BIWIN Technologies, targeting on building “win-win” partnership with our customers and suppliers, has been dedicated to the electromechanical switch field since our foundation in 1986. Specializing in designing and manufacturing dip switches, rotary switches, pushbutton switches, etc., we have our own brand “Sab” with the goal to be a Specialist in creating Advantages in our reliable products and services in order to bring Benefits to our worldwide customers and the industry.

百盈科技的英文名 BIWIN，取自於 win-win，也就是雙贏之意。我們自1986年成立以來，致力於與顧客及供應商建立起雙贏的夥伴關係，並專注投身於電子開關的領域中，我們自主設計並製造如指撥（程式）開關、旋轉開關、按鈕開關等產品，並擁有自己的品牌「Sab」，期許成為開關領域的專家（Specialist），於我們可靠的产品與服務中創造優勢（Advantages），以提供利益（Benefits）予我們遍布全世界的客戶與整個開關產業。

BIWIN TECHNOLOGIES CO., LTD.
百盈科技股份有限公司
NO. 5., ALLEY 9. LANE 33-1, RENHE STREET,
TAIPING, TAICHUNG 41172, TAIWAN
TEL: 886-4-22700988
FAX: 886-4-22701989
E-Mail: sales@biwin.com
Website: www.sab-switch.com / www.biwin.com
**R9 Series — Rotary Coded Switch**

### Features
- Sealed Construction, No Tape Seal Required
- Surface Mount, Thru-Hole and Right Angle 2.54 & 5.08mm
- Octal, Decimal and Hexadecimal Code in Real or Complement
- Gold-Plated Contacts
- Flush or Extended Rotors
- Knobs available
- Washable meet IP67

### Specifications
- **Contact Rating**
  - Switching: 5VDC 20mA (Min. AC/DC 20mA 1μA)
  - Non Switching: Max. 50VDC 100mA
- **Contact Resistance**
  - Min. 100mΩ Max.
- **Insulation Resistance**
  - 1,000MΩ Min. at 100VDC
- **Dielectric Strength**
  - 250VAC for 1 minute
- **Operating Force**
  - 400gf/cm Max. (Standard)
  - 200gf/cm Max. (N type)
- **Life**
  - 20,000 Steps
- **Operating Temperature**
  - -40°C → +85°C
- **Storage Temperature**
  - -40°C →+85°C
- **Hand Soldering**
  - 350°C 3 Sec. max.
- **Wave Soldering**
  - 260±5°C for 10 sec. max.
- **Rework Soldering**
  - Peak temp.: 245°C max. The time above 240 must be 30 sec. max.

### Code Format

<table>
<thead>
<tr>
<th>No.of positions</th>
<th>(10 positions)</th>
<th>(16 positions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>0 1 2 3 4 5 6 7 8 9</td>
<td>A B C D E F</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Code</th>
<th>8</th>
<th>4</th>
<th>2</th>
<th>1</th>
<th>5</th>
<th>4</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real code</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
<td>●</td>
</tr>
<tr>
<td>Complementary</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Special Code</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pin Out</td>
<td>2-3+2pin</td>
<td>3-3+3pin</td>
<td>4-4+1pin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Position

<table>
<thead>
<tr>
<th>R9/93</th>
<th>R94</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

### Order Information

<table>
<thead>
<tr>
<th>R99-10<em>10mm (9.9</em>9.9mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact area with Gold-plated Terminal with Tin-plated</td>
</tr>
</tbody>
</table>

### Knob Order Information

**KR1**

<table>
<thead>
<tr>
<th>Knob Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>00: Blue</td>
</tr>
<tr>
<td>02: Green</td>
</tr>
<tr>
<td>03: Light Grey</td>
</tr>
<tr>
<td>04: Yellow</td>
</tr>
<tr>
<td>05: Dark Grey</td>
</tr>
<tr>
<td>06: White</td>
</tr>
<tr>
<td>08: Red</td>
</tr>
<tr>
<td>09: Black</td>
</tr>
</tbody>
</table>


BIWIN / Sab*

RoHS Compliant

R9 Series — Rotary Coded Switch

Rotor

<table>
<thead>
<tr>
<th>Flat</th>
<th>0.5mm</th>
<th>0.6mm</th>
<th>2.3mm</th>
<th>3mm</th>
<th>7mm</th>
</tr>
</thead>
</table>

**R9 - H/D (Thru-Hole)**

*A type rotor

*D type terminal

**R9 - S (SMD)**

*A type rotor

**R9 - V (Right Angle 2.54mm)**

**R9 - Y (Right Angle 5.08mm)**


Features

- Washable Meet IP67
- Gold plated contacts
- Surface Mount, Thru-Hole and Right Angle
- Flush or Extended Rotors
- Knobs available

Standard Specifications:

Operating temperature range: -40°C ~ +85°C
Storage temperature range: -25°C ~ +70°C
Sealing: Washable "O" ring
Mechanical Life: 20,000 Steps

Electrical Characteristics

Contact rating:
- Non-switching: DC 50V, 100mA
- Switching: DC 5V, 100mA
- Minimum: DC 20mV, 1μA
Contact timing:
- Non-shorting
Contact resistance (Initial/after operating life):
- 60mΩ/100mΩ
Insulation resistance:
- 100MΩ (DC 100V) Max.
Dielectric strength:
- 300VAC/ 1 minute

Soldering Information:

Wave soldering: 260±5°C for 5 sec. max.
Reflow soldering: Peak temp. 245°C max. The time above 240 must be 30 sec. max.
Hand soldering: 350°C 3 Sec. max.

