FCC SAR Test Report

FCC ID: XDQN82

Project No.	:	2207G005
Equipment	:	POS Terminal
Brand Name	:	NEXGO
Test Model	:	N82
Series Model	:	N/A
Date of Receipt	:	Jul. 05, 2022
Date of Test	:	Jul. 08, 2022 ~ Jul. 15, 2022
Issued Date	:	Aug. 08, 2022
Report Version	:	R01
Test Sample	:	Engineering Sample No.: DG202207073
Standard(s)	:	Please refer to page 2.
Applicant	:	Shenzhen Xinguodu Technology Co., Ltd.
Address	:	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen, China
Manufacturer	:	Shenzhen Xinguodu Technology Co., Ltd.
Address	:	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen, China
Factory	:	Shenzhen Xinguodu Technology Co., Ltd. Manufacture Branch.
Address	:	Building C, Dagang Industrial Park, Changzhen Community, Gongming Office, Guangming New District, Shenzhen, Guangdong, China.

The above equipment has been tested and found compliance with the requirement of the relative standards by BTL Inc.

Prepared by : Seven Lu

Approved by : Herbort Liu

TESTING CERT #5123.02

BTL Inc.

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Standard(s)	:	**ANSI Std C95.1-1992** Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz - 300 GHz. (IEEE Std C95.1-1991) **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 – Part 1528: Human models, instrumentation, and procedures (Frequency range of 4 MHz to 10 GHz) **KDB616217 D04** SAR for laptop and tablets v01r02 **KDB447498 D04** Interim General RF Exposure Guidance v01 **KDB248227 D01** 802.11 Wi-Fi SAR v02r02 **KDB865664 D01** SAR measurement 100 MHz to 6 GHz v01r04 **KDB865664 D02** SAR Reporting v01r02 **KDB690783 D01** SAR Listings on Grants v01r03

Declaration

BTL represents to the client that testing is done in accordance with standard procedures as applicable and that test instruments used has been calibrated with standards traceable to international standard(s) and/or national standard(s).

BTL's reports apply only to the specific samples tested under conditions. It is manufacture's responsibility to ensure that additional production units of this model are manufactured with the identical electrical and mechanical components. **BTL** shall have no liability for any declarations, inferences or generalizations drawn by the client or others from **BTL** issued reports.

The report must not be used by the client to claim product certification, approval, or endorsement by NIST, A2LA, or any agency of the U.S. Government.

This report is the confidential property of the client. As a mutual protection to the clients, the public and ourselves, the test report shall not be reproduced, except in full, without our written approval.

BTL's laboratory quality assurance procedures are in compliance with the **ISO/IEC 17025** requirements, and accredited by the conformity assessment authorities listed in this test report.

BTL is not responsible for the sampling stage, so the results only apply to the sample as received.

The information, data and test plan are provided by manufacturer which may affect the validity of results, so it is manufacturer's responsibility to ensure that the apparatus meets the essential requirements of applied standards and in all the possible configurations as representative of its intended use.

Limitation

For the use of the authority's logo is limited unless the Test Standard(s)/Scope(s)/Item(s) mentioned in this test report is (are) included in the conformity assessment authorities acceptance respective.
Please note that the measurement uncertainty is provided for informational purpose only and are not use in determining the Pass/Fail results.

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REPORT ISSUED HISTORY

Report No.	Version	Description	Issued Date	Note
BTL-FCC SAR-1-2207G005	R00	Original Report.	Aug. 03, 2022	Invalid
BTL-FCC SAR-1-2207G005	R01	Added test result of separation distance 1cm, updated simultaneous transmission result and IMEI Code.	Aug. 08, 2022	Valid

1. GENERAL INFORMATION

1.1 STATEMENT OF COMPLIANCE

Mode	Highest Reported Hotspot SAR-1g (W/kg)	Highest Reported Limb SAR-10g (W/kg)
GSM850	0.506	1.086
GSM1900	1.173	1.766
UMTS B2	0.594	1.260
UMTS B5	0.182	0.656
LTE B2	0.571	1.237
LTE B4	0.670	1.103
LTE B5	0.293	0.532
LTE B7	1.178	1.579
2.4G WLAN	0.282	0.408
5.2G WLAN	0.140	/
5.3G WLAN	/	0.316
5.6G WLAN	/	0.329
5.8G WLAN	0.173	0.124
BT	/	0.011

Note: The device is in compliance with Specific Absorption Rate (SAR) for general population uncontrolled exposure limits according to the FCC rule §2.1093, the ANSI C95.1:1992/IEEE C95.1:1991, the NCRP Report Number 86 for uncontrolled environment, and had been tested in accordance with the measurement methods and procedures specified in IEC/IEEE 62209-1528:2020.

1.2 LABORATORY ENVIRONMENT

Temperature	Min. = 20ºC, Max. = 24ºC
Relative humidity	Min. = 30%, Max. = 70%
Ground system resistance	< 0.5Ω
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.	

1.3 GENERAL DESCRIPTION OF EUT

Equipment	POS Terminal		
Brand Name	NEXGO		
Test Model	N82		
Series Model	N/A		
Model Difference(s)	N/A		
IMEI Code	868079060000028, 868079060000036		
	868079060000044, 868079060000051		
Hardware Version	V1.0CI		
Software Version	XGD OS V1.0		
Modulation	GPRS(GMSK/8PSK), UMTS(BPSK/QPSK), LTE(QPSK/16QAM/64QAM), WiFi(DSSS/OFDM), BT(GFSK/π/4-DQPSK/8-DPSK)		
Operation Frequency Range(s)	Band	TX (MHz)	RX (MHz)
	GSM850	824~849	869~894
	GSM1900	1850~1910	1930~1990
	UMTS B2	1850~1910	1930~1990
	UMTS B5	824~849	869~894
	LTE B2	1850~1910	1930~1990
	LTE B4	1710~1755	2110~2155
	LTE B5	824~849	869~894
	LTE B7	2500~2570	2620~2690
	Bluetooth	2400~2483.5	
	2.4G WLAN	2400~2483.5	
	5.2G WLAN	5150~5250	
	5.3G WLAN	5250~5350	
	5.6G WLAN	5470~5725	
	5.8G WLAN	5725~5850	
GPRS/EDGE Multislot Class (12)	Max Number of Timeslots in Uplink:	4	
	Max Number of Timeslots in Downlink:	4	
	Max Total Timeslot:	5	
GPRS Device class	Class B		
HSDPA UE Category	24		
HSUPA UE Category	7		
DC-HSDPA Category	24		
HSPA+ Category	7		
Power Class	4,tested with power level 5(GSM850)		
	1,tested with power level 0(GSM1900)		
	3, tested with power control “all up bits” (UMTS B2/5)		
	3, tested with power control “all Max” (LTE B2/4/5/7)		

<table>
<tr><td rowspan="15">Test Channels
(low-mid-high)</td><td colspan="5">128-190-251 (GSM850)</td></tr>
<tr><td colspan="5">512-661-810 (GSM1900)</td></tr>
<tr><td colspan="5">9262-9400-9538 (UMTS B2)</td></tr>
<tr><td colspan="5">4132-4182-4233 (UMTS B5)</td></tr>
<tr><td colspan="5">18700-18900-19100 (LTE B2 BW=20MHz)</td></tr>
<tr><td colspan="5">20050-20175-20300 (LTE B4 BW=20MHz)</td></tr>
<tr><td colspan="5">20450-20525-20600 (LTE B5 BW=10MHz)</td></tr>
<tr><td colspan="5">20850-21100-21350 (LTE B7 BW=20MHz)</td></tr>
<tr><td colspan="5">0-39-78 (BT)</td></tr>
<tr><td colspan="5">0-19-39 (BLE)</td></tr>
<tr><td colspan="5">1-6-11 (2.4G WIFI 802.11b/g/n HT20)</td></tr>
<tr><td colspan="5">3-6-9 (2.4G WIFI 802.11n HT40)</td></tr>
<tr><td>5G WIFI</td><td>5.2G</td><td>5.3G</td><td>5.6G</td><td>5.8G</td></tr>
<tr><td>802.11a/n HT20</td><td>36-40-44-48</td><td>52-56-60-64</td><td>100-104-108-112-116-132-136-140</td><td>149-153-157-161-165</td></tr>
<tr><td>802.11n HT40</td><td>38-46</td><td>54-62</td><td>102-110-118-126-134</td><td>151-159</td></tr>
<tr><td rowspan="12">Antenna Gain</td><td>Band</td><td colspan="2">Ant 1(dBi)</td><td colspan="2">Ant 2(dBi)</td></tr>
<tr><td>GSM 850</td><td colspan="2">0.36</td><td colspan="2">/</td></tr>
<tr><td>GSM 1900</td><td colspan="2">1.63</td><td colspan="2">/</td></tr>
<tr><td>UMTS B2</td><td colspan="2">1.63</td><td colspan="2">/</td></tr>
<tr><td>UMTS B5</td><td colspan="2">0.36</td><td colspan="2">/</td></tr>
<tr><td>LTE B2</td><td colspan="2">1.63</td><td colspan="2">/</td></tr>
<tr><td>LTE B4</td><td colspan="2">2.84</td><td colspan="2">/</td></tr>
<tr><td>LTE B5</td><td colspan="2">0.36</td><td colspan="2">/</td></tr>
<tr><td>LTE B7</td><td colspan="2">4.18</td><td colspan="2">/</td></tr>
<tr><td>Bluetooth</td><td colspan="2">/</td><td colspan="2">-2.53</td></tr>
<tr><td>WLAN 2.4G</td><td colspan="2">/</td><td colspan="2">-2.53</td></tr>
<tr><td>WLAN 5G</td><td colspan="2">/</td><td colspan="2">-6.55</td></tr>
<tr><td colspan="6">Other Information</td></tr>
<tr><td rowspan="2">Battery Information</td><td>Brand / Model</td><td colspan="4">NEXGO / GX02</td></tr>
<tr><td>Power Rating</td><td colspan="4">DC 3.7V 5200mAh 19.24Wh</td></tr>
</table>

Note: The antenna gain is provided by the manufacturer.

1.4 MAIN TEST INSTRUMENTS

Item	Equipment	Manufacturer	Model	Serial No.	Cal. Date	Cal. Interval
1	Data Acquisition Electronics	Speag	DAE4	1423	Jan. 21, 2022	1 Year
2	Data Acquisition Electronics	Speag	DAE4	1390	Dec. 29, 2021	1 Year
3	Data Acquisition Electronics	Speag	DAE4	1717	Mar. 08, 2022	1 Year
4	E-field Probe	Speag	EX3DV4	3974	Jan. 24, 2022	1 Year
5	E-field Probe	Speag	EX3DV4	7544	Dec. 29, 2021	1 Year
6	System Validation Dipole	Speag	D835V2	4d160	Jun. 01, 2021	3 Years
7	System Validation Dipole	Speag	D1750V2	1101	Jun. 01, 2021	3 Years
8	System Validation Dipole	Speag	D1900V2	5d179	May 31, 2021	3 Years
9	System Validation Dipole	Speag	D2450V2	919	May 28, 2021	3 Years
10	System Validation Dipole	Speag	D5GHzV2	1160	May 27, 2021	3 Years
11	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1811	N/A	N/A
12	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1812	N/A	N/A
13	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1784	N/A	N/A
14	Twin Sam Phantom	Speag	Twin Sam Phantom V5.0	1896	N/A	N/A
15	Radio Communication Analyer	Anritsu	MT8821C	6261915479	Jul. 16, 2022	1 Year
16	Wideband Radio Communication Tester	R&S	CMW500	104462	Jul. 16, 2022	1 Year
17	Power Amplifier	Mini-Circuits	ZHL-42W+	QA1333003	Dec. 26, 2021	1 Year
18	Power Amplifier	Mini-Circuits	ZVE-8G+	520701341	Feb. 19, 2022	1 Year
19	Power Amplifier	Talent Microwave	TLPA1G18G-40-33-HS	220330003	Jun. 13, 2022	1 Year
20	DC Source metter	Iteck	IT6154	006104126768201001	Jul. 16, 2022	1 Year
21	Vector Network Analyzer	Agilent	E5071C	MY46102965	Feb. 19, 2022	1 Year
22	Signal Generator	Agilent	N5172B	MY53050758	Feb. 19, 2022	1 Year
23	Signal Generator	Keysight	N5173B	MY59101420	Feb. 19, 2022	1 Year
24	Smart Power Sensor	R&S	NRP-Z21	102209	Feb. 19, 2022	1 Year
25	3.5mm Economy Calibration Kit	Agilent	85052D	MY43252246	Dec. 14, 2021	1 Year
26	Dielectric Assessment Kit	Speag	DAK-3.5	1226	N/A	N/A
27	Directional Coupler	Woken	TS-PCC0M-05	0107090019	Feb. 19, 2022	1 Year
28	Coupler	Woken	0110A05601O-10	COM5BNW1A2	Feb. 19, 2022	1 Year
29	Coupler	Narda	Model 4216-10	2667	Jun. 07, 2022	1 Year
30	Coupler	Woken	ATD10-400M-6G-A2	2021008	Oct. 25, 2021	1 Year
31	Digital Themometer	TES	TES-1310	210706071	Dec. 07, 2021	1 Year

Note:
1. “N/A” denotes no model name, serial No. or calibration specified.
2.
1) Per KDB865664 D01 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. 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) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement;
d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.
2) Network analyzer probe calibration against air, distilled water and a short block performed before measuring liquid parameters.

2. RF EMISSIONS MEASUREMENT

2.1 TEST FACILITY

The test facilities used to collect the test data in this report is SAR room at the location of Room 108, Building 2, No.1, Yile Road, Songshan Lake Zone, Dongguan City, Guangdong, People’s Republic of China.
BTL’s Designation Number for FCC: CN1240.

