

TEST REPORT

Applicant: KEY PHONE LLC
Address: 630 Flushing Ave, Brooklyn N.Y. 11206 Suite 605
Equipment Type: KP1
Model Name: KP1
Brand Name: Keyphone
FCC ID: 2A6P4-KP1
Test Standard: FCC 47 CFR Part 2.1093
(refer section 3.1)
Maximum SAR: Head (1 g@0mm): 0.92 W/kg
Body-worn (1 g@10mm): 1.19 W/kg
Hotspot (1 g@10mm): 1.19 W/kg
Specific (10 g@0mm): 0.45 W/kg
Sample Arrival Date: Sep. 15, 2025
Test Date: Sep. 26, 2025 - Oct. 08, 2025
Date of Issue: Dec. 02, 2025

ISSUED BY:

Shanghai Tejet Communications Technology Co., Ltd. Testing Center



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Revision History

Version	Issue Date	Revisions Content
<u>Rev. 01</u>	<u>Dec. 02, 2025</u>	<u>Initial Issue</u>

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1 GENERAL INFORMATION

1.1 Test Laboratory

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Address	1-2/F., Building 1, No.222, Xuanlan Road, Xuanqiao, Pudong New District, Shanghai, China

1.2 Test Location

Name	Shanghai Tejet Communications Technology Co., Ltd. Testing Center
Location	1-2/F., Building 1, No.222, Xuanlan Road, Xuanqiao, Pudong New District, Shanghai, China
Accreditation Certificate	The laboratory is a testing organization accredited by FCC as a accredited testing laboratory. The designation number is CN1352. The laboratory has been listed by Industry Canada to perform electromagnetic emission measurements. The recognition numbers of test site are 29671.

1.3 Test Environment Condition

Ambient Temperature	18°C to 25°C
Ambient Relative Humidity	30% to 70%

2 PRODUCT INFORMATION

2.1 Applicant Information

Applicant	KEY PHONE LLC
Address	630 Flushing Ave, Brooklyn N.Y. 11206 Suite 605

2.2 Manufacturer Information

Manufacturer	ShenZhen Wintech Smart Communication co., Ltd
Address	608,6th Floor, Building U3,Junxian U8 Intelligent manufacturing Industrial Park, Hangcheng Avenue, Bao an District, Shenzhen

2.3 Factory Information

Factory	Shenzhen Xunxiang Technology Co., Ltd.
Address	Room 501, Factory Building 1, No. 149, Xin'erzhuang' Village Road, Xin'er Community, Xinqiao Street, Bao'an District, Shenzhen

2.4 General Description for Equipment under Test (EUT)

EUT Name	KP1
Model Name Under Test	KP1
Series Model Name	N/A
Description of Model name differentiation	N/A
Hardware Version	Y6120_MB_V3.2
Software Version	Y6120_A_20251107
Dimensions (Approx.)	N/A
Weight (Approx.)	N/A

2.5 Ancillary Equipment

Ancillary Equipment 1	Battery	
	Brand Name	N/A
	Model No.	KP1-B
	Serial No.	N/A
	Capacity	2400 mAh
	Rated Voltage	3.87V
	Limit Charge Voltage	4.2V

2.6 Technical Information

Network and Wireless connectivity	2G Network GSM/GPRS/EDGE 850/1900 MHz 3G Network WCDMA 2/4 4G Network FDD LTE Band 2/4/5/7/12/13/17/66/71 Bluetooth 2.4G WIFI 802.11b, 802.11g, 802.11n HT20/40 5G WIFI 802.11a, 802.11n(HT20/40), 802.11ac(VHT20/40/80) NFC,GPS,BDS,Galileo
Note: The EUT is a mobile phone, which supports dual SIM card under the same transceiver. Each SIM supports GSM, WCDMA and LTE, and both SIM share the same transmitting electro circuit, NV parameters, so only SIM1 was tested in this report.	

The requirement for the following technical information of the EUT was tested in this report:

Operating Mode	GSM, WCDMA, LTE, WLAN, Bluetooth		
Frequency Range	GSM 850	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	GSM 1900	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	WCDMA Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 2	TX: 1850 ~ 1910 MHz	RX: 1930 ~ 1990 MHz
	LTE Band 4	TX: 1710 ~ 1755 MHz	RX: 2110 ~ 2155 MHz
	LTE Band 5	TX: 824 ~ 849 MHz	RX: 869 ~ 894 MHz
	LTE Band 7	TX: 2500 ~ 2570 MHz	RX: 2620 ~ 2690 MHz
	LTE Band 12	TX: 699 ~ 716 MHz	RX: 729 ~ 746 MHz
	LTE Band 13	TX: 777 ~ 787MHz	RX: 746 ~ 756 MHz
	LTE Band 17	TX: 704 ~ 716 MHz	RX: 734 ~ 746 MHz
	LTE Band 66	TX: 1710 ~ 1780 MHz	RX: 2110 ~ 2180 MHz
	LTE Band 71	TX: 663 ~ 698 MHz	RX: 617 ~ 652 MHz
	2.4G WIFI	2412 ~ 2462 MHz	
	5G WIFI	5150 ~ 5250 MHz	
		5250 ~ 5350 MHz	
		5470 ~ 5725 MHz	
5725 ~ 5850 MHz			
Bluetooth	2402 ~ 2480 MHz		
Antenna Type	WWAN: LDS Antenna; WLAN: LDS Antenna Bluetooth: LDS Antenna; NFC: FPC Antenna		
DTM	N/A		
Hotspot Function	Support		
Power Reduction	Support		
Exposure Category	General Population/Uncontrolled exposure		
Product Type	Portable Device		
EUT Type	☒ Production unit	☐ Identical prototype	

3 SUMMARY OF TEST RESULT

3.1 Test Standards

No.	Identity	Document Title
1	47 CFR Part 2.1093	Radiofrequency radiation exposure evaluation: portable devices
2	ANSI C95.1-1992	IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
3	IEEE Std. 1528-2013	IEEE Recommended Practice for Determining the Peak Spatial-Average Specific Absorption Rate(SAR) in the Human Head from Wireless Communications Devices: Measurement Techniques
4	KDB 447498 D04 v01	447498 D04 Interim General RF Exposure Guidance v01
5	KDB 941225 D01 v03r01	3G SAR MEAUREMENT PROCEDURES
6	KDB 941225 D05 v02r05	SAR Evaluation Considerations for LTE Devices
7	KDB 941225 D05A v01r02	REL. 10 LTE SAR TEST GUIDANCE AND KDB INQUIRIES
7	KDB 941225 D06 v02r01	SAR EVALUATION PROCEDURES FOR PORTABLE DEVICES WITH WIRELESS ROUTER CAPABILITIES
8	KDB 865664 D01 v01r04	SAR Measurement 100 MHz to 6 GHz
9	KDB 865664 D02 v01r02	RF Exposure Reporting
10	KDB 648474 D04 v01r03	SAR EVALUATION CONSIDERATIONS FOR WIRELESS HANDSETS
11	KDB 248227 D01 v02r02	SAR GUIDANCE FOR IEEE 802.11 (Wi-Fi) TRANSMITTERS

3.2 Device Category and SAR Limit

This device belongs to portable device category because its radiating structure is allowed to be used within 20 centimeters of the body of the user.

Limit for General Population/Uncontrolled exposure should be applied for this device, it is 1.6 W/kg as averaged over any 1 gram of tissue.

Table of Exposure Limits:

Body Position	SAR Value (W/Kg)	
	General Population/ Uncontrolled Exposure	Occupational/ Controlled Exposure
Whole-Body SAR (averaged over the entire body)	0.08	0.4
Partial-Body SAR (averaged over any 1 gram of tissue)	1.60	8.0
SAR for hands, wrists, feet and ankles (averaged over any 10 grams of tissue)	4.0	20.0

NOTE:

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

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

3.3 Test Result Summary

3.3.1 Highest SAR Values

Equipment Class	Band	Maximum Scaled SAR (W/kg)				Maximum Report SAR (W/kg)			
		Head (0mm)	Body-worn (10mm)	Hotspot (10mm)	Specific (0mm)	Head (0mm)	Body-worn (10mm)	Hotspot (10mm)	Specific (0mm)
		1g SAR			10g SAR	1g SAR			10g SAR
PCE	GSM 850	0.92	1.15	1.17	/	0.92	1.19	1.19	0.45
	GSM 1900	0.64	1.19	1.19	/				
	WCDMA Band 2	0.44	0.51	0.51	/				
	WCDMA Band 4	0.52	1.16	1.16	/				
	LTE Band 2	0.65	0.68	0.68	/				
	LTE Band 5	0.66	0.79	0.79	/				
	LTE Band 7	0.05	1.01	1.01	/				
	LTE Band 12	0.39	0.70	0.70	/				
	LTE Band 13	0.44	0.67	0.67	/				
	LTE Band 66	0.52	1.10	1.10	/				
	LTE Band 71	0.50	0.77	0.77	/				
DTS	2.4G WIFI	0.37	0.10	0.12	/				
NII	5.2G WIFI	/	/	0.24	/				
	5.3G WIFI	0.25	0.25	/	0.45				
	5.6G WIFI	0.24	0.10	/	0.40				
	5.8G WIFI	0.30	0.08	0.29	/				
DSS	Bluetooth	0.06	0.04	0.12	/				
Limit (W/kg)		1.6			4.0	1.6			4.0
Verdict		PASS							

Note: This device supports LTE Band 12, 17 and LTE Band 4, 66. Since the supported frequency span for LTE Band 17 falls completely within the supported frequency span for LTE Band 12, the supported frequency span for LTE Band 4 falls completely within the supported frequency span for LTE Band 66, these LTE bands have the same target power, and share the same transmission path; therefore, SAR was only assessed for LTE Band 12, 66.

3.3.2 Highest Simultaneous Transmission SAR Values

Equipment Class	Maximum Scaled SAR (W/kg)			
	Head 1g (0mm)	Body-worn 1g (10mm)	Hotspot 1g (10mm)	Specific 10g (0mm)
PCE	1.29	1.43	1.43	/
DTS	1.29	1.27	1.23	/
NII	1.22	1.43	1.43	/
DSS	0.99	1.22	1.22	/
Limit (W/Kg)	1.60	1.60	1.60	4.00
Verdict	Pass			

Note: The highest simultaneous SAR please refer section 12

3.4 Test Uncertainty

3.4.1 Measurement uncertainty evaluation for SAR test

The following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in IEC/IEEE 62209-1528. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

1) System Measurement Uncertainty (Frequency range from 300 MHz to 3 GHz)

DASY5 Uncertainty Budget (Frequency band: 300 MHz - 3 GHz range)								
Symbol	Error Description	Uncert. value	Prob Dist.	Div	(c) 1g	(c) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	$\pm 12.0\%$	N	2	1	1	$\pm 6.0\%$	$\pm 6.0\%$
CF _{drift}	Probe Calibration Drift	$\pm 1.0\%$	N	1	1	1	$\pm 1.0\%$	$\pm 1.0\%$
LIN	Probe Linearity	$\pm 4.7\%$	R	$\sqrt{3}$	1	1	$\pm 2.7\%$	$\pm 2.7\%$
BBS	Broadband Signal	$\pm 3.0\%$	N	2	1	1	$\pm 1.5\%$	$\pm 1.5\%$
ISO	Probe Isotropy	$\pm 7.6\%$	R	$\sqrt{3}$	1	1	$\pm 4.4\%$	$\pm 4.4\%$
DAE	Data Acquisition	$\pm 0.3\%$	N	1	1	1	$\pm 0.3\%$	$\pm 0.3\%$
AMB	RF Ambient	$\pm 1.8\%$	N	1	1	1	$\pm 1.8\%$	$\pm 1.8\%$
Δ_{sys}	Probe Positioning	$\pm 0.2\%$	N	1	0.1 4	0.14	$\pm 0\%$	$\pm 0\%$
DAT	Data Processing	$\pm 1.2\%$	N	1	1	1	$\pm 1.2\%$	$\pm 1.2\%$
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	$\pm 2.5\%$	N	1	0.7 8	0.71	$\pm 2.0\%$	$\pm 1.8\%$
LIQ(T_{σ})	Conductivity (temp.) ^{BB}	$\pm 3.3\%$	R	$\sqrt{3}$	0.7 8	0.71	$\pm 1.5\%$	$\pm 1.4\%$
EPS	Phantom Permittivity	$\pm 14.0\%$	R	$\sqrt{3}$	0	0	$\pm 0\%$	$\pm 0\%$
DAS	Distance DUT - TSL	$\pm 2.1\%$	N	1	2	2	$\pm 4.2\%$	$\pm 4.2\%$
H	Device Holder	$\pm 3.8\%$	N	1	1	1	$\pm 3.8\%$	$\pm 3.8\%$
MOD	DUT Modulation ^m	$\pm 2.4\%$	R	$\sqrt{3}$	1	1	$\pm 1.4\%$	$\pm 1.4\%$
TAS	Time-average SAR	$\pm 2.6\%$	R	$\sqrt{3}$	1	1	$\pm 1.5\%$	$\pm 1.5\%$
RF _{drift}	DUT drift	$\pm 5.0\%$	R	$\sqrt{3}$	1	1	$\pm 2.9\%$	$\pm 2.9\%$
Correction to the SAR results								
C(ϵ , σ)	Deviation to Target	$\pm 1.9\%$	N	1	1	0.84	$\pm 1.9\%$	$\pm 1.6\%$
C(R)	SAR scaling ^p	$\pm 0\%$	R	$\sqrt{3}$	1	1	$\pm 0\%$	$\pm 0\%$
u(Δ SAR)	Combined Uncertainty						$\pm 11.2\%$	$\pm 11.0\%$
U	Expanded Uncertainty						$\pm 22.3\%$	$\pm 22.2\%$

2) System Measurement Uncertainty (Frequency range from 3 GHz to 6 GHz)

DASY5 Uncertainty Budget (Frequency band: 3 GHz - 6 GHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div	(c) 1g	(c) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±14.0%	N	2	1	1	±7.0%	±7.0%
CF _{drift}	Probe Calibration Drift	±1.0%	N	1	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±3.0%	N	2	1	1	±1.5%	±1.5%
ISO	Probe Isotropy	±7.6%	R	√3	1	1	±4.4%	±4.4%
DAE	Data Acquisition	±0.3%	N	1	1	1	±0.3%	±0.3%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.2%	N	1	0.3 3	0.33	±0.1%	±0.1%
DAT	Data Processing	±2.3%	N	1	1	1	±2.3%	±2.3%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	1	0.7 8	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±3.4%	R	√3	0.7 8	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	√3	0.2 5	0.25	±2.0%	±2.0%
DAS	Distance DUT - TSL	±2.1%	N	1	2	2	±4.2%	±4.2%
H	Device Holder	±3.8%	N	1	1	1	±3.8%	±3.8%
MOD	DUT Modulation ^m	±2.4%	R	√3	1	1	±1.4%	±1.4%
TAS	Time-average SAR	±2.6%	R	√3	1	1	±1.5%	±1.5%
RF _{drift}	DUT drift	±5.0%	R	√3	1	1	±2.9%	±2.9%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
C(R)	SAR scaling ^p	±0%	R	√3	1	1	±0%	±0%
u(ΔSAR)	Combined Uncertainty	/	/	/	/	/	±12.1%	±12.0%
U	Expanded Uncertainty	/	/	/	/	/	±24.2%	±24.0%

3.4.2 Measurement uncertainty evaluation for system check

This measurement uncertainty budget is suggested by IEC/IEEE 62209-1528. The breakdown of the individual uncertainties is as follows:

DASY5 Uncertainty Budget (Frequency band: 300 MHz - 6 GHz range)								
Symbol	Error Description	Uncert. value	Prob. Dist.	Div.	(c _i) 1g	(c _i) 10g	Std. Unc. (1g)	Std. Unc. (10g)
Measurement System Errors								
CF	Probe Calibration	±14.0%	N	2	1	1	±7.0%	±7.0%
CF _{drift}	Probe Calibration Drift	±1.0%	N	1	1	1	±1.0%	±1.0%
LIN	Probe Linearity	±4.7%	R	√3	1	1	±2.7%	±2.7%
BBS	Broadband Signal	±0.0%	N	2	1	1	±0.0%	±0.0%
ISO	Probe Isotropy	±7.6%	R	√3	1	1	±4.4%	±4.4%
DAE	Data Acquisition	±0.3%	N	1	1	1	±0.3%	±0.3%
AMB	RF Ambient	±1.8%	N	1	1	1	±1.8%	±1.8%
Δ _{sys}	Probe Positioning	±0.2%	N	1	0.33	0.33	±0%	±0%
Phantom and Device Errors								
LIQ(σ)	Conductivity (meas.) ^{DAK}	±2.5%	N	1	0.78	0.71	±2.0%	±1.8%
LIQ(T _σ)	Conductivity (temp.) ^{BB}	±3.4%	R	√3	0.78	0.71	±1.5%	±1.4%
EPS	Phantom Permittivity	±14.0%	R	√3	0.25	0.25	±2.0%	±2.0%
DAS	Distance DUT - TSL	±1.0%	N	1	2	2	±2.0%	±2.0%
VAL	Validation antenna	±0.0%	R	√3	1	1	±0.0%	±0.0%
P _{in}	Accepted power	±1.2%	N	1	1	1	±1.2%	±1.2%
RF _{drift}	DUT drift	±5.0%	R	√3	1	1	±2.9%	±2.9%
Correction to the SAR results								
C(ε, σ)	Deviation to Target	±1.9%	N	1	1	0.84	±1.9%	±1.6%
u(ΔSAR)	Combined Uncertainty	/	/	/	/	/	±10.4%	±10.3%
U	Expanded Uncertainty	/	/	/	/	/	±20.7%	±20.5%

