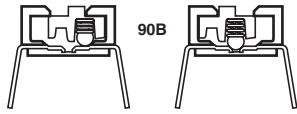
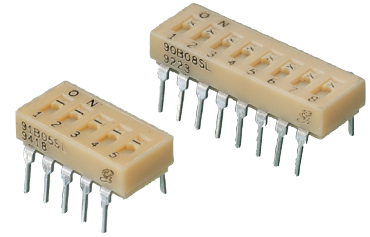


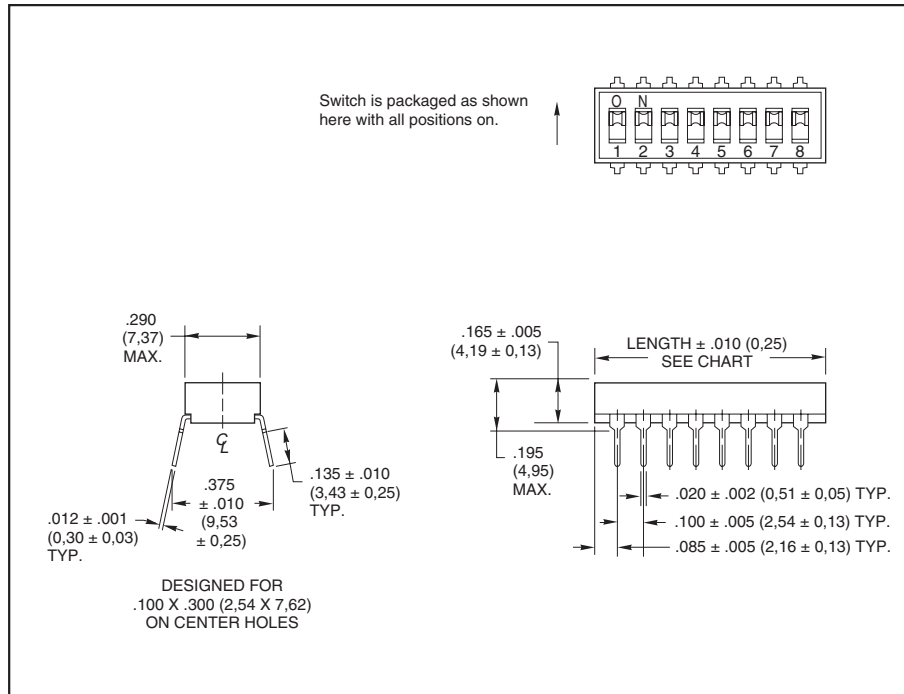
**SERIES 90B**  
Machine Insertable MIDIP

**FEATURES**

- Tested for TO-116 Equipment
- Up to 10 Positions
- High Pressure, Reliable Contacts
- Molded (Sealed) Base and Optional Top Seal

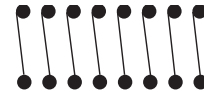


**DIMENSIONS** In inches (and millimeters)



**CIRCUITRY**

As viewed from the top of the switch in the positions shown in the drawing.



DIP Switches

**ORDERING INFORMATION: Tube Packaging** (Each tube is 19.5 inches long)

No. of Positions	Length Inches	Length Metric	Number Per Tube	Part Number*
2	.270"	6,9 mm	60	90B02PT
3	.370"	9,4 mm	47	90B03PT
4	.470"	11,9 mm	37	90B04PT
5	.570"	14,5 mm	31	90B05PT
6	.670"	17,0 mm	26	90B06PT
7	.770"	19,6 mm	23	90B07PT
8	.870"	22,1 mm	20	90B08PT
9	.970"	24,6 mm	18	90B09PT
10	1.070"	27,2 mm	16	90B10PT

**Available from your local Grayhill Distributor.**

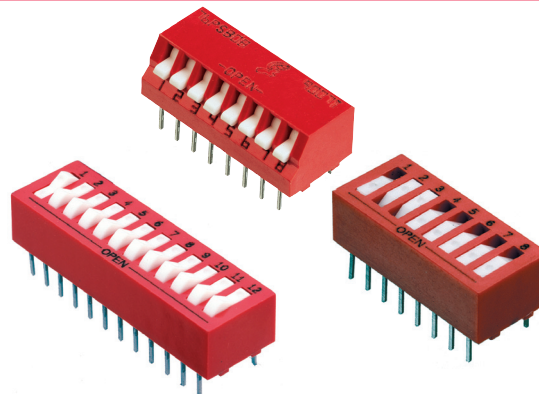
For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

\*The "P" in the part number denotes top tape seal versions. To order without top tape seal, leave the "P" off the part number when ordering.

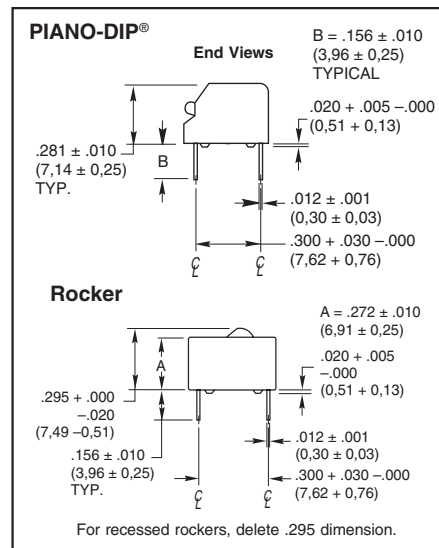
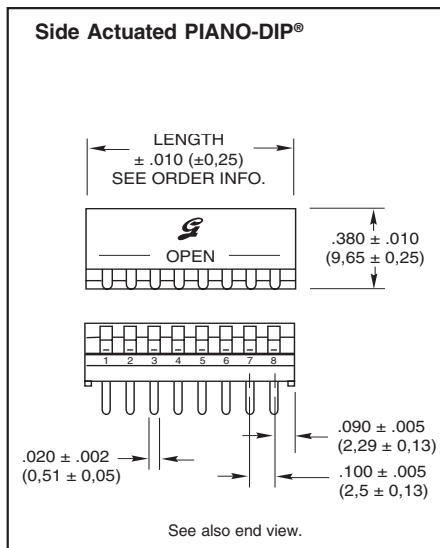
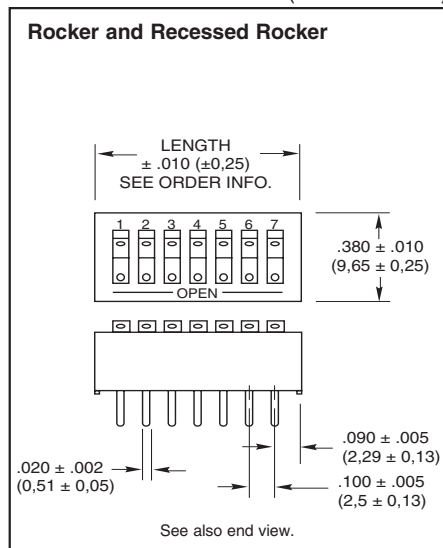
**SERIES 76**  
**SPST Rocker**

