

Toggles

Rockers

Pushbuttons

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

Accessories

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

HP02 SeriesJ12



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

HP03 SeriesJ16



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

Toggle

Rockers

Pushbuttons

Illuminated PB

Programmable

Key locks

Rotaries

Slides

J
Tactiles

Tilt

Touch

Indicators

Accessories

Supplement

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.

Distinctive Characteristics

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

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

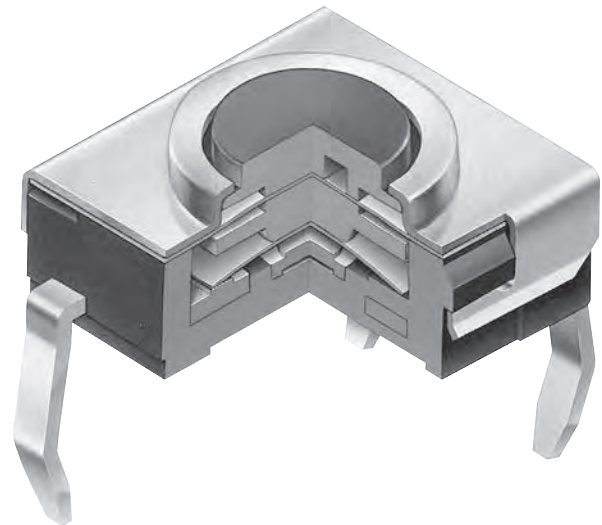
Actuator and base meet UL flammability rating of 94V-0.

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

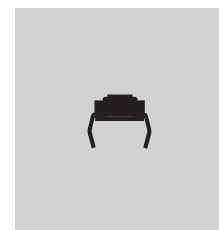
Crimped terminals ensure secure mounting and prevent dislodging during wave soldering.

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

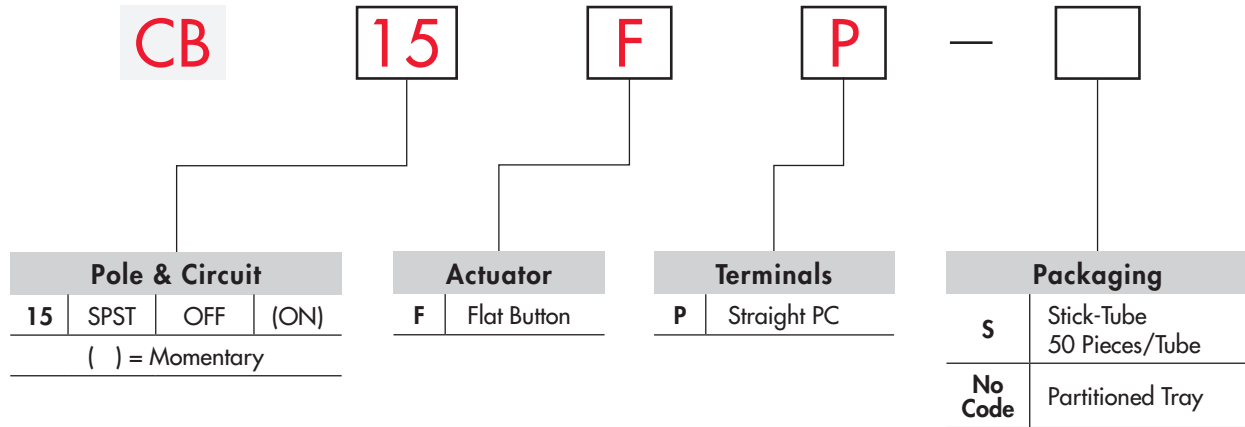
Packaged in stick tube or partitioned tray.



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

CB15FP

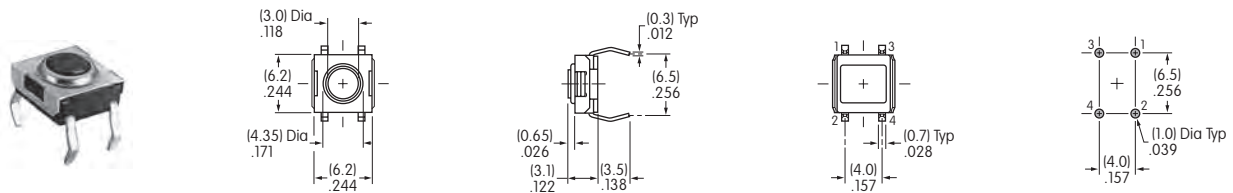


POLE & CIRCUIT

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

TYPICAL SWITCH DIMENSIONS

Single Pole • Single Throw



CB15FP

PACKAGING

S Stick-Tube

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

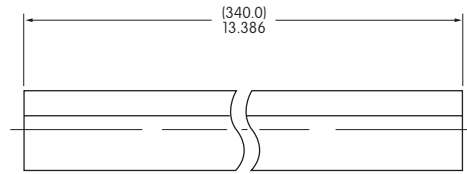
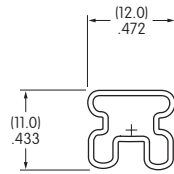
No Code Partitioned Tray

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



Stick-Tube Dimensions

Each stick-tube contains 50 switches



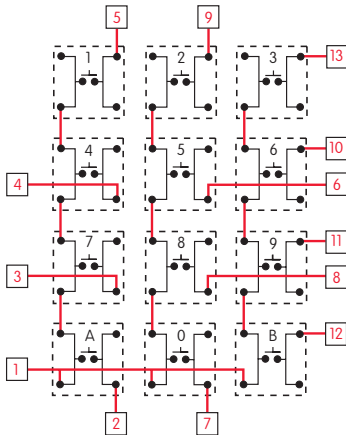
KEYBOARD MATRIX

Common Bus Matrix

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

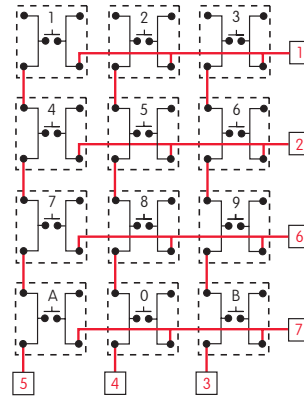
X-Y Matrix

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



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

● = ON



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

● = ON

Red = PCB Trace Black = Switch Circuit

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.

Distinctive Characteristics

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

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

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

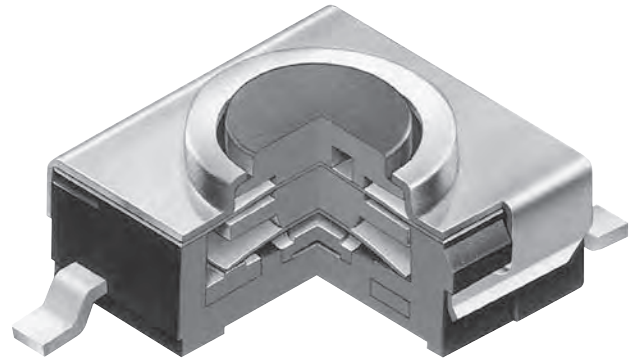
Dome contact gives crisp tactile feedback to positively indicate circuit transfer and assures high reliability and long life – more than 100,000 operations.

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

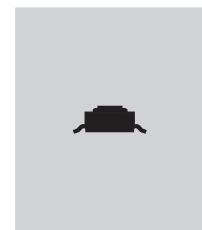
Insert molded terminals lock out flux, solvents, and other contaminants.

Packaged in tape-reel or partitioned tray. Tape-reel packaging meets EIA-481-D Standard.


Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0059" (0.15mm). (Additional coplanarity details in Terms and Acronyms in the Supplement section.)



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

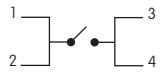
CB3	15	F	P	—	
Pole & Circuit		Actuator		Terminals	
15	SPST OFF (ON)	F	Flat Button	P	Gull Wing for Upright Mount
() = Momentary					
					Packaging
					R
					Tape-Reel 1,000 Pieces/Reel
					No Code
					Partitioned Tray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

CB315FP



POLE & CIRCUIT

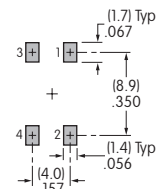
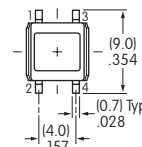
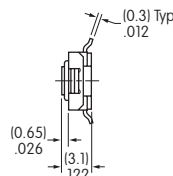
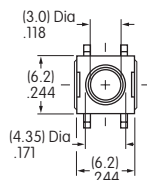
Pole	Model	Actuator Position () = Momentary		Switch Throw & Schematic	Note: Terminal numbers are not actually on switch.
		Normal	Down		
SP	CB315	OFF	(ON)		

TYPICAL SWITCH DIMENSIONS

Single Pole • Single Throw



CB315FP

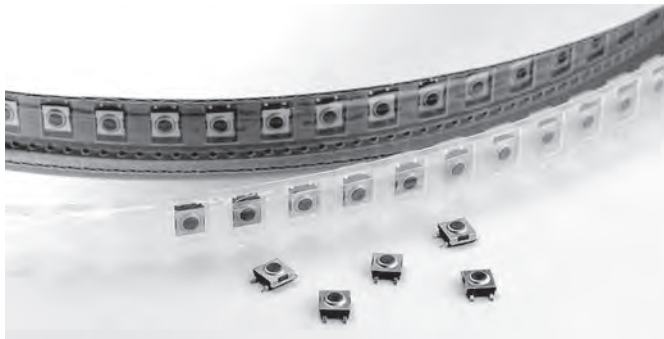


PACKAGING

R

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

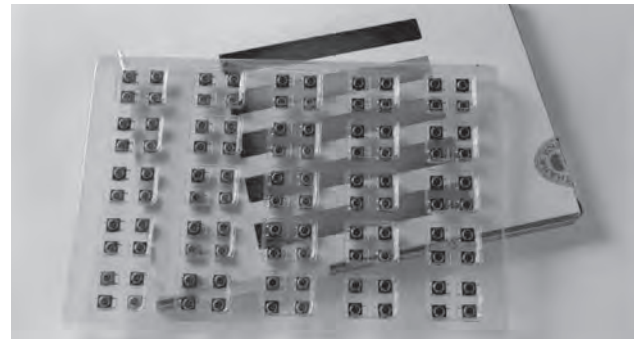
Switches must be ordered in 1,000-piece increments when tape-reel packaging is selected.



No Code

Partitioned Tray

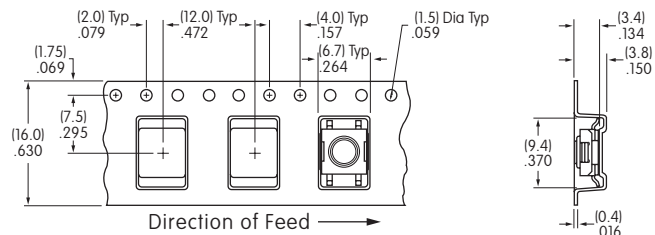
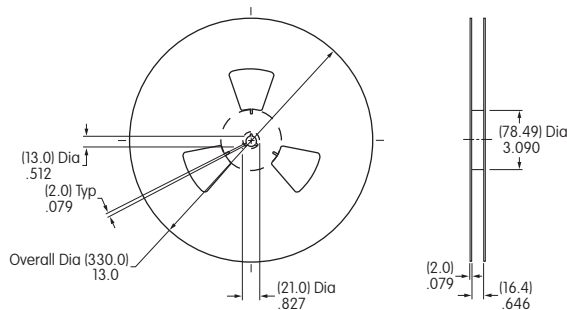
If less than 1,000 pieces are ordered, the switches are packaged in a partitioned tray. No code is required.



