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Evaluation of Epoxy Coated Resistors in High Voltage DC Surge Environments

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The performance data of high voltage resistors in specific pulsed power applications is limited. A series of tests were performed on epoxy coated high voltage ceramic composite resistors. With the implementation of these resistors in unique applications that result in their exposure to high energy surge environments such as air conditioners and electric vehicles, there is a need for a better understanding of performance metrics under these conditions. Thermodynamic data and resistance parameters were experimentally determined with fully and partially coated epoxy resistors. This paper will explore the added benefits of the epoxy, beyond the mechanical strength and aesthetics. The potential gains include a stability of resistance and thermal surface radiation. Data collected indicates that complete epoxy coated resistors show increased performance, maintaining the pretested resistance 54% more accurately and decreasing the radiation temperature exposure to other components by 12°C.

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