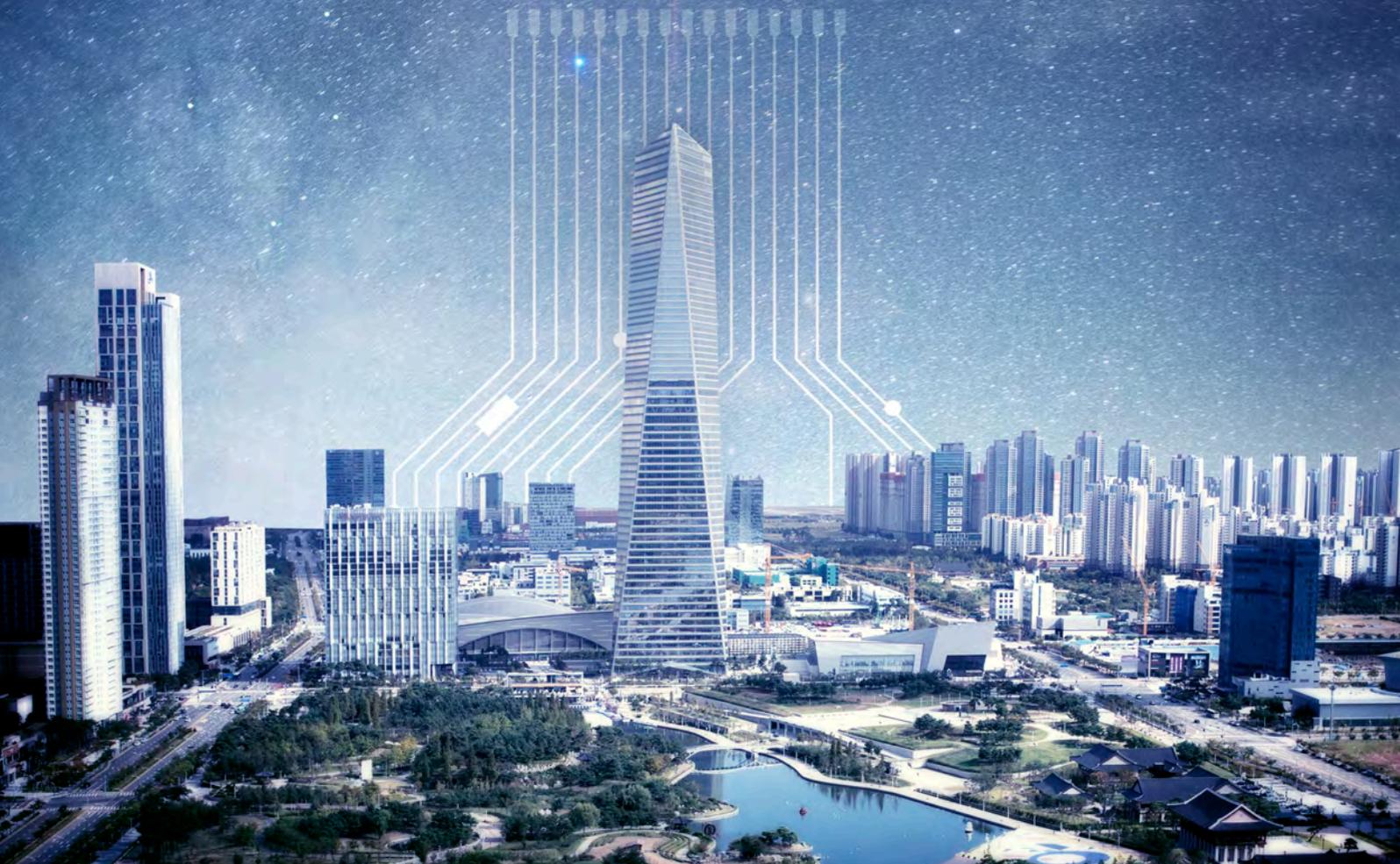


# Together We Create The Future

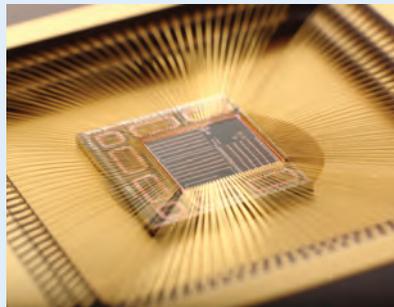
반도체 50년, 희망의 100년



# A Pioneer Turns 50

Korea's first semiconductor company, Amkor Technology celebrates half a century by preparing for the future

Written by **Robert Koehler**



Amkor Technology has done a lot in 50 years.

