FCC 47 CFR § 2.1093
IEEE Std. 1528-2013

SAR EVALUATION REPORT

For

POS Machine

Model: N96

Report Number: 4790951576-SAR-1

Issue Date: Sep 13, 2023

FCC ID: XDQN96-02

Prepared for

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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	09/13/2023	Initial Issue	

Note:

1. The Measurement result for the sample received is<Pass> according to < IEEE Std. 1528-2013> when <Accuracy Method> decision rule is applied.
2. This report is only published to and used by the applicant, and it is not for evidence purpose in China.

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1. Attestation of Test Results

Applicant Name	Shenzhen Xinguodu Technology Co., Ltd.			
Address	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen 518040, China			
Manufacturer	Shenzhen Xinguodu Technology Co., Ltd.			
Address	17B JinSong Mansion, Terra Industrial & Trade Park Chegongmiao, Futian District, Shenzhen 518040, China			
EUT Name	POS Machine			
Model	N96			
Sample Status	Normal			
Sample Received Date	Aug 04, 2023			
Date of Tested	Sep 07,2023 ~ Sep 12,2023			
Applicable Standards	FCC 47 CFR § 2.1093 IEEE Std. 1528-2013 KDB publication			
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**			
	LTE	**DTS**	**NII**	**DSS**
Body-(1-g)	1.353	0.303	1.161	0.165
Test Results	Pass			
Prepared By: Burt Hu Burt Hu Laboratory Engineer	Reviewed By: Denny Huang Denny Huang Senior Project Engineer		Approved By: Stephen Guo 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 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

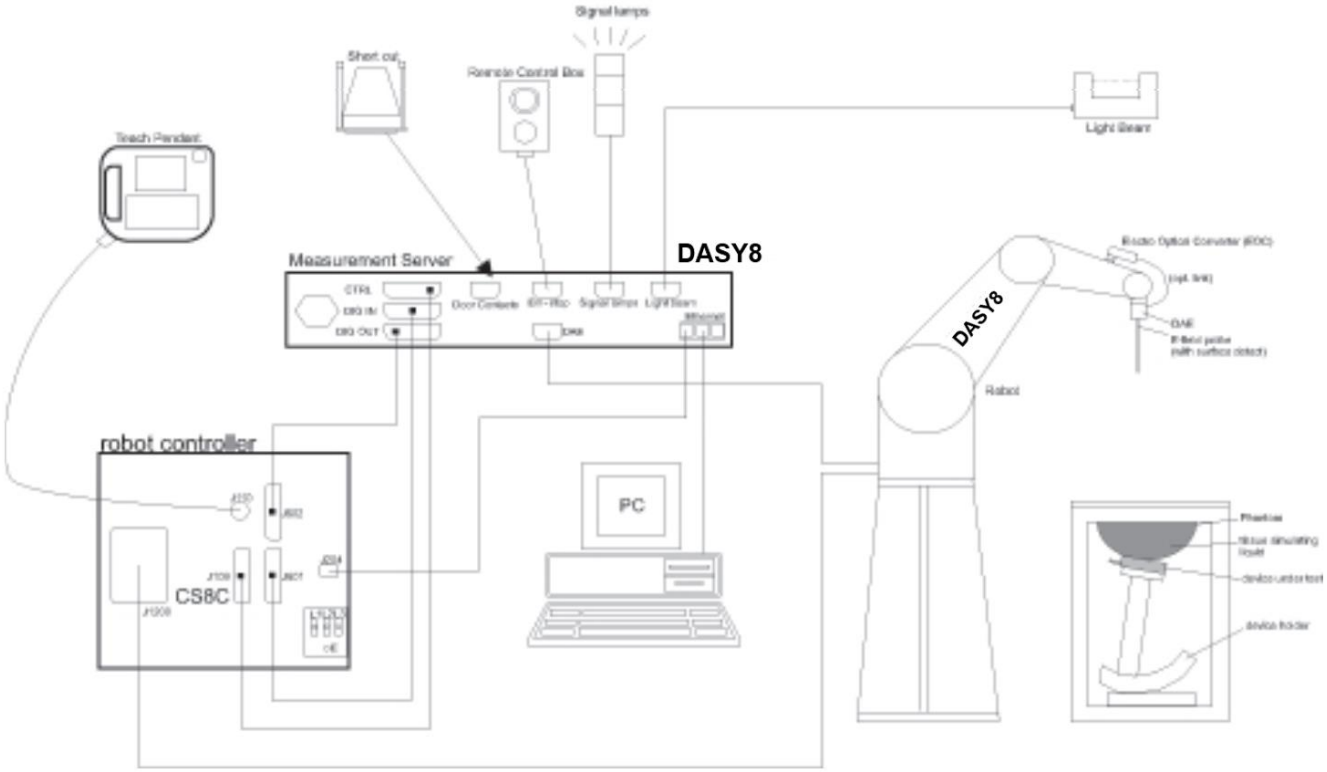
3. Facilities and Accreditation

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 Designation 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 Delcaration of Conformity (DoC) and Certification rules **ISED (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 DASY8 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 Win10 and the DASY8 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 mm ± 1 mm	½·δ·ln(2) mm ± 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

