

Contents Tactiles

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Rockers

Pushbuttons

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Supplement



CB SeriesJ4

6mm Process Sealed
50mA Low/Logic Level
Straight PC
PCB Mount
Flat Button



CB3 SeriesJ8

6mm SMT
Process Sealed
50mA Low/Logic Level
Gull Wing Terminals
Upright Mount
Flat Button



HP02S eriesJ12

6mm
3VA DC Power Level or 0.4VA Logic Level
Straight PC
PCB Mount



HP03S eriesJ16

6mm SMT
3VA DC Power Level & 0.4VA Logic Level
Gull Wing Terminals
Upright Mount



JB SeriesJ20

10mm Process Sealed
50mA or 125mA Low/Logic Level
Straight or Right Angle PC
PCB Mount



JB Illuminated SeriesJ28

Low Profile
50mA or 125mA Low/Logic Level
Process Sealed
Straight PC



JF SeriesJ34

Ultra-Thin
50mA Low/Logic Level
Straight PC
PCB Mount



JF Illuminated SeriesJ40

Ultra-thin
50mA Low/Logic Level
Process Sealed
Straight PC



JL Illuminated SeriesJ46

Ultra-thin
19mm Full Face
50mA Low/Logic Level
Straight PC

Toggles

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Slides

J
Tactiles

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Supplement

Series CB

6mm Process Sealed 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/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 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.

6mm Process Sealed Tactiles

Series CB

Distinctive Characteristics

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

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

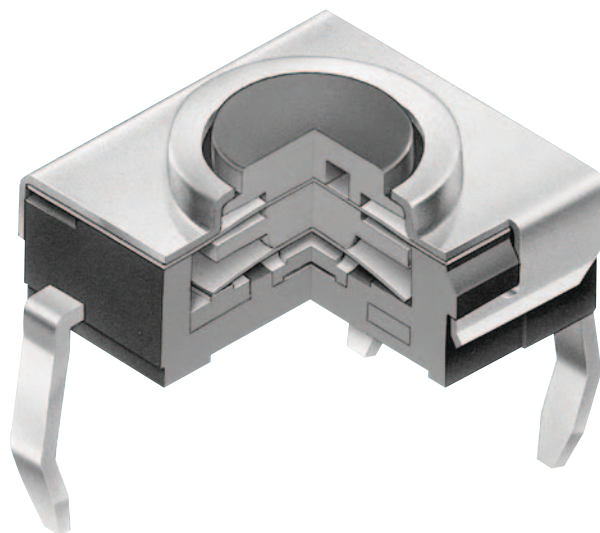
Actuator and base meet UL flammability rating of 94V-0.

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

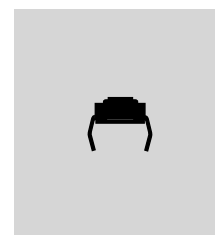
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

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

Packaged in stick tube or partitioned tray.



Actual Size



Series CB

6mm Process Sealed Tactiles

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

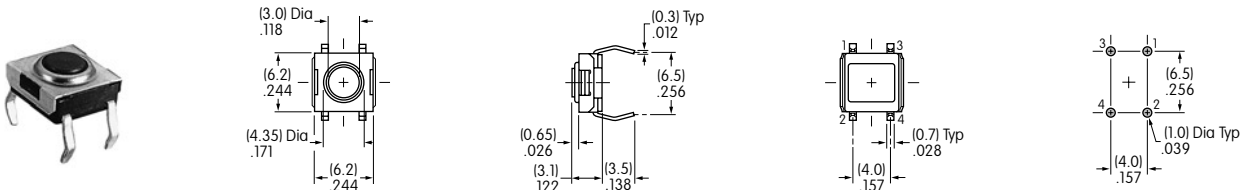


POLE & CIRCUIT

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

TYPICAL SWITCH DIMENSIONS

Single Pole • Single Throw



CB15FP

6mm Process Sealed Tactiles

Series CB

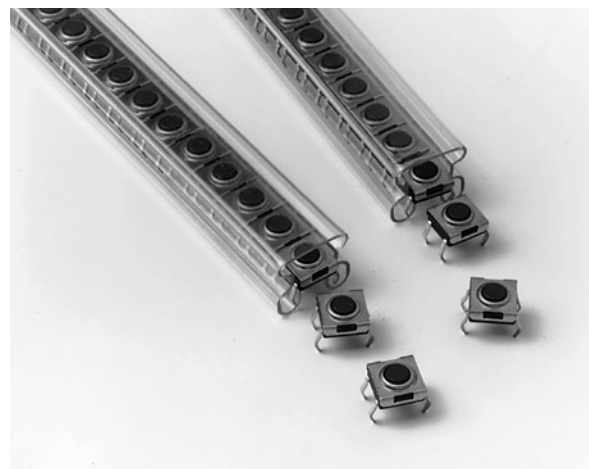
PACKAGING

S**Stick-Tube**

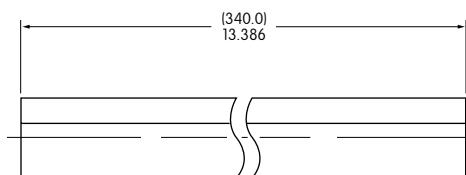
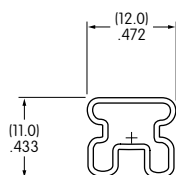
Switches must be ordered in 50-piece increments when stick-tube packaging is selected.

No Code**Partitioned Tray**

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

**Stick-Tube Dimensions**

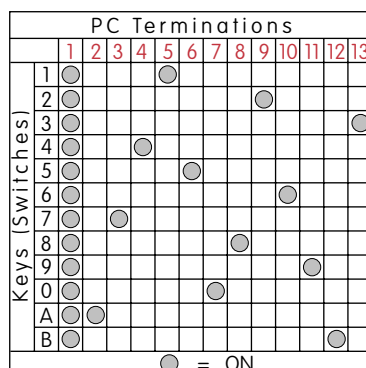
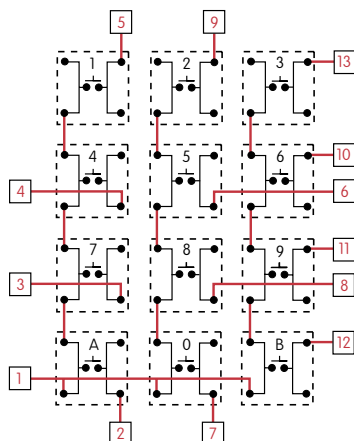
Each stick-tube contains 50 switches



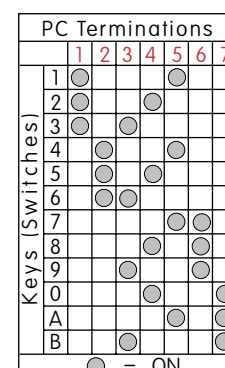
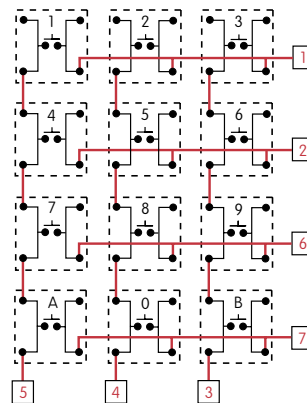
KEYBOARD MATRIX

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

Series CB3

6mm Process Sealed SMT 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/s²) 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.

6mm Process Sealed SMT Tactiles

Series CB3

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.

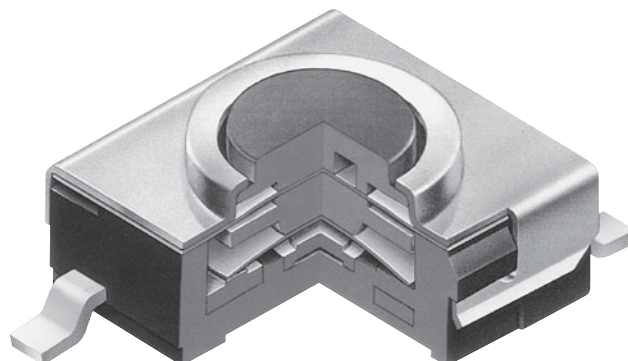
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life – more than 100,000 operations.

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

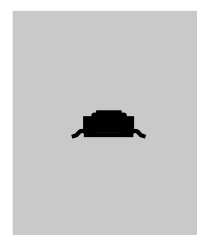
Insert molded terminals lock out flux, solvents, and other contaminants.

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



Series CB3

6mm Process Sealed SMT Tactiles

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

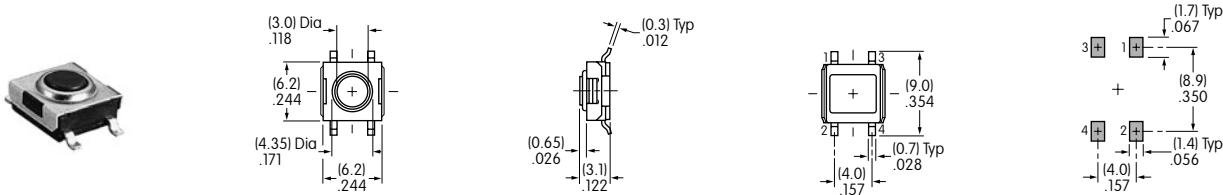


POLE & CIRCUIT

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

TYPICAL SWITCH DIMENSIONS

Single Pole • Single Throw



CB315FP

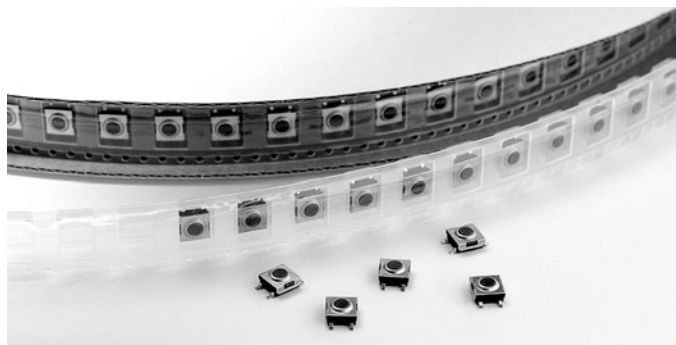
6mm Process Sealed SMT Tactiles

Series CB3

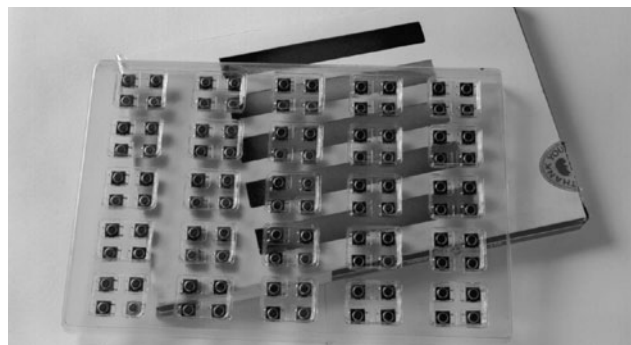
PACKAGING

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

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

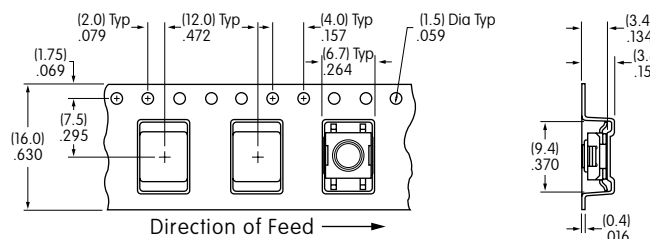
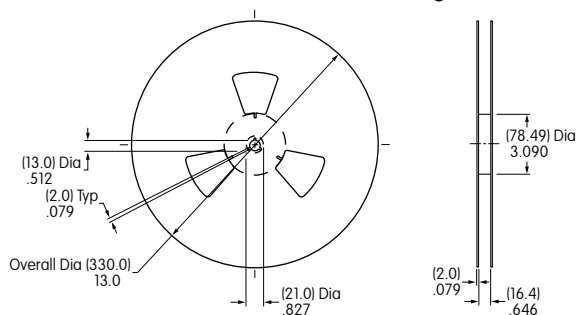
**No Code****Partitioned Tray**

