

A collage of images representing sustainable technology. In the foreground, the hood of a dark car is visible. In the background, there are two robotic arms, a large solar panel array, and several wind turbines. The entire scene is overlaid with a semi-transparent orange filter.

# Accelerating the Journey Towards a Sustainable Ecosystem

May 16, 2023

# Safe Harbor

This presentation contains “forward-looking statements,” as that term is defined in Section 27A of the Securities Act of 1933, as amended, and Section 21E of the Securities Exchange Act of 1934, as amended. All statements, other than statements of historical facts, included or incorporated in this presentation could be deemed forward-looking statements, particularly statements about the future financial performance of onsemi and forward-looking financial guidance. Forward-looking statements are often characterized by the use of words such as “believes,” “estimates,” “expects,” “projects,” “may,” “will,” “intends,” “plans,” “anticipates,” or “Target” or by discussions of strategy, plans, or intentions. All forward-looking statements in this presentation are made based on our current expectations, forecasts, estimates, and assumptions and involve risks, uncertainties, and other factors that could cause results or events to differ materially from those expressed in the forward-looking statements. Investing in our securities involves a high degree of risk and uncertainty, and you should carefully consider the trends, risks, and uncertainties described in this presentation, our 2022 Annual Report on Form 10-K filed with the Securities and Exchange Commission (“SEC”) on February 6, 2023, our Quarterly Report on Form 10-Q for the first quarter of 2023 filed with the SEC on May 1, 2023 and other reports filed with or furnished to the SEC, before making any investment decision with respect to our securities. If any of these trends, risks, or uncertainties actually occurs or continues, our business, financial condition, or operating results could be materially adversely affected, the trading prices of our securities could decline, and you could lose all or part of your investment. We assume no obligation to update such information, which speaks only as of the date made, except as may be required by law. All forward-looking statements attributable to us or persons acting on our behalf are expressly qualified in their entirety by this cautionary statement.

This presentation contains historical non-GAAP financial measures, including, among others, free cash flow (FCF) and FCF margin, non-GAAP gross margin and non-GAAP operating margin. See the Appendix for a description of these financial measures and a reconciliation of all such non-GAAP financial measures to GAAP. This presentation also contains forward looking non-GAAP financial measures, some of which are adjusted for certain special items. These special items are out of our control and could change significantly from period to period. As a result, we are not able to reasonably estimate and separately present the individual impact of these special items, and we are similarly unable to provide a reconciliation of the non-GAAP measures. The reconciliation that is unavailable would include a forward looking income statement, balance sheet, and statement of cash flows prepared in accordance with GAAP. We believe these non-GAAP measures provide important supplemental information to investors. We use these measures, together with GAAP measures, for internal managerial purposes and as a means to evaluate period-to-period comparisons. However, we do not, and you should not, rely on non-GAAP financial measures alone as measures of our performance. In addition, because non-GAAP financial measures are not standardized, it may not be possible to compare these financial measures with other companies’ non-GAAP financial measures, even if they have similar names.

# *Accelerating the Journey Towards a Sustainable Ecosystem*

## **TOPIC**

## **PRESENTER**

**Welcome to the New World**

**Hassane El-Khoury**  
President & CEO

**Powder to Power**

**Simon Keeton**  
Executive Vice President & General Manager  
Power Solutions Group

**Accelerating the Flywheel**

**Sudhir Gopalswamy**  
Senior Vice President & General Manager  
Advanced Solutions Group

**Foundation Set:  
Ready to Accelerate**

**Thad Trent**  
Executive Vice President & CFO

**Q&A**

**All**

## Play to Win

- Focus on high-growth megatrends in Automotive and Industrial and win with **onsemi** intelligent power and sensing
- Double down and don't dabble
- Invest in disruptive innovation to drive higher margin growth

## Implement Structural Changes

- Optimize organizational structure to reduce complexities
- Streamline manufacturing to match the strategy and not the other way around
- Attract and retain the best, diverse talent across the board
- Engage and empower employees to make expeditious, data-driven decisions

## Capture Value

- Focus on highly differentiated products that enable disruptive innovation
- Optimize manufacturing footprint and leverage expertise
- Eliminate price-to-value discrepancies

## Execute

- Leverage new leadership team with history of strong execution
- Drive accountability throughout the organization
- Reward employees for delivering superior results



onsemi™

Winning  
Formula

# RESILIENCY

**B RILEY** Securities

Member FINRA/SIPC | a B. Riley Financial company

Solid Revenues and Margins  
Strong SiC Auto Demand; PT from  
\$80 to \$105, Reiterate Buy

gaining

impressive-execution

value

blowout

BETTER-OUTLOOK

control

RESILIENT

power

STRUCTURAL-IMPROVEMENTS

LEADERSHIP

DE-RISKING

RAISE

PICK

HIGHER-MULTIPLE

STRATEGIC

SCALE

sensing

execution

beat

turnaround  
strong-growth

strong-results

IMPRESSIVE

growth

auto

transformation

GROSS-MARGIN

leader industrial

RESTRUCTURING

exceed

record

reiterate

RAISING-PRICE-TARGET ACCELERATING

transformation-execution

promising

reiterate-buy

buy

ramp

revenue

300mm

adas

grow

earnings

CLEAN-EXECUTION

solid-results

raising-estimates

impresses

power-drives

value rising

reiterate

ACCELERATING

BMO

WELLS  
FARGO

MIZUHO

J.P.

BofA GLOBAL RESEARCH

ON Semiconductor

Investor day highlights: turn

firmly in place, EPS power of \$

Reiterate Rating: BUY | PO: 55.00 USD | Price: 44.82 USD

20

LT

COWEN

Margins on the water

Morgan Stanley

ON strong narrative und

tougher revenue trends

Gross margin improve

MOVE

to Grow

Beats, Lower

ARCH

autos/silicon

inductor Corp.:

to Downticks...

Up

TOP

Focus Still Squarely on

portunity, But Softening

Industrial Will Be a Drag

Downturn Takes Hold But

Ramp and Restructuring

Offset Headwinds. Reiterate Buy.

Results:

value rising

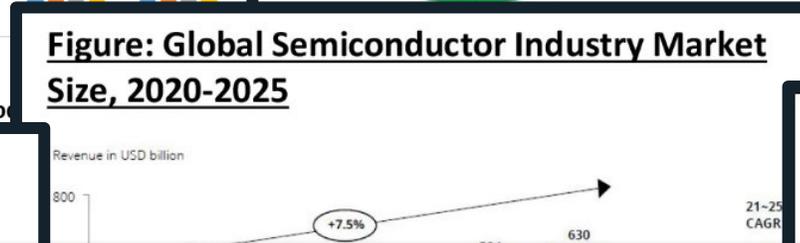
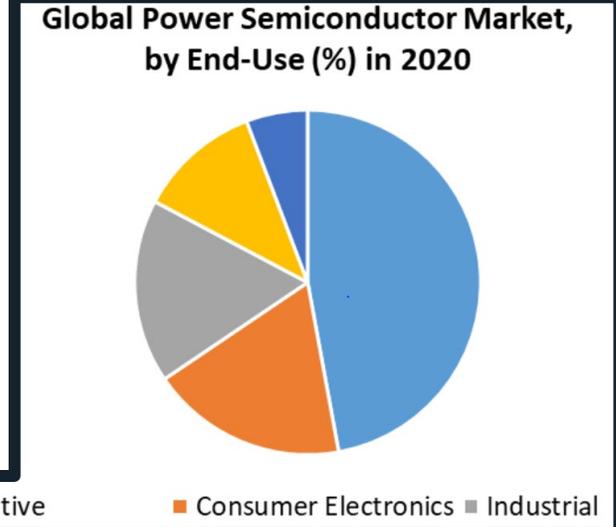
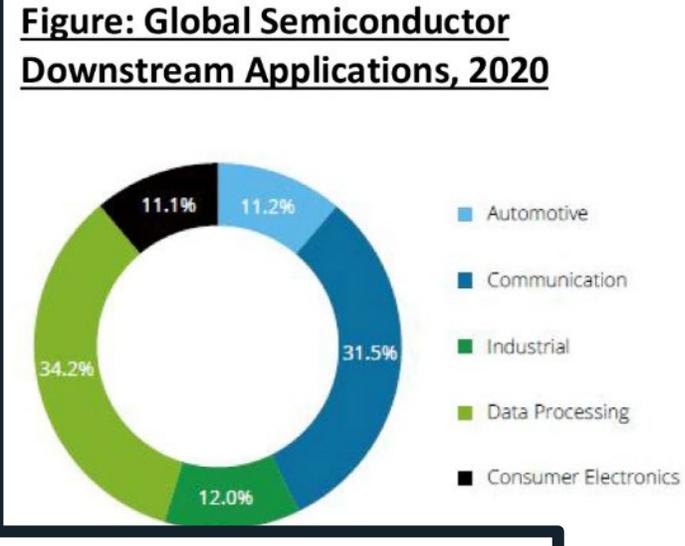
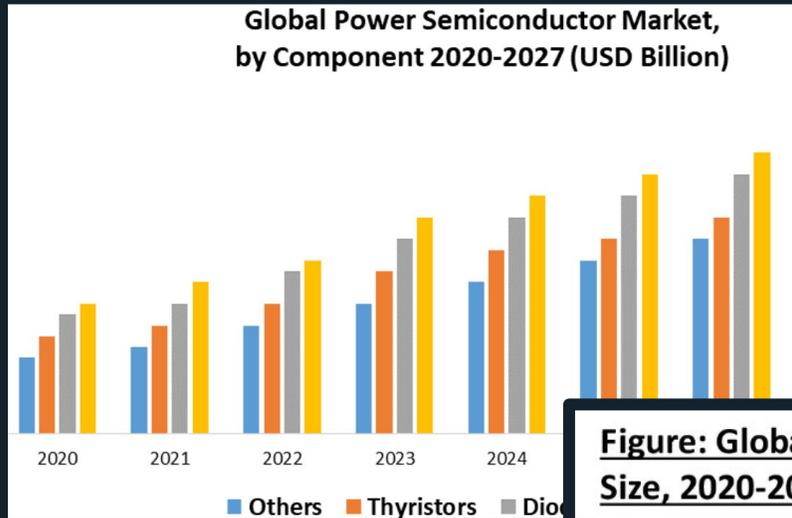
reiterate

ACCELERATING

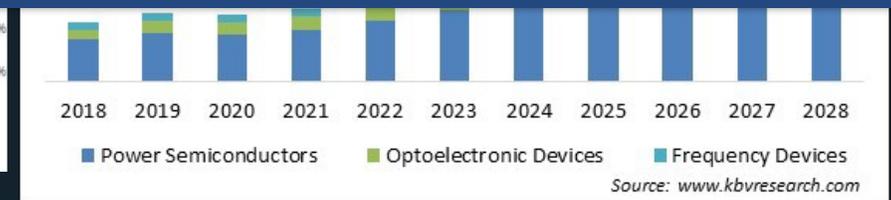
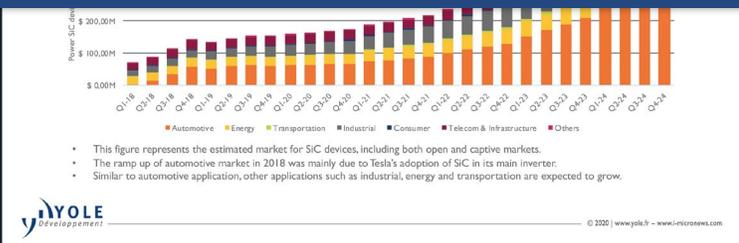
ACCELERATING

onsemi

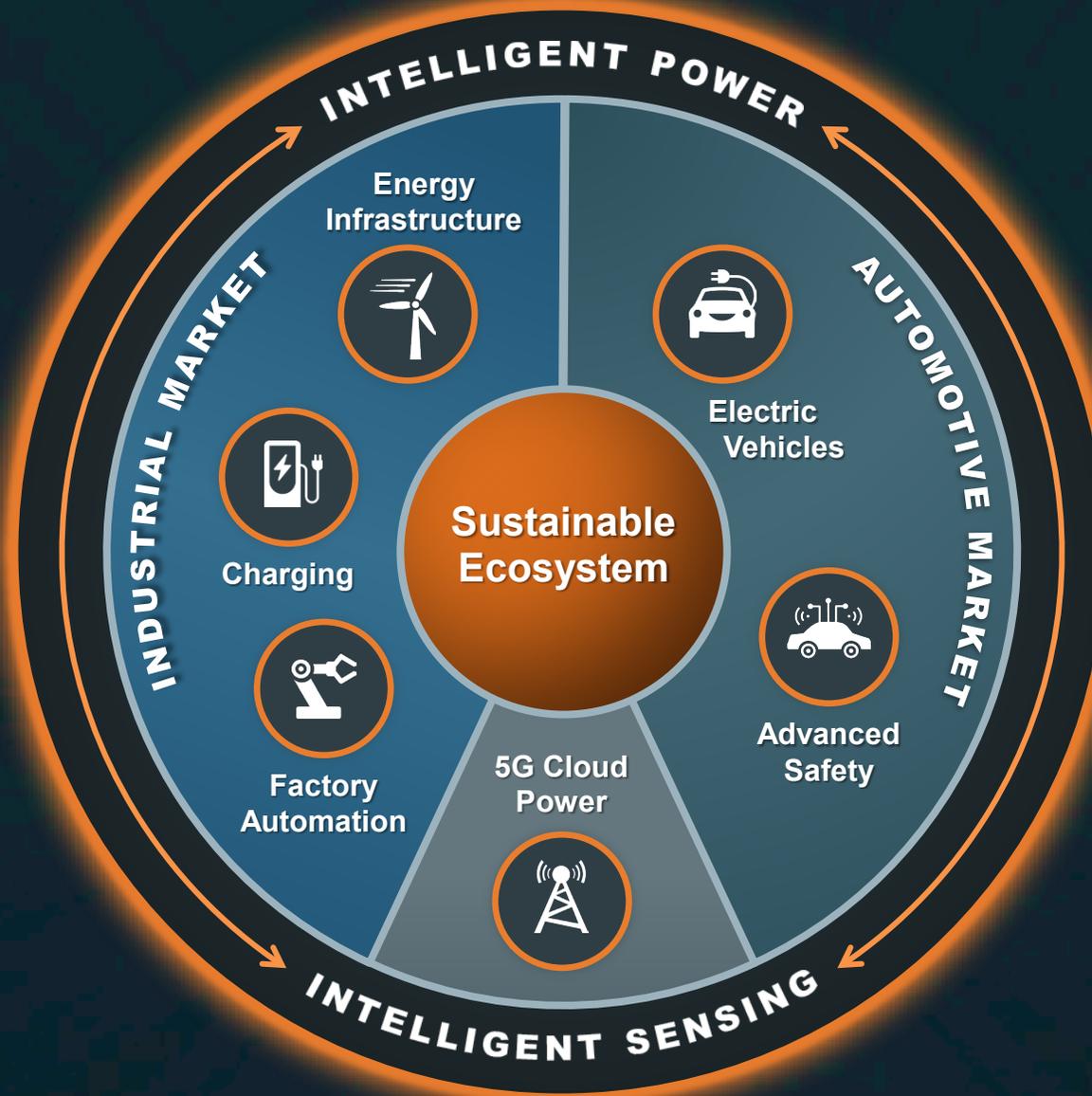
# What you are used to seeing...

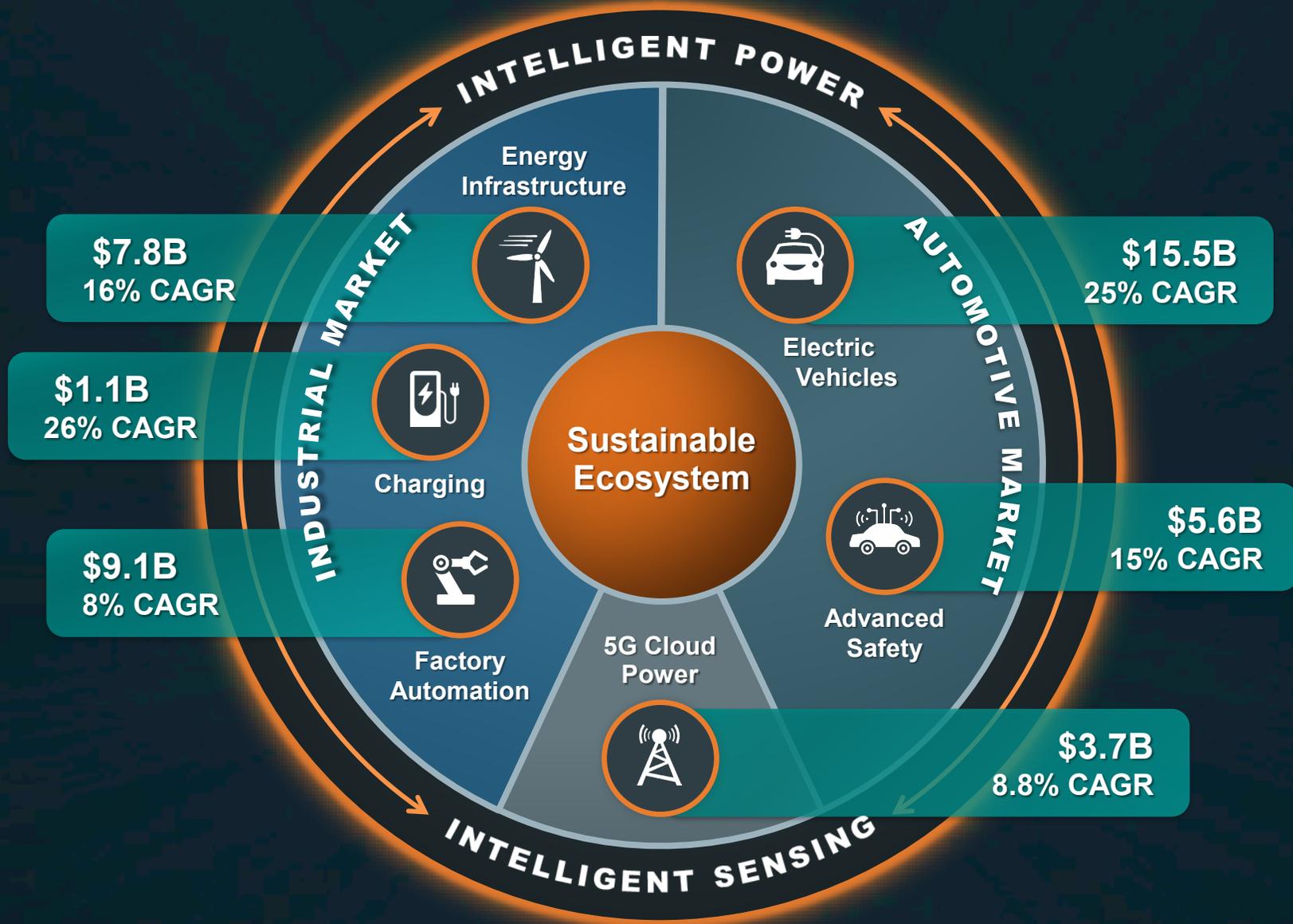


...is a different cut of a market growing at 4%

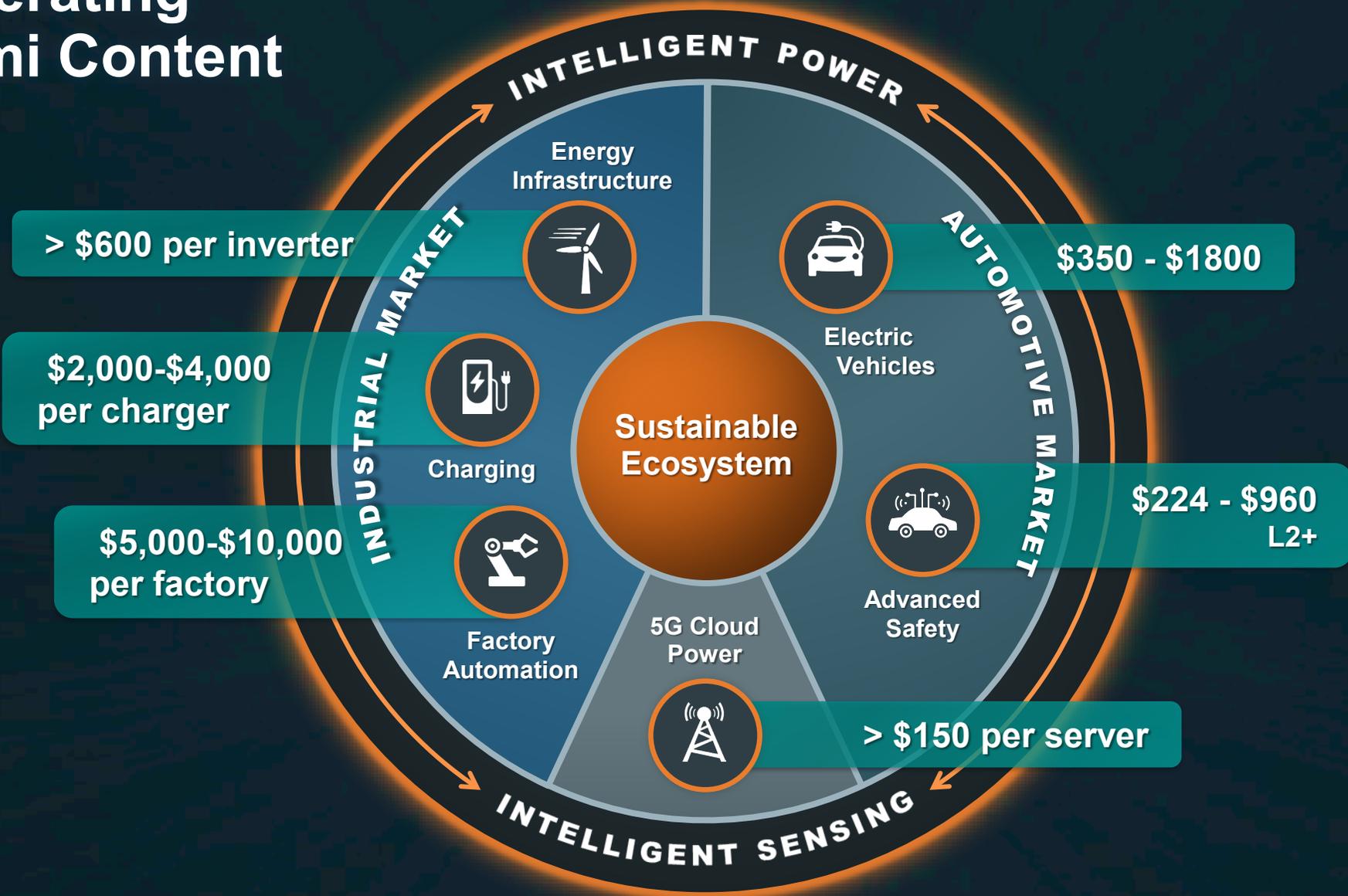


# Welcome to the New World





# Accelerating onsemi Content





onsemi and VW Group Cement Strategic Collaboration on Silicon Carbide Technology for Next-Generation Electric Vehicles with Strategic Agreement / Jan 25, 2023

onsemi Silicon Carbide Power Module for Traction Inverters Selected for Hyundai Motor Group's High-Performance Electric Vehicles / Jan 04, 2022



SensiML Teams with onsemi for Industrial Edge AI Sensing Applications Nov 4, 2021

onsemi Imaging Technology Enables Next Era of Digital Cinematography Sep 14, 2022



ZEEKR

onsemi and ZEEKR Sign Long-Term Supply Agreement for Silicon Carbide Power Devices / Apr 25, 2023

onsemi and Ride Vision Collaborate on Advanced Safety Solutions for Motorcyclists / Oct 25, 2022



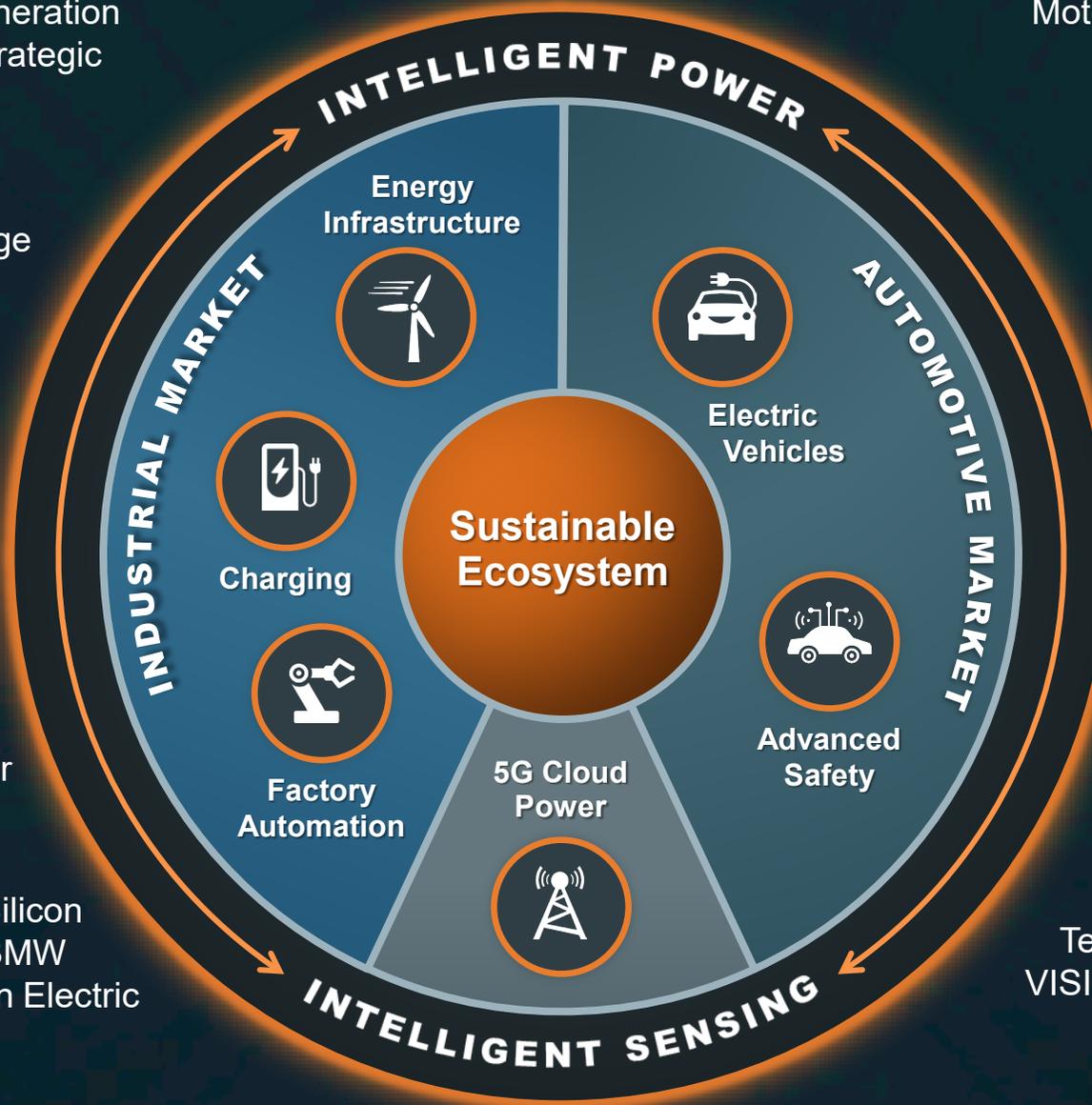
onsemi and Ampt Collaboration Increases Efficiency for Utility Solar Providers / Jan 05, 2023

NIO Selects High-Efficiency Silicon Carbide Traction Power Modules from onsemi / May 11, 2022



onsemi to Integrate its Silicon Carbide Technology in BMW Group's Next-Generation Electric Vehicles / Mar 06, 2023

onsemi Silicon Carbide Technology Enables All-Electric VISION EQXX to Go Further on a Single Charge / Nov 14, 2022



# Markets that Matter

	Semiconductor	Intelligent Power & Sensing	Sustainable Ecosystem
<b>Industry</b>	TAM \$553B CAGR 4%	\$91B 6%	\$43B 16%
	Revenue CAGR 2022 - 2027		
	10-12%	14%	21%



Electrification, creating a multi-decade opportunity for onsemi SiC growth >2x market at ~70%\*



Machine Vision for the future of automation



Power new generation of cloud and 5G infrastructure with onsemi CAGR >20%

onsemi<sup>™</sup>  
**Winning  
Formula**

**Play to Win**

**...Implement Structural Change...**

**...Capture Value...**

**...and Execute...**

onsemi.  
Winning Formula  
Play to Win

- Win the high-growth megatrends of Automotive and Industrial with onsemi's intelligent power and sensing
- Invest in vertical integration and capabilities across all power technologies
- Deliver disruptive innovation across the BOM and drive higher margin growth
- Expand brownfield capacity in SiC and Image Sensors to lead with best-in-class financials
- Create the future with investments in university research and workforce development

## ...Implement Structural Change...

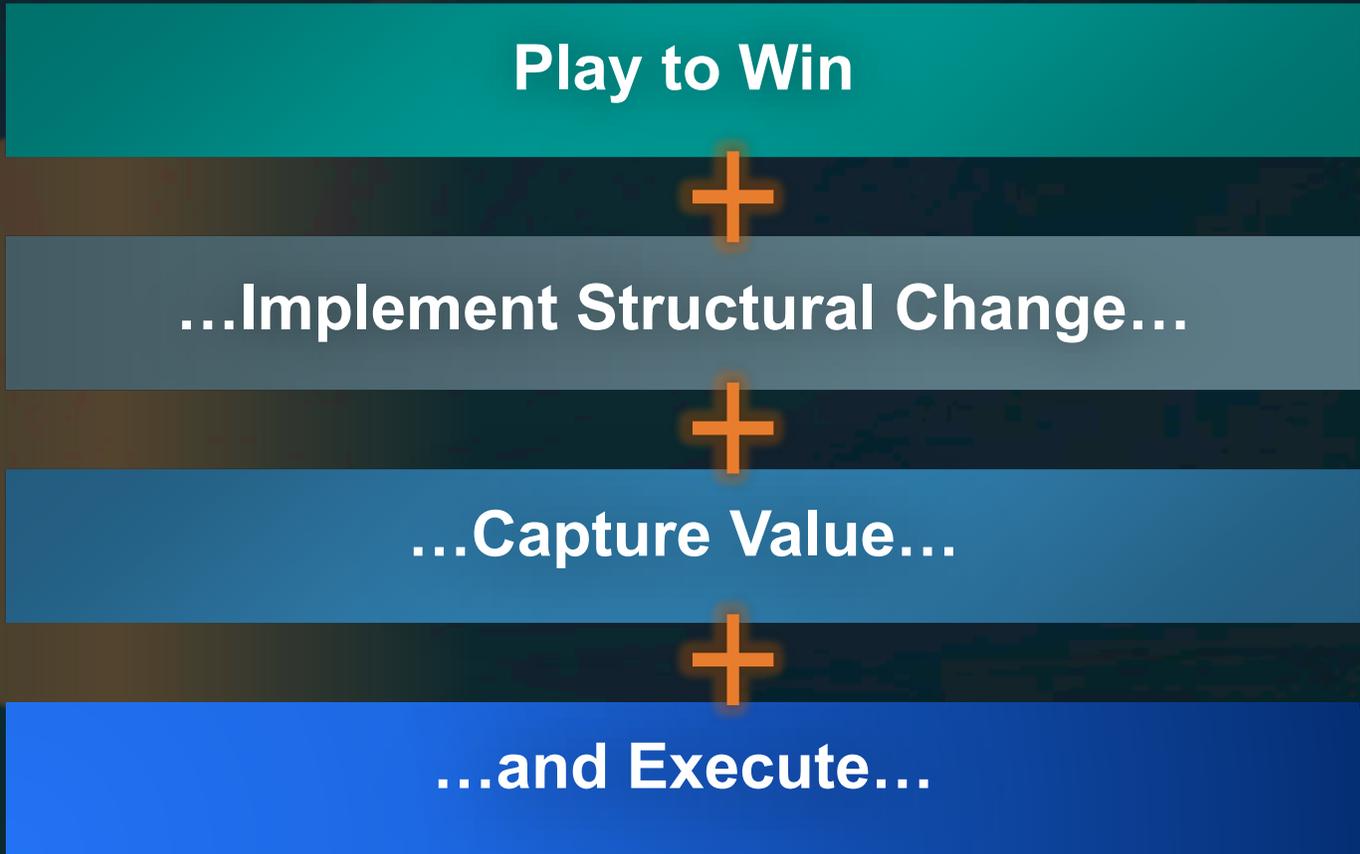
- Expand and scale Go-To-Market to widen reach and accelerate segment penetration
- Lead with Digital First to increase efficiency across all corporate domains
- Invest in new generation of Power ICs to deliver more value with a TAM expansion strategy
- Optimize the manufacturing footprint to support growth and expand margins

onsemi.  
Winning Formula  
...Capture Value...

