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US Semiconductors

800V DC Transition Drives Stronger Analog Recovery. Reiterate TXN as Top Pick. Initiate Upside Catalyst Watch on ON Semi.

CITI'S TAKE

In this report, we outline the implications of the 800V DC transition for our analog and connector coverage and assess where we are in the analog cycle. We are most constructive on TXN, driven by expected share gains in data center power starting in 2H26, and continue to favor MPWR on sustained share gains in Enterprise Data and Comms markets. We initiate an upside Catalyst Watch on ON ahead of its Analyst Day on September 16 as we see renewed momentum in its SiC business driven by the 800V DC transition

800V DC transition likely benefits APH, TEL — Given retrofit constraints and 800V supply-chain readiness, we expect CSP-driven ±400V HVDC sidecar architectures to see earlier adoption, followed by NVDA-led 800V sidecars with Rubin Ultra ramps in late 2H27, supporting up to ~1 MW in power. NVDA-led 800V SST-based architectures for >1 MW deployments to scale from 2029, given greenfield data center build requirements. We view connector-related names like APH and TEL positioned to benefit from higher value content driven by system complexity.

GaN leads at the rack; SiC at infrastructure — We expect earlier adoption of gallium nitride (GaN), given its suitability for sub-650V conversion at the server and rack level, while silicon carbide (SiC) is likely better positioned for higher-power, single-stage conversion at voltages above 1,000V within infrastructure-level applications. TXN is among the few high-voltage (>900V) GaN vendors, with internal manufacturing capacity quadrupling since Oct'24, and we view ON as uniquely differentiated with its vertical GaN offerings.

Expect >70% CAGR for the power delivery market — We estimate a >70% CAGR for the power delivery market (800V-to-1V conversion) from ~$2B in 2026 to ~$12B by 2028, driven by rising power requirements for next-gen GPU/ASIC chips and a shift toward more integrated designs, including increased use of GaN & SiC. Current incumbents include Infineon, Monolithic Power, and Renesas, and we believe TXN is poised to gain share in 2H26. ADI's pending acquisition of Empower Semiconductor could strengthen its position in the power delivery market for next-gen platform.

Analog recovery should still have runway — Unit volumes remain ~30–40% below prior peaks with limited signs of restocking. Mature-node utilization has recovered to ~80% and is approaching the 85–90% optimal range. Broad-based price increases across lagging-edge foundries and analog suppliers, alongside stronger data center demand, should extend the analog upturn, in our view.

Raising estimates and TPs on TXN and ON— We raise our estimates and price targets on TXN ($280 to $345) and ON ($100 to $120), primarily driven by recent price hikes and a stronger analog recovery, underpinned by ~30% CAGR from data center demand for analog and power semis.

Key Sector Debate — Can growing data center sales exposure drive higher P/E? Based on company commentary, we estimate data center-related sales for the analog companies to grow ~86% YoY from ~$9B to ~$17B in 2026 and grow at a ~30% CAGR from 2025 through 2030. We see potential for multiple re-rating as data center or AI-related exposure rises to ~20% of sales.

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See Appendix A-1 for Analyst Certification, Important Disclosures and Research Analyst Affiliations.

Data Summary

						Rating		Short-Term	Target Price						Current Fiscal Year EPS		Next Fiscal Year EPS	
Company	Ticker	Ccy	Price	Mkt Cap (M)	Date & Time	Old	New	View	Old	New	ESPR (%)	Div Yld (%)	ETR (%)	Last Rpt Yr	Old	New	Old	New
ON Semiconductor	ON	US$	116.79	45,770	12 Jun 16:00	2	nc	Upside^	100.00	120.00	2.7	0.0	2.7	Dec-25	3.04	3.07	4.14	4.64
Texas Instruments	TXN	US$	301.12	274,047	12 Jun 16:00	1	nc	-	280.00	345.00	14.6	1.9	16.5	Dec-25	7.97	8.03	9.98	10.10

1 = Buy, 2 = Neutral, 3 = Sell, H = High Risk
ESPR = Expected Share Price Return, ETR = Expected Total Return, nc = no change
Source: Citi Research
^Catalyst Watch

800V DC Transitions Drives Stronger Analog Recovery

In this report, we outline the implications of the 800V DC transition for our analog and connector coverage and assess where we are in the analog cycle.In summary, we estimate data center–related sales for analog companies to grow ~86% YoY, from ~$9B to ~$17B in 2026 and forecast the data center analog and power semiconductor TAM to reach ~$35B by 2030, or a ~30% CAGR from 2025. Our estimates are largely driven by ~19% CAGR in AI data center deployments from ~9 GW to ~21 GW. Over the same period, we model blended analog semiconductor content to grow at ~13% CAGR, as 800V DC transitions necessitate additional power conversion and protection, alongside content gains from architectural changes and adoption of wide-bandgap materials.

In our view, the current environment in the analog industry resembles the 2021–2023 period, as capacity tightness at the leading edge eventually spills over into mature-node capacity due to de-prioritization. Mature-node utilization rates have recovered to ~80% and are approaching the optimal range of ~85–90%. Both lagging-edge foundries and analog semiconductor suppliers have also begun raising prices across the board. We believe the analog cyclical recovery still has room to run, as unit volumes remain 30–40% below prior peaks.

In conclusion, we see a stronger analog upturn versus the prior cycle, driven by higher analog and power semiconductor content from the multi-year 800V DC transition. Within our analog coverage, Texas Instruments remains our top pick, followed by Monolithic Power.

Figure 1. US Analog Semiconductor Ranking

Rank	Company	Rating	Current Price	Old Price Target	New Price Target	Investment Thesis
1	Texas Instruments	Buy	$301	$280	$345	Highest Internal Manufacturing to Capture Cyclical Upside; Share Gains in Data Center Power
2	Monolithic Power	Buy	$1,577	$1,820	$1,820	Share Gains in Enterprise Data/Comms
3	Analog Devices	Buy	$418	$460	$460	Highest Quality Growth with 20% AI-Related Exposure
4	Microchip	Buy	$95	$113	$113	Analog Recovery; Pricing Upside
4	NXPI	Buy	$305	$270	$270	Awaiting Auto Inventory Replenishment; Valuation Discount
6	ON Semi	Neutral	$117	$100	$120	Highest Gross Margin Upside with Emerging Data Center Strength

Source: Citi Research. *Rankings could change based on company results, risks, and other factors.

Source: Citi Research, dataCentral. Note: Data based on Jun 12, 2026 close.

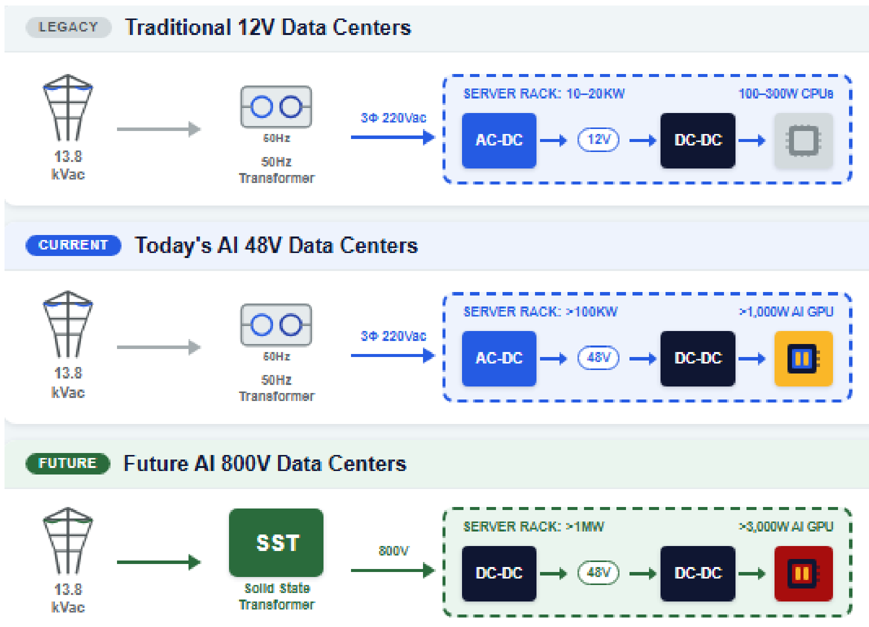
Section 1: Power Conversion from Grid to Core

Data centers are moving to 800V DC...

In the early 2010s, Google pioneered the shift from traditional 12V server architectures to 48V DC power distribution, improving efficiency and enabling rack densities to scale from ~10 kW to ~100 kW. The 48V architecture subsequently became the industry standard.

However, the rapid rise of AI workloads has exposed physical limits, particularly around current levels, copper requirements, and thermal losses, as rack power exceeds 100 kW and climbs toward 1 MW. Data centers must move toward higher voltages, driven by a core principle: higher voltage results in lower current for the same power, and lower current means thinner cables, less heat loss, and fewer power conversion stages.

Figure 2. 48V Data Centers are Transitioning to 800V Data Centers



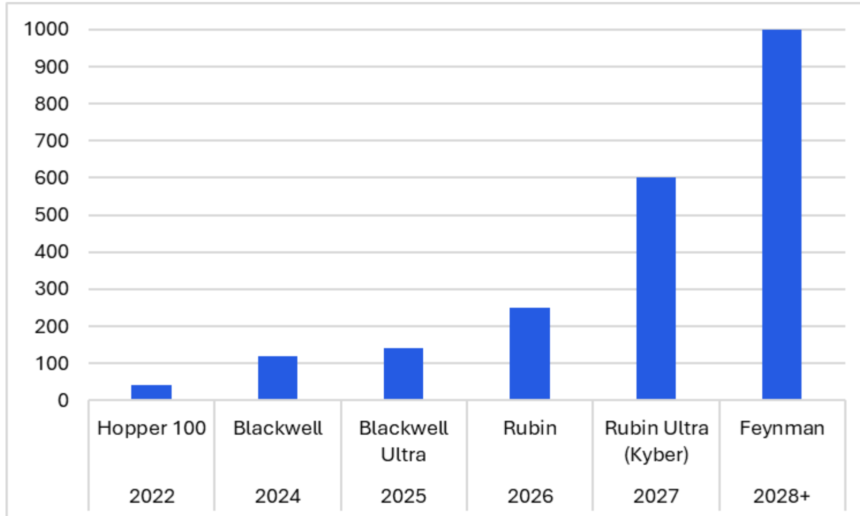
Source: Citi Research

...as power per rack is quadrupling to 600kW in Rubin Ultra

As shown in the chart below, power per rack is doubling from roughly 120–130 kW today to 250 kW in 2026 with the ramp of Vera Rubin NVL 144, quadrupling to 600 kW in 2027 with the rollout of Rubin Ultra NVL 576, and exceeding 1 MW by 2028 with the Feynman platform.

Copper busbars that move electricity from power shelves to compute trays are hitting physical limits as racks exceed 200 kW. According to Gartner, delivering 1MW at 54V would generate currents exceeding 18,000 amps, requiring over 200 kg of copper busbar per rack. As a result, CSPs and NVIDIA are exploring various high-voltage direct current (HVDC) architectures, such as ±400V HVDC or 800V HVDC, as alternatives to the 48V data center architecture.

