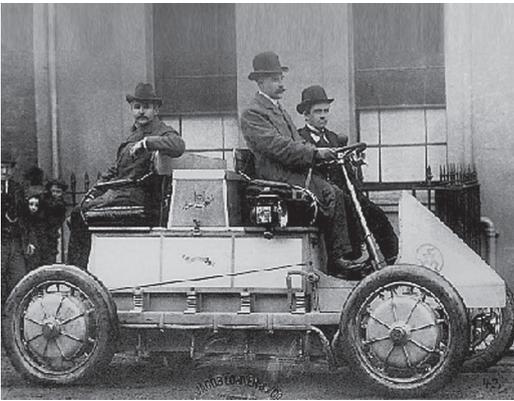


Infineon Latest News

Light Electric Vehicles – Go with the Market Leader

Electrical vehicles are not new in transport:

Several vehicles have been running on electricity for a long time. Electrically driven vehicles have been around since the 1830s and more than 100 years have now passed since the invention of the electric bicycle.



In 1895, Ogden Bolton, Jr. applied for the first patent for a battery-operated bicycle with a 6-pole brush motor built into the rear wheel.

In 1898, Ferdinand Porsche applied for the first patent for a wheel-hub driven electric car and introduced 1901, as a logical consequence, the first hybrid car. The vehicles reached a top speed of at that time amazing 50km/h and distances up to 50km

(Picture source: wikipedia.org)

From a technological point of view, the breakthrough undoubtedly came with the availability of long-lived accumulators - such as the lithium polymer battery – and the use of electronics to increase the power and efficiency of the system. Smart electronics help to control electric motors efficiently, optimize the performance and extend the battery life.

The most frequently used topography in series production of electric bicycles today is a brushless DC motor (BLDC) with Hall sensors. The BLDC motor for the e-Vehicle is of the standard three phase trapezoidal type, typically rated at a few hundred watts and the battery voltage is usually 36V or 48V.

Infineon's contribution for light electric vehicles:

Efficient Motor Control

In practically every second eBike worldwide, the motor is controlled by an 8-bit microcontroller out of Infineon's XC800 family. The characteristics of this product family are tailor made for this application at low cost. The special functions in the microcontroller (fast ADC, capture/compare unit, etc.) make for particularly fast signal recognition and signal generation to switch the individual phase currents of the motor. The cyclist notices the excellent performance of the e-vehicle in every load state. Beside this, of course high quality and reliability are given due to the Automotive proven technologies. Further essential elements of the motor electronics are the robust and intelligent power semiconductors.



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The Infineon **EiceDRIVER™** portfolio includes bridge drivers to control power devices such as IGBTs or MOSFET transistors in 3-phase systems. Based on Silicon-On-Insulator (SOI) technology, these devices show high robustness in harsh environments. The **OptiMOS™2** and **OptiMOS™3** power MOSFETs offer a combination of the lowest available on-state resistance and excellent switching performance. They ensure highest power density in the application and save energy by lowest on-state and switching losses.

Our **Hall Sensors** are directly sensing the magnetic field of the rotor magnets. Due to the automotive qualified robustness and high linearity over temperature these hall switches can be either mounted directly into the motor or can be used outside with an additional magnet ring.

Battery Management

The battery is the primary source of power in an e-vehicle.

With Infineon's **active cell balancing** one can increase the efficiency of the system significantly. This means either an extended range at the same battery size or a reduced number of cells in the battery (1kW battery power costs roughly 1000€). Another advantage using active cell balancing is an extended life time of the battery.

Safety and Peripheral Equipment

Lighting

Infineon's energy efficient and cost-effective semiconductor solutions for driving LEDs and lamps are best-in-class and can be used in any sub application of LEVs, like head and tail lights, indicators and break lights (for more details see please visit www.infineon.com/lighting)

Security

An efficient way to disable the operation of a valuable e-vehicle for non-authorized people is a locking feature. Infineon's SmartLEWIS™ PMA family is the state of the art choice to implement such an immobilizing tag (see www.infineon.com/PMA). Furthermore, it provides an RF transmitter which may be used for wireless remote control of e-bike features, like lights-on/off or remote controlled battery charging start.

Display and HMI

The XC82x/XC83x family offers dedicated set-ups for display applications (led matrix, drive of stepper gauges) and touch pads (HMI). The integrated Capacitive Touch Sensing is much more reliable than mechanical counterparts due to no wear out, decreased bill of material and high flexibility in design (visit www.infineon.com/intouch).

Tire Pressure Monitoring System

The SP37 is a sensor for air pressure measurements. The single package solution with patented sensor design provides the best media compatibility possible for harsh environments (visit www.infineon.com/tpms).

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Support Tools

Webinars / e-briefings, documentation, dedicated application kits and demonstrators is our support to ease your design effort for any light electric vehicle applications.

Please contact your local sales partners for further information and support.

More than 50% market share confirm that Infineon's semiconductor devices meet perfectly the application needs in a very cost sensitive market.

Sincerely,

Your E-mobility team

Joerg Klann (Marketing Manager Sensor Solutions)

Markus Kroh (Marketing Manager Microcontrollers)

Alex Schmidt (Marketing Manager Automotive Power)

Gerhard Stöckl (Manager Segment Marketing)