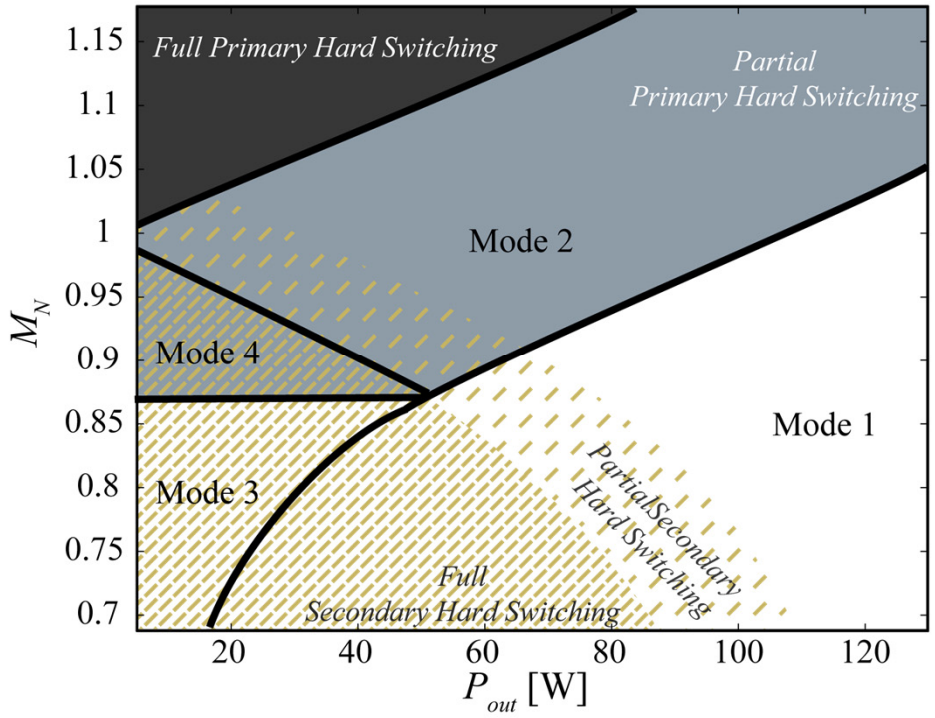
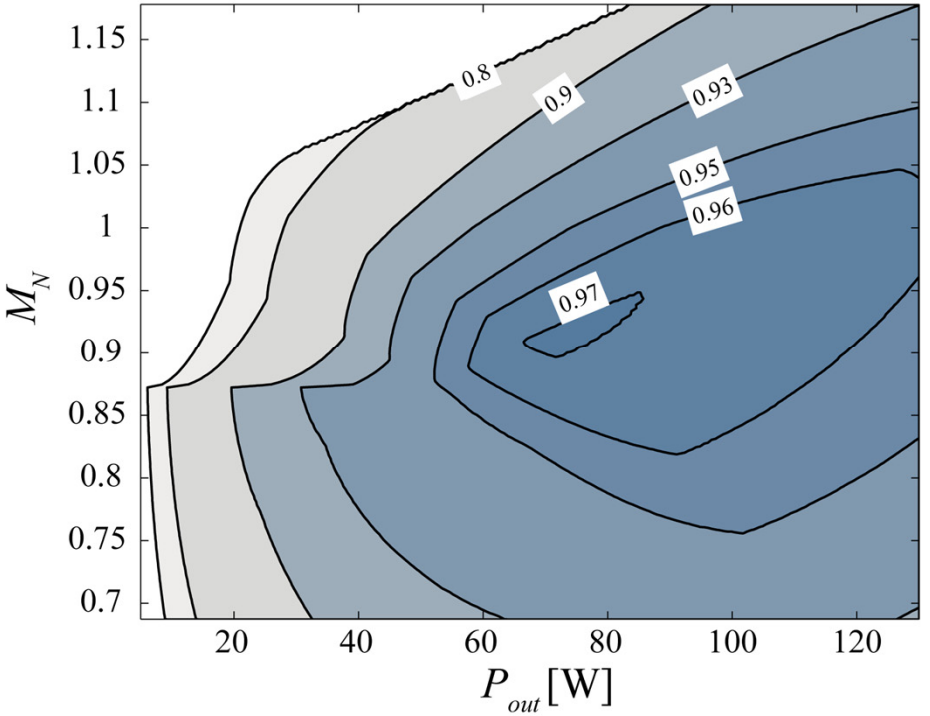
Soft Switching Range with Varying V_{out}





D. Costinett, D. Maksimovic, and R. Zane, "Design and control for high efficiency in high step-down dual active bridge converters operating at high switching frequency," IEEE Trans. Power Electron., vol. PP, no. 99, p. 1, 2012.

