



dicio Company introduction

Sustaining Our World through Intelligent Power

#Power Semiconductor #AI Power System #Energy

www.dicio.io | May 2025

CONFIDENTIAL

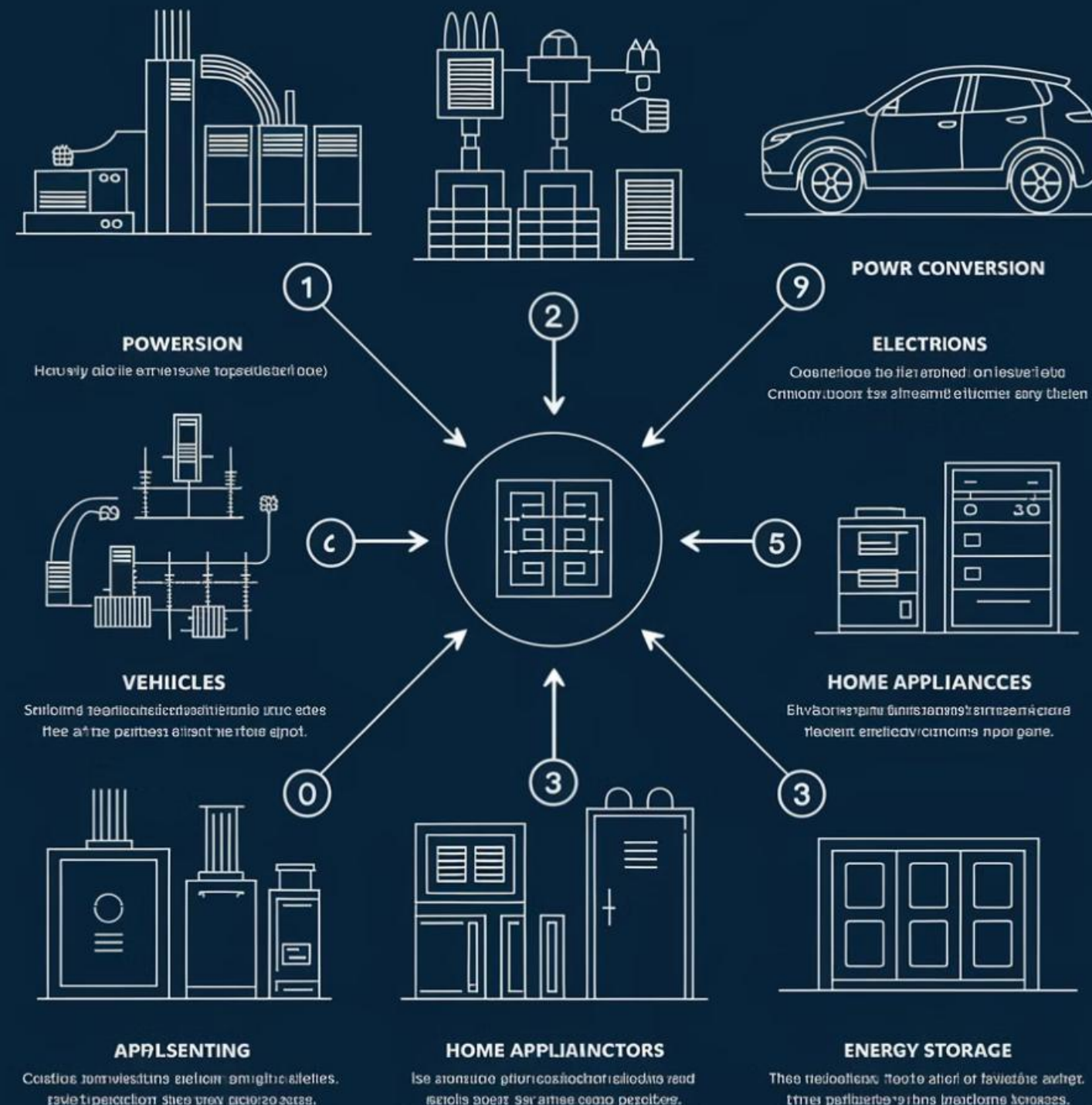


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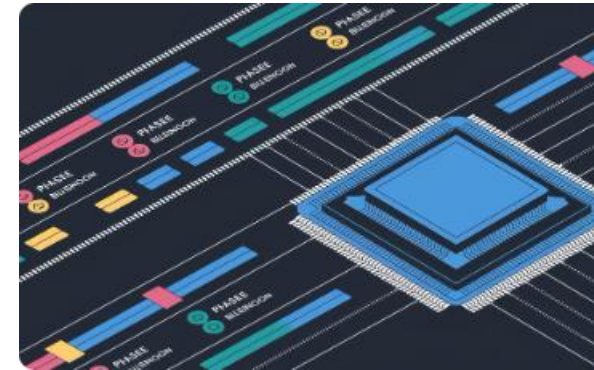
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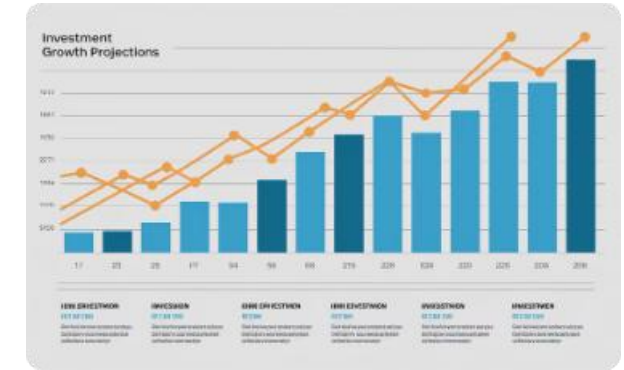
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I. Company Overview

I. Company Overview



1. Corporate Information

Company Name	dicio Co., Ltd.	CEO	Mi Sun Kang
Established	September 16, 2021	Capital	KRW 900 million
Site	Head Office: 8th Floor, 427 Teheran-ro, Gangnam-gu, Seoul, South Korea R&D Center: 3th Floor, 8 Seocho-daero, Seocho-gu, Seoul, South Korea	Business Areas	Development, Design, and sales of power semiconductors
Main Products	IGBTs, IGBT Module/IPM, SiC Diodes·MOSFETs·Modules		

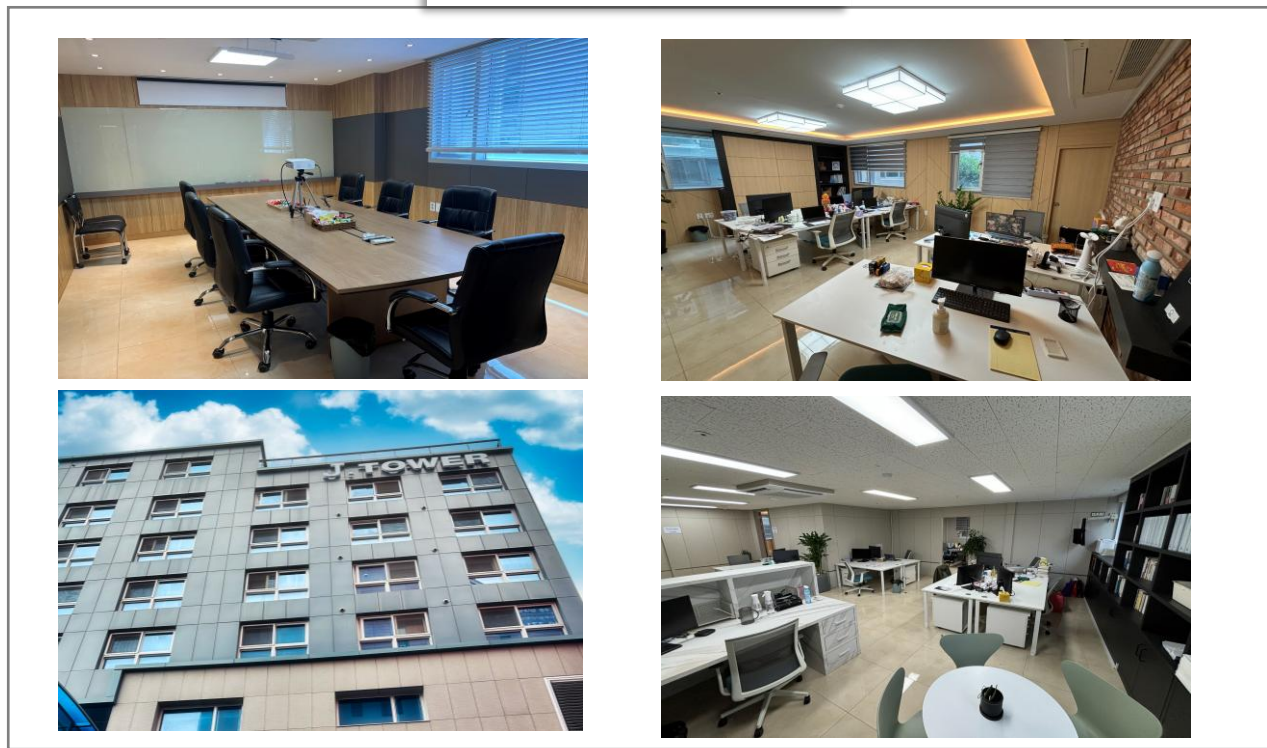
2. Status of shareholders

Shareholder	Ownership (%)
Mi Sun Kang	84.71
UST	4.90
Macron	1.96
4 dicio Executives	8.43
Total	100

