

# TEST REPORT

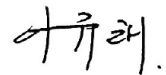
FCC SAR Part 1 Test for SM-A566E/DS  
Class II Permissive Change

APPLICANT  
SAMSUNG Electronics Co., Ltd.

REPORT NO.  
HCT-SR-2509-FC002

DATE OF ISSUE  
September 8, 2025

Tested by  
Gyu Tae Lee



Technical Manager  
Yun Jeang Heo



**HCT CO., LTD.**  
*BongJai Huh*  
BongJai Huh / CEO



HCT CO.,LTD.

2-6, 73, 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Republic of Korea  
Tel. +82 31 645 6300 Fax. +82 31 645 6401

# TEST REPORT

FCC Part 1 SAR Test  
for Class II  
Permissive Change

REPORT NO.

HCT-SR-2509-FC002

DATE OF ISSUE

Sep. 08, 2025

FCC ID

A3LSMA566E

Applicant

SAMSUNG Electronics Co., Ltd  
129, Samsung-ro, Yeongtong-gu, Suwon-Si, Gyeonggi-do, 16677, Korea

Product Name

Mobile Phone

Model Name

SM-A566E/DS

[Series Model Name

SM-A566E

Application Type

Class II Permissive Change

Date of Test

Sep.02,2025

Location of Test

☒ Permanent Testing Lab ☐ On Site Testing Lab  
(Address: 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si)

FCC Rule Part(s)

CFR § 2.1093

Test Results

PASS (SAR Limit : 1.6 W/kg)  
Refer to the clause 3.2 Attestation of test result

## REVISION HISTORY

The revision history for this test report is shown in table.

| Revision No. | Date of Issue | Description     |
|--------------|---------------|-----------------|
| 0            | Sep. 08, 2025 | Initial Release |

## Notice

---

### Content

---

The results shown in this test report only apply to the sample(s), as received, provided by the applicant, unless otherwise stated.

The test results have only been applied with the test methods required by the standard(s).

The laboratory is not accredited for the test results marked \*.

Information provided by the applicant is marked \*\*.

Test results provided by external providers are marked \*\*\*.

When confirmation of authenticity of this test report is required, please contact [www.hct.co.kr](http://www.hct.co.kr)

The test results in this test report are not associated with the ((KS Q) ISO/IEC 17025) accreditation by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA (American Association for Laboratory Accreditation) that are under the ILAC (International Laboratory Accreditation Cooperation) Mutual Recognition Agreement (MRA).

---

## CONTENTS

|                                                      |    |
|------------------------------------------------------|----|
| 1. Test Regulations.....                             | 5  |
| 2. Test Location .....                               | 6  |
| 3. Information of the EUT .....                      | 7  |
| 4. Device Under Test Description .....               | 8  |
| 5. Introduction.....                                 | 13 |
| 6. Description of test equipment .....               | 14 |
| 7. SAR Measurement Procedure.....                    | 15 |
| 8. Description of Test Position .....                | 17 |
| 9. RF Exposure Limits.....                           | 22 |
| 10. FCC SAR General Measurement Procedures .....     | 24 |
| 11. Output Power Specifications .....                | 25 |
| 12. System Verification .....                        | 28 |
| 13. RF Exposure Test Data Summary .....              | 29 |
| 14. Simultaneous SAR Analysis .....                  | 32 |
| 15. Measurement Uncertainty.....                     | 35 |
| 16. SAR Test Equipment .....                         | 36 |
| 17. Conclusion .....                                 | 37 |
| 18. References .....                                 | 38 |
| Appendix A. DUT Ant. Information & SETUP PHOTO ..... | 40 |
| Appendix B. SAR Test Plots                           |    |
| Appendix C. System Verification Plots                |    |
| Appendix D. SAR Tissue Characterization              |    |
| Appendix E. SAR System Validation                    |    |
| Appendix F. Probe Calibration Data                   |    |
| Appendix G. Dipole Calibration Data                  |    |
| Appendix H. Power reduction verification             |    |

## 1. Test Regulations

The tests documented in this report were performed in accordance with FCC CFR § 2.1093, IEEE 1528-2013, ANSI C63.26-2015 the following FCC Published RF exposure KDB procedures:

- FCC KDB Publication 941225 D01 3G SAR Procedures v03r01
- FCC KDB Publication 941225 D06 Hot Spot SAR v02r01
- FCC KDB Publication 941225 D05 SAR for LTE Devices v02r05
- FCC KDB Publication 941225 D05A LTE Rel.10 KDB Inquiry sheet v01r02
- FCC KDB Publication 248227 D01 802.11 Wi-Fi SAR v02r02
- FCC KDB Publication 447498 D01 General RF Exposure Guidance v06
- FCC KDB Publication 648474 D04 Handset SAR v01r03
- FCC KDB Publication 616217 D04 v01r02 (Proximity Sensor)
- FCC KDB Publication 865664 D01 SAR measurement 100 MHz to 6 GHz v01r04
- FCC KDB Publication 865664 D02 SAR Reporting v01r02
- FCC KDB Publication 690783 D01 SAR Listings on Grants v01r03
- FCC KDB Publication 971168 D01 Power Meas License Digital Systems v03r01

In Addition to the above, the following information was used.

- October 2013 TCB Workshop Notes (GPRS testing criteria)
- October 2014 TCB Workshop Notes (Overlapping LTE Bands)
- April 2015 TCB Workshop Notes (Overlapping LTE Bands Test exclusion)
- April 2015 TCB Workshop Notes (Simultaneous transmission summation clarified)
- October 2016 TCB Workshop Notes (Bluetooth Duty Factor)
- November 2017 TCBC Workshop Notes (LTE Carrier Aggregation)
- May 2017 TCBC Workshop Notes (LTE Band 41 Power Class 2)
- April 2019 TCBC Workshop Notes (IEEE 802.11 ax)
- April 2018 TCBC Workshop Notes (LTE UL CA, DL CA SAR Test Exclusion)
- April 2022 TCBC Workshop Notes (Sum-Peak Location Separation Ratio)

## 2. Test Location

### 2.1 Test Laboratory

|              |                                                                                    |
|--------------|------------------------------------------------------------------------------------|
| Company Name | HCT Co., Ltd.                                                                      |
| Address      | 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do,<br>17383 KOREA |
| Telephone    | 031-645-6300                                                                       |
| Fax.         | 031-645-6401                                                                       |

### 2.2 Test Facilities

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

|       |                                                         |
|-------|---------------------------------------------------------|
| Korea | National Radio Research Agency (Designation No. KR0032) |
|       | KOLAS (Testing No. KT197)                               |

### 3. Information of the EUT

#### 3.1 General Information of the EUT

|                       |                               |
|-----------------------|-------------------------------|
| Model Name            | SM-A566E/DS                   |
| Additional Model Name | SM-A566E                      |
| Equipment Type        | Mobile Phone                  |
| FCC ID                | A3LSMA566E                    |
| Application Type      | Class II Permissive Change    |
| Applicant             | SAMSUNG Electronics Co., Ltd. |

#### 3.2 Attestation of test result of device under test

| The Highest Reported SAR                  |                       |                 |                     |              |             |              |
|-------------------------------------------|-----------------------|-----------------|---------------------|--------------|-------------|--------------|
| Band                                      | Tx. Frequency         | Equipment Class | Reported SAR (W/kg) |              |             |              |
|                                           |                       |                 | 1 g Head            | 1 g BodyWorn | 1 g Hotspot | 10 g Phablet |
| GSM/GPRS/EDGE 850                         | 824.2 MHz ~ 848.8 MHz | PCE             | <0.10               | 0.54         | 0.54        | N/A          |
| Simultaneous SAR per KDB 690783 D01v01r03 |                       |                 | 1.576               | 1.595        | 1.595       | 0.021        |
| Date(s) of Tests:                         |                       | Sep.02, 2025    |                     |              |             |              |

Note:

1. This test report contains only the test results performed with the output Power change of antenna A in the GSM850 band. For detailed modification information, please refer to the technical documentation.
2. Please see the original compliance evaluation in Part 1 SAR Report [No. HCT-SR-2412-FC008-R2] for complete evaluation of all other operating modes.
3. The simultaneous transmission analysis for this model was evaluated based on the maximum SAR result from the original SAR report [No. HCT-SR-2412-FC008-R2] and the test results from C2PC.

## 4. Device Under Test Description

### 4.1 DUT specification

| Device Wireless specification overview |                                                                                                                                                                                        |                             |
|----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| Band & Mode                            | Operating Mode                                                                                                                                                                         | Tx Frequency                |
| GSM850                                 | Voice / Data                                                                                                                                                                           | 824.2 MHz ~ 848.8 MHz       |
| GSM1900                                | Voice / Data                                                                                                                                                                           | 1 850.2 MHz ~ 1 909.8 MHz   |
| UMTS Band 2                            | Voice / Data                                                                                                                                                                           | 1 852.4 MHz ~ 1 907.6 MHz   |
| UMTS Band 4                            | Voice / Data                                                                                                                                                                           | 1 712.4 MHz ~ 1 752.6 MHz   |
| UMTS Band 5                            | Voice / Data                                                                                                                                                                           | 826.4 MHz ~ 846.6 MHz       |
| LTE FDD Band 2 (PCS)                   | Voice / Data                                                                                                                                                                           | 1 850.7 MHz ~ 1 909.3 MHz   |
| LTE FDD Band 4 (AWS)                   | Voice / Data                                                                                                                                                                           | 1 710.7 MHz ~ 1 754.3 MHz   |
| LTE FDD Band 5 (Cell)                  | Voice / Data                                                                                                                                                                           | 824.7 MHz ~ 848.3 MHz       |
| LTE FDD Band 12                        | Voice / Data                                                                                                                                                                           | 699.7 MHz ~ 715.3 MHz       |
| LTE FDD Band 13                        | Voice / Data                                                                                                                                                                           | 779.5 MHz ~ 784.5 MHz       |
| LTE FDD Band 17                        | Voice / Data                                                                                                                                                                           | 706.5 MHz ~ 713.5 MHz       |
| LTE FDD Band 25                        | Voice / Data                                                                                                                                                                           | 1 850.7 MHz ~ 1 914.3 MHz   |
| LTE FDD Band 26                        | Voice / Data                                                                                                                                                                           | 814.7 MHz ~ 848.3 MHz       |
| LTE TDD Band 41                        | Voice / Data                                                                                                                                                                           | 2 498.5 MHz ~ 2 687.5 MHz   |
| LTE FDD Band 66 (AWS)                  | Voice / Data                                                                                                                                                                           | 1 710.7 MHz ~ 1 779.3 MHz   |
| NR FDD Band n5                         | Voice / Data                                                                                                                                                                           | 826.5 MHz ~ 846.5 MHz       |
| NR TDD Band n41                        | Voice / Data                                                                                                                                                                           | 2 501.01 MHz ~ 2 685 MHz    |
| NR FDD Band n66                        | Voice / Data                                                                                                                                                                           | 1 712.5 MHz ~ 1 777.5 MHz   |
| NR TDD Band n77                        | Voice / Data                                                                                                                                                                           | 3 705 MHz ~ 3 975 MHz       |
| NR TDD Band n77 DoD                    | Voice / Data                                                                                                                                                                           | 3 445.01 MHz ~ 3 544.98 MHz |
| U-NII-1                                | Voice / Data                                                                                                                                                                           | 5 180 MHz ~ 5 240 MHz       |
| U-NII-2A                               | Voice / Data                                                                                                                                                                           | 5 260 MHz ~ 5 320 MHz       |
| U-NII-2C                               | Voice / Data                                                                                                                                                                           | 5 500 MHz ~ 5 720 MHz       |
| U-NII-3                                | Voice / Data                                                                                                                                                                           | 5 745 MHz ~ 5 825 MHz       |
| U-NII-4                                | Voice / Data                                                                                                                                                                           | 5 845 MHz ~ 5 885 MHz       |
| 2.4 GHz WLAN                           | Voice / Data                                                                                                                                                                           | 2 412 MHz ~ 2 462 MHz       |
| Bluetooth / LE 5.3                     | Data                                                                                                                                                                                   | 2 402 MHz ~ 2 480 MHz       |
| NFC                                    | Data                                                                                                                                                                                   | 13.56 MHz                   |
| Device Description                     |                                                                                                                                                                                        |                             |
| Battery                                | Main: EB-BA566ASY(ATL)                                                                                                                                                                 |                             |
| Device Serial Numbers                  | Mode                                                                                                                                                                                   | Serial Number               |
|                                        | GSM850 Ant A                                                                                                                                                                           | XKI1482M                    |
|                                        | The manufacturer has confirmed that the devices tested have the same physical, mechanical and thermal characteristics are within operational tolerances expected for production units. |                             |

## 4.2 Time-Averaging Algorithm for RF Exposure Compliance

This WWAN Mode of DUT is equipped with an S.LSI chipset to which the Samsung S.LSI proprietary TAS (Time Average SAR) algorithm is applied. This DUT is enabled with the Samsung S.LSI proprietary TAS (Time Average SAR) algorithm for WWAN /WLAN Mode to control and manage transmitting power in real time and to ensure at all times the time-averaged RF exposure is in compliance with the FCC requirement.

FCC RF exposure limit is based on time averaged RF exposure. The SAR regulatory specification is defined over certain measurement duration allowing for time-averaging. The Samsung S.LSI proprietary TAS (Time Average SAR) algorithm has been designed to meet the compliance limits over the required duration, while still allowing dynamic control of transmit power to satisfy the performance of the system.

This feature performs time averaging SAR algorithm in real time to control and manage transmitting power and ensure the time-averaged RF exposure is in compliance with FCC requirements all the time. The S.LSI TAS algorithms, implemented in WWAN and WLAN modes respectively, are independent and always comply with the FCC's RF exposure limit. Only the BT, NFC mode of the device did not apply the time averaged SAR algorithm.

The Samsung S.LSI TAS algorithm allow the device to transmit at higher power instantaneously, as high as Pmax, when needed, but enforces power limiting to maintain time-averaged transmit power to Plimit. Below table shows Plimit NV settings and maximum tune up output power Pmax configured for this DUT for various transmit conditions (Radio SAR indicator RSI for Head /Body SAR of WWAN/WLAN Mode) Note that the device uncertainty for sub-6GHz WLAN/WWAN is 1.0dB for this DUT.

The purpose of this report is to demonstrate that the DUT meets FCC SAR limits when transmitting in static transmission configurations at Plimit specified by manufacturer.

Measurement Condition: All conducted power and SAR measurements in this report were performed by Plimit in static Power condition.

| Plim values in green indicate Plimit < Pmax                        |      |         | Plimit values in grey indicate Plimit > Pmax |                               |                                                     |
|--------------------------------------------------------------------|------|---------|----------------------------------------------|-------------------------------|-----------------------------------------------------|
| Plimit corresponding to 1 W/kg (1g) 2.5W/kg(10g) SAR_Design_target |      |         |                                              | Pmax                          |                                                     |
| SAR Exposure Position                                              |      |         | Head (RCV ON)                                | Non Head (Bodyworn / Hotspot) | Maximum Tune-up Output Power (Frame Averaged Power) |
| Averaging volume                                                   |      |         | 1g                                           | 1g                            |                                                     |
| seperation Distance                                                |      |         | 0 mm                                         | 5 mm                          |                                                     |
| Mode                                                               | Band | Antenna | RSI = 1                                      | RSI = 0                       |                                                     |
| GSM/GPRS/EDGE                                                      | 850  | A       | 20.8                                         | 20.8                          | 25.4                                                |
|                                                                    |      |         |                                              |                               | 48.2%                                               |

\*Note all Plimit and maximum tune up output power Pmax levels entered in above Table correspond to average power levels after accounting for duty cycle in the case of TDD modulation schemes (for e.g., GSM, LTE TDD, 5G NR TDD).

\*The maximum time-averaged output power (dBm) for any 2G/3G/4G/5G WWAN technology, band, and SAR Exposure condition=minimum of "Plimit" and "Maximum tune up output power: "Pmax" + 1dB device uncertainty.

The maximum time averaged output power means P<sub>limit</sub> for each modes SAR values in this report were scaled to the maximum allowed output power to determine compliance per KDB Publication 447498 D01v06.

### 4.3 Nominal and 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 D01v06.

\* The output power for SAR test in WWAN modes [2G/3G/4G/5G] of this device is characterized as Head [RSI=1] and Non-Head [RSI=0], and the output power of non-Head condition.

#### 4.3.1 2G/3G/4G/5G Nominal Output Power

##### A. GSM Modes

| GSM/GPRS/EDGE 850 (Ant A) |                   |                                    |               |               |               |                                     |               |               |               |
|---------------------------|-------------------|------------------------------------|---------------|---------------|---------------|-------------------------------------|---------------|---------------|---------------|
| Power Level               | Voice<br>(in dBm) | Data – Burst Average GMSK (in dBm) |               |               |               | Data – Burst Average 8-PSK (in dBm) |               |               |               |
|                           | 1 TX Slot         | 1 TX Slots                         | 2 TX<br>Slots | 3 TX<br>Slots | 4 TX<br>Slots | 1 TX<br>Slots                       | 2 TX<br>Slots | 3 TX<br>Slots | 4 TX<br>Slots |
| Pmax                      | 33.0              | 33.0                               | 31.0          | 29.8          | 28.6          | 27.0                                | 25.0          | 23.8          | 22.6          |
| RSI = 0 (Non Head)        | 26.0              | 26.0                               | 26.0          | 25.0          | 24.0          | 26.0                                | 24.0          | 23.0          | 22.0          |
| RSI = 1 (Head)            | 26.0              | 26.0                               | 26.0          | 25.0          | 24.0          | 26.0                                | 24.0          | 23.0          | 22.0          |

Tolerance: -1.5 dB ~ +1.0 dB

### 4.4 DUT Antenna Locations

A diagram showing the location of the device antennas for both open and closed configurations can be found in SAR\_setup\_photos. When the device is open, The overall dimensions of this device are > 9 X 5 cm. Since the diagonal dimension of this device is > 160 mm and < 200 mm, it is considered a “phablet”. In the closed configuration, only a simple display/interaction of notifications occurs and overall dimensions are <9 X 5 cm. Therefore, when the device is closed, the only testing considered is for body-worn and hotspot.

| Antenna       | Mode              | Rear | Front | Left | Right | Bottom | Top |
|---------------|-------------------|------|-------|------|-------|--------|-----|
| Main1 [Ant A] | GSM/GPRS/EDGE 850 | Yes  | Yes   | Yes  | Yes   | Yes    | No  |

Particular EUT edges were not required to be evaluated for Bluetooth Tethering and Hotspot SAR if the edges were > 25 mm from the transmitting antenna according to FCC KDB 941225 D06v02r01 on page 2.

