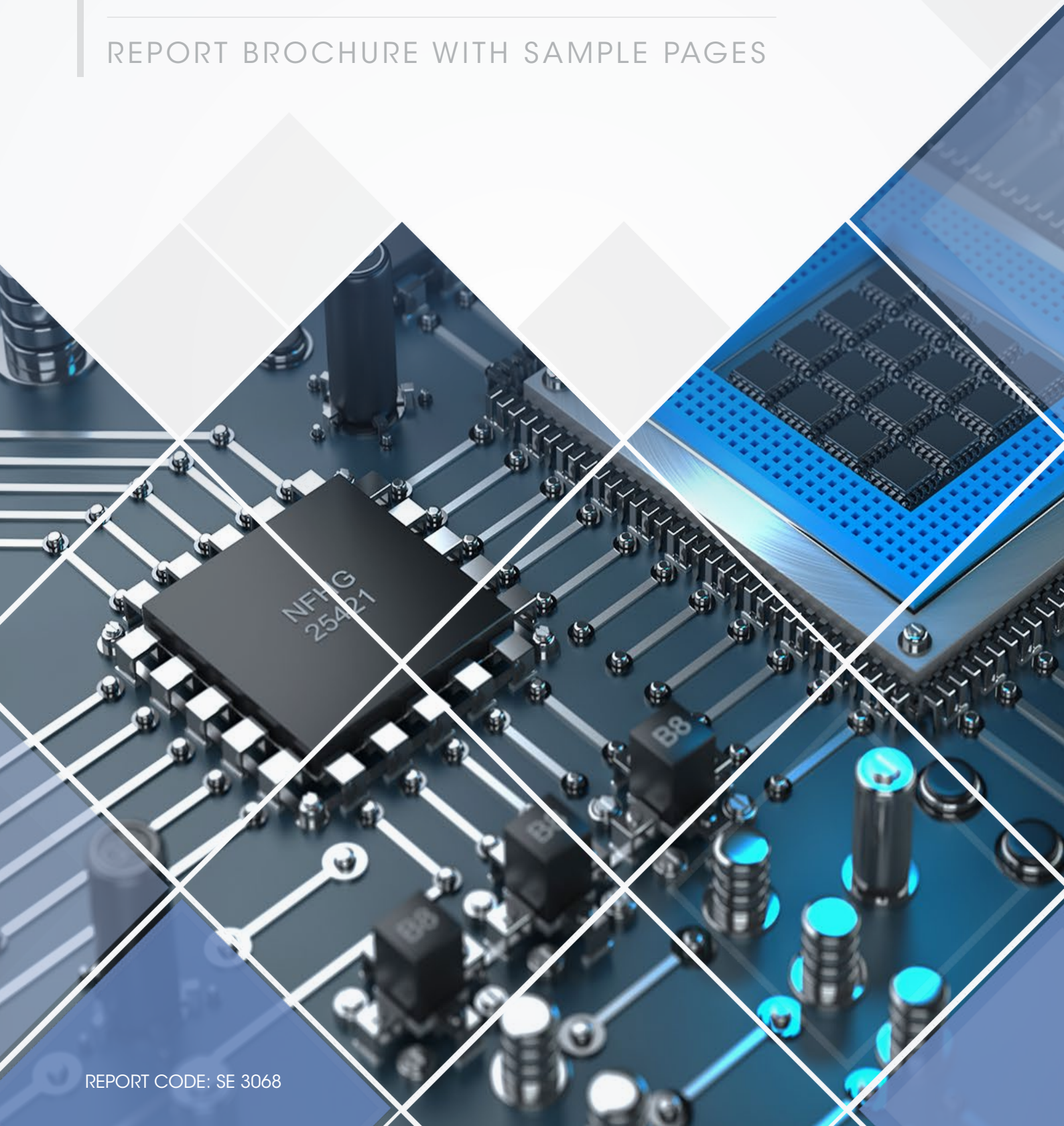
MARKETSANDMARKETS™

FPGA MARKET

GLOBAL FORECAST TO 2029

REPORT BROCHURE WITH SAMPLE PAGES



REPORT CODE: SE 3068

INTRODUCTION

1.1 STUDY OBJECTIVES

- To describe and forecast the FPGA market based on configuration, node size, technology, FPGA and eFPGA market size, vertical, and region, in terms of value
- To describe and forecast the FPGA market for various segments across four major regions—North America, Europe, Asia Pacific, and the Rest of World (RoW), in terms of value
- To forecast the size and market segments of the FPGA market by volume based on configuration
- To provide detailed information regarding drivers, restraints, opportunities, and challenges influencing market growth
- To provide the ecosystem analysis, case study analysis, patent analysis, technology analysis, ASP analysis, Porter's Five Forces analysis, and regulations pertaining to the market under study
- To provide a detailed overview of the value chain of the FPGA landscape
- To strategically analyze micromarkets concerning individual growth trends, prospects, and contributions to the total market
- To strategically profile the key players and comprehensively analyze their market shares and core competencies
- To analyze the opportunities in the market for stakeholders and describe the competitive landscape
- To assess the competitive developments such as collaborations, agreements, partnerships, and product developments in the market
- To analyze the impact of the recession on the FPGA market

1.2 MARKET DEFINITION AND SCOPE

Field-programmable gate arrays (FPGAs) are electronic devices that use a matrix of configurable logic blocks (CLBs) and programmable interconnects to perform different functions. Unlike application-specific integrated circuits (ASICs), which are custom-made for specific tasks, FPGAs can be reprogrammed to suit various application requirements after manufacturing them. Although one-time programmable (OTP) FPGAs are available, most FPGAs use SRAM technology to reprogram them during the design process.

1.2.1 INCLUSIONS AND EXCLUSIONS

SEGMENT	INCLUSION	EXCLUSION
Company	Companies manufacturing FPGAs	Suppliers, distributors, resellers, and after-sales service providers of FPGA
Configuration	Low-end FPGA, Mid-range FPGA, High-end FPGA	NA
Node Size	≤16 NM, 22–90 NM, > 90 NM	NA
Technology	Static random-access memory (SRAM), Flash, Antifuse	Other technologies, such as dynamic random-access memory (DRAM), synchronous dynamic random-access memory (SDRAM), and programmable read-only memory (PROM)

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FPGA and eFPGA Market Size	FPGA, eFPGA	NA
Vertical	Telecommunications, Consumer Electronics, Test, Measurement and Emulation, Data Center & Computing, Military & Aerospace, Industrial, Automotive, Healthcare, Multimedia, and Broadcasting	Energy & power, oil & gas, and chemicals verticals
Region	North America, Europe, Asia Pacific, and Rest of World	Country-wise market sizes for South America, GCC, and Rest of Middle East & Africa

1.3 STUDY SCOPE

1.3.1 MARKETS COVERED

FIGURE 1 FPGA MARKET SEGMENTATION

Note: Rest of World mainly includes the South America, GCC, and Rest of Middle East & Africa

Source: Secondary Research, Interviews with Experts, and MarketsandMarkets Analysis

INTRODUCTION

1.3.2 REGIONAL SCOPE

NORTH AMERICA
- US
- Canada
- Mexico

EUROPE
- UK
- Germany
- France
- Rest of Europe

ASIA PACIFIC
- China
- Japan
- India
- Rest of Asia Pacific

REST OF WORLD
- South America
- GCC
- Rest of Middle East & Africa

Notes: Rest of Europe includes Belgium, Sweden, Denmark, Switzerland, Portugal, the Netherlands, and Ireland.
Rest of Asia Pacific includes South Korea, Singapore, Taiwan, Indonesia, and other countries.
Rest of World mainly includes South America, GCC, and Rest of Middle East & Africa.
Source: Interviews with Experts and MarketsandMarkets Analysis

1.3.3 YEARS CONSIDERED

2020–2022

HISTORICAL YEARS

2023

BASE YEAR

2024

ESTIMATED YEAR

2029

PROJECTED YEAR

Note: The forecast period is from 2024 to 2029. The base year used for the company profiles is 2023. Whenever the information for the base year was unavailable, data for 2022 was considered.

1.4 CURRENCY CONSIDERED

- ISO 4217 codes are used to depict currency names. The market size, in terms of value, is represented using USD.
- The market has mainly been studied in terms of USD million; the denomination is based on the size of the values, enabling uniform accommodation of these values in tables, figures, or any form of study of a particular segment.
- Revenues of companies have been obtained from their latest annual reports. For companies reporting revenue in USD, it has been sourced as it is, whereas, for those reporting revenues in other currencies, the average annual currency conversion rate (from Oanda and USForex, Inc. website) has been used to convert the value to USD.

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1.5 LIMITATIONS

- Some industry players chose to keep quantitative information about certain market segments confidential. As a result, qualitative insights gathered during the study were utilized to determine the value-based market size for these segments.
- South America, GCC, and Rest of Middle East & Africa markets determine the Rest of World FPGA market size. However, due to limited data granularity, the study did not include country-specific market sizes for these regions.

