

The Next Dimension: Market Potential for Innovative Glasses-Free 3D Visual Solutions and the Visual Semiconductor Inc. (VSI) Opportunity

Visual Semiconductor Inc is wholly owned by Incergo PLC: ISIN : LU1917297225, LEI: 2549006BRZ37L3ZAWM25

Date: May 7, 2025

Prepared for: Potential Investors of Incergo S.A.

Disclaimer: This research paper is for informational purposes only and does not constitute investment advice or an offer to sell or a solicitation of an offer to buy any securities. All investments involve risk, and potential investors should consult with their own financial advisors before making investment decisions. Information contained herein is based on publicly available information, data from Visual Semiconductor Inc., and market research, and while believed to be reliable, its accuracy and completeness cannot be guaranteed.

1. Executive Summary

The visual technology landscape is on the cusp of a significant transformation, moving beyond traditional 2D displays towards truly immersive 3D experiences. Visual Semiconductor Inc. (VSI), a company with deep expertise in glasses-free 3D technology, stands at the forefront of this evolution. VSI's proprietary algorithms and custom chips enable the conversion of standard displays (TVs, monitors, mobile devices, large-scale installations) into high-quality, glasses-free 3D platforms, supporting virtual reality (VR), augmented reality (AR), and spatial reality applications.

The global market for 3D displays is projected for substantial growth, with the glasses-free segment, in particular, showing strong momentum (e.g., one report estimates the glasses-free 3D display market to reach \$1.6 billion by 2030 with a CAGR of 14.8% [Source: 1.2], while another broader 3D display market forecast suggests growth from \$127.9 billion in 2023 to \$560.5 billion by 2032, a CAGR of 18.40% [Source: 11.1]). This growth is driven by increasing consumer and enterprise demand for immersive experiences across entertainment, gaming, advertising, education, healthcare, and industrial design.

VSI's technology addresses the critical shortcomings of previous 3D solutions (e.g., cumbersome glasses, user discomfort) and offers a compelling value proposition: a high-quality, multi-viewer, glasses-free 3D experience with unlimited content possibilities through real-time 2D-to-3D conversion. The company has already secured over \$150 million in purchase orders, indicating strong early market traction.

This paper details the market opportunity, VSI's technological differentiation, its competitive advantages, and the investment rationale for Incergo S.A.'s (ICG.VI) strategic acquisition of VSI.



2. The Evolution and Current State of 3D Visual Technology

The pursuit of three-dimensional visual representation has been a long-standing goal in display technology. Early attempts, predominantly reliant on stereoscopic methods requiring specialized eyewear (anaglyph, polarized, or active shutter glasses), achieved limited mainstream success due to several factors:

User Inconvenience: The need for glasses was often seen as cumbersome, impractical for casual viewing, and a barrier to social viewing experiences.

User Discomfort: Issues such as eye strain, headaches, and nausea were reported by a segment of users, often linked to vergence-accommodation conflict or poor-quality 3D rendering.

Content Scarcity: The ecosystem for native 3D content remained relatively limited, hindering widespread adoption.

Cost: Early 3D-enabled devices and glasses carried a premium.

The industry has since pivoted towards autostereoscopic (glasses-free) 3D technology, which aims to deliver a 3D visual experience directly to the viewer without the need for eyewear. This represents the next frontier in visual displays, promising more natural and accessible immersion. VSI is strategically positioned within this advanced segment.

3. Visual Semiconductor Inc.'s (VSI) Innovative Solution

VSI has developed a breakthrough approach to glasses-free 3D, leveraging proprietary algorithms and custom semiconductor chips. This technology can transform existing 2D display hardware across a multitude of devices into immersive 3D experiences.

Key Technological Pillars:

Motion Parallax: VSI's system generates multiple views of a scene, allowing the viewer to perceive different stereo pairs as they move their head horizontally. This creates a strong sense of depth and allows the background to move relative to foreground objects, mimicking natural vision. Crucially, this also enables a percentage of the population who are stereo-blind (unable to perceive depth from traditional two-view 3D) to experience 3D.

