

FCC SAR TEST REPORT

Test File No : F690501-RF-SAR000457

Equipment Under Test	Wireless Headphones
Model Name	ATH-CKS50TW2
Applicant	Audio-Technica Corporation
Address of Applicant	2-46-1 Nishi-naruse, Machida, Tokyo, Japan, 194-8666
FCC ID	JFZCKS50TW2L
Exposure Category	General Population/Uncontrolled Exposure
Standards	FCC 47 CFR Part 2 (2.1093) IEEE 1528, 2013
Receipt No.	GPRI2404000466SR
Date of Receipt	2024-04-22
Date of Test(s)	2024-05-20 ~ 2024-05-23
Date of Issue	2024-05-28
Test Result	PASS, Refer to the Page 04
Measurement Uncertainty	Refer to the Page 27

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

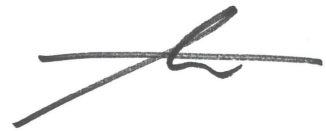
This test report does not assure KOLAS accreditation.

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.



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Technical Manager

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Date of Issue : 2024-05-28

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Revision history

Revision	Date of issue	Revisions	Revised By
-	May 28, 2024	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. Maximum Output Power Specifications*	13
13. Tissue Simulant Fluid for the Frequency Band	14
14. Instruments List	15
15. FCC Power Measurement Procedures	16
16. Measured and Reported SAR	16
17. RF Conducted Power Measurement	16
17.1. Bluetooth Classic Conducted Power(Left)	16
17.2. Bluetooth LE Conducted Power(Left)	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	21
20.1. Measurement Variability	21
20.2. Measurement Uncertainty	21
Appendixes List	22
Appendix A.1 Verification Test Plots for 2450MHz	23
Appendix A.2 SAR Test Plots for Bluetooth Classic	25
Appendix A.3 SAR Test Plots for Bluetooth LE	26
Appendix B.1 Uncertainty Analysis	27
Appendix C.1 Calibration certificate for Probe (S/N : 3791)	28
Appendix C.2 Calibration certificate for DAE (S/N : 1504)	50
Appendix C.3 Calibration certificate for Dipole (S/N: 734)	55
-THE END-	60

1. Testing Laboratory

Company Name	SGS Korea Co., Ltd. (Gunpo Laboratory)
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2. Details of Manufacturer

Manufacturer	Audio-Technica Corporation
Address	2-46-1 Nishi-naruse, Machida, Tokyo, Japan, 194-8666
Email	kamimura@audio-technica.co.jp
Phone No.	+81-42-739-9128

3. Description of EUT(s)

EUT Type	Wireless Headphones	
Model Name	ATH-CKS50TW2	
Serial Number	1	
Software Version	V1.00	
Hardware Version	V1.00	
Mode of Operation	Bluetooth Classic, Bluetooth LE	
Duty Cycle	76.1 % (Bluetooth Classic), 41.5 % (Bluetooth Low Energy)	
Body worn Accessory	None	
Tx Frequency Range	2 402.00 MHz ~ 2 480.00 MHz (Bluetooth) 2 402.00 MHz ~ 2 480.00 MHz (Bluetooth Low Energy 1M) 2 404.00 MHz ~ 2 478.00 MHz (Bluetooth Low Energy 2M)	
Antenna Information *	Manufacturer	AWAVE
	Type	Monopole Antenna
	Antenna Gain (dBi)	-2.80

4. The Highest Reported SAR Values

Equipment Class	Band	Highest Reported SAR 1g (W/kg)
DSS	Bluetooth	0.325
DTS	Bluetooth Low Energy	0.411
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.

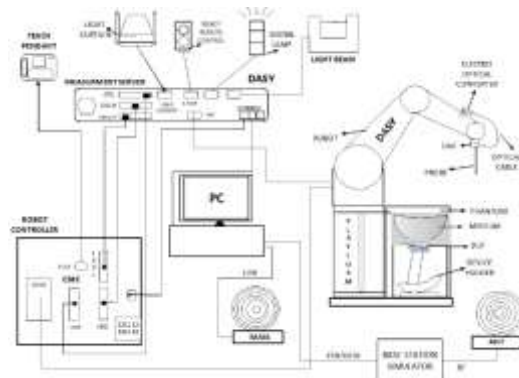
(2) Limits for General Population/Uncontrolled exposure: 0.08 W/kg as averaged over the whole-body and spatial peak SAR not exceeding 1.6 W/kg as averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube). Exceptions are the hands, wrists, feet and ankles where the spatial 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).
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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.

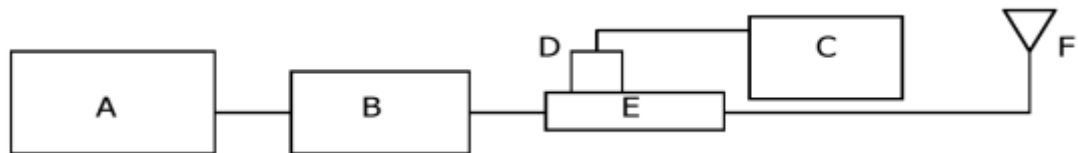


Fig 1. The microwave circuit arrangement used for SAR system verification

- 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	10g SAR	1g SAR	10g SAR	1g SAR	10g SAR		Ambient	Liquid
2450V2	734	3791	2450	0.10	52.90	24.50	54.30	24.70	2.65	0.82	2024-05-20	22.3	22.0
2450V2	734	3791	2450	0.10	52.90	24.50	49.80	22.60	-5.86	-7.76	2024-05-23	22.5	21.7

Table 1 Results system verification

12. 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	10.35
	Normal	9.35
EDR	Maximum	8.50
	Normal	7.50
Tune-up Tolerance: + 1.0dB		

Average power for Production (dBm)					
Mode	Maximum/Normal	Low Energy (Packet: 37)		Low Energy (Packet: 255)	
		1M	2M	1M	2M
LE	Maximum	10.45	10.45	10.45	10.45
	Normal	9.45	9.45	9.45	9.45
Tune-up Tolerance: + 1.0dB					

- 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.

13. 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 Keysight E5063A Network Analyzer 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	38.134	1.767	-2.72	-1.83	2024-05-20	22.0
2402.00	39.20	1.80	38.216	1.735	-2.51	-3.61		
2480.00	39.20	1.80	38.058	1.796	-2.91	-0.22		
2450*	39.20	1.80	37.462	1.831	-4.43	1.72	2024-05-23	21.7
2440.00	39.20	1.80	37.482	1.824	-4.38	1.33		

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				Sucrose: 98+% Pure Sucrose HEC: Hydroxyethyl Cellulose		
DGBE: 99+% Di(ethylene glycol) butyl ether, [2-(2-butoxyethoxy)ethanol]						



14. 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	1997	N/A	N/A	N/A
Verification Dipole	D2450V2	734	2024-01-22	Biennial	2026-01-22
Dielectric Assessment Kit	DAK-3.5	1228	2023-11-20	Annual	2024-11-20
DAE	DAE4	1504	2024-01-17	Annual	2025-01-17
E-Field Probe	EX3DV4	3791	2024-04-22	Annual	2025-04-22
Network Analyzer	E5063A	MY54706220	2024-01-10	Annual	2025-01-10
Power Meter	N1914A	MY63210027	2023-07-07	Annual	2024-07-07
Power Sensor	N8481A	MY63190004	2023-07-07	Annual	2024-07-07
Power Sensor	N8481A	MY63190005	2023-07-07	Annual	2024-07-07
Signal Generator	N5173B	MY62220611	2023-07-06	Annual	2024-07-06
Power Amplifier	BLMA1060-10	1711221	2024-03-14	Annual	2025-03-14
Dual Directional Coupler	772D	MY52180226	2024-03-05	Annual	2025-03-05
Attenuator	18N-03	18	2023-11-30	Annual	2024-11-30
Attenuator	18N-10	20	2023-11-27	Annual	2024-11-27
Hygro-Thermometer	303	210700048	2024-01-30	Annual	2025-01-30
Digital Thermometer	SDT25	19041500179	2023-09-01	Annual	2024-09-01
Bluetooth Tester	MT8852B	1219006	2023-06-08	Annual	2024-06-08
Spectrum Analyzer	FSP	100007	2023-12-01	Annual	2024-12-01

15. 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.

16. 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.

17. RF Conducted Power Measurement

17.1. Bluetooth Classic Conducted Power(Left)

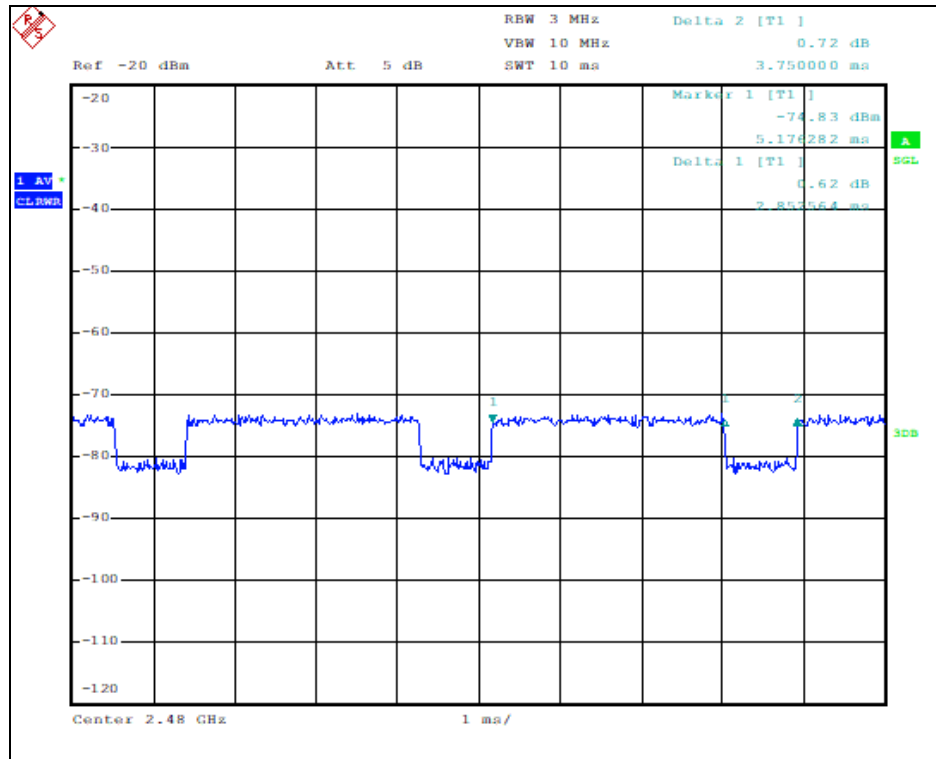
Modulation	Packet	Frequency (MHz)	Channel	Burst-Conducted Average Power	
				Conducted Power (dBm)	E.I.R.P
BDR	DH1	2402.00	0	8.26	2.78
		2441.00	39	8.13	2.65
		2480.00	78	8.32	2.84
	DH3	2402.00	0	9.02	3.54
		2441.00	39	8.87	3.39
		2480.00	78	8.84	3.36
	DH5	2402.00	0	9.51	4.03
		2441.00	39	9.27	3.79
		2480.00	78	9.66	4.18
EDR	2DH1	2402.00	0	7.24	1.76
		2441.00	39	7.07	1.59
		2480.00	78	7.23	1.75
	2DH3	2402.00	0	7.28	1.80
		2441.00	39	7.08	1.60
		2480.00	78	7.21	1.73
	2DH5	2402.00	0	7.34	1.86
		2441.00	39	7.14	1.66
		2480.00	78	7.39	1.91
	3DH1	2402.00	0	7.30	1.82
		2441.00	39	7.06	1.58
		2480.00	78	7.35	1.87
	3DH3	2402.00	0	7.30	1.82
		2441.00	39	7.04	1.56
		2480.00	78	7.23	1.75
	3DH5	2402.00	0	7.31	1.83
		2441.00	39	7.11	1.63
		2480.00	78	7.41	1.93

17.2. Bluetooth LE Conducted Power(Left)

Modulation	Packet	Frequency (MHz)	Channel	Burst-Conducted Average Power	
				Conducted Power (dBm)	E.I.R.P
LE 1M	37byte	2402.00	0	9.34	3.86
		2440.00	19	9.24	3.76
		2480.00	39	9.21	3.73
	255byte	2402.00	0	9.26	3.78
		2440.00	19	9.65	4.17
		2480.00	39	9.29	3.81
LE 2M	37byte	2404.00	1	9.24	3.76
		2440.00	19	9.27	3.79
		2478.00	38	9.26	3.78
	255byte	2404.00	1	9.13	3.65
		2440.00	19	9.56	4.08
		2478.00	38	9.16	3.68

18. Bluetooth Duty Cycle used for SAR Testing

18.1. Bluetooth Classic DH5 Duty Cycle



Bluetooth Duty cycle measurement

$T_{on} = 2.853 \text{ ms}$

$T_{on} + T_{off} = 3.750 \text{ ms}$

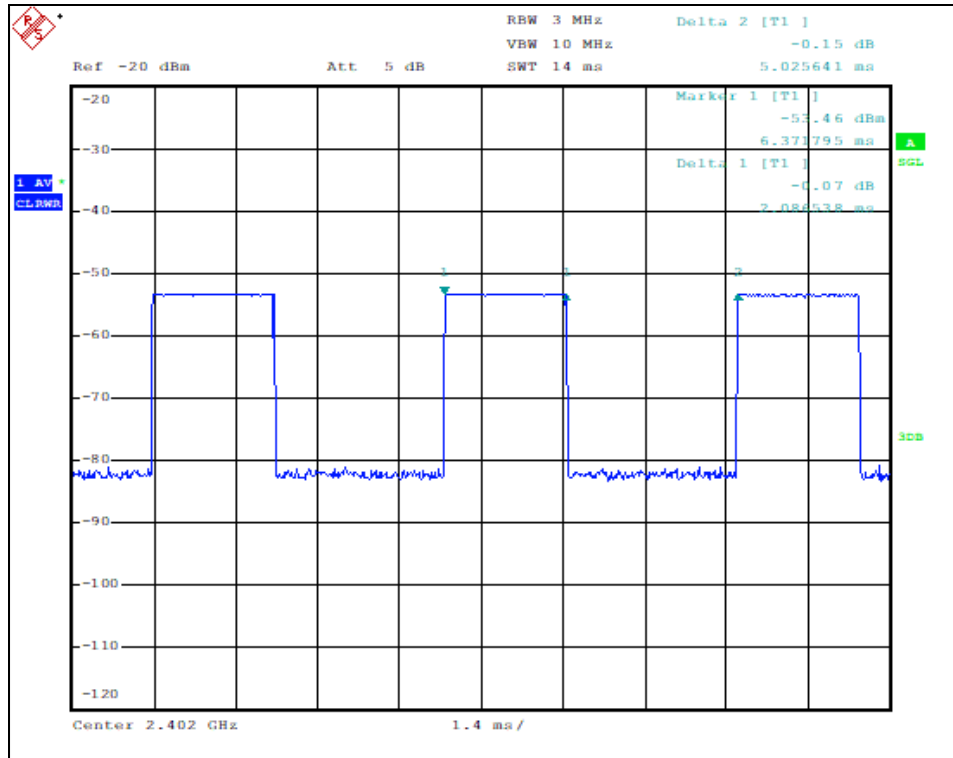
Duty Cycle = $(T_{on} / T_{on} + T_{off}) \times 100$

