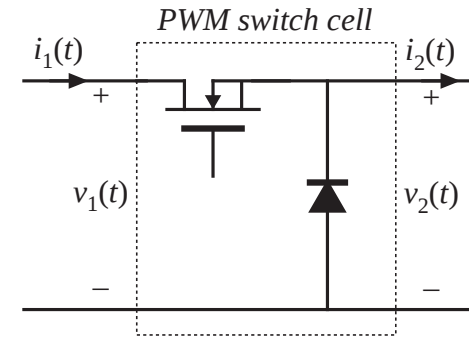
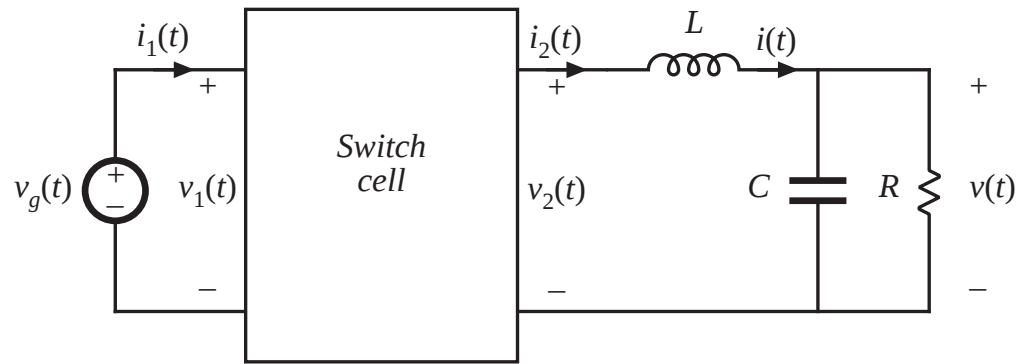
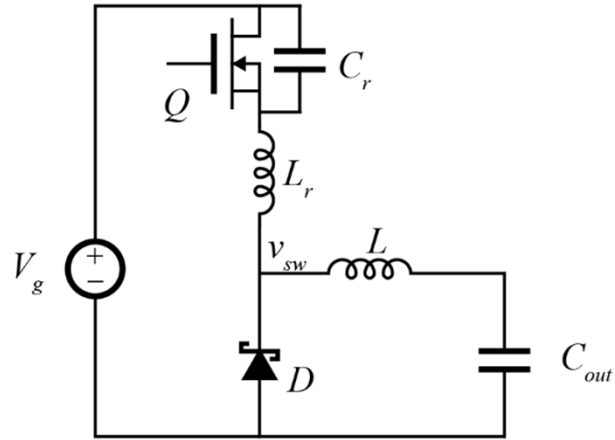


Identification of Resonant Switch



Switching Cell Conversion Ratio



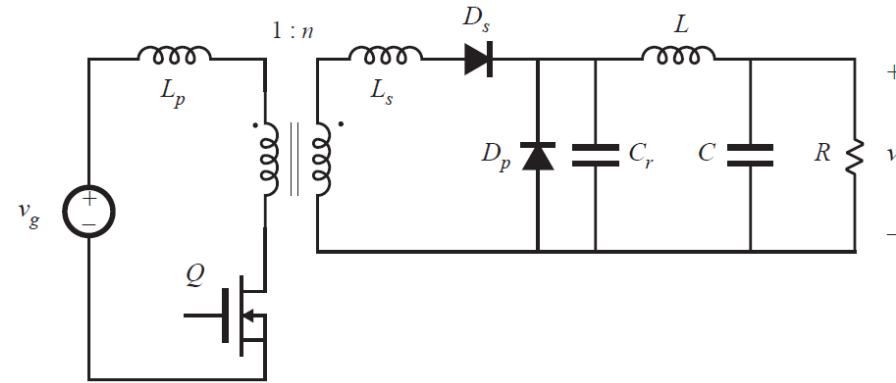
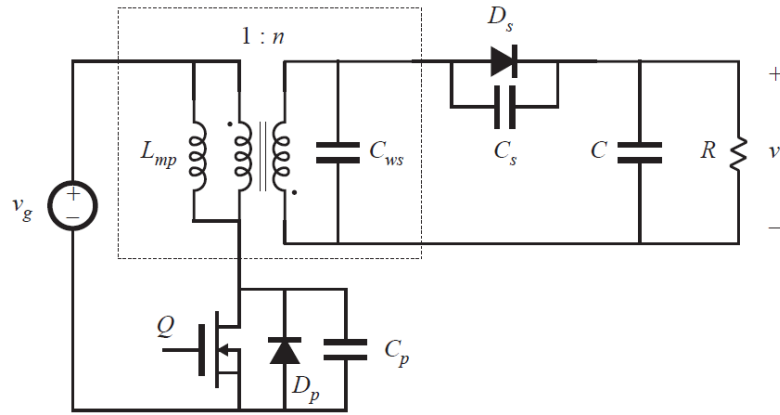
Conversion Ratios of Various Switch Cells