4 MEASUREMENT SYSTEM

4.1 Specific Absorption Rate (SAR) Definition

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

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

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

SAR is expressed in units of Watts per kilogram (W/kg) SAR measurement can be related to the electrical field in the tissue by

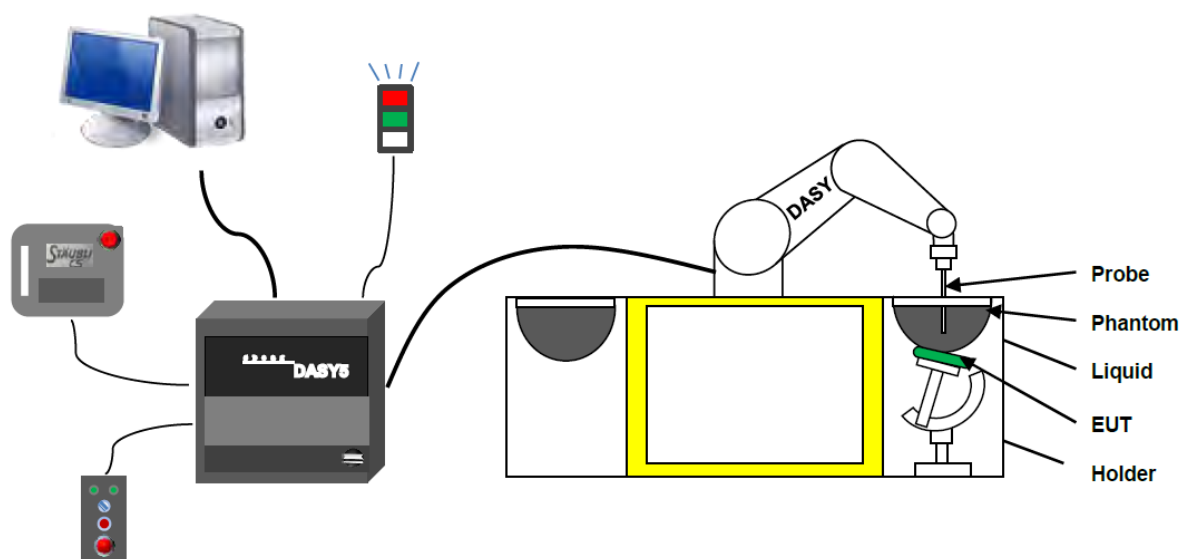
$$\text{SAR} = \frac{\sigma E^2}{\rho}$$

Where: σ is the conductivity of the tissue,

ρ is the mass density of the tissue and E is the RMS electrical field strength.

4.2 DASY SAR System

4.2.1 DASY SAR System Diagram

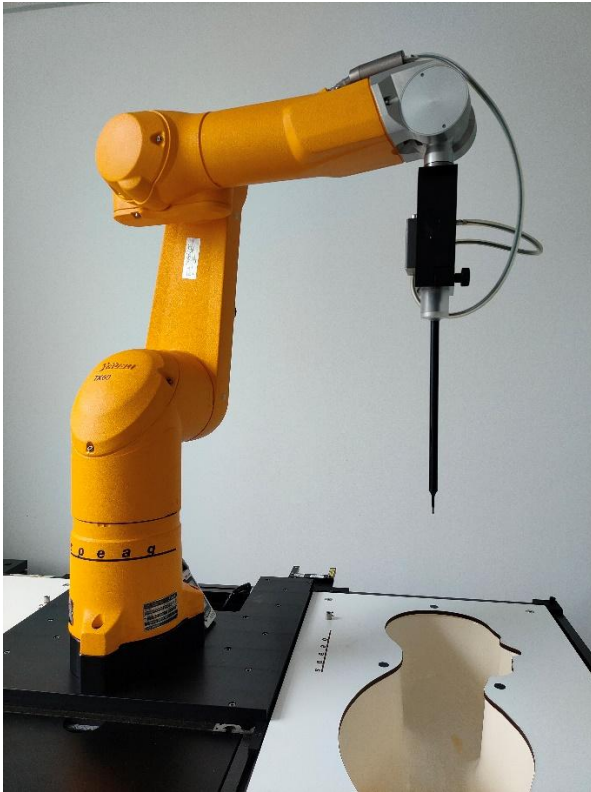


The DASY5 system for performing compliance tests consists of the following items:

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. The DASY5 measurement server, which performs all real-time data evaluation for field measurements and surface detection, controls robot movements and handles safety operation.
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.

4.2.2 Robot

The Dasy SAR system uses the high precision robots. Symmetrical design with triangular core Built-in optical fiber for surface detection system For the 6-axis controller system, Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents). The robot series have many features that are important for our application:



- High precision
(repeatability ± 0.02 mm)
- High reliability
(industrial design)
- Low maintenance costs
(virtually maintenance free due to direct drive gears; no belt drives)
- Jerk-free straight movements
(brush less synchron motors; no stepper motors)
- Low ELF interference
(motor control _elds shielded via the closed metallic construction shields)

4.2.3 E-Field Probe

The probe is specially designed and calibrated for use in liquids with high permittivities for the measurements the Specific Dosimetric E-Field Probe EX3DV4 with following specifications is used.

Construction	Symmetrical design with triangular core Built-in optical fiber for surface detection system Built-in shielding against static charges PEEK enclosure material (resistant to organic solvents, e.g., glycolether)
Calibration	ISO/IEC 17025 calibration service available
Frequency	4 MHz to 10 GHz; Linearity: ± 0.2 dB
Directivity	± 0.2 dB in HSL (rotation around probe axis) ; ± 0.4 dB in HSL (rotation normal to probe axis)
Dynamic range	5 μ W/g to > 100 mW/g; Linearity: ± 0.2 dB
Dimensions	Overall length: 337 mm (Tip: 9 mm) Tip diameter: 2.5 mm (Body: 10 mm) Distance from probe tip to dipole centers: 1.0 mm
Application	General dosimetry up to 3 GHz Compliance tests of mobile phones Fast automatic scanning in arbitrary phantoms (EX3DV4)



E-Field Probe Calibration Process

Probe calibration is realized, in compliance with IEC/IEEE 62209-1528 and IEEE 1528 std, with CALISAR, Antennessa proprietary calibration system. The calibration is performed with the IEC/IEEE 62209-1528 annexe technique using reference guide at the five frequencies.

4.2.4 Data Acquisition Electronics

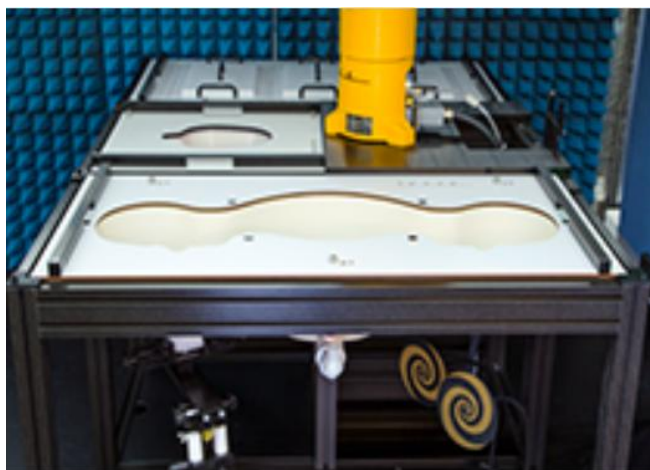
The data acquisition electronics (DAE) consist of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converte and a command decoder with a control logic unit. Transmission to the measurement server is accomplished through an optical downlink for data and status information, as well as an optical uplink for commands and the clock.



- Input Impedance: 200M Ω m
- The Inputs: Symmetrical and Floating
- Commom Mode Rejection: Above 80dB

4.2.5 Phantoms

For the measurements the Specific Anthropomorphic Mannequin (SAM) defined by the IEEE SCC-34/SC2 group is used. The phantom is a polyurethane shell integrated in a wooden table. The thickness of the phantom amounts to 2mm +/- 0.2mm. It enables the dosimetric evaluation of left and right phone usage and includes an additional flat phantom part for the simplified performance check. The phantom set-up includes a cover, which prevents the evaporation of the liquid.



- Left head
- Right head
- Flat phantom

Photo of Phantom SN1473



Serial Number	Material	Length	Height
SN 1473 SAM	Vinylester, glass fiber reinforced	1000	500

4.2.6 Device Holder

The DASY5 device holder has two scales for device rotation (with respect to the body axis) and the device inclination (with respect to the line between the ear openings). The plane between the ear openings and the mouth tip has a rotation angle of 65° . The bottom plate contains three pair of bolts for locking the device holder. The device holder positions are adjusted to the standard measurement positions in the three sections. This device holder is used for standard mobile phones or PDA's only. If necessary an additional support of polystyrene material is used. Larger DUT's (e.g. notebooks) cannot be tested using this device holder. Instead a support of bigger polystyrene cubes and thin polystyrene plates is used to position the DUT in all relevant positions to find and measure spots with maximum SAR values. Therefore those devices are normally only tested at the flat part of the SAM.

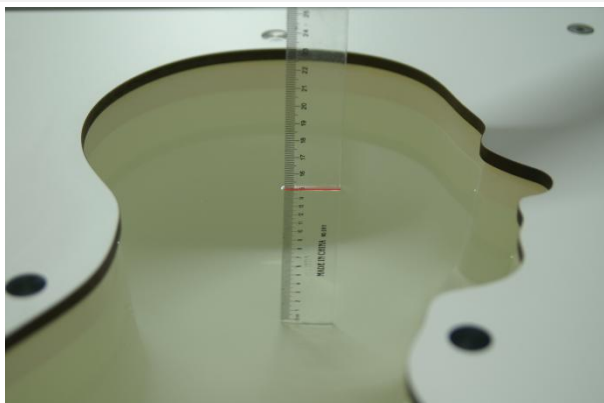


The positioning system allows obtaining cheek and tilting position with a very good accuracy. Incompliance with CENELEC, the tilt angle uncertainty is lower than 1° .

4.2.7 Simulating Liquid

For SAR measurement of the field distribution inside the phantom, the phantom must be filled with homogeneous tissue simulating liquid to a depth of at least 15 cm. For head SAR testing, the liquid height from the ear reference point (ERP) of the phantom to the liquid top surface is larger than 15 cm. For body SAR testing, the liquid height from the center of the flat phantom to the liquid top surface is larger than 15 cm. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5%.

Head Liquid Depth



Body Liquid Depth



The following table gives the recipes for tissue simulating liquid.

TSL	Manufacturer / Model	Freq Range (MHz)	Main Ingredients
Head WideBand	SPEAG HBBL600-10000V6	600-10000	Ethanediol, Sodium petroleum sulfonate, Hexylene Glycol / 2-Methyl-pentane-2.4-diol, Alkoxylated alcohol

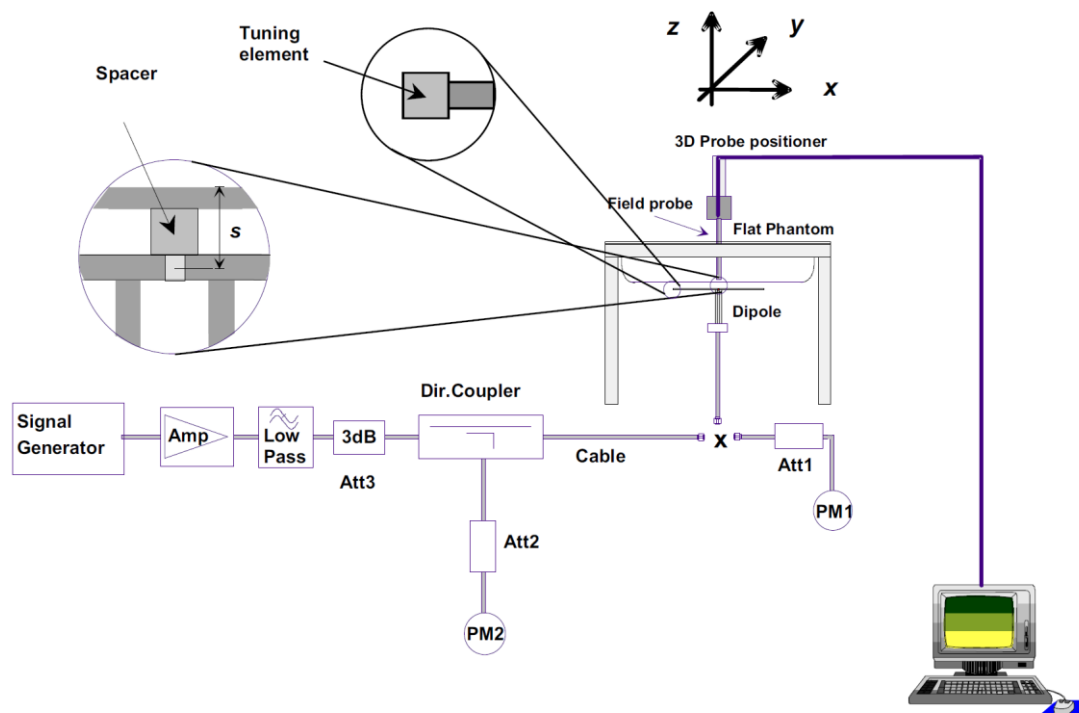
5 SYSTEM VERIFICATION

5.1 Purpose of System Check

The system performance check verifies that the system operates within its specifications. System and operator errors can be detected and corrected. It is recommended that the system performance check be performed prior to any usage of the system in order to guarantee reproducible results. The system performance check uses normal SAR measurements in a simplified setup with a well characterized source. This setup was selected to give a high sensitivity to all parameters that might fail or vary over time. The system check does not intend to replace the calibration of the components, but indicates situations where the system uncertainty is exceeded due to drift or failure.

5.2 System Check Setup

In the simplified setup for system evaluation, the EUT is replaced by a calibrated dipole and the power source is replaced by a continuous wave that comes from a signal generator. The calibrated dipole must be placed beneath the flat phantom section of the SAM twin phantom with the correct distance holder. The distance holder should touch the phantom surface with a light pressure at the reference marking and be oriented parallel to the long side of the phantom. The equipment setup is shown below:



6 TEST POSITION CONFIGURATIONS

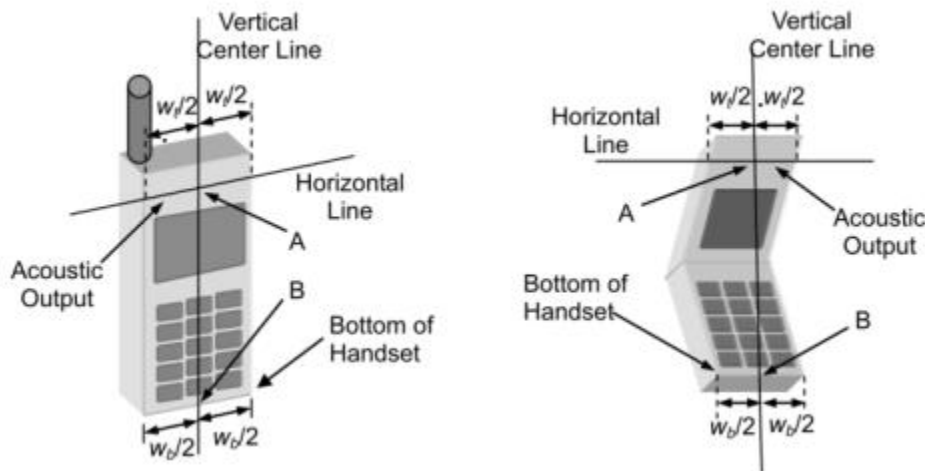
According to KDB 648474 D04 Handset, handsets are tested for SAR compliance in head, body-worn accessory and other use configurations described in the following subsections.

6.1 Head Exposure Conditions

Head exposure is limited to next to the ear voice mode operations. Head SAR compliance is tested according to the test positions defined in IEEE Std 1528-2013 using the SAM phantom illustrated as below.

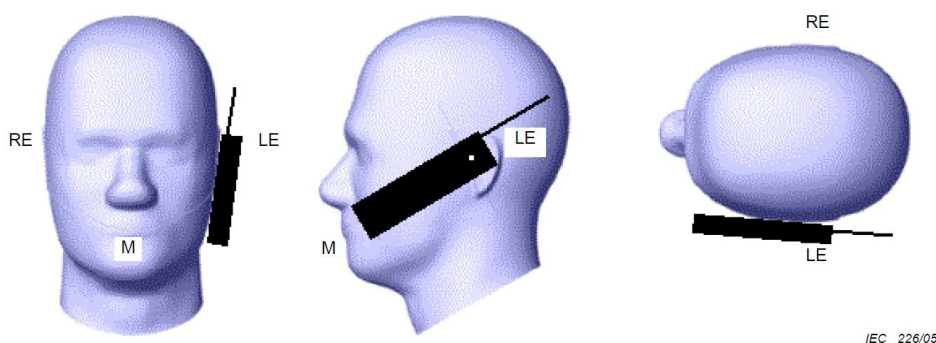
6.1.1 Two Imaginary Lines on the Handset

- The vertical center line passes through two points on the front side of the handset - the midpoint of the width w_t of the handset at the level of the acoustic output, and the midpoint of the width w_b of the bottom of the handset.
- The horizontal line is perpendicular to the vertical centerline and passes through the center of the acoustic output. The horizontal line is also tangential to the face of the handset at point A.
- The two lines intersect at point A. Note that for many handsets, point A coincides with the center of the acoustic output; however, the acoustic output may be located elsewhere on the horizontal line. Also note that the vertical center line is not necessarily parallel to the front face of the handset, especially for clamshell handsets, handsets with flip covers, and other irregularly shaped handsets.



