Please note that Cypress is an Infineon Technologies Company.
The document following this cover page is marked as “Cypress” document as this is the company that originally developed the product. Please note that Infineon will continue to offer the product to new and existing customers as part of the Infineon product portfolio.

Continuity of document content
The fact that Infineon offers the following product as part of the Infineon product portfolio does not lead to any changes to this document. Future revisions will occur when appropriate, and any changes will be set out on the document history page.

Continuity of ordering part numbers
Infineon continues to support existing part numbers. Please continue to use the ordering part numbers listed in the datasheet for ordering.

AN212

Migrating from FM24CL64 to FM24CL64B

Author: Girija Chougala
Associated Project: No
Associated Part Family: FM24CL64, FM24CL64B
Software Version: None
Related Documents: For a complete list, click here

AN212 discusses the key differences that need to be considered when migrating from FM24CL64 to FM24CL64B. FM24CL64 is now obsolete and this application note explains how FM24CL64B is a replacement for FM24CL64.

Introduction

FM24CL64B, a 64-Kbit I^2C F-RAM™, is a replacement device for FM24CL64, which is now obsolete. The two devices are identical in terms of pinout, package composition and dimensions, read/write functionality, Write Protect operation, and address pin functionality. This application note discusses the key differences between the two devices that need to be considered when migrating from FM24CL64 to FM24CL64B.

Drop-In Replacement or Not?

For most designs, FM24CL64B is a drop-in replacement for FM24CL64. From a software point of view, the two devices are identical. From a hardware point of view, the key difference between the two devices is that the FM24CL64B has a slightly higher standby current. Additionally, FM24CL64B 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.

Table 1 shows the compatibility chart of FM24CL64 and FM24CL64B. For a detailed comparison, see Table 3.

Table 1. Compatibility Chart

FM24CL64 Feature or Spec	Is FM24CL64B 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

Ordering Part Numbers

Table 2 gives the recommended FM24CL64B ordering part numbers that correspond to the now obsolete FM24CL64 ordering part numbers

Table 2. Recommended Ordering Part Numbers for Migration

FM24CL64		FM24CL64B		Comments
Ordering Part Number	Status	Ordering Part Number	Status	
FM24CL64-G	Obsolete	FM24CL64B-G	In production	No hardware or software change is required.
FM24CL64-GTR		FM24CL64B-GTR		
FM24CL64-DG		FM24CL64B-DG		
FM24CL64-DGTR		FM24CL64B-DGTR		

Comparison of FM24CL64 and FM24CL64B

Table 3 gives a detailed comparison of the two devices.

Table 3. Detailed Comparison

	FM24CL64	FM24CL64B	Comments
Package Types	-G, -DG	-G, -DG	Identical "green" SOIC and TDFN packages
Package Outlines	SOIC-8, TDFN-8	SOIC-8, TDFN-8	Identical SOIC outline and board footprint
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	75 µA @ 100 kHz 400 µA @ 1 MHz	100 µA @ 100 kHz 300 µA @ 1 MHz	The FM24CL64B offers lower active current at 1 MHz
Standby Current	1 µA (max)	6 µA (max) 3 µA (typical)	FM24CL64B has higher standby current
Read / Write Function	-	-	Identical 2-byte addressing, Identical Slave IDs, Identical Device Select bits
Clock Frequency	1 MHz	1 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	FM24CL64B is virtually unlimited at 1 MHz (1700 years for a 64-byte loop)
V_{DD} Power-Up Ramp Rate (t_{VR})		30 µs / V	Power-up ramp rate should be greater than 30 µs / V for FM24CL64B
V_{DD} Power-Down Ramp Rate (t_{VF})	-	30 µs / V	Power-down ramp rate should be greater than 30 µs / V for FM24CL64B
Power-Up to First Access (t_{PU})	-	1 ms	After power-up, the first access of FM24CL64B should be after 1 ms

Critical Considerations

You should consider all the parameter differences mentioned in Table 3 during the migration to FM24CL64B. 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 FM24CL64B device. Ensure that the power-up and power-down ramp rates are greater than 30 µs / V in your system.

Power-Up to First Access

The power-up to first access specification is added in the FM24CL64B device. Ensure that the FM24CL64B device is accessed only after 1 ms from power-up.

Summary

AN212 discussed the differences between FM24CL64 and FM24CL64B that need to be considered during migration to the FM24CL64B. This application note demonstrates that FM24CL64B is a drop-in replacement for FM24CL64 for most designs.

Related Documents

Datasheet

FM24CL64B: 64-Kbit (8 K × 8) Serial (I^2C) F-RAM datasheet

Document History

Document Title: Migrating from FM24CL64 to FM24CL64B - AN212

Document Number: 001-86818

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	3944550	GVCH	03/26/2013	New Spec
*A	4271353	MEDU	02/04/2014	Updated to Cypress Template Updated Active Supply Current for FM24CL64 from "70 µA @ 100 kHz " to "75 µA @ 100 kHz " Added data retention spec to FM24CL64B at 85 ºC Updated Power-up to first Access for FM24CL64B from "10 ms" to "1 ms" Removed V_{IH} (max) spec from Table 2
*B	4498650	GVCH	09/10/2014	Changed title from “Differences between FM24CL64 and FM24CL64B” to “Migrating from FM24CL64 to FM24CL64B.” Updated abstract. Added “Ordering Part Numbers” section. Added title for Table 3. Added “Related Documents” section.

Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at Cypress Locations.

Products

Automotive	cypress.com/go/automotive
Clocks & Buffers	cypress.com/go/clocks
Interface	cypress.com/go/interface
Lighting & Power Control	cypress.com/go/powerpsoc cypress.com/go/plc
Memory	cypress.com/go/memory
PSoC	cypress.com/go/psoc
Touch Sensing	cypress.com/go/touch
USB Controllers	cypress.com/go/usb
Wireless/RF	cypress.com/go/wireless

PSoC® Solutions

psoc.cypress.com/solutions

PSoC 1 | PSoC 3 | PSoC 4 | PSoC 5LP

Cypress Developer Community

Community | Forums | Blogs | Video | Training

Technical Support

cypress.com/go/support

Cypress Semiconductor
198 Champion Court
San Jose, CA 95134-1709

Phone : 408-943-2600
Fax : 408-943-4730
Website : www.cypress.com