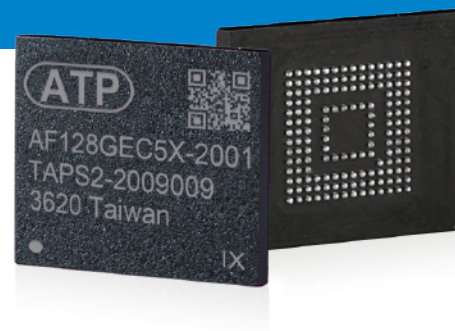


e.MMC 3D MLC and SLC Mode Reliability Report Summary

OBJECTIVE

This report aims to show that the Industrial and Automotive Grade 3 ATP e.MMC based on 3D NAND MLC and SLC mode flash are suitable for write-intensive and read-intensive applications that require a high degree of reliability while providing ample density for storage and stable performance in extreme environments.



COVERAGE CAPACITY

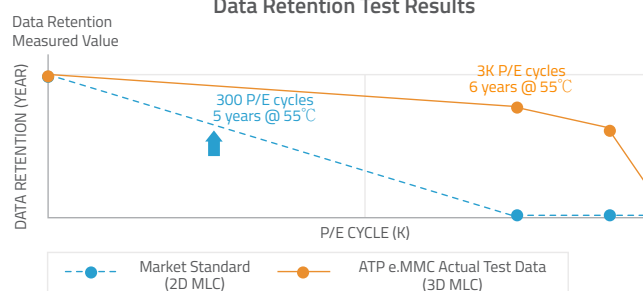
- E600Si/E600Sia (3DMLC) from 16GB ~128GB
- E700Pi/E700Pia (3D SLC mode) from 8GB ~64GB

HIGHLIGHTS

Storage Reliability

Using temperature, P/E cycles and time period as key factors, actual tests showed that the ATP e.MMC can retain data without degradation longer than specified in the data sheet. This makes the ATP 3D e.MMC suitable for read-intensive applications that require longer data retention at the same P/E cycle conditions.

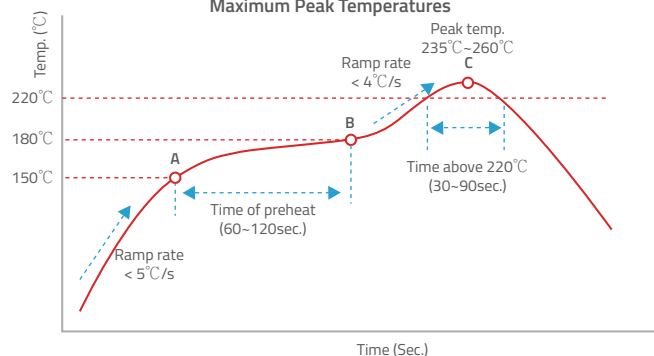
Data Retention Test Results



SMT Resistance with 3X Reflow

The ATP 3D e.MMC can resist high temperatures and keep the integrity of pre-loaded content at full capacity. The graph shows that the e.MMC was subjected to three intense levels of Pb-free reflow temperature, which are higher than Pb (lead) profiles.

General Reflow Profiles for Various Maximum Peak Temperatures



Terabytes Written (TBW): Higher than Benchmark

High TBW makes the ATP 3D e.MMC suitable for write-intensive applications.

Calculation: Sequential Write

Series	Capacity	TBW	REMARKS
E600Si/E600Sia Series (MLC)	128 GB	Up to 824 TB	60% better than benchmarking
E700Pi/E700Pia Series (SLC Mode)	64 GB	Up to 1320 TB	5% better than benchmarking

Outstanding Write Amplification Index/Factor (WAI/WAF)

The ATP 3D e.MMC's low WAI/WAF translates to longer lifespan, higher endurance and optimal total cost of ownership (TCO).

Sequential Write Test Results (Linux DD, 0x00)

Series	WAI/WAF
E600Si/E600Sia Series (MLC)	1.01
E700Pi/E700Pia Series (SLC Mode)	1.04

For inquiries or more information on ATP 3D e.MMC, please contact ATP regional sales, distributors, or send an email to Info@atpinc.com.