Test Report

No. 1-1643-25-02-03_TR1-R01

July 07. 2026

Applicant	BURY Sp. z o.o.
Product	Wireless charger with NFC card protection
Model	WLC MPP Dual
Tested Technology	Wireless charging 128 kHz / 360 kHz
Test Standards	IEEE C 95.3:2021 IEC/IEEE 63184:2025-02
FCC-ID	QZ9-WMD01
Verdict	PASS

The test results apply only to the equipment specified in this document.

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1. Disclaimer

The test results of this test report relate exclusively to the test item specified in chapter “Test sample information”. cetecom advanced does not assume responsibility for any conclusions and generalizations drawn from the test results regarding other specimens or samples of the type of the equipment represented by the test item.

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2. Related cetecom advanced documents

Title	Description	Reference	Total Pages
1-1643-25-02-03_TR1-A101-R01	Photos of EUT and test positions	1-1643-25-02-03_TR1-A101-R01	20
1-1643-25-02-03_TR1-A201-R01	Detailed test results and system checks	1-1643-25-02-03_TR1-A201-R01	16
1-1643-25-02-03_TR1-A301-R01	Detailed WPT System calibration data	1-1643-25-02-03_TR1-A301-R01	36

3. Document history

3.1. Current release

Release No.:	R01
Date of release:	July 07. 2026
Applied changes:	Initial release

3.2. Previous releases

Version	Applied change	Date of release
n/a		

4. Test laboratory

4.1. Contact information

cetecom advanced GmbH
Untertuerkheimer Str. 6-10
66117 Saarbruecken
Germany

4.2. Involved test locations

Saarbrücken Lab

Untertürkheimer Strasse 6 – 10
66117 Saarbrücken
Germany

4.3. Subcontracted laboratories

None.

4.4. Laboratory listings and recognitions

	Saarbrücken	Essen
FCC	DE0002	DE0003
ISED	DE0001 3462C	DE0001 3462D

5. Client information

5.1. Applicant

Name:	BURY Sp. z o.o.
Address:	POLAND, PL-39-300 Mielec, ul. Wojska Polskiego 4
Contact Person:	E-Rechnungs Adresse
Contact Person's Email:	efaktura@bury.com

5.2. Manufacturer

Name:	BURY Sp. z o.o.
Address:	POLAND, PL-39-300 Mielec, ul. Wojska Polskiego 4
Contact Person:	E-Rechnungs Adresse
Contact Person's Email:	efaktura@bury.com

6. Test sample information

The data about the test samples is given/supplied by the customer and not under control by cetecom advanced GmbH.

6.1. General Information

6.1.1. General Data of Main EUT as Declared by Applicant

Kind of test item	Wireless charger with NFC card protectionv
Device type	Automotive device
Model name	WLC MPP Dual
S/N serial number	Sample 1: CW 128 kHz Both coils / 326 000 000 000 01282896 Sample 2: CW 128 kHz Left coil / 326 000 000 000 01282890 Sample 3: CW 128 kHz Right coil / 326 000 000 000 01282884 Sample 4: CW 360 kHz Both coils / 326 000 000 000 01282871 Sample 5: CW 360 kHz Left coil / 326 000 000 000 01282885 Sample 6: CW 360 kHz Right coil / 326 000 000 000 01282874
FCC-ID	QZ9-WMD01
ISED-Number	5927A-WMD01
Hardware Version Identification Number (HVIN)	WLC MPP Dual
Product Marketing Name (PMN)	WLC MPP Dual
Firmware Version Identification Number (FVIN)	-/-
Host Marketing Name (HMN)	-/-
Hardware status	H01
Software status	0002 [Z051 WLC only test SW]
Frequency	Wireless Charging 128 kHz / 360 kHz
Antenna	Integrated antenna
Mounting position	Center console car
Power option	13.58 V DC bx external power supply
Accessories	-/-
Test sample status	Identical prototype
Exposure category	General public / uncontrolled environment

7. Application Details

7.1. Scheduling

Date of sample reception:	May 15.2026
Deate(s) of test:	May 19. 2026 to May 20. 2026

7.2. Climatic data (Lab/Test environment)

Ambient temperature:	20 - 24 °C
Relative humidity content:	40 - 50 %
Air pressure:	not relevant for this kind of testing
Power supply:	230 V / 50 Hz

7.3. Options and interpretations

None

8. Measurement details

8.1. Test methodology

The testing laboratory (area of testing) is accredited according to DIN EN ISO/IEC 17025 (2018-03) by the Deutsche Akkreditierungsstelle GmbH (DAkkS).

