Step-Down/Up DC-DC Converter

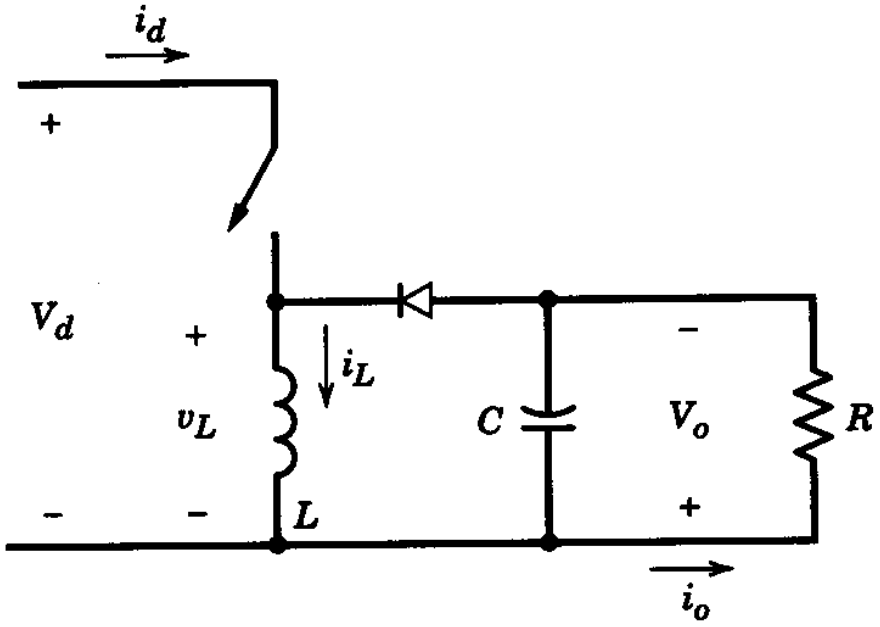

Figure 7-18 Buck–boost converter.

- The output voltage can be higher or lower than the input voltage

Step-Down/ Up DC-DC Converter: Waveforms

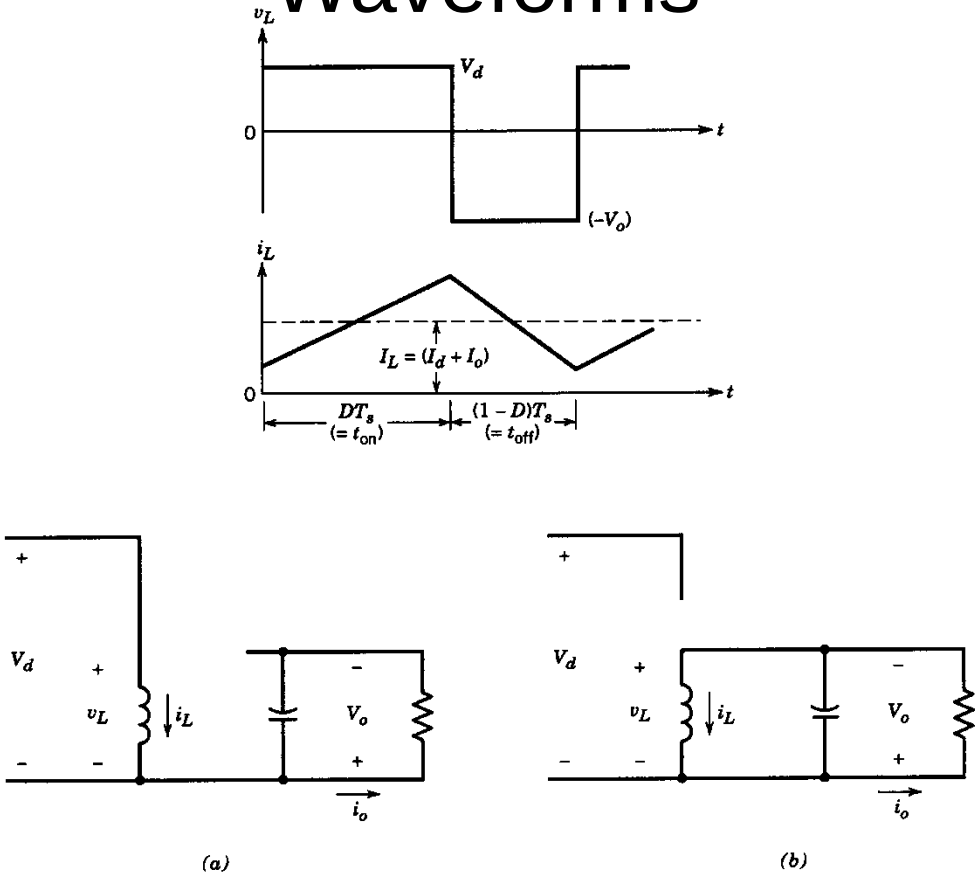

Figure 7-19 Buck–boost converter ($i_L > 0$): (*a*) switch on; (*b*) switch off.

- Continuous conduction mode

Step-Down/ Up DC-DC Converter: Limits of Cont./Discont. Conduction

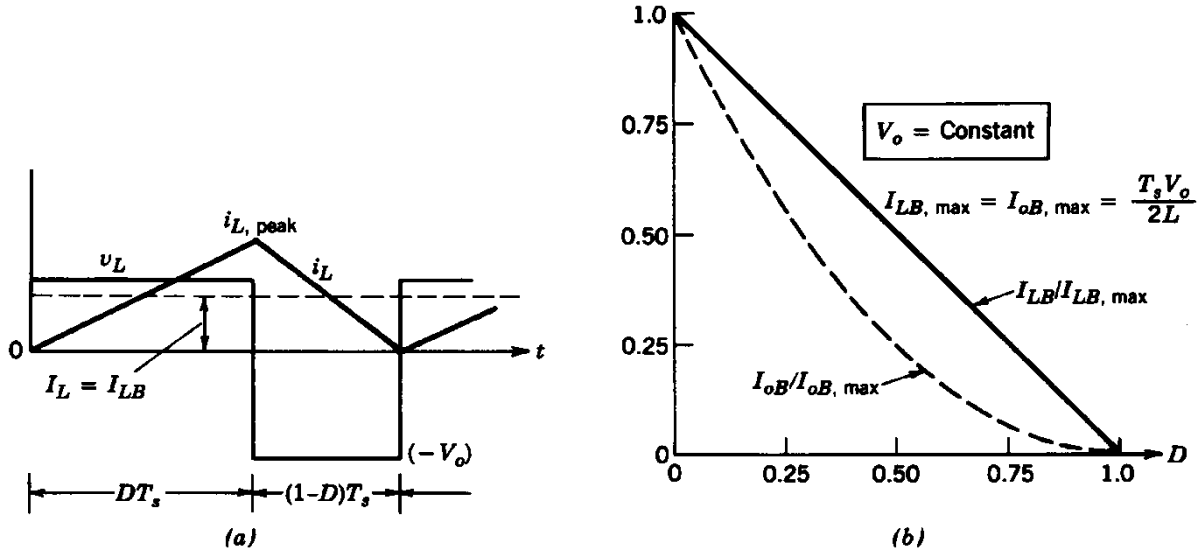

Figure 7-20 Buck–boost converter: boundary of continuous–discontinuous conduction.