Tape-Reel Dimensions & Specifications

Each tape-reel of 1,050 pockets contains 1,000 switches

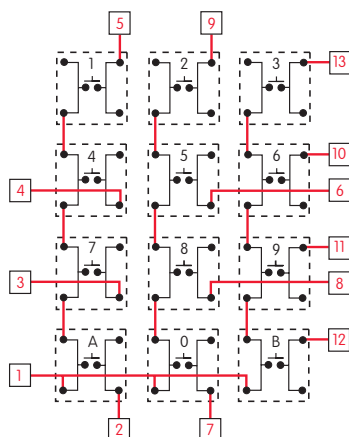
Minimum Leader Length: 16.54" (420mm) Minimum Trailer Length: 7.09" (180mm)



KEYBOARD MATRIX

Common Bus Matrix

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

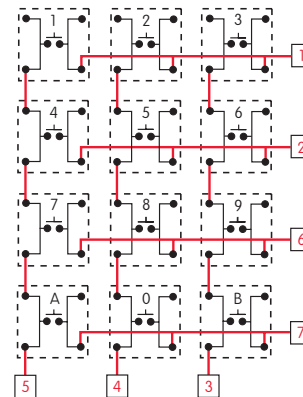


		PC Terminations												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	0													
	A													
	B													

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.



		PC Terminations						
		1	2	3	4	5	6	7
Keys (Switches)	1							
	2							
	3							
	4							
	5							
	6							
	7							
	0							
	A							
	B							

Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Key locks
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)

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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Distinctive Characteristics

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

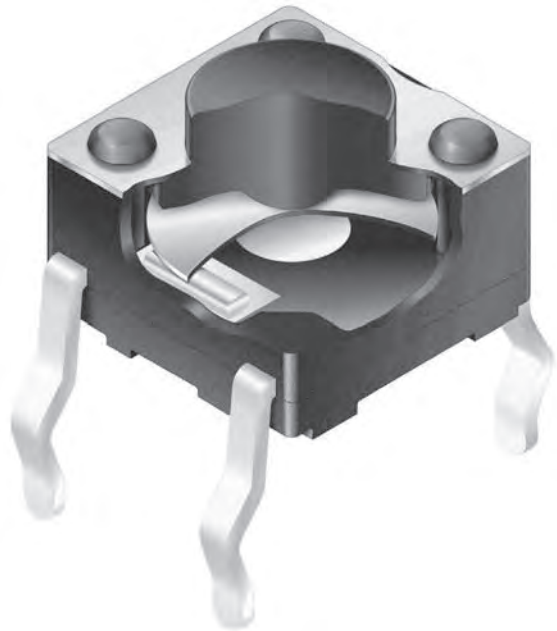
Heat resistant resin body meets lead-free solder processing requirements and UL flammability rating of 94V-0.

Stick-tube packaging allows rapid automated placement of devices.

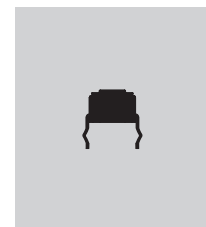
Gold plated contacts available for very low voltage/current applications offer advantages of little or no oxidization or sulfurization and stable contact resistance.

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

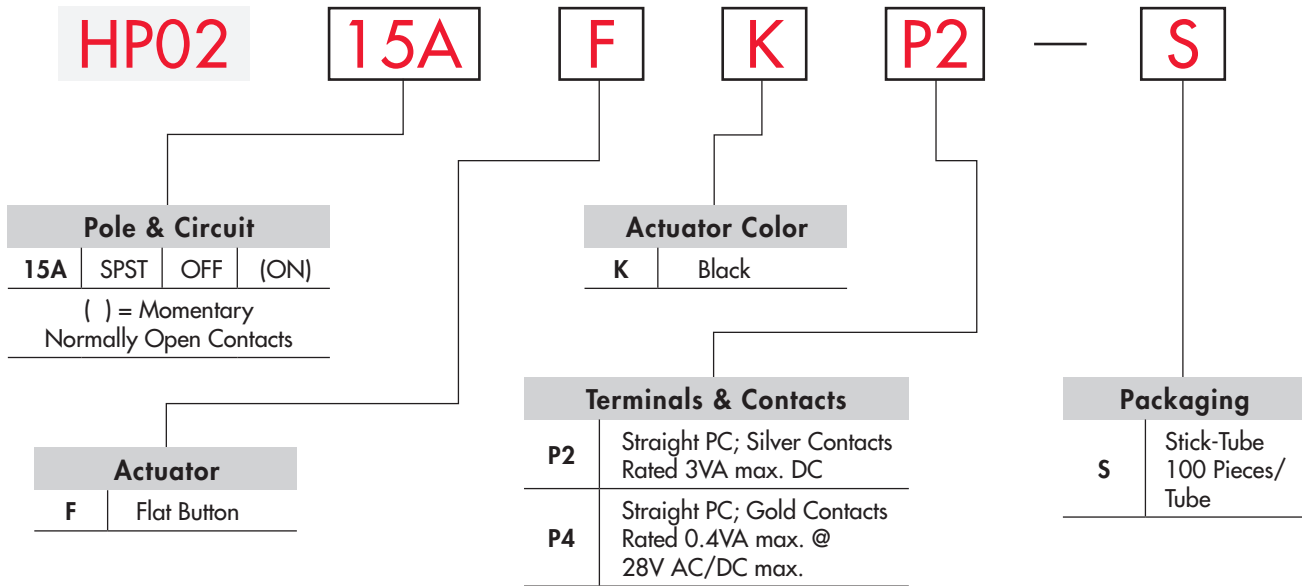
Insert molded terminals lock out flux, solvents, and other contaminants and allow automated soldering.



Actual Size

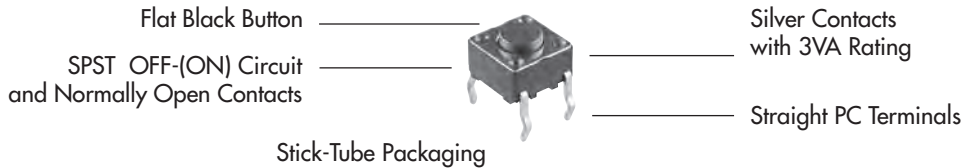


TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

HP0215AFKP2-S



POLE & CIRCUIT

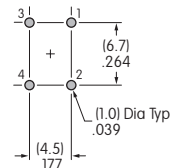
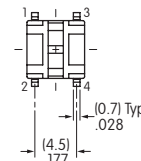
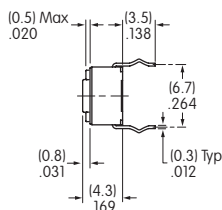
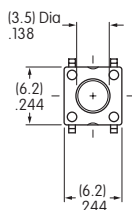
		Actuator Position () = Momentary		Switch Throw & Schematic	Note: Terminal numbers are not actually on the switch.
Pole	Model	Normal	Down		
SP	HP0215A	OFF	(ON)	SPST	

TYPICAL SWITCH DIMENSIONS

Straight PC



HP0215AFKP2

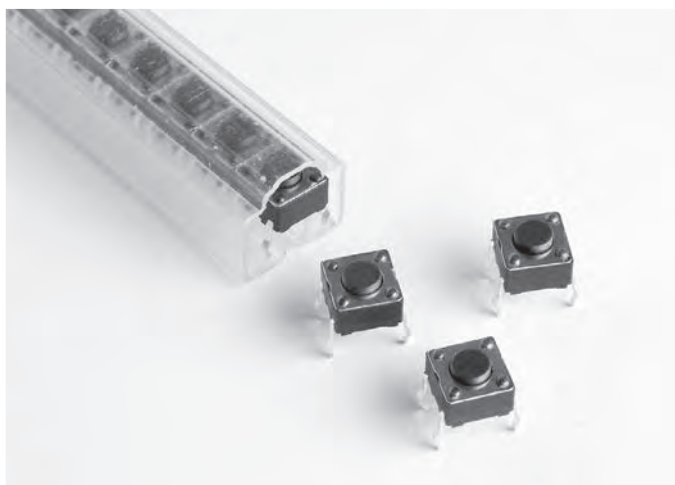


PACKAGING

S

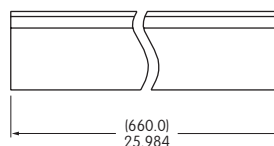
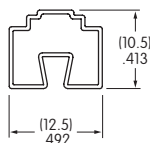
Stick-Tube

Switches must be ordered in 100-piece increments.



Stick-Tube Dimensions

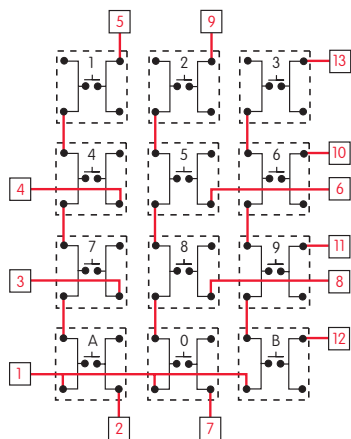
Each stick-tube contains 100 switches.



KEYBOARD MATRIX

Common Bus Matrix

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

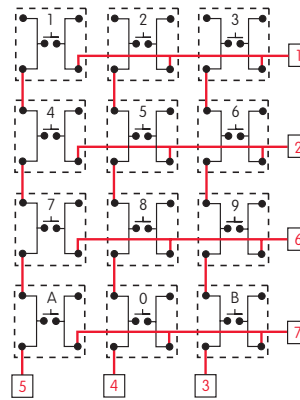


		PC Terminations												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1	●				●								
	2	●									●			
	3	●												●
	4	●			●									
	5	●					●							
	6	●												
	7	●		●										
	8	●						●						
	9	●										●		
	O	●							●					
	A	●											●	
	B	●												●

● = ON

X-Y Matrix

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



		PC Terminations						
		1	2	3	4	5	6	7
Keys (Switches)	1	●				●		
	2	●			●			
	3	●					●	
	4	●		●				
	5	●	●					
	6	●		●				
	7	●			●			
	O	●				●		
	A	●					●	
	B	●						●

● = ON

Red = PCB Trace Black = Switch Circuit

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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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Distinctive Characteristics

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

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

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

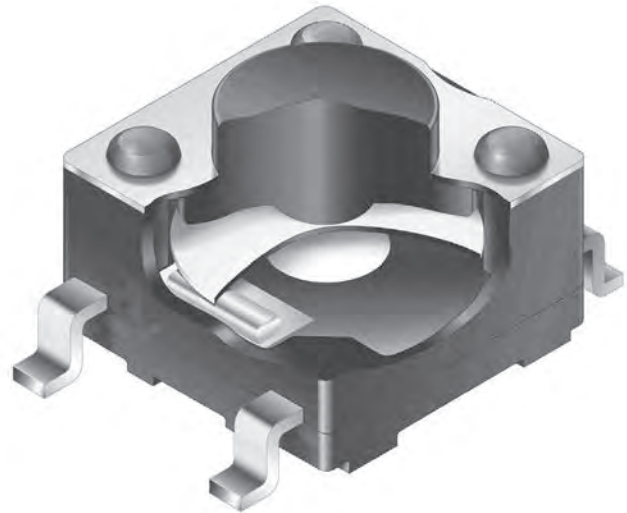
Gold plated contacts available for very low voltage/current applications offer advantages of little or no oxidization or sulfurization and stable contact resistance.

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

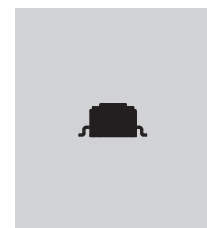
Insert molded terminals lock out flux, solvents, and other contaminants and allow automated soldering.

