AN114

Migrating from FM18L08 to FM18W08

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Associated Project: No
Associated Part Family: FM18L08, FM18W08
Software Version: None
Related Documents: For a complete list, click here

AN114 discusses the key differences that need to be considered when migrating from FM18L08 to FM18W08. FM18L08 is now obsolete and this application note explains how FM18W08 is a replacement for FM18L08.

Introduction

The FM18W08, a 256-Kbit parallel F-RAM™, is a replacement device for FM18L08, which is now obsolete. The two devices are identical in terms of pinout, package dimensions, read/write functionality, and temperature range. This application note discusses the key differences between the two devices that need to be considered when migrating from FM18L08 to FM18W08.

Drop-in Replacement or Not?

From a software point of view, the two devices are compatible since the read/write interface is same. From a hardware point of view, FM18W08 implements all the features of FM18L08 along with additional features like operation up to 5.5 V and lower active current. Additionally, the FM18W08 datasheet adds a power-up and power-down ramp rate specification of 30 µs/V and a power-up to first access specification of 10 ms.

Table 1 shows the compatibility chart of FM18L08 and FM18W08. For a detailed comparison, see Table 3.

Table 1. Compatibility Chart

FM18L08 Feature or Spec	Is FM18W08 compatible?
Package	Yes (SOIC-28)
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 FM18W08 ordering part numbers that correspond to the now obsolete FM18L08 ordering part numbers.

Table 2. Recommended Ordering Part Numbers for Migration

FM18L08		FM18W08	
Ordering Part Number	**Status**	**Ordering Part Number**	**Status**
FM18L08-SG	Obsolete	FM18W08-SG	In production
FM18L08-SGTR		FM18W08-SGTR	

Comparison of FM18L08 and FM18W08

Table 3 gives a detailed comparison of the two devices.

Table 3. Detailed Comparison

	FM18L08	FM18W08	Comments
Package Types	-SG, -TG, -PG	-SG	Identical "green" package for SOIC-28. FM18W08 is not offered in TSOP-32 and DIP-28 packages.
Package Outlines	SOIC-28, TSOP-32, DIP-28	SOIC-28	Identical outline and board footprint for SOIC-28. FM18W08 is not offered in TSOP-32 and DIP-28 packages.
Pinout	-	-	Identical
Temperature Range	–40 °C to +85 °C	–40 °C to +85 °C	Identical
Operating Voltage Range	3.0 V to 3.65 V	2.7 V to 5.5 V	FM18W08 offers a wider operating range.
Active Supply Current	15 mA @ 140 ns cycle	12 mA @ 130 ns cycle	FM18W08 offers lower active current.
Standby Current (CMOS)	15 µA	50 µA (max) 20 µA (typical)	FM18W08 has higher standby current
Standby Current (TTL)	400 µA	Not Specified	
Read / Write Function	-	-	Identical addressing and control pins
Access Time	70 ns	70 ns	Identical
Cycle Time	140 ns	130 ns	FM18W08 is slightly faster
Pre-Charge Time	70 ns	60 ns	Slightly better in FM18W08
Output Enable Access Time (t_{OE})	10 ns	12 ns	Slightly slower in FM18W08
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	FM18W08's endurance is large enough to be considered as unlimited for all practical applications. Even at 100,000 accesses / sec FM18W08's endurance is 31 years.
V_{DD} Power-Up Ramp Rate (t_{VR})	-	30 µs / V	Power-up ramp rate should be slower than 30 µs / V for FM18W08
V_{DD} Power-Down Ramp Rate (t_{VF})	-	30 µs / V	Power-down ramp rate should be slower than 30 µs / V for FM18W08
Power-Up to First Access (t_{PU})	1 µs	10 ms	FM18W08 is slower in first access
Chip Enable Active Time (t_{CA})	2000 ns	-	FM18W08 removes this limitation

Critical Considerations

You should consider all the parameter differences mentioned in Table 3 during the migration to FM18W08. 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 FM18W08 device. Ensure that the power-up and power-down ramp rates are slower than 30 µs / V in your system.

Power-Up to First Access

Power-up to first access specification is slower in FM18W08 device. Ensure that the FM18W08 device is accessed only after 10 ms from power-up.

Summary

AN114 discussed the differences between FM18L08 and FM18W08 that need to be considered during migration to the FM18W08.

Related Documents

Datasheet

FM18W08: 256-Kbit (32 K × 8) Bytewide F-RAM Memory datasheet

Document History

Document Title: Migrating from FM18L08 to FM18W08 - AN114

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	3944550	GVCH	03/26/2013	New Spec
*A	4280097	MEDU	02/13/2014	Updated to Cypress Template Updated the max spec of "Operating Voltage Range" for FM18L08 from 3.6 V to 3.65 V Added data retention spec to FM18W08 at 85 ºC Added Pre-charge time and Output Enable Access Time in Table 2.
*B	4498657	GVCH	09/25/2014	Changed title from “Differences between FM18L08 and FM18W08” to “Migrating from FM18L08 to FM18W08.” Updated abstract. Added “Ordering Part Numbers” section. Added title for Table 3. Added “Related Documents” section.

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