- The output voltage is held constant

Step-Down/ Up DC-DC Converter: Discontinuous Conduction Mode

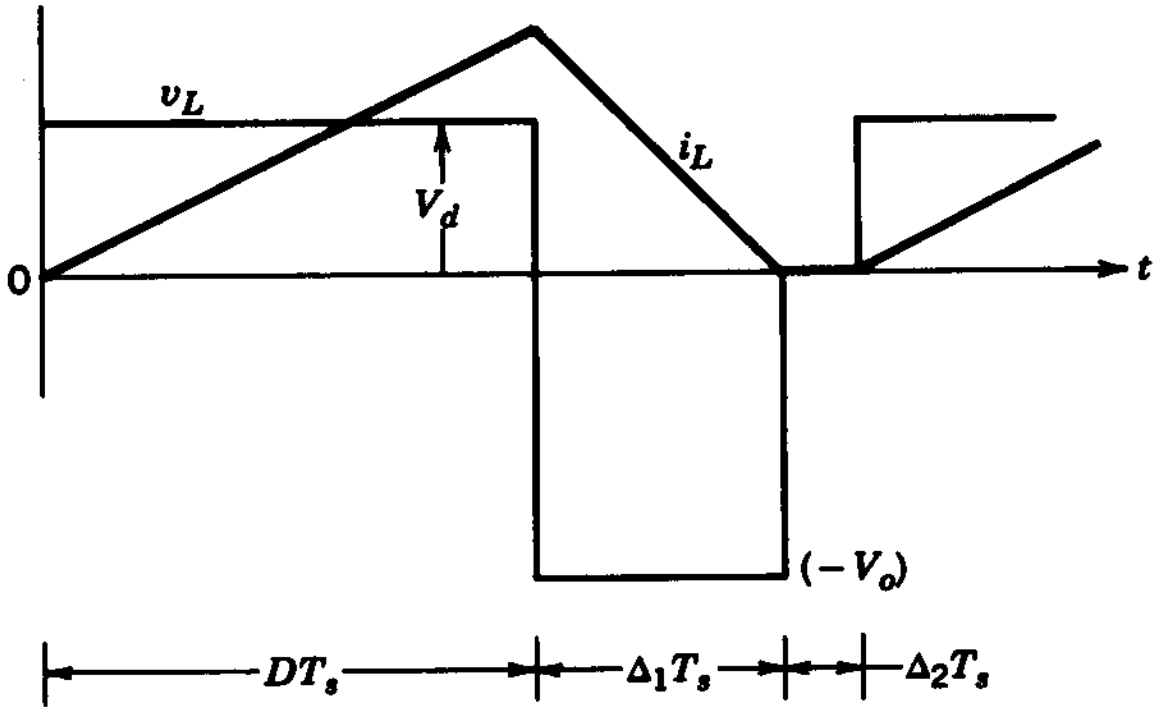

Figure 7-21 Buck–boost converter waveforms in a discontinuous-conduction mode.

