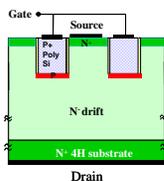


### SiC Diode and FET with >10kV Blocking Voltage

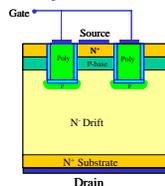
PiN Diode



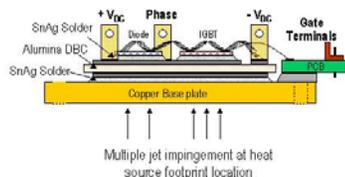
Normally on JFET



Normally off UMOSFET



### Spray/Jet Impingement for High Heat Flux Cooling



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### Goals, Objectives and Main Technical Approach

#### Goals

Develop high voltage, high efficiency, fast switching SiC power switches for high power electronics applications

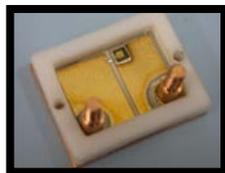
#### Objectives

Develop and demonstrate 10kV SiC switching devices and high speed soft-recovery PIN diodes

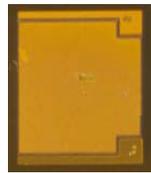
#### Technical Approach

- Thick epitaxy with low defects and low uniform doping
- Voltage-controlled switch with simple gate drive and low losses
- Advanced cooling with high heat removal rate

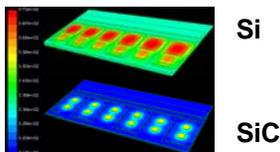
### Key Accomplishments



10kV SiC PIN packaged diode



10kV SiC JFET



Thermal management:  
SiC power module is simulated to run cooler than a Si module

### Major Impact of Technology & Technology Transition Plan

#### Major Impact of Technology

- Increase system efficiency
- Reduce system size and weight
- Reduce components count and improve reliability
- Open new military applications presently inadequately served by Si technology

#### Technology Transition Plan

- RSC partnership with power systems companies facilitates systems insertion
- RSC is an open supplier of SiC power components and packaging/thermal management