

SURFACE MOUNT SWITCHES

- Standard DIP Package Outline Includes PIANO-DIP®
- Tactile Feedback, Board Mount Switches

THRU-HOLE DIP SWITCHES

- Consistent High Contact Pressure With Spring and Ball Contact System
- Standard Base Seal; Optional Top Tape Seal
- Large Selection of Types and Styles Includes Military Qualified Switches

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SURFACE MOUNT SWITCHES

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THRU-HOLE DIP SWITCHES

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SURFACE MOUNT SWITCHES

Circuitry	Description	Type of Actuation	Series	No. of Positions Available	No. of Actuators	Page Number
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	Tactile	Snap Dome	95	1	1	B-5
	Standard DIP Package	Top Actuated, Recessed Slide	90	2-10	1/Station	B-7
	Standard DIP Package	Side Actuated	76	2-10 & 12	1/Station	B-10
SPDT, DPST	Standard DIP Package	Side Actuated, Top Actuated	78	2-10	1/Station	B-9
Standard, Complement Code	Octal, BCD & Hex	Rotary	94	8, 10 & 16	1	B-22

THRU-HOLE DIP SWITCHES

(Also see Series 76, 78 and 90 Surface Mount DIP Switches)

Circuitry	Description	Type of Actuation	Series	No. of Positions Available	No. of Actuators	Page Number
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SINGLE THROW SWITCHES

Single Pole, Single Throw	Machine Insertable	Recessed Slide	90	2-10	1/Station	B-11
	Standard	Raised Rocker	76	2-10 & 12	1/Station	B-12
		Recessed Rocker	76	2-10 & 12	1/Station	B-12
		Side Actuated	76	2-10 & 12	1/Station	B-12
		Slide*	78	2-10 & 12	1/Station	B-13
		Recessed Slide*	78	2-10	1/Station	B-13
	Military Qualified	Raised Rocker (MS83504/01)	76	2-10 & 12	1/Station	B-17
		Recessed Rocker (MS83504/02)	76	2-10 & 12	1/Station	B-17
		Side Actuated (MS83504/11)	76	2-10 & 12	1/Station	B-17
		Slide (MS83504/04)	78	2-10 & 12	1/Station	B-17
Machine Insertable (MS83504/12)		90	2-10	1/Station	B-17	
Multiple Pole, Single Throw	2PST	Slide*	78	1-5	1/Station	B-13
	3PST	Slide*	78	1-3	1/Station	B-13
	4PST	Slide*	78	1 & 2	1/Station	B-13
	5, 6, 7, 8, or 10PST	Slide*	78	1	1/Station	B-13

MULTIPLE THROW SWITCHES

Circuit Selector	1-of-10 Circuits	Linear Action Slide	79	10	1	B-21
	1-of-16 Circuits	Linear Action Slide	79	16	1	B-21
Single Pole, Multiple Throw	Standard	Raised Rocker	76	2-4	1/Station	B-14
		Recessed Rocker	76	2-4	1/Station	B-14
		Toggle	76	2-4	1/Station	B-14
		Slide*	78	1-6	1/Station	B-14
	Military Qualified	Raised Rocker (MS38504/05)	76	2-4	1/Station	B-17
	Recessed Rocker (MS38504/06)	76	2-4	1/Station	B-17	
Double Pole, Double Throw	Standard	Raised Rocker	76	1 & 2	1/Station	B-15
		Recessed Rocker	76	1 & 2	1/Station	B-15
		Toggle	76	1 & 2	1/Station	B-15
		Slide*	78	1 & 2	1/Station	B-15

BINARY CODED OUTPUT SWITCHES

Standard Code	BCD & Hexadecimal	Linear Action Slide	79	10 & 16	1	B-18
	Octal, BCD, & Hex	Rotary	94	8, 10 & 16	1	B-22
Complement	Octal, BCD, & Hex	Rotary	94	8, 10 & 16	1	B-22

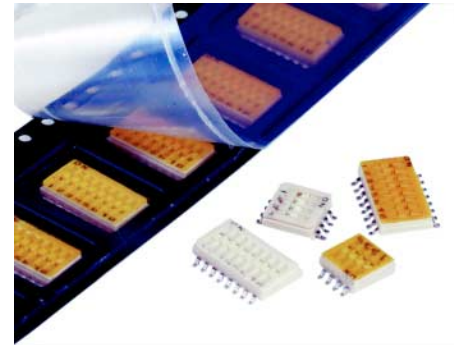
*Switch is also available with right angle termination. See page listed above and page B-20.

Grayhill Series 76 DIP switches are covered by one or more of the following patents pending: 4,031,345, Canada 1,035,820 (1978), and Canada 1,055,551 (1979). Series 79 switches are protected by patent number 4,491,703. Series 90 switches are protected by patent numbers 4,590,344 and 4,670,630.

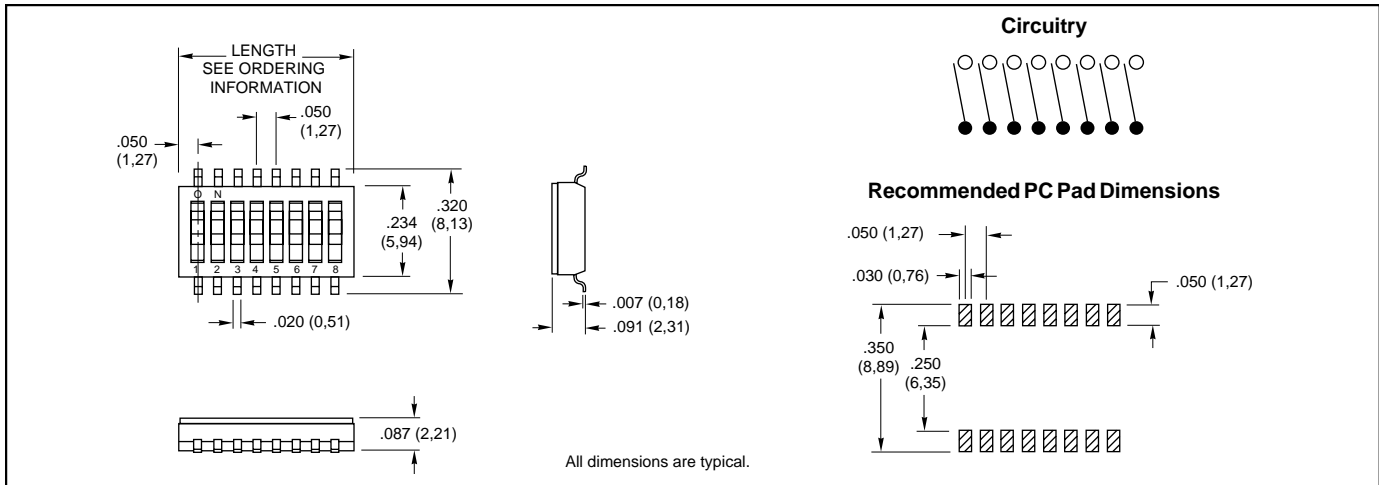
SERIES 97
Half-Pitch

FEATURES

- Requires One-Half the Board Space of a Standard DIP Switch
- Assembly Process Compatible to 260°C
- Available in 4 and 8 Position Lengths
- Tape and Reel Packaging for Surface Mount Assembly



