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## Switches with Illumination

NKK has been designing and manufacturing switches for over 65 years, and one of the most prominent categories is illuminated switches. No wonder, as illuminated switches are a focus in applications for all types of industries. Designers and engineers have come to expect a standard of impeccable quality and endurance in illuminated products, and NKK has a record of delivering. Additionally, it is our goal to offer diverse choices in actuation, power levels, terminations, mounting preferences, shapes and sizes, as well as a wide array of illumination types and colors. Turn to NKK's illuminated switches when you want to highlight your best projects.

### TOGGLES

## Characteristics & Specifications

### B Series Subminiature Fully Illuminated Toggle



- Single or bicolor LED radiates bushing and actuator
- Highly visible actuator status in green, red, amber, or bicolor in red/green LED
- Totally sealed body construction
- Straight, right angle or vertical PC terminals
- Standard PC board terminal spacing of .100" x .100" (2.54mm x 2.54mm)

Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 100,000 operations min
Electrical Life: 50,000 operations min
Angle of throw: 26°
Operating Temperature Range: -25°C ~ +55°C (-13°F ~ +131°F)

## Characteristics & Specifications

### G Series Ultra-Miniature Fully Illuminated Toggle



- Single or bicolor LED illuminates entire actuator
- Highly visible actuator status in green, red, or amber single colors, or bicolor in red/green LED
- Small, compact size facilitates high density mounting
  - Totally sealed body construction
- Straight, right angle or vertical PC terminals
- Standard PC board terminal spacing of .100" x .100" (2.54mm x 2.54mm)

Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 80 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 100,000 operations min
Electrical Life: 100,000 operations min; 10,000 operations min @ 0.1A @ 28V AC/DC
Angle of throw: 28°
Operating Temperature Range: -25°C ~ +55°C (-13°F ~ +131°F)

## Characteristics & Specifications

### M2100 Series Miniature LED Tipped Toggle



- Options for single color LEDs in red, yellow or green, plus bicolor in red/green
- LEDs can operate independently from or synchronously with switching operation
- Stainless steel frame and high torque bushing
- 1/4-40 threaded bushing with solder lug, quick connect or straight PC terminals; right angle PC with smooth bushing
- 1,500V dielectric strength between switch contacts and case achieved by clinching frame away from terminals

Power Level (silver): 6A @ 125V AC or 3A @ 250V AC
Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 10 milliohms for silver; 20 milliohms for gold
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 25,000 operations min
Angle of throw: 20°
Operating Temperature Range: -10°C ~ +55°C (+14°F ~ +131°F)

## Characteristics & Specifications

### TL Series Miniature Fully Illuminated Toggle



- Long or short actuator options with bright LEDs in red, amber or green; super bright LEDs in white, green or blue
- Panel seal rating of IP65 with optional exterior o-ring
- Black face nut enhances front panel appearance
- Antistatic material for toggle withstands 20 kilovolts electrostatic discharge
- 12mm threaded bushing and solder lug terminals
- High insulating barriers protect against crossover

Power Level (silver): 6A @ 125V AC or 3A @ 250V AC Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 10 milliohms for silver; 20 milliohms for gold
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 25,000 operations min for silver; 50,000 min for gold
Angle of throw: 25°
Operating Temperature Range: -10°C ~ +55°C (+14°F ~ +131°F)

## ROCKERS

## Characteristics & Specifications

### CWSB Series Miniature Power Rocker

- Full face neon illumination in red, amber or green choices
- 9-amp electrical capacity in compact, low cost, molded body
- Front panel, snap-in mounting for simple installation
- On Off (I O) symbols molded on the bezel
- Offset terminal alignment provides outstanding resistance and dielectric strength
- .187" (4.75mm) quick connect terminals



Power Level: 9A @ 125V AC
Contact Resistance: 20 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 1,500V AC min between contacts for 1 minute min; 3,000V AC min between contacts & case for 1 minute min
Mechanical Life: 30,000 operations min
Electrical Life: 10,000 operations min
Angle of throw: 30°
Operating Temperature Range: -20°C ~ +85°C (-4°F ~ +185°F)

## Characteristics & Specifications

### GW Series Ultra-Thin Fully Illuminated Paddle

- Highly visible LED status indication in red, green or amber for single color and red/green for bicolor
- Crisp actuation feedback positively indicates circuit transfer
- STC contact mechanism delivers smooth, positive detent actuation, increased contact stability, and unparalleled logic-level reliability
- .100" x .100" (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing for straight and angle mounting



Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 80 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 50,000 operations min
Angle of throw: 28°
Operating Temperature Range: -25°C ~ +55°C (-13°F ~ +131°F)

## Characteristics & Specifications

### JWS Series Miniature Internationally Approved Rocker

- Spot illumination options in red, amber or green LEDs
- Protective barrier available; helps prevent accidental actuation
- Designed for dust resistance with polyamide interior cover between actuator and contact area
- Terminals are molded in to lock out flux, dust and other contaminants
- Heat resistant resin for outer case meets UL94V-0 flammability standard



Power Level: 10A @ 125/250V AC; 6A @ 125/250V AC
Contact Resistance: 10 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 2,000V AC min between contacts for 1 minute min; 4,000V AC min between contacts & case for 1 minute min
Mechanical Life: 30,000 operations min
Electrical Life: 10,000 operations min
Angle of throw: 30°
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### LW Series Standard Size High Capacity Rocker

- LW3021A with translucent red spot illumination window
- Neon lamp with built-in ballast resistor is an integral part of switch
  - Screws supplied for flush panel mounting
  - Firm, crisp actuation
  - Mounting frame of steel with chrome plating
  - Solder lug terminals




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 Resistive Load: 20A @ 110V AC
 

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 Contact Resistance: 10 milliohms max
 

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 Insulation Resistance: 1,000 megohms min @ 500V DC
 

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 Dielectric Strength: 2,000V AC min for 1 minute min
 

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 Mechanical Life: 30,000 operations min
 

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 Electrical Life: 10,000 operations min
 

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 Angle of throw: 22°
 

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 Operating Temperature Range: -10°C ~ +50°C (+14°F ~ +122°F)
 

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## Characteristics & Specifications

### M Series Miniature Snap-in Mount Rocker

- Bezel with LED illumination in red, yellow or green
- Molded diallyl phalate case has UL94V-0 flammability rating
  - Terminals: solder lug, quick connect or wirewrap
  - Prominent external insulating barriers increase insulation resistance and dielectric strength
  - Terminals are epoxy sealed to prevent entry of solder flux and other contaminants
  - Clinching of frame to case well above base and terminals provides 1,500V dielectric strength




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 Power Level (silver): 6A @ 125V AC or 3A @ 250V AC

 Logic Level (gold): 0.4VA max @ 28V AC/DC max
 

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 Contact Resistance: 10 milliohms for silver; 20 milliohms for gold
 

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 Insulation Resistance: 1,000 megohms min @ 500V DC
 

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 Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
 

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 Mechanical Life: 50,000 operations min
 

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 Electrical Life: 25,000 operations for silver; 50,000 operations for gold
 

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 Angle of throw: 25°
 

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 Operating Temperature Range: -15°C ~ +70°C (+5°F ~ +158°F)
 

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## Characteristics & Specifications

### M2100 Series Miniature LED Tipped Rocker & Paddle

- Options for single color LEDs in red, yellow or green, plus bicolor in red/green
- LEDs can operate independently from or synchronously with switching operation
  - Multiple terminal and mounting type combinations
  - Optional bezel in multiple colors for snap-in frame
  - Epoxy sealed terminals prevent entry of solder flux and other contaminants
  - 1,500V dielectric strength between switch contacts and case by clinching frame away from terminals




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 Power Level (silver): 6A @ 125V AC or 3A @ 250V AC

 Logic Level (gold): 0.4VA max @ 28V AC/DC max
 

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 Contact Resistance: 10 milliohms for silver; 20 milliohms for gold
 

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 Insulation Resistance: 1,000 megohms min @ 500V DC
 

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 Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
 

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 Mechanical Life: 50,000 operations min
 

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 Electrical Life: 25,000 operations min
 

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 Angle of throw: 20°
 

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 Operating Temperature Range: -10°C ~ +55°C (+14°F ~ +131°F) for rockers; -25°C ~ +70°C (-13°F ~ +158°F) for paddles
 

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## Characteristics & Specifications

### MLW Series Miniature Snap-in Rocker

- Neon or LED illumination options in several colors
- Caps for neon in rocker, paddle or design rocker; single element LED caps in LED rocker or sculptured rocker
- Optional bezels in multiple colors, both standard and large sizes, adapt to varied panel cutouts
  - Isolated lamp circuit and front panel relamping
  - Stainless steel retaining clips securely hold switches in place, even during vibration exposure
  - Epoxy sealed solder lug terminals




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 Power Level: 5A @ 125V AC; 3A @ 250V AC

 Contact Resistance: 10 milliohms max
 

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 Insulation Resistance: 200 megohms min @ 500V DC
 

