

Three-Phase Current Reconstruction Methodology for Permanent Magnet Synchronous Motor Driver based on Current Transformer Sensors

Jianan Cao¹, Gefei Meng¹, Jia Peng¹, and Yunjia Li¹

¹Xi'an Jiaotong University

August 2, 2022

Abstract

The position sensorless Permanent Magnet Synchronous Motor (PMSM) is widely applied in the field of high reliability, and its driver, the inverter is controlled by closed loop feedback with the three-phase current. For medium and high power PMSM, both safety isolation and detection accuracy of measuring current are extremely significant. This paper presents a method of using Current Transformer (CT) with center taps to measure the high-frequency switch current and of an algorithm to reconstruct the low-frequency three-phase current. The measurement unit and reconfiguration algorithm are then applied to the motor starting stage controlled by the DSP controller TMS320F28335. Lastly, by comparing the waveform of the reconstructed current and one of the inverter phase current, the experimental results show that the proposed reconstruction method is effective.

Hosted file

Research on 3-phase Current Reconstruction Technology for Inverter Control.docx available at <https://authorea.com/users/481166/articles/579449-three-phase-current-reconstruction-methodology-for-permanent-magnet-synchronous-motor-driver-based-on-current-transformer-sensors>

Hosted file

Table1.xlsx available at <https://authorea.com/users/481166/articles/579449-three-phase-current-reconstruction-methodology-for-permanent-magnet-synchronous-motor-driver-based-on-current-transformer-sensors>

