

GLOSSARY

This glossary of technical terms contains definitions of certain terms used in this document in connection with our Company and our business. These terms and their definitions may not correspond to standard industry definitions, and may not be directly comparable to similarly titled terms adopted by other companies operating in the same industries as our Company.

“AC”	alternating current, the electrical current that regularly changes the direction in which it flows
“AC-DC power supply synchronous rectification”	offer improved efficiency and power density, particularly in secondary power supplies and for powering various vehicle systems, reduced voltage drop and power loss, leading to better thermal management and potentially smaller heat sinks
“ADAS”	advanced driver assistance systems, referring to electronic systems developed to automate, adapt, and enhance vehicle systems for safety and better driving, normally featuring level 1 and level 2 driving automation on a vehicle supporting human drivers
“AEC-Q”	standards established by the Automotive Electronics Council
“AEC-Q101 Grade 0/1”	temperature ranges for discrete semiconductor components, such as transistors and diodes. Grade 0 components are designed to operate reliably in harsher conditions, with a temperature range of -40°C to +150°C, while Grade 1 components have a slightly less extreme range of -40°C to +125°C
“AI Edge SoC”	Artificial Intelligence Edge System on a Chip, a specialized integrated circuit designed to enable artificial intelligence processing at the edge of a network, providing the processing power for perception, decision-making, and control in self-driving cars and other autonomous vehicles
“AR/VR”	Augmented Reality and Virtual Reality, which respectively refer to a technology that overlays real-time 3D-rendered computer graphics onto a portion of the real world through a display and a simulated experience that employs 3D near-eye displays and pose tracking to give the user an immersive feel of a virtual world
“AVDD, DVDD, VGH, VGL, and VCOM”	voltage signals commonly found in LCD and other display systems. AVDD is the analog power supply voltage, DVDD is the digital power supply voltage, VGH is the positive gate voltage, VGL is the negative gate voltage, and VCOM is the common voltage for the liquid crystal display

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“BCD”	Bipolar-CMOS-DMOS, a key process technology for PMICs. It is a family of silicon processes, each of which combines the strengths of three different process technologies onto a single chip: Bipolar for precise analog functions, CMOS for digital design and DMOS (Double Diffused Metal Oxide Semiconductor) for power and high-voltage elements
“BMS”	battery management system
“DC”	direct current, the electrical current that always flows in one direction
“DC Charger IC(s)”	direct current charger integrated circuit(s), which are specialized electronic components designed to manage the charging process of batteries using direct current power in electric vehicles
“DDIC”	display driver integrated circuit, which acts as a crucial interface between a digital system and a display panel like LCD or OLED
“DDR5”	Double Data Rate 5, which enables efficient management of multiple high-resolution displays and camera sensors, crucial for ADAS and in-vehicle infotainment
“doping” or “doped”	the intentional introduction of impurities into an intrinsic (undoped) semiconductor for the purpose of modulating its electrical, optical and structural properties
“double-sided cooling packages”	a power module design where heat is dissipated from both the top and bottom surfaces of the module, significantly improving thermal performance and power density
“DRAM”	dynamic random access memory, which refers to a type of semiconductor memory widely used in vehicles for various functions like powering displays, handling data from sensors in ADAS systems, and supporting the processing needs of self-driving technologies
“EEPROM”	electrically erasable programmable read-only memory, referring to a type of non-volatile memory used in vehicles to store important data like engine control unit (ECU) settings, calibration data, and other critical information that needs to be retained even when the car is turned off
“EMI noises”	electromagnetic interference noises, which refers to unwanted electrical signals that disrupt the normal operation of electronic circuits and devices

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“epitaxial”	a process of growing a thin, crystalline layer on top of a substrate, where the new layer’s crystal structure is aligned with the substrate’s structure
“ESD”	electrostatic-sensitive device, the component which can be damaged by common static charges which build up on people, tools, and other non-conductors or semiconductors
“EV”	electric vehicle
“Figure of Merit” or “FOM”	a quantitative measure used to evaluate and compare the performance of a device, system, or method. It’s a metric that helps assess performance relative to its alternatives
“foundry”	a specialized factory, also known as a fabrication plant (fab), that manufactures ICs
“GaN”	gallium nitride, which is typically found in the onboard charger (OBC), which converts AC power from the grid into DC that can charge the battery
“gate charge” or “Qg”	the amount of electrical charge that must be supplied to the gate of a power MOSFET or IGBT to switch it on and off
“GPIO”	general purpose input/output, referring to programmable digital pins on electronic components that can be configured as either inputs or outputs, allowing for flexible communication with various sensors, actuators, and other devices within a vehicle
“IC(s)”	integrated circuit(s)
“IFPM”	Interface PMIC
“IGBT(s)”	insulated-gate bipolar transistor(s), which are semiconductors mainly used as switching devices to allow or stop power flow and allowing for efficient control of the electric motor’s speed and torque by rapidly turning the current on and off
“ISO”	the International Organization for Standardization, a worldwide federation of national standards bodies
“ISO27001”	a globally recognized standard for information security management systems (ISMS)
“ISO 9001”	a globally recognized standard for quality management. It helps organizations of all sizes and sectors to improve their performance, meet customer expectations and demonstrate their commitment to quality. Its requirements define how to establish, implement, maintain, and continually improve a quality management system (QMS)