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

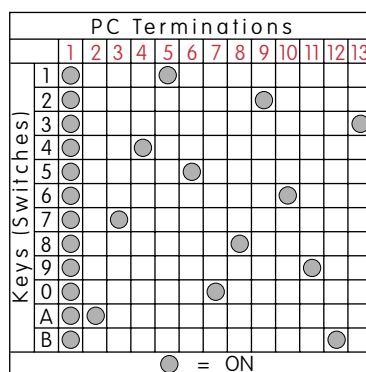
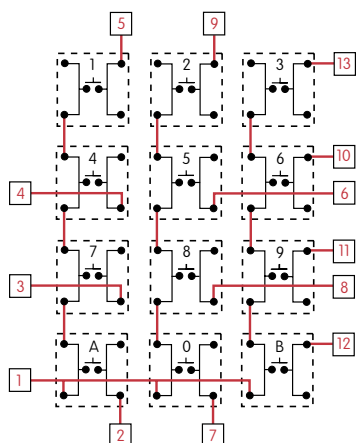
Minimum Leader Length: 16.54" (420mm) Minimum Trailer Length: 7.09" (180mm)



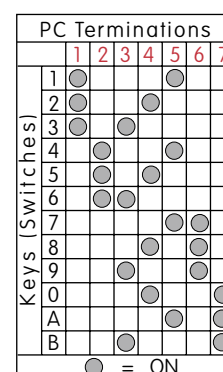
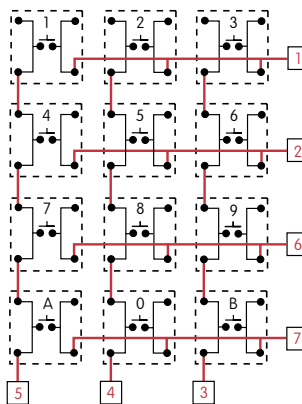
KEYBOARD MATRIX

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

Series HP02

6mm Tactiles

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.
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6mm Tactiles

Series HP02

Distinctive Characteristics

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

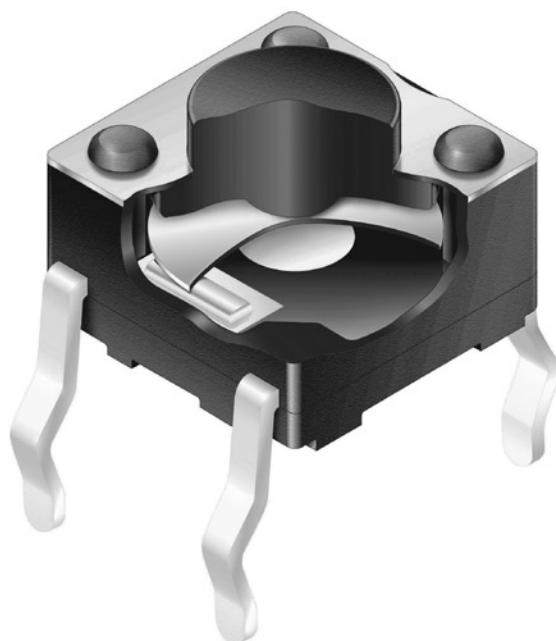
Heat resistant resin body meets lead-free solder processing requirements and UL flammability rating of 94V-0.

Stick-tube packaging allows rapid automated placement of devices.

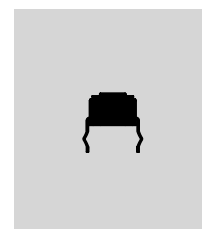
Gold plated contacts available for very low voltage/current applications offer advantages of little or no oxidization or sulfurization and stable contact resistance.

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



Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

J
Tactiles

Tilt

Touch

Indicators

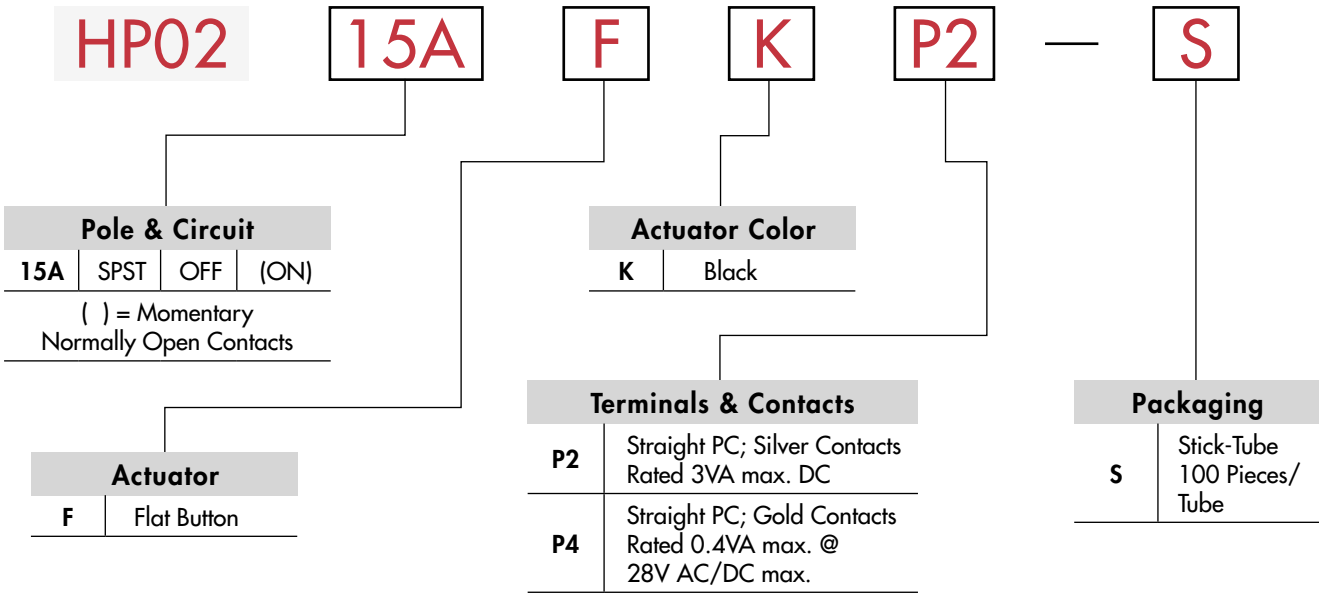
Accessories

Supplement

Series HP02

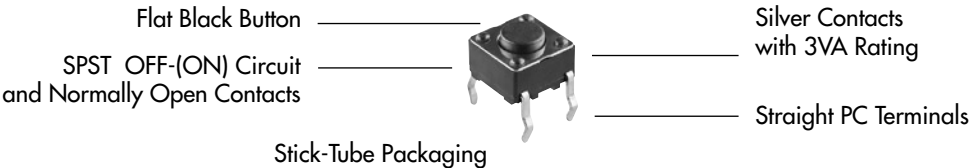
6mm Tactiles

TYPICAL SWITCH ORDERING EXAMPLE






DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

HP0215AFKP2-S

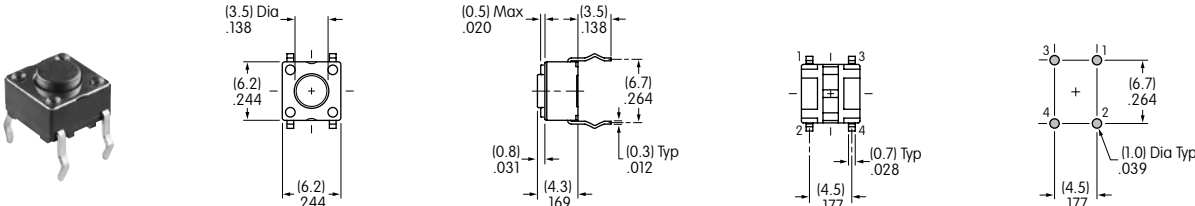


POLE & CIRCUIT

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

TYPICAL SWITCH DIMENSIONS

Straight PC



HP0215AFKP2

6mm Tactiles

Series HP02

PACKAGING

Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

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Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

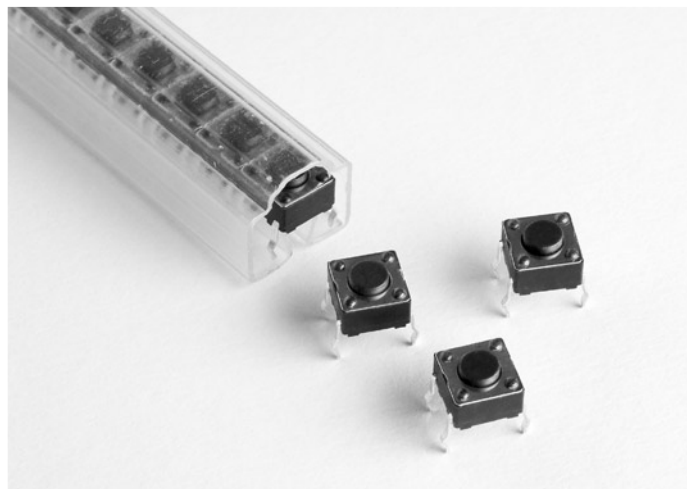
Accessories

Supplement

S

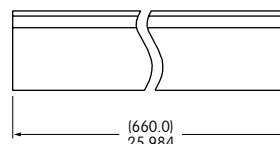
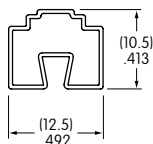
Stick-Tube

Switches must be ordered in 100-piece increments.



Stick-Tube Dimensions

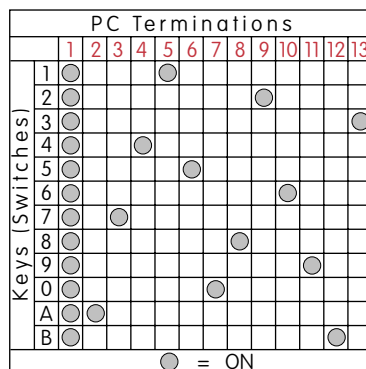
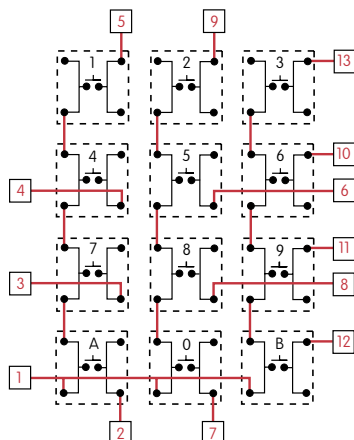
Each stick-tube contains 100 switches.



