

FM24CL64B as Replacement for FM24CL32

Applies to 3V I²C 32Kb and 64Kb Devices



DESCRIPTION

The FM24CL64B is a 64Kbit I²C F-RAM memory that may be used as a replacement device for the FM24CL32. This technical brief highlights the differences between the FM24CL64B and FM24CL32 (32Kbit) devices.

BACKWARD COMPATIBLE

For systems that use the FM24CL32 device and need a replacement, it is possible that the FM24CL64B can be a substitute as long as address A12 is held low when the serial address is clocked in. The FM24CL64B device can be considered a superset of the FM24CL32. The two devices are identical in terms of pinout, package dimensions, and read/write functionality with the exception of the A12 address bit. If the user wishes to transition to a 64Kb chip and take advantage of the additional memory space, it is as straightforward as changing the firmware to support twice the memory space by driving the A12 bit.

The two devices are not hardware compatible when considering power cycle events. The FM24CL64B has three new timing specifications that the board designer needs to check for system compatibility. There are power supply ramp rates and powerup to first access timing parameters that should be reviewed (pg. 2).

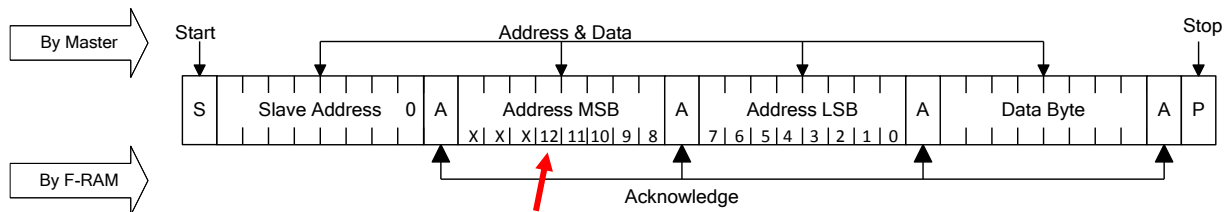


Figure 1. FM24CL64B Write Sequence

Shown above is a write sequence for the FM24CL64B device. Note the addition of address bit A12 in the serial address stream. This is the MSB for a 64Kb device. The FM24CL32 does not have this address bit. Current Address Read and Sequential Read diagrams are not shown because there is no serial address. A Selective (random) Read is not shown either since it begins as a write sequence (shown above). Also both devices can accommodate up to 8 memory devices on the same I²C bus.

COMPATIBILITY CHART

FM24CL32 Feature or Spec	... is FM24CL64B compatible?
Package	Yes
Pinout	Yes
Temperature Range	Yes
Operating Voltage	Yes
Operating Current	Yes
Standby Current	Yes
R/W Function	Yes
Timing/Freq	Yes
PowerUp to 1 st Access	No*
Data Retention	Yes*
Endurance	Yes*

* See table on next page.

DETAILED COMPARISON TABLE

Differences are highlighted in yellow.

	<u>FM24CL32-G</u>	<u>FM24CL64B-G</u>	<u>Comments</u>
Package Types	-	-	Same, “green” SOIC package
Package Outlines	SOIC-8	SOIC-8	Same outline and board footprint
Pinout	-	-	Same
Temperature Range	-40C to +85C	-40C to +85C	Same
Operating Voltage Range	2.7 to 3.6V	2.7 to 3.65V	Same, compatible
Active Supply Current	70µA @ 100kHz 250µA @ 400kHz 600µA @ 1MHz	100µA @ 100kHz 170µA @ 400kHz 300µA @ 1MHz	The 24CL64B offers lower active current at frequencies of 400kHz and above.
Standby Current	12µA	6µA	FM24CL64B has lower I _{SB} .
Read/Write Function	-	-	Same 2-byte addressing, same Slave IDs, same Device Select bits, A12 must be low
Max. Clock Freq	1 MHz	1 MHz	Same
Data Retention *	45 yrs (+85°C)	38 yrs (+75°C)	Nearly the same
Endurance *	“Unlimited”	1E+14	FM24CL64B is virtually unlimited at 1MHz (1700 yrs for a 64-byte loop)

OTHER			
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. Please check that your design performs its first access to F-RAM no sooner than 10 ms from power up.
V_{IH} (max)	V _{DD} +0.5V	V _{DD} +0.3V	