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Adesto® DataFlash® Memory Products Selector

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DataFlash® Product Selector Guide

Density	Root P/N	Status		Voltage Options				Interface			Temperature		Performance		Device Features														Package Options								
		Samples	Production	1.8V	2.3V	2.5V	2.7V	SPI	DUAL	QUAD	Industrial -40°C +85°C	Extended -40°C +105°C	Continuous Read (0x0B)	Continuous Read (0x1B)	Ultra Deep Power Down	Low Power Read <15Mhz	Byte Write	Erase Program Suspend Resume	Single SRAM Buffer	Dual SRAM Buffers	Software Reset	Re-Configurable Page Size	256/264 Byte Pages	512/528 Byte Pages	1024/1056 Byte Pages	Factory Serial Number (64Byte)	User Serial Number (64Byte)	Individual Sector Protection	Sector Lockdown (OTP)	Die / Wafer	SOIC8 150mil	SOIC8 208mil	DFN8 5x6	DFN8 6x8	CASON 8pin	TSOP 28pin	BGA 9ball
1 Mbit	AT45DB011D	Now	Now				•	•			•		66Mhz						•		•		•			•	•	•	•	•	•	•					
2 Mbit	AT45DB021E	Now	Now		1.65V - 3.6V			•			•	•	85Mhz	104Mhz	•	•	•	•		•	•	•	•			•	•	•	•	•	•	•	•				
4 Mbit	AT45DB041E	Now	Now		1.65V - 3.6V			•			•	•	85Mhz	104Mhz	•	•	•	•		•	•	•	•			•	•	•	•	•	•	•	•				
8 Mbit	AT45DB081E	Now	Now		1.7V - 3.6V			•			•		85Mhz	104Mhz	•	•	•	•		•	•	•	•			•	•	•	•	•	•	•	•				
16 Mbit	AT45DB161E	Now	Now		•			•			•	•	85Mhz	104Mhz	•	•	•	•		•	•	•		•		•	•	•	•	•	•	•	•				•
	AT45DQ161	Now	Now		•			•	•	•	•	•	85Mhz		•	•	•	•		•	•	•		•		•	•	•	•	•	•	•	•				•
32 Mbit	AT45DB321E	Now	Now		•			•			•		85Mhz	104Mhz	•	•	•	•		•	•	•		•		•	•	•	•	•		•	•	•			•
	AT45DQ321	Call Factory			•			•	•	•	•		85Mhz		•	•	•	•		•	•	•		•		•	•	•	•	•		•	•	•			•
64 Mbit	AT45DB641E	Now	Now		1.7V - 3.6V			•			•		85Mhz	104Mhz	•	•	•	•		•	•	•	•			•	•	•	•	•		•	•	•			•
128 Mbit	AT45DB128x	Q4'15	Q1'16		1.65V - 3.6V			•	•	•	•		85Mhz	104Mhz	•	•	•	•		•	•	•			TBC	•	•	•	•	•		•	•	•			•
																											Package Code		DWF	SSH	SH	MH	MWH	CNU	TU	CCU

Adesto® DataFlash Memories
Flexible Solutions for Code and Data

Next Generation Serial Flash Architecture: DataFlash

Adesto's AT45DBxxxE Series DataFlash devices are a family of enhanced feature SPI Serial Flash products that will contribute to improved system performance and lower energy consumption. The design philosophy behind these products has been focused on enhanced system performance and operation while contributing to a reduced energy consumption footprint.

Enhanced system performance is achieved through a command-rich interface that off-loads a large portion of the resources a CPU or MCU would need to assign to the memory management tasks. This allows for a significantly reduced CPU overhead and results in a lower overall software signature and energy footprint. The devices also feature a 'byte write' capability, eliminating the need to perform complex data write algorithms or manage large block or sector erase operations. This capability allows DataFlash to compete with Serial E² for the first time without huge software overhead.

Reduced Energy Consumption. Continuing with the philosophy of reducing energy, by reducing the load on the CPU/MCU, Adesto capitalizes on the fact that many systems often keep the non-volatile memory component in an off-line/standby mode for much of the system wake time. This is often achieved using techniques such as an LDO regulator or DC-DC converter or by switching power via a small FET or transistor, all of which are inefficient and add complexity and cost. To this end, Adesto has introduced "ultra deep power down mode", allowing the device to be effectively switched off by software to consume less than 300nA (typical). This mode is also supplemented by an additional low power read command allowing even lower current consumption levels when actively reading the device at low frequencies. To complement these advanced power modes, selected devices also offer continuous uninterrupted Vcc operation from 1.65V to 3.6V further eliminating the need for split rail power supplies, or separate memory device power supply regulators.

