FCC SAR TEST REPORT

Product Name:	Hybrid Full-Touch Handheld computer
Trade Mark:	TSC
Model No.:	X40
Add. Model No.:	N/A
Report Number:	26051324502SAR-1
Test Standards:	FCC 47 CFR Part 2 §2.1093 ANSI/IEEE C95.1-1992 IEEE Std 1528-2013
FCC ID:	VTVX40W1
Test Result:	PASS
Date of Issue:	October 9, 2026

Prepared for:

TSC Auto ID Technology Co., Ltd.
9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan

Prepared by:

Shenzhen UnionTrust Quality and Technology Co., Ltd.
16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China
TEL: +86-755-2823 0888
FAX: +86-755-2823 0886

Prepared by:	Curry Xue Test Engineer	Reviewed by:	Henry Lu Team Leader
Approved by:	Kevin Liang Assistant Manager	Date:	October 9, 2026

UnionTrust Laboratories UnionTrust *Certified*

Version

Version No.	Date	Description
V1.0	October 9, 2026	Original Report

CONTENTS

1. GENERAL INFORMATION 5
   1.1. STATEMENT OF COMPLIANCE 5
   1.2. CLIENT INFORMATION 6
   1.3. EUT INFORMATION 6
      1.3.1. GENERAL DESCRIPTION OF EUT 6
      1.3.2. DESCRIPTION OF ACCESSORIES 6
      1.3.3. EUT TX FREQUENCY BANDS 7
      1.3.4. WIRELESS TECHNOLOGIES 7
   1.4. MAXIMUM CONDUCTED POWER 8
   1.5. OTHER INFORMATION 10
   1.6. TEST LOCATION 10
   1.7. TEST FACILITY 10
   1.8. GUIDANCE STANDARD 11
2. SPECIFIC ABSORPTION RATE (SAR) 12
   2.1. INTRODUCTION 12
   2.2. SAR DEFINITION 12
   2.3. SAR LIMITS 12
3. SAR MEASUREMENT SYSTEM 13
   3.1. SPEAG DASY SYSTEM 13
      3.1.1. ROBOT 13
      3.1.2. PROBE 14
      3.1.3. DATA ACQUISITION ELECTRONICS (DAE) 14
      3.1.4. PHANTOM 15
      3.1.5. DEVICE HOLDER 16
      3.1.6. SYSTEM VALIDATION DIPOLES 16
   3.2. SAR SCAN PROCEDURE 17
      3.2.1. SAR REFERENCE MEASUREMENT (DRIFT) 17
      3.2.2. AREA SCAN 17
      3.2.3. ZOOM SCAN 18
      3.2.4. SAR DRIFT MEASUREMENT 18
   3.3. EQUIPMENT LIST 19
   3.4. MEASUREMENT UNCERTAINTY 19
   3.5. TISSUE DIELECTRIC PARAMETER MEASUREMENT & SYSTEM VERIFICATION 20
      3.5.1. TISSUE SIMULATING LIQUIDS 20
      3.5.2. SYSTEM CHECK DESCRIPTION 22
      3.5.3. TISSUE VERIFICATION 23
      3.5.4. SYSTEM VERIFICATION 23
4. SAR MEASUREMENT EVALUATION 24
   4.1. EUT CONFIGURATION AND SETTING 24
      4.1.1. WLAN CONFIGURATION AND TESTING 24
      4.1.2. RFID CONFIGURATION AND TESTING 25
      4.1.3. BLUETOOTH CONFIGURATION AND TESTING 25
   4.2. EUT TESTING POSITION 26
      4.2.1. HEAD EXPOSURE CONDITIONS 26
      4.2.2. BODY-WORN ACCESSORY EXPOSURE CONDITIONS 28
      4.2.3. HOTSPOT ACCESSORY EXPOSURE CONDITIONS 29
      4.2.4. EXTREMITY EXPOSURE CONDITIONS 30
   4.3. MEASURED CONDUCTED POWER RESULT 31
      4.3.1. CONDUCTED POWER OF WLAN 31
      4.3.2. CONDUCTED POWER OF BT 33
   4.4. SAR TEST EXCLUSION EVALUATIONS 34
      4.4.1. STANDALONE SAR TEST EXCLUSION CONSIDERATIONS 34

4.4.2. ESTIMATED SAR CALCULATION 36
4.5. SAR TESTING RESULTS 37
4.5.1. SAR TEST REDUCTION CONSIDERATIONS 37
4.5.2. SAR RESULTS FOR HEAD EXPOSURE CONDITION 38
4.5.3. SAR RESULTS FOR BODY-WORN EXPOSURE CONDITION (SEPARATION DISTANCE IS 1.0 CM) 40
4.5.4. SAR RESULTS FOR HOTSPOT EXPOSURE CONDITION (SEPARATION DISTANCE IS 1.0 CM) 41
4.5.5. SAR RESULTS FOR EXTREMITY EXPOSURE CONDITION (SEPARATION DISTANCE IS 0 CM) 43
4.6. SAR MEASUREMENT VARIABILITY 45
4.6.1. REPEATED MEASUREMENT 45
4.7. SIMULTANEOUS MULTI-BAND TRANSMISSION EVALUATION 46
4.7.1. SIMULTANEOUS TRANSMISSION SAR TEST EXCLUSION CONSIDERATIONS 46
4.7.2. SIMULTANEOUS TRANSMISSION POSSIBILITIES 47
4.7.3. MAX. STANDALONE SAR 47
4.7.4. SUM OF SAR 47

Appendix A. SAR Plots of System Verification
Appendix B. SAR Plots of SAR Measurement
Appendix C. Calibration Certificate for Probe and Dipole
Appendix D. Photographs of EUT and Setup

1. GENERAL INFORMATION

1.1. STATEMENT OF COMPLIANCE

The maximum results of Specific Absorption Rate (SAR) found during testing for the EUT are as follows:

Equipment Class	Mode	Highest Reported Head SAR_{1g} (W/kg)	Highest Reported Body-worn SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Hotspot SAR_{1g} (1.0 cm Gap) (W/kg)	Highest Reported Extremity SAR_{10g} (0 cm Gap) (W/kg)
Limits		**1.6 W/kg**	**1.6 W/kg**	**1.6 W/kg**	**4 W/kg**
DTS	**2.4G WLAN**	**0.795**	0.250	0.276	N/A
NII-1	**5G WLAN**	0.317	0.247	0.372	N/A
NII-2A	**5G WLAN**	0.207	0.166	N/A	0.531
NII-2C	**5G WLAN**	0.117	0.215	N/A	0.356
NII-3	**5G WLAN**	0.234	0.214	0.220	N/A
NII-5/6/7/8	**6G WLAN** Note 1)	0.022	0.015	N/A	0.051
DSS	**RFID**	N/A	**0.364**	**0.405**	**0.679**
DSS	**Bluetooth**	0.007	0.010	0.010	N/A
DTS	**2nd BLE**	0.003	0.005	0.005	N/A
DXX	**NFC**	N/A	N/A	N/A	N/A
UWB	**UWB**	N/A	N/A	N/A	N/A
Max. SAR		**0.795**	**0.364**	**0.405**	**0.679**
Highest Simultaneous Transmission SAR		**Head (W/kg)**	**Body-worn (W/kg)**	**Hotspot (W/kg)**	**Extremity (W/kg)**
BT(Data)+RFID+2nd BLE		/	0.412	0.412	/
BT(Data)+2nd BLE		0.008	0.015	0.015	/
WLAN+RFID+2nd BLE		/	0.657	**0.657**	/
WLAN+2nd BLE		**0.798**	0.252	0.373	/

Note:

1). The test results of 6G WLAN are based on the Report No.: FA660303 issued by Sporton International Inc. (Shenzhen).

2). The report is based on report number 26051324500SAR-1 to remove WWAN and GNSS functions. After evaluation, all test data and photos refer to report 26051324500SAR-1 except for the worst test position of all Test Item retested.

1.2. CLIENT INFORMATION

Applicant:	TSC Auto ID Technology Co., Ltd.
Address of Applicant:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan
Manufacturer:	TSC Auto ID Technology Co., Ltd.
Address of Manufacturer:	9F., No. 95, Minquan Rd. Xindian Dist., New Taipei City, Taiwan

1.3. EUT INFORMATION

1.3.1. General Description of EUT

Product Name:	Hybrid Full-Touch Handheld computer
Trade Mark:	TSC
Model No.:	X40
Add. Model No.:	N/A
DUT Stage:	Identical Prototype
Sample No:	Sample 1: S202605138612-ZJA02/26 Sample 2: S202605138612-ZJA23/26 Sample 3: S202605138612-ZJA14/26
Software Version:	R2.00 (Provided by the customer)
Hardware Version:	REV0.3 (Provided by the customer)
Sample Received Date:	May 13, 2026
Sample Tested Date 1:	May 16, 2026 to August 23, 2026
Sample Tested Date 2:	June 13, 2026

1.3.2. Description of Accessories

Refer to Report 26051324502EMC-1 for accessories.

1.3.3. EUT Tx Frequency Bands

RF Type	Band(s)	Tx Frequency Range (Unit: MHz)
WLAN	2.4 GHz:	2412 - 2462
	U-NII-1:	5180 - 5240
	U-NII-2A:	5260 - 5320
	U-NII-2C:	5500 - 5720
	U-NII-3:	5745 - 5825
	U-NII-5/6/7/8:	5955 - 7115
RFID	902-928MHz	902-928
UWB	6.0-8.5GHz	7987.2
Bluetooth	2.4 GHz:	2402 - 2480
NFC	13.553-13.567 MHz	13.56

1.3.4. Wireless Technologies

2.4G WLAN	802.11b 802.11g 802.11n (HT20/HT40) 802.11ax (HE20/HE40) Note: SAR testing for WLAN was performed on the maximum power mode.
5G WLAN	802.11a 802.11n (HT20/HT40) 802.11ac (VHT20/VHT40/VHT80/VHT160) 802.11ax (HE20/HE40/HE80/HE160) Note: SAR testing for WLAN was performed on the maximum power mode.
6G WLAN	802.11ax (HE20/HE40/HE80/HE160) Note: SAR testing for WLAN was performed on the maximum power mode.
Bluetooth	BR+EDR LE,2LE, LE Code 2nd BLE
Others	NFC, UWB, RFID
Antenna Type	WLAN / Bluetooth/ RFID: LDS Antenna NFC: Loop Antenna UWB: PIFA Antenna
Power Reduction	Not Support
Dynamic Antenna	Not Support

1.4. MAXIMUM CONDUCTED POWER

The maximum conducted average power including tune-up tolerance is shown as below.

➢ **2.4GHz WLAN**

Mode	Maximum conducted average power (dBm)		
	Ant. 5	Ant. 6	Total
802.11b	16.0	16.0	N/A
802.11g	15.5	15.5	N/A
802.11n-HT20	13.0	11.0	15.0
802.11n-HT40	12.5	12.0	15.0
802.11ax-HE20_SU	12.5	11.5	15.0
802.11ax-HE40_SU	12.5	11.5	15.0

➢ **5GHz WLAN**

Test Mode	RU&Index	Freq. [MHz]	Maximum conducted average power (dBm)		
			Ant. 5	Ant. 6	Total
802.11a	---	5180	13.50	13.50	N/A
802.11a	---	5200			
802.11a	---	5240			
802.11a	---	5260	13.50	13.50	N/A
802.11a	---	5280			
802.11a	---	5320			
802.11a	---	5500	13.50	13.50	N/A
802.11a	---	5600			
802.11a	---	5700			
802.11a	---	5745	13.50	13.50	N/A
802.11a	---	5785			
802.11a	---	5825			
802.11n20	---	5180	11.50	8.50	13.00
802.11n20	---	5200			
802.11n20	---	5240			
802.11n20	---	5260	11.00	10.00	13.00
802.11n20	---	5280			
802.11n20	---	5320			
802.11n20	---	5500	11.00	9.50	13.00
802.11n20	---	5600			
802.11n20	---	5700			
802.11n20	---	5745	11.50	9.50	13.00
802.11n20	---	5785			
802.11n20	---	5825			
802.11n40	---	5190	11.00	8.00	12.50
802.11n40	---	5230			
802.11n40	---	5270	10.50	9.00	12.50
802.11n40	---	5310			
802.11n40	---	5510	11.00	9.00	12.50
802.11n40	---	5590			
802.11n40	---	5670			
802.11n40	---	5755	10.50	8.50	12.50
802.11n40	---	5795			
802.11ac20	---	5180	11.50	8.00	13.00
802.11ac20	---	5200			
802.11ac20	---	5240			
802.11ac20	---	5260	10.50	10.00	13.00
802.11ac20	---	5280			
802.11ac20	---	5320			
802.11ac20	---	5500	11.50	10.00	13.00
802.11ac20	---	5600			
802.11ac20	---	5700			
802.11ac20	---	5745	11.50	9.50	13.00
802.11ac20	---	5785			
802.11ac20	---	5825			
802.11ac40	---	5190	11.00	8.00	12.50