Real-Time 2D-to-3D Conversion: A critical advantage, VSI's technology can convert existing 2D content into 3D in real-time, effectively addressing the historical challenge of 3D content scarcity. This opens up vast libraries of existing movies, shows, games, and applications for immediate 3D enjoyment.

Multi-Viewer Experience: Unlike some earlier glasses-free technologies that had very narrow "sweet spots" or were limited to a single viewer, VSI's solution is designed for multiple users to share the 3D experience simultaneously without head-tracking cameras.

User-Controlled Depth: Users can adjust the level of 3D "pop" and depth, similar to adjusting audio volume, personalizing the experience to their comfort and preference.

Hardware Agnostic (Broad Device Support): The technology is designed for integration into:

- Smart TVs
- PC Monitors



- Laptops
- Tablets
- Smartphones
- Large-format displays (250-500 inches for digital signage, public venues, etc.)

Support for Emerging Realities: The technology underpins glasses-free experiences for Virtual Reality (VR), Augmented Reality (AR), and Spatial Reality.

Benefits of VSI's Solution:

Superior User Experience: Eliminates the need for glasses, reduces discomfort, and provides a more natural and engaging 3D effect.

Cost-Effectiveness (Implied): By leveraging existing display manufacturing processes and adding their chip/software layer, VSI aims for a cost-effective 3D solution compared to entirely new, exotic display manufacturing.

Vast Content Availability: Overcomes the 3D content bottleneck.

Broad Market Applicability: From personal devices to large public displays.

4. Market Opportunity Analysis for Glasses-Free 3D Solutions

The demand for immersive visual experiences is a powerful secular trend. Glasses-free 3D technology is poised to capture a significant share of the overall display market by offering a more convenient and engaging alternative to 2D.

4.1. Overall 3D Display Market:

The global 3D display market was valued at \$76.50 billion in 2020 and is projected to reach \$378.55 billion by 2030, registering a CAGR of 17.6% (Source: Allied Market Research [6.1]). Another report indicates the market size was \$127.9 billion in 2023 and is expected to reach \$560.5 billion by 2032 (CAGR of 18.40%) (Source: Market.us [11.1]).

A further estimate projects the market from \$259.4 billion in 2024 to \$859.4 billion by 2032 (CAGR of 15.7%) (Source: Business Research Insights [11.2]).

While these figures encompass various 3D technologies, they underscore the immense scale and growth trajectory of the immersive visual market.

4.2. Glasses-Free 3D (Autostereoscopic) Display Market:

This segment is a key driver of future growth. One report projects the global glasses-free 3D display market to reach an estimated \$1.6 billion by 2030 with a CAGR of 14.8% from 2024 to 2030 (Source: Lucintel [1.2]).

An earlier report estimated the market at \$13 million in 2020, expected to reach \$52 million by 2027 (CAGR of 21.6%) (Source: Glass Global [1.1]) – this likely represents a narrower, earlier-stage view of the market.

The autostereoscopic 3D display segment led the overall 3D display market in terms of share in 2021 and is anticipated to flourish due to the benefits of viewing 3D content without special hardware (Source: The Insight Partners [2.2]).

The global glass-free UHD 3D display market was estimated at \$2 billion in 2025 and projected to reach \$6 billion by 2033 (CAGR of 15%) (Source: Data Insights Market [5.1]).



4.3. Key Market Drivers:

Growing Consumer Demand for Immersive Entertainment: Consumers increasingly seek more engaging experiences in gaming, movies, and home entertainment.

Advancements in Autostereoscopic Technology: Ongoing improvements in image quality, viewing angles, resolution, and cost-effectiveness are making glasses-free 3D more viable. VSI's motion parallax and algorithm-driven approach are examples of such advancements. Rise of AR/VR and Spatial Computing: While often associated with headsets, glasses-free 3D displays offer an alternative or complementary way to experience spatial content. The spatial computing market is projected to grow from approximately \$129 billion in 2023 to \$600 billion by 2032 (CAGR of nearly 18%) (Source: DataIntelo via London Daily News [3.1]).

Increased Adoption in Commercial and Professional Sectors:

Advertising & Digital Signage: Eye-catching 3D displays (e.g., 3D billboards) offer significantly higher engagement and message retention than 2D displays [Source: 8.1, 9.2]. Healthcare: 3D visualization for medical imaging (e.g., MRI/CT scans), surgical planning, and medical education.