The distance between the transmit antennas and the edges of the device are included in the filing.

- Note: All test configurations are based on front view position.

### 4.5 Near Field Communications (NFC) Antenna

This EUT has NFC operations. The NFC antenna is integrated into the device for this model. Therefore, all SAR tests were performed with the device which already incorporates the NFC antenna. A diagram showing the location of the NFC antenna can be found in SAR\_Setup\_photos.

## 4.6 SAR Summation Scenario

According to FCC KDB 447498 D01v06, transmitters are considered to be transmitting simultaneously when there is overlapping transmission, with the exception of transmissions during network hand-offs with maximum hand-off duration less than 30 seconds. Possible transmission paths for the EUT are shown below paths and are mode in same rectangle to indicate communication modes which share the same path. Modes which share the same transmission path cannot transmit simultaneously with one another.

This device contains multiple transmitters that may operate simultaneously, and therefore requires a simultaneous transmission analysis according to FCC KDB 447498 D01v06.

| Capable Transmit Configuration                              | Head | Body-Worn Accessory | Wireless Router | Phablet |
|-------------------------------------------------------------|------|---------------------|-----------------|---------|
| GSM voice + 2.4 GHz Bluetooth                               | Yes^ | Yes                 | N/A             | Yes     |
| GSM voice + 2.4 GHz WI-FI Ant 1/MIMO                        | Yes  | Yes                 | N/A             | Yes     |
| GSM voice + 5 GHz WI-FI Ant 2/MIMO                          | Yes  | Yes                 | N/A             | Yes     |
| GSM voice + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO      | Yes^ | Yes                 | N/A             | Yes     |
| UMTS + 2.4 GHz Bluetooth                                    | Yes^ | Yes                 | Yes^            | Yes     |
| UMTS + 2.4 GHz WI-FI Ant 1/MIMO                             | Yes  | Yes                 | Yes             | Yes     |
| UMTS + 5 GHz WI-FI Ant 2/MIMO                               | Yes  | Yes                 | Yes             | Yes     |
| UMTS + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO           | Yes^ | Yes                 | Yes^            | Yes     |
| LTE + 2.4 GHz Bluetooth                                     | Yes^ | Yes                 | Yes^            | Yes     |
| LTE + 2.4 GHz WI-FI Ant 1/MIMO                              | Yes  | Yes                 | Yes             | Yes     |
| LTE + 5 GHz WI-FI Ant 2/MIMO                                | Yes  | Yes                 | Yes             | Yes     |
| LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO            | Yes^ | Yes                 | Yes^            | Yes     |
| LTE + 5G NR                                                 | Yes  | Yes                 | Yes             | Yes     |
| LTE + 2.4 GHz Bluetooth + 5G NR                             | Yes^ | Yes                 | Yes^            | Yes     |
| LTE + 2.4 GHz WI-FI Ant 1/MIMO + 5G NR                      | Yes  | Yes                 | Yes             | Yes     |
| LTE + 5 GHz WI-FI Ant 2/MIMO + 5G NR                        | Yes  | Yes                 | Yes             | Yes     |
| LTE + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO + 5G NR    | Yes^ | Yes                 | Yes^            | Yes     |
| GPRS/EDGE Data + 2.4 GHz Bluetooth                          | Yes^ | Yes                 | Yes^            | Yes     |
| GPRS/EDGE Data + 2.4 GHz WI-FI Ant 1/MIMO                   | Yes  | Yes                 | Yes             | Yes     |
| GPRS/EDGE Data + 5G GHz WI-FI Ant 2/MIMO                    | Yes  | Yes                 | Yes             | Yes     |
| GPRS/EDGE Data + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO | Yes^ | Yes                 | Yes^            | Yes     |
| 5G NR + 2.4 GHz Bluetooth                                   | Yes^ | Yes                 | Yes^            | Yes     |
| 5G NR + 2.4 GHz WI-FI Ant 1/MIMO                            | Yes  | Yes                 | Yes             | Yes     |
| 5G NR + 5 GHz WI-FI Ant 2/MIMO                              | Yes  | Yes                 | Yes             | Yes     |
| 5G NR + 2.4 GHz Bluetooth + 5 GHz WI-FI Ant 2/MIMO          | Yes^ | Yes                 | Yes^            | Yes     |

### Note:

- 2.4GHz WLAN and Bluetooth share the same antenna path and cannot transmit simultaneously
- When the user utilizes multiple services in UMTS 3G mode it uses multi-Radio Access Bearer or multi-RAB. The power control is based on a physical control channel (Dedicated Physical Control Channel [DPCCH]) and power control will be adjusted to meet the needs of both services. Therefore, the UMTS+WLAN scenario also represents the UMTS Voice/DATA + WLAN Hotspot scenario
- Per the manufacturer, WIFI Direct is not expected to be used in conjunction with a held-to-ear or body worn accessory voice call. Therefore, there are no simultaneous transmission scenarios involving WIFI direct beyond that listed in the above table
- 5 GHz Wireless Router is only supported for the U-NII-3 by S/W, therefore U-NII-1, U-NII-2A, U-NII-2C, and U-NII-4 were not evaluated for wireless router conditions.
- This device supports 2x2 MIMO Tx for WLAN 802.11a/b/g/n/ac/ax. 802.11a/b/g/n/ac/ax supports CDD and STBC and 802.11n/ac/ax additionally supports SDM.
- This device supports VoWIFI/VoLTE/VoNR.
- LTE + 5G NR FR1 Scenarios are limited to EN-DC combinations with anchor bands as shown in the NR FR1 checklist.
- NFC was evaluated for phablet based on expected usage conditions.
- The ^ indicates the BT Tethering feature.

## 5. Introduction

The FCC has adopted the guidelines for evaluating the environmental effects of radio frequency radiation in ET Docket 93-62 on Aug. 6, 1996 to protect the public and workers from the potential hazards of RF emissions due to FCC-regulated portable devices.

The safety limits used for the environmental evaluation measurements are based on the criteria published by the American National Standards Institute (ANSI) for localized specific absorption rate (SAR) in IEEE/ANSI C95.1-1992 Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz. 1992 by the Institute of Electrical and Electronics Engineers, Inc., New York 10017. The measurement procedure described in IEEE/ANSI C95.3-1992 Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields – RF and Microwave is used for guidance in measuring SAR due to the RF radiation exposure from the Equipment Under Test (EUT). 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 NCRP, 1986, Bethesda, MD 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.

### SAR Definition

Specific Absorption Rate (SAR) is defined as the time derivative of the incremental electromagnetic energy ( $dU$ ) absorbed by (dissipated in) an incremental mass ( $dm$ ) contained in a volume element ( $dV$ ) of a given density ( $\rho$ ). It is also defined as the rate of RF energy absorption per unit mass at a point in an absorbing body.

$$SAR = \frac{d}{dt} \left( \frac{dU}{dm} \right)$$

Figure 1. SAR Mathematical Equation

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

Where:

- = conductivity of the tissue-simulant material (S/m)
- = mass density of the tissue-simulant material ( $\text{kg/m}^3$ )
- = Total RMS electric field strength (V/m)

NOTE: The primary factors that control rate of energy absorption were found to be the wavelength of the incident field in relations to the dimensions and geometry of the irradiated organism, the orientation of the organism in relation to the polarity of field vectors, the presence of reflecting surfaces, and whether conductive contact is made by the organism with a ground plane.

## 6. Description of test equipment

### 6.1 SAR MEASUREMENT SETUP

These measurements are performed using the DASY4 automated dosimetric assessment system. It is made by Schmid & Partner Engineering AG (SPEAG) in Zurich, Switzerland. It consists of high precision robotics system (Staubli), robot controller, Pentium III computer, near-field probe, probe alignment sensor, and the generic twin phantom containing the brain equivalent material. The robot is a six-axis industrial robot performing precise movements to position the probe to the location (points) of maximum electromagnetic field (EMF) (see Figure.2).

A cell controller system contains the power supply, robot controller, teach pendant (Joystick), and remote control, is used to drive the robot motors. The PC with Windows XP or Windows 7 or Windows 10 or Windows 11 is working with SAR Measurement system DASY4 & DASY5 & DASY6 & DASY8 A/D interface card, monitor, mouse, and keyboard. The Staubli Robot is connected to the cell controller to allow software manipulation of the robot. A data acquisition electronic (DAE) circuit performs the signal amplification, signal multiplexing, AD-conversion, offset measurements, mechanical surface detection, collision detection, etc. is connected to the Electro-optical coupler (EOC). The EOC performs the conversion from the optical into digital electric signal of the DAE and transfers data to the PC plug-in card.

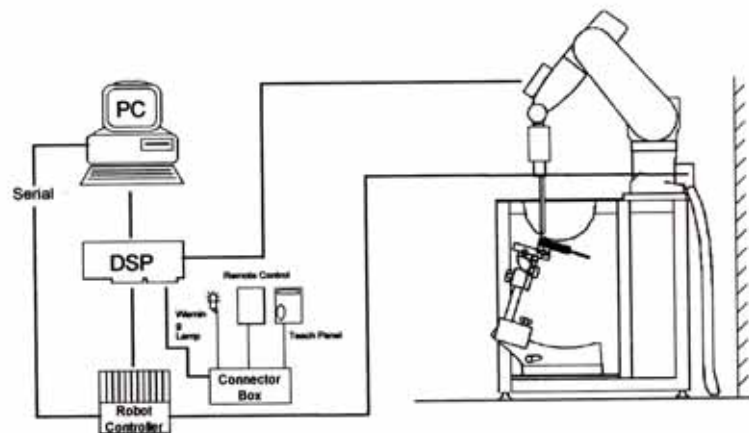


Figure 2. HCT SAR Lab. Test Measurement Set-up

The DAE consists of a highly sensitive electrometer-grade preamplifier with auto-zeroing, a channel and gain-switching multiplexer, a fast 16 bit AD-converter and a command decoder and control logic unit. Transmission to the PC-card is accomplished through an optical downlink for data and status information and an optical uplink for commands and clock lines. The mechanical probe mounting device includes two different sensor systems for frontal and sidewise probe contacts. They are also used for mechanical surface detection and probe collision detection. The robot uses its own controller with a built in VME-bus computer. The system is described in detail in.

## 7. SAR Measurement Procedure

The evaluation was performed using the following procedure compliant to FCC KDB Publication 865664 D01v01r04 and IEEE 1528-2013.

1. The SAR distribution at the exposed side of the head or body was measured at a distance no more than 5.0 mm from the inner surface of the shell. The area covered the entire dimension of the DUT's head and body area and the horizontal grid resolution was depending on the FCC KDB 865664 D01v01r04 table 4-1 & IEEE 1528-2013.
2. Based on step, the area of the maximum absorption was determined by sophisticated interpolations routines implemented in DASY software. When an Area Scan has measured all reachable point. DASY system computes the field maximal found in the scanned are, within a range of the maximum. SAR at this fixed point was measured and used as a reference value.
3. Around this point, a volume was assessed according to the measurement resolution and volume size requirements of FCC KDB 865664 D01v01r04 table 4-1 and IEEE 1528-2013. On the basis of this data set, the spatial peak SAR value was evaluated with the following procedure (reference from the DASY manual.)
  - a. The data at the surface were extrapolated, since the center of the dipoles is no more than 2.7 mm away from the tip of the probe (it is different from the probe type) and the distance between the surface and the lowest measuring point is 1.2 mm. The extrapolation was based on a least square algorithm. A polynomial of the fourth order was calculated through the points in z-axes. This polynomial was then used to evaluate the points between the surface and the probe tip.
  - b. The maximum interpolated value was searched with a straight-forward algorithm. Around this maximum the SAR values averaged over the spatial volumes (1 g or 10 g) were computed using the 3D-Spline interpolation algorithm. The 3D-spline is composed of three one-dimensional splines with the "Not a knot" condition (in x, y, and z directions. The volume was integrated with the trapezoidal algorithm. One thousand points (10 x 10 x 10) were interpolated to calculate the average.
  - c. All neighboring volumes were evaluated until no neighboring volume with a higher average value was found.
4. The SAR reference value, at the same location as step 2, was re-measured after the zoom scan. If the value changed by more than 5 %, the SAR evaluation and drift measurements were repeated.

Area scan and zoom scan resolution setting follow KDB 865664 D01v01r04 quoted below.

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |                                                                                             | $\leq 3 \text{ GHz}$                                                                                                                                                                                                                                                   | $> 3 \text{ GHz}$                                                                                                                               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| Maximum distance from closest measurement point (geometric center of probe sensors) to phantom surface                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                                                                             | $5\pm 1 \text{ mm}$                                                                                                                                                                                                                                                    | $\cdot \delta \cdot \ln(2) \pm 0.5 \text{ mm}$                                                                                                  |
| 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:<br>$\Delta x_{\text{Area}}, \Delta y_{\text{Area}}$                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |                                                                                             | $\leq 2 \text{ GHz: } \leq 15 \text{ mm}$<br>$2\text{-}3 \text{ GHz: } \leq 12 \text{ mm}$                                                                                                                                                                             | $3\text{-}4 \text{ GHz: } \leq 12 \text{ mm}$<br>$4\text{-}6 \text{ GHz: } \leq 10 \text{ mm}$                                                  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           |                                                                                             | 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: $\Delta x_{\text{zoom}}, \Delta y_{\text{zoom}}$                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |                                                                                             | $\leq 2 \text{ GHz: } \leq 8 \text{ mm}$<br>$2\text{-}3 \text{ GHz: } \leq 5 \text{ mm}^*$                                                                                                                                                                             | $3\text{-}4 \text{ GHz: } \leq 5 \text{ mm}^*$<br>$4\text{-}6 \text{ GHz: } \leq 4 \text{ mm}^*$                                                |
| Maximum zoom scan Spatial resolution normal to phantom surface                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | uniform grid: $\Delta z_{\text{zoom}}(n)$ |                                                                                             | $\leq 5 \text{ mm}$                                                                                                                                                                                                                                                    | $3\text{-}4 \text{ GHz: } \leq 4 \text{ mm}$<br>$4\text{-}5 \text{ GHz: } \leq 3 \text{ mm}$<br>$5\text{-}6 \text{ GHz: } \leq 2 \text{ mm}$    |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | graded grid                               | $\Delta z_{\text{zoom}}(1)$ : between 1 <sup>st</sup> two Points closest to phantom surface | $\leq 4 \text{ mm}$                                                                                                                                                                                                                                                    | $3\text{-}4 \text{ GHz: } \leq 3 \text{ mm}$<br>$4\text{-}5 \text{ GHz: } \leq 2.5 \text{ mm}$<br>$5\text{-}6 \text{ GHz: } \leq 2 \text{ mm}$  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                           | $\Delta z_{\text{zoom}}(n>1)$ : between subsequent Points                                   | $\leq 1.5 \cdot \Delta z_{\text{zoom}}(n-1)$                                                                                                                                                                                                                           |                                                                                                                                                 |
| Minimum zoom scan volume                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | x, y, z                                   |                                                                                             | $\geq 30 \text{ mm}$                                                                                                                                                                                                                                                   | $3\text{-}4 \text{ GHz: } \geq 28 \text{ mm}$<br>$4\text{-}5 \text{ GHz: } \geq 25 \text{ mm}$<br>$5\text{-}6 \text{ GHz: } \geq 22 \text{ mm}$ |
| <p>Note: <math>\delta</math> is the penetration depth of a plane-wave at normal incidence to the tissue medium; see draft standard IEEE P1528-2011 for details.</p> <p>* When zoom scan is required and the reported SAR from the area scan based 1-g SAR estimation procedures of KDB447498 is <math>\leq 1.4 \text{ W/kg}</math>, <math>\leq 8 \text{ mm}</math>, <math>\leq 7 \text{ mm}</math> and <math>\leq 5 \text{ mm}</math> zoom scan resolution may be applied, respectively, for 2 GHz to 3 GHz, 3 GHz to 4 GHz and 4 GHz to 6 GHz.</p> |                                           |                                                                                             |                                                                                                                                                                                                                                                                        |                                                                                                                                                 |

## 8. Description of Test Position

### 8.1 EAR REFERENCE POINT

Figure 8-2 shows the front, back and side views of the SAM phantom. The center-of-mouth reference point is labeled “M”, the left ear reference point (ERP) is marked “LE”, and the right ERP is marked “RE.” Each ERP is on the B-M (back-mouth) line located 15 mm behind the entrance-to-ear-canal (EEC) point, as shown in Figure 6-1. The Reference Plane is defined as passing through the two ear reference point and point M. The line N-F (Neck-Front), also called the Reference Pivoting Line, is not perpendicular to the reference plane (See Figure 5-1), Line B-M is perpendicular to the N-F line. Both N-F and B-M lines are marked on the external phantom shell to facilitate handset positioning.

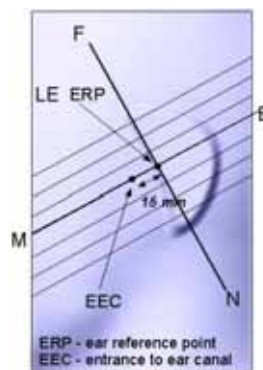


Figure 8-1  
Close-up side view of ERP

## 8.2 HANDSET REFERENCE POINTS

Two imaginary lines on the handset were established: the vertical centerline and the horizontal line. The device under test was placed in a normal operating position with the acoustic output located along the “vertical centerline” on the front of the device aligned to the “ear reference point” (see Figure 8-3). The acoustic output was then located at the same level as the center of the ear reference point. The device under test was positioned so that the “vertical centerline” was bisecting the front surface of the handset at its top and bottom edges, positioning the “ear reference point” on the outer surface of the both the left and right head phantoms on the ear reference point.



Figure 8-2  
Front, back and side views of SAM Twin Phantom

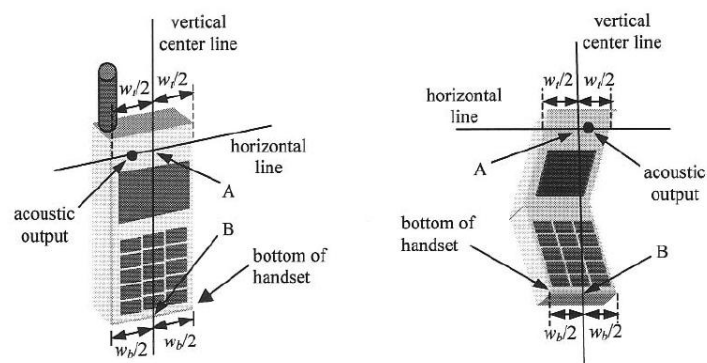


Figure 8-3. Handset vertical and horizontal reference lines

## 8.3 Device Holder

The device holder is made out of low-loss POM material having the following dielectric parameter; relative permittivity  $\epsilon=3$  and loss tangent  $\sigma=0.02$ .