Test Mode	RU&Index	Freq. [MHz]	Maximum conducted average power (dBm)		
			Ant. 5	Ant. 6	Total
802.11ac40	---	5230			
802.11ac40	---	5270	10.50	9.50	12.50
802.11ac40	---	5310			
802.11ac40	---	5510	11.00	9.00	12.50
802.11ac40	---	5590			
802.11ac40	---	5670			
802.11ac40	---	5755	10.50	9.00	12.50
802.11ac40	---	5795			
802.11ac80	---	5210	11.00	7.50	12.50
802.11ac80	---	5290	10.00	8.50	12.50
802.11ac80	---	5530	10.50	9.00	12.50
802.11ac80	---	5610			
802.11ac80	---	5775	10.50	8.00	12.50
802.11ac160	---	5250	10.50	8.00	12.50
802.11ac160	---	5570	10.00	8.50	12.50
802.11ax20	SU	5180	11.00	8.00	12.50
802.11ax20	SU	5200			
802.11ax20	SU	5240			
802.11ax20	SU	5260	10.50	9.50	12.50
802.11ax20	SU	5280			
802.11ax20	SU	5320			
802.11ax20	SU	5500	11.00	9.50	12.50
802.11ax20	SU	5600			
802.11ax20	SU	5700			
802.11ax20	SU	5745	11.00	8.50	12.50
802.11ax20	SU	5785			
802.11ax20	SU	5825			
802.11ax40	SU	5190	11.00	8.00	12.50
802.11ax40	SU	5230			
802.11ax40	SU	5270	10.50	9.50	12.50
802.11ax40	SU	5310			
802.11ax40	SU	5510	11.00	9.50	12.50
802.11ax40	SU	5590			
802.11ax40	SU	5670			
802.11ax40	SU	5755	10.50	9.00	12.50
802.11ax40	SU	5795			
802.11ax80	SU	5210	11.00	8.00	12.50
802.11ax80	SU	5290	10.00	8.50	12.50
802.11ax80	SU	5530	10.50	9.00	12.50
802.11ax80	SU	5610			
802.11ax80	SU	5775	10.00	8.00	12.50
802.11ax160	SU	5250	10.50	8.00	12.50
802.11ax160	SU	5570	10.00	9.00	12.50

➢ **Bluetooth**

Mode	Modulation	Maximum conducted average power (dBm)
BR + EDR	GFSK	7.5
	π/4-DQPSK	4.0
	8-DPSK	4.0
LE	GFSK	2.5
2LE	GFSK	-0.5
LE Code (125k)	GFSK	3.5
LE Code (500k)	GFSK	2.0
2nd BLE	GFSK	2.0

➢ **RFID**

Mode	Modulation	Channel	Maximum Conducted Avg. Power (dBm)
RFID	ASK	1	19.5
		25	19.5
		50	19.5

➢ **UWB**

Channel	Maximum mean e.i.r.p.
Channel 9	-48.0 dBm/MHz

➢ **NFC**

Frequency (MHz)	Maximum Field Strength
13.56	58.0 dBμV/m at 3 meter

1.5. OTHER INFORMATION

None.

1.6. TEST LOCATION

Shenzhen UnionTrust Quality and Technology Co., Ltd.

Address: 16/F., Block A, Building 6, Baoneng Science and Technology Park, Longhua Street, Longhua District, Shenzhen, Guangdong, China
Telephone: +86 (0) 755 2823 0888
Fax: +86 (0) 755 2823 0886

1.7. TEST FACILITY

The test facility is recognized, certified, or accredited by the following organizations:

Shenzhen UnionTrust Quality and Technology Co., Ltd.

CNAS-Lab Code: L9069
The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and is traceable under the ISO/IEC 17025 to international or national standards. Equipment has been calibrated by accredited calibration laboratories.

A2LA-Lab Certificate No.: 4312.01
Shenzhen UnionTrust Quality and Technology Co., Ltd. has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

ISED Wireless Device Testing Laboratories
CAB identifier: CN0032

FCC Accredited Lab.
Designation Number: CN1194
Test Firm Registration Number: 259480

1.8. GUIDANCE STANDARD

The tests documented in this report were performed in accordance with FCC 47 CFR Part 2 §2.1093, IEEE Std 1528-2013, ANSI/IEEE C95.1-1992, the following FCC Published RF exposure KDB procedures:

1. 248227 D01 802.11 Wi-Fi SAR v02r02
2. 447498 D04 General RF Exposure Guidance v06
3. 648474 D04 Handset SAR v01r03
4. 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
5. 865664 D02 RF Exposure Reporting v01r02
6. 941225 D06 Hotspot Mode v02r01
7. 775926 D01 SAR Testing for Irregular Shaped Devices v01

2. SPECIFIC ABSORPTION RATE (SAR)

2.1. INTRODUCTION

SAR is related to the rate at which energy is absorbed per unit mass in an object exposed to a radio field. The SAR distribution in a biological body is complicated and is usually carried out by experimental techniques or numerical modeling, by appropriate techniques, to produce specific absorption rates (SARs) as averaged over the whole-body, any 1 g or any 10 g of tissue (defined as a tissue volume in the shape of a cube). All SAR values are to be averaged over any six-minute period. When portable device was used within 20 cm of the user's body, SAR evaluation of the device will be required. The SAR limit in chapter 2.3.

2.2. SAR DEFINITION

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

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

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

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

Where: σ is the conductivity of the tissue, ρ is the mass density of the tissue and E is the RMS electrical field strength.

2.3. SAR LIMITS

Limits for Occupational/Controlled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.4	8.0	20.0

Limits for General Population/Uncontrolled Exposure (W/kg)

Whole-Body	Partial-Body	Hands, Wrists, Feet and Ankles
0.08	1.6	4.0

Note:

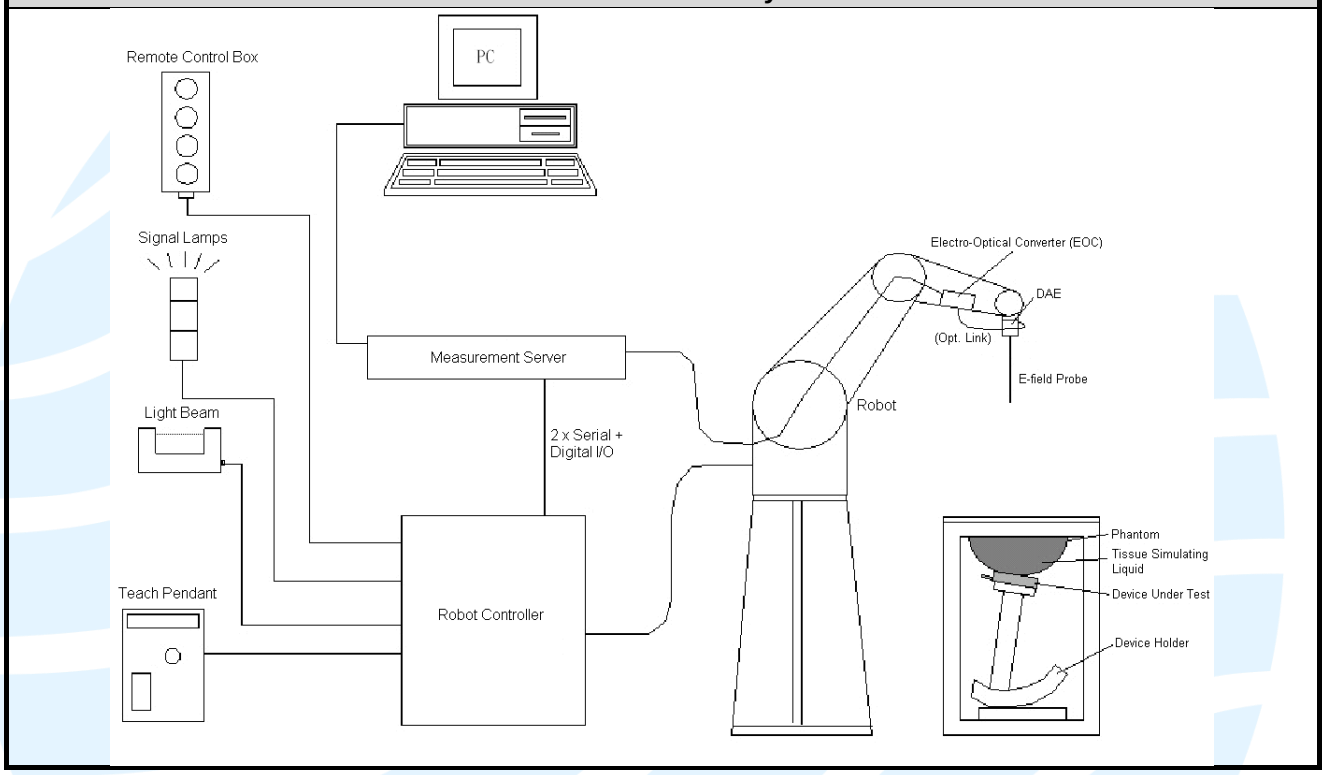
1) Whole-Body SAR is averaged over the entire body, partial-body SAR is averaged over any 1 gram of tissue defined as a tissue volume in the shape of a cube. SAR for hands, wrists, feet and ankles is averaged over any 10 grams of tissue defined as a tissue volume in the shape of a cube.
2) At frequencies above 6.0 GHz, SAR limits are not applicable and MPE limits for power density should be applied at 5 cm or more from the transmitting device.
3) The SAR limit is specified in FCC 47 CFR Part 2 §2.1093, ANSI/IEEE C95.1-1992.

3. SAR MEASUREMENT SYSTEM

3.1. SPEAG DASY SYSTEM

DASY system consists of high precision robot, probe alignment sensor, phantom, robot controller, controlled measurement server and near-field probe. The robot includes six axes that can move to the precision position of the DASY5 software defined. The DASY software can define the area that is detected by the probe. The robot is connected to controlled box. Controlled measurement server is connected to the controlled robot box. The DAE includes amplifier, signal multiplexing, AD converter, offset measurement and surface detection. It is connected to the Electro-optical coupler (ECO). The ECO performs the conversion form the optical into digital electric signal of the DAE and transfers data to the PC.

DASY Measurement System



3.1.1. Robot

The DASY system uses the high precision robots from Stäubli SA (France). For the 6-axis controller system, the robot controller version (DASY5: CS8Cspeag-TX60) from Stäubli is used. The Stäubli robot series have many features that are important for our application:

- High precision (repeatability ±0.02 mm)
- High reliability (industrial design)
- Jerk-free straight movements
- Low ELF interference (the closed metallic construction shields against motor control fields)

3.1.2. Probe

The SAR measurement is conducted with the dosimetric probe. The probe is specially designed and calibrated for use in liquid with high permittivity. The dosimetric probe has special calibration in liquid at different frequency.

Model	EX3DV4	
Construction	Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 6 GHz Linearity: ± 0.2 dB	
Directivity	± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	10 µW/g to 100 mW/g Linearity: ± 0.2 dB (noise: typically < 1 µW/g)	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 2.5 mm (Body: 12 mm) Typical distance from probe tip to dipole centers: 1 mm	

Model	ES3DV3	
Construction	Symmetrical design with triangular core. Interleaved sensors. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE).	
Frequency	10 MHz to 4 GHz Linearity: ± 0.2 dB	
Directivity	± 0.2 dB in HSL (rotation around probe axis) ± 0.3 dB in tissue material (rotation normal to probe axis)	
Dynamic Range	5 µW/g to 100 mW/g Linearity: ± 0.2 dB	
Dimensions	Overall length: 337 mm (Tip: 20 mm) Tip diameter: 3.9 mm (Body: 12 mm) Distance from probe tip to dipole centers: 2.0 mm	

3.1.3. Data Acquisition Electronics (DAE)

Model	DAE3, DAE4	
Construction	Signal amplifier, multiplexer, A/D converter and control logic. Serial optical link for communication with DASY embedded system (fully remote controlled). Two step probe touch detectors for mechanical surface detection and emergency robot stop.	
Measurement Range	-100 to +300 mV (16-bit resolution and two range settings: 4mV, 400mV)	
Input Offset Voltage	< 5µV (with auto zero)	
Input Bias Current	< 50 fA	
Dimensions	60 x 60 x 68 mm	

3.1.4. Phantom

Model	Twin SAM	
Construction	The shell corresponds to the specifications of the Specific Anthropomorphic Mannequin (SAM) phantom defined in IEEE 1528 and IEC 62209-1. It enables the dosimetric evaluation of left and right hand phone usage as well as body mounted usage at the flat phantom region. A cover prevents evaporation of the liquid. Reference markings on the phantom allow the complete setup of all predefined phantom positions and measurement grids by teaching three points with the robot.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2 ± 0.2 mm (6 ± 0.2 mm at ear point)	
Dimensions	Length: 1000 mm Width: 500 mm Height: adjustable feet	
Filling Volume	approx. 25 liters	

Model	ELI	
Construction	Phantom for compliance testing of handheld and body-mounted wireless devices in the frequency range of 30 MHz to 6 GHz. ELI is fully compatible with the IEC 62209-2 standard and all known tissue simulating liquids. ELI has been optimized regarding its performance and can be integrated into our standard phantom tables. A cover prevents evaporation of the liquid. Reference markings on the phantom allow installation of the complete setup, including all predefined phantom positions and measurement grids, by teaching three points. The phantom is compatible with all SPEAG dosimetric probes and dipoles.	
Material	Vinylester, glass fiber reinforced (VE-GF)	
Shell Thickness	2.0 ± 0.2 mm (bottom plate)	
Dimensions	Major axis: 600 mm Minor axis: 400 mm	
Filling Volume	approx. 30 liters	

3.1.5. Device Holder

Model	Mounting Device	
Construction	In combination with the Twin SAM Phantom or ELI4, the Mounting Device enables the rotation of the mounted transmitter device in spherical coordinates. Rotation point is the ear opening point. Transmitter devices can be easily and accurately positioned according to IEC, IEEE, FCC or other specifications. The device holder can be locked for positioning at different phantom sections (left head, right head, flat).	
Material	POM	

Model	Laptop Extensions Kit	
Construction	Simple but effective and easy-to-use extension for Mounting Device that facilitates the testing of larger devices according to IEC 62209-2 (e.g., laptops, cameras, etc.). It is lightweight and fits easily on the upper part of the Mounting Device in place of the phone positioner.	
Material	POM, Acrylic glass, Foam	

3.1.6. System Validation Dipoles

Model	D-Serial	
Construction	Symmetrical dipole with l/4 balun. Enables measurement of feed point impedance with NWA. Matched for use near flat phantoms filled with tissue simulating solutions.	
Frequency	750 MHz to 5800 MHz	
Return Loss	> 20 dB	
Power Capability	> 100 W (f < 1GHz), > 40 W (f > 1GHz)	

3.2. SAR SCAN PROCEDURE

3.2.1. SAR Reference Measurement (drift)

Prior to the SAR test, local SAR shall be measured at a stationary reference point where the SAR exceeds the lower detection limit of the measurement system.