Application Example: Automotive

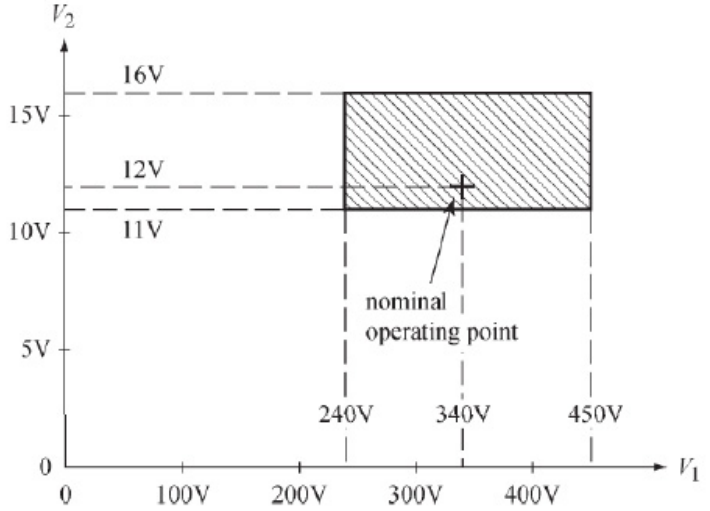


Fig. 1. Converter operating voltage ranges required for automotive application.

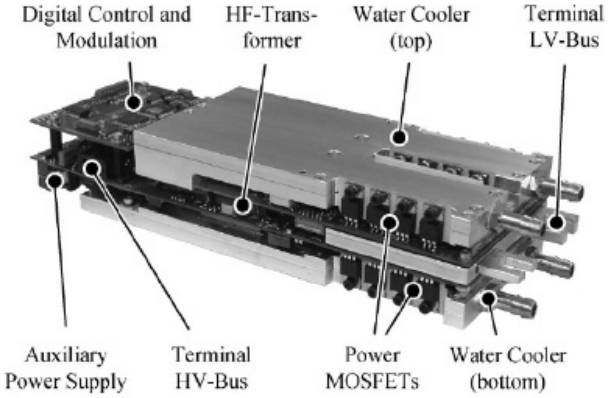
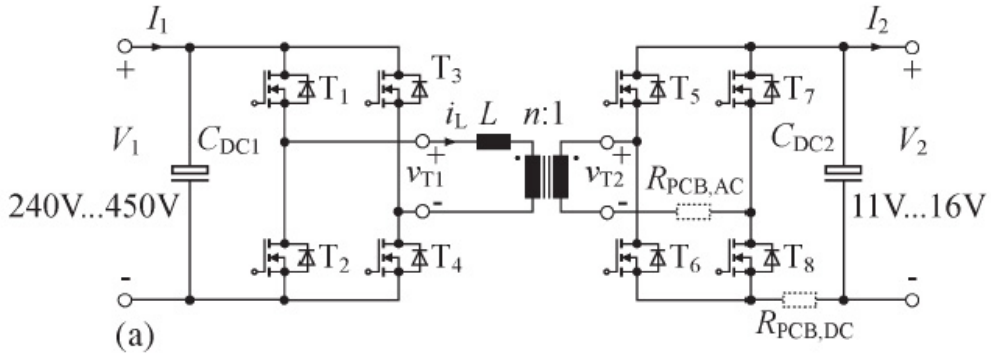


Fig. 3. Automotive DAB converter (273 × 90 × 53 mm).



