Migrating from FM25CL64 to FM25CL64B

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Associated Project: No
Associated Part Family: FM25CL64, FM25CL64B
Software Version: None
Related Documents: For a complete list, click here

AN319 discusses the key differences that need to be considered when migrating from FM25CL64 to FM25CL64B. FM25CL64 is now obsolete and this application note explains how FM25CL64B is a replacement for FM25CL64.

Introduction

FM25CL64B, a 64-Kbit SPI F-RAM™, is a replacement device for FM25CL64, which is now obsolete. The two devices are identical in terms of pinout, packages, and read/write functionality. In terms of speed, both operate up to 20 MHz and have the same timing specifications. This application note discusses the key differences between the two devices that need to be considered when migrating from FM25CL64 to FM25CL64B.

Drop-In Replacement or Not?

From a software point of view, the two devices are identical. The two devices are read/write compatible. Both devices use the same two-byte address. From a hardware point of view the key difference is the higher standby current of the FM25CL64B. Additionally, the FM25CL64B datasheet adds a power-up and power-down ramp rate specification of 30 µs / V and a power-up to first-access specification of 1 ms.

Ordering Part Numbers

Table 2 gives the recommended FM25CL64B ordering part numbers that correspond to the now obsolete FM25CL64 ordering part numbers.

Table 1 shows the compatibility chart of FM25CL64 and FM25CL64B. For a detailed comparison, see Table 3.

Table 1. Compatibility Chart

FM25CL64 Feature or Spec	Is FM25CL64B compatible?
Package	Yes
Pinout	Yes
Temperature Range	Yes
Operating Voltage	Yes
Operating Current	Yes
Standby Current	No
Read / Write Function	Yes
Timing / Frequency	Yes
Data Retention	Refer to Table 3
Endurance	Yes

Table 2. Recommended Ordering Part Numbers for Migration

FM25CL64		FM25CL64B		Comments
Ordering Part Number	**Status**	**Ordering Part Number**	**Status**	
FM25CL64 -G	Obsolete	FM25CL64B -G	In production	No hardware or software change is required
FM25CL64-GTR		FM25CL64B -GTR		
FM25CL64-DG		FM25CL64B -DG		
FM25CL64-DGTR		FM25CL64B -DGTR		

Comparison of FM25CL64 and FM25CL64B

Table 3 gives a detailed comparison of the two devices.

Table 3. Detailed Comparison

	FM25CL64	FM25CL64B	Comments
Package Types	-G, -DG	-G, -DG	Identical "green" SOIC and TDFN packages
Package Outlines	SOIC-8, TDFN-8	SOIC-8, TDFN-8	Identical outlines and board footprints
Pinout	-	-	Identical
Temperature Range	–40 ºC to +85 ºC	–40 ºC to +85 ºC	Identical
Operating Voltage Range	2.7 V to 3.65 V	2.7 V to 3.65 V	Identical
Active Supply Current	350 µA @ 1 MHz 7.0 mA @ 20 MHz	200 µA @ 1 MHz 3.0 mA @ 20 MHz	FM25CL64B offers lower active current
Standby Current	1 µA	6 µA (max) 3 µA (typical)	FM25CL64B has higher standby current
Read / Write Function	-	-	Identical 2-byte addressing, Identical op-codes
Clock Frequency	20 MHz	20 MHz	Identical
Data Retention	45 years (+85 ºC)	10 years (+85 ºC) 38 years (+75 ºC) 151 years (+65 ºC)	Data retention is lower
Endurance (Write/Read Cycles)	Unlimited	1E+14	FM25CL64B's endurance is large enough to be considered as unlimited for all practical applications. For a 64-byte loop, at 20 MHz, FM25CL64B's endurance is 85 years.
V_{DD} Power-Up Ramp Rate (t_{VR})	-	30 µs / V	Power-up ramp rate should be slower than 30 µs / V for FM25CL64B
V_{DD} Power-Down Ramp Rate (t_{VF})	-	30 µs / V	Power-down ramp rate should be slower than 30 µs / V for FM25CL64B
Power-Up to First Access (t_{PU})	-	1 ms	After power-up, the first access of FM25CL64B should be after 1 ms

Critical Considerations

You should consider all the parameter differences mentioned in Table 3 during the migration to FM25CL64B. This section discusses the critical differences. System designers should also review the datasheet when migrating to the new part.

V_{DD} Ramp Rate

V_{DD} power-up and power-down ramp rate specifications are added in FM25CL64B device. Ensure that the power-up and power-down ramp rates are slower than 30 µs / V in your system for proper operation of the device.

Power-Up to First Access

Power-up to first access specification is added in FM25CL64B device. Ensure that the FM25CL64B device is accessed only after 1 ms from power-up.

Summary

AN319 discussed the differences between FM25CL64 and FM25CL64B that need to be considered during migration to the FM25CL64B.

Related Documents

Datasheet

FM25CL64B: 64-Kbit (8 K x 8) Serial (SPI) F-RAM datasheet

Application Note

AN304 – SPI GUIDE FOR F-RAM

Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	3944550	GVCH	03/26/2013	New Spec.
*A	4279018	MEDU	03/05/2014	Updated to Cypress Template. Updated "V_{DD} Power-Down Ramp Rate" for FM25CL64B from 100 µs / V to 30 µs / V. Updated "Power-Up to First Access" for FM25CL64B from 10 ms to 1 ms.
*B	4498653	GVCH	09/22/2014	Changed title from "Differences between FM25CL64 and FM25CL64B" to "Migrating from FM25CL64 to FM25CL64B." Updated abstract. Added "Ordering Part Numbers" section. Added title for Table 3. Added "Related Documents" section.

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