulations of KDB Publication 447498 D01, conduct tests in all directions while maintaining a separation distance of 5 millimeters or less between the device and the phantom.

6.2 Proximity Sensor Triggering Test

Proximity sensor triggering distances:

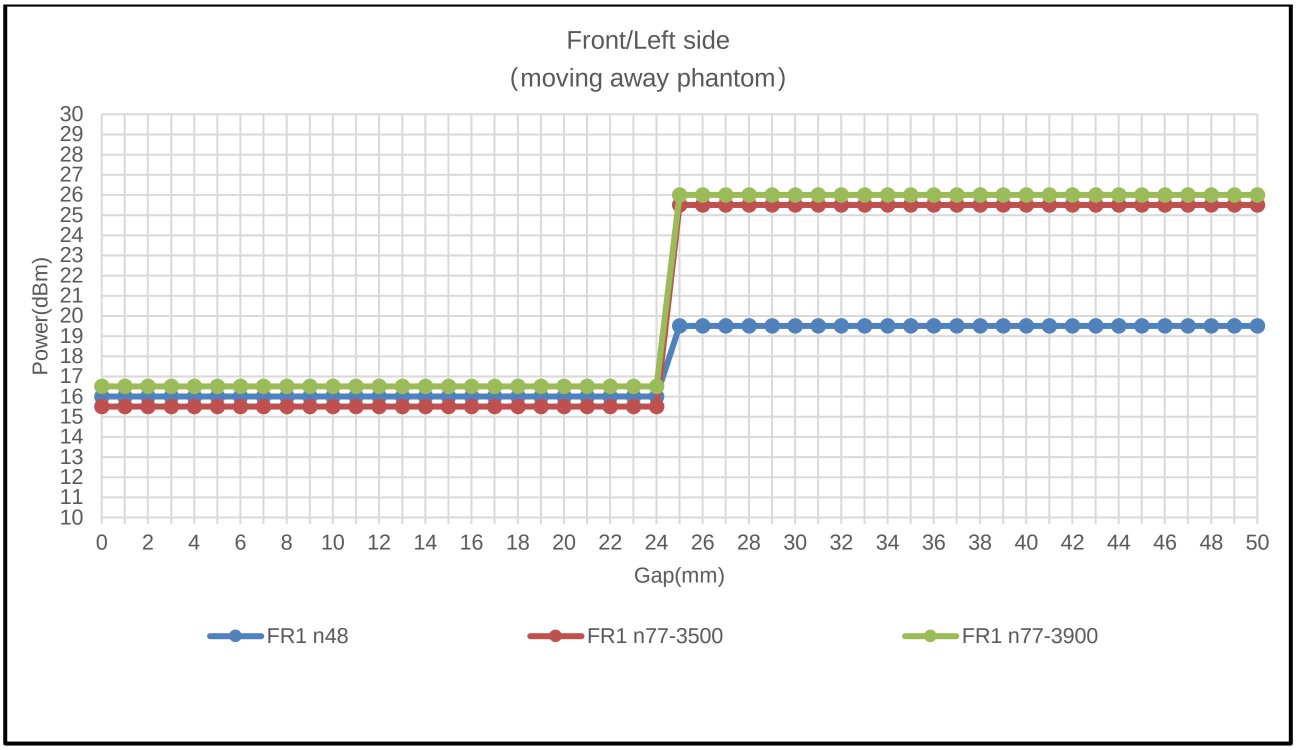
The Proximity sensor triggering was applied to WWAN antenna. Proximity sensor triggering distance testing was performed according to the procedures outlined in KDB 616217 D04 section 6.2, and EUT moving further away from the flat phantom and EUT moving toward the flat phantom were both assessed.

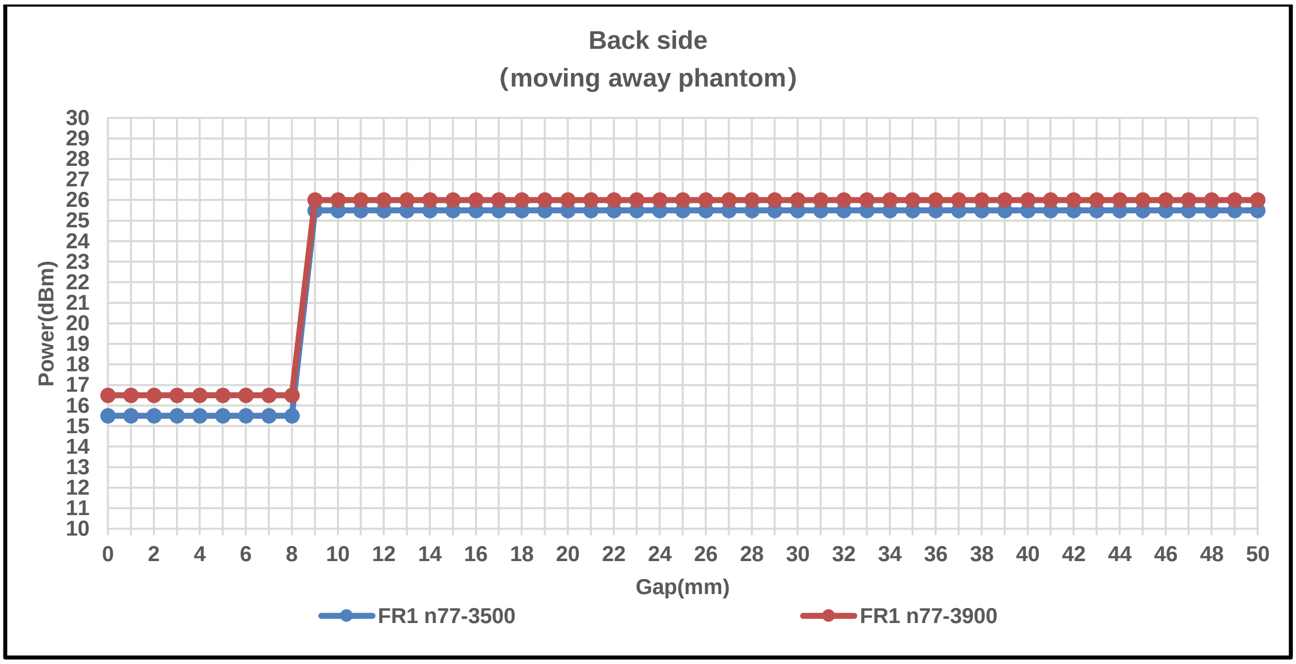


Proximity Sensor Triggering Distance(mm)						
Position	Front side	Back side	Left side	Right side	Top side	Bottom side
Minimum	25	25	25	25	25	25
Required SAR Test	24	8	24	5	NA	5

