General Specifications

Electrical Capacity (Resistive Load)
Logic Level: 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)
Note: Find additional explanation of operating range in Supplement section.

Other Ratings
Contact Resistance: 50 milliohms maximum
Insulation Resistance: 500 megohms minimum @ 500V DC
Dielectric Strength: 500V AC minimum between contacts for 1 minute minimum;
500V AC minimum between contacts & case for 1 minute minimum
Mechanical Life: 100,000 operations minimum for On-None-On & On-Off-On
50,000 operations minimum for other circuits
Electrical Life: 50,000 operations minimum
Nominal Operating Force: 1.47N (momentary); 1.18N (maintained) for .394” (10.0mm) toggles
2.73N (momentary); 1.84N (maintained) for all other toggles
Contact Timing: Nonshorting (break-before-make)
Angle of Throw: 26°

Materials & Finishes
Toggle: Glass fiber reinforced polyamide for antistatic; nickel plated brass for all others
Case Housing: Glass fiber reinforced polyamide
Support Bracket: Tin plated phosphor bronze
Movable Contact: Phosphor bronze with gold plating
Stationary Contacts: Brass with gold plating
Terminals: Brass with gold plating

Environmental Data
Operating Temperature Range: −30°C through +85°C (−22°F through +185°F)
Humidity: 90 ~ 95% humidity for 240 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 Recommended. See Profile A in Supplement section.

Standards & Certifications
The A Series toggles 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

Subminiature size saves space on PC boards.

Specifically developed for logic-level applications.

Totally sealed body construction prevents contact contamination and allows time- and money-saving automated soldering and cleaning.

Award-winning STC contact mechanism with benefits unavailable in conventional mechanisms: smoother, positive detent actuation, increased contact stability and unparalleled logic-level reliability. (Additional STC details in Terms & Acronyms; see Supplement contents.)

Molded-in, epoxy sealed or ultrasonically welded terminals lock out flux, solvents, and other contaminants.

.100” x .100” (2.54mm x 2.54mm) terminal spacing conforms to standard PC board grid spacing.

Toggle option in antistatic material available for dissipating electrostatic discharges.

Matching indicators available.
### TYPICAL SWITCH ORDERING EXAMPLE

<table>
<thead>
<tr>
<th>Poles</th>
<th>Toggles</th>
<th>Optional Caps</th>
<th>Paddles</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 SPST</td>
<td>A .394&quot; (10.0mm) Bat</td>
<td>G .394&quot; (10.0mm) Bat Lever Cap</td>
<td>A Short Paddle for K Toggle</td>
</tr>
<tr>
<td>2 DPDT</td>
<td>J .248&quot; (6.3mm) Bat</td>
<td>J .248&quot; (6.3mm) Bat Lever Cap</td>
<td>B Long Paddle for K Toggle</td>
</tr>
<tr>
<td></td>
<td>J2 .248&quot; (6.3mm) Antistatic Bat</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>E .394&quot; (10.0mm) Flatted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>H .248&quot; (6.3mm) Flatted</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>K Snap Top for A or B Paddle</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Toggles

**A** .394" (10.0mm) Bat

**J** .248" (6.3mm) Bat

**J2** .248" (6.3mm) Antistatic Bat

**E** .394" (10.0mm) Flatted

**H** .248" (6.3mm) Flatted

**K** Snap Top for A or B Paddle

#### Optional Caps

**G** .394" (10.0mm) Bat Lever Cap

**J** .248" (6.3mm) Bat Lever Cap

#### Paddles

**A** Short Paddle for K Toggle

**B** Long Paddle for K Toggle

#### Circuits

1 OFF NONE ON

2 ON NONE ON

3 ON OFF ON

5 ON NONE (ON)

R (ON) NONE ON

8 (ON) OFF (ON)

9 ON OFF (ON)

5 (ON) OFF ON

*4 ON ON ON

*6 (ON) ON (ON)

*7 ON ON (ON)

( ) = Momentary

*3-ON circuits

#### PC Terminals

**P** Straight

**B** Straight with Bracket

**B1** Straight with Inline Bracket (Single Pole only)

**H** Right Angle with Bracket

**V** Vertical with Bracket

**V1** Vertical with Inline Bracket (Single Pole only)

#### Cap Colors

- **A** Black
- **B** White
- **C** Red
- **---** Yellow
- **---** Green
- **---** Blue
- **---** Gray

