

Stand der Komponenten bei byteflight und MOST

Klaus Panzer

Infineon POF Group Regensburg

- MOST
- byteflight
- Assembly Process
- Power Budget
- Conclusion



Infineon Transceiver Components

MOST®

Never
stop thinking

The MOST Bus

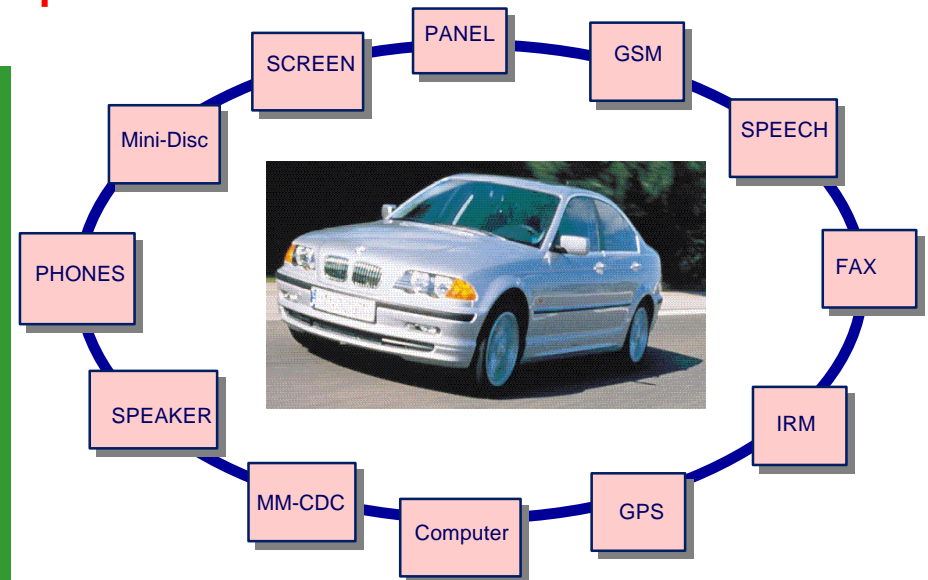
Media Oriented System Transport

MOST

- partnership of car makers, set makers and system architects
- standard for common multimedia network protocol and object model
- open for any company
- worldwide design in

Up to 64 units on the ring bus

Optical Transmission



copper competitive costs Plug and Play

45 Mbd (biphase code)

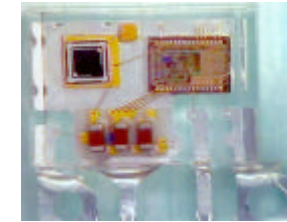
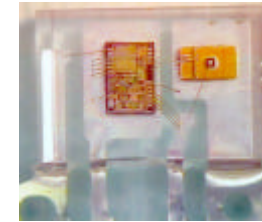
The **MOST** Cooperation

Components

OASIS/Silicon Systems,

Infineon Technologies

Siemens ICP, Mitsubishi Intl



Connector Suppliers

Framatome FCI, Kostal, Harting

Hirschmann, Molex, AMP, SiemensEC ...



Harnessing

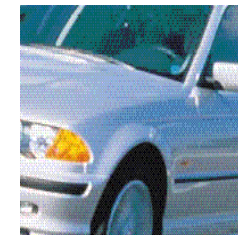
Delphi, Siemens AT, Yazaki, Furukawa ...

Equipment Suppliers

Bosch, VDO Mannesmann, Valeo, Mitsumi

Alpine, Jurk, Bose, Loewe, Clarion, Philips

Grundig, Pioneer, Harman/Becker, RadiSys, Nokia NMP ...

