

MARKET-RESEARCH MONOGRAPH SERIES

The *FPGA* Market

A study of the global field-programmable gate-array market and the value-added design-in channel that carries it into Korea — read through Macus, the country’s only listed pure-play FPGA design-in distributor.

KOSDAQ 093520 · Macus Co., Ltd.

<p>Global FPGA TAM</p> <p>~\$10– 14bn</p> <p>2024–25e (house spread)</p>	<p>Consensus CAGR</p> <p>~9–12%</p> <p>to 2030–32</p>	<p>Top-1 vendor</p> <p>>50%</p> <p>AMD/Xilinx share</p>	<p>Asia-Pacific demand</p> <p>44–55%</p> <p>of 2024 consumption</p>
---	--	---	--

Evidence base.

Global market sizing triangulated across eight independent research houses (MarketsandMarkets, Grand View, Fortune Business Insights, Mordor, GMInsights, Polaris, Global Insight Services, Cognitive). Channel structure from WiseGuy Reports, Avnet 10-K (SEC) and FnGuide. The company lens is grounded in DART filings (DART 20260318000498, DART 20260514000838). KRX market data is near-unused, consulted only to confirm no capital-event cross-reference is required. A market-research study — not investment advice, no price target.

CONTENTS

How to read a market through one participant

The analytical spine runs market-first: size the FPGA market across houses, read demand forward and back, build a forward fan, map the competitive structure, and only then place the company inside it. Macus is the lens through which the design-in distribution segment becomes measurable — never the subject of a valuation.

01	The Market	<i>Sizing across eight houses, structure, segmentation, the value chain</i>	4
02	Demand & the Five-Year Past	<i>Forward drivers; the silicon cycle read through one channel</i>	8
03	Forward Forecast (~5yr)	<i>A house-disagreement fan and the channel-vs-product wedge</i>	11
04	Competitive Structure & Shares	<i>Vendor concentration upstream; the two distribution axes downstream</i>	14
05	The Company Within the Market	<i>Products as market participation; margin as a market read</i>	18
06	Three Market-Environment Scenarios	<i>A forward description of the market environment, not a price</i>	21
07	What the Market Teaches	<i>The generalizable lesson of a design-in franchise</i>	22
	Working With Nathan Research	<i>Expert bench, engagement model, open questions</i>	23
	Appendix	<i>Sources · Methodology · Glossary</i>	25

HOW TO READ THIS DOCUMENT

This is a **market study**, not company research. The market — its size, structure, demand and forward path — is the subject; Macus is the lens that makes the design-in distribution segment concrete. There is no valuation, no multiple, no price target, no bull-bear thesis. The opening hook is a **structural market fact**, and where research houses disagree on market size, the band is preserved — never reconciled to a false single point.

Executive Summary

THE MARKET, THROUGH ONE PARTICIPANT

In 2025 the supply side of the field-programmable gate-array market was structurally re-cut. Intel sold a 51% stake in Altera to Silver Lake at an \$8.75bn valuation ^{EE Times; Altera}, leaving the FPGA market as **two PE- or strategically-backed pure-plays** — AMD/Xilinx, which controls **more than half** the market ^{Yole Group}, and a re-independent Altera — **plus one fast-rising mid-range insurgent, Lattice**. With a single vendor above 50% globally and the top five at **80–86%** ^{MarketsandMarkets}, the scarce, defensible asset in any one country is not the chip. It is the **authorized design-in distribution franchise**.

That structural fact is the spine of this study. The chips are designed in the United States — AMD/Xilinx, Altera, Lattice, Microchip, Achronix — but demand has migrated to Asia: **Asia-Pacific accounted for 44–55% of 2024 FPGA consumption** ^{Polaris Market ResearchFortune Business InsightsMarketsandMarkets}. That design/consumption gap is the structural reason an Asian, authorized, design-in distribution channel exists at all. This document studies that channel — its size, economics and forward path — through **Macus Co., Ltd. (KOSDAQ 093520)**, the only listed Korean pure-play on the FPGA design-in lane, AMD/Xilinx authorized since 1997 ^{pinpointnews; businessreport.kr}.

THE LENS

The lens, stated. This is a study of *the FPGA market and its Korean design-in channel*, told through Macus. The company's financials appear only as market evidence — most of all, its ~12.8% operating margin ^{DART 20260318000498} against ~3.6% at a broadline distributor ^{Avnet 10-K} is the concrete proof that channel value concentrates in the design-in tier. Nothing here is a valuation.

Five things the market says

- ▶ **The market is real and growing at ~9–12%, but houses disagree on its size by ~40%.** The 2024–25 TAM spans ~\$9.9bn (Mordor) to ~\$13.9bn (Fortune Business Insights) ^{Mordor IntelligenceFortune Business Insights} — a scope-driven spread, preserved as a band.
- ▶ **The channel grows slower than the chip.** Semiconductor distribution compounds at ~4–5% ^{WiseGuy Reports} versus ~10% for FPGAs — so value migrates *within* the channel, to design-in over fulfillment.
- ▶ **The design-in premium is ~3.5x.** Technical, design-in distribution earns roughly 5–13% operating margin against ~3.6% for broadline scale players ^{Avnet 10-K} — for the same nominal “distribution” function.
- ▶ **The channel is a levered read on the silicon cycle.** Macus revenue fell 9% in FY2023 ^{DART 20260318000498}, one period ahead of the AMD-Embedded CY2024 trough (\$5.3bn→\$3.6bn, –33%) ^{AMD 8-K, SEC} — absorbing the inventory correction early.
- ▶ **The demand pool is localizing.** Korea's non-memory output target (30%→50% by 2030) ^{Korea.net} and FPGA use as drone main-processors ^{businessreport.kr} enlarge the pool the channel feeds.