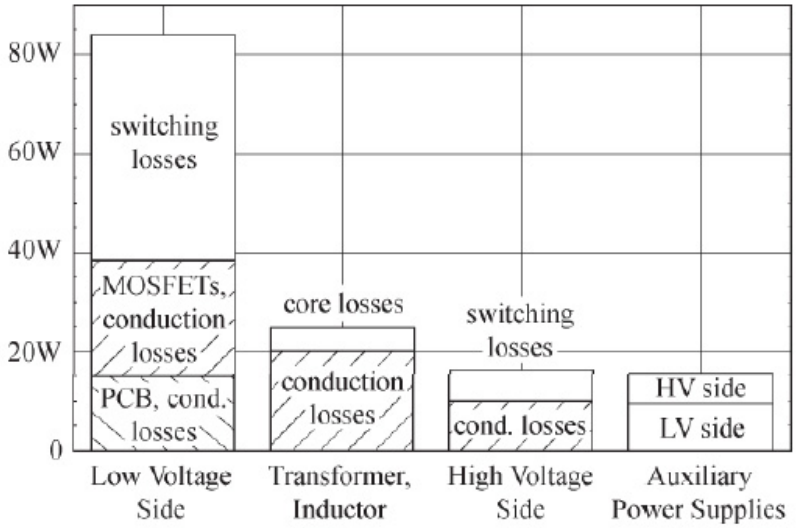
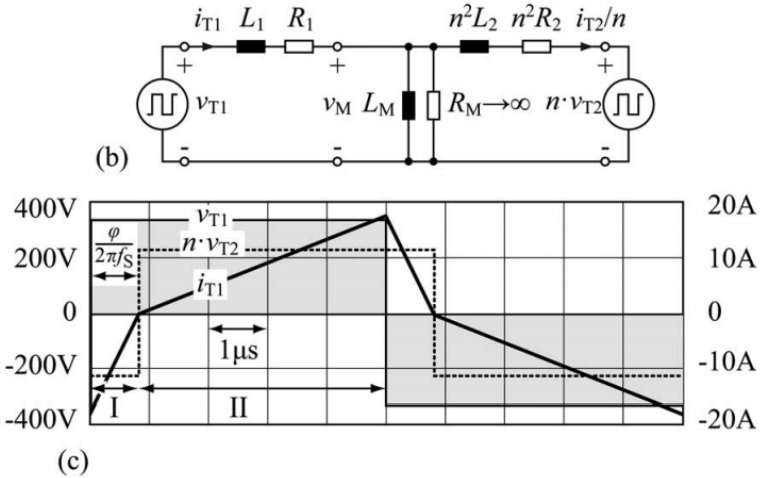
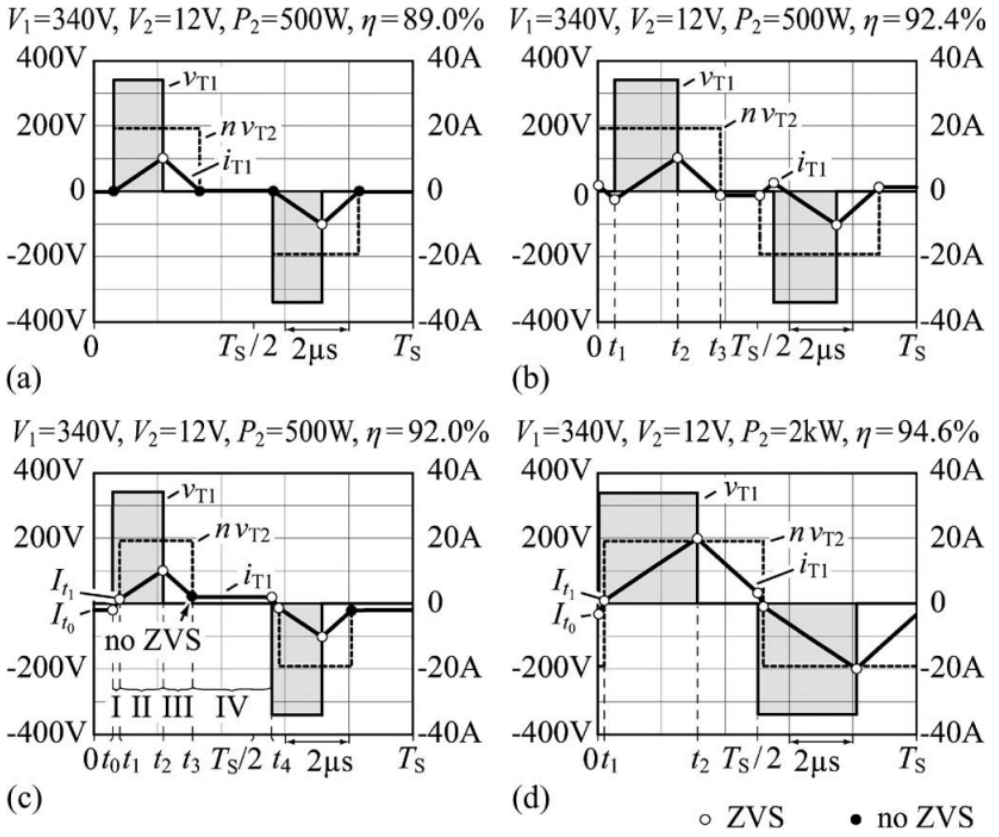