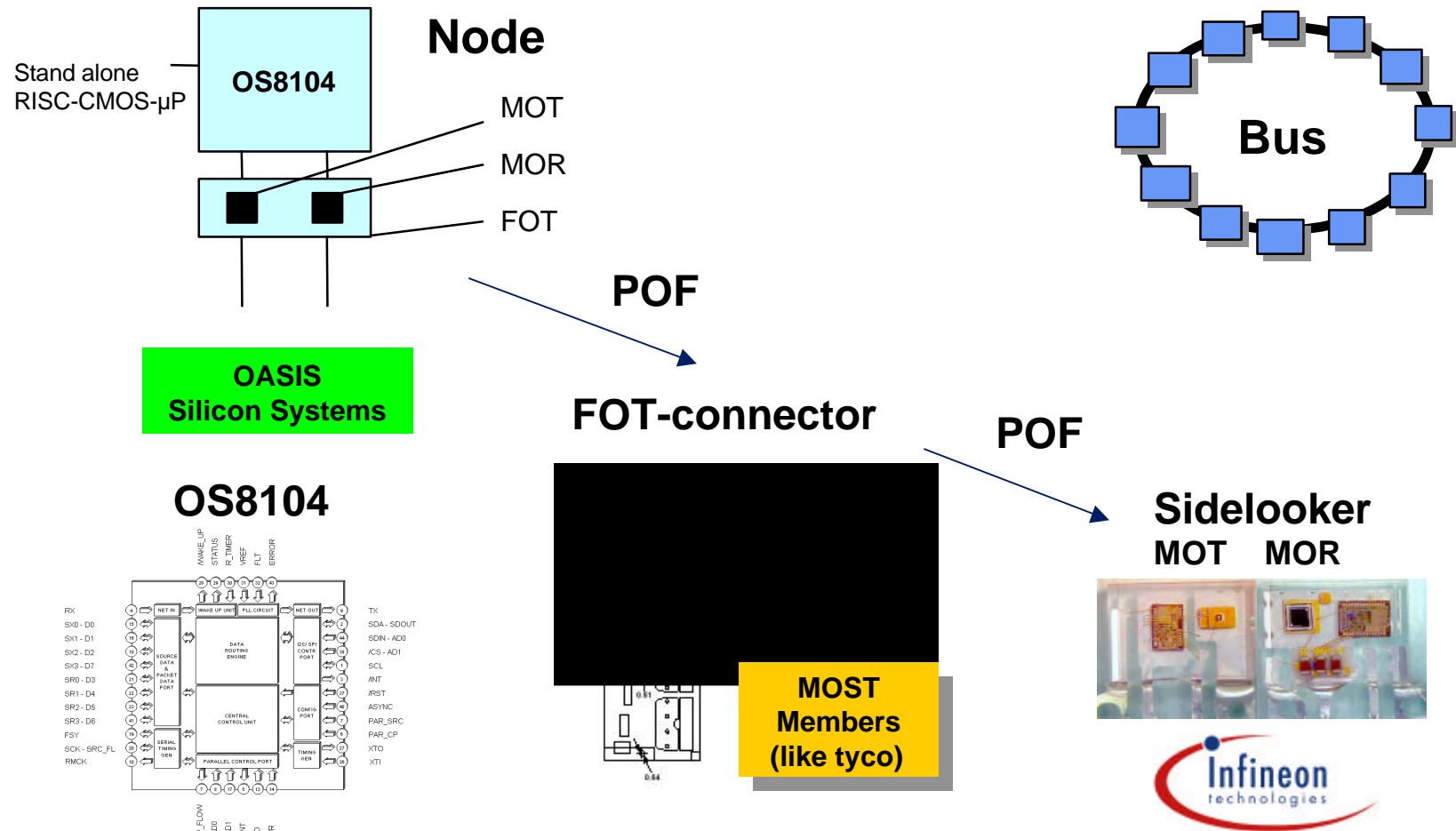


Car Manufacturers

BMW, DaimlerChrysler, Audi,

VW, Saab, Opel, Renault, Fiat, PSA, Volvo, Ford, Porsche ...

Implementation into MOST Bus



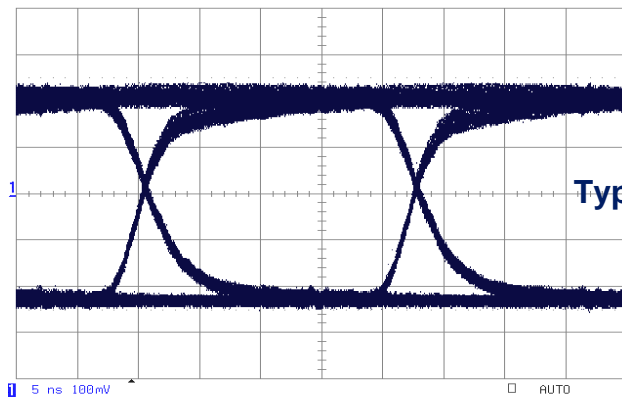
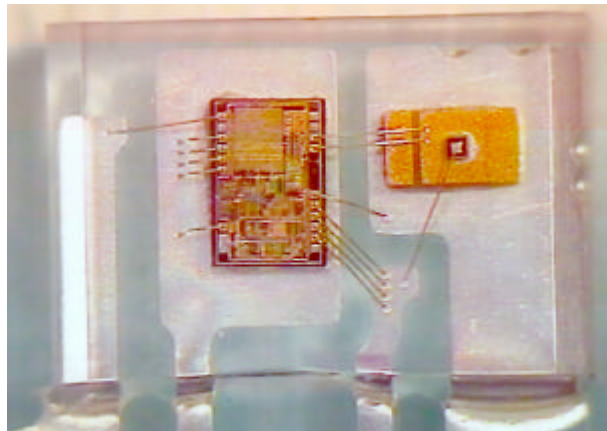
Specification Transceiver Components

Key Parameter for MOST Link Transceiver

- | | |
|----------------------------------|---------------------------------|
| • functionality | logic to light / light to logic |
| • pigtail | optional |
| • datarate | 22,5 Mbit/s |
| • with biphase code | 45 Mbd |
| • temperature range | -40 ... +85 °C |
| • optical power budget | 16,5 dB |
| • dynamic range optical receiver | up to 25 dB |
| • sleep mode | implemented |
| • emission wavelength | 650 nm |
| • supply voltage | 5 V |