Figure 3. Power Per Rack Increase from 125kW to 600kW in 2027 and Eventually to More Than 1MW



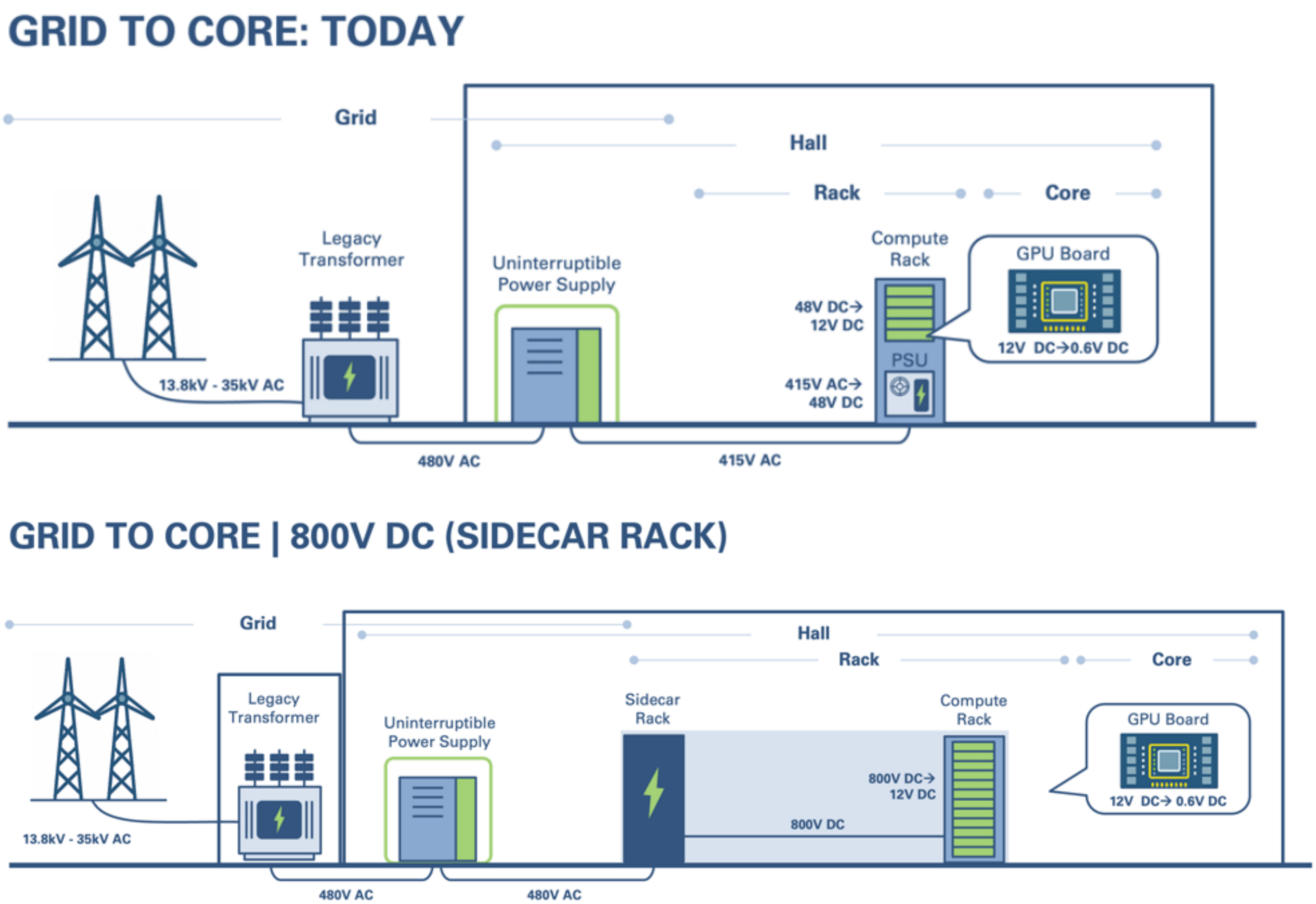
Source: Citi Research, NVDA

a) HVDC System Architectures

There are broadly two emerging high voltage direct current (HVDC) approaches in AI data centers: 1) bipolar ±400V HVDC and 2) monopolar 800V HVDC. While both are often described as "800V," they are fundamentally different architectures and have different implications for semiconductor suppliers.

As shown in the chart below, the transitional 800V DC (includes both ±400V or +800V) uses a "sidecar rack" while native 800V involves solid-state transformer (SST). The sidecar implementations can support rack power densities of approximately 250kW to 1MW, making them suitable for near-term AI deployments from 2027 onwards, while SST-based architectures are designed for >1MW racks, reflecting a more scalable but also more complex solution, with meaningful deployment expected around 2029–2030. Please refer to virtual call for details: Virtual Call with Data Center Infrastructure & SST Experts: Video Webcast

Figure 4. Grid to Core Infrastructure – Current Architecture vs 800V DC with Sidecar Rack



Source: Renesas

i) ±400V HVDC, Sidecar Rack (CSP-Driven)

The Open Compute Project's (OCP) "Mount Diablo" architecture is an initiative led by Meta, Google, and Microsoft to transition data center power delivery from 48V–54V to bipolar ±400V HVDC, to support high-density AI racks. We believe the sidecar implementation can support racks from 250kW to 1MW.

We believe ±400V HVDC will likely be the first HVDC architecture to see broad deployment, emerging in hyperscaler-led environments, particularly NVDA MGX rach architectures, in-house ASIC systems and OCP-driven HVDC deployments. A key enabler of this early adoption should be its compatibility with existing 48V–54V DC power distribution systems, meaningfully reducing deployment risk. This makes ±400V HVDC a flexible transition solution that could support mixed-voltage environments, allow for gradual infrastructure upgrades, maintain backward compatibility with existing 48V servers, and provide a clear migration path toward future 800V architectures.

Implications to Semiconductors: ±400V HVDC is a bipolar architecture using a +400V rail and a −400V rail, creating an 800V differential while keeping each rail at only ~400V relative to ground. We believe GaN should see increased adoption as the voltage stress on a single GaN device does not exceed 650V. This architecture also leverages the mature and cost-competitive 650V GaN power semiconductor ecosystem that was designed for the EV industry.

ii) +800V HVDC, Sidecar Rack (Nvidia-Driven)

Monopolar ~800V HVDC architectures with a sidecar rack are likely to ramp alongside Rubin Ultra deployments. Unlike ±400V systems, this approach utilizes a single ~800V rail referenced to ground, representing a meaningful step-up in distribution voltage. While the 800V monopolar sidecar architecture offers some degree of retrofit compatibility, adoption may be more gradual given the infrastructure upgrades required across most existing data centers, as well as ecosystem readiness constraints.

Implications to Semiconductors: In this configuration, 650V-class devices are generally inadequate, necessitating a transition to 900–1200V class semiconductors, including higher-voltage GaN and SiC solutions. TXN is one of the few established high-voltage GaN suppliers. In addition, the shift to monopolar 800V entails a more fundamental redesign of the power ecosystem. Key components, including power semiconductors, gate drivers, controllers, capacitors, magnetics, connectors, and insulation systems, must be requalified for higher-voltage stress and more stringent fault-handling conditions

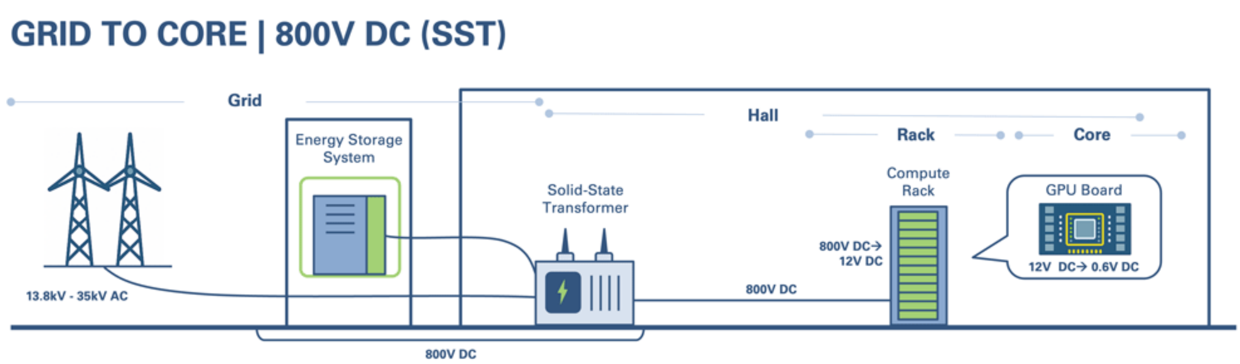
iii) +800V HVDC, SST (Nvidia-Driven)

SST-based 800V architecture represents a true system-level reset, requiring new infrastructure and tighter integration between the utility input and IT load, as high-voltage conversion is pushed closer to the grid interface.

In this configuration, medium-voltage AC (e.g., 13.8 kV–35 kV) is converted directly to regulated ~800V DC using a solid-state transformer (SST), effectively collapsing multiple stages such as traditional transformers, UPS systems, and rectification into a single, highly integrated power conversion layer. **We believe SST-based 800V architectures are primarily suited for greenfield data center deployments, with meaningful deployments likely from 2029 onwards**, given the fundamental redesign required across power distribution, protection, and facility infrastructure.

Implications to Semiconductors: Silicon carbide (SiC) should likely see significant adoption at the infrastructure and grid layer, including in central rectifiers, high-density power shelves, and solid-state transformers (SSTs), where high-voltage capability and efficiency are critical. We believe key SiC suppliers positioned to benefit include Infineon, STMicroelectronics and ON Semi.

Figure 5. Grid to Core Infrastructure – 800V DC (SST), Broad Deployment Expected from 2029 Onwards



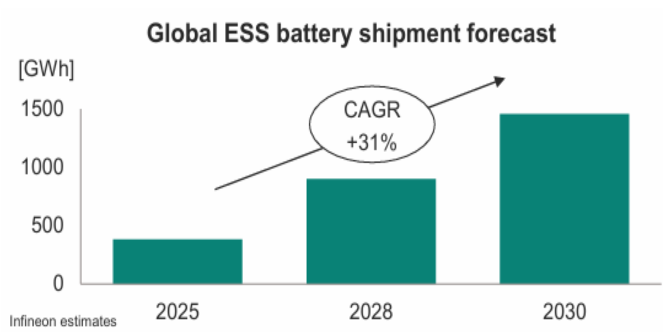
Source: Renesas

~$2B Incremental Revenue Opportunity for Analog Semis

The HVDC transitions from the grid to the data center are largely classified within the Industrial end market for semiconductor companies. The three main semiconductor content opportunities are in energy storage systems (ESS), solid-state transformers (SST), and solid-state circuit breakers (SSCB).

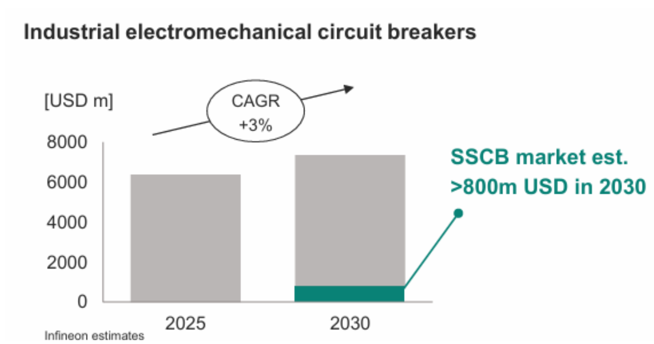
Infineon estimates semiconductor content for energy storage solutions (ESS) at roughly $2,500 per MW, with global ESS shipments growing at a 31% CAGR from 2025 to 2030. ON Semi noted that its ESS business grew at a 40% CAGR over the past five years and that it holds roughly 60% market share. Assuming approximately 10-20 GW of incremental builds per year, the ESS market is around $25-50M. Infineon estimates the SST market at roughly $1 B by 2030 and the SSCB market at more than $800M in 2030. In summary, the incremental revenue opportunity could be ~$2B, representing ~2% of the ~$100B Industrial semiconductor TAM. We see the 800V transition's impact on the Industrial end market for the analog companies as limited over the next 24 months.

