

First to FuSa

On the road to fully autonomous vehicles, nothing is more important than ensuring that automotive electronic and electrical (E/E) systems meet rigorous safety standards. With 30 years of automotive technology innovation, Micron again leads the industry by introducing the first low-power DDR5 DRAM evaluated for automotive safety systems up to ASIL-D.

Without FuSa, autonomous vehicles aren't possible

What is FuSa?

Functional safety (FuSa) is the absence of unacceptable risk due to hazards caused by malfunctioning E/E systems. Since both safety and non-safety systems are typically tied to the same memory and processor, assuring reliability across all automotive applications is a top priority.

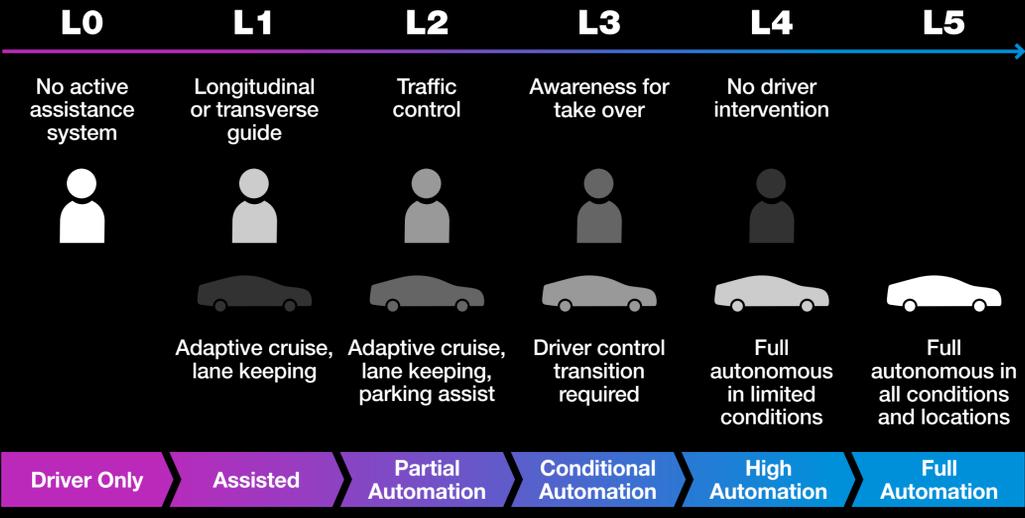
The most stringent set of automotive safety requirements is called **ASIL-D**.

10

Total number of failures per 114,000 years by an ASIL-D system¹

Taking autonomy to the next level

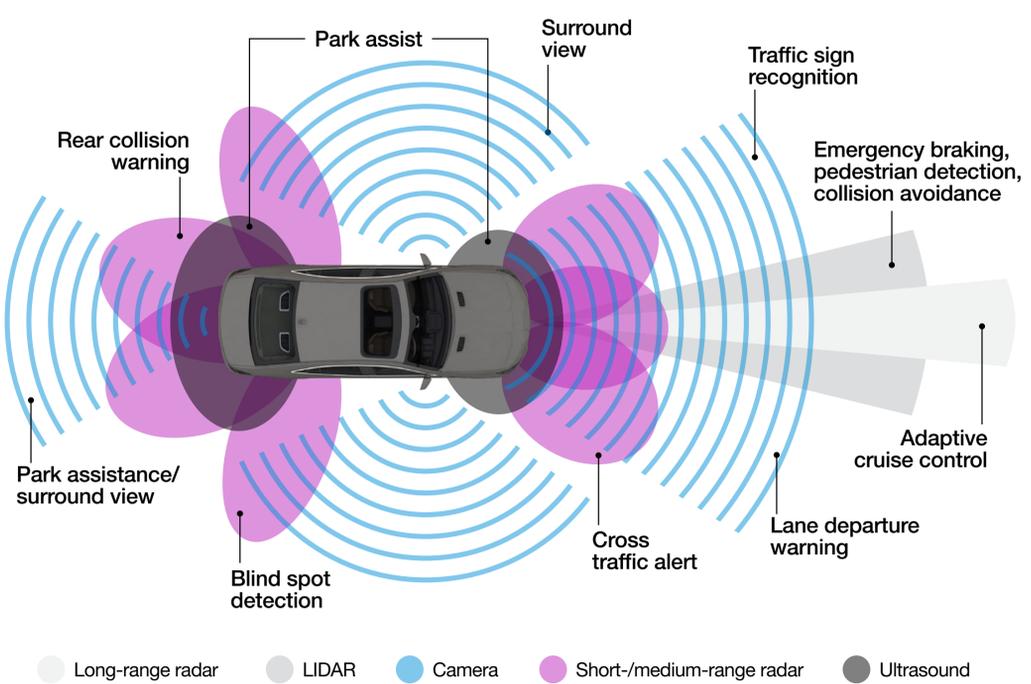
Modern vehicles equipped with advanced driver-assistance systems (ADAS) fall into the L1 to L2 range, with some supporting up to L3 capabilities. Higher levels of ADAS/AD capabilities are accelerating the need for data-centric levels of compute performance at the intelligent edge. Micron's innovations in memory and storage are helping the automotive industry make this shift a reality.



FuSa in ADAS

ADAS, by definition, assists drivers in achieving greater safety, and these systems will be increasingly required to meet the highest FuSa standards (ASIL-D). ADAS relies on sensor data that describes a vehicle's exterior environment.

To function properly, massive amounts of this data are fed into processors using next-generation memory and storage and processed in near real time.



Driving the need for automotive-qualified memory

Fully autonomous vehicles will generate more data than ever before from more sources: radar, lidar, C-V2X, image recognition, 5G and more. This massive data will need to be processed in the vehicle in near-real-time, driving the need for memory designed to handle rugged auto environments while meeting FuSa standards.

4TB
Average daily data today's cars generate²

600+
Tera operations per second (TOPS) required to process autonomous vehicle data (rivals data center compute⁴)

20TB
Average daily data autonomous vehicles will generate³

100M
Lines of code run by today's high-end vehicles (up to 300 million in the future⁵)

Micron is at the heart of automotive innovation

Micron's deep expertise is born from 30+ years of close collaboration with automotive customers during the system architecture definition phase of their product.

#1 supplier of automotive memory (based on market share)

30+ years of experience and commitment to automotive technology innovation

Trillions of miles on the road accumulated by Micron automotive memory and storage solutions since 1991⁶

As modern vehicles evolve from Level 2/3 ADAS systems to Level 4/5 autonomy where massive data volumes are processed at the intelligent edge, memory that meets the strictest FuSa standards will become integral to achieving full autonomy. Micron's automotive-certified LPDDR5 is the first FuSa-supported product in an expanding portfolio of functional safety-focused products.

Sources

¹ISO 26262, "Road vehicles — Functional safety," International Organization for Standardization (ISO), revised 2018
²"100 Million Lines of Code, 4 TB Data Per Day — Is That Your Next Car?" Futuremonger, January 2017, www.futuremonger.com/100-million-lines-of-code-4-tb-data-per-day-is-that-your-next-car-a2724e9bd3fa
³"Data storage is the key to autonomous vehicles' future," IoTNOW Transport, February 2019, www.iotnowtransport.com/2019/02/12/71015-data-storage-key-autonomous-vehicles-future/
⁴"Busy Road Ahead for Automotive Memory," EETimes, February 2021, www.eetimes.com/busy-road-ahead-for-automotive-memory/
⁵"How Many Lines of Code Does It Take?" VisualCapitalist, February 2017, www.visualcapitalist.com/millions-lines-of-code/
⁶Estimate based on Micron's calculations