Contents Tactiles

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC maximum

Other Ratings

Contact Resistance: 100 milliohms maximum
Insulation Resistance: 100 megohms minimum @ 250V DC
Dielectric Strength: 250V AC minimum between contacts & between contacts & case for 1 minute minimum
Mechanical Life: 100,000 operations minimum
Electrical Life: 100,000 operations minimum
Nominal Operating Force: 1.57N
Total Travel: .010" (.250mm)

Materials & Finishes

Actuator: Glass fiber reinforced polyamide (UL94V-0)
Case: Stainless steel
Seal: Polytetrafluoroethylene
Base: Polyphthalamide (UL94V-0)
Movable Contacts: Beryllium copper with silver plating
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating

Environmental Data

Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning specifications in Supplement section.

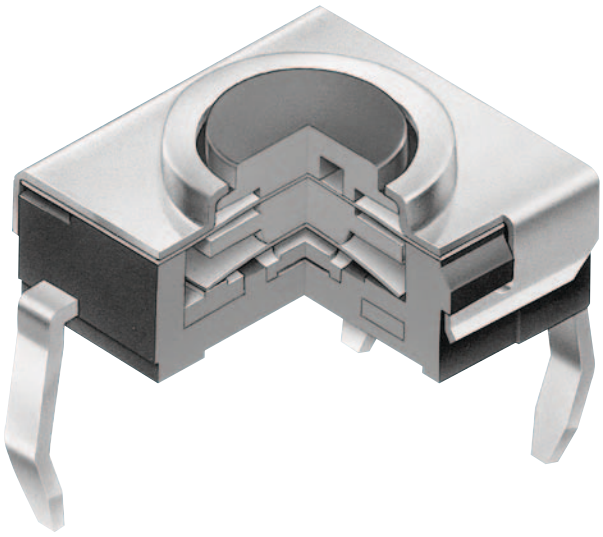
Standards & Certifications

Flammability Standards: UL94V-0 actuator & base
The CB Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Sealed construction prevents contact contamination and allows automated soldering and cleaning.

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



Actuator and base meet UL flammability rating of 94V-0.

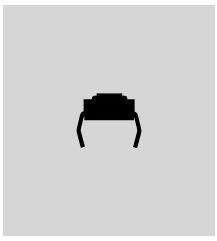
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life – more than 100,000 operations.

Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

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

Packaged in stick tube or partitioned tray.

Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

CB 15 F P — ☐

Pole & Circuit			
15	SPST	OFF	(ON)
( ) = Momentary			

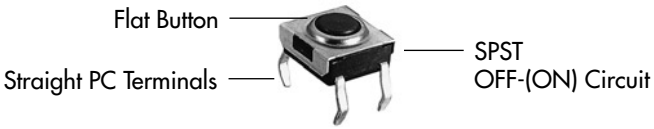
Actuator	
F	Flat Button

Terminals	
P	Straight PC

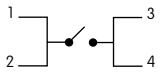
Packaging	
S	Stick-Tube 50 Pieces/Tube
No Code	Partitioned Tray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

CB15FP



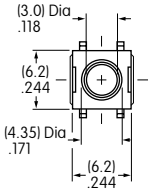
POLE & CIRCUIT

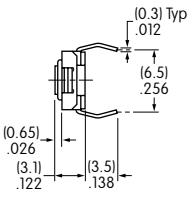
		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	**Model**	**Normal**	**Down**		
SP	**CB15**	OFF	(ON)	SPST 	Note: Terminal numbers are not actually on the switch.

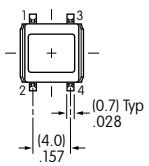
TYPICAL SWITCH DIMENSIONS

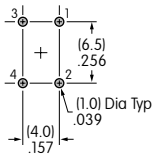
Single Pole • Single Throw

CB15FP





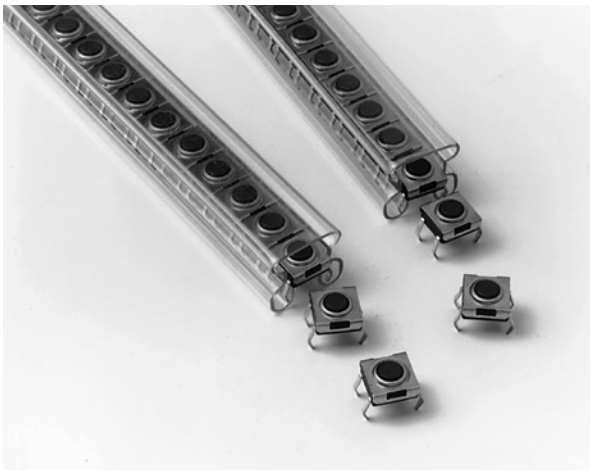




PACKAGING

S **Stick-Tube**

Switches must be ordered in 50-piece increments when stick-tube packaging is selected.

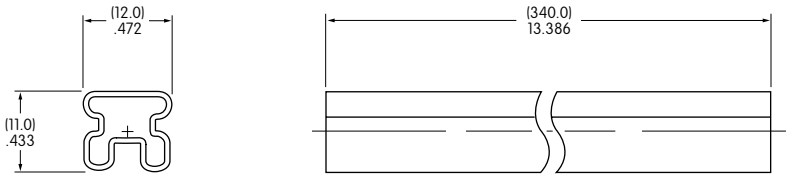


No Code **Partitioned Tray**

If ordered in less than 50-piece increments, the switches are packaged in a partitioned tray.

Stick-Tube Dimensions

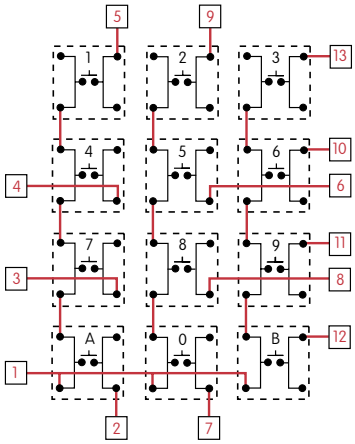
Each stick-tube contains 50 switches

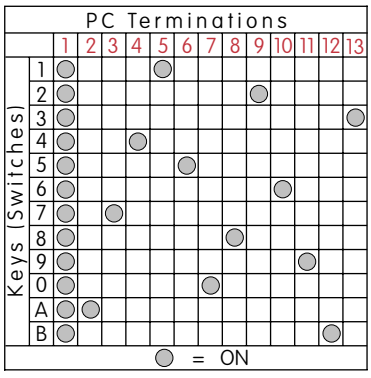


KEYBOARD MATRIX

Common Bus Matrix

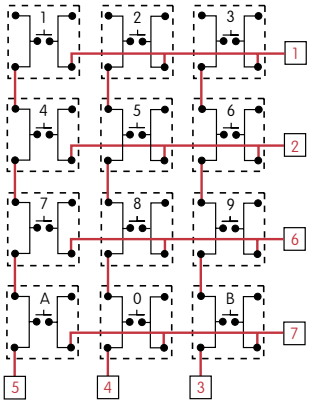
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

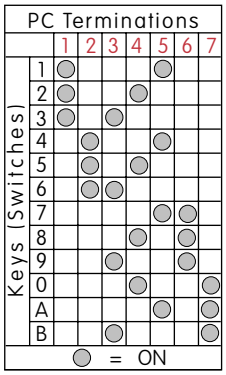




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC maximum

Other Ratings

Contact Resistance: 100 milliohms maximum
Insulation Resistance: 100 megohms minimum @ 250V DC
Dielectric Strength: 250V AC minimum between contacts & between contacts & case for 1 minute minimum
Mechanical Life: 100,000 operations minimum
Electrical Life: 100,000 operations minimum
Nominal Operating Force: 1.57N
Total Travel: .010" (.250mm)

Materials & Finishes

Actuator: Glass fiber reinforced polyamide (UL94V-0)
Case: Stainless steel
Seal: Polytetrafluoroethylene
Base: Polyphthalamide (UL94V-0)
Movable Contacts: Beryllium copper with silver plating
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating

Environmental Data

Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Processing

Soldering: Reflow Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning Specifications in Supplement section.

Standards & Certifications

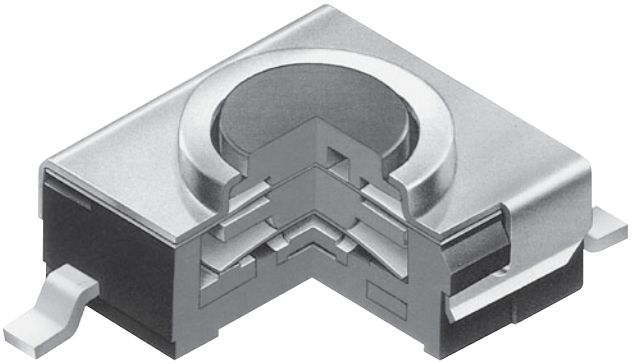
Flammability Standards: UL94V-0 actuator & base
The CB3 Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Sealed construction prevents contact contamination and allows automated soldering and cleaning.

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

Heat tolerant resin used for actuator and base meets UL flammability rating of 94V-0 and maintains switch reliability through vapor phase and infrared convection reflow soldering.



Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life – more than 100,000 operations.

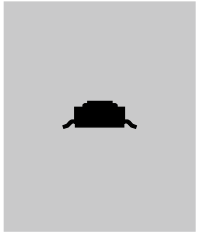
Gull-winged terminals ensure mechanical stability during soldering and simplify solder joint inspection.

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

Packaged in tape-reel or partitioned tray. 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 .0059" (0.15mm). (Additional coplanarity details in Terms and Acronyms in the Supplement section.)

Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

CB3 | 15 | F | P | — | ☐

Pole & Circuit

15	SPST	OFF	(ON)
( ) = Momentary			

Actuator

F	Flat Button

Terminals

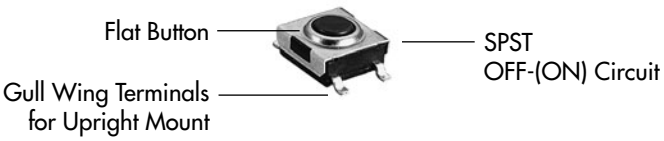
P	Gull Wing for Upright Mount

Packaging

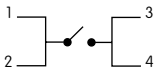
R	Tape-Reel 1,000 Pieces/Reel
No Code	Partitioned Tray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

CB315FP



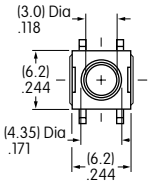
POLE & CIRCUIT

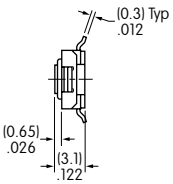
		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	**Model**	**Normal** ▬	**Down** ▬	SPST 	Note: Terminal numbers are not actually on switch.
SP	**CB315**	OFF	(ON)		

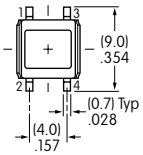
TYPICAL SWITCH DIMENSIONS

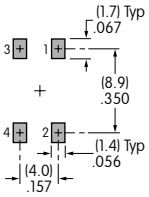
Single Pole • Single Throw

CB315FP





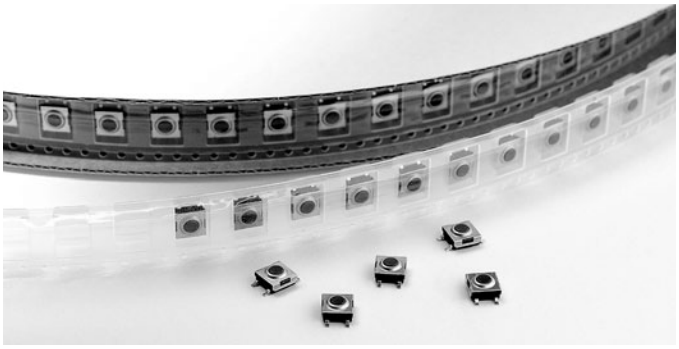




PACKAGING

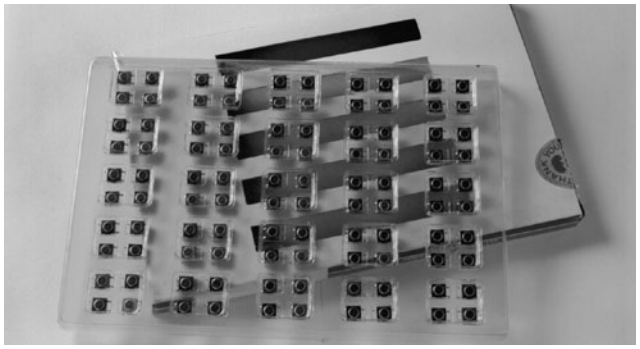
R **Tape-Reel** (packaged to EIA-481-D standard)

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



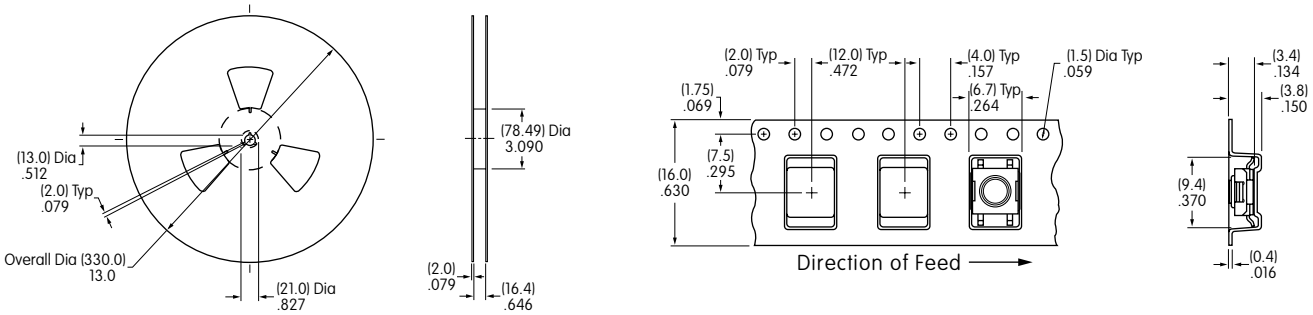
No Code **Partitioned Tray**

If less than 1,000 pieces are ordered, the switches are packaged in a partitioned tray. No code is required.