2.2 MEASUREMENT UNCERTAINTY

Uncertainty Budget for Frequency range of 300 MHz to 3 GHz

Error Description	Uncertainty Value (± %)	Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)	Vi V_{eff}
Measurement System								
Probe Calibration	6.05	Normal	1	1	1	± 6.05 %	± 6.05 %	∞
Axial Isotropy	4.7	Rectangular	$\sqrt{3}$	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical Isotropy	9.6	Rectangular	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary Effects	1	Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Linearity	4.7	Rectangular	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∞
Detection Limits	1	Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Modulation response	2.4	Rectangular	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	0.3	Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response Time	0.8	Rectangular	$\sqrt{3}$	1	1	± 0.5%	± 0.5 %	∞
Integration Time	2.6	Rectangular	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient – Noise	3	Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient – Reflections	3	Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	0.4	Rectangular	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∞
Probe Positioning	2.9	Rectangular	$\sqrt{3}$	1	1	± 1.7 %	±1.7 %	∞
Max.SAR Evaluation	2	Rectangular	$\sqrt{3}$	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related								
Device Positioning	1.58 / 1.57	Normal	1	1	1	± 2.3 %	± 2.1 %	145
Device Holder	1.83 / 2.01	Normal	1	1	1	± 2.2 %	± 2.3 %	5
Power Drift	5.0	Rectangular	$\sqrt{3}$	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Setup								
Phantom Production Tolerances	6.1	Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction	1.9	Rectangular	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid Conductivity (mea.)	2.5	Rectangular	$\sqrt{3}$	0.78	0.71	1.13	1.13	∞
Liquid Permittivity (mea.)	2.5	Rectangular	$\sqrt{3}$	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4	Rectangular	$\sqrt{3}$	0.78	0.71	1.53	1.53	∞
Temp. unc. - Permittivity	0.4	Rectangular	$\sqrt{3}$	0.23	0.26	0.05	0.05	∞
Combined Standard Uncertainty (K = 1)						± 10.5 %	± 10.5 %	361
Expanded Uncertainty (K = 2)						**± 21.0 %**	**± 21.0 %**	

Error Description	Uncertainty Value (± %)		Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)	Vi V_{eff}
Measurement System									
Probe Calibration	6.05		Normal	1	1	1	± 6.05 %	± 6.05 %	∞
Axial Isotropy	4.7		Rectangular	$\sqrt{3}$	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical Isotropy	9.6		Rectangular	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary Effects	1		Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Linearity	4.7		Rectangular	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∞
Detection Limits	1		Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Modulation response	2.4		Rectangular	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	0.3		Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response Time	0.8		Rectangular	$\sqrt{3}$	1	1	± 0.5%	± 0.5 %	∞
Integration Time	2.6		Rectangular	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient – Noise	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient – Reflections	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	0.4		Rectangular	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∞
Probe Positioning	2.9		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	±1.7 %	∞
Max.SAR Evaluation	2		Rectangular	$\sqrt{3}$	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related									
Device Positioning	1.58	1.57	Normal	1	1	1	± 2.3 %	± 2.1 %	145
Device Holder	1.83	2.01	Normal	1	1	1	± 2.2 %	± 2.3 %	5
Power Drift	5.0		Rectangular	$\sqrt{3}$	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Setup									
Phantom Production Tolerances	6.1		Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction	1.9		Rectangular	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid Conductivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.78	0.71	1.13	1.13	∞
Liquid Permittivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4		Rectangular	$\sqrt{3}$	0.78	0.71	1.53	1.53	∞
Temp. unc. - Permittivity	0.4		Rectangular	$\sqrt{3}$	0.23	0.26	0.05	0.05	∞
Combined Standard Uncertainty (K = 1)							± 10.5 %	± 10.5 %	361
Expanded Uncertainty (K = 2)							**± 21.0 %**	**± 21.0 %**	

Uncertainty Budget for Frequency range of 3 GHz to 6 GHz

Error Description	Uncertainty Value (± %)		Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)	Vi V_{eff}
Measurement System									
Probe Calibration	6.65		Normal	1	1	1	± 6.65 %	± 6.65 %	∞
Axial Isotropy	4.7		Rectangular	$\sqrt{3}$	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical Isotropy	9.6		Rectangular	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary Effects	2		Rectangular	$\sqrt{3}$	1	1	± 1.2 %	± 1.2 %	∞
Linearity	4.7		Rectangular	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∞
Detection Limits	1		Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Modulation response	2.4		Rectangular	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	0.3		Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response Time	0.8		Rectangular	$\sqrt{3}$	1	1	± 0.5%	± 0.5 %	∞
Integration Time	2.6		Rectangular	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient – Noise	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient – Reflections	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	0.4		Rectangular	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∞
Probe Positioning	6.7		Rectangular	$\sqrt{3}$	1	1	± 3.9 %	±3.9 %	∞
Max.SAR Evaluation	4		Rectangular	$\sqrt{3}$	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related									
Device Positioning	1.53	3.21	Normal	1	1	1	± 2.3 %	± 2.1 %	145
Device Holder	2.27	3.54	Normal	1	1	1	± 2.2 %	± 2.3 %	5
Power Drift	5.0		Rectangular	$\sqrt{3}$	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Setup									
Phantom Production Tolerances	6.1		Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction	1.9		Rectangular	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid Conductivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.78	0.71	1.13	1.13	∞
Liquid Permittivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4		Rectangular	$\sqrt{3}$	0.78	0.71	1.53	1.53	∞
Temp. unc. - Permittivity	0.4		Rectangular	$\sqrt{3}$	0.23	0.26	0.05	0.05	∞
Combined Standard Uncertainty (K = 1)							± 11.1 %	± 11.7 %	361
Expanded Uncertainty (K = 2)							**± 22.2 %**	**± 23.4 %**	

Error Description	Uncertainty Value (± %)		Probability Distribution	Divisor	Ci (1g)	Ci (10g)	Standard Uncertainty (1g)	Standard Uncertainty (10g)	Vi V_{eff}
Measurement System									
Probe Calibration	6.65		Normal	1	1	1	± 6.65 %	± 6.65 %	∞
Axial Isotropy	4.7		Rectangular	$\sqrt{3}$	0.7	0.7	± 1.9 %	± 1.9 %	∞
Hemispherical Isotropy	9.6		Rectangular	$\sqrt{3}$	0.7	0.7	± 3.9 %	± 3.9 %	∞
Boundary Effects	2		Rectangular	$\sqrt{3}$	1	1	± 1.2 %	± 1.2 %	∞
Linearity	4.7		Rectangular	$\sqrt{3}$	1	1	± 2.7 %	± 2.7 %	∞
Detection Limits	1		Rectangular	$\sqrt{3}$	1	1	± 0.6 %	± 0.6 %	∞
Modulation response	2.4		Rectangular	$\sqrt{3}$	1	1	±1.4 %	±1.4 %	∞
Readout Electronics	0.3		Normal	1	1	1	± 0.3 %	± 0.3 %	∞
Response Time	0.8		Rectangular	$\sqrt{3}$	1	1	± 0.5%	± 0.5 %	∞
Integration Time	2.6		Rectangular	$\sqrt{3}$	1	1	± 1.5 %	± 1.5 %	∞
RF Ambient – Noise	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
RF Ambient – Reflections	3		Rectangular	$\sqrt{3}$	1	1	± 1.7 %	± 1.7 %	∞
Probe Positioner	0.4		Rectangular	$\sqrt{3}$	1	1	± 0.2 %	± 0.2 %	∞
Probe Positioning	6.7		Rectangular	$\sqrt{3}$	1	1	± 3.9 %	±3.9 %	∞
Max.SAR Evaluation	4		Rectangular	$\sqrt{3}$	1	1	± 2.3 %	± 2.3 %	∞
Test Sample Related									
Device Positioning	1.53	3.21	Normal	1	1	1	± 2.3 %	± 2.1 %	145
Device Holder	2.27	3.54	Normal	1	1	1	± 2.2 %	± 2.3 %	5
Power Drift	5.0		Rectangular	$\sqrt{3}$	1	1	± 2.9 %	± 2.9 %	∞
Phantom and Setup									
Phantom Production Tolerances	6.1		Rectangular	$\sqrt{3}$	1	1	2.31	2.31	∞
SAR correction	1.9		Rectangular	$\sqrt{3}$	1	0.84	1.10	1.10	∞
Liquid Conductivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.78	0.71	1.13	1.13	∞
Liquid Permittivity (mea.)	2.5		Rectangular	$\sqrt{3}$	0.26	0.26	0.38	0.38	∞
Temp. unc. - Conductivity	3.4		Rectangular	$\sqrt{3}$	0.78	0.71	1.53	1.53	∞
Temp. unc. - Permittivity	0.4		Rectangular	$\sqrt{3}$	0.23	0.26	0.05	0.05	∞
Combined Standard Uncertainty (K = 1)							± 11.1 %	± 11.7 %	361
Expanded Uncertainty (K = 2)							**± 22.2 %**	**± 23.4 %**	

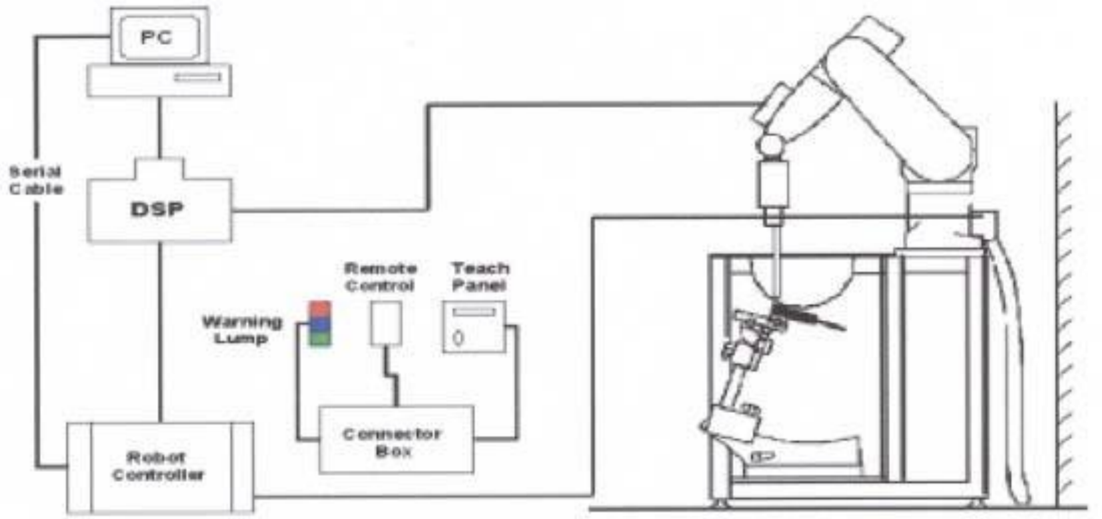
3. SAR MEASUREMENTS SYSTEM CONFIGURATION

3.1 SAR MEASUREMENT SET-UP

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

1. A standard high precision 6-axis robot (Stäubli RX family) with controller and software. An arm extension for accommodating the data acquisition electronics (DAE).
2. 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.
3. A data acquisition electronic (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.
4. A unit to operate the optical surface detector which is connected to the EOC.
5. The Electro-Optical Coupler (EOC) performs the conversion from the optical into a digital electric signal of the DAE. The EOC is connected to the DASY5 measurement server.
6. TheDASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation. A computer operating Windows.
7. DASY5 software and SEMCAD data evaluation software.
8. Remote control with teach panel and additional circuitry for robot safety such as warning lamps, etc.
9. The generic twin phantom enabling the testing of left-hand and right-hand usage.
10. The device holder for handheld mobile phones.
11. Tissue simulating liquid mixed according to the given recipes.
12. System validation dipoles allowing to validate the proper functioning of the system.

3.1.1 TEST SETUP LAYOUT



3.2 DASY5 E-FIELD PROBE SYSTEM

The SAR measurements were conducted with the dosimetric probe EX3DV4 (manufactured by SPEAG), designed in the classical triangular configuration and optimized for dosimetric evaluation.

3.2.1 PROBE SPECIFICATION

EX3DV4

Construction	Symmetrical design with triangular core Interleaved sensors 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 HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	10 µW/g to > 100 mW/g Linearity:± 0.2dB
Dimensions	Overall length: 330 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Distance from probe tip to dipole centers: 1.0 mm

E-field Probe

3.2.2 E-FIELD PROBE CALIBRATION

Each probe is calibrated according to a dosimetric assessment procedure with accuracy better than ±10%. The spherical isotropy was evaluated and found to be better than ± 0.25dB. The sensitivity parameters (NormX, NormY, NormZ), the diode compression parameter (DCP) and the conversion factor (ConvF) of the probe are tested.

The free space E-field from amplified probe outputs is determined in a test chamber. This is performed in a TEM cell for frequencies bellow 1 GHz, and in a wave guide above 1 GHz for free space. For the free space calibration, the probe is placed in the volumetric center of the cavity and at the proper orientation with the field. The probe is then rotated 360 degrees.

E-field temperature correlation calibration is performed in a flat phantom filled with the appropriate simulated brain tissue. The measured free space E-field in the medium correlates to temperature rise in a dielectric medium. For temperature correlation calibration a RF transparent thermostat-based temperature probe is used in conjunction with the E-field probe.

$$\mathbf{SAR} = \mathbf{C}\frac{\Delta T}{\Delta t}$$

Where: Δt=Exposure time (30 seconds),

C =Heat capacity of tissue (brain or muscle),

ΔT=Temperature increase due to RF exposure.

Or

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

Where: σ= Simulated Tissue Conductivity,

ρ=Tissue density (kg/m3).

3.2.3 OTHER TEST EQUIPMENT

3.2.3.1. Device Holder for Transmitters

Construction: Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices (e.g., laptops, cameras, etc.) It is light weight and fits easily on the upper part of the Mounting Device in place of the phone positioner. The extension is fully compatible with the Twin SAM, ELI and SAM v6.0 Phantoms.
Material: POM, Acrylic glass, Foam

3.2.3.2 Phantom

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEC/IEEE 62209-1528 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.	
Shell Thickness	2 ± 0.2 mm	
Filling Volume	Approx. 25 liters	
Dimensions	Length:1000mm; Width: 500mm Height: adjustable feet	
Aailable	Special	

3.2.4 SCANNING PROCEDURE

The DASY5 installation includes predefined files with recommended procedures for measurements and validation. They are read-only document files and destined as fully defined but unmeasured masks. All test positions (head or body-worn) are tested with the same configuration of test steps differing only in the grid definition for the different test positions.

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

The “surface check” measurement tests the optical surface detection system of the DASY5 system by repeatedly detecting the surface with the optical and mechanical surface detector and comparing the results. The output gives the detecting heights of both systems, the difference between the two systems and the standard deviation of the detection repeatability. Air bubbles or refraction in the liquid due to separation of the sugar-water mixture gives poor repeatability (above ± 0.1mm). To prevent wrong results tests are only executed when the liquid is free of air bubbles. The difference between the optical surface detection and the actual surface depends on the probe and is specified with each probe. (It does not depend on the surface reflectivity or the probe angle to the surface within ± 30°.)

- Area Scan

The “area scan” measures the SAR above the DUT or verification dipole on a parallel plane to the surface. It is used to locate the approximate location of the peak SAR with 2D spline interpolation. The robot performs a stepped movement along one grid axis while the local electrical field strength is measured by the probe. The probe is touching the surface of the SAM during acquisition of measurement values. The standard scan uses large grid spacing for faster measurement. Standard grid spacing for head measurements is 15 mm in x- and y- dimension (≤2GHz)，12 mm inx- and y- dimension (2-4 GHz) and 10mm in x- and y- dimension (4-6GHz). If a finer resolution is needed, the grid spacing can be reduced. Grid spacing and orientation have no influence on the SAR result. For special applications where the standard scan method does not find the peak SAR within the grid, e.g. mobile phones with flip cover, the grid can be adapted in orientation.

