

# Development of High Power 20kW Brushless DC Motor Driver and Application of Novel Parallel Hybrid Electric Vehicles

蘇德勝、蔡耀文

E-mail: 9706909@mail.dyu.edu.tw

## ABSTRACT

In recent years, as the environmental protection and global warming has risen, it is important to reduce the pollution of environment. According to The World Energy Council (WEC) estimation, the petroleum of world will be use up in 40-50 year. A solution way is necessary to develop not the sole internal combustion engine (ICE) of compound vehicle. Thus, hybrid electric vehicles (HEVs) are recognized as one of the most promising technologies in significantly reducing the petroleum fuel consumption, and toxic and emissions of greenhouse gases. Based on the importance of HEV, a high output torque HEV system and 20 kW brushless direct current (BLDC) motor is studied in this thesis. For the high power system requirement, a 20 kW high power motor driver with high torque output will be established. On the other hand, the HEV system needs a high performance controller. This controller can provide the stable and robust property. The overall electric controller of the HEV system can achieve the effect of the energy conservation. It should be pointed out that although the low power BLDC motor driver research and design are already complete, compared the high efficiency type over ten thousand Watts BLDC motor driver research were still few. As everyone knows, the high power motor driver is more complicated for the low power driver of motor system. In this thesis, it is achieved several important tasks in the high power driver system design and implementation. In this thesis, the experimental platform of the novel HEV system is already established. By way of the experimental platform test, we had completed the driver of the high performance. Finally, the novel HEV system achieve the energy saving and carbon reduction.

Keywords : Hybrid electric vehicle ; High power brushless direct current motor ; Energy saving and carbon reduction

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