SAR EVALUATION REPORT

FCC 47 CFR § 2.1093
IEEE Std. 1528-2013
RSS-102 Issue 5
IEC/EN 62209-2:2010

For
Shopify POS Go

FCC ID: : 2AB7X-S2001
IC: 24244-S2001
Model: S2001

Report Number: 4790096770-SAR-1
Issue Date: March 15, 2022

Prepared for
BBPOS International Limited(FCC)
Suite 1903-04, Tower 2, Nina Tower, 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong

Shopify Inc(ISED)
150 Elgin Street Ottawa ON K2P1L4 Canada

Prepared by
UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, People's Republic of China

Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	3/15/2022	Initial Issue	

Note:

1.This test report is only published to and used by the applicant, and it is not for evidence purpose in China.

2. The measurement result for the sample received is <Pass> according to < IEEE Std. 1528, RSS-102 ISSUE 5>when <Accuracy Method> decision rule is applied.

Table of Contents

1. Attestation of Test Results

Applicant Name(FCC)	BBPOS International Limited
Address	Room 1903-04, 19/F, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, New Territories, Hong Kong
Manufacturer(FCC)	BBPOS International Limited
Address	Room 1903-04, 19/F, Nina Tower, No. 8 Yeung Uk Road, Tsuen Wan, New Territories, Hong Kong
Applicant Name(ISED)	Shopify Inc
Address	150 Elgin Street Ottawa ON K2P1L4 Canada
Manufacturer(ISED)	BBPOS International Limited
Address	Suite 1903-04, Tower 2, Nina Tower, 8 Yeung Uk Road, Tsuen Wan, NT, Hong Kong
EUT Name	Shopify POS Go
Model	S2001
Sample Status	Normal
Sample Received Date	November 1, 2021
Date of Tested	Dec 24,2021~March 15,2022
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 KDB publication RSS-102 Issue 5 IEC 62209-2:2010

SAR Limits (W/Kg)

Exposure Category	Peak spatial-average (1g of tissue)	Extremities (hands, wrists, ankles, etc.) (10g of tissue)
General population / Uncontrolled exposure	1.6	4

The Highest Reported SAR (W/kg)

RF Exposure Conditions		Equipment Class			
		PCT	DTS	U-NII	DSS
Body-worn (1-g)		1.184	0.092	0.682	0.017
Extremity(10-g)		2.893	0.230	0.868	0.037
	Body-worn (1-g)	1.381			
	Extremity(10-g)	3.172			
Test Results		Pass			

Prepared By:	Reviewed By:	Approved By:
Dean Hua	Shawn Wen	Stephen Guo
Dean Hua Engineer Project Associate	Shawn Wen Laboratory Leader	Stephen Guo Laboratory Manager

2. Test Specification, Methods and Procedures

The tests documented in this report were performed in accordance with IEEE Std.1528-2013, RSS-102 Issue5, IEC/IEE 62209-1528, the following FCC Published RF exposure KDB procedures:

- 248227 D01 802.11 Wi-Fi SAR
- 447498 D01 General RF Exposure Guidance
- 690783 D01 SAR Listings on Grants
- 865664 D01 SAR measurement 100 MHz to 6 GHz
- 865664 D02 RF Exposure Reporting
- 941225 D05 SAR for LTE Devices v02r05
- 941225 D07 UMPC Mini Tablet v01r02
- 941225 D01 3G SAR Procedures

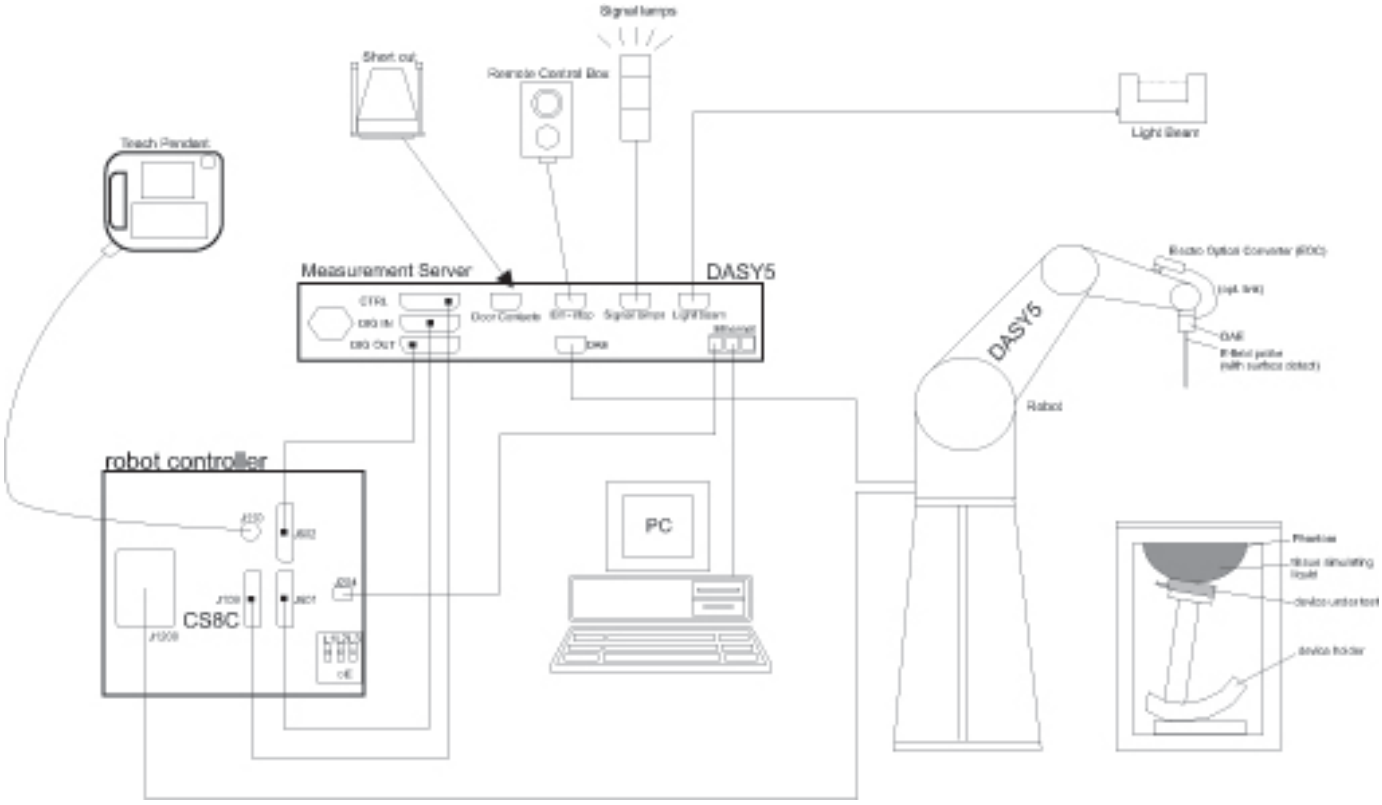
3. Facilities and Accreditation

Test Location	UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch.
Address	Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with A2LA. **FCC (FCC Recognized No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
Description	All measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

4. SAR Measurement System & Test Equipment

4.1. SAR Measurement System

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



- A standard high precision 6-axis robot with controller, teach pendant and software. An arm extension for accommodating the data acquisition electronics (DAE).
- An isotropic Field probe optimized and calibrated for the targeted measurement.
- A data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.
- The Electro-optical converter (EOC) performs the conversion from optical to electrical signals for the digital communication to the DAE. To use optical surface detection, a special version of the EOC is required. The EOC signal is transmitted to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- The Light Beam used is for probe alignment. This improves the (absolute) accuracy of the probe positioning.
- A computer running Win7 and the DASY52 software.
- Remote control and teach pendant as well as additional circuitry for robot safety such as warning lamps, etc.
- The phantom, the device holder and other accessories according to the targeted measurement.

4.2. SAR Scan Procedures

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 2.1 mm. This distance cannot be smaller than the distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2: Area Scan

The Area Scan is used as a fast scan in two dimensions to find the area of high field values, before doing a fine measurement around the hot spot. The sophisticated interpolation routines implemented in DASY software can find the maximum locations even in relatively coarse grids. When an Area Scan has measured all reachable points, it computes the field maximal found in the scanned area, within a range of the global maximum. The range (in Db) is specified in the standards for compliance testing. For example, a 2 Db range is required in IEEE Standard 1528 and IEC 62209 standards, whereby 3 Db is a requirement when compliance is assessed in accordance with the ARIB standard (Japan). If only one Zoom Scan follows the Area Scan, then only the absolute maximum will be taken as reference. For cases where multiple maximums are detected, the number of Zoom Scans has to be increased accordingly.

Area Scan Parameters extracted from KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

	≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface	5 ± 1 mm	½·δ·ln(2) ± 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location	30° ± 1°	20° ± 1°
Maximum area scan spatial resolution: Δx_{Area}, Δy_{Area}	≤ 2 GHz: ≤ 15 mm 2 – 3 GHz: ≤ 12 mm	3 – 4 GHz: ≤ 12 mm 4 – 6 GHz: ≤ 10 mm
	When the x or y dimension of the test device, in the measurement plane orientation, is smaller than the above, the measurement resolution must be ≤ the corresponding x or y dimension of the test device with at least one measurement point on the test device.	

Step 3: Zoom Scan

Zoom Scans are used to assess the peak spatial SAR values within a cubic averaging volume containing 1 g and 10 g of simulated tissue. The Zoom Scan measures points (refer to table below) within a cube whose base faces are centered on the maxima found in a preceding area scan job within the same procedure. When the measurement is done, the Zoom Scan evaluates the averaged SAR for 1 g and 10 g and displays these values next to the job's label.

Zoom Scan Parameters extracted from KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

			≤ 3 GHz	> 3 GHz
Maximum zoom scan spatial resolution: Δx_{Zoom}, Δy_{Zoom}			≤ 2 GHz: ≤ 8 mm 2 – 3 GHz: ≤ 5 mm*	3 – 4 GHz: ≤ 5 mm* 4 – 6 GHz: ≤ 4 mm*
Maximum zoom scan spatial resolution, normal to phantom surface	uniform grid: $\Delta z_{Zoom}(n)$		≤ 5 mm	3 – 4 GHz: ≤ 4 mm 4 – 5 GHz: ≤ 3 mm 5 – 6 GHz: ≤ 2 mm
	graded grid	$\Delta z_{Zoom}(1)$: between 1st two points closest to phantom surface	≤ 4 mm	3 – 4 GHz: ≤ 3 mm 4 – 5 GHz: ≤ 2.5 mm 5 – 6 GHz: ≤ 2 mm
		$\Delta z_{Zoom}(n>1)$: between subsequent points	≤ $1.5 \cdot \Delta z_{Zoom}(n-1)$	
Minimum zoom scan volume	x, y, z		≥ 30 mm	3 – 4 GHz: ≥ 28 mm 4 – 5 GHz: ≥ 25 mm 5 – 6 GHz: ≥ 22 mm

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.

* 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 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in Db from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1.

Step 5: Z-Scan (FCC only)

The Z Scan measures points along a vertical straight line. The line runs along the Z-axis of a one-dimensional grid. In order to get a reasonable extrapolation the extrapolated distance should not be greater than the step size in Z-direction.

4.3. Test Equipment

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

Name of equipment	Manufacturer	Type/Model	Serial No.	Cal. Due Date
ENA Network Analyzer	Keysight	E5080A	MY55100583	2022.10.29
Dielectric Probe kit	SPEAG	SM DAK 040 SA	1155	NCR
DC power supply	Keysight	E36103A	MY55350020	2022.10.29
Signal Generator	Rohde & Schwarz	SME06	837633\001	2022.10.29
BI-Directional Coupler	WERLATONE	C8060-102	3423	2022.10.29
Peak and Average Power Sensor	Keysight	E9323A	MY55440013	2022.10.29
Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	2022.10.29
Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
Dosimetric E-Field Probe	SPEAG	EX3DV4	7589	2022.4.26
Data Acquisition Electronic	SPEAG	DAE4	1673	2022.5.5
Dipole Kit 750 MHz	SPEAG	D750V3	1153	2024.12.14
Dipole Kit 835 MHz	SPEAG	D835V2	4d206	2024.12.16
Dipole Kit 1800 MHz	SPEAG	D1800V2	2d212	2024.12.20
Dipole Kit 1900 MHz	SPEAG	D1900V2	5d212	2024.12.19
Dipole Kit 2300 MHz	SPEAG	D2300V2	1065	2024.12.20
Dipole Kit 2450 MHz	SPEAG	D2450V2	977	2024.12.16
Dipole Kit 2600 MHz	SPEAG	D2600V2	1117	2024.12.19
Dipole Kit 5 GHz	SPEAG	D5GHzV2	1231	2024.12.15
Software	SPEAG	DASY52	N/A	NCR
Twin Phantom	SPEAG	SAM V5.0	1805	NCR
ELI Phantom	SPEAG	ELI V5.0	1235	NCR
Thermometer	/	GX-138	150709653	2022.10.29
Thermometer	VICTOR	ITHX-SD-5	18470005	2022.10.29
Base station	R&S	CMW500	155522	2022.10.29

Note:

1) Per KDB865664D01 v01r04 requirements for dipole calibration, the test laboratory has adopted three-year extended calibration interval. Each measured dipole is expected to evaluate with the following criteria at least on annual interval in Appendix C.

a) There is no physical damage on the dipole;

b) System check with specific dipole is within 10% of calibrated value;

c) The most recent return-loss result, measured at least annually, deviates by no more than 20% from the previous measurement.

d) The most recent measurement of the real or imaginary parts of the impedance, measured at least annually is within 5Ω from the previous measurement.

