

bq2060/bq2060A

Errata



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Errata

This errata applies to all production versions of the bq2060 and bq2060A (bq2060E207, bq2060E411, and bq2060AE619) devices.

1 Normal Operation

The reference schematic in previous bq2060/bq2060A datasheets shows V_{CC} to the EEPROM supplied from the V_{OUT} pin of the bq2060/bq2060A. The gauge only powers the EEPROM when the EEPROM is needed, saving the power consumption of the EEPROM except for the very short intervals when reading or writing to the EEPROM is required. Normally, there is a 10 ms delay after writing this data before V_{OUT} is powered down, giving the EEPROM time to complete the write operation.

2 Errata

All versions of the bq2060/bq2060A have a low probability timing issue when the gauge updates the CycleCount and FullChargeCapacity values stored in the external EEPROM. There is about a 1% probability that the gauge will initiate the update to the EEPROM, but will incorrectly detect a busy condition and shut down V_{CC} to the EEPROM without the normal 10 ms delay. The gauge will retry the operation in about 1 second and will again write the desired value to the EEPROM with the normal 10 ms delay before power is switched off. Therefore, CycleCount and/or FullChargeCapacity values will be written correctly in the EEPROM and the short delay after the first aborted write operation has historically caused no known issues.

3 Problem

One of the predominant EEPROM manufacturers has recently changed the architecture of their EEPROM design and the combination of this change with a short delay in V_{CC} application by the gauge has resulted in unacceptable results. The issue is that the entire 8-byte block will be erased when the write operation is started and the short V_{CC} application would prevent restoring the data. The end result is that the other 6 bytes in the 8-byte block will be left at 0xFF. This issue can result in corrupting the EEPROM values for Misc Options (bq2060A only), Safety Overtemperature (bq2060A only), Charging Voltage, Pack Capacity, Cycle Count Threshold, and Pack Configuration. If the gauge subsequently does a reset for any reason, the RAM will be refreshed from EEPROM and these potentially corrupted values would upset normal gauging operation.

4 Resolution

The easiest solution is to power the EEPROM continually instead of using the V_{OUT} switched power from the gauge. Existing PCB assemblies can be modified by bridging the gauge pin 6 (V_{OUT}) to pin 7 (V_{CC}). The V_{OUT} pin is driven by a FET switch connected to V_{CC} , so shorting from pin 6 to pin 7 will not cause any stress or reliability issues with the gauge. The additional current drain may be less than 1 μ A, depending on the particular EEPROM used.

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