

FCC SAR TEST REPORT

Test File No : F690501-RF-SAR000601

Equipment Under Test	Bluetooth Headset
Model Name	SM-R420
Applicant	Samsung Electronics Co., Ltd.
Address of Applicant	19 Chapin Rd., Building D, Pine Brook, New Jersey, United States, 07058
FCC ID	A3LSMR420L
Exposure Category	General Population/Uncontrolled Exposure
Standards	FCC 47 CFR Part 2 (2.1093) IEEE 1528, 2013
Receipt No.	GPRI2506001094SR
Date of Receipt	2025-06-18
Date of Test(s)	2025-07-02 ~ 2025-07-17
Date of Issue	2025-07-17
Test Result	PASS, Refer to the Page 04
Measurement Uncertainty	Refer to the Page 32

In the configuration tested, the EUT complied with the standards specified above.

This test report does not assure KOLAS accreditation.

Remarks:

- 1) The results of this test report are effective only to the items tested.
- 2) The SGS Korea is not responsible for the sampling, the results of this test report apply to the sample as received.



Report prepared by /
Jayden Jung
Test Engineer



Approved by /
Minhyuk Han
Technical Manager

Report File No : F690501-RF-SAR000601

Date of Issue : 2025-07-17

(All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.)



Revision history

Revision	Date of issue	Revisions	Revised By
-	July 17, 2025	Initial issue	-

Table of Contents

1. Testing Laboratory	4
2. Details of Manufacturer	4
3. Description of EUT(s)	4
4. The Highest Reported SAR Values	4
5. Test Methodology	5
6. Testing Environment	5
7. Specific Absorption Rate (SAR)	6
7.1. Introduction	6
7.2. SAR Definition	6
7.3. Test Standards and Limits	6
8. The SAR Measurement System	8
9. System Components	9
9.1. Probe	9
9.2. SAM Phantom	9
9.3. Device Holder	9
10. SAR Measurement Procedures	10
10.1. Normal SAR Measurement Procedure	10
11. SAR System Verification	12
12. Tissue Simulant Fluid for the Frequency Band	13
13. Instruments List	15
14. FCC Power Measurement Procedures	16
15. Measured and Reported SAR	16
16. Maximum Output Power Specifications*	16
17. RF Conducted Power Measurement	17
17.1. Bluetooth Classic Conducted Power	17
17.2. Bluetooth LE Conducted Power	17
18. Bluetooth Duty Cycle used for SAR Testing	18
18.1. Bluetooth Classic DH5 Duty Cycle	18
18.2. Bluetooth LE 1M 255byte Duty Cycle	19
19. SAR Data Summary	20
19.1. SAR data	20
20. SAR Measurement Variability	22
20.1. Measurement Variability	22
Appendixes List	23
Appendix A.1 Verification Test Plots for 2450MHz	24
Appendix A.2 SAR Test Plots for Bluetooth Classic	30
Appendix A.3 SAR Test Plots for Bluetooth LE	31
Appendix B.1 Uncertainty Analysis	32
Appendix C.1 Calibration certificate for Probe (S/N: 3791)	33
Appendix C.2 Calibration certificate for DAE (S/N: 1340)	55
Appendix C.3 Calibration certificate for Dipole (S/N: 892)	60
-THE END-	65

1. Testing Laboratory

Company Name	SGS Korea Co., Ltd. (Gunpo Laboratory)
Address	4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807 Republic of Korea
Laboratory Conformity Assessment Body Identifier (CABID)	KR0150
Telephone	+82 31 428 5700
FAX	+82 31 427 2371

2. Details of Manufacturer

Manufacturer	Samsung Electronics co., Ltd.
Address	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Email	gogo.kwon@samsung.com
Phone No.	+82 31 301 8362

3. Description of EUT(s)

EUT Type	Bluetooth Headset	
Model Name	SM-R420	
Serial Number	1	
Software Version	R420.001	
Hardware Version	REV1.0	
Mode of Operation	Bluetooth Classic, Bluetooth LE	
Duty Cycle	76.5 % (Bluetooth Classic), 84.9 % (Bluetooth Low Energy)	
Body worn Accessory	None	
Tx Frequency Range	2 402.00 MHz ~ 2 480.00 MHz (Bluetooth)	
Antenna Information ※	Manufacturer	Galtronics Korea
	Type	LDS Antenna
	Antenna Gain (dBi)	-7.64

4. The Highest Reported SAR Values

Band	Highest Reported SAR 1g (W/kg)
Bluetooth	1.282
Simultaneous SAR per KDB 690783 D01v0r03	N/A

5. Test Methodology

ANSI/IEEE C95.1-2005: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. It specifies the maximum exposure limit of 1.6 W/kg / 4.0 W/kg as averaged over any 1 gram / 10 gram of tissue for portable devices being used within 20 cm of the user in the uncontrolled environment.

Test tests documented in this report were performed in accordance with IEEE Standard 1528-2013 and the following published KDB procedures.

In additions;

☒	KDB 865664 D01v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz
☒	KDB 865664 D02v01r02	RF Exposure Compliance Reporting and Documentation Considerations
☒	KDB 447498 D04v01	RF Exposure Procedures and Equipment Authorization Policies for Mobile and Portable Devices
☐	KDB 447498 D02v02r01	SAR Measurement Procedures for USB Dongle Transmitters
☐	KDB 248227 D01v02r02	SAR Guidance For IEEE 802.11 (Wi-Fi) Transmitters
☐	KDB 615223 D01v01r01	802.16e/WiMax SAR Measurement Guidance
☐	KDB 616217 D04v01r02	SAR Evaluation Considerations for Laptop, Notebook, Netbook and Tablet Computers
☐	KDB 643646 D01v01r03	SAR Test Considerations for Occupational PTT Radios
☐	KDB 648474 D03v01r04	Evaluation and Approval Considerations for Handsets with Specific Wireless Charging Battery Covers
☐	KDB 648474 D04v01r03	SAR Evaluation Considerations for Wireless Handsets
☐	KDB 680106 D01v03r01	RF Exposure Considerations for Low Power Consumer Wireless Power Transfer Applications
☐	KDB 941225 D01v03r01	3G SAR Measurement Procedures
☐	KDB 941225 D05v02r05	SAR Evaluation Considerations for LTE Devices
☐	KDB 941225 D06v02r01	SAR Evaluation Procedures for Portable Devices with Wireless Router Capabilities
☐	KDB 941225 D07v01r02	SAR Evaluation Procedures for UMPC Mini-Tablet Devices

6. Testing Environment

Ambient temperature	: 18°C ~ 25°C
Relative humidity	: 30% ~ 70%
Liquid temperature of during the test	: <± 2°C
Ambient noise & Reflection	: < 0.012 W/kg

7. Specific Absorption Rate (SAR)

7.1. 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. The standard recommends limits for two tiers of groups, occupational/controlled and general population/uncontrolled, based on a person's awareness and ability to exercise control over his or her exposure. In general, occupational/controlled exposure limits are higher than the limits for general population/uncontrolled.

7.2. 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:

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

SAR is expressed in units of Watts per kilogram (W/kg)

SAR measurement can be either related to the temperature elevation in tissue by

$$SAR = C \left(\frac{\delta T}{\delta t} \right)$$

Where: C is the specific heat capacity, δT is the temperature rise and δt is the exposure duration, or related to the electrical field in the tissue by

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

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

However for evaluating SAR of low power transmitter, electrical field measurement is typically applied.

7.3. Test Standards and Limits

According to FCC 47CFR §2.1093(d) The limits to be used for evaluation are based generally on criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate ("SAR") in Section 4.2 of "IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz," ANSI/IEEE C95.3-2003, Copyright 2003 by the Institute of Electrical and Electronics Engineers, Inc., New York, New York 10017. These criteria for SAR evaluation are similar to those recommended by the National Council on Radiation Protection and Measurements (NCRP) in "Biological Effects and Exposure Criteria for Radio frequency Electromagnetic Fields," NCRP Report No. 86, Section 17.4.5. Copyright NCRP, 1986, Bethesda, Maryland 20814. SAR is a measure of the rate of energy absorption due to exposure to an RF transmitting

source. SAR values have been related to threshold levels for potential biological hazards. The criteria to be used are specified in paragraphs (d)(1) and (d)(2) of this section and shall apply for portable devices transmitting in the frequency range from 100 kHz to 6 GHz. Portable devices that transmit at frequencies above 6 GHz are to be evaluated in terms of the MPE limits specified in § 1.1310 of this chapter. Measurements and calculations to demonstrate compliance with MPE field strength or power density limits for devices operating above 6 GHz should be made at a minimum distance of 5 cm from the radiating source.

(1) Limits for Occupational/Controlled exposure: 0.4 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 8 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 20 W/kg, as averaged over an 10 grams of tissue (defined as a tissue volume in the shape of a cube). Occupational/Controlled limits apply when persons are exposed as a consequence of their employment provided these persons are fully aware of and exercise control over their exposure. Awareness of exposure can be accomplished by use of warning labels or by specific training or education through appropriate means, such as an RF safety program in a work environment.

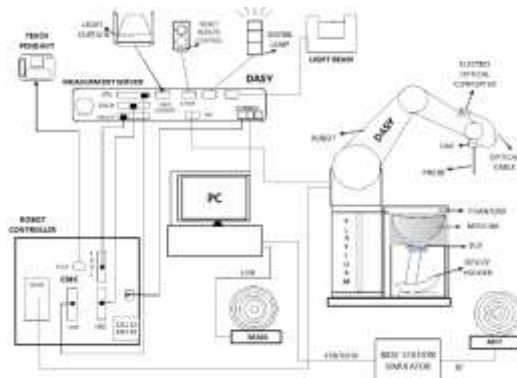
(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial peak SAR shall not exceed 4 W/kg, as averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube). General Population/Uncontrolled limits apply when the general public may be exposed, or when persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or do not exercise control over their exposure. Warning labels placed on consumer devices such as cellular telephones will not be sufficient reason to allow these devices to be evaluated subject to limits for occupational/controlled exposure in paragraph (d)(1) of this section.

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Partial Peak SAR (Partial)	1.60 mW/g	8.00 mW/g
Partial Average SAR (Whole Body)	0.08 mW/g	0.40 mW/g
Partial Peak SAR (Hands/Feet/Ankle/Wrist)	4.00 mW/g	20.00 mW/g

1. The spatial Peak value of the SAR averaged over any 1g gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.
2. The spatial Average value of the SAR averaged over the whole body.
3. The Spatial Peak value of the SAR averaged over any 10 grams of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

A block diagram of the SAR measurement System is given in Fig. 1. This SAR Measurement System uses a Computer-controlled 3-D stepper motor system (SPEAG DASY system). The model EX3DV4 field probe is used to determine the internal electric fields. The SAR can be obtained from the equation $SAR = \sigma (|E_i|^2) / \rho$ where σ and ρ are the conductivity and mass density of the tissue-simulant.

- A standard high precision 6-axis robot (Staubli TX family) with controller, teach pendant and software. An arm extension is for accommodating the data acquisition electronics (DAE).
- A dosimeter probe, i.e., an isotropic E-field probe optimized and calibrated for usage in tissue simulating liquid. The probe is equipped with an optical surface detector system.
- Data acquisition electronics (DAE) which performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. The unit is battery powered with standard or rechargeable batteries. The signal is optically transmitted to the EOC.



- The Electro-optical converter (EOC) performs the conversion between optical and electrical of the signals for the digital communication to the DAE and for the analog signal from the optical surface detection. The EOC is connected to the measurement server.
- The function of the measurement server is to perform the time critical tasks such as signal filtering, control of the robot operation and fast movement interrupts.
- A probe alignment unit which improves the (absolute) accuracy of the probe positioning.
- A computer operating Windows.
- DASY software.
- Remote control with teach pendant and additional circuitry for robot safety such as warning lamps, etc.
- The SAM twin phantom enabling testing left-hand and right-hand usage.
- The device holder for handheld mobile phones.
- Tissue simulating liquid mixed according to the given recipes.
- Verification dipole kits allowing to validate the proper functioning of the system.

9. System Components

9.1. Probe

Construction	: Symmetrical design with triangular core. Built-in shielding against static charges. PEEK enclosure material (resistant to organic solvents, e.g., DGBE)
Calibration	: Basic Broad Band Calibration in air Conversion Factors (CF) for HSL 835 and HSL1900. Additional CF-Calibration for other liquids and frequencies upon request.
Frequency	: 10 MHz to 6 GHz; Linearity: ± 0.2 dB (30 MHz to 6 GHz)
Directivity	: ± 0.3 dB in HSL (rotation around probe axis) ± 0.5 dB in tissue material (rotation normal to probe axis)
Dynamic Range	: $10\mu\text{W/g}$ to > 100 mW/g; Linearity: ± 0.2 dB(noise: typically $< 1\mu\text{W/g}$)
Dimensions	: Overall length: 337 mm (Tip length: 20 mm) Tip diameter: 2.5 mm (Body diameter: 12 mm) Distance from probe tip to dipole centers: 1 mm
Application	: High precision dosimetric measurements in any exposure scenario (e.g., very strong gradient fields). Only probe which enables compliance testing for frequencies up to 6 GHz with precision of better 30%



EX3DV4 E-Field Probe

NOTE:

1. The Probe parameters have been calibrated by the SPEAG. Please reference “APPENDIX C” for the Calibration Certification Report.

9.2. SAM Phantom

Construction	: The SAM Phantom is constructed of a fiberglass shell integrated in a wooden table. The shape of the shell is based on data from an anatomical study designed to determine the maximum exposure in at least 90 % of all users. 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 the evaporation of the liquid. Reference markings on the Phantom allow the complete setup of all predefined phantom positions and measurement grids by manually teaching three points in the robot
Shell Thickness	: $2.0\text{ mm} \pm 0.1\text{ mm}$
Filling Volume	: Approx. 25 liters



SAM Phantom

9.3. Device Holder

Construction:	: In combination with the Twin SAM PhantomV4.0/V4.0C or Twin SAM, the Mounting Device (made from POM) enables the rotation of the mounted transmitter in spherical coordinates, whereby the rotation point is the ear opening. The devices can be easily and accurately positioned according to IEC, IEEE, CENELEC, FCC or other specifications. The device holder can be locked at different phantom locations (left head, right head, flat phantom).
----------------------	--



Device Holder

10. SAR Measurement Procedures

10.1. Normal SAR Measurement Procedure

Step 1: Power Reference Measurement

The Power Reference Measurement and Power Drift Measurements are for monitoring the power drift of the device under test in the batch process. The Minimum distance of probe sensors to surface determines the closest measurement point to phantom surface. The minimum distance of probe sensors to surface is 1.4 mm. This distance cannot be smaller than the Distance of sensor calibration points to probe tip as defined in the probe properties.

Step 2 and 3: Area Scan & Zoom Scan Procedures

The entire evaluation of the spatial peak values is performed within the Post-processing engine (SEMCAD). The system always gives the maximum values for the 1 g and 10 g cubes. The algorithm to find the cube with highest averaged SAR is divided into the following stages:

1. The extraction of the measured data (grid and values) from the Zoom Scan.
2. The calculation of the SAR value at every measurement point based on all stored data (A/D values and measurement parameters)
3. The generation of a high-resolution mesh within the measured volume
4. The interpolation of all measured values from the measurement grid to the high-resolution grid
5. The extrapolation of the entire 3-D field distribution to the phantom surface over the distance from sensor to surface
6. The calculation of the averaged SAR within masses of 1 g and 10 g.

Step 4: Power drift measurement

The Power Drift Measurement measures the field at the same location as the most recent power reference measurement within the same procedure, and with the same settings. The Power Drift Measurement gives the field difference in dB from the reading conducted within the last Power Reference Measurement. This allows a user to monitor the power drift of the device under test within a batch process. The measurement procedure is the same as Step 1. SAR drift shall be kept within $\pm 5 \%$ and if it without $\pm 5 \%$, SAR retest according to measurement procedure step 1~4.

< Area and Zoom Scan Resolutions per FCC KDB Publication 865664 D01v01r04 >

			≤ 3 GHz	> 3 GHz
Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface			5 mm $\pm$ 1 mm	$\frac{1}{2} \cdot \delta \cdot \ln(2)$ mm $\pm$ 0.5 mm
Maximum probe angle from probe axis to phantom surface normal at the measurement location			$30^{\circ} \pm 1^{\circ}$	$20^{\circ} \pm 1^{\circ}$
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 $\leq$ 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
	graded grid	$\Delta z_{Zoom}(1)$: between 1 st 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	$\leq 1.5 \cdot \Delta z_{Zoom}(n-1)$ 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 <u>reported</u> SAR from the <i>area scan based 1-g SAR estimation</i> 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.				

11. SAR System Verification

The microwave circuit arrangement for system verification is sketched in Fig 1. The daily system accuracy verification occurs within the flat section of the SAM phantom. A SAR measurement was performed to see if the measured SAR was within $\pm 10\%$ from the target SAR values. These tests were done at 2450 MHz. The tests were conducted on the same days as the measurement of the DUT. The obtained results from the system accuracy verification are displayed in the table 1. (SAR values are normalized to 1W forward power delivered to the dipole). During the tests, the ambient temperature of the laboratory was in the range $(22 \pm 2)^\circ\text{C}$, the relative humidity was in the range $(55 \pm 5)\%$ R.H and the liquid depth above the ear reference points was $\geq 15\text{ cm} \pm 5\text{ mm}$ (frequency $\leq 3\text{ GHz}$) or $\geq 10\text{ cm} \pm 5\text{ mm}$ (frequency $> 3\text{ GHz}$) in all the cases. It is seen that the system is operating within its specification, as the results are within acceptable tolerance of the reference values.

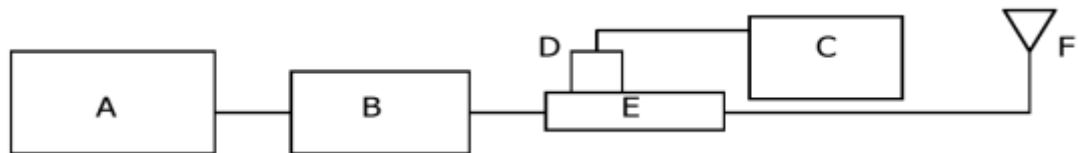


Fig 1. The microwave circuit arrangement used for SAR system verification

- A. Signal Generator
- B. RF Amplifier
- C. Power Meter
- D. Power Sensor
- E. Dual Directional Coupler
- F. Reference dipole Antenna



Photo of the dipole Antenna

SAR System Verification

Dipole Validation Kits		Probe S/N	Freq. (MHz)	Input Power (W)	Target SAR values (W/Kg)	1 W normalized Measured SAR (W/Kg)	Deviation (%)	Date	Temperature (°C)	
					1g SAR	1g SAR	1g SAR		Ambient	Liquid
D2450V2	892	3791	2450	0.10	52.60	54.00	2.66	2025-07-02	21.8	21.7
D2450V2	892	3791	2450	0.10	52.60	51.50	-2.09	2025-07-03	21.9	21.0
D2450V2	892	3791	2450	0.10	52.60	51.50	-2.09	2025-07-08	21.9	21.7
D2450V2	892	3791	2450	0.10	52.60	49.50	-5.89	2025-07-09	21.8	21.5
D2450V2	892	3791	2450	0.10	52.60	52.90	0.57	2025-07-10	21.9	21.8
D2450V2	892	3791	2450	0.10	52.60	49.10	-6.65	2025-07-17	21.6	21.4

Table 1 Results system verification

Report File No : F690501-RF-SAR000601

Date of Issue : 2025-07-17

(All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.)