Tape-Reel Dimensions & Specifications

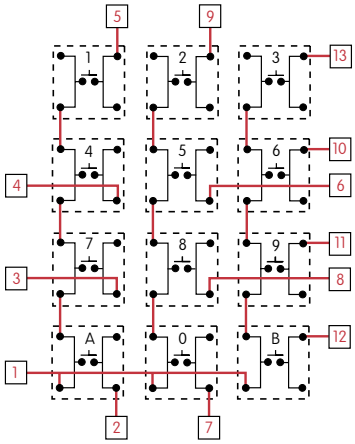
Each tape-reel of 1,050 pockets contains 1,000 switches
Minimum Leader Length: 16.54" (420mm) Minimum Trailer Length: 7.09" (180mm)

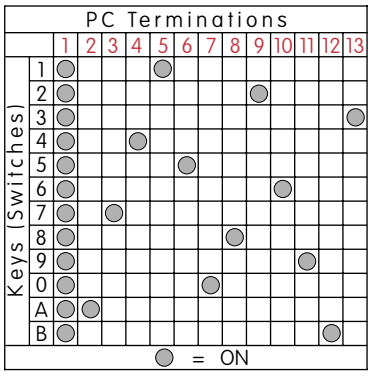


KEYBOARD MATRIX

Common Bus Matrix

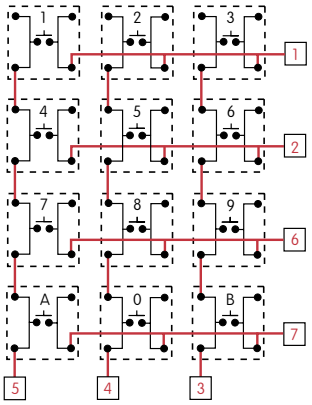
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

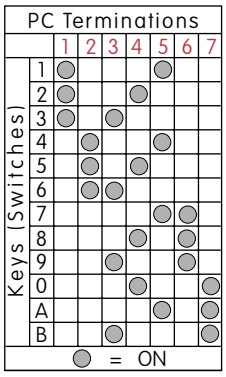




X-Y Matrix

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.





Red = PCB Trace **Black = Switch Circuit**

General Specifications

Electrical Capacity (Resistive Load)

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

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range: –20°C through +70°C (–4°F through +158°F)
Humidity: 90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration: 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
Shock: 100G (981m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

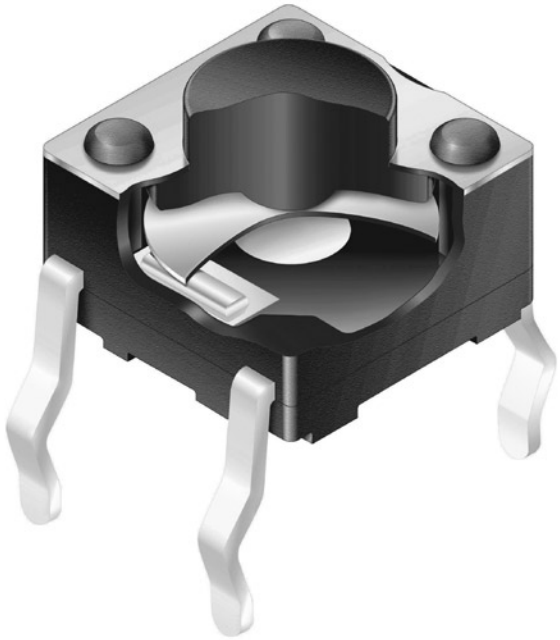
Standards & Certifications

Flammability Standards: UL94V-0 actuator and base
These switches are designed for use in a low-voltage, low-current circuit.
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.



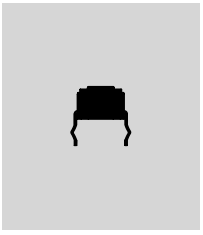
Stick-tube packaging allows rapid automated placement of devices.

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

Crimped terminals provide a spring type action which ensures secure mounting and prevents dislodging during automated soldering.

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

Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

HP02 | 15A | F | K | P2 | — | S

Pole & Circuit

15A	SPST	OFF	(ON)

( ) = Momentary
Normally Open Contacts

Actuator

F	Flat Button

Actuator Color

K	Black

Terminals & Contacts

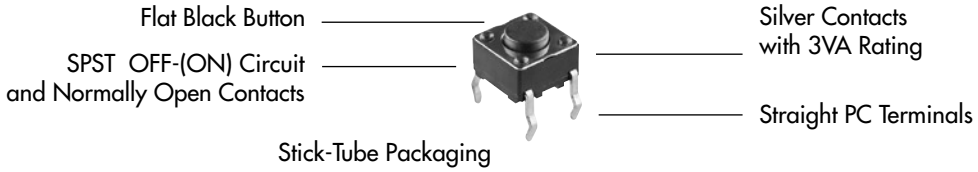
P2	Straight PC; Silver Contacts Rated 3VA max. DC
P4	Straight PC; Gold Contacts Rated 0.4VA max. @ 28V AC/DC max.

Packaging

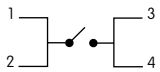
S	Stick-Tube 100 Pieces/ Tube

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

HP0215AFKP2-S



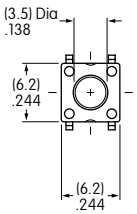
POLE & CIRCUIT

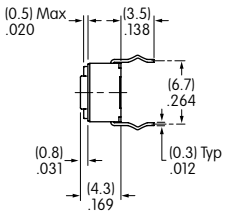
		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	**Model**	**Normal**	**Down**		
SP	**HP0215A**	OFF	(ON)	SPST 	Note: Terminal numbers are not actually on the switch.

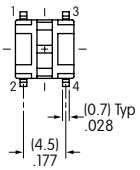
TYPICAL SWITCH DIMENSIONS

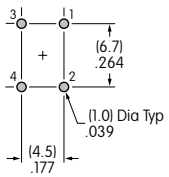
Straight PC

HP0215AFKP2





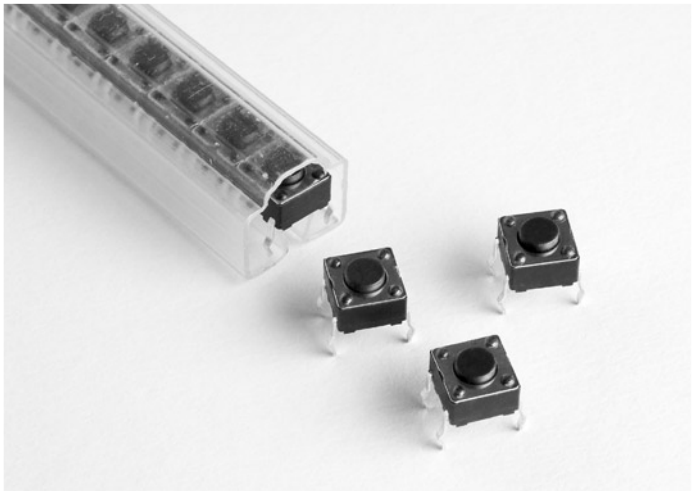




PACKAGING

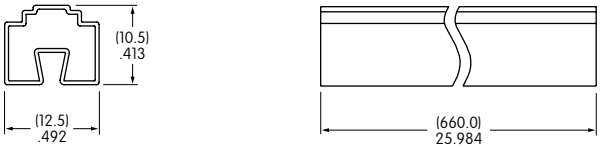
S **Stick-Tube**

Switches must be ordered in 100-piece increments.



Stick-Tube Dimensions

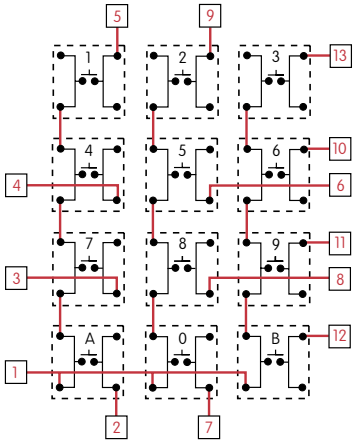
Each stick-tube contains 100 switches.

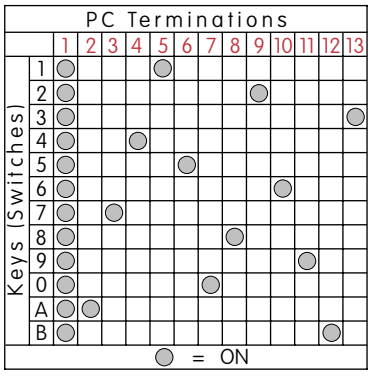


KEYBOARD MATRIX

Common Bus Matrix

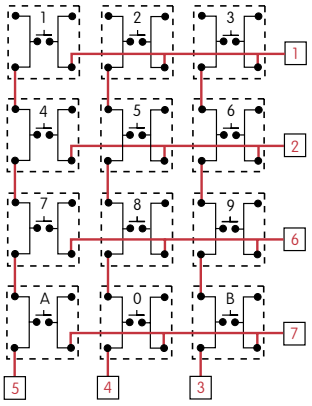
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

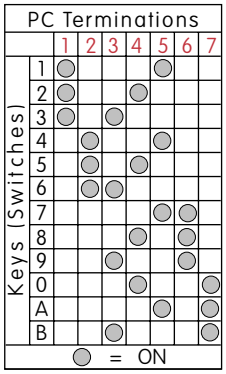




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

General Specifications

Electrical Capacity (Resistive Load)

Power Level (silver): 3VA maximum @ 28V DC maximum
(Applicable Range 10mA ~ 125mA @ 0.1V ~ 28V)

Logic Level (gold): 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Note: See Supplement for further explanation of operating range.

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range: –20°C through +70°C (–4°F through +158°F)
Humidity: 90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration: 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
Shock: 100G (981m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Processing

Soldering: Reflow Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

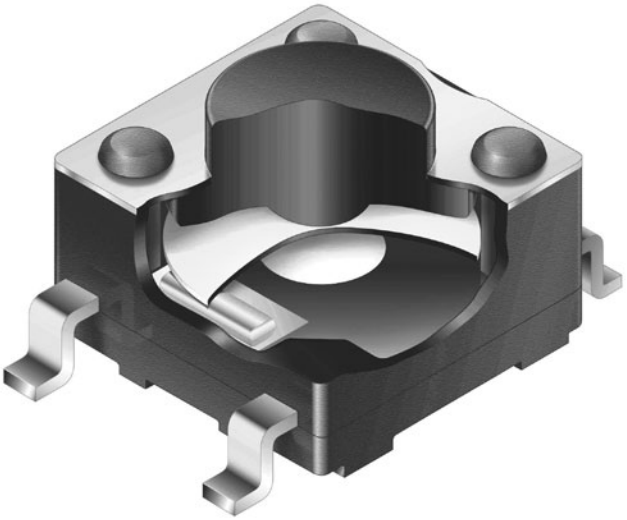
Standards & Certifications

Flammability Standards: UL94V-0 actuator and base
These switches are designed for use in a low-voltage, low-current circuit.
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.

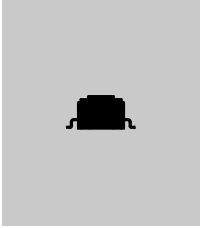
Gull-winged terminals ensure mechanical stability during soldering and simplified solder joint inspection.

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

F	Flat Button

Actuator Color

K	Black

Terminals & Contacts

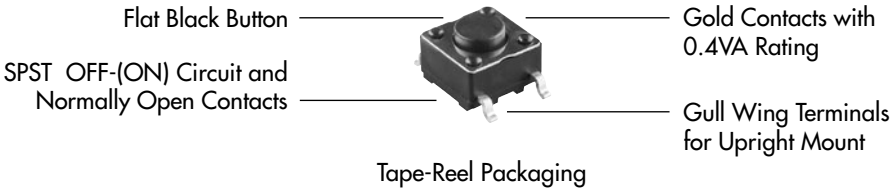
P2	Gull Wing for Upright Mount; Silver Contacts Rated 3VA max. DC
P4	Gull Wing for Upright Mount; Gold Contacts Rated 0.4VA max. @ 28V AC/DC max.