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

5. Measurement Uncertainty

5.1. Uncertainty budget list (30MHz to 3GHz).

Uncertainty component	Tol. (±%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	U_i, 1g (±%)	U_i, 10g (±%)
Measurement system							
Probe Calibration	6.0	N	1	1	1	6.0	6.0
Axial Isotropy	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9
Boundary Effects	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Modulation Response^m	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner	0.4	R	$\sqrt{3}$	1	1	0.2	0.2
Probe Positioning	2.9	R	$\sqrt{3}$	1	1	1.7	1.7
Max. SAR Eval.	2.0	R	$\sqrt{3}$	1	1	1.2	1.2
Test sample related							
Device Positioning	2.9	N	1	1	1	2.9	2.9
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Power Scaling	0	R	$\sqrt{3}$	1	1		
Phantom and set-up							
Phantom Uncertainty	6.1	R	$\sqrt{3}$	1	1	3.5	3.5
SAR correction	1.9	R	$\sqrt{3}$	1	0.84	1.1	0.9
Liquid Conductivity (mea.)	2.5	R	$\sqrt{3}$	0.78	0.71	1.1	1.0
Liquid Permittivity (mea.)	2.5	R	$\sqrt{3}$	0.26	0.26	0.4	0.4
Temp. unc. - Conductivity	3.4	R	$\sqrt{3}$	0.23	0.26	0.5	0.5
Temp. unc. - Permittivity	0.4	R	$\sqrt{3}$	0.78	0.71	0.2	0.2
Combined standard uncertainty						10.58	10.54
Expanded uncertainty (95% confidence interval) k=2						21.16	21.08

5.2. Uncertainty budget list (3GHz to 6GHz).

Uncertainty component	Tol. (±%)	Prob. Dist.	Div.	C_i (1g)	C_i (10g)	U_i, 1g (±%)	U_i, 10g (±%)
Measurement system							
Probe Calibration	6.5	N	1	1	1	6.5	6.5
Axial Isotropy	4.7	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	1.9	1.9
Hemispherical Isotropy	9.6	R	$\sqrt{3}$	$\sqrt{0.5}$	$\sqrt{0.5}$	3.9	3.9
Boundary Effects	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Linearity	4.7	R	$\sqrt{3}$	1	1	2.7	2.7
System Detection Limits	1.0	R	$\sqrt{3}$	1	1	0.6	0.6
Modulation Response	2.4	R	$\sqrt{3}$	1	1	1.4	1.4
Readout Electronics	0.3	N	1	1	1	0.3	0.3
Response Time	0.8	R	$\sqrt{3}$	1	1	0.5	0.5
Integration Time	2.6	R	$\sqrt{3}$	1	1	1.5	1.5
RF Ambient Noise	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
RF Ambient Reflections	3.0	R	$\sqrt{3}$	1	1	1.7	1.7
Probe Positioner	0.4	R	$\sqrt{3}$	1	1	0.2	0.2
Probe Positioning	6.7	R	$\sqrt{3}$	1	1	3.9	3.9
Max. SAR Eval.	4.0	R	$\sqrt{3}$	1	1	2.3	2.3
Test sample related							
Device Positioning	2.9	N	1	1	1	2.9	2.9
Device Holder	3.6	N	1	1	1	3.6	3.6
Power Drift	5.0	R	$\sqrt{3}$	1	1	2.9	2.9
Power Scaling	0	R	$\sqrt{3}$	1	1	0.0	0.0
Phantom and set-up							
Phantom Uncertainty	6.1	R	$\sqrt{3}$	1	1	3.5	3.5
SAR correction	1.9	R	$\sqrt{3}$	1	0.84	1.1	0.9
Liquid Conductivity (mea.)	2.5	R	$\sqrt{3}$	0.78	0.71	1.1	1.0
Liquid Permittivity (mea.)	2.5	R	$\sqrt{3}$	0.26	0.26	0.4	0.4
Temp. unc. - Conductivity	3.4	R	$\sqrt{3}$	0.23	0.26	0.5	0.5
Temp. unc. - Permittivity	0.4	R	$\sqrt{3}$	0.78	0.71	0.2	0.2
Combined standard uncertainty						11.59	11.55
Expanded uncertainty (95% confidence interval) k=2						23.18	23.11

6. Device Under Test (DUT) Information

6.1. DUT Description

The EUT is a portable POS with GSM/WCDMA/HSDPA//HSUPA /LTE radio, IEEE 802.11a/b/g/n/ac and Bluetooth radio.	
Dimension	Overall (Length x Width x Height): 160.8 mm x 81.57 mm x 21.55 mm
Accessory	None

6.2. Wireless Technology

Wireless technologies	Frequency bands	Operating mode	
GSM	850 1900	GPRS (GMSK) EGPRS (8PSK)	GPRS Multi-Slot Class: ☐ Class 8 ☐ Class 10 ☒ Class 12 ☐ Class 33
W-CDMA (UMTS)	Band II Band V Band IV	UMTS Rel. 99 (Data) HSDPA (Rel. 7) HSUPA (Rel. 5)	
LTE	FDD B2 FDD B4 FDD B5 FDD B7 FDD B12 FDD B13 FDD B17 FDD B25 FDD B26 FDD B66 TDD B38 TDD B40 TDD B41	QPSK 16QAM ☒ Rel. 10 Does not support Carrier Aggregation (CA) ☐ Rel. 10 Carrier Aggregation (Downlink only) ☐ Rel. 11 Carrier Aggregation (2 Uplink and 2 Downlinks)	
Wi-Fi	2.4GHz	802.11b 802.11g 802.11n (HT20) 802.11n (HT40)	
Wi-Fi	5GHz	802.11a 802.11n (HT20) 802.11n (HT40) 802.11ac (HT20) 802.11ac (HT40) 802.11ac (HT80)	
BT	2.4GHz	V4.1	
GPS/GLONASS	1.5GHz	L1/G1	

6.3. Antenna Gain

Main Antenna		
Band	Antenna Type	MAX Antenna Gain(dBi)
GSM850	PIFA	-1.19
PCS1900	PIFA	-2.25
WCDMA Band 2	PIFA	-2.22
WCDMA Band 4	PIFA	-2.39
WCDMA Band 5	PIFA	-0.82
LTE B2	PIFA	-0.58
LTE B4	PIFA	-0.73
LTE B5	PIFA	-1.19
LTE B7	PIFA	-0.61
LTE B12	PIFA	-2.89
LTE B13	PIFA	-2.83
LTE B17	PIFA	-1.51
LTE B25	PIFA	-0.58
LTE B26	PIFA	-1.43
LTE B66	PIFA	-0.71
LTE B38	PIFA	-2.18
LTE B40	PIFA	-0.66
LTE B41	PIFA	-0.75
Wi-Fi/BT/GPS Antenna		
Band	Antenna Type	MAX Antenna Gain(dBi)
2.4GHz	PIFA	-1.85
5GHz	PIFA	-3.85
Bluetooth	PIFA	-1.83
GNSS	PIFA	-2.93

7. Conducted Output Power Measurement and tune-up tolerance

Detailed conducted power and tune-up tolerance please refer to Appendix A.

8. Test Configuration

8.1. GSM Test Configuration

SAR tests for GSM850 and GSM1900, a communication link is set up with a base station by air link. Using CMW500 the power lever is set to “5”and “0” in SAR of GSM850 and GSM1900. The tests in the band of GSM850 and GSM1900 are performed in the mode of GPRS/EGPRS function. Since the GPRS class is 12 for this EUT, it has at most 4 timeslots in uplink and at most 4 timeslots in downlink, the maximum total timeslot is 5. The EGPRS class is 12 for this EUT, it has at most 4 timeslots in uplink, and at most 4 timeslots in downlink, the maximum total timeslot is 5.

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

8.2. UMTS Test Configuration

1. Output Power Verification

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

2. WCDMA

Body SAR Measurements

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

3. HSDPA

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

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

HSDPA should be configured according to UE category of a test device. The number of HS-DSCH/HS-PDSCHs, HAPRQ processes, minimum inter-TTI interval, transport block sizes and RV coding sequence are defined by the H-set. To maintain a consistent test configuration and stable transmission condition, QPSK is used in the H-set for SAR testing. HS-DPCCH should be configured with a CQI feedback cycle of 4ms with a CQI repetition factor of 2 to maintain a constant rate of active CQI slots. The □c and □d gain factors for DPCCH and DPDCH

were set according to the values in the below table, □hs for HS-DPCCH is set automatically to the correct value when ΔACK, ΔNACK, ΔCQI = 8. The variation of the □c /□d ratio causes a power reduction at sub-tests 2 - 4.

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

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

Note 2 : CM=1 for β_c/β_d= 12/15, β_{hs}/β_c = 24/15. For all other combinations of DPDCH,DPCCH and HS-DPCCH the MPR is based on the relative CM difference. This is applicable for only UEs that support HSDPA in release 6 and later releases.

Note 3 : For subtest 2 the β_c/β_d ratio of 12/15 for the TFC during the measurement period (TF1, TF0) is achieved by setting the signalled gain factors for the reference TFC (TF1,TF1) to β_c = 11/15 and β_d = 15/15

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

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

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

HSDPA UE category

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

4. HSUPA

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

As per KDB941225 D01v03, the 3G SAR test reduction procedure is applied to HSPA (HSUPA/HSDPA with RMC) body configurations with 12.2 kbps RMC as the primary mode. Otherwise, SAR is measured for HSPA using the HSPA body SAR procedures for the highest reported body exposure SAR configuration in 12.2 kbps RMC.

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

Subtests for WCDMA Release 6 HSUPA

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

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

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

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

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

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

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

HSUPA UE category

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

Note:

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

5. DC-HSDPA

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

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

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

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

Call is set up as per 3GPP TS34.108 v9.5.0 sub clause 7.3.13

The configurations of the fixed reference channels for HSDPA RF tests are described in 3GPP TS 34.121, annex C for FDD and 3GPP TS 34.122.

The measurements were performed with a Fixed Reference Channel (FRC) H-Set 12 with QPSK

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

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

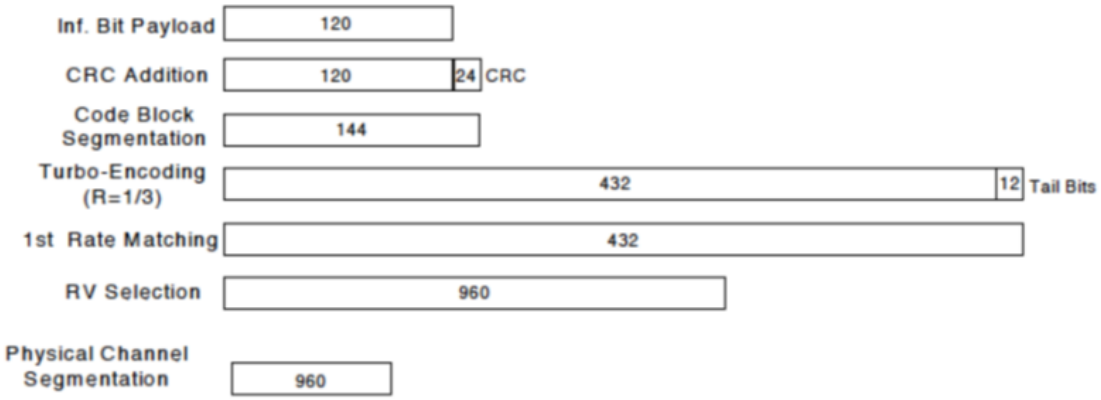


Figure C.8.19: Coding rate for Fixed reference Channel H-Set 12 (QPSK)

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

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

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

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

Note:

1) The Dual Carriers transmission only applies to HSDPA physical channels.
2) The Dual Carriers belong to the same Node and are on adjacent carriers.
3) The Dual Carriers do not support MIMO to serve UEs configured for dual cell operation.
4) The Dual Carriers operate in the same frequency band.
5) The device doesn't support the modulation of 16QAM in uplink but 64QAM in downlink for DC-HSDPA mode.

The device doesn’t support carrier aggregation for it just can operate in Release 8.

8.3. LTE Test Configuration

Establishing connections with base station simulators ensure a consistent means for testing SAR and are recommended for evaluating SAR. The R&S CMW500 was used for LTE output power measurements and SAR testing. Max power control was used so the UE transmits with maximum output power during SAR testing. SAR must be measured with the maximum TTI (transmit time interval) supported by the device in each LTE configuration.