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 Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
 

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 Mechanical Life: 30,000 operations min
 

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 Electrical Life: 10,000 operations min
 

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 Angle of throw: 24° for On-None-(On); 28° for other circuits
 

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 Operating Temperature Range: -10°C ~ +50°C (+14°F ~ +122°F)
 

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**PUSHBUTTONS**

## Characteristics & Specifications

### EB Series Miniature Light Touch Pushbutton

- Snap-in mount versions with multiple style and color options for bezels and LEDs to enhance panel appearance
- Case of heat resistant resin meets UL94V-0 flammability rating
- Stainless steel frame resistant to corrosion
- 1,500V dielectric strength between contacts and case accomplished by clinching the frame away from the terminals
- Epoxy sealed terminals prevent entry of contaminants



Power Level (silver): 3A @ 125V AC
Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 10 milliohms for silver; 20 milliohms for gold
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 100,000 operations min
Electrical Life: 25,000 operations min for silver; 50,000 min for gold
Operating Temperature Range: -10°C ~ +70°C (+14°F ~ +158°F)

## Characteristics & Specifications

### MB2400 Series Miniature Snap-in Mount Pushbutton

- Optional bezels with LED illumination in red, yellow or green
- Smooth actuation, short stroke, light touch, audible feedback due to snap-acting mechanism, which also provides long mechanical life
- Terminals include solder lug, straight PC, wirewrap
- Stainless steel frame resists corrosion
- Prominent external insulating barriers increase insulation resistance and dielectric strength
- Longer center terminal simplifies wiring, soldering



Power Level (silver): 3A @ 125V AC
Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 20 milliohms for silver; 30 milliohms for gold
Insulation Resistance: 1,000 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 200,000 operations min
Electrical Life: 25,000 operations min for silver; 100,000 min for gold
Operating Temperature Range: -10°C ~ +70°C (+14°F ~ +158°F)

Note: NKK also offers the MB2500 Series, as seen in the full line product catalog. It is much like MB2400 Series, except it is metric rather than inch. MB2500 features the same snap-in mount illuminated options. Contact NKK Switches if more information is needed.

**ILLUMINATED PUSHBUTTONS**

## Characteristics & Specifications

### GB Series Ultra-Miniature Fully Illuminated Plungers

- Highly visible status indication with single color LED in red, green or amber
- High density mounting and extremely light weight ideal for hand-held equipment applications
- Totally sealed body construction
- STC contact mechanism administers smooth, positive detent actuation, increased contact stability, unparalleled logic-level reliability
- PC terminals in straight, right angle, vertical



Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 80 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 50,000 operations min
Electrical Life: 50,000 operations min
Operating Temperature Range: -25°C ~ +55°C (-13°F ~ +131°F)

## Characteristics & Specifications

### HB Series Subminiature Pushbutton

- Full face or spot illumination; bright or super bright LEDs
- Compact front panel design with 9mm square or round bezels
- Rear panel threaded mounting with behind panel depth of less than one inch. 8mm diameter body
- Dual, sliding contacts with self-cleaning action contribute to contact stability, high reliability and increased operating life
- Molded-in solder lug terminals with .100" spacing



Power Level: 0.1A max @ 30V AC/DC
Contact Resistance: 50 milliohms max
Insulation Resistance: 100 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 100,000 operations min
Electrical Life: 50,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### HB2 Series Subminiature Audio/Video Pushbutton

- Full face illumination in red/yellow or red/green bicolor LEDs
- Quiet actuation with crisp tactile feedback
- Compact design with short body and square cap
- Sliding twin crossbar mechanism provides unequalled logic-level reliability, contact stability, smooth positive detent actuation and long life
- Option of legends on cap or film insert
- PC terminals



Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 80 milliohms max
Insulation Resistance: 500 megohms min @ 500V DC
Dielectric Strength: 500V AC min for 1 minute min
Mechanical Life: 100,000 operations min
Electrical Life: 100,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### KP Series Miniature Compact Pushbutton

- Super bright LEDs in amber/blue or RGB with 4-pin termination
- Compact switch solution for all control panel needs plus a variety of cap styles and sizes for design flexibility
- Long or shorter travel options; tactile, nontactile, tactile/audible choices
- Height .906" (23mm) from PC board to top of cap
- Twin contacts with gold plating assure outstanding reliability and long life
- Standard and custom alternating legends



