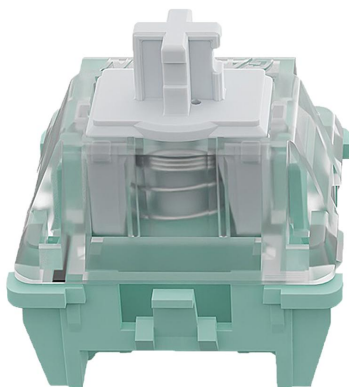


# GATERON

## Product Specification



GATERON Product Name:

Keyboard Switch( Magnetic Jade Switch)

GATERON Item No.:

KS-20TF10B045NW-Y89 (自润)

### 1. General Characteristics:

1.1 Application : This specification is applied to the switch for general applications.

1.2 Operating Temperature Range : -40 °C to +80 °C

1.3 Operating Relative Humidity Range :  $\leq 85\%$  RH, +40 °C

1.4 Test Conditions :

Unless otherwise specified, the atmospheric conditions for making measurements and tests are as follows:

Ambient Temperature : 5-35°C

Air Pressure : 86-106 Kpa

Relative Humidity : 45-85% RH

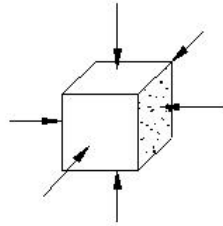
### 2. Appearance, Structure and Dimensions:

2.1 Appearance : The switch shall have good finishing, and no rust, crack or plating defects.

2.2 Structure and Dimensions : Refer to individual product drawing.

2.3 Markings : Refer to individual product drawing.

|     | Item               | Criteria                            | Test Method   |
|-----|--------------------|-------------------------------------|---|
| 3.1 | Total Travel       | Refer to individual product drawing | The Actuator shall be applied to the tip of actuator in operating direction to change component from free position to end point             |
| 3.2 | Initial Force      |                                     | A static load shall be applied to the tip of actuator in operating direction to change the component to initial position (0.3mm)            |
| 3.3 | Total Travel Force | <110gf                              | The Actuator shall be reduced to the tip of actuator in operating direction to change component from operating position to end point(3.5mm) |

|     |           |   |  |
|-----|-----------|---|--|
| 3.4 | Vibration |   | <p>Switch shall be secured to a testing machine by anormal mou device and method. Switch shall be measured after following test</p> <p>(1)(Vibration frequency range) = <u>10-55 Hz</u></p> <p>(2)(Total amplitude) = <u>1.5mm</u></p> <p>(3)(Sweep ratio): <u>10-55-10Hz</u></p> <p>1(Approx. 1 min.)</p> <p>(4)(Method of changing the sweep vibration frequency:logarithm linear)</p> <p>(5)( Direction of vibration: Three perpendicular directions incl actuating direction.)</p> <p>(6)Duration : 2 hours / direction (6 hours in total)</p> |
| 3.5 | Shock     | <p>After test:</p> <ul style="list-style-type: none"> <li>- No abnormalities shall be recognized in appearance and construction.</li> </ul> | <p>(Switch shall be measured after following test:)</p> <p>(1) ( Mounting Method: Normal )</p> <p>(2) (Acceleration) : <u>245m/s<sup>2</sup> (25G)</u></p> <p>(3) ( Duration ) : <u>11ms</u></p> <p>(4) (Test Direction) : <u>6</u> directions)</p> <p>(5)Number of shocks : 3 times per direction (18 times in total)</p>    |

#### 4. Durability Characteristics:

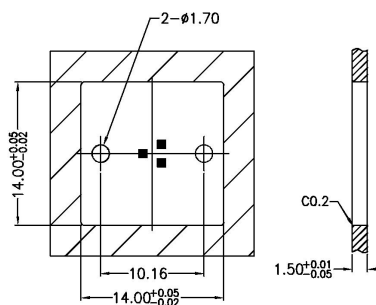
|     | Item                        | Criteria   | Test Method  |
|-----|-----------------------------|--|--|
| 4.1 | Operating Life without Load | <p>After test:</p> <ul style="list-style-type: none"> <li>- Mechanical characteristics of items 3.1 ~ 3.3 shall be satisfied.</li> </ul> | 100,000,000 cycles of operation shall be performed continuously at a rate of 300 cycles per minute without load. |