$$P_{1/2}(x) = \frac{1}{2\pi} \left[\frac{1}{2}x + \pi + \sin^{-1}x + \frac{1}{x} \left(1 - \sqrt{1 - x^2} \right) \right]$$

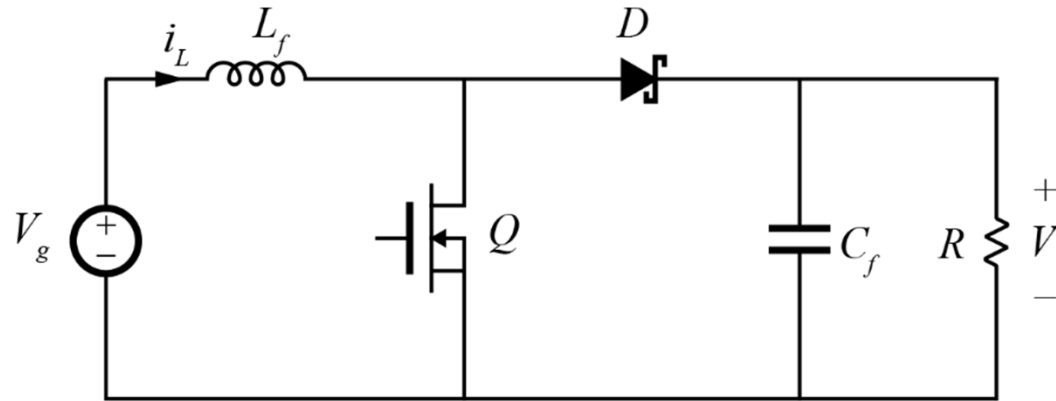
$$P_1(x) = \frac{1}{2\pi} \left[\frac{1}{2}x + 2\pi + \sin^{-1}x + \frac{1}{x} \left(1 - \sqrt{1 - x^2} \right) \right] \approx 1$$

Switch Cell	Conv. Ratio μ	Current Range	Conv. Ratio Range	Requirements on Q
PWM	D	N/A	$0 \leq \mu \leq 1$	
ZVS-QR (half)	$1 - FP_{\frac{1}{2}} \left(\frac{1}{J_L} \right)$	$1 \leq J_L \leq \infty$	$0 \leq \mu \leq 1$	
ZVS-QR (full)	$1 - FP_1 \left(\frac{1}{J_L} \right)$	$1 \leq J_L \leq \infty$	$0 \leq \mu \leq 1$	Bidirectional voltage
ZCS-QR (half)	$FP_{\frac{1}{2}}(J_L)$	$0 \leq J_L \leq 1$	$0 \leq \mu \leq 1$	Unidirectional Current*
ZCS-QR (full)	$FP_1(J_L)$	$0 \leq J_L \leq 1$	$0 \leq \mu \leq 1$	