12. Tissue Simulant Fluid for the Frequency Band

The dielectric properties for this simulant fluid were measured by using the Speag Model DAK-3.5 Dielectric Probe in conjunction with Agilent E5063A Network Analyze by using a procedure.

Freq. (MHz)	Target Value		Measure Value		Deviation (%)		Date	Liquid Temperature (°C)
	Permittivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)	Permittivity	Conductivity (S/m)		
2450*	39.20	1.80	41.071	1.844	4.77	2.44	2025-07-02	21.7
2480.00	39.20	1.80	41.000	1.864	4.59	3.56		
2450*	39.20	1.80	37.743	1.799	-3.72	-0.06	2025-07-03	21.0
2480.00	39.20	1.80	37.747	1.820	-3.71	1.11		
2450*	39.20	1.80	40.392	1.740	3.04	-3.33	2025-07-08	21.7
2402.00	39.20	1.80	40.327	1.712	2.87	-4.89		
2440.00	39.20	1.80	40.368	1.736	2.98	-3.56		
2441.00	39.20	1.80	40.371	1.736	2.99	-3.56		
2480.00	39.20	1.80	40.291	1.780	2.78	-1.11		
2450*	39.20	1.80	39.849	1.751	1.66	-2.72	2025-07-09	21.5
2440.00	39.20	1.80	39.864	1.759	1.69	-2.28		
2450*	39.20	1.80	39.991	1.837	2.02	2.06	2025-07-10	21.8
2402.00	39.20	1.80	40.060	1.791	2.19	-0.50		
2480.00	39.20	1.80	39.916	1.859	1.83	3.28		
2450*	39.20	1.80	39.811	1.842	1.56	2.33	2025-07-17	21.4
2402.00	39.20	1.80	39.924	1.802	1.85	0.11		
2441.00	39.20	1.80	39.827	1.833	1.60	1.83		

The brain mixtures consist of a viscous gel using hydroxyethyl cellulose (HEC) gelling agent and saline solution. Preservation with a bactericide is added and visual inspection is made to make sure air bubbles are not trapped during the mixing process. The mixture is calibrated to obtain proper dielectric constant (permittivity) and conductivity of the desired tissue. The composition of ingredients may be modified accordingly to achieve the desired target tissue parameters required for routine SAR evaluation. The dielectric properties of the liquid material required to fill the phantom shell shall be target.

Frequency (MHz)	450	835	900	1800-2000	2450	2600
Tissue Type	Head & Body					
Ingredient (% by weight)						
Water	38.91	40.29	40.29	55.24	45.0	45.0
Salt (NaCl)	3.79	1.38	1.38	0.31	0	0
Sugar	56.93	57.90	57.90	0	0	0
HEC	0.25	0.24	0.24	0	0	0
Bactericide	0.12	0.18	0.18	0	0	0
Triton X-100	0	0	0	0	0	0
DGBE	0	0	0	44.45	55.00	55.00
Tissue parameter target by IEEE 1528-2013						
Dielectric Constant	43.50	41.50	41.50	40.00	39.20	39.00
Conductivity (S/m)	0.87	0.90	0.97	1.40	1.80	1.96
Salt: 99+% Pure Sodium Chloride Water: De-ionized, 16 M ⁺ resistivity DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]				Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose		

13. Instruments List

Test Platform	SPEAG DASY System				
Manufacture	SPEAG				
Description	SAR Test System				
Software Reference	DASY52: 52.10.4(1527), SEMCAD X: 14.6.14(7483)				
Equipment	Type	Serial Number	Cal Date	Cal Interval	Cal Due
Phantom	SAM Phantom	1998	N/A	N/A	N/A
Dipole Validation Kits	D2450V2	892	2025-01-14	Biennial	2027-01-14
DAE	DAE4	1340	2025-05-21	Annual	2026-05-21
E-Field Probe	EX3DV4	3791	2025-04-22	Annual	2026-04-22
Network Analyzer	E5063A	MY54706220	2025-01-08	Annual	2026-01-08
Power Meter	E4419B	GB43311715	2025-02-19	Annual	2026-02-19
Power Meter	N1914A	MY56120017	2025-06-04	Annual	2026-06-04
Power Sensor	E9300H	MY41495307	2025-04-17	Annual	2026-04-17
Power Sensor	E9300H	MY41495314	2025-04-17	Annual	2026-04-17
Power Sensor	N8481A	MY56120030	2025-02-19	Annual	2026-02-19
Signal Generator	E4421B	MY43350132	2025-02-12	Annual	2026-02-12
RF Amplifier	AMP2027ADB	10006	2025-01-09	Annual	2026-01-09
Dual Directional Coupler	772D	MY52180259	2025-05-24	Annual	2026-05-24
LP Filter	LA-30N	LF03	2025-03-04	Annual	2026-03-04
Attenuator	18N-03	18	2024-12-06	Annual	2025-12-06
Attenuator	18N-20	21	2024-11-27	Annual	2025-11-27
Hygro-Thermometer	BJ5478	12091382-1	2025-05-24	Annual	2026-05-24
Digital Thermometer	SDT25	23111500095	2025-01-09	Annual	2026-01-09
Bluetooth Tester	MT8852B	1219005	2024-08-07	Annual	2025-08-07
Signal Analyzer	FSQ	201057	2025-03-24	Annual	2026-03-24

14. FCC Power Measurement Procedures

The SAR measurement Software calculates a reference point at the start and end of the test to check for power drifts. If conducted power deviations of more than 5 % occurred, the tests were repeated.

15. Measured and Reported SAR

Per FCC KDB Publication 447498 D04v01, When SAR is not measured at the maximum power level allowed for production units, the results must be scaled to the maximum tune-up tolerance limit according to the power applied to the individual channels tested to determine compliance. For simultaneous transmission, the measured aggregate SAR must be scaled according to the sum of the differences between the maximum tune-up tolerance and actual power used to test each transmitter. When SAR is measured at or scaled to the maximum tune-up tolerance limit, the results are referred to as reported SAR. Test highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

16. Maximum Output Power Specifications[※]

This device operates using the following maximum output power specifications. SAR values were scaled to the maximum allowed power to determine compliance per KDB Publication 447498 D04v01.

Bluetooth Tune-up Power

Average power for Production (dBm)		
Mode	Maximum/Normal	Classic
BDR	Maximum	10.90
	Normal	9.90
EDR	Maximum	8.50
	Normal	7.50

Average power for Production (dBm)			
Mode	Maximum/Normal	1M	2M
LE	Maximum	9.50	9.50
	Normal	8.50	8.50

- The data marked ※ in this report was provided by the customer and may affect the validity of the test results.

We are responsible for all the information of this test report except for the data(※) provided by the customer.

17. RF Conducted Power Measurement

17.1. Bluetooth Classic Conducted Power

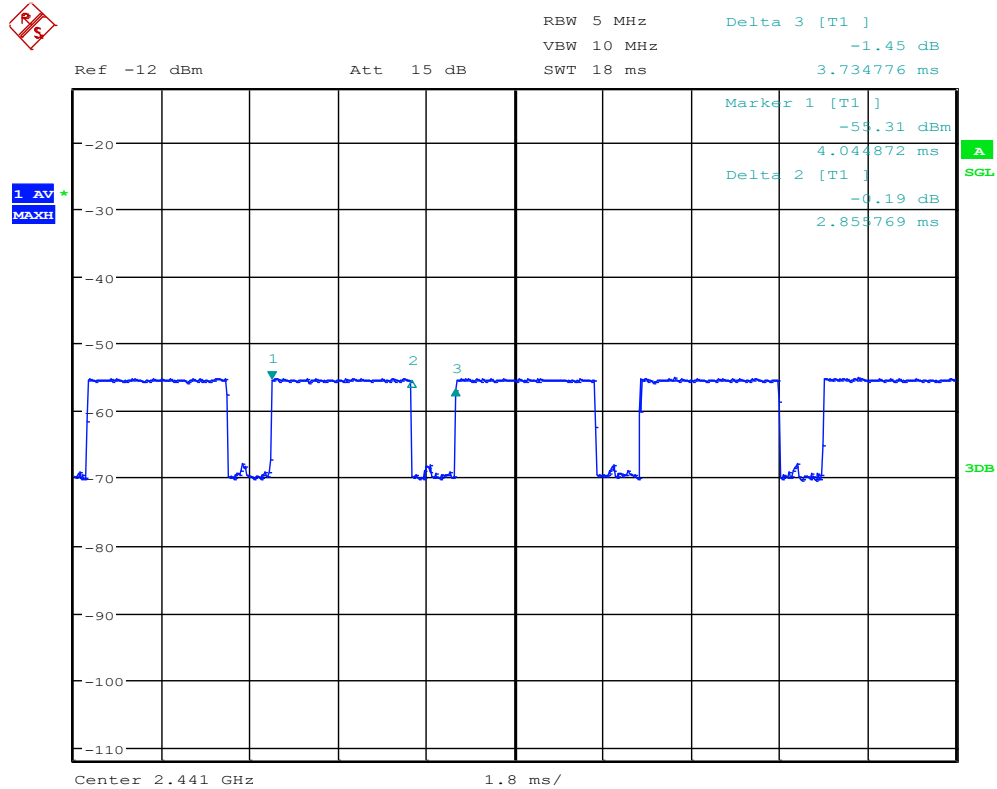
MODE	Frequency	Channel No.	Data Rate	Burst-Conducted Average Power	
	[MHz]		[Mbps]	Conducted Power (dBm)	E.I.R.P
BDR	2402	0	DH1	10.24	2.60
			DH3	10.23	2.59
			DH5	10.18	2.54
	2441	39	DH1	10.78	3.14
			DH3	10.76	3.12
			DH5	10.68	3.04
	2480	78	DH1	10.84	3.20
			DH3	10.80	3.16
			DH5	10.75	3.11
EDR	2402	0	2DH1	6.82	-0.82
			2DH3	6.71	-0.93
			2DH5	6.73	-0.91
	2441	39	2DH1	7.47	-0.17
			2DH3	7.44	-0.20
			2DH5	7.40	-0.24
	2480	78	2DH1	7.56	-0.08
			2DH3	7.55	-0.09
			2DH5	7.51	-0.13
	2402	0	3DH1	6.77	-0.87
			3DH3	6.76	-0.88
			3DH5	6.74	-0.90
	2441	39	3DH1	7.46	-0.18
			3DH3	7.47	-0.17
			3DH5	7.34	-0.30
	2480	78	3DH1	7.52	-0.12
			3DH3	7.52	-0.12
			3DH5	7.48	-0.16

17.2. Bluetooth LE Conducted Power

MODE	Frequency	Channel No.	Packet Length	Burst-Conducted Average Power	
	[MHz]		[bytes]	Conducted Power (dBm)	E.I.R.P
1M	2402	0	37	8.41	0.77
			255	8.54	0.90
	2440	19	37	8.75	1.11
			255	8.75	1.11
	2480	39	37	8.62	0.98
			255	8.68	1.04
2M	2402	0	37	8.52	0.88
			255	8.61	0.97
	2440	19	37	8.79	1.15
			255	8.74	1.10
	2480	39	37	8.86	1.22
			255	8.91	1.27

18. Bluetooth Duty Cycle used for SAR Testing

18.1. Bluetooth Classic DH5 Duty Cycle



Bluetooth Duty cycle measurement

$$T_{on} = 2.856 \text{ ms}$$

$$T_{on} + T_{off} = 3.735 \text{ ms}$$

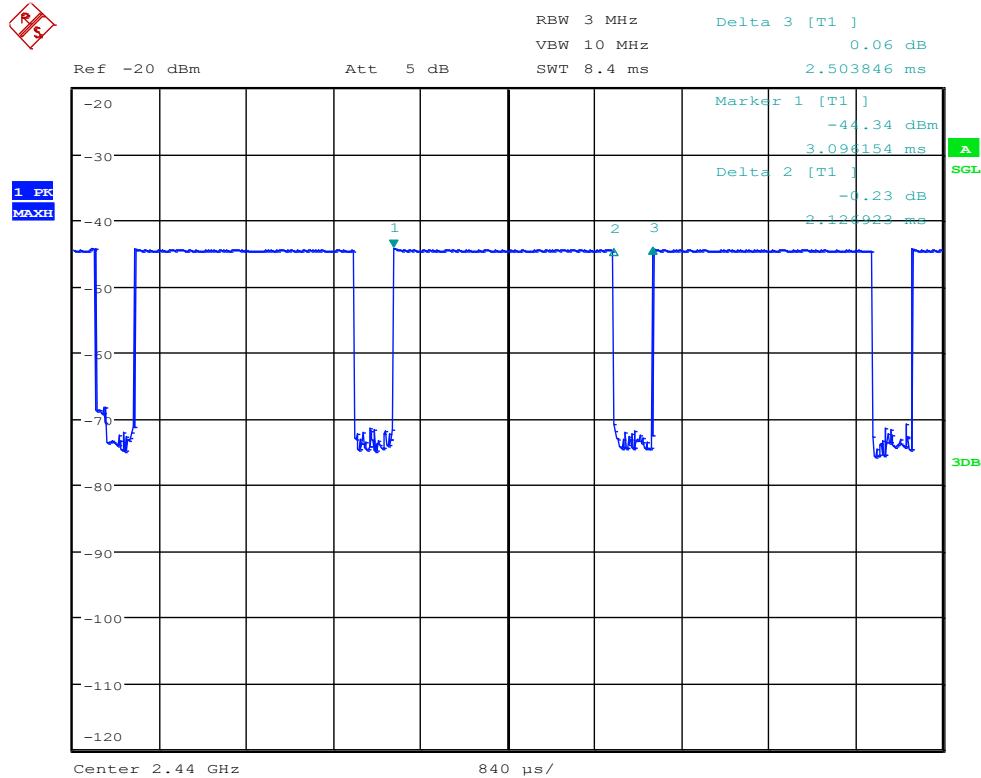
$$\text{Duty Cycle} = (T_{on} / T_{on} + T_{off}) \times 100$$

$$76.5 \% = (2.856 / 3.735) \times 100$$

$$\text{SAR Crest Factor} = 1 / (2.856 / 3.735) = 1.308$$

Bluetooth Duty cycle: 76.5 %

18.2. Bluetooth LE 1M 255byte Duty Cycle



Bluetooth LE Duty cycle measurement

$T_{on} = 2.127 \text{ ms}$

$T_{on} + T_{off} = 2.504 \text{ ms}$

Duty Cycle = $(T_{on} / T_{on} + T_{off}) \times 100$

84.9 % = $(2.127 / 2.504) \times 100$

SAR Crest Factor = $1 / (2.127 / 2.504) = 1.177$

Bluetooth LE Duty cycle: 84.9 %

19. SAR Data Summary

19.1. SAR data

Bluetooth SAR					Ambient Temperature (°C)			21.8 / 21.9 / 21.9 / 21.6			
					Liquid Temperature (°C)			21.7 / 21.0 / 21.7 / 21.4			
					Date			2025-07-02 / 2025-07-03 / 2025-07-08 / 2025-07-17			
Position	Mod.	Freq (MHz)	Ch.	Sensor State	Space (mm)	Measure Power (dBm)	Measure 1 g SAR (W/kg)	Tune-Up Limit (dBm)	Power Scaling Factor	Duty Scaling Factor	Scaling 1 g SAR (W/kg)
Edge1	GFSK DH5	2480.00	78	N/A	0	10.75	0.048	10.90	1.035	1.308	0.065
Edge2	GFSK DH5	2480.00	78	N/A	0	10.75	0.947	10.90	1.035	1.308	1.282
Edge2	GFSK DH5	2480.00	78	N/A	0	10.75	0.869	10.90	1.035	1.308	1.176*
Edge2	GFSK DH5	2441.00	39	N/A	0	10.68	0.916	10.90	1.052	1.308	1.260
Edge2	GFSK DH5	2402.00	0	N/A	0	10.18	0.762	10.90	1.180	1.308	1.176
Edge3	GFSK DH5	2480.00	78	N/A	0	10.75	0.605	10.90	1.035	1.308	0.819
Edge3	GFSK DH5	2441.00	39	N/A	0	10.68	0.509	10.90	1.052	1.308	0.700
Edge3	GFSK DH5	2402.00	0	N/A	0	10.18	0.456	10.90	1.180	1.308	0.704
Edge4	GFSK DH5	2480.00	78	N/A	0	10.75	0.616	10.90	1.035	1.308	0.834
Edge4	GFSK DH5	2441.00	39	N/A	0	10.68	0.436	10.90	1.052	1.308	0.600
Edge4	GFSK DH5	2402.00	0	N/A	0	10.18	0.402	10.90	1.180	1.308	0.620
Top	GFSK DH5	2480.00	78	N/A	0	10.75	0.017	10.90	1.035	1.308	0.023
Bottom	GFSK DH5	2480.00	78	N/A	0	10.75	0.053	10.90	1.035	1.308	0.072

Note:

The data marked (*) in this table was repeated measurement

Bluetooth Low Energy SAR					Ambient Temperature (°C)			21.9 / 21.8 / 21.9			
					Liquid Temperature (°C)			21.7 / 21.5 / 21.8			
					Date			2025-07-08 / 2025-07-09 / 2025-07-10			
Position	Mod.	Freq (MHz)	Ch.	Sensor State	Space (mm)	Measure Power (dBm)	Measure 1 g SAR (W/kg)	Tune-Up Limit (dBm)	Power Scaling Factor	Duty Scaling Factor	Scaling 1 g SAR (W/kg)
Edge1	1M 255bytes	2440.00	19	N/A	0	8.75	0.051	9.50	1.189	1.177	0.071
Edge2	1M 255bytes	2440.00	19	N/A	0	8.75	0.619	9.50	1.189	1.177	0.866
Edge2	1M 255bytes	2402.00	0	N/A	0	8.54	0.520	9.50	1.247	1.177	0.763
Edge2	1M 255bytes	2480.00	39	N/A	0	8.68	0.736	9.50	1.208	1.177	1.046
Edge3	1M 255bytes	2440.00	19	N/A	0	8.75	0.355	9.50	1.189	1.177	0.497
Edge4	1M 255bytes	2440.00	19	N/A	0	8.75	0.363	9.50	1.189	1.177	0.508
Top	1M 255bytes	2440.00	19	N/A	0	8.75	0.014	9.50	1.189	1.177	0.020
Bottom	1M 255bytes	2440.00	19	N/A	0	8.75	0.032	9.50	1.189	1.177	0.045



General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in FCC KDB Publication 447498 D04v01.
2. Liquid tissue depth was at least 15 cm for all frequencies.
3. All modes of operation were investigated, and worst-case results are reported.
4. The EUT is tested 2nd hot-spot peak if it is less than 2 dB below the highest peak.
5. The manufacturer has confirmed that the device(s) tested have the same physical, mechanical and thermal characteristics and are within operational tolerances expected for production units.
6. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB Publication 447498 D04v01.
7. Batteries are fully charged at the beginning of the SAR measurements.

