

Migrating from competitors' 512-Mb and 1-Gb 1.8-V Quad SPI Flash to Infineon SEMPER™ Flash

About this document

Scope and purpose

This document discusses the key differences to consider when migrating to Infineon SEMPER™ Flash with Quad SPI S25HS512T and S25HS01GT devices from Macronix and Micron devices.

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1 Introduction

Infineon SEMPER™ Flash with Quad SPI is a family of 512-Mb and 1-Gb 1.8-V 45-nm MIRRORBIT™ SPI flash memory devices. It incorporates the enhanced SPI x1/x2/x4 protocol along with new data protection mechanisms and additional features such as endurance flex, ECC and data integrity check, providing a distinct advantage over other serial NOR flash devices in the market.

This document provides guidelines to migrate from competitor serial NOR flash products to SEMPER™ Flash S25HS512T and S25HS01GT devices. This application note describes the protocol differences, enhancements in data protection schemes, variations in AC/DC parameters and low-power modes. It is applicable to the S25HS-T family that incorporates the 512 Mb and 1 Gb densities.

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Feature and performance comparison

2 Feature and performance comparison

Infineon S25HS-T devices are well suited for migration from the Macronix MX25U51245G, MX66U1G45G, MX66U51235F; Micron MT25QU512ABB, MT25QU01GBBB parts. The Infineon, Micron, and Macronix serial NOR flash products are compatible in terms of pinouts, packages, standard command sets, and 4-KB/64-KB/256-KB sector architecture.

Infineon S25HS-T provides high-performance read commands, functional-safety-related features, extended temperature ranges, and AEC-Q100 qualification for automotive applications, making it an advantageous choice for migration from Macronix and Micron devices.

Minor differences exist among all serial NOR flash devices such as the command set, timing specifications, power consumption, and Secure Silicon Region architecture. Migration from Macronix and Micron devices to Infineon S25HS-T family may require software changes to accommodate the differences between devices.

System designers should also note differences in power consumption, because it alters the power used by a system. The following sections provide detailed information on the differences among devices to help you achieve a successful migration.

2.1 Comparison of 512-Mb and 1-Gb devices

The following table compares packages, features, and performance of Quad SPI Flash devices.

Parameter ^{1,2}		Infineon S25HS512T / S25HS01GT	Micron MT25QU512ABB / MT25QU01GBBB	Macronix MX25U51245G / MX66U1G45G	Macronix MX66U51235F
Die		Monolithic	Monolithic / 2 x 512 Mb	Monolithic	Monolithic
Package/Pinout	BGA 24 6 × 8 mm	Yes / No	Yes	Yes / No	Yes
	BGA 24 8 × 8 mm	No / Yes	No	Yes	No
	16-pin SOIC 300 mil	Yes / Yes	Yes	Yes	Yes
	8-contact WSON 6 x 8 mm	Yes / No	Yes	Yes / No	Yes
	WL CSP	No	Yes	No / Yes	No
Temperature Range	Industrial (–40°C to 85°C)	Yes	Yes	Yes	Yes
	Industrial Plus (–40°C to 105°C)	Yes	No	No	No
	Extended - Grade 1 (–40°C to 125°C)	Yes	No	No	No
	AEC-Q100 Grade 3 (–40°C to +85°C)	Yes	No	No	No
	AEC-Q100 Grade 2 (–40°C to +105°C)	Yes	Yes	No	No
	AEC-Q100 Grade 1 (–40°C to +125°C)	Yes	No	No	No
Operating Voltage Range		1.7 V to 2.0 V	1.7 V to 2.0 V	1.65 V to 2.0 V	1.65 V to 2.0 V
Standby Current	Typical	11 µA	20 µA / 40 µA	20 µA	40 µA
	Max	113 µA / 160 µA	100 µA / 160 µA	180 µA	200 µA
	Typical	1.3 µA	2 µA / 4 µA	3 µA	3 µA

1 Refer the appropriate product datasheet for information regarding the test conditions applicable to the parameters listed in this table.

