Georgia Tech Panama
Logistics Innovation & Research Center

Regional Hub for
Microelectronics
and Semiconductors

The State of Semiconductor Trade in Latin America: *Key Roles and Trade Flows in Emerging Hubs*

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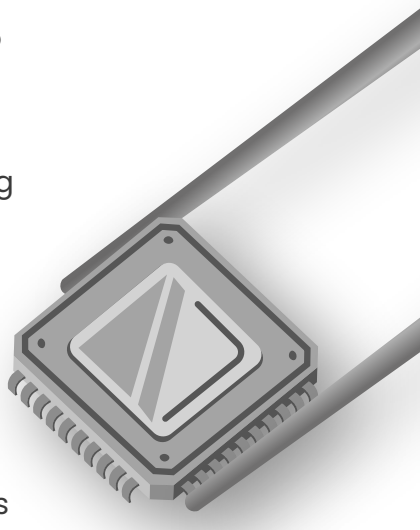
Introduction

The U.S. CHIPS and Science Act, with its $500 million International Technology Security and Innovation (ITSI) fund [1], has ignited a strategic race among Latin American nations to capture a share of the global semiconductor value chain. Incentivized by the global push for nearshoring and friendshoring, countries are launching initiatives to attract investment, particularly in crucial final-stage processes like assembly, testing and packaging (ATP).

However, the presence of this industry in the region is not recent. There is a history of transformation and integration of semiconductors in various sectors, as well as regional trade flows. Countries such as Costa Rica, Mexico and Brazil have historically been the pioneers in the region; however, the current economic and geopolitical context has driven companies to diversify their supply chains, generating opportunities for other Latin American countries to consolidate themselves as strategic hubs in this industry[2].

This analysis focuses on five key nations that are shaping the region's semiconductor ecosystem. The landscape includes Mexico as the manufacturing powerhouse for the North American market, Costa Rica as growing specialist in high-value assembly, test and packaging, Brazil as a major tech consumer, and the emerging logistics hubs of the Dominican Republic and Panama who are leveraging their location to manage the flow and redistribution of electronic components in the Americas. It also examines the origin and evolution of this industry in each country, as well as its current situation, with the aim of identifying commercial opportunities and potential areas of development.



Methodology: Our approach to the analysis of Semiconductor trade

To be able to systematically address the trade of semiconductors, this study relies on the globally recognized **Harmonized System (HS)** of tariff codes, established by the World Customs Organization (WCO). Our

product selection is specifically guided by the codes identified by the Semiconductor Industry Association (SIA) as being central to the sector.

These products fall under **Chapter 85 of the HS**, which covers electrical machinery and equipment [3]. Within this chapter are two four-digit codes directly related to semiconductor products, which are described below based on the most recent version of the Harmonized System, updated in 2022[4].

- Code 8541 includes **diodes, transistors, and similar semiconductor devices; photosensitive devices** (such as photodiodes), **photovoltaic** cells not assembled into modules or panels, and **light-emitting diodes (LEDs)**; as well as **mounted piezoelectric crystals**. Table 1 presents this classification at the six-digit level and the products included within this category.

CODE	DESCRIPTION
8541.1	Diodes (excluding photosensitive or light emitting diodes).
8541.21	Transistors with a dissipation rate of < 1W (excluding photosensitive transistors).
8541.29	Transistors with a dissipation rate of >= 1W (excluding photosensitive transistors).
8541.3	Thyristors, diacs, and triacs (excluding photosensitive transistors).
8541.41	Light emitting diodes (LED).
8541.42	Photovoltaic cells not assembled in modules or made up into panels.
8541.43	Photovoltaic cells assembled in modules or made up into panels.
8541.49	Photosensitive semiconductor devices (excluding photovoltaic generators and cells).
8541.51	Semiconductor-based transducers (excluding photosensitive).
8541.59	Other semiconductor devices.
8541.60	Mounted piezo-electric crystals.
8541.90	Parts of diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, light emitting diodes and mounted piezoelectric crystals.

Table 1. *Semiconductor devices (Chapter 85.41)*

- Code 8542 covers **electronic integrated circuits**, or microchips, the types of which are detailed in Table 2, with their corresponding classification at the digit level in the Harmonized System.

CODE	DESCRIPTION
8542.31	Electronic integrated circuits as processors and controllers, whether or not combined with memories, converters, logic circuits, amplifiers, clock and timing circuits, or other circuits.
8542.32	Electronic integrated circuits as memories.
8542.33	Electronic integrated circuits as amplifiers.
8542.39	Other integrated circuits (excluding such as processors, controllers, memories and amplifiers).
8542.90	Parts of electronic integrated circuits, n.e.s.

Table 2. *Electronic integrated circuits (Chapter 85.42)*

Mapping WSTS Categories to Harmonized System (HS) Codes

To effectively map semiconductor trade, this analysis adopts the classification framework of the **World Semiconductor Trade Statistics (WSTS).** As a respected non-profit comprised of major global manufacturers since 1986, the WSTS provides a crucial industry perspective. It groups all semiconductor products into two primary categories: **Digital Integrated Circuits and DAOs** (Discrete, Analog, and Other Devices)[5][6]. The following section will map these industry-standard categories to their corresponding Harmonized System (HS) codes to enable a precise trade flow analysis.

WSTS SEMICONDUCTOR CLASSIFICATION	
Digital Integrated Circuits	Memory IC Logic IC
DAO Discrete, Analog and Other Devices	Discrete Devices
	Analog IC
	Others (Sensors and optoelectronics)

Table 3. *Semiconductor Classification according to World Semiconductor Trade Statistics*

To bridge the industry-focused WSTS framework with global trade data, we've mapped its categories to the corresponding Harmonized System (HS) codes. While the WSTS provides broad groupings, a more granular view is needed to accurately analyze the supply chain.

For this study, we have disaggregated the broader WSTS categories into six specific sub-groups: **Discrete, Analog IC, Logic IC, Memory IC, Optoelectronics, and Sensors.** This allows for a more precise analysis of the distinct product segments flowing through the region.

Furthermore, we have created a seventh category called **"Parts".** This category isolates tariff codes **8541.90** and **8542.90**, which specifically cover parts of diodes, transistors, and integrated circuits. By separating "Parts" from finished devices, we can better track the trade of essential components versus fully assembled products, offering a clearer picture of the value chain. For the complete table check Appendix A.

CATEGORY	WSTS PARENT CATEGORY	PRIMARY HS CODE(S)	DESCRIPTION
Discrete	DAO	8541.10 - 8541.59	Diodes, Transistors, Thyristors, etc.
Analog IC	Digital / DAO	8542.29, 8542.30, 8542.33, 8542.40, 8542.60	Amplifiers, linear circuits.
Logic IC	Digital	8542.10-8542.19, 8542.31, 8542.31, 8542.39	Logic circuits, gate arrays.
Memory IC	Digital	8542.32	DRAM, Flash, etc.
Optoelectronics	DAO	8541.4	Photosensitive devices, LEDs, photovoltaic cells.
Sensors	DAO	8541.51, 8541.60	Semiconductor-based sensors and transducers.
Parts	Disaggregated from DAO	8541.90, 8542.50, 8542.70 8542.90	Parts of diodes, transistors, ICs and electronic microassemblies.

Table 4. *Semiconductor WSTS-HS Code Mapping*

Global Semiconductor Demand

The global semiconductor market is characterized by cyclical trends, which have become particularly pronounced in recent years. Based on data from WSTS, the market registered a contraction between 2018 and 2019, largely due to a downturn in memory chip prices and rising geopolitical trade tensions.

However, the onset of the COVID-19 pandemic in 2020 triggered a sudden demand surge. A global shift to remote work and a pivot in consumer spending towards electronics fueled record-breaking growth, culminating in a market peak in 2022. This boom led to the infamous global chip shortage, which severely impacted industries from automotive to consumer electronics. The subsequent decrease in 2023 represents a market correction, driven by macroeconomic pressures like inflation and the normalization of post-pandemic demand.

Crucially, the supply chain disruptions of 2020-2022 exposed the risks of geographic over-concentration in semiconductor manufacturing. This realization has become a primary catalyst for change, compelling governments and multinational corporations to prioritize supply chain

resilience. Strategic initiatives like the U.S. CHIPS and Science Act, along with the corporate push for **nearshoring and friendshoring,** are direct responses to the volatility illustrated in this data. It is this global shift that creates a historic window of opportunity for emerging players in Latin America to integrate into the semiconductor value chain.

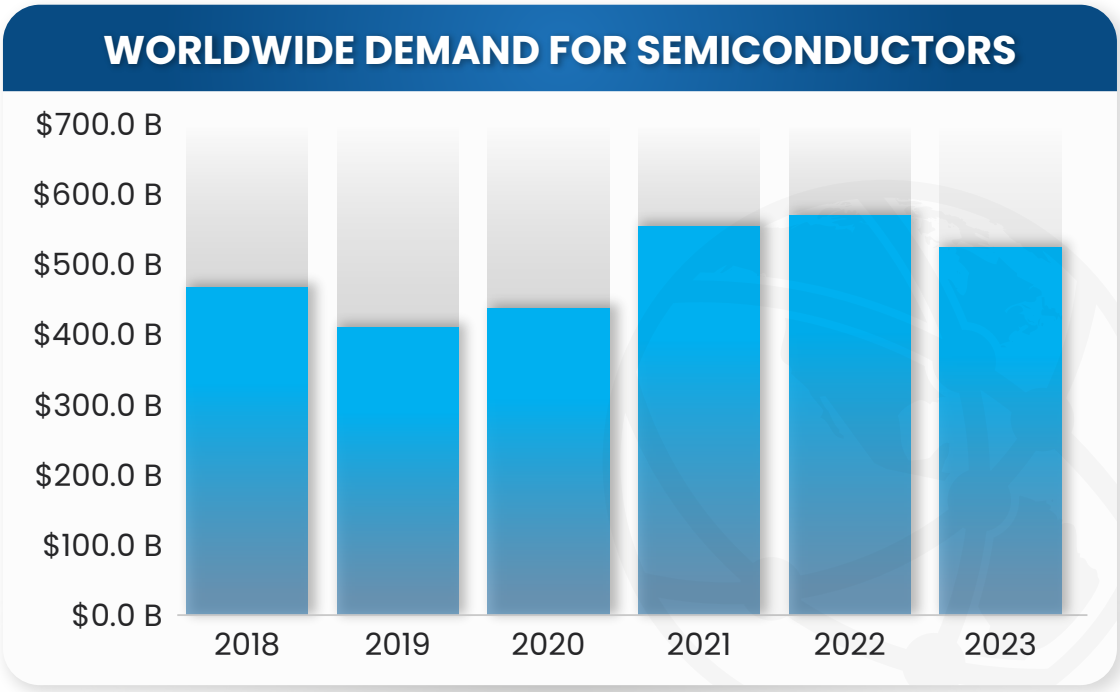


Figure 1. *Annual global demand for semiconductors*

Source: *Authors' elaboration with data from World Semiconductor Trade Statistics (WSTS)*

DAO Semiconductor Demand

Global demand for discrete, analog, and other semiconductor devices, or DAOs, showed varying trends between 2018 and 2023.

- **Analog integrated circuits** dominated this segment. Demand saw a drop from 2018 to 2019 but began to recover in 2020, with significant increases in 2021 and 2022. Although there was a slight decrease in 2023, the levels remained higher than those at the beginning of the period.
- **Discrete devices** had stable demand between 2018 and 2020. From 2021, demand increased consistently through 2023.

- **Optoelectronics** saw moderate growth in the first few years, then remained relatively stable from 2020 to 2023 with minimal fluctuations.
- **Sensors and actuators** experienced sustained growth from 2018 to 2022, followed by a slight dip in 2023, though demand levels stayed above initial years.

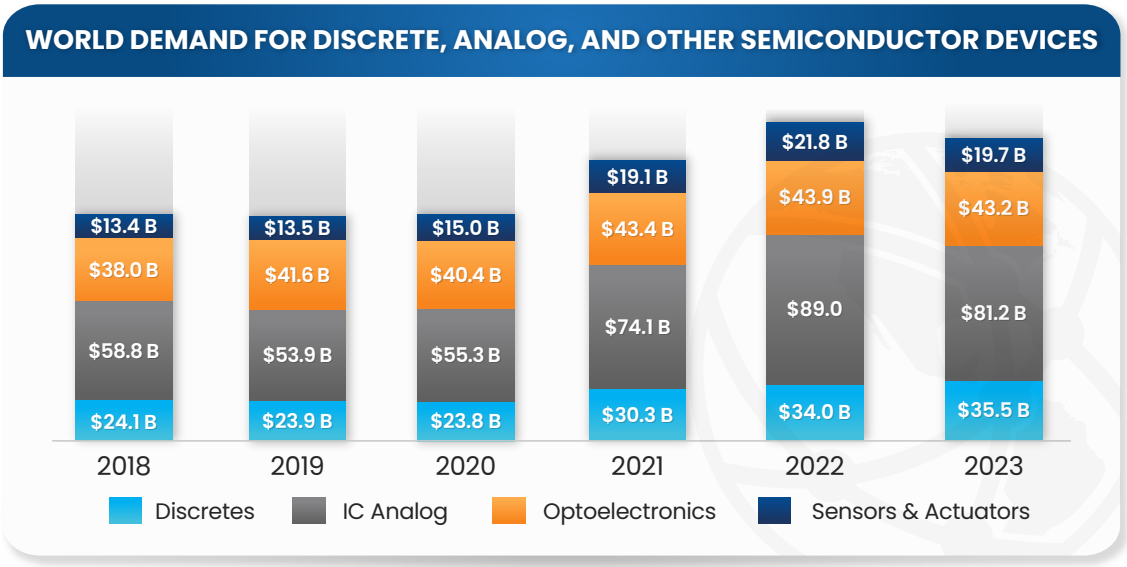


Figure 2. *Annual global demand for DAO semiconductors*

Source: *Authors' elaboration with data from World Semiconductor Trade Statistics WSTS*

Digital Integrated Circuits Demand

The market for digital integrated circuits between 2018 and 2023 followed two divergent paths: the steady growth of logic circuits versus the pronounced volatility of memory chips. Logic circuits demonstrated resilience, experiencing a minor dip in 2019 before embarking on a steady ascent from 2020, peaking in 2022 and maintaining that strength through 2023. In contrast, memory circuits followed a classic boom-and-bust cycle. The segment saw a sharp contraction in 2019, a powerful rebound in 2021, but then entered a significant correction in 2022 that continued through 2023, ultimately closing the period at a lower level than where it began.