**FEATURES**

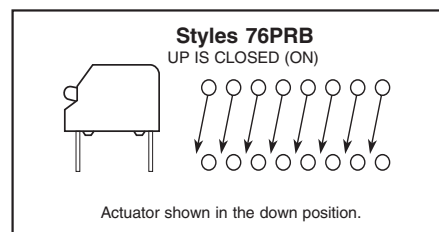
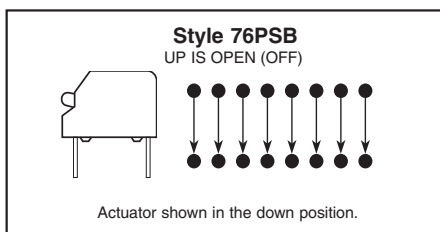
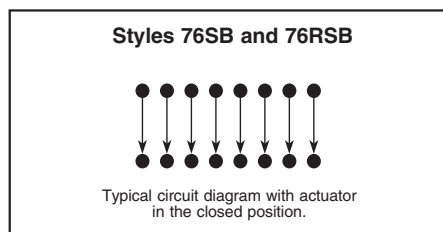
- Raised and Recessed, Rocker and PIANO-DIP® Styles
- Sealed Base Standard
- Spring and Ball Contact
- Top Tape Seal Option



**DIMENSIONS** In inches (and millimeters)



**CIRCUITRY**



**ORDERING INFORMATION**

**Series**

**Switch Style:** SB = Raised Rocker  
RSB = Recessed Rocker  
PSB = Piano-DIP (Up is Off)  
PRB = Piano-DIP (Up is On)

**T** = RoHS compliant

**Sealed\***: S = Tape Seal

**Number of Positions:** 02 through 10, 12

No. of Pos.	Length (Inches)	Length (Metric)	No./Tube
2	0.280"	7,1 mm	35
3	0.380"	9,7 mm	27
4	0.480"	12,2 mm	21
5	0.580"	14,7 mm	18
6	0.680"	17,3 mm	15
7	0.780"	19,8 mm	13
8	0.880"	22,4 mm	12
9	0.980"	24,9 mm	10
10	1.080"	27,4 mm	9
12	1.280"	32,5 mm	8

**76RSB04ST**

\*A top tape seal is required for switches that are machine soldered or heavily cleaned after hand soldering. To order top seal versions, add "S" to the Grayhill part number.

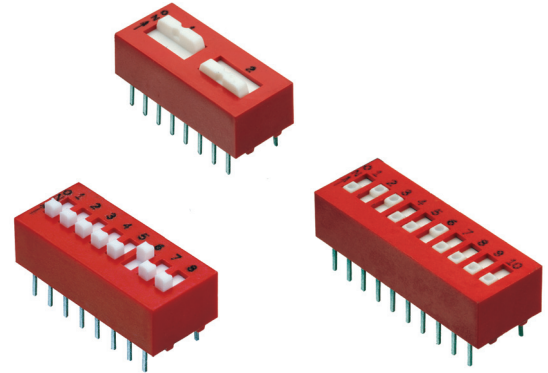
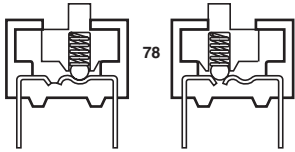
Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

## SERIES 78

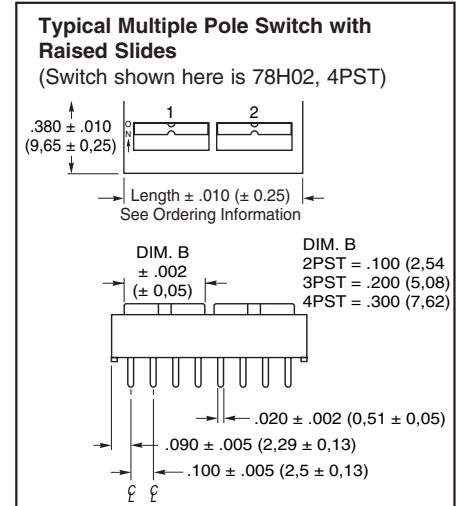
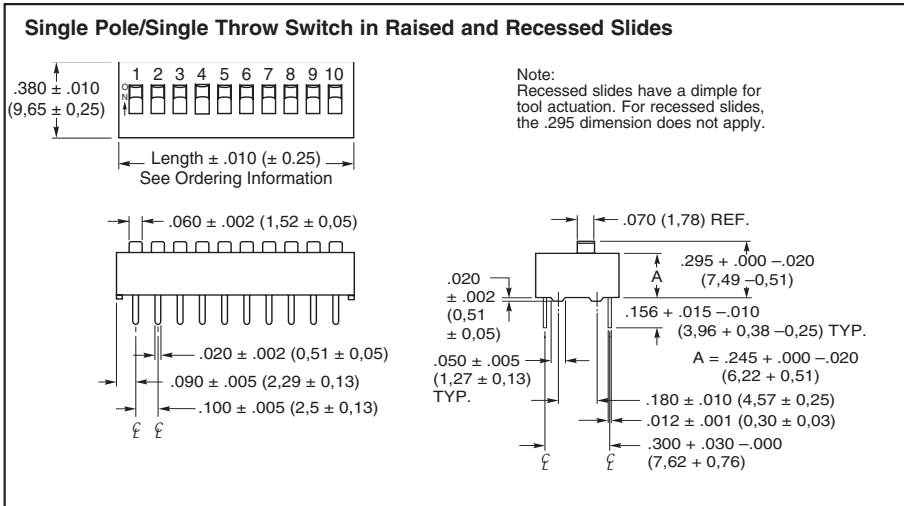
### SPST To 4PST Slide

