GaN at the Tipping Point: from Market Expansion to OEM Adoption

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Bodo's Wide Bandgap Event 2025

Making WBG Designs Happen

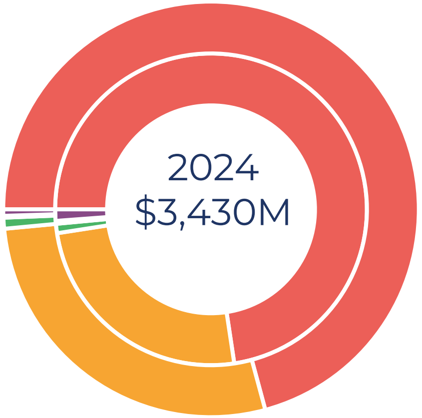
GaN

MARKET FORECAST OF POWER SIC AND POWER GAN

2024 and 2030

2030
$10B
CAGR$_{2024\text{-}2030}$: 20.3%

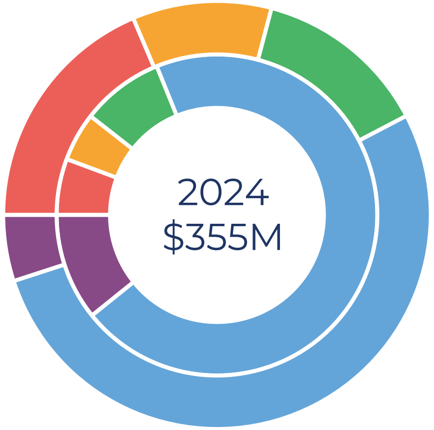
Power SiC



VS

Power GaN

2030
$2.9B
CAGR$_{2024\text{-}2030}$: 42%



- Home appliances
- Mobile fast charging
- Wireless charging
- Audio and Image

Mobile & Consumer

- EV/HEV
- LIDAR in autonomous vehicles
- E-bikes
- E-motorcycles
- Train

Automotive and Mobility

- Data centers, servers
- Base stations

Telecom and Infrastructure

- UPS
- Motor drives
- Industrial power supply
- LIDAR
- DC charging station
- Wind
- Photovoltaics

Industrial

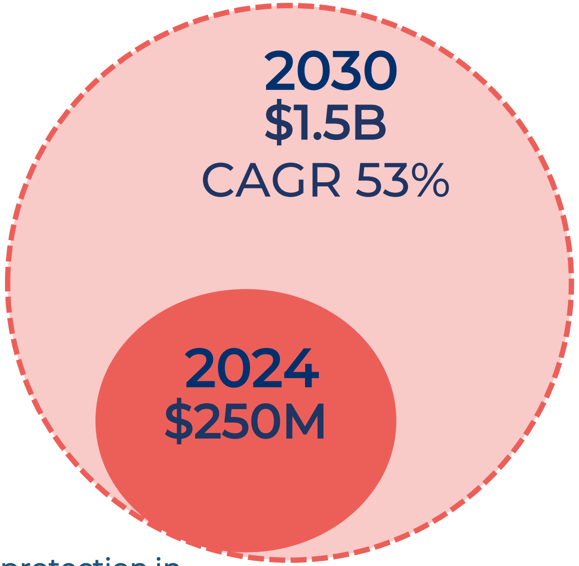
- Defense
- Aerospace applications
- Medical

Others

FOCUS ON CONSUMER

Class D Audio amplifier
Power: ~40-900W
Input voltage: $5V_{DC}$ or $12V_{DC}$

Home appliances power supply, and motor drives
Power: 60W-500W
Voltage: $110V_{AC}$ or $230V_{AC}$



Fast chargers and adapters
Power: ~30-300W
Voltage: $110V_{AC}$ or $230V_{AC}$

Over-voltage protection in smartphones
Input voltage: up to $28V_{DC}$

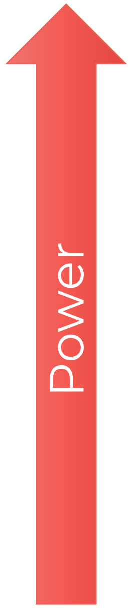
Fast chargers represent 90% of the consumer market in 2024. And are projected to be around 65% in 2030.