## 8.4 Position for cheek

Figure 6.4. shows cheek or touch position. The reference points for the right ear (RE), left ear (LE), and mouth (M), which establish the Reference Plane for handset positioning, are indicated.

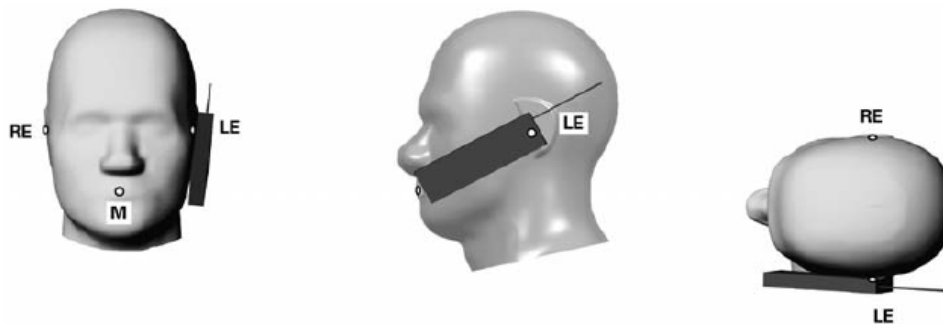


Figure 8.4 Cheek/ Touch position of the wireless device

## 8.5 Definition of the “tilted” position

Figure 6.5. shows tilted position. Place the device in the cheek position. Then while maintaining the orientation of the device, retract the device parallel to the reference plane far enough away from the phantom to enable a rotation of the device by 15°.

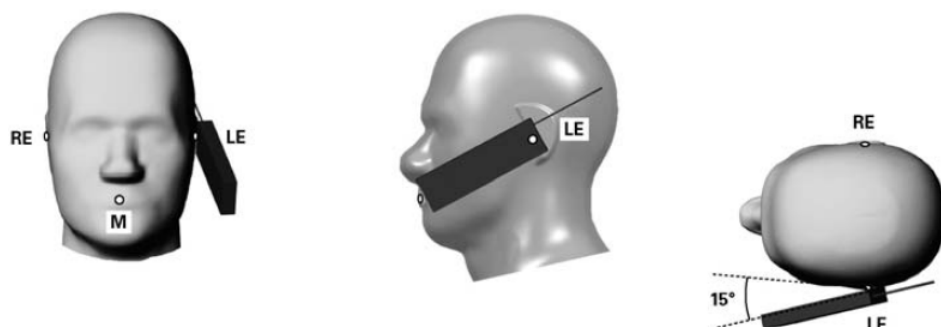


Figure 8.5. Tilt 15° position of the wireless device

## 8.6 Body-Worn Accessory Configurations

Body-worn operating configurations are tested with the belt-dips and holsters attached to the device and positioned against a flat phantom in a normal use configuration (see Figure 6-6). Per FCC KDB Publication 648474 D04v01r03 Body-worn accessory exposure is typically related to voice mode operations when handsets are carried in Body-worn accessories. The Body-worn accessory procedures in FCC KDB Publication 447498 D01v06 should be used to test for Body-worn accessory SAR compliance, without a headset connected to it.. When the reported SAR for a body- worn accessory, measured without a headset connected to the handset, is  $> 1.2 \text{ W/kg}$ , the highest reported SAR configuration for that wireless mode and frequency Band should be repeated for that body- worn accessory with a headset attached to the handset.



Figure 8-6  
Sample Body-Worn Diagram

Accessories for Body-worn operation configurations are divided into two categories: those that do not contain metallic components and those that do contain metallic components. When multiple accessories that do not contain metallic components are supplied with the device, the device is tested with only the accessory that dictates the closest spacing to the body. Then multiple accessories that contain metallic components are tested with the device with each accessory. If multiple accessories share an identical metallic component (i.e. the same metallic belt-dip used with different holsters with no other metallic components) only the accessory that dictates the closest spacing to the body is tested.

## 8.7 Wireless Router Configurations

Some battery-operated handsets have the capability to transmit and receive user data through simultaneous transmission of WIFI simultaneously with a separate licensed transmitter. The FCC has provided guidance in FCC KDB Publication 941225 D06v02r01 where SAR test considerations for handsets ( $L \times W \geq 9\text{cm} \times 5 \text{ cm}$ ) are based on a composite test separation distance of 10 mm from the front back and edges of the device containing transmitting antennas within 2.5 cm of their edges, determined from general mixed use conditions for this type of devices. Since the hotspot SAR results may overlap with the Body-worn accessory SAR requirements, the more conservative configurations can be considered, thus excluding some Body-worn accessory SAR tests.

In the closed configuration, only a simple display/interaction of notifications occurs and overall dimensions are  $< 9 \times 5 \text{ cm}$ . Therefore Per 941225 D06v02r01, when the device is closed, test separation for hotspot mode is 5mm.

When the user enables the personal wireless router functions for the handset actual operations include simultaneous transmission of both the WIFI transmitter and another licensed transmitter. Both transmitters often do not transmit at the same transmitting frequency and thus cannot be evaluated for SAR under actual use conditions due to the limitations of the SAR assessment probes. Therefore, SAR must be evaluated for each frequency transmission and mode separately and spatially summed with the WIFI transmitter according to FCC KDB Publication 447498 D01v06 publication procedures. The Portable Hotspot feature on the handset was NOT activated during SAR assessments, to ensure the SAR measurements were evaluated for a single transmission frequency RF signal at a time.

## 8.8 Extremity Exposure Configurations

Devices that are designed or intended for use on extremities or mainly operated in extremity only exposure conditions: i.e., hands, wrists, feet and ankles, may require extremity SAR evaluation. When the device also operates in close proximity to the user's body, SAR compliance for the body is also required. The 1-g body and 10-g extremity SAR Exclusion Thresholds found in KDB Publication 447498 D01v06 should be applied to determine SAR test requirements.

For smart phones with a display diagonal dimension > 15.0 cm or an overall diagonal dimension > 16.0 cm that provide similar mobile web access and multimedia support found in mini-tablets or UMPC mini-tablets that support voice calls next to the ear. The phablets procedures outlined in KDB Publication 648474 D04 v01r03 should be applied to evaluate SAR compliance. A device marketed as phablets, regardless of form factors and operating characteristics must be tested as a phablet to determine SAR compliance. In addition to the normally required head and body-worm accessory SAR test procedures required for handsets, the UMPC mini-tablet procedures must also be applied to test the SAR of all surfaces and edges with an antenna  $\leq 25$  mm from that surface or edge, in direct contact with the phantom, for 10-g SAR. The UMPC mini-tablet 1-g SAR at 5 mm is not required. When hotspot mode applies, 10-g SAR is required only for the surfaces and edges with hotspot mode scaled to the maximum output power (including tolerance) is 1-g SAR > 1.2 W/kg.

## 8.9 Bluetooth tethering Configurations

Per May 2017 TCBC Workshop Document, When Bluetooth tethering applies, simultaneous transmission SAR needs consideration.

This model allows users to exchange data or media files with other Bluetooth enabled devices using Bluetooth, which means they can connect to other Bluetooth enabled devices via Bluetooth tethering.

Therefore, SAR test was performed for additional simultaneous transmissions.

Head and Bluetooth tethering SAR were evaluated for BT BDR tethering applications.

## 9. RF Exposure Limits

### RF Exposure Limits for Frequencies Below 6GHz

| HUMAN EXPOSURE                                         | UNCONTROLLED ENVIRONMENT<br>General Population<br>(W/kg) | CONTROLLED ENVIRONMENT<br>Occupational<br>(W/kg) |
|--------------------------------------------------------|----------------------------------------------------------|--------------------------------------------------|
| SPATIAL PEAK SAR *<br>(Partial Body)                   | 1.6                                                      | 8.0                                              |
| SPATIAL AVERAGE SAR **<br>(Whole Body)                 | 0.08                                                     | 0.4                                              |
| SPATIAL PEAK SAR ***<br>(Hands / Feet / Ankle / Wrist) | 4.0                                                      | 20.0                                             |

#### NOTES:

\*The Spatial Peak value of the SAR averaged over any 1 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

\*\* The Spatial Average value of the SAR averaged over the whole-body.

\*\*\* The Spatial Peak value of the SAR averaged over any 10 g of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate averaging time.

**Uncontrolled Environments** are defined as locations where there is the exposure of individuals who have no knowledge or control of their exposure. The general population/uncontrolled exposure limits are applicable to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Members of the general public would come under this category when exposure is not employment-related; for example, in the case of a wireless transmitter that exposes persons in its vicinity.

**Controlled Environments** are defined as locations where there is exposure that may be incurred by persons who are aware of the potential for exposure, (i.e. as a result of employment or occupation). In general, occupational/controlled exposure limits are applicable to situations in which persons are exposed as a consequence of their employment, who have been made fully aware of the potential for exposure and can exercise control over their exposure. This exposure category is also applicable when the exposure is of a transient nature due to incidental passage through a location where the exposure levels may be higher than the general population/uncontrolled limits, but the exposed person is fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

## RF Exposure Limits for Frequencies Above 6GHz

Per § 1.1310 (d)(3), the MPE limits are applied for frequencies above 6 GHz. Power Density is expressed in units of  $\text{mW}/\text{cm}^2$  or  $\text{W}/\text{m}^2$ .

Peak Spatially Averaged Power Density was evaluated over a circular area of  $4 \text{ cm}^2$  per interim.

FCC Guidance for near-field power density evaluations per October 2018 TCB Workshop notes.

| HUMAN EXPOSURE                           | Limits For Occupational /<br>Controlled Environments | Limits For General Population /<br>Uncontrolled Environments |
|------------------------------------------|------------------------------------------------------|--------------------------------------------------------------|
| Frequency Range[MHz]                     | 1,500 – 100,000                                      | 1,500 – 100,000                                              |
| Power Density[ $\text{mW}/\text{cm}^2$ ] | 5.0                                                  | 1.0                                                          |
| Average Time[Minutes]                    | 6                                                    | 30                                                           |

NOTES:  $1.0 \text{ mW}/\text{cm}^2$  is  $10 \text{ W}/\text{m}^2$

## 10. FCC SAR General Measurement Procedures

Power Measurements for licensed transmitters are performed using a base simulator under digital average power.

### 10.1 Measured and Reported SAR

Per FCC KDB Publication 447498 D01v06, 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. The highest reported SAR results are identified on the grant of equipment authorization according to procedures in KDB 690783 D01v01r03.

### 10.2 3G SAR Test Reduction Procedure

#### 10.2.1 GSM, GPRS and EDGE

The following procedures may be considered for each frequency Band to determine SAR test reduction for devices operating in GSM/GPRS/EDGE modes to demonstrate RF exposure compliance. GSM voice mode transmits with 1 time-slot. GPRS and EDGE may transmit up to 4 time slots in the 8 time-slot frame according to the multi-slot class implemented in a device.

#### 10.2.2 SAR Test Reduction

In FCC KDB 941225 D01v03r01, certain transmission modes within a frequency Band and wireless mode evaluated for SAR are defined as primary modes. The equivalent modes considered for SAR test reduction are denoted as secondary modes. When the maximum output power including tune-up tolerance specified for production units in a secondary mode is  $\leq 0.25$  dB higher than the primary mode or when the highest reported SAR of the primary mode, scaled by the ratio of specified maximum output power and tune-up tolerance of secondary to primary mode, is  $\leq 1.2$  W/kg, SAR measurements are not required for the secondary mode. These criteria are referred to as the 3G SAR test reduction procedure. When the 3G SAR test reduction procedure is not satisfied, SAR measurements are additionally required for the secondary mode.

SAR test reduction for GPRS and EDGE modes is determined by the source-based time-averaged output power specified for production units, including tune-up tolerance. The data mode with highest specified time-averaged output power should be tested for SAR compliance in the applicable exposure conditions. For modes with the same specified maximum output power and tolerance, the higher number time-slot configuration should be tested.

#### 10.2.3 Procedures Used to Establish RF Signal for SAR

The following procedures are according to FCC KDB 941225 D01v03r01-3G SAR Measurement Procedures.

The handset was placed into a simulated call using a base station simulator in a shielded chamber. Such test signals offer a consistent means for testing SAR and are recommended for evaluation SAR measurements were taken with a fully charged battery. In order to verify that the device was tested and maintained at full power, this was configured with the base station simulator. 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.

## 11. 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 D01v06.

### Licensed Bands

| Test Description       | Test Procedure Used                                                                                                                                 |
|------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| Conducted Output Power | <ul style="list-style-type: none"> <li>- KDB 971168 D01 v03r01 – Section 5.2.4</li> <li>- ANSI C63.26-2015 – Section 5.2.1 &amp; 5.2.4.2</li> </ul> |

### Test Overview

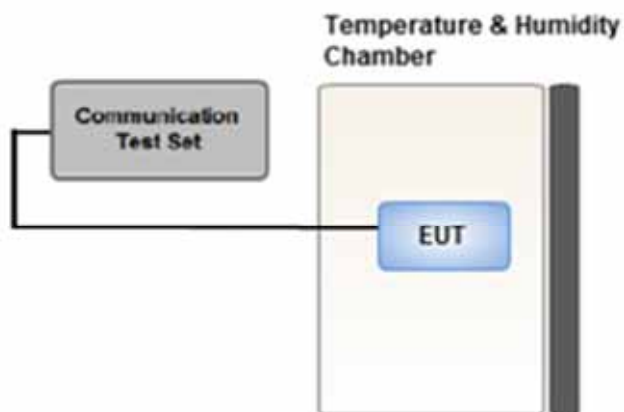
According to ANSI C63.26-2015 Section 5.2.1 when measuring the maximum RF output power from such devices, control over the EUT must be provided either through special test software (provided by manufacturer specifically for compliance testing, but not accessible by an end user) or through use of a base station emulator, communications test set, call box, or similar instrumentation that is capable of establishing a communications link with the EUT to enable control over variable parameters (e.g., output power, OBW, etc.).

In some cases, these instruments also include basic digital spectrum analyzer and/or power meter capabilities that can be utilized to measure the RF output power if the specified detectors and requirements can be realized and the measurement functions have been calibrated.

### Test Procedure

1. The RF port of the EUT was connected to the Communication Tester via an RF cable.
2. Conducted average power was measured using a calibrated Radio Communication Tester.

### Test setup



## 11.1 GSM Maximum Output Power

### 11.1.1 GSM Maximum Conducted Output Power

#### GSM850 – MAIN1 [Ant A]

Measured  $P_{max}$

| Mode / Band |     | Voice | GPRS(GMSK) Data – CS1(dBm) |                      |                      |                      | EDGE Data (dBm)      |                      |                      |                      |
|-------------|-----|-------|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|             |     | GSM   | GPRS<br>1 TX<br>Slot       | GPRS<br>2 TX<br>Slot | GPRS<br>3 TX<br>Slot | GPRS<br>4 TX<br>Slot | EDGE<br>1 TX<br>Slot | EDGE<br>2 TX<br>Slot | EDGE<br>3 TX<br>Slot | EDGE<br>4 TX<br>Slot |
| Maximum     |     | 34.00 | 34.00                      | 32.00                | 30.80                | 29.60                | 28.00                | 26.00                | 24.80                | 23.60                |
| Nominal     |     | 33.00 | 33.00                      | 31.00                | 29.80                | 28.60                | 27.00                | 25.00                | 23.80                | 22.60                |
| GSM 850     | 128 | 32.72 | 32.86                      | 30.23                | 28.72                | 27.70                | 26.54                | 24.75                | 23.24                | 21.78                |
|             | 190 | 33.16 | 33.40                      | 30.57                | 29.21                | 28.17                | 26.86                | 24.95                | 23.74                | 22.11                |
|             | 251 | 33.19 | 33.42                      | 30.55                | 29.23                | 27.99                | 26.83                | 24.91                | 23.44                | 22.04                |

GSM Conducted output powers (Burst-Average)

| Mode / Band |     | Voice | GPRS(GMSK) Data – CS1(dBm) |                      |                      |                      | EDGE Data (dBm)      |                      |                      |                      |
|-------------|-----|-------|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|             |     | GSM   | GPRS<br>1 TX<br>Slot       | GPRS<br>2 TX<br>Slot | GPRS<br>3 TX<br>Slot | GPRS<br>4 TX<br>Slot | EDGE<br>1 TX<br>Slot | EDGE<br>2 TX<br>Slot | EDGE<br>3 TX<br>Slot | EDGE<br>4 TX<br>Slot |
| Maximum     |     | 24.81 | 24.81                      | 25.82                | 26.38                | 26.43                | 18.81                | 19.82                | 20.38                | 20.43                |
| Nominal     |     | 23.81 | 23.81                      | 24.82                | 25.38                | 25.43                | 17.81                | 18.82                | 19.38                | 19.43                |
| GSM 850     | 128 | 23.53 | 23.67                      | 24.05                | 24.3                 | 24.53                | 17.35                | 18.57                | 18.82                | 18.61                |
|             | 190 | 23.97 | 24.21                      | 24.39                | 24.79                | 25                   | 17.67                | 18.77                | 19.32                | 18.94                |
|             | 251 | 24.00 | 24.23                      | 24.37                | 24.81                | 24.82                | 17.64                | 18.73                | 19.02                | 18.87                |

GSM Conducted output powers (Frame-Average)

Measured Non Head(RSI = 0),Head(RSI =1)

| Mode / Band |     | Voice | GPRS(GMSK) Data – CS1(dBm) |                      |                      |                      | EDGE Data (dBm)      |                      |                      |                      |
|-------------|-----|-------|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|             |     | GSM   | GPRS<br>1 TX<br>Slot       | GPRS<br>2 TX<br>Slot | GPRS<br>3 TX<br>Slot | GPRS<br>4 TX<br>Slot | EDGE<br>1 TX<br>Slot | EDGE<br>2 TX<br>Slot | EDGE<br>3 TX<br>Slot | EDGE<br>4 TX<br>Slot |
| Maximum     |     | 27.00 | 27.00                      | 27.00                | 26.00                | 25.00                | 27.00                | 25.00                | 24.00                | 23.00                |
| Nominal     |     | 26.00 | 26.00                      | 26.00                | 25.00                | 24.00                | 26.00                | 24.00                | 23.00                | 22.00                |
| GSM 850     | 128 | 25.65 | 25.83                      | 25.66                | 24.96                | 23.72                |                      |                      |                      |                      |
|             | 190 | 26.08 | 26.06                      | 25.88                | 25.19                | 24.29                |                      |                      |                      |                      |
|             | 251 | 25.95 | 26.01                      | 25.81                | 25.17                | 23.75                |                      |                      |                      |                      |

