

## ATTACHMENT R – PROBE CALIBRATION DATA

ET3DV6 SN:1609

March 23, 2006

# Probe ET3DV6

## SN:1609

|                  |                    |
|------------------|--------------------|
| Manufactured:    | July 27, 2001      |
| Last calibrated: | September 22, 2004 |
| Recalibrated:    | March 23, 2006     |

Calibrated for DASY Systems

(Note: non-compatible with DASY2 system!)

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**DASY - Parameters of Probe: ET3DV6 SN:1609**Sensitivity in Free Space<sup>A</sup>

|       |              |                                     |
|-------|--------------|-------------------------------------|
| NormX | 1.88 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormY | 1.84 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |
| NormZ | 1.84 ± 10.1% | $\mu\text{V}/(\text{V}/\text{m})^2$ |

Diode Compression<sup>B</sup>

|       |       |
|-------|-------|
| DCP X | 95 mV |
| DCP Y | 95 mV |
| DCP Z | 95 mV |

## Sensitivity in Tissue Simulating Liquid (Conversion Factors)

Please see Page 8.

## Boundary Effect

TSL                      900 MHz      Typical SAR gradient: 5 % per mm

|                                                         |        |        |
|---------------------------------------------------------|--------|--------|
| Sensor Center to Phantom Surface Distance               | 3.7 mm | 4.7 mm |
| SAR <sub>be</sub> [%]      Without Correction Algorithm | 8.3    | 4.4    |
| SAR <sub>be</sub> [%]      With Correction Algorithm    | 0.1    | 0.1    |

TSL                      1750 MHz      Typical SAR gradient: 10 % per mm

|                                                         |        |        |
|---------------------------------------------------------|--------|--------|
| Sensor Center to Phantom Surface Distance               | 3.7 mm | 4.7 mm |
| SAR <sub>be</sub> [%]      Without Correction Algorithm | 6.2    | 3.1    |
| SAR <sub>be</sub> [%]      With Correction Algorithm    | 0.2    | 0.2    |

## Sensor Offset

Probe Tip to Sensor Center                      2.7 mm

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%.

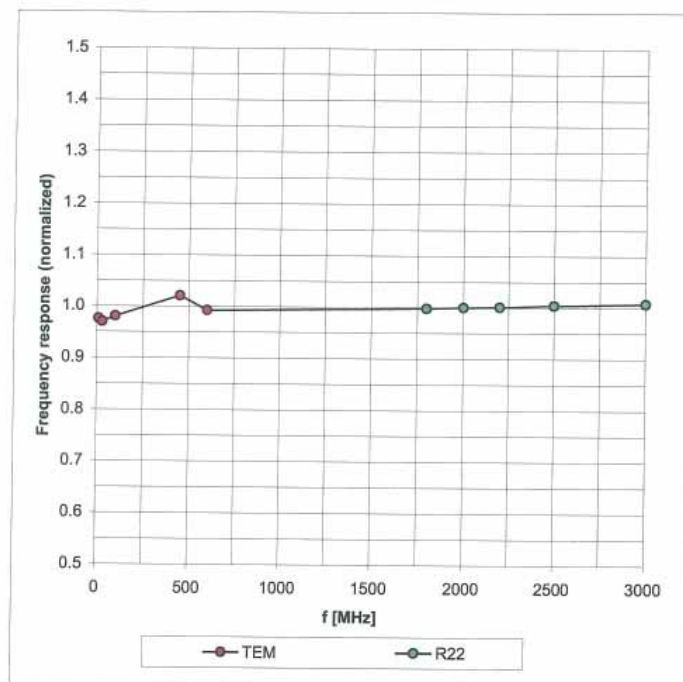
<sup>A</sup> The uncertainties of NormX,Y,Z do not affect the E<sup>2</sup>-field uncertainty inside TSL (see Page 8).<sup>B</sup> Numerical linearization parameter; uncertainty not required.

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### Frequency Response of E-Field

