ANCOM Autoritatea Națională pentru Administrare și Reglementare în Comunicații

Str. Delea Nouă nr.2, Sector 3, București, 030925 România
Tel: 0372 845 400 / 0372 845 454 Fax: 0372 845 402
ancom@ancom.ro www.ancom.ro

[redacted]

Ex.nr. 1

Obiectivul de investiții:
«Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR »

Obiectivul supus recepției:
« Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR (cod CPV:31711120-0), furnizate de către S.C. Global Logistic Systems S.R.L., în baza Contractului nr. e-SC-5772/23.07.2024»

Concluzia: **ADMIS**

PROCES VERBAL DE RECEPŢIE
(Cod 14-2-5) cod angajament **AAATBTP6AF6**

I. DATE GENERALE

Comisia de recepţie numită în baza notei de desemnare a comisiei de recepție nr. e-LICETER/162/30.09.2024, convocată la data de 06.11.2024 şi-a desfăşurat activitatea în data de 06.11.2024.

II. CONSTATĂRI

În urma examinării documentaţiei prezentate şi a cercetării pe teren a produselor furnizate, s-a constatat că produsul reprezentând ***„Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR"***, *cod CPV:31711120-0,* furnizat de către *S.C. Global Logistic Systems S.R.L., în baza Contractului nr. e-SC-5772/23.07.2024*, este funcţional şi are caracteristicile în conformitate cu prevederile din Caietul de sarcini nr. e-LICETER/24/12.03.2024, anexă la comandă.

Valoarea totală a produselor furnizate supuse recepţiei, conform documentelor de decontare este de: **101.974,00 Lei** [fără TVA], respectiv **121.349,06 Lei** [inclusiv TVA].

În cadrul recepţiei au fost întocmite/primite următoarele documente:
- aviz de însoţire marfă;
- certificat de calitate și garanţie;
- declarație de conformitate/certificat de conformitate;
- certificat de etalonare (calibrare).

DS.3408 / 06.11.2024

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III. CONCLUZII

1. Pe baza constatărilor şi concluziilor consemnate mai sus, comisia de recepţie hotărăşte în unanimitate:

SE ADMITE RECEPŢIA OBIECTIVULUI DE INVESTIŢII:
***Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR (cod CPV:31711120-0),* ŞI SE ACORDĂ CALIFICATIVUL „FOARTE BINE".**

2. În conformitate cu H.G. 2.139/2004 pentru aprobarea Catalogului privind clasificarea şi duratele normale de funcţionare a mijloacelor fixe, pentru produsul recepţionat s-a stabilit durata normală de funcționare (vezi tabel).

3. Prezentul proces verbal, care conţine 2 (două) file şi o anexă, însumând 3 (trei) file a fost încheiat azi, 06.11.2024 în trei exemplare originale.

[redacted]

[redacted]

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ANEXĂ LA PROCESUL VERBAL DE RECEPŢIE (cod 14-2-5)

nr. 124 din 06.11.2024 a produselor, în vederea extinderii capabilității de măsurare a echipamentelor existente în cadrul LICETER, respectiv ***Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR (cod CPV:31711120-0)*** furnizată de către ***S.C. Global Logistic Systems S.R.L.***, în baza *Contractului nr. e-SC-5772/23.07.2024.*

Nr. crt.	Denumire echipament	Cantitate	Preţ unitar, fără TVA (lei)	Preţ total, fără TVA (lei)	codul de clasificare cf. H.G. nr. 2139/2004	durata normală de funcționare cf. H.G. nr. 2139/2004 [ani]
1.	Sondă pentru măsurarea câmpului electric în sistemul de măsurare SAR	1	101.974,00	101.974,00	2.2.3.1	4
Valoarea totală a produselor, fără TVA [lei]:				**101.974,00**		
Valoarea totală a produselor, cu TVA [lei]:				**121.349,06**		

*) Preţul include toate costurile ofertantului, directe şi indirecte, legate de încheierea şi executarea contractului, în conformitate cu cerinţele minime obligatorii prevăzute în Secţiunea 2: Caietul de sarcini din Documentaţia de atribuire.

