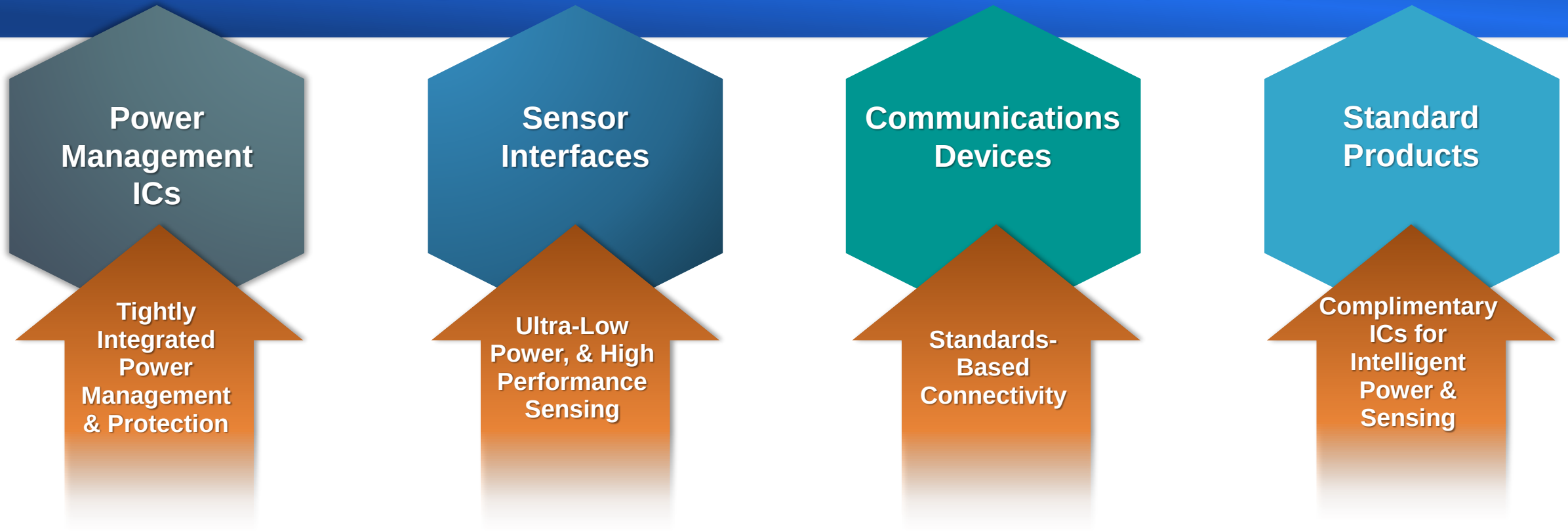
Treo
Analog and Mixed-Signal Platform

November 2024

Analog and Mixed-Signal Group (AMG)



Analog and Mixed-Signal Group (AMG)

Introducing the Treo Platform

The most advanced analog and mixed-signal platform for intelligent power and sensing solutions

Automotive: 3 Key Trends Driving Growth

Electrification

Trend

Ever increasing demand for power, at higher efficiency

SDV/Zonal Arch.

Ethernet connected nodes, with increased intelligence

ADAS

Increasing autonomy, without compromising safety

Need

Higher voltage, robust power management

Intelligent sensing and communications

AI Data Centers: Explosive Demand for Power

160%
Expected growth in data center power demand ‘23~’30

10x
Electricity demand for AI queries vs traditional search

8%
Data centers share of US power demand in 2030

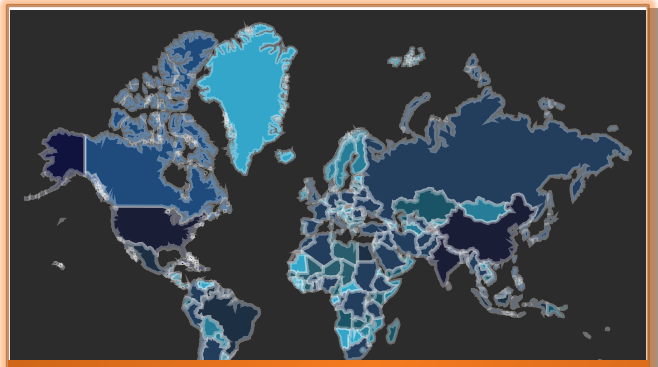
Enough power for a high-speed bullet train network for over 5 years

Enough power for 20,000 schools for a year

Enough power for 250 million electric vehicles (EVs)

Continuous Glucose Monitoring: Improving Quality of Life

Trends



Diabetes Impact Globally

422M diabetics and 720m prediabetics worldwide

$400B+: US treatments cost

75% have comorbidities

CGM

▼ Hospital visits by 34%

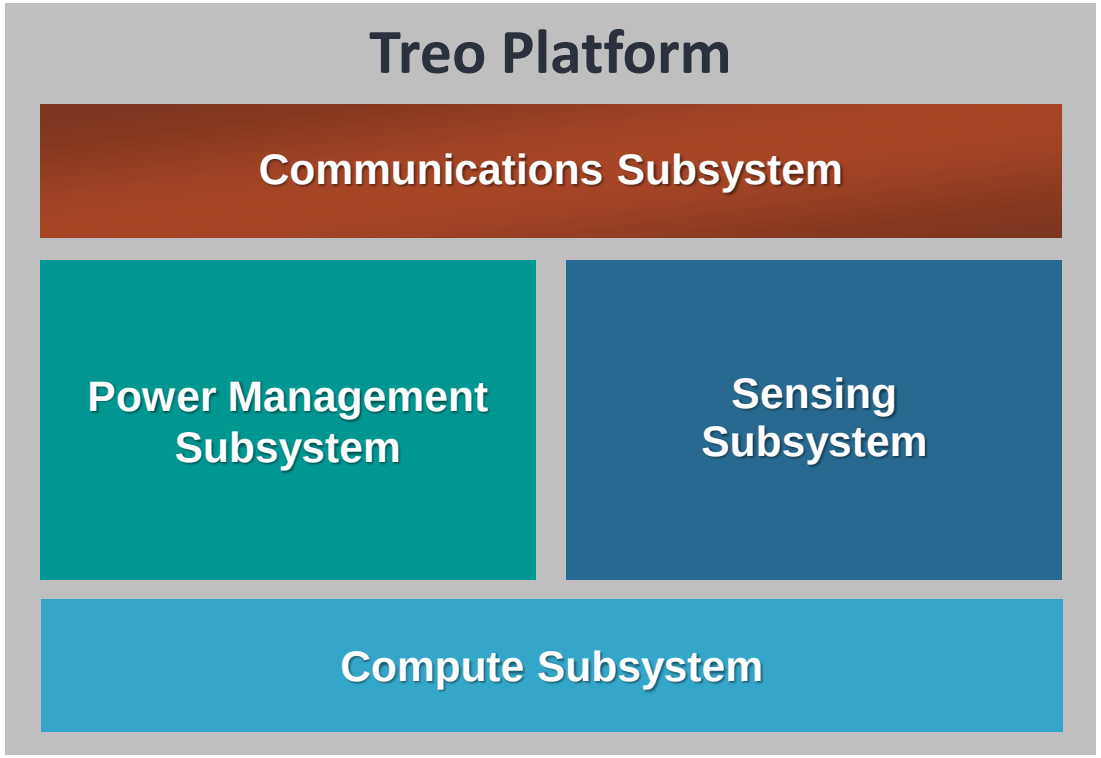
FDA approved OTC (Mar ‘24)