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

Step 4: Power 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	2023.10.16
Dielectric Probe kit	SPEAG	SM DAK 040 SA	1155	2025.02.27
DC power supply	Keysight	E36103A	MY55350020	2023.10.16
Signal Generator	Rohde & Schwarz	SME06	837633\001	2024.08.06
BI-Directional Coupler	KRYTAR	1850	54733	2023.10.16
Peak and Average Power Sensor	Keysight	E9325A	MY62220002	2023.10.25
Peak and Average Power Sensor	Keysight	E9325A	MY62220003	2023.10.25
Dual Channel PK Power Meter	Keysight	N1912A	MY55416024	2023.10.16
Amplifier	CORAD TECHNOLOGY LTD	AMF-4D-00400600-50-30P	1983561	NCR
Dosimetric E-Field Probe	SPEAG	EX3DV4	7733	2023.08.01
Data Acquisition Electronic	SPEAG	DAE4	1739	2023.07.28
Dipole Kit 2450 MHz	SPEAG	D2450V2	977	2024.12.16
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 2600 MHz	SPEAG	D2600V2	1117	2024.12.19
Dipole Kit 5 GHz	SPEAG	D5GHzV2	1231	2024.12.15
Software	SPEAG	DASY8	N/A	NCR
ELI Phantom	SPEAG	ELI V8.0	2178	NCR
Thermometer	/	GX-138	150709653	2023.10.21
Thermometer	VICTOR	ITHX-SD-5	18470005	2023.10.21

Note:

1) As per KDB865664D01 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) Dielectric assessment kit is calibrated against air, distilled water and a shorting block performed before measuring liquid parameters.
3) NCR is short for "No Calibration Requirement".

5. Measurement Uncertainty

Per KDB 865664 D01 SAR Measurement 100 MHz to 6 GHz, when the highest measured 1-g SAR within a frequency band is < 1.5 W/kg, the extensive SAR measurement uncertainty analysis described in IEEE Std. 1528-2013 is not required in SAR reports submitted for equipment approval. The equivalent ratio (1.5/1.6) is applied to extremity and occupational exposure conditions.

6. Device Under Test (DUT) Information

6.1. DUT Description

EUT is a portable payment terminal with LTE wireless, IEEE 802.11a/ b/g/n/ac wireless and Bluetooth wireless	
Dimension	Overall (Length x Width x Height): 213.13 mm x 79 mm x 64.46 mm
Accessory	None

6.2. Wireless Technology

Wireless technologies	Frequency bands	Operating mode
LTE	FDD B2 FDD B4 FDD B5 FDD B7 FDD B12 FDD B13 FDD B14 FDD B17 FDD B25 FDD B26 TDD B41 FDD B66 FDD B71	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 (VHT20) 802.11ac (VHT40) 802.11ac (VHT80)
BT/BLE	2.4GHz	V5.1

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. 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.

1) Spectrum Plots for RB configurations

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

2) MPR

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

Table 6.2.3-1: Maximum Power Reduction (MPR) for Power Class 3

Modulation	Channel bandwidth / Transmission bandwidth (N_{RB})						MPR (dB)
	1.4 MHz	3.0 MHz	5 MHz	10 MHz	15 MHz	20 MHz	
QPSK	> 5	> 4	> 8	> 12	> 16	> 18	≤ 1
16 QAM	≤ 5	≤ 4	≤ 8	≤ 12	≤ 16	≤ 18	≤ 1
16 QAM	> 5	> 4	> 8	> 12	> 16	> 18	≤ 2

3) A-MPR

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

4) SAR test requirements

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.

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.

8.2. 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.

8.2.1. 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.

8.2.2. 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.

8.2.3. 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.

8.2.4. 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.