## FEATURES

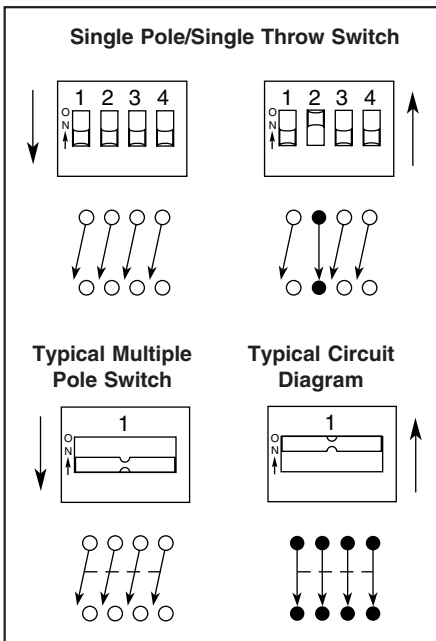
- Raised and Recessed Slides
- SPST, 2PST, 3PST, 4PST
- Sealed Base Standard
- Spring and Ball Contact
- Top Tape Seal Option



## DIMENSIONS In inches (and millimeters)



## CIRCUITRY



For switches with 5, 6, 7, 8, or 10PST circuitry, contact Grayhill.

\*A top tape seal is required for switches that are machine soldered or heavily cleaned after hand soldering. To order top seal versions, add "S" before the "T" in the Grayhill part number.

## ORDERING INFORMATION

Circuitry	No. of Positions	Length Inches	Length Metric	No./Tube	Raised Slides*	Recessed Slides*
SPST	2	0.280"	7,1mm	35	78B02T	78RB02T
	3	0.380"	9,7mm	27	78B03T	78RB03T
	4	0.480"	12,2mm	21	78B04T	78RB04T
	5	0.580"	14,7mm	18	78B05T	78RB05T
	6	0.680"	17,3mm	15	78B06T	78RB06T
	7	0.780"	19,8mm	13	78B07T	78RB07T
	8	0.880"	22,4mm	12	78B08T	78RB08T
	9	0.980"	24,9mm	10	78B09T	78RB09T
	10	1.080"	27,4mm	9	78B10T	78RB10T
	12	1.280"	32,5mm	8	78B12T	78RB12T
2PST	1	0.280"	7,1mm	35	78F01T	Recessed Slides Not Available
	2	0.480"	12,2mm	21	78F02T	
	3	0.680"	17,3mm	15	78F03T	
	4	0.880"	22,4mm	12	78F04T	
	5	1.080"	27,4mm	9	78F05T	
	6	1.280"	32,5mm	8	78F06T	
3PST	1	0.380"	9,7mm	27	78G01T	Recessed Slides Not Available
	2	0.680"	17,3mm	15	78G02T	
	3	0.980"	24,9mm	10	78G03T	
4PST	1	0.480"	12,2mm	21	78H01T	Recessed Slides Not Available
	2	0.880"	22,4mm	12	78H02T	

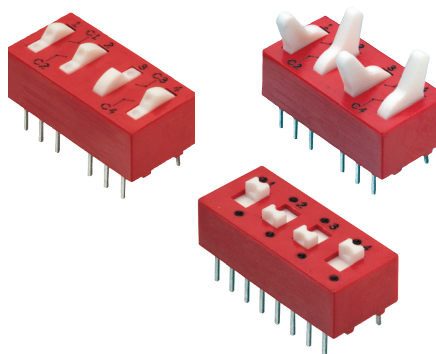
Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

## SERIES 76 and 78

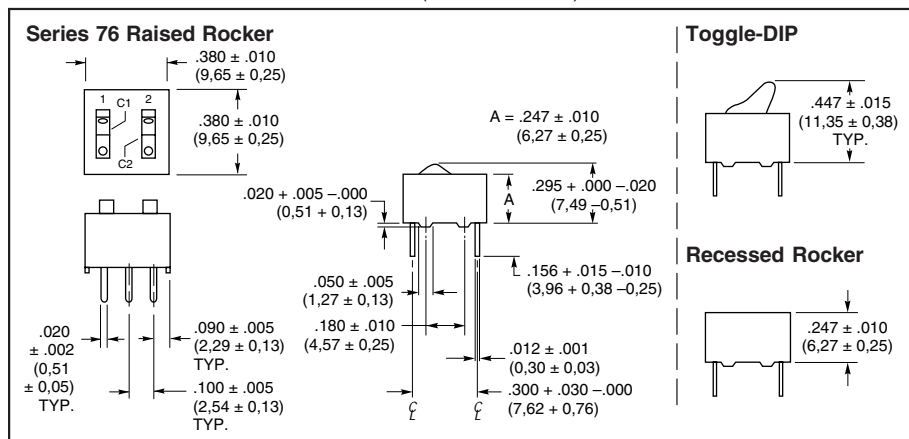
### SPDT

#### FEATURES

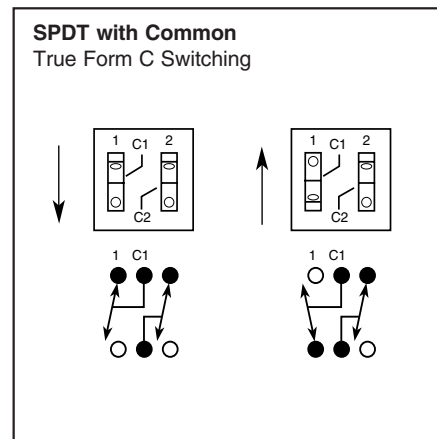
- Raised and Recessed Rocker, and Toggle Actuated Styles
- SPDT with a Common Pole, or SPDT with 2 Isolated Circuits
- Spring and Ball Contact
- Top Tape Seal Option for Most Styles