Drive for ▲ battery life, ▼size

Need

Lower power, more precise intelligent sensing

Treo Analog and Mixed-Signal Platform

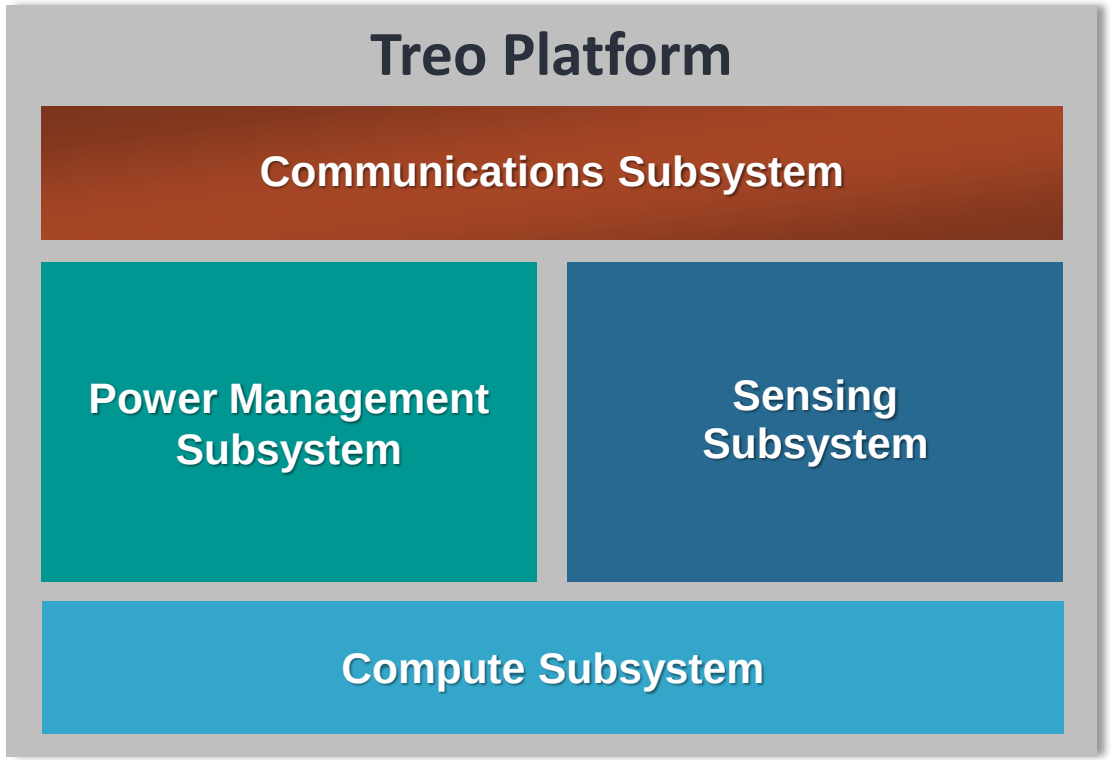


onsemi's Treo is an Analog and Mixed-Signal Platform constructed of an ever-evolving set of reuseable analog, digital and power IP building blocks enabling next-generation of:

- Power management ICs
- Sensor interfaces
- Communication devices
- Standard products…

… and more, **extending onsemi's** trusted portfolio of **intelligent power and sensing solutions**

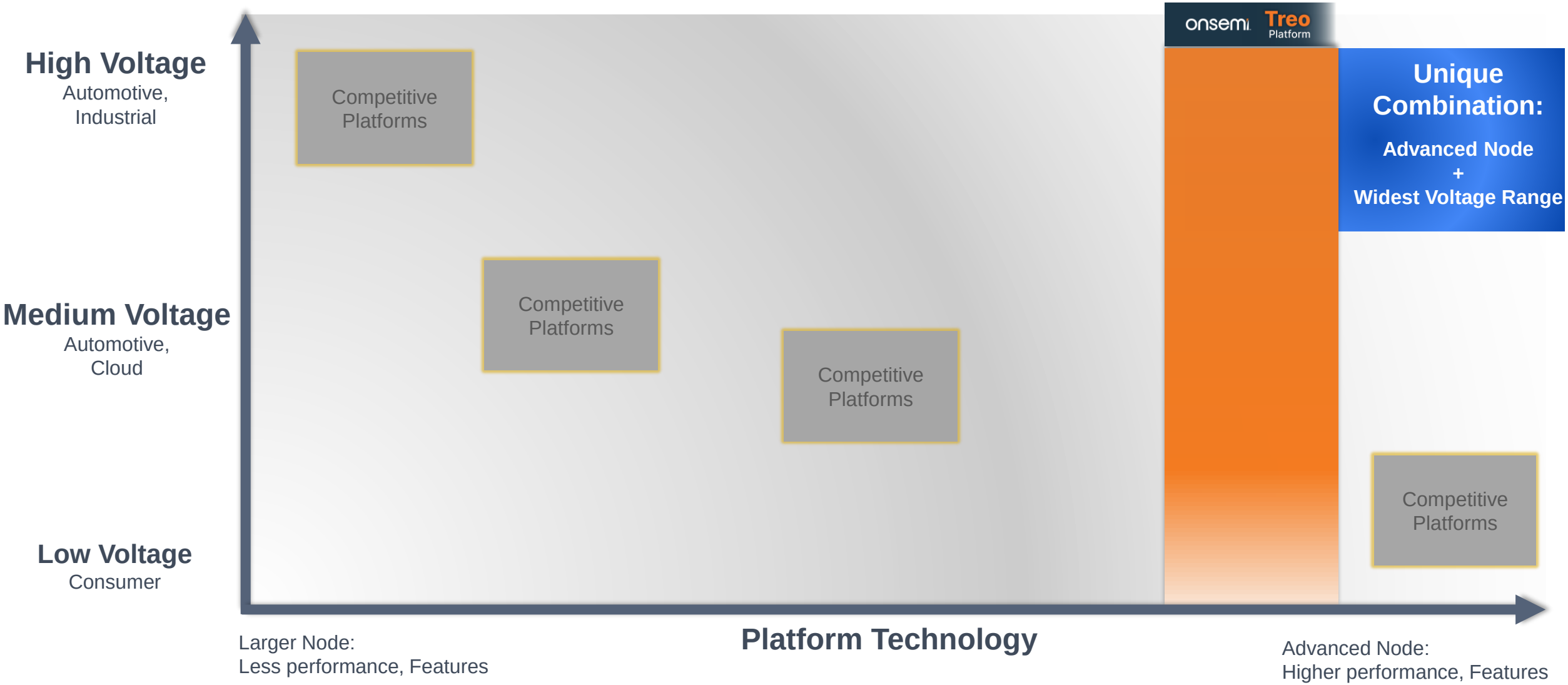
Treo Analog and Mixed-Signal Platform



The **onsemi Treo Platform** is the **most advanced** in the industry, **enabling winning analog and mixed-signal products**, for next generation applications

BCD 65nm technology process	**Best Performance & Advanced Features**
Industry's widest voltage range: 1 – 90V	**Highest integration Enables 48V Transition**
Modular Architecture	**Broad onsemi portfolio Fast time-to-market**

A Step Above the Industry



Treo Analog and Mixed-Signal Platform

Modular, SoC-like Platform

Treo Platform

- Communications Subsystem
- Power Management Subsystem
- Sensing Subsystem
- Compute Subsystem

