

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 \pm 0.5N
High: 2.5N \pm 0.8N
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/s²) 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.

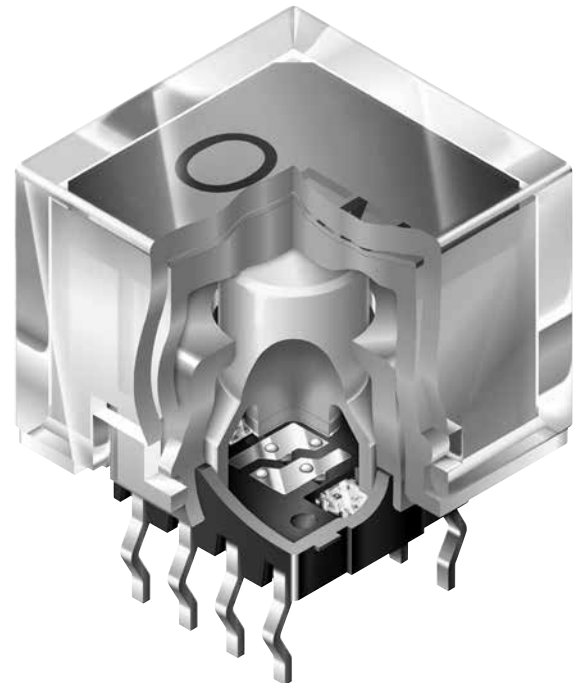
Alternating legend options with bicolor LED.

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

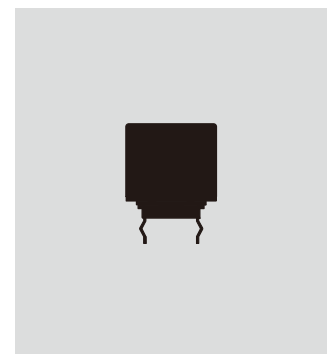
Gold plated contacts provide high reliability.

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

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



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

NP01 15 H G03 L F - JF -

Pole & Circuit			
15	SPST	OFF	(ON)
() = Momentary Normally Open Contacts			

Contacts & Terminals	
G03	Gold Contacts and PC Terminals, Rated 0.4VA @ 28V AC/DC

Illumination	
L	Illuminated
N	Nonilluminated

Packaging	
No Code	Partitioned Tray, Any Quantity (With or without caps installed)
S	Stick-Tube 50 Pieces/Stick (For switch body only; caps packaged separately)

Operating Force	
A	Standard (1.5N) (Black Switch Body)
H	High (2.5N) (Gray Switch Body)

LEDs	
Single or Bicolor LED	
C	Red
D	Amber
F	Green
CF	Bicolor Red/Green
DG	Bicolor Amber/Blue

Cap Types & Colors	
Cap Lens/Diffuser Colors	
JB	Clear/White (Combine with any LED)
JC	Clear/Red
JD	Clear/Amber
JF	Clear/Green

Bicolor LED	
CF	Red/Green
DG	Amber/Blue

Bicolor Alternating Legend Caps	
JCF	Red/Green
JDG	Amber/Blue

Alternating Legends		
11	ON (pos)	OFF (pos)
12	ON (neg)	OFF (neg)
13	START	STOP
14	OPEN	CLOSE

Nonilluminated	
N	No LED

Solid Color Cap	
A	Black
B	White
C	Red
H	Gray

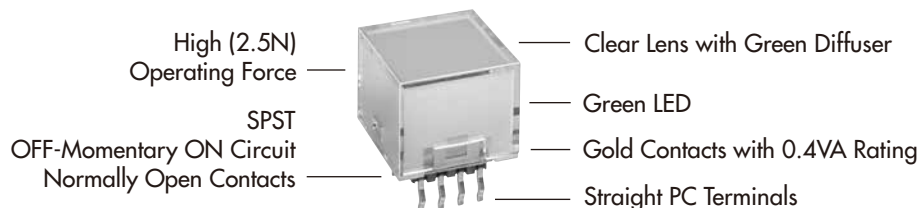
Contact factory for custom options.

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



POLE & CIRCUIT

Illuminated Models

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

Nonilluminated Models

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

OPERATING FORCE

A
Standard Nominal Operating Force
 $1.5 \pm 0.5\text{N}$

Switch base is Black

H
High Nominal Operating Force
 $2.5 \pm 0.8\text{N}$

Switch base is Gray

CONTACTS, TERMINALS, & RATING

G03

Gold Contacts

Straight PC Terminals

0.4VA maximum @ 28V AC/DC maximum

ILLUMINATION

L

Illuminated

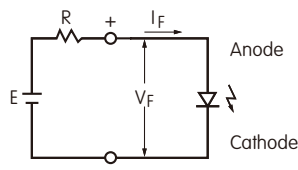
N

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.

