

Detlef Kaiser – competences

high frequency characterisation of components

(for optical communications, InP-system, done at RC of Alcatel SEL AG)

S-parameter and small-signal transfer function:

- E/E devices:

electrical HEMTs (=HFETs)
with transit frequencies
up to $f_T \approx 40$ GHz

*IEEE Trans. Microwave Theory
Tech., vol. MTT-43,
pp. 2334-2341, Sept. 1995*

- O/E converter:

- PIN photodiodes (3dB-bandwidth $B = f_{3dB} \approx 15$ GHz)

- A(valanche)PDs (multiplication-bandwidth-product $M*B \approx 70$ GHz)

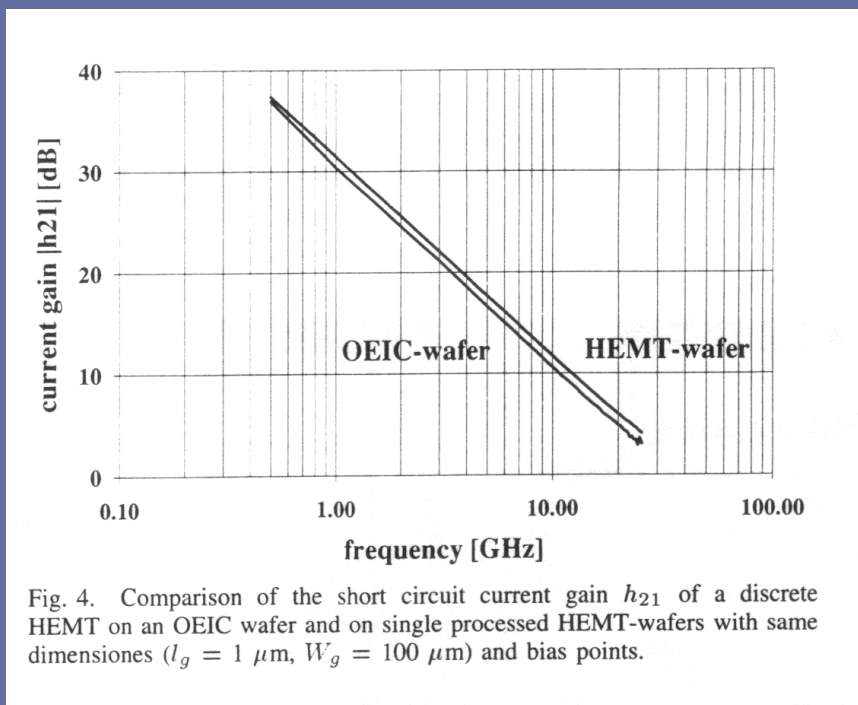


Fig. 4. Comparison of the short circuit current gain h_{21} of a discrete HEMT on an OEIC wafer and on single processed HEMT-wafers with same dimensions ($l_g = 1 \mu\text{m}$, $W_g = 100 \mu\text{m}$) and bias points.

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high frequency characterisation of **components**

(for optical communications, InP-system, done at RC of Alcatel SEL AG)

S-parameter and small-signal transfer function:

- E/O converter:

laserdiodes

($f_{3dB} \approx 10$ GHz)

