

# General Specifications

## Electrical Capacity (Resistive Load)

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

## Other Ratings

**Contact Resistance:** 50 milliohms maximum  
**Insulation Resistance:** 500 megohms minimum @ 250V DC  
**Dielectric Strength:** 250V AC minimum between contacts for 1 minute minimum  
**Mechanical Life:** 500,000 operations minimum  
**Electrical Life:** 500,000 operations minimum  
**Nominal Operating Force:** **Standard:** 1.5N ±0.5 Newtons  
**High:** 2.5N ±0.8 Newtons  
**Stroke:** 1.5mm (.059")

## Materials & Finishes

**Actuator:** Silicon rubber  
**Case:** Polycarbonate resin  
**Base:** Glass fiber reinforced polyamide resin  
**Movable Contact:** Silver over nickel with gold plating  
**Stationary Contacts:** Brass with gold plating  
**Switch Terminals:** Brass with gold plating

## Environmental Data

**Operating Temperature Range:** -25°C through +50°C (-13°F through +122°F) for Illuminated  
 -25°C through +70°C (-13°F through +158°F) for Nonilluminated  
**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<sup>2</sup>) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

## Installation

**Cap Installation Force:** 5.0N maximum downward force on actuator

## PCB Processing

**Soldering:** Wave Soldering: 270°C maximum @ 6 seconds maximum  
 Manual Soldering: 390°C maximum @ 4 seconds maximum  
**Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.

## Standards & Certifications

The NP01 Series pushbuttons 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

Soft touch actuation achieved by mechanical silicon rubber structure.

Distinct, long stroke of 1.5mm (.059").

Entire cap is fully illuminated with single or bicolor LED.

Compact design with dimension of 12.5mm (.492") from PC board to top of cap.

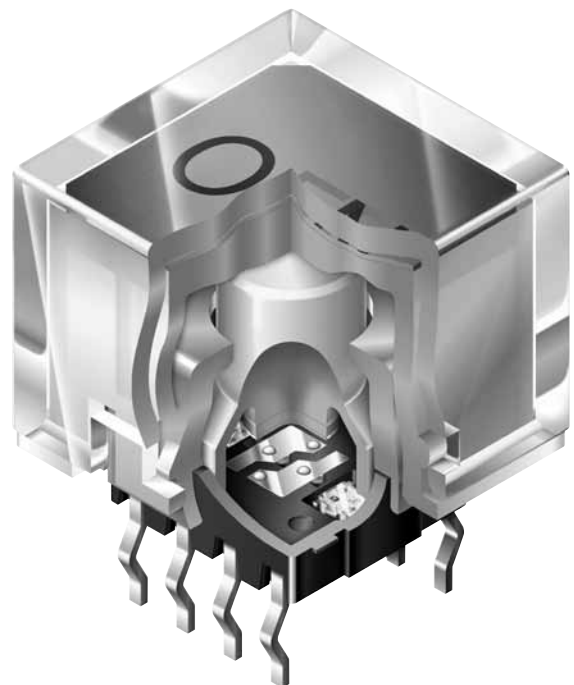
Alternating legend options (patent pending) with bicolor LED.

Available in both high (2.5N) or standard (1.5N) operating force.

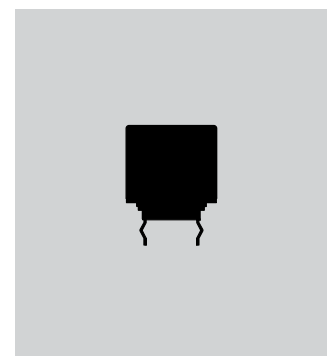
Gold plated contacts provide high reliability.

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

Molded-in terminals prevent entry of flux, solvents, and other contaminants.