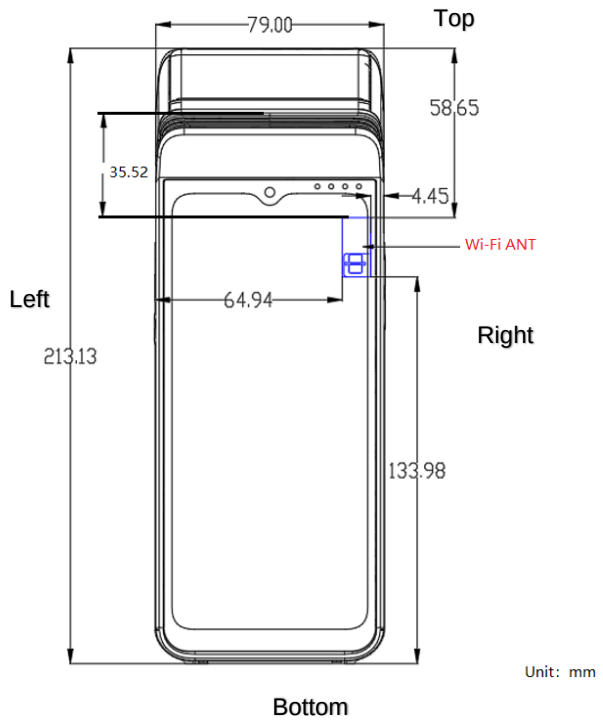
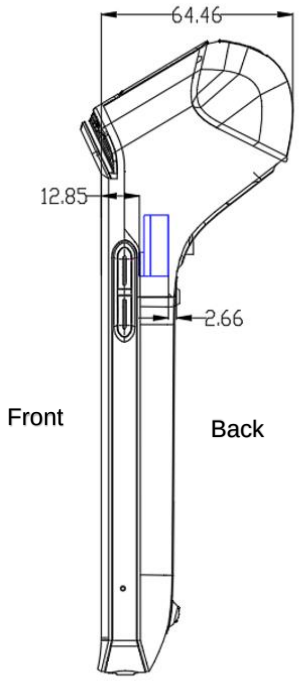
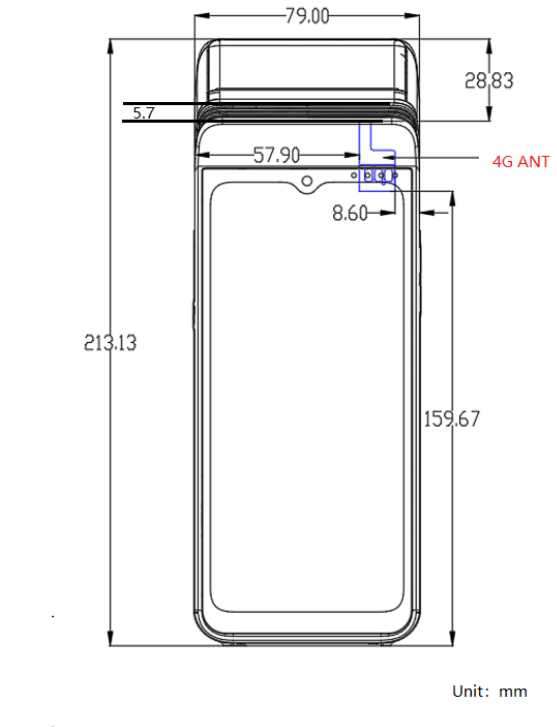
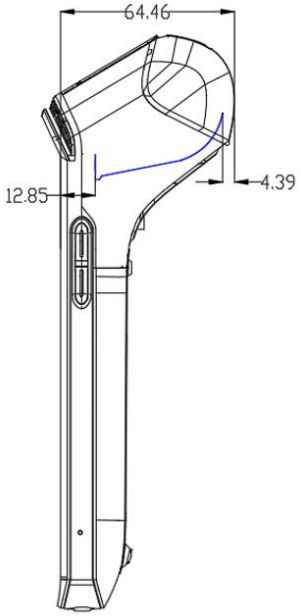
1) When KDB Publication 447498 SAR test exclusion applies to the OFDM configuration.
2) When the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and the adjusted SAR is ≤ 1.2 W/kg.

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.

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.

Front view	Lateral view
	
	

Note:

1) The EUT doesn't support operating next to the ear, so head SAR evaluation isn't considered.

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

4G Ant	Test Position	antenna to-edge-distance	Test required
	Front Surface	<25mm	Yes
	Back Surface	<25mm	Yes
	Left Edge	>25mm	No
	Right Edge	<25mm	Yes
	Top Edge	<25mm	Yes
	Bottom Edge	>25mm	No

10. SAR Test Configuration

EUT is a portable payment terminal that may be used very close to the human body, so consider a 1g Body SAR (5mm) evaluation.

11. Dielectric Property Measurements & System Check

11.1. 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				Deviation(%)		Limit (%)	Temp. (℃)	Test Date
		Measured		Target						
		ϵ_r	σ	ϵ_r	σ	ϵ_r	σ			
Head 750	680	41.60	0.89	42.31	0.89	-1.68	0.00	±5	21.6	2023.9.7
	700	41.20	0.90	42.20	0.89	-2.37	1.12			
	750	42.30	0.93	41.94	0.89	0.86	4.49			
	800	42.20	0.94	41.68	0.90	1.25	4.44			
Head 835	805	41.10	0.91	41.66	0.90	-1.34	1.11	±5	21.6	2023.9.7
	835	41.90	0.93	41.50	0.90	0.96	3.33			
	880	42.20	0.99	41.50	0.96	1.69	3.13			
Head 1800	1720	39.20	1.31	40.13	1.35	-2.32	-2.96	±5	21.6	2023.9.7
	1760	39.10	1.33	40.06	1.38	-2.40	-3.62			
	1800	39.20	1.34	40.00	1.40	-2.00	-4.29			
	1840	39.20	1.36	40.00	1.40	-2.00	-2.86			
	1880	39.10	1.35	40.00	1.40	-2.25	-3.57			

