SURFACE SAR	VOLUME SAR

Maximum location: X=-1.00, Y=45.00

SAR 10g (W/Kg)	0.189877
SAR 1g (W/Kg)	0.359021

Z (mm)	0.00	4.00	9.00	14.00	19.00
SAR (W/Kg)	0.0000	0.3735	0.1999	0.1062	0.0583
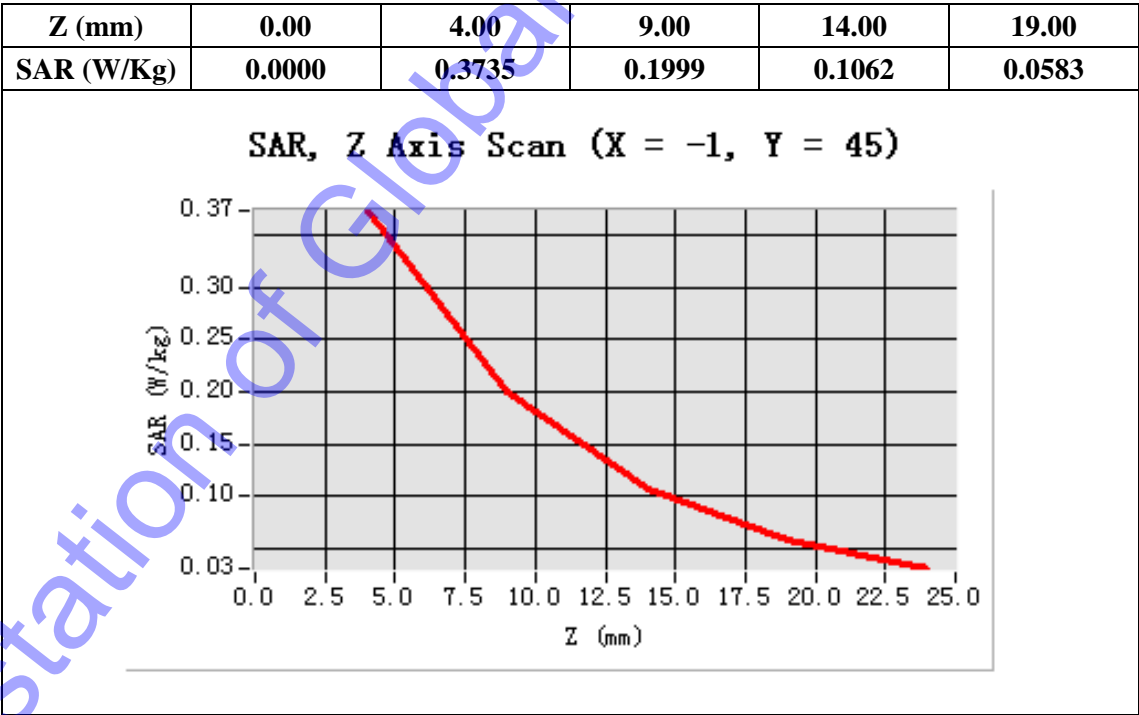
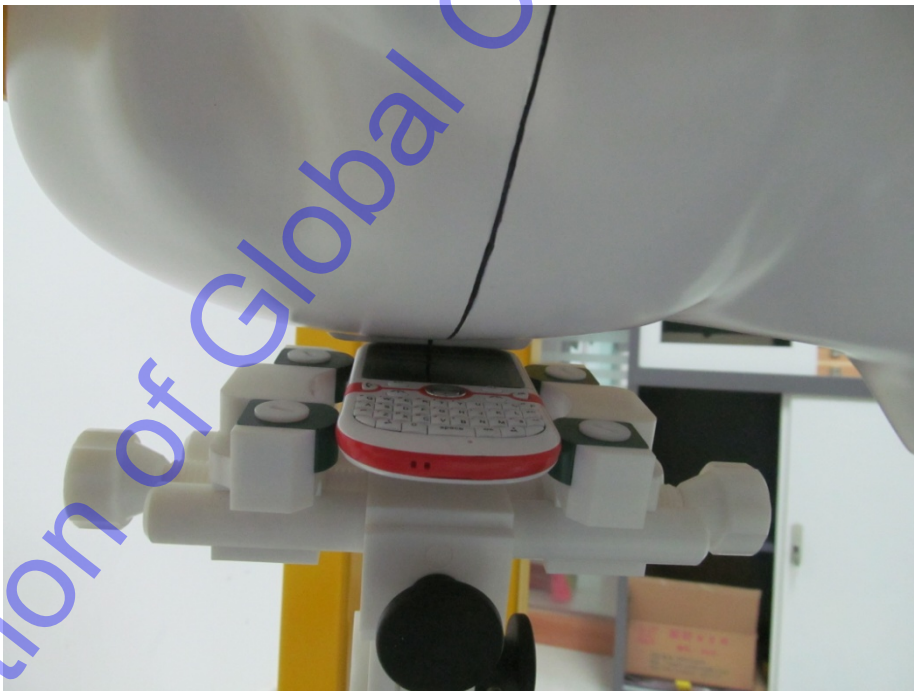| 3D screen shot	Hot spot position