GSM Conducted output powers (Burst-Average)

| Mode / Band |     | Voice | GPRS(GMSK) Data – CS1(dBm) |                      |                      |                      | EDGE Data (dBm)      |                      |                      |                      |
|-------------|-----|-------|----------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|
|             |     | GSM   | GPRS<br>1 TX<br>Slot       | GPRS<br>2 TX<br>Slot | GPRS<br>3 TX<br>Slot | GPRS<br>4 TX<br>Slot | EDGE<br>1 TX<br>Slot | EDGE<br>2 TX<br>Slot | EDGE<br>3 TX<br>Slot | EDGE<br>4 TX<br>Slot |
| Maximum     |     | 17.81 | 17.81                      | 20.82                | 21.58                | 21.83                | 17.81                | 18.82                | 19.58                | 19.83                |
| Nominal     |     | 16.81 | 16.81                      | 19.82                | 20.58                | 20.83                | 16.81                | 17.82                | 18.58                | 18.83                |
| GSM 850     | 128 | 16.46 | 16.64                      | 19.48                | 20.54                | 20.55                |                      |                      |                      |                      |
|             | 190 | 16.89 | 16.87                      | 19.70                | 20.77                | 21.12                |                      |                      |                      |                      |
|             | 251 | 16.76 | 16.82                      | 19.63                | 20.75                | 20.58                |                      |                      |                      |                      |

GSM Conducted output powers (Frame-Average)

**Note:**

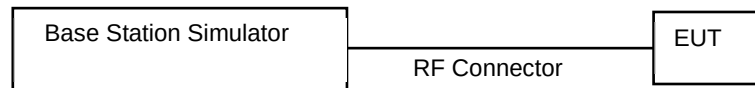
Time slot average factor is as follows:

1 Tx slot = 9.19 dB, Frame-Average output power = Burst-Average output power – 9.19 dB

2 Tx slot = 6.18 dB, Frame-Average output power = Burst-Average output power – 6.18 dB

3 Tx slot = 4.42 dB, Frame-Average output power = Burst-Average output power – 4.42 dB

4 Tx slot = 3.17 dB, Frame-Average output power = Burst-Average output power – 3.17 dB



## 12. System Verification

### 12.1 Tissue Verification

The head simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity.

#### ◆ GSM 850 Band

| Table for Head Tissue Verification |              |             |       |                                |                                          |                              |                                        |              |                |
|------------------------------------|--------------|-------------|-------|--------------------------------|------------------------------------------|------------------------------|----------------------------------------|--------------|----------------|
| Date of Tests                      | Tissue Temp. | Tissue Type | Freq. | Measured Conductivity $\sigma$ | Measured Dielectric Constant, $\epsilon$ | Target Conductivity $\sigma$ | Target Dielectric Constant, $\epsilon$ | dev $\sigma$ | dev $\epsilon$ |
|                                    | [°C]         |             | [MHz] | [S/m]                          |                                          | [S/m]                        |                                        | [%]          | [%]            |
| 09/02/25                           | 19.9         | 835H        | 820   | 0.915                          | 42.173                                   | 0.899                        | 41.577                                 | + 1.78       | + 1.43         |
|                                    |              |             | 835   | 0.920                          | 42.013                                   | 0.900                        | 41.500                                 | + 2.17       | + 1.24         |
|                                    |              |             | 850   | 0.926                          | 41.801                                   | 0.916                        | 41.500                                 | + 1.06       | + 0.73         |

### 12.2 System Verification

Input Power: 50 mW

| Freq. | Date       | Probe | Dipole | Liquid | Amb. Temp. | Liquid Temp. | 1 W Target SAR <sub>1g</sub> (Speag) | 50 mW Measured SAR <sub>1g</sub> | 1 W Normalized SAR <sub>1g</sub> | Dev.   | Limit |
|-------|------------|-------|--------|--------|------------|--------------|--------------------------------------|----------------------------------|----------------------------------|--------|-------|
| [MHz] |            | (S/N) | (S/N)  |        | [°C]       | [°C]         | [W/kg]                               | [W/kg]                           | [W/kg]                           | [%]    | [%]   |
| 835   | 09/02/2025 | 7679  | 4d165  | Head   | 20.1       | 19.9         | 9.32                                 | 0.500                            | 10.00                            | + 7.30 | ± 10  |

### 12.3 System Verification Procedure

#### For SAR Measurement

SAR measurement was prior to assessment; the system is verified to the  $\pm 10$  % of the specifications at each frequency band by using the system verification kit. (Graphic Plots Attached)

- Cabling the system, using the verification kit equipment.
- Generate about 50 mW Input level from the signal generator to the Dipole Antenna.
- Dipole antenna was placed below the flat phantom.
- The measured one-gram SAR at the surface of the phantom above the dipole feed-point should be within 10 % of the target reference value.
- The results are normalized to 1 W input power.

Note;

SAR Verification was performed according to the FCC KDB 865664 D01v01r04.

### 13. RF Exposure Test Data Summary

#### 13.1 SAR Measurement Results

##### 13.1.1 Head SAR Measurement Results

| GSM 850 Head SAR                                                                                  |       |           |      |               |             |             |                                          |            |           |                |              |          |
|---------------------------------------------------------------------------------------------------|-------|-----------|------|---------------|-------------|-------------|------------------------------------------|------------|-----------|----------------|--------------|----------|
| Frequency                                                                                         |       | Mode      | Ant. | Tune-Up Limit | Meas. Power | Power Drift | Test Position                            | Duty Cycle | Meas. SAR | Scaling Factor | Reported SAR | Plot No. |
| (MHz)                                                                                             | (Ch.) |           |      | (dBm)         | (dBm)       | (dB)        |                                          |            | (W/kg)    |                | (W/kg)       |          |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | 0.00        | Left Cheek                               | 1:8.3      | 0.016     | 1.236          | 0.020        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | 0.12        | Left Tilt                                | 1:8.3      | 0.007     | 1.236          | 0.009        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | 0.01        | Right Cheek                              | 1:8.3      | 0.021     | 1.236          | 0.026        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | -0.14       | Right Tilt                               | 1:8.3      | 0.012     | 1.236          | 0.015        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.11       | Left Cheek                               | 1:2.07     | 0.040     | 1.178          | 0.047        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.19       | Left Tilt                                | 1:2.07     | 0.033     | 1.178          | 0.039        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.11       | Right Cheek                              | 1:2.07     | 0.083     | 1.178          | 0.098        | A1       |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.10       | Right Tilt                               | 1:2.07     | 0.013     | 1.178          | 0.015        | -        |
| ANSI/IEEE C95.1 - 2005- Safety Limit<br>Spatial Peak<br>Uncontrolled Exposure/ General Population |       |           |      |               |             |             | Head<br>1.6 W/kg<br>Averaged over 1 gram |            |           |                |              |          |

### 13.1.2 Body Worn SAR Measurement Results

| GSM 850 Bodyworn SAR                                                                              |       |           |      |               |             |             |                                          |            |          |           |                |              |          |
|---------------------------------------------------------------------------------------------------|-------|-----------|------|---------------|-------------|-------------|------------------------------------------|------------|----------|-----------|----------------|--------------|----------|
| Frequency                                                                                         |       | Mode      | Ant. | Tune-Up Limit | Meas. Power | Power Drift | Test Position                            | Duty Cycle | Distance | Meas. SAR | Scaling Factor | Reported SAR | Plot No. |
| (MHz)                                                                                             | (Ch.) |           |      | (dBm)         | (dBm)       | (dB)        |                                          |            | (mm)     | (W/kg)    |                | (W/kg)       |          |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.10       | Rear                                     | 1:2.07     | 5        | 0.456     | 1.178          | 0.537        | B1       |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.07       | Front                                    | 1:2.07     | 5        | 0.365     | 1.178          | 0.430        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | 0.04        | Rear                                     | 1:8.3      | 5        | 0.163     | 1.236          | 0.201        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | -0.12       | Front                                    | 1:8.3      | 5        | 0.131     | 1.236          | 0.162        | -        |
| ANSI/IEEE C95.1 - 2005- Safety Limit<br>Spatial Peak<br>Uncontrolled Exposure/ General Population |       |           |      |               |             |             | Body<br>1.6 W/kg<br>Averaged over 1 gram |            |          |           |                |              |          |

### 13.1.3 Hotspot SAR Measurement Results

| GSM 850 Hotspot SAR                                                                               |       |           |      |               |             |             |                                          |            |          |           |                |              |          |
|---------------------------------------------------------------------------------------------------|-------|-----------|------|---------------|-------------|-------------|------------------------------------------|------------|----------|-----------|----------------|--------------|----------|
| Frequency                                                                                         |       | Mode      | Ant. | Tune-Up Limit | Meas. Power | Power Drift | Test Position                            | Duty Cycle | Distance | Meas. SAR | Scaling Factor | Reported SAR | Plot No. |
| (MHz)                                                                                             | (Ch.) |           |      | (dBm)         | (dBm)       | (dB)        |                                          |            | (mm)     | (W/kg)    |                | (W/kg)       |          |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.10       | Rear                                     | 1:2.07     | 5        | 0.456     | 1.178          | 0.537        | B1       |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | -0.07       | Front                                    | 1:2.07     | 5        | 0.365     | 1.178          | 0.430        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | 0.02        | Left                                     | 1:2.07     | 5        | 0.043     | 1.178          | 0.051        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | 0.06        | Right                                    | 1:2.07     | 5        | 0.234     | 1.178          | 0.276        | -        |
| 836.6                                                                                             | 190   | GPRS 4TX  | A    | 25.0          | 24.29       | 0.01        | Bottom                                   | 1:2.07     | 5        | 0.291     | 1.178          | 0.343        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | 0.04        | Rear                                     | 1:8.3      | 5        | 0.163     | 1.236          | 0.201        | -        |
| 836.6                                                                                             | 190   | GSM Voice | A    | 27.0          | 26.08       | -0.12       | Front                                    | 1:8.3      | 5        | 0.131     | 1.236          | 0.162        | -        |
| ANSI/IEEE C95.1 - 2005- Safety Limit<br>Spatial Peak<br>Uncontrolled Exposure/ General Population |       |           |      |               |             |             | Body<br>1.6 W/kg<br>Averaged over 1 gram |            |          |           |                |              |          |

## 13.2 SAR Test Notes

### General Notes:

1. The test data reported are the worst-case SAR values according to test procedures specified in IEEE 1528-2013, FCC KDB Procedure.
2. Batteries are fully charged at the beginning of the SAR measurements. A standard battery was used for all SAR measurements.
3. Liquid tissue depth was at least 15.0 cm for all frequencies.
4. 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.
5. SAR results were scaled to the maximum allowed power to demonstrate compliance per FCC KDB 447498 D01v06.
6. Device was tested using a fixed spacing for body-worn accessory testing. A separation distance of 5 mm was considered because the manufacturer has determined that there will be body-worn accessories available in the marketplace for users to support this separation distance.
7. Per FCC KDB 648474 D04v01r03, SAR was evaluated without a headset connected to the device. Since the standalone reported SAR was 1.2 W/kg, no additional SAR evaluation using a headset cable were required.
8. Per KDB 648474 D04v01r03, this device is considered a "Phablet" since the diagonal dimension is > 160 mm and < 200 mm. When hotspot mode applies, extremity SAR is required only for the surfaces and edges with hotspot mode scaled to the maximum output power (with tolerance) is 1 g SAR > 1.2 W/kg.
9. Per FCC KDB 865664 D01v01r04, variability SAR measurement were performed when the measured SAR results for a frequency Band were greater than or equal to 0.8 W/kg for 1g SAR and >2 for 10g SAR Please see Section 15 for variability analysis.
10. This device utilizes power reduction for some wireless mode and technologies, as outlined in sec. 4 The maximum output power allowed for each transmitter and exposure condition was evaluated for SAR compliance based on expected use conditions and simultaneous scenarios.
11. During SAR testing for the Hotspot conditions per KDB 941225 D06v02r01, the actual portable hotspot operation (with actual simultaneous transmission of a transmitter with WiFi) was not activated.

### GSM/GPRS Test Notes:

1. This EUT'S GSM and GPRS device class is B.
2. This device supports GPRS VOIP in the head and the body-worn configurations therefore GPRS was additionally evaluated for head and body-worn compliance.
3. Justification for reduced test configurations per KDB 941225 D01v03r01: The source-based time-averaged output power was evaluated for all multi-slot operations. The multi-slot configuration with the highest frame averaged output power including tolerance was evaluated for SAR.
4. Per FCC KDB 447498 D04v01, if the reported (scaled) SAR measured at the middle channel or highest output power channel for each test configuration is 0.8 W/kg then testing at the other channels is not required for such test configuration(s). When the maximum output power variation across the required test channels is 1/2 dB, instead of the middle channel, the highest output power channel must be used.

## 14. Simultaneous SAR Analysis

This device is contained transmitters that may operate simultaneously. Therefore, simultaneous transmission analysis is required. Per KDB Publication 447498 D01v06 4.3.2, simultaneous transmission SAR test exclusion may be applied when the sum of 1g SAR and 10g SAR for all the simultaneous transmitting antennas in a specific a physical test configuration is  $\leq 1.6\text{W/kg}$  for 1g SAR and  $\leq 4\text{ W/kg}$  for 10g SAR. The different test positions in an exposure condition may be considered collectively to determine SAR exclusion according to the sum of 1g or 10g SAR.

This device is enabled with S.LSI Time average SAR algorithm with pre-defined sub6 antenna groups (AG0 and AG1). Simultaneous transmission analysis is performed per antenna groups. Section 14.2 contains analysis to demonstrate the AG0 and AG1+WLAN5 GHz+BT/AG0+WLAN2.4 GHz and AG1+WLAN2.4 GHz are operate mutually exclusive. Additional analysis is provided below to show compliance between AG0 and AG1+WLAN5 GHz+BT/AG0+WLAN2.4 GHz and AG1+WLAN2.4 GHz.

The simultaneous transmission analysis of each antenna group and WLAN/BT was evaluated based on the maximum Reported SAR of the antenna in each Antenna group and the nearest y-axis coordinate of each antenna Group and WLAN/BT

If the sum result with each antenna exceeds the FCC SAR limit of 1.6 W/kg 1g ,4.0 W/kg 10g, the SPLSR was re-evaluated according to FCC KDB 447498 D01v06 4.3.2.

### 14.1 Sub6 Antenna Groups

S.LSI Time average SAR(TAS) algorithm operates based on pre-defined sub6 antenna groups (AG). Sub6 Tx antennas in the device are grouped based on spatial variation of RF exposure distributions, where the RF exposure of one AG is mutually exclusive from other AG. This is accomplished by demonstrating either of below conditions for all exposure scenarios:

LSI Algorithm in WWAN/WLAN adds directly adds the time-averaged RF exposure (LTE+ sub6 NR, WLAN 5 GHz + BT). Smart Transmit algorithm controls the total RF exposure (LTE+ sub6 NR, WLAN 5 GHz + BT) to not exceed FCC limit. Therefore, simultaneous transmission compliance between SAR radio1 + SAR radio2 operations within an antenna group is demonstrated in the Part 2 Report during algorithm validation.

Sum of SAR of one antenna from each of the sub6 AGs and the RF exposure from radios outside TAS is less than regulatory limits. This condition must be demonstrated for all antenna combinations of sub6 AGs.

This device supports two sub6 AG: AG0 and AG1, with AG0 having 4 antennas (Main1(A), Main2(B), Main3(C), Main4(D)) and AG1 having 3 antenna(Sub1(E), Sub2(F), Sub4(H)), ER(WLAN,BT,NFC). The conditions are verified through the following criteria.

The highest reported SAR at Plimit (or Pmax when Plimit > Pmax) for each antenna should be obtained out of all supported WWAN technologies and frequency bands for each exposure condition Demonstrate that the sum of reported SAR of antenna from each of the sub6 AGs and the sum of RF exposure of TAS should be less than the regulatory limit as given below for each RSI.

Obtain the worst-case reported SAR for each antenna group (i.e., maximum reported SAR at Plimit (or Pmax when Plimit > Pmax) out of all supported technologies, frequency bands and antennas in AG0 and AG1), denoted as max.SAR.AG0 and max.SAR.AG1, and obtain the worst-case RF exposure, and demonstrate that the sum of these RF exposures meets

$[ \text{Max.SAR.AG0} + \text{Max.SAR.AG1} ] + [ \text{Max.WLAN} + \text{Max.Bluetooth} ] \leq 1.6$  (for 1g SAR or 4.0 for 10g)

AG0, AG1,ER(WLAN/BT) are described in the table below.

| AG0            |                                                    |
|----------------|----------------------------------------------------|
| ANT A (Main1)  | GSM850, UMTS 5, LTE 12(17)/13/26(5), NR n5         |
| ANT B (Main 2) | GSM 1900, UMTS 2,4, LTE 25(2)/41/66(4), NR n41/n66 |
| ANT D (Main 4) | NR n41 SRS#3                                       |

| AG1           |                                             |
|---------------|---------------------------------------------|
| ANT E (Sub 1) | GSM850, UMTS 5, LTE 12(17)/13/26(5), NR n5  |
| ANT F (Sub 2) | LTE 25(2)/41/66(4) NR n66/n77, NR n41 SRS#1 |
| ANT H (Sub 4) | NR n41 SRS#2                                |

| ER(WLAN/BT)   |                                      |
|---------------|--------------------------------------|
| ANT E (Sub 1) | WLAN 5 GHz(Ant2)                     |
| ANT G (Sub 3) | WLAN 5 GHz(Ant1)                     |
| ANT H (Sub 4) | WLAN 2.4 GHz(Ant 1), Bluetooth(Ant1) |
| ANT J (Sub 6) | WLAN 2.4 GHz(Ant 2)                  |
| NFC           | NFC                                  |

Per S.LSI TAS's the technical document, the Sub6 antenna groups were decoupled by normalizing the maximum measurement results between the module and antenna based on TER, ensuring that the antenna group and module can operate independently while meeting regulatory requirements.

