

**KDB 865664 D01 SAR Measurement 100MHz to 6GHz
FCC 47 CFR part 2 (2.1093)**

SAR EVALUATION REPORT

For

**Model*: Quectel EG91
Contains FCC ID*: 2BM9G-0044000901**

**REPORT NUMBER UL-SAR-RP14983490JD07A V5.0
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Prepared for

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1. Attestation of Test Results

Applicant Name:	ENIGMA SYSTEMY OCHRONY INFORMACJI SP. Z O.O.					
Model*:	Quectel EG91					
Applicable Standards	FCC 47 CFR part 2 (2.1093) FCC KDB publications					
Test Device is	A representative test sample					
Device category*	Portable					
Date Tested	22 May 2024 to 31 May 2024					
ICNIRP Guidelines Limits for SAR Exposure Characteristics	General Population/Localised SAR (Extremity/Limbs) – 10g-SAR limit 4.0 W/kg					
The highest reported SAR values for Localized SAR						
RF Exposure Conditions		Equipment Class				
		Licensed	DTS	U-NII	DSS	SRD
Standalone	Extremity	1.21 W/kg	N/A	N/A	N/A	N/A
Simultaneous Transmission	Extremity	N/A	N/A	N/A	N/A	N/A
Test Results	Pass					
1. This test report shall not be reproduced except in full without the written approval of UL International (UK) Ltd. 2. The results documented in this report apply only to the sample(s) tested. 3. All Pass/Fail indications in this report are observations based on the measurements recorded herein from testing performed in accordance with the standards named above. 4. The measurements in this report are traceable to national or international standards. 5. This report must not be used by the client to claim product certification, approval, or endorsement by UKAS. 6. This report is written to support regulatory compliance of the standards named above. 7. Throughout this report, all information marked with (*) was provided by the Customer, Applicant or Authorised representative.						
Issued By:			Prepared By:			
						
Naseer Mirza Operations Leader			Muhammad Kunnumal Test Engineer			

2. Test Specification, Methods and Procedures

2.1. Test Specification

Reference:	KDB Publication Number: 865664 D01 SAR Measurement 100 MHz to 6 GHz
Title:	SAR Measurement Requirements for 100 MHz to 6 GHz
Introduction:	The SAR Measurement procedures for 100MHz to 6GHz are described in this document. Field probes, tissue dielectric properties, SAR scans, measurement accuracy and variability of the measured results are discussed. The field probe and SAR scan requirements are derived from criteria considered in standard IEEE 1528-2013. The wireless product and technology specific procedures in applicable KDB publications are required to be used unless further guidance has been approved by the FCC.
Purpose of Test:	To determine if the Equipment Under Test complies with the Specific Absorption Rate for general population/uncontrolled exposure limit of 1.6 W/kg as specified in FCC 47 CFR part 2 (2.1093).

2.2. Methods and Procedures Reference Documentation

The methods and procedures used are as detailed in:

IEEE 1528:2013

IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Head from Wireless Communication Devices: Measurement Techniques

IEC/IEEE 62209-1528: 2020

Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices.

FCC KDB Publication:

KDB 447498 D03 Supplement C Cross-Reference v01
 KDB 447498 D04 Interim General RF Exposure Guidance v01
 KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz v01r04
 KDB 865664 D02 RF Exposure Reporting v01r02
 KDB 941225 D01 3G SAR Procedures v03r01
 KDB 941225 D05 SAR for LTE Devices v02r05

2.3. Definition of Measurement Equipment

The measurement equipment used complied with the requirements of the standards referenced in the methods & procedures section above. Section 4.3 contains a list of the test equipment used.

3. Facilities and Accreditation

The measurement facilities used to collect data are located at

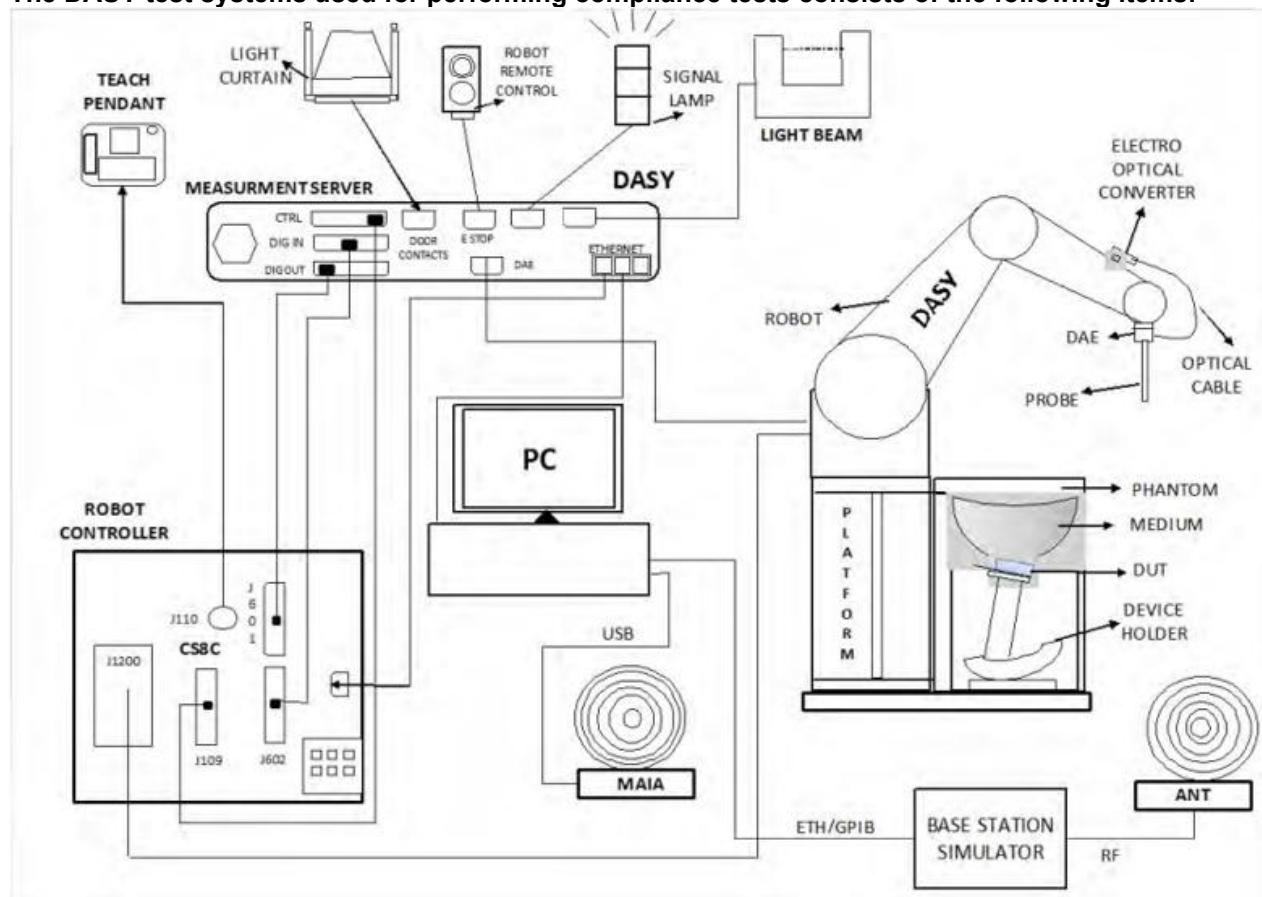
Horizon Unit 1-4, Wade Road, Kingsland Business Park, Basingstoke, Hampshire, RG24 8AH, UK	Facility Type
SAR Lab 61	Controlled Environment Chamber
SAR Lab 62	Controlled Environment Chamber

UL International (UK) Limited is accredited by UKAS (United Kingdom Accreditation Service, Accredited to ISO/IEC 17025:2017), Laboratory UKAS Code 5772.