3.2.2. Area Scan

Measurement procedures for evaluating the SAR of wireless device start with a coarse measurement grid to determine the approximate location of the local peak SAR values. This is known as the area-scan procedure. All antennas and radiating structures that may contribute to the measured SAR or influence the SAR distribution must be included in the area scan. The area scan measurement resolution must enable the extrapolation algorithms of the SAR system to correctly identify the peak SAR location(s) for subsequent zoom scan measurements to correctly determine the 1-g SAR. Area scans are performed at a constant distance from the phantom surface, determined by the measurement frequencies. When a measured peak is closer than ½ the zoom scan volume dimension (x, y) from the edge of the area scan region, unless the entire peak and gram-averaging volume are both captured within the zoom scan volume, the area scan must be repeated by shifting and expanding the area scan region to ensure all peaks are away from the area scan boundary. The area scan resolutions specified in the table below must be applied to the SAR measurements.

	≤ 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 scans 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.	

3.2.3. Zoom Scan

To evaluate the peak spatial-average SAR values with respect to 1 g or 10 g cubes, fine resolution volume scans, called zoom scans, are performed at the peak SAR locations identified during the area scan. If the cube volume within the zoom scan chosen to calculate the peak spatial-average SAR touches any boundary of the zoom-scan volume, the zoom scan shall be repeated with the center of the zoom-scan volume shifted to the new maximum SAR location. For any secondary peaks found in the area scan that are within 2 dB of the maximum peak and are not within this zoom scan, the zoom scan shall be performed for such peaks, unless the peak spatial-average SAR at the location of the maximum peak is more than 2 dB below the applicable SAR limit (i.e., 1 W/kg for a 1.6 W/kg 1 g limit, or 1.26 W/kg for a 2 W/kg 10 g limit). The zoom scan resolutions specified in the table below must be applied to the SAR measurements.

			≤ 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·$\Delta Z_{Zoom}(n-1)$ 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

Note: δ is the penetration depth of a plane-wave at normal incidence to the tissue medium; see IEEE Std 1528-2013 for details.

* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB Publication 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.

3.2.4. SAR Drift Measurement

The local SAR (or conducted power) shall be measured at exactly the same location as in 3.2.1 section. The absolute value of the measurement drift (the difference between the SAR measured in 3.2.1 and 3.2.4 section) shall be recorded. The SAR drift shall be kept within ± 5%.

3.3. EQUIPMENT LIST

Equipment	Manufacturer	Model	S/N	Cal. Date	Cal. Interval
System Validation Dipole	SPEAG	D750V3	1066	Jan. 02, 2024	3 Year
System Validation Dipole	SPEAG	D835V2	4d242	Jun. 07, 2024	3 Year
System Validation Dipole	SPEAG	D900V2	136	Mar. 15, 2024	3 Year
System Validation Dipole	SPEAG	D1750V2	1086	Mar. 14, 2024	3 Year
System Validation Dipole	SPEAG	D1900V2	509	Mar. 14, 2024	3 Year
System Validation Dipole	SPEAG	D2450V2	883	Jan.02, 2024	3 Year
System Validation Dipole	SPEAG	D2600V2	1082	Jan.02, 2024	3 Year
System Validation Dipole	SPEAG	D3500V2	1063	Jun. 06, 2024	3 Year
System Validation Dipole	SPEAG	D3700V2	1020	Jun. 06, 2024	3 Year
System Validation Dipole	SPEAG	D5GHzV2	1115	Jun. 02, 2024	3 Year
Data Acquisition Electronics	SPEAG	DAE4	662	Dec. 15, 2025	1 Year
Dosimetric E-Field Probe	SPEAG	ES3DV3	3090	Dec.15, 2025	1 Year
Dosimetric E-Field Probe	SPEAG	EX3DV4	7506	Nov. 28, 2025	1 Year
Wideband Radio Communication Tester	R&S	CMW500	120932	Mar. 20, 2026	1 Year
UXM 5G Wireless Test Platform	KEYSIGHT	E7515B	MY59020226	Mar. 20, 2026	1 Year
ENA Series Network Analyzer	Agilent	8753ES	US39170317	Oct. 24, 2025	1 Year
Phantom Table	SPEAG	QD 000 P40 CB	TP-1335	N/A	N/A
Phantom Table	SPEAG	QD OVA 002 AA	TP-1254	N/A	N/A
Robot controller	STAUBLI	CS8Cspeag-TX60	F13/5R4XC1/C/01	N/A	N/A
Robot	STAUBLI	TX60Lspeag	F13/5R4XC1/A/01	N/A	N/A
Dielectric Assessment Kit	SPEAG	DAK-3.5	1070	N/A	N/A
USB/GPIB Interface	Agilent	82357B	N10149	N/A	N/A
Signal Generator	R&S	SMB100A	103718	Mar. 20, 2026	1 Year
POWER METER	R&S	NRP	101293	Oct. 24, 2025	1 Year
Thermometer	Shanghai Gao Zhi Precision Instrument Co., Ltd.	HB6801	101293	Oct. 29, 2025	1 Year
Dual Directional Coupler	Agilent	778D	MY52180234	Oct. 24, 2025	1 Year
Amplifier	Mini-Circuit	ZHL42	QA1252001	Mar. 20, 2026	1 Year
DC Source	Agilent	66319B	MY43000795	Oct. 24, 2025	1 Year

3.4. 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.

3.5. TISSUE DIELECTRIC PARAMETER MEASUREMENT & SYSTEM VERIFICATION

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.

3.5.1. Tissue Simulating Liquids

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.

The depth of tissue-equivalent liquid in a phantom must be ≥ 15.0 cm with ≤ ± 0.5 cm variation for SAR measurements ≤ 3 GHz and ≥ 10.0 cm with ≤ ± 0.5 cm variation for measurements > 3 GHz. The nominal dielectric values of the tissue simulating liquids in the phantom and the tolerance of 5% are listed in Table-3.1.

Photo of Liquid Height

Tissue Dielectric Parameters for Head and Body				
Target Frequency	Head		Body	
(MHz)	ε_r	σ(S/m)	ε_r	σ(S/m)
750	*41.9*	*0.89*	*55.5*	*0.96*
835	41.5	0.90	55.2	0.97
900	41.5	0.97	55.0	1.05
1450	*40.5*	*1.20*	*54.0*	*1.30*
1640	*40.3*	*1.29*	*53.8*	*1.40*
1750	*40.1*	*1.37*	*53.4*	*1.49*
1800	40.0	1.40	53.3	1.52
1900	40.0	1.40	53.3	1.52
2000	40.0	1.40	53.3	1.52
2300	*39.5*	*1.67*	*52.9*	*1.81*
2450	39.2	1.80	52.7	1.95
2600	*39.0*	*1.96*	*52.5*	*2.16*
3500	*37.9*	*2.91*	*51.3*	*3.31*
5200	*36.0*	*4.66*	*49.0*	*5.30*
5300	*35.9*	*4.76*	*48.9*	*5.42*
5500	*35.6*	*4.96*	*48.6*	*5.65*
5600	*35.5*	*5.07*	*48.5*	*5.77*
5800	35.3	5.27	48.2	6.00
(ε_r = relative permittivity, σ = conductivity and ρ = 1000 kg/m^3)				

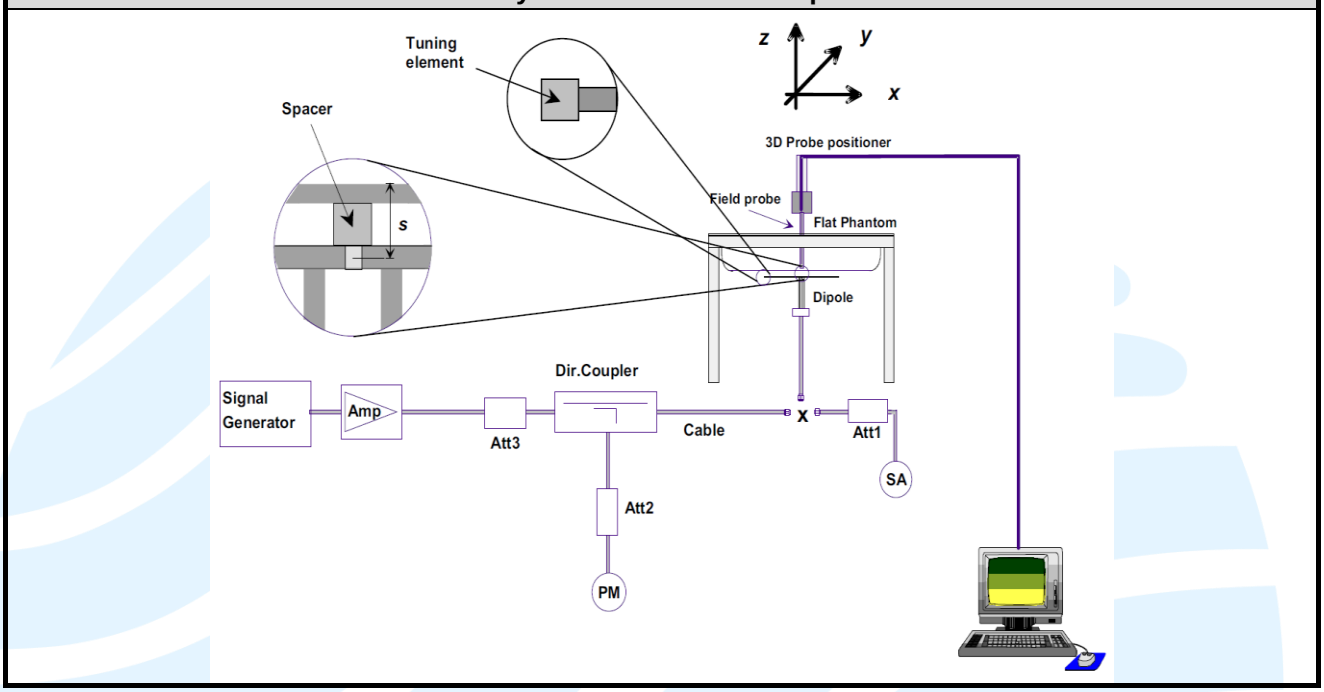
The following table gives the recipes for tissue simulating liquids.

Recipes of Tissue Simulating Liquid								
Tissue Type	Bactericide	DGBE	HEC	NaCl	Sucrose	Triton X-100	Water	Diethylene Glycol Mono-hexylether
H750	0.2	-	0.2	1.4	57.0	-	41.1	-
H835	0.1	-	1.0	1.4	57.0	-	40.5	-
H900	0.1	-	1.0	1.5	56.5	-	40.9	-
H1450	-	45.5	-	0.7	-	-	53.8	-
H1640	-	45.8	-	0.5	-	-	53.7	-
H1750	-	44.5	-	0.3	-	-	55.2	-
H1800	-	44.9	-	0.2	-	-	54.9	-
H1900	-	44.9	-	0.2	-	-	54.9	-
H2000	-	50	-	-	-	-	50	-
H2300	-	44.9	-	0.1	-	-	55.0	-
H2450	-	45.0	-	0.1	-	-	54.9	-
H2600	-	45.1	-	0.1	-	-	54.8	-
H3500	-	8.0	-	0.2	-	20.0	71.8	-
H5G	-	-	-	-	-	17.2	65.52	17.3
B750	0.2	-	0.2	0.8	48.8	-	50.0	-
B835	0.2	-	0.2	0.9	48.5	-	50.2	-
B900	0.2	-	0.2	0.9	48.2	-	50.5	-
B1450	-	34.0	-	0.3	-	-	65.7	-
B1640	-	32.5	-	0.3	-	-	67.2	-
B1750	-	29.4	-	0.4	-	-	70.2	-
B1800	-	29.5	-	0.4	-	-	70.1	-
B1900	-	29.5	-	0.3	-	-	70.2	-
B2000	-	30.0	-	0.2	-	-	69.8	-
B2300	-	31.0	-	0.1	-	-	68.9	-
B2450	-	31.4	-	0.1	-	-	68.5	-
B2600	-	31.8	-	0.1	-	-	68.1	-
B3500	-	28.8	-	0.1	-	-	71.1	-
B5G	-	-	-	-	-	10.7	78.6	10.7

3.5.2. System Check Description

The system check procedure provides a simple, fast, and reliable test method that can be performed daily or before every SAR measurement. The objective here is to ascertain that the measurement system has acceptable accuracy and repeatability. This test requires a flat phantom and a radiating source. The system verification setup is shown as below.

System Verification Setup



3.5.3. Tissue Verification

The measuring results for tissue simulating liquid are shown as below.

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Jun. 03, 2026	Head	900	21.9	0.946	40.694	0.97	41.50	-2.47	-1.94
May 24, 2026	Head	2450	21.7	1.844	39.408	1.80	39.20	2.44	0.53
May 25, 2026	Head	5250	21.6	4.561	37.438	4.71	35.90	-3.16	4.28
May 30, 2026	Head	5600	21.7	4.938	36.734	5.07	35.50	-2.60	3.48
May 30, 2026	Head	5800	21.7	5.145	36.469	5.27	35.30	-2.37	3.31

Verification test

Test Date	Tissue Type	Frequency (MHz)	Liquid Temp. (℃)	Measured Conductivity (σ)	Measured Permittivity (ε_r)	Target Conductivity (σ)	Target Permittivity (ε_r)	Conductivity Deviation (%)	Permittivity Deviation (%)
Jun. 13, 2026	Head	900	21.6	0.947	43.036	0.97	41.50	-2.37	3.70
Jun. 13, 2026	Head	2450	21.6	1.795	38.824	1.80	39.20	-0.28	-0.96
Jun. 13, 2026	Head	5250	21.6	4.579	37.444	4.71	35.90	-2.78	4.30

Note:

The dielectric properties of the tissue simulating liquid must be measured within 24 hours before the SAR testing and within ± 5% of the target values. The variation of the liquid temperature must be within ± 2 °C during the test.