The simultaneous transmission analysis for this model was evaluated based on the maximum SAR result from the original SAR report [No. HCT-SR-2412-FC008-R2] and the test results from C2PC. The test results for the output change of Antenna A in the GSM850 band were all lower than the SAR results in the original SAR report. Therefore, the simultaneous transmission evaluation result for this model is identical to that in the original SAR report. For details, please refer to the original SAR report.

## 14.2 Conclusion

The above numerical summed SAR results is sufficient to show that simultaneous transmission cases will not exceed the SAR limit and therefore no measured volumetric simultaneous SAR summation is required per FCC KDB Publication 447498 D01V06 and IEEE 1528-2013 Section 6.3.4.1

## 15. Measurement Uncertainty

The measured SAR was  $<1.5$  W/Kg for 1g SAR and  $<3.75$  W/Kg For 10g SAR for all frequency Bands. Therefore, per KDB Publication 865664 D01v01r04, the extended measurement uncertainty analysis per IEEE1528-2013 was not required.

## 16. SAR Test Equipment

| Manufacturer | Type / Model                           | S/N                | Calib. Date | Calib.Interval | Calib.Due  |
|--------------|----------------------------------------|--------------------|-------------|----------------|------------|
| SPEAG        | SAM Phantom                            | -                  | N/A         | N/A            | N/A        |
| HP           | SAR System Control PC                  | -                  | N/A         | N/A            | N/A        |
| Staubli      | CS8Cspeag-TX60                         | F/20/0018446/C/001 | N/A         | N/A            | N/A        |
| Staubli      | TX60 Lspeag                            | F/20/0018446/A/001 | N/A         | N/A            | N/A        |
| Staubli      | Teach Pendant (Joystick)               | 1159               | N/A         | N/A            | N/A        |
| TESTO        | 175-H1/Thermometer                     | 44606611906        | 03/20/2025  | Annual         | 03/20/2026 |
| SPEAG        | DAE4                                   | 1254               | 05/21/2025  | Annual         | 05/21/2026 |
| SPEAG        | E-Field Probe EX3DV4                   | 7679               | 08/19/2025  | Annual         | 08/19/2026 |
| SPEAG        | Dipole D835V2                          | 4d165              | 04/14/2025  | Annual         | 04/14/2026 |
| Agilent      | Power Meter E4419B                     | MY41291386         | 09/11/2024  | Annual         | 09/11/2025 |
| Agilent      | Power Meter N1911A                     | MY45101406         | 05/19/2025  | Annual         | 05/19/2026 |
| sAgilent     | Power Sensor 8481A                     | SG1091286          | 09/12/2024  | Annual         | 09/12/2025 |
| H.P          | Power Sensor 8481A                     | MY41090675         | 09/12/2024  | Annual         | 09/12/2025 |
| Agilent      | Wideband Power Sensor N1921A           | MY55220026         | 08/07/2025  | Annual         | 08/07/2026 |
| Agilent      | 11636B/Power Divider                   | 58698              | 01/13/2025  | Annual         | 01/13/2026 |
| SPEAG        | DAKS 3.5                               | 1038               | 01/20/2025  | Annual         | 01/20/2026 |
| SPEAG        | MXA Signal Analyzer                    | MY49100108         | 01/07/2025  | Annual         | 01/07/2026 |
| H.P          | Network Analyzer /8753ES               | JP39240221         | 12/23/2024  | Annual         | 12/23/2025 |
| Protek       | NETWORK ANALYZER                       | X11-15305          | 02/10/2025  | Annual         | 02/10/2026 |
| Agilent      | WIRELESS COMMUNICATION E5515C          | MY48361100         | 09/11/2024  | Annual         | 09/11/2025 |
| Agilent      | WIRELESS COMMUNICATION E5515C          | MY48360252         | 07/29/2025  | Annual         | 07/29/2026 |
| R&S          | Wireless Communication Test Set CMW500 | 115733             | 03/20/2025  | Annual         | 03/20/2026 |
| R&S          | Wireless Communication Test Set CMW500 | 139333             | 12/09/2024  | Annual         | 12/09/2025 |
| Agilent      | SIGNAL GENERATOR N5182A                | MY47070230         | 03/18/2025  | Annual         | 03/18/2026 |
| EMPOWER      | RF Power Amplifier                     | 1084               | 05/20/2025  | Annual         | 05/20/2026 |
| MICRO LAB    | LP Filter / LA-15N                     | 10453              | 09/11/2024  | Annual         | 09/11/2025 |
| Agilent      | Attenuator (3dB) 8693B                 | MY39260298         | 08/18/2025  | Annual         | 08/18/2026 |
| HP           | Attenuator (20dB) 8493C                | 09271              | 08/18/2025  | Annual         | 08/18/2026 |
| HP           | Dual Directional Coupler               | 16072              | 09/11/2024  | Annual         | 09/11/2025 |
| YAMADA       | STRAIGHT RULE                          | -                  | 06/25/2025  | Annual         | 06/25/2026 |

\* The E-field probe was calibrated by SPEAG, by the waveguide technique procedure. Dipole Verification measurement is performed by HCT Lab. before each test. The brain/body simulating material is calibrated by HCT using the DAKS 3.5 to determine the conductivity and permittivity (dielectric constant) of the brain/body-equivalent material.

## 17. Conclusion

The SAR and RF Exposure measurement indicates that the EUT complies with the RF radiation exposure limits of the ANSI/ IEEE C95.1 - 2005.

These measurements were taken to simulate the RF effects exposure under worst-case conditions. Precise laboratory measures were taken to assure repeatability of the tests. The results and statements relate only to the item(s) tested.

Please note that the absorption and distribution of electromagnetic energy in the body are very complex phenomena that depend on the mass, shape, and size of the body, the orientation of the body with respect to the field vectors, and the electrical properties of both the body and the environment. Other variables that may play a substantial role in possible biological effects are those that characterize the environment (e.g. ambient temperature, air velocity, relative humidity, and body insulation) and those that characterize the individual (e.g. age, gender, activity level, debilitation, or disease). Because various factors may interact with one another to vary the specific biological outcome of an exposure to electromagnetic fields, any protection guide should consider maximal amplification of biological effects as a result of field-body interactions, environmental conditions, and physiological variables.

## 18. References

- [1] Federal Communications Commission, ET Docket 93-62, Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation, Aug. 1996.
- [2] ANSI/IEEE C95.1 - 2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 300 kHz to 300 GHz, New York: IEEE, Sept. 1992
- [3] ANSI/IEEE C 95.1 - 2005, American National Standard safety levels with respect to human exposure to radio frequency electromagnetic fields, 3 kHz to 300 GHz, New York: IEEE, 2006
- [4] ANSI/IEEE C95.3 - 2002, IEEE Recommended Practice for the Measurement of Potentially Hazardous Electromagnetic Fields - RF and Microwave, New York: December 2002.
- [5] IEEE Standards Coordinating Committee 34 – IEEE Std. 1528-2013, IEEE Recommended Practice or Determining the Peak Spatial-Average Specific Absorption Rate (SAR) in the Human Body from Wireless Communications Devices
- [6] NCRP, National Council on Radiation Protection and Measurements, Biological Effects and Exposure Criteria for Radio Frequency Electromagnetic Fields, NCRP Report No. 86, 1986. Reprinted Feb. 1995.
- [7] T. Schmid, O. Egger, N. Kuster, Automated E-field scanning system for dosimetric assessments, IEEE Transaction on Microwave Theory and Techniques, vol. 44, Jan. 1996, pp. 105-113.
- [8] K. Pokovic, T. Schmid, N. Kuster, Robust setup for precise calibration of E-field probes in tissue simulating liquids at mobile communications frequencies, ICECOM97, Oct. 1997, pp. 120-124.
- [9] K. Pokovic, T. Schmid, and N. Kuster, E-field Probe with improved isotropy in brain simulating liquids, Proceedings of the ELMAR, Zadar, Croatia, June 23-25, 1996, pp. 172-175.
- [10] Schmid & Partner Engineering AG, Application Note: Data Storage and Evaluation, June 1998, p2.
- [11] V. Hombach, K. Meier, M. Burkhardt, E. Kuhn, N. Kuster, The Dependence of EM Energy Absorption upon Human Head Modeling at 900 MHz, IEEE Transaction on Microwave Theory and Techniques, vol. 44 no. 10, Oct. 1996, pp. 1865-1873.
- [12] N. Kuster and Q. Balzano, Energy absorption mechanism by biological bodies in the near field of dipole antennas above 300 MHz, IEEE Transaction on Vehicular Technology, vol. 41, no. 1, Feb. 1992, pp. 17-23.
- [13] G. Hartsgrove, A. Kraszewski, A. Surowiec, Simulated Biological Materials for Electromagnetic Radiation Absorption Studies, University of Ottawa, Bioelectromagnetics, Canada: 1987, pp. 29-36.
- [14] Q. Balzano, O. Garay, T. Manning Jr., Electromagnetic Energy Exposure of Simulated Users of Portable Cellular Telephones, IEEE Transactions on Vehicular Technology, vol. 44, no.3, Aug. 1995.
- [15] W. Gander, Computer mathematic, Birkhaeuser, Basel, 1992.
- [16] W.H. Press, S.A. Teukolsky, W.T. Vetterling, and B.P. Flannery, Numerical Recipes in C, The Art of Scientific Computing, Second edition, Cambridge University Press, 1992.
- [17] N. Kuster, R. Kastle, T. Schmid, Dosimetric evaluation of mobile communications equipment with known precision, IEEE Transaction on Communications, vol. E80-B, no. 5, May 1997, pp. 645-652.
- [18] CENELEC CLC/SC111B, European Prestandard (prENV 50166-2), Human Exposure to Electromagnetic Fields High-frequency: 10 kHz-300 GHz, Jan. 1995.
- [19] Prof. Dr. Niels Kuster, ETH, Eidgenössische Technische Hochschule Zürich, Dosimetric Evaluation of the Cellular Phone.

- [20] IEC 62209-1, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation and procedures – Part 1: Procedure to determine the specific absorption rate (SAR) for hand-held devices used in close proximity to the ear (frequency range of 300 MHz to 3 GHz), July. 2016..
- [21] IEC 62209-2, Human exposure to radio frequency fields from hand-held and body-mounted wireless communication devices – Human models, instrumentation, and procedures – Part 2: Procedure to determine the specific absorption rate (SAR) for wireless communication devices used in close proximity to the human body (frequency range of 30 MHz to 6 GHz) Mar. 2010.
- [22] Industry Canada RSS-102 Radio Frequency Exposure Compliance of Radio Communication Apparatus (All Frequency Band) Issue 5, March 2015.
- [23] Health Canada Safety Code 6 Limits of Human Exposure to Radio Frequency Electromagnetic Fields in the Frequency range from 3 kHz – 300 GHz, 2009
- [24] FCC SAR Test procedures for 2G-3G Devices, Mobile Hotspot and UMPC Device KDB 941225 D01.
- [25] SAR Measurement Guidance for IEEE 802.11 transmitters, KDB 248227 D01v02r02
- [26] SAR Evaluation of Handsets with Multiple Transmitters and Antennas KDB 648474 D03, D04.
- [27] SAR Evaluation for Laptop, Notebook, Netbook and Tablet computers KDB 616217 D04.
- [28] SAR Measurement and Reporting Requirements for 100 MHz – 6 GHz, KDB 865664 D01, D02.
- [29] FCC General RF Exposure Guidance KDB 447498 D01v06.

## Appendix A. DUT Ant. Information & SETUP PHOTO

Please refer to test DUT Ant. Information & setup photo file no. as follows:

| Report No.          |
|---------------------|
| HCT-SR-2509-FC002-P |

## Appendix B. – SAR Test Plots

## SAR Test Plot(Head)

Test Laboratory: HCT CO., LTD  
EUT Type: Mobile Phone  
Ambient Temperature: 20.1  
Liquid Temperature: 19.9  
Test Date: 09/02/2025  
Plot No.: A1

Measurement Report for Device, CHEEK, GSM 850, GPRS-FDD (TDMA, GMSK, TN 0-1-2-3), Channel 190 (836.600 MHz)

### Exposure Conditions

| Phantom Section, TSL              | Position, Test Distance [mm] | Band    | Group, UID     | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|-----------------------------------|------------------------------|---------|----------------|---------------------------------|-------------------|------------------------|------------------|
| RightHead, Head Simulating Liquid | CHEEK, 0.00                  | GSM 850 | GSM, 10028-DAC | 836.600, 190                    | 9.58              | 0.919                  | 42.0             |

### Hardware Setup

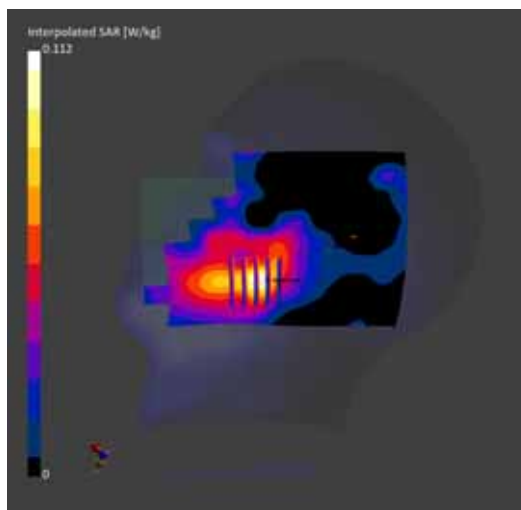
|                                         |                             |                         |
|-----------------------------------------|-----------------------------|-------------------------|
| Phantom                                 | Probe, Calibration Date     | DAE, Calibration Date   |
| Twin-SAM V8.0 (30deg probe tilt) - xxxx | EX3DV4 - SN7679, 2025-08-19 | DAE4 Sn1254, 2025-05-21 |

### Scans Setup

|                     | Area Scan     | Zoom Scan          |
|---------------------|---------------|--------------------|
| Grid Extents [mm]   | 120.0 x 210.0 | 32.0 x 32.0 x 30.0 |
| Grid Steps [mm]     | 15.0 x 15.0   | 8.0 x 8.0 x 5.0    |
| Sensor Surface [mm] | 3.0           | 1.4                |

### Measurement Results

|                  | Area Scan | Zoom Scan |
|------------------|-----------|-----------|
| psSAR1g [W/Kg]   | 0.088     | 0.083     |
| psSAR10g [W/Kg]  | 0.053     | 0.062     |
| Power Drift [dB] | -0.13     | -0.11     |



## SAR Test Plot(Bodyworn, Hotspot)

Test Laboratory: HCT CO., LTD

EUT Type: Mobile Phone

Ambient Temperature: 20.1

Liquid Temperature: 19.9

Test Date: 09/02/2025

Plot No.: B1

Measurement Report for Device, BACK, GSM 850, GPRS-FDD (TDMA, GMSK, TN 0-1-2-3), Channel 190 (836.600 MHz)

### Exposure Conditions

| Phantom Section, TSL         | Position, Test Distance [mm] | Band    | Group, UID     | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|------------------------------|------------------------------|---------|----------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, Head Simulating Liquid | BACK, 5.00                   | GSM 850 | GSM, 10028-DAC | 836.600, 190                    | 9.58              | 0.919                  | 42.0             |

### Hardware Setup

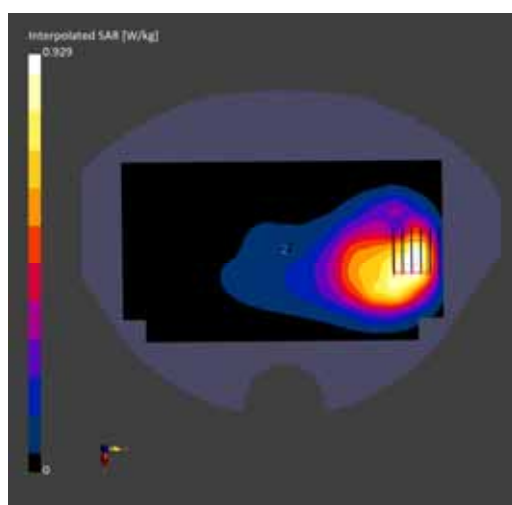
| Phantom                                 | Probe, Calibration Date     | DAE, Calibration Date   |
|-----------------------------------------|-----------------------------|-------------------------|
| Twin-SAM V8.0 (30deg probe tilt) - xxxx | EX3DV4 - SN7679, 2025-08-19 | DAE4 Sn1254, 2025-05-21 |

### Scans Setup

|                     | Area Scan     | Zoom Scan          |
|---------------------|---------------|--------------------|
| Grid Extents [mm]   | 120.0 x 210.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm]     | 15.0 x 15.0   | 6.0 x 6.0 x 1.5    |
| Sensor Surface [mm] | 3.0           | 1.4                |

### Measurement Results

|                  | Area Scan | Zoom Scan |
|------------------|-----------|-----------|
| psSAR1g [W/Kg]   | 0.383     | 0.456     |
| psSAR10g [W/Kg]  | 0.252     | 0.244     |
| Power Drift [dB] | 0.15      | -0.10     |



## Appendix C. – Dipole Verification Plots

Test Laboratory: HCT CO., LTD  
 Input Power: 0.05 W  
 Liquid Temperature: 19.9 °C  
 Test Date: 09/02/2025  
 Band: GSM Band 850 Ant.A  
 Plot No.: V1  
 Measurement Report for Device, , , CW, Channel 0 (835.000 MHz)

### Exposure Conditions

| Phantom Section, TSL         | Group, UID | Frequency [MHz], Channel Number | Conversion Factor | TSL Conductivity [S/m] | TSL Permittivity |
|------------------------------|------------|---------------------------------|-------------------|------------------------|------------------|
| Flat, Head Simulating Liquid | CW, 0--    | 835.000, 0                      | 9.58              | 0.920                  | 42.0             |