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

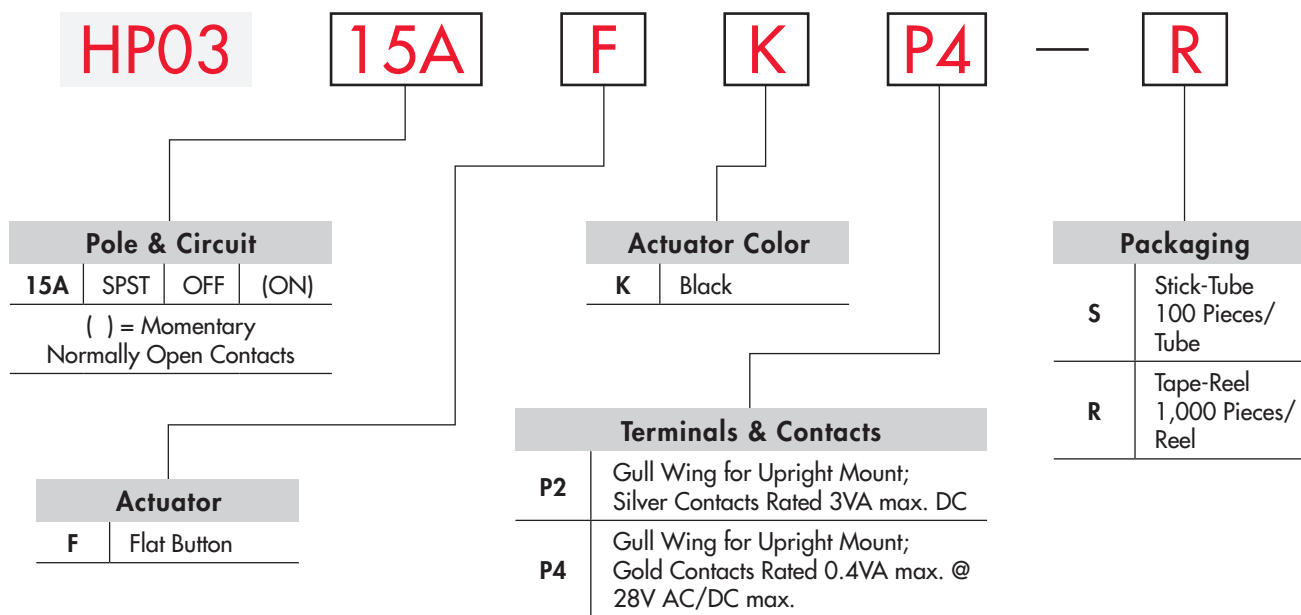
Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0039" (0.10mm). (Additional coplanarity details in Terms and Acronyms in the Supplement section.)



Actual Size

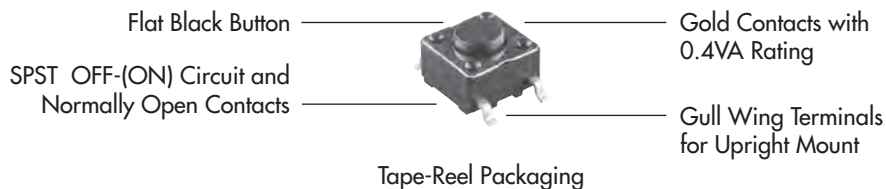


TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

HP0315AFKP4-R



POLE & CIRCUIT

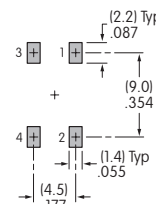
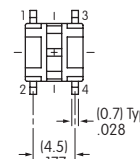
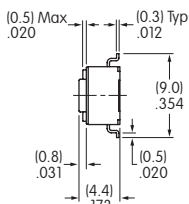
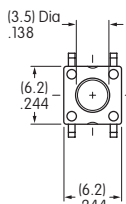
Pole	Model	Actuator Position () = Momentary		Switch Throw & Schematic	Note: Terminal numbers are not actually on the switch.
		Normal	Down		
SP	HP0315A	OFF	(ON)	SPST	

TYPICAL SWITCH DIMENSIONS

Gull-winged



HP0315AFKP4



PACKAGING

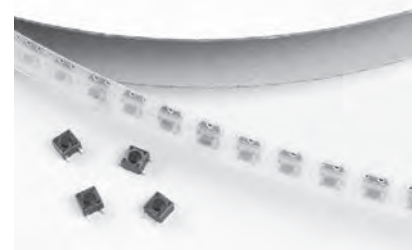
S Stick-Tube

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



R Tape-Reel

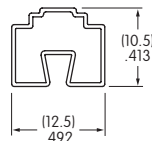
Switches must be ordered in 1,000-piece increments when tape-reel packaging is selected.



Packaging meets EIA-481-D Standard.

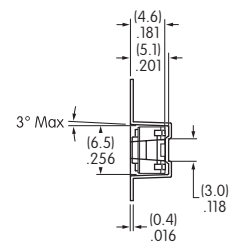
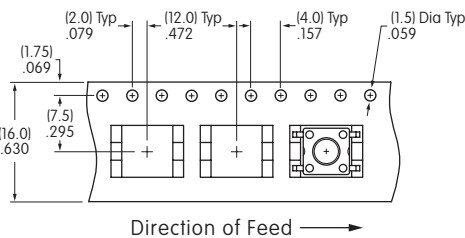
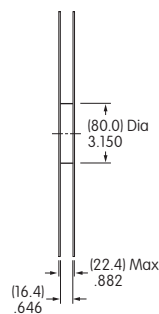
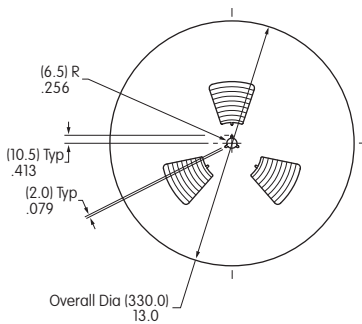
Stick-Tube Dimensions

Each stick-tube contains 100 switches



Tape-Reel Dimensions

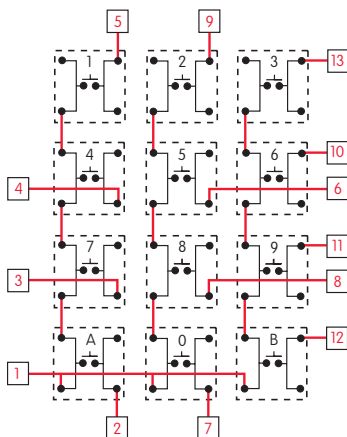
Each tape-reel of 1,100 pockets contains 1,000 switches.
Minimum Leader Length: 15.748" (400mm). Minimum Trailer Length: 6.299" (160mm).



KEYBOARD MATRIX

Common Bus Matrix

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

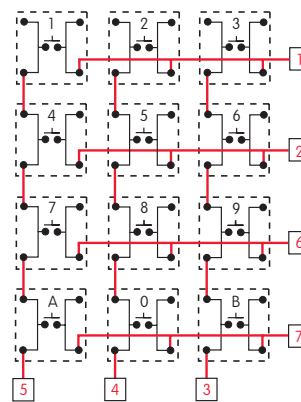


		PC Terminations												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	0													
	A													
	B													

● = ON

X-Y Matrix

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



		PC Terminations						
		1	2	3	4	5	6	7
Keys (Switches)	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	0							
	A							
	B							

● = ON

Red = PCB Trace Black = Switch Circuit

Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Key locks
Rotaries
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

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/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

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

Standards & Certifications

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

Distinctive Characteristics

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.

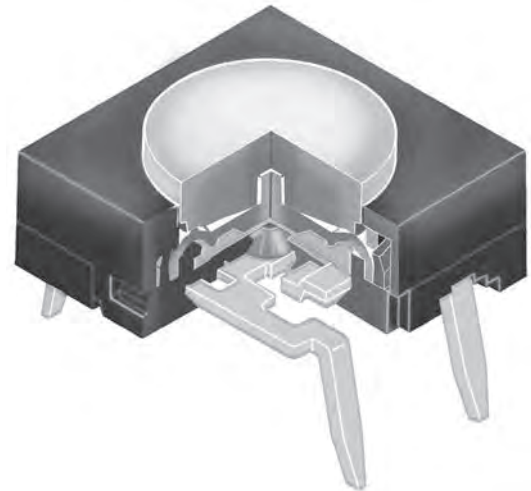
Choice of dimensions from PCB to top of cap allows design flexibility.

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.

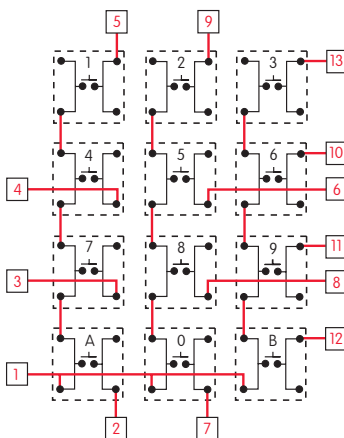


Actual Size



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.

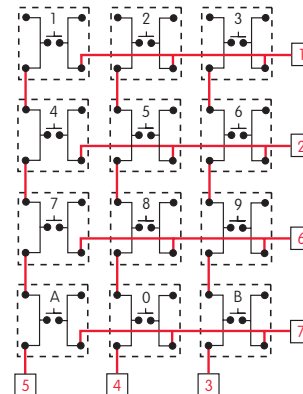


		PC Terminations												
		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1	●												
	2	●												
	3	●												
	4	●												
	5	●												
	6	●												
	7	●												
	8	●												
	9	●												
	0	●												
	A	●												
	B	●												

● = ON

X-Y Matrix

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

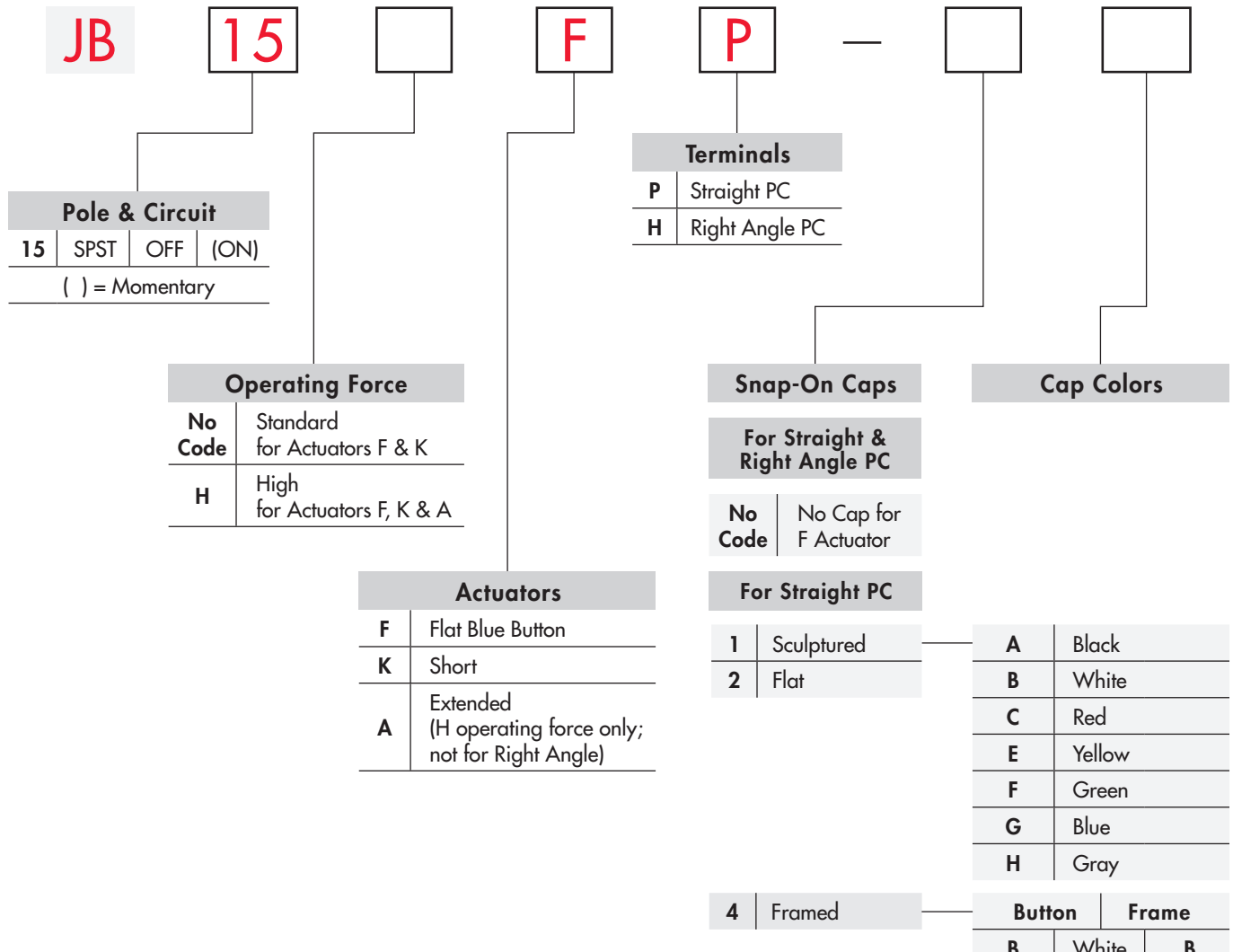


		PC Terminations						
		1	2	3	4	5	6	7
Keys (Switches)	1	●						
	2	●						
	3	●						
	4	●						
	5	●						
	6	●						
	7	●						
	8	●						
	9	●						
	0	●						
	A	●						
	B	●						

