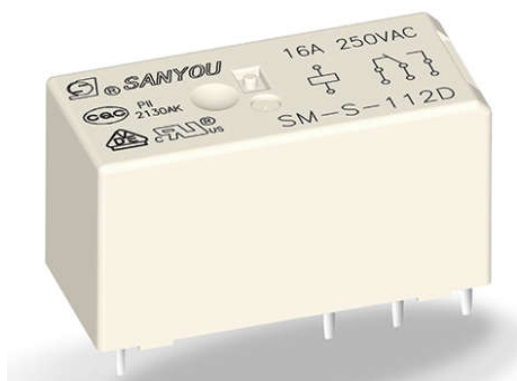




小型功率继电器

Miniature Power Relay

SM1P



特点 Features

- 体积小, 仅 15.7mm 高度。
Small size, 15.7mm high
- 耐压可达 5000 伏 (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 IEC 60335-1 的产品
IEC60335-1 compliant product is available.
- 可提供满足 IEC 60079-15 的产品
IEC60079-15 compliant product is available

安规认证 Safety certificate

UL、cUL 认证号 (File No.) : E190598

VDE 认证号 (File No.) : 40031353

CQC 认证号 (File No.) : CQC10002049463

触点参数 Contact Data

| 型号 Type | SM-1Poles | SM-1Poles (H/T) |
|--|------------|-----------------|
| 额定负载 (阻性) Rated load (Resistive 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 |
| 最小切换负载 Min. switching load | 6V 1A | 6V 1A |

性能参数 Characteristic

| | |
|--|---------------------------------|
| 触点材料 Contact material | 银合金 Silver alloy |
| 接触电阻 Contact resistance | 100m Ω Max. (at 1A 6VDC) |
| 吸合时间 (额定电压) Operate time (at rated coil voltage) | 15ms Max. (不加二极管 No diode) |

| | | |
|-------------------------------|---|---|
| 释放时间 Release time | 10ms Max. (不加二极管 No diode) | |
| 绝缘电阻 Insulation resistance | Min. 1,000MΩ (at 500VDC) | |
| 介质耐压 Dielectric strength | 触点与触点间 Between open contacts: 1,000VAC, 50/60Hz for 1min. 触点与线圈间 Between coil and contact: 5,000VAC, 50/60Hz for 1min. | |
| 抗振动 Vibration resistance | 耐久 Destructive | 10~55Hz, 双振幅 1.5 mm 10~55Hz, at double amplitude of 1.5 mm |
| | 误动作 Functional | 10~55Hz, 双振幅 1.5 mm 10~55Hz, at double amplitude of 1.5 mm |
| 抗冲击 Shock resistance | 耐久 Destructive | 100G Min. |
| | 误动作 Functional | 10G Min. |
| 寿命 Endurance | 机械寿命 (每小时 10,800 次, 室温) Mechanical endurance (10,800 ops./h) | 10,000,000 次 10,000,000 (at room temperature) |
| | 电气寿命 (每小时 360 次, 室温) Electrical endurance (360 ops./h) | 100,000 次 100,000 (at room temperature) |
| 环境温度 Ambient temperature | -40°C ~ +85°C (不冷凝 No condensation) 若需要 105°C 产品, 请联系三友 For ambient temperature is 105°C, please contact Sanyou | |
| 重量 Weight | 约 13.5g Approx.13.5g | |

线圈参数 Coil Data (at 20°C)

| 额定电压 (VDC) Nominal voltage (VDC) | 额定电流 ±10% (mA) Nominal operating current ±10% (mA) | 线圈电阻 ±10% (Ω) Coil resistance ±10% (Ω) | 最大连续 外加电压 Max. allowable voltage | 吸合电压 (Max.) Operate voltage (Max.) | 释放电压 (Min.) Release voltage (Min.) | 额定功率 Nominal operating power |
|--|---|--|--|---|---|---------------------------------------|
| 5 | 80.00 | 62.5 | 额定电压的 130% 130% 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 apply maximum allowable voltage on 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 Certificate Ratings (Note: More details of approved ratings, please refer to the safety certificates)

| 认证类型 Certificates | 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 250VAC Resistive & G.P. 20A 277VAC Resistive & G.P. 1HP, 480/240 VAC 1/2 HP, 120 VAC 10 FLA /60 LRA, 240 VAC Pilot Duty A300 360VA 120VAC | 1Pole(H/T) 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 Pilot Duty A300 360VA 120VAC |

(1) 上述未注明温度的负载, 均指环境温度为室温。

All values unspecified are at 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 typical ratings are listed above and the endurance differ in each load. Other specific load information are available upon request.

