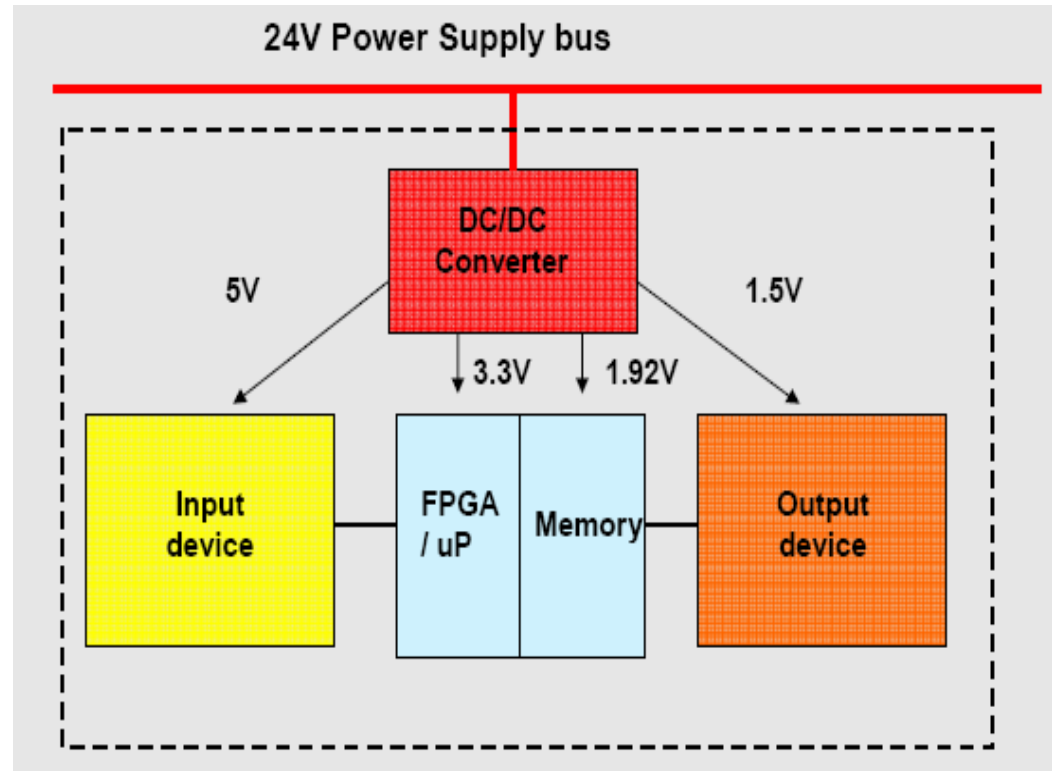
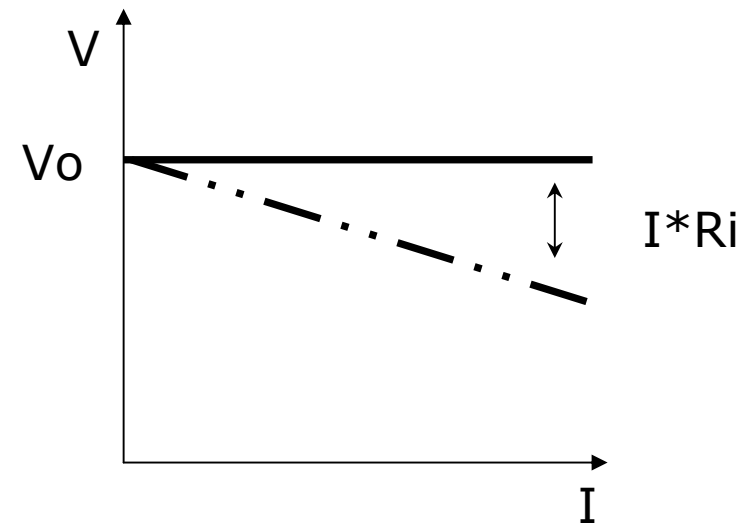
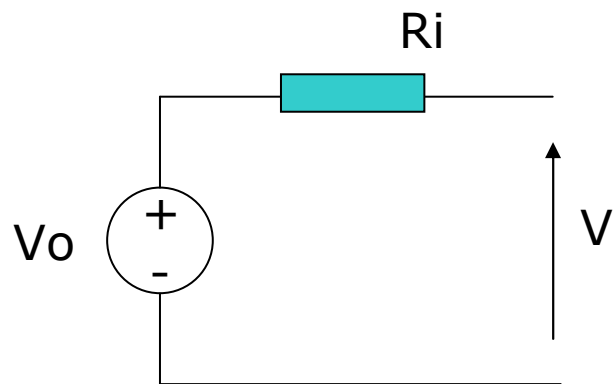
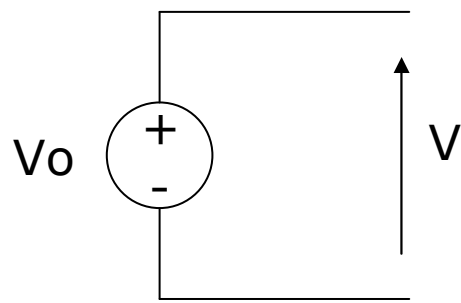


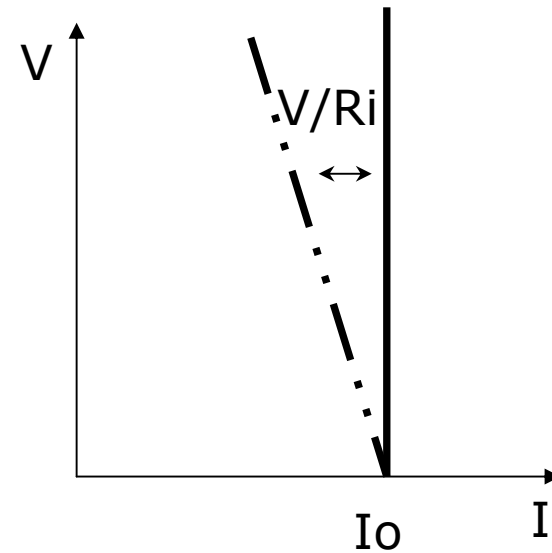
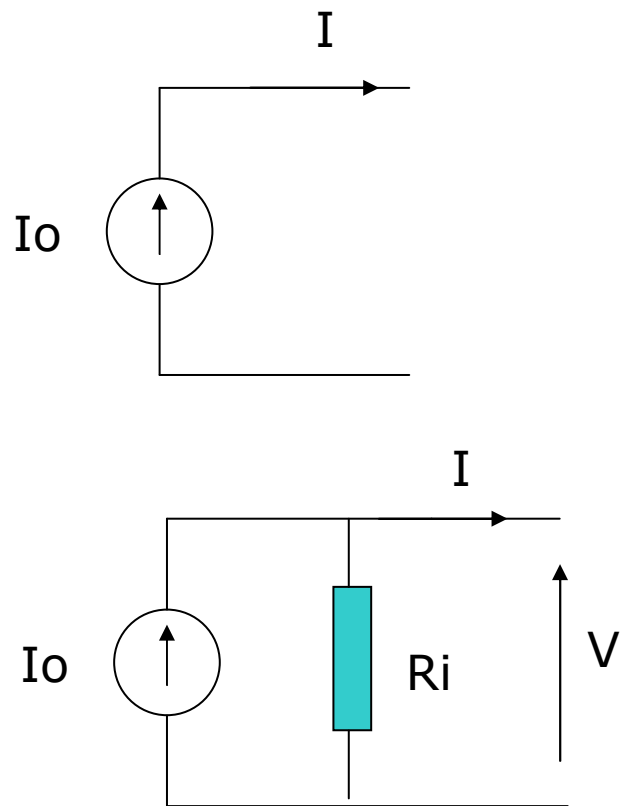
Tensioni di riferimento e alimentazione