- R&D

Korea Semiconductor Research Consortium	Selected for System Semiconductor Support Program
SR	Selected as Innovation Partner
KEPCO (Korea Electric Power Corporation)	Selected for KEPCO Energy Startup Program

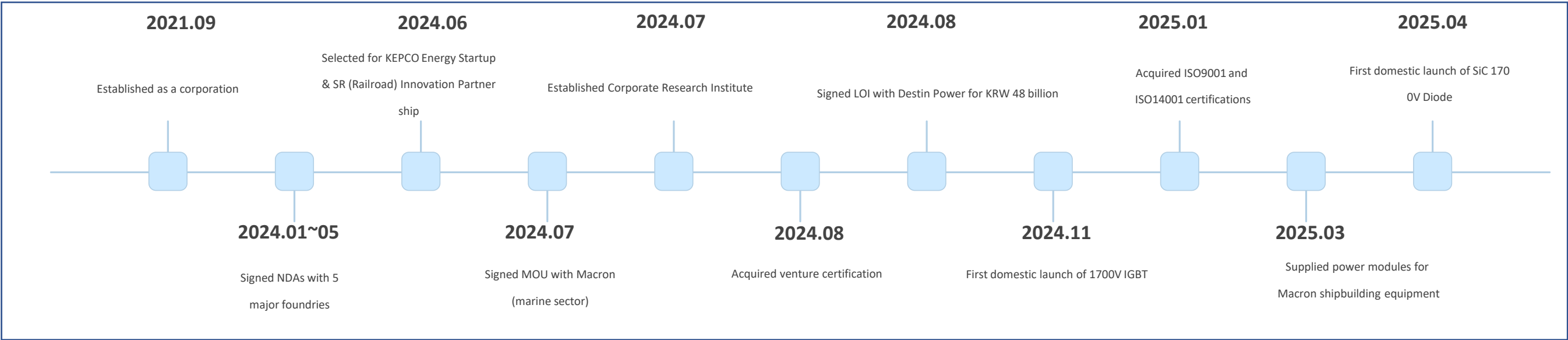
Company View



I. Company Overview



4. Company History



5. Technological Competitiveness



Technological Competitiveness

- The only domestic company specializing in advanced high-voltage power semiconductors
 - Possesses 5 key patented core technologies and relevant certifications
- Experienced team with a strong background in mass production and design
 - Optimized chip design based on deep understanding of equipment and process



Product Development & Launch

- Power Module : 1200V , 1700V –Class
 - Demonstrated technical capability by developing IGBT products equivalent to Infineon's 7th generation
- SiC Diode: 1700V-Class
 - Achieved world-class technical standard



Partnerships & Sales Network

- Customers : GM Zeko, Mitsui C&T, Korea Electric Power Corporation (Destin Power),Macron, K-PRO, JTNU
- Partners : ALT, SP Semiconductor, Inowireless, Pebble Square, Chipsky
- Collaborative Institutions : Pusan National University, Energy Engineering University, Electrical Research Institute, and Railway Research Institute

6. Problems and resolution

Why did DCIO decide to make AI power semiconductors?

The global power infrastructure is based on outdated technology, resulting in significant energy loss and high carbon emissions.

At the same time, the power semiconductor industry is dominated by a few global players, leaving latecomers technologically dependent.

In such a structure, it is difficult to enhance industrial competitiveness or ensure sustainability.

DICIO was founded to fundamentally change this structure.

We are building the world's first **AI-based power semiconductors** to precisely control energy flow and implement an **intelligent power system** that reacts in real-time.

This innovation drastically improves energy efficiency and accelerates the green transition across industries.

We are more than a semiconductor company—We are **designers** who revolutionize the sustainable energy industry and **pioneers** who set new standards in the market.

Problem

- Passive power systems with large energy losses
- Inefficient structures with no innovation for over 40 years
- A lack of technological leadership and innovation
- Carbon-intensive and unsustainable structures



Solution

- Intelligent and efficient power systems
- Revolutionizing power systems for the first time in 40 years through AI
- A leading company setting industry standards
- A paradigm shift toward a sustainable and eco-friendly energy infrastructure



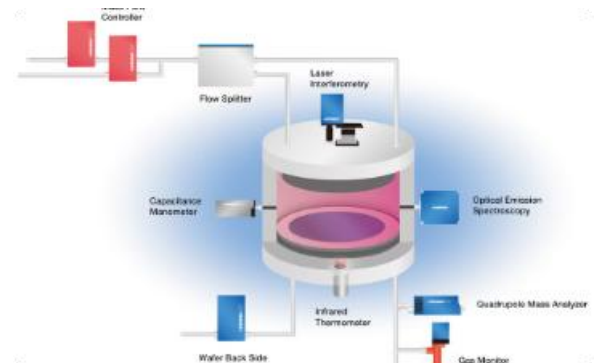
II. Market environment

II. Market environment

1. Concept of Power Semiconductors

Power Control · Conversion · Supply

Devices that “switch on/off,” “convert,” and “distribute” electricity



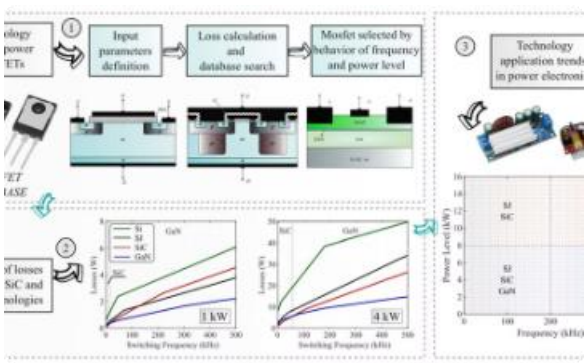
Energy Efficiency

Reduce energy use and extend usage time



Current and Voltage Control

Unlike traditional semiconductors, directly controls current and voltage



2. Types of Power Semiconductors



IGBT

- Insulated Gate Bipolar Transistor
- High-voltage, high-power switching
 - Excellent efficiency at high voltages
 - Applications: Inverters, solar energy, home appliances, electric vehicles



MOSFET

- Metal-Oxide-Semiconductor Field-Effect Transistor
- High-speed, low-voltage switching
 - Fast response time
 - Applications: Servers, chargers, automotive electronics



SiC MOSFET

- Silicon Carbide-based MOSFET
- High-speed, high-temperature, high-efficiency switching
 - Minimizes power loss
 - Applications: Electric vehicles, ESS, high-end industrial use

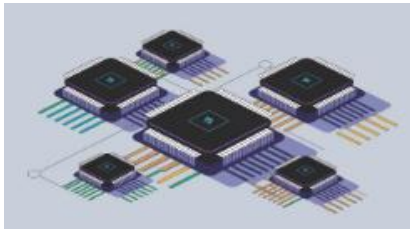


Others (SBD, IPM, Module)

- Prevents reverse current and includes control circuits
- Simplified design, high reliability

II. Market environment

3. Power Semiconductor Market Overview



- **Market Size Forecast** : The global power semiconductor market is expected to grow from **USD 53 billion in 2024** to **USD 97.4 billion by 2037**, with a **CAGR of 4.8%**. (Source: Research Nester)
- **IGBT Market** : Expected to grow from **USD 10.56 billion in 2025** to **USD 17.47 billion by 2029**, with a **CAGR of 13.4%**. (Source: Business Research Company)

4. Market Growth Drivers



Green Energy Transition

Expansion of renewable energy infrastructure driven by global carbon neutrality policies



Expansion of the EV Market

Power semiconductors are essential for inverters, converters, and chargers—core components of electric vehicles