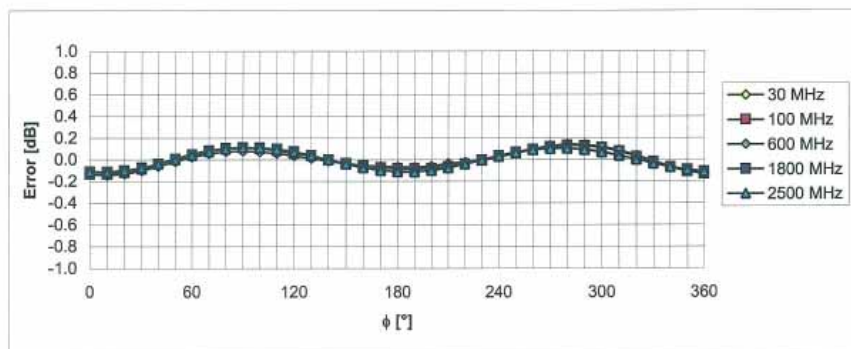
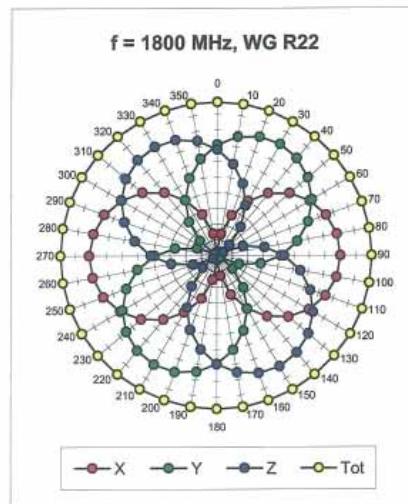
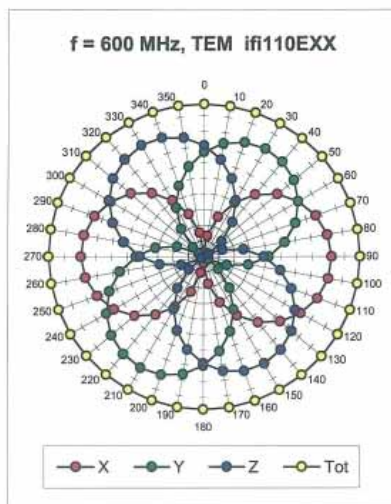
(TEM-Cell:ifi110 EXX, Waveguide: R22)

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

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

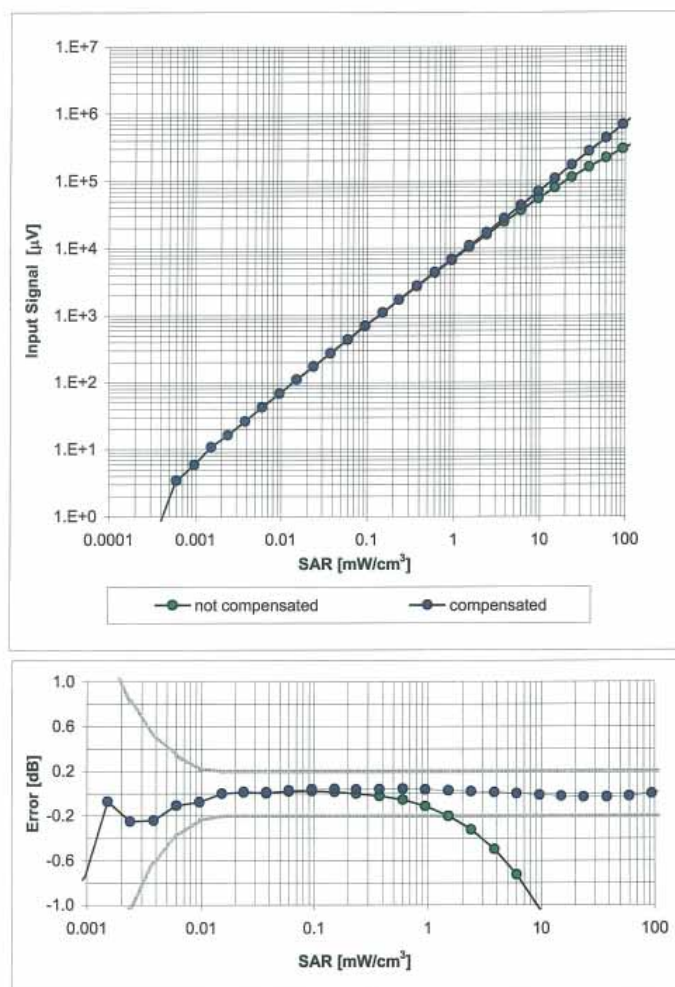


Uncertainty of Axial Isotropy Assessment:  $\pm 0.5\%$  ( $k=2$ )

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### Dynamic Range f(SAR<sub>head</sub>) (Waveguide R22, f = 1800 MHz)

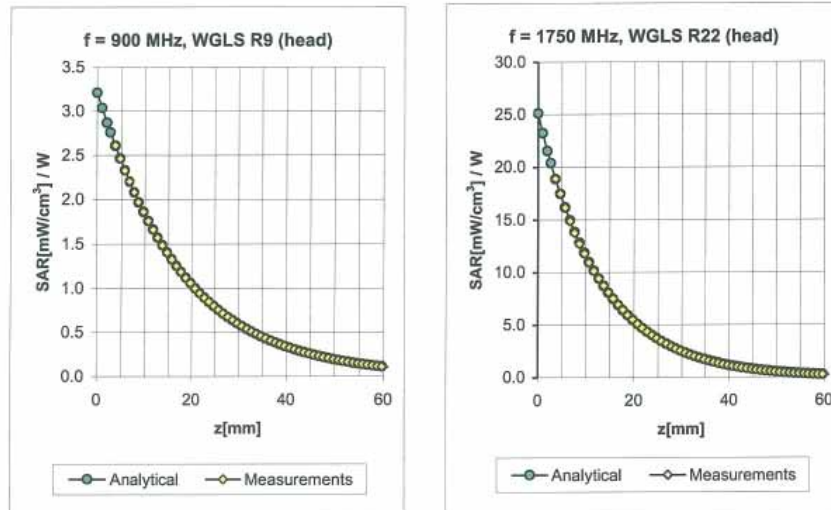


Uncertainty of Linearity Assessment:  $\pm 0.6\%$  ( $k=2$ )

