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FPC

Membrane switches

Designed according to your needs

Manufactured in-house

Overview

Our range of electrical components can split into two sections: FPC (Flexible Printed Circuit) and Membrane.

FPC

Assembled FPC

Available as Single-sided, double-sided, and multi-layer FPCs with various electronic components.

Assembled FPC features:

- C4, ACF, and other assemblies all possible
- Components are assembled to an FPC in sheet form before the final blanking process. This method has various advantages over piece-by-piece assembly.
- Modularized FPCs are available upon request. Please contact us for more information.

Assembled FPC specifications:

- A wide variety of electronic component assembly including flip chip, fully automated SMT, and manual soldering
- Metal-dome sheet assembly
- Mold component assembly
- Various connectors assembly
- Micro electrical wire assembly

Multilayer FPC

A multi-layer FPC has three or more conductive layers. It consists of rigid multilayer portions mounted with components and highly bendable lead portions.

Multilayer FPC applications:

- Electrical wiring in smartphones and tablets
- Camera modules
- Small medical electronic equipment and wearable equipment

Multilayer FPC specifications:

- Fine line/space circuit
- Low spring back force
- Micro size VIA hole (LVH: laser via hole, IVH: inner via hole)
- Board-to-board interconnection
- High bending strength
- Electrical noise shield
- High-speed signal transmission (Impedance control)
- Environmentally friendly (Halogen-free)
- Flame resistant (UL Standards)

Double-sided FPC

A double-sided FPC has two conductive layers that are electrically connected by through hole and/or via hole. This provides higher design flexibility compared to single-sided FPCs.

Applications:

- Typically utilized for high-density wiring that cannot use single-sided FPCs.
- Electrical wiring in smartphones, mobile phones, digital still cameras, digital video cameras, tablets, and notebook PCs
- Flexible lead wires for liquid crystal displays
- Electronic devices that require high bending strength (HDDs, and optical-pickup devices)

Specifications:

- Fine line/space circuit
- Low spring back force
- Micro size via hole (LVH: laser via hole)
- High bending strength
- Electrical noise shield
- High-speed signal transmission (Impedance control)
- Environmentally friendly (halogen-free)
- Flame resistant (UL Standards)

Single-sided FPC

A single-sided flexible printed circuit (FPC) has only one conductive layer, generally made of copper foil on one side of a board.

Applications:

- Generally single-sided FPCs are used in small spaces or electronic devices that require high bending strength.
- Electrical wiring in smartphones, mobile phones, digital still cameras, digital video cameras, tablets, and notebook PCs.
- Flexible lead wires for liquid crystal displays
- Electronic devices that require high bending strength (printers, HDDs, and optical-pickup devices)

Specifications:

- Fine line/space circuits
- Low springback force
- High bending strength
- Electrical noise shield
- Environmentally friendly (halogen-free)
- Flame resistant (UL Standards)

The features of single-sided FPCs are thin, soft, and highly bendable. A low springback feature is needed to keep the shape of FPCs bent at the connecting area with a liquid crystal panel, and to save electric power to run an HDD. FPC properties are highly dependent on the materials to be used. Our experienced engineers will select appropriate materials according to your needs in terms of application areas and required properties, thus providing FPCs with satisfactory characteristics.

Membrane

Membrane switches have a range of benefits, including:

- Flexibility - Various circuits can be fabricated on the flexible and pliable film.
- Low price - Low cost due to printing on PET films.
- Wide applicability - Applicable to various devices by using special inks, mounting various components on the film, or by combining the film with various switches and sensors.

Applications are vast. Some of them are:

- PC peripherals - Keyboards, touch pads, LED indicators, printers, and PC monitors
- Home appliances - Microwave ovens, washing machines, fax machines, electric rice cookers, and electric pots
- Telecommunications equipment - Mobile phones and PDAs
- Automobiles - Seat sensors and various operating switches including those for air conditioners
- AV equipment - DVCs, DSCs, and portable CD or MD players
- Musical instruments - Electronic keyboards and DJ players
- Toys - Computer or TV game devices and XY tablets
- Sanitation - Waterproof shower toilet switch panels
- Display panels - Heat-seal connectors
- Film antennas - RFID tags, digitizers, car GPS, and FM receivers
- Medical equipment - Healthcare equipment
- Others - Automatic vending machines, measuring instruments, and machine tools

Customers have multiple options for membrane switches. You can find a summary of these below.

Chip-mounted membrane

This is a highly functional membrane switch on which component devices such as LEDs and diodes are mounted.

Rubber-mounted membrane

Rubber mounted membranes give the user a tactile feeling. They deliver high-speed keystrokes and greater keystroke endurance. High-accuracy rubber-mounting (up to ± 0.2 mm). Flexible printed circuit boards with "click" tactile membrane switches.

Graphic sheet

This is a printed sheet used for decorative purposes (photographic color printing). Features include metal color-printing, embossing, and the formation of a metal-dome pushbutton actuator mounted on the back. A graphic sheet membrane can be used to integrate a thin operating panel into the external appearance when combined with membrane or sheet switches and they are available according to the customer's needs. The sheets feature metal colour-printing, embossing, and the formation of a metal-dome pushbutton actuator mounted on the back. These membranes are used as a display surface for thin operating panels such as those for microwave ovens, equipment items, and toys.

Sheet switch membrane

The sheet switch is a custom product designed and manufactured in accordance with the customer's requirements, with specifications vary depending on the customer's requests. Sheet switch membranes feature metal domes or poly domes mounted on the membrane. The product lineup includes sheet switches combined with a graphic sheet equipped with an actuator. Various patterns can be printed on the graphic sheet. Applications include Sub-operation switches for laptop PCs and operation switches for DVCs and DSCs.

Waterproof membrane switch

Waterproof membrane switches provide water resistance ranging from drops of water to full submersion, meaning a PC keyboard with the waterproof membrane switch can still work normally even after accidental exposure to water. A portable information device with waterproof membrane switches is free from trouble due to exposure to water even if used outdoors.

Key techniques

- Fine circuit pattern printing - Applicable to a pitch of 0.5 mm for connecting areas
- Migration-resistant performance - Enhanced by carbon overcoating
- Interconnection technique - Connection to liquid crystal, FPC, and MB through ACF and ACP
- Surface mounting technology - Component mounting through electrically conductive adhesives
- Double-sided printing technique - Jumper circuits and through-hole technique
- High conductivity - Use of highly conductive inks for low-resistance printing
- Resistor printing - Formation of ladder resistance and use of sliding resistance