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Opening of the Science City Cleanroom for Energy Efficient Semiconductors

Prof. Phil Mawby

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BIRMINGHAM

What is Electronics?

Electronics

**Information
Processing**

**Energy
Processing**

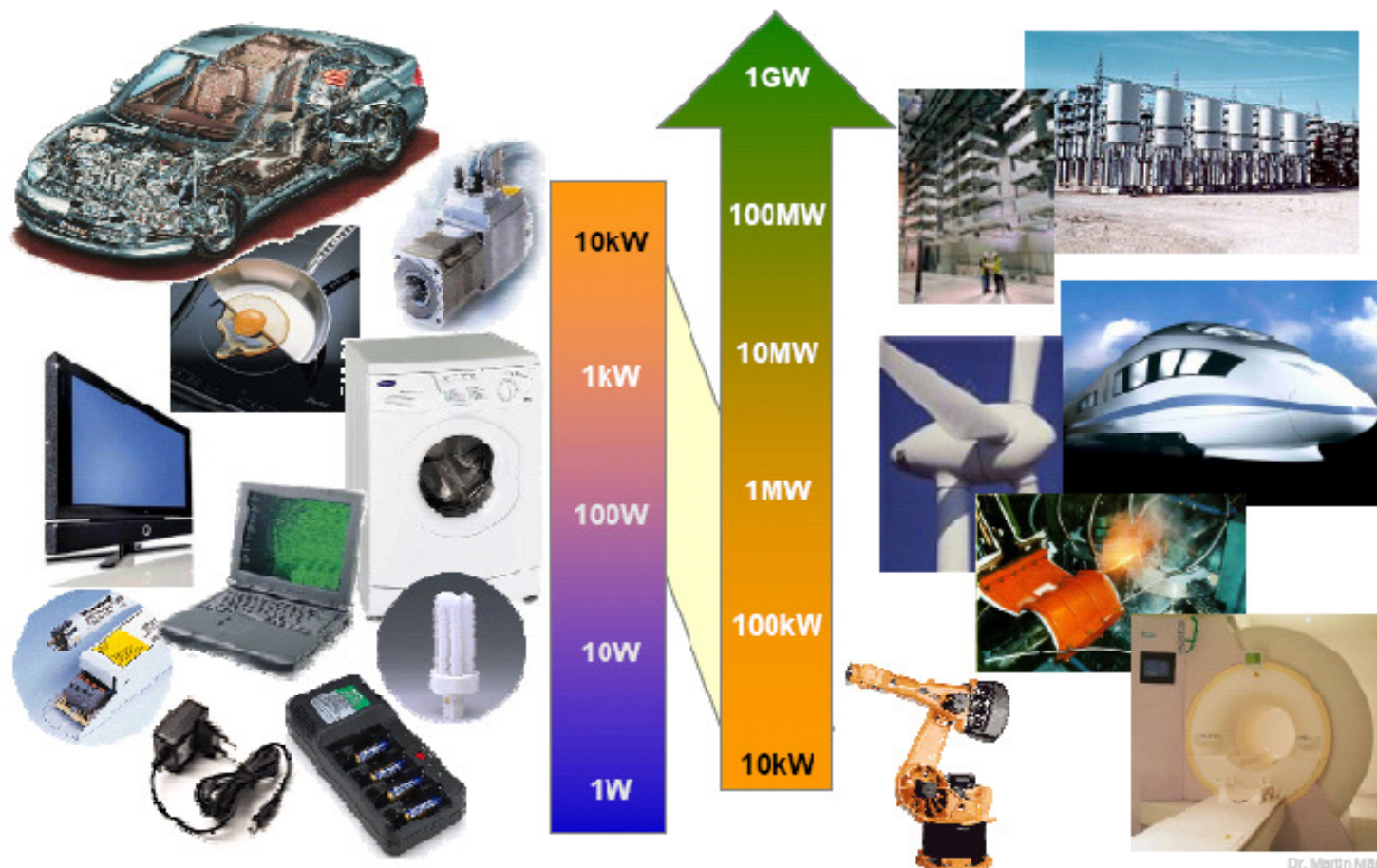
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Birmingham Science City
ideasforlife 