Head 1900	1900	39.20	1.35	40.00	1.40	-2.00	-3.57	±5	21.6	2023.9.7
	1940	39.90	1.43	40.00	1.40	-0.25	2.14			
	1980	39.70	1.45	40.00	1.40	-0.75	3.57			
Head 2450	2360	39.00	1.70	39.36	1.72	-0.91	-1.16	±5	21.6	2023.9.7
	2450	38.90	1.83	39.20	1.80	-0.77	1.67			
	2540	38.80	1.91	39.09	1.90	-0.74	0.53			
Head 2600	2500	38.80	1.84	39.14	1.85	-0.87	-0.54	±5	21.6	2023.9.7
	2540	38.80	1.91	39.09	1.90	-0.74	0.53			
	2600	38.80	1.96	39.01	1.96	-0.54	0.00			
	2660	38.60	2.05	38.93	2.03	-0.85	0.99			
	2700	38.60	2.10	38.88	2.07	-0.72	1.45			
Head 5750	5660	34.50	4.93	35.46	5.13	-2.71	-3.90	±5	21.6	2023.9.7
	5750	34.00	5.05	35.36	5.22	-3.85	-3.26			
	5840	34.10	5.14	35.27	5.30	-3.32	-3.02			
Head 5250	5160	36.00	4.54	36.03	4.61	-0.08	-1.52	±5	22.6	2023.9.12
	5250	35.70	4.72	35.93	4.71	-0.64	0.21			
	5340	35.70	4.72	35.83	4.80	-0.36	-1.67			
Head 5600	5500	35.30	4.86	35.64	4.96	-0.95	-2.02	±5	22.6	2023.9.12
	5600	35.00	4.99	35.53	5.07	-1.49	-1.58			
	5700	34.90	5.06	35.41	5.17	-1.44	-2.13			

11.2. 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, Δ x_{zoom}, Δ y_{zoom}≤ 2GHz - ≤8mm, 2-4GHz - ≤5 mm and 4-6 GHz-≤4mm; Δ z_{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		Messured Results		Target (Ref. value)	Delta (%)	Limit (%)	Temp. (℃)	Test Date
		Zoom Scan (W/Kg)	Normalize to 1W (W/Kg)					
Head 750	1-g	2.150	8.60	8.50	1.18	±10	21.6	2023.9.7
	10-g	1.370	5.48	5.61	-2.32			
Head 835	1-g	2.510	10.04	9.64	4.15	±10	21.6	2023.9.7
	10-g	1.620	6.48	6.26	3.51			
Head 1800	1-g	9.540	38.16	38.70	-1.40	±10	21.6	2023.9.7
	10-g	5.020	20.08	19.90	0.90			
Head 2450	1-g	13.400	53.60	53.20	0.75	±10	21.6	2023.9.7
	10-g	6.330	25.32	24.20	4.63			
Head 2600	1-g	13.200	52.80	55.40	-4.69	±10	21.6	2023.9.7
	10-g	6.240	24.96	24.50	1.88			
Head 5750	1-g	7.760	77.60	78.30	-0.89	±10	21.6	2023.9.7
	10-g	2.230	22.30	22.40	-0.45			
Head 750	1-g	2.070	8.28	8.50	-2.59	±10	21.3	2023.9.8

	10-g	1.360	5.44	5.61	-3.03			
Head 835	1-g	2.540	10.16	9.64	5.39	±10	21.3	2023.9.8
	10-g	1.640	6.56	6.26	4.79			
Head 1900	1-g	9.430	37.72	39.60	-4.75	±10	21.3	2023.9.8
	10-g	4.910	19.64	20.20	-2.77			
Head 2600	1-g	13.800	55.20	55.40	-0.36	±10	21.3	2023.9.8
	10-g	6.300	25.20	24.50	2.86			
Head 750	1-g	2.020	8.08	8.50	-4.94	±10	22.2	2023.9.9
	10-g	1.330	5.32	5.61	-5.17			
Head 1800	1-g	9.510	38.04	38.70	-1.71	±10	22.2	2023.9.9
	10-g	5.030	20.12	19.90	1.11			
Head 2450	1-g	13.800	55.20	53.20	3.76	±10	22.2	2023.9.9
	10-g	6.370	25.48	24.20	5.29			
Head 5250	1-g	7.970	79.70	77.90	2.31	±10	22.6	2023.9.12
	10-g	2.280	22.80	22.60	0.88			
Head 5600	1-g	8.240	82.40	80.90	1.85	±10	22.6	2023.9.12
	10-g	2.350	23.50	23.30	0.86			

12. Measured and Reported (Scaled) SAR Results

General Notes:

1) As per KDB447498 D01, all SAR measurement results are scaled to the maximum tune-up tolerance limit to demonstrate SAR compliance.
2) 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.
3) 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.
4) 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).
5) 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.
6) 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.