- Design in highly differentiated and optimized solutions focused on customer needs
- Go broad with technology and programs for high gross margin market share gain: Elite Power Simulator, DevWare SDK
- Phase-in 200mm SiC substrates for the next wave of EV ramps
- Expand gross margin through efficiencies and new product ramps to accelerate free cash flow
- Deliver best-in-class ROIC across all investment vectors

onsemi.  
Winning Formula  
...and Execute...

- Drive accountability throughout the organization with strategic alignment but decision autonomy
- And reward employees for delivering on our strategy and commitments
- Deliver on >\$17B of customer LTSA's across all markets
- Maintain stable and predictable financial performance across all market conditions



**= The Undisputed Leader of the New World**

# EliteSiC Advantage

## SUPPLY

- History of vertical integration
- Volume SiC boule growth, wafering, substrate, epitaxy, device fabrication
- Best-in-class integrated modules, discrete package solutions and known good die

## SUPERIOR TECHNOLOGY

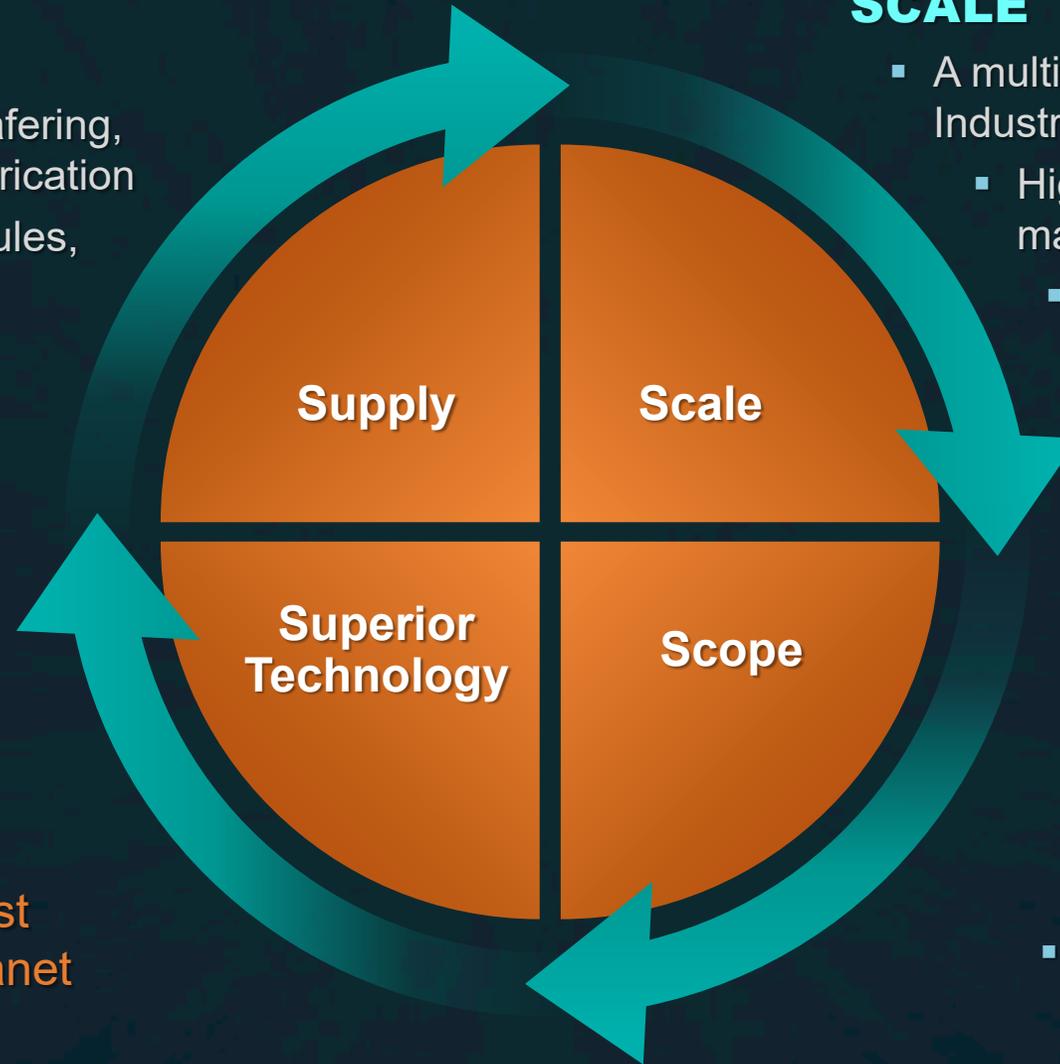
- Lead with die performance
- Differentiate with package innovation
- **Die + Package = THE most optimal solution on the planet**

## SCALE

- A multi-decade history in Auto and Industrial markets
- High-quality high-volume manufacturing
  - Able to ramp inline with customer expectations

## SCOPE

- Suite of sustainable solutions from energy generation to energy consumption
- Depth and breadth of power technologies
- Supporting portfolio for optimized solutions

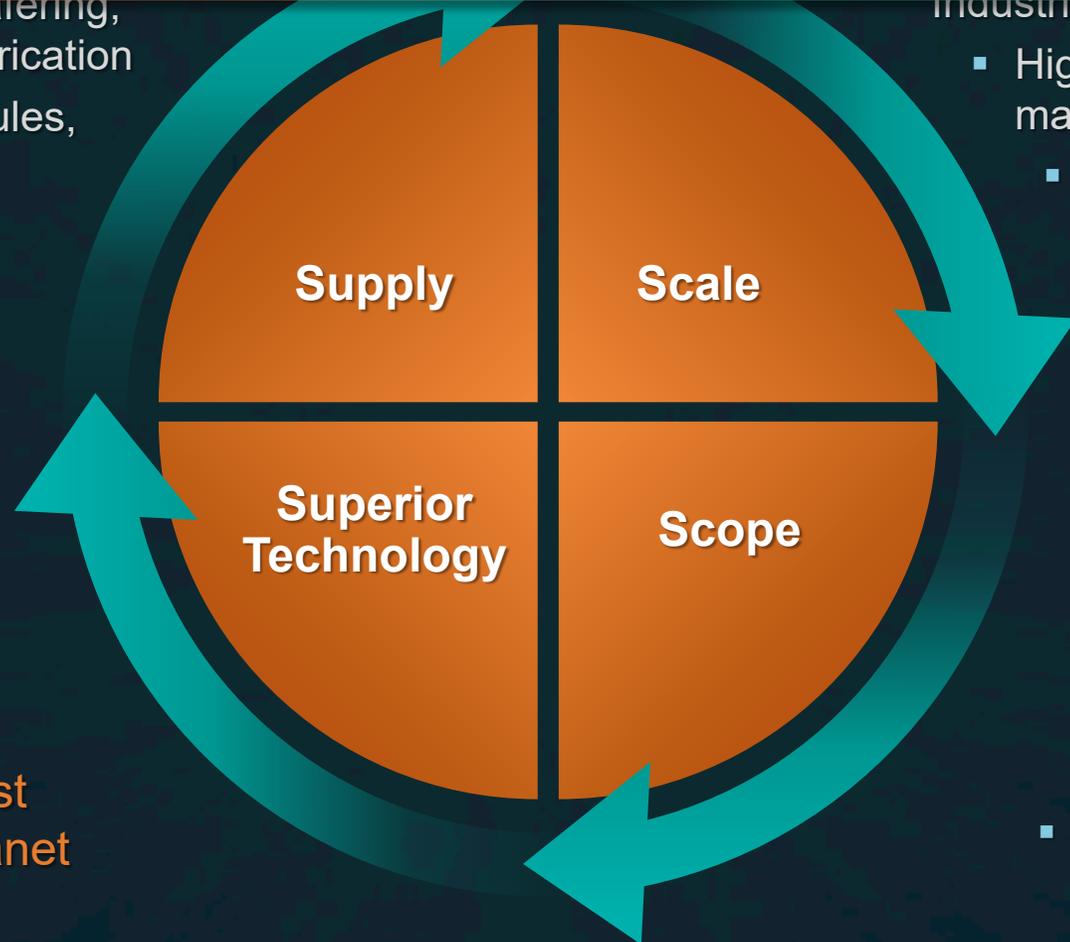


# Superior Technology

- volume SiC boule growth, wafering, substrate, epitaxy, device fabrication
- Best-in-class integrated modules, discrete package solutions and known good die

Industrial markets

- High-quality high-volume manufacturing
  - Able to ramp inline with customer expectations



## SUPERIOR TECHNOLOGY

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## SCOPE

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# Superior Technology



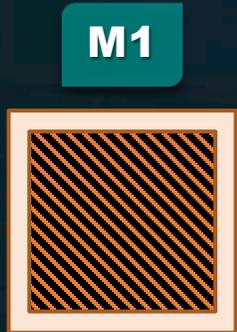
## The Path to the First \$1B



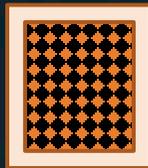
# Lead with Die Performance...

Customer  
Needs

- ↑ Range – Efficiency
- ↓ Size – Fast Switching
- ↑ Reliability – Ruggedness



M1



M2



M3



M4



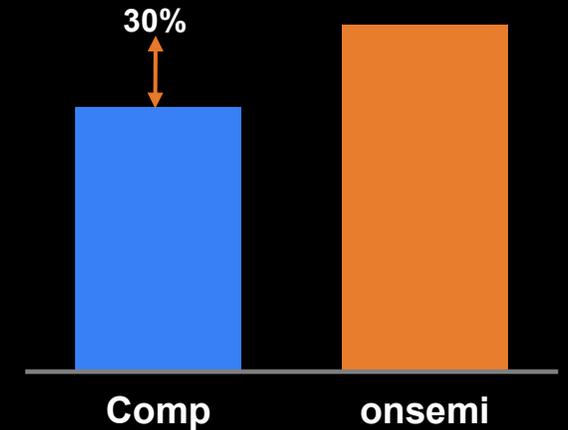
M5

Innovation

## onsemi Delivers

- Innovative Cell Structure
- Channel engineering

### Traction System Figure of Merit



\* $1/R_{SP}$  Chip @ 175°C

# Lead with Die Performance...

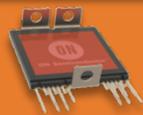
## Differentiate with Package Innovation

### Customer Needs

- ↑ Range – Heat Extraction
- ↑ Flexibility – Scalability
- ↑ Reliability – Ruggedness

Transfer Molded

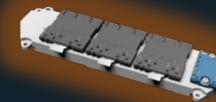
Dual Side Cool



Half Bridge Module



Full Bridge with Cooling Channel

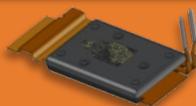


Embedded



Discrete

Single Switch



Next Gen Switch



Gel-filled

Case Module



Case Module+

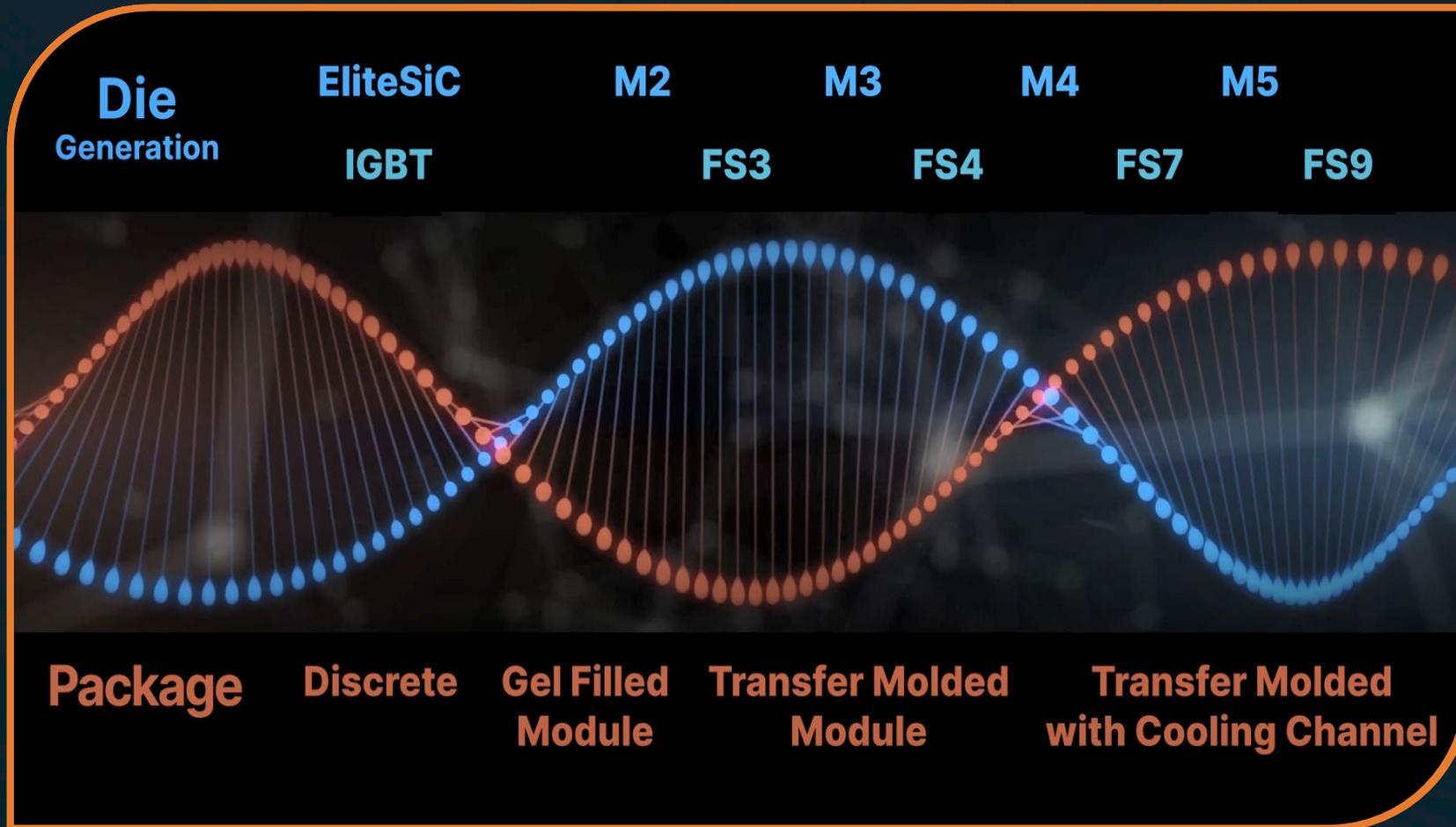


### onsemi Delivers

- Advanced packaging materials
- World class thermal performance
- Simulations at Die, Package and System

*Innovation*

# Optimized Solutions are our DNA



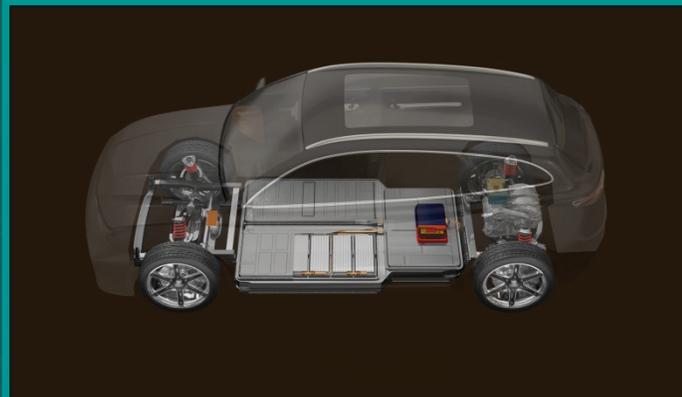
**Concurrent development** of die and package leads to **optimized** solutions



**GENERATION**



**STORAGE**



**ELECTRIFICATION**



**CHARGING**

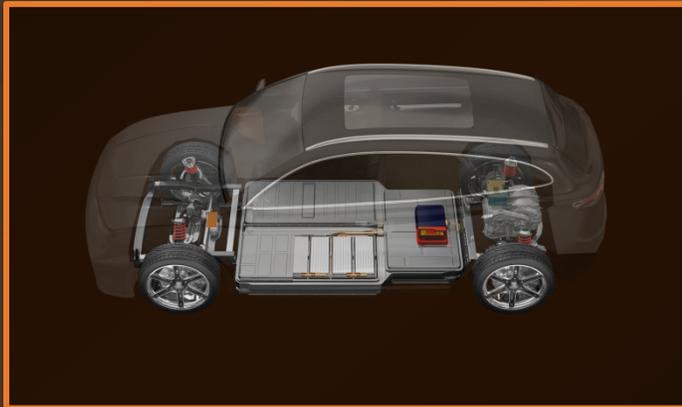




**GENERATION**



**STORAGE**



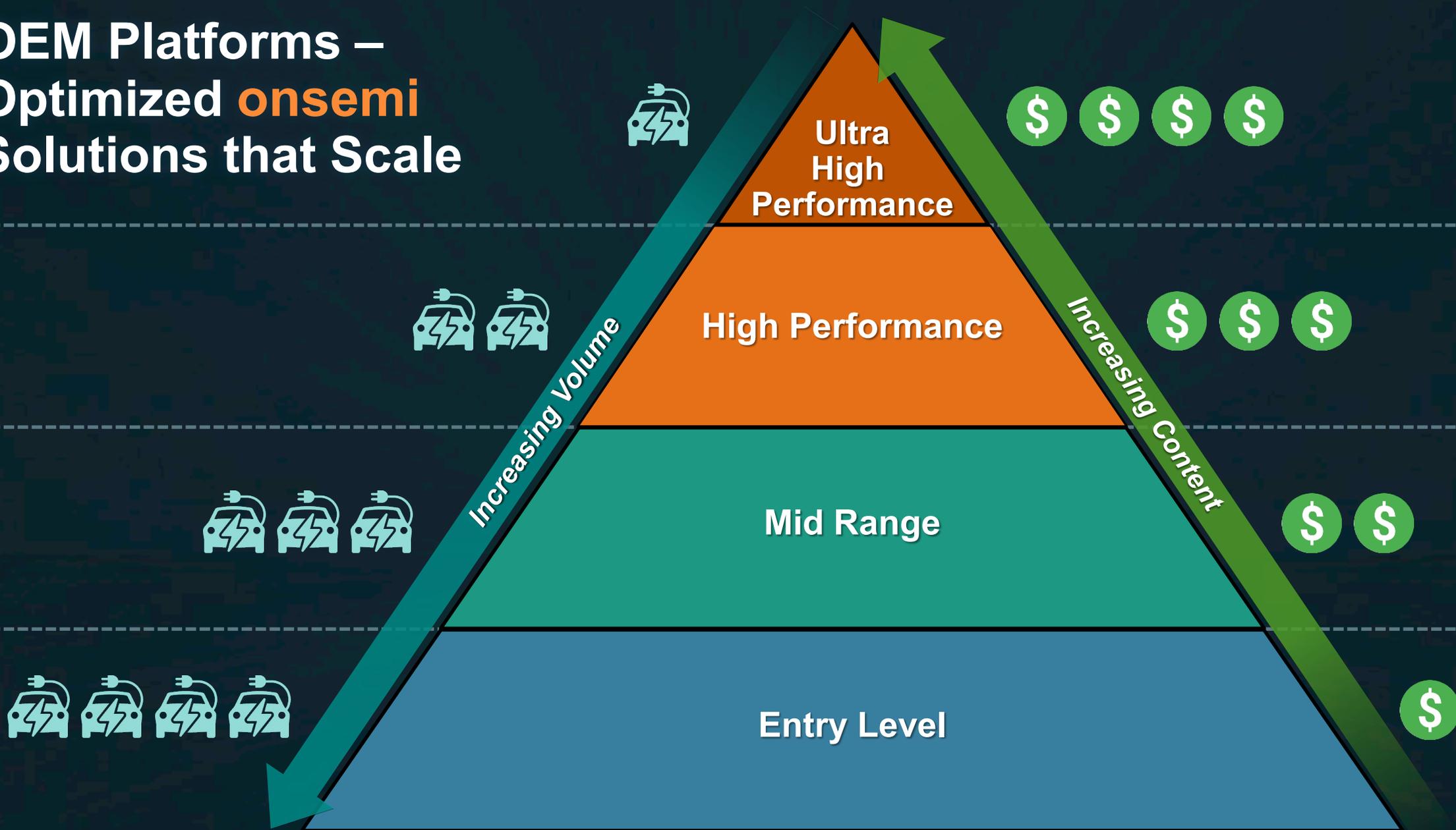
**ELECTRIFICATION**

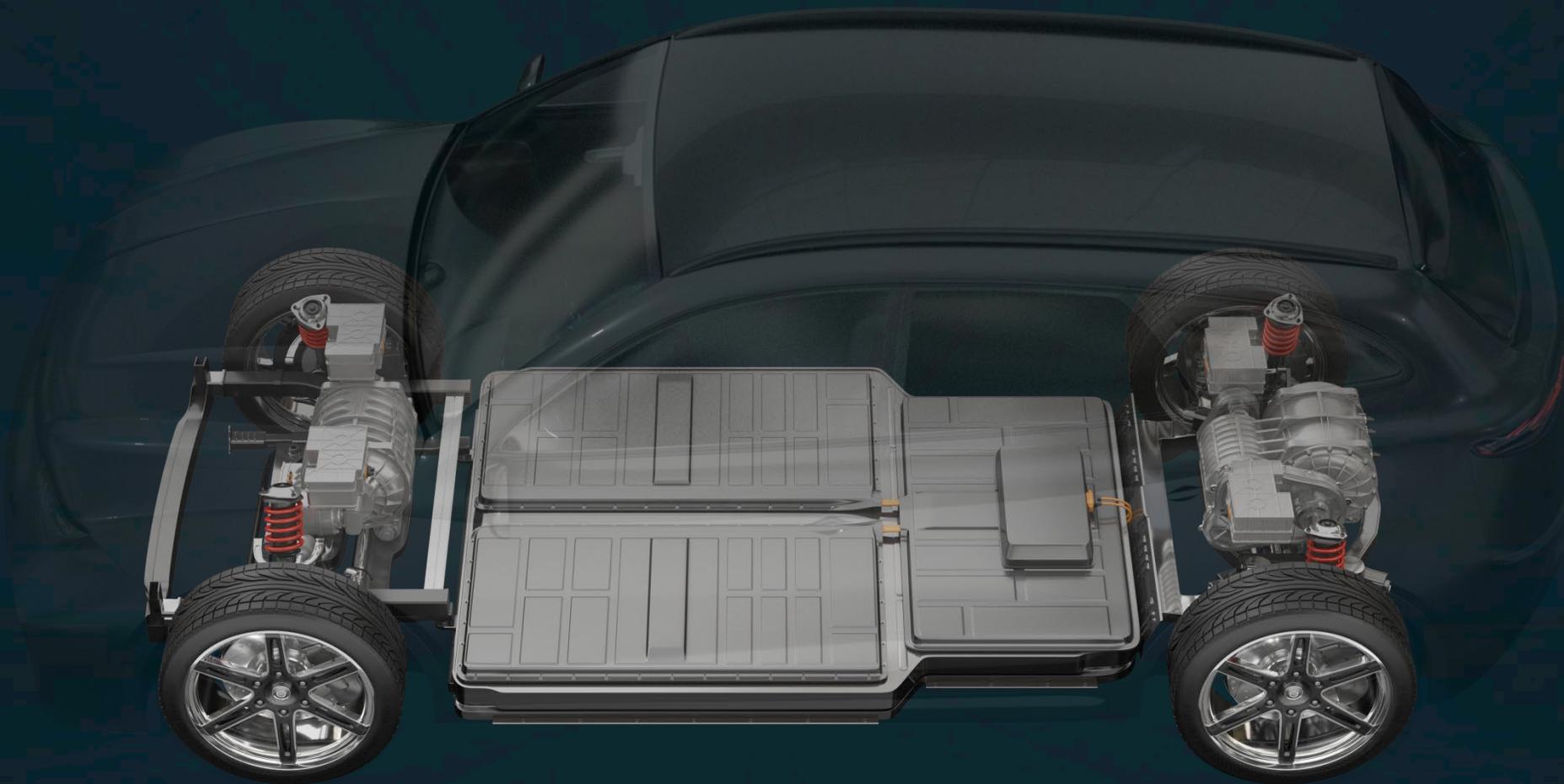


**CHARGING**



# OEM Platforms – Optimized **onsemi** Solutions that Scale



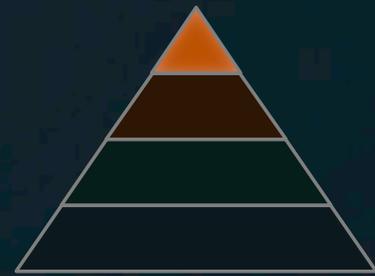


## Powering Every Architecture

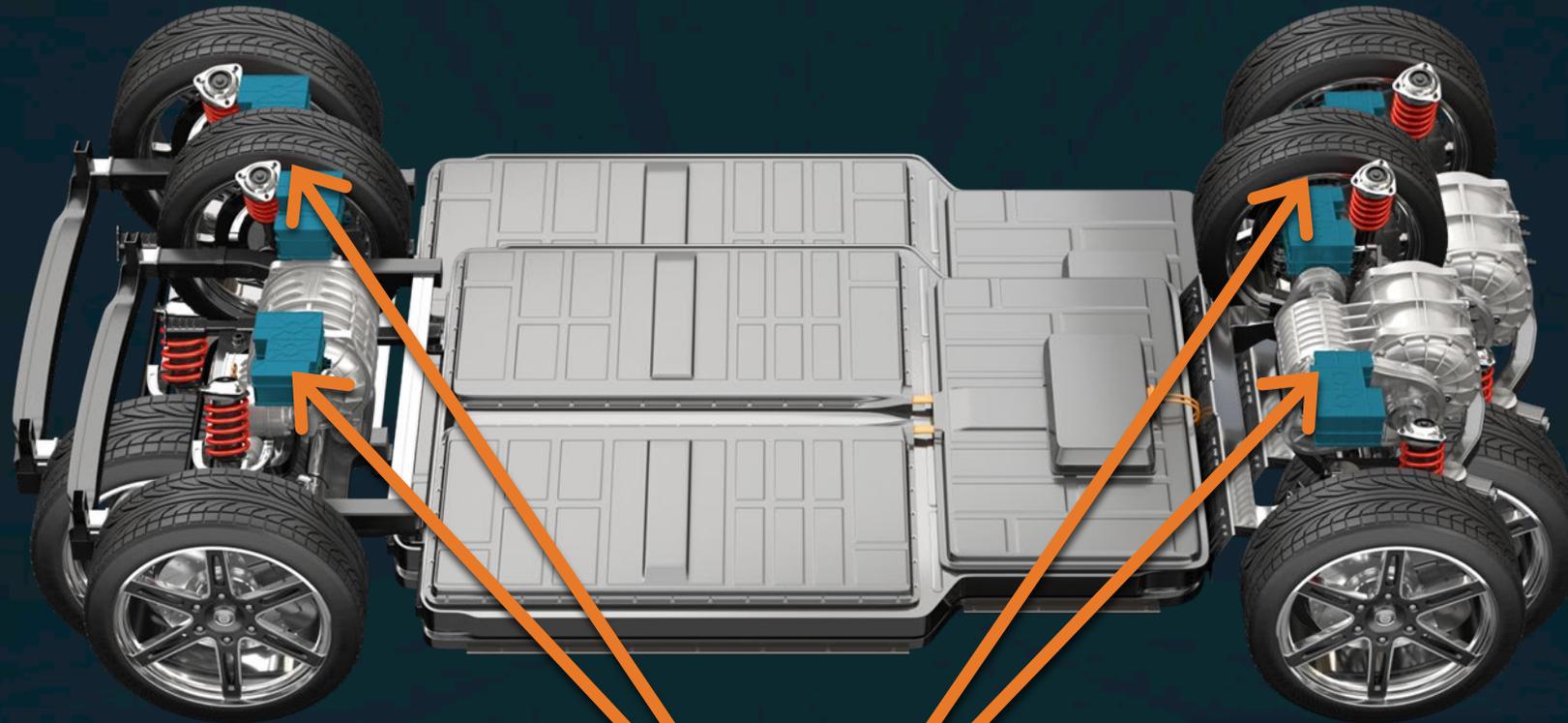
# Powering Every Architecture

Customer  
Needs

Ultra high  
performance



✓ Customer Wins  
& LTSAs



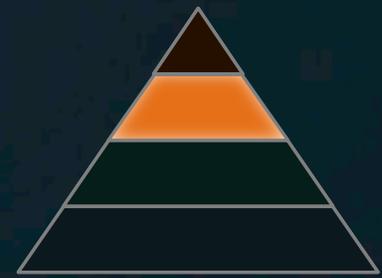
**onsemi** Delivers

Quad SiC traction

SiC

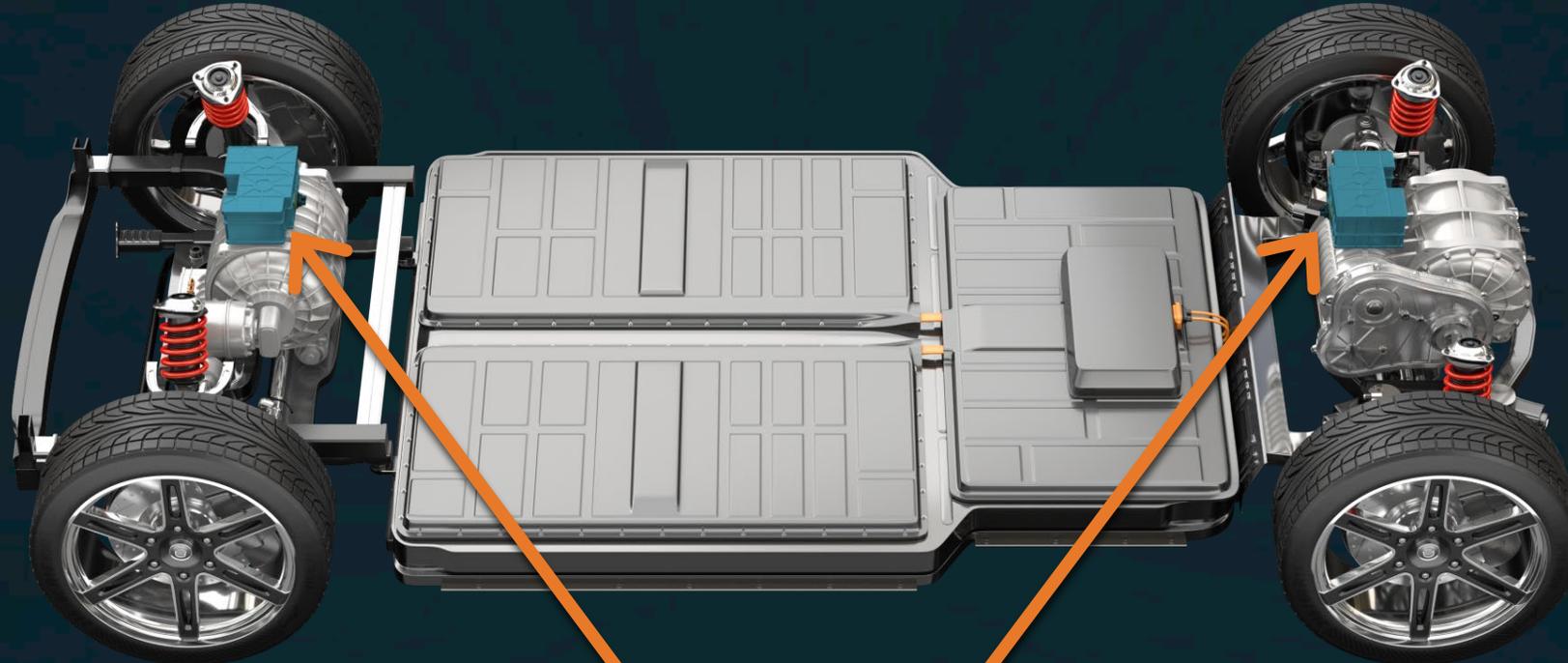
onsemi™

# Powering Every Architecture



✓ Customer Wins & LTSAs

Customer Needs High performance with good range & acceleration



**onsemi** Delivers  
Dual SiC traction

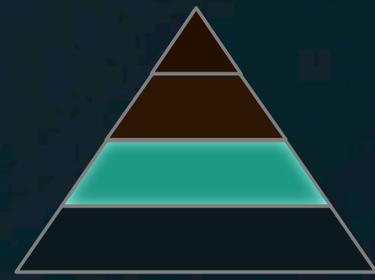
SiC



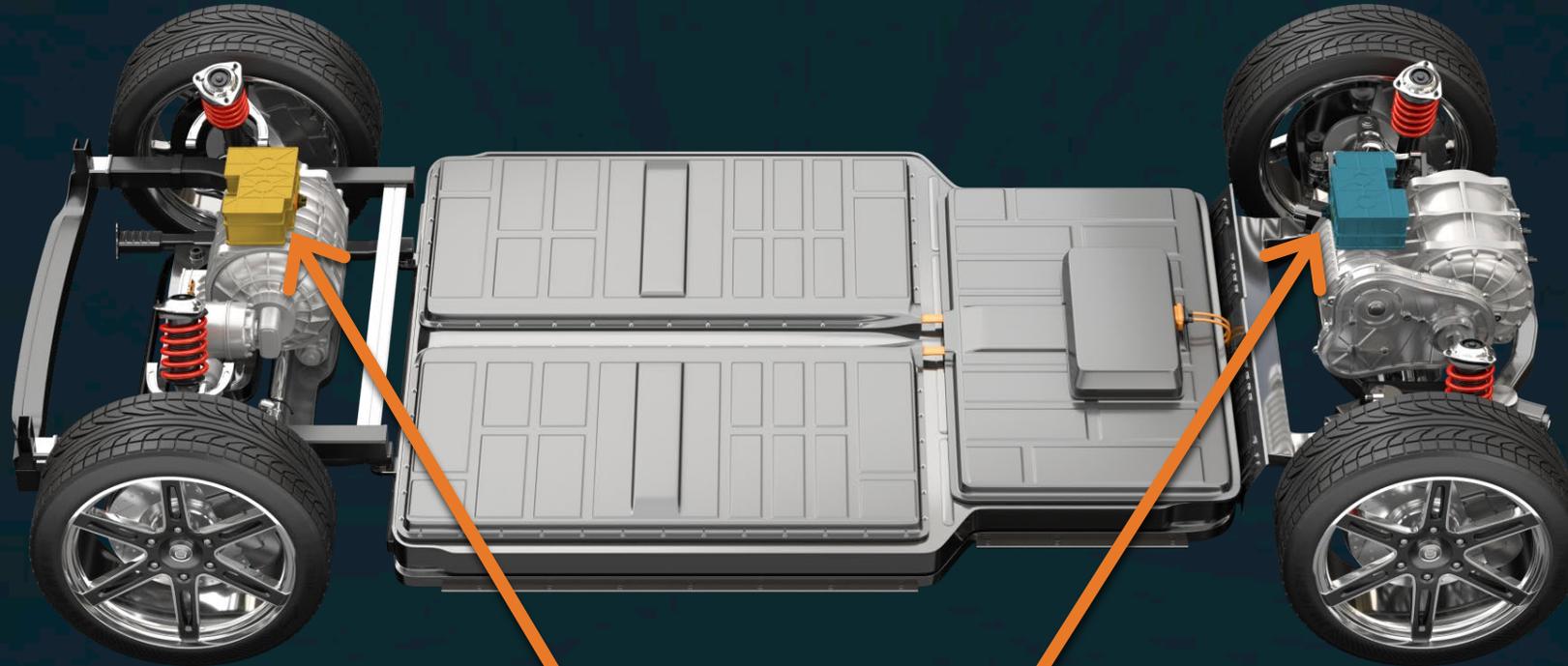
# Powering Every Architecture

Customer  
Needs

Good mid range  
performance with on  
demand acceleration



✓ Customer Wins  
& LTSAs



IGBT



SiC

**onsemi** Delivers

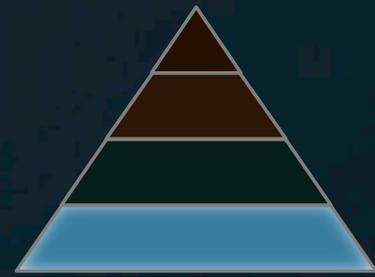
SiC and IGBT solution, optimized  
for system cost and performance

