

GLOSSARY OF TECHNICAL TERMS

This glossary of technical terms contains explanations of certain technical terms used in this document in connection with our Company and our business. Such terminology and meanings may not correspond to standard industry meanings or usages of those terms.

“ADAS”	advanced driver assistance system, a system designed to assist drivers in the operation and safety of vehicles by utilizing various sensors, cameras and software algorithms to provide additional functionalities and enhance the driving experience
“AR”	augmented reality, a technology that overlays digital information, such as images, sounds and other data, onto the real-world environment in real-time, enhancing the user’s perception and interaction with the surroundings
“B2B”	business-to-business, a type of transaction or business model where products or services are sold from one business to another, rather than to individual consumers
“B2C”	business-to-consumer, a type of transaction or business model where products or services are sold directly from a business to individual consumers
“CAGR”	compound annual growth rate
“CAMM”	compression attached memory module, are types of memory modules that utilize compression technology to optimize data storage and retrieval. Other special types of CAMM include, for example, low power CAMM (“LP CAMM”) and small outline CAMM (“SOCAMM”)
“CFexpress”	a high-speed memory card standard designed for professional imaging and video applications, offering faster data transfer rates and improved performance compared to previous formats
“controller chip”	a specialized microprocessor that provides drive and high-speed data transfer for Flash memory media, with specific external interfaces and protocol processing modules responsible for communication with the host, determining the form and category of the storage product
“CPU”	central processing unit, an integrated circuit that serves as the computational and control core of an electronic product
“CXL”	compute express link, an open standard interconnect protocol that enables high-speed communication between CPUs to device or memory, or device to device to enhance data center performance
“DDR”	double data rate, an industry standard for SDRAM products introduced by JEDEC; “ DDR5 ” is the fifth generation

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"die"	an individual integrated circuit that is cut from a semiconductor wafer
"DIMM"	dual inline memory module, a type of memory module that features a series of DRAM integrated circuits mounted on a printed circuit board, with electrical contacts on both sides to connect to a device's motherboard, providing volatile storage for data processing. Major types of DIMMs include Registered DIMM ("RDIMM"), Small Outline DIMM ("SODIMM"), Unbuffered DIMM ("UDIMM"), multiplexed rank DIMM ("MRDIMM"), each designed to cater to specific performance and form factor requirements in various computing environments
"DPPM"	defect parts per million, a quality metric that quantifies the number of defective units in a batch of one million parts, used to assess the manufacturing quality and reliability of products
"DRAM"	dynamic random access memory, a type of volatile memory used in computers and other devices to store data that is actively being used or processed, requiring periodic refreshing to maintain the stored information
"EDA"	electronic design automation, a category of specialized software tools used for the design, simulation, verification and layout of integrated circuits and electronic systems
"embedded storage"	memory products that are integrated into the main system of an electronic product, featuring high-capacity embedded NAND Flash solutions or DRAM solutions or compounded NAND and DRAM solutions, and are primarily used in devices such as smartphones and PCs
"eMCP"	embedded multi-chip package, a semiconductor packaging technique where eMMC and LPDDR are enclosed within a single package, allowing for increased functionality and performance while minimizing space and enhancing connectivity between the chips
"eMMC"	embedded multi-media card, an integrated non-volatile memory system consisting of Flash memory and a Flash memory controller, used primarily in portable devices for reliable and efficient data storage and management
"EMS provider"	electronic manufacturing service ("EMS") provider, a company that provide a range of services including design, assembly, production and testing of electronic components and products for OEMs, enabling them to focus on core competencies such as innovation and market expansion
"ePoP"	embedded package on package, a semiconductor packaging technique where eMMC and LPDDR are integrated within a package, and stacked directly on top of the CPU surface