All leading consumer OEMs have adopted GaN

500W
Higher GaN content
Up to 4 GaN devices per charger

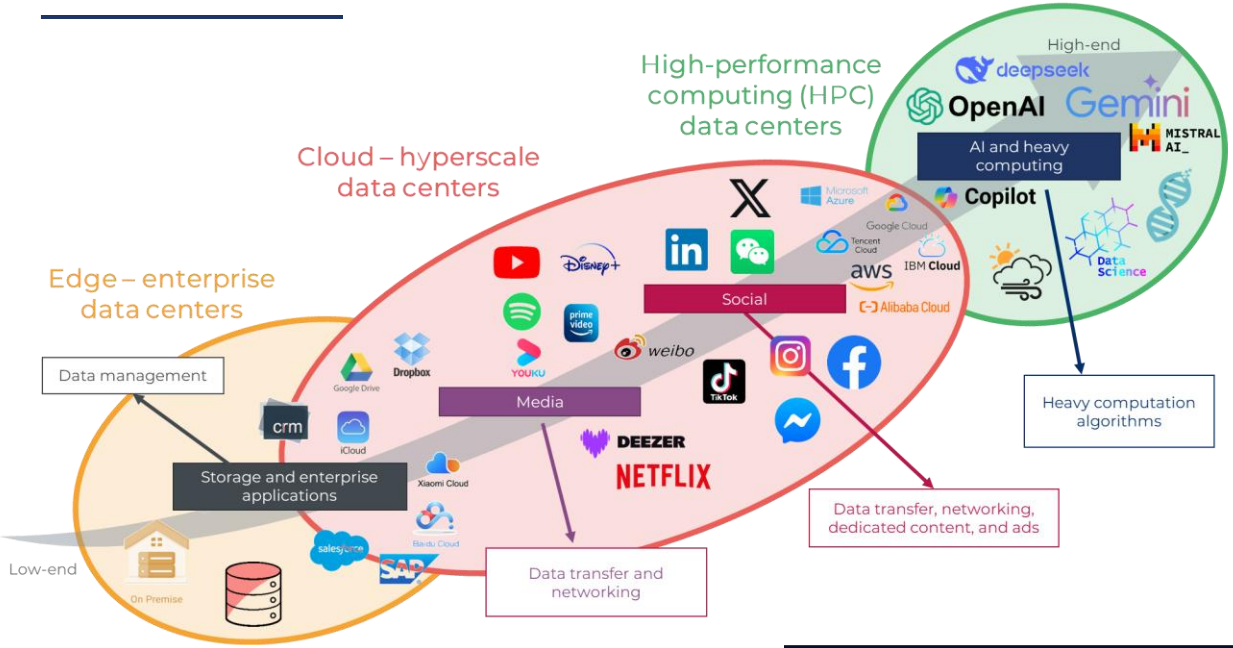
300W

65W



FOCUS ON DATACOM

The Rise of Digital Infrastructure



The need for datacenters keep on increasing

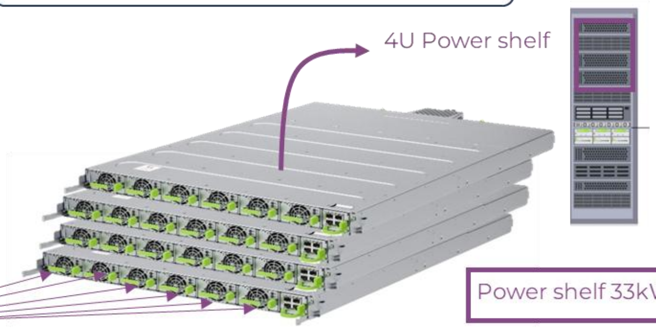
- According to the International Energy Agency (IEA), data centers accounted for 1.5% of the world's electricity consumption in 2024.
- This consumption is set to reach 3% by 2030.