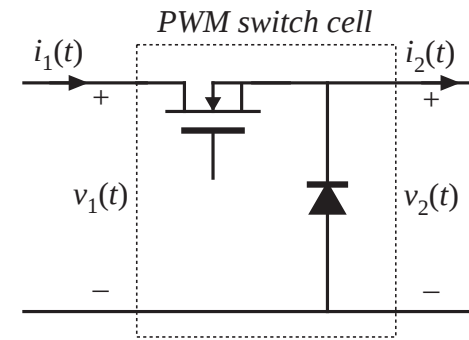
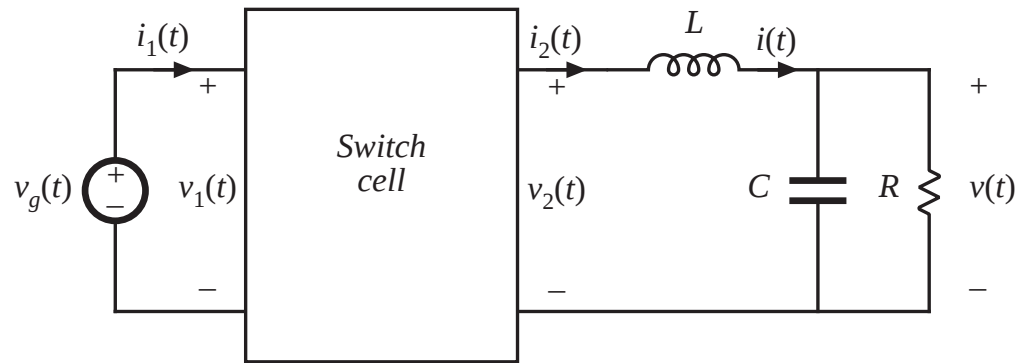
Resonant Switch Identification Examples



ZCS-QR Boost

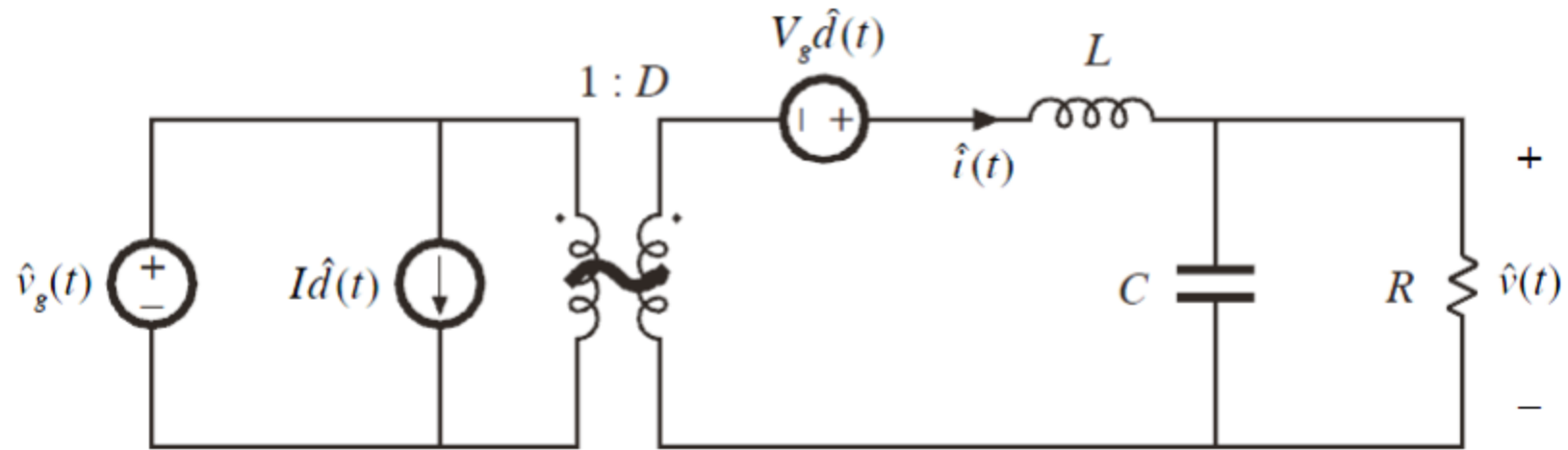


SSM - PWM Parent



SSM, PWM Case

Textbook, Fig.7.17(a)



ZVS-QR Switch Cell SSM