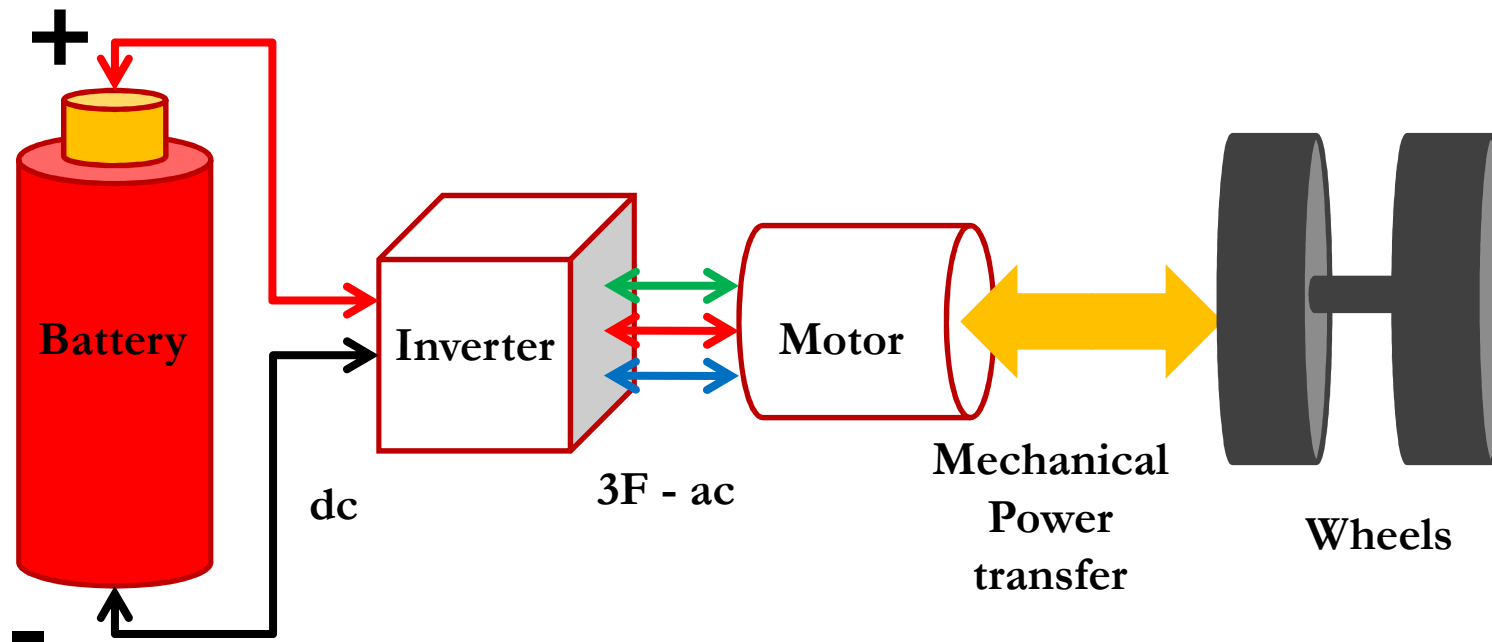
Power Electronics



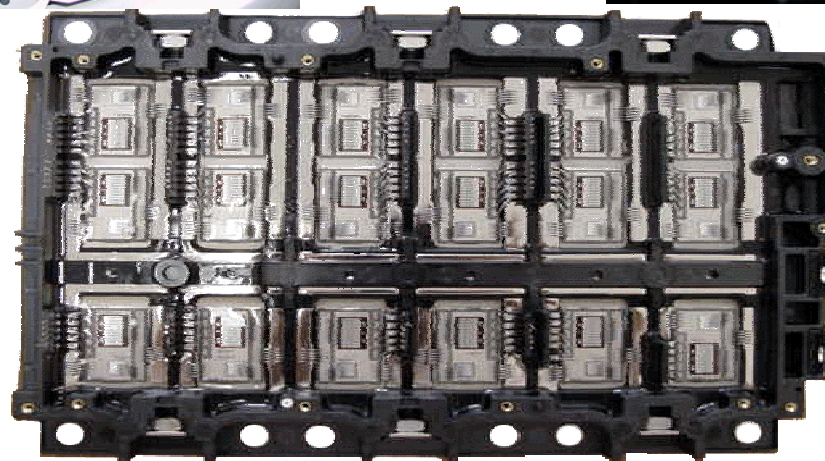
Electrification of Road Transport



Simple electrical drive system



