

Several capacitor compensation methods

What are the types of compensation capacitors?

Compensation capacitors are divided into two type families (A and B) in accordance with IEC 61048 A2. o Type A capacitors are defined as: "Self-healing parallel capacitors; without an (overpressure) break-action mechanism in the event of failure"; They are referred to as unsecured capacitors.

What is the purpose of a compensation capacitor?

Objective of compensation is to achieve stable operation when negative feedback is applied around the op amp. Miller - Use of a capacitor feeding back around a high-gain, inverting stage. Miller capacitor only Miller capacitor with an unity-gain buffer to block the forward path through the compensation capacitor. Can eliminate the RHP zero.

What are the contradicting requirements of a capacitor?

Tighter line and load regulation, low quiescent current operation, capacitor-free and wide-range output capacitor specifications are some of the contradicting requirements in which drive newer topologies and newer frequency compensation techniques. The objective of this paper is to provide LDO,

How can a compensation resistor be used?

This can be achieved by several methods including a zero nulling resistor (RZ) or a voltage buffer in series with the compensation capacitor in the feedback path. A common-gate stage can also be employed to block the feed-forward component of the compensation current while achieving pole-splitting.

What is the difference between a Miller capacitor and a feedforward capacitor?

Miller capacitor with an unity-gain buffer to block the forward path through the compensation capacitor. Can eliminate the RHP zero. Miller with a nulling resistor. Similar to Miller but with an added series resistance to gain control over the RHP zero. Feedforward - Bypassing a positive gain amplifier resulting in phase lead.

What is a simple compensation method?

A simple compensation method, using only one extra component, consists in adding a resistor in series between the output of the amplifier and its load (see Figure 13). It is often referred to as the out-of-the-loop compensation method because the additional component (ROL) is added outside of the feedback loop.

Both techniques adopt two compensation capacitors, which exploit the Miller effect, to split low-frequency poles and to achieve the desired phase margin and transient response. Starting ...

Compensation capacitors are used to counteract reactive current (increased power factor) and are basically either connected in parallel or in series. Compensation capacitors are not required when using electronic ballasts, whose power factor is generally in the region of 0.95.

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Several op-amp and LDO architectures have evolved, from a simple two-stage topology using Miller compensation with nulling resistor to a complex multi-stage op-amp with feed forward and nested/reverse-nested feedback paths which utilize active capacitance multiplication techniques.

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