Power Level: 100mA max @ 12V DC
Contact Resistance: 200 milliohms max
Insulation Resistance: 100 megohms min @ 250V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 5,000,000 operations min; 1,000,000 operations min for Rectangular Switch/Cap Assembly
Electrical Life: 5,000,000 operations min; 1,000,000 for Rectangular
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### KP04 Series Miniature Compact SMT Pushbutton

- RGBP LED for full color spectrum in unlimited combinations, or RGBW LED with white option assists in reducing variations of color tones for white illumination
- Surface mount technology in brilliant compact design, contributing to diminished board and material handling costs
- Nontactile or tactile/audible actuation options
- Three cap sizes in flat, sculptured or home key; perfect for custom legends on cap or film insert
- Distinct, total travel of .138" (3.5mm) with height of .906" (23.0mm) from PC board to top of cap
- Twin contacts with gold plating deliver excellent reliability and long life



Power Level: 100mA max @ 12V DC
Contact Resistance: 200 milliohms max
Insulation Resistance: 100 megohms min @ 250V DC
Dielectric Strength: 500V AC min between contacts for 1 minute min; 500V AC min between contacts & case for 1 minute min
Mechanical Life: 3,000,000 operations min
Electrical Life: 3,000,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)



## Characteristics & Specifications

### LB Series Standard Size Pushbutton

- Light diffusion and filtering system produces bright, full surface illumination with front panel relamping
- White, green or blue super bright LEDs; standard or bright in red, amber or green; spot illuminated
- Square, round, rectangular body shapes available
- Panel seal version meets IP65 specifications
- Snap-action contact mechanism for long electrical life and sensitivity of actuation
- Epoxy sealed solder lug/quick connect terminals



Power Level (silver): 3A @ 125V AC or 3A @ 250V AC
Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms for silver; 100 milliohms for gold
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 1,000,000 operations min for momentary circuit 200,000 operations min for maintained circuit
Electrical Life: 100,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### LP01 Series Miniature Short Body Pushbutton

- Bright LED illumination in red, green or amber through smooth, slightly concave, translucent white cap designed to prevent removal and prohibit tampering
- Super bright spot illumination options
- Compact body conserves behind-panel space
- Crisp actuation, clear circuit status from snap-action contact mechanism. Protection against crossover provided by arc barrier between movable contacts.
- Combination solder lug/quick connect terminals



Power Level: 3A @ 125V AC or 3A @ 250V AC
Contact Resistance: 50 milliohms max
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 500,000 operations min
Electrical Life: 50,000 operations min
Operating Temperature Range: -10°C ~ +50°C (+14°F ~ +122°F)

## Characteristics & Specifications

### NP01 Series Subminiature Smooth Actuation Pushbutton

- Entire cap illumination with single or bicolor LED options
- Alternating legends with bicolor LEDs: standard or custom choices
- Soft touch actuation with distinct, long stroke of .059" (1.5mm)
- Gold plated contacts maintain high reliability
- Compact design facilitates high density mounting
- Available in high or standard operating forces
- Molded-in PC terminals prevent contaminant entry



Logic Level: 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms max
Insulation Resistance: 500 megohms min @ 250V DC
Dielectric Strength: 250V AC min between contacts for 1 minute min
Mechanical Life: 500,000 operations min
Electrical Life: 500,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### UB Series Miniature Low Profile Pushbutton

- Bright or super bright LED illumination offered in multiple options
- Bicolor in red/green or amber/blue for alternating legends
- Compact applications simplified with PCB mountability, short body
- Small behind panel dimension for snap-in mounting in tight spaces
- Latchdown mechanism, independent of switching mechanism, provides visible and tactile indication of circuit status
- Quick-make, quick-break attribute limits arcing and extends electrical life
- Solder lug or straight PC epoxy sealed terminals



Power Level (silver): 5A @ 125V AC or 5A @ 250V AC
Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms for silver; 100 milliohms for gold
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 1,000,000 operations min for momentary; 200,000 operations min for alternate action
Electrical Life: 10,000 operations min for silver; 200,000 operations min for gold
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### UB2 Series Miniature Low Profile Pushbutton

- Wide selection of illumination effects with single or bicolor LEDs and flat, beveled or sculptured caps
- Super bright bicolor LEDs in red/green or amber/blue enhance standard or custom alternating legends
- PCB or snap-in mounting and short body dimensions accommodate compact applications
  - Snap-acting contact mechanism provides sensitive actuation and audible feedback; quick-make, quick-break characteristic limits arcing and prolongs electrical life
  - Latchdown mechanism, independent of switching mechanism, delivers excellent stability and reliability plus visible and tactile indication of circuit status
  - Epoxy sealed solder lug or straight PC terminals