Fig. 13. Calculated distribution of the power losses for operation at $V_1 = 340$ V, $V_2 = 12$ V, and $P_2 = 2$ kW.

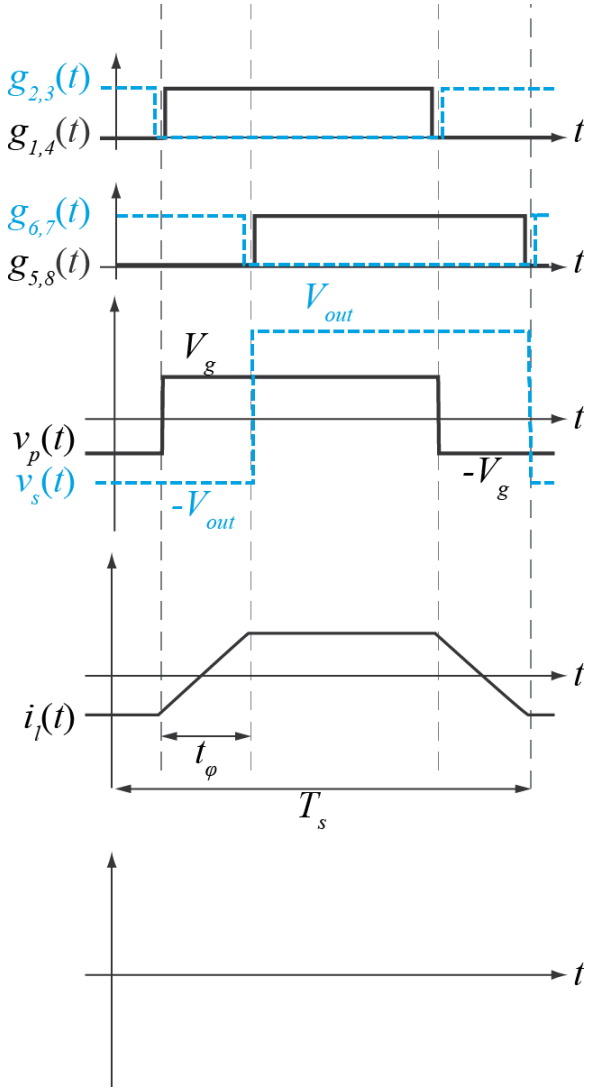
*F. Krismer, J.W.Kolar, "Accurate Power Loss Model Derivation of a High-Current Dual Active Bridge Converter for an Automotive Application, IEEE Trans. On Industrial Electronics, March 2010