1 The Market

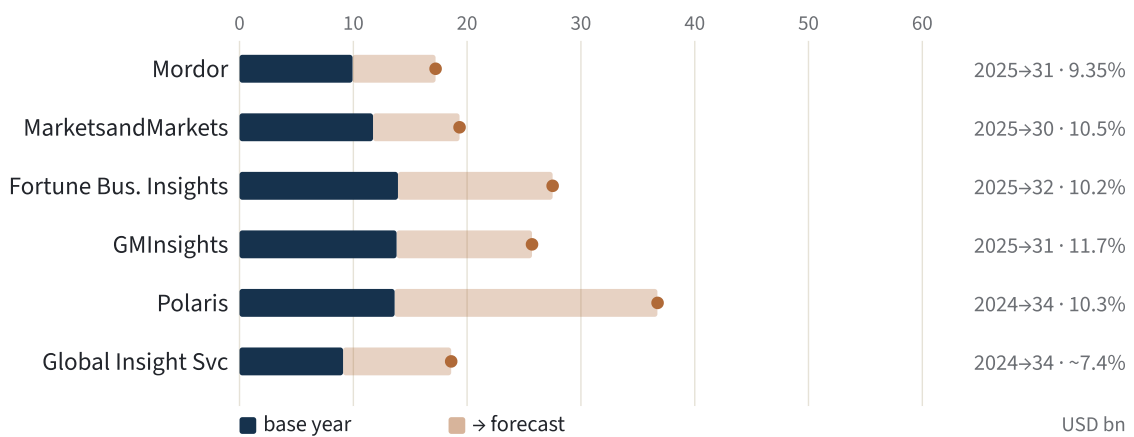
SIZING · STRUCTURE · SEGMENTATION · VALUE CHAIN

An FPGA is reconfigurable silicon: a chip whose logic is programmed after manufacture, prized where workloads change faster than a fixed ASIC can be re-spun — 5G base stations, AI inference, radar and avionics, industrial control. The market for these chips is real, concentrated, and growing at high single to low double digits. But its **measured size depends entirely on which house you read**, and on whether that house folds adaptive system-on-chip families (AMD’s Versal) into “FPGA.” We therefore begin not with one number, but with the spread.

Sizing the market — **eight houses, one band**

Each research house carries a different base year, base size, terminal year and CAGR. The honest representation is a band, not a point. The 2024–25 base ranges from **\$9.93bn** (Mordor) Mordor Intelligence through **\$11.73bn** (MarketsandMarkets) MarketsandMarkets to **\$13.92bn** (Fortune Business Insights) Fortune Business Insights; the mid-decade terminal (2030–32) clusters at **~\$17–28bn**, with the most aggressive houses reaching **\$37–41bn by 2034–35** Polaris Market ResearchGMInsights. Consensus CAGR sits at **~9–12%**.

Exhibit 1 · The global FPGA market, sized across eight houses (base year → published terminal)



Source: Mordor Intelligence; MarketsandMarkets; Fortune Business Insights; GMInsights; Polaris Market Research; Global Insight Services. Grand View (\$23.34bn 2030, 10.8%) and Cognitive (\$10.5bn 2024, 8.9%) omitted from the bar for scale legibility; both sit within the band. House spread is scope-driven (adaptive-SoC inclusion) and preserved, not reconciled.

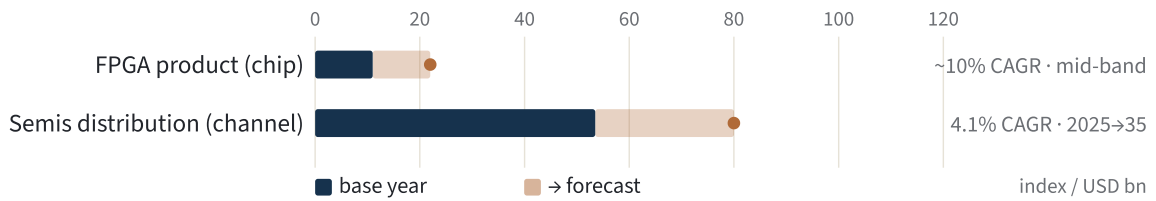
A RANGE, NOT A POINT

GAP-1, stated plainly. The ~40% spread in the 2024–25 base is not noise — it is a definitional disagreement about whether adaptive system-on-chip families belong inside “FPGA.” We print the cover TAM as a range (~\$10–14bn) and never average the houses into a single false point. Mordor IntelligenceFortune Business Insights

The market Macus actually lives in — **the channel, not the chip**

A distributor does not sell into the chip TAM; it earns a slice of the **distribution channel**. The global semiconductor distribution market is **\$53.5bn (2025)**, **growing to ~\$80bn by 2035 at ~4.1% CAGR** ^{WiseGuy Reports}. The central structural finding follows immediately: the channel grows **materially slower (~4–5%)** than the FPGA product it carries (**~10%**). Mechanically, FPGA content value per unit rises faster than distribution fee value — so growth and margin migrate *within* the channel, toward the technical, design-in tier and away from broadline fulfillment. This wedge is the reason Macus’s lane exists and the spine of Sections 3 and 4.

Exhibit 2 · Two clocks: the FPGA product compounds at ~2x the channel that carries it



Source: WiseGuy Reports (distribution channel \$53.5bn→80bn); FPGA product mid-band CAGR ~10% from the eight-house synthesis (Exhibit 1). Chip bar is an indexed illustration of the relative growth rate; channel bar is the published USD-bn TAM. The point is the slope contrast, not a shared axis.

Structure — how the market segments

Within the chip market, value and growth do not sit in the same place. By performance tier, **low-end holds the largest share** but **mid-range grows fastest (~14% CAGR)** — led by Lattice’s Avant family — with high-end the highest-value but slower-growing tip ^{GMInsights}. By application, **IT & telecom leads at ~35%** (5G base stations), data-center/computing is the highest-CAGR vertical (AI acceleration), and military & aerospace is among the fastest-growing (secure, radiation-tolerant, long-life) ^{MarketsandMarketsPolaris Market Research}.