### Hardware Setup

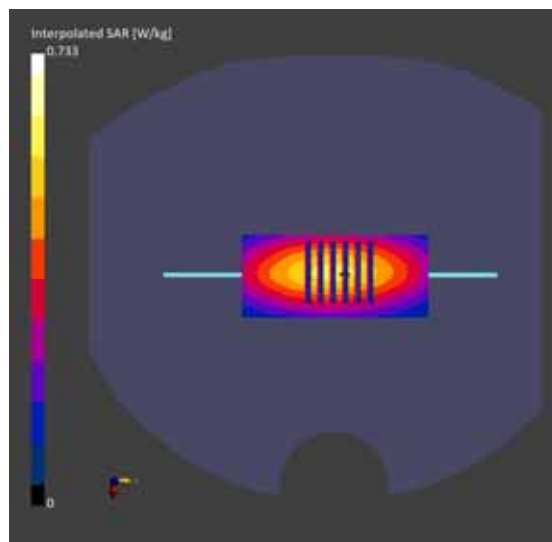
|                                         |                             |                         |
|-----------------------------------------|-----------------------------|-------------------------|
| Phantom                                 | Probe, Calibration Date     | DAE, Calibration Date   |
| Twin-SAM V8.0 (30deg probe tilt) - xxxx | EX3DV4 - SN7679, 2025-08-19 | DAE4 Sn1254, 2025-05-21 |

### Scans Setup

|                     | Area Scan   | Zoom Scan          |
|---------------------|-------------|--------------------|
| Grid Extents [mm]   | 40.0 x 90.0 | 30.0 x 30.0 x 30.0 |
| Grid Steps [mm]     | 10.0 x 15.0 | 6.0 x 6.0 x 1.5    |
| Sensor Surface [mm] | 3.0         | 1.4                |

### Measurement Results

|                  | Area Scan | Zoom Scan |
|------------------|-----------|-----------|
| psSAR1g [W/Kg]   | 0.500     | 0.500     |
| psSAR10g [W/Kg]  | 0.331     | 0.328     |
| Power Drift [dB] | 0.01      | -0.00     |



## Appendix D. – SAR Tissue Characterization

The brain and muscle mixtures consist of a viscous gel using hydrox-ethyl cellulose (HEC) gelling agent and saline solution (see Table 3.1). 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 mixture characterizations used for the brain and muscle tissue simulating liquids are according to the data by C. Gabriel and G. Harts grove.

| Ingredients<br>(% by weight)  | Frequency (MHz) |      |       |       |       |       |               |      |              |       |
|-------------------------------|-----------------|------|-------|-------|-------|-------|---------------|------|--------------|-------|
|                               | 750             |      | 835   |       | 1 900 |       | 2 450 – 2 700 |      | 3500 - 5 800 |       |
| Tissue Type                   | Head            | Body | Head  | Body  | Head  | Body  | Head          | Body | Head         | Body  |
| Water                         | 41.1            | 51.7 | 40.45 | 53.06 | 54.9  | 70.17 | 71.88         | 73.2 | 65.52        | 78.66 |
| Salt (NaCl)                   | 1.4             | 0.9  | 1.45  | 0.94  | 0.18  | 0.39  | 0.16          | 0.1  | 0.0          | 0.0   |
| Sugar                         | 57.0            | 47.2 | 57.0  | 44.9  | 0.0   | 0     | 0.0           | 0.0  | 0.0          | 0.0   |
| HEC                           | 0.2             | 0    | 1.0   | 1.0   | 0.0   | 0     | 0.0           | 0.0  | 0.0          | 0.0   |
| Bactericide                   | 0.2             | 0.1  | 0.1   | 0.1   | 0.0   | 0     | 0.0           | 0.0  | 0.0          | 0.0   |
| Triton X-100                  | 0.0             | 0.0  | 0.0   | 0.0   | 0.0   | 0.0   | 19.97         | 0.0  | 17.24        | 10.67 |
| DGBE                          | 0.0             | 0.0  | 0.0   | 0.0   | 44.92 | 29.44 | 7.99          | 26.7 | 0.0          | 0.0   |
| Diethylene glycol hexyl ether | -               | -    | -     | -     | -     | -     | -             | -    | -            | -     |

|                           |                                                                      |        |                        |
|---------------------------|----------------------------------------------------------------------|--------|------------------------|
| Salt:                     | 99 % Pure Sodium Chloride                                            | Sugar: | 98 % Pure Sucrose      |
| Water:                    | De-ionized, 16M resistivity                                          | HEC:   | Hydroxyethyl Cellulose |
| DGBE:                     | 99 % Di (ethylene glycol) butyl ether, [2-(2-butoxyethoxy) ethanol]  |        |                        |
| Triton X-100(ultra-pure): | Polyethylene glycol mono [4-(1,1,3,3-tetramethylbutyl) phenyl] ether |        |                        |

Composition of the Tissue Equivalent Matter

## Appendix E. – SAR System Validation

Per FCC KDB 865664 D02v01r02, SAR system validation status should be document to confirm measurement accuracy. The SAR systems (including SAR probes, system components and software versions) used for this device were validated against its performance specifications prior to the SAR measurements. Reference dipoles were used with the required tissue- equivalent media for system validation, according to the procedures outlined in IEEE 1528-2013 and FCC KDB 865664 D01v01r04. Since SAR probe calibrations are frequency dependent, each probe calibration point was validated at a frequency within the valid frequency range of the probe calibration point, using the system that normally operates with the probe for routine SAR measurements and according to the required tissue-equivalent media.

A tabulated summary of the system validation status including the validation date(s), measurement frequencies, SAR probes and tissue dielectric parameters has been included.

| SAR System No. | Probe | Probe Type | Probe Calibration Point |     | Dipole | Date       | Dielectric Parameters |                       | CW Validation |                 |                | Modulation Validation |             |     |
|----------------|-------|------------|-------------------------|-----|--------|------------|-----------------------|-----------------------|---------------|-----------------|----------------|-----------------------|-------------|-----|
|                |       |            |                         |     |        |            | Measured Permittivity | Measured Conductivity | Sensitivity   | Probe Linearity | Probe Isotropy | MOD. Type             | Duty Factor | PAR |
| 10             | 7679  | EX3DV4     | Head                    | 835 | 4d165  | 2025-08-30 | 41.6                  | 0.92                  | PASS          | PASS            | PASS           | N/A                   | N/A         | N/A |
| 10             | 7679  | EX3DV4     | Head                    | 835 | 4d165  | 2025-08-30 | 41.6                  | 0.92                  | PASS          | PASS            | PASS           | GMSK                  | PASS        | N/A |

SAR System Validation Summary

### Note;

All measurement were performed using probes calibrated for CW signal only. Modulations in the table above represent test configurations for which the measurement system has been validated per FCC KDB Publication 865664 D01v01r04. SAR system were validated for modulated signals with a periodic duty cycle, such as GMSK, or with a high peak to average ratio (>5 dB), such as OFDM according to KDB 865664 D01v01r04.

## Appendix F. – Probe Calibration Data

### 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

HCT

Gyeonggi-do, Republic of Korea

Certificate No.

EX-7679\_Aug25

### CALIBRATION CERTIFICATE

Object

EX3DV4 - SN:7679

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

August 19, 2025

This calibration certificate documents the traceability to national standards, which realize the physical units of measurements (SI).  
The measurements and the uncertainties with confidence probability are given on the following pages and are part of the certificate.

All calibrations have been conducted in the closed laboratory facility: environment temperature  $(22 \pm 3)^\circ\text{C}$  and humidity  $< 70\%$ .

Calibration Equipment used (M&TE critical for calibration)

| Primary Standards           | ID         | Calibration Date (Certificate No.)     | Sched. Cal. |
|-----------------------------|------------|----------------------------------------|-------------|
| Power Sensor R&S NRP-33T    | SN: 100967 | 30-Apr-25 (No. 1020-300791789)         | Apr-26      |
| N-type mismatch combination | SN: L1119  | 26-Mar-25 (No. 217-04292)              | Mar-26      |
| OCP DAK-12                  | SN: 1016   | 24-Sept-24 (No. OCP-DAK12-1016_Sep24)  | Sep-25      |
| OCP DAK-3.5                 | SN: 1249   | 23-Sept-24 (No. OCP-DAK3.5-1249_Sep24) | Sep-25      |
| Reference Probe EX3DV4      | SN: 7349   | 10-Jan-25 (No. EX3-7349_Jan25)         | Jan-26      |
| DAE4                        | SN: 1301   | 07-Nov-24 (No. DAE4-1301_Nov24)        | Nov-25      |

| Secondary Standards | ID        | Check Date (in house)                            | Sched. Check |
|---------------------|-----------|--------------------------------------------------|--------------|
| ACAP 2020 Setup 1   | SN: L1404 | 30-Sept-24 (No. Report_ACAP2020E-Cave_20240930s) | Sep-25       |
| OCP DAK-12          | SN: 1029  | 27-Feb-25 (No. OCP-DAK12-1029_Feb25)             | Feb-26       |
| OCP DAK-3.5         | SN: 1336  | 09-Dec-24 (No. OCP-DAK3.5-1336_Dec24)            | Dec-25       |

|                                                                                                                 |                       |                         |
|-----------------------------------------------------------------------------------------------------------------|-----------------------|-------------------------|
| Name                                                                                                            | Function              | Signature               |
| Calibrated by<br>Joanna Lleshaj                                                                                 | Laboratory Technician |                         |
| Approved by<br>Sven Kühn                                                                                        | Technical Manager     |                         |
|                                                                                                                 |                       | Issued: August 19, 2025 |
| This calibration certificate shall not be reproduced except in full without written approval of the laboratory. |                       |                         |

Certificate No: EX-7679\_Aug25

Page 1 of 22

|       |            |            |
|-------|------------|------------|
| 결     | 담당자        | 확인자        |
| 재     | 김지훈        | 김지훈        |
| 작업/성명 | DL 김지훈     | BS 김지훈     |
| 일시    | 2025.08.29 | 2025.08.29 |

## 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 <sub>x,y,z</sub>  | sensitivity in free space                                                                                                                      |
| ConvF                  | sensitivity in TSL / NORM <sub>x,y,z</sub>                                                                                                     |
| DCP                    | diode compression point                                                                                                                        |
| CF                     | crest factor (1/duty_cycle) of the RF signal                                                                                                   |
| A, B, C, D             | modulation dependent linearization parameters                                                                                                  |
| Polarization $\varphi$ | $\varphi$ rotation around probe axis                                                                                                           |
| Polarization $\theta$  | $\theta$ 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 865664, "SAR Measurement Requirements for 100 MHz to 6 GHz"

## Methods Applied and Interpretation of Parameters:

- NORM<sub>x,y,z</sub>**: Assessed for E-field polarization  $\theta = 0$  ( $f \leq 900$  MHz in TEM-cell;  $f > 1800$  MHz: R22 waveguide). NORM<sub>x,y,z</sub> are only intermediate values, i.e., the uncertainties of NORM<sub>x,y,z</sub> does not affect the E<sup>2</sup>-field uncertainty inside TSL (see below ConvF).
- NORM(f)<sub>x,y,z</sub>** = NORM<sub>x,y,z</sub> \* 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<sub>x,y,z</sub>**: 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<sub>x,y,z</sub>; B<sub>x,y,z</sub>; C<sub>x,y,z</sub>; D<sub>x,y,z</sub>; VR<sub>x,y,z</sub>**: 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<sub>x,y,z</sub> \* ConvF whereby the uncertainty corresponds to that given for ConvF. A frequency dependent ConvF is used in DASY version 4.4 and higher which allows extending the validity from  $\pm 50$  MHz to  $\pm 100$  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<sub>x</sub> (no uncertainty required).

EX3DV4 - SN:7679

August 19, 2025

## Parameters of Probe: EX3DV4 - SN:7679

### Basic Calibration Parameters

|                                                           | Sensor X | Sensor Y | Sensor Z | Unc (k = 2)  |
|-----------------------------------------------------------|----------|----------|----------|--------------|
| Norm ( $\mu\text{V}/(\text{V}/\text{m})^2$ ) <sup>A</sup> | 0.65     | 0.52     | 0.66     | $\pm 10.1\%$ |
| DCP (mV) <sup>B</sup>                                     | 105.1    | 104.4    | 101.9    | $\pm 4.7\%$  |

### Calibration Results for Modulation Response

| UID   | Communication System Name   |   | A<br>dB | B<br>dB $\sqrt{\mu\text{V}}$ | C     | D<br>dB | VR<br>mV | Max<br>dev. | Max<br>Unc <sup>E</sup><br>k = 2 |
|-------|-----------------------------|---|---------|------------------------------|-------|---------|----------|-------------|----------------------------------|
| 0     | CW                          | X | 0.00    | 0.00                         | 1.00  | 0.00    | 146.0    | $\pm 2.3\%$ | $\pm 4.7\%$                      |
|       |                             | Y | 0.00    | 0.00                         | 1.00  |         | 129.0    |             |                                  |
|       |                             | Z | 0.00    | 0.00                         | 1.00  |         | 143.5    |             |                                  |
| 10352 | Pulse Waveform (200Hz, 10%) | X | 12.00   | 74.00                        | 11.00 | 10.00   | 60.0     | $\pm 3.2\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 1.59    | 61.10                        | 6.82  |         | 60.0     |             |                                  |
|       |                             | Z | 1.44    | 60.35                        | 5.87  |         | 60.0     |             |                                  |
| 10353 | Pulse Waveform (200Hz, 20%) | X | 10.00   | 72.00                        | 9.00  | 6.99    | 80.0     | $\pm 2.5\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 0.78    | 60.00                        | 5.00  |         | 80.0     |             |                                  |
|       |                             | Z | 18.00   | 74.00                        | 9.00  |         | 80.0     |             |                                  |
| 10354 | Pulse Waveform (200Hz, 40%) | X | 0.54    | 60.00                        | 3.62  | 3.98    | 95.0     | $\pm 2.7\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 0.19    | 118.61                       | 1.36  |         | 95.0     |             |                                  |
|       |                             | Z | 0.54    | 159.87                       | 20.97 |         | 95.0     |             |                                  |
| 10355 | Pulse Waveform (200Hz, 60%) | X | 11.88   | 155.05                       | 9.23  | 2.22    | 120.0    | $\pm 1.7\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 2.77    | 158.59                       | 6.11  |         | 120.0    |             |                                  |
|       |                             | Z | 8.90    | 128.70                       | 9.50  |         | 120.0    |             |                                  |
| 10387 | QPSK Waveform, 1 MHz        | X | 0.62    | 62.74                        | 11.27 | 1.00    | 150.0    | $\pm 4.8\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 0.49    | 61.67                        | 10.48 |         | 150.0    |             |                                  |
|       |                             | Z | 0.92    | 67.26                        | 13.63 |         | 150.0    |             |                                  |
| 10388 | QPSK Waveform, 10 MHz       | X | 1.35    | 64.63                        | 13.29 | 0.00    | 150.0    | $\pm 1.4\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 1.23    | 64.01                        | 12.85 |         | 150.0    |             |                                  |
|       |                             | Z | 1.58    | 66.71                        | 14.69 |         | 150.0    |             |                                  |
| 10396 | 64-QAM Waveform, 100 kHz    | X | 1.67    | 64.21                        | 15.78 | 3.01    | 150.0    | $\pm 1.3\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 1.68    | 64.27                        | 15.77 |         | 150.0    |             |                                  |
|       |                             | Z | 1.82    | 65.97                        | 17.14 |         | 150.0    |             |                                  |
| 10399 | 64-QAM Waveform, 40 MHz     | X | 2.83    | 65.63                        | 14.67 | 0.00    | 150.0    | $\pm 2.4\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 2.72    | 65.27                        | 14.51 |         | 150.0    |             |                                  |
|       |                             | Z | 3.04    | 66.59                        | 15.40 |         | 150.0    |             |                                  |
| 10414 | WLAN CCDF, 64-QAM, 40 MHz   | X | 3.90    | 65.39                        | 14.98 | 0.00    | 150.0    | $\pm 4.5\%$ | $\pm 9.6\%$                      |
|       |                             | Y | 3.95    | 65.94                        | 15.26 |         | 150.0    |             |                                  |
|       |                             | Z | 4.16    | 66.08                        | 15.58 |         | 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%.

<sup>A</sup> The uncertainties of Norm X,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Pages 5 and 6).

<sup>B</sup> Linearization parameter uncertainty for maximum specified field strength.

<sup>E</sup> 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:7679

August 19, 2025

## Parameters of Probe: EX3DV4 - SN:7679

### Sensor Model Parameters

|   | C1<br>fF | C2<br>fF | $\alpha$<br>$V^{-1}$ | T1<br>$msV^{-2}$ | T2<br>$msV^{-1}$ | T3<br>ms | T4<br>$V^{-2}$ | T5<br>$V^{-1}$ | T6   |
|---|----------|----------|----------------------|------------------|------------------|----------|----------------|----------------|------|
| x | 12.4     | 90.07    | 33.56                | 5.16             | 0.00             | 4.90     | 0.40           | 0.00           | 1.00 |
| y | 11.4     | 84.55    | 34.78                | 1.80             | 0.00             | 4.96     | 0.49           | 0.03           | 1.00 |
| z | 14.1     | 105.71   | 35.77                | 3.76             | 0.00             | 4.90     | 0.51           | 0.00           | 1.01 |

### Other Probe Parameters

|                                               |            |
|-----------------------------------------------|------------|
| Sensor Arrangement                            | Triangular |
| Connector Angle                               | 49.0°      |
| Mechanical Surface Detection Mode             | enabled    |
| Optical Surface Detection Mode                | disabled   |
| Probe Overall Length                          | 337 mm     |
| Probe Body Diameter                           | 12 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:7679

August 19, 2025

## Parameters of Probe: EX3DV4 - SN:7679

### Calibration Parameter Determined in HSL

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity <sup>F</sup> (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc <sup>H</sup> (k = 2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|--------------------------|
| 750                  | 41.9                               | 0.89                            | 9.95    | 9.01    | 9.71    | 0.38               | 1.27                    | ±11.0%                   |
| 835                  | 41.5                               | 0.90                            | 9.58    | 8.68    | 9.35    | 0.38               | 1.27                    | ±11.0%                   |
| 900                  | 41.5                               | 0.97                            | 9.47    | 8.58    | 9.24    | 0.38               | 1.27                    | ±11.0%                   |
| 1640                 | 40.2                               | 1.31                            | 8.48    | 7.68    | 8.28    | 0.37               | 1.27                    | ±11.0%                   |
| 1750                 | 40.1                               | 1.37                            | 8.39    | 7.60    | 8.20    | 0.37               | 1.27                    | ±11.0%                   |
| 1900                 | 40.0                               | 1.40                            | 8.13    | 7.37    | 7.94    | 0.37               | 1.27                    | ±11.0%                   |
| 2300                 | 39.5                               | 1.67                            | 7.99    | 7.24    | 7.80    | 0.37               | 1.27                    | ±11.0%                   |
| 2450                 | 39.2                               | 1.80                            | 7.71    | 6.98    | 7.53    | 0.37               | 1.27                    | ±11.0%                   |
| 2600                 | 39.0                               | 1.96                            | 7.79    | 7.05    | 7.60    | 0.37               | 1.27                    | ±11.0%                   |
| 3300                 | 38.2                               | 2.71                            | 6.94    | 6.29    | 6.78    | 0.37               | 1.27                    | ±13.1%                   |
| 3500                 | 37.9                               | 2.91                            | 7.09    | 6.42    | 6.92    | 0.37               | 1.27                    | ±13.1%                   |
| 3700                 | 37.7                               | 3.12                            | 6.95    | 6.29    | 6.78    | 0.36               | 1.27                    | ±13.1%                   |
| 3900                 | 37.5                               | 3.32                            | 6.78    | 6.14    | 6.62    | 0.36               | 1.27                    | ±13.1%                   |
| 4100                 | 37.2                               | 3.53                            | 6.64    | 6.01    | 6.48    | 0.36               | 1.27                    | ±13.1%                   |
| 5250                 | 35.9                               | 4.71                            | 5.88    | 5.33    | 5.74    | 0.32               | 1.27                    | ±13.1%                   |
| 5600                 | 35.5                               | 5.07                            | 5.43    | 4.92    | 5.30    | 0.29               | 1.27                    | ±13.1%                   |
| 5750                 | 35.4                               | 5.22                            | 5.40    | 4.89    | 5.27    | 0.27               | 1.27                    | ±13.1%                   |
| 5800                 | 35.3                               | 5.27                            | 5.36    | 4.86    | 5.23    | 0.27               | 1.27                    | ±13.1%                   |

<sup>C</sup> Frequency validity above 300 MHz of ±100 MHz only applies for DASY 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 220 MHz respectively. Validity of ConvF assessed at 6 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.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  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.