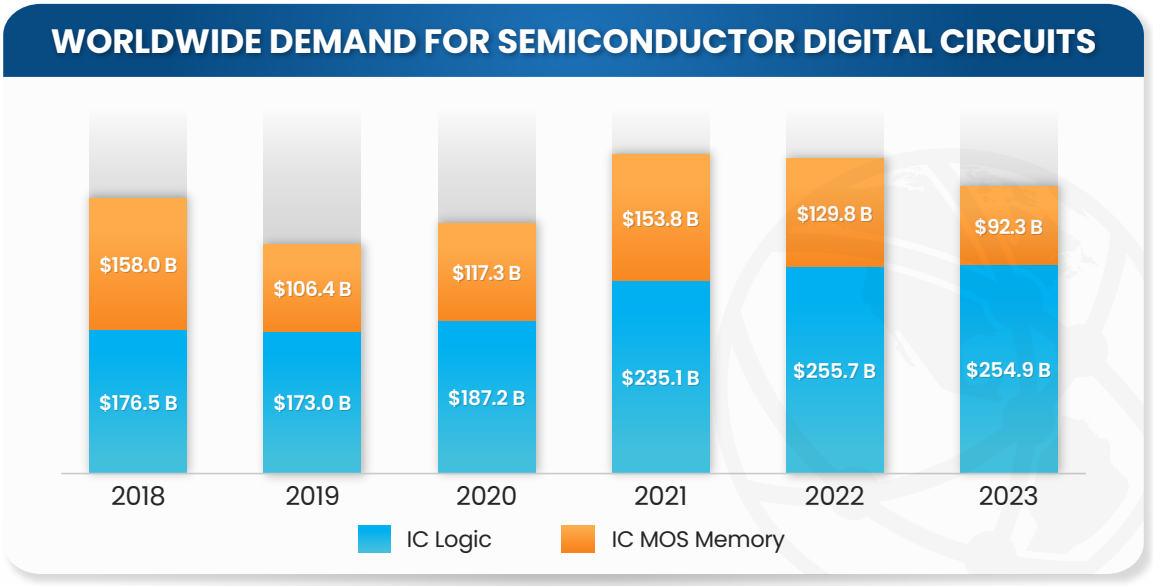


Figure 3. *Annual global demand for digital circuit semiconductors*

Source: *Authors' elaboration with data from World Semiconductor Trade Statistics WSTS*

Semiconductor Trade in Latin America

Driven by the global push for supply chain resilience and the momentum of nearshoring, Latin America is emerging as a region of strategic importance for the semiconductor industry. While not a center for advanced wafer fabrication, the region offers a diverse and growing ecosystem focused on the crucial mid-stream and back-end stages of the value chain, particularly in Assembly, Testing, and Packaging (ATP), as well as in logistics and distribution. The semiconductor landscape in the region is not uniform; instead, it is defined by a spectrum of countries with distinct roles and varying levels of industry maturity.

For this analysis, we focus on five key nations that represent these different archetypes. At one end are **the established players, Mexico** and **Brazil,** whose large industrial bases and historical ties to the automotive and electronics manufacturing sectors have made them foundational to regional trade. Occupying a specialized niche is the **high-tech hub** of **Costa Rica**, which has successfully leveraged foreign investment and a skilled workforce to excel in high-value testing, assembly, and research. Finally, a new category of **emerging logistics hubs** is represented by **Panama** and the **Dominican Republic.** These

nations are capitalizing on their strategic geographic locations and to become critical nodes in the semiconductor supply chain.

The following sections will provide a detailed analysis of the semiconductor trade flows and historical development within each of these five countries. Given its unique logistical capabilities and strategic importance to global trade, **special attention will be devoted to the case of Panama**, examining its rapidly evolving role as a critical hub for the Americas.

COSTA RICA

The semiconductor industry in Costa Rica began in 1996 with the installation by Intel of a microprocessor assembly and testing plant. This fact marked a before and after, positioning the country as the first in Central America to integrate into the supply chain of this industry. In 2014, Intel closed the plant and moved its operations to Malaysia due to operating costs, keeping only staff for research and development. The factory reopened in 2020, motivated by the chip shortage during the COVID-19 pandemic[7]. In addition to Intel, Costa Rica is home to companies such as Teradyne, Qorvo, NI, HPE, and R&D Altanova (of ADVANTEST Corporation), which are involved in activities ranging from assembly and testing, to integrated circuit design, research and development[8].

Following the announcement of Costa Rica's inclusion as a strategic ally under the Semiconductor and Science Act (CHIPS Act) in July 2023, the country has implemented strategies to attract investment, such as the launch of the Roadmap for the Strengthening of the Semiconductor Ecosystem in Costa Rica, prepared by the Ministry of Foreign Trade and published in March 2024. This document proposes to evaluate and highlight the country's position and competitiveness in the sector, as well as to present concrete actions to boost the industry and strengthen the proposal to attract investment, based on specific comparative advantages. The plan is structured in four pillars: human talent,

incentives 2.0, FDI attraction and regulatory improvement, with measures defined for the short, medium and long term[9].

Costa Rica's Semiconductor Trade Balance by Category (2018-2024)

The trade data for Costa Rica's semiconductor sector reveals a significant overall trade deficit which highlights a clear picture of the country's **specialized and strategic role** within the global semiconductor supply chain. Costa Rica has successfully carved out a niche for itself not as a manufacturer of raw components, but as a crucial hub for the final stages of production.

Costa Rica's industry is concentrated in the **Assembly, Test, and Packaging (ATP)** phase. This means companies import semi-finished products to perform the critical final steps. They assemble components into their final casings, conduct rigorous quality tests, and package them for shipment. This model naturally results in high import values and can potentially explain the large trade deficits, such as the $409 million gap in discrete semiconductors and the **$383 million** deficit in logical integrated circuits. The value added in Costa Rica is in the technical service and quality assurance, not in the raw material itself.

An interesting detail in the data is the trade surplus in **analog integrated circuits**, which suggests that Costa Rica has developed a highly specialized capability in this specific area and demonstrates a maturing ecosystem that is moving into bringing more specialized value to the industry.

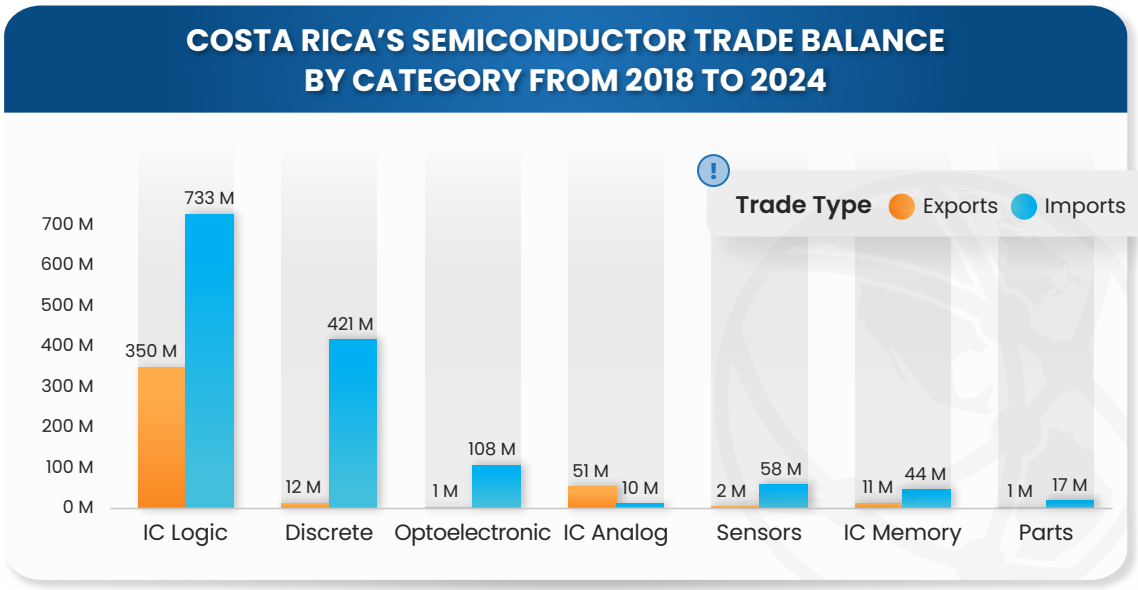


Figure 4. *Costa Rica's Semiconductor Trade Balance by Category from 2018 to 2024*

Source: *Prepared by the authors based on data from the International Trade Centre (ITC, Trade Map), using statistics from PRtOCOMER and the Central Bank of Costa Rica.*

Exports

From 2018 to 2024, Costa Rica's semiconductor exports were overwhelmingly led by **logic integrated circuits.** This category peaked at **$72 million** in 2018 and, despite fluctuating, consistently remained the primary export driver.

A key shift occurred in 2022 as the country's export mix began to **diversify. Analog integrated circuits** emerged as the clear second leading export, growing to a high of **$18 million** in 2023. Other components made smaller, more sporadic contributions, such as a notable **$8 million** spike for discrete components in 2022 and growing sales of memory circuits in 2024. Throughout this period, categories like optoelectronics, parts, and sensors consistently remained minor exports.

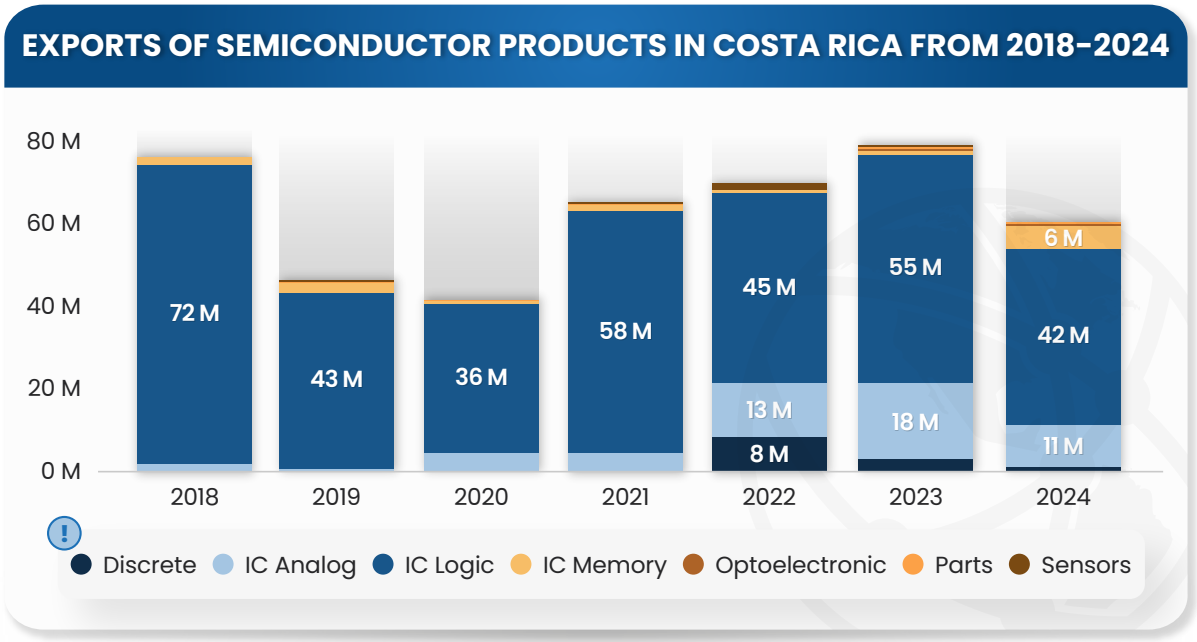


Figure 5. *Exports of semiconductor products in Costa Rica from 2018-2024*

Source: *Prepared by the authors based on data from the International Trade Centre (ITC, Trade Map), using statistics from PROCOMER and the Central Bank of Costa Rica*

Imports

Costa Rica's semiconductor import landscape showed significant changes from 2018 to 2024. Initially from 2018 to 2020, **logic integrated circuits** were the undisputed top import, peaking at **$132 million.** During this period, other categories, such as discrete components, were purchased in comparatively small volumes.

Beginning in 2021, this dynamic shifted entirely. **Discrete components** experienced a large surge in demand, climbing from just **$17 million** to a peak of **$136 million** by 2023. The import mix also broadened as sensors emerged as another key category. Throughout this entire transformation, imports of optoelectronics, parts, and memory circuits remained consistently marginal.

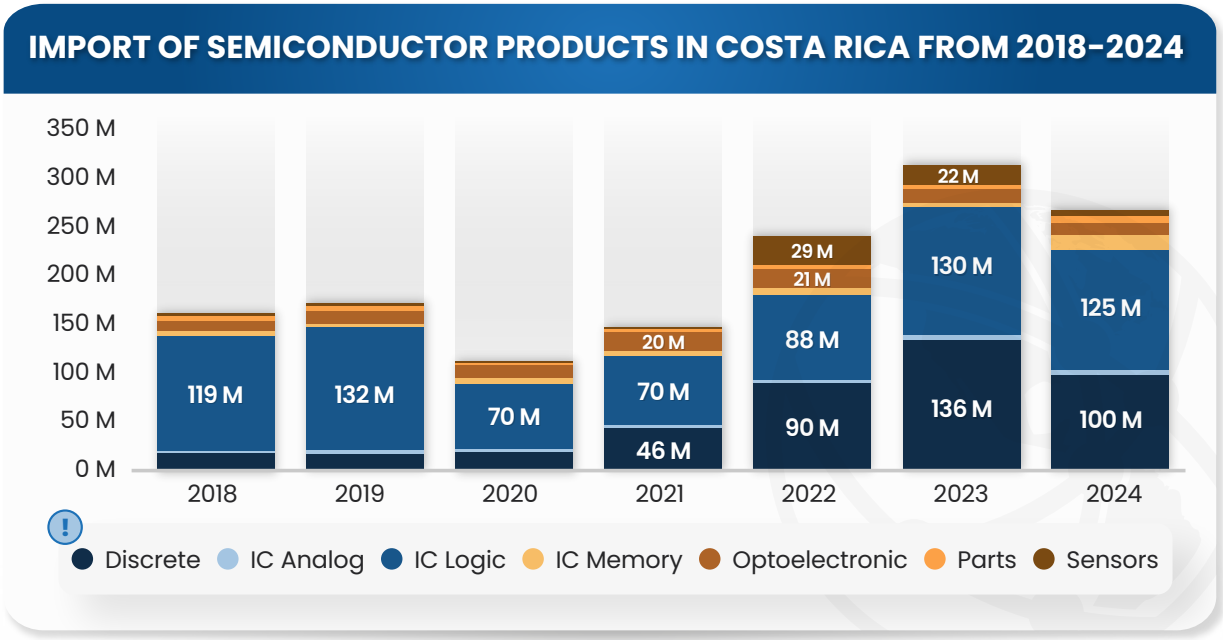


Figure 6. *Import of semiconductor products in Costa Rica from 2018-2024*

Source: *Prepared by the authors based on data from the International Trade Centre (ITC, Trade Map), using statistics from PROCOMER and the Central Bank of Costa Rica.*

Costa Rica's International Trade Flow of Semiconductors (2018-2024)

The data clearly shows that the **United States** is the central pillar of Costa Rica's semiconductor trade, acting as both its **largest supplier and its biggest customer.** However, the relationship is asymmetrical; Costa Rica imports nearly **$817 million** from the U.S. but exports only about **$304 million** back. This significant trade deficit ($513 million) highlights the U.S.'s role as a primary source of high-value components, equipment, and designs that feed into Costa Rica's assembly and testing facilities.

