Adesto Technologies— Fusion Serial Flash

Wide Voltage, Ultra-Low Power Products for Wearable, Mobile and Energy-Conscious Applications

Adesto Technologies introduces a new family of wide-voltage range, ultra-low power Serial Flash memory products. Targeted for wearable, mobile, and other energy conscious applications, the new "Fusion" Serial Flash family enhances Adesto's existing AT25DF products by combining industry standard sector sizes and read/write commands with new features such as wide Vcc (1.65V-4.4V), "ultra-deep power down" mode, and page erase capability. The ultra-deep power down mode allows devices to function with a class leading standby current of 200 nanoamps -- an order of magnitude improvement over standby modes available today. With these features, the new memory can extend the life of battery-operated devices such as Bluetooth low energy (BLE) products, DECT ULE (Ultra Low Energy), ZigBee RF4CE, Z-Wave and other Wi-Fi and Wi-Fi Direct applications.

Wide Vcc Operation:
For mobile or battery operated devices, Fusion products can run unregulated to maximize battery life from 1.65V to 4.4V 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.

Ultra Deep Power Down:
Fusion products offers maximum energy savings, via a simple software instruction for ultra-deep power down. The power-down mode offered 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.

Page Erase Functionality:
With Adesto's Fusion products, designers can erase pages as small as 256 bytes when reprogramming the device. This differs from standard Serial Flash products which require a minimum of 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 (reduced code size), and lower MCU overheads. This results in much lower power requirements and gives designers the flexibility to use smaller, lower cost microcontrollers, or forego the need for supplementary external SRAM. A page erase architecture significantly enhances system capability.

The Fusion family is ideally suited for wearable, mobile, and other energy-conscious memory applications. A companion set of new devices with a narrow Vcc range (2.3-3.6V) which include the ultra-deep power down feature is also available for customers with standard voltage range requirements.

Key Features

- Single 1.65V - 3.6V, 2.3 - 3.6V or 1.6V - 4.4V Supply
- Serial Peripheral Interface (SPI) Compatible
- 85MHz Maximum Operating Frequency
  - Clock-to-Output (tV) of 6 ns
- Flexible, Optimized Erase Architecture for Code and Data Storage Applications
  - Uniform 256-Byte Page Erase
  - Uniform 4-Kbyte Block Erase
  - Uniform 32-Kbyte Block Erase
  - Full Chip Erase
- Hardware Controlled Locking of Protected Sectors
- Fast Program and Erase times
  - 1.5ms Typical Page Program (256 Bytes) Time
  - 50ms Typical 4-Kbyte Block Erase Time
  - 400ms Typical 32-Kbyte Block Erase Time
- Automatic Checking and Reporting of Erase and Program Failures
- Software Controlled Reset
- JEDEC Standard Manufacturer and Device ID Read
- Low Power Dissipation
  - 200nA Ultra Deep Power Down (Typical)
  - 5µA Deep Power-Down (Typical)
  - 25uA Standby current (Typical)
  - 5mA Active Read Current (Typical)

