

bq27541-G1 to bq27542-G1 Change List

ABSTRACT

This document describes the changes made from bq27541-G1 to bq27542-G1. The latest ordering information and data sheet is available on the [TI Web site](#).

NOTE:

- bq27541-G1 ICs *cannot* be upgraded with bq27542-G1 firmware.
- bq27542-G1 includes a new ROM version to enable updated firmware features.
- Although the bq27541-G1 reports FW version 2.24 and the bq27542-G1 reports FW version 2.01, bq27542-G1 is from a new code branch and is therefore more recent.

1 Introduction

The bq27542-G1 firmware version 2.01 enables several feature additions and performance improvements. The following newly released orderable part numbers are shipped pre-programmed with this new version of firmware:

- bq27542DRZR-G1
- bq27542DRZT-G1

To use the bq27542-G1, download the latest version of [Battery Management Studio \(bqStudio\)](#) evaluation software from ti.com.

Due to a ROM update, existing bq27541 ICs and EVMs *cannot* be upgraded to parity with bq27542.

NOTE: If a golden image created for any version of bq27541 is loaded into a bq27542-G1 IC, the IC will become non-functional and must be replaced. The best practice is to generate a new golden image (DFI file) for bq27542-G1. If a learning cycle for an existing cell or battery has already been performed on bq27541, it is acceptable to program the same chemID and then copy the learned Qmax and Ra values to a new bq27542 golden file.

2 Change Details

Table 1. Change Details

Change	bq27541-G1	bq27542-G1	Comments
ROM version update	Older ROM version	Newer ROM version	bq27541 ICs <i>cannot</i> be upgraded with bq27542 firmware.
Support Fast Qmax	Fast Qmax feature is not present.	Allows the use of the FastQmax algorithm feature to increase the likelihood of Qmax updates for applications where periodic relaxations may not be possible. New enable bit added to Pack Configuration C: FastQmax	New Feature
Support Battery Trip Point (BTP)	BTP is not supported.	Provides full BTP compliance for customers designing Win8 products. New bit added to Pack Configuration C: BTP_EN	New Feature

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Table 1. Change Details (continued)

Change	bq27541-G1	bq27542-G1	Comments
Support TURBO mode	TURBO mode is not supported.	Provides useful current reporting to inform the system when to throttle back consumption to avoid brownout. Enables dynamic or load scaling of system current.	New Feature
Add Trace/Downstream Resistance Feature	Feature is not supported.	Allows applications with non-trivial parasitic trace resistances between cell and PACK+/- nodes, as well as between PACK+/- and system +/- nodes. This enables the gauge to better predict when Terminate Voltage will be reached on the system side where power is used, rather than on the cell side.	New Feature
Filtered remaining capacity reporting options	Filtered RemCap and SOC must start decreasing immediately on discharge, and increase immediately on start of charge, even if over-charged (>100%) or over-discharged (below empty). In these situations, the Unfiltered values stay at 100% and 0% to reflect the true state.	New options are added to maintain legacy filtered behavior or else allow Filtered SOC and RemCap to hold at 100% and 0% until overcharged and over-discharged conditions pass. New bits added to Pack Config: SOCHoldOvrChg SOCHoldOvrDsg	Feature Change
SOC reporting improvement	Gauge is allowed to report 100% before charge termination detection or 0% before Terminate Voltage is reached.	Gauge can be configured to hold SOC at 99% until charge termination conditions are detected, and at 0% until Terminate Voltage is reached. New enable bits added to Pack Config: SOCHold99 SOCHold1	Feature Change
Add time-based or instant synchronization to SOC smoothing during RELAXATION	Filtered and Unfiltered capacity values will necessarily diverge as conditions change. They can only be synchronized at full or empty points, unless RelaxRCJumpOK is enabled and a temperature change causes a jump.	Option is added to allow convergence of Filtered values to match Unfiltered values either over time or instantly during relaxation. New enable bits added: Pack Configuration C [RlxSmEn] and Pack Configuration D [SMRLXSYNC] .	New Feature
Dedicated Load Select for Fast Ra Scaling	Same Load Select option used for simulations both before and after Fast Ra Scaling starts.	Allows customization of load used for Fast Ra Scaling simulations. Helps for better convergence at end of discharge. New parameter is added: Fast Scale Load Select .	New Feature
Disable Thermal model at the end of discharge	Thermal model may overestimate heating at end of discharge and can lead to poor convergence to empty.	Thermal model can be disabled during Fast Ra Scaling if needed. Helps for better convergence at end of discharge. New bit added to Pack Configuration C: FConvTempEn	New Feature
Allow resistance updates based on IR drop	Resistance updates at lower rates cannot be reliable at times. They are not allowed if the current is <C/10.	Gives extra flexibility in allowing resistance updates at low rates. This leads to reliable resistance updates in applications with low rates provided the resistance is high enough (at low temperatures, for example).	New Feature
Improve simulations at Low Temperature		Improves convergence to 0% at low temperature.	New Feature
T ambient (T _A) enhancement		Improve adaptability of the gauging algorithm to external temperature changes during charging. New bit added to Pack Configuration D: PREDICTAMB	New Feature
Use Ra1 instead of interpolation for DOD positions below grid1	Simulation accuracy at low DOD may not be accurate at times due to high resistance.	Improved simulation accuracy at low depth-of-discharge. Improves user experience by avoiding SOC jump at low depth-of-discharge.	New Feature
Enter HIBERNATE with HDQ mode	Use of HIBERNATE mode is not allowed if the gauge is configured for HDQ communications.	Can enter HIBERNATE mode with HDQ enabled.	New Feature

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