Actual Size



Toggles

Rockers

Pushbuttons

**D**  
Illuminated PB

Programmable

Keylocks

Rotaries

Slides

Tactiles

Tilt

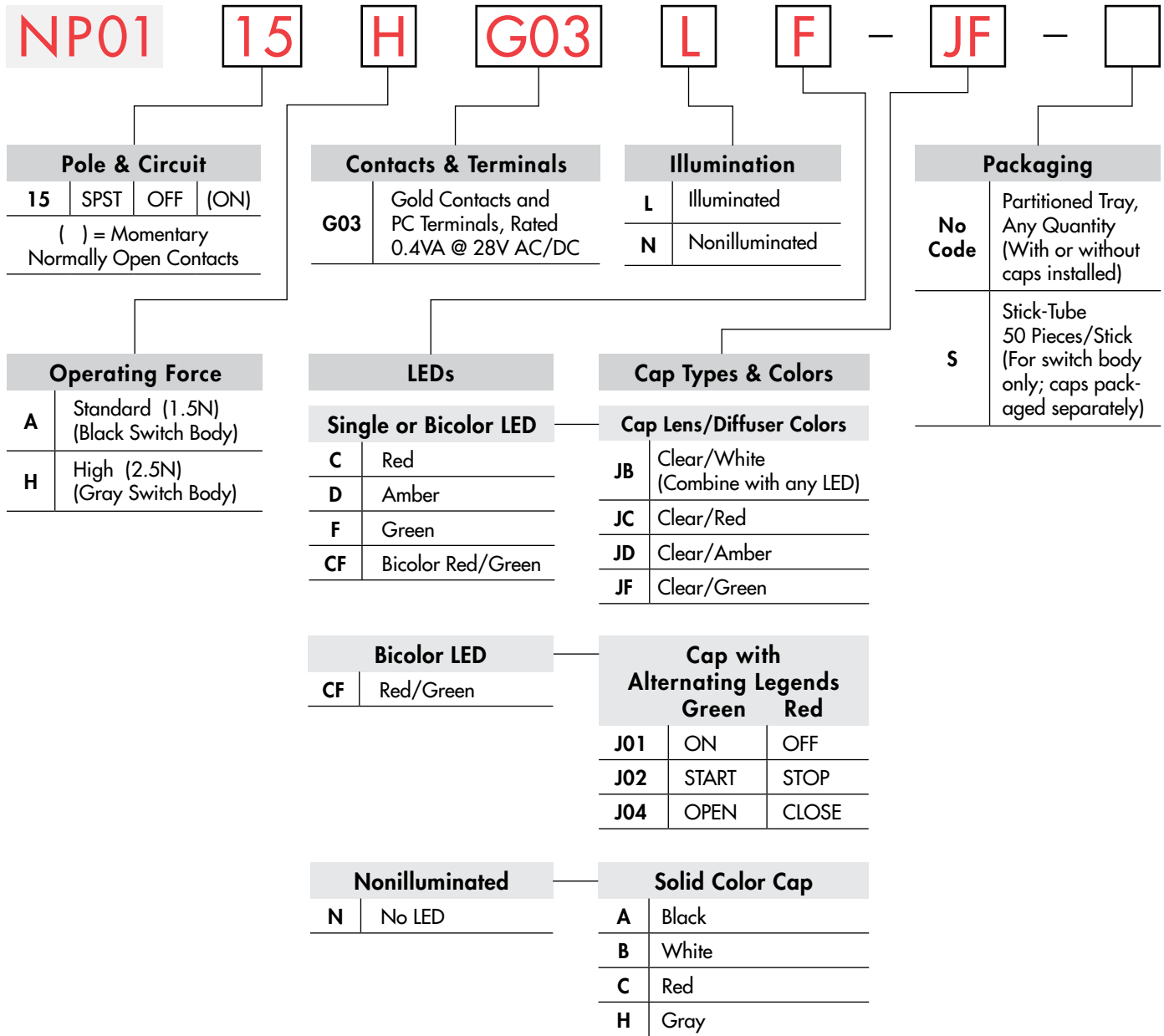
Touch

Indicators

Accessories

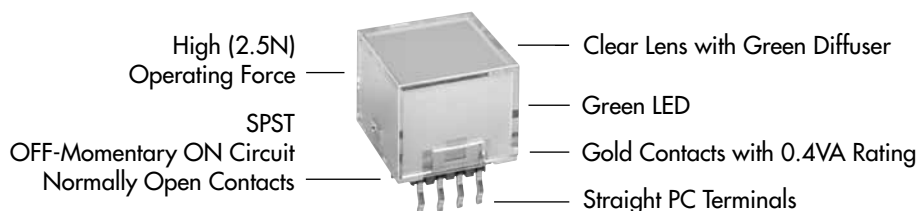
Supplement

### TYPICAL SWITCH ORDERING EXAMPLE



### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE





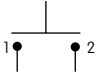
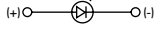
#### NP0115HG03LF-JF








