



厦门宏发汽车电子有限公司

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产品规格书

Product Specification

文件编号 File No.: 4517509GGS029

顾客 Customer: <u>N/A</u>			
顾客零件号 Customer Part No.: <u>N/A</u>			
产品名称 Product Name: <u>汽车继电器 AUTOMOTIVE RELAY</u>			
产品型号 Hongfa Part NO.: <u>HFKC/012-2ZST</u>			
发布日期 Release Date: <u>2024年4月23日</u>			
版本 Version: <u>a</u>			
宏发审批签字 Signature by Hongfa			顾客确认 Customer Approval
拟制 Release by	审核 Checked by	批准 Approved by	负责人 By:
许春木	技术中心陈红波	林银河	日期 Date:
<p>Technical Center</p> <p>特别说明:</p> <ol style="list-style-type: none"> 1. 此规格书请顾客在 2 周内确认, 如未在规定时间内答复, 则视为同意。 2. 自提供规格书之日起 2 年内, 顾客没有下单订货, 本规格书失效。 3. 此规格书未经宏发盖章, 视为无效。 <p>Special claim:</p> <ol style="list-style-type: none"> 1. This specification is expected to be confirmed within 2 weeks. Without feedback after 2 weeks, Hongfa will consider it's approved by the customer automatically. 2. This specification will be invalid if no order within 2 years. 3. This specification is deemed invalid if it is not stamped by Hongfa. 			

变更履历 Revision Record

顾客 Customer		产品型号 Product Part No.		
变更版 Version No.	变更日期 Change Date	变更内容 Description	原因 Reason	负责人 Responsible
a	2024.04.23	--	新增 Initial version	许春木 Chunmu Xu

HFKC 汽车继电器

1 线圈额定参数 Coil Rating

at 23 °C

额定电压 Rated Voltage Vd. c.	动作电压 Operate Voltage Vd. c.	释放电压 Release Voltage Vd. c.	允许最大线圈电压 ¹⁾ Max Allowable Coil Voltage Vd. c.	线圈电阻 Coil Resistance Ω	线圈功耗 Coil Power W
12	≤6.9	≥1.5	16	254X(1±10%)	0.55
¹⁾ 触点在无负载电流情况下，继电器线圈允许施加的最大连续工作电压。 ¹⁾ The maximum continuous working voltage allowed to be applied by the relay coil when the contact is under no load current.					

2 触点参数 Contact Parameters

2.1 触点形式 Contact Form: 2Z (详见订货标记 See ordering information for more details)

2.2 触点材料 Contact Material: AgSnO₂

2.3 触点电压降 Contact Voltage Drop: ≤250 mV (at 10 A)

2.4 最大连续电流 Max Continuous Current: 30 A (23 °C, 线圈电压/Coil Voltage 13.5 Vd. c., 1 h)

2.5 最大切换电流 Max Switching Current: 30 A (13.5 Vd. c., 断开 Break, 阻性负载 Resistive Load)

2.6 最小适用负载 Min Applicable Load: 6 Vd. c. 1 A (阻性负载 Resistive Load, 非结冰凝露条件下 Under non icing non fogging conditions)

3 性能 Performance

3.1 耐久性 Endurance

3.1.1 电耐久性 Electrical Endurance

结构型式 Version	触点负载 Contact Rating	环境温度 Ambient Temperature	通断时间 On/Off duration		电耐久性 Electrical Endurance
			接通 ON	断开 OFF	
2组转换 2 Form C	阻性负载 Resistive Load 20 A 13.5 Vd. c.	23 °C	1 s	5 s	3×10 ⁵ 次 (ops)

3.1.2 机械耐久性 Mechanical Endurance

结构型式 Version	触点负载 Contact Rating	环境温度 Ambient Temperature	通断时间 On/Off duration		机械耐久性 Mechanical Endurance
			接通 ON	断开 OFF	
2组转换 2 Form C	无负载 No load	常温 Room Temperature	0.1 s	0.1 s	1×10^7 次 (ops)

3.2 绝缘电阻 Insulation Resistance

3.2.1 断开触点电路的各引出端之间 Between terminals of each opened contact circuit: 100 MΩ (500 Vd.c.)。

3.2.2 所有线圈引出端与所有触点电路引出端之间 Between all coil terminals and all contact circuit terminals: 100 MΩ (500 Vd.c.)。

3.2.3 各独立的触点电路的引出端之间 Between terminals of separate contact circuits: 100 MΩ (500 Vd.c.)

