

New 2nd Generation Welder Diode RAXMGC

Powerex has been manufacturing and supplying thyristor and rectifier products for several decades in the power semiconductor market. Our design engineering group evaluates and designs new products to address the growing trends of the market.



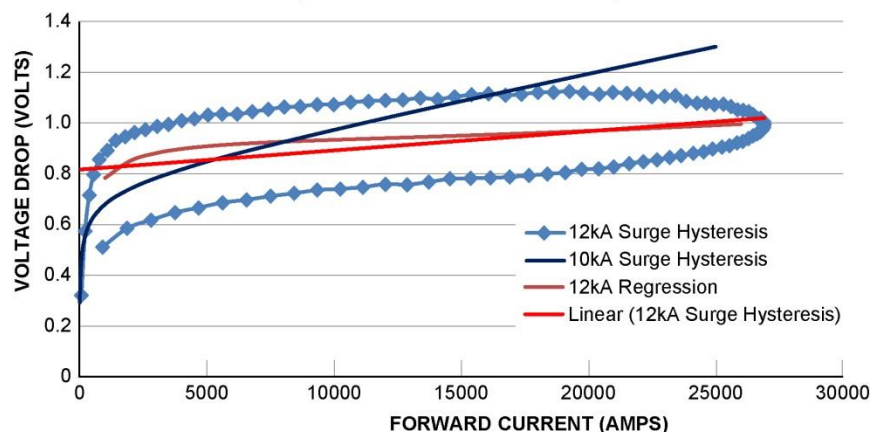
One industry sector Powerex has been focusing on is the OEMs of arc welding machine manufacturing. These OEMs use houseless high current rectifier assemblies with voltage ratings up to 400V at an operating frequency of 1 kHz and with welding current values in the 5-10kA range.

Powerex has a standard 10kA, 400V houseless welder diode in its product line for this type of application. There are several offshore manufacturers who fabricate these types of houseless diode products, specifically for welding applications. After reviewing the recommendations and the growing market trend in this application sector, Powerex had designed, evaluated and produced a 2nd generation houseless welder diode of 12kA, 200V/400V. This 2nd generation welder diode assembly provides the lowest voltage drop (5-12kA) in its class as compared to the assembly offered by the offshore manufacturers. Powerex employed a design improvement at the silicon level to achieve enhanced electrical performance in this product. The passive components in the assembly remain unchanged.

Additionally, the non-repetitive surge current test results of the 2nd generation device show a 25% higher surge current capability as compared to the existing 10kA design. The forward voltage drop curves of the 1st generation and 2nd generation welder diodes are shown in the graph. These results are very important on the application side of the assembly. Lower voltage drop at operating current (10kA)

will have low power dissipation, i.e. device will have a higher life expectancy in terms of number of shots versus temperature excursion. The forward voltage drop is ~20% lower in the new design as compared to the existing design at a rated current of 12kA, 175°C.

**Surge Current Test RAXMGC
(12kA vs 10kA, 175°C)**



Development is under way on a 3rd generation houseless welder diode, focusing on enhancing the critical electrical/thermal characteristics compared to the previous generations.

