

小型功率继电器 Miniature Power Relay

SM1P

特点 Features

- 体积小, 仅 15.7mm 高度。
Small size, 15.7mm high
- 耐压可达 5kV (线圈触点间), 耐 10kV 浪涌电流。
IP/OP 5kV, withstand surge voltage of 10kV
- 多种触点形式可供选择
Several contact types available
- 线圈和触点之间的爬电距离和空气间隙 $\geq 10\text{mm}$
Creepage and clearance distance between coil and contacts $\geq 10\text{mm}$
- 可提供满足 IEC60335-1/IEC60079-15 的产品
IEC60335-1 compliance product is available

安规认证 Safety Approval

UL/CUL 认证号 (File No.): E190598
VDE 认证号 (File No.): 40031353
CQC 认证号 (File No.): CQC10002049463

触点负载 Contact Capacity

型号 Model	SM-1Poles	SM-1Poles (H/T)
额定负载 (阻性) Nominal switching capacity (Res. load)	16A 250VAC	12A 250VAC
最大切换电流 Max. switching current	16A	12A
最大切换电压 Max. switching voltage	277VAC	277VAC
最大切换功率 Max. switching power	4432VA	3324VA

性能参数 Characteristic Data

触点材料 Contact material	银合金 Silver alloy	
接触电阻 Contact resistance	100mΩ Max. (1A 6VDC)	
吸合时间 Actuation time	15msec. Max. (不加二极管 No diode)	
释放时间 Release time	10msec. Max. (不加二极管 No diode)	
绝缘电阻 Initial insulation resistance	1,000MΩ Min.(DC500V)	
介质耐压 Initial dielectric strength	触点与触点间 Between open contacts: AC1,000V, 50/60Hz 1min. 触点与线圈间 Between coil and contact: AC50,00V, 50/60Hz 1min.	
抗振动 Vibration resistance	耐久 Functional	10~55Hz, 双振幅 1.5 mm 10~55Hz, at double amplitude of 1.5 mm
	误动作 Destructive	10~55Hz, 双振幅 1.5 mm 10~55Hz, at double amplitude of 1.5 mm
	耐久 Functional	100G Min.
	误动作 Destructive	10G Min.
寿命 Endurance(operations)	机械寿命(每小时 10,800 次) Mechanical (at 10,800 ops./h)	10,000,000 (室温 at room temperature)
	电气寿命(每小时 360 次) Electrical (at 360 ops./h)	100,000 (室温 at room temperature)

环境温度 Ambient temperature	-40℃ ~ +85℃ (不冷凝 No condensation) -40℃ ~ +105℃ 仅适用于 16A (Only for 16A)
重量 Unit weight	约 Approx.13.5g

线圈参数(at 20℃) Coil Data (at 20℃)

额定电压 Nominal voltage (VDC)	额定电流 Nominal operating Current ±10% (mA)	线圈电阻 Coil Resistance ±10% (Ω)	最大连续 外加电压 Max. Allowable voltage	吸合电压 Pick- up voltage (Max.)	释放电压 Drop- out voltage (Min.)	额定功率 Nominal Operating power
5	80.00	62.5	额定电压的 150% 150% of Nominal voltage	额定电压的 75% 75% of Nominal voltage	额定电压的 10% 10% of Nominal voltage	约 0.4W Approx.0.4W
6	66.67	90				
9	44.44	202.5				
12	33.33	360				
18	22.22	810				
24	16.67	1440				
48	8.33	5760				
60	7.00	8570				
110	3.82	28800				

上述值为初始值；请勿在产品上连续施加最大电压 > 10min，以免线圈过度发热。
The data shown above are initial values. Do not energize the maximum allowable voltage of the coil for more than 10 minutes to avoid overheating of the coil.

安规认证负载（注：更多详细的认证负载，参考安规证书）

Safety Approval Ratings (Note: More detail of approval ratings, please refer to the safety certification)

认证类型 Approval	CQC	VDE	UL/CUL	
认证号码 File No.	CQC10002049463	40031353	E190598	
认证负载 Approved ratings	16A 250VAC 12A 250VAC	16A 250VAC 12A 250VAC 10A 250VAC	1Pole(16A) 16A 250VAC Resistive&G.P; 20A 277VAC Resistive&G.P. 1HP, 480/240 VAC; 1/2 HP, 120 VAC 10 FLA /60 LRA, 240 VAC; PilotDuty A300 360VA	1Pole(12A) 12A 250VAC Resistive&G.P. 10A 277VAC Resistive&G.P. 3/4HP, 3.5FLA, 480VAC; 1/2HP, 4.9FLA, 240VAC 1/3 HP, 120 VAC; 10 FLA /48 LRA, 240 VAC PilotDuty A300 360VA, 120VAC

(1) 上述未注明温度的负载，均指环境温度为室温。
The above-mentioned unspecified temperature ratings, means that the ambient temperature is room temperature.

