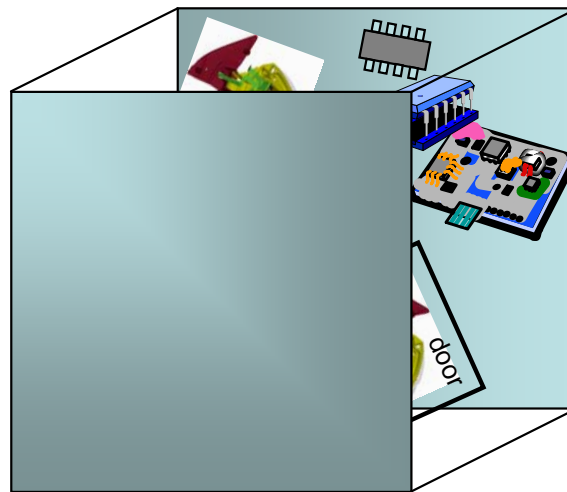


Way to get an “OEM-standardized LIN-portfolio”

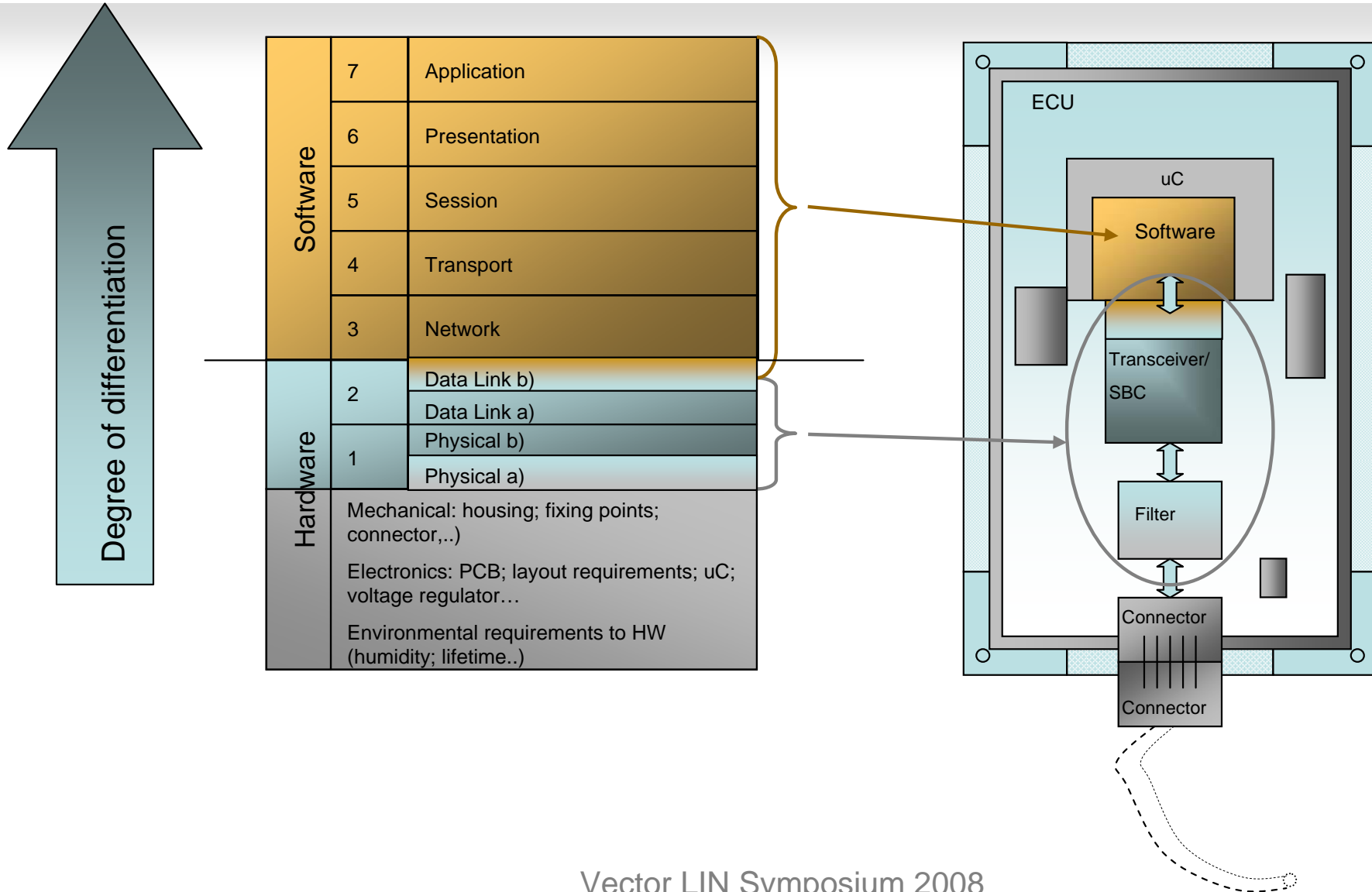


OEM LIN-portfolio

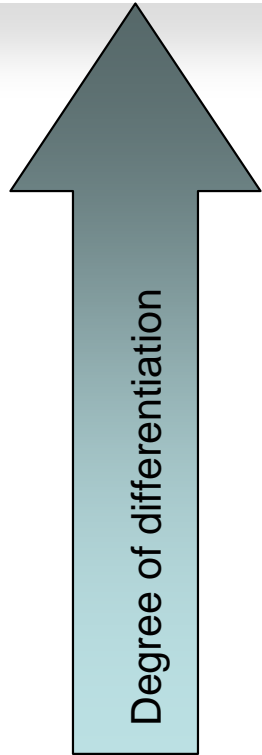
Vector LIN Symposium, Stuttgart
February 19, 2008



Way to get OEM-standardized LIN-ECUs



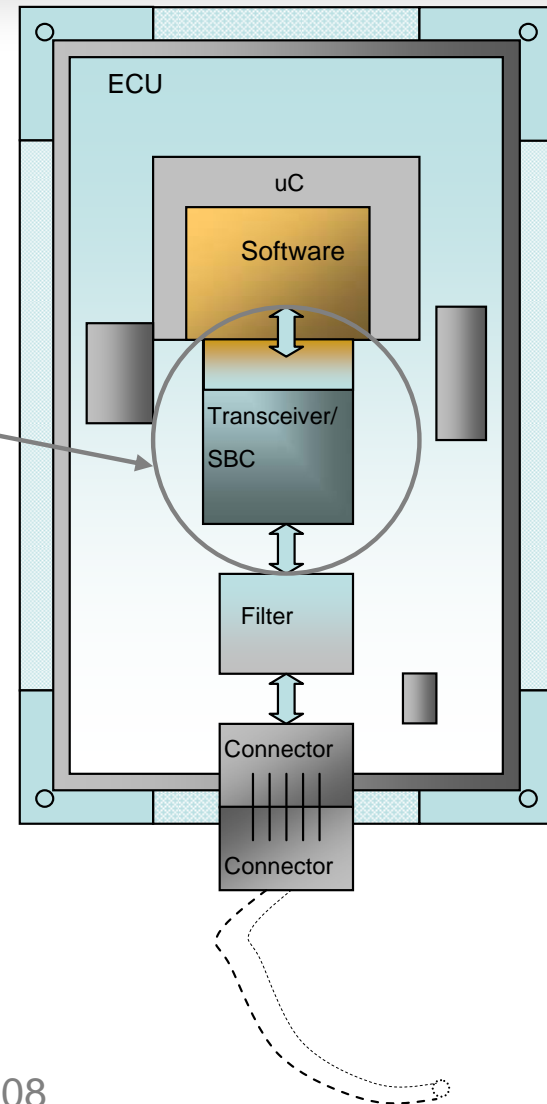
1. Step: LIN-semiconductor



- LIN-Specification (1.3/2.0/2.1)
- LIN-Conformance-Test-Specification (1.3/2.0/2.1)
- LIN semiconductor approved by LIN-test-house

problem: no EMC-CT limits
→ different OEM requirements

Hardware	2	Data Link b)
		Data Link a)
	1	Physical b)
		Physical a)