DIMENSIONS In inches (and millimeters)



SPECIFICATIONS

Electrical Ratings

Contact Rating: 100 mA at 50 Vdc non-switching; 25 mA at 24 Vdc, 10 mA at 50 Vdc switching.
Contact Resistance: 100 mohms maximum initially (measured at 10 mA, 50 mVdc). 150 mohms maximum after life.
Insulation Resistance: Minimum at 100 Vdc between adjacent closed contacts and also across open switch contacts.
 Initial: 1,000 Mohms After Life: 200 Mohms
Dielectric Strength: 300 Vac RMS, minimum voltage measured between adjacent closed contacts and also across open switch contacts.
Switch Capacitance: 5 pF at 1 megahertz

Mechanical Ratings

Mechanical Life: 1,000 cycles minimum
Vibration Resistance: Per MIL-STD-202, Method 204, Test Condition A: There shall be no opening of closed contacts or closing of open contacts in excess of 10 microseconds, and there shall be no evidence of broken, loose, deformed or displaced parts.
Mechanical Shock: Per MIL-STD-202, Method 213, Test Condition E: There shall be no opening of closed contacts or closing of open contacts in excess of 10 microseconds, and there shall be no evidence of broken, loose, deformed or displaced parts.
Thermal Shock Resistance: Per MIL-STD-202, Method 107G, there shall be no evidence of physical damage or permanent change in electrical characteristics.

Terminal Strength: Per MIL-STD-202, Method 211A, Test Condition A. There shall be no evidence of mechanical distortion, cracking of the switch body or changes in the electrical characteristics.
Thermal Aging: Per MIL-STD-202, Method 108A. 1000 hours at 125°C.

Environmental Ratings

Operating Temperature: -40°C to +85°C
Storage Temperature Range: -55°C to +85°C
Moisture Resistance: Per MIL-STD-202, Method 106, there shall be no evidence of corrosion and the insulation resistance shall be no less than 10 Mohms.

Soldering Information

Recommended Processing Temperature: 220°C–230°C (1 pass—260°C maximum)
Resistance to Soldering Heat: Reflow or infrared soldering, 260°C for 60 seconds.
Flux Cleaning: Sealed switches withstand aqueous, detergent and isopropyl alcohol washing.

Materials and Finishes

Non-Conductive Parts: Cover, slide and base are a natural colored thermoplastic. (UL94V-O)
Shorting Member: Copper alloy, plated. 10 microinches minimum gold over nickel.
Base Contacts: Brass, plated. 10 microinches minimum gold over nickel.
Terminals: Brass, solder-plated, solderable per MIL-STD-202, Method 208.

Tape and Reel Packaging

Switches will be supplied on 13 inch reels with 2000 switches per reel. The 4 position switches have a tape width of 16mm, while the 8 position switches have a tape width of 24mm. The tape pockets have a 12mm pitch.

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

ORDERING INFORMATION* (2000 switches per reel)

No. of Positions	Length Inches (mm)	Part Number Without Tape Seal	Part Number With Tape Seal
4	0.250 (6,35)	97S04R	97S04SR
8	0.450 (11,43)	97S08R	97S08SR

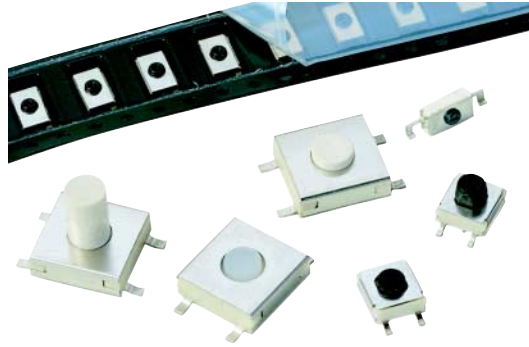
* Consult Grayhill for 2 and 6 position switches.

SERIES 95

Tactile

FEATURES

- Excellent Tactile Feedback
- Compatible with SMT Assembly Including Infrared and Vapor Phase



DIP Switches

DIMENSIONS In inches (and millimeters)

6.9 mm x 3.5 mm Flush Mount Right Angle 95B04 Style

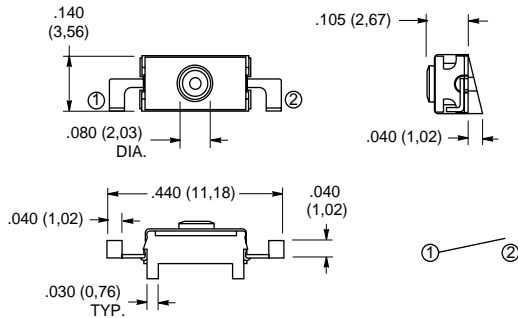


Figure 1

6.0 mm x 6.0 mm Gull Wing 95B06 Style

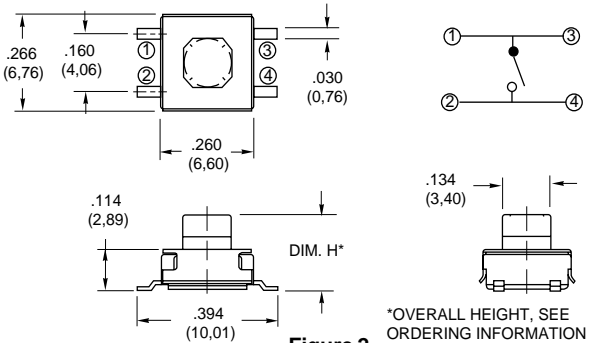


Figure 2

11.5 mm x 11.5 mm Gull Wing 95B12 Style

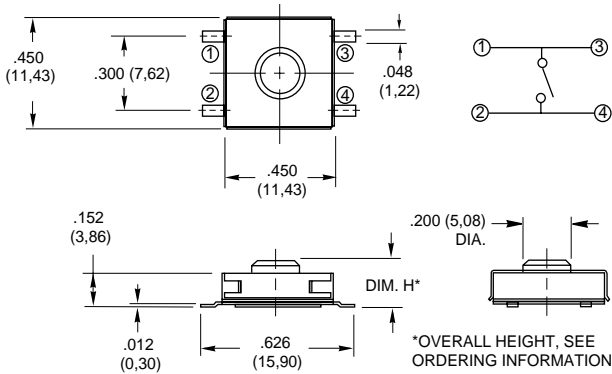
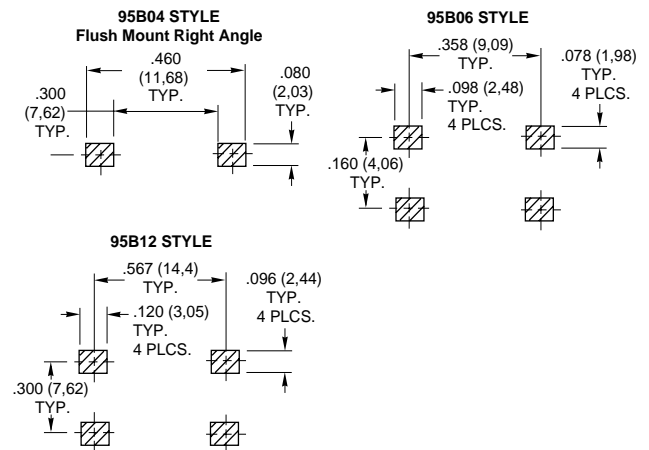