The accreditation is valid for the scope of testing procedures as stated in the accreditation certificate with the registration number D-PL-12047-01-00.

Test method, standard, rule	Description
IEEE C 95.3:2021	IEEE Recommended Practice For Measurements And Computations Of Electric, Magnetic, And Electromagnetic Fields With Respect To Human Exposure To Such Fields, 0 Hz To 300 GHz
IEC/IEEE 63184:2025-02	Assessment methods of the human exposure to electric and magnetic fields from wireless power transfer systems – Models, instrumentation, measurement and computational methods and procedures (frequency range of 3 kHz to 30 MHz)

9. Additional documents

9.1. Application note

Testing WPT Devices with DASY8/6 Modules WPT and SAR for Compliance with IEC/IEEE 63184
(Chapter 5 Test System and Procedures for Frequencies below 4 MHz, by SPEAG, R3, 05/24)

9.2. WPT manual

DASY 8 Module WPT System Handbook incl. SW Module WPT 3.2 (by SPEAG, 05/12/2025)

9.3. Further relevant measurment standards out of accreditation space

Test method, standard, rule	Description
IEC TR 62905	IEC/TR 62905:2018(E) is a Technical Report. It describes general exposure assessment methods for wireless power transfer (WPT) at frequency up to 10 MHz considering thermal and stimulus effects. Exposure assessment procedures and experimental results are shown as examples such as electric vehicles (EVs) and mobile devices.

10. Description of the test setup

Typically, the calibrations of the test apparatus are commissioned to and performed by an accredited calibration laboratory. The calibration intervals are determined in accordance with the DIN EN ISO/IEC 17025. In addition to the external calibrations, the laboratory executes comparison measurements with other calibrated test systems or effective verifications. Weekly chamber inspections and range calibrations are performed. Where possible, RF generating and signaling equipment as well as measuring receivers and analyzers are connected to an external high-precision 10 MHz reference (GPS-based or rubidium frequency standard).

In order to simplify the identification of the equipment used at some special tests, some items of test equipment and ancillaries can be provided with an identifier or number in the equipment list below (Lab/Item).

Each block diagram listed can contain several test setup configurations. All devices belonging to a test setup are identified with the same letter syntax. For example: Column Setup and all devices with an A.

Note: Monitoring

Abbreviation	Explanation
cal	Calibration
calchk	Calibration and Validation
car	Calibration Restricted Use
chk	Validation
chr	Validation Restricted Use
cpu	Validation prior to Use
cnn	No Monitoring

10.4. **WPT-System**

MAGPy-8H3D+E3D V2, DASY 8 WPT-System

Equipment table:

Config	Equipment	Manufacturer	Serial no.	INV. no.	Monitoring	Last Cal./Val.	Next Cal./Val.
A	V-Coil 50/400 kHz	Schmid & Partner Engineering AG / Zürich	1021	40864	cal	Nov 11. 2025	Nov 11. 2026
A	MAGPy-8H3D+E3DV2	Schmid & Partner Engineering AG / Zürich	3079	40950	cal	Nov 11. 2025	Nov 11. 2026
A	MAGPy-DASV2 Data Acquisition System	Schmid & Partner Engineering AG / Zürich	1023	40952	cal	Nov 11. 2025	Nov 11. 2026

11. RF exposure limits

RF Exposure levels according CFR 47 – Part 1, §1.1310:

Human Exposure	Uncontrolled Environment General Population	Controlled Environment Occupational
Spatial Peak SAR* (Brain and Trunk)	**1.60 W/kg**	8.00 W/kg
Spatial Average SAR** (Whole Body)	0.08 W/kg	0.40 W/kg
Spatial Peak SAR*** (Hands/Feet/Ankle/Wrist)	**4.00 W/kg**	20.00 W/kg

Table 1: RF exposure limits (100 kHz to 6 GHz)

The limit applied in this test report is shown in bold letters

Notes:

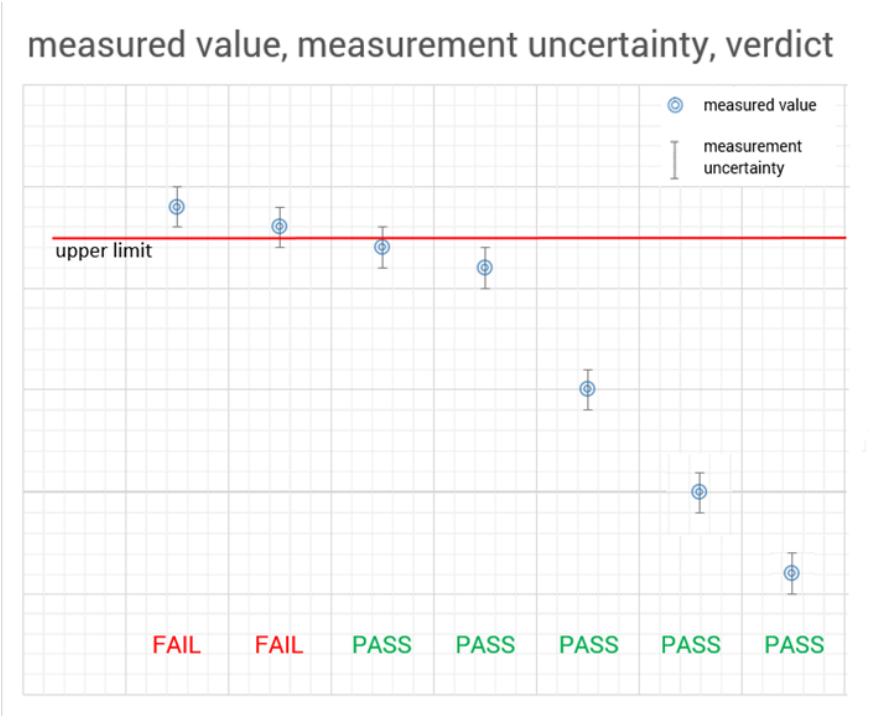
*	The Spatial Peak value of the SAR averaged over any 1 gram of tissue (defined as a tissue volume in the shape of a cube) and over the appropriate time.
**	The Spatial Average value of the SAR averaged over the whole body.
***	The Spatial Peak value of the SAR average over any 10 grams of tissue (defined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

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).

12. Reporting statements of conformity – decision rule

Only the measured values related to their corresponding limits will be used to decide whether the equipment under test meets the requirements of the test standards listed in chapter 3. The measurement uncertainty is mentioned in this test report, see chapter 9, but is not taken into account - neither to the limits nor to the measurement results. Measurement results with a smaller margin to the corresponding limits than the measurement uncertainty have a potential risk of more than 20% that the decision might be wrong.



13. Summary of measurement results

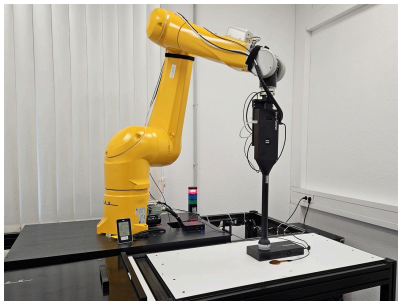
☑	No deviations from the technical specifications ascertained
☐	Deviations from the technical specifications ascertained

	Maximum SAR value (W/kg)	
	reported	limit
body worn 0mm distance for 1g	0.059	1.6
extremity 0mm distance for 10g	0.025	4.0

14. Test Set-Up

14.1. Measurement System

14.1.1. Measurement with MAGPy-8H3D+E3D probe / DASY 8 WPT-System



The DASY8 WPT-System is a complete high precision robot-based evaluation platform for demonstrating compliance of wireless power transfer (WPT) devices according to IEC/IEEE 63184:2025(Chapter 8 Measurement and numerical combination methods") and enables fully automated compliance testing. [1]

It is composed of the isotropic probe MAGPy-8H3D+E3D V2, the reference amplitude and phase probe (MAGPy-RAφ V2), and the data acquisition system (MAGPy-DAS V2) mounted to the DASY8 robot via the emergency stop (MAGPy-ES). The induced electric (E-) fields and specific absorption rate (SAR) are assessed with Sim4Life's Quasi-Static EM Solver (P-EM-QS) using only the measured data. The dedicated

graphical user interface (GUI) fully automates the testing workflow.