- Zoom Scan

A “zoom scan” measures the field in a volume around the 2D peak SAR value acquired in the previous “coarse” scan. This is a fine grid with maximum scan spatial resolution: Δx_{zoom}, Δy_{zoom}≤ 2GHz -≤8mm, 2-4GHz -≤ 5 mm and 4-6 GHz-≤ 4mm; Δz_{zoom}≤ 3GHz -≤ 5 mm, 3-4 GHz-≤ 4mm and 4-6GHz-≤ 2mm where the robot additionally moves the probe along the z-axis away from the bottom of the Phantom. DASY is also able to perform repeated zoom scans if more than 1 peak is found during area scan. In this document, the evaluated peak 1g and 10g averaged SAR values are shown in the 2D-graphics in Appendix B. Test results relevant for the specified standard (see chapter 1.4.) are shown in table form in chapter 7.2.

A Z-axis scan measures the total SAR value at the x-and y-position of the maximum SAR value found during the cube scan. The probe is moved away in z-direction from the bottom of the SAM phantom in 2 mm steps. This measurement shows the continuity of the liquid and can - depending in the field strength – also show the liquid depth.

The following table summarizes the area scan and zoom scan resolutions per FCC KDB 865664D01:

Frequency	Maximun Area Scan resolution (Δx_{area}, Δy_{area})	Maximun Zoom Scan spatial resolution (Δx_{Zoom}, Δy_{Zoom})	Maximun Zoom Scan spatial resolution			Minimum zoom scan volume (x,y,z)
			Uniform Grid	Graded Grad		
			$\Delta z_{Zoom}(n)$	$\Delta z_{Zoom}(1)$*	$\Delta z_{Zoom}(n>1)$*	
≤2GHz	≤15mm	≤8mm	≤5mm	≤4mm	≤1.5*Δz_{Zoom}(n-1)	≥30mm
2-3GHz	≤12mm	≤5mm	≤5mm	≤4mm	≤1.5*Δz_{Zoom}(n-1)	≥30mm
3-4GHz	≤12mm	≤5mm	≤4mm	≤3mm	≤1.5*Δz_{Zoom}(n-1)	≥28mm
4-5GHz	≤10mm	≤4mm	≤3mm	≤2.5mm	≤1.5*Δz_{Zoom}(n-1)	≥25mm
5-6GHz	≤10mm	≤4mm	≤2mm	≤2mm	≤1.5*Δz_{Zoom}(n-1)	≥22mm

3.2.5 SPATIAL PEAK SAR EVALUATION

The spatial peak SAR - value for 1 and 10 g is evaluated after the Cube measurements have been done. The basis of the evaluation are the SAR values measured at the points of the fine cube grid consisting of 5 x 5 x 7 points (with 8mm horizontal resolution) or 7 x 7 x 7 points (with 5mm horizontal resolution) or 8 x 8 x 7 points (with 4mm horizontal resolution). The algorithm that finds the maximal averaged volume is separated into three different stages.

- The data between the dipole center of the probe and the surface of the phantom are extrapolated. This data cannot be measured since the center of the dipole is 2.7 mm away from the tip of the probe and the distance between the surface and the lowest measuring point is about 1 mm (see probe calibration sheet). The extrapolated data from a cube measurement can be visualized by selecting “Graph Evaluated”.
- The maximum interpolated value is searched with a straight-forward algorithm. Around this maximum the SAR - values averaged over the spatial volumes (1g or 10 g) are computed using the 3d-spline interpolation algorithm. If the volume cannot be evaluated (i.e., if a part of the grid was cut off by the boundary of the measurement area) the evaluation will be started on the corners of the bottom plane of the cube.
- All neighboring volumes are evaluated until no neighboring volume with a higher average value is found.

Extrapolation

The extrapolation is based on a least square algorithm [W. Gander, Computer mathematic, p.168-180]. Through the points in the first 3 cm along the z-axis, polynomials of order four are calculated. These polynomials are then used to evaluate the points between the surface and the probe tip. The points, calculated from the surface, have a distance of 1 mm from each other.

Interpolation

The interpolation of the points is done with a 3d-Spline. The 3d-Spline is composed of three one-dimensional splines with the "Not a knot"-condition [W. Gander, Computer mathematic, p.141-150] (x, y and z -direction) [Numerical Recipes in C, Second Edition, p.123ff].

Volume Averaging

At First the size of the cube is calculated. Then the volume is integrated with the trapezoidal algorithm. 8000 points (20x20x20) are interpolated to calculate the average.

Advanced Extrapolation

DASY5 uses the advanced extrapolation option which is able to compensate boundary effects on E-field probes.

3.2.6 DATA STORAGE AND EVALUATION

3.2.6.1 Data Storage

The DASY5 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 “DAE”. 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], [mW/g], [mW/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.

3.2.7 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, a_{i0}, a_{i1}, a_{i2}
	Conversion factor	$ConvF_i$
	Diode compression point	Dcp_i
Device parameters:	Frequency	f
	Crest factor	cf
Media parameters:	Conductivity	
	Density	

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 DASY5 components. In the direct measuring mode of the multi meter 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	V_i = compensated signal of channel i	(i = x, y, z)
	U_i = 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 V_i = compensated signal of channel i (i = x, y, z)

$Norm_i$ = 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]

E_i = electric field strength of channel i in V/m

H_i = 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.

$$SAR = (E_{tot})^2 \cdot \sigma / (\rho \cdot 1000)$$

With SAR = local specific absorption rate in mW/g

E_{tot} = total field strength in V/m

= conductivity in [mho/m] or [Siemens/m]

= equivalent tissue density in g/cm^3

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.

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

With P_{pwe} = equivalent power density of a plane wave in mW/cm^2

E_{tot} = total field strength in V/m

H_{tot} = total magnetic field strength in A/m

4. SYSTEM VERIFICATION PROCEDURE

4.1 TISSUE VERIFICATION

The simulating liquids should be checked at the beginning of a series of SAR measurements to determine of the dielectic parameter are within the tolerances of the specified target values. The measured conductivity and relative permittivity should be within ± 5% of the target values.

The following materials are used for producing the tissue-equivalent materials.

Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
Head 835	0.2	-	0.2	1.5	57.0	-	41.1	-
Head 1750	-	47.0	-	0.4	-	-	52.6	-
Head 1900	-	44.5	-	0.2	-	-	55.3	-
Head 2450	-	45.0	-	0.1	-	-	54.9	-
Head 2600	-	45.1	-	0.1	-	-	54.8	-
Head 5G	-	-	-	-	-	17.2	65.5	17.3

Salt: 99+% Pure Sodium Chloride; Sugar: 98+% Pure Sucrose; Water: De-ionized, 16M + resistivity
HEC: Hydroxyethyl Cellulose; DGBE: 99+% Di(ethylene glycol) butyl ether,[2-(2-butoxyethoxy)ethanol]
Triton X-100(ultra pure): Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl)phenyl]ether

Tissue Verification									
Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Conductivity (σ)	Permittivity (εr)	Targeted Conductivity (σ)	Targeted Permittivity (εr)	Deviation Conductivity (σ) (%)	Deviation Permittivity (εr) (%)	Date
Head	835	22.3	0.914	41.972	0.90	41.5	1.56	1.14	Jul. 08, 2022
Head	835	22.3	0.938	42.541	0.90	41.5	4.22	2.51	Jul. 09, 2022
Head	1750	22.4	1.340	39.988	1.37	40.1	-2.19	-0.28	Jul. 08, 2022
Head	1750	22.3	1.343	39.624	1.37	40.1	-1.97	-1.19	Jul. 09, 2022
Head	1900	22.5	1.335	41.014	1.40	40.0	-4.64	2.54	Jul. 08, 2022
Head	1900	22.5	1.336	40.975	1.40	40.0	-4.57	2.44	Jul. 09, 2022
Head	2450	22.3	1.848	39.751	1.80	39.2	2.67	1.41	Jul. 12, 2022
Head	2600	22.3	2.007	39.261	1.96	39.0	2.40	0.67	Jul. 12, 2022
Head	5250	22.5	4.781	35.788	4.71	36.0	1.51	-0.45	Jul. 15, 2022
Head	5600	22.5	5.256	34.973	5.07	35.5	3.67	-1.48	Jul. 15, 2022
Head	5750	22.5	5.378	34.569	5.22	35.4	3.03	-2.21	Jul. 15, 2022

Note:
1)The dielectric parameters of the tissue-equivalent liquid should be measured under similar ambient conditions and within 2 °C of the conditions expected during the SAR evaluation to satisfy protocol requirements.
2)KDB 865664 was ensured to be applied for probe calibration frequencies greater than or equal to 50MHz of the EUT frequencies.
3)The above measured tissue parameters were used in the DASY software to perform interpolation via the DASY software to determine actual dielectric parameters at the test frequencies. The SAR test plots may slightly differ from the table above since the DASY rounds to three significant digits.

4.2 SYSTEM CHECK

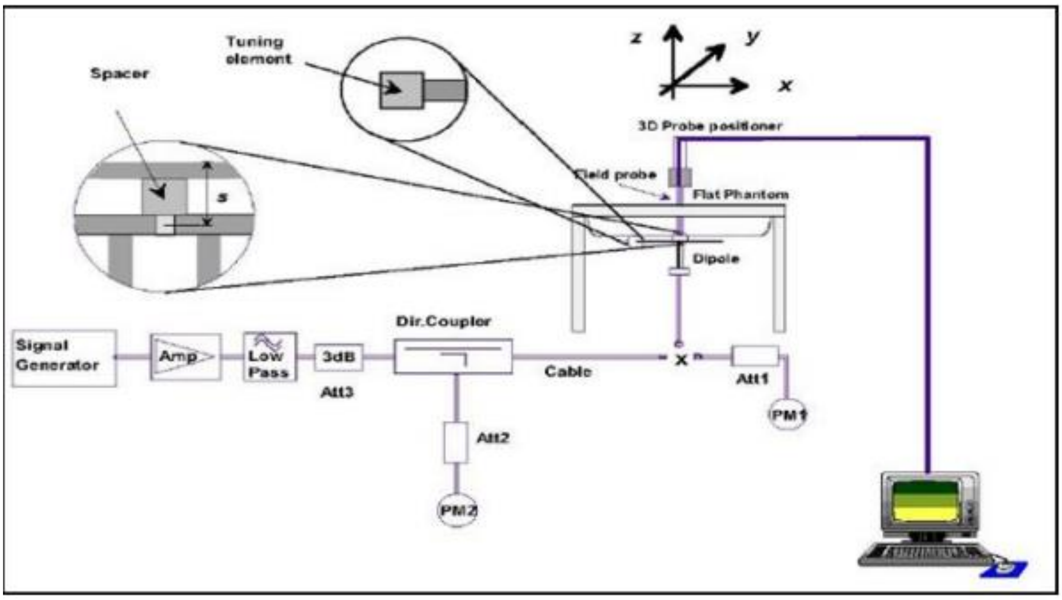
The system check is performed for verifying the accuracy of the complete measurement system and performance of the software. The system check is performed with tissue equivalent material according to IEC/IEEE 62209-1528 (described above). The following table shows system check results for all frequency bands and tissue liquids used during the tests.

System Check	Date	Frequency (MHz)	Targeted SAR 1g (W/kg)	Targeted SAR 10g (W/kg)	Measured SAR 1g (W/kg)	Measured SAR 10g (W/kg)	normalized SAR 1g (W/kg)	normalized SAR 10g (W/kg)	Deviation 1g (%)	Deviation 10g (%)	Dipole S/N
Head	Jul. 08, 2022	835	9.52	6.14	2.38	1.56	9.52	6.24	0.00	1.63	4d160
Head	Jul. 09, 2022	835	9.52	6.14	2.43	1.59	9.72	6.36	2.10	3.58	4d160
Head	Jul. 08, 2022	1750	36.40	18.90	8.68	4.58	34.72	18.32	-4.62	-3.07	1101
Head	Jul. 09, 2022	1750	36.40	18.90	8.77	4.63	35.08	18.52	-3.63	-2.01	1101
Head	Jul. 08, 2022	1900	39.60	20.00	9.61	4.97	38.44	19.88	-2.93	-0.60	5d179
Head	Jul. 09, 2022	1900	39.60	20.00	9.41	4.87	37.64	19.48	-4.95	-2.60	5d179
Head	Jul. 12, 2022	2450	52.10	23.70	13.50	6.20	54.00	24.80	3.65	4.64	919
Head	Jul. 12, 2022	2600	56.90	24.90	13.80	6.08	55.20	24.32	-2.99	-2.33	1067
Head	Jul. 15, 2022	5250	78.00	22.40	7.57	2.16	75.70	21.60	-2.95	-3.57	1160
Head	Jul. 15, 2022	5600	80.60	23.00	7.80	2.21	78.00	22.10	-3.23	-3.91	1160
Head	Jul. 15, 2022	5750	76.50	21.60	7.87	2.21	78.70	22.10	2.88	2.31	1160

4.3 SYSTEM CHECK PROCEDURE

The system check is performed by using a system check dipole which is positioned parallel to the planar part of the SAM phantom at the reference point. The distance of the dipole to the SAM phantom is determined by a plexiglass spacer. The dipole is connected to the signal source consisting of signal generator and amplifier via a directional coupler, N-connector cable and adaption to SMA. It is fed with a power of 250mW (below 3GHz) or 100mW (3-6GHz). To adjust this power a power meter is used.
The power sensor is connected to the cable before the system check to measure the power at this point and do adjustments at the signal generator. At the outputs of the directional coupler both return loss as well as forward power are controlled during the system check to make sure that emitted power at the dipole is kept constant. This can also be checked by the power drift measurement after the test.

System check results have to be equal or near the values determined during dipole calibration (target SAR in table above) with the relevant liquids and test system (±10 %).



5. SAR MEASUREMENT VARIABILITY AND UNCERTAINTY

5.1 SAR MEASUREMENT VARIABILITY

Per KDB865664 D01 SAR measurement 100 MHz to 6 GHz, 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.

The detailed repeated measurement results are shown in Section 7.2.