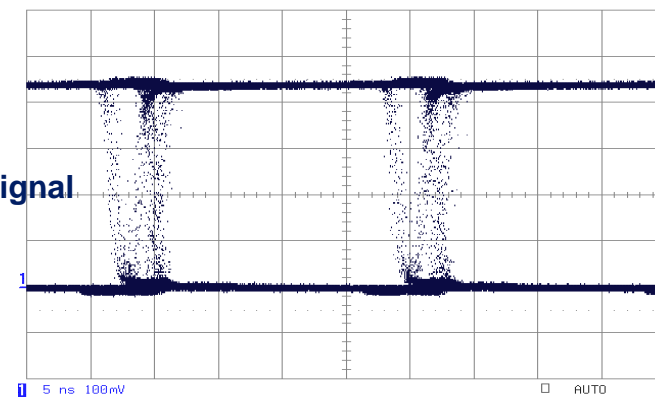
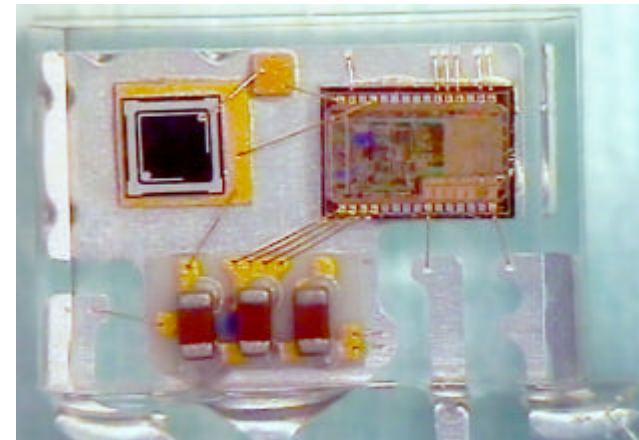
MOST Transmitter and Receiver

Transmitter SPF MOT 002



Signal with 15 KOhm external resistor and 45 Mbit/s.

Receiver SPF MOR 002



4 μ W (- 24 dBm) average power, good for BER < 10^{-9} (45 Mbit/s)

Typical output signal

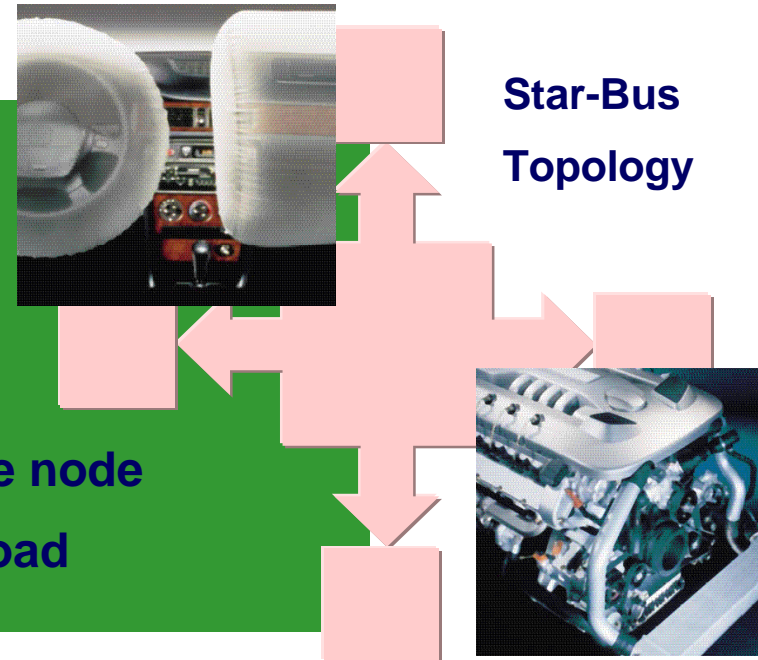


Infineon **Transceiver Components**

byteflight

byteflight overview

- safety and information LAN
- deterministic protocol
- flexible use of bandwidth
- fault tolerance / fail silence
- star coupler can switch off single node
- diagnostics and software download