Digital AI Infrastructure Expansion

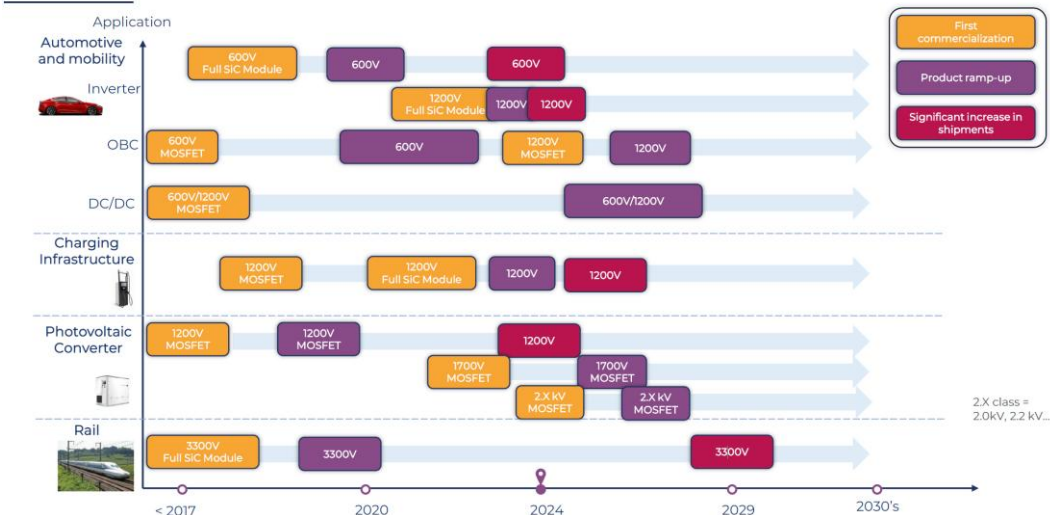
Rising electricity demand due to the growth in data centers and AI servers



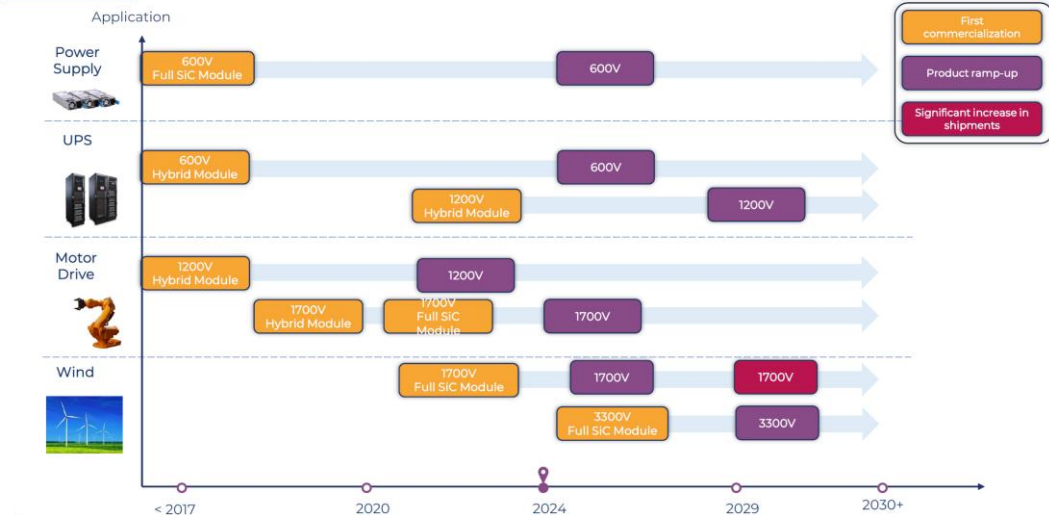
Supply Chain Restructuring & Localization Demand

Over 95% of power semiconductors depend on suppliers in Japan and Europe. Trade tariffs and global tensions are increasing supply chain risks

SIC POWER APPLICATION MARKET ROADMAP – 1/2



SIC POWER APPLICATION MARKET ROADMAP – 2/2

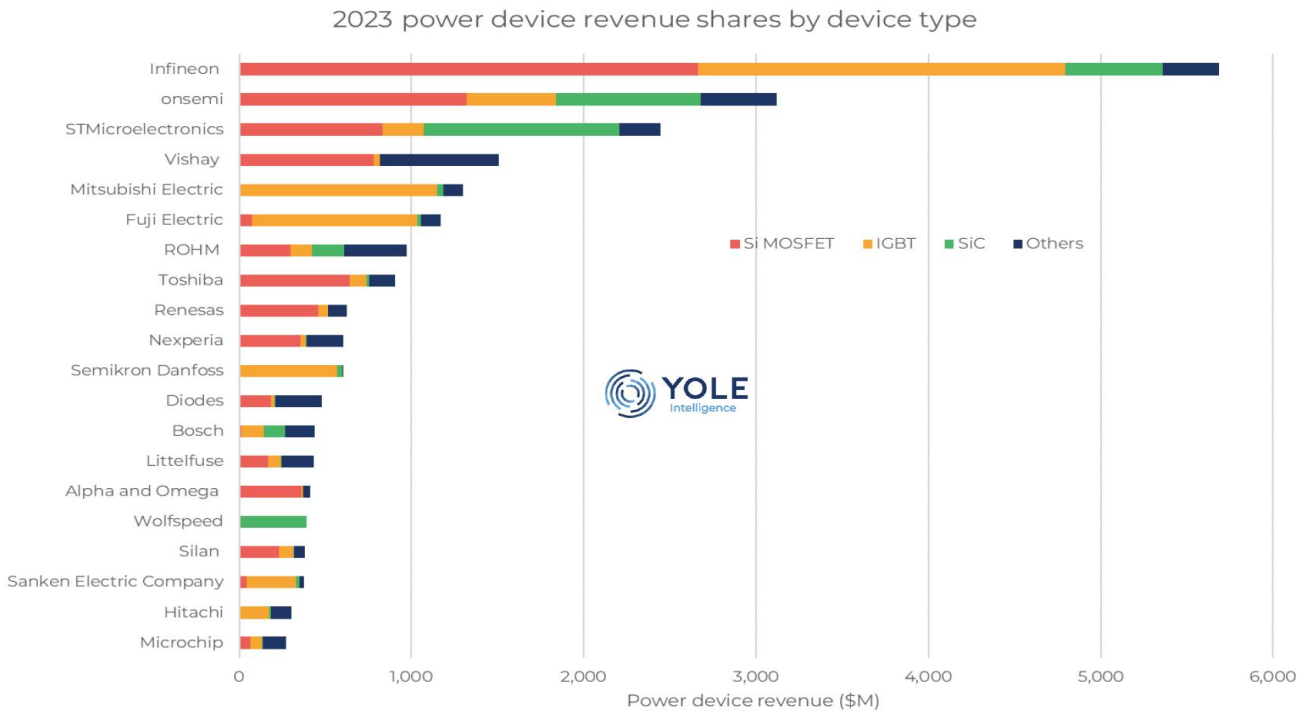


II. Market environment

5. Competition status



IGBT Supply Chain by Voltage



Sales of major companies by type of power semiconductor

6. Our Product Differentiators



650V to 3,300V Voltage Range

Specializing in high-voltage segments (1700V and above)
Expertise in power module integration



AI-Powered Power Systems

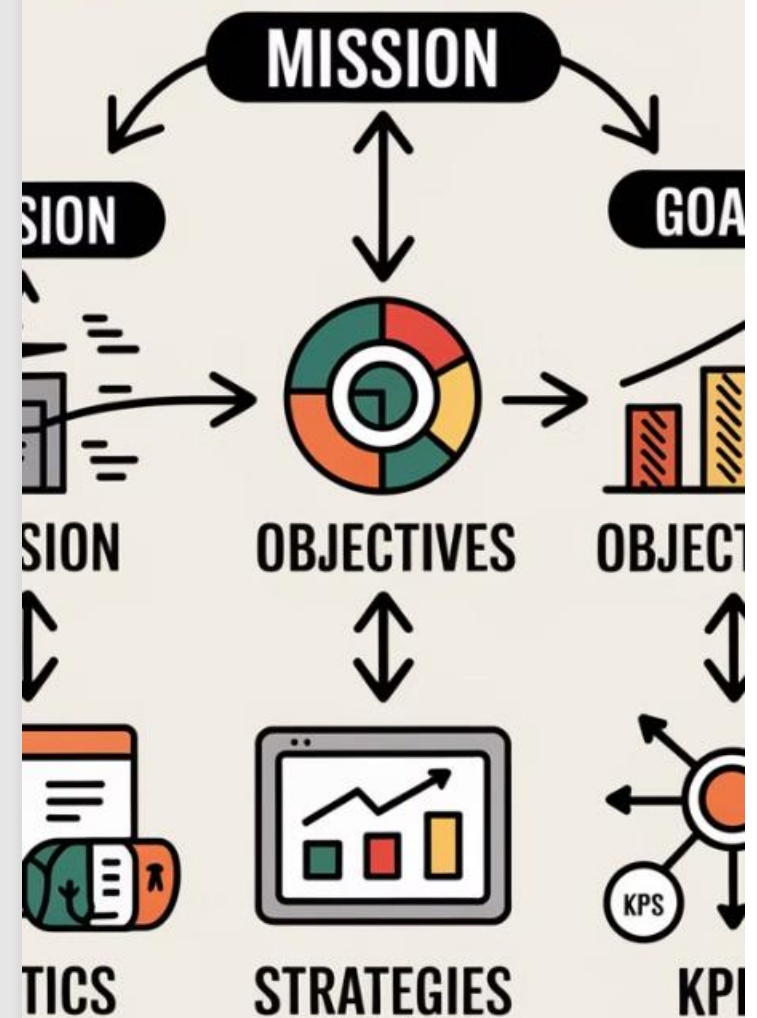
Providing intelligent, efficient, and safe power systems using
AI Custom-built to meet specific customer needs



Entry into High-Barrier Markets (Marine, Defense, etc.)