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.
2) A-MPR was disabled for all SAR test by setting NS_01 on the base station simulator. SAR tests were performed with the same number of RB and RB offsets transmitting on all TTI frames(maximum TTI)

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.

12.1. SAR Test Results of Bluetooth

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
Front Surface	BT 3DH5	39	9.5	9.28	0.015	0.00	77.01	0.020
Back Surface	BT 3DH5	39	9.5	9.28	0.043	-0.05	77.01	0.059
Right Edge	BT 3DH5	39	9.5	9.28	0.121	-0.02	77.01	0.165

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.2. SAR Test Results of 2.4GHz Wi-Fi

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
Front Surface	11b	11	17.0	16.60	0.064	-0.05	99.03	0.071
Back Surface	11b	11	17.0	16.60	0.139	0.01	99.03	0.154
Right Edge	11b	11	17.0	16.60	0.274	-0.04	99.03	0.303

Note:
The SAR testing was set to transmit at maximum power for all tests.

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	50.12	0.303	\	\
802.11g	16.5	44.67	\	0.270	Excluded
802.11n20	15.5	35.48	\	0.215	Excluded
802.11n40	15.5	35.48	\	0.215	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.

12.3. SAR Test Results of 5GHz Wi-Fi

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		SAR Value	Power Drift	Duty Factor (%)	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)			
5.3GHz								
Front Surface	11n40	62	16.0	15.69	0.094	-0.03	96.84	0.104
Back Surface	11n40	62	16.0	15.69	0.416	-0.02	96.84	0.461
Right Edge	11n40	62	16.0	15.69	0.739	0.00	96.84	0.820
Right Edge	11n40	54	16.0	15.65	0.940	0.02	96.84	1.052
Worst Case repeated								
Right Edge	11n40	54	16.0	15.69	0.932	-0.05	96.84	1.034
5.6GHz								
Front Surface	11n20	140	16.5	16.03	0.136	-0.05	97.91	0.155
Back Surface	11n20	140	16.5	16.03	0.638	-0.01	97.91	0.726
Right Edge	11n20	140	16.5	16.03	0.879	-0.01	97.91	1.000
Right Edge	11n20	116	16.5	15.62	0.928	-0.01	97.91	1.161
Worst Case repeated								
Right Edge	11n20	116	16.5	15.62	0.921	0.00	97.91	1.152
5.8GHz								
Front Surface	11ac80	157	16.0	15.77	0.079	0.00	91.84	0.091
Back Surface	11ac80	157	16.0	15.77	0.452	-0.01	91.84	0.519
Right Edge	11ac80	157	16.0	15.77	0.666	0.00	91.84	0.765

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.
2) The SAR testing was set to transmit at maximum power for all tests.

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
802.11n 40M	16	39.81	1.052	\	\
802.11a-20	16	39.81	\	1.052	Excluded
802.11n 20M	16	39.81	\	1.052	Excluded
802.11ac 20M	16	39.81	\	1.052	Excluded
802.11ac 40M	15	31.62	\	0.836	Excluded
802.11ac 80M	15	31.62	\	0.836	Excluded

Note:

1) The 802.11n40 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
802.11n 20M	16.5	44.67	1.161	\	\
802.11a-20	16	39.81	\	1.035	Excluded
802.11ac 20M	16.5	44.67	\	1.161	Excluded
802.11n 40M	14.5	28.18	\	0.733	Excluded
802.11ac 40M	14.5	28.18	\	0.733	Excluded
802.11ac 80M	13	19.95	\	0.519	Excluded

Note:

1) The 802.11n20 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
802.11ac 80M	16	39.81	0.765	\	\
802.11a-20	16	39.81	\	0.765	Excluded
802.11n 20M	16	39.81	\	0.765	Excluded
802.11n 40M	16	39.81	\	0.765	Excluded
802.11ac 20M	16	39.81	\	0.765	Excluded
802.11ac 40M	16	39.81	\	0.765	Excluded

Note:

2) 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.