Order Information

RS8 06 7 H R U

Function Code

- 03 13 20
- 04 14 23
- 05 15
- 06 16
- 07 17

Rotor Style

- 0=Flat (Arrow)
- 1=0.5mm (Minus Slot)
- 3=3mm (Minus Slot)
- 7=7mm (Minus Slot)

Terminal Style

- H=Thru-hole
- S=SMD
- T=Thru-hole Refelow
- Y=Right Angle 5.08mm (C vs Pin 1)
- YC=Right Angle 5.08mm (C vs Pin 2)

Package

- None=Tube
- R=Tape & Reel
- U=Halogen

Rotor Style

- Flat
- 0.5mm
- 3mm
- 7mm
**RoHS Compliant**

**RS8 Series — Rotary Selector Switch**

### Schematic & Terminal Connection

![Schematic Diagram]

### Package

<table>
<thead>
<tr>
<th>P/N</th>
<th>Function Code</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS8_H/T</td>
<td>03,04,05,06,07</td>
<td>50</td>
</tr>
<tr>
<td>RS8_H/T</td>
<td>13,14,15,16,17</td>
<td>50</td>
</tr>
<tr>
<td>RS8_H/T</td>
<td>20,23</td>
<td>50</td>
</tr>
<tr>
<td>RS8_S</td>
<td>03,04,05,06,07</td>
<td>50</td>
</tr>
<tr>
<td>RS8_S</td>
<td>13,14,15,16,17</td>
<td>50</td>
</tr>
<tr>
<td>RS8_S</td>
<td>20,23</td>
<td>50</td>
</tr>
<tr>
<td>RS8_Y</td>
<td>03,04,05,06,07</td>
<td>45</td>
</tr>
<tr>
<td>RS8_Y</td>
<td>13,14,15,16,17</td>
<td>45</td>
</tr>
<tr>
<td>RS8_Y</td>
<td>20,23</td>
<td>45</td>
</tr>
</tbody>
</table>

### Knob Order Information

<table>
<thead>
<tr>
<th>Knob Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00 : Blue</td>
<td>KR1</td>
</tr>
<tr>
<td>02 : Green</td>
<td>KR2</td>
</tr>
<tr>
<td>03 : Light Grey</td>
<td>KR3</td>
</tr>
<tr>
<td>04 : Yellow</td>
<td></td>
</tr>
<tr>
<td>05 : Dark Grey</td>
<td></td>
</tr>
<tr>
<td>08 : Red</td>
<td></td>
</tr>
<tr>
<td>09 : Black</td>
<td></td>
</tr>
</tbody>
</table>

### Dummy Terminals

<table>
<thead>
<tr>
<th>Positions</th>
<th>Terminals</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>④ ⑤ ⑥ ⑦</td>
</tr>
<tr>
<td>4</td>
<td>⑤ ⑥ ⑦</td>
</tr>
<tr>
<td>5</td>
<td>⑥ ⑦</td>
</tr>
<tr>
<td>6</td>
<td>⑦</td>
</tr>
<tr>
<td>7</td>
<td>--</td>
</tr>
</tbody>
</table>

* NC= Dummy terminal
BIWIN / Sab
RS8 Series — Rotary Selector Switch

RoHS Compliant

Outline Dimensions

Thru-Hole
RS8070H
RS8170H

SMD
RS8070S
RS8170S

Right Angle 5.08mm(C vs Pin 1)
RS8070Y
RS8170Y

Right Angle 5.08mm(C vs Pin 2)
RS8040YC
RS8140YC

DRILLING PLAN
SMD SOLDERING PAD
BIWIN / Sab®
SOJ/P/F Series—Half Pitch DIP Switch

Features
- Half Pitch (0.05 inch / 1.27mm) terminal
- Standard gold-plated electrical contacts
- Tape sealed version available to ensure washability
- Singular pole: 1, 3 and 5 available
- Gull Wing Lead, J Lead and Flat Lead

SOJ (J Lead)

SOP (Gull Wing Lead)

SOF (Flat Lead)

Specifications
- Contact Rating
  - Switching: 25mA, 24VDC
  - Non-Switching: 100mA, 50VDC
- Contact Resistance
  - Initial: 50mΩ Max.
  - After Life Test: 100mΩ Max.
- Insulation Resistance: 100MΩ min at 500VDC
- Dielectric Strength: 300VAC / 1 minute
- Operating Force: 500g Max.
- Mechanical Life: 2,000 cycles
- Electrical Life: 1,000 cycles

Materials
- Cove & Base: Thermoplastic 94V-0, Black
- Actuator: Thermoplastic UL 94-HB, White
- Movable Contact: Copper Alloy, Gold or Pure-Tin-plated
- Terminal Contact & Terminal: Copper Alloy, Gold or Pure-Tin-Plated
- Tape Sealed: Polyimide Film

