



## NXP – next generation power electronics:

**At a glance:** Semiconductor manufacturers are growing gallium nitride (GaN) on silicon substrates to create discrete devices for high-voltage power electronics applications.

The Technology Strategy Board has funded a consortia-based project focused to explore performance and reliability gains for these “next generation” devices.

**Challenge:** To reduce system losses and enable higher efficiency at lower cost than current solutions.

**Approach:** Under the ‘PEARGaN - Power Electronics Applications for Reliability in GaN’ - initiative the partners are looking to develop new system-level concepts and circuit architectures, evaluate advanced manufacturing process technologies and create demonstrators to fully understand device behaviour and failure mechanisms.

Led by NXP Semiconductors UK Ltd., partners include Manchester University’s Power Conversion Group and Liverpool University’s Materials & Structures Centre. (Holland’s NXP Semiconductors N.V. is a leader in high performance, mixed signal electronics with operations in over 25 countries.)

**Benefits:** Unlocking potential delivery of superior performance in breakdown voltage, on-state resistance and higher switching speeds.

Demonstration that the devices are robust and can deliver life-time reliability levels demanded by early adopters in a range of power management/control applications.

**KCMC Support:** The KCMC atomic layer deposition facilities are being exploited to integrate high-performance dielectrics in GaN-based devices. The integrated design is targeting higher operating voltages for more efficient and compact electrical power management systems.

**Timeline:** Ongoing. The two-year project started in October 2012.