76.1 % = $(2.853 / 3.750) \times 100$

SAR Crest Factor = $1 / (2.853 / 3.750) = \mathbf{1.314}$

Bluetooth Duty cycle: 76.1 %

18.2. Bluetooth LE 1M 255byte Duty Cycle



Bluetooth Duty cycle measurement

$T_{on} = 2.087 \text{ ms}$

$T_{on} + T_{off} = 5.026 \text{ ms}$

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

41.5 % = $(2.087 / 5.026) \times 100$

SAR Crest Factor = $1 / (2.087 / 5.026) = \mathbf{2.410}$

Bluetooth Duty cycle: 41.5 %

19. SAR Data Summary

19.1. SAR data

Bluetooth Classic SAR(Left)					Ambient Temperature (°C)			22.3			
					Liquid Temperature (°C)			22.0			
					Date			2024-05-20			
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)
Front	GFSK DH5	2480.00	78	N/A	0	9.66	0.211	10.35	1.172	1.314	0.325
Rear	GFSK DH5	2480.00	78	N/A	0	9.66	0.029	10.35	1.172	1.314	0.045
Right Edge	GFSK DH5	2480.00	78	N/A	0	9.66	0.115	10.35	1.172	1.314	0.177
Left Edge	GFSK DH5	2480.00	78	N/A	0	9.66	0.120	10.35	1.172	1.314	0.185
Top	GFSK DH5	2480.00	78	N/A	0	9.66	0.059	10.35	1.172	1.314	0.091
Bottom	GFSK DH5	2480.00	78	N/A	0	9.66	0.153	10.35	1.172	1.314	0.236

Bluetooth LE SAR(Left)					Ambient Temperature (°C)			22.5			
					Liquid Temperature (°C)			21.7			
					Date			2024-05-23			
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)
Front	1M 255byte	2440.00	19	N/A	0	9.65	0.142	10.45	1.202	2.410	0.411
Rear	1M 255byte	2440.00	19	N/A	0	9.65	0.024	10.45	1.202	2.410	0.070
Right Edge	1M 255byte	2440.00	19	N/A	0	9.65	0.073	10.45	1.202	2.410	0.211
Left Edge	1M 255byte	2440.00	19	N/A	0	9.65	0.008	10.45	1.202	2.410	0.023
Top	1M 255byte	2440.00	19	N/A	0	9.65	0.029	10.45	1.202	2.410	0.084
Bottom	1M 255byte	2440.00	19	N/A	0	9.65	0.118	10.45	1.202	2.410	0.342

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

20.2. Measurement Uncertainty

The measured SAR was < 1.5 W/kg for all frequency bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE 1528-2013 was not required.



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: 1504) C.3 Calibration certificate for Dipole 2450 MHz (S/N: 734)

Appendix A.1 Verification Test Plots for 2450MHz

Date/Time: 2024-05-20 13:15:58

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2024-05-20.da53:0](#)

Input Power: 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:734

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.767$ S/m; $\epsilon_r = 38.134$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

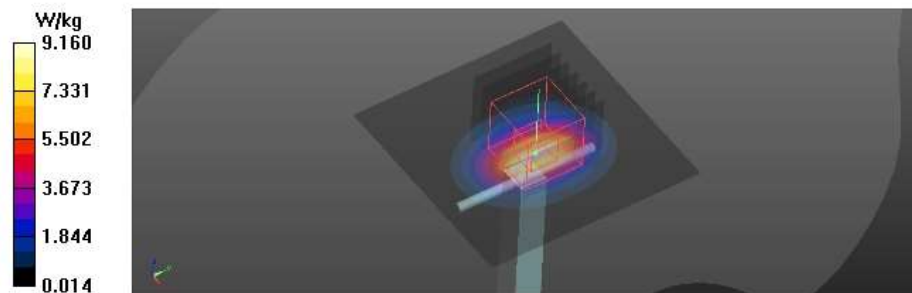
DASY52 Configuration:
- Probe: EX3DV4 - SN3791; ConvF(7.29, 6.72, 6.14) @ 2450 MHz; Calibrated: 2024-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1504; Calibrated: 2024-01-17
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1997; Type: QD 000 P41 Ax; Serial: 1997
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (interpolated) = 9.16 W/kg

Verification/Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm
Reference Value = 65.22 V/m; Power Drift = 0.19 dB
Peak SAR (extrapolated) = 11.4 W/kg
SAR(1 g) = 5.43 W/kg; SAR(10 g) = 2.47 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 47.3%

Info: Interpolated medium parameters used for SAR evaluation.
Maximum value of SAR (measured) = 9.22 W/kg



Date/Time: 2024-05-23 13:56:34

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [Verification 2450MHz 2024-05-23.da53:0](#)

Input Power: 100 mW

DUT: Dipole 2450 MHz D2450V2; Type: D2450V2; Serial: D2450V2 - SN:734

Communication System: UID 0, CW (0); Frequency: 2450 MHz; Duty Cycle: 1:1
Medium parameters used (interpolated): $f = 2450$ MHz; $\sigma = 1.831$ S/m; $\epsilon_r = 37.462$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.29, 6.72, 6.14) @ 2450 MHz; Calibrated: 2024-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1504; Calibrated: 2024-01-17
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1997; Type: QD 000 P41 Ax; Serial: 1997
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Verification/Verification 2450MHz/Area Scan (81x81x1): Interpolated grid: $dx=1.000$ mm, $dy=1.000$ mm

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (interpolated) = 8.65 W/kg

Verification/Verification 2450MHz/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5$ mm, $dy=5$ mm, $dz=5$ mm

Reference Value = 72.14 V/m; Power Drift = -0.01 dB

Peak SAR (extrapolated) = 10.5 W/kg

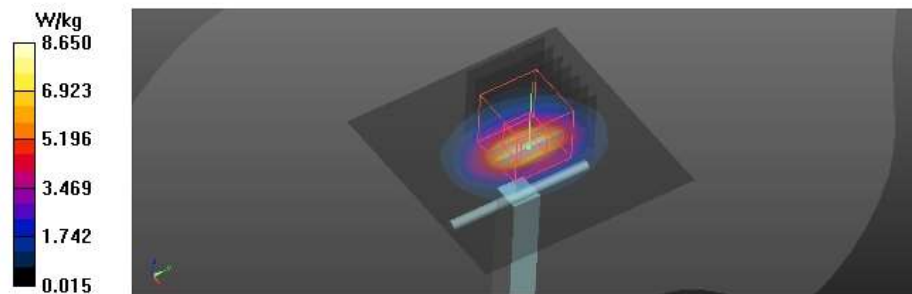
SAR(1 g) = 4.98 W/kg; SAR(10 g) = 2.26 W/kg

Smallest distance from peaks to all points 3 dB below = 9 mm

Ratio of SAR at M2 to SAR at M1 = 47.2%

Info: Interpolated medium parameters used for SAR evaluation.

Maximum value of SAR (measured) = 8.45 W/kg



Appendix A.2 SAR Test Plots for Bluetooth Classic

Date/Time: 2024-05-20 13:53:24

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [BT Ant1 Front GFSK DH5 CH78 Left.da53:0](#)

DUT: ATH-CKS50TW2; Type: Wireless Headphones; Serial: 1

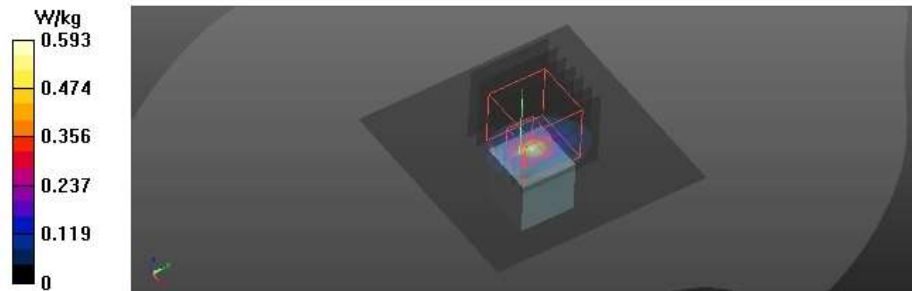
Communication System: UID 0, Bluetooth (0); Frequency: 2480 MHz; Duty Cycle: 1:1.31401
Medium parameters used: $f = 2480 \text{ MHz}$; $\sigma = 1.796 \text{ S/m}$; $\epsilon_r = 38.058$; $\rho = 1000 \text{ kg/m}^3$
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.29, 6.72, 6.14) @ 2480 MHz; Calibrated: 2024-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1504; Calibrated: 2024-01-17
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1997; Type: QD 000 P41 Ax; Serial: 1997
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Head/BT Ant1_Front_GFSK_DH5_CH78_Left/Area Scan (81x81x1): Interpolated grid: $dx=1.000 \text{ mm}$,
 $dy=1.000 \text{ mm}$
Maximum value of SAR (interpolated) = 0.593 W/kg

Head/BT Ant1_Front_GFSK_DH5_CH78_Left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: $dx=5\text{mm}$,
 $dy=5\text{mm}$, $dz=5\text{mm}$
Reference Value = 19.59 V/m; Power Drift = 0.00 dB
Peak SAR (extrapolated) = 1.52 W/kg
SAR(1 g) = 0.211 W/kg; SAR(10 g) = 0.055 W/kg
Smallest distance from peaks to all points 3 dB below = 4.1 mm
Ratio of SAR at M2 to SAR at M1 = 14.2%
Maximum value of SAR (measured) = 0.659 W/kg



Appendix A.3 SAR Test Plots for Bluetooth LE

Date/Time: 2024-05-23 14:30:59

Test Laboratory : SGS Korea (Gunpo Laboratory)
File Name: [BTLE Ant1_Front_1M_255byte_CH19_Left.da53:0](#)

DUT: ATH-CKS50TW2; Type: Wireless Headphones; Serial: 1

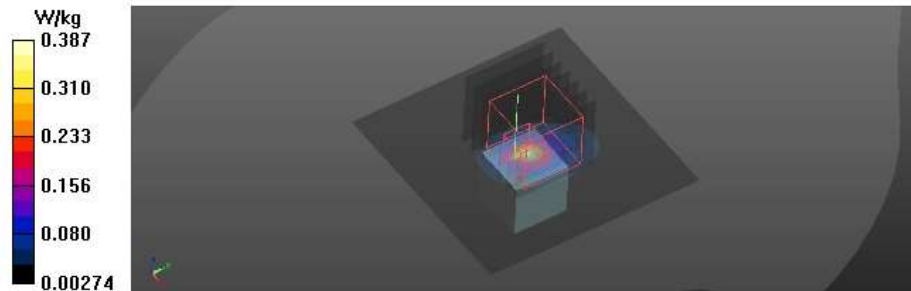
Communication System: UID 0, Bluetooth LE (0); Frequency: 2440 MHz; Duty Cycle: 1:2.41046
Medium parameters used: $f = 2440$ MHz; $\sigma = 1.824$ S/m; $\epsilon_r = 37.482$; $\rho = 1000$ kg/m³
Phantom section: Flat Section

DASY52 Configuration:

- Probe: EX3DV4 - SN3791; ConvF(7.29, 6.72, 6.14) @ 2440 MHz; Calibrated: 2024-04-22
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn1504; Calibrated: 2024-01-17
- Phantom: Twin-SAM V8.0 (20deg probe tilt)_1997; Type: QD 000 P41 Ax; Serial: 1997
- DASY52 52.10.4(1527)SEMCAD X 14.6.14(7483)

Head/BTLE Ant1_Front_1M_255byte_CH19_Left/Area Scan (81x81x1): Interpolated grid: dx=1.000 mm, dy=1.000 mm
Maximum value of SAR (interpolated) = 0.387 W/kg

Head/BTLE Ant1_Front_1M_255byte_CH19_Left/Zoom Scan (7x7x7)/Cube 0: Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 16.98 V/m; Power Drift = 0.03 dB
Peak SAR (extrapolated) = 1.10 W/kg
SAR(1 g) = 0.142 W/kg; SAR(10 g) = 0.043 W/kg
Smallest distance from peaks to all points 3 dB below = 3.6 mm
Ratio of SAR at M2 to SAR at M1 = 13.9%
Maximum value of SAR (measured) = 0.464 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	1.88/1.97	N	1.00	1.00	1.00	1.88	1.97	35
Device holder uncertainty	3.07/3.21	N	1.00	1.00	1.00	3.07	3.21	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- Target	5.00	N	1.00	0.78	0.71	3.90	3.55	∞
Liquid conductivity- measurement	3.10	N	1.00	0.78	0.71	2.42	2.20	71
Liquid permittivity- Target	5.00	N	1.00	0.23	0.26	1.15	1.30	∞
Liquid permittivity- measurement	2.86	N	1.00	0.23	0.26	0.66	0.74	71
Liquid conductivity-temperature	2.46	R	1.73	0.78	0.71	1.11	1.01	20
Liquid permittivity - temperature	0.59	R	1.73	0.23	0.26	0.08	0.09	20
Combined standard uncertainty			RSS			12.93	12.85	854/502
Expanded uncertainty (95% CONFIDENCE INTERVAL)			k=2			25.86	25.70	

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

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zughausstrasse 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'etonnage
S Servizio svizzero di taratura
S Swiss Calibration Service

Accreditation No.: SCS 0108

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

Certificate No. **EX-3791_Apr24**

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, 2024**

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 (MATE critical for calibration)

