

# General Specifications

## Electrical Capacity (Resistive Load)

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

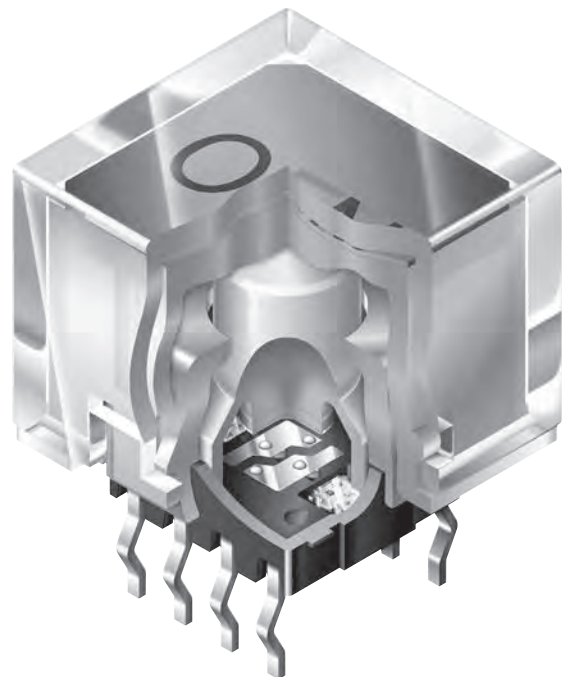
Alternating legend options with bicolor LED.

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

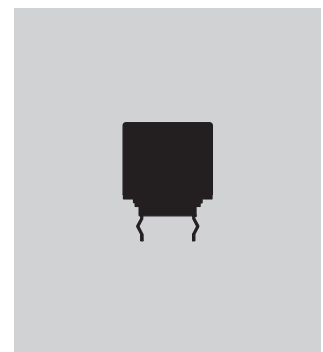
Gold plated contacts provide high reliability.