3.5.4. System Verification

The measuring result for system verification is tabulated as below.

Test Date	Tissue Type	Freq. (MHz)	1W Target SAR-1g (W/kg)	1W Target SAR-10g (W/kg)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Normalized to 1W SAR-10g (W/kg)	Deviation 1g(%)	Deviation 10g(%)	Dipole S/N	Probe S/N	DAE S/N
Jun. 03, 2026	Head	900	11.00	7.03	2.680	1.750	10.72	7.00	-2.55	-0.43	136	3090	662
May 24, 2026	Head	2450	53.70	24.80	13.300	6.160	53.20	24.64	-0.93	-0.65	883	3090	662
May 25, 2026	Head	5250	78.60	22.30	8.040	2.330	80.40	23.30	2.29	4.48	1115	7506	662
May 30, 2026	Head	5600	81.90	23.10	7.900	2.230	79.00	22.30	-3.54	-3.46	1115	7506	662
May 30, 2026	Head	5800	78.60	22.00	8.130	2.300	81.30	23.00	3.44	4.55	1115	7506	662

Verification test

Test Date	Tissue Type	Freq. (MHz)	1W Target SAR-1g (W/kg)	1W Target SAR-10g (W/kg)	Measured SAR-1g (W/kg)	Measured SAR-10g (W/kg)	Normalized to 1W SAR-1g (W/kg)	Normalized to 1W SAR-10g (W/kg)	Deviation 1g(%)	Deviation 10g(%)	Dipole S/N	Probe S/N	DAE S/N
Jun. 13, 2026	Head	900	11.00	7.03	2.780	1.810	11.12	7.24	1.09	2.99	136	7506	662
Jun. 13, 2026	Head	2450	53.70	24.80	12.800	5.900	51.20	23.60	-4.66	-4.84	883	7506	662
Jun. 13, 2026	Head	5250	78.60	22.30	7.740	2.220	77.40	22.20	-1.53	-0.45	1115	7506	662

Note:

Comparing to the reference SAR value, the validation data should be within its specification of 10%. The result indicates the system check can meet the variation criterion and the plots can be referred to Appendix A of this report.

4. SAR MEASUREMENT EVALUATION

4.1. EUT CONFIGURATION AND SETTING

Connections between EUT and System Simulator

For WWAN SAR testing, the EUT was linked and controlled by base station emulator. Communication between the EUT and the emulator was established by air link. The distance between the EUT and the communicating antenna of the emulator is larger than 50 cm and the output power radiated from the emulator antenna is at least 30 dB smaller than the output power of EUT. The EUT was set from the emulator to radiate maximum output power during SAR testing.

4.1.1. WLAN Configuration and Testing

In general, various vendor specific external test software and chipset based internal test modes are typically used for SAR measurement. These chipset-based test mode utilities are generally hardware and manufacturer dependent, and often include substantial flexibility to reconfigure or reprogram a device. A Wi-Fi device must be configured to transmit continuously at the required data rate, channel bandwidth and signal modulation, using the highest transmission duty factor supported by the test mode tools for SAR measurement. The test frequencies established using test mode must correspond to the actual channel frequencies. When 802.11 frame gaps are accounted for in the transmission, a maximum transmission duty factor of 92 - 96% is typically achievable in most test mode configurations. A minimum transmission duty factor of 85% is required to avoid certain hardware and device implementation issues related to wide range SAR scaling. In addition, a periodic transmission duty factor is required for current generation SAR systems to measure SAR correctly. The reported SAR must be scaled to 100% transmission duty factor to determine compliance at the maximum tune-up tolerance limit.

According to KDB 248227 D01, this device has installed WLAN engineering testing software which can provide continuous transmitting RF signal. During WLAN SAR testing, this device was operated to transmit continuously at the maximum transmission duty with specified transmission mode, operating frequency, lowest data rate, and maximum output power.

Initial Test Configuration

An initial test configuration is determined for OFDM transmission modes in 2.4 GHz and 5 GHz bands 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. When the same maximum power is specified for multiple transmission modes in a frequency band, the largest channel bandwidth, lowest order modulation, lowest data rate and lowest order 802.11a/g/n/ac mode is used for SAR measurement, on the highest measured output power channel in the initial test configuration, for each frequency band.

Subsequent Test Configuration

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. Additional power measurements may be required to determine if SAR measurements are required for subsequent highest output power channels in a subsequent test configuration. 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.

SAR Test Configuration and Channel Selection

When multiple channel bandwidth configurations in a frequency band have the same specified maximum output power, the initial test configuration is using largest channel bandwidth, lowest order modulation, lowest data rate, and lowest order 802.11 mode (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.

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 or two mid-band channels, the higher frequency (number) channel is selected for SAR measurement.

Test Reduction for U-NII-1 (5.2 GHz) and U-NII-2A (5.3 GHz) Bands

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).

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.

4.1.2. RFID Configuration and Testing

According to KDB 775926 D01v01, When a SAR test exemption is not permitted or when the criteria of section 3.2.1 cannot be met, SAR testing is required to show device compliance. Scanners that are designed to be held in the hand and do not typically transmit continuously require, at a minimum, SAR testing of extremities. Scanners may also contain other radios connected to omnidirectional antennas that transmit more often. If the scanner contain such other radios, body-worn SAR also needs to be evaluated.

Since the duty cycle adopted by RFID(902-928MHz) in actual use does not exceed 48.37%, the reported value is not extrapolated to 100% in this report.

4.1.3. Bluetooth Configuration and Testing

For Bluetooth SAR testing was selected 1Mbps (DH5), due to its highest average power

The Bluetooth duty cycle is 77.33% for Antenna 5, According to 2016 Oct. TCB workshop for Bluetooth SAR consideration and the theoretical duty cycle is 83.3%, Therefore the duty cycle scaling factor 1.08 should be used to calculating the reported SAR.

4.2. EUT TESTING POSITION

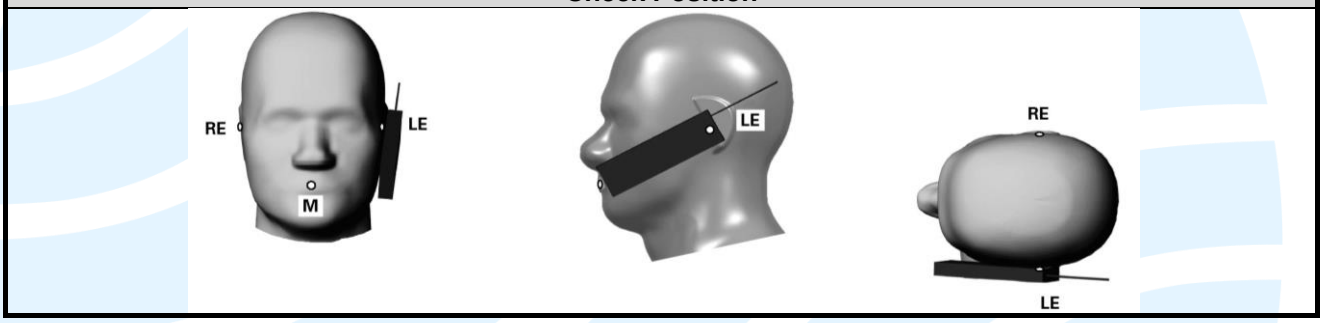
4.2.1. Head Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Head	Right Cheek	0 cm	N/A
	Right Tilted		
	Left Cheek		
	Left Tilted		

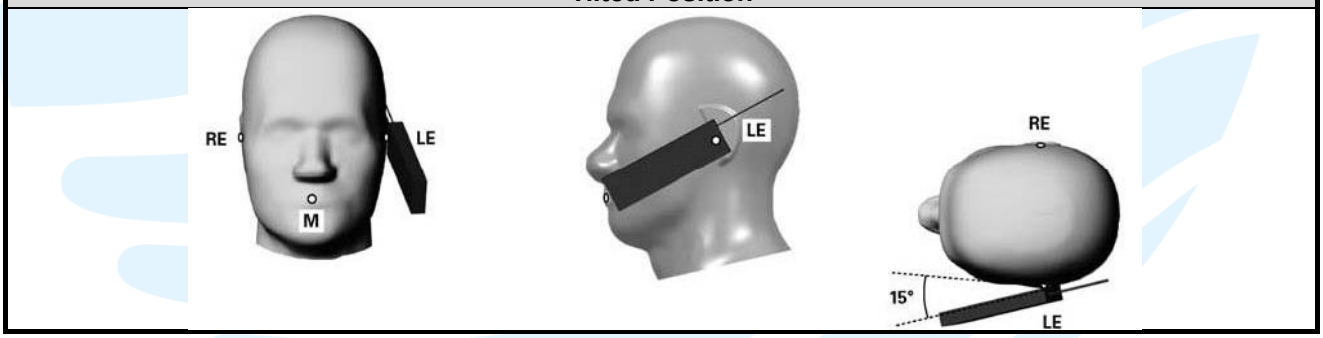
Note:

1) Head exposure for voice mode of handset is limited to next to the ear exposure conditions.
2) Devices that are designed to transmit next to the ear must be tested using the SAM phantom.
3) Other head exposure conditions, for example, in-front-of the face, should be tested using a flat phantom according to the required published RF exposure KDB procedures.
4) When data mode operates in next to the ear configurations, either data alone or in conjunction with voice transmissions, SAR evaluation is required for such use conditions.
5) When device supports VoIP, SAR evaluation for head Exposure Conditions using the most appropriate wireless data mode configurations is required.

Cheek Position



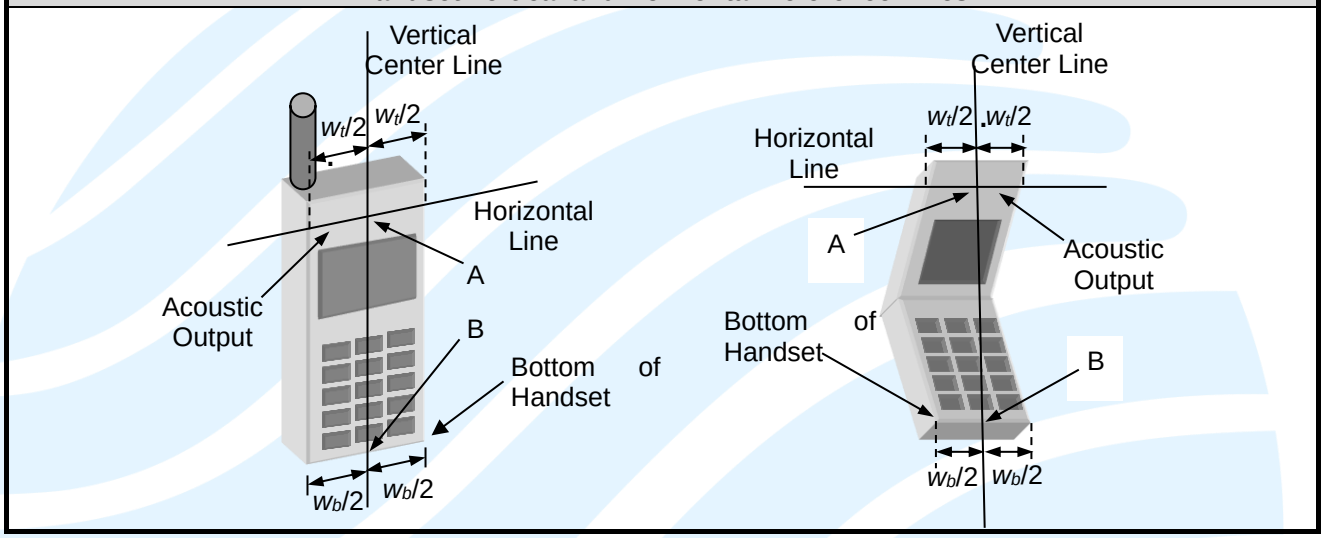
Tilted Position



Define two imaginary lines on the handset

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

Handset Vertical and Horizontal Reference Lines

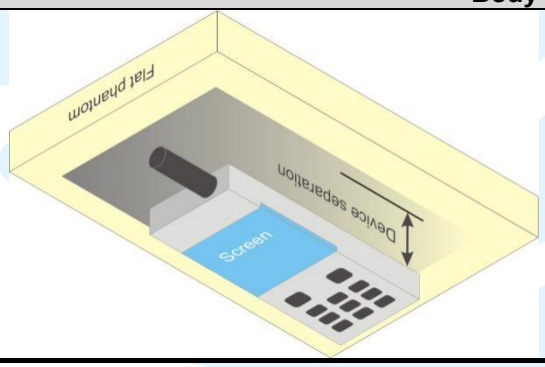
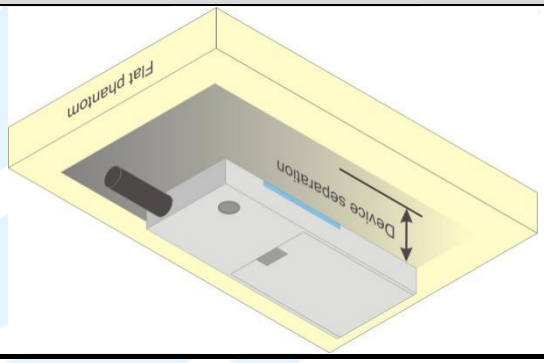


4.2.2. Body-worn Accessory Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Body-worn	Front Face	0 ~ 2.5 cm	N/A
	Rear Face		

Note:

1) Body-worn accessories that do not contain metallic or conductive components may be tested according to worst-case exposure configurations, typically according to the smallest test separation distance required for the group of body-worn accessories with similar operating and exposure characteristics. All body-worn accessories containing metallic components are tested in conjunction with the host device.
2) Body-worn accessory SAR compliance is based on a single minimum test separation distance for all wireless and operating modes applicable to each body-worn accessory used by the host, and according to the relevant voice and/or data mode transmissions and operations. If a body-worn accessory supports voice only operations in its normal and expected use conditions, testing of data mode for body-worn compliance is not required.
3) A conservative minimum test separation distance for supporting off-the-shelf body-worn accessories that may be acquired by users of consumer handsets should be used to test for body-worn accessory SAR compliance. This distance is determined by the handset manufacturer according to the typical body-worn accessories users may acquire at the time of equipment certification, but not more than 2.5 cm, to enable users to purchase aftermarket body-worn accessories with the required minimum separation.
4) Devices that are designed to operate on the body of users using lanyards and straps or without requiring additional body-worn accessories must be tested for SAR compliance using a conservative minimum test separation distance ≤ 5 mm to support compliance.
5) When device supports VoIP, SAR evaluation for body-worn accessory Exposure Conditions using the most appropriate wireless data mode configurations is required.
6) Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in body-worn accessories.
7) When the reported SAR for a body-worn accessory, measured without a headset connected to the handset, is > 1.2 W/kg, the highest reported SAR configuration for that wireless mode and frequency band should be repeated for the body-worn accessory with a headset attached to the handset.

