

Production Flow with bq20z80 Gas Gauges

Battery Management

1.1 Preproduction steps

Before production, the followings steps must be finalized

1. Design and testing of the PCB
2. Choice of the data-flash constants providing the desired functionality (most important, settings for number of serial cells and capacity)
3. The optimal value of the board offset should be found by characterizing several packs, see “calibration” ([SLUA386](#)).
4. The optimization cycle should be done on one battery pack for preparing optimized battery model related data-flash parameters as described in ([SLUA334](#)) “preparing optimized data-flash constants”
5. The data-flash image file (golden image) should be prepared using the bqTester or custom software as described in *Using the bqTester Software chapter to calibrate PCB* ([SLUA352](#)).

1.2 Typical production flow (some other custom steps can be added)

1. Assemble the PCB
2. Functionality test:
Test the PCB for functionality of critical elements (ICs, FETs, Fuse blowing circuit). If necessary, the FET ON/OFF status can be controlled using command 46. To prevent data-flash corruption, do not enable IT at this stage .
3. Write data flash and calibrate:
Use the previously created golden image with optimized data-flash constants , made as described in [SLUA352](#) to calibrate the PCB. A multy-channel version of bqTester is also available. Alternatively, use a custom made software as described in *Data Flash Programming/Calibrating the bq20z80 Gas Gauges* ([SLUA355](#)).
4. Connect the cells to the PCB.
5. Send the IT enable command (Manufacturer Access 0021).
This step starts the fuel-gauging and Life Time Data update. It should not be made until cells are connected. If cells were disturbed by charge or discharge testing during some previous steps, at least 30 min should pass before IT is enabled to assure that the open circuit voltage is stabilized.
6. Short discharge test:
If the battery is removable (NR bit in DF.Op.Config B is 0), short the System Present pin to the ground to emulate battery insertion into system. If NR bit is 1, above is not needed. Connect the typical load for short time (1-2 seconds) to check that the battery can be discharged as expected. This tests correctness of data-flash programing and FETs functionality. It is not required for the gas-gauge functionality.
7. Check the reported RSOC by pushing the LED button. Typicaly, cells are in the 50% charged state, so half of the LEDs should light up.
8. Send the “seal” command to block assess to the data-flash (Manufacturer Access 0x0020). Note that after giving this command at least once, pack is unsealed by using the unseal code, but it reseals itself upon reset.
9. Before shipment and long storage, it use the “shut down” command (Manufacturer Access 0x0010), which causes GG to shut-down (lowest power mode) until the next application for the charger volage to Pack+ and Pack-.

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Mailing Address: Texas Instruments
Post Office Box 655303 Dallas, Texas 75265

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