6.1.2 Cheek Position

- (a) To position the device with the vertical center line of the body of the device and the horizontal line crossing the center piece in a plane parallel to the sagittal plane of the phantom. While maintaining the device in this plane, align the vertical center line with the reference plane containing the three ear and mouth reference point (M: Mouth, RE: Right Ear, and LE: Left Ear) and align the center of the ear piece with the line RE-LE.
- (b) To move the device towards the phantom with the ear piece aligned with the line LE-RE until the phone touched the ear. While maintaining the device in the reference plane and maintaining the phone contact with the ear, move the bottom of the phone until any point on the front side is in contact with the cheek of the phantom or until contact with the ear is lost.



6.1.3 Tilted Position

- (a) To position the device in the “cheek” position described above.
- (b) While maintaining the device the reference plane described above and pivoting against the ear, moves it outward away from the mouth by an angle of 15 degrees or until contact with the ear is lost.

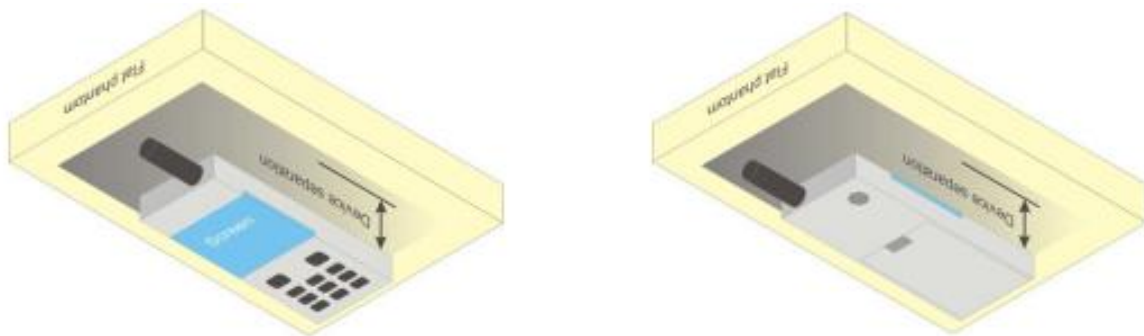


6.2 Body-worn Position Conditions

Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories. The body-worn accessory procedures in KDB 447498 are used to test for body-worn accessory SAR compliance, without a headset connected to it. This enables the test results for such configuration to be compatible with that required for hotspot mode when the body-worn accessory test separation distance is greater than or equal to that required for hotspot mode. When the reported SAR for a body-worn accessory.

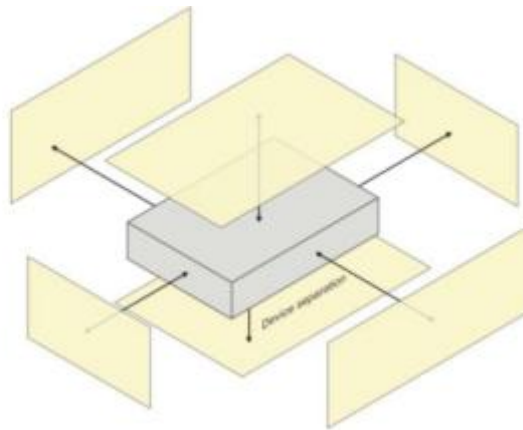
Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.

Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required. A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets is used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer, according to the requirements of Supplement C 01-01. Devices that are designed to operate on the body of users using lanyards and straps, or without requiring additional body-worn accessories, will be tested using a conservative minimum test separation distance ≤ 5 mm to support compliance.



6.3 Hotspot Mode Exposure Position Conditions

For handsets that support hotspot mode operations, with wireless router capabilities and various web browsing functions, the relevant hand and body exposure conditions are tested according to the hotspot SAR procedures in KDB 941225. A test separation distance of 10 mm is required between the phantom and all surfaces and edges with a transmitting antenna located within 25 mm from that surface or edge. When the form factor of a handset is smaller than 9 cm x 5 cm, a test separation distance of 5 mm (instead of 10 mm) is required for testing hotspot mode. When the separation distance required for body-worn accessory testing is larger than or equal to that tested for hotspot mode, in the same wireless mode and for the same surface of the phone, the hotspot mode SAR data may be used to support body-worn accessory SAR compliance for that particular configuration (surface).



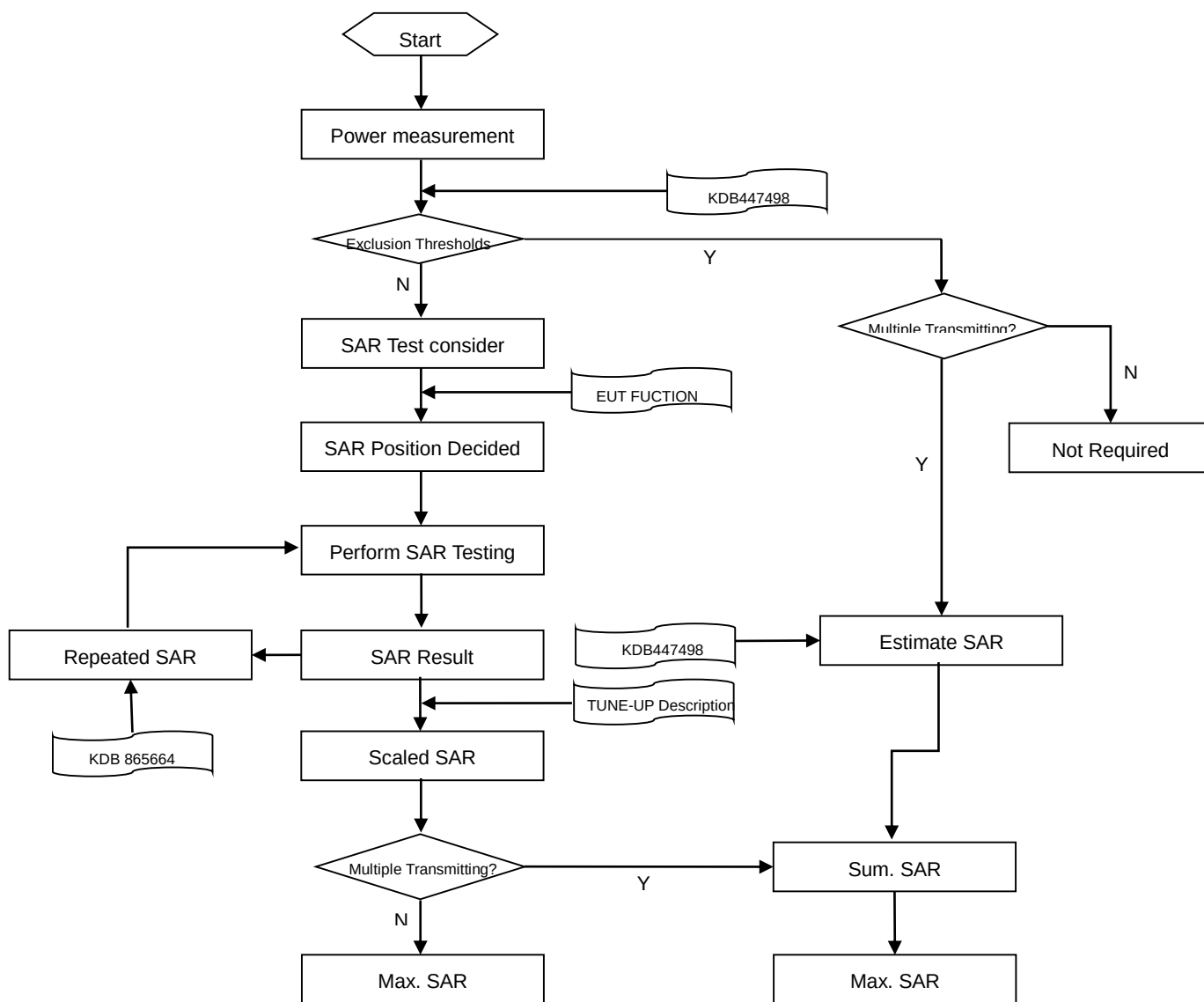
6.4 Product Specific 10g Exposure Consideration

According with FCC KDB 648474 D04, for smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear, unless it is confirmed otherwise through KDB inquiries, the following phablet procedures should be applied to evaluate SAR compliance for each applicable wireless modes and frequency band. Devices marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance;

The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB 865664 to address interactive hand use exposure conditions. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg.

7 MEASUREMENT PROCEDURE

7.1 Measurement Process Diagram



7.2 SAR Scan General Requirement

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

			≤3GHz	>3GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5±1 mm	½·δ·ln(2)±0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			30°±1°	20°±1°
Maximum area scan spatial resolution: Δx Area , Δy Area			≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3–4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
			When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	
Maximum zoom scan spatial resolution: Δx Zoom , Δy Zoom			≤ 2 GHz: ≤ 8 mm 2 –3 GHz: ≤ 5 mm*	3–4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: Δz Zoom (n)		≤ 5 mm	3–4 GHz: ≤ 4 mm
				4–5 GHz: ≤ 3 mm
				5–6 GHz: ≤ 2 mm
	graded grid	Δz Zoom (1): between 1st two points closest to phantom surface	≤ 4 mm	3–4 GHz: ≤ 3 mm
				4–5 GHz: ≤ 2.5 mm
		Δz Zoom (n>1): between subsequent points	≤ 1.5·Δz Zoom (n-1)	
Minimum zoom scan volume	x, y, z		≥30 mm	3–4 GHz: ≥ 28 mm
				4–5 GHz: ≥ 25 mm
				5–6 GHz: ≥ 22 mm

Note:

1. δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.
2. * When zoom scan is required and the reported SAR from the area scan based 1 g SAR estimation procedures of KDB 447498 is ≤ 1.4 W/kg, ≤ 8 mm, ≤ 7 mm and ≤ 5 mm zoom scan resolution may be applied, respectively, for 2 GHz to 3GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

7.3 Measurement Procedure

The following steps are used for each test position

- a. Establish a call with the maximum output power with a base station simulator. The connection between the mobile and the base station simulator is established via air interface
- b. Measurement of the local E-field value at a fixed location. This value serves as a reference value for calculating a possible power drift.
- c. Measurement of the SAR distribution with a grid of 8 to 16mm * 8 to 16 mm and a constant distance to the inner surface of the phantom. Since the sensors cannot directly measure at the inner phantom surface, the values between the sensors and the inner phantom surface are extrapolated. With these values the area of the maximum SAR is calculated by an interpolation scheme.
- d. Around this point, a cube of 30 * 30 * 30 mm or 32 * 32 * 32 mm is assessed by measuring 5 or 8 * 5 or 8*4 or 5 mm. With these data, the peak spatial-average SAR value can be calculated.

7.4 Area & Zoom Scan Procedure

First Area Scan is used to locate the approximate location(s) of the local peak SAR value(s). The measurement grid within an Area Scan is defined by the grid extent, grid step size and grid offset. Next, in order to determine the EM field distribution in a three-dimensional spatial extension, Zoom Scan is required. The Zoom Scan is performed around the highest E-field value to determine the averaged SAR-distribution over 10 g. Area scan and zoom scan resolution setting follows KDB 865664 D01v01r04 quoted below.

When the 1 g SAR of the highest peak is within 2 dB of the SAR limit, additional zoom scans are required for other peaks within 2 dB of the highest peak that have not been included in any zoom scan to ensure there is no increase in SAR.

8 CONDUCTED RF OUPUT POWER

8.1 GSM

Please refer the document “BL-SH2591049-AP.pdf”.

8.2 WCDMA

Please refer the document “BL-SH2591049-AP.pdf”.

8.3 LTE

Please refer the document “BL-SH2591049-AP.pdf”.

8.4 WIFI

8.4.1 2.4G WIFI

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Limit (dBm)	SAR Test Require.
2.4 (2.4~2.4835)	802.11b	1	2412	17.11	18.00	Yes
		6	2437	17.01	18.00	No
		11	2462	17.03	18.00	No
	802.11g	1	2412	15.00	16.00	No
		6	2437	15.17	16.00	No
		11	2462	15.04	16.00	No
	802.11n(HT20)	1	2412	14.89	16.00	No
		6	2437	15.05	16.00	No
		11	2462	14.90	16.00	No
	802.11n(HT40)	3	2422	14.42	15.50	No
		6	2437	14.31	15.50	No
		9	2452	14.38	15.50	No

Note: When multiple channel bandwidth configurations in a frequency band have the same maximum tune-up output power, the test configuration is determined by applying the following steps sequentially.

- 1) The largest channel bandwidth configuration is selected between the multiple configurations in a frequency band with the same maximum tune-up output power.
- 2) When multiple transmission modes (802.11b/g/n) have the same maximum tune-up output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11b is chosen over 802.11g, and 802.11g chosen over 802.11n.
- 3) According KDB 247228, 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, OFDM SAR test is not required.

Adjusted SAR = $0.367 * (35.48\text{mW}/63.10\text{mW}) = 0.206$ W/Kg, so 2.4G OFDM SAR test is not required.

8.4.2 5G WIFI

Band (GHz)	Mode	Channel	Freq. (MHz)	Conducted Power (dBm)	Tune-up Limit (dBm)	SAR Test Require.
5.2 (5.15~5.25)	802.11a	36	5180	9.21	10.00	No
		44	5220	9.22	10.00	Yes
		48	5240	9.21	10.00	No
	802.11n(HT20)	36	5180	9.53	10.50	No
		44	5220	9.17	10.00	No
		48	5240	9.14	10.00	No
	802.11n(HT40)	38	5190	5.63	6.50	No
		46	5230	5.37	6.50	No

	802.11ac(VHT20)	36	5180	6.54	7.50	No
		44	5220	6.31	7.50	No
		48	5240	6.15	7.00	No
	802.11ac(VHT40)	38	5190	5.69	6.50	No
		46	5230	5.38	6.50	No
	802.11ac(VHT80)	42	5210	6.35	7.50	No
5.3 (5.25~5.35)	802.11a	52	5260	9.67	10.50	Yes
		60	5300	9.08	10.00	No
		64	5320	9.04	10.00	No
	802.11n(HT20)	52	5260	9.16	10.00	No
		60	5300	8.83	10.00	No
		64	5320	8.82	10.00	No
	802.11n(HT40)	54	5270	5.96	7.00	No
		62	5310	5.74	6.50	No
	802.11ac(VHT20)	52	5260	5.90	7.00	No
		60	5300	5.81	7.00	No
		64	5320	5.65	6.50	No
	802.11ac(VHT40)	54	5270	5.99	7.00	No
		62	5310	5.79	7.00	No
	802.11ac(VHT80)	58	5290	5.92	7.00	No
5.6 (5.47~5.725)	802.11a	100	5500	8.84	9.50	No
		116	5580	9.05	10.00	Yes
		140	5700	8.84	9.50	No
	802.11n(HT20)	100	5500	8.75	9.50	No
		116	5580	8.88	9.50	No
		140	5700	8.65	9.50	No
	802.11n(HT40)	102	5510	7.03	7.50	No
		118	5590	6.73	7.50	No
		134	5670	6.31	7.00	No
	802.11ac(VHT20)	100	5500	6.23	7.00	No
		116	5580	6.82	7.50	No
		140	5700	6.31	7.00	No
	802.11ac(VHT40)	102	5510	7.01	7.50	No
		118	5590	6.85	7.50	No
		134	5670	6.39	7.00	No
	802.11ac(VHT80)	106	5530	6.92	7.50	No
		122	5690	6.68	7.00	No
5.8 (5.725~5.850)	802.11a	149	5745	8.70	9.50	Yes
		157	5785	8.65	9.50	No

		165	5825	8.69	9.50	No
	802.11n(HT20)	149	5745	8.53	9.50	No
		157	5785	8.52	9.50	No
		165	5825	8.55	9.50	No
	802.11n(HT40)	151	5755	6.50	7.00	No
		159	5795	6.61	7.50	No
	802.11ac(VHT20)	149	5745	6.59	7.50	No
		157	5785	6.65	7.50	No
		165	5825	6.57	7.50	No
	802.11ac(VHT40)	151	5755	6.49	7.00	No
		159	5795	6.63	7.50	No
	802.11ac(VHT80)	155	5775	6.62	7.00	No

Note: 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, each band is tested independently for SAR.