● = ON

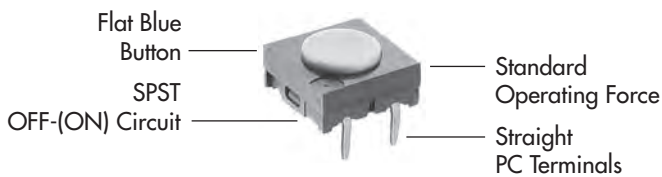
Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JB15FP



5	Cap with Black Mounter	A	Black
		B	White
		C	Red
		H	Gray

For Right Angle PC

6	Flat	A	Black
		B	White
		C	Red
		H	Gray

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

POLE & CIRCUIT

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

OPERATING FORCE

No Code

Standard Operating Force

1.76N

For F & K Actuators

H

High Operating Force

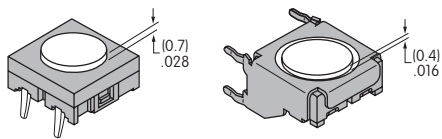
2.65N

For F, K & A Actuators

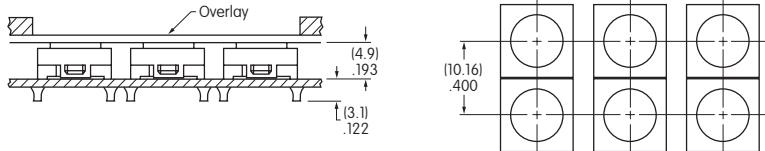
ACTUATORS

F

Flat Blue Button



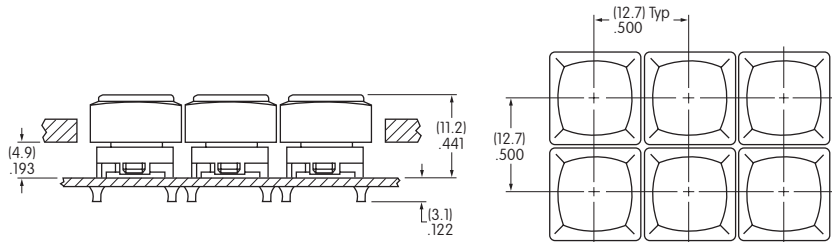
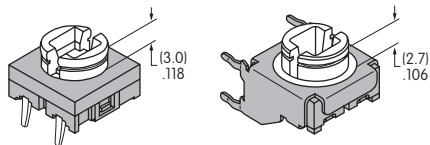
Flat button is an integral part of the switch and cannot be ordered separately.



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

K

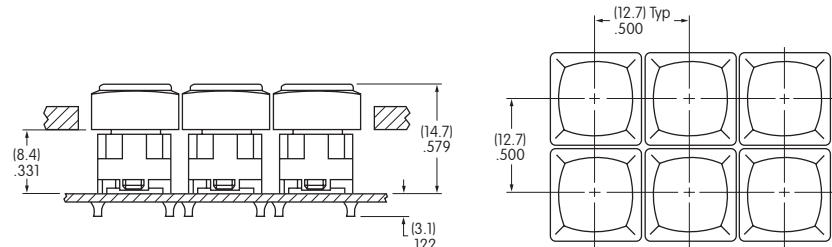
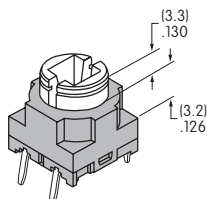
Short Actuator



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

A

Extended Actuator

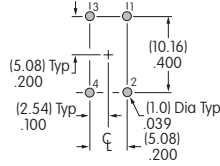
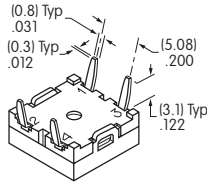


Combines with high operating force only; not for right angle.

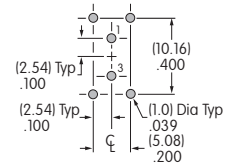
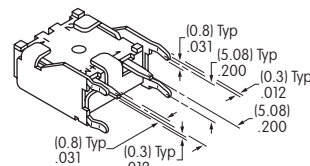
Custom keyboards can be designed with caps installed through a panel cutout (illustration with framed cap AT4078 and button AT4077).

TERMINALS

P Straight PC



H Right Angle PC

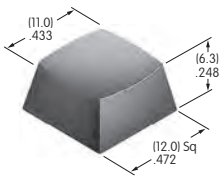


Further details shown in Typical Switch Dimensions

SNAP-ON CAPS

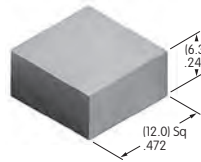
1 AT4058 Sculptured for Straight PC

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



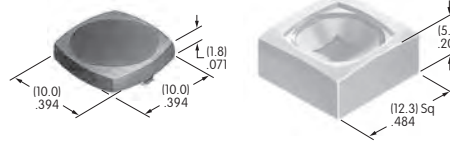
2 AT4059 Flat for Straight PC

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



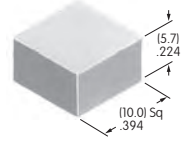
4 Framed: AT4077 Button & AT4078 Frame for Straight PC

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



6 AT4139 Flat for Right Angle PC

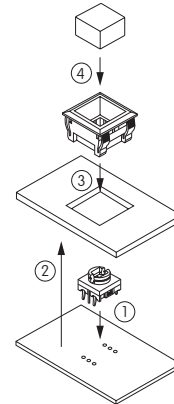
Material: Polycarbonate
Finish: Glossy
Colors: A B C H



5 AT4140 Cap with AT547 Mounter for Straight PC

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

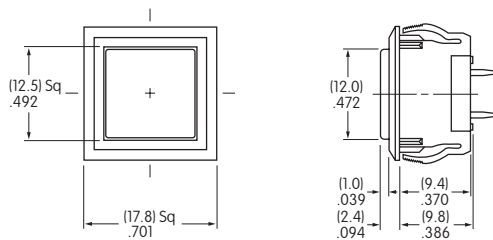
Mounter
Material: Polyamide
Finish: Matte
Color: A



Assembly Procedure

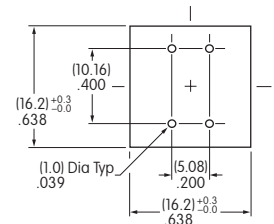
1. Solder switch to PCB.
2. Install PCB in equipment.
3. Snap mounter into panel. Dimension from top of panel to top of PCB is .386" (9.8mm).
4. Snap cap onto plunger.

Panel 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

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

TYPICAL SWITCH DIMENSIONS

Flat Blue Button • Straight PC

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

JB15FP

Flat Blue Button • Right Angle PC

JB15FH

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

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

JB15KP-1C

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

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

JB15KP-2C

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

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

JB15FHAP-4BC

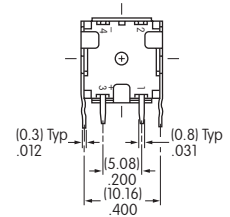
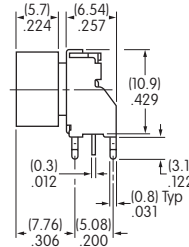
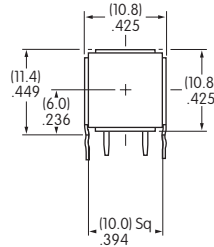
Toggles
Rocker
Pushbuttons
Illuminated PB
Programmable
Key locks
Rotaries
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

TYPICAL SWITCH DIMENSIONS

Flat Snap-on Cap • Right Angle PC



JB15KH-6C



LEGENDS

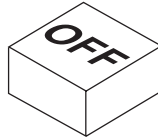
NKK Switches can provide custom legends for caps. Contact factory for more information.

Shaded Areas are Printable Areas

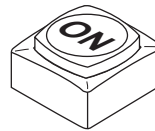
AT4058



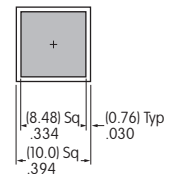
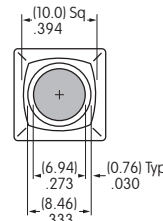
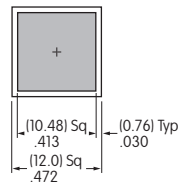
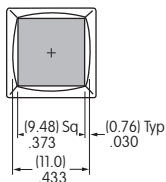
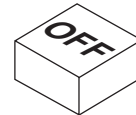
AT4059 & AT4140



AT4077 Button



AT4139



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

General Specifications

Electrical Capacity (Resistive Load)

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

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range:	-25°C through +70°C (-13°F through +158°F)
Humidity:	90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration:	10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
Shock:	50G (490m/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

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

Standards & Certifications

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

Distinctive Characteristics

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

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

Higher operating force type provides more pronounced operating feel.

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

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

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

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

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

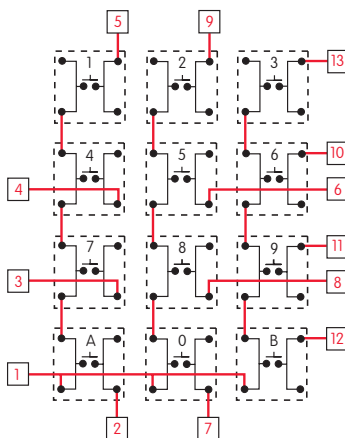


Actual Size



Common Bus Matrix

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

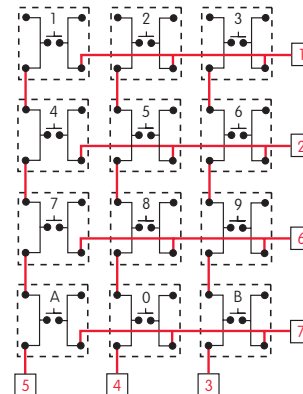


PC Terminations		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	0													
	A													
	B													

