

# General Specifications

## Electrical Capacity (Resistive Load)

|                              |   |
|------------------------------|---|
| <b>Power Level (silver):</b> | 3VA maximum @ 28V DC maximum<br>(Applicable Range 10mA ~ 125mA @ 0.1V ~ 28V)      |
| <b>Logic Level (gold):</b>   | 0.4VA maximum @ 28V AC/DC maximum<br>(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V) |
|                              | Note: See Supplement for further explanation of operating range.                  |

## Other Ratings

|                                 |   |
|---------------------------------|---|
| <b>Contact Resistance:</b>      | 100 milliohms maximum   |
| <b>Insulation Resistance:</b>   | 100 megohms minimum @ 100V DC   |
| <b>Dielectric Strength:</b>     | 250V AC minimum for 1 minute minimum between contacts & between contacts & case |
| <b>Mechanical Life:</b>         | 500,000 operations minimum  |
| <b>Electrical Life:</b>         | 500,000 operations minimum  |
| <b>Nominal Operating Force:</b> | 1.60N   |
| <b>Total Travel:</b>            | .008" (0.2mm)   |

## Materials & Finishes

|                             |   |
|-----------------------------|---|
| <b>Actuator:</b>            | Glass fiber reinforced polyamide (UL94V-0)  |
| <b>Case:</b>                | Stainless steel                             |
| <b>Base:</b>                | Glass fiber reinforced polyamide (UL94V-0)  |
| <b>Movable Contacts:</b>    | Stainless steel with silver or gold plating |
| <b>Stationary Contacts:</b> | Brass with silver or gold plating           |
| <b>Terminals:</b>           | Brass with silver or gold plating           |

## Environmental Data

|                                     |  |
|-------------------------------------|--|
| <b>Operating Temperature Range:</b> | -20°C through +70°C (-4°F through +158°F)  |
| <b>Humidity:</b>                    | 90 ~ 95% humidity for 240 hours @ 40°C (104°F)   |
| <b>Vibration:</b>                   | 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours |
| <b>Shock:</b>                       | 100G (981 m/s <sup>2</sup> ) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)                             |

## Processing

|                   |  |
|-------------------|--|
| <b>Soldering:</b> | Reflow Soldering Recommended. See Profile A in Supplement section.<br>Manual Soldering: See Profile A in Supplement section. |
| <b>Cleaning:</b>  | These devices are not process sealed. Hand clean locally using alcohol based solution.                                       |

## Standards & Certifications

|                                |  |
|--------------------------------|--|
| <b>Flammability Standards:</b> | UL94V-0 actuator and base<br>These switches are designed for use in a low-voltage, low-current circuit.<br>When used as intended, the results do not produce hazardous energy. |
|--------------------------------|--|

# Distinctive Characteristics

.244" (6.2mm) square body allows compact mounting.

Heat resistant resin body meets lead-free solder processing requirements and UL flammability rating of 94V-0.

Stick-tube and tape-reel packaging allow rapid automated placement of devices.

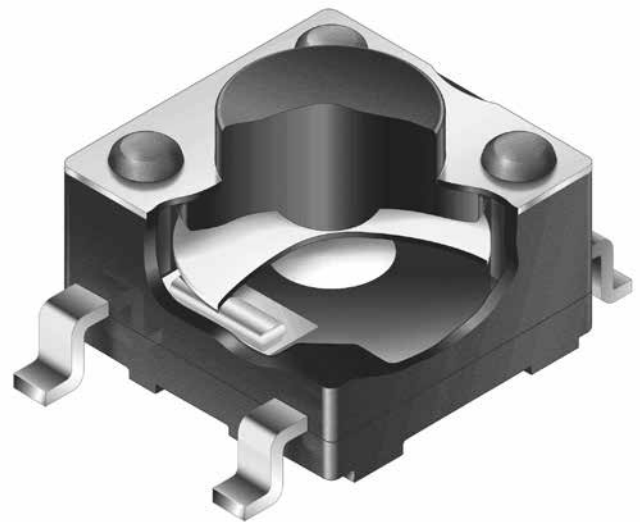
Gold plated contacts available for very low voltage/current applications offer advantages of little or no oxidization or sulfurization and stable contact resistance.

Gull-winged terminals ensure mechanical stability during soldering and simplified solder joint inspection.

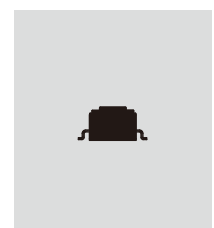
Insert molded terminals lock out flux, solvents, and other contaminants and allow automated soldering.