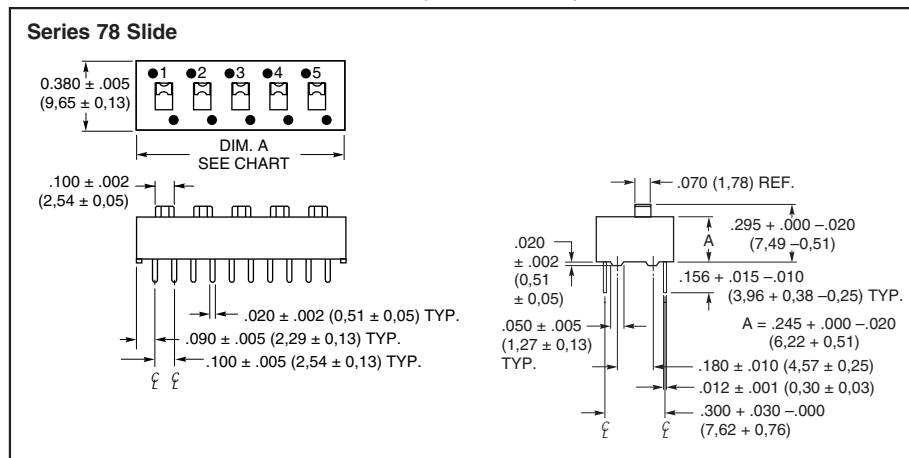
#### DIMENSIONS: Series 76 In inches (and millimeters)



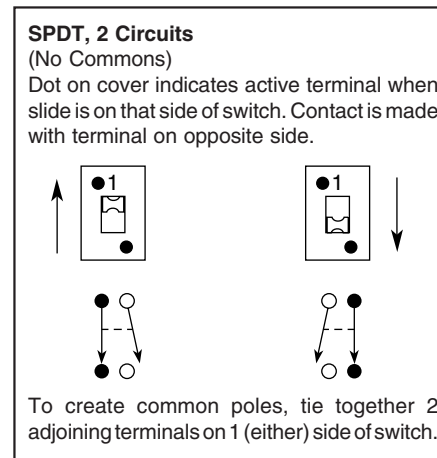
#### CIRCUITRY: Series 76



#### DIMENSIONS: Series 78 In inches (and millimeters)



#### CIRCUITRY: Series 78



#### ORDERING INFORMATION

Circuitry	Positions	Length Inches	Length Metric	No./ Tube	Raised Type*	Recessed Rockers*	Toggle-DIP*
SPDT Form C	2	0.380"	9,7mm	27	76SC02T	76RSC02T	76STC02T
	3	0.580"	14,7mm	18	76SC03T	76RSC03T	76STC03T
	4	0.780"	19,8mm	13	76SC04T	76RSC04T	76STC04T
SPDT 2 Circuits	1	0.280"	7,1mm	35	78J01T	—	—
	2	0.480"	12,2mm	21	78J02T	—	—
	3	0.680"	17,3mm	15	78J03T	—	—
	4	0.880"	22,4mm	12	78J04T	—	—
	5	1.080"	27,4mm	9	78J05T	—	—
	6	1.280"	32,5mm	8	78J06T	—	—

\*To order top seal versions, add "S" before the "T" in the Grayhill part number.  
Not available on Toggle-DIP.

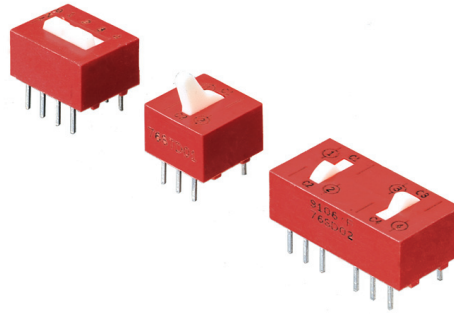
Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

## SERIES 76 and 78

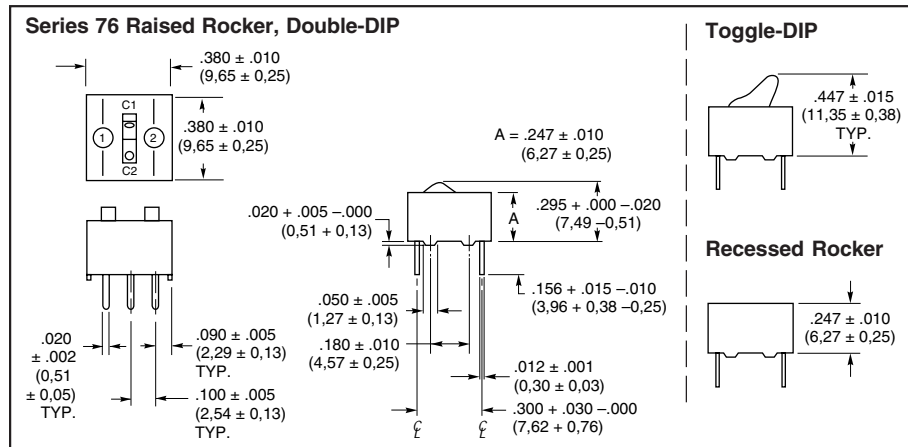
### DPDT

#### FEATURES

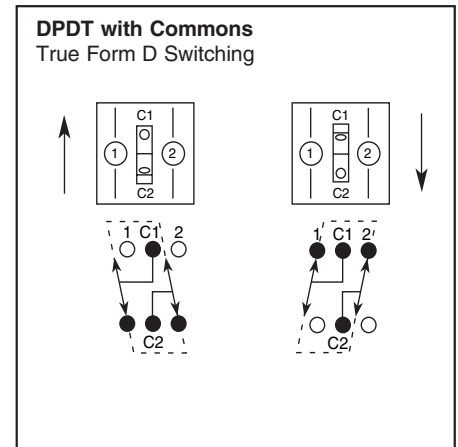
- Raised and Recessed Rocker, and Toggle Actuated Styles
- DPDT with Common Poles, or DPDT with 4 Isolated Circuits
- Spring and Ball Contact
- Top Tape Seal Option for Most Styles



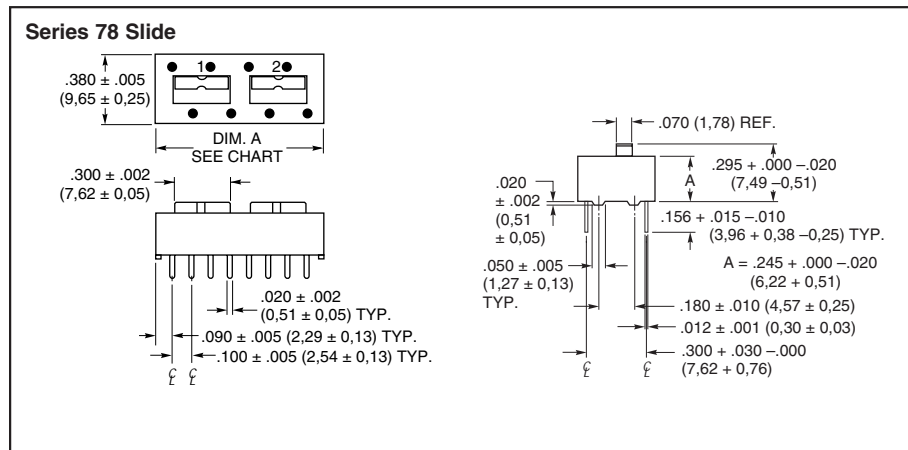
#### DIMENSIONS: Series 76 In inches (and millimeters)



