

## ANALYSIS OF SHORT CIRCUIT CONDITIONS IN HIGH POWER DEVICES

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**ABSTRACT** *Method of protection against failure or explosion hazard of semiconductor power devices, which can occur in high power converters, is discussed. This method base on a comparing of the permissible over current declared by manufactures, with the short-circuit current that can appear in case of failure. Different case of failure was analyzed and new criterion for protection of the semiconductor power devices is proposed. Taking the declared current, and the calculated integral  $i^2t$  as function of time, of the short circuit current, one is able to select circuit breaker operating time that should be applied in substation. This criterion assumed was verified with gut accuracy during experimental investigation in high current conditions. Tests were made at traction DC current unit of 3,3 kV and 1700 A.*

**Keywords:** *High Power converters, short circuit conditions, semiconductor power devices*