Characteristic:

- Electrical insulation between chip and substrate, 2500V AC insulation.
- Using independently developed and produced silicon nitride+glass passivation process chip soldering, excellent temperature characteristics and power cycling capability.
- Small size,light weight typical.

Applications:

- Heating controller
- AC/DC motor control

Various rectifier power supplies

- AC switch

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	T_j(℃)	VALUE			UNIT
				Min	Type	Max	
$I_{T(AV)}$	Mean on-state current	180° half sine wave, 50Hz Single side cooled, T_c= 85℃	125			110	A
$I_{T(RMS)}$	RMS on-state current		125			173	A
I_{DRM} I_{RRM}	Repetitive peak current	at V_{DRM} at V_{RRM}	125			10	mA
I_{TSM}	Surge on-state current	10ms half sine wave V_R=60%V_{RRM}	125			2.10	kA
I^2t	I^2t for fusing coordination					29	10^3A^2s
V_{TO}	Threshold voltage		125			0.80	V
r_T	On-state slope resistance					2.29	mΩ
V_{TM}	Peak on-state voltage	I_{TM}=330A	25			1.65	V
dv/dt	Critical rate of rise of off-state voltage	V_{DM}=67%V_{DRM}	125			800	V/μs
di/dt	Critical rate of rise of on-state current	I_{TM}=400A, Gate source 1.5A t_r≤0.5μs Repetitive	125			100	A/μs
I_{GT}	Gate trigger current	V_A= 12V, I_A=1A	25	30		80	mA
V_{GT}	Gate trigger voltage			0.7		2.5	V
I_H	Holding current			10		180	mA
I_L	Latching current					500	mA
V_{GD}	Non-trigger gate voltage	V_{DM}=67%V_{DRM}	125			0.2	V
V_{DRM}	Repeat peak voltage in the off-state	V_{DRM}&V_{RRM} tp=10ms	125	1200	1800	2500	V
V_{RRM}	Reverse Repeat Peak Voltage	V_{DSM}&V_{RSM}= V_{DRM}&V_{RRM}+200V					

SYMBOL	CHARACTERISTIC	TEST CONDITIONS	T_j(℃)	VALUE			UNIT
				Min	Type	Max	
$R_{th(j-c)}$	Thermal resistance Junction to case	Single side cooled per chip				0.250	℃W
$R_{th(c-h)}$	Thermal resistance case to heat sink	Single side cooled per chip				0.150	℃W
V_{iso}	Isolation voltage	50Hz,R.M.S,t= 1min,I_{iso}:1mA(MAX)		2500			V
F_m	Terminal connection torque (M5)				2		N·m
	Mounting torque (M6)				3		N·m
T_j	Junction temperature			-40		125	℃
T_{stg}	Stored temperature			-40		125	℃
W_t	Weight				140		g
Outline	M220、M225						