Wiring Diagram

Order Information

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOP01</td>
<td>1</td>
<td>2.31mm</td>
<td>93 ( Half )</td>
</tr>
<tr>
<td>SOP02</td>
<td>2</td>
<td>3.58mm</td>
<td>125</td>
</tr>
<tr>
<td>SOP03</td>
<td>3</td>
<td>4.85mm</td>
<td>90</td>
</tr>
<tr>
<td>SOP04</td>
<td>4</td>
<td>6.12mm</td>
<td>70</td>
</tr>
<tr>
<td>SOP05</td>
<td>5</td>
<td>7.39mm</td>
<td>60</td>
</tr>
<tr>
<td>SOP06</td>
<td>6</td>
<td>8.66mm</td>
<td>50</td>
</tr>
<tr>
<td>SOP08</td>
<td>8</td>
<td>11.20mm</td>
<td>40</td>
</tr>
<tr>
<td>SOP10</td>
<td>10</td>
<td>13.74mm</td>
<td>30</td>
</tr>
<tr>
<td>SOP12</td>
<td>12</td>
<td>16.28mm</td>
<td>25</td>
</tr>
</tbody>
</table>

Order Information

<table>
<thead>
<tr>
<th>Terminal:</th>
<th>P</th>
<th>08</th>
<th>L</th>
<th>E</th>
<th>R</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>J=J Lead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>P=Gull Wing Lead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F=Flat Lead</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positions:</td>
<td>06-6 Position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tape Sealed</td>
<td>None=Tape Sealed</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>L=No Tape Sealed</td>
<td>None=Flat</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&quot;L type: un-washable&quot;</td>
<td>E=Tin Plated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finished:</td>
<td>None=Gold Plated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Package</td>
<td>None=Tube</td>
<td>No=Rape &amp; Reel</td>
<td>None=Satin</td>
<td>U=Halogen Free</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Soldering Information
- Hand Soldering
- Soldering iron of 30W or under at 300°C for 4±1 sec. max.
- Reflow Soldering
- Peak temperature: 260°C max. The time above 255°C must be 30 sec. max.
- Keep all actuators in “OFF” position during soldering and cleaning process

Packaging Information

<table>
<thead>
<tr>
<th>Package</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tube: SOJ P/SOP</td>
<td>SOP01</td>
<td>1</td>
<td>93 ( Half )</td>
</tr>
</tbody>
</table>
**Features**
- Gold-plated contact points & double movable contacts to ensure reliability and longer life expectancy
- Unique twin suspended springs offer high resistance to physical shock & vibration
- Clear ON/OFF actuation clicks
- Insert-molding technology avoids epoxy and water from intruding

**BS/BSE**

**Specifications**
- **Contact Rating**
  - Switching: 25mA, 24VDC
  - Non-Switching: 100mA, 50VDC
- **Contact Resistance**
  - Initial: 50mΩ Max
  - After Life Test: 100mΩ Max
- **Insulation Resistance**
  - 100MΩ min at 500VDC
- **Dielectric Strength**
  - 500V/ 1 minute
- **Operating Force**
  - 1,000g Max
- **Mechanical Life**
  - 5,000 cycles
- **Electrical Life**
  - 2,000 cycles

**Soldering Information**
- **Hand Soldering**
  - Soldering iron 30W (or under) at 350°C for 3 sec. max.
- **Wave Soldering**
  - BS: 260±5°C for 10 sec. max.
  - BSE: 260±5°C for 5 sec. max.
- **Reflow Soldering**
  - Peak temperature: 245°C max. The time above 240°C must be 30 sec. max.
- **Keep all actuators in "OFF" position during soldering and cleaning process**

**Order Information**

<table>
<thead>
<tr>
<th>BS</th>
<th>M</th>
<th>2F</th>
<th>06</th>
<th>G</th>
<th>B</th>
<th>T</th>
<th>R</th>
<th>U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Box Slide Type</td>
<td>Terminal: None=Standard M=SMD</td>
<td>Contact Forms: None=Standard 2F=2PST</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BS=bottom surrounding with Epoxy sealed</td>
<td></td>
<td></td>
<td></td>
<td>Actuator: G.Raise Actuator L=Flat Actuator</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BSE=bottom surrounding without Epoxy sealed</td>
<td>Positions: 02-2 Position 06-6 Position</td>
<td>Color: B=Blue R=Red K=Black (BSM &amp; THR)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None=Standard T=Tape Sealed(L) T=Tape Sealed(G)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None=Standard U=Halogen Free</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>None=Tube R=Tape &amp; Reel(SMD)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Materials**
- Cover: Thermoplastic UL 94V-0: Blue, Red & Black
- Base: Thermoplastic UL 94-HB or UL 94V-0, Black
- Actuator: Copper Alloy, Gold-plated
- Contact: Copper Alloy, Pure-Tin-plated
- Terminal: Copper Alloy, Pure-Tin-plated
- Tape Sealed: Polyester Film

**Packaging Information**
- Tape & Reel: BSM
- Tube: BS/ BSE/ B2F
- Actuators all in "OFF" position

**Wiring Diagram**

**DRILLING PLAN**

---


Jul. 2018
RoHS Compliant

Features
◆ Twin contacts designed to ensure stable contact
◆ Highly resistant to physical shock & vibration
◆ Tape sealed version available to ensure washability
◆ Low profile to save PCB space
◆ Light click feeling
◆ Heat resistance: 260°C for 10 sec.