3.3 介质耐电压 Dielectric Strength (漏电流 Leakage Current: 1 mA)

3.3.1 断开触点电路的各引出端之间 Between terminals of each opened contact circuit: 500 Va.c. (50/60 Hz 1 min)。

3.3.2 所有线圈引出端与所有触点电路引出端之间 Between all coil terminals and all contact circuit terminals: 500 Va.c. (50/60 Hz 1 min)。

3.3.3 各独立的触点电路的引出端之间 Between terminals of separate contact circuits: 500 Va.c. (50/60 Hz 1 min)。

3.4 时间参数 Time Parameters(额定电压下 At Rated Voltage)

3.4.1 动作时间 Operate Time: ≤ 10 ms。

3.4.2 释放时间 Release Time: ≤ 10 ms。

3.5 振动 Vibration

强度: 10 Hz~500 Hz, 58.8 m/s²。产品外观、结构和性能不应有异常。

Durability: 10 Hz~500 Hz, 58.8 m/s² .It shall be no abnormalities in appearance, construction and performance.

3.6 冲击 Shock

强度: 294 m/s² (脉冲持续时间 6 ms), 36次(三个相互垂直轴线的每一个方向 6次, 总共 36次) 产品外观、结构和性能不应有异常。

Durability: 294 m/s²(Duration 6 ms), 36 shocks (six ops in both directions of each of the three mutually perpendicular axes, totally 36 ops) It shall be no abnormalities in appearance, construction and performance.

3.7 焊接性能 Solderbility

继电器引出端在焊锡温度 $(260 \pm 3)^\circ\text{C}$ 下，浸锡时间 (5 ± 0.5) s 之后，被浸锡部分应有 90% 以上连续覆盖一层锡层。

The terminals of relay in solder temperature of $(260 \pm 3)^\circ\text{C}$ and immerging time for (5 ± 0.5) s, 90% of the immerged portion shall be soldered continuously.

4 订货标记 Ordering Information

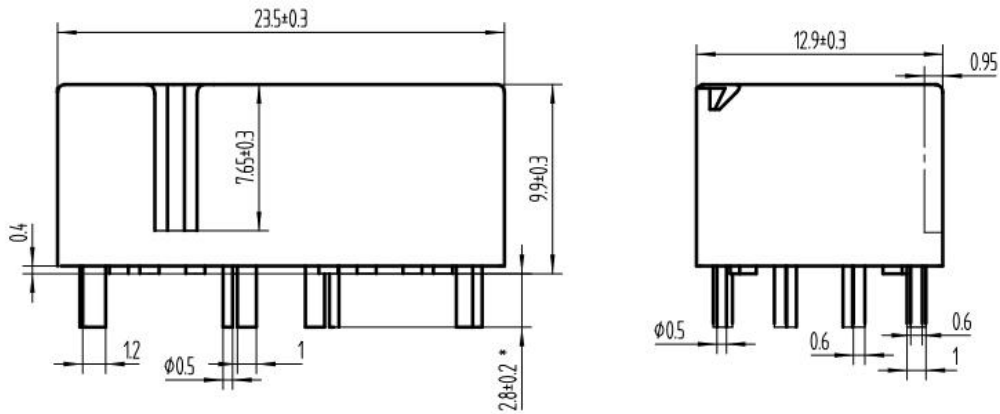
HFKC/ 012 - 2Z S T

① ② ③ ④ ⑤

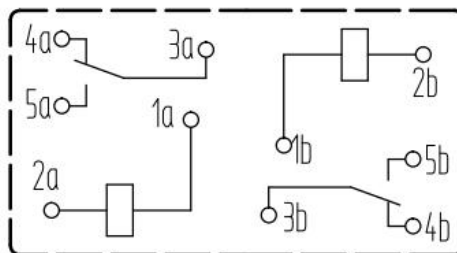
① 产品型号 Product Part NO.	HFKC
② 线圈电压 Coil voltage	12 VDC
③ 触点形式 Contact form	2Z: 2组转换 2 Form C
④ 封装形式 Construction	S: 塑封型 Plastic Sealed
⑤ 触点材料 Contact material	T: AgSnO ₂ 系列