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

The DASY test systems used for performing compliance tests consists of the following items:



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win10 with DASY software installed.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Measurement Procedure

4.2.1. Normal SAR Measurement Procedure

The following procedure shall be performed for each of the test conditions

- a) Measure the local SAR at a test point within 8 mm of the phantom inner surface that is closest to the DUT.
- b) Measure the two-dimensional SAR distribution within the phantom (area scan procedure). The boundary of the measurement area shall not be closer than 20 mm from the phantom side walls. The distance between the measurement points should enable the detection of the location of local maximum with an accuracy of better than half the linear dimension of the tissue cube after interpolation. A maximum grid spacing of 20 mm for frequencies below 3 GHz and $(60/f \text{ [GHz]})$ mm for frequencies of 3 GHz and greater is recommended. The maximum distance between the geometrical centre of the probe detectors and the inner surface of the phantom shall be 5 mm for frequencies below 3 GHz and $\delta \ln(2)/2$ mm for frequencies of 3 GHz and greater, where δ is the plane wave skin depth and $\ln(x)$ is the natural logarithm. The maximum variation of the sensor-phantom surface distance shall be ± 1 mm for frequencies below 3 GHz and $\pm 0,5$ mm for frequencies of 3 GHz and greater. At all measurement points the angle of the probe with respect to the line normal to the surface should be less than 5° . If this cannot be achieved for a measurement distance to the phantom inner surface shorter than the probe diameter, additional uncertainty evaluation is needed.
- c) From the scanned SAR distribution, identify the position of the maximum SAR value, in addition identify the positions of any local maxima with SAR values within 2 dB of the maximum value that will not be within the zoom scan of other peaks; additional peaks shall be measured only when the primary peak is within 2 dB of the SAR compliance limit (e.g., 1 W/kg for 1,6 W/kg 1 g limit, or 1,26 W/kg for 2 W/kg, 10 g limit).
- d) Measure the three-dimensional SAR distribution at the local maxima locations identified in step c) (zoom scan). For frequencies at or below 3 GHz, the following procedure shall be applied: The horizontal grid step shall be 8 mm or less. The grid step in the vertical direction shall be 5 mm or less if uniform spacing is used. If variable spacing is used in the vertical direction, the maximum spacing between the two closest measured points to the phantom shell (M1 and M2) shall be 4 mm or less and the spacing between farther points shall increase by a factor of 1,5 or less. The minimum size of the zoom scan volume shall be 30 mm by 30 mm by 30 mm.

For frequencies above 3 GHz, the minimum size of the zoom scan volume may be reduced to 22 mm by 22 mm by 22 mm. The horizontal grid step shall be $(24/f \text{ [GHz]})$ mm or less. If uniform spacing in the vertical direction is used, the grid step in the vertical direction shall be $(10/(f \text{ [GHz]} - 1))$ mm or less. If variable spacing is used in the vertical direction, the maximum spacing between the two measured points closest to the phantom shell shall be $(12/f \text{ [GHz]})$ mm or less and the spacing between further points shall increase by a factor of 1,5 or less. For other parameters, see Zoom Scan Parameters table.

When the highest 1 g or 10 g cube is touching the boundary of a zoom-scan volume, the entire zoom scan shall be repeated with the new centre located at the maximum SAR location indicated by the preceding zoom scan measurement. If the zoom scan measured as defined above complies with both of the following criteria, or if the peak spatial-average SAR is below 0,1 W/kg, no additional measurements are needed:

1) the smallest horizontal distance from the local SAR peaks to all points 3 dB below the SAR peak shall be larger than the horizontal grid steps in both x and y directions (Δx , Δy). This shall be checked for the measured zoom scan plane conformal to the phantom at the distance z_{M1} . The minimum distance shall be recorded in the SAR test report;

2) the ratio of the SAR at the second measured point (M2) to the SAR at the closest measured point (M1) at the x-y location of the measured maximum SAR value shall be at least 30 %. This ratio (in %) shall be recorded in the SAR test report.

If one or both of the above criteria are not met, the zoom scan measurement shall be repeated using a finer resolution while keeping the other zoom scan parameters compatible with Zoom Scan Parameters table. New horizontal and vertical grid steps shall be determined from the measured SAR distribution so that the above criteria are met. Compliance with the above two criteria shall be demonstrated for the new measured zoom scan. The size of the higher resolution zoom scan and other parameters of Zoom Scan Parameters table shall apply. The closest point to the phantom shell shall be 2 mm or less for graded grids and the grading factor shall be 1,5 or less.

Uncertainties due to field distortion between the media boundary and the dielectric enclosure of the probe should also be minimized, which is achieved if the distance between the phantom surface and physical tip of the probe is larger than the probe tip diameter. Other methods may utilize correction procedures to compensate for boundary effects that enable high precision measurements closer than half the probe diameter. For all measurement points, the angle of the probe normal to the flat phantom surface shall be less than 5°.

Zoom Scan Parameters

Parameter	DUT transmit frequency being tested	
	$f \leq 3$ GHz	$3 \text{ GHz} < f \leq 6$ GHz
Maximum distance between the closest measured points and the phantom surface (z_{M1} in Figure 14 and Table 2, in mm)	5	$\delta \ln(2)/2$ ^a
Maximum angle between the probe axis and the flat phantom surface normal (α in Figure 14)	5°	5°
Maximum spacing between measured points in the x- and y-directions (Δx and Δy , in mm)	8	$24/f$ ^{b,c}
For uniform grids: Maximum spacing between measured points in the direction normal to the phantom shell (Δz_1 in Figure 14, in mm)	5	$10/(f - 1)$
For graded grids: Maximum spacing between the two closest measured points in the direction normal to the phantom shell (Δz_1 in Figure 14, in mm)	4	$12/f$
For graded grids: Maximum incremental increase in the spacing between measured points in the direction normal to the phantom shell ($R_z = \Delta z_2/\Delta z_1$ in Figure 14)	1,5	1,5
Minimum edge length of the zoom scan volume in the x- and y-directions (L_z in 7.2.5.3, in mm)	30	22
Minimum edge length of the zoom scan volume in the direction normal to the phantom shell (L_h in 7.2.5.3, in mm)	30	22
Tolerance in the probe angle	1°	1°
^a δ is the penetration depth for a plane-wave incident normally on a planar half-space. ^b This is the maximum spacing allowed, which may not work for all circumstances. ^c f is the frequency in GHz.		

- e) Use post processing (e.g. interpolation and extrapolation) procedures to determine the local SAR values at the spatial resolution needed for mass averaging.
- f) The local SAR should be measured at the same location as in Step a). SAR drift is assessed and reported in the uncertainty budget.

In the event that the evaluation of measurement drift exceeds the 5 % tolerance, it is required that SAR be reassessed following guidelines contained within this standard.

If the drift is larger than 5 %, then the measurement drift shall be considered a bias, not an uncertainty. A correction shall be applied to the measured SAR value. It is not necessary to record the drift in the uncertainty budget (i.e. $u_i = 0$ %). The uncertainty budget reported in a measurement report should correspond to the highest SAR value reported (after correction, if applicable). Alternatively, the uncertainty budget reported should cover all measurements, i.e., it should report a conservative value.

4.3. Test Equipment

Measuring equipment used to perform the tests is documented in this report and has been calibrated in accordance with UKAS' recommendations and is traceable to recognized national standards.

