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SiC Merged PiN and Schottky (MPS) Power Diodes Electrothermal Modeling in SPICE

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Abstract : This paper sets out a behavioral macro-model of a Merged PiN and Schottky (MPS) diode based on silicon carbide (SiC). This model holds good for both static and dynamic electrothermal simulations for industrial applications. Its parameters have been worked out from datasheets curves by drawing on the optimization method: Simulated Annealing (SA) for the SiC MPS diodes made available in the industry. The model also adopts the Analog Behavioral Model (ABM) of PSPICE in which it has been implemented. The thermal behavior of the devices was also taken into consideration by making use of Foster’ canonical network as figured out from electro-thermal measurement provided by the manufacturer of the device.

Keywords : SiC MPS diode, electro-thermal, SPICE model, behavioral macro-model
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