

IT & Electronics

Field Intelligence Report

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Semiconductor Packaging / AI & Machine Learning / Quantum Computing / Photonics & Optical Comms

Market Mood

75

/ 100 Optimistic

AI-Driven Compute & Connectivity

Advanced packaging, optical networks, and quantum computing converge to power the next generation of AI and HPC.

AI Infrastructure Investment	Optical Transceiver Capacity	Liquid Cooling Penetration	Largest Trapped-Ion Qubit System
\$1.3 Trillion	1.6T	53%	98-qubit
+69% H1 2026 VC	3.2T in testing	—	—

Weekly Summary

The IT & Electronics domain is experiencing a profound transformation driven by AI. Advanced semiconductor packaging is critical for integrating high-performance AI chips, with innovations in 3D stacking and panel-level solutions. AI itself is rapidly evolving, demanding unprecedented compute and power, pushing infrastructure towards liquid cooling and distributed architectures. Quantum computing is demonstrating verifiable advantage and advancing towards practical applications, while photonics and optical communications are essential for terabit-era data transfer in AI data centers. Western players must strategically invest in these converging technologies to maintain competitive edge and secure supply chains.

4 Sub-Topic Summary

Sub-Topic	Headline	Momentum	Key Insight
Semiconductor Packaging	Advanced Packaging Innovations Drive AI/HPC Performance with 3D Stacking & PLP	Accelerating	New packaging technologies like EMIB, hybrid bonding, and panel-level packaging are crucial for integrating high-density AI/HPC chiplets, addressing thermal and power challenges, and diversifying supply chains.

AI & Machine Learning	AI Model Evolution Accelerates, Driving \$1.3T Infrastructure Investment & Regulatory Scrutiny	Accelerating	AI models are rapidly advancing in multimodality and cost-efficiency, fueling unprecedented demand for data center infrastructure, liquid cooling, and specialized AI ASICs, while facing increasing regulatory and cybersecurity challenges.
Quantum Computing	Quantum Computing Achieves Verifiable Advantage, Accelerating PQC Migration & Industrial Applications	Building	Quantum computers are demonstrating verifiable advantage on specific problems, driving significant investments in scalable hardware and quantum networks, while urgent mandates for Post-Quantum Cryptography (PQC) migration are being established globally.
Photonics & Optical Comms	Optical Interconnects & Photonics Essential for Terabit AI Data Centers, Driving \$2.5B Market	Accelerating	The explosion of AI data center demand is accelerating the adoption of 1.6T/3.2T optical transceivers, silicon photonics, and advanced modulators like TFLN, which are critical for high-bandwidth, low-latency, and energy-efficient data transfer.

Shin-Etsu Chemical Implements Significant Silicon Wafer Price Hikes

Source: Gemini Grounding (market reports), TDnet/

Summary: Shin-Etsu Chemical, a dominant player controlling approximately 53% of the global silicon wafer market alongside SUMCO, has announced its first broad silicon wafer price increase in over three years, effective August 2026. General wafer prices have risen by ap...

WHY ENGINEERS SHOULD CARE

Procurement teams must immediately re-evaluate BOM costs for all semiconductor products, especially those utilizing 300mm wafers for AI applications, and prioritize securing long-term supply agreement...

JSR Accelerates EUV Photoresist Capacity for Sub-2nm Nodes

Source: Gemini Grounding, TDnet/JSR

Summary: JSR Corporation is significantly expanding its Extreme Ultraviolet (EUV) photoresist production capabilities, establishing its first photoresist facility in Taiwan expected to commence operations by 2028, targeting advanced processes at 2nm and below in collab...

WHY ENGINEERS SHOULD CARE

Design teams targeting sub-3nm or 2nm nodes should closely monitor JSR's capacity ramp-up and material qualification timelines, particularly for MOR, as supply stability for these critical upstream ma...

Japan Commits Trillions in Subsidies for Advanced Semiconductor Manufacturing

Source: Gemini Grounding (METI reports)

Summary: Japan's Ministry of Economy, Trade and Industry (METI) has committed substantial subsidies to bolster domestic and foreign advanced semiconductor manufacturing. This includes up to 536 billion JPY for Micron Hiroshima's advanced DRAM and HBM development (part ...

WHY ENGINEERS SHOULD CARE

Technical planners should factor these significant government investments into their long-term supply chain strategies, recognizing Japan's growing role in advanced memory (HBM), leading-edge logic (2...

This Week's Japan Technology Highlights

Japan's commitment of over 3.7 trillion JPY in semiconductor subsidies and a 10-22% silicon wafer price hike signal a pivotal shift in global supply chain dynamics.

China Watch | IT & Electronics

Full English content available after pipeline regeneration.

Huawei's Kirin 2026 with "LogicFolding" Architecture: Advanced Mobile SoC Density Claims

■ China's Move

Huawei has unveiled details regarding its Kirin 2026 chip, which incorporates a new "LogicFolding" architecture. This architecture is claimed to significantly boost transistor density by 53.5%, achieving 238 million transistors per square millimeter (MTr/mm²),...

■ Technical Verification

[CONFIRMED]	Huawei has officially announced the Kirin 2026 chip with a "LogicFolding" architecture and provided specific density figures (238 MTr/mm ²). / The chip is scheduled to debut in Huawei's flagship Mate...
[BOTTLENECK]	Achieving and sustaining high manufacturing yield rates for such complex, high-density architectures, especially if relying on non-EUV lithography. / The practical implementation and manufacturabili...

■ Implications for Western Engineers

- Mobile SoC Architects: Monitor independent teardowns and performance benchmarks of the Kirin 2026 upon its release to verify cla...
- Process Technology Teams: Analyze the "LogicFolding" concept for potential novel approaches to transistor density and architectu...
- Competitive Intelligence Analysts: Assess the implications of a potentially competitive advanced mobile SoC from China on global...

Key Trends This Week (5 Total)

TR-01 HIGH Cross-Domain

AI-Driven Infrastructure & Compute Demand Surges

AI Demands Drive \$1.3 Trillion Infrastructure Investment, Accelerating Liquid Cooling & Custom Silicon Adoption

The insatiable demand for AI compute is fueling an unprecedented surge in data center infrastructure investment, projected to exceed \$1.3 trillion by 2027. This necessitates advanced thermal management solutions, with liquid cooling reaching 53% penetration in high-end AI systems, and a shift towards custom AI ASICs and distributed AI factories beyond traditional data centers. This trend impacts packaging, power delivery, and optical interconnects across the board.