Packaging

S	Stick-Tube 100 Pieces/ Tube
R	Tape-Reel 1,000 Pieces/ Reel

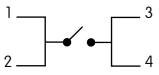
DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

HP0315AFKP4-R



Tape-Reel Packaging

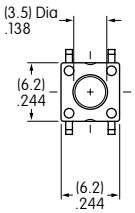
POLE & CIRCUIT

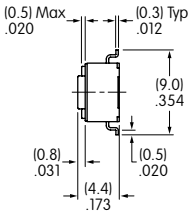
		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	**Model**	**Normal**	**Down**		
SP	**HP0315A**	OFF	(ON)	SPST 	Note: Terminal numbers are not actually on the switch.

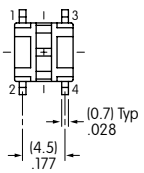
TYPICAL SWITCH DIMENSIONS

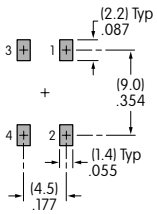
Gull-winged

HP0315AFKP4









PACKAGING

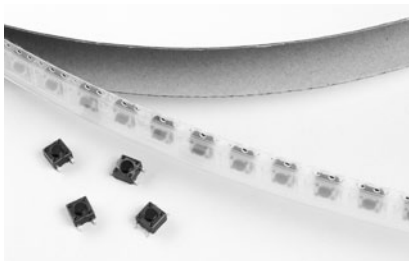
S **Stick-Tube**

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

R **Tape-Reel**

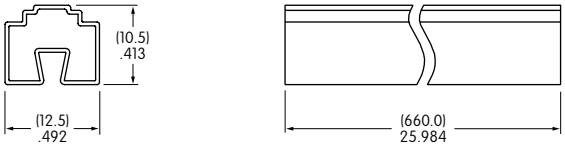
Switches must be ordered in 1,000-piece increments when tape-reel packaging is selected.

Packaging meets EIA-481-D Standard.



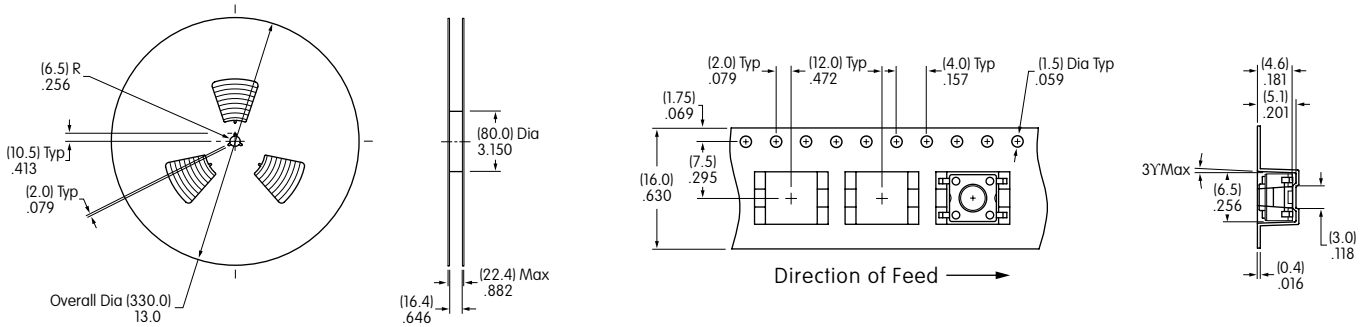
Stick-Tube Dimensions

Each stick-tube contains 100 switches



Tape-Reel Dimensions

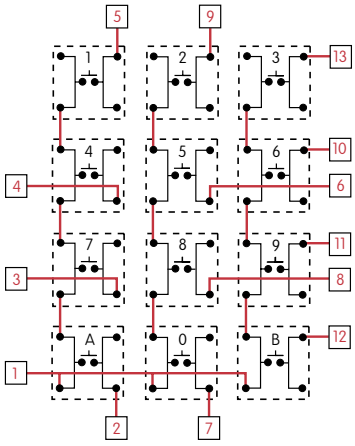
Each tape-reel of 1,100 pockets contains 1,000 switches.
Minimum Leader Length: 15.748" (400mm). Minimum Trailer Length: 6.299" (160mm).

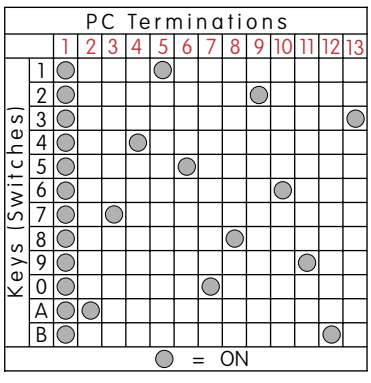


KEYBOARD MATRIX

Common Bus Matrix

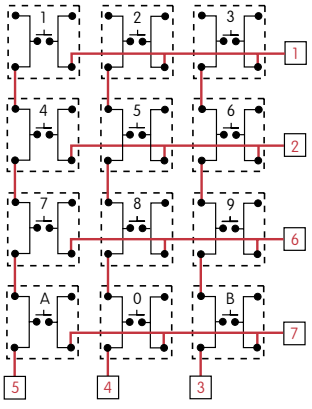
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

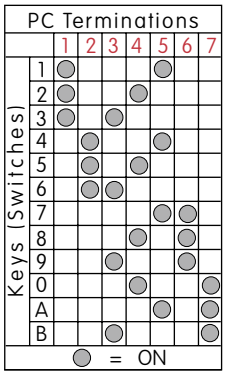




X-Y Matrix

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.





Red = PCB Trace **Black = Switch Circuit**

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC maximum for Standard Operating Force models
125mA @ 24V DC maximum for High Operating Force models

Other Ratings

	Standard Operating Force	High Operating Force
Contact Resistance:	50 milliohms maximum	50 milliohms maximum
Insulation Resistance:	500 megohms minimum @ 250V DC	500 megohms minimum @ 250V DC
Dielectric Strength:	250V AC minimum for 1 minute minimum	250V AC minimum for 1 minute minimum
Mechanical Life:	5,000,000 operations minimum	1,000,000 operations minimum
Electrical Life:	5,000,000 operations minimum	1,000,000 operations minimum
Nominal Operating Force:	1.76N for JB15	2.65N for JB15H
Total Travel:	.010" (.250mm)	.012" (.300mm)

Materials & Finishes

Actuator: Glass fiber reinforced PBT for Extended actuator; PBT for Flat; Polyacetal for Short
Case: Glass fiber reinforced polyamide (UL94V-0)
Seal: Nitrile butadiene rubber
Base: Glass fiber reinforced PBT (UL94V-0)
Movable Contacts: Stainless steel
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating
Mounting Bracket: Phosphor bronze with tin plating

Environmental Data

Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
Humidity: 90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning specifications in Supplement section.

Standards & Certifications

Flammability Standards: UL94V-0 rated case & base
The JB Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Special bracket for right angle mounting provides added design variations.

Higher operating force type provides more pronounced operating feel.

Rubber seal construction prevents contact contamination and allows automated soldering and cleaning.

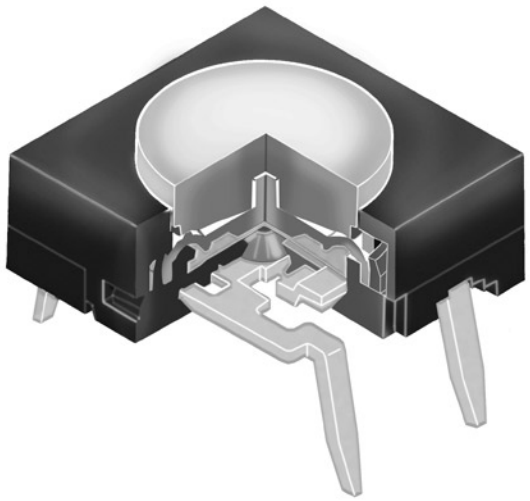
Choice of dimensions from PCB to top of cap allows design flexibility.

Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life of up to 5,000,000 operations.

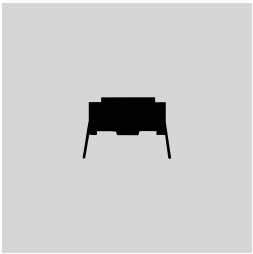
Slanted terminals provide a spring type action which ensures secure mounting and prevents dislodging during wave soldering.

Molded-in terminals are part of the sealed construction which allows automated soldering and washing.

Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

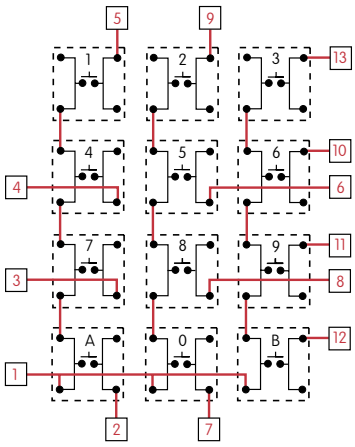


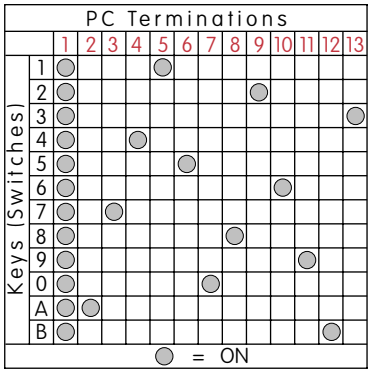
Actual Size



Common Bus Matrix

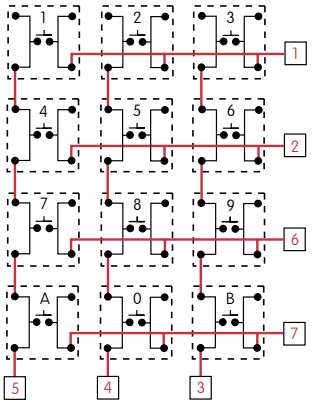
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

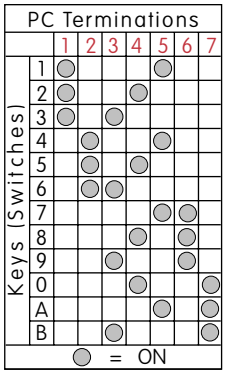




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

JB | 15 | ☐ | F | P | — | ☐ | ☐

Pole & Circuit

15	SPST	OFF	(ON)

( ) = Momentary

Operating Force

No Code	Standard for Actuators F & K
H	High for Actuators F, K & A

Actuators

F	Flat Blue Button
K	Short
A	Extended (H operating force only; not for Right Angle)

Terminals

P	Straight PC
H	Right Angle PC

Snap-On Caps

For Straight & Right Angle PC

No Code	No Cap for F Actuator

For Straight PC

1	Sculptured
2	Flat
4	Framed
5	Cap with Black Mounter

For Right Angle PC

6	Flat

Cap Colors

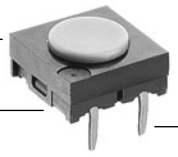
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

For Framed (4):

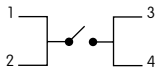
Button		Frame
B	White	B
C	Red	C
E	Yellow	E
F	Green	F
G	Blue	G
H	Gray	H

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JB15FP



POLE & CIRCUIT

		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	Model	Normal	Down	SPST 	Note: Terminal numbers are shown on the switch.
SP	**JB15**	OFF	(ON)		

OPERATING FORCE

No Code **Standard Operating Force**
1.76N

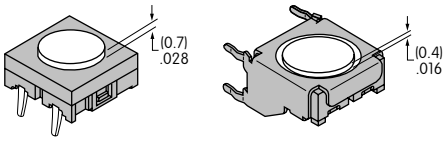
For F & K Actuators

H **High Operating Force**
2.65N

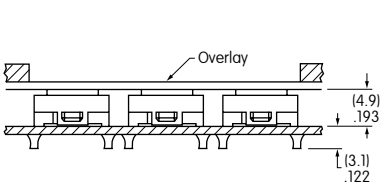
For F, K & A Actuators

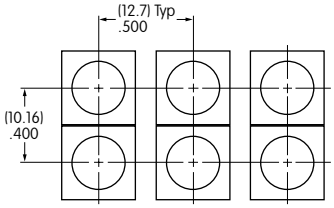
ACTUATORS

F Flat Blue Button



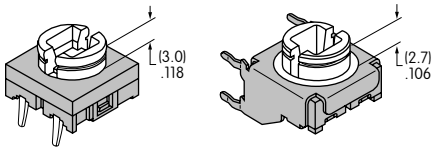
Flat button is an integral part of the switch and cannot be ordered separately.

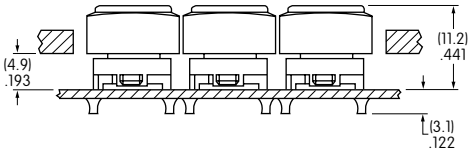


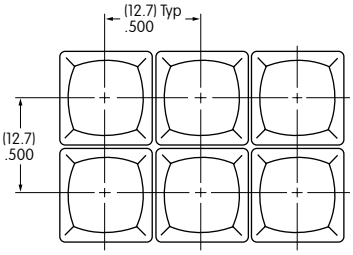


Custom keyboards can be designed with flat buttons beneath an overlay. Not applicable for right angle mounting.