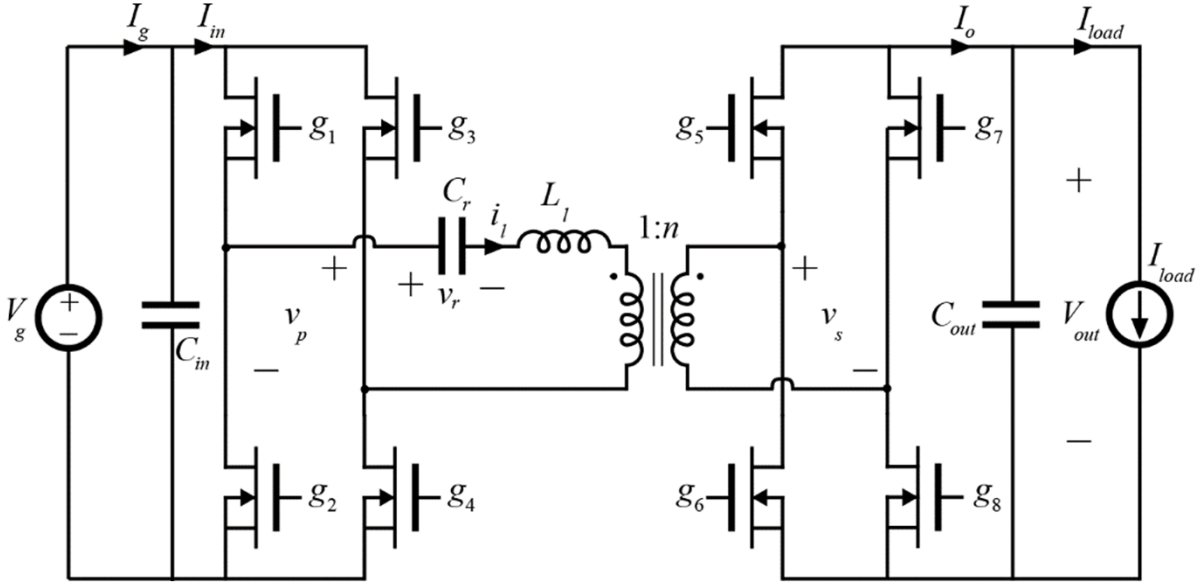
Alternate Modulation Schemes



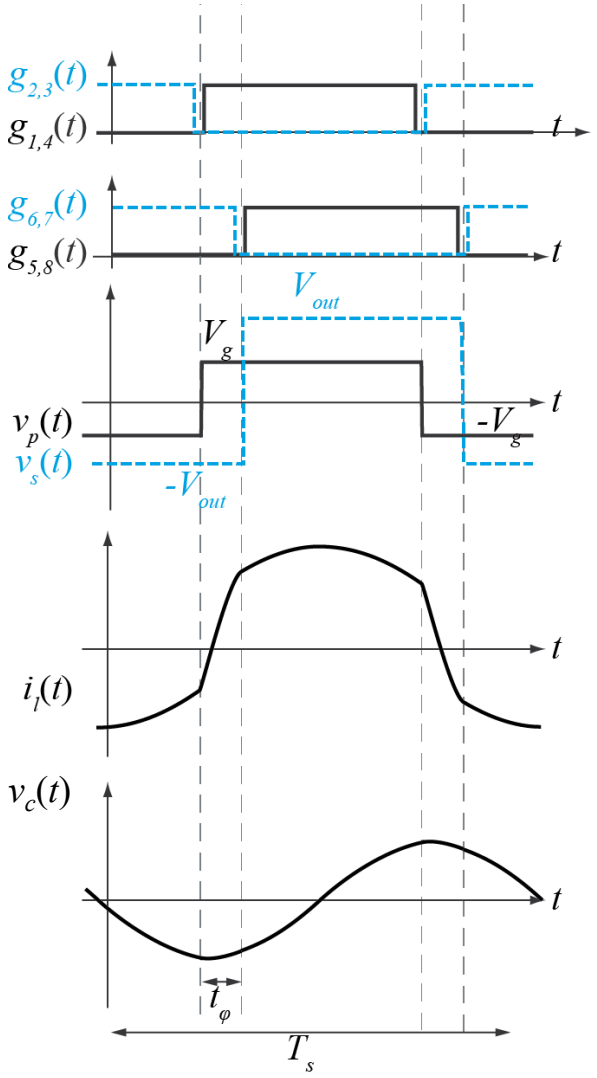


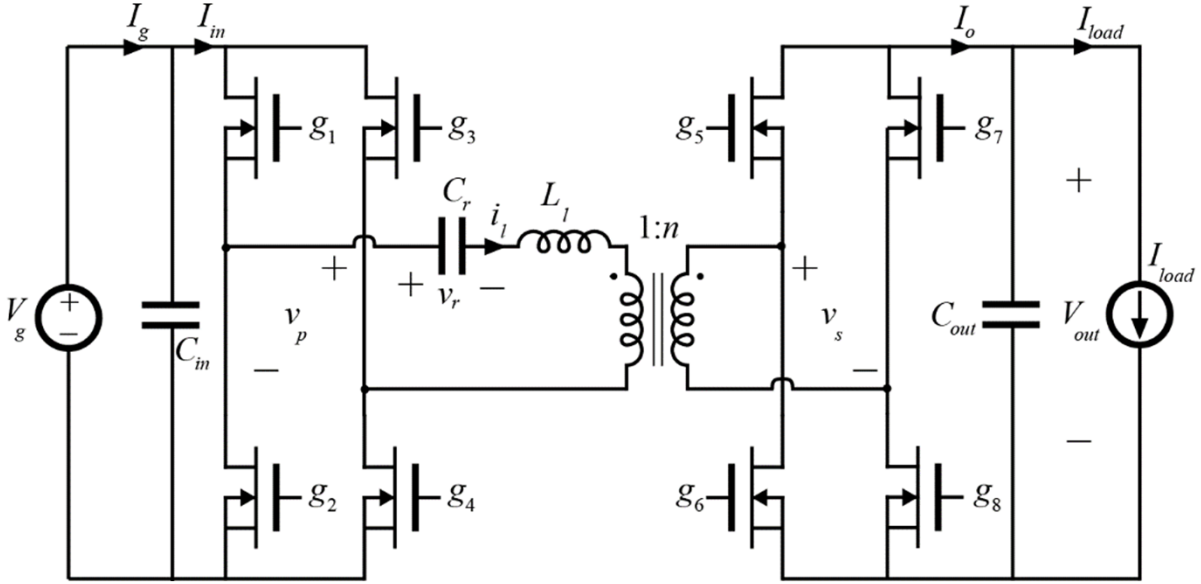