Adesto® Serial Flash/Fusion Memory Products Selector

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Serial Flash 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	QPI	Industrial -40°C +85°C	Extended -40°C +105°C	Extended -40°C +125°C	Continuous Read	Ultra Deep Power Down	Extra Low Energy	Low Power Program Erase	Low Power Read	Byte /Page Write	256 Byte Page Erase	4KB Block Erase	32KB Block Erase	64KB Block Erase	Erase Program Suspend Resume	Sequential Program	Active Interrupt	JEDEC RESET	Software Reset	HOLD RESET Pin	SFDP	Factory Serial Number	User OTP Register	H/W Sector Protect	Individual Sector Protect	Sector Lockdown (OTP)	RoHS Compliant	Die/ Wafer	SOIC8 150mil	SOIC8 208mil	DFN8 2x3	DFN8 5x6	DFN8 6x8	TSSOP8	WLCSP	BGA
256Kbit	AT25DF256	•	•	1.65V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
	AT25DN256	•	•	2.3V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
512Kbit	AT25DF512C	•	•	1.65V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
	AT25DN512C	•	•	2.3V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
	AT25XE512C	•	•	1.65V - 3.6V	•	•			•			85Mhz	•	•		•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
1Mbit	AT25DF011	•	•	1.65V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
	AT25DN011	•	•	2.3V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
	AT25XE011	•	•	1.65V - 3.6V	•	•			•			85Mhz	•	•		•	•	•	•	•			•			•			•	•	•			•	•	•				•	○	
2Mbit	AT25DF021A	•	•	1.65V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
	AT25XE021A	•	•	1.65V - 3.6V	•	•			•			85Mhz	•	•		•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
	AT25XV021A	•	•	1.65V - 4.4V	•	•			•			85Mhz	•	•		•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
4Mbit	AT25DF041B	•	•	1.65V - 3.6V	•	•			•			85Mhz	•			•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
	AT25SF041	•	•	2.5V - 3.6V	•	•	•		•			104Mhz					•		•	•	•						•					•			•	•	•	•	•	•	•	•	
	AT25XE041B	•	•	1.65V - 3.6V	•	•			•			85Mhz	•	•		•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
	AT25XV041B	•	•	1.65V - 4.4V	•	•			•			85Mhz	•	•		•	•	•	•	•	•		•	•		•			•	•	•			•	•	•		•	•	•	•	•	
8Mbit	AT25DF081A	•	•	2.5V - 3.6V	•	•			•			85Mhz					•		•	•	•		•						•	•	•			•	•	•	•		•				
	AT25DL081	•	•	1.65V - 1.95V	•	•			•			85Mhz					•		•	•	•		•						•	•	•			•	•	•	•				•		
	AT25SF081	•	•	2.5V - 3.6V	•	•	•		•		○	104Mhz					•		•	•	•						•					•			•	•	•	•	•	•	•	•	
	AT25XV081B	Q1'18	Q3'18	1.65V - 4.4V	•	•	•	•	•		○	85Mhz	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	
16Mbit	AT25DL161	•	•	1.65V - 1.95V	•	•			•			85Mhz					•		•	•	•	•	•								•			•	•	•	•		•			•	○
	AT25SF161	•	•	2.5V - 3.6V	•	•	•		•		○	104Mhz					•		•	•	•	•				•	•				•			•	•	•	•		•			○	○
	AT25XV161B	2H'18	2H'18	1.65V - 4.4V	•	•	•	•	•			85Mhz	•	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•			•	•	•	•		•			•	
32Mbit	AT25DF321A	•	•	2.5V - 3.6V	•	•			•			85Mhz					•		•	•	•	•	•								•	•		•	•	•	•		•				•
	AT25SF321	•	•	2.5V - 3.6V	•	•	•		•		○	104Mhz					•		•	•	•	•				•	•				•			•	•	•	•		•			○	○
	AT25SL321	•	•	1.65V - 1.95V	•	•	•	•	•		○	104Mhz					•		•	•	•	•				•		•		•	•			•	•	•	•		•			○	○
	AT25QL321	•	•	1.65V - 1.95V	•	•	•	•	•		○	104Mhz					•		•	•	•	•				•		•		•	•			•	•	•	•		•			○	○
64Mbit	AT25DF641A	•	•	2.7V - 3.6V	•	•			•			85Mhz					•		•	•	•	•	•						•	•	•	•		•	•		•		•	○			○
	AT25SF641	•	•	2.7V - 3.6V	•	•	•	•	•			104Mhz					•		•	•	•	•				•		•		•	•			•	•		•		•	○		○	○
	AT25QF641	•	•	2.7V - 3.6V	•	•	•	•	•			104Mhz					•		•	•	•	•				•		•		•	•			•	•		•		•	○		○	○
	AT25SL641	•	•	1.65V - 1.95V	•	•	•	•	•			104Mhz					•		•	•	•	•				•		•		•	•			•	•		•		•	○		○	○
	AT25QL641	•	•	1.65V - 1.95V	•	•	•	•	•			104Mhz					•		•	•	•	•				•		•		•	•			•	•		•		•	○		○	○
128Mbit	AT25SF128	Q2'17	Q3'17	2.7V - 3.6V	•	•	•	•	•			104Mhz					•		•	•	•	•			○	•		•		•	•			•	•		•		•	○		○	○
	AT25SL128A	•	•	1.65V - 1.95V	•	•	•	•	•			104Mhz					•		•	•	•	•			○	•		•		•	•			•	•		•		•	○		○	○
	AT25QL128A	•	•	1.65V - 1.95V	•	•	•	•	•			104Mhz					•		•	•	•	•			○	•		•		•	•			•	•		•		•	○		○	○

- • Available
- ○ Option
- Blank Not Available

As modern electronics evolve, the need for new low density, low energy data and code storage memory devices has emerged to meet the needs of mobile, medical, wearable, industrial, security and home automation applications. These applications are rapidly growing in a world connecting everything around us.

Adesto's Serial Flash family addresses these needs with Fusion Serial Flash and standard block erase memory products. Adesto's Fusion Serial Flash products combine industry standard sector sizes, block erase and read/write commands with low energy operation, powerful energy management options and page erase features. Together, Adesto Serial Flash products provide high flexibility for a variety of code storage applications.

Fusion Serial Flash: Features and Benefits

- Wide Vcc operating range (1.65-4.4V) extends battery life without sacrificing performance
- Ultra deep power down operates at <200nA significantly reducing system standby power
- Page erase enables faster programming updates
- Advanced security functions and embedded serial numbers provide anti-tamper and traceability

Standard Serial Flash: Features and Benefits

- SPI industry-standard compatibility
- 4KB, 32KB, and 64KB block erase size provide flexibility for code management

adesto® TECHNOLOGIES

Adesto® Serial Flash Memories
Flexible Solutions for Code and Data Storage