Power Level (silver): 5A @ 125V AC or 5A @ 250V AC Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms for silver; 100 milliohms for gold
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 1,000,000 operations min for momentary; 200,000 operations min for alternate action
Electrical Life: 10,000 operations min for silver; 200,000 operations min for gold
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### YB Series Miniature Short Body Pushbutton

- Full face or spot illumination with multi-element LEDs
- Super bright LEDs in white, green or blue, and bright LEDs in red, amber or green
- Splashproof, dust and oil tight panel seal model is rated IP65 and supplied with an exterior o-ring
  - Available in square, round or rectangular shapes
  - Combination bezel-barrier is an integral part of the switch and prevents accidental actuation
  - Less than one inch behind panel depth
  - Distinctive design of snap-action contacts for shock resistance, long life and sensitive actuation
  - Epoxy sealed straight PC or solder lug/.110" (2.8mm) quick connect terminals



Power Level: 3A @ 125V AC or 3A @ 250V AC Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms for silver; 100 milliohms for gold
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 1,000,000 operations min for momentary circuit; 200,000 operations min for maintained circuit
Electrical Life: 100,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)

## Characteristics & Specifications

### YB2 Series Standard Size Panel Seal Pushbutton

- Brilliant illumination options in bright and super bright LEDs
- Multiple illuminating effects with various lens/diffuser caps for enhanced panel appearance. Caps include metallic silver with clear ring illumination, unbrushed chrome with look of stainless steel. Bezels in black or brushed chrome.
  - 24mm square and 25mm diameter pushbuttons with tamper resistant 18mm square and 19mm diameter actuators
  - Meets IP65 of IEC 60529 Standards for dust tight and splashproof panel seal protection
  - Short body conserves behind panel space
  - Solder lug/quick connect terminals are epoxy sealed
  - Standard and custom legends available



Power Level: 3A @ 125V AC or 3A @ 250V AC Logic Level (gold): 0.4VA max @ 28V AC/DC max
Contact Resistance: 50 milliohms for silver; 100 milliohms for gold
Insulation Resistance: 200 megohms min @ 500V DC
Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min
Mechanical Life: 1,000,000 operations min for momentary circuit; 200,000 operations min for maintained circuit
Electrical Life: 100,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)



## SMARTDISPLAY PROGRAMMABLE

### Characteristics & Specifications

#### IS Series Standard Size OLED Frameless Pushbutton

- High definition, contrast, and resolution in OLED display module with range of 65,536 colors; pixel format 96RGB x 64 (h x v)
  - Maximum use of display lens with ultra-thin frame provides full screen capacity
  - Multiple units easily combine to form one borderless screen, offering flexibility in size and layout
  - Operated by commands and data supplied via serial communications protocol (SPI)
  - Dust tight construction; low energy consumption
  - Snap-in standoff, epoxy sealed straight PC terminals



Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Operating Life (Display): 50,000 hours @ 100cd/m <sup>2</sup> (based on 40% pixels ON; Ta = 77°F)
Viewing Area H x V: Display: 21.28mm x 18.74mm (0.838" x 0.738")
Operating Temperature Range: -20°C ~ +70°C (-4°F ~ +158°F)

### Characteristics & Specifications

#### IS Series Standard Size OLED Pushbutton

- Range of 65,536 colors in 16 bit mode, 256 colors in 8 bit mode
- Exceptional contrast: 50 times greater than LCD products
  - Enhanced resolution of 64RGB x 48 pixels, producing sharp, clear images of very small characters
  - Operated by commands and data supplied via serial communications protocol (SPI)
  - Stylish, translucent black housing design; snap-in standoff for easy, secure mounting and alignment
  - Epoxy sealed straight PC terminals



Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 3,000,000 operations min
Electrical Life: 3,000,000 operations min
Operating Life (Display): 30,000 hours @ 100cd/m <sup>2</sup> (based on 40% pixels ON); 60,000 hours @ 50cd/m <sup>2</sup> (based on 40% pixels ON)
Viewing Area H x V: Display: 15.5mm x 11.6mm (0.610" x 0.457")
Operating Temperature Range: -20°C ~ +70°C (-4°F ~ +158°F)

### Characteristics & Specifications

#### IS Series Standard Size OLED Display

- Range of 65,536 colors in 16 bit mode, 256 colors in 8 bit mode
  - Vivid colors with 52RGB x 36 pixel resolution
  - Bracket with crimped legs ensures secure PC mounting and prevents dislodging during wave soldering
  - Low energy consumption