DIJ

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>08</td>
</tr>
<tr>
<td>IC Type</td>
<td>DI</td>
</tr>
<tr>
<td>Terminal</td>
<td>J=J Lead</td>
</tr>
<tr>
<td>S=SMO</td>
<td>A=Auto -insert</td>
</tr>
<tr>
<td>H=Straight</td>
<td></td>
</tr>
<tr>
<td>Positions</td>
<td>06-6 Position</td>
</tr>
<tr>
<td></td>
<td>08-8 Position</td>
</tr>
<tr>
<td>Actuator</td>
<td>G=Raise Actuator</td>
</tr>
<tr>
<td>L=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td>T=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G, M &amp; L types: un-washable</td>
</tr>
<tr>
<td></td>
<td>Finished: 01-1u&quot; Gold</td>
</tr>
<tr>
<td></td>
<td>03-3u&quot; Gold</td>
</tr>
<tr>
<td></td>
<td>E-Tin Plated</td>
</tr>
<tr>
<td></td>
<td>Tape Sealed</td>
</tr>
<tr>
<td></td>
<td>None-Tube</td>
</tr>
<tr>
<td></td>
<td>R-Tape &amp; Reel</td>
</tr>
</tbody>
</table>

DIS

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>P/N</td>
<td>08</td>
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<tr>
<td>IC Type</td>
<td>DI</td>
</tr>
<tr>
<td>Terminal</td>
<td>J=J Lead</td>
</tr>
<tr>
<td>S=SMO</td>
<td>A=Auto -insert</td>
</tr>
<tr>
<td>H=Straight</td>
<td></td>
</tr>
<tr>
<td>Positions</td>
<td>06-6 Position</td>
</tr>
<tr>
<td></td>
<td>08-8 Position</td>
</tr>
<tr>
<td>Actuator</td>
<td>G=Raise Actuator</td>
</tr>
<tr>
<td>L=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td>T=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G, M &amp; L types: un-washable</td>
</tr>
<tr>
<td></td>
<td>Finished: 01-1u&quot; Gold</td>
</tr>
<tr>
<td></td>
<td>03-3u&quot; Gold</td>
</tr>
<tr>
<td></td>
<td>E-Tin Plated</td>
</tr>
<tr>
<td></td>
<td>Tape Sealed</td>
</tr>
<tr>
<td></td>
<td>None-Tube</td>
</tr>
<tr>
<td></td>
<td>R-Tape &amp; Reel</td>
</tr>
</tbody>
</table>

DIA/H

<table>
<thead>
<tr>
<th>Component</th>
<th>Dimensions</th>
</tr>
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<tbody>
<tr>
<td>P/N</td>
<td>08</td>
</tr>
<tr>
<td>IC Type</td>
<td>DI</td>
</tr>
<tr>
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<td>J=J Lead</td>
</tr>
<tr>
<td>S=SMO</td>
<td>A=Auto -insert</td>
</tr>
<tr>
<td>H=Straight</td>
<td></td>
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<tr>
<td>Positions</td>
<td>06-6 Position</td>
</tr>
<tr>
<td></td>
<td>08-8 Position</td>
</tr>
<tr>
<td>Actuator</td>
<td>G=Raise Actuator</td>
</tr>
<tr>
<td>L=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td>T=Flat Actuator</td>
<td></td>
</tr>
<tr>
<td></td>
<td>G, M &amp; L types: un-washable</td>
</tr>
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<td></td>
<td>Finished: 01-1u&quot; Gold</td>
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<tr>
<td></td>
<td>03-3u&quot; Gold</td>
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<td></td>
<td>E-Tin Plated</td>
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<td></td>
<td>None-Tube</td>
</tr>
<tr>
<td></td>
<td>R-Tape &amp; Reel</td>
</tr>
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</table>

Specifications
Contact Rating
Switching 25mA, 24VDC
Non-Switching 100mA, 50VDC
Contact Resistance
Initial 50mΩ max.
After Life Test 100mΩ min at 500VDC
Dielectric Strength 500VAC/1 minute
Operating Force 1,000g Max.
Mechanical Life 5,000 cycles
Electrical Life 2,000 cycles

Materials
Cover & Base: Thermoplastic UL 94V-0, Black
Actuator: Thermoplastic UL 94-HB, White
Movable Contact: Copper Alloy, Gold- or Pure-Tin-plated
Terminal Contact & Terminal: Copper Alloy, Gold- or Pure-Tin-plated
Tape Sealed: Polyimide film

Packaging Information
L/T type M type G type
Tube, SMD Soldering Pad
Tape & Reel: DIS/ DIJ

Soldering Information
Hand Soldering
Soldering Iron of 30W or under at 350°C for 3 sec. max.
Wave Soldering
260±5°C for 10 sec. max.
Reflow Soldering
Peak temperature: 245 or 250°C max.
Keep all actuators in “OFF” position during soldering and cleaning process

Order Information
P/N No. Of Pole Dim. A Quantity per Tube
DI/S/A/H01 1 2.98mm 174
DI/S/A/H02 2 5.52mm 95
DI/S/A/H03 3 8.06mm 65
DI/S/A/H04 4 10.50mm 48
DI/S/A/H05 5 13.14mm 39
DI/S/A/H06 6 15.68mm 33
DI/S/A/H07 7 18.22mm 28
DI/S/A/H08 8 20.76mm 25
DI/S/A/H09 9 23.30mm 22
DI/S/A/H10 10 25.84mm 20
DI/S/A/H12 12 30.92mm 17
RoHS Compliant

