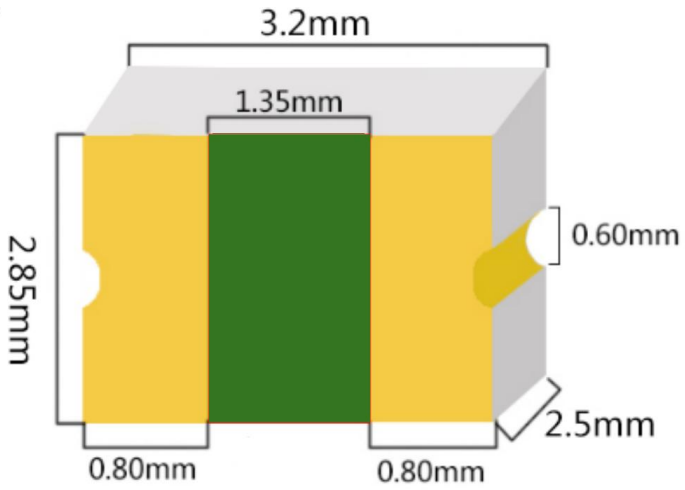
KD1908

Data Sheet
规格书



KD1908

Normally Open Mechanical Tilt / Angle Switch
常开型机械式倾斜 / 角度开关

Description / 功能概述

The KD1908is a compact SMD normally open mechanical tilt / angle switch designed for reliable orientation and angle-triggered detection in electronic control systems.
When the device is tilted beyond the preset angle, the internal mechanical contact is activated and the output switches state. Once the device returns to its original position, the contact opens again.
KD1908 是一款贴片式 **常开型机械式倾斜 / 角度开关**，用于电子控制系统中的姿态与角度触发检测。当设备倾斜超过设定角度时，内部机械触点被触发导通；当设备恢复至原始位置时，触点自动断开。

The triggering angle can be customized according to application requirements, with common options including 30°, 45°, and 60°.The sensor supports both top-side and bottom-side mounting, enabling reverse conduction behavior depending on installation orientation, which provides greater flexibility for PCB layout and system design.
产品支持多种触发角度定制，常见角度包括 30°、45°、60°，可根据具体应用需求进行设定。同时支持**正面与反面贴装**，不同安装方向可实现反向导通功能，为 PCB 布局及系统设计提供更高灵活性。

Featuring a fully sealed mechanical structure, the KD1908offers stable performance, long operational life, and strong resistance to dust and environmental influences. Its simple on/off output can be directly connected to MCU GPIO pins or control logic circuits, making it suitable for a wide range of angle-based, posture-based, and safety-related trigger applications.Its sealed internal photoelectric mechanism ensures stable response, long service life, and excellent environmental resistance. The digital output can directly interface with MCU GPIO to support a wide range of motion-triggered applications.

采用全密封机械结构设计，具备响应稳定、使用寿命长以及良好的防尘和环境适应能力。其简单的开关量输出信号可直接连接 MCU GPIO 或控制逻辑电路，广泛适用于各类**基于角度、姿态及安全控制的触发应用场景**。

Features / 产品特性

- Normally open mechanical tilt / angle switch
常开型机械式倾斜 / 角度开关
- Preset triggering angle with customization options (e.g. 30°, 45°, 60°)
预设触发角度设计，支持多种角度定制（如 30°、45°、60°）
- Conducts when tilted beyond the preset angle; opens when returned to original position
当倾斜超过设定角度时导通，恢复原始位置后自动断开
- Supports both top-side and bottom-side mounting with reverse conduction behavior
支持正面与反面贴装，不同安装方向可实现反向导通
- Simple on/off output suitable for direct connection to MCU GPIO or control logic circuits
简单的开关量输出，可直接连接 MCU GPIO 或控制逻辑电路
- Compact SMD package saves PCB space and supports miniaturized designs
贴片式小型封装，节省 PCB 空间，适用于紧凑型设计
- Fully sealed structure provides resistance to dust and environmental influences
全密封结构设计，具备良好的防尘及环境适应能力
- Long operational life with stable and reliable mechanical performance
机械结构稳定，使用寿命长，可靠性高
- 100% factory tested before shipment
出厂前 100% 测试

Applications / 应用领域

This mechanical tilt / angle switch is designed for reliable angle-based and orientation-triggered detection in electronic control systems.