K Short Actuator

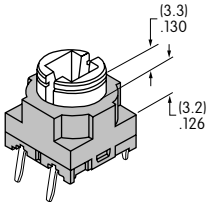




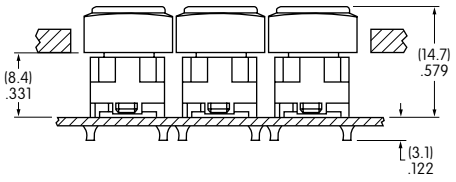


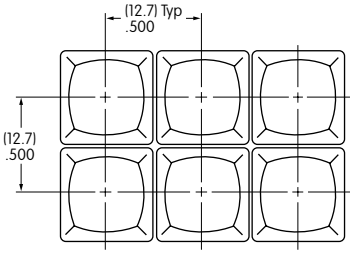
Custom keyboards can be designed with caps installed through a panel cutout (illustration with framed cap AT4078 and button AT4077). Not applicable for right angle mounting.

A Extended Actuator



Combines with high operating force only; not for right angle.

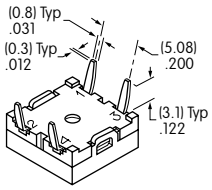


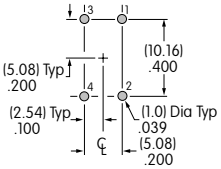


Custom keyboards can be designed with caps installed through a panel cutout (illustration with framed cap AT4078 and button AT4077).

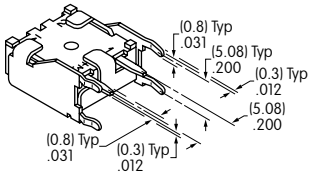
TERMINALS

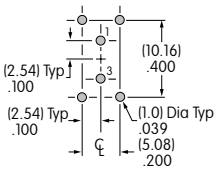
P Straight PC





H Right Angle PC



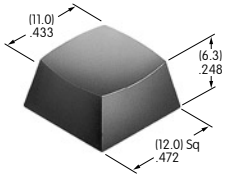


Further details shown in Typical Switch Dimensions

SNAP-ON CAPS

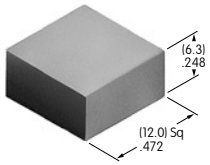
1 AT4058 Sculptured for Straight PC

Material: Polyamide
Finish: Matte
Colors: A B C E F G H



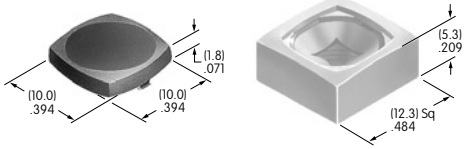
2 AT4059 Flat for Straight PC

Material: Polycarbonate
Finish: Glossy
Colors: A B C E F G H



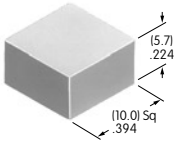
4 Framed: AT4077 Button & AT4078 Frame for Straight PC

Material: Polycarbonate
Finish: Matte
Colors: B C E F G H



6 AT4139 Flat for Right Angle PC

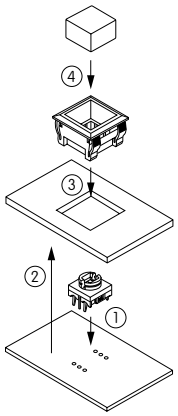
Material: Polycarbonate
Finish: Glossy
Colors: A B C H



5 AT4140 Cap with AT547 Mounter for Straight PC

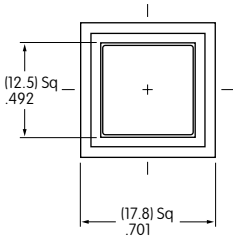
Cap
Material: Polycarbonate
Finish: Glossy
Colors: A B C H

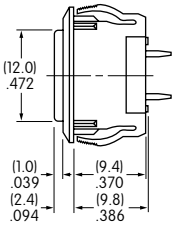
Mounter
Material: Polyamide
Finish: Matte
Color: A



Assembly Procedure

1. Solder switch to PCB.
2. Install PCB in equipment.
3. Snap mounter into panel. Dimension from top of panel to top of PCB is .386" (9.8mm).
4. Snap cap onto plunger.

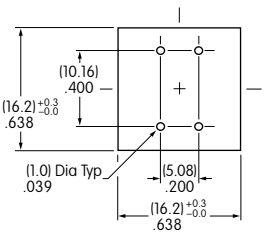




Panel Mounting Dimensions

Panel Thickness:
.039" ~ .079"
(1.0mm ~ 2.0mm)

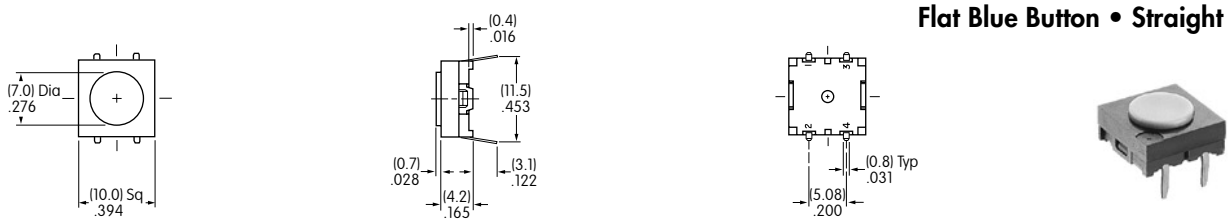
Panel Cutout & Footprint



Cap Colors Available: A Black · B White · C Red · E Yellow · F Green · G Blue · H Gray

TYPICAL SWITCH DIMENSIONS

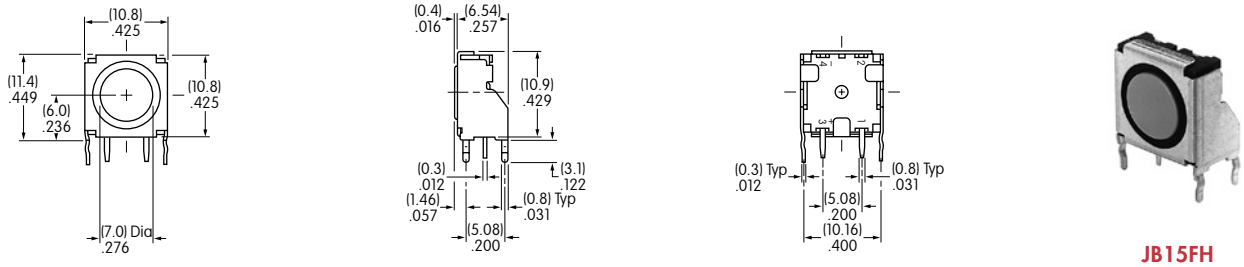
Flat Blue Button • Straight PC



Spring action terminals conform to .100" (2.54mm) PCB spacing

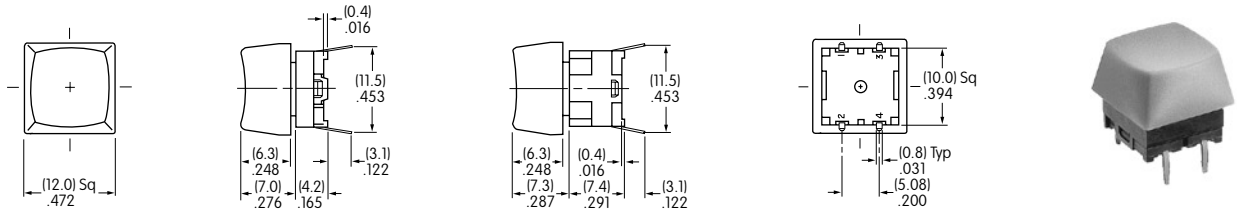
JB15FP

Flat Blue Button • Right Angle PC



JB15FH

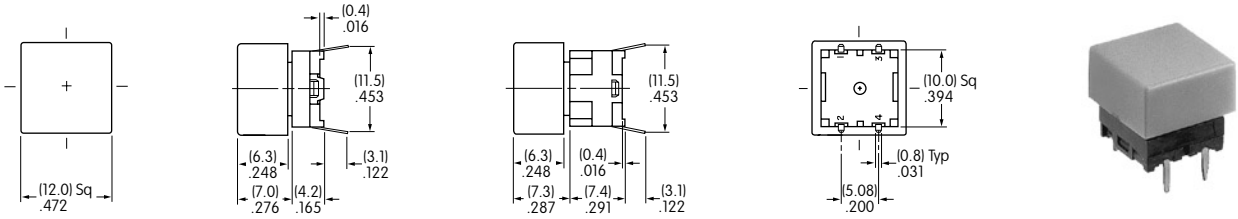
Short Actuator / Extended Actuator / Sculptured Snap-on Cap • Straight PC



Spring action terminals conform to .100" (2.54mm) PCB spacing

JB15KP-1C

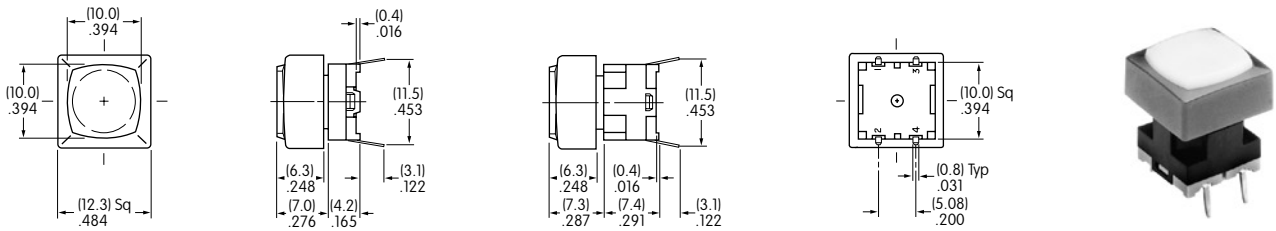
Short Actuator / Extended Actuator / Flat Snap-on Cap • Straight PC



Spring action terminals conform to .100" (2.54mm) PCB spacing

JB15KP-2C

Short Actuator / Extended Actuator / Framed Snap-on Cap • Straight PC

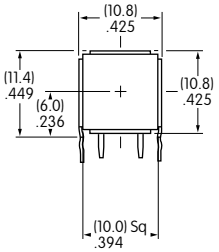


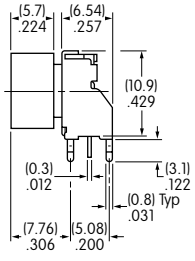
Spring action terminals conform to .100" (2.54mm) PCB spacing

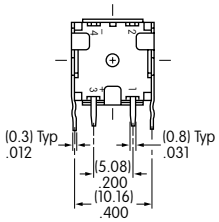
JB15FHAP-4BC

TYPICAL SWITCH DIMENSIONS

Flat Snap-on Cap • Right Angle PC







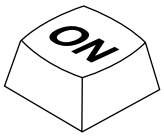
JB15KH-6C

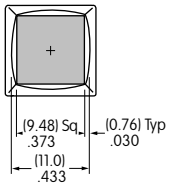
LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

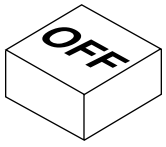
Shaded Areas are Printable Areas

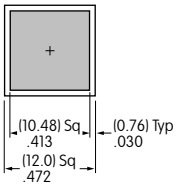
AT4058



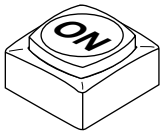


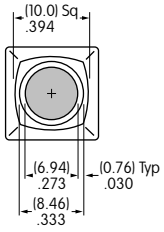
AT4059 & AT4140



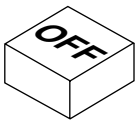


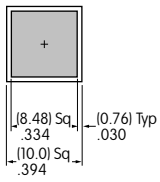
AT4077 Button





AT4139





Recommended Print Method: Screen Print or Pad Print. Epoxy based ink is recommended.

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC maximum for Standard Operating Force models
125mA @ 24V DC maximum for High Operating Force models

Other Ratings

	Standard Operating Force	High Operating Force
Contact Resistance:	50 milliohms maximum	50 milliohms maximum
Insulation Resistance:	500 megohms minimum @ 250V DC	500 megohms minimum @ 250V DC
Dielectric Strength:	250V AC minimum for 1 minute minimum	250V AC minimum for 1 minute minimum
Mechanical Life:	5,000,000 operations minimum	1,000,000 operations minimum
Electrical Life:	5,000,000 operations minimum	1,000,000 operations minimum
Nominal Operating Force:	1.76N for JB15L	2.65N for JB15HL & JB15HB
Total Travel:	.010" (.254mm)	.012" (.300mm)

Materials & Finishes

Actuator: Polyacetal for Short; Glass fiber reinforced PBT for Extended
Case: Glass fiber reinforced polyamide (UL94V-0)
Seal: Nitrile butadiene rubber
Base: Glass fiber reinforced PBT (UL94V-0)
Movable Contacts: Stainless steel
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating

Environmental Data

Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
Humidity: 90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning specifications in Supplement section.

Standards & Certifications

Flammability Standards: UL94V-0 rated case & base
The JB Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Choice of dimensions from PCB to top of cap adds to design flexibility.

Bright, full-face illumination with red, green, or yellow LEDs for attractive, functional panel layouts.

Higher operating force type provides more pronounced operating feel.

