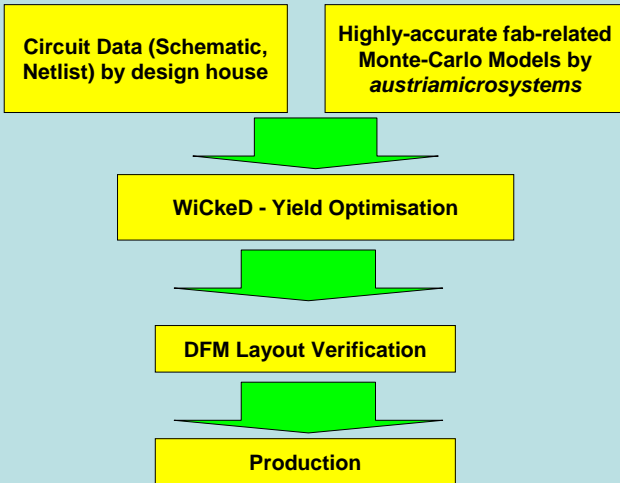


# austriamicrosystems' Design for Manufacturability (DFM) reference design flow using MunEDA DFM-DFY tool WiCkeD

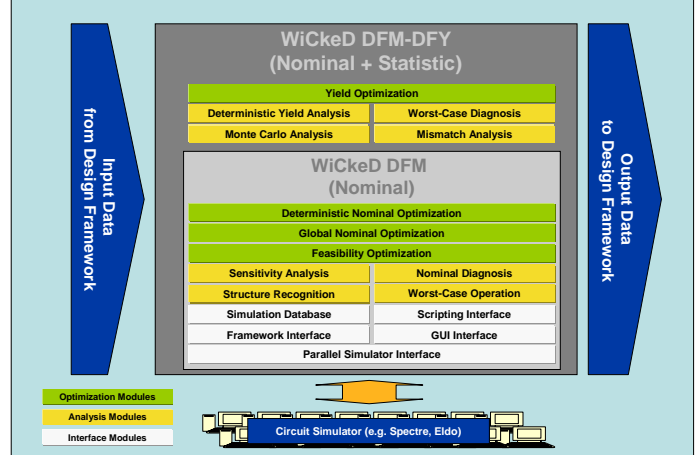
austriamicrosystems' business unit Full Service Foundry supports MunEDA's Design for Manufacturability and Yield (DFM/DFY) tool "WiCkeD" as part of austriamicrosystems' DFM reference design flow. The further improved DFM reference design flow is now available for austriamicrosystems advanced 0.35µm and 0.8µm CMOS, High-Voltage CMOS and SiGe-BiCMOS process technologies. The combination of highly accurate fab-related Monte Carlo models provided by austriamicrosystems

and MunEDA's yield optimization tool "WiCkeD" results in an excellent correspondence between measured and simulated results on parametric yield in consideration of supply voltage and temperature variations. Easy to use and fully integrated into austriamicrosystems' process design environment (HIT-Kit), "WiCkeD" supports product designers to create robust and first time right designs.