SAR test requirements

A) Largest channel bandwidth standalone SAR test requirements

i) QPSK with 1 RB allocation

Start with the largest channel bandwidth and measure SAR for QPSK with 1 RB allocation, using the RB offset and required test channel combination with the highest maximum output power for RB offsets at the upper edge, middle and lower edge of each required test channel. When the reported SAR is ≤ 0.8 W/kg, testing of the remaining RB offset configurations and required test channels is not required for 1 RB allocation; otherwise, SAR is required for the remaining required test channels and only for the RB offset configuration with the highest output power for that channel. When the reported SAR of a required test channel is > 1.45 W/kg, SAR is required for all three RB offset configurations for that required test channel.

ii) QPSK with 50% RB allocation

The procedures required for 1 RB allocation in i) are applied to measure the SAR for QPSK with 50% RB allocation.

iii) QPSK with 100% RB allocation

For QPSK with 100% RB allocation, SAR is not required when the highest maximum output power for 100 % RB allocation is less than the highest maximum output power in 50% and 1 RB allocations and the highest reported SAR for 1 RB and 50% RB allocation in i) and ii) are ≤ 0.8 W/kg. Otherwise, SAR is measured for the highest output power channel and if the reported SAR is > 1.45 W/kg, the remaining required test channels must also be tested.

iv) Higher order modulations

For each modulation besides QPSK; e.g., 16-QAM, 64-QAM, apply the QPSK procedures in above sections to determine the QAM configurations that may need SAR measurement. For each configuration identified as required for testing, SAR is required only when the highest maximum output power for the configuration in the higher order modulation is > ½ dB higher than the same configuration in QPSK or when the reported SAR for the QPSK configuration is > 1.45 W/kg.

B) Other channel bandwidth standalone SAR test requirements

For the other channel bandwidths used by the device in a frequency band, apply all the procedures required for the largest channel bandwidth in section A) to determine the channels and RB configurations that need SAR testing and only measure SAR when the highest maximum output power of a configuration requiring testing in the smaller channel bandwidth is > ½ dB higher than the equivalent channel configurations in the largest channel bandwidth configuration or the reported SAR of a configuration for the largest channel bandwidth is > 1.45 W/kg.

8.4. LTE(TDD) Test Configuration

According to KDB 941225 D05 SAR for LTE Devices V02r05, for Time-Division Duplex(TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band supports 3GPP TS 36 For Time-Division Duplex (TDD) systems, SAR must be tested using a fixed periodic duty factor according to the highest transmission duty factor implemented for the device and supported by the defined 3GPP LTE TDD configurations.

TDD LTE Band supports 3GPP TS 36.211 section 4.2 for Type 2 Frame Structure and Table 4.2-2 for uplink-downlink configurations and Table 4.2-1 for Special subframe configurations.

Figure 4.2-1: Frame structure type 2

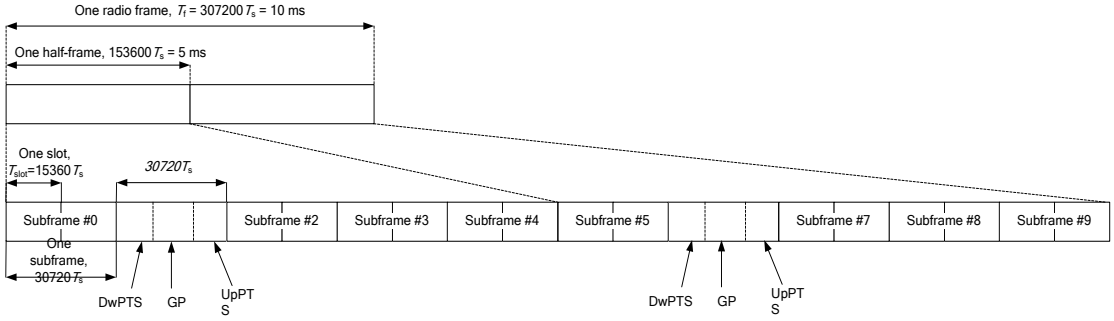


Table 4.2-1: Configuration of special subframe (lengths of DwPTS/GP/UpPTS)

Special subframe configuration	Normal cyclic prefix in downlink			Extended cyclic prefix in downlink		
	DwPTS	UpPTS		DwPTS	UpPTS	
		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink		Normal cyclic prefix in uplink	Extended cyclic prefix in uplink
0	$6592 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$	$7680 \cdot T_s$	$2192 \cdot T_s$	$2560 \cdot T_s$
1	$19760 \cdot T_s$			$20480 \cdot T_s$		
2	$21952 \cdot T_s$			$23040 \cdot T_s$		
3	$24144 \cdot T_s$			$25600 \cdot T_s$		
4	$26336 \cdot T_s$			$7680 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$
5	$6592 \cdot T_s$	$4384 \cdot T_s$	$5120 \cdot T_s$	$20480 \cdot T_s$		
6	$19760 \cdot T_s$			$23040 \cdot T_s$		
7	$21952 \cdot T_s$			$12800 \cdot T_s$		
8	$24144 \cdot T_s$			-	-	-
9	$13168 \cdot T_s$			-	-	-

Table 4.2-2: Uplink-downlink configurations

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

According to Figure 4.2-1, one radio frame is configured by 10 subframes, which consist of Uplink-subframe, Downlink-subframe and Special subframe. For TDD-LTE, the Duty Cycle should be calculated on Uplink-subframes and Special subframes, due to Special subframe containing both Uplink transmissions. So for one radio frame, Duty Cycle can be calculated with formula as below. The count of Uplink subframes are according to Table 4.2-2:

Duty cycle =(30720Ts*Ups+Uplink Component*Specials)/(307200Ts)

About the uplink component of Special subframes, we can figure out by Table 4.2-1:

Uplink Component=UpPTS

In conclusion, for the TDD LTE Band, Duty Cycle can be calculated with formula as below .all these sets are ok when we test, or we can set as below.

Duty cycle =[(30720Ts*Ups)+ UpPTS *Specials]/(307200Ts)

And we can get different Duty cycles under different configurations:

Uplink-downlink configuratin	Subframe number			Configuration of special subframe							
				Normal cyclic prefix in downlink				Extended cyclic prefix in downlink			
				Normal cyclic prefix in uplink		Extended cyclic prefix in uplink		Normal cyclic prefix in uplink		Extended cyclic prefix in uplink	
	D	S	U	configuration 0-4	configuration 5-9	configuration 0-4	configuration 5-9	configuration 0-3	configuration 4-7	configuration 0-3	configuration
0	2	2	6	61.43%	62.85%	61.67%	63.33%	61.43%	62.85%	61.67%	63.33%
1	4	2	4	41.43%	42.85%	41.67%	43.33%	41.43%	42.85%	41.67%	43.33%
2	6	2	2	21.43%	22.85%	21.67%	23.33%	21.43%	22.85%	21.67%	23.33%
3	6	1	3	30.71%	31.43%	30.83%	31.67%	30.71%	31.43%	30.83%	31.67%
4	7	1	2	20.71%	21.43%	20.83%	21.67%	20.71%	21.43%	20.83%	21.67%
5	8	1	1	10.71%	11.43%	10.83%	11.67%	10.71%	11.43%	10.83%	11.67%
6	3	2	5	51.43%	52.85%	51.67%	53.33%	51.43%	52.85%	51.67%	53.33%

For TDD LTE, SAR should be tested with the highest transmission duty factor (63.33%) using Uplink-downlink configuration 0 and Special subframe configuration 7 for Frame structure type 2.

For TDD LTE B40, SAR should be tested with the highest transmission duty factor (31.67%) using Uplink-downlink configuration 3 and Special subframe configuration 3 for Frame structure type 2.

Note:

The device supports both LTE Band 2 and LTE Band 25, Since the supported frequency span for LTE band 2 falls completely within the supported frequency span for LTE Band 25, both LTE bands have the same target power, and if both LTE Bands share the same transmission path, SAR was only assessed for LTE Band 25.

The device supports both LTE Band 4 and LTE Band 66, Since the supported frequency span for LTE band 4 falls completely within the supported frequency span for LTE Band 66, both LTE bands have the same target power, and if both LTE Bands share the same transmission path, SAR was only assessed for LTE Band 66.

8.5. Wi-Fi Test Configuration

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

8.5.1. Initial Test Position Procedure

For exposure condition with multiple test position, such as handsets operating next to the ear, devices with hotspot mode or UMPC mini-tablet, procedures for initial test position can be applied. Using the transmission mode determined by the DSSS procedure or initial test configuration, area scans are measured for all position in an exposure condition. The test position with the highest extrapolated (peak) SAR is used as the initial test position. When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the reported SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

8.5.2. Initial Test Configuration Procedure

An initial test configuration is determined for OFDM transmission modes according to the channel bandwidth, modulation and data rate combination(s) with the highest maximum output power specified for production units in each standalone and aggregated frequency band. SAR is measured using the highest measured maximum output power channel. For configurations with the same specified or measured maximum output power, additional transmission mode and test channel selection procedures are required (see section 5.3.2 of KDB 248227D01). SAR test reduction of subsequent highest output test channels is based on the reported SAR of the initial test configuration.

For next to the ear, hotspot mode and UMC mini-tablet exposure configurations where multiple test positions are required, the initial test position procedure is applied to minimize the number of test positions required for SAR measurement using the initial test configuration transmission mode. For fixed exposure conditions that do not have multiple SAR test positions, SAR is measured in the transmission mode determined by the initial test configuration.

When the reported SAR of the initial test configuration is > 0.8 W/kg, SAR measurement is required for the subsequent next highest measured output power channel(s) in the initial test configuration until the reported SAR is ≤ 1.2 W/kg or all required channels are tested.

8.5.3. Sub Test Configuration Procedure

SAR measurement requirements for the remaining 802.11 transmission mode configurations that have not been tested in the initial test configuration are determined separately for each standalone and aggregated frequency band, in each exposure condition, according to the maximum output power specified for production units.

When the highest reported SAR for the initial test configuration, according to the initial test position or fixed exposure position requirements, is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for that subsequent test configuration.

8.5.4. 2.4GHz Wi-Fi SAR Test Procedures

Separate SAR procedures are applied to DSSS and OFDM configurations in the 2.4 GHz band to simplify DSSS test requirements. For 802.11b DSSS SAR measurements, DSSS SAR procedure applies to fixed exposure test position and initial test position procedure applies to multiple exposure test positions.

A) 802.11b DSSS SAR Test Requirements

SAR is measured for 2.4 GHz 802.11b DSSS using either a fixed test position or, when applicable, the initial test position procedure. SAR test reduction is determined according to the following:

1) When the reported SAR of the highest measured maximum output power channel (section 3.1 of KDB 248227D01) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.
2) When the reported SAR is > 0.8 W/kg, SAR is required for that exposure configuration using the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel; i.e., all channels require testing.

B) 2.4GHz 802.11g/n OFDM SAR Test Exclusion Requirements

When SAR measurement is required for 2.4 GHz 802.11g/n OFDM configurations, the measurement and test reduction procedures for OFDM are applied (section 5.3 of KDB 248227D01). SAR is not required for the following 2.4 GHz OFDM conditions.

1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

C) SAR Test Requirements for OFDM configurations

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

8.5.5. 5GHz Wi-Fi SAR Test Procedures

A) U-NII-1 and U-NII-2A Bands

For devices that operate in only one of the U-NII-1 and U-NII-2A bands, the normally required SAR procedures for OFDM configurations are applied. For devices that operate in both U-NII bands using the same transmitter and antenna(s), SAR test reduction is determined according to the following:

1) When the same maximum output power is specified for both bands, begin SAR measurement in U-NII-2A band by applying the OFDM SAR requirements. If the highest reported SAR for a test configuration is ≤ 1.2 W/kg, SAR is not required for U-NII-1 band for that configuration (802.11 mode and exposure condition); otherwise, both bands are tested independently for SAR.
2) When different maximum output power is specified for the bands, begin SAR measurement in the band with higher specified maximum output power. The highest reported SAR for the tested configuration is adjusted by the ratio of lower to higher specified maximum output power for the two bands. When the adjusted SAR is ≤ 1.2 W/kg, SAR is not required for the band with lower maximum output power in that test configuration; otherwise, both bands are tested independently for SAR.
3) The two U-NII bands may be aggregated to support a 160 MHz channel on channel number 50. Without additional testing, the maximum output power for this is limited to the lower of the maximum output power certified for the two bands. When SAR measurement is required for at least one of the bands and the highest reported SAR adjusted by the ratio of specified maximum output power of aggregated to standalone band is > 1.2 W/kg, SAR is required for the 160 MHz channel. This procedure does not apply to an aggregated band with maximum output higher than the standalone band(s); the aggregated band must be tested independently for SAR. SAR is not required when the 160 MHz channel is operating at a reduced maximum power and also qualifies for SAR test exclusion.

B) U-NII-2C and U-NII-3 Bands

The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. When Terminal Doppler Weather Radar (TDWR) restriction applies, all channels that operate at 5.60 – 5.65 GHz must be included to apply the SAR test reduction and measurement procedures.
When the same transmitter and antenna(s) are used for U-NII-2C band and U-NII-3 band or 5.8 GHz band of §15.247, the bands may be aggregated to enable additional channels with 20, 40 or 80 MHz bandwidth to span across the band gap, as illustrated in Appendix B. The maximum output power for the additional band gap channels is limited to the lower of those certified for the bands. Unless band gap channels are permanently disabled, they must be considered for SAR testing. The frequency range covered by these bands is 380 MHz (5.47 – 5.85 GHz), which requires a minimum of at least two SAR probe calibration frequency points to support SAR measurements. To maintain SAR measurement accuracy and to facilitate test reduction, the channels in U-NII-2C band above 5.65 GHz may be grouped with the 5.8 GHz channels in U-NII-3 or §15.247 band to enable two SAR probe calibration frequency points to cover the bands, including the band gap channels. When band gap channels are supported and the bands are not aggregated for SAR testing, band gap channels must be considered independently in each band according to the normally required OFDM SAR measurement and probe calibration frequency points requirements.

C) OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements

The initial test configuration for 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures. When multiple configurations in a frequency band have the same specified maximum output power, the initial test configuration is determined according to the following steps applied sequentially.