12.4. SAR Test Results of LTE B2

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#49	18900	22.00	21.39	0.209	-0.04	0.241
Back Surface	20M QPSK 1RB#49	18900	22.00	21.39	0.852	-0.01	0.980
Right Edge	20M QPSK 1RB#49	18900	22.00	21.39	0.724	0.02	0.833
Top Edge	20M QPSK 1RB#49	18900	22.00	21.39	0.167	-0.11	0.192
Back Surface	20M QPSK 1RB#49	18700	22.00	21.31	0.738	-0.05	0.865
Back Surface	20M QPSK 1RB#0	19100	22.00	21.38	0.832	-0.01	0.960
50%RB							
Front Surface	20M QPSK 50RB#0	19100	20.50	20.45	0.165	0.00	0.167
Back Surface	20M QPSK 50RB#0	19100	20.50	20.45	0.718	0.00	0.726
Right Edge	20M QPSK 50RB#0	19100	20.50	20.45	0.568	-0.03	0.575
Top Edge	20M QPSK 50RB#0	19100	20.50	20.45	0.131	-0.05	0.133
100% RB							
Back Surface	20M QPSK 100RB#0	18900	20.50	20.37	0.688	-0.01	0.709
Worst Case repeated							
Back Surface	20M QPSK 1RB#49	18900	22.00	21.39	0.852	0.00	0.980

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.5. SAR Test Results of LTE B4

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#99	20050	22.00	21.00	0.073	-0.03	0.092
Back Surface	20M QPSK 1RB#99	20050	22.00	21.00	0.277	-0.01	0.349
Right Edge	20M QPSK 1RB#99	20050	22.00	21.00	0.435	-0.01	0.548
Top Edge	20M QPSK 1RB#99	20050	22.00	21.00	0.071	0.03	0.089
50%RB							
Front Surface	20M QPSK 50RB#50	20050	20.50	19.86	0.060	0.00	0.070
Back Surface	20M QPSK 50RB#50	20050	20.50	19.86	0.253	0.03	0.293
Right Edge	20M QPSK 50RB#50	20050	20.50	19.86	0.323	-0.08	0.374
Top Edge	20M QPSK 50RB#50	20050	20.50	19.86	0.055	-0.04	0.064

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.6. SAR Test Results of LTE B5

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	10M QPSK 1RB#49	20450	23.00	22.44	0.219	-0.05	0.249
Back Surface	10M QPSK 1RB#49	20450	23.00	22.44	0.456	-0.02	0.519
Right Edge	10M QPSK 1RB#49	20450	23.00	22.44	0.358	0.00	0.407
Top Edge	10M QPSK 1RB#49	20450	23.00	22.44	0.089	0.00	0.101
50%RB							
Front Surface	10M QPSK 25RB#25	20450	22.00	21.15	0.166	0.00	0.202
Back Surface	10M QPSK 25RB#25	20450	22.00	21.15	0.320	0.01	0.389
Right Edge	10M QPSK 25RB#25	20450	22.00	21.15	0.267	-0.01	0.325
Top Edge	10M QPSK 25RB#25	20450	22.00	21.15	0.066	-0.03	0.080

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.7. SAR Test Results of LTE B7

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#49	20850	19.50	19.22	0.375	-0.02	0.400
Back Surface	20M QPSK 1RB#49	20850	19.50	19.22	1.000	-0.03	1.067
Right Edge	20M QPSK 1RB#49	20850	19.50	19.22	0.604	-0.03	0.644
Top Edge	20M QPSK 1RB#49	20850	19.50	19.22	0.205	-0.03	0.219
Back Surface	20M QPSK 1RB#49	21100	19.50	19.42	1.290	-0.01	1.314
Back Surface	20M QPSK 1RB#49	21350	19.50	18.69	0.772	-0.15	0.930
50%RB							
Front Surface	20M QPSK 50RB#25	20850	19.50	19.49	0.278	0.00	0.279
Back Surface	20M QPSK 50RB#25	20850	19.50	19.49	1.350	0.00	1.353
Right Edge	20M QPSK 50RB#25	20850	19.50	19.49	0.542	0.00	0.543
Top Edge	20M QPSK 50RB#25	20850	19.50	19.49	0.171	-0.07	0.171
Back Surface	20M QPSK 50RB#0	21100	19.50	18.96	1.080	-0.05	1.223
Back Surface	20M QPSK 50RB#0	21350	19.50	18.49	0.816	-0.03	1.030
100% RB							
Back Surface	20M QPSK 100RB#0	20850	19.00	19.00	1.340	-0.05	1.340
Back Surface	20M QPSK 100RB#0	21100	19.00	18.83	1.010	-0.08	1.050
Back Surface	20M QPSK 100RB#0	21350	19.00	18.45	0.779	-0.03	0.884
Worst Case repeated							
Back Surface	20M QPSK 50RB#25	20850	19.50	19.49	1.320	-0.01	1.323

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.8. SAR Test Results of LTE B12