DAB: Transformer Saturation



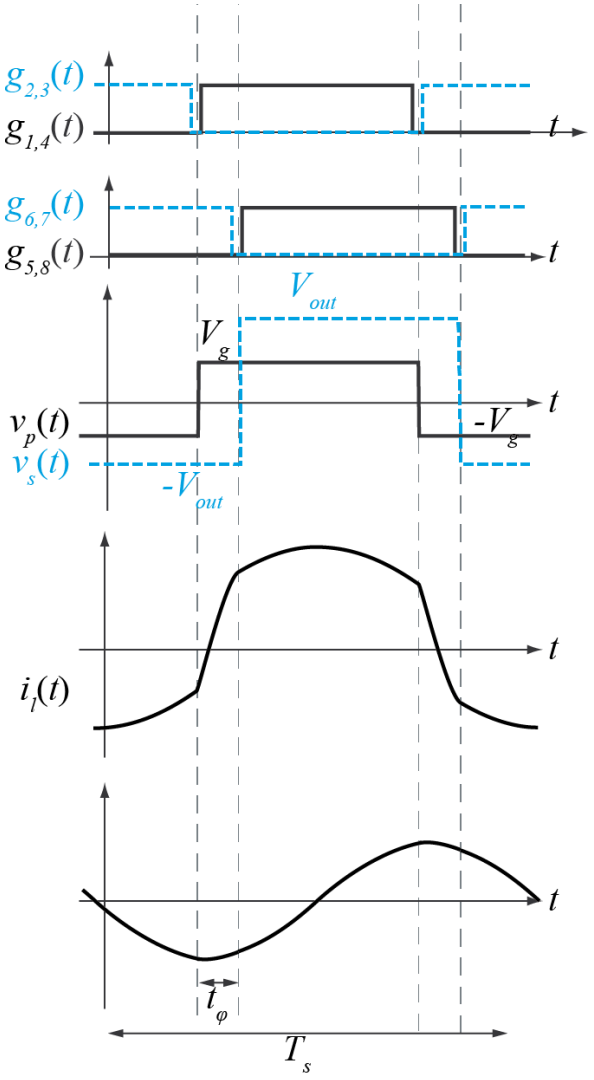


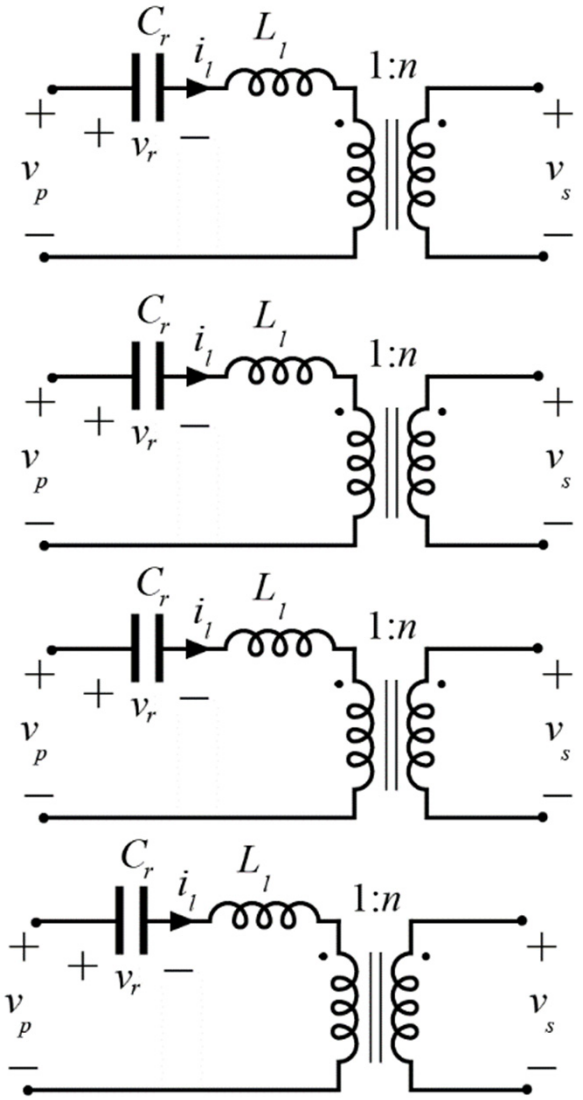
Series Resonant Converter