Exhibit 3 · FPGA market segmentation — where share sits vs. where growth sits

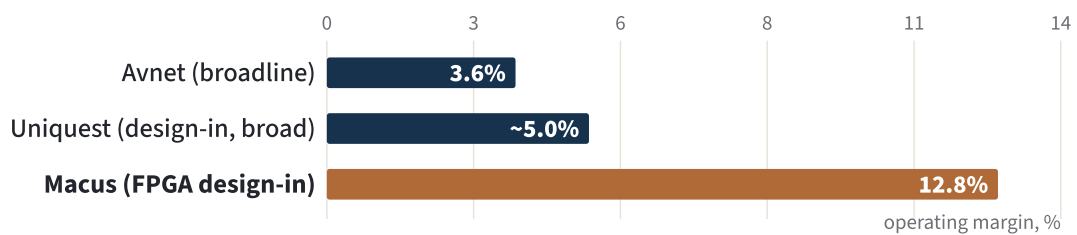
Axis	Largest share (2024)	Fastest growth	Note
Performance tier	Low-end	Mid-range (~14%)	Lattice Avant insurgent
Application	IT & Telecom ~35%	Data center / AI	5G → inference shift
Technology	SRAM (dominant)	Flash	volatile vs non-volatile
Geography	Asia-Pacific 44–55%	Asia-Pacific	design/consume gap

Source: GMInsights; MarketsandMarkets; Polaris. “Share” = 2024 position; “Growth” = forward CAGR direction. eFPGA scope-flagged (GAP-7) — see Section 3.

The value chain — who sells what to whom

The chain runs from a handful of US-headquartered vendors, through authorized regional distributors, to Korean OEM/ODM customers in defense and drones, 5G and networking, data-center and storage, industrial and medical-AI. The distribution layer splits into two structurally different models. **Broadline fulfillment** — Avnet, Arrow, WT Microelectronics, WPG — competes on scale and logistics at roughly **3–4% operating margin**. **Technical, design-in distribution** — Macus, Uniquest — embeds circuit design, firmware and field-application engineering into the customer’s product from planning through mass production, at roughly **5–13% operating margin**. The same word, “distribution,” names two different economics.

Exhibit 4 · The design-in premium: operating margin by distribution model (latest FY)



Source: Avnet 10-K FY2024 (SEC); Uniquest FY2025 (FnGuide A077500; DART); Macus FY2025 consolidated DART 20260318000498 — OP ₩29.10bn on revenue ₩227.24bn = 12.8%. The ~3.5x gap between Macus and a broadline distributor is the entire economic case for the design-in segment.

THE DESIGN-IN PREMIUM

The central value-chain finding. ~12.8% operating margin at an FPGA design-in distributor versus ~3.6% at a broadline distributor is a ~3.5x differential for the *same nominal function*. The premium is paid for engineering embedded in the customer’s design, not for moving boxes. This is the dynamic the entire study tests through one participant.

Region as structure. The chips are designed in the United States but consumed in Asia — Asia-Pacific is 44–55% of 2024 demand Polaris Market ResearchMarketsandMarkets. That geographic gap, combined with above-50% single-vendor concentration, makes the **authorized regional design-in franchise** — not the chip — the scarce asset in any one country. The franchise is what a Korean OEM cannot replicate; the chip it can buy from anyone authorized to sell it.

2 Demand & the Five-Year Past

DRIVERS FORWARD · THE CYCLE BACKWARD

Demand reads two ways. Forward, through the structural drivers pulling FPGAs into new workloads. Backward, through a five-year revenue cycle that — because the channel takes no long-term contracts and prices spot per order DART 20260318000498 — transmits the underlying silicon cycle almost directly. The channel is not an independent business; it is a **levered read on the FPGA demand cycle**.

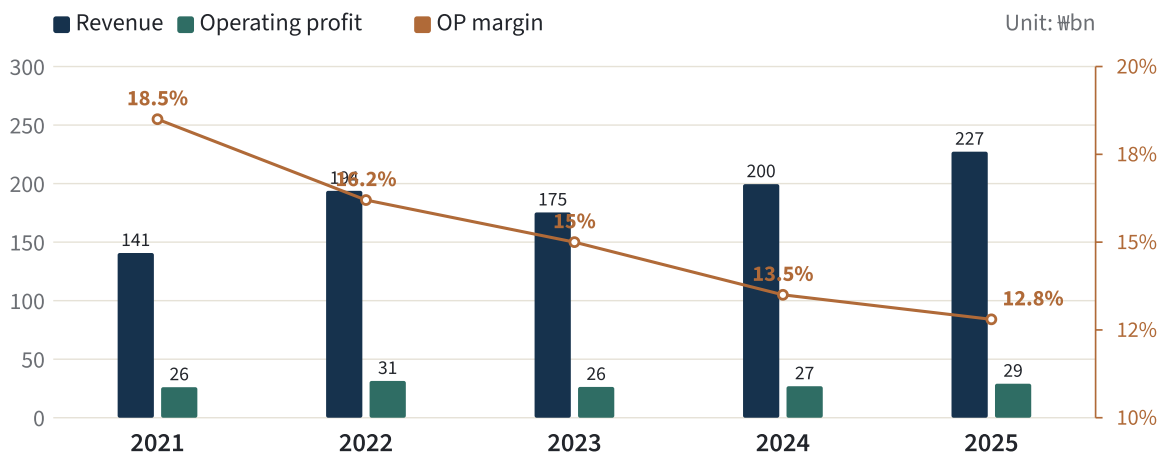
What pulls demand forward

- ▶ **AI inference, at the edge and in the data center.** FPGAs win on latency and performance-per-watt versus CPU/GPU for inference, network and storage acceleration SemiEngineering. AMD's Versal Premium Gen2 targets the data center — samples early-2026, production mid-2026 AMD — pulling the highest-CAGR vertical forward.
- ▶ **5G & telecom.** Programmable base-station and edge hardware sustains the ~35% telecom application share MarketsandMarkets — still the single largest 2024 slice.
- ▶ **Aerospace & defense.** Secure, adaptable, long-lifecycle silicon for radar and avionics; a Korea-specific tailwind as Xilinx FPGAs serve as drone main-processors amid new Korean drone units businessreport.kr.
- ▶ **Sovereign semiconductor pushes.** Korea's K-Semiconductor strategy and the non-memory 30%→50% (by 2030) target Korea.net enlarge the localized demand pool the channel feeds.
- ▶ **Automotive electrification / ADAS.** A steady secondary draw at ~9.8% application CAGR MarketsandMarkets.