**Note: The test equipment was within 1-year annual calibration during the time of testing.

UL Asset No.	Instrument Name	Manufacturer	Type	Serial No.	Date Last Calibrated	Cal. Interval (Months)
168970	E-Field Probe	SPEAG	EX3DV4	7496	15 Mar 2024	12**
168969	E-Field Probe	SPEAG	EX3DV4	7497	15 Mar 2024	12**
134031	Data Acquisition Equipment	SPEAG	DAE4	1435	12 Feb 2024	12**
130804	Data Acquisition Equipment	SPEAG	DAE4	450	19 Oct 2023	12**
170206	Phantom	SPEAG	Twin SAM V8	1949	Cal. as part of system	-
234940	Phantom	SPEAG	Twin SAM V8	2128	Cal. as part of system	-
134145	Dipole Antenna	SPEAG	D900V2	1d168	13 Oct 2023	12**
168975	Dipole Antenna	SPEAG	D1800V2	2d218	08 Mar 2024	12**
130805	Dipole Antenna	SPEAG	D1800V2	2d009	09 Feb 2024	12**
132925	Dipole Antenna	SPEAG	D1900V2	537	14 Feb 2024	12**
130806	Dipole Antenna	SPEAG	D1900V2	540	13 Oct 2023	12**
180463	POWERSOURCE1	SPEAG	SE UMS 160 BA	4012	07 Mar 2024	12**
234642	POWERSOURCE1	SPEAG	SE UMS 160 CB	4313	12 Feb 2024	12**
151859	RS Hygrometer	RS Components	408-6109	612Q19R(2)	04 Mar 2024	12**
151858	RS Hygrometer	RS Components	408-6109	612Q19R(1)	04 Mar 2024	12**
191047	Body Handset Positioner	SPEAG	MD4HACV5	None	Cal. not required	-
133684	Body Handset Positioner	SPEAG	MD4HACV5	None	Cal. not required	-
132854	Head Handset Positioner	SPEAG	MD4HHTV5	None	Cal. not required	-
170221	Head Handset Positioner	SPEAG	MD4HHTV5	None	Cal. not required	-
133845	Measurement Server	SPEAG	SE UMS 011 EA	1437	Cal. not required	-
168794	Measurement Server	SPEAG	SE UMS 028 BB	1566	Cal. not required	-
138452	Phantom Support Structure	SPEAG	Phantom Table	-	Cal. not required	-
170217	Phantom Support Structure	SPEAG	Phantom Table	-	Cal. not required	-
131908	Robot Arm	Staubli	TX60 L	F14/5UA6A1/A/01	Cal. not required	-
168792	Robot Arm	Staubli	TX60 L	F17/5ETWA1/A/01	Cal. not required	-
131905	Robot Power Supply	SPEAG	CS8C	F14/5T5ZA1/C/01	Cal. not required	-
168800	Robot Power Supply	SPEAG	CS8C	F17/5ETWA1/C/01	Cal. not required	-
247859	Communication Test Set	Rohde & Schwarz	CMW500	140331	23 Apr 2024	12**
206673	Communication Test Set	Rohde & Schwarz	CMW500	143584	02 May 2024	12**
137944	Communication Test Set	Rohde & Schwarz	CMW500	145921	14 Dec 2023	12**
132628	Communication Test Set	Anritsu	MT8821C	6200938937	10 Nov 2023	12**
166282	Power Sensor	Rohde & Schwarz	NRP-Z51	103031-NV	05 Dec 2023	12**
133925	Power Sensor	Rohde & Schwarz	NRP-Z51	103246	11 Mar 2024	12**
166281	Power Sensor	Rohde & Schwarz	NRP-Z51	104649-JG	28 Mar 2024	12**
248445	Thermometer (Fluid)	R & S	Test 925	84796614	07 May 2024	12**
248442	Thermometer (Fluid)	R & S	TEST0 925	84866571	07 May 2024	12**
147741	Vector Network Analyser	Rohde & Schwarz	ZND 132.5170K92	100151	15 Feb 2024	12**
235355	DAK 3.5 Fluid Probe	SPEAG	SM DAK 040 CA	1337	Cal. before use	-
133906	DAK 3.5 Fluid Probe	SPEAG	SM DAK 040 CA	1089	Cal. before use	-
212960	Digital Camera	Nikon	S3600	41010357	Cal. not required	-
184269	RF Coax Cable	Taoglas	CAB.721	-	Cal. not required	-
184271	RF Coax Cable	Taoglas	CAB.721	-	Cal. not required	-
134732	RF Coax Cable	-	70530/4PE	-	Cal. not required	-
137559	RF Coax Cable	Huber+Suhner	ST18/SMAm/Nm/36	-	Cal. not required	-
170215	Antenna	SPEAG	Mod. and Audio Interf. Analyzer	1236	Cal. not required	-

4.3.1. SAR System Specifications

Robot System	
Positioner:	Stäubli Unimation Corp. Robot Model: TX60L
Repeatability:	±0.030 mm
No. of Axes:	6
Serial Number:	F14/5UA6A1/A/01; F17/5ETWA1/A/01
Reach:	920 mm
Payload:	2.0 kg
Control Unit:	CS8C
Programming Language:	V+
Data Acquisition Electronic (DAE) System	
Serial Number:	DAE4: 1435; 450
PC Controller	
PC:	HP EliteDesk800
Operating System:	Windows 10
Data Card:	DASY Measurement Server
Data Converter	
Features:	Signal Amplifier, multiplexer, A/D converted and control logic.
Software:	DASY6 PRO Software
Connecting Lines:	Optical downlink for data and status info. Optical uplink for commands and clock.
PC Interface Card	
Function:	24 bit (64 MHz) DSP for real time processing Link to DAE4 16 bit A/D converter for surface detection system serial link to robot direct emergency stop output for robot.
Phantom	
Phantom:	SAM Phantom
Shell Material:	Fibreglass
Thickness:	2.0 ±0.1 mm

E-Field Probe	
Model:	EX3DV4
Serial No:	7496; 7497
Construction:	Triangular core
Frequency:	10 MHz to > 6 GHz
Linearity:	± 0.2 dB (30 MHz to 6 GHz)
Probe Length (mm):	337
Probe Diameter (mm):	10
Tip Length (mm):	9
Tip Diameter (mm):	2.5
Sensor X Offset (mm):	1
Sensor Y Offset (mm):	1
Sensor Z Offset (mm):	1

5. Measurement Uncertainty

No measurement or test can ever be perfect and the imperfections give rise to error of measurement in the results. Consequently, the result of a measurement is only an approximation to the value of the measurand (the specific quantity subject to measurement) and is only complete when accompanied by a statement of the uncertainty of the approximation.

The expression of uncertainty of a measurement result allows realistic comparison of results with reference values and limits given in specifications and standards.

The uncertainty of the result may need to be taken into account when interpreting the measurement results.

The reported expanded uncertainties below are based on a standard uncertainty multiplied by an appropriate coverage factor, such that a confidence level of approximately 95% is maintained. For the purposes of this document “approximately” is interpreted as meaning “effectively” or “for most practical purposes”.

Test Name	Confidence Level	Calculated Uncertainty
Uncertainty- Freq. 300 MHz - 3 GHz Head & Body Configuration 10g	95%	±25.4%

5.1.Method of Calculation

The methods used to calculate the above uncertainties are in line with those recommended within the various measurement specifications. Where measurement specifications do not include guidelines for the evaluation of measurement uncertainty, the published guidance of the appropriate accreditation body is followed.

5.2. Equipment Accuracy and Decision Rule

Measurement system instrumentation shall be used with an accuracy specification meeting the accuracy specification limits according to IEC/IECEE OD-5014.

As applicable, unless specified otherwise in this quotation, the compliance “Decision Rule” is based on Simple Acceptance. If the measured value is on the limit, the result is defined as a pass. In this case the risk of a false positive is 50%. For further information regarding risk assessment refer to ILAC G8:09/2019.

