Design of a mutually coupled switched reluctance motor (MCSRM) competitive to the third generation interior permanent magnet synchronous motor (IPMSM) of Toyota Prius 2010 is presented. Compared with conventional SRM (CSRM), the proposed machine utilizes the standard six-switch voltage source inverter, which can facilitate the adoption of reluctance machines for traction applications. The structure of the MCSRM has been optimized for 60 kW output power over wide speed range of operation (2768-13500 r/min). Design details to improve machine torque density and to achieve the wide constant power speed range are presented. Performance evaluation under the targeted benchmark shows that the designed MCSRM can attain competitive performance metrics as that of the third generation IPMSM.