The five-year past — the cycle, read through one channel

The clearest available read on Korean FPGA-channel demand is the revenue of the one listed participant. Macus consolidated revenue ran **₩86.91bn (2020) → ₩140.73bn (2021, +62%) → ₩193.76bn (2022, +38% peak) → ₩175.41bn (2023, -9%) → ₩199.58bn (2024, +14%) → ₩227.24bn (2025, +14% record)** ^{DART 20260318000498}. The 2021–22 surge is the 5G and IT build; the 2023 dip is an inventory correction; 2024–25 is recovery into a record. This is demand evidence, not a company result.

Exhibit 5 · The Korean FPGA-channel demand cycle, read through Macus (consolidated)



Source: DART 20260318000498 (consolidated). Revenue and operating profit are company-reported; OP margin re-computed (OP ÷ revenue). Cited here as a demand proxy for the Korean FPGA channel, not as a company performance metric.

The cross-check that matters. Macus’s -9% FY2023 dip falls *one period ahead* of the AMD-Embedded segment (≈ Xilinx FPGA) trough: AMD Embedded ran **\$5.3bn (2023, +17%) → \$3.6bn (2024, -33% inventory normalization) → ~\$3.7bn (FY2025)** ^{AMD 8-K, SEC}. A regional channel absorbs the inventory correction earlier — through sell-through to Korean OEMs — then recovers as vendor inventory normalizes. The two series, moving together with a lag, confirm the channel is a levered read on the silicon cycle.

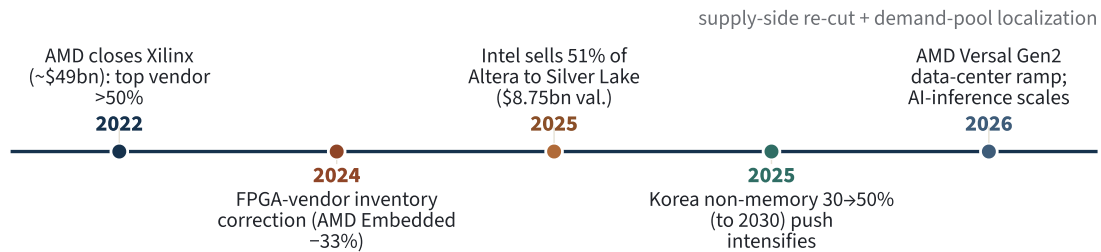
A SINGLE DATA POINT

Read the latest print correctly. Q1-2026 revenue was ₩55.27bn versus ₩66.23bn a year earlier (-16.6% YoY) ^{DART 20260514000838} — but against an unusually strong Q1-2025, with Q1 operating profit nearly flat (₩9.09bn vs ₩9.68bn). On the evidence this is base-effect softness, one data point, not a confirmed new down-cycle. We treat it as such.

Structural shifts — the supply side re-cut beneath the demand

Beneath the demand cycle, the market’s structure changed. The Xilinx acquisition made half the duopoly strategic; the 2024 inventory correction set the trough the channel tracks; and the 2025 Altera carve-out re-cut the supply side into two pure-plays plus an insurgent. These are the events that frame the forward forecast in Section 3.

Exhibit 6 · Structural & regulatory shifts re-shaping the FPGA market, 2022–2026



Source: EE Times; Altera press release; Tom’s Hardware; AMD 8-K (SEC); Korea.net; SemiEngineering. The 2025 Altera carve-out is the structural event that defines the current supply side.

Where the channel revenue comes from

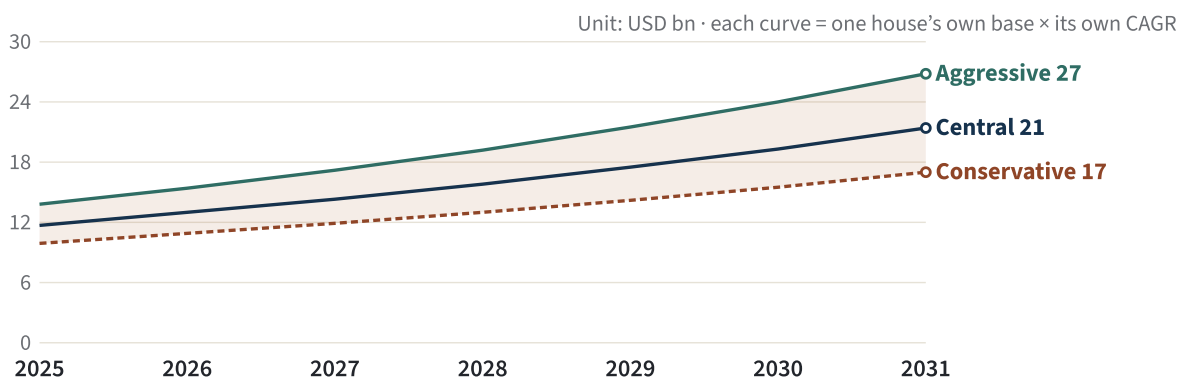
The consolidated ₩227.24bn decomposes into a single dominant line. **Parent merchandise — FPGA, analog, RF and MCU (AMD, Renesas, MACOM and others) — is ₩218.74bn, or 96.25% of the total** ^{DART 20260318000498}. The enterprise-storage arm (Macus Systems, Pure Storage distribution) contracted from ₩14.9bn (FY2024) to ₩5.0bn (FY2025), concentrating the story almost wholly in the core component-distribution line. Crucially, **DART discloses no FPGA-vs-analog-vs-RF-vs-MCU split** within that line ^{DART 20260318000498} — so we do not invent the intra-line mix (GAP-3).

3 Forward Forecast (~5yr)

SCENARIO RANGES · HOUSE-DISAGREEMENT BANDS

The honest forward statement of this market is a **band, not a curve**. Houses agree on direction (~9–12% CAGR) and disagree on level. We group them into a conservative / central / aggressive fan, each retaining its own base, terminal and CAGR — the dispersion is the message. The forward company is **not** forecast here: there is no price target and no valuation.

Exhibit 7 · The forward FPGA market — a house-disagreement fan, 2025→2031



Source: Conservative = Mordor Intelligence (\$9.93bn 2025 @ 9.35%); Central = MarketsandMarkets (\$11.73bn 2025 @ 10.5%); Aggressive = GMInsights (\$13.80bn 2025 @ 11.7%). Curves are each house's published base compounded at its published CAGR — the band, not any single curve, is the forecast.

