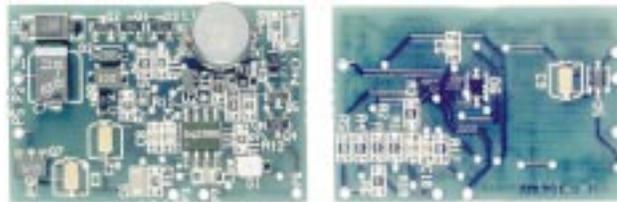


Designed to GO . . .

Practical and Cost-Effective Battery Management Design Examples by Benchmark
Series 2000, Number One



High Efficiency Dual-Chemistry Charger Using The bq2000



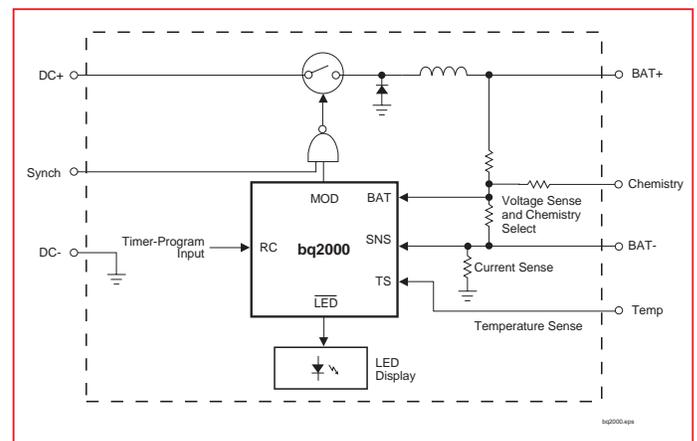
Features

- ◆ Circuit board measures only 1.5 x 1.0 in (37.5 x 25 mm)
- ◆ Supports 1 Li-Ion or 3 NiCd/NiMH cells
- ◆ 1A charging current
- ◆ 6-16V input DC voltage
- ◆ Pre-charge qualification by checking battery voltage and temperature
- ◆ Pre-charge conditioning for reviving deeply discharged batteries
- ◆ Charge status display
- ◆ High-frequency buck regulator
- ◆ Thermistor interface
- ◆ Input for synchronizing to an external oscillator
- ◆ Schematic, bill-of-materials and board layout available from Benchmark for immediate implementation

Typical Applications

- ◆ Low cost chemistry-independent fast chargers for cellular and handheld electronic equipment
- ◆ Cigarette lighter adapter chargers

Functional Block Diagram



bq2000 Designed to Go

General Description

In this example the bq2000 is used to design a simple and cost-effective chemistry-independent charger. This implementation is suitable for any application requiring a high efficiency charge management in a small footprint.

This design takes advantage of various built-in features of the bq2000 to safely manage charging of both lithium and nickel based chemistries.

Circuit topology: Switching buck regulator with high-side current sensing

Charge algorithm: NiCd/NiMH: Constant current followed by top-off and trickle charge. Li-Ion: Constant current followed by constant voltage

Battery chemistries supported: Lithium-Ion, NiCd, and NiMH

Maximum number of cells: Configured for one Li-Ion, or three NiCd/NiMH

Maximum charging current: 1A

Input requirements: 6-16V

Pre-charge qualification: Battery voltage and temperature

Charge termination: NiCd/NiMH: Peak voltage detection. Li-Ion: Minimum current. There also is a safety charge timer for both chemistries.

Chemistry select: For Li-Ion, the CSEL is left floating.
For NiCd/NiMH, the CSEL is tied to BAT-.

Please refer to bq2000 Data Sheet for full specifications

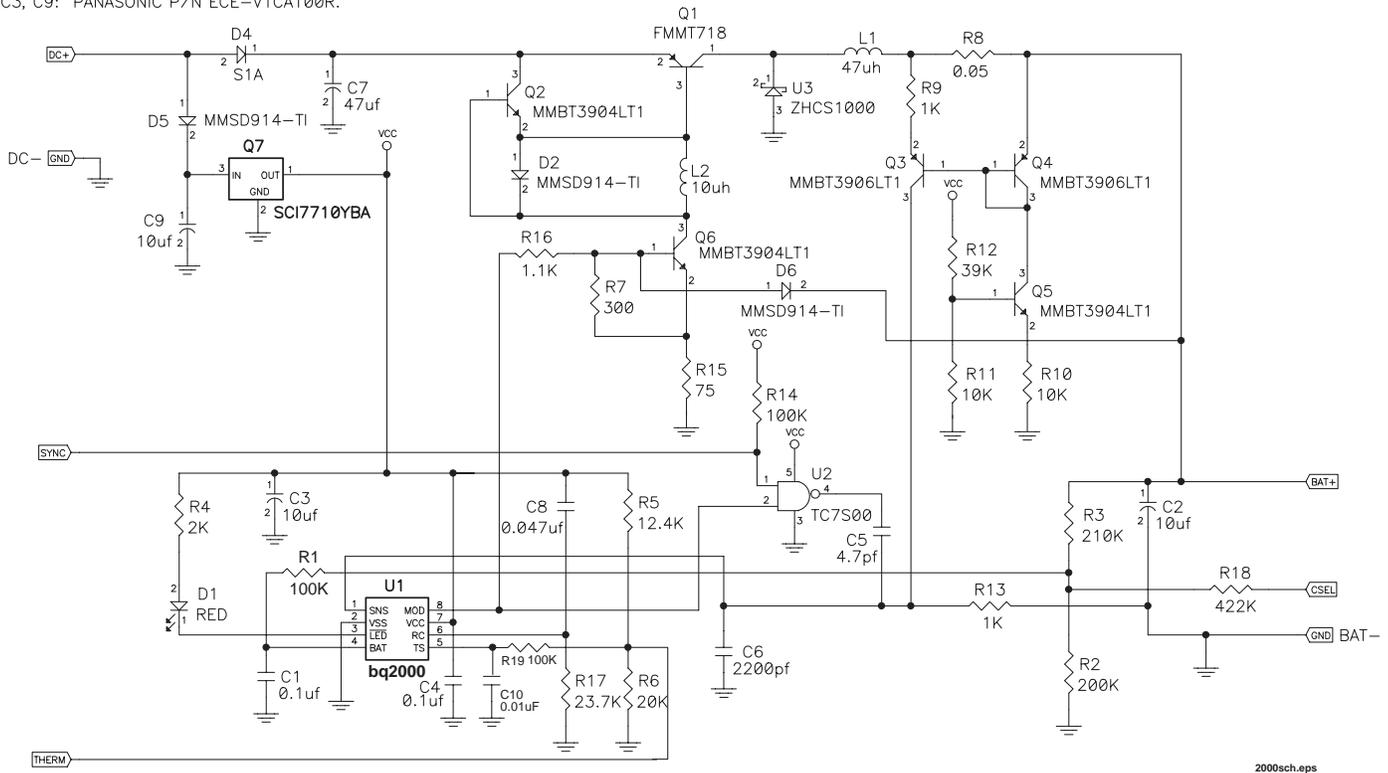
bq2000 Schematic

L1: 3L GLOBAL P/N PKSM-1005-470K-1A

L2: HOLD ADVANCED TECHNOLOGY CO., LTD. P/N HML321611T-100-M.

C7: PANASONIC P/N ECE-V1CA470P.

C2, C3, C9: PANASONIC P/N ECE-V1CA100R.



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