This allows for Laboratory evaluation of WPT devices and any other local electromagnetic source not requiring magnetic (H-) field volume scans exceeding 2000 x 1000 x 1500 mm³ with a precision of ±2.0mm.

The H-field distributions can be analyzed directly, and the values are compared to the reference level, or they are converted into Maxwell field and used as excitations for determining the basic restriction quantities for further dosimetric analysis with the Magneto Quasi-Static (MQS) solver [2].

This specific solution is optimized for:

- Evaluation of E & H-field (3 kHz – 10 MHz)
- Demonstration of compliance (3 kHz and 4 MHz) according to IEC 63184:2021 [3]

<u>References:</u>

[1] Assessment methods of the human exposure to electric and magnetic fields from wireless power transfer systems. Models, instrumentation, measurement and numerical methods and procedures (frequency range of 1 kHz to 30MHz), IEC/IEEE 63184:2025.

[2] The MQS conditions are violated above 4MHz and SPEAG recommends to use IEC/IEEE 62209-1528 for the frequency range above 4 MHz.

[3] Sim4Life, V7.2, ZMT Zurich MedTech AG, Zurich, Switzerland.

14.1.2. Workflow for Tier-4 Compliance Testing of IEC /IEEE 63184:2025

Compliance testing according to Tier-4 of IEC/IEEE 63184:2025 is the most accurate method ensuring no overestimation of the exposure. The workflow implemented in DASY8 Module WPT consists of the following steps:

1. probe alignment,
2. teaching of the DUT position,
3. 3D scan with automated grid optimization,
4. vector potential reconstruction (Sim4Life),
5. solving the MQS equation in the muscle half-space,
6. applying coverage factors (pre-determined by the IT'IS Foundation),
7. advanced evaluations in various posed Sim4Life ViP phantoms.

Additionally, the system performance is routinely verified using the standard verification sources as DUT's.

14.1.3. Compatibility with IEC/IEEE 63184:2025

DASY8 Module WPT is fully compliant with IEC/IEEE 63184:2025 and evaluates the reference values and basic restrictions according to:

- ICNIRP 2020
- ICNIRP 2010
- ICNIRP 1998
- IEEE C95.1 - 2019
- FCC Regulation
- FCC KDB 680106 D01
- FCC KDB 447498 D01
- Health Canada Safety Code 6
- ISED Canada RSS-102.NS.MEAS
- IEC/IEEE 63184 (Tier 4 and Tier 2)

14.1.4. **MAGPy-Probes**

MAGPy-8H3D+E3D V2

The MAGPy-8H3D+E3D V2 probe consists of eight isotropic H-field subprobes and one isotropic E-field subprobe that are all integrated inside the probe head with a flat tip. Each isotropic H-field subprobe is comprised of three concentric orthogonal loop coil sensors.

The isotropic E-field subprobe is composed of three orthogonal sensors (x and y sensors are dipoles, and the sensor measuring the z component is a monopole).