6. OPERATIONAL CONDITIONS DURING TEST

6.1 GENERAL DESCRIPTION OF TEST PROCEDURES

Connection to the EUT is established via air interface with Anritsu MT8821C & R&S CMW500, and the EUT is set to maximum output power by Anritsu MT8821C & R&S CMW500. The EUT battery must be fully charged and checked periodically during the test to ascertain uniform power output. The antenna connected to the output of the base station simulator shall be placed at least 50cm away from the EUT. The signal transmitted by the simulator to the antenna feeding point shall be lower than the output power level of the EUT by at least 30dB.

6.2 SAR TEST CONFIGURATION

6.2.1 GSM TEST CONFIGURATION

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link.
Using 8960 Series the power lever is set to "5" and "0" in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

When SAR tests for EGPRS mode is necessary, GMSK modulation should be used to minimize SAR measurement error due to higher peak-to-average power (PAR) ratios inherent in 8PSK.

According to specification 3GPP TS 51.010, the maximum power of the GSM can do the power reduction for the multi-slot.

The allowed power reduction in the multi-slot configuration is as following:

Number of timeslots in uplink assignment		Reduction of maximum output power (dB)		
Band	Time Slots	GPRS (GMSK)	EGPRS (GMSK)	EGPRS (8PSK)
GSM850	1 TX slot	0.0	0.0	6.4
	2 TX slots	3.0	3.0	9.4
	3 TX slots	4.8	4.8	11.2
	4 TX slots	6.0	6.0	12.4
GSM1900	1 TX slot	0.0	0.0	4.3
	2 TX slots	3.0	3.0	7.3
	3 TX slots	4.8	4.8	9.1
	4 TX slots	6.0	6.0	10.3

6.2.2 UMTS TEST CONFIGURATION

1. Output Power Verification

Maximum output power is verified on the High, Middle and Low channels according to the procedures description in section 5.2 of 3GPP TS 34.121, using the appropriate RMC or AMR with TPC (transmit power control) set to all "1s" for WCDMA/HSDPA or by applying the required inner loop power control procedures to maintain maximum output power while HSUPA is active. Result for all applicable physical channel configurations (DPCCH, DPDCHn and spreading codes, HSDPA, HSPA) should be tabulated in the SAR report. All configuration that are not supported by the DUT or cannot be measured due to technical or equipment limitation should be clearly identified.

2. WCDMA

(1) Head SAR Measurements
SAR for next to ear head exposure is measured using a 12.2 kbps RMC with TPC bits configured to all "1s". The 3G SAR test reduction procedure is applied to AMR configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for 12.2 kbps AMR with 3.4kbps SRB (signaling radio bearer) using the highest reported SAR configuration in 12.2 kbps RMC for head exposure.

(2) Body SAR Measurements
SAR for body-worn accessory is measured using the 12.2 kbps RMC with the TPC bits configured to all "1s". The 3G SAR test reduction procedure is applied to other spreading codes and multiple DPDCHn configurations supported by handset with 12.2 kbps RMC as the primary mode.

3. HSDPA

SAR for body exposure configurations is measured according to the "Body SAR Measurements" procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode. This is referred to as the 3G SAR test reduction procedure in the following SAR test guidance, where the primary mode is identified in the applicable wireless mode test procedures and the secondary mode is wireless mode being considered for SAR test reduction by that procedure. When the 3G SAR test reduction procedure is not satisfied, it is identified as "otherwise" in the applicable procedures; SAR measurement is required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedure is applied to HSDPA body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSDPA using the HSDPA body SAR procedures for the highest reported SAR body exposure configuration in 12.2 kbps RMC.

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The β_c and β_d gain factors for DPCCH and DPDCH were set according to the values in the below table, β_{hs} for HS-DPCCH is set automatically to the correct value when ΔACK, ΔNACK, ΔCQI = 8. The variation of the β_c / β_d ratio causes a power reduction at sub-tests 2 - 4.

Sub-test	β_c	β_d	β_d (SF)	β_c / β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: ΔACK, ΔNACK and ΔCQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$
Note 2 : CM=1 for $\beta_c/\beta_d = 12/15$, $\beta_{hs}/\beta_c = 24/15$. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to $\beta_c = 11/15$ and $\beta_d = 15/15$

The measurements were performed with a Fixed Reference Channel (FRC) and H-Set 1 QPSK.

Settings of required H-Set 1 QPSK acc. to 3GPP 34.121

Parameter	Value
Nominal average inf. bit rate	534 kbit/s
Inter-TTI Distance	3 TTI‟s
Number of HARQ Processes	2 Processes
Information Bit Payload	3202 Bits
MAC-d PDU size	336 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	4800 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	9600 SMLs
Coding Rate	0.67
Number of Physical Channel Codes	5

HSDPA UE category

HS-DSCH Category	Maximum HS-DSCH Codes Received	Minimum Inter-TTI Interval	Maximum HS-DSCH Transport Block Bits/HS-DSCH TTI	Total Soft Channel Bits
1	5	3	7298	19200
2	5	3	7298	28800
3	5	2	7298	28800
4	5	2	7298	38400
5	5	1	7298	57600
6	5	1	7298	67200
7	10	1	14411	115200
8	10	1	14411	134400
9	15	1	25251	172800
10	15	1	27952	172800
11	5	2	3630	14400
12	5	1	3630	28800
13	15	1	34800	259200
14	15	1	42196	259200
15	15	1	23370	345600
16	15	1	27952	345600

4. HSUPA

SAR for Body exposure configurations is measured according to the “Body SAR Measurements” procedures of 3G device. When the maximum output power and tune-up tolerance specified for production units in a secondary mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode and the adjusted SAR is ≤ 1.2W/kg, SAR measurement is not required for the secondary mode.

Per KDB941225 D01, the 3G SAR test reduction procedures is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

Due to inner loop power control requirements in HSUPA, a commercial communication test set should be used for the output power and SAR tests. The 12.2 kbps RMC, FRC H-set 1 and E-DCH configurations for HSDPA should be configured according to the values indicated below as well as other applicable procedures described in the “WCDMA Handset” and “Release 5 HSDPA Data Device” sections of 3G device.

Subtests for WCDMA Release 6 HSUPA

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	β_{ec}	β_{ed}	β_{ec} (SF)	β_{ed} (code)	CM (2) (dB)	MPR (dB)	AG (4) Index	E-TFCI
1	11/15 (3)	15/15 (3)	64	11/15 (3)	22/15	209/225	1039/225	4	1	1.0	0.0	20	75
2	6/15	15/15	64	6/15	12/15	12/15	94/75	4	1	3.0	2.0	12	67
3	15/15	9/15	64	15/9	30/15	30/15	β_{ed1}:47/15 β_{ed2}:47/15	4	2	2.0	1.0	15	92
4	2/15	15/15	64	2/15	4/15	2/15	56/75	4	1	3.0	2.0	17	71
5	15/15 (4)	15/15 (4)	64	15/15 (4)	30/15	24/15	134/15	4	1	1.0	0.0	21	81

Note 1: Δ ACK, Δ NACK and Δ CQI = 8 $A_{hs} = \beta_{hs}/\beta_c = 30/15$ $\beta_{hs} = 30/15 * \beta_c$

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

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

Note 4 : For subtest 5 the β_c/β_d ratio of 15/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1, TF1) to $\beta_c = 14/15$ and $\beta_d = 15/15$.

Note 5 : Testing UE using E-DPDCH Physical Layer category 1 Sub-test 3 is not required according to TS 25.306 Table 5.1g.

Note 6: β_{ed} can not be set directly; it is set by Absolute Grant Value.

HSUPA UE category

UE E-DCH Category	Maximum E-DCH Codes Transmitted	Number of HARQ Processes	E-DCH TTI(ms)	Minimum Speading Factor	Maximum E-DCH Transport Block Bits	Max Rate (Mbps)
1	1	4	10	4	7110	0.7296
2	2	8	2	4	2798	1.4592
	2	4	10	4	14484	
3	2	4	10	4	14484	1.4592
4	2	8	2	2	5772	2.9185
	2	4	10	2	20000	2.00
5	2	4	10	2	20000	2.00
6 (No DPDCH)	4	8	10	2SF2&2SF4	11484	5.76
	4	4	2		20000	2.00
7 (No DPDCH)	4	8	2	2SF2&2SF4	22996	?
	4	4	10		20000	?

NOTE: When 4 codes are transmitted in parallel, two codes shall be transmitted with SF2 and two with SF4.UE categories 1 to 6 support QPSK only. UE category 7 supports QPSK and 16QAM. (TS25.306-7.3.0).

5. DC-HSDPA

SAR is required for Rel. 8 DC-HSDPA when SAR is required for Rel.5 HSDPA; otherwise, the 3G SAR test reduction procedure is applied to DC-HSDPA with 12.2 kbps RMC as the primary mode.
Power is measured for DC-HSDPA according to the H-Set 12, FRC configuration in Table C.8.1.12 of 3GPP TS 34.121-1 to determine SAR test reduction. A primary and a Second serving HS-DSCH cell are required to perform the power measurement and for the results to be acceptable.

The following tests were completed according to procedures in section 7.3.13 of 3GPP TS 34.108 v9.5.0. A summary of these settings are illustrated below:

Downlink Physical Channels are set as per 3GPP TS34.121-1 v9.0.0 E.5.0
Levels for HSDPA connection setup

Parameter During Connection setup	Unit	Value
P-CPICH_Ec/Ior	dB	-10
P-CCPCH and SCH_Ec/Ior	dB	-12
PICH _Ec/Ior	dB	-15
HS-PDSCH	dB	off
HS-SCCH_1	dB	off
DPCH_Ec/Ior	dB	-5
OCNS_Ec/Ior	dB	-3.1

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13
The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.
The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

Parameter	Value
Nominal average inf. bit rate	60 kbit/s
Inter-TTI Distance	1 TTI"s
Number of HARQ Processes	6 Processes
Information Bit Payload	120 Bits
Number Code Blocks	1 Block
Binary Channel Bits Per TTI	960 Bits
Total Available SMLs in UE	19200 SMLs
Number of SMLs per HARQ Process	3200 SMLs
Coding Rate	0.15
Number of Physical Channel Codes	1

Note:
1.The RMC is intended to be used for DC-HSDPA mode and both cells shall transmit with identical parameters as listed in the table above.
2.Maximum number of transmission is limited to 1,i.e.,retransmission is not allowed. The redundancy and constellation version 0 shall be used.

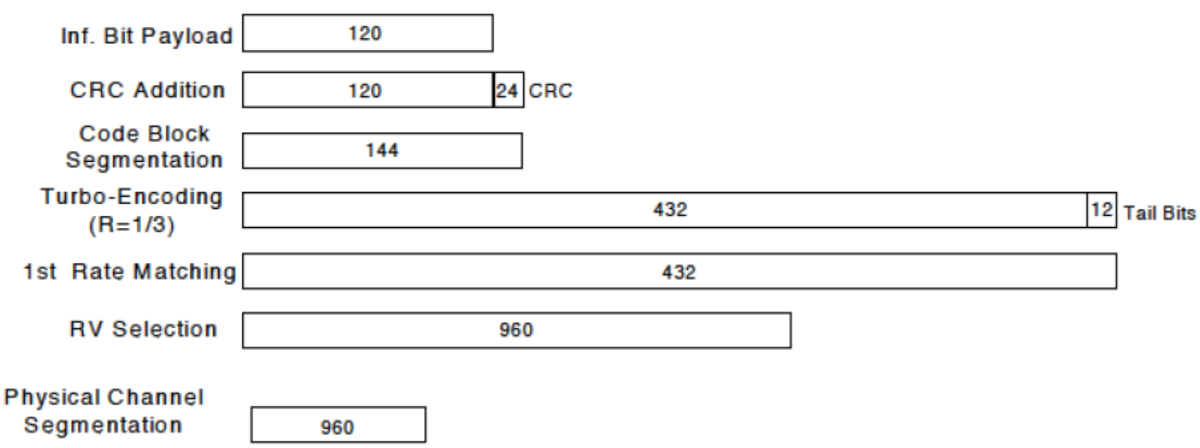


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

The following 4 Sub-tests for HSDPA were completed according to Release 5 procedures. A summary of subtest settings are illustrated below:

Sub-test	β_c	β_d	β_d (SF)	β_c/β_d	β_{hs} (1)	CM(dB)(2)	MPR (dB)
1	2/15	15/15	64	2/15	4/15	0.0	0
2	12/15(3)	15/15(3)	64	12/15(3)	24/15	1.0	0
3	15/15	8/15	64	15/8	30/15	1.5	0.5
4	15/15	4/15	64	15/4	30/15	1.5	0.5

Note 1: ΔACK, ΔNACK and ΔCQI=8 $A_{hs}=\beta_{hs}/\beta_c=30/15$ $\beta_{hs}=30/15*\beta_c$
Note 2 : CM=1 for $\beta_c/\beta_d=12/15$, $\beta_{hs}/\beta_c=24/15$. For all other combinations of DPDCH, DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.
Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to β_c=11/15 and β_d=15/15

Up commands are set continuously to set the UE to Max power.

6. HSPA+

An E-DCH call is set up according to TS 34.108 [3] 7.3.9 with the following exceptions in the RADIO BEARER SETUP messages. These exceptions allow the beta values to be set according to table C.11.1.4 and each UL physical channel to be at constant power at the start of the measurement. RF parameters are set up according to table E.5.A.1. Settings for the serving cell are defined in table 5.2E.4. Uplink SRB for DCCH mapped on E-DCH and downlink SRB for DCCH on DCH. E-DCH is configured with 2ms TTI.

Table C.11.1.4: β values for transmitter characteristics tests with HS-DPCCH and E-DCH with 16QAM

Sub-test	β_c (Note3)	β_d	β_{HS} (Note1)	β_{ec}	β_{ed} (2xSF2) (Note 4)	β_{ed} (2xSF4) (Note 4)	CM (dB) (Note 2)	MPR (dB) (Note 2)	AG Index (Note 4)	E-TFCI (Note 5)	E-TFCI (boost)
1	1	0	30/15	30/15	β_{ed}1: 30/15 β_{ed}2: 30/15	β_{ed}3: 24/15 β_{ed}4: 24/15	3.5	2.5	14	105	105

Note 1: Δ_{ACK}, Δ_{NACK} and Δ_{CQI} = 30/15 with $\beta_{hs} = 30/15 * \beta_c$.
Note 2: CM = 3.5 and the MPR is based on the relative CM difference, MPR = MAX(CM-1,0).
Note 3: DPDCH is not configured, therefore the β_c is set to 1 and β_d = 0 by default.
Note 4: β_{ed} can not be set directly; it is set by Absolute Grant Value.
Note 5: All the sub-tests require the UE to transmit 2SF2+2SF4 16QAM EDCH and they apply for UE using E-DPDCH category 7. E-DCH TTI is set to 2ms TTI and E-DCH table index = 2. To support these E-DCH configurations DPDCH is not allocated. The UE is signaled to use the extrapolation algorithm.