Data Protection and Integrity. To ensure data security and data integrity and prevent accidental or malicious data corruption, new 'E' series devices come with advanced sector protection features. Sectors can be locked and unlocked via software with non-volatile settings, negating the need to reset the configuration at power up. Additionally, any sector can be permanently locked; preventing that sector from ever being erased or re-programmed. The device can also be 'frozen' to prevent further malicious or accidental locking of sectors that could potentially render the application useless. To further enhance security, every DataFlash device is pre-programmed with a unique, non-alterable 64Byte electronic serial number, supplemented by a 64Byte user programmable serial number register. These can be combined with the unique UID's included with most MCU/CPU devices to create basic Anti-Tamper / Secure Boot Mechanisms.

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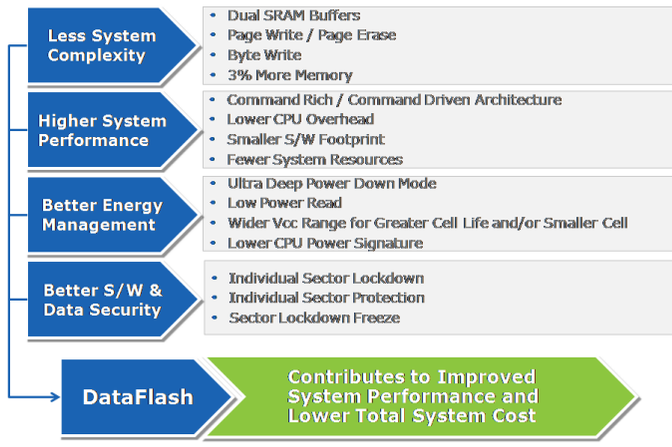
Adesto DataFlash® E Series

Improved Power Management, Higher System Efficiency, Lower System Costs

Adesto Technologies DataFlash "E" Series is a new family of non-volatile memory devices with lower power requirements and smart features for higher system efficiency and lower system costs. The E Series offers a range of features and options including industry-first capabilities such as wide Vcc voltage and an "ultra deep power down" mode. The products also include new smart features to improve system performance such as efficient "byte write" that doesn't require large block erase and an industry-standard "erase-program-suspend-resume" command.



Byte-write: Serial E²PROM Functionality in a Serial Flash Device

With Adesto's E Series devices, programmers issue a single software command to erase/write a single byte. This differs from standard Serial Flash products which require a 4Kb block erase. That means less memory management is required from the host controller, freeing it for higher priority operations. Less memory management also means a smaller software footprint in the controller's SRAM, providing the designer the flexibility to use a smaller microcontroller, or forego external SRAM. This feature will also reduce the MCU overheads, significantly reducing power consumption.

Ultra Deep Power Down:

The E-Series offers maximum energy savings, via a simple software instruction for ultra-deep power down. The power-down mode offered by the E Series is measured in nanoamps, an order of magnitude better than other competitive products. Software control of power down allows the designer to eliminate extra hardware components such as low dropout (LDO) voltage regulators, DC-DC converters or transistors, which add cost and complexity.

Extended Vcc Operation:

For mobile or battery operated devices, the DataFlash E-Series products can run unregulated to maximize battery life from 1.65V to 3.6V uninterrupted. In a comparison of standard Vcc parts, the extended voltage range can maximize the energy utilization from the battery by as much as 1000%, significantly enhancing the battery life in the product.

Low Power Read:

For applications running from smaller, slower MCU/CPU's and not operating in high MHz ranges, DataFlash now supports a low power read command that can boost energy savings by typically 20%+ at clock frequencies under 10MHz compared to standard read command options.

The E Series is ideally suited for digital voice, image, program code, data storage, and other memory applications.

Key Features

- 1-Mbit to 64-Mbit densities
- Small page array architecture
- Extended Vcc operation, continuous 1.65V to 3.6V and 2.3V to 3.6V
- Industry first, byte write Serial Flash
- Individually erasable pages of 256/264, or 512/528 bytes each
- Dual on-chip, independent SRAM buffers
  - SRAM buffer size equal to Flash memory page size
- Command-rich instruction set for reduced CPU overhead
- Enhanced low-power read operations
- Zero-power shutdown options: typically 300nA standby modes
- Software reset capability
- Erase-Program-Suspend-Resume command for concurrent Read/Write Operations
- 104MHz, 85MHz, SPI, dual-I/O and quad-I/O support
- Individual sector protection and 'OTP' sector lockdown
- 128-byte OTP security register
- 100,000 cycles per page minimum
- JEDEC manufacturer and device ID standard

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