1) The largest channel bandwidth configuration is selected among the multiple configurations with the same specified maximum output power.
2) If multiple configurations have the same specified maximum output power and largest channel bandwidth, the lowest order modulation among the largest channel bandwidth configurations is selected.
3) If multiple configurations have the same specified maximum output power, largest channel bandwidth and lowest order modulation, the lowest data rate configuration among these configurations is selected. When multiple transmission modes (802.11a/g/n/ac) have the same specified maximum output power, largest channel bandwidth, lowest order modulation and lowest data rate, the lowest order 802.11 mode is selected; i.e., 802.11a is chosen over 802.11n then 802.11ac or 802.11g is chosen over 802.11n.

After an initial test configuration is determined, if multiple test channels have the same measured maximum output power, the channel chosen for SAR measurement is determined according to the following. These channel selection procedures apply to both the initial test configuration and subsequent test configuration(s), with respect to the default power measurement procedures or additional power measurements required for further SAR test reduction. The same procedures also apply to subsequent highest output power channel(s) selection.

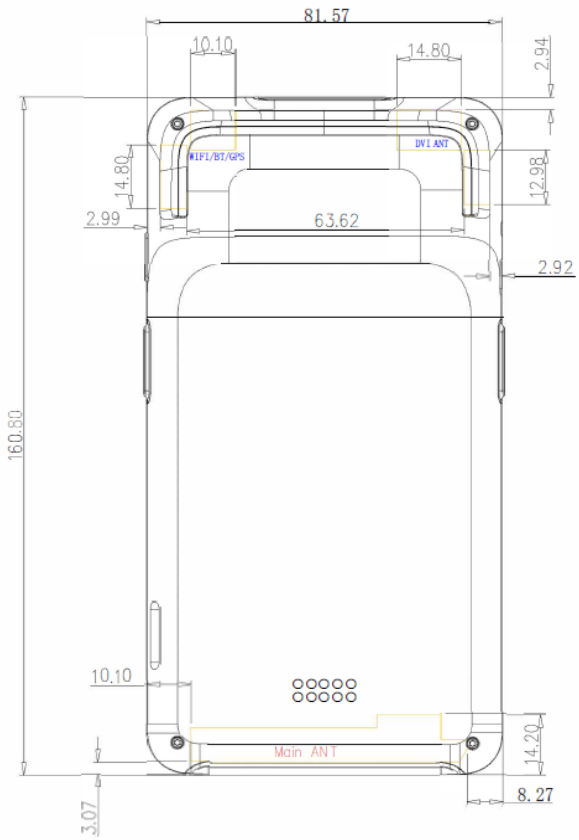
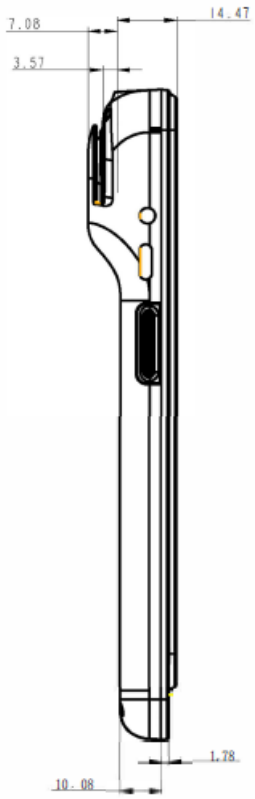
1) The channel closest to mid-band frequency is selected for SAR measurement.
2) For channels with equal separation from mid-band frequency; for example, high and low channels

D) SAR Test Requirements for OFDM configurations

When SAR measurement is required for 802.11 a/n/ac OFDM configurations, each standalone and frequency aggregated band is considered separately for SAR test reduction. When the same transmitter and antenna(s) are used for U-NII-1 and U-NII-2A bands, additional SAR test reduction applies. When band gap channels between U-NII-2C band and 5.8 GHz U-NII-3 or §15.247 band are supported, the highest maximum output power transmission mode configuration and maximum output power channel across the bands must be used to determine SAR test reduction, according to the initial test configuration and subsequent test configuration requirements. In applying the initial test configuration and subsequent test configuration procedures, the 802.11 transmission configuration with the highest specified maximum output power and the channel within a test configuration with the highest measured maximum output power should be clearly distinguished to apply the procedures.

9. RF Exposure Conditions

Refer to the diagram inside the device which attached below for the specific details of the antenna-to-edges distances. As per KDB 941225 D06, when the antenna to-edge-distance is greater than 2.5 cm, SAR evaluation is not required for the corresponding position.

Rear Review	Left Review
	

	Test Position	antenna to-edge-distance	Test required
Main Ant	Front Edge	<25mm	Yes
	Back Edge	<25mm	Yes
	Left Edge	<25mm	Yes
	Right Edge	<25mm	Yes
	Top Edge	>25mm	No
	Bottom Edge	<25mm	Yes

Wi-Fi/BT/GPS Ant	Test Position	antenna to-edge-distance	Test required
	Front Edge	<25mm	Yes
	Back Edge	<25mm	Yes
	Left Edge	>25mm	No
	Right Edge	<25mm	Yes
	Top Edge	<25mm	Yes
	Bottom Edge	>25mm	No

Note:
1) The EUT doesn't support operating next to the ear, so head SAR evaluation isn't considered.
2) The Main Antenna in the bottom of EUT, it supports LTE/WCDMA/GSM;
3) The Dvi antenna in the top left of EUT, it only supports RX for LTE/WCDMA/GSM;
4) The Wi-Fi/BT/GPS antenna in the top right of EUT.
5) The test distance of 10mm for body exposure was agreed on through KDB inquiry. In the same inquiry the FCC approved limiting testing for extremity SAR at 0mm to test cases where body SAR exceeded 1.2 W/Kg. Although body SAR measurements were all less than 1.2 W/Kg, extremity SAR measurements were made at a separation distance of 0mm from each side/surface of the device using the cellular mode with the highest SAR value for body exposure on that surface. All Wi-Fi bands were also evaluated for extremity SAR even though the 10mm body SAR value was less than 1.2 W/Kg.

10. Dielectric Property Measurements & System Check

10.1. Dielectric Property Measurements

The temperature of the tissue-equivalent medium used during measurement must also be within 18°C to 25°C and within ± 2°C of the temperature when the tissue parameters are characterized.
The dielectric parameters must be measured before the tissue-equivalent medium is used in a series of SAR measurements. The parameters should be re-measured after each 3 – 4 days of use; or earlier if the dielectric parameters can become out of tolerance; for example, when the parameters are marginal at the beginning of the measurement series.
Tissue dielectric parameters were measured at the low, middle and high frequency of each operating frequency range of the test device.

Tissue Dielectric Parameters

FCC KDB 865664 D01 v01r04 SAR Measurement 100 MHz to 6 GHz

Target Frequency (MHz)	Head		Body	
	ε_r	σ (S/m)	ε_r	σ (S/m)
150	52.3	0.76	61.9	0.80
300	45.3	0.87	58.2	0.92
450	43.5	0.87	56.7	0.94
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
915	41.5	0.98	55.0	1.06
1450	40.5	1.20	54.0	1.30
1610	40.3	1.29	53.8	1.40
1800 – 2000	40.0	1.40	53.3	1.52
2450	39.2	1.80	52.7	1.95
3000	38.5	2.40	52.0	2.73
5000	36.2	4.45	49.3	5.07
5100	36.1	4.55	49.1	5.18
5200	36.0	4.66	49.0	5.30
5300	35.9	4.76	48.9	5.42
5400	35.8	4.86	48.7	5.53
5500	35.6	4.96	48.6	5.65
5600	35.5	5.07	48.5	5.77
5700	35.4	5.17	48.3	5.88
5800	35.3	5.27	48.2	6.00

IEEE Std 1528-2013
Refer to Table 3 within the IEEE Std 1528-2013

Dielectric Property Measurements Results:

Liquid	Freq.	Liquid Parameters				Delta(%)		Limit (%)	Temp. (℃)	Test Date
		Measured		Target						
		ϵ_r	σ	ϵ_r	σ	ϵ_r	σ			
HBBL600~10000V6	650	41.33	0.91	42.46	0.89	-2.66	2.76	±5	22.3	2022.1.15
	750	42.12	0.91	41.94	0.89	0.43	1.86	±5		
	850	42.21	0.93	41.50	0.92	1.71	1.51	±5		
	750	41.75	0.93	41.94	0.89	-0.46	4.10	±5	21.7	2021.12.24
	850	42.15	0.94	41.50	0.92	1.57	2.60	±5		
	950	42.63	0.99	41.43	0.99	2.89	-0.44	±5		
	750	41.33	0.91	41.94	0.89	-1.45	2.25	±5	20.4	2022.2.23
	850	40.98	0.93	41.50	0.92	-1.25	1.09	±5		
	950	40.88	1.02	41.43	0.99	-1.33	3.03	±5		
	750	42.12	0.93	41.94	0.89	0.43	4.10	±5	22.1	2021.12.27
	850	42.33	0.95	41.50	0.92	2.00	3.69	±5		
	950	42.66	1.01	41.43	0.99	2.96	1.57	±5		
	1700	41.11	1.39	40.16	1.34	2.37	3.57	±5	22.3	2021.12.30
	1750	41.02	1.41	40.08	1.37	2.35	2.84	±5		
	1800	40.97	1.44	40.00	1.40	2.43	2.86	±5		
	1700	41.52	1.37	40.16	1.34	3.39	2.08	±5	21.9	2022.1.7
	1750	41.21	1.41	40.08	1.37	2.82	2.84	±5		
	1800	41.05	1.42	40.00	1.40	2.62	1.43	±5		
	1800	39.77	1.42	40.00	1.40	-0.57	1.43	±5	22.3	2021.12.28
	1900	39.51	1.42	40.00	1.40	-1.23	1.43	±5		
	2000	39.12	1.41	40.00	1.40	-2.20	0.71	±5		
	1800	40.88	1.42	40.00	1.40	2.20	1.43	±5	21.5	2022.1.14
	1900	41.12	1.44	40.00	1.40	2.80	2.86	±5		
	2000	39.77	1.44	40.00	1.40	-0.57	2.86	±5		
	2300	40.02	1.74	39.47	1.67	1.40	4.40	±5	21.3	2022.1.12
	2350	40.41	1.73	39.38	1.71	2.62	1.10	±5		
	2400	40.31	1.80	39.29	1.76	2.60	2.53	±5		
	2300	40.22	1.71	39.47	1.67	1.90	2.40	±5	20.4	2022.2.23
	2350	40.18	1.74	39.38	1.71	2.03	1.75	±5		
	2400	40.21	1.80	39.29	1.76	2.34	2.27	±5		
	2400	40.20	1.82	39.29	1.76	2.32	3.67	±5	21.4	2022.1.3
	2450	40.02	1.86	39.20	1.80	2.09	3.33	±5		
	2500	40.47	1.87	39.14	1.85	3.41	0.83	±5		
	2400	40.12	1.78	39.29	1.76	2.11	1.14	±5	20.4	2022.2.23
	2450	40.31	1.82	39.20	1.80	2.83	1.11	±5		
	2500	40.22	1.86	39.14	1.85	2.76	0.54	±5		
	2500	40.22	1.88	39.14	1.85	2.77	1.37	±5	21.3	2022.1.11

	2600	40.10	1.90	39.01	1.96	2.80	-3.24	±5		
	2700	39.97	2.11	38.88	2.07	2.80	1.80	±5		
	5100	37.12	4.62	36.10	4.55	2.83	1.48	±5	21.2	2022.1.3
	5250	36.99	4.79	35.93	4.71	2.95	1.78	±5		
	5400	36.89	4.91	35.76	4.86	3.17	1.03	±5		
	5100	35.88	4.59	36.10	4.55	-0.61	0.88	±5	20.4	2022.2.23
	5250	36.11	4.77	35.93	4.71	0.50	1.27	±5		
	5400	36.21	4.91	35.76	4.86	1.26	1.03	±5		
	5500	36.45	5.01	35.64	4.96	2.26	0.96	±5	21.2	2022.1.3
	5600	36.42	5.11	35.53	5.07	2.51	0.89	±5		
	5700	36.11	5.31	35.41	5.17	1.96	2.76	±5		
	5500	36.11	4.98	35.64	4.96	1.32	0.40	±5	20.4	2022.2.23
	5600	36.01	4.99	35.53	5.07	1.35	-1.58	±5		
	5700	35.97	5.12	35.41	5.17	1.58	-0.97	±5		
	5725	36.54	5.23	35.39	5.19	3.26	0.71	±5	21.2	2022.1.3
	5800	36.55	5.33	35.30	5.27	3.54	1.14	±5		
	5850	36.48	5.38	35.25	5.27	3.49	2.04	±5		
	750	42.33	0.91	41.94	0.89	0.93	1.86	±5	22.6	2022.3.15
	850	42.64	0.93	41.50	0.92	2.75	1.51	±5		
	950	42.52	1.02	41.43	0.99	2.62	2.58	±5		
	1800	41.02	1.42	40.00	1.40	2.55	1.43	±5	22.6	2022.3.15
	1900	41.11	1.41	40.00	1.40	2.78	0.71	±5		
	2000	40.97	1.44	40.00	1.40	2.43	2.86	±5		
	2400	40.03	1.81	39.29	1.76	1.89	3.10	±5	22.6	2022.3.15
	2450	40.11	1.85	39.20	1.80	2.32	2.78	±5		
	2500	40.21	1.89	39.14	1.85	2.74	1.91	±5		
	2500	40.21	1.89	39.14	1.85	2.74	1.91	±5	22.6	2022.3.15
	2600	40.07	1.97	39.01	1.96	2.72	0.32	±5		
	2700	39.94	2.13	38.88	2.07	2.72	2.76	±5		
	5725	36.22	5.21	35.39	5.19	2.36	0.32	±5	22.6	2022.3.15
	5800	36.19	5.32	35.30	5.27	2.52	0.95	±5		
	5850	36.30	5.30	35.25	5.27	2.98	0.52	±5		

10.2. System Check

SAR system verification is required to confirm measurement accuracy, according to the tissue dielectric media, probe calibration points and other system operating parameters required for measuring the SAR of a test device. The system verification must be performed for each frequency band and within the valid range of each probe calibration point required for testing the device. The same SAR probe(s) and tissue-equivalent media combinations used with each specific SAR system for system verification must be used for device testing. When multiple probe calibration points are required to cover substantially large transmission bands, independent system verifications are required for each probe calibration point. A system verification must be performed before each series of SAR measurements using the same probe calibration point and tissue-equivalent medium. Additional system verification should be considered according to the conditions of the tissue-equivalent medium and measured tissue dielectric parameters, typically every three to four days when the liquid parameters are re-measured or sooner when marginal liquid parameters are used at the beginning of a series of measurements.

