



Integrated BMS and ASIC Technology Creates Charge Isolation Safety Architecture in Large Battery Systems

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1Power Solutions – Next Generation Power Management Technology Delivers Energy-Efficient Vehicles

1Power Delivers Intelligent Battery Management Products for Large Battery Systems:

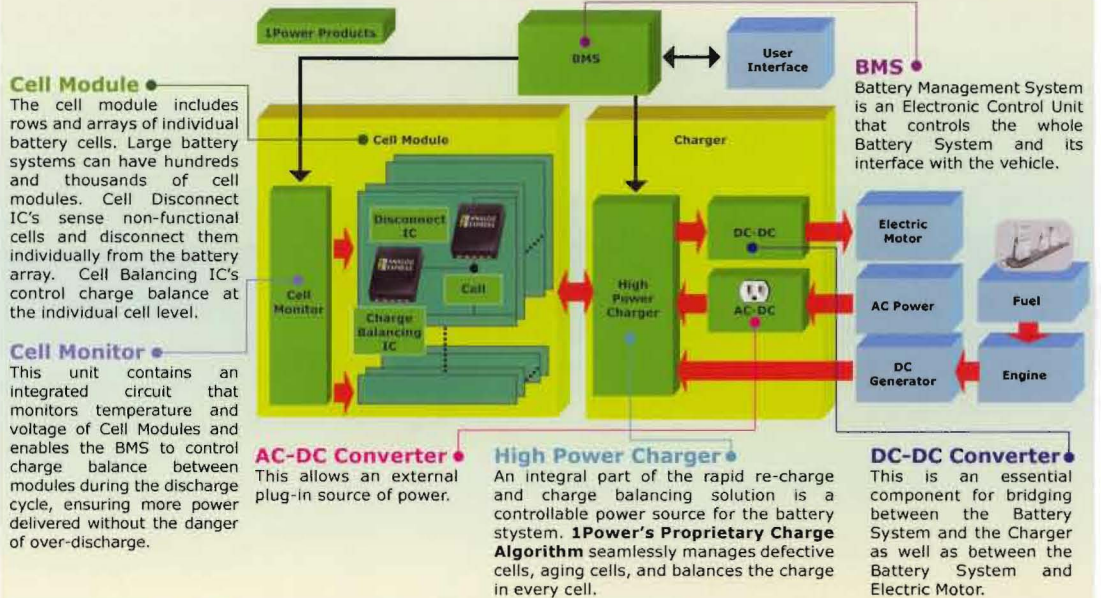
Block Diagram on Series Hybrid Vehicles and Electric Vehicles

INTRODUCTION:

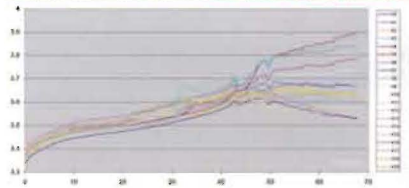
Battery safety and longevity issues are significantly magnified in large battery system structures such as those employed in Battery Electric Vehicles (BEVs), Underwater Autonomous Vehicles (UAVs), and specialized aerospace, army, and naval applications. These issues exist mainly due to the slight differences in charge, discharge, and capacity characteristics between individual battery cells. When any cell reaches a full charge, its resistance begins to increase. That decreases the current available to charge other cells connected in series with the fully charged one. When a battery is discharged, one cell can discharge faster than the others. If it is over-discharged, it can be damaged. Finally, cell charge capacity degrades as cells age. Most battery management systems compensate for these problems by limiting usage to some fraction of the total charge capacity available from the battery.

1Power Solutions' Approach:

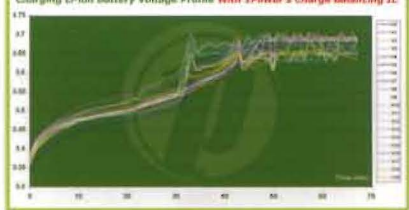
We regain a significant portion of that unused capacity in large battery systems. This technology is possible because three unique integrated circuits (ICs) are used to isolate, measure, and control charge balance at the individual cell and cell module levels to within +/- 2 mV. This approach also reduces the time needed to re-charge the battery.



Charging Li-ion Battery Voltage Profile Without 1Power's Charge Balancing IC



Charging Li-ion Battery Voltage Profile With 1Power's Charge Balancing IC



About 1Power:

1Power Solutions (1Power) provides high-precision and high-power drive train components for hybrid and electric automotive manufacturers. Specifically, 1Power offers innovative battery management systems that implement analog ICs, DC-DC converters, and high-power chargers to deliver energy-efficient vehicles. 1Power is recognized for its expertise in safely increasing the range of energy available from battery systems while decreasing the time to re-charge the system.

1Power was founded in 2007 with headquarters in Cupertino, California to respond to the increasing demand for energy efficient systems. 1Power's unique partnership with IC design house, **Analog Express**, allows us to deliver the most cost-effective integrated system available to manage large battery systems.

1Power's Technical Advantages:

1Power's innovative and safe method of battery control for large battery systems is generic, scalable, seamless, and neutral to chemistry, size, and form-factor. We expect our **next-gen power management technology** products will revolutionize the automotive industry.