(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 in the 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-AgSnO ₂ , 2-AgNi & AgSnO ₂ 3-三复合 (3 Compounds) AgNi (Form C) 4-三复合 (3 Compounds) AgSnO ₂ (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 Arrangement: 无 Nil-Form C M-Form A |
| | | | | | | | | | 线圈功耗 Coil Power: D-0.4W |
| | | | | | | | | | 线圈电压 Rated Coil Voltage (VDC): 05, 06, 09, 12, 18, 24, 48, 60, 110 |
| | | | | | | | | | 触点组数 Number of Poles: 1-1 Pole |
| | | | | | | | | | 封装形式 Protective Construction: S-塑封式 Flux-proofed SH-防水式 Sealed type washable |
| | | | | | | | | | 基本型号 Type: SM |

(1) 塑封式不能在污染环境 (含有 H₂S、SO₂、NO₂、粉尘等污染物) 中使用。

Plastic sealing type can not be used in polluted environment (containing H₂S, SO₂, NO₂, 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。

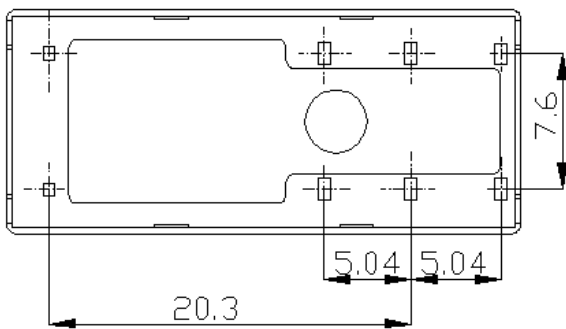
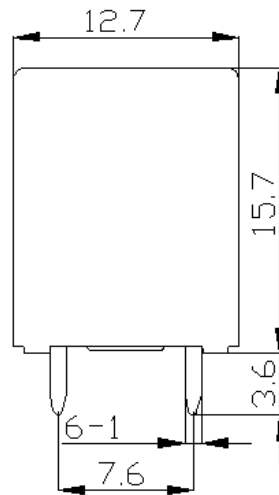
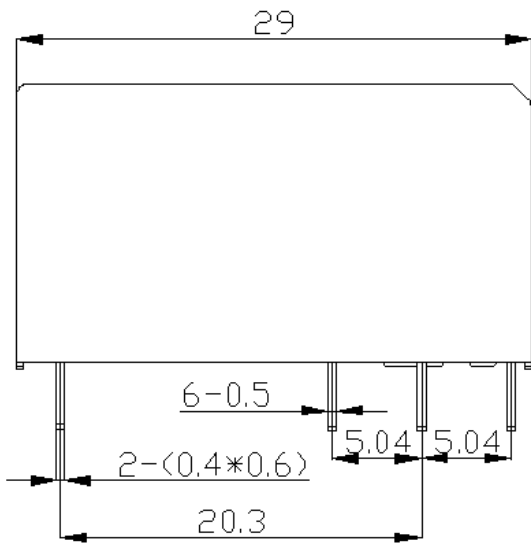
Special requirements of customers (XX) shall be evaluated by our company and marked by characteristic symbols.

(4) SM-H and SM-T, 无三复合触点规格。

No 3 compounds contact specifications for SM-H and SM-T.

