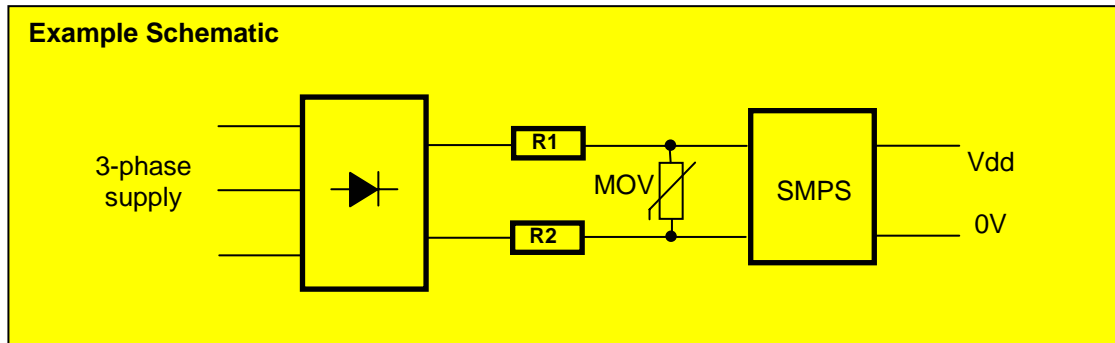


Welwyn Components Revolutionises Pulse Performance Density

When a major manufacturer of industrial circuit breakers wanted to re-engineer its core range of products, the research and development team at TT electronics Welwyn Components set to work on a revolutionary solution. One area of focus was how to provide power resistive products in an SMD assembly. For the inrush resistor slots (R1 & R2 below) the traditional choice was wirewound resistors, which were selected for their good pulse performance.

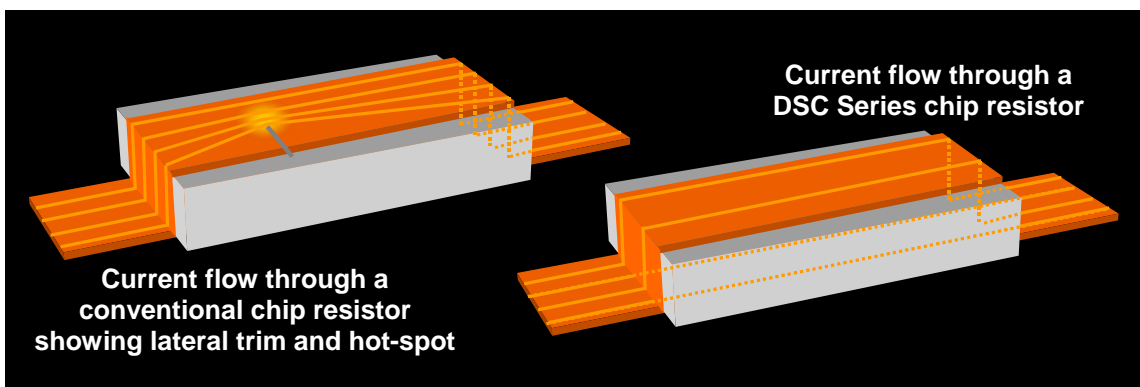


This is a critical feature in this application, as the resistors must withstand both functional and abnormal pulses. In the first case, the inrush current at switch-on produces a momentary overload of several hundred watts. In the second case the resistors must withstand lightning induced surges of several kV peak on the supply input.