Main Drive Power Electronics



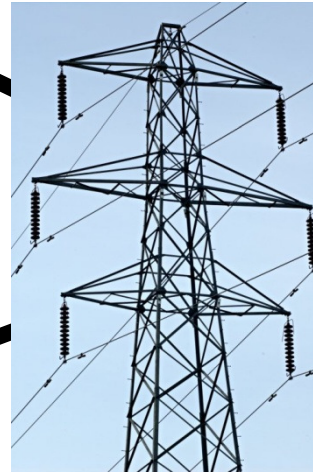
Aerospace





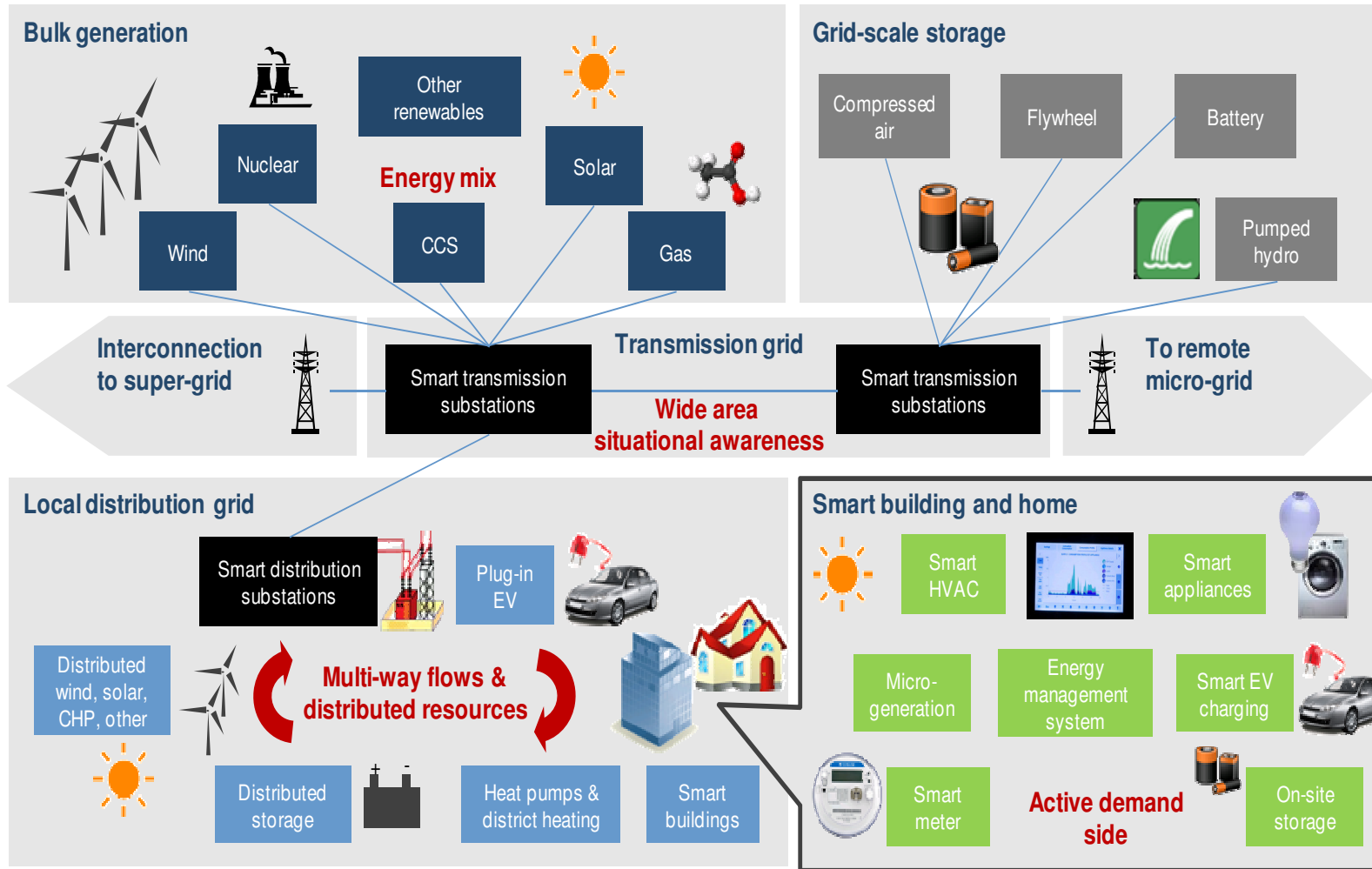
Queen Mary 2 - electric propulsion system: 4 pods totalling 86MW.