1.6 STAKEHOLDERS

- Original equipment manufacturers (OEMs)
- Technology solution providers
- Research institutes
- Market research and consulting firms
- Forums, alliances, and associations related to the FPGA market
- Technology investors
- Governments and financial institutions
- Analysts and strategic business planners
- Existing end users and prospective ones
- Business providers
- Professional service/solution providers

1.7 SUMMARY OF CHANGES

- Changes in the report's scope on the FPGA market: The report includes an updated classification of FPGAs based on different node sizes, such as ≤16 nm, 20–90 nm, and >90 nm. Market sizes by FPGA and eFPGA are also covered in this report.
- Changes in market size: In the previous version, the forecast period for the FPGA market considered was 2019–2028. This version estimated the market size for 2020–2029, with 2023 as the base year and 2024 to 2029 as the forecast period.
- New and improved representation of financial information: This version provides updated financial information until 2023 (depending on data availability) for each listed company in a geographical representation. This will aid in analyzing the current status of profiled companies, including their financial strength, profitability, key revenue-generating locations, countries, and business segments.
- Recent market developments: Recent developments help understand market trends and growth strategies adopted by leading players in the FPGA market. For instance, in this market, the number of product launches and other developments, such as partnerships and expansions, are covered from 2020 to 2023, while in the old version, key developments were covered from 2020 to 2023.
- Market overview: Ecosystem analysis, case study analysis, patent analysis, key conferences & events, key stakeholders & buying criteria analysis, technology analysis, pricing analysis, Porter's Five Forces analysis, trade analysis, and regulations pertaining to the market are provided.

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- Average Selling Price (ASP): The study also consists of the ASP analysis across different configurations and applications of FPGA.
- Regulatory analysis: The report provides detailed use cases from different verticals and a region-wise regulatory landscape.
- Latest product portfolio: Tracking product portfolios helps analyze the FPGA products available in the market. The new version provides an updated product portfolio of the companies profiled in the report.
- Company profiles: These have been updated according to the present names, headquarters, product portfolios, and revenue.
- Competitive landscape: The market share of the top five players for 2023 has been provided in the competitive landscape chapter, along with the company evaluation matrix for the leading 25 market players. A start-up/SME evaluation matrix has also been provided for 10 companies. Competitive benchmarking and company footprint analysis have also been provided in this chapter.
- Competitive leadership mapping: This covers a comprehensive study of 25 key vendors offering FPGAs. These vendors are placed in either of the four categories: stars, pervasive companies, emerging leaders, and participants, based on the analysis of their product footprint and market share/rank.

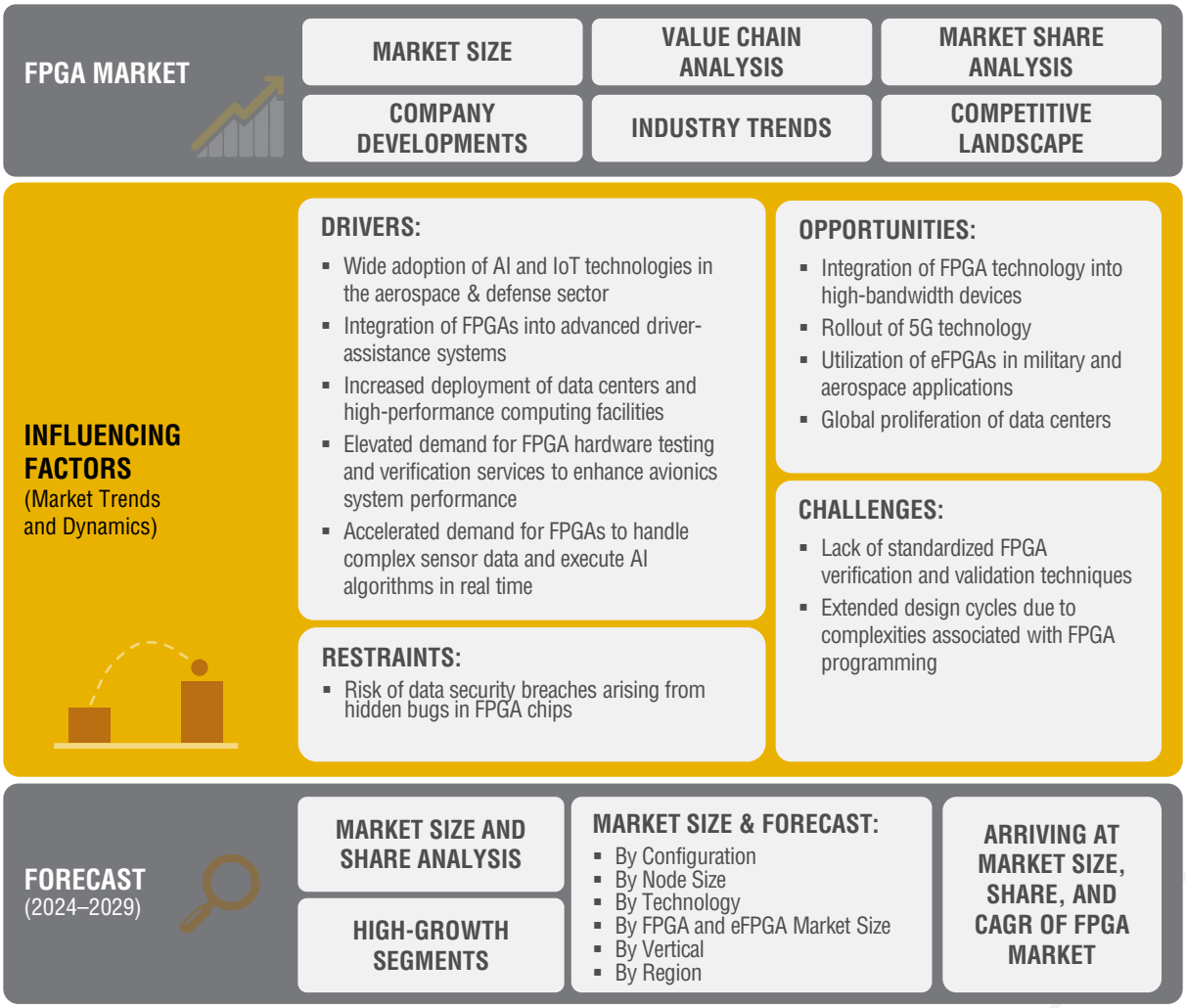
RESEARCH METHODOLOGY

2.1 RESEARCH DATA

This section helps us understand the methodology for developing the FPGA market report. This research study involved the extensive use of secondary sources, directories, and databases (such as annual reports or presentations of companies, industry association publications, directories, technical handbooks, World Economic Outlook (WEO), trade websites, Hoovers, Bloomberg Businessweek, Factiva, and OneSource) to identify and collect information useful for this technical, market-oriented, and commercial study of the FPGA market. Primary sources mainly comprise several experts from the core and related industries, along with preferred suppliers, manufacturers, distributors, service providers, system providers, technology developers, alliances, and standards and certification organizations related to the various phases of this industry's value chain.

In-depth interviews have been conducted with various primary respondents, including key industry participants, subject matter experts (SMEs), C-level executives of key market players, and industry consultants, to obtain and verify critical qualitative and quantitative information and assess market prospects. The following figure shows the market research methodology applied in making this report on the FPGA market.

FIGURE 2 FPGA MARKET: RESEARCH DESIGN



Source: Company Website and MarketsandMarkets Analysis

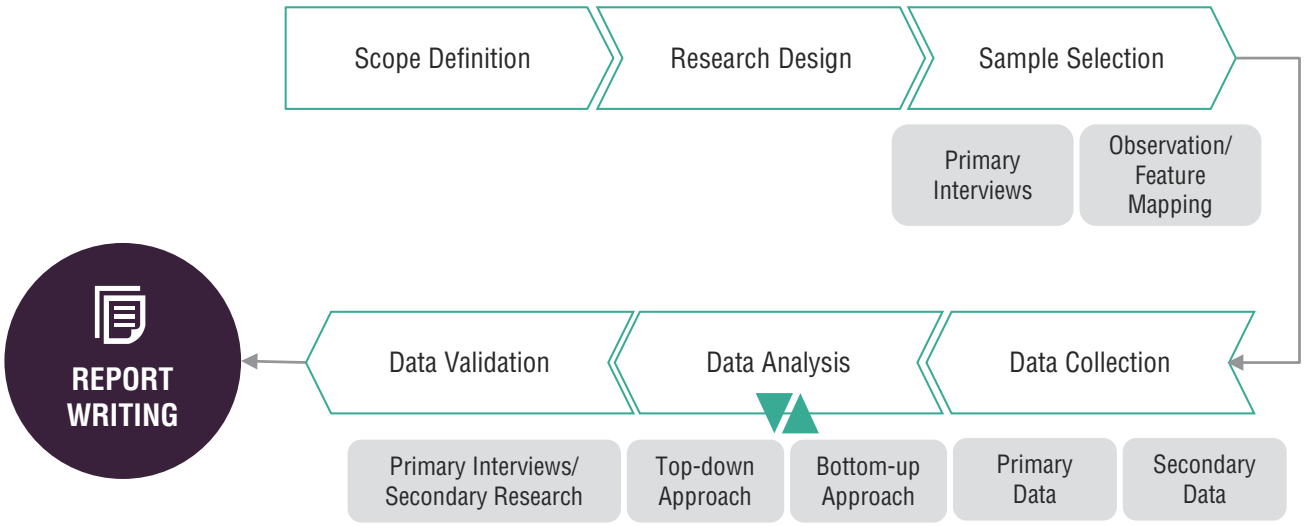
RESEARCH METHODOLOGY

2.2 MARKET SIZE ESTIMATION METHODOLOGY

In the complete market engineering process, top-down and bottom-up approaches and several data triangulation methods were used to estimate and forecast overall market segments and subsegments listed in this report. The key players in the market were identified through secondary research, and their market shares in the respective regions were determined through primary and secondary research. This entire procedure includes the study of annual and financial reports of the top market players and extensive interviews for key insights (quantitative and qualitative) with industry experts (such as CEOs, VPs, directors, and marketing executives).