#### 5. Weather Proof Characteristics:

|     | Item                | Criteria   | Test Method   |
|-----|---------------------|--|---|
| 5.1 | Cold Proof          | <p>After test:</p> <ul style="list-style-type: none"> <li>- Mechanical characteristics of items 3.1 ~ 3.3 shall be satisfied.</li> </ul> | After testing at -40±2°C for 96 hours, the switch can stay under normal temperature and humidity conditions for 1 hours, and measurement shall be made within 1 hour after that. Water drops shall be eliminated.           |
| 5.2 | Hot Proof           |  | After testing at 80±2°C for 96 hours, the switch can stay under normal temperature and humidity conditions for 1 hours and measurement shall be made within 1 hour after that.  |
| 5.3 | Moisture Resistance |  | After testing at 40±2°C, 90-95% RH for 96 hours, the switch can stay under normal temperature and humidity conditions for 1 hours, and measurement shall be made within 1 hour after that. Water drops shall be eliminated. |

#### 6. Mounting Options:

The suggestion dimension of mounting:



|  |
|--|
|  |
|--|

## 7. BOM:

| No. | Parts Name | Quantity | Material and Specifications | Prevent fire grade | Remarks     |
|-----|------------|----------|-----------------------------|--------------------|-------------|
| 1   | Cover      | 1        | Thermoplastic               |                    | Transparent |
| 2   | Case       | 1        | Thermoplastic               |                    | Cyan        |
| 3   | Actuator   | 1        | Thermoplastic               |                    | Grey white  |
| 4   | Spring     | 1        | Stainless steel             |                    |             |
| 5   | Magnet     | 1        |                             |                    |             |

### Precautions for use:

1. General: The product is used mainly in electronic devices such as automotive devices, visual devices, home electrical appliances, information devices and communication settings. If the products is intended to be used for other endurance equipments requiring higher safety and reliability such as life support system, space and aviation devices, disaster and safety system, it's necessary to make verification of conformity or contact us for the details before using.

#### 2. Assembly structure and Mechanical design:

The dimensions for the holes and the pattern on PCB should refer to the recommended dimensions on the engineering drawing.

(2) The switch might be broken if there is stress stronger than the specified is given on it. Take special care not to stress the switch beyond its specification.

(3) If the switch is being used together other products, please confirm the compatibility of the specification, laws and regulations. Please also confirm the compatibility of switch to be installed in the systems, machines and devices used by customer. If you want to change the operating conditions of the switch, please consult with us in advance.

#### 3. Operating Environment

(1) If the product is always used near sulfurate hot spring where sulfide gas is generated or in a place where exhaust gas from automobiles exists, it's necessary to pay more attention because the switch performance may be affected.

(2) If the below parts or materials are used in the module where the switch is installed, directions below should be followed:

A. For parts, rubber materials, adhesive agents, packing material and grease used for the mechanical part of the device, don't use any material that may generate gas of sulfurization or oxidation.

B. If silicon rubber, grease, adhesive agents and oil are used, choose the material that will not generate low molecular siloxane gas, because the low molecular siloxane gas may form silicon dioxide coat on the switch contact part, resulting of failing contact.

(3) Don't use the switch in the environment with high humidity or other bedewing possibility, as it may cause leaking among the terminals.

(4) The effect caused by outer immersed dust: Because the switch was designed without dust-proof structure, it may have failing contact due to the immersed dust from the outer environment. When using the switch, it's necessary to take dust-proof actions. Examples of immersed dust, which should be prevented during the operation:

A. The scraps being generated during PCB processing, or other waste from the protective material for PCB such as newspaper, foam, polystyrene materials, may immerse inside the switch.

B. The flux or solder powder being generated when stacking the PCB may immerse inside the switch.

#### 4. Storage Method:

(1) In order to protect the switch performance, it should keep the switch under the following conditions:

A. Temperature of -40C to +80C, with humidity lower than 85%RH;

B. Avoid storing in the environment containing corrosive gas;

C. After purchasing, the storage period should not exceed 6 months.

D. Avoid keeping it in the location with direct sunlight.

(2) Store using the standard packing without exerting force.

(3) The standard storage period is 3 months, with maximum up to 6 months, preferably to be used as soon as possible. After opening the package, you should put the remaining switches in a plastic bag to prevent from damp and corrosive gas.