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“fabless”	a semiconductor business model in which a company designs and sells integrated circuits but does not own or operate wafer fabrication facilities, instead outsourcing the manufacturing of its chip designs to wafer foundries
“firmware”	a pre-installed program code in memory, running within the Flash memory controller, responsible for core tasks such as protocol processing, data management and hardware driving in the memory
“Flash”	a type of non-volatile semiconductor memory chip, which retains stored information even when powered off, featuring the ability to be repeatedly read, erased and written, and is considered a major category of memory products
“flip-chip”	a method used to connect semiconductor dies within a package, involving flipping the semiconductor die so that its active side faces down towards the substrate, which allows for a higher density of interconnections, improved electrical performance due to shorter connection paths, and better thermal management as the die is in closer contact with the substrate
“GB”	gigabyte, a unit of digital information storage equal to one billion bytes, commonly used to quantify data storage capacity in computers and other electronic devices
“Gb”	gigabit, a unit of digital information equal to one billion bits, commonly used to measure data transfer speeds
“HBM”	high bandwidth memory, a type of memory used in high-performance computing and graphics applications, offering high-speed data transfer rates and increased bandwidth through advanced packaging techniques
“HLC”	High-Level Cache, a proprietary caching technology that leverages innovation across the controller chip, firmware and system-level architecture to enable SSD or UFS storage devices to take over part of the data caching functions traditionally handled by DRAM, thereby reducing the DRAM capacity required in edge AI devices
“IATF”	International Automotive Task Force, a coalition of automotive manufacturers and trade associations dedicated to establishing global quality standards for the automotive industry, exemplified by the IATF 16949 certification
“ICT”	information and communications technology, a technology that facilitates the use, management and exchange of information and communication through electronic means

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“IDM”	integrated device manufacturer, a company that designs, manufactures and sells its own products, handling the entire production process from design to fabrication and distribution, and in the context of the semiconductor industry, a company that covers the entire business segment, including chip design, wafer manufacturing and packaging and testing
“integrated circuit” or “IC”	integrated circuit, a type of miniature electronic device or component, manufactured using semiconductor techniques, integrating all the necessary transistors, resistors, capacitors, inductors and their connecting wires for a circuit onto a small semiconductor wafer (such as a silicon chip or substrate), which is then soldered and encapsulated within a casing to form an electronic device with the desired circuit functions
“IoT”	internet of things, a network of interconnected devices that communicate and exchange data with each other over the internet
“ISA”	intelligent storage agent, a proprietary firmware-level technology designed for AI inference on edge devices
“JEDEC”	Joint Electron Device Engineering Council, a standardization institution in the solid-state and semiconductor industry that develops industry standards for solid-state electronics
“LLM”	large language model, an AI model trained on extensive text data to understand and generate human language, capable of tasks such as translation, summarization, and question answering
“LPDDR”	low power double data rate, an industry standard for low-power SDRAM products introduced by the JEDEC
“MB”	megabyte, a unit of digital information storage equal to approximately one million bytes, frequently used to describe the size of files or the capacity of storage devices
“Mb”	megabit, a unit of digital information equal to approximately one million bits, frequently used to measure data transfer speeds
“MCP”	multi-chip package, a semiconductor packaging technique that encapsulates two or more memory chips within a single package through methods such as stacking

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“memory module”	circuit boards equipped with memory chips that provide DRAM solutions for temporary data processing and program execution, and are used in a wide range of computing and industrial applications, including personal computers, educational systems and industrial automation
“memory wafer”	a silicon semiconductor integrated circuit material, processed with specific techniques to have particular circuit functions, which can be made into a finished integrated circuit product after undergoing cutting, packaging and testing processes
“micro SD card”	a smaller version of the SD card, used in mobile phones and other compact electronic devices for additional storage capacity
“mobile storage”	portable storage devices such as USB Flash drives, memory cards and portable SSDs; mobile storage products primarily serve as tools for data transfer and backup in applications such as security cameras, automotive systems and high-definition photography
“NAND Flash”	a type of non-volatile Flash memory technology and the products based on this technology, typically used for data storage
“NFC”	near field communication, a short-range wireless communication technology that enables data exchange between devices placed within close proximity, commonly used for contactless payments, access control and device pairing
“NVMe”	non-volatile memory express, a high-performance interface protocol designed specifically for SSD, enabling faster data transfer speeds and lower latency compared to legacy protocols
“ODM”	original design manufacturer, a company that designs and manufactures a product or component as specified and eventually rebranded by another firm for sale
“OEM”	original equipment manufacturer, a company that uses its brand advantages, core technologies and sales channels to have products produced by a manufacturer with production capabilities and then sells them to the market
“OSAT”	outsourced semiconductor assembly and test, critical stages of the production process of semiconductor products outsourced to third-party services providers to handle the assembly, packaging and testing of semiconductor devices