Body Worn Position	
	

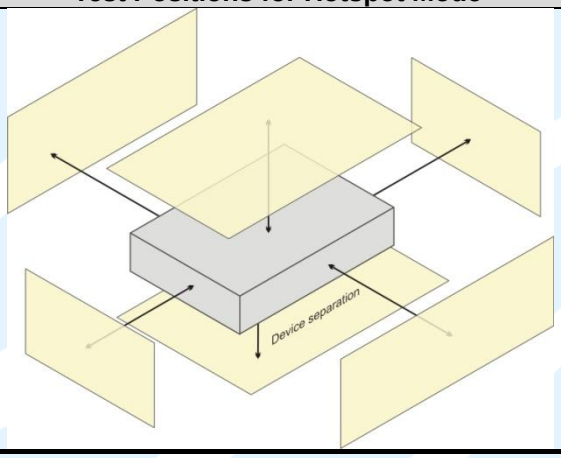
4.2.3. Hotspot Accessory Exposure Conditions

RF Exposure Conditions	Test Position	Separation Distance	SAR test exclusion
Hotspot	Front Face	1 cm	Note 2/3
	Rear Face		
	Left Side		
	Right Side		
	Top Side		
	Bottom Side		

Note:

1) The SAR test separation distance for hotspot mode is determined according to device form factor. When the overall length and width of a device is > 9 cm x 5 cm (~3.5” x 2”), a test separation distance of 10 mm is required for hotspot mode SAR measurements. A test separation distance of 5 mm or less is required for smaller devices. The SAR test separation distance for hotspot mode is determined according to device form factor.
2) Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.
3) Based on the antenna location shown on appendix D of this report, the SAR testing required for hotspot mode is listed on section 4.5.1.

Test Positions for Hotspot Mode



4.2.4. Extremity Exposure Conditions

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

a) The normally required head and body-worn accessory SAR test procedures for handsets, including hotspot mode, must be applied.

b) The UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna located at ≤ 25 mm from that surface or edge, in direct contact with a flat phantom, for 10-g extremity SAR according to the body-equivalent tissue dielectric parameters in KDB Publication 865664 D01 to address interactive hand use exposure conditions. The 1-g SAR at 5 mm for UMPC mini-tablets is not required. When hotspot mode applies, 10-g extremity SAR is required only for the surfaces and edges with hotspot mode 1-g reported SAR > 1.2 W/kg. however, when power reduction applies to hotspot mode the measured SAR must be scaled to the maximum output power, including tolerance, allowed for phablet modes to compare with the 1.2 W/kg SAR test reduction threshold. The normal tablet procedures in KDB Publication 616217 are required when the overall diagonal dimension of the device is > 20.0 cm. Hotspot mode SAR is not required when normal tablet procedures are applied. Extremity 10-g SAR is also not required for the front (top) surface of larger form factor full size tablets. The more conservative normal tablet SAR results can be used to support phablet mode 10-g extremity SAR.

4.3. MEASURED CONDUCTED POWER RESULT

4.3.1. Conducted Power of WLAN

The measuring conducted average power is shown as below.

Test Mode	RU&Index	Freq. [MHz]	Corr'd Average power Result [dBm]		
			Ant. 5	Ant. 6	Total
11B	---	2412	15.23	15.35	--
11B	---	2437	15.15	15.34	--
11B	---	2462	15.55	15.66	--
11G	---	2412	14.68	15.23	--
11G	---	2437	13.92	14.54	--
11G	---	2462	15.11	15.17	--
11N20MIMO	---	2412	12.22	10.39	14.41
11N20MIMO	---	2437	11.78	10.38	14.15
11N20MIMO	---	2462	12.72	10.35	14.71
11N40MIMO	---	2422	11.54	11.31	14.44
11N40MIMO	---	2437	11.72	11.22	14.49
11N40MIMO	---	2452	11.88	11.21	14.57
11AX20MIMO	SU	2412	12.01	10.29	14.24
11AX20MIMO	SU	2437	11.66	10.27	14.03
11AX20MIMO	SU	2462	11.86	10.88	14.41
11AX40MIMO	SU	2422	11.30	11.03	14.18
11AX40MIMO	SU	2437	11.86	11.13	14.52
11AX40MIMO	SU	2452	11.58	10.84	14.24

Test Mode	RU&Index	Freq. [MHz]	Corr'd Value (dBm)		
			Ant. 5	Ant. 6	Total
11A	---	5180	13.13	12.62	--
11A	---	5200	13.15	13.01	--
11A	---	5240	13.21	12.98	--
11A	---	5260	13.01	13.02	--
11A	---	5280	13.07	13.14	--
11A	---	5320	13.13	12.97	--
11A	---	5500	13.02	12.85	--
11A	---	5600	12.98	13.22	--
11A	---	5700	12.83	12.81	--
11A	---	5745	13.08	12.80	--
11A	---	5785	13.19	12.93	--
11A	---	5825	12.95	13.11	--
11N20MIMO	---	5180	10.81	7.66	12.52
11N20MIMO	---	5200	10.67	7.71	12.45
11N20MIMO	---	5240	10.92	8.05	12.73
11N20MIMO	---	5260	10.10	8.17	12.25
11N20MIMO	---	5280	10.35	8.73	12.63
11N20MIMO	---	5320	9.51	9.44	12.49
11N20MIMO	---	5500	9.53	9.21	12.38
11N20MIMO	---	5600	10.62	7.67	12.40
11N20MIMO	---	5700	10.66	7.33	12.32
11N20MIMO	---	5745	10.88	7.24	12.44
11N20MIMO	---	5785	10.00	8.63	12.38
11N20MIMO	---	5825	10.19	8.91	12.61
11N40MIMO	---	5190	10.27	6.96	11.93
11N40MIMO	---	5230	10.36	7.28	12.10
11N40MIMO	---	5270	9.92	7.98	12.07
11N40MIMO	---	5310	8.96	8.68	11.83
11N40MIMO	---	5510	8.82	8.58	11.71
11N40MIMO	---	5590	9.97	7.04	11.76
11N40MIMO	---	5670	10.29	6.85	11.91
11N40MIMO	---	5755	10.07	7.28	11.91

Test Mode	RU&Index	Freq. [MHz]	Corr'd Value (dBm)		
			Ant. 5	Ant. 6	Total
11N40MIMO	---	5795	9.45	7.77	11.70
11AC20MIMO	---	5180	10.79	7.66	12.51
11AC20MIMO	---	5200	10.58	7.64	12.36
11AC20MIMO	---	5240	10.45	7.60	12.27
11AC20MIMO	---	5260	10.17	8.13	12.28
11AC20MIMO	---	5280	10.03	8.67	12.41
11AC20MIMO	---	5320	9.36	9.37	12.38
11AC20MIMO	---	5500	9.43	9.68	12.57
11AC20MIMO	---	5600	10.66	7.74	12.45
11AC20MIMO	---	5700	10.78	7.70	12.52
11AC20MIMO	---	5745	10.90	7.56	12.55
11AC20MIMO	---	5785	10.55	8.59	12.69
11AC20MIMO	---	5825	10.18	8.88	12.59
11AC40MIMO	---	5190	10.36	7.01	12.01
11AC40MIMO	---	5230	10.41	7.50	12.20
11AC40MIMO	---	5270	10.01	8.16	12.19
11AC40MIMO	---	5310	9.14	8.90	12.03
11AC40MIMO	---	5510	8.92	8.67	11.81
11AC40MIMO	---	5590	10.43	7.52	12.22
11AC40MIMO	---	5670	10.59	6.82	12.11
11AC40MIMO	---	5755	10.20	6.74	11.82
11AC40MIMO	---	5795	9.67	8.48	12.13
11AC80MIMO	---	5210	10.30	6.79	11.90
11AC80MIMO	---	5290	9.75	8.12	12.02
11AC80MIMO	---	5530	9.45	8.69	12.10
11AC80MIMO	---	5610	10.19	7.89	12.20
11AC80MIMO	---	5775	9.85	7.65	11.90
11AC160MIMO	---	5250	10.13	7.57	12.05
11AC160MIMO	---	5570	9.51	7.81	11.75
11AX20MIMO	SU	5180	10.41	7.08	12.07
11AX20MIMO	SU	5200	10.23	7.27	12.01
11AX20MIMO	SU	5240	10.21	7.61	12.11
11AX20MIMO	SU	5260	9.80	8.12	12.05
11AX20MIMO	SU	5280	9.96	8.27	12.21
11AX20MIMO	SU	5320	9.11	8.98	12.06
11AX20MIMO	SU	5500	8.71	8.78	11.76
11AX20MIMO	SU	5600	10.28	7.19	12.01
11AX20MIMO	SU	5700	10.48	7.00	12.09
11AX20MIMO	SU	5745	10.42	6.71	11.96
11AX20MIMO	SU	5785	9.61	7.71	11.77
11AX20MIMO	SU	5825	9.29	8.03	11.72
11AX40MIMO	SU	5190	10.29	7.03	11.97
11AX40MIMO	SU	5230	10.08	7.45	11.97
11AX40MIMO	SU	5270	9.97	8.35	12.25
11AX40MIMO	SU	5310	9.29	9.18	12.25
11AX40MIMO	SU	5510	9.36	8.80	12.10
11AX40MIMO	SU	5590	10.30	7.42	12.10
11AX40MIMO	SU	5670	10.29	6.88	11.92
11AX40MIMO	SU	5755	9.98	7.04	11.76
11AX40MIMO	SU	5795	9.66	8.51	12.13
11AX80MIMO	SU	5210	10.56	7.30	12.24
11AX80MIMO	SU	5290	9.59	8.02	11.89
11AX80MIMO	SU	5530	8.91	8.63	11.78
11AX80MIMO	SU	5610	10.17	7.33	11.99
11AX80MIMO	SU	5775	9.75	7.60	11.82
11AX160MIMO	SU	5250	10.18	7.62	12.10
11AX160MIMO	SU	5570	9.44	8.45	11.98

4.3.2. Conducted Power of BT

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
BR + EDR	GFSK	0	2402	6.86
		39	2441	6.96
		78	2480	7.23
	π/4-DQPSK	0	2402	3.34
		39	2441	3.41
		78	2480	3.63
	8-DPSK	0	2402	3.35
		39	2441	3.42
		78	2480	3.68

Mode	Modulation	Channel	Frequency (MHz)	Average Power (dBm)
LE	GFSK	0	2402	1.39
		19	2440	1.52
		39	2480	1.95
2LE	GFSK	0	2402	-1.35
		19	2440	-1.22
		39	2480	-0.79
LE Code(125k)	GFSK	0	2402	2.64
		19	2440	2.78
		39	2480	3.23
LE Code(500k)	GFSK	0	2402	1.13
		19	2440	1.25
		39	2480	1.69
2nd BLE	GFSK	0	2402	1.52
		19	2440	1.45
		39	2480	0.94

4.4. SAR TEST EXCLUSION EVALUATIONS

4.4.1. Standalone SAR Test Exclusion Considerations

According to KDB 447498 D04, SAR-based thresholds are derived based on frequency, power, and separation distance of the RF source. The formula defines the thresholds in general for either available maximum time-averaged power or maximum time-averaged ERP, whichever is greater.

The separation distance is the smallest distance from any part of the antenna or radiating structure for all persons, during operation at the applicable ERP. In the case of mobile or portable devices, the separation distance is from the outer housing of the device where it is closest to the antenna.

This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{\text{th}}\ (\text{mW}) = ERP_{20\ \text{cm}}\ (\text{mW}) = \begin{cases} 2040f & 0.3\ \text{GHz} \le f < 1.5\ \text{GHz} \\ 3060 & 1.5\ \text{GHz} \le f \le 6\ \text{GHz} \end{cases} \qquad \text{(B.1)}$$

$$P_{\text{th}}\ (\text{mW}) = \begin{cases} ERP_{20\ \text{cm}}(d/20\ \text{cm})^x & d \le 20\ \text{cm} \\ ERP_{20\ \text{cm}} & 20\ \text{cm} < d \le 40\ \text{cm} \end{cases} \qquad \text{(B.2)}$$

where

$$x = -\log_{10}\left(\frac{60}{ERP_{20\ \text{cm}}\sqrt{f}}\right)$$

f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1).