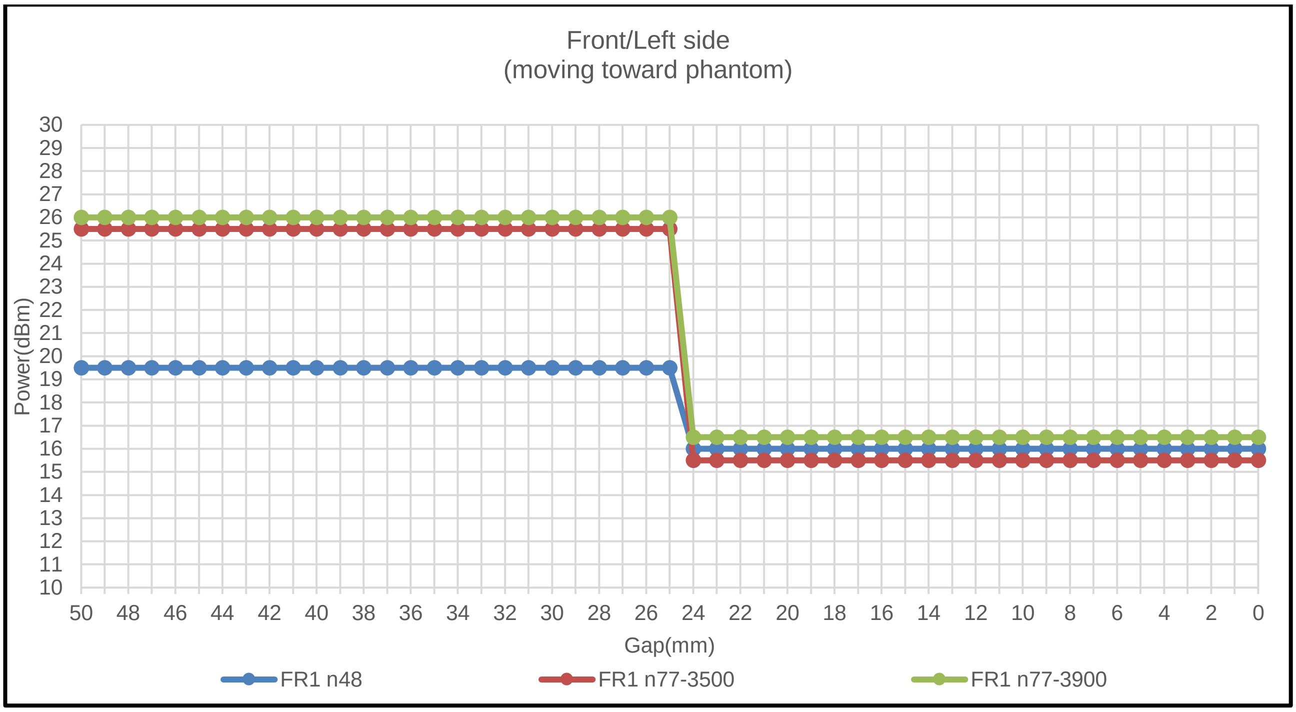
Note: SAR tests with proximity sensor power reduction are only required for the sides of frequency bands in the table above. For the other sides or other frequency bands of the device, SAR is still tested at the maximum power level with sensor off.

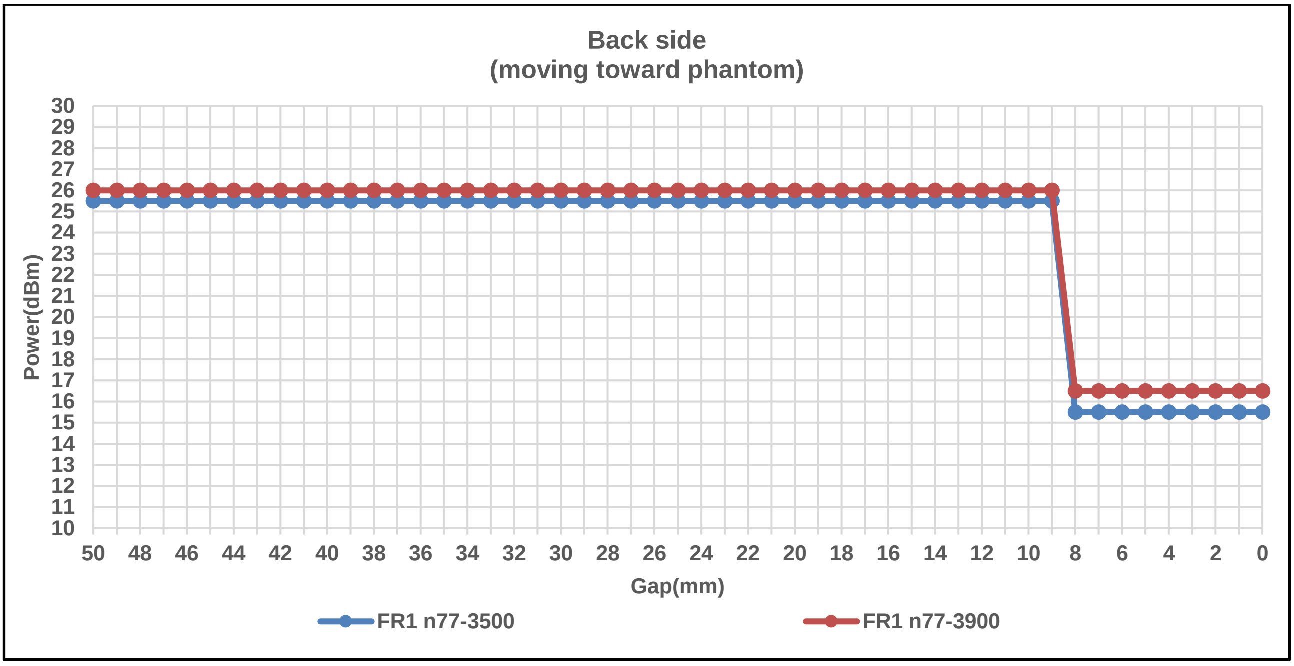
- DUT Moving Away(Release) from the Phantom





