Application Report
SLUA880A–March 2018–Revised April 2018

bq40z50-R2 v2.08 to v2.11 Change List

ABSTRACT

This document describes the changes made from bq40z50-R2 v2.08 to v2.11, as well as new features and bug fixes The bq40z50-R2 ICs will continue shipping with v2.08 pre-programmed, but v2.11 is available for download from ti.com. All previous versions of bq40z50 ICs can be upgraded to run v2.11.

Contents

Trademarks

1 Introduction

bq40z50-R2 firmware version 2.11 has been released to enable several feature additions and performance improvements.

To work with bq40z50-R2 v2.11, download and install the latest version of the Battery Management Studio (bqStudio) evaluation software from ti.com. Alternatively, place a copy of the 4500_2_11-bq40z50R2.bqz file in to the following directory before launching bqStudio: C:\ti\BatteryManagementStudio\config.

The existing bq40z50, bq40z50-R1, and bq40z50-R2 integrated circuits and evaluation modules (EVMs) can be upgraded to bq40z50-R2 v2.11 firmware by programming the .srec firmware file for v2.11.

An installer is available from the Software section of the bq40z50-R2 product folder on ti.com, which places the v2.11 .srec and .bqz files on the PC. If users have any existing golden .srec files used for the bq40z50-R2 v2.08 firmware, they can be migrated to v2.11.

The recommended steps to migrate from v2.08 to v2.11 firmware using bqStudio follow:

1. Program an existing v2.08 .srec golden file in to a bq40z50EVM.
2. Export a .gg.csv file with *_v208_golden.gg.csv* in the filename.
3. Use the CHEM_ID button to confirm the chemistry ID used in the file.
4. Program the default v2.11 .srec file.
5. Export a .gg.csv file with *bq40z50-R2_v211_default.gg.csv* in the filename.
6. Compare the two files. Copy the firmware versions and build numbers from the v2.11 file header to the v2.08 file and save the new file with *_v211_goldendraft.gg.csv* in the filename.
7. Import the new gg.csv file into the IC.
8. Program the desired chemID using the Chemistry plugin—this overwrites the learned Ra tables and Ra flags back to the default and unlearned values, so the user must manually update the tables back to the learned values after programming the chemID.
9. Review all other data flash parameters and modify if desired.
10. Export a new *_v211_golden.gg.csv* file.
11. Export a new *_v211_golden.srec* file to use for production.

No change in gauging performance is expected due to the firmware upgrade, but testing is recommended to ensure the process was followed correctly.

2 Change Details

Table 1. Change Details

CHANGE HIGH-LEVEL DESCRIPTION	bq40z50-R2 v2.11	bq40z50-R2 v2.08	COMMENTS
Repair timing issue with AD conversions on entry to and exit from Sleep.	Bug fixed.	If Sleep mode is used there is a small but non-zero chance for incorrect ADC readings to occur, leading to large temporary jumps in measured voltages and temperatures.	Sleep mode should not be enabled if using v2.08, or there is a possibility for a false PF to occur.
Add new ***[CUDEP_REQ_CHG]*** option to the ***Protection Configuration*** data flash parameter.	New feature. Bit is marked as ***[CUDEP_REQ_CHG]***.	Feature does not exist. Bit is marked as ***[RSVD]***.	When enabled, the charging voltage and current requested will be non-zero during the CUDEP period (when SUV_MODE = 1). When the battery voltage is below CVUV and the gauge wakes up from shutdown, some systems using v2.08 firmware were unable to charge the battery. The following happens: On wake up from shutdown, the gauge performs a copper deposition check. As part of this check the following tasks are carried out: 1) Turn off DFET and CFET. 2) Request Charging Voltage and Charging Current = 0 (in v2.08). Some chargers interpret the request for Charging Voltage = 0 to mean that they should turn off completely. This can result in no power from the battery or charger and the system may crash. In v2.11 the user has the option to enable this bit to specify a non-zero Charging Voltage and Charging Current during the copper deposition check period. Actual charge current would be blocked during the check because FETs will be off temporarily.
Prevent sleep during copper deposition check period.	Will not sleep during CUDEP period.	Sleep allowed during CUDEP check period.	In v2.11, when [SUV_MODE] is enabled the gauge will not be allowed to enter Sleep mode at POR until the SUV check has passed.
Fix timing for ***[CS_CV]*** feature.	***Time Interval*** units are 1 s. This matches documentation.	***Time interval*** units are 0.8 s. This does not match documentation.	Only relevant if ***Charging Configuration: [CS_CV]*** is enabled. This feature is disabled by default in both versions.
Fix AFE latch safety never clearing due to latch decay gated by latch status.	ASCC, AOLD, and ASCD Latch Counters decrement and reset correctly, per documentation. Okay to use ASCCL, AOLDL, and ASCDL protections if desired.	ASCC, AOLD, and ASCD Latch Counters do not decrement and reset per documentation, possibly causing spurious ASCCL, AOLDL, and ASCDL protection to be triggered. Recommend keeping these protections disabled.	These protections are disabled by default in both versions.
Removed ***Valid Wake up Comm check Delay*** from data flash.	Data flash parameter not present.	Data flash parameter visible but unused.	This parameter is not used in either version, so it has been hidden.

Revision History

Changes from Original (March 2018) to A Revision **Page**

- Changed column headers of *Change Details* table to include version number 3
- Added the *Removed Valid Wake up Comm check Delay* row to the *Change Details* table 3

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