

SAR Test Report

Part 1 of 3

Project Number: 5106021**Quotation Number:** SUW-202301003949**Report Number:** 5106021EMC01**Revision Level:** 0**Client:** Aegex Technologies, LLC**Equipment Under Test:** Tablet**Model Name:** Aegex100M**Model Number:** 100M**FCC ID:** Contains 2AGVY-100MWBXX01**IC:** Contains 21074-100MWBXX01**Applicable Standards:** IEC 62209-1528**Report issued on:** 23 August 2024**Test Result:** Compliant

FOR THE SCOPE OF ACCREDITATION UNDER CERTIFICATE NUMBER: 3212.01

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TABLE 01F CONTENTS

1	SUMMARY OF RESULTS.....	3
2	GENERAL INFORMATION	4
2.1	CLIENT INFORMATION.....	4
2.2	TEST LABORATORY	4
2.3	GENERAL INFORMATION OF EUT	4
2.4	TX FREQUENCY BANDS.....	5
2.5	EQUIPMENT UNDER TEST.....	5
2.6	ANTENNA LOCATION.....	6
2.7	TEST METHODOLOGY AND REFERENCED STANDARDS AND GUIDELINES	6
3	TEST EQUIPMENT AND MEASUREMENT SYSTEM.....	7
3.1	TEST EQUIPMENT – WLAN 2.4 GHz.....	7
3.2	TEST EQUIPMENT – WLAN 5 GHz & BLUETOOTH	8
3.3	MEASUREMENT SYSTEM BLOCK DIAGRAM.....	9
3.4	MEASUREMENT SYSTEM PHANTOM DESCRIPTIONS	10
3.5	MEASUREMENT SYSTEM TISSUE DESCRIPTION	10
4	SYSTEM VALIDATIONS AND VERIFICATIONS.....	10
4.1	SYSTEM VALIDATIONS – WLAN 2.4 GHz.....	10
4.2	SYSTEM VALIDATIONS – WLAN 5 GHz & BLUETOOTH	11
4.3	SYSTEM VERIFICATIONS	12
4.4	TISSUE MEASUREMENT RESULTS	13
5	ENVIRONMENTAL CONDITIONS	14
6	MEASUREMENT PROCEDURES.....	14
6.1	HEAD CONFIGURATION.....	14
6.2	BODY TABLET CONFIGURATION	14
6.3	LIMB CONFIGURATION	14
6.4	SAR PROCEDURES SETUP	15
7	MEASURED OUTPUT POWER MEASUREMENTS.....	16
8	SAR RESULTS.....	17
8.1	WLAN 2.4GHz.....	18
8.2	WLAN 5GHz.....	18
8.3	BLUETOOTH	18
9	VARIABILITY ASSESSMENT.....	19
10	SIMULTANEOUS TRANSMISSION.....	19
10.1	DIRECT SUMMATION AND SPLSR	19
10.2	ENLARGED ZOOM MULTI BAND RESULT	19
11	SYSTEM UNCERTAINTY	19
12	REVISION HISTORY	20

1 SUMMARY OF RESULTS

RF Exposure Conditions	General Population/Uncontrolled		Compliance to RSS – 102, FCC 2.1093
	Localized SAR 1g (Head and Body)	Localized SAR 10g (Extremities)	
	1.6 W/kg	NA	
			Complies

Equipment Class	Band	Highest SAR values (W/kg)				
		Head		Body		Extremity
		1g	10g	1g	10g	10g
DTS	WLAN 2401-2495 MHz	NA	NA	0.55	NA	NA
	WLAN 5150-5895 MHz	NA	NA	0.96	NA	NA
	Bluetooth	NA	NA	0.15	NA	NA
Simultaneous Results		NA	NA	1.03	NA	NA

2 GENERAL INFORMATION

2.1 CLIENT INFORMATION

Name: Aegex Technologies, LLC
Address: 84 Peachtree Street NW
City, State, Zip, Country: Atlanta, Georgia, 30303, USA

2.2 TEST LABORATORY

Name: SGS North America, Inc.
Address: 620 Old Peachtree Road NW, Suite 100
City, State, Zip, Country: Suwanee, GA 30024, USA

2.3 GENERAL INFORMATION OF EUT

Equipment Under Test Tablet
Host Model Name: Aegex100M
Host Model Number: 100M
Sample ID Number: SAR Radiated:
E1232850186
E1232850013
E1232850104
Conducted:
E1231910037

Frequencies of Operation: WLAN 2.4GHz: 2412 – 2484 MHz
WLAN 5GHz: 5160 – 5885 MHz
Bluetooth: 2400 – 2483 MHz

WLAN: 2.4GHz: BPSK, QPSK, 16QAM, 64QAM
5GHz: BPSK, QPSK, 16QAM, 64QAM, 256QAM
Bluetooth: BDR/EDR: GFSK, $\pi/4$ DQPSK, 8DPSK
BLE: GFSK

Maximum Conducted Power: See Section 2.4 of this report

Battery Model: AAEB-100-XX
WLAN Main Antenna Model: X1005 (W3006, Pulse), Ceramic chip 2.4/5GHz dual band
*Antenna Gain: 2.42GHz: 2.0dBi, 5.15GHz: 3.2dBi, 5.51GHz 4.0dBi,
5.85GHz 5.0dBi
WLAN Aux/BT Antenna Model: X1000 (W3095 Pulse), Ceramic chip 2.4/5GHz dual band
*Antenna Gain: 2.4GHz: 1.5dBi, 5.0GHz: 2.9dBi, 5.5GHz 3.9dBi, 6.0GHz 4.3dBi

Dates of testing: WLAN 2.4GHz, 24 January 2024 – 30 January 2024
WLAN 5GHz and Bluetooth, 29 March 2024 – 12 April 2024, 3 May 2024 – 8 May 2024

**Data was not measured by SGS laboratory and therefore not responsible for accuracy. Data obtained via customer, specification sheet, previous regulatory filing or other.*