There is a stark imbalance in the trade relationship with major Asian manufacturing hubs. Costa Rica imports a massive **$304 million** from **China** and over **$65 million** from **Malaysia**, while exporting minimal amounts in return ($11 million and $2 million, respectively). This pattern strongly suggests that these Asian countries function as foundational suppliers, providing the essential raw materials and semi-finished

components that Costa Rica's industry depends on for its assembly and testing operations.

In sharp contrast to the relationships with the U.S. and Asia, Costa Rica maintains a **trade surplus** with both Mexico and **Hong Kong. It exports $44 million** to Mexico while importing only $9 million, and sends **$36 million** to Hong Kong with minimal imports. This reveals their role as key destination markets for Costa Rica's finished or value-added products.

Figure 7. *Costa Rica's International Trade Flow of Semiconductors (2018-2024)*

Source: *Prepared by the authors based on data from the International Trade Centre (ITC, Trade Map), using statistics from PROCOMER and the Central Bank of Costa Rica*

MEXICO

The electronics industry in Mexico was consolidated in the late 1960s with the arrival of foreign companies such as Mexican Burroughs and Motorola de México, which began operations in 1968. Its establishment was promoted by the Temporary Import Program for Export (PITEX), which allowed the temporary import of goods for processing and subsequent export without payment of taxes, laying the foundations of the maquiladora regime[10] .

Another relevant milestone was the entry into force of the North American Free Trade Agreement (NAFTA) between Mexico, the United States, and Canada, which boosted manufacturing exports, foreign direct investment, and integration into North American supply chains[11].

The semiconductor industry in Mexico has evolved towards higher value-added activities thanks to multinationals that have diversified their operations beyond basic manufacturing. Intel, through its Guadalajara Design Center (GDC), develops design, prototyping, validation of integrated circuits, software and corporate services globally, standing out as a key center for research and development in technologies such as 5G and artificial intelligence[12]. NXP Semiconductors, with its main facility in Guadalajara, started in the manufacture of discrete semiconductor components and then expanded its operations to supply chain management, software engineering, application development, IT, technical support, sales and marketing[13]. Texas Instruments operates 15 facilities worldwide, including wafer fabs and assembly and testing plants; one of them is located in Aguascalientes, Mexico[14].

Mexico's Semiconductor Trade Balance (2018-2023)

From 2018 to 2023, **Mexico's** semiconductor trade was characterized by a significant deficit, with imports far exceeding exports across nearly all major categories. This trend highlights the country's role in consuming and integrating components for higher-value manufacturing.

Logic integrated circuits dominated this trade imbalance, with import reaching **$113.53 billion** against exports of only **$17.45 billion.** Other key categories also showed substantial deficits, including **Memory Integrated Circuits** with $13.64 billion in imports versus $0.42 billion in exports, **Discrete Components** with $9.82 billion in imports against $2.51 billion in exports, and **Optoelectronics** with $6.74 billion in imports compared to $0.53 billion in exports. Smaller deficits were recorded for sensors and analogue integrated circuits and parts and other components.

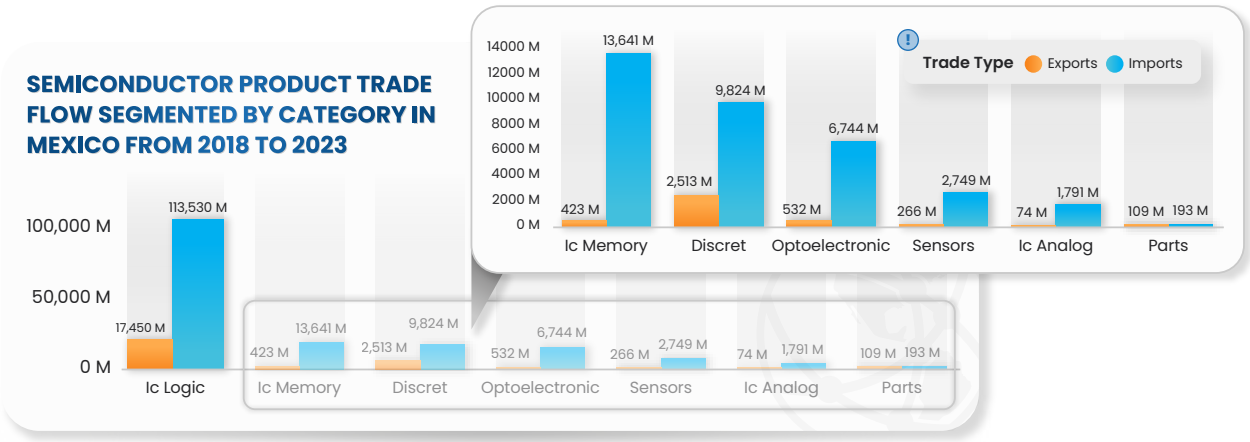


Figure 8. *Semiconductor product trade flow segmented by category in Mexico from 2018 to 2023*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from UN COMTRADE since January 2019 and from the National Institute of Statistics and Geography (INEGI) for the period from January 2015 to January 2019.*

EXPORTS

From 2018 to 2023, Mexico's semiconductor exports were overwhelmingly dominated by **logic integrated circuits.** This category saw significant fluctuation, rising from **$2.03 billion** in 2018 to a high of **$4.06 billion** in 2022, then falling to **$3.23 billion** in 2023. In contrast, **discrete components** demonstrated steady, modest growth, increasing from **$391 million** in 2020 to **$481 million** in 2023. Optoelectronic device exports declined until a recovery in 2023, while other categories like parts, sensors, and memory circuits remained minor contributors throughout the period.

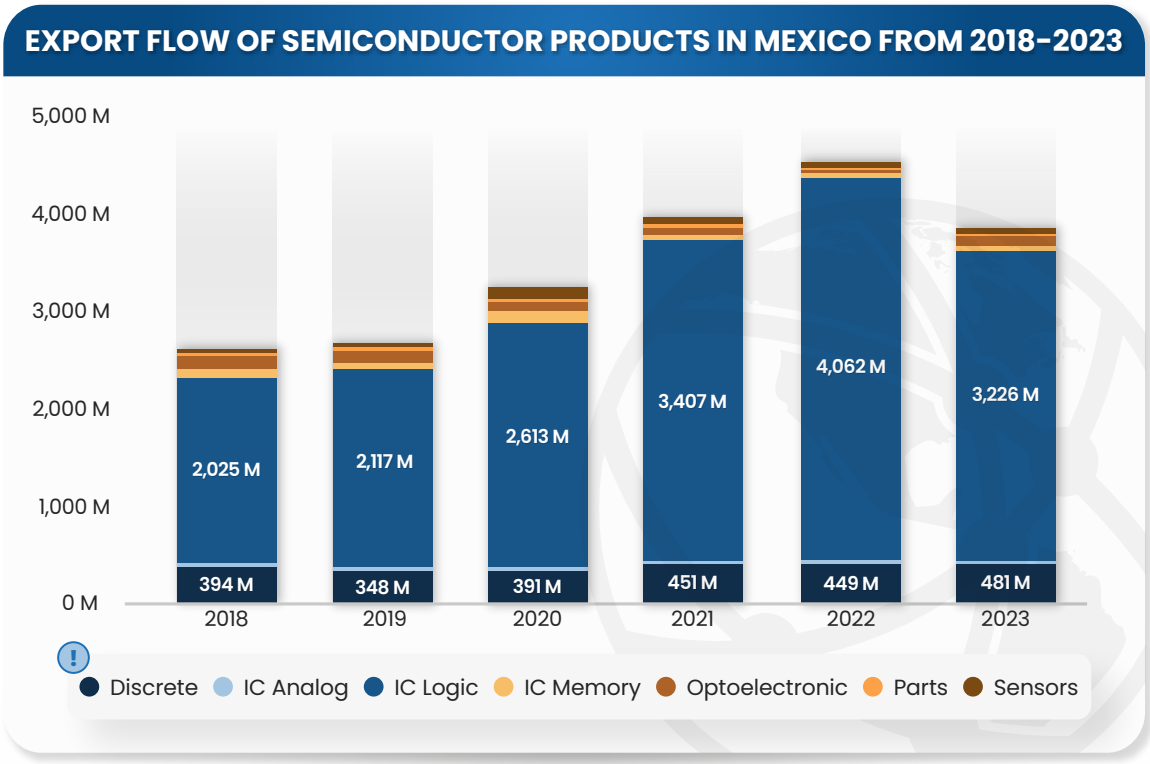


Figure 9. *Export flow of semiconductor products in Mexico from 2018-2023*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from UN COMTRADE since January 2019 and from the National Institute of Statistics and Geography (INEGI) for the period from January 2015 to January 2019*

IMPORTS

From 2018 to 2023, Mexico's semiconductor imports were dominated by **logic integrated circuits,** which grew steadily to a peak of **$23.65 billion** in 2022 before declining to **$21.55 billion** in 2023. The second-largest category, **memory integrated circuits,** exhibited significant volatility; after a high of **$4.02 billion** in 2019, imports plummeted to less than **$1 billion** by 2023. In contrast, **discrete components** and **optoelectronic devices** showed much greater stability. Discrete components peaked at **$2.0 billion** in 2022 and saw a minor dip in 2023, while optoelectronics maintained consistent import levels around **$1.4 billion** annually. Other categories like sensors and analogue circuits represented a smaller, stable portion of imports.

In contrast to the volatility of logic or memory integrated circuits, the stability in imports of **discrete components** and **optoelectronics** is significant. These are often "workhorse" components used across many industries, especially automotive and industrial manufacturing. Their steady import levels indicate that Mexico's broader manufacturing base, which relies on these parts, is stable and less susceptible to the wild swings of the high-end consumer electronics market.

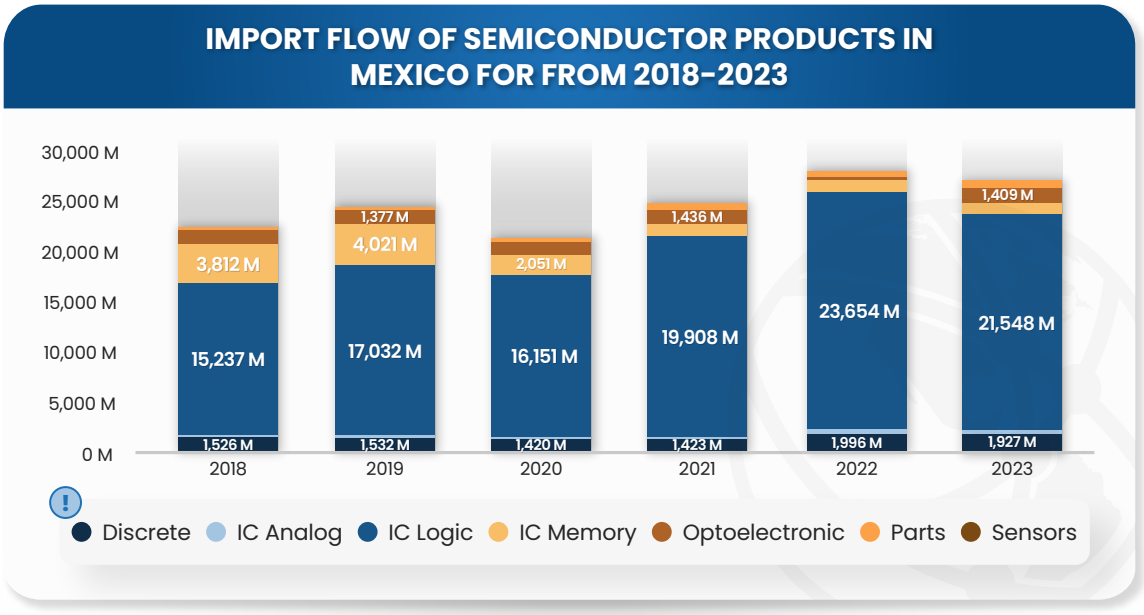


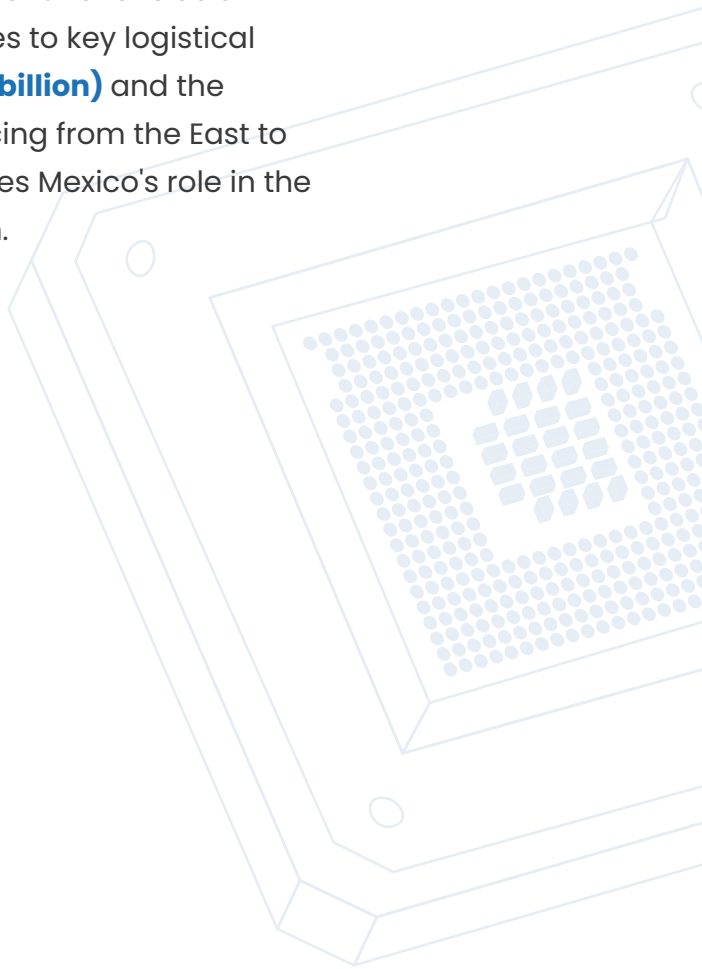
Figure 10. *Import flow of semiconductor products in Mexico for from 2018-2023*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from UN COMTRADE since January 2019 and from the National Institute of Statistics and Geography (INEGI) for the period from January 2015 to January 2019*

Mexico's International Trade Flow of Semiconductors (2018-2023)

Mexico's semiconductor trade profile is that of a strategic manufacturing powerhouse, fundamentally shaping the North American technology landscape. The nation's industry is fueled by a massive influx of foundational components from Asia, with imports exceeding **$45 billion** from **Malaysia** alone. This dependency on Asian inputs sets the stage for Mexico's primary role as a transformer of components into higher-value products for global distribution.