5.3.Uncertainty – Freq. 300MHz - 3 GHz Head & Body Configuration 10g

Type	Source of uncertainty	+ Value	- Value	Probability Distribution	Divisor	C _i (10g)	Standard Uncertainty		v _i or v _{eff}
							+ u (%)	- u (%)	
B	Probe calibration	12.000	12.000	normal (k=2)	2.0000	1.0000	6.000	6.000	∞
B	Probe calibration drift	1.700	1.700	Rectangular	1.7321	1.0000	0.981	0.981	∞
B	Probe Linearity and Detection Limits	4.700	4.700	Rectangular	1.7321	1.0000	2.714	2.714	∞
B	Broadband Signal	3.000	3.000	Rectangular	1.7321	1.0000	1.732	1.732	∞
B	Probe Isotropy	7.600	7.600	Rectangular	1.7321	1.0000	4.388	4.388	∞
B	Data Acquisition	0.300	0.300	normal (k=1)	1.0000	1.0000	0.300	0.300	∞
B	RF Ambient conditions	0.260	0.260	normal (k=1)	1.0000	1.0000	0.260	0.260	∞
B	Probe Positioning	0.600	0.600	normal (k=1)	1.0000	0.1400	0.084	0.084	∞
B	Data Processing Errors	4.000	4.000	Rectangular	1.7321	1.0000	2.309	2.309	∞
B	Uncertainty in SAR correction for deviations in permittivity and conductivity	1.900	1.900	normal (k=1)	1.0000	0.8400	1.596	1.596	∞
B	Liquid Conductivity (measured value)	2.500	2.500	normal (k=1)	1.0000	0.7100	1.775	1.775	∞
B	Liquid Permittivity (measured value)	2.500	2.500	normal (k=1)	1.0000	0.0000	0.000	0.000	∞
B	Liquid Conductivity (temperature uncertainty)	3.300	3.300	Rectangular	1.7321	0.7100	1.353	1.353	∞
B	Liquid Permittivity (temperature uncertainty)	0.310	0.310	Rectangular	1.7321	0.0000	0.000	0.000	∞
B	Phantom Shell Permittivity	14.000	14.000	Rectangular	1.7321	0.0000	0.000	0.000	∞
B	Distance DUT - TSL	2.000	2.000	normal (k=1)	1.0000	2.0000	4.000	4.000	∞
A	Test Sample Positioning	4.240	4.240	normal (k=1)	1.0000	1.0000	4.240	4.240	25
A	Device Holder uncertainty	6.090	6.090	normal (k=1)	1.0000	1.0000	6.090	6.090	5
B	DUT Modulation	2.400	2.400	Rectangular	1.7321	1.0000	1.386	1.386	∞
B	Drift of output power	5.000	5.000	Rectangular	1.7321	1.0000	2.887	2.887	∞
	Combined standard uncertainty			t-distribution			12.69	12.69	92
	Expanded uncertainty			k = 2			25.4	25.4	92

6. Equipment Under Test (EUT)

6.1. Description of Equipment Under Test (EUT)

DUT Description:	The equipment under test (EUT) was a cellular module integrated into curfew enforcement ankle bracelet OPT3+.	
Serial Number*:	Radiated Sample(s)	04270020 04270021 04270709 04270010 04270022
	Conducted Sample(s)	04270030 04270031 04270023
Hardware Version Number*:	12440603	
Software Version Number*:	1.0.8	
Baseband Firmware Version*:	1.0.8	
Country of Manufacture*:	Poland	
Date of Receipt:	15 Feb 2024	
Operating Configurations	Extremity	
Device dimension	Overall (Length x Width x Depth): 80.2 mm x 76.3 mm x 27.3 mm	
Battery Type	☒ Standard – Lithium-ion battery ☐ Extended (large capacity)	

6.2. Wireless Technologies

Wireless technologies	Frequency bands	Operating mode	Duty Cycle
W-CDMA ☒ (FDD) ☐ (TDD)	Band 2 Band 5	WCDMA Rel. 99 (Voice & Data) HSDPA (Rel. 5)	100%
LTE ☒ (FDD) ☐ (TDD)	Band 2 Band 4 Band 5 Band 66	QPSK 16QAM	100% (FDD)

Additional Information Related to Testing:

Antenna Type:	Internal integral
Antenna Lengths:	As specified in Appendix 11.1

Number of Antennas:	Antenna Name	Antenna Type	Type
	WWAN	Cellular	1 fixed

Additional Information Related to Testing:

WCDMA			
Band	Description		
WCDMA FDD 2	Frequency Range: 1852 - 1908 MHz		
	Channel Number	Channel Description	Frequency (MHz)
	9262	Low	1852.4
	9400	Middle	1880
	9538	High	1907.6
WCDMA FDD 5	Frequency Range: 824 - 849 MHz		
	Channel Number	Channel Description	Frequency (MHz)
	4132	Low	826.4
	4183	Middle	836.6
	4233	High	846.6

LTE							
Band	Description						
LTE FDD 2	Frequency Range: 1850 - 1910 MHz						
	Channel Description	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Channel No. / Freq. (MHz)						
	Low	18700 / 1860	18675 / 1857.5	18650 / 1855	18625 / 1712.5	18615 / 1851.5	18607 / 1850.7
	Mid	18900 / 1880	18900 / 1880	18900 / 1880	18900 / 1880	18900 / 1880	18900 / 1880
	High	19100 / 1900	19125 / 1902.5	19150 / 1905	19175 / 1907.5	19185 / 1908.5	19193 / 1909.3
LTE FDD 4	Frequency Range: 1710 - 1755 MHz						
	Channel Description	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Channel No. / Freq. (MHz)						
	Low	20050 / 1720	20025 / 1717.5	20000 / 1715	19975 / 1712.5	19965 / 1711.5	19957 / 1710.7
	Mid	20175 / 1732.5	20175 / 1732.5	20175 / 1732.5	20175 / 1732.5	20175 / 1732.5	20175 / 1732.5
	High	20300 / 1745	20325 / 1747.5	20350 / 1750	20375 / 1752.5	20385 / 1753.5	20393 / 1754.3
LTE FDD 5	Frequency Range: 824 - 849 MHz						
	Channel Description	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Channel No. / Freq. (MHz)						
	Low			20450 / 829	20425 / 826.5	20415 / 825.5	20407 / 824.7
	Mid			20525 / 836.5	20525 / 836.5	20525 / 836.5	20525 / 836.5
	High			20660 / 844	20625 / 846.5	20635 / 847.5	20643 / 848.3
LTE FDD 66	Frequency Range: 1710- 1780 MHz						
	Channel Description	Channel Bandwidth					
		20 MHz	15 MHz	10 MHz	5 MHz	3 MHz	1.4 MHz
	Channel No. / Freq. (MHz)						
	Low	132072 / 1720	132047 / 1717.5	132022 / 1715	131997 / 1712.5	131987 / 1711.5	131979 / 1710.7
	Mid	132322 / 1745	132322 / 1745	132322 / 1745	132322 / 1745	132322 / 1745	132322 / 1745
	High	132575 / 1770	132597 / 1772.5	132622 / 1775	132645 / 1777.5	132657 / 1778.5	132665 / 1779.3

6.3.Nominal and Maximum Output power*: WCDMA

RF Air interface	Channel/ Frequency	Mode	Target + Max. Tolerances (dBm)
Band 2	All	RMC Mode	23.70
		HSDPA Sub-Test 1	23.70
		HSDPA Sub-Test 2	23.70
		HSDPA Sub-Test 3	23.20
		HSDPA Sub-Test 4	23.20
		HSUPA Sub-Test 1	23.70
		HSUPA Sub-Test 2	21.70
		HSUPA Sub-Test 3	22.70
		HSUPA Sub-Test 4	21.70
		HSUPA Sub-Test 5	23.70
		DC-HSDPA Sub-Test 1	23.70
		DC-HSDPA Sub-Test 2	23.70
		DC-HSDPA Sub-Test 3	23.20
		DC-HSDPA Sub-Test 4	23.20
Band 5	All	RMC Mode	23.70
		HSDPA Sub-Test 1	23.70
		HSDPA Sub-Test 2	23.70
		HSDPA Sub-Test 3	23.20
		HSDPA Sub-Test 4	23.20
		HSUPA Sub-Test 1	23.70
		HSUPA Sub-Test 2	21.70
		HSUPA Sub-Test 3	22.70
		HSUPA Sub-Test 4	21.70
		HSUPA Sub-Test 5	23.70
		DC-HSDPA Sub-Test 1	23.70
		DC-HSDPA Sub-Test 2	23.70
		DC-HSDPA Sub-Test 3	23.20
		DC-HSDPA Sub-Test 4	23.20

Note:

1. The nominal and maximum average source based rated powers declared and supplied by manufacturer are shown in the above tables and including of the Upper Tolerance.

