

Amkor Technology, Inc. (NASDAQ: AMKR)

Recommend to buy at 5% | PT: \$32.60

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CIMG Investment Research

Packaged for Outsized Returns in a Transforming Industry

The Technology Committee is recommending a buy of Amkor at a 5% weight. Amkor is a OSAT that deals with semiconductor packaging and testing. Packaging and testing are integral to the semiconductor build chain, as the process is the final step and includes combining integrated circuits within a casing and testing to verify functionality. Amkor offers a unique investment opportunity as TSMC will not be able to fulfill near-term advanced packaging and testing demand. With Amkor's proven strength in major end markets, notably automotive and communications, they are set to capture the unfulfilled TSMC advanced packaging demand with their online capacity and increasingly larger advanced packaging and testing focus.

Investment Thesis

Amkor is the solution to TSMC's advanced packaging capacity bottleneck: After OpenAI successfully launched ChatGPT, the NVDA chips used to train the model became seen as the building blocks of a new age in artificial intelligence and machine learning. NVDA chips have historically been developed and packaged by TSMC, a company that has traditionally focused on smaller node sizes and other front-end developments; however, as Moore's law started to slow, TSMC has begun focusing on vertically integrating and improving packaging efficiency. This can be seen through the development and widespread use of 2.5D or CoWos (Chip-on-Wafer-on-Substrate) packaging technology. Before OpenAI's breakthrough, TSMC's new \$10B packaging facility had no issue meeting advanced demand, but the increasing need for NVDA leading-edge chips has created a bottleneck for TSMC. Currently, TSMC can only meet 80% of NVDA's demand, and until additional facilities come online in 2025, this shortage will likely worsen. TSMC's lack of capacity, paired with a new AMKR packaging facility in Vietnam, allows AMKR to enter the more attractive business of advanced packaging quickly, yielding higher margins and more significant barriers to entry.

Amkor is positioned to see benefits from 5G-enabled smartphones that need advanced packaging and sustained mandates from TSMC's inability to meet near-term demand: 5G-enabled smartphones are not a new trend, but one that is increasingly penetrating the total smartphone market. In 2023, 5G-enabled smartphones make up 69% of the global smartphone market, making for a large opportunity for Amkor to see furthered revenue from the Communications end market. 5G-enabled smartphones need better, more advanced technology to sustain innovations. Amkor's advanced packaging capabilities support many of the innovations that 5G provides in the smartphone, positioning them in an opportune spot as the worldwide smartphone shipment forecasts turns positive looking forward. Amkor will also benefit from TSMC's inability to dominate on all of the demand for advanced packaging in the near-term. Amkor's online capacity and experience with iOS and Android smartphones places them in a forefront position to capitalize on the 2.5D advanced packaging needs in the space.

Amkor excels in advanced automotive packaging that is poised for growth: As ADAS and EV components see further adoption in the automotive industry, there is an increased demand for advanced flip-chip packaging. Flip-chip can support high-temperature stress and increased signal intensity driven by the improved electrical performance of the chip. These features are driving demand with flip-chip technology growth projected to be more than 20% per year by volume over the next five years. Few companies have the capacity for this, as the processing is highly technical and requires specific capacity to underfill and connect components with gaps as small as 60 and 25 microns.

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Figure 1: AMKR 1 Year Stock Chart



Price	\$23.72
PT	\$32.60
Dividend Yield	1.3%
Upside	37.44%
52-Week Range	\$17.58 - \$31.38
Mkt Cap	\$5.8bn
LTM P/E	10.98x
LTM Prices/Sales	0.83x
LTM EV/EBITDA	4.15x
TTM Revenue	\$6.7bn

The advanced packaging needs can only be met by tier-one OSATS (first contact in chip-supply contracts). ASE, the other major competitor in this space, has minimal investments in automotive, dedicating its focus to its Electronic Manufacturing Services segment. This makes AMKR the OSAT of choice for auto packaging needs. To cover the gap that exists with current foundries and IDMs and support the growing number of advanced automotive chips, customers will turn to Amkor at every major location of the automotive supply chain.

Valuation

We drove the company's revenue via its four end markets (Communication, Auto, Compute, and Consumer). Amkor's revenue has historically tracked the broader semiconductor market sales; furthermore, its gross margin is heavily correlated with fab utilization and inversely correlated with inventories on hand. In the short term, we expect demand across all end markets to decline for the year and experience a recovery in 2H24. In conjunction with this, we see fab utilization driving gross margin improvement to ~ pre-COVID levels. Furthermore, the buildout of CoWoS capacity and advanced packaging is projected to provide idiosyncratic tailwinds to topline and gross margin throughout the projection. In order to represent the business's ability to retain the competitive edge in advanced packaging, we have CapEx intensity increasing to ~15% (from low teens guidance) and R&D growing with revenue (as opposed to historical flatness). With these assumptions, we valued the business with a Terminal EV/EBIT multiple and a LTGR DCF. The terminal EV/EBIT multiple was placed at 12x to account for the rerating we see happening as AMKR expands into higher value-add businesses.

Company Overview

Amkor Technology is an outsourced semiconductor supply and test (OSAT) company that operates on a global scale. They specialize in providing outsourced semiconductor packaging and test services to fabless customers, integrated device manufacturers, and original equipment manufacturers. Major customers include Amkor offers a number of services, including wafer-level packaging, advanced bumping, and system-in-package (SiP), among others. The company was founded in Korea but is now headquartered in the United States. The name 'Amkor' refers to America and Korea. They have 20 manufacturing locations in 8 countries to serve their global customers. Amkor's end markets consist of Communications, Computing, Automotive and Industrial, and Consumer.

Industry Overview

Amkor is an OSAT (Outsourced Semiconductor Assembly and Test) Company. They operate in the back end of the semiconductor manufacturing process, where OSATs turn etched silicon wafers into completed chips. OSATs are primarily responsible for three stages, packaging, validation testing, and assembly. Amkor is the only large US based OSAT, with their chief competitors being, the Taiwan based company ASE and the China based company JCET. OSATs operate in a \$43 billion dollar market, that is growing with a CAGR of 8.9% through 2027. In recent years, the increased adoption of advanced packaging technology continues to increase chip performance while decreasing size has added increased relevance to this industry in the scope of semiconductor production.