



Subject: SAD Technology versus MOV Technology

There are many different types of TVSS technology available today including MOV-only devices, Silicon Avalanche Diode (SAD)/MOV hybrid devices and Selenium enhanced devices. The real issue for proper evaluation does not necessarily lie within the technology being used but within the ultimate performance of the device. These performance criteria should be evaluated with actual test data rather than the reliance upon the marketing specification sheet since this will clearly show actual data rather than theoretical values.

The theories behind including Silicon Avalanche Diodes (SADs) are: 1) The SAD has good protective characteristics, 2) The SAD element has a fast response time and 3) The SADs in a SAD/MOV hybrid device will enhance the longevity of the device. The SAD, however, does not have the capability of surviving as high a maximum surge current rating as an MOV and is not usually used as the single surge element. The “response time” of the SAD is also greatly diminished when considering the parasitic inductance of the element leads. The need for extremely fast response times within a facility is debated based on waveform attenuation through AC conductors and it is often said that the MOV response time is satisfactory in most applications. The NEMA LS-1 standard demonstrated this by eliminating “response time” as a legitimate rating in the 1991 revision.

The SAD is usually used in parallel with an MOV to prolong the life of the MOV. Since the SAD has a faster response time than an MOV, it will handle the low level surge event and keep the MOV from operating. By reducing the current through the MOV, the life of the MOV is greatly enhanced. The real way to evaluate this, however, is to review repetitive surge current test data. For example, our Tranquell VII, 50kA TVSS is capable of surviving over 3,500 ANSI/IEEE C62.41, category C3 (10kA) impulses at one-minute intervals which is equivalent or greater than the longevity characteristics of devices that use SAD/MOV technology.

The bottom line is that we have longevity characteristics that meet and exceed the ratings of devices that use SAD technology. We also provide the test data to back up our claims. Finally, the concept of “response time” is not a repeatable test that is supported by any standard as a legitimate rating.

