Migration from Micron® MT29F (1-2-4 Gb) to SkyHigh S34ML-1 (1-2-4 Gb)

AN200963 details how to migrate designs from Micron MT29F NAND flash memory devices to SkyHigh S34ML-1 NAND flash memory devices.

1 Introduction

This application note details how to migrate designs from Micron 1-Gb MT29F1G08, 2-Gb MT29F2G08, and 4-Gb MT29F4G08 NAND flash memory devices to SkyHigh's 1-Gb S34ML01G1, 2-Gb S34ML02G1, and 4-Gb S34ML04G1 NAND flash memory devices, respectively. S34ML01G1/ S34ML02G1/ S34ML04G1 devices are 3.0-volt NAND flash memory manufactured with the 4x nm technology.

Note: All the information provided in this guide illustrates only the differences for each section. See the respective data sheets for more information.

SkyHigh S34ML-1 NAND flash family devices are compatible with the Micron MT29F NAND flash family devices with respect to:

- Block, page, byte size architecture
- JEDEC standard-compliant software command set

2 Feature Comparison

Most of the features of S34ML-1 and MT29F are similar, except for a few differences that are highlighted in Table 1. See the respective Micron MT29F and SkyHigh S34ML-1 data sheets to verify any other features.

Table 1. Feature Comparison

	SkyHigh S34ML-1	Micron MT29F
Generic Part#	S34ML-1	MT29F
V_{CC}	3 V (2.7-3.6 V)	3 V and 1.8 V (2.7-3.6/1.7-1.95 V)
I/O Bus width	x8/x16	x8/x16
Sequential access time (Page Read (ns))	25	20
Block Erase time (ms)	2	700 µs
ECC Capability	1-bit/512 + 16-byte ECC	4-bit/516 + 8-byte ECC

3 AC Specification

The S34ML-1 and MT29F have primarily compatible specifications. Differences in AC characteristics between the devices are highlighted in Table 2. The potential impact of any parameter specification differences should be evaluated and validated. See the respective Micron MT29F and SkyHigh S34ML-1 data sheets to verify the most
up-to-date specifications.

Table 2. AC Characteristics

Parameter	Symbol	SkyHigh S34ML-1			Micron MT29F		
		Min	Max	Unit	Min	Max	Unit
ALE setup time	t_{ALS}	12	—	ns	10	—	ns
CLE setup time	t_{CLS}	12	—	ns	10	—	ns
CE# setup time	t_{CS}	20	—	ns	15	—	ns
Data setup time	t_{DS}	12	—	ns	7	—	ns
Read cycle time	t_{RC}	25	—	ns	20	—	ns
RE# HIGH hold time	t_{REH}	10	—	ns	7	—	ns
RE# pulse width	t_{RP}	12	—	ns	10	—	ns
Write cycle time	t_{WC}	25	—	ns	20	—	ns
WE# HIGH hold time	t_{WH}	10	—	ns	7	—	ns
WE# pulse width	t_{WP}	12	—	ns	10	—	ns
CE# HIGH to output HI-Z	t_{CHZ}	—	30	ns	—	50	ns
RE# access time	t_{REA}	—	20	ns	—	16	ns

Table 3. AC Test Conditions

Parameter	SkyHigh S34ML-1	Micron MT29F
Output load (2.7 V-3.6 V) 1 TTL Gate and CL	50 pF	30 pF

4 DC Specification

The S34ML-1 and MT29F have primarily compatible specifications. Differences in DC characteristics between the devices are highlighted in Table 4. The potential impact of any parameter specification differences should be evaluated and validated. See the respective Micron MT29F and SkyHigh S34ML-1 data sheets to verify the most up-to-date specifications.

Table 4. DC Characteristics

Parameter	Symbol	SkyHigh S34ML-1				Micron MT29F			
		Min	Typ	Max	Units	Min	Typ	Max	Units
Sequential READ current	I_{CC1}	—	15	30	mA	—	25	35	mA
Program current	I_{CC2}	—	15	30	mA	—	25	35	mA
Erase current	I_{CC3}	—	15	30	mA	—	25	35	mA

5 Device ID

This section provides a comparison between Micron and SkyHigh flash memory Device IDs.

Table 5. Manufacture/Device ID

SkyHigh S34ML-1				Micron MT29F			
Manufacture ID	Device ID			Manufacture ID	Device ID		
	1G	2G	4G		1G	2G	4G
01h	F1h	DAh	DCh	2Ch	20h	AAh/BAh/ CAh/DAh	DCh/CCh/ ACh/BCh/ A3h/B3h/ D3h/C3h

6 References

■ SkyHigh NAND S34ML Flash Memory Family Data Sheet, Publication Number S34ML01G1_4G1

■ Micron MT29F Data Sheet

Document History Page

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**	–	–	07/20/2012	Initial version
*A	4940076	YOQI	09/29/2015	Updated in Cypress template
*B	5807219	AESATMP8	07/10/2017	Updated logo and Copyright.
*C	6272156	MNAD	08/03/2018	Updated template
*D		MNAD	06/04/2019	Updated to SkyHigh format