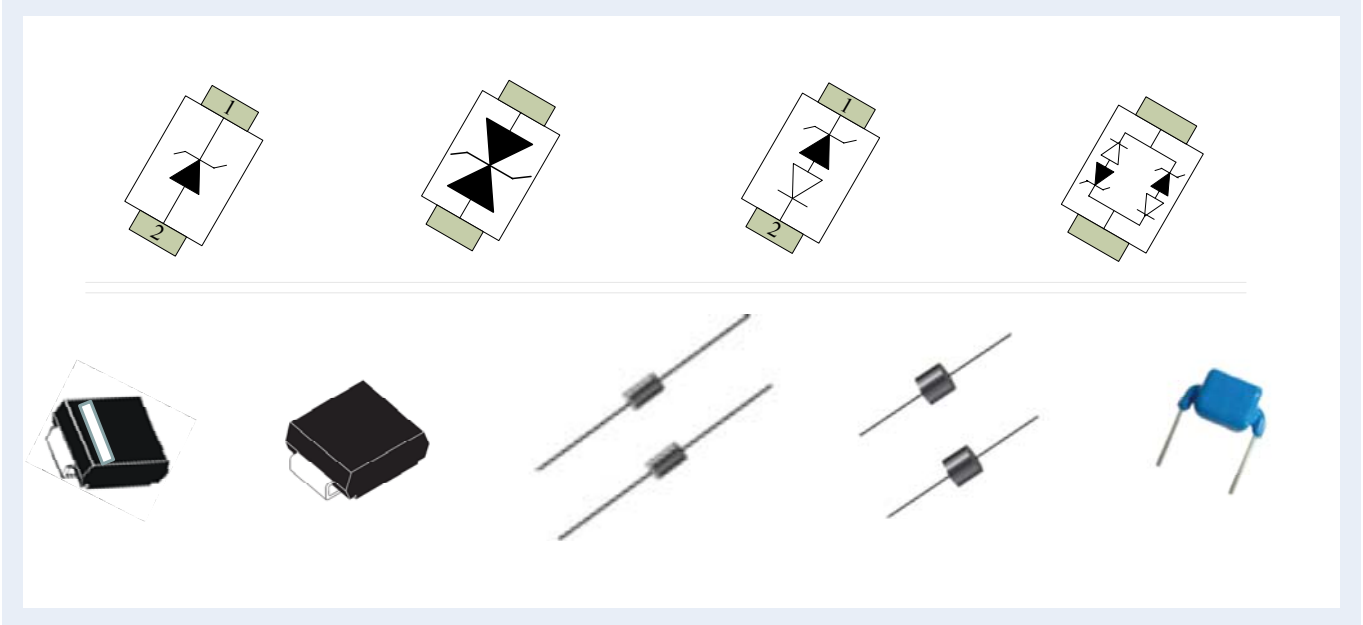
Transient Voltage Suppressors

TVS(Transient Voltage Suppressor) diodes is a type of voltage suppressing device, also know as TVP or ABD. It can clamp an over-voltage spike to within a safe range in picosecond, protecting circuit from damage.