● = ON

X-Y Matrix

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

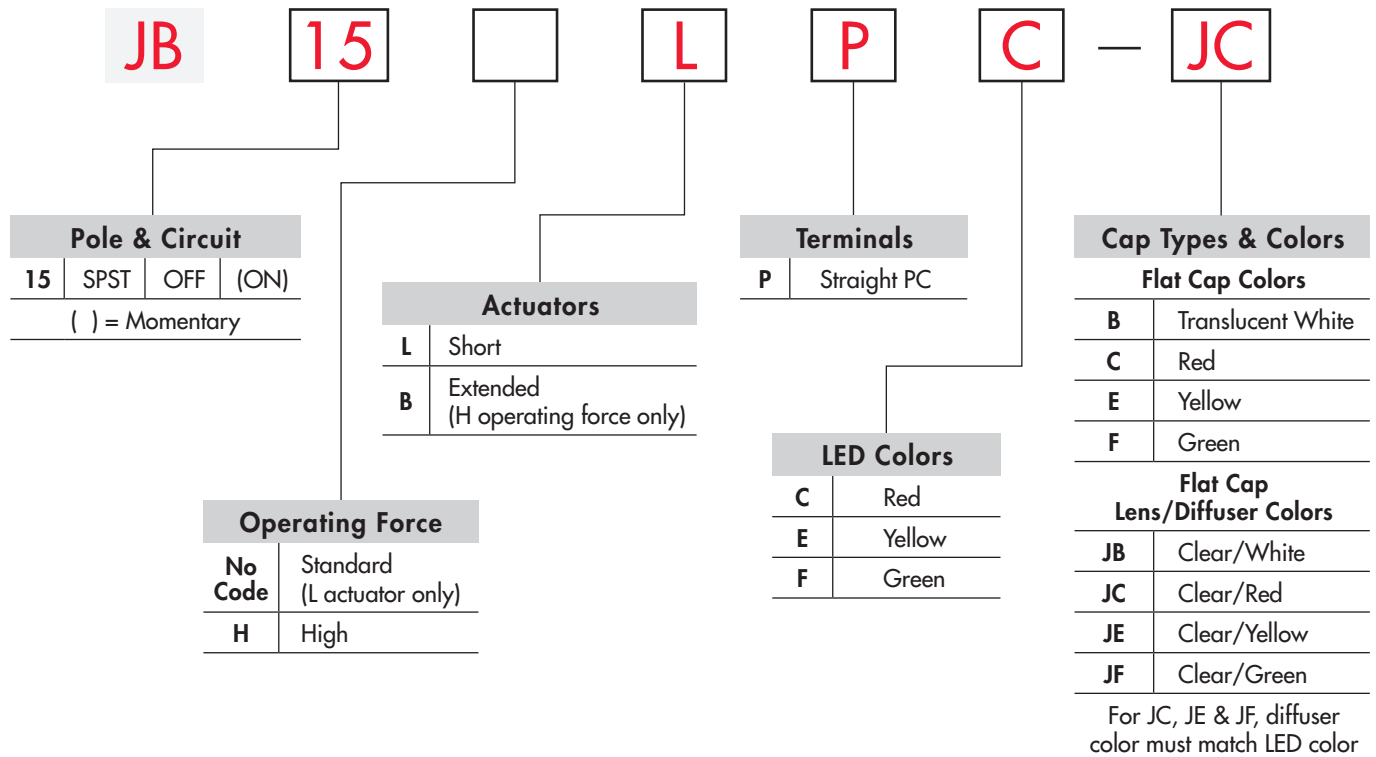


PC Terminations		1	2	3	4	5	6	7
Keys (Switches)	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	0							
	A							
	B							

● = ON

Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JB15LPC-JC



Framed Cap Button/Frame Colors

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

POLE & CIRCUIT

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

OPERATING FORCE

No Code

Standard Nominal Operating Force
1.76N

Available with short actuator only (code L)

H

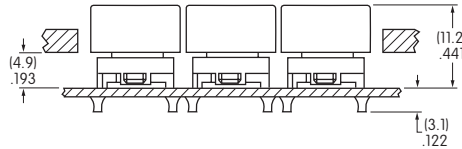
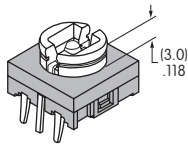
High Nominal Operating Force
2.65N

Available with both short and extended actuators

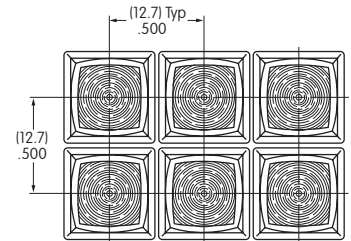
ACTUATORS

L

Short Actuator

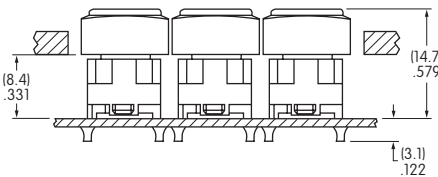
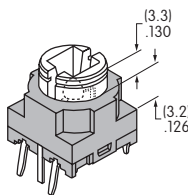


Custom keyboards can be designed with caps installed through a panel cutout (illustration with cap AT4060).

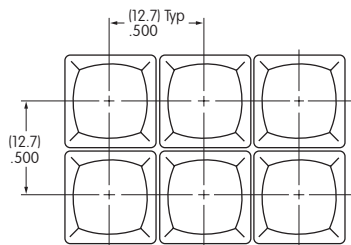


B

Extended Actuator



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



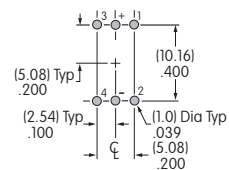
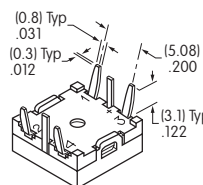
High operating force only

TERMINALS

P

Straight PC Terminals

Further details in Typical Switch Dimensions



LED COLORS & SPECIFICATIONS

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

LED polarity markings are on the bottom of the switch.

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

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

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

		C	E	F
Color		Red	Yellow	Green
Maximum Forward Current	I_{FM}	30mA	20mA	30mA
Typical Forward Current	I_F	10mA	10mA	10mA
Forward Voltage	V_F	1.8V	2.0V	2.1V
Maximum Reverse Voltage	V_{RM}	5V	5V	5V
Current Reduction Rate Above 25°C	ΔI_F	* 0.50mA/°C	* 0.33mA/°C	* 0.50mA/°C
Ambient Temperature Range		-25°C ~ +70°C		

* Applies to temperatures above 50°C

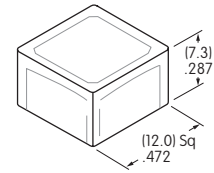
SNAP-ON CAPS

AT4135 Flat

Cap Color Codes:

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

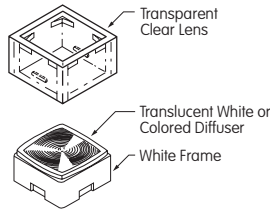
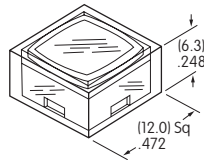
Material: Polycarbonate Finish: Frosted



AT4060 Flat

Lens/Diffuser Color Codes:

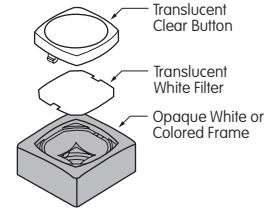
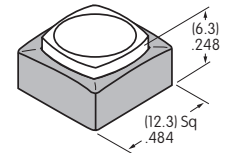
- | |
|-----------------------------------|
| JB Clear/Translucent White |
| JC Clear/Red |
| JE Clear/Yellow |
| JF Clear/Green |



Framed: AT4076 Button with Frame

Translucent Button/Frame Color Codes:

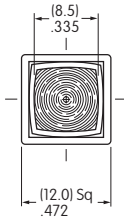
- | |
|------------------------|
| BB White/White |
| BC White/Red |
| BE White/Yellow |
| BF White/Green |
| BH White/Gray |



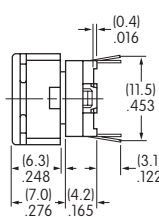
Material: Polycarbonate Lens Finish: Glossy Material: Polycarbonate Button Finish: Frosted

TYPICAL SWITCH DIMENSIONS

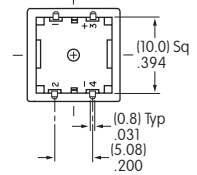
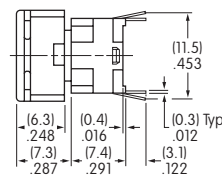
Flat Snap-on Cap



Short Actuator



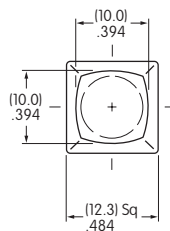
Extended Actuator



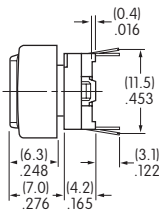
JB15LPC-JC

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

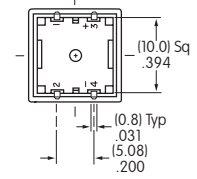
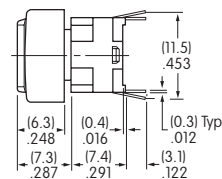
Framed Snap-on Cap



Short Actuator



Extended Actuator



JB15HBPC-BC

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

LEGENDS

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

Suggested Printable Area for Cap, Lens, or Button

Recommended Methods:

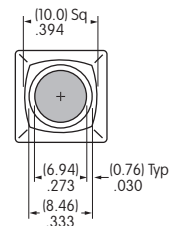
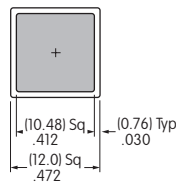
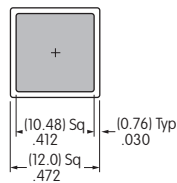
Laser Etch, Screen Print or Pad Print

Laser Etch or Pad Print

Epoxy based ink is recommended.

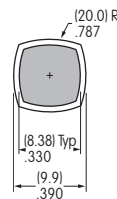
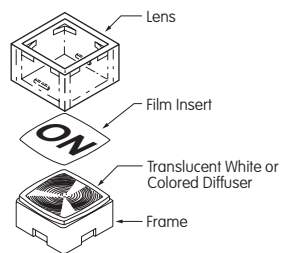


Epoxy based ink is recommended.



Shaded areas are printable areas.

Suggested Printable Area for Film Insert



Shaded area is printable area.

Film Insert: Clear Polyester 7 mil maximum thickness

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range:	-25°C through +85°C (-13°F through +185°F)
Humidity:	90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration:	10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
Shock:	50G (490m/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

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

Standards & Certifications

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

Distinctive Characteristics

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

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

Minimal operating force and short stroke permit light touch operation.

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

Wide choice of body shapes and colors.

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

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

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

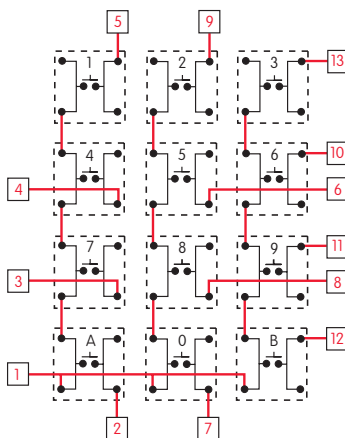


Actual Size



Common Bus Matrix

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

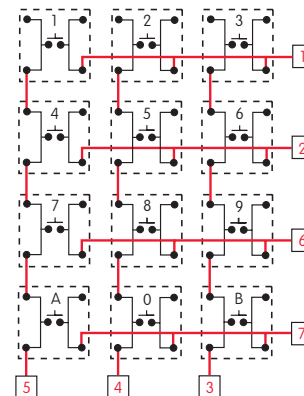


PC Terminations		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1	●												
	2		●											
	3			●										
	4				●									
	5					●								
	6						●							
	7							●						
	8								●					
	9									●				
	0										●			
	A											●		
	B												●	

● = ON

X-Y Matrix

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

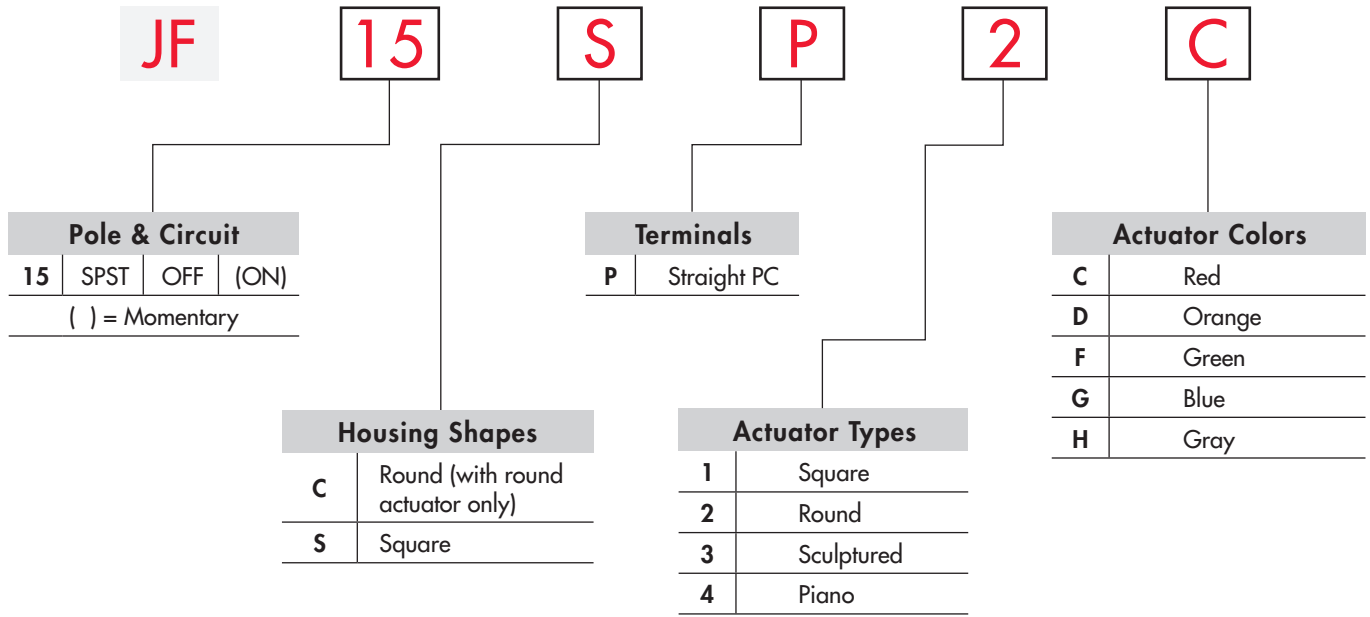


PC Terminations		1	2	3	4	5	6	7					
Keys (Switches)	1	●											
	2		●										
	3			●									
	4				●								
	5					●							
	6						●						
	7							●					
	8								●				
	9									●			
	0										●		
	A											●	
	B												●