Figure 6. ESS Battery Shipment Forecast



Source: Infineon

Figure 7. Solid-state Circuit Breakers Forecast



Source: Infineon

APH and TEL are Positioned Favorably

Given a wide array of power interconnects, power distribution busbars, high-power cable assemblies and complex multi-branch harness systems connectors, power distribution and thermal management units, **we view connector-related names like APH and TEL as favorably positioned to benefit from this transition as well.**

The transition to 800V DC power should drive more specialized and higher value-added power distribution and connectivity componentry that should sustain robust growth momentum in their datacom/data network segments. Amphenol has noted on its recent earnings call that higher complexity of these AI systems (higher voltage, transmission speeds, higher densities) is beneficial as it drives "more of everything" with Amphenol very well positioned with broad offerings and broadest abilities to address these challenging tradeoffs.

In tandem, TEL has noted that the transition to higher rack power (as well as higher data needs) is a driver for the 50%+ CAGR growth expectations (FY25-FY27) for its DDN segment with power connectivity representing ~25% of segment revenues and the shift to 800V could drive 30%+ content increase vs today, underpinned by the need to create a separate power architecture going from the board, whole new busbars, and liquid cooling. Additionally, TEL has also highlighted the 800V transition as a positive for its energy business where trends are favoring grid hardening and power connections that come into the datacenter, representing ~66% and ~20% of its energy business, respectively.

Figure 8. Datacenter exposure for APH and TEL

	C25	% of Sales	Commentary
APH	$8.4B	36%	AL revenues to represent 50% of IT datacom revenues
TEL	$2.5B	14%	AI & Cloud revenues represent ~64% of data networks revenues, power is ~25% of data networks revenues; AI expected to grow by 50%+ CAGR F25-F27. Energy segment is an additional 9% of sales; 66% related to grid hardening and 20% related to power connections coming to data center

Source: Citi Research

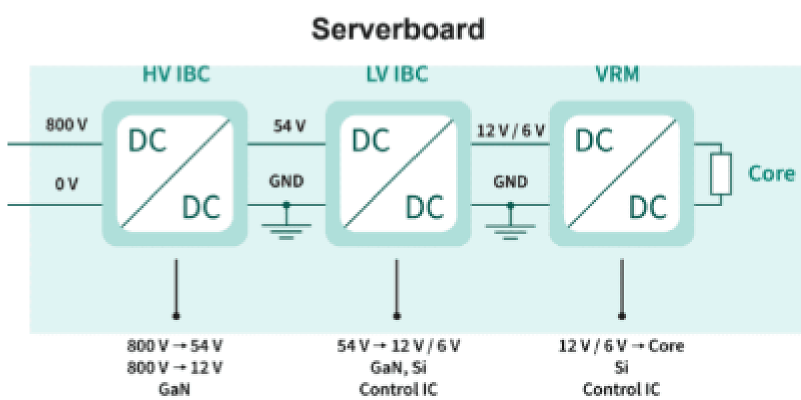
b) Rack/Server Layer

Mirroring the transformation occurring at the system level, the rack/server layer is undergoing a parallel re-architecture across two key dimensions: 1) the number of power conversion stages, spanning three-stage to two-stage delivery architectures, and 2) the physical implementation of the voltage regulator module (VRM), ranging from lateral board-level designs to vertical and on-package integrated solutions. Revenues from this layer are classified in the Data Center end market of the analog companies.

i) Power Conversion Stages

As shown in the chart below, Stage 1 refers to 48V/54V → 12V in today's servers or 800V → 12V/6V in next-generation platforms while stage 2 conversion refers to the 12V/6V → sub-1V.

Figure 9. 800V Step Down Power Conversions



Source: Infineon

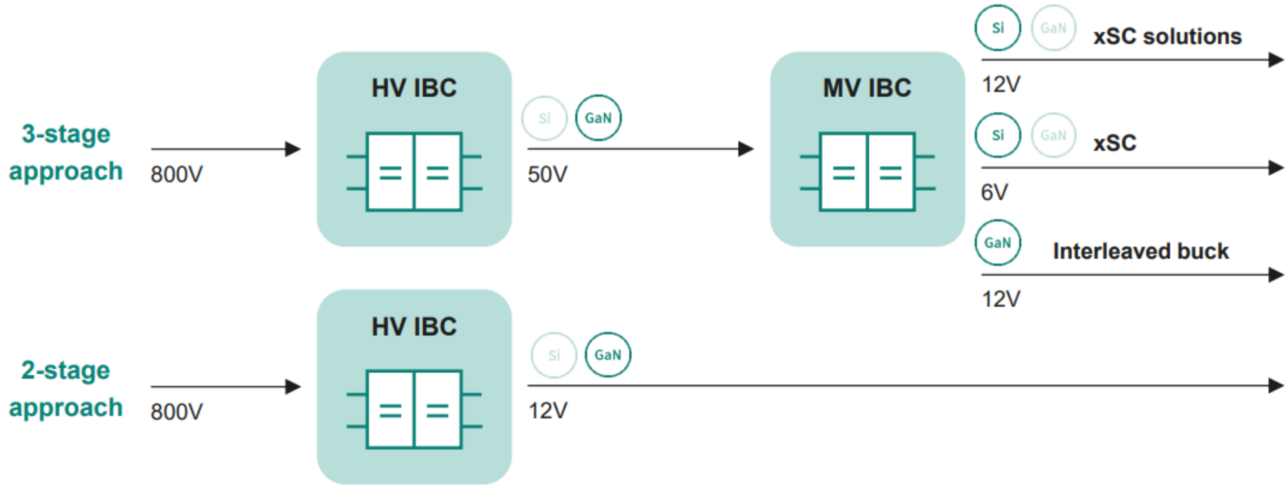
a. **Current approach (48V/54V → 12V → sub-1V) –** Current data center converts 48V-54V to 12V intermediate bus voltages, and eventually down to sub-1V to critical components like CPUs and GPUs. Only silicon-based components are used in this stage.

b. **Three-stage approach (800V → 48/54V → 12V → sub-1V, likely 2H27 onwards) –** We expect the three-stage approach to be adopted first, as it leverages the existing 48–54V/12V ecosystem and mature voltage regulator module (VRM) designs, enabling better controllability and faster deployment.

We believe it is primarily silicon-based, with GaN increasingly used at the intermediate (~48–54V) stage, as shown in the chart below. This approach is likely transitory, as the multiple conversion stages result in higher component count, cost, and cumulative conversion losses. We believe NVDA's Rubin Ultra could be deploying the three-stage approach first.

c. **Two-stage approach (800V → 12V or 6V → sub-1V, longer-term) –** Over time, 2-stage direct conversion should gain traction as this approach eliminates the intermediate stage, enabling direct HV conversion and reducing system losses, component count, and footprint. However, it requires GaN/SiC devices and tighter thermal or control design. As such, we view this as the long-term architecture to be adopted with 800V-native, high-density AI systems, sometime in late 2028, likely along in NVDA's Feynmann architecture.

Figure 10. 2-stage vs 3-stage approaches



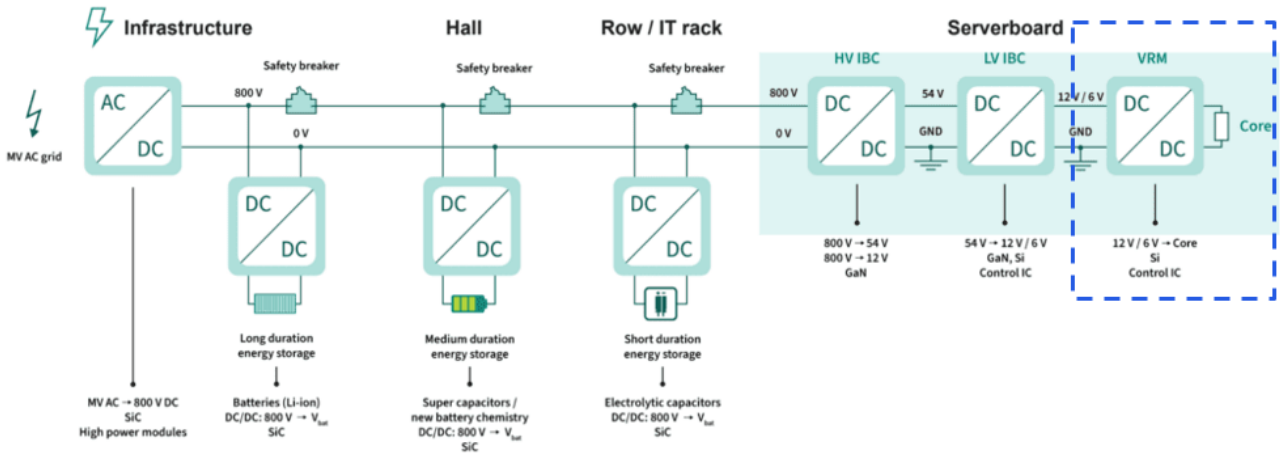
Source: Infineon

ii) Voltage-Regulator Module

The voltage-regular module (VRM), or the point-of-load (PoL) layer, sits right next to the GPU/ASIC and performs the most difficult conversion in the entire power tree, delivering sub-1V power at extremely high current (1800-2500A) directly to the GPU/ASIC chip as shown in the dotted blue section in the chart below.

We believe the VRM layer will remain the largest semiconductor layer, **at roughly 60% of the entire power semiconductor content and that it will likely remain on silicon**. VRM content growth is largely an integration premium story where the greatest dollar uplift comes from solutions that consolidate multiple discrete components into a single module or shift voltage regulation onto the processor package itself.

Figure 11. Voltage Regulator Module

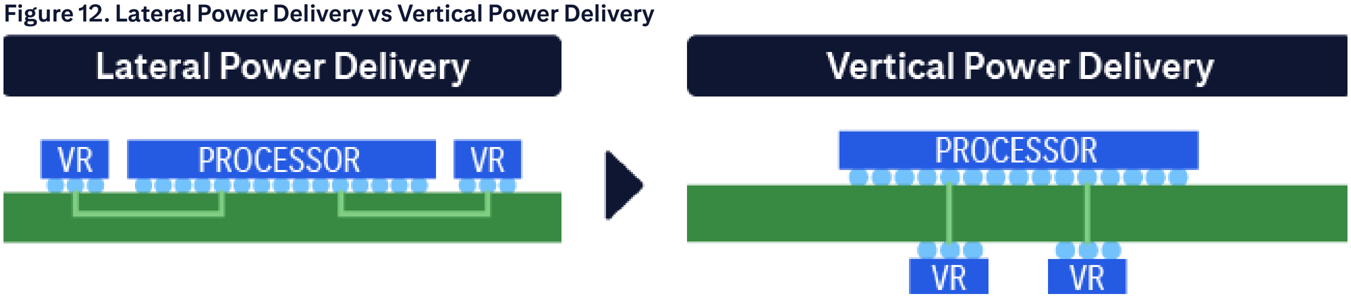


Source: Infineon

Voltage-Regulator Module Implementation:

a. **Lateral power delivery using discretes (2023-2026+)** – Voltage regulators are placed on the PCB beside the processor, with power flowing down into the board, laterally across traces, then back up into the chip, creating long current loops and higher resistance/inductance losses. We note that NVDA Rubin and Rubin Ultra architectures remain on lateral power delivery largely due to cost considerations.