2 Values shown for –40°C to 85°C.

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Feature and performance comparison

Parameter ^{1,2}		Infineon S25HS512T / S25HS01GT	Micron MT25QU512ABB / MT25QU01GBBB	Macronix MX25U51245G / MX66U1G45G	Macronix MX66U51235F
Deep Power Down Current	Max	18 µA / 24 µA	50 µA / 65 µA	50 µA	40 µA
SDR Quad Read Current	Typical	53 mA @ 166 MHz	–	22 mA @ 133 MHz	–
	Max	69 mA / 72 mA @ 166 MHz	28 mA / 35 mA @ 166 MHz	30 mA @ 133 MHz	40 mA @ 108 MHz
Page Program Current	Typical	50 mA	–	30 mA	20 mA
	Max	58 mA / 66 mA	35 mA	40 mA	25 mA
Write Status Register Current	Typical	50 mA	–	20 mA	20 mA
	Max	55 mA / 66 mA	35 mA	40 mA	40 mA
Erase Current	Typical	50 mA	–	20 mA	40 mA
	Max	55 mA / 66 mA	35 mA	40 mA	50 mA
Data Retention		25-year ³	20-year Typical	20-year	20-year
Endurance (Program/Erase Cycles)		1.280 M / 2,560 M Minimum ³	100k Minimum	100k Typical	100k Typical
Burst Wrap Lengths		8, 16, 32, 64 bytes	16, 32, 64 bytes	8, 16, 32, 64 bytes	8, 16, 32, 64 bytes
Non-Volatile Write Register Time	Typical	44 ms	1.3 ms	–	–
	Max	357.5 ms	8 ms	40 ms	40 ms
Page Buffer Size		256 - 512 byte	256 byte	256 byte	256 byte
Page Program Time	Typical	480 µs - 570 µs (256-KB sector)	120 µs	150 µs	1000 µs
	Max	1700 µs - 1700µs	2800 µs	750 µs	3000 µs
Sector Erase Time (4 KB)	Typical	42 ms	50 ms	25 ms	45 ms
	Max	335 ms	400 ms	400 ms	200 ms
Sector Erase Time (64 KB)	Typical	N/A	150 ms	150 ms	400 ms
	Max	N/A	1000 ms	1000 ms	2000 ms
Sector Erase Time (256 KB) Endurance Flex Disabled	Typical	773 ms	N/A	N/A	N/A
	Max	2677 ms	N/A	N/A	N/A
Chip Erase Time	Typical	201 s / 398 s	153 s / 306 s	150 s	200 s
	Max	696 s / 1381 s	460 s / 920 s	300 s	320 s
Configurable Output Drive Strength		Yes	Yes	Yes	Yes
Data Learning Pattern		Yes	Yes	Yes	No
Program/Erase Suspend/Resume		Yes / Yes	Yes / Yes	Yes / Yes	Yes / Yes
Security Region		32 x 32 byte	64 byte	8K bit	4K bit
Error Correcting Code		Yes	No	No	No
Data Integrity CRC		Yes	Yes	No	No
Endurance Flex		Yes	No	No	No
Autoboot		Yes	No	Yes	Yes
SafeBoot / Power Loss Recovery		Yes	Yes	No	No
RESET# Signal		Yes	Yes	Yes	Yes
DQ3 / RESET# Signal		Yes	No	No	No

³ See the datasheet for details on cycling and data retention specification.

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Feature and performance comparison

Parameter ^{1,2}	Infineon S25HS512T / S25HS01GT	Micron MT25QU512ABB / MT25QU01GBBB	Macronix MX25U51245G / MX66U1G45G	Macronix MX66U51235F
CS# Signaling Reset Method	Yes	No	No	No

3 Package comparison

Infineon S25HS512T and S25HS01GT devices are pin-to-pin compatible with competitor devices of the same package. SEMPER™ Flash devices offer additional functionality that is unavailable on some of the serial NOR flash competitor devices of interest, such as the RESET# signal. Optional signals, such as RESET#, WP#/IO2, and IO3/RESET#, have internal pull-up resistors to allow the pins to remain unconnected if not used by the host system.

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Capacitance comparison

4 Capacitance comparison

See the product datasheets for additional information regarding capacitance values. System designers should note differences in input/output capacitance and investigate how these differences may affect the timing of the system.