System Performance Check Measurement Conditions:

- The measurements were performed in the flat section of the TWIN SAM or ELI phantom, shell thickness: 2.0 ±0.2 mm (bottom plate) filled with Body or Head simulating liquid of the following parameters.
- The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm for SAR measurements ≤ 3 GHz and ≥ 10.0 cm for measurements > 3 GHz.
- The DASY system with an E-Field Probe was used for the measurements.
- The dipole was mounted on the small tripod so that the dipole feed point was positioned below the center marking of the flat phantom section and the dipole was oriented parallel to the body axis (the long side of the phantom). The standard measuring distance was 10mm (above 1GHZ) and 15mm (below 1GHz) from dipole center to the simulating liquid surface.
- For area scan, standard grid spacing for head measurements is 15 mm in x- and y- dimension(≤2GHz), 12 mm in x- and y-dimension(2-4 GHz) and 10mm in x- and y- dimension(4-6GHz).
- For zoom scan, Δx_{zoom}, Δy_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δz_{zoom} ≤3GHz - ≤5 mm, 3-4 GHz- ≤4mm and 4-6GHz-≤2mm.
- Distance between probe sensors and phantom surface was set to 3 mm except for 5 GHz band. For 5GHz band, Distance between probe sensors and phantom surface was set to 2.5 mm
- The dipole input power (forward power) was set to 100 mW or 250 mW depend on the certificate of the dipoles.
- The results are normalized to 1 W input power.

System Check Results

The 1-g and 10-g SAR measured with a reference dipole, using the required tissue-equivalent medium at the test frequency, must be within 10% of the manufacturer calibrated dipole SAR target.

T.S. Liquid		Measured Results		Target (Ref. value)	Delta (%)	Limit (%)	Temp. (℃)	Test Date
		Zoom Scan (W/Kg)	Normalize to 1W (W/Kg)					
Head 750	1-g	2.03	8.12	8.5	-4.47	±10	22.3	2022.1.15
	10-g	1.33	5.32	5.61	-5.17	±10		
Head 835	1-g	2.29	9.16	9.64	-4.98	±10	21.7	2021.12.24
	10-g	1.48	5.92	6.26	-5.43	±10		
Head 835	1-g	2.29	9.16	9.64	-4.98	±10	22.1	2021.12.27
	10-g	1.49	5.96	6.26	-4.79	±10		
Head 835	1-g	2.45	9.8	9.64	1.66	±10	20.4	2022.2.23
	10-g	1.6	6.4	6.26	2.24	±10		
Head 1800	1-g	9.23	36.92	38.7	-4.60	±10	22.3	2021.12.30
	10-g	4.84	19.36	19.9	-2.71	±10		
Head 1800	1-g	9.42	37.68	38.7	-2.64	±10	21.9	2022.1.7
	10-g	4.95	19.8	19.9	-0.50	±10		
Head 1900	1-g	10.3	41.2	39.6	4.04	±10	22.3	2021.12.28
	10-g	5.38	21.52	20.2	6.53	±10		
Head 1900	1-g	9.93	39.72	39.6	0.30	±10	21.5	2022.1.14
	10-g	5.16	20.64	20.2	2.18	±10		
Head 2300	1-g	12.1	48.4	47.8	1.26	±10	21.3	2022.1.12
	10-g	5.77	23.08	22.4	3.04	±10		
Head 2300	1-g	12.6	50.4	47.8	5.44	±10	20.4	2022.2.23
	10-g	5.95	23.8	22.4	6.25	±10		
Head 2450	1-g	13.6	54.4	53.2	2.26	±10	21.4	2022.1.3
	10-g	6.39	25.56	24.2	5.62	±10		
Head 2450	1-g	13.2	52.8	53.2	-0.75	±10	20.4	2022.2.23
	10-g	6.06	24.24	24.2	0.17	±10		
Head 2600	1-g	13.6	54.4	55.4	-1.81	±10	21.3	2022.1.11
	10-g	6.16	24.64	24.5	0.57	±10		
Head 5250	1-g	8.21	82.1	77.9	5.39	±10	21.2	2022.1.3
	10-g	2.41	24.1	22.6	6.64	±10		
Head 5250	1-g	8.23	82.3	77.9	5.65	±10	20.4	2022.2.23
	10-g	2.36	23.6	22.6	4.42	±10		
Head 5600	1-g	7.92	79.2	80.9	-2.10	±10	21.2	2022.1.3
	10-g	2.26	22.6	23.3	-3.00	±10		
Head 5600	1-g	7.92	79.2	80.9	-2.10	±10	20.4	2022.2.23
	10-g	2.26	22.6	23.3	-3.00	±10		
Head 5750	1-g	8.16	81.6	78.3	4.21	±10	21.2	2022.1.3
	10-g	2.35	23.5	22.4	4.91	±10		

Head 835	1-g	2.37	9.48	9.64	-1.66	±10	22.6	2022.3.15
	10-g	1.55	6.2	6.26	-0.96	±10		
Head 1900	1-g	9.98	39.92	39.6	0.81	±10	22.6	2022.3.15
	10-g	5.17	20.68	20.2	2.38	±10		
Head 2450	1-g	13.12	52.48	53.2	-1.35	±10	22.6	2022.3.15
	10-g	6.08	24.32	24.2	0.50	±10		
Head 2600	1-g	13.52	54.08	55.4	-2.38	±10	22.6	2022.3.15
	10-g	6.16	24.64	24.5	0.57	±10		
Head 5750	1-g	7.98	79.8	78.3	1.92	±10	22.6	2022.3.15
	10-g	2.31	23.1	22.4	3.13	±10		

11. Measured and Reported (Scaled) SAR Results

General Notes:

1) Same mode and same distance is selected to conduct SAR evaluation for body-worn and hotspot scenario.
2) As per KDB447498 D01, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
3) As per KDB447498 D01, testing of other required channels within the operating mode of a frequency band is not required when the reported 1-g or 10-g SAR for the mid-band or highest output power channel is:
   ● ≤ 0.8W/kg for 1-g or 2.0W/kg for 10-g respectively, when the transmission band is ≤ 100MHz.
   ● ≤ 0.6 W/kg or 1.5 W/kg, for 1-g or 10-g respectively, when the transmission band is between 100 MHz and 200 MHz.
   ● ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz.
   When the maximum output power variation across the required test channels is > ½ dB, instead of the middle channel, the highest output power channel must be used.
4) As per KDB865664 D01 for each frequency band, repeated SAR measurement is required only when the measured SAR is ≥0.8W/Kg; if the deviation among the repeated measurement is ≤20%, and the measured SAR <1.45W/Kg, only one repeated measurement is required.
5) As per KDB941225 D06, the DUT Dimension is bigger than 9 cm x 5 cm, so 10mm is chosen as the test separation distance for Hotspot mode. When the antenna-to-edge distance is greater than 2.5cm, such position does not need to be tested.
6) As per KDB648474 D04, SAR is evaluated without a headset connected to the device. When the standalone reported body-worn SAR is ≤1.2 W/kg, no additional SAR evaluations using a headset are required.
7) As per KDB865664 D02, SAR plot is only required for the highest measured SAR in each exposure configuration, wireless mode and frequency band combination; Plots are also required when the measured SAR is > 1.5 W/kg, or > 7.0 W/kg for occupational exposure. The published RF exposure KDB procedures may require additional plots; for example, to support SAR to peak location separation ratio test exclusion and/or volume scan post-processing (Refer to appendix B for detailed SAR plots).
8) Additional SAR tests in simultaneous transmission fixed power reduction scenario are also tested in some frequency bands and required test positions for the SAR worst case, which are only used to ensure simultaneous transmission SAR test exclusion. The standalone SAR compliance still uses the SAR results tested at the maximum output power level.
9) As per KDB 648474D04, for handsets with additional batteries, the highest reported SAR for each wireless technology, frequency band, operating mode and applicable exposure condition (head, body-worn accessory, hotspot mode, etc.) must be repeated with the specific accessory attached. In addition, for test cases where the measured SAR for a handset is greater than 1.2 W/kg, these tests should also be repeated with the additional batteries.
10) As per KDB 648474 D04, Phones with built-in NFC functions do not require separate SAR testing and can generally be tested according to the SAR measurement procedures normally required for the phone. Influences of the hardware introduced by the built-in NFC functions are inherently considered through testing of the other transmitters that require SAR.
11) Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 10 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.

GSM Notes:

1) As per KDB941225 D01, SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.
2) As per KDB648474 D04, the device does not support DTM function. Body-worn accessory testing is typically associated with voice operations. Therefore, GSM voice was evaluated for body-worn SAR.

UMTS Notes:

1) As per KDB941225 D01, when the maximum output power and tune-up tolerance specified for production units in a Second mode is ≤ ¼ dB higher than the primary mode or when the highest reported SAR of the primary mode is scaled by the ratio of specified maximum output power and tune-up tolerance of Second to primary mode and the adjusted SAR is ≤ 1.2 W/kg, SAR measurement is not required for the Second mode.

LTE Notes:

1) The LTE test configurations are determined according to KDB941225 D05. The general test procedures used for SAR testing can be found in Section 8.3.

Wi-Fi Notes:

As per KDB248227 D01:

1) When reported SAR for the initial test position is ≤ 0.4W/kg, no additional testing for the remaining test position is required. Otherwise, SAR is evaluated at the subsequent highest peak SAR position until the reported SAR result is ≤ 0.8W/kg or all test position are measured. For all positions/configurations tested using the initial test position and subsequent test positions, when the *reported* SAR is > 0.8 W/kg, SAR is measured for these test positions/configurations on the subsequent next highest measured output power channel(s) until the *reported* SAR is ≤ 1.2 W/kg or all required channels are tested.
2) The highest SAR measured for the initial test position or initial test configuration should be used to determine SAR test exclusion according to the sum of 1-g SAR and SAR peak to location ratio provisions in KDB 447498. In addition, a test lab may also choose to perform standalone SAR measurements for test positions and 802.11 configurations that are not required by the initial test position or initial test configuration procedures and apply the results to determine simultaneous transmission SAR test exclusion, according to sum of 1-g and SAR peak to location ratio requirements to reduce the number of simultaneous transmission SAR measurements.