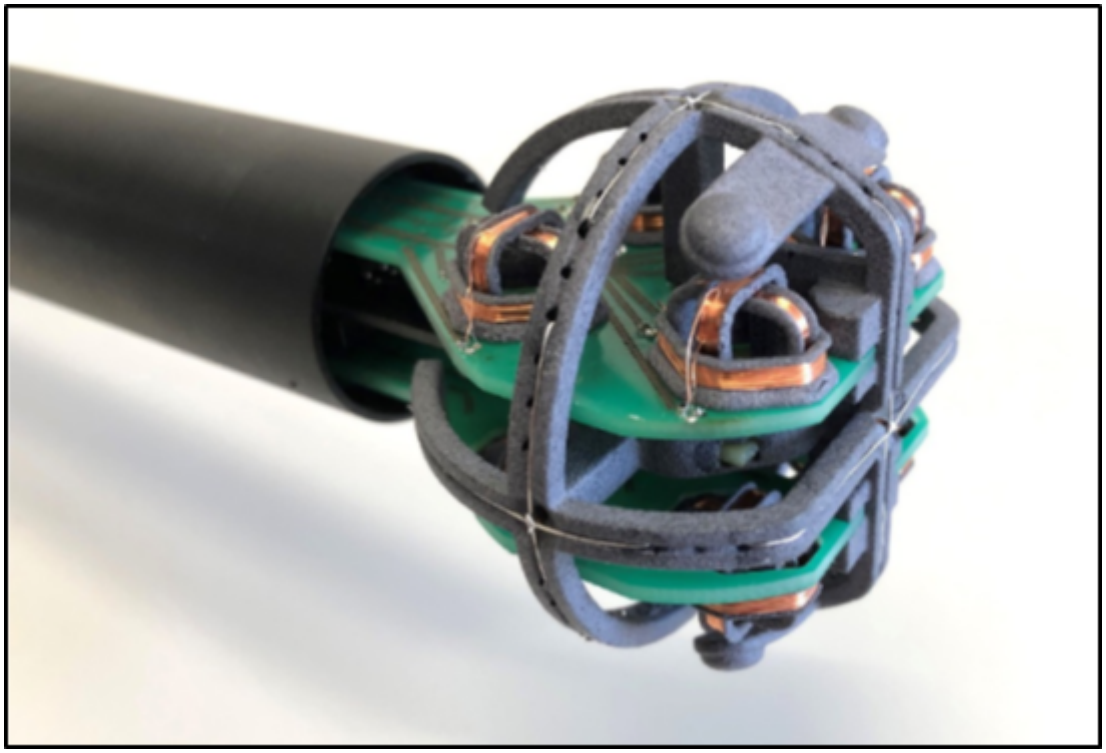
In total, the MAGPy-8H3D+E3D V2 probe contains 27 sensors that measure in the time domain. The specifications of the probe are provided in the table below.

The MAGPy-8H3D+E3D V2 probe measures the isotropic H-field and E-field, and is compatible withDASY8 Module WPT V2.2 and MAGPy V2.2.

Probe design	
Probe head diameter	60mm
H-field sub-probes	8 isotropic H-field sub-probes Concentric loops of 1cm² arranged at the corners of a 22mm cube
E-field sub probes	1 isotropic E-field sub-probe Orthogonal dipole/monopole (arm length: 50mm)
Temperature range	0-40 °C
Dimensions	110mmx635mmx35mm (MAGPy-8H3D+E3D V2 & MAGPy-DAS V2)
H-field measurement specifications	
Frequency range	3kHz - 10MHz
Dynamic range	0.1-3200A/m (0.12µT - 4mT)
E-field measurement specifications	
Frequency range	3kHz - 10MHz
Dynamic range	0.08-2000V/m

The sensor offset, i.e., the distance from the outer surface (tip) of the probe to the center of the closest H-field sensors inside, is 7.5 mm. The distance to the virtual measuring point is 19 mm
(The center of the 8 sub-field probes)

The following picture shows The MAGPy-8H3D+E3D V2 probe with the probe-head cap removed, showing the eight isotropic H-field sub-probes and one isotropic E-field sub-probe:



MAGPy-RAφ V2

The MAGPy-RAφ V2 probe is a pick-up coil to serve as a phase and amplitude reference, composed of one loop with the specifications shown in following table.

It is connected to the MAGPy-8H3D+E3D V2 probe and should be placed near the DUT during the spatial scan to ensure a sufficient signal-to-noise ratio.

Frequency range	3kHz - 10MHz
Dynamic range	0.1 - 3200 A/m (0.12µT - 4mT)
Loop coil size	50 x 50 mm²

14.1.5. **MAGPy-DAS: Data Aqcuisition System**

Description of MAGPy-DAS V2

The MAGPy-DAS V2 is a speed-optimized unit that can process up to 27 input channels in real-time with a sampling rate of 25 MHz. The specifications of the MAGPy-DAS are:

- 27 x 14 Bit ADC Channels with 25 MSPs
- peak detection stage
- hardware supervising unit
- data transfer to backend
- 22 tap FIR filter

The measured analog signals from the MAGPy probes are firstly transferred to the analog input stage, which comprises filters, amplifiers, and attenuators. The analog signal is then transformed into a digital signal through the analog to digital converter (ADC) and treated in the field programmable gate arrays (FPGA) controller. The FPGA firmware consists of:

- FIR filter
- peak detection
- AGC (Automatic gain control unit)
- scaling unit

The controller communicates with the MAGPy software installed on the desktop or tablet PC across USB 2.0.