Power Supply

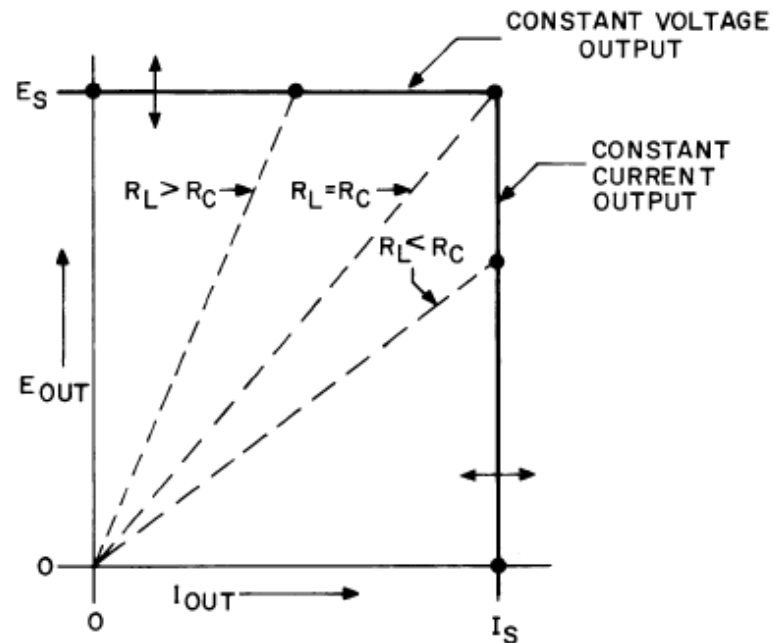


Power Supply



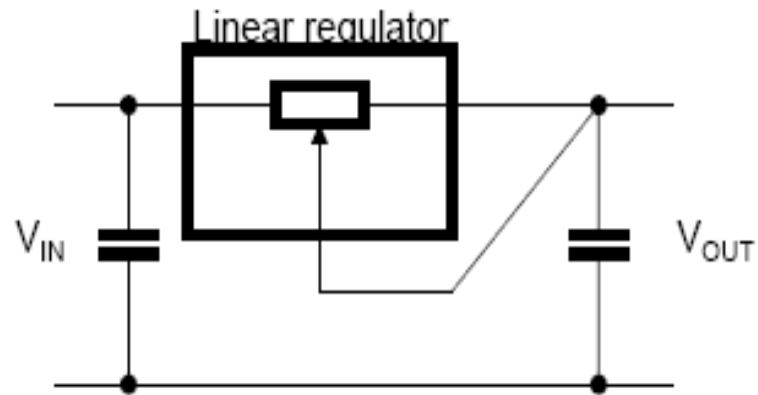
Power Supply

CONSTANT VOLTAGE/CONSTANT CURRENT (CV/CC) OUTPUT CHARACTERISTIC

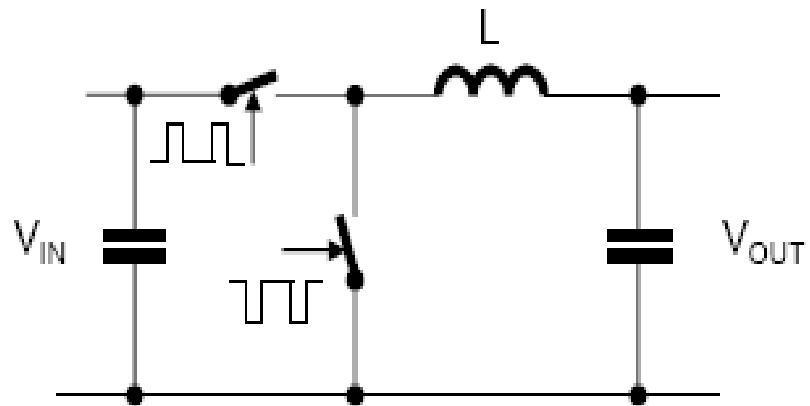


