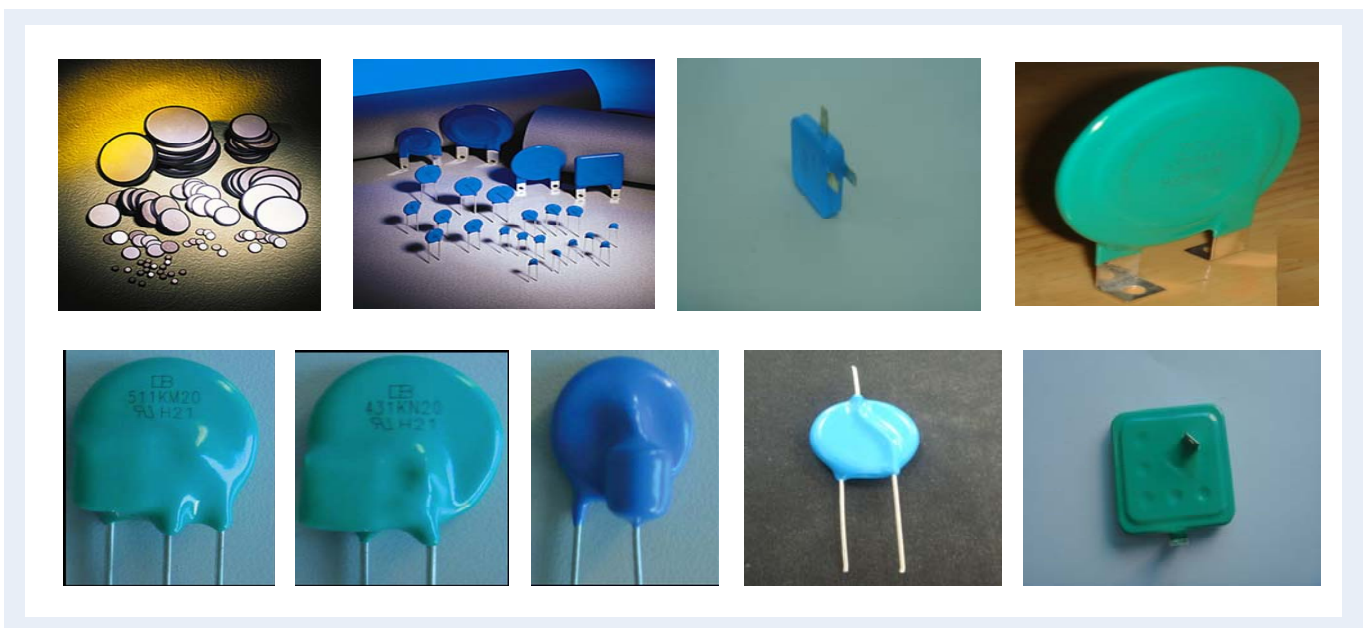


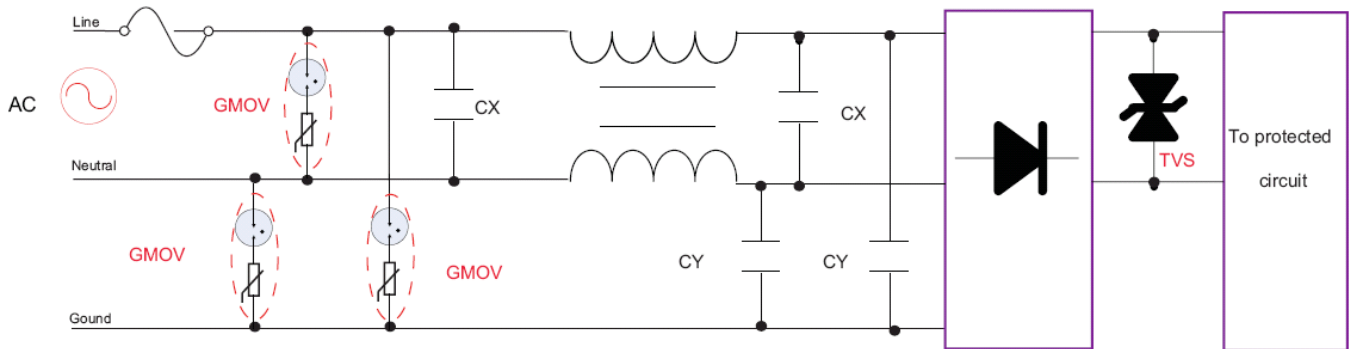
Metal Oxide Varistors

MOV has large capability in absorbing transient over-voltage. It mainly consists zinc oxide and several kinds of metal oxide additive. It is also called ZOV. It adopts ceramic firing technology and flame retardant epoxy polymer insulating material meets.