**BA/BA2F Series—Right Angle DIP Switch**

**Features**
- Unique Back Support design provides easiness for PCB manual assembly and high resistance to actuation shock
- Gold-plated contact points & double movable contacts to ensure reliability and longer life expectancy
- Unique twin suspended springs offer high resistance to physical shock & vibration
- Clear ON/OFF actuation clicks
- Insert-molding technology avoids epoxy and water from intruding

**BA**

```
ON
1 2 3 4

SAB
G Type  L Type
```

**BA2F**

```
ON
1 2 3 4

SAB
G Type  L Type
```

**Specifications**
- **Contact Rating**
  - Switching: 25mA, 24VDC
  - Non-Switching: 100mA, 50VDC
- **Contact Resistance**
  - Initial: 50mΩ Max
  - After Life Test: 100mΩ Max.
- **Insulation Resistance**
  - 100MΩ min at 500VDC
- **Dielectric Strength**
  - 500VDC/1 minute
- **Operating Force**
  - 1,000g Max
- **Mechanical Life**
  - 5,000 cycles
- **Electrical Life**
  - 2,000 cycles

**Materials**
- **Cover**: Thermoplastic UL 94V-0; Blue, Red or Black
- **Base**: Thermoplastic UL 94-HB, Black
- **Support**: Thermoplastic UL 94-HB, White
- **Contact**: Copper Alloy, Gold-plated
- **Terminals**: Copper Alloy, Pure Tin-plated
- **Tape Sealed**: Polyester Film

**Packaging Information**
- All DIP switches are shipped in Tube
- Actuators all in "OFF" position

**Soldering Information**
- **Hand Soldering**
  - Soldering Iron 30W (or under) at 350°C for 3 sec. Max. or at 270°C for 5 sec. Max.
- **Wave Soldering**
  - 260±5°C for 10 sec. max.
  - Keep all actuators in "OFF" position during soldering and cleaning process

**Order Information**

<table>
<thead>
<tr>
<th>BA</th>
<th>2F</th>
<th>08</th>
<th>G</th>
<th>B</th>
<th>T</th>
<th>U</th>
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<tbody>
<tr>
<td>BA</td>
<td></td>
<td></td>
<td>G</td>
<td>B</td>
<td>T</td>
<td>U</td>
</tr>
<tr>
<td>BA2F</td>
<td>08</td>
<td></td>
<td>G</td>
<td>B</td>
<td>T</td>
<td>U</td>
</tr>
</tbody>
</table>

**Contact Forms**
- None=Standard
- 2F=2PST

**Position**
- 02=2 Position
- 06=6 Position

**Actuator**
- G=Raise Actuator
- L=Flat Actuator

**Color**
- B=Blue
- R=Red
- K=Black

**Notes**
- None=Standard
- U=Halogen Free

**Wiring Diagram**

**Package**

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>BA02</td>
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<td>6.08mm</td>
<td>85</td>
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<td>BA03</td>
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<td>61</td>
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<tr>
<td>BA04</td>
<td>4</td>
<td>11.16mm</td>
<td>47</td>
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<tr>
<td>BA05</td>
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<td>13.70mm</td>
<td>38</td>
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<tr>
<td>BA06</td>
<td>6</td>
<td>16.24mm</td>
<td>32</td>
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<tr>
<td>BA07</td>
<td>7</td>
<td>18.78mm</td>
<td>28</td>
</tr>
<tr>
<td>BA08</td>
<td>8</td>
<td>21.32mm</td>
<td>24</td>
</tr>
<tr>
<td>BA09</td>
<td>9</td>
<td>23.86mm</td>
<td>22</td>
</tr>
<tr>
<td>BA10</td>
<td>10</td>
<td>26.40mm</td>
<td>20</td>
</tr>
<tr>
<td>BA12</td>
<td>12</td>
<td>31.48mm</td>
<td>16</td>
</tr>
<tr>
<td>BA2F01</td>
<td>1</td>
<td>6.08mm</td>
<td>85</td>
</tr>
<tr>
<td>BA2F02</td>
<td>2</td>
<td>11.16mm</td>
<td>47</td>
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<tr>
<td>BA2F03</td>
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<td>16.24mm</td>
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<td>BA2F04</td>
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<td>BA2F05</td>
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<td>26.40mm</td>
<td>20</td>
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<tr>
<td>BA2F06</td>
<td>6</td>
<td>31.48mm</td>
<td>16</td>
</tr>
</tbody>
</table>


**Features**

- Gold-plated contact points & double movable contacts to ensure reliability and longer life expectancy
- Unique twin suspended springs offer high resistance to physical shock & vibration
- Clear ON/OFF actuation clicks
- Insert-molding technology avoids epoxy and water from intruding
- Thru-Hole or SMD available

**Specifications**

- **Contact Rating**
  - Switching .............. 25mA, 24VDC
  - Non-Switching .......... 100mA, 50VDC
- **Contact Resistance**
  - Initial ................. 50mΩ Max.
  - After Life Test ......... 100mΩ Max.
- **Insulation Resistance** .... 100Mohm min at 500VDC
- **Dielectric Strength** .... 500VAC/1 minute
- **Operating Force** ......... 1.000g Max.
- **Mechanical Life** ........ 5,000 cycles
- **Electrical Life** ........ 2,000 cycles

