

# PTC

## 产品概述：

YSMZ1系列PTC热敏电阻器是一种对异常温度及异常电流自动保护、自动恢复的保护元件，俗称“自复保险丝”“万次保险丝”。它取代传统的保险丝，可广泛用于马达、变压器、电子线路等的过流过载保护。热敏电阻器通过其阻值突变限制整个线路中的电流。在传统的保险丝线路中，其熔断后无法自行恢复，而PTC热敏电阻器在故障排除后可恢复其正常保护功能。



## Product Overview:

YSMZ1 series of PTC thermistor is a kind of abnormal temperature and abnormal current automatic protection, automatic recovery of the protection devices, commonly known as "self-resettable fuse" "million times fuse." It is to replace the traditional fuse, widely used in motors, transformers, electronic circuits such as over-current overload protection. Thermistor resistance mutation, through its restrictions on the consumption of the entire circuit to reduce the residual current value, in the traditional fuse circuit, the fuse can not be on their own after the recovery, while the PTC thermistor in failure resume their protective function after withdrawal

## 产品应用范围：

电子线路的过流过载保护、家用电器、变压器、适配器、充电器、开关电源、仪器仪表、电表、电机等

## Application scope:

electronic circuit over-current overload protection, household appliances, transformers, adapters, chargers, switching power supplies, instruments, meters, motors, etc.

## 应用原理：

其原理如图1所示,当电路处于正常状态时,通过PTC热敏电阻器的电流小于额定电流,PTC热敏电阻器处于常态,阻值很小,不会影响被保护电路的正常工作。当电路出现故障,电流大大超过额定电流时,PTC热敏电阻器陡然发热,呈高阻态,使电路处于相对“断开”状态,从而保护电路不受破坏。当故障排除后,PTC热敏电阻器亦自动回复至低阻态,电路恢复正常工作。

图2为电路正常工作时的伏-安特性曲线和负载曲线示意图,由A点到B点,施加在PTC热敏电阻器上的电压逐步升高,流过PTC热敏电阻器的电流也线性增加,表明PTC热敏电阻器的电阻值基本不变,即保持在低电阻态;由B点到E点,电压逐步升高,PTC热敏电阻器由于发热而电阻迅速增大,流过PTC热敏电阻器的电流也迅速降低,表明PTC热敏电阻器进入保护状态。正常的负载曲线低于B点,PTC热敏电阻器就不会进入保护状态。

## Application of Principle:

The principle shown in Figure 1,When the circuit is in normal state, the current through PTC thermistor less than rated current, PTC thermistor in normal state and resistance very small, which does not affect the normal operation of the circuit to be protected. When the circuit fails, the current is much higher than the rated current, PTC thermistor abrupt fevers, shows high resistance state, so the circuit is in a relatively "off" state and protects the circuit from damage. After trouble shooting, PTC thermistor will automatically revert to low resistance state, and the circuit resumes to normal work.

Fig. 2 shows the circuit of the V - A characteristics curve and load curve diagram when it works properly, from point A to point B, voltage exerted on the PTC thermistor is gradually on the rise,current flowing through the PTC thermistor also increases, indicating that PTC thermistor resistance values remain basically unchanged, that is maintained at a low resistance state; from point B to the E point, the voltage gradually increased, PTC thermistor and the resistance increases rapidly due to heat, current flowing through PTC thermistor is rapidly reduced, indicating PTC thermistor into protection state. The normal load curve below the B-point, PTC thermistor will not enter the protection.