Figure 3

Recommended Solder Pad Layout



SPECIFICATIONS

Electrical Ratings

Maximum Power: .5 VA

Maximum Voltage: 50 volts

Maximum Current: 100 mA

Insulation Resistance: 5000 mohms after life

Dielectric Strength: ≤ 50 mohms initial, ≤ 100 mohms after life

Contact Resistance: 50 mohms maximum initially (measured at 10 mA, 50 mVdc). 100 mohms maximum after life.

Contact Bounce: less than 10 mS

Contact System:

B04/B12: Silver on silver;

B06: Silver on palladium

Mechanical Ratings

Actuation Force: See Ordering Information; dependent on switch style

Mechanical Life: See Ordering Information; dependent on switch style

Button Travel: See Ordering Information; dependent on switch style

Terminal Strength: 5 cycle bends per MIL-STD-202F, Method 211

Vibration Resistance: Pass 10-2000 Hz at 15G, or a 0.060 inch double amplitude test per MIL-STD 204, Condition B.

Mechanical Shock: Pass 50G, 11 mS, half-sine test per MIL-STD 213B, Condition A.

Thermal Shock Resistance: Pass MIL-STD-202F, Method 107G showing no evidence of physical damage or change in electrical characteristics including normal contact resistance after 5 operations.

Thermal Aging: Pass MIL-STD-202F, Method 108A, Test Condition D. Requires operation at 125°C for 1,000 hours. Measurements at 500 and 1,000 hours of exposure showing no more than 50% change in contact resistance for test duration.

Environmental Ratings

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

Storage Temperature Range: -40°C to +85°C

Moisture Resistance: Pass MIL-STD-202F, Method 106 showing no evidence of corrosion and insulation resistance greater than 10 Mohms, 1,000 Mohms at 250 Vac after drying period.

Flammability: Test to IEC Standard 695-2-2 for 30 seconds of exposure

Environmental Life: 50 mohms maximum contact resistance after exposure to a Battelle Class III test per EIA 364, TP 65 (B04 tested only).

Soldering Information

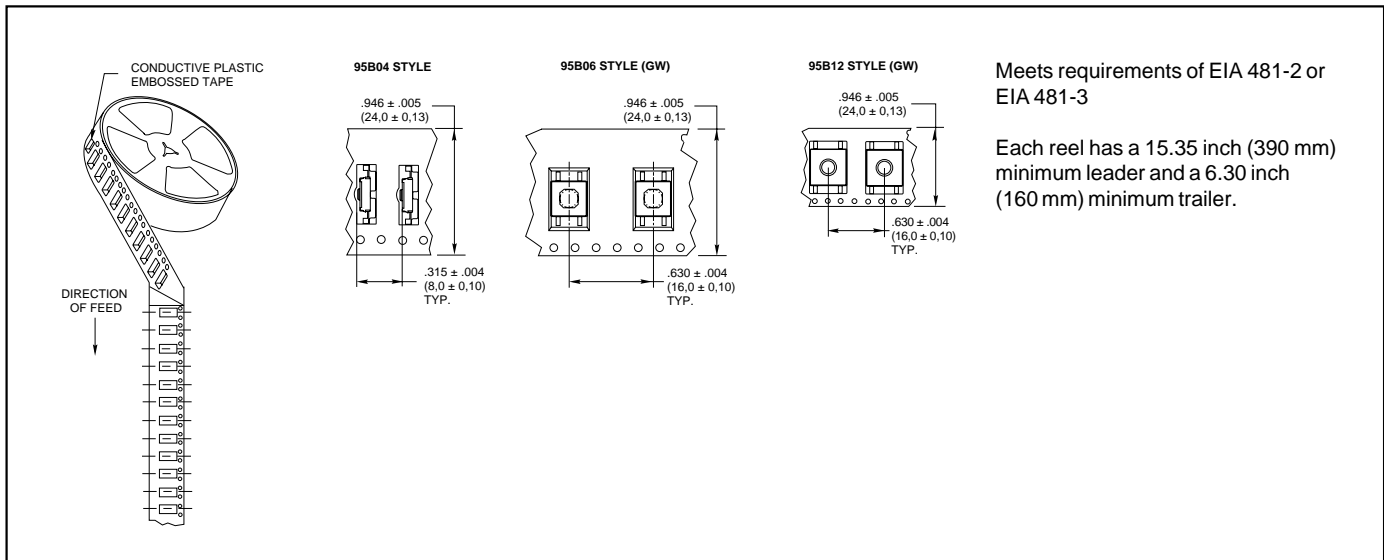
Soldering Temperature: Infrared or Vapor Phase with 260°C maximum temperature for 95B06 and 95B12 styles, 230° maximum temperature for 95B04 styles.

Cleaning: sealed to withstand cleaning processes.

Tape and Reel Packaging

Standard Tape and Reel Packaging per EIA-481-2
Switches per reel: See Ordering Information

TAPE AND REEL PACKAGING



ORDERING INFORMATION

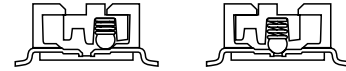
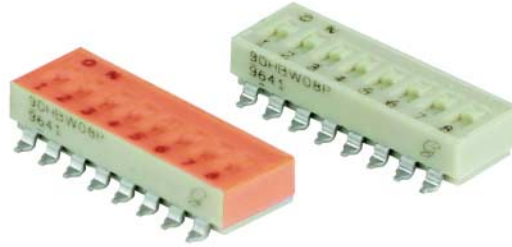
Description	Figure	Actuator Type	Overall Height	Actuation Force	Life (Cycles)	Switches/ Reel	Switch Part Number
Flush Mount Right Angle	1	Standard	.105"	240± 60g	25,000	2000	95B04A2RAR
Perpendicular mnt. w/gull wing terminals	2	Standard	.213"	140 ± 50g	500,000	1000	95B06C1GWR
Perpendicular mnt. w/gull wing terminals	2	Standard	.213"	275 ± 60g	100,000	1000	95B06C3GWR
Perpendicular mnt. w/gull wing terminals	2	Soft/rubber	.159"	140 ± 50g	500,000	1000	95S06A1GWR
Perpendicular mnt. w/gull wing terminals	2	Soft/rubber	.159"	275 ± 60g	100,000	1000	95S06A3GWR
Perpendicular mnt. w/gull wing terminals	3	Standard	.172"	300 ± 75g	1,000,000	750	95B12A3GWR
Perpendicular mnt. w/gull wing terminals	3	Standard	.205"	300 ± 75g	1,000,000	750	95B12B3GWR
Perpendicular mnt. w/gull wing terminals	3	Standard	.445"	300 ± 75g	1,000,000	750	95B12C3GWR