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

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



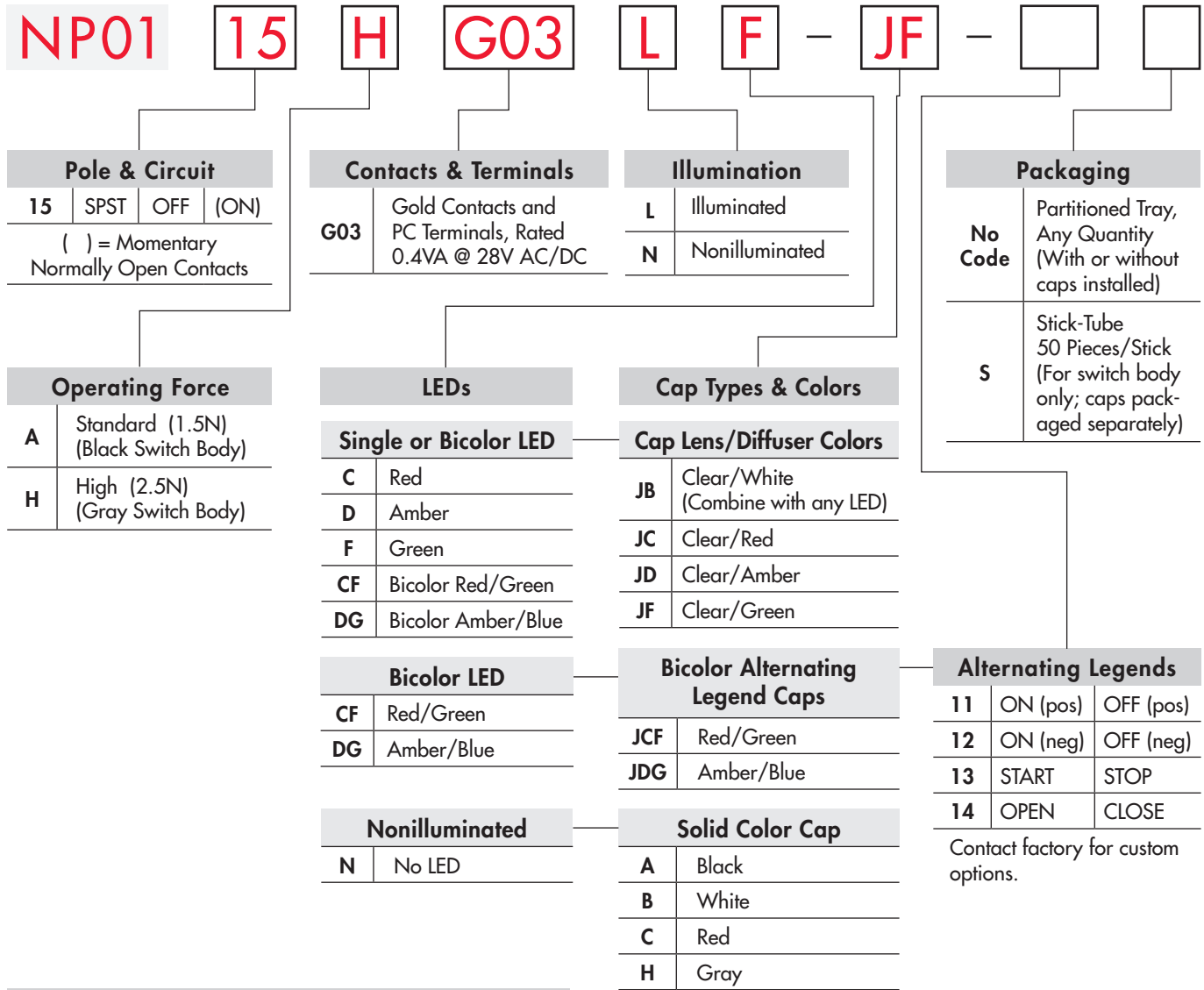
Actual Size



# Series NP01

## Subminiature Smooth Actuation Pushbuttons

### TYPICAL SWITCH ORDERING EXAMPLE

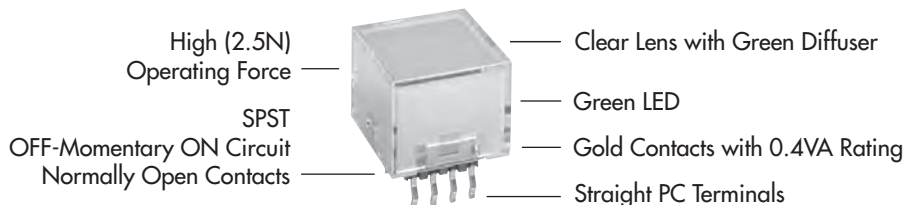


Part Numbers for Alternating Legends	
Color	Part Number
Red/Green	AT3023JCF11 ~ AT3023JCF14
Amber/Blue	AT3023JDG11 ~ AT3023JDG14

Refer to Ordering Table for Alternating Legend that corresponds with last 2 digits of part number.

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

#### NP0115HG03LF-JF



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

## POLE & CIRCUIT

### Illuminated Models

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

### Nonilluminated Models

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

## OPERATING FORCE

**A**
**Standard Nominal Operating Force**
 $1.5 \pm 0.5N$ 

Switch base is Black

**H**
**High Nominal Operating Force**
 $2.5 \pm 0.8N$ 

Switch base is Gray

## CONTACTS, TERMINALS, & RATING

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

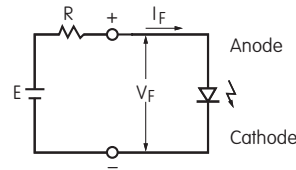
## ILLUMINATION

**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. Specifications in parentheses ( ) below for Bicolor LED denote simultaneous illumination of Red and Green.