Table B.2—Example Power Thresholds (mW)

Frequency (MHz)	Distance (mm)									
	5	10	15	20	25	30	35	40	45	50
300	39	65	88	110	129	148	166	184	201	217
450	22	44	67	89	112	135	158	180	203	226
835	9	25	44	66	90	116	145	175	207	240
1900	3	12	26	44	66	92	122	157	195	236
2450	3	10	22	38	59	83	111	143	179	219
3600	2	8	18	32	49	71	96	125	158	195
5800	1	6	14	25	40	58	80	106	136	169

Mode	Ant.	Max. time-averaged Power (dBm)	Gain (dBi)	ERP (dBm)	P_{ant} (mW)	Left Side			Right Side			Top Side			Bottom Side		
						Ant. to Surface (cm)	P_{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P_{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P_{th} (mW)	Require SAR Testing ?	Ant. to Surface (cm)	P_{th} (mW)	Require SAR Testing ?
WLAN 2.4G	5	16.0	-2.13	11.72	39.81	0.5	2.73	Yes	2.2	45.84	No	0.5	2.73	Yes	13.1	1367.69	No
	6	16.0	0.12	13.97	39.81	5.7	280.66	No	0.5	2.73	Yes	0.5	2.73	Yes	13.2	1387.63	No
	5+6	15.0	2.08	17.08	51.05	0.5	2.73	Yes	0.5	2.73	Yes	0.5	2.73	Yes	13.1	1367.69	No
WLAN 5G	5	13.5	0.42	11.77	22.39	0.5	1.37	Yes	2.2	30.34	No	0.5	1.37	Yes	13.1	1263.65	No
	6	13.5	0.97	12.32	22.39	5.7	221.94	No	0.5	1.37	Yes	0.5	1.37	Yes	13.2	1283.89	No
	5+6	13.0	3.71	16.71	46.88	0.5	1.37	Yes	0.5	1.37	Yes	0.5	1.37	Yes	13.1	1263.65	No
Bluetooth	5	7.5	-2.13	3.22	5.62	0.5	2.72	Yes	2.2	45.68	No	0.5	2.72	Yes	13.1	1366.78	No
2nd BLE	8	2.0	-4.57	-4.72	1.58	1.8	31.17	No	2.1	41.81	No	3.1	87.79	No	12.5	1250.01	No
RFID	5	19.5	-3.09	14.26	89.13	0.5	7.97	Yes	2.2	71.74	Yes	0.5	7.97	Yes	13.1	1010.88	No

Note:

1) Based on the antenna location shown on appendix D of this report for SAR test exclusion.
2) The 1 mW Blanket Exemption applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power of no more than 1 mW, regardless of separation distance.

4.4.2. Estimated SAR Calculation

According to KDB 447498 D04, when an antenna qualifies for test exemption in single transmitter/antenna mode, its actual SAR value may not be available, because it was not required to be measured. In this case, the SAR contribution of that antenna to simultaneous transmission must be estimated relative to the SAR or MPE based exemption criteria for the applicable terms in the equation of § 1.1307(b)(3(ii)(B) (see also Appendix C), by multiplying the corresponding ratio by the SAR limit of 1.6 W/kg for 1-g SAR. This is referred to as estimated SAR.

For instance, a given antenna may qualify for a SAR-based exemption according to Section B.4, with $P_{ant} < P_{th}$, where Pant is maximum time-averaged power or effective radiated power (ERP), whichever is greater, and P_{th} is defined in Formula (B.2). Then, per the preceding paragraph, the estimated SAR is computed as $SAR_{est} = 1.6\ P_{ant} / P_{th}$ [W/kg].

Mode / Band	Ant.	Freq. (GHz)	P_{ant} (mW)	Ant. to Surface (cm)	P_{th} (mW)	Test Position	Estimated 1g SAR (W/kg)
WLAN 2.4G	5	2462	39.81	2.2	45.84	Right Side	1.390
WLAN 2.4G	5	2462	39.81	13.1	1367.69	Bottom Side	0.047
WLAN 2.4G	6	2462	39.81	5.7	280.66	Left Side	0.227
WLAN 2.4G	6	2462	39.81	13.2	1387.63	Bottom Side	0.046
WLAN 2.4G	5+6	2462	51.05	13.1	1367.69	Bottom Side	0.060
WLAN 5G	5	5825	22.39	2.2	30.34	Right Side	1.181
WLAN 5G	5	5825	22.39	13.1	1263.65	Bottom Side	0.028
WLAN 5G	6	5825	22.39	5.7	221.94	Left Side	0.161
WLAN 5G	6	5825	22.39	13.2	1283.89	Bottom Side	0.028
WLAN 5G	5+6	5825	46.88	13.1	1263.65	Bottom Side	0.059
Bluetooth	5	2480	5.62	2.2	45.68	Right Side	0.197
Bluetooth	5	2480	5.62	13.1	1366.78	Bottom Side	0.007
2nd BLE	8	2480	1.58	1.8	31.17	Left Side	0.081
2nd BLE	8	2480	1.58	2.1	41.81	Right Side	0.060
2nd BLE	8	2480	1.58	3.1	87.79	Top Side	0.029
2nd BLE	8	2480	1.58	12.5	1250.01	Bottom Side	0.002
RFID	5	928	89.13	13.1	1010.88	Bottom Side	0.141

4.5. SAR TESTING RESULTS

4.5.1. SAR Test Reduction Considerations

KDB 447498 D04 General RF Exposure Guidance

Testing of other required channels within the operating mode of a frequency band is not required when the reported SAR for the mid-band or highest output power channel is:

a) ≤ 0.8 W/kg or 2.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≤ 100 MHz
b) ≤ 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
c) ≤ 0.4 W/kg or 1.0 W/kg, for 1-g or 10-g respectively, when the transmission band is ≥ 200 MHz

KDB 941225 D06 Hot Spot SAR

Hotspot mode SAR is measured for all edges and surfaces of the device with a transmitting antenna located within 25 mm from that surface or edge.

Antenna	Front Face	Rear Face	Left Side	Right	Top Side	Bottom Side
WLAN Ant. 5	Yes	Yes	Yes	N/A	Yes	N/A
WLAN Ant. 6	Yes	Yes	N/A	Yes	Yes	N/A

KDB 248227 D01 Wi-Fi SAR

a) For handsets operating next to ear, hotspot mode or mini-tablet configurations, the initial test position procedures were applied. The test position with the highest extrapolated peak SAR will be used as the initial test position. When the reported SAR of initial test position is <= 0.4 W/kg, SAR testing for remaining test positions is not required. Otherwise, SAR is evaluated at the subsequent highest peak SAR positions until the reported SAR result is <= 0.8 W/kg or all test positions are measured.
b) For WLAN 2.4 GHz, the highest measured maximum output power channel for DSSS was selected for SAR measurement. When the reported SAR is <= 0.8 W/kg, no further SAR testing is required. Otherwise, SAR is evaluated at the next highest measured output power channel. When any reported SAR is > 1.2 W/kg, SAR is required for the third channel. For OFDM modes (802.11g/n), SAR is not required when the highest reported SAR for DSSS is adjusted by the ratio of OFDM to DSSS specified maximum output power and it is <= 1.2 W/kg.
c) For WLAN 5 GHz, the initial test configuration was selected according to the transmission mode with the highest maximum output power. When the reported SAR of initial test configuration is > 0.8 W/kg, SAR is required for the subsequent highest measured output power channel until the reported SAR result is <= 1.2 W/kg or all required channels are measured. For other transmission modes, SAR is not required when the highest reported SAR for initial test configuration is adjusted by the ratio of subsequent test configuration to initial test configuration specified maximum output power and it is <= 1.2 W/kg.
d) For WLAN MIMO mode, the power-based standalone SAR test exclusion or the sum of SAR provision in KDB 447498 to determine simultaneous transmission SAR test exclusion should be applied. Otherwise, SAR for MIMO mode will be measured with all applicable antennas transmitting simultaneously at the specified maximum output power of MIMO operation.

4.5.2. SAR Results for Head Exposure Condition

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	2.4GHz	802.11b	Right Cheek	11	5	1	16.0	15.55	1.11	-0.08	0.16	0.177
	2.4GHz	802.11b	Right Tilted	11	5	1	16.0	15.55	1.11	-0.05	0.091	0.101
	2.4GHz	802.11b	Left Cheek	11	5	1	16.0	15.55	1.11	-0.06	0.064	0.071
	2.4GHz	802.11b	Left Tilted	11	5	1	16.0	15.55	1.11	0.07	0.047	0.052
	2.4GHz	802.11b	Right Cheek	11	6	1	16.0	15.66	1.08	0.13	0.308	0.333
	2.4GHz	802.11b	Right Tilted	11	6	1	16.0	15.66	1.08	-0.03	0.191	0.207
28	2.4GHz	802.11b	Left Cheek	11	6	1	16.0	15.66	1.08	0.16	0.735	**0.795**
28-1*	2.4GHz	802.11b	Left Cheek	11	6	1	16.0	15.66	1.08	-0.10	0.662	**0.716**
	2.4GHz	802.11b	Left Tilted	11	6	1	16.0	15.66	1.08	-0.08	0.444	0.480
	2.4GHz	802.11n-HT40	Right Cheek	9	5+6	1	15.0	14.57	1.10	0.05	0.111	0.123
	2.4GHz	802.11n-HT40	Right Tilted	9	5+6	1	15.0	14.57	1.10	0.01	0.068	0.075
	2.4GHz	802.11n-HT40	Left Cheek	9	5+6	1	15.0	14.57	1.10	0.06	0.264	0.291
	2.4GHz	802.11n-HT40	Left Tilted	9	5+6	1	15.0	14.57	1.10	0.09	0.159	0.176
29	U-NII-1	802.11a	Right Cheek	48	5	99.06%	13.5	13.17	1.08	-0.02	0.294	**0.317**
29-1*	U-NII-1	802.11a	Right Cheek	48	5	99.06%	13.5	13.17	1.08	-0.09	0.273	**0.295**
	U-NII-1	802.11a	Right Tilted	48	5	99.06%	13.5	13.17	1.08	0.03	0.253	0.273
	U-NII-1	802.11a	Left Cheek	48	5	99.06%	13.5	13.17	1.08	-0.03	0.227	0.245
	U-NII-1	802.11a	Left Tilted	48	5	99.06%	13.5	13.17	1.08	-0.08	0.213	0.230
	U-NII-1	802.11a	Right Cheek	40	6	99.06%	13.5	12.97	1.13	-0.04	0.018	0.020
	U-NII-1	802.11a	Right Tilted	40	6	99.06%	13.5	12.97	1.13	-0.05	0.022	0.025
	U-NII-1	802.11a	Left Cheek	40	6	99.06%	13.5	12.97	1.13	-0.03	0.031	0.035
	U-NII-1	802.11a	Left Tilted	40	6	99.06%	13.5	12.97	1.13	0.14	0.036	0.041
	U-NII-1	802.11n-HT20	Right Cheek	48	5+6	99.06%	13.0	12.76	1.06	0.06	0.175	0.185
	U-NII-1	802.11n-HT20	Right Tilted	48	5+6	99.06%	13.0	12.76	1.06	0.01	0.151	0.160
	U-NII-1	802.11n-HT20	Left Cheek	48	5+6	99.06%	13.0	12.76	1.06	0.08	0.135	0.143
	U-NII-1	802.11n-HT20	Left Tilted	48	5+6	99.06%	13.0	12.76	1.06	0.06	0.127	0.134
30	U-NII-2A	802.11a	Right Cheek	64	5	99.06%	13.5	13.09	1.10	-0.05	0.188	**0.207**
	U-NII-2A	802.11a	Right Tilted	64	5	99.06%	13.5	13.09	1.10	0.13	0.172	0.189
	U-NII-2A	802.11a	Left Cheek	64	5	99.06%	13.5	13.09	1.10	0.04	0.15	0.165
	U-NII-2A	802.11a	Left Tilted	64	5	99.06%	13.5	13.09	1.10	0.04	0.166	0.182
	U-NII-2A	802.11a	Right Cheek	56	6	99.53%	13.5	13.10	1.10	-0.05	0.029	0.032
	U-NII-2A	802.11a	Right Tilted	56	6	99.53%	13.5	13.10	1.10	0.10	0.046	0.050
	U-NII-2A	802.11a	Left Cheek	56	6	99.53%	13.5	13.10	1.10	-0.01	0.078	0.086
	U-NII-2A	802.11a	Left Tilted	56	6	99.53%	13.5	13.10	1.10	0.02	0.063	0.069

