Reliability of IGBT Modules in Energy Conversion

Abstract:

This tutorial addresses the reliability of the IGBT power module which is the heart of converters used in energy conversion applications. It has proven to be a highly reliable and rugged component. However, it must be applied within its ratings and capabilities. This tutorial will discuss the proper selection of the IGBT, its limitations and failure modes, the precautions that must be taken to ensure long life, and the design and application considerations that affect reliability. Attendees will gain an understanding of the need to protect the IGBT from internal and external disturbances and practical solutions to over current, over voltage, and over temperature conditions. The workshop is intended to be of interest to those who use, apply, procure, or specify power electronic products based on the IGBT as the power switch.

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Instructor Bios:

John F. Donlon received the B.S. degree with high honors in Electrical Engineering from the Lowell Technological Institute and the M.S. degree in Electrical Engineering from Syracuse University. He is Senior Application Engineer at Powerex, Inc. in Youngwood, PA and has been involved in the rating, evaluation, and application of power semiconductors for over 35 years. He has been active in the publication of over sixty technical papers, articles, and application notes describing the characteristics and proper application of power semiconductors.

Eric R. Motto is Principal Application Engineer with Powerex. He holds a Bachelor of Science in Electrical Engineering from Pennsylvania State University and a Bachelor of Arts in Mathematics from Saint Vincent College. From 1987 to 1990 Eric worked as a design engineer at Lutron Electronics in Coopersburg Pennsylvania developing circuits for the control and stabilization of electronic dimming ballasts. Since 1990 Eric has been with Powerex, Inc. in Youngwood Pennsylvania providing technical support for users of Mitsubishi power semiconductor devices in North America. Eric has written and presented more than thirty-five technical papers at industry conferences and published numerous application notes and magazine articles related to the design and application of IGBT and Intelligent Power Modules.