All percentage shares, splits, and breakdowns were determined using secondary sources and verified through primary sources. The parameters affecting the markets covered in this research study were accounted for, viewed in detail, verified through primary research, and analyzed to obtain the final quantitative and qualitative data. This data was consolidated and supplemented with detailed inputs and analysis from MarketsandMarkets and presented in this report.

FIGURE 3 FLOW FOR MARKET SIZE ESTIMATION PROCESS



2.2.1 BOTTOM-UP APPROACH

The bottom-up approach was used to determine the overall size of the FPGA market from the revenues of the key players and their shares in the market. The overall market size was calculated based on the revenues of the key players identified in the market.

2.2.1.1 ESTIMATING MARKET SIZE USING BOTTOM-UP ANALYSIS

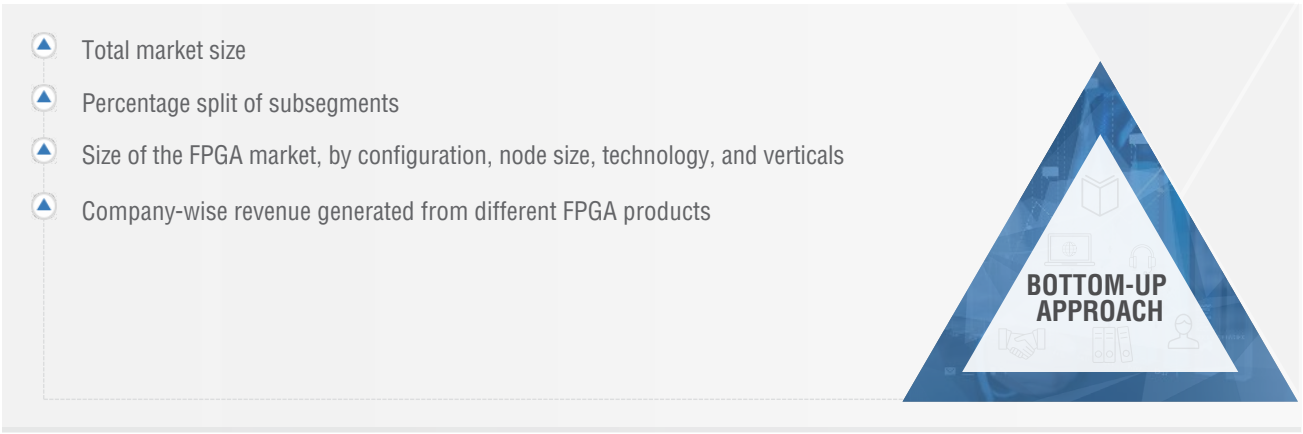
- Identifying various FPGA products
- Analyzing the penetration of each product through secondary and primary research
- Conducting multiple discussion sessions with key opinion leaders to understand the detailed working of FPGAs and their implementation by multiple end users to analyze the break-up of the scope of work carried out by each major company
- Verifying and cross-checking the estimates at every level with key opinion leaders, including CEOs, directors, operation

RESEARCH METHODOLOGY

managers, and MarketsandMarkets' domain experts

- Studying various paid and unpaid sources of information, such as annual reports, press releases, white papers, and databases

FIGURE 4 MARKET SIZE ESTIMATION METHODOLOGY: BOTTOM-UP APPROACH

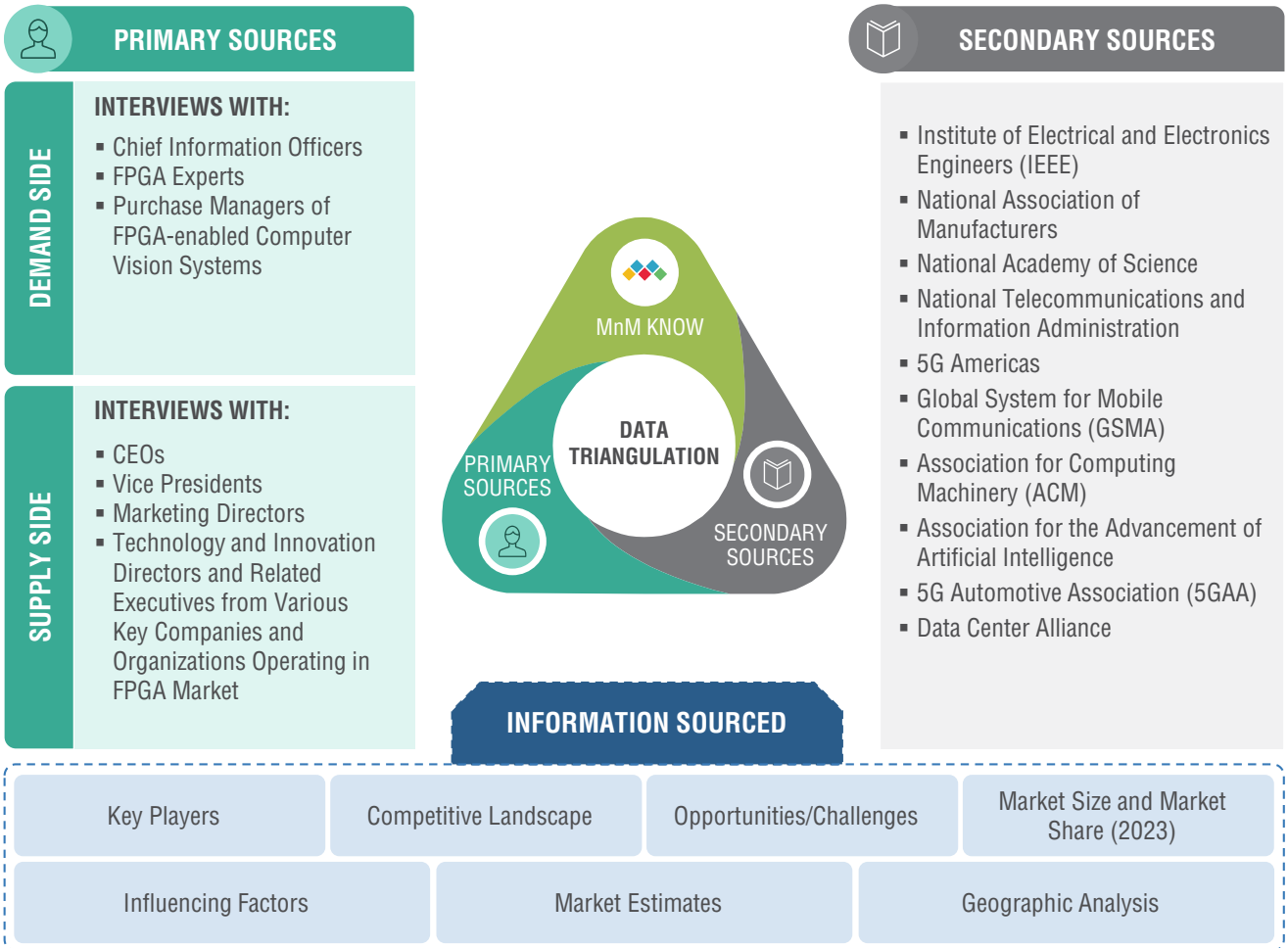


RESEARCH METHODOLOGY

2.3 DATA TRIANGULATION

After arriving at the overall market size from the estimation process explained above, the market was split into several segments and subsegments. The data triangulation procedure was employed wherever applicable to complete the overall market engineering process and determine the exact statistics for all segments and subsegments. The data was triangulated by studying various factors and trends from both the demand and supply sides. The market size was validated using top-down and bottom-up approaches.

FIGURE 5 FPGA MARKET: DATA TRIANGULATION



Note: MnM KNOW stands for MarketsandMarkets' "Knowledge Asset Management" framework. In this context, it stands for the existing market research knowledge repository of over 5,000 granular markets, our flagship competitive intelligence and market research platform "Knowledge Store," subject matter experts, and independent consultants. MnM KNOW acts as an independent source that helps us validate information gathered from primary and secondary sources.

RESEARCH METHODOLOGY

2.4 RESEARCH ASSUMPTIONS

The following assumptions were considered to complete the overall market engineering of the FPGA market.

PARAMETER	ASSUMPTION
GLOBAL ECONOMIC DOWNTURN	The global economy has a direct impact on any market. The impact of recession has been considered while estimating the market size.
EXCHANGE RATE FLUCTUATIONS	Exchange rates have been assumed to remain stable while forecasting the size of the FPGA market. For converting various currencies to the US dollar, average historical exchange rates were used according to the year specified. The ofx.com website was used to find historical and current exchange rates required for calculations and currency conversions.
SEGMENTATION CLASSIFICATION	All market segments and subsegments listed in this report through various forms of classification were mutually exclusive.
DATA AUTHENTICITY	Company revenues and segment-specific information were derived from annual reports of respective companies. The information provided in the annual reports was assumed to be authentic.
POLITICAL OUTLOOK	For the FPGA market, the global political environment was assumed to remain stable during the forecast period.
AVERAGE SELLING PRICES	Prices of FPGA for the next five years are assumed to be decreasing at the same rate as the years before the study period. The price variation by configuration is considered; however, price variation is not considered in the case of node size, technology, and vertical.
QUALITATIVE ANALYSIS	The qualitative analysis of the quantitative data is solely based on understanding the market and its trends identified by the team of experts involved in making this report

RESEARCH METHODOLOGY

2.5 RECESSION IMPACT ANALYSIS

TABLE 1 PARAMETERS CONSIDERED WHILE STUDYING RECESSION IMPACT

PARAMETER	DESCRIPTION
Discussions with Economic Experts	Detailed discussion with the in-house economic expert on possible recession in 2023 on the FPGA industry for both the demand and supply sides
Analysis of Companies' Quarterly Results	Analyzed the major and relevant companies' quarterly results and forecasts to understand the impact of FPGAs
Russia-Ukraine War	Considered the impact of the Russia-Ukraine war on rising energy costs globally
Impact on Industries	Studied the recession's impact on the automotive, healthcare, military & aerospace industries
Source of Macro Data	Sourced various macro data from the International Monetary Fund (IMF) to forecast the impact of the recession

2.6 RESEARCH LIMITATIONS

METHODOLOGY-RELATED LIMITATIONS

- All forecast values are based on historical data. The changing prices of FPGA offerings by different companies at different geographic locations may change the market size.
- Quantitative information for some market segments has been kept confidential by industry players. Hence, the qualitative insights gathered during the study have been used to arrive at the market size, in terms of value, for these segments.

