Product manual

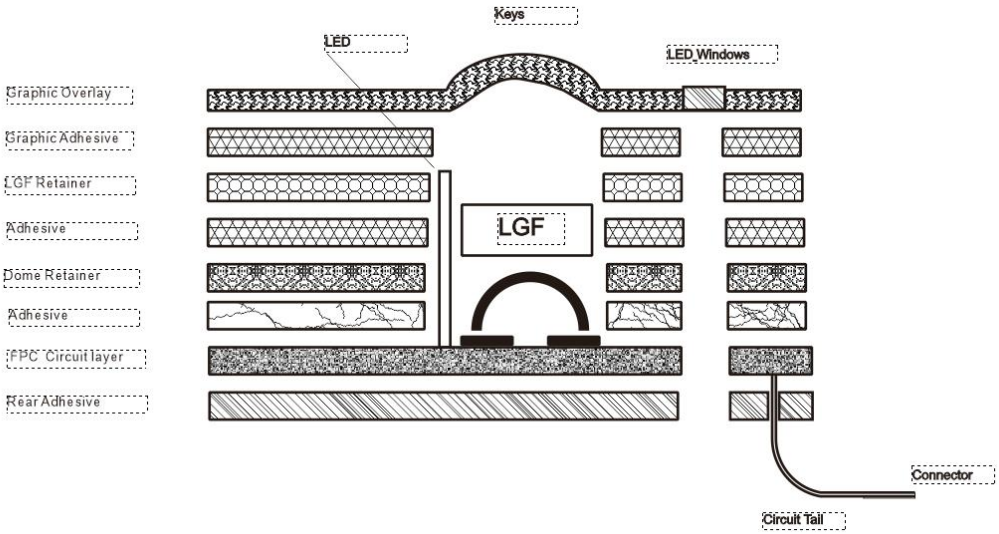


- Product Number: MBR-0009

- Product Name：LGF backlit key panel

- Application condition: Suitable for various types of switch panels, especially suitable for use at night and in environments with poor lighting;

- Product structure description and structure diagram-anatomic diagram:



a. Graphic Overlay: PET materials with a thickness of 0.13mm-0.2mm are generally used. Use screen printing or digital printing on the back of PET material. The areas requiring light transmission shall be printed with transparent ink using silk screen technology, and the key area on the graphic overlay is generally embossed 0.4-0.6mm;

b. Graphic Adhesive: Use black double-sided adhesive to prevent light overflow and paste graphic overlay and under structure. Double-sided adhesive will be punched in key areas and each opening area will be connected with air slots;

c. LGF Retainer+LGF: Use 0.2mm black PET with LGF mounting holes in the backlit area; LGF is embedded in the installation holes of the LGF retainer; LGF is composed of five layers of materials from top to bottom: diffusion film, double-sided adhesive, light guide film, double-sided adhesive, and reflective film; The light guiding film can be completed using screen printing, engraving, and molding processes.

d. Middle Adhesive: Use black double-sided adhesive to paste LGF retainer and under structure ;

e. Dome Retainer: White PET with a diameter of 0.1mm is used as the dome retainer to limit the position of the dome.

f. Adhesive: Use black double-sided adhesive to paste dome retainer and under structure. Open holes in the area of the keys to place and fix metal dome;

g. FPC circuit layer: Arrange LED lights (side lights) and touch pads for buttons on the circuit;

h. Rear Adhesive: Use 3M468 double-sided adhesive to bond to the backing plate.

- Working principle: When the finger presses the crystal key, the metal dome contacts the contact of the circuit, closing the circuit. When the finger releases the key, the metal dome separates from the contact of the circuit and opens the circuit; When the side lights are powered on, the LED lights on. The light passes through the light guiding film to light the designated area, and then evenly emits light through the reflective film and diffusion film to illuminate the key area.

- Product advantages: Low energy consumption, high brightness, can achieve separate control of various luminous areas, and display multiple colors in the same area.

- Product challenges: It is necessary to design a suitable LGF structure according to product requirements, and the light guide film in the LGF structure needs to be professionally adjusted to produce uniform light.

- Product parameters: Maximum working voltage: 42V (DC) or 25V (AC);

a. Maximum working current: 100mA;

b. Maximum loop resistance: 100 Ω; (or specified by customers)

c. Product forming tolerance: ±0.1mm

d. Key life: 1,000,000 times

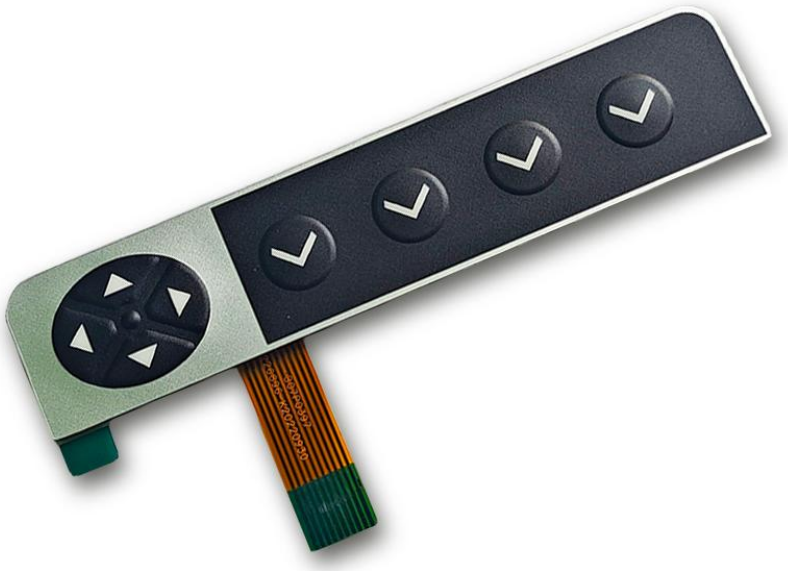
e. Insulation resistance: 100M Ω;

f. High voltage resistance: 500V, 50HZ, no breakdown or flashover for 1 minute

g. Bending of lead strip: R2mm, repeated bending at 90 ° for 50 times. The loop resistance less than 100 Ω;

h. Usage and storage environment: -20 ℃ ~85 ℃ . Relative humidity not exceeding 80%;

i. Key force: 400g-600g;