Based on the bold — some said crazy — belief that semiconductors were Korea's future, Amkor became the country's first semiconductor manufacturer in 1968, a time when few Koreans even knew what a semiconductor was, let alone how to make one. A half century later, Amkor is the world's second largest provider of semiconductor packaging and test services, a global giant with production, research and development facilities in seven countries. Its products have even been to space. The company owes its success to a deeply ingrained appreciation for quality control. "The people at Amkor put great care into everything we do, and it shows," says Founder and Executive Chairman James J. Kim. "Our facilities are some of the most advanced in the world when it comes to minimizing defects and maximizing efficiency. Together, we do our best for every customer, helping enable and improve the technology that increasingly impacts all of our lives."

What's more, Amkor isn't taking time off in 2018, the 50th anniversary of the company's founding. Instead, it's busy preparing for the future with an eye towards becoming a century-old semiconductor manufacturer. At its glistening new research and development facility in Incheon's Songdo, for instance, automated robots navigate

state-of-the-art clean rooms, managed by automated quality control facilities that ensure a production environment free from defects. Cooperating closely with customers, the company is also developing next-generation technologies suited to the demands of an age of ubiquitous computing and smaller, lighter, more sophisticated devices.

## Achieving a bigger world

James J. Kim was accepted to the top law school in Korea, which guaranteed a respected career and comfortable life. Instead, brushing aside an enviable future, he opted to go to the U.S. at the age of 19, with the vision of contributing to the economic development of Korea. "My father helped me see the bigger world and have better opportunities. I was and will always be grateful for that," he said. "Sending a child overseas for better education at that juncture in the Korean history was something that required great sacrifice. I did the best that I could too. I earned my tuitions and living expenses by working in several jobs throughout my school years."

In 1957, Kim, then a student at the prestigious Wharton School of the University of Pennsylvania, set off on a tour of the world with his father, inspecting major cities and industrial facilities in the United States, United



As Korea had many people but few natural resources, James J. Kim and his father believed that technology-based industries were a shortcut to national development.



Kingdom, Germany, Switzerland, France, Italy, Belgium, the Netherlands and elsewhere. Every day was an intense schedule. They were strongly motivated to meet new people and see the new world that inspired them. The trip was indeed well worth the effort because it helped them decide to start the semiconductor business later. As Korea had many people but few natural resources, they believed that technology-based industries were a shortcut to national development. Korea has been ravaged twice, first by the Japanese occupation and then by the Korean War. Kim and his father, the late Kim Hyang-soo, desperately needed to find ways to save the country from hunger and poverty.

The late Kim Hyang-soo, in a way, had already made his first attempt by making a company in 1956, Korea Bicycle Industries, Inc., to manufacture bicycle parts. He believed the bicycle suited Korea. The country produced no oil, and bicycling would promote public health.

“My father lived his whole life feeling responsible for his people and country and played a pivotal role in the development and industrialization of Korea,” said James J. Kim. “We have always agreed on the importance of making jobs for people, creating prosperity and wealth. I am still carrying out this worthy cause and thankfully, Amkor has grown to more than 30,000 employees worldwide. I will

keep trying my best to take a small but meaningful part in contributing to the prosperity of humanity worldwide, while dedicating myself to the world of business with trustworthiness, reliability and devotion.”

In 1967, following a second tour of the world’s industrial facilities, James J. Kim, then an assistant professor at Villanova University in Villanova, Pennsylvania, decided to enter the semiconductor business, a growing and potentially exciting sector. In 1968, he established Amkor Electronics, Inc. in Pennsylvania to handle semiconductor packaging technology, sales and marketing. In the same year, his father purchased a factory in Seoul’s Hwayang-dong district and named it Anam Industrial. There the elder Kim began manufacturing semiconductors.

And so Korea’s first semiconductor company was born. The father and the son were partners right from the start and embarking on a business that even Korea’s biggest corporations were hesitant to touch. Few Koreans understood semiconductors at the time. Indeed, only countries such as the United States, with its space exploration and missile development programs, had shown much interest in the sector.