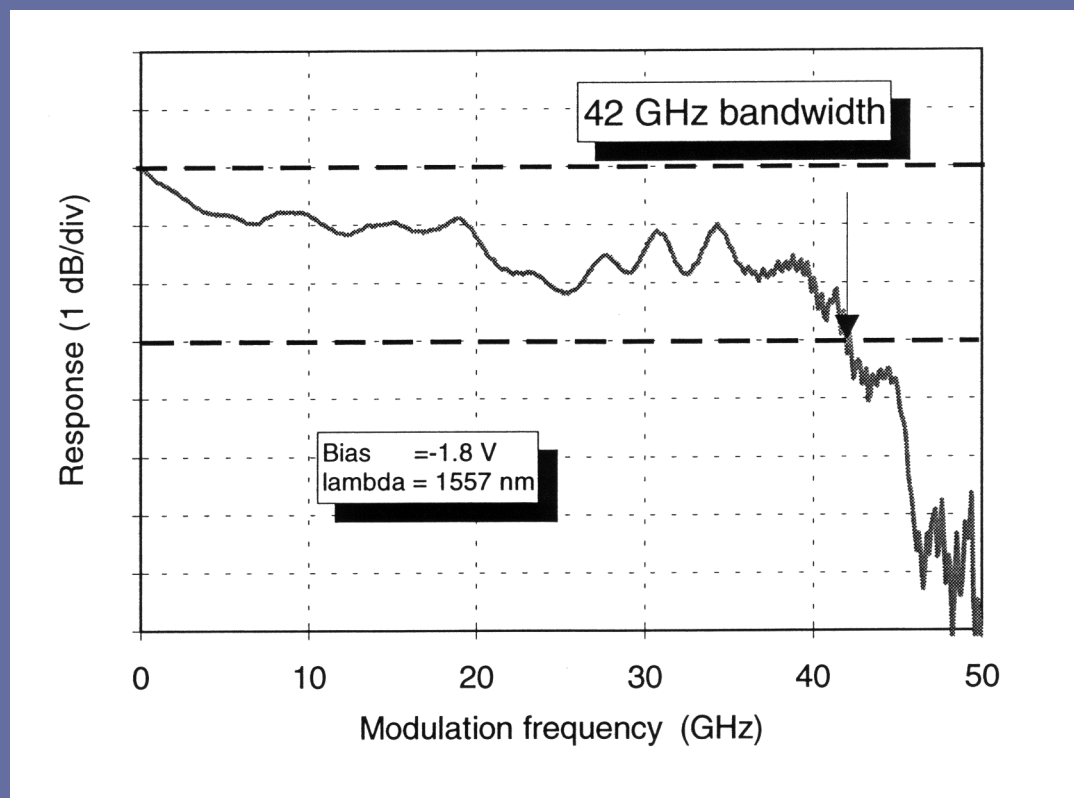
- O/O devices:

electroabsorption

modulators

($f_{3dB} \approx 42$ GHz)

Electron. Lett., 1995,
vol. 31, pp. 2030-2032



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high frequency characterisation of *circuits*

(for optical communications, InP-system, done at RC of Alcatel SEL AG)

- S-parameter and small-signal transfer function (O/E):
monolithic photoreceiver with transimpedance preamplifier: for 10 GBit/s
- noise measurements:
equivalent input noise
current density: 13 pA/√Hz
- digital transmission:
pseudo-random bit-stream (PRBS)
and eye-diagram,
PRBS and bit error ratio (BER)
measurements, receiver and
system sensitivity measurements:
BER=10⁻⁹ at -19 dBm @ 10 Gbit/s

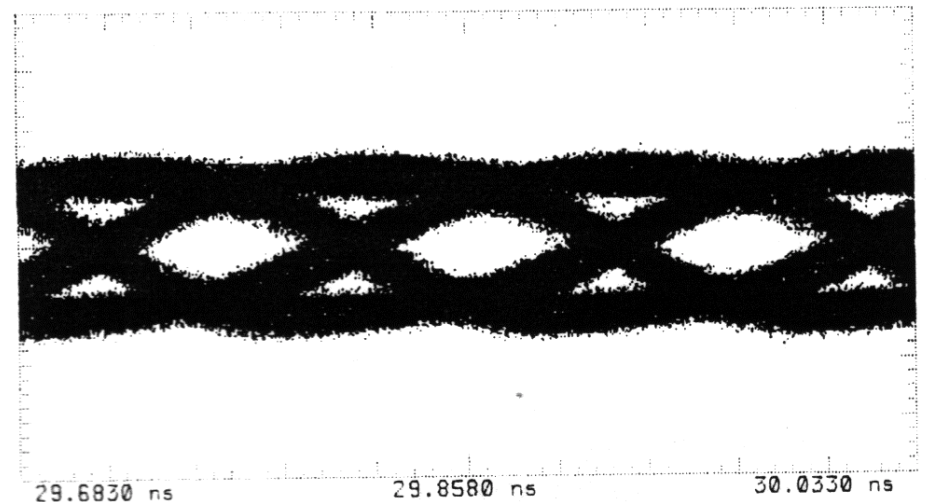


Fig. 11. On-wafer measured 10 Gb/s eye-diagram of a transimpedance-cascade circuit TI at an optical input power of -11.2 dBm (see text). Scale is 35 ps and 10 mV per division.

Detlef Kaiser – competences

high frequency characterisation

- of all kind of device types
(on-wafer, submount, module)
- use of network analyser
and sampling scope
(frequency and time domain)
- familiar with hf-wafer prober
and lightwave testset

„non-insertable“ two-port devices
and „de-embedding“ procedures
*"Improved Error Correction Technique
for On-Wafer Lightwave Measurements
of Photodetectors";*

IEEE Photonics Technology Letters, 1995, vol. 7, pp. 418-420

- simulations using Hewlett Packard MDS