20. SAR Measurement Variability

20.1. Measurement Variability

Per FCC KDB Publication 865664 D01v01r04, SAR measurement variability was assessed for each frequency band, which was determined by the SAR probe calibration point and tissue-equivalent medium used for the device measurements. When both head and body tissue-equivalent media were required for SAR measurements in a frequency band, the variability measurement procedures were applied to the tissue medium with the highest measured SAR, using the highest measured SAR configuration for that tissue-equivalent medium. These additional measurements were repeated after the completion of all measurements requiring the same head or body tissue-equivalent medium in a frequency band. The test device was returned to ambient conditions (normal room temperature) with the battery fully charged before it was re-mounted on the device holder for the repeated measurement(s) to minimize any unexpected variations in the repeated results.

SAR Measurement Variability was assessed using the following procedures for each frequency band:

1. When the original highest measured SAR is ≥ 0.80 W/kg, the measurement was repeated once.
2. A second repeated measurement was performed only if the ratio of largest to smallest SAR for the original and first repeated measurements was > 1.20 or when the original or repeated measurement was ≥ 1.45 W/kg ($\sim 10\%$ from the 1-g SAR limit).
3. A third repeated measurement was performed only if the original, first or second repeated measurement was ≥ 1.5 W/kg and the ratio of largest to smallest SAR for the original, first and second repeated measurements is > 1.20 .
4. Repeated measurements are not required when the original highest measured SAR is < 0.80 W/kg



Appendixes List

Appendix A	A.1 Verification Test Plots for 2450MHz A.2 SAR Test Plots for Bluetooth Classic A.3 SAR Test Plots for Bluetooth LE
Appendix B	B.1 Uncertainty Analysis
Appendix C	C.1 Calibration certificate for Probe (S/N: 3791) C.2 Calibration certificate for DAE (S/N: 1340) C.3 Calibration certificate for Dipole 2450 MHz (S/N: 892)

Appendix A.1 Verification Test Plots for 2450MHz

Date/Time: 2025-07-02 01:04:18

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2025-07-02.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.844$ S/m; $\epsilon_r = 41.071$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 9.75 W/kg

Verification/Verification 2450MHz/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 63.28 V/m; Power Drift = 0.17 dB

Peak SAR (extrapolated) = 10.0 W/kg

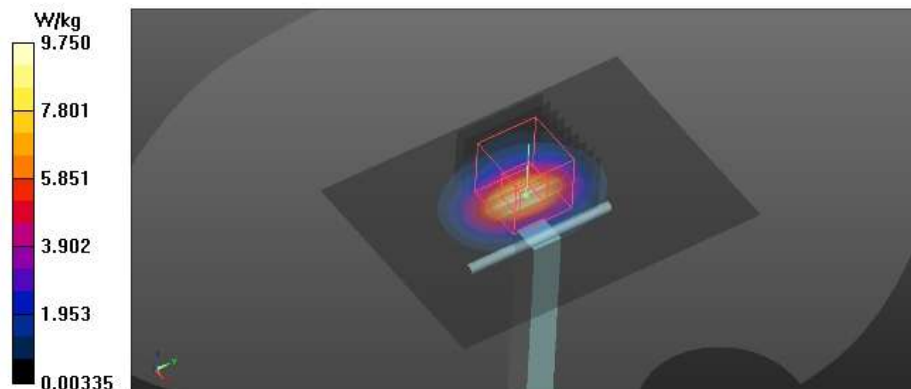
SAR(1 g) = 5.4 W/kg; SAR(10 g) = 2.61 W/kg

Smallest distance from peaks to all points 3 dB below = 9.4 mm

Ratio of SAR at M2 to SAR at M1 = 84.8%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 8.47 W/kg



Date/Time: 2025-07-03 01:19:02

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2025-07-03.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.799$ S/m; $\epsilon_r = 37.743$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

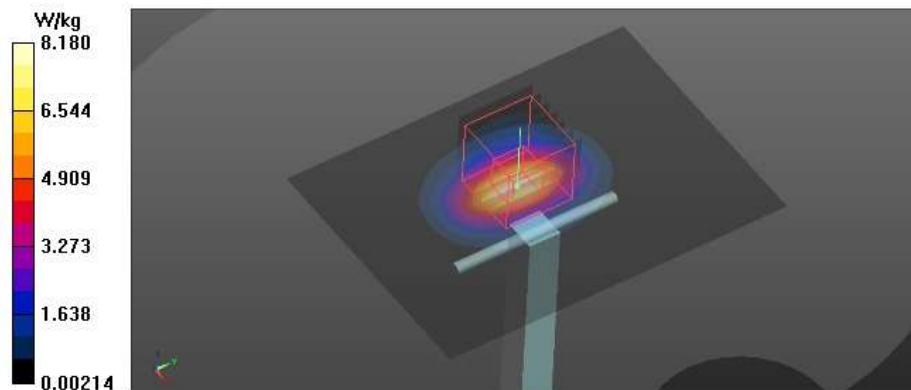
- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 8.18 W/kg

Verification/Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm
Reference Value = 63.32 V/m; Power Drift = 0.17 dB
Peak SAR (extrapolated) = 9.63 W/kg
SAR(1 g) = 5.15 W/kg; SAR(10 g) = 2.5 W/kg
Smallest distance from peaks to all points 3 dB below = 8.9 mm
Ratio of SAR at M2 to SAR at M1 = 84.5%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 8.16 W/kg



Date/Time: 2025-07-08 08:24:28

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2025-07-08.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.74$ S/m; $\epsilon_r = 40.392$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 7.67 W/kg

Verification/Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 62.27 V/m; Power Drift = 0.19 dB

Peak SAR (extrapolated) = 9.72 W/kg

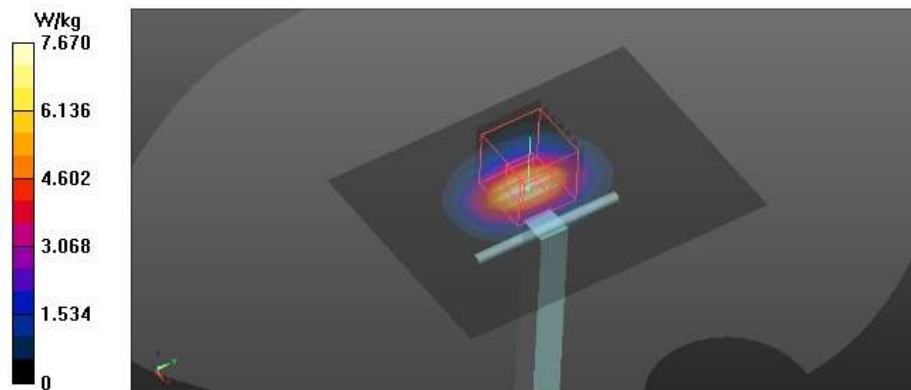
SAR(1 g) = 5.15 W/kg; SAR(10 g) = 2.49 W/kg

Smallest distance from peaks to all points 3 dB below = 8.8 mm

Ratio of SAR at M2 to SAR at M1 = 84.2%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 8.18 W/kg



Date/Time: 2025-07-09 08:06:59

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2025-07-09.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.751$ S/m; $\epsilon_r = 39.849$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 8.00 W/kg

Verification/Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=4$ mm, $dy=4$ mm, $dz=1.4$ mm

Reference Value = 53.21 V/m; Power Drift = 0.18 dB

Peak SAR (extrapolated) = 9.14 W/kg

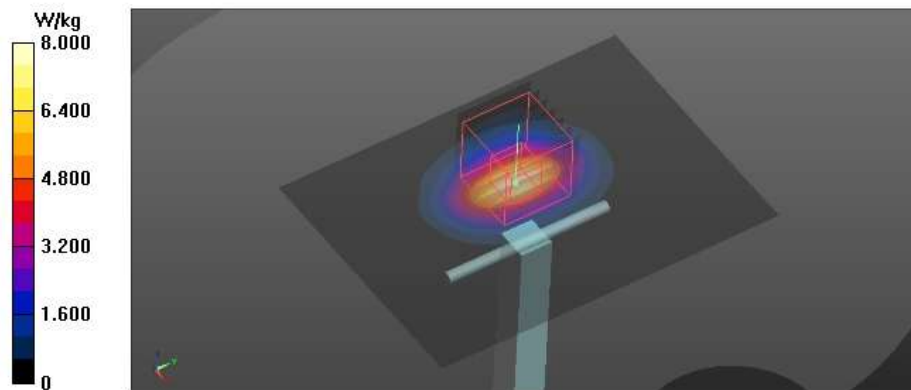
SAR(1 g) = 4.95 W/kg; SAR(10 g) = 2.41 W/kg

Smallest distance from peaks to all points 3 dB below = 8.8 mm

Ratio of SAR at M2 to SAR at M1 = 85.1%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 7.82 W/kg



Date/Time: 2025-07-10 10:12:04

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz_2025-07-10.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.837$ S/m; $\epsilon_r = 39.991$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 8.67 W/kg

Verification/Verification 2450MHz/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.55 V/m; Power Drift = 0.06 dB

Peak SAR (extrapolated) = 9.96 W/kg

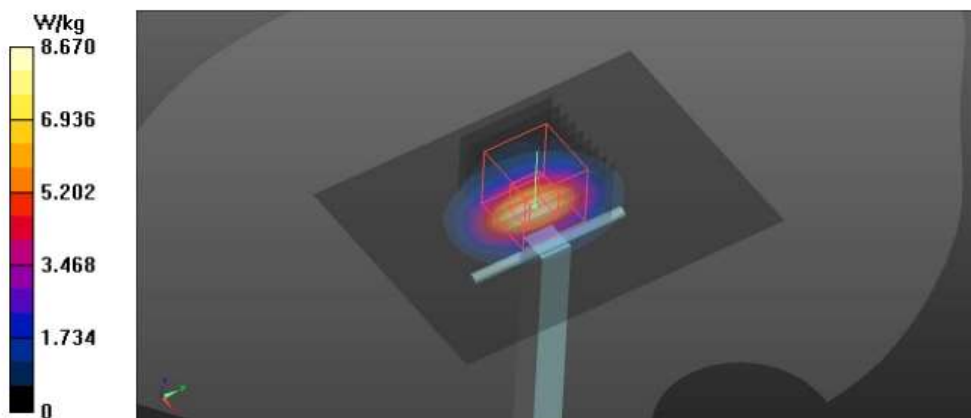
SAR(1 g) = 5.29 W/kg; SAR(10 g) = 2.56 W/kg

Smallest distance from peaks to all points 3 dB below = 8.8 mm

Ratio of SAR at M2 to SAR at M1 = 84.4%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 8.37 W/kg



Date/Time: 2025-07-17 09:51:34

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz_2025-07-17.da53:0](#)

Input Power : 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:892

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.842$ S/m; $\epsilon_r = 39.811$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2450 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt) 1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x111x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 8.15 W/kg

Verification/Verification 2450MHz/Zoom Scan (9x9x7)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm

Reference Value = 69.98 V/m; Power Drift = -0.02 dB

Peak SAR (extrapolated) = 9.44 W/kg

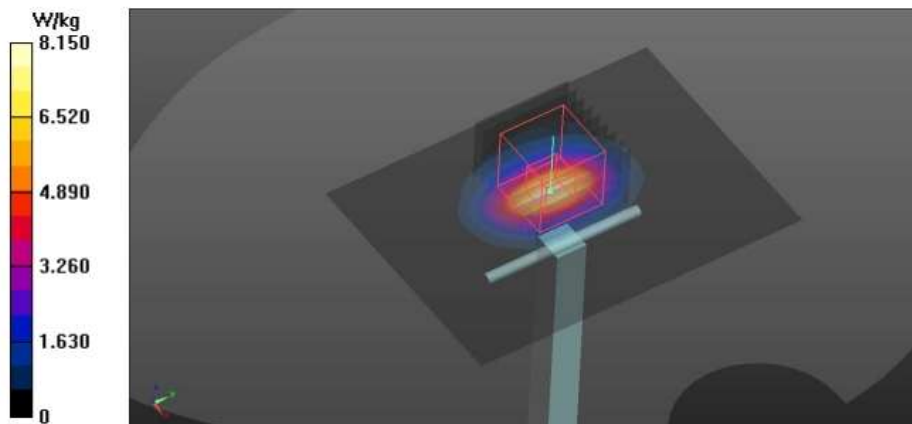
SAR(1 g) = 4.91 W/kg; SAR(10 g) = 2.32 W/kg

Smallest distance from peaks to all points 3 dB below = 8.8 mm

Ratio of SAR at M2 to SAR at M1 = 83.8%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 7.94 W/kg



Appendix A.2 SAR Test Plots for Bluetooth Classic

Date/Time: 2025-07-03 04:27:27

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: BT_GFSK_DH5_Left Unit.da53:0

DUT: SM-R420_Left Unit; Type: Bluetooth Headset; Serial: #1

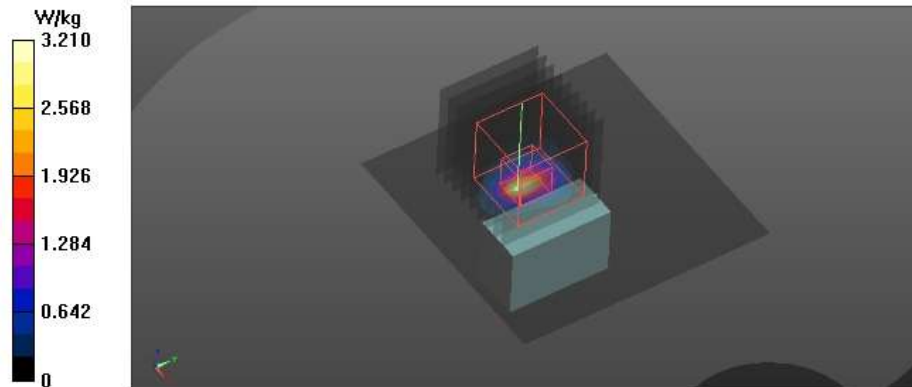
Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1.30768
Medium parameters used: $f = 2480$ MHz; $\sigma = 1.82$ S/m; $\epsilon_r = 37.747$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2480 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/BT_Edge2_GFSK_DH5_CH78 for FCC/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 3.21 W/kg

Body/BT_Edge2_GFSK_DH5_CH78 for FCC/Zoom Scan (9x9x8)/Cube 0: Measurement grid: dx=4mm, dy=4mm, dz=1.4mm
Reference Value = 12.93 V/m; Power Drift = -0.07 dB
Peak SAR (extrapolated) = 6.01 W/kg
SAR(1 g) = 0.947 W/kg; SAR(10 g) = 0.298 W/kg
Smallest distance from peaks to all points 3 dB below = 3.6 mm
Ratio of SAR at M2 to SAR at M1 = 56.6%
Maximum value of SAR (measured) = 2.85 W/kg



Appendix A.3 SAR Test Plots for Bluetooth LE

Date/Time: 2025-07-10 16:04:43

Test Laboratory : SGS Korea (Gunpo Laboratory)

File Name: [BTLE_Left Unit_1M.da53:0](#)

DUT: SM-R420_Left Unit; Type: Bluetooth Headset; Serial: #1

Communication System: UID 0, Bluetooth LE (0); Frequency: 2480 MHz; Duty Cycle: 1:1.17706

Medium parameters used: $f = 2480$ MHz; $\sigma = 1.859$ S/m; $\epsilon_r = 39.916$; $\rho = 1000$ kg/m³

Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.12, 6.5, 6.11) @ 2480 MHz; Calibrated: 2025-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1340; Calibrated: 2025-05-21
- Phantom: Twin-SAM V8.0 (20deg probe tilt) 1998; Type: QD 000 P41 Ax; Serial: 1998
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Body/BTLE_Edge2_1M_CH39 for FCC/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm

Maximum value of SAR (interpolated) = 2.21 W/kg

Body/BTLE_Edge2_1M_CH39 for FCC/Zoom Scan (11x11x8)/Cube 0: Measurement grid: dx=3mm, dy=3mm, dz=1.4mm

Reference Value = 38.31 V/m; Power Drift = -0.19 dB

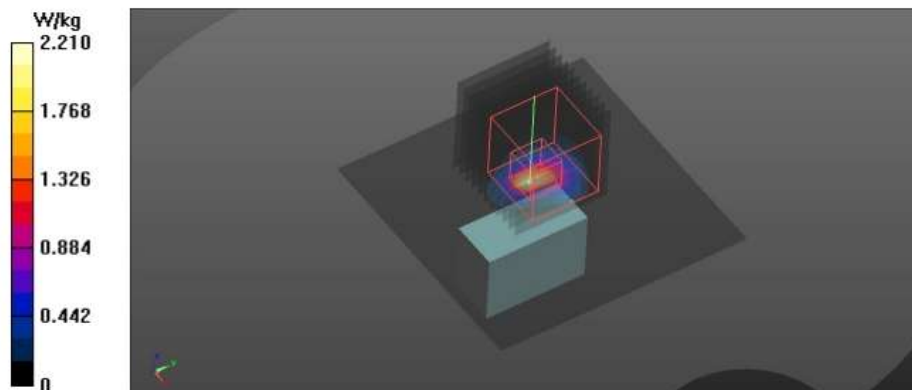
Peak SAR (extrapolated) = 6.67 W/kg

SAR(1 g) = 0.736 W/kg; SAR(10 g) = 0.231 W/kg

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

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

Maximum value of SAR (measured) = 2.17 W/kg



Appendix B.1 Uncertainty Analysis

a	c	d	e = f(d,k)	f	g	h =	i =	k
						cxg/e	cxg/e	
Uncertainty Component	Tol	Prob .	Div.	Ci	Ci	1g	10g	Vi
	(%)	Dist.		(1g)	(10g)	ui (%)	ui (%)	(Veff)
Probe calibration	6.55	N	1.00	1.00	1.00	6.55	6.55	∞
Axial Isotropy	4.70	R	1.73	0.71	0.71	1.92	1.92	∞
Hemispherical Isotropy	9.60	R	1.73	0.71	0.71	3.92	3.92	∞
Boundary Effects	2.00	R	1.73	1.00	1.00	1.15	1.15	∞
Linearity	4.70	R	1.73	1.00	1.00	2.71	2.71	∞
System Detection Limits	0.25	R	1.73	1.00	1.00	0.14	0.14	∞
Modulation Response	4.80	R	1.73	1.00	1.00	2.77	2.77	∞
Readout Electronics	0.30	N	1.00	1.00	1.00	0.30	0.30	∞
Response Time	0.80	R	1.73	1.00	1.00	0.46	0.46	∞
Integration Time	2.60	R	1.73	1.00	1.00	1.50	1.50	∞
RF Ambient Noise	3.00	R	1.73	1.00	1.00	1.73	1.73	∞
RF Ambient Reflections	3.00	R	1.73	1.00	1.00	1.73	1.73	∞
Probe Positioner mechanical tolerance	0.40	R	1.73	1.00	1.00	0.23	0.23	∞
Probe Positioning with respect to phantom shell	6.70	R	1.73	1.00	1.00	3.87	3.87	∞
Extrapolation, interpolation, and integration algorithms for max. SAR evaluation	4.00	R	1.73	1.00	1.00	2.31	2.31	∞
Test sample positioning	1.35/2.10	N	1.00	1.00	1.00	1.35	2.10	35
Device holder uncertainty	3.98/3.17	N	1.00	1.00	1.00	3.98	3.17	3
Output power variation - SAR drift measurement	5.00	R	1.73	1.00	1.00	2.89	2.89	∞
Phantom uncertainty	6.60	R	1.73	1.00	1.00	3.81	3.81	∞
Liquid conductivity- measurement	2.89	N	1.00	0.78	0.71	2.25	2.05	59
Liquid permittivity- measurement	2.47	N	1.00	0.23	0.26	0.57	0.64	59
Liquid conductivity-temperature	1.65	R	1.73	0.78	0.71	0.74	0.68	20
Liquid permittivity - temperature	1.47	R	1.73	0.23	0.26	0.20	0.22	20
Combined standard uncertainty			RSS			12.40	12.24	281/660
Expanded uncertainty (95% CONFIDENCE INTERVAL)			k=2			24.80	24.48	