The output of this system is overwhelmingly geared towards the **United States,** which receives **$17.09 billion** in exports, creating a massive trade surplus for Mexico, as it only imports **$8.88 billion** in return. This nearly 2-to-1 export ratio highlights Mexico's critical position as a value-add manufacturing hub for the U.S. automotive and electronics sectors. Beyond its regional dominance, Mexico also functions as a global export platform, shipping significant volumes to key logistical hubs in Asia and Europe, such as **Hong Kong ($1.4 billion)** and the **Netherlands ($369 million).** This dynamic of sourcing from the East to supply the West and the rest of the world showcases Mexico's role in the modern, nearshored global technology ecosystem.



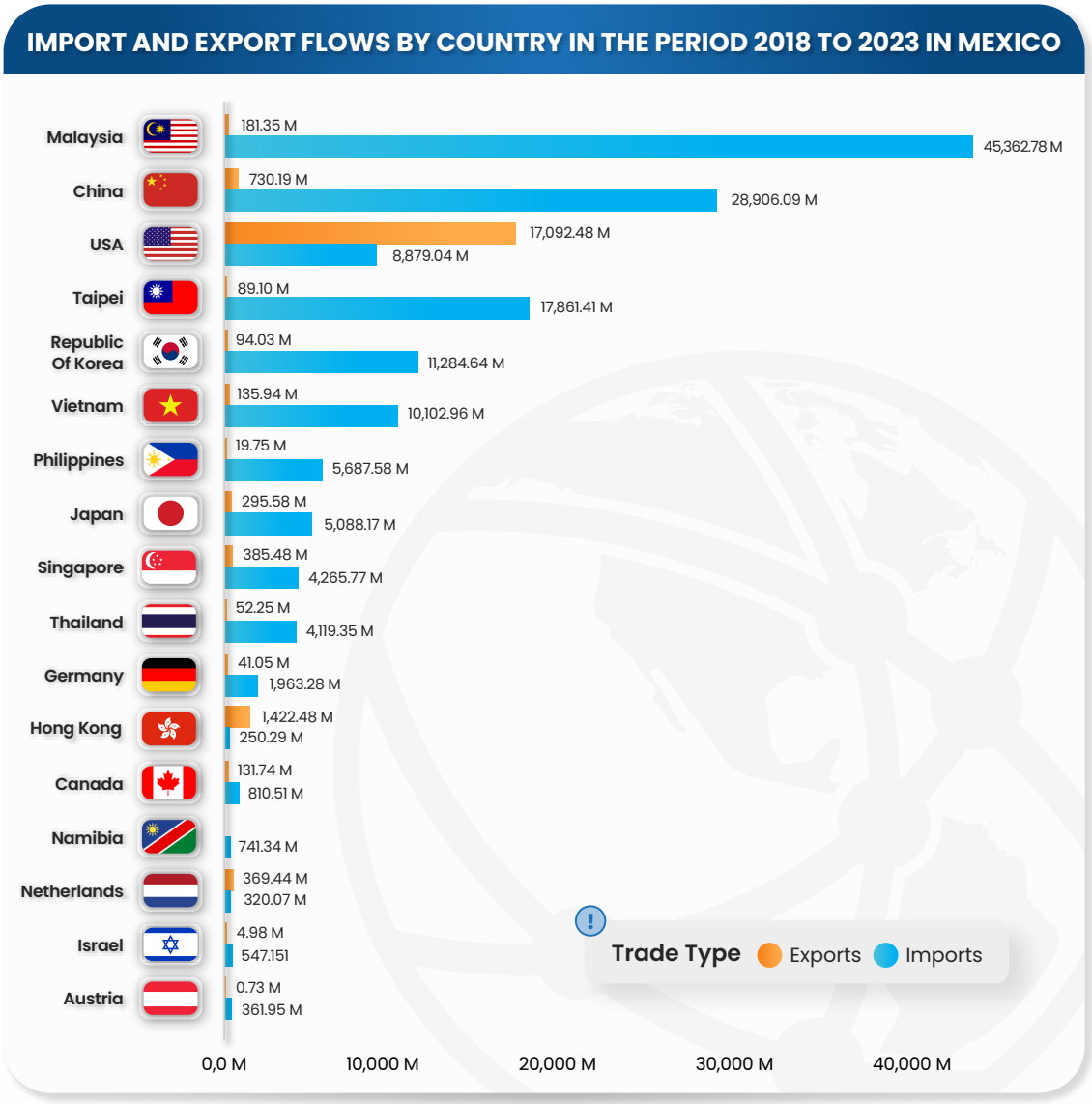


Figure 11. *Import and export flows by country in the period 2018 to 2023 in Mexico*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from UN COMTRADE since January 2019 and from the National Institute of Statistics and Geography (INEGI) for the period from January 2015 to January 2019*

BRAZIL

The semiconductor industry in Brazil has gone through stages of boom, collapse and recovery. By the 1980s, more than twenty companies were operating, including subsidiaries of global leaders. The policy of market reserve and its abrupt elimination in the early nineties led to the closure of factories by multinationals, which chose to supply the market

through imports. National companies were unable to sustain themselves in the face of the new competition and only cases such as Semikron and Motorola (now NXP), which maintained a design house in Campinas since 1997, survived. Starting in 2000, the State implemented public policies and strategic programs to reactivate the sector, such as the National Microelectronics Program (2002), which promoted the training of human resources and institutional articulation; CI-Brasil (2005), focused on creating and attracting design houses; and Padis (2007), which established a robust scheme of tax incentives for semiconductor manufacturing and development. These policies were complemented by favorable regulatory frameworks and direct state financing, such as the transformation of Ceitec S.A. into a federal public company, BNDES' participation in Unitec Semiconductores, and support for BrPhotonics[15].

Brazil's Semiconductor Trade Balance (2018-2024)

Brazil's semiconductor trade from 2018 to 2023 is defined by a profound and consistent trade deficit, underscoring its role as a major technology consumer rather than a producer. The imbalance is most pronounced in high-value categories, with **Logic ICs** showing a staggering deficit of over **$17 billion** ($17.55B imported vs. $256M exported). This pattern persists across all segments, from **memory chips** ($7.58B in imports vs. $136M in exports) to more specialized components. In foundational areas like **sensors,** the disparity becomes even more stark, with imports reaching **$360 million** against negligible exports of just **$4 million.** This data paints a clear picture of an industrial base heavily reliant on foreign components to fuel its domestic technology and manufacturing sectors.

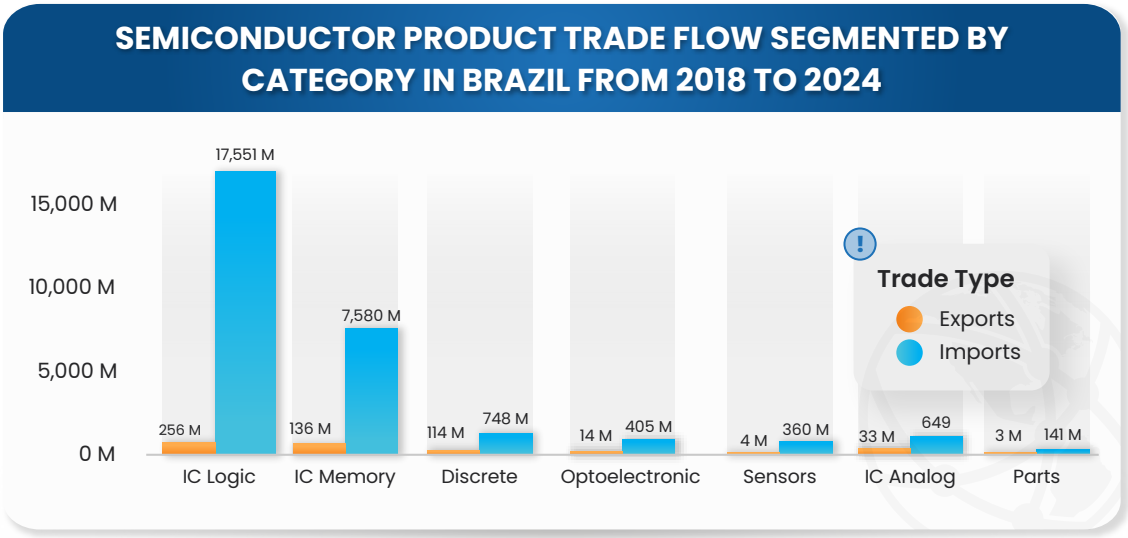


Figure 12. *Semiconductor product trade flow segmented by category in Brazil from 2018 to 2024*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the Ministry of Development, Industry and Foreign Trade (MDIC) of Brazil since January 2015*

Exports

Brazil's semiconductor export portfolio between 2018 and 2024 was defined by two distinct trends: volatility in its primary export categories and stability in its niche ones. **Logic circuits, memory,** and **discrete components** experienced a turbulent cycle, beginning with a sharp market contraction in 2019, where memory exports, for example, were more than halved to just **$12 million.** This was followed by a gradual recovery that culminated in a peak performance in 2023, with logic circuit exports reaching a high of **$52 million.** However, this growth proved unsustainable, as 2024 saw a general downturn across these key areas. In stark contrast, exports of optoelectronics, sensors, and analog ICs provided a steady, albeit modest, baseline, showing minimal fluctuation throughout the entire period.

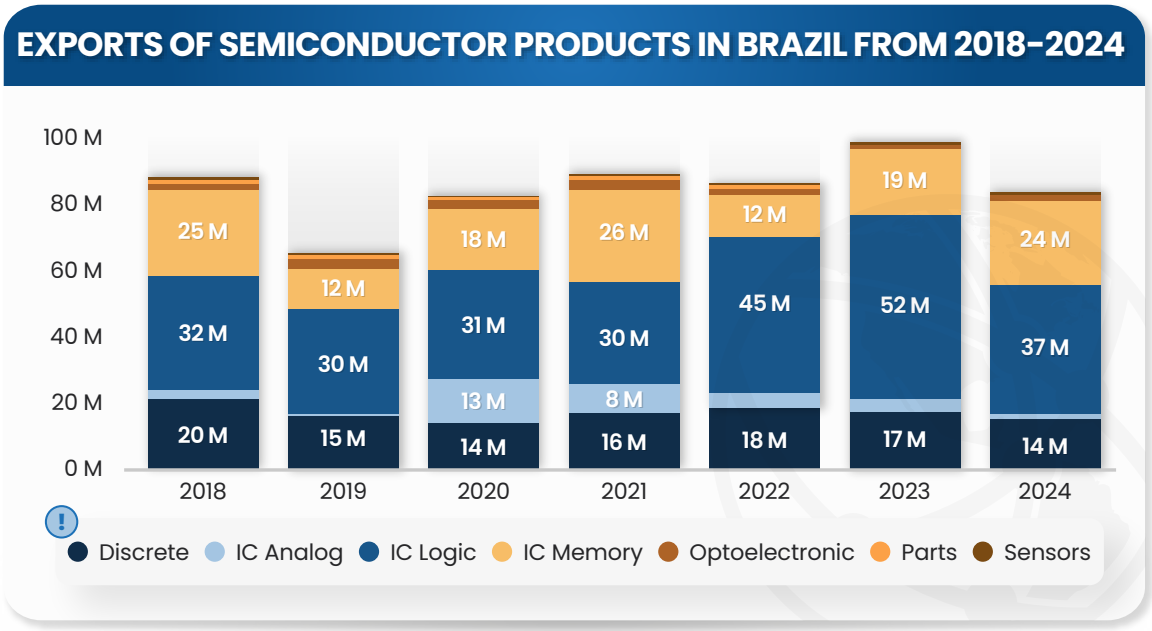


Figure 13. *Exports of semiconductor products in Brazil from 2018-2024*

Source: *Prepared by the authors based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the Ministry of Development, Industry and Foreign Trade (MDIC) of Brazil*

Imports

An analysis of Brazil's semiconductor imports from 2018 to 2024 reveals a technology sector undergoing significant advancement, with total annual imports growing from approximately **$4.0 billion** to **over $4.4 billion.** The market is overwhelmingly dominated by a strong and consistently growing demand for **IC Logic**, which surged by over 54% from **$1.985 billion** in 2018 to **$3.071 billion** in 2024. This trend indicates a clear industrial shift toward manufacturing more complex, digitally intelligent products. In stark contrast, the market's second-largest category, **IC Memory**, demonstrated large volatility, peaking at **$1.659 billion** in 2018 before crashing to just **$574 million** in 2023 and then partially recovering. This fluctuation exposes the Brazilian electronics industry to the boom-and-bust cycles of the global commodity chip market. Together, these trends depict an expanding, more sophisticated technology sector that remains critically dependent on international supply chains for its most vital components.

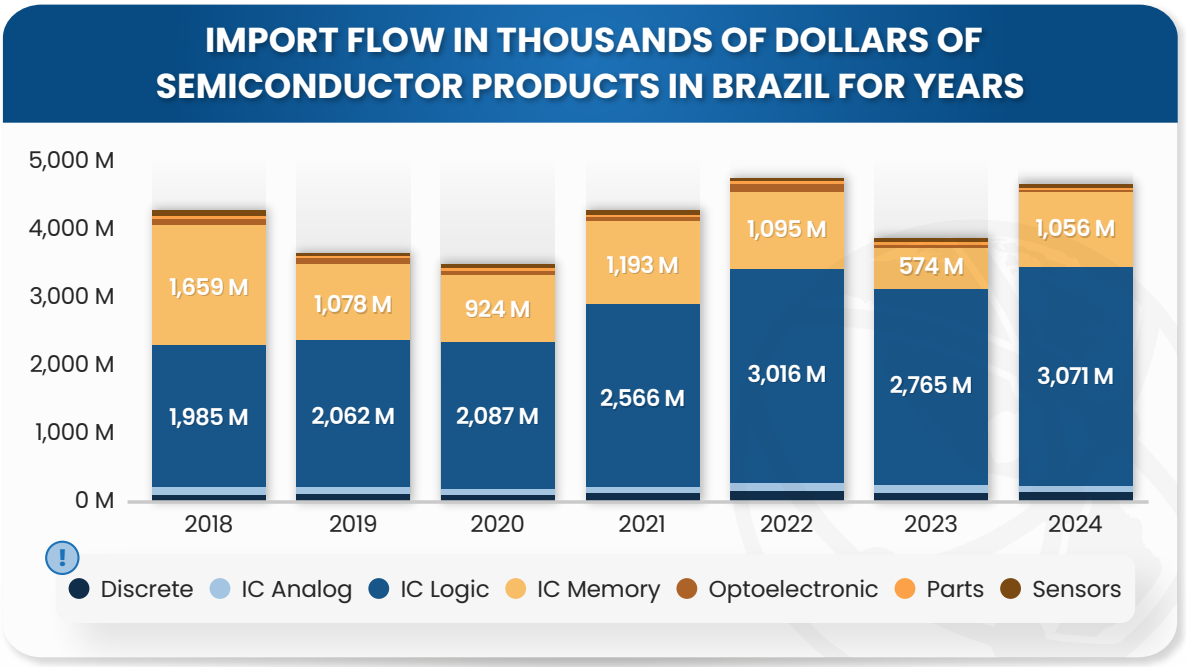


Figure 14. *Import flow in thousands of dollars of semiconductor products in Brazil for years*

Source: *Authors' elaboration based on calculations from the International Trade Centre (ITC), through Trade Map, using statistics from the Ministry of Development, Industry and Foreign Trade (MDIC) of Brazil since January 2015*

Brazil's International Semiconductor Trade (2018-2024)

Brazil's semiconductor trade is defined by a sharp contrast between its import sources and export destinations. The nation's supply chain is heavily dependent on a concentrated group of **Asian suppliers,** with imports overwhelmingly sourced from countries like **South Korea ($9.056 billion) and Taiwan ($6.586 billion).** In stark opposition to this, Brazil's export strategy is globally diversified, targeting high-value industrial hubs across different continents. Its main export destinations include **Vietnam ($153.66 million)** for electronics assembly, the **United States ($93.97 million)** for its high-tech industry, and **Germany ($86.67 million),** likely for the automotive sector. This dual dynamic, relying on Asia for components while serving as a specialized supplier to a varied set of global leaders, characterizes Brazil's unique position in the international semiconductor market.