(2) 以上仅列出了该产品认证的部分负载，每个负载的详细测试条件不同，因此电寿命次数不一样。如需了解详细情况，请联系三友。
Only some typical ratings are listed above. Each rating's test condition is different, so the electrical endurance will be different. If more details are required, please contact us.

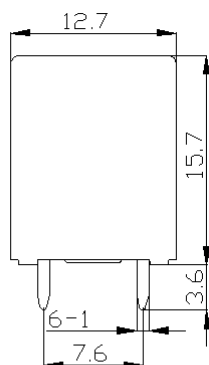
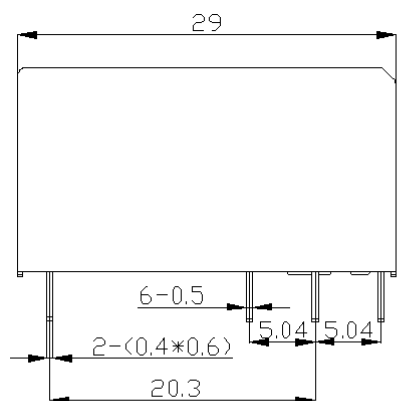
(3) 对于塑封式、防水式产品试验时，应打开外壳的透气孔。
For sealed type testing, please open the ventilation hole of case before test.

订货标记 Ordering Information									
型号命名规则 Nomenclature									
SM	-S	-1	12	D	M	H	1	-F	-XX
								特殊参数: Special Parameter:	无-标准型, 字母或数字-特殊要求, Nil-Standard type; Letters or Numbers-Special requirements
								绝缘等级: Insulation System:	无-普通型(Nil-Standard), B-Class B F-Class F
								触点材质: Contact Material:	无 Nil-AgNi, 1-AgSnO2, 2AgNi+AgSnO2 3-AgNi 三复合动点(Form C) 3 Compound Movable Contact (Form C) 4-AgSnO2 三复合动点(Form C) 3 Compound Movable Contact (Form C)
								负载能力: Load capacity:	无 Nil-16A, 5mm 脚位 pin H-12A, 5mm 脚位 pin T-12A, 3.5mm 脚位 pin
								触点形式: Contact Form:	无 Nil-Form C M-Form A
								线圈功耗 Coil Power:	D-0.4W
								线圈规格: Coil Voltage (VDC) :	05, 06, 09, 12, 18, 24, 48, 60, 110
								触点组数: Number of Poles:	1-1 组(Pole)
								封装形式: Protective	S-塑封式 Flux proofed SH-防水式 Sealed type washable
								基本型号: Type Designation:	SM

- (1) 塑封式不能在污染环境（含有 H2S、S02、N02、粉尘等污染物）中使用。
Plastic sealing type can not be used in polluted environment (containing H2S, S02, N02, dust and other pollutants)
- (2) 塑封式装入 PCB 焊接后，不能进行整体清洗或表面处理。
After the plastic seal product is loaded into PCB welding, the whole cleaning or surface treatment can not be carried out.
- (3) 客户特殊要求 (XX)，由我司评估后，按特性符号标识。
Special requirements of customers (XX) shall be evaluated by our company and marked by characteristic symbols.
- (4) SM-H/SM-T(12A), 无三复合触点规格。
No 3 compound contact specifications for SM-H/SM-T(12A).

外形尺寸图、接线图、安装孔位图 (单位: mm)

Outline dimension drawing, wiring diagram, installation vacancy drawing (unit: mm)



未注尺寸公差

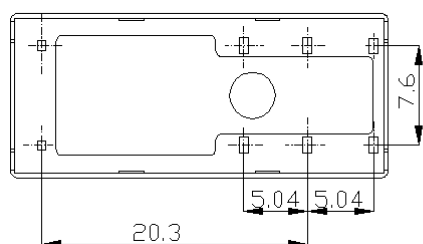
<1mm: $\pm 0.2\text{mm}$

1~5mm: $\pm 0.3\text{mm}$

>5mm: $\pm 0.4\text{mm}$

注: 1、引出脚尺寸为预焊前尺寸

2、安装孔尺寸公差: $\pm 0.1\text{mm}$



Unless otherwise specified:

If dimension <1mm, tolerance: $\pm 0.2\text{mm}$;

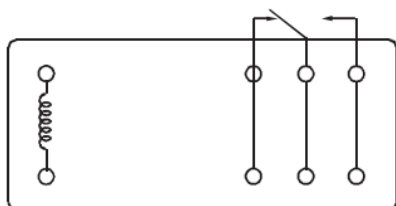
If dimension 1~5mm, tolerance: $\pm 0.3\text{mm}$;

If dimension >5mm, tolerance: $\pm 0.4\text{mm}$.