● = ON

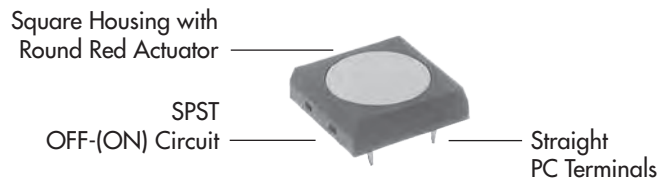
Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE

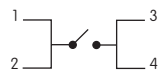


DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

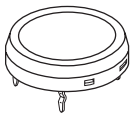
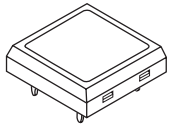
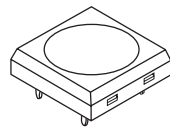
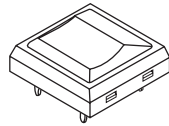
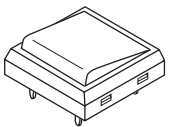
JF15SP2C



POLE & CIRCUIT

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

HOUSING SHAPES & ACTUATOR TYPES

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

Actuator Colors Available:

C Red

D Orange

F Green

G Blue

H Gray

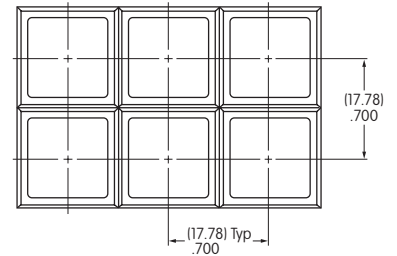
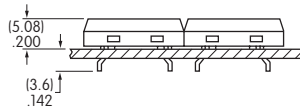
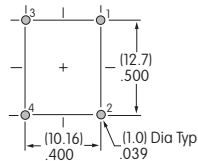
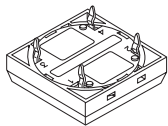
Housing is Black

TERMINALS & PANEL DESIGN

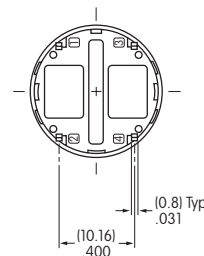
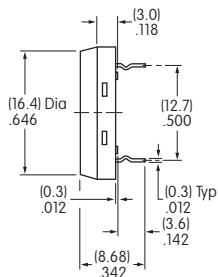
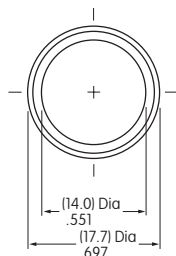
P Straight PC

Additional details in Typical Switch Dimensions

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



TYPICAL SWITCH DIMENSIONS



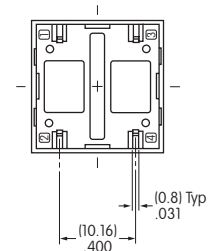
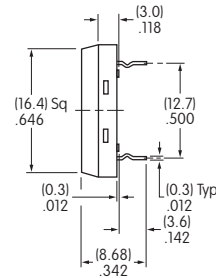
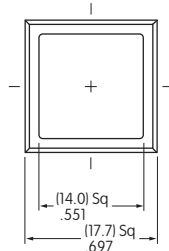
Round Actuator



JF15CP2C

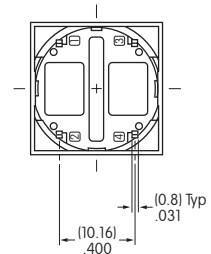
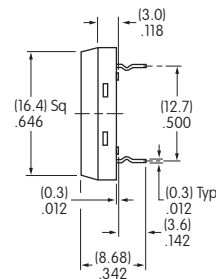
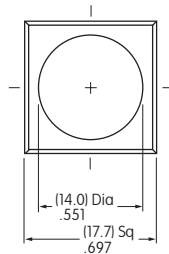
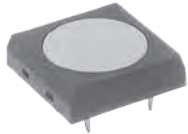
TYPICAL SWITCH DIMENSIONS

Square Actuator



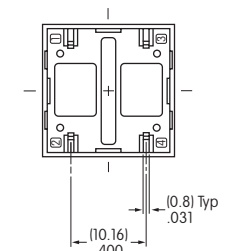
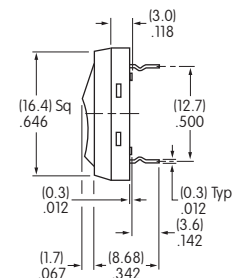
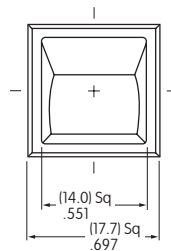
JF15SP1C

Round Actuator



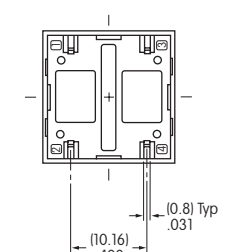
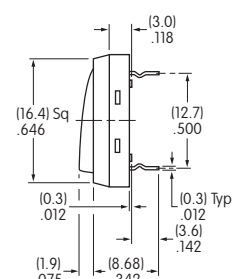
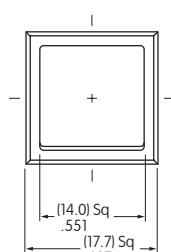
JF15SP2C

Sculptured Actuator



JF15SP3C

Piano Actuator

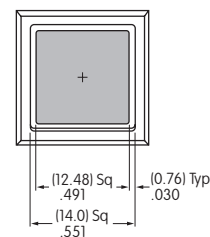
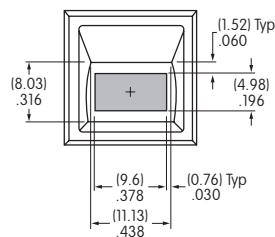
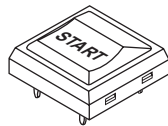
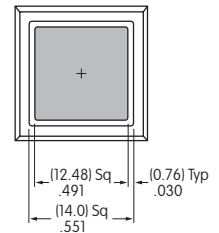
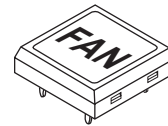
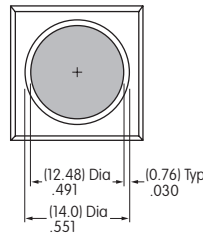
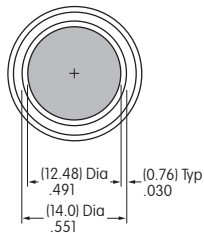


JF15SP4C

LEGENDS

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

Shaded Areas are Printable Areas



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

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range:	-25°C through +70°C (-13°F through +158°F)
Humidity:	90 ~ 95% humidity for 96 hours @ 40°C (104°F)
Vibration:	10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
Shock:	50G (490m/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

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

Standards & Certifications

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

Distinctive Characteristics

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

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

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

Minimal operating force and short stroke permit light touch operation.

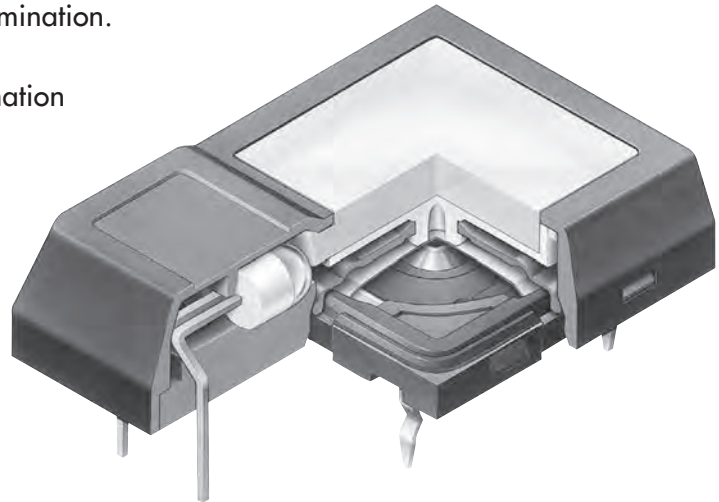
Dome contact gives crisp tactile and audible feedback to positively indicate circuit transfer and assures high reliability and long life.

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

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.

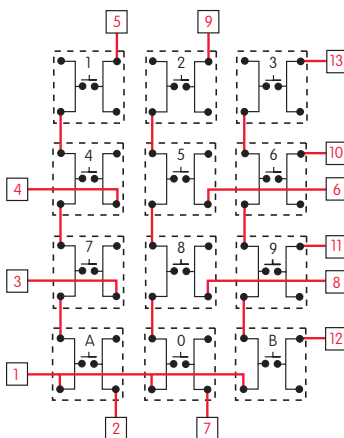


Actual Size



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.

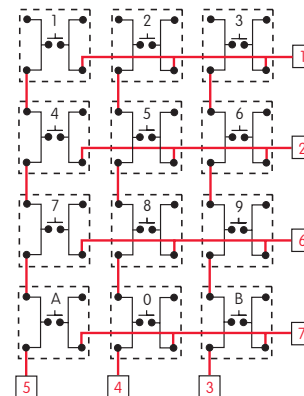


PC Terminations		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1	●												
	2		●											
	3			●										
	4				●									
	5					●								
	6						●							
	7							●						
	8								●					
	9									●				
	0										●			
	A											●		
	B												●	