Toggles  
 Rockers  
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 Illuminated PB  
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 Supplement

## POLE & CIRCUIT

### Illuminated Models

| Pole | Model                      | Plunger Position<br>( ) = Momentary  |   | Connected Terminals  |  | Throw & Switch Schematic   |
|------|----------------------------|--|---|--|--|--|
|      |                            | Normal   | Down  |  |  |  |
| SP   | NP0115AG03L<br>NP0115HG03L | OFF<br> | (ON)<br> | Normally Open<br> | 1-2<br> | Notes: Switch is marked with LC1, 1, L3, L4, L1, L2, 2, LC2.<br>Lamp circuit is isolated and requires an external power source.<br>  |

### Nonilluminated Models

| Pole | Model                      | Plunger Position<br>( ) = Momentary  |   | Connected Terminals  |  | Throw & Switch Schematic   |
|------|----------------------------|--|---|--|--|--|
|      |                            | Normal   | Down  |  |  |  |
| SP   | NP0115AG03N<br>NP0115HG03N | OFF<br> | (ON)<br> | Normally Open<br> | 1-2<br> | Note: Switch is marked with LC1, 1, L3, L4, L1, L2, 2, LC2.<br> |

## OPERATING FORCE

**A** Standard Nominal Operating Force  
1.5 ±0.5N  
Switch base is Black

**H** High Nominal Operating Force  
2.5 ±0.8N  
Switch base is Gray

## CONTACTS, TERMINALS, & RATING

**G03** Gold Contacts      Straight PC Terminals      0.4VA maximum @ 28V AC/DC maximum

## ILLUMINATION

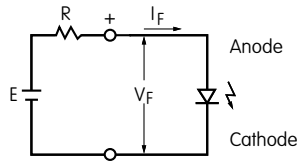
**L** Illuminated

**N** Nonilluminated

## LED COLORS & SPECIFICATIONS

LEDs are an integral part of the switch and not available separately. The electrical specifications shown are determined at a basic temperature of 25°C.

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

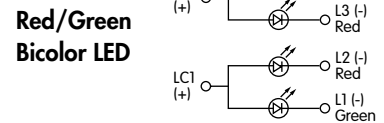
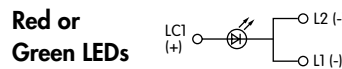
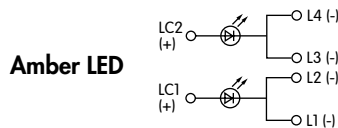


$$R = \frac{E - V_F}{I_F}$$

Where: R = Resistor Value (Ohms)  
E = Source Voltage (V)  
V<sub>F</sub> = Forward Voltage (V)  
I<sub>F</sub> = Forward Current (A)

| Single Color LED                                |   |                         |                         | Bicolor LED             |   |       |   |                         |
|---|---|-------------------------|-------------------------|-------------------------|---|-------|---|-------------------------|
| ATTENTION<br>ELECTROSTATIC<br>SENSITIVE DEVICES | Color                                   | <b>C</b><br>Red         | <b>D</b><br>Amber       | <b>F</b><br>Green       | ATTENTION<br>ELECTROSTATIC<br>SENSITIVE DEVICES | Color | <b>CF</b><br>Red                        | Green                   |
|   | Maximum Forward Current I <sub>FM</sub> |                         | 30mA                    | 30mA                    |   | 25mA  | Maximum Forward Current I <sub>FM</sub> |                         |
| Typical Forward Current I <sub>F</sub>          |   | 20mA                    | 20mA                    | 16mA                    | Typical Forward Current I <sub>F</sub>          |       | 20 (20)mA                               | 16 (5)mA                |
| Forward Voltage V <sub>F</sub>                  |   | 1.95V                   | 2.0V                    | 3.3V                    | Forward Voltage V <sub>F</sub>                  |       | 1.95V                                   | 3.3V                    |
| Maximum Reverse Voltage V <sub>RM</sub>         |   | 5V                      | 5V                      | 5V                      | Maximum Reverse Voltage V <sub>RM</sub>         |       | 5V                                      | 5V                      |
| Current Reduction Rate ΔI <sub>F</sub>          |   | 0.41mA/°C<br>above 25°C | 0.38mA/°C<br>above 25°C | 0.33mA/°C<br>above 25°C | Current Reduction Rate ΔI <sub>F</sub>          |       | 0.40mA/°C<br>above 25°C                 | 0.33mA/°C<br>above 25°C |
| Ambient Temperature Range                       |   | -25° ~ +50°C            |                         |                         | Ambient Temperature Range                       |       | -25° ~ +50°C                            |                         |