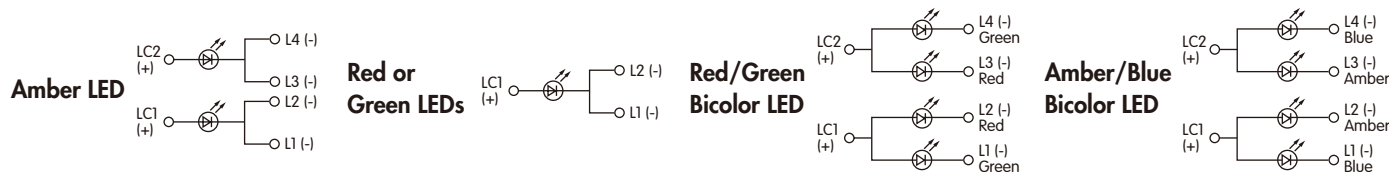


$$R = \frac{E - V_F}{I_F}$$

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

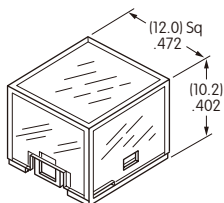


Color	Single Color LED			Bicolor LED			
	C Red	D Amber	F Green	CF Red Green		DG Amber Blue	
Maximum Forward Current I _{FM}	30mA	30mA	25mA	30 (25)mA	25 (25)mA	30mA	30mA
Typical Forward Current I _F	20mA	20mA	16mA	20 (20)mA	16 (5)mA	20mA	20mA
Forward Voltage V _F	1.95V	2.0V	3.3V	1.95V	3.3V	2.0V	3.2V
Maximum Reverse Voltage V _{RM}	5V	5V	5V	5V	5V	5V	5V
Current Reduction Rate ΔI _F	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

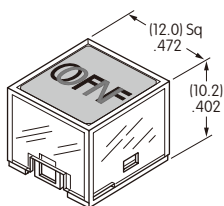


Material:
Polycarbonate Resin

Cap for Single or Bicolor LED

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

AT3023
12mm Square Cap

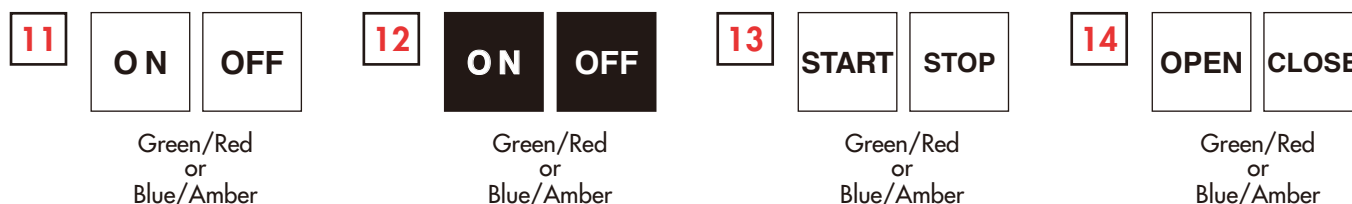


Material:
Polycarbonate Resin

Alternating Legend Cap for Bicolor LED

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

Standard Alternating Legend Pairs



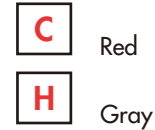
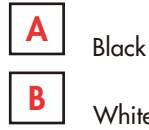
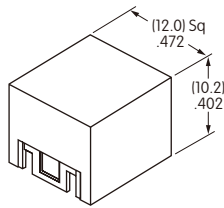
Cap illumination is alternating Green/Red or Blue/Amber; legend text is black.
 Contact factory for other Alternating Legends.
 Legend illustrations are approximate representations of the actual characters on the filters.

CAP TYPES & COLORS (CONTINUED)

Solid Color Cap for Nonilluminated

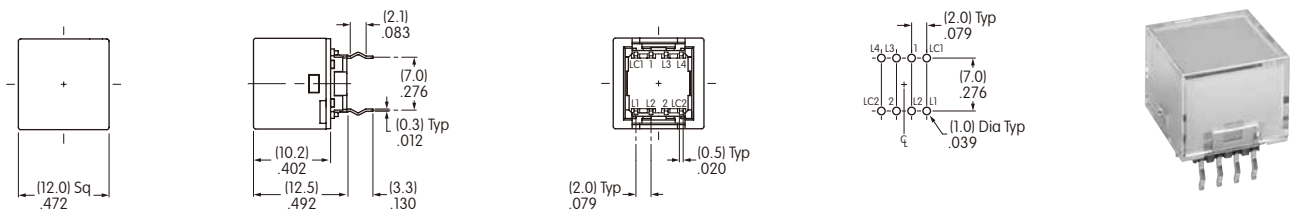
AT3024
12mm Square Cap

Material:
Polycarbonate Resin



TYPICAL SWITCH DIMENSIONS

Illuminated • Straight PC



NP01 15HG03LF-JF

PACKAGING

No Code

Partitioned Tray

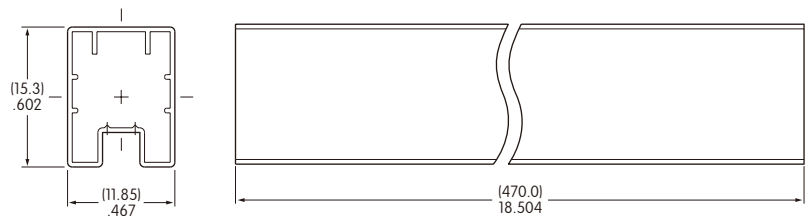
Any quantity. No code is required. Switches may be packaged with or without caps installed.

S

Stick-Tube Packaging

50 pieces per stick

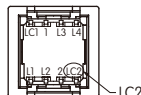
Switches must be ordered in 50-piece increments when stick-tube packaging is selected. This packaging is for the switch body only. Caps will be packaged separately.



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.