● = ON

X-Y Matrix

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

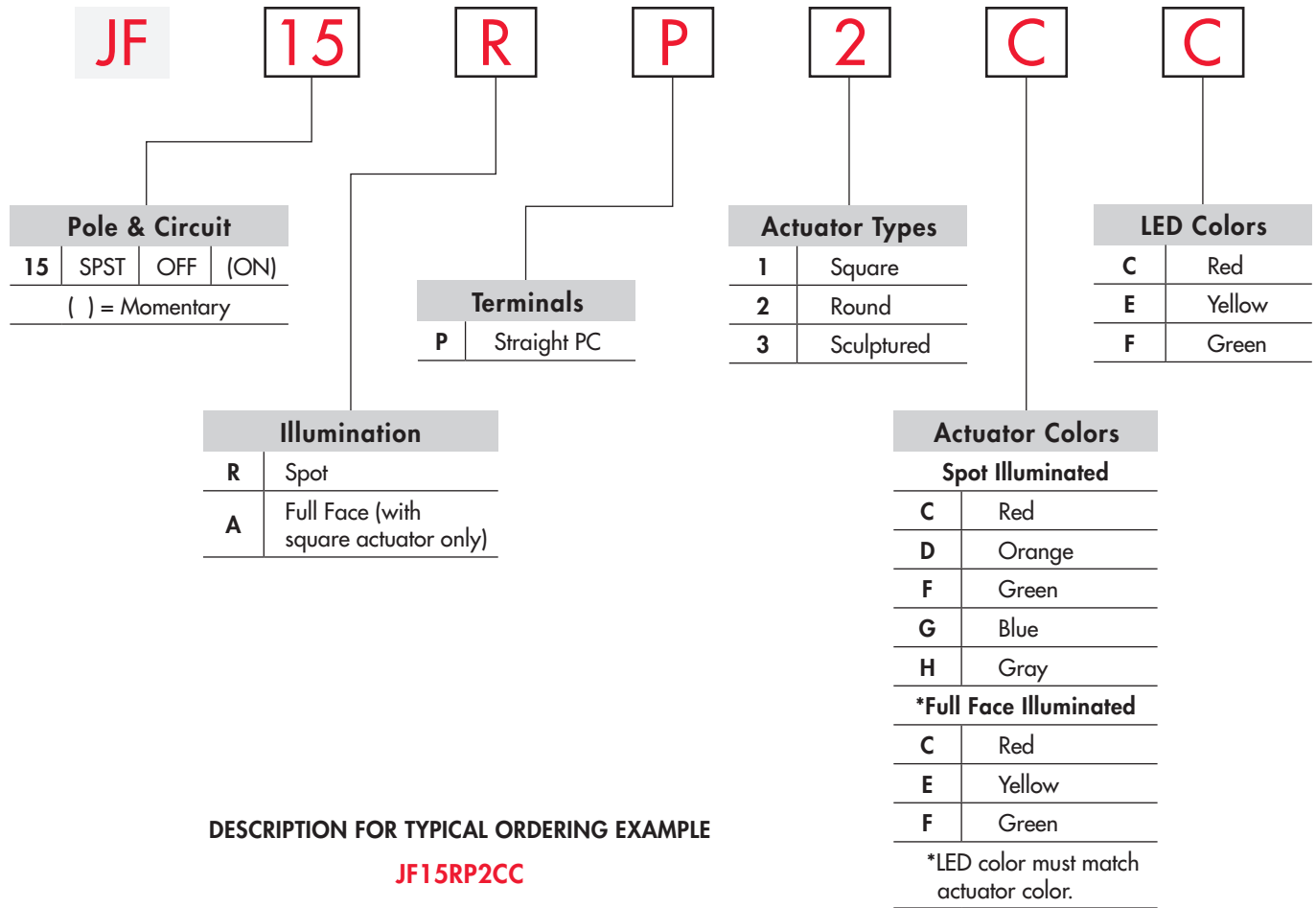


PC Terminations		1	2	3	4	5	6	7					
Keys (Switches)	1	●											
	2		●										
	3			●									
	4				●								
	5					●							
	6						●						
	7							●					
	8								●				
	9									●			
	0										●		
	A											●	
	B												●

● = ON

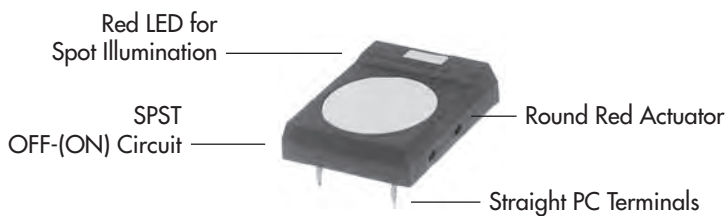
Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JF15RP2CC



POLE & CIRCUIT

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

ILLUMINATION & ACTUATOR TYPES

R Spot Illumination

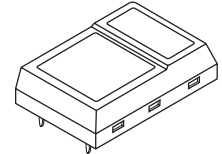
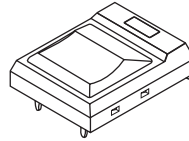
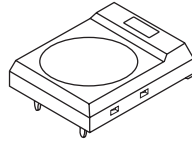
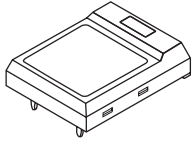
A Full Face Illumination

1 Square Actuator

2 Round Actuator

3 Sculptured Actuator

1 Square Actuator



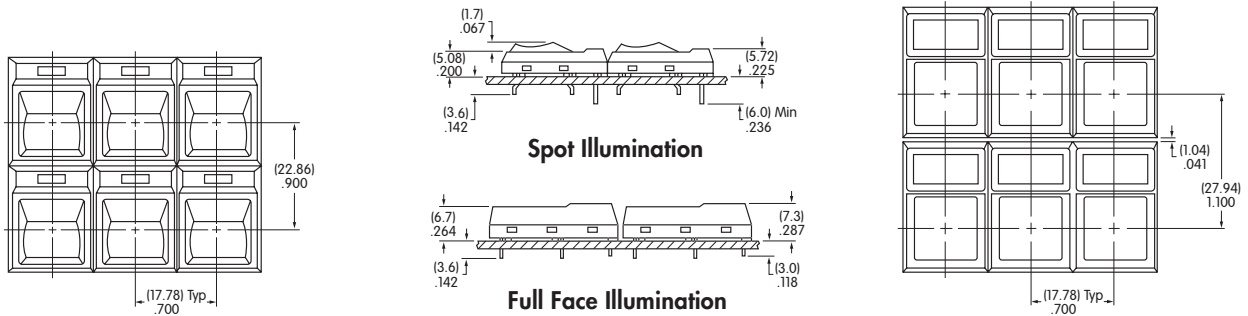
Actuator Colors Available: C, D, F, G, H
Housing is black

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

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

Flexible Panel Design

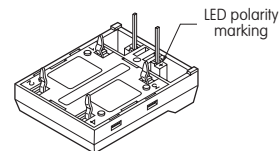
Versatile panel arrangements can be made to fit individual design needs.



TERMINALS

P Straight PC Terminals

With isolated lamp circuit
Further details in Typical Switch Dimensions



LED COLORS & SPECIFICATIONS

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

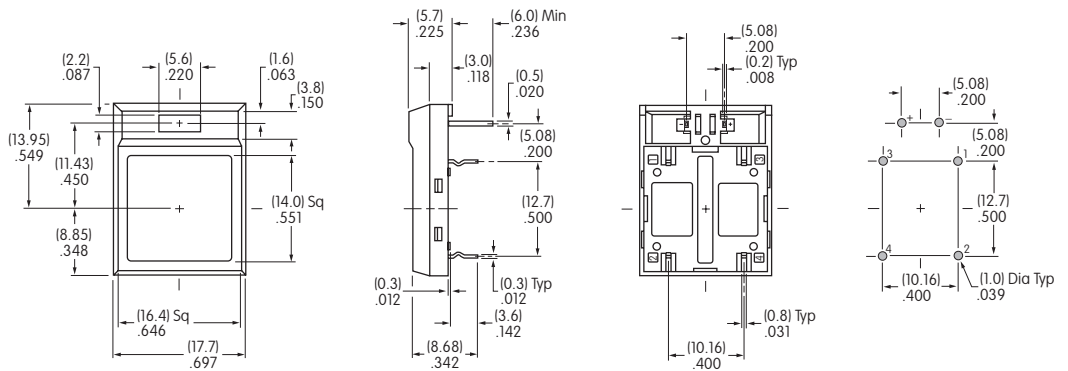
Color		Spot Illumination			Full Face Illumination		
		Red C	Yellow E	Green F	Red C	Yellow E	Green F
Maximum Forward Current	I_{FM}	40mA	40mA	40mA	30mA	30mA	30mA
Typical Forward Current	I_F	30mA	30mA	30mA	20mA	20mA	20mA
Forward Voltage	V_F	1.7V	2.2V	2.2V	1.77V	2.1V	2.3V
Maximum Reverse Voltage	V_{RM}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