AI Infrastructure Investment	Liquid Cooling Penetration	AI ASIC Efficiency Gain
\$1.3 Trillion by 2027	53%	30%

► NVIDIA ► Google ► OpenAI ► Intel ► Coherent

Refs: S2-09 S2-12 S2-15 S2-23 S2-27 S2-31 S2-35 S4-08

TR-02 HIGH Semiconductor Packaging

Heterogeneous Integration & Advanced Packaging Critical for AI/HPC

Advanced Packaging Innovations Enable Next-Gen AI/HPC Performance, Diversifying Supply Chains

The complexity and performance requirements of AI and HPC chips are driving rapid advancements in semiconductor packaging. Technologies like EMIB, hybrid bonding, 3D stacking, and panel-level packaging are becoming essential for high-density chiplet integration, thermal management, and power efficiency. This shift is also influencing supply chain diversification strategies, with new production capacities emerging outside traditional hubs.

Panel-Level Packaging Target	Thermal Conductivity Improvement	FC-BGA Capacity Expansion
600mm by 2030	30%	20%

► Intel ► Rapidus ► Applied Materials ► imec ► AT&S;

Refs: S1-01 S1-02 S1-03 S1-05 S1-08 S1-11 S1-14 S1-19 S4-14

TR-03 MED Quantum Computing

Quantum-AI Convergence & PQC Urgency Accelerate

Quantum Computing Demonstrates Verifiable Advantage, Driving PQC Migration & AI-Quantum Research

Quantum computing is moving beyond theoretical promise, with verifiable quantum advantage demonstrations and the development of larger qubit systems. This progress, coupled with the looming threat of 'Harvest Now, Decrypt Later' attacks, is accelerating global mandates for Post-Quantum Cryptography (PQC) migration by 2030. Concurrently, the convergence of AI and quantum machine learning is emerging as a critical area for drug discovery, finance, and energy optimization.

Quantum Advantage Time	Largest Trapped-Ion Qubit	PQC Deprecation Deadline
15 minutes	98-qubit	2030

► IBM ► Quantinuum ► Microsoft ► Entrust ► Pasqal

Refs: S3-02 S3-04 S3-09 S3-10 S3-13 S3-15 S3-17 S3-20

TR-04 MED

Photonics & Optical Comms

Optical Interconnects & Silicon Photonics Enable Terabit Data Rates

Terabit Optical Transceivers & Silicon Photonics Essential for AI Data Center Bandwidth

The exponential growth in AI workloads is driving an urgent need for higher bandwidth and lower latency in data centers, making advanced optical interconnects and silicon photonics indispensable. The industry is rapidly deploying 1.6T transceivers and testing 3.2T, leveraging technologies like Thin Film Lithium Niobate (TFLN) modulators and Co-Packaged Optics (CPO). Foundries are playing a crucial role in industrializing silicon photonics for heterogeneous integration.

TFLN Market Projection	Transceiver Deployment	Signal Loss Reduction
\$2.51 Billion by 2034	1.6T operational, 3.2T in testing	Halving

► Lumentum ► Coherent ► NVIDIA ► imec ► GlobalFoundries

Refs: S4-02 S4-04 S4-05 S4-06 S4-08 S4-12 S4-18 S4-19

TR-05 LOW

AI & Machine Learning

AI in Life Sciences & Healthcare Accelerates

AI Drug Discovery Advances to Clinical Trials, Facing Regulatory & Validation Hurdles

AI's role in drug discovery is expanding from target identification to clinical development, with AI-generated drug candidates entering Phase III trials. Major pharmaceutical companies and tech giants are investing heavily, building 'AI factories' for R&D.; However, regulatory frameworks are emerging to address bias and ensure real-world patient benefits, highlighting the need for rigorous validation and ethical deployment of medical AI systems.

FDA-Cleared AI Devices Verified	AI Drug Discovery Investment	AI M&A; in Biotech
3 of 1,357	\$2.1 Billion	\$400 Million

► Eli Lilly ► NVIDIA ► Insilico Medicine ► Isomorphic Labs ► FDA

Refs: S2-17 S2-18 S2-25 S2-26 S2-28 S2-32 S2-34 S2-36 S2-37 S2-39

Macro Market Indicators

Indicator	Direction	Value	Note	Source
Global AI Infrastructure Investment	↑	\$1.3 Trillion by 2027	Hyperscaler investments projected to surpass \$1.3 trillion by 2027.	S&P; Global Ratings
AI Venture Capital Inflow	↑	\$430 Billion in H1 2026	Record VC inflow, a 69% increase over total 2025 investments.	EY Ireland (via S&P; Global Ratings)
EU AI Act Enforcement	→	August 2, 2026	Key provisions on transparency and GPAI model obligations officially enforced.	Exterro
Post-Quantum Cryptography Mandates	↑	2030 deadline	NIST deadline for deprecating current public-key cryptography, driving global PQC migration.	NIST (via Entrust Blog)

Macro Environment Summary

Global AI infrastructure investment is projected to exceed \$1.3 trillion by 2027, fueled by a record \$430 billion in H1 2026 VC inflow. This rapid expansion is occurring amidst new regulatory frameworks, such as the EU AI Act's enforcement on August 2, 2026, and urgent mandates for Post-Quantum Cryptography migration by 2030 to secure future digital assets.

Market Data: SOXX (Semiconductors) Weekly Trend

508.62 USD -2.20%

Global AI Infrastructure Investment Forecast Source: S&P; Global Ratings

H1 2026 VC inflow up 69% over total 2025

Year	Prev (Billion USD)	Curr (Billion USD)	Δ
2025	254.0	254.0	+0
2026	800.0	800.0	+0
2027	1300.0	1300.0	+0

CoWoS Capacity Constraints & Alternatives TSMC CoWoS → Intel EMIB, Glass Substrates, PLP: Diversifying

Google adopting Intel EMIB for TPUs to address CoWoS constraints.

Action Recommendations by Player

Action Recommendations for Western OEM

OEM Google, NVIDIA, Intel, Microsoft, Eli Lilly, AstraZeneca, Roche, STMicroelectronics, Infineon, John Deere

Western OEMs are aggressively integrating AI into products (Google TPUs, automotive AI) and leveraging AI for R&D; (Eli Lilly's AI factory). They are also major consumers of advanced packaging and optical interconnects.

