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Accreditation No.: **SCS 108**

Client **Nokia Salo TCC**

Certificate No: **H3-6053_Jan05**

CALIBRATION CERTIFICATE

Object **H3DV6 - SN:6053**

Calibration procedure(s) **QA CAL-03.v4
Calibration procedure for H-field probes optimized for close near field
evaluations in air**

Calibration date: **January 20, 2005**

Condition of the calibrated item **In Tolerance**

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 #	Cal Date (Calibrated by, Certificate No.)	Scheduled Calibration
Power meter E4419B	GB41293874	5-May-04 (METAS, No. 251-00388)	May-05
Power sensor E4412A	MY41495277	5-May-04 (METAS, No. 251-00388)	May-05
Reference 3 dB Attenuator	SN: S5054 (3c)	10-Aug-04 (METAS, No. 251-00403)	Aug-05
Reference 20 dB Attenuator	SN: S5086 (20b)	3-May-04 (METAS, No. 251-00389)	May-05
Reference 30 dB Attenuator	SN: S5129 (30b)	10-Aug-04 (METAS, No. 251-00404)	Aug-05
Reference Probe H3DV6	SN: 6182	6-Oct-04 (SPEAG, No. H3-6182_Oct04)	Oct-05
DAE4	SN: 617	29-Sep-04 (SPEAG, No. DAE4-617_Sep04)	Sep-05

Secondary Standards	ID #	Check Date (in house)	Scheduled Check
Power sensor HP 8481A	MY41092180	18-Sep-02 (SPEAG, in house check Oct-03)	In house check: Oct 05
RF generator HP 8648C	US3642U01700	4-Aug-99 (SPEAG, in house check Dec-03)	In house check: Dec-05
Network Analyzer HP 8753E	US37390585	18-Oct-01 (SPEAG, in house check Nov-04)	In house check: Nov 05

	Name	Function	Signature
Calibrated by:	Nico Vetterli	Laboratory Technician	

	Name	Function
Approved by:	Katja Pokovic	Technical Manager

Issued: January 20, 2005

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

DASY - Parameters of Probe: H3DV6 SN:6053

Sensitivity in Free Space [A/m / $\sqrt{(\mu V)}$]

	a0	a1	a2
X	2.716E-03	-6.885E-5	-4.497E-5 ± 5.1 % (k=2)
Y	2.563E-03	-1.866E-4	6.857E-5 ± 5.1 % (k=2)
Z	2.906E-03	-3.590E-4	5.491E-5 ± 5.1 % (k=2)

Diode Compression¹

DCP X	86 mV
DCP Y	86 mV
DCP Z	86 mV

Sensor Offset (Probe Tip to Sensor Center)