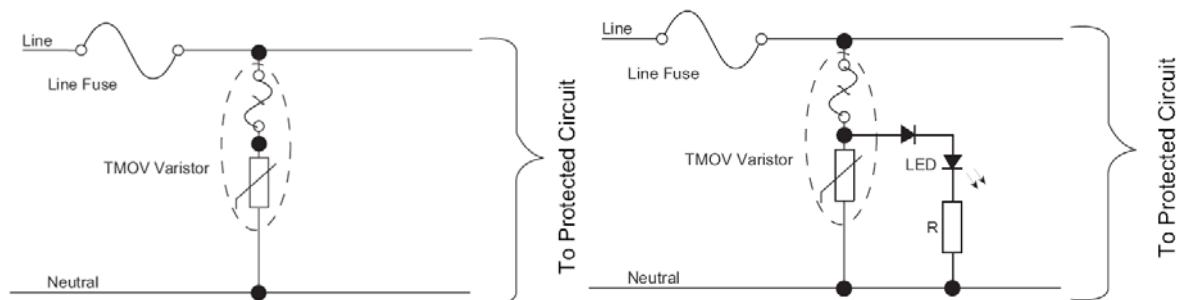


- It has fast response speed, less than 25ns
- It is a clamping type which is paralleled in the circuit. It is a kind of devices that has strong clamping ability in surge voltage protection.
- Its Voltage ranges from 18V to 1800V. Absorbing current ranges from several hundreds amperes to dozens thousands amperes. The biggest is up to 70 kiloamperes.
- Various package dimension: $\Phi 5$, $\Phi 7$, $\Phi 10$, $\Phi 14$, $\Phi 20$, $\Phi 25$, $\Phi 32$, $\Phi 40$, $\Phi 53$, 34S and TMOV type E/N/M.
- High capacitance
- No polarity, easy to install.
- Easy to fatigue and decay.
- Especially used in power supply and low frequency communication signal lines protection.

Because MOV is easy to decay, we usually use gas discharge tube or spark gap protectors accompanied with MOV in order to enhance MOV's reliability and prolong its life expectancy.



MOV's failure mode is short circuit and is easy to flame. In this case it will influence product's safety. Brightking provides a kind of TMOV with thermal fuse.



MOV is widely applied in consumer power supply product and power system's semiconductor and sensitive component. It can prevent IC from instantaneous over voltage's damage.

- Relocatable power tap, switch power and supplementary protector etc.
- Multifunction meter, electronic ballast, AC/DC converter, charger, instrument meter and Vcc.

BrightKing MOV products comply with RoHS WEEE compliant and meet the following test standards : UL1449 Third Edition, IEC60950-1, IEC61000-4-5, IEC61643-331: 2003, VDE, CSA and CQC etc.

How to Select MOV

ELECTRICAL CHARACTERISTICS

Part Number		Maximum Allowable Voltage		Varistor Voltage	Maximum Clamping Voltage		Withstanding Surge Current		Maximum Energy (10/1000μs)		Rated Power	Typical Capacitance (Reference)
Standard	High Surge	V _{AC} (V)	V _{DC} (V)	V _{1mA} (V)	I _P (A)	V _C (V)	I(A) Standard	I(A) High Surge	(J) Standard	(J) High Surge	(W)	@1KHz(pf)
180KD20	180KD20J	11	14	18(15~21.6)	20	36	2000	3000	11	13	0.2	28500
220KD20	220KD20J	14	18	22(19.5~26)	20	43	2000	3000	14	16	0.2	18500
270KD20	270KD20J	17	22	27(24~31)	20	53	2000	3000	16	19	0.2	13000
330KD20	330KD20J	20	26	33(29.5~36.5)	20	65	2000	3000	23	24	0.2	11500

V _{AC}	Maximum allowable AC voltage	V _C	Clamping voltage tested in I _P
V _{DC}	Maximum allowable DC voltage	I _P	Pulse current at 8/20μs waveform
V _{1mA}	Varistor voltage tested at 1mA	I _{MP}	Maximum lightning surge current at 8/20μs waveform
E	Maximum energy at 10/1000μs waveform	C _{type}	Typical Capacitance

Selection of MOV Voltage

Varistor voltage can be calculated in below equation:

$$U_{1mA} = K U_{sp} / (1-a)(1-b)$$

‘K’ is a coefficient which is related to power supply quality, usually it adopts 1.1~1.6. When the city’s power supply quality is better, we can choose smaller one. However we should choose bigger one in someplace where power supply quality is worse. ‘U_{sp}’ is the peak pulse voltage of power supply. It equals to 1.414×‘U_{ac}’ in AC power supply, while it equals to ‘U_{dc}’ in AC power supply. ‘a’ is decay coefficient, usually adopts 0.1. ‘b’ is the tolerance of varistor voltage.

Calculate as the equation above:

1. It is proper to use MOV whose varistor voltage is 430V to 620V in 220VAC power supply

lightning surge protection.

2. It is proper to use MOV whose varistor voltage is 200V to 300V in 110VAC power supply lightning surge protection.

When select higher varistor voltage's MOV, it can slow down the failure rate. Also it can prolong MOV's life expectancy when use gas tube accompanied with it.

Selection of MOV Surge current

We select MOV's dimension based on customer product's lightning surge test standard.