Ultrasonic Sensor for ADAS

- TX/RX
- AFE
- DSP
- Oscillator
- System Management

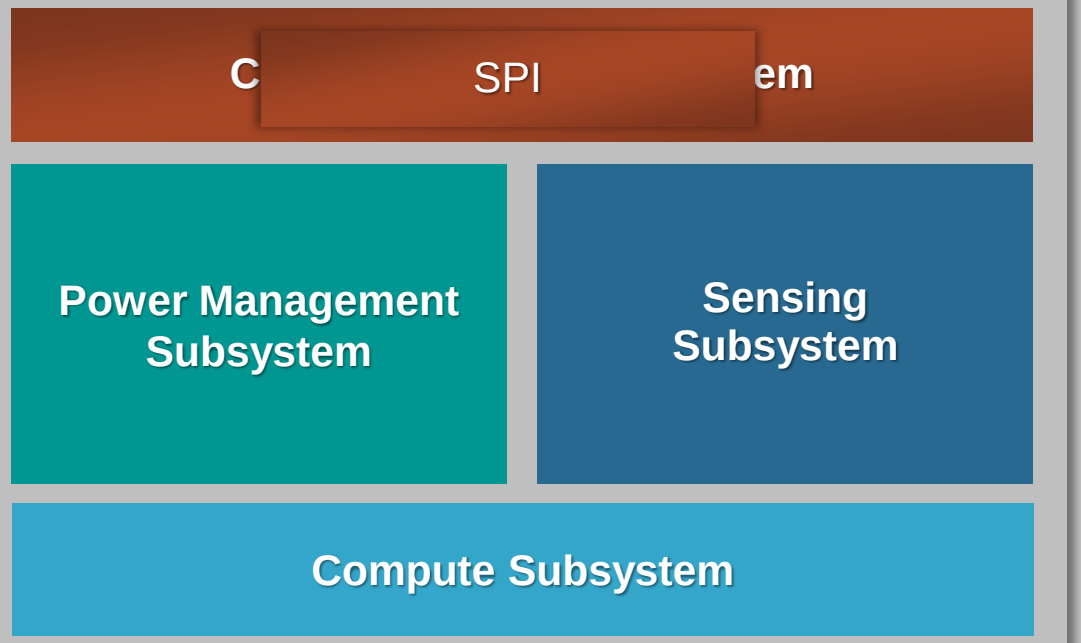
Need Safer, more effective Park Assist

Solution Improved accuracy by a factor of 2

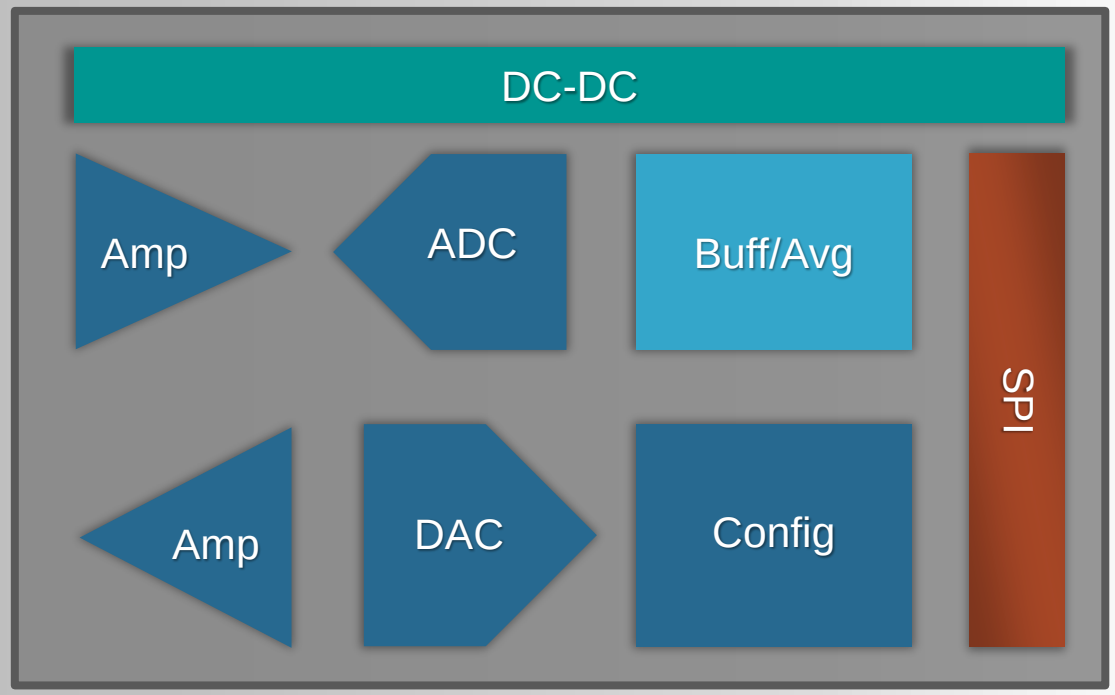
Treo Analog and Mixed-Signal Platform

Modular, SoC-like Platform

Treo Platform



Low Power AFE for CGM



Need	**Tiny form factor**	**Extended battery life**
Solution	**50% smaller footprint**	**Ultra-low-power, low-leakage design**