**Materials**

- **Cover:** Thermoplastic UL 94V-0; Black, Red & Blue
- **Actuator:** Thermoplastic UL 94-HB or UL 94V-0, White
- **Contact:** Copper Alloy, Gold-plated
- **Terminal:** Copper Alloy, Pure-Tin-plated
- **Tape Sealed:** Polyester Film

**Packaging Information**

- **Tape & Reel:** NPS/NPH/NPT
- **Actuators all in “OFF” position

**Soldering Information**

- **Hand Soldering**
  - Soldering Iron of 30W or under at 350°C for 3 sec. max. or at 270°C for 5 sec. max.
- **Wave Soldering**
  - 260±5°C for 10 sec. max.
- **Reflow Soldering**
  - Peak temperature: 245°C max. The time above 240°C must be 30 sec. max.
- **Keep all actuators in “OFF” position during soldering and cleaning process

**Order Information**

- **NP**
  - **S:** Terminal:
    - S=SMD
    - H=Straight
    - T=Thru hole for ref low soldering
  - **G:** Positions:
    - 06=6 Position
    - 09=9 Position
  - **K:** Color:
    - K=Black (NPT/NPS)
    - B=Blue (NPH)
    - R=Red (NPH)
  - **T:** None=Standard
  - **R:** T=Sealed(L Actuator)
  - **U:** None=Standard
  - **U:** Halogen Free

**Order Information Legend**

- **NP** New Piano Type
- **S** Terminal:
  - S=SMD
  - H=Straight
  - T=Thru hole for ref low soldering
- **G** Positions:
  - 06=6 Position
  - 09=9 Position
- **K** Color:
  - K=Black (NPT/NPS)
  - B=Blue (NPH)
  - R=Red (NPH)
- **T** None=Standard
- **R** T=Sealed(L Actuator)
- **U** None=Standard
  - U=Halogen Free

**Order Information Diagram**

- SMD SOLDERING PAD
- DRILLING PLAN

**NPS**

**NPH/NPT**

**Wiring Diagram**

**Package**

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>NPH/S/T02</td>
<td>2</td>
<td>6.08mm</td>
<td>85</td>
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<td>NPH/S/T03</td>
<td>3</td>
<td>8.62mm</td>
<td>61</td>
</tr>
<tr>
<td>NPH/S/T04</td>
<td>4</td>
<td>11.16mm</td>
<td>38</td>
</tr>
<tr>
<td>NPH/S/T05</td>
<td>5</td>
<td>13.70mm</td>
<td>32</td>
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<tr>
<td>NPH/S/T06</td>
<td>6</td>
<td>16.24mm</td>
<td>28</td>
</tr>
<tr>
<td>NPH/S/T07</td>
<td>7</td>
<td>18.76mm</td>
<td>24</td>
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<tr>
<td>NPH/S/T08</td>
<td>8</td>
<td>21.32mm</td>
<td>20</td>
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<td>NPH/S/T10</td>
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<td>NPH/S/T12</td>
<td>12</td>
<td>31.48mm</td>
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</table>

**Order Information**

- **http://www.biwin.com**
- **http://www.sab.com.tw**
- **http://www.sab-switch.com.cn**

**Oct. 2016**
**Features**
- Gold-plated contact points & double movable contacts to ensure reliability and longer life expectancy
- Unique twin suspended springs offer high resistance to physical shock & vibration
- Clear ON/OFF actuation clicks
- Insert-molding technology avoids epoxy and water from intruding

**BP Series—Piano Type DIP Switch**

**Features**
- Gold-plated contact points & double movable contacts to ensure reliability and longer life expectancy
- Unique twin suspended springs offer high resistance to physical shock & vibration
- Clear ON/OFF actuation clicks
- Insert-molding technology avoids epoxy and water from intruding

**BP**

**Specifications**
- Contact Rating
  - Switching: 25mA, 24VDC
  - Non-Switching: 100mA, 50VDC
- Contact Resistance
  - Initial: 50mΩ Max
  - After Life Test: 100mΩ Max
- Insulation Resistance: 100MΩ min at 500VDC
- Dielectric Strength: 500VAC/1 minute
- Operating Force: 1,000g Max
- Mechanical Life: 5,000 cycles
- Electrical Life: 2,000 cycles

**Soldering information**
- Hand Soldering: Soldering Iron 30W(under) at 350°C for 3 sec. max. or at 270°C for 5 sec. max.
- Wave Soldering: 260±5°C for 10 sec. max.
- Keep all actuators in "OFF" position during soldering and cleaning process

**Order Information**
- All DIP switches are shipped in Tube
- Actuators all in "OFF" position

**BP2F**

**Materials**
- Cover: Thermoplastic UL 94V-0; Blue, Red & Black
- Base: Thermoplastic UL 94-HB, Black
- Actuator: Copper Alloy, Gold-plated
- Contact: Copper Alloy, Gold-plated
- Terminal: Copper Alloy, Pure-Tin-plated
- Tape Sealed: Polyester Film