Engineering & Design: Product visualization, CAD/CAM applications, architectural modeling. Education & Training: Immersive learning environments and complex simulations.

Technological Convergence: Integration with AI for content conversion and display optimization, higher resolution panels (4K, 8K), and faster processing power enable better 3D experiences.

4.4. Market Trends:

Expansion into Mobile Devices: Significant growth is expected in the mobile 3D market, driven by gaming, video streaming, and AR applications. The mobile 3D market is predicted to grow from \$43.46 billion in 2024 to \$233.36 billion by 2029 (CAGR of 40.2%) (Source: TBRC [7.1]). VSI's technology is explicitly designed for mobile form factors.

Higher Resolution and Image Quality: Demand for UHD (4K and beyond) glasses-free 3D displays is increasing.

Wider Viewing Angles and Elimination of "Sweet Spots": Technologies like VSI's, which support multiple viewers and motion parallax, are crucial.

Content Creation and Conversion Tools: The ease of converting 2D to 3D, as offered by VSI, is a critical trend for widespread adoption.

Interactive 3D Content: Moving beyond passive viewing to interactive experiences across various applications.

4.5. Addressable Device Markets (as per VSI Fact Sheet, with context):

Smart TVs (\$205B): A primary target for enhanced home entertainment. The TV segment acquired the largest share of the 3D display market in 2020 [Source: 6.1].

Computers (PC Monitors, Laptops - \$204B): Gaming, professional applications (design, content creation), and general productivity with an added dimension.

Cell Phones (\$510B): A massive market where immersive experiences in gaming, video, and AR are increasingly sought. This aligns with the high growth forecast for the mobile 3D market [Source: 7.1].

Tablets: Similar use cases to cell phones and laptops, bridging portability and screen size. Large Format Displays (250-500 inches): High-impact applications in digital out-of-home (DOOH) advertising, public information displays, command and control centers, and entertainment venues.



4.6. VSI's Initial Market Validation:

The \$154 million in secured purchase orders (\$14M from Cystar International, \$140M from Southern Telecom) provides strong initial validation of VSI's technology and market demand from significant players in the electronics distribution and manufacturing space. This de-risks the initial commercialization phase considerably.

5. VSI's Competitive Landscape & Advantages

While the glasses-free 3D market is evolving, VSI possesses several key differentiators highlighted in its technology and approach:

Competitive Technologies (General Landscape):

Lenticular Lenses: A common approach, but can suffer from resolution loss, fixed viewing zones, and potential issues with brightness/color. VSI's is superior in areas like motion parallax and avoiding pronounced viewing cone transitions. Realfiction's recent work with MicroLED highlights challenges for lenticular lenses with high heat output displays [Source: 10.1].

Parallax Barrier: Can impact brightness and color reproduction, and also has defined viewing zones.

Integral Imaging & Holography: Often considered more advanced but face challenges in feasibility of mass production, content creation, and cost.

Volumetric Displays: Offer true 3D but are complex and currently limited in scalability and resolution for many consumer applications.

VSI's Stated Advantages:

Superior 3D Image Quality & Depth Perception: Achieved through motion parallax and advanced algorithms.

No Viewing Cones / Pronounced Transitions (Implied): Aims for a smoother, more natural multiviewer experience.

Unaffected Color Reproduction & Energy Efficiency (vs. some alternatives): Important for consumer and commercial adoption.

High Feasibility of Mass Production: Leverages existing display manufacturing with the addition of VSI's chips and software, rather than entirely new and complex display structures.

Unlimited Content via Real-Time Conversion: A massive advantage over technologies requiring native 3D content.

Multi-Viewer Support Without Tracking: Simplifies use and reduces system complexity/cost. Addresses Stereo Blindness: Expands the addressable market.

Broad Form Factor Support: From small mobile screens to very large installations.

Experienced Team: Key executives with over a decade of experience in the Glasses-Free 3D industry.