Risk

- Over-reliance on non-Western advanced packaging (TSMC CoWoS) creates 12-18 month supply chain vulnerabilities
- Lack of internal AI chip design capabilities compared to hyperscalers may lead to 6-month product delays
- Unverified medical AI devices (3 of 1,357) pose significant patient safety and regulatory compliance risks

Opportunity

- Lead in AI-native product development (automotive AI, medical AI) for \$50B+ market by 2030
- Secure diversified advanced packaging and optical component supply chains for 2027-28 product launches
- Invest in AI-driven R&D; for competitive advantage, reducing drug discovery timelines by 18-24 months

Actions This Week

- Diversify advanced packaging suppliers beyond TSMC by Q4 2026 to mitigate geopolitical risks
- Establish joint R&D; programs for AI-native hardware by Q1 2027 to enhance internal capabilities
- Secure long-term contracts for 1.6T/3.2T optical modules by end of this week to meet AI data center demand

□ Scenario: If geopolitical tensions disrupt Asian advanced packaging supply, Western OEMs without diversified sources will face 12-18 month product launch delays — initiate multi-region supplier qualification now.

□ Quick Win : Engage Intel's EMIB team this week to evaluate next-gen TPU packaging options for 2027 product roadmaps.

Action Recommendations for Western Contract Manufacturer

Foundry GlobalFoundries, Intel

Western foundries like GlobalFoundries are enhancing data center energy efficiency and evolving to provide advanced packaging and heterogeneous integration solutions. Intel is gaining traction with EMIB.

Risk

- Lagging behind Asian competitors in leading-edge process nodes and advanced packaging capacity by 2-3 years
- High investment costs for new packaging technologies (e.g., 600mm PLP) may strain capital budgets
- Limited market share in high-volume AI chip production compared to established Asian players

Opportunity

- Capitalize on demand for diversified supply chains, specializing in advanced packaging for AI/HPC by 2028
- Leverage EU Chips Act funding for advanced packaging capacity expansion, targeting €500M+ grants
- Lead in glass substrate and silicon photonics integration for next-gen AI/HPC, capturing \$5B+ market by 2030

Actions This Week

- Accelerate 3D stacking and hybrid bonding R&D; with imec by Q4 2026 to close technology gaps
- Secure EU Chips Act funding for advanced packaging capacity expansion by Q1 2027 to boost competitiveness
- Partner with Western OEMs to co-develop custom AI packaging solutions by Q3 2027 for guaranteed demand

□ Scenario: If Western OEMs prioritize supply chain resilience over lowest cost, then Western foundries can capture significant advanced packaging market share – invest in 600mm panel-level packaging capabilities now.

□ Quick Win : Schedule strategic meetings with Google and Microsoft by end of this week to present EMIB and glass substrate packaging roadmaps for 2027 AI hardware.

Action Recommendations for Western T&M; Provider

T&M; KLA, Onto Innovation

Western T&M; providers are crucial for ensuring yield and quality in advanced packaging and optical component manufacturing, developing AI-powered inspection and high-precision metrology solutions.

■ Risk

- Rapid pace of packaging and optical technology development requires continuous R&D; , risking obsolescence
- High capital expenditure for new inspection systems may limit market entry for smaller players
- Complexity of 3D stacked chips and fine-pitch RDLs increases defect detection challenges by 20-30%

■ Opportunity

- Develop specialized inspection and metrology tools for 3D stacked chips, PLP, and silicon photonics, targeting \$1B+ market by 2029
- Offer AI-powered yield management solutions for complex AI/HPC packages, reducing defect rates by 15-20%
- Expand into quantum computing component testing, supporting emerging hardware development by 2028

■ Actions This Week

- Launch AI-powered defect inspection solutions for 3D stacked packages by Q4 2026 to meet market demand
- Partner with leading foundries (e.g., GlobalFoundries) to co-develop metrology for glass substrates by Q2 2027
- Invest in R&D; for quantum computing component testing solutions by Q3 2027 to capture early market share

□ Scenario: If advanced packaging yields remain challenging for 3D-ICs, then T&M; providers offering AI-driven, high-precision inspection will become indispensable – accelerate product development for 2027 CoWoS alternatives.

□ Quick Win : Host a webinar on 'AI-Powered Yield Management for Heterogeneous Integration' by next month, showcasing KLA's new inspection system and Onto Innovation's metrology.

Action Recommendations for Western Material Supplier

Material BASF, Dow, DuPont, Resonac

Western material suppliers are developing innovative thermal management materials and advanced substrates critical for high-performance AI/HPC packages and optical modules.

■ Risk

- Dependence on Asian manufacturers for high-volume ABF film production (Ajinomoto, Ibiden) creates supply gaps
- Intense R&D; required for new materials for quantum and photonics applications, with long development cycles
- Geopolitical risks impacting raw material sourcing and manufacturing locations by 2027

■ Opportunity

- Develop next-generation thermal interface materials (TIMs) and encapsulants for AI chips, achieving 30% improvement by 2027
- Innovate low-dielectric materials for high-speed optical modules, supporting 1.6T/3.2T transceivers

- Supply specialized materials for quantum computing hardware, targeting superconducting and trapped-ion systems

■ Actions This Week

- Invest in R&D; for 30%+ thermal conductivity improvement materials by Q1 2027 to meet AI chip demands
 - Secure long-term supply contracts with Western foundries and packaging houses for advanced substrates by Q3 2027
 - Establish diversified raw material sourcing strategies by Q4 2026 to mitigate geopolitical risks
- Scenario: If AI chip power density continues to increase by 20% annually, then Western material suppliers with superior thermal management solutions will gain significant market share – prioritize TIM and encapsulant R&D; now.
- Quick Win : Initiate joint development projects with Intel and GlobalFoundries this week to qualify new low-dielectric and thermal materials for their advanced packaging roadmaps.

Action Recommendations for Western Distributor

Distributor Arrow, Avnet

Western distributors play a key role in enabling access to a diverse range of components, including advanced packaging substrates and optical modules, for Western OEMs and smaller players.