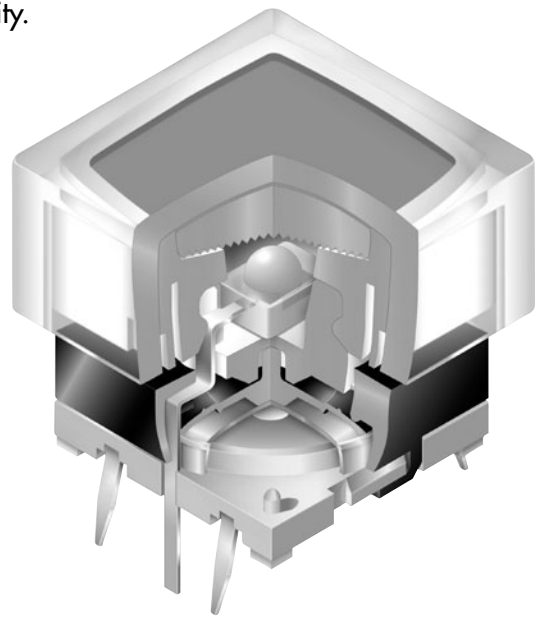
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life of up to 5,000,000 operations.

Rubber seal construction prevents contact contamination and allows automated soldering and cleaning.

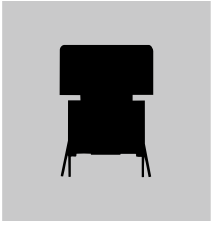
Slanted terminals provide a spring type action which ensures secure mounting and prevents dislodging during wave soldering.

Molded-in terminals are part of the sealed construction which allows automated soldering and cleaning.

Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

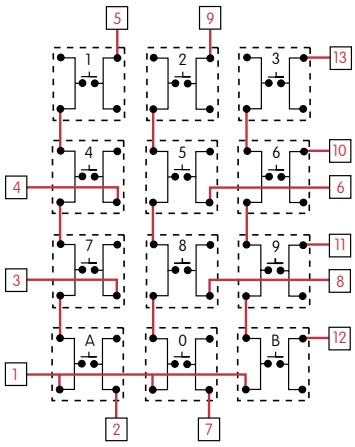


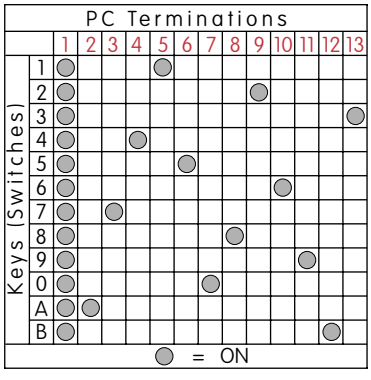
Actual Size



Common Bus Matrix

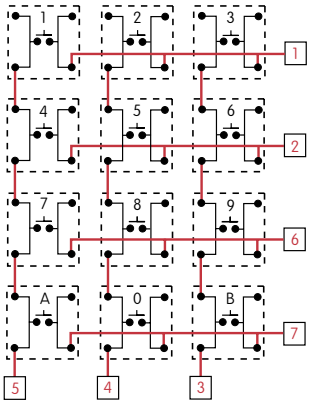
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

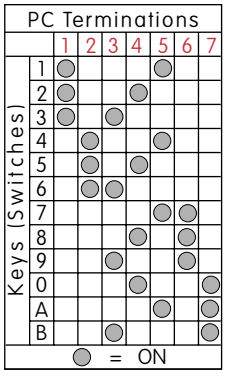




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

JB 15 [ ] L P C – JC

Pole & Circuit

15	SPST	OFF	(ON)

( ) = Momentary

Actuators

L	Short
B	Extended (H operating force only)

Operating Force

No Code	Standard (L actuator only)
H	High

Terminals

P	Straight PC

LED Colors

C	Red
E	Yellow
F	Green

Cap Types & Colors

Flat Cap Colors

B	Translucent White
C	Red
E	Yellow
F	Green

Flat Cap Lens/Diffuser Colors

JB	Clear/White
JC	Clear/Red
JE	Clear/Yellow
JF	Clear/Green

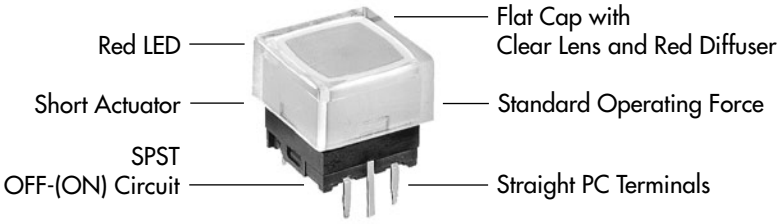
For JC, JE & JF, diffuser color must match LED color

Framed Cap Button/Frame Colors

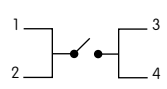
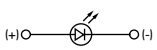
BB	White/White
BC	White/Red
BE	White/Yellow
BF	White/Green
BH	White/Gray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JB15LPC-JC



POLE & CIRCUIT

		Actuator Position ( ) = Momentary		Switch Throw & Schematic	LED Schematic	
Pole & Throw	Model	Normal	Down			
SPST	JB15	OFF	(ON)	SPST 		Notes: Terminal numbers are shown on switch. LED circuit is isolated & requires external power source.

OPERATING FORCE

No Code — **Standard Nominal Operating Force**
1.76N

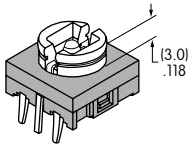
Available with short actuator only (code L)

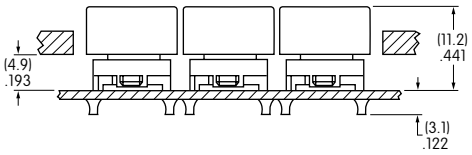
H — **High Nominal Operating Force**
2.65N

Available with both short and extended actuators

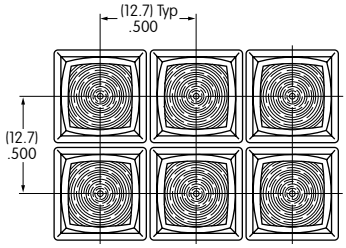
ACTUATORS

L — **Short Actuator**

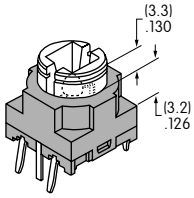




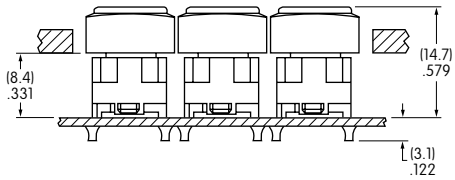
Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4060).



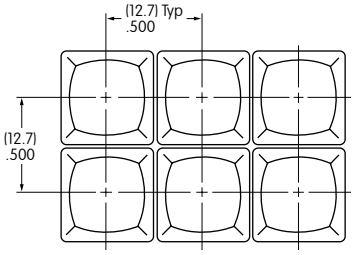
B — **Extended Actuator**



High operating force only



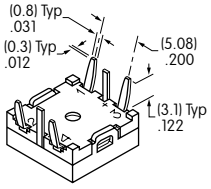
Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4076).

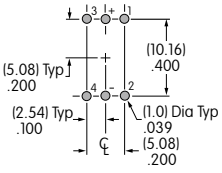


TERMINALS

P — **Straight PC Terminals**

Further details in Typical Switch Dimensions





LED COLORS & SPECIFICATIONS

LEDs are supplied as an integral part of illuminated devices and are not available separately.

LED polarity markings are on the bottom of the switch.

The electrical specifications shown here are determined at a basic temperature of 25°C.

If the source voltage exceeds the rated voltage, a ballast resistor is required.

The resistor value can be calculated by using the formula in the Supplement section.

Color		C Red	E Yellow	F Green
Forward Peak Current	I_{FM}	25mA	25mA	25mA
Typical Forward Current	I_F	20mA	20mA	20mA
Forward Voltage	V_F	2.0V	2.2V	2.1V
Reverse Peak Voltage	V_{RM}	4V	4V	4V
Current Reduction Rate Above 25°C	ΔI_F	0.42mA/°C		
Ambient Temperature Range		−25°C ~ +70°C		

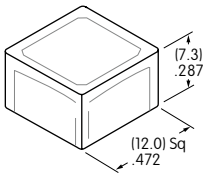
SNAP-ON CAPS

AT4135 Flat

Cap Color Codes:

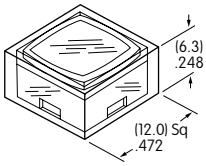
- **B** Translucent White
- **C** Red
- **E** Yellow
- **F** Green

Material: Polycarbonate Finish: Frosted

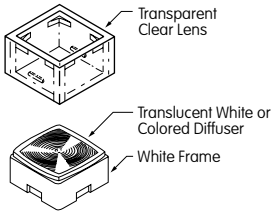


AT4060 Flat

Lens/Diffuser Color Codes:



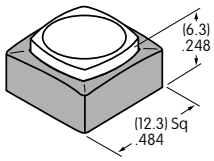
- **JB** Clear/Translucent White
- **JC** Clear/Red
- **JE** Clear/Yellow
- **JF** Clear/Green



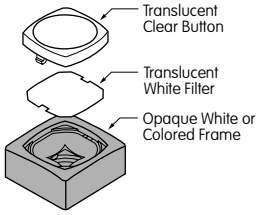
Material: Polycarbonate Lens Finish: Glossy

Framed:
AT4076 Button with Frame

Translucent Button/Frame Color Codes:



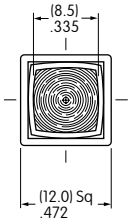
- **BB** White/White
- **BC** White/Red
- **BE** White/Yellow
- **BF** White/Green
- **BH** White/Gray



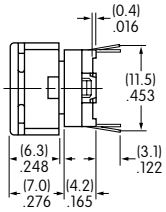
Material: Polycarbonate Button Finish: Frosted

TYPICAL SWITCH DIMENSIONS

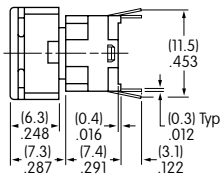
Flat Snap-on Cap

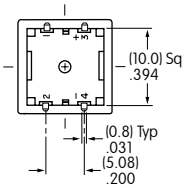


Short Actuator



Extended Actuator

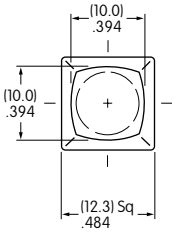




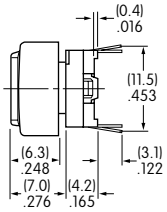
JB15LPC-JC

Spring action terminals conform to .100" (2.54mm) PCB spacing

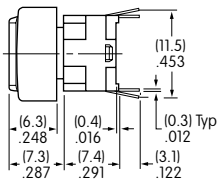
Framed Snap-on Cap

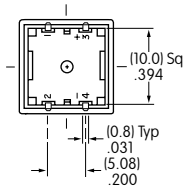


Short Actuator



Extended Actuator





JB15HBPC-BC

Spring action terminals conform to .100" (2.54mm) PCB spacing

LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for Cap, Lens, or Button

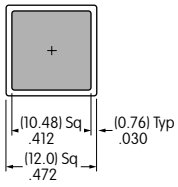
Recommended Methods:

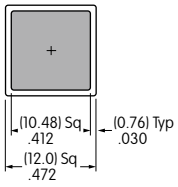
Laser Etch, Screen Print or Pad Print

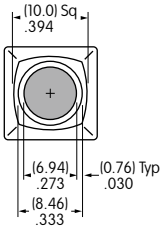
Epoxy based ink is recommended.

Laser Etch or Pad Print

Epoxy based ink is recommended.

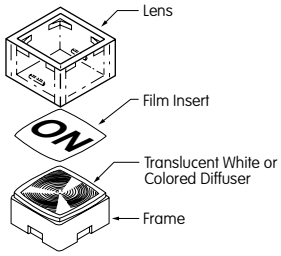


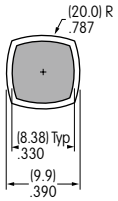




Shaded areas are printable areas.

Suggested Printable Area for Film Insert





Shaded area is printable area.

Film Insert: Clear Polyester 7 mil maximum thickness

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

Contact Resistance: 50 milliohms maximum
Insulation Resistance: 500 megohms minimum @ 250V DC
Dielectric Strength: 250V AC minimum for 1 minute minimum
Mechanical Life: 500,000 operations minimum
Electrical Life: 500,000 operations minimum
Nominal Operating Force: 1.96N for sculptured actuator
2.0N for piano actuator
3.0N for square & round flush actuators
Total Travel: Flush Actuators .016" (0.4mm)
Sculptured & Piano Actuators .031" (0.8mm)

Materials & Finishes

Actuator: Polyamide
Case: Glass fiber reinforced polyamide
Seal: Nitrile butadiene rubber
Base: Glass fiber reinforced polyester
Movable Contact: Phosphor bronze with silver plating
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating

Environmental Data

Operating Temperature Range: –25°C through +85°C (–13°F through +185°F)
Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering Recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning specifications in Supplement section.

Standards & Certifications

The JF Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

Extremely low profile of 5mm from PCB to top of switch.

