Functionality of PSpice Models for
Vishay VDRS, VDRH, and MLV Varistors

The PSpice libraries and symbols (.lib and .olb files) downloaded from the Vishay web page are functional for PSpice DC, AC, and time transient simulations. In order to show the functionality of the models, the following PSpice simulations were performed using the Cadence OrCAD PSpice 16.6 program and compared to experimental measurements, when available.

REPRODUCTION OF THE VOLTAGE / CURRENT CURVES

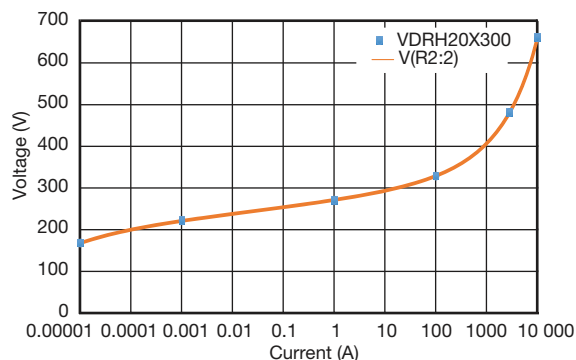The simulation curve is in orange, while measurements points are in blue.

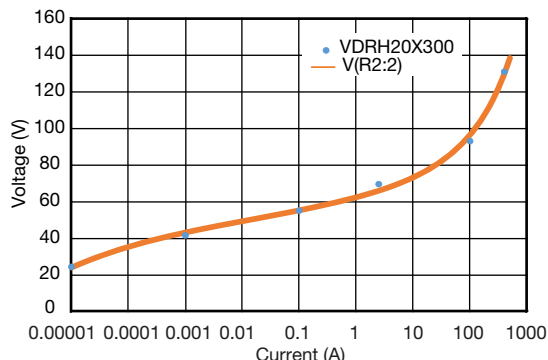**Fig. 1 - Voltage / Current Curve for the VDRH020X140**

Fig. 2 - Voltage / Current Curve for the MLV1210E32503T

VOLTAGE PULSE APPLICATION TO A VDR

Figure 3 shows a standard V (U4) voltage discharge pulse of 6 kV - with a rise time of 1.2 µs decay time of 50 µs generated by the circuit presented below on the right. When the VDR is connected (circuit on the left), the voltage V (U3) is clamped and the current I (U3) curve generated into the VDR is very close to a current pulse of 8/20 µs.
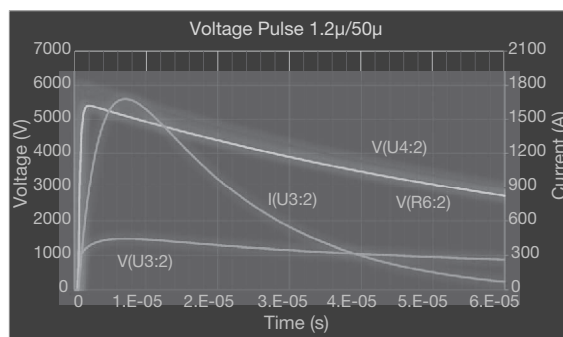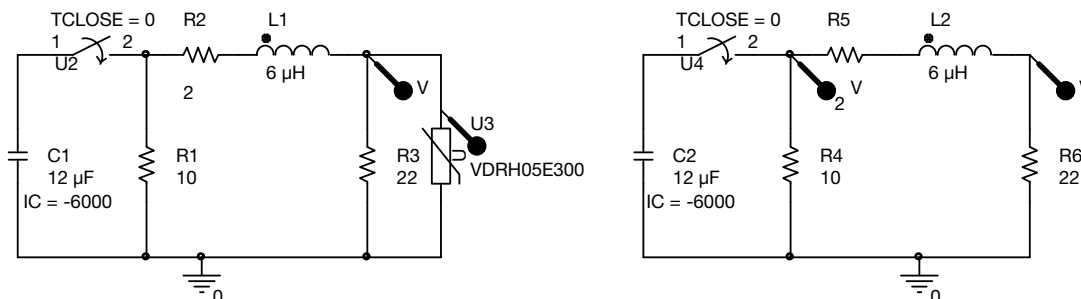

Fig. 3 - Voltage Pulse Discharge in the VDRH05E300

AC VOLTAGE CLAMPING OF A VDRH

The following circuit illustrates the AC voltage clamping of a VDRH and the current conduction above a certain level of crest voltage. Figure 4 shows the voltage and current forms.
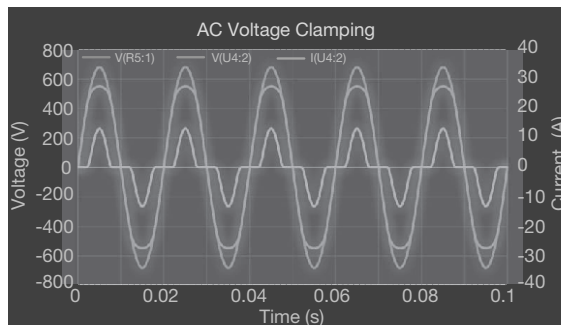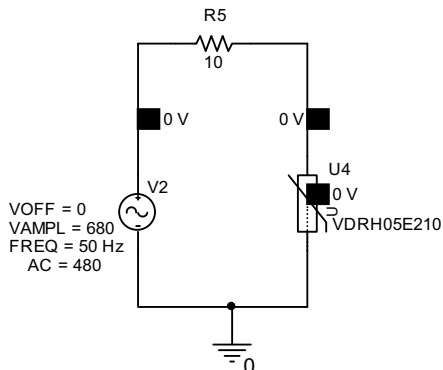
R5
10

0 V   0 V

U4
0 V

V2

VOFF = 0
VAMPL = 680
FREQ = 50 Hz
AC = 480

VDRH05E210

0

Fig. 4 - AC Voltage Clamping of the VDRH05E210

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