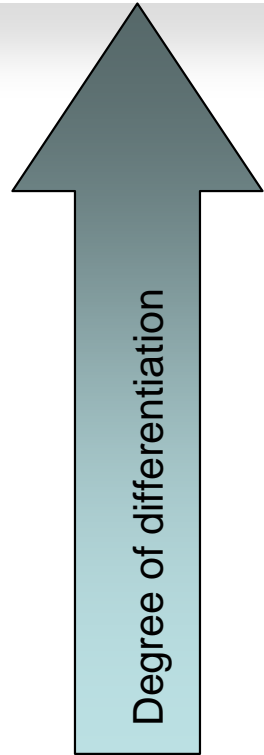


done

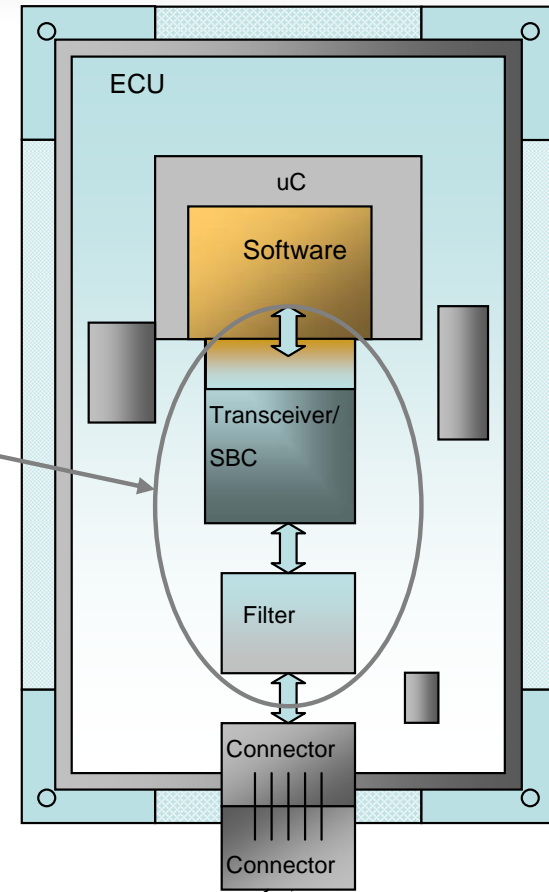
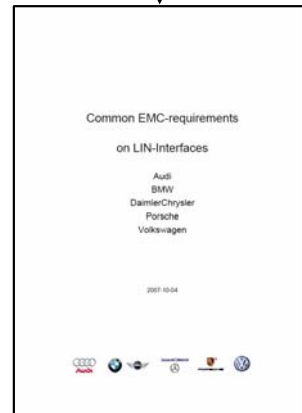
2. Step: OEM-filter-requirements and EMC-limits

- OEM-Working group (1. public OEM-version 4th October 07)

desire: take over into LIN-Consortium;



Hardware	2	Data Link b)
		Data Link a)
	1	Physical b)
		Physical a)



done

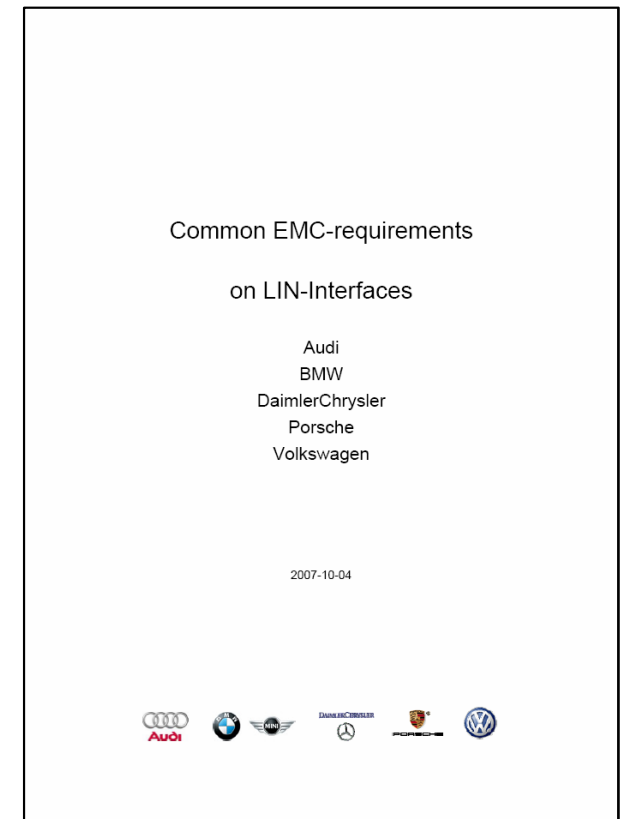
Details: Public OEM-version (4th October 07)

Common OEM (Audi, BMW Group, Daimler, VW, Porsche) requirements for LIN Interfaces in Automotive ECUs.