- DUT Moving Toward (Trigger)the Phantom





Proximity sensor coverage

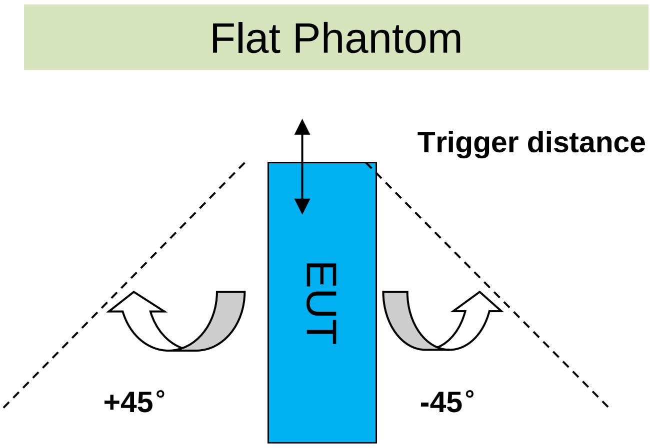
If a sensor is spatially offset from the antenna(s), it is necessary to verify sensor triggering for conditions where the antenna is next to the user but the sensor is laterally further away to ensure sensor coverage is sufficient for reducing the power to maintain compliance. For p-sensor coverage testing, the device is moved and “along the direction of maximum antenna and sensor offset”.

The proximity sensor and main antenna use same metallic electrode, so there is no spatial offset.

Device tilt angle influences to 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 to Proximity Sensor Triggering for Top Side													
Band (MHz)	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°
NR n48/77/78	Top side:25mm	Top side:25mm	on	on	on	on	on	on	on	on	on	on	on

7 SAR System Verification Procedure

7.1 Tissue Simulate Liquid

7.1.1 Recipes for Tissue Simulate Liquid

The bellowing tables give the recipes for tissue simulating liquids to be used in different frequency bands：

Ingredients (% by weight)	Frequency (MHz)				
	450	700-900	1750-2000	2300-2500	2500-2700
Water	38.56	40.30	55.24	55.00	54.92
Salt (NaCl)	3.95	1.38	0.31	0.2	0.23
Sucrose	56.32	57.90	0	0	0
HEC	0.98	0.24	0	0	0
Bactericide	0.19	0.18	0	0	0
Tween	0	0	44.45	44.80	44.85

Salt: 99^{+}% Pure Sodium Chloride
Sucrose: 98^{+}% Pure Sucrose
Water: De-ionized, 16 $M\Omega^{+}$ resistivity
HEC: Hydroxyethyl Cellulose
Tween: Polyoxyethylene (20) sorbitan monolaurate

HSL13MHz is composed of the following ingredients：

Water：50-90%

Non-ionic detergents：5-50%

Nacl：0-2%

Preservative：0.03-0.1%

HSL5GHz is composed of the following ingredients：

Water：50-65%

Mineral oil：10-30%

Emulsifiers：8-25%

Sodium salt：0-1.5%

Table 2：Recipe of Tissue Simulate Liquid

7.1.2 Measurement for Tissue Simulate Liquid

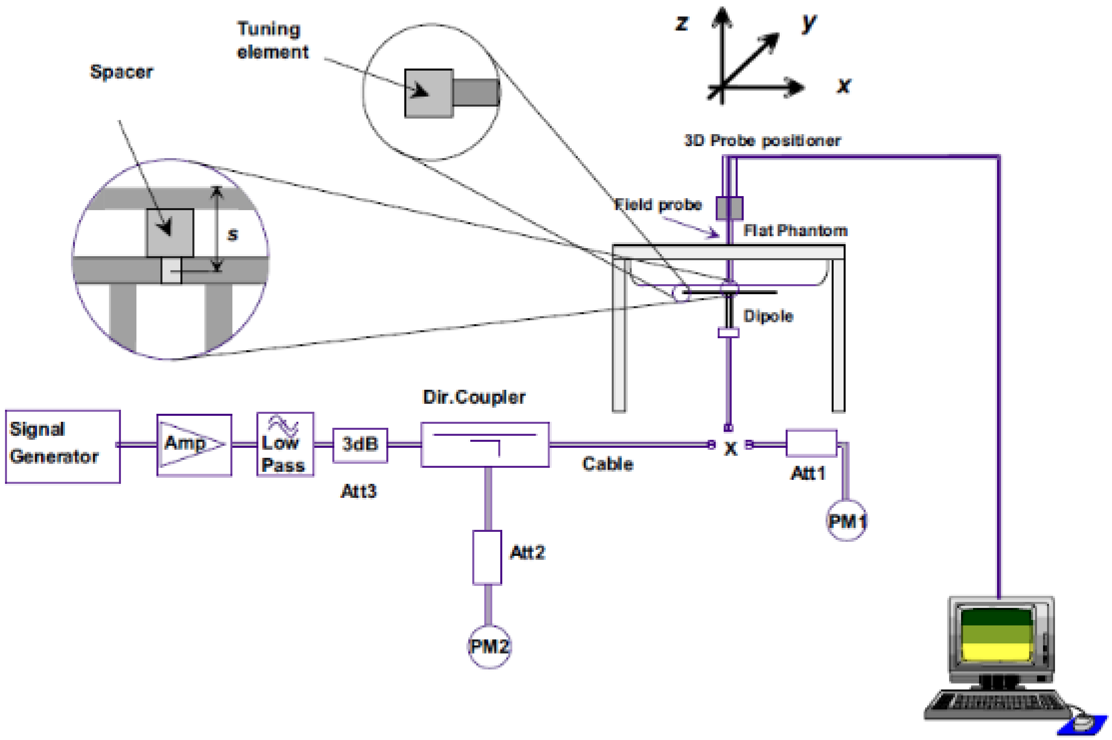
The Conductivity (σ) and Permittivity (ρ) are listed in bellow table. For the SAR measurement given in this report. The temperature variation of the Tissue Simulate Liquids was 22±2°C.