Trend towards higher power capacity

- AI is increasing the power needed traditionally from 15kW or 30kW to 132kW per rack.
- The requirements for an AI rack are nowadays 132kW ➔ 5.5kW per PSU, and 33kW per power shelf.

AI rack

- Each power shelf takes up one rack unit (1U).
- Up to 4U can be paralleled = 132kW.



5.5kW released

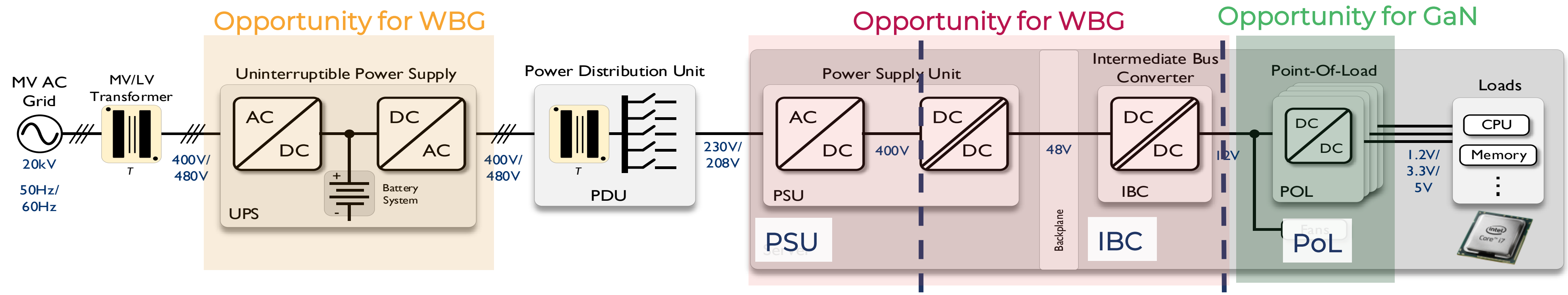
5.5kW announced

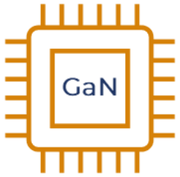
Has GaN components

DELTA, Advanced Energy, LITEON, acbel, VERTIV, muRata

FOCUS ON DATACOM

Could the AI server trend drive significant GaN adoption?





kW level power consumption!

- Higher efficiency
- High switching frequency
- Cost and space reduction

Several players involved

NVIDIA, Navitas, Infineon, Texas Instruments, transphorm, bel Power Solutions & Protection, EPC Efficient Power Conversion

transphorm: Acquired by Renesas in Q3-24

MPS, LITEON, Innoscience 英诺赛科, Schneider Electric, VERTIV, flex, muRata, DELTA, HUAWEI

Strong value proposition:

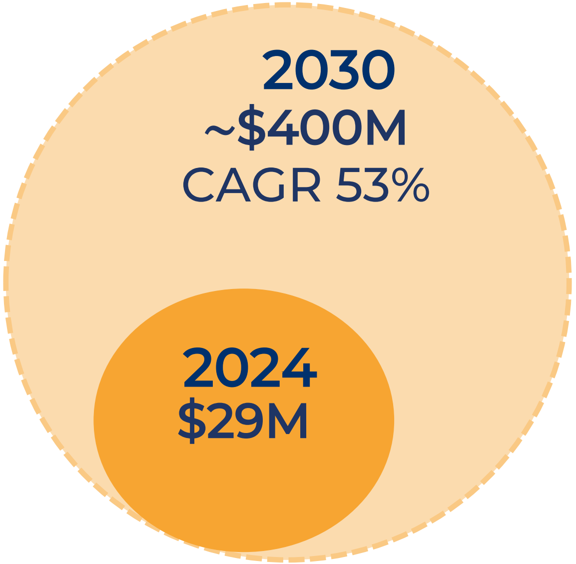
- ✓ Data center profit increase.
- ✓ Data center OpEx reduction.
- ✓ Comply with new regulations.
- ✓ CO_2 footprint reduction.