11.1. SAR Test Results of GSM850.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
Back Surface	GPRS 3TX slots	190	30.5	30.30	0.295	0.09	0.309
Front Surface	GPRS 3TX slots	190	30.5	30.30	0.472	0.00	**0.494**
Left Edge	GPRS 3TX slots	190	30.5	30.30	0.186	0.04	0.195
Right Edge	GPRS 3TX slots	190	30.5	30.30	0.326	0.00	0.341
Bottom Edge	GPRS 3TX slots	190	30.5	30.30	0.188	-0.11	0.197

11.2. SAR Test Results of GSM1900.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
Back Surface	GPRS 3TX slots	810	28.5	28.45	0.167	0.04	0.169
Front Surface	GPRS 3TX slots	810	28.5	28.45	1.130	0.08	1.143
Left Edge	GPRS 3TX slots	810	28.5	28.45	0.160	0.14	0.162
Right Edge	GPRS 3TX slots	810	28.5	28.45	0.056	0.19	0.056
Bottom Edge	GPRS 3TX slots	810	28.5	28.45	0.923	-0.03	0.934
Front Surface	GPRS 3TX slots	512	28.5	26.79	0.427	-0.02	0.633
Front Surface	GPRS 3TX slots	661	28.5	26.83	0.716	0.02	1.052
Repeated for GSM1900							
Front Surface	GPRS 3TX slots	810	28.5	28.45	1.170	0.03	**1.184**

11.3. SAR Test Results of WCDMA Band 2.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
Back Surface	12.2kbps RMC	9400	22.0	21.75	0.115	0.16	0.122
Front Surface	12.2kbps RMC	9400	22.0	21.75	0.797	-0.06	0.844
Left Edge	12.2kbps RMC	9400	22.0	21.75	0.170	0.04	0.180
Right Edge	12.2kbps RMC	9400	22.0	21.75	0.103	0.05	0.109
Bottom Edge	12.2kbps RMC	9400	22.0	21.75	0.590	-0.09	0.625
Front Surface	12.2kbps RMC	9262	22.0	21.62	0.602	-0.02	0.657
Front Surface	12.2kbps RMC	9538	22.0	21.65	1.040	0.05	1.127
Repeated for WCDMA B2							
Front Surface	12.2kbps RMC	9538	22.0	21.65	1.050	-0.15	**1.138**

11.4. SAR Test Results of WCDMA Band 4

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
Back Surface	12.2kbps RMC	1413	23.0	22.99	0.090	0.00	0.091
Front Surface	12.2kbps RMC	1413	23.0	22.99	0.567	0.01	0.568
Left Edge	12.2kbps RMC	1413	23.0	22.99	0.176	0.00	0.176
Right Edge	12.2kbps RMC	1413	23.0	22.99	0.098	0.09	0.098
Bottom Edge	12.2kbps RMC	1413	23.0	22.99	0.413	-0.01	0.414
Front Surface	12.2kbps RMC	1312	23.0	22.62	0.739	-0.05	**0.807**
Front Surface	12.2kbps RMC	1513	23.0	22.98	0.639	-0.04	0.642

11.5. SAR Test Results of WCDMA Band 5

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
Back Surface	12.2kbps RMC	4233	24.5	24.01	0.252	-0.03	0.282
Front Surface	12.2kbps RMC	4233	24.5	24.01	0.575	0.07	**0.644**
Left Edge	12.2kbps RMC	4233	24.5	24.01	0.198	0.06	0.222
Right Edge	12.2kbps RMC	4233	24.5	24.01	0.100	0.05	0.112
Bottom Edge	12.2kbps RMC	4233	24.5	24.01	0.372	0.15	0.416
Front Surface	12.2kbps RMC	4132	24.5	23.58	0.505	-0.06	0.624
Front Surface	12.2kbps RMC	4183	24.5	23.89	0.525	0.02	0.604

11.6. SAR Test Results of LTE B2.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#0	18900	22.5	22.28	0.142	0.04	0.149
Front Surface	20M QPSK 1RB#0	18900	22.5	22.28	0.857	-0.02	0.902
Left Edge	20M QPSK 1RB#0	18900	22.5	22.28	0.238	0.16	0.250
Right Edge	20M QPSK 1RB#0	18900	22.5	22.28	0.060	0.01	0.063
Bottom Edge	20M QPSK 1RB#0	18900	22.5	22.28	0.659	0.16	0.693
Front Surface	20M QPSK 1RB#0	18700	22.5	22.06	0.677	-0.12	0.749
Front Surface	20M QPSK 1RB#0	19100	22.5	21.95	0.985	-0.06	**1.118**
50%RB							
Back Surface	20M QPSK 50RB#25	18900	21.5	21.08	0.081	-0.14	0.090
Front Surface	20M QPSK 50RB#25	18900	21.5	21.08	0.736	-0.06	0.811
Left Edge	20M QPSK 50RB#25	18900	21.5	21.08	0.110	0.03	0.121
Right Edge	20M QPSK 50RB#25	18900	21.5	21.08	0.031	0.02	0.035
Bottom Edge	20M QPSK 50RB#25	18900	21.5	21.08	0.514	-0.01	0.566
Front Surface	20M QPSK 50RB#0	18700	21.5	20.99	0.558	0.02	0.628
Front Surface	20M QPSK 50RB#25	19100	21.5	20.91	0.899	0.07	1.030
100%RB							
Back Surface	20M QPSK 100RB#0	18900	21.0	21.00	0.097	0.19	0.097
Front Surface	20M QPSK 100RB#0	18900	21.0	21.00	0.683	-0.03	0.683
Left Edge	20M QPSK 100RB#0	18900	21.0	21.00	0.133	-0.02	0.133
Right Edge	20M QPSK 100RB#0	18900	21.0	21.00	0.039	-0.09	0.039
Bottom Edge	20M QPSK 100RB#0	18900	21.0	21.00	0.582	-0.17	0.582
Worst Case repeated							
Front Surface	20M QPSK 1RB#0	19100	22.5	21.95	0.978	-0.09	1.110

11.7. SAR Test Results of LTE B4.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#99	20175	22.5	22.08	0.123	0.04	0.135
Front Surface	20M QPSK 1RB#99	20175	22.5	22.08	0.581	-0.02	**0.640**
Left Edge	20M QPSK 1RB#99	20175	22.5	22.08	0.158	0.14	0.174
Right Edge	20M QPSK 1RB#99	20175	22.5	22.08	0.098	0.02	0.108
Bottom Edge	20M QPSK 1RB#99	20175	22.5	22.08	0.365	0.01	0.402
50%RB							
Back Surface	20M QPSK 50RB#50	20175	21.5	21.07	0.103	0.03	0.114
Front Surface	20M QPSK 50RB#50	20175	21.5	21.07	0.438	0.06	0.484
Left Edge	20M QPSK 50RB#50	20175	21.5	21.07	0.128	-0.01	0.141
Right Edge	20M QPSK 50RB#50	20175	21.5	21.07	0.048	0.03	0.053
Bottom Edge	20M QPSK 50RB#50	20175	21.5	21.07	0.238	-0.10	0.263

11.8. SAR Test Results of LTE B5.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	10M QPSK 1RB#24	20525	23.0	22.87	0.116	-0.02	0.120
Front Surface	10M QPSK 1RB#24	20525	23.0	22.87	0.407	0.01	**0.419**
Left Edge	10M QPSK 1RB#24	20525	23.0	22.87	0.142	0.16	0.146
Right Edge	10M QPSK 1RB#24	20525	23.0	22.87	0.076	0.06	0.078
Bottom Edge	10M QPSK 1RB#24	20525	23.0	22.87	0.220	0.00	0.227
50%RB							
Back Surface	10M QPSK 25RB#25	20600	22.0	21.95	0.245	-0.01	0.248
Front Surface	10M QPSK 25RB#25	20600	22.0	21.95	0.304	0.02	0.308
Left Edge	10M QPSK 25RB#25	20600	22.0	21.95	0.149	-0.05	0.151
Right Edge	10M QPSK 25RB#25	20600	22.0	21.95	0.307	-0.07	0.311
Bottom Edge	10M QPSK 25RB#25	20600	22.0	21.95	0.170	-0.15	0.172

11.9. SAR Test Results of LTE B7.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#99	20850	22.0	21.59	0.298	-0.04	0.328
Front Surface	20M QPSK 1RB#99	20850	22.0	21.59	0.717	-0.01	0.788
Left Edge	20M QPSK 1RB#99	20850	22.0	21.59	0.345	-0.02	0.379
Right Edge	20M QPSK 1RB#99	20850	22.0	21.59	0.120	0.01	0.132
Bottom Edge	20M QPSK 1RB#99	20850	22.0	21.59	0.795	0.02	0.874
Bottom Edge	20M QPSK 1RB#49	21100	22.0	21.55	0.848	0.03	0.941
Bottom Edge	20M QPSK 1RB#49	21350	22.0	21.53	0.900	-0.17	1.003
50%RB							
Back Surface	20M QPSK 50RB#50	20850	21.0	20.62	0.251	0.01	0.274
Front Surface	20M QPSK 50RB#50	20850	21.0	20.62	0.603	-0.03	0.658
Left Edge	20M QPSK 50RB#50	20850	21.0	20.62	0.308	-0.02	0.336
Right Edge	20M QPSK 50RB#50	20850	21.0	20.62	0.092	-0.14	0.100
Bottom Edge	20M QPSK 50RB#50	20850	21.0	20.62	0.743	-0.10	0.811
Bottom Edge	20M QPSK 50RB#50	21100	21.0	20.53	0.734	0.01	0.818
Bottom Edge	20M QPSK 50RB#50	21350	21.0	20.51	0.773	-0.06	0.865
100%RB							
Back Surface	20M QPSK 100RB#0	20850	21.0	20.59	0.101	-0.06	0.111
Front Surface	20M QPSK 100RB#0	20850	21.0	20.59	0.527	-0.06	0.579
Left Edge	20M QPSK 100RB#0	20850	21.0	20.59	0.192	0.01	0.211
Right Edge	20M QPSK 100RB#0	20850	21.0	20.59	0.048	0.04	0.053
Bottom Edge	20M QPSK 100RB#0	20850	21.0	20.59	0.685	-0.03	0.753
Worst Case repeated							
Bottom Edge	20M QPSK 1RB#49	21350	22.0	21.53	0.923	0.17	**1.028**

11.10. SAR Test Results of LTE B12.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	10M QPSK 1RB#49	23130	23.0	22.69	0.134	0.01	0.144
Front Surface	10M QPSK 1RB#49	23130	23.0	22.69	0.177	0.07	**0.190**
Left Edge	10M QPSK 1RB#49	23130	23.0	22.69	0.107	0.07	0.115
Right Edge	10M QPSK 1RB#49	23130	23.0	22.69	0.151	0.01	0.162
Bottom Edge	10M QPSK 1RB#49	23130	23.0	22.69	0.046	0.03	0.049
50%RB							
Back Surface	10M QPSK 25RB#25	23130	22.0	21.63	0.106	-0.08	0.115
Front Surface	10M QPSK 25RB#25	23130	22.0	21.63	0.130	0.04	0.142
Left Edge	10M QPSK 25RB#25	23130	22.0	21.63	0.087	0.01	0.094
Right Edge	10M QPSK 25RB#25	23130	22.0	21.63	0.146	-0.01	0.159
Bottom Edge	10M QPSK 25RB#25	23130	22.0	21.63	0.040	-0.04	0.043

11.11. SAR Test Results of LTE B13.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	10M QPSK 1RB#49	23230	22.5	22.08	0.262	0.06	0.289
Front Surface	10M QPSK 1RB#49	23230	22.5	22.08	0.298	0.05	**0.328**
Left Edge	10M QPSK 1RB#49	23230	22.5	22.08	0.181	0.01	0.199
Right Edge	10M QPSK 1RB#49	23230	22.5	22.08	0.192	0.02	0.211
Bottom Edge	10M QPSK 1RB#49	23230	22.5	22.08	0.098	0.06	0.108
50%RB							
Back Surface	10M QPSK 25RB#12	23230	21.5	21.22	0.214	0.00	0.228
Front Surface	10M QPSK 25RB#12	23205	21.5	21.22	0.264	0.04	0.282
Left Edge	10M QPSK 25RB#12	23205	21.5	21.22	0.149	0.05	0.159
Right Edge	10M QPSK 25RB#12	23205	21.5	21.22	0.269	-0.02	0.287
Bottom Edge	10M QPSK 25RB#12	23205	21.5	21.22	0.130	-0.08	0.139

11.12. SAR Test Results of LTE B17.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	10M QPSK 1RB#49	23790	23.0	22.71	0.128	-0.05	0.137
Front Surface	10M QPSK 1RB#49	23790	23.0	22.71	0.176	0.04	**0.188**
Left Edge	10M QPSK 1RB#49	23790	23.0	22.71	0.095	0.05	0.102
Right Edge	10M QPSK 1RB#49	23790	23.0	22.71	0.102	0.12	0.109
Bottom Edge	10M QPSK 1RB#49	23790	23.0	22.71	0.043	0.08	0.046
50%RB							
Back Surface	10M QPSK 25RB#25	23800	22.0	21.59	0.109	-0.04	0.120
Front Surface	10M QPSK 25RB#25	23800	22.0	21.59	0.138	-0.07	0.152
Left Edge	10M QPSK 25RB#25	23800	22.0	21.59	0.085	0.03	0.093
Right Edge	10M QPSK 25RB#25	23800	22.0	21.59	0.135	0.04	0.148
Bottom Edge	10M QPSK 25RB#25	23800	22.0	21.59	0.033	0.10	0.036

11.13. SAR Test Results of LTE B25.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#99	26365	21.5	21.21	0.206	0.00	0.220
Front Surface	20M QPSK 1RB#99	26365	21.5	21.21	0.760	-0.06	0.812
Left Edge	20M QPSK 1RB#99	26365	21.5	21.21	0.217	-0.07	0.232
Right Edge	20M QPSK 1RB#99	26365	21.5	21.21	0.144	-0.07	0.154
Bottom Edge	20M QPSK 1RB#99	26365	21.5	21.21	0.563	-0.14	0.602
Front Surface	20M QPSK 1RB#49	26140	21.5	21.09	0.541	-0.05	0.595
Front Surface	20M QPSK 1RB#0	26590	21.5	21.20	0.778	0.07	0.834
50%RB							
Back Surface	20M QPSK 50RB#25	26365	20.5	20.31	0.120	-0.08	0.125
Front Surface	20M QPSK 50RB#25	26365	20.5	20.31	0.540	-0.12	0.564
Left Edge	20M QPSK 50RB#25	26365	20.5	20.31	0.165	0.20	0.172
Right Edge	20M QPSK 50RB#25	26365	20.5	20.31	0.102	0.03	0.107
Bottom Edge	20M QPSK 50RB#25	26365	20.5	20.31	0.445	-0.17	0.465
100%RB							
Back Surface	20M QPSK 100RB#0	26365	20.5	20.27	0.074	0.08	0.078
Front Surface	20M QPSK 100RB#0	26365	20.5	20.27	0.538	0.13	0.567
Left Edge	20M QPSK 100RB#0	26365	20.5	20.27	0.112	0.05	0.118
Right Edge	20M QPSK 100RB#0	26365	20.5	20.27	0.032	0.08	0.033
Bottom Edge	20M QPSK 100RB#0	26365	20.5	20.27	0.392	-0.14	0.413
Worst Case repeated							
Front Surface	20M QPSK 1RB#0	26590	21.5	21.20	0.801	0.07	**0.858**