SCOPE-RELATED LIMITATIONS

- The scope of the report is limited to the revenue generated by companies from the sale of FPGAs.
- Certain applications of FPGAs are not considered since their usage is still under the purview of research.

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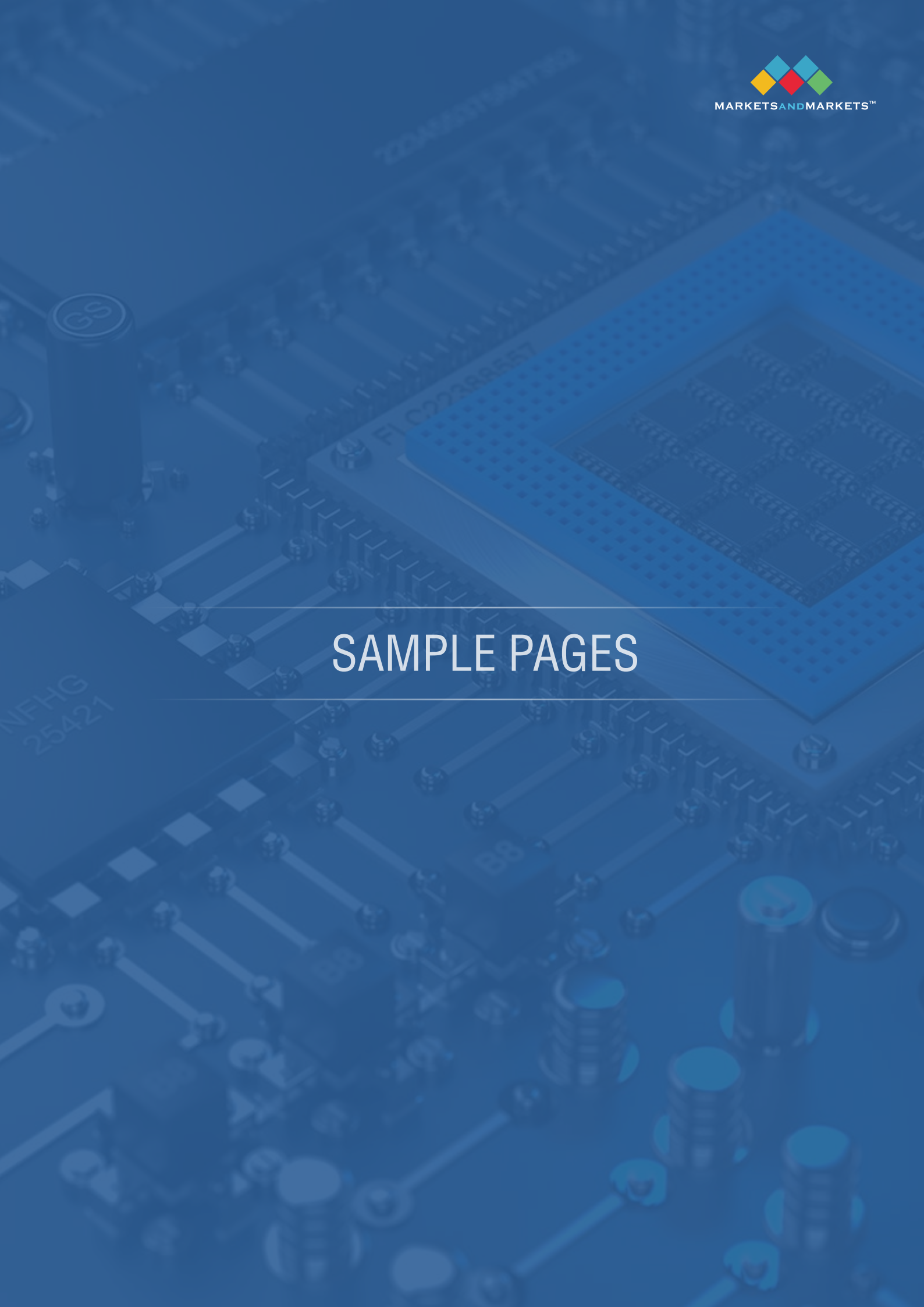


SAMPLE PAGES

1 EXECUTIVE SUMMARY

FPGAs are semiconductor devices comprising a matrix of configurable logic blocks (CLBs) connected via programmable interconnects. They can be reprogrammed to desired application or functionality requirements after manufacturing.

FGPAs are widely used in applications such as telecommunications, consumer electronics, testing, measurement and emulation, data center & computing, military & aerospace, industrial, automotive, healthcare, multimedia, and broadcasting.

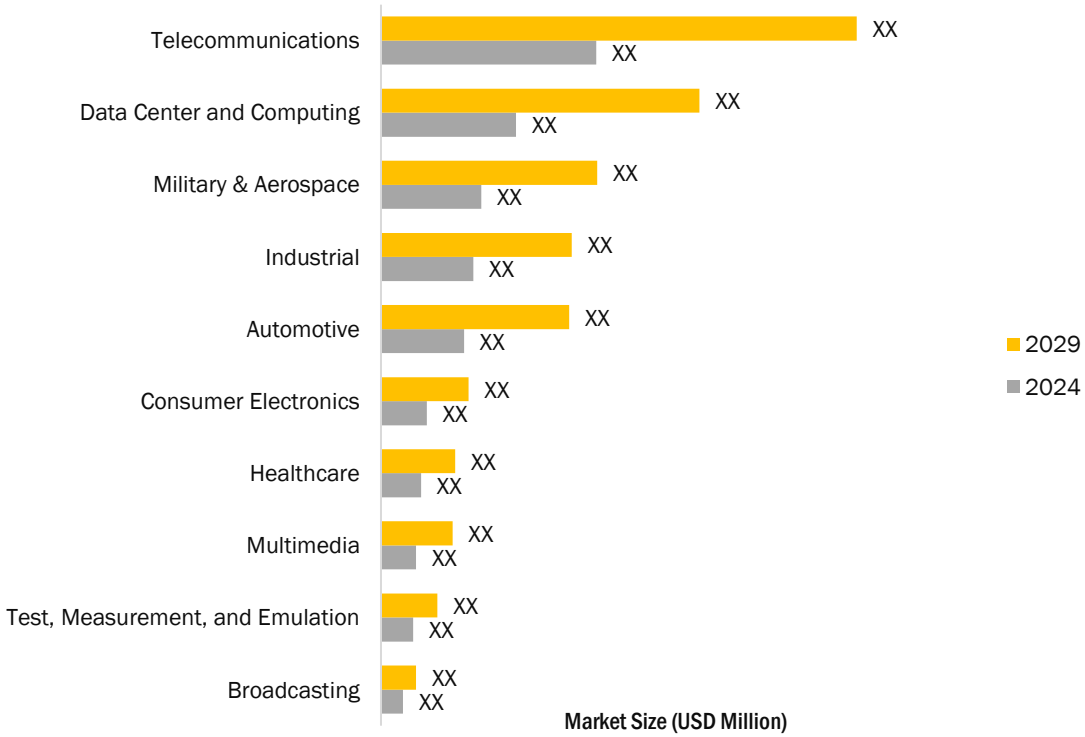
The FPGA market is projected to be valued at USD XX million in 2024 and will likely reach USD XX million by 2029, at a CAGR of XX% during the forecast period. The major market drivers include increased adoption of artificial intelligence (AI) and Internet of Things (IoT) technologies in various applications, integration of FPGAs into advanced driver assistance systems (ADAS), increasing number of data centers and high-performance computing (HPC) facilities, pressing need for FPGA hardware verification of avionics, and higher efficiency of field-programmable gate arrays (FPGA) compared with application-specific integrated circuits (ASIC). The major restraints for the market are security concerns associated with FPGAs. Critical challenges facing the FPGA market include the lack of improved, standardized verification techniques and complex programming. The opportunities include rising demand for FPGAs in high bandwidth devices, surging deployment of 5G communication infrastructure, and increasing penetration of eFPGAs into the military & aerospace industry.

The FPPGA market has been segmented based on configuration, node size, technology, FPGA & eFPGA market size, verticals, and geography. This report thoroughly analyzes the FPGA market by segment.

The competitive landscape chapter in this report provides the ranking of the key players in the FPGA market based on their product portfolio, contribution to the FPGA market, employee size, geographic reach, and growth after entry into the FPGA market. This chapter also describes the key growth strategies adopted by the market players between 2020 and 2023 to expand their global presence and increase their market share. Most companies implement key strategies in the FPGA market, including product launches, new product developments, collaborations and partnerships, and acquisitions. These strategies helped players efficiently cater to the anticipated demand for FPGA from different applications.