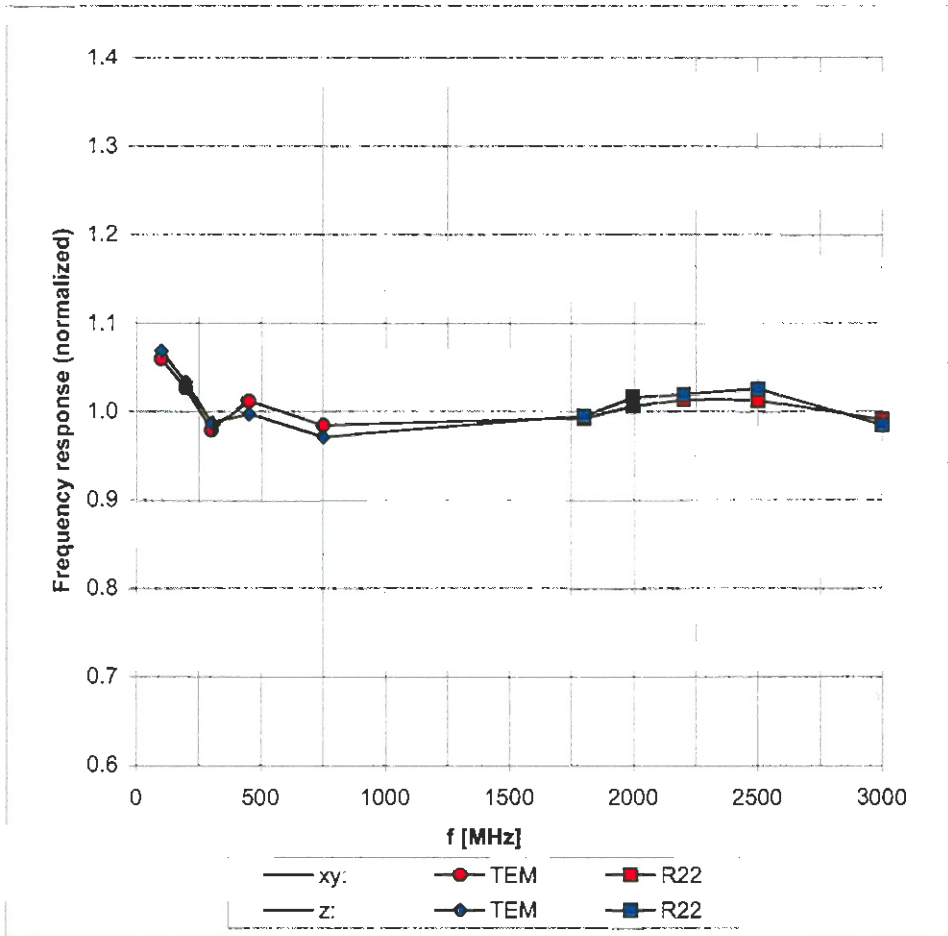
X	3.0 mm
Y	3.0 mm
Z	3.0 mm

Connector Angle 33 °

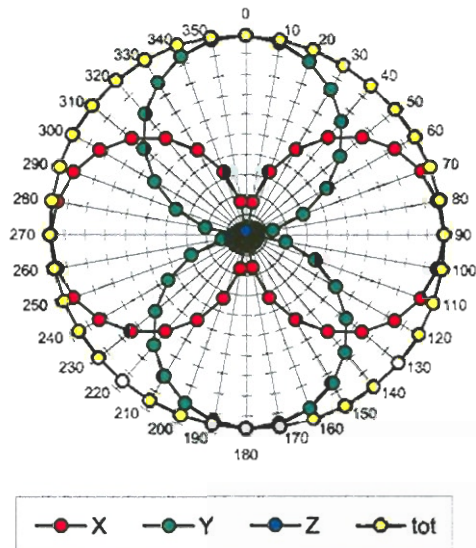
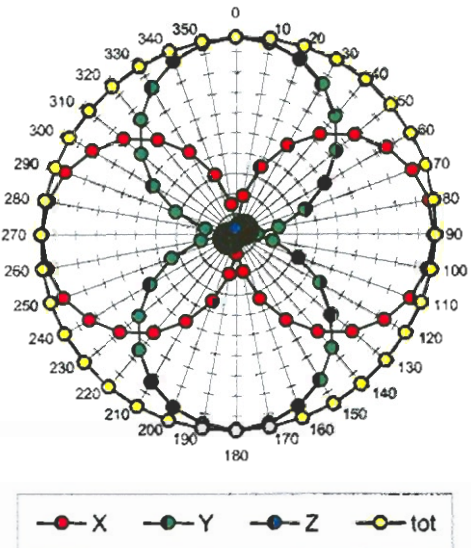
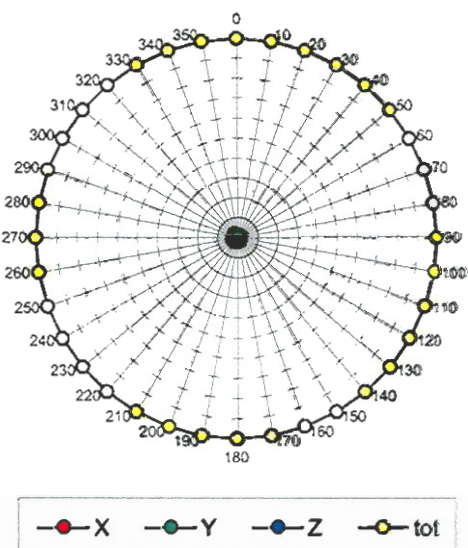
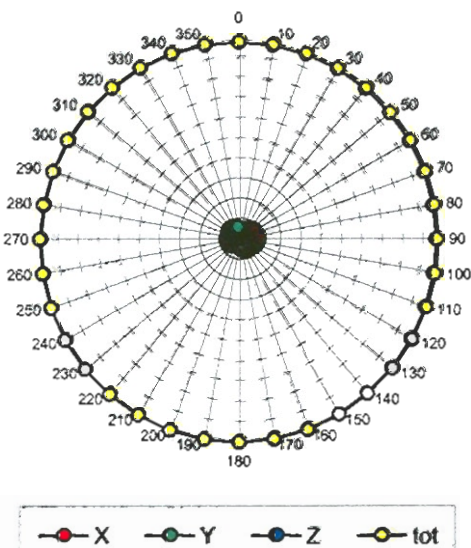
The reported uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to a coverage probability of approximately 95%.