Primary Standards	ID	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP-2	SN: 104778	26-Mar-24 (No. 217-04036/04037)	Mar-25
Power sensor NRP-251	SN: 103244	26-Mar-24 (No. 217-04036)	Mar-25
OCF DAK-3.5 (weighted)	SN: 1249	05-Oct-23 (OCF-DAK3.5-1249_Oct23)	Oct-24
OCF DAK-12	SN: 1016	05-Oct-23 (OCF-DAK12-1016_Oct23)	Oct-24
Reference 20 dB Attenuator	SN: CG2552 (20s)	26-Mar-24 (No. 217-04046)	Mar-25
DAE4	SN: 693	23-Feb-24 (No. DAE4-693_Feb24)	Feb-25
Reference Probe EX3DV4	SN: 7349	03-Nov-23 (No. EX3-7349_Nov23)	Nov-24

Secondary Standards	ID	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: GB41290674	06-Apr-16 (in house check Jun-22)	In house check Jun-24
Power sensor E4412A	SN: MY41499387	06-Apr-16 (in house check Jun-22)	In house check Jun-24
Power sensor E4412A	SN: 009110210	06-Apr-16 (in house check Jun-22)	In house check Jun-24
RF generator HP 8448C	SN: US3642U01703	04-Aug-99 (in house check Jun-22)	In house check Jun-24
Network Analyzer E8358A	SN: US41085477	31-Mar-14 (in house check Oct-22)	In house check Oct-24

Name	Function	Signature
Calibrated by Joanna Uesha	Laboratory Technician	
Approved by Sven Kohn	Technical Manager	

Issued: April 22, 2024

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

Certificate No: EX-3791_Apr24

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	tissue 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 86584, "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_{100,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 whereas 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, 2024

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	0.50	0.54	0.55	±10.1%
DCP (mV) ^B	103.4	102.0	102.0	±4.7%

Calibration Results for Modulation Response

UID	Communication System Name		A dB	B dB/√μV	C	D dB	V _{RI} mV	Max dev.	Max Unc ^H k = 2
0	CW	X	0.00	0.00	1.00	0.00	128.6	±1.1%	±4.7%
		Y	0.00	0.00	1.00		135.7		
		Z	0.00	0.00	1.00		129.2		
10352	Pulse Waveform (200Hz, 10%)	X	20.00	93.28	23.69	10.00	60.0	±2.8%	±9.6%
		Y	20.00	94.10	23.49		60.0		
		Z	20.00	94.39	24.15		60.0		
10353	Pulse Waveform (200Hz, 20%)	X	20.00	93.05	22.27	6.59	60.0	±1.4%	±9.6%
		Y	20.00	94.10	22.40		60.0		
		Z	20.00	94.47	22.95		60.0		
10354	Pulse Waveform (200Hz, 40%)	X	20.00	94.56	21.46	3.98	95.0	±0.9%	±9.6%
		Y	20.00	96.33	22.11		95.0		
		Z	20.00	96.19	22.25		95.0		
10355	Pulse Waveform (200Hz, 60%)	X	20.00	97.55	21.54	2.22	120.0	±1.0%	±9.6%
		Y	20.00	100.22	22.65		120.0		
		Z	20.00	99.17	22.26		120.0		
10387	QPSK Waveform, 1 MHz	X	1.56	64.16	13.85	1.00	150.0	±2.1%	±9.6%
		Y	1.63	65.35	14.42		150.0		
		Z	1.59	64.61	14.03		150.0		
10388	QPSK Waveform, 10 MHz	X	2.00	66.88	14.46	0.00	150.0	±1.1%	±9.6%
		Y	2.14	67.07	15.13		150.0		
		Z	2.07	66.39	14.71		150.0		
10396	64-QAM Waveform, 100 kHz	X	3.12	70.25	16.35	3.01	150.0	±0.7%	±9.6%
		Y	2.95	70.09	16.46		150.0		
		Z	2.98	69.65	16.18		150.0		
10399	64-QAM Waveform, 40 MHz	X	3.37	66.24	15.13	0.00	150.0	±0.9%	±9.6%
		Y	3.49	66.89	15.54		150.0		
		Z	3.45	66.54	15.32		150.0		
10414	WLAN CCDF, 64-QAM, 40 MHz	X	4.79	65.22	15.13	0.00	150.0	±2.1%	±9.6%
		Y	4.68	64.95	15.07		150.0		
		Z	4.87	65.48	15.32		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 Uncertainty 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, 2024

Parameters of Probe: EX3DV4 - SN:3791

Sensor Model Parameters

	C1 IF	C2 IF	a V ⁻¹	T1 msV ⁻²	T2 msV ⁻¹	T3 ms	T4 V ⁻²	T5 V ⁻¹	T6
x	47.8	347.49	33.79	24.82	1.16	5.05	1.50	0.30	1.01
y	44.3	326.33	34.59	24.76	0.55	5.10	1.13	0.28	1.01
z	47.1	349.13	34.66	24.69	0.95	5.10	0.99	0.36	1.01

Other Probe Parameters

Sensor Arrangement	Triangular
Connector Angle	67.8°
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, 2024

Parameters of Probe: EX3DV4 - SN:3791

Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^E	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^G	Depth ^H (mm)	Unc (k = 2)
750	41.9	0.89	9.15	8.90	6.17	0.38	1.27	±11.0%
835	41.5	0.90	8.68	8.71	7.96	0.40	1.27	±11.0%
900	41.5	0.97	8.28	8.08	7.80	0.39	1.27	±11.0%
1750	40.1	1.37	8.11	7.47	6.83	0.30	1.27	±11.0%
1900	40.0	1.40	7.90	7.31	6.63	0.31	1.27	±11.0%
1950	40.0	1.40	7.81	7.22	6.55	0.33	1.27	±11.0%
2300	39.5	1.67	7.51	6.91	6.29	0.34	1.27	±11.0%
2450	39.2	1.80	7.29	6.72	6.14	0.33	1.27	±11.0%
2600	39.0	1.96	7.17	6.60	6.05	0.32	1.27	±11.0%
3300	38.2	2.71	6.77	6.21	5.71	0.36	1.27	±13.1%
3500	37.9	2.91	6.72	6.13	5.63	0.38	1.27	±13.1%
3700	37.7	3.12	6.62	6.05	5.57	0.38	1.27	±13.1%
3900	37.5	3.32	6.53	5.95	5.47	0.40	1.27	±13.1%
4100	37.2	3.53	6.44	5.86	5.40	0.40	1.27	±13.1%
5200	36.0	4.66	5.37	4.88	4.59	0.38	1.60	±13.1%
5300	35.9	4.76	5.14	4.68	4.40	0.39	1.63	±13.1%
5500	35.6	4.96	4.92	4.44	4.17	0.45	1.61	±13.1%
5600	35.5	5.07	4.83	4.32	4.09	0.44	1.67	±13.1%
5800	35.3	5.27	4.80	4.30	4.08	0.43	1.78	±13.1%

^C Frequency validity above 300 MHz of ±100 MHz only applies for CASY v4.4 and higher (see Page 2), 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, 128, 150 and 200 MHz respectively. Validity of ConvF assessed at 9 MHz is 4–9 MHz, and ConvF assessed at 13 MHz is 9–19 MHz. Above 5 GHz frequency validity can be extended to ±110 MHz.

^E 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 ±3%) and are valid for TSL with deviations of up to ±10% if SAR correction is applied.

^G Alpha/Depth are determined during calibration. SPEAG 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 3–8 GHz at any distance larger than half the probe tip diameter from the boundary.

EX3DV4 - SN:3791

April 22, 2024

Parameters of Probe: EX3DV4 - SN:3791

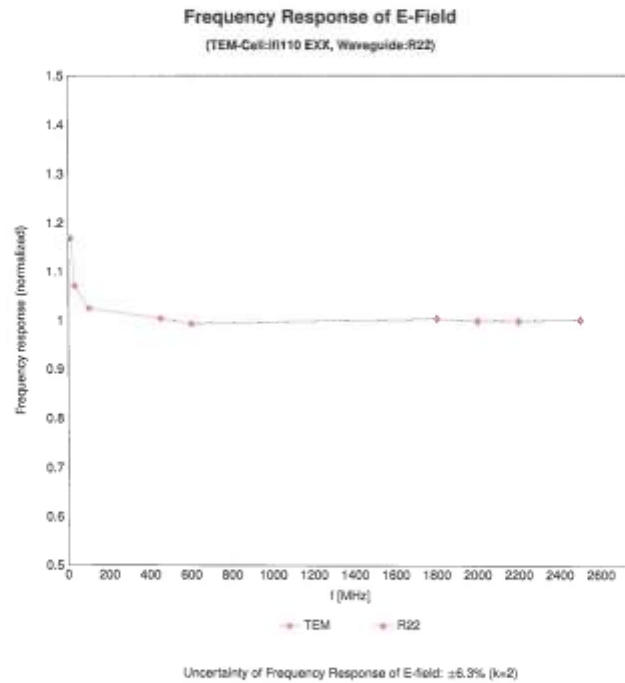
Calibration Parameter Determined in Head Tissue Simulating Media

f (MHz) ^C	Relative Permittivity ^F	Conductivity ^F (S/m)	ConvF X	ConvF Y	ConvF Z	Alpha ^D	Depth ^D (mm)	Unc- (k = 2)
6500	34.5	6.07	5.04	4.70	4.90	0.20	2.00	±18.6%

^C Frequency validity at 6.5GHz is -600~+700MHz, and ±700MHz 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.
^F The probes are calibrated using tissue simulating liquids (TSL) that deviate for ϵ' and σ by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±15%.
^D Alpha/Depth are determined during calibration. SPEAG 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.

