

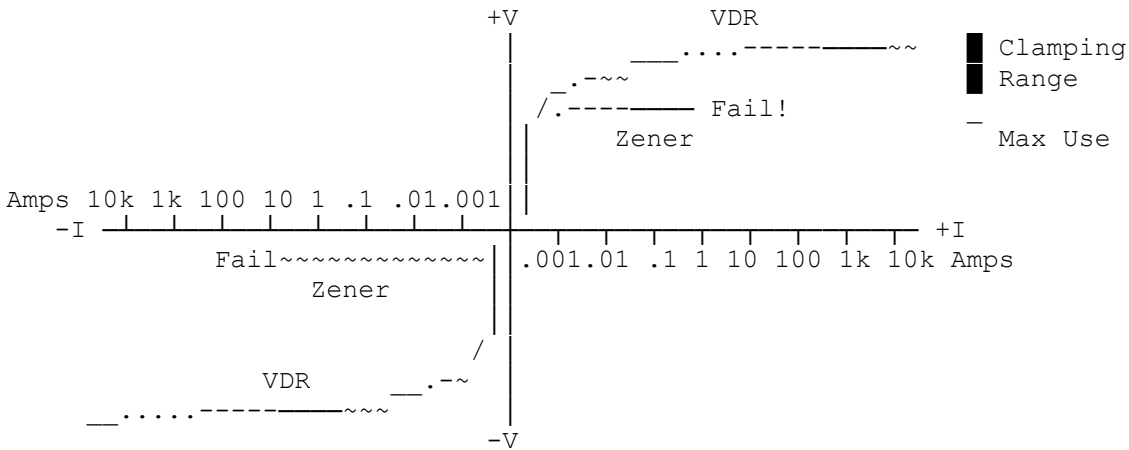
Voltage Dependent Resistors

By G8MNY

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(8 Bit ASCII Graphics use code page 437 or 850)

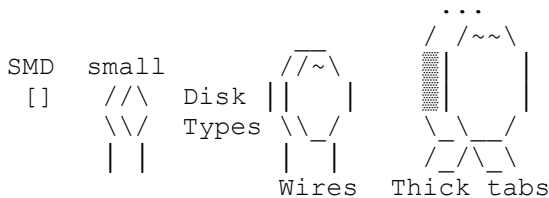
These transient suppressing devices also called Varistors (carbon) or Metal Oxide Varistors (MOVs), they are used to protect modern electronics such as mains SMPSUs from excessive line voltages. Unlike a normal zener they offer symmetrical clamping on AC & VERY high pulse power capacity. For low voltage DC there are special protection zeners that fail short at high current. that can offer better protection to sensitive electronics than VDRs.



Clamping voltages start as low as 10V up to 600V DC. But the action is not as defined as a zener & there are several voltages in the specs.

Disk Size	Voltage AC	Voltage DC	Voltage @ 1mA	Max peak Current	Power Joules
SMD	4	5.5	7	150 A	0.4
SMD	10	14	16.4	150 A	0.4
7mm	250	320	390	400 A	8.2
9mm	11	14	18	250 A	0.8
9mm	115	150	180	1200 A	8.4
9mm	230	300	360	1200 A	17
16mm	250	320	390	4500 A	65
22mm	250	320	390	8000 A	140

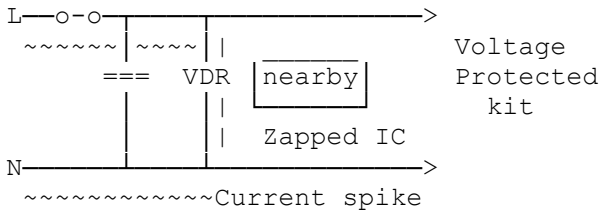
As you can see from the above examples these devices can really handle some peak current. But of course only for a short time like uS-1mS, so as not to exceed the transient dissipation rating quoted in Joules. (Watt x Seconds)



However as with a lot of safety items there can be a reliability cost. VDRs are known to fail on there own when there is no peaks! So yes the kit involved is better protected, but like adding a fuse there will be unexplained failures.

EXPLODING VDRs

As these devices are used in power circuits, if the dissipation is exceeded or there is physical (e.g. wet) or electrical (cumulative) damage, the VDR is likely to explode. In doing so it can do electrical & physical damage, from its own EMP current pulse, as well as plating the surroundings with conductive soot from the flash arcing when it failed.



So when mounting them is worth considering this & leave room for a reasonably safe discharge without recking the kit.

N.B. putting longer wires on one is not a good idea, as pulses "ring up" to higher voltages along unterminated transmission lines.

See my buls on "Mains Power Protection" & "12V System Surge Protection".

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