Securing global competitiveness through cutting-edge technology
Playing a leading role in localization and domestic supply

BUSINESS STRATEGY



III. Business Strategy

III. Business Strategy

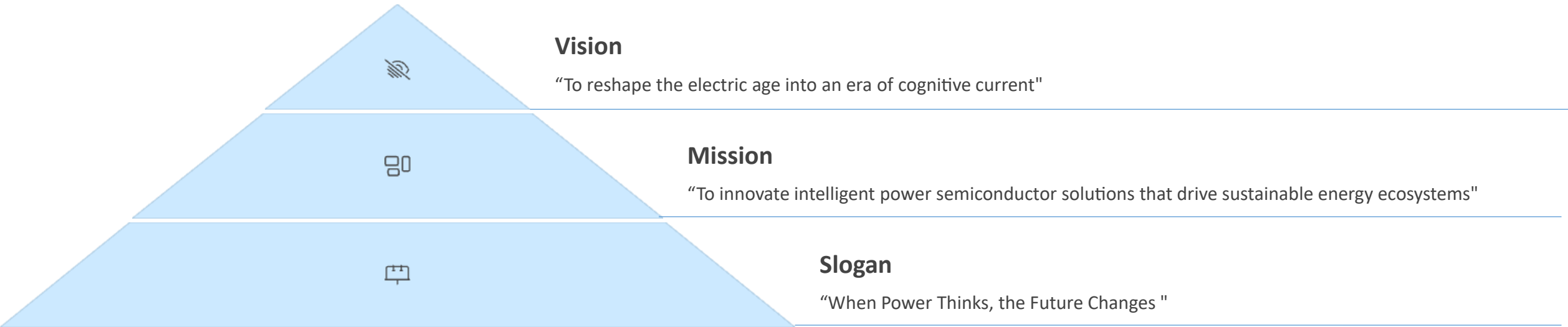


1. CORPORATE IDENTITY

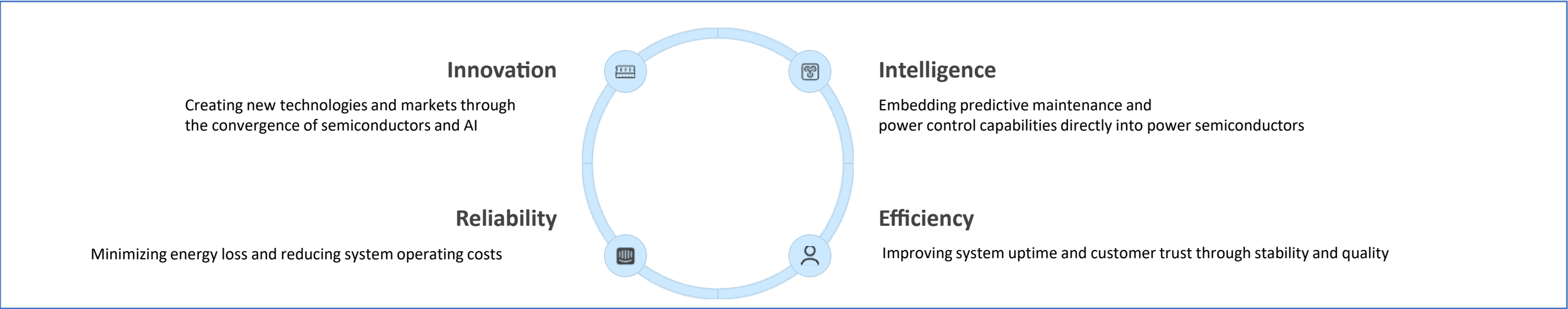
dicio

The name dicio is derived from Latin, meaning "Power."

We design power semiconductors and integrate AI technologies to build intelligent systems, providing power solutions at the core of a sustainable energy ecosystem.



Core Value



III. Business Strategy



2. Our Competitive Edge

(1) Proprietary Technological Advantage

(The only domestic company specializing in advanced power semiconductor technology)

Specialized in High-Voltage Power Semiconductors	First in Korea to mass-produce 1700V IGBT and SiC 1700V diodes/ MOSFETs→Currently expanding product lineup to ultra-high voltage segments above 3300V
Experienced Design Talent with Mass Production Expertise	Secured engineers with years of experience in the power semiconductor field → Strong capabilities in optimized design and process linkage
Focused Entry into High-Barrier Markets such as Defense and Maritime	Established partnerships with clients like Macron and Destin Power in defense/maritime industries → Targeting high-barrier and strategic markets
Proven Technical Performance	Demonstrated superior switching loss and short-circuit resistance compared to Infineon's latest 7th generation products → Verified through testing by Korea Energy Research Institute)

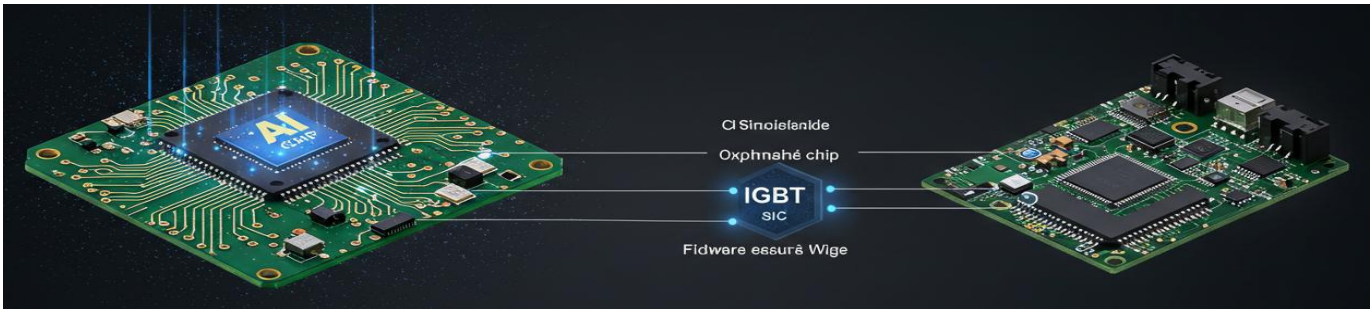
(2) external market competitiveness

Category	Market Entry Barriers for Potential Competitors	Our Competitive Advantage
Large Corporations	Mass production structures are not suited to high-mix, low-volume demand	Able to respond quickly to a wide variety of customized products across voltage and current classes
SMEs and Startups	Lack of references makes it difficult to enter specialized markets like defense and shipbuilding	Establishing cooperative networks with clients in defense, maritime, and electric power to proceed with live POC (Proof of Concept)

(World's First) AI-Based Power System Integration

Applying AI Chips and Machine Learning for Predictive Maintenance and Power Loss Reduction

- **Intelligent Power Control & Conversion**
Our AI-integrated semiconductors analyze data in real time to optimize power flow, minimize energy loss, and maximize system efficiency.
- **Predictive Maintenance & Self-Diagnosis** AI algorithms detect anomalies in power systems early, enabling preventive maintenance and significantly improving system stability and reliability.



III. Business Strategy

3. Business Execution Plan

Specialization in high-voltage, high-efficiency power semiconductors
Focused on ultra-high-voltage products (1700V and above)

Expanding product portfolio based on Si IGBT and SiC

Launching a wide range of voltage-grade products

Emphasis on packaging/modularized complete solutions

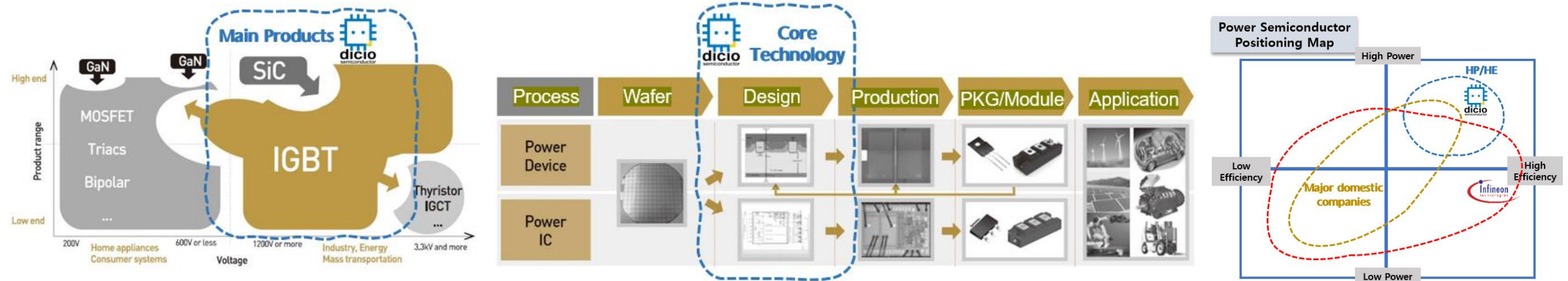
Focused on supplying finished products for real customer needs