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	10M QPSK 1RB#0	23130	23.00	22.50	0.204	-0.01	0.229
Back Surface	10M QPSK 1RB#0	23130	23.00	22.50	0.412	-0.02	0.462
Right Edge	10M QPSK 1RB#0	23130	23.00	22.50	0.246	-0.03	0.276
Top Edge	10M QPSK 1RB#0	23130	23.00	22.50	0.039	-0.08	0.044
50%RB							
Front Surface	10M QPSK 25RB#0	23130	21.50	21.27	0.157	0.00	0.166
Back Surface	10M QPSK 25RB#0	23130	21.50	21.27	0.299	-0.02	0.315
Right Edge	10M QPSK 25RB#0	23130	21.50	21.27	0.188	-0.01	0.198
Top Edge	10M QPSK 25RB#0	23130	21.50	21.27	0.029	0.10	0.031

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.9. SAR Test Results of LTE B13

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	10M QPSK 1RB#0	23230	22.50	22.33	0.245	0.01	0.255
Back Surface	10M QPSK 1RB#0	23230	22.50	22.33	0.412	0.01	0.428
Right Edge	10M QPSK 1RB#0	23230	22.50	22.33	0.345	-0.13	0.359
Top Edge	10M QPSK 1RB#0	23230	22.50	22.33	0.053	-0.04	0.055
50%RB							
Front Surface	10M QPSK 25RB#0	23230	21.50	21.25	0.195	-0.01	0.207
Back Surface	10M QPSK 25RB#0	23230	21.50	21.25	0.321	-0.05	0.340
Right Edge	10M QPSK 25RB#0	23230	21.50	21.25	0.267	0.00	0.283
Top Edge	10M QPSK 25RB#0	23230	21.50	21.25	0.041	-0.06	0.043

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.10. SAR Test Results of LTE B14

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	10M QPSK 1RB#0	23330	22.50	22.12	0.230	-0.03	0.251
Back Surface	10M QPSK 1RB#0	23330	22.50	22.12	0.444	-0.01	0.485
Right Edge	10M QPSK 1RB#0	23330	22.50	22.12	0.382	-0.01	0.417
Top Edge	10M QPSK 1RB#0	23330	22.50	22.12	0.050	0.06	0.055
50%RB							
Front Surface	10M QPSK 25RB#0	23230	21.50	21.25	0.195	-0.01	0.207
Back Surface	10M QPSK 25RB#0	23230	21.50	21.25	0.321	-0.05	0.340
Right Edge	10M QPSK 25RB#0	23230	21.50	21.25	0.267	0.00	0.283
Top Edge	10M QPSK 25RB#0	23230	21.50	21.25	0.041	-0.06	0.043

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.11. SAR Test Results of LTE B17

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	10M QPSK 1RB#0	23790	23.00	22.61	0.203	-0.01	0.222
Back Surface	10M QPSK 1RB#0	23790	23.00	22.61	0.417	-0.03	0.456
Right Edge	10M QPSK 1RB#0	23790	23.00	22.61	0.249	-0.01	0.272
Top Edge	10M QPSK 1RB#0	23790	23.00	22.61	0.037	-0.11	0.040
50%RB							
Front Surface	10M QPSK 25RB#12	23780	21.50	21.30	0.149	0.00	0.156
Back Surface	10M QPSK 25RB#12	23780	21.50	21.30	0.303	0.00	0.317
Right Edge	10M QPSK 25RB#12	23780	21.50	21.30	0.189	0.02	0.198
Top Edge	10M QPSK 25RB#12	23780	21.50	21.30	0.027	-0.08	0.028

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.12. SAR Test Results of LTE B25

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#0	26140	22.00	21.54	0.194	0.00	0.216
Back Surface	20M QPSK 1RB#0	26140	22.00	21.54	0.722	-0.03	0.803
Right Edge	20M QPSK 1RB#0	26140	22.00	21.54	0.568	-0.05	0.631
Top Edge	20M QPSK 1RB#0	26140	22.00	21.54	0.220	-0.01	0.245
Back Surface	20M QPSK 1RB#49	26365	22.00	21.37	0.826	-0.05	0.955
Back Surface	20M QPSK 1RB#99	26590	22.00	21.46	0.833	-0.03	0.943
50%RB							
Front Surface	20M QPSK 50RB#0	26590	20.50	20.41	0.149	-0.05	0.152
Back Surface	20M QPSK 50RB#0	26590	20.50	20.41	0.640	-0.01	0.653
Right Edge	20M QPSK 50RB#0	26590	20.50	20.41	0.446	-0.03	0.455
Top Edge	20M QPSK 50RB#0	26590	20.50	20.41	0.175	-0.05	0.179
100% RB							
Back Surface	20M QPSK 100RB#0	26140	20.50	20.44	0.602	-0.05	0.610
Worst Case repeated							
Back Surface	20M QPSK 1RB#99	26590	22.00	21.46	0.823	-0.04	0.932

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.13. SAR Test Results of LTE B26