6.4.Nominal and Maximum Output power*: LTE

RF Air interface	Channel	BW (MHz)	Mode	Target + Max. Tolerances (dBm)		
				1RB	50%RB	100%RB
LTE B2	All	1.4	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		3	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		5	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		10	QPSK	23.40	22.40	
			16QAM	22.40	21.40	Not Supported
		15	QPSK	23.40	22.40	
			16QAM	22.40	Not Supported	
LTE B4	All	1.4	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		3	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		5	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		10	QPSK	23.40	22.40	
			16QAM	22.40	21.40	Not Supported
		15	QPSK	23.40	22.40	
			16QAM	22.40	Not Supported	
LTE B5	All	1.4	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		3	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		5	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		10	QPSK	23.40	22.40	
			16QAM	22.40	21.40	Not Supported
LTE B66	All	1.4	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		3	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		5	QPSK	23.40	22.40	
			16QAM	22.40	21.40	
		10	QPSK	23.40	22.40	
			16QAM	22.40	21.40	Not Supported
		15	QPSK	23.40	22.40	
			16QAM	22.40	Not Supported	
		20	QPSK	23.40	22.40	
			16QAM	22.40	Not Supported	

Note:

1. The nominal and maximum average source based rated powers declared and supplied by manufacturer are shown in the above tables and including of the Upper Tolerance.
2. These are specified maximum allowed average power for all the wireless modes and frequency bands supported.

7. RF Exposure Conditions (Test Configurations)

7.1. Configuration Consideration

Technology Port	Configuration	DUT-to-User Separation	Position	Antenna-to-Edge Separation (mm)	Evaluation Considered
Cellular (Ant 1)	Limbs/Extremity	0mm	Front	< 50	Yes
			Back	< 50	Yes
			Edge 1 (Top Edge)	< 50	Yes
			Edge 2 (Right Edge)	< 50	Yes
			Edge 3 (Bottom Edge)	< 50	Yes
			Edge 4 (Left Edge)	< 50	Yes

Notes

1. The Antenna to edge separation distances is indicated in the 'Antenna Schematics' located in Section 11.1 of this report.
2. Prior to testing, FCC was contacted for test plan approval via KDB inquiry.

7.2. SAR Test Exemption Consideration

Frequency Band	Configuration(s)
	Extremity/Limbs
Cellular (Ant 1)	No

Note:

1. As per KDB 447498 D04, the frequency bands with rated power including upper tolerance, which qualify for **Standalone SAR Test Exemption**, are as per the above table.
2. The details for the Maximum Rated Power and tolerance(s) can be found in section 6.

8. Conducted output power measurements

8.1. RF Output Average Power Measurement: WCDMA

As per KDB 941225 D01v03r01, SAR measurement is not required for the HSDPA, HSUPA and DC-HSDPA. When the primary mode and the adjust SAR is $\leq 75\%$ of the SAR limit and secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode.

Modes			HSDPA				HSUPA					DC-HSDPA (Cat 24)				WCDMA
Sets			1	2	3	4	1	2	3	4	5	1	2	3	4	Voice / RMC 12.2kbps
Band	Ch.	Freq (MHz)	Power [dBm]													
2	9262	1852.4	21.60	21.05	21.20	21.00	21.55	21.00	21.60	21.60	21.10	21.70	21.00	20.90	20.90	22.50
	9400	1880.0	21.70	21.20	21.30	21.30	21.70	21.20	21.70	21.60	21.00	21.70	21.00	21.10	20.90	22.70
	9538	1907.6	21.75	21.20	21.20	21.25	21.75	21.30	21.85	21.60	21.30	21.70	21.00	21.10	20.90	22.60
5	4132	826.4	23.00	22.60	22.60	22.50	23.00	22.45	23.00	22.80	22.40	22.80	22.20	22.30	22.30	23.20
	4183	836.6	22.90	22.70	22.60	22.60	23.00	22.30	22.90	23.00	22.40	22.90	22.30	22.30	22.40	23.20
	4233	846.6	22.90	22.50	22.60	22.60	22.90	22.50	22.90	22.80	22.40	22.80	22.30	22.40	22.40	23.30
βc			2	12	15	15	11	6	15	2	15	2	12	15	15	
βd			15	15	8	4	15	15	9	15	15	15	15	8	4	
ΔACK, ΔNACK, ΔCQI			8	8	8	8	8	8	8	8	8	8	8	8	8	
AGV			-	-	-	-	20	12	15	17	21	-	-	-	-	

8.2.RF Output Average Power Measurement: LTE

As defined in the 3GPP specification, RF Output Power of 16QAM < QPSK.

LTE FDD Band 2

Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	49 Offset	99 Offset	0 Offset	25 Offset	50 Offset	
20	Extremity	QPSK	18700	1860.0	21.90	21.80	21.60	20.70	20.75	20.80	20.75
			18900	1880.0	21.50	21.85	21.50	20.65	20.75	20.65	20.70
			19100	1900.0	21.60	21.50	21.90	20.65	20.70	20.70	20.60
		16QAM	18700	1860.0	20.60	20.90	21.10	Not Supported			
			18900	1880.0	21.20	21.60	20.90				
			19100	1900.0	21.00	21.30	21.30				
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	37 Offset	74 Offset	0 Offset	19 Offset	39 Offset	
15	Extremity	QPSK	18675	1857.5	22.50	22.50	22.40	21.45	21.50	21.50	21.45
			18900	1880.0	22.80	22.65	22.50	21.75	21.65	21.55	21.75
			19125	1902.5	22.35	22.45	22.40	21.55	21.60	21.50	21.60
		16QAM	18675	1857.5	20.95	20.85	20.85	Not Supported			
			18900	1880.0	21.40	21.30	20.80				
			19125	1902.5	20.80	21.30	20.80				
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	25 Offset	49 Offset	0 Offset	13 Offset	25 Offset	
10	Extremity	QPSK	18650	1855.0	22.40	22.05	22.10	21.15	21.00	21.05	21.05
			18900	1880.0	22.40	22.25	22.20	21.40	21.30	21.30	21.35
			19150	1905.0	22.20	22.15	22.10	21.20	20.95	21.10	21.20
		16QAM	18650	1855.0	20.95	20.85	20.75	20.30	20.20	20.40	Not Supported
			18900	1880.0	21.50	21.30	21.20	20.55	20.80	20.70	
			19150	1905.0	20.90	21.15	20.95	20.40	20.35	20.25	
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	13 Offset	24 Offset	0 Offset	7 Offset	13 Offset	
5	Extremity	QPSK	18625	1852.5	22.20	22.40	22.20	21.10	21.10	21.10	21.15
			18900	1880.0	22.30	22.25	22.15	21.35	21.40	21.35	21.25
			19175	1907.5	22.10	22.00	22.10	21.00	21.05	21.10	21.15
		16QAM	18625	1852.5	21.05	20.85	21.20	20.30	20.35	20.45	20.50
			18900	1880.0	21.40	21.40	21.20	20.40	20.40	20.30	20.60
			19175	1907.5	21.15	20.90	20.80	20.30	20.20	20.30	20.45
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	8 Offset	14 Offset	0 Offset	4 Offset	7 Offset	
3	Extremity	QPSK	18615	1851.5	22.75	22.55	22.70	21.60	21.70	21.50	21.60
			18900	1880.0	22.80	22.50	22.65	21.70	21.80	21.80	21.70
			19185	1908.5	22.70	22.60	22.65	21.60	21.70	21.60	21.65
		16QAM	18615	1851.5	21.40	21.25	21.25	20.60	20.55	20.55	20.60
			18900	1880.0	21.45	21.40	21.50	20.70	20.70	20.60	20.80
			19185	1908.5	21.20	20.95	21.25	20.45	20.50	20.50	20.70
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	3 Offset	5 Offset	0 Offset	2 Offset	3 Offset	
1.4	Extremity	QPSK	18607	1850.7	22.55	22.60	22.45	22.65	22.65	22.55	21.60
			18900	1880.0	22.60	22.70	22.60	22.85	22.85	22.70	21.80
			19193	1909.3	22.55	22.55	22.55	22.65	22.65	22.60	21.55
		16QAM	18607	1850.7	20.85	21.25	21.25	21.45	21.35	21.45	20.35
			18900	1880.0	21.25	21.35	21.50	21.40	21.55	21.45	20.55
			19193	1909.3	21.15	20.95	20.70	21.40	21.40	21.35	20.35