外形尺寸图、接线图、安装孔位图 (单位: mm)

Outline dimension, wiring diagram, PCB layout (Unit: mm)



未标注尺寸公差

In case of no tolerance shown on outline dimension

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

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

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

注 Note:

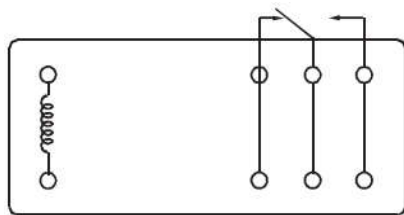
1. 引出脚尺寸为预焊前尺寸

The dimension of pin is the size before tinning

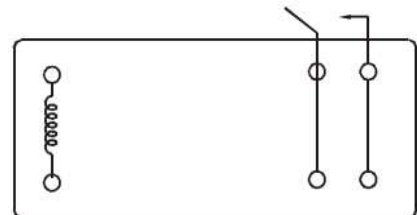
2. 安装孔尺寸公差: $\pm 0.1\text{mm}$

Tolerance of PCB layout: $\pm 0.1\text{mm}$

1P 16A
5mm 脚位 Pin

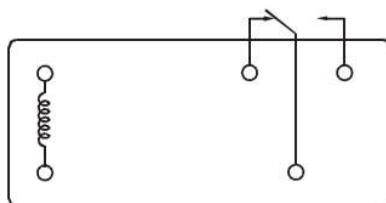


1 c

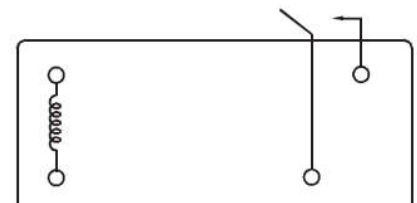


1 a

1P 12A
5mm 脚位 Pin

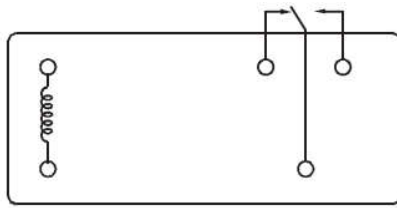


1 c

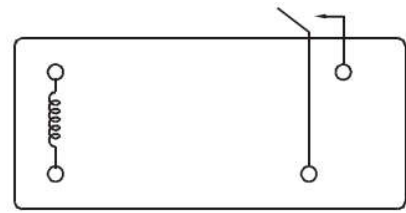


1 a

1P 12A
3.5mm 脚位 Pin



1 c

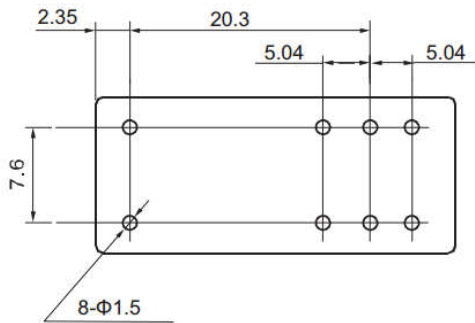


1 a

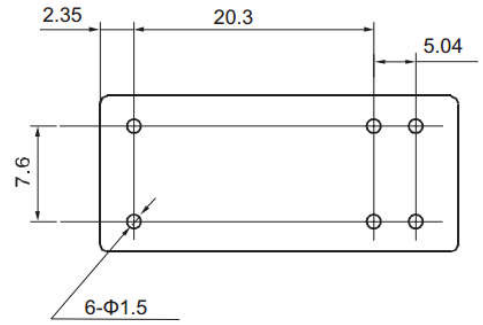
接线图 (底视图)

Wiring Diagram (bottom view)