5 产品结构 Configuration

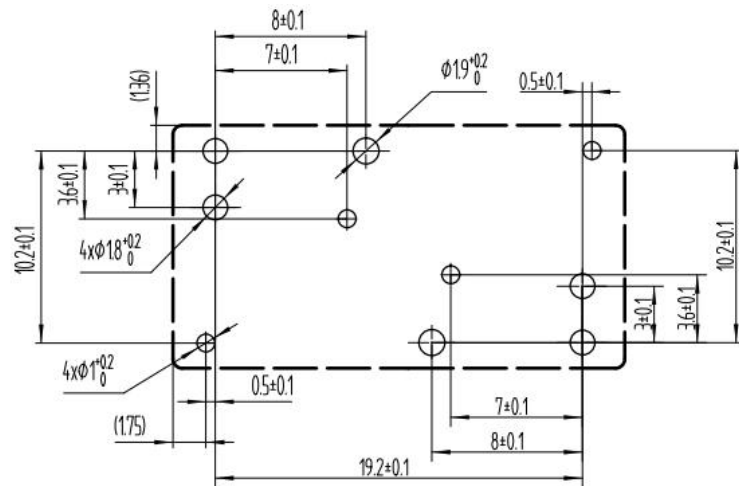
5.1 外形图 Outline Dimensions



5.2 接线图 Wiring Diagram



5.3 安装孔位图 (底视图) PCB Layout (Bottom View)



注：未注尺寸公差按下表执行。

Note: All unspecified tolerance please refer to the following table.

产品外形尺寸未注尺寸公差 Outline dimensions with no tolerance specified mm		PC 板未注尺寸公差 with no tolerance specified mm
外形尺寸 Outline Dimensions	公差 Tolerance	±0.1
≤1	±0.2	
>1~5	±0.3	
>5	±0.4	

6 其它 Others

6.1 标准测试条件 Standard Test Conditions

6.1.1 温度 Temperature: 23 °C ± 5 °C。

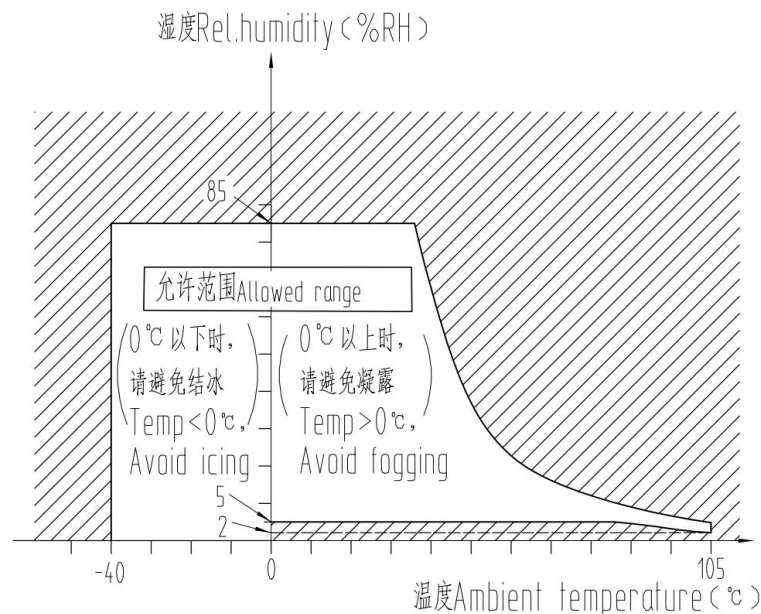
6.1.2 湿度 Humidity: 25%~75% RH。

6.1.3 方向 Direction of Measurement: 任意 Free。

6.2 使用环境条件 Operate Ambient Conditions

6.2.1 环境温度 Ambient Temperature: -40 °C ~ 105 °C。环境湿度 Ambient Humidity: 2%~85% RH (应避免结冰、凝露。Avoid icing and fogging)。

另外，湿度范围会因温度不同而有所不同，故应控制在下图所示范围。Also, the range of humidity varies depending on temperature, so it should be controlled within the range shown in the following graph.



6.2.2 安装方向 Mounting Direction: 任意 Free。

6.3 贮存条件 Storage Conditions

6.3.1 温度 Temperature: 不宜超过 40 °C。Not exceeding 40°C.

6.3.2 湿度 Humidity: 不宜超过 85% RH。Not exceeding 85% RH.

6.3.3 环境 Environment

a) 产品贮存场地不能有腐蚀性气体 Store in locations where the product is not exposed to corrosive gas;

b) 贮存中应避免阳光直照产品 Avoid sunshine during storage;

6.4 塑封型产品, 在焊接完成后, 如果要进行清洗, 请与宏发技术中心联系。Regarding the plastic sealed specifications of reflow soldering relay, after the reflow soldering, its plastic seal performance will be degraded, and the plastic performance of the relay is not guaranteed. The housing of the relay has a slight bulge. The plastic sealed relay, if cleaning is necessary after soldering, please contact Hongfa R&D center.