Note:
1. The Dual Carriers transmission support HSDPA and HSUPA physical channels.
2. The Dual Carriers belong to the same Node and are on adjacent carriers.
3. The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation.
4. The Dual Carriers operate in the same frequency band.
5. The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.
6. The device doesn’t support carrier aggregation for it just can operate in Release 8.

6.2.3 LTE TEST CONFIGURATION

Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The Anritsu MT8820C was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.
If the power and MPR match the maximum bandwidth required by 3GPP and all modulations, the other bandwidths will only measure the maximum power.
If power reduction is supported, the power measures the maximum bandwidth of all modulations, and other bandwidths will only measure the maximum power.

1) Spectrum Plots for RB configurations
A properly configured base station simulator was used for LTE output power measurements and SAR testing. Therefore, spectrum plots for RB configurations were not required to be included in this report.

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

3) A-MPR
A-MPR (Additional MPR) has been disabled for all SAR tests by using Network Signaling Value of "NS=01" on the base station simulator.

4) SAR test requirements
The LTE SAR test is choice the max power mode and start with the max power channel.

A) Largest channel bandwidth standalone SAR test requirements
i) QPSK with 1 RB allocation
When the SAR is ≤ 1 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the 10-g SAR of a required test channel is > 1.8 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation
For QPSK with 50% RB allocation, SAR is measured for the largest channel bandwidth and the maximum output power channel.

iii) QPSK with 100% RB allocation
For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest 10-g SAR for 1 RB and 50% RB allocation in i) and ii) are ≤ 1.5 W/kg. Otherwise, SAR is measured for the highest output power channel and if the 10-g SAR is >1.8 W/kg, the remaining required test channels must also be tested

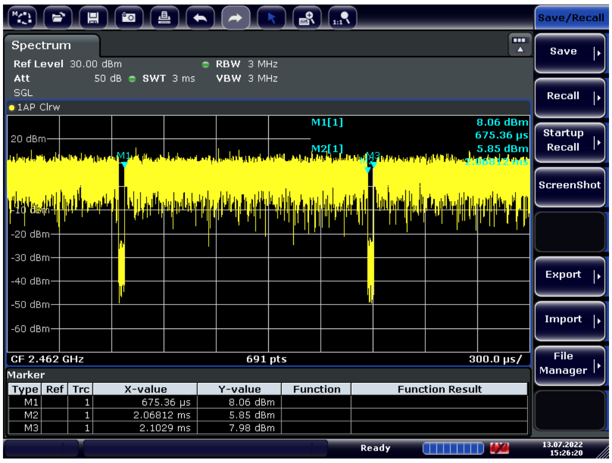
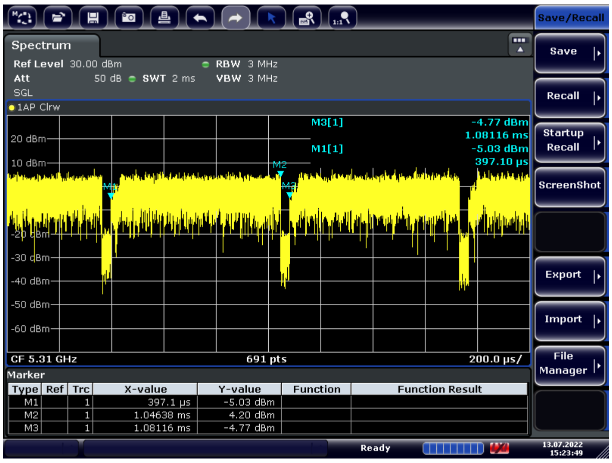
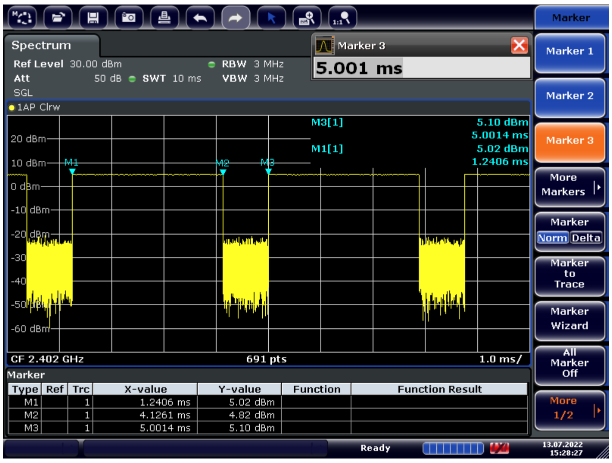
iv) Higher order modulations
For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the 10-g SAR for the QPSK configuration is > 1.8 W/kg

B) Other channel bandwidth standalone SAR test requirements
For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the SAR of a configuration for the largest channel bandwidth is > 1.80 W/kg.

6.2.4 WIFI TEST CONFIGURATION

For WLAN / BT SAR testing, WLAN / BT engineering testing software installed on the DUT can provide continuous transmitting RF signal.

For WiFi SAR testing, a communication link is set up with the test mode software for WiFi mode test. During the test, at the each test frequency channel, the EUT is operated at the RF continuous emission mode. The test procedures in KDB 248227 D01 are applied.

Duty Cycle	Duty Cycle
WiFi 2.4G	WiFi 5G
97.56%	94.92%
	
Duty Cycle	
BT	
76.73%	
	

6.2.4.1 2.4G SAR Test Requirements

802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:
1) When the reported SAR of the highest measured maximum output power channel for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

2.4 GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied. SAR is not required for the following 2.4 GHz OFDM conditions.
1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

SAR Test Requirements for OFDM configurations

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, each stand alone. And frequency aggregated band is considered separately for SAR test reduction. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

6.2.4.2 5G SAR Test Requirements

✧ **U-NII-1 and U-NII-2A Band**

For devices that operate in both U-NII-1 and U-NII-2A bands, when the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR. When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.

✧ **U-NII-2C, U-NII-3 Bands**

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, the channels at 5.60 – 5.65 GHz in U-NII-2C band must be disabled with acceptable mechanisms and documented in the equipment certification.
Unless band gap channels are permanently disabled, they must be considered for SAR testing. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels.11 When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

6.2.4.3 OFDM transmission mode and SAR test channel selection

For the 2.4GHz and 5GHz bands, when the same maximum output power was specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration with the largest channel bandwidth, lowest order modulation and lowest data rate. When the maximum output power of a channel is the same for equivalent OFDM configurations (for example 802.11a, 802.11n and 802.11ac, or 802.11g and 802.11n, with the same channel bandwidth, modulation, and data rate, etc.), the lower order 802.11 mode (i.e.802.11a then 802.11n and 802.11ac, or 802.11g then 802.11n) is used for SAR measurement. When the maximum output power are the same for multiple test channels, either according to the default or additional power measurement requirements, SAR is measured using the channel closest to the middle of the frequency band or aggregated band. When there are multiple channels with the same maximum output power, SAR is measured using the higher number channel.

6.2.4.4 Initial test configuration procedure

For OFDM, in both 2.4G and 5GHz bands, an initial test configuration is determined for each frequency band and aggregated band, according to the transmission mode with the highest maximum output power specified for SAR measurements. When the same maximum output power is specified for multiple OFDM transmission mode configurations in a frequency band or aggregated band, SAR is measured using the configuration(s) with the largest channel bandwidth, lowest order modulation, and lowest data rate. If the average RF output powers of the highest identical transmission modes are within 0.25 dB of each other, mid channel of the transmission mode with highest average RF output powers is the initial test channel. Otherwise, the channel of the transmission mode with the highest average RF output power will be the initial test configuration.
When the reported SAR is ≤ 0.8 W/kg, no additional measurements on other test channels are required. Otherwise, SAR is evaluated using the subsequent highest average RF output channel until the reported SAR result is ≤1.2 W/kg or all channels are measured. When there are multiple untested channels having the same subsequent highest average RF output power, the channel with higher frequency from the lowest 802.11 mode is considered for SAR measurement.

6.3 TEST POSITION OF PORTABLE DEVICES

6.3.1 HAND-HELD USAGE OF THE DEVICE TEST CONFIGURATION

This device that fall into this category includes tablet type portable computers and credit card transaction authorization terminals, point-of-sale and/or inventory terminals. Where these devices may be torso or limb-supported, the same principles for body-supported devices are applied. The device uses by the hand-held and hotspot mode, so the test procedure is follow the Appendix D.

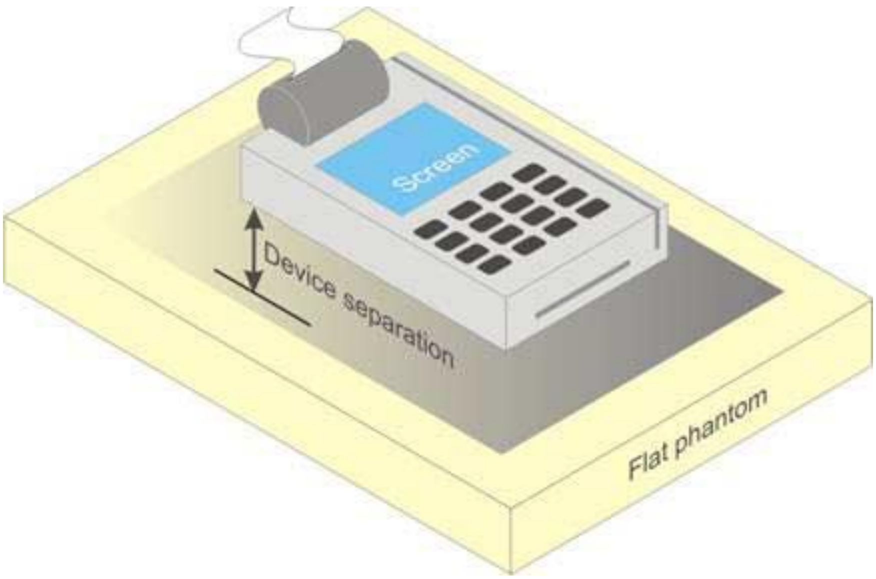


Figure 1: Test positions for body supported device

7. TEST RESULT

7.1 CONDUCTED POWER RESULTS

The conducted power measurement result please refer to Appendix E.

7.2 SAR TEST RESULTS

General Notes:

1) Per KDB447498 D04, all measurement SAR results are scaled to the maximum tune-up tolerance limit to demonstrate compliant.
2) Per KDB447498 D04, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is: ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz. 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.
3) Per KDB865664 D01, for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥ 0.8W/kg; if the deviation among the repeated measurement is ≤ 20%, and the measured SAR < 1.45W/kg, only one repeated measurement is required.
4) Per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
5) Per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤ 1.2 W/kg, no additional SAR evaluations using a headset are required.
6) Per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing.

WLAN Notes:

1. For exposure conditions with multiple test positions, such as handset operating next to the ear, devices with hotspot mode, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all positions in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8 W/kg or all test positions are measured.
2. Justification for test configurations for WLAN per KDB Publication 248227 for 2.4GHZ WIFI single transmission chain operations, the highest measured maximum output power Channel for DSSS was selected for SAR measurement. SAR for OFDM modes (2.4GHz 802.11g/n) was not required due to the maximum allowed powers and the highest reported DSSS SAR. See Section7.1 for more information.
3. Justification for test configurations for WLAN per KDB Publication 248227 for 5GHZ WIFI single transmission chain operations, the initial test configuration was selected according to the transmission mode with the highest maximum allowed power. Other transmission modes were not investigated since the highest reported SAR for initial test configuration adjusted by the ratio of maximum output powers is less than 1.2W/kg. See Section 7.1 for more information.

7.2.1 SAR MEASUREMENT RESULT OF LIMB

1. Limb SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
G01	GSM 850	GPRS4TX	190	Front Face	0	1	1	30	29.77	0.03	0.280	0.207	0.218
G02	GSM 850	GPRS4TX	190	Rear Face	0	1	1	30	29.77	0.01	0.722	0.343	0.362
G03	GSM 850	GPRS4TX	190	Left Side	0	1	1	30	29.77	-0.04	0.527	0.324	0.342
G04	GSM 850	GPRS4TX	190	Right Side	0	1	1	30	29.77	0.11	**1.560**	**1.030**	**1.086**
G05	GSM 850	GPRS4TX	190	Top Side1	0	1	1	30	29.77	0.01	0.418	0.284	0.299
G06	GSM 850	GPRS4TX	190	Top Side2	0	1	1	30	29.77	-0.11	0.220	0.151	0.159
G07	GSM 850	GPRS4TX	190	Bottom Side	0	1	1	30	29.77	-0.13	0.049	0.037	0.039
G08	GSM 850	GPRS4TX	190	Right Side	0	2	1	30	29.77	0.06	1.430	0.963	1.015
G11	GSM 1900	GPRS4TX	661	Front Face	0	1	1	28	27.73	-0.02	0.733	0.436	0.464
G12	GSM 1900	GPRS4TX	661	Rear Face	0	1	1	28	27.73	0.03	0.424	0.223	0.237
G13	GSM 1900	GPRS4TX	661	Left Side	0	1	1	28	27.73	-0.01	0.195	0.102	0.109
G14	GSM 1900	GPRS4TX	661	Right Side	0	1	1	28	27.73	-0.14	**2.980**	**1.660**	**1.766**
G15	GSM 1900	GPRS4TX	661	Top Side1	0	1	1	28	27.73	0.04	0.254	0.151	0.161
G16	GSM 1900	GPRS4TX	661	Top Side2	0	1	1	28	27.73	0.01	0.220	0.122	0.130
G17	GSM 1900	GPRS4TX	661	Bottom Side	0	1	1	28	27.73	0.09	0.110	0.068	0.072
G18	GSM 1900	GPRS4TX	661	Right Side	0	2	1	28	27.73	0.12	2.560	1.410	1.500

Note: The value with boldface is the maximum SAR Value of each test band.

