# Single-phase capacitor compensation current

What is the compensation method for EMI-capacitor reactive current?
The proposed compensation method for EMI-capacitor reactive current was tested on a modified 360-W, single-phase PFC evaluation module (EVM), UCD3138PFCEVM-026, which was controlled by a UCD3138 digital power controller. The input voltage for the test condition was VIN = 230 V, 50 Hz.

How to compensate for reactive current caused by EMI capacitor?
There is a novel method to actively compensate for the reactive current caused by the EMI capacitor. Moreover, the PFC current-loop reference is reshaped at the AC zero-crossing to accommodate for the fact that any reverse current will be blocked by the diode bridge. Both PF and THD are improved as a result. Figure 3.

How to use the proposed EMI-capacitor compensation method?
To use the proposed EMI-capacitor compensation method,the current reference needs to be modified according to Equation 7. The EMI-capacitor reactive current,iC(t),needs to be calculated first. With a digital controller,the input AC voltage is sampled by an ADC at a fixed sample rate.

Are PF and ThD improved with EMI-capacitor compensation method?
Both PF and THD are improvedwith the proposed EMI-capacitor compensation method. The proposed novel method to compensate EMI-capacitor reactive current reshaped the current reference during the AC zero-crossing area. Test results showed that both PF and THD were improved.

Does the dual-feedback inverter current control with capacitor current active damping work?
In terms of the inverter current control with capacitor current active damping,i.e.,the dual-feedback inverter current control,its operation cases have not been thoroughly unfolded yet,despite the existing expositions on its stability improvements [18,19,20,21,22].

Can a notch filter extract capacitor current?
From the perspective of computing the capacitor current,some observer-based schemes have been proposed in [24,25,26]. However,their effectiveness is highly dependent on the model accuracy. Alternatively,from the perspective of extracting the capacitor current,it is feasibleby using a notch filter  or a high-pass filter .

Aalborg University, Department of Energy, Denmark chenl@energy.aau.dk, pda@energy.aau.dk, fbl@energy.aau.dk dary conduction mode (BCM) can be employed in single-phase grid ...

Abstract: The existing active power decoupling methods for single-phase current source rectifiers (SCSRs) usually involve a lot of additional semiconductor devices or energy storage units, which is adverse to cost and efficiency. This study proposes an active power decoupling method to buffer the double-frequency ripple

power.

Where I L is the compensation current of ASC injected into the distribution network.. When a single-phase grounding fault occurs on phase j (j = A, B, C).The antiphase ...

In the series compensation decoupling circuits [24, 25], the compensation voltage is injected to offset the pulsed voltage caused by the twice ripple power. In the parallel compensation decoupling circuits [7, 26-32] the ...

A cost-efficient single-feedback inverter current control is developed, where the notch filter is used to extract the capacitor current from the sensed inverter current for active ...

This paper proposes a compensation method to make the grid current and voltage in phase by compensating for the capacitor current to the reference current without any auxiliary components.

The main concern of the single-phase active power filters (1pHAPF) [3, 4, 17] are reactive power and current harmonics compensation to brings significant in power quality. Although the rating of the single-phase nonlinear loads are small (usually less than 3 kVA), its cumulative harmonic effect are serious.

Boundary conduction mode (BCM) can be employed in single-phase grid-connected inverters to enhance the efficiency due to its soft-switching feature. The average current of the inductor is controlled to follow a sinusoidal reference. However, the presence of the output capacitor current introduces a phase lag between the grid current and grid voltage. This ...

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