Differences in FM25L256B and FM25V02

Applies to 256Kb SPI F-RAM Devices

DESCRIPTION

This document points out the differences the FM25L256B and FM25V02 F-RAM devices. For most designs, the FM25V02 device can be considered a superset of the FM25L256B. The two devices are identical in terms of pinout, package dimensions and composition, and read/write functionality. In terms of speed, both operate up to 20MHz but the FM25V02 allows read/write operations up to 40MHz. It also adds a sleep mode feature which effectively lowers the standby/idle current to 8µA.

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 FM25V02's higher standby current. The FM25V02 adds many features: operates to down to 2.0V, sleep mode capability, Device ID feature, and higher speed capability. The summary table below highlights the differences.

COMPATIBILITY CHART

FM25L256B Feature or Spec		**… is FM25V02 compatible?**
Package		Yes (SOIC)
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

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May 2009

DETAILED COMPARISON TABLE

Differences are highlighted in yellow.

	FM25L256B	FM25V02	Comments
Package Types	-G, -DG	-G	SOIC only
Package Outlines	SOIC-8, TDFN-8	SOIC-8	Same SOIC outline and board footprint
Pinout	-	-	Same
Temperature Range	-40C to +85C	-40C to +85C	Same
Operating Voltage Range	2.7 to 3.6V	2.0 to 3.6V	FM25V02 allows operation down to 2V
Active Supply Current	500µA @ 1MHz 10.0mA @ 20MHz	300µA @ 1MHz 3.0mA @ 40MHz	The 25V02 offers lower active current even at low freq.
Standby Current	10µA	150µA	FM25V02 has higher I_{SB}.
Sleep Mode Current	-	8µA	FM25V02 offers a sleep mode which reduces the "idle" current
Read/Write Function	-	-	Same 2-byte addressing, same op-codes
Clock Freq	20 MHz	40 MHz	FM25V02 offers higher speed
Data Retention	10 yrs	10 yrs	Same
Endurance	Unlimited	1E+14	FM25V02 is unlimited at 20MHz (85 yrs for a 64-byte loop)
OTHER			
V_{DD} Rise/Fall Time	50µs/V, 100µs/V	50µs/V, 100µs/V	Same
t_{PU} Power Up Time	10 ms	0.25 ms	FM25V02 faster to first access
/HOLD pin pullup	-	Internal pullup	Most systems tie /HOLD to V_{DD} but this should be checked in your design.
Device ID Feature	-	Yes	