

NEW PRODUCTS

Contact No. 149

NP01 Pushbuttons

Rubber Contact Structure

Long, Distinctive Stroke

Super Bright Single or Bicolor LEDs

Alternating Legends Options

High or Standard Operating Force

Available September 30, 2008



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:** 1.5 ±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: **Illuminated:** -25°C through +50°C (-13°F through +122°F)
Nonilluminated: -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: 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.

Distinctive Characteristics

Distinctive, long stroke achieved by rubber contact structure (patent pending).

Wide selection of illumination effects achieved with single or bicolor LEDs.

Alternating legend options (patent pending) with super bright bicolor LEDs.

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

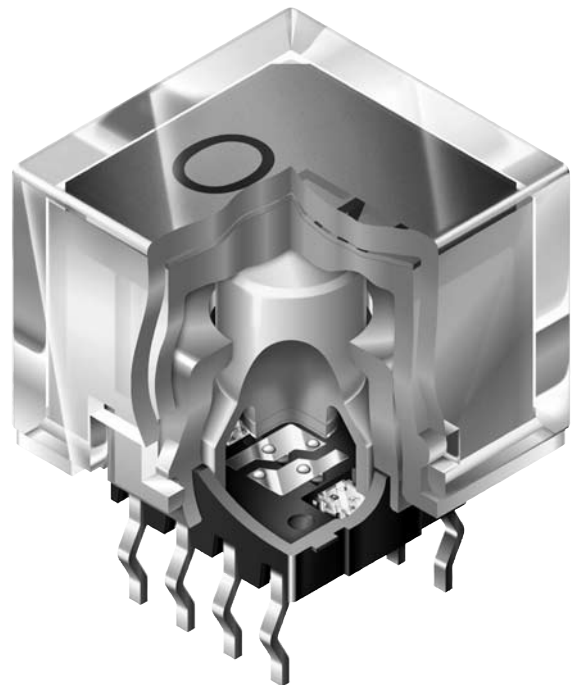
Compact design with height of 12.5mm from PC board to top of cap.

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.

Nonilluminated and illuminated models available.

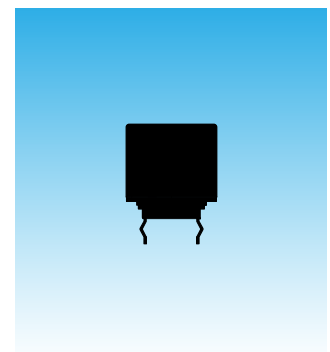


APPLICATIONS

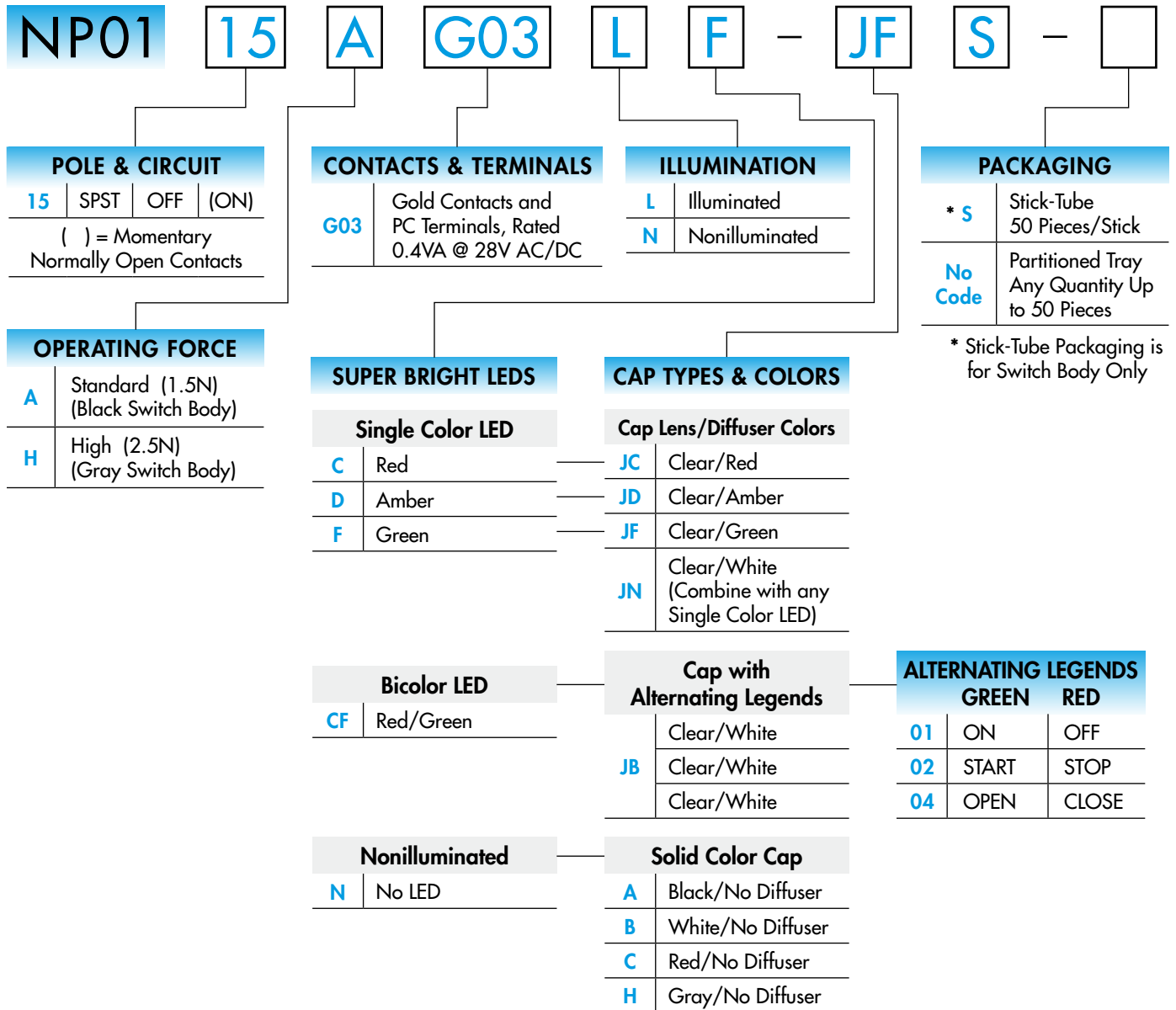
The NP01 Pushbuttons complement multiple applications, including:

- Communication equipment
- Radio applied devices
- Broadcast & audio equipment
- Electronic measurement equipment
- Control boards
- Amusement equipment
- OA.FA. equipment
- Operation panels

Actual Size



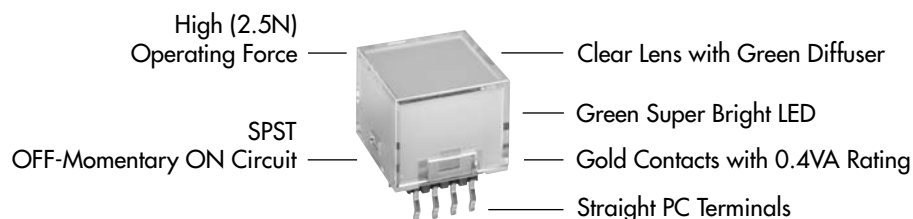
TYPICAL SWITCH ORDERING EXAMPLE



* Stick-Tube Packaging is for Switch Body Only

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

NP01 15HG03LF-JFS



POLE & CIRCUIT

Nonilluminated Models

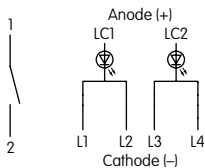
		Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematic
Pole	Model	Normal 	Down 			Note: Terminal numbers are on the switch.
SP	NP0115AG03N NP0115HG03N	OFF 	(ON) 	Normally Open 	1-2 	SPST

Illuminated Models

		Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematic
Pole	Model	Normal 	Down 			Note: Terminal numbers are on the switch.
SP	NP0115AG03L NP0115HG03L	OFF 	(ON) 	Normally Open 	1-2 	SPST

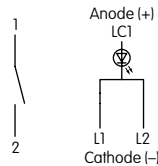
Yellow LED

Standard or High Operating Force



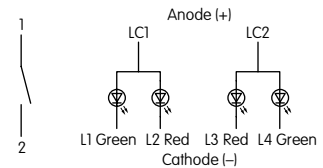
Red or Green LEDs

Standard or High Operating Force



Red/Green Bicolor LED

Standard or High Operating Force



OPERATING FORCE

A

Standard Nominal Operating Force

1.5 ±0.5N

Color of switch base is Black

H

High Nominal Operating Force

2.5 ±0.8N

Color of switch base is Gray

CONTACTS, TERMINALS, & RATING

G03

Gold Contacts

Straight PC Terminals

0.4VA maximum @ 28V AC/DC maximum

ILLUMINATION

L

Illuminated

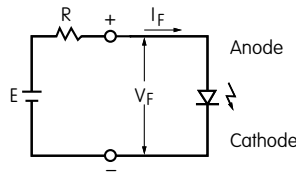
N

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 rated voltage, a ballast resistor is required.