**P/N**

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Poles</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
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</tr>
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<td>BP03</td>
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<td>BP04</td>
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<td>11.16mm</td>
<td>47</td>
</tr>
<tr>
<td>BP05</td>
<td>5</td>
<td>13.70mm</td>
<td>38</td>
</tr>
<tr>
<td>BP06</td>
<td>6</td>
<td>16.24mm</td>
<td>32</td>
</tr>
<tr>
<td>BP07</td>
<td>7</td>
<td>18.78mm</td>
<td>28</td>
</tr>
<tr>
<td>BP08</td>
<td>8</td>
<td>21.32mm</td>
<td>24</td>
</tr>
<tr>
<td>BP09</td>
<td>9</td>
<td>23.86mm</td>
<td>22</td>
</tr>
<tr>
<td>BP10</td>
<td>10</td>
<td>26.40mm</td>
<td>20</td>
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<tr>
<td>BP12</td>
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<td>31.48mm</td>
<td>16</td>
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<tr>
<td>BP2F01</td>
<td>1</td>
<td>6.08mm</td>
<td>85</td>
</tr>
<tr>
<td>BP2F02</td>
<td>2</td>
<td>11.16mm</td>
<td>47</td>
</tr>
<tr>
<td>BP2F03</td>
<td>3</td>
<td>16.24mm</td>
<td>32</td>
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<tr>
<td>BP2F04</td>
<td>4</td>
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<td>24</td>
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<td>BP2F05</td>
<td>5</td>
<td>26.40mm</td>
<td>20</td>
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<tr>
<td>BP2F06</td>
<td>6</td>
<td>31.48mm</td>
<td>16</td>
</tr>
</tbody>
</table>

**BP=bottom surrounding with Epoxy sealed**

**BP=bottom surrounding with Epoxy sealed**
**Features**

- Twin contacts designed to ensure stable contact
- Highly resistant to physical shock & vibration
- Tape sealed version available to ensure washability
- Low profile to save PCB space
- Tri-State(+,0,-) setting function
  - 8 poles=(3^3)=6,561 codes
  - 10 poles=(3^10)=59,049 codes
- Light click feeling

---

### Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Rating</th>
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</thead>
<tbody>
<tr>
<td>Contact Rating</td>
<td>25mA, 24VDC</td>
</tr>
<tr>
<td>Non-Switching Contact Resistance</td>
<td>100mA, 50VDC</td>
</tr>
<tr>
<td>Contact Resistance Initial</td>
<td>50mA Max.</td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>100MΩ Max.</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>500VAC/ 1 minute</td>
</tr>
<tr>
<td>Operating Force</td>
<td>1,000g Max.</td>
</tr>
<tr>
<td>Mechanical Life</td>
<td>3,000 cycles</td>
</tr>
<tr>
<td>Electrical Life</td>
<td>2,000 cycles</td>
</tr>
</tbody>
</table>

---

### Materials

- **Cover & Base**: Thermoplastic UL 94V-0, Black
- **Actuator**: Thermoplastic UL 94-HB, White
- **Movable Contact**: Copper Alloy, Gold- or Pure-Tin-plated
- **Terminal & Terminal Contact**: Copper Alloy, Gold- or Pure-Tin-plated
- **Tape Sealed**: Polyimide film

---

### Soldering Information

- **Hand Soldering**: Soldering iron of 30W or under at 350°C for 3 sec. max. or at 270°C for 5 sec. max.
- **Wave Soldering**: 260±5°C for 10 sec. max.
- **Reflow Soldering**: Peak temperature: 245 or 250°C max. The time above 240 or 245°C must be 30 sec. max.
- **Keep all actuators in "OFF" position during soldering and cleaning process**

---

### Wiring Diagram

---

### Package

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>DTS/A/H02</td>
<td>2</td>
<td>5.52mm</td>
<td>95</td>
</tr>
<tr>
<td>DTS/A/H03</td>
<td>3</td>
<td>8.06mm</td>
<td>65</td>
</tr>
<tr>
<td>DTS/A/H04</td>
<td>4</td>
<td>10.60mm</td>
<td>48</td>
</tr>
<tr>
<td>DTS/A/H06</td>
<td>6</td>
<td>15.68mm</td>
<td>25</td>
</tr>
<tr>
<td>DTS/A/H07</td>
<td>7</td>
<td>18.22mm</td>
<td>20</td>
</tr>
<tr>
<td>DTS/A/H08</td>
<td>8</td>
<td>20.76mm</td>
<td>17</td>
</tr>
<tr>
<td>DTS/A/H09</td>
<td>9</td>
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<tr>
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<td>10</td>
<td>25.84mm</td>
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</tr>
<tr>
<td>DTS/A/H12</td>
<td>12</td>
<td>30.92mm</td>
<td></td>
</tr>
</tbody>
</table>
**Features**

- Cost effective DIP shunt designed for switches with only one-time setup.
- Connected terminal can be easily separated with a ball pen.
- All shunts can be supplied either un-programmed or preprogrammed.

**HTS**

**Materials**

- Rating: 1A
- Insulation Resistance: 100MΩ min at 500VDC
- Dielectric Strength: 500VAC/1 minute
- Operating Temperature: -55°C~150°C

**Specifications**

- Base: Thermoplastic UL 94V-0, Black
- Terminal: Copper Alloy, Pure-Tin-plated
- Tape Sealed: Polyimide film

**Wiring Diagram**

**Packaging Information**

- Tube: HTS/HTA/HTH
- Tape & Reel: HTS

**Soldering Information**

- Hand Soldering:
  - Soldering iron of 30W or under at 350°C for 3 sec. max. or at 270°C for 5 sec. max.
- Wave Soldering:
  - 260±5°C for 10 sec. max.
- Reflow Soldering:
  - Peak temperature: 260°C max. The time above 255°C must be 30 sec. max.

