

## Differences in FM24L256 and FM24V02

*Applies to 256Kb I<sup>2</sup>C F-RAM Devices*



### DESCRIPTION

This document points out the differences the FM24L256 and FM24V02 F-RAM devices. For most designs, the FM24V02 device can be considered a superset of the FM24L256. The two devices are identical in terms of pinout, package dimensions and composition, read/write functionality, WP pin operation, and address pin functionality. In terms of speed, both operate up to 1MHz and the FM24V02's timing specs are tighter. The FM24V02 incorporates a new HS-mode that allows read/write operations up to 3.4MHz. 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 FM24V02's higher standby current. The FM24V02 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

FM24L256 Feature or Spec		... is FM24V02 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

## DETAILED COMPARISON TABLE

Differences are highlighted in yellow.

	<b><u>FM24L256</u></b>	<b><u>FM24V02</u></b>	<b><u>Comments</u></b>
<b>Package Types</b>	-G	-G	Same, “green” SOIC
<b>Package Outlines</b>	SOIC-8	SOIC-8	Same outline and board footprint
<b>Pinout</b>	-	-	Same
<b>Temperature Range</b>	-40C to +85C	-40C to +85C	Same
<b>Operating Voltage Range</b>	2.7 to 3.6V	2.0 to 3.6V	FM24V02 allows operation down to 2V
<b>Active Supply Current</b>	70µA @ 100kHz 0.6mA @ 1MHz	175µA @ 100kHz 0.4mA @ 1MHz	The 24V02 offers lower active current above 700kHz.
<b>Standby Current</b>	12µA	150µA	FM24V02 has higher I <sub>SB</sub> .
<b>Sleep Mode Current</b>	-	8µA	FM24V02 offers a sleep mode which can be used to reduce the standby/idle current
<b>Read/Write Function</b>	-	-	Same 2-byte addressing, same Slave IDs, same Device Select bits
<b>Clock Freq</b>	1 MHz	1 MHz	Same clk freq but improved timings
<b>Data Retention</b>	10 yrs	10 yrs	Same
<b>Endurance</b>	Unlimited	1E+14	Unlimited at 1MHz (1700 yrs for a 64-byte loop)
<b>OTHER</b>			
<b>V<sub>DD</sub> Rise/Fall Time</b>	50µs/V, 100µs/V	50µs/V, 100µs/V	Same
<b>t<sub>PU</sub> Power Up Time</b>	5 ms	0.25 ms	FM24V02 faster to first access
<b>HS-mode Clock Freq</b>	-	3.4 MHz	Needs new commands
<b>V<sub>IH</sub> (max)</b>	V <sub>DD</sub> +0.5V	V <sub>DD</sub> +0.3V	
<b>I<sub>OL</sub> Test Condition</b>	3 mA	2 mA	V <sub>OL</sub> (max) is guaranteed to be ≤ 0.4V but the test current is different.
<b>Device ID Feature</b>	-	Yes	