onsemi™

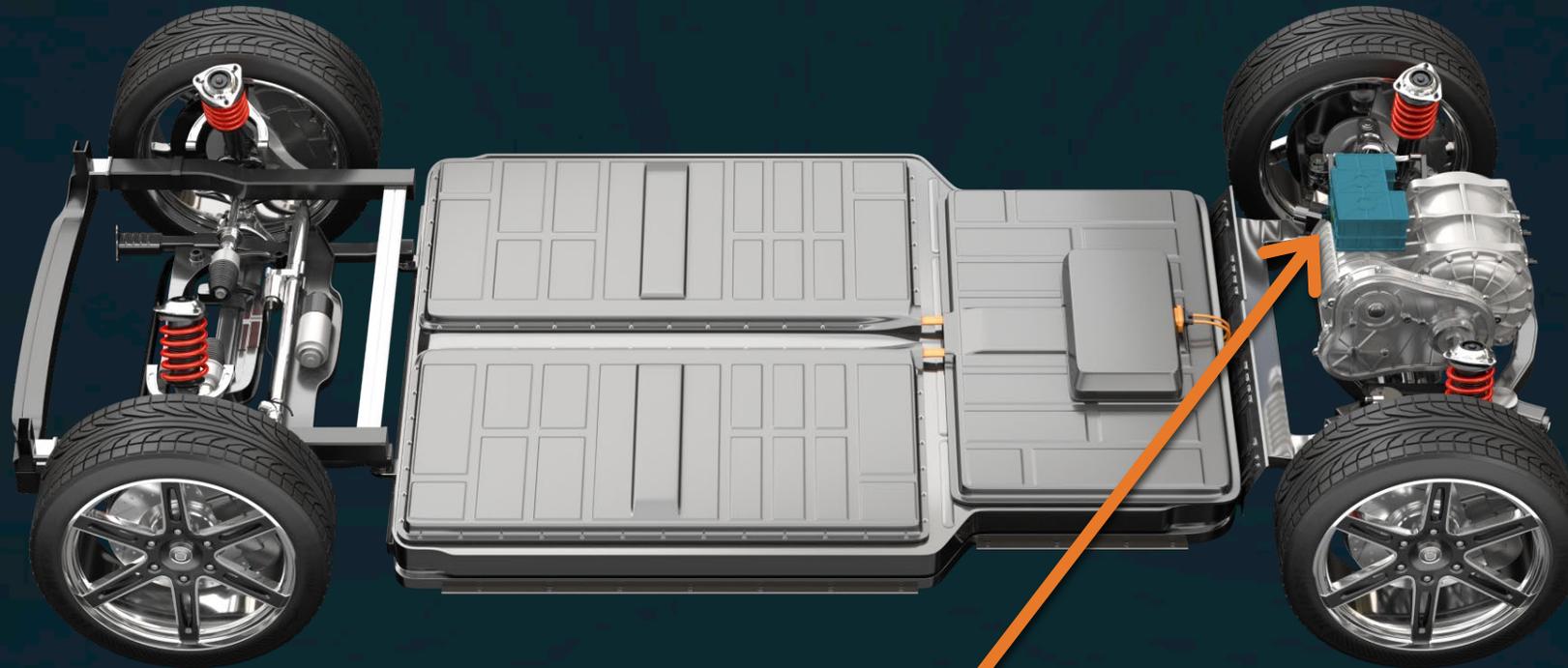
# Powering Every Architecture

Customer  
Needs

EV entry level vehicle  
with extended range



✓ Customer Wins  
& LTSAs



**onsemi** Delivers

Single SiC traction device

SiC

onsemi™

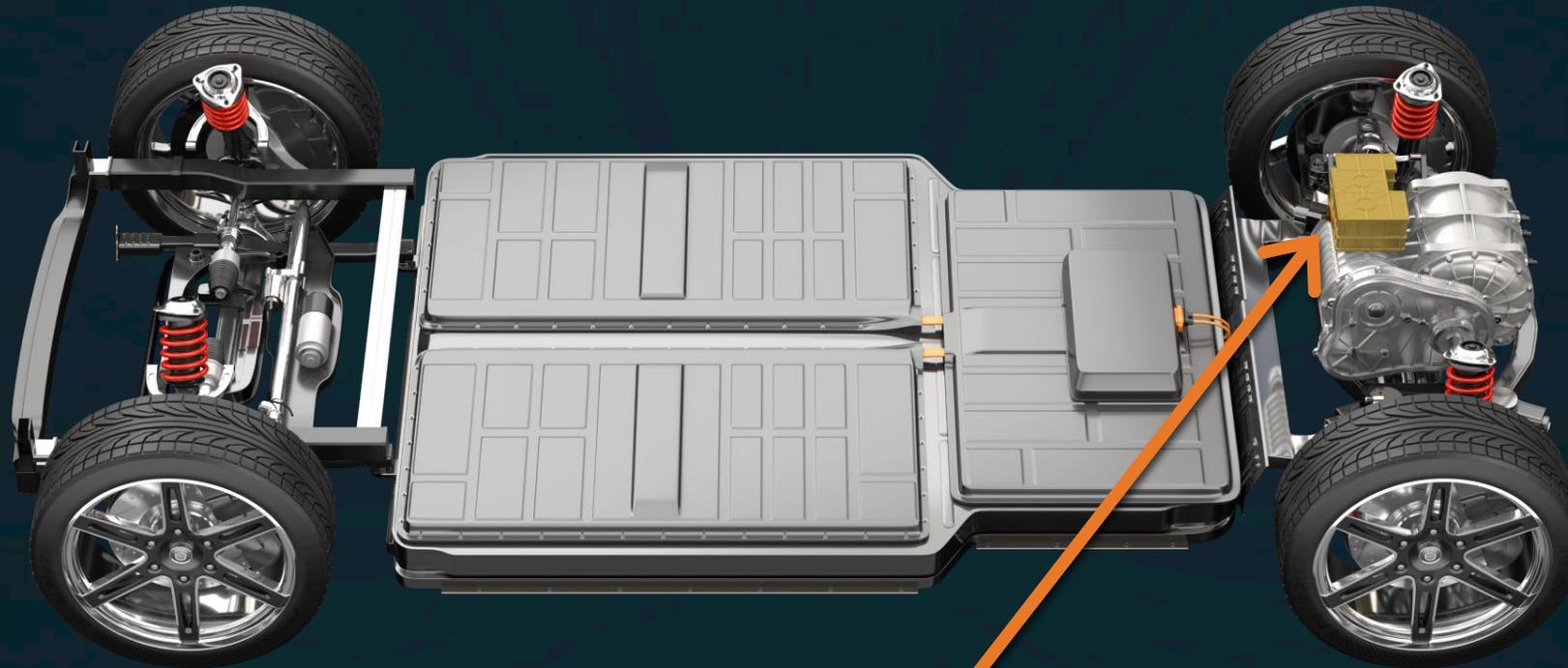
# Powering Every Architecture

Customer  
Needs

EV entry point vehicle



✓ Customer Wins  
& LTSAs



IGBT

**onsemi** Delivers

Cost effective IGBT-based  
system with upgrade path

onsemi™

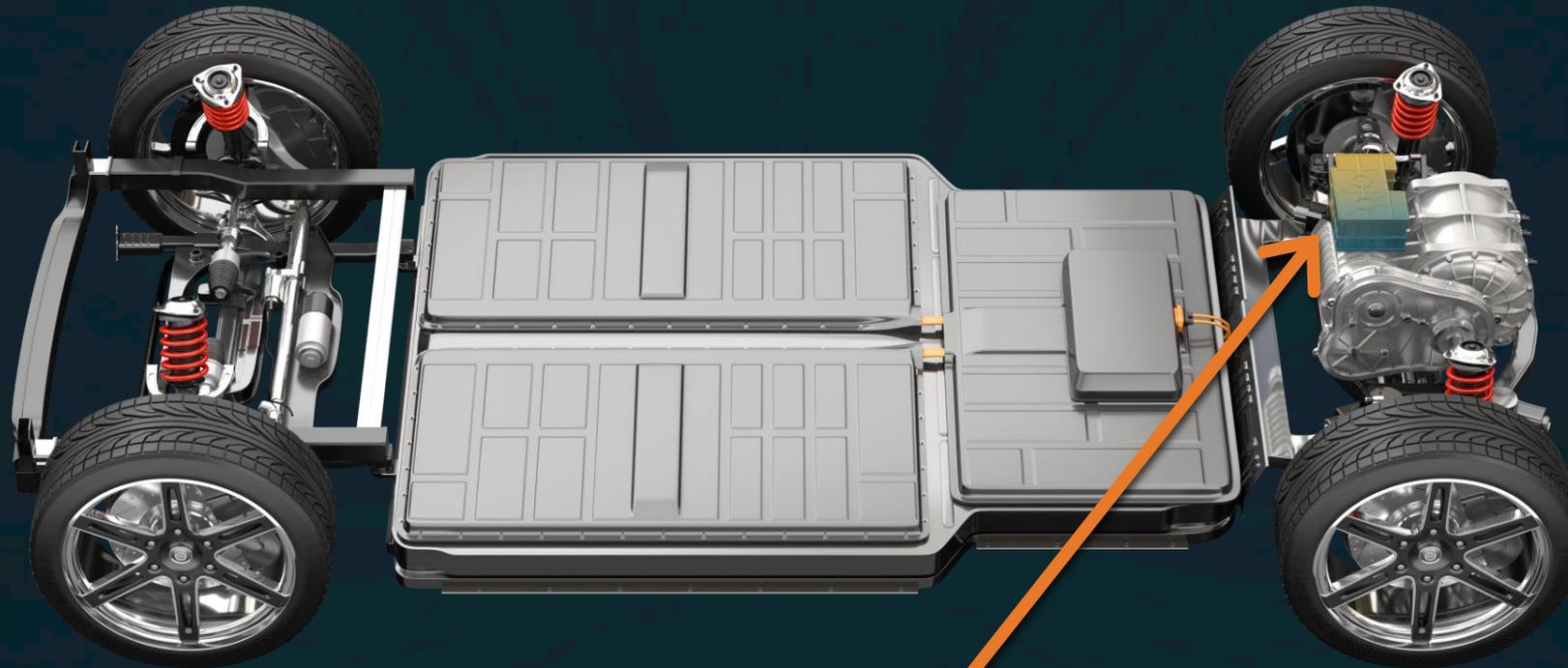
# Powering Every Architecture

Customer  
Needs

Meet evolving market  
demand for increased  
performance at entry level



✓ Customer Wins  
& LTSAs



SiC & IGBT

**onsemi** Delivers

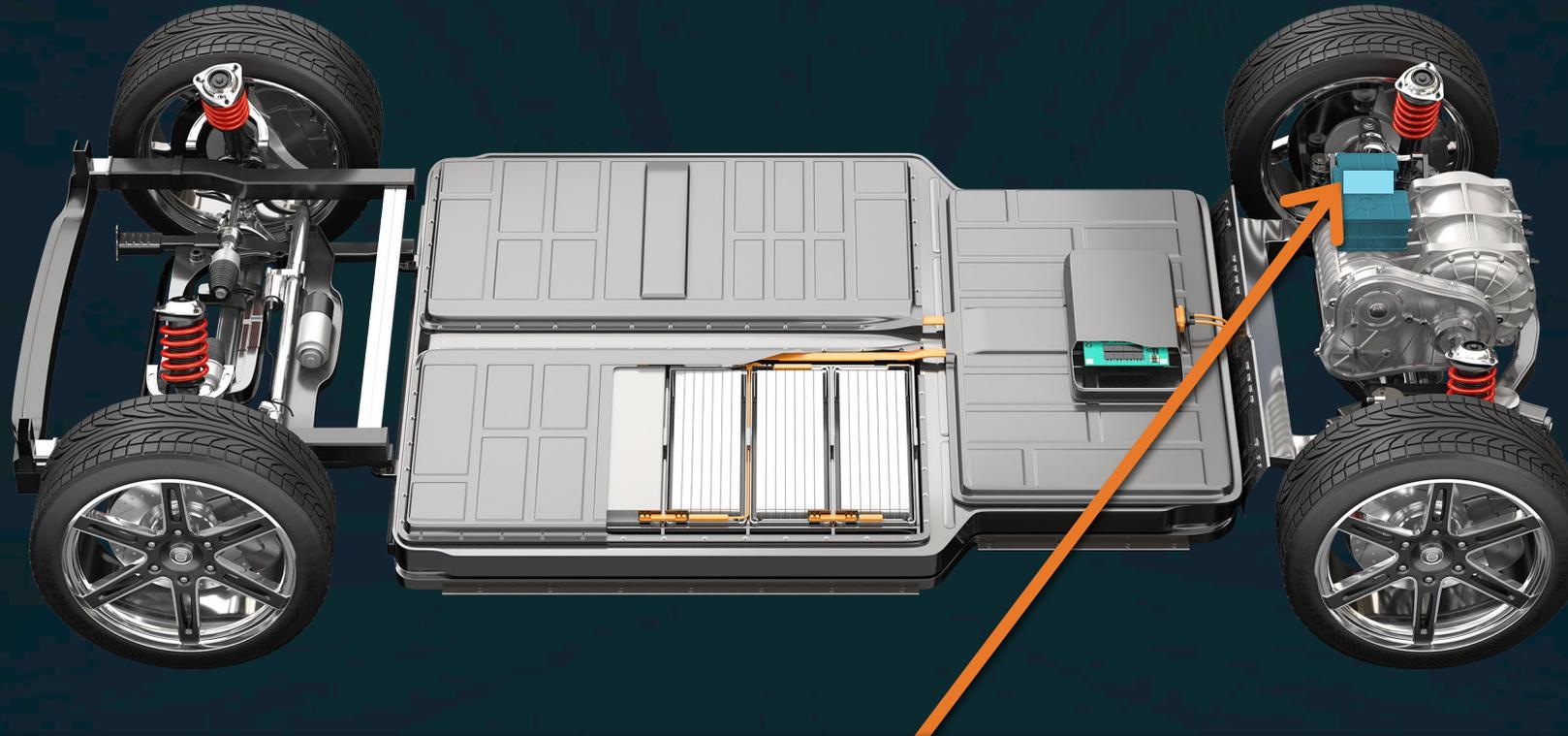
Blended technology solution  
combining best of IGBT and SiC

onsemi™

# Enabling a Greener Choice

## Exciter Module

✓ Customer Wins  
& LTSAs



onsemi delivers an exciter module

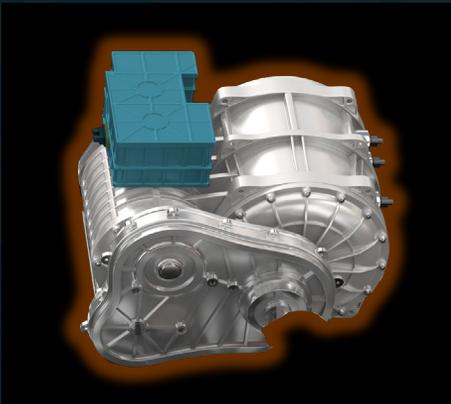
SiC

# Enabling a Greener Choice

✓ Customer Wins  
& LTSAs

## Problem: Rare Earth Metals

- Regional dependency
- Industrial Waste (neodymium)
- Government mandate



SiC

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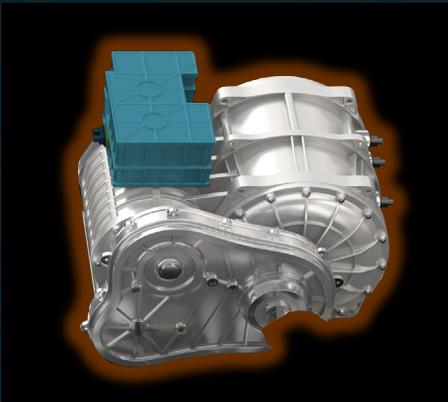
onsemi™

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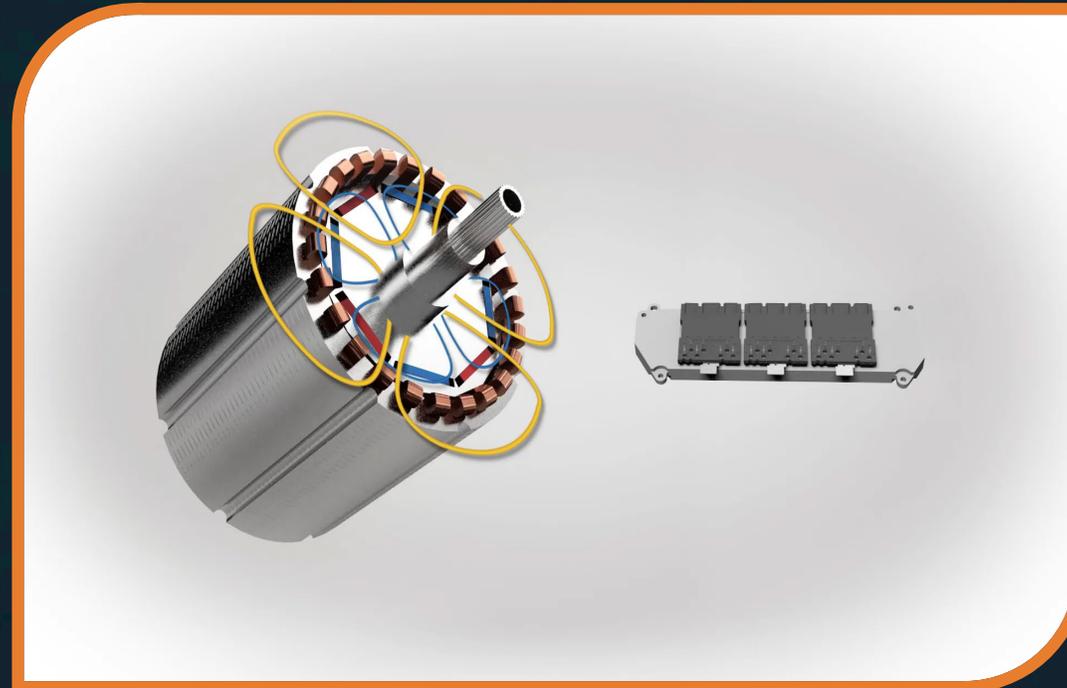
SiC

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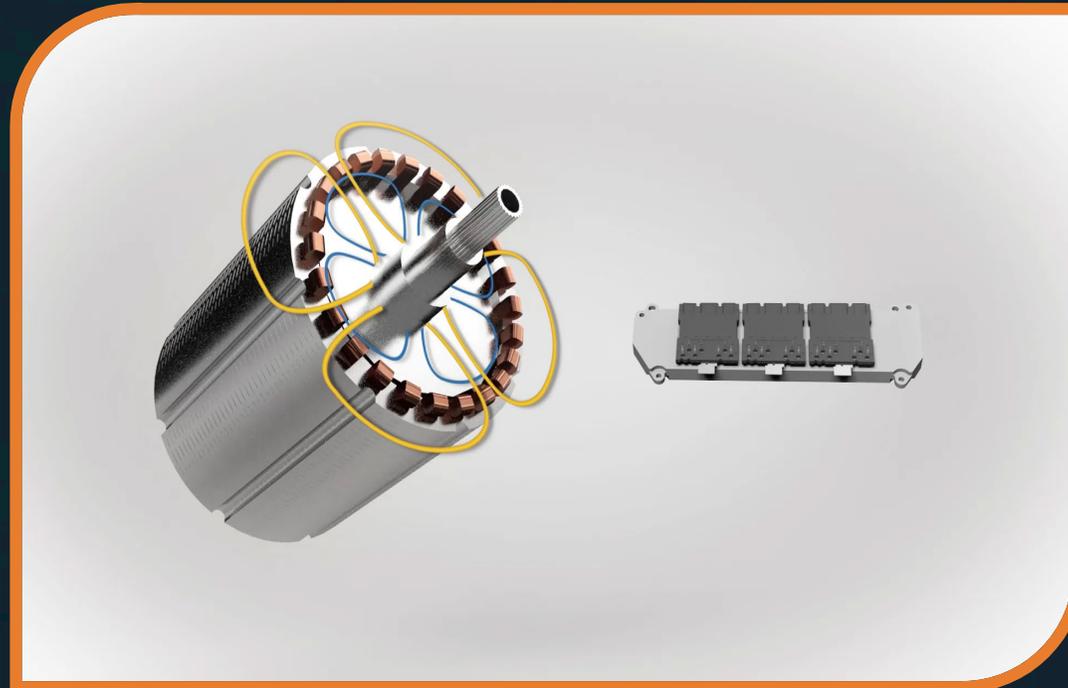
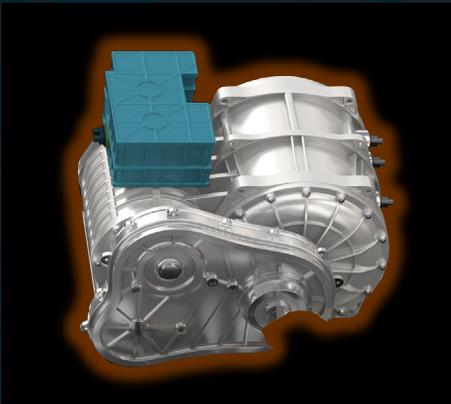
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# Enabling a Greener Choice

✓ Customer Wins  
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# Enabling a Greener Choice

✓ Customer Wins  
& LTSAs

## Solution

- Enabling Separately Excited Synchronous Motor
- Eliminates Magnets



# Enabling a Greener Choice

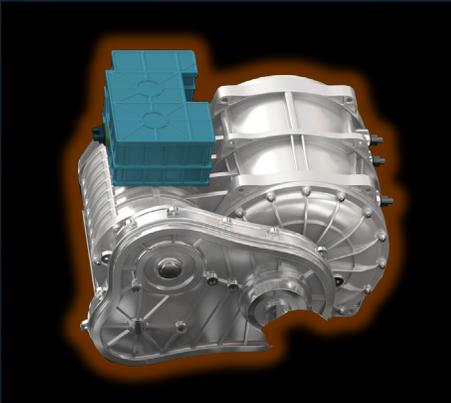
✓ Customer Wins & LTSAs

## Problem: Rare Earth Metals

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# Enabling a Greener Choice

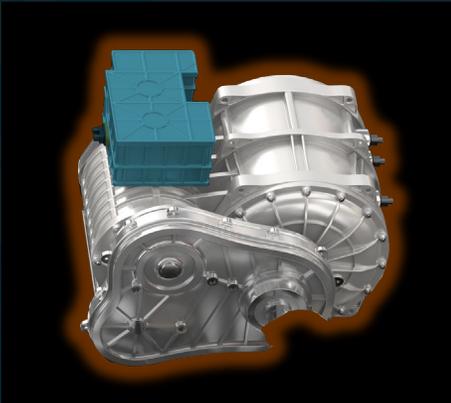
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# Enabling a Greener Choice

✓ Customer Wins & LTSA's

## Problem: Rare Earth Metals

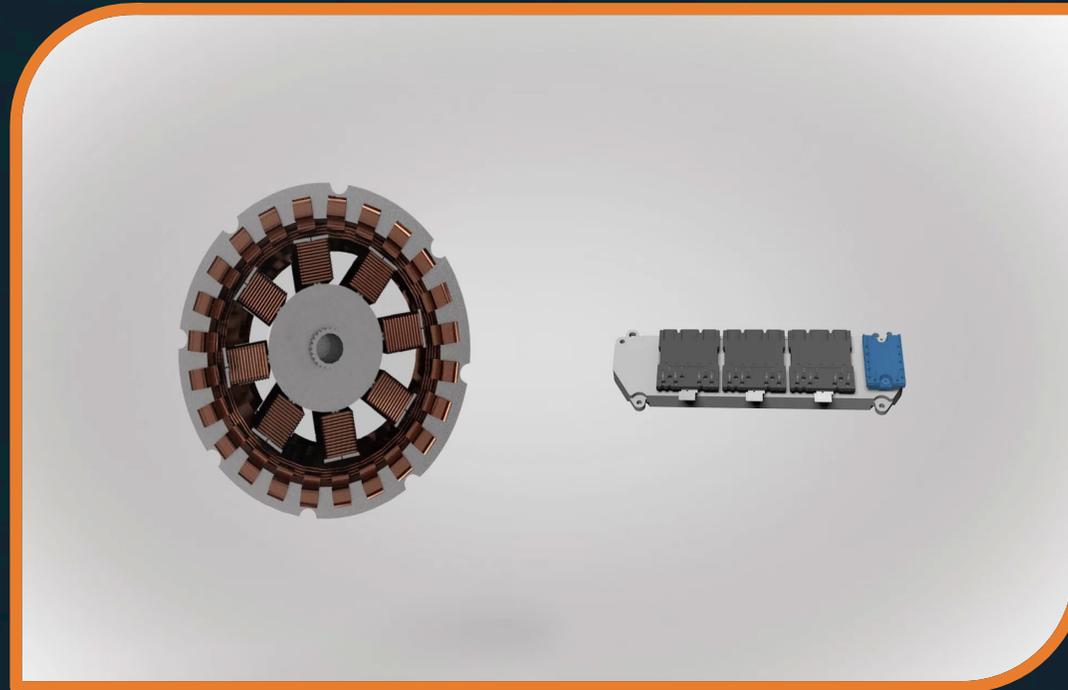
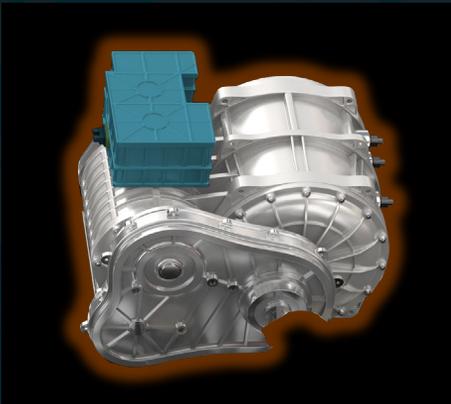
- Regional dependency
- Industrial Waste (neodymium)
- Government mandate

## Solution

- Enabling Separately Excited Synchronous Motor
- Eliminates Magnets

## onsemi delivers

- Exciter Module → completes the onsemi traction solution
- ✓ Customer Win & LTSA



SiC

# Enabling a Greener Choice

✓ Customer Wins & LTSAs

## Problem: Rare Earth Metals

- Regional dependency
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- Enabling Separately Excited Synchronous Motor
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## onsemi delivers

- Exciter Module → completes the onsemi traction solution
- ✓ Customer Wins & LTSAs



**onsemi** Solutions for a Sustainable Future

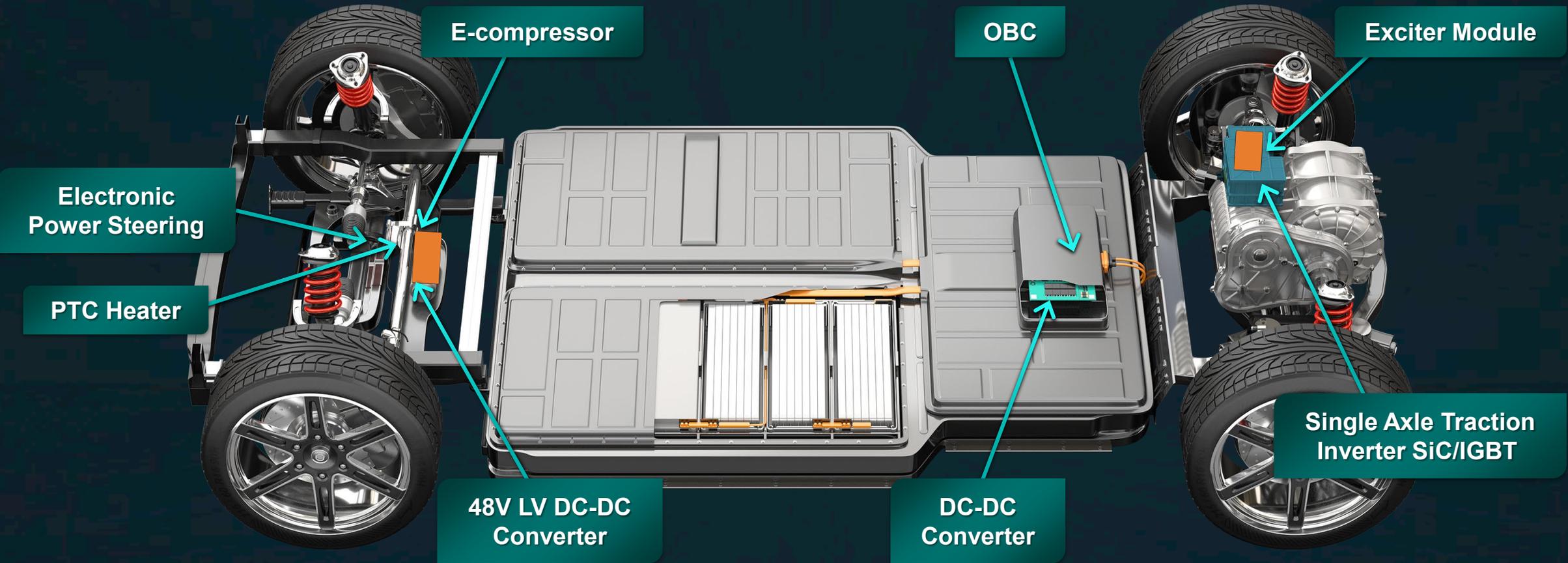


SiC

# Power of the Portfolio

## Broadest Portfolio to Capture the EV Market

✓ Customer Wins & LTSAs



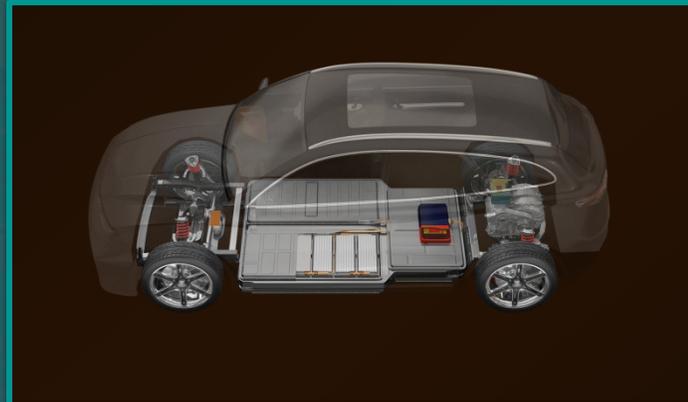
**160%** annual growth in each of the last two years



**GENERATION**



**STORAGE**



**ELECTRIFICATION**

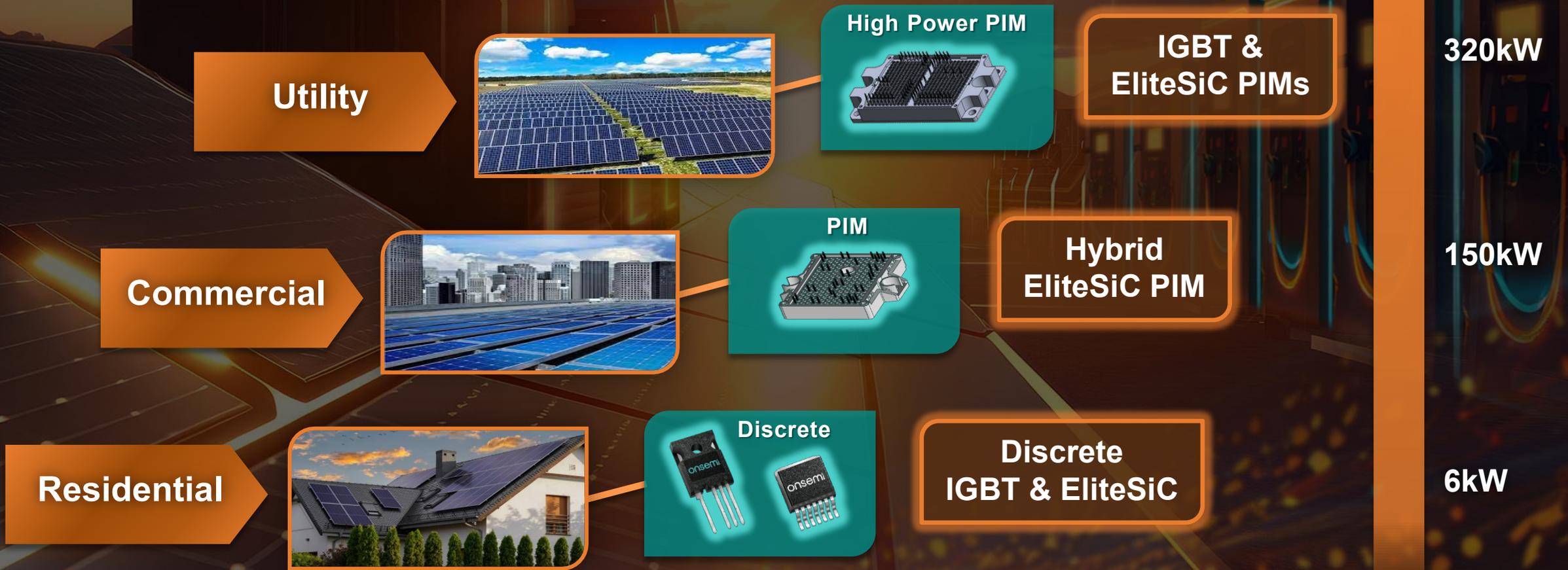


**CHARGING**





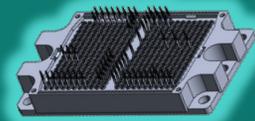
# Lead with Scalability...