■ Risk

- Supply chain disruptions from geopolitical tensions, particularly for critical components manufactured in Asia
- Rapid technological shifts require constant inventory and expertise updates, increasing operational costs
- Increased direct sourcing by large OEMs bypasses distributors for high-volume, strategic components

■ Opportunity

- Specialize in distributing advanced packaging materials (e.g., ABF film alternatives) and high-speed optical transceivers, targeting \$500M+ market by 2028
- Offer value-added services like supply chain risk mitigation and geopolitical diversification strategies
- Develop expertise in AI hardware component sourcing and logistics, supporting emerging AI startups

■ Actions This Week

- Establish strategic partnerships with non-China optical component manufacturers (e.g., Enablence/ShunYun Vietnam) by Q4 2026
 - Develop expertise in AI hardware component sourcing and logistics by Q1 2027 to support new market segments
 - Implement advanced inventory management systems by Q2 2027 to adapt to rapid technological shifts
- Scenario: If geopolitical risks continue to drive supply chain diversification, then distributors with robust non-China sourcing networks will become preferred partners – expand Vietnam/Mexico/EU sourcing capabilities now.
- Quick Win : Conduct a supply chain resilience audit for top 10 Western OEM clients by next month, identifying critical AI/HPC component dependencies and proposing alternative sourcing strategies.

Action Recommendations for Western Equipment Maker

Equipment Applied Materials, ASMT, Coherent, Lumentum, Ouster, Vertiv

Western equipment makers are critical for advanced packaging (hybrid bonding, TCB), optical component manufacturing (InP wafers), and AI data center infrastructure (liquid cooling).

■ Risk

- Intense competition from Asian equipment makers, potentially eroding market share by 10-15%

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- High R&D; costs for next-generation tools (e.g., 3.2T optical, fault-tolerant quantum) with uncertain ROI
 - Dependency on semiconductor industry cycles, leading to volatile demand for capital equipment

■ Opportunity

- Lead in hybrid bonding and 3D stacking equipment for AI/HPC, capturing \$2B+ market by 2029
- Expand production of 1.6T/3.2T optical transceiver manufacturing tools, meeting 200G/300G lane speed demands
- Provide advanced liquid cooling solutions for AI data centers, doubling chiller production by late 2026

■ Actions This Week

- Accelerate development of ultra-fine pitch hybrid bonding platforms by Q4 2026 to maintain leadership
- Expand 6-inch InP manufacturing capacity for 200G/300G lane speeds by Q2 2027 to meet optical demand
- Double chiller production capacity by late 2026 through strategic investments to address AI data center needs

□ Scenario: If AI compute demand continues its current growth trajectory, then equipment makers providing high-throughput, high-precision tools for advanced packaging and optical interconnects will see sustained demand – prioritize capacity expansion for 2027.

□ Quick Win : Secure Q4 2026 orders for new hybrid bonding platforms from Intel and GlobalFoundries by offering early-adopter incentives this week.

Impact Matrix (Players × Trends)

++ = Strong Tailwind + = Tailwind 0 = Neutral – = Headwind -- = Strong Headwind

Player	TR-01 HIGH AI-Dri	TR-02 HIGH Hetero	TR-03 MED Quantu	TR-04 MED Optica	TR-05 LOW AI in
Western OEM	++	++	+	++	++
Western Contract Manufacturer	+	++	0	+	0
Western T&M; Provider	+	++	+	+	+
Western Material Supplier	+	++	+	++	+
Western Distributor	+	+	0	+	0
Western Equipment Maker	++	++	+	++	0

Timeline This Week (10 Events)

Date	Tag	Headline	Source
2026-08-02	policy	EU AI Act Transparency & GPAI Model Obligations Enforced	Europe S2-07
2026-08-20	product	Quantinuum Unveils 'Helios' 98-Qubit Trapped-Ion Quantum Computer	USA S3-04
2026-08-20	policy	Entrust Releases PQC Migration Guide, Urging Action by 2030	USA S3-09
2026-08-21	deal	Eli Lilly Builds Pharma's Largest AI Factory with NVIDIA Blackwell DGX SuperPODs	USA S2-34
2026-08-24	milestone	IBM & UChicago Achieve Verifiable Quantum Advantage in 15 Minutes	USA S3-02
2026-08-24	milestone	TSMC Completes 1.6nm A16 Process Development, Targets Q4 Mass Production	Taiwan S4-13
2026-08-27	product	Google Adopts Intel EMIB for Next-Gen TPUs, Achieves Yield Targets	Taiwan S1-01
2026-08-28	product	Applied Materials Unveils Hybrid Bonding Platform for High-Volume 3D Stacked Chip Manufacturing	USA S1-11
2026-08-28	deal	French Quantum Computing Firm Pasqal Lists on Nasdaq, Raises \$360M	France S3-20

Date	Tag	Headline	Source
2030-01-01	policy	NIST Deadline for Deprecating Current Public-Key Cryptography	USA S3-09

Company Spotlight

NVIDIA [NVDA] ↑ AI Factory Distribution

NVIDIA's Vera Rubin AI chips in full production; next multi-billion opportunity in distributing AI compute beyond data centers.

- Expand partnerships for distributed AI compute infrastructure by Q1 2027
- Invest in advanced optical interconnects for high-speed network fabrics by Q3 2027

Intel [INTC] ↑ Advanced Packaging Traction

Google adopted Intel's EMIB for next-gen TPUs, achieving yield targets; Intel also unveiled 'Crescent Island' AI accelerator details.

- Aggressively market EMIB and other advanced packaging solutions to hyperscalers by Q4 2026
- Accelerate 'Crescent Island' AI accelerator deployment by Q2 2027

Pasqal [PASQ] ↑ Quantum Commercialization

French quantum computing firm listed on Nasdaq, raised \$360M, with stock surging 60%; demonstrated light-trapped atoms from a single chip.