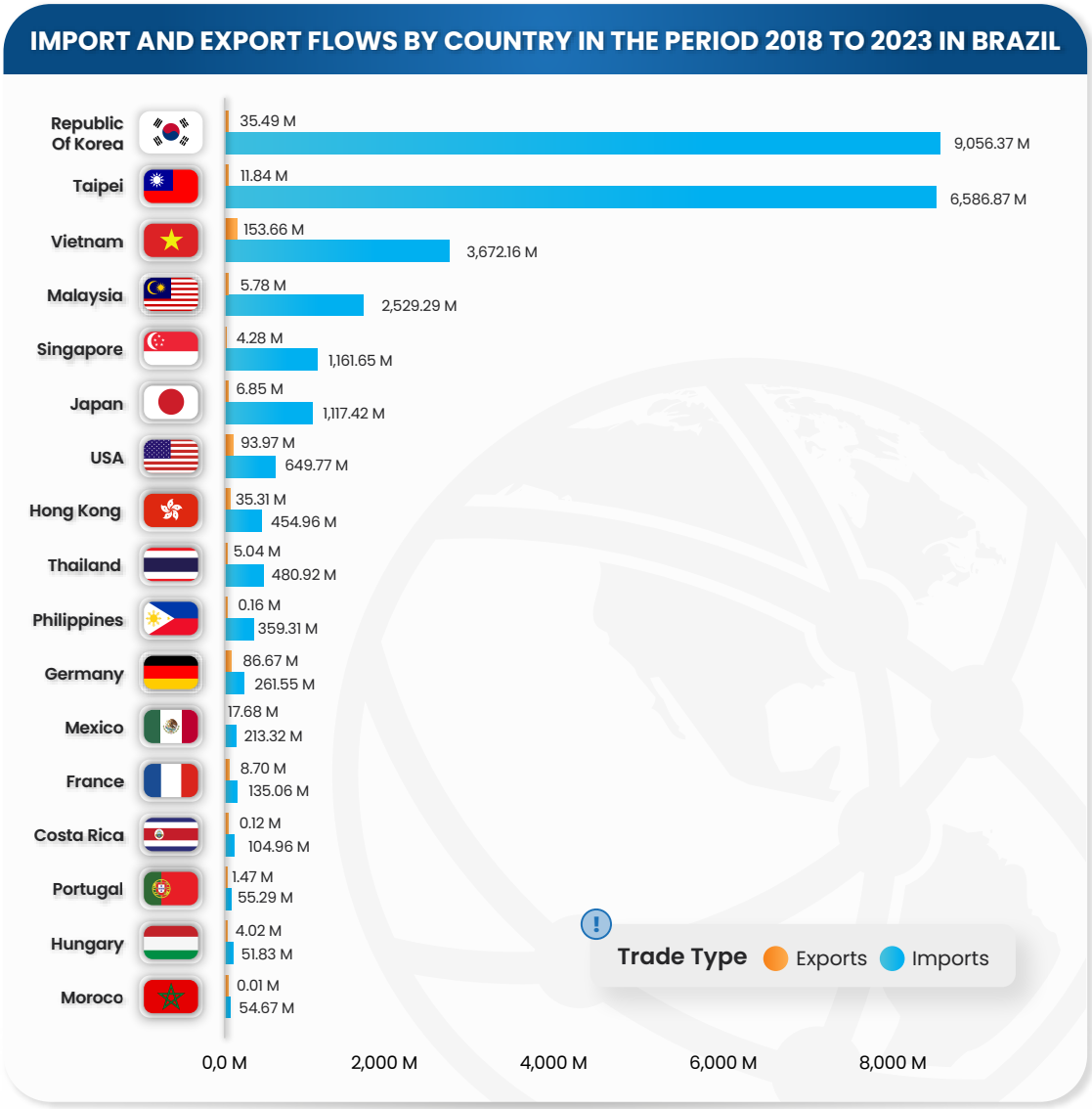


Figure 15. *Import and export flows by country in the period 2018 to 2023 in Brazil*

Source: *Authors' elaboration based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the Ministry of Development, Industry and Foreign Trade (MDIC) of Brazil since January 2015*

Dominican Republic

The growth of the manufacturing industry in the Dominican Republic has been closely linked to the development of free zones, which began in 1969 with the establishment of the first industrial park in La Romana. Since then, the country has consolidated a solid industrial ecosystem that, to date, has more than 87 free zone parks distributed throughout the national territory. These parks offer highly competitive tax incentives, such as total exemption from income tax, tariffs, VAT and other taxes,

which has positioned the country as a regional epicenter in electronic and medical device manufacturing[16].

Numerous companies in the electronics sector, both multinational and local, operate in this environment, covering a wide range of activities. Among the most prominent international firms are Eaton Corporation, through its subsidiaries Cutler Hammer and Souriau, dedicated to the manufacture of switches and connectors; Rockwell Automation, specializing in circuit boards, cables and sensors; Vishay Hirel, exporter of inductors and electronic components; Napco (USA), focused on electronic lock and alarm systems; K&L Microwave, a manufacturer of radio frequency filters; and Johanson Dominicana, producer of capacitors. In addition, local and mixed-capital companies such as Airlink Distribution DR (parts for cell phones and devices), Amlat PCS (refurbishment of smart devices), Back & Forth Logistics (export of video game consoles and speakers) and E-Cycling International (management of printers and electronic boards) complement this ever-expanding industrial fabric[17].

Dominican Republic Semiconductor Trade Balance by Category (2018-2024)

The Dominican Republic's trade balance in the semiconductor sector has a marked deficit, with imports much higher than exports in all categories. The dynamic is most pronounced in high-volume categories. For example, in optoelectronics, the country imported $639 million in materials, while related exports totaled just $48.36 million. A similar gap exists for electronic parts, with $590 million in imports compared to only $22.84 million in exports.

The trend continues with more specialized items. Imports of integrated logic circuits stood at $46.59 million, more than 20 times the export value of $2.06 million. Meanwhile, imports of other crucial components like discrete circuits, memory chips, and sensors collectively exceeded $21 million, with exports in these categories being negligible.

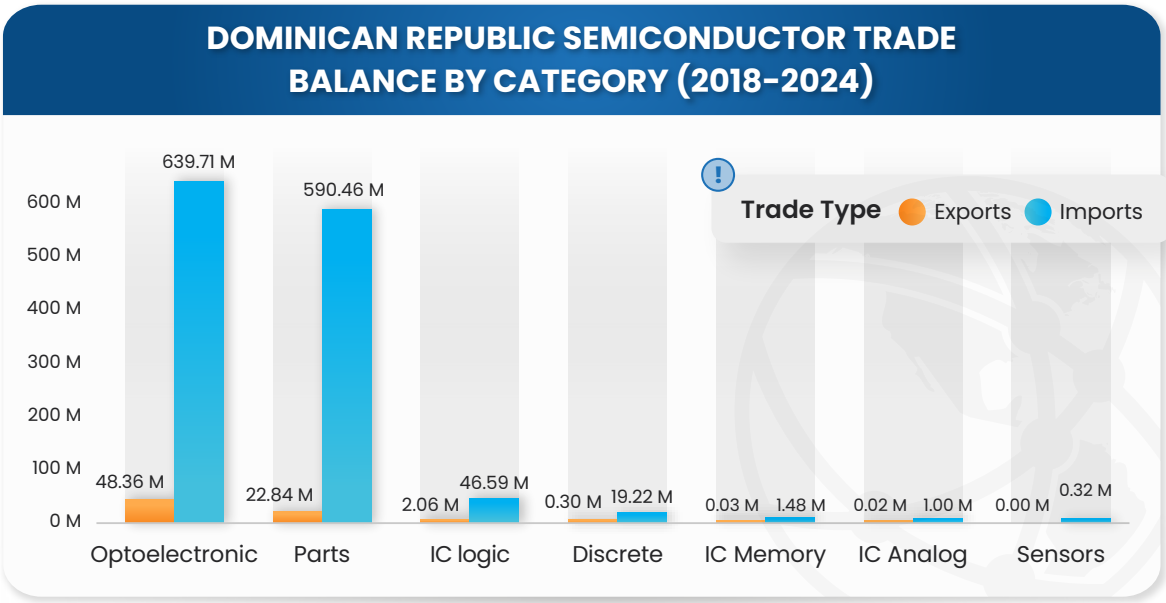


Figure 16. *Dominican Republic Semiconductor Trade Balance by Category (2018-2024)*

Source: *Prepared by the authors based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the National Statistics Office (ONE) of the Dominican Republic*

Exports

An analysis of electronics export data from 2018 to 2024 reveals a period of growth followed by a market normalization, highlighting the Dominican Republic's evolving role in the global supply chain. Dominican exports surged from approximately $4 million annually in 2018-2019 to a peak of **$17.8 million in 2021.** This expansion was driven by the **Optoelectronics** category, which grew largely during this period, likely in response to heightened global demand during the COVID-19 pandemic. Throughout this timeline, the **"Parts"** category served as a stable foundation, maintaining consistent export levels.

The post-2021 trend shows a normalization of exports, which have stabilized at a level significantly higher than the pre-pandemic baseline. This pattern suggests that while the export boom was tied to extraordinary global demand, the Dominican Republic has successfully retained has retained a greater share of the light electronics assembly market.

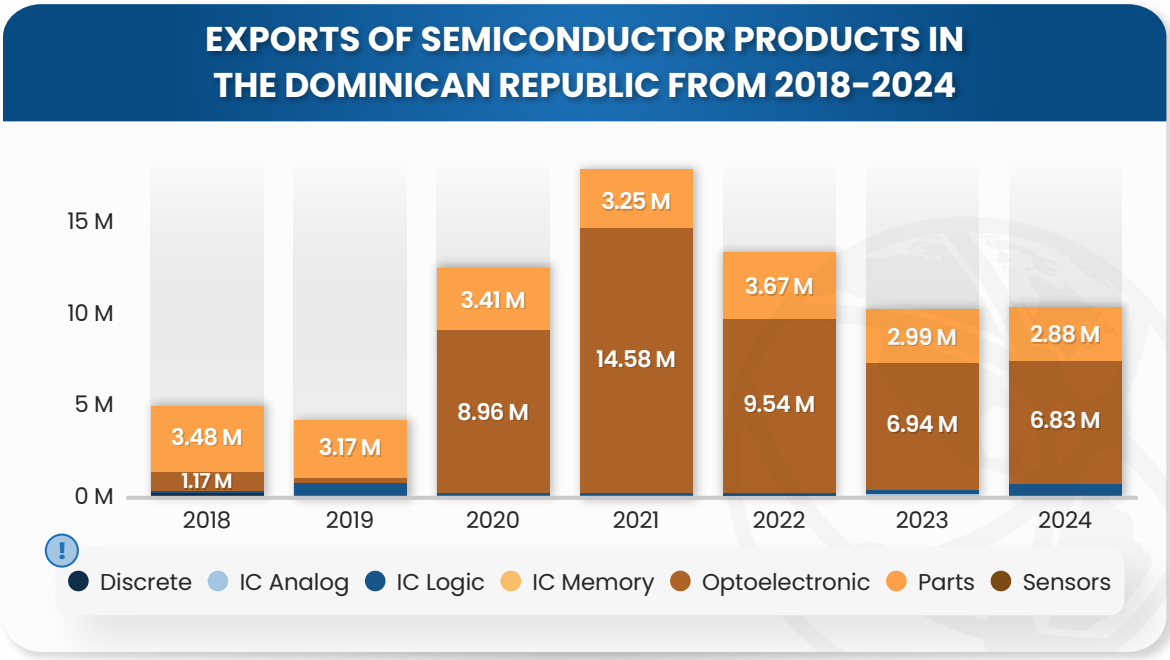


Figure 17. *Exports of semiconductor products in the Dominican Republic from 2018-2024*

Source: *Prepared by the authors based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the National Statistics Office (ONE) of the Dominican Republic*

Imports

Import data suggests a recent expansion of the Dominican Republic's industrial capacity in terms of semiconductors. After a period of relative stability between 2018 and 2021, where component imports averaged approximately $140 million annually, the sector saw an explosive surge beginning in 2023. Total import values nearly tripled, exceeding **$300 million** that year and continuing this strong pace into 2024. This growth was almost entirely fueled by a massive increase in **Optoelectronics** imports, supplemented by a consistently high volume of **"Parts"**. Growth in 2023 and 2024 could be linked to higher local demand, changes in supply chains, or adjustments in trade policy.

