Application Note AN400-A1

Adesto 64Mbit Products Overview

Revision History

Version	Date	Description
A1	12/19	Initial release.

Table of Contents

List of Tables

1. Adesto 64Mbit Products Overview

This document describes 64Mbit products available from Adesto Serial Flash Memory family. It also provides information on migrating from the AT25SF641 (not recommended for new designs) to other 64Mbit products available from Adesto.

Table 1: Products Overview

Family	Part Number	Product Status	Nominal System Voltage	SPI Support
SF	AT25SF641B	New Product	3.3V	Single/Dual/Quad
SF	AT25SF641	Not recommended for new designs	3.3V	Single/Dual/Quad
QF	AT25QF641			Quad enable default
SL	AT25SL641	Mass Production	1.8V	Single/Dual/Quad
QL	AT25SL641			Quad enable default

2. Feature Comparison

Table 2 describes major feature differences between the 64Mbit products.

Column1	AT25SF641B	AT25SF/QF641	AT25SL/QL641
Memory Organization			
Total Memory (Mbit)	64	64	64
Total Memory (MB)	8	8	8
Total 64KB block #	128	128	128
Total 32KB block #	256	256	256
Total 4KB sector #	2048	2048	2048
Page Size (Bytes)	256	256	256
Total Page #	32768	32768	32768
Block Erase Size	64KB / 32KB	64KB / 32KB	64KB / 32KB
Sector Erase Size	4KB	4KB	4KB
OTP Organization	3 x 256 Byte	4KB	4KB
UID / ESN Register Size	64-bit	128-bit	128-bit
SFDP Table	x	x	x
Host Interface Support			
Single SPI (1-1-1) 03/0B	x	x	x
Dual Read (1-1-2) 3B	x	x	x
Dual I/O (1-2-2) BB	x	x	x
Quad Read (1-1-4) 6B	x	x	x
Quad I/O (1-4-4, 0-4-4) EB [XiP]	x	x	x
Quad I/O (1-4-4, 0-4-4) E7 [XiP]	x	x	x
Quad Page Program (1-1-4) 32h	x	-	-
Quad Page Program (1-4-4) 33h	-	x	x
QPI (4-4-4) EB/0C	-	x	x
Operating Condition			
Operating Voltage Range [V]	2.7 – 3.6	2.7 – 3.6	1.7 – 2.0
Operating Temperature	-40 to 85	-40 to 85	-40 to 85
Endurance	100K	100K	100K
Data Retention	20yr	20yr	20yr

Table 2: Feature Comparison

3. Command Set (Opcode) Comparision

Table 3 shows the comparisons in Command Set or Opcode for all 64Mbit products.

Column1	AT25SF641B	AT25SF/QF641	AT25SL/QL641
System Commands			
Enable Reset	66h	66h	66h
Reset Device	99h	99h	99h
Deep Power-down	B9h	B9h	B9h
Release/Resume from Deep Power-down	ABh	ABh	ABh
Read Commands			
Normal Read Data	03h	03h	03h
Fast Read	0Bh	0Bh	0Bh
Dual Output Fast Read	3Bh	3Bh	3Bh
Dual I/O Fast Read (Continuous Mode)	BBh	BBh	BBh
Quad Output Fast Read	6Bh	6Bh	6Bh
Quad I/O Fast Read (Continuous Mode)	EBh	EBh	EBh
Word Read Quad I/O (Continuous Mode)	E7h	E7h	E7h
Set Burst with Wrap	77h	77h	77h
Write Commands			
Write Enable	06h	06h	06h
Volatile Status Reg. Write Enable	50h	50h	50h
Write Disable	04h	04h	04h
Program Commands			
Page Program	02h	02h	02h
Sequential Program Mode	-	-	-
Dual Page Program	-	-	-
Quad Page Program (1-1-4)	32h	-	-
Quad Page Program (1-4-4)	-	33h	33h
Erase Commands			
Page Erase (256B)	-	-	-
Sector Erase (4KB)	20h	20h	20h
Block Erase (32KB)	52h	52h	52h
Block Erase (64KB)	D8h	D8h	D8h
Chip Erase	60h/C7h	60h/C7h	60h/C7h
Status Register Commands			
Read Status Register 1	05h	05h	05h
Read Status Register 2	35h	35h	35h