Appendix C.1 Calibration certificate for Probe (S/N: 3791)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates




S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

Client: **SGS**
Gyeonggi-do, Republic of Korea

Certificate No.: **EX-3791_Apr25**

CALIBRATION CERTIFICATE

Object: EX3DV4 - SN:3791

Calibration procedure(s): QA CAL-01.v10, QA CAL-12.v10, QA CAL-14.v7, QA CAL-23.v6, QA CAL-25.v8
Calibration procedure for dosimetric E-field probes

Calibration date: April 22, 2025

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.
All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 75%.
Calibration Equipment used (M&E critical for calibration)

Primary Standards	ID	Calibration Date (Certificate No.)	Sched. Cal.
Power Sensor RMS NRP-35T	SN: 103967	26-Mar-25 (No. 217-04280)	Mar-26
Type-N mismatch combination	SN: L1119	26-Mar-25 (No. 217-04280)	Mar-26
DCP DAK-12	SN: 1016	24-Sep-24 (No. DCP-DAK12-1016_Sep24)	Sep-25
DCP DAK-3.5	SN: 1249	23-Sep-24 (No. DCP-DAK3.5-1249_Sep24)	Sep-25
Reference Probe EX3DV4	SN: 7349	10-Jan-25 (No. EX3-7349_Jan25)	Jan-26
DAE4	SN: 1301	07-Nov-24 (No. DAE4-1301_Nov24)	Nov-25

Secondary Standards	ID	Check Date (in house)	Sched. Check
ACAP 2020 Calibration Setup	SN: L1404	30-Sep-24 (No. Report_ACAP2020E-Cave_20240930a)	Sep-25

	Name	Function	Signature
Calibrated by	Joanna Ueshaj	Laboratory Technician	
Approved by	Sven Kühn	Technical Manager	

Issued: April 22, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: EX-3791_Apr25

Page 1 of 22

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary

TSL	issue simulating liquid
NORM _{x,y,z}	sensitivity in free space
ConvF	sensitivity in TSL / NORM _{x,y,z}
DCP	diode compression point
CF	crest factor (1/duty_cycle) of the RF signal
A, B, C, D	modulation dependent linearization parameters
Polarization φ	φ rotation around probe axis
Polarization θ	θ rotation around an axis that is in the plane normal to probe axis (at measurement center), i.e., $\theta = 0$ is normal to probe axis
Connector Angle	Information used in DASY system to align probe sensor X to the robot coordinate system

Calibration is Performed According to the Following Standards:

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices – Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865684, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Methods Applied and Interpretation of Parameters:

- NORM_{x,y,z}: Assessed for E-field polarization $\theta = 0$ ($f \leq 900$ MHz in TEM-cell; $f > 1800$ MHz: R22 waveguide). NORM_{x,y,z} are only intermediate values, i.e., the uncertainties of NORM_{x,y,z} does not affect the E²-field uncertainty inside TSL (see below ConvF).
- NORM_{x,y,z} = NORM_{x,y,z} * frequency_response (see Frequency Response Chart). This linearization is implemented in DASY4 software versions later than 4.2. The uncertainty of the frequency response is included in the stated uncertainty of ConvF.
- DCP_{x,y,z}: DCP are numerical linearization parameters assessed based on the data of power sweep with CW signal. DCP does not depend on frequency nor media.
- PAR: PAR is the Peak to Average Ratio that is not calibrated but determined based on the signal characteristics
- A_{x,y,z}; B_{x,y,z}; C_{x,y,z}; D_{x,y,z}; VR_{x,y,z}: A, B, C, D are numerical linearization parameters assessed based on the data of power sweep for specific modulation signal. The parameters do not depend on frequency nor media. VR is the maximum calibration range expressed in RMS voltage across the diode.
- ConvF and Boundary Effect Parameters: Assessed in flat phantom using E-field (or Temperature Transfer Standard for $f \leq 800$ MHz) and inside waveguide using analytical field distributions based on power measurements for $f > 800$ MHz. The same setups are used for assessment of the parameters applied for boundary compensation (alpha, depth) of which typical uncertainty values are given. These parameters are used in DASY4 software to improve probe accuracy close to the boundary. The sensitivity in TSL corresponds to NORM_{x,y,z} * ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from ± 50 MHz to ± 100 MHz.
- Spherical Isotropy (3D deviation from isotropy): in a field of low gradients realized using a flat phantom exposed by a patch antenna.
- Sensor Offset: The sensor offset corresponds to the offset of virtual measurement center from the probe tip (on probe axis). No tolerance required.
- Connector Angle: The angle is assessed using the information gained by determining the NORM_x (no uncertainty required).

EX3DV4 - SN:3791

April 22, 2025

Parameters of Probe: EX3DV4 - SN:3791

Basic Calibration Parameters

	Sensor X	Sensor Y	Sensor Z	Unc (k = 2)
Norm ($\mu V/(V/m)^2$) ^A	0.51	0.55	0.54	±10.1%
DCP (mV) ^B	104.2	102.9	102.3	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB $\sqrt{\mu V}$	C	D dB	VR mV	Max dev.	Max Unc ^C k = 2
0	CW	X	0.00	0.00	1.00	0.00	120.0	±1.0%	±4.7%
		Y	0.00	0.00	1.00		135.9		
		Z	0.00	0.00	1.00		130.3		
10352	Pulse Waveform (200Hz, 10%)	X	20.00	92.88	23.36	10.00	60.0	±2.8%	±9.6%
		Y	20.00	92.87	22.79		60.0		
		Z	20.00	94.88	24.31		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	92.71	21.99	5.99	60.0	±1.1%	±9.6%
		Y	20.00	92.80	21.68		60.0		
		Z	20.00	95.16	23.25		60.0		
10354	Pulse Waveform (200Hz, 40%)	X	20.00	93.38	20.77	3.98	95.0	±0.9%	±9.6%
		Y	20.00	94.73	21.28		95.0		
		Z	20.00	97.18	22.89		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	95.86	20.63	2.22	120.0	±0.9%	±9.6%
		Y	20.00	97.86	21.48		120.0		
		Z	20.00	100.13	22.88		120.0		
10367	QPSK Waveform, 1 MHz	X	1.63	65.11	14.24	1.00	150.0	±2.2%	±9.6%
		Y	1.58	65.09	14.14		150.0		
		Z	1.51	63.97	13.60		150.0		
10368	QPSK Waveform, 10 MHz	X	2.14	66.98	14.95	0.00	150.0	±1.2%	±9.6%
		Y	2.06	66.65	14.89		150.0		
		Z	1.97	65.60	14.29		150.0		
10398	64-QAM Waveform, 100 kHz	X	3.55	72.77	15.50	3.01	150.0	±0.7%	±9.6%
		Y	2.93	70.56	15.40		150.0		
		Z	2.91	69.46	15.12		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.32	66.08	15.05	0.00	150.0	±1.1%	±9.6%
		Y	3.42	66.64	15.39		150.0		
		Z	3.36	66.09	15.05		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.72	65.09	15.05	0.00	150.0	±2.2%	±9.6%
		Y	4.80	65.53	15.35		150.0		
		Z	4.78	65.18	15.14		150.0		

Note: For details on UID parameters see Appendix

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

^A The uncertainties of Norm X,Y,Z do not affect the E²-field uncertainty inside TSL (see Pages 5 and 6).

^B Linearization parameter uncertainty for maximum specified field strength.

^C Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

EX3DV4 - SN:3791

April 22, 2025

Parameters of Probe: EX3DV4 - SN:3791

Sensor Model Parameters

	C1 IF	C2 IF	a V ⁻¹	T1 ms V ⁻²	T2 ms V ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	T6
x	46.2	334.86	33.64	24.57	1.11	5.06	1.65	0.26	1.01
y	41.8	308.20	34.65	26.60	0.52	5.10	1.29	0.25	1.01
z	45.1	333.80	34.81	23.75	0.86	5.10	1.29	0.26	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	65.3°
Mechanical Surface Detection Mode	enabled
Optical Surface Detection Mode	disabled
Probe Overall Length	337 mm
Probe Body Diameter	10 mm
Tip Length	9 mm
Tip Diameter	2.5 mm
Probe Tip to Sensor X Calibration Point	1 mm
Probe Tip to Sensor Y Calibration Point	1 mm
Probe Tip to Sensor Z Calibration Point	1 mm
Recommended Measurement Distance from Surface	1.4 mm

Note: Measurement distance from surface can be increased to 3-4 mm for an Area Scan job.

EX3DV4 - SN:3791

April 22, 2025

Parameters of Probe: EX3DV4 - SN:3791

Calibration Parameter Determined in HSL

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^H (mm)	Unc ^H (k = 2)
750	41.9	0.89	9.25	8.45	7.95	0.38	1.27	±11.0%
635	41.5	0.90	8.89	8.12	7.64	0.38	1.27	±11.0%
500	41.5	0.97	8.74	7.98	7.51	0.38	1.27	±11.0%
1750	40.1	1.37	7.93	7.25	6.82	0.38	1.27	±11.0%
1900	40.0	1.40	7.69	7.02	6.60	0.38	1.27	±11.0%
2300	39.5	1.67	7.30	6.67	6.27	0.37	1.27	±11.0%
2450	39.2	1.80	7.12	6.50	6.11	0.37	1.27	±11.0%
2600	39.0	1.96	6.98	6.37	6.00	0.37	1.27	±11.0%
3300	38.2	2.71	6.70	6.12	5.75	0.37	1.27	±13.1%
3500	37.9	2.91	6.65	6.07	5.71	0.37	1.27	±13.1%
3700	37.7	3.12	6.56	5.99	5.64	0.37	1.27	±13.1%
3900	37.5	3.32	6.51	5.95	5.59	0.37	1.27	±13.1%
4100	37.2	3.53	6.42	5.86	5.51	0.37	1.27	±13.1%
5200	36.0	4.68	5.52	5.05	4.75	0.33	1.27	±13.1%
5300	35.9	4.76	5.33	4.87	4.58	0.32	1.27	±13.1%
5500	35.8	4.96	5.20	4.75	4.47	0.30	1.27	±13.1%
5600	35.5	5.07	5.26	4.81	4.52	0.29	1.27	±13.1%
5800	35.3	5.27	5.18	4.73	4.45	0.27	1.27	±13.1%

^C Frequency validity above 300 MHz of ±100 MHz only applies for DASV v4.4 and higher (see Page 21), else it is restricted to ±50 MHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band. Frequency validity below 300 MHz is ±10, 25, 40, 50 and 70 MHz for ConvF assessments at 30, 64, 125, 150 and 220 MHz respectively. Validity of ConvF assessed at 6 MHz is 4-6 MHz, and ConvF assessed at 13 MHz is 9-19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±5% from the target values (typically better than ±5%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

^H Alpha/Depth are determined during calibration. SPREAD warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz and below ±2% for frequencies between 3-6 GHz at any distance larger than half the probe tip diameter from the boundary.

^H The stated uncertainty is the total calibration uncertainty (k = 2) of Norm ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62339-1:2020.

EX3DV4 - SN:3791

April 22, 2025

Parameters of Probe: EX3DV4 - SN:3791

Calibration Parameter Determined in HSL

f (MHz) ^①	Relative Permittivity ^②	Conductivity ^② (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^③	Depth ^④ (mm)	Unc ^⑤ (k = 2)
6500	34.5	6.07	5.57	5.09	4.79	0.20	1.27	±18.6%

^① Frequency validity at 6.5 GHz is -600/-700 MHz, and ±700 MHz at or above 7 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

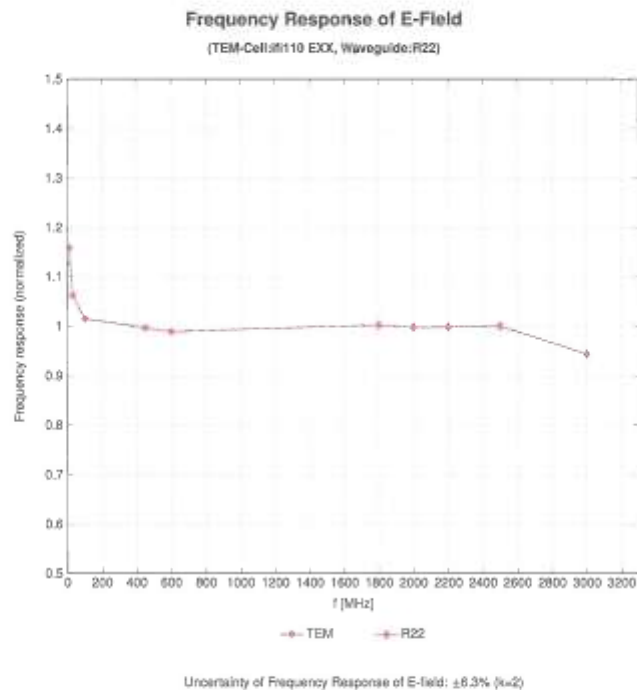
^② The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ and σ by less than ±18% from the target values (typically better than ±8%) and are valid for TSL with deviations of up to ±10%.

^③ Alpha/Depth are determined during calibration. SPENAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3-6 GHz; and below ±4% for frequencies between 6-10 GHz at any distance larger than half the probe tip diameter from the boundary.

^⑤ The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2025.

EX3DV4 - SN:3791

April 22, 2025

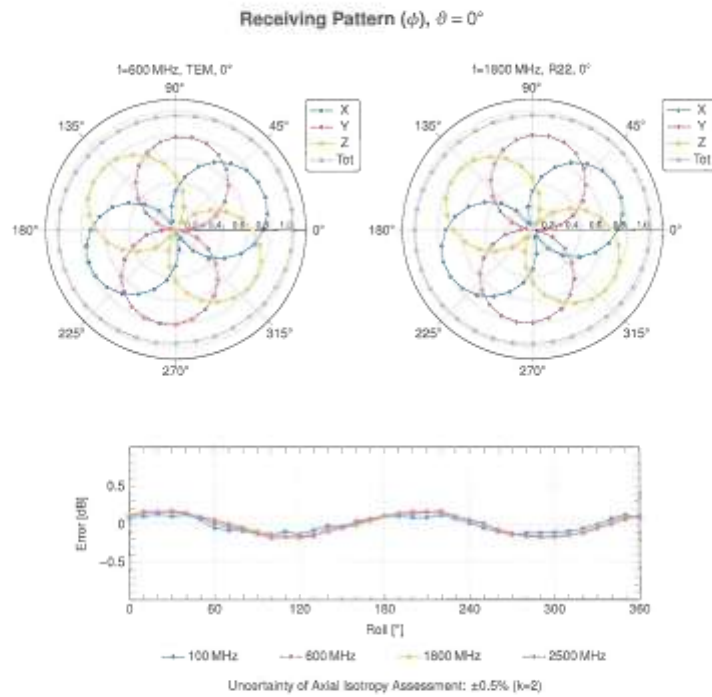


Certificate No: EX-3791_Apr25

Page 7 of 22

EX3DV4 - SN:3791

April 22, 2025

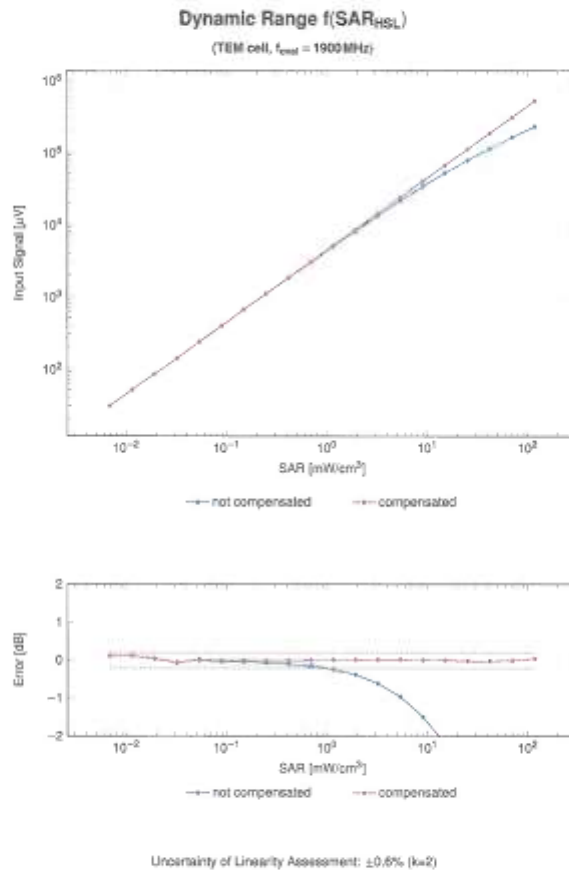


Certificate No: EX-5791_Apr25

Page 8 of 22

EX3DW4 - SN3791

April 22, 2025



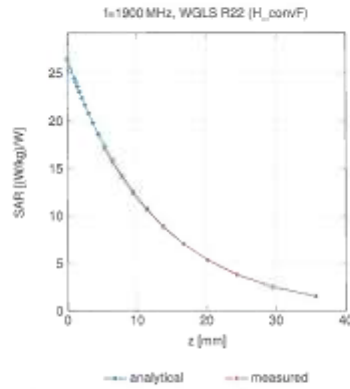
Certificate No: EX-3791_Apr25

Page 9 of 22

EX3DV4 - SN:3791

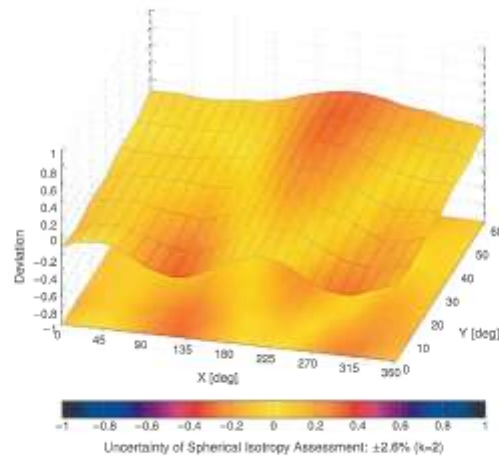
April 22, 2025

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (ϕ, θ), $f = 900 \text{ MHz}$



