

## **Let's Create More Efficient Electronic Systems Together**

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Like many technology companies, IR sponsors internal programs to promote, encourage and reward energy conservation and environmentally responsible behaviors of our employees. But the real impact of IR's "green technology" is the energy efficiency improvements our products enable in the many diverse end-markets we serve. IR was *founded* on the principles of energy efficiency back in 1947, and our founder's 1912 Baker electric car (which IR modified to become the world's first solar-powered car in 1958) is still on display at our Temecula wafer Fab. IR has consistently promoted its products and technology for energy efficiency for 64 years - long before it became fashionable and everyone else jumped-on the bandwagon calling it green technology.

IR was a pioneer in the development and commercialization of the power MOSFET more than 30 years ago, which enabled a whole new class of power supplies that operated in the much more efficient switched-mode, rather than the lossy linear mode. Switched-mode supplies now make up the vast majority of the power-supply market. As a result, power supply energy efficiency has improved dramatically, from the 70% range with massive heatsinks, up to today's modern "platinum" energy efficiency models with 94%+ peak efficiency.

Motor drives were the next big energy-saving revolution after power supplies. IR's High-voltage FETs, IGBTs and high-voltage monolithic gate driver ICs enabled higher performance inverters that could extract superior performance out of both permanent magnet and induction motors compared to traditional on-off motor control. The higher switching frequencies enabled by better silicon translated to wider control bandwidth, and the resulting high performance servos that are a standard part of all modern assembly and manufacturing equipment. To complement the inverters, IR also developed digital control engines to reduce the cost and complexity of implementing sensorless motor drives. Low-cost sensorless control provides the means to apply energy-efficient, high-performance motor

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controllers for everyday cost-sensitive appliance applications like washing machines, refrigeration and HVAC systems.

The same technology advances in FETs and ICs also enabled a revolution in power electronics for lighting applications. Modern electronic ballasts are far more efficient than the traditional magnetic ballasts for fluorescent lighting – and the only solution with density suitable for compact fluorescents. And before the CFL even matures, the LED lighting wave is taking the market by storm. All of these modern lighting technologies take advantage of the power and control silicon pioneered by IR.

But the biggest opportunity for the most “green” energy savings of all is in the automotive market, where power electronics play a huge role in both hybrid and full electric cars, which have an enormous appetite for high performance power switches.

IR is now poised to again build-on its historic past by introducing new semiconductor switches based on Gallium Nitride (GaN) grown on Silicon wafers. These devices offer dramatic additional improvements in the performance, cost and density of efficient power electronics to address the consumer, industrial, automotive, networking and telecom industries.

IR is at the same time, the world’s oldest semiconductor company and the world’s original energy-efficiency champion, developing cutting-edge energy-efficient technologies to address broad markets that help to improve our lives and our planet.

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