EX3DV4 - SN:3791

April 22, 2024

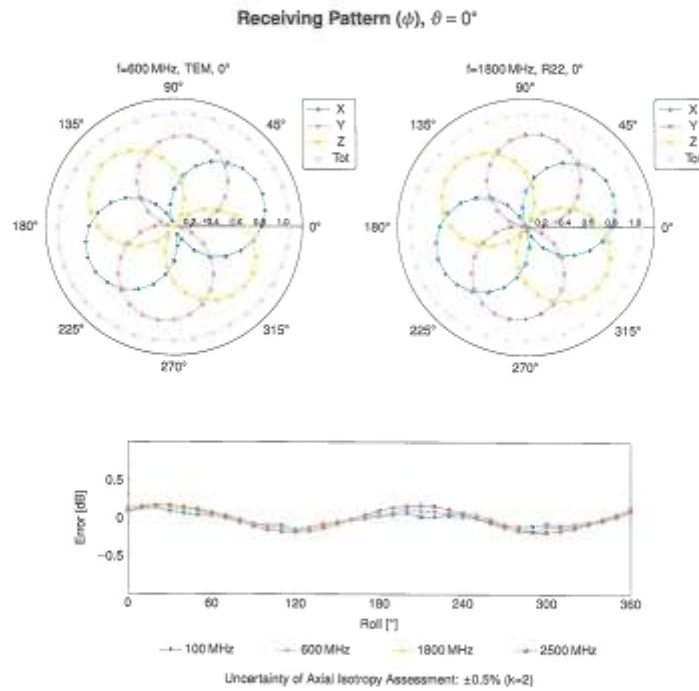


Certificate No: EX-3791_Apr24

Page 7 of 22

EX3DV4 - SN:3791

April 22, 2024

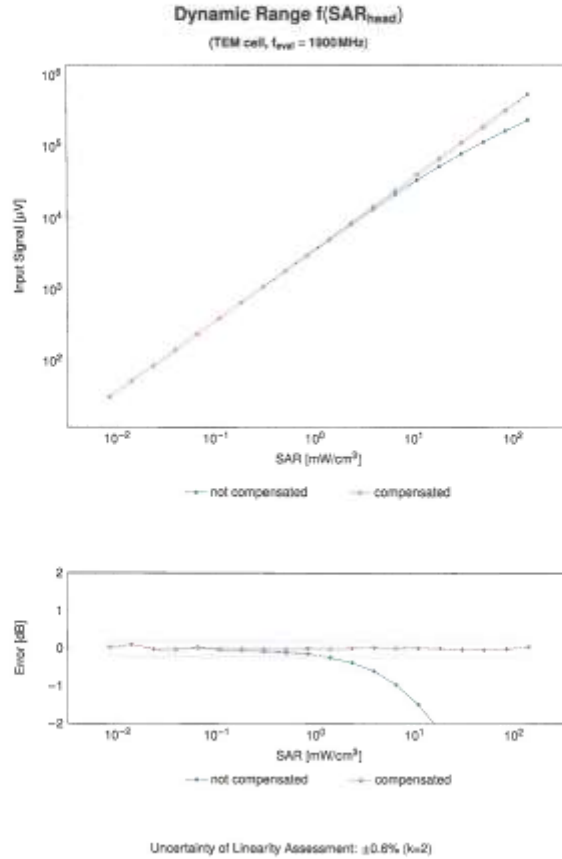


Certificate No: EX-3791_Apr24

Page 8 of 22

EX30V4 - SN-3791

April 22, 2024



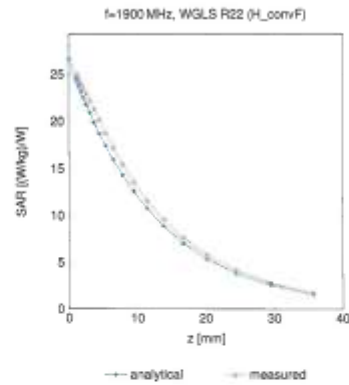
Certificate No: EX-3791_Apr24

Page 9 of 22

EX3DV4 - SN:3791

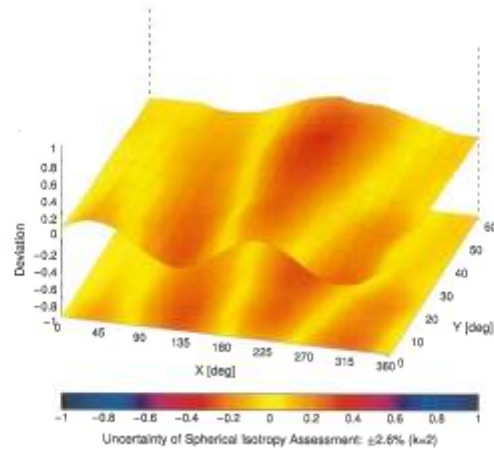
April 22, 2024

Conversion Factor Assessment



Deviation from Isotropy in Liquid

Error (φ, θ), f=900 MHz



Certificate No: EX-3791_Apr24

Page 10 of 22

EX3DV4 - SN:3791

April 22, 2024

Appendix: Modulation Calibration Parameters

SID	Rev	Communication System Name	Group	PLR (dB)	Unc ² k = 2
0		CW	CW	0.00	±4.7
10010	CAB	SAR Validation (Square, 120 ms, 10 ms)	Test	10.00	±9.6
10011	CAC	UMTS-FDD (WCDMA)	WCDMA	2.91	±9.6
10012	CAB	IEEE 802.11b WiFi 2.4 GHz (GSSS, 1 Mbps)	WLAN	1.87	±9.6
10013	CAB	IEEE 802.11g WiFi 2.4 GHz (GSSS-OFDM, 6 Mbps)	WLAN	9.46	±9.6
10021	DAC	GSM-FDD (TDMA, GMSK)	GSM	9.39	±9.6
10023	DAC	GPRS-FDD (TDMA, GMSK, TN 0)	GSM	9.57	±9.6
10024	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1)	GSM	6.56	±9.6
10025	DAC	EDGE-FDD (TDMA, 8PSK, TN 0)	GSM	12.62	±9.6
10026	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1)	GSM	9.55	±9.6
10027	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2)	GSM	4.80	±9.6
10028	DAC	GPRS-FDD (TDMA, GMSK, TN 0-1-2-3)	GSM	3.65	±9.6
10029	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2)	GSM	7.78	±9.6
10030	CAB	IEEE 802.15.1 Bluetooth (GFSK, DH1)	Bluetooth	5.30	±9.6
10031	CAB	IEEE 802.15.1 Bluetooth (GFSK, DH3)	Bluetooth	1.87	±9.6
10032	CAB	IEEE 802.15.1 Bluetooth (GFSK, DH5)	Bluetooth	1.16	±9.6
10033	CAB	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH1)	Bluetooth	7.74	±9.6
10034	CAB	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH3)	Bluetooth	4.23	±9.6
10035	CAB	IEEE 802.15.1 Bluetooth (P4-DQPSK, DH5)	Bluetooth	3.83	±9.6
10036	CAB	IEEE 802.15.1 Bluetooth (8-PSK, DH1)	Bluetooth	8.01	±9.6
10037	CAB	IEEE 802.15.1 Bluetooth (8-PSK, DH3)	Bluetooth	4.77	±9.6
10038	CAB	IEEE 802.15.1 Bluetooth (8-PSK, DH5)	Bluetooth	4.10	±9.6
10039	CAB	CDMA2000 (1xRTT, RC1)	CDMA2000	4.57	±9.6
10042	CAB	IS-54 / IS-136 FDD (TDMA/FDM, P4-DQPSK, Fullrate)	AMPS	7.78	±9.6
10044	CAB	IS-97/IS-136 FDD (TDMA, FM)	AMPS	0.00	±9.6
10048	CAB	DECT (TGO, TDMA/FDM, GFSK, Full Slot, 24)	DECT	13.80	±9.6
10049	CAB	DECT (TGO, TDMA/FDM, GFSK, Double Slot, 12)	DECT	10.79	±9.6
10056	CAB	UMTS-TDD (TD-SCDMA, 1.28 Mbps)	TD-SCDMA	11.01	±9.6
10058	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)	GSM	6.53	±9.6
10060	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)	WLAN	2.12	±9.6
10062	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 5.5 Mbps)	WLAN	2.83	±9.6
10061	CAB	IEEE 802.11b WiFi 2.4 GHz (DSSS, 11 Mbps)	WLAN	3.00	±9.6
10062	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 6 Mbps)	WLAN	8.03	±9.6
10063	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 9 Mbps)	WLAN	8.83	±9.6
10064	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 12 Mbps)	WLAN	9.09	±9.6
10065	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 18 Mbps)	WLAN	9.00	±9.6
10066	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 24 Mbps)	WLAN	9.38	±9.6
10067	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 36 Mbps)	WLAN	10.12	±9.6
10068	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 48 Mbps)	WLAN	10.34	±9.6
10069	CAB	IEEE 802.11a WiFi 5 GHz (OFDM, 54 Mbps)	WLAN	10.36	±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	9.62	±9.6
10073	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 18 Mbps)	WLAN	9.94	±9.6
10074	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 24 Mbps)	WLAN	10.30	±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	10.94	±9.6
10077	CAB	IEEE 802.11g WiFi 2.4 GHz (DSSS/OFDM, 54 Mbps)	WLAN	11.00	±9.6
10081	CAB	CDMA2000 (1xRTT, RC2)	CDMA2000	3.97	±9.6
10082	CAB	IS-54 / IS-136 FDD (TDMA/FDM, P4-DQPSK, Fullrate)	AMPS	4.77	±9.6
10083	DAC	GPRS-FDD (TDMA, GMSK, TN 0-4)	GSM	6.58	±9.6
10087	CAC	UMTS-FDD (HSDPA)	WCDMA	3.33	±9.6
10088	CAC	UMTS-FDD (HSDPA, Subcar 0)	WCDMA	3.99	±9.6
10089	DAC	EDGE-FDD (TDMA, 8PSK, TN 0-4)	GSM	9.55	±9.6
10100	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-FDD	5.87	±9.6
10101	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-FDD	6.42	±9.6
10102	CAB	LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-FDD	6.50	±9.6
10103	CAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)	LTE-TDD	9.29	±9.6
10104	CAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)	LTE-TDD	9.87	±9.6
10105	CAB	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)	LTE-TDD	10.01	±9.6
10108	CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-FDD	5.80	±9.6
10109	CAB	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-FDD	6.43	±9.6
10110	CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-FDD	5.75	±9.6
10111	CAB	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-FDD	6.44	±9.6

Certificate No: EX-3791_Apr24

Page 11 of 22

EX3DV4 - SN.3791

April 22, 2024

UID	Rev	Communication System Name	Group	PAR (dB)	Unc* k = 2
10112	CAH	LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-FDD	6.59	±0.6
10113	CAH	LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-FDD	6.62	±0.6
10114	CAE	IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)	WLAN	8.15	±0.6
10115	CAE	IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)	WLAN	8.48	±0.6
10116	CAE	IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM)	WLAN	8.15	±0.6
10117	CAE	IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)	WLAN	8.07	±0.6
10118	CAE	IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)	WLAN	8.58	±0.6
10119	CAE	IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)	WLAN	8.13	±0.6
10140	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-FDD	6.46	±0.6
10141	CAF	LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-FDD	6.53	±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	6.35	±0.6
10144	CAF	LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-FDD	6.66	±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
10149	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	6.60	±0.6
10151	CAH	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)	LTE-FDD	6.26	±0.6
10152	CAH	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)	LTE-FDD	6.62	±0.6
10153	CAH	LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)	LTE-FDD	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, 10 MHz, 64-QAM)	LTE-FDD	6.62	±0.6
10159	CAH	LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-FDD	6.56	±0.6
10160	CAF	LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-FDD	5.82	±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
10166	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-FDD	5.46	±0.6
10167	CAG	LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.31	±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, 20 MHz, QPSK)	LTE-FDD	5.73	±0.6
10170	CAF	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-FDD	6.53	±0.6
10171	AAP	LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-FDD	6.49	±0.6
10172	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)	LTE-TDD	9.21	±0.6
10173	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10174	CAH	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10175	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-FDD	5.72	±0.6
10176	CAH	LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-FDD	6.54	±0.6
10177	CAJ	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	5.79	±0.6
10182	CAF	LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10183	AAX	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
10186	AAP	LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-FDD	6.50	±0.6
10187	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-FDD	5.73	±0.6
10188	CAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-FDD	6.52	±0.6
10189	AAG	LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-FDD	6.55	±0.6
10190	CAE	IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)	WLAN	8.06	±0.6
10194	CAE	IEEE 802.11n (HT Greenfield, 33 Mbps, 16-QAM)	WLAN	8.12	±0.6
10195	CAE	IEEE 802.11n (HT Greenfield, 85 Mbps, 64-QAM)	WLAN	8.21	±0.6
10196	CAE	IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)	WLAN	8.10	±0.6
10197	CAE	IEEE 802.11n (HT Mixed, 33 Mbps, 16-QAM)	WLAN	8.12	±0.6
10198	CAE	IEEE 802.11n (HT Mixed, 85 Mbps, 64-QAM)	WLAN	8.27	±0.6
10219	CAE	IEEE 802.11n (HT Mixed, 7.5 Mbps, BPSK)	WLAN	8.03	±0.6
10220	CAE	IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)	WLAN	8.15	±0.6
10221	CAE	IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)	WLAN	8.27	±0.6
10222	CAE	IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)	WLAN	8.06	±0.6
10223	CAE	IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)	WLAN	8.48	±0.6
10224	CAE	IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)	WLAN	8.08	±0.6

Certificate No: EX-3791_Apr24

Page 12 of 22

EX3D14 - SN-3791

April 22, 2024

UD	Ref	Communication System Name	Group	PAR (dB)	Unc ^a k = 2
10225	CAC	UMTS-FDD (HSRPA)	WCDMA	5.97	±0.6
10226	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10227	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.28	±0.6
10228	CAC	LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)	LTE-TDD	9.22	±0.6
10229	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10230	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10231	CAE	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.19	±0.6
10232	CAH	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10233	CAH	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10234	CAH	LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)	LTE-TDD	9.21	±0.6
10235	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10236	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10237	CAH	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)	LTE-TDD	9.21	±0.6
10238	CA0	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)	LTE-TDD	9.48	±0.6
10239	CA0	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)	LTE-TDD	10.25	±0.6
10240	CA0	LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)	LTE-TDD	9.21	±0.6
10241	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.82	±0.6
10242	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)	LTE-TDD	9.86	±0.6
10243	CAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)	LTE-TDD	9.46	±0.6
10244	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-TDD	10.06	±0.6
10245	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-TDD	10.06	±0.6
10246	CAE	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-TDD	9.30	±0.6
10247	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)	LTE-TDD	9.21	±0.6
10248	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)	LTE-TDD	10.06	±0.6
10249	CAH	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)	LTE-TDD	9.29	±0.6
10250	CAH	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.81	±0.6
10251	CAH	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.17	±0.6
10252	CAH	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.24	±0.6
10253	CA0	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)	LTE-TDD	9.80	±0.6
10254	CA0	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)	LTE-TDD	10.14	±0.6
10255	CA0	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)	LTE-TDD	9.20	±0.6
10256	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)	LTE-TDD	9.96	±0.6
10257	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)	LTE-TDD	10.08	±0.6
10258	CAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)	LTE-TDD	9.34	±0.6
10259	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)	LTE-TDD	9.90	±0.6
10260	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)	LTE-TDD	9.97	±0.6
10261	CAE	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)	LTE-TDD	9.34	±0.6
10262	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)	LTE-TDD	9.83	±0.6
10263	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)	LTE-TDD	10.16	±0.6
10264	CAH	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)	LTE-TDD	9.23	±0.6
10265	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)	LTE-TDD	9.92	±0.6
10266	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)	LTE-TDD	10.27	±0.6
10267	CAH	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)	LTE-TDD	9.30	±0.6
10268	CA0	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)	LTE-TDD	10.05	±0.6
10269	CA0	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)	LTE-TDD	10.13	±0.6
10270	CA0	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)	LTE-TDD	9.58	±0.6
10274	CAC	UMTS-FDD (HSRPA, Subnet 5, 3GPP R99.1c)	WCDMA	4.87	±0.6
10275	CAC	UMTS-FDD (HSRPA, Subnet 5, 3GPP R99.1c)	WCDMA	3.95	±0.6
10277	CAA	PHS (QPSK)	PHS	11.81	±0.6
10278	CAA	PHS (QPSK, BW 984 MHz, Radiol 0.5)	PHS	11.81	±0.6
10279	CAA	PHS (QPSK, BW 984 MHz, Radiol 0.38)	PHS	12.19	±0.6
10280	AAB	CDMA2000, RC1, SQ6, Full Rate	CDMA2000	3.91	±0.6
10281	AAB	CDMA2000, RC1, SQ6, Full Rate	CDMA2000	3.46	±0.6
10282	AAB	CDMA2000, RC1, SQ6, Full Rate	CDMA2000	3.39	±0.6
10283	AAB	CDMA2000, RC1, SQ6, Full Rate	CDMA2000	3.50	±0.6
10284	AAB	CDMA2000, RC1, SQ6, 1/8th Rate 25 ft.	CDMA2000	12.49	±0.6
10287	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	9.81	±0.6
10288	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)	LTE-FDD	9.72	±0.6
10289	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)	LTE-FDD	8.39	±0.6
10290	AAC	LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)	LTE-FDD	8.63	±0.6
10291	AAA	IEEE 802.16e WIMAX (20.15, 5 ms, 10 MHz, QPSK, PUSC)	WIMAX	12.59	±0.6
10292	AAA	IEEE 802.16e WIMAX (20.15, 5 ms, 10 MHz, QPSK, PUSC, 3 CYCL symbols)	WIMAX	12.57	±0.6
10293	AAA	IEEE 802.16e WIMAX (31.15, 5 ms, 10 MHz, 64QAM, PUSC)	WIMAX	12.52	±0.6
10294	AAA	IEEE 802.16e WIMAX (20.15, 5 ms, 10 MHz, 64QAM, PUSC)	WIMAX	11.86	±0.6
10295	AAA	IEEE 802.16e WIMAX (31.15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols)	WIMAX	13.34	±0.6
10296	AAA	IEEE 802.16e WIMAX (20.15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols)	WIMAX	14.67	±0.6