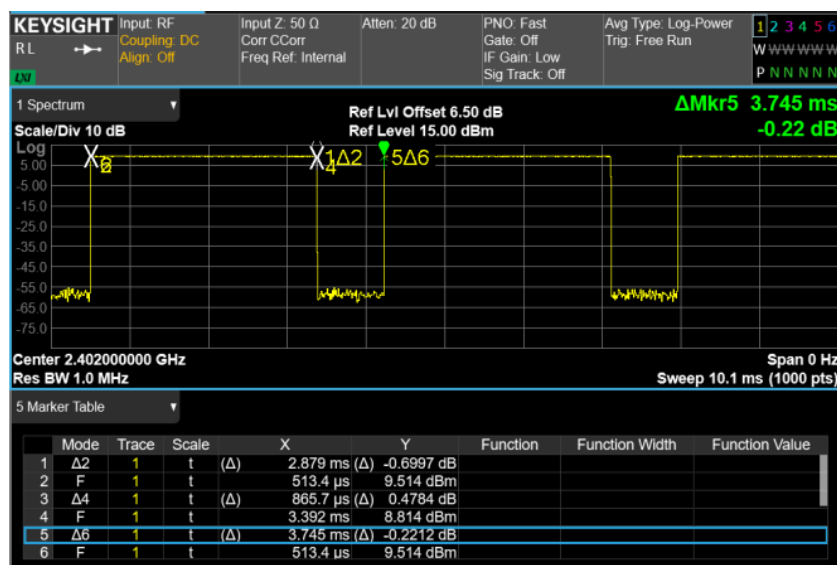
8.5 Bluetooth

Mode	GFSK			$\pi/4$ -DQPSK		
Channel	0	39	78	0	39	78
Frequency (MHz)	2402	2441	2480	2402	2441	2480
EIRP (dBm)	10.15	10.98	11.08	8.89	10.38	10.41
Tune-Up Limit (dBm)	11.00	12.00	12.00	10.00	11.50	11.50
SAR Test Require	NO	NO	YES	NO	NO	NO
Mode	8-DPSK			/		
Channel	0	39	78	/	/	/
Frequency (MHz)	2402	2441	2480	/	/	/
EIRP (dBm)	8.92	10.37	10.42	/	/	/
Tune-Up Limit (dBm)	10.00	11.50	11.50	/	/	/
SAR Test Require	NO	NO	NO	/	/	/
Mode	BLE-1Mbps			BLE-2Mbps		
Channel	0	19	39	0	19	39
Frequency (MHz)	2402	2440	2480	2402	2440	2480
EIRP (dBm)	-3.15	-3.01	-3.17	-3.05	-2.92	-3.05
Tune-Up Limit (dBm)	-2.00	-2.00	-2.00	-2.00	-2.00	-2.00
SAR Test Require	NO	NO	NO	NO	NO	NO

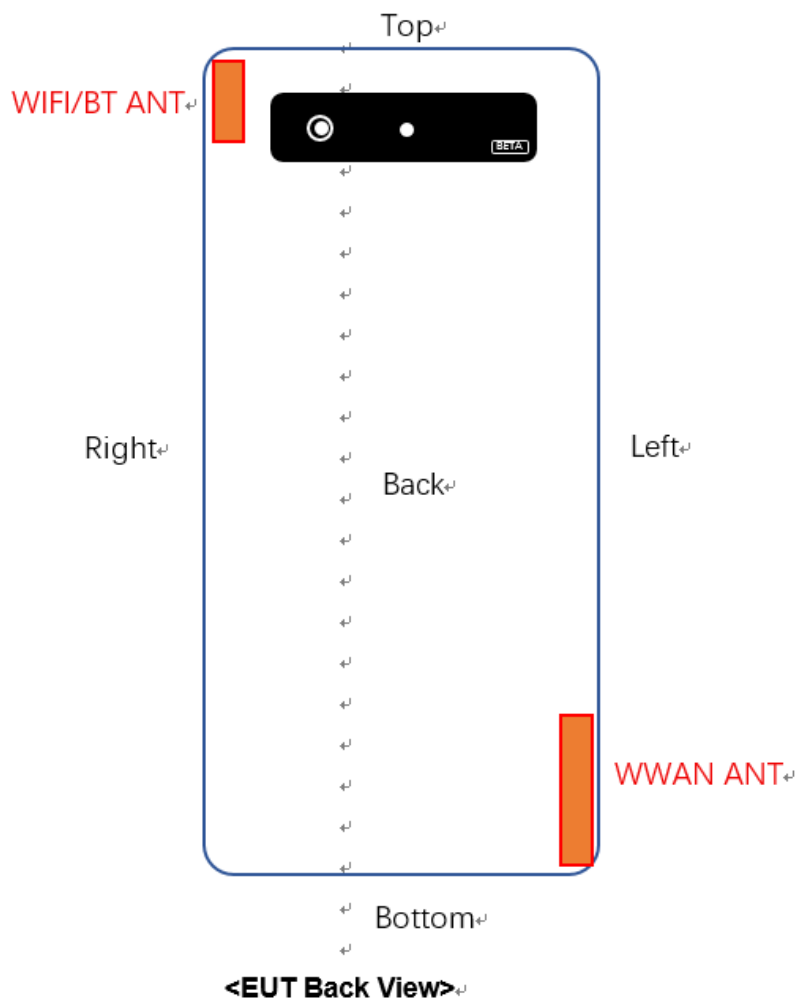
Note 1: Since bluetooth BR mode is the maximum output power mode, SAR measurements were performed with test software using DH5 modulation, and SAR measurement is not required for the EDR and LE. When the secondary mode is $\leq \frac{1}{4}$ dB higher than the primary mode.

Note: The Bluetooth duty cycle is 76.88 % as following figure, according to 2016 Oct. TCB workshop for Bluetooth SAR scaling need further consideration and the maximum duty cycle is 100%, therefore the actual duty cycle will be scaled up to 100% for Bluetooth reported SAR calculation.

Duty Cycle



9 TEST EXCLUSION CONSIDERATION



Antenna	Support Bands
WWAN	GSM 850/1900; WCDMA B2/4; LTE B2/4/5/7/12/13/17/66/71
WIFI/BT	2.4G/5G WLAN, BT

9.1 SAR Test Exclusion Consideration Table

Antenna	Front Side(mm)	Back Side(mm)	Left Edge(mm)	Right Edge(mm)	Top Edge(mm)	Bottom Edge(mm)
WWAN	<25	<25	<25	>25	>25	<25
WLAN/BT	<25	<25	>25	<25	<25	>25

Note: 1. Per KDB 941225 DO6, When the overall length and width of a device is > 9 cm *5 cm, a test separation distance of 10 mm is required for hotspot mode SAR measurements and hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.

10 TEST RESULT

10.1GSM 850

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head											
Left cheek	0	GPRS 4slot	190	836.6	-0.13	0.772	28.23	29.00	1.194	0.922	1
Left tilt			190	836.6	0.06	0.499	28.23	29.00	1.194	0.596	/
Right cheek			190	836.6	-0.05	0.542	28.23	29.00	1.194	0.647	/
Right tilt			190	836.6	0.18	0.343	28.23	29.00	1.194	0.409	/
Left cheek			128	824.2	0.12	0.717	28.14	29.00	1.219	0.873	/
Left cheek			251	848.8	0.06	0.707	28.17	29.00	1.211	0.856	/
Body-worn&Hotspot											
Front side	10	GPRS 4slot	190	836.6	0.11	0.733	28.23	29.00	1.194	0.875	/
Back side			190	836.6	0.16	0.960	28.23	29.00	1.194	1.146	/
Left side			190	836.6	-0.11	0.977	28.23	29.00	1.194	1.167	2
Left side			190	836.6	-0.02	0.914	28.23	29.00	1.194	1.091	Repeated
Bottom side			190	836.6	0.03	0.318	28.23	29.00	1.194	0.380	/
Front side			128	824.2	0.04	0.725	28.14	29.00	1.219	0.884	/
Front side			251	848.8	-0.06	0.711	28.17	29.00	1.211	0.861	/
Back side			128	824.2	0.04	0.945	28.14	29.00	1.219	1.152	/
Back side			251	848.8	-0.06	0.893	28.17	29.00	1.211	1.081	/
Left side			128	824.2	-0.07	0.908	28.14	29.00	1.219	1.107	/
Left side			251	848.8	-0.03	0.872	28.17	29.00	1.211	1.056	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.2GSM 1900

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head											
Left cheek	0	GPRS 4slot	661	1880	-0.14	0.545	25.81	26.50	1.172	0.639	3
Left tilt			661	1880	0.03	0.320	25.81	26.50	1.172	0.375	/
Right cheek			661	1880	0.08	0.289	25.81	26.50	1.172	0.339	/
Right tilt			661	1880	-0.03	0.134	25.81	26.50	1.172	0.157	/
Body-worn&Hotspot											
Front side	10	GPRS 4slot	661	1880	-0.03	0.452	25.81	26.50	1.172	0.530	/
Back side			661	1880	-0.04	0.804	25.81	26.50	1.172	0.942	/
Left side			661	1880	0.16	0.385	25.81	26.50	1.172	0.451	/
Bottom side			661	1880	0.09	0.423	25.81	26.50	1.172	0.496	/
Back side			512	1850.2	-0.06	1.010	25.80	26.50	1.175	1.187	4
Back side			512	1850.2	-0.07	0.957	25.80	26.50	1.175	1.124	Repeated
Back side			810	1909.8	-0.18	0.916	25.69	26.50	1.205	1.104	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.3WCDMA Band 2

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head											
Left cheek	0	RMC	9400	1880	0.08	0.364	20.65	21.50	1.216	0.443	5
Left tilt			9400	1880	0.03	0.155	20.65	21.50	1.216	0.189	/
Right cheek			9400	1880	0.11	0.127	20.65	21.50	1.216	0.154	/
Right tilt			9400	1880	0.02	0.067	20.65	21.50	1.216	0.081	/
Body-worn&Hotspot											
Front side	10	RMC	9400	1880	-0.09	0.237	20.65	21.50	1.216	0.288	/
Back side			9400	1880	-0.16	0.420	20.65	21.50	1.216	0.511	6
Left side			9400	1880	-0.1	0.229	20.65	21.50	1.216	0.279	/
Bottom side			9400	1880	-0.05	0.206	20.65	21.50	1.216	0.251	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.4WCDMA Band 4

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head											
Left cheek	0	RMC	1413	1732.6	-0.19	0.288	20.16	21.00	1.213	0.349	/
Left tilt			1413	1732.6	-0.16	0.190	20.16	21.00	1.213	0.231	/
Right cheek			1413	1732.6	0.16	0.430	20.16	21.00	1.213	0.522	7
Right tilt			1413	1732.6	0.06	0.147	20.16	21.00	1.213	0.178	/
Body-worn&Hotspot											
Front side	10	RMC	1413	1732.6	0.17	0.432	20.16	21.00	1.213	0.524	/
Back side			1413	1732.6	0.16	0.851	20.16	21.00	1.213	1.033	/
Left side			1413	1732.6	-0.01	0.311	20.16	21.00	1.213	0.377	/
Bottom side			1413	1732.6	0.12	0.594	20.16	21.00	1.213	0.721	/
Back side			1312	1712.4	-0.07	0.945	20.12	21.00	1.225	1.157	8
Back side			1312	1712.4	0.04	0.933	20.12	21.00	1.225	1.143	Repeated
Back side			1513	1752.6	0.05	0.800	19.83	21.00	1.309	1.047	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.											

10.5LTE Band 2 (20MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/ kg)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left Cheek	0	QPSK	18900	1880	1	0	-0.06	0.539	21.69	22.50	1.205	0.650	9
Left Tilt			18900	1880	1	0	0.19	0.215	21.69	22.50	1.205	0.259	/
Right Cheek			18900	1880	1	0	-0.03	0.240	21.69	22.50	1.205	0.289	/
Right Tilt			18900	1880	1	0	0.03	0.144	21.69	22.50	1.205	0.174	/
Left cheek	0	QPSK	18900	1880	50	0	-0.05	0.259	20.95	21.50	1.135	0.294	/
Left tilt			18900	1880	50	0	0.15	0.169	20.95	21.50	1.135	0.192	/
Right cheek			18900	1880	50	0	-0.02	0.193	20.95	21.50	1.135	0.219	/
Right tilt			18900	1880	50	0	0.17	0.120	20.95	21.50	1.135	0.136	/
Body-worn&Hotspot													
Front side	10	QPSK	18900	1880	1	0	0.08	0.322	21.69	22.50	1.205	0.388	/
Back side			18900	1880	1	0	0.05	0.565	21.69	22.50	1.205	0.681	10
Left side			18900	1880	1	0	0.1	0.290	21.69	22.50	1.205	0.349	/
Bottom side			18900	1880	1	0	0.16	0.257	21.69	22.50	1.205	0.310	/
Front side	10	QPSK	18900	1880	50	0	-0.15	0.254	20.95	21.50	1.135	0.288	/
Back side			18900	1880	50	0	-0.02	0.393	20.95	21.50	1.135	0.446	/
Left side			18900	1880	50	0	-0.17	0.251	20.95	21.50	1.135	0.285	/
Bottom side			18900	1880	50	0	-0.08	0.228	20.95	21.50	1.135	0.259	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.6LTE Band 5 (10MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	20525	836.5	1	0	0.10	0.540	22.66	23.50	1.213	0.655	11
Left tilt			20525	836.5	1	0	-0.13	0.240	22.66	23.50	1.213	0.291	/
Right cheek			20525	836.5	1	0	0.1	0.340	22.66	23.50	1.213	0.413	/
Right tilt			20525	836.5	1	0	-0.07	0.187	22.66	23.50	1.213	0.227	/
Left cheek	0	QPSK	20525	836.5	25	0	-0.11	0.482	21.50	22.50	1.259	0.607	/
Left tilt			20525	836.5	25	0	0.12	0.287	21.50	22.50	1.259	0.361	/
Right cheek			20525	836.5	25	0	0.19	0.291	21.50	22.50	1.259	0.366	/
Right tilt			20525	836.5	25	0	0.07	0.158	21.50	22.50	1.259	0.199	/
Body-worn&Hotspot													
Front side	10	QPSK	20525	836.5	1	0	0.03	0.538	22.66	23.50	1.213	0.653	/
Back side			20525	836.5	1	0	-0.02	0.651	22.66	23.50	1.213	0.790	12
Left side			20525	836.5	1	0	-0.05	0.465	22.66	23.50	1.213	0.564	/
Bottom side			20525	836.5	1	0	-0.16	0.249	22.66	23.50	1.213	0.302	/
Front side	10	QPSK	20525	836.5	25	0	-0.13	0.438	21.50	22.50	1.259	0.551	/
Back side			20525	836.5	25	0	-0.15	0.535	21.50	22.50	1.259	0.674	/
Left side			20525	836.5	25	0	-0.11	0.387	21.50	22.50	1.259	0.487	/
Bottom side			20525	836.5	25	0	0.03	0.234	21.50	22.50	1.259	0.295	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.7LTE Band 7 (20MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	21100	2535	1	0	0.01	0.041	24.07	25.00	1.239	0.051	13
Left tilt			21100	2535	1	0	-0.1	0.011	24.07	25.00	1.239	0.014	/
Right cheek			21100	2535	1	0	0.12	0.016	24.07	25.00	1.239	0.020	/
Right tilt			21100	2535	1	0	-0.06	0.012	24.07	25.00	1.239	0.015	/
Left cheek	0	QPSK	21100	2535	50	0	-0.09	0.034	23.24	24.00	1.191	0.041	/
Left tilt			21100	2535	50	0	0.1	0.005	23.24	24.00	1.191	0.006	/
Right cheek			21100	2535	50	0	-0.17	0.008	23.24	24.00	1.191	0.010	/
Right tilt			21100	2535	50	0	-0.09	0.007	23.24	24.00	1.191	0.008	/
Body-worn&Hotspot													
Front side	10	QPSK	21100	2535	1	0	-0.02	0.112	24.07	25.00	1.239	0.139	/
Back side			21100	2535	1	0	0.11	0.814	24.07	25.00	1.239	1.008	14
Back side			21100	2535	1	0	0.02	0.737	24.07	25.00	1.239	0.913	Repeated
Left side			21100	2535	1	0	0.11	0.198	24.07	25.00	1.239	0.245	/
Bottom side			21100	2535	1	0	-0.04	0.166	24.07	25.00	1.239	0.206	/
Back side			20850	2510	1	0	-0.12	0.751	23.98	25.00	1.265	0.950	/
Back side			21350	2560	1	0	0.08	0.553	24.02	25.00	1.253	0.693	/
Front side	10	QPSK	21100	2535	50	0	0.14	0.098	23.24	24.00	1.191	0.117	/
Back side			21100	2535	50	0	0.01	0.637	23.24	24.00	1.191	0.759	/
Left side			21100	2535	50	0	-0.12	0.141	23.24	24.00	1.191	0.168	/
Bottom side			21100	2535	50	0	-0.08	0.144	23.24	24.00	1.191	0.172	/
Back side			21100	2535	100	0	0.13	0.515	23.09	24.00	1.233	0.635	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.8LTE Band 12 (10MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/k g)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	23095	707.5	1	0	-0.05	0.313	23.51	24.50	1.256	0.393	15
Left tilt			23095	707.5	1	0	0.19	0.158	23.51	24.50	1.256	0.198	/
Right cheek			23095	707.5	1	0	-0.09	0.197	23.51	24.50	1.256	0.247	/
Right tilt			23095	707.5	1	0	-0.07	0.158	23.51	24.50	1.256	0.198	/
Left cheek	0	QPSK	23095	707.5	25	0	0.05	0.247	22.50	23.50	1.259	0.311	/
Left tilt			23095	707.5	25	0	0.16	0.153	22.50	23.50	1.259	0.193	/
Right cheek			23095	707.5	25	0	0.16	0.180	22.50	23.50	1.259	0.227	/
Right tilt			23095	707.5	25	0	0.14	0.150	22.50	23.50	1.259	0.189	/
Body-worn&Hotspot													
Front side	10	QPSK	23095	707.5	1	0	-0.02	0.284	23.51	24.50	1.256	0.357	/
Back side			23095	707.5	1	0	-0.18	0.557	23.51	24.50	1.256	0.700	16
Left side			23095	707.5	1	0	-0.13	0.539	23.51	24.50	1.256	0.677	/
Bottom side			23095	707.5	1	0	0.07	0.194	23.51	24.50	1.256	0.244	/
Front side	10	QPSK	23095	707.5	25	0	-0.15	0.268	22.50	23.50	1.259	0.337	/
Back side			23095	707.5	25	0	-0.09	0.521	22.50	23.50	1.259	0.655	/
Left side			23095	707.5	25	0	0.11	0.512	22.50	23.50	1.259	0.645	/
Bottom side			23095	707.5	25	0	-0.18	0.136	22.50	23.50	1.259	0.171	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.9LTE Band 13 (10MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/k g)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	23230	782	1	0	0.16	0.352	23.58	24.50	1.236	0.435	17
Left tilt			23230	782	1	0	0.03	0.262	23.58	24.50	1.236	0.324	/
Right cheek			23230	782	1	0	0.11	0.223	23.58	24.50	1.236	0.276	/
Right tilt			23230	782	1	0	-0.07	0.174	23.58	24.50	1.236	0.215	/
Left cheek	0	QPSK	23230	782	25	0	-0.1	0.321	22.48	23.50	1.265	0.406	/
Left tilt			23230	782	25	0	-0.15	0.216	22.48	23.50	1.265	0.273	/
Right cheek			23230	782	25	0	-0.18	0.190	22.48	23.50	1.265	0.240	/
Right tilt			23230	782	25	0	-0.19	0.149	22.48	23.50	1.265	0.188	/
Body-worn&Hotspot													
Front side	10	QPSK	23230	782	1	0	-0.15	0.300	23.58	24.50	1.236	0.370	/
Back side			23230	782	1	0	-0.19	0.545	23.58	24.50	1.236	0.673	18
Left side			23230	782	1	0	0.08	0.519	23.58	24.50	1.236	0.641	/
Bottom side			23230	782	1	0	0.08	0.109	23.58	24.50	1.236	0.134	/
Front side	10	QPSK	23230	782	25	0	-0.07	0.267	22.48	23.50	1.265	0.338	/
Back side			23230	782	25	0	-0.18	0.441	22.48	23.50	1.265	0.557	/
Left side			23230	782	25	0	0.04	0.468	22.48	23.50	1.265	0.592	/
Bottom side			23230	782	25	0	-0.19	0.110	22.48	23.50	1.265	0.138	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.10 LTE Band 66 (20MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(d Bm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	132322	1745	1	0	0.11	0.419	20.05	21.00	1.245	0.521	19
Left tilt			132322	1745	1	0	0.05	0.207	20.05	21.00	1.245	0.258	/
Right cheek			132322	1745	1	0	-0.01	0.187	20.05	21.00	1.245	0.233	/
Right tilt			132322	1745	1	0	0.12	0.087	20.05	21.00	1.245	0.108	/
Left cheek	0	QPSK	132322	1745	50	0	0.15	0.237	19.21	20.00	1.199	0.284	/
Left tilt			132322	1745	50	0	-0.1	0.183	19.21	20.00	1.199	0.220	/
Right cheek			132322	1745	50	0	-0.05	0.176	19.21	20.00	1.199	0.211	/
Right tilt			132322	1745	50	0	-0.18	0.084	19.21	20.00	1.199	0.101	/
Body-worn&Hotspot													
Front side	10	QPSK	132322	1745	1	0	0.16	0.426	20.05	21.00	1.245	0.530	/
Back side			132322	1745	1	0	0.16	0.835	20.05	21.00	1.245	1.039	/
Left side			132322	1745	1	0	0.01	0.335	20.05	21.00	1.245	0.417	/
Bottom side			132322	1745	1	0	-0.16	0.591	20.05	21.00	1.245	0.736	/
Back side			132072	1720	1	0	0.04	0.853	20.01	21.00	1.256	1.071	/
Back side			132572	1770	1	0	-0.08	0.867	19.95	21.00	1.274	1.104	20
Back side			132572	1770	1	0	0.05	0.843	19.95	21.00	1.274	1.074	Repeated
Front side	10	QPSK	132322	1745	50	0	0.12	0.349	19.21	20.00	1.199	0.419	/
Back side			132322	1745	50	0	-0.16	0.676	19.21	20.00	1.199	0.811	/
Left side			132322	1745	50	0	-0.07	0.283	19.21	20.00	1.199	0.339	/
Bottom side			132322	1745	50	0	0.07	0.490	19.21	20.00	1.199	0.588	/
Back side			132072	1720	50	0	0.19	0.744	19.36	20.00	1.159	0.862	/
Back side			132572	1770	50	0	0.16	0.626	19.00	20.00	1.259	0.788	/
Back side			132322	1745	100	0	-0.06	0.644	19.23	20.00	1.194	0.769	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.11 LTE Band 71 (20MHz Bandwidth)