<sup>G</sup> 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 3–6 GHz at any distance larger than half the probe tip diameter from the boundary.

<sup>H</sup> The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

EX3DV4 - SN:7679

August 19, 2025

## Parameters of Probe: EX3DV4 - SN:7679

### Calibration Parameter Determined in HSL

| f (MHz) <sup>C</sup> | Relative Permittivity <sup>F</sup> | Conductivity <sup>F</sup> (S/m) | ConvF X | ConvF Y | ConvF Z | Alpha <sup>G</sup> | Depth <sup>G</sup> (mm) | Unc <sup>H</sup> (k = 2) |
|----------------------|------------------------------------|---------------------------------|---------|---------|---------|--------------------|-------------------------|--------------------------|
| 6500                 | 34.5                               | 6.07                            | 5.73    | 5.20    | 5.60    | 0.20               | 1.27                    | ±18.6%                   |

<sup>C</sup> Frequency validity is -600/+700 MHz at 6.5 GHz, ±700 MHz at or above 7 GHz, and ±150 MHz at 9.85 GHz. The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

<sup>F</sup> The probes are calibrated using tissue simulating liquids (TSL) that deviate for  $\epsilon$  and  $\sigma$  by less than ±10% from the target values (typically better than ±6%) and are valid for TSL with deviations of up to ±10%.

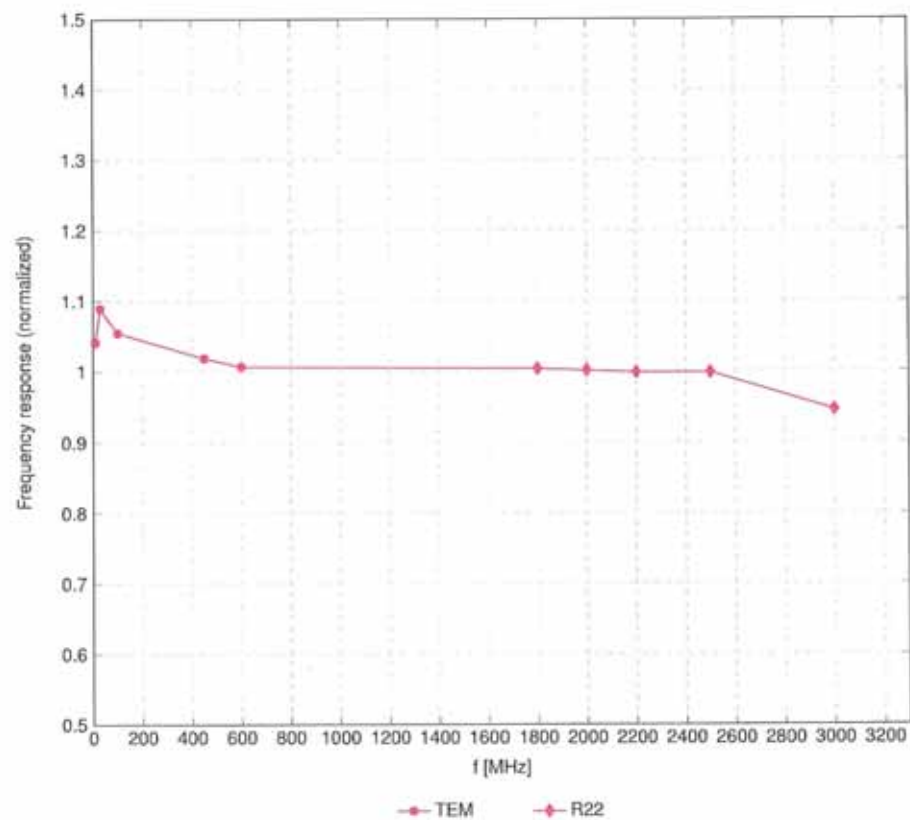
<sup>G</sup> Alpha/Depth are determined during calibration. SPEAG warrants that the remaining deviation due to the boundary effect after compensation is always less than ±1% for frequencies below 3 GHz; below ±2% for frequencies between 3–6 GHz; and below ±4% for frequencies between 6–10 GHz at any distance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

<sup>H</sup> The stated uncertainty is the total calibration uncertainty (k = 2) of Norm-ConvF. This is equivalent to the uncertainty component with the symbol CF in Table 9 of IEC/IEEE 62209-1528:2020.

EX3DV4 - SN:7679

August 19, 2025

## Frequency Response of E-Field (TEM-Cell:ifi110 EXX, Waveguide:R22)

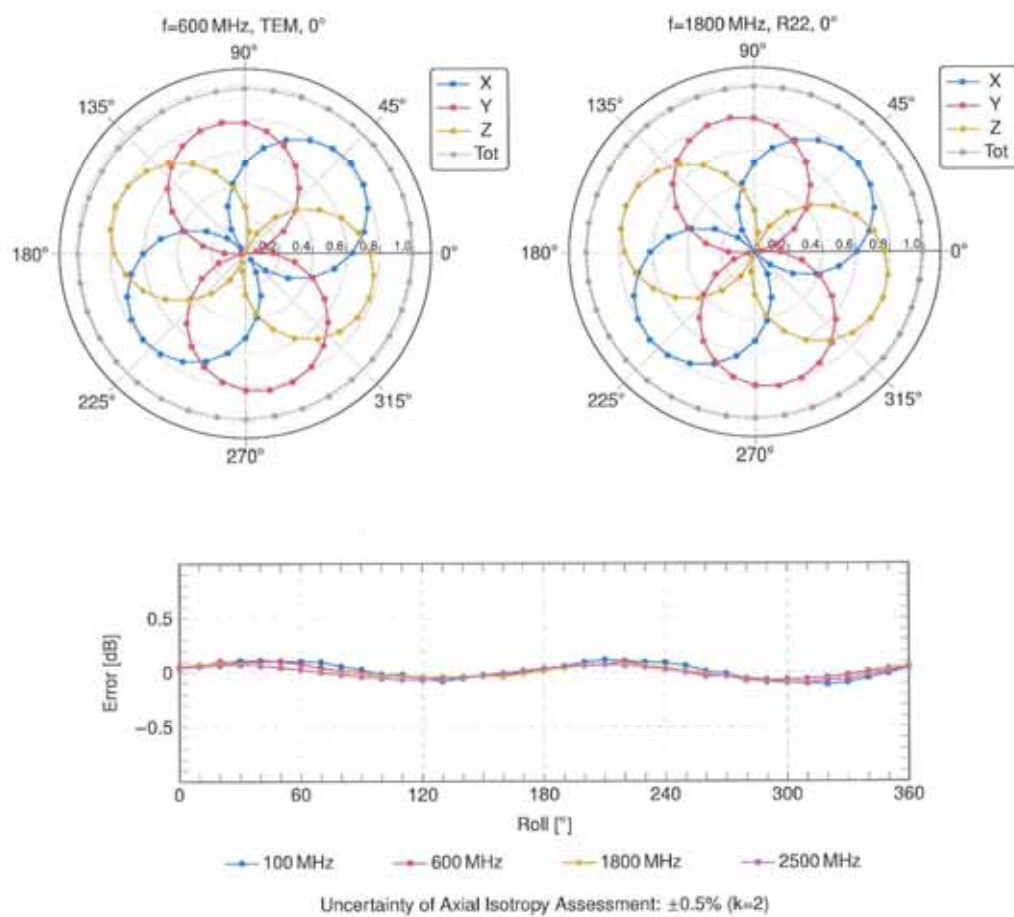


Uncertainty of Frequency Response of E-field:  $\pm 6.3\%$  ( $k=2$ )

EX3DV4 - SN:7679

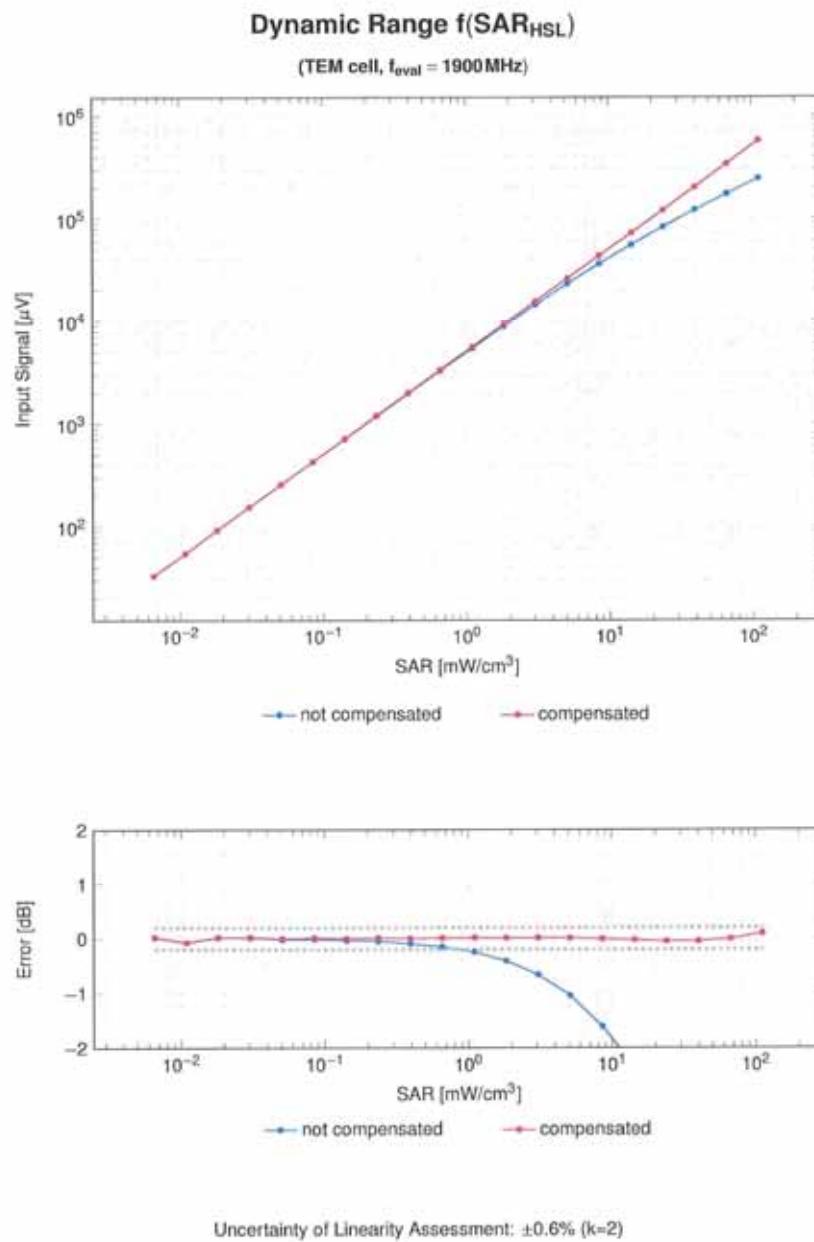
August 19, 2025

## Receiving Pattern ( $\phi$ ), $\theta = 0^\circ$



EX3DV4 - SN:7679

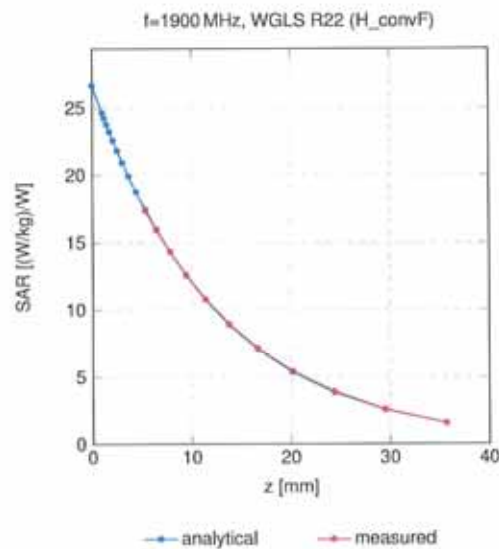
August 19, 2025



EX3DV4 - SN:7679

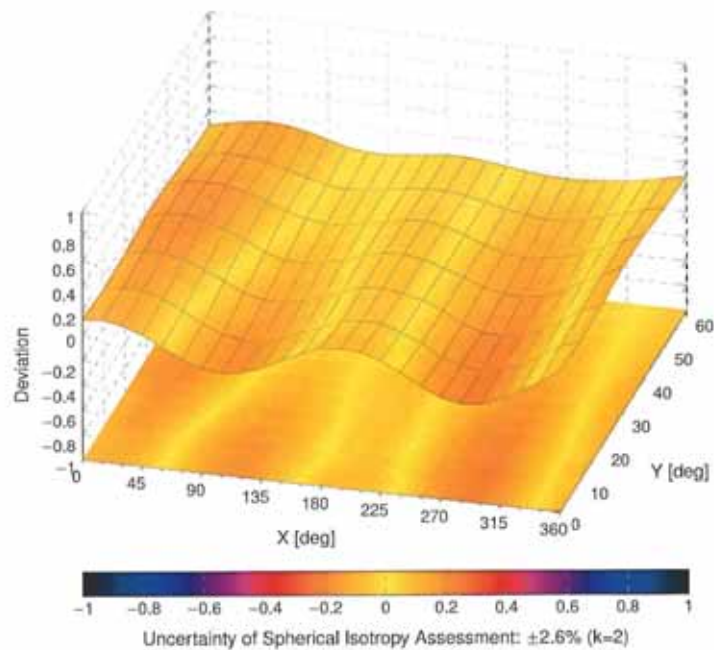
August 19, 2025

## Conversion Factor Assessment



## Deviation from Isotropy in Liquid

Error ( $\phi, \theta$ ),  $f = 900\text{ MHz}$



EX3DV4 - SN:7679

August 19, 2025

## Appendix: Modulation Calibration Parameters

| UID   | Rev | Communication System Name                           | Group     | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|-----------------------------------------------------|-----------|----------|------------------------|
| 0     |     | CW                                                  | CW        | 0.00     | ±4.7                   |
| 10010 | CAB | SAR Validation (Square, 100 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 (DSSS, 1 Mbps)            | WLAN      | 1.87     | ±9.6                   |
| 10013 | CAB | IEEE 802.11g WiFi 2.4 GHz (DSSS-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       | 3.55     | ±9.6                   |
| 10029 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2)                     | GSM       | 7.78     | ±9.6                   |
| 10030 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH1)                 | Bluetooth | 5.30     | ±9.6                   |
| 10031 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH3)                 | Bluetooth | 1.87     | ±9.6                   |
| 10032 | CAA | IEEE 802.15.1 Bluetooth (GFSK, DH5)                 | Bluetooth | 1.16     | ±9.6                   |
| 10033 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH1)           | Bluetooth | 7.74     | ±9.6                   |
| 10034 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH3)           | Bluetooth | 4.53     | ±9.6                   |
| 10035 | CAA | IEEE 802.15.1 Bluetooth (PI/4-DQPSK, DH5)           | Bluetooth | 3.83     | ±9.6                   |
| 10036 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH1)               | Bluetooth | 8.01     | ±9.6                   |
| 10037 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, DH3)               | Bluetooth | 4.77     | ±9.6                   |
| 10038 | CAA | IEEE 802.15.1 Bluetooth (8-DPSK, 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, PI/4-DQPSK, Halfrate) | AMPS      | 7.78     | ±9.6                   |
| 10044 | CAA | IS-91/EIA/TIA-553 FDD (FDMA, FM)                    | AMPS      | 0.00     | ±9.6                   |
| 10048 | CAA | DECT (TDD, TDMA/FDM, GFSK, Full Slot, 24)           | DECT      | 13.80    | ±9.6                   |
| 10049 | CAA | DECT (TDD, TDMA/FDM, GFSK, Double Slot, 12)         | DECT      | 10.79    | ±9.6                   |
| 10056 | CAA | UMTS-TDD (TD-SCDMA, 1.28 Mcps)                      | TD-SCDMA  | 11.01    | ±9.6                   |
| 10058 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-1-2-3)                   | GSM       | 6.52     | ±9.6                   |
| 10059 | CAB | IEEE 802.11b WiFi 2.4 GHz (DSSS, 2 Mbps)            | WLAN      | 2.12     | ±9.6                   |
| 10060 | 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      | 3.60     | ±9.6                   |
| 10062 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 6 Mbps)            | WLAN      | 8.68     | ±9.6                   |
| 10063 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 9 Mbps)            | WLAN      | 8.63     | ±9.6                   |
| 10064 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 12 Mbps)           | WLAN      | 9.09     | ±9.6                   |
| 10065 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 18 Mbps)           | WLAN      | 9.00     | ±9.6                   |
| 10066 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 24 Mbps)           | WLAN      | 9.38     | ±9.6                   |
| 10067 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 36 Mbps)           | WLAN      | 10.12    | ±9.6                   |
| 10068 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 48 Mbps)           | WLAN      | 10.24    | ±9.6                   |
| 10069 | CAE | IEEE 802.11a/h WiFi 5 GHz (OFDM, 54 Mbps)           | WLAN      | 10.56    | ±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, RC3)                               | CDMA2000  | 3.97     | ±9.6                   |
| 10082 | CAB | IS-54 / IS-136 FDD (TDMA/FDM, PI/4-DQPSK, Fullrate) | AMPS      | 4.77     | ±9.6                   |
| 10090 | DAC | GPRS-FDD (TDMA, GMSK, TN 0-4)                       | GSM       | 6.56     | ±9.6                   |
| 10097 | CAC | UMTS-FDD (HSDPA)                                    | WCDMA     | 3.98     | ±9.6                   |
| 10098 | CAC | UMTS-FDD (HSUPA, Subtest 2)                         | WCDMA     | 3.98     | ±9.6                   |
| 10099 | DAC | EDGE-FDD (TDMA, 8PSK, TN 0-4)                       | GSM       | 9.55     | ±9.6                   |
| 10100 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-FDD   | 5.67     | ±9.6                   |
| 10101 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-FDD   | 6.42     | ±9.6                   |
| 10102 | CAF | LTE-FDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-FDD   | 6.60     | ±9.6                   |
| 10103 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, QPSK)            | LTE-TDD   | 9.29     | ±9.6                   |
| 10104 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 16-QAM)          | LTE-TDD   | 9.97     | ±9.6                   |
| 10105 | CAH | LTE-TDD (SC-FDMA, 100% RB, 20 MHz, 64-QAM)          | LTE-TDD   | 10.01    | ±9.6                   |
| 10108 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, QPSK)            | LTE-FDD   | 5.80     | ±9.6                   |
| 10109 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)          | LTE-FDD   | 6.43     | ±9.6                   |
| 10110 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, QPSK)             | LTE-FDD   | 5.75     | ±9.6                   |
| 10111 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)           | LTE-FDD   | 6.44     | ±9.6                   |

