

## Surface Mount Switches

NKK offers many innovative options for customers requiring dependable surface mount switches. Several actuators within the SMT group are featured, including toggles, pushbuttons, rotaries, slides and tactiles. The process sealed series simplify automated processing and cleaning techniques. DIP switches are represented in both rotaries and slides. Packaging for the surface mount switches includes tape reel, stick-tube or partitioned tray options. Benefits of each series are presented to assist in the selection of the most appropriate device for the application. If assistance is needed, our skilled engineers are available for consultation and support. The customer can confidently move forward with the design, equipped with the best products and outstanding service.

### PROCESS SEALED SMT TOGGLE

## Characteristics & Specifications

#### G3T Series Process Sealed Ultra-Miniature Toggle

- Very small compact size facilitates high density mounting; light weight of 0.6 gram ideal in handheld equipment
- Gull-wing terminals with upright, upright with bracket, and right angle mounting options provide stability during soldering
- Heat resistant resin used for housing, base and lever permits vapor phase and infrared convection reflow soldering
- Rapid automated placement enabled by tape-reel, stick-tube packaging. Tape reel packaging meets EIA-481-D Standard.
- Design features achieve total seal, allowing automated processing techniques that include flux cleaning procedures: one-piece bushing and housing, rubber seals surrounding actuator and base, epoxy at joint of case and base, and molded-in, epoxy sealed terminals
- Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0059" (0.15mm)

Resistive Load Logic Level: 0.4VA max @ 28V AC/DC max (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
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
Nominal Operating Force: 1.6N for momentary; 1.7N for maintained
Angle of Throw: 28°
Operating Temperature Range: -30°C ~ +85°C (-22°F ~ +185+°F)

### PROCESS SEALED SMT PUSHBUTTON

## Characteristics & Specifications

#### G3B Series Process Sealed Ultra-Miniature Pushbutton

- Ultra-miniature size assists in high density mounting, extremely light weight of 0.6 gram perfect for handheld equipment
- Gull-wing terminals with upright, upright with bracket, and right angle mounting options provide stability during soldering
- Heat resistant resin used for housing, base and lever permits vapor phase and infrared convection reflow soldering
- Rapid automated placement enabled by tape-reel, stick-tube packaging. Tape reel packaging meets EIA-481-D Standard
- Total seal permits automated processing techniques, including flux cleaning procedures: one-piece bushing and housing, rubber seals surrounding actuator and base, epoxy at joint of case and base, and molded-in, epoxy sealed terminals
- Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0059" (0.15mm)

Resistive Load Logic Level: 0.4VA max @ 28V AC/DC max (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
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
Nominal Operating Force: 2.0N
Travel: Pretravel .024" (0.6mm); Overtravel .019" (0.5mm); Total Travel .043" (1.1mm)
Operating Temperature Range: -30°C ~ +85°C (-22°F ~ +185+°F)

## ULTRA-THIN SMT DIP ROTARY

### Characteristics & Specifications

#### FR02 Series 10mm Subminiature Rotary

- Slim body of .150" (3.8mm) with low profile enables close stacking of PC boards
- Screwdriver or shaft actuators with arrow position indication and highly visible legends result in trouble-free code setting
- Gull-wing terminals for upright mounting give mechanical stability during soldering, simplify solder joint inspection
- Detent mechanism delivers crisp, positive action for accurate switch setting
- Use of heat resistant resin allows infrared convection reflow soldering
- Contact reliability and continuity reinforced by cam activated movable contact and gold contacts
- Stick-tube or tape-reel packaging available. Tape-reel packaging meets EIA-481-2 Standard.
- Coplanarity: all considered surfaces must lie between two parallel planes that are a maximum distance apart of .0059" (0.15mm)

Resistive Load Switching Rating: 100mA @ 5V DC Nonswitching Rating: 100mA @ 50V DC
Contact Resistance: 100 milliohms max for circuit; 30 milliohms max for contact point
Insulation Resistance: 1,000 megohms min @ 250V DC
Dielectric Strength: 250V AC min for 1 minute min
Mechanical Life: 10,000 detent operations min
Electrical Life: 10,000 detent operations min
Nominal Operating Torque: 0.008Nm for decimal devices; 0.01Nm for hexadecimal devices
Contact Timing: Nonshorting
Operating Temperature Range: -25°C ~ +85°C (-13°F ~ +185°F)

## EXTENDED OR FLUSH ACTUATOR SMT DIP SLIDES

### Characteristics & Specifications

#### JS02 & JS04 Series Ultra-Miniature Slides

- Extended (JS02) and flush (JS04) actuator options available
- End-to-end stackable
- Twin sliding contact mechanism with self-cleaning action (JS02) for smooth actuation and high contact reliability
- Gold plated contacts prevent oxidation and sulfide effect while providing stable contact resistance
- UL 94V-0 certified material used in cover and base provides high arc resistance and high insulation resistance
- Secure PCB mounting with gull-wing terminals; prevents dislodging during vapor phase and infrared convection reflow soldering
- Terminal spacing conforms to standard PCB grid. For JS02: .100" (2.54mm). For JS04: .050" (1.27mm)
- Tape-reel or stick-tube packaging options. 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)