Available from your local Grayhill Distributor.
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SERIES 90HB SPST, Low Profile

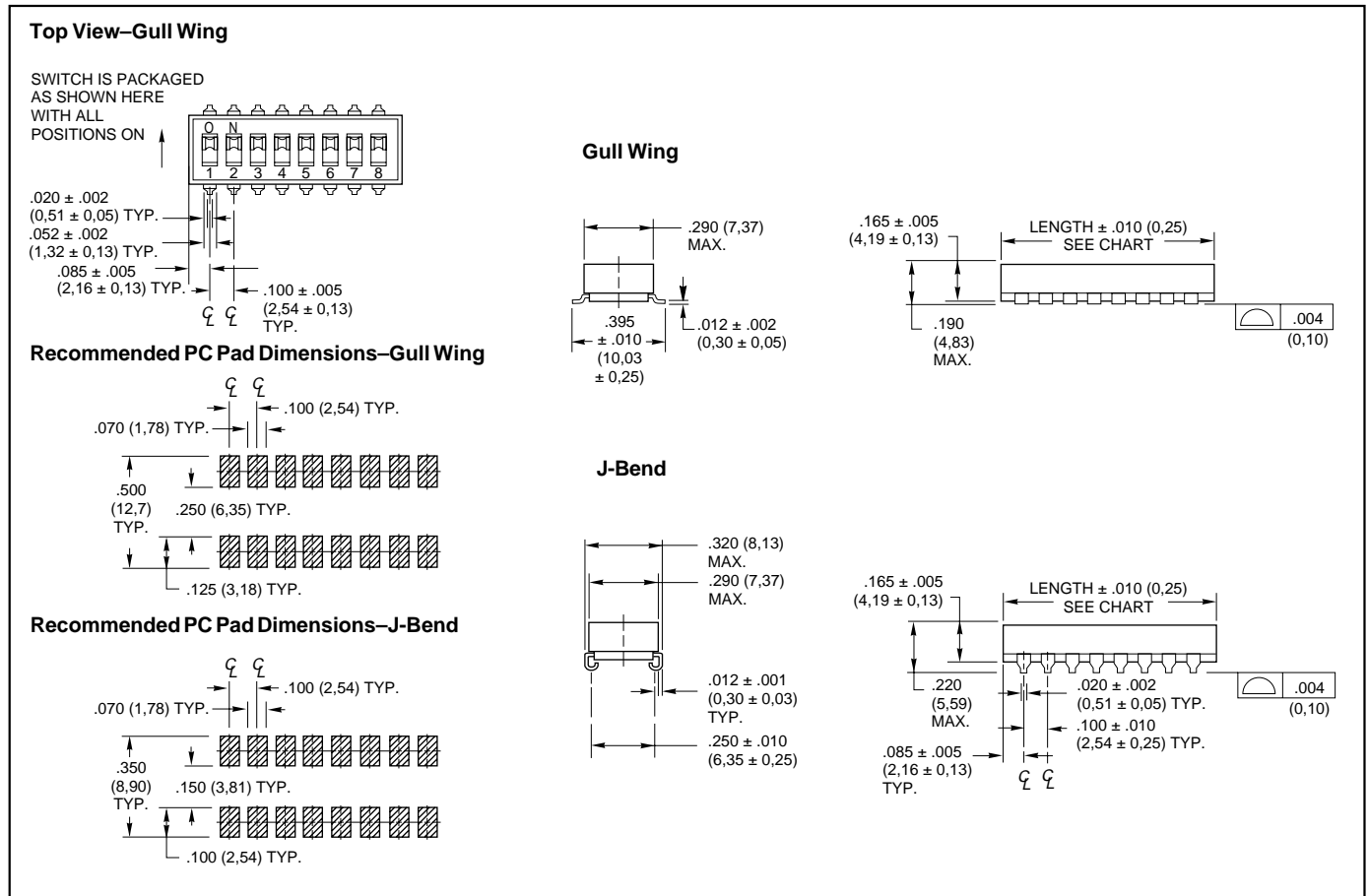
FEATURES

- Now Available with Polyimide Tape Seal that Easily Removes After Processing
- Compatible with SMT Assembly, Including Infrared Reflow and Vapor-Phase
- Top Seal Withstands High Pressure Aqueous Cleaning
- Reliable Spring and Ball Contact



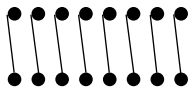
DIP Switches

DIMENSIONS In inches (and millimeters)



CIRCUITRY

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



SPECIFICATIONS

Electrical Ratings

Make-and-break Current Rating: 2,000 operations per switch position at these resistive loads: 10 mA, 30 Vdc; or 10 mA, 50 mVdc; 10 mA, 50 mVdc; or 25 mA, 24 Vdc; or 100 mA, 6 Vdc.

Contact Resistance: (measured at 10 mA, 50 mVdc). Initial: 20 mohms maximum, After Life: 100 mohms maximum

Insulation Resistance: Minimum, at 100 Vdc between adjacent closed contacts and also across open switch contacts.

Initial (Mohms): 5,000, After Life (Mohms): 1,000

Dielectric Strength: Minimum voltage (AC RMS) measured between adjacent closed contacts and also across open switch contacts.

Initial: 500 volts, After Life: 500 volts

Current Carry Rating: 3A maximum rise of 20°C

Switch Capacitance: 2 pF at 1 megahertz

Mechanical Ratings

Where Grayhill performance is superior, the MIL spec is listed in parentheses.

Mechanical Life: 5,000 operations per switch position

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

Mechanical Shock: Per Method 213, Test Condition A. 1mS 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.

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

Storage Temperature Range: -40°C to +85°C

Moisture Resistance: Per specification, Method 106.

Soldering Information

Solderability: Per MIL-STD-202, Method 208

Soldering Heat Resistance: Per MIL-S-83504, six second test.

Recommended Processing Temperature: 220°C–230°C (1 pass—260°C maximum)

Processing Position: Switch is to be processed with all actuators in the closed (on) position as shipped.