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	U-NII-2A	802.11n-HT20	Right Cheek	56	5+6	99.53%	13.0	12.63	1.09	0.05	0.1	0.109
	U-NII-2A	802.11n-HT20	Right Tilted	56	5+6	99.53%	13.0	12.63	1.09	0.07	0.091	0.099
	U-NII-2A	802.11n-HT20	Left Cheek	56	5+6	99.53%	13.0	12.63	1.09	0.09	0.079	0.086
	U-NII-2A	802.11n-HT20	Left Tilted	56	5+6	99.53%	13.0	12.63	1.09	0.01	0.088	0.096
	U-NII-2C	802.11a	Right Cheek	100	5	99.53%	13.5	12.98	1.13	-0.08	0.096	0.108
31	U-NII-2C	802.11a	Right Tilted	100	5	99.53%	13.5	12.98	1.13	0.11	0.104	**0.117**
	U-NII-2C	802.11a	Left Cheek	100	5	99.53%	13.5	12.98	1.13	0.02	0.089	0.100
	U-NII-2C	802.11a	Left Tilted	100	5	99.53%	13.5	12.98	1.13	0.06	0.098	0.110
	U-NII-2C	802.11a	Right Cheek	120	6	99.53%	13.5	13.18	1.08	0.02	0.034	0.037
	U-NII-2C	802.11a	Right Tilted	120	6	99.53%	13.5	13.18	1.08	0.10	0.053	0.057
	U-NII-2C	802.11a	Left Cheek	120	6	99.53%	13.5	13.18	1.08	-0.01	0.063	0.068
	U-NII-2C	802.11a	Left Tilted	120	6	99.53%	13.5	13.18	1.08	-0.01	0.074	0.080
	U-NII-2C	802.11n-HT20	Right Cheek	120	5+6	99.53%	13.0	12.40	1.15	0.06	0.056	0.064
	U-NII-2C	802.11n-HT20	Right Tilted	120	5+6	99.53%	13.0	12.40	1.15	0.01	0.06	0.069
	U-NII-2C	802.11n-HT20	Left Cheek	120	5+6	99.53%	13.0	12.40	1.15	0.08	0.052	0.060
	U-NII-2C	802.11n-HT20	Left Tilted	120	5+6	99.53%	13.0	12.40	1.15	0.06	0.057	0.065
	U-NII-3	802.11a	Right Cheek	157	5	99.53%	13.5	13.15	1.08	-0.09	0.189	0.205
	U-NII-3	802.11a	Right Tilted	157	5	99.53%	13.5	13.15	1.08	0.05	0.162	0.176
	U-NII-3	802.11a	Left Cheek	157	5	99.53%	13.5	13.15	1.08	-0.01	0.163	0.177
32	U-NII-3	802.11a	Left Tilted	157	5	99.53%	13.5	13.15	1.08	0.03	0.216	**0.234**
	U-NII-3	802.11a	Right Cheek	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11a	Right Tilted	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11a	Left Cheek	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11a	Left Tilted	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11n-HT20	Right Cheek	165	5+6	99.53%	13.0	12.60	1.10	-0.08	0.096	0.105
	U-NII-3	802.11n-HT20	Right Tilted	165	5+6	99.53%	13.0	12.60	1.10	0.01	0.082	0.090
	U-NII-3	802.11n-HT20	Left Cheek	165	5+6	99.53%	13.0	12.60	1.10	0.08	0.082	0.090
	U-NII-3	802.11n-HT20	Left Tilted	165	5+6	99.53%	13.0	12.60	1.10	0.06	0.109	0.120
33	2.4GHz	Bluetooth_DH5	Right Cheek	78	5	77.33%	7.5	7.23	1.06	0.00	0.00577	**0.007**
	2.4GHz	Bluetooth_DH5	Right Tilted	78	5	77.33%	7.5	7.23	1.06	0.00	0.00228	0.003
	2.4GHz	Bluetooth_DH5	Left Cheek	78	5	77.33%	7.5	7.23	1.06	-0.02	0.00372	0.004
	2.4GHz	Bluetooth_DH5	Left Tilted	78	5	77.33%	7.5	7.23	1.06	-0.05	0.00319	0.004
	2.4GHz	Bluetooth_2nd BLE	Right Cheek	0	8	100%	2.0	1.52	1.12	0.00	<0.001	<0.001
	2.4GHz	Bluetooth_2nd BLE	Right Tilted	0	8	100%	2.0	1.52	1.12	0.00	<0.001	<0.001
33-1	2.4GHz	Bluetooth_2nd BLE	Left Cheek	0	8	100%	2.0	1.52	1.12	0.03	0.00235	0.003
	2.4GHz	Bluetooth_2nd BLE	Left Tilted	0	8	100%	2.0	1.52	1.12	0.00	<0.001	<0.001

Note:
1). the data marked with "*" are verification data, used to confirm the differences of the samples.
2). Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

4.5.3. SAR Results for Body-Worn Exposure Condition (Separation Distance is 1.0 cm)

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	2.4GHz	802.11b	Front Face	11	5	100.0%	16.0	15.55	1.11	-0.03	0.035	0.039
	2.4GHz	802.11b	Rear Face	11	5	100.0%	16.0	15.55	1.11	-0.14	0.089	0.099
	2.4GHz	802.11b	Front Face	11	6	100.0%	16.0	15.66	1.08	-0.07	0.19	0.205
61	2.4GHz	802.11b	Rear Face	11	6	100.0%	16.0	15.66	1.08	-0.08	0.231	**0.250**
	2.4GHz	802.11n-HT40	Front Face	9	5+6	100.0%	13.0	12.76	1.06	-0.09	0.07	0.074
	2.4GHz	802.11n-HT40	Rear Face	9	5+6	100.0%	13.0	12.76	1.06	0.01	0.085	0.090
	U-NII-1	802.11a	Front Face	48	5	99.06%	13.5	13.17	1.08	0.02	0.06	0.065
62	U-NII-1	802.11a	Rear Face	48	5	99.06%	13.5	13.17	1.08	0.00	0.229	**0.247**
	U-NII-1	802.11a	Front Face	40	6	99.06%	13.5	12.97	1.13	0.00	0.016	0.018
	U-NII-1	802.11a	Rear Face	40	6	99.06%	13.5	12.97	1.13	-0.04	0.082	0.093
	U-NII-1	802.11n-HT20	Front Face	48	5+6	99.06%	13.0	12.76	1.06	-0.06	0.036	0.038
	U-NII-1	802.11n-HT20	Rear Face	48	5+6	99.06%	13.0	12.76	1.06	0.08	0.136	0.144
	U-NII-2A	802.11a	Front Face	64	5	99.06%	13.5	13.09	1.10	0.00	0.023	0.025
63	U-NII-2A	802.11a	Rear Face	64	5	99.06%	13.5	13.09	1.10	0.00	0.151	**0.166**
	U-NII-2A	802.11a	Front Face	56	6	99.53%	13.5	13.10	1.10	0.00	0.00854	0.009
	U-NII-2A	802.11a	Rear Face	56	6	99.53%	13.5	13.10	1.10	0.00	0.121	0.133
	U-NII-2A	802.11n-HT20	Front Face	56	5+6	99.53%	13.0	12.63	1.09	-0.06	0.012	0.013
	U-NII-2A	802.11n-HT20	Rear Face	56	5+6	99.53%	13.0	12.63	1.09	0.08	0.08	0.087
	U-NII-2C	802.11a	Front Face	100	5	99.53%	13.5	12.98	1.13	0.00	0.034	0.038
	U-NII-2C	802.11a	Rear Face	100	5	99.53%	13.5	12.98	1.13	0.00	0.088	0.099
	U-NII-2C	802.11a	Front Face	120	6	99.53%	13.5	13.18	1.08	0.00	0.012	0.013
64	U-NII-2C	802.11a	Rear Face	120	6	99.53%	13.5	13.18	1.08	0.00	0.2	**0.215**
	U-NII-2C	802.11n-HT20	Front Face	120	5+6	99.53%	13.0	12.40	1.15	0.06	0.00339	0.004
	U-NII-2C	802.11n-HT20	Rear Face	120	5+6	99.53%	13.0	12.40	1.15	0.01	0.057	0.065
	U-NII-3	802.11a	Front Face	157	5	99.53%	13.5	13.15	1.08	0.02	0.081	0.088
65	U-NII-3	802.11a	Rear Face	157	5	99.53%	13.5	13.15	1.08	0.00	0.197	**0.214**
	U-NII-3	802.11a	Front Face	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11a	Rear Face	165	6	99.53%	13.5	13.07	1.10	0.00	0.024	0.026
	U-NII-3	802.11n-HT20	Front Face	165	5+6	99.53%	13.0	12.60	1.10	0.08	0.041	0.045
	U-NII-3	802.11n-HT20	Rear Face	165	5+6	99.53%	13.0	12.60	1.10	0.01	0.1	0.110

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	2.4GHz	Bluetooth_DH5	Front Face	78	5	77.33%	7.5	7.23	1.06	0.00	<0.01	<0.01
66	2.4GHz	Bluetooth_DH5	Rear Face	78	5	77.33%	7.5	7.23	1.06	-0.02	0.00455	**0.005**
66-1	2.4GHz	Bluetooth_2nd BLE	Front Face	0	8	100%	2.0	1.52	1.12	0.06	0.00456	**0.005**
	2.4GHz	Bluetooth_2nd BLE	Rear Face	0	8	100%	2.0	1.52	1.12	-0.11	0.00168	0.002
	902-928MHz	RFID	Front Face	902.75MHz	5	48.37%	19.5	18.90	1.15	0.06	0.224	0.257
67	902-928MHz	RFID	Rear Face	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.01	0.317	**0.364**

Note:

1). the data marked with "*" are verification data, used to confirm the differences of the samples.

2). Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

4.5.4. SAR Results for Hotspot Exposure Condition (Separation Distance is 1.0 cm)

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	2.4GHz	802.11b	Front Face	11	5	100.0%	16.0	15.55	1.11	-0.03	0.035	0.039
	2.4GHz	802.11b	Rear Face	11	5	100.0%	16.0	15.55	1.11	-0.14	0.089	0.099
	2.4GHz	802.11b	Left Side	11	5	100.0%	16.0	15.55	1.11	-0.03	0.102	0.113
	2.4GHz	802.11b	Right Side	11	5	100.0%	16.0	15.55	1.11	-0.02	0.004	0.004
	2.4GHz	802.11b	Top Side	11	5	100.0%	16.0	15.55	1.11	0.02	0.049	0.054
	2.4GHz	802.11b	Front Face	11	6	100.0%	16.0	15.66	1.08	-0.07	0.19	0.205
61	2.4GHz	802.11b	Rear Face	11	6	100.0%	16.0	15.66	1.08	-0.08	0.231	**0.250**
	2.4GHz	802.11b	Left Side	11	6	100.0%	16.0	15.66	1.08	0.01	<0.01	<0.01
	2.4GHz	802.11b	Right Side	11	6	100.0%	16.0	15.66	1.08	0.00	0.127	0.137
61-1	2.4GHz	802.11b	Top Side	11	6	100.0%	16.0	15.66	1.08	-0.01	0.255	**0.276**
61-2*	2.4GHz	802.11b	Top Side	11	6	100.0%	16.0	15.66	1.08	-0.09	0.193	**0.209**
	2.4GHz	802.11n-HT40	Front Face	9	5+6	100.0%	13.0	12.76	1.06	-0.09	0.07	0.074
	2.4GHz	802.11n-HT40	Rear Face	9	5+6	100.0%	13.0	12.76	1.06	0.01	0.085	0.090
	2.4GHz	802.11n-HT40	Left Side	9	5+6	100.0%	13.0	12.76	1.06	0.05	0.044	0.046
	2.4GHz	802.11n-HT40	Right Side	9	5+6	100.0%	13.0	12.76	1.06	0.11	0.047	0.050
	2.4GHz	802.11n-HT40	Top Side	9	5+6	100.0%	13.0	12.76	1.06	0.06	0.094	0.099
	U-NII-1	802.11a	Front Face	48	5	99.06%	13.5	13.17	1.08	0.02	0.06	0.065
62	U-NII-1	802.11a	Rear Face	48	5	99.06%	13.5	13.17	1.08	0.00	0.229	**0.247**
62-1	U-NII-1	802.11a	Left Side	48	5	99.06%	13.5	13.17	1.08	-0.09	0.335	**0.361**
62-2*	U-NII-1	802.11a	Left Side	48	5	99.06%	13.5	13.17	1.08	-0.03	0.345	**0.372**

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	U-NII-1	802.11a	Right Side	48	5	99.06%	13.5	13.17	1.08	0.04	0.007	0.008
	U-NII-1	802.11a	Top Side	48	5	99.06%	13.5	13.17	1.08	-0.03	0.186	0.201
	U-NII-1	802.11a	Front Face	40	6	99.06%	13.5	12.97	1.13	0.00	0.016	0.018
	U-NII-1	802.11a	Left Side	40	6	99.06%	13.5	12.97	1.13	0.01	<0.01	<0.01
	U-NII-1	802.11a	Rear Face	40	6	99.06%	13.5	12.97	1.13	-0.04	0.082	0.093
	U-NII-1	802.11a	Right Side	40	6	99.06%	13.5	12.97	1.13	0.00	0.019	0.021
	U-NII-1	802.11a	Top Side	40	6	99.06%	13.5	12.97	1.13	-0.02	0.047	0.053
	U-NII-1	802.11n-HT20	Front Face	48	5+6	99.06%	13.0	12.76	1.06	-0.06	0.036	0.038
	U-NII-1	802.11n-HT20	Rear Face	48	5+6	99.06%	13.0	12.76	1.06	0.08	0.136	0.144
	U-NII-1	802.11n-HT20	Left Side	48	5+6	99.06%	13.0	12.76	1.06	0.01	0.199	0.210
	U-NII-1	802.11n-HT20	Right Side	48	5+6	99.06%	13.0	12.76	1.06	-0.09	0.00612	0.006
	U-NII-1	802.11n-HT20	Top Side	48	5+6	99.06%	13.0	12.76	1.06	0.05	0.111	0.117
	U-NII-3	802.11a	Front Face	157	5	99.53%	13.5	13.15	1.08	0.02	0.081	0.088
65	U-NII-3	802.11a	Rear Face	157	5	99.53%	13.5	13.15	1.08	0.00	0.197	**0.214**
65-1	U-NII-3	802.11a	Left Side	157	5	99.53%	13.5	13.15	1.08	-0.07	0.203	**0.220**
	U-NII-3	802.11a	Right Side	157	5	99.53%	13.5	13.15	1.08	-0.02	0.006	0.007
	U-NII-3	802.11a	Top Side	157	5	99.53%	13.5	13.15	1.08	-0.04	0.137	0.148
	U-NII-3	802.11a	Front Face	165	6	99.53%	13.5	13.07	1.10	0.00	<0.01	<0.01
	U-NII-3	802.11a	Rear Face	165	6	99.53%	13.5	13.07	1.10	0.00	0.024	0.026
	U-NII-3	802.11a	Left Side	165	6	99.53%	13.5	13.07	1.10	0.03	<0.01	<0.01
	U-NII-3	802.11a	Right Side	165	6	99.53%	13.5	13.07	1.10	0.02	0.022	0.024
	U-NII-3	802.11a	Top Side	165	6	99.53%	13.5	13.07	1.10	0.00	0.022	0.024
	U-NII-3	802.11n-HT20	Front Face	165	5+6	99.53%	13.0	12.60	1.10	0.08	0.041	0.045
	U-NII-3	802.11n-HT20	Rear Face	165	5+6	99.53%	13.0	12.60	1.10	0.01	0.1	0.110
	U-NII-3	802.11n-HT20	Left Side	165	5+6	99.53%	13.0	12.60	1.10	0.09	0.103	0.113
	U-NII-3	802.11n-HT20	Right Side	165	5+6	99.53%	13.0	12.60	1.10	0.06	0.00842	0.009
	U-NII-3	802.11n-HT20	Top Side	165	5+6	99.53%	13.0	12.60	1.10	0.08	0.069	0.076
	2.4GHz	Bluetooth_DH5	Front Face	78	5	77.33%	7.5	7.23	1.06	0.00	<0.01	<0.01
66	2.4GHz	Bluetooth_DH5	Rear Face	78	5	77.33%	7.5	7.23	1.06	-0.02	0.00455	**0.005**
	2.4GHz	Bluetooth_DH5	Left Side	78	5	77.33%	7.5	7.23	1.06	-0.06	0.00471	0.005
	2.4GHz	Bluetooth_DH5	Right Side	78	5	77.33%	7.5	7.23	1.06	0.01	<0.01	<0.01
	2.4GHz	Bluetooth_DH5	Top Side	78	5	77.33%	7.5	7.23	1.06	0.00	<0.01	<0.01
66-1	2.4GHz	Bluetooth_2nd BLE	Front Face	0	8	100%	2.0	1.52	1.12	0.06	0.00456	**0.005**
	2.4GHz	Bluetooth_2nd BLE	Rear Face	0	8	100%	2.0	1.52	1.12	-0.11	0.00168	0.002
	2.4GHz	Bluetooth_2nd BLE	Left Side	0	8	100%	2.0	1.52	1.12	0	<0.001	<0.001
	2.4GHz	Bluetooth_2nd BLE	Right Side	0	8	100%	2.0	1.52	1.12	0	<0.001	<0.001