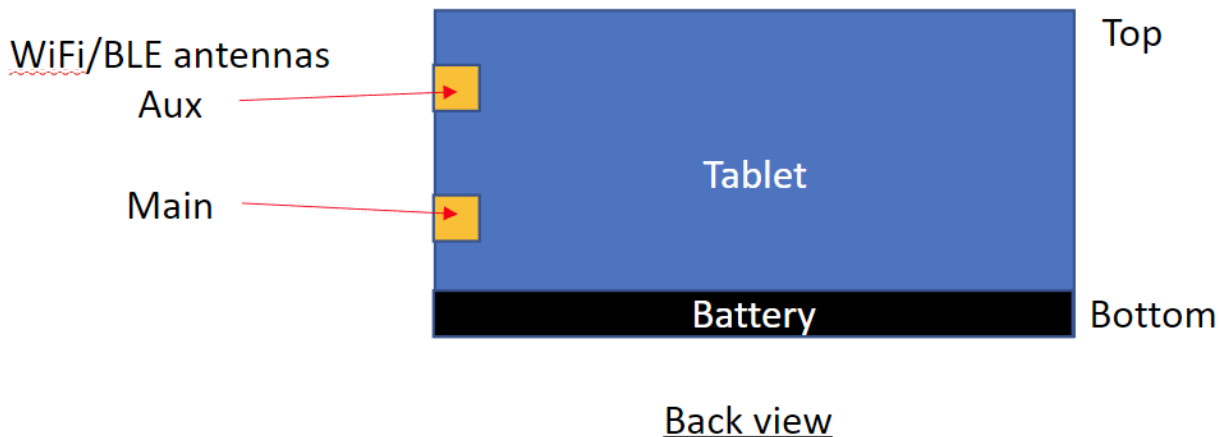
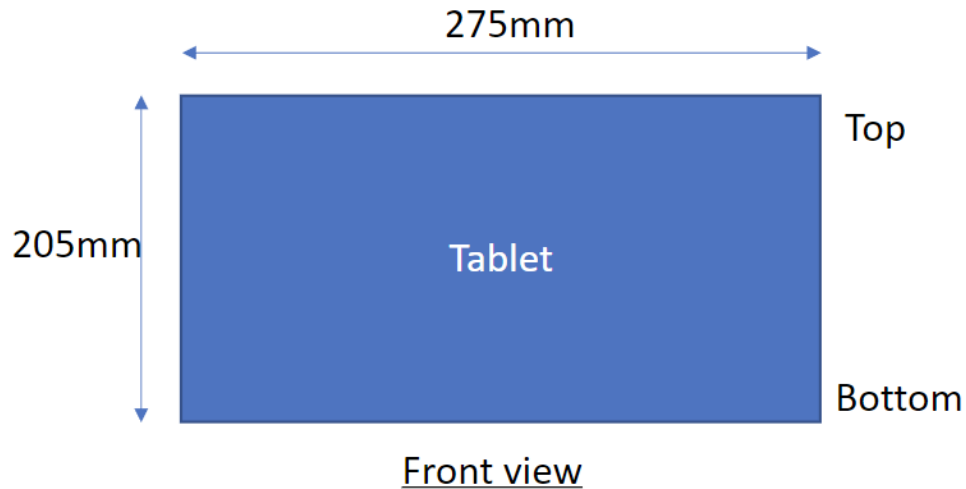
2.4 TX FREQUENCY BANDS

Band / Mode		Frequency Range MHz	Channel Bandwidths MHz	Specified Maximum Power (dBm)
WLAN 2.4GHz	802.11 b/g/n	2412 – 2484	20	16.0
			40	15.5
WLAN 5GHz	802.11 a/n/ac	5160 – 5885	20	10.0
			40	9.5
			80	9.5
Bluetooth	BDR/EDR	2400 - 2483	1, 2	10.86

2.5 EQUIPMENT UNDER TEST

Device Description	Tablet
Device Category	Portable
Stage of production	Pre-production unit
Intended Use	Body
Antennas	X1005 Main dual band 2.4/5GHz X1000 AUX/BT dual band 2.4/5GHz
Battery	AAEB-100-XX
Optional Accessories	NA

2.6 ANTENNA LOCATION



2.7 TEST METHODOLOGY AND REFERENCED STANDARDS AND GUIDELINES

Tests were conducted in accordance with the following applicable standards and guidelines.

IEC62209-1528 Edition 1.0 2020-10, Measurement procedure for the assessment of specific absorption rate of human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices –

Part 1528: Human models, instrumentation, and procedures
(Frequency Range of 4 MHz to 10 GHz)

Federal Communications Commission, “Evaluating Compliance with FCC Guidelines for Human Exposure to Radio frequency Electromagnetic Fields”, OET Bulletin 65, FCC, Washington, D.C.: 1997.

RSS – 102 Radio Frequency (RF) Exposure Compliance of Radiocommunication Apparatus

RSS – 102.SAR.MEAS – Measurement Procedure for Assessing Specific Absorption Rate (SAR)
Compliance in Accordance with RSS-102