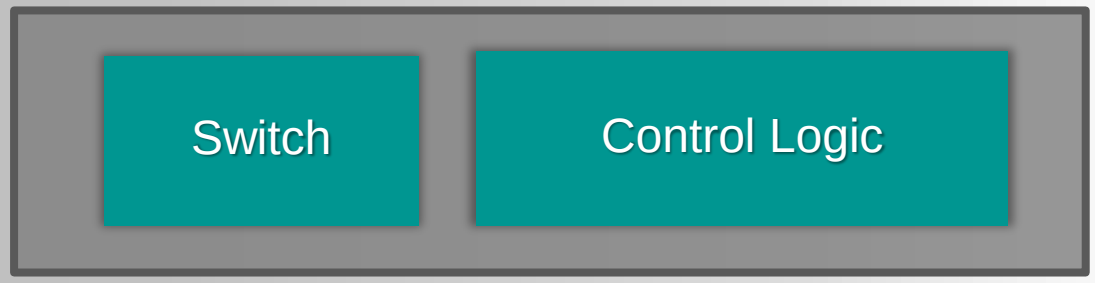
Treo Analog and Mixed-Signal Platform

Modular, SoC-like Platform

Treo Platform

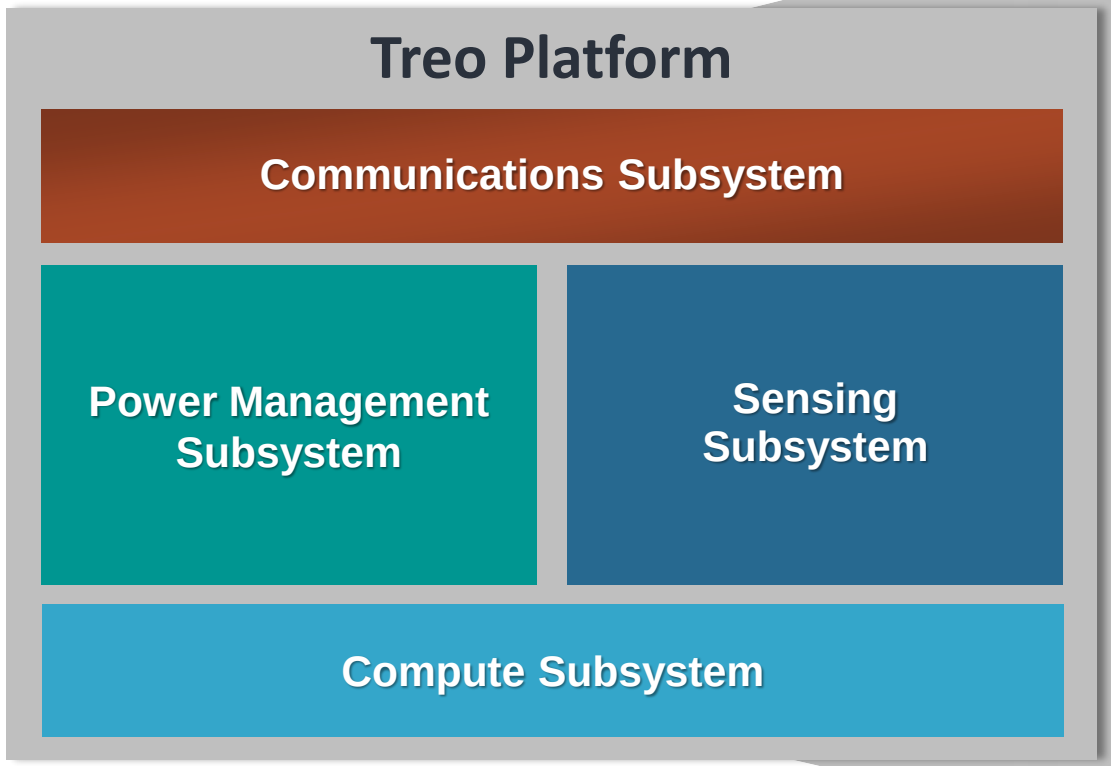
- Communications Subsystem
- Power Management Subsystem
- Sensing Subsystem
- Compute Subsystem

PoL for AI Power Tree



Need	Small system size	Rapid time-to-market
Solution	Small form factor, High Performance	Spec → Silicon: 6-9 months