Power Supply

Lineare

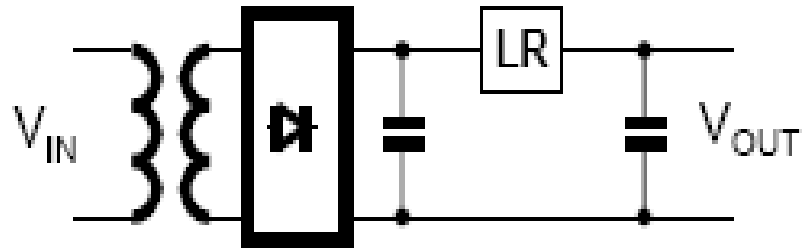


Switching

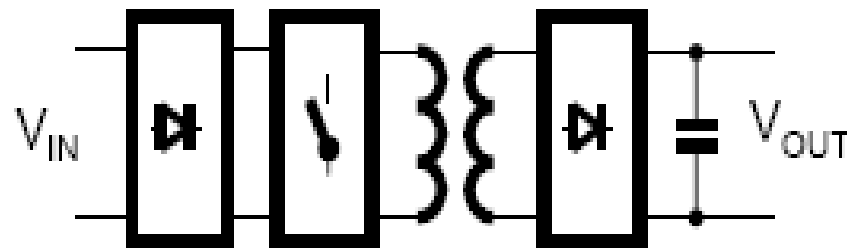


Power Supply

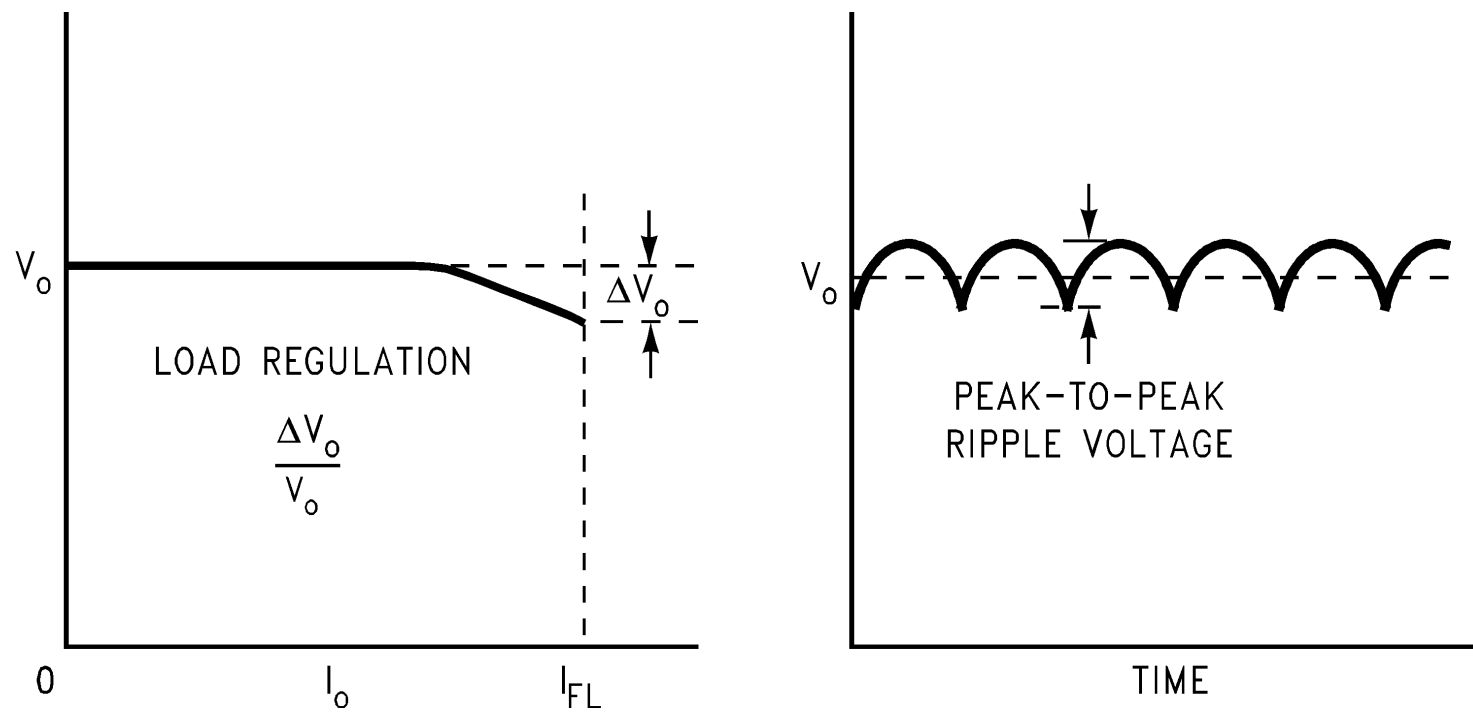
Lineare



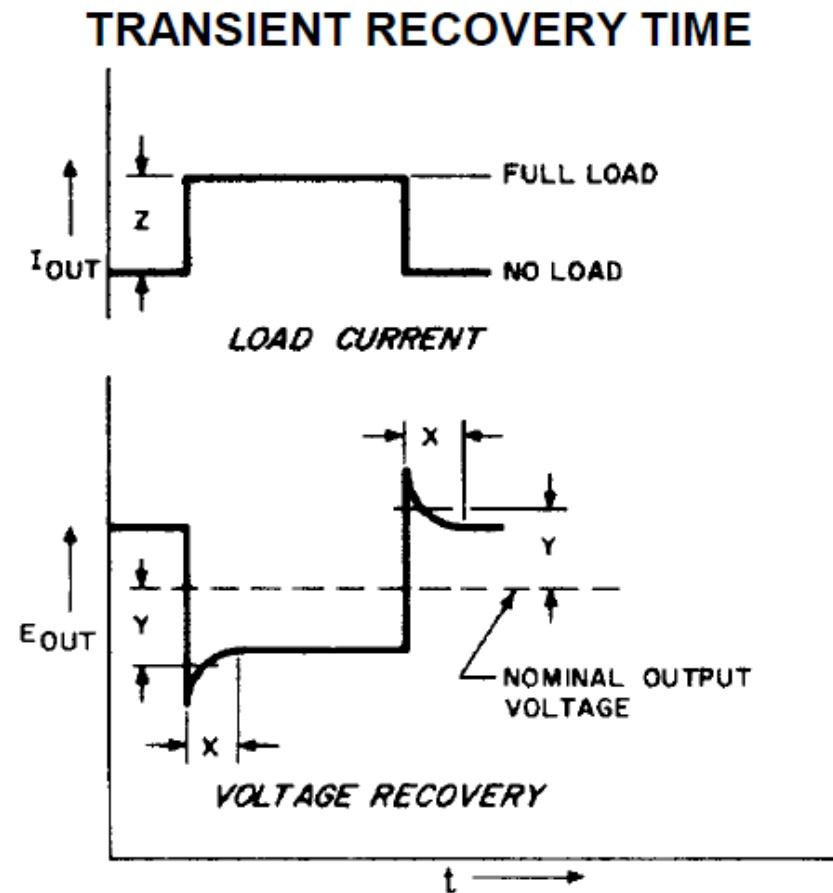