FCC KDB – 447498 D01 General RF Exposure Guidance v06

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

FCC KDB – 248227 D01 802.11 WiFi SAR v02r02

3 TEST EQUIPMENT AND MEASUREMENT SYSTEM

3.1 TEST EQUIPMENT – WLAN 2.4 GHZ

Test Start Date: 24-Jan-2024

Test End Date: 30-Jan-2024

Tester: PL

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
DATA ACQUISITION ELECTRONICS	SD 000 D04 BM	SPEAG	16004	16-Feb-2023	16-Feb-2024
POWER AMPLIFIER 1-6GHZ	8100-007	ETS LINDGREN	16002	11-Sep-2015	CNR
DIELECTRIC PROBE KIT	DAK-3.5	SPEAG	B079797	14-Feb-2023	14-Feb-2024
SAR DIPOLE	D2450V2	SPEAG	B079805	2-Feb-2023	2-Feb-2024
SAR DOSIMETRIC E-FIELD PROBE	EX3DV4	SPEAG	B079814	22-Feb-2023	22-Feb-2024
POWER METER	E4419B	AGILENT	B079628	14-Nov-2023	14-Nov-2024
DIRECTIONAL COUPLER	11692D	HEWLETT PACKARD	B079666	4-Aug-2023	4-Aug-2026
POWER SENSOR	8481A	AGILENT	B079679	17-Nov-2023	17-Nov-2024
POWER SENSOR	8481A	AGILENT	B086132	17-Nov-2023	17-Nov-2024
SIGNAL GENERATOR (TS8997)	SMB 100A	ROHDE & SCHWARZ	B094876	16-Nov-2023	16-Nov-2026
RF CABLE	CBL-25FT-NMNM	MINI-CIRCUITS	B094941	7-Aug-2023	7-Aug-2024
RF CABLE NM TO NM, 0.01-18GHZ	90-195-079	TELEDYNE STORM MICROWAVE	20124	13-Feb-2023	13-Feb-2024
RF CABLE RIGHT ANGLE NM TO NM, 0.01-18GHZ	90-076-020	TELEDYNE STORM MICROWAVE	20133	13-Mar-2023	13-Mar-2024
N to N RF Cable	90-076-020	TELEDYNE STORM MICROWAVE	22035	26-Dec-2023	26-Dec-2024
ATTENUATOR, 20DB 100W	BW-20N100W+	MINI-CIRCUITS	20143	14-Mar-2023	14-Mar-2024

3.2 TEST EQUIPMENT – WLAN 5 GHZ & BLUETOOTH

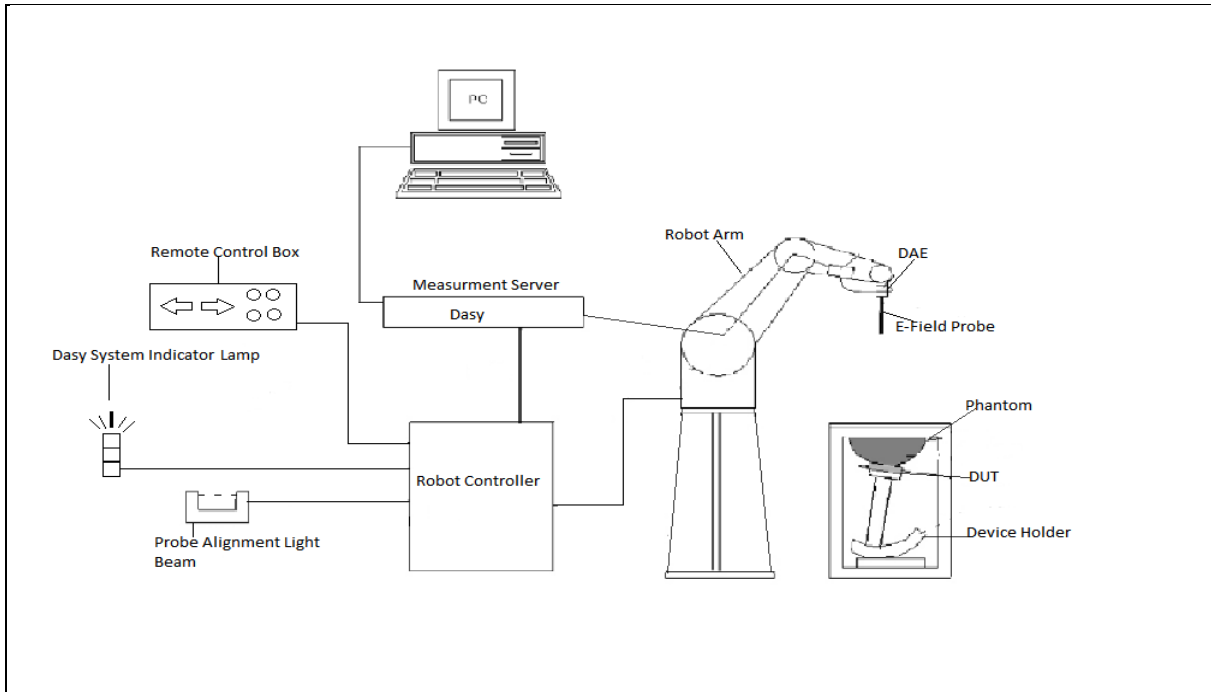
Test Start Date: 29-Mar-2024

Test End Date: 8-May-2024

Tester: PL

Equipment	Model	Manufacturer	Asset	Cal Date	Cal Due Date
DATA ACQUISITION ELECTRONICS	SD 000 D04 BM	SPEAG	16004	19-Feb-2024	19-Feb-2025
POWER AMPLIFIER 1-6GHZ	8100-007	ETS LINDGREN	16002	11-Sep-2015	CNR
DIELECTRIC PROBE KIT	DAK-3.5	SPEAG	B079797	19-Feb-2024	19-Feb-2025
SAR DIPOLE	D5GHZV2	SPEAG	B079795	22-Feb-2023	22-Feb-2026
SAR DOSIMETRIC E-FIELD PROBE	EX3DV4	SPEAG	B079814	26-Feb-2024	26-Feb-2025
POWER METER	E4419B	AGILENT	B079628	14-Nov-2023	14-Nov-2024
POWER SENSOR	8481A	AGILENT	B079679	17-Nov-2023	17-Nov-2024
POWER SENSOR	8481A	AGILENT	B086132	17-Nov-2023	17-Nov-2024
SIGNAL GENERATOR (TS8997)	SMB 100A	ROHDE & SCHWARZ	B094876	16-Nov-2023	16-Nov-2026
RF CABLE	CBL-25FT-NMNM	MINI-CIRCUITS	B094941	7-Aug-2023	7-Aug-2024
RF CABLE RIGHT ANGLE NM TO NM, 0.01-18GHZ	90-076-020	TELEDYNE STORM MICROWAVE	20132	19-Mar-2024	19-Mar-2025
N to N RF Cable	90-076-020	TELEDYNE STORM MICROWAVE	22035	26-Dec-2023	26-Dec-2024
N to N RF Cable	90-076-020	TELEDYNE STORM MICROWAVE	22036	26-Dec-2023	26-Dec-2024
DIRECTIONAL COUPLER	11692D	HEWLETT PACKARD	B079666	4-Aug-2023	4-Aug-2026
VECTOR SIGNAL GENERATOR (TS8997)	SMBV 100A	ROHDE & SCHWARZ	15002	22-Dec-2021	22-Dec-2024
ATTENUATOR, 20DB 100W	BW-20N100W+	MINI-CIRCUITS	20143	20-Mar-2024	20-Mar-2025