Appendix C. TEST SETUP PHOTOGRAPHS &EUT PHOTOGRAPS
Test Setup Photographs

LEFT-CHECK TOUCH
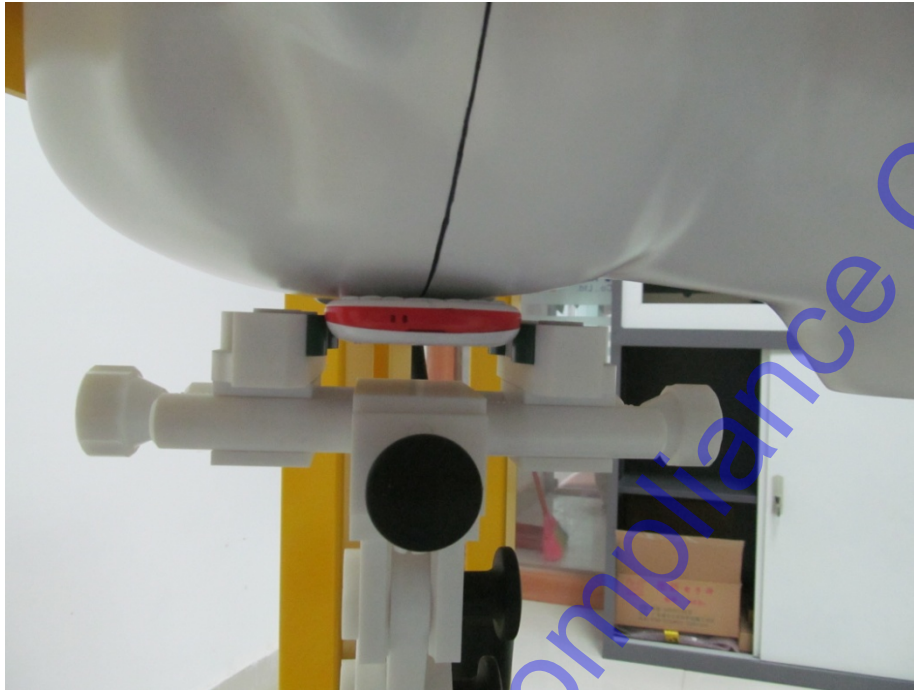