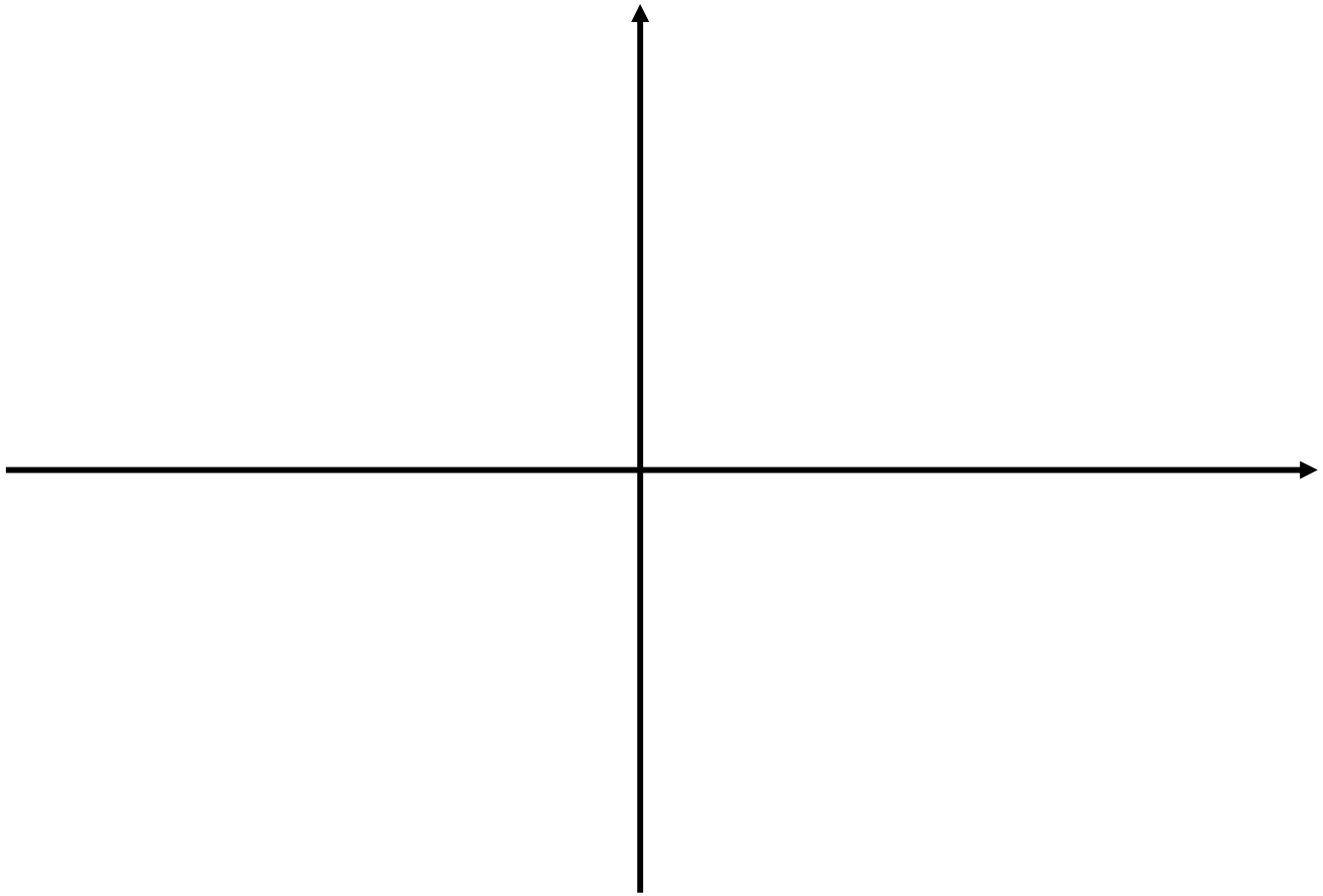


Subinterval Equivalent Circuits





Complete State Plane – Phase Shift Modulation