DISPERSION, PRESERVED

The bands are the message. By 2031 the same market is sized anywhere from **~\$18.6bn** (conservative) to **~\$29.6bn** (aggressive) on these curves — a ~60% spread that no averaging should hide. Grand View (\$23.34bn 2030), Fortune Business Insights (\$27.51bn 2032) and Polaris (\$36.73bn 2034) all sit within or above this fan

Grand View Research Fortune Business Insights Polaris Market Research

Within the market — where the growth concentrates

The aggregate band hides a sharper internal story. The **high-end sub-market lags** the overall market (7.5% CAGR, \$7.5bn→\$12.8bn to 2034) ^{Verified Market Reports}, while **mid-range and embedded-FPGA lead** (14–20% CAGR). The embedded-FPGA figures are scope-confused and must be segregated (GAP-7): the “embedded FPGA” *chip market* is sized at ~\$10.5bn (2024) growing to ~\$67.8bn (2034) at 20.5% ^{Market.us}, while the narrower “eFPGA IP” licensing market is only ~\$0.13bn (2025)→~\$0.60bn (2035) ^{SNS Insider}. **Never blend the IP-licensing number with the chip-market number.** We use the eFPGA figure only to mark the fastest-growing sub-segment.

Exhibit 8 · Within-market dispersion — sub-segment CAGRs span 7.5% to ~20%

Sub-segment	CAGR	Base → terminal	Read
High-end FPGA	7.5%	\$7.5→12.8bn ('34)	AI/DC/defense tip; lags
Mid-range	~14%	fastest tier	Lattice Avant insurgent
eFPGA (chip)	20.5%	\$10.5→67.8bn ('34)	scope-flagged (GAP-7)
eFPGA IP (licensing)	16.6%	\$0.13→0.60bn ('35)	do NOT blend with above

Source: Verified Market Reports (high-end); GMInsights (mid-range); Market.us / SNS Insider (eFPGA, scope-segregated per GAP-7). Sub-segment CAGRs are not additive to the aggregate.

The channel forward — compression at the bottom, premium at the top

The forward channel read restates the Section 1 wedge as a forecast. The distribution channel compounds at ~4.1% to \$80bn by 2035 ^{WiseGuy Reports} — below the ~10% FPGA product. As content value per unit outruns distribution fee value, margin and growth keep migrating to the design-in tier. The forward thesis of the value chain is *compression at the bottom, premium at the top*.

[NRG SCENARIO MODEL]

The Korea-served slice is an [NRG scenario model], not a published number. No research house forecasts a Korea-specific or “value-added FPGA distribution” market (GAP-4). Any Korea slice = global FPGA CAGR (9–12%) × an Asia-Pacific share trajectory (APAC 44–55% of 2024 demand) × a technical-distribution capture assumption. We show it only as a fan, never as a point, and never present it as a measured market size.

4 Competitive Structure & Shares

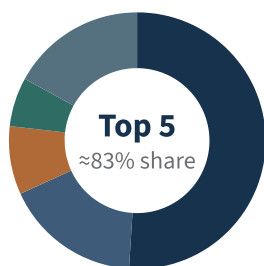
UPSTREAM CONCENTRATION · DOWNSTREAM AXES

The competitive structure has two layers. **Upstream**, the chip vendors are a duopoly-plus, re-cut in 2025 into two PE-/strategically-backed pure-plays plus a mid-range insurgent. **Downstream**, the distribution channel competes on two orthogonal axes — scale and design-in — and Macus sits at the high-margin, narrow-scope corner of the second. The through-line: with one vendor above 50%, the **geographic franchise** is the defensible asset.

Upstream — a re-cut duopoly-plus

AMD/Xilinx holds **more than 50%** of the market at roughly \$1bn of revenue per quarter ^{Yole Group}; Altera (Intel→Silver Lake 51%, 2025) is the clear #2; Lattice is the fast-growing mid-range insurgent at **8.6%**; Microchip holds **6.2%** in flash/antifuse for industrial and aerospace; Achronix holds the eFPGA/data-center remainder ^{GMInsights}. The **top five hold 80–86%** ^{MarketsandMarkets}.

Exhibit 9 · Upstream FPGA-vendor concentration — the top five hold 80–86%



■ AMD / Xilinx	51.0
>50% · ~\$1bn rev/qtr	
■ Altera (Silver Lake)	17.2
#2 · re-independent 2025	
■ Lattice	8.6
mid-range insurgent	
■ Microchip	6.2
flash/antifuse	
■ Achronix	6.2
eFPGA/data-center	

Source: Yole Group; GMInsights (Lattice 8.6%, Microchip 6.2%); MarketsandMarkets (top-5 80–86%). AMD/Xilinx fixed at the >50% floor; Altera #2 share derived to meet the mid-point of the published top-5 band (83%) — an [NRG estimate] within the cited concentration structure, not a measured per-vendor figure.

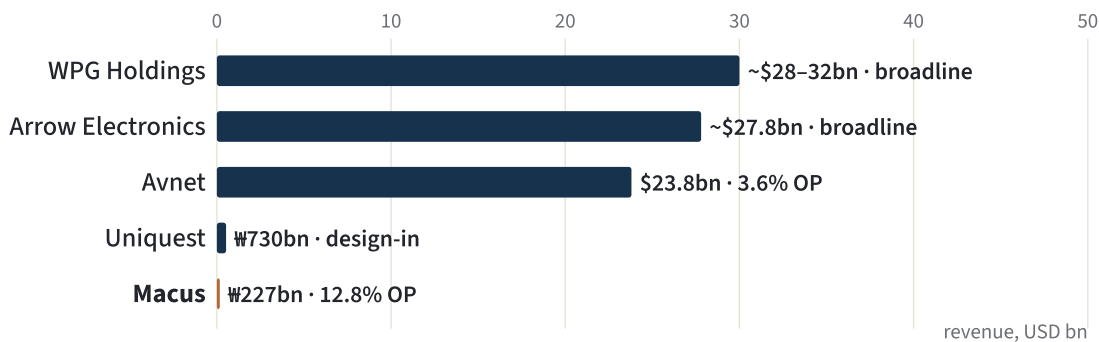
CONCENTRATION → FRANCHISE

The structural hook. With AMD/Xilinx above 50% globally, no Korean OEM can negotiate the chip on geography. The scarce, defensible asset in any one country is the **authorized design-in distribution franchise** — precisely Macus’s position, AMD/Xilinx authorized since 1997 ^{orangeboard; pinpointnews}.