ANCOM	Numele şi prenumele	Semnătura
[redacted]		

[redacted]

AVIZ DE INSOTIRE A MARFII

Serie GLS Numar 75

Data 04.11.2024 - RON -

Furnizor	Client
S.C.GLOBAL LOGISTIC SYSTEMS SRL	**AUTORITATEA NATIONALA PENTRU ADMINISTRARE SI REGLEMENTARE IN COM**
CIF RO13930048 RC J40/5444/2001	CIF 14751237
Capital soc. 2 000 RON BUCURESTI sect. 3 str. DIMITRIE BOLINTINEANU nr. 5 ap. 44 Telefon 0212527681 Email contact@gls.ro	BUCURESTI SECTOR 3, STR. DELEA NOUA, NR. 2
Banca ING BANK, IBAN (RON) RO96INGB0000999907340337	
Banca TREZORERIA STATULUI, IBAN(RON) RO54TREZ7035069XXX001141	

Nr. crt.	Denumire produse/servicii	UM	Cantitate	Pret unitar	Valoare	TVA (19%)
1	SONDA PENTRU MASURAREA CAMPIULUI ELECTRIC IN SISTEM DE MASURARE SAR; COD PRODUS 3724-EPGO-411, SAR PROBE	BUC	1.000	101 974.0000	101 974.00	19 375.06
					101 974.00	**19 375.06**
				Total		**121 349.06**

[redacted]

S.C. Global Logistic Systems SRL

Punct de lucru: Str. CORBENI, nr. 10, Sector 2, Bucuresti
J40/5444/2001, RO 13930048
IBAN: RO96INGB0000999907340337, ING BANK NV
IBAN: RO54TREZ7035069XXX001141, Trezoreria Sector 3
Tel. 021 252 76 81, Mobil (+4) 0722 661 266
Website: http://www.gls.ro ; e-mail: contact@gls.ro

CERTIFICAT DE CALITATE SI GARANTIE

Data 06.11.2024

Conform factura fiscala: seria GLS nr 17775/ 04.11.2024

Termenul de garantie pentru: Sonda pentru masurarea campului electric in sistem de masura SAR; respectiv cod produs: 3724-EPGO-411 SAR PROBE, este de 12 luni.

Declaram ca produsul este conform specificatiilor din oferta.

Nu fac obiectul garantiei, accesoriile rupte, sparturi, , zgarieturi, componente desprinse, defecte datorate scufundarii in lichide sau manevrarii gresite ale produselor

Instructiunile de utilizare, depozitare, instalare, sunt furnizate odata cu echipamentele.

Instalarea sau interventia asupra echipamentelor si/sau accesoriilor de catre alte persoane decat cele autorizate de catre furnizor atrage pierderea garantiei.

Perioada de garantie se prelungeste cu durata cat echipamentele s-au aflat in reparatii.

Furnizorul poate decide daca in perioada de garantie va repara echipamentele defecte sau le va inlocui definitiv cu echipamente similare.

Furnizorul nu este responsabil pentru eventualele pierderi suferite de catre cumparator ca urmare a nefunctionarii echipamentelor.

[redacted]

DECLARATIE DE CONFORMITATE

Declaram pe propia raspundere ca echipamentele furnizate sunt conform cu specificatiile fabricantului.

[redacted]

COMOSAR E-Field Probe Calibration Report

Ref : ACR.275.31.24.BES.B

Cancel and replace the report ACR.275.31.24.BES.A

ANCOM

LOCALITATEA PREJMER, STRADA MITROPOLIT ANDREI ȘAGUNA NR. 1033, JUDEȚUL BRAȘOV

MVG COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: 3724-EPGO-441

Calibrated at MVG

Z.I. de la pointe du diable

Technopôle Brest Iroise – 295 avenue Alexis de Rochon

29280 PLOUZANE - FRANCE

Calibration date: 10/10/2024

Accreditations #2-6789
Scope available on www.cofrac.fr

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed at MVG, using the CALIPROBE test bench, for use with a MVG COMOSAR system only. The test results covered by accreditation are traceable to the International System of Units (SI).