Renewable Energy



Power Electronics
Make Renewable energy possible

Possible Future Energy Systems

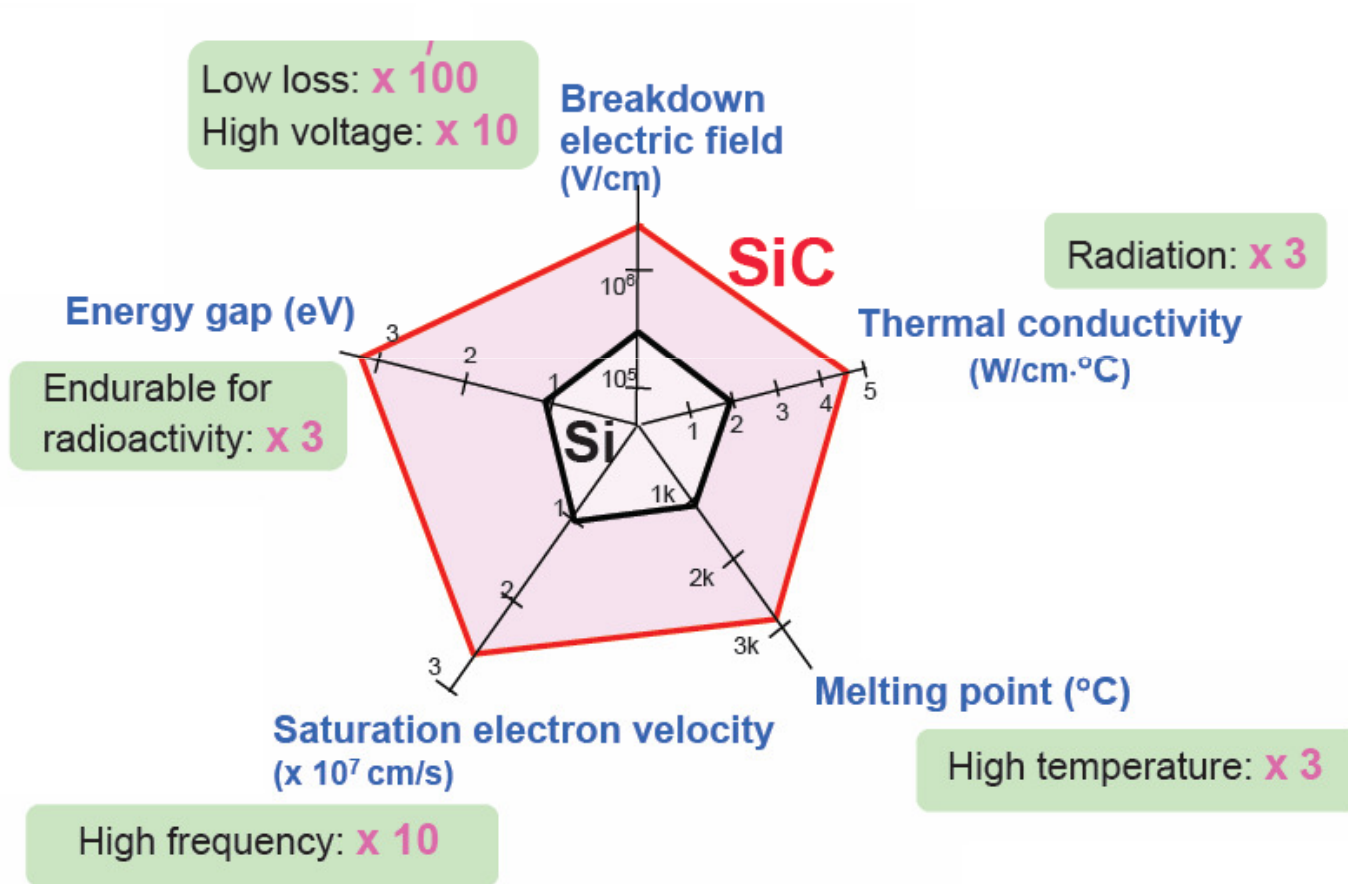


Various components of the future electricity network at the generation, transmission and distribution levels.
 Source – Bloomberg Consortium on Digital Energy 2010