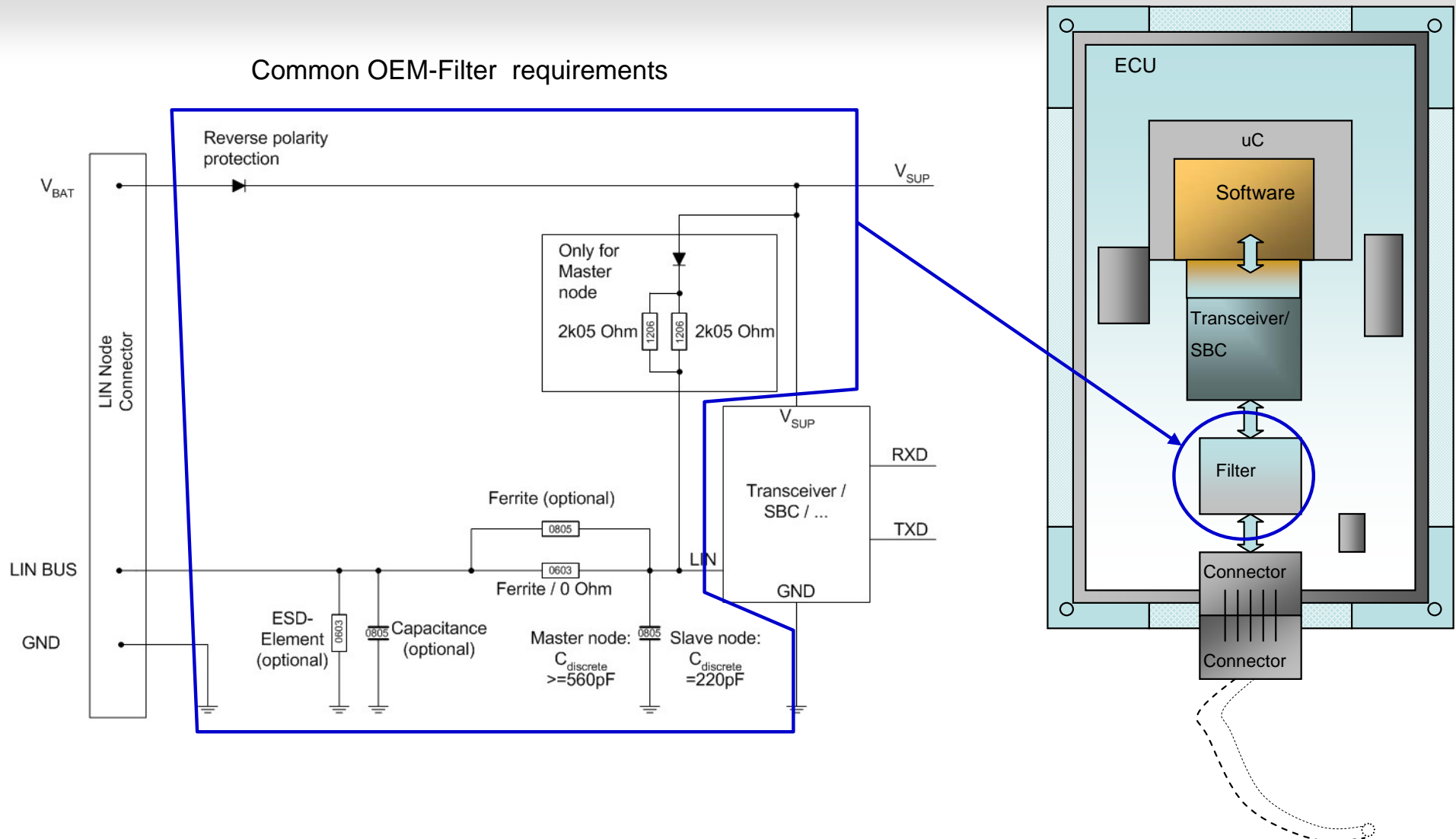
Document based on the LIN Specification Package 2.1 and LIN EMC Test Specification

Advantage

- OEM-unique information of the LIN pin circuit
- OEM-unique requirements of LIN transceivers and LIN SBCs concerning ESD and EMC.
- The aim of using this common LIN circuit and requirements, a maximum ESD/ EMC performance combined with the flexibility of the ECU being used by all the involved OEMs.
- The conformance of any new transceiver or SBC to the given limits for immunity, emissions, ESD and standard pulses is condition precedent for semiconductor manufacturers in order to receive an approval for their product by all OEMs involved in this document.



