SAND2003-3500P

R&D 100

2003 Award Winner

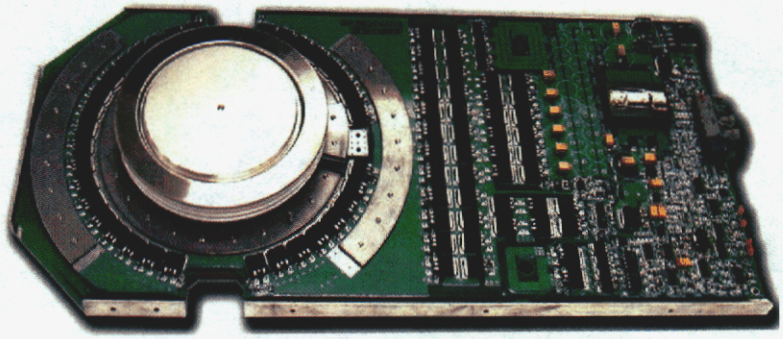
Solitronics, Virginia Tech, ACI, DOE, Sandia Labs

The Emitter Turn-Off (ETO) Thyristor

is a key enabling technology for Flexible AC Transmission System (FACTS) that will safeguard our nations electric power transmission and distribution

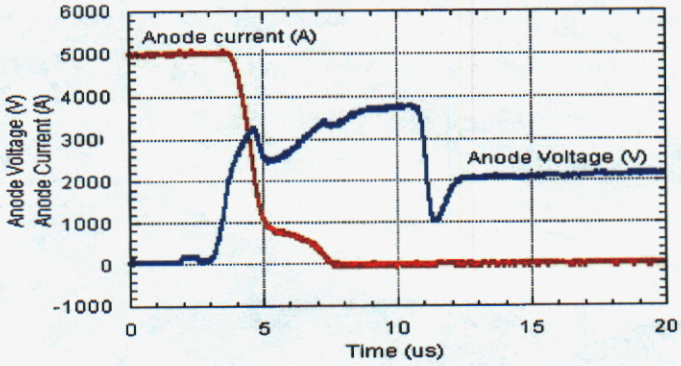
Gate drive power consumption

- low gate drive power consumption, high reliability
- gate drive power does not vary significantly with ETO current and switching frequency, approximately 15 – 25 watt.



Snubberless turn-off

- turn-off current: 5000A
- turn-off bus voltage: 2500V
- turn-off peak voltage: 3800V
- maximum power density: 239 kW/cm^2
- maximum current density: 100 A/cm^2



Applications of the ETO:

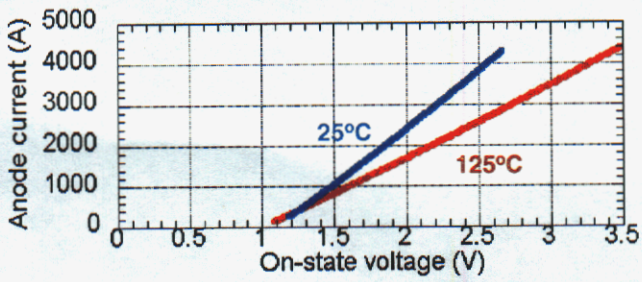
- *Distributed Energy Resources*
- *Energy Storage*
- *FACTs*
- *Motor Drives*
- *Power System Protection*

Advantages of the ETO:

- *5000A snubberless turn-off capability*
- *Low switching loss & conduction loss*
- *Low cost device and circuit*
- *Easy for series and parallel operation*
- *Low gate drive power*
- *Built-in over-current protection and current sensor*

On-state characteristics

- low voltage drop, low conduction loss
- strong positive temperature coefficiency
- excellent for parallel operation



Snubberless turn-off loss

- fast turn-off speed, low turn-off loss
- different turn-off loss with different ETO