2. Limb SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
U01	UMTS B2	RMC12.2K	9400	Front Face	0	1	1	24	23.25	-0.08	0.378	0.225	0.267
U02	UMTS B2	RMC12.2K	9400	Rear Face	0	1	1	24	23.25	0.09	0.225	0.122	0.145
U03	UMTS B2	RMC12.2K	9400	Left Side	0	1	1	24	23.25	-0.15	0.115	0.061	0.072
U04	UMTS B2	RMC12.2K	9400	Right Side	0	1	1	24	23.25	-0.05	**1.900**	**1.060**	**1.260**
U05	UMTS B2	RMC12.2K	9400	Top Side1	0	1	1	24	23.25	0.11	0.149	0.094	0.112
U06	UMTS B2	RMC12.2K	9400	Top Side2	0	1	1	24	23.25	0.02	0.153	0.081	0.096
U07	UMTS B2	RMC12.2K	9400	Bottom Side	0	1	1	24	23.25	0.03	0.063	0.040	0.047
U08	UMTS B2	RMC12.2K	9400	Right Side	0	2	1	24	23.25	0.15	1.780	0.922	1.096
U11	UMTS B5	RMC12.2K	4182	Front Face	0	1	1	24	23.17	0.02	0.059	0.041	0.050
U12	UMTS B5	RMC12.2K	4182	Rear Face	0	1	1	24	23.17	0.06	0.226	0.119	0.144
U13	UMTS B5	RMC12.2K	4182	Left Side	0	1	1	24	23.17	-0.01	0.309	0.203	0.246
U14	UMTS B5	RMC12.2K	4182	Right Side	0	1	1	24	23.17	-0.09	**0.828**	**0.542**	**0.656**
U15	UMTS B5	RMC12.2K	4182	Top Side1	0	1	1	24	23.17	-0.04	0.060	0.041	0.050
U16	UMTS B5	RMC12.2K	4182	Top Side2	0	1	1	24	23.17	0.07	0.135	0.084	0.102
U17	UMTS B5	RMC12.2K	4182	Bottom Side	0	1	1	24	23.17	0.04	0.047	0.030	0.036
U18	UMTS B5	RMC12.2K	4182	Right Side	0	2	1	24	23.17	-0.17	0.793	0.489	0.592

Note: The value with boldface is the maximum SAR Value of each test band.

3. Limb SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
L01	LTE B2	QPSK20M	18700	1	50	Front Face	0	1	1	25	24.37	0.05	0.571	0.349	0.403
L02	LTE B2	QPSK20M	18700	1	50	Rear Face	0	1	1	25	24.37	0.16	0.291	0.158	0.183
L03	LTE B2	QPSK20M	18700	1	50	Left Side	0	1	1	25	24.37	-0.04	0.146	0.078	0.090
L04	LTE B2	QPSK20M	18700	1	50	Right Side	0	1	1	25	24.37	-0.01	**1.910**	**1.070**	**1.237**
L05	LTE B2	QPSK20M	18700	1	50	Top Side1	0	1	1	25	24.37	-0.13	0.140	0.087	0.101
L06	LTE B2	QPSK20M	18700	1	50	Top Side2	0	1	1	25	24.37	0.01	0.185	0.099	0.114
L07	LTE B2	QPSK20M	18700	1	50	Bottom Side	0	1	1	25	24.37	-0.04	0.078	0.046	0.053
L08	LTE B2	QPSK20M	18700	50	0	Front Face	0	1	1	24	23.22	0.01	0.413	0.253	0.303
L09	LTE B2	QPSK20M	18700	50	0	Rear Face	0	1	1	24	23.22	0.09	0.196	0.107	0.128
L10	LTE B2	QPSK20M	18700	50	0	Left Side	0	1	1	24	23.22	0.04	0.098	0.053	0.063
L11	LTE B2	QPSK20M	18700	50	0	Right Side	0	1	1	24	23.22	-0.04	1.480	0.835	1.000
L12	LTE B2	QPSK20M	18700	50	0	Top Side1	0	1	1	24	23.22	-0.11	0.115	0.070	0.084
L13	LTE B2	QPSK20M	18700	50	0	Top Side2	0	1	1	24	23.22	-0.17	0.148	0.076	0.091
L14	LTE B2	QPSK20M	18700	50	0	Bottom Side	0	1	1	24	23.22	-0.16	0.079	0.046	0.055
L15	LTE B2	QPSK20M	18700	1	50	Right Side	0	2	1	25	24.37	0.02	1.730	0.966	1.117
L19	LTE B4	QPSK20M	20175	1	50	Front Face	0	1	1	24	23.91	0.08	0.594	0.376	0.384
L20	LTE B4	QPSK20M	20175	1	50	Rear Face	0	1	1	24	23.91	0.14	0.223	0.125	0.128
L21	LTE B4	QPSK20M	20175	1	50	Left Side	0	1	1	24	23.91	-0.09	0.105	0.037	0.038
L22	LTE B4	QPSK20M	20175	1	50	Right Side	0	1	1	24	23.91	-0.05	**1.840**	**1.080**	**1.103**
L23	LTE B4	QPSK20M	20175	1	50	Top Side1	0	1	1	24	23.91	0.01	0.152	0.099	0.101
L24	LTE B4	QPSK20M	20175	1	50	Top Side2	0	1	1	24	23.91	0.07	0.155	0.088	0.089
L25	LTE B4	QPSK20M	20175	1	50	Bottom Side	0	1	1	24	23.91	0.09	0.054	0.034	0.034
L26	LTE B4	QPSK20M	20175	50	0	Front Face	0	1	1	23	22.74	-0.16	0.466	0.296	0.314
L27	LTE B4	QPSK20M	20175	50	0	Rear Face	0	1	1	23	22.74	0.03	0.193	0.103	0.109
L28	LTE B4	QPSK20M	20175	50	0	Left Side	0	1	1	23	22.74	-0.11	0.051	0.026	0.027
L29	LTE B4	QPSK20M	20175	50	0	Right Side	0	1	1	23	22.74	-0.02	1.330	0.780	0.828
L30	LTE B4	QPSK20M	20175	50	0	Top Side1	0	1	1	23	22.74	0.04	0.093	0.019	0.020
L31	LTE B4	QPSK20M	20175	50	0	Top Side2	0	1	1	23	22.74	-0.05	0.123	0.072	0.077
L32	LTE B4	QPSK20M	20175	50	0	Bottom Side	0	1	1	23	22.74	0.18	0.037	0.022	0.023
L33	LTE B4	QPSK20M	20175	1	50	Right Side	0	2	1	24	23.91	0.01	1.510	0.833	0.850

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
L37	LTE B5	QPSK10M	20600	1	24	Front Face	0	1	1	24	23.68	0.07	0.192	0.131	0.141
L38	LTE B5	QPSK10M	20600	1	24	Rear Face	0	1	1	24	23.68	0.11	0.380	0.170	0.183
L39	LTE B5	QPSK10M	20600	1	24	Left Side	0	1	1	24	23.68	0.06	0.288	0.193	0.208
L40	LTE B5	QPSK10M	20600	1	24	Right Side	0	1	1	24	23.68	-0.04	**0.795**	**0.494**	**0.532**
L41	LTE B5	QPSK10M	20600	1	24	Top Side1	0	1	1	24	23.68	-0.13	0.223	0.143	0.154
L42	LTE B5	QPSK10M	20600	1	24	Top Side2	0	1	1	24	23.68	0.01	0.172	0.114	0.123
L43	LTE B5	QPSK10M	20600	1	24	Bottom Side	0	1	1	24	23.68	0.07	0.038	0.026	0.028
L44	LTE B5	QPSK10M	20600	25	12	Front Face	0	1	1	23	22.56	-0.14	0.145	0.102	0.113
L45	LTE B5	QPSK10M	20600	25	12	Rear Face	0	1	1	23	22.56	0.05	0.309	0.148	0.164
L46	LTE B5	QPSK10M	20600	25	12	Left Side	0	1	1	23	22.56	-0.02	0.210	0.142	0.157
L47	LTE B5	QPSK10M	20600	25	12	Right Side	0	1	1	23	22.56	0.03	0.626	0.388	0.429
L48	LTE B5	QPSK10M	20600	25	12	Top Side1	0	1	1	23	22.56	0.15	0.224	0.147	0.163
L49	LTE B5	QPSK10M	20600	25	12	Top Side2	0	1	1	23	22.56	-0.11	0.128	0.086	0.096
L50	LTE B5	QPSK10M	20600	25	12	Bottom Side	0	1	1	23	22.56	0.03	0.044	0.028	0.031
L51	LTE B5	QPSK10M	20600	1	24	Right Side	0	2	1	24	23.68	0.09	0.707	0.456	0.491
L55	LTE B7	QPSK20M	20850	1	50	Front Face	0	1	1	25	24.69	0.01	0.878	0.484	0.520
L56	LTE B7	QPSK20M	20850	1	50	Rear Face	0	1	1	25	24.69	0	0.870	0.471	0.506
L57	LTE B7	QPSK20M	20850	1	50	Left Side	0	1	1	25	24.69	0.05	0.475	0.237	0.255
L58	LTE B7	QPSK20M	20850	1	50	Right Side	0	1	1	25	24.69	-0.04	**2.980**	**1.470**	**1.579**
L59	LTE B7	QPSK20M	20850	1	50	Top Side1	0	1	1	25	24.69	0.01	0.428	0.222	0.238
L60	LTE B7	QPSK20M	20850	1	50	Top Side2	0	1	1	25	24.69	-0.05	0.486	0.250	0.268
L61	LTE B7	QPSK20M	20850	1	50	Bottom Side	0	1	1	25	24.69	0.02	0.067	0.031	0.033
L62	LTE B7	QPSK20M	21100	50	50	Front Face	0	1	1	24	23.54	0.08	0.637	0.345	0.384
L63	LTE B7	QPSK20M	21100	50	50	Rear Face	0	1	1	24	23.54	0.13	1.120	0.477	0.531
L64	LTE B7	QPSK20M	21100	50	50	Left Side	0	1	1	24	23.54	0.05	0.658	0.307	0.342
L65	LTE B7	QPSK20M	21100	50	50	Right Side	0	1	1	24	23.54	0.13	2.520	1.230	1.369
L66	LTE B7	QPSK20M	21100	50	50	Top Side1	0	1	1	24	23.54	-0.04	0.343	0.182	0.203
L67	LTE B7	QPSK20M	21100	50	50	Top Side2	0	1	1	24	23.54	0.06	0.355	0.177	0.197
L68	LTE B7	QPSK20M	21100	50	50	Bottom Side	0	1	1	24	23.54	0.08	0.042	0.021	0.024
L69	LTE B7	QPSK20M	20850	1	50	Right Side	0	2	1	25	24.69	0.11	2.530	1.230	1.321

Note: The value with boldface is the maximum SAR Value of each test band.

4. Limb SAR test results of WIFI 2.4G

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Ant	Duty Cycle (%)	Duty Factor	Power Setting	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
W01	802.11b	11	Front Face	0	1	2	97.56	1.03	20	17	16.62	0.06	0.093	0.043	0.048
W02	802.11b	11	Rear Face	0	1	2	97.56	1.03	20	17	16.62	-0.11	0.097	0.046	0.051
W03	802.11b	11	Left Side	0	1	2	97.56	1.03	20	17	16.62	0.08	0.057	0.025	0.028
W04	802.11b	11	Right Side	0	1	2	97.56	1.03	20	17	16.62	-0.04	**0.895**	**0.365**	**0.408**
W05	802.11b	11	Top Side1	0	1	2	97.56	1.03	20	17	16.62	0.14	<0.001	<0.001	<0.001
W06	802.11b	11	Top Side2	0	1	2	97.56	1.03	20	17	16.62	-0.01	0.027	0.013	0.015
W07	802.11b	11	Bottom Side	0	1	2	97.56	1.03	20	17	16.62	0.01	0.053	0.025	0.028

Note: The value with boldface is the maximum SAR Value of each test band.

5. Limb SAR test results of BT

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Ant	Duty Cycle (%)	Duty Factor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
B01	BT BLE	0	Front Face	0	1	2	76.73	1.30	8	7.77	0.08	0.003	0.001	0.002
B02	BT BLE	0	Rear Face	0	1	2	76.73	1.30	8	7.77	-0.16	0.002	0.001	0.001
B03	BT BLE	0	Left Side	0	1	2	76.73	1.30	8	7.77	0.02	<0.001	<0.001	<0.001
B04	BT BLE	0	Right Side	0	1	2	76.73	1.30	8	7.77	-0.03	**0.027**	**0.008**	**0.011**
B05	BT BLE	0	Top Side1	0	1	2	76.73	1.30	8	7.77	-0.08	<0.001	<0.001	<0.001
B06	BT BLE	0	Top Side2	0	1	2	76.73	1.30	8	7.77	0.14	0.003	0.001	0.001
B07	BT BLE	0	Bottom Side	0	1	2	76.73	1.30	8	7.77	-0.11	<0.001	<0.001	<0.001

Note: The value with boldface is the maximum SAR Value of each test band.

6. Limb SAR test results of WIFI 5G

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Ant	Duty Cycle %	Duty Factor	Power Setting	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 10g SAR
W17	802.11n HT40	54	Front Face	0	MCS0	2	94.92	1.05	18	12	11.85	0.11	0.052	0.012	0.013
W18	802.11n HT40	54	Rear Face	0	MCS0	2	94.92	1.05	18	12	11.85	0.02	0.071	0.025	0.027
W19	802.11n HT40	54	Left Side	0	MCS0	2	94.92	1.05	18	12	11.85	-0.04	0.040	0.010	0.011
W20	802.11n HT40	54	Right Side	0	MCS0	2	94.92	1.05	18	12	11.85	-0.05	**1.170**	**0.290**	**0.316**
W21	802.11n HT40	54	Top Side1	0	MCS0	2	94.92	1.05	18	12	11.85	-0.13	0.037	0.008	0.009
W22	802.11n HT40	54	Top Side2	0	MCS0	2	94.92	1.05	18	12	11.85	-0.01	0.036	0.011	0.012
W23	802.11n HT40	54	Bottom Side	0	MCS0	2	94.92	1.05	18	12	11.85	0.06	0.009	0.002	0.002
W25	802.11n HT40	110	Front Face	0	MCS0	2	94.92	1.05	17.5	12	11.97	-0.05	0.091	0.026	0.028
W26	802.11n HT40	110	Rear Face	0	MCS0	2	94.92	1.05	17.5	12	11.97	0.01	0.094	0.028	0.029
W27	802.11n HT40	110	Left Side	0	MCS0	2	94.92	1.05	17.5	12	11.97	0.16	0.120	0.027	0.028
W28	802.11n HT40	110	Right Side	0	MCS0	2	94.92	1.05	17.5	12	11.97	-0.08	**1.180**	**0.310**	**0.329**
W29	802.11n HT40	110	Top Side1	0	MCS0	2	94.92	1.05	17.5	12	11.97	-0.09	0.150	0.029	0.031
W30	802.11n HT40	110	Top Side2	0	MCS0	2	94.92	1.05	17.5	12	11.97	0.04	0.104	0.018	0.020
W31	802.11n HT40	110	Bottom Side	0	MCS0	2	94.92	1.05	17.5	12	11.97	0.05	0.098	0.027	0.028
W33	802.11n HT40	151	Front Face	0	MCS0	2	94.92	1.05	17	12	11.76	0.01	0.268	0.071	0.078
W34	802.11n HT40	151	Rear Face	0	MCS0	2	94.92	1.05	17	12	11.76	-0.01	0.127	0.029	0.032
W35	802.11n HT40	151	Left Side	0	MCS0	2	94.92	1.05	17	12	11.76	0.02	0.087	0.020	0.022
W36	802.11n HT40	151	Right Side	0	MCS0	2	94.92	1.05	17	12	11.76	-0.08	**0.438**	**0.111**	**0.124**
W37	802.11n HT40	151	Top Side1	0	MCS0	2	94.92	1.05	17	12	11.76	0.06	0.008	0.002	0.002
W38	802.11n HT40	151	Top Side2	0	MCS0	2	94.92	1.05	17	12	11.76	0.11	0.064	0.016	0.017
W39	802.11n HT40	151	Bottom Side	0	MCS0	2	94.92	1.05	17	12	11.76	0.05	<0.001	<0.001	<0.001

Note: The value with boldface is the maximum SAR Value of each test band.