Details: Public OEM-version (4th October 07)

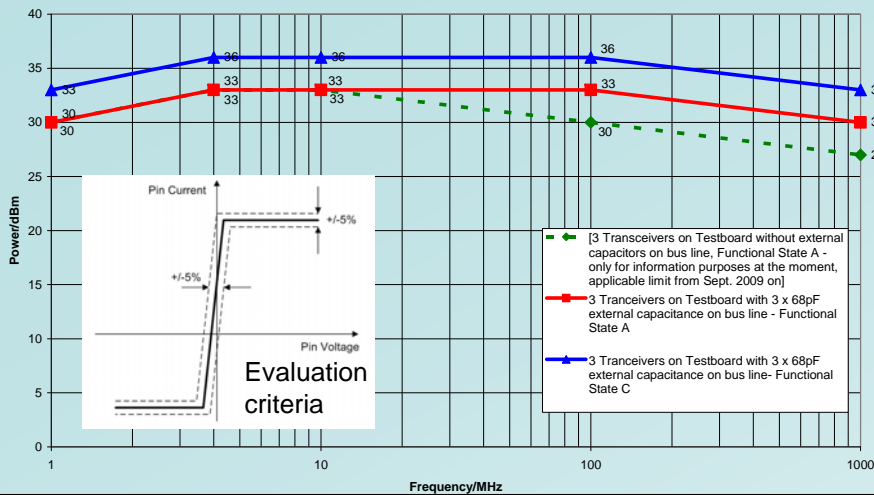


Details: Public OEM-version (4th October 07)