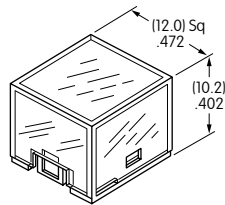
The electrical specifications shown are determined at a basic temperature of 25°C.  
Specifications in parentheses ( ) above for Bicolor LED denote simultaneous illumination of Red and Green.



## CAP TYPES & COLORS

**AT3022**  
12mm Square Cap

Material:  
Polycarbonate Resin



Cap for Single or Bicolor LED

**JB** Clear Lens/White Diffuser

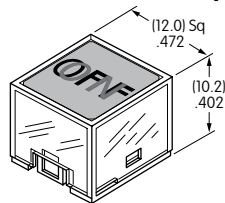
**JD** Clear Lens/Amber Diffuser

**JC** Clear Lens/Red Diffuser

**JF** Clear Lens/Green Diffuser

**AT3023**  
12mm Square Cap

Material:  
Polycarbonate Resin



Alternating Legend Cap for Bicolor LED

Clear Lens  
Alternating Legend Filter

Standard Alternating Legend Pairs

**J01**  
**ON**  
Green

**OFF**  
Red

**J02**  
**START**  
Green

**STOP**  
Red

**J04**  
**OPEN**  
Green

**CLOSE**  
Red

Cap illumination is alternating Green/Red; legend text is black.  
Contact factory for other Alternating Legends.

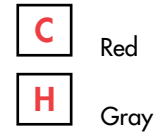
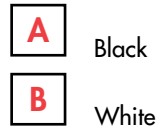
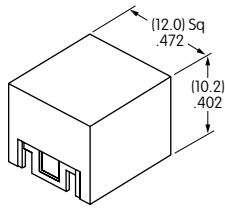
Legend illustrations are approximate representations of the actual characters on the filters.

## CAP TYPES & COLORS (CONTINUED)

### Solid Color Cap for Nonilluminated

**AT3024**  
12mm Square Cap

Material:  
Polycarbonate Resin



## TYPICAL SWITCH DIMENSIONS

### Illuminated • Straight PC



**NP0115HG03LF-JF**

## PACKAGING



### Partitioned Tray

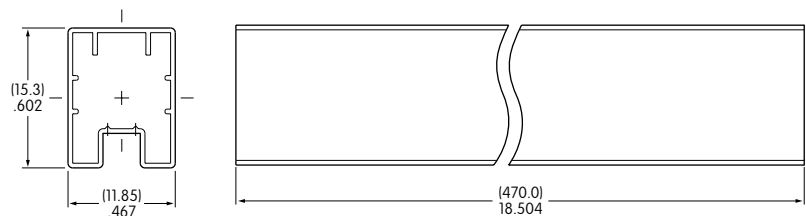
Any quantity. No code is required. Switches may be packaged with or without caps installed.



### Stick-Tube Packaging

50 pieces per stick

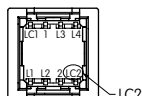
Switches must be ordered in 50-piece increments when stick-tube packaging is selected. This packaging is for the switch body only. Caps will be packaged separately.



## LEGEND ORIENTATION

Top View

Bottom View



Orient cap with legend as shown here, and "LC2" at lower right of switch body. Orders for switches with legends will be assembled as illustrated.

## PRECAUTIONS FOR HANDLING & STORAGE

- NP01 Pushbuttons are electrostatically sensitive. To prevent damage to LED, devices must be properly isolated from static electricity.
  - Once the cap is installed onto the switch body, it cannot be removed.
  - When assembling cap, align projection on switch body to slot on inside of cap. (Refer to illustration at right.)
  - \* Legends may be printed on the lens with laser etch, screen print or pad print methods. Epoxy based ink is recommended.
  - Do not use excessive force during installation on PC board or for cap installation.
- \* NKK Switches can provide custom legends for caps. Contact factory for more information.