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

Where: R = Resistor Value (Ohms)
 E = Source Voltage (V)
 V_F = Forward Voltage (V)
 I_F = Forward Current (A)

Single Color LED

Super Bright LED		C	D	F
Color		Red	Amber	Green
Forward Peak Current	I _{FM}	50mA	50mA	30mA
Continuous Forw'd Current	I _F	20mA	20mA	20mA
Forward Voltage	V _F	2.0V	2.1V	3.5V
Reverse Peak Voltage	V _{RM}	5V	5V	5V
Current Reduction Rate	ΔI _F	0.88mA/°C above 40°C	0.88mA/°C above 90°C	0.48mA/°C above 30°C
Ambient Temperature Range		-25° ~ +50°C		

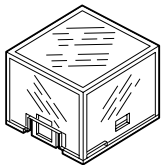
Bicolor LED

Super Bright LED		CF	
Color		Red	Green
Forward Peak Current	I _{FM}	50mA	30mA
Continuous Forw'd Current	I _F	20mA	20mA
Forward Voltage	V _F	2.0V	3.5V
Reverse Peak Voltage	V _{RM}	5V	5V
Current Reduction Rate	ΔI _F	0.88mA/°C above 40°C	0.48mA/°C above 30°C
Ambient Temperature Range		-25° ~ +50°C	

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

CAP TYPES & COLORS

Cap for Super Bright Single or Bicolor LED



AT3022
12mm Square Cap

Material:
Polycarbonate Resin



Clear Lens/Red Diffuser



Clear Lens/Green Diffuser

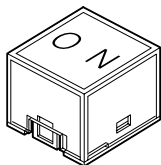


Clear Lens/Amber Diffuser



Clear Lens/White Diffuser

Alternating Legend Cap for Super Bright Bicolor LED



AT3023
12mm Square Cap

Material:
Polycarbonate Resin

Clear Lens
Alternating Legend Filter

Standard Alternating Legend Pairs



Green



Red



Green



Red



Green

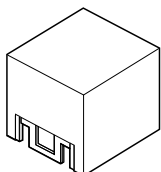


Red

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.

Solid Color Cap for Nonilluminated



AT3024
12mm Square Cap

Material:
Polycarbonate Resin



Black



White



Red

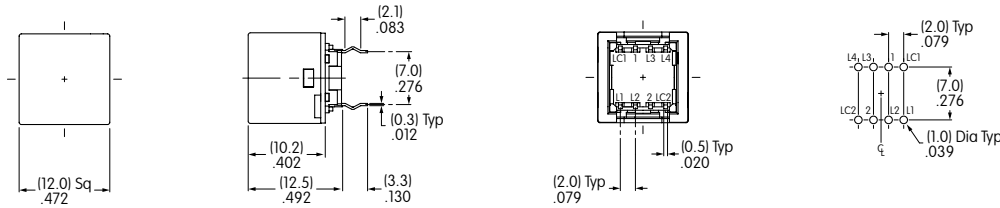


Gray

Caps for Nonilluminated do not have a Diffuser.

TYPICAL SWITCH DIMENSIONS

Super Bright LED Straight PC



NP0115HG03LF-JF

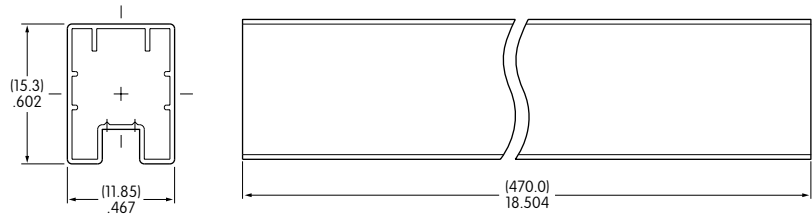
PACKAGING



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.



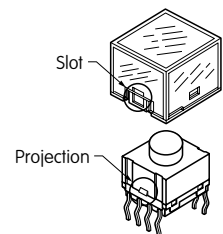
Partitioned Tray

Any quantity

If the NP01 models are ordered in less than 50-piece increments, the switches are packaged in a partitioned tray. No code is required.

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 of switch body to slot on inside of cap. (Refer to illustration at right.)
- NP01 Pushbuttons are not process sealed.
- Use an alcohol-based solvent for cleaning flux from board surface after soldering.
- Legends may be printed on the lens with laser etch, screen print or pad print methods. Epoxy based ink is recommended.
- Terminals are crimped to prohibit dislodging while soldering. Do not exceed recommended specifications for soldering to prevent entry of flux during installation.
- Do not use excessive force during installation on PC board or for cap installation.





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