EMC- requirements

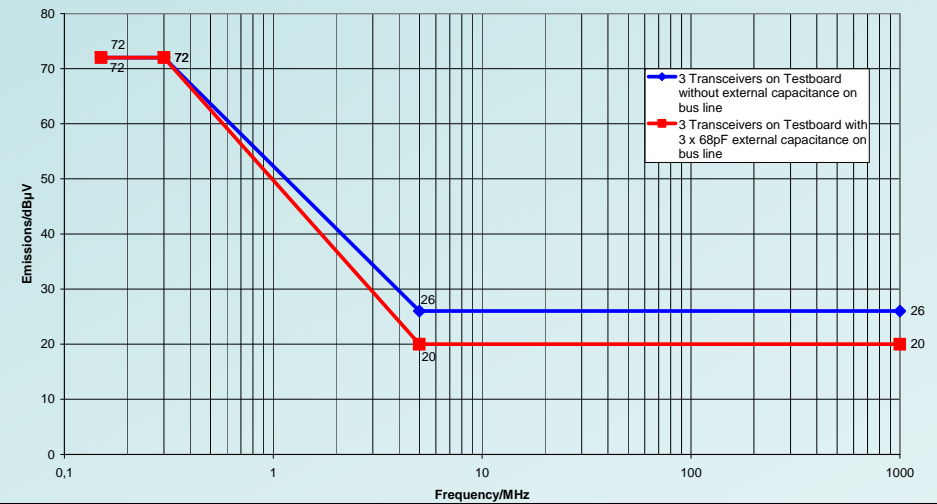
Immunity against RF disturbances

Immunity Levels LIN Transceivers



Emission of LIN transceivers/ SBCs

Emissions Levels LIN Transceivers



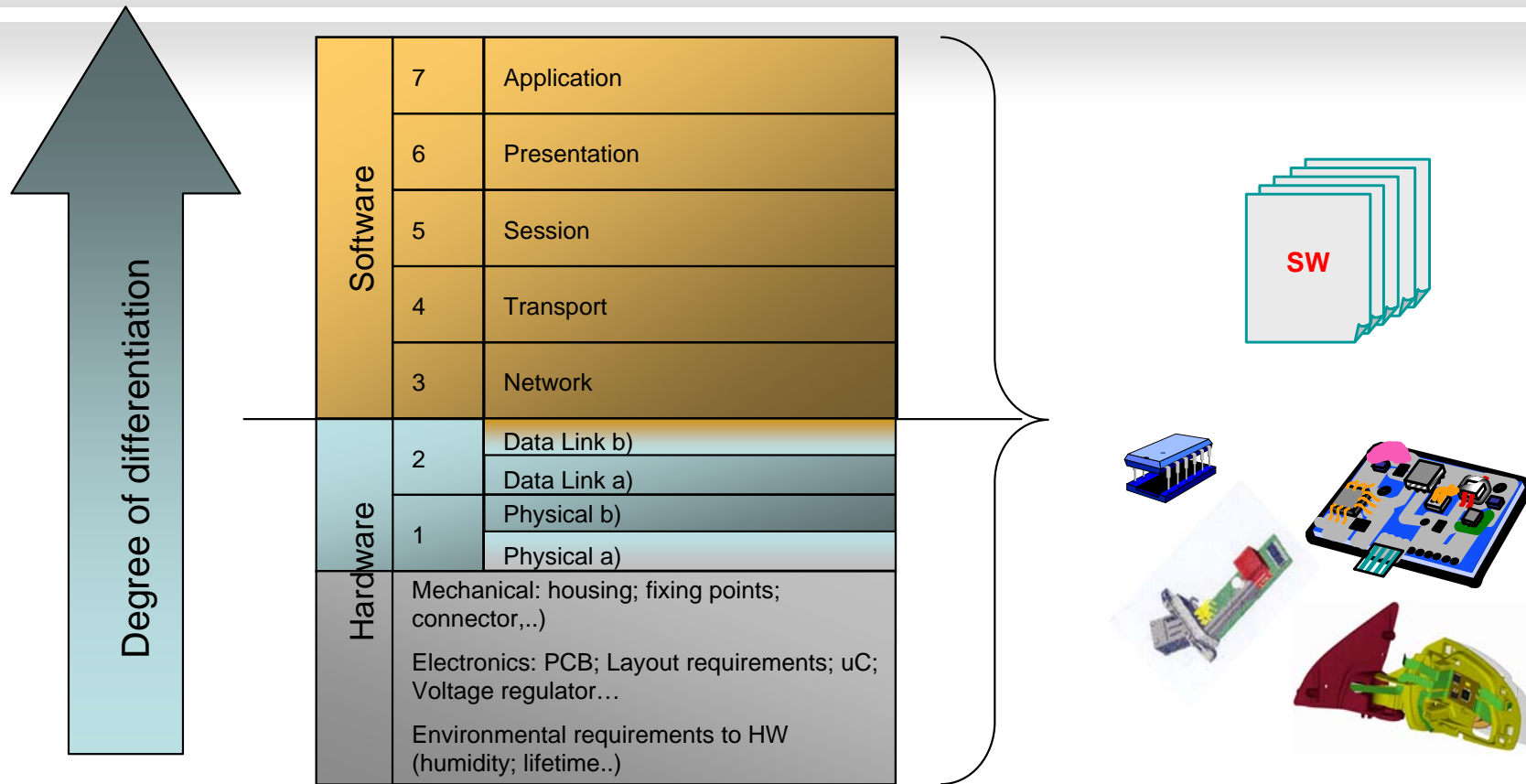
Immunity against ESD

Test description	Minimum value to be guaranteed
Acc. to IEC 61000-4-2 (330 Ohm, 150pF)	± 6kV
Human Body Model (1k Ohm, 100pF)	± 8kV
Charge Device Model	± 500V
Machine Model	± 100V

Immunity against standard pulses

Test pulse	Amplitude [V]
1	-200
2a	+150
3a	-300
3b	200

3. Step: Standardized LIN-messages/ functions/ applications



partly done

Continuing and increasing already started activities for getting low-cost common-OEM-Semiconductors/ECUs with standardized LIN-messages and functions with configurable data (with/without EEPROM..).

Working-group of responsible OEM-departments for applications like stepper motor for air-condition, blower-motor, garage-opener, wiper-motor, battery-sensor...
Some OEM-common projects already started/ are in series.