15. Measurement uncertainty

The probe uncertainties stated by the manufacturer are considered to be the main relevant and dominant issues.

Typical uncertainty of Module WPT

DASY8 Uncertainty Budget for Peak H-field according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Gradient uncertainty	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.10
12	Surface field reconstruction	0.3	N	1	1	0.3
Combined uncertainty $(k = 1)$						0.59
Expanded uncertainty $(k = 2)$						**1.33 (16.6%)**

Uncertainty budget for peak incident H-field measured with DASY8 Module WPT assesed according to IEC/IEEE 63148

DASY8 Uncertainty Budget for Incident E-field according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.53	N	1	1	0.53
2	Probe anisotropy	0.8	R	$\sqrt{3}$	1	0.46
3	Probe dynamic linearity	1	R	$\sqrt{3}$	1	0.58
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Parasitic H-field sensitivity	0.2	R	$\sqrt{3}$	1	0.12
7	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
8	Readout electronics	0	N	1	1	0
9	Repeatability	0.1	N	1	1	0.10
Combined uncertainty ($k = 1$)						0.95
Expanded uncertainty ($k = 2$)						**1.89 (24.4%)**

Uncertainty budget for incident E-field measured with DASY8 Module WPT with linear gradients across the probe.

DASY8 Uncertainty Budget for Peak 2×2×2 mm³ Cube-Average E_{ind} according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic *E*-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.3	N	1	1	0.3
Numerical simulations						
13	Grid resolution	0.18	R	$\sqrt{3}$	1	0.10
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.24	N	1	1	0.24
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.72
Expanded uncertainty ($k = 2$)						**1.44 (18.0%)**

Uncertainty budget for peak 2x2x2mm³ cube-average induced E-field measured with DASY8 Module WPT assessed according IEC/IEEE 63184.

DASY8 Uncertainty Budget for Peak 5 mm Line-Average E_{ind} according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.3	N	1	1	0.3
Numerical simulations						
13	Grid resolution	0.25	R	$\sqrt{3}$	1	0.14
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.27	N	1	1	0.27
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.74
Expanded uncertainty ($k = 2$)						**1.48 (18.5%)**

Uncertainty budget for peak 5mm line-average induced E-field measured with DASY8 Module WPT assessed according to IEC/IEEE 63184.

DASY8 Uncertainty Budget for Peak Local E_{ind} according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.3	N	1	1	0.3
Numerical simulations						
13	Grid resolution	0.09	R	$\sqrt{3}$	1	0.05
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.27	N	1	1	0.27
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.73
Expanded uncertainty ($k = 2$)						**1.45 (18.2%)**

Uncertainty budget for peak local (i.e., not spatial averaged) induced E-field measured with DASY8 Module WPT assessed according to IEC/IEEE 63184.

DASY8 Uncertainty Budget for Peak 1 cm² Area-Average J_{ind} according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.3	N	1	1	0.3
Numerical simulations						
13	Grid resolution	0.12	R	$\sqrt{3}$	1	0.07
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.1	N	1	1	0.1
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.68
Expanded uncertainty ($k = 2$)						**1.36 (17.0%)**

Uncertainty budget for peak 1 cm² area-average induced current density measured with DASY8 Module WPT assessed according to IEC/IEEE 63184.

DASY8 Uncertainty Budget for psSAR1 g according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.2	N	1	1	0.2
Numerical simulations						
13	Grid resolution	0.02	R	$\sqrt{3}$	1	0.01
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.09	N	1	1	0.09
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.63
Expanded uncertainty ($k = 2$)						**1.27 (33.9%)**

Uncertainty budget for peak 1 gramm mass average induced SAR measured with DASY8 Module WPT assessed according to IEC/IEEE 63184.

NOTE: SAR Upscaling to compensate for the unfulfilled Uncertainty budget

As all other uncertainties fulfil the <30% Budget, uspcaling of the SAR Value by 3% (1.339/1.3=1.03) for both 1g and 10g SAR is sufficient to offset the expanded by SAR measurements to ensure a reasonable overestimation.