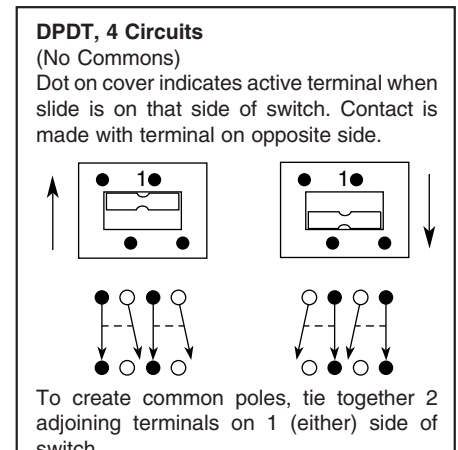
#### CIRCUITRY: Series 76



#### DIMENSIONS: Series 78 In inches (and millimeters)



#### CIRCUITRY: Series 78



#### ORDERING INFORMATION

Circuitry	No./ Positions	Length Inches	Length Metric	No./ Tube	Raised Type*	Recessed Rockers*	Toggle-DIP*
DPDT Form D	1	0.380"	9,7mm	27	76SD01T	76RSD01T	76STD01T
		0.780"	19,8mm	13	76SD02T	76RSD02T	76STD02T
DPDT 4 Circ.	2	0.480"	12,2mm	21	78K01T	—	—
		0.880"	22,4mm	12	78K02T	—	—

Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

A top tape seal is required for switches that are machine soldered or heavily cleaned after hand soldering. To order top seal versions, add "S" before the "T" in the Grayhill part number. Not available on Toggle-DIP.

**SPECIFICATIONS: Standard Styles**

Ratings	76	78	90B
<b>Mechanical Life:</b> Operations per switch position	2,000	2,000	2,000
<b>Make-and-break Current Rating:</b> Operations per switch position at these resistive loads			
1 mA, 5 Vdc; 50 mA, 30 Vdc; or 150 mA, 30 Vdc:	2,000	2,000	—
10 mA, 30 Vdc; or 10 mA, 50 mVdc:	—	—	2,000
10 mA, 50 mVdc; or 25 mA, 24 Vdc; or 100 mA, 6 Vdc:	—	—	2,000
<b>Contact Resistance:</b> Initially:	≤ 30 mΩ	≤ 30 mΩ	≤ 20 mΩ
After life, at 10 mA, 50 mVdc, open circuit:	≤ 100 mΩ	≤ 100 mΩ	≤ 100 mΩ
<b>Insulation Resistance:</b>			
Minimum, at 100 Vdc between adjacent closed contacts and also across open switch contacts			
Initially (Mohms):	5,000	5,000	5,000
After life (Mohms):	1,000	1,000	1,000
<b>Dielectric Strength:</b> Minimum voltage (AC, RMS) measured between adjacent closed contacts and also across open switch contacts.			
Initially:	750 V	750 V	500 V
After life:	500 V	500 V	500 V
<b>Current Carry Rating:</b> Maximum rise of 20°C	5 A	4 A	3 A
<b>Switch Capacitance:</b> At 1 megahertz	2 pF	2 pF	2 pF
<b>Operating Temperature Range:</b>	-40°C to + 85°C	-40°C to + 85°C	-40°C to + 85°C
<b>Storage Temperature Range:</b>	-55°C to + 85°C	-55°C to + 85°C	-55°C to + 85°C

**Mechanical Ratings**

**Vibration Resistance:** Per Method 204, Test Condition B, 1 mS opening (10 mS allowed)

**Mechanical Shock:** Per Method 213, Test Condition A. 1 mS opening (10 mS allowed)

**Thermal Shock Resistance:** Per specification; no failures; passes contact resistance.

**Terminal Strength:** Per specification

**Thermal Aging:** 1,000 hours at 85°C; no failures.

**Environmental Ratings**

Meets all requirements of MIL- S-83504. Where Grayhill performance is superior, the MIL spec is listed in parentheses.

**Moisture Resistance:** Per MIL-STD-202, Method 106.

**Soldering Information**

Series 90 MIDIP and Series 76 recessed rocker (76RSB style) sealed switches have been tested to EIA Standard RS-448-2. Similar performance can be expected from other sealed Series 76 and 78 DIP switches.

**Solderability:** Per MIL-STD-202, Method 208  
**Resistance to Soldering Heat:** 76RSB: Passes EIA Standard using two, four, and six second soldering time. 90: Per MIL-S-83504, six second test.

**Fluxing:** Per EIA RS-448-2 with flux touching switch body.

**Cleaning:** 76, 78 and 90 series tape sealed products: Passes immersion test using water/detergent. Acceptable solutions include 1-1-1 trichlorethane, freon, (TF, TE, or TMS), isopropyl alcohol, detergent (140°F maximum). Terpene acceptable for Series 90 only. Solutions which are not recommended include acetone, methylene chloride, freon TMC.

**Materials and Finishes**

**Shorting Member (Ball):** Brass, gold-plated over nickel barrier.

**Base Contacts:** Copper alloy, gold-plated over nickel barrier.

**Terminals:** Copper alloy, matte tin plated over nickel barrier.

**Non-Conductive Parts:** Thermoplastic (UL94V-O)

**Potting Material:** Epoxy, 76,78 only.

**Protective Cover:** 76,78, only-Polycarbonate.

**Tape Seal:**

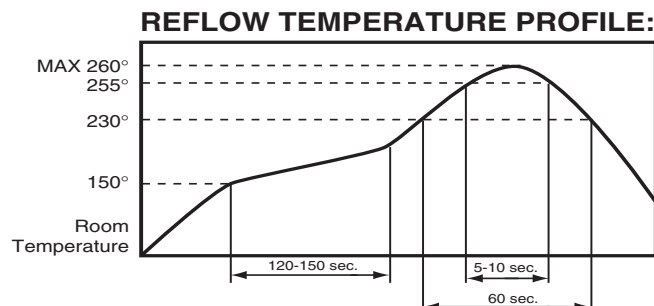
76, 78: Polyester film

90: Polyimide film

**Tape Seal Integrity:** Passes gross leak test using 125°C flourinert for 20 seconds minimum. Reference MIL-STD-202, Method 112.