Manufacturer	Device	Input capacitance (CIN)		Output capacitance (COUT)	
		Maximum	Test conditions	Maximum	Test conditions
Infineon ⁴	S25HS512T	6.5 pF	T _A = 25°C, 1 MHz, V _{IN} = 0 V	7.5 pF	T _A = 25°C, 1 MHz, V _{OUT} = 0 V
	S25HS01GT				
Micron	MT25QU512ABB	6 pF ⁵	T _A = 25°C, 54 MHz, V _{IN} = 0 V	10 pF	T _A = 25°C, 54 MHz, V _{OUT} = 0 V
	MT25QU01GBBB	18 pF ⁶	T _A = 25°C, 54 MHz, V _{IN} = 0 V	18 pF	T _A = 25°C, 54 MHz, V _{OUT} = 0 V
Macronix	MX25U51245G	8 pF	T _A = 25°C, 1 MHz, V _{IN} = 0 V	8 pF	T _A = 25°C, 1 MHz, V _{OUT} = 0 V
	MX66U1G45G	16 pF	T _A = 25°C, 1 MHz, V _{IN} = 0 V	16 pF	T _A = 25°C, 1 MHz, V _{OUT} = 0 V
	MX66U51235F	16 pF	T _A = 25°C, 1 MHz, V _{IN} = 0 V	16 pF	T _A = 25°C, 1 MHz, V _{OUT} = 0 V

⁴ CIN applies to SCK, CS#, and IO3/RESET#; COUT applies to all I/Os on the BGA package.

⁵ CIN/S# (Input/Chip Select) = 10 pF.

⁶ CIN/S# (Input/Chip Select) = 14 pF.

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AC characteristics

5 AC characteristics

A comparison of AC characteristics is necessary to ensure the desired timing when migrating from a competitor device to Infineon S25HS-T devices. Timing differences exist among devices from all manufacturers. You may need to modify the host system software that controls the serial NOR flash device to accommodate the differences in timing when migrating. The following table provides the most pertinent AC characteristics for the serial NOR devices of interest.

Characteristics		Unit		Infineon	Micron	Macronix	
				S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GBB	MX25U51245G / MX66U1G45G	MX66U51235F
SDR Read Clock Rate (f_{CK})	Max	MHz		50	54	66	55
SDR Dual I/O and Quad I/O Read Clock Rate (f_{CK})	Max	MHz		166	166	166	108
DDR Quad I/O Read Clock Rate (f_{CK})	Max	MHz		102	90	100	-
CS# High Time Read (t_{CS})	Min	ns		10	6	7	7
CS# High Time Non-Read (t_{CS})	Min	ns		50	30	30	30
CS# Active Setup Time (t_{CSS})	$f_{CK} \leq 50$ MHz	Min	ns	5	2.7	3	5
	$f_{CK} > 50$ MHz			4			
CS# Active Hold Time (relative to CK in Mode 0) (t_{CSH0})	Min	ns		4	2.7	4	7
Data in Setup Time (t_{SU})	$f_{CK} \leq 50$ MHz	Min	ns	5	1.75	2	2.5
	$f_{CK} > 50$ MHz			2			
Data in Hold Time (t_{HD})	$f_{CK} \leq 50$ MHz	Min	ns	5	2 / 1	2	3.5
	$f_{CK} > 50$ MHz			2			
Clock Low to Output Valid (t_V)	30 pF	Max	ns	8	6	5	12
	15 pF			6	-	5	9
	10 pF				5	5	-
Output Hold Time (t_{HO})	Min	ns		1.5	1	1	1

All characteristics apply to single data rate (SDR) operations aside from the DDR Quad I/O Read Clock Rate.

6 Command sets

6.1 Addressing

Legacy SPI flash command sets support 24-bit addressing, which allows addressing memory of up to 16 MB (128 Mb). With the advent of 32-MB (256-Mb) and larger devices, additional address bits are required to access the complete address space. SPI flash manufacturers have developed the following methods to resolve this issue:

- New commands that accept only 4-byte addressing
- A dedicated 4-byte addressing mode and commands to enter and exit this mode
- A bank address register to supply the extra high-order address bits for legacy software

The following table illustrates whether the device can accept 4-byte commands, whether there are commands to enter and exit 4-byte addressing, and whether the device has a bank address register. Note that competitor devices refer to the bank address register as the “extended address register”. All manufacturers provide a means to use 4-byte addressing on their devices.

Manufacturer	Device	4-byte commands	Commands to enter/exit 4-byte addressing	Bank address register
Infineon ⁷	S25HS512T / S25HS01GT	Yes	Yes	No
Micron	MT25QU512ABB / MT25QU01GBB	Yes	Yes	Yes
Macronix	MX25U51245G / MX66U1G45G	Yes	Yes	Yes
	MX66U51235F	Yes	Yes	Yes

6.2 Read Device ID

When supported, the Read JEDEC Serial Flash Discoverable Parameters (SFDP) 5Ah command allows the host system to read the device identification, feature, and configuration information in accordance with the JEDEC JESD216 standard. If the device does not support this command, the Read ID (RDID) 9Fh command allows access to the manufacturer identification, device identification, and Common Flash Interface (CFI) information.