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	RB Num.	RB Start	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	QPSK	133322	683	1	0	0.06	0.401	23.54	24.50	1.247	0.500	21
Left tilt			133322	683	1	0	0.06	0.197	23.54	24.50	1.247	0.246	/
Right cheek			133322	683	1	0	0.13	0.226	23.54	24.50	1.247	0.282	/
Right tilt			133322	683	1	0	0.04	0.146	23.54	24.50	1.247	0.182	/
Left cheek	0	QPSK	133322	683	50	0	-0.07	0.287	22.59	23.50	1.233	0.354	/
Left tilt			133322	683	50	0	0.09	0.159	22.59	23.50	1.233	0.196	/
Right cheek			133322	683	50	0	-0.07	0.191	22.59	23.50	1.233	0.236	/
Right tilt			133322	683	50	0	-0.02	0.126	22.59	23.50	1.233	0.155	/
Body-worn&Hotspot													
Front side	10	QPSK	133322	683	1	0	-0.09	0.269	23.54	24.50	1.247	0.336	/
Back side			133322	683	1	0	-0.16	0.616	23.54	24.50	1.247	0.768	22
Left side			133322	683	1	0	0.01	0.535	23.54	24.50	1.247	0.667	/
Bottom side			133322	683	1	0	-0.1	0.119	23.54	24.50	1.247	0.149	/
Front side	10	QPSK	133322	683	50	0	0.13	0.228	22.59	23.50	1.233	0.281	/
Back side			133322	683	50	0	-0.14	0.527	22.59	23.50	1.233	0.650	/
Left side			133322	683	50	0	0.17	0.444	22.59	23.50	1.233	0.548	/
Bottom side			133322	683	50	0	-0.11	0.147	22.59	23.50	1.233	0.181	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.12 Bluetooth

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	Duty cycle(%)	Duty Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	DH5	78	2480	-0.08	0.039	11.08	12.00	1.236	76.88	1.301	0.063	23
Left tilt			78	2480	0.11	0.015	11.08	12.00	1.236	76.88	1.301	0.024	
Right cheek			78	2480	-0.03	0.016	11.08	12.00	1.236	76.88	1.301	0.026	
Right tilt			78	2480	0.12	0.010	11.08	12.00	1.236	76.88	1.301	0.016	
Body-worn&Hotspot													
Front side	10	DH5	78	2480	-0.19	0.026	11.08	12.00	1.236	76.88	1.301	0.042	
Back side			78	2480	-0.08	0.018	11.08	12.00	1.236	76.88	1.301	0.029	
Right side			78	2480	0.01	0.073	11.08	12.00	1.236	76.88	1.301	0.117	24
Top side			78	2480	-0.03	0.014	11.08	12.00	1.236	76.88	1.301	0.023	
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.13 WIFI 2.4GHz

Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	Duty cycle(%)	Duty Factor	1g Scaled SAR (W/kg)	Meas. No.
Head													
Left cheek	0	802.11b 1Mbps	1	2412	-0.12	0.297	17.11	18.00	1.226	99.16	1.008	0.367	25
Left tilt			1	2412	-0.19	0.155	17.11	18.00	1.226	99.16	1.008	0.192	/
Right cheek			1	2412	0.17	0.157	17.11	18.00	1.226	99.16	1.008	0.194	/
Right tilt			1	2412	-0.1	0.099	17.11	18.00	1.226	99.16	1.008	0.122	/
Body-worn&Hotspot													
Front side	10	802.11b 1Mbps	1	2412	-0.06	0.078	17.11	18.00	1.226	99.16	1.008	0.096	/
Back side			1	2412	-0.12	0.066	17.11	18.00	1.226	99.16	1.008	0.082	/
Left side			1	2412	-0.17	0.045	17.11	18.00	1.226	99.16	1.008	0.056	/
Right side			1	2412	-0.06	0.093	17.11	18.00	1.226	99.16	1.008	0.115	26
Top side			1	2412	0.15	0.028	17.11	18.00	1.226	99.16	1.008	0.035	/
Bottom side			1	2412	-0.18	0.017	17.11	18.00	1.226	99.16	1.008	0.021	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.													

10.14 WIFI 5GHz

Test Band	Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	Duty cycle(%)	Duty Factor	1g Scaled SAR (W/kg)	Meas . No.
Head														
WLAN 5.3G	Left cheek	0	802.11a 6Mbps	52	5260	0.01	0.181	9.27	10.50	1.327	96.66	1.035	0.249	27
	Left tilt			52	5260	-0.18	0.126	9.27	10.50	1.327	96.66	1.035	0.173	/
	Right cheek			52	5260	-0.18	0.134	9.27	10.50	1.327	96.66	1.035	0.185	/
	Right tilt			52	5260	0.14	0.101	9.27	10.50	1.327	96.66	1.035	0.139	/
WLAN 5.6G	Left cheek	0	802.11a 6Mbps	116	5580	0.14	0.182	9.05	10.00	1.245	96.66	1.035	0.235	28
	Left tilt			116	5580	0.01	0.101	9.05	10.00	1.245	96.66	1.035	0.130	/
	Right cheek			116	5580	0.07	0.143	9.05	10.00	1.245	96.66	1.035	0.185	
	Right tilt			116	5580	-0.1	0.106	9.05	10.00	1.245	96.66	1.035	0.137	/
WLAN 5.8G	Left cheek	0	802.11a 6Mbps	149	5745	0.18	0.238	8.70	9.50	1.203	96.66	1.035	0.296	29
	Left tilt			149	5745	0.04	0.120	8.70	9.50	1.203	96.66	1.035	0.149	/
	Right cheek			149	5745	-0.13	0.177	8.70	9.50	1.203	96.66	1.035	0.220	/
	Right tilt			149	5745	0.12	0.171	8.70	9.50	1.203	96.66	1.035	0.213	/
Body-worn														
WLAN 5.3G	Front side	10	802.11a 6Mbps	52	5260	-0.16	0.143	9.27	10.50	1.327	96.66	1.035	0.196	/
	Back side			52	5260	-0.01	0.180	9.27	10.50	1.327	96.66	1.035	0.247	30
WLAN 5.6G	Front side			116	5580	0.18	0.045	9.05	10.00	1.245	96.66	1.035	0.058	/
	Back side			116	5580	0.07	0.075	9.05	10.00	1.245	96.66	1.035	0.096	31
WLAN 5.8G	Front side			149	5745	-0.05	0.057	8.70	9.50	1.203	96.66	1.035	0.071	/
	Back side			149	5745	0.06	0.066	8.70	9.50	1.203	96.66	1.035	0.082	32
Hotspot														
WLAN 5.2G	Front side	10	802.11a 6Mbps	44	5220	0.03	0.125	9.22	10.50	1.343	96.66	1.035	0.174	/
	Back side			44	5220	0.06	0.175	9.22	10.50	1.343	96.66	1.035	0.243	33
	Right side			44	5220	-0.06	0.153	9.22	10.50	1.343	96.66	1.035	0.213	/
	Top side			44	5220	-0.03	0.137	9.22	10.50	1.343	96.66	1.035	0.190	/
WLAN 5.8G	Front side	10	802.11a 6Mbps	149	5745	0.14	0.167	8.70	9.50	1.203	96.66	1.035	0.208	/
	Back side			149	5745	0.01	0.137	8.70	9.50	1.203	96.66	1.035	0.171	/
	Right side			149	5745	-0.01	0.232	8.70	9.50	1.203	96.66	1.035	0.289	34
	Top side			149	5745	-0.08	0.204	8.70	9.50	1.203	96.66	1.035	0.254	/
Note: Refer to ANNEX C for the detailed test data for each test configuration.														

Test Band	Position	Dist. (mm)	Test Mode	Ch.	Freq. (MHz)	Power Drift (dB)	1 g Meas SAR(W/kg)	Meas. Power (dBm)	Max. tune-up power(dBm)	Scaling Factor	Duty cycle(%)	Duty Factor	1g Scaled SAR (W/kg)	Meas No.
Extremity														
WLAN 5.3G	Front side	0	802.11a 6Mbps	52	5260	-0.07	0.075	9.27	10.50	1.327	96.66	1.035	0.102	/
	Back side			52	5260	-0.05	0.101	9.27	10.50	1.327	96.66	1.035	0.138	/
	Left side			52	5260	-0.18	0.031	9.27	10.50	1.327	96.66	1.035	0.043	/
	Right side			52	5260	0.18	0.324	9.27	10.50	1.327	96.66	1.035	0.445	35
	Top side			52	5260	-0.15	0.065	9.27	10.50	1.327	96.66	1.035	0.089	/
	Bottom side			52	5260	-0.15	0.011	9.27	10.50	1.327	96.66	1.035	0.015	/
WLAN 5.6G	Front side	0	802.11a 6Mbps	116	5580	0.12	0.081	9.05	10.00	1.245	96.66	1.035	0.104	/
	Back side			116	5580	-0.17	0.103	9.05	10.00	1.245	96.66	1.035	0.133	/
	Left side			116	5580	0.19	0.016	9.05	10.00	1.245	96.66	1.035	0.021	/
	Right side			116	5580	0.01	0.310	9.05	10.00	1.245	96.66	1.035	0.400	36
	Top side			116	5580	-0.03	0.051	9.05	10.00	1.245	96.66	1.035	0.066	/
	Bottom side			116	5580	-0.04	0.017	9.05	10.00	1.245	96.66	1.035	0.022	/

10.15 NFC SAR

1. According to the 2022.04 TCBC Workshop meeting, the power threshold is $\leq 100\text{MHz}$, refer to P6s.

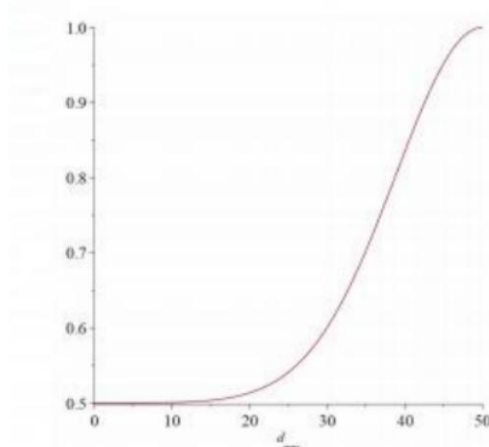
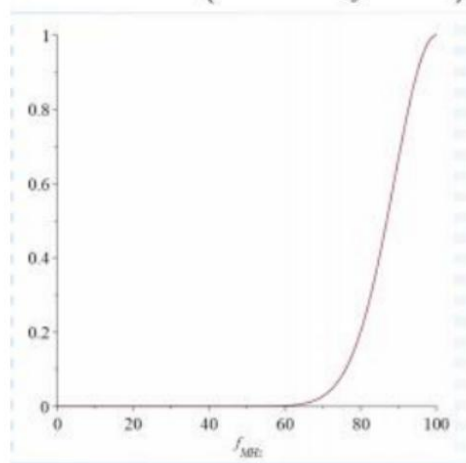
$$P_{7X}(d_{mm}, f_{MHz}) := \begin{cases} P_{6S}(d_{mm}, f_{MHz}) & f_{MHz} \leq 100 \\ P_{6to7}(d_{mm}, f_{MHz}) & 100 < f_{MHz} \leq 300 \\ P_7(d_{mm}, f_{MHz}) & 300 < f_{MHz} \end{cases}$$

2. For portable products, when using a distance of $\leq 50\text{mm}$, such as mobile phone NFC, P6s is calculated with the following formula calculate.

$$S_f(f_{MHz}) \cdot P_{431a}(d_{mm}, f_{MHz}) + (1 - S_f(f_{MHz})) \cdot S_d(d_{mm}) \cdot P_{431b1}(50., 100.) \cdot \left(1 + \log_{10}\left(\frac{100.}{f_{MHz}}\right)\right) \quad d_{mm} \leq 50 \text{ and } f_{MHz} \leq 100$$

3. The smoothing functions Sf and Sd in P6s calculate the limits based on KDB 447498 V06 and are calculated as follows.

$$S_f(f_{MHz}) := \exp\left(-10 \frac{(f_{MHz} - f_{max})^2}{\Delta f^2}\right) \quad S_d(d_{mm}) := 0.5 + 0.5 \cdot \exp\left(-10 \frac{(d_{mm} - d_{max})^2}{\Delta d^2}\right)$$



d≤50mm					
f Max(MHz)	100		d Max(mm)	50	
f MHz	13.56		d(mm)	5	
△f(MHz)	100		△d	50	
Sr(fMHz)	0.000568861		Sd (dmm)	0.50015177	
P6s(mW)	443.1257378				
Note: SAR testing is required when the distance is 5mm and the power is greater than 443.13mW.					