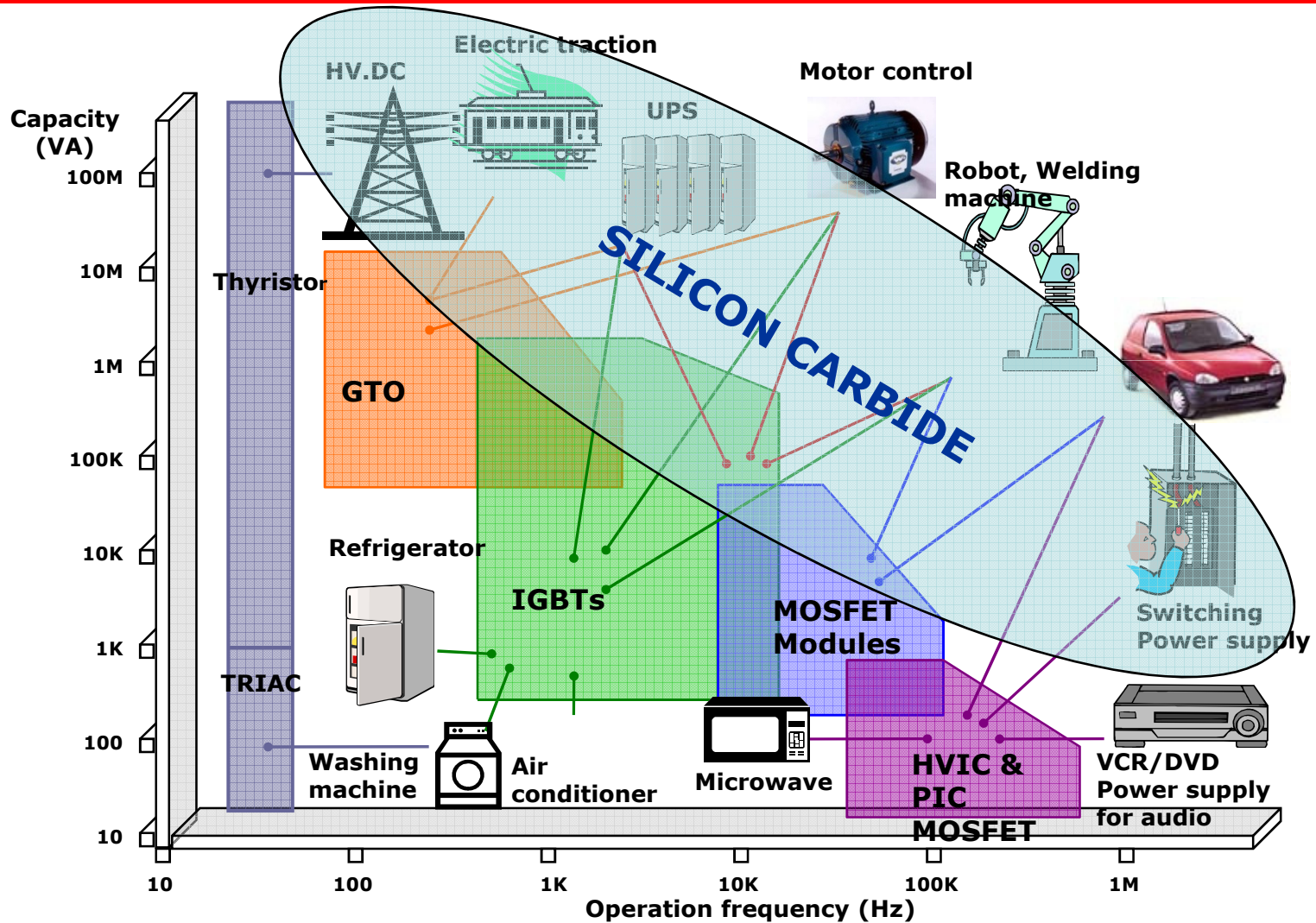
Application in HVDC System



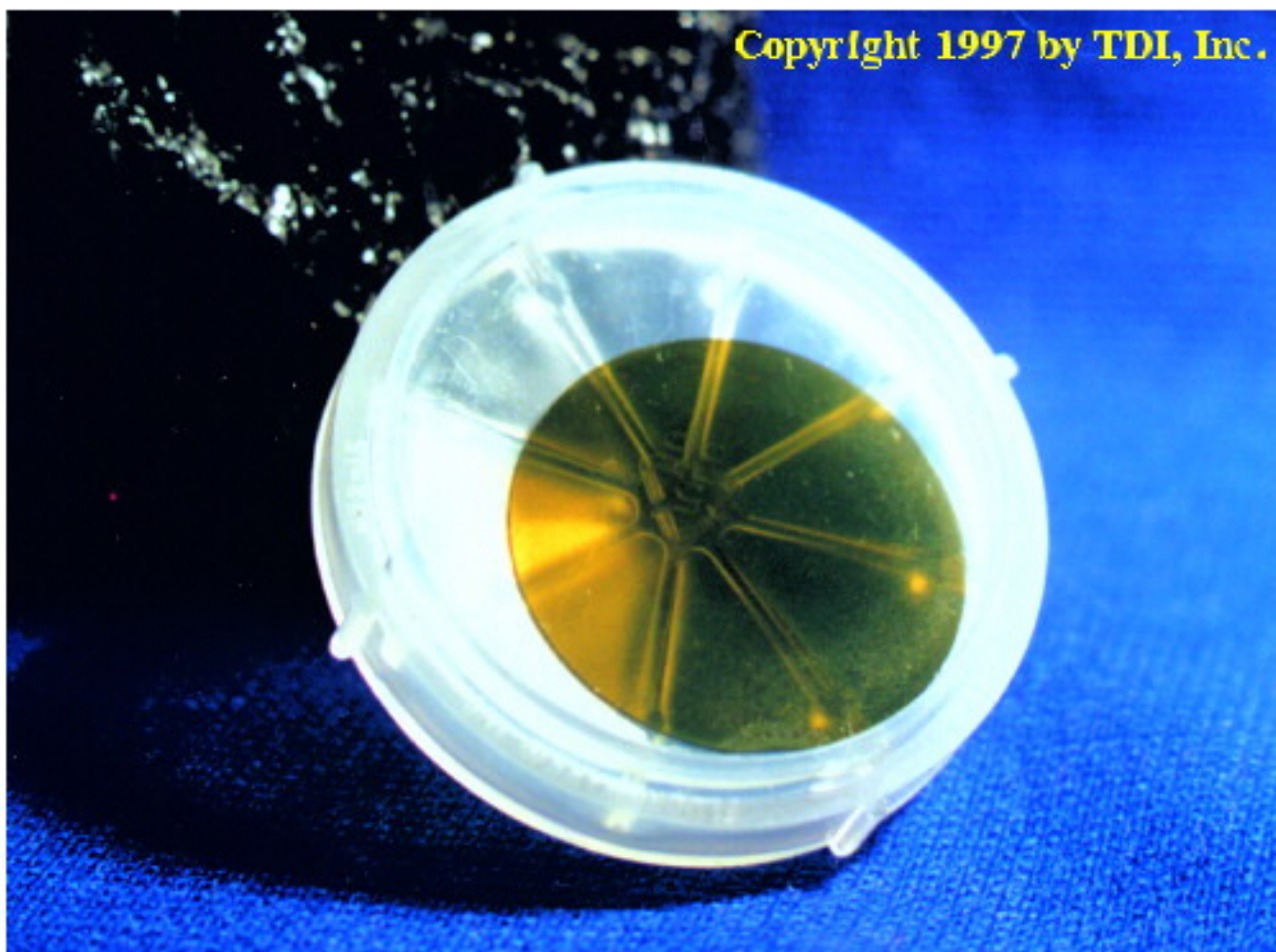
Silicon Carbide Properties