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"PCB"	printed circuit board, a board used in electronics to connect electronic components using conductive pathways, tracks, or signal traces etched from copper sheets laminated onto a non-conductive substrate
"PCBA"	printed circuit board assembly, the process and resulting product of mounting and soldering electronic components onto a PCB, forming a functional electronic assembly
"PCIe"	peripheral component interconnect express, a high-speed interface standard used to connect various hardware components to a computer's motherboard, providing fast data transfer and improved performance, with different generations such as Gen1 to Gen5
"PTM"	product, technology and manufacturing
"QFN"	quad flat no-lead, a surface-mount integrated circuit package that features exposed pads on the bottom of the package rather than protruding leads, offering a compact form factor and excellent thermal performance
"RAM"	random access memory, a type of computer memory that can be accessed randomly, used to store working data and machine code currently in use, allowing for quick read and write access
"ROM"	read-only memory, a type of non-volatile memory used in computers and other electronic devices to store firmware or software that is not intended to be modified frequently
"SATA"	serial advanced technology attachment, an interface standard that uses serial connection, and is widely used to connect storage devices like hard drives and SSDs to a computer's motherboard, facilitating data transfer
"SRAM"	static random access memory, a type of RAM that uses bi-stable latching circuitry to store each bit, providing faster access times than DRAM and not requiring periodic refreshing
"SD card"	secure digital card, a non-volatile memory card format used in portable devices like cameras, smartphones and tablets for data storage and transfer
"semiconductor memory product"	a semiconductor component with information storage capabilities, widely used in various electronic products, serving as the hardware medium for data or programs
"SiP"	system-in-package, a type of chip packaging technology that combines multiple electronic components, such as processors, memory and sensors, passive components, and other electronic components into a single package, offering high integration, design flexibility and reduced space for compact electronic devices

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“SLC”	single-level cell, a type of Flash memory that stores one bit of data per cell, offering higher durability and faster performance compared to triple-Level Cell (“TLC”), which stores three bits per cell, and quad-level cell (“QLC”), which stores four bits per cell, all of which provide higher storage density at the cost of reduced speed and endurance
“SPU”	storage processing unit, a type of intelligent storage controller chip that integrates a memory control engine for data transfer and an intelligent processing engine for functions such as data compression, hot-cold data identification and workload adaptation
“SMT”	surface-mount technology, a technology where packaged chips and other electronic components are precisely mounted onto printed circuit boards
“SPI NAND Flash”	a type of non-volatile memory that combines the high-density storage benefits of NAND Flash with the efficient Serial Peripheral Interface (“SPI”) for data transfer, offering a compact and cost-effective solution for embedded systems and IoT devices
“SSD”	solid-state drive, an internal storage component installed within a computer or server, providing enhanced performance and reliability over traditional hard disk drives. Other special types of SSD include enterprise SSD (“eSSD”), portable SSD (“PSSD”), and micro-SSD (“mSSD”)
“stacked-die”	a packaging technology in which two or more dies are stacked and bonded in a single package. In this document, “stacked-die” specifically pertains to technologies that employ flip-chip and wire bonding techniques
“tape out”	the final step in the design phase of an integrated circuit, in which the completed circuit layout is sent to a wafer foundry for photomask production and wafer fabrication
“TB”	terabyte, a unit of digital information storage equal to approximately one trillion bytes, often used to measure the storage capacity of large databases and storage systems
“TCM”	technology contract manufacturing
“UFS”	universal flash storage, a high-performance, scalable flash storage specification designed for use in mobile devices and consumer electronics, offering fast data transfer speeds and improved power efficiency

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“uMCP”	UFS-based multi-chip package, a semiconductor packaging technique that integrates UFS and LPDDR within a single package, designed to be versatile and adaptable for various applications by supporting a wide range of functionalities and interconnections
“USB”	universal serial bus, a standardized interface that enables communication and power supply between computers and peripheral devices, facilitating easy connectivity and data transfer across a wide range of electronic equipment
“VOC”	volatile organic compounds, organic chemicals that have a high vapor pressure at room temperature, leading to significant vaporization and potential environmental and health impacts due to their presence in the atmosphere
“VR”	virtual reality, a technology that creates a simulated, immersive environment, allowing users to interact with and experience a computer-generated world as if it were real, typically through the use of specialized headsets and sensors
“wafer foundry”	a semiconductor manufacturing facility that fabricates integrated circuits on silicon wafers on behalf of other companies that provide the circuit designs, enabling fabless companies to produce their self-designed chips without owning fabrication facilities
“wafer supplier”	companies that design, manufacture and supply memory wafers and memory devices, and often collaborate with other companies that may integrate these memory chips or devices into their products or sell them under their own brand names
“wire bonding”	a method where fine wires are used to connect the bond pads on the semiconductor die to the corresponding pads on the substrate or lead frame. The die is placed face-up, and the wires are bonded using techniques such as thermo-compression, thermo-sonic, or ultrasonic bonding, which is a well-established, cost-effective, and flexible method suitable for a wide range of applications