LTE FDD Band 4

Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	49 Offset	99 Offset	0 Offset	25 Offset	50 Offset		
20	Extremity	QPSK	20050	1720.0	21.80	21.90	22.05	20.75	20.80	20.90	20.80	
			20175	1732.5	21.95	21.85	21.80	20.85	20.85	20.70	20.80	
			20300	1745.0	21.90	21.75	21.80	20.90	20.75	20.75	20.70	
		16QAM	20050	1720.0	20.50	20.50	20.70	Not Supported				
			20175	1732.5	20.50	20.80	20.50					
			20300	1745.0	20.70	20.60	20.50					
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	37 Offset	74 Offset	0 Offset	19 Offset	39 Offset		
15	Extremity	QPSK	20025	1717.5	21.80	21.90	22.05	20.80	20.80	20.70	20.75	
			20175	1732.5	21.90	22.10	21.80	21.05	21.05	20.95	21.00	
			20325	1747.5	22.25	21.55	21.75	20.90	20.75	20.60	20.80	
		16QAM	20025	1717.5	20.50	20.45	20.80	Not Supported				
			20175	1732.5	20.60	20.50	20.50					
			20325	1747.5	20.45	20.45	20.45					
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	25 Offset	49 Offset	0 Offset	13 Offset	25 Offset		
10	Extremity	QPSK	20000	1715.0	21.85	22.00	21.95	20.75	20.80	20.75	20.75	
			20175	1732.5	21.65	21.90	21.75	21.00	20.85	20.75	20.80	
			20350	1750.0	21.90	21.75	21.80	20.80	20.75	20.60	20.70	
		16QAM	20000	1715.0	20.45	20.60	20.50	19.80	19.85	19.90	Not Supported	
			20175	1732.5	20.70	20.95	20.45	20.05	20.10	20.05		
			20350	1750.0	20.50	20.45	20.45	19.85	19.70	19.70		
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	13 Offset	24 Offset	0 Offset	7 Offset	13 Offset		
5	Extremity	QPSK	19975	1712.5	21.75	21.85	22.00	20.65	20.75	20.75	20.75	
			20175	1732.5	21.95	21.85	21.85	21.00	21.05	21.10	21.10	
			20375	1752.5	21.80	21.70	21.95	20.60	20.65	20.75	20.65	
		16QAM	19975	1712.5	20.45	20.45	20.45	19.55	19.55	19.80	19.75	
			20175	1732.5	20.75	20.70	20.65	19.95	20.05	20.00	20.15	
			20375	1752.5	20.45	20.50	20.45	19.45	19.45	19.70	19.65	
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	8 Offset	14 Offset	0 Offset	4 Offset	7 Offset		
3	Extremity	QPSK	19965	1711.5	21.95	22.00	22.10	20.90	21.00	20.90	20.95	
			20175	1732.5	22.40	22.30	22.30	21.40	21.35	21.30	21.30	
			20385	1753.5	21.75	21.85	22.00	20.90	21.00	20.90	20.75	
		16QAM	19965	1711.5	20.65	20.45	20.40	20.20	19.90	20.00	19.90	
			20175	1732.5	20.85	20.75	20.70	20.30	20.35	20.40	20.30	
			20385	1753.5	20.40	20.45	20.70	19.95	20.00	19.80	19.85	
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)							
					1RB			50%RB			100%RB	
					0 Offset	3 Offset	5 Offset	0 Offset	2 Offset	3 Offset		
1.4	Extremity	QPSK	19957	1710.7	21.80	21.90	21.85	22.10	22.05	22.00	20.85	
			20175	1732.5	22.20	22.30	22.15	22.40	22.35	22.30	21.20	
			20393	1754.3	21.75	22.00	21.95	22.05	22.10	22.10	21.00	
		16QAM	19957	1710.7	20.50	20.55	20.45	20.80	20.85	20.90	19.75	
			20175	1732.5	20.95	21.10	21.10	21.25	21.40	21.25	20.10	
			20393	1754.3	20.50	20.50	20.45	20.50	20.80	20.85	19.85	

LTE FDD Band 5

Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	25 Offset	49 Offset	0 Offset	13 Offset	25 Offset	
10	Extremity	QPSK	20450	829.0	22.50	22.45	22.45	21.60	21.55	21.55	21.60
			20525	836.5	22.35	22.40	22.30	21.55	21.55	21.50	21.40
			20600	844.0	22.45	22.40	22.45	21.60	21.35	21.35	21.50
		16QAM	20450	829.0	20.85	21.10	20.95	20.55	20.75	20.70	-
			20525	836.5	20.90	21.20	21.10	20.55	20.55	20.55	-
			20600	844.0	21.15	21.05	21.25	20.55	20.45	20.45	-
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	13 Offset	24 Offset	0 Offset	7 Offset	13 Offset	
5	Extremity	QPSK	20425	826.5	21.85	21.75	22.05	21.20	21.15	21.15	21.20
			20525	836.5	21.85	21.90	22.00	20.95	21.20	21.05	21.10
			20625	846.5	21.95	21.95	22.30	21.05	21.00	21.25	21.15
		16QAM	20425	826.5	21.05	20.80	20.75	20.45	20.35	20.35	20.60
			20525	836.5	21.20	21.25	21.10	20.25	20.55	20.55	20.65
			20625	846.5	21.10	20.90	21.15	20.25	20.40	20.45	20.55
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	8 Offset	14 Offset	0 Offset	4 Offset	7 Offset	
3	Extremity	QPSK	20415	825.5	22.70	22.80	22.55	22.00	21.90	21.75	21.95
			20525	836.5	22.80	22.90	22.85	21.80	21.90	21.90	21.90
			20635	847.5	22.75	22.75	23.00	21.70	21.75	21.85	21.75
		16QAM	20415	825.5	21.25	21.15	20.90	20.85	21.00	20.95	21.00
			20525	836.5	21.90	21.60	21.55	20.95	20.75	20.75	20.70
			20635	847.5	21.15	21.15	21.30	20.80	20.70	20.80	20.50
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	3 Offset	5 Offset	0 Offset	2 Offset	3 Offset	
1.4	Extremity	QPSK	20407	824.7	22.50	22.65	22.60	22.60	22.70	22.65	21.80
			20525	836.5	22.50	22.60	22.50	22.70	22.80	22.70	21.70
			20643	848.3	22.55	22.85	22.70	22.75	22.95	22.75	21.80
		16QAM	20407	824.7	21.50	21.20	20.90	21.55	21.75	21.75	20.60
			20525	836.5	21.40	21.60	21.60	21.55	21.60	21.55	20.50
			20643	848.3	21.45	21.50	21.50	21.50	21.70	21.70	20.55

