



# All-Terrain Automotive Storage Solutions for the Road Ahead

ATP Electronics leverages nearly 30 years of manufacturing experience and a decade of automotive expertise to provide best-in-class automotive-grade memory and storage solutions.

The world's leading OEM/Tier 1 suppliers, system developers and service providers trust ATP to deliver the highest levels of data accuracy, consistency and integrity for the most demanding automotive applications.



# Why the Automotive World Trusts ATP



## Automotive Quality System

Qualified, Certified and Recognized

ATP Automotive Solutions comply with the most stringent international quality standards for the automotive sector.

### IATF 16949



This is one of the automotive industry's most widely used international standards. On October 3rd, 2016 IATF 16949:2016 was published by the IATF (International Automotive Task Force) and supersedes and replaces the current ISO/TS 16949, defining the quality management system requirements for the design and development, production and, when relevant, installation and service of automotive-related products.

(Certificates to ISO/TS 16949:2009 will no longer be valid after 14th September 2018)

### VDA 6.3



Part of a quality management system standard that is mandatory for German car makers, VDA 6.3 defines a process-based audit standard for production parts and services to evaluate and improve controls in a manufacturing organization. It was developed by the German trade association for the automotive industry (Verband der deutschen Automobilindustrie E.V.).

### International Material Data System (IMDS)



Used by the world's leading OEMs, the IMDS is a global archive of information on all materials found in finished automobile manufacturing.



## Automotive Compliance and Standards

Always Ready for the Rough Road

Vehicles operate under diverse environmental challenges. They should be able to withstand extreme temperatures, power limitations, natural elements and more. ATP Automotive Solutions are designed and built for rigorous, extended use.

### AEC-Q100\*

The AEC-Q100 is a failure mechanism-based stress test qualification for integrated circuits. The Automotive Electronics Council (AEC) was originally formed by leading car makers to establish common part-qualification and quality-system standards.

- **e.MMC:** -40°C to +105°C (Grade 2), -40°C to +85°C (Grade 3) ambient operating temperature range
- **SD/microSD:** Selected AEC-Q100 and AEC-Q104 test items; -40°C to +85°C (Grade 3) ambient operating temperature range

\* Selected AEC-Q100 test items and conditions approved by customers. May vary by product and project support.

### International Protection Marking\*

- Waterproof (IPX7)
- Dustproof (IP6X/IP5X)

\* For SD/microSD cards only.



## Longevity Commitment

Your Partner for the Long Haul

As your partner, ATP is committed to optimizing your investment, ensuring low total cost of ownership (TCO) and stable supply.

### Controlled BOM with PCN/EOL Notice\*

Implemented to guarantee long product cycles with buffer inventory. ATP makes sure that any changes affecting the process or product, as well as product end of life, are communicated to you.

- 5-year roadmap
- PCN/EOL notice typically 6 months in advance

### Global and Local FAE Support

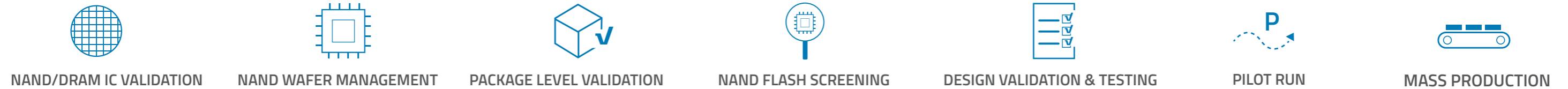
- Over 100 engineers and technical staff worldwide (31% of ATP's total workforce)
- Global presence in five countries with support sales and service offices
- Several global and regional franchised distributors including representatives proudly carrying the ATP brand

\* May vary by product and project support.



# Automotive Storage One-Stop Shop

From the IC level to wafer packaging all the way up to module level and mass production, ATP exercises total control of the manufacturing process to meticulously characterize, test and validate every component and finished product. Customers can have total peace of mind that they are not getting ODM or turnkey flash products.