Certificate No: EX-3791_Apr25

Page 10 of 22

EX3DV4 - SN:3791

April 22, 2025

Appendix: Modulation Calibration Parameters

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ² k=2
10010	CAB	SAR Validation (Square, 100 ms, 10 ms)	CW	0.00	±4.7
10011	CAC	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
10012	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	1.87	±9.6
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 5 Mbps)	WLAN	3.45	±9.6
10021	CAC	GSM-FDD (TDMA, GSM)	GSM	9.39	±9.6
10023	CAC	GPRS-FDD (TDMA, GSM, TN 3)	GSM	9.57	±9.6
10024	CAC	GPRS-FDD (TDMA, GSM, TN 3-1)	GSM	8.56	±9.6
10025	CAC	EDGE-FDD (TDMA, GPRS, TN 3)	GSM	12.62	±9.6
10026	CAC	EDGE-FDD (TDMA, GPRS, TN 3-1)	GSM	9.56	±9.6
10027	CAC	GPRS-FDD (TDMA, GSM, TN 3-1-2)	GSM	4.86	±9.6
10028	CAC	GPRS-FDD (TDMA, GSM, TN 3-1-2-3)	GSM	3.55	±9.6
10029	CAC	EDGE-FDD (TDMA, GPRS, TN 3-1-2)	GSM	7.76	±9.6
10030	CAA	IEEE 802.15.1 Bluetooth (FSK, DH)	Bluetooth	5.50	±9.6
10031	CAA	IEEE 802.15.1 Bluetooth (FSK, DH)	Bluetooth	1.67	±9.6
10032	CAA	IEEE 802.15.1 Bluetooth (FSK, DH)	Bluetooth	1.16	±9.6
10033	CAA	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH)	Bluetooth	7.74	±9.6
10034	CAA	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH)	Bluetooth	4.53	±9.6
10035	CAA	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH)	Bluetooth	3.23	±9.6
10036	CAA	IEEE 802.15.1 Bluetooth (B-DQPSK, DH)	Bluetooth	5.01	±9.6
10037	CAA	IEEE 802.15.1 Bluetooth (B-DQPSK, DH)	Bluetooth	4.77	±9.6
10038	CAA	IEEE 802.15.1 Bluetooth (B-DQPSK, DH)	Bluetooth	4.10	±9.6
10039	CAB	CDMA2000 (1xRTT, RCT)	CDMA2000	4.57	±9.6
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDD, P4-DQPSK, Fullrate)	AMPS	7.76	±9.6
10044	CAA	IS-61E/WIA-SSS FDD (TDMA, FSK)	AMPS	0.00	±9.6
10048	CAA	DECT (TDD, TDMA/FDD, GFSK, Full Rate, 24)	DECT	13.80	±9.6
10049	CAA	DECT (TDD, TDMA/FDD, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10050	CAA	UMTS-TDD (TD-SSCDMA, 1.38 Mcps)	TD-SSCDMA	11.01	±9.6
10058	CAC	EDGE-FDD (TDMA, GPRS, TN 3-1-2-3)	GSM	6.52	±9.6
10059	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps)	WLAN	2.12	±9.6
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 3.5 Mbps)	WLAN	2.83	±9.6
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.80	±9.6
10062	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.88	±9.6
10063	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	6.53	±9.6
10064	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.99	±9.6
10065	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	±9.6
10066	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.39	±9.6
10067	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6
10068	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.34	±9.6
10069	CAC	IEEE 802.11a/n WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.58	±9.6
10071	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 9 Mbps)	WLAN	9.83	±9.6
10072	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 12 Mbps)	WLAN	9.82	±9.6
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 18 Mbps)	WLAN	9.84	±9.6
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 24 Mbps)	WLAN	10.32	±9.6
10075	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 36 Mbps)	WLAN	10.77	±9.6
10076	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 48 Mbps)	WLAN	10.54	±9.6
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS-OFDM, 54 Mbps)	WLAN	11.00	±9.6
10081	CAB	CDMA2000 (1xRTT, RCT)	CDMA2000	3.87	±9.6
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDD, P4-DQPSK, Fullrate)	AMPS	4.77	±9.6
10090	CAC	GPRS-FDD (TDMA, GSM, TN 3-4)	GSM	6.56	±9.6
10097	CAC	UMTS-FDD (HSDPA)	WCDMA	3.98	±9.6
10098	CAC	UMTS-FDD (HSDPA, Subclass 2)	WCDMA	3.58	±9.6
10099	CAC	EDGE-FDD (TDMA, GPRS, TN 3-4)	GSM	9.55	±9.6
10100	CAF	LTE-FDD (SC-FDMA, 100% RB, 25-MHz, QPSK)	LTE-FDD	5.67	±9.6
10101	CAF	LTE-FDD (SC-FDMA, 100% RB, 25-MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAF	LTE-FDD (SC-FDMA, 100% RB, 25-MHz, 64-QAM)	LTE-FDD	6.60	±9.6
10103	CAH	LTE-TDD (SC-FDMA, 100% RB, 25-MHz, QPSK)	LTE-TDD	9.29	±9.6
10104	CAH	LTE-TDD (SC-FDMA, 100% RB, 25-MHz, 16-QAM)	LTE-TDD	9.97	±9.6
10105	CAH	LTE-TDD (SC-FDMA, 100% RB, 25-MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10109	CAH	LTE-FDD (SC-FDMA, 100% RB, 10-MHz, QPSK)	LTE-FDD	6.80	±9.6
10109	CAH	LTE-FDD (SC-FDMA, 100% RB, 10-MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10110	CAH	LTE-FDD (SC-FDMA, 100% RB, 5-MHz, QPSK)	LTE-FDD	5.75	±9.6
10111	CAH	LTE-FDD (SC-FDMA, 100% RB, 5-MHz, 16-QAM)	LTE-FDD	6.44	±9.6

Certificate No: EX-3791_Apr25

Page 11 of 22

EX3DV4 - SN3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ² k = 2
10112	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	8.59	±0.6
10113	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	8.62	±0.6
10114	CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.10	±0.6
10115	CAB	IEEE 802.11n (HT Greenfield, 8.1 Mbps, 16-QAM)	WLAN	8.46	±0.6
10116	CAB	IEEE 802.11n (HT Greenfield, 13.5 Mbps, 64-QAM)	WLAN	8.15	±0.6
10117	CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±0.6
10118	CAB	IEEE 802.11n (HT Mixed, 8.1 Mbps, 16-QAM)	WLAN	8.50	±0.6
10119	CAB	IEEE 802.11n (HT Mixed, 13.5 Mbps, 64-QAM)	WLAN	8.13	±0.6
10140	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	8.40	±0.6
10141	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	8.63	±0.6
10142	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-FDD	5.73	±0.6
10143	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-FDD	6.36	±0.6
10144	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.85	±0.6
10145	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-FDD	5.76	±0.6
10146	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.41	±0.6
10147	CAG	LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.72	±0.6
10148	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±0.6
10150	CAF	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	6.90	±0.6
10151	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-TDD	9.20	±0.6
10152	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-TDD	9.92	±0.6
10153	CAH	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-TDD	10.05	±0.6
10154	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)	LTE-FDD	5.75	±0.6
10155	CAH	LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±0.6
10156	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-FDD	5.79	±0.6
10157	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-FDD	6.49	±0.6
10158	CAH	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.82	±0.6
10159	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10160	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	6.30	±0.6
10161	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-FDD	6.43	±0.6
10162	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-FDD	6.58	±0.6
10163	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.48	±0.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.21	±0.6
10168	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.79	±0.6
10169	CAF	LTE-FDD (SC-FDMA, 1 RB, 30 MHz, QPSK)	LTE-FDD	5.73	±0.6
10170	CAF	LTE-FDD (SC-FDMA, 1 RB, 30 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10171	CAF	LTE-FDD (SC-FDMA, 1 RB, 30 MHz, 64-QAM)	LTE-FDD	6.49	±0.6
10172	CAH	LTE-TDD (SC-FDMA, 1 RB, 30 MHz, QPSK)	LTE-TDD	9.21	±0.6
10173	CAH	LTE-TDD (SC-FDMA, 1 RB, 30 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10174	CAH	LTE-TDD (SC-FDMA, 1 RB, 30 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10175	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.73	±0.6
10176	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10177	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)	LTE-FDD	5.73	±0.6
10178	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10179	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10180	CAH	LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10181	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-FDD	5.72	±0.6
10182	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10183	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10184	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-FDD	5.73	±0.6
10186	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-FDD	6.51	±0.6
10189	CAF	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10197	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	±0.6
10198	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10199	CAF	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10193	CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.09	±0.6
10194	CAB	IEEE 802.11n (HT Greenfield, 3.9 Mbps, 16-QAM)	WLAN	8.12	±0.6
10195	CAB	IEEE 802.11n (HT Greenfield, 6.5 Mbps, 16-QAM)	WLAN	8.21	±0.6
10196	CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	±0.6
10197	CAB	IEEE 802.11n (HT Mixed, 3.9 Mbps, 16-QAM)	WLAN	8.15	±0.6
10198	CAB	IEEE 802.11n (HT Mixed, 6.5 Mbps, 64-QAM)	WLAN	8.27	±0.6
10219	CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)	WLAN	8.03	±0.6
10220	CAB	IEEE 802.11n (HT Mixed, 4.3 Mbps, 16-QAM)	WLAN	8.13	±0.6
10221	CAB	IEEE 802.11n (HT Mixed, 7.2 Mbps, 64-QAM)	WLAN	8.27	±0.6
10222	CAB	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±0.6
10223	CAB	IEEE 802.11n (HT Mixed, 9.0 Mbps, 16-QAM)	WLAN	8.40	±0.6
10224	CAB	IEEE 802.11n (HT Mixed, 15.0 Mbps, 64-QAM)	WLAN	8.08	±0.6

Certificate No: EX-3791_Apr25

Page 12 of 22

EX3D4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Line# & w/2
10225	CAC	UMTS-FDD (HSPA+)	WCDMA	5.97	±0.5
10226	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 16-QAM)	LTE-TDD	9.49	±0.5
10227	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, 64-QAM)	LTE-TDD	10.24	±0.5
10228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4MHz, QPSK)	LTE-TDD	9.23	±0.5
10229	CAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 16-QAM)	LTE-TDD	9.48	±0.5
10230	CAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, 64-QAM)	LTE-TDD	10.25	±0.5
10231	CAC	LTE-TDD (SC-FDMA, 1 RB, 3MHz, QPSK)	LTE-TDD	9.19	±0.5
10232	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 16-QAM)	LTE-TDD	9.48	±0.5
10233	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, 64-QAM)	LTE-TDD	10.25	±0.5
10234	CAH	LTE-TDD (SC-FDMA, 1 RB, 5MHz, QPSK)	LTE-TDD	9.21	±0.5
10235	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 16-QAM)	LTE-TDD	9.46	±0.5
10236	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, 64-QAM)	LTE-TDD	10.25	±0.5
10237	CAH	LTE-TDD (SC-FDMA, 1 RB, 10MHz, QPSK)	LTE-TDD	9.21	±0.5
10238	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 16-QAM)	LTE-TDD	9.48	±0.5
10239	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, 64-QAM)	LTE-TDD	10.25	±0.5
10240	CAG	LTE-TDD (SC-FDMA, 1 RB, 15MHz, QPSK)	LTE-TDD	9.21	±0.5
10241	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 16-QAM)	LTE-TDD	9.02	±0.5
10242	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, 64-QAM)	LTE-TDD	9.80	±0.5
10243	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4MHz, QPSK)	LTE-TDD	8.96	±0.5
10244	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 16-QAM)	LTE-TDD	10.06	±0.5
10245	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, 64-QAM)	LTE-TDD	10.06	±0.5
10246	CAE	LTE-TDD (SC-FDMA, 50% RB, 3MHz, QPSK)	LTE-TDD	9.30	±0.5
10247	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 16-QAM)	LTE-TDD	9.91	±0.5
10248	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, 64-QAM)	LTE-TDD	10.09	±0.5
10249	CAH	LTE-TDD (SC-FDMA, 50% RB, 5MHz, QPSK)	LTE-TDD	9.29	±0.5
10250	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 16-QAM)	LTE-TDD	9.81	±0.5
10251	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, 64-QAM)	LTE-TDD	10.17	±0.5
10252	CAH	LTE-TDD (SC-FDMA, 50% RB, 10MHz, QPSK)	LTE-TDD	9.34	±0.5
10253	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, 16-QAM)	LTE-TDD	9.80	±0.5
10254	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, 64-QAM)	LTE-TDD	10.14	±0.5
10255	CAG	LTE-TDD (SC-FDMA, 50% RB, 15MHz, QPSK)	LTE-TDD	9.20	±0.5
10256	CAG	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 16-QAM)	LTE-TDD	9.94	±0.5
10257	CAG	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, 64-QAM)	LTE-TDD	10.08	±0.5
10258	CAG	LTE-TDD (SC-FDMA, 100% RB, 1.4MHz, QPSK)	LTE-TDD	9.34	±0.5
10259	CAG	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 16-QAM)	LTE-TDD	9.98	±0.5
10260	CAG	LTE-TDD (SC-FDMA, 100% RB, 3MHz, 64-QAM)	LTE-TDD	9.97	±0.5
10261	CAG	LTE-TDD (SC-FDMA, 100% RB, 3MHz, QPSK)	LTE-TDD	9.24	±0.5
10262	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 16-QAM)	LTE-TDD	9.83	±0.5
10263	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, 64-QAM)	LTE-TDD	10.18	±0.5
10264	CAH	LTE-TDD (SC-FDMA, 100% RB, 5MHz, QPSK)	LTE-TDD	9.29	±0.5
10265	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 16-QAM)	LTE-TDD	9.92	±0.5
10266	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, 64-QAM)	LTE-TDD	10.07	±0.5
10267	CAH	LTE-TDD (SC-FDMA, 100% RB, 10MHz, QPSK)	LTE-TDD	9.30	±0.5
10268	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 16-QAM)	LTE-TDD	10.06	±0.5
10269	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, 64-QAM)	LTE-TDD	10.13	±0.5
10270	CAG	LTE-TDD (SC-FDMA, 100% RB, 15MHz, QPSK)	LTE-TDD	9.58	±0.5
10274	CAC	UMTS-FDD (HSPA, Subnet 5, 3GPP Rel10)	WCDMA	4.07	±0.5
10275	CAC	UMTS-FDD (HSPA, Subnet 6, 3GPP Rel10)	WCDMA	3.06	±0.5
10277	CAA	PHS (QPSK)	PHS	11.81	±0.5
10278	CAA	PHS (QPSK, BW 884MHz, Rel10 3.2)	PHS	11.81	±0.5
10279	CAA	PHS (QPSK, BW 884MHz, Rel10 3.2)	PHS	12.10	±0.5
10290	AAB	CDMA2000, RC1, SC96, Full Rate	CDMA2000	3.91	±0.5
10291	AAB	CDMA2000, RC3, SC96, Full Rate	CDMA2000	3.46	±0.5
10292	AAB	CDMA2000, RC3, SC96, Full Rate	CDMA2000	3.39	±0.5
10293	AAB	CDMA2000, RC3, SC96, Full Rate	CDMA2000	3.50	±0.5
10295	AAB	CDMA2000, RC1, SC96, 1.08 Rate 25 ft	CDMA2000	12.49	±0.5
10297	AAC	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	5.81	±0.5
10298	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	5.72	±0.5
10299	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	6.39	±0.5
10300	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	6.90	±0.5
10301	AAA	IEEE 802.11a WMAX (20-18, 57ma, 10MHz, QPSK, PUSC)	WMAX	12.33	±0.5
10302	AAA	IEEE 802.11a WMAX (20-18, 57ma, 10MHz, QPSK, PUSC, 3 CTR symbols)	WMAX	12.37	±0.5
10303	AAA	IEEE 802.11a WMAX (20-18, 57ma, 10MHz, 64QAM, PUSC)	WMAX	12.42	±0.5
10304	AAA	IEEE 802.11a WMAX (20-18, 57ma, 10MHz, 64QAM, PUSC)	WMAX	11.85	±0.5
10305	AAA	IEEE 802.11a WMAX (20-18, 18ma, 10MHz, 64QAM, PUSC, 15 symbols)	WMAX	10.34	±0.5
10306	AAA	IEEE 802.11a WMAX (20-18, 18ma, 10MHz, 64QAM, PUSC, 15 symbols)	WMAX	14.87	±0.5