Combining both SiC and GaN (SiC in PFC stage, and GaN in DC/DC stage) seems to be the most efficient according to WBG players like Infineon and Navitas.

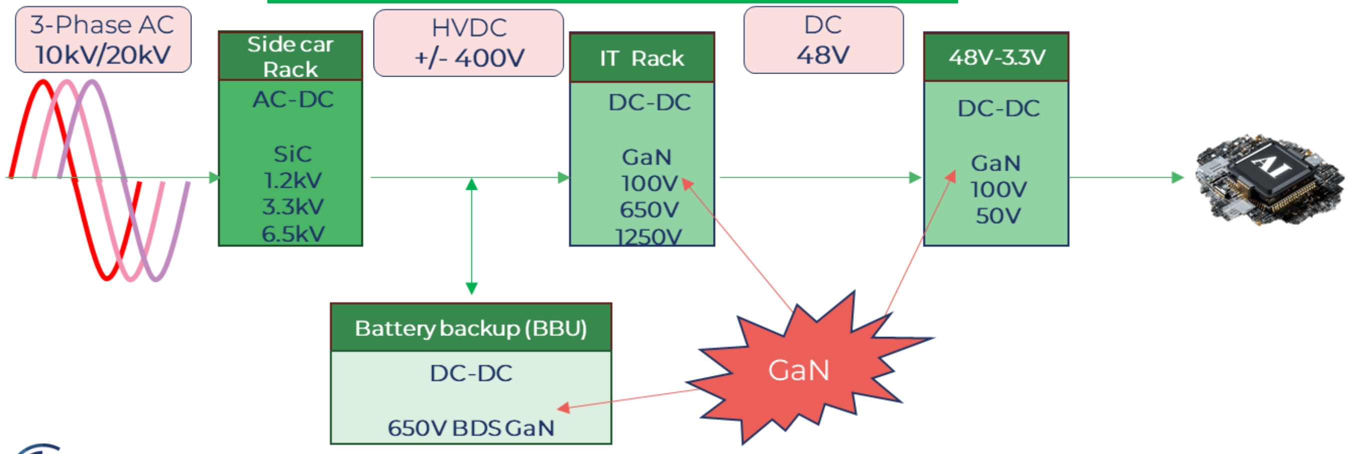
FOCUS ON DATACOM

NVIDIA fueling WBG adoption

Telecom & Infrastructure Market in $M



Next GEN-1 architecture expected end of 2026



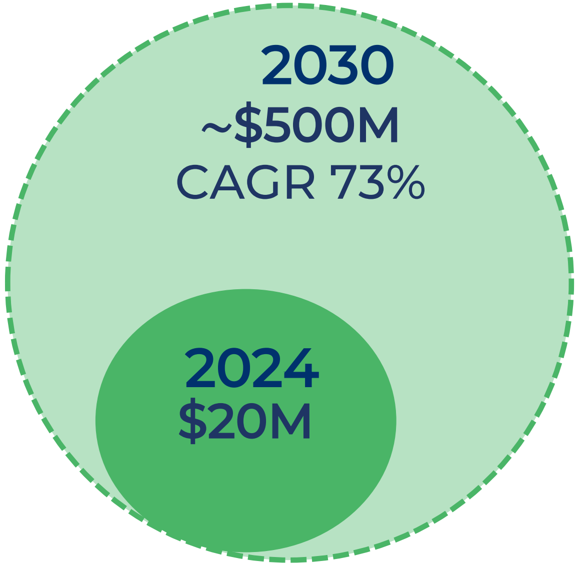
Why 800 V ?

- **Much lower current for the same power**, reducing I² R (heat) losses and dramatically cutting copper weight (45% reduction in copper weight).
- **Higher overall power-distribution efficiency**, thanks to fewer conversion stages.
- **Simplifies power architecture**, centralizing AC-to-DC conversion and reducing the number of components and maintenance points inside racks.
- **Supports megawatt-class AI racks**, enabling higher power density and future scalability.