They were convinced that semiconductors represented Korea’s best path for development. They believed the technology-intensive and high value-added sector was perfect for Korea, a nation with few natural resources. With a pioneering spirit, they sought to grow an industry that would produce high-tech products, boost exports, expand employment and cultivate skills.

Anam Industrial began in 1968 with semiconductor packaging — usually metal, plastic, glass or ceramic — that contains the semiconductor’s electronic components. The company’s semiconductor packaging business succeeded beyond anyone’s imagination. In 1970, Anam Industrial employed just seven people in its semiconductor operations. Just one year later, the number had grown to 140 and to 4,300 by 1975. Soon, the company had acquired a dominating 40 percent market share of the world’s semiconductor packaging market. Anam Industrial’s semiconductor packages even found themselves in the robotic arm of NASA’s space shuttle Columbia in 1982.

Of course, the path hasn’t been all smooth sailing. Armed with economies of scale, big Japanese companies entered the semiconductor market in the 1980s, threatening even giants like Intel. Mother Nature could be capricious, too. Destructive floods in 1972, 1984, 1987 and 1990 caused much damage to the factory. Through a combination of wise management and a culture of cooperation with its employees, however, the company has managed not only to survive challenges, but to flourish.

The company faced its biggest challenge in the wake of the East Asian financial crisis of 1997. The crisis hit the company hard, threatening its very survival. It took

Amkor Technology is now a true multinational with 19 production facilities and research centers in seven countries

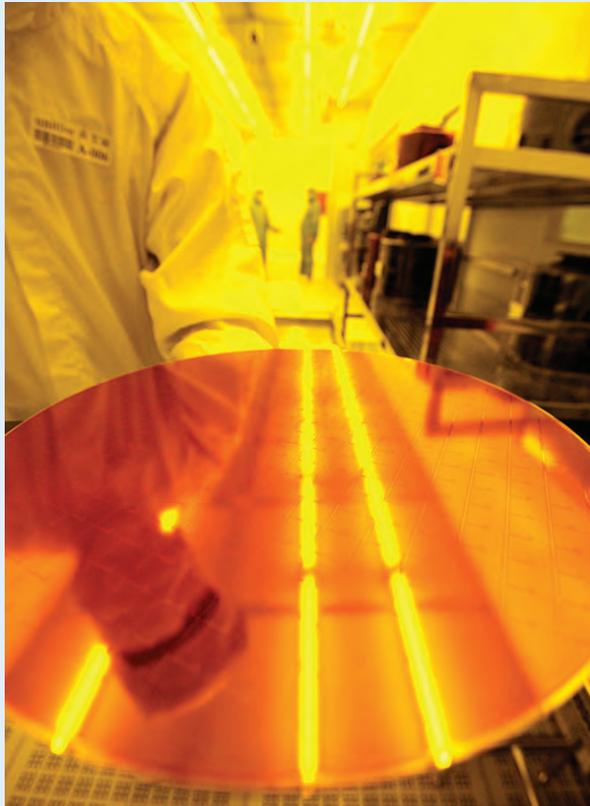


The Chinese characters *sinui* mean “reliability and trust.” This is Amkor’s corporate motto.



The Total Quality Management is driven by the QualityFIRST initiative that incorporates a variety of preventative strategies, including total production maintenance, best known methods and benchmarking.

The company's automated production line, a veritable "smart factory," makes possible a zero defect environment.



James J. Kim five weeks to meet with 600 or so investment bankers from 120 financial institutions in the U.S. and Europe. His arduous work paid off in 1998, when he changed Amkor Electronics, Inc. to Amkor Technology, Inc. and listed it on the NASDAQ, raising more than USD 2.5 billion through an IPO over the next two years.

In 1999, the company acquired Anam Industrial's semiconductor facility in the southwestern city of Gwangju. The year after that, it acquired Anam Industrial's three remaining semiconductor facilities. It started with a crisis but in a way, it was an opportunity for Amkor to evolve through the stages of growth and spread throughout the world and restructure.

### Success through reliability and trust

With its headquarters in Tempe, Arizona, Amkor Technology is now a true multinational with 19 production facilities and research centers in seven countries, including China, Japan, Taiwan, the Philippines, Malaysia, Portugal and, of course, Korea. It is one of the world's leading providers of outsourced semiconductor packaging and test services. It offers more than 1,000 different package formats and sizes, from traditional leadframe ICs for through-hole and surface mounting, to those required in high pin count and high-density applications such as Stacked Die, wafer level, MEMS, Flip Chip, Through Silicon Via (TSV) and 2.5/3D Packaging.

