Output Current Vs. Inductance

Constraints on Inductance
DAB: Experimental Results


Operation with $V \neq nV_g$

- **E.g.** Decrease to $M_N < 1$ by decreasing output voltage
- **Current** now ramping, causing more energy available for primary ZVS, but higher RMS currents
- **Can use** behavior to extend ZVS range of one bridge
Soft Switching Range with Varying $V_{out}$

Application Example: Automotive

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

Fig. 3. Automotive DAB converter (273 mm × 55 mm).


Alternate Modulation Schemes

DAB: Transformer Saturation

Florian Krismer, Johann W. Kolar, "Closed Form Solution for Minimum Conduction Loss Modulation of DAB Converters"
Series Resonant Converter

Subinterval Equivalent Circuits
Complete State Plane – Phase Shift Modulation