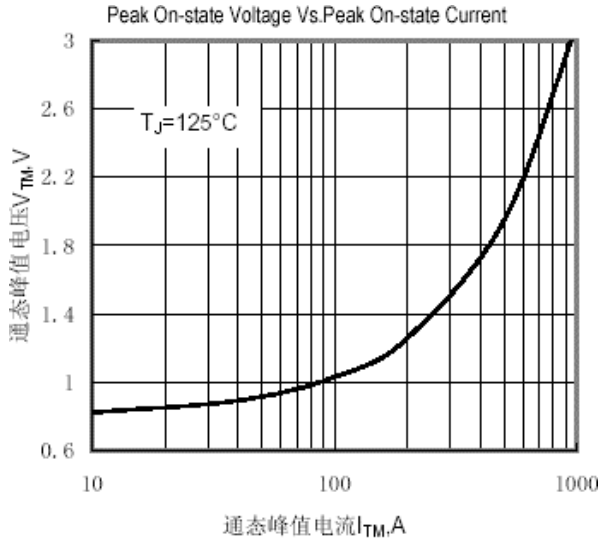


Fig.1通态伏安特性曲线

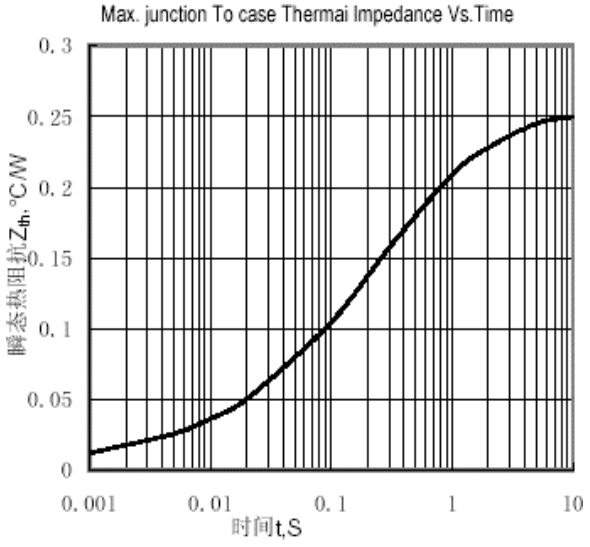


Fig.2 结至管壳瞬态热阻抗曲线

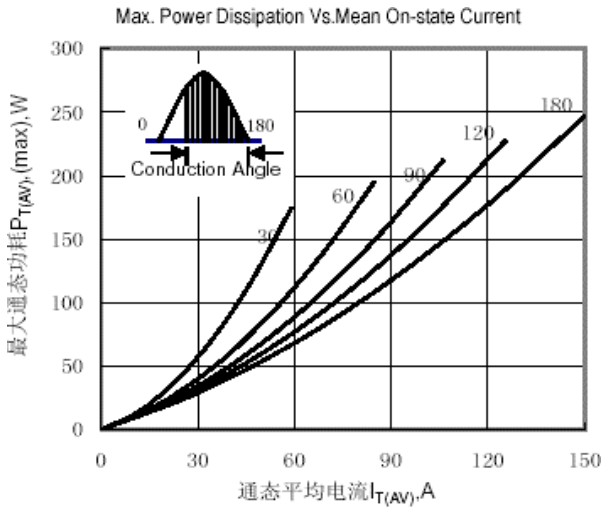


Fig.3最大功耗与平均电流关系曲线

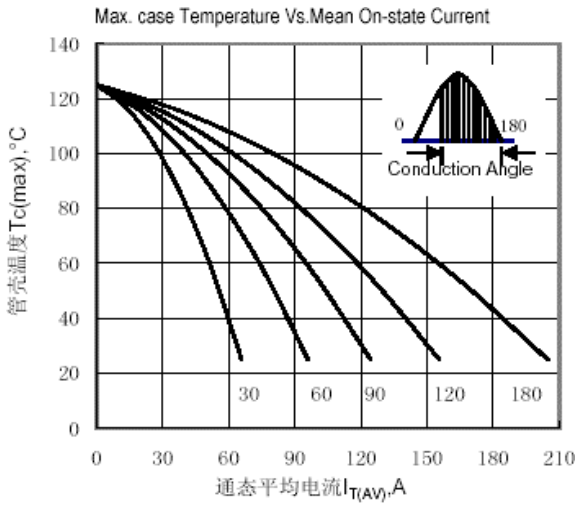


