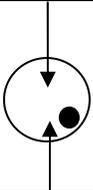
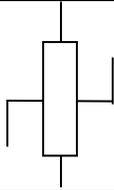
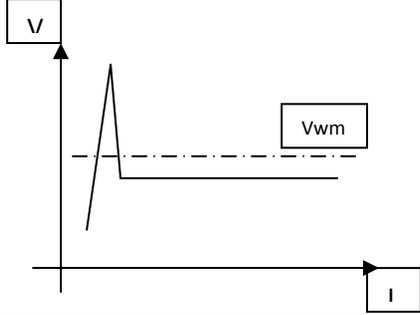
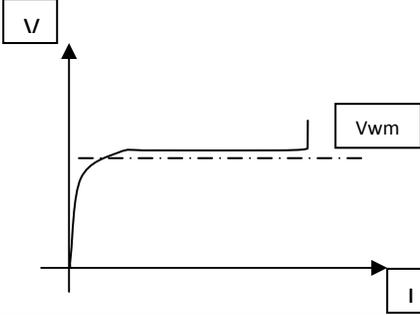
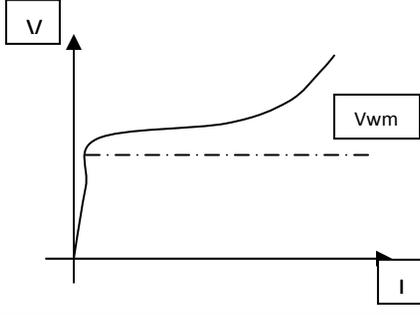


PARAMETERS	TECHNOLOGY		
	GDT	TVS DIODE	VARISTOR (MOV/MLV)
Ability to Divert Large Surge Currents > 500AMP	Can handle large surge currents.	With the new process technology TVS diodes can also handle large surge currents. Example: 2700SM78CA can handle 18000A of surge current.	Can handle moderate surge currents. At higher currents there is risk of device catching fire. Many cases were seen where the surge power strips with MOV's caught fire and have burned homes.
Fast Response to Rapid Transient Voltages Rises	Slow response time. The gas inside has to ionize.	Fast response time. As a result of the silicon technology, response is directly proportional to the speed of the electron.	Slow response. The surge current has to go thru the Metal Oxide, and the device impedance will change only after the trigger voltage is reached – typically 1000V. Typical Clamping Voltage is 150V.
Minimum Capacitance (Minimum Insertion Loss)	The electrodes are physically separated as a result; the GDT can achieve very low capacitance.	TVS diode technology can achieve ultra low capacitance in the sub-Pico Farads range. Example: GBLC08CLC has a line cap of 0.4pF.	The contacts are physically separated with some kind of a dielectric material which results in lower capacitance
Ability to Protect at Low voltages Levels < 50V	Not a good device for protection under 50V. The lowest spark over voltage for GDT is 70V. Suitable only for AC applications. It is not a good device for protecting DC sources and DC applications.	Can protect any voltage ranging from 0.7V to 320V AC and DC. Device size is typically smaller, allowing for placement on the printed circuit board.	Though they have devices which have operating voltage as low as 5V, the device does not turn on or act until the trigger voltage is reached – typically 1000V. The typical Clamping Voltage is 150V.
Ability to Protect at High Voltage Levels 400V	Can be used for protecting higher voltages. However the device size increases and the need voltage increase. Packaging is bulky.	Can be used for protecting higher voltages. Packaging is not bulky.	Can be used for protecting higher voltages. However the device size increases and the need voltage increase. Packaging is bulky.

Protection Technology Comparison Chart

PARAMETERS	TECHNOLOGY		
	GDT	TVS DIODE	VARISTOR (MOV/MLV)
Ability to Extinguish on DC Systems	Not a good device to use across the DC applications. In DC systems, extinguishing of the GDT will be a problem if the normal system voltage is greater than the arc voltage. GDTs require use of an additional component like a fuse.	Suitable for DC system. TVS devices are available in unidirectional configurations.	Not a suitable device for DC systems.
Capable of Bipolar Operation	Suitable for use in AC applications only.	Suitable for AC applications. TVS devices are available in bidirectional configurations.	Suitable for use in AC applications only.
Temperature Dependence	Temperature Dependent. Requires proper cooling or ground for heat dissipation. Excessive heat can inhibit the extinguishing of the GDT and can damage the GDT.	Temperature Dependent.	MOVs are temperature dependent.
VI Characteristics	Symmetrical and non-linear characteristics.	Bi-Polar : Symmetrical and linear characteristics. Uni-Polar : Unsymmetrical and linear characteristics.	Symmetrical and non-linear characteristics.
Reliability	Less Reliable Performance degrades over time. With every surge exposure the electrodes inside the GDT get corroded and will lead to misfiring or and complete failure of the GDT.	Very Reliable No relation between performance and time period.	Less Reliable Performance degrades over time. With every surge exposure the metal oxide degrades and over a period of time the device completely fails by either a complete short circuit or an open circuit.
Leakage Current	Initially displays very good leakage characteristics, but over a period of time the performance degrades.	No degradation over time.	Initially displays very good leakage characteristics, but over a period of time the performance degrades.

Protection Technology Comparison Chart

PARAMETERS	TECHNOLOGY		
	GDT	TVS DIODE	VARISTOR (MOV/MLV)
Device Symbol			
VI Characteristics			
Packaging	Thru-Hole package configurations only.	Both surface mount and thru-hole package configurations in high and low power applications.	Thru-Hole package configurations for high power applications Surface mount for low power applications.