

Zero-Error Systems

Intangibles Disclosure Framework Example Report

This is a brief analysis of Zero-Error Systems (ZES)'s Intangible Assets (IA) using the Intangibles Disclosure Framework (IDF).

The IDF outlines principles for businesses to disclose and communicate their IA such as brand value, patents or registered designs in a systematic and comprehensive way.

The disclosure principles in the IDF are anchored in four pillars: Strategy, Identification, Measurement, and Management (SIMM).

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An Overview of Zero-Error Systems

Zero-Error Systems (ZES) specialises in high-reliability semiconductor solutions and intellectual properties for space and power management applications.

Founded in 2019 and based in Singapore, ZES has developed patented technologies for radiation-hardened semiconductor integrated circuits. These technologies enable low-cost, commercial-off-the-shelves semiconductor devices for space applications such as low Earth orbit satellites and deep space rovers and landers, ensuring power reliability and data integrity.

Their versatile solutions are also applicable to various power management needs on Earth, including 5G/6G, Internet of Things, servers, and automotive. This technology can be customised for different needs, enabling scalability for both space and terrestrial environments. The IP developed for space can also be reused for commercial applications, offering significantly lower costs while delivering better performance compared to incumbent solutions.

ZES envisions transforming into a globally recognised IP-strong product company in strategic domains such as space, automotive, and consumer electronics.





STRATEGY

Key Competitive Advantage

ZES provides state-of-the-art power reliability and data integrity in electronics. This is based on their unique and innovative portfolio of technologies in power management, reduction of error rates in computing, and radiation protection for commercial-off-the-shelves semiconductor devices.

Based on many years of deep tech research, ZES has created concrete proprietary solutions implemented in semiconductor and system designs.

Alignment of IA and Business Strategies for Value Creation

Over the years, ZES has built a comprehensive portfolio of IP to protect their proprietary solutions. For instance, they have increased their number of patent applications by fivefold from 2019 to 2024. They have also increased their IP licensing and partnerships internationally.

In 2024, ZES opened a US office branch – Zero-Error Systems America LLC. To date, ZES has a team of 25 people, and 7 overseas distributors located in US, India, Japan, Korea, Taiwan, and European region.

These measures will support their quest to create sustainable long-term value.



IDENTIFICATION	MEASUREMENT
Key Intangibles	Metrics and Drivers
<p>Technology –</p> <ul style="list-style-type: none"> • Portfolio of patents and design know-how for semi-conductors • First commercial Laser Testing in Asia 	<ul style="list-style-type: none"> • Patent portfolio – total of 27 patents filed, of which 6 are granted
<p>Human capital –</p> <ul style="list-style-type: none"> • Management team with more than 25 years in Semiconductors • Staff with deep expertise 	<ul style="list-style-type: none"> • Quality management team (ISO standardisation) • Certified engineer experts in AI • 60% of staff with PhD and Masters
<p>Contract –</p> <ul style="list-style-type: none"> • Global network of distributors • Design services contract • Supply Chain Partnership with Top Wafer Foundries 	<ul style="list-style-type: none"> • 6 distributors worldwide • 6 IP Licensing contracts, Industry’s 1st IP in “AI-for-Space Radiation detector” • 6 years design services contract
<p>Customer –</p> <ul style="list-style-type: none"> • Space agencies at various countries/regions (TASA, NASA, JASA, ISRO, etc.) 	<ul style="list-style-type: none"> • Coverage of 5 regions – US, Asia, Europe, Australia and India
<p>Marketing -</p> <ul style="list-style-type: none"> • ZSOM – ZES System On Module for satellites (to be trade marked) • Completed and future flight legacy in satellites: Japan @ 2021, OneWeb @ 2023, NASA @ 2024, India @ 2024, Japan @ 2025 	<ul style="list-style-type: none"> • Tracking space agency engagements, e.g., 2x increase in satellite launch legacy, technology MOU with NASA/ISRO by 2025 • Tracking brand enhancement activities into new space, e.g., number of advertisements/exhibitions



MANAGEMENT

Comprehensive market research to identify opportunities and risks. For example:

- The number of satellites in space is projected to increase sixfold by 2030 (Source: New Space, USA). As a result, there is a growing need to extend the lifespan of these satellites. ZES's "Power Management and Data Integrity Products" enhances satellite longevity through edge computing solutions.
- 5G and 6G through satellite communication is expected to increase the space semiconductor revenue by tenfold by 2030. ZES's products offer a 3-8x performance increase for satellites using ZSOM lineups.
- The satellite market is currently dominated by two companies, controlling over 80% of the market share. Future diversification of satellite manufacturers is needed to break the existing monopoly.

Risk mitigation plans implemented to manage key technology and market. For example:

- Strategy for ZES proprietary IP to revolutionise the space-electronics industry by providing cost benefits of 0.3x compared to expensive space grade components.
- Investing in the development of key artificial intelligence IP and forming marketing partnerships with satellite manufacturers, with plans for future investor partnerships.
- Expanding into worldwide markets and investing in key engagements with space agencies such as NASA, ISRO, ESA.



Find out more about the Intangibles Disclosure Framework [here](#).

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