Target: LIN-Standardized OEM-approved semiconductors/ECUs/systems

Worst case:

Individual OEM-LIN-portfolio because different OEM HW, SW, functions requirements

Best case:

Standardized OEM-requirements:

- standardized LIN-portfolio
 - standardized HW, LIN-messages, software and functions
 - differences, if present, covered only by Data configuration

Advantage:

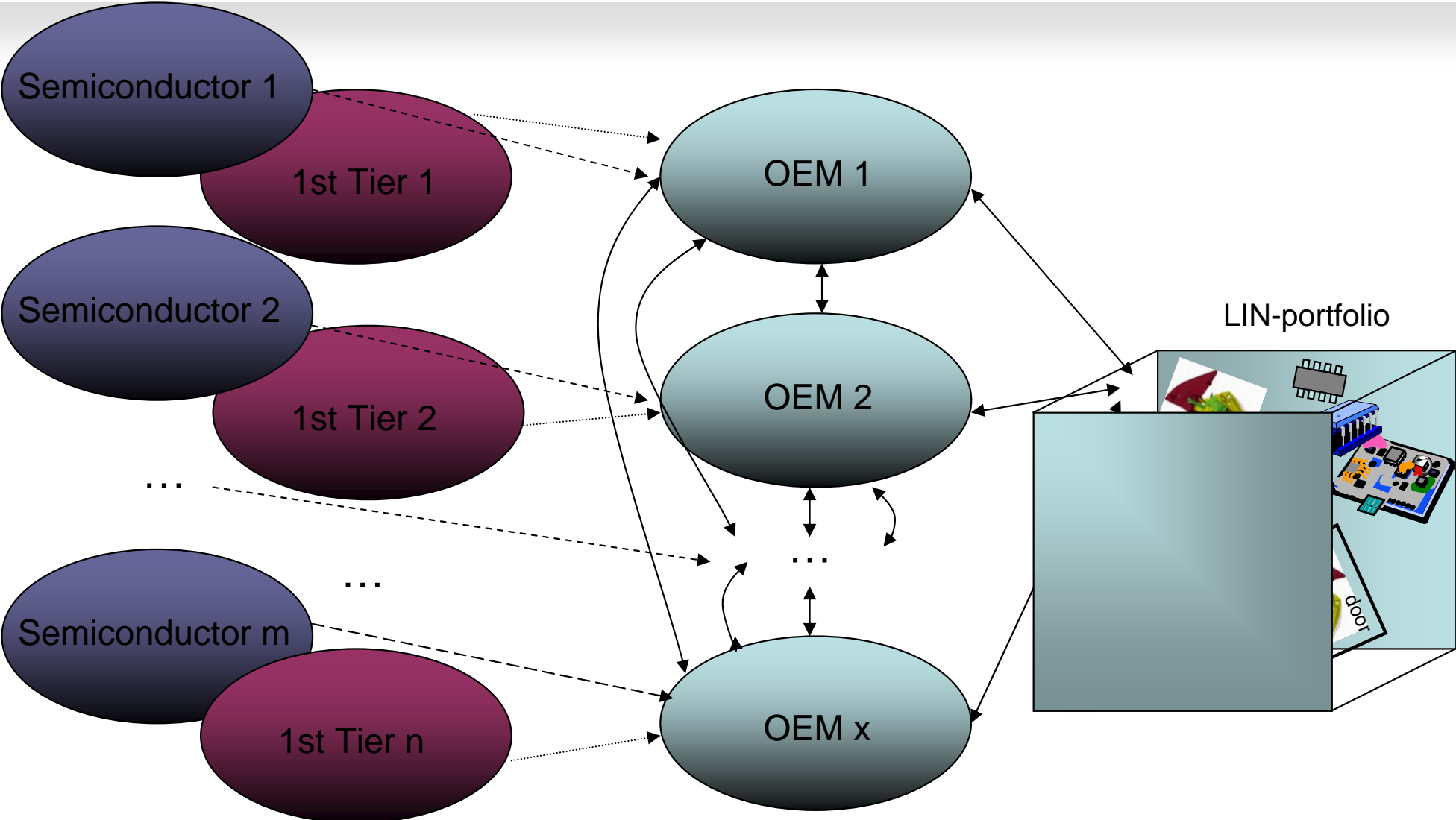
Standard LIN-portfolio

- higher HW and SW quality
- lower part-cost
- faster system development by using “Off the shelves ECUs”

Activities for reaching the “Best case” already started.

OEM Working-groups for applications like stepper motor for air-condition, blower-motor, garage-opener, wiper-motor, battery-sensor...

Target: LIN-Standardized OEM-approved semiconductors/ECUs/systems



Thank you for your attention

End of presentation

Way to get an “OEM-standardized LIN-portfolio”