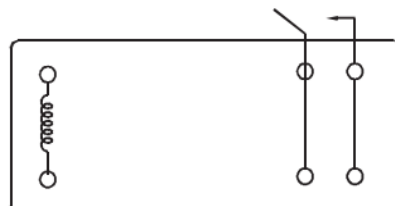
Note: 1. Extended terminal dimension is dimension before soldering.

2. Tolerance of P.C.B. layout: $\pm 0.1\text{mm}$.

1P, 16A
5mm 脚位 Pin

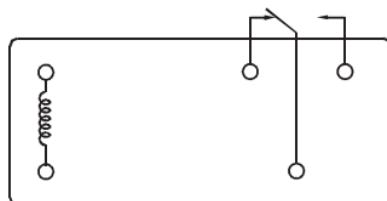


1 c



1 a

1P, 12A
5mm 脚位 Pin

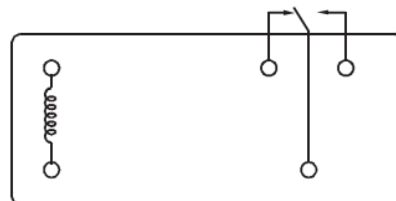


1 c

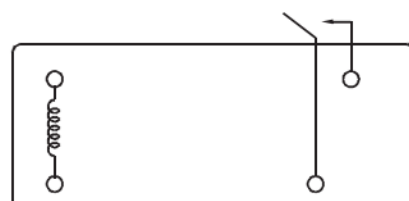


1 a

1P, 12A
3.5mm 脚位 Pin



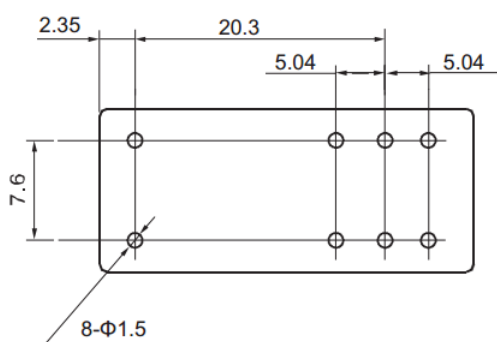
1 c



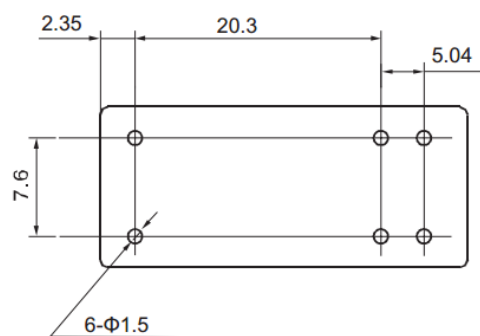
1 a

接线图 (底视图)
Wiring Diagram (Bottom View)