Rubber seal construction prevents contact contamination and allows automated soldering and cleaning.

Minimal operating force and short stroke permit light touch operation.

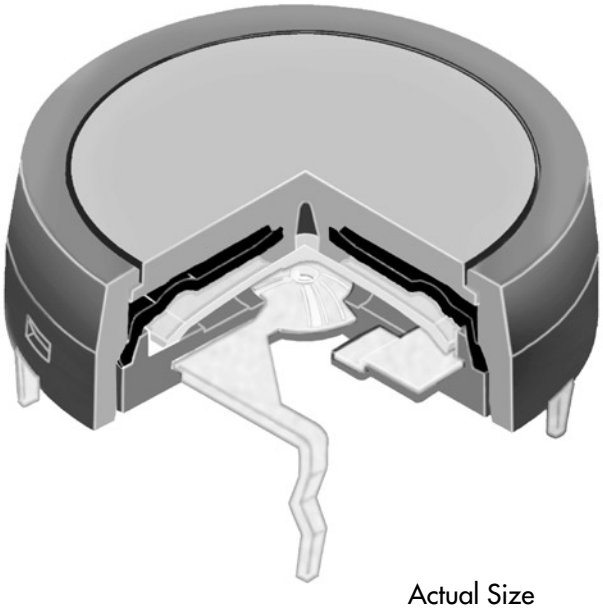
Dome contact gives crisp tactile and audible feedback to positively indicate circuit transfer and assures high reliability and long life.

Wide choice of body shapes and colors.

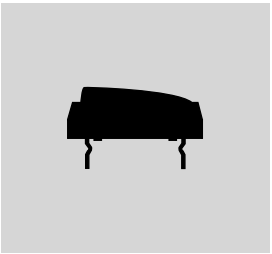
Crimped terminals provide a spring type action to ensure secure mounting and prevent dislodging during wave soldering.

Space saving body dimensions provide for compact, side-by-side mounting on a standard grid.

Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

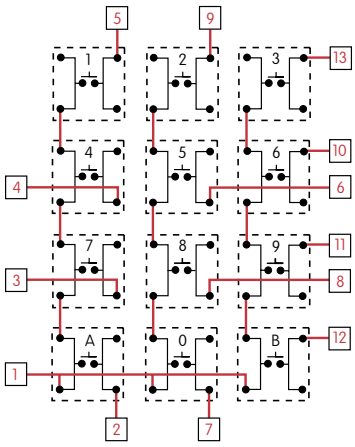


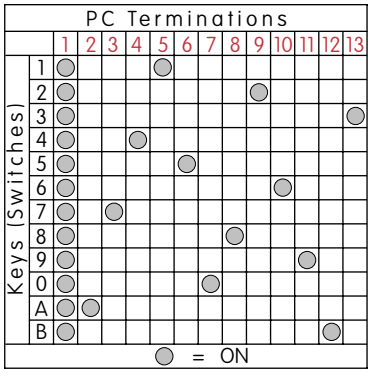
Actual Size



Common Bus Matrix

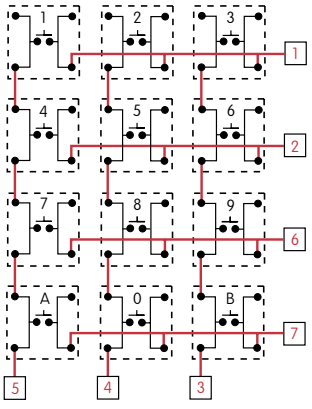
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

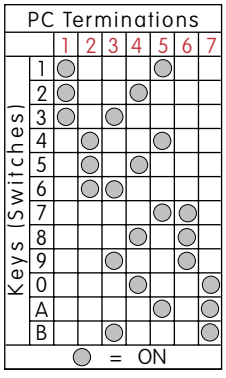




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

JF | 15 | S | P | 2 | C

Pole & Circuit

15	SPST	OFF	(ON)

( ) = Momentary

Housing Shapes

C	Round (with round actuator only)
S	Square

Terminals

P	Straight PC

Actuator Types

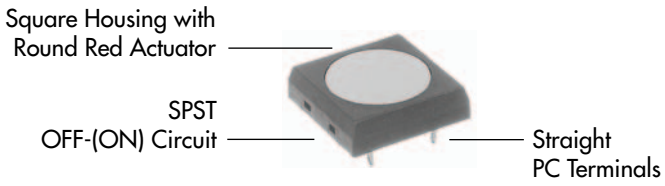
1	Square
2	Round
3	Sculptured
4	Piano

Actuator Colors

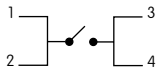
C	Red
D	Orange
F	Green
G	Blue
H	Gray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JF15SP2C



POLE & CIRCUIT

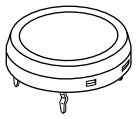
		Actuator Position ( ) = Momentary		Switch Throw & Schematic	
Pole	**Model**	**Normal**	**Down**		
SP	**JF15**	OFF	(ON)	SPST 	Note: Terminal numbers are shown on the switch.

HOUSING SHAPES & ACTUATOR TYPES

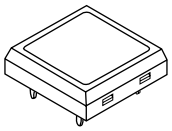
C Round Housing

S Square Housing

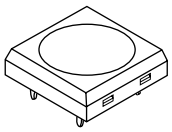
2 Round Actuator



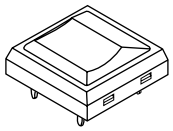
1 Square Actuator



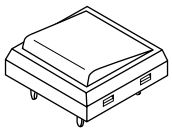
2 Round Actuator



3 Sculptured Actuator



4 Piano Actuator



Actuator Colors Available:

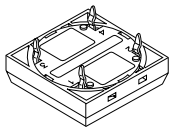
C Red **D** Orange **F** Green **G** Blue **H** Gray

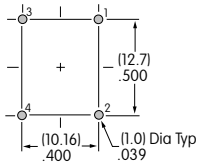
Housing is Black

TERMINALS & PANEL DESIGN

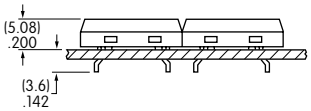
P Straight PC

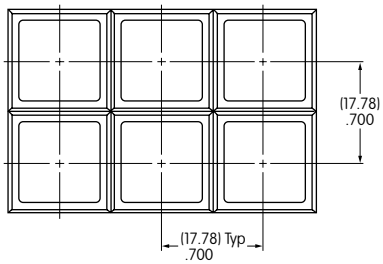
Additional details in Typical Switch Dimensions





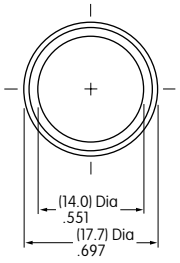
Versatile panel arrangements can be made to fit individual design needs.

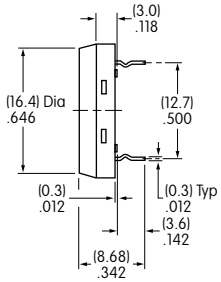


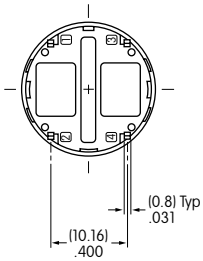


TYPICAL SWITCH DIMENSIONS

Round Actuator



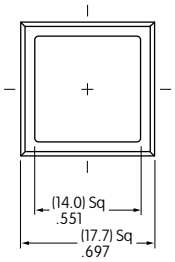


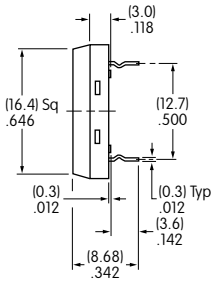


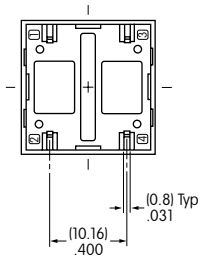
JF15CP2C

TYPICAL SWITCH DIMENSIONS

Square Actuator

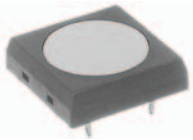


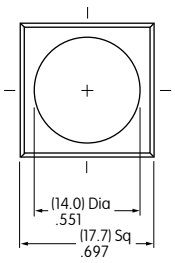


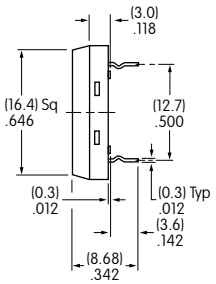


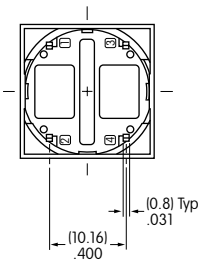
JF15SP1C

Round Actuator



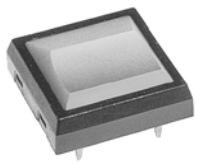


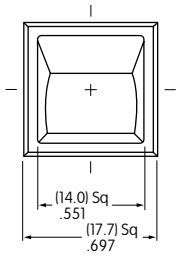


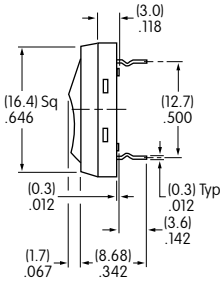


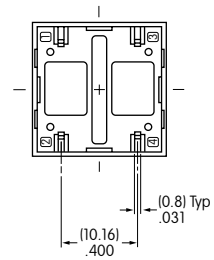
JF15SP2C

Sculptured Actuator



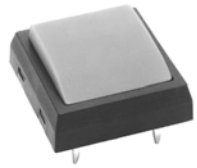


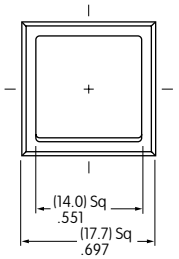


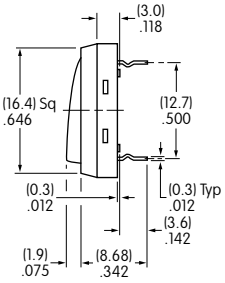


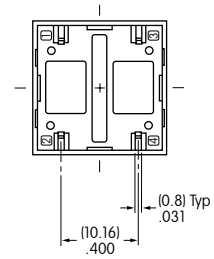
JF15SP3C

Piano Actuator







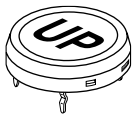


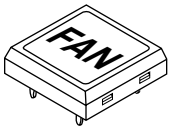
JF15SP4C

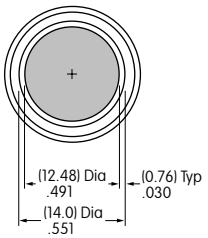
LEGENDS

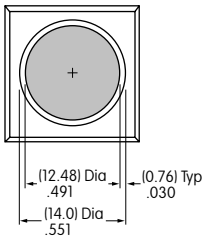
NKK Switches can provide custom legends for caps. Contact factory for more information.

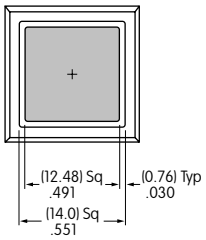
Shaded Areas are Printable Areas

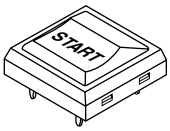


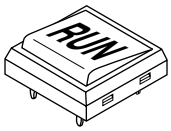


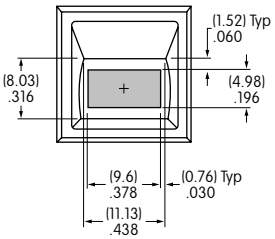


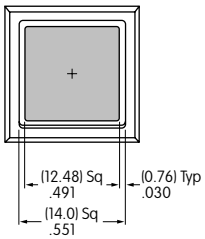












Recommended Print Methods: Screen Print or Pad Print. Epoxy based ink is recommended.

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

Contact Resistance: 50 milliohms maximum
Insulation Resistance: 500 megohms minimum @ 250V DC
Dielectric Strength: 250V AC minimum for 1 minute minimum
Mechanical Life: 500,000 operations minimum
Electrical Life: 500,000 operations minimum
Nominal Operating Force: 3.0N for flush actuator
2.0N for sculptured actuator
Total Travel: Flush Actuators .016" (0.4mm); Sculptured Actuator: .031" (0.8mm)

Materials & Finishes

Actuator: Polyamide for spot illuminated; polycarbonate for full face
Case: Glass fiber reinforced polyamide
Seal: Nitrile butadiene rubber
Base: Glass fiber reinforced polyester
Movable Contact: Phosphor bronze with silver plating
Stationary Contacts: Brass with silver plating
Terminals: Brass with silver plating

Environmental Data

Operating Temperature Range: –25°C through +70°C (–13°F through +158°F)
Humidity: 90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering recommended. See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: Automated cleaning. See Cleaning specifications in Supplement section.
Switches should not be operated or have any pressure on the actuators during cleaning.
Full face illuminated models suitable only for bottom board spray wash to avoid contamination of the 2-layered actuator, which may compromise the aesthetics.

Standards & Certifications

The JF Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current, logic-level circuit.
When used as intended in a logic-level circuit, the results do not produce hazardous energy.