The company also provides semiconductor testing services, such as wafer and strip testing, and final, system level testing.

In particular, the company offers full turnkey solutions, from semiconductor design to production and delivery. This is especially important when electronics and information technology, including smart phones, artificial intelligence, self-driving cars and the Internet of Things, are rapidly growing smaller, lighter and more advanced, requiring semiconductor packages that can take multiple chips.

Though technology is important, even more important to Amkor's success has been its corporate philosophy. For Amkor, reliability is everything. The corporate motto is *sinui*, Chinese characters that mean "reliability and trust." In his autobiography, the late Kim Hyang-soo wrote, "The customer is king' is a belief a corporation must live by. We may profess to have the best quality, best delivery, or best service, but if the customer is not convinced of our loyalty and devotion, we cannot survive and grow."

Amkor boasts a "Total Quality Management" culture, a policy that extends to its suppliers, too. The Total Quality Management is driven by the QualityFIRST initiative that incorporates a variety of preventative strategies, including total production maintenance, best known methods and benchmarking. The company's automated production line,



Amkor's new, state-of-the-art Global R&D Center and K5 campus in Songdo, Incheon, is the most advanced semiconductor packaging and test facility

a veritable “smart factory,” makes possible a zero defect environment.

### Ready for another 50 years

At 50 years, most companies would be content to rest on their laurels, satisfied with their achievements and their position in the corporate ecosystem.

Not Amkor, though. Based on the experience and global leadership gained over its first 50 years, the company is preparing for the next 50 with the goal of becoming a century-old semiconductor firm, no mean feat in a tech sector defined by constant disruption and change.

At the center of this challenge is Amkor's new, state-of-the-art Global R&D Center and K5 campus in Songdo, a mere 20 minutes from Incheon International Airport, Korea's most important logistical nexus. Beginning operation in March 2017, the sprawling complex is the most advanced semiconductor packaging facility in the world, boasting Class 100 cleanrooms and bleeding-edge automated systems such as auto guide vehicles that move wafers and assembly lots from process to process, advanced planning and scheduling, real-time dispatching and material control systems. The center reflects Amkor's full turnkey solution strategy, handling everything from package design and research to testing and even drop shipping.

To meet the demands of the so-called Fourth Industrial Revolution, a movement wedding ubiquitous information

technology to traditional industries, Amkor is working closely with customers to jointly develop packaging technologies for the 5G Internet environment, including 2.5/3D TSV (Through Silicon Via), Homogeneous/Heterogeneous Integration, Fan-Out Packaging and SiP (System in Package).

To boost competitiveness and prepare for the future, Amkor continues to strengthen its automotive capacities and maintain its technological edge. The company is also changing the mindset of its employees, too. This year, all employees attend “5S Day,” where they learn how to maintain and effective and efficient workspace. Through small group activities, they also learn how to make quality control part of their daily lives. Employees are also encouraged to find ways to cut costs and improve productivity.

The firm is also establishing a global standard. Amkor is striving to establish production facilities in the world's major electronics centers, facilities where employees adhere to the “Amkor Global Standard,” offering customers the same high level of services anywhere in the world.

Executive Vice President Park Yong-chul, Amkor Worldwide Manufacturing Operations, said, “Continuously growing into a 100-year-old company by perfecting smart factories that are one step ahead by offering distinctive services only Amkor could provide is our goal as it celebrates its 50th anniversary.”

# Building a Leader Through Trust and Innovation

Amkor Technology Founder and Executive Chairman James J. Kim believes change is crucial to the company's future



“I have tried my best to implement the necessary changes to survive and adapt to the many challenges we faced during the last 50 years. I have tried to strike the balance between tradition and change. We regarded the relationships with customers and partners as being crucial to the success of Amkor. The mutually supportive relationships based on reliability, trust and dependability were essential to navigating and overcoming the changes and challenges we had to face.”

Amkor Technology Founder and Executive Chairman James J. Kim

has been involved in every step of the company's success, from fact-finding trips overseas in the 1950s to the present day. Throughout it all, he has striven to build and strengthen a relationship based on unwavering reliability, on trust not only with customers, but also with employees. “We recognized the employees as an important factor in Amkor's success,” he says. “Retaining long-term employees allows for long-term growth and sustainability that builds upon our corporate history.”

