Differences in FM20L08 and FM28V100

Applies to 1Mb Parallel F-RAM Devices

DESCRIPTION

This document points out the differences the FM20L08 and FM28V100 parallel F-RAM devices. For most designs, the FM28V100 device can be considered equivalent or better than the FM20L08. The two devices are identical in terms of pinout, package dimensions and composition, read/write functionality, and address pin functionality. In terms of speed, the FM28V100 has faster access timing and cycle timing.

DROP-IN REPLACEMENT OR NOT

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 the FM28V100's higher standby current. The FM28V100 adds many features: operates to down to 2.0V and higher speed capability. The summary table below highlights the differences.

COMPATIBILITY CHART

FM20L08 Feature or Spec		**… is FM28V100 compatible?**
Package		Yes
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

* Drop-in replacement if pins 6 and 9 are not connected on pcb

** Output hold time is shorter and pg mode timing is slightly slower

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DETAILED COMPARISON TABLE

Differences are highlighted in yellow.

	FM20L08	FM28V100	Comments
Package Types	-TG	-TG	Same "green" package
Package Outlines	32-pin TSOP	32-pin TSOP	Same outline and board footprint
Pinout	-	-	FM28V100 drops into an FM20L08 socket
Temperature Range	-40C to +85C (-TG) -25C to +85C (-TGC)	-40C to +85C	Same or improved
Operating Voltage Range	3.0 to 3.6V	2.0 to 3.6V	FM28V100 allows operation down to 2V
Active Supply Current	25mA @ 150ns cycle	12mA @ 90ns cycle	The 28V100 offers lower active current.
Standby Current	25µA	150µA	FM28V100 has higher I_{SB}.
Read/Write Function	-	-	Same R/W function, same addressing
Access Time	60 ns	60 ns	FM28V100 is faster
Cycle Time	150 ns	90 ns	FM28V100 is faster
t_{OH} Output Hold Time	50 ns	20 ns	FM28V100 requires that the system latch the read data sooner than the FM20L08. This is only a concern for the Read Cycle Timing 1 case. Most systems will latch the data when the address is changed but this is a timing parameter to check in your system.
t_{AAP} Page Mode Address Access Time	25 ns	30 ns	FM28V100 is slower for page mode reads, so this timing parameter should be checked.
Data Retention	10 yrs	10 yrs	Same
Endurance	Unlimited	1E+14	FM28V100 is unlimited at 200ns cycle time (182 yrs for a 256-byte loop)
OTHER			
V_{DD} Rise/Fall Time	50µs/V, 100µs/V	50µs/V, 100µs/V	Same
t_{PU} Power Up Time	5 ms	0.25 ms	FM28V100 faster to first access
V_{IH} / V_{IL} Input Trip Points	2.2V / 0.6V	$0.7V_{DD}$ / $0.3V_{DD}$	Most controllers swing outputs rail-to-rail but this is a DC parameter to check.