Figure 12. Lateral Power Delivery vs Vertical Power Delivery



Source: Citi Research, Semiconductor Engineering. https://semiengineering.com/voltage-regulation-moves-into-the-package/

b. **Vertical power delivery using modules (2025-2028+)** – Regulators are moved underneath or directly below the processor (backside of PCB), shortening the current path from centimeters to millimeters and reducing routing losses. As shown in the chart below, vertical power delivery becomes increasingly relevant as GPU TDP approaches ~1,000 W, where sub-1 V operation implies kiloamp-scale currents (i.e., ~1,000 A+), stressing conventional lateral power delivery. Both Infineon and MPWR have stated that **content for vertical power delivery module is at least 3X more than lateral discrete solutions**. We believe MPWR has been shipping vertical power modules to Google in 2025 and expect AWS and AMD to adopt increasingly more vertical power modules in 2026

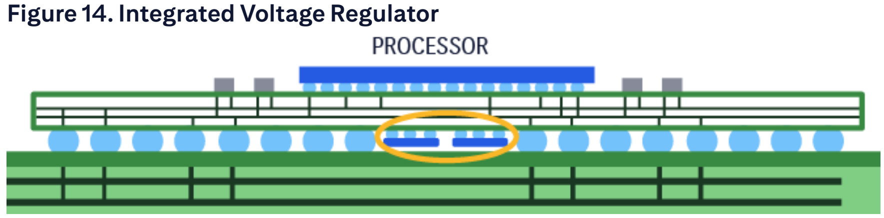
Figure 13. NVDA GPU Platforms and Power Requirements

Year	Platform	GPU Architecture	GPU Dies per Rack	Approx. Individual GPU Power (TDP)	Approx. Rack Power
2022	H100 Systems (assume 4U servers)	Hopper	32	**700W**	~40 kW
2024	Blackwell NVL72	Blackwell	144	**1,000-1,200W**	~120 kW
2025	Blackwell Ultra	Blackwell Ultra	144	**1,400W**	~130 kW
2026	Rubin NVL144	Rubin	144	**1,800W**	~250 kW
2027	Rubin Ultra NVL576 (Kyber)	Rubin Ultra	576	**3,600W**	~600kW
2028+	Future Systems	Feynman	TBD	**TBD**	~1,000+ kW (TBD)

Source: Citi Research, Nvidia

c. **Integrated voltage regulator (2028 onwards)** – Voltage regulators are co-packaged within or on the chip substrate, minimizing the distance to near-zero and enabling micron-scale power delivery loops. Given the tight integration, the engineering process likely needs to happen at least 1-2 years before production ramp. ADI's pending acquisition of Empower Semiconductor, is a key pure play in integrated voltage regulators, with ADI noting initial design wins expected in 2H26. We note that MPWR is partnering Marvell on co-packaged IVR solutions, while TXN has indicated comparable IVR capabilities.

Figure 14. Integrated Voltage Regulator



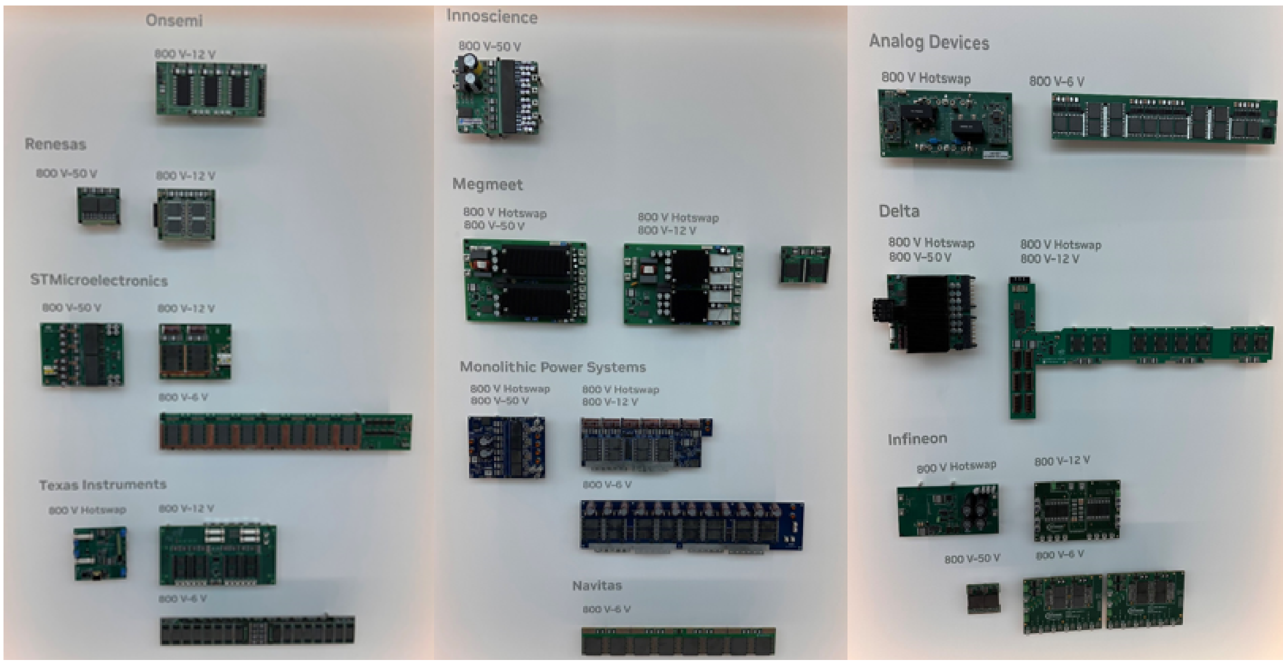
Source: Citi Research

Power Delivery Market Share Dynamics

MPWR dominated the GPU voltage regular module market in 2023–2024, with near sole-source positioning in Hopper platforms. From late 2024 to 2025, NVDA shifted to multi-sourcing, adding Infineon and Renesas alongside MPWR in the Stage 1 and Stage 2 (VRM) power delivery market. In 2026, in addition to the three incumbents, we believe TXN and ON Semi are also in the qualification stage for Rubin and Rubin Ultra for Stage 1 and Stage 2 sockets given an increasingly tight supply chain. **We believe MPWR has gained some share in Stage 2 and TXN appears on track to begin ramping in 2H26 for Stage 1 and Stage 2 sockets in Rubin GPUs.**

Within the Stage 1 and 2 power delivery market, we believe growth is mainly driven by 1) rising thermal design power (TDP) per GPU, 2) integration premiums and 3) transition into wide-gap materials. However, we believe content uplift does not scale linearly with TDP and is likely tempered by the structural dynamics of the power semiconductor industry. The power delivery market operates on standardized footprints and specifications, to enable component interchangeability and supply assurance for hyperscalers and NVDA. As a result, the supplier landscape is fragmented with ~11 vendors as shown in the chart below and there are instances of cross-supply (e.g., Delta sourcing semiconductors from Infineon). This dynamic is likely to limit pricing power for analog vendors and caps the degree to which integration premiums can be fully captured.

Figure 15. 2026 GTC 800V Solutions by 11 Suppliers



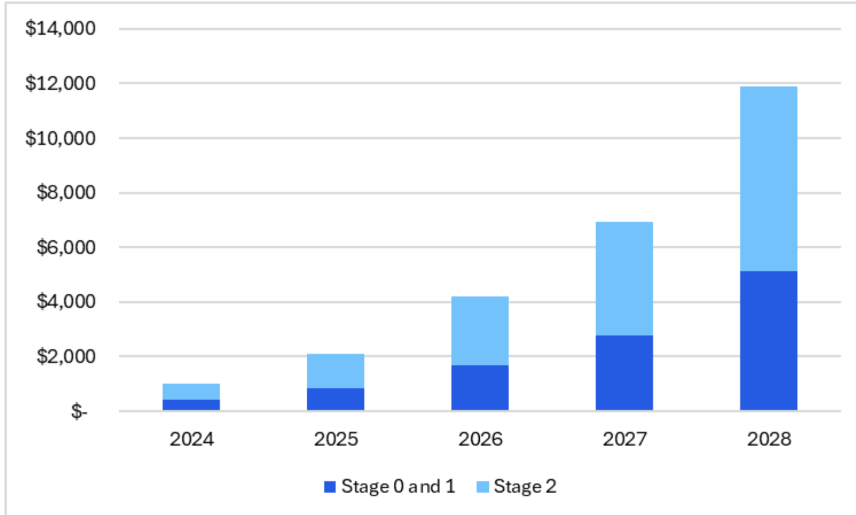
Source: Citi Research, GTC 2026

Potential GPU Power Delivery Market TAM of $12B

We estimate the rack-level GPU power delivery TAM (800V to sub-1V conversion) to grow at a ~75% CAGR, expanding from roughly $2B in 2025 to ~$12B in 2028, with Stage 2 (sub-1V conversion) accounting for roughly 60% of the content. Key suppliers in this market are Infineon, MPWR, Renesas with TXN positioned as the relative share gainer, in our view.

Within the CPU VRM market, TXN is a key supplier alongside Infineon and MPWR. As CPU demand rises with the adoption of agentic AI, we believe this dynamic should create incremental opportunities for the power delivery market as well.

Figure 16. GPU Power Delivery Semiconductors TAM



Source: Citi Research

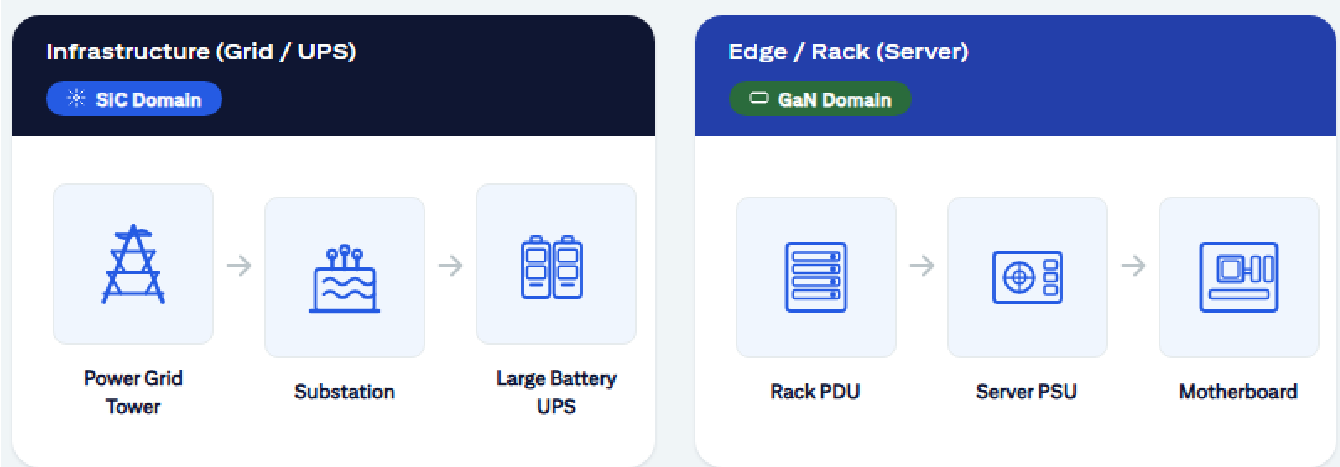
Section 2: Silicon Carbide vs Gallium Nitride

We believe silicon carbide and gallium nitride could reshape AI data center power architectures. In summary, GaN is likely to be preferred for sub-650 V conversion stages at the server and rack level, while SiC is better suited for high-power, single-stage conversions at voltages above 1,000V within the infrastructure-layer. However, this boundary is increasingly fluid, as cost dynamics and technological advancements in GaN are blurring the lines between GaN and SiC applications. **We like TXN and Infineon's GaN exposure and 300mm manufacturing scale, and favor ON Semi for its SiC and vertical GaN capabilities.**

Silicon Carbide (SiC) is generally preferred for high-voltage applications, ranging from 1,000V to 3,300V, within high-power infrastructure. As such, we believe SiC is likely to penetrate upstream infrastructure layers such as facility conversion, HVDC distribution, solid-state transformers (SSTs), and DC protection. SiC is also presented as a viable solution in 800V step-down conversions at the rack level.