11.14. SAR Test Results of LTE B26.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	15M QPSK 1RB#74	26915	23.0	22.98	0.255	-0.01	0.256
Front Surface	15M QPSK 1RB#74	26915	23.0	22.98	0.489	0.03	**0.491**
Left Edge	15M QPSK 1RB#74	26915	23.0	22.98	0.123	0.06	0.124
Right Edge	15M QPSK 1RB#74	26915	23.0	22.98	0.320	0.05	0.321
Bottom Edge	15M QPSK 1RB#74	26915	23.0	22.98	0.239	0.08	0.240
50%RB							
Back Surface	15M QPSK 38RB#18	26965	22.0	21.85	0.207	-0.01	0.214
Front Surface	15M QPSK 38RB#18	26965	22.0	21.85	0.376	0.08	0.389
Left Edge	15M QPSK 38RB#18	26965	22.0	21.85	0.101	0.06	0.105
Right Edge	15M QPSK 38RB#18	26965	22.0	21.85	0.240	0.04	0.248
Bottom Edge	15M QPSK 38RB#18	26965	22.0	21.85	0.189	0.09	0.196

11.15. SAR Test Results of LTE B38.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#49	38000	22.5	22.33	0.074	0.16	0.077
Front Surface	20M QPSK 1RB#49	38000	22.5	22.33	0.318	0.07	0.331
Left Edge	20M QPSK 1RB#49	38000	22.5	22.33	0.075	0.06	0.078
Right Edge	20M QPSK 1RB#49	38000	22.5	22.33	0.071	0.11	0.074
Bottom Edge	20M QPSK 1RB#49	38000	22.5	22.33	0.371	0.05	**0.386**
50%RB							
Back Surface	20M QPSK 50RB#25	38000	21.5	21.47	0.047	-0.05	0.047
Front Surface	20M QPSK 50RB#25	38000	21.5	21.47	0.208	0.05	0.209
Left Edge	20M QPSK 50RB#25	38000	21.5	21.47	0.063	0.11	0.063
Right Edge	20M QPSK 50RB#25	38000	21.5	21.47	0.018	0.09	0.019
Bottom Edge	20M QPSK 50RB#25	38000	21.5	21.47	0.271	0.12	0.273

11.16. SAR Test Results of LTE B40.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	10M QPSK 1RB#0	39200	20.5	20.47	0.067	0.05	0.067
Front Surface	10M QPSK 1RB#0	39200	20.5	20.47	0.328	-0.09	0.330
Left Edge	10M QPSK 1RB#0	39200	20.5	20.47	0.113	0.17	0.114
Right Edge	10M QPSK 1RB#0	39200	20.5	20.47	0.016	0.09	0.016
Bottom Edge	10M QPSK 1RB#0	39200	20.5	20.47	0.393	0.00	**0.396**
50%RB							
Back Surface	10M QPSK 25RB#0	39200	20.5	20.28	0.055	0.09	0.058
Front Surface	10M QPSK 25RB#0	39200	20.5	20.28	0.310	0.09	0.326
Left Edge	10M QPSK 25RB#0	39200	20.5	20.28	0.077	0.03	0.081
Right Edge	10M QPSK 25RB#0	39200	20.5	20.28	0.012	0.06	0.013
Bottom Edge	10M QPSK 25RB#0	39200	20.5	20.28	0.328	0.01	0.345

11.17. SAR Test Results of LTE B41.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#0	41490	23.0	22.74	0.083	-0.06	0.088
Front Surface	20M QPSK 1RB#0	41490	23.0	22.74	0.364	-0.06	0.386
Left Edge	20M QPSK 1RB#0	41490	23.0	22.74	0.088	0.11	0.093
Right Edge	20M QPSK 1RB#0	41490	23.0	22.74	0.032	0.07	0.034
Bottom Edge	20M QPSK 1RB#0	41490	23.0	22.74	0.461	0.05	**0.489**
50%RB							
Back Surface	20M QPSK 50RB#0	41490	21.0	20.85	0.053	0.09	0.055
Front Surface	20M QPSK 50RB#0	41490	21.0	20.85	0.224	0.09	0.232
Left Edge	20M QPSK 50RB#0	41490	21.0	20.85	0.051	-0.05	0.052
Right Edge	20M QPSK 50RB#0	41490	21.0	20.85	0.017	0.06	0.017
Bottom Edge	20M QPSK 50RB#0	41490	21.0	20.85	0.297	0.05	0.307

11.18. SAR Test Results of LTE B66.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Back Surface	20M QPSK 1RB#0	132322	22.0	21.73	0.080	0.09	0.086
Front Surface	20M QPSK 1RB#0	132322	22.0	21.73	0.490	-0.05	**0.521**
Left Edge	20M QPSK 1RB#0	132322	22.0	21.73	0.152	0.16	0.162
Right Edge	20M QPSK 1RB#0	132322	22.0	21.73	0.117	0.03	0.125
Bottom Edge	20M QPSK 1RB#0	132322	22.0	21.73	0.328	0.03	0.349
50%RB							
Back Surface	20M QPSK 50RB#25	132322	21.5	21.35	0.073	0.04	0.076
Front Surface	20M QPSK 50RB#25	132322	21.5	21.35	0.397	0.01	0.411
Left Edge	20M QPSK 50RB#25	132322	21.5	21.35	0.151	0.16	0.156
Right Edge	20M QPSK 50RB#25	132322	21.5	21.35	0.050	0.04	0.052
Bottom Edge	20M QPSK 50RB#25	132322	21.5	21.35	0.316	0.04	0.327

11.19. SAR Test Results of 2.4GHz Wi-Fi.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
Back Surface	802.11b	2437	17.50	17.15	0.037	0.01	97.52	0.041
Front Surface	802.11b	2437	17.50	17.15	0.081	-0.05	97.52	0.090
Right Edge	802.11b	2437	17.50	17.15	0.083	0.01	97.52	**0.092**
Top Edge	802.11b	2437	17.50	17.15	0.029	0.08	97.52	0.032
Right Edge	802.11b	2412	17.50	16.56	0.064	-0.12	97.52	0.081
Right Edge	802.11b	2462	17.50	16.63	0.068	-0.05	97.52	0.085

OFDM mode SAR evaluation exclusion analysis

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	17.5	56.23	0.092	\	\
802.11g	17.0	50.12	\	0.089	Excluded
802.11n20	15.0	~~31.62~~	\	0.079	Excluded
802.11n40	18.0	63.10	\	0.095	Excluded

Note:

1) The highest reported SAR for DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, so SAR evaluation for 802.11g/n is not required.

11.20. SAR Test Results of 5GHz Wi-Fi.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
5.2GHz								
Back Surface	802.11ac40	5190	18.0	17.63	0.351	0.03	87.37	**0.437**
Front Surface	802.11ac40	5190	18.0	17.63	0.067	0.08	87.37	0.084
Right Edge	802.11ac40	5190	18.0	17.63	0.085	0.04	87.37	0.106
Top Edge	802.11ac40	5190	18.0	17.63	0.141	0.03	87.37	0.176
5.6GHz								
Back Surface	802.11ac80	5610	17.0	16.98	0.501	0.03	74.55	**0.675**
Front Surface	802.11ac80	5610	17.0	16.98	0.146	0.02	74.55	0.197
Right Edge	802.11ac80	5610	17.0	16.98	0.209	0.06	74.55	0.282
Top Edge	802.11ac80	5610	17.0	16.98	0.263	0.01	74.55	0.354
5.8GHz								
Back Surface	802.11a	5745	16.5	16.15	0.585	0.15	93.02	**0.682**
Front Surface	802.11a	5745	16.5	16.15	0.119	-0.09	93.02	0.139
Right Edge	802.11a	5745	16.5	16.15	0.206	-0.08	93.02	0.240
Top Edge	802.11a	5745	16.5	16.15	0.240	0.02	93.02	0.280

Note:

1) When the reported SAR of the initial test configuration is ＞0.8W/kg, SAR measurement is required for subsequent nest highest measured output power channel(s) in the initial test configuration until reported SAR is ≤1.2 W/kg or all required channels are tested.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-I band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	17.0	50.12	\	0.413	\
802.11n 20M	17.5	56.23	\	0.425	Excluded
802.11n 40M	17.5	56.23	\	0.425	Excluded
802.11ac 20M	17.5	56.23	\	0.425	Excluded
802.11ac 40M	18.0	63.10	0.437	\	Excluded
802.11ac 80M	17.5	56.23	\	0.425	Excluded

Note:

1) The 802.11ac40 mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes is not required.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-2C band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	16.5	44.67	\	0.655	\
802.11n 20M	16.0	39.81	\	0.635	Excluded
802.11n 40M	16.0	39.81	\	0.635	Excluded
802.11ac 20M	17.0	50.12	\	0.675	Excluded
802.11ac 40M	17.0	50.12	\	0.675	Excluded
802.11ac 80M	17.0	50.12	0.675	\	Excluded

Note:

1) The 802.11ac80 mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes is not required.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-3 band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	16.5	44.67	0.682	\	\
802.11n 20M	16.0	39.81	\	0.661	Excluded
802.11n 40M	16.0	39.8	\	0.661	Excluded
802.11ac 20M	15.5	35.48	\	0.641	Excluded
802.11ac 40M	15.5	35.48	\	0.641	Excluded
802.11ac 80M	16	39.81	\	0.661	Excluded

Note:

2) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg, SAR test for the other 802.11 modes is not required.

11.21. SAR Test Results of Bluetooth.

Scenario and Distance (Body Worn 10mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
Back Surface	BLE 2M	39/2480	6.50	6.47	0.003	-0.05	33.87	0.009
Front Surface	BLE 2M	39/2480	6.50	6.47	0.005	-0.06	33.87	0.015
Right Edge	BLE 2M	39/2480	6.50	6.47	0.006	-0.04	33.87	**0.017**
Top Edge	BLE 2M	39/2480	6.50	6.47	0.000	0.00	33.87	0.000
Right Edge	BLE 2M	0/2402	6.50	5.74	0.004	0.03	33.87	0.013
Right Edge	BLE 2M	19/2440	6.50	5.69	0.004	-0.01	33.87	0.014

11.22. Limb SAR Test Results

Reference to section 9, extremity SAR measurements were made at a separation distance of 0mm from each side/surface of the device using the cellular mode with the highest SAR value for body exposure on that surface. All Wi-Fi bands were also evaluated for extremity SAR even though the 10mm body SAR value was less than 1.2 W/Kg.

Scenario and Distance (Limb 0mm)	Test Mode	Channel/ Frequency	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	10-g (W/Kg)		
Back Surface	LTE B7 20M QPSK 1RB#99	20850	22	21.59	0.247	0.07	0.271
Front Surface	GPRS1900 3TX slots	810	28.5	28.45	2.860	-0.06	2.893
Left Edge	LTE B7 20M QPSK 1RB#99	20850	22	21.59	0.348	-0.06	0.382
Right Edge	GPRS850 3TX slots	190	30.5	30.3	0.275	-0.03	0.288
Bottom Edge	LTE B7 20M QPSK 1RB#49	21350	22	21.53	1.100	0.08	1.226

Scenario and Distance (Limb 0mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	10-g (W/Kg)			
2.4GHz Wi-Fi								
Back Surface	802.11b	2437	17.50	17.15	0.123	0.06	97.52	0.137
Front Surface	802.11b	2437	17.50	17.15	0.207	0.08	97.52	**0.230**
Right Edge	802.11b	2437	17.50	17.15	0.152	0.03	97.52	0.169
Top Edge	802.11b	2437	17.50	17.15	0.093	0.11	97.52	0.103

OFDM mode SAR evaluation exclusion analysis

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11b	17.5	56.23	0.230	\	\
802.11g	17.0	50.12	\	0.203	Excluded
802.11n20	15.0	~~31.62~~	\	0.129	Excluded
802.11n40	18.0	63.10	\	0.258	Excluded

Note:

The highest reported SAR for DSSS adjusted by the ratio of OFDM 802.11g/n to DSSS specified maximum output power and the adjusted SAR is ≤ 3 W/kg, so SAR evaluation for 802.11g/n is not required.

Scenario and Distance (Limb 0mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	10-g (W/Kg)			
5.2GHz								
Back Surface	802.11ac40	5190	18.0	17.63	0.287	0.05	87.37	**0.358**
Front Surface	802.11ac40	5190	18.0	17.63	0.099	0.00	87.37	0.124
Right Edge	802.11ac40	5190	18.0	17.63	0.131	0.02	87.37	0.163
Top Edge	802.11ac40	5190	18.0	17.63	0.257	0.03	87.37	0.320
5.6GHz								
Back Surface	802.11ac80	5610	17.0	16.98	0.614	0.02	74.55	0.827
Front Surface	802.11ac80	5610	17.0	16.98	0.207	0.00	74.55	0.279
Right Edge	802.11ac80	5610	17.0	16.98	0.249	0.19	74.55	0.336
Top Edge	802.11ac80	5610	17.0	16.98	0.644	0.01	74.55	**0.868**
5.8GHz								
Back Surface	802.11a	5745	16.5	16.15	0.512	-0.04	93.02	**0.597**
Front Surface	802.11a	5745	16.5	16.15	0.146	-0.07	93.02	0.170
Right Edge	802.11a	5745	16.5	16.15	0.252	0.01	93.02	0.294
Top Edge	802.11a	5745	16.5	16.15	0.459	0.09	93.02	0.535

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-I band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	17.0	50.12	\	0.338	\
802.11n 20M	17.5	56.23	\	0.348	Excluded
802.11n 40M	17.5	56.23	\	0.348	Excluded
802.11ac 20M	17.5	56.23	\	0.348	Excluded
802.11ac 40M	18.0	63.10	0.358	\	Excluded
802.11ac 80M	17.5	56.23	\	0.348	Excluded

Note:

2) The 802.11ac40 mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 3 W/kg, SAR test for the other 802.11 modes is not required.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-2C band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	16.5	44.67	\	0.842	\
802.11n 20M	16.0	39.81	\	0.817	Excluded
802.11n 40M	16.0	39.81	\	0.817	Excluded
802.11ac 20M	17.0	50.12	\	0.868	Excluded
802.11ac 40M	17.0	50.12	\	0.868	Excluded
802.11ac 80M	17.0	50.12	0.868	\	Excluded

Note:

3) The 802.11ac80 mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 3 W/kg, SAR test for the other 802.11 modes is not required.