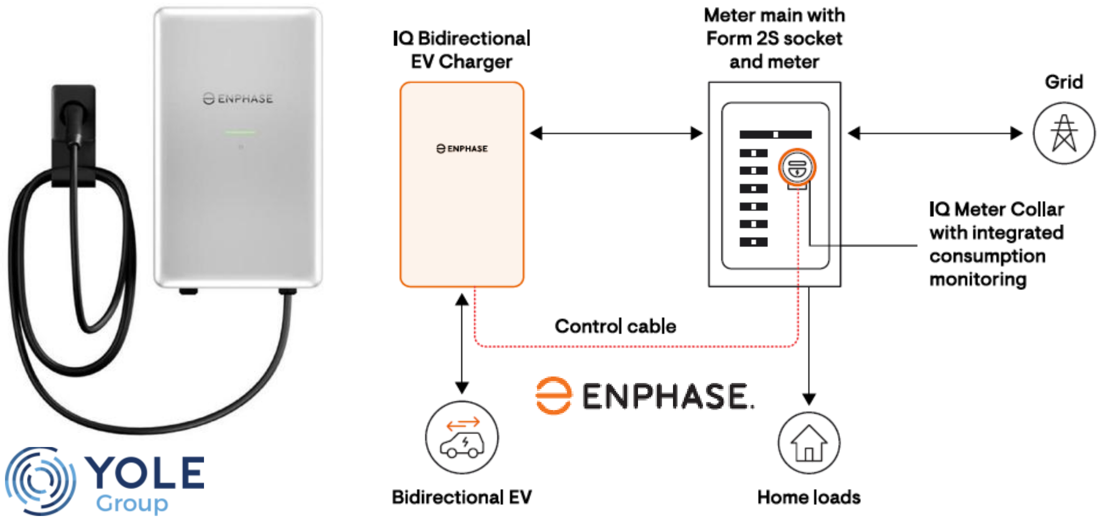
800V creates a potential entry point for GaN, as 650 V and 1250V switches are already commercially available.

FOCUS ON AUTOMOTIVE

Automotive and mobility Market in $M



Enphase vehicle-to-grid solution using GaN BDS
Expected in Q4-2026



In February 2025, Changan Automobile (CN) launched GaN-based OBC using Navitas Semiconductor technology. This OBC is used in the Qiyuan E07 electric car. Mass production is expected in 2025, and product release in 2026.