4. According to the ANSI C63.10 clause 11.12.2.2:

The value of maximum peak output power is according to the method described in ANSI C63.10 clause 11.12.2.2 General procedure for conducted measurements in restricted bands:

a) Measure the conducted output power (in dBm) using the detector specified (see guidance regarding measurement procedures for determining quasi-peak, peak, and average conducted output power, respectively).

b) Add the maximum transmit antenna gain (in dBi) to the measured output power level to determine the ERP level (see guidance on determining the applicable antenna gain)

c) Add the appropriate maximum ground reflection factor to the ERP level (6 dB for frequencies ≤ 30 MHz, 4.7 dB for frequencies between 30 MHz and 1000 MHz, inclusive and 0 dB for frequencies > 1000 MHz).

d) For devices with multiple antenna-ports, measure the power of each individual chain and sum the ERP of all chains in linear terms (e.g., Watts, mW).

e) Convert the resultant ERP level to an equivalent electric field strength using the following relationship:

$$E = \text{ERP} - 20 \log D + 104.8$$

where:

E = electric field strength in dB μ V/m,

ERP = equivalent isotropic radiated power in dBm

D = specified measurement distance in meters.

Mode	f (MHz)	Max. E-Field strength (dB μ V/m)	D (m)	Ground reflection factor (dB)	ERP (dBm)
NFC (13.56MHz)	13.56	46.56	3	6	-32.24
Note:					
1. Add the appropriate maximum ground reflection factor to the ERP level (6 dB for frequencies ≤ 30 MHz).					
2.ERP=46.56+20*Log(10) - 104.8 + 6 =-32.24 (dBm)					

According to the FCC KDB 447498 D04

Estimated SAR: SAR test =1.6 · Pant / Pth [W/kg]

Estimated SAR	1.6 · Pant / Pth [W/kg]		
Pmeas.(dBm)	-32.24	Pmeas.(mW)	0.001
Pth.(mW)	443.13		
NFC Estimated 1g SAR [W/kg]	<0.001		

11 SAR Measurement Variability

According to KDB 865664 D01, SAR measurement variability was assessed for each frequency band, which is determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media are required for SAR measurements in a frequency band, the variability measurement procedures should be applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. Alternatively, if the highest measured SAR for both head and body tissue-equivalent media are ≤ 1.45 W/kg and the ratio of these highest SAR values, i.e., largest divided by smallest value, is ≤ 1.10 , the highest SAR configuration for either head or body tissue-equivalent medium may be used to perform the repeated measurement. These additional measurements are repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device should be returned to ambient conditions (normal room temperature) with the battery fully charged before it is re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR repeated measurement procedure:

1. When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2. When the highest measured SAR is ≥ 0.80 W/kg, repeat that measurement once.
3. 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, perform a second repeated measurement.
4. If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 , and the original, first or second repeated measurement is ≥ 1.5 W/kg, perform a third repeated measurement.

Frequency Band (MHz)	Wireless Band	RF Exposure Conditions	Test Position	Highest	Repeated SAR	Repeated ^{1st}	Largest to Smallest SAR Ratio
				Measured SAR (W/kg)	(Yes/No)	Measured SAR(W/kg)	
835	GSM 850	Body-worn&Hotspot	Left side	1.167	Yes	1.091	1.07
1900	GSM 1900	Body-worn&Hotspot	Back side	1.187	Yes	1.124	1.06
1750	WCDMA Band4	Body-worn&Hotspot	Back side	1.157	Yes	1.143	1.01
2600	LTE Band7	Body-worn&Hotspot	Back side	0.814	Yes	0.737	1.10
1750	LTE Band66	Body-worn&Hotspot	Back side	1.104	Yes	1.074	1.03

Note: The ratio of largest to smallest SAR for the original and first repeated measurements is < 1.20 , the second repeated measurement. is not required.

12 SIMULTANEOUS TRANSMISSION

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR 1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR 1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR 1g is greater than the SAR limit (SAR 1g 1.6 W/kg), SAR test exclusion is determined by the SAR to Peak Location Ratio (SPLSR).

12.1 Simultaneous Transmission Mode Consider

No.	Simultaneous Tx Combination	Head	Body-worn	Hotspot
1	WWAN + WiFi 2.4G	Yes	Yes	Yes
2	WWAN + WiFi 5G	Yes	Yes	Yes
3	WWAN+BT	Yes	Yes	Yes

Note:

1. 2G&3G&4G share the same antenna and can't transmit simultaneously.
2. 2.4G WLAN can't transmit simultaneously with Bluetooth or 5G WLAN.
3. The maximum SAR summation is calculated based on the same configuration and test position.

12.2 Sum SAR of Simultaneous Transmission

12.2.1 Sum Head SAR of Simultaneous Transmission

Band	Position	Stand alone SAR				SUM SAR		
		1	2	3	4			
		WWAN	2.4GWIFI MAX	5G WIFI MAX	Bluetooth MAX	1+2	1+3	1+4
GSM 850	Left Cheek	0.922	0.367	0.296	0.063	1.289	1.218	0.985
	Left Tilt	0.596	0.192	0.173	0.024	0.788	0.769	0.620
	Right Cheek	0.647	0.194	0.220	0.026	0.841	0.867	0.673
	Right Tilt	0.409	0.122	0.213	0.016	0.531	0.622	0.425
GSM 1900	Left Cheek	0.639	0.367	0.296	0.063	1.006	0.935	0.702
	Left Tilt	0.375	0.192	0.173	0.024	0.567	0.548	0.399
	Right Cheek	0.339	0.194	0.220	0.026	0.533	0.559	0.365
	Right Tilt	0.157	0.122	0.213	0.016	0.279	0.370	0.173
WCDMA B2	Left Cheek	0.443	0.367	0.296	0.063	0.810	0.739	0.506
	Left Tilt	0.189	0.192	0.173	0.024	0.381	0.362	0.213
	Right Cheek	0.154	0.194	0.220	0.026	0.348	0.374	0.180
	Right Tilt	0.081	0.122	0.213	0.016	0.203	0.294	0.097
WCDMA B4	Left Cheek	0.349	0.367	0.296	0.063	0.716	0.645	0.412
	Left Tilt	0.231	0.192	0.173	0.024	0.423	0.404	0.255
	Right Cheek	0.522	0.194	0.220	0.026	0.716	0.742	0.548
	Right Tilt	0.178	0.122	0.213	0.016	0.300	0.391	0.194
LTE B2	Left Cheek	0.650	0.367	0.296	0.063	1.017	0.946	0.713
	Left Tilt	0.259	0.192	0.173	0.024	0.451	0.432	0.283
	Right Cheek	0.289	0.194	0.220	0.026	0.483	0.509	0.315
	Right Tilt	0.174	0.122	0.213	0.016	0.296	0.387	0.190
LTE B5	Left Cheek	0.655	0.367	0.296	0.063	1.022	0.951	0.718
	Left Tilt	0.361	0.192	0.173	0.024	0.553	0.534	0.385
	Right Cheek	0.413	0.194	0.220	0.026	0.607	0.633	0.439
	Right Tilt	0.227	0.122	0.213	0.016	0.349	0.440	0.243
LTE B7	Left Cheek	0.051	0.367	0.296	0.063	0.418	0.347	0.114
	Left Tilt	0.014	0.192	0.173	0.024	0.206	0.187	0.038
	Right Cheek	0.020	0.194	0.220	0.026	0.214	0.240	0.046
	Right Tilt	0.015	0.122	0.213	0.016	0.137	0.228	0.031
LTE B12	Left Cheek	0.393	0.367	0.296	0.063	0.760	0.689	0.456
	Left Tilt	0.198	0.192	0.173	0.024	0.390	0.371	0.222
	Right Cheek	0.247	0.194	0.220	0.026	0.441	0.467	0.273
	Right Tilt	0.198	0.122	0.213	0.016	0.320	0.411	0.214
LTE B13	Left Cheek	0.435	0.367	0.296	0.063	0.802	0.731	0.498
	Left Tilt	0.324	0.192	0.173	0.024	0.516	0.497	0.348

	Right Cheek	0.276	0.194	0.220	0.026	0.470	0.496	0.302
	Right Tilt	0.215	0.122	0.213	0.016	0.337	0.428	0.231
LTE B66	Left Cheek	0.521	0.367	0.296	0.063	0.888	0.817	0.584
	Left Tilt	0.258	0.192	0.173	0.024	0.450	0.431	0.282
	Right Cheek	0.233	0.194	0.220	0.026	0.427	0.453	0.259
	Right Tilt	0.108	0.122	0.213	0.016	0.230	0.321	0.124
LTE B71	Left Cheek	0.500	0.367	0.296	0.063	0.867	0.796	0.563
	Left Tilt	0.246	0.192	0.173	0.024	0.438	0.419	0.270
	Right Cheek	0.282	0.194	0.220	0.026	0.476	0.502	0.308
	Right Tilt	0.182	0.122	0.213	0.016	0.304	0.395	0.198

Note:

1: The simultaneous transmission combinations of the antennas contain combinations of two antennas, so only the worst simultaneous transmission combinations was shown in this table.

2: The highest Summed 1g SAR is 1.289 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

12.2.2 Sum Body-worn SAR of Simultaneous Transmission

Band	Position	Stand alone SAR				SUM SAR		
		1	2	3	4			
		WWAN	2.4GWIFI MAX	5G WIFI MAX	Bluetooth MAX	1+2	1+3	1+4
GSM 850	Front Side	0.884	0.096	0.196	0.042	0.980	1.080	0.926
	Back Side	1.152	0.082	0.247	0.029	1.234	1.399	1.181
GSM 1900	Front Side	0.530	0.096	0.196	0.042	0.626	0.726	0.572
	Back Side	1.187	0.082	0.247	0.029	1.269	1.434	1.216
WCDMA B2	Front Side	0.288	0.096	0.196	0.042	0.384	0.484	0.330
	Back Side	0.511	0.082	0.247	0.029	0.593	0.758	0.540
WCDMA B4	Front Side	0.524	0.096	0.196	0.042	0.620	0.720	0.566
	Back Side	1.157	0.082	0.247	0.029	1.239	1.404	1.186
LTE B2	Front Side	0.388	0.096	0.196	0.042	0.484	0.584	0.430
	Back Side	0.681	0.082	0.247	0.029	0.763	0.928	0.710
LTE B5	Front Side	0.653	0.096	0.196	0.042	0.749	0.849	0.695
	Back Side	0.790	0.082	0.247	0.029	0.872	1.037	0.819
LTE B7	Front Side	0.139	0.096	0.196	0.042	0.235	0.335	0.181
	Back Side	1.008	0.082	0.247	0.029	1.090	1.255	1.037
LTE B12	Front Side	0.357	0.096	0.196	0.042	0.453	0.553	0.399
	Back Side	0.700	0.082	0.247	0.029	0.782	0.947	0.729
LTE B13	Front Side	0.370	0.096	0.196	0.042	0.466	0.566	0.412
	Back Side	0.673	0.082	0.247	0.029	0.755	0.920	0.702
LTE B66	Front Side	0.530	0.096	0.196	0.042	0.626	0.726	0.572
	Back Side	1.104	0.082	0.247	0.029	1.186	1.351	1.133
LTE B71	Front Side	0.336	0.096	0.196	0.042	0.432	0.532	0.378
	Back Side	0.768	0.082	0.247	0.029	0.850	1.015	0.797

Note:

1: The simultaneous transmission combinations of the antennas contain combinations of two antennas, so only the worst simultaneous transmission combinations was shown in this table.

2: The highest Summed 1g SAR is 1.434 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

12.2.3 Sum Hotspot mode SAR of Simultaneous Transmission

Band	Position	Stand alone SAR				SUM SAR		
		1	2	3	4			
		WWAN	2.4GWIFI MAX	5G WIFI MAX	Bluetooth MAX	1+2	1+3	1+4
GSM 850	Front Side	0.884	0.096	0.208	0.042	0.980	1.092	0.926
	Back Side	1.152	0.082	0.243	0.029	1.234	1.395	1.181
	Left Side	1.167	0.056	0.000	0.000	1.223	1.167	1.167
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.380	0.021	0.000	0.000	0.401	0.380	0.380
GSM 1900	Front Side	0.530	0.096	0.208	0.042	0.626	0.738	0.572
	Back Side	1.187	0.082	0.243	0.029	1.269	1.430	1.216
	Left Side	0.451	0.056	0.000	0.000	0.507	0.451	0.451
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.496	0.021	0.000	0.000	0.517	0.496	0.496
WCDMA B2	Front Side	0.288	0.096	0.208	0.042	0.384	0.496	0.330
	Back Side	0.511	0.082	0.243	0.029	0.593	0.754	0.540
	Left Side	0.279	0.056	0.000	0.000	0.335	0.279	0.279
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.251	0.021	0.000	0.000	0.272	0.251	0.251
WCDMA B4	Front Side	0.524	0.096	0.208	0.042	0.620	0.732	0.566
	Back Side	1.157	0.082	0.243	0.029	1.239	1.400	1.186
	Left Side	0.377	0.056	0.000	0.000	0.433	0.377	0.377
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.721	0.021	0.000	0.000	0.742	0.721	0.721
LTE B2	Front Side	0.388	0.096	0.208	0.042	0.484	0.596	0.430
	Back Side	0.681	0.082	0.243	0.029	0.763	0.924	0.710
	Left Side	0.349	0.056	0.000	0.000	0.405	0.349	0.349
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.310	0.021	0.000	0.000	0.331	0.310	0.310

LTE B5	Front Side	0.653	0.096	0.208	0.042	0.749	0.861	0.695
	Back Side	0.790	0.082	0.243	0.029	0.872	1.033	0.819
	Left Side	0.564	0.056	0.000	0.000	0.620	0.564	0.564
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.302	0.021	0.000	0.000	0.323	0.302	0.302
LTE B7	Front Side	0.139	0.096	0.208	0.042	0.235	0.347	0.181
	Back Side	1.008	0.082	0.243	0.029	1.090	1.251	1.037
	Left Side	0.245	0.056	0.000	0.000	0.301	0.245	0.245
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.206	0.021	0.000	0.000	0.227	0.206	0.206
LTE B12	Front Side	0.357	0.096	0.208	0.042	0.453	0.565	0.399
	Back Side	0.700	0.082	0.243	0.029	0.782	0.943	0.729
	Left Side	0.677	0.056	0.000	0.000	0.733	0.677	0.677
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.244	0.021	0.000	0.000	0.265	0.244	0.244
LTE B13	Front Side	0.370	0.096	0.208	0.042	0.466	0.578	0.412
	Back Side	0.673	0.082	0.243	0.029	0.755	0.916	0.702
	Left Side	0.641	0.056	0.000	0.000	0.697	0.641	0.641
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.138	0.021	0.000	0.000	0.159	0.138	0.138
LTE B66	Front Side	0.530	0.096	0.208	0.042	0.626	0.738	0.572
	Back Side	1.104	0.082	0.243	0.029	1.186	1.347	1.133
	Left Side	0.417	0.056	0.000	0.000	0.473	0.417	0.417
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.736	0.021	0.000	0.000	0.757	0.736	0.736
LTE B71	Front Side	0.336	0.096	0.208	0.042	0.432	0.544	0.378
	Back Side	0.768	0.082	0.243	0.029	0.850	1.011	0.797
	Left Side	0.667	0.056	0.000	0.000	0.723	0.667	0.667
	Right Side	0.000	0.115	0.289	0.117	0.115	0.289	0.117
	Top Side	0.000	0.035	0.254	0.023	0.035	0.254	0.023
	Bottom Side	0.181	0.021	0.000	0.000	0.202	0.181	0.181

Note:

1: The simultaneous transmission combinations of the antennas contain combinations of two antennas, so only the worst simultaneous transmission combinations was shown in this table.

2: The highest Summed 1g SAR is 1.430 W/Kg < 1.6 W/kg, so Simultaneous Transmission SAR test is not required.

12.2.4 Highest Total Exposure Ratio of Simultaneous Transmission

NFC multi-transmit requires the use of the TER formula:

$$TER = \sum_{k=1}^{N_s} \left(\frac{SAR_k}{SAR_{lim}} \right) + \sum_{k=1}^{N_f} \left(\frac{MPE_{field, k}}{MPE_{field, lim}} \right)^2 + \sum_{k=1}^{N_{PD}} \left(\frac{MPE_{PD, k}}{MPE_{PD, lim}} \right) \quad \text{The}$$

maximum SAR value for Simultaneous Transmission is 1.434 [W/kg]. Therefore, the worst TER = (1.434+0.001)/1.6 = 0.897 < 1, the NFC SAR transmit simultaneously Pass.