Fig.4管壳温度与通态平均电流关系曲线

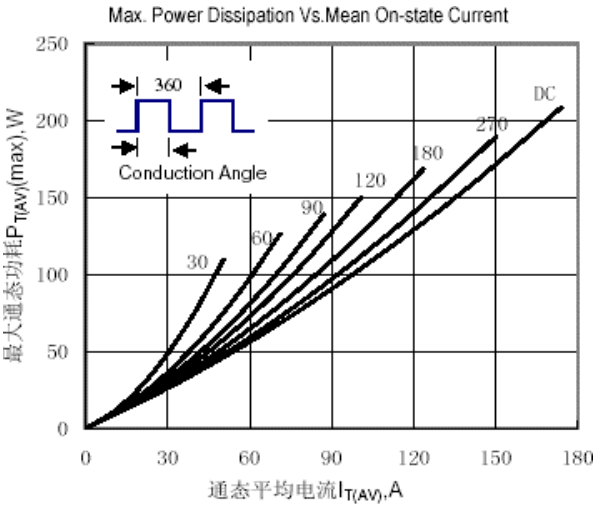


Fig.5 最大功耗与平均电流关系曲线

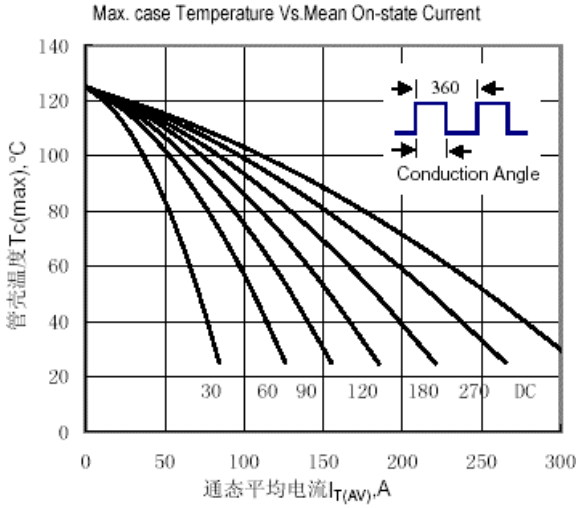


Fig.6 管壳温度与通态平均电流关系曲线

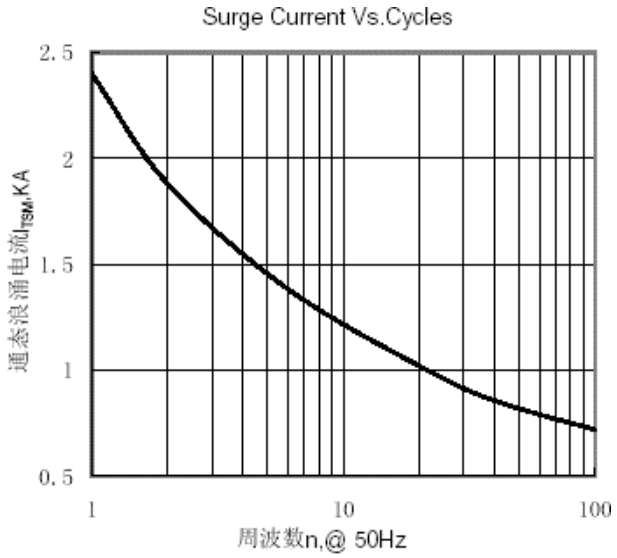


Fig.7 通态浪涌电流与周波数的关系曲线