KEYBOARD MATRIX

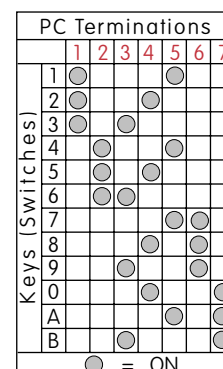
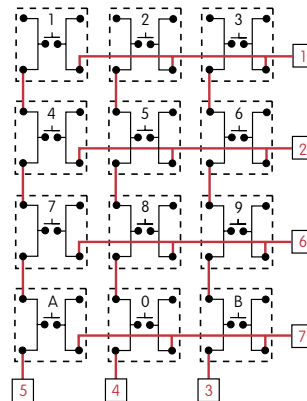
Common Bus Matrix

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

Series HP03

6mm SMT Tactiles

Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

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.
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6mm SMT Tactiles**Series HP03**

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.

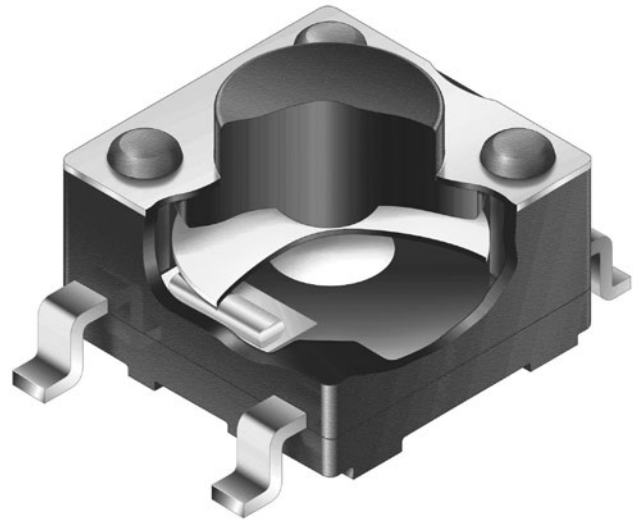
Gold plated contacts available for very low voltage/current applications offer advantages of little or no oxidization or sulfurization and stable contact resistance.

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

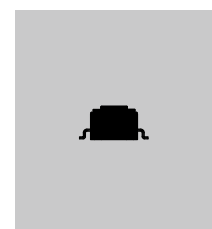
Insert molded terminals lock out flux, solvents, and other contaminants and allow automated soldering.

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



Series HP03

6mm SMT Tactiles

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

Flat Black Button

SPST OFF-(ON) Circuit and
Normally Open Contacts

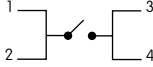


Gold Contacts with
0.4VA Rating

Gull Wing Terminals
for Upright Mount

Tape-Reel Packaging

POLE & CIRCUIT

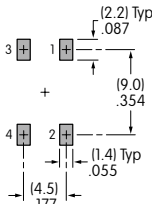
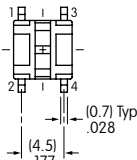
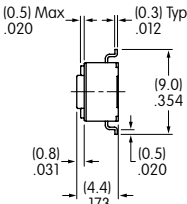
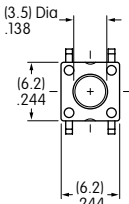
		Actuator Position () = Momentary		Switch Throw & Schematic	Note: Terminal numbers are not actually on the switch.
Pole	Model	Normal	Down		
SP	HP0315A	OFF	(ON)	SPST 	

TYPICAL SWITCH DIMENSIONS

Gull-winged



HP0315AFKP4



6mm SMT Tactiles

Series HP03

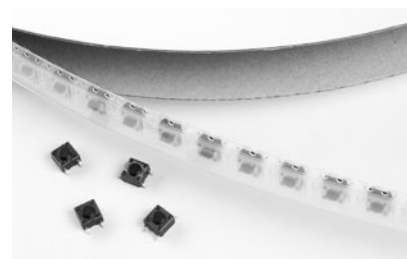
PACKAGING

S**Stick-Tube**

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

**R****Tape-Reel**

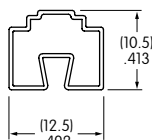
Switches must be ordered in 1,000-piece increments when tape-reel packaging is selected.



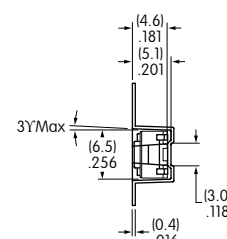
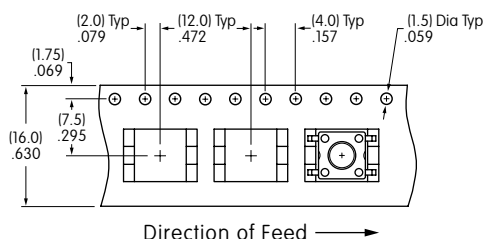
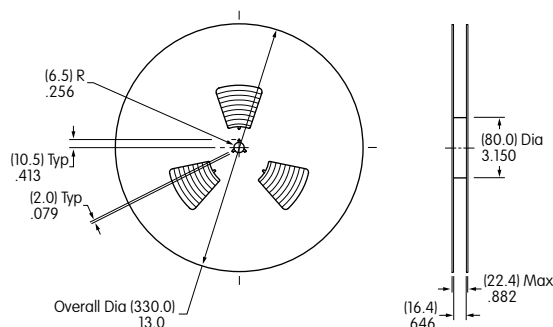
Packaging meets EIA-481-D Standard.

Stick-Tube Dimensions

Each stick-tube contains 100 switches

**Tape-Reel Dimensions**

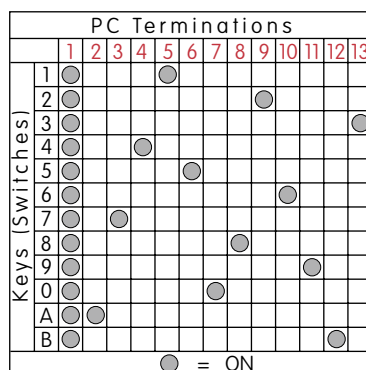
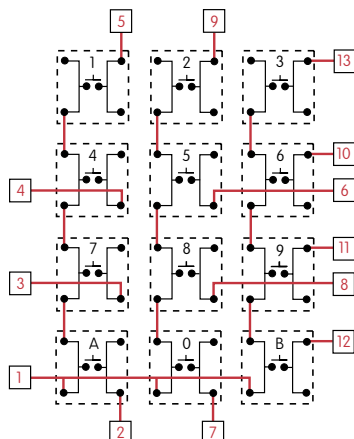
Each tape-reel of 1,100 pockets contains 1,000 switches.
Minimum Leader Length: 15.748" (400mm). Minimum Trailer Length: 6.299" (160mm).



KEYBOARD MATRIX

Common Bus Matrix

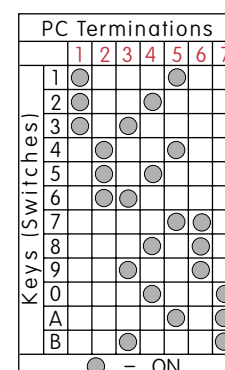
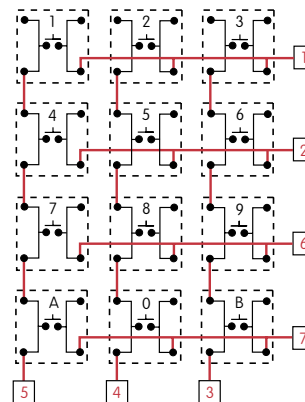
These single pole, single throw switches can be used in a keyboard matrix and, using strapped terminals, achieve a common bus electrical configuration on a single-sided PC board.



Red = PCB Trace Black = Switch Circuit

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.



Series JB

Low Profile Process Sealed Tactiles

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)
Sealing:	IP67 of IEC60529 standard (similar to NEMA 4 & 13)

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.
-------------------------	--

Low Profile Process Sealed Tactiles

Series JB

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.

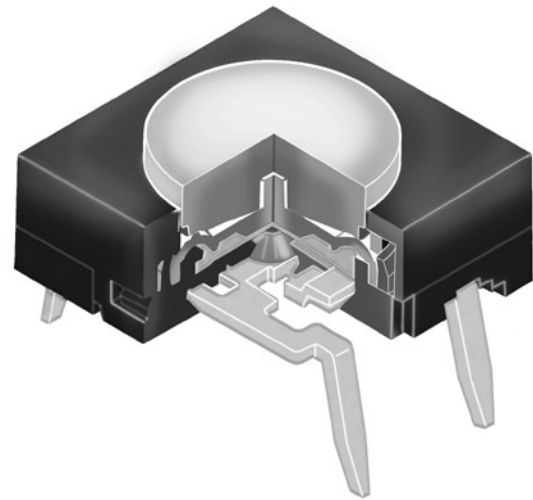
Choice of dimensions from PCB to top of cap allows design flexibility.

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.

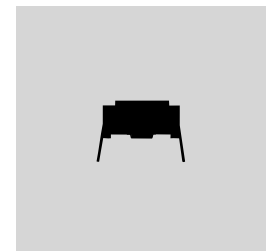
Slanted terminals provide a spring type action which ensures secure mounting and prevents dislodging during wave soldering.

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.

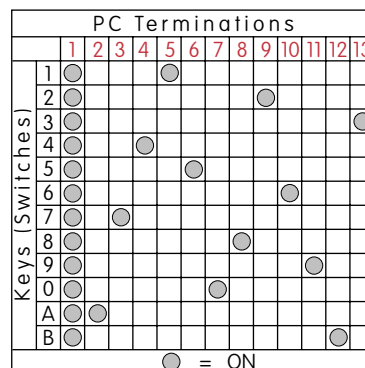
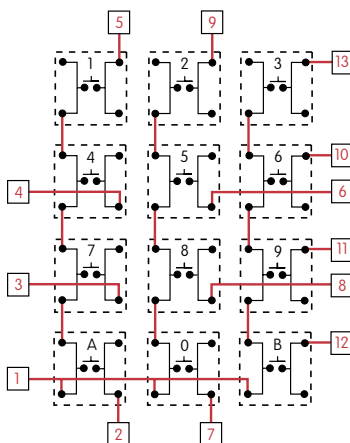


Actual Size



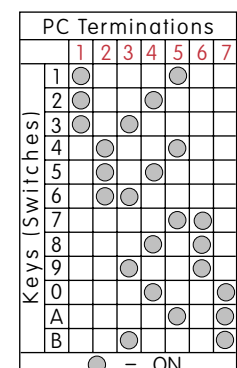
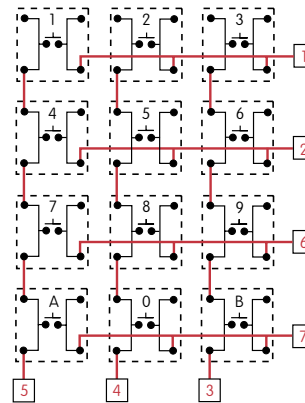
Common Bus Matrix