Switching



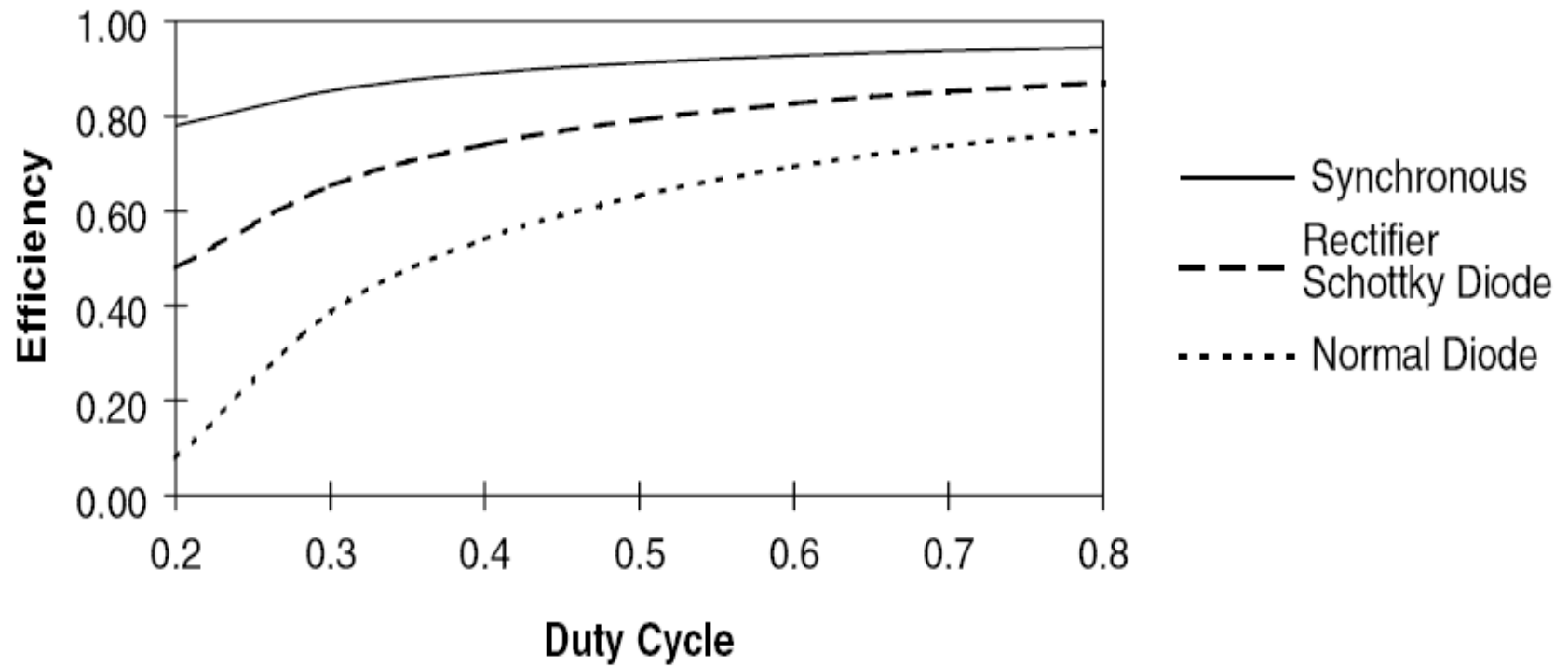
Power Supply



Power Supply



Power Supply

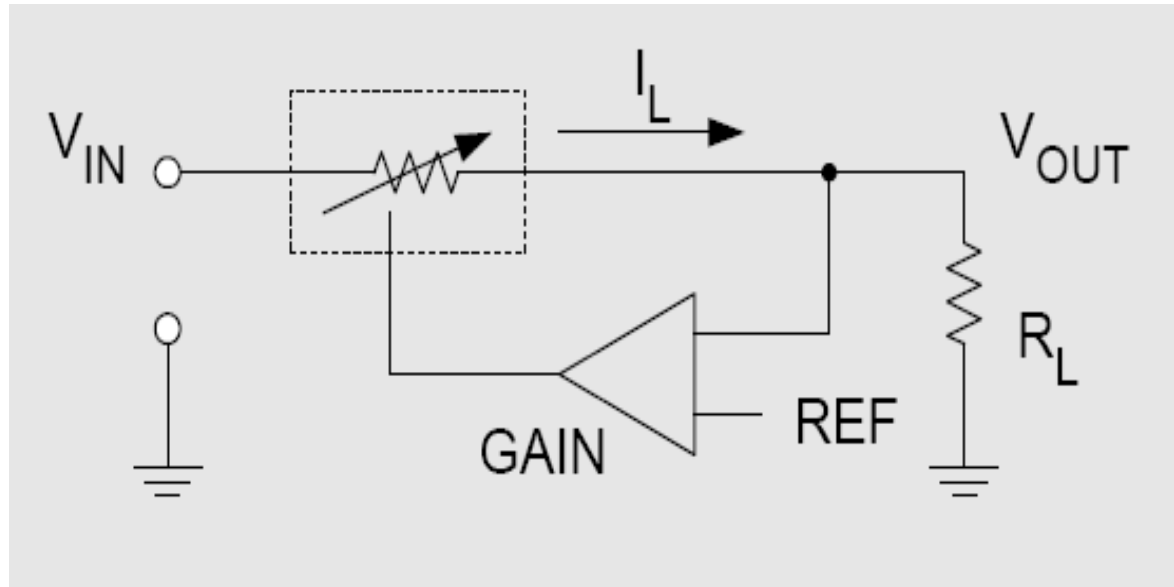




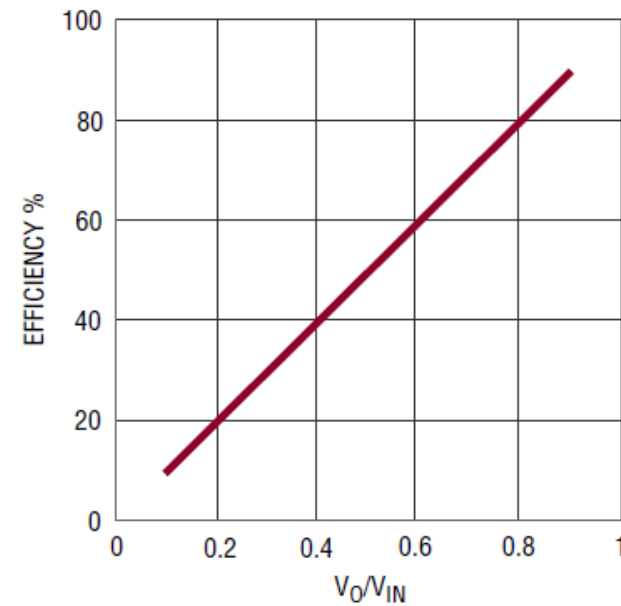
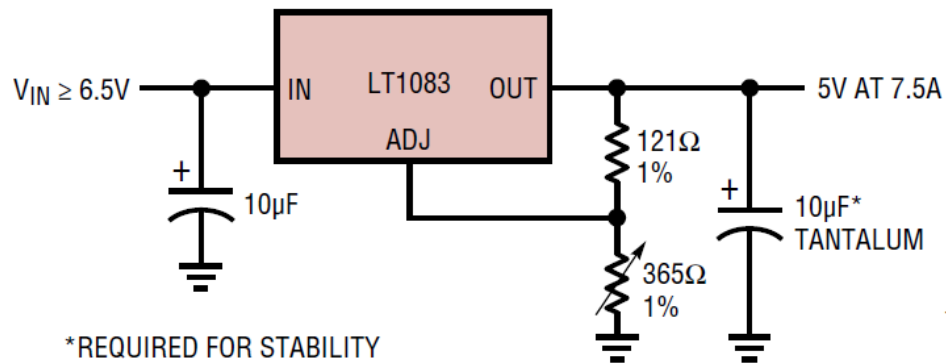
Power Supply