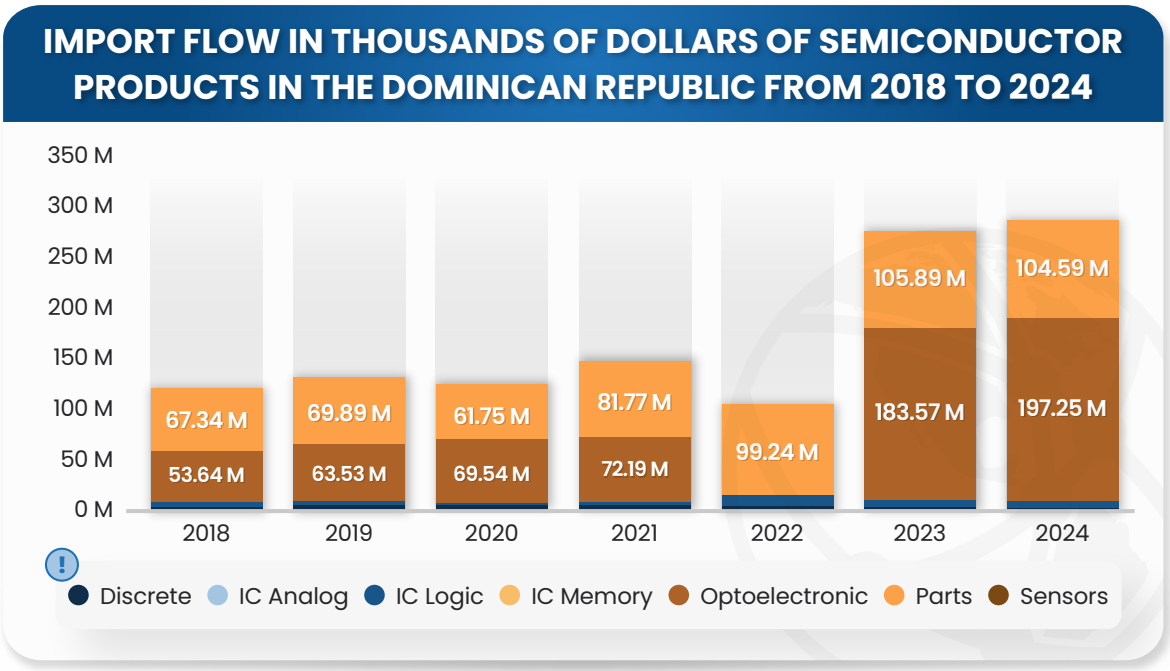


Figure 18. *Import flow in thousands of dollars of semiconductor products in the Dominican Republic from 2018 to 2024*

Source: *Prepared by the authors based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the National Statistics Office (ONE) of the Dominican Republic*

Dominican Republic's International Semiconductor Trade (2018-2024)

The Dominican Republic's international trade in the electronics sector is defined by a dual dependence on China and the United States, who serve distinctly different but complementary roles. China functions as the **primary upstream supplier**, providing nearly $600 million in components with minimal reciprocal exports, establishing it as the starting point of the value chain. In contrast, the United States acts as the principal **strategic partner and end-market.** While also a major supplier, it is the primary destination for over $63 million in assembled goods, suggesting a **"triangular trade"** pattern where components are sourced from Asia, assembled in the Dominican Republic, and sold in the North American market.

This trade structure results in a high geographic concentration that creates both efficiencies and strategic risks. The heavy reliance on two main partners makes the nation's electronics sector vulnerable to geopolitical tensions, trade policy shifts, and logistical disruptions in Asia or North America. The presence of other trading partners, such as Spain, Mexico, South Korea, and Japan, represents a smaller-scale diversification effort. These secondary relationships likely provide access to specialized components and alternative markets, offering a partial hedge against the risks associated with this concentrated trade corridor.

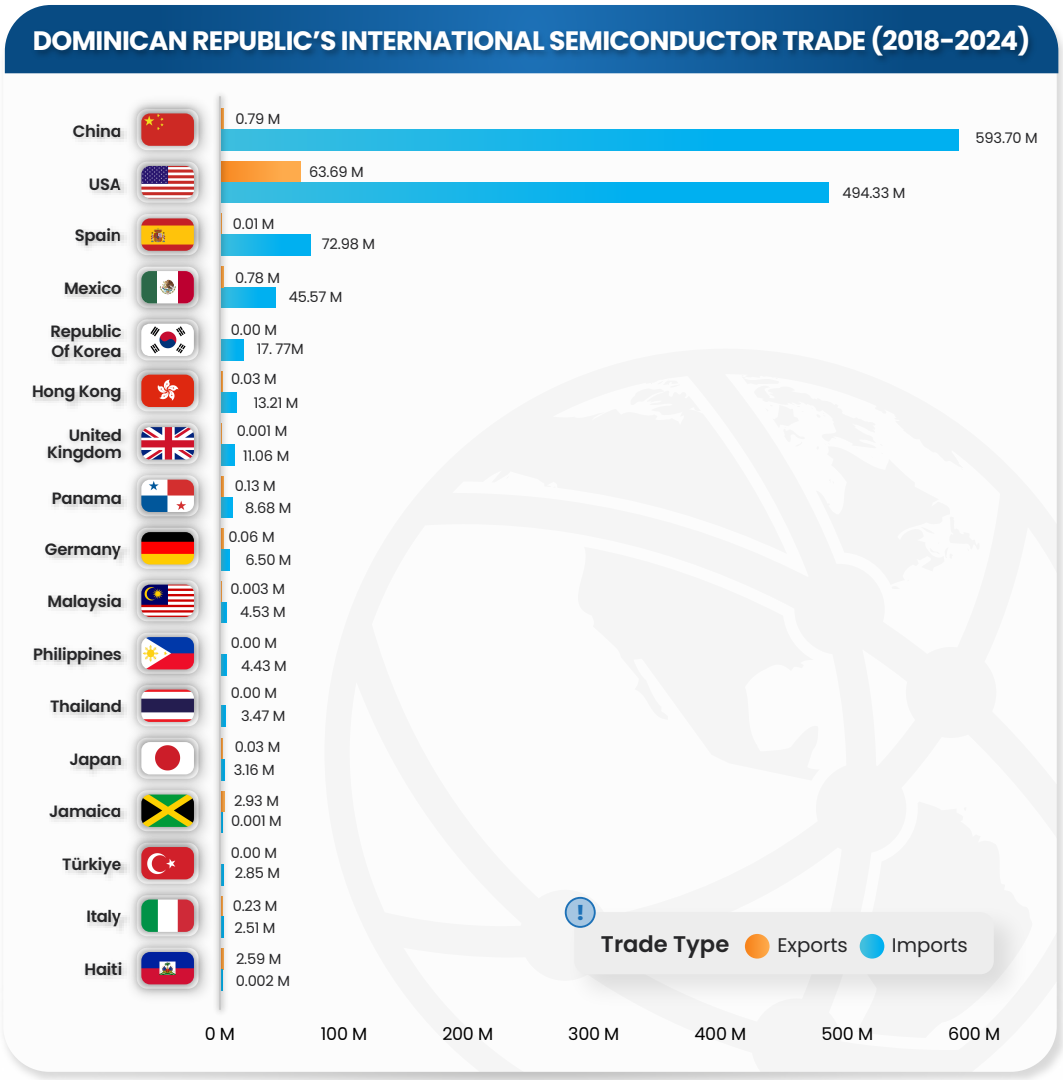


Figure 19. *Dominican Republic's International Semiconductor Trade (2018-2024)*

Source: *Prepared by the authors based on calculations by the International Trade Centre (ITC), through Trade Map, using statistics from the National Statistics Office (ONE) of the Dominican Republic*

Panama

Panama has not historically developed an electronics, microelectronics or semiconductor manufacturing industry. However, it has established itself as an important transit center for consumer goods at the regional level. In order to diversify its economy and attract foreign direct investment, it has implemented legal frameworks such as the Special Regime for the Establishment and Operation of Multinational Companies for the Provision of Services Related to Manufacturing (Law 159 of 2020 - EMMA) and the Special Regime for the Establishment and Operation of Headquarters of Multinational Companies (Law 41 of 2007 - MHQ). These laws are complemented by three types of special economic zones: the Colon Free Zone (second largest in the world), the Panama Pacifico Special Economic Zone and a set of twelve active free zones plus six under development distributed throughout the country. These regimes offer attractive incentives, such as tax exemptions on wealth, profits and goods intended for production, guaranteed by law[5].

Following the enactment of the CHIPS Act in 2023, Panama was recognized as a strategic ally to boost its participation in the semiconductor industry. This alliance opened opportunities to strengthen and diversify the global ecosystem through the International Fund for Security and Technology Innovation (ITSI Fund) [1]. The country has established various strategies to attract this industry, such as Executive Decree No. 7 (2024), which provides for the creation of the Commission for Innovation in Microelectronics and Semiconductors (CIMS), a national fund managed by SENACYT and tax and immigration incentives to attract investment and talent. In addition, with the support of universities such as Arizona State University, scholarship programs and the development of the Center for Advanced Technologies in Semiconductors (C-TASC AIP) have been initiated at UTP, aimed at training a specialized workforce [18]. In July 2025, the President of Panama, José Raúl Mulino, announced an investment of B/.105 million over five years, to train talent, attract companies and strengthen infrastructures, highlighting that a semiconductor plant can generate

more than 2 thousand jobs and up to 2 billion in foreign investment, with an impact of up to 2% of GDP[19].

National Goods Semiconductor Imports – 2018 to 2024

Panama import data paints a picture of an economy driven by a specific niche rather than a broad electronics industry. The concentration of imports in the **optoelectronics** category, valued at over $104 million, strongly suggests that Panama's current role in the microelectronics industry is that of a large-scale consumer of **photovoltaic components.** This points to imports for solar farm projects or widespread commercial and residentail installations, which indicate a significant national investment in solar energy infrastructure, positioning the country, in the context of semiconductor technologies, as an **emerging market for renewable energy technology** rather than a hub for manufacturing consumer electronics.

In stark contrast, the negligible import volumes for foundational semiconductor components; **logic circuits, memory chips, and analog devices,** which are the essential building blocks of all modern technology, is a clear indicator that Panama currently lacks a significant industry for assembling complex electronics like computers, smartphones, or medical devices. “Parts” and “Discretes” are made up of **semiconductor parts** for maintenance, repair and basic assembly.

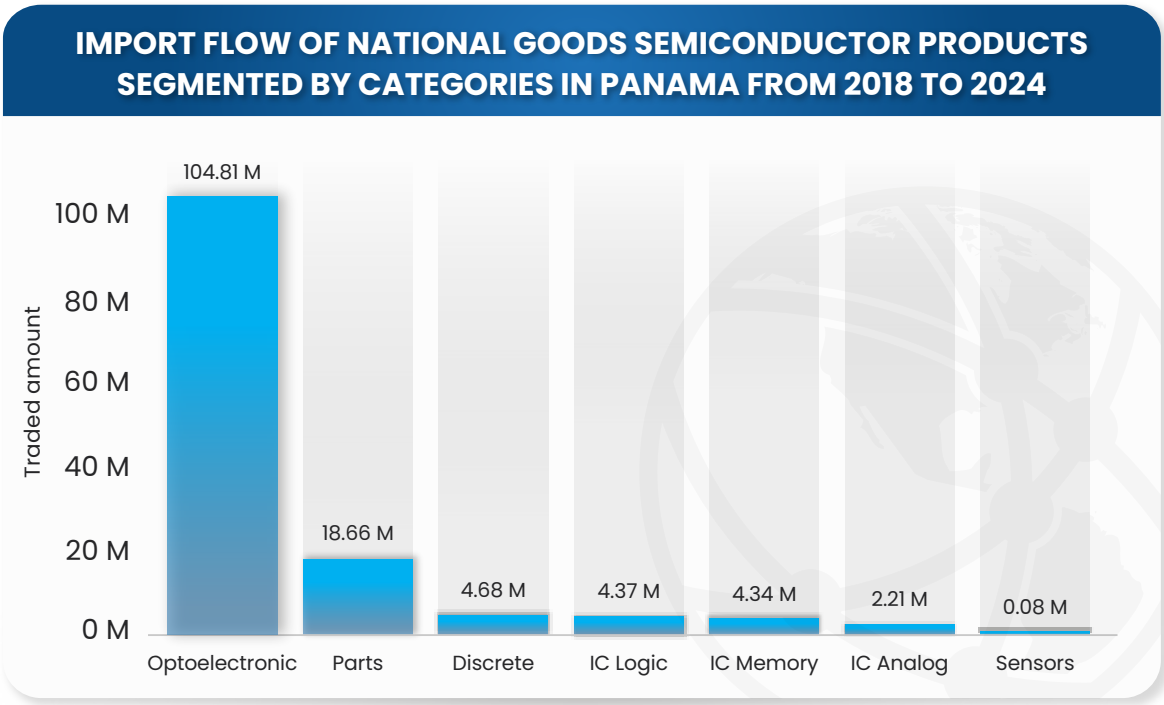


Figure 20. *Import flow of national goods semiconductor products segmented by categories in Panama from 2018 to 2024*
Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Panama's National Goods International Trade Flow of Semiconductors – 2018 to 2024

The main origin of semiconductor imports to Panama is mainland China, with $233.48 million dollars, a figure that represents by far the largest part of purchases in this sector. Far behind are the United States ($14.62 million) and the internal special economic zones: the Colon Free Zone ($9.53 million) and the Free Trade Zones ($7.38 million), reflecting internal movements or re-exports. Panama also imports from Spain ($5.11 million), Mexico ($2.16 million) and Chile ($2.14 million). Overall, the list includes large industrial economies such as Germany, Italy, Japan, and South Korea, along with countries with relevant logistics hubs such as Hong Kong and Singapore.

This pattern indicates that most of the semiconductors arriving in Panama, for **internal consumption**, come from Asia, especially China, reflecting its dependence on this country. Taking into account that most of these semiconductors are **optoelectronics,** it mainly means that

most of these are composed of LED lights, solar panels and photovoltaic components.

It also points to Panama's role as a logistics hub, where the internal free zones and the Colon Free Zone actively participate in the redistribution and transit of these products.

Figure 21. *Import flow by country of origin* **Source:** *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Optoelectronics grew significantly, from 81.92% in 2018 to a maximum of 96.93% in 2024. Categories such as analog integrated circuits, logic integrated circuits, memory integrated circuits, discrete, sensors, and others maintained a very small and variable presence over time. In 2023, logic integrated circuits reached 8.45% of the total, being the second most relevant group that year. However, in 2024 the participation of all categories, except optoelectronics, fell to minimum levels.