It is especially suitable for applications with limited internal space and high reliability requirements, where a simple and stable on/off trigger is required.该机械式倾斜 / 角度开关适用于电子控制系统中的角度与姿态触发检测，特别适用于内部空间受限且对稳定性和可靠性。要求较高的应用场景，可实现简单、可靠的开关量触发控制。

Typical applications include but are not limited to:
产品广泛应用于但不限于以下领域：
•Smart toilets 智能马桶
•Wearable devices (wrist-raise detection)
可穿戴设备（抬腕亮屏）
•Fall detection for smart canes or medical beds
智能拐杖或医疗床跌倒检测
•Smart meters (anti-tampering detection)
智慧电表防窜改检测
•Home appliances and smart home systems
家用电器及智能家居系统
•Robotics and automation equipment
机器人及自动化设备

Electrical Characteristics / 电气特性

Rated Voltage 额定电压	0.5-9V
Contact Resistance 接触电阻	10mΩ Max
Rated Current 额定电流	2μA~0.5A
Temperature Range 耐温	-40℃~85℃
Insulation Resistance 绝缘电阻	>10MΩ
Vibration Lifetime 振动寿命	≥2,000,000 cycles

Functional Characteristics / 功能特性

1. Operating Principle / 工作原理

The KD1908 operates based on a mechanical contact switching mechanism. When the device is positioned within its normal orientation range, the internal contact remains in an open state. Once the device is tilted beyond the preset triggering angle, the mechanical contact is activated and the output switches to a conductive (ON) state. When the device returns to its original position, the contact automatically opens again.

HS1908-F30 采用 **机械式触点开关结构** 工作。当产品处于正常安装姿态范围内时，内部触点保持断开状态；当设备倾斜超过预设触发角度时，机械触点被触发并导通；当设备恢复至原始位置后，触点自动复位并再次断开。

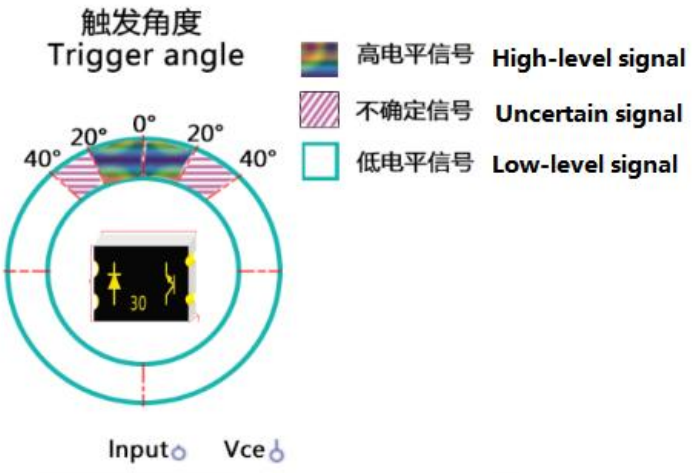
2. Trigger Angle Characteristics / 触发角度特性

TheThe triggering behavior of the HS1908 is determined by the preset mechanical angle threshold.

HS1908-F30 的触发行为由预设的机械触发角度决定，其工作特性如下：

•Within the normal orientation range → Contact remains open
在正常安装姿态范围内 → 触点保持断开
•Approaching the preset angle → Contact may intermittently change state due to mechanical tolerance
接近触发角度时 → 由于机械公差，触点可能出现短暂变化
•Beyond the preset triggering angle → Contact switches to a stable conductive (ON) state
超过设定触发角度后 → 触点稳定导通

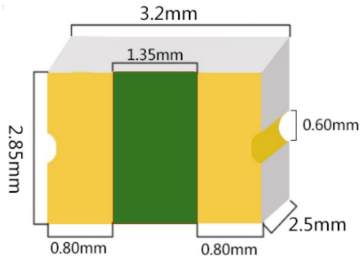
The triggering angle can be customized according to application requirements, such as 30°, 45°, or 60°.
触发角度可根据应用需求进行定制，例如 **30°、45° 或 60°** 。
A typical representation of the triggering angle behavior is shown in the diagram below.
典型的触发角度示意请参见下图。



Mechanical Dimensions / 机械尺寸

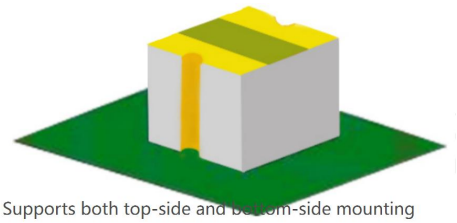
Mechanical dimensions are shown as follows. All dimensions are in millimeters unless otherwise specified.