Certificado No: EX-3791_Apr25

Page 13 of 22

EX3DV4 - SN3791

April 22, 2025

UID	Rev	Communication System Name	Group	PNR (dB)	Unc ² k = 2
10307	AAA	IEEE 802.16e WIMAX (20~18, 10 ms, 10 MHz, QPSK, PUSC, 18 symbols)	WIMAX	14.48	±0.6
10308	AAA	IEEE 802.16e WIMAX (20~18, 10 ms, 10 MHz, 16QAM, PUSC)	WIMAX	14.48	±0.6
10309	AAA	IEEE 802.16e WIMAX (20~18, 10 ms, 10 MHz, 16QAM, AMC 2x3, 18 symbols)	WIMAX	14.58	±0.6
10310	AAA	IEEE 802.16e WIMAX (20~18, 10 ms, 10 MHz, QPSK, AMC 2x3, 18 symbols)	WIMAX	14.57	±0.6
10311	AAC	LTE-FDD (SC-FDMA, 100% PSK, 15 MHz, QPSK)	LTE-FDD	8.06	±0.6
10313	AAA	iDEN 1.3	iDEN	10.51	±0.6
10314	AAA	iDEN 1.8	iDEN	13.48	±0.6
10315	AAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 1 Mbps, 90% duty cycle)	WLAN	1.71	±0.6
10316	AAB	IEEE 802.11g WiFi 2.4 GHz (ERP-CFDM, 6 Mbps, 90% duty cycle)	WLAN	8.36	±0.6
10317	AAC	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps, 90% duty cycle)	WLAN	8.36	±0.6
10352	AAA	Pulse Waveform (200Hz, 10%)	Generic	10.00	±0.6
10353	AAA	Pulse Waveform (200Hz, 20%)	Generic	6.99	±0.6
10354	AAA	Pulse Waveform (200Hz, 40%)	Generic	3.99	±0.6
10355	AAA	Pulse Waveform (200Hz, 60%)	Generic	2.02	±0.6
10356	AAA	Pulse Waveform (200Hz, 80%)	Generic	0.97	±0.6
10397	AAA	QPSK Waveform, 1 MHz	Generic	5.10	±0.6
10398	AAA	QPSK Waveform, 10 MHz	Generic	5.22	±0.6
10399	AAA	64-QAM Waveform, 100 kHz	Generic	6.27	±0.6
10399	AAA	64-QAM Waveform, 40 MHz	Generic	6.37	±0.6
10400	AAP	IEEE 802.11ac WiFi (20 MHz, 64-QAM, 90% duty cycle)	WLAN	8.37	±0.6
10401	AAP	IEEE 802.11ac WiFi (40 MHz, 64-QAM, 90% duty cycle)	WLAN	8.60	±0.6
10402	AAP	IEEE 802.11ac WiFi (80 MHz, 64-QAM, 90% duty cycle)	WLAN	8.63	±0.6
10403	AAB	CDMA2000 1X-EV-DO, Rev. 0	CDMA2000	3.76	±0.6
10404	AAB	CDMA2000 1X-EV-DO, Rev. A	CDMA2000	3.77	±0.6
10405	AAB	CDMA2000 1X-EV-DO, Rev. B	CDMA2000	3.78	±0.6
10410	AAB	CDMA2000 1X-EV-DO, Rev. C	CDMA2000	3.79	±0.6
10411	AAB	CDMA2000 1X-EV-DO, Rev. D	CDMA2000	3.80	±0.6
10412	AAB	CDMA2000 1X-EV-DO, Rev. E	CDMA2000	3.81	±0.6
10413	AAB	CDMA2000 1X-EV-DO, Rev. F	CDMA2000	3.82	±0.6
10414	AAB	CDMA2000 1X-EV-DO, Rev. G	CDMA2000	3.83	±0.6
10415	AAB	CDMA2000 1X-EV-DO, Rev. H	CDMA2000	3.84	±0.6
10416	AAB	CDMA2000 1X-EV-DO, Rev. I	CDMA2000	3.85	±0.6
10417	AAB	CDMA2000 1X-EV-DO, Rev. J	CDMA2000	3.86	±0.6
10418	AAB	CDMA2000 1X-EV-DO, Rev. K	CDMA2000	3.87	±0.6
10419	AAB	CDMA2000 1X-EV-DO, Rev. L	CDMA2000	3.88	±0.6
10420	AAB	CDMA2000 1X-EV-DO, Rev. M	CDMA2000	3.89	±0.6
10421	AAB	CDMA2000 1X-EV-DO, Rev. N	CDMA2000	3.90	±0.6
10422	AAB	CDMA2000 1X-EV-DO, Rev. O	CDMA2000	3.91	±0.6
10423	AAB	CDMA2000 1X-EV-DO, Rev. P	CDMA2000	3.92	±0.6
10424	AAB	CDMA2000 1X-EV-DO, Rev. Q	CDMA2000	3.93	±0.6
10425	AAB	CDMA2000 1X-EV-DO, Rev. R	CDMA2000	3.94	±0.6
10426	AAB	CDMA2000 1X-EV-DO, Rev. S	CDMA2000	3.95	±0.6
10427	AAB	CDMA2000 1X-EV-DO, Rev. T	CDMA2000	3.96	±0.6
10428	AAB	CDMA2000 1X-EV-DO, Rev. U	CDMA2000	3.97	±0.6
10429	AAB	CDMA2000 1X-EV-DO, Rev. V	CDMA2000	3.98	±0.6
10430	AAB	CDMA2000 1X-EV-DO, Rev. W	CDMA2000	3.99	±0.6
10431	AAB	CDMA2000 1X-EV-DO, Rev. X	CDMA2000	4.00	±0.6
10432	AAB	CDMA2000 1X-EV-DO, Rev. Y	CDMA2000	4.01	±0.6
10433	AAB	CDMA2000 1X-EV-DO, Rev. Z	CDMA2000	4.02	±0.6
10434	AAB	CDMA2000 1X-EV-DO, Rev. AA	CDMA2000	4.03	±0.6
10435	AAB	CDMA2000 1X-EV-DO, Rev. AB	CDMA2000	4.04	±0.6
10436	AAB	CDMA2000 1X-EV-DO, Rev. AC	CDMA2000	4.05	±0.6
10437	AAB	CDMA2000 1X-EV-DO, Rev. AD	CDMA2000	4.06	±0.6
10438	AAB	CDMA2000 1X-EV-DO, Rev. AE	CDMA2000	4.07	±0.6
10439	AAB	CDMA2000 1X-EV-DO, Rev. AF	CDMA2000	4.08	±0.6
10440	AAB	CDMA2000 1X-EV-DO, Rev. AG	CDMA2000	4.09	±0.6
10441	AAB	CDMA2000 1X-EV-DO, Rev. AH	CDMA2000	4.10	±0.6
10442	AAB	CDMA2000 1X-EV-DO, Rev. AI	CDMA2000	4.11	±0.6
10443	AAB	CDMA2000 1X-EV-DO, Rev. AJ	CDMA2000	4.12	±0.6
10444	AAB	CDMA2000 1X-EV-DO, Rev. AK	CDMA2000	4.13	±0.6
10445	AAB	CDMA2000 1X-EV-DO, Rev. AL	CDMA2000	4.14	±0.6
10446	AAB	CDMA2000 1X-EV-DO, Rev. AM	CDMA2000	4.15	±0.6
10447	AAB	CDMA2000 1X-EV-DO, Rev. AN	CDMA2000	4.16	±0.6
10448	AAB	CDMA2000 1X-EV-DO, Rev. AO	CDMA2000	4.17	±0.6
10449	AAB	CDMA2000 1X-EV-DO, Rev. AP	CDMA2000	4.18	±0.6
10450	AAB	CDMA2000 1X-EV-DO, Rev. AQ	CDMA2000	4.19	±0.6
10451	AAB	CDMA2000 1X-EV-DO, Rev. AR	CDMA2000	4.20	±0.6
10452	AAB	CDMA2000 1X-EV-DO, Rev. AS	CDMA2000	4.21	±0.6
10453	AAB	CDMA2000 1X-EV-DO, Rev. AT	CDMA2000	4.22	±0.6
10454	AAB	CDMA2000 1X-EV-DO, Rev. AU	CDMA2000	4.23	±0.6
10455	AAB	CDMA2000 1X-EV-DO, Rev. AV	CDMA2000	4.24	±0.6
10456	AAB	CDMA2000 1X-EV-DO, Rev. AW	CDMA2000	4.25	±0.6
10457	AAB	CDMA2000 1X-EV-DO, Rev. AX	CDMA2000	4.26	±0.6
10458	AAB	CDMA2000 1X-EV-DO, Rev. AY	CDMA2000	4.27	±0.6
10459	AAB	CDMA2000 1X-EV-DO, Rev. AZ	CDMA2000	4.28	±0.6
10460	AAB	CDMA2000 1X-EV-DO, Rev. BA	CDMA2000	4.29	±0.6
10461	AAB	CDMA2000 1X-EV-DO, Rev. BB	CDMA2000	4.30	±0.6
10462	AAB	CDMA2000 1X-EV-DO, Rev. BC	CDMA2000	4.31	±0.6
10463	AAB	CDMA2000 1X-EV-DO, Rev. BD	CDMA2000	4.32	±0.6
10464	AAB	CDMA2000 1X-EV-DO, Rev. BE	CDMA2000	4.33	±0.6
10465	AAB	CDMA2000 1X-EV-DO, Rev. BF	CDMA2000	4.34	±0.6
10466	AAB	CDMA2000 1X-EV-DO, Rev. BG	CDMA2000	4.35	±0.6
10467	AAB	CDMA2000 1X-EV-DO, Rev. BH	CDMA2000	4.36	±0.6
10468	AAB	CDMA2000 1X-EV-DO, Rev. BI	CDMA2000	4.37	±0.6
10469	AAB	CDMA2000 1X-EV-DO, Rev. BJ	CDMA2000	4.38	±0.6
10470	AAB	CDMA2000 1X-EV-DO, Rev. BK	CDMA2000	4.39	±0.6
10471	AAB	CDMA2000 1X-EV-DO, Rev. BL	CDMA2000	4.40	±0.6

Certificate No: EX-5791_Apr25

Page 14 of 22



SGS Korea Co., Ltd.

4, LS-ro 182beon-gil, Gunpo-si, Gyeonggi-do, 15807

Tel. 031-428-5700 / Fax. 031-427-2371

<http://www.sgsgroup.kr>

Page : 47/65

EX3DV4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Use ¹ & = 2
10472	AAG	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±0.5
10473	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±0.5
10474	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±0.5
10475	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±0.5
10477	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±0.5
10478	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±0.5
10479	AAG	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.5
10480	AAG	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.18	±0.5
10481	AAG	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	±0.5
10482	AAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.71	±0.5
10483	AAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	±0.5
10484	AAG	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.47	±0.5
10485	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.59	±0.5
10486	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.38	±0.5
10487	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.68	±0.5
10488	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.78	±0.5
10489	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±0.5
10490	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.64	±0.5
10491	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.5
10492	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.11	±0.5
10493	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.58	±0.5
10494	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.5
10495	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.37	±0.5
10496	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.64	±0.5
10497	AAG	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±0.5
10498	AAG	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.16	±0.5
10499	AAG	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.56	±0.5
10500	AAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±0.5
10501	AAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.44	±0.5
10502	AAG	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.62	±0.5
10503	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.72	±0.5
10504	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±0.5
10505	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.64	±0.5
10506	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.5
10507	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.36	±0.5
10508	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.65	±0.5
10509	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.69	±0.5
10510	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.49	±0.5
10511	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.51	±0.5
10512	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.5
10513	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.42	±0.5
10514	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	±0.5
10515	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	1.58	±0.5
10516	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	1.57	±0.5
10517	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	1.58	±0.5
10518	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 3 Mbps, 90pc duty cycle)	WLAN	8.23	±0.5
10519	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.39	±0.5
10520	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.12	±0.5
10521	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	7.97	±0.5
10522	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 30 Mbps, 90pc duty cycle)	WLAN	8.05	±0.5
10523	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.08	±0.5
10524	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 42 Mbps, 90pc duty cycle)	WLAN	8.27	±0.5
10525	AAD	IEEE 802.11ac WFI 20 MHz, MCS0, 90pc duty cycle)	WLAN	8.36	±0.5
10526	AAD	IEEE 802.11ac WFI 20 MHz, MCS1, 90pc duty cycle)	WLAN	8.42	±0.5
10527	AAD	IEEE 802.11ac WFI 20 MHz, MCS2, 90pc duty cycle)	WLAN	8.21	±0.5
10528	AAD	IEEE 802.11ac WFI 20 MHz, MCS3, 90pc duty cycle)	WLAN	8.36	±0.5
10529	AAD	IEEE 802.11ac WFI 20 MHz, MCS4, 90pc duty cycle)	WLAN	8.36	±0.5
10530	AAD	IEEE 802.11ac WFI 20 MHz, MCS5, 90pc duty cycle)	WLAN	8.43	±0.5
10531	AAD	IEEE 802.11ac WFI 20 MHz, MCS6, 90pc duty cycle)	WLAN	8.29	±0.5
10532	AAD	IEEE 802.11ac WFI 20 MHz, MCS7, 90pc duty cycle)	WLAN	8.39	±0.5
10533	AAD	IEEE 802.11ac WFI 20 MHz, MCS8, 90pc duty cycle)	WLAN	8.38	±0.5
10534	AAD	IEEE 802.11ac WFI 40 MHz, MCS0, 90pc duty cycle)	WLAN	8.45	±0.5
10535	AAD	IEEE 802.11ac WFI 40 MHz, MCS1, 90pc duty cycle)	WLAN	8.45	±0.5
10536	AAD	IEEE 802.11ac WFI 40 MHz, MCS2, 90pc duty cycle)	WLAN	8.32	±0.5
10537	AAD	IEEE 802.11ac WFI 40 MHz, MCS3, 90pc duty cycle)	WLAN	8.44	±0.5
10538	AAD	IEEE 802.11ac WFI 40 MHz, MCS4, 90pc duty cycle)	WLAN	8.54	±0.5
10539	AAD	IEEE 802.11ac WFI 40 MHz, MCS5, 90pc duty cycle)	WLAN	8.39	±0.5

Certificate No: EX-3791_Apr25

Page 15 of 22

Report File No : F690501-RF-SAR000601

Date of Issue : 2025-07-17

(All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.)

SAR7081-04 (2020.12.15)(0)

A4 (210mm x 297mm)

EX30V4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Unc [±] A = 2
10541	AAD	IEEE 802.11ac WiFi (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.46	±0.6
10542	AAD	IEEE 802.11ac WiFi (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.95	±0.6
10543	AAD	IEEE 802.11ac WiFi (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.59	±0.6
10544	AAD	IEEE 802.11ac WiFi (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.47	±0.6
10545	AAD	IEEE 802.11ac WiFi (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.55	±0.6
10546	AAD	IEEE 802.11ac WiFi (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.35	±0.6
10547	AAD	IEEE 802.11ac WiFi (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.48	±0.6
10548	AAD	IEEE 802.11ac WiFi (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.37	±0.6
10550	AAD	IEEE 802.11ac WiFi (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.38	±0.6
10551	AAD	IEEE 802.11ac WiFi (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.50	±0.6
10552	AAD	IEEE 802.11ac WiFi (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.42	±0.6
10553	AAD	IEEE 802.11ac WiFi (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.45	±0.6
10554	AAD	IEEE 802.11ac WiFi (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.48	±0.6
10555	AAD	IEEE 802.11ac WiFi (160 MHz, MCS1, 90pc duty cycle)	WLAN	8.47	±0.6
10556	AAD	IEEE 802.11ac WiFi (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.26	±0.6
10557	AAD	IEEE 802.11ac WiFi (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.52	±0.6
10558	AAD	IEEE 802.11ac WiFi (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.61	±0.6
10560	AAD	IEEE 802.11ac WiFi (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.73	±0.6
10561	AAD	IEEE 802.11ac WiFi (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.56	±0.6
10562	AAD	IEEE 802.11ac WiFi (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.69	±0.6
10563	AAD	IEEE 802.11ac WiFi (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.77	±0.6
10564	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.35	±0.6
10565	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.45	±0.6
10566	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.13	±0.6
10567	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.30	±0.6
10568	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.37	±0.6
10569	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.10	±0.6
10570	AAA	IEEE 802.11g WiFi 2.4 GHz (DSSS-CFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.30	±0.6
10571	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	WLAN	1.99	±0.6
10572	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	1.99	±0.6
10573	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	1.98	±0.6
10574	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	1.98	±0.6
10575	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	±0.6
10576	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.65	±0.6
10577	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.75	±0.6
10578	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.48	±0.6
10579	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±0.6
10580	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.78	±0.6
10581	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	±0.6
10582	AAA	IEEE 802.11n WiFi 2.4 GHz (DSSS-CFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±0.6
10583	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.58	±0.6
10584	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.66	±0.6
10585	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.76	±0.6
10586	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.49	±0.6
10587	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.36	±0.6
10588	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.76	±0.6
10589	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.35	±0.6
10590	AAD	IEEE 802.11ah WiFi 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.67	±0.6
10591	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc duty cycle)	WLAN	8.60	±0.6
10592	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc duty cycle)	WLAN	8.79	±0.6
10593	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc duty cycle)	WLAN	8.94	±0.6
10594	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±0.6
10595	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc duty cycle)	WLAN	8.75	±0.6
10596	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc duty cycle)	WLAN	8.71	±0.6
10597	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc duty cycle)	WLAN	8.72	±0.6
10598	AAD	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc duty cycle)	WLAN	8.50	±0.6
10599	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc duty cycle)	WLAN	8.79	±0.6
10600	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc duty cycle)	WLAN	8.83	±0.6
10601	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc duty cycle)	WLAN	8.82	±0.6
10602	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc duty cycle)	WLAN	8.94	±0.6
10603	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc duty cycle)	WLAN	8.93	±0.6
10604	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc duty cycle)	WLAN	8.78	±0.6
10605	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc duty cycle)	WLAN	8.87	±0.6
10606	AAD	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±0.6
10607	AAD	IEEE 802.11ac WiFi (20 MHz, MCS0, 90pc duty cycle)	WLAN	8.64	±0.6
10608	AAD	IEEE 802.11ac WiFi (20 MHz, MCS1, 90pc duty cycle)	WLAN	8.77	±0.6

