

Tutorial #3

200 kW 1050 VDC SiC Dual Inverter for Heavy-Duty Vehicles

Brij Singh – John Deere



Biography

Brij N. Singh is a senior staff engineer in John Deere. He is leading DOE PowerAmerica funded project in John Deere to develop 200 kW SiC inverter for heavy-duty vehicle applications. Brij has earned B.E. in Electrical Engineering from Madan Mohan Malviya University of Technology in 1989, the M.E. in Electrical Engineering from the Indian Institute of Technology, Roorkee, in 1991, and the Ph.D. in Electrical Engineering from the Indian Institute of Technology, New Delhi, India, in 1996. In 1996, Brij joined the École de Technologie Supérieure (School of Advanced Technology), Université du Québec (University of Quebec), Montreal, QC, Canada, as a Post-Doctoral Fellow. In 1999, Brij joined Concordia University, Montreal, QC, Canada as a Research Fellow. In 2000, Brij joined the Department of Electrical Engineering and Computer Science, Tulane University, New Orleans, Louisiana, as an Assistant Professor. In 2007, Brij joined John Deere in Fargo, North Dakota. Brij has published over 90 research papers in various Journals, such as IEEE Transactions and IET Journals. Brij has 12 US patents and numerous pending patents.

Abstract

This presentation discusses publically known information related to John Deere project funded by the DOE-PowerAmerica Institute at North Carolina State University, Raleigh. Through PowerAmerica, John Deere has formed a collaboration with researchers from the Department of Energy National Renewable Energy Laboratory to develop a 200 kW 1050 VDC silicon carbide-based inverter. The inverter will convert vehicle engine power into electrical power needed for hybrid motors in heavy duty construction vehicles. In April 2017, the Fargo, North Dakota-based John Deere Electronic Solutions successfully demonstrated the SiC inverter in a John Deere 644K hybrid front loader vehicle, using the engine radiator fluid to cool the SiC power electronics. The SiC inverter technology demonstration took place at John Deere Dubuque Works in Dubuque, Iowa. DOE-PowerAmerica funding has helped accelerate the development of this technology. YouTube link related to JD 644K Hybrid front loader vehicle is; <https://www.youtube.com/watch?v=jlg0NwhO4Fg>