Macronix also offers an additional, legacy method to determine the ID information such as the Read Device ID ABh and Read Manufacturer Device commands. The Read SFDP and Read ID commands provide the same information as these legacy commands.

Infineon recommends using the Read SFDP 5Ah command instead of the Read Device ID ABh command, and the Read Manufacturer Device ID 90h, 92h, and 94h commands, which may require changes to the host system software. The following table lists the commands used by the serial NOR flash devices of interest to access the Device ID information.

Manufacturer	Device	Read SFDP (5Ah)	READ ID (9Fh)	READ QUAD ID (AFh)	Read Unique ID (4Ch)	Read Device ID (ABh)	Read Manufacturer Device ID (90h, 92h, 94h) ⁷
Infineon	S25HS512T / S25HS01GT	Yes	Yes ⁸	Yes	Yes	No	No
Micron	MT25QU512ABB / MT25QU01GBB	Yes	Yes ⁹	Yes	No	No	No

⁷ 90h single-bit output, 92h 2-bit output, 94h 4-bit output.

⁸ JEDEC Manufacturer ID.

⁹ Read ID = 9Fh or 9Eh

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Manufacturer	Device	Read SFDP (5Ah)	READ ID (9Fh)	READ QUAD ID (AFh)	Read Unique ID (4Ch)	Read Device ID (ABh)	Read Manufacturer Device ID (90h, 92h, 94h) ⁷
Macronix	MX25U51245G / MX66U1G45G	Yes	Yes	Yes	No	Yes	90h only
	MX66U51235F	Yes	Yes	Yes	No	Yes	90h only

6.3 Read Flash Array

All manufacturers support multiple commands to read the flash array, which define the modes the host and device use to transfer the address of the data and the data itself. The following table summarizes the read commands used by the serial NOR flash devices of interest. Note that some Micron devices feature read commands, which other manufacturers do not. Changes to the host system software are necessary when migrating if the software implemented these commands.

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GBBB	MX25U51245G / MX25U01GT	MX66U51235F
Read	03h (50 MHz)	03h (54 MHz)	03h (66 MHz)	03h (55 MHz)
Fast Read	0Bh (166 MHz)	0Bh (166 MHz)	0Bh (166 MHz)	0Bh (108 MHz)
Read Dual Out	–	3Bh (166 MHz)	3Bh (166 MHz)	3Bh (108 MHz)
Read Quad Out	6Bh (166 MHz)	6Bh (166 MHz)	6Bh (166 MHz)	6Bh (108 MHz)
Dual I/O Read	BBh (166 MHz)	BBh (166 MHz)	BBh (166 MHz)	BBh (108 MHz)
Quad I/O Read	EBh (166 MHz)	EBh (166 MHz)	EBh (133 MHz)	EBh (108 MHz)
DDR Fast Read	–	0Dh (90 MHz)	–	–
DDR Read Dual Out	–	3Dh (90 MHz)	–	–
DDR Read Quad Out	–	6Dh (90 MHz)	–	–
DDR Dual I/O Read	–	BDh (90 MHz)	–	–
DDR Quad I/O Read	EDh (102MHz)	EDh (90 MHz)	EDh (100 MHz)	–
Read (4-Byte Address)	13h (50 MHz)	13h (54 MHz)	13h (66 MHz)	13h (55 MHz)
Fast Read (4-Byte Address)	0Ch (166 MHz)	0Ch (166 MHz)	0Ch (166 MHz)	0Ch (108 MHz)
Read Dual Out (4-Byte Address)	–	3Ch (166 MHz)	3Ch (166 MHz)	3Ch (108 MHz)
Read Quad Out (4-Byte Address)	6Ch (166 MHz)	6Ch (166 MHz)	6Ch (166 MHz)	6Ch (108 MHz)
Dual I/O Read (4-Byte Address)	BCh (166 MHz)	BCh (166 MHz)	BCh (166 MHz)	BCh (108 MHz)
Quad I/O Read (4-Byte Address)	ECh (166 MHz)	ECh (166 MHz)	ECh (133 MHz)	ECh (108 MHz)
DDR Fast Read (4-Byte Address)	–	0Eh (90 MHz)	–	–
DDR Dual I/O Read (4-Byte Address)	–	BEh (90 MHz)	–	–
DDR Quad I/O Read (4-Byte Address)	EEh (102 MHz)	EEh (90 MHz)	EEh (100 MHz)	–
Word Read Quad I/O	–	E7h (166 MHz)	–	–

6.4 Program Flash Array

All devices of interest support Page Program command to program the main memory array. All Infineon devices, Micron and Macronix devices support specific 4-byte address program commands. All these devices support suspending and resuming program operations.

