

# Space Vector PWM Control for 3kW Brushless Motor Driver Design and Application for Novel Parallel Hybrid Electric Vehicle

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## ABSTRACT

In recent years, owing to the environmental protection concept has risen and global warming, it is important to reduce the environmental pollution. If the merits of both internal combustion engine and permanent magnet synchronous motor (PMSM) can be integrated to become a hybrid electric vehicle, it must have ultra-low pollution and energy-saving but still keeping high performance. For this reason, the central purpose of this thesis is to develop a novel parallel hybrid electric vehicle system driver and controller. Electronic motor control systems used by extremely versatile digital signal processor (DSP). The important space vector pulse-width-modulation (SVPWM) technology is applied to the PMSM control to provide more efficiency of the hybrid electric vehicle. The SVPWM technology is also guarantees the system to be stable with better performance. Subsequently, by way of experiment results have proved the SVPWM technology provides more and more performance of the PMSM and the SVPWM technology have been applied in hybrid electric vehicle with high efficiency. Finally, a prototype of the hybrid electric heavy-duty motorcycle has been established and it has been exhibit on the " Taipei international automobile electronics show " at the Taipei world trade center in 2007.

Keywords : Hybrid electric vehicle ; digital signal processor ; space vector pulse-width-modulation ; permanent magnet synchronous motor

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