#### 5. Others: Please take good care to comply with the following guidelines:

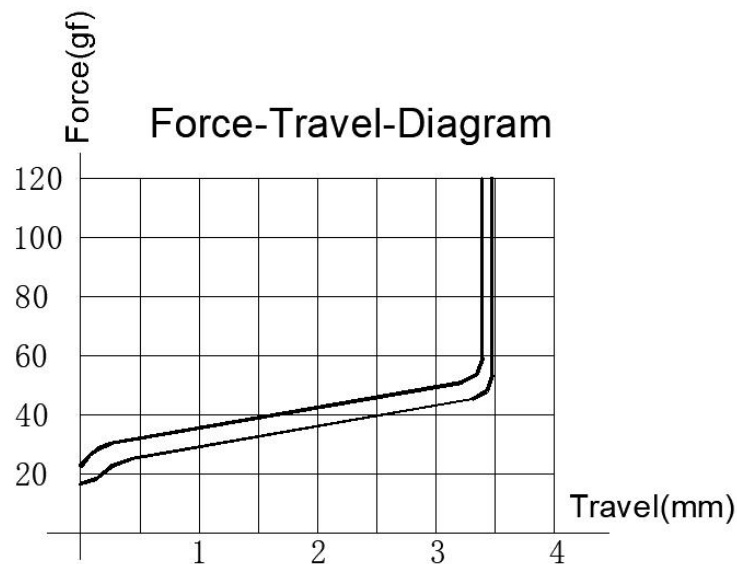
(1) , The prohibited practices where there is fire and fume:

A It might catch fire if the rating exceeds the specifications. Never use the switch beyond the rating.

B If the rating may exceed due to some abuse or abnormal usage, please take protective measures such as protective circuit to shut down the circuit.

(2) Precautions to the products requiring special safety:

- A. Though we are confident in switch quality, we can't deny the possibility that there could be failure due to inferior performance, short or open circuit. Therefore, when designing the product requiring special safety, please verify in advance what effects would show on your product in case the switch alone may fail.
  - B. Prepare the system with protective circuit and protective devices for safety purposes.
  - C. Prepare safety standby circuit to preclude the whole system failure that may result from specific failure.
- (3) Force travel diagram, soft tactile action:

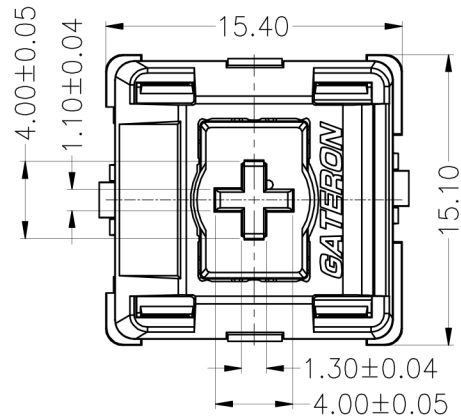


This specification issued by:

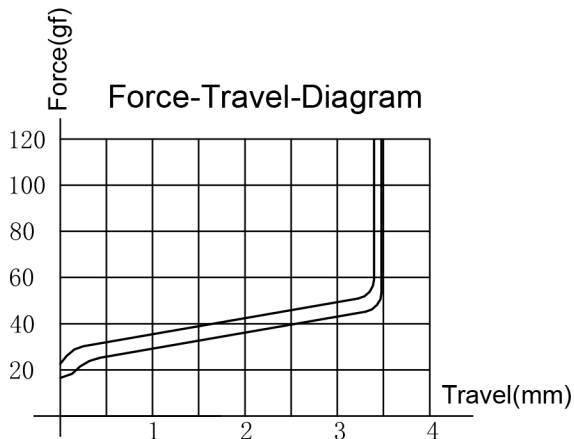
Company: Huizhou GATERON Electronic Technology Co., Ltd.

Address: No. 1, Songbei Road, China - Korea (Huizhou) Industrial Park, Zhongkai High Tech Zone,  
Huizhou City, Guangdong Province, China, 516000

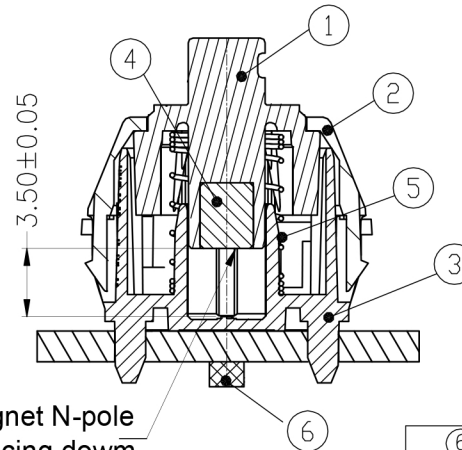
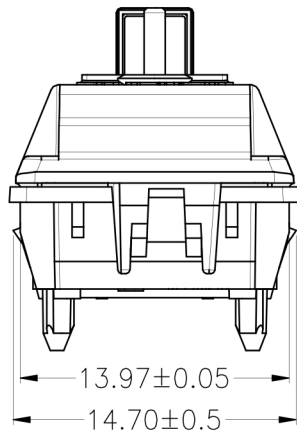
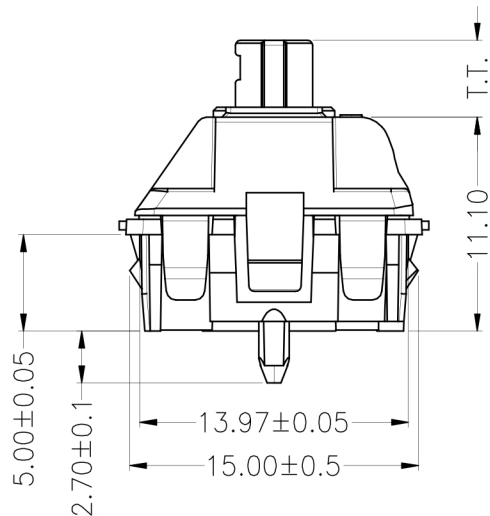
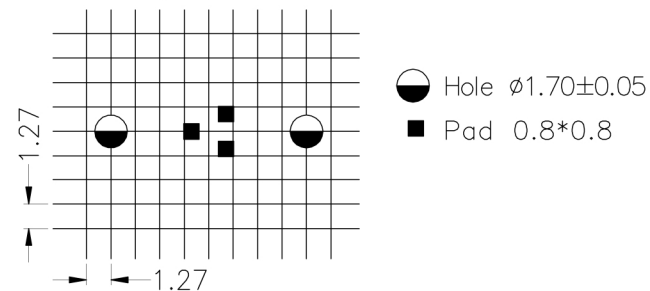
Web: [www.gateron.com](http://www.gateron.com)