#### Paddle Colors

- **A**
- **B**
- **C**
- **---**
- **---**
- **---**

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**A12JV**

.248" (6.3mm) Long Bat Toggle

SPDT ON-NONE-ON Circuit

Vertical PC Terminals
### POLES & CIRCUITS

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Up</th>
<th>Center</th>
<th>Down</th>
<th>Up</th>
<th>Center</th>
<th>Down</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>A11</td>
<td>OFF</td>
<td>NONE</td>
<td>ON</td>
<td>OPEN</td>
<td>OPEN</td>
<td>3-1</td>
</tr>
<tr>
<td></td>
<td>A12</td>
<td>ON</td>
<td>NONE</td>
<td>ON</td>
<td>2-3</td>
<td>OPEN</td>
<td>2-1</td>
</tr>
<tr>
<td></td>
<td>A13</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A15</td>
<td>ON</td>
<td>NONE</td>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A1R</td>
<td>(ON)</td>
<td>NONE</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A18</td>
<td>ON</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A19</td>
<td>ON</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A1S</td>
<td>(ON)</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DP</td>
<td>A22</td>
<td>ON</td>
<td>NONE</td>
<td>ON</td>
<td>2-3</td>
<td>5-6</td>
<td>2-1</td>
</tr>
<tr>
<td></td>
<td>A23</td>
<td>ON</td>
<td>OFF</td>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A25</td>
<td>ON</td>
<td>NONE</td>
<td>ON</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A2R</td>
<td>(ON)</td>
<td>NONE</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A28</td>
<td>ON</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A29</td>
<td>ON</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>A2S</td>
<td>(ON)</td>
<td>OFF</td>
<td>(ON)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**For 3 Throw (3-on)**

<table>
<thead>
<tr>
<th>Pole</th>
<th>Model</th>
<th>Up</th>
<th>Center</th>
<th>Down</th>
<th>Connected Terminals &amp; Schematics</th>
<th>External Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP</td>
<td>A24</td>
<td>ON</td>
<td>(ON)</td>
<td>ON</td>
<td>2-3 5-6</td>
<td>The SP3T model utilizes a double pole base.</td>
</tr>
<tr>
<td></td>
<td>A26</td>
<td>ON</td>
<td>(ON)</td>
<td>ON</td>
<td>2-3 5-4</td>
<td>External connections must be made during field installation.</td>
</tr>
<tr>
<td></td>
<td>A27</td>
<td>ON</td>
<td>(ON)</td>
<td>ON</td>
<td>2-1 5-4</td>
<td></td>
</tr>
</tbody>
</table>

### TOGGLES

**Standard Material & Finish:** Brass with Bright Nickel  
**Material & Finish for J2:** Matte finish black glass fiber reinforced polyamide

- **A** .394” (10.0mm) Bat
- **J** .248” (6.3mm) Bat
- **J2** .248” (6.3mm) Antistatic Bat

* Dissipating 20Kv ESD: Straight PC  
* Dissipating 10Kv ESD: Straight PC with Bracket, Right Angle, & Vertical

- **E** .394” (10.0mm) Flatted  
- **H** .248” (6.3mm) Flatted  
- **K** Snap Top for Paddles

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Series A
Process Sealed Subminiature Toggles

PC TERMINALS

Use of a support bracket is recommended to increase PCB mounting strength and stability.

A11 models do not have Terminal 2.

P  Straight

B  Straight with Bracket

B1  Straight with Inline Bracket
Single Pole only

H  Right Angle with Bracket

V  Vertical with Bracket

V1  Vertical with Inline Bracket
Single Pole only

CAPS & PADDLES

G  AT4003
.394” (10.0mm) Bat Lever Cap

Material: PVC
Colors Available:
A, B, C

J  AT4064
.248” (6.3mm) Bat Lever Cap

Material: PVC
Colors Available:
A, B, C

A  AT467
Short Paddle

Material: Polyamide
Colors Available:
A, B, C, E, F, G, H

B  AT468
Long Paddle

Material: Polyamide
Colors Available:
A, B, C, E, F, G, H

Color Codes:
A  Black  B  White  C  Red
E  Yellow  F  Green  G  Blue  H  Gray

www.nkkswitches.com
Process Sealed Subminiature Toggles

Series A

TYPICAL SWITCH DIMENSIONS

Single Pole

Straight PC

Double Pole

Straight PC

A11 models do not have Terminal 2

A12AP

A22AP

Single Pole

Straight PC • Bracket

B Terminals

B1 Terminals

A12AB

Double Pole

Straight PC • Bracket

A22AB

www.nkkswitches.com
TYPICAL SWITCH DIMENSIONS

Right Angle PC

Single Pole

A12AH

Right Angle PC

Double Pole

A22AH

Vertical PC

Single Pole

A12AV

Vertical PC

Double Pole

A22AV