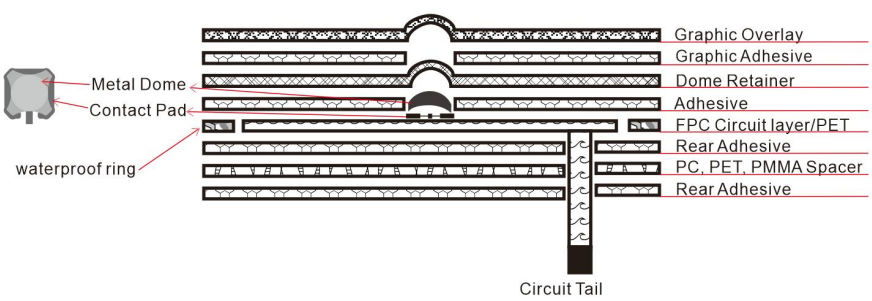


- Product Number: MBR-0001

- Product Name: Waterproof membrane switch

- Application condition: We produce high-quality membrane switches for various industries, including industrial control membrane switches, Instruments and meters used in the car, control panels for outdoor applications or high humidity environments (such as navigation, bathrooms, water rooms, etc.).

- Product structure description and structure diagram-anatomic drawing:



a. Graphic Overlay: PET materials with a thickness of 0.13mm-0.2mm are generally used. Use screen printing or digital printing on the back or front of PET material. Cover multiple layers of ink according to the designed pattern and color, then use the designed mould to press the shape of the key in the corresponding area、punching out shapes and holes;

b. Upper Adhesive: Use double-sided adhesive tape to paste graphic overlay and under structure. Generally, in order to make the keys feel better, double-sided adhesive will be punched in the area of the keys and each key opening area will be connected with an air slot;

c. Dome Retainer; Generally, use 0.1mm or 0.125mm transparent PET and holes are made in the corresponding key area;

d. The Spacer: Use double-sided adhesive to bond the dome retainer and under structure.Open holes in the area of the keys to place and fix metal shrapnel, and connect the holes with air slots;

e. Waterproof rings and Circuit: The circuit layer generally uses 0.12mm-0.2mm silver paste circuits or flexible printed circuits. Process the circuit according to the design drawing. As shown in the above figure, the back of the circuit is designed with a shielding mesh to prevent electromagnetic interference and cut to the designed size; Waterproof rings are generally made of PET with the same thickness as the circuit layer and cut into closed

rings, The narrowest width of the ring is greater than 3mm, and the circuit layer is embedded in the waterproof ring;

f. Backing adhesive: Use double-sided adhesive to bond the backing and upper structure;

g. Backing: Use 0.5mm PC to increase the structural strength of the product;

h. Back adhesive: The use of 3M468 double-sided adhesive is an excellent waterproof double-sided adhesive for bonding to the installation position of the machine casing or equipment;

- Working principle: Touch membrane switch. When the finger presses the key, the metal dome contacts the contact of the circuit, closing the circuit. When the finger releases the key, the metal dome separates from the contact of the circuit and opens the circuit.

- Product advantages; Meets the waterproof requirements of IP67 and is suitable for harsh usage environments

Summary Table of IP Rating Numbers			
1st Digit	**Protection From Foreign Body and Particulate Ingress**	**2nd Digit**	**Protection from moisture ingress**
0	No Protection	0	No Protection
1	Protected from solid objects over 50mm	1	Protected from vertical falling drops of water
2	Protected from solid objects over 12mm	2	Protected from direct sprays of water 15° off vertical
3	Protected from solid objects over 2.5mm	3	Protected from direct sprays of water 60° off vertical
4	Protected from solid objects over 1mm	4	Protected from direct sprays of water from all directions - limited ingress permitted
5	Protected from limited dust ingress	5	Protected from low pressure jets of water from all directions - limited ingress permitted
6	Totally protected from dust ingress	6	Protected from strong jets of water from all directions - limited ingress permitted
		7	Protected from temporary water immersion up to 1m deep
		8	Protected from long periods of immersion under pressure

- Product challenges: There needs to be sufficient space to arrange waterproof rings, and the structural design is challenging;

- Product parameters: Maximum working voltage: 42V (DC) or 25V (AC);

    a. Maximum working current: 100mA;

b. Maximum loop resistance: 100 Ω; (or specified by customers);

c. Product forming tolerance: ± 0.1mm;

d. Key life: 1,000,000 times;

e. Insulation resistance: 100M Ω;

f. High voltage resistance: 500V, 50HZ, no breakdown or flashover for 1 minute

g. Bending of lead strip: R2mm, repeated bending at 90 ° for 50 times. The loop resistance less than 100 Ω;

h. Usage and storage environment: -15 ℃~45 ℃. Relative humidity not exceeding 80%;

i. Key force: 350g-400g;