1P 16A
5mm 脚位 Pin

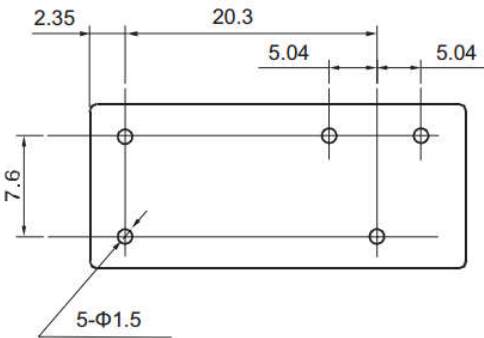


1 c

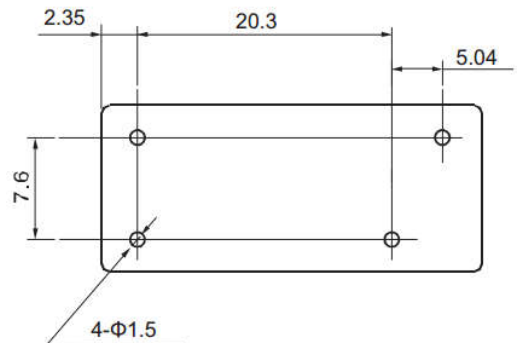


1 a

1P 12A
5mm 脚位 Pin

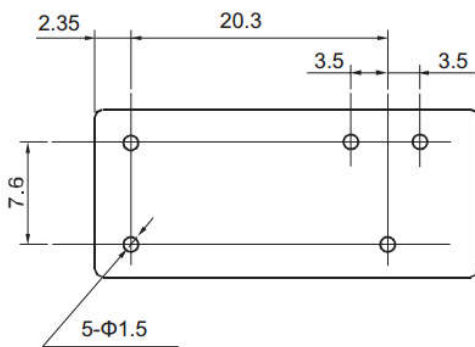


1 c

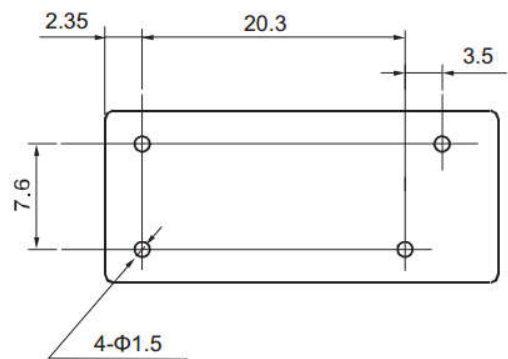


1 a

1P 12A
3.5mm 脚位 Pin



1 c



1 a

安装孔位图 (底视图)

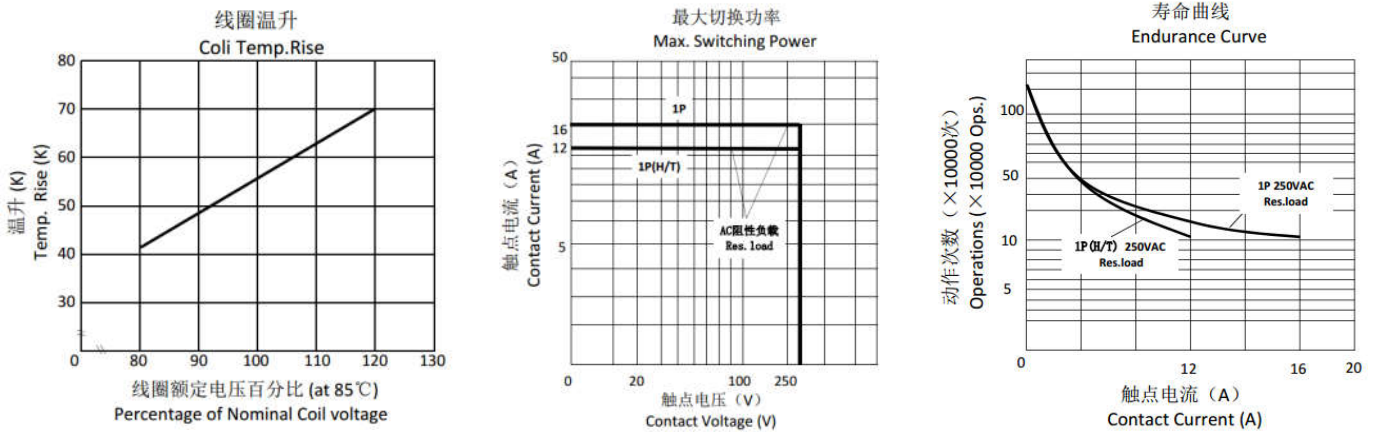
P.C.B. Layout (bottom view)

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



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: The specification is for reference only. Specifications are subject to change without prior notice.

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