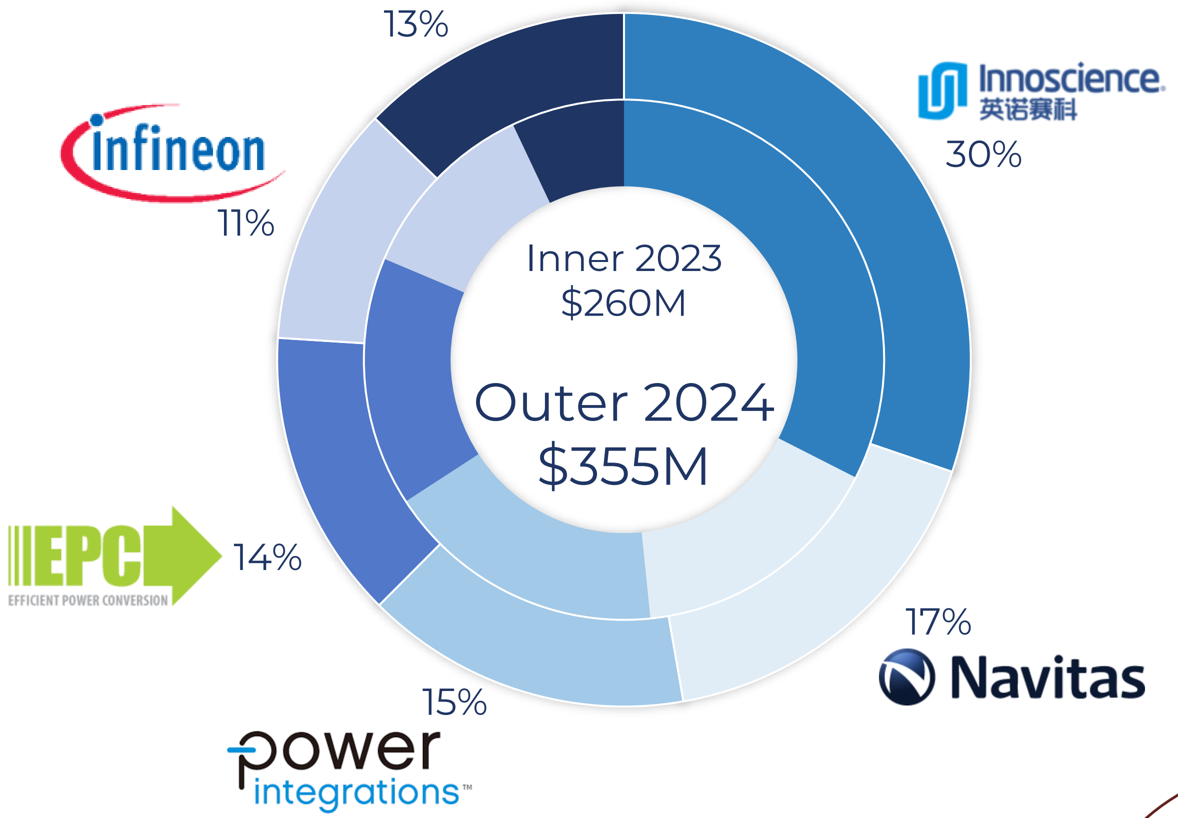
Source: https://www.bilibili.com/

Inovance announced its OBC with GaN, combined with DC/DC, reaching 4.8kW/L.

Sungrow announced its single stage OBC with GaN, reaching 6.1kW/L.