	Name	Function	Date	Signature
Prepared by :	[redacted]			
Checked & approved by:				
Authorized by:				

	Customer Name
Distribution :	ANCOM

Issue	Name	Date	Modifications
A	[redacted]		
B			

TABLE OF CONTENTS

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	MVG
Model	SSE2
Serial Number	3724-EPGO-441
Product Condition (new / used)	New
Frequency Range of Probe	0.15 GHz-7.5GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=0.227 MΩ Dipole 2: R2=0.232 MΩ Dipole 3: R3=0.223 MΩ

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

MVG's COMOSAR E field Probes are built in accordance to the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards.

Figure 1 – *MVG COMOSAR Dosimetric E field Probe*

Probe Length	330 mm
Length of Individual Dipoles	2 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	2.5 mm
Distance between dipoles / probe extremity	1 mm

3 MEASUREMENT METHOD

The IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their effect. All calibrations / measurements performed meet the fore-mentioned standards.

3.1 SENSITIVITY

The sensitivity factors of the three dipoles were determined using a two step calibration method (air and tissue simulating liquid) using waveguides as outlined in the standards for frequency range 600-7500MHz and using the calorimeter cell method (transfer method) as outlined in the standards for frequency 150-450 MHz.

3.2 LINEARITY

The evaluation of the linearity was done in free space using the waveguide, performing a power sweep to cover the SAR range 0.01W/kg to 100W/kg.

3.3 ISOTROPY

The axial isotropy was evaluated by exposing the probe to a reference wave from a standard dipole with the dipole mounted under the flat phantom in the test configuration suggested for system validations and checks. The probe was rotated along its main axis from 0 to 360 degrees in 15-degree steps. The hemispherical isotropy is determined by inserting the probe in a thin plastic box filled with tissue-equivalent liquid, with the plastic box illuminated with the fields from a half wave dipole. The dipole is rotated about its axis (0°–180°) in 15° increments. At each step the probe is rotated about its axis (0°–360°).

3.4 BOUNDARY EFFECT

The boundary effect is defined as the deviation between the SAR measured data and the expected exponential decay in the liquid when the probe is oriented normal to the interface. To evaluate this effect, the liquid filled flat phantom is exposed to fields from either a reference dipole or waveguide. With the probe normal to the phantom surface, the peak spatial average SAR is measured and compared to the analytical value at the surface.

The boundary effect uncertainty can be estimated according to the following uncertainty approximation formula based on linear and exponential extrapolations between the surface and d_{be} + d_{step} along lines that are approximately normal to the surface:

$$\mathrm{SAR}_{\mathrm{uncertainty}}[\%] = \Delta\mathrm{SAR}_{be}\,\frac{(d_{be}+d_{step})^2}{2d_{step}}\,\frac{\left(e^{-d_{be}/(\delta/2)}\right)}{\delta/2} \quad \text{for } (d_{be}+d_{step}) < 10\ \mathrm{mm}$$

where

$\mathrm{SAR}_{\mathrm{uncertainty}}$	is the uncertainty in percent of the probe boundary effect
d_{be}	is the distance between the surface and the closest *zoom-scan* measurement point, in millimetre
Δ_{step}	is the separation distance between the first and second measurement points that are closest to the phantom surface, in millimetre, assuming the boundary effect at the second location is negligible
δ	is the minimum penetration depth in millimetres of the head tissue-equivalent liquids defined in this standard, i.e., $\delta \approx 14$ mm at 3 GHz;
$\Delta\mathrm{SAR}_{be}$	in percent of SAR is the deviation between the measured SAR value, at the distance d_{be} from the boundary, and the analytical SAR value.

The measured worst case boundary effect SARuncertainty[%] for scanning distances larger than 4mm is 1.0% Limit ,2%).

3.5 PROBE MODULATION RESPONSE

MVG's probe were evaluated experimentally with various modulated signal and the deviation from CW response were found neglectable in the used power range of the probe. So the correction to taking into account the linearization parameters for different modulation is null, therefore the CW factor given in this report can be used whatever the measured modulation

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEC/IEEE 62209-1528 and FCC KDB865664 D01 standards were followed to generate the measurement uncertainty associated with a SAR probe calibration using the waveguide or calorimetric cell technique depending on the frequency.