Treo Analog and Mixed-Signal Platform



Automotive LED Driver

Mobile DC-DC Converter

Low Power AFE

Single-Pair Ethernet

LDOs

Ultrasonic Sensor I/F

Inductive Sensor I/F

Bus Switch

Voltage Translators

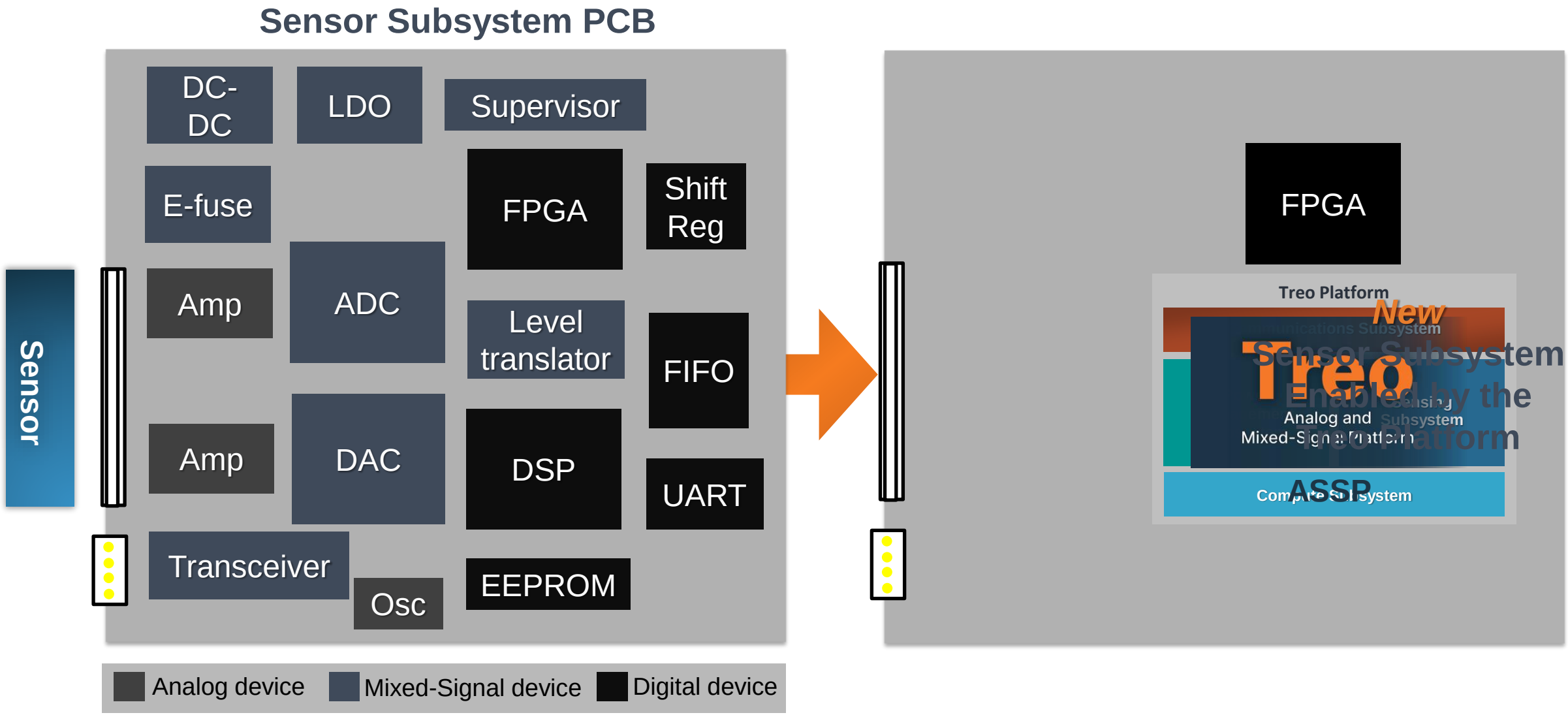
Cloud PoL

LIN

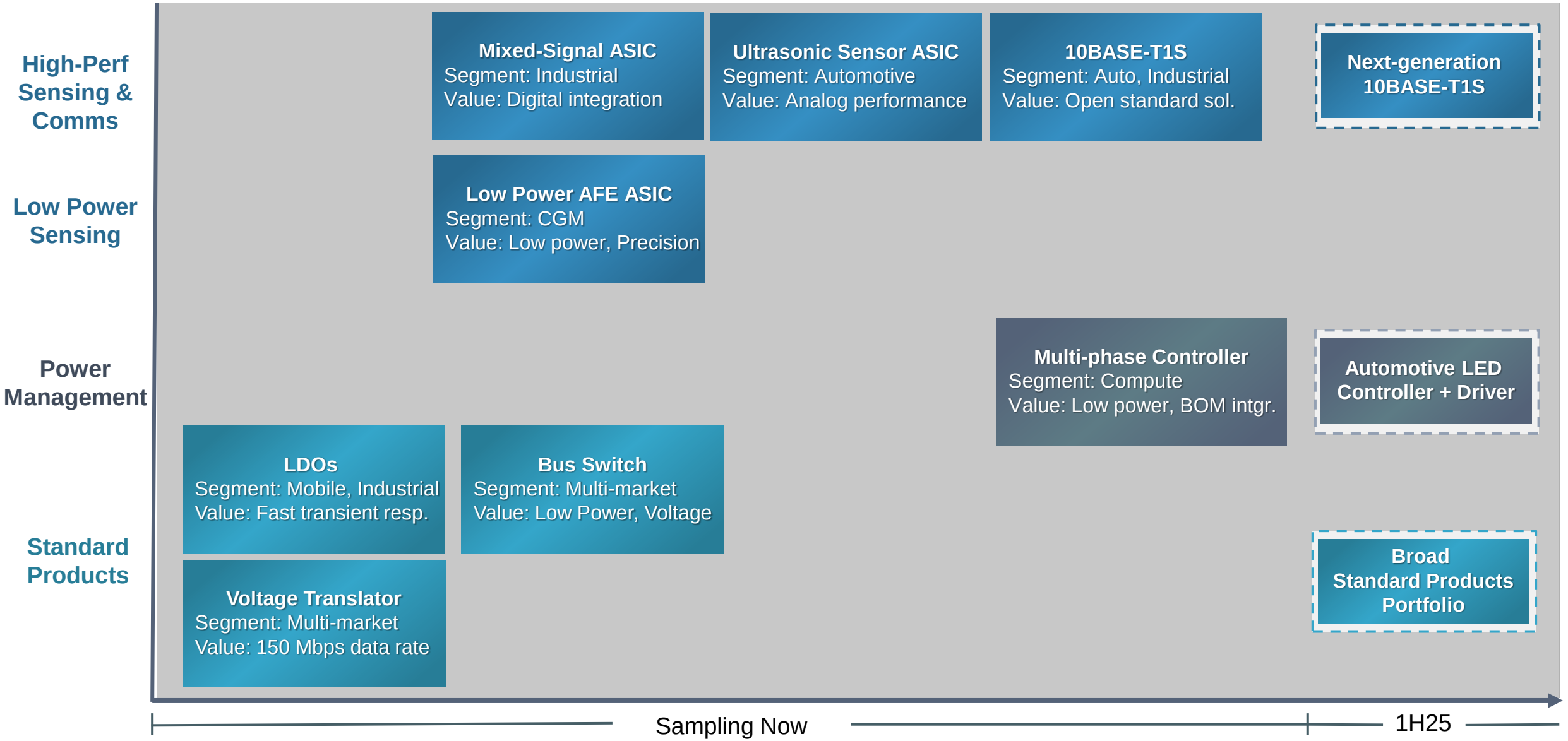
Enabling Next-Gen onsemi Analog and Mixed-Signal Portfolios

Treo Analog and Mixed-Signal Platform

Unmatched Integration Capability
Multiple Devices on a PCB → One



Analog and Mixed-Signal Products Sampling Now, Built on Treo



Treo Analog and Mixed-Signal Platform

- The Treo Platform is the most advanced in the industry, enabling winning onsemi analog and mixed-signal products, for next generation applications
- This platform delivers the foundation for a wide range of solutions including high-performance and low-power sensing, high-efficiency power management, and purpose-built communications devices
- Leveraging the Treo Platform, customers can accelerate product development for existing applications, and rapidly respond to emerging market opportunities
- Multiple products built on the platform are sampling, with many more upcoming

The Treo Platform provides onsemi a new growth trajectory into 2025 & beyond

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Intelligent Technology. Better Future.

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APPENDIX

Treo Analog and Mixed-Signal Platform

Value Proposition for Next-Generation Analog and Mixed-Signal Solutions

Feature	Why it Matters	Example
Widest Voltage Range: 1 – 90V	Ability to integrate subsystems across a range of voltages into one silicon solution	Multi-chip Automotive Ethernet solution (PHY at 70V, Controller at 1V) to a single chip
Modular, SoC-like Architecture	Fast time-to-market for customers due to accelerated development cycle	Specification to Silicon in 6-9 months: Keeping up with the pace of AI Power
Precision Analog	Higher accuracy, increased safety	Improved ultrasonic sensing accuracy for park assist by 2x
Embedded Intelligence	Configurable products with advanced features	Real-time inductive position sensing that is 10x more accurate than peers
High Efficiency & Low Power	Reduced power losses leading to lower TCO, extended battery life	Compact Smart Power Stages improve efficiency for GPU/CPUs in AI Data Centers CGM Sensor Replacement: Days → Weeks
High Temperature	Increased system robustness and reliability requirements	175 °C operation needed for new Automotive Power Distribution Network

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onsemi Aligns Business Groups to Expand Product Portfolio and Accelerate Growth

Analog and Mixed-Signal Group (AMG)

Delivering an analog and mixed-signal portfolio that solves our customers' most critical system-level power and sensing problems

AMG provides a suite of novel and differentiated technologies to optimize next-generation solutions with **high efficiency**, **advanced integration**, and industry **best-in-class performance** for Automotive, Industrial and AI Data Center

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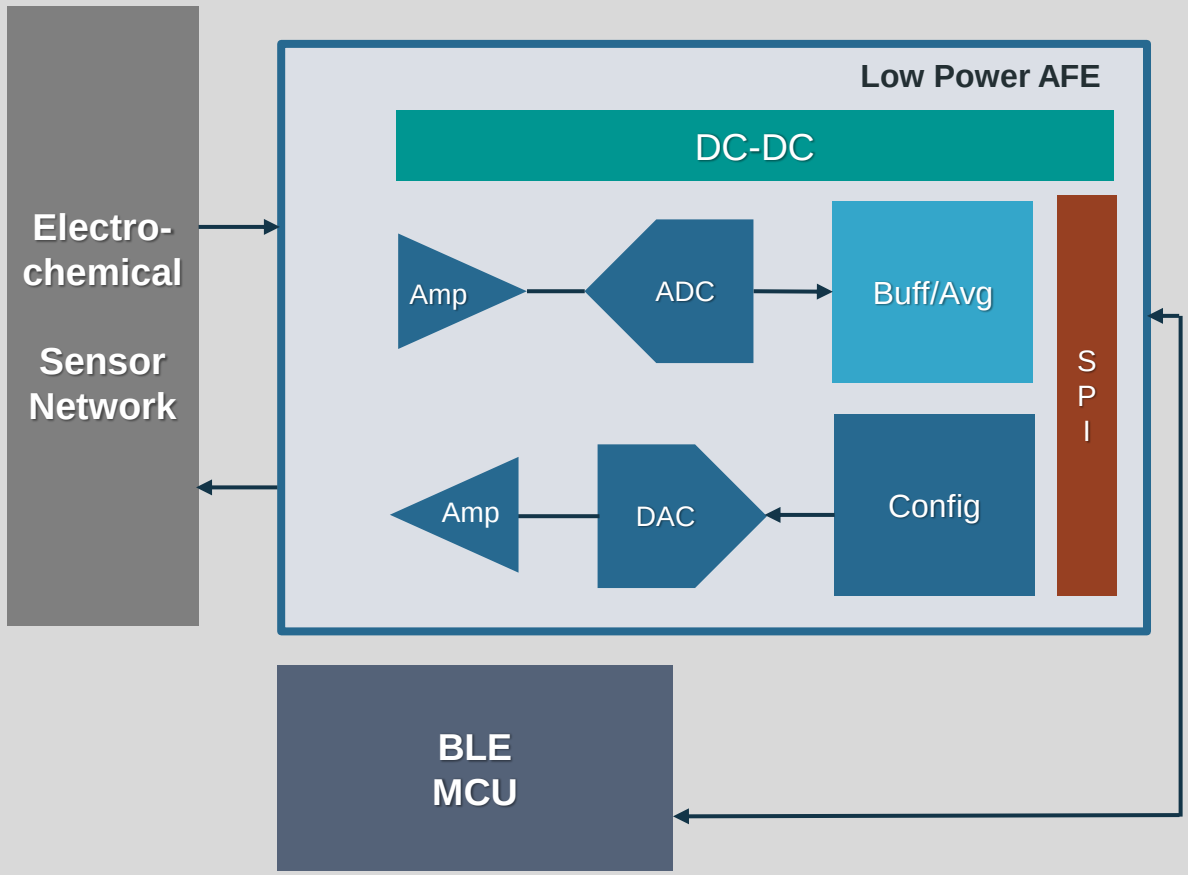
Application Use Case: Low Power AFE for CGM