Measurement for Tissue Simulate Liquid							
Tissue Type	Measured Frequency （MHz）	Target Tissue (±5%)		Measured Tissue		Liquid Temp.	Test Date
		ε_r	σ(S/m)	ε_r	σ(S/m)	(℃)	
3500 Head	3500	38	2.81	38.697	2.873	22.1	2025/3/3
3700 Head	3700	37.7	3.12	38.281	3.035	22.3	2025/3/4
3900 Head	3900	37.5	3.32	38.020	3.220	22.2	2025/3/5

Table 3： Measurement result of Tissue electric parameters.

7.2 SAR System Check

The microwave circuit arrangement for system Check is sketched in F-12. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within +/- 10% from the target SAR values. The tests were conducted on the same days as the measurement of the EUT. The obtained results from the system accuracy verification are displayed in the following table (A power level of 250mW (below 3GHz) or 100mW (3-6GHz) was input to the dipole antenna). During the tests, the ambient temperature of the laboratory was in the range 22±2°C, the relative humidity was in the range 60% and the liquid depth above the ear reference points was above 15±0.5 cm in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.



F-1. the microwave circuit arrangement used for SAR system check

7.2.1 Justification for Extended SAR Dipole Calibrations

1) Referring to KDB865664 D01 requirements for dipole calibration, instead of the typical annual calibration recommended by measurement standards, longer calibration intervals of up to three years may be considered when it is demonstrated that the SAR target, impedance and return loss of a dipole have remain stable according to the following requirements. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.
a) There is no physical damage on the dipole;
b) System check with specific dipole is within 10% of calibrated value;
c) Return-loss is within 10% of calibrated measurement;
d) Impedance is within 5Ω from the previous measurement.

2) Network analyzer probe calibration against air, distilled water and a shorting block performed before measuring liquid parameters.

7.2.2 Summary System Check Result(s)

SAR System Validation Result(s)											
Validation Kit		Measured SAR 100mW	Measured SAR 100mW	Measured SAR (normalized to 1W)	Measured SAR (normalized to 1W)	Target SAR (normalized to 1W)	Target SAR (normalized to 1W)	Deviation (Within ±10%)		Liquid Temp. (℃)	Test Date
		1g (W/kg)	10g (W/kg)	1g (W/kg)	10g (W/kg)	1-g(W/kg)	10-g(W/kg)	1-g(W/kg)	10-g(W/kg)		
D3500V2	Head(3.5GHz)	6.25	2.44	62.50	24.40	66.50	26.10	-6.02%	-6.51%	22.1	2025/3/3
D3700V2	Head(3.7GHz)	6.39	2.45	63.90	24.50	66.10	24.70	-3.33%	-0.81%	22.3	2025/3/4
D3900V2	Head(3.9GHz)	6.65	2.37	66.50	23.70	66.70	23.80	-0.30%	-0.42%	22.2	2025/3/5

Table 4： SAR System Check Result.

7.2.3 Detailed System Check Results

Please see the Appendix A

8 Test Configuration

8.1.1 5G NR Test Configuration

1. 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
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 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 n41,n78. 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 n41,n78 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 n41,n78.

9 Test Result

9.1 Measurement of RF Conducted Power.

Note:

1）. For SAR the time based average power is relevant. The difference in between depends on the duty cycle of the TDMA signal:

No. of timeslots	1	2	3	4
Duty Cycle	1:8.3	1:4.15	1:2.77	1:2.075
Time based avg. power compared to slotted avg. power	-9.19	-6.18	-4.42	-3.17

2）. The frame-averaged power is linearly proportion to the slot number configured and it is linearly scaled the maximum burst-averaged power based on time slots. The calculated method is shown as below:
Frame-averaged power = 10 x log (Burst-averaged power mW x Slot used / 8

3）. When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.

9.1.1 Conducted Power of NR

N48				Conducted Power(dBm)			
SCS 30kHz							
Bandwidth	Modulation	RB size	RB offset	Channel 638000	Channel 641666	Channel 645332	Tune up
				3570	3624.99	3679.98	
40MHz	DFT-s-OFDM PI/2 BPSK	1	1	18.54	18.49	18.40	19.50
		1	108	18.47	18.39	18.34	19.50
		1	214	18.20	18.35	18.19	19.50
		108	0	17.69	17.78	17.94	19.00
		108	54	18.62	18.49	18.60	19.50
		108	108	17.86	17.99	17.87	19.00
		216	0	18.02	17.92	17.95	19.00
	DFT-s-OFDM QPSK	1	1	18.64	18.72	18.68	19.50
		1	108	18.41	18.33	18.36	19.50
		1	214	18.28	18.23	18.24	19.50
		108	0	17.44	17.47	17.50	18.50
		108	54	18.60	18.65	18.48	19.50
		108	108	17.44	17.42	17.32	18.50
		216	0	17.41	17.40	17.52	18.50
	DFT-s-OFDM 16QAM	1	1	17.43	17.48	17.47	18.50
	DFT-s-OFDM 64QAM	1	1	15.94	15.81	15.84	17.00
	DFT-s-OFDM 256QAM	1	1	13.88	13.79	13.81	15.00
Bandwidth	Modulation	RB size	RB offset	Channel 638000	Channel 641666	Channel 645332	Tune up
40MHz	CP-OFDM QPSK	1	1	16.22	16.35	16.26	18.00
Bandwidth	Modulation	RB size	RB offset	Channel 637334	Channel 641666	Channel 646000	Tune up
20MHz	DFT-s-OFDM QPSK	1	1	18.38	18.43	18.51	19.50