## austriamicrosystems' HIT-Kit DFM reference design flow

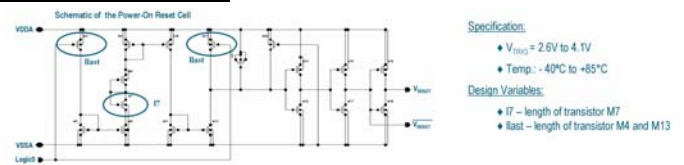


## WiCkeD Features

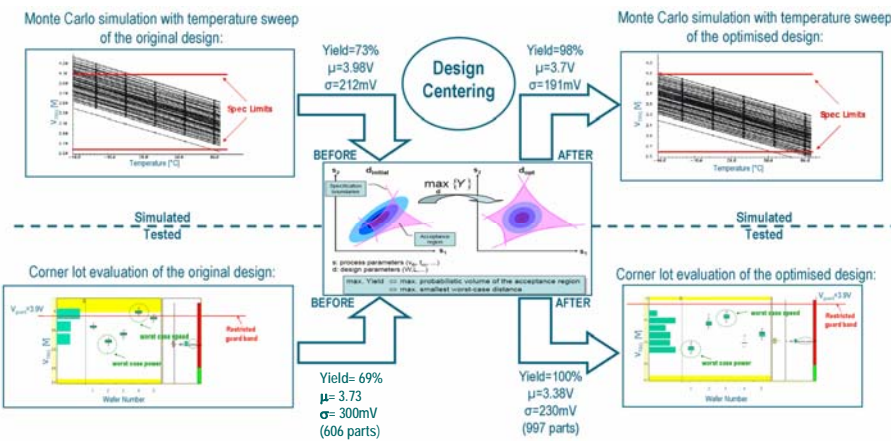


## DFM-DFY Circuit Yield Optimization & Silicon Verification of a Power-on reset (POR)

Simulation based yield optimisation is becoming an important solution for increasing robustness of analog IP blocks. The present investigation describes the yield optimisation of a power-on reset cell as part of an analog IP library using the DFY tool WiCkeD/MunEDA. The initial design showed low yield (73%) at a temperature of -40°C. Yield analysis of the initial design is performed and sensitivities with respect to process parameters are determined by Monte Carlo simulation. The input parameters used for the Monte Carlo simulation describe global and local variations of the semiconductor devices. The results of the yield analysis are used to determine a shift of production parameters (1) enabling a yield enhancement of the initial design. A re-design using simulation-based design centering (2) is performed resulting in a significant yield increase in consideration of the operating conditions. The optimised results on improved production yield are verified by electrical test at water level for varying process conditions.

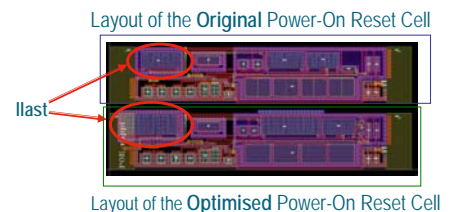


- Specification**
- $V_{DDA} = 2.6V$  to  $4.1V$
  - Temp.:  $-40^{\circ}C$  to  $+85^{\circ}C$
- Design Variables:**
- $l7$  - length of transistor M7
  - $l_{last}$  - length of transistor M4 and M13



	Original Design	Optimised Design
Monte Carlo Simulation at -40°C	Y=73% $\mu=3.98V$ $\sigma=212mV$	Y=98% $\mu=3.7V$ $\sigma=191mV$
Total Yield	Y=72%	Y=93%
Design Parameters	L7=6µm L4=L13=75µm Area=2055µm²	L7=7µm L4=L13=150µm Area=2446µm²

Moderate increase of chip area enables an easy replacement of the original design using the layout area reserved for this block.



## About austriamicrosystems

austriamicrosystems is a leading designer and manufacturer of high performance analog ICs, combining almost 25 years of analog design capabilities and system know-how with its own state-of-the-art manufacturing and test facilities. austriamicrosystems leverages its expertise in low power and high accuracy to provide industry-leading customized and standard analog products. Operating worldwide with more than 850 employees, austriamicrosystems focuses on the areas of power management, sensors & sensor interfaces, portable audio and car access in its markets Communications, Industry & Medical and Automotive, complemented by its Full Service Foundry activities. austriamicrosystems is listed on the SWX Swiss Exchange in Zurich (ticker symbol: AMS).

## About MunEDA

MunEDA provides leading EDA technology for analysis and optimization of yield and performance of analog, mixed-signal and digital designs. MunEDA's products and consulting enable customers to reduce the design times of their circuits and to maximize robustness and yield. MunEDA's solutions are in industrial use by leading semiconductor companies in the areas of communication, computer, memories, automotive, and consumer electronics. WiCkeD is a comprehensive and powerful software tool for interactive, manual, semi- and full automatic analysis, sizing, design centering and yield optimization of analog and mixed signal circuits. WiCkeD is marketed also under the trademark DesignMD®.