Major players in the FPGA market include Advanced Micro Devices, Inc. (Formerly Xilinx, Inc.) (US), Intel Corporation (US), Microchip Technology Inc., (US), Lattice Semiconductor Corporation (US), Achronix Semiconductor Corporation (US), QuickLogic Corporation (US), Efinix, Inc. (US), FlexLogix (US), GOWIN Semiconductor Corporation (China), and S2C (China).

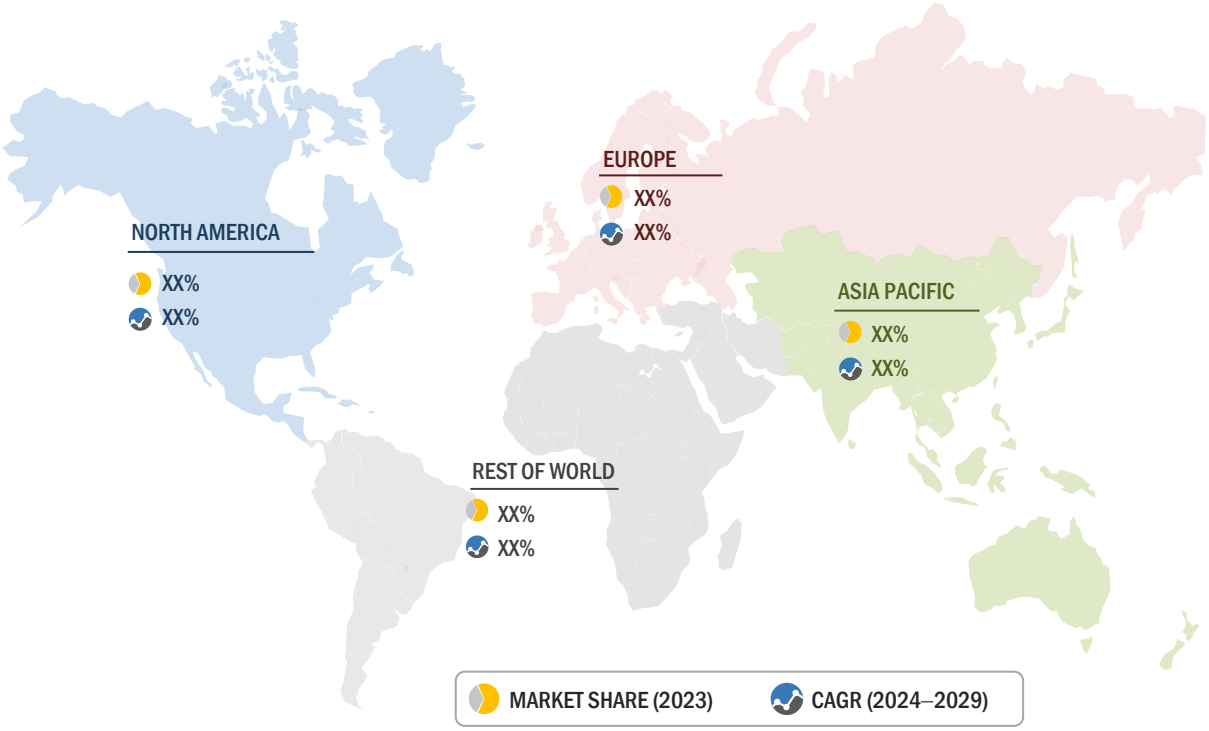
FIGURE 1 TELECOMMUNICATIONS SEGMENT TO LEAD MARKET DURING FORECAST PERIOD



Source: Secondary Research, Interviews with Experts, and MarketsandMarkets Analysis

The telecommunications segment of the FPGA market is projected to be USD XX million in 2024 and to reach USD XX million by 2029; it is expected to grow at a CAGR of XX% during the forecast period. The expansion of this sector can be credited to the increasing prevalence of FPGAs in diverse communication applications, including network processing, optical transport networks (OTN), wireless baseband, and backhaul solutions. The re-programmable nature of FPGAs enables swift updates to telecommunication systems for telecom operators, facilitating the resolution of issues and integration of new features. Additionally, the widespread deployment of 5G communication infrastructure on a global scale, encompassing both developed and emerging economies, is poised to propel the adoption of FPGAs further in the coming years.

FIGURE 2 ASIA PACIFIC TO DOMINATE MARKET DURING FORECAST PERIOD



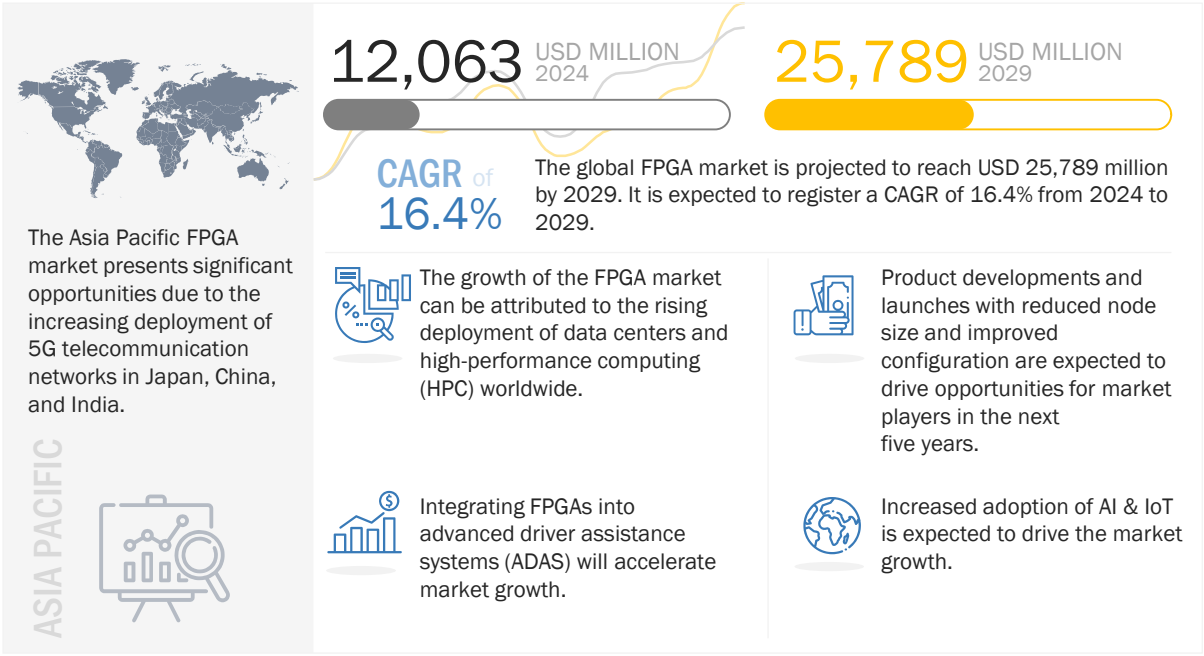
Source: Secondary Research, Interviews with Experts, and MarketsandMarkets Analysis

Asia Pacific currently holds the largest share of the FPGA market due to the increasing deployment of 5G telecommunication networks in China, Japan, and India. As per GSMA's "The Mobile Economy Asia Pacific 2023" report, the anticipated economic contribution of 5G to the Asia Pacific region in 2030 stands at a significant USD 133 billion, comprising over 13% of the total economic influence of mobile technology. This presents growth opportunities for telecom companies in India, thus driving the FPGA market. The demand for field-programmable gate arrays (FPGAs) is increasing in Asia Pacific due to the rise of industrial automation. FPGAs are crucial for 5G networks as they are more flexible and offer better performance to meet the increasing demand for wireless connectivity. The FPGA market is expected to grow over the forecast period due to the large-scale deployment of 5G infrastructure across the region.

2 PREMIUM INSIGHTS

2.1 ATTRACTIVE OPPORTUNITIES FOR PLAYERS IN FPGA MARKET

FIGURE 3 INCREASED ADOPTION OF AI AND IOT TO DRIVE MARKET DURING FORECAST PERIOD



Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, Organizations, Associations, White Papers, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