Applications and Uses:

- Series Hybrid Vehicles
- Battery Electric Vehicles
- Plug-in Hybrid Vehicles
- Underwater Vehicles



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1Power Solutions Overview

1Power Solutions is a Transportation Clean Tech company providing power management solutions in drive trains for the EV and HEV markets, focusing on passenger vehicles, as well as medium- and heavy-duty commercial and industrial vehicles. *1Power offers OEMs and system integrators a uniquely integrated IC-based power management system that is generic, scalable, and battery neutral.*

We answer automaker's challenges on the use of battery technologies in vehicles—high cost, safety, and reliability. 1Power's disruptive patent-pending IP optimizes and manages battery capacity, maximizes battery life and minimizes charge time to create safer, more reliable and lower-cost battery systems. Our technology uniquely positions 1Power to be battery-neutral (in chemistry and form-factor), with versatility to adapt to customer requirements.

Tier 1 Ancillary Systems is a \$1 trillion a year market, with over 10,000 established vendors.

Our executive team is comprised of successful serial entrepreneurs, executives, and engineers with decades of experience in Transportation Clean Tech. CEO Alexander Choi previously led a \$600 million IPO in 2005, and CTO Dr. Chris Mi recently completed projects with DOE, US Army, and automotive OEM and suppliers in the EV and HEV space.

Our strategic partnerships are critical to our technology leadership. Analog Express, an IC design house, is integral to our IC-based solution. We also collaborate with University of Michigan in power electronics.

1Power is engaged in multiple customer projects focused on battery manufacturers, independent system suppliers, energy providers, and OEM passenger vehicles and light-duty trucks.

1Power key milestones to-date ensure a sustainable competitive advantage:

- Acquisition of a management and technical team with an average of 25 years of automotive, power electronics, and semiconductor industry experience;
- Technology/IP: Three patents pending on battery control ICs. Multi-chemistry lithium battery IC was released in 1Q08.
- 2400W charger: completed prototype and testing. Proprietary charge algorithm significantly improves thermal control during 20A charging in comparison to competing solutions.
- Our ICs are already developed. We are one to two years ahead of competitors because of the significant lead time in ICs (typically 18-24 months from design to fabrication).

1Power's IC solution redefines the motive power management system for commodity cells. Our customers will benefit from first-mover advantage and favorable margins.

1Power Solutions is a Delaware company, with offices in Northern California and Michigan. Our global operations reach to Asia with ISO certified contract manufacturing partners in Hong Kong, Taiwan and Mainland China. We have a compelling two page executive summary that we would like to send you. For more information, please contact **Mr. John H. Holmes** at john@1PowerSolutions.com or (866) 620-3586. www.1powersolutions.com



FOR IMMEDIATE RELEASE

1POWER DEBUTS A BATTERY SYSTEM THAT BALANCES INDIVIDUAL CELLS

1Power Inside™—A Battery System with Integrated ICs that Fully Charge Every Cell Row, Every Time

CUPERTINO, California (July 18, 2008)—1Power Solutions, Inc. announces its new patent-pending battery systems that use a proprietary integrated circuit, the Analog Express BP1000, to safely control cell balancing during battery charging. 1Power is the first company to deliver a large system lithium-ion battery pack, the *1Power Pack™*, which integrates this integrated circuit (IC) on each individual battery cell.

“Batteries are like people—age, tolerance, temperature, and capacity vary from cell to cell,” said Alexander Choi, CEO and co-founder of 1Power. “These differences reduce the capacity, lifetime, and safety of the battery. Cell balancing and over-voltage protection are the solutions.”

But most cell balancing schemes require trade-offs in charging time, lost efficiency, and expensive components. “Our added IC cost is less than fifteen cents per cell at volume,” Choi continued. “We get the full capacity of every cell, and guarantee that no cell sees over-voltage.”

Choi concluded, “We believe our IC-based solution can get the most mileage at the lowest cost from any size battery pack. And 1Power can deliver this solution for system integrators worldwide.”

In the *1Power Pack™*, every cell within the battery system rapidly balances within a tolerance of +/- 2mV to protect against overvoltage. In contrast, traditional balancing methods use a row charging and balancing scheme. They either stop charging when the first cell reaches its target voltage, or implement a prolonged algorithm to charge individual cells sequentially— which can mean a tolerance of more than +/- 100mV. A 150 mV difference in cell balance can reduce capacity (think mileage) to 50% of the original value over the life of the battery.

1Power connects the IC in parallel with each battery cell to independently sense when the cell has reached its target voltage. At that point, the IC shunts charge current around the cell, allowing a sophisticated charging algorithm that lets other series connected cell rows continue charging at full rate.

1Power Solutions, headquartered in the San Jose area, promotes its *1Power Pack™* as a revolution in battery pack design, combining IC control on the individual cell level and full-system integration of battery cells, components and electronics. For more information, contact Mr. John Holmes at (866) 620-3586 or info@1powersolutions.com.

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About 1Power Solutions

1Power provides innovative battery management systems and power electronic system components for integrators of hybrid and electric vehicles. 1Power’s integration of battery ICs allows the most cost-effective implementation and best charge performance for large battery management systems. Discover the power of 1Power Inside™ – next-gen power management technology delivering energy-efficient vehicles today. www.1powersolutions.com