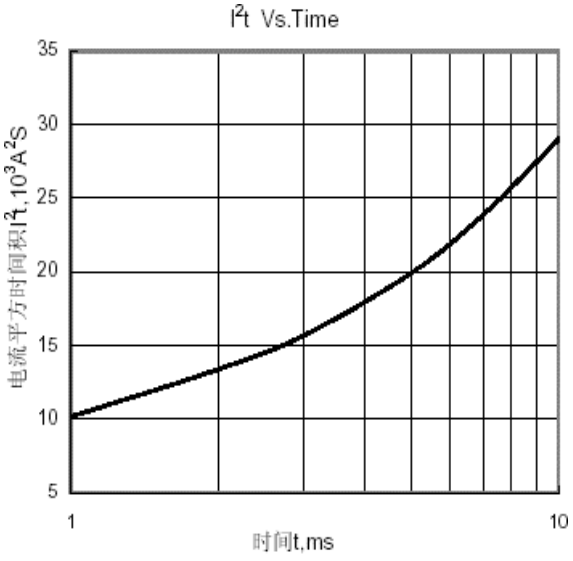


Fig.8 I^2t特性曲线

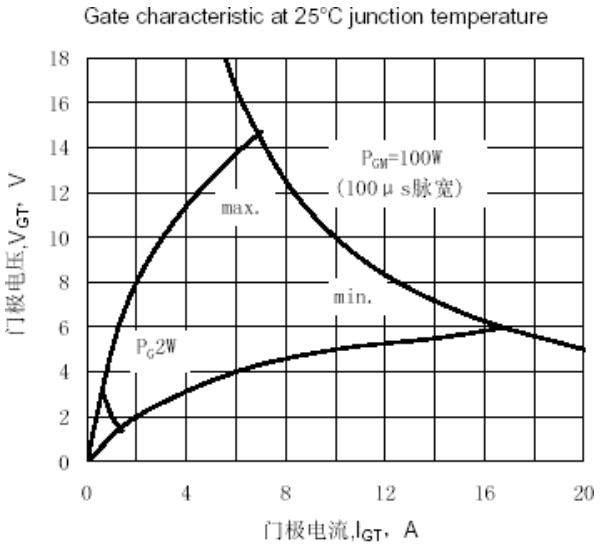


Fig.9 门极功率曲线

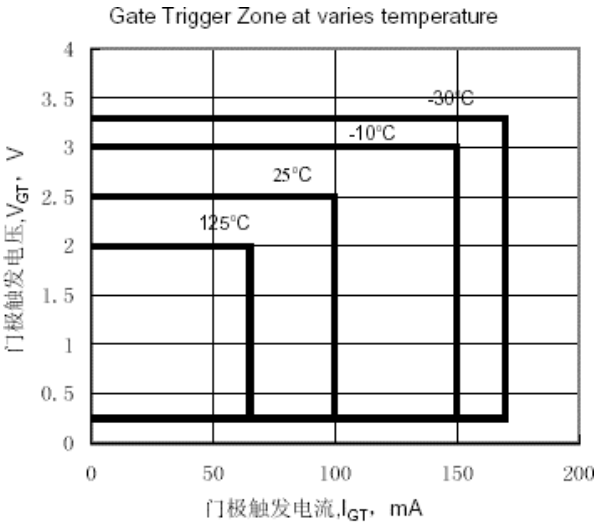
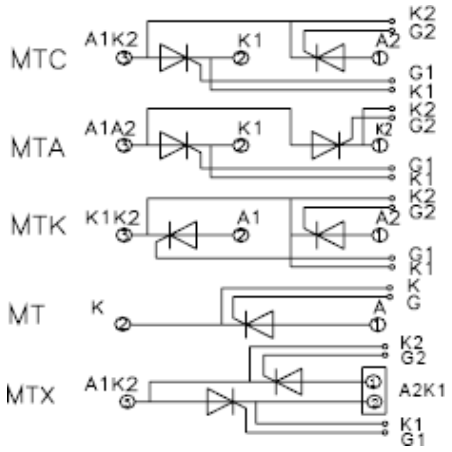
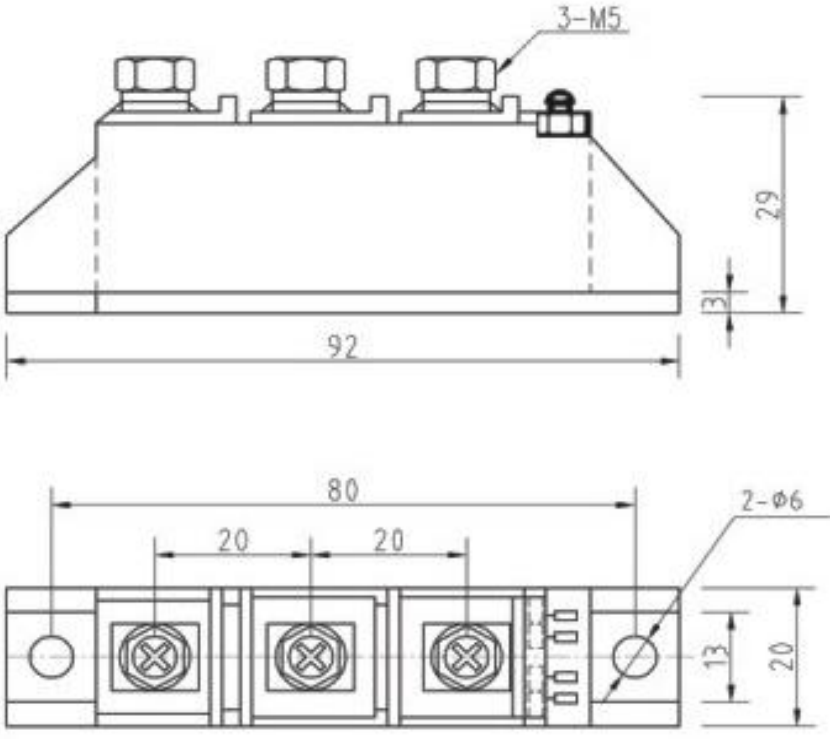


