Dynamic analysis of capacitor parameters

Can capacitor current loop enhance dynamic characteristics of current source inverters?
In this paper, a strategy to enhance the dynamic characteristics of current source inverters by constructing a capacitor current loop was proposed. The main conclusions are as follows. 1.

How does decoupling capacitor location affect PDN frequency response?
Decoupling capacitor location has significant impact on power plane loop inductancewhich directly affects the PDN frequency response. Placing capacitor further away from load circuit power pins,thus increasing the loop inductance,can lead to ground bounce noise and coupling from power planes to high-speed signal traces.

What is capacitor voltage feedback based active damping?
Capacitor voltage feedback (CVF) based active damping (AD) can suppress this resonance,and has the advantage of simple implementation. However,the amplitude of the filter capacitor voltage is much larger than the amplitude of the direct current,which leads to an inability to obtain the optimal damping ratio when CVF-AD is employed.

Why do ICS need a decoupling capacitor?
Miniaturization leads to decreased supply voltages,which combined with higher current consumptionof the integrated circuits (ICs) creates the need for more demanding power distribution network (PDN) requirements. The essential components in the PDN design are the decoupling capacitors.

Why is the filter capacitor voltage amplitude important?
Nonetheless,the filter capacitor voltage amplitude is large relative to the DC-side current amplitude,and the direct feedback of the filter capacitor voltage to realize CVF-AD is prone to lead to system saturation,which affects the dynamic characteristics and stability of the system .

Why should a capacitor be placed further away from a load circuit?
Placing capacitor further away from load circuit power pins,thus increasing the loop inductance,can lead to ground bounce noise and coupling from power planes to high-speed signal traces. Capacitor placement should be done in such way as to minimize the current path of the inductive loop.

The system dynamic analysis is done with a user-friendly Simulink interface constructed to allow easy introduction of capacitor design dimensions, material parameter values and voltage signal stimuli.

The dynamic characteristics and optimization of a cutting mechanism about aluminum electrolytic capacitor casing machine were investigated with a lumped mass-spring damper model in this paper.

However, the bandwidth of the high-pass filter is coupled with the controller parameters, which increases the

difficulty of system parameter design. To address this issue, the inverter current is decomposed into the grid current and the capacitor current depending on the circuit. Then the capacitor current loop (CCL) is constructed.

PDN simulation using dynamic capacitor models To evaluate capacitor modeling impact on PDN performance a test layout was realized. A 10-layer stack-up was chosen with the power net routed on layers 5 and 6, while the ground net on layers 4 and 7. Figure 9 highlights

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Abstract. The paper presents a mathematical model and simulation results of dynamic characteristics of the single-phase capacitor induction motor for different values of the capacitor capacitance and moment of inertia at no-load and nominal load conditions. The model has been used to study the effect of some machine parameters on the start-up and load performance of ...

Based on the sensitivity analysis, the proposed control scheme consists of an inner FM loop for fine control, an outer PWM loop for coarse control, and a provision to increase the dynamic range of ...

Compared with the above compensators, the dynamic capacitor (D-CAP) is a simple, reliable, and economical solution without bulky electrolytic capacitors, which is composed of a power capacitor and ...

This paper presents an ultra-low power comparator with minimum delay and low offset, used in successive approximation register analog-to-digital converters (SAR ADCs) for biomedical system-on-chips (SoCs). To reduce the power consumption, the proposed comparator is designed with a minimum supply voltage in the sub-threshold region. Additionally, ...

The direct current (DC)-DC converter presents abundant nonlinear phenomena, such as periodic bifurcation and chaotic motion, under certain conditions. For a switched-inductor buck-boost (SIBB) converter with ...

In this article, for a multistage induction coil launcher, the current loop model is established to solve its dynamic process. The McKinney analysis method is e ... When the goal entry and exit speed of the armature are given, the capacitor parameters are inverted stage by stage. Finally, the above optimization algorithm is applied to a five ...

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