N77 PC2				Conducted Power(dBm)			
SCS 30kHz(3450~3550)							
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	633334	/	
				/	3500	/	
100MHz	DFT-s-OFDM PI/2 BPSK	1	1	/	24.57	/	25.50
		1	137	/	24.46	/	25.50
		1	271	/	24.42	/	25.50
		135	0	/	24.07	/	25.00
		135	69	/	24.55	/	25.50
		135	138	/	24.06	/	25.00
		270	0	/	24.04	/	25.00
	DFT-s-OFDM QPSK	1	1	/	24.94	/	25.50
		1	137	/	24.45	/	25.50
		1	271	/	24.41	/	25.50
		135	0	/	23.55	/	24.50
		135	69	/	24.76	/	25.50
		135	138	/	23.44	/	24.50
		270	0	/	23.62	/	24.50
	DFT-s-OFDM 16QAM	1	1	/	23.56	/	24.50
	DFT-s-OFDM 64QAM	1	1	/	22.02	/	23.00
	DFT-s-OFDM 256QAM	1	1	/	19.91	/	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	633334	/	
100MHz	CP-OFDM QPSK	1	1	/	22.32	/	23.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				632668	633334	634000	
80MHz	DFT-s-OFDM QPSK	1	1	24.54	24.52	24.56	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				632000	633334	634668	
60MHz	DFT-s-OFDM QPSK	1	1	24.47	24.56	24.55	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				631334	633334	635334	
40MHz	DFT-s-OFDM QPSK	1	1	24.55	24.44	24.59	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				631000	633334	635666	
30MHz	DFT-s-OFDM QPSK	1	1	24.52	24.49	24.61	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				630668	633334	636000	
20MHz	DFT-s-OFDM QPSK	1	1	24.50	24.51	24.60	25.50

N77 PC2				Conducted Power(dBm)			
SCS 30kHz(3700~3980)							
Bandwidth	Modulation	RB size	RB offset	Channel 650000	Channel 656000	Channel 662000	Tune up
				3750	3840	3930	
100MHz	DFT-s-OFDM PI/2 BPSK	1	1	25.25	25.32	25.26	26.00
		1	137	25.14	25.12	25.18	26.00
		1	271	25.02	25.05	25.06	26.00
		135	0	24.64	24.75	24.72	25.50
		135	69	25.32	25.38	25.36	26.00
		135	138	24.62	24.68	24.72	25.50
		270	0	24.79	24.69	24.83	25.50
	DFT-s-OFDM QPSK	1	1	25.37	25.41	25.35	26.00
		1	137	25.13	25.09	25.13	26.00
		1	271	25.07	25.11	25.05	26.00
		135	0	24.21	24.22	24.39	25.00
		135	69	25.39	25.34	25.38	26.00
		135	138	24.25	24.20	24.22	25.00
		270	0	24.29	24.27	24.33	25.00
	DFT-s-OFDM 16QAM	1	1	24.26	24.29	24.28	25.00
	DFT-s-OFDM 64QAM	1	1	22.70	22.70	22.74	23.50
	DFT-s-OFDM 256QAM	1	1	20.69	20.64	20.64	21.50
Bandwidth	Modulation	RB size	RB offset	Channel 650000	Channel 656000	Channel 662000	Tune up
100MHz	CP-OFDM QPSK	1	1	23.02	23.06	23.01	24.50
Bandwidth	Modulation	RB size	RB offset	Channel 649334	Channel 656000	Channel 662666	Tune up
80MHz	DFT-s-OFDM QPSK	1	1	25.22	25.20	25.18	26.00
Bandwidth	Modulation	RB size	RB offset	Channel 648668	Channel 656000	Channel 663332	Tune up
60MHz	DFT-s-OFDM QPSK	1	1	25.22	25.21	25.20	26.00
Bandwidth	Modulation	RB size	RB offset	Channel 648000	Channel 656000	Channel 664000	Tune up
40MHz	DFT-s-OFDM QPSK	1	1	25.24	25.19	25.24	26.00
Bandwidth	Modulation	RB size	RB offset	Channel 647668	Channel 656000	Channel 664332	Tune up
30MHz	DFT-s-OFDM QPSK	1	1	25.21	25.25	25.25	26.00
Bandwidth	Modulation	RB size	RB offset	Channel 647334	Channel 656000	Channel 664666	Tune up
20MHz	DFT-s-OFDM QPSK	1	1	25.29	25.19	25.20	26.00