3.3 MEASUREMENT SYSTEM BLOCK DIAGRAM



The DASY52 SAR test system version 52.10 (4) consists of:

- 1 TX60L Stäubli Robot and system controller cabinet
- 1 Electro Optical Converter mounted on robot's arm
- Robot stand
- Robot remote controller
- Light beam for E-field probe alignment
- DASY5 measurement server
- SAM Twin Phantom or Oval
- Hand-Held/ Laptop device holder
- PC with DASY5 software
- Data Acquisition Electronics (DAE)
- System validation dipole kit
- HBBL600-10000V6 Head Simulating Liquid
- E-field probe
- Warning lamps

3.4 MEASUREMENT SYSTEM PHANTOM DESCRIPTIONS

Type	Dimensions	Frequency Range	Dielectric (ϵ_r)	Loss Tangent	Material Thickness
Oval ELI5	600x400x190	300MHz - 6GHz	4 ± 1	<0.05	2mm $\pm$ 0.2mm
SAM	Human Shaped		< 5		

3.5 MEASUREMENT SYSTEM TISSUE DESCRIPTION

Broadband tissue simulation liquid HBBL600-10000V6 was used for SAR testing. Manufactured by Speag and main ingredients are water and oil.

Dielectric Assessment Kit (DAK) was used to measure tissue parameters daily.

4 SYSTEM VALIDATIONS AND VERIFICATIONS

4.1 SYSTEM VALIDATIONS – WLAN 2.4 GHz

System validations were completed following KDB 856664 and are summarized in table below.

Dates	Probe Calibration Point		Probe SN	Measured Tissue		Validation		
				ϵ _r	σ	Sensitivity	Linearity	Isotropy
CW								
3/1/2023	Head	2450	1149	40.7203	1.82535	Pass	Pass	Pass
3/2/2023	Head	2550	1149	40.5393	1.90785	Pass	Pass	Pass
3/2/2023	Head	5000	1149	36.2695	4.29423	Pass	Pass	Pass
3/2/2023	Head	5200	1149	35.9778	4.61188	Pass	Pass	Pass
3/2/2023	Head	5500	1149	35.6986	4.91208	Pass	Pass	Pass
3/2/2023	Head	5600	1149	35.4628	4.98174	Pass	Pass	Pass
3/3/2023	Head	5800	1149	34.9702	5.24333	Pass	Pass	Pass
3/3/2023	Head	5850	1149	34.988	5.33879	Pass	Pass	Pass
7/14/2023	Head	2300	1149	39.4667	1.66667	Pass	Pass	Pass
802.11								
3/10/2023	Head	2450	1149	38.9006	1.80496	Pass	Pass	Pass
3/10/2023	Head	5000	1149	34.2242	4.30139	Pass	Pass	Pass
3/13/2023	Head	5200	1149	34.9302	4.50284	Pass	Pass	Pass
3/13/2023	Head	5500	1149	34.504	4.83549	Pass	Pass	Pass
3/13/2023	Head	5600	1149	34.304	4.93868	Pass	Pass	Pass
3/14/2023	Head	5800	1149	33.6558	5.21552	Pass	Pass	Pass
3/14/2023	Head	5850	1149	34.988	5.33879	Pass	Pass	Pass
LTE								
3/14/2023	Head	2550	1149	39.4514	1.88182	Pass	Pass	Pass
7/14/2023	Head	2300	1149	39.4667	1.66667	Pass	Pass	Pass

4.2 SYSTEM VALIDATIONS – WLAN 5 GHz & BLUETOOTH

System validations were completed following KDB 856664 and are summarized in table below.

Dates	Probe Calibration Point		Probe SN	Measured Tissue		Validation		
				ϵ _r	σ	Sensitivity	Linearity	Isotropy
CW								
3/12/2024	Head	2300	1149	39.4667	1.6667	Pass	Pass	Pass
3/13/2024	Head	2450	1149	39.2000	1.8000	Pass	Pass	Pass
3/12/2024	Head	2550	1149	39.0727	1.9091	Pass	Pass	Pass
3/14/2024	Head	5000	1149	36.2143	4.4500	Pass	Pass	Pass
3/25/2024	Head	5200	1149	35.9857	4.6550	Pass	Pass	Pass
3/14/2024	Head	5500	1149	35.6429	4.9625	Pass	Pass	Pass
3/20/2024	Head	5600	1149	35.5286	5.0650	Pass	Pass	Pass
3/15/2024	Head	5800	1149	35.3000	5.2700	Pass	Pass	Pass
3/20/2024	Head	5850	1149	35.2428	5.3213	Pass	Pass	Pass
802.11								
3/14/2024	Head	2450	1149	39.2000	1.8000	Pass	Pass	Pass
3/14/2024	Head	5000	1149	36.2143	4.4500	Pass	Pass	Pass
3/20/2024	Head	5200	1149	35.9857	5.0650	Pass	Pass	Pass
3/15/2024	Head	5500	1149	35.6429	4.9625	Pass	Pass	Pass
3/15/2024	Head	5600	1149	35.5286	5.0650	Pass	Pass	Pass
3/15/2024	Head	5800	1149	35.3000	5.2700	Pass	Pass	Pass
3/20/2024	Head	5850	1149	35.2428	5.3213	Pass	Pass	Pass
LTE								
3/13/2024	Head	2300	1149	39.4667	1.6667	Pass	Pass	Pass
3/12/2024	Head	2550	1149	39.0727	1.9091	Pass	Pass	Pass

4.3 SYSTEM VERIFICATIONS

System verification is required for the probe calibration points used to measure SAR. The measured results are normalized to 1W and compared to the results from applicable dipole calibration certificates. Results must be within $\pm 10\%$ of target values.