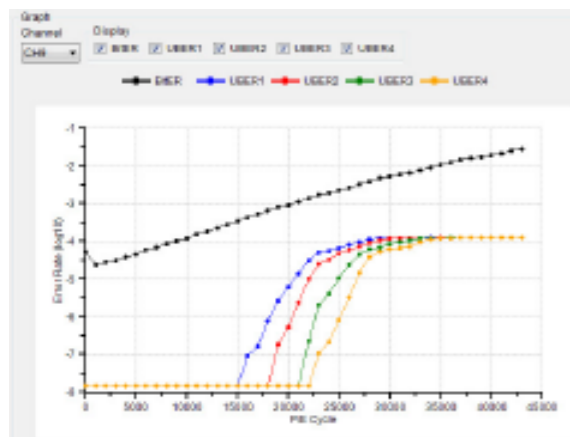


## Testing Capabilities

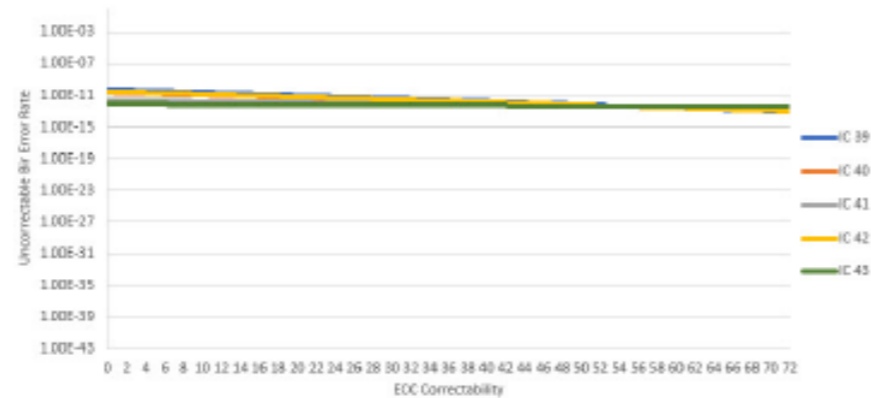
ATP exercises total control of the manufacturing process to meticulously characterize, test and validate every component and finished product. On top of standard tests, ATP offers own-designed unique and customized hardware, software and firmware testing. Below are examples of tests performed from IC, Module/Drive up to Mass Production Level.

### IC Level

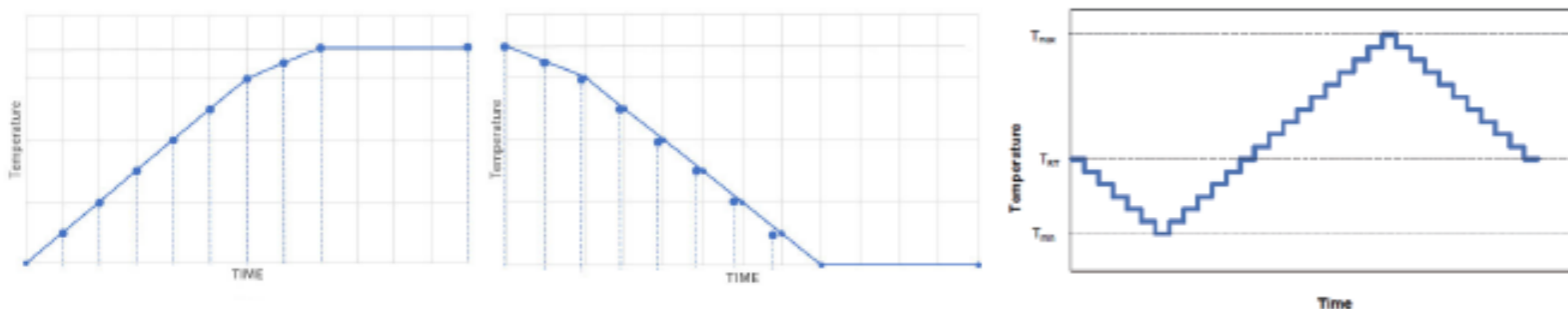
**Endurance Testing: UBER (Uncorrectable Bit Error Rate) based on different ECC levels**



**High Temperature Data Retention Testing: UBER after P/E cycling**



**Cross-Temperature Testing based on different test profiles**



### Drive Level

**Power Cycling Test**

This test uses ATP-developed tester platforms/scripts to uncover any power failure conditions such as unstable or marginal voltage supply, sudden power loss and power spikes that cause glitches.



**Joint Validation Test (Memory Cards)**

Compatibility and function tests with client-supplied host devices and systems to proactively detect failures and optimized system in prototype design phase.