Distinctive Characteristics

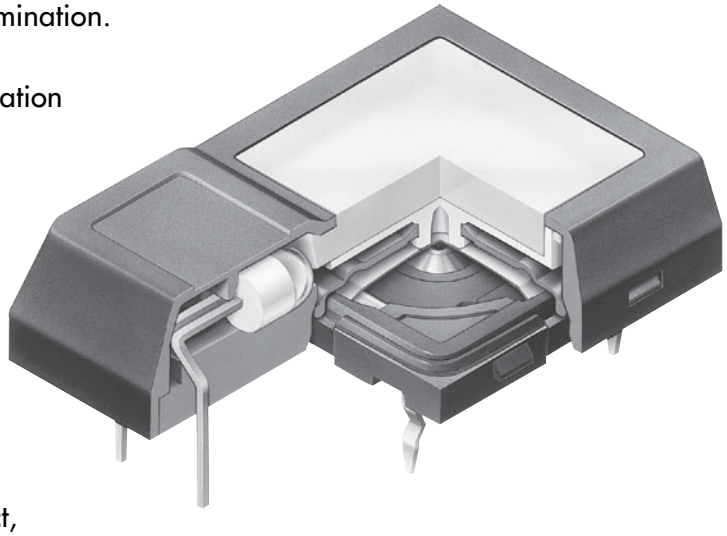
Extremely low profile of .224" (5.7mm) from PCB to top of switch.

Red, green, or yellow LED with spot or full face illumination.

Rubber seal construction prevents contact contamination and allows automated soldering and cleaning.

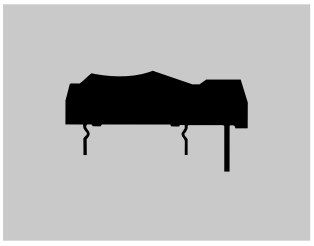
Minimal operating force and short stroke permit light touch operation.

Dome contact gives crisp tactile and audible feedback to positively indicate circuit transfer and assures high reliability and long life.



Space saving body dimensions provide for compact, side-by-side mounting on a standard grid.

Actual Size



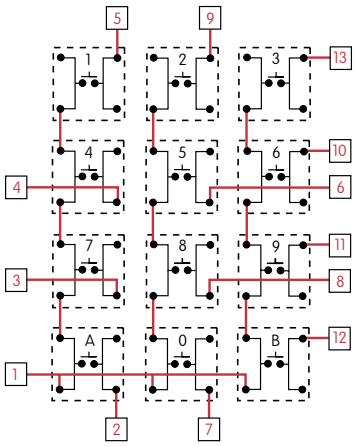
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

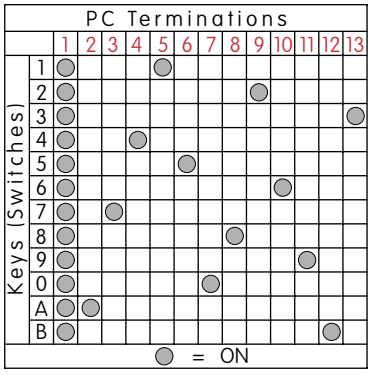
Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

Matching indicator available and shown at the end of Section M.

Common Bus Matrix

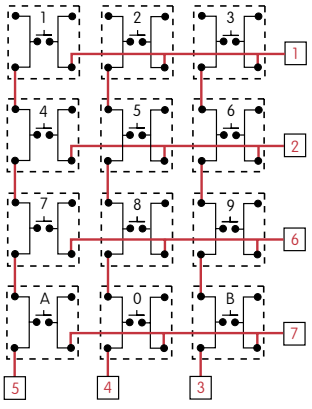
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

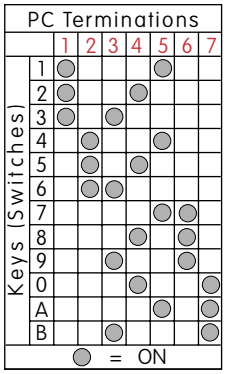




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

JF 15 R P 2 C C

Pole & Circuit

15	SPST	OFF	(ON)

( ) = Momentary

Terminals

P	Straight PC

Actuator Types

1	Square
2	Round
3	Sculptured

LED Colors

C	Red
E	Yellow
F	Green

Illumination

R	Spot
A	Full Face (with square actuator only)

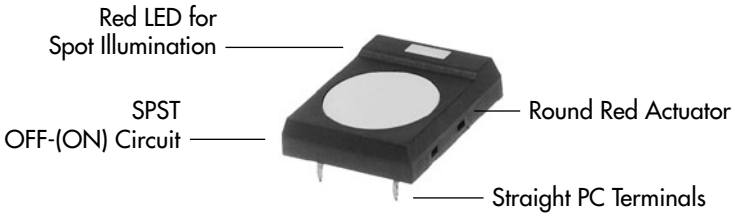
Actuator Colors

Spot Illuminated	
C	Red
D	Orange
F	Green
G	Blue
H	Gray
***Full Face Illuminated**	
C	Red
E	Yellow
F	Green

*LED color must match actuator color.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JF15RP2CC



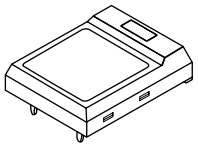
POLE & CIRCUIT

		Actuator Position ( ) = Momentary		Switch Throw & Schematic	LED Schematic	
Pole	Model	Normal	Down			
SP	JF15	OFF	(ON)	SPST 1 2 3 4	(+) (-)	Notes: Terminal numbers are shown on switch. LED circuit is isolated & requires external power source.

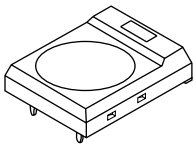
ILLUMINATION & ACTUATOR TYPES

R **Spot Illumination**

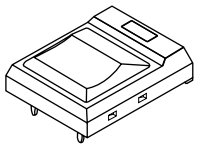
1 **Square Actuator**



2 **Round Actuator**



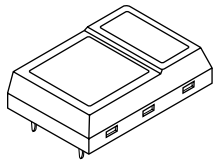
3 **Sculptured Actuator**



Actuator Colors Available: C, D, F, G, H
Housing is black

A **Full Face Illumination**

1 **Square Actuator**

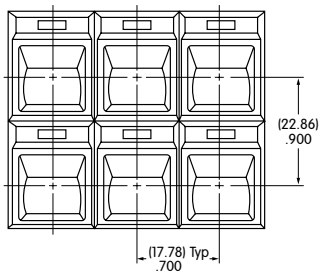


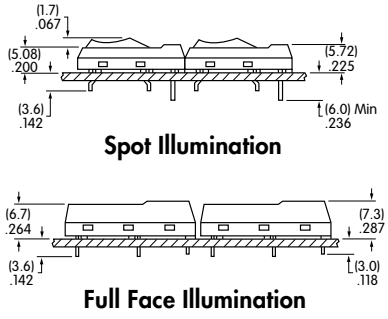
Actuator Colors Available: C, E, F
Housing is black

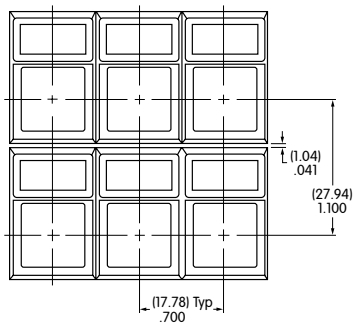
Color Codes: **C** Red **D** Orange **E** Yellow **F** Green **G** Blue **H** Gray

Flexible Panel Design

Versatile panel arrangements can be made to fit individual design needs.



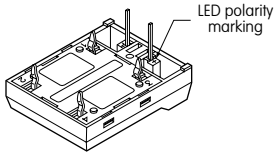




TERMINALS

P **Straight PC Terminals**

With isolated lamp circuit
Further details in Typical Switch Dimensions



LED COLORS & SPECIFICATIONS

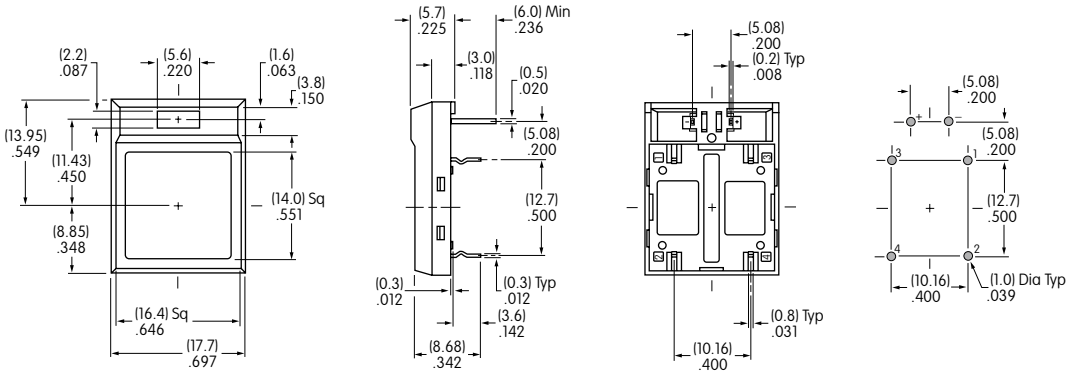
LEDs are supplied as an integral part of the switch. The electrical specifications shown are determined at a basic temperature of 25°C.
If the source voltage exceeds the rated voltage, a ballast resistor is required.
The resistor value can be calculated by using the formula in the Supplement section.

		Spot Illumination			Full Face Illumination		
Color		Red C	Yellow E	Green F	Red C	Yellow E	Green F
Forward Peak Current	I_{FM}	40mA	40mA	40mA	30mA	30mA	30mA
Typical Forward Current	I_F	30mA	30mA	30mA	20mA	20mA	20mA
Forward Voltage	V_F	1.7V	2.2V	2.2V	1.77V	2.1V	2.3V
Reverse Peak Voltage	V_{RM}	4V	4V	4V	4V	4V	4V
Current Reduction Rate Above 25°C	ΔI_F	0.67mA/°C	0.67mA/°C	0.67mA/°C	0.4mA/°C	0.4mA/°C	0.4mA/°C
Ambient Temperature Range		−25° ~ +70°C			−25° ~ +70°C		

TYPICAL SWITCH DIMENSIONS

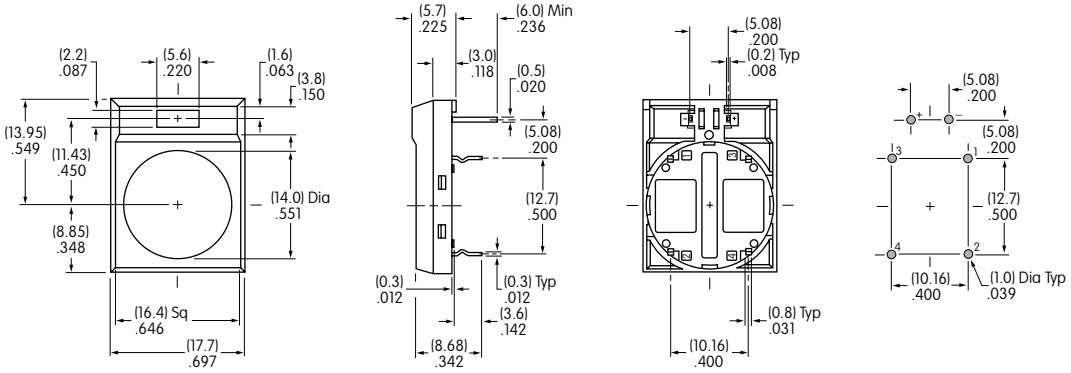
Spot Illuminated with Square Actuator

JF15RP1CC



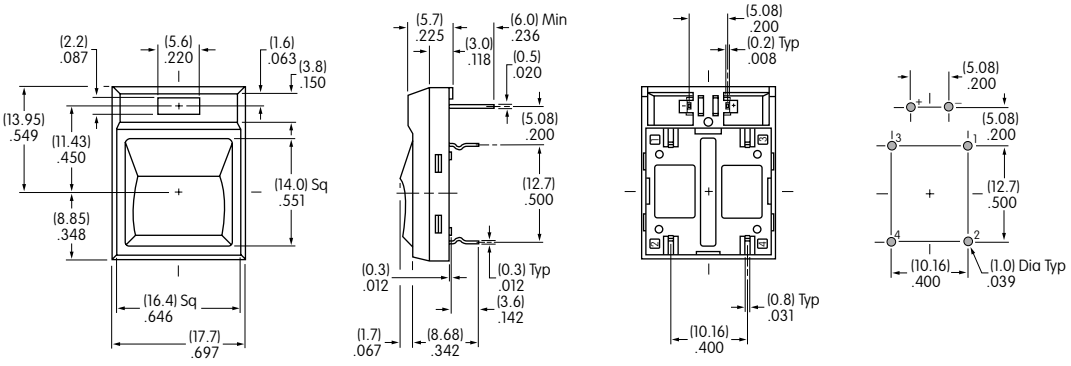
Spot Illuminated with Round Actuator

JF15RP2CC



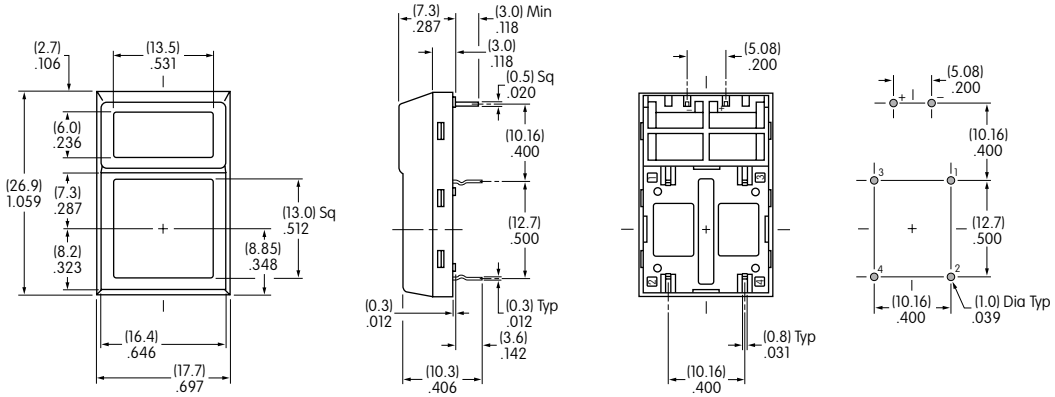
Spot Illuminated with Sculptured Actuator

