bq27510-G1 to bq27510-G2 Change List

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ABSTRACT

This document describes the changes made from bq27510-G1 to bq27510-G2. The latest ordering information and data sheet is available on the Texas Instruments (TI) Web site.

NOTE that bq27510-G1 uses FW version 1.12 and the bq27510-G2 uses FW version 1.23.

1 Introduction

The bq27510-G2 firmware version 1.23 has been released to enable several feature additions. The following new orderable part numbers have been released with ship preprogrammed with to the new version of firmware:

- BQ27510DRZR-G2
- BQ27510DRZT-G2

The latest version of the evaluation software is required to be able to read and write all the data flash configuration locations. The necessary evaluation software and the corresponding V1.23 SENC file can be downloaded from the bq27510-G2 product folder on the TI Web site at www.ti.com. Existing bq27510 or bq27510-G1 (including EVMs) can be upgraded to the latest firmware version by following the instructions in application report SLUA453.

NOTE: If a golden image created for another version of bq27510-G1 is loaded into an integrated circuit (IC) running firmware version 1.23, the IC will become nonfunctional and must be replaced. Ensure that all instructions in application report *Updating Firmware With the bq2750x and EVM* (SLUA453) are followed if upgrading ICs or converting your production line to bq27510-G2. The best practice is to generate a new golden image (DFI file) for bq27510-G2.

NOTE: NOTE: bq27510-G1 golden image can not be directly used for bq27510-G2. The chemical ID has to be re-determined as the bq27510-G2 is using different chemistry profile structure. The cell chemical ID need to be determined for bq27510-G2 and new golden image has to be re-generated based on the new ID

2 Change Details

Table 1. Change Details

CHANGE	bq27510-G1	bq27510-G2	Comments
Remove Manufacturer Info Block C	Has Manufacturer Block C	No Manufacturer Block C	Save memory space
Add two temperature coefficients and normalize the Ra to 25C	One temperature coefficient; Ra table is normalized at 0C	Two temperature coefficients; Ra table is normalized at 25C	Improve low temperature performance
Thermal modeling added. This accounts for cell heating during discharge	No thermal modeling	Added thermal modeling to account for cell heating during the discharge	Improve low temperature performance. New data flash parameters are added: Thermal Rise Factor and Thermal Time Constant
Transient modeling is added	No transient modeling	Added transient modeling	Better low temperature simulation performance. Improve gauging accuracy at low temperature and high discharge rate. New data flash parameters are added: TransientFactorCharge, TransientFactorDischarge
Add data flash parameters: OpConfig B	No OpConfig B	Add OpConfig B with RFACTSTEP bit	RFACTSTEP is used to enable resistance update range set by Min/Max Res Factor
Use ADC current for OCV compensation on battery insert, reset or wake from hibernate	No current compensation for OCV measurement	ADC current is used for compensation	Improve OCV measurement accuracy under load
Add delay before reading V, to allow V to settle after battery insertion	No delay	Delay added to allow voltage to settle at battery insertion	Improve first voltage measurement accuracy
Reduce BAT_GD assertion time after battery insertion	BAT_GD asserted for 2 seconds after battery insertion	BAT_GD asserted for 1.7~1.8 seconds after battery insertion	Reduce gauge initialization time
Fixed issue of CHG_INH and XCHG clearing if FC = 1	CHG_INH and XCHG will be cleared if FC = 1 even with temperature outside safety threshold	CHG_INH and XCHG will not clear when temperature is outside the safe range set by data flash even if FC = 1	Bug fix in firmware
Disable I2C engine during DF writing. This is configurable in OpConfig using I2C_NACK bit	I2C clock will stretch during DF writing	If the I2C_NACK is set, I2C engine will NACK the command during the DF update. I2C engine will clock stretch if the bit is cleared.	I2C communication improvement
Add data flash parameter: Ra Max Delta	No Ra Max Delta parameter	Add Data flash parameter to limit maximum allowed Ra update. It should be set to 15% of uncompressed* grid 4 Ra value after optimization cycle.	Improve Ra update accuracy
Add OpConfigB.SleepWakeChg	No OpConfigB.SleepWakeChg	Addition of average accumulated charge during sleep. This feature is enabled by setting OpConfigB.SleepWakeChg.	Algorithm improvement
Add constrain on Ra update condition	Ra will updated even the Qmax is not learned	Ra is not updated if the Qmax is not learned	Algorithm improvement

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