6.5 如果在硫化气体或有机气体环境中长时间放置或使用继电器, 触点表面有时会腐蚀, 发生接触不稳定及接触障碍, PCB 继电器引出端可焊性下降。如果在硅气体环境中长时间放置或使用继电器, 触点表面会生成硅膜, 导致接触不良。

可采用以下措施降低有害气体的影响:

a) 继电器安装在密封的电器盒或控制器中;

b) 使用塑封型继电器。

If the relay is put or used in the vulcanized gas or organic gas for a long time, the contact surface will sometimes be corroded, leading to the unstable or faulty contact and the solderability of the PCB relay terminal will be reduced.

If the relay is put or used in the silicon gas for a long time, the contact surface will generate the silicon membrane, thus causing the poor contact.

You can take the following measures to mitigate the effect of the harmful gas:

- a) To install the relay into a sealed electric box or control box;
- b) To use a sealed relay.

6.6 PCB 继电器表面及周围不得涂覆含有有机硅的表面处理剂。Do not apply silicone-coated adhesive to the surface of the PCB relay and its surroundings.

6.7 请避免让继电器在含有机硅的环境下使用，否则有机硅进入继电器内部后，有可能会造成继电器触点加速失效。使用环境气体中，如果含有水汽及 H₂S、SO₂、NO₂、Cl、P、粉尘等以及目前未知的有害物质、元素，可能会导致继电器使用过程中，触点发生电阻变大、接触不良等。以上情况下，请对产生有害物质、元素的物料进行管控或使用塑封继电器规格，并进行相关试验验证，确认是满足使用要求。Please avoid using the relay in silicone gas environment, otherwise the entry of silicone into the relay may acceleration contact failure. If there are harmful substances and elements such as water vapor, H₂S, SO₂, NO₂, Cl, P, dust, etc., as well as unknown harmful substances and elements, In the use of environmental gases, it may lead to increased contact resistance and poor contact during the use of relays. In the above situations, please control the materials that produce harmful substances and elements or use plastic sealed type, and arrange relevant tests to confirm that it meet the requirements for actual use.

6.8 为了防止印制板的绝缘劣化，如果要进行表面处理，请参考“术语解释及使用指南”（见 <https://source.cn.hongfa.com/pdf/web/viewer.html?file=\Uploads\Down\PDF\GR1002.pdf>）或与宏发技术中心联系。In order to prevent PCB insulation degradation, if coating is necessary, please see to <https://source.cn.hongfa.com/pdf/web/viewer.html?file=\Uploads\Down\PDF\GR1006.pdf> for more information or contact with Hongfa R&D center.

6.9 避免在强磁场条件下使用、运输、贮存继电器，外界强磁场会造成继电器动作和释放等参数发生变化。Avoid using、transportation、storage relays in strong magnetic field because it will change the parameters of relay such as operate and release voltage.

6.10 对宏发而言，不可能评定继电器在每个应用领域、应用环境的所有性能参数要求，因而，客户应根据具体的使用条件选择与之相匹配的产品，若有疑问，请与宏发联系获得更多的技术支持。但产品的选型责任仅由客户负责。We could not evaluate all the performance and all the parameters for every possible application field and environment. Thus the user should be in a right position to choose the suitable produce for their own application. If there is any query, please contact Hongfa for the technical service. However, it is the use's responsibility to determine which product should be used only.

6.11 本产品规格书供客户使用时参考，其中，未明确规定的要求条件，参考“继电器术语解释及使用指南”（见 <https://source.cn.hongfa.com/pdf/web/viewer.html?file=\Uploads\Down\PDF\GR1006.pdf>）

[n\PDF\GR1002.pdf](#))。The specification is for reference only. See to “Terminology and Guidelines” (see <https://source.cn.hongfa.com/pdf/web/viewer.html?file=\Uploads\Down\PDF\GR1006.pdf>) for more information.

6.12 为了保持继电器的性能，请注意不要使继电器掉落或受到强冲击。强烈建议掉落后
的继电器报废。To maintain the performances of relays, please do not make the relay
drop or be shocked strongly. If the relay is dropped , It should not be used again。
Suggest that the relays dropped be scrapped.

6.13 规格书内的各项性能参数是基于标准测试条件下测得的初始值。All the
performance data listed in the data sheet are the initial values tested under
standard testing condition.

6.14 环保措施 Environmental Protection

宏发产品均符合 RoHS 要求。Hongfa products are all RoHS compliant.

6.15 宏发保留对产品更改的权利，客户在首次下单之前应确认此规格书内容，必要时可
要求我司提供新的规格书。Hongfa reserves the right to make changes. Customers
should reconfirm the contents of the specification before first orders and ask
for us to supply a new specification if necessary.

6.16 事前协议事项 Priority Consultation

无 None