1P 16A
5mm 脚位 Pin

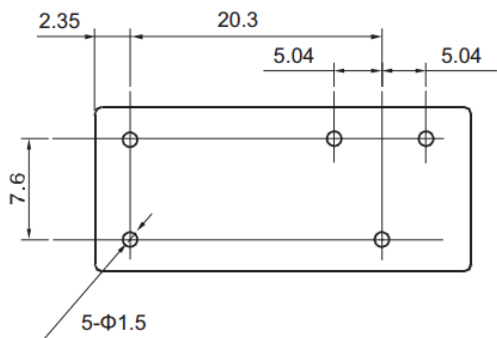


1 c

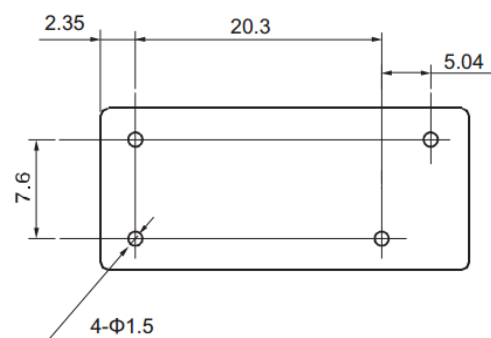


1 a

1P 12A
5mm 脚位 Pin

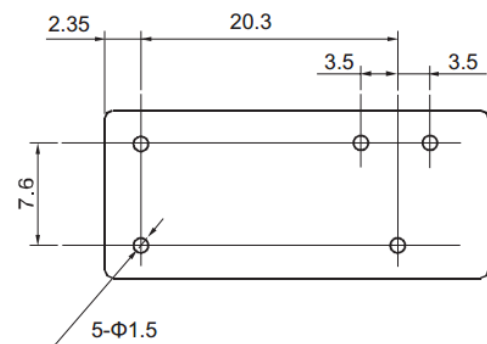


1 c

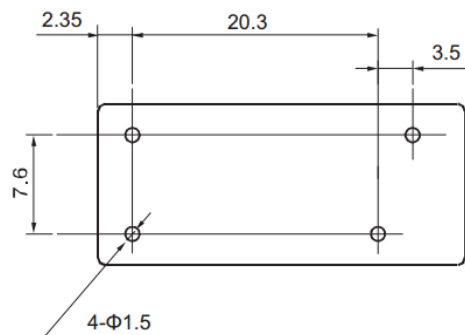


1 a

1P 12A
3.5mm 脚位 Pin



1 c



1 a

安装孔位图 (底视图)
PCB Layout (Bottom View)

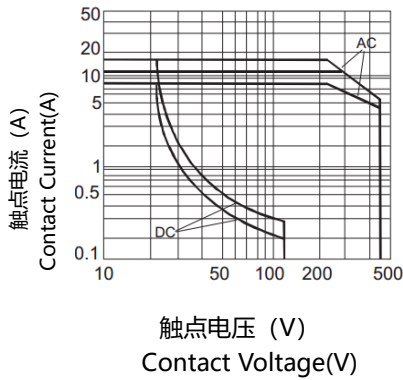
典型用途 Typical Applications

◇ 家用电器、洗衣机、空调、微波炉、音响、显示器、工业控制仪等

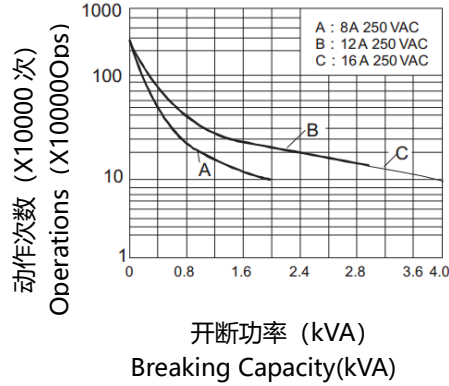
Home appliances, Washing machine, air-conditioning, microwave oven, sound, monitor, Industrial control instrument, etc.

性能曲线图 Characteristic Curves

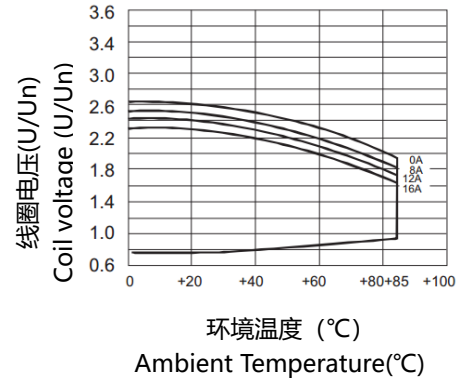
最大切换功率
Maximum Switching Power



寿命曲线
Endurance Curve



线圈工作温度范围
Coil Operating Range



声明：本产品规格书仅供客户使用时参考，若有更改，恕不另行通知。

对三友而言，不可能评定继电器在每个具体应用领域的所有性能参数要求，因而客户应该根据具体的使用条件选择与之相匹配的产品。对于密封继电器在安装清洗后，使用前请打开外壳上的透气孔。如有疑问，请与三友联系获取更多的技术支持。但产品选型责任仅由客户负责。

Disclaimer: This datasheet is the customers' reference. All the specification are subject to change without notice.

We could not evaluate all the performance and all the parameters for every possible application. Thus the user should in a right position to choose the suitable product for their own application. For sealed relays after installation and cleaning, please open the vent hole on the case before use. If there is any query, please contact Sanyou for the technical service. However it is the user's responsibility to determine which product should be used only.