System verifications were completed within 24 hours of SAR testing and results are summarized in table below.

Date	Dipole	Probe Calibration Point	Zoom SAR (1g)	Zoom SAR Normalized (1W)	1W Dipole Target SAR (1g)	% Error from Validation Target
WLAN 2.4 GHz						
1/24/2024	D2450V2	2450	3.89	51.87	51.40	0.91%
1/25/2024	D2450V2	2450	3.92	52.27	51.40	1.69%
1/26/2024	D2450V2	2450	3.88	51.73	51.40	0.65%
1/30/2024	D2450V2	2450	3.91	52.13	51.40	1.43%
WLAN 5 GHz						
3/29/2024	D5GHzV2	5800	3.76	75.20	80.60	-6.70%
3/31/2024	D5GHzV2	5200	3.74	74.80	78.10	-4.23%
4/1/2024	D5GHzV2	5200	3.70	74.00	78.10	-3.51%
4/1/2024	D5GHzV2	5600	4.07	81.40	83.30	-3.93%
4/2/2024	D5GHzV2	5200	3.94	78.80	78.10	0.90%
4/3/2024	D5GHzV2	5200	4.01	80.20	78.10	-3.49%
4/3/2024	D5GHzV2	5600	4.14	82.80	83.30	-5.31%
4/4/2024	D5GHzV2	5800	3.82	76.40	80.60	-4.45%
4/5/2024	D5GHzV2	5800	3.91	78.20	80.60	-4.86%
4/5/2024	D5GHzV2	5200	3.88	77.60	78.10	-3.35%
4/10/2024	D5GHzV2	5600	4.13	82.60	83.30	-4.60%
4/10/2024	D5GHzV2	5500	4.08	81.60	84.90	-5.64%
Bluetooth						
4/12/2024	D2450V2	2450	2.57	51.40	51.40	0.00%
Enlarged Zoom Scan						
5/3/2024	D5GHzV2	5800	3.79	75.80	80.60	-5.96%
5/6/2024	D5GHzV2	5800	3.99	79.80	80.60	-0.99%
5/8/2024	D2450V2	2450	2.62	52.40	51.40	1.95%

4.4 TISSUE MEASUREMENT RESULTS

The tissue dielectric parameters were measured at the beginning of the test or within 24 hours of the first SAR test. All measured dielectric parameters are within $\pm 10\%$ tolerance values shown in Table 1. The $\pm 10\%$ tolerance is permitted when using SAR correction formula for deviation from target dielectric values.

Date	Frequency MHz	Measured		Target		Deviation	
		Permittivity ϵ_r	Conductivity σ	Permittivity ϵ_r	Conductivity σ	Permittivity ϵ_r	Conductivity σ
WLAN 2.4 GHz							
1/24/2024	2437	36.52	1.74	39.22	1.79	-6.89	-2.77
	2450	36.50	1.75	39.20	1.80	-6.88	-2.89
1/25/2024	2437	36.52	1.74	39.22	1.79	-6.89	-2.77
	2450	36.50	1.75	39.20	1.80	-6.88	-2.89
	2462	36.49	1.76	39.18	1.81	-6.89	-3.13
1/26/2024	2437	36.66	1.73	39.22	1.79	-6.54	-3.33
	2450	36.64	1.74	39.20	1.80	-6.53	-3.44
1/30/2024	2437	36.27	1.74	39.22	1.79	-7.54	-2.73
	2450	36.25	1.75	39.20	1.80	-7.53	-2.83
	2462	36.23	1.76	39.18	1.81	-7.54	-3.06
WLAN 5 GHz							
3/29/2024	5800	32.04	4.81	35.30	5.27	-9.23	-8.78
3/31/2024	5200	33.30	4.30	35.99	4.66	-7.47	-7.72
4/1/2024	5200	33.97	4.33	35.99	4.66	-5.61	-7.00
	5600	33.39	4.73	35.53	5.07	-6.01	-6.70
4/2/2024	5200	33.31	4.28	35.99	4.66	-7.44	-8.09
4/3/2024	5200	33.09	4.28	35.99	4.66	-8.05	-8.08
	5600	32.51	4.66	35.53	5.07	-8.50	-7.91
4/4/2024	5800	31.81	4.99	35.30	5.27	-9.90	-5.40
4/5/2024	5800	32.38	4.96	35.30	5.27	-8.29	-5.98
	5200	33.38	4.36	35.99	4.66	-7.23	-6.37
4/10/2024	5600	32.70	4.72	35.53	5.07	-7.95	-6.80
	5500	32.87	4.63	35.64	4.96	-7.77	-6.74
Bluetooth							
4/12/2024	2402	37.22	1.72	39.29	1.76	-5.25	-2.39
	2441	37.17	1.74	39.22	1.79	-5.23	-2.74
	2450	37.15	1.75	39.20	1.80	-5.22	-2.81
	2480	37.11	1.77	39.16	1.83	-5.24	-3.37
Enlarged Zoom Scan							
5/3/2024	5745	32.18	4.74	35.36	5.21	-9.00	-9.00
5/6/2024	5785	32.33	4.88	35.32	5.25	-8.44	-7.18
5/8/2024	2441	37.21	1.75	39.22	1.79	-5.11	-2.37

5 ENVIRONMENTAL CONDITIONS

The SAR Laboratory is controlled environment. The ambient temperature is maintained between 18 – 25°C and tissue temperatures are monitored to ensure $\pm 2^\circ\text{C}$ is maintained otherwise tissue parameters are remeasured. The tissue level is confirmed to be $\geq 15\text{cm}$.