Gallium Nitride (GaN) is best suited for high-frequency, high-density power conversion stages, with voltage ranges not exceeding 650V. As such, it is more likely to dominate low-voltage intermediate bus conversion (IBC). However, we note that there has been breakthrough in high-voltage GaN with voltages as high as 1250V or 1700V (Power Integrations, 2025). GaN power devices are epitaxially grown on one of two substrate platforms: silicon (GaN-on-Si) or silicon carbide (GaN-on-SiC), but the most commercialized power GaN is GaN on silicon.

Figure 17. SiC Targets Infrastructure-Level Power Conversion while GaN Targets Rack-Level Power Conversion



Source: Citi Research

Adoption Timeline

The expected timeline for adoption of wideband gap materials in power conversions is likely going to be a phased process, aligned with the architectural transitions described above.

2027–2028+: While both SiC and GaN are presented as viable solutions in 800V step-down conversions, we believe GaN should see higher adoption in the rack-level conversion, particularly in ±400V HVDC bipolar architecture, where the voltage stress on a single GaN device does not exceed 650V, enabling the use of more mature and cost-competitive 650V GaN solutions.

2028–2030+: As monopolar ~800V sidecar deployments and early SST-based systems scale, we expect SiC adoption to increase, as >900V operation structurally favors SiC. Over time, as SST-based architectures mature, SiC content is likely to expand beyond conversion into protection, switching, and broader facility- and grid-level applications.

There are fewer high-voltage (900V and above) GaN suppliers versus low-voltage GaN suppliers and we highlight that Texas Instruments is among the more established players in this segment. The company has quadrupled its internal GaN manufacturing capacity across US and Japan fabs since late 2024.

Figure 18. GaN and SiC Devices by Suppliers

	% of Internal Manufacturing	GaN devices	SiC devices
ADI	~50%	Yes	No
Infineon	~75%	Yes	Yes
MCHP	<40%	Yes, RF	Yes
MPWR	0%	Yes	Yes
NXPI	~38%	Yes, RF	No
ON	~60%	Yes, vGAN	Yes
Renesas	~35%	Yes	No
STMicroelectronics	~80%	Yes	Yes
TXN	~85%	Yes	No

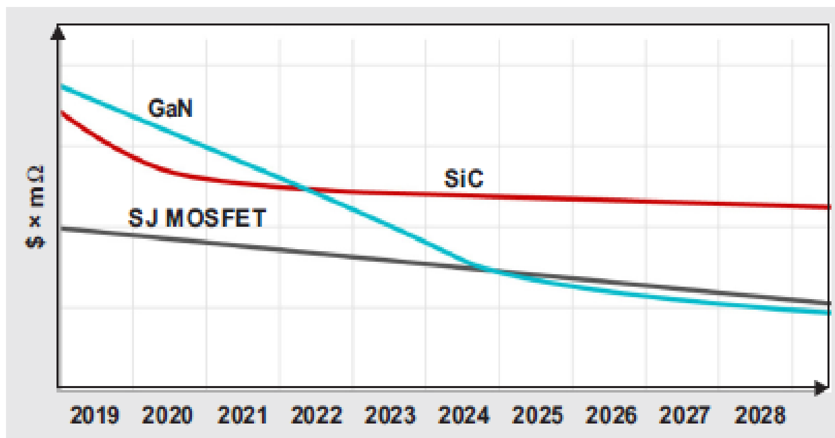
Source: Citi Research, Company Reports

Cost Considerations

According to Texas Instruments, GaN on silicon is projected to have the lowest device cost as shown in the chart below. While the epitaxy process is technically demanding, GaN can be fabricated on readily available silicon substrates in cost-effective 300mm fabs, leveraging mature CMOS technology to achieve higher yields and lower substrate and manufacturing costs. Infineon similarly mentioned that its fully scaled 300-millimeter GaN production will contribute to gallium nitride cost parity with silicon, or effectively gallium nitride performance at the cost of silicon.

In contrast, SiC devices tend to carry higher costs, driven by expensive substrates, greater manufacturing complexity, and a less mature supply chain. The production process requires temperatures above 2,500°C, leading to significant energy consumption. Most of the SiC devices today are currently produced on 150mm substrates, with SICC leading the industry in launching 300mm SiC fabs.

Figure 19. Relative Cost Projection by FET technology



Source: Texas Instruments

Vertical GaN

As shown in the chart below, GaN offers a higher critical breakdown field, faster switching speed, and lower losses, which theoretically suggests a semiconductor with superior power.

However, most commercial GaN devices today are built as lateral devices on silicon substrates, where current flows sideways across the structure. These architectures work extremely well for high-frequency and lower-voltage applications but become increasingly difficult to scale to very high voltages and large currents. By contrast, SiC devices are typically built using vertical structures, where current flows through the wafer, making them more robust for 800V–1,200V systems, grid infrastructure and high-power environments.

If the industry successfully commercializes reliable vertical GaN devices on a scale, particularly GaN-on-GaN, it could combine its intrinsic switching advantages with true high-voltage capability, enabling it to challenge SiC beyond rack-level power and into infrastructure applications. **We note that ON Semi is the only supplier within our coverage actively developing vertical GaN**. ON Semi is currently sampling its vertical GaN solutions and expects shipment in 2H27.

Figure 20. Silicon vs Silicon Carbide vs Gallium Nitride Differences

Parameter	Silicon (Si)	Silicon Carbide (SiC)	Gallium Nitride (GaN)
Best Suited Applications	Low Voltage, Low Frequency	High-Voltage, high-Effiency	High-frequency, High-power density
Voltage Range	<900V	600V- 3300V	<650V
Switching Frequency	<100k Hz	100kHz - MHz	MHz - GHz
Cost	Low	Medium -High	Medium -High
Breakdown Field (MV/cm)	0.3	3	3.3

Source: Citi Research, DigiKey

Analog/Mixed Signal Data Center TAM of ~$17B in 2026E

Based on commentary from the leading nine analog/mixed-signal companies (MPWR, TXN, Infineon, ADI, MCHP, Renesas, ON, STM, NXPI), we estimate data center revenue to be growing ~86% YoY from ~$6.8B in 2025 to ~$12.6B in 2026E.

Figure 21. Data Center-Related Sales for Analog/Mixed Signal Suppliers

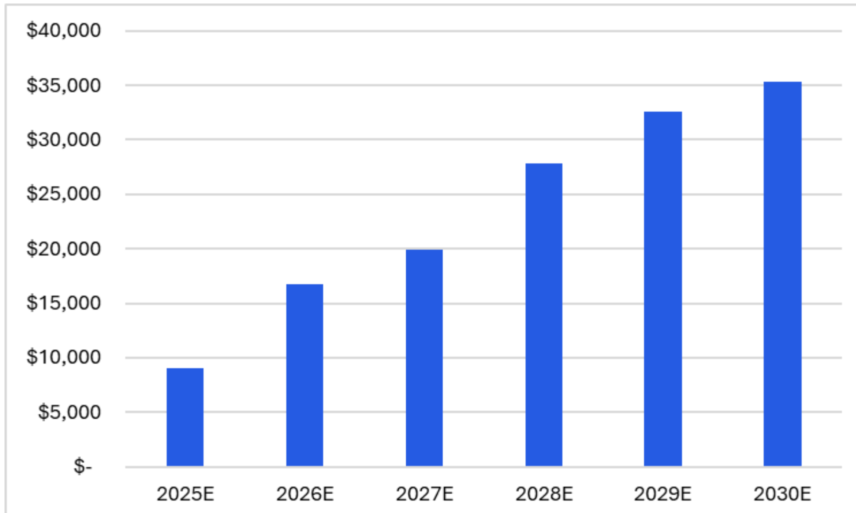
	2024	2025	2026E	YoY	2025	% of 2026 Sales	Commentary
MPWR		1,099	1,894	72%	39%	51%	Data center power to grow >85% YoY in 2026
TXN		1,556	3,116	100%	9%	14%	Data center mix could eclipse PE mix
Infineon		1,266	2,645	109%	8%	15%	Target EUR $1.5B in F26, EUR $2.5B in F27
ADI		1,200	1,620	35%	10%	10%	AI-related sales to see multi-year double digit growth
MCHP		303	500	65%	7%	9%	Expects $500 million in 2026; growing at 65% YoY
Renesas		393	785	100%	4%	8%	Data center revenue doubling in 2026 to roughly 8% of mix
ON		250	500	100%	4%	8%	Expects a 40% CAGR for AI Data TAM
STMicroelectronics		500	1,000	100%	4%	7%	Target $1 Billion by 2026 and $2 billion by 2027
NXPI		200	500	150%	2%	4%	Expects $1B in 2026 and double in 2027
Total Data Center Revenue		**6,767**	**12,559**	**86%**			

Source: Citi Research, Company Reports

Expect a ~30% CAGR from 2025 to 2030

Assuming the nine companies represent ~75% of the analog/mixed-signal market, we infer a total data center opportunity of ~$9B in 2025. We expect the total mixed-signal and discrete semiconductor data center TAM to grow at a 30% CAGR from ~$9B in 2025 to ~$35B by 2030E, driven primarily by new AI data center builds and higher analog semiconductor content from increased rack power, architectural changes, and adoption of wide-bandgap materials.

Figure 22. Data Center Analog, MCU, Power Semiconductor Revenue Growing at a 30% CAGR Through 2030

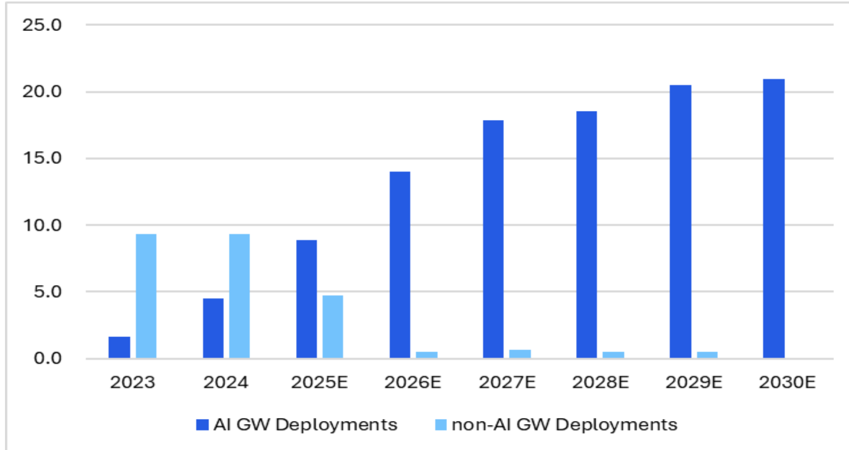


Source: Citi Research

As shown in the chart below, we expect roughly 14GW of AI data center deployments in 2026, up 58% from 2025, and project AI deployments to grow at a ~19% CAGR from 2025 to 2030.