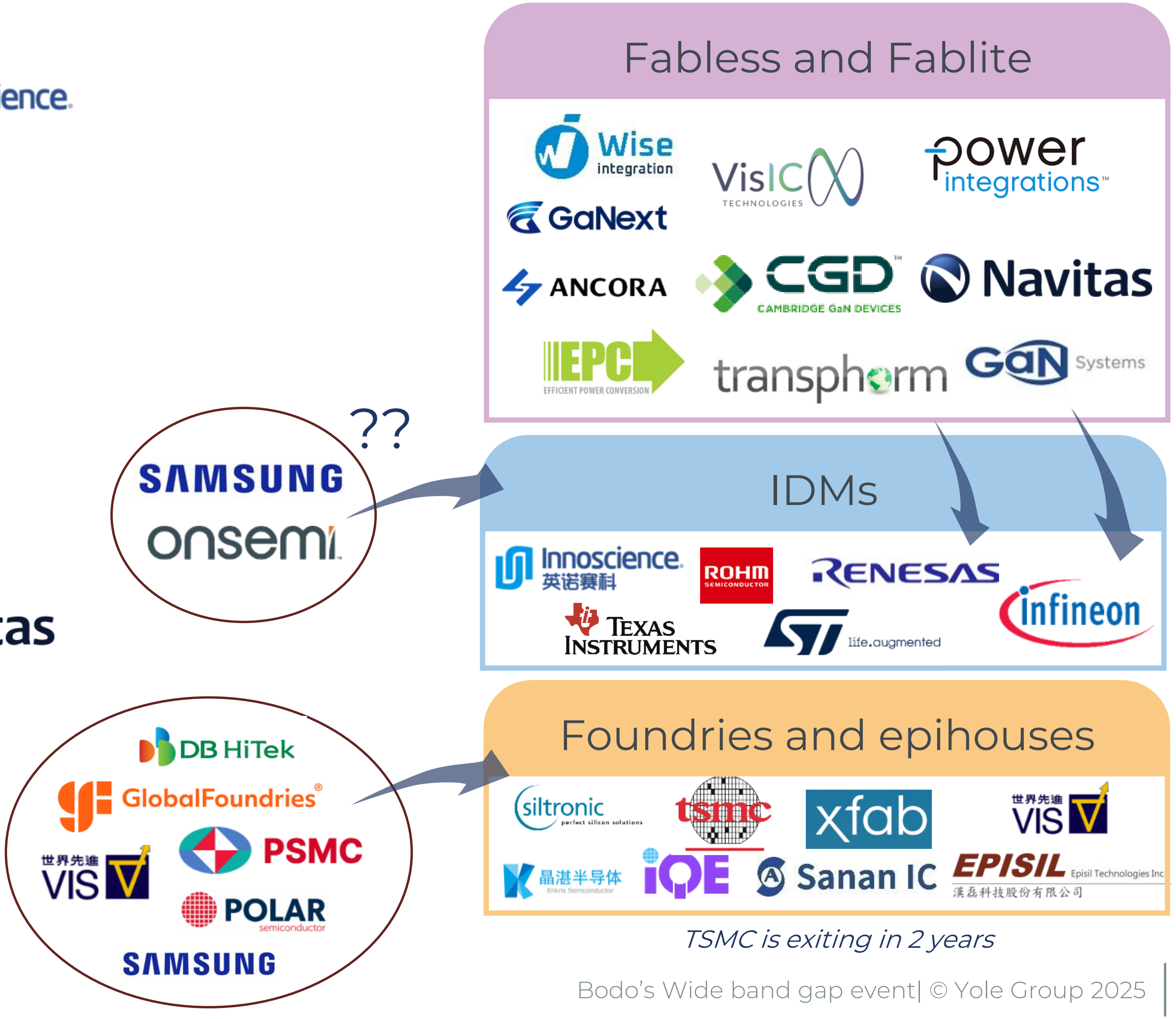
Competition landscape and ecosystem

Others include Renesas (4%), Texas instruments, ROHM, Nexperia…



Over the next 5 years, the ecosystem will be IDM dominant, but still with the coexistence of three business models.

As of Q4-25



TSMC is exiting in 2 years

KEY TAKEAWAYS

- **The power GaN market is projected to reach $3 billion by 2030. Consumer remains GaN's anchor market**, sustaining more than half of total revenues by 2030 as fast charging stays dominant and white-good adoption accelerates.
- **2025 and 2026 stand as a turning point**, marking GaN's transition from early adoption to true mainstream penetration across automotive and datacom.
- **The rise of AI and NVIDIA adoption of WBG propels GaN in datacenters**, with telecom & infrastructure markets growing nearly **10 times from 2024–2030**.
- **Automotive is emerging as a strong second growth engine**, driven by the first commercial GaN OBCs in 2026 and rising activity in off-board charging as promoted by Enphase.
- **The ecosystem is shifting toward vertical integration**, with IDMs steadily taking the lead, but still coexisting with fabless and foundries business models.