产品机械尺寸如下，除特别说明外，单位均为毫米。



Front View 正面

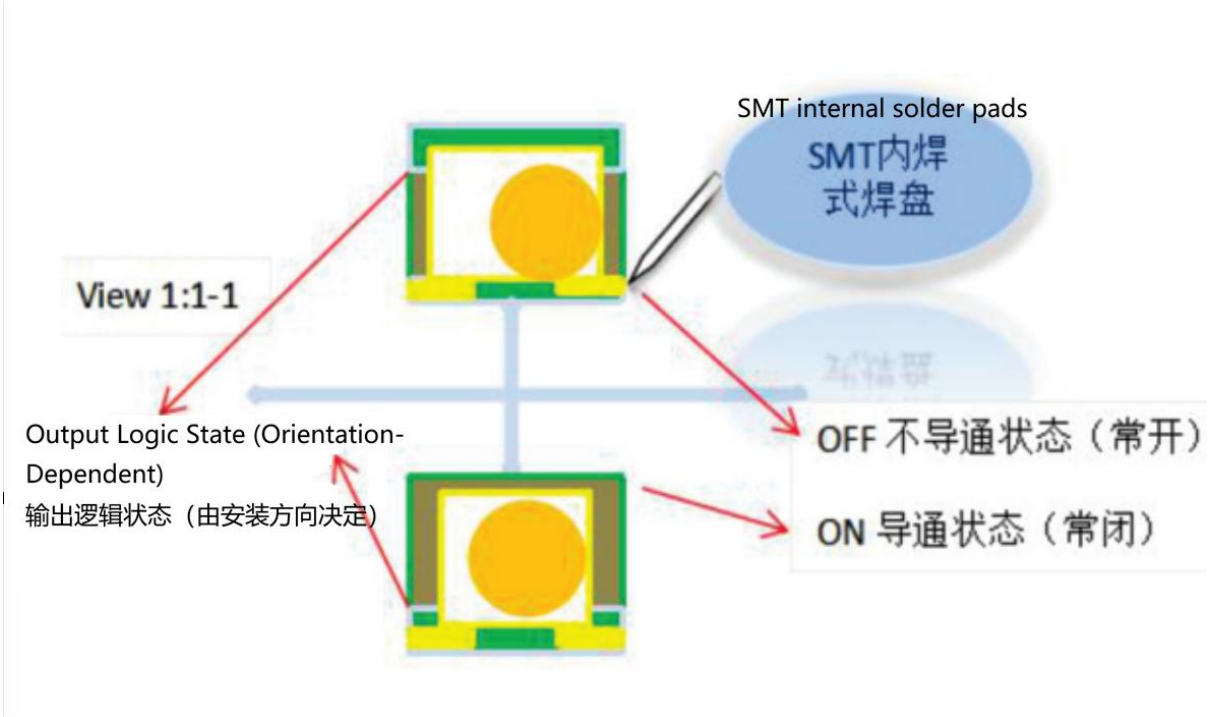
Back View 反面



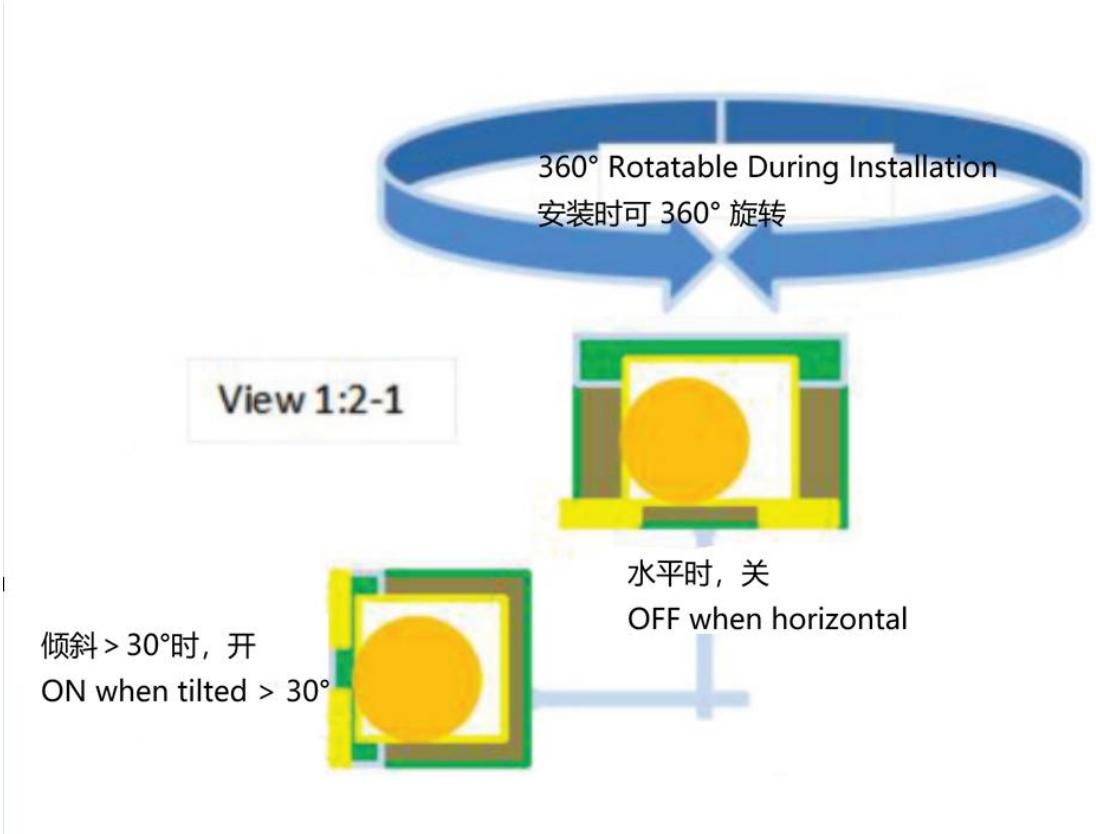
SMT both side 正反面可贴

Mounting Orientation and Operating States/ 产品安装方向与工作状态示意

The operating state of the sensor depends on the mounting orientation and tilt angle. By mounting the device in different orientations (top-side or bottom-side placement), opposite output logic can be obtained under the same tilt condition.
传感器的工作状态与安装方向及倾斜角度有关。 通过正贴或反贴安装方式，可在相同倾斜条件下获得相反的输出逻辑



The device can be rotated around its mounting axis during installation.Electrical switching behavior is determined by gravity direction relative to the sensor body.
器件在安装时可绕自身轴线旋转，其电气导通状态由重力方向相对于器件本体的位置决定。



Soldering Characteristics / 焊接特性

Manual Soldering

手工焊接

- Max tip temperature: **330°C ±10°C**

烙铁温度 **330°C ±10°C**

- Max contact time: **< 3 seconds**

接触时间 **< 3 秒**

Reflow Soldering (SMT)

回流焊（SMT）

• Peak temperature: **255°C ±10°C**

峰值温度 **255°C ±10°C**

• Max exposure time: **< 5 seconds**

加热时间 **< 5 秒**

Flux Requirements

助熔剂要求

• Do not use strong acid or alkaline flux

助焊剂不得使用强酸性或强碱性材料

General Caution

注意

• Avoid mechanical stress during and after soldering

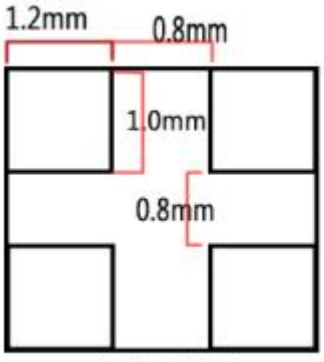
焊接过程中及焊后需避免机械应力

• Do not reflow more than twice