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

Cleaning: 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 10 microinches minimum over nickel barrier.

Base Contacts: Copper alloy, gold-plated 10 microinches minimum over nickel barrier.

Terminals: Copper alloy, solder-plated over nickel barrier.

Non-Conductive Parts: Thermoplastic (UL94V-O)

Tape and Reel Packaging

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

Tape Seal: Polyimide film

ORDERING INFORMATION

Series

Terminal Style: W = Gull Wing, J = J-Bend

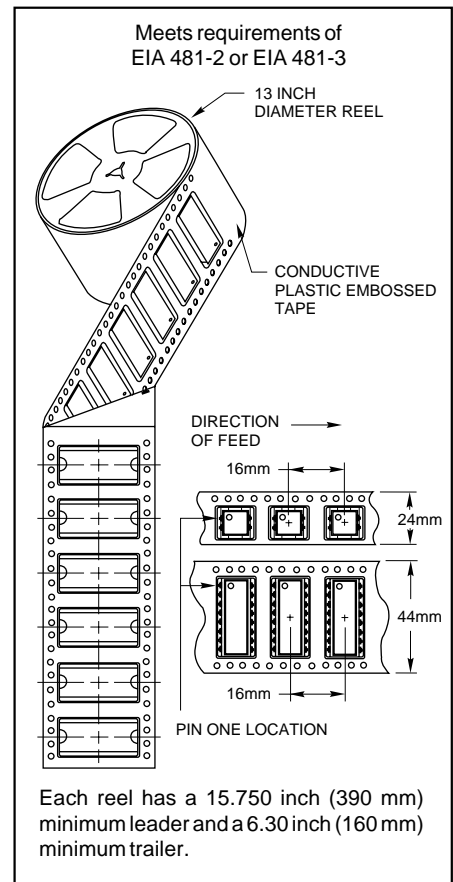
Packaging: R = Tape and reel packaging (750 switches/reel)
Blank = Tube packaging (each tube is 19.5" long)

Seal: P = Polyimide Seal
Blank = No Seal

Number of Positions: 02 through 10

No. of Pos.	Length Inches	Length Metric	No. of Pos.	Length Inches	Length Metric
2	.270"	6,9 mm	7	.770"	19,56 mm
3	.370"	9,4 mm	8	.870"	22,1 mm
4	.470"	11,9 mm	9	.970"	24,64 mm
5	.570"	14,48 mm	10	1.070"	27,2 mm
6	.670"	17,0 mm			

TAPE AND REEL PACKAGING

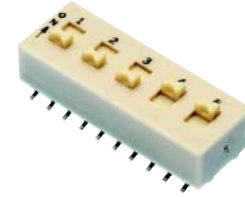


Available from your local Grayhill Distributor. For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

SERIES 78H SPDT and DPST

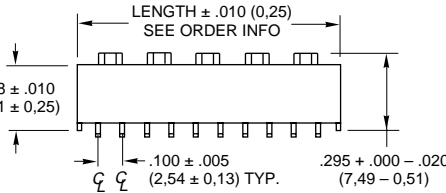
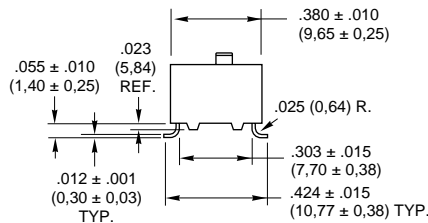
FEATURES

- Compatible with SMT Assembly Including Infrared Reflow and Vapor-Phase
- Circuitry not Offered in any Other Surface Mount Configuration
- Reliable Spring and Ball Contact

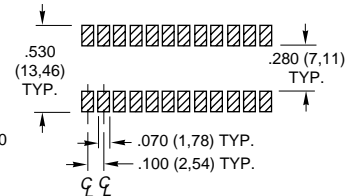


DIMENSIONS In inches (and millimeters)

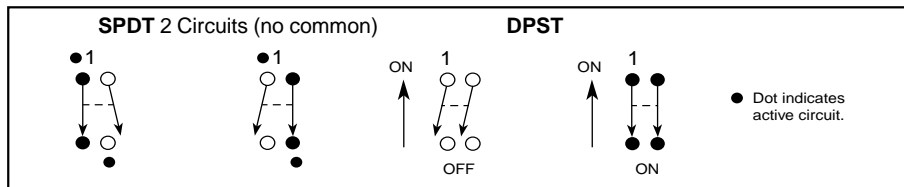
SPDT, DPST, Top Actuated, Slide Operated



Recommended PC Pad Dimensions



CIRCUITRY



SPECIFICATIONS

Electrical Ratings

Make-and-break Current Rating: 10,000 operations per switch position at 1 mA, 5 Vdc; 50 mA, 30 Vdc; or 150 mA, 30 Vdc

Contact Resistance: Initial: 30 mohms max. After Life: 100 mohms max. (10 mA at 50 Vdc, open circuit)

Insulation Resistance: Minimum, at 100 Vdc between adjacent closed contacts and also across open switch contacts. Initial: 2,000 Mohms; After Life: 1,000 Mohms

Dielectric Strength: Minimum voltage (AC, RMS) measured between adjacent closed contacts and also across open switch contacts. Initial: 750 volts; After Life: 500 volts

Current Carry Rating: 4 amps, maximum rise of 20°C

Switch Capacitance: 2 pF at 1megahertz

Mechanical Ratings

Mechanical Life: 20,000 operations per switch position

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)

ORDERING INFORMATION: Tube Packaging

No. of Positions	Length (inches)	Length (metric)	Carrier Width Dim. A	Part Number*	
				SPDT	DPST
1	0.280"	7,1 mm	24 mm	78HJ01GW	78HF01GW
2	0.480"	12,2 mm	24 mm	78HJ02GW	78HF02GW
3	0.680"	17,3 mm	32 mm	78HJ03GW	78HF02GW
4	0.880"	22,4 mm	44 mm	78HJ04GW	78HF04GW
5	1.080"	27,4 mm	44 mm	78HJ05GW	78HF05GW

* Add "R" to the Grayhill part number for tape and reel packaging (500 switches/reel).

