عنوان مقاله:

Design, Construction and Comparison of a Sensorless Driver Circuit for Switched Reluctance Motor

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خلاصه مقاله:

In the presented paper, a sensorless driver circuit is designed, constructed and tested to control two types of three-phase Switched Reluctance Motor (SRM). The presented control algorithm has threesteps. In the first step, the SRM is started and controlled by an open-loop method. In the second step, anovel method is introduced which uses the optimized flux-current-rotor position relation in order to calculate the position of the rotor and then control the motor in low speed. In the third step, the current waveform of the excited phase of the motor is utilized in order to detect the rotor position and controlthe SRM in high speed. Because of using the presented novel method, a low cost and simple sensorless driver circuit has been designed. In the circuit, an inexpensive Atmega128 AVR microcontroller is used to implement the control algorithms and generate gate pulses of transistors. Asymmetric bridgeconverter with N-channel Mosfets is used in order to excite the winding of phases. The parameters of the SRMs which are required for designing the sensorless driver circuit are obtained by simulating and analyzing the motors by Finite Element Method (FEM). The constructed circuit is tested in laboratoryby driving the selected SRMs in no-load condition and the operational results are obtained and compared to each other at the end

کلمات کلیدی:

Sensorless ,SRM ,FEM