Display: Color OLED display module; 30,000/60,000 hours @ 40%
Viewing Area H x V: Display: 12.9mm x 9.9mm (0.508" x 0.390")
Operating Temperature Range: -20°C ~ +70°C (-4°F ~ +158°F)

### Characteristics & Specifications

#### IS Series Standard Size OLED Rocker

- Organic LED technology in monochrome display rocker features sharp contrast and resolution of 96 x 64 pixels
- Multi-function programmable device replaces multiple switches
  - Conforms to IP64 of IEC 60529 Standards on panel surface; dust tight construction prevents entry of dust, improves contact reliability
  - Large 0.92" display; wide viewing angle of 180°
  - Short, behind panel depth of .575" (14.6mm)
  - Panel mount with easy, snap-in installation



Electrical Capacity (Resistive Load): 3VA max @ 24V DC max
Contact Resistance: 200 milliohms max
Insulation Resistance: 500 megohms min @ 250V DC
Dielectric Strength: 250V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Display: Monochrome OLED; white/black; 52,000 hours @ 30%
Viewing Area H x V: Display: 19.16mm x 13.22mm (0.754" x 0.520")
Operating Temperature Range: -20°C ~ +70°C (-4°F ~ +158°F)

## Characteristics & Specifications

### IS Series Standard Size LCD Pushbutton • Standard Travel

- Programmable to display graphics for alphanumeric characters and animated sequences. Dynamically control 64 colors of backlighting.
- Operated by commands and data supplied via serial communications protocol (SPI)



- Crisp, vivid resolution in 64 x 32 pixel format
- Operated by commands and data supplied via serial communications protocol (SPI)
- Dual image VRAM quickly changes displayed images
- Dust tight construction; low energy consumption
- Snap-in standoff legs, straight PC terminals

Total Travel: 1.8mm (0.071")
Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Viewing Area H x V: 17.0mm x 13.0mm (0.669" x 0.512")
Operating Temperature Range: -15°C ~ +50°C (+5°F ~ +122°F)

## Characteristics & Specifications

### IS Series Standard Size LCD Pushbutton • Long Travel

- Programmable to display graphics for alphanumeric characters and animated sequences. Dynamically control 64 colors of backlighting.
- Operated by commands and data supplied via serial communications protocol (SPI)



- Crisp, vivid resolution in 64 x 32 pixel format
- Operated by commands and data supplied via serial communications protocol (SPI)
- Dual image VRAM quickly changes displayed images
- Dust tight construction; low energy consumption
- Snap-in standoff legs, straight PC terminals

Total Travel: 4.5mm (0.177")
Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 3,000,000 operations min
Electrical Life: 3,000,000 operations min
Viewing Area H x V: 17.0mm x 13.0mm (0.669" x 0.512")
Operating Temperature Range: -15°C ~ +50°C (+5°F ~ +122°F)

## Characteristics & Specifications

### IS Series Compact LCD Pushbutton

- Programmable to display graphics for alphanumeric characters and animated sequences. Dynamically control 64 colors of backlighting.
- Operated by commands and data supplied via serial communications protocol (SPI)



- Crisp, vivid resolution in 64 x 32 pixel format
- Operated by commands and data supplied via serial communications protocol (SPI)
- Dual image VRAM quickly changes displayed images
- Dust tight construction; low energy consumption
- Snap-in standoff legs, straight PC terminals

Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Viewing Area H x V: 14.5mm x 11.8mm (0.571" x 0.465")
Operating Temperature Range: -15°C ~ +50°C (+5°F ~ +122°F)

## Characteristics & Specifications

### IS Series Standard Size LCD Display

- 64 colors of backlighting can be dynamically controlled
- Crisp, vivid resolution in 64 x 32 pixel format
- Bracket with crimped legs ensures secure PC mounting and prevents dislodging during wave soldering
- Controllable in three software commands
- Low energy consumption



Display: LCD with RGB backlight
Viewing Area H x V: Display: 14.4mm x 11.8mm (0.567" x 0.465")
Operating Temperature Range: -15°C ~ +50°C (+5°F ~ +122°F)

## Characteristics & Specifications

### IS Series Standard Size LCD Pushbutton

- Programmable to display graphics for alphanumeric characters and animated sequences; broad and even light diffusion
- Consistent RGB backlighting and 36 x 24 pixel format
  - Wide viewing angle with high contrast and clarity
  - Daisy chain capability; sunlight readable display
  - High reliability and long life with a tactile touch
  - Low energy consumption
  - Snap-in standoff, epoxy sealed straight PC terminals
  - Optional accessories available to enhance panel design and simplify production process



Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Viewing Area H x V: 17.0mm x 13.0mm (0.669" x 0.512")
Operating Temperature Range: -20°C ~ +60°C (-4°F ~ +140°F)

## Characteristics & Specifications

### IS Series Compact LCD Pushbutton

- Programmable to display graphics for alphanumeric characters and animated sequences; variety of LED backlighting colors
- Perfect for rack mount router, other applications with space restraints
  - Vibrant illumination with 36 x 24 pixel format
  - Daisy chain capability; sunlight readable display
  - High reliability and long life with a tactile touch
  - User controlled backlight; low energy consumption
  - Snap-in standoff for secure mounting and alignment
  - Epoxy sealed, straight PC terminals prevent entry of solder flux and other contaminants



Electrical Capacity (Resistive Load): 100mA @ 12V DC
Contact Resistance: 200 milliohms max @ 20mV 10mA
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 125V AC for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Viewing Area H x V: 14.5mm x 11.8mm (0.571" x 0.465")
Operating Temperature Range: -20°C ~ +60°C (-4°F ~ +140°F)

## Characteristics & Specifications

### IS Series Standard Size LCD Display

- Programmable to display graphics for alphanumeric characters and animated sequences. RGB LED provides numerous color variations.
- Integrated liquid crystal display enables wide viewing angle with high contrast and clarity; 36 x 24 pixel format
- Can be used alone or in conjunction with electromechanical switches
  - Daisy chain capability; sunlight readable display
  - User controlled backlight; low energy consumption
  - Bracket with crimped legs ensures secure PC mounting and prevents dislodging during wave soldering
  - Low energy consumption



Display: LCD with RGB backlight
Viewing Area H x V: Display: 14.4mm x 11.8mm (0.567" x 0.465")
Operating Temperature Range: -20°C ~ +60°C (-4°F ~ +140°F)

## SLIDES

### Characteristics & Specifications

#### MS Series Miniature Illuminated Slide

- Bright LED illumination in red, yellow or green at tip of actuator
- Over-center actuator block and plunger design gives crisp actuation, diminishes sparking and increases operating life



- Antijamming design protects contacts from damage due to excessive downward force on actuator
- Prominent external insulating barriers increase insulation resistance and dielectric strength
- Epoxy sealed solder lug (with 2-screw flange) or straight PC terminals

Power Level: 6A @ 125V AC or 3A @ 250V AC

Contact Resistance: 10 milliohms max

Insulation Resistance: 1,000 megohms min @ 500V DC

Dielectric Strength: 1,000V AC min between contacts for 1 minute min; 1,500V AC min between contacts & case for 1 minute min

Mechanical Life: 50,000 operations min

Electrical Life: 25,000 operations min

Operating Temperature Range: -15°C ~ +60°C (+5°F ~ +140°F)

### Characteristics & Specifications

#### SS Series Ultra-Miniature Illuminated Slide

- Bright LED illumination in red, yellow or green at tip of actuator
- Top or side actuation permits flexible board design
- Compact dimensions and low profile contribute to high density mounting and close stacking of PC boards



- Double molded thermoset base and thermoplastic housing prevent loosening of terminals due to high soldering temperatures
- Insert molded terminals, .100" x .100" standard PC board grid spacing, lock out flux and contaminants

Power Level: 0.1A @ 30V DC

Contact Resistance: 20 milliohms max

Insulation Resistance: 100 megohms min @ 500V DC

Dielectric Strength: 500V AC min for 1 minute min

Mechanical Life: 10,000 operations min

Electrical Life: 10,000 operations min

Operating Temperature Range: -15°C ~ +60°C (+5°F ~ +140°F)

## TACTILES

### Characteristics & Specifications

#### JB Series Subminiature Low Profile Tactile

- Bright, full face illumination with red, green or yellow LED
- Choice of multiple caps and colors, with flat, flat with lens and diffuser, or framed cap options
- Rubber seal construction plus molded-in terminals prevent contact contamination and allow automated soldering and cleaning
  - Actuators in short or extended options, with extended for high operating force model
  - Dome contact gives crisp positive feedback, indicating circuit transfer, high reliability and long life
  - Molded-in straight PC terminals conform to standard .100" (2.54mm) PCB grid