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

Materials and Finishes

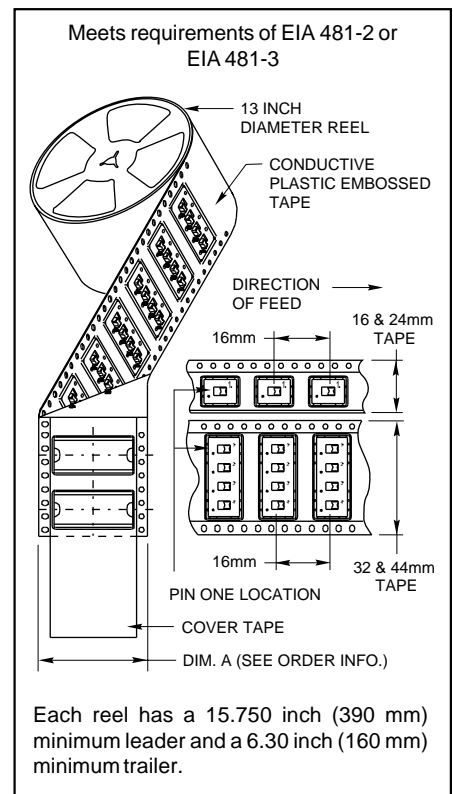
Shorting Member: Brass, gold-plated, 10 microinches minimum over nickel barrier.

Base Contacts: Copper alloy, gold-plated, 10 microinches minimum over nickel barrier.

Terminals: Copper alloy, solder-plated over nickel barrier.

Non-Conductive Parts: Cover is natural color thermoplastic, actuators are white thermoplastic (UL94V-O)

TAPE AND REEL PACKAGING

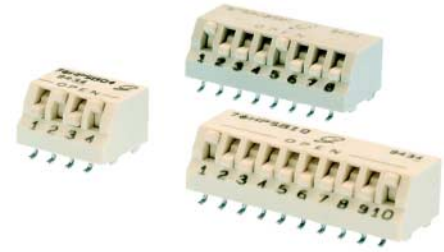


SERIES 76HP

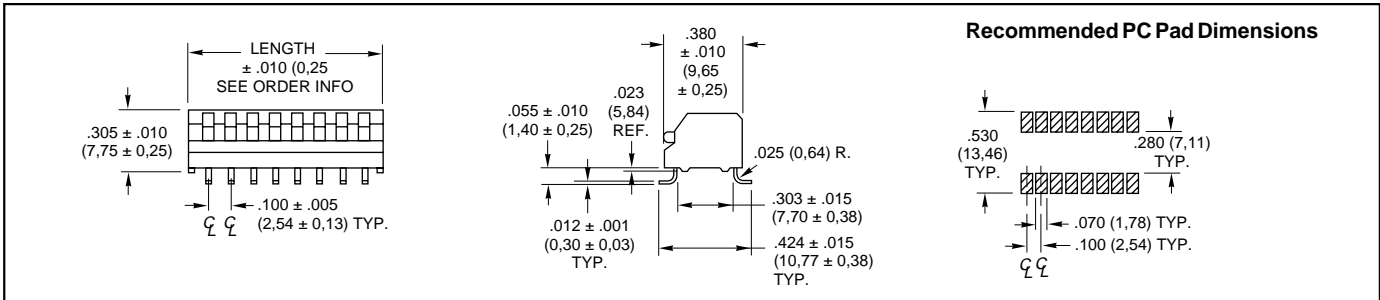
Side Actuated PIANO-DIP®

FEATURES

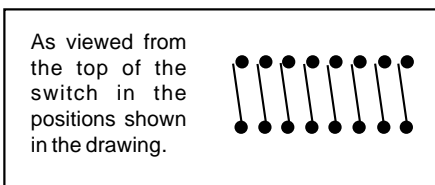
- Compatible with SMT Assembly Including Infrared Reflow and Vapor-Phase
- Easily Accessed when PC Boards are Racked
- Reliable Spring and Ball Contact



DIMENSIONS In inches (and millimeters)



CIRCUITRY



SPECIFICATIONS

Electrical Ratings

Make-and-break Current Rating: 10,000 operations per switch position at 1 mA, 5 Vdc; 50 mA, 30 Vdc; or 150 mA, 30 Vdc

Contact Resistance: Initial: 30 mohms maximum; After Life: 100 mohms maximum (10 mA at 50 Vdc, open circuit)

Insulation Resistance: Minimum, at 100 Vdc between adjacent closed contacts and also across open switch contacts. Initial: 2,000 Mohms

Dielectric Strength: Minimum voltage (AC RMS) measured between adjacent closed contacts and also across open switch contacts. Initial: 750 volts; After Life: 500 volts

Carry Rating: 5 amps, maximum rise of 20°C

Switch Capacitance: 2 pF at 1 megahertz

Mechanical Ratings

Mechanical Life: 20,000 operations per switch position

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.

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

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

Moisture Resistance: Per specification, Method 106

Soldering Information

Solderability: Per MIL-STD-202, Method 208 Tested to EIA Standard RS-448-2.

Resistance to Soldering Heat: Per MIL-S-83504, six second test

Recommended Processing Temperature: 220°C—230°C (1 pass—260°C maximum)

Processing Position: Switch is to be processed with all actuators in the closed (on) position as shipped.

Materials and Finishes

Shorting Member: Brass, gold-plated, 10 microinches minimum over nickel barrier.

Base Contacts: Copper alloy, gold-plated,

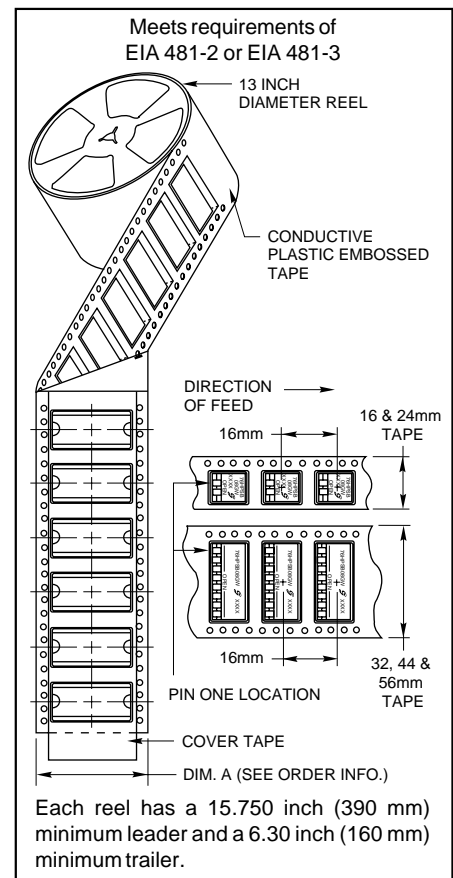
10 microinches minimum over nickel barrier.

Terminals: Copper alloy, solder plated over nickel barrier.

Non-Conductive Parts: Cover is natural color thermoplastic, actuators are white thermoplastic (UL94V-O)

Tape Seal: Provided without tape seal. Contact Grayhill if tape seal is required.