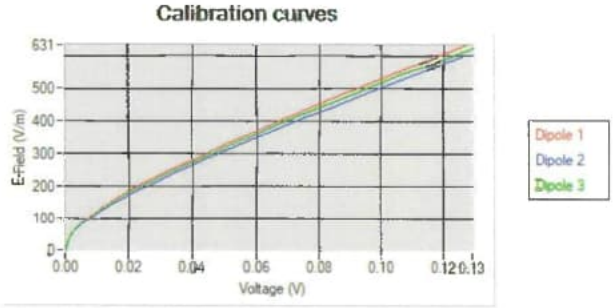
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-11% for the frequency range 150-450MHz.
The estimated expanded uncertainty (k=2) in calibration for SAR (W/kg) is +/-14% for the frequency range 600-7500MHz.

5 CALIBRATION RESULTS

Ambient condition	
Liquid Temperature	20 +/- 1 °C
Lab Temperature	20 +/- 1 °C
Lab Humidity	30-70 %

5.1 CALIBRATION IN AIR

The following curve represents the measurement in waveguide of the voltage picked up by the probe toward the E-field generated inside the waveguide.



From this curve, the sensitivity in air is calculated using the below formula.

$$E^2 = \sum_{i=1}^{3} \frac{V_i \left(1 + {}^{V_i}/_{DCP_i}\right)}{Norm_i}$$

where
Vi=voltage readings on the 3 channels of the probe
DCPi=diode compression point given below for the 3 channels of the probe
Normi=dipole sensitivity given below for the 3 channels of the probe

Normx dipole 1 ($\mu V/(V/m)^2$)	Normy dipole 2 ($\mu V/(V/m)^2$)	Normz dipole 3 ($\mu V/(V/m)^2$)
0.66	0.76	0.67

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
122	110	131

5.2 CALIBRATION IN LIQUID

The calorimeter cell or the waveguide is used to determine the calibration in liquid using the formula below.

$$ConvF = \frac{E^2_{liquid}}{E^2_{air}}$$

The E-field in the liquid is determined from the SAR measurement according to the below formula.

$$E^2_{liquid} = \frac{\rho\, SAR}{\sigma}$$

where
σ=the conductivity of the liquid
ρ=the volumetric density of the liquid
SAR=the SAR measured from the formula that depends on the setup used. The SAR formulas are given below

For the calorimeter cell (150-450 MHz), the formula is:

$$SAR = c\frac{dT}{dt}$$

where
c=the specific heat for the liquid
dT/dt=the temperature rises over the time

For the waveguide setup (600-75000 MHz), the formula is:

$$SAR = \frac{4P_W}{ab\delta} e^{\frac{-2z}{\delta}}$$

where
a=the larger cross-sectional of the waveguide
b=the smaller cross-sectional of the waveguide
δ=the skin depth for the liquid in the waveguide
Pw=the power delivered to the liquid

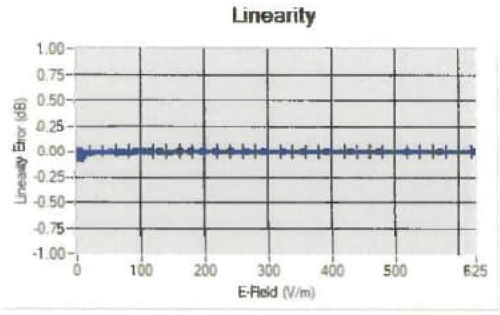
The below table summarize the ConvF for the calibrated liquid. The curves give examples for the measured SAR depending on the voltage in some liquid.