LEFT-TILT 15^0

RIGHT-CHECK TOUCH
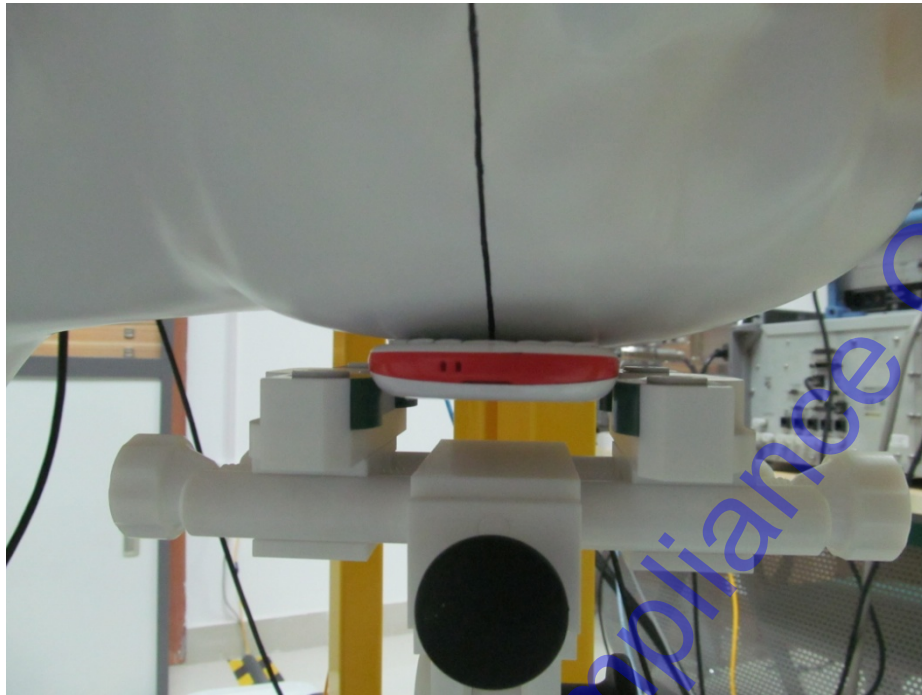
RIGHT-TILT 15^{0}
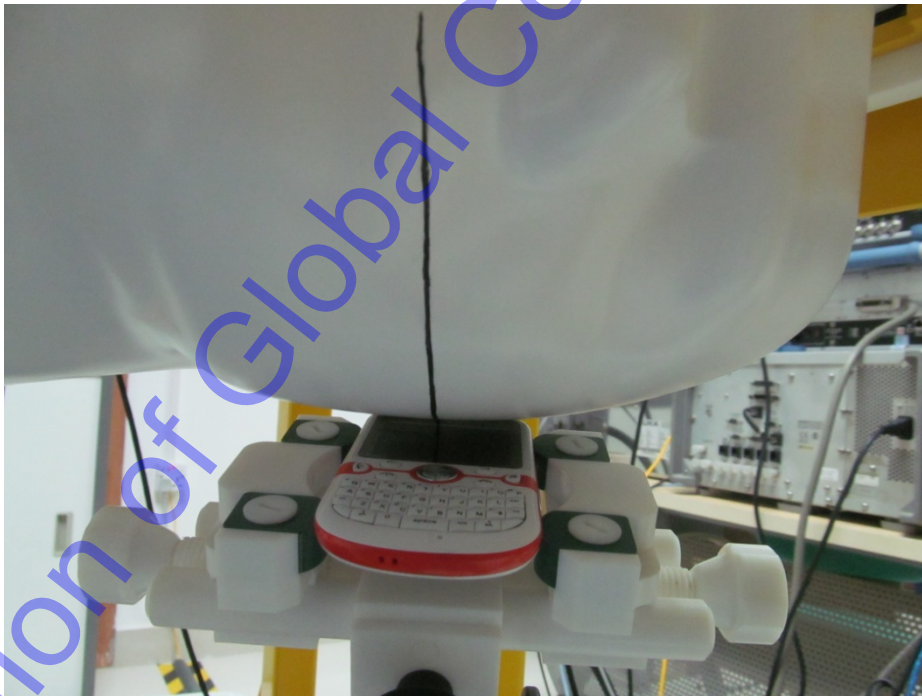
Body Back15mm