Date	Tissue Type	Tissue Temp. Range C°	Lab Temp. Range C°
1/24/2024	Head	21.52 – 22.38	23.74 – 24.78
1/25/2024	Head	21.78 – 22.47	23.81 – 24.48
1/26/2024	Head	21.93 – 22.06	23.11 – 23.39
1/30/2024	Head	21.15 – 21.60	23.55 – 23.99
3/29/2024	Head	21.19 – 21.82	23.30 – 24.05
3/31/2024	Head	21.85 – 22.03	23.99 – 24.05
4/1/2024	Head	21.98 – 22.76	23.90 – 24.14
4/2/2024	Head	22.41 – 22.92	23.55 – 24.66
4/3/2024	Head	22.01 – 22.32	23.84 – 24.74
4/4/2024	Head	20.98 – 21.25	23.09 – 24.43
4/5/2024	Head	20.91 – 21.58	22.85 – 23.22
4/10/2024	Head	21.92 – 22.53	24.05 – 24.74
4/12/2024	Head	21.18 – 21.58	22.72 – 24.12
5/3/2024	Head	22.53 – 23.26	24.66 – 24.85
5/6/2024	Head	22.59 – 22.82	24.65 – 22.82
5/8/2024	Head	22.72 – 22.78	24.66 – 24.81

RF ambient noise is monitored by conducting a noise cube scan during system verification. A spectrum analyzer is used to monitor unwanted signals that might influence measurements.

The tissue depth was verified to be $\geq 15\text{cm}$.

6 MEASUREMENT PROCEDURES

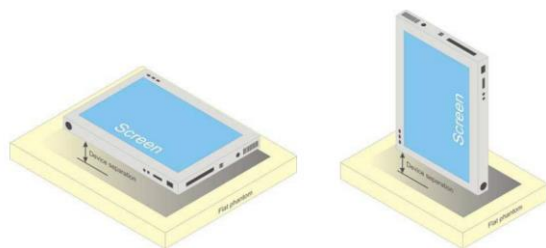
6.1 HEAD CONFIGURATION

NA

6.2 BODY TABLET CONFIGURATION

A tablet device is a battery-operated wireless device with the ability to transmit while in close proximity to the user's body. These devices shall be positioned with its base (bottom surface) and applicable edges against phantom.

Photos of EUT are included in Part 2 of this report.



6.3 LIMB CONFIGURATION

NA

6.4 SAR PROCEDURES SETUP

- Area Scan is used for a fast scan in two dimensions to find the area of high field values before any finer measurement around the hotspot. The routines implemented in the DASY5 software can find the maximum locations.
- Zoom Scan is used to assess the peak spatial values within a cubic averaging volume containing 1g and 10g of simulated tissue. The scan measures points within the cube. Once measurement is done the values are displayed within the job's label.
- Power Drift will measure the field at the same location as the most recent power reference measurement within the same procedure and settings. The Power Drift Measurement gives the field difference in dB.
- Z- Scan measure points along a straight vertical line. The lines run along the z-axis of a one-dimension grid.

The area and zoom scan resolutions specified in KDB 865664 are in table below.

Description		≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface		5 mm ± 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ 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.	
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
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.			

7 MEASURED OUTPUT POWER MEASUREMENTS

Test Mode	Frequency (MHz)	Measured Output Power (dBm)	
		Aux Antenna	Main Antenna
802.11b	2412	14.37	14.28
	2437	15.39	14.49
	2462	14.32	14.52
802.11g	2412	15.44	15.41
	2437	15.73	15.80
	2462	15.58	15.52
Bluetooth	2402	8.86	NA
	2441	9.32	NA
	2478	9.2	NA
UNII-1 802.11a	5180	9.2	9.16
	5200	9.2	9.24
	5220	9.24	9.19
	5240	9.08	8.89
UNII-2A 802.11a	5260	9.02	8.94
	5280	8.88	8.98
	5300	8.99	8.75
	5320	8.87	8.79
UNII-2C 802.11a	5500	8.93	9.02
	5520	8.88	9.04
	5540	9.08	8.94
	5560	8.93	8.9
	5580	8.84	9.05
	5600	9.08	8.98
	5620	9.31	9.28
	5640	9.28	9.27
	5660	9.3	9.23
	5680	9.19	9.05
	5700	9.27	9.07
	5720	9.22	8.81
UNII-3 802.11a	5745	9.32	9.07
	5765	9.35	9.14
	5785	9.19	9.16
	5805	9.28	9.13
	5825	9.22	9.35

8 SAR RESULTS

Scaled SAR results include scaling up to maximum tune-up tolerance and negative drift.

WLAN SAR Test Reduction Procedure:

KDB 248227 D01 802.11 WiFi SAR:

KDB Section 5.1.1 Initial Test Position SAR Test Reduction Procedure

a) When the reported SAR of the initial test position is ≤ 0.4 W/kg, further SAR measurement is not required for the other (remaining) test positions in that exposure configuration and 802.11 transmission mode combinations within the frequency band or aggregated band. SAR is also not required for that exposure configuration in the subsequent test configuration(s).

b) When the reported SAR of the initial test position is > 0.4 W/kg, SAR is repeated for the 802.11 transmission mode configuration tested in the initial test position using subsequent highest extrapolated or estimated 1-g SAR conditions determined by area scans or next closest/smallest test separation distance and maximum RF coupling test positions based on manufacturer justification, on the highest maximum output power channel, until the reported SAR is ≤ 0.8 W/kg or all required test positions (left, right, touch, tilt or subsequent surfaces and edges) are tested.

c) 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

Section 5.2.1 802.11b 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:

a) When the reported SAR of the highest measured maximum output power channel (see 3.1) for the exposure configuration is ≤ 0.8 W/kg, no further SAR testing is required for 802.11b DSSS in that exposure configuration.

b) 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.

