AN94902

Migrating from FM25V02/FM25V01 to FM25V02A/FM25V01A

Author: Girija Chougala

Associated Part Family: FM25V02, FM25V01, FM25V02A, FM25V01A

Related Documents: For a complete list, click here

AN94902 discusses the key differences that need to be considered when migrating from FM25V02/FM25V01 to FM25V02A/FM25V01A. FM25V02/FM25V01 is now “Not Recommended for New Designs”; this application note explains how FM25V02A/FM25V01A is a replacement for FM25V02/FM25V01.

1 Introduction

FM25V02A/FM25V01A, a 256-Kbit/128-Kbit SPI F-RAM™, is a replacement device for FM25V02/FM25V01, which is now “Not recommended for new designs.” The two devices are identical in terms of pinout, package composition and dimensions, and read/write functionality. This application note discusses the key differences between the two devices that need to be considered when migrating from FM25V02/FM25V01 to FM25V02A/FM25V01A.

2 Drop-In Replacement or Not?

From a hardware point of view, the two devices are identical. From a software point of view, the two devices are identical except for the Device ID.

Refer to the Critical Considerations section for more details.

Table 1 shows the compatibility chart of FM25V02/FM25V01 and FM25V02A/FM25V01A. For a detailed comparison, see Table 3.

Table 1. Compatibility Chart

FM25V02/FM25V01 Feature or Spec	Is FM25V02A/FM25V01A compatible?
Package	Yes
Pinout	Yes
Temperature Range	Yes
Operating Voltage	Yes
Operating Current	Yes
Standby Current	Yes
Read / Write Function	Yes
Timing / Frequency	Yes
Data Retention	Yes
Endurance	Yes

3 Ordering Part Numbers

Table 2 lists the recommended FM25V02A/FM25V01A ordering part numbers that correspond to the FM25V02/FM25V01 (Not Recommended for New Designs) ordering part numbers.

Table 2. Recommended Ordering Part Numbers for Migration

FM25V02/FM25V01		FM25V02A/FM25V01A		Comments
Ordering Part Number	**Status**	**Ordering Part Number**	**Status**	
FM25V02-G	Not Recommended for New Designs	FM25V02A-G	In production	No hardware change but software changes are required.
FM25V02-GTR		FM25V02A-GTR		
FM25V02-DG		FM25V02A-DG		
FM25V02-DGTR		FM25V02A-DGTR		
FM25V01-G	Not Recommended for New Designs	FM25V01A-G	In production	No hardware change but software changes are required.
FM25V01-GTR		FM25V01A-GTR		

4 Comparison of FM25V02/FM25V01 and FM25V02A/FM25V01A

Table 3 gives a detailed comparison of the two devices.

Table 3. Detailed Comparison Table

	FM25V02/FM25V01	FM25V02A/FM25V01A	Comments
Package Types	-G (FM25V02/FM25V01)	-G (FM25V02A/FM25V01A)	Identical “green (RoHS)” packages
	-DG (FM25V02)	-DG (FM25V02A)	
Pinout/Package Outlines	SOIC-8 (FM25V02/FM25V01)	SOIC-8 (FM25V02A/FM25V01A)	Identical pinout, outline and board footprint
	DFN-8 (FM25V02)	DFN-8 (FM25V02A)	
Temperature Range	–40 ºC to +85 ºC	–40 ºC to +85 ºC	Identical
Operating Voltage Range	2.0 V to 3.6 V	2.0 V to 3.6 V	Identical
Active Supply Current	0.22 mA @ 1 MHz 2.5 mA @ 40 MHz	0.22 mA @ 1 MHz 2.5 mA @ 40 MHz	Identical
Standby Current	150 µA @ 85 ºC	150 µA @ 85 ºC	Identical
Sleep Current	8 µA @ 85 ºC	8 µA @ 85 ºC	Identical
Read / Write Function	-	-	Identical 2-byte addressing, Identical opcodes
Clock Frequency	40 MHz	40 MHz	Identical
Data Retention	10 years (+85 ºC) 38 years (+75 ºC) 151 years (+65 ºC)	10 years (+85 ºC) 38 years (+75 ºC) 151 years (+65 ºC)	Identical
Endurance (Write/Read Cycles)	1E+14	1E+14	Identical
Power-Up to First Access (t_{PU})	250 µs	250 µs	Identical
Device ID	7F7F7F7F7F7FC22100h (FM25V01)	7F7F7F7F7F7FC22108h (FM25V01A)	Different. Refer to “Critical Considerations” for more details.

	FM25V02/FM25V01	FM25V02A/FM25V01A	Comments
	7F7F7F7F7F7FC22200h (FM25V02)	7F7F7F7F7F7FC22208h (FM25V02A)	
Clock HIGH time (t_{CH})	20 ns	18 ns	FM25V02A/FM25V01A has better spec
Clock LOW time (t_{CL})	20 ns	18 ns	FM25V02A/FM25V01A has better spec
Output data valid time (t_{ODV})	18 ns	16 ns	FM25V02A/FM25V01A has better spec

5 Critical Considerations

You should consider all the parameter differences mentioned in Table 3 during the migration to FM25V02A/FM25V01A. This section discusses the critical differences. System designers should also review the datasheet when migrating to the new part.

5.1 Device ID Feature

The FM25V02A/FM25V01A and FM25V02/FM25V01 incorporate a 9-byte read-only Device ID to identify the product uniquely. The Device ID allows the host to determine the manufacturer, product density, and product revision. Table 4 gives a Device ID of FM25V02/FM25V01 and FM25V02A/FM25V01A. A system software update is required to use this feature when migrating to the FM25V02A/FM25V01A.

Table 4. Device ID

Device ID	
FM25V01	**FM25V01A**
7F7F7F7F7F7FC22100h	7F7F7F7F7F7FC22108h
FM25V02	**FM25V02A**
7F7F7F7F7F7FC22200h	7F7F7F7F7F7FC22208h

Note: Device ID difference is highlighted in red color.

6 Summary

AN94902 discussed the differences between FM25V02/FM25V01 and FM25V02A/FM25V01A that need to be considered during migration to the FM25V02A/FM25V01A.

7 Related Documents

7.1 Datasheet

FM25V02A: 256-Kbit (32K × 8) Serial (SPI) F-RAM

FM25V01A: 128-Kbit (16K × 8) Serial (SPI) F-RAM

7.2 Application Note

AN304 – SPI GUIDE FOR F-RAM

Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	4652338	GVCH	03/17/2015	New Spec.
*A	5623862	GVCH	02/08/2017	Updated “Drop-In Replacement or Not?” section. Updated Table 3: Changed “Power-Up to First Access (tPU)” parameter spec value from 1 ms to 250 µs for FM25V02A part. Critical Considerations section: Removed “Power-Up to First Access (t_{PU})” description (not applicable).
*B	5848940	HARA	08/17/2017	Updated logo and copyright.

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