LTE FDD Band 66

Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	49 Offset	99 Offset	0 Offset	25 Offset	50 Offset	
20	Extremity	QPSK	132072	1720.0	21.60	21.95	22.10	20.75	20.80	20.90	20.80
			132322	1745.0	22.15	21.85	21.65	21.00	20.85	20.65	20.90
			132572	1770.0	21.70	21.90	21.95	20.90	21.00	20.70	20.90
		16QAM	132072	1720.0	20.50	20.90	20.70	Not Supported			
			132322	1745.0	20.70	20.70	20.60				
			132572	1770.0	21.00	21.10	20.60				
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	37 Offset	74 Offset	0 Offset	19 Offset	39 Offset	
15	Extremity	QPSK	132047	1717.5	21.85	22.30	22.15	21.05	21.25	21.25	21.05
			132322	1745.0	22.45	22.10	21.95	21.25	21.05	20.90	21.25
			132597	1772.5	22.20	22.05	22.05	21.10	21.05	20.85	21.15
		16QAM	132047	1717.5	20.50	21.00	20.60	Not Supported			
			132322	1745.0	21.20	20.70	20.60				
			132597	1772.5	21.20	20.90	20.60				
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	25 Offset	49 Offset	0 Offset	13 Offset	25 Offset	
10	Extremity	QPSK	132022	1715.0	22.10	22.20	22.15	21.10	21.15	21.30	21.15
			132322	1745.0	22.35	22.15	21.90	21.30	21.10	20.90	21.15
			132622	1775.0	22.05	22.05	22.00	21.10	20.90	20.75	21.00
		16QAM	132022	1715.0	20.90	20.70	21.00	20.00	20.15	20.20	Not Supported
			132322	1745.0	20.80	20.80	20.50	20.15	20.05	19.85	
			132622	1775.0	20.75	20.75	20.45	20.10	20.10	20.00	
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	13 Offset	24 Offset	0 Offset	7 Offset	13 Offset	
5	Extremity	QPSK	131997	1712.5	21.50	21.50	21.65	20.55	20.55	20.70	20.65
			132322	1745.0	21.70	21.50	21.40	20.75	20.55	20.50	20.60
			132647	1777.5	21.50	21.45	21.65	20.50	20.45	20.50	20.50
		16QAM	131997	1712.5	20.75	20.50	20.65	19.90	20.00	20.05	20.05
			132322	1745.0	20.60	20.45	20.45	20.05	20.05	20.20	20.20
			132647	1777.5	20.50	20.50	20.45	19.85	19.90	19.95	20.00
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	8 Offset	14 Offset	0 Offset	4 Offset	7 Offset	
3	Extremity	QPSK	131987	1711.5	22.50	22.45	22.50	21.50	21.30	21.40	21.45
			132322	1745.0	22.60	22.30	22.45	21.40	21.40	21.25	21.45
			132657	1778.5	22.50	22.40	22.45	21.40	21.40	21.30	21.45
		16QAM	131987	1711.5	21.00	20.60	20.70	20.60	20.60	20.40	20.35
			132322	1745.0	21.20	21.10	21.15	20.50	20.60	20.30	20.40
			132657	1778.5	21.25	21.25	21.25	20.70	20.40	20.30	20.45
Ch.BW (MHz)	Config	Mode	Channel	Frequency (MHz)	Measured Avg Power (dBm)						
					1RB			50%RB			100%RB
					0 Offset	3 Offset	5 Offset	0 Offset	2 Offset	3 Offset	
1.4	Extremity	QPSK	131979	1710.7	22.25	22.35	22.35	22.50	22.30	22.30	21.25
			132322	1745.0	22.05	22.15	22.20	22.40	22.35	22.35	21.35
			132665	1779.3	22.35	22.30	22.10	22.45	22.40	22.35	21.40
		16QAM	131979	1710.7	21.15	21.15	20.70	21.35	21.35	21.30	20.25
			132322	1745.0	21.20	21.15	20.70	21.35	21.55	21.35	20.25
			132665	1779.3	21.15	21.20	21.15	21.45	21.55	21.45	20.35

9. Measurements, Examinations and Derived Result

9.1. Specific Absorption Rate - Test Results

9.1.1. WCDMA FDD 2 Extremity 10g

Max Reported SAR = 1.21 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
RMC	0	Front	9400	1880.0	N/A	N/A	23.70	22.70	0.93	1.17	-	
RMC	0	Back	9400	1880.0	N/A	N/A	23.70	22.70	0.39	0.49	-	
RMC	0	Right Side	9400	1880.0	N/A	N/A	23.70	22.70	0.24	0.30	-	
RMC	0	Left Side	9400	1880.0	N/A	N/A	23.70	22.70	0.71	0.90	-	
RMC	0	Top	9400	1880.0	N/A	N/A	23.70	22.70	0.02	0.03	-	
RMC	0	Bottom	9400	1880.0	N/A	N/A	23.70	22.70	0.26	0.33	-	
RMC	0	Front	9262	1852.4	N/A	N/A	23.70	22.50	0.92	1.21	-	001
RMC	0	Front	9538	1907.6	N/A	N/A	23.70	22.60	0.75	0.96	-	
RMC	0	Front	9262	1852.4	N/A	N/A	23.70	22.50	0.86	1.13	1	

Note(s):

1. Worst Case performed with unmodified sample.

9.1.2. WCDMA FDD 5 Extremity 10g

Max Reported SAR = 0.69 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
RMC	0	Front	4233	846.6	N/A	N/A	23.70	23.30	0.35	0.38	-	
RMC	0	Back	4233	846.6	N/A	N/A	23.70	23.30	0.07	0.08	-	
RMC	0	Right Side	4233	846.6	N/A	N/A	23.70	23.30	0.11	0.12	-	
RMC	0	Left Side	4233	846.6	N/A	N/A	23.70	23.30	0.08	0.08	-	
RMC	0	Top	4233	846.6	N/A	N/A	23.70	23.30	0.00	0.00	-	
RMC	0	Bottom	4233	846.6	N/A	N/A	23.70	23.30	0.12	0.13	-	
RMC	0	Front	4132	826.4	N/A	N/A	23.70	23.20	0.62	0.69	-	002
RMC	0	Front	4183	836.6	N/A	N/A	23.70	23.20	0.60	0.67	-	
RMC	0	Front	4132	826.4	N/A	N/A	23.70	23.20	0.52	0.59	1	

Note(s):

1. Worst Case performed with unmodified sample.

9.1.3. LTE FDD 2 Extremity 10g

Max Reported SAR = 0.99 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
QPSK	0	Front	18700	1860.0	1	0	23.40	21.90	0.62	0.88	-	
QPSK	0	Front	18700	1860.0	50	50	22.40	20.80	0.48	0.69	-	
QPSK	0	Back	18700	1860.0	1	0	23.40	21.90	0.36	0.51	-	
QPSK	0	Back	18700	1860.0	50	50	22.40	20.80	0.29	0.42	-	
QPSK	0	Left Side	18700	1860.0	1	0	23.40	21.90	0.60	0.85	-	
QPSK	0	Left Side	18700	1860.0	50	50	22.40	20.80	0.47	0.69	-	
QPSK	0	Right Side	18700	1860.0	1	0	23.40	21.90	0.25	0.35	-	
QPSK	0	Right Side	18700	1860.0	50	50	22.40	20.80	0.18	0.26	-	
QPSK	0	Top	18700	1860.0	1	0	23.40	21.90	0.02	0.02	-	
QPSK	0	Top	18700	1860.0	50	50	22.40	20.80	0.01	0.02	-	
QPSK	0	Bottom	18700	1860.0	1	0	23.40	21.90	0.16	0.23	-	
QPSK	0	Bottom	18700	1860.0	50	50	22.40	20.80	0.13	0.19	-	
QPSK	0	Front	18900	1880.0	1	50	23.40	21.85	0.62	0.89	-	
QPSK	0	Front	19100	1900.0	1	99	23.40	21.90	0.49	0.69	-	
QPSK	0	Front	18900	1880.0	1	50	23.40	21.85	0.69	0.99	1	003