Fig.10 门极触发特性曲线

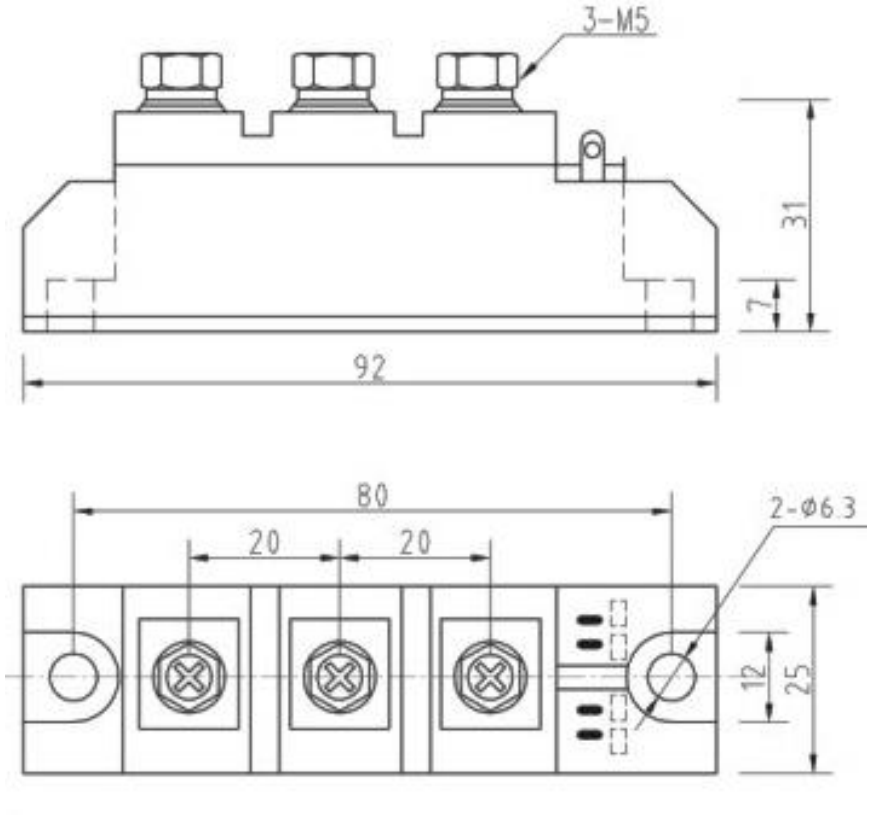
Typical circuit of module
Electrical connection form
(Right picture)



Module outline drawing and installation drawing:
Size: mm



（M220）



(M225)

instructions:

■ Usage conditions and precautions:

1. The usage environment should be free of severe vibration and impact, and the environmental medium should be free of corrosive metals and impurities and atmospheres that damage insulation.

2. Working junction temperature of module die: -40 ℃～ 125 ℃ for thyristor; The ambient temperature shall not exceed 40℃; The environmental humidity is less than 86%.

3. Before using the module, it is necessary to install a radiator. The selection of radiators can be found in the next section. Natural cooling, forced air cooling, or water cooling can be used for heat dissipation. When forced air cooling, the wind speed should be greater than 6 meters per second.

■ Installation precautions:

1. Due to the fact that the thyristor module is insulated (i.e. the insulation withstand voltage between the module terminals and the copper substrate is greater than the effective value of 2.5KV), multiple modules can be installed on the same heat sink or the grounding shell of the device.

2. The installation surface of the radiator should be flat and smooth, without scratches, bumps, or debris. The surface smoothness of the radiator should be less than 10 μ m. When installing modules on the heat sink, a thin layer of thermal grease should be applied between their contact surfaces. Before applying grease, use fine sandpaper to remove the oxide layer on the contact surface of the radiator, and then wipe the surface clean with anhydrous ethanol to ensure good contact and reduce thermal resistance. When fastening the module to the surface of the radiator, use M5 or M6 screws and spring washers, and tighten the screws with a torque of 4NM

The connection with the main electrode of the module should use copper bars and have smooth and flat contact surfaces to ensure good contact. After the module has been working for 3 hours, all screws must be tightened again.

Module heat sink selection

When selecting a radiator, users must consider the following factors:

① The working current of the module determines the required heat dissipation area;

② Based on the usage environment, it can be determined which cooling method to adopt - natural cooling, forced air cooling, or water cooling;

③ The shape and volume of the device, as well as the size of the reserved space for the radiator, can be used to determine what shape of radiator to use. Generally speaking, most users will choose aluminum profile heat sinks.

For the convenience of users, the required heat dissipation area is provided in the characteristic parameter table. This area is a reference value when the module is operating at full load and subjected to forced air cooling. The following is the calculation formula for the length of the radiator:

Module required heat dissipation area=(perimeter of heat sink) × (length of heat sink)+(cross-sectional area) × 2

Among them, the required heat dissipation area of the module is the reference value given in the module characteristic parameter table, the circumference and cross-sectional area of the radiator can be found in the radiator manufacturer's sample, and the length of the radiator is the quantity to be calculated.

Serious statement: Currently, the market is flooded with various inferior radiators. Please pay attention to identification when purchasing. Our company is not responsible for any module damage or other serious consequences caused by the use of inferior radiators.

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