**Order Information**

<table>
<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim. A</th>
<th>Quantity per Tube</th>
</tr>
</thead>
<tbody>
<tr>
<td>HTS / A / H 02</td>
<td>2</td>
<td>5.08mm</td>
<td>105</td>
</tr>
<tr>
<td>HTS / A / H 03</td>
<td>3</td>
<td>7.62mm</td>
<td>70</td>
</tr>
<tr>
<td>HTS / A / H 04</td>
<td>4</td>
<td>10.16mm</td>
<td>52</td>
</tr>
<tr>
<td>HTS / A / H 05</td>
<td>5</td>
<td>12.70mm</td>
<td>42</td>
</tr>
<tr>
<td>HTS / A / H 06</td>
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<td>15.24mm</td>
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<td>HTS / A / H 07</td>
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<td>30</td>
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<td>HTS / A / H 08</td>
<td>8</td>
<td>20.32mm</td>
<td>26</td>
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<td>HTS / A / H 09</td>
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<td>22.86mm</td>
<td>23</td>
</tr>
<tr>
<td>HTS / A / H 10</td>
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<td>HTS / A / H 12</td>
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</table>

**DRILLING PLAN**

- SAB SMD SOLDERING PAD
- SAB DRILLING PLAN

BIWIN / Sab
*SIP/H/L/S Series—Single In-Line Package Switches
RoHS Compliant

Features
◆ Unique SMD type provided with Gull wing and L lead terminal types
◆ Easy operation: Raise and Flat Actuators without special tools needed
◆ Long life: 3,000 cycles
◆ End to end stackable in 2.54 center for full versions
◆ Heat resistance: 260°C for 10 sec.
◆ Save more than 50% of the PCB space compared with the standard DIP switch

Specifications
Materials
◆ Contact Rating
  Switching …………………… 25mA, 24VDC
  Non-Switching ………………… 100mA, 50VDC
◆ Contact Resistance
  Initial …………………… 50mΩ Max.
  After Life Test ………………… 100mΩ Max.
◆ Insulation Resistance ……… 100MΩ min at 500VDC
◆ Dielectric Strength ………… 500VAC/1 minute
◆ Operating Force …………… 1000g Max.
◆ Mechanical Life …………… 3,000 cycles
◆ Electrical Life …………… 3,000 cycles
◆ Cover & Base: Thermoplastic UL 94V-0, Black
◆ Actuator: Thermoplastic UL 94-HB, White
◆ Movable Contact: Copper Alloy, Gold- or Pure-Tin-plated
◆ Terminal Contact & Terminal: Copper Alloy, Gold- or Pure-Tin-plated
◆ Tape Sealed: Polyimide film

Packaging Information
◆ Tube: SIP/ SIH/ SIS/ SIL
◆ Tape & Reel: SIS/ SIL
◆ Actuators all in "OFF" position

Soldering Information
◆ Hand Soldering
  Soldering iron of 30W or under at 350°C for 3 sec. max. or at 270°C for 5 sec. max.
◆ Wave Soldering
  260±5°C for 10 sec. max.
◆ Reflow Soldering
  Peak temperature: 245 or 250°C max. The time above 240 or 245°C must be 30 sec. max.
◆ Keep all actuators in "OFF" position during soldering and cleaning process

Order Information

Table:

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<thead>
<tr>
<th>P/N</th>
<th>No. Of Pole</th>
<th>Dim.</th>
<th>Quantity per Tube</th>
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<td>SIP04</td>
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<td>SIP06</td>
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<td>SIP08</td>
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**Features**

- SPDT Multipole DIP Switch
- Design Patented
- Save space for the PCB
- More Function than the SIP Switch & choice
- Change over signal circuit

**DNIS**

**Specifications**

- **Contact Rating**
  - Switching: 25mA, 24VDC
  - Non-Switching: 100mA, 50VDC
- **Contact Resistance**
  - Initial: 50mΩ Max.
  - After Life Test: 100mΩ Max.
- **Insulation Resistance**
  - Switching: 100MΩ min at 500VDC
  - Non-Switching: 100MΩ min at 500VDC
- **Dielectric Strength**
  - 500VAC/ 1 minute
- **Operating Force**
  - 1,000g Max.
- **Mechanical Life**
  - 5,000 cycles
- **Electrical Life**
  - 2,000 cycles

**Materials**

- **Cover & Base**: Thermoplastic UL 94V-0, Black
- **Actuator**: Thermoplastic UL 94-HB, White
- **Movable Contact**: Copper Alloy, Gold- or Pure-Tin-plated
- **Terminal & Terminal Contact**: Copper Alloy, Gold- or Pure-Tin-plated
- **Tape Sealed**: Polyimide film

**Soldering Information**

- **Hand Soldering**
  - Soldering Iron of 30W or under at 350°C for 3 sec. max. or at 270°C/ 5 sec. max.
- **Wave Soldering**
  - 260±5°C for 10 sec. max.
- **Reflow Soldering**
  - Peak temperature: 245 or 250°C max. The time above 240 or 245°C must be 30 sec. max.
- Keep all actuators in “OFF” position during soldering and cleaning process

**Order Information**

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<tr>
<th>DNIS/A/H01</th>
<th>DNIS/A/H02</th>
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**Packaging Information**

- Tube: DMIS/ DMA/ DMIH
- Tape & Reel: DMIS
- Actuators all in “OFF” position