Over the same period, we model blended analog semiconductor content to grow at a ~13% CAGR. According to Gartner, the GaN and SiC transistor market for data centers is expected to grow from approximately $130M in 2025 to ~$650M by 2030, implying a ~38% CAGR. For context, at the peak of the SiC boom in the EV market, ON Semi secured ~$9B in long-term supply agreements, suggesting the potential scale of demand once adoption inflects.

Figure 23. AI Deployments vs Non-AI Deployments (GW)



Source: Citi Research, Company Reports

Section 3: Analog Cyclical Recovery

In our view, the current environment in the analog industry resembles the 2021–23 period, when strong data center, PC, and handset demand led to de-prioritization mature-node capacity, which led to the 'golden screw' phenomenon.

While mature-node capacity remains less tight compared to memory or leading-edge nodes, utilization rates have recovered to ~80% and approaching the optimal range of ~85–90%. Both lagging-edge foundries and analog semiconductor suppliers have also begun raising prices across the board. We believe the analog cyclical recovery still has room to run, as unit volumes remain 30-40% below prior peaks, with additional pricing upside likely as utilization rates exceed high-90%.

Quarterly industry revenue could increase by at least 30%

We analyzed the historical analog and microcontroller cycles to gauge where we are in the upturn. As shown in the chart below, quarterly industry analog revenue in the current cycle is down 2% versus prior peak, below the average ~30% growth in prior cycles. Quarterly analog units are still up 4% versus the prior peak, well below the average of ~40% growth. The current analog upcycle has lasted ~7 quarters versus a typical ~9-11-quarter cycle.

Figure 24. Analog Cycle Analysis

Analog Trough Qtr	Analog Peak Qtr	Trough Revenue	Trough Units	Trough ASPs	Peak Revenue	Peak Units	Peak ASPs	Length of Cycle (Quarters)	Current vs Prior Revenue Peak	Current vs Prior Units Peak	Current ASPs vs Prior Peak
Sep-98	Dec-00	4.58	6.72	0.68	8.21	10.45	0.79	9	53%	67%	-9%
Mar-02	Sep-07	5.20	8.66	0.60	9.57	17.97	0.53	22	17%	72%	-9%
Mar-09	Sep-10	6.02	12.49	0.48	11.04	22.93	0.48	6	15%	28%	-10%
Dec-11	Sep-14	9.69	24.22	0.40	11.64	29.31	0.40	11	6%	28%	-17%
Mar-16	Sep-18	10.95	29.76	0.37	14.94	42.58	0.35	10	28%	45%	-12%
Jun-20	Sep-22	12.19	39.27	0.31	23.21	57.77	0.40	9	55%	36%	15%
								11	29%	46%	-7%
Jun-24	Mar-26	19.01	44.78	0.43	22.76	59.87	0.38	7	-2%	4%	-5%

Source: Citi Research, WSTS

Similarly, quarterly industry microcontroller revenue in the current cycle is still down 20% versus prior peak, below the average 21% growth in prior cycles. Overall quarterly units are still down 23% versus the prior peak, below the average 40%-unit growth. In contrast to analog, the microcontroller cycle has only lasted ~4 quarters.

Figure 25. Microcontroller Cycle Analysis

MCU Trough Qtr	MCU Peak Qtr	Trough Revenue	Trough Units	Trough ASPs	Peak Revenue	Peak Units	Peak ASPs	Length of Cycle (Quarters)	Current vs prior Revenue Peak	Current vs Prior Units Peak	Current ASPs vs Prior Peak
Jun-98	Sep-00	2.13	1.06	2.00	3.24	1.55	2.09	9	29%	53%	-16%
Dec-01	Mar-08	2.00	1.25	1.61	3.67	2.66	1.38	25	13%	72%	-34%
Mar-09	Dec-10	2.02	1.72	1.17	3.97	3.37	1.18	7	8%	27%	-14%
Dec-11	Sep-14	3.56	3.71	0.96	3.97	4.40	0.90	11	0%	30%	-23%
Mar-16	Jun-18	3.55	4.95	0.72	4.49	6.68	0.67	9	13%	52%	-26%
Jun-20	Sep-23	3.45	5.92	0.58	7.26	7.08	1.02	13	62%	6%	52%
								12	18%	37%	-11%
Mar-25	Mar-26	4.95	5.09	0.97	5.79	5.47	1.06	4	-20%	-23%	3%

Source: Citi Research, WSTS

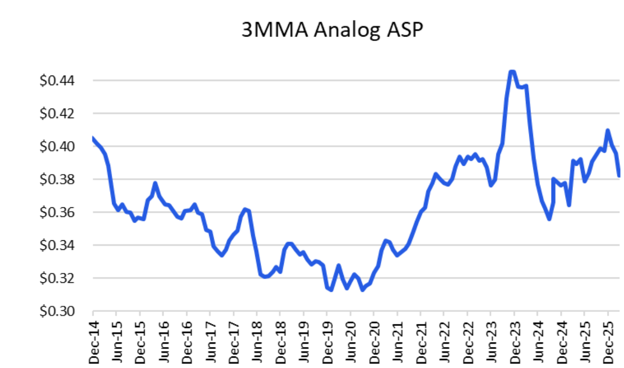
Pricing continues to edge higher

As shown in the charts below, average 3MMA analog pricing is around $0.38, up 7% from 1Q25 through $0.36, below the prior peak of $0.45 in 4Q23. MCU pricing has been relatively stable since the upturn in 2022.

According to TrendForce (May 28, 2026), Infineon (TrendForce, May 27, 2026), TXN (TrendForce, May 11, 2026) and NXPI have announced second round of price hikes, effective in June/July, driven by rising supply chain costs and strong demand. MCHP announced a broad-based price increase starting in June. ON has implemented price increases as well, with benefits expected to contribute positively in 2H26.

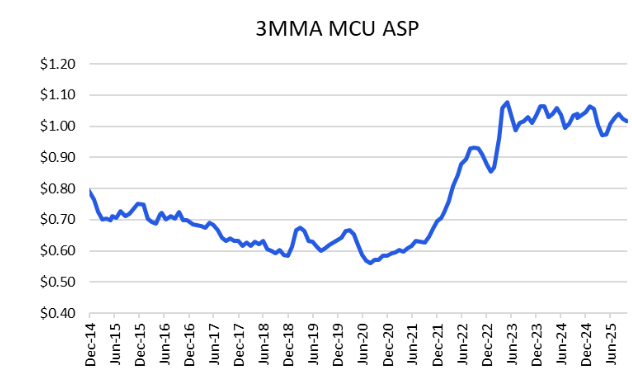
Similarly, United Microelectronics (UMC) has signaled pricing actions in 2H26 and 2027, driven by rising raw material and expansion costs. Vanguard raised prices by ~15% in April 2026 as its Singapore 12-inch fab reached full utilization. A Chinese foundry implemented price increases in 1Q26 on strong PMIC demand.

Figure 26. 3MMA Analog Pricing Trending Higher



Source: Citi Research, WSTS

Figure 27. 3MMA Microcontroller Pricing Stabilizing



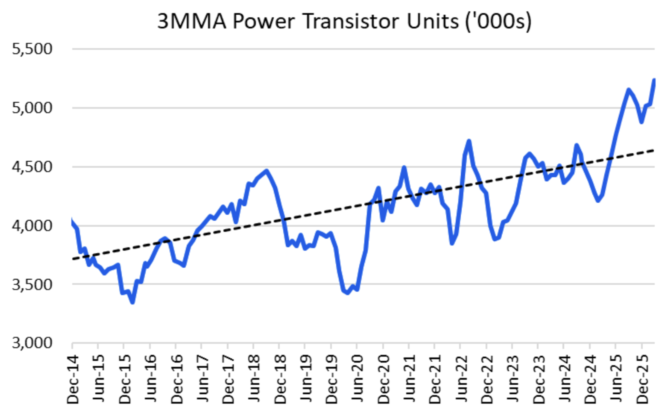
Source: Citi Research, WSTS

Power semiconductor chip pricing was up 70% in the last cycle

TrendForce (May 7, 2026) notes that leading foundries have been reducing 8-inch capacity since 2H25, and foundries have been reallocating capacity away from weaker segments such as DDIC and CIS toward PMICs, BCD, and power discretes, Strong demand for power management and power devices have driven average 8-inch utilization across the top global foundries to nearly 90% in 2026, up from ~80% in 2025.

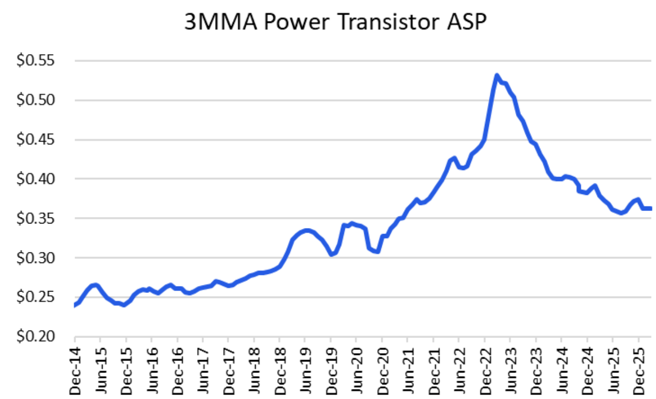
As shown in the chart below, underlying demand for power discretes has rebounded meaningfully over the past few quarters. On the other hand, 3MMA pricing for power semiconductor chips has declined by more than 30% from its 2H23 peak of $0.52 to ~$0.36 currently. We highlight that power discrete pricing increased by more than 70%, rising from ~$0.31 in late 2021 to ~$0.52 in 2H23, and believe power discrete chips could see upward pricing pressure.