Front Back15mm
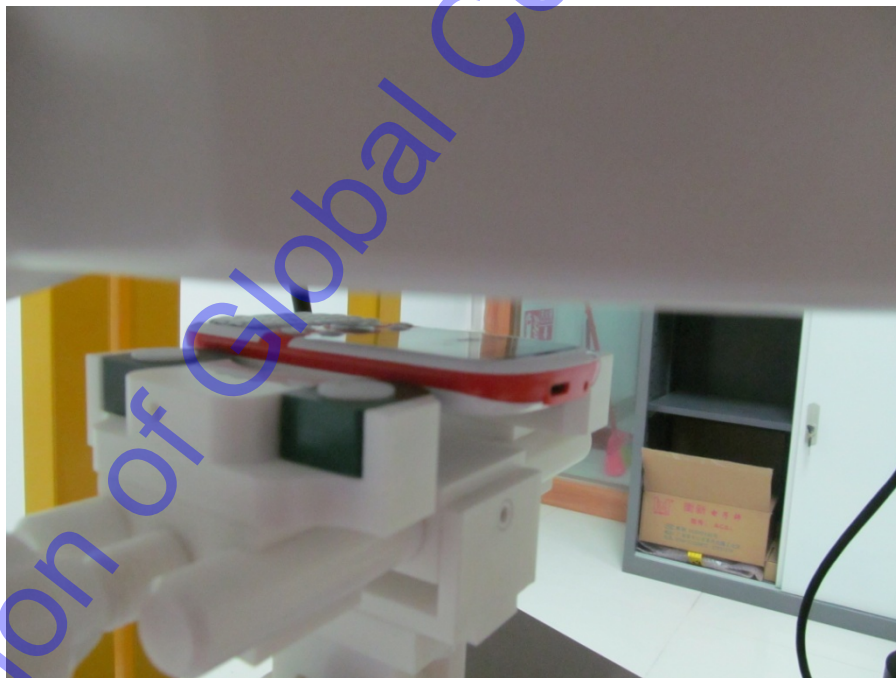
Body back with Headset
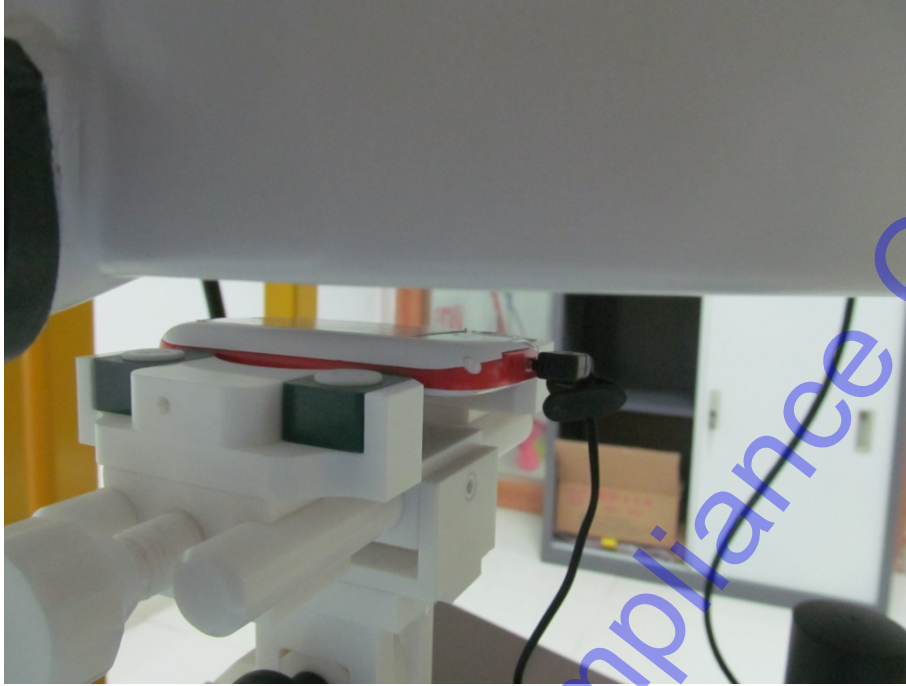
DEPTH OF THE LIQUID IN THE PHANTOM—ZOOM IN

