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CG Semi OSAT: India's Semiconductor Assembly Push at Sanand

7 July 2026 · SCIENCE & TECH · GS3

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7 July 2026 · 5 min read ·

Source: ujiyari.com — researched, fact-checked & UPSC-mapped

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WHY IN NEWS

On July 4, 2026, Prime Minister Narendra Modi inaugurated the CG Semi Outsourced Semiconductor Assembly and Test (OSAT) facility at Sanand, Gujarat, a Rs 7,600 crore (about USD 870 million) plant built under the India Semiconductor Mission.

THE PLANT AT A GLANCE

The CG Semi facility at Sanand, in Ahmedabad district, is a joint venture of three players: CG Power and Industrial Solutions (part of the Murugappa Group) of India, Renesas Electronics of Japan, and Stars Microelectronics of Thailand. The Rs 7,600 crore investment makes it one of India's first major chip assembly and packaging plants to reach commercial production.

The plant packages and tests semiconductors for the automotive, 5G, Internet of Things (IoT) and power-application sectors, with output destined for markets including Japan, the United States and Europe. Its first (G1) line begins at an initial capacity of about 200 million units per year, scalable toward billions of units, with a second unit (G2) expected by the end of 2026. The project is projected to generate several thousand direct and indirect jobs over the coming years.

Understanding OSAT

OSAT stands for Outsourced Semiconductor Assembly and Test. It is the back-end of the chip value chain, distinct from front-end fabrication:

STAGE	WHAT HAPPENS	COMMON NAME
Front-end	Etching transistors onto silicon wafers in a fabrication plant	“Fab” (wafer fabrication)
Back-end	Cutting wafers into dies, assembling, wire-bonding, encapsulating and testing	OSAT / ATMP

ATMP, Assembly, Testing, Marking and Packaging, is the term the Indian scheme uses for the same back-end activity. In simple terms, a fab creates the chip on a wafer; an OSAT unit turns that wafer into the finished, packaged, tested chip that goes into a car, phone or appliance. CG Semi’s Sanand plant handles legacy packages alongside advanced options serving the automotive and power sectors.

WHY INDIA STARTED WITH OSAT, NOT A FAB

India deliberately entered semiconductors through the back-end rather than the far more capital- and technology-intensive front-end. The reasons are strategic:

- **Lower capital and technology barrier.** A leading-edge fab can cost USD 10 to 20 billion and demands ultra-pure water, uninterrupted power and access to extreme-ultraviolet lithography controlled by a handful of firms. OSAT and ATMP plants are cheaper, faster to build and less dependent on tightly held frontier technology.
- **Faster ecosystem and skills build-up.** Back-end plants create a trained workforce, a materials and equipment supply base, and customer relationships that a future fab can draw upon.
- **The “China plus one” opportunity.** Global electronics firms are diversifying assembly and testing away from over-concentration in China, and India is positioning itself as a credible alternative destination.

THE POLICY ARCHITECTURE

The plant sits within the India Semiconductor Mission (ISM), the government’s flagship programme to build a domestic chip ecosystem and reduce import dependence. The ISM works alongside the wider electronics push, notably the Production-Linked Incentive (PLI) schemes for electronics and components, which together aim to make India a manufacturing hub across the value chain.

Sanand is emerging as a semiconductor cluster in its own right. It also hosts a Micron assembly and test unit and a Kaynes Technology facility, giving Gujarat a concentration of back-end capacity that anchors the national mission.

SANAND SEMICONDUCTOR PLAYERS	NATURE
CG Semi (CG Power, Renesas, Stars Microelectronics)	OSAT / ATMP, Rs 7,600 crore
Micron	Assembly and test (ATMP)
Kaynes Technology	OSAT / ATMP

ANALYSIS AND WAY FORWARD

The CG Semi inauguration is a genuine milestone: it moves India from policy announcements to a functioning, commercially producing node in the global chip supply chain. Starting with OSAT is a pragmatic (https://ujiyari.com/vocab/pragmatic/) entry strategy that builds skills, suppliers and credibility before the country attempts the enormous leap to leading-edge fabrication.

The road ahead has clear tests. India must secure reliable inputs, substrates, bonding wire, specialty chemicals, much of which is still imported, so that the back-end does not simply relocate an import dependency. Sustained, uninterrupted power and water, a deep talent pipeline of packaging and test engineers, and predictable policy support will determine whether these plants scale to the billions-of-units level they promise. If the ecosystem matures, OSAT becomes the launchpad for genuine fabrication and for India's ambition of semiconductor self-reliance rather than an end in itself.

UPSC RELEVANCE

GS Paper 3: Indigenisation (https://ujiyari.com/vocab/indigenisation/) of technology and developing new technology; effects of liberalisation on the economy; growth and development; achievements of Indians in science and technology; the electronics and semiconductor manufacturing ecosystem.

Prelims pointers:

- OSAT stands for Outsourced Semiconductor Assembly and Test; it is the back-end (assembly, testing, packaging) of the chip value chain.
- ATMP means Assembly, Testing, Marking and Packaging.
- The CG Semi plant is a joint venture of CG Power (India), Renesas Electronics (Japan) and Stars Microelectronics (Thailand).
- It is built under the India Semiconductor Mission (ISM).
- Sanand (Gujarat) also hosts Micron and Kaynes semiconductor units.
- A "fab" refers to front-end wafer fabrication, distinct from OSAT.

Mains question: "India's semiconductor strategy has prioritised assembly and testing over fabrication." Examine the rationale for this choice and the challenges in building a self-reliant chip ecosystem. (15 marks, 250 words)

FACTS CORNER

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CG Semi OSAT plant: Inaugurated by PM Modi on July 4, 2026 at Sanand, Gujarat; Rs 7,600 crore (about USD 870 million).

Joint venture: CG Power and Industrial Solutions (India), Renesas Electronics (Japan) and Stars Microelectronics (Thailand).

OSAT: Outsourced Semiconductor Assembly and Test, the back-end (assembly, testing, packaging) of the chip value chain, distinct from front-end fabrication (a “fab”).

ATMP: Assembly, Testing, Marking and Packaging, the Indian scheme’s term for the same back-end work.

Capacity: Starts around 200 million units per year, scalable toward billions; second unit (G2) expected end-2026.

End markets: Automotive, 5G, IoT and power sectors; chips exported to Japan, the US and Europe.

Policy frame: Built under the India Semiconductor Mission (ISM); complemented by Production-Linked Incentive (PLI) schemes.

Sanand cluster: Also hosts Micron and Kaynes Technology semiconductor units.

Why OSAT first: Lower capital and technology barrier than a fab; builds skills and supply base; captures the “China plus one” diversification opportunity.

Sources: Press Information Bureau (https://pib.gov.in/), Ministry of Electronics and Information Technology (https://www.meity.gov.in/), Business Standard (https://www.business-standard.com/), The Hindu (https://www.thehindu.com/)

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