High profitability from module-based offerings

Providing AI-Based Power Optimization Solutions

Developing AI-driven fault prediction firmware

Launching AI-integrated power modules



-Market entry strategy by period

► Short-Term Strategy

Products: Si IGBT + SiC + Power Modules

Technology: Development of AI-based fault prediction systems

Target Industries: Home appliances, renewable energy, data centers

- Secure sales through strategic partnerships
- Respond flexibly to high-mix, low-volume production demands

► Mid-to-Long-Term Strategy

Products: SiC + GaN + AI Power Modules + AI Power Systems

Technology: AI-based fault prediction + optimized power conversion and control technologies

Target Industries: Expansion into electric vehicles, railways, aerospace, and defense

Follow up when existing customers switch from Si-based to compound semiconductors

Leverage mass production know-how to launch market-leading products

III. Business Strategy



IGBT Wafer

Product name	V rating [V]	I rating [A]	VCE (SAT), typ @25 °C [V]	Eoff, typ @25 °C [mJ]
DIG15N170FAW1	1700	15	2.8	1.05
DIG20N170FAW1		20	2.8	1.4
DIG150N170FBW1		150	2.1	21
DIG20N120FAW1	1200	20	1.7	0.8
DIG30N120FAW1		30	1.7	1.2
DIG40N120FAW1		40	1.7	1.6
DIG50N120FAW1		50	1.7	2.0
DIG75N120FBW1		75	1.7	3.75

IGBT Package

Product name	V rating [V]	I rating [A]	VCE (SAT), typ @25 °C [V]	Eoff, typ @25 °C [mJ]	Package Type
DIGH15N170FAS1	1700	15	2.8	1.05	TO-247
DIGH20N170FAS1		20	2.8	1.4	TO-247
DIGHP150N170FBN1		150	2.1	21	TO-264
DIGH20N120FAS1	1200	20	1.7	0.8	TO-247
DIGH30N120FAS1		30	1.7	1.2	TO-247
DIGH40N120FAS1		40	1.7	1.6	TO-247
DIGH50N120FAS1		50	1.7	2.0	TO-247
DIGHP75N120FBS1		75	1.7	3.75	TO-247P





Si Module

Product name	V rating [V]	I rating [A]	Remark
DPM300GB120LS1	1200	300	62mm 2-pack module
DPM1200GD170LX1	1700	1200	Under develop

SiC SBD

Product name	V rating [V]	I rating [A]	Remark
DSD75U170W1	1700	75	Under develop (Fab)
DSD20U120W1	1200	20	Under develop
DSD20U650W1	650	20	Under develop

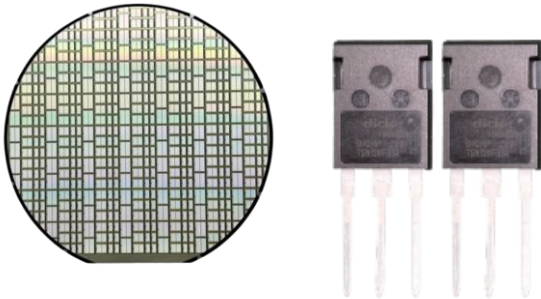
5. product development plan

 Y2025	 Y2026	 Y2027	 Y2028
650V/1200V/1700V-class IGBT 1200V/1700V-class SiC MOSFET 1700V IGBT Module	650V/1200V/1700V-class IGBT(Gen 2) 1200V/1700V/3300V-class SiC MOSFET 3300V SiC Module 650V-class AI Power System	650V/1200V/1700V-class IGBT 3 rd 1200V/1700V/3300V-class SiC (Gen 2) 3300V SiC Module 2 nd 1200V-class AI Power System	650V/1200V/1700V-class IGBT 4 th 1700V/3300V/4500V-class SiC(Gen 3) 4500V SiC Module 1200V-class AI Power System 2 nd

- Key Product Lineup

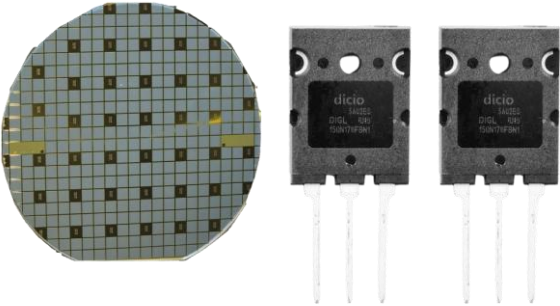
Si IGBT Product Family

- Voltage Ratings : 650V, 1200V, 1350V, 1700V, 3300V
- Packages: 4 types including TO-247, TO-247P, TO-264
- 2025 Target: Total of 82 product variants to be developed



SiC Product Family

- Voltage Ratings : 650V, 900V, 1000V, 1200V, 1700V, 3300V
- 2025–2026 Target: Total of 64 product variants to be developed



Module Products

- 62mm 2-pack module (DPM300GB120LS1)
- 1700V 1200A module under development(DPM1200GD170LX1)



III. Business Strategy



6. Technology Differentiation Strategy

Leading the Market with Next-Gen High-Voltage/High-Efficiency Materials

- Voltage range: 650V → 1700V → 3300V → Over 10kV

Securing technologies on par

- with Infineon's latest 7th-generation products

Rapid Capacity Expansion for Modular High-Performance Products

- Building technical collaborations and partnerships with domestic and international manufacturing companies
- Establishing an internal workforce to control the entire production process, acting as a Control Tower

World's First AI Power System Development

- Launch of power modules incorporating artificial intelligence
- Providing new value and functionality to customers

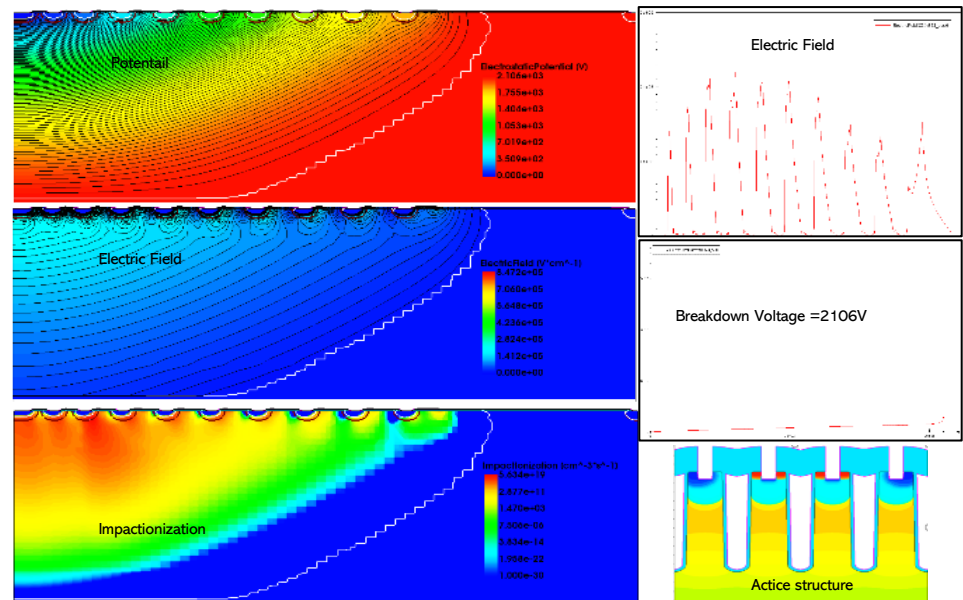
In-House Technical Capabilities

Simulation-Based Chip Design Optimization

- Capable of analyzing electrical characteristics of Simulation Decks, including active, ring, and periphery regions

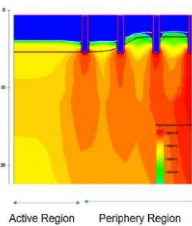
Optimized Product Design Through Deep Process Understanding

- Application of optimized processes through Process Equipment and Process Sequence Set-up

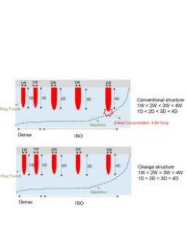


Patent Portfolio Overview

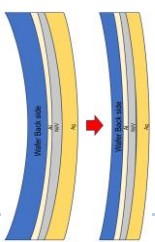
Semiconductor device preventing gate failure through trench formation in the periphery area



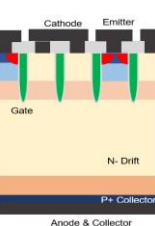
Semiconductor device using a trench structure to stabilize blocking voltage in isolation regions