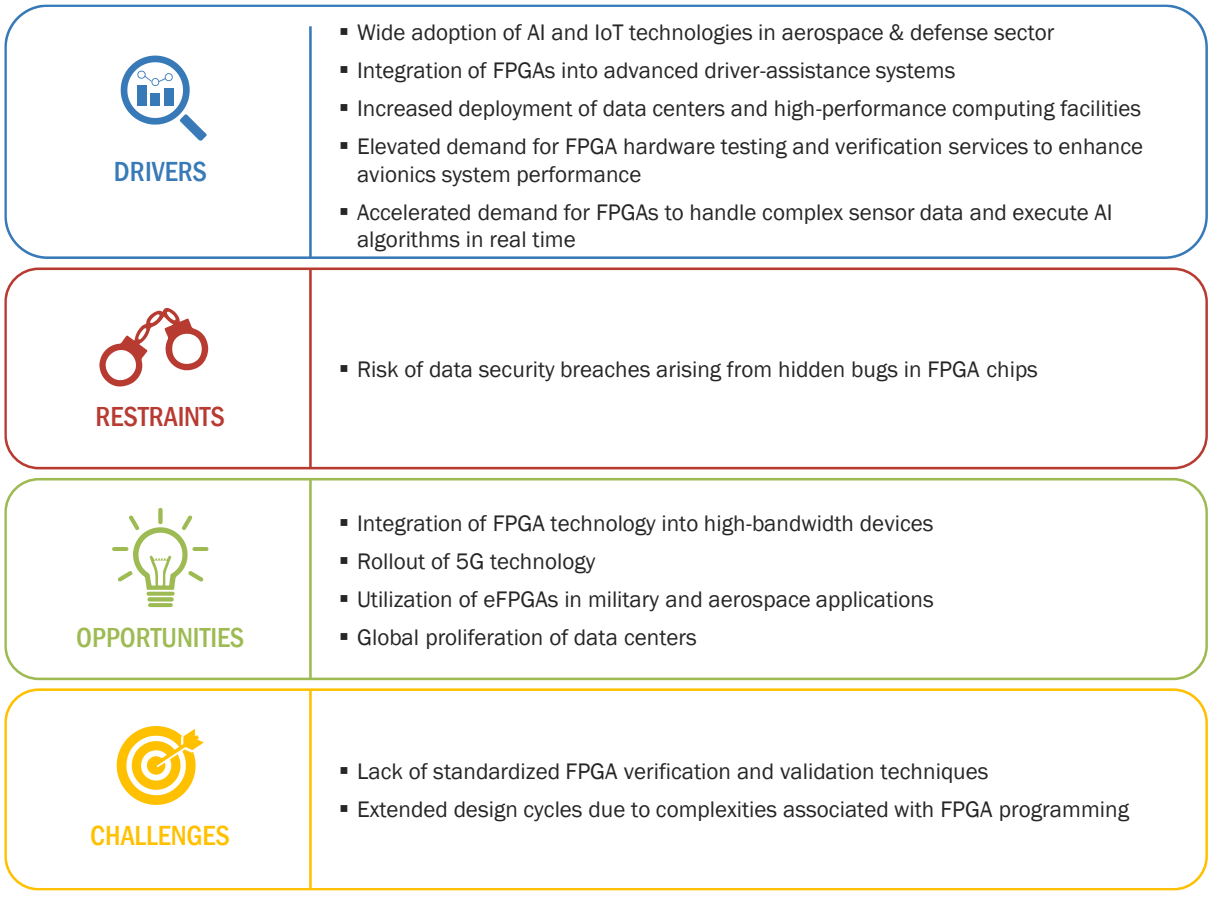
3 MARKET OVERVIEW

3.1 INTRODUCTION

The field-programmable gate arrays (FPGA) market has experienced a significant surge in growth and is poised for further expansion in the coming years. The FPGAs are highly versatile and can be reprogrammed after manufacturing, making them ideal for various applications. Due to their flexibility in hardware and acceleration in processing speed, programmable chips have gained popularity across various industries.

3.2 MARKET DYNAMICS

FIGURE 4 FPGA MARKET: DRIVERS, RESTRAINTS, OPPORTUNITIES, AND CHALLENGES



Source: Secondary Research, Interviews with Experts, and MarketsandMarkets Analysis

4 FPGA MARKET, BY VERTICAL

KEY FINDINGS

- The FPGA market for the telecommunications segment was valued at USD XX million in 2024 and is expected to reach USD XX million by 2029, at a CAGR of XX% from 2024 to 2029.
- Increasing mobile data traffic and rising adoption of 5G network infrastructure worldwide have contributed significantly to the growth of the telecommunications segment. There is a growing focus on security as network providers seek to protect their networks from cyberattacks.
- The market for the data center & computing segment was valued at USD XX million in 2024 and is projected to reach USD XX million by 2029; it is projected to record the highest CAGR at XX% from 2024 to 2029.
- The growth of the data center & computing segment can be attributed to the ongoing adoption of high-performance computing (HPC) in cloud storage and increasing technological developments in artificial intelligence, machine learning, and deep learning.
- The demand for FPGAs in the automotive vertical is primarily driven by the growing installation of ADAS, automotive infotainment systems, and driver information systems in automobiles.

4.1 TELECOMMUNICATIONS

FPGAs have become pivotal in the telecom sector, offering unparalleled adaptability, performance, and responsiveness to evolving needs. Baseband processing refers to the manipulation and preparation of a signal before it's transmitted or after it's received. In baseband processing, FPGAs efficiently handle modulation, demodulation, error correction, and enhancing data transmission. Their role in Network Function Virtualization (NFV) is crucial, accelerating functions like firewalls and deep packet inspection. FPGAs also contribute to Radio Access Networks (RANs) by implementing beamforming and signal processing functions, enhancing network coverage and capacity. In the era of edge computing, FPGAs excel in real-time processing, supporting tasks like image processing and data compression at the network's edge. Their significance extends to deploying 5G networks, where FPGAs power high-performance base stations and facilitate network slicing. The advantages of FPGA adoption in telecom encompass flexibility, high performance, low latency, power efficiency, cost-effectiveness, scalability, security, accelerated innovation, and futureproofing, collectively shaping the dynamic landscape of telecommunications. In line with this trend, Napatech (Denmark), in September 2023, strategically utilized Intel Corporation's (US) Intel Agilex FPGA for their 400Gbps SmartNIC solutions, aligning with the growing adoption of FPGAs in the telecom sector and contributing to the overall expansion of the FPGA market.

TABLE 1 TELECOMMUNICATIONS: FPGA MARKET, BY CONFIGURATION, 2020–2023 (USD MILLION)

Configuration	2020	2021	2022	2023	CAGR (2020–2023)
Low-end FPGA	XX	XX	XX	XX	XX
Mid-range FPGA	XX	XX	XX	XX	XX
High-end FPGA	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

TABLE 2 TELECOMMUNICATIONS: FPGA MARKET, BY CONFIGURATION, 2024–2029 (USD MILLION)

Configuration	2024	2025	2026	2027	2028	2029	CAGR (2024-2029)
Low-end FPGA	XX	XX	XX	XX	XX	XX	XX
Mid-range FPGA	XX	XX	XX	XX	XX	XX	XX
High-end FPGA	XX	XX	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

TABLE 3 TELECOMMUNICATIONS: FPGA MARKET, BY TYPE, 2020–2023 (USD MILLION)

Type	2020	2021	2022	2023	CAGR (2020–2023)
Wireless Communication	XX	XX	XX	XX	XX
Wired Communication	XX	XX	XX	XX	XX
5G	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**

Note: "-" indicates that 5G was not commercialized in that specific year.

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

TABLE 4 TELECOMMUNICATIONS: FPGA MARKET, BY TYPE, 2024–2029 (USD MILLION)

Type	2024	2025	2026	2027	2028	2029	CAGR (2024-2029)
Wireless Communication	XX	XX	XX	XX	XX	XX	XX
Wired Communication	XX	XX	XX	XX	XX	XX	XX
5G	XX	XX	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

5 FPGA MARKET, BY REGION

5.1 INTRODUCTION

This chapter provides insights into the FPGA market in major regions. The market has been segmented based on region into North America, Europe, Asia Pacific, and Rest of World, which includes South America, the Middle East, and Africa. This section also provides the FPGA market size for leading countries and quantitative insights into the market.

Asia Pacific accounted for the largest share at XX% of the overall FPGA market, in terms of value, in 2023 and is projected to record the highest CAGR from 2024 to 2029. The surge in market expansion is propelled by the rising adoption of 5G telecommunication networks across economies in the Asia Pacific region, encompassing China, Japan, and South Korea. According to the press release by the State Council Information Office, China, in April 2023, by the end of March, China had more than 2.64 million 5G base stations, with 620 million 5G cellphone users. The entire country's counties were covered by 5G signals, indicating widespread adoption of 5G technologies in the Chinese economy. China's plan includes adding approximately 600,000 more 5G base stations in 2023, aiming for 2.9 million. FPGAs are crucial in 5G networks because they provide the necessary flexibility and performance to meet the growing and dynamic demands of 5G wireless connectivity. The extensive rollout of 5G infrastructure throughout the region is set to drive the growth of the FPGA market in the forecast period.

Anticipated growth in the FPGA market in North America is attributed to the increasing prevalence of data centers during the forecast period. There is a heightened demand for FPGAs in various data center applications, including hardware acceleration, network interface controls, storage interface controls, and high-performance computing (HPC). According to the statistics by Data Centers Map as of September 2023, the global data centers accounted for 5,065 data centers worldwide, of which North America has the highest number (2,164) and Western Europe ranks second (1,285). With the increasing deployment of new data centers in the region, the FPGA market growth is expected to grow.

TABLE 5 FPGA MARKET, BY REGION, 2020–2023 (USD MILLION)

Region	2020	2021	2022	2023	CAGR (2020–2023)
North America	XX	XX	XX	XX	XX
Europe	XX	XX	XX	XX	XX
Asia Pacific	XX	XX	XX	XX	XX
Rest of World	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**

Note: Rest of World mainly includes the Middle East, Africa, and South America.