Note：The position used in the measurement were according to IEEE 1528-2003

EUT PHOTOGRAPS

TOP VIEW OF SAMPLE

BOTTOM VIEW OF SAMPLE

LEFT VIEW OF SAMPLE

RIGHT VIEW OF SAMPLE

FRONT VIEW OF SAMPLE

BACK VEIW OF SAMPLE

ALL VIEW OF SAMPLE

OPEN VIEW OF SAMPLE-1

OPEN VIEW OF SAMPLE-2

OPEN VIEW OF SAMPLE-3
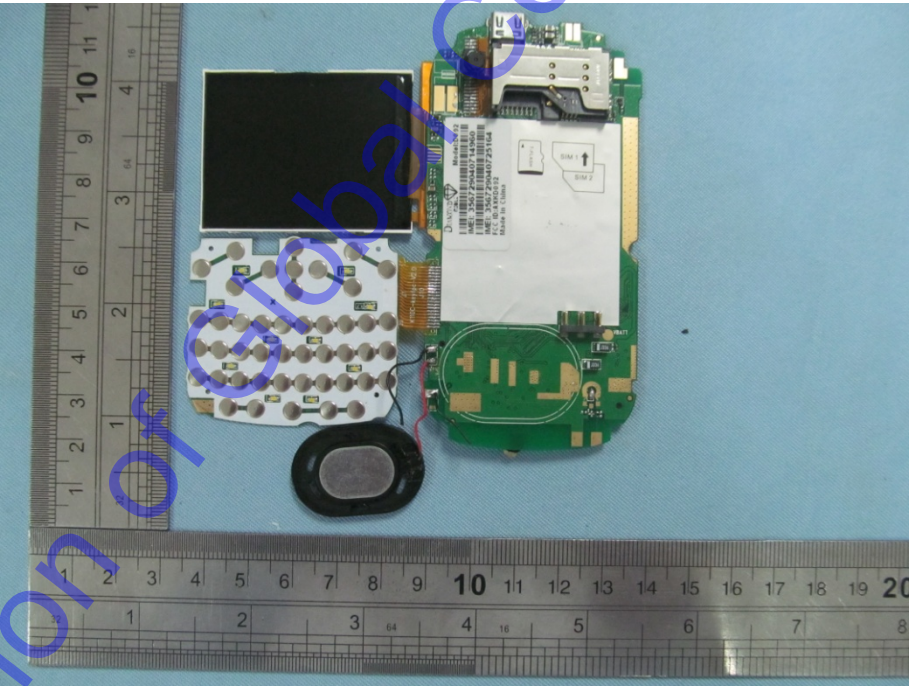
OPEN VIEW OF SAMPLE-4
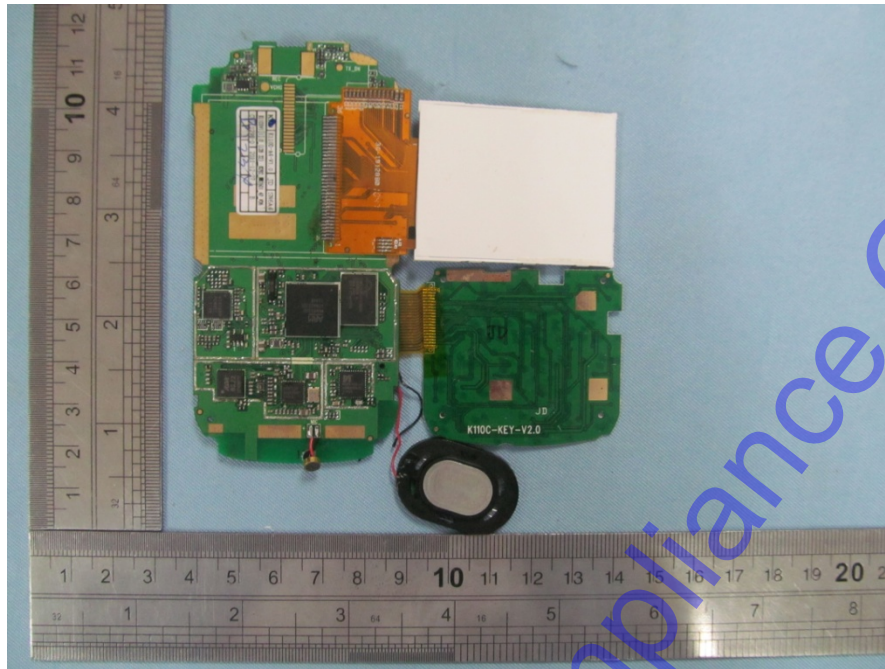
Appendix D. Probe Calibration Data

COMOSAR E-Field Probe Calibration Report

Ref : ACR.343.2.11.SATU.A

ATTESTATION OF GLOBAL COMPLIANCE CO. LTD.

1&2F, NO.2 BUILDING, HUAFENG NO.1 INDUSTRIAL PARK, GUSHU COMMUNITY XIXIANG STREET BAOAN DISTRICT, SHENZHEN, P.R. CHINA

SATIMO COMOSAR DOSIMETRIC E-FIELD PROBE

SERIAL NO.: SN 35/11 EP132

Calibrated at SATIMO US

2105 Barrett Park Dr. - Kennesaw, GA 30144

A2L ACCREDITED
Calibration CERT #2246.02

12/09/11

Summary:

This document presents the method and results from an accredited COMOSAR Dosimetric E-Field Probe calibration performed in SATIMO USA using the CALISAR / CALIBAIR test bench, for use with a SATIMO COMOSAR system only. All calibration results are traceable to national metrology institutions.