Key Players in the Broader 3D Display Market (Illustrative, not necessarily direct VSI competitors on all fronts):

The market includes display manufacturers, technology licensors, and component suppliers. Some names appearing in research include Royal Philips, Samsung, LG, Sony, Sharp, Toshiba, Dimenco, IZON, Alioscopy, Evistek, Exceptional 3D, Realfiction, and others developing various 3D display technologies [Source: 1.1, 1.2, 5.1, 10.1]. VSI's model appears to be as a technology provider (algorithms and chips) to device manufacturers.



6. Challenges and Mitigation Strategies

While the opportunity is significant, VSI and the broader glasses-free 3D market face challenges:

Content Ecosystem Development:

Challenge: While VSI's 2D-to-3D conversion is a key strength, the availability of high-quality, natively created 3D content will further enhance the user experience and drive demand. Mitigation (VSI): Provide tools and SDKs to encourage native 3D content creation. Partner with content creators and platforms. The real-time conversion capability remains the primary solution for immediate content availability.

Manufacturing Scaling & Quality Control:

Challenge: Ensuring consistent quality and performance of the 3D effect across diverse display types, sizes, and manufacturers at scale.

Mitigation (VSI): Close collaboration with manufacturing partners, robust quality assurance processes for their chipsets and software integration.

Overcoming Consumer Skepticism:

Challenge: Past negative experiences with glasses-based 3D or early-generation glasses-free 3D may have created skepticism.

Mitigation (VSI): Focus on delivering a demonstrably superior user experience. Marketing efforts should emphasize the "must-have solution once you see it" aspect, leveraging positive reviews and demonstrations. The large initial purchase orders suggest key industry players are already convinced.

Competitive Advancements:

Challenge: The technology landscape is dynamic. Competitors will continue to innovate. Mitigation (VSI): Continuous R&D investment to maintain a technological edge in algorithms, chip design, and new features. Strong IP protection.

Cost to End Consumer:

Challenge: While VSI aims for cost-effectiveness, the final price of devices incorporating their technology will be a factor in mass adoption.

Mitigation (VSI): Work with OEM partners to optimize integration costs. The value proposition of a premium, glasses-free 3D experience should justify a reasonable price increment.

7. Investment Rationale for Incergo S.A.

Incergo S.A.'s proposed acquisition of Visual Semiconductor Inc. presents a compelling strategic opportunity to capitalize on the burgeoning market for advanced visual technologies.

Access to Disruptive, High-Growth Technology: VSI's glasses-free 3D solution is positioned in a market segment with substantial growth forecasts, driven by fundamental shifts in consumer and enterprise demand for immersive experiences.

Significant Revenue Potential & De-Risking: The \$154 million in existing purchase orders from established customers (Cystar International, Southern Telecom) significantly de-risks the investment and provides a clear path to near-term revenue generation. This validates the technology's commercial viability.

Proprietary IP and Technological Edge: VSI's custom chips and algorithms offer a differentiated solution that addresses key limitations of previous 3D technologies.

Experienced Management Team: VSI's leadership possesses deep industry experience in the 3D visual technology space, crucial for navigating development and commercialization.



Scalable Business Model: As a provider of core technology (chips and software) to OEM manufacturers, VSI has a highly scalable model that can address a wide range of device markets.

Synergy with Incergo's Strategy: Aligns with Incergo's stated objective of growing through acquisitions in the visual technology space, potentially transforming Incergo into a key enabler of next-generation visual experiences. The post-acquisition market capitalization of ~€65.0m reflects the significant value attributed to VSI.

8. Conclusion

The transition from 2D to immersive 3D is a defining trend in the evolution of visual technology. Glasses-free 3D stands as the most promising path towards mass adoption, offering convenience, comfort, and a more natural viewing experience. Visual Semiconductor Inc., with its innovative approach leveraging motion parallax, real-time content conversion, and broad device applicability, is exceptionally well-positioned to become a leader in this rapidly expanding market.

The substantial early purchase orders demonstrate strong market confidence in VSI's solution. For Incergo S.A., the acquisition of VSI represents a strategic investment into a company with validated technology, a clear path to revenue, an experienced team, and the potential to capture a significant share of a multi-billion dollar global market. This positions Incergo to deliver substantial value to its shareholders as the world embraces the next dimension of visual engagement.