**Recommended Soldering Conditions:**
**Reflow Soldering Profile:**

(260°C Peak Temperature)



**WAVE SOLDERING:** 260°C maximum solder temperature for 5 seconds max.



## SERIES 79A

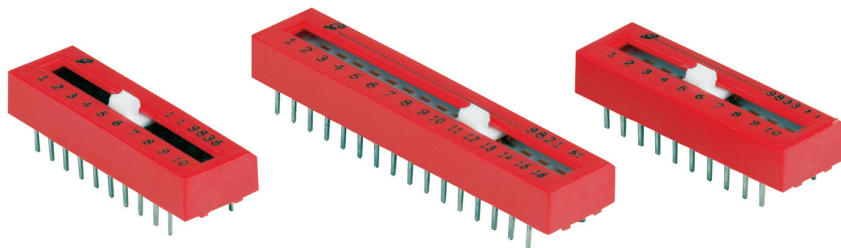
Linear Action Circuit Selector

## SERIES 79C

Linear Action Tap

### FEATURES

- Single-Setting Programming
- Isolated or Bussed Circuits
- 10 or 16 Positions
- 125 mA, 6 Vdc, 2000 Cycles



### Circuit Selector

#### Isolated Circuits in 10 and 16 Positions

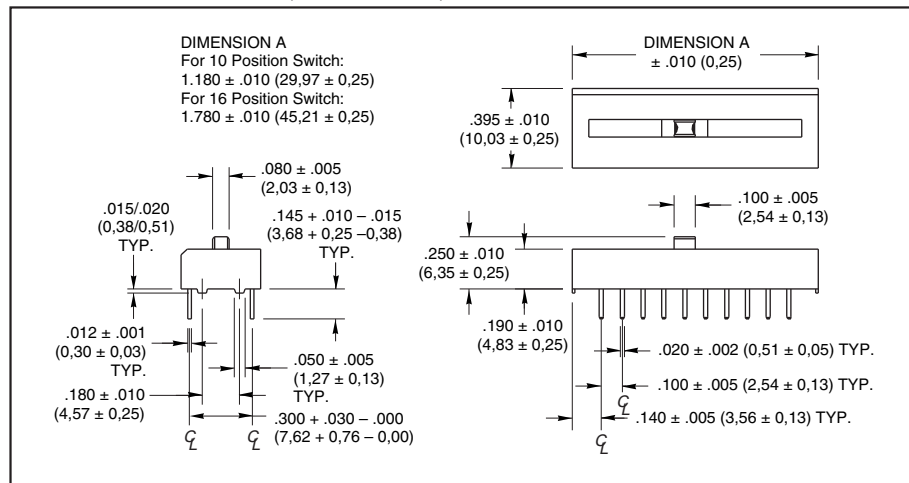
Each position is a single isolated circuit, which connects the two terminals across the switch package. The movable contact is non-shorting.

### Tap Switch

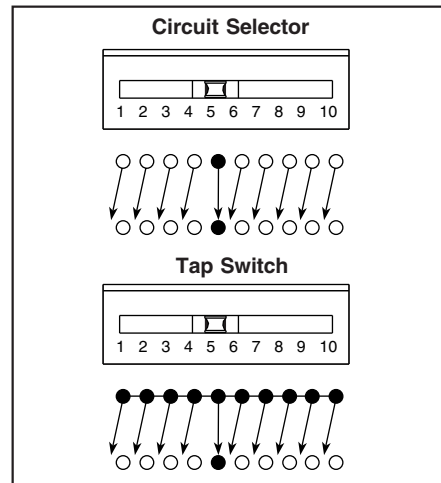
#### SP/10 Positions, and SP/16 Positions

All contacts on one side of the switch are internally bussed for a common pole. Any terminal on that side may be used as a common, the others may be clipped. The movable contact is non-shorting.

### DIMENSIONS In inches (and millimeters)



### CIRCUITRY



### SPECIFICATIONS

#### Electrical Ratings

**Make-and-break Current Rating:** 2,000 cycles at 10 mA, 50 mVdc; 2,000 cycles at 125 mA, 6 Vdc; 2,000 cycles at 50 mA, 30 Vdc.

**Contact Resistance:** (measured at 10 mA, 50 mVdc) Coded Switches: 60 mohms maximum initially. Other Switches: 50 mohms maximum initially. After Llife: 100 mohms maximum

#### Insulation Resistance (at 100 Vdc):

Between adjacent isolated contacts: Initial: 5,000 Mohms; 1,000 Mohms minimum after life. Across open contacts: Initial: 5,000 Mohms; 1,000 Mohms minimum after life.

**Dielectric Strength:** Between adjacent isolated contacts and also across open contacts. Initially: 750 Vac; 500 Vac after life

**Contact Carry Rating:** 2 Amps with a maximum contact temperature rise of 20°C

#### Mechanical Ratings

**Mechanical Life:** 4,000 cycles maximum. Note: a cycle is one complete operation, back and forth through all switch positions.

**Vibration Resistance:** 10 to 2,000 Hz at 15G or 0.060" double amplitude, per MIL-STD-202F per MIL-5-83504; Method 213, Condition A. No damage and no contact openings exceeding 10 mS (Method 204, Test Condition B).