Utility



High Power PIM



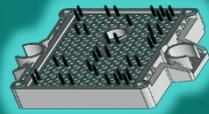
IGBT & EliteSiC PIMs

320kW

Commercial



PIM



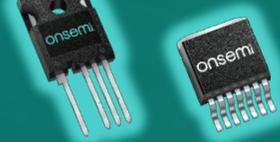
Hybrid EliteSiC PIM

150kW

Residential



Discrete



Discrete IGBT & EliteSiC

6kW

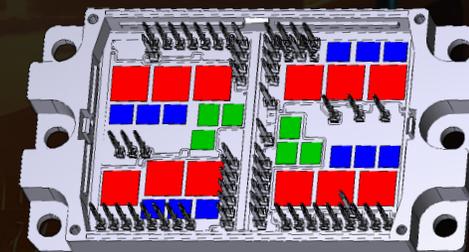
# Lead with Scalability... Differentiate with Optimization

✓ Customer Wins  
& LTSA's

Case Study:  
320kW, 1500V  
Utility Scale  
Solar Inverter

## Customer Needs:

Performance ✓      System Cost ✓  
Weight ✓            Go-to-Market speed ✓  
Size ✓                Supply assurance ✓



■ IGBT  
■ SiC  
■ Si Diodes

## onsemi Delivers

<b>Time to Market</b>	Elite Power Simulator
<b>Module Design</b>	Optimized topology with a combination of best of Si and SiC devices
<b>Technology</b>	Optimized die process with leading performance
<b>Packaging</b>	Optimized for best thermals, 15% reduction in Rth with tailored package & layout

# Powering Every Architecture

## Energy Storage

Power System

SiC/  
IGBT

## Energy Generation

DC-AC  
Inverter

DC-AC  
Inverter

SiC

IGBT

## Ultra Fast EV Charger

AC-DC  
inverter

DC-DC  
converter

SiC

LTSAs with **8 of top 10** Solar Inverter Customers

**70%** annual growth in each of the last 2 years



**GENERATION**



**STORAGE**



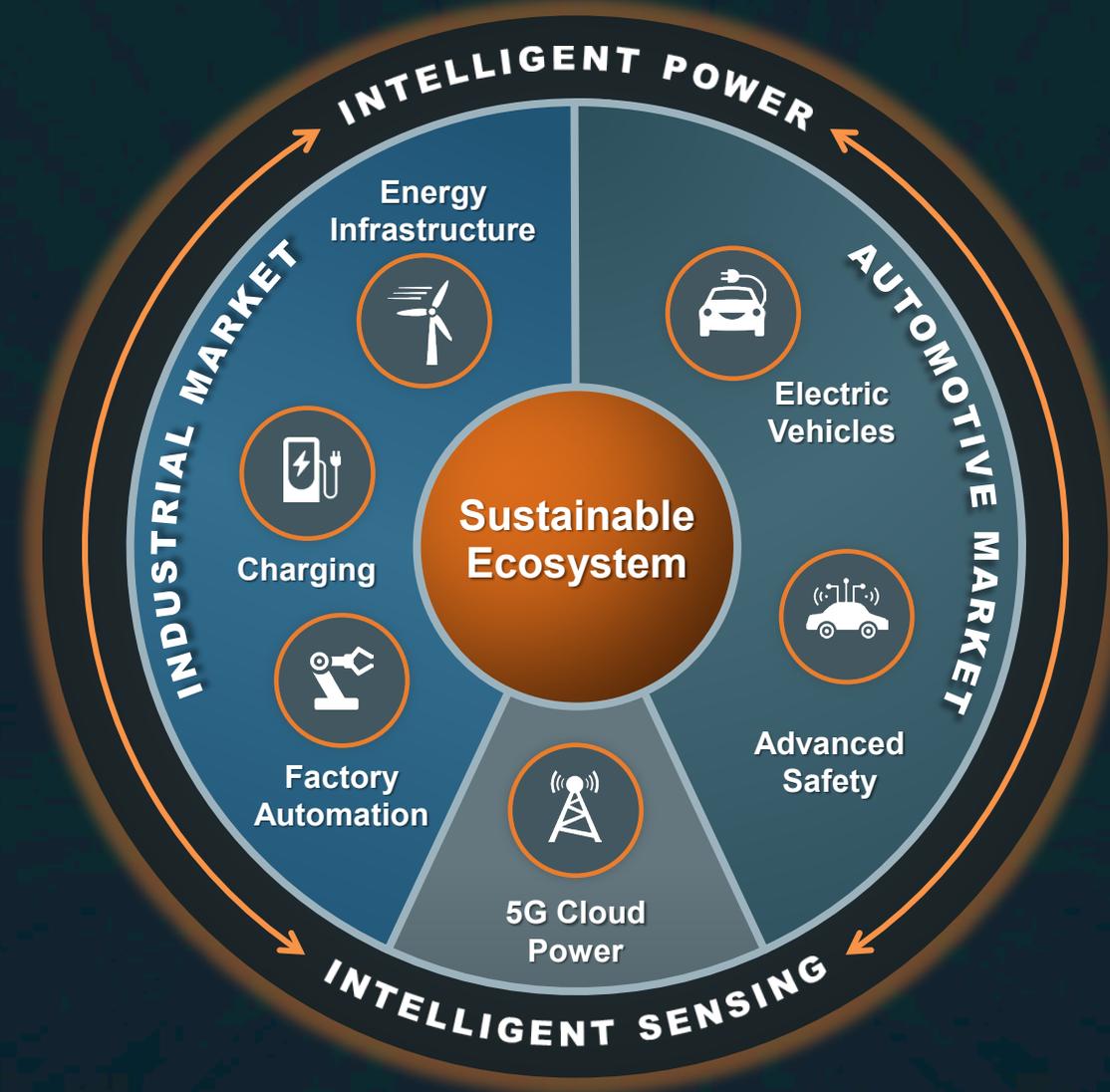
**ELECTRIFICATION**



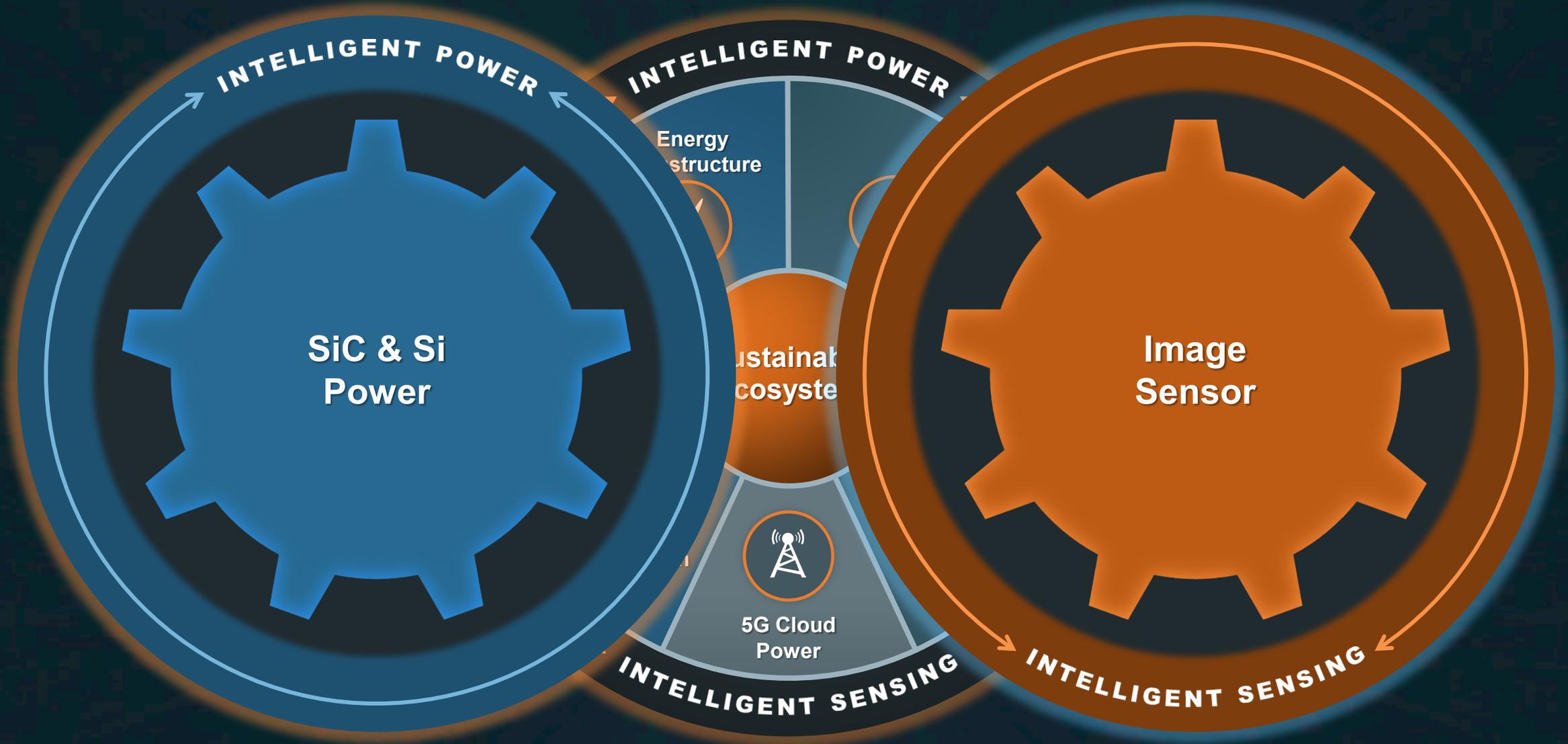
**CHARGING**



# onsemi Flywheel



# Winning at the Core





**#2** Global Position

**9%** Market Share ('22)

**38%** Rev Growth CAGR  
( '22 - '27)

# The Profound Impact of 1%



**Electric Vehicles**

**EV Miles Driven**



**>3.2B/year**  
more EV miles driven WW



**Data Centers**

**Power Consumption**

**205 TWh**  
**= ~19M homes**

**>\$390M/year**  
electricity cost savings WW



**Industrial Automation**

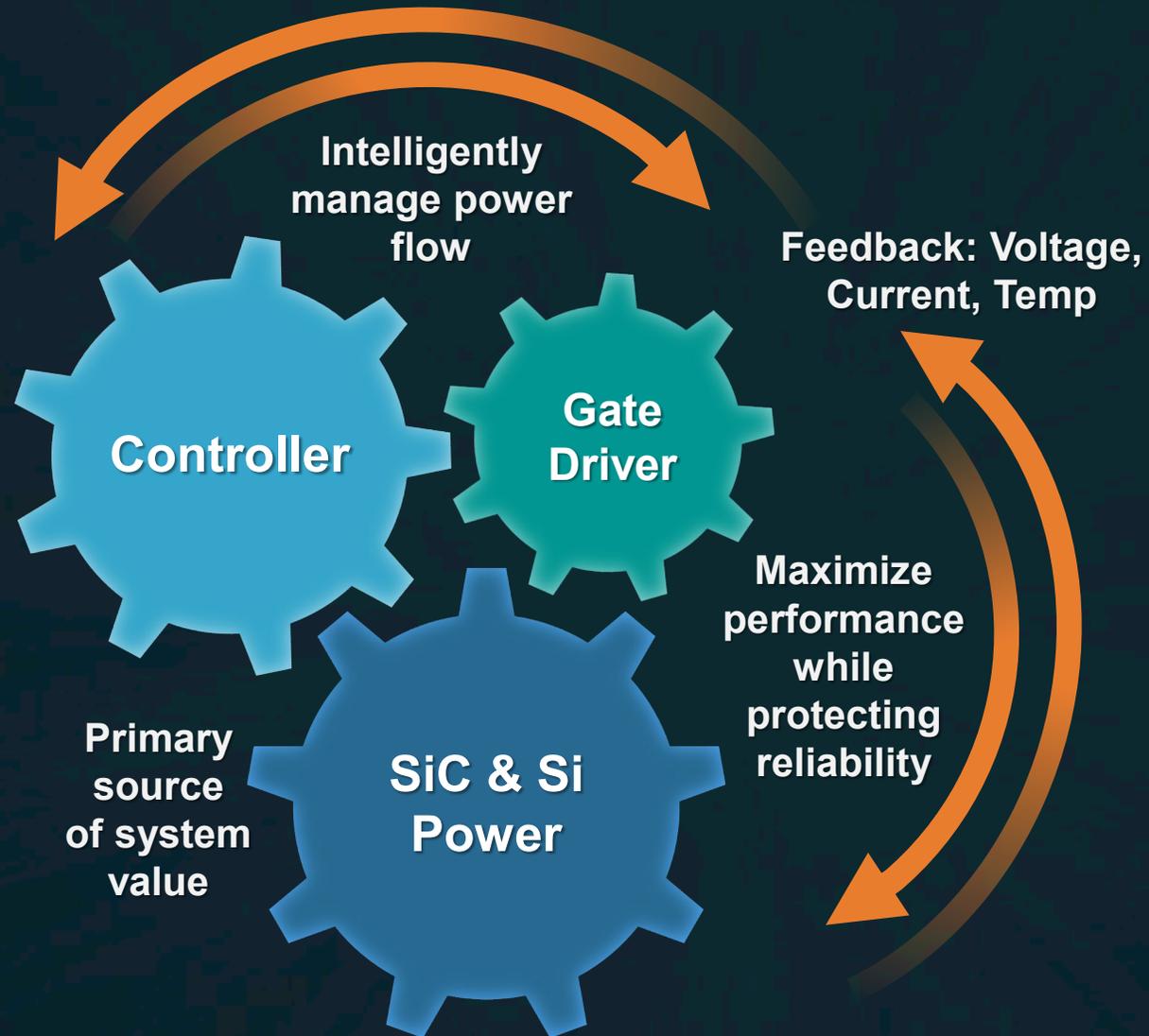
**Industrial Motor**

**50% of the World's Electricity**

**>\$25B/year**  
electricity cost savings WW

**1% Efficiency Improvement**

# Expanding from the Core

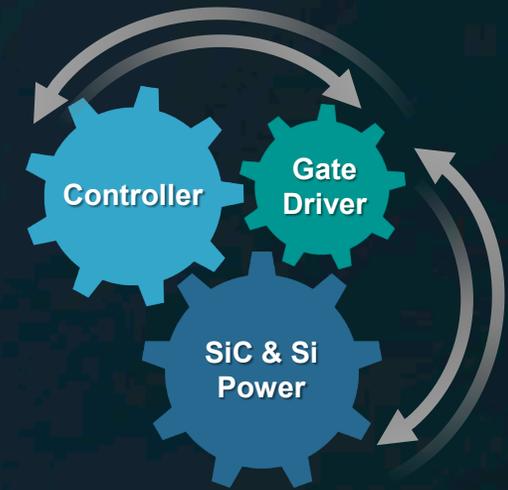


## **onsemi** delivers

- ↑ **Efficiency (1-2%)**
- ↑ **Reliability**
- ↑ **Ease of Design**
- ↓ **System Cost**

# Expanding from the Core

## Build from Leadership Position



# Expanding from the Core Proliferate Power IC Portfolio

Lowest Cost  
Highest Flexibility  
Ease-of-Design



Highest Efficiency

Digital

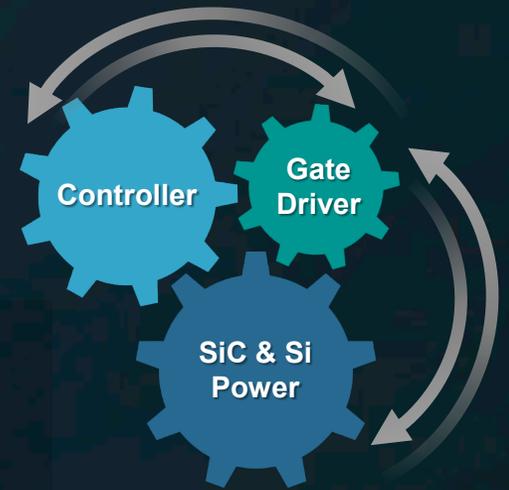
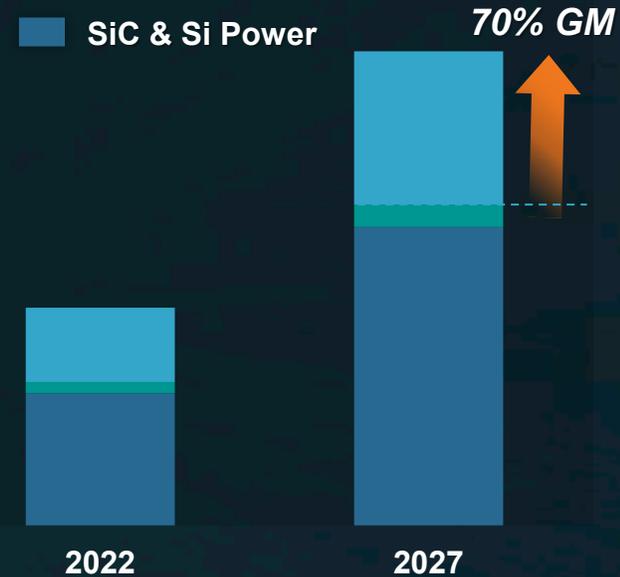
Analog



	Auto	Ind	Cloud
AC-DC			
PoL			
PMIC			
Multi-Phase			
Switch/E-Fuse			

## Sustainable Ecosystem TAM (\$B)

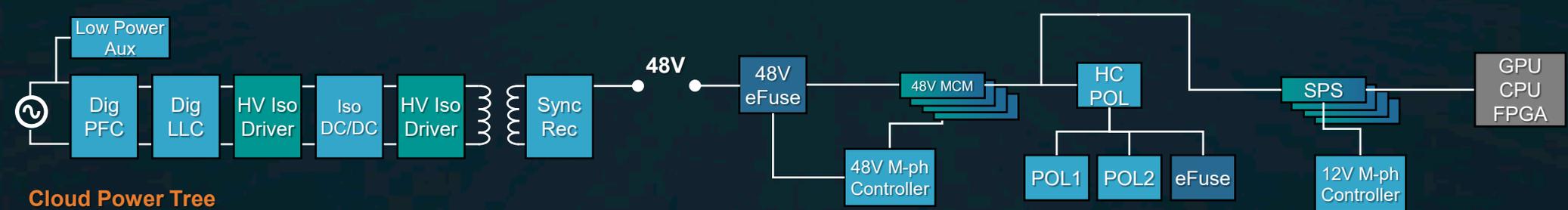
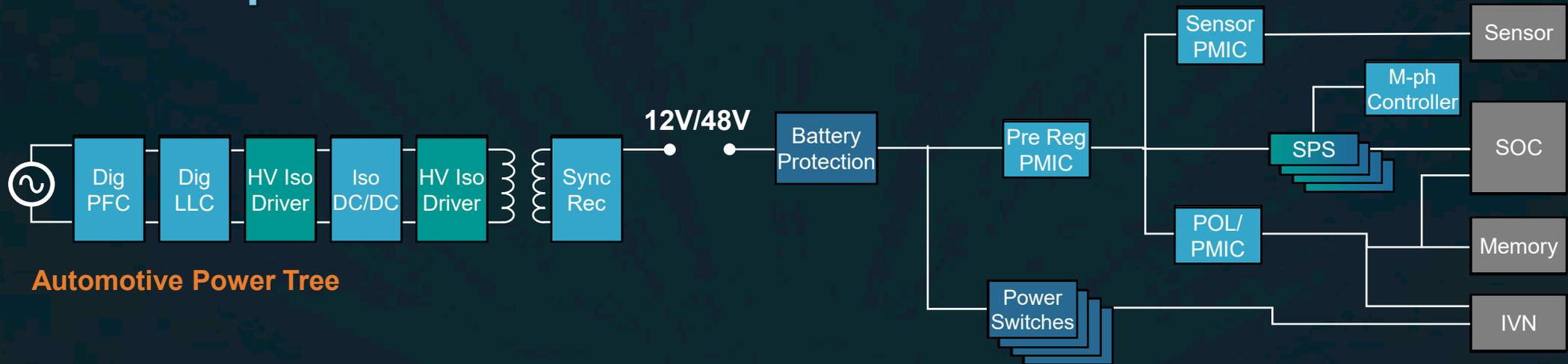
- Controller
- Gate Driver
- SiC & Si Power

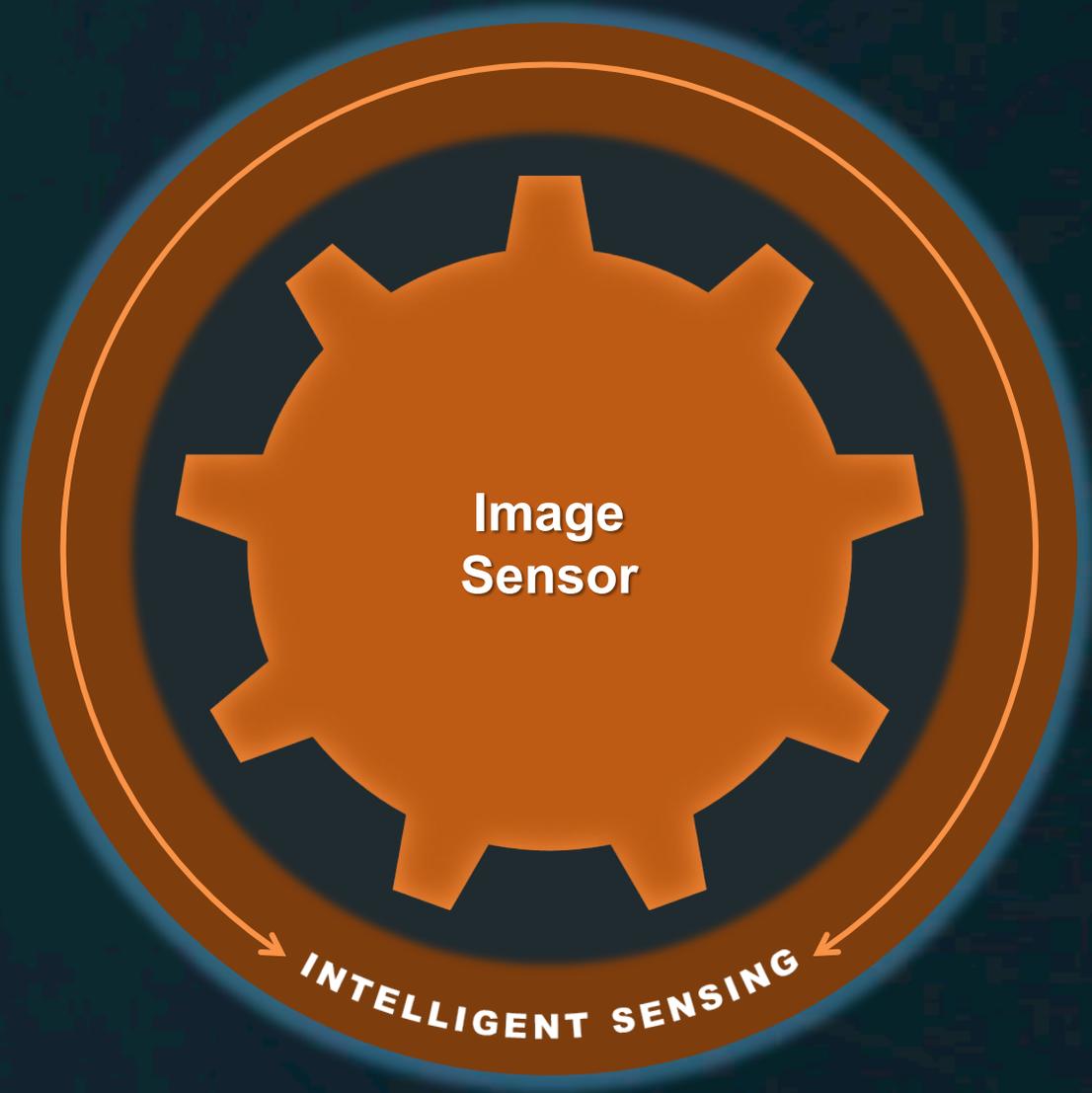


Unlocks \$14B of TAM Opportunity at up to 70% Gross Margin

# Expanding from The Core Delivers Complete Power Tree

Controller	Gate Driver	SiC & Si Power	Non-Power
------------	-------------	----------------	-----------





**#1** Global Position  
in auto & industrial

**46%** Auto Market  
Share ('22)

**68%** ADAS Market  
Share ('22)



# onsemi Advantage

- Global Shutter
- Rolling Shutter
- Image Signal Processing

**Superior  
Technology**

**Auto & Industrial  
Focus**

- Installed base of >450M automotive sensors

**onsemi's  
Image  
Sensor**

- Devware
- Ref Designs
- Ecosystem

**Solution  
Enablement**

**Decades  
of Innovation**

- 45+ years of sustained innovation

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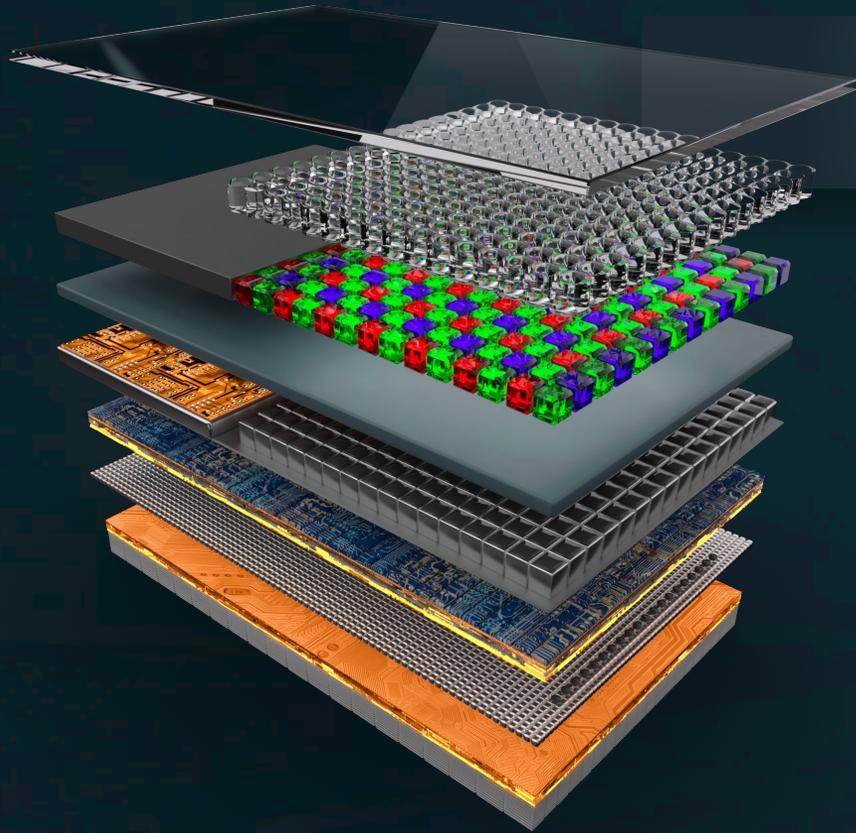
- Devware
- Ref Designs
- Ecosystem

**Solution  
Enablement**

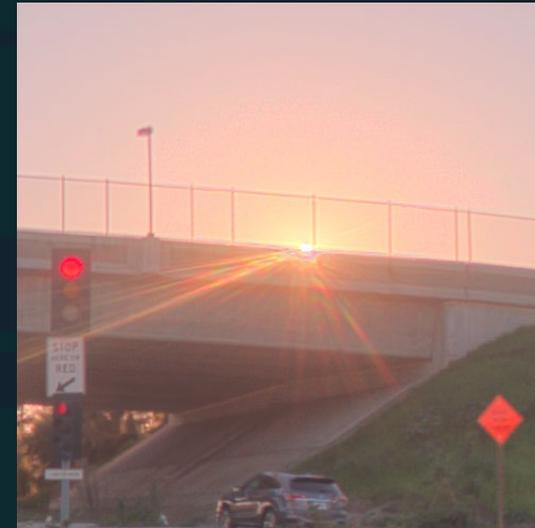
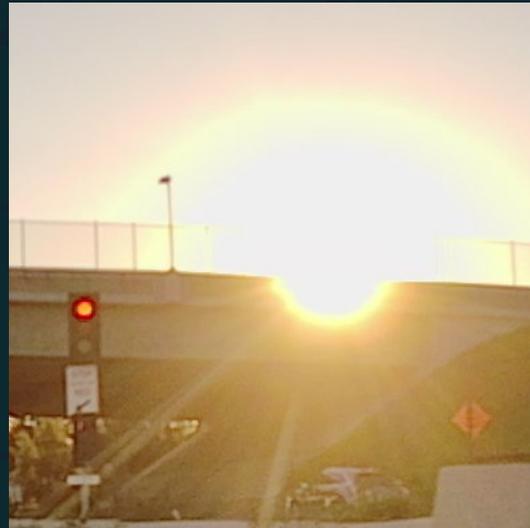
**Decades  
of Innovation**