DASY8 Uncertainty Budget for psSAR10 g according to IEC/IEEE 63184						
Item	Error Description	Unc. Value (±dB)	Probab. Distr.	Div.	(c_i)	Std. Unc. (±dB)
Measurement system						
1	Amplitude calibration uncertainty	0.35	N	1	1	0.35
2	Probe anisotropy	0.6	R	$\sqrt{3}$	1	0.35
3	Probe dynamic linearity	0.2	R	$\sqrt{3}$	1	0.12
4	Probe frequency domain response	0.3	R	$\sqrt{3}$	1	0.17
5	Probe frequency linear interp. fit	0.15	R	$\sqrt{3}$	1	0.09
6	Spatial averaging	0.1	R	$\sqrt{3}$	1	0.06
7	Parasitic E-field sensitivity	0.1	R	$\sqrt{3}$	1	0.06
8	Detection limit	0.15	R	$\sqrt{3}$	1	0.09
9	Readout electronics	0	N	1	1	0
10	Probe positioning	0.19	N	1	1	0.19
11	Repeatability	0.1	N	1	1	0.1
12	Surface field reconstruction	0.2	N	1	1	0.2
Numerical simulations						
13	Grid resolution	0	R	$\sqrt{3}$	1	0
14	Tissue parameters	0	R	$\sqrt{3}$	1	0
15	Exposure position	0	R	$\sqrt{3}$	1	0
16	Source representation	0.04	N	1	1	0.04
17	Convergence and power budget	0	R	$\sqrt{3}$	1	0
18	Boundary conditions	0.1	R	$\sqrt{3}$	1	0.06
19	Phantom loading/backscattering	0.1	R	$\sqrt{3}$	1	0.06
Combined uncertainty ($k = 1$)						0.63
Expanded uncertainty ($k = 2$)						**1.25 (33.4%)**

Uncertainty budget for peak 10 gram mass-average induced SAR measured with DASY8 Module WPT assessed according to IEC/IEEE 63184.

NOTE: SAR Upscaling to compensate for the unfulfilled Uncertainty budget

As all other uncertainties fulfil the <30% Budget, upscaling of the SAR Value by 3% (1.339/1.3=1.03) for both 1g and 10g SAR is sufficient to offset the expanded by SAR measurements to ensure a reasonable overestimation.

16. Definition of test positions and distances

In absence of an equipment specific regulation with given test distances, all not further noted test positions were measured in “touched” mode, the probe radome touching the DUT at the defined test position.

Due to the mechanical concept of the used probe a distance between DUT surface and electrical centre of the probe antennas remains.

	Closest physical test distance (cm)	
Probe type	Magentic field	Electrical field
MAGPy-8H3D+E3D V2	0.75 (Sub @ lowest plane)	5.0