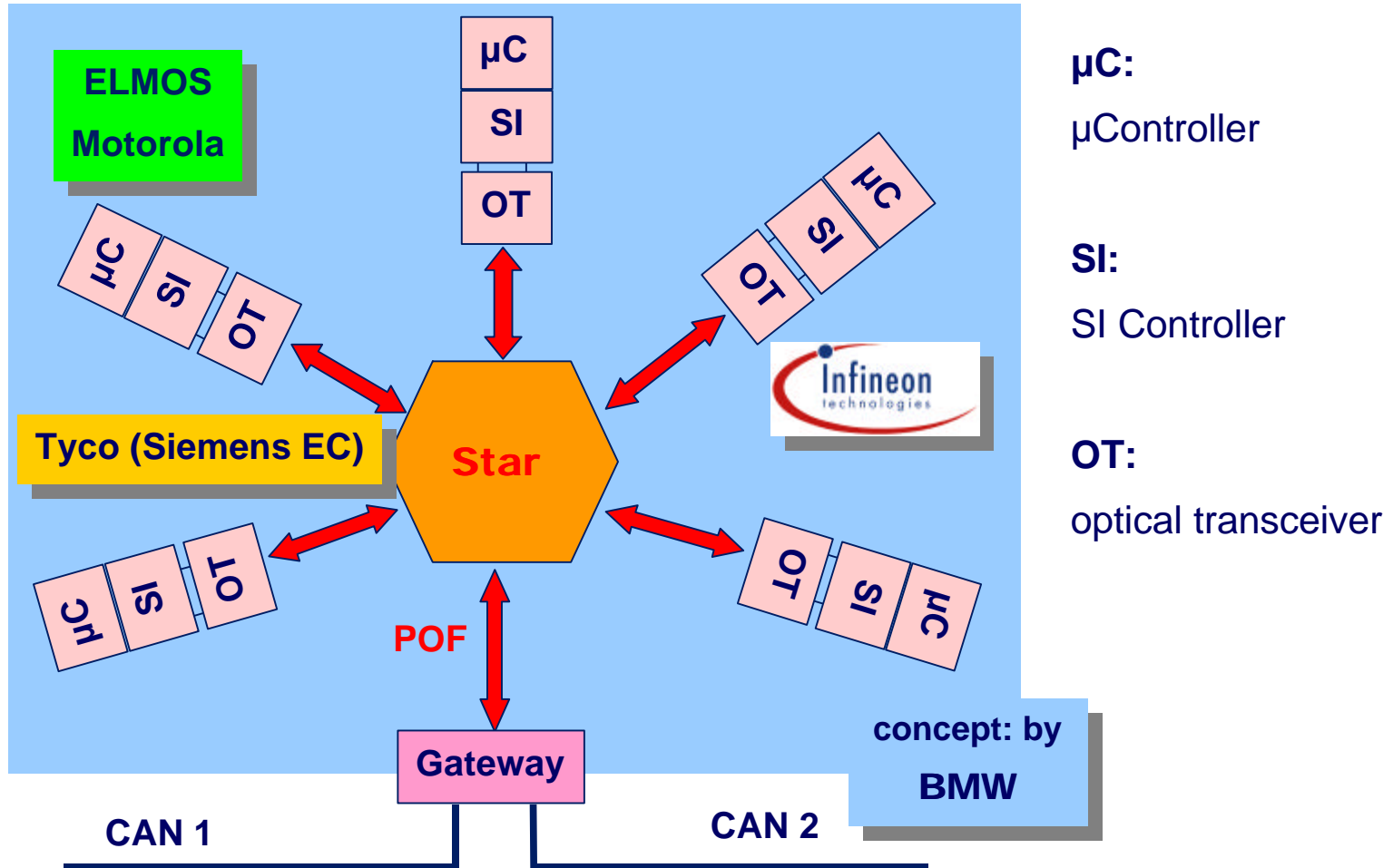


Optical Transceiver Requirements

Logic to Light and Light to Logic

bidirectional, half duplex data transfer over a single POF

byteflight configuration



µC:
µController

SI:
SI Controller

OT:
optical transceiver

byteflight applications

First serial product for
passive safety, comfort
and body control

- Brakes
- Airbags
- Steer
- Motor

**High
Priority
Message**

**Body
Control
&
Comfort**

**Low
Priority
Message**



byteflight Protocol

- **High priority messages (safety)**

synchronous transmission in each SYNC frame

duration of SYNC frame 250µs or scalable

- **Low priority messages (body control, diagnostics)**

asynchronous transmission not in each SYNC frame

flexible bus access for all identifiers

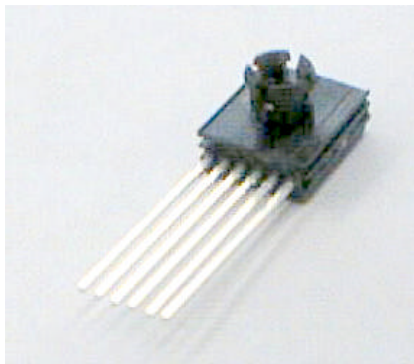
byteflight Transceiver Components

Key Parameter for *byteflight* Transceiver

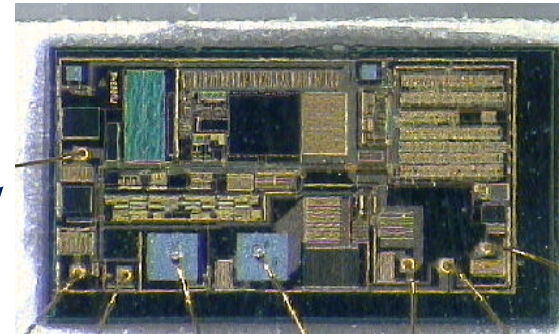
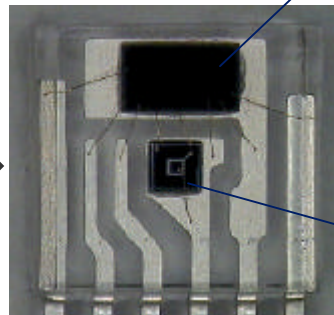
- functionality logic to light / light to logic
- bidirectional transmission halfduplex
- burst mode data rate 10 Mbps
- ambient temperature range - 40°C ... 85°C
- transmitter:
 - optical power, peak @ 30mA >300 μ W
 - optical rise time / fall time < 30 ns
 - emission wavelength 650 nm
- receiver:
 - sensitivity < -23 dBm
- transceiver:
 - supply current in stand-by mode < 10 μ A
 - supply voltage 5 V or 9 V

