Supply Chain Explorer

By the Emerging Technology Observatory

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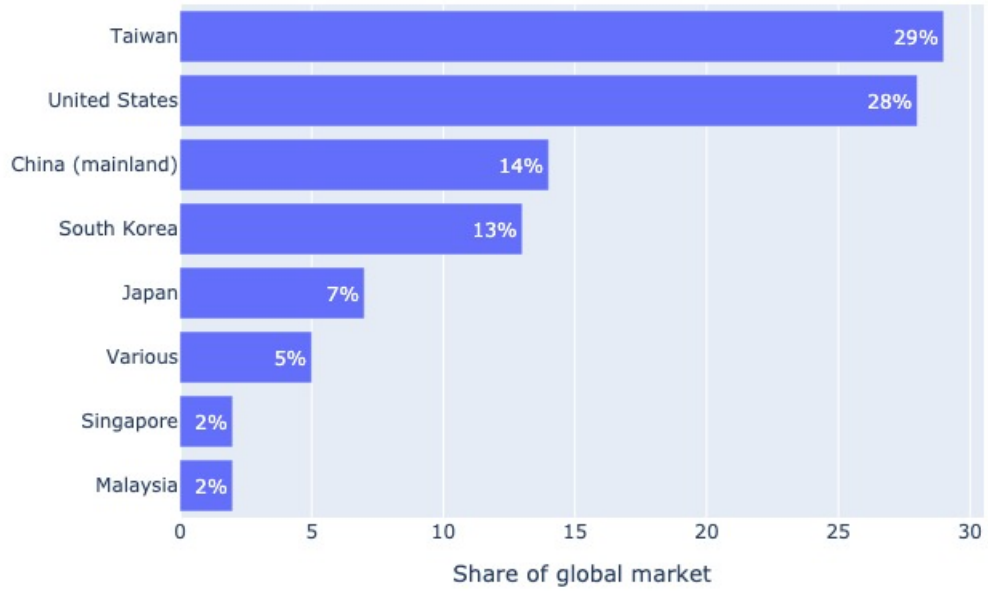
Assembly, testing, and packaging (ATP)

Assembly, testing, and packaging starts with cutting a finished wafer—which contains dozens of chips in a grid pattern after fabrication—into separate chips. Each chip is mounted on a frame with wires that connect the chip to external devices, and enclosed in a protective casing. The chip is also tested to ensure it operates as intended. Although ATP was historically low value, as transistor densities in logic chips have increased exponentially, packaging has increasingly become a bottleneck on chip performance.

ATP occurs under two business models: (1) as in-house ATP services performed by integrated device manufacturers (IDMs) and foundries after fabrication; and (2) by outsourced semiconductor assembly and test (OSAT) firms, which perform ATP for third-party customers. Firms headquartered in Taiwan, the United States, China, and South Korea are the main providers of ATP services.

Country provision



Notable supplier companies

- ASE - Taiwan
- Amkor - United States
- Intel - United States
- JCET - China (mainland)
- Micron - United States
- Powertech - Taiwan
- SK Hynix - South Korea
- Samsung - South Korea
- TSMC - Taiwan
- Tianshui Huatian Technology - China (mainland)
- TongFu - China (mainland)
- UTAC - Singapore