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	15M QPSK 1RB#0	26765	23.00	22.70	0.241	-0.03	0.258
Back Surface	15M QPSK 1RB#0	26765	23.00	22.70	0.377	0.02	0.404
Right Edge	15M QPSK 1RB#0	26765	23.00	22.70	0.341	-0.01	0.365
Top Edge	15M QPSK 1RB#0	26765	23.00	22.70	0.068	-0.05	0.073
50%RB							
Front Surface	15M QPSK 36RB#0	26765	22.00	21.52	0.189	0.00	0.211
Back Surface	15M QPSK 36RB#0	26765	22.00	21.52	0.347	-0.05	0.388
Right Edge	15M QPSK 36RB#0	26765	22.00	21.52	0.271	-0.09	0.303
Top Edge	15M QPSK 36RB#0	26765	22.00	21.52	0.054	-0.01	0.060

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.14. SAR Test Results of LTE B41

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#49	39750	21.50	20.96	0.126	0.00	0.143
Back Surface	20M QPSK 1RB#49	39750	21.50	20.96	0.822	-0.01	0.931
Right Edge	20M QPSK 1RB#49	39750	21.50	20.96	0.248	-0.02	0.281
Top Edge	20M QPSK 1RB#49	39750	21.50	20.96	0.086	-0.01	0.097
Back Surface	20M QPSK 1RB#0	40620	21.50	20.71	0.517	0.00	0.620
Back Surface	20M QPSK 1RB#0	41490	21.50	20.43	0.837	0.03	1.071
50%RB							
Front Surface	20M QPSK 50RB#25	39750	20.50	20.03	0.099	-0.01	0.110
Back Surface	20M QPSK 50RB#25	39750	20.50	20.03	0.728	-0.04	0.811
Right Edge	20M QPSK 50RB#25	39750	20.50	20.03	0.193	0.00	0.215
Top Edge	20M QPSK 50RB#25	39750	20.50	20.03	0.066	-0.15	0.074
100% RB							
Back Surface	20M QPSK 100RB#0	39750	20.00	19.93	0.728	-0.05	0.740
Worst Case repeated							
Back Surface	20M QPSK 1RB#0	41490	21.50	20.43	0.829	0.00	1.061

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.15. SAR Test Results of LTE B66

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#99	132322	22.00	21.58	0.114	0.00	0.126
Back Surface	20M QPSK 1RB#99	132322	22.00	21.58	0.381	0.00	0.420
Right Edge	20M QPSK 1RB#99	132322	22.00	21.58	0.607	0.00	0.669
Top Edge	20M QPSK 1RB#99	132322	22.00	21.58	0.179	-0.02	0.197
50%RB							
Front Surface	20M QPSK 50RB#50	132072	20.50	20.18	0.060	-0.05	0.065
Back Surface	20M QPSK 50RB#50	132072	20.50	20.18	0.258	-0.04	0.278
Right Edge	20M QPSK 50RB#50	132072	20.50	20.18	0.313	-0.12	0.337
Top Edge	20M QPSK 50RB#50	132072	20.50	20.18	0.092	0.00	0.099

Note:
The SAR testing was set to transmit at maximum power for all tests.

12.16. SAR Test Results of LTE B71

Scenario and Distance (Body 5mm)	Test Mode	Channel	Power (dBm)		Measured SAR Value	Power Drift	Scaled (W/Kg)
			Tune-up	Meas.	1-g (W/Kg)		
1RB							
Front Surface	20M QPSK 1RB#0	133322	22.00	21.59	0.116	-0.02	0.127
Back Surface	20M QPSK 1RB#0	133322	22.00	21.59	0.369	-0.03	0.406
Right Edge	20M QPSK 1RB#0	133322	22.00	21.59	0.182	-0.03	0.200
Top Edge	20M QPSK 1RB#0	133322	22.00	21.59	0.034	-0.05	0.037
50%RB							
Front Surface	20M QPSK 50RB#25	133322	21.00	20.74	0.098	0.00	0.104
Back Surface	20M QPSK 50RB#25	133322	21.00	20.74	0.232	-0.01	0.246
Right Edge	20M QPSK 50RB#25	133322	21.00	20.74	0.145	0.04	0.154
Top Edge	20M QPSK 50RB#25	133322	21.00	20.74	0.025	-0.01	0.027

Note:
The SAR testing was set to transmit at maximum power for all tests.

13. Simultaneous Transmission SAR Analysis

The customer claims that 4G ANT and Wi-Fi/BT ANT cannot be transmitted simultaneously, so SAR simultaneous transmission analysis is not considered.

Appendixes

Refer to separated files for the following appendixes.

4790951576-SAR-1_APP A Conducted Power

4790951576-SAR-1_App B Photo

4790951576-SAR-1_App C System Check Plots

4790951576-SAR-1_App D Highest Test Plots

4790951576-SAR-1_App E Cal. Certificates

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