N78 PC2				Conducted Power(dBm)			
SCS 30kHz(3450~3550)							
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	633334	/	
				/	3500	/	
100MHz	DFT-s-OFDM PI/2 BPSK	1	1	/	24.56	/	25.50
		1	137	/	24.42	/	25.50
		1	271	/	24.44	/	25.50
		135	0	/	24.02	/	25.00
		135	69	/	24.62	/	25.50
		135	138	/	24.07	/	25.00
		270	0	/	24.05	/	25.00
	DFT-s-OFDM QPSK	1	1	/	24.75	/	25.50
		1	137	/	24.44	/	25.50
		1	271	/	24.40	/	25.50
		135	0	/	23.56	/	24.50
		135	69	/	24.67	/	25.50
		135	138	/	23.48	/	24.50
		270	0	/	23.54	/	24.50
	DFT-s-OFDM 16QAM	1	1	/	23.48	/	24.50
	DFT-s-OFDM 64QAM	1	1	/	21.96	/	23.00
	DFT-s-OFDM 256QAM	1	1	/	19.95	/	21.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	633334	/	
100MHz	CP-OFDM QPSK	1	1	/	22.33	/	23.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				633000	633334	633668	
90MHz	DFT-s-OFDM QPSK	1	1	24.43	24.43	24.60	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				632668	633334	634000	
80MHz	DFT-s-OFDM QPSK	1	1	24.42	24.52	24.56	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				632334	633334	634332	
70MHz	DFT-s-OFDM QPSK	1	1	24.44	24.50	24.53	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				632000	633334	634668	
60MHz	DFT-s-OFDM QPSK	1	1	24.53	24.52	24.56	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				631668	633334	635000	
50MHz	DFT-s-OFDM QPSK	1	1	24.54	24.42	24.53	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				631334	633334	635334	
40MHz	DFT-s-OFDM QPSK	1	1	24.55	24.52	24.51	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				631000	633334	635668	

30MHz	DFT-s-OFDM QPSK	1	1	24.57	24.42	24.54	25.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				630668	633334	636000	
20MHz	DFT-s-OFDM QPSK	1	1	24.55	24.43	24.50	25.50

N78 PC2				Conducted Power(dBm)			
SCS 30kHz(3700~3800)							
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	650000	/	
				/	3750.00	/	
100MHz	DFT-s-OFDM PI/2 BPSK	1	1	/	25.33	/	26.00
		1	137	/	25.13	/	26.00
		1	271	/	25.10	/	26.00
		135	0	/	24.66	/	25.50
		135	69	/	25.24	/	26.00
		135	138	/	24.70	/	25.50
		270	0	/	24.74	/	25.50
	DFT-s-OFDM QPSK	1	1	/	25.49	/	26.00
		1	137	/	25.13	/	26.00
		1	271	/	25.04	/	26.00
		135	0	/	24.22	/	25.00
		135	69	/	25.31	/	26.00
		135	138	/	24.22	/	25.00
		270	0	/	24.20	/	25.00
	DFT-s-OFDM 16QAM	1	1	/	24.32	/	25.00
	DFT-s-OFDM 64QAM	1	1	/	22.60	/	23.50
	DFT-s-OFDM 256QAM	1	1	/	20.71	/	21.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				/	650000	/	
100MHz	CP-OFDM QPSK	1	1	/	23.05	/	23.50
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				649668	650000	650334	
90MHz	DFT-s-OFDM QPSK	1	1	25.25	25.28	25.20	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				649334	650000	650668	
80MHz	DFT-s-OFDM QPSK	1	1	25.31	25.29	25.30	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				649000	650000	651000	
70MHz	DFT-s-OFDM QPSK	1	1	25.18	25.18	25.27	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				648668	650000	651334	
60MHz	DFT-s-OFDM QPSK	1	1	25.18	25.24	25.19	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				648334	650000	651668	
50MHz	DFT-s-OFDM QPSK	1	1	25.29	25.30	25.25	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				648000	650000	652000	
40MHz	DFT-s-OFDM QPSK	1	1	25.17	25.17	25.21	26.00
Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				647668	650000	652334	

30MHz	DFT-s-OFDM QPSK	1	1	25.30	25.18	25.32	26.00

Bandwidth	Modulation	RB size	RB offset	Channel	Channel	Channel	Tune up
				647334	650000	652668	
20MHz	DFT-s-OFDM QPSK	1	1	25.25	25.26	25.26	26.00

9.2 Measurement of SAR Data

Note:

1) Graph results refer to Appendix B.
2) Per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   - ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
   - ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
   - ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.
3) Maximum bandwidth does not support at least three non-overlapping channels in certain channel bandwidths. When a device supports overlapping channel assignment in a channel bandwidth configuration, the middle channel of the group of overlapping channels should be selected for testing.

9.2.1 SAR Result of NR Band n48

SA N48 SAR Test Record											
Main Ant.											
Test position	BW.	Modulation	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body (Sensor on) Test data(Separate 5mm 1RB)											
Front side	40	QPSK 1_1	641666/3624.99	1:1	0.852	0.13	15.32	16.00	1.169	0.996	22.3
Front side-Repeat SAR	40	QPSK 1_1	641666/3624.99	1:1	0.843	0.13	15.32	16.00	1.169	0.986	22.3
Front side	40	QPSK 1_1	638000/3570	1:1	0.832	-0.02	15.24	16.00	1.191	0.991	22.3
Front side	40	QPSK 1_1	645332/3679.98	1:1	0.839	0.10	15.29	16.00	1.178	0.988	22.3
Left side	40	QPSK 1_1	641666/3624.99	1:1	0.822	-0.01	15.32	16.00	1.169	0.961	22.3
Left side	40	QPSK 1_1	638000/3570	1:1	0.814	-0.02	15.24	16.00	1.191	0.970	22.3
Left side	40	QPSK 1_1	645332/3679.98	1:1	0.811	0.12	15.29	16.00	1.178	0.955	22.3
Body (Sensor on) Test data(Separate 5mm 50%RB)											
Front side	40	QPSK 108_54	641666/3624.99	1:1	0.839	0.13	15.29	16.00	1.178	0.988	22.3
Front side	40	QPSK 108_54	641666/3624.99	1:1	0.815	0.16	15.26	16.00	1.186	0.966	22.3
Front side	40	QPSK 108_54	641666/3624.99	1:1	0.803	0.11	15.23	16.00	1.194	0.959	22.3
Left side	40	QPSK 108_54	641666/3624.99	1:1	0.727	-0.19	15.29	16.00	1.178	0.856	22.3
Left side	40	QPSK 108_54	641666/3624.99	1:1	0.708	0.11	15.26	16.00	1.186	0.840	22.3
Left side	40	QPSK 108_54	641666/3624.99	1:1	0.695	-0.18	15.23	16.00	1.194	0.830	22.3
Body (Sensor on) Test data(Separate 5mm 100%RB)											
Front side	40	QPSK 216_0	641666/3624.99	1:1	0.808	-0.18	15.20	16.00	1.202	0.971	22.3
Left side	40	QPSK 216_0	641666/3624.99	1:1	0.684	0.01	15.20	16.00	1.202	0.822	22.3
Body (Sensor off) Test data(Separate 1RB)											
Front side-24mm	40	QPSK 1_1	641666/3624.99	1:1	0.228	0.06	18.72	19.50	1.197	0.273	22.3
Back side-5mm	40	QPSK 1_1	641666/3624.99	1:1	0.576	0.07	18.72	19.50	1.197	0.689	22.3
Left side-24mm	40	QPSK 1_1	641666/3624.99	1:1	0.220	-0.17	18.72	19.50	1.197	0.263	22.3
Right side-5mm	40	QPSK 1_1	641666/3624.99	1:1	0.165	0.01	18.72	19.50	1.197	0.197	22.3
Bottom side-5mm	40	QPSK 1_1	641666/3624.99	1:1	0.449	0.16	18.72	19.50	1.197	0.537	22.3
Body Test data (Separate 50%RB)											
Front side-24mm	40	QPSK 108_54	641666/3624.99	1:1	0.224	-0.11	18.65	19.50	1.216	0.272	22.3
Back side-5mm	40	QPSK 108_54	641666/3624.99	1:1	0.511	-0.10	18.65	19.50	1.216	0.621	22.3
Left side-24mm	40	QPSK 108_54	641666/3624.99	1:1	0.195	0.05	18.65	19.50	1.216	0.237	22.3
Right side-5mm	40	QPSK 108_54	641666/3624.99	1:1	0.144	0.04	18.65	19.50	1.216	0.175	22.3
Bottom side-5mm	40	QPSK 108_54	641666/3624.99	1:1	0.382	0.01	18.65	19.50	1.216	0.465	22.3