通常而言有三种过流过载保护的类型：

- 1、电流过载（图3）：RL1为正常工作时的负载曲线，当负载阻值减少，如变压器线路短路，负载曲线由RL1变为RL2，超过B点，PTC热敏电阻器进入保护状态；
- 2、电压过载（图4）：电源电压增加，如220V电源线突然升到380V，负载曲线由RL1变为RL2，超过B点，PTC热敏电阻器进入保护状态；
- 3、温度过热（图5）：当环境温度升高超过一定限度，PTC热敏电阻器伏-安特性曲线由A-B-E变成A-B1-F，负载曲线RL超过B1点，PTC热敏电阻器进入保护状态；

Usually, there are three over-current overload protection type:

- 1、current overload (Fig. 3): RL1 as the load curve during normal working hours, when the load resistance reduced, such as the transformer short-circuit, the load curve by the RL1 becomes RL2, more than B points, PTC thermistor into the protection state;
- 2、voltage overload (Fig.4): supply voltage increases, such as the 220V power cord suddenly rose to 380V, the load curve by the RL1 becomes RL2, more than B points, PTC thermistor into the protection of state;
- 3、temperature overheating (Fig.5): When the ambient temperature increases beyond a certain limit, PTC thermistor V - A characteristics curve by ABE to become A-B1-F, the load curve of RL than B1-point, PTC thermistor access to protected state;

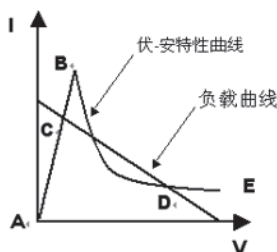


图 2. 电路正常工作状态

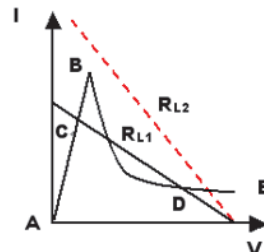


图 3. 电流过载保护示意图

## YSMZ1 系列PTC热敏电阻器 YSMZ1 series PTC thermistor

# YSMZ1

系列PTC热敏电阻器

YSMZ1 series  
PTC thermistor

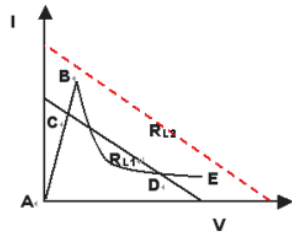


图4.电压过载保护示意图

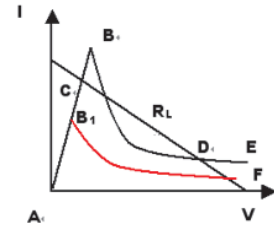
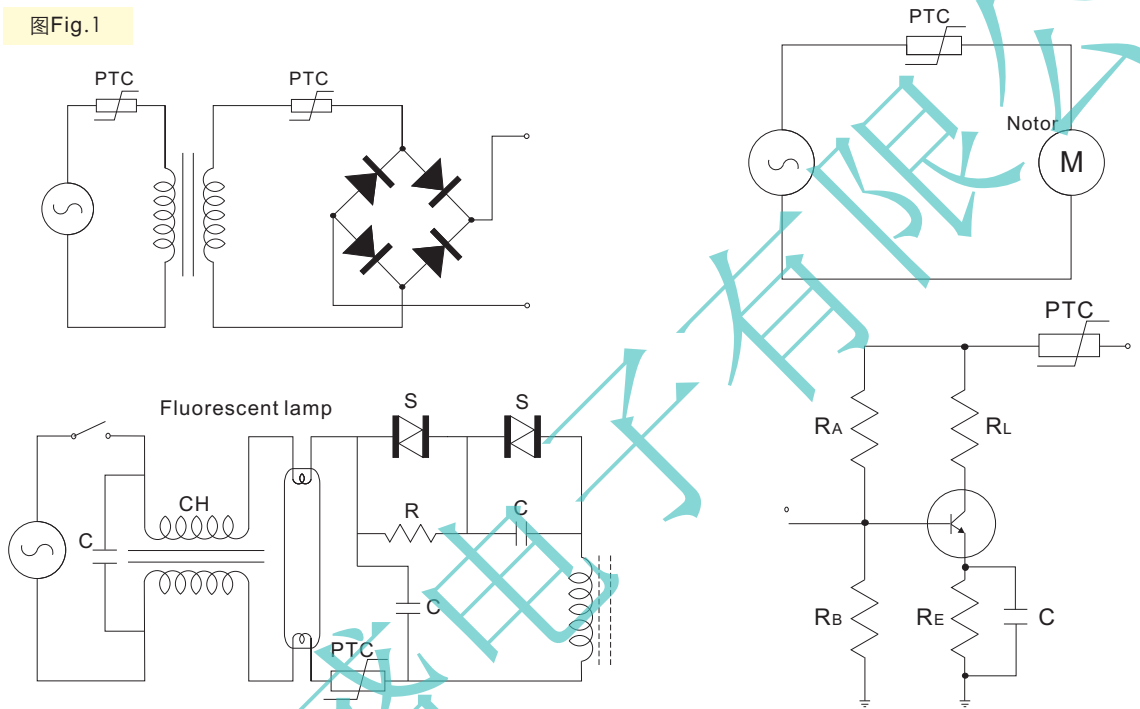