17. System Check and Validation

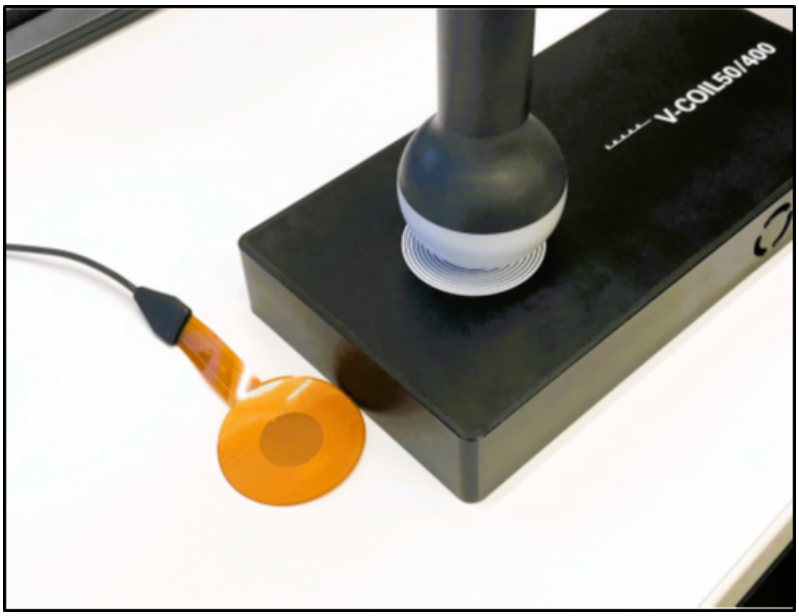
Overview

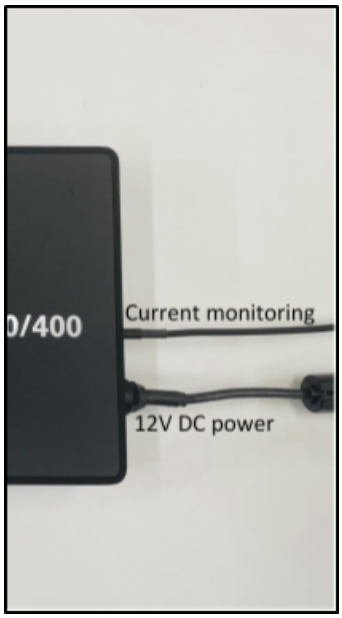
Verification and Validation (V&V) sources are designed as well-defined sources with target values to verify that the system works within its specification. A system check is typically performed prior to any compliance evaluation.

For the DASY8 Module WPT, a set of four system validation sources (3kHz, 85kHz, 400kHz, and 6.78 MHz) are available. These sources consist of series resonant spiral coils, fed with an integrated current source. The current source consists of an oscillator and an amplifier at the appropriate frequency.

A monitoring port in the form of a SMB connector is available on the device to monitor the current through the coil. The port offers the voltage across a 1Ohm resistor connected in series with the coil, therefore the current I corresponds to the measured voltage $V_{testport}$ (I= $V_{testport}$). The voltage on the port can thus be monitored with an oscilliscope and this should be equal to the current through the coil.

Target values ($H_{inc;max}$, $E_{ind;max}$, $J_{ind;max}$) for each source have been determined for several distances through simulations using the MQS solver in Sim4Life. The details of the evalluation are available at Application Notes, for each source.





The picture above shows a 400 kHz sytem check and validation device, with the power cable and the current monitoring cable connected.

Specifications

The specifications of the sources are as follows:

Item	V-Coil500/3	V-Coil350/85	V-Coil50/400	V-Coil25/6780
Frequency (kHz)	3	85	400	6780
Coil Dimension (mm)	500 x 500	320 x 200	50 x 50	25 x25
No. of Turns	11	13	11	10
Current Source	I500/3	I350/85	I150/400	I25/6780
Current Monitor Port	SMB	SMB	SMB	SMB
Device Dimensions (mm)	500 x 500 x 35	250 x 500 x35	125 x 250 x 35	125 x 250 x 35

18. Test Results

18.1. DASY8 Module WPT - SAR Measurement Results

DUT	frequency	Distance	Peak H_{inc}	Peak E_{inc}	psSAR (mW/kg, rms) LIMIT: 1600 1g avg.		psSAR (mW/kg, rms) LIMIT: 4000 10g avg.		H-field extend -20 dB Radius
	(kHz)	(mm)	(A/m, rms)	(V/m, rms)	Meas.	Rep.*	Meas.	**Rep.***	(mm)
CW - B	128.00	0	1631	31.4	12.00	12.36	4.98	5.13	29.33
CW - L	128.00	0	1494	31.6	10.70	11.02	4.46	4.59	29.33
CW - R	128.00	0	1521	30.7	10.80	11.12	4.48	4.61	29.33
CW - B	**360.36**	0	1296	72.5	**57.40**	**59.12**	**24.40**	**25.13**	29.33
CW - L	360.37	0	1212	73.1	54.10	55.72	22.40	23.07	29.33
CW - R	306.36	0	1224	72.9	54.80	56.44	22.80	23.48	29.33

*) SAR values were up-scaled to compensate for the unfulfilles Uncertainty budget by factor 1.03

Max SAR W/kg(1g): 0.059
Max SAR W/kg(10g): 0.025

18.2. Detailed results and system checks

Detailed test results and Sytem cheks for the WPT System are described in the additional document:
1-1643-25-02-03_TR1-A201-R01

18.3. Calibration data for DASY8 System WPT

Detailed calibration documents for the DASY8 WPT system are provided in the external Annex dicument:
1-1643-25-02-03_TR1-A301-R01

End of document