

Chemistry ID Selection

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Choosing the proper ChemID is critical to the achieving good performance in Impedance Track™ devices. Texas Instruments' Battery Management Solution group has a large portfolio of ChemID's that have been created and new cells are characterized upon customer request. The ChemID is selected from the portfolio using the bqEvaluation tool that was released for the device.

There are three options to select the proper ChemID for your cell.

1. Check for a battery part number match in the Chemistry Updater tool in the bqEvaluation program.
2. Collect data and find a match using a special Mathcad™ tool.
3. Send cells to TI for characterization.

Most commercially available cells have already been added to the ChemID portfolio that is available in the bqEvaluation tool. One caveat to using this ChemID is that the cell was characterized at a point in time and battery manufacturers may adjust their materials and processes and degrade the accuracy of the ChemID match to the cell. If you select a ChemID from the part number list in the bqEvaluation tool and see unexpected gauging performance in your battery pack, then you should take the next step to verify that the ChemID matches your cell.

A Mathcad™ tool is available on the TI website to help to find a ChemID match for your battery. You can find the Mathcad™ program and files at <http://www.ti.com/litv/zip/sluc138bg> or a link to the program can be found under the Software section on most of the bq device websites. Discharge data will be required for analysis by the tool.

Li-Ion, Li-Polymer, LiFePO4 Cell Chemistries

- You will need to monitor the cell voltage, cell temperature, current and set the time to log every 1 second. You can log additional data, but that is all that is needed. You can also have several cells in series, but it is more accurate to use the voltage for one of the cells. The bq34z100 series does not monitor individual cell voltages, so you can use the stack voltage and the Mathcad™ tool will allow you to select number of series cells in the setup section.
- Charge the pack to full and allow it to taper to a C/100 taper current.
- Let it rest for at least 2 hours, then discharge it at a C/10 rate to discharge complete.
- Let it rest for about 5 hours.
- Use the Mathcad™ tool to analyze the data and search for a ChemID match. If you do not have access to Mathcad™, then contact TI for support with the analysis.

Lead Acid and Primary Cell Chemistries

- You will need to monitor the cell voltage, cell temperature, current and set the time to log every 1 second. You can log additional data, but that is all that is needed. You can also have several cells in series, but it is more accurate to use the voltage for one of the cells. The bq34z100 series does not monitor individual cell voltages, so you can use the stack voltage and the Mathcad™ tool will allow you to select number of series cells in the setup section.
- Charge the pack to full and allow it to taper to a C/100 taper current.
- Let it rest for at least 2 hours, then discharge it at a C/20 rate to discharge complete.
- Let it rest for about 5 hours.
- Use the Mathcad™ tool to analyze the data and search for a ChemID match. If you do not have access to Mathcad™, then contact TI for support with the analysis.

If the Mathcad™ tool does not yield an acceptable ChemID match, then your battery will need to be characterized at TI. Contact TI for information on submitting a battery for characterization.

The basic items needed are:

- 1) Battery characterization information form
- 2) Two cells
- 3) Battery datasheet