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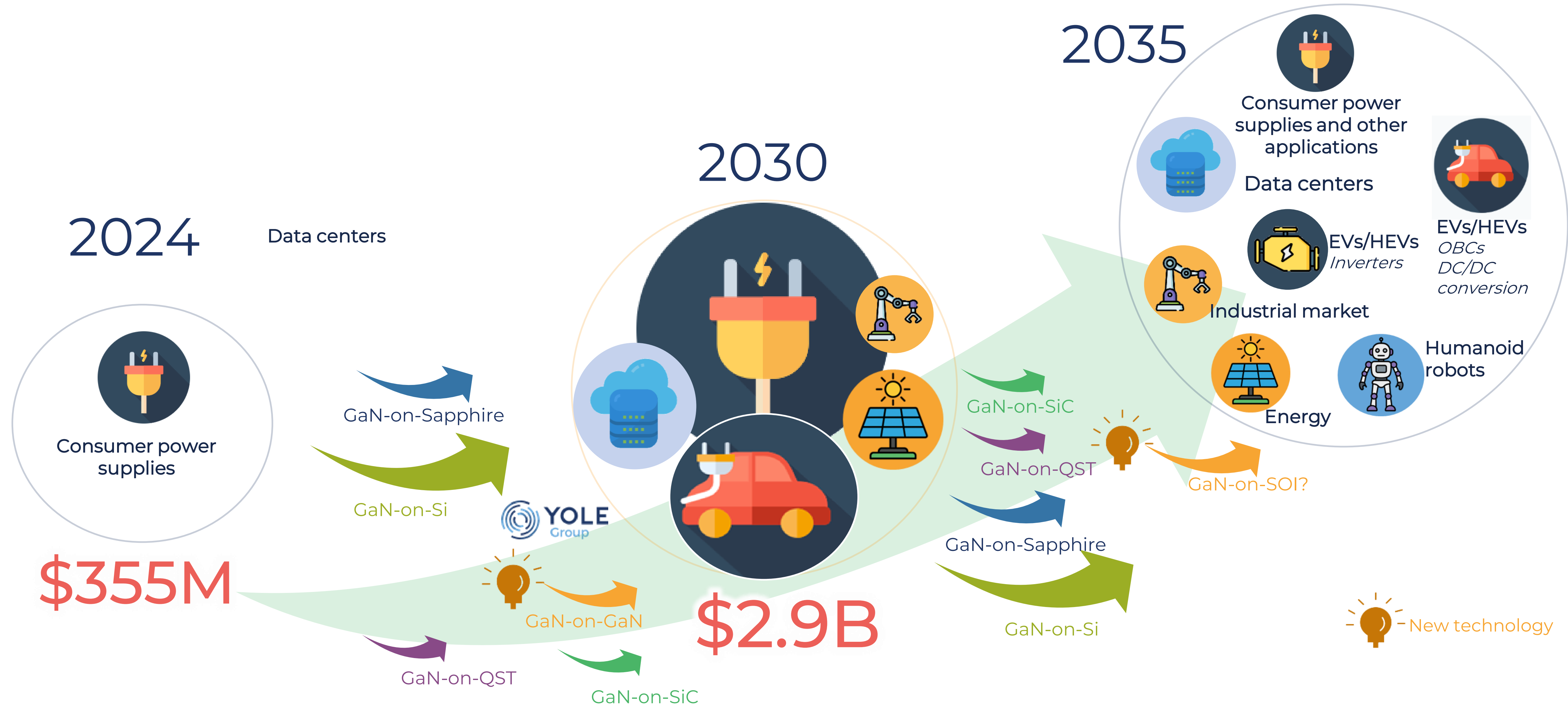
POWER GaN MARKET OUTLOOK



Thank you!

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Power SiC 2025 - Markets and Applications

Automotive Powertrain and Electrification 2025 –

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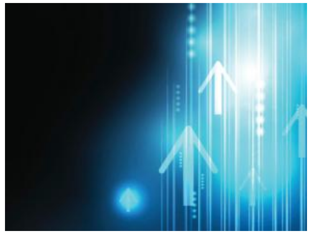
Power Electronics for Data Centers 2025

Power SiC 2025 - Front-End Manufacturing Equipment



Status of the Power Electronics Industry 2025

Power Converters 2025

IGBT 2025

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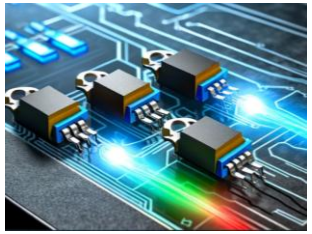
[Power SiC Transistor Comparison 2025]



[SiC MOSFET Discretes Performance Comparison Analysis 2025 Vol 2]

[Humanoid Robots 2026]

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[LiDAR for Automotive 2025]

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Coming soon

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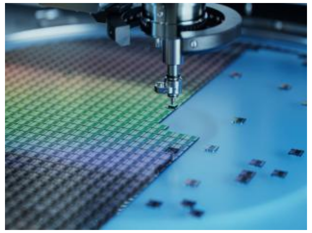
[Power SiC/GaN Compound Semiconductor Market Monitor]



[Semiconductor Back-End Equipment Market Monitor]

[Wafer Data Monitor]

[Semiconductor Equipment Subsystems Market Monitor]

[Wafer Fab Equipment Market Monitor]

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