

# AN314

## Migrating from FM25040A to FM25040B

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**Associated Project: No**

**Associated Part Family: FM25040A, FM25040B**

**Software Version: None**

**Related Documents: For a complete list, [click here](#)**

AN314 discusses the key differences that need to be considered when migrating from FM25040A to FM25040B. FM25040A is now obsolete and this application note explains how FM25040B is a replacement for FM25040A.

### Introduction

FM25040B, a 4-Kbit SPI F-RAM™, is a replacement device for FM25040A, which is now obsolete. The two devices are identical in terms of pinouts and read/write functionality. This application note discusses the key differences between the two devices that need to be considered when migrating from FM25040A to FM25040B.

### Drop-In Replacement or Not?

For most designs, FM25040B is a drop-in replacement for FM25040A. From a software point of view, the two devices are identical. From a hardware point of view the key difference is the lower active current in FM25040B. Additionally, FM25040B datasheet adds a power-up and power-down ramp rate specification of 30  $\mu\text{s} / \text{V}$  and a power-up to first-access specification of 1 ms.

[Table 1](#) shows the compatibility chart of FM25040A and FM25040B. For a detailed comparison, see [Table 3](#).

Table 1. Compatibility Chart

FM25040A Feature or Spec	Is FM25040B 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	Refer to <a href="#">Table 3</a>
Endurance	Yes

### Ordering Part Numbers

[Table 2](#) gives the recommended FM25040B ordering part numbers that correspond to the now obsolete FM25040A ordering part numbers.

Table 2. Recommended Ordering Part Numbers for Migration

FM25040A		FM25040B		Comments
Ordering Part Number	Status	Ordering Part Number	Status	
FM25040A-G	Obsolete	FM25040B-G	In production	No hardware or software change is required
FM25040A-GTR		FM25040B-GTR		

## Comparison of FM25040A and FM25040B

Table 3 gives a detailed comparison of the two devices.

Table 3. Detailed Comparison

	FM25040A	FM25040B	Comments
Package Types	-G	-G	Identical "green" SOIC package
Package Outlines	SOIC-8	SOIC-8	Identical outline and board footprint
Pinout	-	-	Identical
Temperature Range	-40 °C to +85 °C	-40 °C to +85 °C	Identical
Operating Voltage Range	4.5 V to 5.5 V	4.5 V to 5.5 V	Identical
Active Supply Current	400 $\mu$ A @ 1 MHz 8.0 mA @ 20 MHz	250 $\mu$ A @ 1 MHz 4.0 mA @ 20 MHz	FM25040B offers lower active current
Standby Current	10 $\mu$ A	10 $\mu$ A	Identical
Read / Write Function	-	-	Identical 1-byte addressing, Identical op-codes
Clock Frequency	20 MHz	20 MHz	Identical
Data Retention	45 years (+85 °C)	10 years (+85 °C) 38 years (+75 °C) 151 years (+65 °C)	Data retention is lower
Endurance (Write/Read Cycles)	1E+12	1E+14	FM25040B offers better endurance
V <sub>DD</sub> Power-Up Ramp Rate (t <sub>VR</sub> )	-	30 $\mu$ s / V	Power-up ramp rate should be slower than 30 $\mu$ s / V for FM25040B
V <sub>DD</sub> Power-Down Ramp Rate (t <sub>VF</sub> )	-	30 $\mu$ s / V	Power-down ramp rate should be slower than 30 $\mu$ s / V for FM25040B
Power-Up to First Access (t <sub>PU</sub> )	-	1 ms	After power-up, the first access of FM25040B should be after 1 ms

## Critical Considerations

You should consider all the parameter differences mentioned in Table 3 during the migration to FM25040B. This section discusses the critical differences. System designers should also review the [datasheet](#) when migrating to the new part.

### V<sub>DD</sub> Ramp Rate

V<sub>DD</sub> power-up and power-down ramp rate specifications are added in FM25040B device. Ensure that both the power-up and power-down ramp rates are slower than 30  $\mu$ s / V in your system.

### Power-Up to First Access

Power-up to first access specification is added in FM25040B device. Ensure that the FM25040B device is accessed only after 1 ms from power-up.

## Summary

AN314 discussed the differences between FM25040A and FM25040B that need to be considered during migration to the FM25040B.

## Related Documents

### Datasheet

[FM25040B: 4-Kbit \(512 × 8\) Serial \(SPI\) F-RAM datasheet](#)

### Application Note

[AN304 – SPI GUIDE FOR F-RAM](#)

## Document History

Document Title: Migrating from FM25040A to FM25040B - AN314

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	3944550	GVCH	03/26/2013	New Spec.
*A	4278908	MEDU	02/12/2014	Updated to Cypress Template. Updated Endurance for FM25040B from E+12 to E+14. Updated "V <sub>DD</sub> Power-Down Ramp Rate" for FM25040B from 100 µs / V to 30 µs / V. Updated "Power-Up to First Access" for FM25040B from 10 ms to 1 ms.
*B	4498652	GVCH	09/22/2014	Changed title from "Differences between FM25040A and FM25040B" to "Migrating from FM25040A to FM25040B." Updated abstract. Added " <a href="#">Ordering Part Numbers</a> " section. Added title for <a href="#">Table 3</a> . Added " <a href="#">Related Documents</a> " section.

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