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

TABLE 6 FPGA MARKET, BY REGION, 2024–2029 (USD MILLION)

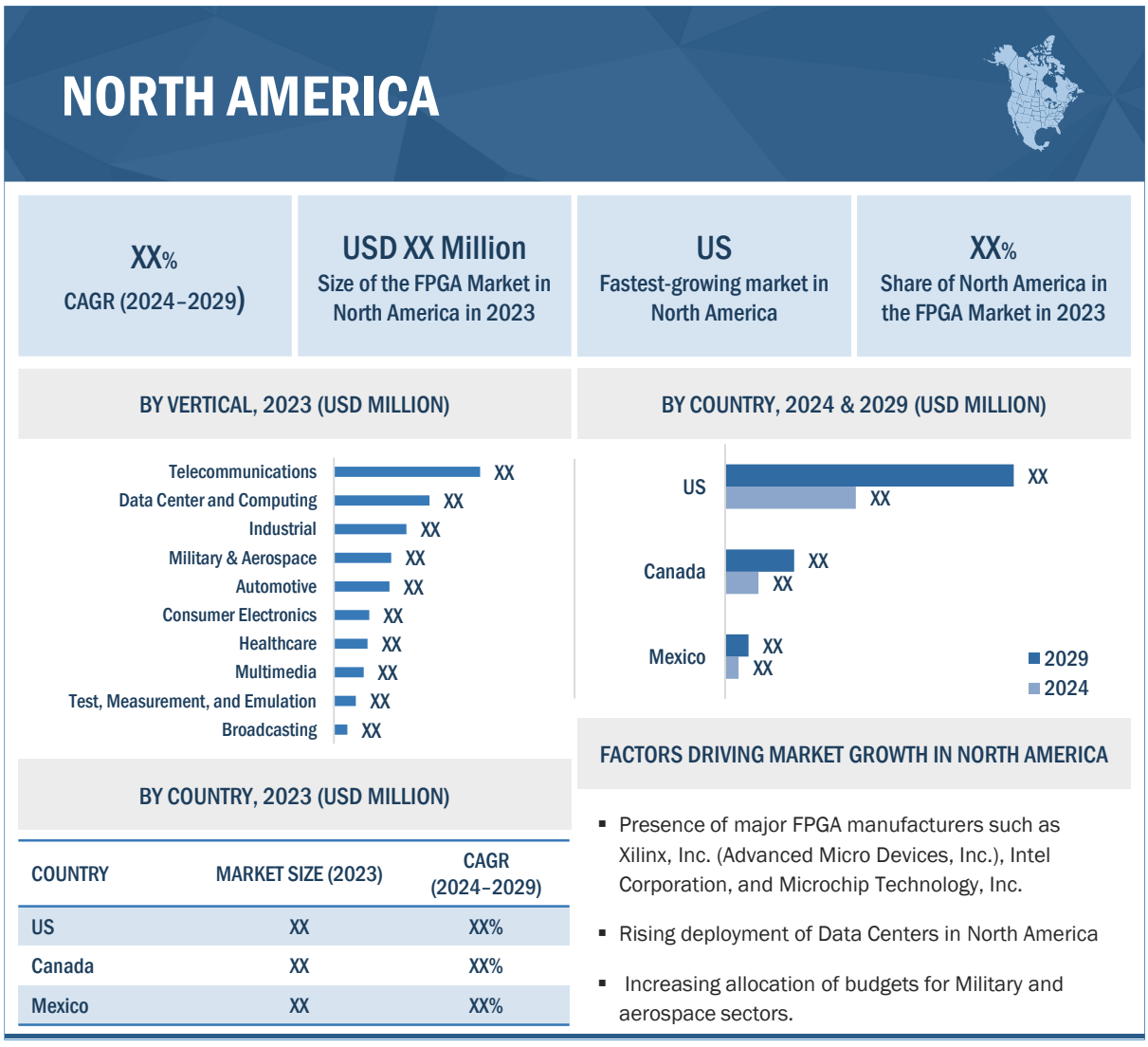
Region	2024	2025	2026	2027	2028	2029	CAGR (2024-2029)
North America	XX	XX	XX	XX	XX	XX	XX
Europe	XX	XX	XX	XX	XX	XX	XX
Asia Pacific	XX	XX	XX	XX	XX	XX	XX
Rest of World	XX	XX	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

Note: Rest of World mainly includes the Middle East, Africa, and South America.

Source: Secondary Research, Annual Reports, Press Releases, Journals, Industry News, White Papers, Articles, Interviews with Experts, Blogs, and MarketsandMarkets Analysis

5.2 NORTH AMERICA

FIGURE 5 NORTH AMERICA: SNAPSHOT OF FPGA MARKET



Source: Investor Presentations, Interviews with Experts, Industry Journals, Magazines, and MarketsandMarkets Analysis

TABLE 7 NORTH AMERICA: FPGA MARKET, BY CONFIGURATION, 2020–2023 (USD MILLION)

Configuration	2020	2021	2022	2023	CAGR (2020–2023)
Low-end FPGA	XX	XX	XX	XX	XX
Mid-range FPGA	XX	XX	XX	XX	XX
High-end FPGA	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Investor Presentations, Interviews with Experts, Industry Journals, Magazines, and MarketsandMarkets Analysis

TABLE 8 NORTH AMERICA: FPGA MARKET, BY CONFIGURATION, 2024–2029 (USD MILLION)

Configuration	2024	2025	2026	2027	2028	2029	CAGR (2024-2029)
Low-end FPGA	XX	XX	XX	XX	XX	XX	XX
Mid-range FPGA	XX	XX	XX	XX	XX	XX	XX
High-end FPGA	XX	XX	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Investor Presentations, Interviews with Experts, Industry Journals, Magazines, and MarketsandMarkets Analysis

TABLE 9 NORTH AMERICA: FPGA MARKET, BY TECHNOLOGY, 2020–2023 (USD MILLION)

Technology	2020	2021	2022	2023	CAGR (2020–2023)
SRAM	XX	XX	XX	XX	XX
Flash	XX	XX	XX	XX	XX
Antifuse	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Investor Presentations, Interviews with Experts, Industry Journals, Magazines, and MarketsandMarkets Analysis

TABLE 10 NORTH AMERICA: FPGA MARKET, BY TECHNOLOGY, 2024–2029 (USD MILLION)

Technology	2024	2025	2026	2027	2028	2029	CAGR (2024-2029)
SRAM	XX	XX	XX	XX	XX	XX	XX
Flash	XX	XX	XX	XX	XX	XX	XX
Antifuse	XX	XX	XX	XX	XX	XX	XX
Total	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**	**XX**

Source: Investor Presentations, Interviews with Experts, Industry Journals, Magazines, and MarketsandMarkets Analysis

6 COMPETITIVE LANDSCAPE

6.1 OVERVIEW

This section of the report describes the dynamics of the FPGA market from a market player's perspective. As a part of this, market share analysis has been carried out based on the revenue generated by key players from various segments of the overall FPGA value chain. The key strategies adopted by most companies in the FPGA market to uphold their position and ensure long-term growth and market success are product launches, collaborations, and partnerships.

6.2 KEY PLAYER STRATEGIES/RIGHT TO WIN

TABLE 11 KEY STRATEGIES ADOPTED BY MAJOR COMPANIES

KEY PLAYERS	PRODUCT / SERVICE TYPE	STRATEGIC DEVELOPMENTS/ PARTNERSHIPS	PRODUCT LAUNCHES	GEOGRAPHIC PRESENCE
Advanced Micro Devices, Inc. (Xilinx, Inc.) (US)	Kintex-7 FPGA Virtex-7 FPGA UltraScale Series FPGA UltraScale+ Series FPGA Artix-7 FPGA	Advanced Micro Devices Inc. (US) and Hewlett Packard Enterprise Co. (HPE) (US) collaborated on various initiatives emphasizing sustainability in technology. AMD's approach to energy efficiency involves chip design to enhance efficiency and drive innovation for a more sustainable future. This innovation promises significant strides in sustainability.	Xilinx, Inc. has recently introduced two new additions to their UltraScale+ series of electronics - the AU7P field-programmable gate array (FPGA) and ZU3T system-on-chip (SoC). These 16 nm FinFET-based devices are designed for low power consumption, high performance-per-watt, and compact form factor applications.	The company has a strong presence in Asia Pacific, North America, Europe, and Japan, generating more than XX% of the total revenue from Asia Pacific.
Intel Corporation (US)	Intel Agilex Series Intel Stratix Series Intel Arria Series Intel Max Series Intel Cyclone Series	Intel Corporation (US) announced a partnership with Taiwan Semiconductor Manufacturing Company Limited (Taiwan) to manufacture chips for Intel's high-performance computing and graphics products. The partnership will help Intel reduce its reliance on external foundries.	Intel's Agilex FPGA portfolio expansion meets diverse application needs, from data centers to embedded systems and military projects. The range includes high-performance Intel Agilex 9 for specialized tasks, Intel Agilex 7 with top data rate transceivers and memory bandwidth, and Intel Agilex 5 with power-efficient options for midrange applications. This comprehensive lineup offers solutions for varying performance and power requirements.	The company has a strong presence in China, Singapore, the US, and Taiwan. China contributed more than XX% to the total revenue generated by the company.
Microchip Technology Inc. (US)	PolarFire FPGAs IGLOO 2 FPGAs	Microchip Technology Inc. announced joining the Defense Advanced Research	Microchip Technology Inc. has announced the launch of the industry's first mid-	The company has a major

	ProASIC 3 FPGAs IGLOO FPGAs Fusion Mixed-Signal FPGAs SoC FPGA Radiation Tolerant FPGA Antifuse FPGA	Projects Agency (DARPA) Toolbox initiative, which is expected to deliver open licensing opportunities to organization researchers. Microchip's participation helps accelerate innovation across defense & aerospace development programs. It helps deliver zero-cost access to DARPA researchers to the company's Libero design software suite and IP for developing systems based on low-power FPGA products.	range industrial edge stack, ready-to-customize cryptography and boot libraries of soft intellectual property (IP), and new tools to convert current FPGA designs to PolarFire devices are all announced as new development resources and design services to help with the transition.	presence across the Americas, Europe, and Asia. Asia contributed more than XX% of the total revenue generated by the company.
Lattice Semiconductor Corporation (US)	Advanced General Purpose FPGA Low-Power General Purpose FPGA Low Power FPGAs Video Connection FPGAs Ultra-Low Power FPGAs Advanced Secure Control FPGA Control & Security FPGAs	Lattice Semiconductor Corporation partnered with GuardKnox (Israel) to enhance automotive Electrical/Electronic architecture. This partnership combines GuardKnox's high-performance CommEngine with Lattice's low-power FPGA solutions, providing advanced connectivity for evolving automotive needs, such as ADAS and enhanced in-vehicle experiences, with low latency and built-in security for faster development cycles.	Lattice Semiconductor launched the Lattice CrossLinkU-NX FPGA family, introducing the industry's first FPGAs with integrated USB device functionality. These FPGAs enhance USB-equipped system designs, improve thermal management, and offer reference designs. Designed for various markets, they simplify USB-based design for applications in the Computing, Industrial, Automotive, and Consumer sectors, aligning with the growing need for efficient AI and vision applications.	The company has a strong presence in Asia, the Americas, and Europe. Asia generated about XX% of the total revenue in FY2022.
Achronix Semiconductor Corporation (US)	Speedster7t FPGA family Speedcore-embedded FPGA IP FPGA Design Tools Accelerator Cards	Achronix Semiconductor Corporation announced a partnership with Myrtle.ai (UK), introducing an accelerated automatic speech recognition (ASR) solution powered by the Speedster7t FPGA. This innovation enables the conversion of spoken language into text in over 1,000 real-time streams, delivering exceptional accuracy and response times, all while outperforming competitors by up to 20 times.	Achronix Semiconductor Corporation announced the commercial availability of its AC7t1500 FPGA and the addition of the power-efficient AC7t800 FPGA to the Achronix Tool Suite.	The company has a strong presence in North America.