The behavior of imports showed an irregular evolution, with an increase in the first years, a period of relative stability and a decrease between 2020 and 2023. In 2024, imports increased significantly, far exceeding the records of previous years, again, **specifically for optoelectronics,** which might suggest the boom of photovoltaic imports due to **key fiscal incentives, active construction projects, and a critical mass of utility scale solar projects.**

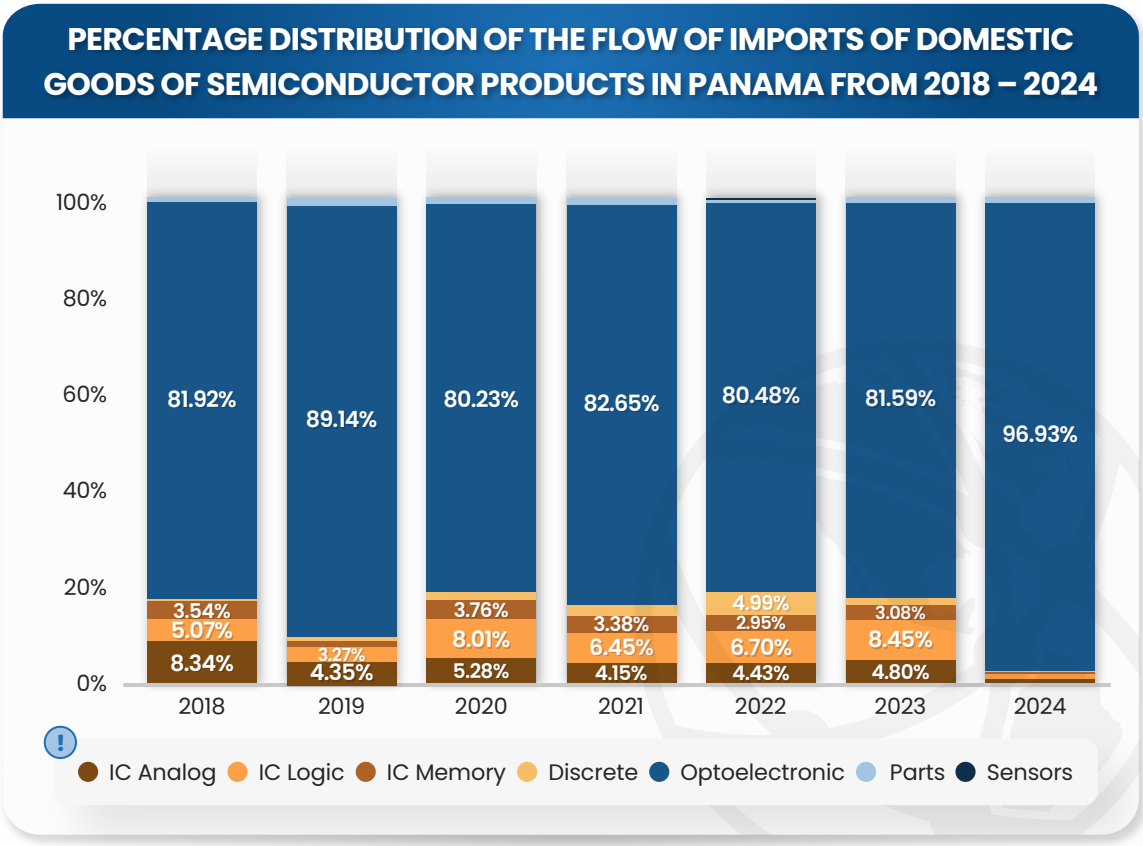


Figure 22. *Percentage distribution of the Flow of imports of domestic goods of semiconductor products in Panama from 2018 – 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

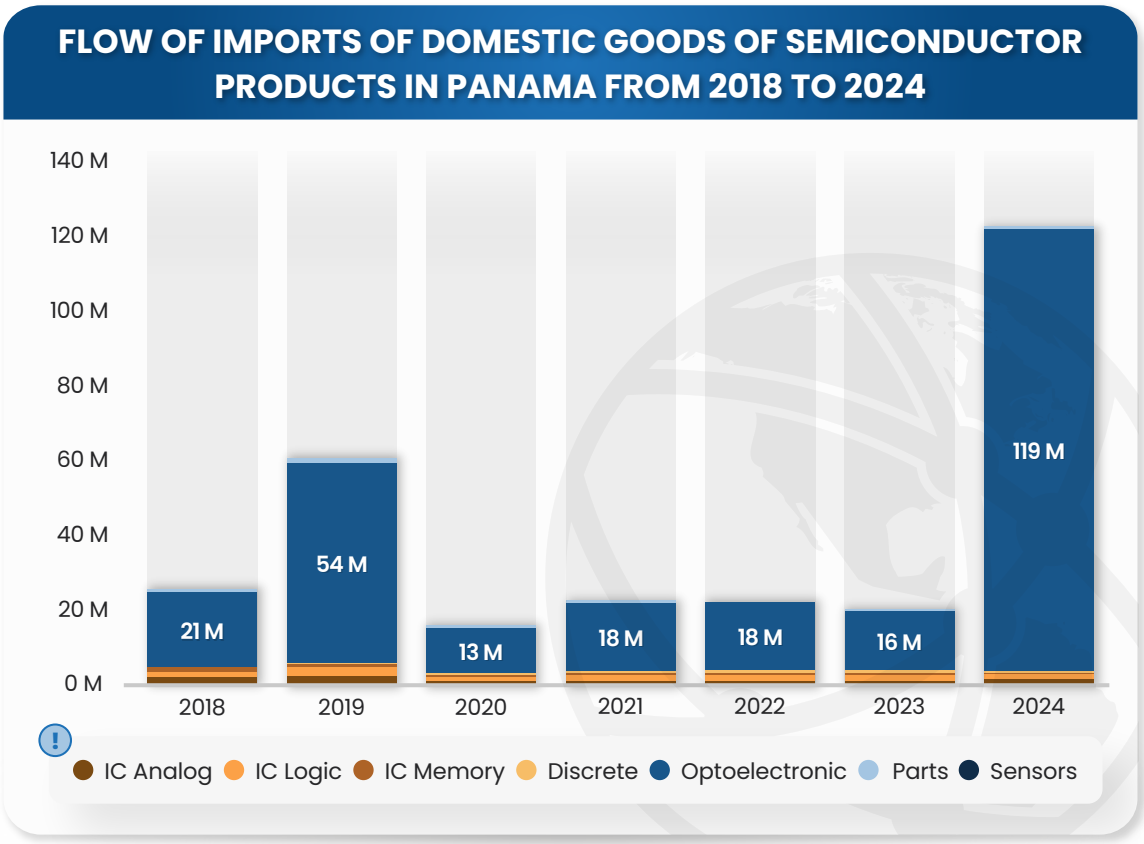


Figure 23. *Flow of imports of domestic goods of semiconductor products in Panama from 2018 to 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

National Goods Exports

Panama has not exported any of the categories analyzed under tariff codes 85.41 and 85.42. However, generally these exports are made through the Special Economic Zones shown in the next section.

Panama Special Economic Zones – Trade Flow from 2018 to 2024

The trade flow from Panama's special economic zones once again highlight its role as a powerful **logistics and redistribution hub,** overwhelmingly dominated by the movement of **optoelectronics.** The **products (LEDs, solar panels, photovoltaic cells)** throughout the region. Interestingly, the trade surplus in the "Parts" category, $12.25 million

inbound and $18.7 million in outbound, suggests that beyond simple transit, some **minor value-add activities** like **kitting** or **light assembly** are occurring for a category that's **primarily** composed of **semiconductor parts,** specifically, **"parts of electronic integrated circuits"** as classified by the Harmonized System.

This contrasts sharply with the low-volume, pass-through trade of advanced integrated circuits, confirming that Panama's current strength lies in **high-volume logistics** and **light processing,** not in deep-tech manufacturing or consumption.

Integrated circuits (memory, logic and analog) and discrete devices recorded relatively balanced levels, wi th values ranging from $4 million to $5 million. Finally, the sensors, although present, reflected very limited commercial activity, with 0.14 million imported and 0.08 million exported.

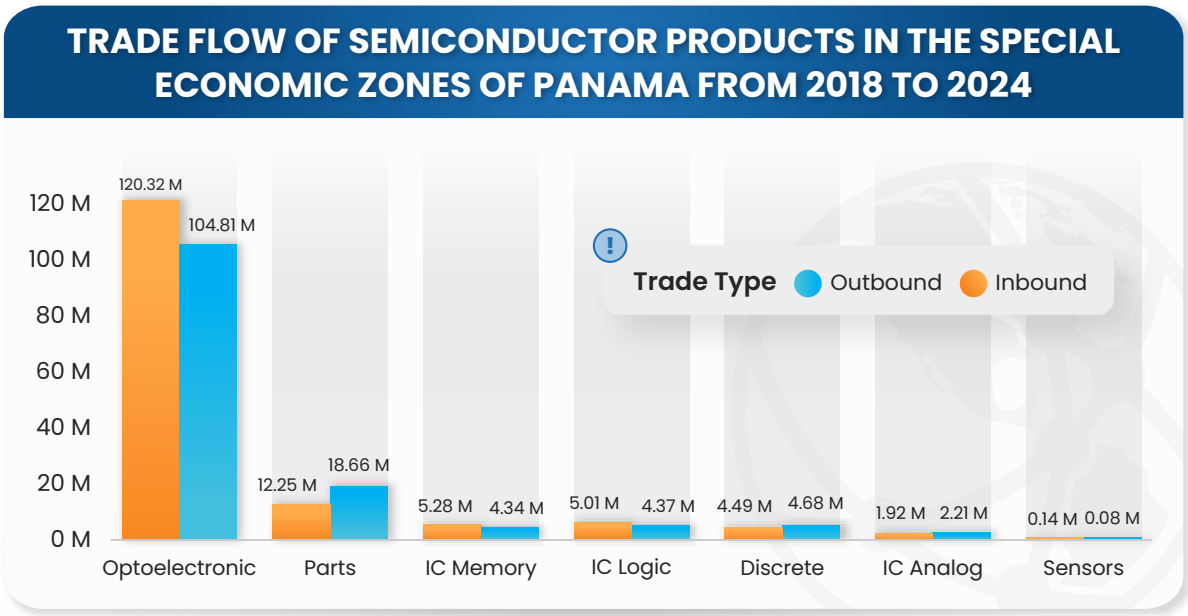


Figure 24. *Trade flow of semiconductor products in the Special Economic Zones of Panama from 2018 to 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Panama Special Economic Zones – International Trade Flow 2018 to 2024

Panama's special economic zones maintain an **asymmetrical trade flow** with Asia, importing massive quantities of components from manufacturing giants like **China** and **Vietnam** (in the case of Vietnam without significant corresponding exports). In contrast, it holds a more integrated, **two-way partnership with the United States,** which serves as both a major supplier and its single largest export destination. In this way, Panama's special economic zones effectively channel goods sourced from Asia and the U.S. to neighboring countries like Costa Rica and the Dominican Republic.

China stands out as the main country of origin, with inbound flows reaching $93.7 million. In contrast, the United States was the largest recipient of outbound flows from Special Economic Zones with $29.4 million and, in addition, one of the main supplier countries with $13.5 million. Vietnam represented another relevant source of imports, with $17.54 million.

Figure 25. *Import and export flows by country in the period from 2018 to 2024 in the special economic zones*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Panama Special Economic Zones - Inbound Flows – 2018 to 2024

The inbound flow of goods into Panama's special economic zones reveals a **volatile, project-driven import pattern** rather than steady industrial growth. The massive peaks in 2019 and 2022, where **optoelectronics** accounted for over 84% of imports, strongly suggest that demand is tied to periodic, large-scale infrastructure projects or demand spikes due to national fiscal incentives.

However, a recent trend towards **diversification** is emerging, as the share of optoelectronics decreased in 2023-2024 while the "Parts" category grew to a quarter of all inbound trade. This signals a potential **diversification** of activity with the special economic zones, which could point to an increase in imports of various small parts and components for **minor assembly, or kitting** operations mentioned earlier.

Beneath these large fluctuations, a stable but small undercurrent of trade in core integrated circuits and discrete devices indicates a consistent, baseline logistical function for a variety of tech components.

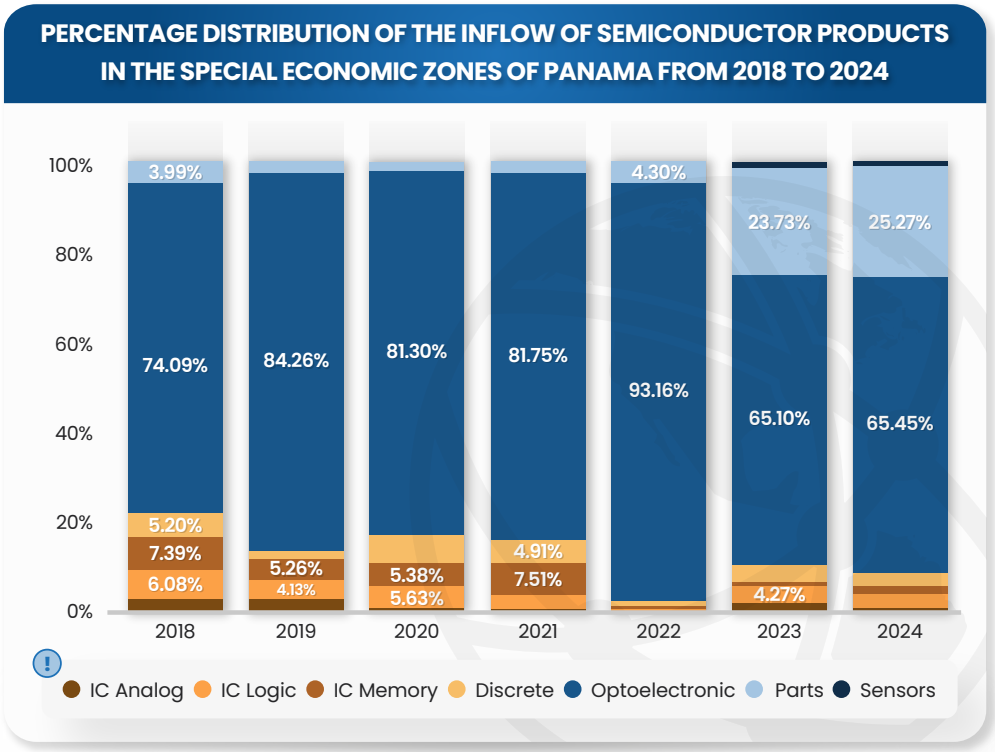


Figure 26. *Percentage distribution of the inflow of semiconductor products in the special economic zones of Panama from 2018 to 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