TAPE AND REEL PACKAGING



ORDERING INFORMATION: Tape and Reel Packaging (500 switches per reel)

No. of Positions*	Length (inches)	Length (metric)	Carrier Width Dim. A	Part Number
2	0.280"	7,1 mm	24 mm	76HPSB02GWR
4	0.480"	12,2 mm	24 mm	76HPSB04GWR
6	0.680"	17,3 mm	32 mm	76HPSB06GWR
8	0.880"	22,4 mm	44 mm	76HPSB08GWR
10	1.080"	27,4 mm	44 mm	76HPSB10GWR

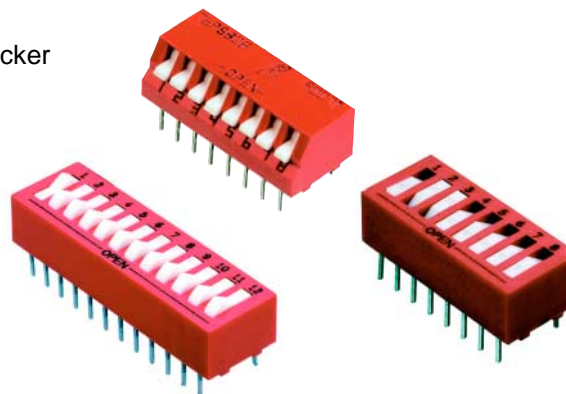
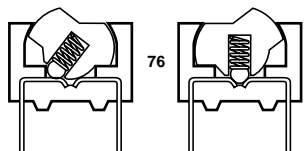
* For other lengths, contact Grayhill, Inc.

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

SERIES 76
SPST Rocker

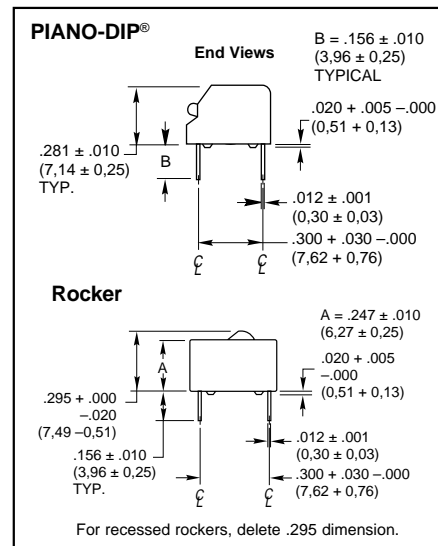
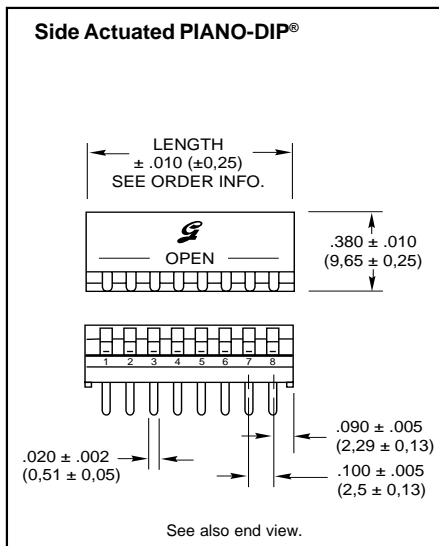
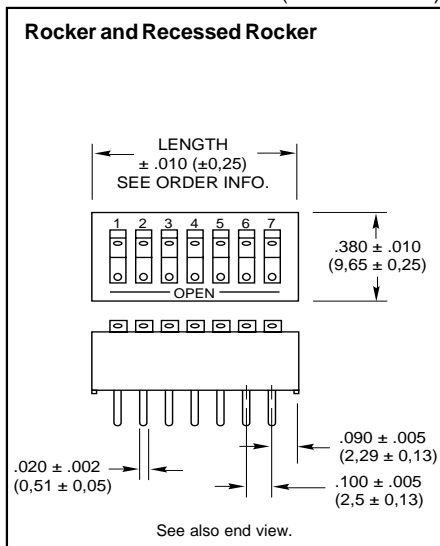
FEATURES

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

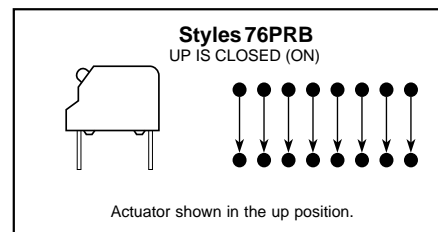
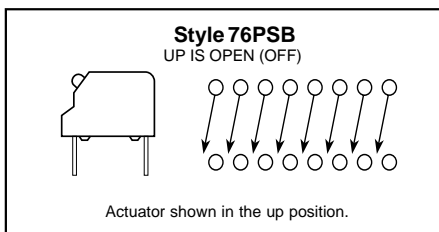
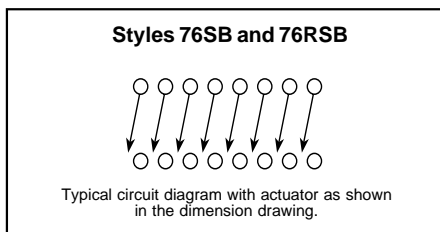


DIP Switches

DIMENSIONS In inches (and millimeters)



CIRCUITRY



ORDERING INFORMATION

76RSB04S

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

Seal*: S = Tape Seal
Blank = No 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

*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.

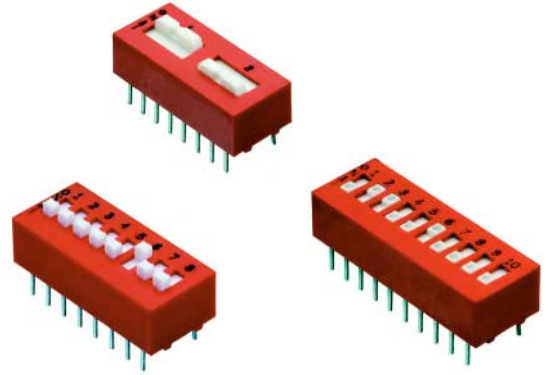
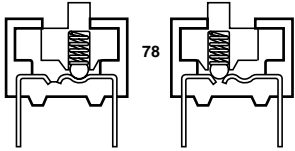
For Specifications, see page B-16.
For Options and Accessories, see page B-20.

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



DIP Switches

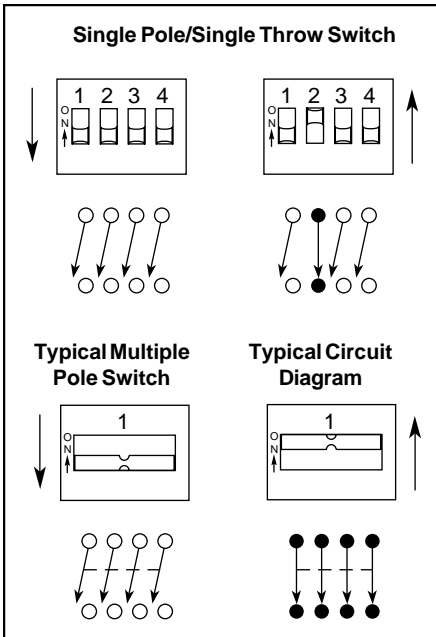
DIMENSIONS In inches (and millimeters)

Single Pole/Single Throw Switch in Raised and Recessed Slides

Note: Recessed slides have a dimple for tool actuation. For recessed slides, the .295 dimension does not apply.