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.343.2.11.SATU.A

	Name	Function	Date	Signature
Prepared by :	Jérôme LUC	Product Manager	12/9/2011	
Checked by :	Jérôme LUC	Product Manager	12/9/2011	
Approved by :	Kim RUTKOWSKI	Quality Manager	12/9/2011	

	Customer Name
Distribution :	ATTESTATION OF GLOBAL COMPLIANCE CO. LTD.

Issue	Date	Modifications
A	12/9/2011	Initial release

COMOSAR E-FIELD PROBE CALIBRATION REPORT

Ref: ACR.343.2.11.SATU.A

TABLE OF CONTENTS

COM OSAR E-FIELD PROBE CALIBRATION REPORT   Ref ACR.343.2.11.SATU.A

1 DEVICE UNDER TEST

Device Under Test	
Device Type	COMOSAR DOSIMETRIC E FIELD PROBE
Manufacturer	Satimo
Model	SSE5
Serial Number	SN 35/11 EP132
Product Condition (new / used)	new
Frequency Range of Probe	0.3 GHz-3GHz
Resistance of Three Dipoles at Connector	Dipole 1: R1=1.200 MΩ Dipole 2: R2=1.214 MΩ Dipole 3: R3=1.004 MΩ

A yearly calibration interval is recommended.

2 PRODUCT DESCRIPTION

2.1 GENERAL INFORMATION

Satimo's COMOSAR E field Probes are built in accordance to the IEEE 1528, OET 65 Bulletin C and CEI/IEC 62209 standards.
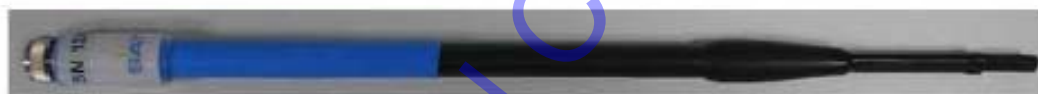
Figure 1 – *Satimo COMOSAR Dosimetric E field Dipole*

Probe Length	330 mm
Length of Individual Dipoles	4.5 mm
Maximum external diameter	8 mm
Probe Tip External Diameter	5 mm
Distance between dipoles / probe extremity	2.7 mm

3 MEASUREMENT METHOD

The IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards provide recommended practices for the probe calibrations, including the performance characteristics of interest and methods by which to assess their affect. All calibrations / measurements performed meet the fore mentioned standards.

3.1 LINEARITY

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

	COMOSAR E-FIELD PROBE CALIBRATION REPORT	Ref: ACR.343.2.11.SATU.A

3.2 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.

3.3 LOWER DETECTION LIMIT

The lower detection limit was assessed using the same measurement set up as used for the linearity measurement. The required lower detection limit is 10 mW/kg.

3.4 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 - 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°).

3.5 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.

4 MEASUREMENT UNCERTAINTY

The guidelines outlined in the IEEE 1528, OET 65 Bulletin C, CENELEC EN50361 and CEI/IEC 62209 standards were followed to generate the measurement uncertainty associated with an E-field probe calibration using the waveguide technique. All uncertainties listed below represent an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2, traceable to the Internationally Accepted Guides to Measurement Uncertainty.

Uncertainty analysis of the probe calibration in waveguide					
ERROR SOURCES	Uncertainty value (%)	Probability Distribution	Divisor	c_i	Standard Uncertainty (%)
Incident or forward power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Reflected power	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Liquid conductivity	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Liquid permittivity	4.00%	Rectangular	$\sqrt{3}$	1	2.309%
Field homogeneity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%
Field probe positioning	5.00%	Rectangular	$\sqrt{3}$	1	2.887%
Field probe linearity	3.00%	Rectangular	$\sqrt{3}$	1	1.732%

COMOSAR E-FIELD PROBE CALIBRATION REPORT	Ref: ACR.343.2.11.SATU.A

Combined standard uncertainty					5.831%
Expanded uncertainty 95 % confidence level k = 2					11.662%

5   CALIBRATION MEASUREMENT RESULTS

Calibration Parameters	
Liquid Temperature	21 °C
Lab Temperature	21 °C
Lab Humidity	45 %

