Next Generation Serial Flash Architecture: DataFlash

Adesto's DataFlash devices are a family of enhanced feature SPI Serial Flash products that will contribute to improved system performance and lower energy consumption. The DataFlash-L family are page-erase serial flash devices optimized for wireless and wired protocols such as Z-Wave, BLE, Zigbee and other wi-fi platforms. DataFlash-L products feature a standard serial flash footprint for simple conversion from competitor's products, such as Micron's M25PE devices.

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 E^2 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, DataFlash 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® Memory Products Selector

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DataFlash® Product Selector Guide

Inventing Memory for Things™

Density	Part Number (Root)	Status		Voltage	Interface			Temperature			Performance		Device Features																Package Options						
		Samples	Production	Range	SPI	DUAL	QUAD	Industrial -40°C +85°C	Extended -40°C +105°C	Extended -40°C +125°C	Continuous Read (0x0B)	Continuous Read (0x1B)	Ultra Deep Power Down	Low Power Read <15Mhz	Byte Write	Active Interrupt	Erase Program Suspend Resume	Dual SRAM Buffers	Software Reset	Re-Configurable Page Size	256/264 Byte Pages	512/528 Byte Pages	Factory Serial Number	User OTP Register	Individual Sector Protect	Sector Lockdown (OTP)	RoHS Compliant	Die / Wafer	SOIC8 150mil	SOIC8 208mil	DFN8 5x6	DFN8 6x8	WLCSP	BGA 9ball
2Mbit	AT45DB021E	Now	Now	1.65V - 3.6V	•			•	○	○	85Mhz	104Mhz	•	•	•		•		•	•	•		•	•	•	•	•	•	•	•	•			
4Mbit	AT45DB041E	Now	Now	1.65V - 3.6V	•			•	○	•	85Mhz	104Mhz	•	•	•		•	•	•	•	•		•	•	•	•	•	•	•	•	•	•		
8Mbit	AT45DB081E	Now	Now	1.7V - 3.6V	•			•	○	○	85Mhz	104Mhz	•	•	•		•	•	•	•	•		•	•	•	•	•	•	•	•	•	•		
16Mbit	AT45DB161E	Now	Now	2.3V - 3.6V	•			•	•		85Mhz	104Mhz	•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•
	AT45DQ161	Now	Now	2.3V - 3.6V	•	•	•	•	•		85Mhz		•	•	•		•	•	•	•		•	•	•	•	•	•	•	•	•	•	○	•
32Mbit	AT45DB321E	Now	Now	2.3V - 3.6V	•			•	•		85Mhz	104Mhz	•	•	•		•	•	•	•		•	•	•	•	•	•	•		•	•	•	○	•
	AT45DQ321	Now	Now	2.3V - 3.6V	•	•	•	•	•		85Mhz		•	•	•		•	•	•	•		•	•	•	•	•	•	•		•	•	•	○	•
	AT45DB32xF	Q1'18	Q3'18	1.65V - 3.6V	•	•	•	•	○	○	85Mhz	104Mhz	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•
64Mbit	AT45DB641E	Now	Now	1.7V - 3.6V	•			•	○		85Mhz	104Mhz	•	•	•		•	•	•	•	•		•	•	•	•	•	•		•	•	•	•	•
	AT45DB64xF	Q3'17	Q2'18	1.65V - 3.6V	•	•	•	•	○	○	85Mhz	104Mhz	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•	•	•	•	•

- • Available
- ○ Option
- Blank Not Available

DataFlash-L Product Selector Guide

Density	Part Number (Root)	Status		Voltage	Interface			Temperature			Performance		Device Features															Package Options						
		Samples	Production	Range	SPI	DUAL	QUAD	Industrial -40°C +85°C	Extended -40°C +105°C	Extended -40°C +125°C	Continuous Read (0x0B)	Continuous Read (0x1B)	Ultra Deep Power Down	Low Power Read <15Mhz	Byte Write	Active Interrupt	Erase Program Suspend Resume	Dual SRAM Buffers	Software Reset	Configurable Page Size	256/264 Byte Pages	512/528 Byte Pages	Factory Serial Number	User OTP Register	Individual Sector Protect	Sector Lockdown (OTP)	RoHS COMPLIANT	Die / Wafer	SOIC8 150mil	SOIC8 208mil	DFN8 5x6	DFN8 6x8	WLCSP	BGA 9ball
2Mbit	AT25PE20	Now	Q4'17	1.65V - 3.6V	•			•			85Mhz	85Mhz	•	•	•				•	•	•		•		•		•		•	•	•			
4Mbit	AT25PE40	Q4'17	Q1'18	1.65V - 3.6V	•			•			85Mhz	85Mhz	•	•	•			•	•	•	•		•		•		•		•	•	•			
8Mbit	AT25PE80	Q4'17	Q1'18	1.7V - 3.6V	•			•			85Mhz	85Mhz	•	•	•			•	•	•	•		•		•		•		•	•	•			
16Mbit	AT25PE16	Q4'17	Q1'18	2.3V - 3.6V	•			•			85Mhz	85Mhz	•	•	•			•	•	•		•	•		•		•		•	•	•			

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Adesto® DataFlash Memories

Flexible Solutions for Code and Data Storage