13 TEST EQUIPMENTS LIST

Description	Manufacturer	Model	Serial No./Version	Cal. Date	Cal. Due
PC	Dell	N/A	N/A	N/A	N/A
Test Software	Speag	DASY5	52.10.4.15.35	N/A	N/A
750MHz Validation Dipole	Speag	D750V3	1201	2024/09/03	2027/09/03
835MHz Validation Dipole	Speag	D835V2	4d277	2024/08/30	2027/08/30
1750MHz Validation Dipole	Speag	D1750V2	1183	2024/09/03	2027/09/03
1900MHz Validation Dipole	Speag	D1900V2	5d155	2024/09/02	2027/09/02
2450MHz Validation Dipole	Speag	D2450V2	1065	2024/09/05	2027/09/05
2600MHz Validation Dipole	Speag	D2600V2	1184	2024/08/30	2027/08/30
5GHz Validation Dipole	Speag	D5GHzV2	1333	2024/09/04	2027/09/04
Data Acquisition Electronicsr	Speag	DAE4	SN: 1423	2025/06/05	2026/06/04
E-Field Probe	Speag	EX3DV4	SN: 3974	2025/06/05	2026/06/04
Signal Generator	R&S	SMB100A	182635	2025/02/12	2026/02/12
Power Meter	Agilent	E4419B	MY45104512	2025/02/11	2026/02/11
Power Sensor	Agilent	E9304A	MY41499059	2025/02/11	2026/02/11
Power Sensor	Agilent	E9304A	MY41499060	2025/02/11	2026/02/11
Wireless Communication Test Set	R&S	CMW500	168792	2025/02/11	2026/02/11
Wireless Communication Test Set	Anritsu	MT8820C	6201061029	2025/02/12	2026/02/12
Network Analyzer	Agilent	E5071C	MY56301409	2025/02/12	2026/02/12
Thermometer	CEM	DT-322	210402350	2025/01/22	2026/01/22
Thermometer	Elitech	RC-4HC	EF7247001275	2025/01/22	2026/01/22
Power Amplifier	COM-MW	PAO.4	201704001	N/A	N/A
Dielectric Probe Kit	Keysight	85070E	MY44300524	N/A	N/A
Phantom	Speag	SAM	1473	N/A	N/A
Attenuator	COM-MW	ZA-S1-31	1305003187	N/A	N/A

Note: For dipole antennas, Tejet has adopted 3 years as calibration intervals, and on annual basis, every measurement dipole has been evaluated and is in compliance with the following criteria:

1. There is no physical damage on the dipole;
2. System validation with specific dipole is within 10% of calibrated value;
3. Return-loss in within 20% of calibrated measurement.
4. Impedance (real or imaginary parts) in within 5 Ohms of calibrated measurement.

ANNEX A SIMULATING LIQUID VERIFICATION RESULT

The dielectric parameters of the liquids were verified prior to the SAR evaluation using an 85070E Dielectric Probe Kit.

Head Liquid

Date	Liquid Type	Fre. (MHz)	Temp. (°C)	Meas. Conductivity (σ) (S/m)	Meas. Permittivity (ϵ)	Target Conductivity (σ) (S/m)	Target Permittivity (ϵ)	Conductivity Tolerance (%)	Permittivity Tolerance (%)
2025.9.26	Head	750	21.1	0.87	42.78	0.89	41.94	-2.25	2.00
2025.9.27	Head	835	21.2	0.90	42.32	0.90	41.50	0.00	1.98
2025.9.28	Head	1750	21.2	1.38	39.21	1.37	40.08	0.73	-2.17
2025.9.29	Head	1900	21.4	1.44	38.93	1.40	40.00	2.86	-2.68
2025.9.30	Head	2450	21.4	1.83	38.40	1.80	39.20	1.67	-2.04
2025.10.4	Head	2600	21.2	1.97	38.07	1.96	39.01	0.51	-2.41
2025.10.5	Head	5300	21.1	4.65	35.10	4.76	35.87	-2.31	-2.15
2025.10.6	Head	5600	21.4	4.96	34.48	5.07	35.53	-2.17	-2.96
2025.10.8	Head	5800	21.3	5.17	34.08	5.27	35.30	-1.90	-3.46

Note: The tolerance limit of Conductivity and Permittivity is $\pm 5\%$.

ANNEX B SYSTEM CHECK RESULT

Comparing to the original SAR value provided by Speag, the validation data should be within its specification of 10 %(for 1 g).

Head liquid 1g

Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)
2025.9.26	Head	750	100	0.835	8.35	8.46	-1.30
2025.9.27	Head	835	100	0.957	9.57	9.59	-0.21
2025.9.28	Head	1750	100	3.480	34.80	36.50	-4.66
2025.9.29	Head	1900	100	3.760	37.60	39.90	-5.76
2025.9.30	Head	2450	100	5.250	52.50	52.60	-0.19
2025.10.4	Head	2600	100	5.510	55.10	55.30	-0.36
2025.10.5	Head	5300	100	8.370	83.70	79.00	5.95
2025.10.6	Head	5600	100	8.860	88.60	82.80	7.00
2025.10.8	Head	5800	100	8.190	81.90	78.50	4.33
Note: The tolerance limit of System validation $\pm 10\%$.							

Head liquid 10g

Date	Liquid Type	Freq. (MHz)	Power (mW)	Measured SAR (W/kg)	Normalized SAR (W/kg)	Dipole SAR (W/kg)	Tolerance (%)
2025.10.5	Head	5300	100	2.430	24.30	23.00	5.65
2025.10.6	Head	5600	100	2.530	25.30	24.00	5.42
Note: The tolerance limit of System validation $\pm 10\%$.							

System Performance Check Data (750MHz)

Date: 2025/9/26

Communication System Band: D750 (750.0 MHz); Frequency: 750 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 750 \text{ MHz}$; $\sigma = 0.873 \text{ S/m}$; $\epsilon_r = 42.783$; $\rho = 1000 \text{ kg/m}^3$

Phantom section: Flat Section

Ambient Temperature: 22.1°C Liquid Temperature: 21.1°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.7, 10.7, 10.7); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW750/Area Scan (71x131x1): Interpolated grid: $dx=1.500 \text{ mm}$, $dy=1.500 \text{ mm}$

Maximum value of SAR (interpolated) = 1.09 W/kg

CW750/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8\text{mm}$, $dy=8\text{mm}$, $dz=5\text{mm}$

Reference Value = 36.38 V/m; Power Drift = 0.05 dB

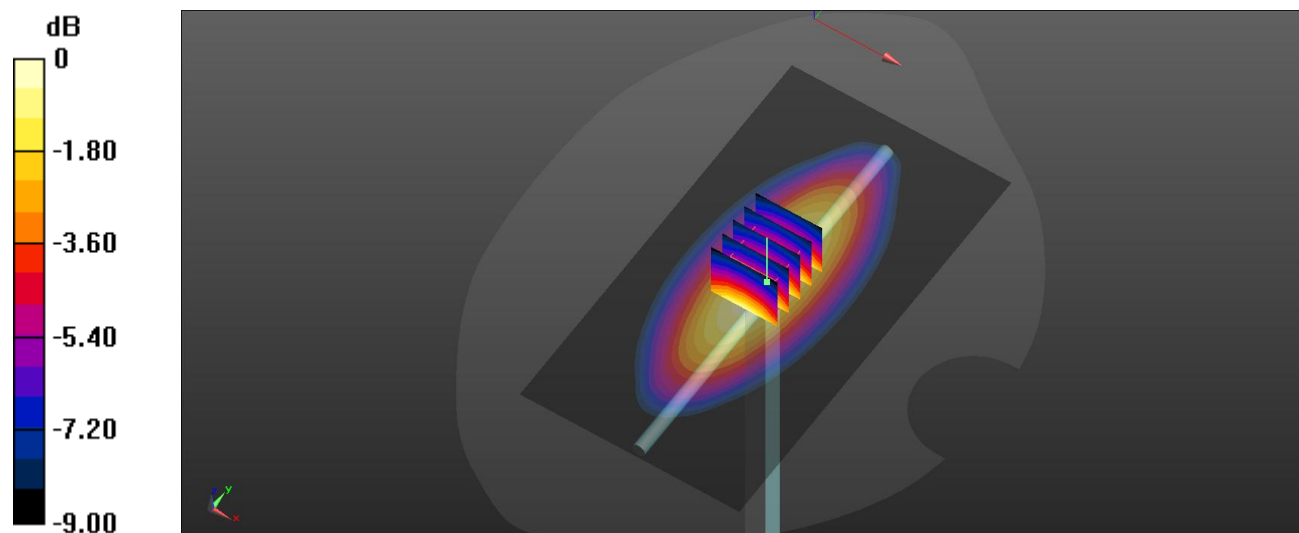
Peak SAR (extrapolated) = 1.28 W/kg

SAR(1 g) = 0.835 W/kg; SAR(10 g) = 0.576 W/kg

Smallest distance from peaks to all points 3 dB below = 23.8 mm

Ratio of SAR at M2 to SAR at M1 = 66.2%

Maximum value of SAR (measured) = 1.11 W/kg



0 dB = 1.11 W/kg

System Performance Check Data (835MHz)

Date: 2025/9/27

Communication System Band: D835 (835.0 MHz); Frequency: 835 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 835$ MHz; $\sigma = 0.902$ S/m; $\epsilon_r = 42.323$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.3°C Liquid Temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(10.7, 10.7, 10.7); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW835/Area Scan (71x121x1): Interpolated grid: $dx=1.500$ mm, $dy=1.500$ mm

Maximum value of SAR (interpolated) = 1.24 W/kg

CW835/Zoom Scan (5x5x7)/Cube 0: Measurement grid: $dx=8$ mm, $dy=8$ mm, $dz=5$ mm

Reference Value = 33.91 V/m; Power Drift = -0.11 dB

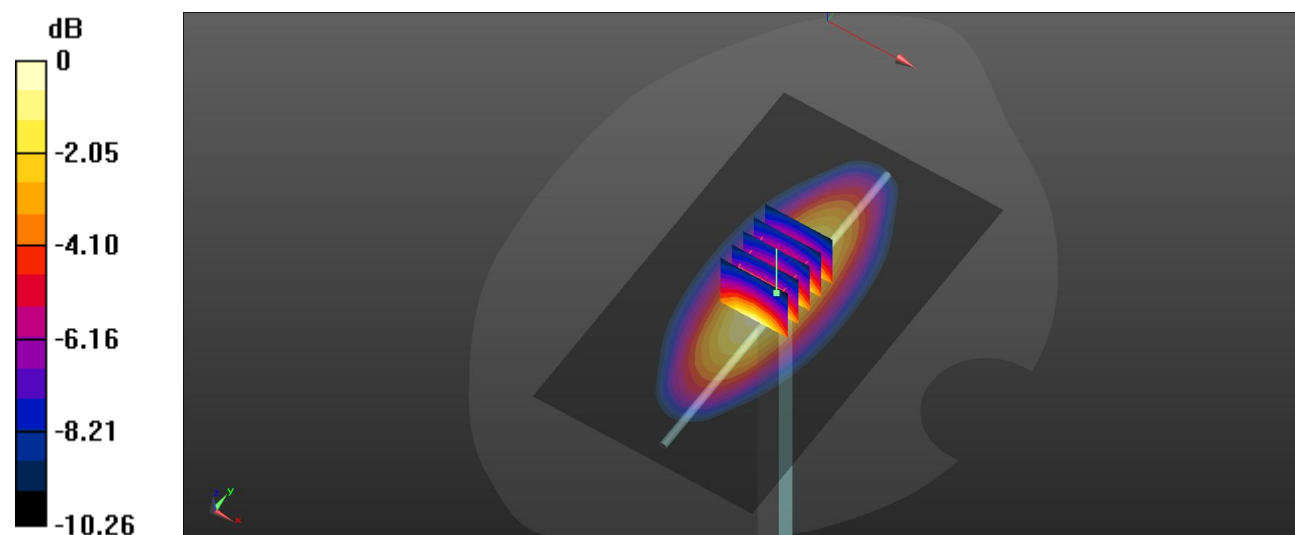
Peak SAR (extrapolated) = 1.59 W/kg

SAR(1 g) = 0.957 W/kg; SAR(10 g) = 0.616 W/kg

Smallest distance from peaks to all points 3 dB below = 13.7 mm

Ratio of SAR at M2 to SAR at M1 = 60.9%

Maximum value of SAR (measured) = 1.36 W/kg



0 dB = 1.36 W/kg

System Performance Check Data (1750MHz)

Date: 2025/9/28

Communication System Band: D1750 (1750.0 MHz); Frequency: 1750 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1750$ MHz; $\sigma = 1.382$ S/m; $\epsilon_r = 39.211$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.4°C Liquid Temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.87, 8.87, 8.87); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW1750/Area Scan (51x91x1): Interpolated grid: $dx=1.200$ mm, $dy=1.200$ mm

Maximum value of SAR (interpolated) = 5.18 W/kg

CW1750/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 56.89 V/m; Power Drift = -0.01 dB

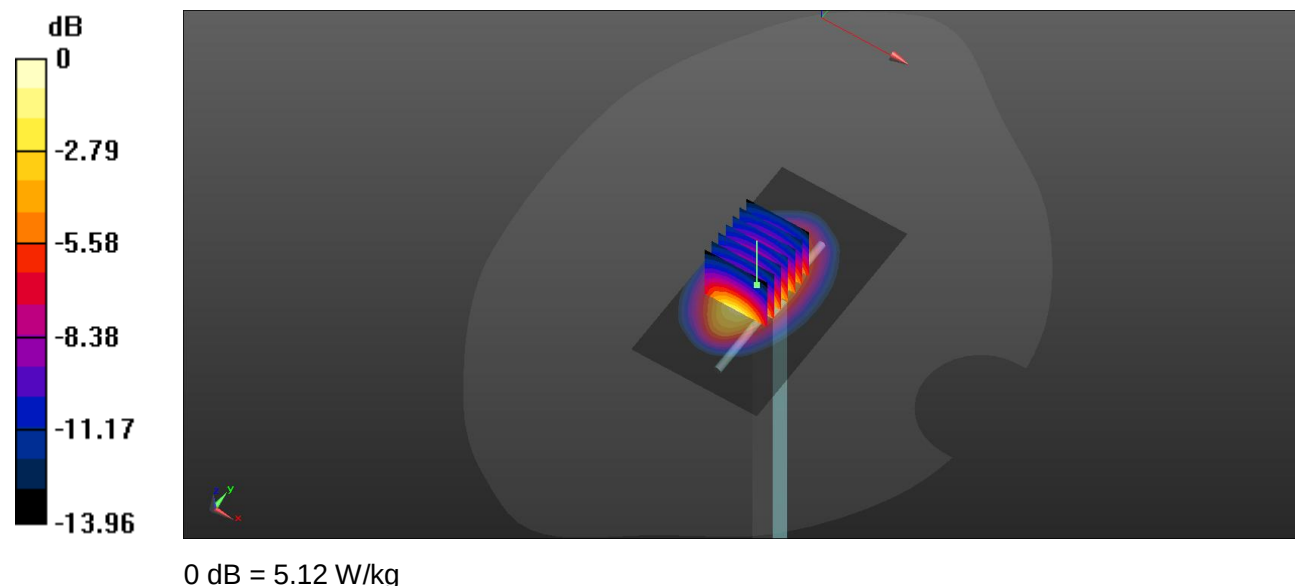
Peak SAR (extrapolated) = 5.98 W/kg

SAR(1 g) = 3.48 W/kg; SAR(10 g) = 1.99 W/kg

Smallest distance from peaks to all points 3 dB below = 11 mm

Ratio of SAR at M2 to SAR at M1 = 59.4%

Maximum value of SAR (measured) = 5.12 W/kg



System Performance Check Data (1900MHz)

Date: 2025/9/29

Communication System Band: D1900 (1900.0 MHz); Frequency: 1900 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 1900$ MHz; $\sigma = 1.443$ S/m; $\epsilon_r = 38.928$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.3°C Liquid Temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8.53, 8.53, 8.53); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW1900/Area Scan (61x101x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 5.55 W/kg

CW1900/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 53.72 V/m; Power Drift = 0.05 dB

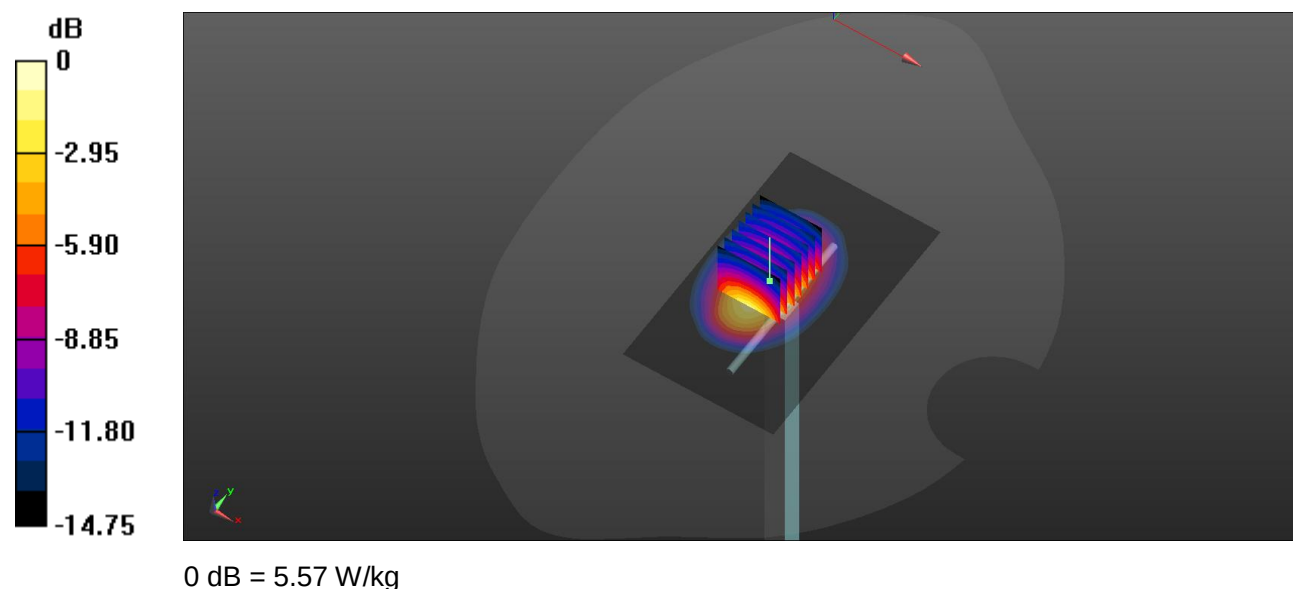
Peak SAR (extrapolated) = 6.52 W/kg

SAR(1 g) = 3.76 W/kg; SAR(10 g) = 2.1 W/kg

Smallest distance from peaks to all points 3 dB below = 10 mm

Ratio of SAR at M2 to SAR at M1 = 58.8%

Maximum value of SAR (measured) = 5.57 W/kg



System Performance Check Data (2450MHz)