System Solution



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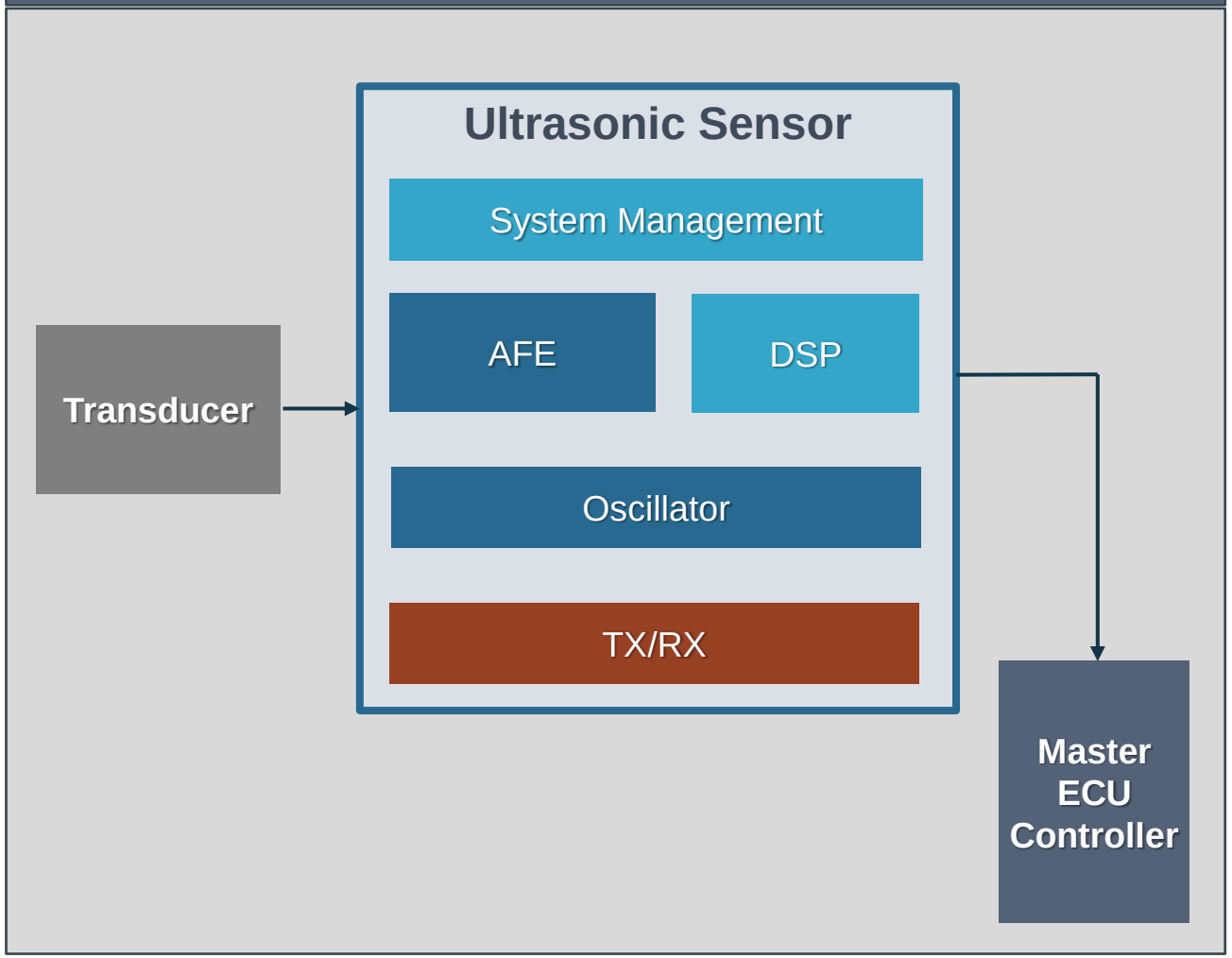
Ultra-low power Analog Front End (AFE) in Continuous Glucose Monitoring (CGM)

Need	Treo Platform Solution
Tiny form factor	50% smaller footprint than existing solutions
Energy efficiency	Ultra-low-power, low-leakage design
Enhanced accuracy and new functionality	Precision analog design needed for pA readings, Advanced digital processing capability

Application Use Case: Ultrasonic Sensor for Park Assist ADAS

System Solution



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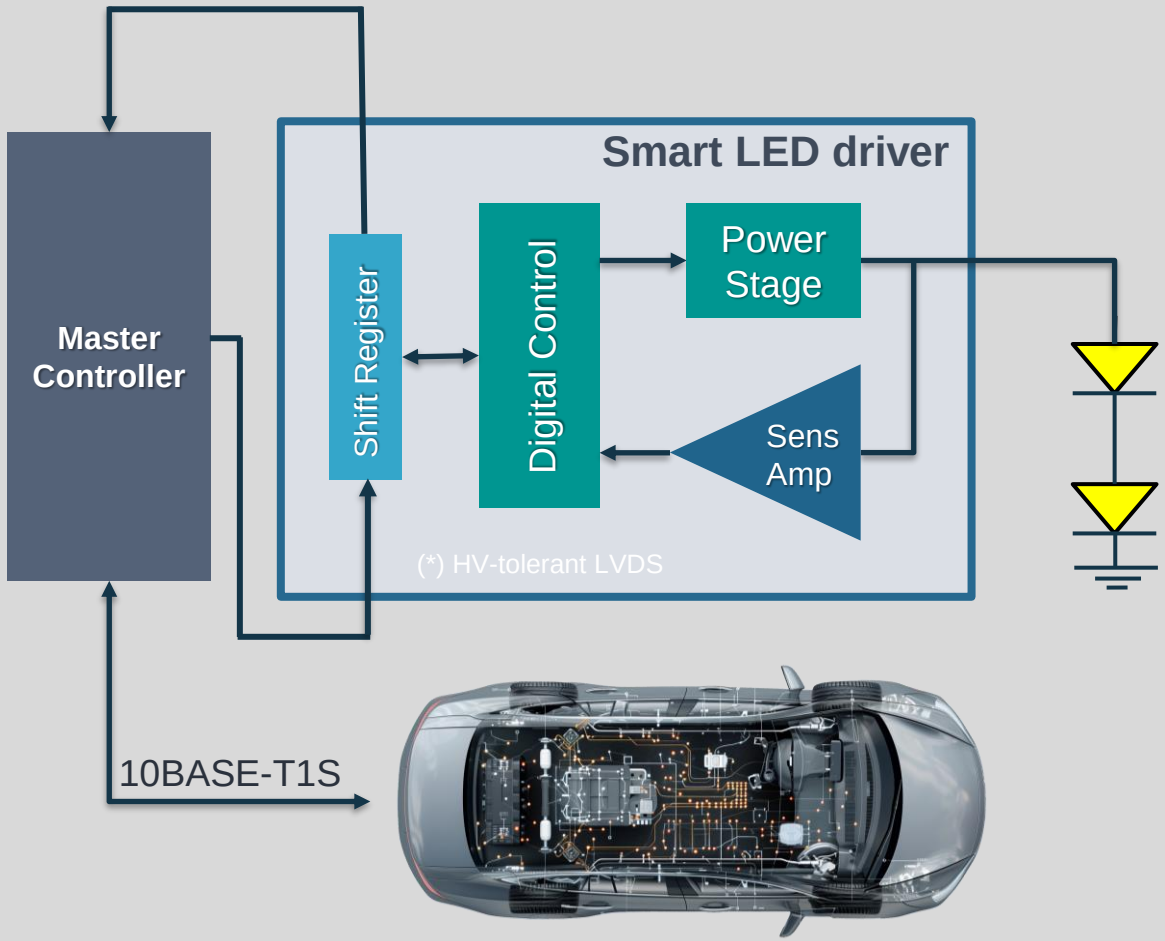
High Precision Ultrasonic Sensor for Park Assist ADAS applications