## Innovate or perish

Amkor's growth mirrors that of Korea's. When Kim and his father started the business in the 1960s, they had the future of the nation very much in mind. “We considered and were aware of much of the risks that could come along but still wanted to create jobs and establish a foothold for all the Korean conglomerates in the high tech electronic industry,” he says. “We wanted to make the country a strong one and did not want to pass down the hardships and sufferings to the younger generations.”

Though the semiconductor industry is a difficult one, with technological advances constantly shortening the life cycle of products, Amkor has prospered because of innovation. In the 1980s, Kim's brother, Dr. Kim Joo-chai, suggested the automation of the company's factory. When it was implemented, productivity and product quality improved. Moreover, since the 1980s, the company has been a

technology leader in the industry.

Amkor is determined to continue this spirit of innovation over the next 50 years, too, with the new Global Research and Development Center in Incheon's Songdo as a launching pad. “Unless we continue to innovate and come up with groundbreaking products, we do not have a future,” he says. “The Amkor Global R&D Center & K5 campus will be the cornerstone of our global expansion, offering cutting edge products and technology platforms. The state-of-the-art R&D center will lead us through the highly competitive market of the semiconductor packaging industry. Now in 2018, we are aiming to surpass what we have achieved over the last 50 years.”

## Brighter times ahead

As Amkor embarks on its next half-century, Kim wants nothing more than sustainable growth for the company. He says that the company not only needs technology, quality and service differentiation, but also should constantly update its organizational structures, foster leadership, transform its corporate culture and ensure global transparency standards. “With all these efforts and competitive advantages by each and every employee and management, we are sure to have a brighter future ahead of us,” he says. “Amkor Worldwide united, we can challenge ourselves to worthy causes and sustainable growth, which will ultimately ensure our continued presence amongst the ranks of best global companies.” ©

# AMKOR WORLDWIDE PRESENCE

## Strategically Located Factories and Customer Support Centers

● Amkor Headquarters  
 ● Sales/ Customer Support Center  
 ● Assembly & Test Facility  
 ● Sales/ Customer Support Center & Assembly & Test Facility



## WHO WE ARE

Founded in 1968, Amkor's continuous path of improvement, growth and innovation has led us to be a strategic and trusted manufacturing partner for more than 300 of the world's leading semiconductor companies. Our unique expertise in high-volume manufacturing techniques and the ability to solve the technological challenges facing the industry are among our greatest strengths.

Customer demand for highly sophisticated products has made semiconductor packaging a vital contributor to system performance. As one of the world's largest suppliers of outsourced semiconductor advanced packaging design, assembly and test services, Amkor helps make innovative technologies a reality.

Opening ceremony for Amkor Global R&D Center and K5 campus.

## PRODUCTS AND SERVICES

### PACKAGING

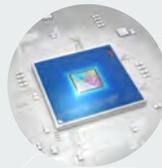
Consumers are demanding greater functionality and performance in a smaller space at a lower cost. Amkor is an industry leader in finding semiconductor packaging solutions to meet these complex requirements.

### ASSEMBLY

With global high-volume manufacturing, Amkor assembles a broad portfolio of packaging solutions including wirebond and flip chip using Pb-free and green packaging.

### FINAL TEST SERVICES

Amkor provides a complete range of semiconductor test services including various types of final, system level, wafer and strip testing and complete end-of-line services up to and including final shipping.



## FEATURED PRODUCTS INCLUDE

### 2.5/3D – THROUGH SILICON VIA

Through Silicon Via (TSV) interconnects serve a wide range of 2.5D and 3D packaging applications and architectures. TSV meets high performance, low energy demands.

### FLIP CHIP

Amkor is committed to being the leading provider of Flip Chip technology. Flip chip production capability is available in our Portugal, Philippines, Korea, Taiwan and China factories.

### SYSTEM IN PACKAGE (SiP)

Industry demands for higher levels of integration and lower costs coupled with a growing awareness of complete system configuration drive the popularity of System in Package (SiP) solutions.

### WAFER LEVEL PACKAGING

Amkor offers a broad array of Wafer Level Packaging capabilities and processes for packaging schemes from fan-out to chip scale to 3D to System in Package (SiP).