7.2.2 SAR MEASUREMENT RESULT OF HOTSPOT

1. Hotspot SAR test results of GSM

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
G20	GSM 850	GPRS4TX	190	Front Face	1	1	1	30	29.77	0.03	0.251	0.184	0.265
G21	GSM 850	GPRS4TX	190	Rear Face	1	1	1	30	29.77	0.02	0.184	0.14	0.194
G22	GSM 850	GPRS4TX	190	Left Side	1	1	1	30	29.77	0.12	0.24	0.163	0.253
G23	GSM 850	GPRS4TX	190	Right Side	1	1	1	30	29.77	-0.04	0.476	0.331	0.502
G24	GSM 850	GPRS4TX	190	Top Side1	1	1	1	30	29.77	0.07	0.153	0.104	0.161
G25	GSM 850	GPRS4TX	190	Top Side2	1	1	1	30	29.77	-0.03	0.105	0.0729	0.111
G26	GSM 850	GPRS4TX	190	Bottom Side	1	1	1	30	29.77	0.04	0.0234	0.0137	0.025
G27	GSM 850	GPRS4TX	190	Right Side	1	2	1	30	29.77	-0.06	**0.480**	**0.334**	**0.506**
G29	GSM 1900	GPRS4TX	661	Front Face	1	1	1	28	27.73	0.02	0.358	0.235	0.381
G30	GSM 1900	GPRS4TX	661	Rear Face	1	1	1	28	27.73	0.09	0.191	0.128	0.203
G31	GSM 1900	GPRS4TX	661	Left Side	1	1	1	28	27.73	-0.04	0.079	0.048	0.084
G32	GSM 1900	GPRS4TX	661	Right Side	1	1	1	28	27.73	-0.08	0.957	0.608	1.018
G33	GSM 1900	GPRS4TX	661	Top Side1	1	1	1	28	27.73	0.13	0.134	0.088	0.143
G34	GSM 1900	GPRS4TX	661	Top Side2	1	1	1	28	27.73	0.01	0.106	0.069	0.113
G35	GSM 1900	GPRS4TX	661	Bottom Side	1	1	1	28	27.73	-0.05	0.08	0.052	0.085
G36	GSM 1900	GPRS4TX	512	Right Side	1	1	1	28	27.21	-0.07	**0.978**	**0.644**	**1.173**
G37	GSM 1900	GPRS4TX	810	Right Side	1	1	1	28	27.56	-0.04	0.864	0.538	0.956
G38	GSM 1900	GPRS4TX	512	Right Side	1	2	1	28	27.21	0.03	0.963	0.617	1.155
G39	GSM 1900	GPRS4TX	512	Right Side (Repeated)	1	1	1	28	27.21	-0.07	0.955	0.613	1.146

Note: The value with boldface is the maximum SAR Value of each test band.

2. Hotspot SAR test results of UMTS

Test No.	Band	Mode	Channel	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
U20	UMTS B2	RMC12.2K	9400	Front Face	1	1	1	24	23.25	0.03	0.184	0.120	0.219
U21	UMTS B2	RMC12.2K	9400	Rear Face	1	1	1	24	23.25	0.01	0.097	0.065	0.116
U22	UMTS B2	RMC12.2K	9400	Left Side	1	1	1	24	23.25	0.06	0.027	0.014	0.032
U23	UMTS B2	RMC12.2K	9400	Right Side	1	1	1	24	23.25	-0.02	**0.500**	**0.315**	**0.594**
U24	UMTS B2	RMC12.2K	9400	Top Side1	1	1	1	24	23.25	0.09	0.030	0.021	0.036
U25	UMTS B2	RMC12.2K	9400	Top Side2	1	1	1	24	23.25	0.12	0.065	0.041	0.077
U26	UMTS B2	RMC12.2K	9400	Bottom Side	1	1	1	24	23.25	0.04	0.023	0.013	0.028
U27	UMTS B2	RMC12.2K	9400	Right Side	1	2	1	24	23.25	0.06	0.469	0.297	0.557
U29	UMTS B5	RMC12.2K	4182	Front Face	1	1	1	24	23.17	0.03	0.036	0.017	0.021
U30	UMTS B5	RMC12.2K	4182	Rear Face	1	1	1	24	23.17	-0.04	0.126	0.093	0.113
U31	UMTS B5	RMC12.2K	4182	Left Side	1	1	1	24	23.17	0.05	0.019	0.012	0.015
U32	UMTS B5	RMC12.2K	4182	Right Side	1	1	1	24	23.17	-0.18	**0.263**	**0.150**	**0.182**
U33	UMTS B5	RMC12.2K	4182	Top Side1	1	1	1	24	23.17	0.11	0.016	0.013	0.015
U34	UMTS B5	RMC12.2K	4182	Top Side2	1	1	1	24	23.17	0.09	0.014	0.012	0.015
U35	UMTS B5	RMC12.2K	4182	Bottom Side	1	1	1	24	23.17	-0.06	0.014	0.011	0.013
U36	UMTS B5	RMC12.2K	4182	Right Side	1	2	1	24	23.17	0.07	0.257	0.149	0.180

Note: The value with boldface is the maximum SAR Value of each test band.

3. Limb SAR test results of LTE

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L80	LTE B2	QPSK20M	18700	1	50	Front Face	1	1	1	25	24.37	0.03	0.189	0.124	0.219
L81	LTE B2	QPSK20M	18700	1	50	Rear Face	1	1	1	25	24.37	0.16	0.095	0.061	0.110
L82	LTE B2	QPSK20M	18700	1	50	Left Side	1	1	1	25	24.37	-0.05	0.043	0.019	0.050
L83	LTE B2	QPSK20M	18700	1	50	Right Side	1	1	1	25	24.37	-0.06	**0.494**	**0.314**	**0.571**
L84	LTE B2	QPSK20M	18700	1	50	Top Side1	1	1	1	25	24.37	0.01	0.056	0.035	0.065
L85	LTE B2	QPSK20M	18700	1	50	Top Side2	1	1	1	25	24.37	0.08	0.061	0.041	0.071
L86	LTE B2	QPSK20M	18700	1	50	Bottom Side	1	1	1	25	24.37	-0.1	0.037	0.019	0.043
L87	LTE B2	QPSK20M	18700	50	0	Front Face	1	1	1	24	23.22	-0.02	0.143	0.096	0.171
L88	LTE B2	QPSK20M	18700	50	0	Rear Face	1	1	1	24	23.22	0.04	0.074	0.050	0.089
L89	LTE B2	QPSK20M	18700	50	0	Left Side	1	1	1	24	23.22	0.09	0.048	0.023	0.058
L90	LTE B2	QPSK20M	18700	50	0	Right Side	1	1	1	24	23.22	-0.07	0.414	0.263	0.496
L91	LTE B2	QPSK20M	18700	50	0	Top Side1	1	1	1	24	23.22	0.13	0.052	0.029	0.062
L92	LTE B2	QPSK20M	18700	50	0	Top Side2	1	1	1	24	23.22	0.08	0.041	0.021	0.049
L93	LTE B2	QPSK20M	18700	50	0	Bottom Side	1	1	1	24	23.22	0.07	0.026	0.012	0.031
L94	LTE B2	QPSK20M	18700	1	50	Right Side	1	2	1	25	24.37	0.01	0.479	0.296	0.554
L96	LTE B4	QPSK20M	20175	1	50	Front Face	1	1	1	24	23.91	0.03	0.248	0.162	0.253
L97	LTE B4	QPSK20M	20175	1	50	Rear Face	1	1	1	24	23.91	0.09	0.107	0.074	0.109
L98	LTE B4	QPSK20M	20175	1	50	Left Side	1	1	1	24	23.91	0.01	0.028	0.015	0.028
L99	LTE B4	QPSK20M	20175	1	50	Right Side	1	1	1	24	23.91	0.05	**0.656**	**0.420**	**0.670**
L100	LTE B4	QPSK20M	20175	1	50	Top Side1	1	1	1	24	23.91	-0.03	0.059	0.041	0.060
L101	LTE B4	QPSK20M	20175	1	50	Top Side2	1	1	1	24	23.91	0.06	0.030	0.014	0.030
L102	LTE B4	QPSK20M	20175	1	50	Bottom Side	1	1	1	24	23.91	0.04	0.031	0.017	0.032
L103	LTE B4	QPSK20M	20175	50	0	Front Face	1	1	1	23	22.74	0.09	0.198	0.129	0.210
L104	LTE B4	QPSK20M	20175	50	0	Rear Face	1	1	1	23	22.74	0.01	0.086	0.058	0.091
L105	LTE B4	QPSK20M	20175	50	0	Left Side	1	1	1	23	22.74	0.06	0.023	0.017	0.025
L106	LTE B4	QPSK20M	20175	50	0	Right Side	1	1	1	23	22.74	0.03	0.505	0.323	0.536
L107	LTE B4	QPSK20M	20175	50	0	Top Side1	1	1	1	23	22.74	0.12	0.023	0.011	0.025
L108	LTE B4	QPSK20M	20175	50	0	Top Side2	1	1	1	23	22.74	-0.03	0.025	0.013	0.026
L109	LTE B4	QPSK20M	20175	50	0	Bottom Side	1	1	1	23	22.74	0.09	0.021	0.011	0.022
L110	LTE B4	QPSK20M	20175	1	50	Right Side	1	2	1	24	23.91	0.05	0.611	0.406	0.624

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L112	LTE B5	QPSK10M	20600	1	24	Front Face	1	1	1	24	23.68	0.09	0.157	0.118	0.169
L113	LTE B5	QPSK10M	20600	1	24	Rear Face	1	1	1	24	23.68	0.03	0.107	0.083	0.115
L114	LTE B5	QPSK10M	20600	1	24	Left Side	1	1	1	24	23.68	0.04	0.150	0.106	0.161
L115	LTE B5	QPSK10M	20600	1	24	Right Side	1	1	1	24	23.68	-0.12	**0.272**	**0.190**	**0.293**
L116	LTE B5	QPSK10M	20600	1	24	Top Side1	1	1	1	24	23.68	0.03	0.104	0.073	0.112
L117	LTE B5	QPSK10M	20600	1	24	Top Side2	1	1	1	24	23.68	-0.06	0.084	0.046	0.091
L118	LTE B5	QPSK10M	20600	1	24	Bottom Side	1	1	1	24	23.68	0.12	0.031	0.023	0.033
L119	LTE B5	QPSK10M	20600	25	12	Front Face	1	1	1	23	22.56	-0.04	0.123	0.094	0.136
L120	LTE B5	QPSK10M	20600	25	12	Rear Face	1	1	1	23	22.56	-0.08	0.084	0.067	0.093
L121	LTE B5	QPSK10M	20600	25	12	Left Side	1	1	1	23	22.56	0.06	0.124	0.088	0.137
L122	LTE B5	QPSK10M	20600	25	12	Right Side	1	1	1	23	22.56	-0.08	0.217	0.151	0.240
L123	LTE B5	QPSK10M	20600	25	12	Top Side1	1	1	1	23	22.56	0.04	0.079	0.054	0.087
L124	LTE B5	QPSK10M	20600	25	12	Top Side2	1	1	1	23	22.56	0.02	0.067	0.047	0.074
L125	LTE B5	QPSK10M	20600	25	12	Bottom Side	1	1	1	23	22.56	0.01	0.032	0.021	0.036
L126	LTE B5	QPSK10M	20600	1	24	Right Side	1	2	1	24	23.68	-0.03	0.210	0.182	0.226

Test No.	Band	Mode	Channel	RB	offset	Test Position	Separation Distance (cm)	SIM	Ant	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
L128	LTE B7	QPSK20M	20850	1	50	Front Face	1	1	1	25	24.69	0.05	0.259	0.154	0.278
L129	LTE B7	QPSK20M	20850	1	50	Rear Face	1	1	1	25	24.69	-0.01	0.357	0.209	0.383
L130	LTE B7	QPSK20M	20850	1	50	Left Side	1	1	1	25	24.69	-0.13	0.092	0.056	0.099
L131	LTE B7	QPSK20M	20850	1	50	Right Side	1	1	1	25	24.69	-0.09	0.977	0.544	1.049
L132	LTE B7	QPSK20M	20850	1	50	Top Side1	1	1	1	25	24.69	0.02	0.168	0.103	0.180
L133	LTE B7	QPSK20M	20850	1	50	Top Side2	1	1	1	25	24.69	-0.04	0.156	0.095	0.168
L134	LTE B7	QPSK20M	20850	1	50	Bottom Side	1	1	1	25	24.69	0.03	0.044	0.026	0.047
L135	LTE B7	QPSK20M	21100	50	50	Front Face	1	1	1	24	23.54	0.17	0.159	0.097	0.177
L136	LTE B7	QPSK20M	21100	50	50	Rear Face	1	1	1	24	23.54	0.08	0.248	0.144	0.276
L137	LTE B7	QPSK20M	21100	50	50	Left Side	1	1	1	24	23.54	0.07	0.109	0.066	0.121
L138	LTE B7	QPSK20M	21100	50	50	Right Side	1	1	1	24	23.54	-0.03	0.803	0.450	0.894
L139	LTE B7	QPSK20M	21100	50	50	Top Side1	1	1	1	24	23.54	-0.12	0.149	0.091	0.166
L140	LTE B7	QPSK20M	21100	50	50	Top Side2	1	1	1	24	23.54	0.05	0.176	0.106	0.196
L141	LTE B7	QPSK20M	21100	50	50	Bottom Side	1	1	1	24	23.54	0.01	0.039	0.017	0.043
L142	LTE B7	QPSK20M	21100	1	50	Right Side	1	1	1	25	24.50	-0.09	**1.050**	**0.510**	**1.178**
L143	LTE B7	QPSK20M	21350	1	50	Right Side	1	1	1	25	24.69	-0.03	0.732	0.401	0.786
L144	LTE B7	QPSK20M	20850	50	50	Right Side	1	1	1	24	23.10	0.04	0.720	0.377	0.886
L145	LTE B7	QPSK20M	21350	50	50	Right Side	1	1	1	24	23.01	0.02	0.739	0.406	0.928
L146	LTE B7	QPSK20M	21100	1	50	Right Side	1	2	1	25	24.50	0.02	0.869	0.465	0.975
L147	LTE B7	QPSK20M	21100	1	50	Right Side (Repeated)	1	1	1	25	24.50	-0.09	0.978	0.482	1.097

Note: The value with boldface is the maximum SAR Value of each test band.