- AC/AC transformers
- AC/DC rectifiers
- DC/DC converters
- DC/AC inverters

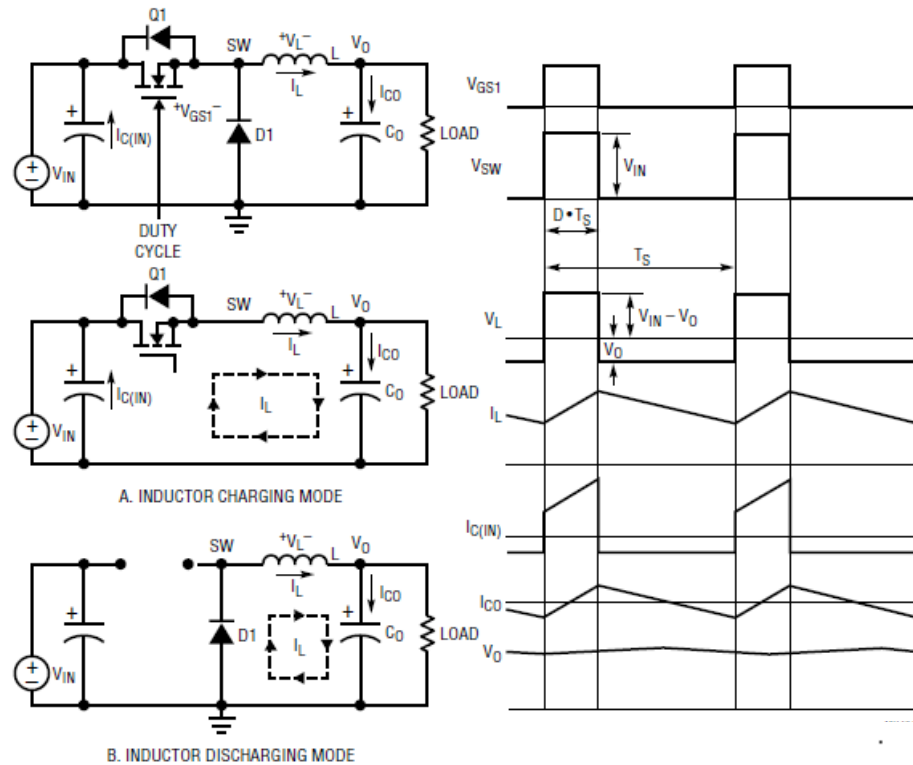
Stabilizzatori lineari



Stabilizzatori lineari

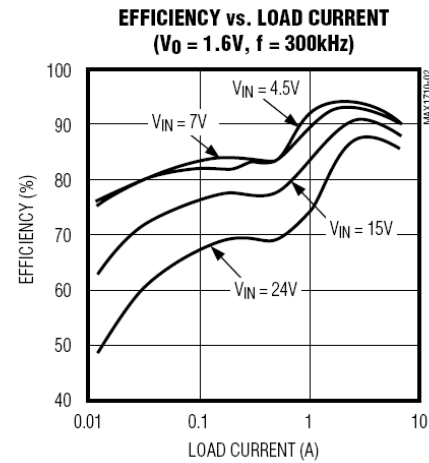
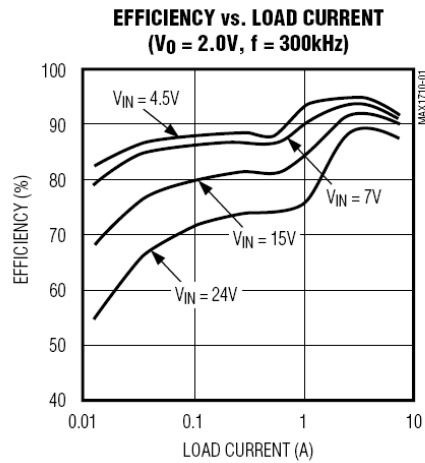
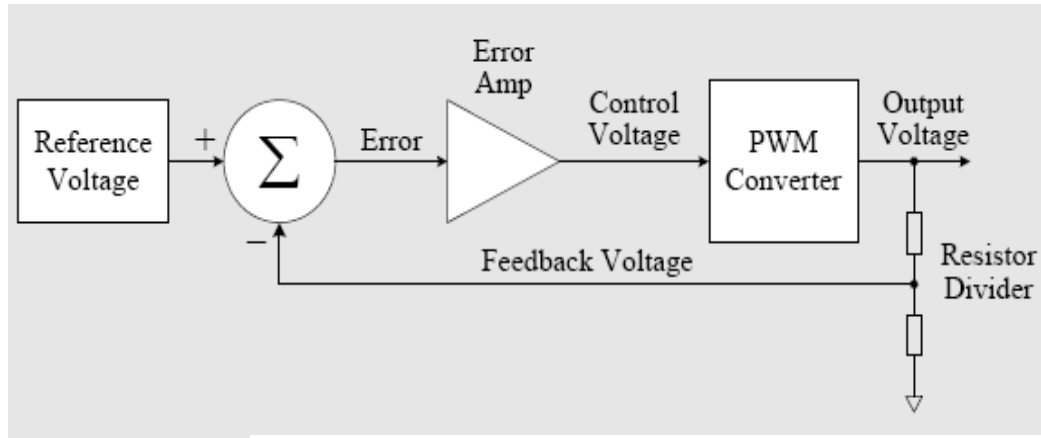