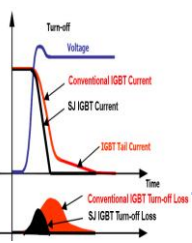
Method for reinforcing IGBT back metal to improve warpage



Circuit used to prevent damage to switching device components due to overvoltage in power conversion circuits



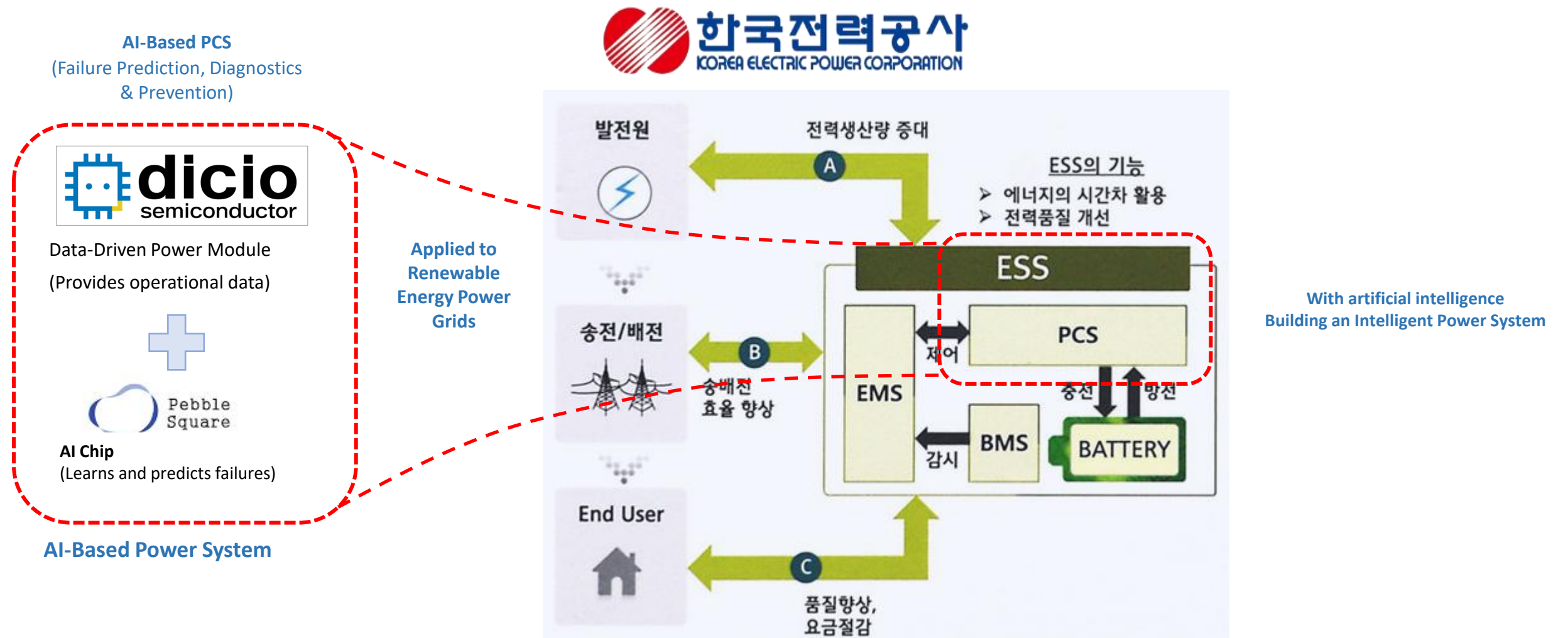
Fabrication method for SJ IGBT to improve switching speed



III. Business Strategy

6. Technology Differentiation Strategy

- o **World's First** AI-Based Power System– Application of AI chips and machine learning enables fault prediction and proactive diagnostics, minimizing power loss.
 - Use Case (Pilot Project) : Transition of Korea Electric Power Corporation's PCS system to AI-powered platform
 - Implementation of a predictive system for KEPCO: Optimized control using power module temperature and current data via AI chips.
 - + SiC material replacement: Enhances energy efficiency, reduces size, increases lifespan, and lowers carbon emissions (eco-friendly benefits)



III. Business Strategy

6. Technology Differentiation Strategy

AI Module (Board) Development Plan

1. Database Construction



Collection of temperature, humidity, current, and voltage data

2. AI Model Training



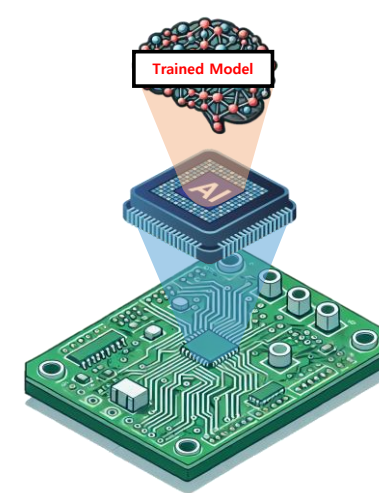
Development of AI models for lifespan prediction and fault diagnostics of power devices

3. Model Optimization



Optimization and streamlining of AI models for real-time prediction

4. AI Module Development



Development of AI modules for lifespan prediction and fault diagnostics



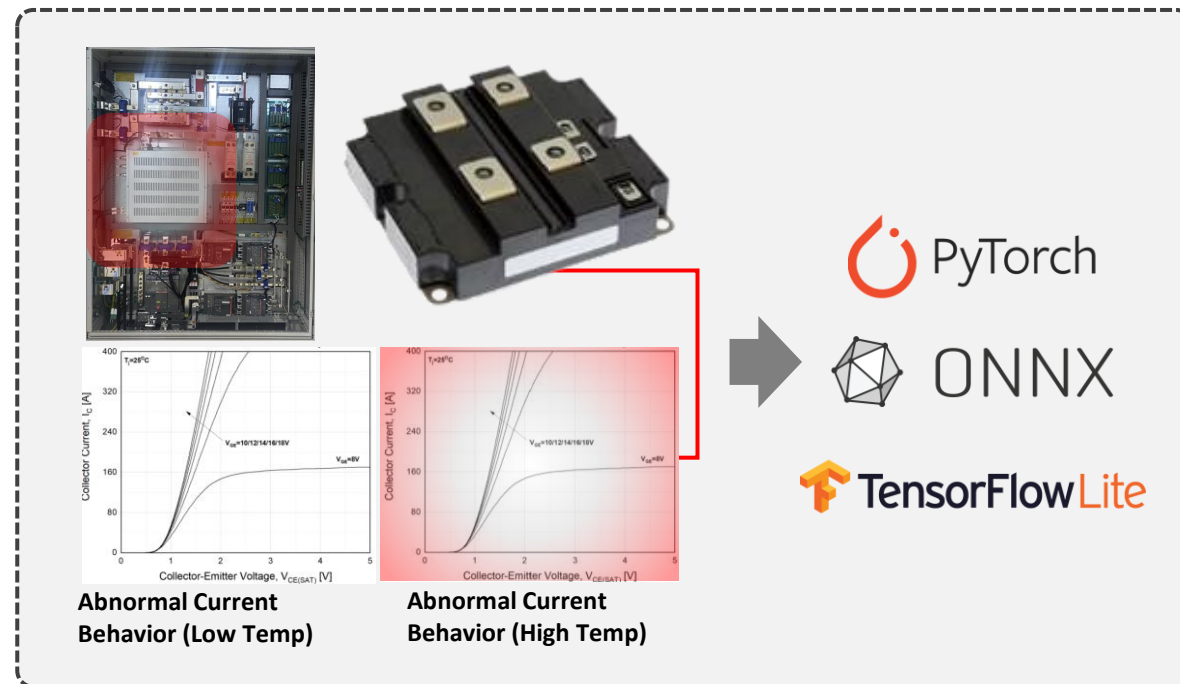
Deployment of AI modules into smart PCS (Power Conversion Systems)

III. Business Strategy

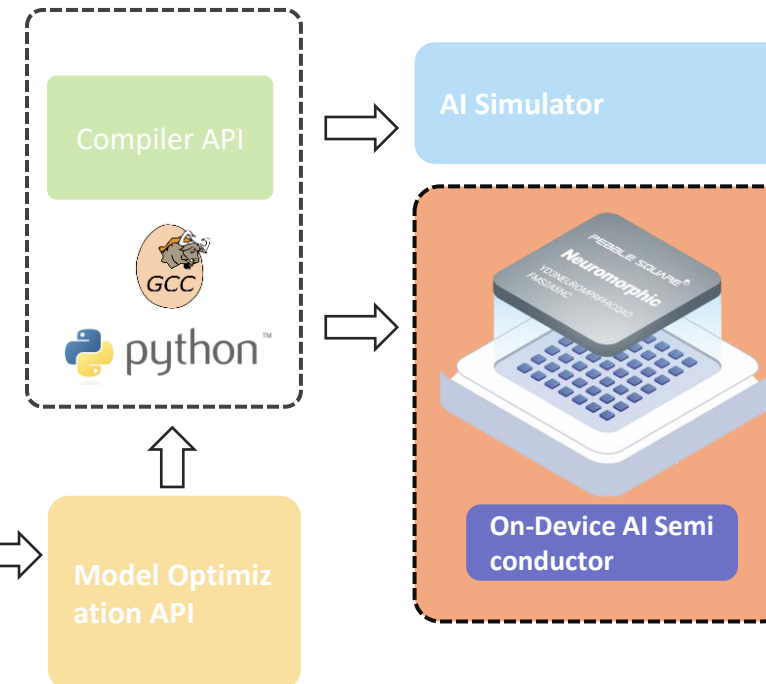
6. Technology Differentiation Strategy

AI Model Development Toolkit (Software - Development Kit)

