

Comparing FM31xx and FM3127x/FM31L27x

I²C Processor Companion with F-RAM Devices



DESCRIPTION

The FM31xx and FM3127x/FM31L27x processor companion families are similar in many ways, however there are a few key differences. The original FM31xx family operates over a wide voltage range, 2.7V to 5.5V. The FM3127x and FM31L27x families are split into 5V and 3V versions, respectively.

The following table shows the new part numbers and the corresponding densities.

Density	Original Family	New 5V Family	New 3V Family
256Kb	FM31256-G	FM31278-G	FM31L278-G
64Kb	FM3164-G	FM31276-G	FM31L276-G
16Kb	FM3116-G	FM31274-G	FM31L274-G
4Kb	FM3104-G	FM31272-G	FM31L272-G

The original and new devices are mostly the same. The interface, features, and densities are the same, however, there are a few differences: (1) operating voltage range, (2) trickle charger, (3) RTC crystal, and (4) no special battery insertion precautions on the new devices.

Register 0Bh, FM31xx

Reg	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0Bh	SNL	-	-	WP1	WP0	VBC	VTP1	VTP0

Register 0Bh, FM3127x/FM31L27x

Reg	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
0Bh	SNL	-	FC	WP1	WP0	VBC	-	VTP

- (1) The new FM3127x devices operate from 4.0V to 5.5V and requires only one bit to program two VTP trip points, 3.9V and 4.4V. Similarly the new FM31L27x devices operate from 2.7V to 3.6V and also requires only one bit to program two VTP trip points, 2.6V and 2.9V. Register 0Bh is shown above for original and new devices. Note: This is code compatible with the original FM31xx since Bit 1 in the new FM3127x/FM31L27x is ignored.
- (2) The new devices have a higher trickle charger current for the base setting (FC=0). They also have a new Fast Charge mode (FC=1) that is user-selectable. This Fast Charge mode allows a 0.1F supercap to be fully charged in 15 minutes. Note the VBC bit remains in location Bit 2, Register 0Bh. The FC bit has been added to location Bit 5, Register 0Bh. If the trickle charger is disabled (i.e. VBC=0 and battery used as backup source), then the trickle charger changes are irrelevant.
- (3) The new families use a 12.5pF crystal, a more commonly available type than the 6pF type. Otherwise there is no change to the RTC.
- (4) On the original FM31xx devices, there was a chance that higher than normal I_{BAK} current would occur when the battery was first inserted. A recommended sequence of applying power (V_{DD} and V_{BAK}) was described in the datasheet (pg 7). The new FM3127x/31L27x devices do not have this problem. The battery may be installed whether or not the device is V_{DD} -powered.

All other specifications have remained the same for the new family of companions. The new families are software backward compatible.

The original and new devices are available in the “green”/RoHS package, designated as “-G”.

COMPARISON TABLE

The differences between the original and new families are summarized below.

	Original Family	New 5V Family	New 3V Family	
	FM31xx	FM3127x	FM31L27x	Comments
Operating Voltage Range	2.7V to 5.5V	4.0 to 5.5V	2.7V to 3.6V	Split into 5V and 3V versions.
Voltage Detect Trip Points	2.6V, 2.9V, 3.9V, 4.4V	3.9V, 4.4V	2.6V, 2.9V	New devices have only one VTP bit in register 0Bh.
RTC Crystal Type	6 pF	12.5 pF		A more common crystal
Trickle Charger (min - max range)	5 – 25 μ A	50 – 120 μ A, FC=0 200 – 2500 μ A, FC=1		Added Fast Charge mode (Register 0Bh, bit 5). Increased current on standard setting.