Table 5: SAR of NR Band n48 for Body.

Test Position	Channel/ Frequency	Measured SAR (1g)	1st Repeated	Ratio	2nd Repeated	3rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Front side	641666/3624.99	0.852	0.843	1.01067616	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was preformed only if the original, first or second repeated measurement was ⩾ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

9.2.2 SAR Result of NR Band n77 Part 27Q (PC2)

SA N77 SAR Test Record											
Main Ant.											
Test position	BW.	Modulation	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body (Sensor on) Test data(Separate 5mm 1RB)											
Front side	100	QPSK 1_1	633334/3500	1:1	0.969	0.12	14.89	15.50	1.151	1.115	22.1
Back side	100	QPSK 1_1	633334/3500	1:1	0.110	-0.09	14.89	15.50	1.151	0.127	22.1
Left side	100	QPSK 1_1	633334/3500	1:1	0.834	0.12	14.89	15.50	1.151	0.960	22.1
Body (Sensor on) Test data (Separate 5mm 50%RB)											
Front side	100	QPSK 135_69	633334/3500	1:1	0.924	-0.03	14.71	15.50	1.199	1.108	22.1
Back side	100	QPSK 135_69	633334/3500	1:1	0.098	0.06	14.71	15.50	1.199	0.118	22.1
Left side	100	QPSK 135_69	633334/3500	1:1	0.805	0.09	14.71	15.50	1.199	0.966	22.1
Body (Sensor on) Test data (Separate 5mm 100%RB)											
Front side	100	QPSK 270_0	633334/3500	1:1	0.749	0.12	14.85	15.50	1.161	0.870	22.1
Left side	100	QPSK 270_0	633334/3500	1:1	0.705	0.07	14.85	15.50	1.161	0.819	22.1
Body (Sensor off) Test data(Separate 1RB)											
Front side-24mm	100	QPSK 1_1	633334/3500	1:1	0.989	-0.09	24.94	25.50	1.138	1.125	22.1
Front side 24mm-Repeat SAR	100	QPSK 1_1	633334/3500	1:1	0.974	0.12	24.94	25.50	1.138	1.108	22.1
Back side-8mm	100	QPSK 1_1	633334/3500	1:1	0.793	-0.12	24.94	25.50	1.138	0.902	22.1
Left side-24mm	100	QPSK 1_1	633334/3500	1:1	0.851	-0.10	24.94	25.50	1.138	0.968	22.1
Right side-5mm	100	QPSK 1_1	633334/3500	1:1	0.432	0.16	24.94	25.50	1.138	0.491	22.1
Bottom side-5mm	100	QPSK 1_1	633334/3500	1:1	0.515	-0.07	24.94	25.50	1.138	0.586	22.1
Body Test data (Separate 50%RB)											
Front side-24mm	100	QPSK 135_69	633334/3500	1:1	0.943	-0.12	24.76	25.50	1.186	1.118	22.1
Back side-8mm	100	QPSK 135_69	633334/3500	1:1	0.682	0.03	24.76	25.50	1.186	0.809	22.1
Left side-24mm	100	QPSK 135_69	633334/3500	1:1	0.822	0.01	24.76	25.50	1.186	0.975	22.1
Right side-5mm	100	QPSK 135_69	633334/3500	1:1	0.316	-0.11	24.76	25.50	1.186	0.375	22.1
Bottom side-5mm	100	QPSK 135_69	633334/3500	1:1	0.449	-0.03	24.76	25.50	1.186	0.532	22.1
Body Test data (Separate 100%RB)											
Front side-24mm	100	QPSK 270_0	633334/3500	1:1	0.936	0.13	24.76	25.50	1.186	1.110	22.1
Back side-8mm	100	QPSK 270_0	633334/3500	1:1	0.695	-0.05	24.76	25.50	1.186	0.824	22.1
Left side-24mm	100	QPSK 270_0	633334/3500	1:1	0.816	-0.09	24.76	25.50	1.186	0.968	22.1

Table 6： SAR of NR Band n77 Part 27Q (PC2) for Body is covering NR Band n78.

