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STMicroelectronics Reveals Climate-Saving Power Devices with High-Temperature Performance Edge

ST is among first to commercialize silicon-carbide power MOSFETs, and achieves industry-leading 200°C rating for more efficient, simplified designs

Geneva, March 12, 2014 – STMicroelectronics (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, has revealed an advanced new product family enabling power supply designers to drive up energy efficiency in applications such as solar inverters and electric vehicles, enterprise computing, and industrial motor drives.

ST is among the first companies to produce this type of device, a high-voltage silicon carbide (SiC) power MOSFET, and has achieved the industry's highest temperature rating of 200°C. SiC properties help save at least 50% of the energy normally wasted passing through conventional silicon power transistors. The devices can also be physically smaller for a high breakdown voltage. This technology is seen as essential for continued improvement in system energy efficiency, miniaturization, and cost.

In computer rooms and data centers, high energy costs are driving power and efficiency to the top of many IT directors' concerns. Replacing ordinary silicon switches with SiC devices, in bulk power supplies, helps increase Power Usage Effectiveness (PUE); a standard metric for determining data-center energy efficiency. The Climate Savers Computing Initiative (CSCI) claims that more energy-efficient networking systems and devices can help save over \$5 billion and offset 38 million tons of CO₂ by 2015.

SiC MOSFETs are also used in solar inverters, as an alternative for conventional high-voltage silicon IGBTs (Insulated Gate Bipolar Transistor) to convert the DC output from the panel into high-voltage AC feeding into the mains supply with no special drive circuitry required. In addition, by operating at higher frequencies than IGBTs, SiC MOSFETs allow designers to miniaturize other components in the power supply thereby reducing cost and size as well as enhancing energy efficiency.

In electric vehicles, SiC is expected to help significantly increase the energy efficiency and reduce the size of traction systems. The US DRIVE Electrical & Electronics Technical Team, a partnership between industry and the US government's Department of Energy, is calling for energy losses to be approximately

halved by 2020 while also reducing size by more than 20%. The team's roadmap specifies wide bandgap semiconductors – in other words, SiC technology – as a focus for R&D to increase power-converter efficiency and make the device tolerate higher operating temperatures more safely. The increased temperature capability of ST's SiC devices (200°C), compared to ordinary silicon and competitors' SiC MOSFETs, will help simplify vehicle cooling system design.

ST's new 1200V SiC power MOSFET, the SCT30N120, is currently sampling and will enter volume production by June 2014. It is available in ST's proprietary HiP247 package, which has an industry-standard outline and is optimized for high thermal performance. The guide price is \$35.00 in quantities of 1,000 units.

For more information visit www.st.com/sicmos

Major features of SCT30N120:

- On-state resistance ($R_{DS(ON)}$):
 - 80mΩ typ. @ 25°C
 - ≤100mΩ typ over entire temperature range to 200°C
- Low turn-off energy and gate charge (ensures efficient, high-speed switching)
- Leakage current lower than 10 μA typ (enhances system energy efficiency and reliability, compared to other structures based on the same material)
- Very fast intrinsic and robust body diode (saves external freewheeling diode for cost/size reduction)
- Simplified gate drive circuitry (reduces costs of network driving)
- 200°C max. operating temperature (reduces pc-board size, simplifies thermal management)

About STMicroelectronics

ST is a global leader in the semiconductor market serving customers across the spectrum of sense and power and automotive products and embedded processing solutions. From energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play, ST is found everywhere microelectronics make a positive and innovative contribution to people's life. By getting more from technology to get more from life, ST stands for life.augmented.

In 2013, the Company's net revenues were \$8.08 billion. Further information on ST can be found at www.st.com.

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