- This occurs at light loads

Step-Down/ Up DC-DC Converter: Limits of Cont./Discont. Conduction

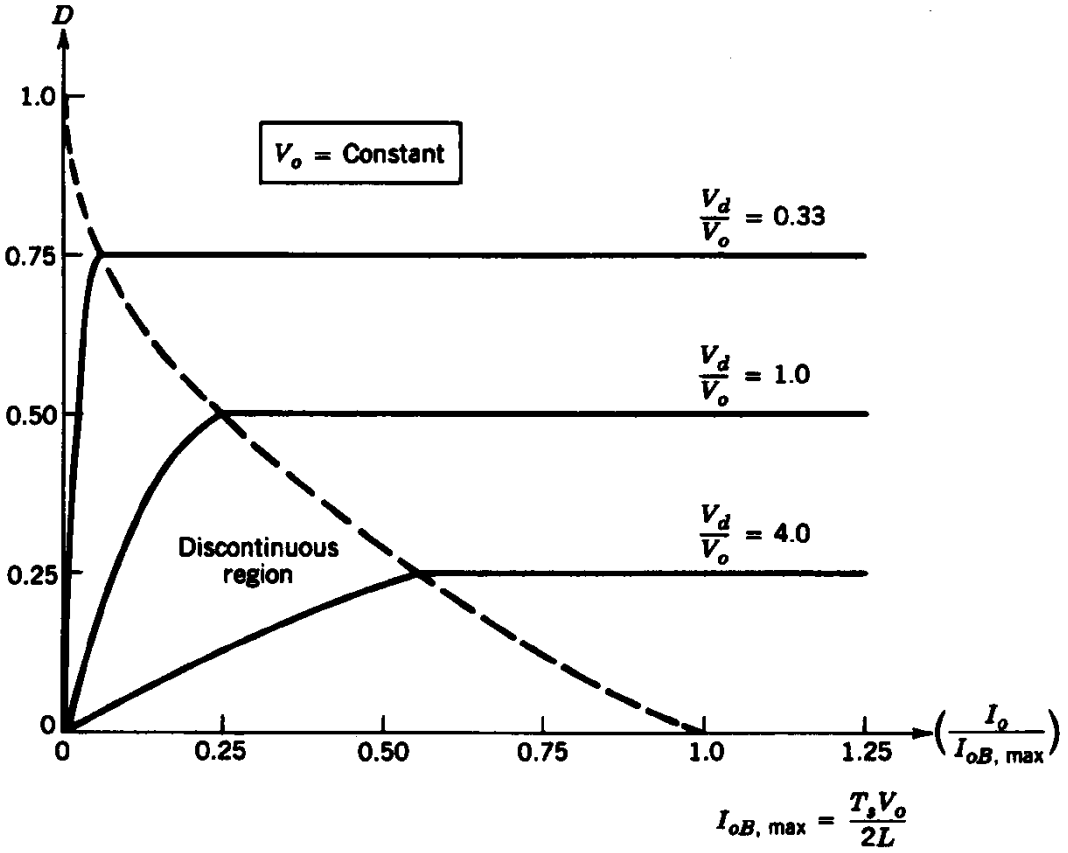

Figure 7-22 Buck–boost converter characteristics keeping V_o constant.

- The output voltage is held constant

Switch Utilization in DC-DC Converters

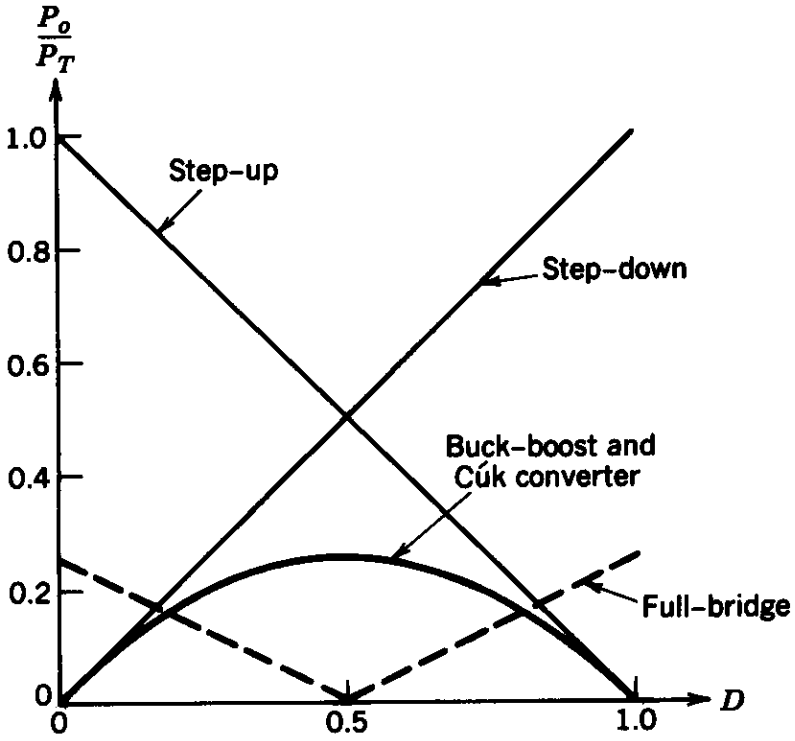

Figure 7-31 Switch utilization in dc–dc converters.

- It varies significantly in various converters