5.3.2 OFDM Transmission Mode SAR Test Configuration and Channel Selection Requirements The initial test configuration for 2.4 GHz and 5 GHz OFDM transmission modes is determined by the 802.11 configuration with the highest maximum output power specified for production units, including tune-up tolerance, in each standalone and aggregated frequency band. SAR for the initial test configuration is measured using the highest maximum output power channel determined by the default power measurement procedures (see Clause 4)

8.1 WLAN 2.4GHz

Antenna	Test Mode	Channel	Frequency (MHz)	Test Position	Top (mm)	Middle (mm)	Bottom (mm)	Duty Cyle (%)	Max Power (dBm)	Meas. Power (dBm)	Power Scaling factor	Drift (dB)	Drift Scaling factor	Meas. SAR 1g	Meas. SAR 10g	Scaled SAR 1g	Scaled SAR 10g	Plot No.
Main	802.11b 1 Mbps	11	2462	Right	0	2	1	99	16	14.52	1.41	0.67	1.00	0.16	0.06	0.22	0.08	
		11	2462	Front	0	0	3	99	16	14.52	1.41	0.21	1.00	0.18	0.07	0.26	0.10	1
		11	2462	Back	1	7	1	99	16	14.52	1.41	-0.15	1.04	0.11	0.05	0.16	0.07	
Aux	802.11b 1 Mbps	6	2437	Right	0	2	1	99	16	15.39	1.15	0.33	1.00	0.31	0.12	0.36	0.14	
		6	2437	Front	0	0	3	99	16	15.39	1.15	0.08	1.00	0.11	0.04	0.12	0.05	
		6	2437	Back	1	7	1	99	16	15.39	1.15	-1.83	1.52	0.31	0.13	0.55	0.22	2
Main	802.11g 6 Mbps	6	2437	Right	0	2	1	99	16	15.8	1.05	0.93	1.00	0.05	0.02	0.05	0.02	
		6	2437	Front	0	0	3	99	16	15.8	1.05	0.56	1.00	0.06	0.03	0.07	0.03	3
		6	2437	Back	1	7	1	99	16	15.8	1.05	0.50	1.00	0.05	0.02	0.05	0.02	
Aux	802.11g 6 Mbps	6	2437	Right	0	2	1	99	16	15.73	1.06	0.49	1.00	0.13	0.05	0.14	0.05	
		6	2437	Front	0	0	3	99	16	15.73	1.06	0.37	1.00	0.06	0.02	0.07	0.03	
		6	2437	Back	1	7	1	99	16	15.73	1.06	0.05	1.00	0.15	0.06	0.16	0.06	4

8.2 WLAN 5GHz

Antenna	Test Mode	Channel	Frequency (MHz)	Test Position	Top (mm)	Middle (mm)	Bottom (mm)	Duty Cyle (%)	Max Power (dBm)	Meas. Power (dBm)	Power Scaling factor	Drift (dB)	Drift Scaling factor	Meas. SAR 1g	Meas. SAR 10g	Scaled SAR 1g	Scaled SAR 10g	Plot No.
Main	UNII-1 802.11a 6 Mbps	40	5200	Right	0	2	1	99	10	9.24	1.19	-0.28	1.07	0.38	0.10	0.48	0.13	5
		44	5220	Right	0	2	1	99	10	9.19	1.21	0.48	1.00	0.28	0.08	0.34	0.09	
		40	5200	Front	1	0	3	99	10	9.24	1.19	-0.12	1.03	0.24	0.07	0.29	0.08	
		40	5200	Back	1	7	1	99	10	9.24	1.19	-0.04	1.01	0.14	0.05	0.17	0.06	
	UNII-2A 802.11a 6 Mbps	56	5280	Right	0	2	1	99	10	8.98	1.26	0.54	1.00	0.31	0.08	0.39	0.11	6
		56	5280	Front	1	0	3	99	10	8.98	1.26	-0.59	1.15	0.25	0.07	0.36	0.10	
		56	5280	Back	1	7	1	99	10	8.98	1.26	0.02	1.00	0.12	0.04	0.15	0.05	
	UNII-2C 802.11a 6 Mbps	124	5620	Right	0	2	1	99	10	9.28	1.18	0.56	1.00	0.67	0.19	0.79	0.22	
		128	5640	Right	0	2	1	99	10	9.27	1.18	0.23	1.00	0.73	0.20	0.86	0.23	7
		116	5580	Right	0	2	1	99	10	9.05	1.24	0.02	1.00	0.64	0.18	0.80	0.22	
		104	5520	Right	0	2	1	99	10	9.04	1.25	0.44	1.00	0.63	0.18	0.78	0.23	
		124	5620	Front	1	0	3	99	10	9.28	1.18	-0.06	1.01	0.20	0.06	0.23	0.07	
		124	5620	Back	1	7	1	99	10	9.28	1.18	0.12	1.00	0.31	0.11	0.36	0.13	
	UNII-3 802.11a 6 Mbps	165	5825	Right	0	2	1	99	10	9.35	1.16	0.22	1.00	0.78	0.21	0.90	0.24	
		157	5785	Right	0	2	1	99	10	9.16	1.21	0.69	1.00	0.79	0.21	0.96	0.26	8
		153	5765	Right	0	2	1	99	10	9.14	1.22	0.56	1.00	0.65	0.17	0.79	0.21	
		165	5825	Front	1	0	3	99	10	9.35	1.16	-0.14	1.03	0.21	0.05	0.25	0.06	
		165	5825	Back	1	7	1	99	10	9.35	1.16	-0.22	1.05	0.34	0.11	0.41	0.14	
		157	5785	Back	1	7	1	99	10	9.16	1.21	-0.28	1.07	0.26	0.09	0.33	0.11	
Aux	UNII-1 802.11a 6 Mbps	44	5220	Right	0	2	1	99	10	9.24	1.19	0.72	1.00	0.37	0.09	0.44	0.11	
		40	5200	Right	0	2	1	99	10	9.20	1.20	0.86	1.00	0.40	0.10	0.48	0.12	9
		44	5220	Front	1	0	3	99	10	9.24	1.19	-0.07	1.02	0.25	0.07	0.31	0.09	
		44	5220	Back	1	7	1	99	10	9.24	1.19	-0.02	1.00	0.22	0.07	0.26	0.08	
	UNII-2A 802.11a 6 Mbps	52	5260	Right	0	2	1	99	10	9.02	1.25	0.66	1.00	0.40	0.10	0.50	0.12	
		60	5300	Right	0	2	1	99	10	8.99	1.26	0.98	1.00	0.43	0.11	0.54	0.14	10
		52	5260	Front	1	0	3	99	10	9.02	1.25	0.30	1.00	0.23	0.07	0.29	0.09	
	UNII-2C 802.11a 6 Mbps	52	5260	Back	1	7	1	99	10	9.02	1.25	-0.05	1.01	0.24	0.07	0.31	0.09	
		124	5620	Right	0	2	1	99	10	9.31	1.17	0.43	1.00	0.49	0.12	0.57	0.14	
		128	5640	Right	0	2	1	99	10	9.28	1.18	0.28	1.00	0.57	0.14	0.68	0.17	11
		124	5620	Front	1	0	3	99	10	9.31	1.17	0.25	1.00	0.19	0.06	0.23	0.07	
		124	5620	Back	1	7	1	99	10	9.31	1.17	-0.04	1.01	0.36	0.10	0.42	0.12	
		128	5640	Back	1	7	1	99	10	9.28	1.18	-0.11	1.03	0.45	0.13	0.54	0.16	
	UNII-3 802.11a 6 Mbps	153	5765	Right	0	2	1	99	10	9.35	1.16	0.35	1.00	0.56	0.14	0.65	0.16	
		149	5745	Right	0	2	1	99	10	9.32	1.17	0.28	1.00	0.63	0.16	0.74	0.18	12
		153	5765	Front	1	0	3	99	10	9.35	1.16	-0.04	1.01	0.13	0.04	0.16	0.05	
		153	5765	Back	1	7	1	99	10	9.35	1.16	-0.06	1.01	0.41	0.12	0.48	0.14	
		149	5745	Back	1	7	1	99	10	9.32	1.17	0.15	1.00	0.51	0.15	0.59	0.17	