¹ numerical linearization parameter: uncertainty not required

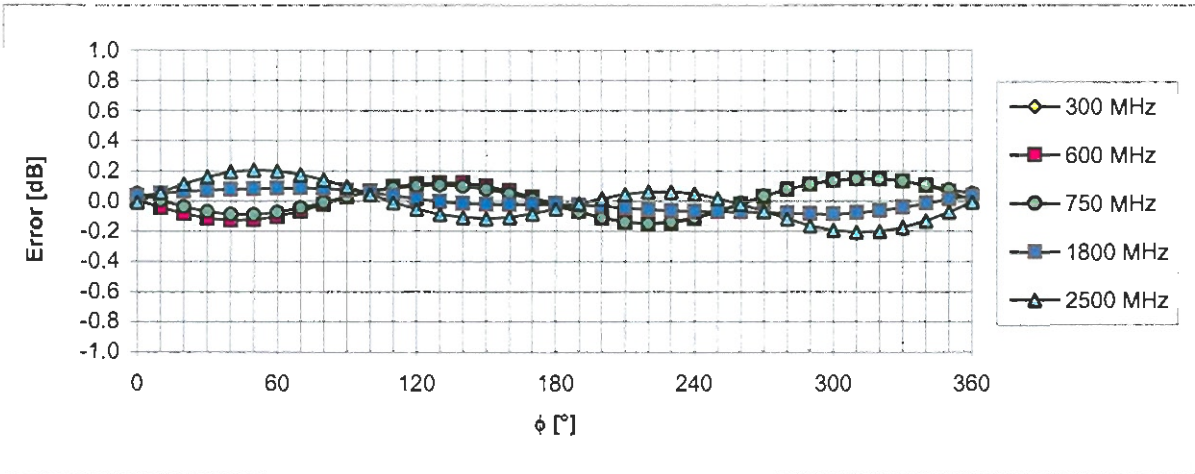
Frequency Response of H-Field
(TEM-Cell:ifi110, Waveguide R22)



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

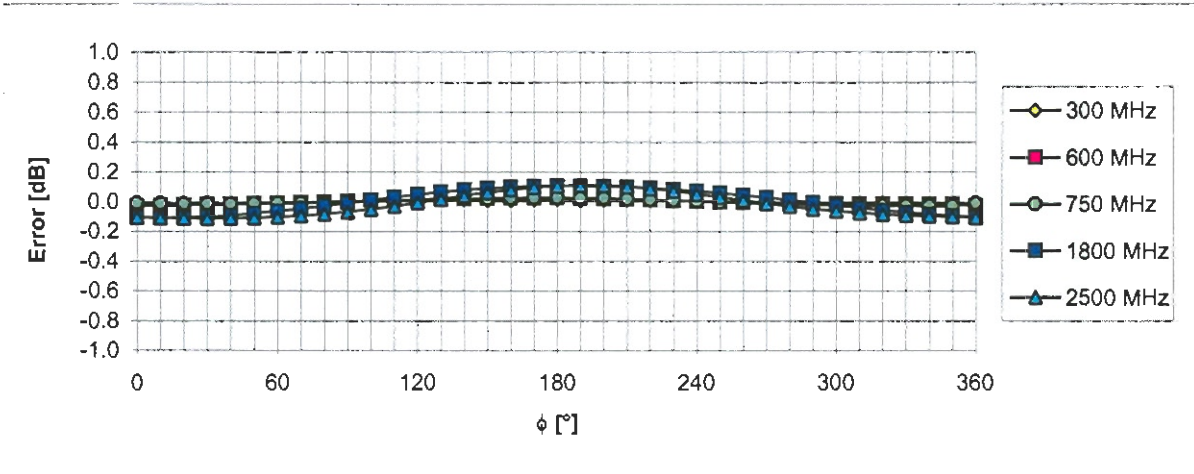
Receiving Pattern (ϕ), $\vartheta = 90^\circ$ $f = 300 \text{ MHz}$, TEM ifi110EXX $f = 2500 \text{ MHz}$, WG R22Receiving Pattern (ϕ), $\vartheta = 0^\circ$ $f = 300 \text{ MHz}$, TEM ifi110EXX $f = 2500 \text{ MHz}$, WG R22

