

# # C815662 : MAJOR POWER ELECTRONICS

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SANTHIPHONG KHOSITKASAME : A HYBRID PARALLEL ACTIVE POWER FILTER FOR HARMONIC SUPPRESSION . THESIS ADVISOR : DR. SOMBOON SANGWONGWANICH  
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In this thesis, we study the advantages and disadvantages of several passive and active harmonic filters, and propose a hybrid parallel active power filter, which is a combination of a passive filter and an active power filter, for harmonic suppression. The active filter will suppress low-order harmonic currents in the system using current injection to cancel the harmonic current, and the passive filter, which is just a high-pass filter, will reduce the remaining high-order harmonic currents in the system including switching ripples generated by the active power filter. A novel harmonic current detection using a band-pass filter which is constructed on a synchronous rotating frame of the fundamental frequency (50 Hz) is also introduced. Several types of the hybrid filter are also studied and compared from the viewpoint of stability and filtering characteristics. A hybrid active filter is designed and tested with a harmonic source consisting of a 2.5 kVA rectifier and a smoothing dc reactor. Experimental results shown in this thesis confirm the simulation results , and indicate the effectiveness of the proposed active filter.

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