- Utilize new capital to accelerate hardware development and global expansion by Q1 2027
- Secure strategic partnerships with industrial clients for neutral atom QC applications by Q3 2027

Technology Roadmap

2026

- ◆ EU AI Act enforcement begins
- ◆ 1.6T optical transceivers deployed
- ◆ 98-qubit quantum computers unveiled
- ◆ AI drug candidates enter Phase III trials

2027

- ◆ AI infrastructure investment exceeds \$1.3 trillion
- ◆ ABF film supply shortages anticipate easing
- ◆ 3.2T optical transceivers enter testing phase
- ◆ New large-scale integrated test labs for cooling systems completed

2028

- ◆ NVIDIA GB/VR rack-scale solution shipments projected to double
- ◆ Strong demand outlook for Coherent optical solutions extends
- ◆ Initial commercialization of glass substrate packaging for HBM/chiplets

2029

- ◆ Microsoft targets scalable quantum computer with Majorana 2 chip
- ◆ Increased adoption of AI-powered defect inspection in advanced packaging

2030

- ◆ Rapidus targets 600mm panel-level packaging and 8-reticle interposers
- ◆ NIST deadline for deprecating current public-key cryptography

References (107 Total)

ID	Title	Source	Date	Region	Sub-Topic
S1-01	Google's Next-Gen TPUs Adopt Intel EMIB Packaging, Achieve Yield Targets in First Mass Production	digitimes	2026-08-27	Taiwan	Semiconductor Packaging
S1-02	Rapidus Targets 600mm Panel-Level Packaging and 8-Reticle Interposers by 2030 for Advanced AI/HPC Systems	TrendForce	2026-08-21	Japan	Semiconductor Packaging
S1-03	ASMPT to Showcase Advanced Thermocompression and Hybrid Bonding Innovations for HPC and AI at SEMICON Taiwan 2026	ASMPT SEMI Solutions	2026-08-26	Taiwan	Semiconductor Packaging
S1-04	Unimicron Initiates Mass Production at New Thai ABF Substrate Plant to Meet Surging AI Server Demand, Diversifying Geopolitical Risk	DigiTimes Japan	2026-08-27	Taiwan	Semiconductor Packaging
S1-05	Samsung Electro-Mechanics Boosts FC-BGA Substrate Capacity by 20% for AI/HPC, Enhances Competitiveness with Fine-Pitch Wiring	The Korea Economic Daily	2026-08-26	South Korea	Semiconductor Packaging
S1-06	Ibiden Announces Significant Yield Improvement in AI Chip ABF Substrates with New Process Technology, Stabilizing Supply	Nikkei Asia	2026-08-24	Japan	Semiconductor Packaging
S1-07	Shinko Electric Industries Expands High-Density Package Substrate Supply to European Automotive and Industrial Clients, Targeting Automotive AI Demand	Japan Times	2026-08-23	Japan	Semiconductor Packaging
S1-08	Resonac Develops Innovative Thermal Management Materials Achieving 30% Thermal Conductivity Improvement for AI/HPC Semiconductor Packages	Chemical Daily	2026-08-22	Japan	Semiconductor Packaging
S1-09	Ajinomoto Fine-Techno to Expand ABF Film Production Capacity, Anticipates Easing AI Chip Supply Shortages by Early 2027	The Wall Street Journal	2026-08-21	Japan	Semiconductor Packaging
S1-10	Japan Introduces New Subsidy Program for Advanced Packaging R&D, Focusing on Heterogeneous Integration and 3D Stacking to Enhance Competitiveness	METI Press Release	2026-08-20	Japan	Semiconductor Packaging
S1-11	Applied Materials Unveils New Hybrid Bonding Platform for High-Volume 3D Stacked Chip Manufacturing, Enabling Ultra-Fine Pitch Integration	Business Wire	2026-08-28	US	Semiconductor Packaging
S1-12	KLA Unveils AI-Powered High-Speed, High-Precision Defect Inspection Solution to Boost Yield in Advanced Packages like CoWoS	SEMI Global	2026-08-27	US	Semiconductor Packaging
S1-13	Onto Innovation Unveils High-Precision, High-Speed Metrology Solution to Accelerate Panel Level Packaging Mass Production	Photonics.com	2026-08-26	US	Semiconductor Packaging

ID	Title	Source	Date	Region	Sub-Topic
S1-14	imec Pioneers Glass Substrates for Next-Gen 3D Packaging, Accelerating AI/HPC Commercialization	EETimes	2026-08-25	Belgium	Semiconductor Packaging
S1-15	Fraunhofer IZM Demonstrates High-Density Flexible Hybrid Substrate (FHS) Technology, Opening New Frontiers for Wearable and IoT Devices	Semiconductor Engineering	2026-08-24	Germany	Semiconductor Packaging
S1-16	AT&S; Ramps Up HPC Substrate Capacity to Meet Surging Data Center and AI Demand	Business Journal	2026-08-23	Austria	Semiconductor Packaging
S1-17	Infineon Strengthens Advanced Packaging Collaboration in Europe under EU Chips Act, Building Chiplet and Heterogeneous Integration Supply Chain	Reuters	2026-08-22	Germany	Semiconductor Packaging
S1-18	STMicroelectronics Unveils Modular SiP Solution for Automotive AI Market, Driving Miniaturization and Performance in Autonomous Driving and ADAS	Electronics Weekly	2026-08-21	Switzerland/France	Semiconductor Packaging
S1-19	Glass Substrates in Advanced Packaging Accelerate from Prototype to Mass Production, Emerging as Key Technology for HBM and Chiplet Integration	Solid State Technology	2026-08-28	US	Semiconductor Packaging
S2-01	SkillUp Launches AI-Powered 'JobReady Bundle' in Asia to Bridge Youth Employment & STEM Skills Gap by 2026	SkillUp	2026-08-26	International	AI & Machine Learning
S2-02	David Lin Report: Surging Silver Demand from AI & Data Centers Faces 'AI Bubble' Risk Due to High Interest Rates	ForecastCard (The David Lin Report)	2026-08-20	International	AI & Machine Learning
S2-03	Taiwan's Keelung Chang Gung Memorial Hospital to Drive AI Integration in Healthcare with Landmark CME Event	/	2026-08-21	Taiwan	AI & Machine Learning
S2-04	FIRDI Academy Unveils Benchmarking Course on Japanese Food AI & Generative AI Applications	FIRDI Academy	2026-08-20	Taiwan	AI & Machine Learning
S2-05	Taiwan's CPC Advances AI Infrastructure with Key High-Performance Computing Tender	財團法人中衛發展中心	2026-08-28	Taiwan	AI & Machine Learning
S2-06	Zaptiva Launches Enterprise Autonomous AI Agent Development; Cloudflare Unveils 'Kitesurf' Browser Runtime for Agents	Daily AI Agent News	2026-08-20	International	AI & Machine Learning
S2-07	EU AI Act Transparency & GPAI Model Obligations Officially Enforced as of August 2, 2026	Exterro	2026-08-27	Europe	AI & Machine Learning
S2-08	14 New AI Models Released in August 2026, Including Z.AI's GLM-5.3 Flash and DeepSeek V4 Flash Vision Exp	LLM Gateway	2026-08-26	International	AI & Machine Learning

ID	Title	Source	Date	Region	Sub-Topic
S2-09	Liquid Cooling Penetration Reaches 53% in AI Infrastructure, Becoming Standard for High-Performance AI Chips	Electronics360	2026-08-26	International	AI & Machine Learning
S2-10	Claude Mythos 5 Dominates August 2026 LLM Leaderboard; Qwen3.8 Max Leads Open-Weight Models	LLM Leaderboard	2026-08-24	International	AI & Machine Learning
S2-11	arXiv Publishes New Papers on Quantile Temporal Difference Learning, CNN Efficiency, and Time Series Forecasting in August 2026	arXiv	2026-08-28	International	AI & Machine Learning
S2-12	Hot Chips 2026: OpenAI Unveils 'Jalapeño' AI ASIC, Claiming 30% Efficiency & Throughput Gains Over Nvidia Blackwell	Tom's Hardware	2026-08-27	US	AI & Machine Learning
S2-13	Edge AI Shifts to Micro-Desktops & On-Device Personal Systems: 100 Billion Parameter Models Now Run Locally	Metaplugs News	2026-08-22	International	AI & Machine Learning
S2-14	Hot Chips 2026: South Korea's BOS Semiconductors Unveils 'Eagle-N' AI Accelerator with up to 2,000 TOPS for Physical & Automotive AI	The Elec Inc.	2026-08-26	South Korea	AI & Machine Learning
S2-15	Hot Chips 2026: Intel Unveils Crescent Island AI Accelerator Details, Targeting Maximum AI FLOPS per Watt with Larger Caches & Deeper XMN Engines	Tom's Hardware	2026-08-25	US	AI & Machine Learning
S2-16	August 2026: AI Model Evolution Accelerates with Multimodality, Cost Efficiency, and Open-Weight Dominance	Local AI Zone	2026-08-26	US	AI & Machine Learning
S2-17	Pharma, AI Ventures, and Big Tech Shift Strategy to Clinical Application of AI Drug Discovery	IBTimes JP	2026-08-26	Japan	AI & Machine Learning
S2-18	California Bill Mandating Bias Mitigation in Medical AI Systems Passes Legislature	Transparency Coalition	2026-08-27	US	AI & Machine Learning
S2-19	OpenAI, Google, and Major Tech Companies Warn of Imminent AI-Driven Cyberattacks, Urge Collective Action	Voz.us	2026-08-28	US	AI & Machine Learning
S2-20	PNAS Study Warns: LLM Involvement in NIH Grant Applications Increases Funding Success but Decreases Research Novelty	Buttontdown	2026-08-20	US	AI & Machine Learning
S2-21	Data Center World Power 2026 to Focus on Energy as Central Challenge for the AI Economy	Morningstar	2026-08-27	US	AI & Machine Learning
S2-22	Driving Business Process Automation: Retell AI Unveils Top 10 Enterprise AI Solutions for 2026	Retell AI	2026-08-24	US	AI & Machine Learning

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S2-23	AI Data Center Demand Explodes Globally, Facing Regulatory and Power Supply Hurdles in the US	Buttontdown	2026-08-26	US	AI & Machine Learning
S2-24	Multimodal AI Models Leading Innovation in 2026: Google Gemini, OpenAI GPT-5, Anthropic Claude Top Tier	Enlight Lab	2026-08-25	US	AI & Machine Learning
S2-25	AI Drug Discovery Platform Trends: Converge Bio Emerges as Top Ranker for 2026	GHP News	2026-08-25	UK	AI & Machine Learning
S2-26	Generative AI Revolutionizes Hit Identification in Drug Discovery, Dramatically Extending Medicinal Chemists' Capabilities	News Medical Life Sciences	2026-08-27	UK	AI & Machine Learning
S2-27	NVIDIA's Next Multi-Billion-Dollar Market: Distributing the AI Factory Beyond the Data Center	siliconANGLE.com	2026-08-27	US	AI & Machine Learning
S2-28	Study Reveals Only 3 of 1,357 FDA-Cleared Medical AI Devices Verified for Real-World Patient Benefits	PLOS Digital Health	2026-08-20	US	AI & Machine Learning
S2-29	AI M&A; Surges to One-Third of All Deals in August 2026, Reshaping Software Industry; Nvidia Secures \$6B Poolside Licensing Deal	AIFOD	2026-08-20	US	AI & Machine Learning
S2-30	Broadcom Reportedly Negotiating Over \$60 Billion Debt Financing for AI Chip Deals, Including Anthropic	Seeking Alpha	2026-08-20	US	AI & Machine Learning
S2-31	AI Infrastructure Investment to Exceed \$1.3 Trillion by 2027; H1 2026 Sees Record \$430 Billion VC Inflow	S&P; Global Ratings	2026-08-26	Global	AI & Machine Learning
S2-32	Generate:Biomedicines Discloses Early Clinical Data for AI-Discovered Respiratory Drug Candidate After Poster Leak	Endpoints News	2026-08-27	US	AI & Machine Learning
S2-33	Industrial AI Activity Jumps Over 218% in 2025, Generative AI and Physical AI Drive Manufacturing Commercialization	ABI Research	2026-08-20	Global	AI & Machine Learning
S2-34	Eli Lilly Builds Pharmaceutical Industry's Largest AI Factory with NVIDIA Blackwell DGX SuperPODs, Secures Multi-Billion Dollar Deals with Insilico Medicine and Isomorphic Labs	GlobeNewswire	2026-08-21	US	AI & Machine Learning
S2-35	Vertiv Bolsters AI Infrastructure with Major Italian Investment, Doubling Chiller Production by 2026	AINewsWire	2026-08-24	Italy	AI & Machine Learning
S2-36	US FDA Launches Discussion on Generative AI Medical Device Regulatory Framework, Covering Risk Assessment and Post-Market Surveillance	Regulations.gov (via US FDA)	2026-08-20	US	AI & Machine Learning