Read Status Register 3	15h	-	-
Write Status Register 1	01h	01h	01h
Write Status Register 2	31h	31h	31h
Write Status Register 3	11h	-	-
Suspend/Resume Commands			
Program/Erase Suspend	75h	75h	75h
Program/Erase Resume	7Ah	7Ah	7Ah
Device Info			
Manuf/Device ID	90h	90h	90h
Manuf/Device ID Dual I/O	92h	92h	92h
Manuf/Device ID Quad I/O	94h	94h	94h
Read JEDEC ID	9Fh	9Fh	9Fh
Read Serial Flash Discoverable Parameter	5Ah	5Ah	5Ah
OTP Commands			
Enter Secure OTP / Program Security Registers	-	B1h	B1h
Exit Secure OTP	-	C1h	C1h
Erase Security Registers	44h	-	-
Write Security Registers	42h	2Fh	2Fh
Read Security Registers	48h	2Bh	2Bh
Read Unique ID Number	4Bh	-	-
QPI Commands			
Enable QPI Mode	-	38h	38h
Disable QPI Mode	-	FFh	FFh
Burst Read with Wrap	-	0Ch	0Ch
Set Read Parameter	-	C0h	C0h

Table 3: Command Set Comparison

4. Device ID Comparison

All Adesto 64Mbit products have a different device ID to allow identification by the host system.

Column1	AT25SF641B	AT25SF/QF641	AT25SL/QL641
Release Power-down / Read ID [ABh]	16h	16h	16h
Manufacturer and Device ID Single I/O [90h]	1Fh, 16h	1Fh, 16h	1Fh, 16h
Manufacturer and Device ID Dual I/O [92h]	1Fh, 16h	1Fh, 16h	1Fh, 16h
Manufacturer and Device ID Quad I/O [94h]	1Fh, 16h	1Fh, 16h	1Fh, 16h
Read JEDEC ID [9Fh]	1Fh, 88h, 01h	1Fh, 32h, 17h	1Fh, 43h, 17h
Read SFDP [5Ah]	Yes	Yes	Yes

Table 4: Device ID Comparison

5. Status Register Comparision

Table 5 shows the comparisons in Status Register definitions and access method for all Adesto 64Mbit products.

	AT25SF641B	AT25SF/QF641	AT25SL/QL641
Status Register			
Read Status Register 1	05h	05h	05h
Read Status Register 2	35h	35h	35h
Read Status Register 3	15h	-	-
Write Status Register 1	01h	01h	01h
Write Status Register 2	31h	01h	31h
Write Status Register 3	11h	-	-

Table 5: Status Register Commands Comparison

Table 6 shows the comparisons in Status Register definitions for all Adesto 64Mbit products.

	AT25SF641B	AT25SF/QF641	AT25SL/QL641
Status Register 1			
0	RDY/BSY	RDY/BSY	RDY/BSY
1	WEL	WEL	WEL
2	BP0	BP0	BP0
3	BP1	BP1	BP1
4	BP2	BP2	BP2
5	TB	TB	TB
6	SEC	SEC	SEC
7	SRP0	SRP0	SRP0
Status Register 2			
0	SRP1	SRP1	SRP1
1	QE	QE	QE
2	P_SUS	Reserved	Reserved
3	LB1	Reserved	Reserved
4	LB2	Reserved	Reserved
5	LB3	Reserved	Reserved
6	CMP	CMP	CMP
7	E_SUS	SUS	SUS
Status Register 3			
0	Reserved		
1	Reserved		
2	Reserved		
3	Reserved		
4	Reserved		
5	DRV0		
6	DRV1		
7	Reserved		

Table 6: Status Register Bit Level Comparison

6. Packaging Options

Table 7 provides the current packaging options available for all 64Mbit products. Contact Adesto for questions regarding packaging options. Most 64Mbit products are also available in KGD form.

	AT25SF641B	AT25SF/QF641	AT25SL/QL641
SOIC			
8-pin SOIC (0.208" wide body)	X	X	X
UDFN			
8-pad 5 x 6 mm UDFN	X	X	X
WLCSP			
8-ball WLCSP			X
Die Wafer Form			
Wafer	X		

Table 7: Packaging Options