4. Hotspot SAR test results of WIFI 2.4G

Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Ant	Duty Cycle (%)	Duty Factor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W41	802.11b	11	Front Face	1	1	2	97.56	1.03	17	16.62	0.03	0.021	0.012	0.024
W42	802.11b	11	Rear Face	1	1	2	97.56	1.03	17	16.62	0.04	0.041	0.023	0.046
W43	802.11b	11	Left Side	1	1	2	97.56	1.03	17	16.62	0.09	0.026	0.012	0.029
W44	802.11b	11	Right Side	1	1	2	97.56	1.03	17	16.62	0.18	**0.252**	**0.119**	**0.282**
W45	802.11b	11	Top Side1	1	1	2	97.56	1.03	17	16.62	0.12	0.020	0.010	0.023
W46	802.11b	11	Top Side2	1	1	2	97.56	1.03	17	16.62	0.06	0.023	0.011	0.026
W47	802.11b	11	Bottom Side	1	1	2	97.56	1.03	17	16.62	0.03	0.021	0.011	0.023

Note: The value with boldface is the maximum SAR Value of each test band.

5. Hotspot SAR test results of WIFI 5G

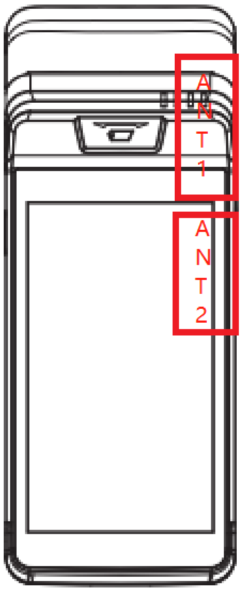
Test No.	Band	Channel	Test Position	Separation Distance (cm)	Data Rate	Ant	Duty Cycle (%)	Duty Factor	Maximum Tune-up (dBm)	Conducted Power (dBm)	Power Drift (dB)	SAR 1g (W/kg)	SAR 10g (W/kg)	Reported 1g SAR
W49	802.11n HT40	36	Front Face	1	MCS0	2	94.92	1.05	12	11.89	0.03	0.070	0.024	0.075
W50	802.11n HT40	36	Rear Face	1	MCS0	2	94.92	1.05	12	11.89	0.04	0.103	0.036	0.111
W51	802.11n HT40	36	Left Side	1	MCS0	2	94.92	1.05	12	11.89	0.09	0.042	0.016	0.046
W52	802.11n HT40	36	Right Side	1	MCS0	2	94.92	1.05	12	11.89	-0.03	**0.130**	**0.043**	**0.140**
W53	802.11n HT40	36	Top Side1	1	MCS0	2	94.92	1.05	12	11.89	0.01	0.065	0.021	0.070
W54	802.11n HT40	36	Top Side2	1	MCS0	2	94.92	1.05	12	11.89	0.01	0.040	0.013	0.044
W55	802.11n HT40	36	Bottom Side	1	MCS0	2	94.92	1.05	12	11.89	0.06	0.016	0.010	0.018
W57	802.11n HT40	151	Front Face	1	MCS0	2	94.92	1.05	12	11.76	0.04	0.091	0.024	0.102
W58	802.11n HT40	151	Rear Face	1	MCS0	2	94.92	1.05	12	11.76	0.03	0.113	0.034	0.126
W59	802.11n HT40	151	Left Side	1	MCS0	2	94.92	1.05	12	11.76	0.12	0.064	0.020	0.071
W60	802.11n HT40	151	Right Side	1	MCS0	2	94.92	1.05	12	11.76	-0.08	**0.155**	**0.051**	**0.173**
W61	802.11n HT40	151	Top Side1	1	MCS0	2	94.92	1.05	12	11.76	0.06	0.054	0.020	0.061
W62	802.11n HT40	151	Top Side2	1	MCS0	2	94.92	1.05	12	11.76	0.07	0.049	0.020	0.054
W63	802.11n HT40	151	Bottom Side	1	MCS0	2	94.92	1.05	12	11.76	0.01	0.038	0.012	0.042

Note: The value with boldface is the maximum SAR Value of each test band.

7.3 MULTIPLE TRANSMITTER EVALUATION

The following tables list information which is relevant for the decision if a simultaneous transmit evaluation is necessary according to FCC KDB447498 D04 Interim General RF Exposure Guidance v01.

The location of the antennas inside the EUT is shown as below picture:



7.3.1 STAND-ALONE SAR TEST EXCLUSION

Per FCC KDB447498 D04, SAR compliance for simultaneous transmission must be considered when the maximum duration of overlapping transmissions, including network hand-offs, is greater than 30 seconds. This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis.

The Simultaneous Transmission Possibilities of this device are as below:

No.	Configuration	Limb	Hotspot
1	GPRS/UMTS/LTE + 2.4G WIFI	Yes	Yes
2	GPRS/UMTS/LTE + 5G WIFI	Yes	Yes
3	GPRS/UMTS/LTE + BT	Yes	No

7.3.2 SIMULTANEOUS TRANSMISSION CONDITIONS

Position / SAR_{1g}(W/Kg)	Front Face	Rear Face	Left Side	Right Side	Top Side1	Top Side2	Bottom Side
GSM 850	0.265	0.194	0.253	0.506	0.161	0.111	0.025
GSM 1900	0.381	0.203	0.084	1.173	0.143	0.113	0.085
UMTS B2	0.219	0.116	0.032	0.594	0.036	0.077	0.028
UMTS B5	0.021	0.113	0.015	0.182	0.015	0.015	0.013
LTE B2	0.219	0.110	0.058	0.571	0.065	0.071	0.043
LTE B4	0.253	0.109	0.028	0.670	0.060	0.030	0.032
LTE B5	0.169	0.115	0.161	0.293	0.112	0.091	0.036
LTE B7	0.278	0.383	0.121	1.049	0.180	0.196	0.047
WIFI2.4G	0.024	0.046	0.029	0.282	0.023	0.026	0.023
WIFI5.2G	0.075	0.111	0.046	0.140	0.070	0.044	0.018
WIFI5.6G	/	/	/	/	/	/	/
WIFI5.8G	0.102	0.126	0.071	0.173	0.061	0.054	0.042
Bluetooth	/	/	/	/	/	/	/
MAX $\sum SAR_{10g}$	**0.483**	**0.509**	**0.324**	**1.455**	**0.250**	**0.250**	**0.127**

Note:
1) MAX. $\sum SAR_{1g}$ <4.0 W/Kg, the SAR to peak location separation ratio should not be considered, otherwise, see section 7.3.3 for more information.
2) The highest simultaneous SAR value=1.455W/Kg, per KDB690783 D01.

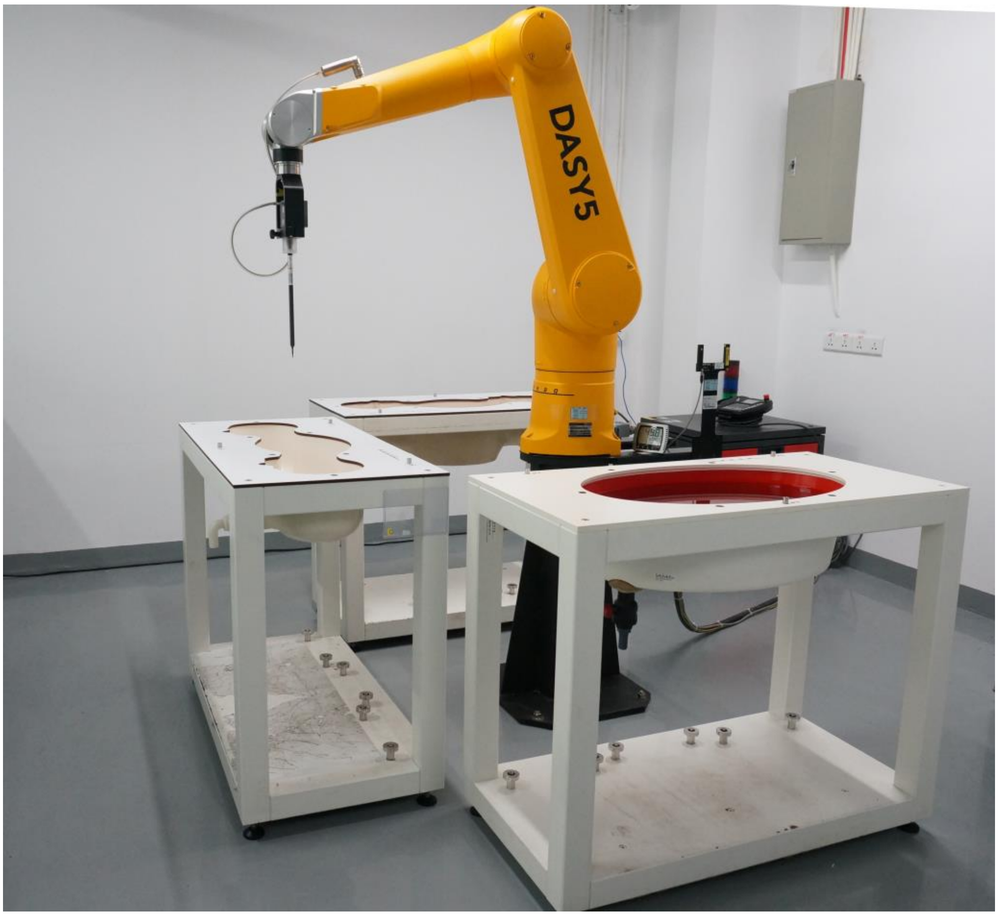
Position / SAR_{10g}(W/Kg)	Front Face	Rear Face	Left Side	Right Side	Top Side1	Top Side2	Bottom Side
GSM 850	0.218	0.362	0.342	1.086	0.299	0.159	0.039
GSM 1900	0.464	0.237	0.109	1.766	0.161	0.130	0.072
UMTS B2	0.267	0.145	0.072	1.260	0.112	0.096	0.047
UMTS B5	0.050	0.144	0.246	0.656	0.050	0.102	0.036
LTE B2	0.403	0.183	0.090	1.237	0.101	0.114	0.055
LTE B4	0.384	0.128	0.038	1.103	0.101	0.089	0.034
LTE B5	0.141	0.183	0.208	0.532	0.163	0.123	0.031
LTE B7	0.520	0.531	0.342	1.579	0.238	0.268	0.033
WIFI2.4G	0.048	0.051	0.028	0.408	<0.001	0.015	0.028
WIFI5.3G	0.013	0.027	0.011	0.316	0.009	0.012	0.002
WIFI5.6G	0.028	0.029	0.028	0.329	0.031	0.020	0.028
WIFI5.8G	0.078	0.032	0.022	0.124	0.002	0.017	<0.001
Bluetooth	0.002	0.001	<0.001	0.011	<0.001	0.001	<0.001
MAX $\sum SAR_{10g}$	**0.598**	**0.582**	**0.370**	**2.174**	**0.330**	**0.288**	**0.100**

Note:
1) MAX. $\sum SAR_{10g}$ <4.0 W/Kg, the SAR to peak location separation ratio should not be considered, otherwise, see section 7.3.3 for more information.
2) The highest simultaneous SAR value=2.174W/Kg, per KDB690783 D01.

APPENDIX

1. TEST LAYOUT

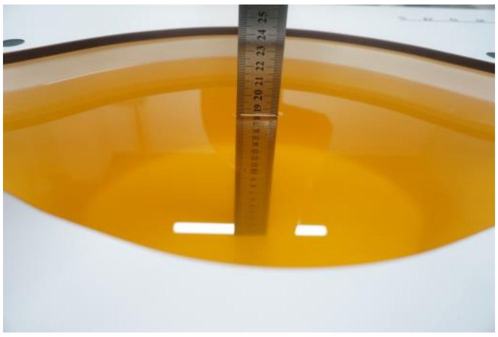
Specific Absorption Rate Test Layout



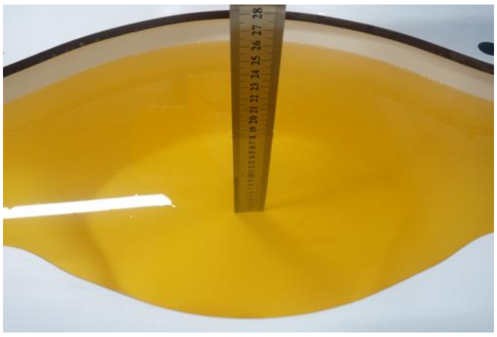
Liquid depth in the flat Phantom (≥15cm depth)

HSL_695MHz-925 MHz_Body_19.4cm

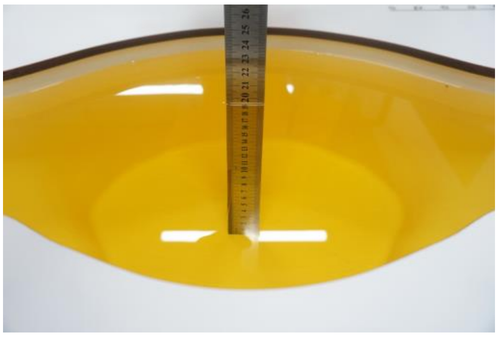
HSL_1700MHz-1900MHz_Body_18.5cm



HSL_1900MHz-2300MHz_Body_18.7cm



HSL_2300MHz-2700MHz_Body_19.5cm



HSL_5000MHz-6000MHz_Body_19cm

Appendix A. SAR Plots of System Verification

(Pls See BTL-FCC SAR-1-2207G005_Appendix A.)

Appendix B. SAR Plots of SAR Measurement

(Pls See BTL-FCC SAR-1-2207G005_Appendix B.)

Appendix C. Calibration Certificate

(Pls See BTL-FCC SAR-1-2207G005_Appendix C.)

Appendix D. Photographs of the Test Set-Up

(Pls See BTL-FCC SAR-1-2207G005_Appendix D.)

Appendix E. Conducted Power Measurement Result

(Pls See BTL-FCC SAR-1-2207G005_Appendix E.)

End of Test Report