Infineon *byteflight* Transceiver

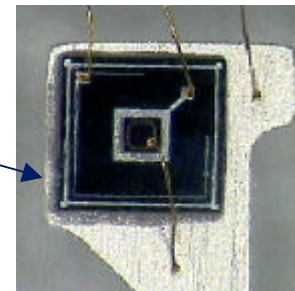
- Chip on Chip technology (COC)
- Casting technology
- Operating temperature range
Ta - 40 to + 85 °C



byteflight CAI
6 PIN



EL MOS
IC



COC:
transmitter LED
mounted on
receiver diode



Infineon **Transceiver Components**

Assembly Process

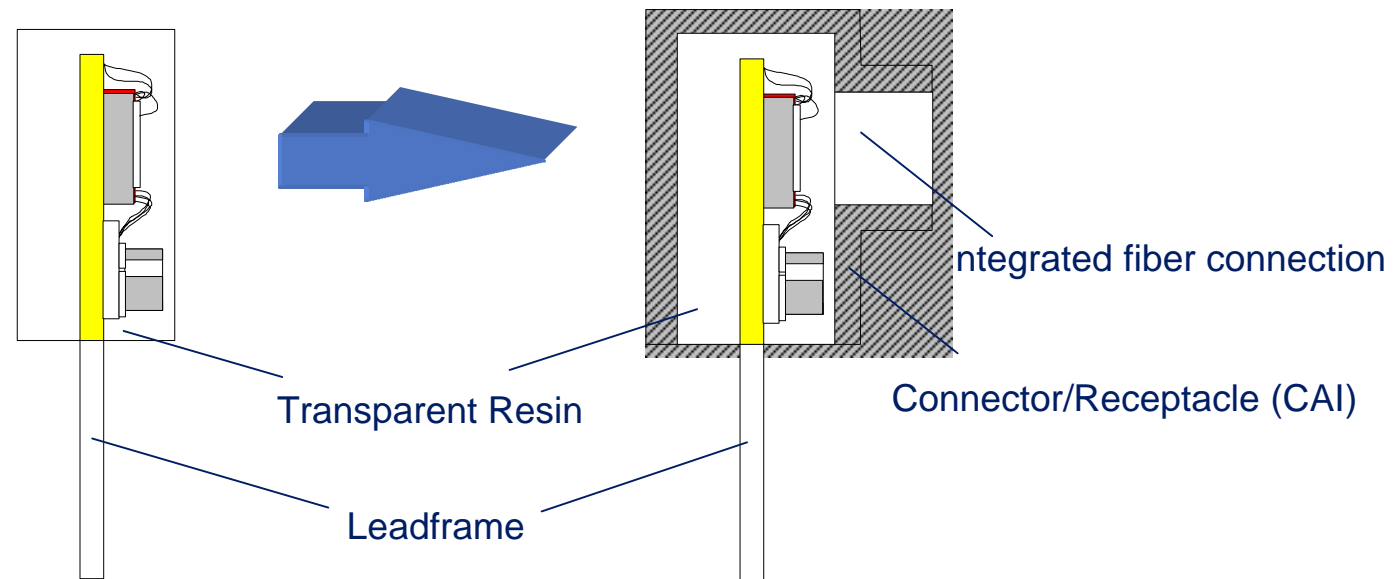
Production concept

Cavity As Interface (CAI)