Certificate No: EX-3791_Apr24

Page 13 of 22

EX30V4 - SN:3791

April 22, 2024

Item	Communication System Name	Group	Pass (dB)	Use# A = 2
10387	AAA IEEE 802.11e WMAX (25T1E, 10 ms, 10 MHz, QPSK, PUSC, 18 symbols)	WMAX	14.43	±0.5
10388	AAA IEEE 802.11e WMAX (25T1E, 10 ms, 10 MHz, 16QAM, PUSC)	WMAX	14.48	±0.5
10389	AAA IEEE 802.11e WMAX (25T1E, 10 ms, 10 MHz, 16QAM, AMC 2x3, 18 symbols)	WMAX	14.58	±0.5
10390	AAA IEEE 802.11e WMAX (25T1E, 10 ms, 10 MHz, QPSK, AMC 2x3, 18 symbols)	WMAX	14.57	±0.5
10391	AAE LTE-FDD (SC-FDMA, 100% RS, 15 MHz, QPSK)	LTE-FDD	8.06	±0.5
10392	AAA TDEN 1.3	TDEN	10.51	±0.5
10393	AAA TDEN 1.7	TDEN	13.48	±0.5
10394	AAE IEEE 802.11a WIF 2.4 GHz (DSSS, 1 Mbps, 99% duty cycle)	WLAN	1.71	±0.5
10395	AAE IEEE 802.11a WIF 2.4 GHz (ERP-OFDM, 6 Mbps, 99% duty cycle)	WLAN	8.26	±0.5
10396	AAE IEEE 802.11a WIF 2.4 GHz (OFDM, 9 Mbps, 99% duty cycle)	WLAN	8.36	±0.5
10397	AAA Pulse Waveform (200Hz, 10%)	Generic	10.00	±0.5
10398	AAA Pulse Waveform (200Hz, 20%)	Generic	8.99	±0.5
10399	AAA Pulse Waveform (200Hz, 40%)	Generic	3.98	±0.5
10400	AAA Pulse Waveform (200Hz, 60%)	Generic	2.22	±0.5
10401	AAA Pulse Waveform (200Hz, 80%)	Generic	0.97	±0.5
10402	AAA QPSK Waveform, 1 MHz	Generic	5.10	±0.5
10403	AAA QPSK Waveform, 15 MHz	Generic	5.22	±0.5
10404	AAA 64-QAM Waveform, 150 MHz	Generic	6.27	±0.5
10405	AAA 64-QAM Waveform, 40 MHz	Generic	6.07	±0.5
10406	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.37	±0.5
10407	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.60	±0.5
10408	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10409	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10410	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10411	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10412	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10413	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10414	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10415	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10416	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10417	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10418	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10419	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10420	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10421	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10422	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10423	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10424	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10425	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10426	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10427	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10428	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10429	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10430	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10431	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10432	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10433	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10434	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10435	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10436	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10437	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10438	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10439	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10440	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10441	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10442	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10443	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10444	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10445	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10446	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10447	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10448	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10449	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10450	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10451	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10452	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10453	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10454	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10455	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10456	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10457	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10458	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10459	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10460	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10461	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10462	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10463	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10464	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10465	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10466	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10467	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10468	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10469	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10470	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5
10471	AAE IEEE 802.11ac WIF 5 GHz (64-QAM, 99% duty cycle)	WLAN	8.53	±0.5

Certificate No: EX-3791_Apr24

Page 14 of 22

EX30N4 - SN 3791

April 22, 2024

UID	Rev	Communication System Name	Group	PAR (dB)	Unc ^a & = 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	±0.6
10473	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.82	±0.8
10474	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±0.6
10475	AAP	LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±0.6
10477	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.32	±0.6
10478	AAG	LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.57	±0.6
10479	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.6
10480	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.18	±0.8
10481	AAC	LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.48	±0.6
10482	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.71	±0.6
10483	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.39	±0.6
10484	AAD	LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.47	±0.6
10485	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.88	±0.8
10486	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.38	±0.6
10487	AAG	LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.60	±0.6
10488	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.76	±0.6
10489	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±0.6
10490	AAG	LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±0.6
10491	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.6
10492	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.41	±0.6
10493	AAP	LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	±0.6
10494	AAD	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.6
10495	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.37	±0.6
10496	AAG	LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±0.6
10497	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±0.6
10498	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.40	±0.6
10499	AAC	LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.66	±0.6
10500	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.67	±0.6
10501	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.44	±0.6
10502	AAD	LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.58	±0.6
10503	AAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.72	±0.6
10504	AAD	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.31	±0.6
10505	AAG	LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.54	±0.6
10506	AAG	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.6
10507	AAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.36	±0.6
10508	AAD	LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.55	±0.6
10509	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.69	±0.6
10510	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.49	±0.6
10511	AAP	LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.51	±0.6
10512	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK, UL Subframe=2,3,4,7,8,9)	LTE-TDD	7.74	±0.6
10513	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.42	±0.6
10514	AAG	LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM, UL Subframe=2,3,4,7,8,9)	LTE-TDD	8.45	±0.6
10515	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 2 Mbps, 99% duty cycle)	WLAN	1.98	±0.6
10516	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 5.5 Mbps, 99% duty cycle)	WLAN	1.57	±0.6
10517	AAA	IEEE 802.11b WFI 2.4 GHz (DSSS, 11 Mbps, 99% duty cycle)	WLAN	1.50	±0.6
10518	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 9 Mbps, 99% duty cycle)	WLAN	8.33	±0.6
10519	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 12 Mbps, 99% duty cycle)	WLAN	8.39	±0.6
10520	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 18 Mbps, 99% duty cycle)	WLAN	8.12	±0.6
10521	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 24 Mbps, 99% duty cycle)	WLAN	7.97	±0.6
10522	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 36 Mbps, 99% duty cycle)	WLAN	8.45	±0.6
10523	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 48 Mbps, 99% duty cycle)	WLAN	8.59	±0.6
10524	AAD	IEEE 802.11a WFI 5 GHz (OFDM, 54 Mbps, 99% duty cycle)	WLAN	8.27	±0.6
10525	AAD	IEEE 802.11a WFI 20 MHz, MCS0, 99% duty cycle)	WLAN	8.35	±0.6
10526	AAD	IEEE 802.11a WFI 20 MHz, MCS1, 99% duty cycle)	WLAN	8.42	±0.6
10527	AAD	IEEE 802.11a WFI 20 MHz, MCS2, 99% duty cycle)	WLAN	8.21	±0.6
10528	AAD	IEEE 802.11a WFI 20 MHz, MCS3, 99% duty cycle)	WLAN	8.35	±0.6
10529	AAD	IEEE 802.11a WFI 20 MHz, MCS4, 99% duty cycle)	WLAN	8.35	±0.6
10530	AAD	IEEE 802.11a WFI 20 MHz, MCS5, 99% duty cycle)	WLAN	8.43	±0.6
10531	AAD	IEEE 802.11a WFI 20 MHz, MCS6, 99% duty cycle)	WLAN	8.39	±0.6
10532	AAD	IEEE 802.11a WFI 20 MHz, MCS7, 99% duty cycle)	WLAN	8.39	±0.6
10533	AAD	IEEE 802.11a WFI 20 MHz, MCS8, 99% duty cycle)	WLAN	8.45	±0.6
10534	AAD	IEEE 802.11a WFI 40 MHz, MCS0, 99% duty cycle)	WLAN	8.45	±0.6
10535	AAD	IEEE 802.11a WFI 40 MHz, MCS1, 99% duty cycle)	WLAN	8.45	±0.6
10536	AAD	IEEE 802.11a WFI 40 MHz, MCS2, 99% duty cycle)	WLAN	8.32	±0.6
10537	AAD	IEEE 802.11a WFI 40 MHz, MCS3, 99% duty cycle)	WLAN	8.44	±0.6
10538	AAD	IEEE 802.11a WFI 40 MHz, MCS4, 99% duty cycle)	WLAN	8.54	±0.6
10540	AAD	IEEE 802.11a WFI 40 MHz, MCS8, 99% duty cycle)	WLAN	8.39	±0.6

Certificate No: EX-3791_Apr24

Page 15 of 22

EX30N4 - SN:3791

April 22, 2024

UID	Rev	Communications System Name	Group	PMR (dB)	Use* A = 2
10541	AAO	IEEE 802.11a WLAN (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.45	±0.5
10542	AAO	IEEE 802.11a WLAN (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.65	±0.5
10543	AAO	IEEE 802.11a WLAN (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.65	±0.5
10544	AAO	IEEE 802.11a WLAN (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.47	±0.5
10545	AAO	IEEE 802.11a WLAN (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.55	±0.5
10546	AAO	IEEE 802.11a WLAN (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.35	±0.5
10547	AAO	IEEE 802.11a WLAN (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.48	±0.5
10548	AAO	IEEE 802.11a WLAN (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.37	±0.5
10550	AAO	IEEE 802.11a WLAN (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.38	±0.5
10561	AAO	IEEE 802.11a WLAN (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.53	±0.5
10562	AAO	IEEE 802.11a WLAN (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.42	±0.5
10563	AAO	IEEE 802.11a WLAN (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.45	±0.5
10564	AAE	IEEE 802.11a WLAN (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.48	±0.5
10565	AAE	IEEE 802.11a WLAN (160 MHz, MCS1, 90pc duty cycle)	WLAN	8.47	±0.5
10566	AAE	IEEE 802.11a WLAN (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.50	±0.5
10567	AAE	IEEE 802.11a WLAN (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.52	±0.5
10568	AAE	IEEE 802.11a WLAN (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.61	±0.5
10569	AAE	IEEE 802.11a WLAN (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.73	±0.5
10591	AAE	IEEE 802.11a WLAN (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.56	±0.5
10592	AAE	IEEE 802.11a WLAN (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.69	±0.5
10593	AAE	IEEE 802.11a WLAN (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.77	±0.5
10594	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.25	±0.5
10595	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.45	±0.5
10596	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.13	±0.5
10597	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.09	±0.5
10598	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.37	±0.5
10599	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.10	±0.5
10570	AAA	IEEE 802.11b WIF 2.4 GHz (DSSS, 1 Mbps, 90pc duty cycle)	WLAN	7.99	±0.5
10571	AAA	IEEE 802.11b WIF 2.4 GHz (DSSS, 2 Mbps, 90pc duty cycle)	WLAN	7.99	±0.5
10572	AAA	IEEE 802.11b WIF 2.4 GHz (DSSS, 3 Mbps, 90pc duty cycle)	WLAN	7.98	±0.5
10573	AAA	IEEE 802.11b WIF 2.4 GHz (DSSS, 5.5 Mbps, 90pc duty cycle)	WLAN	7.98	±0.5
10574	AAA	IEEE 802.11b WIF 2.4 GHz (DSSS, 11 Mbps, 90pc duty cycle)	WLAN	7.98	±0.5
10575	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.59	±0.5
10576	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.60	±0.5
10577	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.70	±0.5
10578	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.49	±0.5
10579	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.39	±0.5
10580	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.70	±0.5
10581	AAA	IEEE 802.11g WIF 2.4 GHz (DSSS-OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.35	±0.5
10582	AAA	IEEE 802.11a WIF 5 GHz (OFDM, 6 Mbps, 90pc duty cycle)	WLAN	8.67	±0.5
10583	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 9 Mbps, 90pc duty cycle)	WLAN	8.50	±0.5
10584	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 12 Mbps, 90pc duty cycle)	WLAN	8.60	±0.5
10585	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 18 Mbps, 90pc duty cycle)	WLAN	8.70	±0.5
10586	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 24 Mbps, 90pc duty cycle)	WLAN	8.49	±0.5
10587	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 36 Mbps, 90pc duty cycle)	WLAN	8.35	±0.5
10588	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 48 Mbps, 90pc duty cycle)	WLAN	8.70	±0.5
10589	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 54 Mbps, 90pc duty cycle)	WLAN	8.35	±0.5
10590	AAO	IEEE 802.11a WIF 5 GHz (OFDM, 94 Mbps, 90pc duty cycle)	WLAN	8.67	±0.5
10591	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS0, 90pc duty cycle)	WLAN	8.63	±0.5
10592	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS1, 90pc duty cycle)	WLAN	8.70	±0.5
10593	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS2, 90pc duty cycle)	WLAN	8.64	±0.5
10594	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±0.5
10595	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS4, 90pc duty cycle)	WLAN	8.74	±0.5
10596	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS5, 90pc duty cycle)	WLAN	8.71	±0.5
10597	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS6, 90pc duty cycle)	WLAN	8.72	±0.5
10598	AAO	IEEE 802.11n (HT Mixed, 20 MHz, MCS7, 90pc duty cycle)	WLAN	8.90	±0.5
10599	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS0, 90pc duty cycle)	WLAN	8.79	±0.5
10600	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS1, 90pc duty cycle)	WLAN	8.80	±0.5
10601	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS2, 90pc duty cycle)	WLAN	8.82	±0.5
10602	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS3, 90pc duty cycle)	WLAN	8.94	±0.5
10603	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS4, 90pc duty cycle)	WLAN	9.03	±0.5
10604	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS5, 90pc duty cycle)	WLAN	8.70	±0.5
10605	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS6, 90pc duty cycle)	WLAN	8.97	±0.5
10606	AAO	IEEE 802.11n (HT Mixed, 40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±0.5
10607	AAO	IEEE 802.11ac WIF 30 MHz (MCS0, 90pc duty cycle)	WLAN	8.66	±0.5
10608	AAO	IEEE 802.11ac WIF 30 MHz (MCS1, 90pc duty cycle)	WLAN	8.77	±0.5