PCS Lifespan Prediction / Fault Diagnosis AI Model Training



AI Model Debugging & Development Tools



Applicable Solutions



Energy Storage Systems (ESS)



Smart Factories



EV Charging Stations

◆ AI Model Training Data

Module-Level - Temperature (T1, T2, T3), Current(I1, I2, I3), Voltage(V1, V2, V3)

System-Level - Temperature (T), Humidity(H)

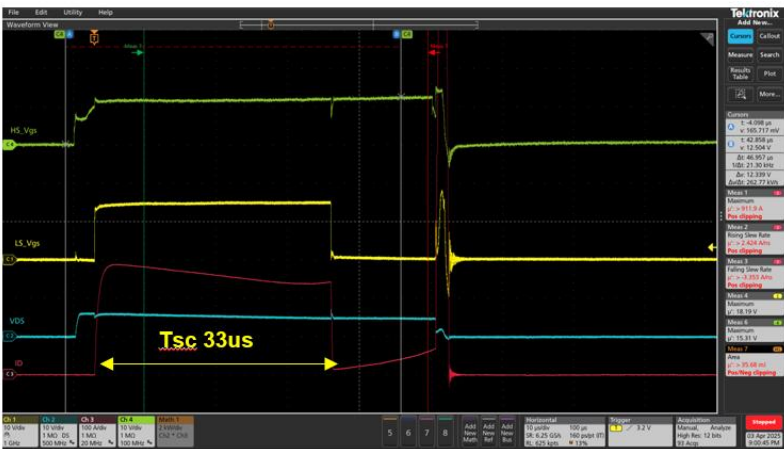
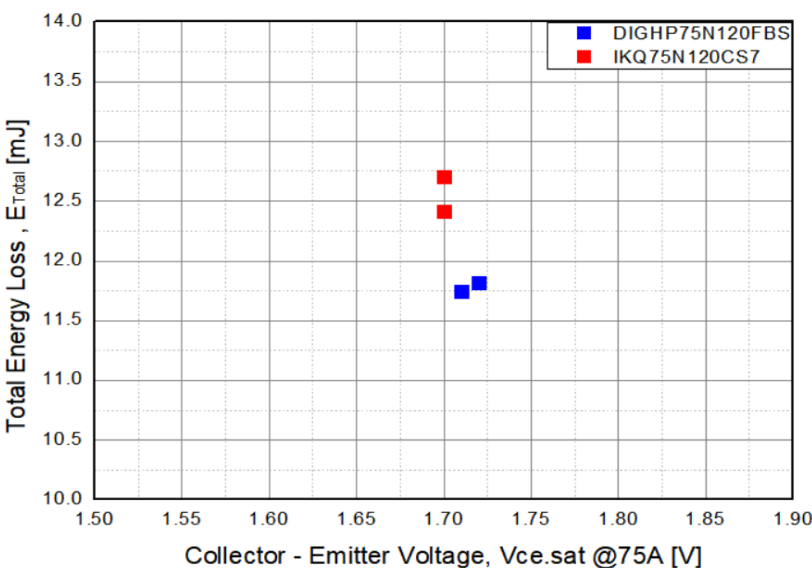
III. Business Strategy

7. Competitive Technology Comparison – Si IGBT

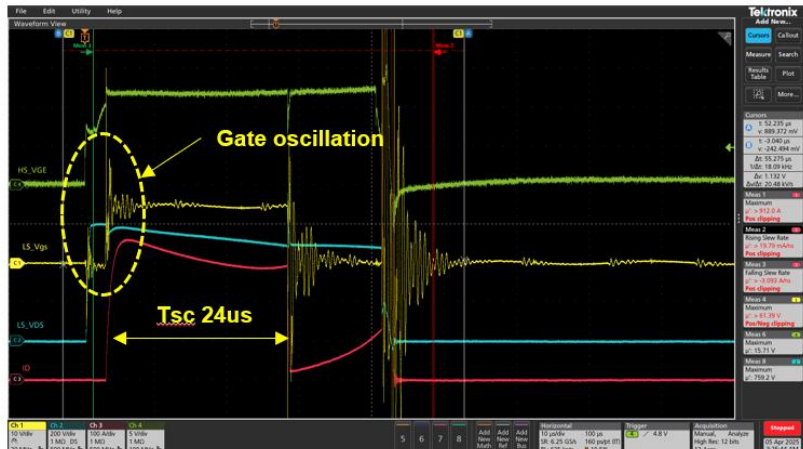
- (1) dicio vs. Infineon (7th Generation) Product Comparison – **Demonstrating Performance Comparable to Global Leader Infineon**

- Evaluation result

- ✓ **Switching test results** show that the dicio product achieved a total switching loss (E_{total}) of 11.7 mJ at room temperature, compared to 12.6 mJ for Infineon's product, demonstrating **8% better switching performance**.
- ✓ **DICIO's short circuit withstand time (Tsc)** was measured at **33μs**, which is superior to Infineon's **24μs**, indicating better short circuit width stand time performance.
- ✓ In short circuit test waveform comparison, dicio's product exhibited smaller current and voltage overshoot and reduced gate voltage oscillation, resulting in improved circuit stability compared to Infineon's product..



DIGHP75N120FBS (dicio)



IKQ75N120CS7 (Infineon)

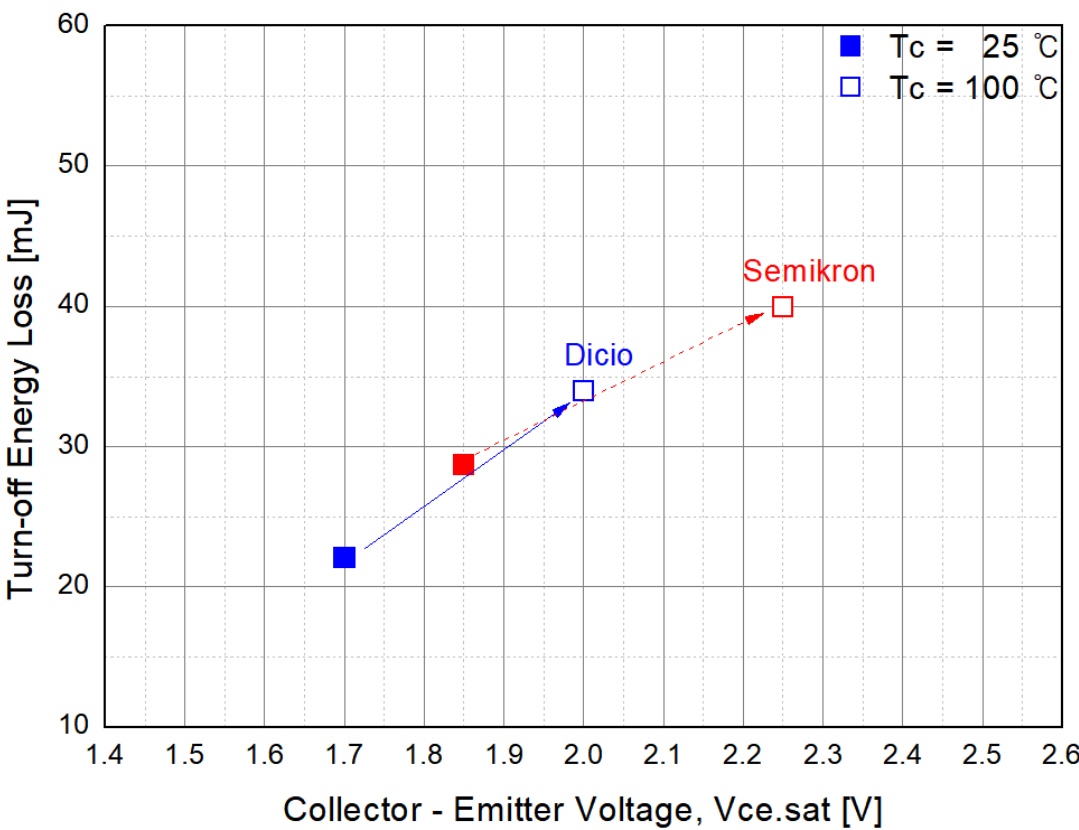
7. Competitive Technology Comparison – Power Module

- (2) 1200V 300A Module Analysis

dicio (DPM300GB120LS1(T)) vs. Semikron (SKM300GB12T4)

Switching test results show that dicio's product achieved total switching losses (Etotal) of 47.6 mJ (at 25°C) and 71 mJ (at 150°C), demonstrating 48% and 42% lower switching losses, respectively, compared to Semikron.