**Shock Resistance:** 509, 11 mS, half sine; no damage and no openings exceeding 10 mS (Method 213, Test Condition A).

#### Environmental Rating

**Operating Temperature Range:** -40°C to +85°C

**Storage Temperature Range:** -55°C to +85°C

**Moisture Resistance:** 240 hours with temperature cycling and polarization, per MIL-STD-202F, Method 305

#### Materials and Finishes

**Nonconductive Parts:** Plastic UL94V-O

**Shorting Arm:** Phosphor bronze, gold plate over nickel plate

**Base Contacts:** Copper alloy, gold plate over nickel plate

**Terminals:** Copper alloy, matte tin plated over nickel barrier.

**Potting Material:** Epoxy

#### Tape and Seal Packaging

**Seal Strength:** Per MIL-STD-202, Method 112. 30 seconds at 125° hot Fluorocarbon

**Solderability:** Per MIL-STD-202, Method 208.

**Tape Seal:** Polyester film

#### Available from your local Grayhill Distributor.

For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

### ORDERING INFORMATION

Number of Positions	Type of Circuit Code	Number per Tube	Part Number*
10	Circuit Selector	9	79A10T
10	Single Pole	9	79C10T
16	Circuit Selector	6	79A16T
16	Single Pole	6	79C16T

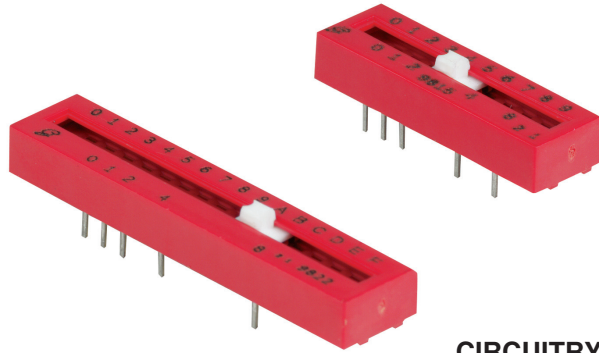
\*A top tape seal is required for switches that are machine soldered or heavily cleaned after hand soldering. To order top seal versions, add "S" before the "T" in the Grayhill part number.

## SERIES 79B

### Linear Action, Coded Output

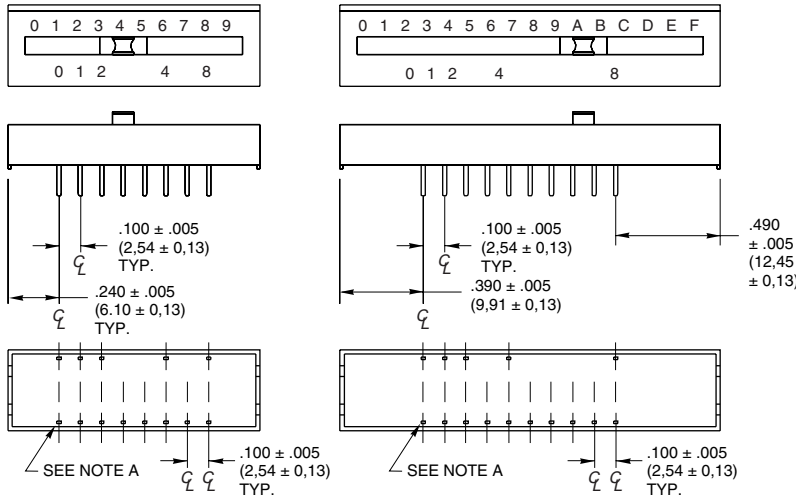
#### FEATURES

- Reliable Switching, Positive Detent
- Codes in BCD and Hexadecimal
- True Zero Output
- 10 or 16 Positions
- 2000 Cycle Life
- Up to 60,000 Detent Operations



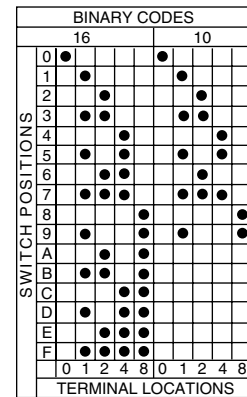
#### DIMENSIONS In inches (and millimeters)

All dimensions not shown here are the same as those on the facing page.



NOTE A: All terminals on this side of the switch are bussed internally. Any one of them may be used as the common terminal.

#### CIRCUITRY



Dot indicates contact made between contact and output terminal.

#### SPECIFICATIONS

##### Electrical Ratings

**Make-and-break Current Rating:** 2,000 cycles at 10 mA, 50 mVdc; 2,000 cycles at 125 mA, 6 Vdc; 2,000 cycles at 50 mA, 30 Vdc.

**Contact Resistance:** 100 mohms maximum after life, measured at 10 mA dc and 50 mV (open circuit). Initial values are 60 mohms maximum for coded switches, and 50 mohms for other linear action switches.

##### Insulation Resistance (at 100 Vdc):

Between adjacent isolated contacts: Initial: 5,000 Mohms minimum; After Life: 1,000 Mohms minimum

Across open contacts: Initial: 5,000 Mohms minimum; After Life: 1,000 Mohms minimum

**Dielectric Strength:** Between adjacent isolated contacts and across open contacts. Initial: 750 Vac; After Life: 500 Vac

**Contact Carry Rating:** 2 amps with a maximum

contact temperature rise of 20°C.

##### Mechanical Ratings

**Mechanical Life:** 4,000 cycles maximum. Note: a cycle is one complete operation, back and forth through all switch positions.

**Vibration Resistance:** 10 to 2,000 Hz at 15G or 0.060" double amplitude; no damage and no contact openings exceeding 10 mS (Method 204, Test Condition B).

**Shock Resistance:** 509, 11 mS, half sine; no damage and no openings exceeding 10 microseconds (Method 213, Test Condition A).

##### Environmental Ratings

Refer to MIL-STD-202F per MIL-S-83504

**Operating Temperature Range:** -40°C to +85°C

**Storage Temperature Range:** -55°C to +85°C

**Moisture Resistance:** 240 hours with temperature cycling and polarization, per MIL-STD-202F, Method 305

##### Materials and Finishes

**Nonconductive Parts:** Plastic UL94V-O

**Shorting Arm:** Phosphor bronze, gold plate over nickel plate

**Base Contacts:** Copper alloy, gold plate over nickel plate

**Terminals:** Copper alloy, matte tin plated over nickel barrier

**Potting Material:** Epoxy

##### Tape Seal and Packaging

**Tape Seal:** Polyester film

#### ORDERING INFORMATION

Number of Positions	Type of Circuit Code	Number per Tube	Part Number*
10	Binary Code Decimal	9	<b>79B10T</b>
16	Hexadecimal	6	<b>79B16T</b>

\*A top tape seal is required for switches that are machine soldered or heavily cleaned after hand soldering. To order top seal versions, add "S" before the "T" in the Grayhill part number.

Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.