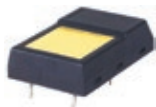


Operating Force	Standard	High
Low/Logic Level	50mA @ 24V DC max	125mA @ 24V DC max
Contact Resistance	50 milliohms max	
Insulation Resistance	500 megohms min @ 250V DC	
Dielectric Strength	250V AC min for 1 minute min	
Mechanical Life	5,000,000 operations	1,000,000 operations
Electrical Life	5,000,000 operations	1,000,000 operations
Operating Temperature Range: -25°C ~ +70°C (-13°F ~ +158°F)		

### Characteristics & Specifications

#### JF Series Subminiature Ultra-Thin Tactile

- Red, green or yellow LED with spot or full face illumination
- Extremely low profile of .224" (5.7mm) from PCB to top of switch; compact body dimensions for side-by-side mounting on standard .100" (2.54mm) PCB grid
- Rubber seal construction prevents contact contamination and permits automated soldering and cleaning
  - Minimal operating force and short stroke enable light touch operation
  - Crimped PC terminals ensure secure mounting and prevent dislodging during wave soldering

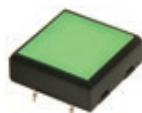


Low/Logic Level: 50mA @ 24V DC
Contact Resistance: 50 milliohms max
Insulation Resistance: 500 megohms min @ 250V DC
Dielectric Strength: 250V AC min for 1 minute min
Mechanical Life: 500,000 operations min
Electrical Life: 500,000 operations min
Operating Temperature Range: -25°C ~ +70°C (-13°F ~ +158°F)

### Characteristics & Specifications

#### JL Series Subminiature Ultra-Thin Tactile

- Bright, full face illumination with red, amber or green LED
- Distinctive design achieves full face illumination in extra low profile of 0.31" (7.85mm) from PCB to top of switch
- Streamlined housing dimensions accommodate compact, side-by-side mounting on a standard PCB grid
  - Dome contact gives crisp tactile and audible feedback with short stroke, assuring high reliability and long life
  - Crimped PC terminals ensure secure mounting and prevent dislodging during the soldering process. Standard .100" (2.54mm) PCB grid spacing.



Low/Logic Level: 50mA @ 24V DC
Contact Resistance: 50 milliohms max
Insulation Resistance: 500 megohms min @ 250V DC
Dielectric Strength: 250V AC min for 1 minute min
Mechanical Life: 1,000,000 operations min
Electrical Life: 1,000,000 operations min
Operating Temperature Range: -25°C ~ +50°C (-13°F ~ +122°F)



## INDICATORS

### Characteristics

#### A Indicators - Complement to A Switches



- Red, yellow or green LED color options
- Low .079" (2.0mm) profile
- Subminiature size and compact body contributes to design flexibility
- Variety of PC terminal configurations: straight PC, straight PC with bracket, right angle or vertical PC

### Characteristics

#### UB Indicators - Complement to UB Switches



- Red, amber or green bright LEDs; white, green or blue super bright LEDs; super bright bicolor LEDs in red/green or amber/blue for alternating legends (square or rectangular shapes)
- Full face or spot illumination options
- Solder lug terminals with snap-in mounting
- Straight PC terminals for PCB mounting

### Characteristics

#### G Indicators - Complement to G Switches



- LED choices in red, yellow or green
- Ultra-miniature, space conserving body
- Straight or vertical PC terminals; vertical PC model has anode and cathode terminals in addition to two support pins
- Partner with G Series toggles, rockers or pushbuttons

### Characteristics

#### UB2 Indicators - Complement to UB2 Switches



- Red, amber or green bright LEDs; white, green or blue super bright LEDs; super bright bicolor LEDs in red/green or amber/blue
- Sculptured, beveled and flat caps
- Square bodies with PCB or snap-in mounting
- Standard and custom legends available
- Silver PC/turret terminals

### Characteristics

#### HB Indicators - Complement to HB Switches



- Bright LEDs in red, amber or green; super bright LEDs in white, green or blue
- Multiple cap options with lens/diffuser combinations, plus square or round shapes
- 8mm threaded bushing
- Solder lug terminals

### Characteristics

#### YB Indicators - Complement to YB Switches



- Red, amber or green bright LEDs; white, green or blue super bright LEDs; bicolor LED in red/green
- Square, round or rectangular shapes with bushing or snap-in mounting choices
- Panel seal model available in bushing mount
- Solder lug/.110" (2.8mm) quick connect terminals

### Characteristics

#### LB Indicators - Complement to LB Switches



- Neon, bright or super bright illumination in variety of colors
- Insert caps with lens/filter or LED caps with lens/diffuser combination
- Square, round and rectangular shapes
- Secure mounting supported by stainless steel clips
- Solder lug/quick connect terminals