This indicates significantly superior switching efficiency.



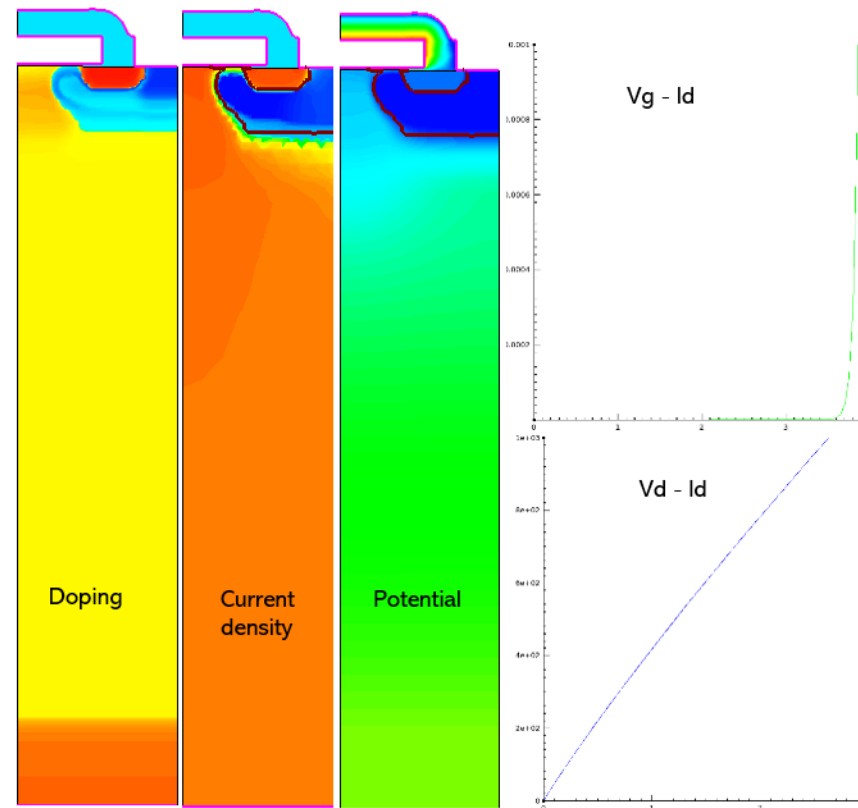
Item		dicio(D)	Semikron(S)	Normalized(D/S)
Vce,sat @300A	Tc = 25°C	1.70V	1.85V	0.92
	Tc = 150°C	2.0V	2.25V	0.89
Eoff @300A, RG=10Ω	Tc = 25°C	22.1mJ	28.7mJ	0.77
	Tc = 150°C	34.0mJ	40.7mJ	0.84



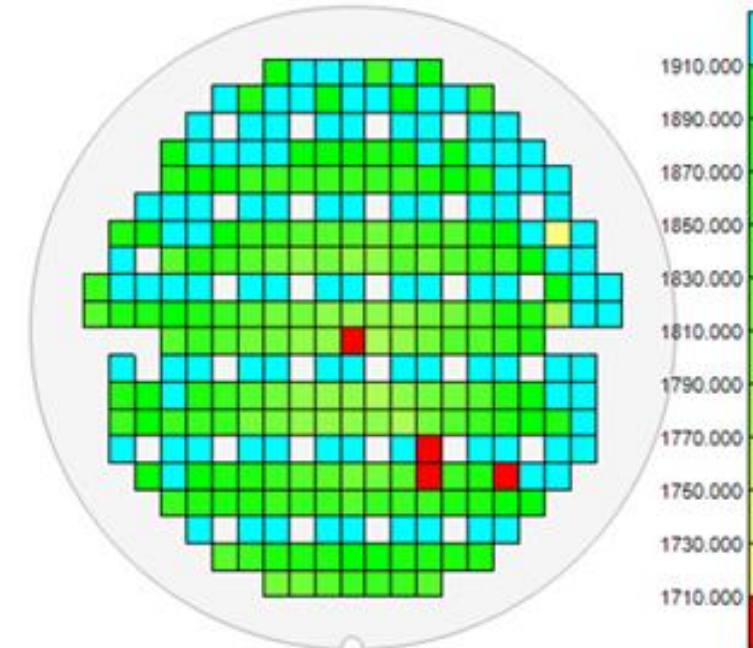
7. Competitive Technology Comparison – SiC Diode

(3) dicio SiC

- 1200V SiC MOSFET active structure
 - . $V_{th} = 3.4V$
 - . $R_{sp} = 2.23mW.cm^2$



- 1700V 75A SiC Diode
 - . CP test result



III. Business Strategy



8. Status of collaboration with major customers



- Leading company in marine equipment (80% market share in the cruise ship market.)
- Applied dicio power semiconductors to UPS (Uninterruptible Power Supply) systems
- Built a fault prediction system for ships (proactive maintenance system)
- Improved efficiency and reduced size by implementing SiC components

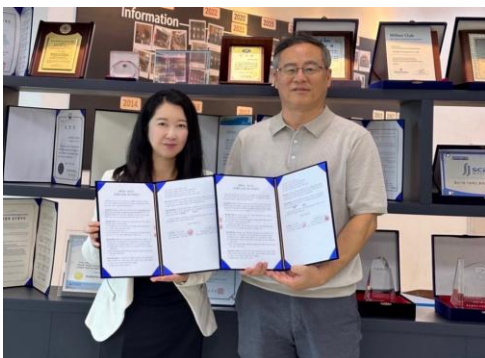


- Leading company in power conversion and energy storage systems
- Signed a Letter of Intent (LOI) for purchase worth KRW 48 billion.
- Transitioned Korea Electric Power Corporation's PCS system to an AI-powered paradigm
- Built a predictive system for KEPCO.
- Enhanced efficiency with the adoption of SiC components

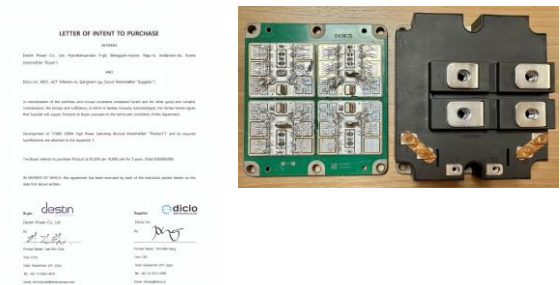


- Specialized power module manufacturer
- Designated as a certified enterprise in the Busan Specialized Industrial Complex, holding patents
- Supplies to top 10 global power semiconductor companies
- Holds core technologies in power semiconductors and power modules
- Signed a contract with dicio for the development and supply of power modules

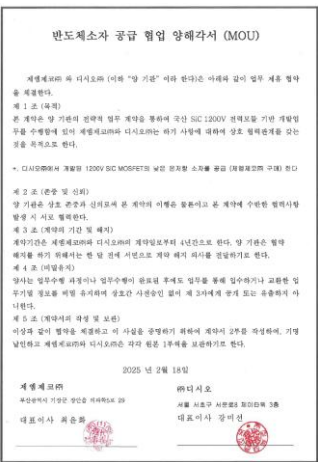
<DICIO & Macron Conclusion of business agreement >



<Destin Power the conclusion of a letter of intent to purchase >



<JMJ KOREA MOU CONCLUDE>



III. Business Strategy

9. prospective client



- 1700V 1200A IGBT Module
(For KEPCO ESS System)



- 1200V 1200A IGBT Module
(For GE Solar Inverter)



- 650V 60A IGBT
(LG Induction Cooktops)



- 1700V 20A IGBT
(cardiac defibrillator)



- 600V 40A IGBT
(For Midea Air Conditioners)



- 1350V 30A IGBT
(For SUPOR Rice Cookers)



- 650V 60A IGBT
(SK Magic Induction Cooktops)



Mercedes-Benz

- 1200V 40A IGBT
(For Mercedes-Benz Car Heaters)



- 650V 80A IGBT
(For Hyundai Car Heaters)

Thank you.

dicio Co., Ltd.



E-MAIL

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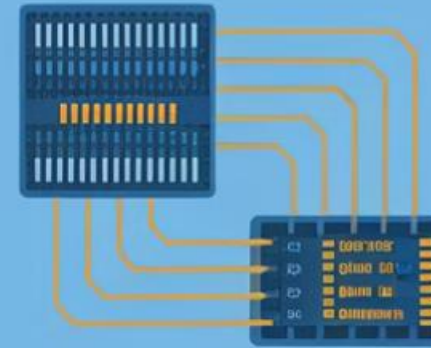
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