Certificate No: EX-3791_Apr25

Page 16 of 22

EK3DV4 - BN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Unit# & = 2
10109	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.57	±0.5
10110	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.76	±0.5
10111	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.70	±0.5
10112	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.77	±0.5
10113	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.94	±0.5
10114	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.59	±0.5
10115	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.82	±0.5
10116	AAD	IEEE 802.11ac WPI (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.82	±0.5
10117	AAD	IEEE 802.11ac WPI (40 MHz, MCS1, 80pc duty cycle)	WLAN	8.81	±0.5
10118	AAD	IEEE 802.11ac WPI (40 MHz, MCS2, 80pc duty cycle)	WLAN	8.58	±0.5
10119	AAD	IEEE 802.11ac WPI (40 MHz, MCS3, 80pc duty cycle)	WLAN	8.85	±0.5
10120	AAD	IEEE 802.11ac WPI (40 MHz, MCS4, 80pc duty cycle)	WLAN	8.87	±0.5
10121	AAD	IEEE 802.11ac WPI (40 MHz, MCS5, 80pc duty cycle)	WLAN	8.77	±0.5
10122	AAD	IEEE 802.11ac WPI (40 MHz, MCS5, 80pc duty cycle)	WLAN	8.58	±0.5
10123	AAD	IEEE 802.11ac WPI (40 MHz, MCS7, 80pc duty cycle)	WLAN	8.82	±0.5
10124	AAD	IEEE 802.11ac WPI (40 MHz, MCS8, 80pc duty cycle)	WLAN	8.94	±0.5
10125	AAD	IEEE 802.11ac WPI (40 MHz, MCS9, 80pc duty cycle)	WLAN	8.88	±0.5
10126	AAD	IEEE 802.11ac WPI (60 MHz, MCS1, 80pc duty cycle)	WLAN	8.83	±0.5
10127	AAD	IEEE 802.11ac WPI (60 MHz, MCS1, 80pc duty cycle)	WLAN	8.88	±0.5
10128	AAD	IEEE 802.11ac WPI (60 MHz, MCS2, 80pc duty cycle)	WLAN	8.71	±0.5
10129	AAD	IEEE 802.11ac WPI (60 MHz, MCS3, 80pc duty cycle)	WLAN	8.85	±0.5
10130	AAD	IEEE 802.11ac WPI (60 MHz, MCS4, 80pc duty cycle)	WLAN	8.72	±0.5
10131	AAD	IEEE 802.11ac WPI (60 MHz, MCS5, 80pc duty cycle)	WLAN	8.81	±0.5
10132	AAD	IEEE 802.11ac WPI (60 MHz, MCS5, 80pc duty cycle)	WLAN	8.74	±0.5
10133	AAD	IEEE 802.11ac WPI (60 MHz, MCS7, 80pc duty cycle)	WLAN	8.83	±0.5
10134	AAD	IEEE 802.11ac WPI (60 MHz, MCS8, 80pc duty cycle)	WLAN	8.80	±0.5
10135	AAD	IEEE 802.11ac WPI (60 MHz, MCS9, 80pc duty cycle)	WLAN	8.81	±0.5
10136	AAD	IEEE 802.11ac WPI (160 MHz, MCS1, 80pc duty cycle)	WLAN	8.83	±0.5
10137	AAD	IEEE 802.11ac WPI (160 MHz, MCS1, 80pc duty cycle)	WLAN	8.76	±0.5
10138	AAD	IEEE 802.11ac WPI (160 MHz, MCS2, 80pc duty cycle)	WLAN	8.86	±0.5
10139	AAD	IEEE 802.11ac WPI (160 MHz, MCS3, 80pc duty cycle)	WLAN	8.85	±0.5
10140	AAD	IEEE 802.11ac WPI (160 MHz, MCS4, 80pc duty cycle)	WLAN	8.86	±0.5
10141	AAD	IEEE 802.11ac WPI (160 MHz, MCS4, 80pc duty cycle)	WLAN	9.06	±0.5
10142	AAD	IEEE 802.11ac WPI (160 MHz, MCS5, 80pc duty cycle)	WLAN	9.05	±0.5
10143	AAD	IEEE 802.11ac WPI (160 MHz, MCS7, 80pc duty cycle)	WLAN	8.89	±0.5
10144	AAD	IEEE 802.11ac WPI (160 MHz, MCS8, 80pc duty cycle)	WLAN	8.05	±0.5
10145	AAD	IEEE 802.11ac WPI (160 MHz, MCS9, 80pc duty cycle)	WLAN	9.11	±0.5
10146	AAD	IEEE 802.11ac WPI (160 MHz, MCS9, 80pc duty cycle)	WLAN	9.11	±0.5
10147	AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2.7)	LTE-TDD	11.96	±0.5
10148	AAD	LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK, UL Subframe=2.7)	LTE-TDD	11.96	±0.5
10149	AAA	CDMA2000 (1x Advanced)	CDMA2000	3.45	±0.5
10150	AAP	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.91	±0.5
10151	AAP	LTE-TDD (OFDMA, 5 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±0.5
10152	AAP	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.96	±0.5
10153	AAP	LTE-TDD (OFDMA, 15 MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.21	±0.5
10154	AAB	Pulse Waveform (200Hz, 10%)	Test	10.00	±0.5
10155	AAB	Pulse Waveform (200Hz, 20%)	Test	6.99	±0.5
10156	AAB	Pulse Waveform (200Hz, 40%)	Test	3.99	±0.5
10157	AAB	Pulse Waveform (200Hz, 60%)	Test	2.22	±0.5
10158	AAB	Pulse Waveform (200Hz, 80%)	Test	0.97	±0.5
10159	AAA	Bluetooth Low Energy	Bluetooth	2.19	±0.5
10160	AAC	IEEE 802.11ax (20 MHz, MCS1, 80pc duty cycle)	WLAN	9.09	±0.5
10161	AAC	IEEE 802.11ax (20 MHz, MCS1, 80pc duty cycle)	WLAN	8.57	±0.5
10162	AAC	IEEE 802.11ax (20 MHz, MCS2, 80pc duty cycle)	WLAN	8.76	±0.5
10163	AAC	IEEE 802.11ax (20 MHz, MCS2, 80pc duty cycle)	WLAN	8.74	±0.5
10164	AAC	IEEE 802.11ax (20 MHz, MCS4, 80pc duty cycle)	WLAN	8.90	±0.5
10165	AAC	IEEE 802.11ax (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.77	±0.5
10166	AAC	IEEE 802.11ax (20 MHz, MCS5, 80pc duty cycle)	WLAN	8.73	±0.5
10167	AAC	IEEE 802.11ax (20 MHz, MCS7, 80pc duty cycle)	WLAN	8.75	±0.5
10168	AAC	IEEE 802.11ax (20 MHz, MCS9, 80pc duty cycle)	WLAN	8.89	±0.5
10169	AAC	IEEE 802.11ax (20 MHz, MCS9, 80pc duty cycle)	WLAN	8.95	±0.5
10170	AAC	IEEE 802.11ax (20 MHz, MCS10, 80pc duty cycle)	WLAN	8.52	±0.5
10171	AAC	IEEE 802.11ax (20 MHz, MCS11, 80pc duty cycle)	WLAN	8.83	±0.5
10172	AAC	IEEE 802.11ax (20 MHz, MCS1, 80pc duty cycle)	WLAN	9.43	±0.5
10173	AAC	IEEE 802.11ax (20 MHz, MCS1, 80pc duty cycle)	WLAN	8.28	±0.5
10174	AAC	IEEE 802.11ax (20 MHz, MCS2, 80pc duty cycle)	WLAN	8.33	±0.5
10175	AAC	IEEE 802.11ax (20 MHz, MCS3, 80pc duty cycle)	WLAN	8.28	±0.5

Certificate No: EX-3791_Apr25

Page 17 of 22

EX3DV4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Use ¹ A = 2
10687	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.45	±0.5
10688	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.39	±0.5
10689	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.55	±0.5
10690	AAC	IEEE 802.11ax (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.29	±0.5
10691	AAC	IEEE 802.11ax (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.25	±0.5
10692	AAC	IEEE 802.11ax (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.28	±0.5
10693	AAC	IEEE 802.11ax (20 MHz, MCS10, 90pc duty cycle)	WLAN	8.25	±0.5
10694	AAC	IEEE 802.11ax (20 MHz, MCS11, 90pc duty cycle)	WLAN	8.57	±0.5
10695	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.78	±0.5
10696	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.91	±0.5
10697	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.61	±0.5
10698	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.69	±0.5
10699	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.62	±0.5
10700	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.73	±0.5
10701	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.66	±0.5
10702	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.70	±0.5
10703	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.62	±0.5
10704	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.66	±0.5
10705	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.69	±0.5
10706	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.66	±0.5
10707	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.52	±0.5
10708	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±0.5
10709	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.33	±0.5
10710	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.29	±0.5
10711	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.39	±0.5
10712	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.47	±0.5
10713	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.33	±0.5
10714	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.20	±0.5
10715	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.45	±0.5
10716	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.30	±0.5
10717	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.48	±0.5
10718	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.34	±0.5
10719	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.81	±0.5
10720	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.87	±0.5
10721	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.78	±0.5
10722	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±0.5
10723	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±0.5
10724	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.90	±0.5
10725	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.74	±0.5
10726	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.72	±0.5
10727	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.68	±0.5
10728	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.65	±0.5
10729	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.64	±0.5
10730	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.67	±0.5
10731	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.42	±0.5
10732	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.48	±0.5
10733	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.48	±0.5
10734	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.25	±0.5
10735	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.33	±0.5
10736	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.27	±0.5
10737	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.36	±0.5
10738	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.42	±0.5
10739	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.29	±0.5
10740	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.48	±0.5
10741	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.40	±0.5
10742	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.43	±0.5
10743	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.94	±0.5
10744	AAC	IEEE 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	9.16	±0.5
10745	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.93	±0.5
10746	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.11	±0.5
10747	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc duty cycle)	WLAN	9.04	±0.5
10748	AAC	IEEE 802.11ax (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±0.5
10749	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.90	±0.5
10750	AAC	IEEE 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.79	±0.5
10751	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±0.5
10752	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.91	±0.5

Certificate No: EX-3791_Apr25

Page 18 of 22



EX3DV4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Unit ² A = 2
10753	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	9.00	±0.0
10754	AAC	IEEE 802.11ax (180 MHz, MCS11, 80ps duty cycle)	WLAN	8.94	±0.0
10755	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.94	±0.0
10756	AAC	IEEE 802.11ax (180 MHz, MCS11, 80ps duty cycle)	WLAN	8.77	±0.0
10757	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.77	±0.0
10758	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.95	±0.0
10759	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.95	±0.0
10760	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.94	±0.0
10761	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.98	±0.0
10762	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.49	±0.0
10763	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.53	±0.0
10764	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.54	±0.0
10765	AAC	IEEE 802.11ax (180 MHz, MCS10, 80ps duty cycle)	WLAN	8.54	±0.0
10766	AAC	IEEE 802.11ax (180 MHz, MCS11, 80ps duty cycle)	WLAN	8.51	±0.0
10767	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	7.99	±0.0
10768	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.01	±0.0
10769	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.01	±0.0
10770	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.02	±0.0
10771	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.02	±0.0
10772	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.23	±0.0
10773	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.09	±0.0
10774	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.02	±0.0
10775	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.31	±0.0
10776	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.30	±0.0
10777	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.30	±0.0
10778	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.34	±0.0
10779	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.42	±0.0
10780	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.36	±0.0
10781	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.38	±0.0
10782	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.43	±0.0
10783	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.31	±0.0
10784	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.26	±0.0
10785	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.40	±0.0
10786	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.35	±0.0
10787	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.44	±0.0
10788	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.39	±0.0
10789	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.37	±0.0
10790	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 15 kHz)	5G NR FRI TDD	8.39	±0.0
10791	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.63	±0.0
10792	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.62	±0.0
10793	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.55	±0.0
10794	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.62	±0.0
10795	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.64	±0.0
10796	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.62	±0.0
10797	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.01	±0.0
10798	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.89	±0.0
10799	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.93	±0.0
10800	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.89	±0.0
10801	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.87	±0.0
10802	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.93	±0.0
10803	AAC	5G NR (CP-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	7.93	±0.0
10804	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.34	±0.0
10805	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.37	±0.0
10806	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.34	±0.0
10807	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.34	±0.0
10808	AAC	5G NR (CP-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.35	±0.0
10809	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.35	±0.0
10810	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.34	±0.0
10811	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.33	±0.0
10812	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.33	±0.0
10813	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.33	±0.0
10814	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.33	±0.0
10815	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.33	±0.0
10816	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.41	±0.0
10817	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.41	±0.0
10818	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.38	±0.0
10819	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.39	±0.0
10820	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.41	±0.0
10821	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.42	±0.0
10822	AAC	5G NR (CP-OFDM, 100% RB, 5 MHz, QPSK, 30 kHz)	5G NR FRI TDD	8.43	±0.0

Certificate No: EX-3791_Apr25

Page 19 of 22

EX30V4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	Power (dB)	Unit ¹ A = 2
10839	AAF	SG NR (CP-OFDM, 100% RB, 500 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	6.40	±0.0
10833	AAE	SG NR (CP-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.83	±0.6
10831	AAO	SG NR (CP-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.73	±0.6
10833	AAE	SG NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.74	±0.6
10833	AAO	SG NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.70	±0.6
10834	AAE	SG NR (CP-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.75	±0.6
10839	AA*	SG NR (CP-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.70	±0.6
10838	AAE	SG NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.66	±0.6
10837	AAF	SG NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.83	±0.6
10838	AAF	SG NR (CP-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.70	±0.6
10840	AAE	SG NR (CP-OFDM, 1 RB, 90 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.67	±0.6
10841	AAF	SG NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	7.71	±0.6
10843	AAO	SG NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.49	±0.9
10844	AAE	SG NR (CP-OFDM, 50% RB, 25 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.34	±0.6
10846	AAE	SG NR (CP-OFDM, 50% RB, 35 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.41	±0.6
10854	AAE	SG NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.34	±0.6
10855	AAO	SG NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.38	±0.6
10856	AAE	SG NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.37	±0.6
10857	AAO	SG NR (CP-OFDM, 100% RB, 25 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.35	±0.6
10858	AAE	SG NR (CP-OFDM, 100% RB, 35 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.38	±0.6
10859	AAF	SG NR (CP-OFDM, 100% RB, 45 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.34	±0.6
10860	AAE	SG NR (CP-OFDM, 100% RB, 55 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.41	±0.6
10861	AAF	SG NR (CP-OFDM, 100% RB, 65 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.42	±0.6
10863	AAF	SG NR (CP-OFDM, 100% RB, 85 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.41	±0.6
10864	AAE	SG NR (CP-OFDM, 100% RB, 95 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.37	±0.6
10865	AAF	SG NR (CP-OFDM, 100% RB, 105 MHz, QPSK, 60 kHz)	SG NR PR1 TDD	8.41	±0.6
10866	AAF	SG NR (DFT-s-OFDM, 1 RB, 105 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10868	AAF	SG NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.66	±0.5
10869	AAE	SG NR (DFT-s-OFDM, 1 RB, 105 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	5.75	±0.6
10870	AAE	SG NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	5.66	±0.6
10871	AAE	SG NR (DFT-s-OFDM, 1 RB, 105 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	5.75	±0.6
10872	AAE	SG NR (DFT-s-OFDM, 100% RB, 105 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	5.82	±0.6
10873	AAE	SG NR (DFT-s-OFDM, 1 RB, 105 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	5.81	±0.6
10874	AAE	SG NR (DFT-s-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	5.65	±0.5
10875	AAE	SG NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	7.78	±0.6
10876	AAE	SG NR (CP-OFDM, 100% RB, 165 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	8.39	±0.6
10877	AAE	SG NR (CP-OFDM, 1 RB, 100 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	7.55	±0.5
10878	AAE	SG NR (CP-OFDM, 100% RB, 165 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	8.41	±0.6
10879	AAE	SG NR (CP-OFDM, 1 RB, 100 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	8.12	±0.5
10880	AAE	SG NR (CP-OFDM, 100% RB, 100 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	8.34	±0.6
10881	AAE	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	5.75	±0.6
10882	AAE	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	5.66	±0.6
10883	AAE	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	5.67	±0.6
10884	AAE	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	5.53	±0.5
10885	AAE	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	5.61	±0.5
10886	AAE	SG NR (DFT-s-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	5.65	±0.6
10887	AAE	SG NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	7.78	±0.6
10888	AAE	SG NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 120 kHz)	SG NR PR2 TDD	8.35	±0.6
10889	AAE	SG NR (CP-OFDM, 1 RB, 50 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	8.02	±0.5
10890	AAE	SG NR (CP-OFDM, 100% RB, 50 MHz, 16QAM, 120 kHz)	SG NR PR2 TDD	8.46	±0.6
10891	AAE	SG NR (CP-OFDM, 1 RB, 50 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	8.13	±0.5
10892	AAE	SG NR (CP-OFDM, 100% RB, 50 MHz, 64QAM, 120 kHz)	SG NR PR2 TDD	8.41	±0.6
10893	AAE	SG NR (DFT-s-OFDM, 1 RB, 5 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.66	±0.5
10898	AAO	SG NR (DFT-s-OFDM, 1 RB, 10 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.67	±0.5
10899	AAO	SG NR (DFT-s-OFDM, 1 RB, 15 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.67	±0.5
10900	AAO	SG NR (DFT-s-OFDM, 1 RB, 20 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10901	AAO	SG NR (DFT-s-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10902	AAO	SG NR (DFT-s-OFDM, 1 RB, 30 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10903	AAO	SG NR (DFT-s-OFDM, 1 RB, 40 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10904	AAO	SG NR (DFT-s-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10905	AAO	SG NR (DFT-s-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10906	AAO	SG NR (DFT-s-OFDM, 1 RB, 80 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.68	±0.5
10907	AAE	SG NR (DFT-s-OFDM, 50% RB, 5 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.76	±0.5
10908	AAO	SG NR (DFT-s-OFDM, 50% RB, 10 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.80	±0.5
10909	AAO	SG NR (DFT-s-OFDM, 50% RB, 15 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.80	±0.5
10910	AAO	SG NR (DFT-s-OFDM, 50% RB, 20 MHz, QPSK, 30 kHz)	SG NR PR1 TDD	5.80	±0.5

Certificate No: EX-3791_Apr25

Page 20 of 22



EX30V4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	Power (dB)	Unc ^a k = 2
10011	AAS	5G NR (DFT-s-OFDM, 50% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±0.6
10012	AAC	5G NR (DFT-s-OFDM, 50% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10013	AAD	5G NR (DFT-s-OFDM, 50% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10014	AAC	5G NR (DFT-s-OFDM, 50% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	±0.6
10015	AAD	5G NR (DFT-s-OFDM, 50% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.93	±0.6
10016	AAD	5G NR (DFT-s-OFDM, 50% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.97	±0.6
10017	AAD	5G NR (DFT-s-OFDM, 100% RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10018	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	±0.6
10019	AAC	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.86	±0.6
10020	AAB	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.87	±0.6
10021	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±0.6
10022	AAB	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.82	±0.6
10023	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±0.6
10024	AAD	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.84	±0.6
10025	AAC	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.95	±0.6
10026	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10027	AAD	5G NR (DFT-s-OFDM, 100% RB, 80 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.94	±0.6
10028	AAC	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±0.6
10029	AAC	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±0.6
10030	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±0.6
10031	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10032	AAC	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10033	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10034	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10035	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10036	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.90	±0.6
10037	AAD	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	±0.6
10038	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.77	±0.6
10039	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±0.6
10040	AAC	5G NR (DFT-s-OFDM, 100% RB, 25 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.88	±0.6
10041	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±0.6
10042	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±0.6
10043	AAD	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±0.6
10044	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.81	±0.6
10045	AAD	5G NR (DFT-s-OFDM, 100% RB, 10 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.85	±0.6
10046	AAC	5G NR (DFT-s-OFDM, 100% RB, 15 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.83	±0.6
10047	AAC	5G NR (DFT-s-OFDM, 100% RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±0.6
10048	AAC	5G NR (DFT-s-OFDM, 100% RB, 30 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.84	±0.6
10049	AAC	5G NR (DFT-s-OFDM, 100% RB, 40 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.87	±0.6
10050	AAC	5G NR (DFT-s-OFDM, 100% RB, 50 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.94	±0.6
10051	AAD	5G NR (DFT-s-OFDM, 100% RB, 60 MHz, QPSK, 15 kHz)	5G NR FR1 FDD	5.82	±0.6
10052	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	±0.6
10053	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.15	±0.6
10054	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.25	±0.6
10055	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.42	±0.6
10056	AAA	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.14	±0.6
10057	AAA	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.31	±0.6
10058	AAA	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.61	±0.6
10059	AAA	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.35	±0.6
10060	AAB	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.32	±0.6
10061	AAC	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.26	±0.6
10062	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.40	±0.6
10063	AAC	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.55	±0.6
10064	AAB	5G NR DL (CP-OFDM, TM 3.1, 5 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.26	±0.6
10065	AAC	5G NR DL (CP-OFDM, TM 3.1, 10 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.37	±0.6
10066	AAB	5G NR DL (CP-OFDM, TM 3.1, 15 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.55	±0.6
10067	AAC	5G NR DL (CP-OFDM, TM 3.1, 20 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.42	±0.6
10068	AAD	5G NR DL (CP-OFDM, TM 3.1, 100 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.49	±0.6
10072	AAC	5G NR (CP-OFDM, 1 RB, 20 MHz, QPSK, 15 kHz)	5G NR FR1 TDD	11.59	±0.6
10073	AAD	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	9.95	±0.6
10074	AAD	5G NR (CP-OFDM, 100% RB, 100 MHz, 256-QAM, 30 kHz)	5G NR FR1 TDD	10.38	±0.6
10078	AAA	ULLA BDR4	ULLA	1.78	±0.6
10080	AAA	ULLA HDR8	ULLA	10.32	±0.6
10081	AAA	ULLA HDRp4	ULLA	3.19	±0.6
10082	AAA	ULLA HDRp6	ULLA	3.43	±0.6

Certificate No: EX-3791_Apr25

Page 21 of 22

EX30V4 - SN:3791

April 22, 2025

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ² k = 2
10183	AAC	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.31	±0.6
10184	AAB	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	9.42	±0.6
10185	AAC	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.54	±0.6
10186	AAB	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.50	±0.6
10187	AAC	5G NR DL (CP-OFDM, TM 3.1, 60 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.53	±0.6
10188	AAB	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.38	±0.6
10189	AAC	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.33	±0.6
10190	AAB	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	9.52	±0.6
11003	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 TDD	10.24	±0.6
11004	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 TDD	10.73	±0.6
11005	AAA	5G NR DL (CP-OFDM, TM 3.1, 35 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.79	±0.6
11006	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.58	±0.6
11007	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.46	±0.6
11008	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR FR1 FDD	8.51	±0.6
11009	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.76	±0.6
11010	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.56	±0.6
11011	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.66	±0.6
11012	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR FR1 FDD	8.58	±0.6
11013	AAB	IEEE 802.11be (320 MHz, MCS1, 9900 duty cycle)	WLAN	8.47	±0.6
11014	AAB	IEEE 802.11be (320 MHz, MCS2, 9900 duty cycle)	WLAN	8.45	±0.6
11015	AAB	IEEE 802.11be (320 MHz, MCS3, 9900 duty cycle)	WLAN	8.44	±0.6
11016	AAB	IEEE 802.11be (320 MHz, MCS4, 9900 duty cycle)	WLAN	8.44	±0.6
11017	AAB	IEEE 802.11be (320 MHz, MCS5, 9900 duty cycle)	WLAN	8.41	±0.6
11018	AAB	IEEE 802.11be (320 MHz, MCS6, 9900 duty cycle)	WLAN	8.40	±0.6
11019	AAB	IEEE 802.11be (320 MHz, MCS7, 9900 duty cycle)	WLAN	8.29	±0.6
11020	AAB	IEEE 802.11be (320 MHz, MCS8, 9900 duty cycle)	WLAN	8.27	±0.6
11021	AAB	IEEE 802.11be (320 MHz, MCS9, 9900 duty cycle)	WLAN	8.46	±0.6
11022	AAB	IEEE 802.11be (320 MHz, MCS10, 9900 duty cycle)	WLAN	8.36	±0.6
11023	AAB	IEEE 802.11be (320 MHz, MCS11, 9900 duty cycle)	WLAN	8.09	±0.6
11024	AAB	IEEE 802.11be (320 MHz, MCS12, 9900 duty cycle)	WLAN	8.42	±0.6
11025	AAB	IEEE 802.11be (320 MHz, MCS13, 9900 duty cycle)	WLAN	8.37	±0.6
11026	AAB	IEEE 802.11be (320 MHz, MCS0, 9900 duty cycle)	WLAN	8.36	±0.6

² Uncertainty is determined using the max. deviation from linear response applying rectangular distribution and is expressed for the square of the field value.