- improved alignment
- customer specific geometry

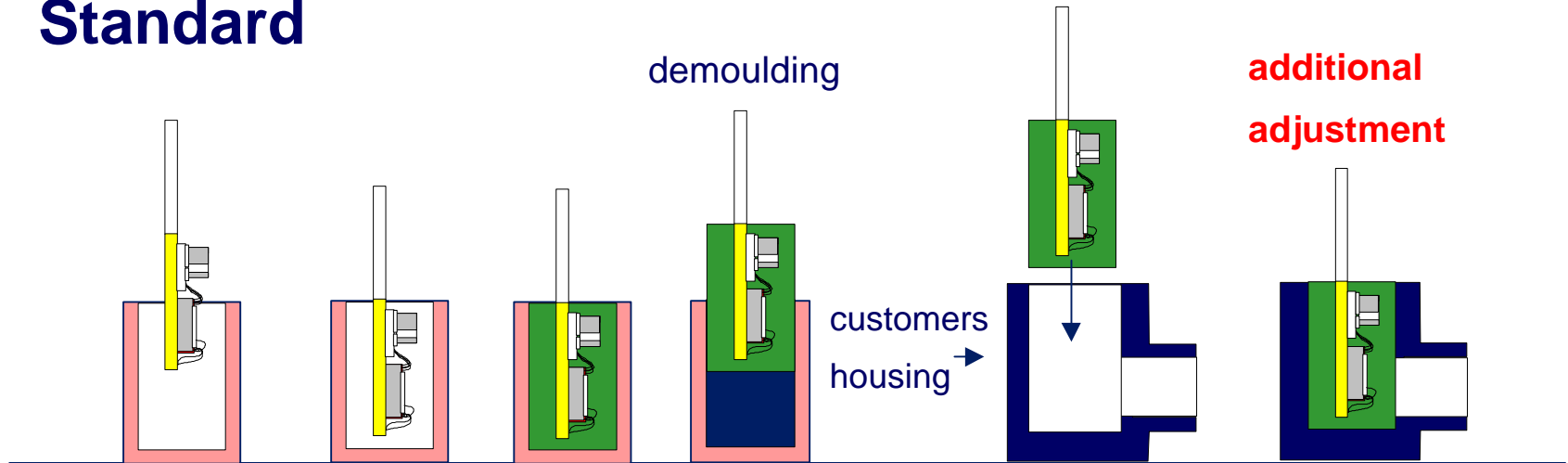
Standard Casting

CAI Concept



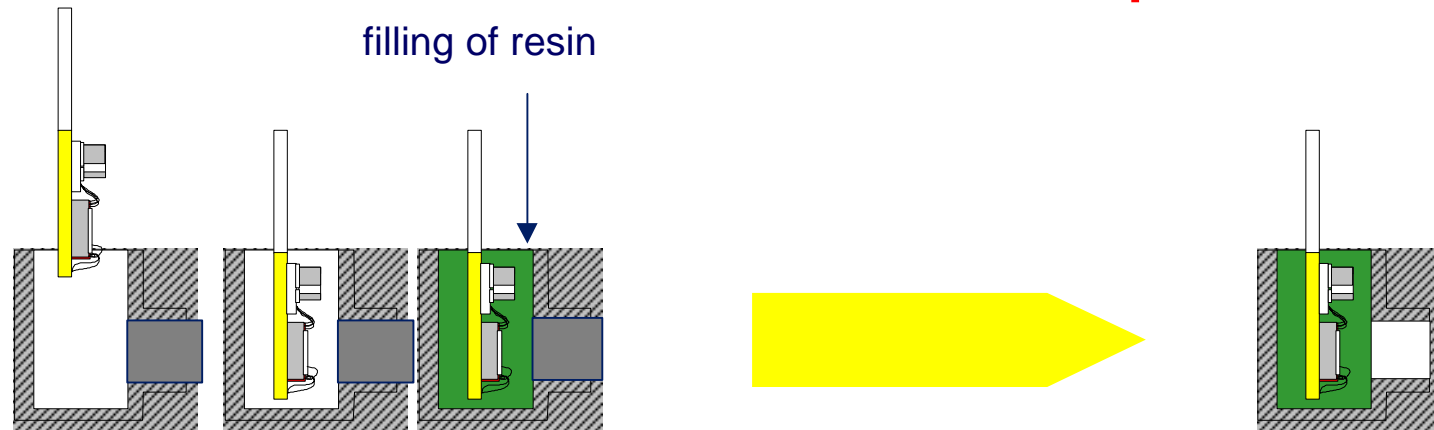
Process steps of Casting

Standard



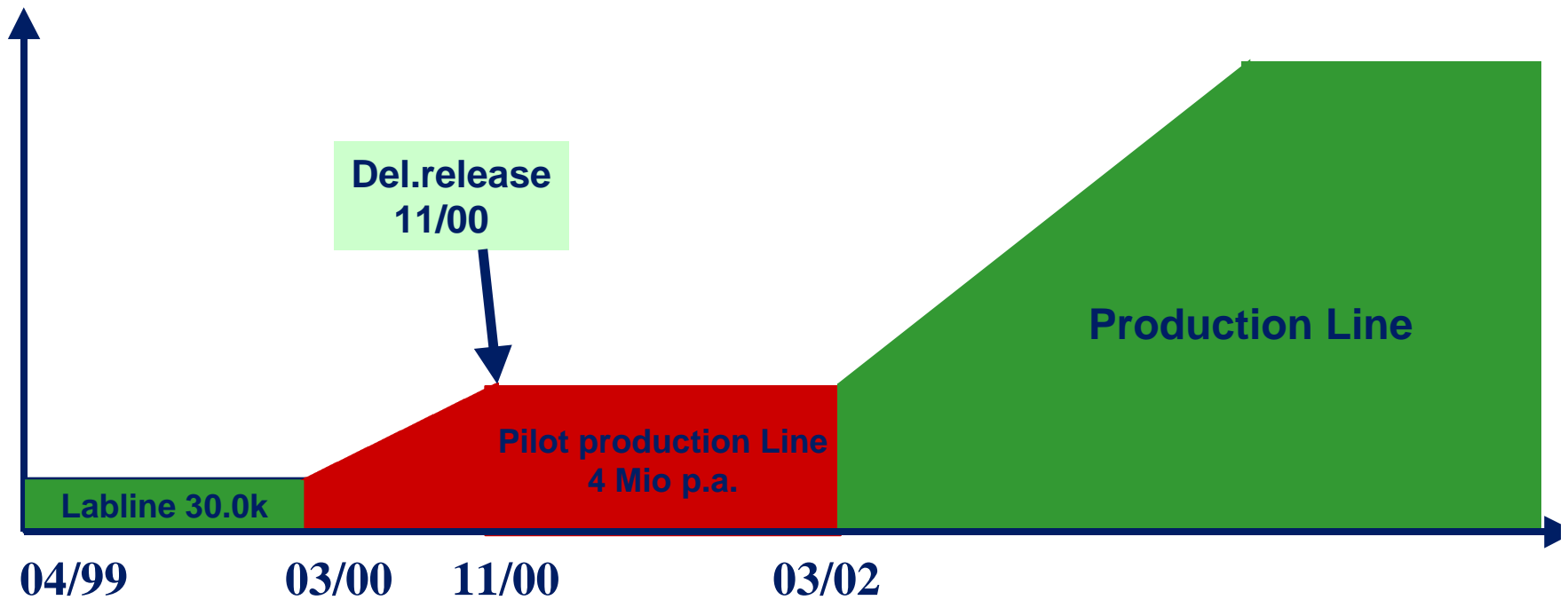
CAI

reduction of steps



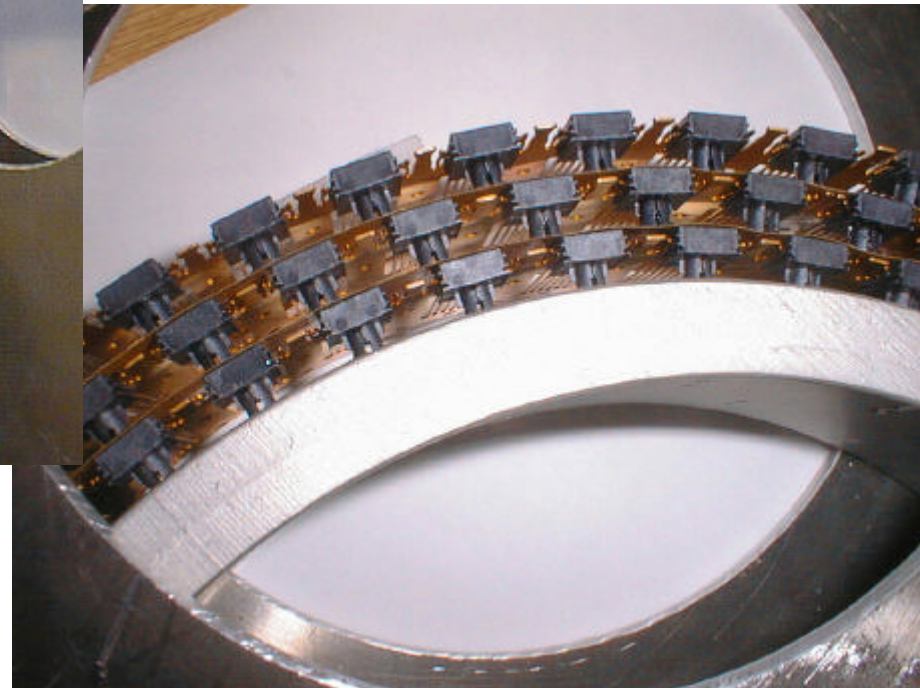
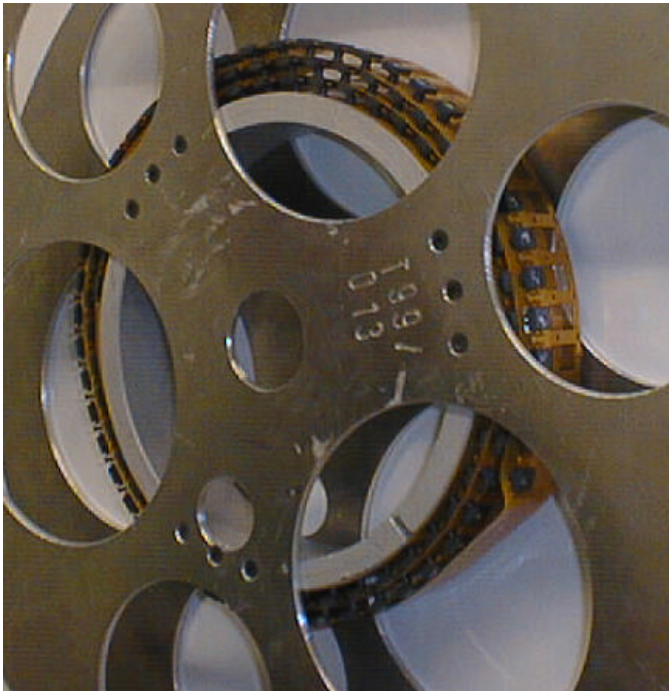