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

Series JB

Low Profile Process Sealed Tactiles

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

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

Cap Colors

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

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JB15FP

Flat Blue Button

SPST OFF-(ON) Circuit



Standard Operating Force

Straight PC Terminals

5

Cap with Black Mounter

For Right Angle PC

6

Flat

A	Black
B	White
C	Red
H	Gray

Low Profile Process Sealed Tactiles

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

OPERATING FORCE



Standard Operating Force
1.76N
For F & K Actuators

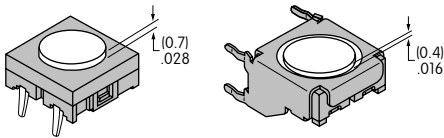


High Operating Force
2.65N
For F, K & A Actuators

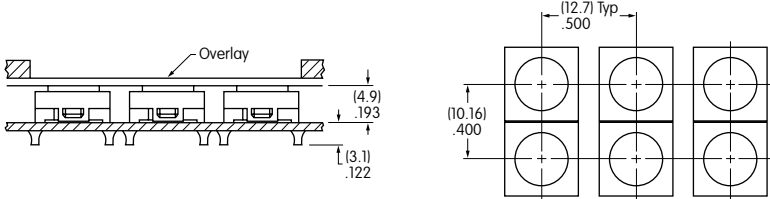
ACTUATORS



Flat Blue Button



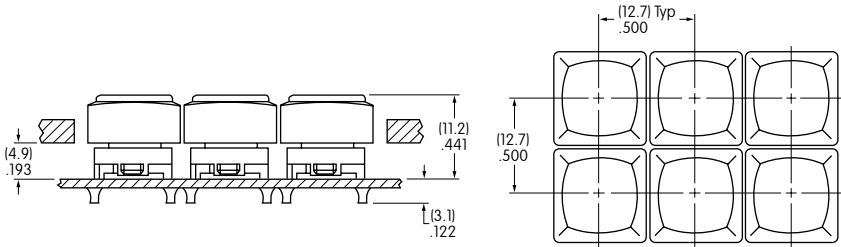
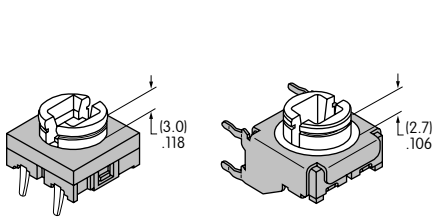
Flat button is an integral part of the switch and cannot be ordered separately.



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



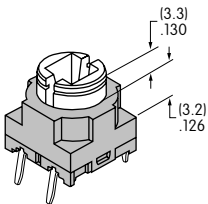
Short Actuator



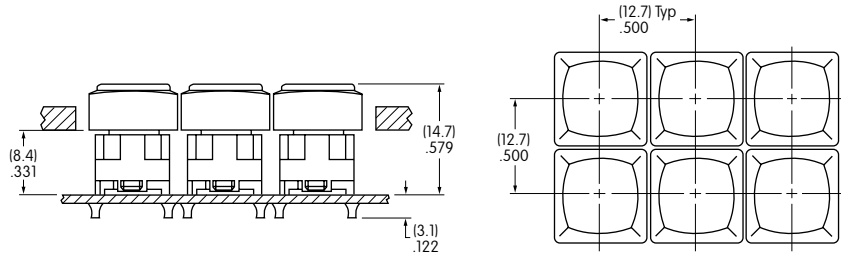
Custom keyboards can be designed with caps installed through a panel cutout (illustration with framed cap AT4078 and button AT4077). Not applicable for right angle mounting.



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).

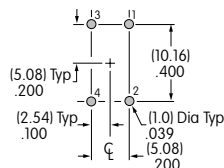
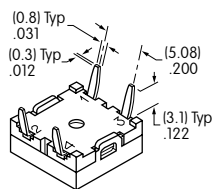
Series JB

Low Profile Process Sealed Tactiles

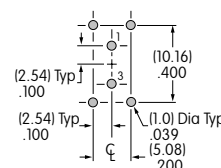
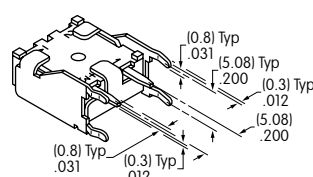
TERMINALS

P

Straight PC

**H**

Right Angle PC



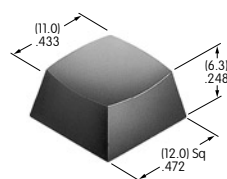
Further details shown in Typical Switch Dimensions

SNAP-ON CAPS

1

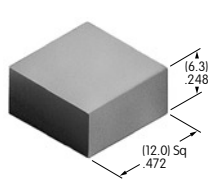
AT4058 Sculptured for Straight PC

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

**2**

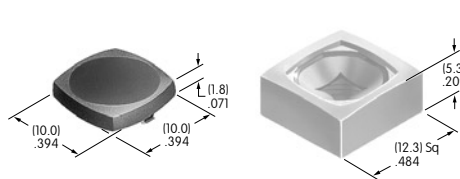
AT4059 Flat for Straight PC

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

**4**

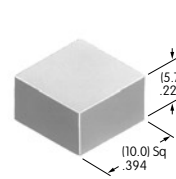
Framed: AT4077 Button & AT4078 Frame for Straight PC

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

**6**

AT4139 Flat for Right Angle PC

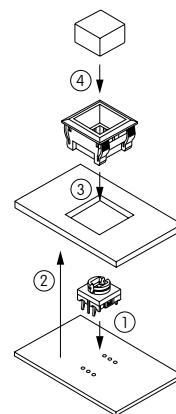
Material: Polycarbonate
Finish: Glossy
Colors: A B C H

**5**

AT4140 Cap with AT547 Mounter for Straight PC

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

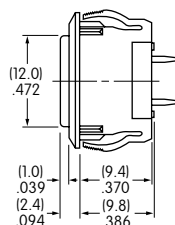
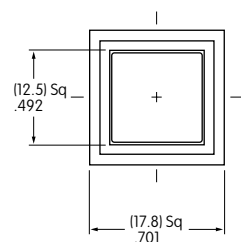
Mounter
Material: Polyamide
Finish: Matte
Color: A



Assembly Procedure

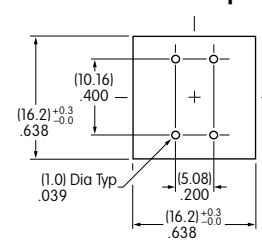
1. Solder switch to PCB.
2. Install PCB in equipment.
3. Snap mounter into panel. Dimension from top of panel to top of PCB is .386" (9.8mm).
4. Snap cap onto plunger.

Panel Cutout & Footprint



Panel Mounting Dimensions

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



Cap Colors
Available:

A

Black

B

White

C

Red

E

Yellow

F

Green

G

Blue

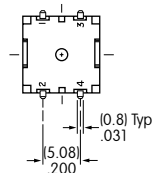
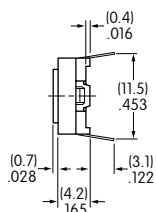
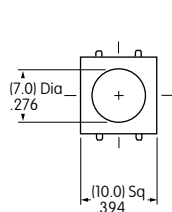
H

Gray

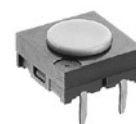
Low Profile Process Sealed Tactiles

Series JB

TYPICAL SWITCH DIMENSIONS

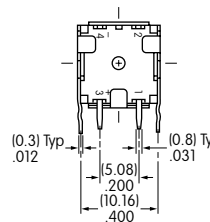
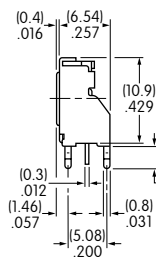
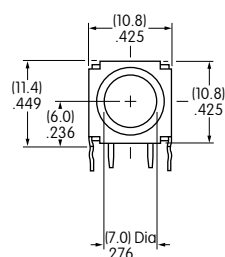


Flat Blue Button • Straight PC



JB15FP

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



Flat Blue Button • Right Angle PC

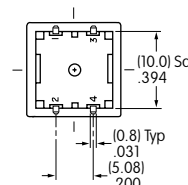
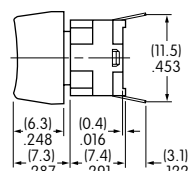
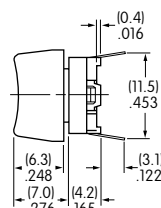
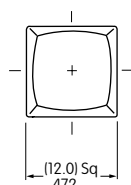


JB15FH

Short Actuator

Extended Actuator

Sculptured Snap-on Cap • Straight PC



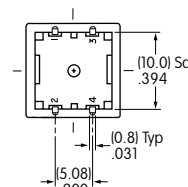
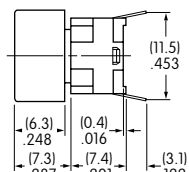
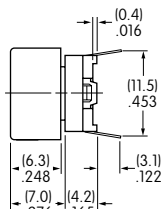
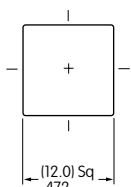
Spring action terminals conform to .100" (2.54mm) PCB spacing

JB15KP-1C

Short Actuator

Extended Actuator

Flat Snap-on Cap • Straight PC



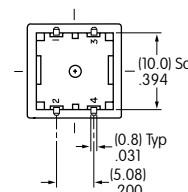
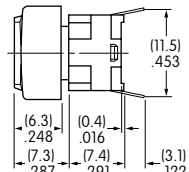
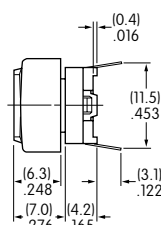
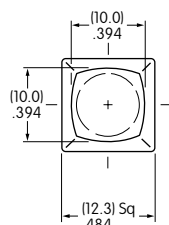
Spring action terminals conform to .100" (2.54mm) PCB spacing

JB15KP-2C

Short Actuator

Extended Actuator

Framed Snap-on Cap • Straight PC



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

JB15FHAP-4BC

Series JB

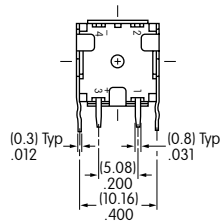
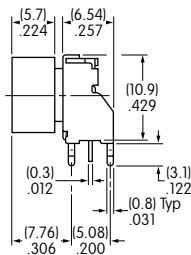
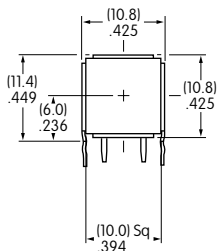
Low Profile Process Sealed Tactiles

TYPICAL SWITCH DIMENSIONS

Flat Snap-on Cap • Right Angle PC



JB15KH-6C

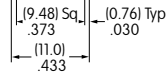
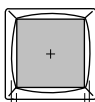
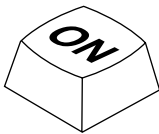


LEGENDS

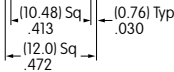
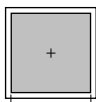
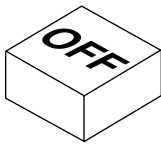
NKK Switches can provide custom legends for caps. Contact factory for more information.

Shaded Areas are Printable Areas

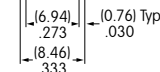
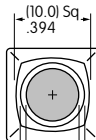
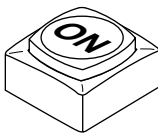
AT4058



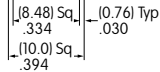
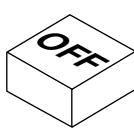
AT4059 & AT4140



AT4077 Button



AT4139



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

Series JB

Illuminated Low Profile Process Sealed Tactiles

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/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.