Resistive Load Switching Rating: 25mA @ 24V DC Nonswitching Rating: 0.1A @ 50V DC
Contact Resistance: JS02 & JS04 - 50 milliohms max
Insulation Resistance: JS02 - 100 megohms min @ 500V DC JS04 - 100 megohms min @ 100V DC
Dielectric Strength: JS02 - 500V AC min for 1 minute min JS04 - 300V AC min for 1 minute min
Mechanical Life: JS02 & JS04 - 2,000 operations min
Electrical Life: JS02 & JS04 - 2,000 operations min
Total Travel: JS02 - .031" (0.8mm); JS04 - .026" (0.65mm)
Operating Temperature Ranges: JS02 Extended Actuator: -25°C ~ +70°C (-13°F ~ +158°F) JS04 Flush Actuator: -30°C ~ +85°C (-22°F ~ +185°F)

## SIDE ACTUATED SMT SLIDE

### Characteristics & Specifications

#### SS3 Series Ultra-Miniature Slide

- High density mounting and close stacking of PC boards credited to low profile and compact dimensions
- Crisp actuation positively indicates circuit status
- Smooth, positive detent actuation, increased contact stability and unparalleled logic-level reliability
- Heat resistant resin allows vapor phase and infrared convection reflow soldering
- Gull-wing terminals provide mechanical stability during soldering and simplified solder joint inspection
- Insert molded terminals lock out flux, solvents and other contaminants
- Metric terminal spacing of 2.0mm x 2.0mm for standard PC board grid
- Tape-reel or partitioned tray packaging options. 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)

---

#### Resistive Load

Logic Level: 0.4VA max @ 28V AC/DC max  
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

---

Contact Resistance: 50 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

---

Contact Timing: SS312S – Shorting (make-before-break)

---

Total Travel: .079" (2.0mm)

---

Operating Temperature Range: -25°C ~ +85°C (-13°F ~ +185°F)

---

## PROCESS SEALED SMT TACTILE

### Characteristics & Specifications

#### CB3 Series 6mm Ultra-Miniature Tactile

- Automated soldering and cleaning permitted due to sealed construction; sealing also prevents contamination
- .244" (6.2mm) square body perfect for compact mounting
- Actuator and base meet UL 94V-0 flammability rating for heat tolerant resin, while maintaining switch reliability through vapor phase and infrared convection reflow soldering
- Positive indication of circuit transfer due to dome contact, also assuring high reliability and long life
- Gull-wing terminals provide mechanical stability during soldering and simplify solder joint inspection
- Insert molded terminals block flux, solvents and other contaminants
- Tape-reel or partitioned tray packaging options. 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)

---

#### Resistive Load

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

---

Contact Resistance: 100 milliohms max

---

Insulation Resistance: 100 megohms min @ 250V DC

---

Dielectric Strength: 250V AC min between contacts & between contacts & case for 1 minute min

---

Mechanical Life: 100,000 operations min

---

Electrical Life: 100,000 operations min

---

Nominal Operating Force: 1.57N

---

Total Travel: .010" (0.25mm)

---

Operating Temperature Range: -25°C ~ +70°C (-13°F ~ +158°F)

---

## FLAT BUTTON SMT TACTILE

### Characteristics & Specifications

#### HP03 Series 6mm Ultra-Miniature Tactile

- Compact square body dimension of .244" (6.2mm) accommodates high density mounting
- Heat resistant resin body meets lead-free solder processing requirements and UL 94V-0 flammability rating
- Gold plated contacts option available for very low voltage/current applications with advantages of little or no oxidization or sulfurization and stable contact resistance
- Gull-wing terminals provide mechanical stability during soldering and simplify solder joint inspection
- Insert molded terminals lock out flux, solvents and other contaminants, and permit automated soldering
- Packaging options for stick-tube or tape-reel, allowing for rapid automated placement of devices. 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)

---

Resistive Load
Power Level for Silver: 3VA max @ 28V DC max (Applicable Range 10mA ~ 125mA @ 0.1V ~ 28V)
Logic Level for Gold: 0.4VA max @ 28V AC/DC max (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Contact Resistance: 100 milliohms max
Insulation Resistance: 100 megohms min @ 100V DC
Dielectric Strength: 250V AC min for 1 minute min between contacts & between contacts & case
Mechanical Life: 500,000 operations min
Electrical Life: 500,000 operations min
Nominal Operating Force: 1.60N
Total Travel: .008" (0.2mm)
Operating Temperature Range: -20°C ~ +70°C (-4°F ~ +158°F)

---