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

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



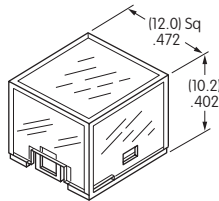
	Single Color LED			Bicolor LED			
	<b>C</b> Red	<b>D</b> Amber	<b>F</b> Green	<b>CF</b> Red Green	<b>DG</b> Amber Blue		
Maximum Forward Current I <sub>FM</sub>	30mA	30mA	25mA	30 (25)mA	25 (25)mA	30mA	30mA
Typical Forward Current I <sub>F</sub>	20mA	20mA	16mA	20 (20)mA	16 (5)mA	20mA	20mA
Forward Voltage V <sub>F</sub>	1.95V	2.0V	3.3V	1.95V	3.3V	2.0V	3.2V
Maximum Reverse Voltage V <sub>RM</sub>	5V	5V	5V	5V	5V	5V	5V
Current Reduction Rate ΔI <sub>F</sub>	0.41mA/°C above 25°C	0.38mA/°C above 25°C	0.33mA/°C above 25°C	0.40mA/°C above 25°C	0.33mA/°C above 25°C	0.40mA/°C above 25°C	0.40mA/°C above 25°C
Ambient Temperature Range	-25° ~ +50°C			-25° ~ +50°C			



### CAP TYPES & COLORS

**AT3022**  
12mm Square Cap

Material:  
Polycarbonate Resin

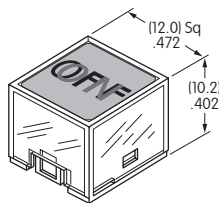


Cap for Single or Bicolor LED

- |                                     |                                     |
|-------------------------------------|-------------------------------------|
| <b>JB</b> Clear Lens/White Diffuser | <b>JD</b> Clear Lens/Amber Diffuser |
| <b>JC</b> Clear Lens/Red Diffuser   | <b>JF</b> Clear Lens/Green Diffuser |

**AT3023**  
12mm Square Cap

Material:  
Polycarbonate Resin



Alternating Legend Cap for Bicolor LED

- |                       |                           |
|-----------------------|---------------------------|
| <b>JCF</b> Red/Green  | Clear Lens                |
| <b>JDG</b> Amber/Blue | Alternating Legend Filter |

Standard Alternating Legend Pairs

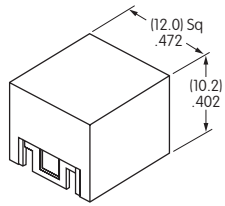


Cap illumination is alternating Green/Red or Blue/Amber; legend text is black.  
Contact factory for other Alternating Legends.  
Legend illustrations are approximate representations of the actual characters on the filters.

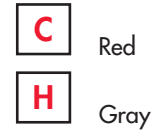
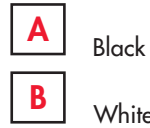
## CAP TYPES & COLORS (CONTINUED)

**AT3024**  
12mm Square Cap

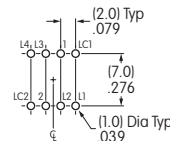
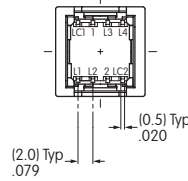
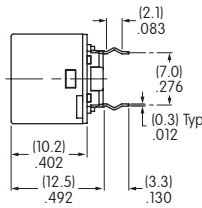
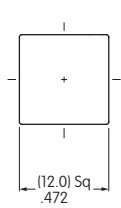
Material:  
Polycarbonate Resin



Solid Color Cap for Nonilluminated



## TYPICAL SWITCH DIMENSIONS



Illuminated • Straight PC



**NP0115HG03LF-JF**

## PACKAGING

**No Code**

**Partitioned Tray**

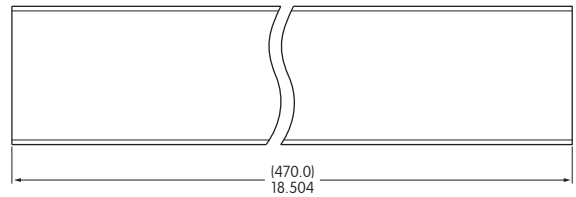
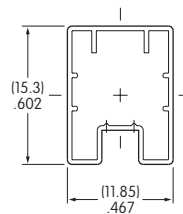
Any quantity. No code is required. Switches may be packaged with or without caps installed.

**S**

**Stick-Tube Packaging**

50 pieces per stick

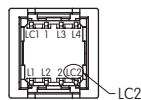
Switches must be ordered in 50-piece increments when stick-tube packaging is selected. This packaging is for the switch body only. Caps will be packaged separately.



## 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.