- 45+ years of sustained innovation

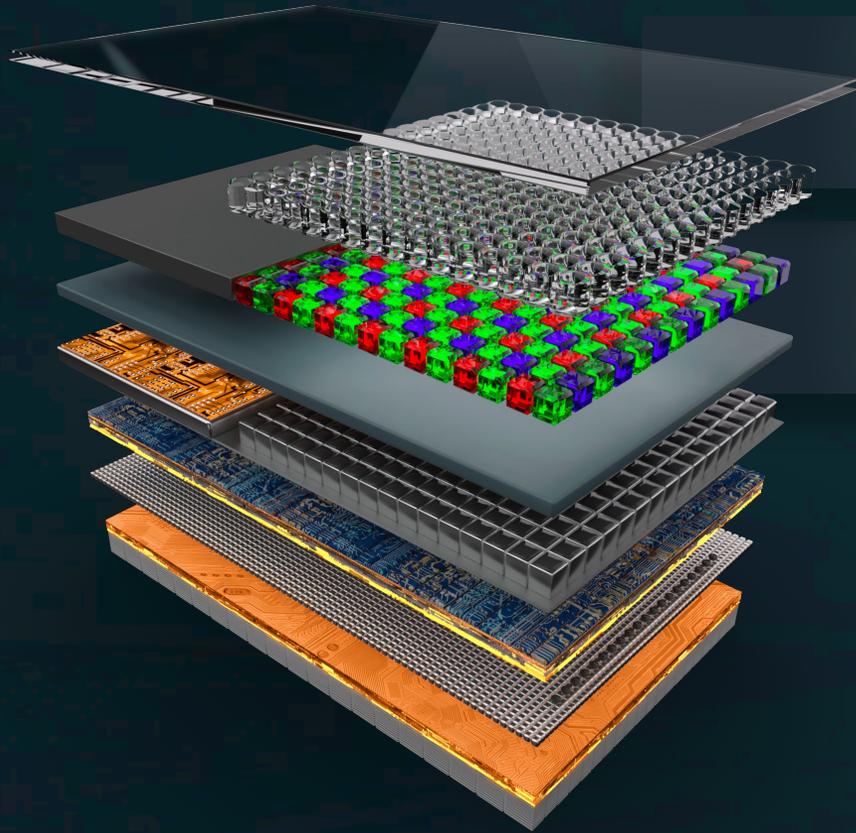
# Superior Technology



High Dynamic Range



# Superior Technology

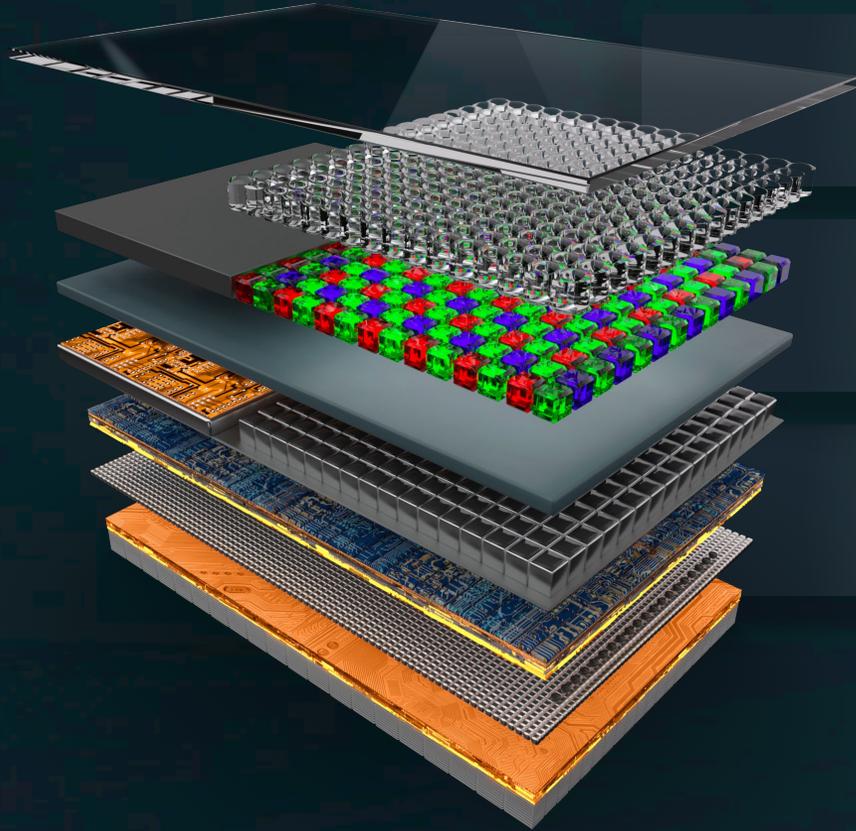


High Dynamic Range

Low Light Performance



# Superior Technology



High Dynamic Range

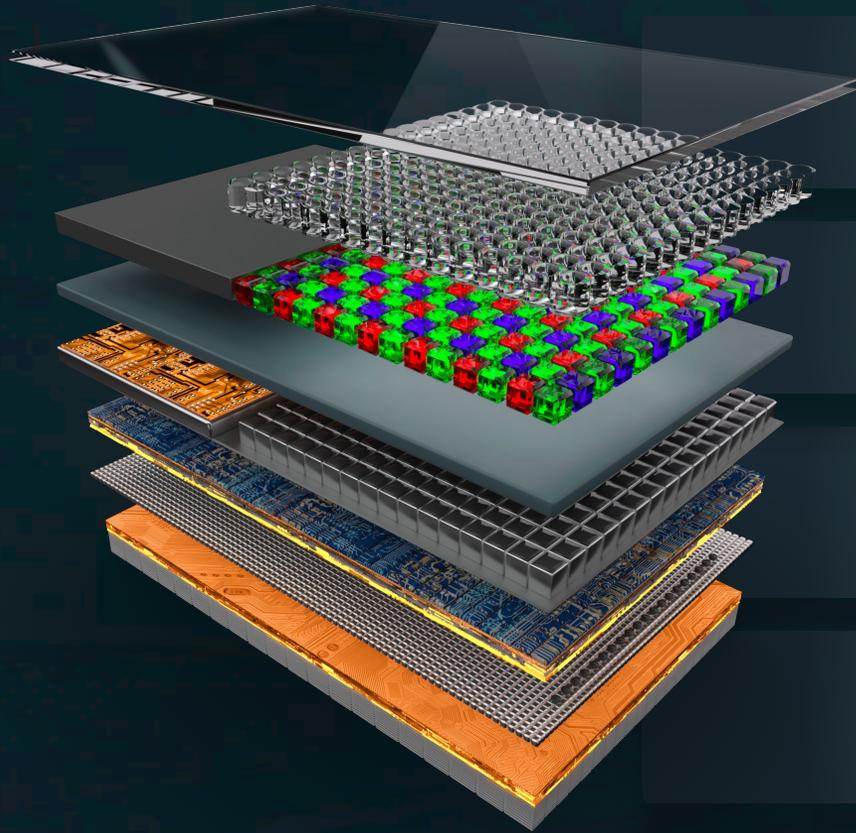
Low Light Performance

Low Power



Latest generation is  
30-70%  
more power efficient

# Superior Technology



High Dynamic Range

Low Light Performance

Low Power

System Functions



Cybersecurity

Functional Safety

# onsemi Advantage

- Global Shutter
- Rolling Shutter
- Image Signal Processing

Superior  
Technology

Auto & Industrial  
Focus

- Installed base of >450M automotive sensors

onsemi's  
Image  
Sensor

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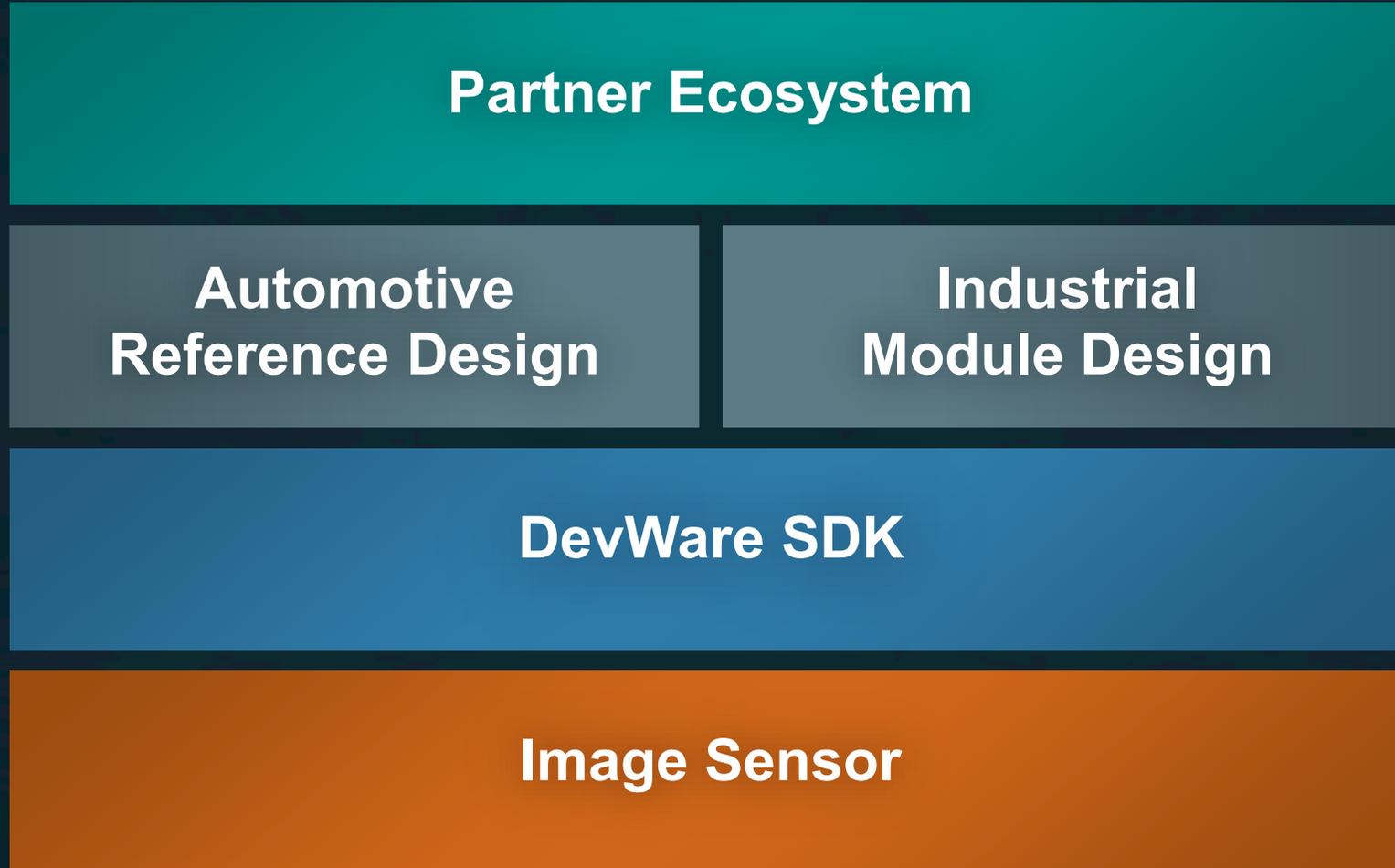
Solution  
Enablement

Decades  
of Innovation

- 45+ years of sustained innovation

# Image Sensor Leadership

## Only Provider to Enable Complete Solutions



# DevWare SDK

## Scale Business to 1000s of Customers

**Info**

Part Number	ASX340AT
Version	REV3
Firmware	2.1
Interface	Parallel/BT.656
Build Name	6.1.29_Daily
Build Version	6.1.29.59092
Build Date	04/06/2023
Demo Board	DEMO3 (4C/211)
Array Clock	27.00 MHz
Output Clock	54.00 MHz
Width	720
Height	487i
Image Type	YCBCR
Frame (bytes)	701,280
Frames	207
Dropped Frames	0
FPS (Sensor)	30.0
FPS (DataLink)	30.0
FPS (Display)	31.0
Cursor Pos	507, 63
Y: Raw Data	131
Cb: Raw Data	134
Cr: Raw Data	129
RGB Output	135, 131, 143

**Image/SOC Control**

Filter: YCbCr to RGB

Bayer Pattern:  Auto  G R  R G  B G  G B  R G

True Black Subtraction (Bayer Data Pedestal):  Automatic  Off  On Level: 42 Scale: 10-bit (1024)

De-Interlacing:  Automatic  Off  Top Field First  Bottom Field First

Display Color Channel: All Channels in Color Orientation: Normal

**Registers**

Address (hex)	Display Name	Value (hex)
0x3002	y_addr_start	0x0024
0x3004	x_addr_start	0x0028
0x3006	y_addr_end	0x0208
0x3008	x_addr_end	0x02AF
0x300A	frame_length_lines	0x020D
0x300C	line_length_pck	0x035A
0x3010	fine_correction	0x0031
0x3012	coarse_integration_time	0x0105
0x3014	fine_integration_time	0x0044
0x301A	reset_register	0x90F4
0x301E	data_pedestal	0x002A
0x3040	read_mode	0x0041
0x3056	green1_gain	0x1020
0x3058	blue_gain	0x1020
0x305A	red_gain	0x1020
0x305C	green2_gain	0x1020
0x305E	global_gain	0x1029
0x31F4	fuse_id1	0xE228
0x31F6	fuse_id2	0x7CD8
0x31F8	fuse_id3	0xDF47
0x31FA	fuse_id4	0x546A
0x31FE	customer_rev	0x23

**Register Watch**

Key	Addr (hex)	Description	Value (hex)	Change (hex)
REG	0x305E	global_gain	0x1029	+ 0x0009

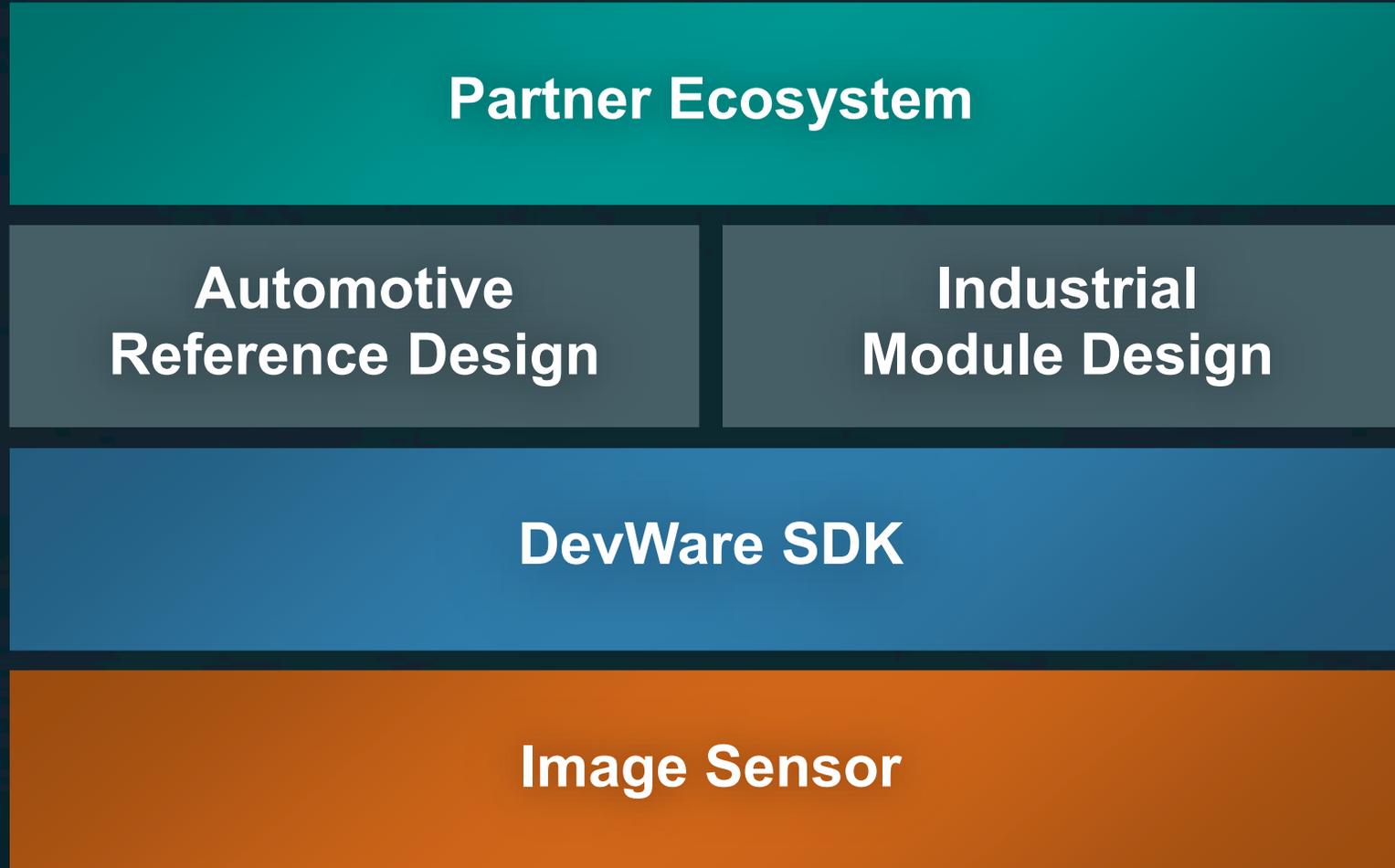
**Analysis Graph**

Intensity Cumulative Intensity Histogram Cumulative Histogram Noise Vectorscope

Y min: 0, Y max: 256

# Image Sensor Leadership

## Only Provider to Enable Complete Solutions



## Automotive Reference Design

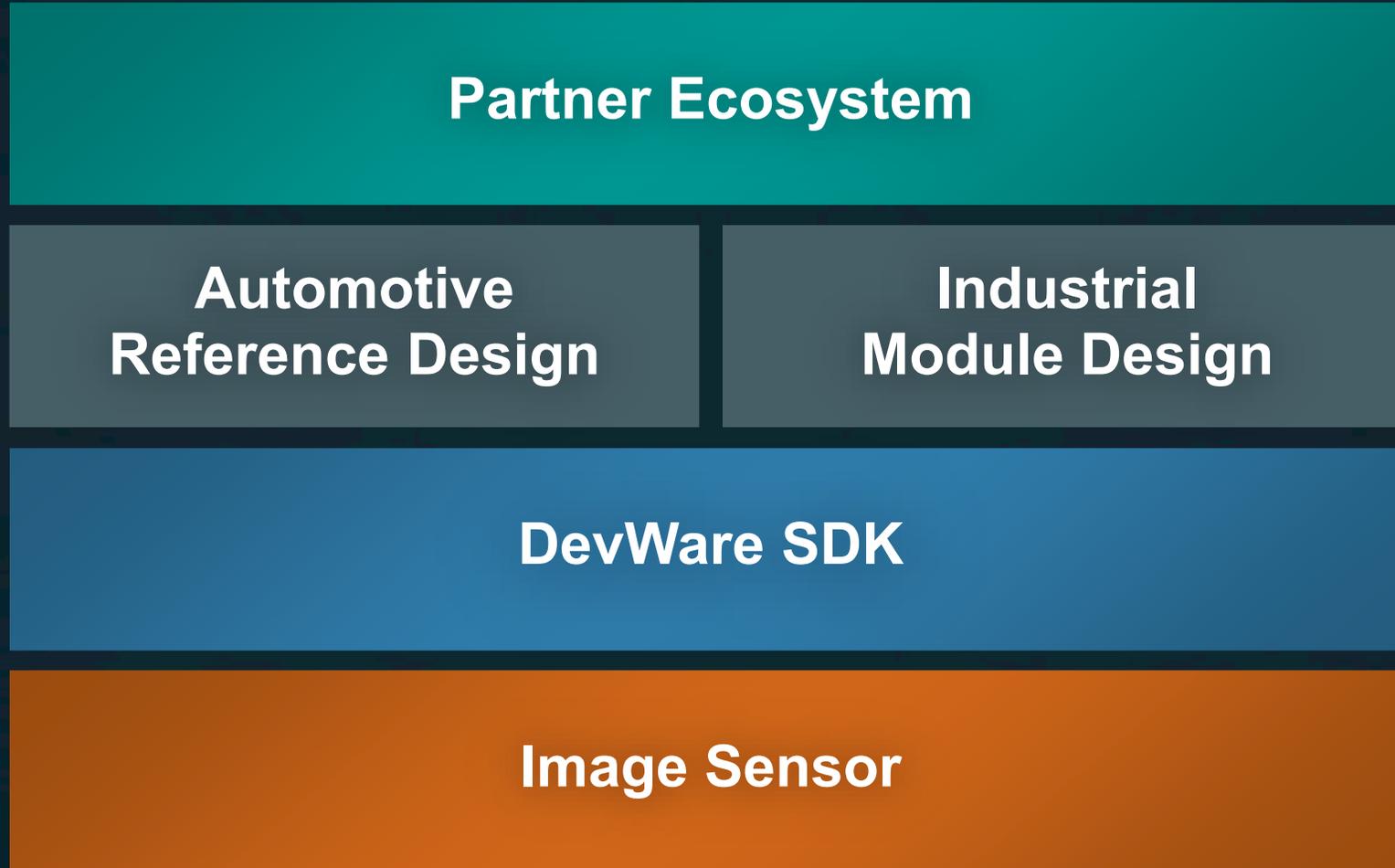


## Industrial Module Design



# Image Sensor Leadership

## Only Provider to Enable Complete Solutions



# Partner Ecosystem

Partner Ecosystem

# Partner Ecosystem

## Optics



Sunex

EVETAR®

SEKONIX

Nidec

联创光学  
LCE-Optics

## Discrete ISP



nextchip

BROADCOM®



## SerDes /IF



THine

BROADCOM®

MICREL

Techpoint

LATTICE

## SoC/FPGA

mobileye™



intel AMD XILINX



QUALCOMM®

RENESAS



XILINX

## ISVs



smart eye



Imagination

apical



onsemi Automotive Partner Ecosystem

> 50 End-to-End Image Solution Partners

# onsemi Advantage

- Global Shutter
- Rolling Shutter
- Image Signal Processing

**Superior  
Technology**

**Auto & Industrial  
Focus**

- Installed base of >450M automotive sensors

**onsemi's  
Image  
Sensor**

- Devware
- Ref Designs
- Ecosystem

**Solution  
Enablement**

**Decades  
of Innovation**

- 45+ years of sustained innovation

# Image Sensor Leadership

45+ Years of Sustained Innovation

# onsemi™

imec   Fillfactory   CYPRESS

## Kodak

TRUESENSE

JPL   Photobit   Micron   Aptina

sensL

1st proto digital camera  
1975

Bayer Pattern  
1975

1st Megapixel CCD  
1986

1st CMOS APS  
1993

1st Camera on Chip  
1995

1st Global Shutter Pixel  
1995

1st Auto CMOS Sensor  
2005

1st >Film Digital Sensor  
2012

1st HDR+LFM Auto Sensor  
2017

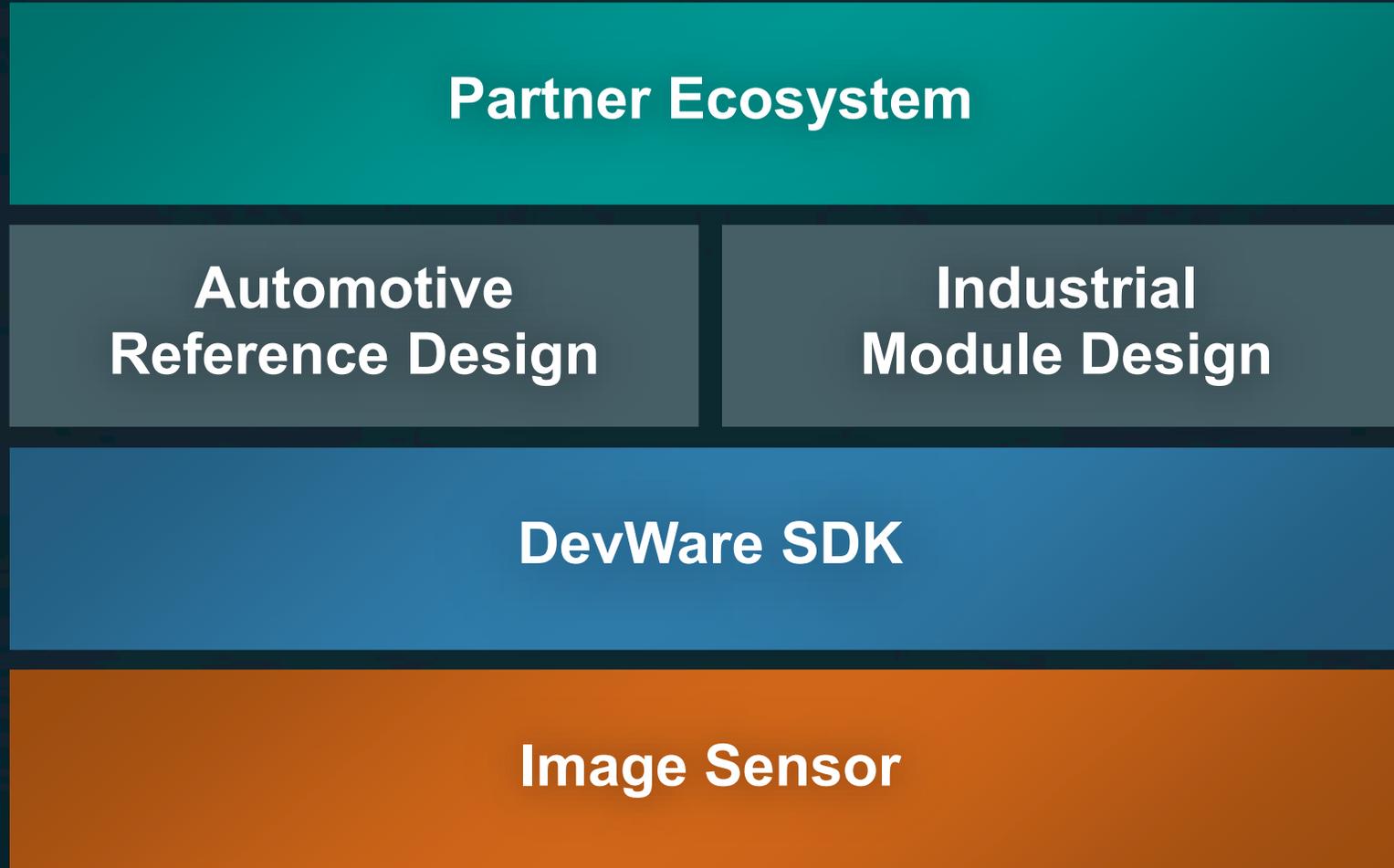
SiPM for dToF LiDAR  
2018

Smart iToF Depth Sensor  
2022

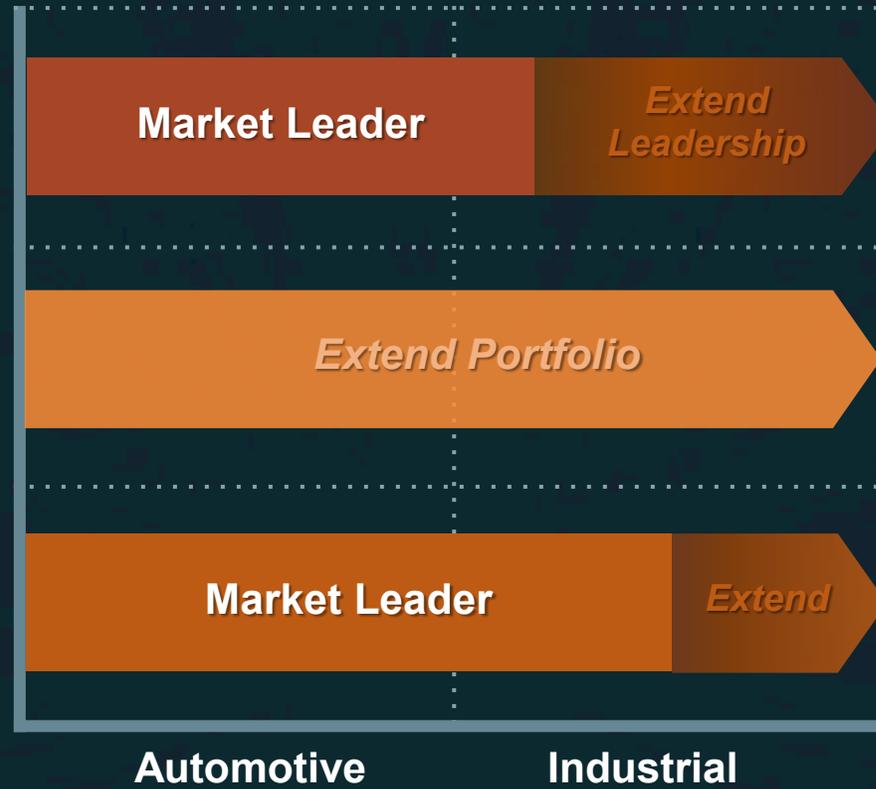
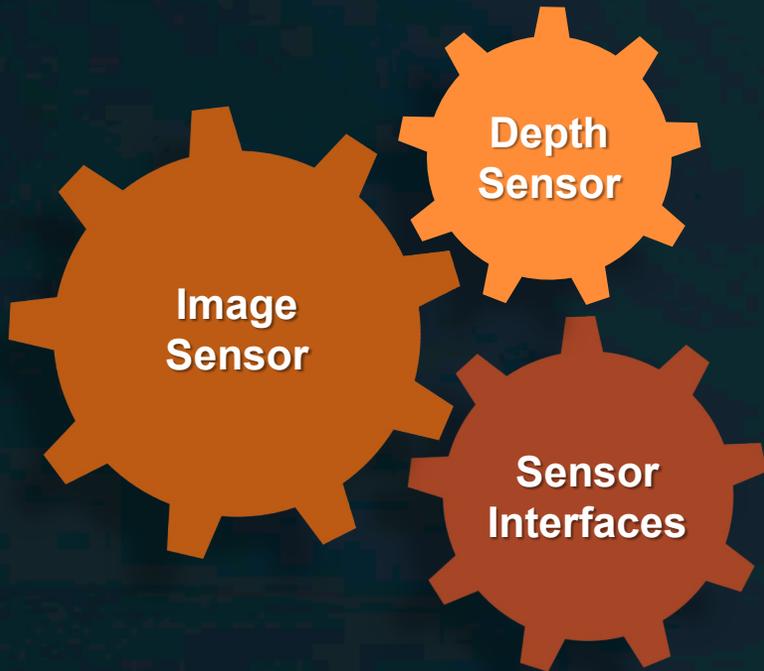
1st 150 dB HDR+LFM Sensor  
2023

# Image Sensor Leadership

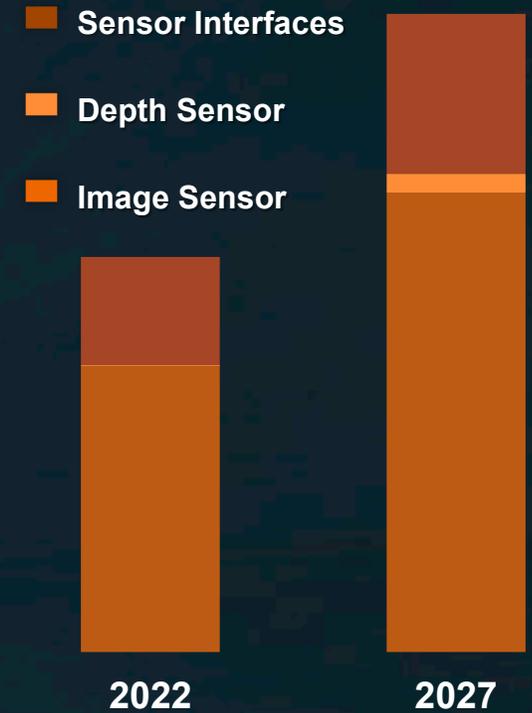
## Only Provider to Enable Complete Solutions