Click [here](#) for a video showing detailed information on the Joint Validation program:

### MP Level

**Rapid Diagnostic Test**

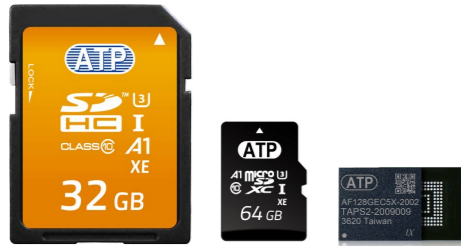
Applying the experiment of NAND Flash IC validation and P/R test, ATP is able to conduct NAND screening test (RDT) in mass production level. RDT involves complete, block-by-block testing of the entire drive including firmware, user and spare areas to improve drive reliability and endurance.

ATP has the capability to run high-low temperature testing in the chamber at mass production volumes



# Applications

Vehicles typically traverse areas with little or no network connectivity, move between varied climates and temperatures, and constantly generate and record vast amounts of data. Automotive storage, therefore should be able to keep data accurate, secure, and available when needed.



Telematics



In-Vehicle Infotainment (IVI)/  
Navigation System



Autonomous/  
Self-Driving Car



Advanced Driver  
Assistance System (ADAS)



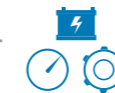
Event Data Recorder (EDR) /  
Tachograph



EV/PHV Charging Station



Drive Recorder /  
Surround View Monitoring



In-Vehicle Computer Automotive



Driver Monitoring System (DMS)



Fleet Surveillance/  
Management

# Summary of ATP Capabilities and Key Differentiators

## ATP Automotive One-Stop Shop

### Complete Process Ownership

- No turnkey solutions!
- Total manufacturing control from IC to drive and MP level
- Complete supply chain control







### Meticulous Testing and Validation

- ATP-designed testing boards and platforms
- ATP-developed testing programs
- Exhaustive testing and validation from IC to drive and MP level

### Value-Added Services

- Joint Validation Program
- Other customization services, depending on project and project support

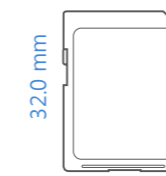
# Complete Automotive Storage Portfolio

Product	Dimensions (L x W x H mm)	NAND Type	Densities	Operating Temp.	Data Transfer Rate (max.)	TBW* (max.)	Power Failure Protection	Secure Erase (S/W)**	Life Monitor (S/W)**	
<b>SD</b>										
SDHC/SDXC	 64 GB	32.0 x 24.0 x 2.1	C-Temp 2D NAND	4 GB-64 GB	-25°C~ 85°C	Read: 96 MB/s Write: 78 MB/s	77 TB	✓	✓	✓***
			I-Temp 2D NAND		-40°C~ 85°C					
microSDHC/ microSDXC	 64 GB	15.0 x 11.0 x 1.0	C-Temp 2D NAND	4 GB-64 GB	-25°C~ 85°C	Read: 96 MB/s Write: 81 MB/s	77 TB	✓	✓	✓***
			I-Temp 2D NAND		-40°C~ 85°C					
SDHC/SDXC	 64 GB	32.0 x 24.0 x 2.1	C-Temp 3D NAND	32 GB-128GB	-25°C~ 85°C	Coming Soon				
			I-Temp 3D NAND		-40°C~ 85°C					
microSDHC/ microSDXC	 64 GB	15.0 x 11.0 x 1.0	C-Temp 3D NAND	32 GB-128 GB	-25°C~ 85°C					
			I-Temp 3D NAND		-40°C~ 85°C					
<b>Managed NAND</b>										
e.MMC		11.5 x 13.0 x 1.3 (max.)	3D SLC mode	8 GB-64 GB	-40°C~ 85°C	Read: 300 MB/s Write: 240 MB/s	1,320 TB	✓	✓	✓
			3D MLC	16 GB-128 GB						
e.MMC		11.5 x 13.0 x 1.3 (max.)	3D SLC mode	8 GB-64 GB	-40°C~ 105°C	Read: 300 MB/s Write: 240 MB/s	1,213 TB	✓	✓	✓
			3D MLC	16 GB-128 GB						

### ▪ NVMe, SATA, BGA SSD, UFS by project support

- \* Under highest Sequential write value. May vary by density, configuration and applications.
- \*\* ATP software support for demo use only.
- \*\*\* By project support

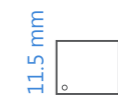
### Product Dimensions (Size) Comparison



SD



microSD



e.MMC



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