图5.过热保护示意图

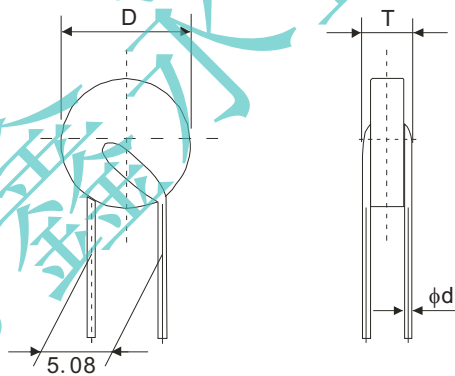
## 应用实例: Application examples

图Fig.1

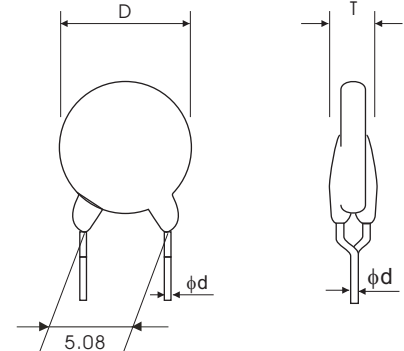


## 产品外形尺寸: Product Dimensions

Unit:mm

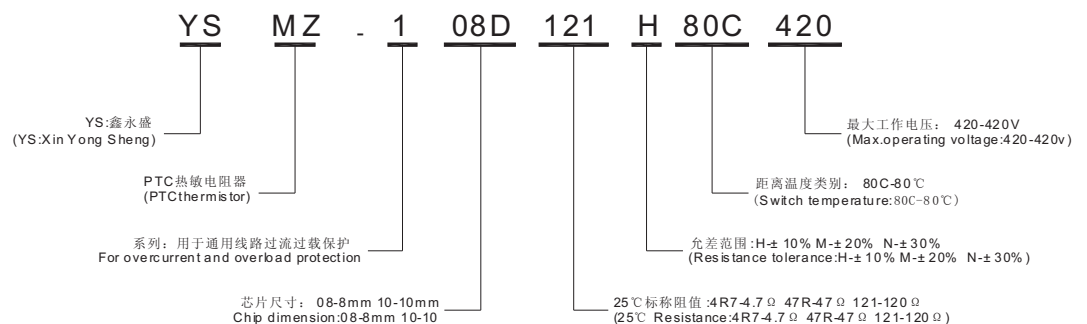


无涂装型



侧弯引线型

## 产品型号说明: Product Type Description



**YSMZ1系列参数表**  
**Specification table**

Part number 型号	Resistance @25°C 额定电阻值 $R_s$ ( $\Omega$ )	Non-trip current 不动作电流 Int (mA)		Trip current 动作 电流 @25°C $I_t$ (mA)	Max. operating voltage 最大工作电压 $V_{max}$ (V)	Max. current 最大电流 $I_{max}$ (A)	Switch temperature 居里温度 $T_c$ (°C)	Dimension 外形尺寸 (mm)		
		@25°C	@60°C					$D_{max}$	$T_{max}$	$\Phi d$
YSMZ1-03D151H80C265	150	22	15	45	265	0.2		4.5	5.0	0.5
YSMZ1-03D102H80C265	1000	8	5	15	265	0.1		4.5	5.0	0.5
YSMZ1-03D152H80C265	1500	7	4	10	265	0.1		4.5	5.0	0.5
YSMZ1-04D251H80C265	250	20	12	40	265	0.3		5.5	5.0	0.6
YSMZ1-05D45RH80C265	45	40	25	80	265	0.8		6.5	5.0	0.6
YSMZ1-05D601H80C420	600	15	7	30	420	0.2		6.5	5.0	0.6
YSMZ1-05D102H80C420	1000	10	6	25	420	0.1		6.5	5.0	0.6
YSMZ1-05D152H80C420	1500	8	4	18	420	0.1		6.5	5.0	0.6
YSMZ1-07D20RH80C265	20	80	50	170	265	0.6		8.0	5.0	0.6
YSMZ1-07D25RH80C265	25	70	40	150	265	0.6		8.0	5.0	0.6
YSMZ1-07D101H80C265	100	40	25	80	265	0.6		8.0	5.0	0.6
YSMZ1-07D112H80C550	1100	15	10	30	550	0.5		8.0	5.0	0.6
YSMZ1-09D45RN80C265	45	60	30	120	265	1.0		10.0	5.0	0.6
YSMZ1-09D50RH80420	50	75	45	150	420	1.0		10.0	5.0	0.6
YSMZ1-09D60RH80C420	60	65	40	130	420	1.0		10.0	5.0	0.6