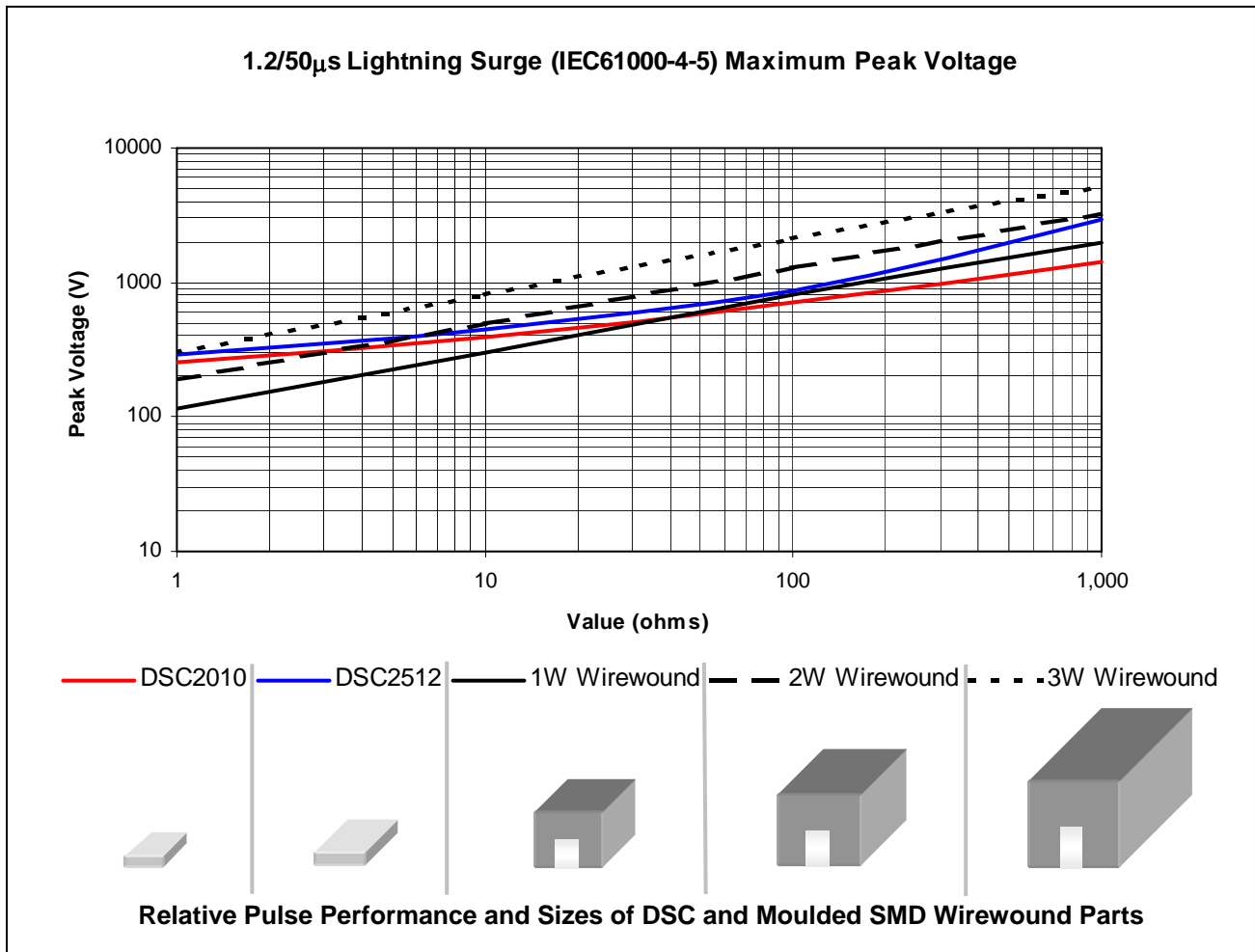
In order to meet challenging restrictions in overall product size and also to provide for maximum automation in manufacture, surface mount parts were used wherever possible. For the resistors this meant that standard thick-film chips were selected in most cases, but they could not be used in these two slots because of the pulse requirements. This had led to the selection of a relatively costly and bulky moulded wirewound SMD resistor.

During the redesign project Welwyn was approached to generate an innovative solution for combining the performance of wirewound technology with the convenience and size of a thick-film chip. The result was the DSC series; a double-sided chip resistor.

Conventional chip resistors conduct current on one face only and have lateral trimming cuts which cause current crowding. This gives pulse performance which is poor and, worse still, varies from batch to batch. The DSC provides enhanced pulse performance because the unique construction spreads the current flow evenly over both faces of the chip. Furthermore, a special trim technique is used that avoids generating hot-spots.



The resulting pulse performance compares favourably with wirewound parts of considerably larger sizes.



The DSC looks set to revolutionise component selection for inrush limiting and protection resistors in compact PSU designs where “pulse performance density” is an important consideration.

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