**SERIES 78C**  
Right Angle Option

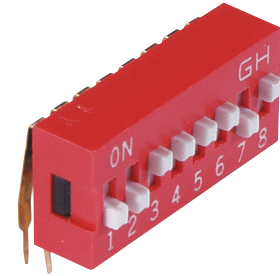


**FEATURES**

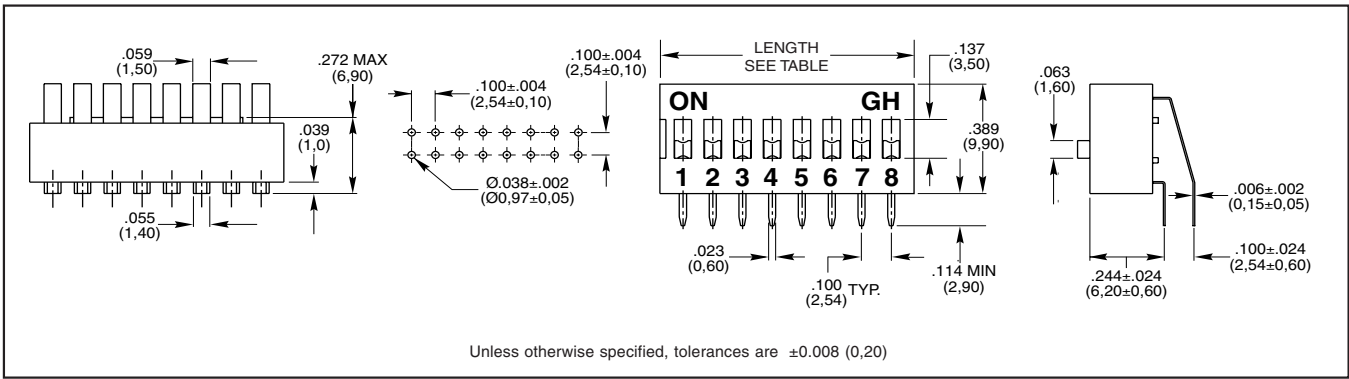
- Easy Access
- SPST Circuitry
- 2-10 and 12 positions available
- Sealed versions available

**APPLICATIONS**

Telecommunications, computers and peripherals, instruments and controls.



**Series 78C DIMENSIONS** In inches (and millimeters)



DIP Switches

**SPECIFICATIONS**

**Mechanical**

- Mechanical Life:** 2000 operations per switch.
- Operation Force:** 1000gf max.
- Stroke:** 2.0mm
- Operation Temp:** -20°C to 70°C
- Storage Temp:** -40°C to 85°C
- Vibration Test:** MIL-STD-202F METHOD 201A.
- Frequency: 10-55-10Hz/1 min.
- Directions: X,Y,Z, three mutually perpendicular directions.
- Time: 2 hours each direction.
- High reliability.
- Shock Test:** MIL-STD-202F METHOD 213 B. CONDITION A.
- Gravity: 50G (peak value), 11 msec.
- Direction and times: 6 sides and 3 Times in each direction.
- High reliability.

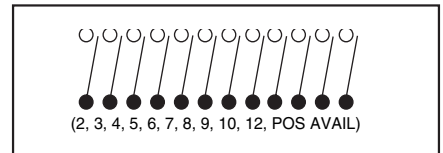
**Electrical**

- Electrical Life:** 2000 operations per switch
- 24VDC, 25mA.
- Non-Switching Rating:** 100mA, 50VDC.
- Switching rating:** 25mA, 24VDC.
- Contact Resistance:** 50mΩ max. at initial.
- Insulation Resistance:** (at 500VDC) 100mΩ min.
- Dielectric Strength:** 500VAC/1 minute.
- Capacitance:** 5pF max.
- Circuit: Single pole single throw.

**Soldering and Cleaning Process**

- For best results follow these recommendations:
- Keep switch contacts in "OFF" position for all operations.
- Wave Soldering:** Recommended solder temperature: 500°F (260°C) max 5 seconds.
- Hand Soldering:** Use a soldering iron of 30 Watts or less, controlled at 608°F (320°C) approximately 2 seconds while applying solder.
- Cleaning:** Tape sealed versions withstand cleaning processes.

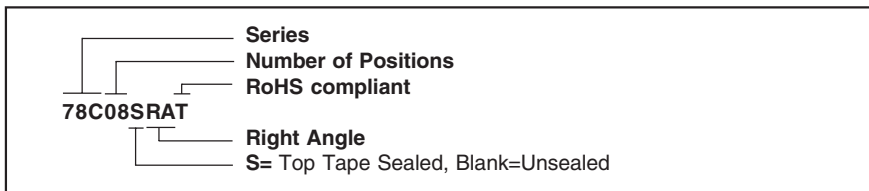
**CIRCUITRY**



**Materials**

- Base Contact:** Phosphor bronze with gold plating over nickel
- Terminals:** Brass with gold plating over nickel
- Nonconductive Parts:** Plastic UL94V-0
- Potting Material:** Epoxy
- Tape Seal:** Polyester film.

**ORDERING INFORMATION**



TABLE

Grayhill Part Number	Length Dimension inches (mm)	Packaging
78C02RAT	0.254(6,44)	73 pcs/tube
78C03RAT	0.354(8,98)	52 pcs/tube
78C04RAT	0.454(11,52)	40 pcs/tube
78C05RAT	0.554(14,06)	33 pcs/tube
78C06RAT	0.654(16,60)	28 pcs/tube
78C07RAT	0.754(19,14)	24 pcs/tube
78C08RAT	0.854(21,68)	21 pcs/tube
78C09RAT	0.954(24,22)	19 pcs/tube
78C10RAT	1.054(26,76)	17 pcs/tube
78C12RAT	1.254(31,84)	14 pcs/tube
78C02SRAT	0.254(6,44)	70 pcs/tube
78C03SRAT	0.354(8,98)	52 pcs/tube
78C04SRAT	0.454(11,52)	39 pcs/tube
78C05SRAT	0.554(14,06)	32 pcs/tube
78C06SRAT	0.654(16,60)	28 pcs/tube
78C07SRAT	0.754(19,14)	24 pcs/tube
78C08SRAT	0.854(21,68)	21 pcs/tube
78C09SRAT	0.954(24,22)	19 pcs/tube
78C10SRAT	1.054(26,76)	17 pcs/tube
78C12SRAT	1.254(31,84)	14 pcs/tube