Note(s):

1. Worst Case performed with unmodified sample.

9.1.4. LTE FDD 4 Extremity 10g

Max Reported SAR = 1.12 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
QPSK	0	Front	20050	1720.0	1	99	23.40	22.05	0.82	1.12	-	004
QPSK	0	Front	20050	1720.0	50	50	22.40	20.90	0.62	0.87	-	
QPSK	0	Back	20050	1720.0	1	99	23.40	22.05	0.42	0.57	-	
QPSK	0	Back	20050	1720.0	50	50	22.40	20.90	0.40	0.57	-	
QPSK	0	Left Side	20050	1720.0	1	99	23.40	22.05	0.45	0.62	-	
QPSK	0	Left Side	20050	1720.0	50	50	22.40	20.90	0.37	0.52	-	
QPSK	0	Right Side	20050	1720.0	1	99	23.40	22.05	0.42	0.58	-	
QPSK	0	Right Side	20050	1720.0	50	50	22.40	20.90	0.35	0.50	-	
QPSK	0	Top	20050	1720.0	1	99	23.40	22.05	0.01	0.02	-	
QPSK	0	Top	20050	1720.0	50	50	22.40	20.90	0.01	0.02	-	
QPSK	0	Bottom	20050	1720.0	1	99	23.40	22.05	0.21	0.29	-	
QPSK	0	Bottom	20050	1720.0	50	50	22.40	20.90	0.17	0.24	-	
QPSK	0	Front	20175	1732.5	1	0	23.40	21.95	0.73	1.02	-	
QPSK	0	Front	20300	1745.0	1	0	23.40	21.90	0.72	1.02	-	
QPSK	0	Front	20050	1720.0	1	99	23.40	22.05	0.58	0.79	1	

Note(s):

1. Worst Case performed with unmodified sample.

9.1.5. LTE FDD 5 Extremity 10g

Max Reported SAR = 0.73 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
QPSK	0	Front	20450	829.0	1	0	23.40	22.50	0.59	0.73	-	005
QPSK	0	Front	20450	829.0	25	0	22.40	21.60	0.44	0.53	-	
QPSK	0	Back	20450	829.0	1	0	23.40	22.50	0.11	0.13	-	
QPSK	0	Back	20450	829.0	25	0	22.40	21.60	0.09	0.10	-	
QPSK	0	Left Side	20450	829.0	1	0	23.40	22.50	0.11	0.13	-	
QPSK	0	Left Side	20450	829.0	25	0	22.40	21.60	0.08	0.10	-	
QPSK	0	Right Side	20450	829.0	1	0	23.40	22.50	0.15	0.19	-	
QPSK	0	Right Side	20450	829.0	25	0	22.40	21.60	0.12	0.14	-	
QPSK	0	Top	20450	829.0	1	0	23.40	22.50	0.00	0.00	-	
QPSK	0	Top	20450	829.0	25	0	22.40	21.60	0.00	0.00	-	
QPSK	0	Bottom	20450	829.0	1	0	23.40	22.50	0.19	0.23	-	
QPSK	0	Bottom	20450	829.0	25	0	22.40	21.60	0.19	0.22	-	
QPSK	0	Front	20525	836.5	1	25	23.40	22.40	0.49	0.62	-	
QPSK	0	Front	20600	844.0	1	0	23.40	22.45	0.42	0.52	-	
QPSK	0	Front	20450	829.0	1	0	23.40	22.50	0.53	0.65	1	

Note(s):

1. Worst Case performed with unmodified sample.

9.1.6. LTE FDD 66 Extremity 10g

Max Reported SAR = 1.17 (W/kg)

					For LTE Only		Power (dBm)		10g: SAR Results (W/kg)			
Mode	Dist. (mm)	EUT Position	Channel Number	Freq (MHz)	#RB	Start RB	Tune Up Limit	Meas.	Meas. SAR Level	Reported SAR	Notes	Plot No.
QPSK	0	Front	132322	1745.0	1	0	23.40	22.15	0.71	0.94	-	
QPSK	0	Front	132322	1745.0	50	0	22.40	21.00	0.60	0.83	-	
QPSK	0	Back	132322	1745.0	1	0	23.40	22.15	0.48	0.64	-	
QPSK	0	Back	132322	1745.0	50	0	22.40	21.00	0.39	0.54	-	
QPSK	0	Left Side	132322	1745.0	1	0	23.40	22.15	0.38	0.50	-	
QPSK	0	Left Side	132322	1745.0	50	0	22.40	21.00	0.32	0.44	-	
QPSK	0	Right Side	132322	1745.0	1	0	23.40	22.15	0.35	0.47	-	
QPSK	0	Right Side	132322	1745.0	50	0	22.40	21.00	0.29	0.40	-	
QPSK	0	Top	132322	1745.0	1	0	23.40	22.15	0.01	0.01	-	
QPSK	0	Top	132322	1745.0	50	0	22.40	21.00	0.01	0.02	-	
QPSK	0	Bottom	132322	1745.0	1	0	23.40	22.15	0.20	0.26	-	
QPSK	0	Bottom	132322	1745.0	50	0	22.40	21.00	0.16	0.23	-	
QPSK	0	Front	132072	1720.0	1	99	23.40	22.10	0.76	1.02	-	
QPSK	0	Front	132572	1770.0	1	99	23.40	21.95	0.84	1.17	-	006
QPSK	0	Front	132322	1745.0	1	99	23.40	21.95	0.79	1.10	1	

Note(s):

1. Worst Case performed with unmodified sample.

9.2.SAR Measurement Variability

In accordance with published RF Exposure KDB procedure 865664 D01 SAR measurement 100 MHz to 6 GHz. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

10g-SAR (Extremity)

- 1) Repeated measurement is not required when the original highest measured SAR is < 2.0 W/Kg; steps 2) through 4) do not apply.
- 2) When the original highest measured 10g-SAR is ≥ 2.00 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 ≥ 3.625 W/kg (~10% from the 10g-SAR limit).
- 4) Perform a third repeated measurement only if the original, first or second repeated measurement is ≥ 3.75 W/Kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .

Note: Since the 10g measured SAR for none of the runs was > 2.0 W/Kg, repeat measurements were not performed on Extremity.

10.Highest Standalone SAR and Simultaneous Transmission

10.1.Highest Standalone Reported SAR

Individual Transmitter Evaluation per Band: Cellular

Exposure Configuration	Technology Band	Reported 10g - SAR (W/Kg)	Equipment Class	Highest Reported 10g - SAR (W/Kg)
LIMBS / EXTREMITY (Separation Distance 0mm)	WCDMA FDD 2	1.21	PCB	1.21
	WCDMA FDD 5	0.69		
	LTE Band 2	0.99		
	LTE Band 4	1.12		
	LTE Band 5	0.73		
	LTE Band 66	1.17		

10.2.Simultaneous Transmission analysis

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. The worst case simultaneous transmission analysis is considered for the following cases:

Note: Simultaneous transmission analysis was not done in this RF exposure report since SRD was not evaluated in this report.