

Migration from Samsung K9F1G08U0D to SkyHigh S34ML01G1

AN98593 details how to migrate designs from a Samsung K9F1G08U0D NAND flash memory device to a SkyHigh S34ML01G1 NAND flash memory device.

1 Overview

This application note details how to migrate designs from a Samsung K9F1G08U0D NAND flash memory device to a SkyHigh S34ML01G1 NAND flash memory device. The S34ML01G1 device is a 3.0 volt, x8-only, NAND flash memory manufactured with 4x nm technology.

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

The SkyHigh S34ML01G NAND flash memory device is compatible with the Samsung K9F1G08U0D NAND flash memory device with respect to block, page size, and command set.

2 Feature Comparison

Most of the features between the S34ML01G1 and K9F1G08U0D are similar, except a few differences that are highlighted in [Table 1](#). Refer to the respective Samsung K9F1G08U0D and SkyHigh S34ML01G1 data sheets to verify any other features.

Table 1. Feature Comparison

Parameter	SkyHigh S34ML01G1	Samsung K9F1G08U0D
Random Access	25 μ s (Max)	35 μ s (Max)
Sequential Access	25 ns (Min)	30 ns (Min)
Page Program Time	200 μ s (Typ)	250 μ s (Typ)

3 Command Set

All commands supported by the K9F1G08U0D can be used on the S34ML01G1. The S34ML01G1 supports some additional commands. [Table 2](#) shows the supported command list.

Table 2. Command Set (Sheet 1 of 2)

Command	Supported on S34ML01G1	Supported on K9F1G08U0D
Page Read	Yes	Yes
Page Program	Yes	Yes
Random Data Input	Yes	Yes
Random Data Output	Yes	Yes
Block Erase	Yes	Yes
Copy Back Read	Yes	Yes
Copy Back Program	Yes	Yes
Read Status Register	Yes	Yes
Reset	Yes	Yes
Read ID	Yes	Yes
Read ID2	Yes	No

Table 2. Command Set (Sheet 2 of 2)

Command	Supported on S34ML01G1	Supported on K9F1G08U0D
Read ONFI Signature	Yes	No
Read Parameter Page	Yes	No
Read Cache	Yes	No
Read Cache End	Yes	No
One-time Programmable (OTP) Area Entry	Yes	No

4 Absolute Maximum Ratings

Differences in Absolute Maximum Ratings are highlighted in [Table 3](#).

Table 3. Absolute Maximum Ratings

Parameter	Symbol	SkyHigh S34ML01G1		Samsung K9F1G08U0D	
		Value	Unit	Value	Unit
Temperature under Bias	T _{BIAS}	-50 to +125	°C	-10 to +125 (K9F1G08U0D-SCB0) -40 to +125 (K9F1G08U0D-SIB0)	°C

5 AC Characteristics

The S34ML01G1 and K9F1G08U0D have primarily compatible specifications. Differences in AC Characteristics between the devices are highlighted in [Table 4](#). The potential impact of any parameter specification differences should be evaluated and validated. Refer to the respective Samsung K9F1G08U0D and SkyHigh S34ML01G1 data sheets to verify the most up to date specifications.

Table 4. AC Characteristics

Parameter	Symbol	SkyHigh S34ML01G1			Samsung K9F1G08U0D		
		Min	Max	Unit	Min	Max	Unit
ALE Setup Time	t _{ALS}	10	—	ns	15	—	ns
Address to Data Loading Time	t _{ADL}	70	—	ns	100	—	ns
CLE Setup Time	t _{CLS}	10	—	ns	15	—	ns
CE# High to ALE or CLE Don't Care	t _{CSD}	10	—	ns	0	—	ns
Data Setup Time	t _{DS}	10	—	ns	15	—	ns
Data Transfer from Cell to Register	t _R	—	25	µs	—	35	µs
Read Cycle Time	t _{RC}	25	—	ns	30	—	ns
RE# Pulse Width	t _{RP}	12	—	ns	15	—	ns
Write Cycle Time	t _{WC}	25	—	ns	30	—	ns
WE# Pulse Width	t _{WP}	12	—	ns	15	—	ns

6 DC Characteristics

The S34ML01G1 and K9F1G08U0D have primarily compatible specifications. Differences in DC Characteristics between the devices are highlighted in [Table 5](#). The potential impact of any parameter specification differences should be evaluated and validated. Refer to the respective Samsung K9F1G08U0D and SkyHigh S34ML01G1 data sheets to verify the most up to date specifications.

Table 5. DC Characteristics

Parameter		Symbol	SkyHigh S34ML01G1			Samsung K9F1G08U0D		
			Typ	Max	Unit	Typ	Max	Unit
Operating Current	Sequential Read	I_{CC1}	15	30	mA	20	35	mA
	Program	I_{CC2}						
	Erase	I_{CC3}						

7 Pin Capacitance

Table 6 shows the differences in pin capacitance between the S34ML01G1 and K9F1G08U0D.

Table 6. Pin Capacitance

Parameter	Symbol	Test Condition	SkyHigh S34ML01G1			Samsung K9F1G08U0D		
			Min	Max	Unit	Min	Max	Unit
Input	C_{IN}	$V_{IN} = 0V$	—	10	pF	—	8	pF
Input / Output	C_{IO}	$V_{IL} = 0V$	—	10	pF	—	8	pF

8 Device ID

Table 7 shows the device ID comparison between the S34ML01G1 and K9F1G08U0D.

Table 7. Manufacturer / Device ID

SkyHigh S34ML01G1					Samsung K9F1G08U0D				
1st	2nd	3rd	4th	5th	1st	2nd	3rd	4th	5th
01h	F1h	00h	1Dh	—	ECh	F1h	00h	15h	40h

9 References

- [SkyHigh S34ML01G1 Data Sheet](#)
- [Samsung K9F1G08U0D Data Sheet](#)

Document History Page

Document Title: AN98593 - Migration from Samsung K9F1G08U0D to SkyHigh S34ML01G1				
Document Number: 001-98593				
Rev.	ECN No.	Orig. of Change	Submission Date	Description of Change
**	–	–	05/08/2013	Initial version
*A	4979125	MSWI	10/21/2015	Updated in Cypress template
*B	5813047	AESATMP8	07/12/2017	Updated logo and Copyright.
*C		MNAD	06/12/2017	Updated to SkyHigh format.