Date: 2025/9/30

Communication System Band: D2450 (2450.0 MHz); Frequency: 2450 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2450$ MHz; $\sigma = 1.83$ S/m; $\epsilon_r = 38.395$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.4°C Liquid Temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(8, 8, 8); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW2450/Area Scan (71x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 8.24 W/kg

CW2450/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 63.38 V/m; Power Drift = 0.02 dB

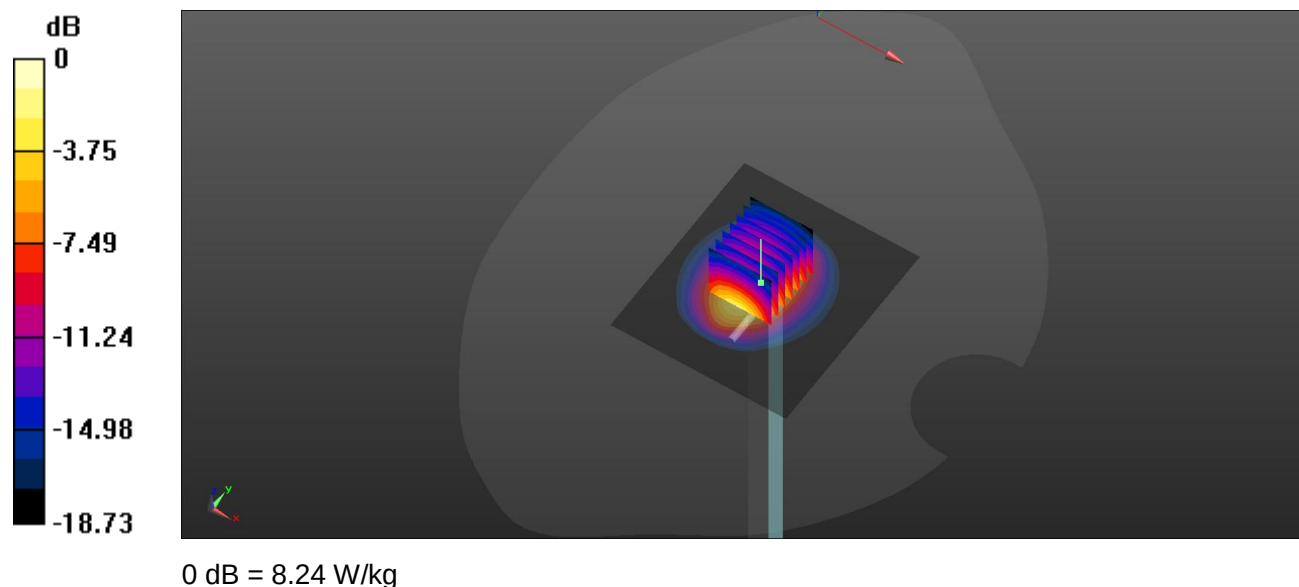
Peak SAR (extrapolated) = 9.65 W/kg

SAR(1 g) = 5.25 W/kg; SAR(10 g) = 2.65 W/kg

Smallest distance from peaks to all points 3 dB below = 9.5 mm

Ratio of SAR at M2 to SAR at M1 = 56%

Maximum value of SAR (measured) = 8.07 W/kg



System Performance Check Data (2600MHz)

Date: 2025/10/4

Communication System Band: D2600 (2600.0 MHz); Frequency: 2600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 2600$ MHz; $\sigma = 1.97$ S/m; $\epsilon_r = 38.067$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.3°C Liquid Temperature: 21.2°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(7.83, 7.83, 7.83); Calibrated: 2025/6/5
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW2600/Area Scan (71x81x1): Interpolated grid: dx=1.200 mm, dy=1.200 mm

Maximum value of SAR (interpolated) = 9.18 W/kg

CW2600/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm

Reference Value = 68.26 V/m; Power Drift = -0.17 dB

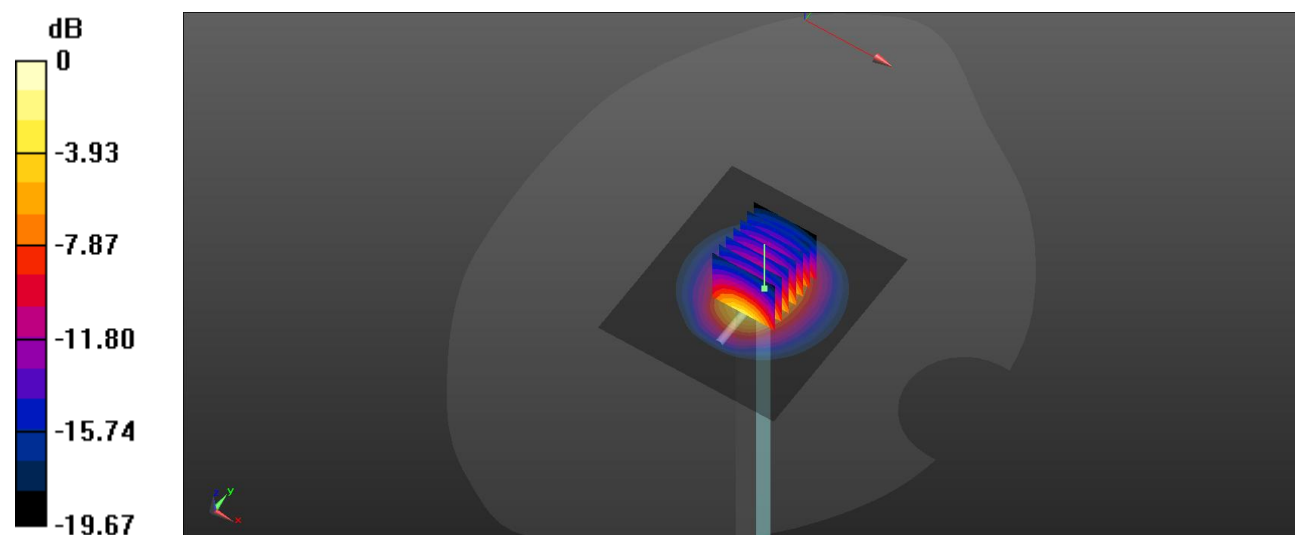
Peak SAR (extrapolated) = 10.7 W/kg

SAR(1 g) = 5.51 W/kg; SAR(10 g) = 2.69 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 52.7%

Maximum value of SAR (measured) = 8.82 W/kg



0 dB = 9.18 W/kg

System Performance Check Data (5300MHz)

Date: 2025/10/5

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5300 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5300$ MHz; $\sigma = 4.653$ S/m; $\epsilon_r = 35.101$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.2°C Liquid Temperature: 21.1°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.56, 5.56, 5.56); Calibrated: 2025/6/5
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW5300/Area Scan (61x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 16.7 W/kg

CW5300/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 68.27 V/m; Power Drift = 0.03 dB

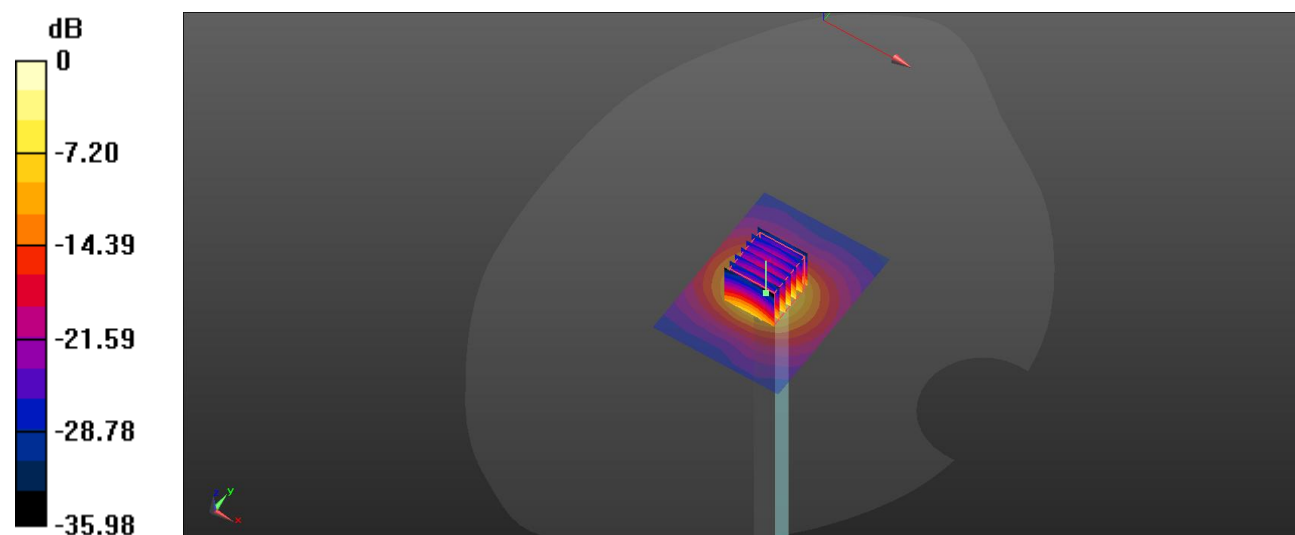
Peak SAR (extrapolated) = 29.7 W/kg

SAR(1 g) = 8.37 W/kg; SAR(10 g) = 2.43 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 59.7%

Maximum value of SAR (measured) = 17.0 W/kg



0 dB = 16.7 W/kg

System Performance Check Data (5600MHz)

Date: 2025/10/6

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5600 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5600$ MHz; $\sigma = 4.963$ S/m; $\epsilon_r = 34.483$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.3°C Liquid Temperature: 21.4°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.05, 5.05, 5.05); Calibrated: 2025/6/5
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW5600/Area Scan (81x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 18.4 W/kg

CW5600/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 71.65 V/m; Power Drift = 0.03 dB

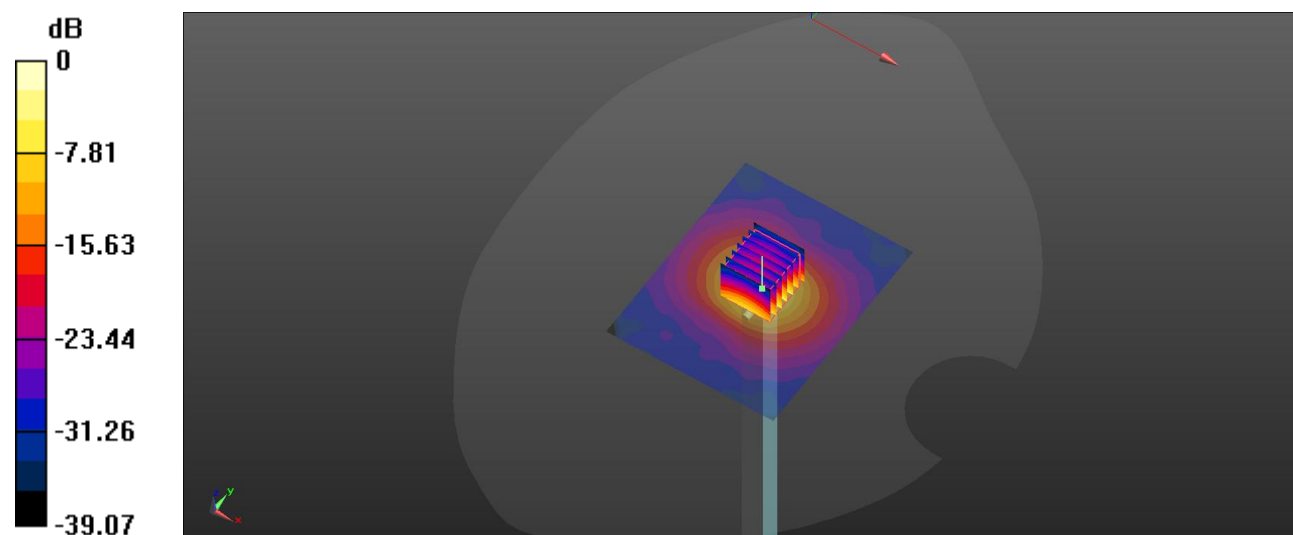
Peak SAR (extrapolated) = 34.1 W/kg

SAR(1 g) = 8.86 W/kg; SAR(10 g) = 2.53 W/kg

Smallest distance from peaks to all points 3 dB below = 7.4 mm

Ratio of SAR at M2 to SAR at M1 = 57%

Maximum value of SAR (measured) = 18.4 W/kg



0 dB = 18.4 W/kg

System Performance Check Data (5800MHz)

Date: 2025/10/8

Communication System Band: D5GHz (5000.0 - 6000.0 MHz); Frequency: 5800 MHz; Duty Cycle: 1:1

Medium parameters used: $f = 5800$ MHz; $\sigma = 5.166$ S/m; $\epsilon_r = 34.081$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

Ambient Temperature: 22.3°C Liquid Temperature: 21.3°C

DASY5 Configuration:

- Probe: EX3DV4 - SN3974; ConvF(5.14, 5.14, 5.14); Calibrated: 2025/6/5
- Sensor-Surface: 2mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1423; Calibrated: 2025/6/5
- Phantom: SAM2; Type: QD 000 P40 CC; Serial: 1473
- Measurement SW: DASY52, Version 52.10 (4); SEMCAD X Version 14.6.14 (7501)

CW5800/Area Scan (81x101x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 17.4 W/kg

CW5800/Zoom Scan (7x7x12)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=2mm

Reference Value = 68.98 V/m; Power Drift = -0.14 dB

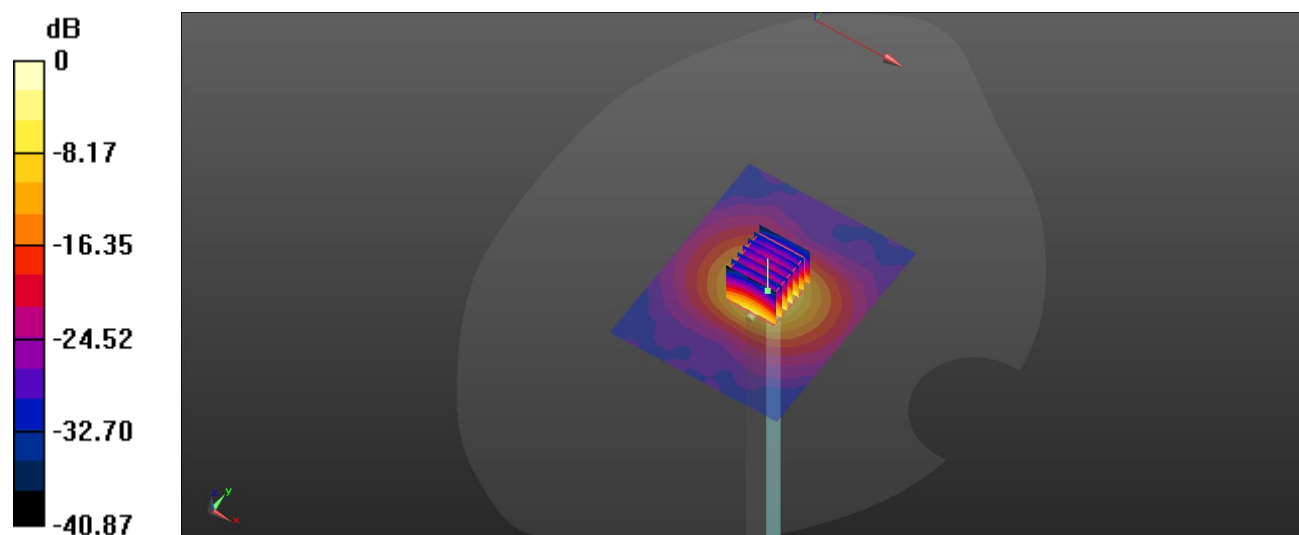
Peak SAR (extrapolated) = 32.2 W/kg

SAR(1 g) = 8.19 W/kg; SAR(10 g) = 2.35 W/kg

Smallest distance from peaks to all points 3 dB below = 7.2 mm

Ratio of SAR at M2 to SAR at M1 = 55.9%

Maximum value of SAR (measured) = 17.0 W/kg



0 dB = 17.4 W/kg

ANNEX C TEST DATA

Please refer the document “BL-SH2591049-ATD.pdf”.

ANNEX D EUT EXTERNAL PHOTOS

Please refer the document “BL-SH2591049-AW.pdf”.

ANNEX E SAR TEST SETUP PHOTOS

Please refer the document “BL-SH2591049-AS.pdf”.

ANNEX F CALIBRATION REPORT

Please refer the document “BL-SH2591049-AC.pdf”.

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--END OF REPORT--