Downstream — two orthogonal axes

The channel competes on two axes that do not trade against each other. **Axis one is scale and logistics:** WT Microelectronics (#1 by revenue post-Future Electronics), WPG Holdings (~\$28–32bn, ~30% of Asia), Arrow (~\$27.8bn) and Avnet (\$23.8bn, 3.6% OP) — global, box-moving, thin-margin ^{SEC}. **Axis two is technical design-in:** Macus and Uniquet — regional, engineering-embedded, 5–13% OP. These broadline players dwarf Macus by revenue, but they *do not compete with it for the same dollar*: Macus competes on the design-in axis, where scale is small by design and margin is the evidence.

Exhibit 10 · Distribution channel by revenue scale — broadline vs. design-in (latest FY, USD bn)



Source: SEC (Arrow, Avnet); WPG Holdings / MarketScreener; FnGuide A077500 (Uniquet ₩730bn); DART 20260318000498 (Macus ₩227.24bn). KRW converted at ~₩1,375/USD for a common axis. WT Microelectronics (#1) omitted — figure not on a comparable basis. Scale and margin sit on different axes.

SCALE VS. MARGIN

The positioning punchline. Macus is ~1/3 of Uniquet’s revenue but carries **more than twice its operating margin** (12.8% vs ~5.0%) ^{DART 20260318000498}; against a broadline like Avnet (3.6%), the differential is ~3.5x. Small scale is the design, not the limitation — the margin is the proof that channel value concentrates in the design-in tier.

A measurement caveat (GAP-5). No published FPGA-distribution market share exists for Korea. The “only listed pure-play” claim omits private and in-house import channels — we state it as *company/press-asserted, not measured*.

The two axes, mapped

Plotting the channel on revenue scale against operating margin makes the orthogonality visible. The broadline players occupy the high-scale, low-margin region; the design-in players occupy the low-scale, high-margin region. Macus sits at the extreme high-margin corner — the smallest by revenue, the highest by margin. This is not a ranking on one axis; it is two different businesses sharing one word.

Exhibit 11 · The channel mapped — revenue scale vs. operating margin (the two axes)



Source: DART 20260318000498 (Macus); FnGuide A077500 (Uniquet); SEC (Avnet, Arrow). Arrow OP margin ~3.0% directional. The two clusters — high-scale/low-margin and low-scale/high-margin — are the two competitive axes; they do not trade against each other.

TWO LEADERBOARDS

The synthesis. The channel does not have one leader; it has two leaderboards. On scale, Macus is invisible; on the design-in axis, it is the only listed Korean pure-play, structurally insulated from the broadline price war by the engineering it embeds. The franchise — not the box, not the chip — is the moat.

5 The Company Within the Market

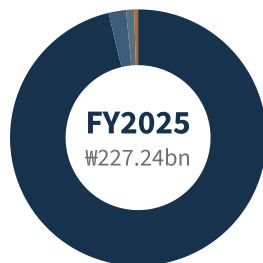
PRODUCTS AS MARKET PARTICIPATION

Macus is the lens, not the subject — so this section is deliberately compact. Its products are read as **market participation**; its financials as **evidence of a market dynamic**, never as a value argument. The richness of this study sits on the market side; the company interior is, by disclosure, thin.

What Macus is — and is not

Macus is a non-memory semiconductor solution company — the Korean authorized partner of **AMD/Xilinx (FPGA)**, **MACOM (RF)** and **Renesas (MCU / analog)**, with **no production facilities of its own** DART 20260318000498. It describes itself explicitly as **not a simple reseller**: it joins the customer’s design from product-planning and circuit design through to supply at mass production — the design-in, technical-sales model that Sections 1 and 4 frame as the high-margin axis. It listed on KOSDAQ on 2007-02-12; it was spun from Coacross in 2006; its head office is in Gangnam, Seoul DART 20260318000498.

Exhibit 12 · Revenue architecture — products as market participation (FY2025, consolidated)

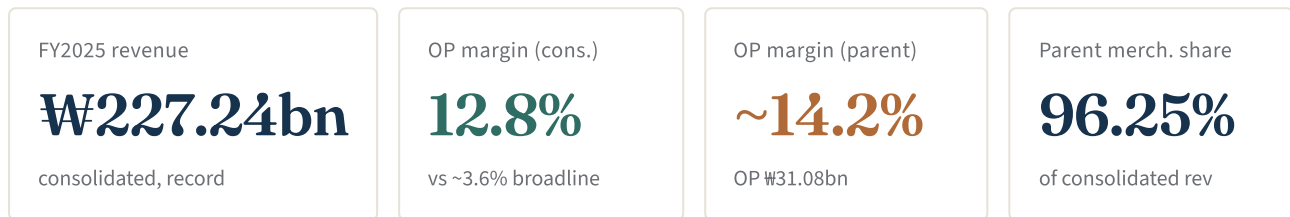


■ Parent merchandise (FPGA/analog/RF/MCU)	96.3
₩218.74bn · the FPGA + non-memory market	
■ Macus Systems — merchandise	2.2
₩5.0bn · enterprise-storage channel	
■ Macus Investment — income	1.0
₩2.3bn · non-operating	
■ Macus Systems — maintenance	0.5
₩1.2bn · service tail	

Source: DART 20260318000498. The consolidated story is almost wholly the parent component-distribution line (96.25%). Within that line, DART discloses NO FPGA-vs-analog-vs-RF-vs-MCU split (GAP-3) — the intra-line mix is not shown and not invented.