Figure 28. 3MMA Power Transistor Units Rising



Source: Citi Research, WSTS

Figure 29. 3MMA Power Transistor ASP

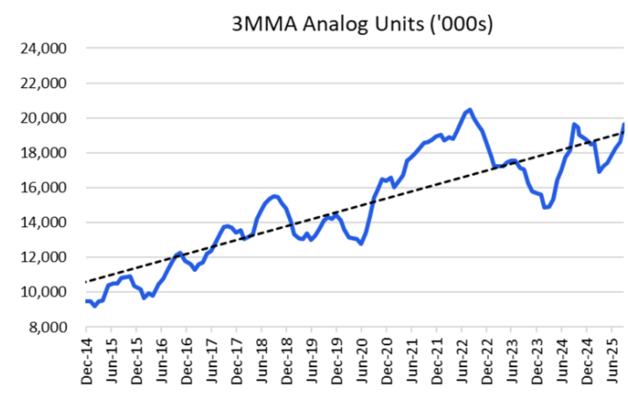


Source: Citi Research, WSTS

Still awaiting restocking – Analog units back to trend line while MCU units remain 30% below prior peak

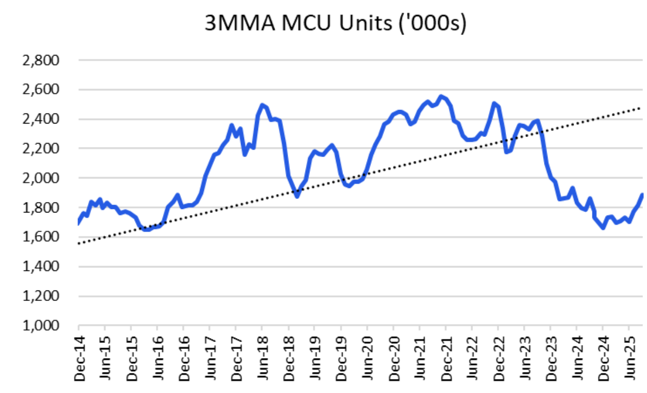
Analog unit volumes are approaching their prior trend and are 3% below prior peak, while MCU volumes remain roughly 30% below prior peak. Based on recent commentary, analog companies have yet to see meaningful signs of inventory restocking, reflecting muted end demand in the automotive market. This reinforces our view that there should still be upside remaining in the analog recovery.

Figure 30. 3MMA Analog Units



Source: Citi Research, WSTS

Figure 31. 3MMA Microcontroller Units

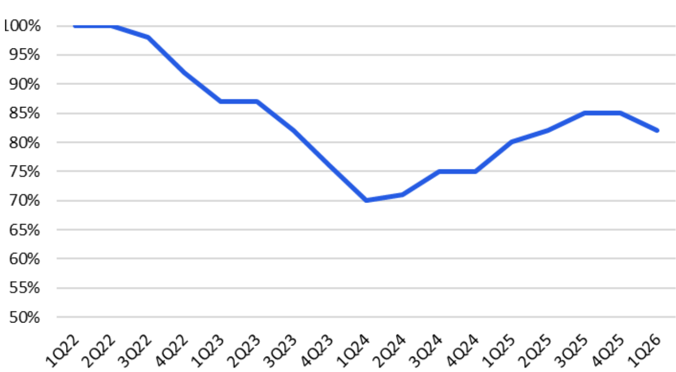


Source: Citi Research, WSTS

Utilization rates are improving

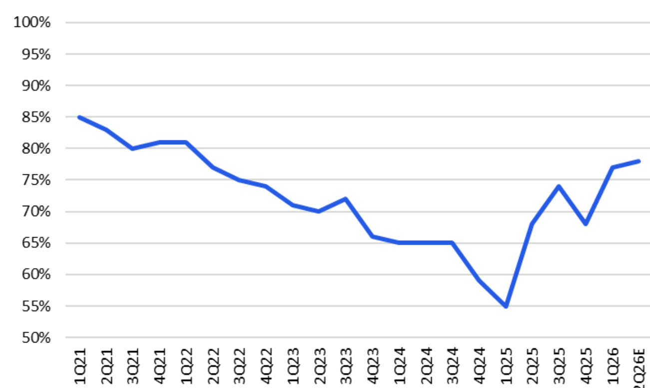
In the last upturn, utilization rates of the lagging-edge foundries like GFS and UMC were 90-100% in some quarters, above the optimal utilization rate of 85%. As shown in the charts below, utilization rates of Global Foundries, ON Semi and NXPI have been improving from the trough in 2024 and are almost back to optimal levels of mid-80s%.

Figure 32. GlobalFoundries Utilization Rate



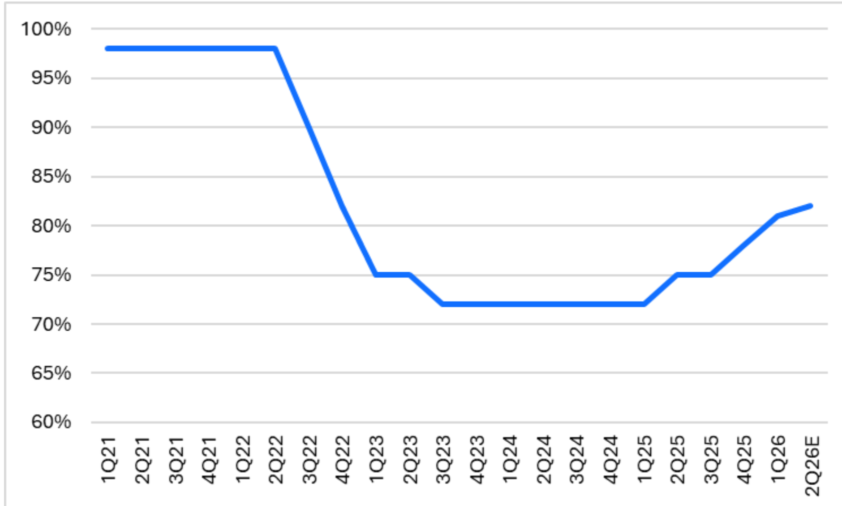
Source: Citi Research, Company Reports

Figure 33. ON Semi Utilization Rate



Source: Citi Research, Company Reports

Figure 34. NXPI Utilization Rate

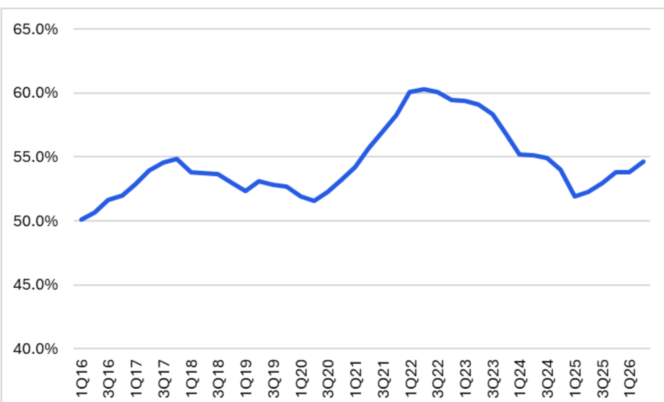


Source: Citi Research, Company Reports

Gross margin expansion

As shown in the charts below, average gross margins of the analog companies are roughly 55% today, below peak gross margins of 60% back in 2022.

Figure 35. Average Analog Semiconductors Gross Margins



Source: Citi Research, Company Reports

Figure 36. Current Gross Margins vs Peak/Target Model

	Current	Quarter	Peak		Current to Peak
ON	39.0%	2Q26E	53.0%	Peak Target Model	1400 bps
TXN	59.5%	2Q26E	70.0%	Historical Peak	1050 bps
NXPI	57.6%	2Q26E	62.5%	Peak Target Model	490 bps
MCHP	62.0%	2Q26E	64.5%	Target Model	250 bps
ADI	73.5%	2Q26E	74.0%	Historical Peak	50 bps
Avg				**Average**	**648 bps**
Median					**490 bps**

Source: Citi Research, Company Reports

We see ON and TXN as having the largest gross margin expansion opportunities, at more than 10 percentage points. TXN manufactures roughly 85% of its wafers internally, while ON is at ~65%, among the highest levels of internal manufacturing capacity in our coverage. As such, improving utilization rates should drive meaningful gross margin expansion.

Figure 37. End Market Exposure for Analog Semiconductor Suppliers

	% of Internal Manufacturing	China as % of Sales	Auto % of sales	Industrial % of sales	Data Center as % of Sales
TXN	~85%	20%	30%	34%	15%
STMicroelectronics	~80%	15%	39%	21%	7%
Infineon	~75%	29%	52%	21%	15%
ON	~66%	25%	51%	26%	8%
ADI	~50%	26%	30%	45%	10%
MCHP	<40%	18%	16%	48%	9%
NXPI	~38%	17%	59%	19%	4%
Renesas	~35%	31%	47%	55%	8%
MPWR	0%	30%	19%	6%	51%

Source: Citi Research, Company Reports

Analysis of current upturn vs prior upturn

We analyzed consensus estimates across our coverage and compared them with the prior upturn to assess potential upside. Consensus implies an average peak-to-peak CAGR of ~4–5% for analog companies, below the ~9–11% industry revenue growth achieved in the last cycle, while trough-to-peak CAGR is projected at ~12–13%, versus ~13–18% in the prior upturn. We believe consensus expectations have largely embedded a normal cyclical recovery.

Given strength in the data center end market, ongoing price increases, and eventual inventory replenishment from the industrial and automotive end markets, we believe revenue growth in the current cycle could match levels achieved in the prior upturn.

Figure 38. Relative Annual Revenue Growth Analysis between Companies and Industry

	2018-2022/2023 CAG (Peak to Peak)	2019-2022 CAGR (Trough to Peak)	Factset 022/2023-2028 CAG (Peak to Peak)	Factset 2024-2028 CAGR (Trough to Peak)
ADI	10%	15%	7%	17%
MCHP	12%	15%	-1%	19%
MPWR	32%	42%	19%	24%
NXPI	7%	11%	5%	11%
ON	9%	15%	-1%	11%
TXN	6%	12%	4%	13%
Average	13%	18%	6%	16%
Median	10%	15%	4%	15%
Analog	11%	18%		
Microcontroller	10%	17%		
Discretes	9%	13%		

Source: Citi Research, Factset, Company Reports. ADI revenue growth from 2018/2019-2022 excludes Maxim's contribution

As shown in the chart below, quarterly sales for both ADI and TXN bottomed in 1Q24, declining roughly 30–35% from peak levels. Notably, neither TXN nor ADI entered into long-term supply agreements during the last upturn, unlike peers such as ON, NXP, and Microchip. While current quarterly revenue for ON and MCHP are still below prior peak, we believe the difference was largely due to the pricing. Since the trough, ADI's quarterly revenue has rebounded by over 80%, while TXN is up only ~45%. As a result, we see greater upside to TXN revenue estimates.

Figure 39. Relative Quarterly Revenue Growth Analysis

	Prior Peak	Calendar Qtr	Trough	Calendar Qtr	Current	Calendar Qtr	Peak to Trough	Trough to Current	Prior Peak vs Current
ON	$ 2,193	3Q22	$ 1,446	1Q25	$ 1,600	2Q26E	-34%	11%	-27%
NXPI	$ 3,445	3Q22	$ 2,835	1Q25	$ 3,460	2Q26E	-18%	22%	0%
TXN	$ 5,241	3Q22	$ 3,661	1Q24	$ 5,300	2Q26E	-30%	45%	1%
MCHP	$ 2,289	2Q23	$ 971	1Q25	$ 1,456	2Q26E	-58%	50%	-36%
ADI	$ 3,263	1Q23	$ 2,159	1Q24	$ 3,950	2Q26E	-34%	83%	21%
MPWR	$ 495	3Q22	$ 454	4Q23	$ 910	2Q26E	-8%	100%	84%

Source: Citi Research, Factset, Company Reports.

Estimate changes

TXN: Raise estimates and TP

We are raising our above-consensus C26/C27/C28 EPS estimates on TXN by 1%/1%/6% to $8.03/$10.10/$11.42 driven by the recent price hikes and our expectations of data center share gains. Given its capacity investments over the past five years, we believe TXN is the strongest positioned within our coverage to fully benefit from the cyclical recovery, in addition to incremental demand tied to the 800V DC transition. We raise our price target from $280 to $345, our target multiple from 28X to 30X 2028E EPS (rolled forward from 2027E), as we expect data center–driven demand to support a more prolonged upcycle.