Liquid	Frequency (MHz*)	ConvF
HL750	750	2.81
HL835	835	2.68
HL900	900	2.71
HL1800	1800	2.70
HL1900	1900	2.91
HL2000	2000	3.16
HL2450	2450	3.07
HL2600	2600	2.93
HL3500	3500	2.50
HL3700	3700	2.44

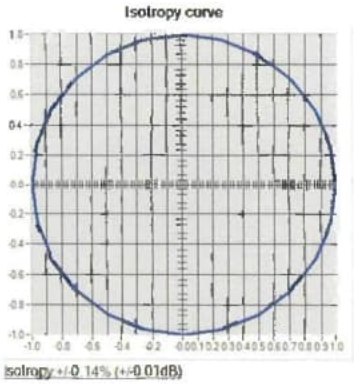
(*) Frequency validity is +/-50MHz below 600MHz, +/-100MHz from 600MHz to 6GHz and +/-700MHz above 6GHz

6 VERIFICATION RESULTS

The figures below represent the measured linearity and axial isotropy for this probe. The probe specification is +/-0.2 dB for linearity and +/-0.15 dB for axial isotropy.



Linearity: +/-1.91% (+/-0.08dB)



Isotropy: +/-0.14% (+/-0.01dB)

7 LIST OF EQUIPMENT

Equipment Summary Sheet				
Equipment Description	**Manufacturer / Model**	**Identification No.**	**Current Calibration Date**	**Next Calibration Date**
CALIPROBE Test Bench	Version 2	NA	Validated. No cal required.	Validated. No cal required.
Network Analyzer	Rohde & Schwarz ZVM	100203	08/2021	08/2026
Network Analyzer – Calibration kit	Rohde & Schwarz ZV-Z235	101223	07/2022	07/2025
Multimeter	Keithley 2000	4013982	02/2023	02/2026
Signal Generator	Rohde & Schwarz SMB	106589	03/2022	03/2025
Amplifier	MVG	MODU-023-C-0002	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Power Meter	NI-USB 5680	170100013	06/2021	06/2026
USB Sensor	Keysight U2000A	SN: MY62340002	10/2022	10/2025
Directional Coupler	Krytar 158020	131467	Characterized prior to test. No cal required.	Characterized prior to test. No cal required.
Fluoroptic Thermometer	LumaSense Luxtron 812	94264	09/2022	09/2025
Coaxial cell	MVG	SN 32/16 COAXCELL_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG2_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G600_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG4_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_0G900_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG6_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG8_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800B_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_1G800H_1	Validated. No cal required.	Validated. No cal required.

Waveguide	MVG	SN 32/16 WG10_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_3G500_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG12_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_5G000_1	Validated. No cal required.	Validated. No cal required.
Waveguide	MVG	SN 32/16 WG14_1	Validated. No cal required.	Validated. No cal required.
Liquid transition	MVG	SN 32/16 WGLIQ_7G000_1	Validated. No cal required.	Validated. No cal required.
Temperature / Humidity Sensor	Testo 184 H1	44235403	02/2024	02/2027

ORDIN DE PLATA MULTIPLU ELECTRONIC (OPME)

Tip Entitate: (•) Entitate Publica ( ) Alte Entitati ( ) Persoana Fizica

Suma control: 15029071

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Numar document: 0000000846

Data document: 18.11.2024 Nr.inregistrari: 2

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Denumire Platitor: ANCOM CIF platitor: 14751237 Adresa platitor: DELEA NOUA 2 SECTOR 3

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VALIDARE SI GENERARE XML

Semnatura 1 [redacted] Semnatura 2 [redacted]

FISIERELE CARE SE IMPORTA TREBUIE SA AIBA TERMINATIA .XML, SA FI FOST GENERATE DIN VERSIUNI ANTERIOARE ALE ACESTUI FORMULAR SAU SA FI FOST GENERATE DIN APLICATIILE BENEFICIARULUI, CU RESPECTAREA INTOCMAI A STRUCTURII DIN GHIDUL UTILIZATORULUI.

NERESPECTAREA ACESTOR INSTRUCTIUNI VA PROVOCA O FUNCTIONARE DEFECTUOASA A FORMULARULUI.

ATENTIE!!! Debitarea contului se va realiza in functie de data si ora la care se depune documentul si se primeste prima notificare din partea sistemului prin care se confirma corectitudinea formala a documentului.


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Import XML