



Instruction :

The plots in the right side show various data during one half period of the mains voltage - i.e. 10msec or 8.3msec. The zero crossings of the mains voltage are in the left and the right edge of the plots.

ϕ is the mains phase angle : $\phi = \omega \cdot t = 2 \cdot \pi \cdot f_{net} \cdot t$.

Discontinuous choke current occurs when the choke minimum current goes to zero in part of the time. Choke max. and min. current are shown as dotted traces in the 2nd plot. Discontinuous current also has the effect that the duty cycle does not reach "1".

Red traces are generally chosen at the lowest mains voltage, where losses are highest.

The upper left plot shows the average conduction loss in a FET or an IGBT as a function of AC mains voltage. Note that the switching loss (not shown) can be of the same magnitude as the conduction loss !