Need	Treo Platform Solution
Safer, more effective Park Assist	Improved accuracy by a factor of 2
Ability to implement new functionality	Advanced on-chip digital signal processing

Application Use Case: Automotive LED Drivers

System Solution



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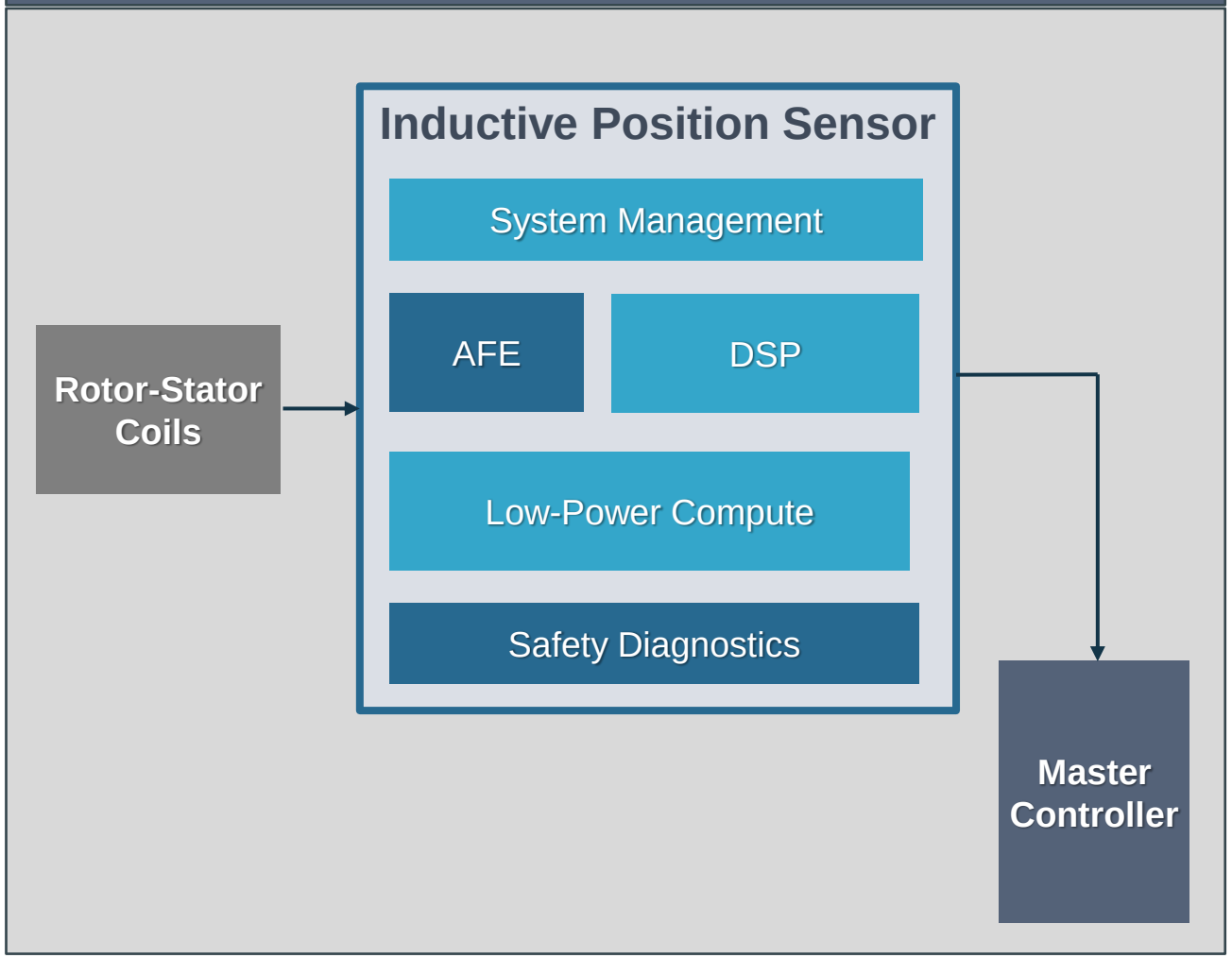
Automotive Smart LED driver with Integrated Power Stage

Need	Treo Platform Solution
Space Savings	30% smaller footprint than competition
New functionality with robustness	Advanced digital for control and diagnostics with integrated EMC-robust protection

Application Use Case: Inductive Position Sensor

System Solution



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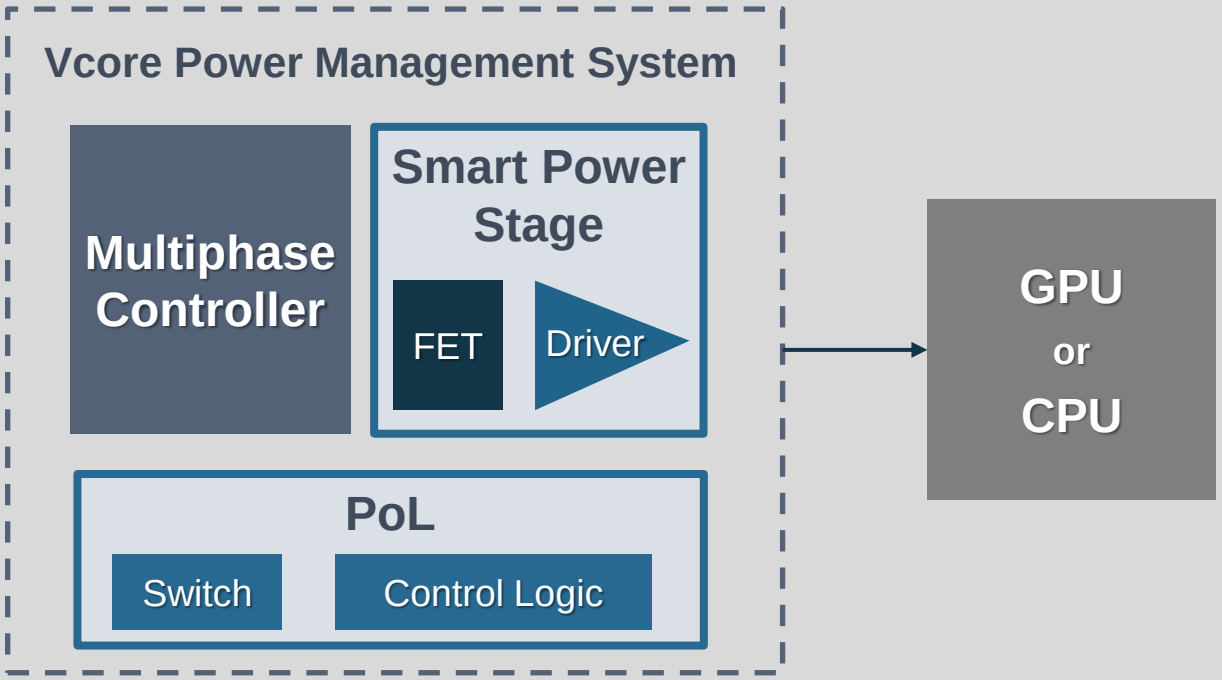
High Accuracy Inductive Position Sensor for Motors, Robots, Valves