Switching

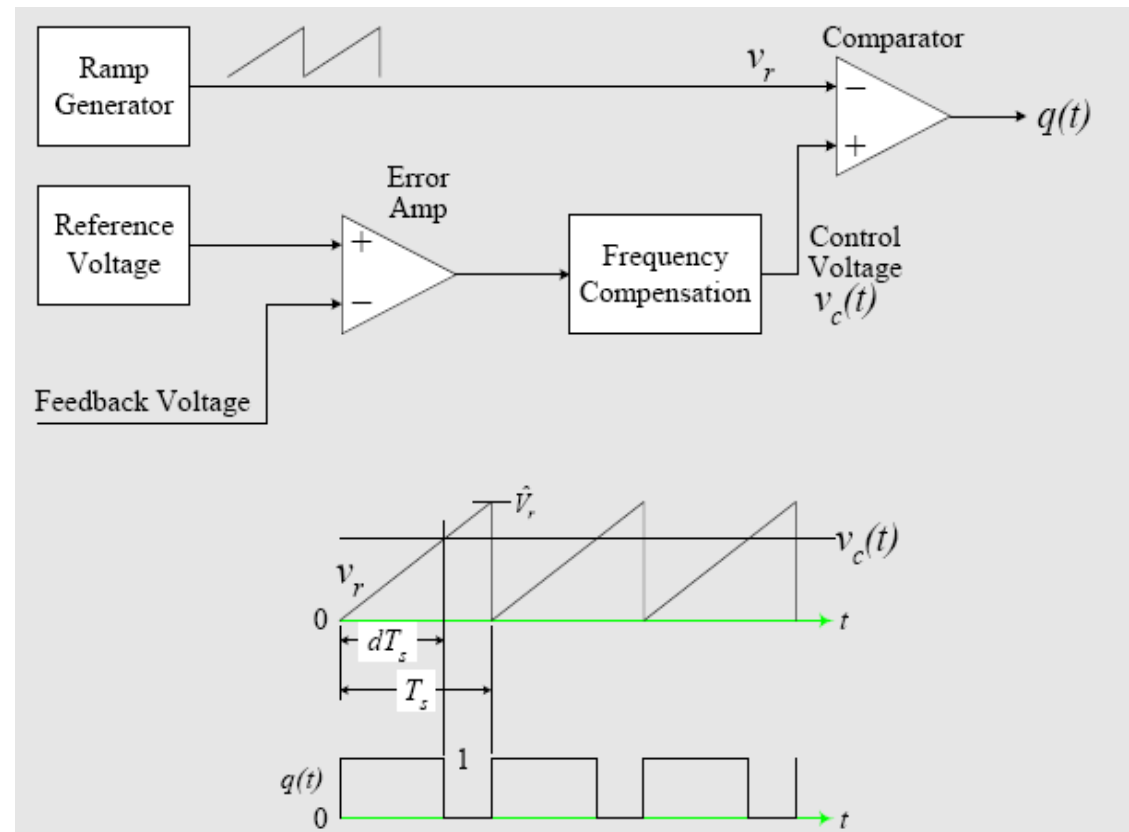


$$V_{O(DC)} = \text{AVG}[V_{SW}] = \frac{T_{ON}}{T_S} \cdot V_{IN}$$

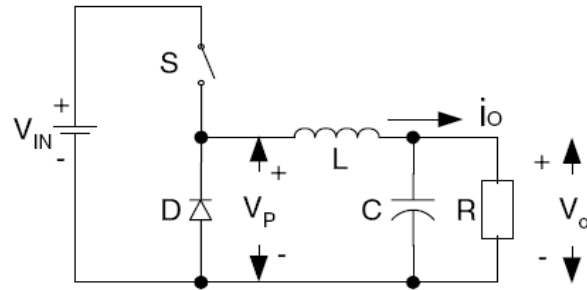
Switching



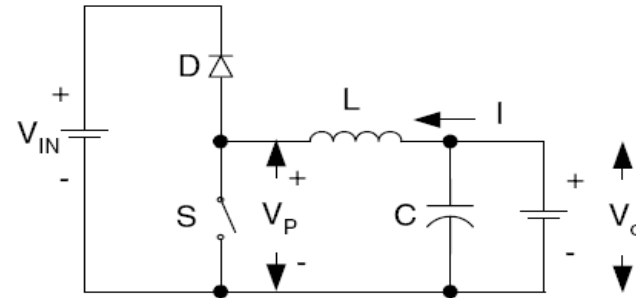
Switching



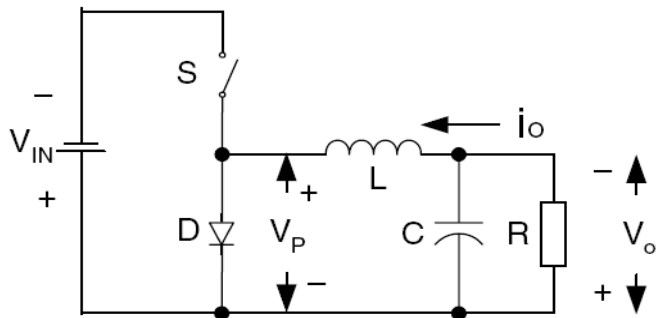
Switching



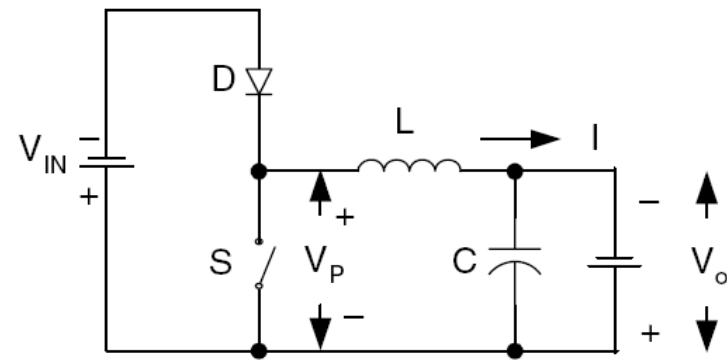
(a) Circuit Diagram



(a) Circuit Diagram

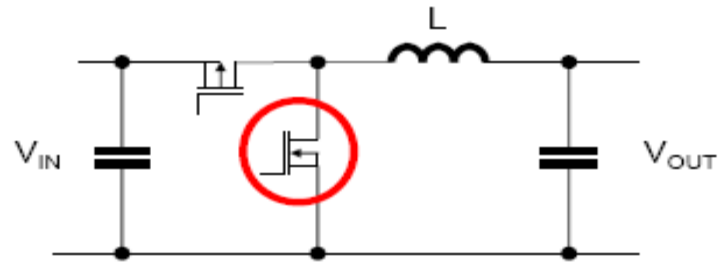


(a) Circuit Diagram

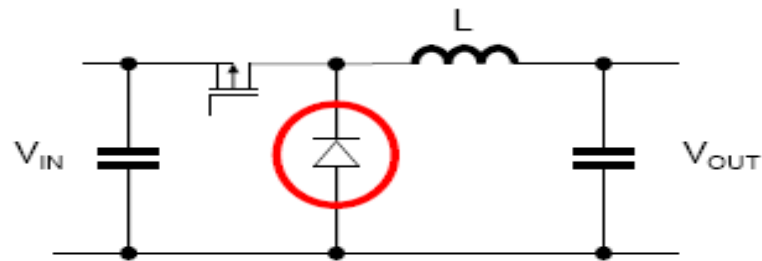


(a) Circuit Diagram

Switching



Synchronous rectification



Freewheeling diode

Power Supply

Example 1

$$V_{IN} = 24 \text{ V DC}$$

$$V_{OUT} = 5 \text{ V DC}$$

$$I_{OUT} = 5 \text{ A}$$

$$P_{OUT} = 25 \text{ W}$$

Linear solution:

$$\eta = 20.8 \%$$

$$P_{LOSS} = 95 \text{ W}$$

Switching solution:

$$\eta = 85 \%$$

(estimation)

$$P_{LOSS} = 4.4 \text{ W}$$

Compare



Example 2

$$V_{IN} = 3.3 \text{ V DC}$$

$$V_{OUT} = 2.5 \text{ V DC}$$

$$I_{OUT} = 20 \text{ mA}$$

$$P_{OUT} = 50 \text{ mW}$$

Linear solution:

$$\eta = 75.7 \%$$

$$P_{LOSS} = 16 \text{ mW}$$

Switching solution:

$$\eta = 65 \%$$

(estimation)

$$P_{LOSS} = 27 \text{ mW}$$

Layout per DC/DC converter

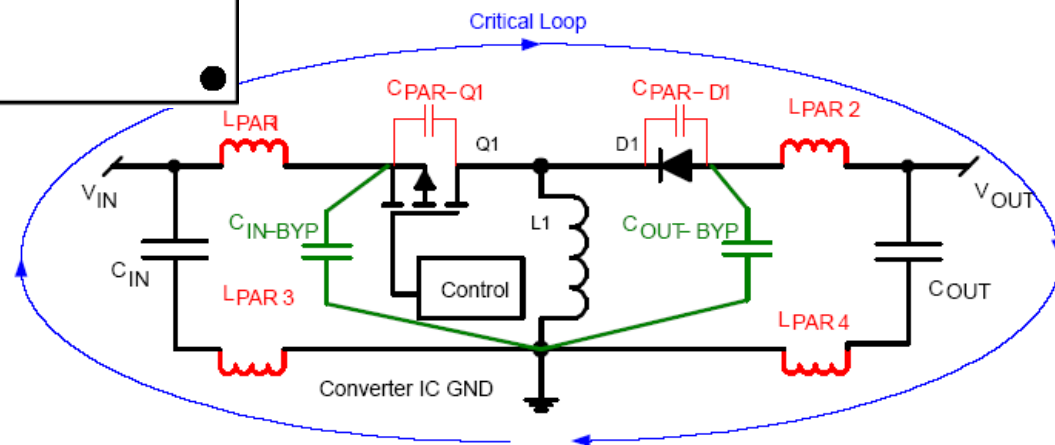
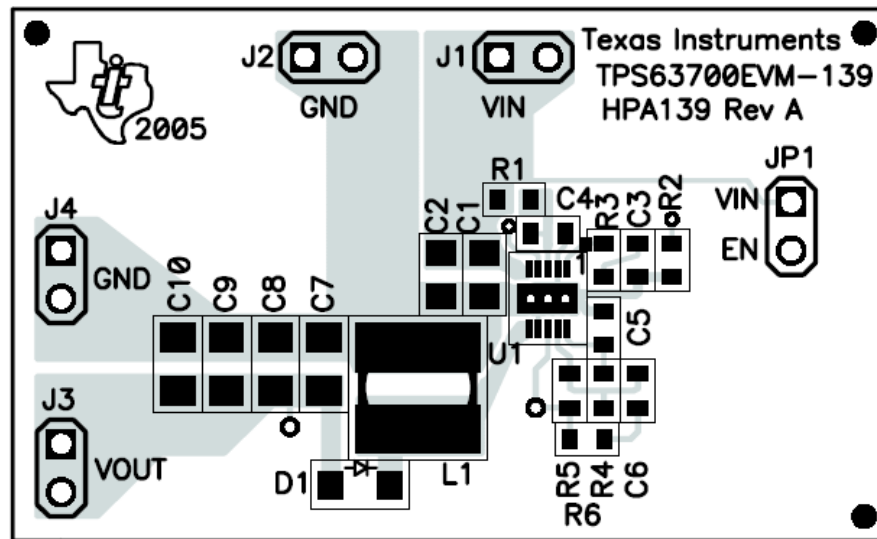


Figure 3. Buck-Boost (Inverting) Converter Schematic



Riferimenti di tensione

Indipendente dalla alimentazione

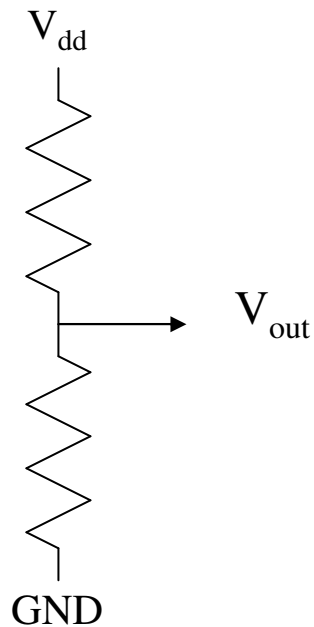
Indipendente dalla Temperatura

Indipendente dalla corrente assorbita

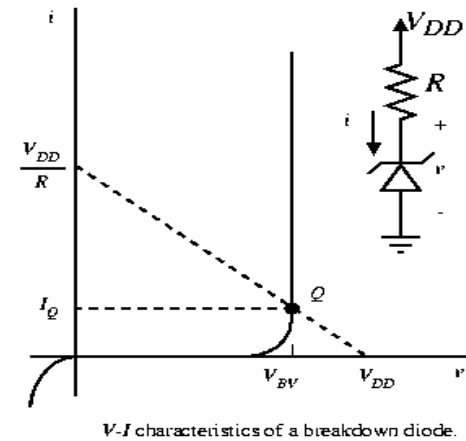
Indipendente dal Rumore

Sensibilità: $S_{V_{dd}}^{V_{ref}} = \left(\Delta V_{ref} / V_{ref} \right) / \left(\Delta V_{dd} / V_{dd} \right)$