Illuminated Low Profile Process Sealed Tactiles

Series JB

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.

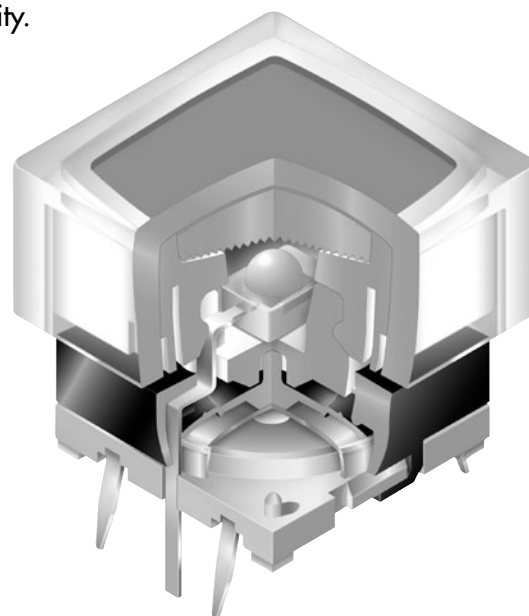
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life of up to 5,000,000 operations.

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

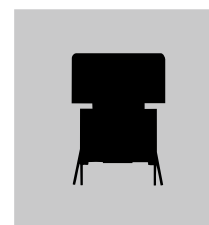
Slanted terminals provide a spring type action which ensures secure mounting and prevents dislodging during wave soldering.

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.

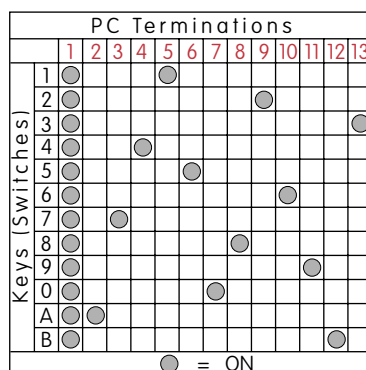
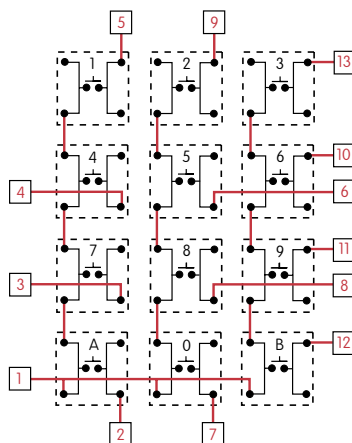


Actual Size



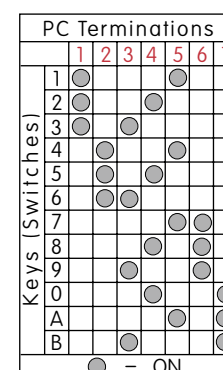
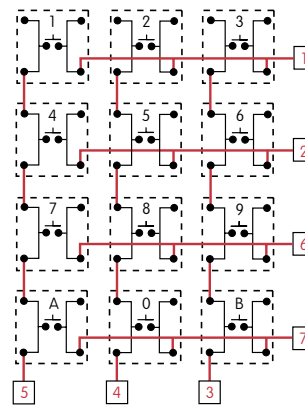
Common Bus Matrix

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

Series JB

Illuminated Low Profile Process Sealed Tactiles

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

Red LED

Short Actuator

SPST
OFF-(ON) Circuit

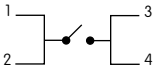



Flat Cap with
Clear Lens and Red Diffuser

Standard Operating Force

Straight PC Terminals

POLE & CIRCUIT

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

Series JB

Illuminated Low Profile Process Sealed Tactiles

OPERATING FORCE



Standard
Nominal Operating Force
1.76N

Available with short actuator only (code L)



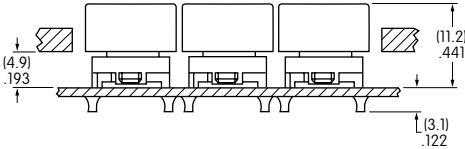
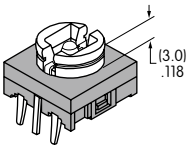
High
Nominal Operating Force
2.65N

Available with both short and extended actuators

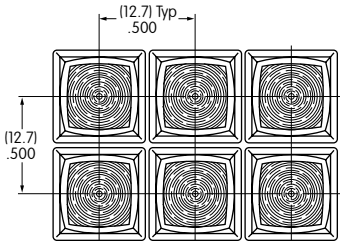
ACTUATORS



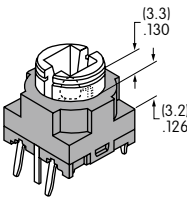
Short Actuator



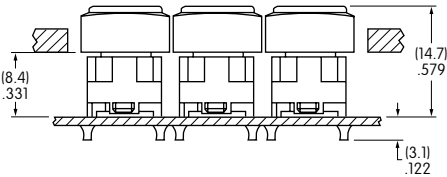
Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4060).



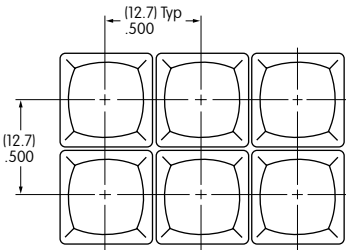
Extended Actuator



High operating force only



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

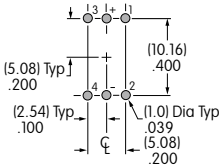
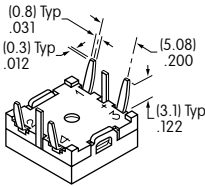


TERMINALS



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.

		C	E	F
Color		Red	Yellow	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		



Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

Series JB

Illuminated Low Profile Process Sealed Tactiles

SNAP-ON CAPS

AT4135 Flat

Cap Color Codes:



Translucent White



Yellow



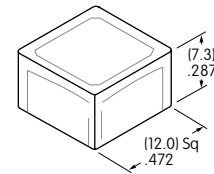
Red



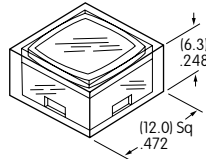
Green

Material: Polycarbonate

Finish: Frosted



AT4060 Flat

Lens/Diffuser
Color Codes:

Clear/Translucent White



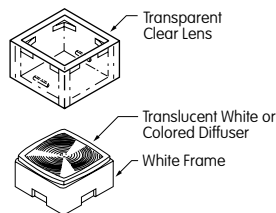
Clear/Red



Clear/Yellow

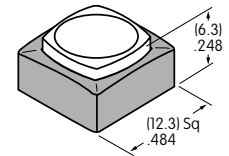


Clear/Green



Framed:

AT4076 Button with Frame

Translucent Button/Frame
Color Codes:

White/White



White/Red



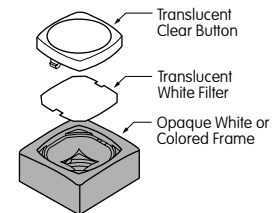
White/Yellow



White/Green



White/Gray



Material: Polycarbonate

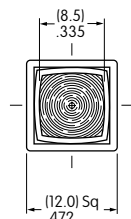
Lens Finish: Glossy

Material: Polycarbonate

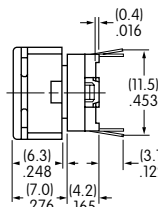
Button Finish: Frosted

TYPICAL SWITCH DIMENSIONS

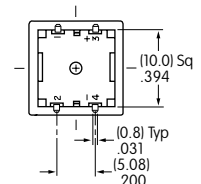
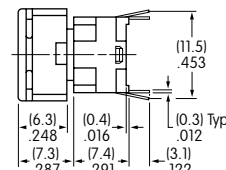
Flat Snap-on Cap



Short Actuator



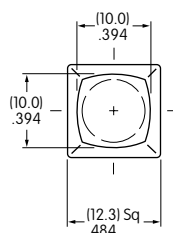
Extended Actuator



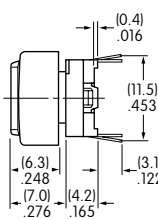
JB15LPC-JC

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

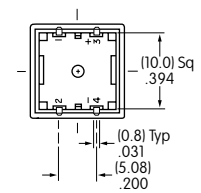
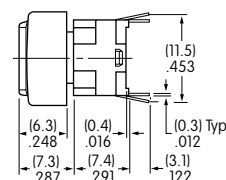
Framed Snap-on Cap



Short Actuator



Extended Actuator



JB15HBPC-BC

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

Illuminated Low Profile Process Sealed Tactiles

LEGENDS

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

Suggested Printable Area for Cap, Lens, or Button

Recommended Methods:

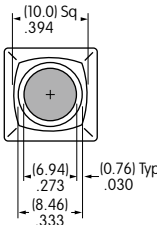
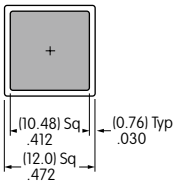
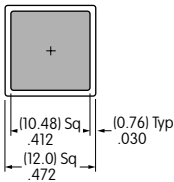
Laser Etch, Screen Print or Pad Print

Laser Etch or Pad Print

Epoxy based ink
is recommended.

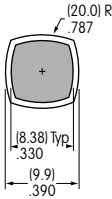
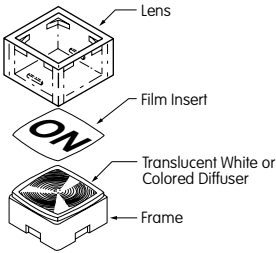


Epoxy based ink
is recommended.



Shaded areas are printable areas.

Suggested Printable Area for Film Insert



Shaded area is printable area.

Film Insert: Clear Polyester 7 mil maximum thickness

Series JF

Ultra-Thin Process Sealed Tactiles

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/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

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.

Ultra-Thin Process Sealed Tactiles

Series JF

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.

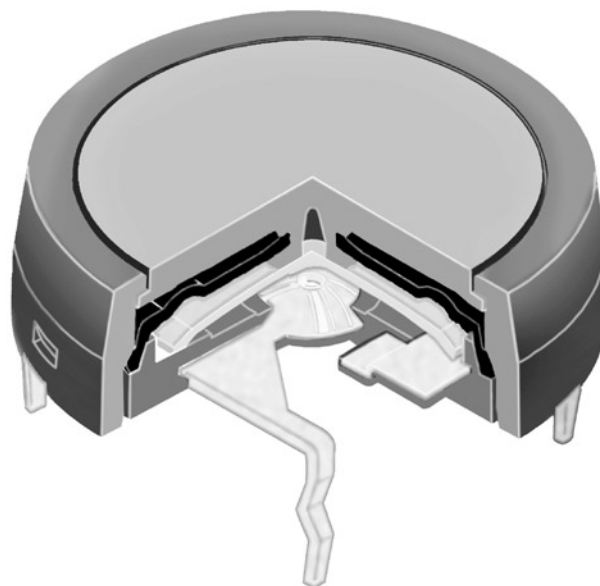
Dome contact gives crisp tactile and audible feedback to positively indicate circuit transfer and assures high reliability and long life.