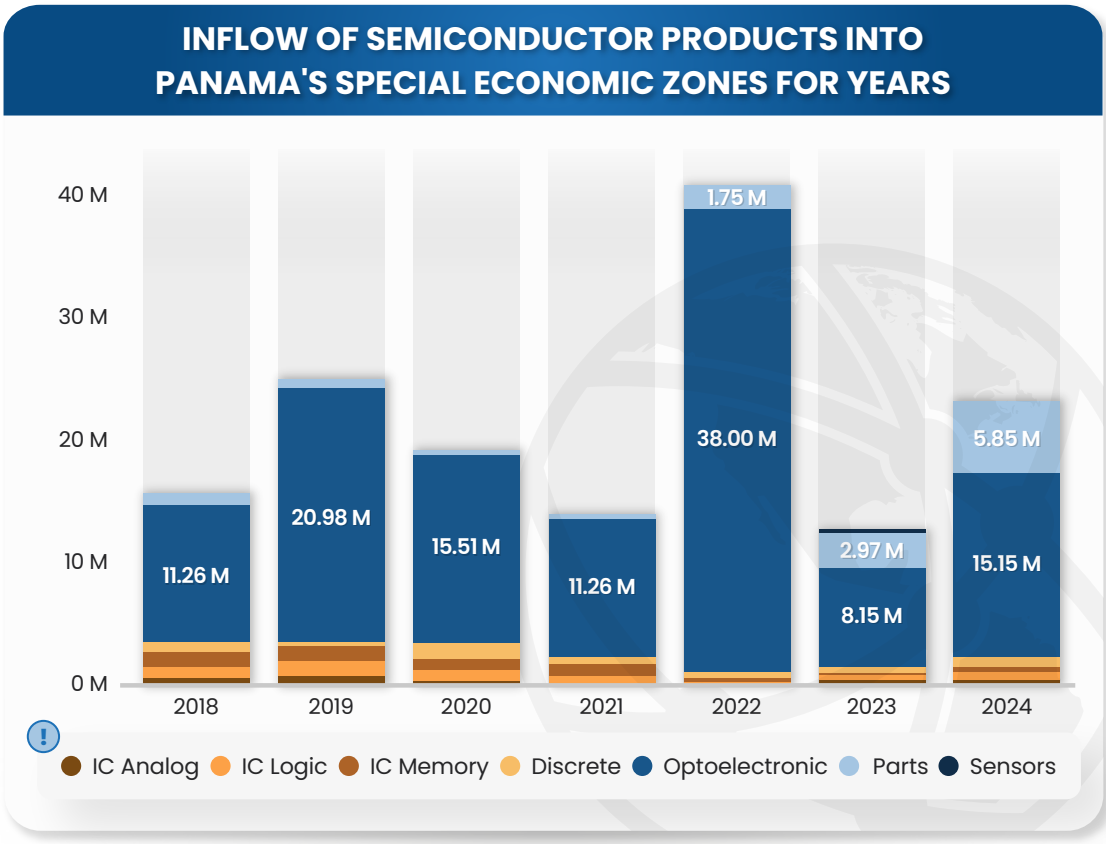


Figure 27. *Inflow of semiconductor products into Panama's special economic zones for years*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Panama Special Economic Zones - Outbound Flows – 2018 to 2024

The outbound and inbound trade data together show the complete picture of Panama's role as a logistics hub, revealing a clear **import-stock-re-export model** in the special economic zones. The massive influx of **optoelectronics** during peak import years like 2019, 2022 and 2024 directly correlates with the subsequent export surges in 2022 and 2024, demonstrating a cycle of **bulk purchasing followed by regional redistribution.**

This high-volume movement of optoelectronics runs in parallel with a more diversified, baseline trade in the **"Parts" category,** primarily composed of **semiconductor parts,** which gains prominence when the optoelectronics flow is lower. Meanwhile, the steady, low-volume "pass-

through" of core integrated circuits confirms the zones' function as a **simple transit point for a wide array of high-tech components.**

Of special note is the **progressive increase** of the **"Parts"** category in 2023 and 2024, which suggests an **increasing participation of Panama's special economic zones in the movement of semiconductor parts,** but one that is not new since there were also outbound flows of this category in 2018 and 2019.

Optoelectronic products remained the leading category of outbound flows from special economic zones, especially in 2021 and 2022, when they accounted for 86.66% and 88.63% of total exports, with values of 11.50 and 28.40 million dollars, respectively. In contrast, in 2018, 2019 and 2024 its participation was lower, with 66.58%, 59.99% and 66.55%, registering amounts of $13.89, $13.44 and $14.91 million.

In those same years, the "Parts" category increased its share, with 22.99% in 2018, 20.00% in 2019 and up to 23.88% in 2024, with amounts of $4.80, $4.48 and $5.35 million.

The behavior of product outputs from these areas was variable. In 2019 and 2022, the highest values were recorded, with 21.62 and 31.38 million dollars, while in 2020, 2021 and 2023 the amounts were lower, with 11.77, 11.50 and 12.38 million, respectively. In 2024, a recovery was observed, reaching 22.45 million.

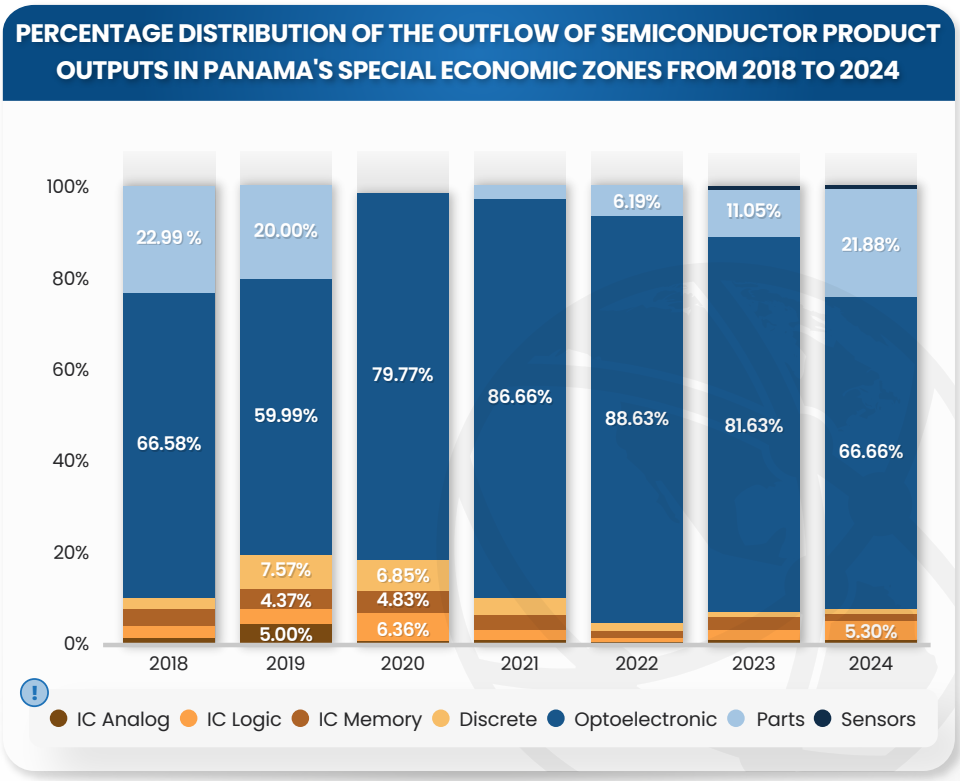


Figure 28. *Percentage distribution of the flow of semiconductor product outputs in Panama's special economic zones from 2018 to 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

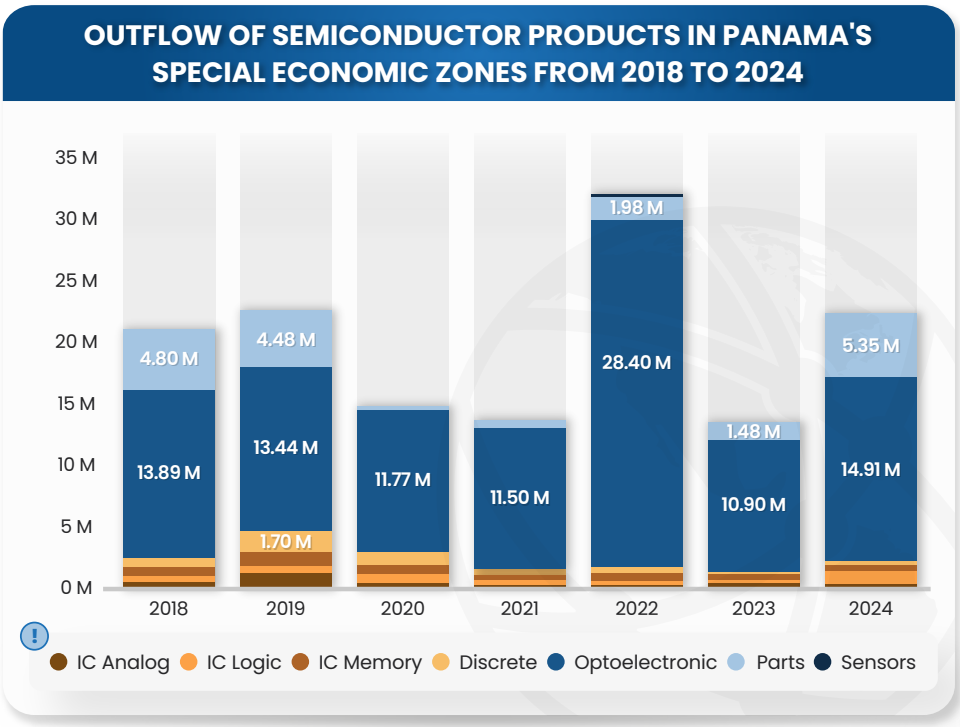


Figure 29. *Outflow of semiconductor products in Panama's special economic zones from 2018 to 2024*

Source: *Prepared by the authors with data from the National Institute of Statistics and Census (INEC)*

Key Findings and Strategic Outlook

Latin America is an active participant in the global semiconductor ecosystem, though its role is characterized by a strong dependence on imports and specialization in the final stages of the value chain. Mexico concentrates the largest flows in the region in logic and memory integrated circuits, while Costa Rica, with its developments in the assembly, test and packaging (ATP) sector, also registers relevant volumes in discrete products, optoelectronics and logic integrated circuits. Brazil reflects robust domestic consumption, supported by high imports and reduced exports, and the Dominican Republic presents some value-added activities from its free zones. Panama is not establishing itself as a manufacturer of microelectronics, but as a **logistics hub** for **optoelectronic products** and **DAO parts** along with **digital circuits parts,** integrating regional trade as a strategic redistribution point.

The regional landscape is dominated by extra-regional imports, mainly from the United States, China and Malaysia, demonstrating that even countries with greater capacities are highly dependent on external suppliers. Exports, on the other hand, are concentrated to North America and, to a lesser extent, in intraregional markets, evidencing a limited and fragmented pattern of specialization. This dynamic confirms that the movement of semiconductors in the region is real and growing, but it is still linked to final functions of the global chain, such as assembly, packaging and redistribution.

The discrete, optoelectronics, and logic integrated circuits segments have the largest trade flows and provide a foundation for boosting local production capabilities. In countries such as Brazil, with high domestic demand, advancing in value-added processes would allow them to better serve their domestic market and reduce external dependence[20]. For **Panama**, this perspective is relevant where **its logistics role can be transformed into a productive integration platform,** combining its **international connectivity** with **light assembly services, design, certification and technical support.**

Among the main opportunities for the region is the training of technical talent, which allows them to advance beyond the basic phases and venture into more specialized areas. It is key to continue attracting foreign direct investment, with clear regulatory frameworks, incentives, and a value proposition focused on stability and access to nearby markets. Building strategic alliances between countries is an advantage where some can focus on assembly and testing, others can lead in distribution or support services. In addition, they can benefit from cooperation that goes beyond niche specialization with the exchange of knowledge, experiences, technical and regulatory best practices. This model of regional collaboration will be able to strengthen not only productive capacity, but also talent training, innovation and supply chain resilience.

In short, Latin America is not starting from scratch. The region already has advances and developed capacities, but it is necessary to reinforce these achievements and continue to progress to strategically integrate into an expanding industry, driven by technological development and conditioned by geopolitical factors that seek to guarantee the supply of essential inputs for various sectors.

Notes

[1] U. S. M. Panama, «New Partnership with Panama to Explore Semiconductor Supply-Chain Opportunities», U.S. Embassy in Panama. Accedido: 1 de julio de 2025. [En línea]. Disponible en: https://pa.usembassy.gov/new-partnership-with-panama-to-explore-semiconductor-supply-chain-opportunities/

[2] «Enhancing the role of latin america in the semiconductor global value chain 1».

[3] «semiconductors-and-the-future-of-the-hs_sia-white-paper_april-2019.pdf». Accedido: 11 de junio de 2025. [En línea]. Disponible en: https://www.wcoomd.org//media/wco/public/global/pdf/events/2019/hs-conference/semiconductors-and-the-future-of-the-hs_sia-white-paper_april-2019.pdf?la=fr

[4] «1685_2022e.pdf». Accedido: 11 de junio de 2025. [En línea]. Disponible en: https://www.wcoomd.org/-/media/wco/public/global/pdf/topics/nomenclature/instruments-and-tools/hs-nomenclature-2022/2022/1685_2022e.pdf?la=en

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APPENDIX | HS CODES BY CATEGORY

HS 4	HS 6	DESCRIPTION	CATEGORY
8541	854110	Diodes (excl. photosensitive or light emitting diodes "LED")	Discrete
	854121	Transistors with a dissipation rate < 1 W (excl. photosensitive transistors)	Discrete
	854129	Transistors with a dissipation rate ≥ 1 W (excl. photosensitive transistors)	Discrete
	854130	Thyristors, diacs and triacs (excl. photosensitive semiconductor devices)	Discrete
	854140	Photosensitive semiconductor devices, incl. photovoltaic cells whether or not assembled in modules or made up into panels; light emitting diodes (excl. photovoltaic generators)	Optoelectronic
	854141	Light emitting diodes "LED"	Optoelectronic
	854142	Photovoltaic cells not assembled in modules or made up into panels	Optoelectronic
	854143	Photovoltaic cells assembled in modules or made up into panels	Optoelectronic
	854149	Photosensitive semiconductor devices (excl. photovoltaic generators and cells)	Optoelectronic
	854150	Semiconductor devices, n.e.s.	Discrete
	854151	Semiconductor-based transducers (excl. photosensitive)	Sensors
	854159	Semiconductor devices, n.e.s.	Discrete
	854160	Mounted piezo-electric crystals	Sensors
	854190	Parts of diodes, transistors and similar semiconductor devices; photosensitive semiconductor devices, light emitting diodes and mounted piezoelectric crystals, n.e.s.	Parts
8542	854210	Cards incorporating an electronic integrated circuit "smart card", whether or not with a magnetic stripe	IC Logic
	854221	Monolithic integrated circuits, digital (excluding cards incorporating an electronic monolithic digital integrated circuit "smart cards")	IC Logic
	854229	Electronic integrated circuits, monolithic, analogue or analogue and digital	IC Analog
	854231	Electronic integrated circuits as processors and controllers, whether or not combined with memories, converters, logic circuits, amplifiers, clock and timing circuits, or other circuits	IC Logic
	854232	Electronic integrated circuits as memories	IC Memory
	854233	Electronic integrated circuits as amplifiers	IC Analog
	854239	Electronic integrated circuits (excl. such as processors, controllers, memories and amplifiers)	IC Logic
	854260	Hybrid integrated circuits	IC Analog
	854270	Electronic microassemblies made from discrete, active or both active and passive components, combined and interconnected	Parts
	854290	Parts of electronic integrated circuits, n.e.s.	Parts

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About the **Why Panama** Program

In the current dynamic global landscape, it is clear that having access to high-quality insights is crucial when determining the optimal location for regional distribution in order to take advantage on the present structure of global value chains.

Georgia Tech Panama Logistics Innovation & Research Center recognizes the importance of key insights in the decision-making process, and works closely with companies seeking to assess their supply chains and how Panama can become a key part of their global logistics network.

The "Why Panama" program utilizes quantitative data and analytics to assess key variables and compare the costs, investments, and service benefits of setting up a distribution center in Panama. By conducting a thorough analysis, the program aims to provide businesses with valuable insights into the advantages of establishing a hub in Panama.

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