ON: Raise estimates and TP; initiate upside Catalyst Watch

We are raising our C26/C27/C28 EPS estimates on ON by 1%/12%/9% to $3.07/ $4.64/$6.00 driven by price hikes and an extended analog recovery. We raise our price target from $100 to $120, or 20X P/E on 2028E EPS, up from its 3-year average of 17X, given growing data center power exposure. We reiterate Neutral on ONsemi as demand from the Auto end market

We are opening a 90-day upside Catalyst Watch on ON Semi ahead of its Analyst Day in September. We expect the company to detail its data center revenue opportunity, and highlight its differentiated SiC, vertical GaN and progress of the margin-accretive Treo platform.

Adding Upside 90-Day Catalyst Watch on ON Semiconductor (ON.O)

Direction:	**Upside**
Duration:	Within 90 Days
Catalyst:	Mgmt announcement

We have an upside Catalyst Watch on ON Semi ahead of its Analyst Day in September, where we expect a higher target model driven by its power portfolio and renewed momentum in its silicon carbide (SiC) business from the 800V DC transition.

Bull/Bear: ON Semiconductor (ON.O)

US$140.00	US$120.00	US$50.00
▲20% Upside	▲2.7% Upside	▼57% Downside

Spread 77pp
Current Price and expected returns (upside/downside) as of 12 Jun 2026

BULL Assumptions

- Better-than-expected demand and margin expansion
- Multiple expansion

BASE Assumptions

- 20X C28E EPS

BEAR Assumptions

- Correction in the auto and industrial end markets
- Multiple compression

Bull/Bear: Texas Instruments Inc (TXN.O)

US$ 400.00 ▲33% Upside	US$ 345.00 ▲15% Upside	US$ 225.00 ▼25% Downside

Spread 58pp
Current Price and expected returns (upside/downside) as of 12 Jun 2026

BULL Assumptions

- Higher than expected revenue and/or margins
- Multiple expansion

BASE Assumptions

- 10% revenue CAGR from 2025
- Peak EPS of over $12

BEAR Assumptions

- Recession
- Lower than expected revenue and/or margins
- Multiple compression

ON Semiconductor

Company description

ON Semiconductor is a diversified semiconductor company focused on energy efficient electronics in automotive, industrial, PC, computing, consumer, and handset applications. ON has a broad product portfolio that includes application products such as power converters, switches, light sensors, ASICs, ASSPs, and RF tuners as well as standard discrete components such as power MOSFETs, LED drivers, diodes, and transistors. The company is based in Phoenix, Arizona and operates wafer fabrication facilities in the U.S., Japan, Malaysia, Czech Republic, and Belgium. ON also operates back-end assembly/test facilities in Canada, China, Malaysia, Philippines, Vietnam, and Japan.

Investment strategy

We are Neutral rated on ON Semi as the Auto demand remains mixed, pressuring gross margins.

Valuation

Our target price for ON Semi is $120 based on 20X P/E on C28 EPS, above the company's three-year average of 17X, given growing data center exposure.

Risks

M&A Accretion: If ON fails to achieve margin/EPS accretion from its recent acquisitions, it could result in downside to our estimates. Similarly, if margins from the Sanyo Semi (SSG) unit decline, it could result in downside to our EPS estimates.

End Market: ON Semi derives more than 50% of sales from the Automotive end market. Therefore, any major uptick/downtick in automotive production could result in upside/downside to our estimates and target price for ON.

Competition: Any fluctuations in the multi-market analog and discrete component segments between ON Semi and its competitors could result in risk to our estimates.

Inventory Risk: ON sells roughly 55% of its products through distribution. As a result, we believe any major inventory corrections in the distribution channel could result in downside risk to our estimates.

Semiconductor Cycle: ON has broad-based exposure across multiple products and end markets. Therefore, if the overall semiconductor market enters a downturn, it could result in downside to our estimates.

Macroeconomic: ON Semi's geographic exposure spans multiple geographies including the U.S., Europe, and Asia. As a result, any prolonged macroeconomic downturn/upturn could result in downside/upside to our estimates and target price.

If the impact from the above risks turns out to be greater/less than we expect, the shares could fail to achieve/exceed our target price.

Texas Instruments Inc

Company description

Texas Instruments (TXN) is a diversified semiconductor company that supplies analog semiconductors, embedded processing products, microcontrollers, application-specific standard products, calculators, and many other types of semiconductors. The company's products are used in a variety of end markets such as computing, handset, communications, industrial, and automotive. Based in Dallas, Texas, Texas Instruments has roughly 30,000 employees worldwide. Texas Instruments has a diverse customer base of more than 100,000 customers. Texas Instruments' competitors include Analog Devices, Maxim and Microchip.

Investment strategy

We rate TXN a Buy as we believe we are at the start of the analog upturn, and TI should see one of the biggest EPS increases given the depressed margins.

Valuation

Our target price of $345 is based on i30X C28E EPS, above its analog peers due to greater upside potential to consensus, in our view.

Risks

We note the following upside/downside risks to our target price:

End Market: Texas Instruments derives roughly 40% of sales from the industrial end market. Therefore, any major downtick or increase in the industrial end market could result in downside/upside to our estimates and rating for TI.

Competition: Texas Instruments competes with Analog Devices, Microchip, NXP and others in the analog market. Consequently, any loss of market share could result in downside/upside risk to our estimates and rating to TI.

Product Obsolescence: Texas Instruments spends a smaller percentage of its revenue on R&D compared to its competitors. Consequently, if TI fails to develop future products suitable for its customers, it could result in downside risk to our estimates and rating.

Inventory Risk: Texas Instruments sells roughly 35% of its products through distributors. Thus, any major inventory corrections in the distribution channel could result in downside risk to our estimates and rating.

Semiconductor Cycle: TI has broad-based exposure across multiple products and end markets. Therefore, if the overall semiconductor market enters a downturn, it could result in downside risk to our estimates and rating.

Macroeconomic: Texas Instruments' geographic exposure spans multiple geographies including the U.S., Europe, and Asia. As a result, any prolonged macroeconomic downturn could result in downside risk to our estimates and rating.

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Appendix A-1

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Ratings and Target Price History
Fundamental Research

Analyst: Atif Malik

	Date	Rating	Target Price	Closing Price
1	17-Jul-23 07:11:15	1	*118.00	104.33
2	31-Jul-23 14:11:45	1	*125.00	107.75
3	30-Oct-23 18:36:13	1	*85.00	65.34
4	15-Jul-24 07:16:26	*2	*77.00	76.37
5	11-Feb-25 03:00:00	2	*52.00	47.93
6	11-Apr-25 07:12:27	2	*40.00	35.08
7	07-Jul-25 03:00:00	2	*60.00	54.61
8	04-Aug-25 16:20:47	2	*54.00	47.97
9	15-Jan-26 07:24:43	2	*66.00	60.28
10	09-Feb-26 23:09:58	2	*68.00	65.10
11	05-May-26 09:56:23	2	*100.00	102.67

*Indicates Change

Rating/target price changes above reflect Eastern Time

Texas Instruments Inc (TXN)

Ratings and Target Price History
Fundamental Research

Analyst: Atif Malik

	Date	Rating	Target Price	Closing Price
1	17-Jul-23 07:11:15	2	*182.00	183.40
2	25-Oct-23 03:28:55	2	*142.00	141.79
3	24-Jan-24 06:44:11	2	*167.00	170.07
4	13-May-24 03:00:00	2	*185.00	187.82
5	15-Jul-24 07:16:26	2	*200.00	201.76
6	21-Aug-24 03:00:00	*1	*235.00	208.37
7	11-Apr-25 07:12:27	1	*210.00	147.60
8	09-Jun-25 03:05:02	1	*220.00	199.21
9	07-Jul-25 03:00:00	1	*260.00	213.41
10	16-Oct-25 03:00:00	1	*235.00	175.48
11	23-Apr-26 00:10:27	1	*280.00	282.23

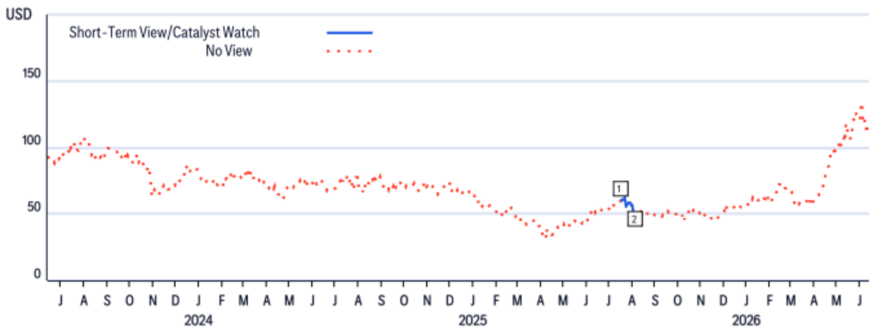
*Indicates Change

Rating/target price changes above reflect Eastern Time

ON Semiconductor (ON)

Short-Term View/Catalyst Watch Research

Analyst: Atif Malik



	Date	Action	Expected Direction	Duration	Closing Price
1	17-Jul-25 23:00:00	Add STV	Downside	30 Days	59.41
2	04-Aug-25 12:20:47	Remove STV	Downside	30 Days	47.97

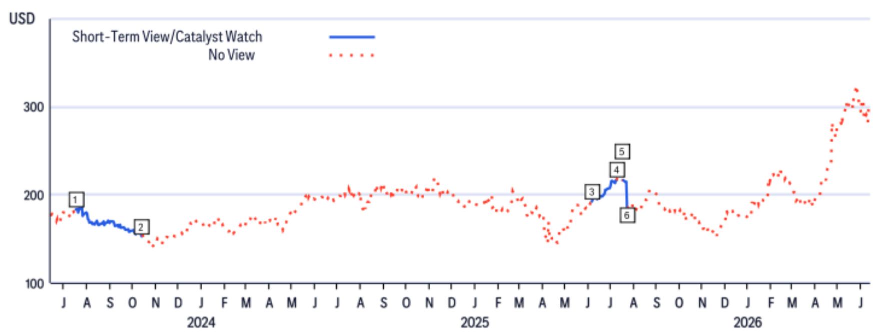
CW - Catalyst Watch , STV - Short-Term View

Rating/target price changes above reflect Eastern Time

Texas Instruments Inc (TXN)

Short-Term View/Catalyst Watch Research

Analyst: Atif Malik



	Date	Action	Expected Direction	Duration	Closing Price
1	17-Jul-23 03:11:15	Add CW	Downside	90 Days	183.40
2	15-Oct-23 12:07:37	Remove CW	Downside	90 Days	152.75
3	08-Jun-25 23:05:02	Add STV	Upside	30 Days	192.42
4	09-Jul-25 12:20:41	Remove STV	Upside	30 Days	216.39
5	17-Jul-25 23:00:00	Add STV	Upside	30 Days	216.59
6	23-Jul-25 02:25:13	Remove STV	Upside	30 Days	186.25

CW - Catalyst Watch , STV - Short-Term View

Rating/target price changes above reflect Eastern Time

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	12 Month Rating			Catalyst Watch		
Data current as of 01 Apr 2026	**Buy**	**Hold**	**Sell**	**Buy**	**Hold**	**Sell**
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