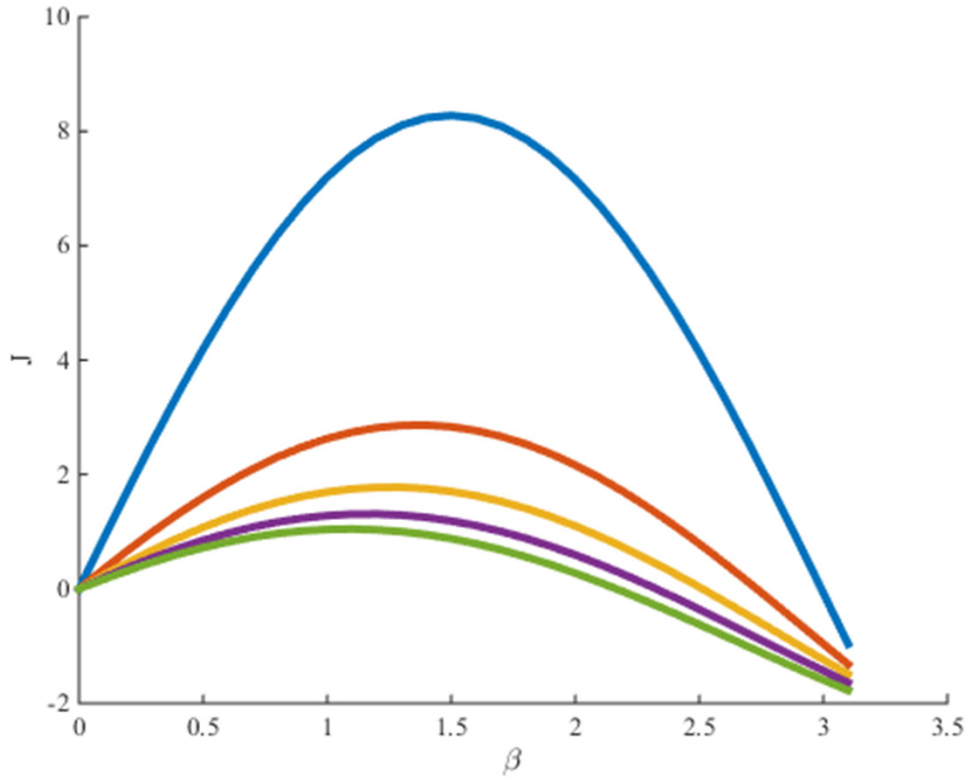


State Plane Solution

Averaging Step

Closed-Form Solution

SRC Control Trajectory



SRC Current Stress