Margin as a market read

The single most useful number the company gives the market study is its margin. FY2025 consolidated operating margin was ~**12.8%** (OP ₩29.10bn on revenue ₩227.24bn) DART 20260318000498; parent-only it was ~**14.2%** (OP ₩31.08bn on revenue ₩218.74bn). Set against broadline ~3.6% (Avnet) and the broader design-in peer Uniquet at ~5.0%, this margin is the **concrete evidence** that the design-in segment of the distribution value chain commands a premium. The Section 1 and 4 value-chain claim becomes measurable through one participant — which is exactly the lens’s purpose.



Why the revenue is cyclical — structural, not idiosyncratic

Macus reports **no long-term supply contracts** — spot pricing per customer order DART 20260318000498. The channel therefore transmits the FPGA demand cycle directly, which is why the FY2023 -9% tracked the FPGA-vendor inventory correction (Section 2). The cyclicity is a property of the *market*, not a flaw in the firm. The design-in moat — high-difficulty technical training and support from the customer’s early development stage — is what holds the margin premium through the cycle.

THE DISCLOSURE GAPS

What DART does not disclose (the company-interior gaps). No geographic export split; no customer-concentration percentage (GAP-6); no measured FPGA-distribution share (GAP-5); no intra-merchandise product mix (GAP-3). These gaps are the reason this section stays compact — the lens’s interior is thin by disclosure, and the richness sits on the market side. KRX market data is near-unused: consulted only to confirm no listed-share-count capital event requires DART cross-referencing — not a valuation input.

6 Three Market-Environment Scenarios

THE MARKET ENVIRONMENT, NOT A PRICE

This section describes **the forward market environment** — the demand, supply-cycle and localization conditions a participant in this channel would face. It is explicitly **not** a company price or valuation scenario. The levers are the AI-inference / data-center pull, the silicon cycle, and Korea’s non-memory localization.

<p>Up-case market ~12% CAGR</p> <p>Demand pull. Versal Gen2 and edge-inference ramps accelerate high-end and data-center demand ^{AMD}.</p> <p>Cycle. The post-2024 recovery sustains into 2027 with no second correction.</p> <p>Korea. Non-memory 30→50% pulls defense and industrial design wins onshore ^{Korea.net}.</p> <p>Channel read: design-in volume and the localized pool both expand together.</p>	<p>Base-case market ~10% CAGR</p> <p>Demand pull. Steady ~35% telecom share with a rising data-center mix ^{MarketsandMarkets}.</p> <p>Cycle. A normal 3–4-year cycle with one shallow correction.</p> <p>Korea. Gradual localization in line with the national target.</p> <p>Channel read: the design-in premium persists; growth tracks the global band.</p>	<p>Down-case market ~7% CAGR</p> <p>Demand pull. AI-accelerator share is lost to ASIC/GPU; FPGAs confined to legacy I/O.</p> <p>Cycle. A second inventory correction echoes the FY2023 / CY2024 trough ^{AMD 8-K, SEC}.</p> <p>Korea. Global softness swamps the localization tailwind.</p> <p>Channel read: volume compresses; the design-in margin is the cushion, not immunity.</p>
---	--	---

WHAT THIS TABLE IS — AND IS NOT

Read this as market weather, not a stock call. The three cases bracket the *market environment* — CAGR bands drawn from the eight-house synthesis (Section 3), demand levers from Section 2, and the supply-cycle and localization dynamics from Sections 1 and 4. There is no price target, no valuation, and no positioning recommendation. A participant’s outcome within any case still turns on its position on the design-in axis.

7 What the Market Teaches

THE GENERALIZABLE LESSON

Strip the company away and a general lesson about technology markets remains. When a product market is **both concentrated and geographically split — designed in one place, consumed in another — the durable economic rent migrates to the franchise that bridges the gap**, not to the product and not to the logistics that move it.

Three things this market teaches

1 Concentration upstream creates a franchise downstream. A single vendor above 50% and a top five at 80–86% {cite(S_MNM)} mean the chip is not the scarce asset in any one country — the authorized, design-in franchise is. Where supply concentrates, value re-pools at the access point.

2 Within a channel, the technical tier compounds; the logistics tier compresses. The channel grows at ~4–5% while the product grows at ~10% {cite(S_WGR)} — so the only place a distributor can earn an above-fulfillment return is by embedding engineering. The ~3.5x margin gap between design-in and broadline {cite("Avnet 10-K")} is the measure of that lesson.

3 A channel is a levered read on its product's cycle — and a clean one. Because it prices spot and holds no long-term contracts {cite(DART_AR)}, the channel transmits the silicon cycle with a short lead — the FY2023 dip ahead of the CY2024 vendor trough {cite("AMD 8-K, SEC")}. For a market analyst, a listed channel participant is a high-fidelity, early instrument on the underlying market.

WHAT THE LENS TAUGHT

The lens, closed. Macus mattered to this study not as a company but as the one place where the FPGA market's structure became measurable: its ~12.8% margin ^{DART 20260318000498} is the design-in premium made concrete; its revenue cycle is the silicon cycle made visible; its franchise is the upstream concentration made local. That is what one well-chosen participant can teach about a market — which is the whole purpose of reading a market through a lens.

Working With Nathan Research

EXPERT NETWORK · MARKET
DILIGENCE

Nathan Research Group studies Korean technology markets the way a fund needs them studied — market-first, evidence-first, the company as a lens and never as a pitch. This monograph is the public face of a deeper diligence capability: an expert network and a primary-research bench fitted to the sector.

A sector-fitted expert bench

SUPPLY & VENDOR STRUCTURE

- ▶ Former FPGA-vendor regional channel managers (AMD/Xilinx, Altera, Lattice)
- ▶ Semiconductor-distribution operators across broadline and design-in models
- ▶ Adaptive-SoC / Versal application specialists

KOREAN DEMAND & DESIGN-IN

- ▶ Korean OEM/ODM design engineers (defense/drone, 5G, storage)
- ▶ Field-application engineers on the customer side of the design-in relationship

FORECAST & MARKET SIZING

- ▶ Cross-house reconciliation of FPGA TAM scope (logic vs adaptive-SoC)
- ▶ Channel-vs-product growth-wedge modelling
- ▶ Korea non-memory localization-policy analysts

FINANCIAL & DISCLOSURE

- ▶ DART/EDGAR filing forensics for channel participants
- ▶ Margin-tier benchmarking across distribution models

How an engagement runs

- 1 Scope.** We frame the market question precisely — sizing, structure, forecast, or a named participant's position — and agree the evidence standard up front.
- 2 Assemble & verify.** We triangulate published houses, primary filings and expert calls, preserving disagreement as ranges rather than false precision.
- 3 Deliver.** A monograph like this one, plus the underlying model and an expert-call program for your own diligence.