Production Ramp Up **MOST / byteflight**

FY	99/00	00/01	01/02	02/03	03/04	04/05
pcs	30.0	1'0	4'6	8'1	16'7	27'0



Production Concept for High Volume

byteflight - reel to reel





Infineon Transceiver Components

Power Budget

Power Budget **MOST**

Definition:

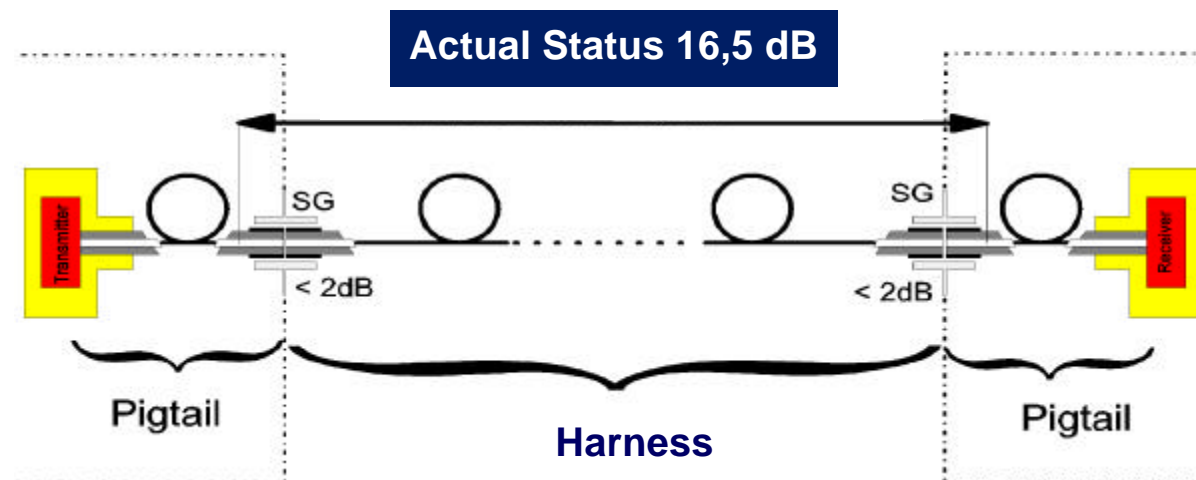
worst case of available dynamics = „Power Budget“