Test Position	Channel/ Frequency	Measured SAR (1g)	1st Repeated	Ratio	2nd Repeated	3rd Repeated
	(MHz)		SAR (1g)		SAR (1g)	SAR (1g)
Front side	633334/3500	0.989	0.974	1.015400411	N/A	N/A
Note: 1) When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.						
2) A second repeated measurement was preformed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg (~ 10% from the 1-g SAR limit).						
3) A third repeated measurement was preformed only if the original, first or second repeated measurement was ⩾ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20.						
4) Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg						

9.2.3 SAR Result of NR Band n77 Part 27O (PC2)

SA N77 SAR Test Record											
Main Ant.											
Test position	BW.	Modulation	Test ch./Freq.	Duty Cycle	SAR (W/kg) 1-g	Power drift (dB)	Conducted Power(dBm)	Tune up Limit(dBm)	Scaled factor	Scaled SAR 1-g (W/kg)	Liquid Temp.(℃)
Body (Sensor on) Test data(Separate 5mm 1RB)											
Front side	100	QPSK 1_1	656000/3840	1:1	0.351	-0.05	15.82	16.50	1.169	0.410	22.2
Back side	100	QPSK 1_1	656000/3840	1:1	0.176	0.11	15.82	16.50	1.169	0.206	22.2
Left side	100	QPSK 1_1	656000/3840	1:1	0.285	-0.04	15.82	16.50	1.169	0.333	22.2
Body (Sensor on) Test data (Separate 5mm 50%RB)											
Front side	100	QPSK 135_69	656000/3840	1:1	0.315	0.10	15.50	16.50	1.259	0.397	22.2
Back side	100	QPSK 135_69	656000/3840	1:1	0.146	0.09	15.50	16.50	1.259	0.184	22.2
Left side	100	QPSK 135_69	656000/3840	1:1	0.252	0.04	15.50	16.50	1.259	0.317	22.2
Body (Sensor off) Test data(Separate 1RB)											
Front side-24mm	100	QPSK 1_1	656000/3840	1:1	0.517	-0.04	25.41	26.00	1.146	0.592	22.2
Back side-8mm	100	QPSK 1_1	656000/3840	1:1	0.509	-0.14	25.41	26.00	1.146	0.583	22.2
Left side-24mm	100	QPSK 1_1	656000/3840	1:1	0.421	-0.07	25.41	26.00	1.146	0.482	22.2
Right side-5mm	100	QPSK 1_1	656000/3840	1:1	0.224	0.03	25.41	26.00	1.146	0.257	22.2
Bottom side-5mm	100	QPSK 1_1	656000/3840	1:1	0.504	-0.19	25.41	26.00	1.146	0.577	22.2
Body Test data (Separate 50%RB)											
Front side-24mm	100	QPSK 135_69	656000/3840	1:1	0.464	0.01	25.34	26.00	1.164	0.540	22.2
Back side-8mm	100	QPSK 135_69	656000/3840	1:1	0.451	0.19	25.34	26.00	1.164	0.525	22.2
Left side-24mm	100	QPSK 135_69	656000/3840	1:1	0.372	-0.14	25.34	26.00	1.164	0.433	22.2
Right side-5mm	100	QPSK 135_69	656000/3840	1:1	0.224	-0.01	25.34	26.00	1.164	0.261	22.2
Bottom side-5mm	100	QPSK 135_69	656000/3840	1:1	0.456	0.05	25.34	26.00	1.164	0.531	22.2

Table 7： SAR of NR Band n77 Part 27O (PC2) for Body is covering NR Band n78.

10 Equipment list

Test Platform		SPEAG DASY5 Professional				
Description		SAR Test System (Frequency range 300MHz-6GHz)				
Software Reference		DASY52 52.10.4(1527); SEMCAD X 14.6.14(7483)				
Hardware Reference						
Equipment		Manufacturer	Model	Serial Number	Calibration Date	Due date of calibration
☒	DAE	SPEAG	DAE4	1484	2024-10-15	2025-10-14
☒	Twin Phantom	SPEAG	SAM 8	1824	NCR	NCR
☒	E-Field Probe	SPEAG	EX3DV4	3982	2024-04-29	2025-04-28
☒	Validation Kits	SPEAG	D3500V2	1082	2022-09-19	2025-09-18
☒	Validation Kits	SPEAG	D3700V2	1046	2022-09-15	2025-09-14
☒	Validation Kits	SPEAG	D3900V2	1026	2022-09-16	2025-09-15
☒	Dielectric parameter probes	SPEAG	DAKS-3.5	1102	N/A	N/A
☒	Universal Radio Communication Tester	R&S	CMW500	111637	2024-09-12	2025-09-11
☒	RF Bi-Directional Coupler	Agilent	86205-60001	MY31400031	NCR	NCR
☒	Signal Generator	R&S	SMB100A	182393	2025-02-05	2026-02-04
☒	Preamplifier	Qiji	YX28980933	202104001	NCR	NCR
☒	Power Sensor	Keysight	U2002H	121251	2024-09-13	2025-09-12
☒	Attenuator	SHX	TS2-3dB	30704	NCR	NCR
☒	Coaxial low pass filter	Mini-Circuits	VLF-2500(+)	NA	NCR	NCR
☒	Coaxial low pass filter	Microlab Fxr	LA-F13	NA	NCR	NCR
☒	DC POWER SUPPLY	SAKO	SK1730SL5A	NA	NCR	NCR
☒	Speed reading thermometer	LKM	DTM3000	NA	2024-09-14	2025-09-13
☒	Humidity and Temperature Indicator	MingGao	MingGao	NA	2024-09-16	2025-09-15

Note: All the equipments are within the valid period when the tests are performed.

11 Calibration certificate

Please see the Appendix C

12 Photographs

Please see the Appendix D

Appendix A: Detailed System Check Results

Appendix B: Detailed Test Results

Appendix C: Calibration certificate

Appendix D: Photographs

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