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## Conversion Factor Assessment



| f [MHz] | Validity [MHz] <sup>c</sup> | TSL  | Permittivity | Conductivity | Alpha | Depth | ConvF Uncertainty  |
|---------|-----------------------------|------|--------------|--------------|-------|-------|--------------------|
| 450     | ± 50 / ± 100                | Head | 43.5 ± 5%    | 0.87 ± 5%    | 0.27  | 3.19  | 6.82 ± 13.3% (k=2) |
| 835     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.90 ± 5%    | 0.57  | 1.83  | 6.85 ± 11.0% (k=2) |
| 900     | ± 50 / ± 100                | Head | 41.5 ± 5%    | 0.97 ± 5%    | 0.59  | 1.81  | 6.53 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Head | 40.1 ± 5%    | 1.37 ± 5%    | 0.48  | 2.69  | 5.46 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.52  | 2.45  | 5.16 ± 11.0% (k=2) |
| 1950    | ± 50 / ± 100                | Head | 40.0 ± 5%    | 1.40 ± 5%    | 0.52  | 2.43  | 5.08 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Head | 39.2 ± 5%    | 1.80 ± 5%    | 0.60  | 2.30  | 4.50 ± 11.8% (k=2) |
| 450     | ± 50 / ± 100                | Body | 56.7 ± 5%    | 0.94 ± 5%    | 0.24  | 4.02  | 7.32 ± 13.3% (k=2) |
| 835     | ± 50 / ± 100                | Body | 55.2 ± 5%    | 0.97 ± 5%    | 0.47  | 2.06  | 6.42 ± 11.0% (k=2) |
| 1750    | ± 50 / ± 100                | Body | 53.4 ± 5%    | 1.49 ± 5%    | 0.53  | 2.59  | 4.80 ± 11.0% (k=2) |
| 1900    | ± 50 / ± 100                | Body | 53.3 ± 5%    | 1.52 ± 5%    | 0.70  | 2.19  | 4.63 ± 11.0% (k=2) |
| 2450    | ± 50 / ± 100                | Body | 52.7 ± 5%    | 1.95 ± 5%    | 0.62  | 2.21  | 4.17 ± 11.8% (k=2) |

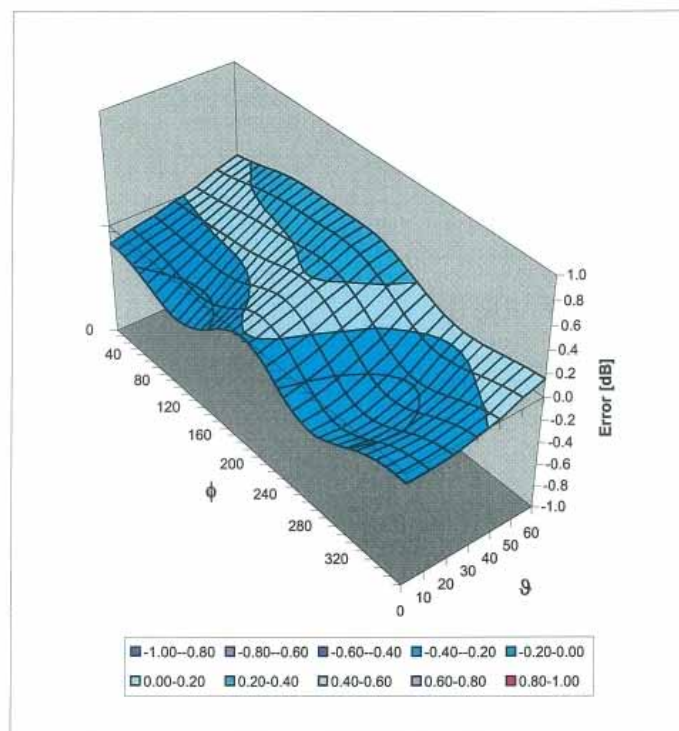
<sup>c</sup> The validity of ± 100 MHz only applies for DASY v4.4 and higher (see Page 2). The uncertainty is the RSS of the ConvF uncertainty at calibration frequency and the uncertainty for the indicated frequency band.

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### Deviation from Isotropy in HSL

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



Uncertainty of Spherical Isotropy Assessment:  $\pm 2.6\%$  ( $k=2$ )