Subsequent test configuration SAR evaluation exclusion analysis for U-NII-3 band

Mode	Tune-up (dBm)	Tune-up (mW)	Highest Reported SAR (W/Kg)	Adjusted SAR (W/Kg)	SAR Test
802.11a-20	16.5	44.67	0.597	\	\
802.11n 20M	16.0	39.81	\	0.532	Excluded
802.11n 40M	16.0	39.81	\	0.532	Excluded
802.11ac 20M	15.5	35.48	\	0.474	Excluded
802.11ac 40M	15.5	35.48	\	0.474	Excluded
802.11ac 80M	16	39.81	\	0.532	Excluded

Note:

4) The 802.11a mode is selected as Initial Test Configuration for SAR test according to the specified maximum output power. As the highest reported SAR for the initial test configuration is adjusted by the ratio of the subsequent test configuration to initial test configuration specified maximum output power and the adjusted SAR is ≤ 3 W/kg, SAR test for the other 802.11 modes is not required.

Scenario and Distance (Limb 0mm)	Test Mode	Channel/ Frequency	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	10-g (W/Kg)			
BLE								
Back Surface	BLE 2M	39/2480	6.50	6.47	0.006	0.05	33.87	0.018
Front Surface	BLE 2M	39/2480	6.50	6.47	0.013	-0.02	33.87	**0.037**
Right Edge	BLE 2M	39/2480	6.50	6.47	0.007	0.03	33.87	0.022
Top Edge	BLE 2M	39/2480	6.50	6.47	0.006	-0.13	33.87	0.000
Front Surface	BLE 2M	0/2402	6.50	5.74	0.008	0.06	33.87	0.028
Front Surface	BLE 2M	19/2440	6.50	5.69	0.007	0.00	33.87	0.026

12. Simultaneous Transmission SAR Analysis

According to FCC OET KDB447498 D01, when the sum of 1g SAR for all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit, SAR test exclusion applies to that simultaneous transmission configuration.

12.1. Simultaneous Transmission combination.

NO.	Combination	Scenario	
		Body-worn	Extremity
1	GSM+2.4GHz Wi-Fi	√	√
2	GSM+5GHz Wi-Fi	√	√
3	GSM+BT	√	√
4	UMTS+2.4GHz Wi-Fi	√	√
5	UMTS+5GHz Wi-Fi	√	√
6	UMTS+BT	√	√
7	LTE+2.4GHz Wi-Fi	√	√
8	LTE+5GHz Wi-Fi	√	√
9	LTE+BT	√	√

Note:
1) "√" indicates exist, "×" indicates inexistence.

12.2. Highest Reported SAR

GSM Highest Reported SAR (1-g) (W/kg) For Body worn			
Test Position	GSM850	GSM1900	GSM_{MAX}
Back Surface	0.309	0.169	0.309
Front Surface	0.494	1.184	1.184
Left Edge	0.195	0.162	0.195
Right Edge	0.341	0.056	0.341
Top Edge	/	/	/
Bottom Edge	0.197	0.934	0.934

WCDMA Highest Reported SAR (1-g) (W/kg) For Body worn				
Test Position	WCDMA Band II	WCDMA Band IV	WCDMA Band V	$WCDMA_{MAX}$
Back Surface	0.122	0.091	0.282	0.282
Front Surface	1.138	0.807	0.644	1.138
Left Edge	0.180	0.176	0.222	0.222
Right Edge	0.109	0.098	0.112	0.112
Top Edge	/	/	/	/
Bottom Edge	0.625	0.414	0.416	0.625

LTE Highest Reported SAR (1-g) (W/kg) For Body worn														
Test Position	LTE B2	LTE B4	LTE B5	LTE B7	LTE B12	LTE B13	LTE B17	LTE B25	LTE B26	LTE B38	LTE B40	LTE B41	LTE B66	LTE_{MAX}
Back Surface	0.149	0.135	0.248	0.328	0.144	0.289	0.137	0.220	0.256	0.077	0.067	0.088	0.086	0.328
Front Surface	1.118	0.640	0.419	0.788	0.190	0.328	0.188	0.858	0.491	0.331	0.330	0.386	0.521	1.118
Left Edge	0.250	0.174	0.151	0.379	0.115	0.199	0.102	0.232	0.124	0.078	0.114	0.093	0.162	0.379
Right Edge	0.063	0.108	0.311	0.132	0.162	0.287	0.148	0.154	0.321	0.074	0.016	0.034	0.125	0.321
Top Edge	/	/	/	/	/	/	/	/	/	/	/	/	/	/
Bottom Edge	0.693	0.402	0.227	1.028	0.049	0.139	0.046	0.602	0.240	0.386	0.396	0.489	0.349	1.028

GSM/WCDMA/LTE Highest Reported SAR (10-g) (W/kg) For Limb	
Test Position	GSM/WCDMA/LTE
Back Surface	0.271
Front Surface	2.893
Left Edge	0.382
Right Edge	0.288
Top Edge	/
Bottom Edge	1.226

2.4GHz Wi-Fi Highest Reported SAR (1-g) (W/kg) For Body worn		2.4GHz Wi-Fi Highest Reported SAR (10-g) (W/kg) For Limb
Test Position	2.4GHz Wi-Fi	2.4GHz Wi-Fi
Back Surface	0.041	0.137
Front Surface	0.090	0.230
Left Edge	/	/
Right Edge	0.092	0.169
Top Edge	0.032	0.103
Bottom Edge	/	/

5GHz Wi-Fi Highest Reported SAR (1-g) (W/kg) For Body worn				
Test Position	UNII-1	UNII-2C	UNII-3	5GHz Wi-Fi$_{max}$
Back Surface	0.437	0.675	0.682	0.682
Front Surface	0.084	0.197	0.139	0.197
Left Edge	/	/	/	/
Right Edge	0.106	0.282	0.240	0.282
Top Edge	0.176	0.354	0.280	0.354
Bottom Edge	/	/	/	/
5GHz Wi-Fi Highest Reported SAR (10-g) (W/kg) for Limb				
Test Position	UNII-1	UNII-2C	UNII-3	5GHz Wi-Fi$_{max}$
Back Surface	0.358	0.827	0.597	0.827
Front Surface	0.124	0.279	0.170	0.279
Left Edge	/	/	/	/
Right Edge	0.163	0.336	0.294	0.336
Top Edge	0.320	0.868	0.535	0.868
Bottom Edge	/	/	/	/

BT Highest Reported SAR (1-g) (W/kg) For Body worn		BT Highest Reported SAR (10-g) (W/kg) For Limb
Test Position	BT	BT
Back Surface	0.009	0.018
Front Surface	0.015	0.037
Left Edge	/	/
Right Edge	0.017	0.022
Top Edge	0.000	0.000
Bottom Edge	/	/

12.3. Simultaneous Transmission calculation.

Simultaneous Transmission Combination 1 For Body worn				
Test Position	GSM_{max}	2.4GHz Wi-Fi	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.309	0.041	0.350	1.6
Front Surface	1.184	0.090	1.274	
Left Edge	0.195	/	0.195	
Right Edge	0.341	0.092	0.433	
Top Edge	/	0.032	0.032	
Bottom Edge	0.934	/	0.934	

Simultaneous Transmission Combination 2 For Body worn				
Test Position	GSM_{max}	5GHz $Wi\text{-}Fi_{max}$	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.309	0.682	0.991	1.6
Front Surface	1.184	0.197	1.381	
Left Edge	0.195	/	0.195	
Right Edge	0.341	0.282	0.623	
Top Edge	/	0.354	0.354	
Bottom Edge	0.934	/	0.934	

Simultaneous Transmission Combination 3 For Body worn				
Test Position	GSM_{max}	BT	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.309	0.009	0.318	1.6
Front Surface	1.184	0.015	1.199	
Left Edge	0.195	/	0.195	
Right Edge	0.341	0.017	0.358	
Top Edge	/	0.000	0.000	
Bottom Edge	0.934	/	0.934	

Simultaneous Transmission Combination 4 For Body worn				
Test Position	$WCDMA_{MAX}$	2.4GHz Wi-Fi	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.282	0.041	0.323	1.6
Front Surface	1.138	0.090	1.228	
Left Edge	0.222	/	0.222	
Right Edge	0.112	0.092	0.204	
Top Edge	/	0.032	0.032	
Bottom Edge	0.625	/	0.625	

Simultaneous Transmission Combination 5 For Body worn				
Test Position	$WCDMA_{MAX}$	5GHz $Wi\text{-}Fi_{max}$	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.282	0.682	0.964	1.6
Front Surface	1.138	0.197	1.335	
Left Edge	0.222	/	0.222	
Right Edge	0.112	0.282	0.394	
Top Edge	/	0.354	0.354	
Bottom Edge	0.625	/	0.625	

Simultaneous Transmission Combination 6 For Body worn				
Test Position	$WCDMA_{MAX}$	BT	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.282	0.009	0.291	1.6
Front Surface	1.138	0.015	1.153	
Left Edge	0.222	/	0.222	
Right Edge	0.112	0.017	0.129	
Top Edge	/	0.000	0.000	
Bottom Edge	0.625	/	0.625	

Simultaneous Transmission Combination 7 For Body worn				
Test Position	LTE_{MAX}	2.4GHz Wi-Fi	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.328	0.041	0.369	1.6
Front Surface	1.118	0.090	1.208	
Left Edge	0.379	/	0.379	
Right Edge	0.321	0.092	0.413	
Top Edge	/	0.032	0.032	
Bottom Edge	1.028	/	1.028	

Simultaneous Transmission Combination 8 For Body worn				
Test Position	LTE_{MAX}	5GHz $Wi\text{-}Fi_{max}$	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.328	0.682	1.010	1.6
Front Surface	1.118	0.197	1.315	
Left Edge	0.379	/	0.379	
Right Edge	0.321	0.282	0.603	
Top Edge	/	0.354	0.354	
Bottom Edge	1.028	/	1.028	

Simultaneous Transmission Combination 9 For Body worn				
Test Position	LTE_{MAX}	BT	∑SAR 1-g (W/kg)	Limit (W/kg)
Back Surface	0.328	0.009	0.337	1.6
Front Surface	1.118	0.015	1.133	
Left Edge	0.379	/	0.379	
Right Edge	0.321	0.017	0.338	
Top Edge	/	0.000	0.000	
Bottom Edge	1.028	/	1.028	

Note:
1) Because the maximum SUM 1-g SAR ≤ 1.6 W/Kg, so the SPLSR analysis is not required.

Simultaneous Transmission Combination 10 For Limb				
Test Position	GSM/WCDMA/ LTE_{max}	Wi-Fi 2.4GHz	∑SAR 10-g (W/kg)	Limit (W/kg)
Back Surface	0.271	0.137	0.408	4
Front Surface	2.893	0.230	3.123	
Left Edge	0.382	/	0.382	
Right Edge	0.288	0.169	0.457	
Top Edge	/	0.103	0.103	
Bottom Edge	1.226	/	1.226	

Simultaneous Transmission Combination 11 For Limb				
Test Position	GSM/WCDMA/ LTE_{max}	Wi-Fi 5GHz	∑SAR 10-g (W/kg)	Limit (W/kg)
Back Surface	0.271	0.827	1.098	4
Front Surface	2.893	0.279	3.172	
Left Edge	0.382	/	0.382	
Right Edge	0.288	0.336	0.624	
Top Edge	/	0.868	0.868	
Bottom Edge	1.226	/	1.226	

Simultaneous Transmission Combination 12 For Limb				
Test Position	GSM/WCDMA/ LTE_{max}	BT	∑SAR 10-g (W/kg)	Limit (W/kg)
Back Surface	0.271	0.018	0.289	4
Front Surface	2.893	0.037	2.93	
Left Edge	0.382	/	0.382	
Right Edge	0.288	0.022	0.31	
Top Edge	/	0.000	0	
Bottom Edge	1.226	/	1.226	

Note:

Because the maximum SUM 1-g SAR ≤ 4 W/Kg, so the SPLSR analysis is not required.

Appendixes

Refer to separated files for the following appendixes.

4790096770-SAR-1_APP A Conducted Power

4790096770-SAR-1_App B Photo

4790096770-SAR-1_App C System Check Plots

4790096770-SAR-1_App D Highest Test Plots

4790096770-SAR-1_App E Cal. Certificates

---------End of Report---------