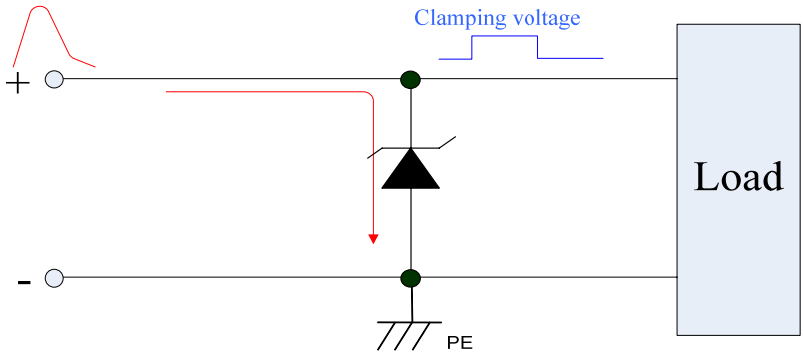


- It responds fastest in all the diodes, less than 1 picosecond. Also its clamping ability is the most excellent among all the diodes.
- It is a clamping type device, which is paralleled in the circuit. It has the most excellent clamping ability.
- It has wide range voltage from 5 to 600V.
- It has wide range pulse power dissipation from 400W to 30KW at 10/1000μs waveform, sometimes even more. Hyperfix's surge current can reach 3KA, 6KA, 10KA, 16KA and 20KA at 8/20μs waveform.
- Low leakage, about several μA.
- Reliable characteristics, not easy to fatigue.
- Various packages: SMA, SMB, SMC, DO-41, DO-15, DO-201&P600 etc.
- Unidirectional and bidirectional, color band denotes unidirectional.
- Used in protection of power and low frequency lines.

In order to meet large surge current standard requirement, Brightking offers professional Hyperfix series products, which has 3KA, 6KA, 10KA, 16KA and 20KA surge current.

Meanwhile, lower capacitance TVS is applied in high frequency lines circuit. Brightking offers SMB package B6A and B6C whose capacitance is 35pF. Axial lead package SAC series (50pF) and LCE series (100pF) can be used in protection of high frequency lines too.

Working theory diagram of TVS is shown below:



TVS is applied widely in semiconductor and sensitive component's protection. It is usually used in secondary power supply& signal circuit's protection and electrostatic discharge protection in order to prevent IC from over voltage damage.

- Data lines.
- Power supply.
- Interface of RS232/422/485.
- Products applied in vehicle.
- Motor, fire alarm equipment, telegraph key, laser diode, FETs, sensor, flame lighter.
- Multifunction meter's data protection, power/signal secondary lightning module, electric ballast, AC/DC converter, charger, instrument & meter and Vcc protection.
- Hyperfix can be used directly in high standard lightning surge protection.

Brightking TVS products comply with RoHS WEEE compliant and meet the following test standards UL497B、UL1449、GR1089、ITU K21、IEC61000-4-5、IEC61643-321：2001 ABD、ISO7637.

How to Select TVS

ELECTRICAL CHARACTERISTICS

Part Number		Device Marking Code		Reverse Stand-Off Voltage	Breakdown Voltage @I_T	Breakdown Voltage @I_T	Test Current	Maximum Clamping Voltage @I_{PP}	Peak Pulse Current	Reverse Leakage @V_{RWM}
UNI-POLAR	BI-POLAR	UNI	BI	V_{RWM}(V)	$V_{BR\ MIN.}$(V)	$V_{BR\ MAX.}$(V)	I_T(mA)	V_C(V)	I_{PP}(A)	I_R(μA)
SMBJ5.0A	SMBJ5.0CA	KE	AE	5.0	6.40	7.00	10	9.2	65.3	800
SMBJ6.0A	SMBJ6.0CA	KG	AG	6.0	6.67	7.37	10	10.3	58.3	800
SMBJ6.5A	SMBJ6.5CA	KK	AK	6.5	7.22	7.98	10	11.2	53.6	500
SMBJ7.0A	SMBJ7.0CA	KM	AM	7.0	7.78	8.60	10	12.0	50.0	200

V_{RWM}	Reverse stand-off voltage or working voltage	V_C	Maximum clamping voltage
I_{RM}	Maximum reverse leakage current	I_{PP}	Lightning surge current ability at 10/1000μs waveform
V_{BR}	Reverse breakdown voltage tested at 1mA	Ctype	Typical Capacitance

- V_{RWM}: Make sure the reverse stand-off voltage is higher than the maximum voltage of protected circuit.
- V_C: The circuit's damage voltage should be lower than TVS's breakdown voltage
- Peak pulse current and peak pulse power dissipation should be concerned referring to product's withstanding ability.
- In higher frequency data lines, low capacitance series B6A, B6C, SAC, LCE or use diodes to bring down capacitance. Refer to below diagram: