



BACKGROUNDERS
Press Information Bureau
Government of India

Powering Next-Generation Technology

Fueling innovation through indigenous 7 nm processor

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India has steadily advanced its indigenous semiconductor capabilities over the past decade, developing home-grown processor architectures, nurturing design talent, and strengthening research infrastructure. These efforts have built a strong foundation for the country's emergence as a key player in the global chip design ecosystem.

Building on this progress, India is now taking a major step forward with the development of a 7 nanometre processor, marking its entry into advanced node semiconductor design. Announced by Union Minister Ashwini Vaishnaw on 18 October 2025, the initiative signifies a defining moment in India's semiconductor journey and reaffirms the nation's commitment to self-reliant, next-generation technology innovation.

The Implementation framework

- The 7 nm processor is being developed by the **Indian Institute of Technology, Madras (IIT Madras)**, a key institution in India's processor design ecosystem through its **SHAKTI** initiative. Started in 2013, SHAKTI is based on open-source instruction set architecture, allowing anyone to adopt and use it freely without restrictions.
- India is presently adopting RISC-V architecture, an open-source architecture, and a family of microprocessors is being developed based on different types of devices. As part of the SHAKTI project, a medium-range open-source processor has been developed so that any start-up can take up and carry the work forward.
- The project functions under Ministry of Electronics and Information Technology (MeitY), which leads national efforts in semiconductor R&D, chip design, and innovation infrastructure.
- The initiative aligns with the **India Semiconductor Mission**, a dedicated programme to establish end-to-end semiconductor and display manufacturing capabilities and strengthen the national electronics value chain.
- The framework fosters collaboration among academia, industry, and startups to enhance R&D infrastructure and expand talent capacity.

India's leap to 7nm: Why it matters

- Designed for high performance and energy efficiency, the 7 nm processor targets server applications across financial services, communications, defence, and strategic sectors.

- Represents a major leap in semiconductor design, with higher transistor density and enhanced computing efficiency.
- Strengthens India's readiness for future fabrication (fab) integration, aligning with national efforts to establish domestic semiconductor manufacturing capabilities under the India Semiconductor Mission.
- Forms the backbone for emerging technologies such as 5G, AI, and supercomputing — key focus areas under the Digital India initiative.
- Reinforces India's strategic goal of technological self-reliance under the Atmanirbhar Bharat vision, reducing dependence on imported chips for critical applications.

India in Global Semiconductor Landscape

- Under the ₹76,000 crore India Semiconductor Mission (ISM), 10 semiconductor projects with investments exceeding ₹1.6 lakh crore have been approved across six states.
- More than 288 academic institutions are supported under MeitY's Design Linked Incentive (DLI) scheme.
- The indigenous 7 nm processor design initiative marks India's entry into advanced node R&D, placing it among the emerging nations advancing research and design at cutting-edge technology nodes such as those pioneered by the United States, Taiwan, and South Korea.
- Together, these initiatives strengthen India's position as a trusted partner in global semiconductor value chains and advance its vision of building an end-to-end semiconductor ecosystem.

The future roadmap

- Continued progress toward sub-7 nm nodes through the Semicon India Programme.
- Establishing advanced chip design, testing, and packaging facilities within India.
- Semiconductor initiatives under MeitY and ISM are expected to attract very large investments and create thousands of high-skill jobs.
- 24 chip design projects have been sanctioned and 87 companies now use advanced design tools.
- The initiative aims to build chips in India for the world.

The indigenous 7 nm processor initiative represents more than a technological feat — it is a statement of intent. By bridging innovation, academia, and industry, India is laying the foundation for a self-reliant, globally competitive semiconductor ecosystem. Through sustained R&D and strategic investment, the nation is set to emerge as a vital hub in the global semiconductor value chain.

References:

<https://www.pib.gov.in/FactsheetDetails.aspx?Id=150300>
<https://www.pib.gov.in/PressReleasePage.aspx?PRID=2155456>
<https://cdn.digitalindiacorporation.in/wp-content/uploads/2025/09/PIB2163622.pdf>
<https://www.pib.gov.in/PressReleseDetailm.aspx?PRID=2150464>
<https://x.com/AshwiniVaishnaw/status/1979531474950095199>

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