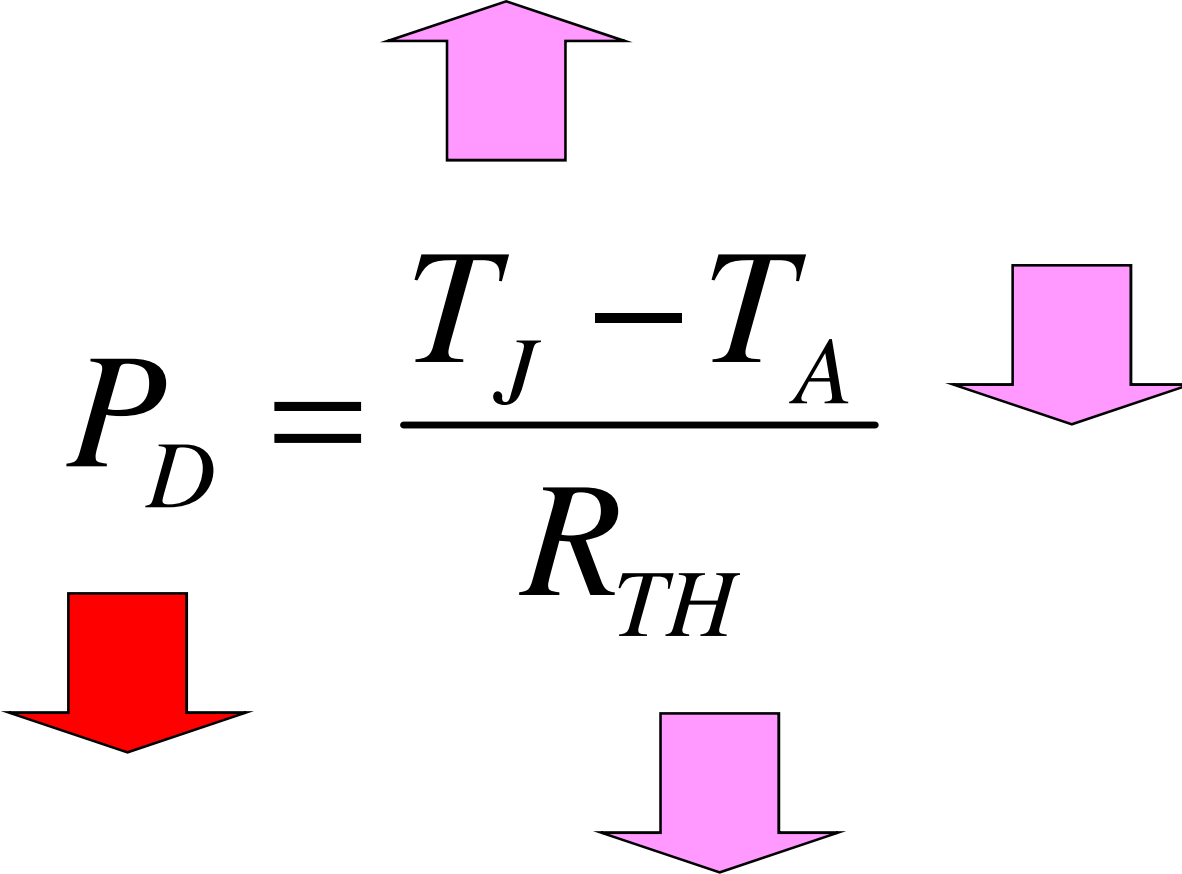
Power Electronics



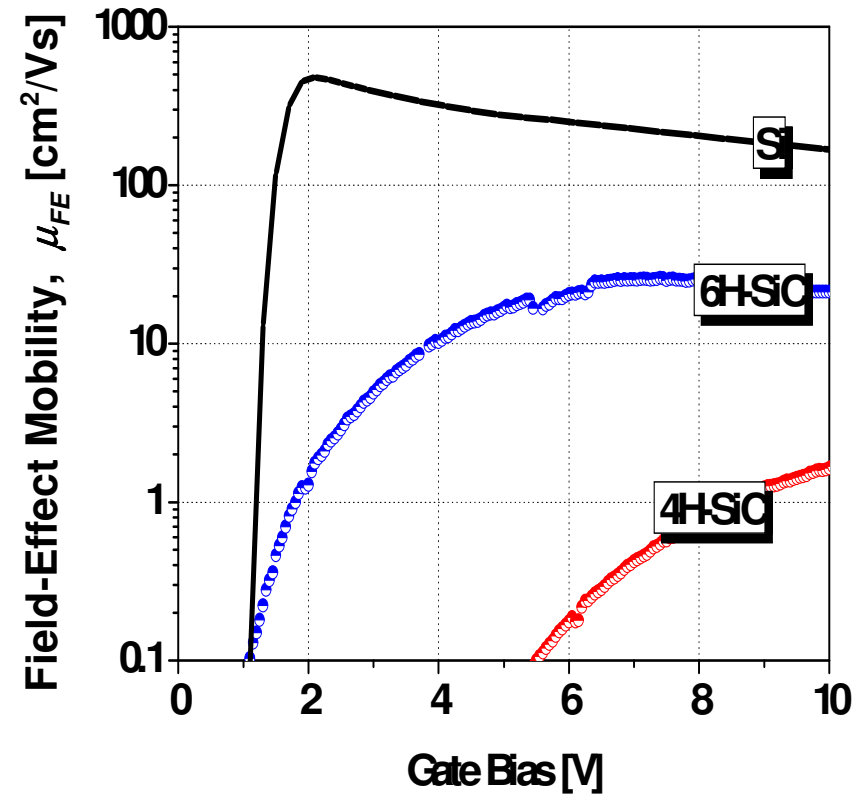
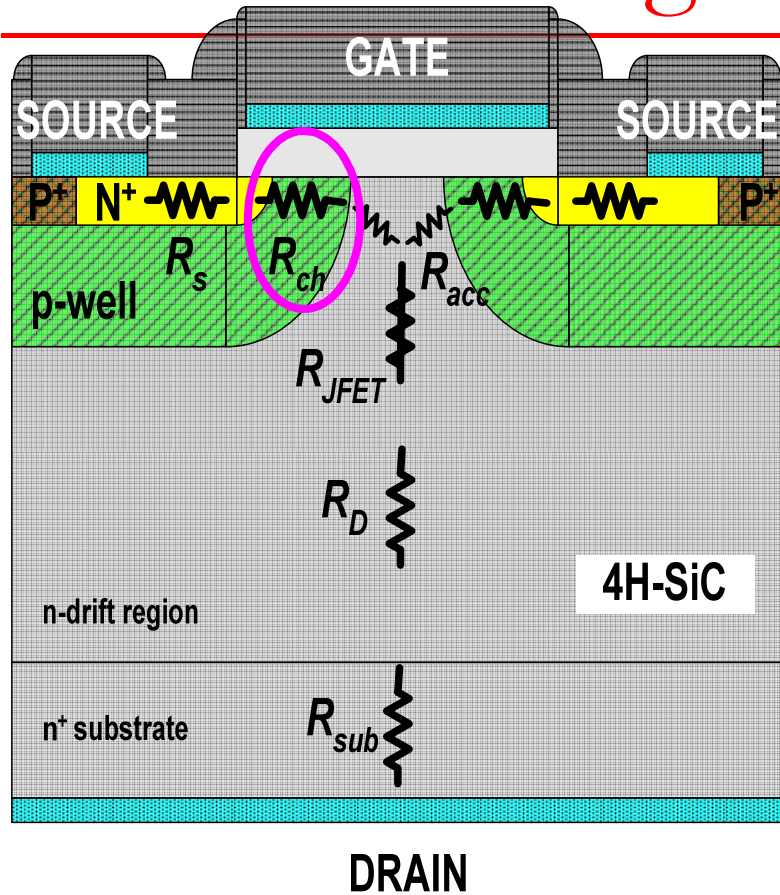
Silicon Carbide Wafer



Limitation of power electronics


$$P_D = \frac{T_J - T_A}{R_{TH}}$$


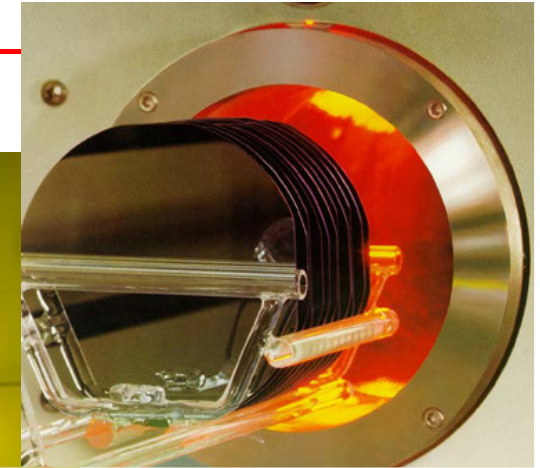
SiC Technological Problems



Cleanroom Equipment



Stepper



High Temperature oxidation Furnace



ICP RIE system

Metal Sputterer

GVC 401 Sputtering System



Contacts

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