Need	Treo Platform Solution
More safety and precision	10x higher accuracy vs. competition, with high voltage integration
Spacing Savings	33% smaller footprint vs. competition
Extended battery life	50% lower power consumption vs. peers

Application Use Case: Power Management for AI Data Centers

System Solution



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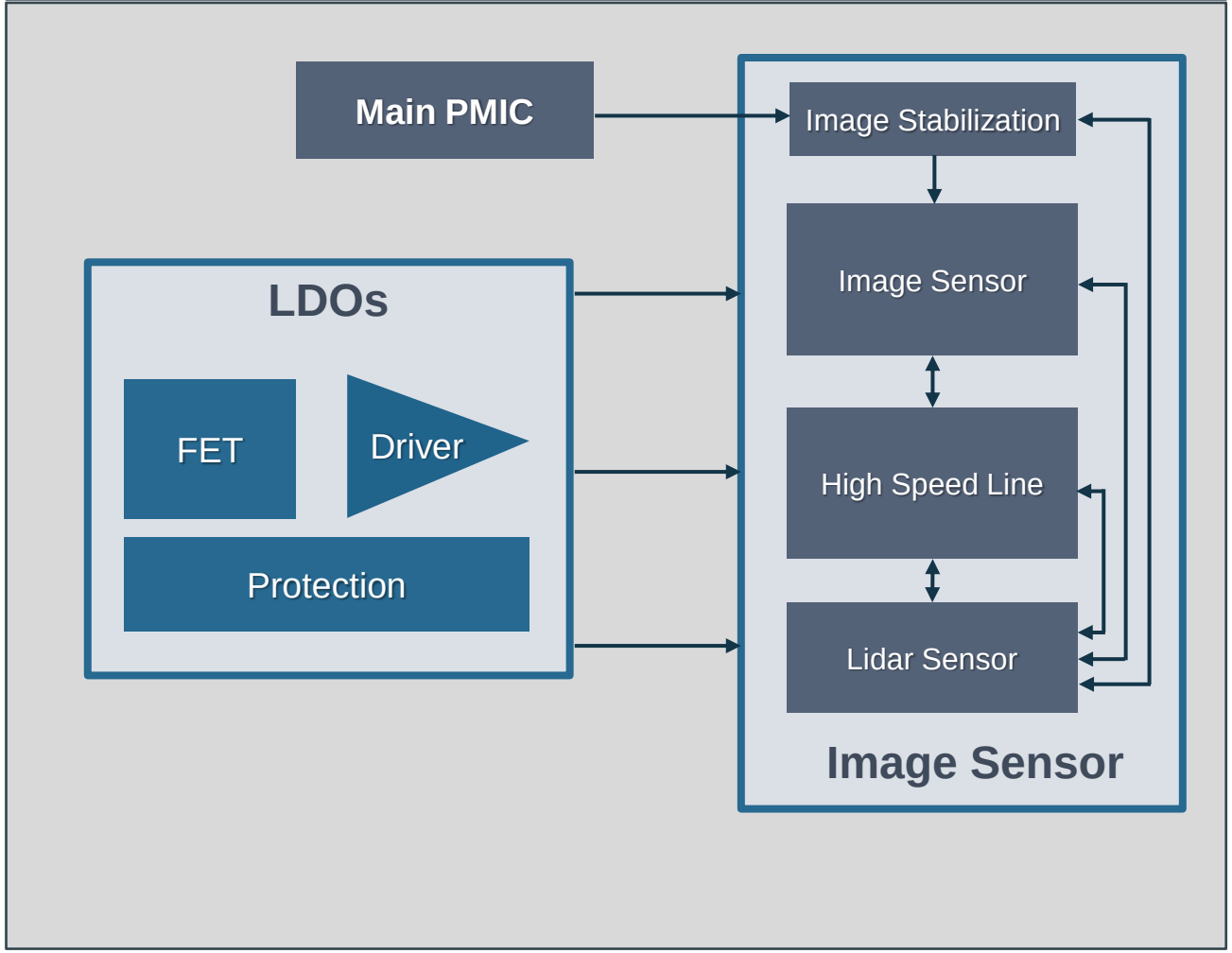
Smart Power Stages enabled with Treo drivers, for CPU/GPU power delivery

Need	Treo Platform Solution
Higher Efficiency Power Density	Compact onsemi smart power stages with optimized drivers and high-performance PoLs deliver more efficiency across the power tree

Application Use Case: High-Res Image Sensor Power Management

System Solution



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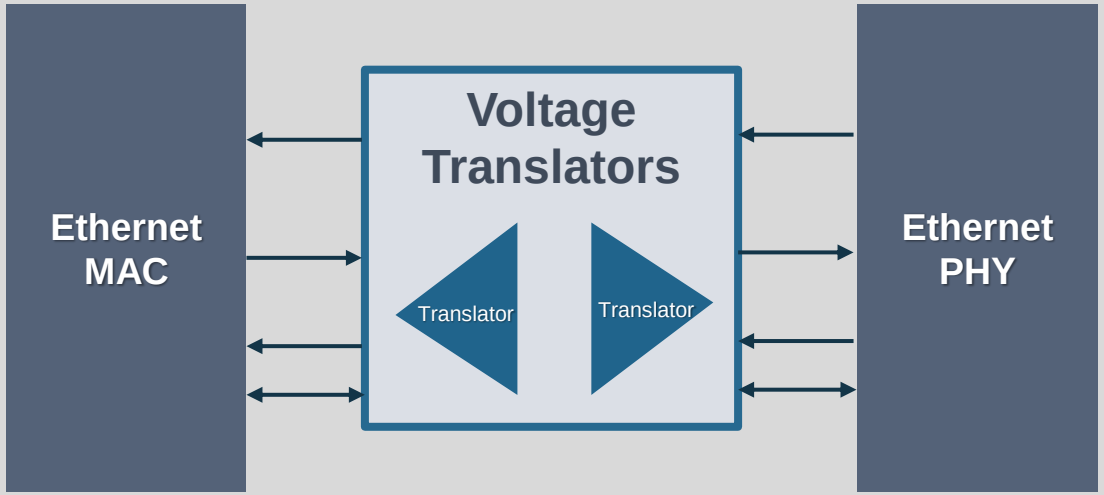
Low Noise, High Performance
Low Drop Regulator (LDO)

Need	Treo Platform Solution
Space Savings	Small package, increasing power density of 28%
Higher performance	Best in class noise performance for improved image clarity

Application Use Case: Gigabit Ethernet

System Solution



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Next Generation
Logic Level Translators

Need	Treo Platform Solution
High Performance Connectivity	High Data Rates (1 Gbps/Lane)
Space Savings	Tiny package
Low Power Operation	Low voltage operation down to 0.9V