OPEN QUESTIONS

The questions this study leaves open. (1) What is the true intra-merchandise split inside the parent component line — FPGA versus analog/RF/MCU? (2) What is the unmeasured Korean FPGA-distribution share once private and in-house import channels are counted? (3) How fast does the eFPGA chip market displace standalone FPGAs in Korean designs? (4) Where does the Versal Gen2 data-center ramp land Korean design-in demand by 2027? Each is answerable with primary research — and is where a market study turns into an edge.

Partner With Nathan Research

CONTACT

To commission a market study, an expert-call program, or bespoke diligence on a Korean technology market, contact Nathan Research Group directly.

WEB www.nathanrg.com

EMAIL team@nathanrg.com general & engagements

nathan@nathanrg.com Nathan Choi, CEO

PHONE [+82 10 3059 3630](tel:+821030593630) direct

[+82 2 939 3630](tel:+8229393630) office

IMPORTANT DISCLOSURE

This document is a market-research study prepared by Nathan Research Group for professional and institutional readers. It is **not investment advice, not a recommendation, and contains no price target or valuation**. Company financials are cited solely as evidence of a market dynamic. Market sizes are drawn from independent research houses and preserved as ranges where those houses disagree; figures labelled [NRG estimate] or [NRG scenario model] are illustrative and not published market sizes. Filings are cited by DART receipt number and date. KRX market data is near-unused and is not a valuation input. The author may hold no position relevant to any company named.

Appendix

SOURCES · METHODOLOGY · GLOSSARY

Sources

Market-research houses (sizing & CAGR ranges used)

- MarketsandMarkets — FPGA Market (fpga-market-194123367); PRNewswire 302595178
- Grand View Research — FPGA Market, 2023–2030
- Fortune Business Insights — FPGA Market (report 104798)
- Mordor Intelligence — FPGA Market; Korea Semiconductor Device Market
- GMI Insights — FPGA Market (vendor shares; tier CAGRs)
- Polaris Market Research — FPGA Market
- Global Insight Services; Cognitive Market Research — FPGA band
- Verified Market Reports / intelmarketresearch — high-end FPGA
- Market.us; SNS Insider — embedded-FPGA chip vs eFPGA IP (scope-segregated)
- WiseGuy Reports — semiconductor distribution channel TAM
- Yole Group — FPGA vendor concentration

Company-evidence filings (DART)

- Annual Report **20260318000498** (2026-03-18, FY2025) — primary
- Quarterly Report **20260514000838** (2026-05-14, Q1-2026)
- Quarterly Report 20251112000530 (2025-11-12, Q3-2025)
- [Amended] Annual Report 20250814001082 (2025-08-14, FY2024)
- 5%-holding reports 20250805000123; 20251010000154 (ownership; not material)

Peer / cross-check filings

- Avnet 10-K FY2024 (SEC); Arrow Electronics (SEC); AMD 8-K / ARS (SEC, Embedded segment)
- Uniquist FY2025 — FnGuide A077500; DART
- WPG Holdings / MarketScreener (scale)

Trade / press / policy

- EE Times; Tom's Hardware; Altera press release (carve-out)
- SemiEngineering; AMD (Versal Gen2)
- Korea.net; ajupress (K-Semiconductor / non-memory target)
- pinpointnews; businessreport.kr; orangeboard (Macus profile)

KRX — near-unused; consulted only to confirm no listed-share-count capital event requires DART cross-referencing. Not a valuation input.

Methodology & caveats

Sizing. Global FPGA TAM is triangulated across eight independent houses; the base-year spread (~\$9.9–13.9bn, 2024–25) is scope-driven (adaptive-SoC inclusion) and preserved as a band, never reconciled to a single point (GAP-1). The forward fan compounds each house's own published base at its own published CAGR. **Estimates.** The Korea-served slice is an [NRG scenario model] = global CAGR × APAC-share trajectory × technical-distribution capture — no house publishes this number (GAP-2, GAP-4); the per-vendor share split derives Altera's #2 position to the mid-point of the cited top-5 band (an [NRG estimate] within a measured concentration structure). **Disclosure limits.** DART gives no intra-merchandise product split (GAP-3), no geographic/customer concentration (GAP-6), and no measured distribution share (GAP-5); the “only listed pure-play” status is company/press-asserted, not measured. The embedded-FPGA chip market and the eFPGA IP-licensing market are kept strictly separate (GAP-7). Currency conversions use ₩1,375/USD for a common axis only. All company figures are cited by DART receipt number and date.

Glossary

FPGA — field-programmable gate array; reconfigurable logic chip programmed after manufacture.

eFPGA — embedded FPGA; reconfigurable fabric inside a larger SoC. Distinct from eFPGA IP (the licensing market).

Design-in — technical distribution embedding circuit design, firmware and FAE support into the customer's product.

Broadline — scale/logistics distribution (fulfillment); thin margin.

TAM / SAM — total / serviceable addressable market.

CFS / OFS — consolidated / parent-only (separate) financial statements.

매킨스 (Macus) — the focal company; KOSDAQ 093520, Korea's only listed pure-play FPGA design-in distributor.

사업보고서 (saeop bogoseo) — Annual Report — the primary DART filing (rcept 20260318000498).

분기보고서 (bunggi bogoseo) — Quarterly Report — the Q1-2026 DART filing (rcept 20260514000838).

코아크로스 (Coacross) — the entity Macus was spun from in 2006.

비메모리 (bimemori) — non-memory — logic/system semiconductors; the localized demand pool (Korea 30→50% target).

SCOPE & DISCLAIMER

Scope & disclaimer. A market-research study of the FPGA market and its Korean design-in channel, read through Macus as a lens. **Not investment advice; no price target; no valuation; no bull-bear thesis.** Company financials are cited only as market evidence. Market sizes are preserved as ranges where houses disagree. Prepared by Nathan Research Group for professional readers.