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.

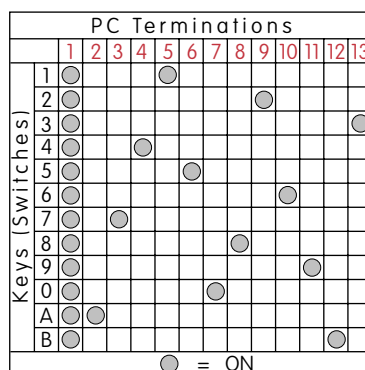
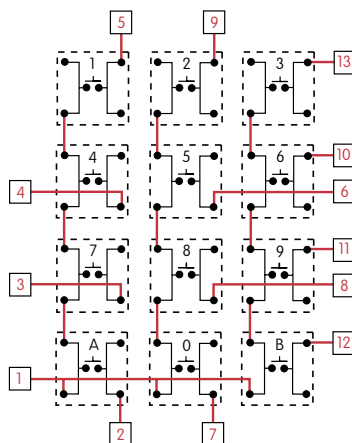


Actual Size



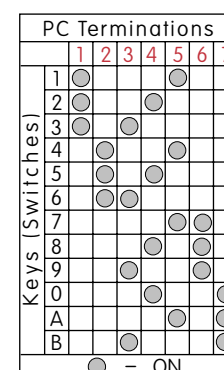
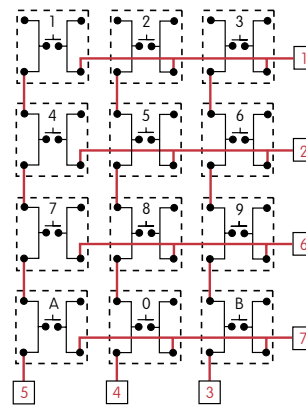
Common Bus Matrix

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.

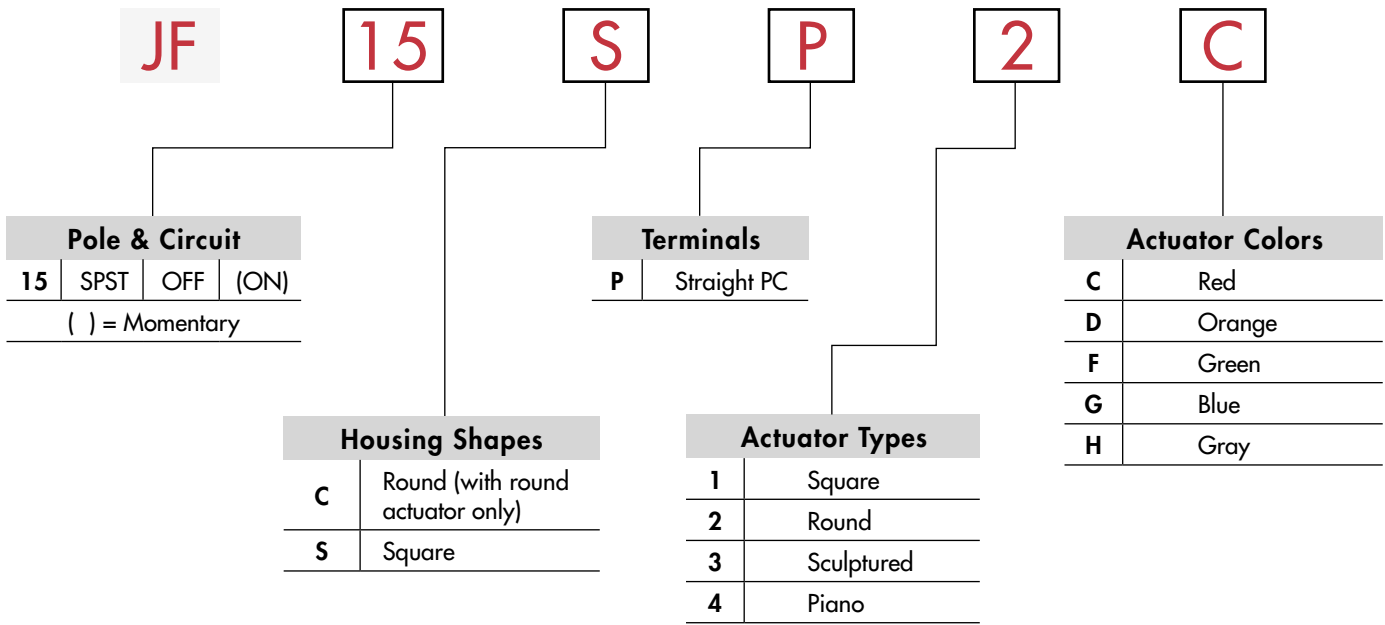


Red = PCB Trace Black = Switch Circuit

Series JF

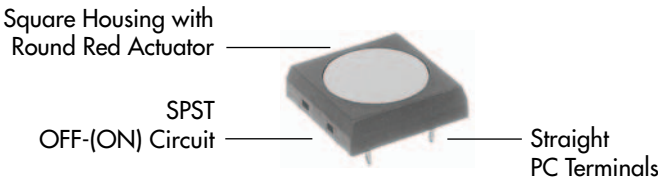
Ultra-Thin Process Sealed Tactiles

TYPICAL SWITCH ORDERING EXAMPLE






DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JF15SP2C



POLE & CIRCUIT

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

Ultra-Thin Process Sealed Tactiles

Series JF

HOUSING SHAPES & ACTUATOR TYPES

<div>C</div> Round Housing	<div>S</div> Square Housing
<div>2</div> Round Actuator	<div>1</div> Square Actuator
<div>2</div> Round Actuator	<div>2</div> Round Actuator
	<div>3</div> Sculptured Actuator
	<div>4</div> 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

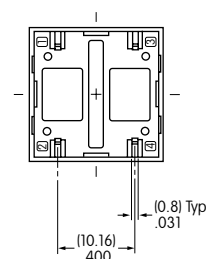
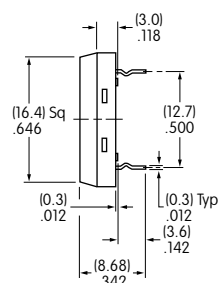
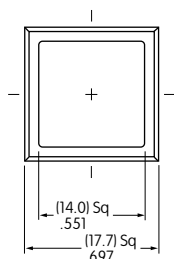
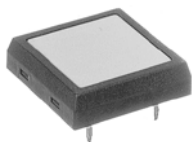
shunto@126.com

Series JF

Ultra-Thin Process Sealed Tactiles

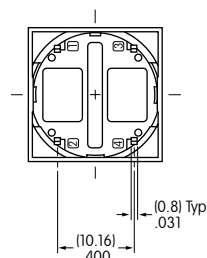
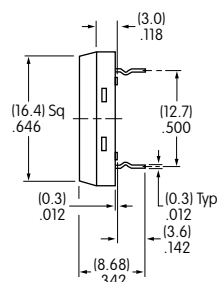
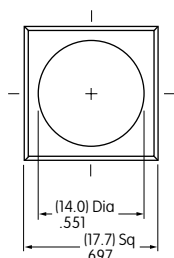
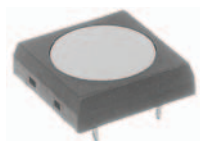
TYPICAL SWITCH DIMENSIONS

Square Actuator



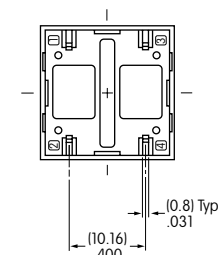
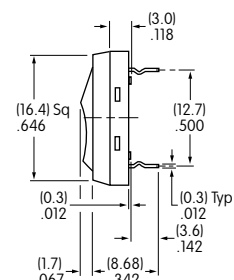
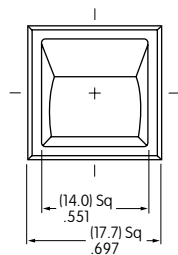
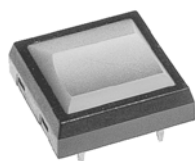
JF15SP1C

Round Actuator



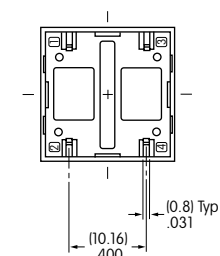
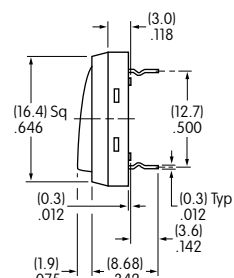
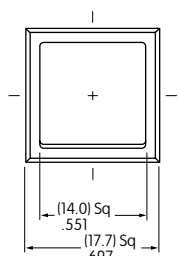
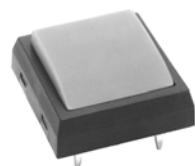
JF15SP2C

Sculptured Actuator



JF15SP3C

Piano Actuator



JF15SP4C

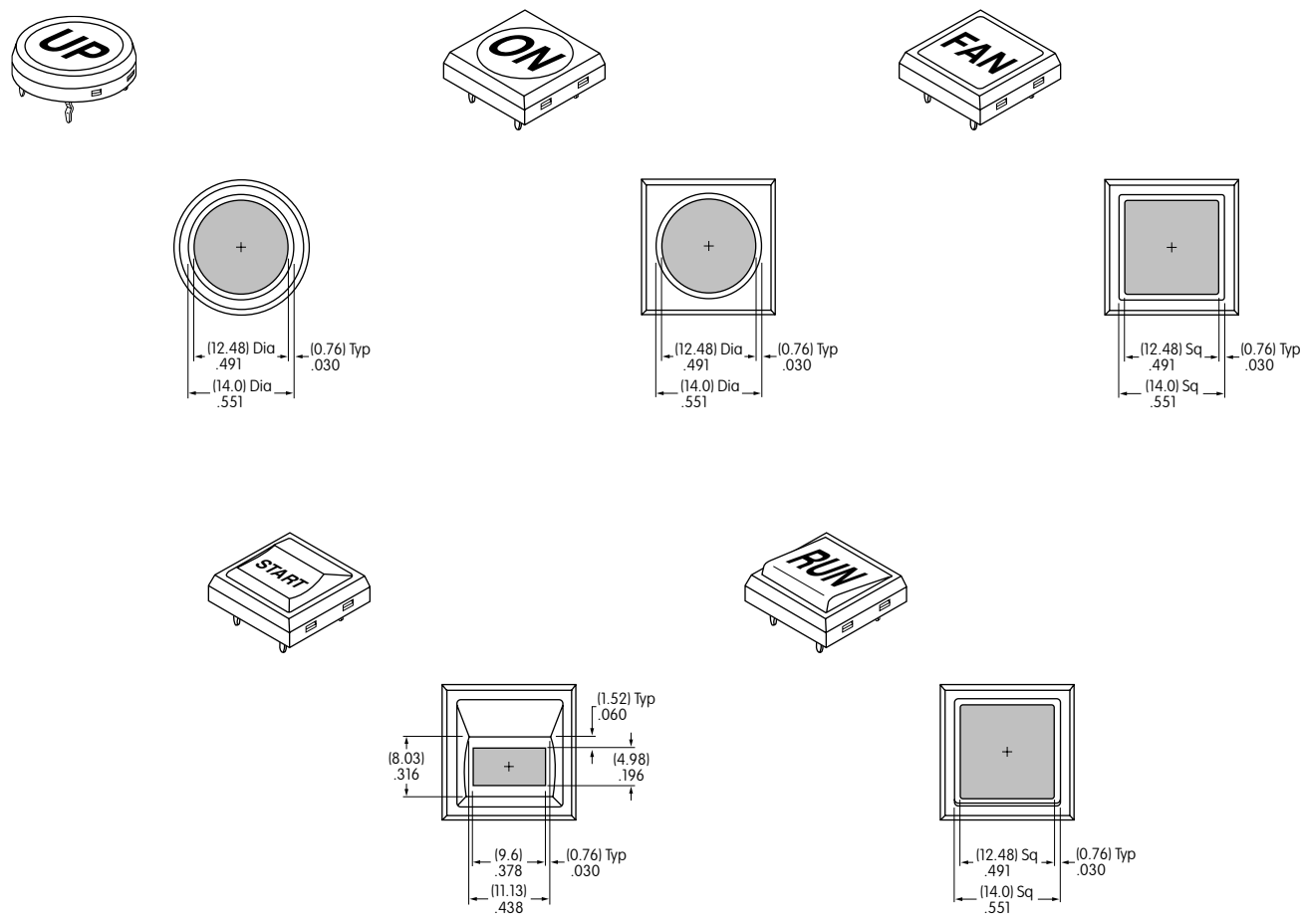
Ultra-Thin Process Sealed Tactiles

Series JF

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.