JF15RP3CC



Full Face Illuminated with Square Actuator

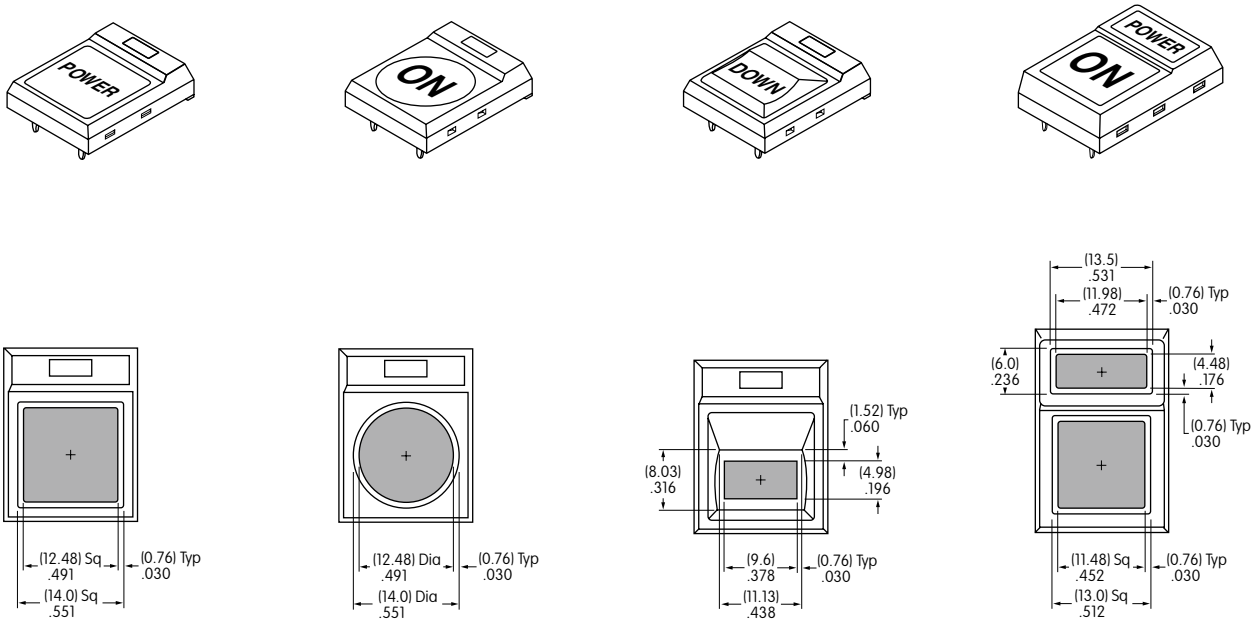
JF15AP1CC



LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area



Recommended Print Method:

Screen Print or Pad Print

Epoxy based ink is recommended.

Shaded areas are printable areas.

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

Contact Resistance: 50 milliohms maximum
Insulation Resistance: 500 megohms minimum @ 250V DC
Dielectric Strength: 250V AC minimum for 1 minute minimum
Mechanical Life: 1,000,000 operations minimum
Electrical Life: 1,000,000 operations minimum
Nominal Operating Force: 3.0N
Total Travel: .030" (0.75mm)

Materials & Finishes

Actuator: Polycarbonate
Case: Glass fiber reinforced polyamide
Base: Glass fiber reinforced polybutylene terephthalate (PBT)
Movable Contact: Stainless steel
Stationary Contacts: Brass with silver plating
Switch Terminals: Brass with silver plating
Lamp Terminals: Brass with tin plating

Environmental Data

Operating Temperature Range: –25°C through +50°C (–13°F through +122°F)
Humidity: 90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration: 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
Shock: 50G (490m/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

Soldering: Wave Soldering: See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

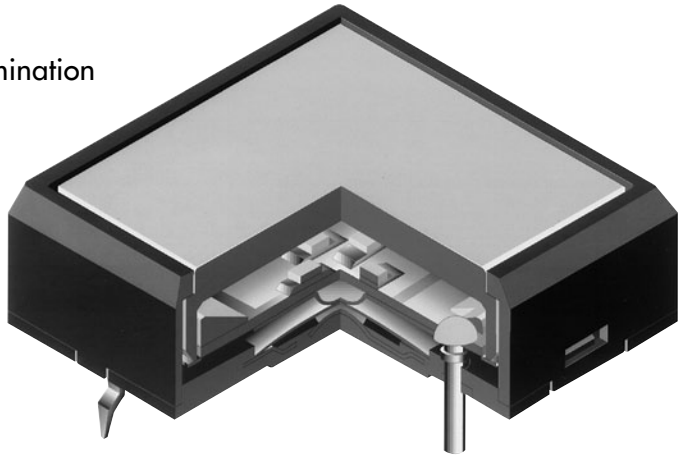
Standards & Certifications

The JL Series tactiles have not been tested for UL recognition or CSA certification.
These switches are designed for use in a low-voltage, low-current circuit.
When used as intended, the results do not produce hazardous energy.

Distinctive Characteristics

Bright, full face illumination with choice of red, green, or amber LEDs.

Multiple LED arrays and interior reflectors enhance illumination of the large, .75" (19mm) square actuator surface.



Distinctive design allows full face illumination in extra low profile of 0.31" (7.85mm) from PCB to top of switch.

Dome contact gives crisp tactile and audible feedback with short stroke and assures high reliability and long life of 1,000,000 operations.

Crimped terminals provide a spring type action to ensure secure mounting and prevent dislodging during the soldering process.

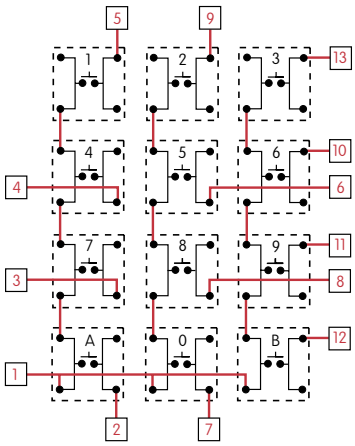
Actual Size

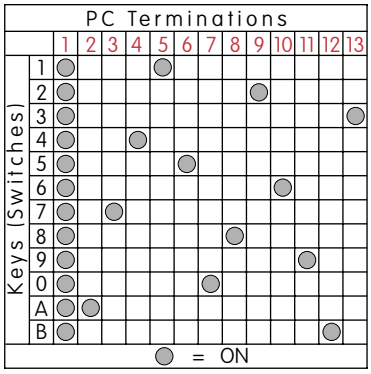
Streamlined housing dimensions provide for compact, side-by-side mounting on a standard grid.

Terminal spacing conforms to standard .100" (2.54mm) PCB grid.

Common Bus Matrix

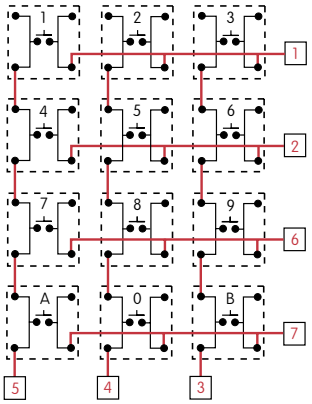
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.

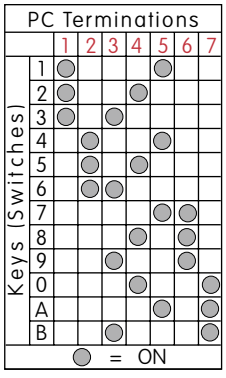




X-Y Matrix

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.





Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

JL | 15 | SK | S | C | C | P2

Pole & Circuit

15	SPST	OFF	(ON)

( ) = Momentary

Housing & Color

SK	Square Black

Actuator Shape

S	Square

Actuator Colors

B	White
C	Red
D	Amber
F	Green

LED Colors

C	Red
D	Amber
F	Green

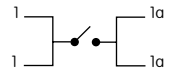
Terminals

P2	Silver Contacts Straight PC

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

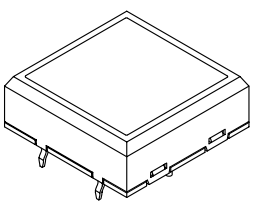
JL15SKSCCP2

POLE & CIRCUIT

		Actuator Position ( ) = Momentary		Switch Throw & Schematic	LED Schematic	
Pole	**Model**	**Normal**	**Down**			
SP	**JL15**	OFF	(ON)	SPST 		Note: Terminal markings "1", "1a", "–", and "+" are shown on the switch.

HOUSING & COLOR

SK **Square Black Housing**



ACTUATOR SHAPE & COLORS

S **.748" (19.0mm) Square Actuator**

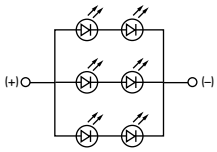
Actuator Colors Available:

B White **C** Red **D** Amber **F** Green

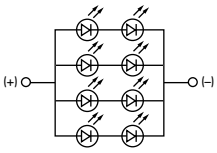
LED COLORS & SPECIFICATIONS

LEDs are an integral part of the switch. The electrical specifications shown are determined at a basic temperature of 25°C.
If the source voltage exceeds the rated voltage, a ballast resistor is required.
The resistor value can be calculated by using the formula in the Supplement.

Red LED model has 6 LEDs.



Amber & Green models each have 8 LEDs.

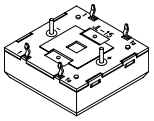


1-color, 1-element LEDs grouped in arrays of 6 or 8.	Color	C Red	D Amber	F Green
Forward Peak Current	I_{FM}	75mA	100mA	100mA
Typical Forward Current	I_F	60mA	80mA	80mA
Forward Voltage	V_F	4.0V	4.2V	4.2V
Reverse Peak Voltage	V_{RM}	8V	8V	8V
Current Reduction Rate Above 25°C	ΔI_F	0.98mA/°C	1.31mA/°C	1.31mA/°C
Ambient Temperature Range		–25°C ~ +50°C		

TERMINALS

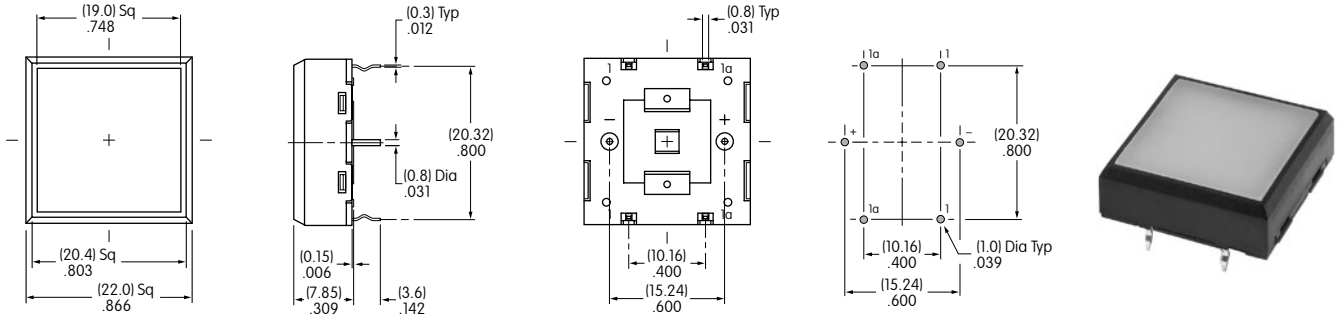
P2 **Silver Contacts Straight PC**

Additional details in Typical Switch Dimensions



TYPICAL SWITCH DIMENSIONS

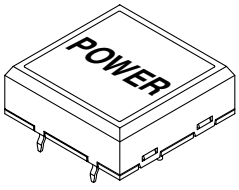
Square Actuator

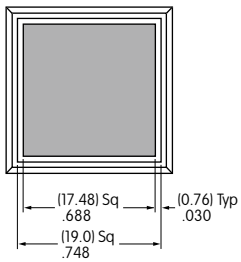


JL15SKSCCP2

LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.





Shaded area is printable area.

Recommended Print Methods:

Screen Print or Pad Print.

Epoxy based ink is recommended.

Additional Method

Engraving is not recommended as an additional method for legends.

Contact factory if engraving is required; it must be done before the actuator is assembled.