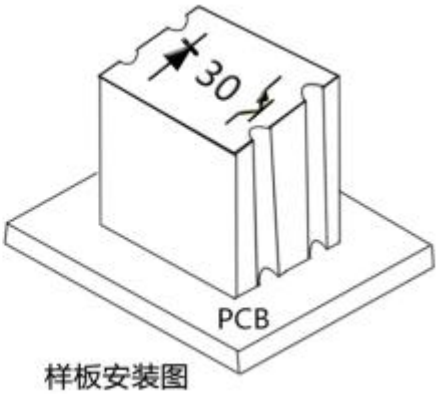
不建议回流焊超过两次

• Allow full cooling before handling

冷却前请勿搬动或外力按压器件



PCB焊盘贴片位

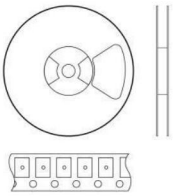


样板安装图

Packaging/包装

Tape&Reel packing
编带包装

4000pcs/Packing
4000pcs/盘



Notes & Safety Instructions/注意事项

1. Perform application-specific verification before use.
Before using this product, perform necessary tests and verification under actual application conditions to ensure proper functionality and reliability.
在使用本产品之前，应根据实际应用环境和条件进行必要的功能与可靠性测试，确认产品能够满足要求。

2. Use this product according to its intended purpose and specifications.
Refer to the datasheet for product characteristics, performance limits, and recommended operating conditions.
请依据产品特性、性能限制及规格书中规定的适用条件进行使用。

3.This product is not intended for life-support, safety-critical, or high-reliability systems.
Do not use the product in medical life-support equipment, safety protection systems, or devices requiring extremely high reliability.
本产品不得用于医疗生命维持设备、安全关键系统或其他需极高可靠性的装置。

4. Avoid contact with corrosive or conductive substances.
Keep the product away from acids, alkalis, corrosive chemicals, moisture, and conductive

liquids to prevent damage.
Also avoid placing the product near strong magnetic or ferromagnetic materials.
请避免产品接触酸性、碱性、腐蚀性化学品及导电液体（如水、湿气），以防损坏。
同时避免将产品置于强磁场或铁磁性物体附近。