Appendix C.2 Calibration certificate for DAE (S/N: 1340)

**Calibration Laboratory of
Schmid & Partner
Engineering AG**
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Client **SGS**
Gyeonggi-do - Republic of Korea

Certificate No: **DAE4-1340_May25**

CALIBRATION CERTIFICATE																							
Object	DAE4 - SD 000 D04 BO - SN: 1340																						
Calibration procedure(s)	QA CAL-06.v30 Calibration procedure for the data acquisition electronics (DAE)																						
Calibration date:	May 21, 2025																						
This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI). The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate. All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%. Calibration Equipment used (M&TE critical for calibration) <table border="1"> <thead> <tr> <th>Primary Standards</th> <th>ID #</th> <th>Cal Date (Certificate No.)</th> <th>Scheduled Calibration</th> </tr> </thead> <tbody> <tr> <td>Keithley Multimeter Type 2001</td> <td>SN: 0810278</td> <td>27-Aug-24 (No:40547)</td> <td>Aug-25</td> </tr> <tr> <th>Secondary Standards</th> <th>ID #</th> <th>Check Date (in house)</th> <th>Scheduled Check</th> </tr> <tr> <td>Auto DAE Calibration Unit</td> <td>SE UWS 053 AA 1001</td> <td>23-Jan-25 (in house check)</td> <td>In house check: Jan-26</td> </tr> <tr> <td>Calibrator Box V2.1</td> <td>SE UMS 006 AA 1002</td> <td>23-Jan-25 (in house check)</td> <td>In house check: Jan-26</td> </tr> </tbody> </table>				Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration	Keithley Multimeter Type 2001	SN: 0810278	27-Aug-24 (No:40547)	Aug-25	Secondary Standards	ID #	Check Date (in house)	Scheduled Check	Auto DAE Calibration Unit	SE UWS 053 AA 1001	23-Jan-25 (in house check)	In house check: Jan-26	Calibrator Box V2.1	SE UMS 006 AA 1002	23-Jan-25 (in house check)	In house check: Jan-26
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration																				
Keithley Multimeter Type 2001	SN: 0810278	27-Aug-24 (No:40547)	Aug-25																				
Secondary Standards	ID #	Check Date (in house)	Scheduled Check																				
Auto DAE Calibration Unit	SE UWS 053 AA 1001	23-Jan-25 (in house check)	In house check: Jan-26																				
Calibrator Box V2.1	SE UMS 006 AA 1002	23-Jan-25 (in house check)	In house check: Jan-26																				
Calibrated by:	Name Eric Hainfeld	Function Laboratory Technician	Signature 																				
Approved by:	Sven Kühn	Technical Manager																					
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			Issued: May 21, 2025																				

Certificate No: DAE4-1340_May25

Page 1 of 5

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: **SCS 0108**

Glossary

DAE data acquisition electronics
Connector angle information used in DASY system to align probe sensor X to the robot coordinate system.

Methods Applied and Interpretation of Parameters

- *DC Voltage Measurement*: Calibration Factor assessed for use in DASY system by comparison with a calibrated instrument traceable to national standards. The figure given corresponds to the full scale range of the voltmeter in the respective range.
- *Connector angle*: The angle of the connector is assessed measuring the angle mechanically by a tool inserted. Uncertainty is not required.
- The following parameters as documented in the Appendix contain technical information as a result from the performance test and require no uncertainty.
 - *DC Voltage Measurement Linearity*: Verification of the Linearity at +10% and -10% of the nominal calibration voltage. Influence of offset voltage is included in this measurement.
 - *Common mode sensitivity*: Influence of a positive or negative common mode voltage on the differential measurement.
 - *Channel separation*: Influence of a voltage on the neighbor channels not subject to an input voltage.
 - *AD Converter Values with inputs shorted*: Values on the internal AD converter corresponding to zero input voltage
 - *Input Offset Measurement*: Output voltage and statistical results over a large number of zero voltage measurements.
 - *Input Offset Current*: Typical value for information; Maximum channel input offset current, not considering the input resistance.
 - *Input resistance*: Typical value for information: DAE input resistance at the connector, during internal auto-zeroing and during measurement.
 - *Low Battery Alarm Voltage*: Typical value for information. Below this voltage, a battery alarm signal is generated.
 - *Power consumption*: Typical value for information. Supply currents in various operating modes.

DC Voltage Measurement

A/D - Converter Resolution nominal

High Range: 1LSB = 6.1 μ V, full range = -100...+300 mV

Low Range: 1LSB = 61nV, full range = -1.....+3mV

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Calibration Factors	X	Y	Z
High Range	404.489 $\pm$ 0.02% (k=2)	404.417 $\pm$ 0.02% (k=2)	404.502 $\pm$ 0.02% (k=2)
Low Range	3.98225 $\pm$ 1.50% (k=2)	3.97749 $\pm$ 1.50% (k=2)	3.99902 $\pm$ 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	205.0 $^{\circ}$ $\pm$ 1 $^{\circ}$
---	-------------------------------------

Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	199996.62	0.96	0.00
Channel X + Input	20003.94	1.17	0.01
Channel X - Input	-20000.14	1.97	-0.01
Channel Y + Input	199996.31	0.25	0.00
Channel Y + Input	20001.53	-1.11	-0.01
Channel Y - Input	-20002.72	-0.49	0.00
Channel Z + Input	199996.47	1.37	0.00
Channel Z + Input	20000.37	-2.21	-0.01
Channel Z - Input	-20004.95	-2.67	0.01

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2001.30	-0.06	-0.00
Channel X + Input	202.25	0.64	0.32
Channel X - Input	-197.12	0.99	-0.50
Channel Y + Input	2001.12	-0.12	-0.01
Channel Y + Input	201.21	-0.24	-0.12
Channel Y - Input	-198.84	-0.59	0.30
Channel Z + Input	2001.25	0.07	0.00
Channel Z + Input	200.52	-0.93	-0.46
Channel Z - Input	-199.40	-1.20	0.61

2. Common mode sensitivity

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Common mode Input Voltage (mV)	High Range Average Reading (μV)	Low Range Average Reading (μV)
Channel X	200	1.68	0.14
	- 200	1.46	-0.21
Channel Y	200	-12.95	-13.14
	- 200	11.63	12.10
Channel Z	200	-10.77	-10.74
	- 200	9.34	8.73

3. Channel separation

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	Input Voltage (mV)	Channel X (μV)	Channel Y (μV)	Channel Z (μV)
Channel X	200	-	0.23	-3.11
Channel Y	200	6.42	-	0.14
Channel Z	200	10.64	3.75	-

4. AD-Converter Values with inputs shorted

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

	High Range (LSB)	Low Range (LSB)
Channel X	15822	15865
Channel Y	16183	15782
Channel Z	16003	15405

5. Input Offset Measurement

DASY measurement parameters: Auto Zero Time: 3 sec; Measuring time: 3 sec

Input 10MΩ

	Average (μV)	min. Offset (μV)	max. Offset (μV)	Std. Deviation (μV)
Channel X	1.06	0.40	1.68	0.26
Channel Y	-0.04	-1.84	0.85	0.35
Channel Z	-0.65	-1.54	0.49	0.34

6. Input Offset Current

Nominal Input circuitry offset current on all channels: <25fA

7. Input Resistance (Typical values for information)

	Zeroing (kOhm)	Measuring (MOhm)
Channel X	200	200
Channel Y	200	200
Channel Z	200	200

8. Low Battery Alarm Voltage (Typical values for information)

Typical values	Alarm Level (VDC)
Supply (+ Vcc)	+7.9
Supply (- Vcc)	-7.6

9. Power Consumption (Typical values for information)

Typical values	Switched off (mA)	Stand by (mA)	Transmitting (mA)
Supply (+ Vcc)	+0.01	+6	+14
Supply (- Vcc)	-0.01	-8	-9

Appendix C.3 Calibration certificate for Dipole (S/N: 892)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8004 Zurich, Switzerland

S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Client: **SGS**
Gyeonggi-do, Republic of Korea

Certificate No.: **D2450V2-892_Jan25**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN: 892**

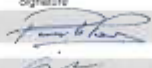
Calibration procedure(s): **QA CAL-05.v12**
Calibration Procedure for SAR Validation Sources between 0.7 - 3 GHz

Calibration date: **January 14, 2025**

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements [S].
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.
All calibrations have been conducted in the closed laboratory facility: environment temperature (22 ± 3)°C and humidity < 70%.
Calibration Equipment used (M&TE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Cal
Power Sensor R&S NRP-331	SN: 100667	28-Mar-24 (No. 217-24038)	Mar-25
Power Sensor R&S NRP18A	SN: 101699	22-Jul-24 (No. 4030A315938547)	Jul-25
Spectrum Analyser R&S FSU40	SN: 101832	25-Jan-24 (No. 4030-519937561)	Jan-25
Mismatch, Short [SA108] Attenuator [SA423]	SN: 1152	28-Mar-24 (No. 217-24038)	Mar-25
DCP DAK-12	SN: 1016	24-Sep-24 (No. OCP-DAK12-1016_Sep24)	Sep-25
DCP DAK-3.5	SN: 1249	23-Sep-24 (No. OCP-DAK3.5-1349_Sep24)	Sep-25
Reference Probe EX3DA4	SN: 7249	10-Jan-25 (No. EX3-7249_Jan25)	Jan-26
DAE4ip	SN: 1638	28-Oct-24 (No. DAE4ip-1638_Oct24)	Oct-25

Secondary Standards	ID	Check Date (in house)	Scheduled Check
ACAD Source Box	SN: 1000	28-May-24 (No. 675-ACAD_Source_Box-240528)	May-25
Signal Generator R&S SMB100A	SN: 182081	28-May-24 (No. 675-CALIF-B45488-240528)	May-25
Mismatch: SWA	SN: 1102	23-May-24 (No. 675-Mismatch_SMA-240523)	May-25

Calibrated by: **Paulo Pine** (Name), **Laboratory Technician** (Function),  (Signature)

Approved by: **Sven Kohn** (Name), **Technical Manager** (Function),  (Signature)

Issued: January 14, 2025

This calibration certificate shall not be reproduced except in full without written approval of the laboratory.

Certificate No: D2450V2-892_Jan25

Page 1 of 6

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 45, 8004 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accredited by the Swiss Accreditation Service (SAS)
The Swiss Accreditation Service is one of the signatories to the EA
Multilateral Agreement for the recognition of calibration certificates

Accreditation No.: SCS 0108

Glossary

TSL tissue simulating liquid
ConrF sensitivity in TSL / NORM x,y,z
N/A not applicable or not measured

Calibration is Performed According to the Following Standards

- IEC/IEEE 62209-1528, "Measurement Procedure For The Assessment Of Specific Absorption Rate Of Human Exposure To Radio Frequency Fields From Hand-Held And Body-Worn Wireless Communication Devices - Part 1528: Human Models, Instrumentation And Procedures (Frequency Range of 4 MHz to 10 GHz)", October 2020.
- KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation

- DASy System Handbook

Methods Applied and Interpretation of Parameters

- Measurement Conditions: Further details are available from the Validation Report at the end of the certificate. All figures stated in the certificate are valid at the frequency indicated.
- Antenna Parameters with TSL: The dipole is mounted with the spacer to position its feed point exactly below the center marking of the fat phantom section, with the arms oriented parallel to the body axis.
- Feed Point Impedance and Return Loss: These parameters are measured with the dipole positioned under the liquid filled phantom. The impedance stated is transformed from the measurement at the SMA connector to the feed point. The Return Loss ensures low reflected power. No uncertainty required.
- Electrical Delay: One-way delay between the SMA connector and the antenna feed point. No uncertainty required.
- SAR measured: SAR measured at the stated antenna input power.
- SAR normalized: SAR as measured, normalized to an input power of 1 W at the antenna connector.
- SAR for nominal TSL parameters: The measured TSL parameters are used to calculate the nominal SAR result.

The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor $k=2$, which for a normal distribution corresponds to a coverage probability of approximately 95%.

D2450V2 - SN: 892

January 14, 2025

Measurement Conditions

DASY system configuration, as far as not given on page 1.

DASY Version	DASY8 Module SAR	16.4.0
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with spacer
Zoom Scan Resolution	dx, dy = 5mm, dz = 1.5mm	Graded Ratio = 1.5 mm (Z direction)
Frequency	2450MHz ±1MHz	

Head TSL parameters at 2450 MHz

The following parameters and calculations were applied.

	Temperature	Permittivity	Conductivity
Nominal Head TSL parameters	22.0 °C	39.2	1.80 mho/m
Measured Head TSL parameters	(22.0 ±0.2)°C	37.9 ±6%	1.87 mho/m ±6%
Head TSL temperature change during test	< 0.5 °C		

SAR result with Head TSL at 2450 MHz

SAR averaged over 1 cm³ (1 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	13.2 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.6 W/kg ±17.0% (k = 2)

SAR averaged over 10 cm³ (10 g) of Head TSL	Condition	
SAR for nominal Head TSL parameters	24 dBm input power	6.21 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.7 W/kg ±16.5% (k = 2)

D2450V2 - SN: 892

January 14, 2025

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL at 2450 MHz

Impedance	53.2 Ω $\pm$ 2.7 j Ω
Return Loss	-27.9 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.162 ns
----------------------------------	----------

After long term use with 100W radiated power, only a slight warming of the dipole near the feedpoint can be measured. The dipole is made of standard semirigid coaxial cable. The center conductor of the feeding line is directly connected to the second arm of the dipole. The antenna is therefore short-circuited for DC-signals. On some of the dipoles, small end caps are added to the dipole arms in order to improve matching when loaded according to the position as explained in the "Measurement Conditions" paragraph. The SAR data are not affected by this change. The overall dipole length is still according to the Standard. No excessive force must be applied to the dipole arms, because they might bend or the soldered connections near the feedpoint may be damaged.

Additional EUT Data

Manufactured by	SPE/AG
-----------------	--------

D2450V2 - SN: 892

January 14, 2025

System Performance Check Report

Summary

Device	Frequency (MHz)	TSL	Power (dBm)
D2450V2 - SAR92	2450	1SL	24

Exposure Conditions

Reference Section, TSL	Test Distance (mm)	Band	Group, UED	Frequency (MHz), Channel Number	Conversion Factor	TSL Conductivity (S/m)	TSL Permittivity
1SL	18	CW, 6--	2450, 9		7.86	5.87	27.9

Hardware Setup

Platform	TSL Measured Data	Probe, Calibration Date	DMS, Calibration Date
MIP V60 Camera	HSL 2825-01-14	DOOV4 - 587149, 2025-01-13	DMSRP Set 1818, 2024-10-28

Scans Setup

	Device Scan
Grid Size (mm)	30 x 30 x 30
Grid Steps (mm)	5.0 x 5.0 x 1.5
Sensor Surface (mm)	1.4
Grided Grid	Yes
Griding Ratio	1.5
MMA	N/A
Surface Detection	VMS - 80
Scan Method	Measured

Measurement Results

	Zoom Scan
Date	2025-01-14
ptSAR1g (W/kg)	18.2
ptSAR10g (W/kg)	6.21
Power Shift (dB)	0.80
Power Scaling	Standard
Scaling Factor (dB)	
TSL Correction	Positive / Negative



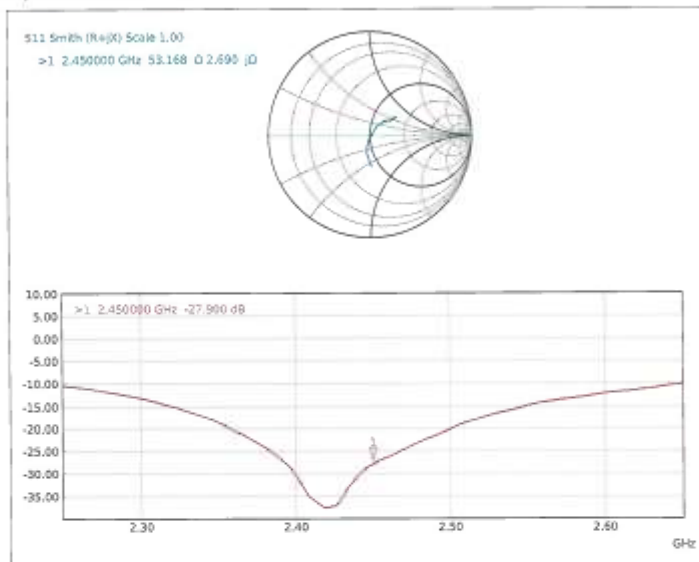
Certificate No: D2450V2-892_Jan25

Page 5 of 6

D2450V2 - SN: 892

January 14, 2025

Impedance Measurement Plot for Head TSL



Certificate No: D2450V2-892_Jan25

Page 6 of 6

-THE END-

Report File No : F690501-RF-SAR000601

Date of Issue : 2025-07-17

(All SGS services are rendered in accordance with the applicable SGS conditions of service available on request and accessible at <http://www.sgs.com/en/Terms-and-Conditions.aspx>.)

SAR7081-04 (2020.12.15)(0)

A4 (210mm x 297mm)