Full Bridge Converter
Solution For Conversion Ratio

Transformer Saturation: Nonidealities
Half Bridge Isolated Buck

- Replace transistors $Q_3$ and $Q_4$ with large capacitors
- Voltage at capacitor centerpoint is $0.5V_g$
- $v_c(t)$ is reduced by a factor of two
- $M = 0.5 \times nD$

Push Pull Converter

$V = nDV_g \quad 0 \leq D \leq 1$
6.3.2 Forward Converter

- Buck-derived transformer-isolated converter
- Single-transistor and two-transistor versions
- Maximum duty cycle is limited
- Transformer is reset while transistor is off

Subinterval 1
Subinterval 2

$V_g^+ \quad \frac{n_1}{n_2} = n_3 \quad L_M \quad i_1' \quad i_1^+ \quad i_2^+ \quad i_3^+ \quad D_2 \text{ on} \quad i_2 = i_M n_1/n_2 \quad i_4^+ \quad i_3^+ \quad V_{D3}^+ \quad C \quad R \quad V^-

Subinterval 3

$V_g^+ \quad \frac{n_1}{n_2} = n_3 \quad L_M \quad i_1' \quad i_1^+ \quad i_2^+ \quad i_3^+ \quad D_3 \text{ on} \quad Q_1 \text{ off} \quad D_1 \text{ off} \quad i_4^+ \quad i_3^+ \quad V_{D3}^+ \quad C \quad R \quad V^-$
Forward Waveforms

Transformer Saturation When $D > 0.5$

magnetizing current waveforms, for $n_1 = n_2$
Two-Transistor Forward Converter

\[ V = nDV_s \quad D \leq \frac{1}{2} \quad \text{max}(v_{Q1}) = \text{max}(v_{Q2}) = V_s \]

Flyback Converter: Buck-Boost Derived