

FM18W08 Replaces FM18L08

Upgrade Your Board with new F-RAM Device



DESCRIPTION

The FM18W08 is a new 256Kbit byte-wide parallel F-RAM memory that offers a wide operating voltage range while the FM18L08 is limited to a 3.0 to 3.6V range. Existing designs that use the FM18L08 now have a potential replacement part. This technical brief highlights the differences between the FM18W08 and FM18L08 devices.

UPWARD COMPATIBLE

For systems that use the FM18L08 device, the transition to the FM18W08 chip could be straightforward assuming the design can accommodate the minor differences that the 18W08 brings. For most designs, the FM18W08 device can be considered a replacement for the FM18L08. The two devices are identical in terms of pinout, package dimensions, read/write functionality, and temperature range.

From a software point of view, the two devices are compatible. The two devices are read/write compatible. From a hardware point of view, the key differences between the two devices are the added features that the FM18W08 implements. The FM18W08 adds these features: operates to up to 5.5V and has lower active current. In terms of speed, both have the same access time and cycle time but the FM18W08 has improved timing characteristics. The 18L08 endurance is unlimited but the 1E14 endurance of the W part is quite a lot of cycles. FM18W08 is effectively unlimited if you consider that 1E14 cycles will allow 100,000 accesses per second for over 31 yrs.

The W part adds V_{dd} rise/fall times of 30µs/V and 100µs/V, a power up to first access time of 10ms. It is recommended that the board designer reviews these new additions.

COMPATIBILITY CHART

FM18L08 Feature or Spec	... is FM18W08 compatible?
Package	Yes (SOIC28)
Pinout	Yes
Temperature Range	Yes
Operating Voltage	Yes
Operating Current	Yes
Standby Current	No
R/W Function	Yes
Timing/Freq	Yes
Data Retention	Yes*
Endurance	Yes*

* See table on next page.

DETAILED COMPARISON TABLE

Differences are highlighted in yellow.

	<u>FM18L08-70-SG</u>	<u>FM18W08-SG</u>	<u>Comments</u>
Package Types	-	-	Same, “green” SOIC package
Package Outlines	SOIC-28	SOIC-28	Same outline and board footprint
Pinout	-	-	Same
Temperature Range	-40°C to +85°C	-40°C to +85°C	Same
Operating Voltage Range	3.0 to 3.6V	2.7 to 5.5V	The 18W08 offers a wider operating range.
Active Supply Current	15mA @ 140ns cycle	12mA @ 130ns cycle	The 18W08 offers lower active current.
Standby Current	15µA	50µA (max) 20µA (typ)	FM18W08 has higher I _{SB} , typical is 20µA.
Read/Write Function	-	-	Same addressing and control pins
Access Time	70ns	70ns	Same
Cycle Time	140ns	130ns	FM18W08 is slightly faster.
Data Retention *	45 yrs (+85°C)	38 yrs (+75°C)	Nearly the same
Endurance *	“Unlimited”	1E+14	FM18W08 is virtually unlimited even at 100,000 accesses/sec (1E14 cycles is reached after 31 yrs)

OTHER			
t_{CA} CE low time (max)	2000ns	-	FM18W08 removes this limitation.
V_{DD} Rise/Fall Time	-	30µs/V, 100µs/V	Added power ramp specs
t_{PU} Power Up Time	-	10 ms	Added first access timing spec
V_{IH} (max)	V _{DD} +0.5V	V _{DD} +0.3V	
I_{OL} Test Condition	3.2 mA	2 mA	V _{OL} (max) is guaranteed to be ≤ 0.4V but the test current is different. Generally this is not an issue since most designs drive CMOS loads.