Source: Annual Reports, Press Releases, and MarketsandMarkets Analysis

6.3 COMPANY EVALUATION MATRIX, 2023

The company evaluation matrix section provides an overview of the prevailing competitive scenario in the FPGA market. This section maps more than 25 players in the FPGA market. The ranking of these players is based on two major factors—market share/rank and the strength of the product portfolio.

Factors such as geographic footprints, growth strategies, and vision alignment of companies have been considered for rating companies on the market share rank parameter. Similarly, factors such as the focus on product innovations and breadth of offerings have been considered for rating companies on the strength of their product portfolios.

FIGURE 6 FPGA MARKET: COMPANY EVALUATION MATRIX, 2023

Source: MarketsandMarkets Analysis

7 COMPANY PROFILES

7.1 KEY PLAYERS

7.1.1 ADVANCED MICRO DEVICES, INC. (FORMERLY XILINX, INC.)

7.1.1.1 Business overview

AMD offers products under four reportable segments: Data Center, Client, Gaming, and Embedded Segments. The Data Center segment offers CPUs, GPUs, DPUs, FPGAs, and adaptive SoC products for data centers. The portfolio of the Client segment consists of CPUs, APUs, and chipsets for desktop and notebook computers. The Gaming segment provides discrete GPUs, semi-custom SoC products, and development services. The Embedded segment offers embedded CPUs, GPUs, APUs, FPGAs, and Adaptive SoC devices. The company offers its products to a wide range of industries, including aerospace & defense, architecture, engineering & construction, automotive, broadcast & professional audio/visual, government, consumer electronics, design & manufacturing, education, emulation & prototyping, healthcare & sciences, industrial & vision, media & entertainment, robotics, software & sciences, supercomputing & research, telecom & networking, test & measurement, and wired & wireless communications.

The company offers a range of FPGA brands, including Virtex-6, Virtex-7, Virtex UltraScale+, Kintex-7, Kintex UltraScale, Kintex UltraScale+, Artix-7, Artix UltraScale+, Spartan-6, and Spartan-7. These products are sold to customers from various industries and sectors, such as aerospace & defense, consumer electronics, broadcasting, industrial, communication infrastructure, automotive, and data centers. The company has major sales operations across the US, China, Japan, Europe, Taiwan, and Singapore.

As of December 31, 2022, the company had 13,200 issued patents and 6,600 pending patent applications globally. It held around 8,200 issued patents and approximately 2,200 patent applications in the US. The company has a major regional presence in the US, China, Hong Kong, Japan, Europe, Taiwan, and Singapore.

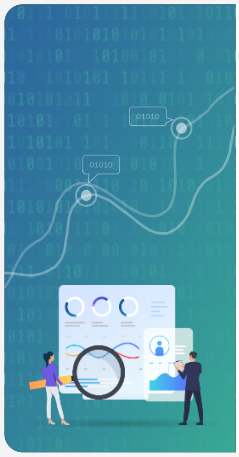
In February 2022, AMD announced the successful acquisition of Xilinx through all stock transactions, with Xilinx, Inc. (US) now operating as a wholly-owned subsidiary of AMD. This acquisition will enable AMD to provide an impressive range of high-performance and adaptive computing solutions to the cloud, edge, and intelligent devices markets. Xilinx has brought together a complementary range of products, customers, and markets with adaptive computing leaders, making it a valuable addition to AMD's Adaptive and Embedded Computing Group (AECG), which will focus on adaptive SoC, FPGA, and software roadmaps.

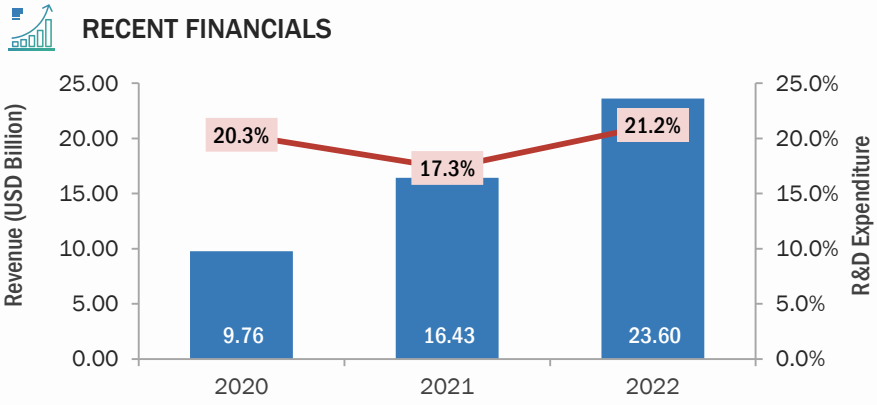
TABLE 12 ADVANCED MICRO DEVICES, INC.: COMPANY OVERVIEW

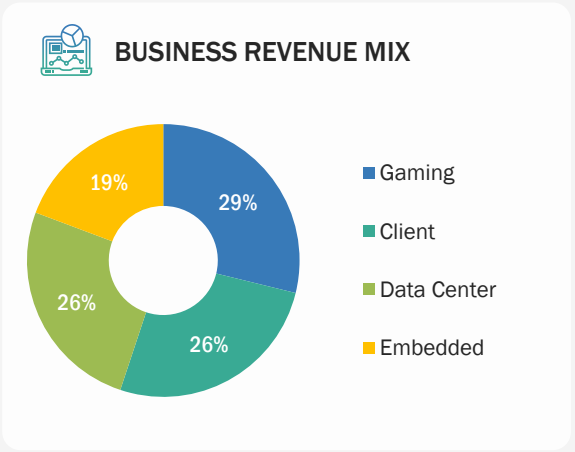
Founded	1969
Headquarters Country	US
Headquarters State/City	Santa Clara, California
Employee Count	25,000 (December 2022)
Ownership Type	Public (NASDAQ: AMD)

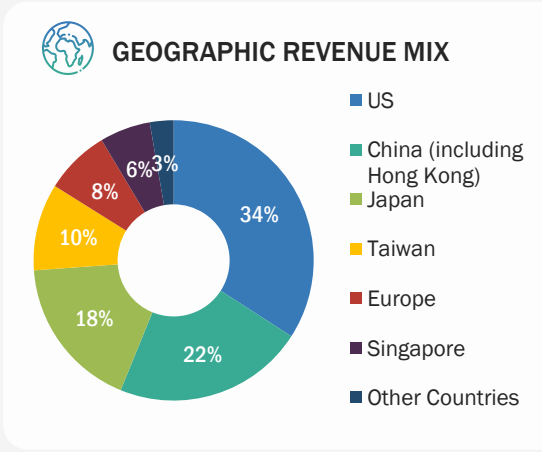
Source: Company Website and Annual Reports

FIGURE 7 ADVANCED MICRO DEVICES, INC.: COMPANY SNAPSHOT









Note: The pie chart numbers are rounded off to the nearest unit, and there could be instances where the total might not add up to 100.

In the recent financials block, the R&D expenditure has been calculated as the percentage of the total revenue.

The company's financial year ends on December 31.

Source: Company Website and Annual Reports

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MARKETSANDMARKETS™

RELATED REPORTS

ARTIFICIAL INTELLIGENCE (CHIPSETS) MARKET

GLOBAL FORECAST TO 2028

MAY - 2023

HIGH-PERFORMANCE COMPUTING MARKET

GLOBAL FORECAST TO 2027

MAY - 2022

ABOUT MARKETSANDMARKETS™

MarketsandMarkets™ is the world's largest revenue impact company, serving over 7500 customers. 80% of top 2000 companies globally rely on us for identifying new high growth and niche revenue opportunities.

In the face of constant technology innovation and market disruption, we help organizations plan and operationalize their future revenue mix decisions by identifying over 30,000 high growth opportunities ranging from $1B to $500B across 90+ industry trends and markets. Organizations choose MarketsandMarkets™ to stay ahead of the curve and accelerate their revenue decisions and implementations by 6 – 12 months, giving them a unique, first-mover advantage.

Our revenue impact methodology provides quantified and actionable insights on converged, granular and connected market eco-systems that result from disruptive technologies and high-growth markets. We provide an extended lens on not only what will impact our client's revenue but also what will impact their clients' revenues, continually uncovering latent opportunities.

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