Complete State Plane – Phase Shift Modulation

Averaging Step

Y. Cheron, “Soft Commutation”
CRS – Heavy Load

SRC – Light Load
SRC Near Resonance

SRC – Low $V_{out}$
Comparison of Non-Resonant and Super-Resonant Dual-Active ZVS-Operated High-Power DC-DC Converters

Fig. 3: Converter characteristics in dependence of control angle $\varphi$ for different frequency ratios, at power neutral variation of $V_{in} = k_v V_{res}$ and $V_{out} = 1/k_v V_{res}$ ($V_{res}$ being an arbitrary rated voltage)

Fig. 6: Analytical voltage and current waveforms of DAB (top) and DSRC (bottom) operated at three different p.u. voltage combinations. The plots on left, middle and right result from three different control angle values for rated power operation at base voltages $V_{in} V_{out} = 1.0, 1.0$, and the according adjustments in series inductance.

![Diagram of DC/DC converters]

Figure 5. Calculated efficiency of the single stage (a) and two stage (b) converters at \( f = 42 \) and \( f = 43 \) depending on the output power.

Figure 6. Isolated and bi-directional DC/DC converter topologies: (a) D/A, (b) D/S, (c) S/A, (d) S/S, (e) D/S, (f) S/A, (g) S/S, (h) D/A, and (i) S/A, each stage connected based on the combination of an isolation stage with a non-isolated voltage converter.