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-1g (W/kg)	Scaled SAR-1g (W/kg)
	2.4GHz	Bluetooth_2nd BLE	Top Side	0	8	100%	2.0	1.52	1.12	0	<0.001	<0.001
	902-928MHz	RFID	Front Face	902.75MHz	5	48.37%	19.5	18.90	1.15	0.06	0.224	0.257
67	902-928MHz	RFID	Rear Face	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.01	0.317	**0.364**
67-1*	902-928MHz	RFID	Rear Face	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.07	0.353	**0.405**
	902-928MHz	RFID	Left Side	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.12	0.158	0.181
	902-928MHz	RFID	Right Side	902.75MHz	5	48.37%	19.5	18.90	1.15	0.04	0.067	0.077
	902-928MHz	RFID	Top Side	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.02	0.215	0.247

Note:

1). the data marked with "*" are verification data, used to confirm the differences of the samples.

2). Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

4.5.5. SAR Results for Extremity Exposure Condition (Separation Distance is 0 cm)

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-10g (W/kg)	Scaled SAR-10g (W/kg)
	U-NII-2A	802.11a	Front Face	64	5	99.06%	13.5	13.09	1.10	0.00	0.09	0.099
68	U-NII-2A	802.11a	Rear Face	64	5	99.06%	13.5	13.09	1.10	0.00	0.446	**0.490**
68-1*	U-NII-2A	802.11a	Rear Face	64	5	99.06%	13.5	13.09	1.10	0.00	0.483	**0.531**
	U-NII-2A	802.11a	Left Side	64	5	99.06%	13.5	13.09	1.10	-0.05	0.441	0.485
	U-NII-2A	802.11a	Top Side	64	5	99.06%	13.5	13.09	1.10	-0.04	0.189	0.208
	U-NII-2A	802.11a	Front Face	56	6	99.53%	13.5	13.10	1.10	0.00	0.027	0.030
	U-NII-2A	802.11a	Rear Face	56	6	99.53%	13.5	13.10	1.10	0.00	0.232	0.254
	U-NII-2A	802.11a	Right Side	56	6	99.53%	13.5	13.10	1.10	0.00	0.094	0.103
	U-NII-2A	802.11a	Top Side	56	6	99.53%	13.5	13.10	1.10	-0.18	0.214	0.235
	U-NII-2A	802.11n-HT20	Front Face	56	5+6	99.53%	10.4	13.09	0.53	0.09	0.048	0.026
	U-NII-2A	802.11n-HT20	Rear Face	56	5+6	99.53%	13.0	12.63	1.09	-0.04	0.022	0.024
	U-NII-2A	802.11n-HT20	Left Side	56	5+6	99.53%	13.0	12.63	1.09	0.01	0.022	0.024
	U-NII-2A	802.11n-HT20	Right Side	56	5+6	99.53%	13.0	12.63	1.09	0.05	0.037	0.040
	U-NII-2A	802.11n-HT20	Top Side	56	5+6	99.53%	13.0	12.63	1.09	0.06	0.083	0.090
	U-NII-2C	802.11a	Front Face	100	5	99.53%	13.5	12.98	1.13	0.00	0.063	0.071
	U-NII-2C	802.11a	Rear Face	100	5	99.53%	13.5	12.98	1.13	0.00	0.221	0.249
	U-NII-2C	802.11a	Left Side	100	5	99.53%	13.5	12.98	1.13	0.05	0.17	0.192
	U-NII-2C	802.11a	Top Side	100	5	99.53%	13.5	12.98	1.13	0.08	0.127	0.143
	U-NII-2C	802.11a	Front Face	120	6	99.53%	13.5	13.18	1.08	0.00	0.016	0.017

Plot No.	Band	Mode	Test Position	Ch.	Ant.	Duty Cycle	Max. Tune-up Power (dBm)	Measured Conducted Power (dBm)	Scaling Factor	Power Drift (dB)	Measured SAR-10g (W/kg)	Scaled SAR-10g (W/kg)
69	U-NII-2C	802.11a	Rear Face	120	6	99.53%	13.5	13.18	1.08	0.00	0.331	**0.356**
	U-NII-2C	802.11a	Right Side	120	6	99.53%	13.5	13.18	1.08	0.02	0.131	0.141
	U-NII-2C	802.11a	Top Side	120	6	99.53%	13.5	13.18	1.08	0.08	0.172	0.185
	U-NII-2C	802.11n-HT20	Front Face	120	5+6	99.53%	13.0	12.60	1.10	0.01	0.04	0.044
	U-NII-2C	802.11n-HT20	Rear Face	120	5+6	99.53%	13.0	12.60	1.10	-0.04	0.148	0.162
	U-NII-2C	802.11n-HT20	Left Side	120	5+6	99.53%	13.0	12.60	1.10	0.02	0.107	0.117
	U-NII-2C	802.11n-HT20	Right Side	120	5+6	99.53%	13.0	12.60	1.10	0.00	0.059	0.065
	U-NII-2C	802.11n-HT20	Top Side	120	5+6	99.53%	13.0	12.60	1.10	0.12	0.077	0.084
70	902-928MHz	RFID	Front Face	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.10	0.524	**0.602**
70-1*	902-928MHz	RFID	Front Face	902.75MHz	5	48.37%	19.5	18.90	1.15	0.03	0.591	**0.679**
	902-928MHz	RFID	Left Side	902.75MHz	5	48.37%	19.5	18.90	1.15	0.09	0.416	0.478
	902-928MHz	RFID	Right Side	902.75MHz	5	48.37%	19.5	18.90	1.15	-0.02	0.085	0.098

Note:

1). the data marked with "*" are verification data, used to confirm the differences of the samples.

2). Scaled SAR-1g (W/kg) = (Measured SAR-1g (W/kg) x Scaling Factor) / Duty Cycle.

4.6. SAR MEASUREMENT VARIABILITY

4.6.1. Repeated Measurement

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

SAR repeated measurement procedure:

1) When the highest measured SAR is < 0.80 W/kg, repeated measurement is not required.
2) When the highest measured SAR is >= 0.80 W/kg, repeat that measurement once.
3) If the ratio of largest to smallest SAR for the original and first repeated measurements is > 1.20, or when the original or repeated measurement is >= 1.45 W/kg, perform a second repeated measurement.
4) If the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20, and the original, first or second repeated measurement is >= 1.5 W/kg, perform a third repeated measurement.

All the measured SAR are less than 0.8 W/kg, so the repeated measurement is not required.

4.7. SIMULTANEOUS MULTI-BAND TRANSMISSION EVALUATION

4.7.1. Simultaneous Transmission SAR Test Exclusion Considerations

a) Sum of SAR

Simultaneous transmission SAR test exclusion is determined for each operating configuration and exposure condition according to the reported standalone SAR of each applicable simultaneous transmitting antenna. When the sum of SAR1g of all simultaneously transmitting antennas in an operating mode and exposure condition combination is within the SAR limit (SAR1g 1.6 W/kg), the simultaneous transmission SAR is not required. When the sum of SAR1g is greater than the SAR limit (SAR1g 1.6 W/kg), SAR test exclusion is determined by the SPLSR.

b) SAR to Peak Location Separation Ratio

The simultaneous transmitting antennas in each operating mode and exposure condition combination are considered one pair at a time to determine the SPLSR.

$$SPLSR = (SAR_1 + SAR_2)^{1.5}/R_i$$

The ratio is rounded to two decimal digits, and must be ≤ 0.04 for all antenna pairs in the configuration to qualify for 1-g SAR test exclusion. When 10-g SAR applies, the ratio must be ≤ 0.10.
SAR_1 and SAR_2 are the highest reported or estimated SAR values for each antenna in the pair, and R_i is the separation distance in mm between the peak SAR locations for the antenna pair

$$peak\ location\ separation\ distance = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

Where $(x_1,\ y_1,\ z_1)$ and $(x_2,\ y_2,\ z_2)$ are the coordinates of the extrapolated peak SAR locations in the area or zoom scans.
When standalone test exclusion applies, SAR is estimated; the peak location is assumed to be at the feed-point or geometric center of the antenna. Due to curvatures on the SAM phantom, when SAR is estimated for one of the antennas in an antenna pair, the measured peak SAR location will be translated onto the test device to determine the peak location separation for the antenna pair.
When SAR is estimated for both antennas, the peak location separation should be determined by the closest physical separation of the antennas, according to the feed-point or geometric center of the antennas.

c) Volume Scan

When the SPLSR is <= 0.04 for 1-g SAR and <= 0.10 for 10-g SAR, the simultaneous transmission SAR is not required. Otherwise, the enlarged zoom scan and volume scan post-processing procedures will be performed.

4.7.2. Simultaneous Transmission Possibilities

The simultaneous transmission possibilities for this device are listed as below.

Simultaneous Transmission Configurations	Head	Body-worn
BT(Data)+RFID+2nd BLE	No	Yes
BT(Data)+2nd BLE	Yes	Yes
WLAN+RFID+2nd BLE	No	Yes
WLAN+2nd BLE	Yes	Yes
UWB+2nd BLE	No	Yes
UWB+BT(Data)	No	Yes

Note:

1) The 2.4G WLAN, 5G WLAN, 6G WLAN cannot transmit simultaneously.
2) The WLAN and Bluetooth cannot transmit simultaneously, so there is no co-location test requirement for WLAN and Bluetooth.

4.7.3. Max. Standalone SAR

Band	Ant.	Head				Body					
		Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
Bluetooth	5	0.007	0.003	0.004	0.004	0.010	0.005	0.005	0.010	0.010	0.007
2nd BLE	8	0.001	0.001	0.003	0.001	0.005	0.002	0.001	0.001	0.001	0.002
2.4G Wi-Fi	5	0.177	0.101	0.071	0.052	0.039	0.099	0.113	0.004	0.054	0.047
	6	0.333	0.207	0.795	0.480	0.205	0.250	0.010	0.137	0.276	0.046
	5+6	0.123	0.075	0.291	0.176	0.074	0.090	0.046	0.050	0.099	0.060
5G Wi-Fi	5	0.317	0.273	0.245	0.234	0.088	0.247	0.372	0.008	0.201	0.028
	6	0.037	0.057	0.086	0.080	0.018	0.215	0.010	0.024	0.053	0.028
	5+6	0.185	0.160	0.143	0.134	0.045	0.144	0.210	0.009	0.117	0.059
6G Wi-Fi	5+6	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100	0.100
RFID	5	--	--	--	--	0.257	0.405	0.181	0.077	0.247	0.141

4.7.4. Sum of SAR

Sum of SAR	Head				Body					
	Right Cheek	Right Tilted	Left Cheek	Left Tilted	Front Face	Rear Face	Left Side	Right Side	Top Side	Bottom Side
BT(Data)+RFID+2nd BLE	/	/	/	/	0.272	0.412	0.187	0.088	0.258	0.15
BT(Data)+2nd BLE	0.008	0.004	0.007	0.005	0.015	0.007	0.006	0.011	0.011	0.009
WLAN+RFID+2nd BLE	/	/	/	/	0.467	0.657	0.554	0.215	0.524	0.203
WLAN+2nd BLE	0.334	0.274	0.798	0.481	0.21	0.252	0.373	0.138	0.277	0.102
Highest Simultaneous Transmission SAR (W/kg)	**0.798**				**0.657**					

*** End of Report ***

The test report is effective only with both signature and specialized stamp. The result(s) shown in this report refer only to the sample(s) tested. Without written approval of UnionTrust, this report can't be reproduced except in full.

APPENDIX A. SAR PLOTS OF SYSTEM VERIFICATION

The plots for system verification with largest deviation for each SAR system combination are shown as follows.

APPENDIX B. SAR PLOTS OF SAR MEASUREMENT

The SAR plots for highest measured SAR in each exposure configuration, wireless mode and frequency band combination, and measured SAR > 1.5 W/kg are shown as follows.

APPENDIX C. CALIBRATION CERTIFICATE FOR PROBE AND DIPOLE

The calibration certificates are shown as follows.

APPENDIX D. PHOTOGRAPHS OF EUT AND SETUP

The photographs of EUT and setup are shown as follows.