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“IDM”	integrated device manufacture, referring to a company/entity that handles all stages of semiconductor production, from design to manufacturing and packaging/testing
“Interfaced IC(s)”	interface integrated circuit(s), designed to facilitate the integration of diverse systems, such as sensors, displays, control modules, and communication networks, to ensure the efficient operation of automotive applications
“LCD”	liquid crystal displays, referring to flat-panel displays that utilize liquid crystals to modulate light and are used in various in-car systems like instrument clusters, infotainment systems, and rear-seat entertainment
“LDO”	low dropout regulators, referring to provide a stable voltage to various electronic systems within a vehicle and are used to convert the fluctuating voltage from the car battery into a steady, lower voltage required by sensitive electronic components
“LED”	a light-emitting diode, a semiconductor device that emits light when current flows through it
“MCU”	microcontroller unit, small computers on a single IC containing a processor core, memory and programmable input and output
“MOS”	metal oxide semiconductor
“MOSFET”	Metal-Oxide-Semiconductor Field-Effect Transistors, which are used in automobile applications to optimize weight and size factors, to simplify systems without penalizing convenience or safety, and to improve electrical energy efficiency
“NAND”	referring to NAND flash memory, a type of non-volatile storage technology used in various automotive applications and is chosen for its ability to store various types of data even when the vehicle is turned off
“N-type”	a type of semiconductor where electrons are the primary charge carriers
“OLED”	organic light-emitting diode, which is a light-emitting technology used to create thin, efficient and flexible displays and lighting panels

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“ON-resistance” or “ $R_{DS(ON)}$ ”	the resistance value between the drain and source of a MOSFET during operation (ON). It is measured by evaluating the voltage drop from drain to source under specific conditions. The smaller this value is, the lower the power loss
“OVP”	over voltage protection
“OSAT”	outsourced semiconductor assembly and test, referring to companies that specialize in packaging, assembling, and testing semiconductor components used in vehicles
“PDU”	power distribution unit, which acts as a central hub for distributing electrical vehicles (EVs) and as a central hub for distributing electrical power from the high-voltage battery and other sources to various vehicles systems, while also protecting against overcurrent and short circuits
“PLC(s)”	programmable logic controller(s), which are specialized computers that replace traditional electromechanical relays and timers to control industrial operations and machinery
“PMIC(s)”	power management integrated circuit(s)
“P-type”	a type of semiconductor material that has been doped with impurities to create a surplus of positively charged “holes”
“P-Well”	in an N-type doped semiconductor substrate, a p-well is a localized section of substrate that has been doped with P-type atoms or molecules, making that portion of the semiconductor P-type
“RGB display control”	a full-color display system using red, green, and blue (RGB) light-emitting diodes (LEDs) or other light sources to create a broad spectrum of colors
“Shielded Gate Trench” or “SGT”	a specific type of MOSFET design that improves performance by incorporating a shielding electrode within the trench structure
“SoC”	a System-on-a-Chip, an integrated circuit that combines most or all key components of a computer or electronic system onto a single microchip
“Super-Junction” or “SJ”	a specific structure used in power MOSFETs that allows for significantly lower ON-resistance while maintaining high breakdown voltage
“USB”	universal serial bus

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“USB VBUS line”	the power line within a USB connect that delivers 5V DC power from the vehicle’s power system to a connected device, like a smartphone or other portable electronics, mainly for charging devices and potentially for data transfer
“SiC”	silicon carbide, a semiconductor material used in electric vehicles (EVs) and other power electronics
“SOA”	safe operating area, referring to the defined range of voltage, current, and temperature within which a battery or other electrical component can operate without sustaining damage or causing a safety hazard
“T-CON”	timing controller, which receives image data and converts the format for the source drivers’ input and also generates controlling signals for gate and source drivers
“wafer”	a thin and round sheet made by slicing a monocrystalline ingot obtained by growing silicon (Si), gallium arsenide (GaAs), and other materials, which is the key material used to create semiconductor integrated circuits