YSMZ1-09D70RH80C420	70	60	35	110	420	1.0		10.0	5.0	0.6
YSMZ1-09D151H80C265	150	45	25	90	265	1.0		10.0	5.0	0.6
YSMZ1-10D25RH80C265	25	50	40	120	265	1.5		11.0	5.0	0.6
YSMZ1-03D401N100C265	400	20	12	40	265	0.2		4.5	5.0	0.5
YSMZ1-03D301H100C265	300	25	15	50	265	0.2		4.5	5.0	0.5
YSMZ1-03N151H100C265	150	30	25	60	265	0.2		4.5	5.0	0.5
YSMZ1-05D601H100C420	600	20	12	40	420	0.2		6.5	5.0	0.6
YSMZ1-05D751H100C420	750	18	12	36	420	0.2	100	6.5	5.0	0.6
YSMZ1-05D102H100C420	1000	15	10	30	420	0.2		6.5	5.0	0.6
YSMZ1-05D152H100C550	1500	12	7	21	550	0.1		6.5	5.0	0.6
YSMZ1-07D151H100C265	150	35	25	80	265	0.2		8.0	5.0	0.6
YSMZ1-05D39RH120C250	39	80	65	160	250	0.2		6.5	5.0	0.6
YSMZ1-05D70RH120C265	70	65	50	130	265	0.3		6.5	5.0	0.6
YSMZ1-05D601N120C420	600	21	14	45	420	0.2		6.5	5.0	0.6
YSMZ1-05D751H120C420	750	18	10	30	420	0.2		6.5	5.0	0.6
YSMZ1-05D152H120C550	1500	15	9	24	550	0.1		6.5	5.0	0.6
YSMZ1-07D501H120C420	500	20	15	50	265	0.6	120	8.0	5.0	0.6
YSMZ1-08D70RN120C420	70	65	50	125	420	1.4		9.0	5.0	0.6
YSMZ1-08D501N120C420	500	24	19	48	420	1.4		9.0	5.0	0.6
YSMZ1-12D20RH120C420	20	160	120	350	420	1.5		9.0	5.0	0.6
YSMZ1-13D18RH120C265	18	220	140	450	265	1.8		14.0	6.0	0.6

注1. 除上述温度保护点外, 同时也可以根据客户的实际要求进行设计。

2. 产品外形可以根据客户要求订做: 引线封装类、金属外壳封装类。

Note 1. BESIDES the above-mentioned temperature protection spots, We can design according to customer's actual requirements.

2. Product shape can be customized according to customer requirements: leaded package types, metal wrapper classes