# Expanding from the Core

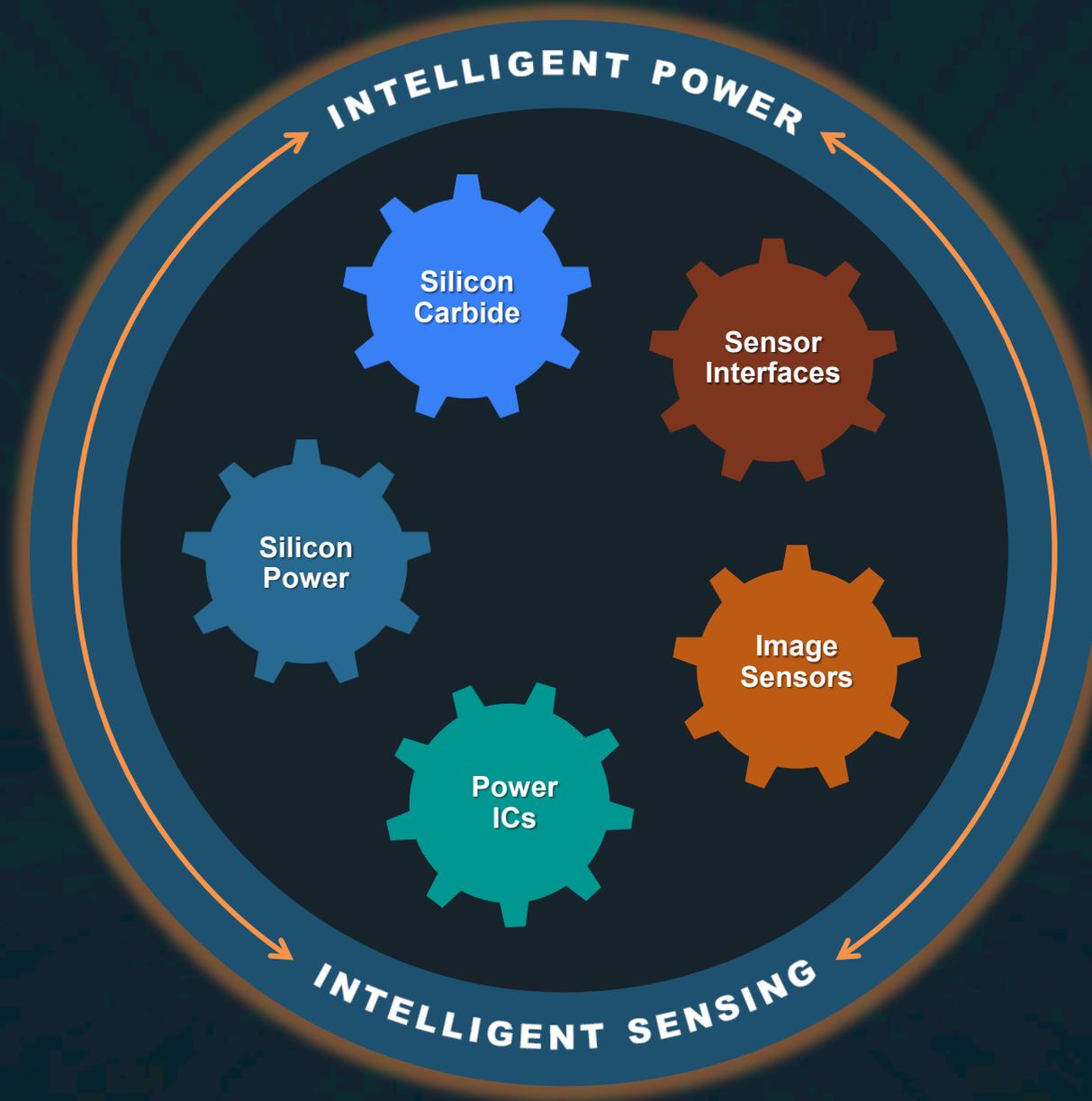


## Sustainable Ecosystem TAM (\$B)



**\$5.3B TAM Opportunity by 2027**

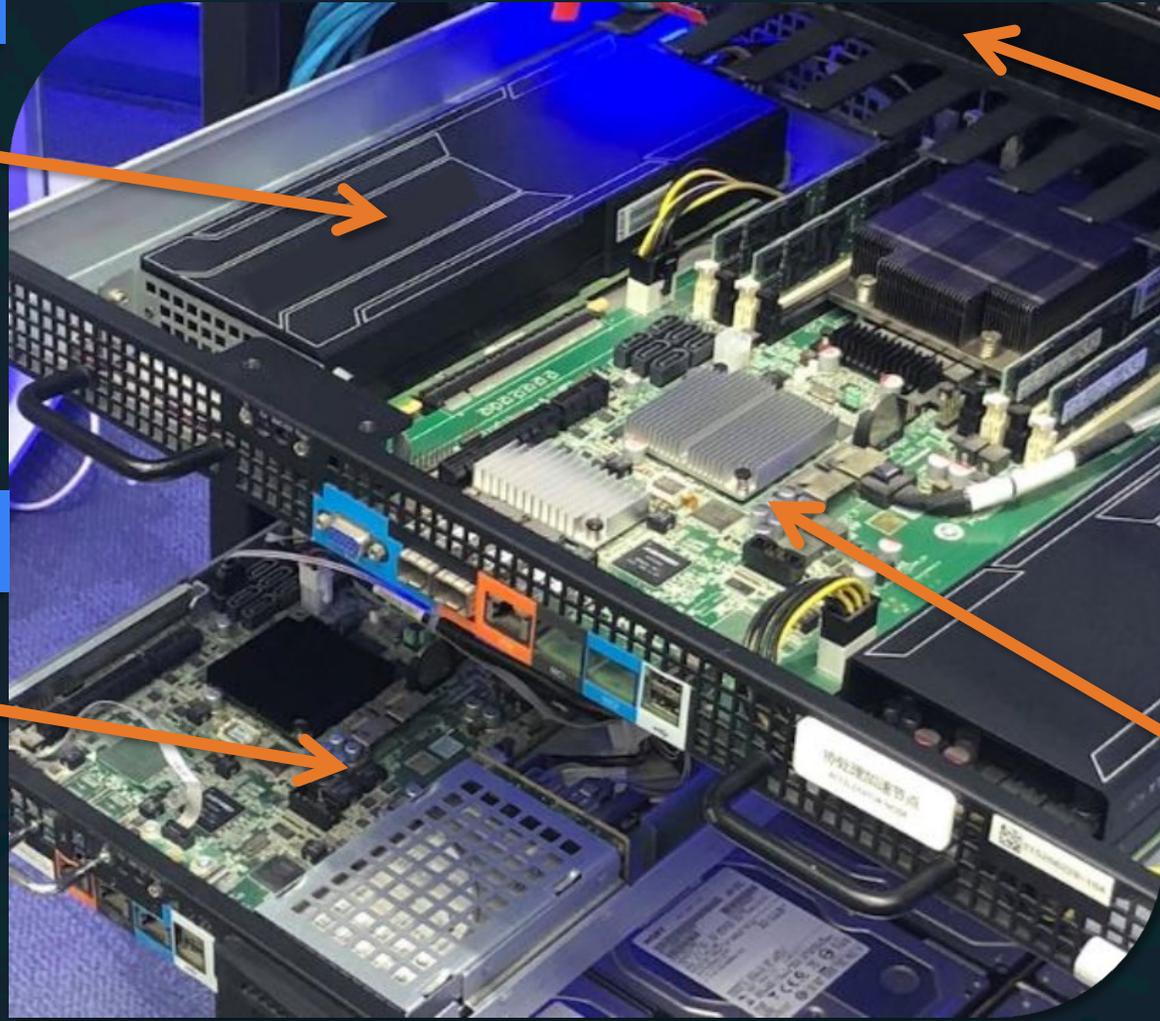




\$14 → \$60

### Artificial Intelligence Accelerator

- Multiphase Controllers
- Smart Power Stages
- 48V MCM
- POL Regulators
- e-fuse Protection Devices



\$14 → \$25

### High Power AC/DC

- AC/DC Totem Pole PFC
- LLC Controller
- HV Isolated Drivers
- Isolated DC/DC Converter
- WBG FETs

\$2 → \$17

### Networking Unit

- Multiphase Controllers
- Smart Power Stages
- POL Regulators
- e-fuse Protection Devices

\$7 → \$50

### Server Board

- Multiphase Controllers
- Smart Power Stages
- 48V MCM
- POL Regulators
- e-fuse Protection Devices

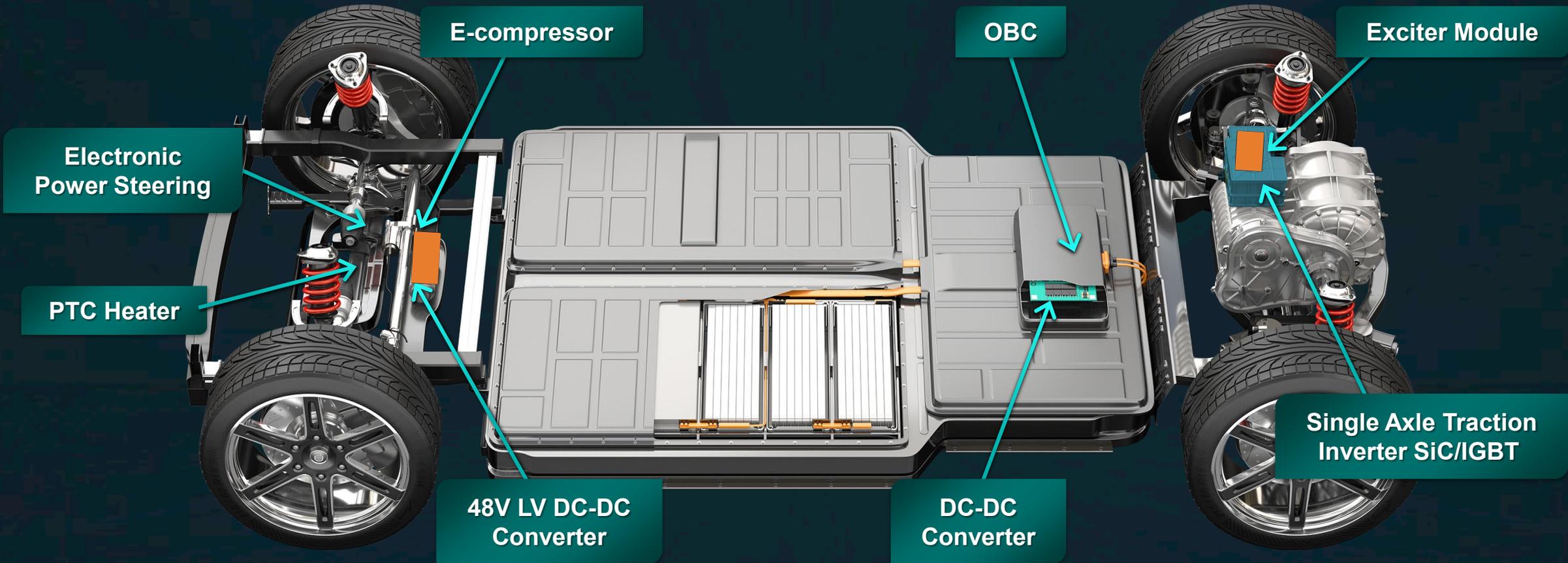
Portfolio expansion increases our opportunity up to \$5M per data center

# Power of the Portfolio

✓ Customer Wins & LTSAs

## Broadest Portfolio to Capture the EV Market

EV Power Applications



# onsemi. Everywhere. Today.

EV Power Applications

E-compressor

OBC

Exciter Module

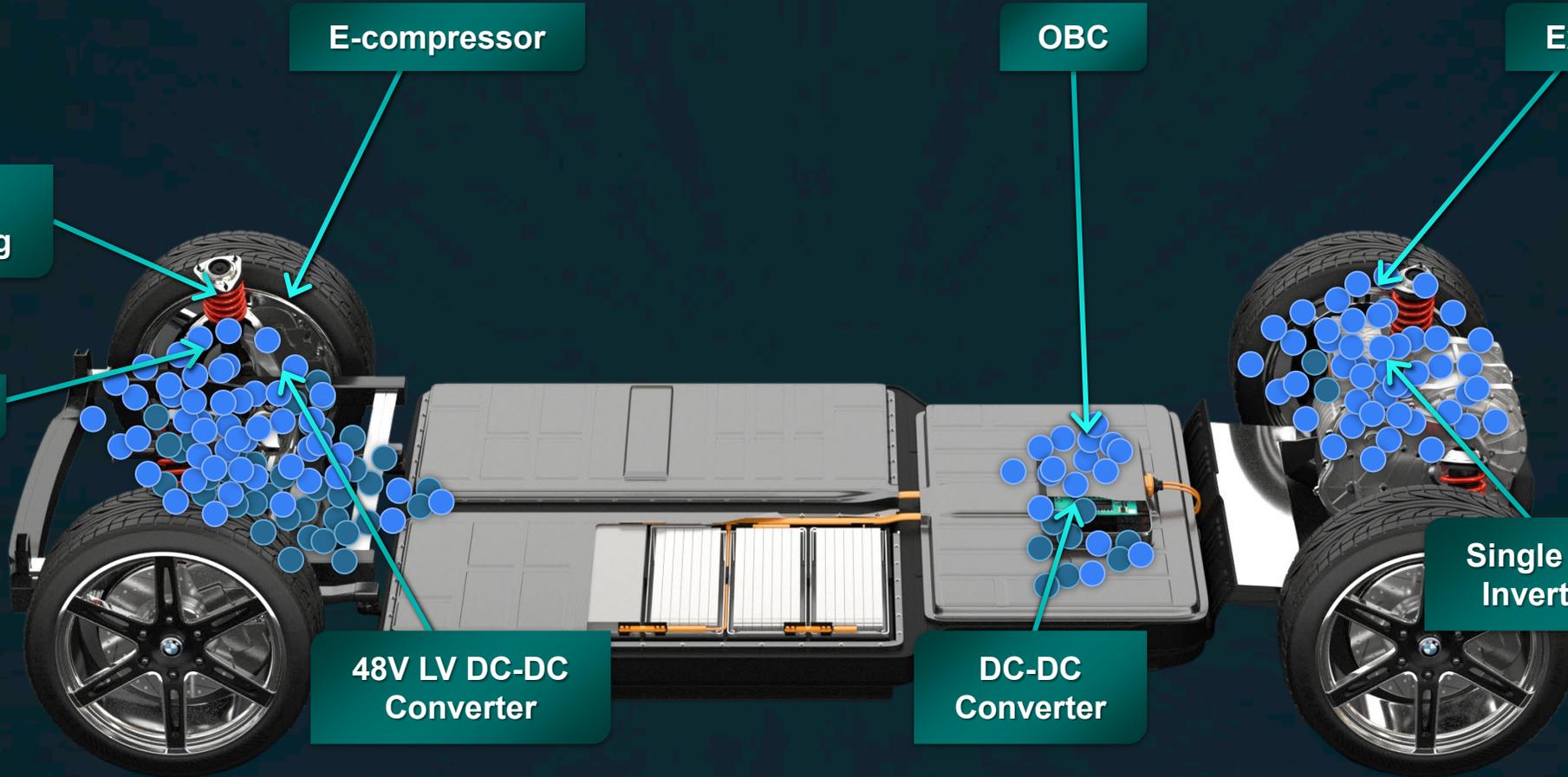
Electronic Power Steering

PTC Heater

48V LV DC-DC Converter

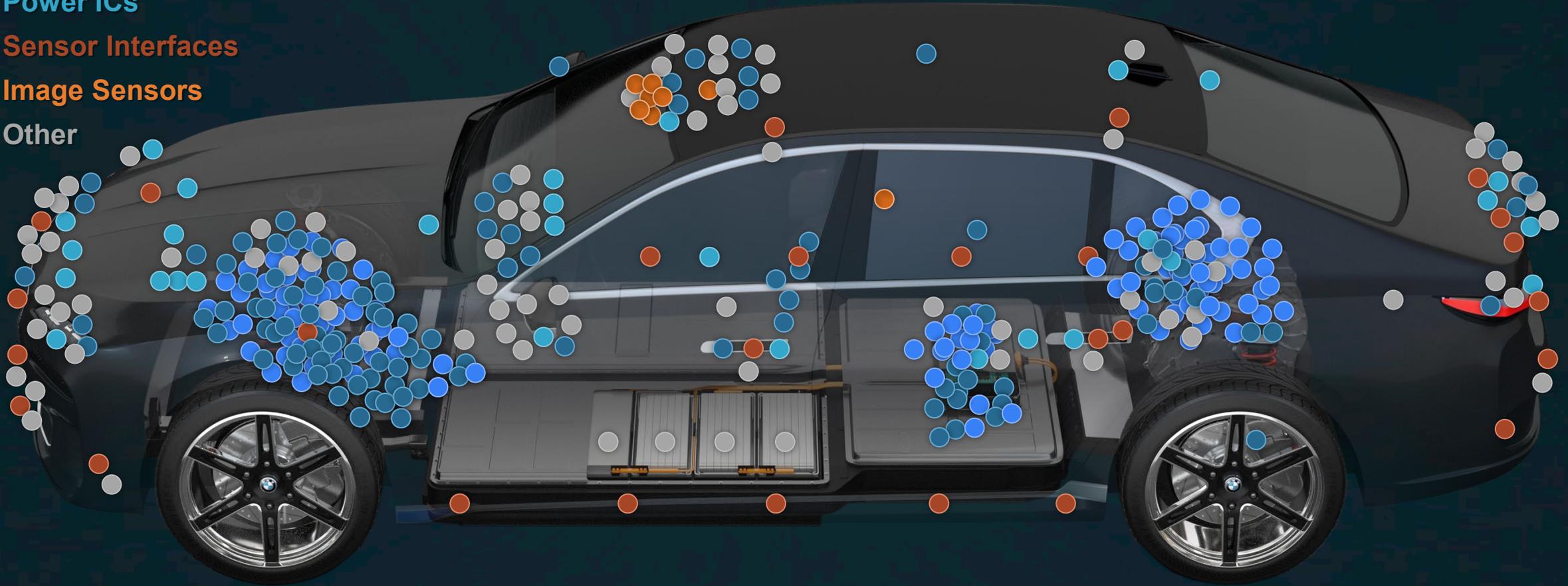
DC-DC Converter

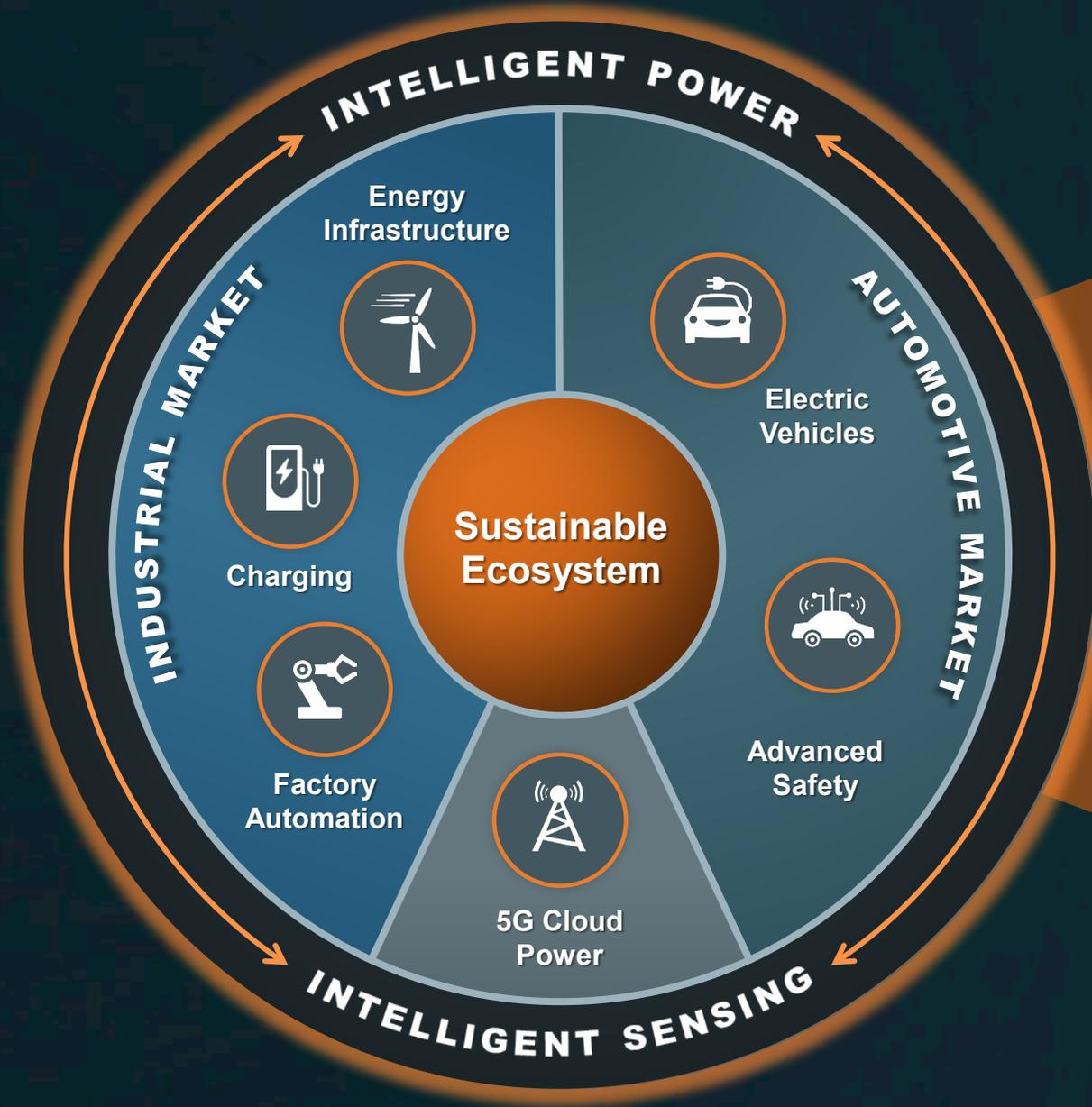
Single Axle Traction Inverter SiC/IGBT



# onsemi. Everywhere. Today.

- Silicon Carbide
- Silicon Power
- Power ICs
- Sensor Interfaces
- Image Sensors
- Other



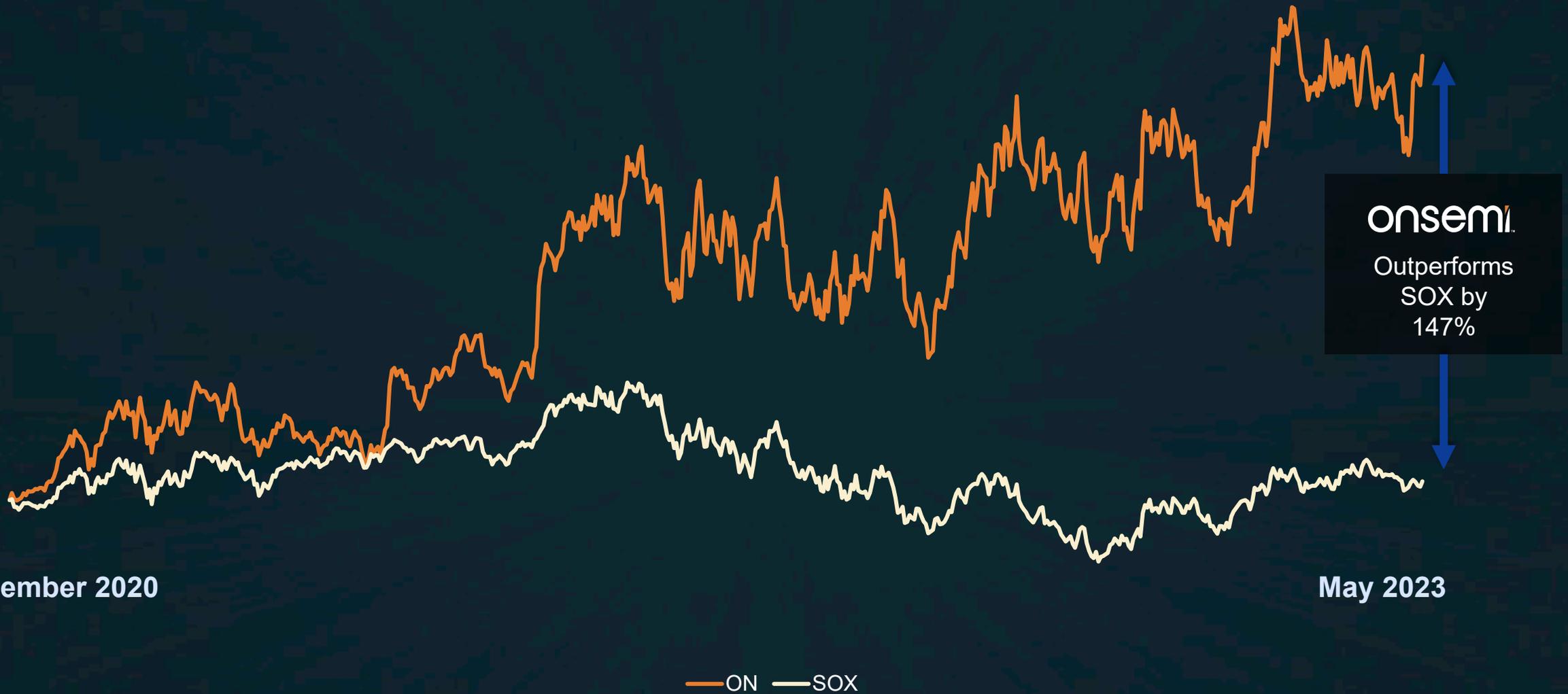


SiC/Si Power leadership enables us to win complete power trees, unlocking \$14B TAM @ up to 70% GM

We are expanding intelligent sensing leadership through focused innovation in Auto & Industrial

We accessorize these solutions with a broad array of products that make us indispensable to customers

# onsemi's Transformation has Driven Outperformance



December 2020

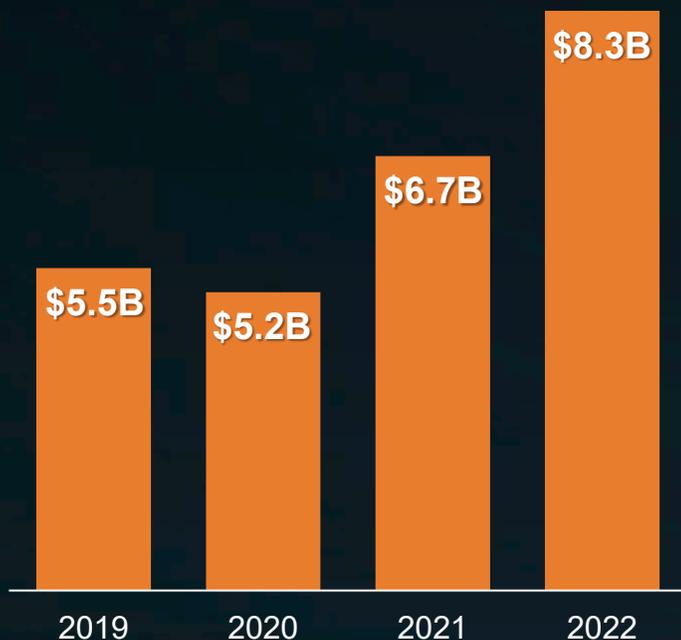
May 2023

— ON — SOX

onsemi  
Outperforms  
SOX by  
147%

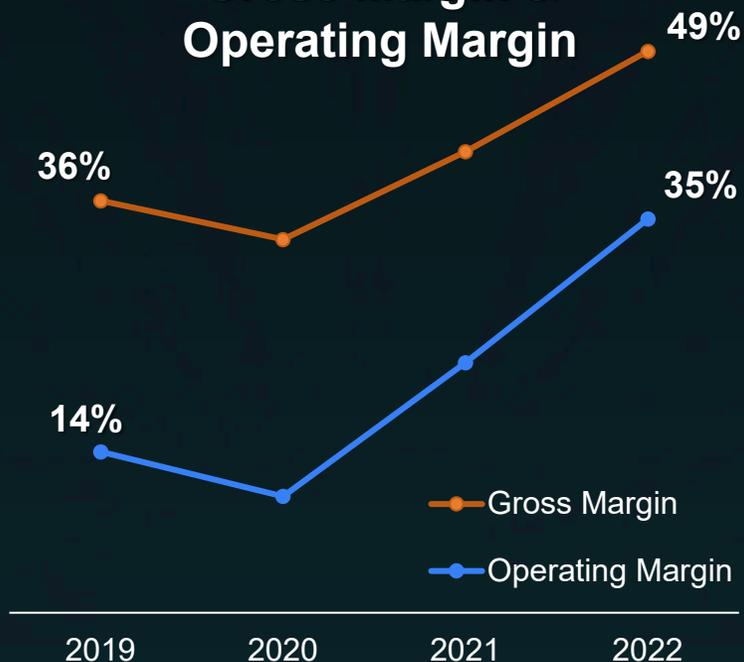
# Structural Changes Set the Foundation for Growth

## Revenue



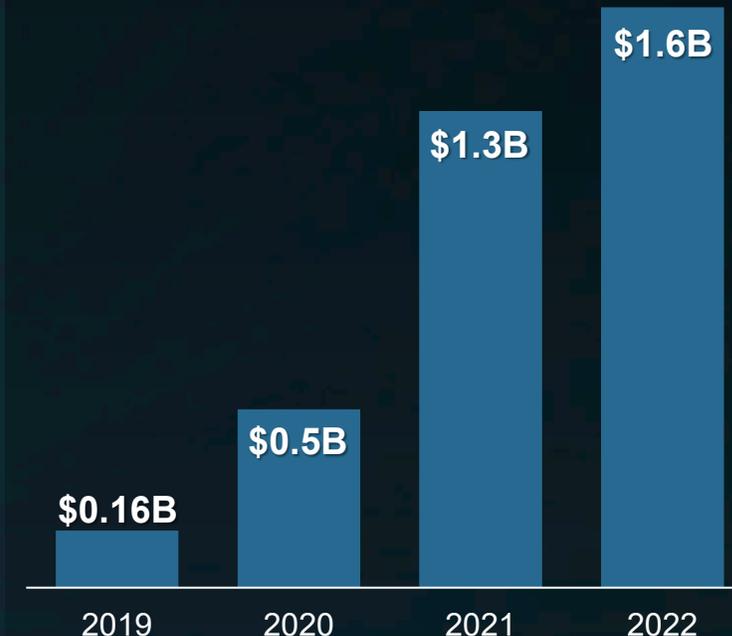
- **Revenue** at 26% CAGR 2020-2022
- Focused on high-growth megatrends in Auto and Industrial
- Doubled down on Silicon Carbide

## Gross Margin & Operating Margin



- **Gross Margin** improved by 1,310 bps
- Exited non-core low margin businesses
- Executed Fab Liter Strategy
- Eliminated Price to Value Discrepancies
- **Operating Income** increased 5.3x faster than revenue
- Reduced OpEx to <15% of revenue

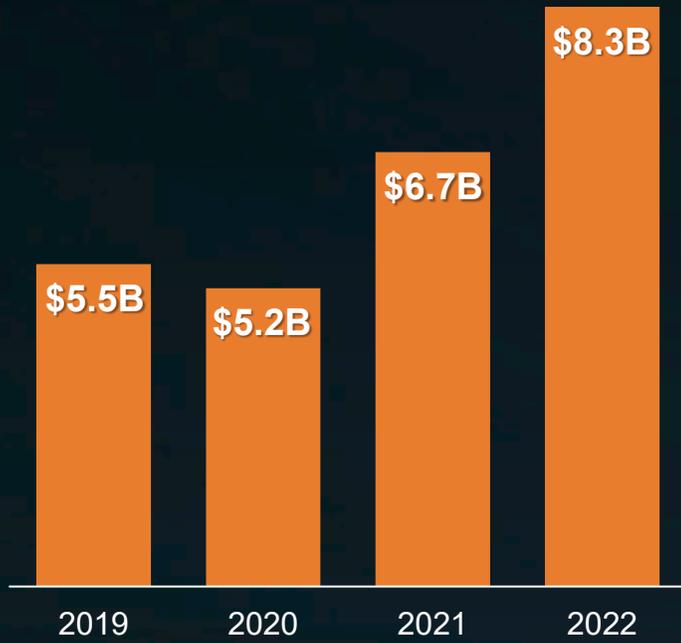
## Free Cash Flow



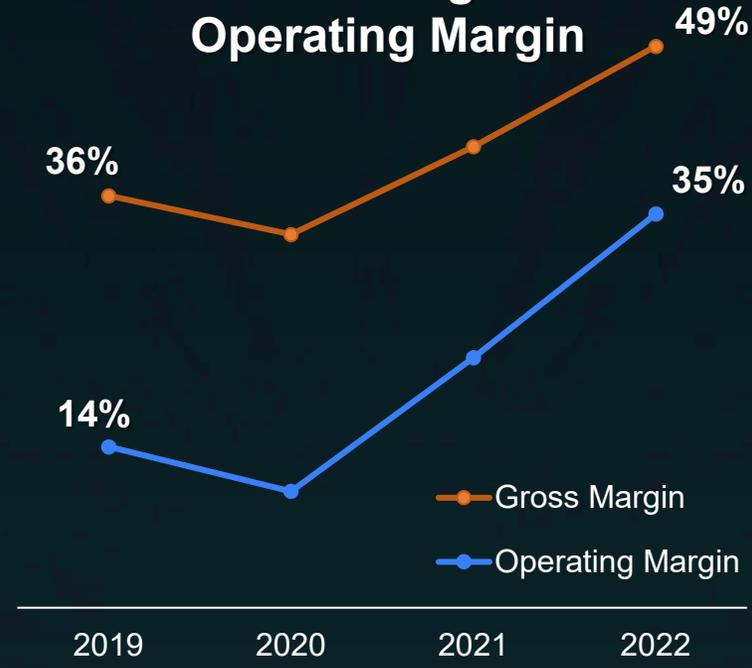
- **Free Cash flow** increased by 10x
- Invested in Silicon Carbide and 300mm fab
- Initiated share repurchases; \$3B repurchase authorization