= minimum optical power at transmitter connector

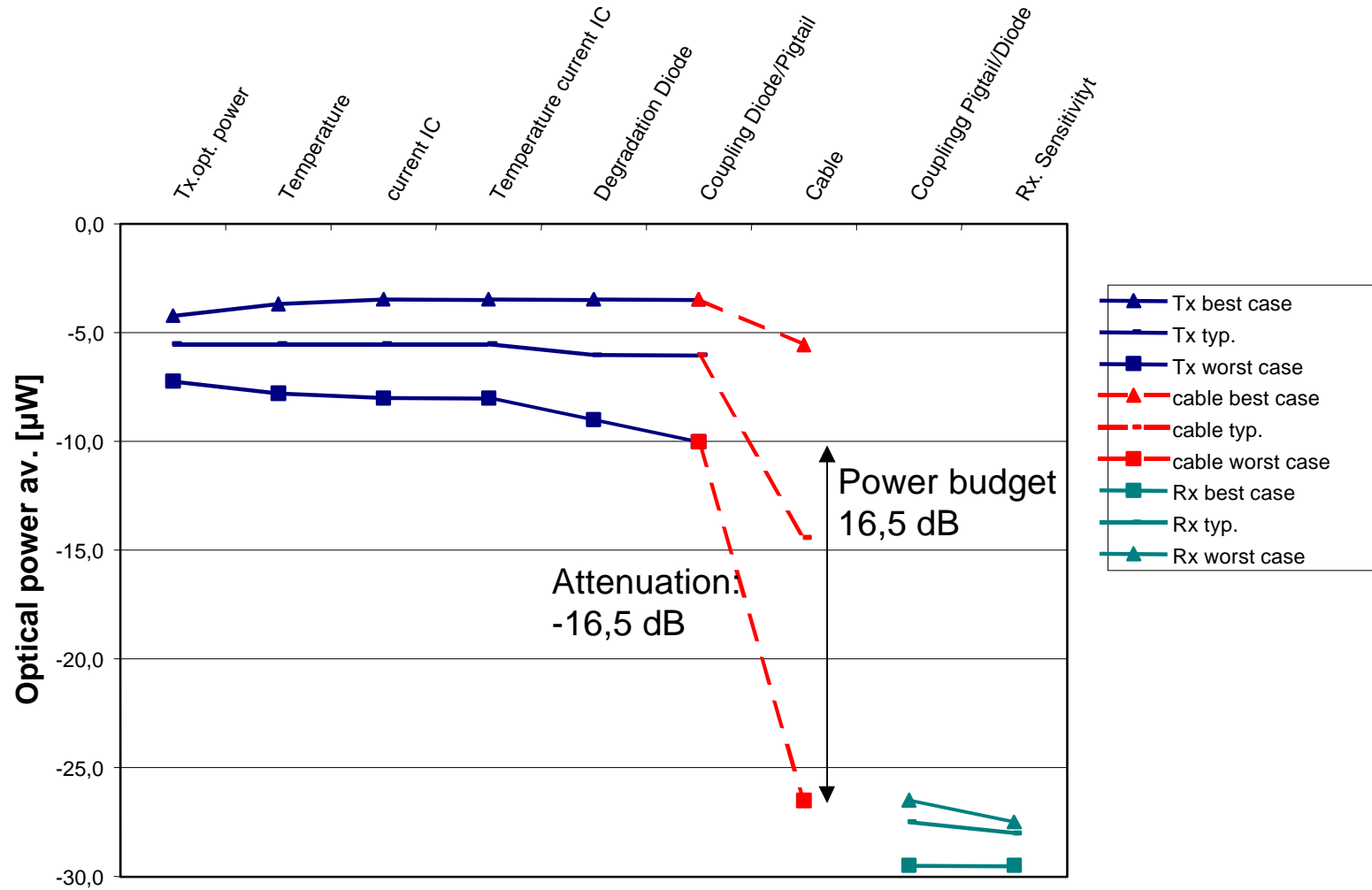
- minimum sensitivity at receiver connector

(for point to point interlink)

Dieter Seidl
Daimler-Benz AG; EP/MUT
6.11.98



Power Budget **MOST**: Target



Summary and Conclusion

**MOST and *byteflight*
cover the requirements
of today's automotive applications !**

MOST for Multimedia *byteflight* for Safety and Information

Transceiver components by Infineon Technologies

Next Generation IEEE1394 (S100, S200, S400)



500Mbps