The following table summarizes the program commands used by the serial NOR flash devices of interest. Note that Micron devices feature Fast Program commands for use with external programmers, which other manufacturers do not. Changes to the host system software are necessary when migrating if the software implemented these commands.

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Command sets

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GBBB	MX25U51245G / MX66U1G45G	MX66U51235F
Page Program	02h	02h	02h	02h
Page Program (4-Byte Address)	12h	12h	12h	12h
Dual Input Fast Program	–	A2h	–	–
Extended Dual Input Fast Program	–	D2h	–	–
Quad Page Program	–	32h	38h	38h
Quad Input Fast Program	–	–	–	–
Extended Quad Input Fast Program	–	38h	–	–
Quad Page Program (4-Byte Address)	–	34h	3Eh	3Eh
Extended Quad Input Fast Program (4-Byte Address)	–	3Eh	–	–
Program Suspend	75h - 85h - B0h	75h	B0h	B0h
Program Resume	7Ah - 8Ah - 30h	7Ah	30h	30h

6.5 Erase Flash Array

All devices support erasing 4-KB sectors or subsectors and 64-KB blocks or sectors. All, except Infineon devices, support erasing a 32-KB half block, while the Infineon device supports erasing a 256-KB block. All Infineon devices, Micron 512-Mb, and Macronix 512-Mb devices support specific 4-byte address erase commands. All devices support suspending and resuming erase operations. Infineon S25HS-T family offer additional erase status check-related commands.

The following table provides a summary of the erase commands used by the serial NOR flash devices of interest.

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GBBB	MX25U51245G / MX66U1G45G	MX66U51235F
Sector Erase (4 KB)	20h	20h	20h	20h
Half Block Erase (32 KB)	–	52h	52h	52h
Block Erase (256 KB or 64 KB)	D8h ¹⁰	D8h	D8h	D8h
Chip Erase	60h/ C7h	60h/ C7h	60h/ C7h	60h/ C7h
Sector Erase (4-Byte Address)	21h	21h	21h	21h
Half Block Erase (4-Byte Address)	–	5Ch	5Ch	5Ch
Block Erase (4-Byte Address)	DCh	DCh	DCh	DCh
Erase Suspend	75h - 85h - B0h	75h	B0h	B0h
Erase Resume	7Ah - 8Ah - 30h	7Ah	30h	30h
Evaluate Erase Status	D0	–	–	–
Sector Erase Count	5D	–	–	–

6.6 Register Access

All manufacturers support the following write and register access commands: Write Enable 06h, Write Disable 04h, Read Status Register 05h, and Write Register 01h.

Status and configuration registers command operations require customization due to register bit and operational differences among manufacturers. For example, Infineon, Macronix, and Micron have the same 8-

¹⁰ 256-KB block.

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Command sets

bit Status Register 1 access with the Read Status Register 05h and Write Register 01h commands, but the definitions of some Status Register 1 bits are different for each manufacturer.

Infineon S25HS-T family feature the additional Read Any Register 65h and Write Any Register 71h commands, which eliminate the need for several read and write register commands. Changes to the host system software may be required to use these commands.

The following table provides a summary of the register access commands for the serial NOR Flash devices of interest.