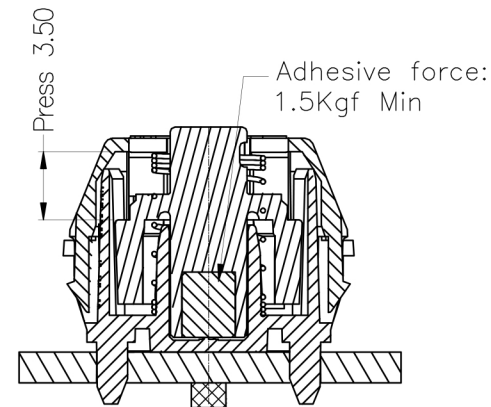
Force-Travel-Diagram



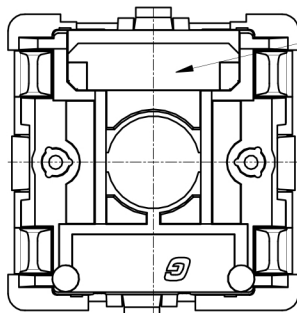
Layout of PCB



Magnet N-pole  
is facing down





Notes:  
There is a slight oil overflow in the lubed  
switch, which is a normal phenomenon.  
Please choose it carefully.



The hole for setting RGB

|      |             |                            |
|------|-------------|----------------------------|
| ⑥    | Hall sensor |                            |
| ⑤    | Spring      | Stainless steel            |
| ④    | Magnet      |                            |
| ③    | Case        | Thermoplastic(Cyan)        |
| ②    | Cover       | Thermoplastic(Transparent) |
| ①    | Actuator    | Thermoplastic (Grey White) |
| ITEM | Part Name   | Material                   |

|                           |   |
|---------------------------|---|
| Initial Force:            | 30±10gf   |
| Total travel:             | 3.5±0.2mm   |
| Magnetic Flux<br>(N Pole) | Initial Position: 120±15Gs<br>Total Travel Position: 700±80Gs |
| Operation Life:           | 100,000,000 Cycles Min  |

|             |                     |               |            |   |                                      |  |        |              |               |
|-------------|---------------------|---------------|------------|---|--------------------------------------|--|--------|--------------|---------------|
|             |                     |               |            |   |                                      |  |        |              |               |
| REV.        | DATE                | MODIFICATION  |            |   |                                      |  |        |              | PRIOR VERSION |
| Title/Proj  |                     | KS-20T SERIES |            |   | Tolerance Unless Otherwise Specified |  |        |              |               |
| Part No     | KS-20TF10B045NW-Y89 | Version       | 1          | ~3  | >3~10                                | >10~30   | >30~80 | >80~180      | Angle         |
| Drawing No  | KS-20TF10B045NW-Y89 | Scale         | 5:2        | ±0.2  | ±0.3                                 | ±0.4   | ±0.6   | ±0.8         | ±3'           |
| Drafted by  | Zhu Yinjun          | Date          | 2024-01-16 | Unit: mm  |                                      | Size: A4   |        | SHEET 1 OF 1 |               |
| Checked by  | Wu Furong           | Date          | 2024-01-16 | THIRD ANGLE   |                                      | <div><br/>GATERON Electronic Technology Co.,Ltd</div> |        |              |               |
| Approved by | He Shiyong          | Date          | 2024-01-16 |  |                                      |  |        |              |               |

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