Riferimenti di tensione

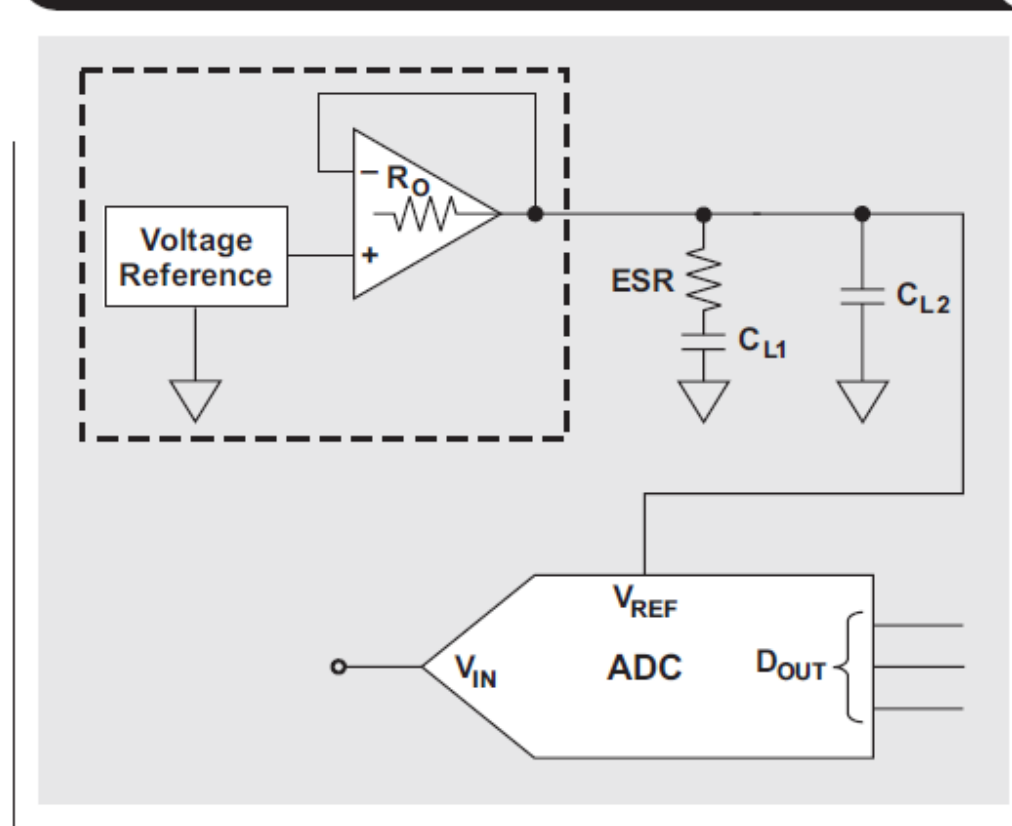


$$S_{V_{dd}}^{V_{ref}} = 1$$



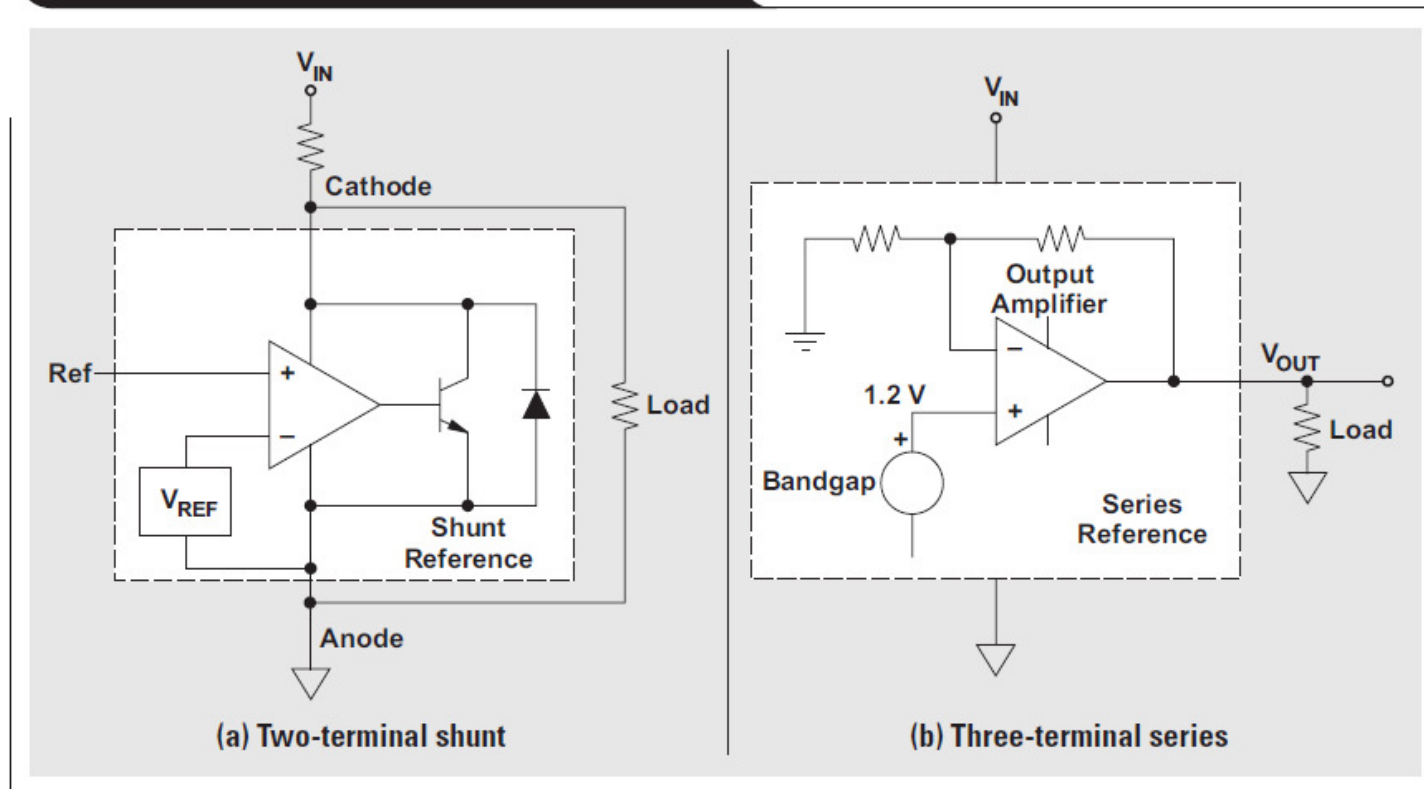
Riferimenti di tensione

Figure 1. Voltage-reference system for SAR ADC



Riferimenti di tensione

Figure 2. Voltage-reference configurations



Riferimenti di tensione

Figure 4. Total noise at ADC output as a function of ADC input voltage