Certificate No: EX-7679\_Aug25

Page 11 of 22

EX3DV4 - SN:7679

August 19, 2025

| UID   | Rev | Communication System Name                      | Group   | PAR (dB) | Unc <sup>E</sup> $k = 2$ |
|-------|-----|------------------------------------------------|---------|----------|--------------------------|
| 10112 | CAH | LTE-FDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)     | LTE-FDD | 6.59     | ±9.6                     |
| 10113 | CAH | LTE-FDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)      | LTE-FDD | 6.62     | ±9.6                     |
| 10114 | CAE | IEEE 802.11n (HT Greenfield, 13.5 Mbps, BPSK)  | WLAN    | 8.10     | ±9.6                     |
| 10115 | CAE | IEEE 802.11n (HT Greenfield, 81 Mbps, 16-QAM)  | WLAN    | 8.46     | ±9.6                     |
| 10116 | CAE | IEEE 802.11n (HT Greenfield, 135 Mbps, 64-QAM) | WLAN    | 8.15     | ±9.6                     |
| 10117 | CAE | IEEE 802.11n (HT Mixed, 13.5 Mbps, BPSK)       | WLAN    | 8.07     | ±9.6                     |
| 10118 | CAE | IEEE 802.11n (HT Mixed, 81 Mbps, 16-QAM)       | WLAN    | 8.59     | ±9.6                     |
| 10119 | CAE | IEEE 802.11n (HT Mixed, 135 Mbps, 64-QAM)      | WLAN    | 8.13     | ±9.6                     |
| 10140 | CAF | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)     | LTE-FDD | 6.49     | ±9.6                     |
| 10141 | CAF | LTE-FDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)     | LTE-FDD | 6.53     | ±9.6                     |
| 10142 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, QPSK)        | LTE-FDD | 5.73     | ±9.6                     |
| 10143 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)      | LTE-FDD | 6.35     | ±9.6                     |
| 10144 | CAF | LTE-FDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)      | LTE-FDD | 6.65     | ±9.6                     |
| 10145 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)      | LTE-FDD | 5.76     | ±9.6                     |
| 10146 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)    | LTE-FDD | 6.41     | ±9.6                     |
| 10147 | CAG | LTE-FDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)    | LTE-FDD | 6.72     | ±9.6                     |
| 10149 | CAF | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-FDD | 6.42     | ±9.6                     |
| 10150 | CAF | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-FDD | 6.60     | ±9.6                     |
| 10151 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, QPSK)        | LTE-TDD | 9.28     | ±9.6                     |
| 10152 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 16-QAM)      | LTE-TDD | 9.92     | ±9.6                     |
| 10153 | CAH | LTE-TDD (SC-FDMA, 50% RB, 20 MHz, 64-QAM)      | LTE-TDD | 10.05    | ±9.6                     |
| 10154 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, QPSK)        | LTE-FDD | 5.75     | ±9.6                     |
| 10155 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)      | LTE-FDD | 6.43     | ±9.6                     |
| 10156 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, QPSK)         | LTE-FDD | 5.79     | ±9.6                     |
| 10157 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)       | LTE-FDD | 6.49     | ±9.6                     |
| 10158 | CAH | LTE-FDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)      | LTE-FDD | 6.62     | ±9.6                     |
| 10159 | CAH | LTE-FDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)       | LTE-FDD | 6.56     | ±9.6                     |
| 10160 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, QPSK)        | LTE-FDD | 5.82     | ±9.6                     |
| 10161 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)      | LTE-FDD | 6.43     | ±9.6                     |
| 10162 | CAF | LTE-FDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)      | LTE-FDD | 6.58     | ±9.6                     |
| 10166 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)       | LTE-FDD | 5.46     | ±9.6                     |
| 10167 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)     | LTE-FDD | 6.21     | ±9.6                     |
| 10168 | CAG | LTE-FDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)     | LTE-FDD | 6.79     | ±9.6                     |
| 10169 | CAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-FDD | 5.73     | ±9.6                     |
| 10170 | CAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                     |
| 10171 | AAF | LTE-FDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-FDD | 6.49     | ±9.6                     |
| 10172 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, QPSK)          | LTE-TDD | 9.21     | ±9.6                     |
| 10173 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 16-QAM)        | LTE-TDD | 9.48     | ±9.6                     |
| 10174 | CAH | LTE-TDD (SC-FDMA, 1 RB, 20 MHz, 64-QAM)        | LTE-TDD | 10.25    | ±9.6                     |
| 10175 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, QPSK)          | LTE-FDD | 5.72     | ±9.6                     |
| 10176 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                     |
| 10177 | CAJ | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, QPSK)           | LTE-FDD | 5.73     | ±9.6                     |
| 10178 | CAH | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)         | LTE-FDD | 6.52     | ±9.6                     |
| 10179 | CAH | LTE-FDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)        | LTE-FDD | 6.50     | ±9.6                     |
| 10180 | CAH | LTE-FDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)         | LTE-FDD | 6.50     | ±9.6                     |
| 10181 | CAF | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, QPSK)          | LTE-FDD | 5.72     | ±9.6                     |
| 10182 | CAF | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)        | LTE-FDD | 6.52     | ±9.6                     |
| 10183 | AAE | LTE-FDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)        | LTE-FDD | 6.50     | ±9.6                     |
| 10184 | CAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, QPSK)           | LTE-FDD | 5.73     | ±9.6                     |
| 10185 | CAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)         | LTE-FDD | 6.51     | ±9.6                     |
| 10186 | AAF | LTE-FDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)         | LTE-FDD | 6.50     | ±9.6                     |
| 10187 | CAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)         | LTE-FDD | 5.73     | ±9.6                     |
| 10188 | CAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)       | LTE-FDD | 6.52     | ±9.6                     |
| 10189 | AAG | LTE-FDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)       | LTE-FDD | 6.50     | ±9.6                     |
| 10193 | CAE | IEEE 802.11n (HT Greenfield, 6.5 Mbps, BPSK)   | WLAN    | 8.09     | ±9.6                     |
| 10194 | CAE | IEEE 802.11n (HT Greenfield, 39 Mbps, 16-QAM)  | WLAN    | 8.12     | ±9.6                     |
| 10195 | CAE | IEEE 802.11n (HT Greenfield, 65 Mbps, 64-QAM)  | WLAN    | 8.21     | ±9.6                     |
| 10196 | CAE | IEEE 802.11n (HT Mixed, 6.5 Mbps, BPSK)        | WLAN    | 8.10     | ±9.6                     |
| 10197 | CAE | IEEE 802.11n (HT Mixed, 39 Mbps, 16-QAM)       | WLAN    | 8.13     | ±9.6                     |
| 10198 | CAE | IEEE 802.11n (HT Mixed, 65 Mbps, 64-QAM)       | WLAN    | 8.27     | ±9.6                     |
| 10219 | CAE | IEEE 802.11n (HT Mixed, 7.2 Mbps, BPSK)        | WLAN    | 8.03     | ±9.6                     |
| 10220 | CAE | IEEE 802.11n (HT Mixed, 43.3 Mbps, 16-QAM)     | WLAN    | 8.13     | ±9.6                     |
| 10221 | CAE | IEEE 802.11n (HT Mixed, 72.2 Mbps, 64-QAM)     | WLAN    | 8.27     | ±9.6                     |
| 10222 | CAE | IEEE 802.11n (HT Mixed, 15 Mbps, BPSK)         | WLAN    | 8.06     | ±9.6                     |
| 10223 | CAE | IEEE 802.11n (HT Mixed, 90 Mbps, 16-QAM)       | WLAN    | 8.48     | ±9.6                     |
| 10224 | CAE | IEEE 802.11n (HT Mixed, 150 Mbps, 64-QAM)      | WLAN    | 8.08     | ±9.6                     |

EX3DV4 - SN:7679

August 19, 2025

| UID   | Rev | Communication System Name                                            | Group    | PAR (dB) | Unc <sup>E</sup> k = 2 |
|-------|-----|----------------------------------------------------------------------|----------|----------|------------------------|
| 10225 | CAC | UMTS-FDD (HSPA+)                                                     | WCDMA    | 5.97     | ±9.6                   |
| 10226 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 16-QAM)                             | LTE-TDD  | 9.49     | ±9.6                   |
| 10227 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, 64-QAM)                             | LTE-TDD  | 10.26    | ±9.6                   |
| 10228 | CAC | LTE-TDD (SC-FDMA, 1 RB, 1.4 MHz, QPSK)                               | LTE-TDD  | 9.22     | ±9.6                   |
| 10229 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 16-QAM)                               | LTE-TDD  | 9.48     | ±9.6                   |
| 10230 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, 64-QAM)                               | LTE-TDD  | 10.25    | ±9.6                   |
| 10231 | CAE | LTE-TDD (SC-FDMA, 1 RB, 3 MHz, QPSK)                                 | LTE-TDD  | 9.19     | ±9.6                   |
| 10232 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 16-QAM)                               | LTE-TDD  | 9.48     | ±9.6                   |
| 10233 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, 64-QAM)                               | LTE-TDD  | 10.25    | ±9.6                   |
| 10234 | CAH | LTE-TDD (SC-FDMA, 1 RB, 5 MHz, QPSK)                                 | LTE-TDD  | 9.21     | ±9.6                   |
| 10235 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 16-QAM)                              | LTE-TDD  | 9.48     | ±9.6                   |
| 10236 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, 64-QAM)                              | LTE-TDD  | 10.25    | ±9.6                   |
| 10237 | CAH | LTE-TDD (SC-FDMA, 1 RB, 10 MHz, QPSK)                                | LTE-TDD  | 9.21     | ±9.6                   |
| 10238 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 16-QAM)                              | LTE-TDD  | 9.48     | ±9.6                   |
| 10239 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, 64-QAM)                              | LTE-TDD  | 10.25    | ±9.6                   |
| 10240 | CAG | LTE-TDD (SC-FDMA, 1 RB, 15 MHz, QPSK)                                | LTE-TDD  | 9.21     | ±9.6                   |
| 10241 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 16-QAM)                           | LTE-TDD  | 9.82     | ±9.6                   |
| 10242 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, 64-QAM)                           | LTE-TDD  | 9.86     | ±9.6                   |
| 10243 | CAC | LTE-TDD (SC-FDMA, 50% RB, 1.4 MHz, QPSK)                             | LTE-TDD  | 9.46     | ±9.6                   |
| 10244 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)                             | LTE-TDD  | 10.06    | ±9.6                   |
| 10245 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                             | LTE-TDD  | 10.06    | ±9.6                   |
| 10246 | CAE | LTE-TDD (SC-FDMA, 50% RB, 3 MHz, QPSK)                               | LTE-TDD  | 9.30     | ±9.6                   |
| 10247 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 16-QAM)                             | LTE-TDD  | 9.91     | ±9.6                   |
| 10248 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, 64-QAM)                             | LTE-TDD  | 10.09    | ±9.6                   |
| 10249 | CAH | LTE-TDD (SC-FDMA, 50% RB, 5 MHz, QPSK)                               | LTE-TDD  | 9.29     | ±9.6                   |
| 10250 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 16-QAM)                            | LTE-TDD  | 9.81     | ±9.6                   |
| 10251 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, 64-QAM)                            | LTE-TDD  | 10.17    | ±9.6                   |
| 10252 | CAH | LTE-TDD (SC-FDMA, 50% RB, 10 MHz, QPSK)                              | LTE-TDD  | 9.24     | ±9.6                   |
| 10253 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 16-QAM)                            | LTE-TDD  | 9.90     | ±9.6                   |
| 10254 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, 64-QAM)                            | LTE-TDD  | 10.14    | ±9.6                   |
| 10255 | CAG | LTE-TDD (SC-FDMA, 50% RB, 15 MHz, QPSK)                              | LTE-TDD  | 9.20     | ±9.6                   |
| 10256 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 16-QAM)                          | LTE-TDD  | 9.96     | ±9.6                   |
| 10257 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, 64-QAM)                          | LTE-TDD  | 10.08    | ±9.6                   |
| 10258 | CAC | LTE-TDD (SC-FDMA, 100% RB, 1.4 MHz, QPSK)                            | LTE-TDD  | 9.34     | ±9.6                   |
| 10259 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 16-QAM)                            | LTE-TDD  | 9.98     | ±9.6                   |
| 10260 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, 64-QAM)                            | LTE-TDD  | 9.97     | ±9.6                   |
| 10261 | CAE | LTE-TDD (SC-FDMA, 100% RB, 3 MHz, QPSK)                              | LTE-TDD  | 9.24     | ±9.6                   |
| 10262 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 16-QAM)                            | LTE-TDD  | 9.83     | ±9.6                   |
| 10263 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, 64-QAM)                            | LTE-TDD  | 10.16    | ±9.6                   |
| 10264 | CAH | LTE-TDD (SC-FDMA, 100% RB, 5 MHz, QPSK)                              | LTE-TDD  | 9.23     | ±9.6                   |
| 10265 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 16-QAM)                           | LTE-TDD  | 9.92     | ±9.6                   |
| 10266 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, 64-QAM)                           | LTE-TDD  | 10.07    | ±9.6                   |
| 10267 | CAH | LTE-TDD (SC-FDMA, 100% RB, 10 MHz, QPSK)                             | LTE-TDD  | 9.30     | ±9.6                   |
| 10268 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 16-QAM)                           | LTE-TDD  | 10.06    | ±9.6                   |
| 10269 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, 64-QAM)                           | LTE-TDD  | 10.13    | ±9.6                   |
| 10270 | CAG | LTE-TDD (SC-FDMA, 100% RB, 15 MHz, QPSK)                             | LTE-TDD  | 9.58     | ±9.6                   |
| 10274 | CAC | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.10)                            | WCDMA    | 4.87     | ±9.6                   |
| 10275 | CAC | UMTS-FDD (HSUPA, Subtest 5, 3GPP Rel8.4)                             | WCDMA    | 3.96     | ±9.6                   |
| 10277 | CAA | PHS (QPSK)                                                           | PHS      | 11.81    | ±9.6                   |
| 10278 | CAA | PHS (QPSK, BW 884 MHz, Rolloff 0.5)                                  | PHS      | 11.81    | ±9.6                   |
| 10279 | CAA | PHS (QPSK, BW 884 MHz, Rolloff 0.38)                                 | PHS      | 12.18    | ±9.6                   |
| 10290 | AAB | CDMA2000, RC1, SO55, Full Rate                                       | CDMA2000 | 3.91     | ±9.6                   |
| 10291 | AAB | CDMA2000, RC3, SO55, Full Rate                                       | CDMA2000 | 3.46     | ±9.6                   |
| 10292 | AAB | CDMA2000, RC3, SO32, Full Rate                                       | CDMA2000 | 3.39     | ±9.6                   |
| 10293 | AAB | CDMA2000, RC3, SO3, Full Rate                                        | CDMA2000 | 3.50     | ±9.6                   |
| 10295 | AAB | CDMA2000, RC1, SO3, 1/8th Rate 25 fr.                                | CDMA2000 | 12.49    | ±9.6                   |
| 10297 | AAE | LTE-FDD (SC-FDMA, 50% RB, 20 MHz, QPSK)                              | LTE-FDD  | 5.81     | ±9.6                   |
| 10298 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, QPSK)                               | LTE-FDD  | 5.72     | ±9.6                   |
| 10299 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 16-QAM)                             | LTE-FDD  | 6.39     | ±9.6                   |
| 10300 | AAE | LTE-FDD (SC-FDMA, 50% RB, 3 MHz, 64-QAM)                             | LTE-FDD  | 6.60     | ±9.6                   |
| 10301 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC)                 | WiMAX    | 12.03    | ±9.6                   |
| 10302 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, QPSK, PUSC, 3 CTRL symbols) | WiMAX    | 12.57    | ±9.6                   |
| 10303 | AAA | IEEE 802.16e WiMAX (31:15, 5 ms, 10 MHz, 64QAM, PUSC)                | WiMAX    | 12.52    | ±9.6                   |
| 10304 | AAA | IEEE 802.16e WiMAX (29:18, 5 ms, 10 MHz, 64QAM, PUSC)                | WiMAX    | 11.86    | ±9.6                   |
| 10305 | AAA | IEEE 802.16e WiMAX (31:15, 10 ms, 10 MHz, 64QAM, PUSC, 15 symbols)   | WiMAX    | 15.24    | ±9.6                   |
| 10306 | AAA | IEEE 802.16e WiMAX (29:18, 10 ms, 10 MHz, 64QAM, PUSC, 18 symbols)   | WiMAX    | 14.67    | ±9.6                   |