5.1   SENSITIVITY IN AIR

Normx dipole 1 $(\mu V/(V/m)^2)$	Normy dipole 2 $(\mu V/(V/m)^2)$	Normz dipole 3 $(\mu V/(V/m)^2)$
5.01	4.86	4.77

DCP dipole 1 (mV)	DCP dipole 2 (mV)	DCP dipole 3 (mV)
99	104	101

Calibration curves ei=f(V) (i=1,2,3) allow to obtain H-field value using the formula:

$$E = \sqrt{E_1^2 + E_2^2 + E_3^2}$$

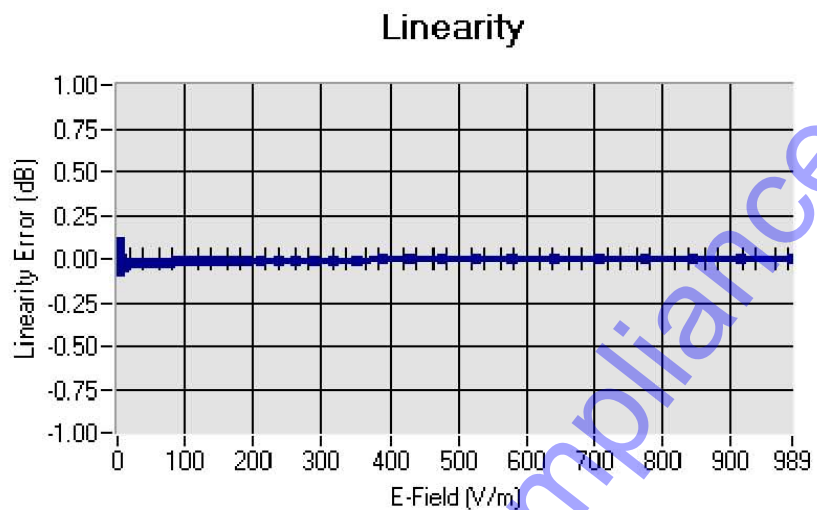Calibration curves
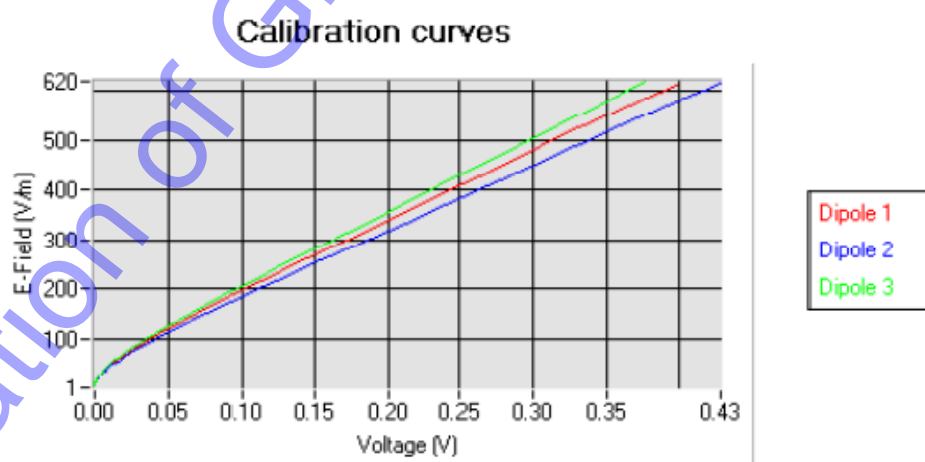
COMOSAR E-FIELD PROBE CALIBRATION REPORT   Ref: ACR.343.2.11.SATU.A

5.2 LINEARITY

Linearity: +/-2.29% (+/-0.10dB)

5.3 SENSITIVITY IN LIQUID

Liquid	Frequency(MHz+/-100MHz)	Permittivity	Epsilon(S/m)	ConvF
HL300	300	44.76	0.86	5.91
HL450	450	42.52	0.88	6.06
HL850	850	41.53	0.91	6.79
HL900	900	41.54	0.97	6.82
HL1800	1750	38.35	1.38	6.01
HL1900	1880	39.43	1.42	6.42
HL2000	1950	40.34	1.44	5.77
HL2450	2450	38.99	1.84	5.60

LOWER DETECTION LIMIT: 7mW/kg