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MTQU01GBBB	MX25U51245G / MX66U1G45G	MX66U51235F
Read Status Register 1	05h	05h	05h	05h
Read Status Register 2	07h	–	–	–
Read Config. Register 1	35h	–	15h	15h
Read Any Register	65h	–	–	–
Write Register	01h	01h	01h	01h
Write Disable	04h	04h	04h	04h
Write Enable for Non-Volatile Status and Configuration Registers	06h	06h	06h	06h
Write Enable for Volatile Status and Configuration Registers	50h	–	–	–
Write Any Register	71h	–	–	–
Clear Status Register	30h / 82h	–	–	–
Enter 4-Byte Address Mode	B7h	B7h	B7h	B7h
Exit 4-Byte Address Mode	B8h	E9h	E9h	E9h
Set Burst Length	Config. Reg. - 4	–	C0h	C0h
Read ECC Data Unit Status	19h	–	–	–
Read ECC Data Unit Status (4-Byte Address)	18h	–	–	–
Clear ECC Status Register	1Bh	–	–	–
Enter Quad I/O Mode	–	35h	35h	35h
Enter SPI Mode	–	F5h	F5h	F5h
Data Learning Pattern Read	41h	–	–	–
Program Non-Volatile Learning Data Reg.	43h	–	–	–
Write Volatile Learning Data	4Ah	–	–	–
AutoBoot Register Read	–	–	16h	16h
AutoBoot Register Write	15h	–	17h	17h
AutoBoot Register Erase	–	–	18h	18h
Read Extended Address Register	–	C8h	C8h	C8h
Write Extended Address Register	–	C5h	C5h	C5h
Read Flag Status Register	–	70h	–	–
Clear Flag Status Register	–	50h	–	–
Read Non-Volatile Config. Register	–	B5h	–	–
Write Non-Volatile Config. Register	–	B1h	–	–
Read Volatile Config. Register	–	85h	–	–
Write Volatile Config. Register	–	81h	–	–
Read Enhanced Volatile Config. Register	–	65h	–	–
Write Enhanced Volatile Config. Register	–	61h	–	–
Read General Purpose Read Register	–	96h	–	–

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Command sets

6.7 Software Reset

All devices support software reset enable and software reset with the same set of commands. The following table summarizes the reset commands used by the serial NOR flash devices of interest.

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GT	MX25U51245G / MX66U1G45G	MX66U51235F
Software Reset Enable	66h	66h	66h	66h
Software Reset	99h	99h	99h	99h
Legacy Software Reset	F0h	–	–	–
Deep Power Down (DPD)	B9h	B9h	B9h	B9h

6.8 Array Protection

Manufacturers have implemented different mechanisms to perform the same array protection functions. It is important to understand these differences when migrating devices. There are two broad categories of protection mechanisms: legacy protection and additional protection. Each manufacturer provides a mechanism in both categories.

The following table provides a comparison of the protection used by the serial NOR flash devices of interest.

Command description	Infineon	Micron	Macronix	
	S25HS512T / S25HS01GT	MT25QU512ABB / MT25QU01GBB	MX25U51245G / MX66U1G45G	MX66U51235F
Block Protection	Yes	Yes	Yes	Yes
Advanced Sector Protection	Yes	Yes	Yes	No
Write Enable	Yes	Yes	Yes	Yes

Summary

7 Summary

Migration from competitor devices to Infineon S25HS512T and S25HS01GT SEMPER™ Flash devices is uncomplicated and requires minimal hardware and software adjustments. Moreover, after migration, if required, SEMPER™ Flash can enable use of higher density devices, providing greater performance in existing systems.

Migrating from competitors' 512-Mb and 1-Gb 1.8-V Quad SPI Flash to Infineon SEMPER™ Flash



Related documents

Related documents

[1] **Infineon:** www.infineon.com

- Infineon S25HS256T / S25HS512T / S25HS01GT / S25HL256T / S25HL512T / S25HL01GT, 256-Mb (32-MB), 512-Mb (64-MB), 1-Gb (128-MB), HS-T (1.8-V), HL-T (3.0-V), SEMPER™ Flash with Quad SPI Datasheet, Revision R

[2] **Micron:** www.micron.com

- Micron MT25QU512ABB Datasheet, Revision F
- Micron MT25QU01GBBB Datasheet, Revision B

[3] **Macronix:** www.macronix.com

- Macronix MX25U51245G Datasheet, Revision 1.1
- Macronix MX66U1G45G Datasheet, Revision 1.2
- Macronix MX66U51235F Datasheet, Revision 1.1

Migrating from competitors' 512-Mb and 1-Gb 1.8-V Quad SPI Flash to Infineon SEMPER™ Flash



Revision history

Revision history

Document version	Date of release	Description of changes
**	2017-03-13	New Application Note
*A	2018-04-25	Updated to S25HS512T SEMPER™ Flash devices
*B	2018-09-24	Added 1Gb Density devices
*C	2019-06-17	Updated AC and DC Specifications
*D	2019-08-13	Updated Deep Power Down and Chip Erase Specification
*E	2021-02-25	Migrated to Infineon template
*F	2022-03-31	Updated AC characteristics, Command sets Removed 'Cypress' and replaced with 'Infineon'

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