Certificate No: EX-3791_Apr24

Page 16 of 22

EX3DV4 - SN:3791

April 22, 2024

UID	Rev	Communication System Name	Group	PAR (dB)	Unit# k = 2
10899	AAD	IEEE 802.11ac WIF (20 MHz, MCS2, 90pc duty cycle)	WLAN	8.57	±0.6
10910	AAD	IEEE 802.11ac WIF (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.70	±0.6
10911	AAD	IEEE 802.11ac WIF (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.70	±0.6
10912	AAD	IEEE 802.11ac WIF (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±0.6
10913	AAD	IEEE 802.11ac WIF (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.94	±0.6
10914	AAD	IEEE 802.11ac WIF (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.59	±0.6
10915	AAD	IEEE 802.11ac WIF (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.83	±0.6
10916	AAD	IEEE 802.11ac WIF (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.82	±0.6
10917	AAD	IEEE 802.11ac WIF (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.81	±0.6
10918	AAD	IEEE 802.11ac WIF (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.58	±0.6
10919	AAD	IEEE 802.11ac WIF (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.88	±0.6
10920	AAD	IEEE 802.11ac WIF (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.87	±0.6
10921	AAD	IEEE 802.11ac WIF (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±0.6
10922	AAD	IEEE 802.11ac WIF (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.88	±0.6
10923	AAD	IEEE 802.11ac WIF (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.82	±0.6
10924	AAD	IEEE 802.11ac WIF (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.96	±0.6
10925	AAD	IEEE 802.11ac WIF (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.96	±0.6
10926	AAD	IEEE 802.11ac WIF (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±0.6
10927	AAD	IEEE 802.11ac WIF (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.88	±0.6
10928	AAD	IEEE 802.11ac WIF (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.71	±0.6
10929	AAD	IEEE 802.11ac WIF (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±0.6
10930	AAD	IEEE 802.11ac WIF (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.72	±0.6
10931	AAD	IEEE 802.11ac WIF (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.81	±0.6
10932	AAD	IEEE 802.11ac WIF (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±0.6
10933	AAD	IEEE 802.11ac WIF (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.83	±0.6
10934	AAD	IEEE 802.11ac WIF (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.80	±0.6
10935	AAD	IEEE 802.11ac WIF (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±0.6
10936	AAD	IEEE 802.11ac WIF (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.83	±0.6
10937	AAD	IEEE 802.11ac WIF (160 MHz, MCS1, 90pc duty cycle)	WLAN	8.70	±0.6
10938	AAD	IEEE 802.11ac WIF (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.86	±0.6
10939	AAD	IEEE 802.11ac WIF (160 MHz, MCS3, 90pc duty cycle)	WLAN	8.85	±0.6
10940	AAD	IEEE 802.11ac WIF (160 MHz, MCS4, 90pc duty cycle)	WLAN	8.96	±0.6
10941	AAD	IEEE 802.11ac WIF (160 MHz, MCS5, 90pc duty cycle)	WLAN	9.06	±0.6
10942	AAD	IEEE 802.11ac WIF (160 MHz, MCS6, 90pc duty cycle)	WLAN	9.06	±0.6
10943	AAD	IEEE 802.11ac WIF (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.89	±0.6
10944	AAD	IEEE 802.11ac WIF (160 MHz, MCS8, 90pc duty cycle)	WLAN	9.05	±0.6
10945	AAD	IEEE 802.11ac WIF (160 MHz, MCS9, 90pc duty cycle)	WLAN	9.11	±0.6
10946	AAD	LTE-TDD (SC-FDMA, 1.8M, 5MHz, QPSK, UL, Subframe=2.7)	LTE-TDD	11.96	±0.6
10947	AAD	LTE-TDD (SC-FDMA, 1.8M, 5MHz, QPSK, UL, Subframe=2.7)	LTE-TDD	11.95	±0.6
10948	AAD	CDMA2000 (1x Advanced)	CDMA2000	3.45	±0.6
10949	AAD	LTE-TDD (OFDMA, 10MHz, E-TM 3.1, Clipping 40%)	LTE-TDD	6.91	±0.6
10950	AAD	LTE-TDD (OFDMA, 10MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.42	±0.6
10951	AAD	LTE-TDD (OFDMA, 15MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	6.95	±0.6
10952	AAD	LTE-TDD (OFDMA, 20MHz, E-TM 3.1, Clipping 44%)	LTE-TDD	7.31	±0.6
10953	AAD	Pulse Waveform (200Hz, 10%)	Test	10.00	±0.6
10954	AAD	Pulse Waveform (200Hz, 20%)	Test	6.99	±0.6
10955	AAD	Pulse Waveform (200Hz, 40%)	Test	3.93	±0.6
10956	AAD	Pulse Waveform (200Hz, 60%)	Test	3.23	±0.6
10957	AAD	Pulse Waveform (200Hz, 80%)	Test	0.97	±0.6
10958	AAD	Bluetooth Low Energy	Bluetooth	2.19	±0.6
10959	AAD	IEEE 802.11a (20 MHz, MCS0, 90pc duty cycle)	WLAN	9.29	±0.6
10960	AAD	IEEE 802.11a (20 MHz, MCS1, 90pc duty cycle)	WLAN	9.37	±0.6
10961	AAD	IEEE 802.11a (20 MHz, MCS2, 90pc duty cycle)	WLAN	9.78	±0.6
10962	AAD	IEEE 802.11a (20 MHz, MCS3, 90pc duty cycle)	WLAN	8.74	±0.6
10963	AAD	IEEE 802.11a (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.90	±0.6
10964	AAD	IEEE 802.11a (20 MHz, MCS5, 90pc duty cycle)	WLAN	8.77	±0.6
10965	AAD	IEEE 802.11a (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.73	±0.6
10966	AAD	IEEE 802.11a (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.78	±0.6
10967	AAD	IEEE 802.11a (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.89	±0.6
10968	AAD	IEEE 802.11a (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.80	±0.6
10969	AAD	IEEE 802.11a (20 MHz, MCS10, 90pc duty cycle)	WLAN	8.65	±0.6
10970	AAD	IEEE 802.11a (20 MHz, MCS11, 90pc duty cycle)	WLAN	8.65	±0.6
10971	AAD	IEEE 802.11a (20 MHz, MCS12, 90pc duty cycle)	WLAN	8.42	±0.6
10972	AAD	IEEE 802.11a (20 MHz, MCS13, 90pc duty cycle)	WLAN	8.26	±0.6
10973	AAD	IEEE 802.11a (20 MHz, MCS14, 90pc duty cycle)	WLAN	8.33	±0.6
10974	AAD	IEEE 802.11a (20 MHz, MCS15, 90pc duty cycle)	WLAN	8.58	±0.6

Certificate No: EX-3791_Apr24

Page 17 of 22

EX3DV4 - SN:3791

April 22, 2024

UID	Rev	Communication System Name	Group	PAR (dB)	Uplink EIRP
10887	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.45	±0.5
10888	AAC	IEEE 802.11ax (20 MHz, MCS4, 90pc duty cycle)	WLAN	8.25	±0.5
10889	AAC	IEEE 802.11ax (20 MHz, MCS6, 90pc duty cycle)	WLAN	8.55	±0.5
10890	AAC	IEEE 802.11ax (20 MHz, MCS7, 90pc duty cycle)	WLAN	8.20	±0.5
10891	AAC	IEEE 802.11ax (20 MHz, MCS8, 90pc duty cycle)	WLAN	8.25	±0.5
10892	AAC	IEEE 802.11ax (20 MHz, MCS9, 90pc duty cycle)	WLAN	8.20	±0.5
10893	AAC	IEEE 802.11ax (20 MHz, MCS10, 90pc duty cycle)	WLAN	8.35	±0.5
10894	AAC	IEEE 802.11ax (20 MHz, MCS11, 90pc duty cycle)	WLAN	8.57	±0.5
10895	AAC	IEEE 802.11ax (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.70	±0.5
10896	AAC	IEEE 802.11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.91	±0.5
10897	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.61	±0.5
10898	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.89	±0.5
10899	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.82	±0.5
10900	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.73	±0.5
10901	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.80	±0.5
10902	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.70	±0.5
10903	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±0.5
10904	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.90	±0.5
10905	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.99	±0.5
10906	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.60	±0.5
10907	AAC	IEEE 802.11ax (40 MHz, MCS0, 90pc duty cycle)	WLAN	8.30	±0.5
10908	AAC	IEEE 802.11ax (40 MHz, MCS1, 90pc duty cycle)	WLAN	8.55	±0.5
10909	AAC	IEEE 802.11ax (40 MHz, MCS2, 90pc duty cycle)	WLAN	8.33	±0.5
10910	AAC	IEEE 802.11ax (40 MHz, MCS3, 90pc duty cycle)	WLAN	8.29	±0.5
10911	AAC	IEEE 802.11ax (40 MHz, MCS4, 90pc duty cycle)	WLAN	8.39	±0.5
10912	AAC	IEEE 802.11ax (40 MHz, MCS5, 90pc duty cycle)	WLAN	8.67	±0.5
10913	AAC	IEEE 802.11ax (40 MHz, MCS6, 90pc duty cycle)	WLAN	8.33	±0.5
10914	AAC	IEEE 802.11ax (40 MHz, MCS7, 90pc duty cycle)	WLAN	8.25	±0.5
10915	AAC	IEEE 802.11ax (40 MHz, MCS8, 90pc duty cycle)	WLAN	8.45	±0.5
10916	AAC	IEEE 802.11ax (40 MHz, MCS9, 90pc duty cycle)	WLAN	8.35	±0.5
10917	AAC	IEEE 802.11ax (40 MHz, MCS10, 90pc duty cycle)	WLAN	8.48	±0.5
10918	AAC	IEEE 802.11ax (40 MHz, MCS11, 90pc duty cycle)	WLAN	8.54	±0.5
10919	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.67	±0.5
10920	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.67	±0.5
10921	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.76	±0.5
10922	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.55	±0.5
10923	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.75	±0.5
10924	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.90	±0.5
10925	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.74	±0.5
10926	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.72	±0.5
10927	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.68	±0.5
10928	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.55	±0.5
10929	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.64	±0.5
10930	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.67	±0.5
10931	AAC	IEEE 802.11ax (80 MHz, MCS0, 90pc duty cycle)	WLAN	8.42	±0.5
10932	AAC	IEEE 802.11ax (80 MHz, MCS1, 90pc duty cycle)	WLAN	8.45	±0.5
10933	AAC	IEEE 802.11ax (80 MHz, MCS2, 90pc duty cycle)	WLAN	8.42	±0.5
10934	AAC	IEEE 802.11ax (80 MHz, MCS3, 90pc duty cycle)	WLAN	8.25	±0.5
10935	AAC	IEEE 802.11ax (80 MHz, MCS4, 90pc duty cycle)	WLAN	8.33	±0.5
10936	AAC	IEEE 802.11ax (80 MHz, MCS5, 90pc duty cycle)	WLAN	8.27	±0.5
10937	AAC	IEEE 802.11ax (80 MHz, MCS6, 90pc duty cycle)	WLAN	8.36	±0.5
10938	AAC	IEEE 802.11ax (80 MHz, MCS7, 90pc duty cycle)	WLAN	8.42	±0.5
10939	AAC	IEEE 802.11ax (80 MHz, MCS8, 90pc duty cycle)	WLAN	8.28	±0.5
10940	AAC	IEEE 802.11ax (80 MHz, MCS9, 90pc duty cycle)	WLAN	8.48	±0.5
10941	AAC	IEEE 802.11ax (80 MHz, MCS10, 90pc duty cycle)	WLAN	8.40	±0.5
10942	AAC	IEEE 802.11ax (80 MHz, MCS11, 90pc duty cycle)	WLAN	8.43	±0.5
10943	AAC	IEEE 802.11ax (160 MHz, MCS0, 90pc duty cycle)	WLAN	8.94	±0.5
10944	AAC	IEEE 802.11ax (160 MHz, MCS1, 90pc duty cycle)	WLAN	9.16	±0.5
10945	AAC	IEEE 802.11ax (160 MHz, MCS2, 90pc duty cycle)	WLAN	8.93	±0.5
10946	AAC	IEEE 802.11ax (160 MHz, MCS3, 90pc duty cycle)	WLAN	9.11	±0.5
10947	AAC	IEEE 802.11ax (160 MHz, MCS4, 90pc duty cycle)	WLAN	9.04	±0.5
10948	AAC	IEEE 802.11ax (160 MHz, MCS5, 90pc duty cycle)	WLAN	8.93	±0.5
10949	AAC	IEEE 802.11ax (160 MHz, MCS6, 90pc duty cycle)	WLAN	8.90	±0.5
10950	AAC	IEEE 802.11ax (160 MHz, MCS7, 90pc duty cycle)	WLAN	8.79	±0.5
10951	AAC	IEEE 802.11ax (160 MHz, MCS8, 90pc duty cycle)	WLAN	8.82	±0.5
10952	AAC	IEEE 802.11ax (160 MHz, MCS9, 90pc duty cycle)	WLAN	8.81	±0.5