ID	Title	Source	Date	Region	Sub-Topic
S2-37	AI-Discovered Drugs Advance: Insilico Medicine's Rentosertib Enters Phase III, But Fully AI-Designed Drugs Await Approval (As of 2026)	Life Science Daily News	2026-08-24	Global	AI & Machine Learning
S2-38	SK Group Inks \$795M Deal to Propel Biohaven's Epilepsy Therapy Toward FDA Approval	Fierce Biotech	2026-08-26	US	AI & Machine Learning
S2-39	AI, Fintech, Biotech Lead 2026 Startup M&A;: Anthropic Acquires Coefficient Bio for \$400M, Expanding into Life Sciences	Value Add Pulse (via Crunchbase News data)	2026-08-24	US	AI & Machine Learning
S3-01	SpinQ Leverages Superconducting Quantum Computers for Accelerated Drug Discovery Research	SpinQ	2026-08-20	China	Quantum Computing
S3-02	IBM and University of Chicago Achieve Verifiable Quantum Advantage, Solving Intractable Problem in 15 Minutes	almerja.com	2026-08-24	US	Quantum Computing
S3-03	U.S. NSF Invests Over \$290 Million in Eight University-Led Quantum Leap Institutes to Accelerate Quantum Science	Forbes	2026-08-26	US	Quantum Computing
S3-04	Quantinuum Unveils 'Helios,' the World's Largest 98-Qubit Trapped-Ion Quantum Computer, Pointing to Post-Supercomputing Era	ZME Science	2026-08-20	US	Quantum Computing
S3-05	University of Bristol and Collaborators Develop Dynamic Entanglement Quantum Network for Multi-User Applications	Quantum Zeitgeist	2026-08-26	UK	Quantum Computing
S3-06	University of Strathclyde-Led International Team Develops Quantum Memories for Long-Distance Networks with €2M EU Funding	University of Strathclyde	2026-08-25	UK	Quantum Computing
S3-07	QPU137 Assesses Quantum Advantage: Limited to Benchmarks, No Practical Value Yet	QPU137	2026-08-20	Unknown	Quantum Computing
S3-08	Brookhaven National Laboratory and Stony Brook University Demonstrate 'Wireless' Quantum Network with 161-Mile Fiber Integration	BNL Newsroom (Brookhaven National Laboratory)	2026-08-21	US	Quantum Computing
S3-09	Entrust Releases Comprehensive Guide for Post-Quantum Cryptography (PQC) Migration, Urging Action by 2030	Entrust Blog	2026-08-20	US	Quantum Computing
S3-10	Antti V. Seppala, Quantum Machine Learning Architect, Drives AI-Quantum Convergence in Drug Discovery, Finance, and Energy	Aviator PPG	2026-08-22	Unknown	Quantum Computing
S3-11	Quantum Countdown: Saudi Arabia Urged to Accelerate Post-Quantum Cryptography Adoption	CPI Financial	2026-08-26	Saudi Arabia	Quantum Computing

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S3-12	Canada-Japan Quantum Partnership Expands to Accelerate Semiconductor Materials Development and Innovate EUV Lithography	ChemAnalyst	2026-08-26	Canada	Quantum Computing
S3-13	Microsoft Unveils Majorana 2 Quantum Chip with 1,000x Reliability Improvement, Targeting Scalable QC by 2029	Onclick Innovations	2026-08-24	US	Quantum Computing
S3-14	NSF Grants \$37.5M to Yale and UC San Diego-Led PRACTIQAL Center for Self-Correcting Quantum Computers	UC San Diego News Center	2026-08-27	US	Quantum Computing
S3-15	Quantum Imperative: Sweden Charts Future with National Strategy and 2030 PQC Mandate	HPCwire	2026-08-27	Sweden	Quantum Computing
S3-16	China's Atom Matrix Lands Nine-Figure Series A+ Investment to Commercialize Neutral Atom Quantum Computing	新浪□□	2026-08-20	China	Quantum Computing
S3-17	France's Pasqal Demonstrates World-First Quantum Computing with Light-Trapped Atoms from a Single Chip	Media24.fr	2026-08-20	France	Quantum Computing
S3-18	South Korea's 2026 Autumn Quantum Tech Conferences Focus on Post-Quantum Cryptography Migration Roadmaps and Standardization	□□□□□□	2026-08-22	South Korea	Quantum Computing
S3-19	South Korea's 'Quantum Reframing Challenge' Unlocks Industrial Catalyst Optimization with Diverse Quantum Architectures	, □□	2026-08-26	South Korea	Quantum Computing
S3-20	French Quantum Computing Firm Pasqal Lists on Nasdaq, Raises \$360M with Stock Surging 60%	Boursorama	2026-08-28	France	Quantum Computing
S3-21	Samsung Active Asset Management Launches 'KoAct Global' Fund, Targeting Quantum Computing's Frontier	□□□□□□□□ □ ()	2026-08-28	South Korea	Quantum Computing
S3-22	RIKEN's Q-Portal Charts Quantum Computing's Industrial Future at JASIS2026	RIKEN	2026-08-28	Japan	Quantum Computing
S4-01	Solinide Photonics Secures €4M Seed Round to Commercialize AI Data Center Microcomb Technology	Tech.eu	2026-08-20	Sweden	Photonics & Optical Comms
S4-02	Thin Film Lithium Niobate Modulator Market Projected to Reach \$2.51 Billion by 2034	EINPresswire.com (The National Law Review)	2026-08-25	US	Photonics & Optical Comms
S4-03	Heterogeneously Integrated Thin-Film Lithium Niobate Coupled-Cavity Modulator Enables Tunable Frequency Beam Splitting on Silicon	arXiv	2026-08-27	International	Photonics & Optical Comms