Series JF

Illuminated Ultra-Thin Process Sealed Tactiles

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/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.

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.

Illuminated Ultra-Thin Process Sealed Tactiles

Series JF

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.

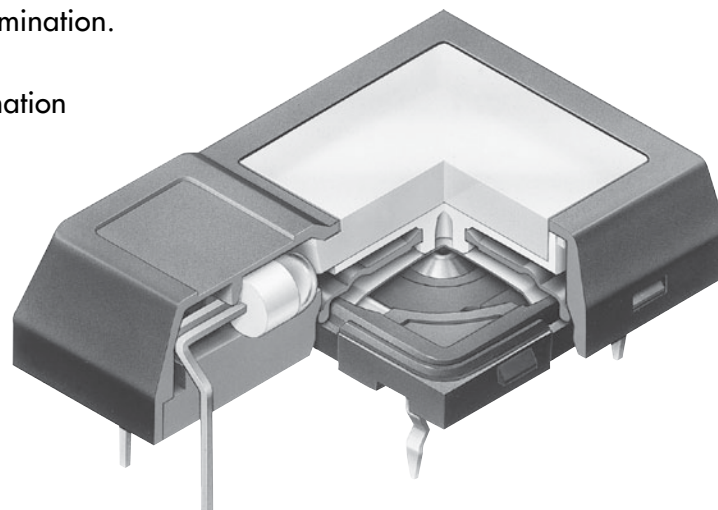
Dome contact gives crisp tactile and audible feedback to positively indicate circuit transfer and assures high reliability and long life.

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

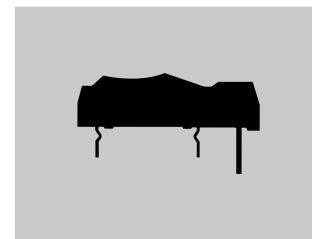
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

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

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

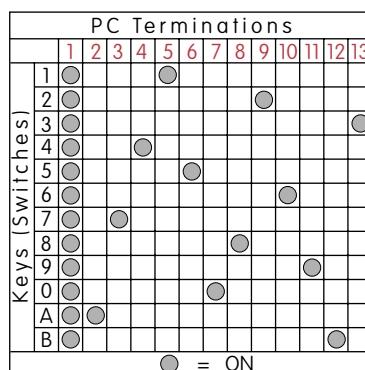
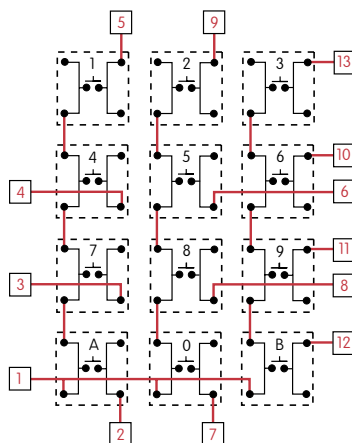


Actual Size



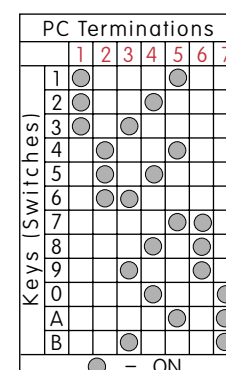
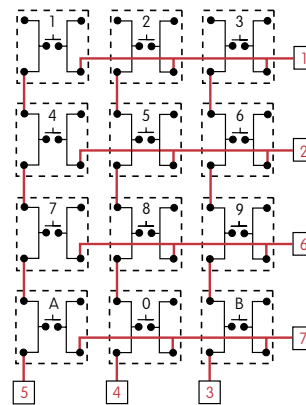
Common Bus Matrix

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

Series JF

Illuminated Ultra-Thin Process Sealed Tactiles

TYPICAL SWITCH ORDERING EXAMPLE

JF

15

R

P

2

C

C

Pole & Circuit

15	SPST	OFF	(ON)
----	------	-----	------

() = Momentary

Terminals

P	Straight PC
---	-------------

Illumination

R	Spot
A	Full Face (with square actuator only)

Actuator Types

1	Square
2	Round
3	Sculptured

LED Colors

C	Red
E	Yellow
F	Green

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

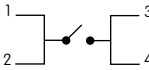
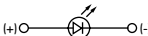


Red LED for Spot Illumination

SPST OFF-(ON) Circuit

Round Red Actuator

Straight PC Terminals

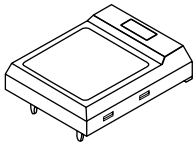
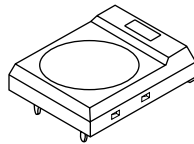
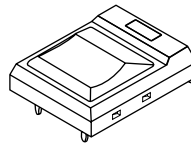
POLE & CIRCUIT

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

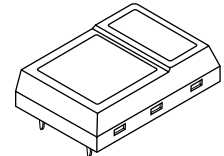
Illuminated Ultra-Thin Process Sealed Tactiles

Series JF

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

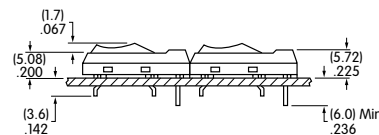
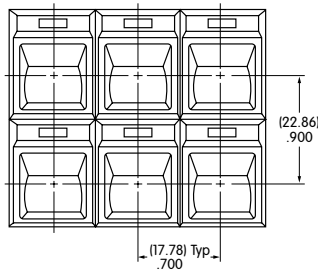
A Full Face Illumination**1** Square Actuator

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

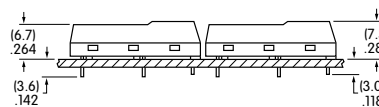
Color Codes: **C** Red **D** Orange **E** Yellow **F** Green **G** Blue **H** Gray

Flexible Panel Design

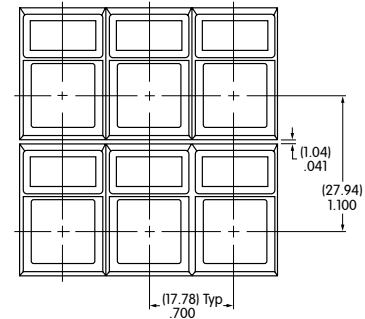
Versatile panel arrangements can be made to fit individual design needs.



Spot Illumination



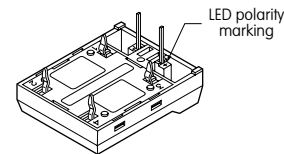
Full Face Illumination



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		
		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		

Series JF

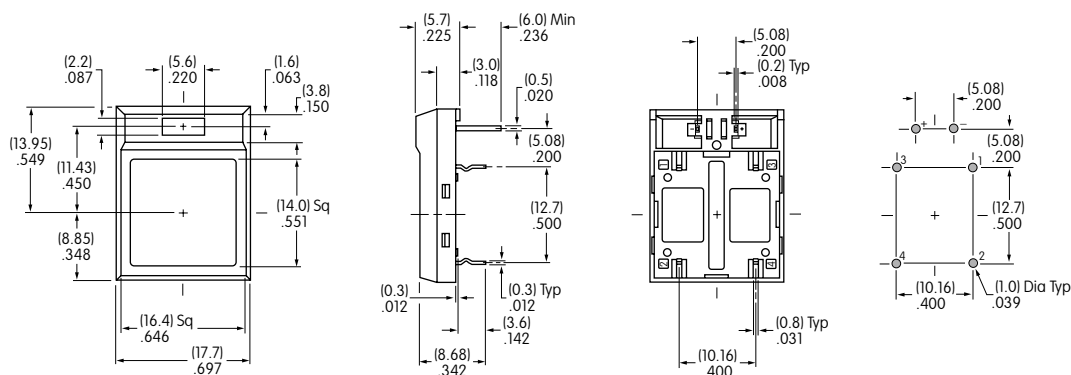
Illuminated Ultra-Thin Process Sealed Tactiles