TYPICAL SWITCH DIMENSIONS

Spot Illuminated with Square Actuator



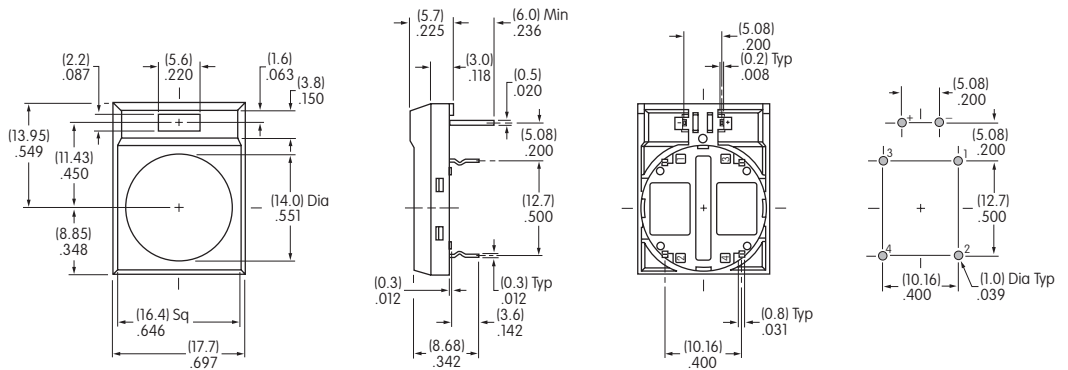
JF15RP1CC



Spot Illuminated with Round Actuator



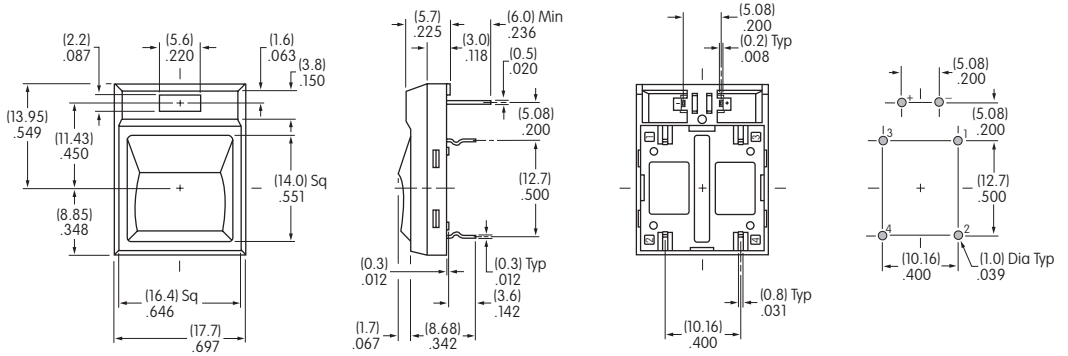
JF15RP2CC



Spot Illuminated with Sculptured Actuator



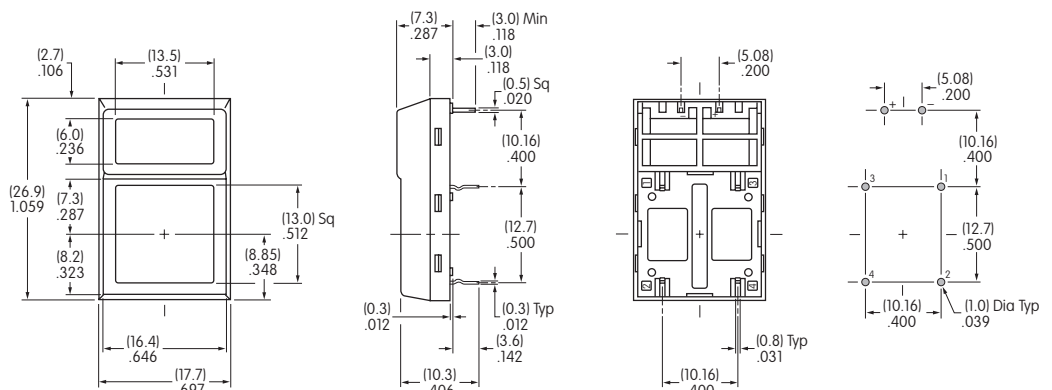
JF15RP3CC



Full Face Illuminated with Square Actuator



JF15AP1CC



Toggles

Rockers

Pushbuttons

Illuminated PB

Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

Touch

Indicators

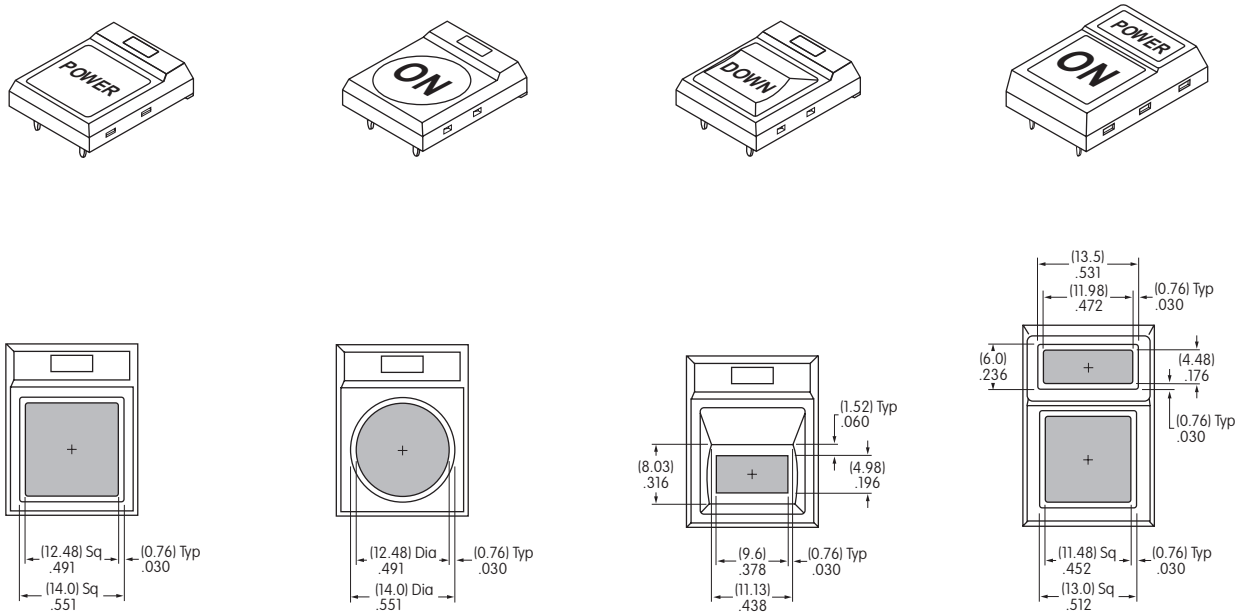
Accessories

Supplement

LEGENDS

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

Suggested Printable Area



Recommended Print Method:

Screen Print or Pad Print

Epoxy based ink is recommended.

Shaded areas are printable areas.

General Specifications

Electrical Capacity (Resistive Load)

Low/Logic Level: 50mA @ 24V DC

Other Ratings

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

Materials & Finishes

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

Environmental Data

Operating Temperature Range:	-25°C through +50°C (-13°F through +122°F)
Humidity:	90 ~ 95% humidity for 240 hours @ 40°C (104°F)
Vibration:	10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
Shock:	50G (490m/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

PCB Processing

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

Standards & Certifications

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

Distinctive Characteristics

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

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

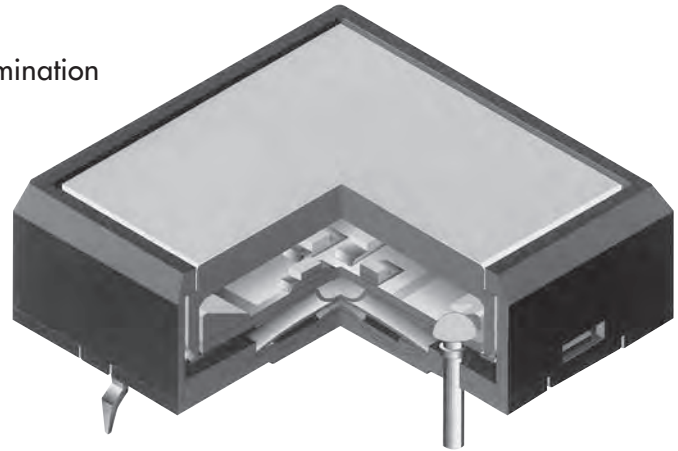
Distinctive design allows full face illumination in extra low profile of 0.31" (7.85mm) from PCB to top of switch.

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

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

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

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

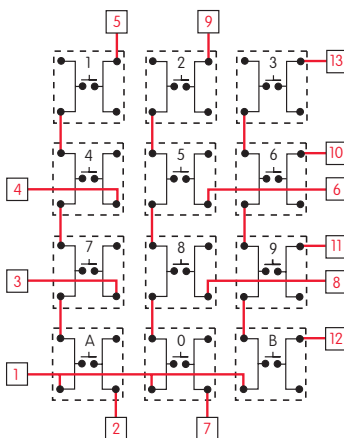


Actual Size



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.

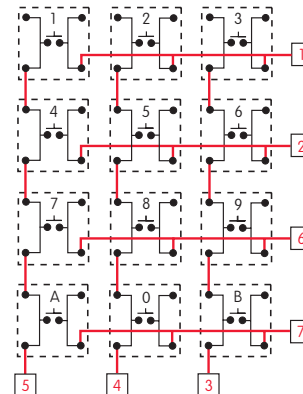


PC Terminations		1	2	3	4	5	6	7	8	9	10	11	12	13
Keys (Switches)	1													
	2													
	3													
	4													
	5													
	6													
	7													
	8													
	9													
	0													
	A													
	B													

● = ON

X-Y Matrix

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

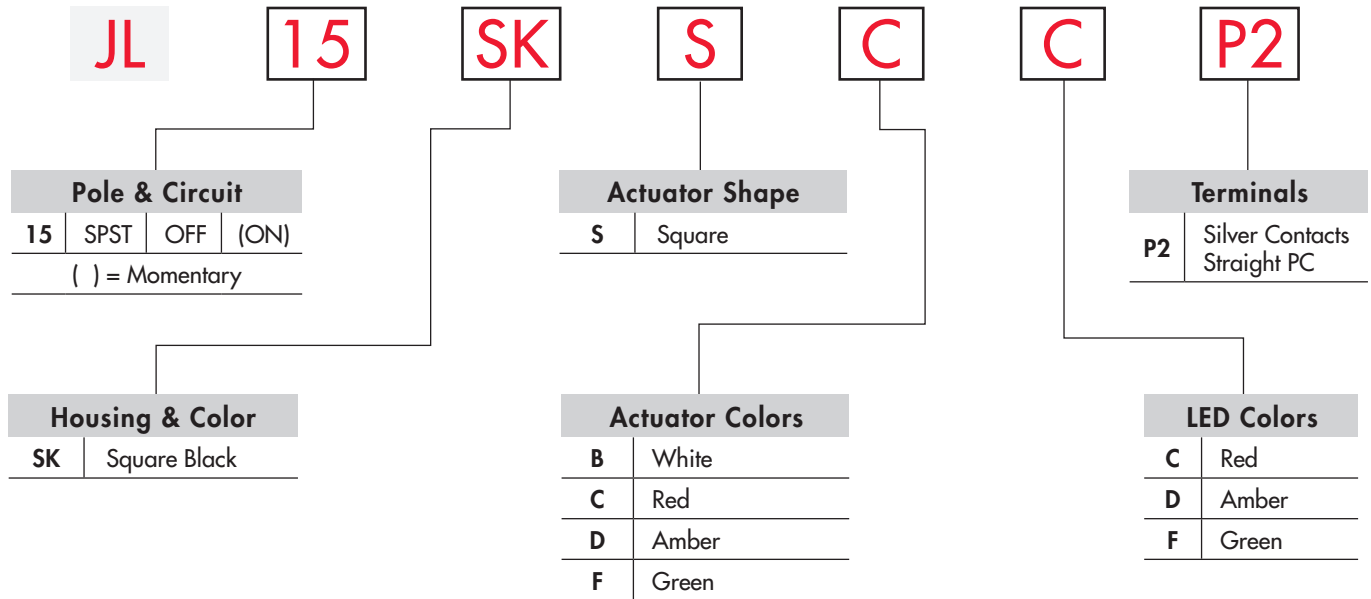


PC Terminations		1	2	3	4	5	6	7
Keys (Switches)	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	0							
	A							
	B							

● = ON

Red = PCB Trace Black = Switch Circuit

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

JL15SKSCP2

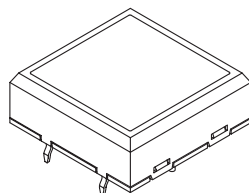


POLE & CIRCUIT

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

HOUSING & COLOR

SK Square Black Housing



ACTUATOR SHAPE & COLORS

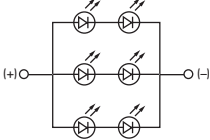
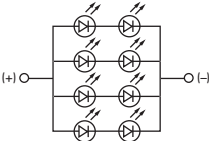
S .748" (19.0mm) Square Actuator

Actuator Colors Available:

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

LED COLORS & SPECIFICATIONS

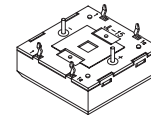
LEDs are an integral part of the switch. The electrical specifications shown are determined at a basic temperature of 25°C. If the source voltage exceeds the rated voltage, a ballast resistor is required. The resistor value can be calculated by using the formula in the Supplement.

Red LED model has 6 LEDs. 	1-color, 1-element LEDs grouped in arrays of 6 or 8.	Color	C Red	D Amber	F Green
	Amber & Green models each have 8 LEDs. 	Maximum Forward Current I_{FM}		90mA	120mA
	Typical Forward Current I_F		60mA	80mA	80mA
	Forward Voltage V_F		3.9V	4.0V	4.2V
	Maximum Reverse Voltage V_{RM}		10V	10V	10V
	Current Reduction Rate Above 25°C ΔI_F		1.2mA/°C	1.6mA/°C	1.6mA/°C
	Ambient Temperature Range		-25°C ~ +50°C		

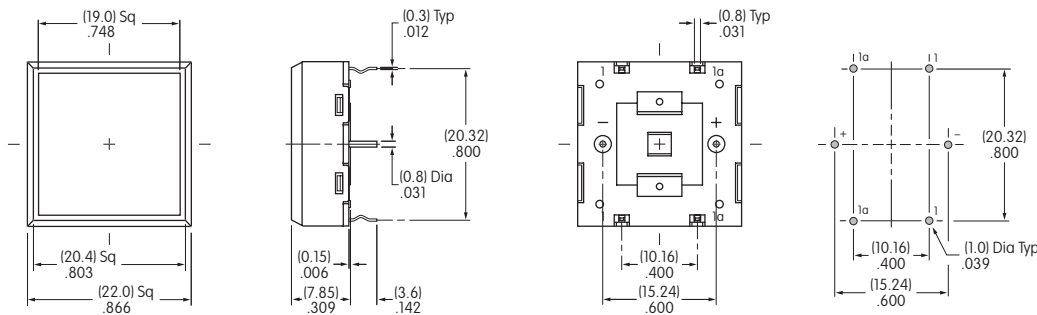
TERMINALS

P2 Silver Contacts Straight PC

Additional details in Typical Switch Dimensions



TYPICAL SWITCH DIMENSIONS



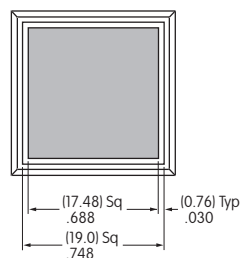
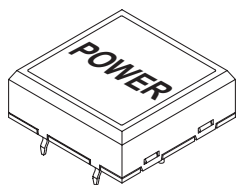
Square Actuator



JL15KSCCP2

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.



NKK Switches

Over 65 Years of Innovation

NKK Switches is known throughout the world as the industry leader of electromechanical switches and manufacturer of the widest range of illuminated, process sealed, miniature, specialty, surface mount and programmable switches. With over 3.5 million switch options, all products are designed with innovation, high reliability, customization and a commitment to excellence.

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Our manufacturing centers are ISO 9001 and ISO 14001 certified and feature state-of-the-art production and testing facilities to assure the highest quality products.

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- ▶ Custom Products for Specific Applications
- ▶ High Quality and Environmentally Safe Products (RoHS, REACH)
- ▶ ISO Certified Facilities



Warranty: All NKK products are warranted against defects in workmanship, material and construction for a period of one (1) year from the date of shipment if the products have been properly installed, used, and maintained. There are no express warranties of merchantability or fitness for a particular purpose. Materials, finishes, and component parts are subject to change without notification.



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