# Structural Changes Set the Foundation for Growth

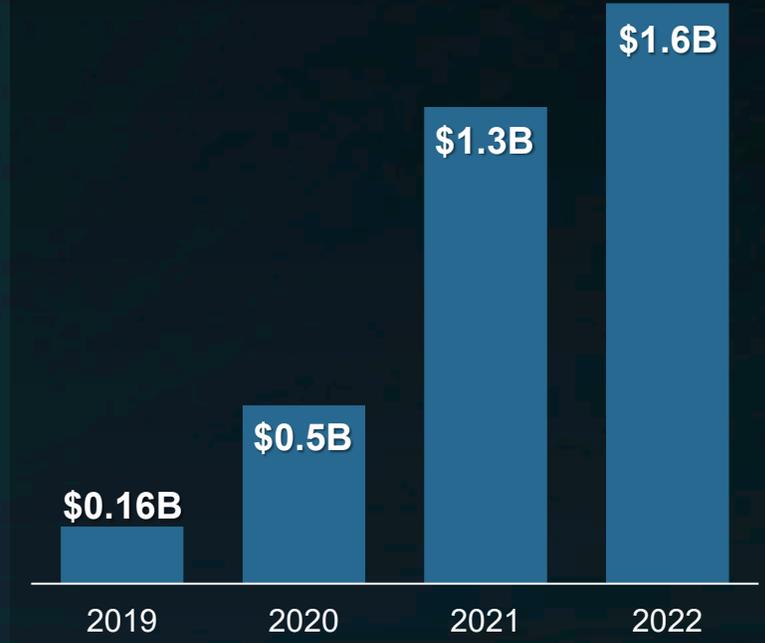
## Revenue



## Gross Margin & Operating Margin



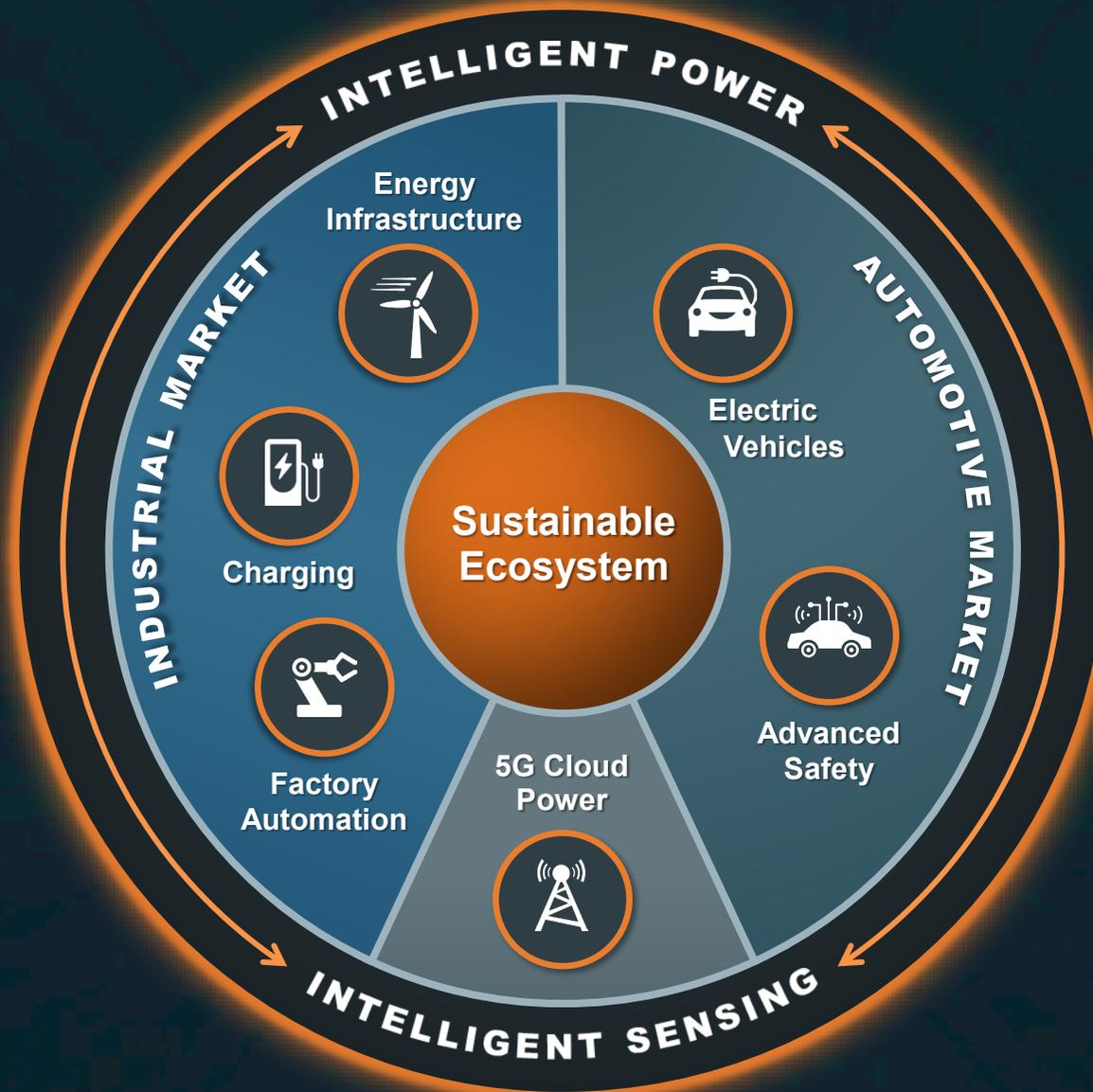
## Free Cash Flow



## Industry-Leading Results Accelerating Shareholder Value

- Free Cash Flow growth of 10x: **#1** among global semis
- ROIC of 38.6%: **Top 4** in global semis
- Operating Income growth of 3.7x: **Top 3** in global semis

# Premium Businesses



# Premium Businesses

## Intelligent Power

### Silicon Carbide

- Revenue growing >2x market at 70%
- Vertically integrated manufacturing at scale
- Industry-leading efficiency through innovative device and packaging technologies

### Silicon Power – IGBT, FET

- #2 position with growing market share
- Expanding BOM coverage with new products
- Exited price sensitive markets

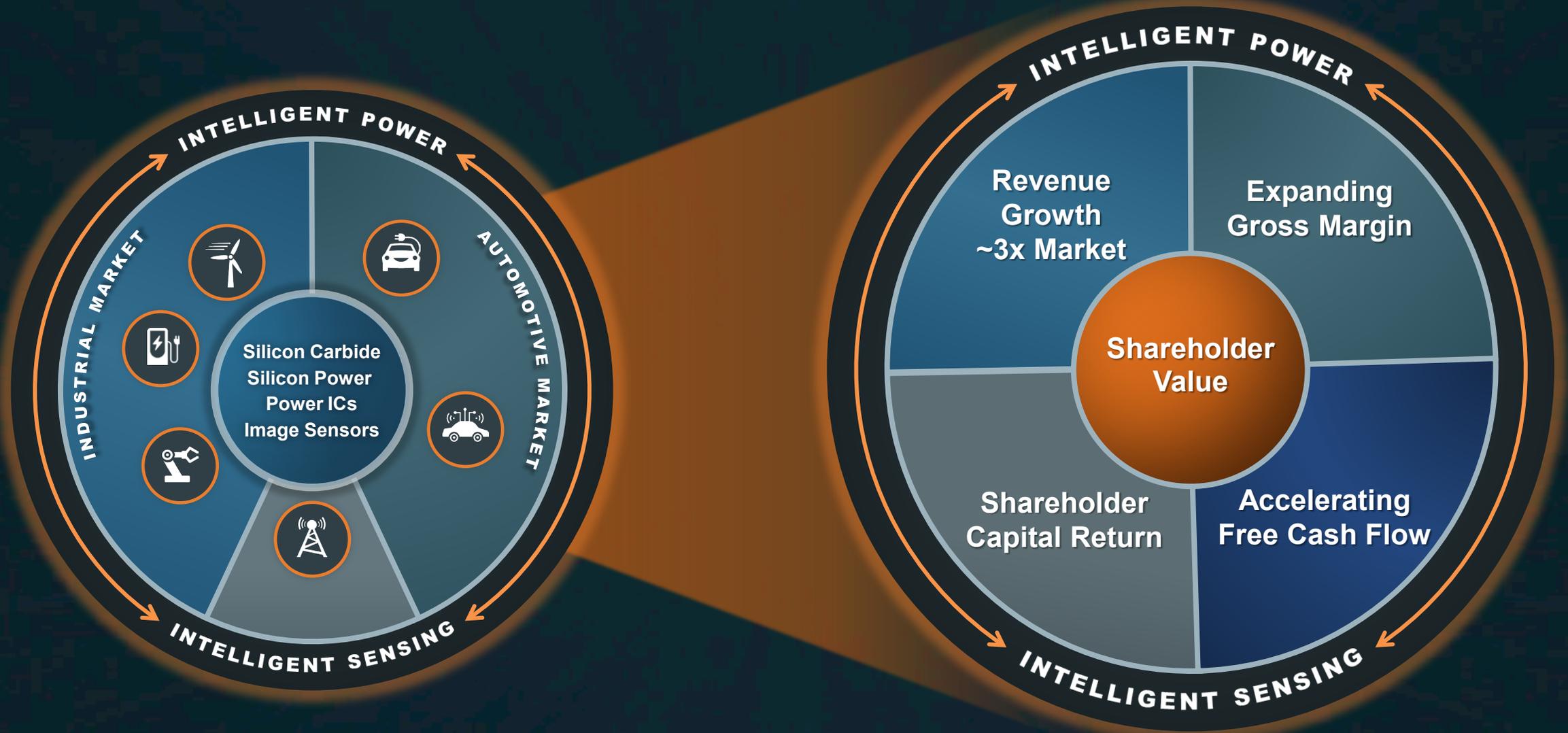
### Power ICs

- Double down on \$14B TAM with >70% gross margin
- Optimize system cost with gate drivers and controllers
- Expand leadership to full Power Tree solutions

## Intelligent Sensing

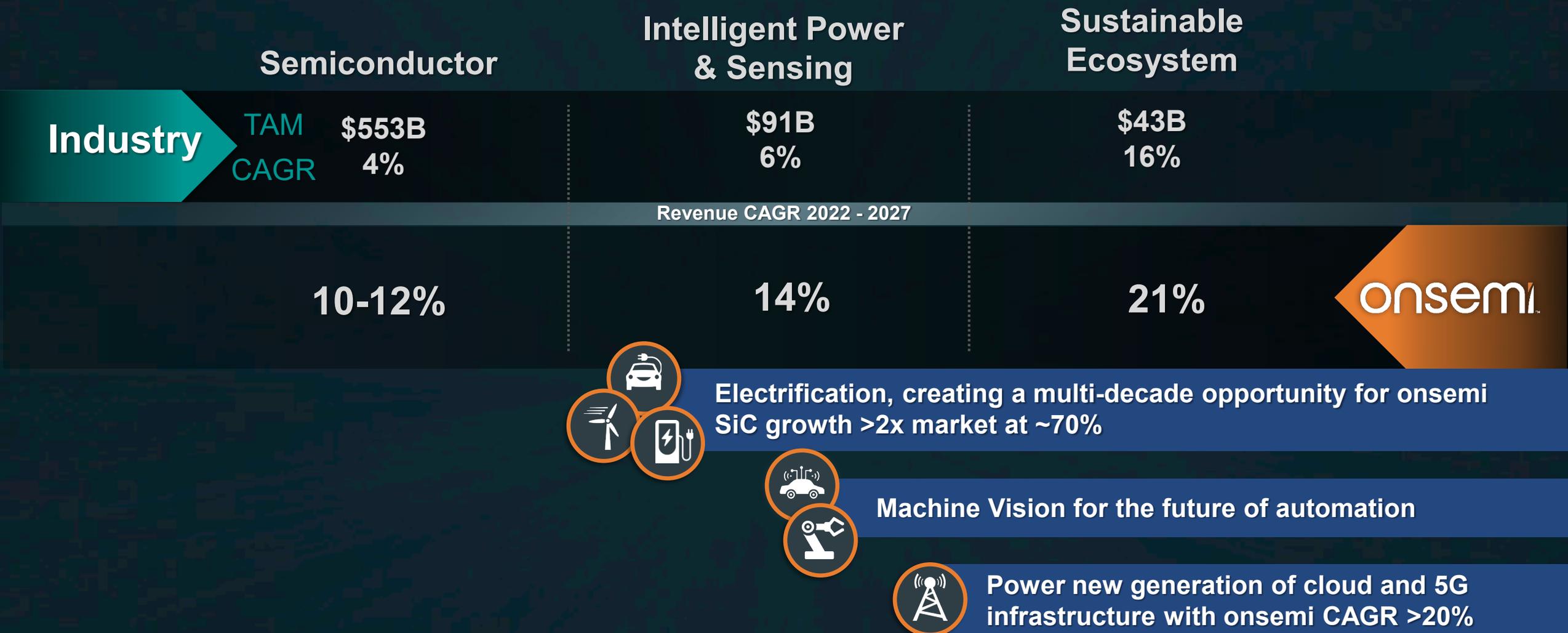
- #1 position in Auto and Industrial
- Growing in machine vision
- 68% market share in ADAS, 27% market share in industrial
- 8MP ramping with ~2.5x ASP uplift
- #1 in Ultrasonic and Inductive Sensing for Automotive and Industrial
- Delivering high margin and the most profitable sensor business in the industry

# Premium Businesses Driving Premium Results

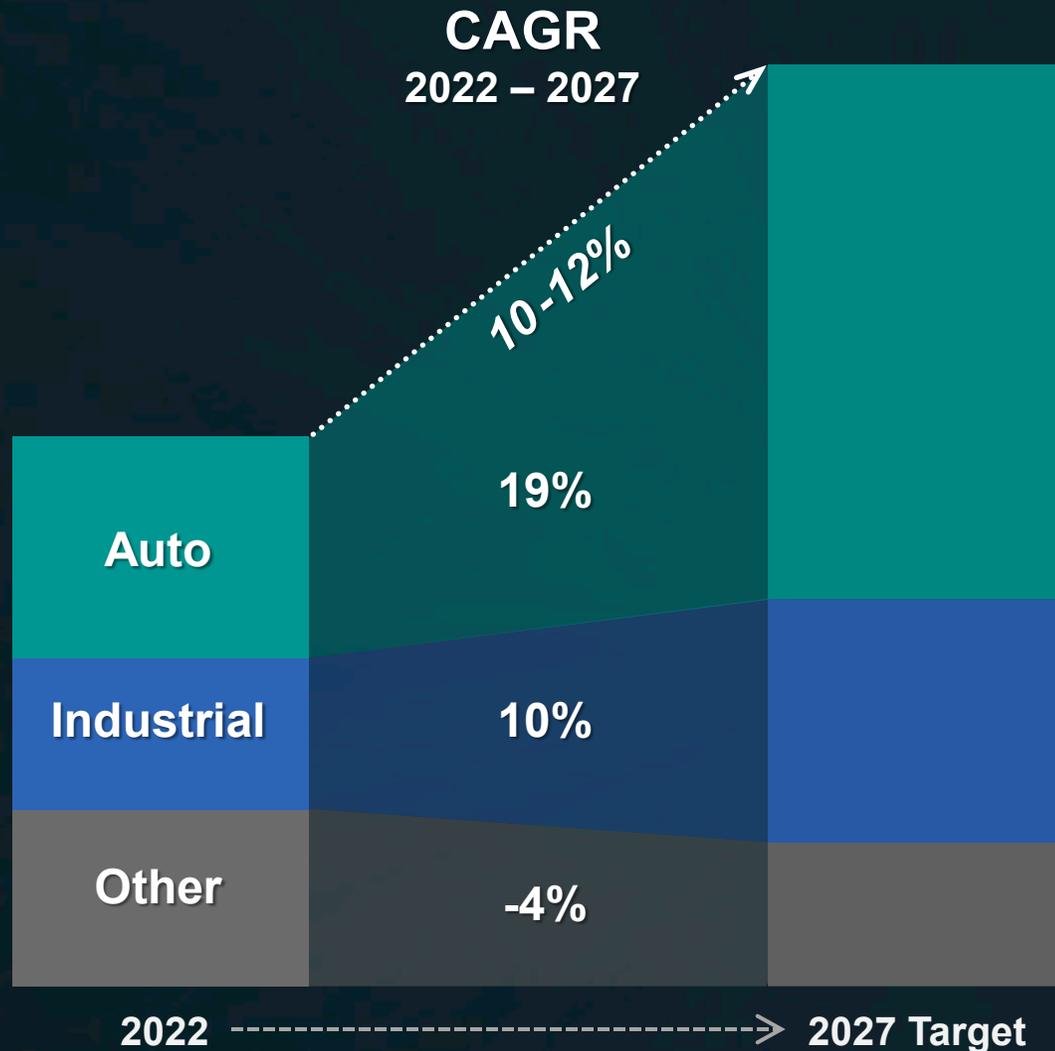




# Markets that Matter



# Sustainable Ecosystem to Drive ~3x the Market Growth



## Automotive

- Electrification – SiC & IGBT
- Increasing ADAS Adoption
- Power Management for LED and Advanced Safety

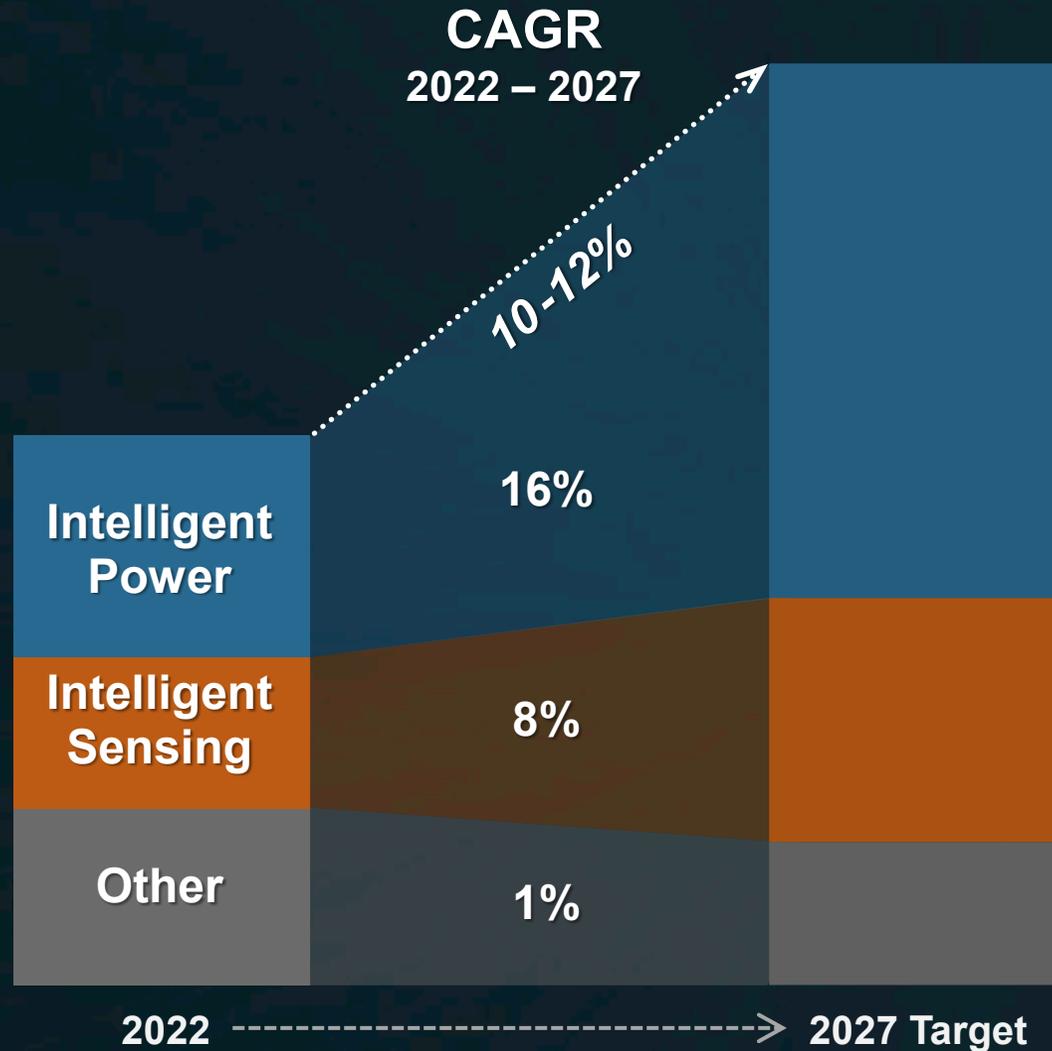
## Industrial

- Energy Infrastructure
- Factory Automation
- EV Charging

## Other

- 5G & Cloud Power growing at 22%
- Engage with Strategic market leaders opportunistically with value driven solutions
- No investment in broad markets

# Sustainable Ecosystem to Drive ~3x the Market Growth



## Intelligent Power

- SiC growth 2x the industry at 70%; 35-40% market share
- Si Power – IGBT, FET share gain in Auto & Industrial
- Accelerate Power IC growth with controllers and gate drivers

## Intelligent Sensing

- Grow in machine vision for auto and industrial
- Advanced safety for ADAS and in-cabin vision
- Factory Automation
- Opportunistic in human vision applications

## Other

- Attractive cash flow businesses
- BOM indispensability and complementarity

# Highly Diversified Customer Base



## Customer Needs:

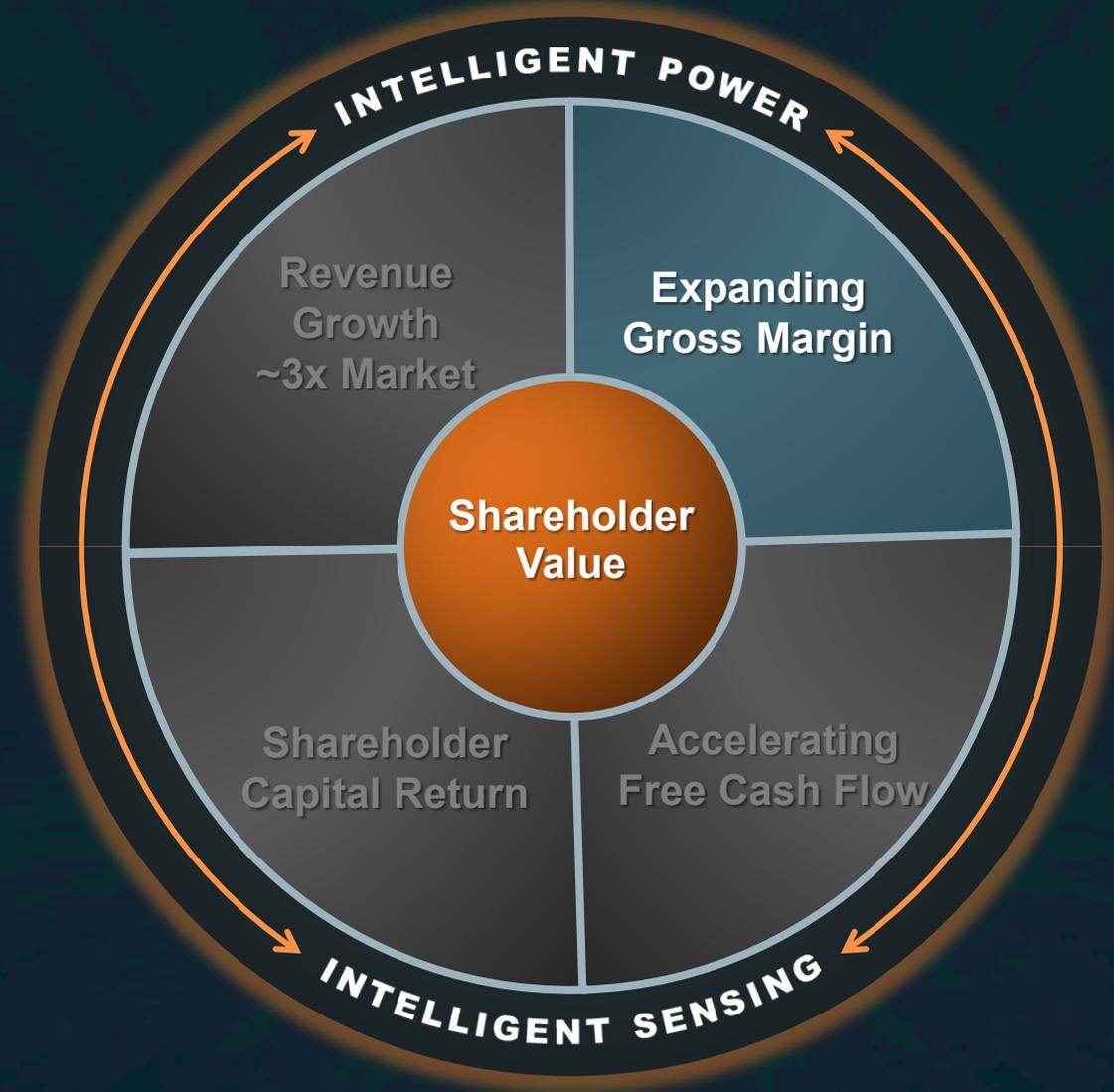
- Best-in-Class Performance
- Reliable suppliers at scale
- Tighter supplier base
- Competitive system cost

## onsemi Delivers:

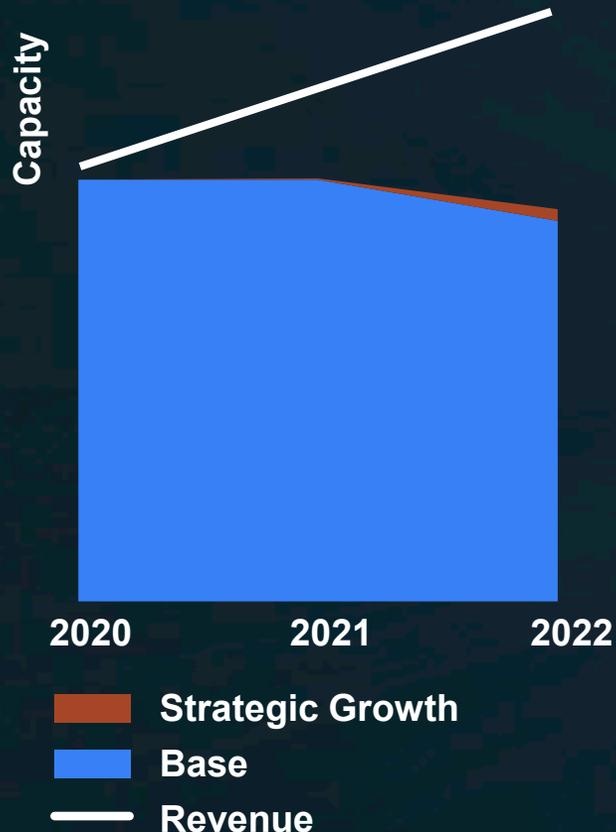
- Industry-leading products
- Vertically integrated supply chain
- Broad portfolio of products
- Solution optimization across BOM

Top 20 customers represent ~35% of revenue

Top 20 customers each buy ~800 products on average



# Executed Fab Liter Manufacturing Strategy

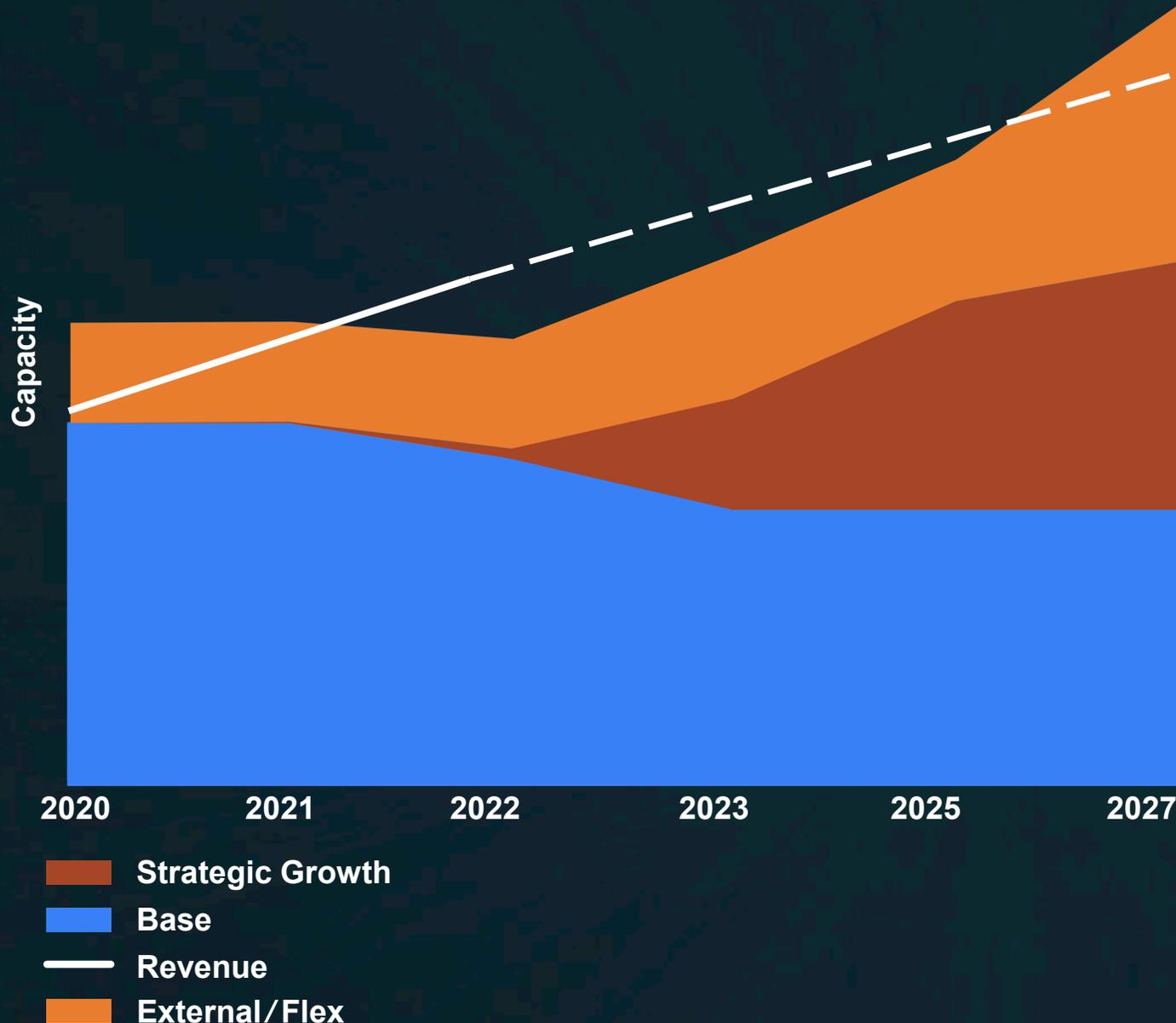


## Fab Liter

### Flexible, Low Fixed-Cost Footprint

- Reduced legacy capacity to minimize fab footprint – Fab Filler strategy is dead
- Captive capacity for differentiated technologies. Leverage external manufacturing for non-proprietary technologies
- Invested in brownfield expansion for capital efficiency and industry-leading ROIC
- Divested four subscale fabs – recognize \$160M in annualized savings through 2025
- Reduces gross margin volatility

# The Next Strategy: Fab Right



## Fab Right

### Optimize asset footprint for efficiencies and best-in-class ROIC

- Optimize mix across the network for best cost structure
- Ramping 300mm Fab for scale and capacity
- Leverage Base footprint and brownfield investments for Strategic Growth
- Multi-year LTSA's provide visibility for expansion
- Extract savings of \$160M from divestiture of four Fabs
- Geographically diverse footprint for supply chain assurance
  - EFK is the only US-based 300mm power semiconductor Fab

### External/Flex capacity

- Utilize internal capacity for differentiated products with external partners for flex capacity
- Maximize internal utilization to reduce volatility in margins

# Fab Right: onsemi's Path to Net Zero by 2040



## Greenhouse Gas Emissions

*Near-term targets to be published in 2024*

21% YoY Scope 2 emissions reduction in 2022



## Water

*42% water recycled in 2022*

19% YoY water withdrawal reduction in 2022

SBTi  
Letter signed  
December  
2022

## Waste

*70% waste diverted from landfill in 2022*

23% YoY waste Reduction in 2022



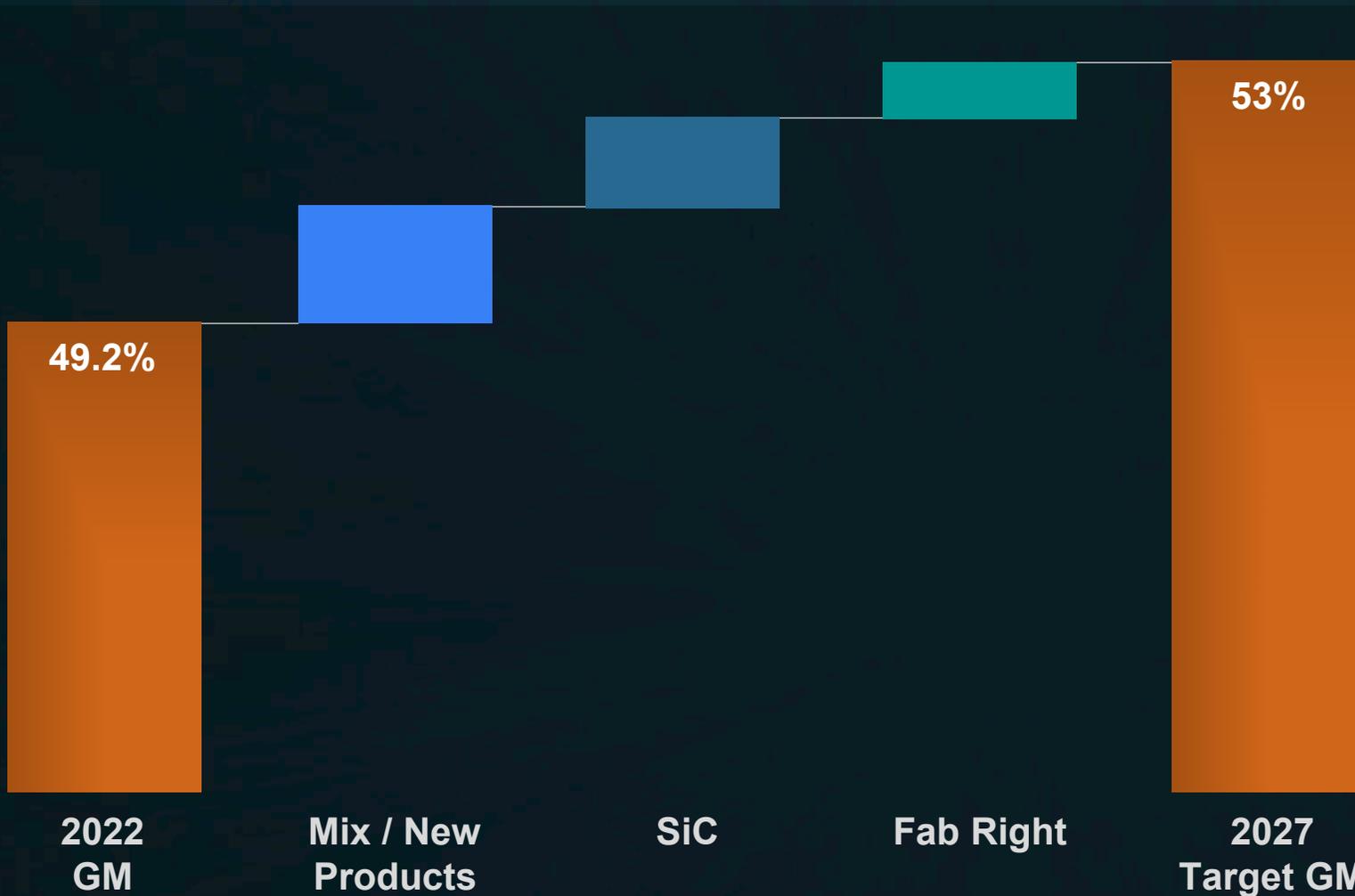
## Energy Saving

*Fab Right Energy Savings of 18% in kWh/Wafer by 2027*

18% savings by 2027



# The Next Milestone: Expand Gross Margin to 53%



## Mix / New Products

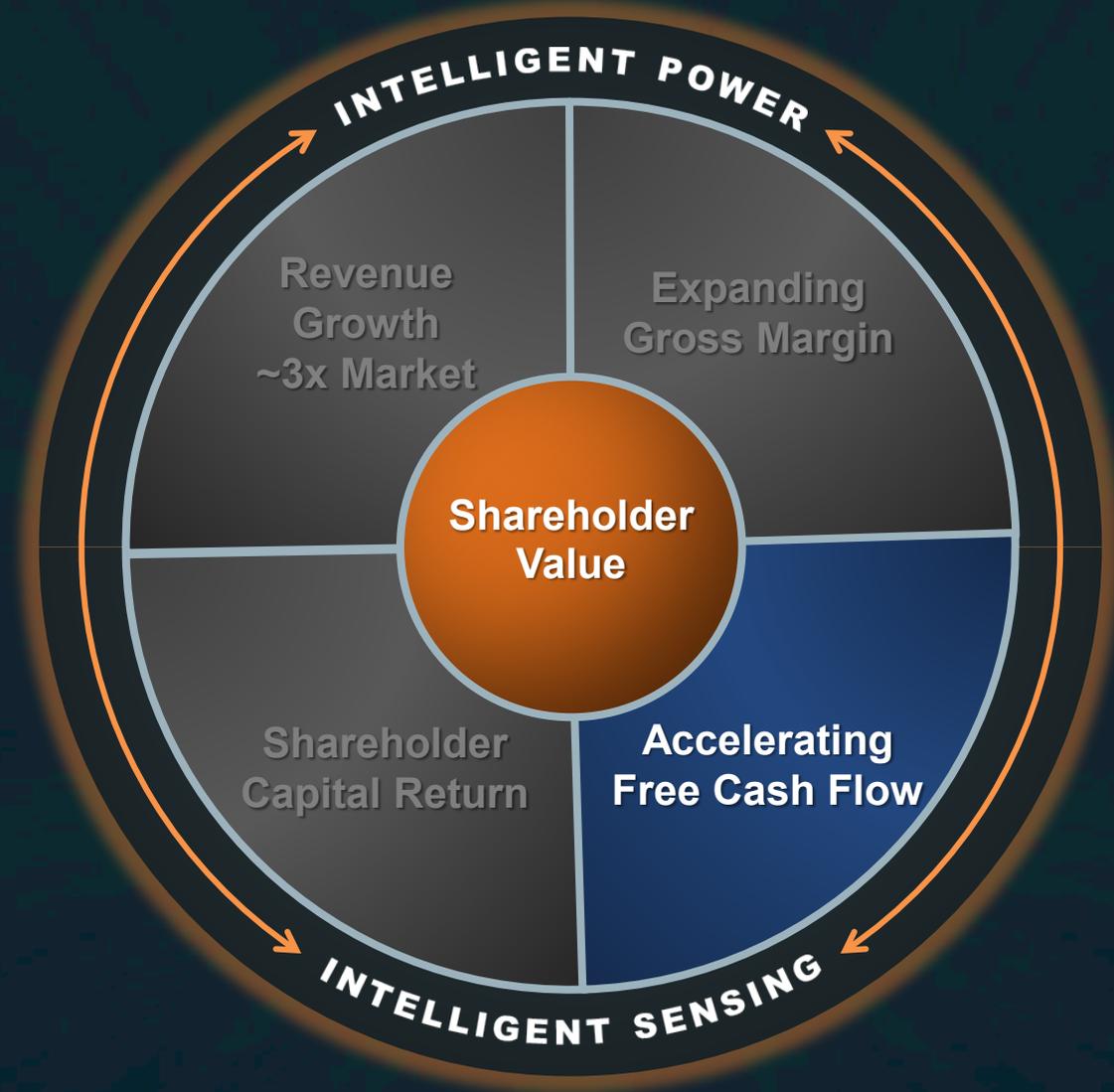
- Continued mix shift to Auto & Industrial
- Ramp new and differentiated products at margins above target

## Silicon Carbide (SiC)

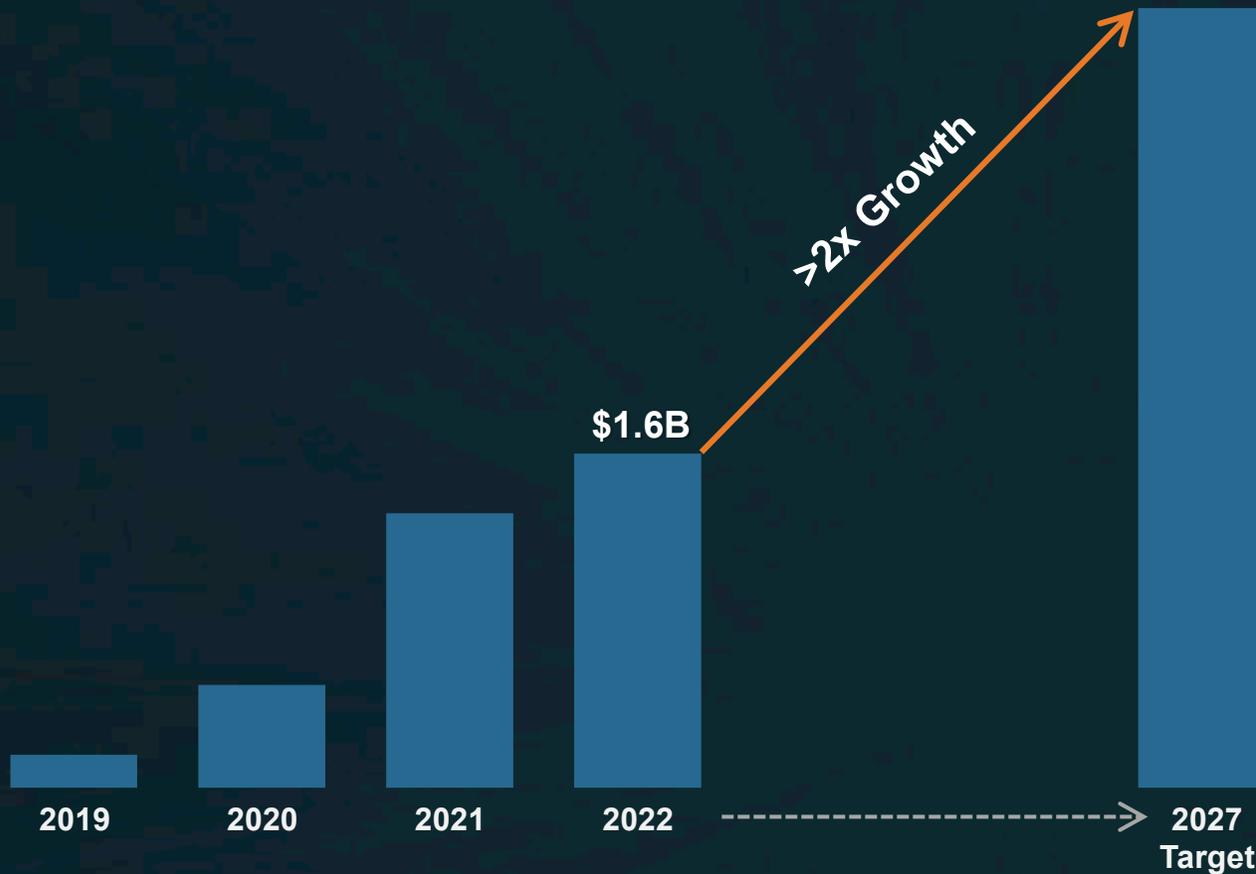
- Accretive margins at scale
- Absorption of startup costs
- SiC growing 2x market<sup>1</sup>

## Fab Right

- Optimize manufacturing network for cost efficiency
- \$160M in fixed-cost savings from four Fab divestitures in 2022
- Maximize utilization across network with flex to external capacity



# Accelerating Free Cash Flow



## Expanding Free Cash Flow Margin to 25-30%

- Grow revenue ~3x semiconductor industry
- Expand Gross Margin
- Targeted Operating Expense deployment
- High ROIC investments
- Working Capital & Inventory management

**\$3.5 - 4.0 billion in Free Cash Flow in 2027**

# Market Success Driving Investments

## Fab Right: Expanding Capacity

- Expand capacity for strategic growth to capture market opportunity
- Ramp 300mm and capacity expansion
- Augment competitive advantage in packaging

## Silicon Carbide Expansion

- Invest \$2B in next phase of end-to-end SiC capacity
- Evaluate brownfield opportunities in Europe, USA and Korea

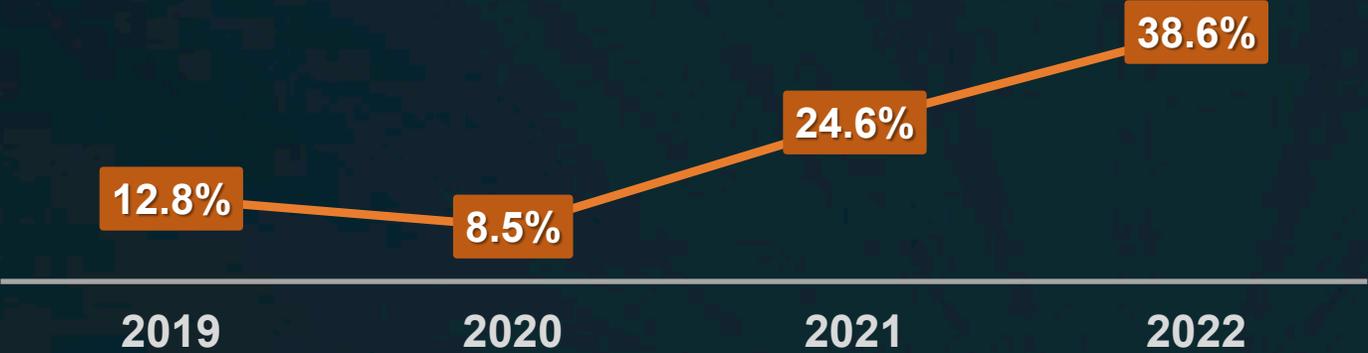
## Capital Efficiency

- Capital Intensity to be 15-20% through 2024 and decline to 11% by 2027
- Minimize risk through customer co-investments and LTSA visibility
- Government subsidies to offset CapEx investments and enhance ROIC

Investing for growth while maintaining best-in-class ROIC

# Delivering Best-in-Class ROIC

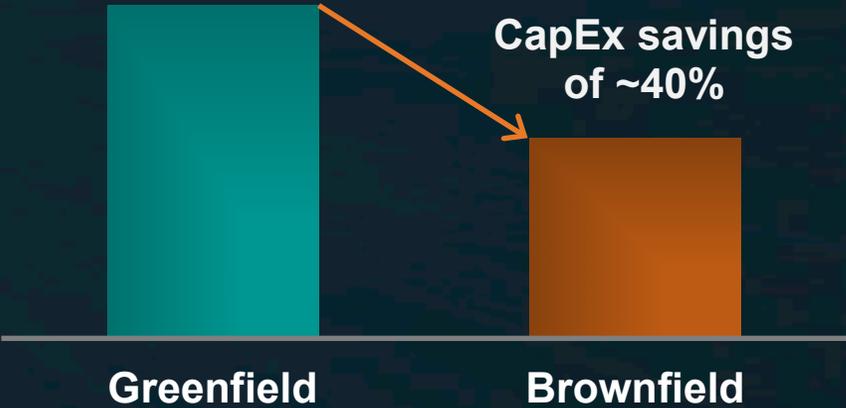
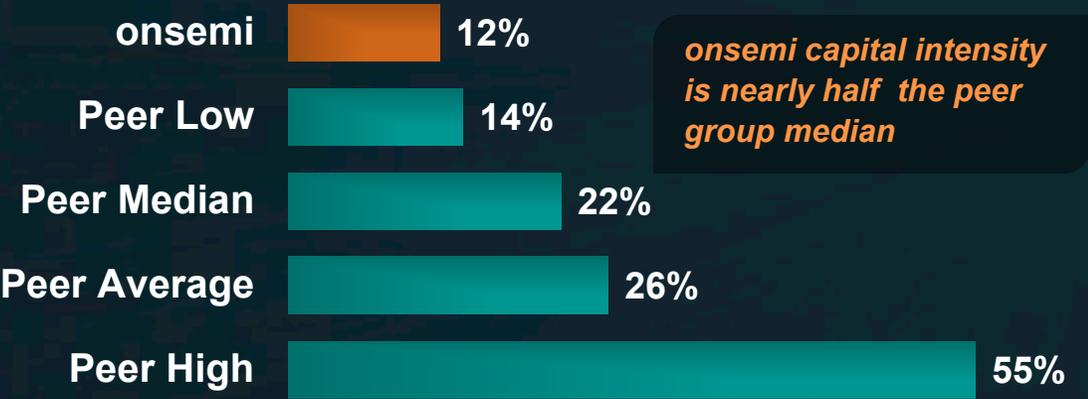
## onsemi ROIC

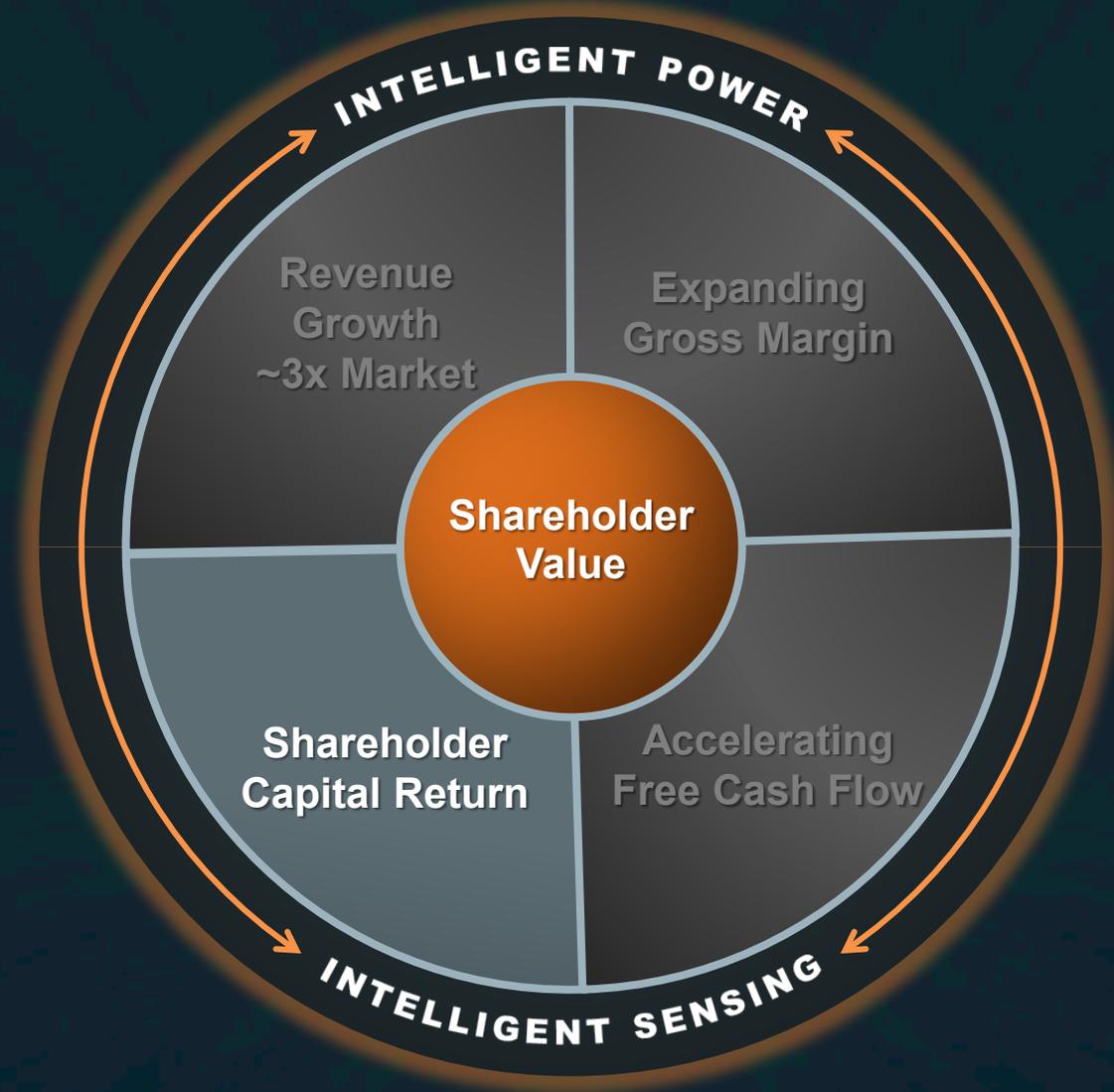


## Brownfield Efficiency

- 40% less CapEx compared to Greenfield investment
- Accelerates time to market by 2 years

## 2022 Capital Intensity





# Investments and Capital Allocation



## R&D and CapEx

- Invest in organic initiatives to extend competitive advantage
- Maintain best-in-class ROIC



## M&A

- Strategic M&A adjacent and complimentary
- Technology tuck-ins
- Accretive to financial model
- Low leverage provides firepower



## Balance Sheet

- Maintain flexibility to pursue organic and inorganic growth
- Maintain existing credit rating of BB+/Ba1



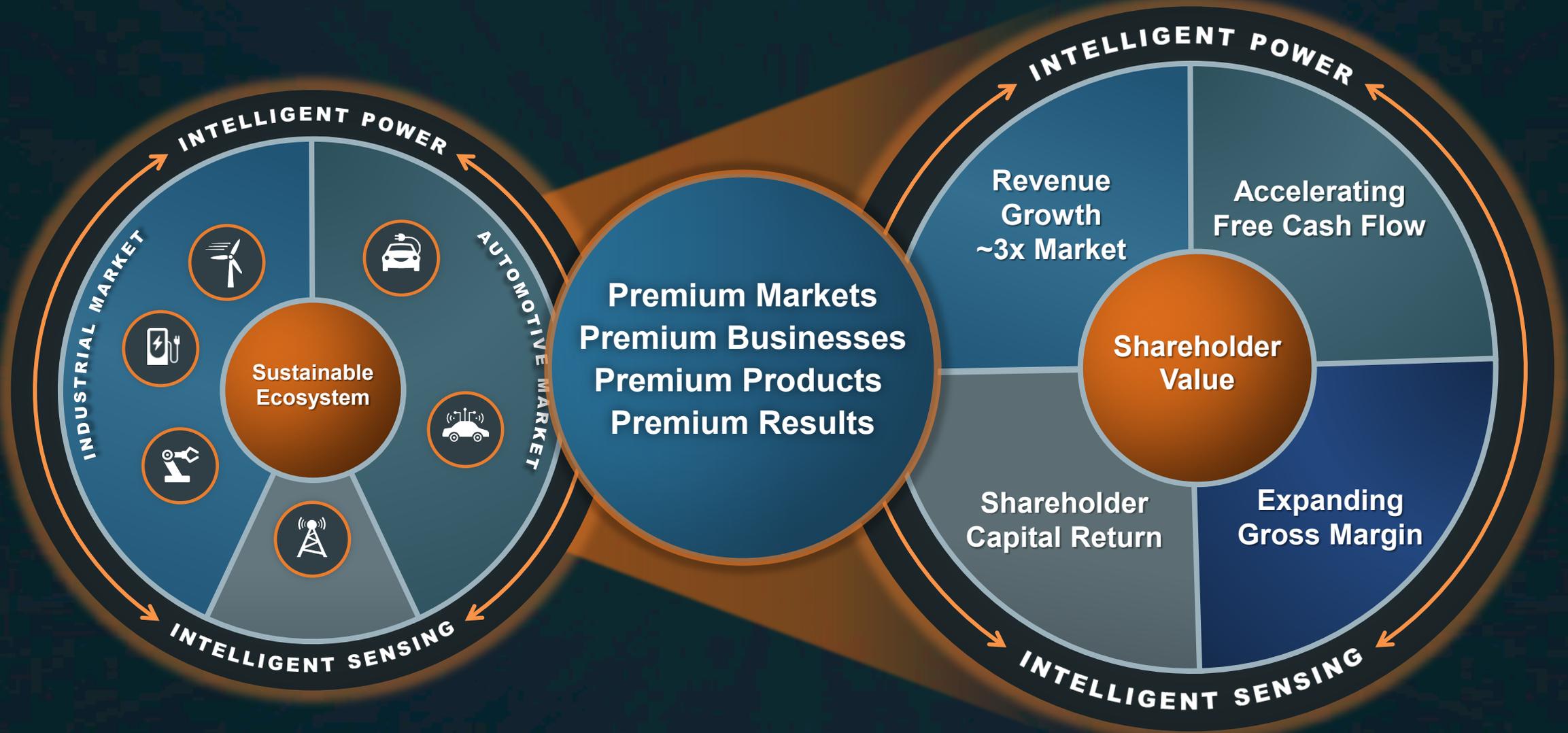
## Shareholder Returns

- Return 50% of Free Cash Flow through share repurchases
- \$3B repurchase authorization in place

# Accelerating the Financial Model

	2022 Actual	2027 Target	
Revenue	\$8.3B	10-12% CAGR	<ul style="list-style-type: none"> <li>Grow at ~3x the semiconductor industry</li> </ul>
Gross Margin	49.2%	53%	<ul style="list-style-type: none"> <li>Mix shift, new products &amp; SiC ramp at accretive margins</li> <li>Optimize cost through Fab Right</li> </ul>
Operating Expenses	14.6%	13%	<ul style="list-style-type: none"> <li>Invest in R&amp;D for long-term growth</li> <li>Digital First - embrace new technologies &amp; data analytics</li> </ul>
Operating Margin	34.7%	40%	<ul style="list-style-type: none"> <li>Grow Operating Income faster than revenue</li> </ul>
CapEx	12%	11%	<ul style="list-style-type: none"> <li>Market success drives investments</li> <li>High ROIC brownfield investments</li> </ul>
Free Cash Flow	20%	25-30%	<ul style="list-style-type: none"> <li>\$3.5-\$4.0B of Free Cash Flow in 2027</li> <li>Return 50% to shareholders</li> </ul>

# Premium Businesses Driving Premium Results



# Appendix

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# Appendix – GAAP to Non GAAP Reconciliation

\$ in Millions	FY 2019	FY 2020	FY 2021	FY 2022
Reconciliation of GAAP to Non-GAAP Gross Margin:				
GAAP Gross Margin	35.8%	32.7%	40.3%	49.0%
a) Impact of business wind down	0.0%	0.0%	0.0%	0.2%
b) Amortization of acquisition-related intangible assets	0.0%	0.0%	0.0%	0.1%
c) Non-recurring facility costs	0.0%	0.0%	0.1%	0.0%
d) Amortization of fair market value step-up of inventory	0.4%	0.0%	0.0%	0.0%
Non-GAAP Gross Margin	36.1%	32.7%	40.4%	49.2%

Reconciliation of GAAP to Non-GAAP Operating Margin	FY 2019	FY 2020	FY 2021	FY 2022
GAAP Operating Margin	7.8%	6.6%	19.1%	28.3%
a) Amortization of acquisition-related intangible assets	2.1%	2.3%	1.5%	1.0%
b) Restructuring, asset impairments and other, net	0.5%	1.2%	1.1%	0.2%
c) Goodwill and intangible asset impairment	0.0%	0.0%	0.0%	4.6%
d) Third party acquisition and divestiture-related costs	0.2%	0.0%	0.2%	0.2%
e) Non-recurring facility costs	0.0%	0.0%	0.1%	0.0%
f) Impact of business wind down	0.0%	0.0%	0.0%	0.2%
g) Amortization of fair market value step-up of inventory	0.4%	0.0%	0.0%	0.0%
h) Litigation settlement	3.1%	0.0%	0.0%	0.0%
Non-GAAP Operating Margin	14.1%	10.2%	21.9%	34.5%

Reconciliation of net cash provided by operating activities to free cash flow:	FY 2019	FY 2020	FY 2021	FY 2022
Net cash provided by operating activities	\$ 694.7	\$ 884.3	\$ 1,782.0	\$ 2,633.1
Purchase of property, plant and equipment	(534.6)	(383.6)	(444.6)	(1,005.0)
Free Cash Flow	\$ 160.1	\$ 500.7	\$ 1,337.4	\$ 1,628.1
Free Cash Flow Margin	2.9%	9.5%	19.8%	19.6%

# Notes and Sources – Welcome to the New World

## What you are used to seeing (images)

- Maximize Market Research Pvt. Ltd
- Deloitte and Mordor Intelligence
- KBV Research
- Yole

## Sustainable Ecosystem '22-'27 TAM CAGRs

- onsemi estimates
- LMC Automotive: Global Hybrid & Electric Vehicle Forecast - Quarter 4, 2022
- Omdia: Power IC Market Tracker, Sep'22

## Sustainable Ecosystem Accelerating onsemi Content

- Based on total onsemi BOM opportunity

## Markets that Matter

- onsemi estimates based on current market projections
- Semiconductor TAM excludes Memory

## Winning Formula...and Execute

- >\$17B: onsemi Form 10-Q filing for period ended March 31 2023

# Notes and Sources – Powder to Power

## Die Performance

- Internal benchmarking

## Optimized Package Thermals 15% reduction in Rth

- Based on internal estimates

## Lifetime LTSA Value

- Based on signed customer agreements

# Notes and Sources - Accelerating The Flywheel

## Winning at the Core – SiC and Si Power

- '22 – '27 CAGR, Global position and market share based on onsemi estimates

## The Profound Impact of 1%

- <https://www.iea.org/data-and-statistics/charts/global-ev-sales-by-scenario-2020-2030>
- 2022 Global Electricity Cost: [https://www.globalpetrolprices.com/electricity\\_prices/](https://www.globalpetrolprices.com/electricity_prices/)
- 2022 Global Electricity Production: <https://ourworldindata.org/electricity-mix>
- Industrial motor consumption: <https://www.globalefficiencyintel.com/new-blog/2017/infographic-energy-industrial-motor-systems>
- 2022 WW data center power consumption: [cc-techgroup.com](https://www.cc-techgroup.com)
- 2022 US Household Total Power Usage: [enerdata.net](https://www.enerdata.net)

## Expanding from the Core - Power

- onsemi estimates
- Omdia: 1Q23 - Semiconductor Device Data By Application Markets
- Omdia: Industrial Semiconductor Market Tracker – 3Q22 Database, Jan'23
- Omdia: Power Semiconductors in Automotive Report – 2022 Database, 5/26/22
- LMC Automotive: Global Hybrid & Electric Vehicle Forecast - Quarter 4, 2022
- Omdia: Power IC Market Tracker, Sep'22
- Yole: Silicon Carbide Forecast 2023
- Yole: 2022-27 SiC market forecast of 33% CAGR

## Winning at the Core - Image Sensor

- onsemi estimates
- TSR: Automotive Camera Market Analysis 2021-2022
- Yole: Status of CMOS Image Sensor Industry 2021 Report

## Image Sensor – onsemi Advantage

- onsemi image sensor shipments

## Image Sensor – Superior Technology

- onsemi estimates

## Expanding from the Core - Sensing

- onsemi estimates
- Sensor Interfaces Source: Research & Markets 2020 report
- Omdia: 2021 Industrial Market Tracker
- Omdia: Industrial Semiconductor Market Tracker – 3Q22 Database Jan'23
- Omdia: AMFT 1Q23
- Yole: Imaging for Automotive 2022

## Data Center Opportunity

- onsemi estimates based on total BOM opportunity

## Electric Vehicle Opportunity

- onsemi estimates based on onsemi devices designed in BMW's electric 7 Series vehicles

# Notes and Sources – Foundation Set: Ready to Accelerate

## Stock Chart

- Stock Chart represents period from: December 7, 2020 to May 5, 2023; Source: FactSet

## Structural Changes Set the Foundation for Growth

- Non-memory semiconductor device companies with market cap. of more than \$5B & 100% revenue from semiconductor devices, adjusted for acquisitions; Source: FactSet
- 2019-2022 for Free Cash Flow & Operating Income growth; 2022 for ROIC ; Source: FactSet

## Premium Businesses

- onsemi estimates
- Omdia: 1Q23 - Semiconductor Device Data By Application Markets
- Omdia: Industrial Semiconductor Market Tracker – 3Q22 Database, Jan'23
- Yole: Imaging for Automotive 2022
- Omdia: Power Semiconductors in Automotive Report – 2022 Database, 5/26/22
- LMC Automotive: Global Hybrid & Electric Vehicle Forecast - Quarter 4, 2022
- Omdia: Power IC Market Tracker, Sep'22
- Yole: Silicon Carbide Forecast 2023
- Bank of America Research
- Yole: 2022-27 SiC market forecast of 33% CAGR
- TSR: Automotive Camera Market Analysis 2021-2022
- Yole: Status of CMOS Image Sensor Industry 2021 Report

## Markets that matter

- onsemi estimates based on current market projections, excludes Memory

## Sustainable Ecosystem to Drive ~3x the Market Growth

- onsemi estimates based on current market projections

## Fab Right, Revenue by End markets and technology

- onsemi estimates based on current market projections

## Onsemi's Path to net Zero

- Scope 2 Emissions normalized by annual revenue (Metric Tons CO2e per \$ Million Revenue); 2022 GHG data is in progress for limited assurance
- Total Water Withdrawal normalized by annual revenue (Megaliters per \$ Million Revenue)
- Total Waste Generation normalized by annual revenue (Metric Ton Waste per \$ Million Revenue)
- Projected. Energy Savings based on internal estimates

## The Next Milestone: Expand Gross Margin to 53%

- 2027 Target based on onsemi internal estimates

## Market Success Driving Investments

- Capital Efficiency projections based on internal onsemi estimates

## Driving Best in Class ROIC

- Factset
- Company reports, onsemi estimates
- Capital Intensity peer group includes TXN, IFX, Rohm, STM & WOLF
- $ROIC = (\text{Operating income} - \text{Tax}) / (\text{Shareholder equity} + \text{net debt})$

## Accelerating the Financial Model

- 2027 Target based on internal onsemi estimates

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