TYPICAL SWITCH DIMENSIONS

Spot Illuminated with Square Actuator



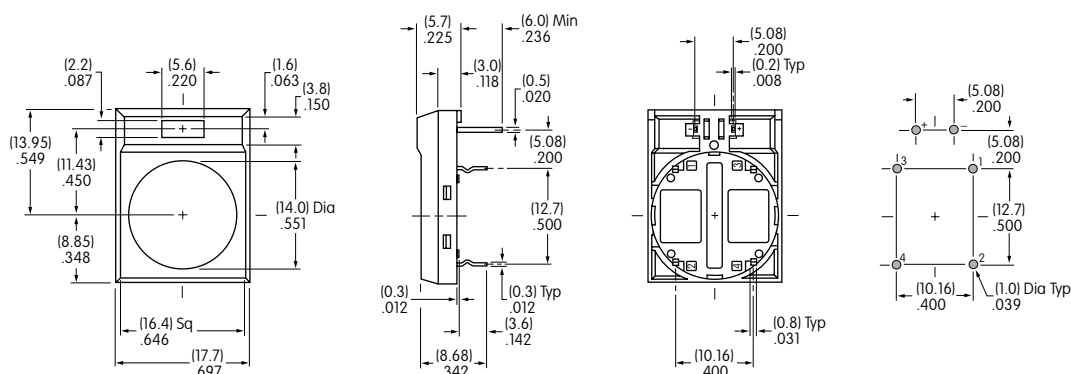
JF15RP1CC



Spot Illuminated with Round Actuator



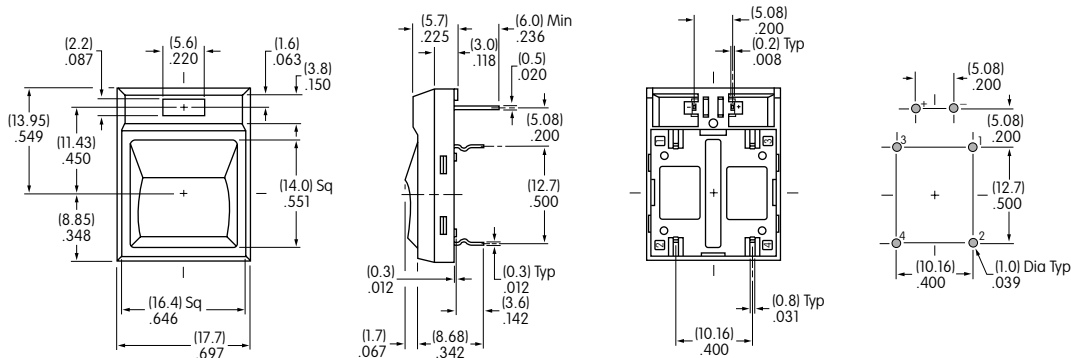
JF15RP2CC



Spot Illuminated with Sculptured Actuator



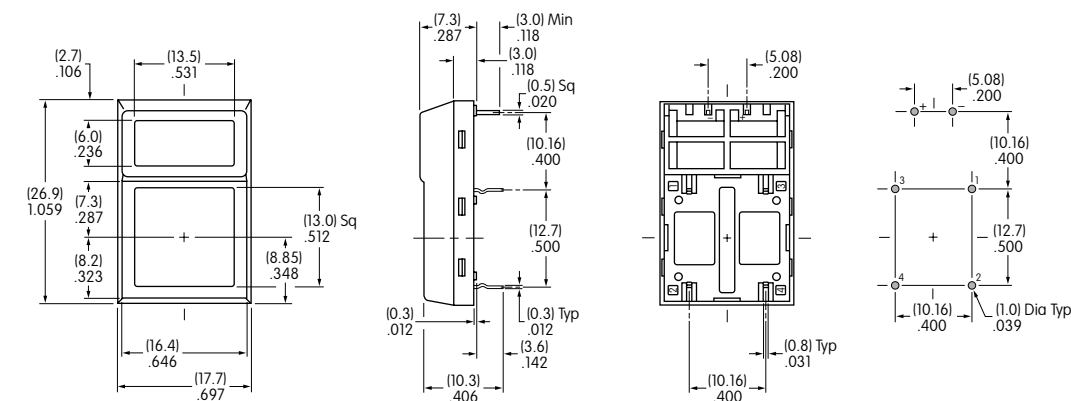
JF15RP3CC



Full Face Illuminated with Square Actuator



JF15AP1CC



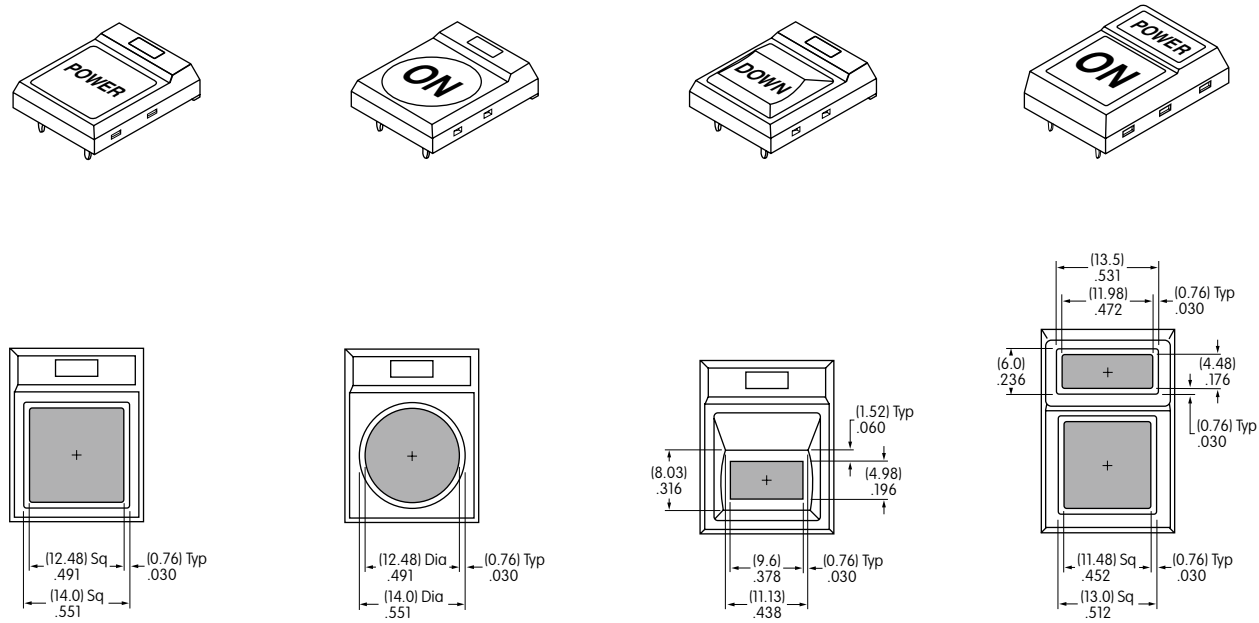
Illuminated Ultra-Thin Process Sealed Tactiles

Series JF

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.

Series JL

Illuminated Ultra-Thin Tactiles

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/s²) 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.

Illuminated Ultra-Thin Tactiles

Series JL

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.

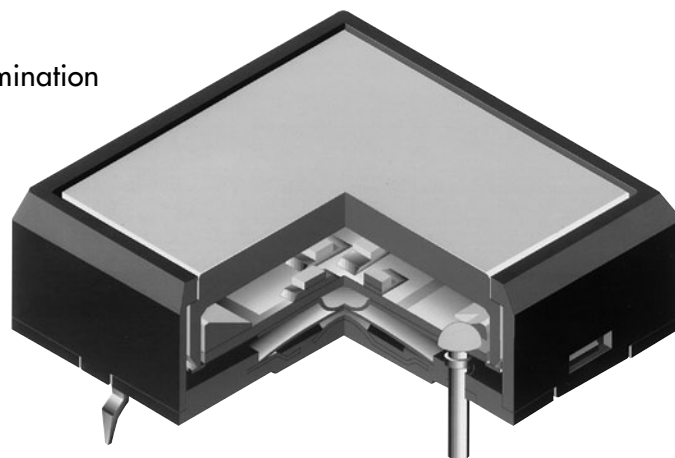
Distinctive design allows full face illumination in extra low profile of 0.31" (7.85mm) from PCB to top of switch.

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

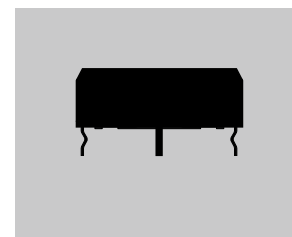
Crimped terminals provide a spring type action to ensure secure mounting and prevent dislodging during the soldering process.

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

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

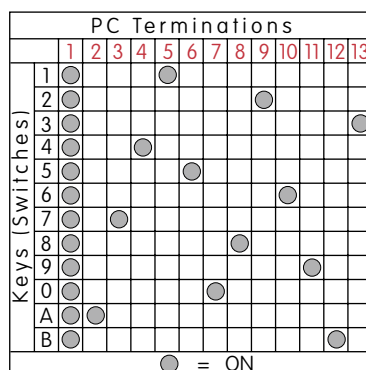
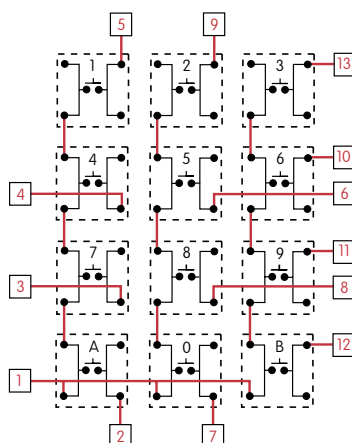


Actual Size



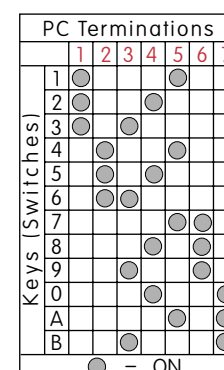
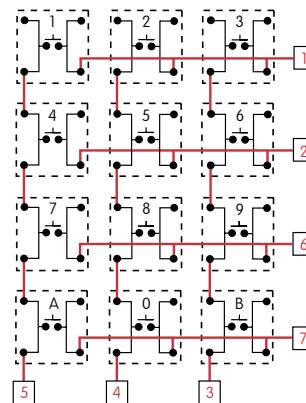
Common Bus Matrix

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

Series JL

Illuminated Ultra-Thin Tactiles

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

Terminals

P2	Silver Contacts Straight PC
----	--------------------------------

LED Colors

C	Red
D	Amber
F	Green

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JL15SKSCCP2





Red Square Actuator with Red LED

Square Black Housing

SPST OFF-(ON) Circuit

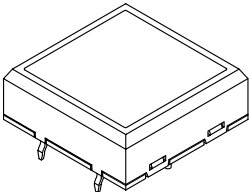
Silver Contacts Straight PC Terminals

POLE & CIRCUIT

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

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

Illuminated Ultra-Thin Tactiles

Series JL

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.

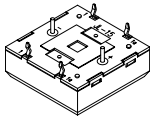
<div>Red LED model has 6 LEDs.</div> <div>Amber & Green models each have 8 LEDs.</div>		1-color, 1-element LEDs grouped in arrays of 6 or 8.	Color	<div>C</div> Red	<div>D</div> Amber	<div>F</div> Green
		Forward Peak Current	I_{FM}	75mA	100mA	100mA
		Typical Forward Current	I_F	60mA	80mA	80mA
		Forward 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

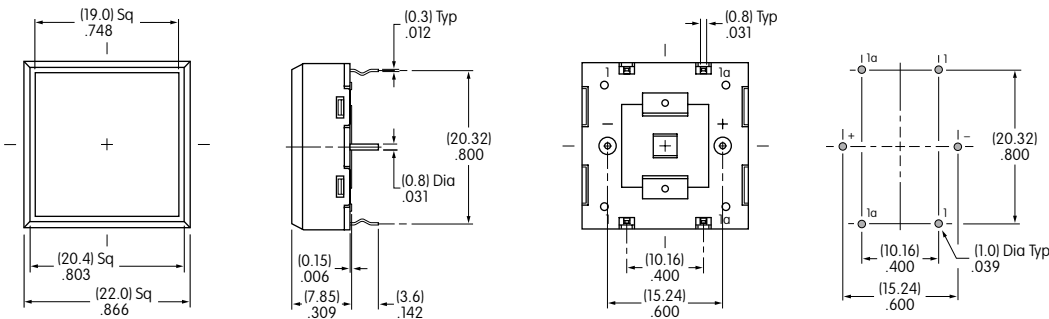
Silver Contacts
Straight PC

Additional details in
Typical Switch Dimensions



TYPICAL SWITCH DIMENSIONS

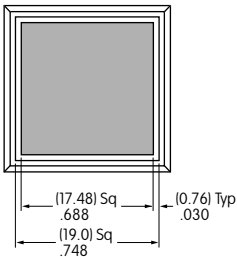
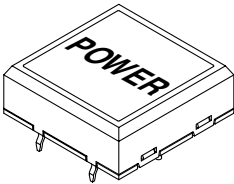
Square Actuator



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.



Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

Supplement