Tape-reel packaging meets EIA-481-D Standard.

Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0039" (0.10mm). (Additional coplanarity details in Terms and Acronyms in the Supplement section.)



Actual Size



### TYPICAL SWITCH ORDERING EXAMPLE

**HP03**    **15A**    **F**    **K**    **P4**    —    **R**

| Pole & Circuit                         |      |     |      |
|--|------|-----|------|
| 15A                                    | SPST | OFF | (ON) |
| ( ) = Momentary Normally Open Contacts |      |     |      |

| Actuator Color |       |
|----------------|-------|
| K              | Black |

| Packaging |                                    |
|-----------|------------------------------------|
| S         | Stick-Tube<br>100 Pieces/<br>Tube  |
| R         | Tape-Reel<br>1,000 Pieces/<br>Reel |

| Actuator |             |
|----------|-------------|
| F        | Flat Button |

| Terminals & Contacts |  |
|----------------------|--|
| P2                   | Gull Wing for Upright Mount;<br>Silver Contacts Rated 3VA max. DC                  |
| P4                   | Gull Wing for Upright Mount;<br>Gold Contacts Rated 0.4VA max. @<br>28V AC/DC max. |

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

#### HP0315AFKP4-R

Flat Black Button

SPST OFF-(ON) Circuit and Normally Open Contacts

Gold Contacts with 0.4VA Rating

Gull Wing Terminals for Upright Mount

Tape-Reel Packaging

### POLE & CIRCUIT

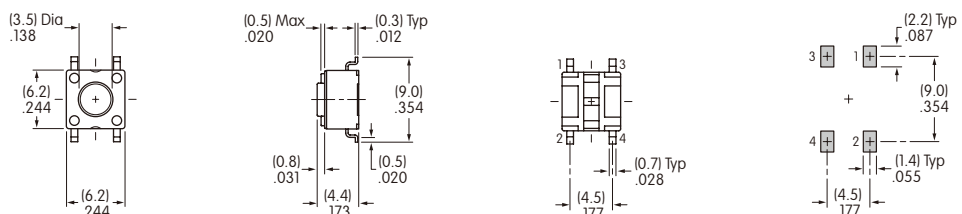
|      |         | Actuator Position<br>( ) = Momentary |      | Switch Throw & Schematic | Note: Terminal numbers are not actually on the switch. |
|------|---------|--------------------------------------|------|--------------------------|--|
| Pole | Model   | Normal                               | Down |                          |  |
| SP   | HP0315A | OFF                                  | (ON) | SPST                     |  |

### TYPICAL SWITCH DIMENSIONS

#### Gull-winged



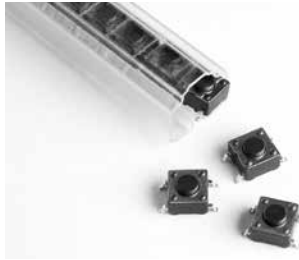
HP0315AFKP4



PACKAGING

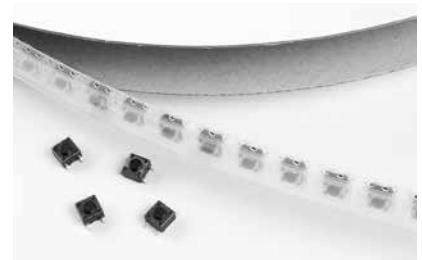
**S** Stick-Tube

Switches must be ordered in 100-piece increments when stick-tube packaging is selected.



**R** Tape-Reel

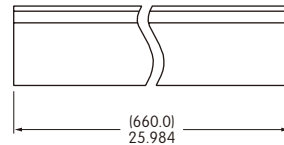
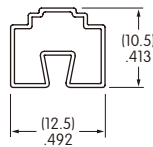
Switches must be ordered in 1,000-piece increments when tape-reel packaging is selected.



Packaging meets EIA-481-D Standard.

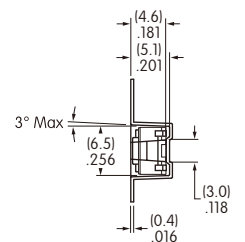
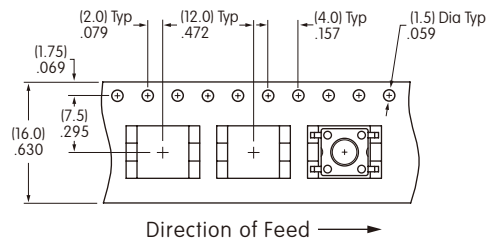
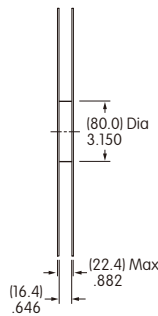
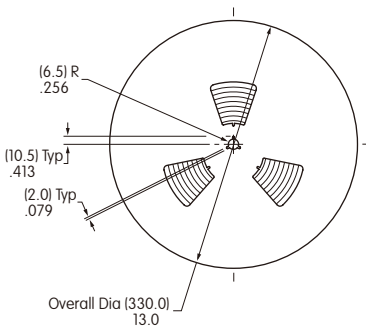
Stick-Tube Dimensions