8.3 BLUETOOTH

Antenna	Test Mode	Channel	Frequency (MHz)	Test Position	Top (mm)	Middle (mm)	Bottom (mm)	Duty Cyle (%)	Max Power (dBm)	Meas. Power (dBm)	Power Scaling factor	Drift (dB)	Drift Scaling factor	Meas. SAR 1g	Meas. SAR 10g	Scaled SAR 1g	Scaled SAR 10g	Plot No.
Aux	BT	39	2441	Right	0	2	1	99	10.86	9.32	1.43	1.26	1.00	0.10	0.04	0.15	0.06	13
		39	2441	Front	0	0	3	99	10.86	9.32	1.43	0.26	1.00	0.03	0.01	0.04	0.02	
		39	2441	Back	1	7	1	99	10.86	9.32	1.43	0.04	1.00	0.09	0.03	0.13	0.05	

9 VARIABILITY ASSESSMENT

Per the guidelines in KDB 865664 SAR variability assessment is not required because SAR results are below 50% threshold of applicable limit

10 SIMULTANEOUS TRANSMISSION

This device does support simultaneous transmissions.

10.1 DIRECT SUMMATION AND SPLSR

Position	Simultaneous TX Antenna Combination		SAR Main	SAR Aux	Total SAR	Limit	Requires SPLSR	SPLSR	Requires Enlarge Zoom
	Main	Aux							
Right	WLAN 5GHz	WLAN 5GHz	0.96	0.74	1.70	1.6	Yes	0.06	Yes
	WLAN 5GHz	WLAN 5GHz + BT	0.96	0.89	1.85	1.6	Yes	0.05	Yes
	WLAN 5GHz	BT	0.96	0.15	1.11	1.6	No		
	WLAN 2.4GHz	WLAN 2.4GHz	0.22	0.36	0.58	1.6	No		
	WLAN 2.4GHz	BT	0.22	0.15	0.37	1.6	No		
Front	WLAN 5GHz	WLAN 5GHz	0.36	0.31	0.67	1.6	No		
	WLAN 5GHz	WLAN 5GHz + BT	0.36	0.35	0.71	1.6	No		
	WLAN 5GHz	BT	0.36	0.04	0.40	1.6	No		
	WLAN 2.4GHz	WLAN 2.4GHz	0.26	0.12	0.38	1.6	No		
	WLAN 2.4GHz	BT	0.26	0.04	0.30	1.6	No		
Back	WLAN 5GHz	WLAN 5GHz	0.41	0.59	1.00	1.6	No		
	WLAN 5GHz	WLAN 5GHz + BT	0.41	0.72	1.13	1.6	No		
	WLAN 5GHz	BT	0.41	0.13	0.54	1.6	No		
	WLAN 2.4GHz	WLAN 2.4GHz	0.16	0.55	0.71	1.6	No		
	WLAN 2.4GHz	BT	0.16	0.13	0.29	1.6	No		

10.2 ENLARGED ZOOM MULTI BAND RESULT

SAR plots are located in Appendix C.

Position	Simultaneous TX Antenna Combination		SAR Multi Band Result	Limit	Plot
	Main	Aux			
Right	WLAN 5GHz	WLAN 5GHz	1.00	1.6	14
	WLAN 5GHz	WLAN 5GHz + BT	1.03	1.6	15

11 SYSTEM UNCERTAINTY

A System uncertainty analysis per KDB 865664 is not required since reported SAR is < 93.75% of applicable limit.

Per guidelines of ISO 17025 and RSS - 102 reported system uncertainty is required and therefore included in Part 3.

12 REVISION HISTORY

Revision Level	Description of changes	Revision Date
0	Initial release	23 August 2024