Certificate No: EX-3791_Apr24

Page 18 of 22

EX30V4 - SN:3791

April 22, 2024

UID	Rev	Communication System Name	Group	PAR (dB)	Use# k = 2
10753	AAC	IEEE 802.11ax (160MHz, MCS15, 90pc duty cycle)	WLAN	8.90	±0.6
10754	AAC	IEEE 802.11ax (160MHz, MCS11, 90pc duty cycle)	WLAN	8.84	±0.6
10755	AAC	IEEE 802.11ax (160MHz, MCS0, 90pc duty cycle)	WLAN	8.84	±0.6
10756	AAC	IEEE 802.11ax (160MHz, MCS1, 90pc duty cycle)	WLAN	8.77	±0.6
10757	AAC	IEEE 802.11ax (160MHz, MCS2, 90pc duty cycle)	WLAN	8.77	±0.6
10758	AAC	IEEE 802.11ax (160MHz, MCS3, 90pc duty cycle)	WLAN	8.69	±0.6
10759	AAC	IEEE 802.11ax (160MHz, MCS4, 90pc duty cycle)	WLAN	8.58	±0.6
10760	AAC	IEEE 802.11ax (160MHz, MCS5, 90pc duty cycle)	WLAN	8.48	±0.6
10761	AAC	IEEE 802.11ax (160MHz, MCS6, 90pc duty cycle)	WLAN	8.58	±0.6
10762	AAC	IEEE 802.11ax (160MHz, MCS7, 90pc duty cycle)	WLAN	8.49	±0.6
10763	AAC	IEEE 802.11ax (160MHz, MCS8, 90pc duty cycle)	WLAN	8.53	±0.6
10764	AAC	IEEE 802.11ax (160MHz, MCS9, 90pc duty cycle)	WLAN	8.54	±0.6
10765	AAC	IEEE 802.11ax (160MHz, MCS10, 90pc duty cycle)	WLAN	8.54	±0.6
10766	AAC	IEEE 802.11ax (160MHz, MCS11, 90pc duty cycle)	WLAN	8.51	±0.6
10767	AAC	5G NR (CP-OFDM, 1 RB, 5MHz, QPSK, 15kHz)	5G NR FR1 TDD	7.86	±0.6
10768	AAC	5G NR (CP-OFDM, 1 RB, 10MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.01	±0.6
10769	AAC	5G NR (CP-OFDM, 1 RB, 15MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.01	±0.6
10770	AAC	5G NR (CP-OFDM, 1 RB, 20MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.02	±0.6
10771	AAC	5G NR (CP-OFDM, 1 RB, 25MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.02	±0.6
10772	AAC	5G NR (CP-OFDM, 1 RB, 30MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.03	±0.6
10773	AAC	5G NR (CP-OFDM, 1 RB, 40MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.03	±0.6
10774	AAC	5G NR (CP-OFDM, 1 RB, 50MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.02	±0.6
10775	AAC	5G NR (CP-OFDM, 50% RB, 5MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.31	±0.6
10776	AAC	5G NR (CP-OFDM, 50% RB, 10MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.30	±0.6
10777	AAC	5G NR (CP-OFDM, 50% RB, 15MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.30	±0.6
10778	AAC	5G NR (CP-OFDM, 50% RB, 20MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.34	±0.6
10779	AAC	5G NR (CP-OFDM, 50% RB, 25MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.40	±0.6
10780	AAC	5G NR (CP-OFDM, 50% RB, 30MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.38	±0.6
10781	AAC	5G NR (CP-OFDM, 50% RB, 40MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.38	±0.6
10782	AAC	5G NR (CP-OFDM, 50% RB, 50MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.40	±0.6
10783	AAC	5G NR (CP-OFDM, 100% RB, 5MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.31	±0.6
10784	AAC	5G NR (CP-OFDM, 100% RB, 10MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.29	±0.6
10785	AAC	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.40	±0.6
10786	AAC	5G NR (CP-OFDM, 100% RB, 20MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.35	±0.6
10787	AAC	5G NR (CP-OFDM, 100% RB, 25MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.44	±0.6
10788	AAC	5G NR (CP-OFDM, 100% RB, 30MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.39	±0.6
10789	AAC	5G NR (CP-OFDM, 100% RB, 40MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.37	±0.6
10790	AAC	5G NR (CP-OFDM, 100% RB, 50MHz, QPSK, 15kHz)	5G NR FR1 TDD	8.39	±0.6
10791	AAC	5G NR (CP-OFDM, 1 RB, 5MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.83	±0.6
10792	AAC	5G NR (CP-OFDM, 1 RB, 10MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.92	±0.6
10793	AAC	5G NR (CP-OFDM, 1 RB, 15MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.96	±0.6
10794	AAC	5G NR (CP-OFDM, 1 RB, 20MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.82	±0.6
10795	AAC	5G NR (CP-OFDM, 1 RB, 25MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.84	±0.6
10796	AAC	5G NR (CP-OFDM, 1 RB, 30MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.82	±0.6
10797	AAC	5G NR (CP-OFDM, 1 RB, 40MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.61	±0.6
10798	AAC	5G NR (CP-OFDM, 1 RB, 50MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.89	±0.6
10799	AAC	5G NR (CP-OFDM, 1 RB, 60MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.93	±0.6
10800	AAC	5G NR (CP-OFDM, 1 RB, 80MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.82	±0.6
10801	AAC	5G NR (CP-OFDM, 1 RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.82	±0.6
10802	AAC	5G NR (CP-OFDM, 1 RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.87	±0.6
10803	AAC	5G NR (CP-OFDM, 1 RB, 100MHz, QPSK, 30kHz)	5G NR FR1 TDD	7.83	±0.6
10804	AAC	5G NR (CP-OFDM, 50% RB, 10MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10805	AAC	5G NR (CP-OFDM, 50% RB, 15MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.37	±0.6
10806	AAC	5G NR (CP-OFDM, 50% RB, 20MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10807	AAC	5G NR (CP-OFDM, 50% RB, 25MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10808	AAC	5G NR (CP-OFDM, 50% RB, 30MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10809	AAC	5G NR (CP-OFDM, 50% RB, 40MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10810	AAC	5G NR (CP-OFDM, 50% RB, 50MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10811	AAC	5G NR (CP-OFDM, 50% RB, 60MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.38	±0.6
10812	AAC	5G NR (CP-OFDM, 50% RB, 80MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.38	±0.6
10813	AAC	5G NR (CP-OFDM, 50% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.38	±0.6
10814	AAC	5G NR (CP-OFDM, 100% RB, 10MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.34	±0.6
10815	AAC	5G NR (CP-OFDM, 100% RB, 15MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.33	±0.6
10816	AAC	5G NR (CP-OFDM, 100% RB, 20MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.30	±0.6
10817	AAC	5G NR (CP-OFDM, 100% RB, 25MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.41	±0.6
10818	AAC	5G NR (CP-OFDM, 100% RB, 30MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.41	±0.6
10819	AAC	5G NR (CP-OFDM, 100% RB, 40MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.30	±0.6
10820	AAC	5G NR (CP-OFDM, 100% RB, 50MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.30	±0.6
10821	AAC	5G NR (CP-OFDM, 100% RB, 60MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.41	±0.6
10822	AAC	5G NR (CP-OFDM, 100% RB, 80MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.41	±0.6
10823	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.30	±0.6
10824	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.30	±0.6
10825	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.41	±0.6
10826	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.42	±0.6
10827	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.42	±0.6
10828	AAC	5G NR (CP-OFDM, 100% RB, 90MHz, QPSK, 30kHz)	5G NR FR1 TDD	8.43	±0.6

Certificate No: EX-3791_Apr24

Page 19 of 22

EX3DV4 - SN:3791

April 22, 2024

UID	Rev	Communication System Name	Group	PRF (dB)	Unc ^k k = 2
10029	AAF	5G NR (CP-OFDM, 1 RB, 180 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	8.40	±0.6
10030	AAF	5G NR (CP-OFDM, 1 RB, 180 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.68	±0.6
10031	AAF	5G NR (CP-OFDM, 1 RB, 180 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.75	±0.6
10032	AAF	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.74	±0.6
10033	AAF	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.70	±0.6
10034	AAF	5G NR (CP-OFDM, 1 RB, 25 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.75	±0.6
10035	AAF	5G NR (CP-OFDM, 1 RB, 45 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.70	±0.6
10036	AAF	5G NR (CP-OFDM, 1 RB, 50 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.68	±0.6
10037	AAF	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.68	±0.6
10038	AAF	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.70	±0.6
10039	AAF	5G NR (CP-OFDM, 1 RB, 60 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.67	±0.6
10040	AAF	5G NR (CP-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	7.71	±0.6
10041	AAF	5G NR (CP-OFDM, 50% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.49	±0.6
10042	AAF	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±0.6
10043	AAF	5G NR (CP-OFDM, 50% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±0.6
10044	AAF	5G NR (CP-OFDM, 100% RB, 10 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±0.6
10045	AAF	5G NR (CP-OFDM, 100% RB, 15 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.38	±0.6
10046	AAF	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±0.6
10047	AAF	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.35	±0.6
10048	AAF	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.36	±0.6
10049	AAF	5G NR (CP-OFDM, 100% RB, 40 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.34	±0.6
10050	AAF	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±0.6
10051	AAF	5G NR (CP-OFDM, 100% RB, 50 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.40	±0.6
10052	AAF	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±0.6
10053	AAF	5G NR (CP-OFDM, 100% RB, 30 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.37	±0.6
10054	AAF	5G NR (CP-OFDM, 100% RB, 100 MHz, QPSK, 60 kHz)	5G NR FR1 TDD	8.41	±0.6
10055	AAF	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.88	±0.6
10056	AAF	5G NR (DFT-s-OFDM, 1 RB, 180 MHz, QPSK, 30 kHz)	5G NR FR1 TDD	5.89	±0.6
10057	AAF	5G NR (DFT-s-OFDM, 1 RB, 100 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.75	±0.6
10058	AAF	5G NR (DFT-s-OFDM, 1 RB, 180 MHz, QPSK, 120 kHz)	5G NR FR2 TDD	5.88	±0.6
10059	AAF	5G NR (DFT-s-OFDM, 1 RB, 130 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.75	±0.6
10060	AAF	5G NR (DFT-s-OFDM, 1 RB, 130 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.52	±0.6
10061	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10062	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10063	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10064	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10065	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10066	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10067	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10068	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10069	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10070	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10071	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10072	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10073	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10074	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10075	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10076	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10077	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10078	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10079	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10080	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10081	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10082	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10083	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10084	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10085	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10086	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10087	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10088	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10089	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10090	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10091	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10092	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10093	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10094	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10095	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10096	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10097	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6
10098	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.65	±0.6
10099	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.59	±0.6
10100	AAF	5G NR (DFT-s-OFDM, 1 RB, 150 MHz, 16QAM, 120 kHz)	5G NR FR2 TDD	5.61	±0.6

Certificate No: EX-3791_Apr24

Page 20 of 22

EX30V4 - SN-3791

April 22, 2024

UID	Item	Communication System Name	Group	PAR (dB)	Unc ^k k = 2
10911	AAB	SG NR (DFT-s-OFDM, 50% RB, 25MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.93	±0.6
10912	AAC	SG NR (DFT-s-OFDM, 50% RB, 25MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10913	AAD	SG NR (DFT-s-OFDM, 50% RB, 40MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10914	AAC	SG NR (DFT-s-OFDM, 50% RB, 50MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.85	±0.6
10915	AAD	SG NR (DFT-s-OFDM, 50% RB, 60MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.83	±0.6
10916	AAD	SG NR (DFT-s-OFDM, 50% RB, 60MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.87	±0.6
10917	AAD	SG NR (DFT-s-OFDM, 50% RB, 100MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10918	AAC	SG NR (DFT-s-OFDM, 100% RB, 5MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.88	±0.6
10919	AAC	SG NR (DFT-s-OFDM, 100% RB, 10MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.88	±0.6
10920	AAB	SG NR (DFT-s-OFDM, 100% RB, 15MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.87	±0.6
10921	AAC	SG NR (DFT-s-OFDM, 100% RB, 20MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10922	AAB	SG NR (DFT-s-OFDM, 100% RB, 25MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.82	±0.6
10923	AAC	SG NR (DFT-s-OFDM, 100% RB, 30MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10924	AAD	SG NR (DFT-s-OFDM, 100% RB, 40MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10925	AAC	SG NR (DFT-s-OFDM, 100% RB, 50MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.86	±0.6
10926	AAD	SG NR (DFT-s-OFDM, 100% RB, 60MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10927	AAD	SG NR (DFT-s-OFDM, 100% RB, 80MHz, QPSK, 30kHz)	SG NR PR1 TDD	5.84	±0.6
10928	AAD	SG NR (DFT-s-OFDM, 1 RB, 5MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.92	±0.6
10929	AAD	SG NR (DFT-s-OFDM, 1 RB, 10MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.92	±0.6
10930	AAC	SG NR (DFT-s-OFDM, 1 RB, 15MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.92	±0.6
10931	AAC	SG NR (DFT-s-OFDM, 1 RB, 20MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.91	±0.6
10932	AAC	SG NR (DFT-s-OFDM, 1 RB, 25MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.91	±0.6
10933	AAC	SG NR (DFT-s-OFDM, 1 RB, 30MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.91	±0.6
10934	AAC	SG NR (DFT-s-OFDM, 1 RB, 40MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.91	±0.6
10935	AAD	SG NR (DFT-s-OFDM, 1 RB, 50MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.91	±0.6
10936	AAD	SG NR (DFT-s-OFDM, 50% RB, 5MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.90	±0.6
10937	AAD	SG NR (DFT-s-OFDM, 50% RB, 10MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.97	±0.6
10938	AAC	SG NR (DFT-s-OFDM, 50% RB, 15MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.90	±0.6
10939	AAC	SG NR (DFT-s-OFDM, 50% RB, 20MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.89	±0.6
10940	AAC	SG NR (DFT-s-OFDM, 50% RB, 30MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.88	±0.6
10941	AAC	SG NR (DFT-s-OFDM, 50% RB, 40MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.88	±0.6
10942	AAC	SG NR (DFT-s-OFDM, 50% RB, 50MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.88	±0.6
10943	AAD	SG NR (DFT-s-OFDM, 50% RB, 60MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.86	±0.6
10944	AAD	SG NR (DFT-s-OFDM, 100% RB, 5MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.81	±0.6
10945	AAD	SG NR (DFT-s-OFDM, 100% RB, 10MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.88	±0.6
10946	AAC	SG NR (DFT-s-OFDM, 100% RB, 15MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.83	±0.6
10947	AAC	SG NR (DFT-s-OFDM, 100% RB, 20MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.87	±0.6
10948	AAC	SG NR (DFT-s-OFDM, 100% RB, 25MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.94	±0.6
10949	AAC	SG NR (DFT-s-OFDM, 100% RB, 30MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.87	±0.6
10950	AAC	SG NR (DFT-s-OFDM, 100% RB, 40MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.84	±0.6
10951	AAD	SG NR (DFT-s-OFDM, 100% RB, 50MHz, QPSK, 15kHz)	SG NR PR1 FDD	5.92	±0.6
10952	AAA	SG NR DL (CP-OFDM, TM 3.1, 5MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.25	±0.6
10953	AAA	SG NR DL (CP-OFDM, TM 3.1, 10MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.15	±0.6
10954	AAA	SG NR DL (CP-OFDM, TM 3.1, 15MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.23	±0.6
10955	AAA	SG NR DL (CP-OFDM, TM 3.1, 20MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.42	±0.6
10956	AAA	SG NR DL (CP-OFDM, TM 3.1, 30MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.14	±0.6
10957	AAA	SG NR DL (CP-OFDM, TM 3.1, 40MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.31	±0.6
10958	AAA	SG NR DL (CP-OFDM, TM 3.1, 50MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.61	±0.6
10959	AAA	SG NR DL (CP-OFDM, TM 3.1, 60MHz, 64-QAM, 15kHz)	SG NR PR1 FDD	6.33	±0.6
10960	AAA	SG NR DL (CP-OFDM, TM 3.1, 80MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.32	±0.6
10961	AAC	SG NR DL (CP-OFDM, TM 3.1, 10MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.36	±0.6
10962	AAB	SG NR DL (CP-OFDM, TM 3.1, 15MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.40	±0.6
10963	AAC	SG NR DL (CP-OFDM, TM 3.1, 20MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.55	±0.6
10964	AAC	SG NR DL (CP-OFDM, TM 3.1, 30MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.29	±0.6
10965	AAC	SG NR DL (CP-OFDM, TM 3.1, 40MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.37	±0.6
10966	AAB	SG NR DL (CP-OFDM, TM 3.1, 50MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.55	±0.6
10967	AAC	SG NR DL (CP-OFDM, TM 3.1, 60MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.42	±0.6
10968	AAD	SG NR DL (CP-OFDM, TM 3.1, 80MHz, 64-QAM, 15kHz)	SG NR PR1 TDD	6.49	±0.6
10972	AAC	SG NR (CP-OFDM, 1 RB, 20MHz, QPSK, 15kHz)	SG NR PR1 TDD	11.59	±0.6
10973	AAD	SG NR (DFT-s-OFDM, 1 RB, 100MHz, QPSK, 30kHz)	SG NR PR1 TDD	6.06	±0.6
10974	AAD	SG NR (CP-OFDM, 100% RB, 100MHz, 256-QAM, 30kHz)	SG NR PR1 TDD	16.28	±0.6
10976	AAA	ULLA HDR	ULLA	7.16	±0.6
10979	AAA	ULLA HDR4	ULLA	8.06	±0.6
10980	AAA	ULLA HDR8	ULLA	10.32	±0.6
10981	AAA	ULLA HDRp4	ULLA	3.19	±0.6
10982	AAA	ULLA HDRp8	ULLA	3.43	±0.6