Each stick-tube contains 100 switches



Tape-Reel Dimensions

Each tape-reel of 1,100 pockets contains 1,000 switches.  
Minimum Leader Length: 15.748" (400mm). Minimum Trailer Length: 6.299" (160mm).



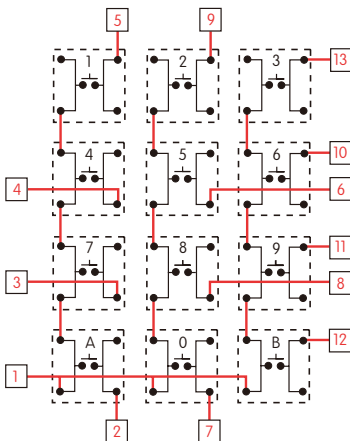
KEYBOARD MATRIX

Common Bus Matrix

These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

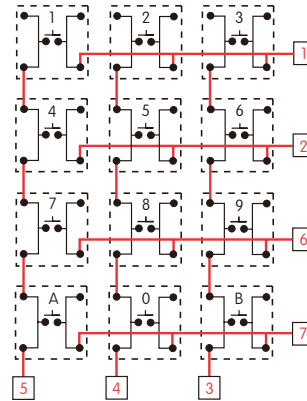
X-Y Matrix

These single pole, single throw switches can be arranged on a single-sided PC board matrix with strapped terminals to achieve an X-Y type electrical interconnection.



| PC Terminations |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|-----------------|---|---|---|---|---|---|---|---|---|---|----|----|----|----|
| 1               | ● |   |   |   |   |   |   |   |   |   |    |    |    |    |
| 2               |   | ● |   |   |   |   |   |   |   |   |    |    |    |    |
| 3               |   |   | ● |   |   |   |   |   |   |   |    |    |    |    |
| 4               |   |   |   | ● |   |   |   |   |   |   |    |    |    |    |
| 5               |   |   |   |   | ● |   |   |   |   |   |    |    |    |    |
| 6               |   |   |   |   |   | ● |   |   |   |   |    |    |    |    |
| 7               |   |   |   |   |   |   | ● |   |   |   |    |    |    |    |
| 8               |   |   |   |   |   |   |   | ● |   |   |    |    |    |    |
| 9               |   |   |   |   |   |   |   |   | ● |   |    |    |    |    |
| 0               |   |   |   |   |   |   |   |   |   | ● |    |    |    |    |
| A               |   |   |   |   |   |   |   |   |   |   | ●  |    |    |    |
| B               |   |   |   |   |   |   |   |   |   |   |    | ●  |    |    |

● = ON



| PC Terminations |   | 1 | 2 | 3 | 4 | 5 | 6 | 7 |   |   |   |   |
|-----------------|---|---|---|---|---|---|---|---|---|---|---|---|
| 1               | ● |   |   |   |   |   |   |   |   |   |   |   |
| 2               |   | ● |   |   |   |   |   |   |   |   |   |   |
| 3               |   |   | ● |   |   |   |   |   |   |   |   |   |
| 4               |   |   |   | ● |   |   |   |   |   |   |   |   |
| 5               |   |   |   |   | ● |   |   |   |   |   |   |   |
| 6               |   |   |   |   |   | ● |   |   |   |   |   |   |
| 7               |   |   |   |   |   |   | ● |   |   |   |   |   |
| 8               |   |   |   |   |   |   |   | ● |   |   |   |   |
| 9               |   |   |   |   |   |   |   |   | ● |   |   |   |
| 0               |   |   |   |   |   |   |   |   |   | ● |   |   |
| A               |   |   |   |   |   |   |   |   |   |   | ● |   |
| B               |   |   |   |   |   |   |   |   |   |   |   | ● |

● = ON

Red = PCB Trace Black = Switch Circuit

Toggle  
Rockers  
Pushbuttons  
Illuminated PB  
Programmable  
Keylocks  
Rotaries  
Slides  
Tactiles  
Tilt  
Touch  
Indicators  
Accessories  
Supplement