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S4-04	Optical Communications Rapidly Advances: 1.6T Transceivers Deployed, 3.2T in Testing as Terabit Era Dawns	Fibre Systems	2026-08-25	UK	Photonics & Optical Comms
S4-05	Lumentum Drives 1.6T Optical Module Market with NVIDIA Multi-Billion Deal, Expands Japan Production for AI Data Centers	MarketBeat	2026-08-28	US	Photonics & Optical Comms
S4-06	Coherent Achieves Record Q4 2026 Revenue, Driven by Robust 800G/1.6T Optical Transceiver Demand from AI Data Centers	The Motley Fool	2026-08-20	US	Photonics & Optical Comms
S4-07	Enablence and ShunYun Achieve Volume Production Readiness in Vietnam for 800G/1.6T, CPO/LPO High-Speed PLCs, Bolstering Non-China Supply	Newsfile	2026-08-27	US	Photonics & Optical Comms
S4-08	Coherent Accelerates AI Optical Interconnect Growth with NVIDIA Partnership and \$2 Billion US Investment Plan, Meeting 800G/1.6T Demand	Andy Lin's Long-term Stock Investment Blog	2026-08-23	US	Photonics & Optical Comms
S4-09	Ciena Awaits Q3 2026 Earnings, Market Focus on Coherent Optical Solutions and Network Automation Trajectory	MarketBeat	2026-08-27	US	Photonics & Optical Comms
S4-10	High-Frequency MLCC Evolution Critical for 800G/1.6T Optical Modules: Enabling AI-Era High-Capacity Communications	Barron (Barron MLCC)	2026-08-21	International	Photonics & Optical Comms
S4-11	Ciena Gains Focus with e& UAE Network Deal, Deploying WaveLogic Coherent Optical Technology for High-Capacity Regional Networks	Kalkine Media	2026-08-20	US	Photonics & Optical Comms
S4-12	Shanghai Jiao Tong University Develops FOWLP for Seamless Opto-Electronic Integration, Halving Signal Loss in Data Centers	IMAPS 3D InCites Content Platform	2026-08-20	China	Photonics & Optical Comms
S4-13	TSMC Completes 1.6nm A16 Process Development, Targets Q4 Mass Production for Next-Gen AI/HPC Chips	Design And Reuse	2026-08-24	Taiwan	Photonics & Optical Comms
S4-14	Rapidus Targets 8-Reticle Interposers on 600mm Advanced Packaging Panels by 2030, Accelerating Heterogeneous Integration for AI/HPC	Design And Reuse	2026-08-24	Japan	Photonics & Optical Comms
S4-15	Alibaba Develops RISC-V Chip Capable of Running 27 Billion Parameter AI Model Without GPU	Design And Reuse	2026-08-24	China	Photonics & Optical Comms
S4-16	Arteris Reports High Premium for AI Chip IP, Reflecting Soaring Demand for Specialized Silicon	Design And Reuse	2026-08-24	US	Photonics & Optical Comms

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S4-17	TIER IV and Renesas Partner to Develop AI-Native Software-Defined Vehicle Platform, Integrating Advanced Sensing and Photonic Computing	Design And Reuse	2026-08-24	Japan	Photonics & Optical Comms
S4-18	Semiconductor Foundries Evolve Role, Driving Industrialization of Silicon Photonics and Advanced Heterogeneous Integration	Design And Reuse	2026-08-20	US	Photonics & Optical Comms
S4-19	Socionext Expands SoC Roadmap with Intel 18A-P Process, Bolstering Next-Gen Opto-Electronic Device Integration	Design And Reuse	2026-08-20	Japan	Photonics & Optical Comms
S4-20	imec Revolutionizes Sensing and Imaging with Integrated Photonics Breakthroughs at SPIE Optics + Photonics 2026: CMOS-Compatible SWIR and Real-Time Scattering Compensation	imec	2026-08-23	Belgium	Photonics & Optical Comms
S4-21	Hesai Rides Smart Car Boom in China, Expands LiDAR Dominance and Supply Chain Ambitions	South China Morning Post	2026-08-20	China	Photonics & Optical Comms
S4-22	Hamamatsu Photonics Europe Enhances Advanced Imaging Solutions with Fairchild Imaging CMOS Sensor Technologies Post-Acquisition	Electronics360	2026-08-20	Japan	Photonics & Optical Comms
S4-23	Optalysys Demonstrates Photonic Hardware for Compute-in-Transit, Revolutionizing AI and Cryptographic Workloads by Eliminating Data Movement Bottlenecks	Quantum Zeitgeist	2026-08-21	UK	Photonics & Optical Comms
S4-24	Innoviz-Highlighted Analysis Warns Automotive OEMs of Escalating China Supply Chain Risks	Innoviz	2026-08-25	Israel	Photonics & Optical Comms
S4-25	GlobalFoundries Elevates Data Center Energy Efficiency with Strategic 48V Power Delivery Approach	GlobalFoundries	2026-08-20	US	Photonics & Optical Comms
S4-26	GUSS Automation Selects Ouster Rev8 OS0 Digital LiDAR Sensors for Next-Generation Autonomous Orchard Fleet	Ouster	2026-08-26	US	Photonics & Optical Comms
S4-27	Compact On-Chip BIC Lasers Deliver High Purity Linearly Polarized Light, Accelerating Optical Computing and Quantum Photonics	Photonics Spectra	2026-08-21	US	Photonics & Optical Comms

Editor's Note

Navigating the AI-Driven IT & Electronics Frontier

The IT & Electronics sector is at an inflection point, driven by the relentless expansion of AI. This week's developments highlight a critical convergence: advanced semiconductor packaging is enabling the high-density integration required for next-gen AI chips, while optical communications are providing the essential terabit-era bandwidth for AI data centers. Simultaneously, quantum computing is demonstrating

tangible progress towards practical applications, promising future computational breakthroughs.

Western manufacturers, investors, and executives must recognize these interconnected trends. Strategic investments in domestic advanced packaging capabilities, diversification of critical material supply chains, and accelerated adoption of Post-Quantum Cryptography are no longer optional but imperative for competitive resilience. The shift towards distributed AI infrastructure and the integration of AI in life sciences also present significant new market opportunities.

The competitive landscape is intensifying, with Asian players making aggressive moves in advanced packaging and AI infrastructure. Western firms must leverage their strengths in R&D, specialized equipment, and regulatory leadership (e.g., EU AI Act, FDA frameworks) to secure their position. Proactive collaboration across the value chain—from material suppliers to OEMs—will be key to navigating this complex, high-growth environment.

- ◆ How can Western OEMs best diversify their advanced packaging supply chains to mitigate geopolitical risks and secure access to cutting-edge AI chip integration technologies by Q4 2026?
- ◆ What specific R&D investments should Western material and equipment suppliers prioritize to capitalize on the surging demand for liquid cooling, high-speed optical interconnects, and quantum computing hardware over the next 18 months?
- ◆ How should Western governments and industry collaborate to accelerate Post-Quantum Cryptography migration and establish robust, quantum-safe digital infrastructure by the 2030 deadline?

Troy Technical Weekly Editorial Team Editorial Assistant

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