Certificate No: EX-3791_Apr24

Page 21 of 22

EX3DV4 - SN-3791

April 22, 2024

Std	Rev	Communication System Name	Group	PAR (dB)	Unc [®] k = 2
10983	AAC	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR PR1 TDD	9.31	±0.6
10994	AAB	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR PR1 TDD	9.42	±0.6
10995	AAC	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.64	±0.6
10996	AAB	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.50	±0.6
10987	AAC	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.53	±0.6
10988	AAB	5G NR DL (CP-OFDM, TM 3.1, 70 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.36	±0.6
10990	AAC	5G NR DL (CP-OFDM, TM 3.1, 80 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.33	±0.6
10990	AAB	5G NR DL (CP-OFDM, TM 3.1, 90 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	9.52	±0.6
11003	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR PR1 TDD	10.24	±0.6
11004	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR PR1 TDD	10.75	±0.6
11005	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 15 kHz)	5G NR PR1 FDD	9.70	±0.6
11006	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 15 kHz)	5G NR PR1 FDD	9.95	±0.6
11007	AAA	5G NR DL (CP-OFDM, TM 3.1, 40 MHz, 64-QAM, 15 kHz)	5G NR PR1 FDD	9.66	±0.6
11008	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 15 kHz)	5G NR PR1 FDD	9.51	±0.6
11009	AAA	5G NR DL (CP-OFDM, TM 3.1, 25 MHz, 64-QAM, 30 kHz)	5G NR PR1 FDD	9.70	±0.6
11010	AAA	5G NR DL (CP-OFDM, TM 3.1, 30 MHz, 64-QAM, 30 kHz)	5G NR PR1 FDD	9.95	±0.6
11011	AAA	5G NR DL (CP-OFDM, TM 3.1, 45 MHz, 64-QAM, 30 kHz)	5G NR PR1 FDD	9.95	±0.6
11012	AAA	5G NR DL (CP-OFDM, TM 3.1, 50 MHz, 64-QAM, 30 kHz)	5G NR PR1 FDD	9.68	±0.6
11013	AAB	IEEE 802.11be (320 MHz, MCS1, 56ps duty cycle)	WLAN	8.47	±0.6
11014	AAB	IEEE 802.11be (320 MHz, MCS2, 56ps duty cycle)	WLAN	8.45	±0.6
11015	AAB	IEEE 802.11be (320 MHz, MCS3, 56ps duty cycle)	WLAN	8.44	±0.6
11016	AAB	IEEE 802.11be (320 MHz, MCS4, 56ps duty cycle)	WLAN	8.44	±0.6
11017	AAB	IEEE 802.11be (320 MHz, MCS5, 56ps duty cycle)	WLAN	8.41	±0.6
11018	AAB	IEEE 802.11be (320 MHz, MCS6, 56ps duty cycle)	WLAN	8.45	±0.6
11019	AAB	IEEE 802.11be (320 MHz, MCS7, 56ps duty cycle)	WLAN	8.29	±0.6
11020	AAB	IEEE 802.11be (320 MHz, MCS8, 56ps duty cycle)	WLAN	8.27	±0.6
11021	AAB	IEEE 802.11be (320 MHz, MCS9, 56ps duty cycle)	WLAN	8.48	±0.6
11022	AAB	IEEE 802.11be (320 MHz, MCS10, 56ps duty cycle)	WLAN	8.36	±0.6
11023	AAB	IEEE 802.11be (320 MHz, MCS11, 56ps duty cycle)	WLAN	8.59	±0.6
11024	AAB	IEEE 802.11be (320 MHz, MCS12, 56ps duty cycle)	WLAN	8.42	±0.6
11025	AAB	IEEE 802.11be (320 MHz, MCS13, 56ps duty cycle)	WLAN	8.37	±0.6
11026	AAB	IEEE 802.11be (320 MHz, MCS14, 56ps duty cycle)	WLAN	8.39	±0.6

[®] 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 : 1504)

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.: DAE4-1504_Jan24	

CALIBRATION CERTIFICATE			
Object	DAE4 - SD 000 D04 BM - SN: 1504		
Calibration procedure(s)	QA CAL-06.v30 Calibration procedure for the data acquisition electronics (DAE)		
Calibration date	January 17, 2024		
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)			
Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Kathley Multimeter Type 2001	SN: 0610278	29-Aug-23 (No:37421)	Aug-24
Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Auto DAE Calibration Unit	SE UMS 053 AA 1001	27-Jan-23 (in house check)	In house check Jan-24
Calibrator Box V2.1	SE UMS 006 AA 1002	27-Jan-23 (in house check)	In house check Jan-24
Calibrated by:	Name Dominique Steffen	Function Laboratory Technician	Signature 
Approved by:	Name Sven Kuhn	Function Technical Manager	Signature 
This calibration certificate shall not be reproduced except in full without written approval of the laboratory.			Issued: January 17, 2024

Certificate No: DAE4-1504_Jan24	Page 1 of 5
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**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

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 = 6.1μV, 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	404.412 ± 0.02% (k=2)	403.989 ± 0.02% (k=2)	403.937 ± 0.02% (k=2)
Low Range	3.95738 ± 1.50% (k=2)	3.95342 ± 1.50% (k=2)	4.01625 ± 1.50% (k=2)

Connector Angle

Connector Angle to be used in DASY system	79.0 ° ± 1 °
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Appendix (Additional assessments outside the scope of SCS0108)

1. DC Voltage Linearity

High Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	200007.15	-0.23	-0.00
Channel X + Input	20017.75	2.63	0.01
Channel X - Input	-19984.39	4.44	-0.02
Channel Y + Input	200006.81	-1.02	-0.00
Channel Y + Input	20013.77	-1.57	-0.01
Channel Y - Input	-19989.24	-0.56	0.00
Channel Z + Input	200006.10	-1.17	-0.00
Channel Z + Input	20013.80	-1.65	-0.01
Channel Z - Input	-19988.76	-0.08	0.00

Low Range	Reading (μV)	Difference (μV)	Error (%)
Channel X + Input	2015.88	1.45	0.07
Channel X + Input	216.22	1.61	0.75
Channel X - Input	-183.53	1.65	-0.89
Channel Y + Input	2015.02	0.47	0.02
Channel Y + Input	214.12	-0.65	-0.30
Channel Y - Input	-185.25	-0.07	0.04
Channel Z + Input	2014.58	0.00	0.00
Channel Z + Input	214.04	-0.77	-0.36
Channel Z - Input	-185.59	-0.30	0.16

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	-6.16	-8.34
	- 200	10.38	8.54
Channel Y	200	7.38	7.56
	- 200	-8.71	-8.97
Channel Z	200	-3.44	-3.56
	- 200	1.65	1.43

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	-	-1.00	-4.15
Channel Y	200	7.05	-	0.89
Channel Z	200	10.80	4.58	-

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	15945	16176
Channel Y	15782	15862
Channel Z	16056	16639

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	0.97	0.05	1.95	0.35
Channel Y	-0.00	-1.10	0.66	0.35
Channel Z	-0.47	-1.48	1.44	0.49

6. Input Offset Current

Nominal input circuitry offset current on all channels: <25nA

7. Input Resistance (Typical values for information)

	Zeroing (kΩ)	Measuring (MΩ)
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)	+7.8
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	+8	+14
Supply (- Vcc)	-0.01	-8	-9

Appendix C.3 Calibration certificate for Dipole (S/N: 734)

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zaughausstrasse 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. **D2450V2-734_Jan24**

CALIBRATION CERTIFICATE

Object: **D2450V2 - SN:734**

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

Calibration date: **January 22, 2024**

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)

Primary Standards	ID #	Cal Date (Certificate No.)	Scheduled Calibration
Power meter NRP2	SN: 104778	30-Mar-23 (No. 217-03804/03805)	Mar-24
Power sensor NRP-ZB1	SN: 103244	30-Mar-23 (No. 217-03804)	Mar-24
Power sensor NRP-ZB1	SN: 103245	30-Mar-23 (No. 217-03805)	Mar-24
Reference 20 dB Attenuator	SN: BH8384 (20k)	30-Mar-23 (No. 217-03806)	Mar-24
Type-N mismatch combination	SN: 310882 / 08327	30-Mar-23 (No. 217-03810)	Mar-24
Reference Probe EX30V4	SN: 7349	15-Jan-23 (No. EX3-7348_Jan23)	Jan-24
DAB4	SN: 601	03-Oct-23 (No. DAB4-601_Oct23)	Oct-24

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power meter E4419B	SN: 0839512475	30-Oct-14 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: US37292783	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
Power sensor HP 8481A	SN: MY41093315	07-Oct-15 (in house check Oct-22)	In house check: Oct-24
RF generator R&S SMV-06	SN: 100972	15-Jun-15 (in house check Oct-22)	In house check: Oct-24
Network Analyzer Agilent E8358A	SN: US41080477	31-Mar-14 (in house check Oct-22)	In house check: Oct-24

Calibrated by: **Paulo Pina**

Approved by: **Sven Kühn**

Name: **Paulo Pina**
Function: **Laboratory Technician**

Name: **Sven Kühn**
Function: **Technical Manager**

Signature: 

Signature: 

Issued: January 23, 2024

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

Certificate No: D2450V2-734_Jan24

Page 1 of 6

Calibration Laboratory of
Schmid & Partner
Engineering AG
Zeughausstrasse 43, 8604 Zurich, Switzerland



S Schweizerischer Kalibrierdienst
C Service suisse d'étalonnage
S Servizio svizzero di taratura
S Swiss Calibration Service
Accreditation No.: SCS 0108

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

Glossary:

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

Calibration is Performed According to the Following Standards:

- a) 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.
- b) KDB 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

Additional Documentation:

- c) 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 source is mounted in a touch configuration below the center marking of the flat phantom.
- *Return Loss:* This parameter is measured with the source positioned under the liquid filled phantom (as described in the measurement condition clause). The Return Loss ensures low reflected power. 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%.

Measurement Conditions

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

DASY Version	DASY52	V52.10.4
Extrapolation	Advanced Extrapolation	
Phantom	Modular Flat Phantom	
Distance Dipole Center - TSL	10 mm	with Spacer
Zoom Scan Resolution	dx, dy, dz = 5 mm	
Frequency	2450 MHz ± 1 MHz	

Head TSL parameters

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	38.5 ± 6 %	1.85 mho/m ± 6 %
Head TSL temperature change during test	< 0.5 °C	---	---

SAR result with Head TSL

SAR averaged over 1 cm ³ (1 g) of Head TSL	Condition	
SAR measured	250 mW input power	13.5 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	52.9 W/kg ± 17.0 % (k=2)
SAR averaged over 10 cm ³ (10 g) of Head TSL	condition	
SAR measured	250 mW input power	8.19 W/kg
SAR for nominal Head TSL parameters	normalized to 1W	24.5 W/kg ± 16.5 % (k=2)

Appendix (Additional assessments outside the scope of SCS 0108)

Antenna Parameters with Head TSL

Impedance, transformed to feed point	51.3 Ω + 6.2 j Ω
Return Loss	- 24.1 dB

General Antenna Parameters and Design

Electrical Delay (one direction)	1.153 ns
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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	SPEAG
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DASY5 Validation Report for Head TSL

Date: 22.01.2024

Test Laboratory: SPEAG, Zurich, Switzerland

DUT: Dipole 2450 MHz; Type: D2450V2; Serial: D2450V2 - SN:734

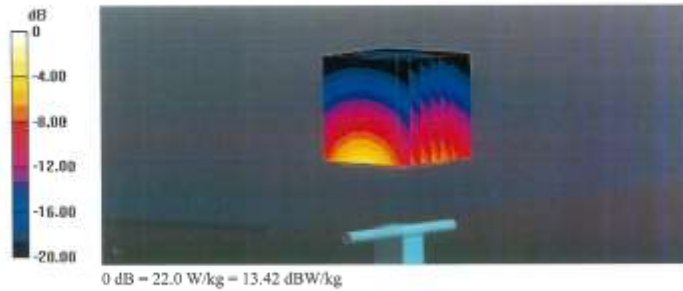
Communication System: UID 0 - CW; Frequency: 2450 MHz
Medium parameters used: $f = 2450$ MHz; $\sigma = 1.85$ S/m; $\epsilon_r = 38.5$; $\rho = 1000$ kg/m³
Phantom section: Flat Section
Measurement Standard: DASY5 (IEEE/IEC/ANSI C63.19-2011)

DASY52 Configuration:

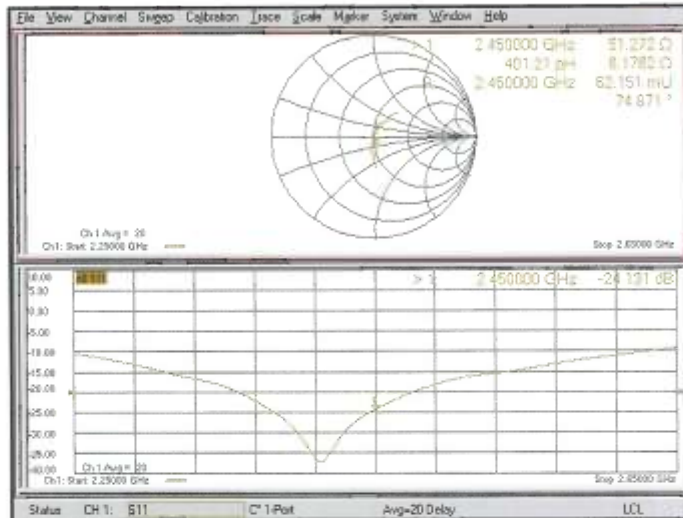
- Probe: EX3DV4 - SN7349; ConvF(7.96, 7.96, 7.96) @ 2450 MHz; Calibrated: 03.11.2023
- Sensor-Surface: 1.4mm (Mechanical Surface Detection)
- Electronics: DAE4 Sn601; Calibrated: 03.10.2023
- Phantom: Flat Phantom 5.0 (front); Type: QD000P50AA; Serial: 1001
- DASY52 52.10.4(1535); SEMCAD X 14.6.14(7501)

Dipole Calibration for Head Tissue/Pin=250 mW, d=10mm/Zoom Scan (7x7x7)/Cube 0:

Measurement grid: dx=5mm, dy=5mm, dz=5mm
Reference Value = 116.2 V/m; Power Drift = 0.06 dB
Peak SAR (extrapolated) = 26.8 W/kg
SAR(1 g) = 13.5 W/kg; SAR(10 g) = 6.19 W/kg
Smallest distance from peaks to all points 3 dB below = 9 mm
Ratio of SAR at M2 to SAR at M1 = 50.2%
Maximum value of SAR (measured) = 22.0 W/kg



Impedance Measurement Plot for Head TSL



-THE END-