Receiving Pattern (ϕ), $\vartheta = 90^\circ$



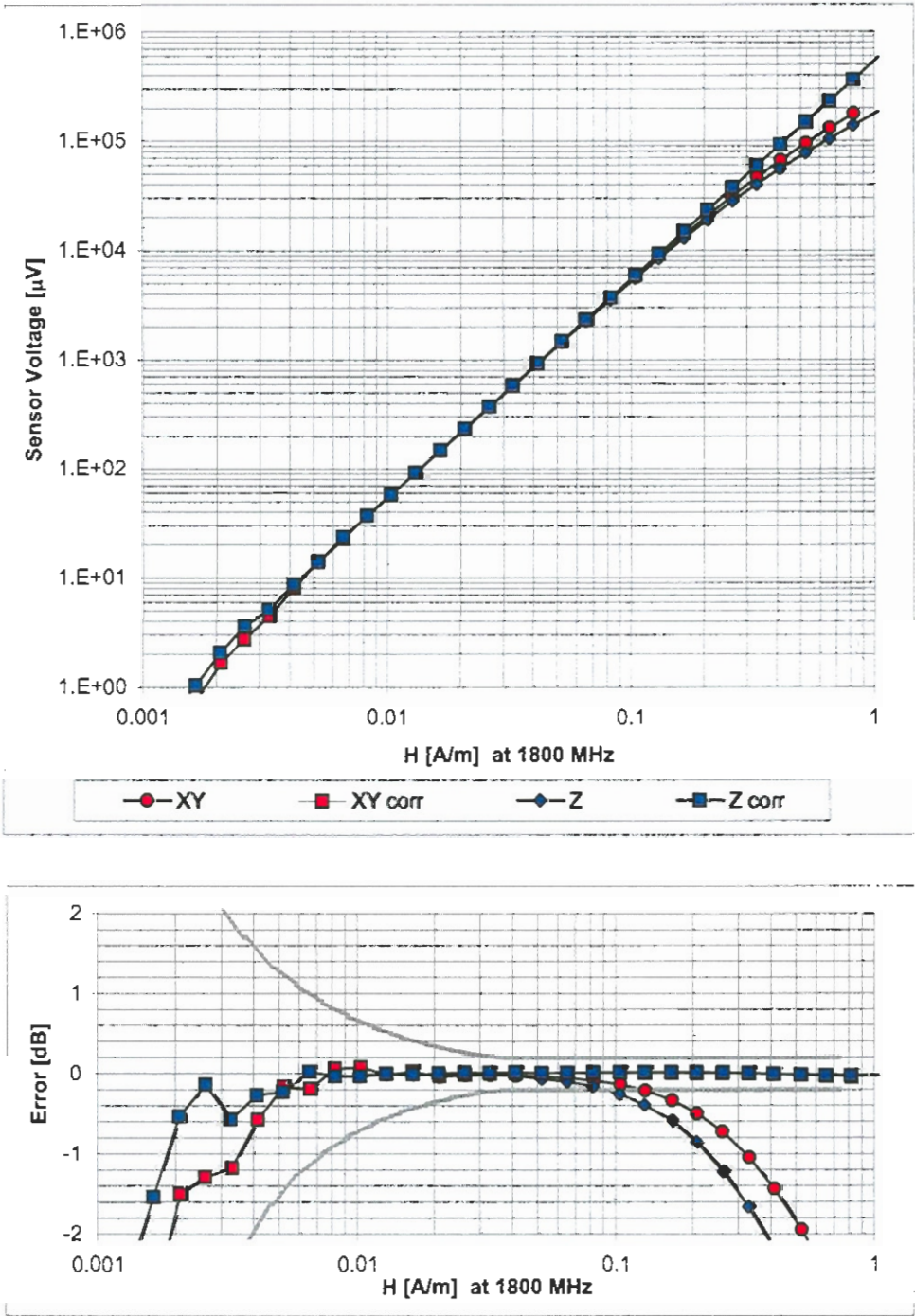
Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Receiving Pattern (ϕ), $\vartheta = 0^\circ$



Uncertainty of Axial Isotropy Assessment: $\pm 0.5\%$ ($k=2$)

Dynamic Range f(H-field)
(Waveguide R22, f = 1800 MHz)



Uncertainty of Linearity Assessment: ± 0.6% (k=2)