Typical Multiple Pole Switch with Raised Slides (Switch shown here is 78H02, 4PST)

CIRCUITRY



ORDERING INFORMATION

Circuitry	No. of Positions	Length Inches	Length Metric	No./Tube	Raised Slides*	Recessed Slides*	
SPST	2	0.280"	7,1mm	35	78B02	78RB02	
	3	0.380"	9,7mm	27	78B03	78RB03	
	4	0.480"	12,2mm	21	78B04	78RB04	
	5	0.580"	14,7mm	18	78B05	78RB05	
	6	0.680"	17,3mm	15	78B06	78RB06	
	7	0.780"	19,8mm	13	78B07	78RB07	
	8	0.880"	22,4mm	12	78B08	78RB08	
	9	0.980"	24,9mm	10	78B09	78RB09	
	10	1.080"	27,4mm	9	78B10	78RB10	
	12	1.280"	32,5mm	8	78B12	78RB12	
	2PST	1	0.280"	7,1mm	35	78F01	Recessed Slides Not Available
		2	0.480"	12,2mm	21	78F02	
3		0.680"	17,3mm	15	78F03		
4		0.880"	22,4mm	12	78F04		
5		1.080"	27,4mm	9	78F05		
6		1.280"	32,5mm	8	78F06		
3PST	1	0.380"	9,7mm	27	78G01	Recessed Slides Not Available	
	2	0.680"	17,3mm	15	78G02		
	3	0.980"	24,9mm	10	78G03		
4PST	1	0.480"	12,2mm	21	78H01	Recessed Slides Not Available	
	2	0.880"	22,4mm	12	78H02		

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" to the Grayhill part number.

ADDITIONAL INFORMATION

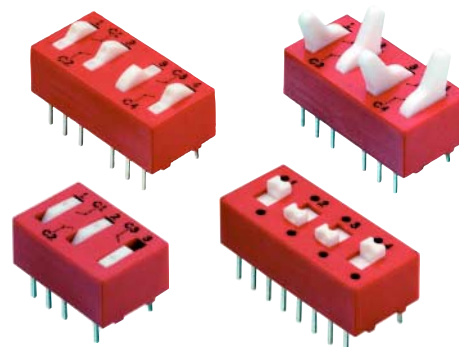
For Specifications see page B-16.
For other Options and Accessories, see pages B-20 and B-21.

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

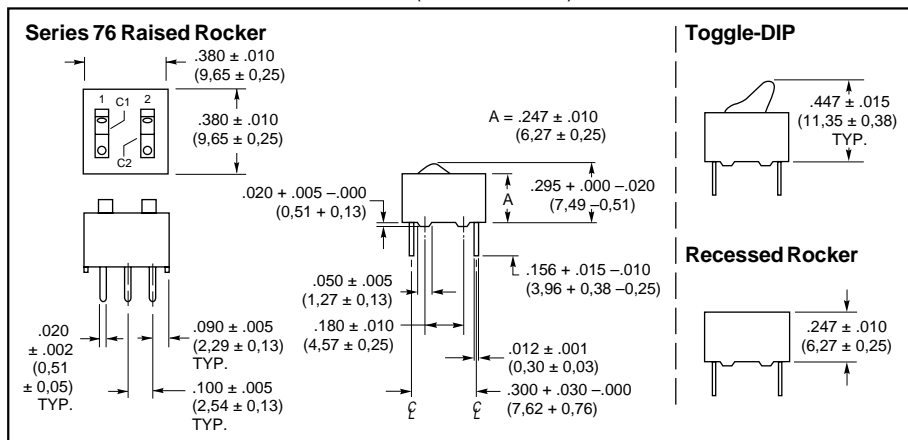
FEATURES

- 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

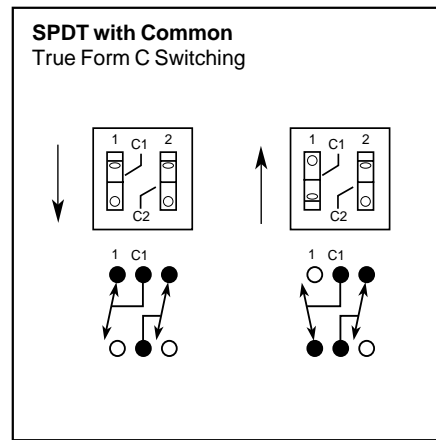


DIP Switches

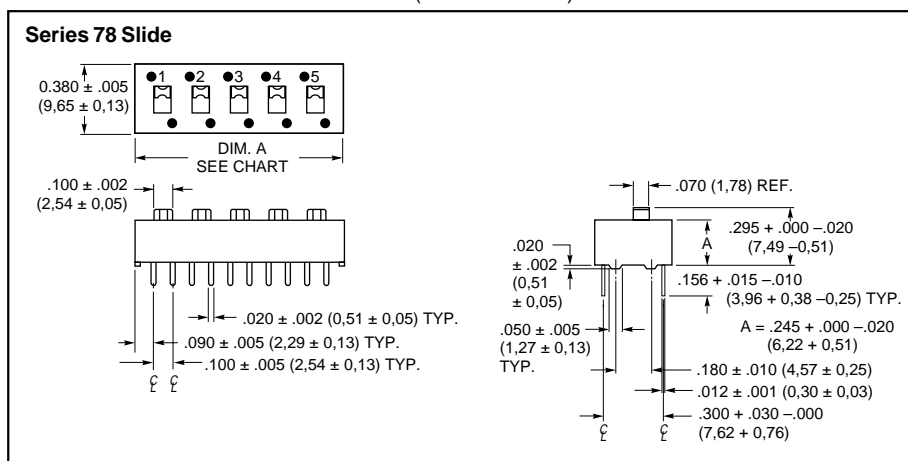
DIMENSIONS: Series 76 In inches (and millimeters)



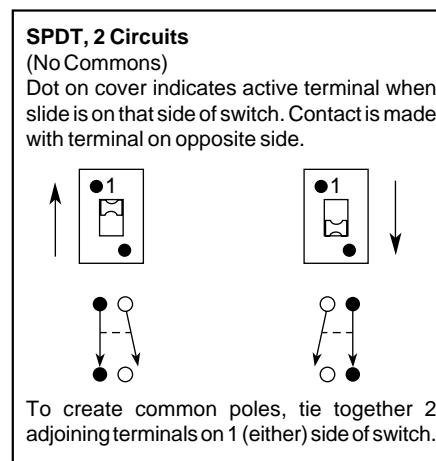
CIRCUITRY: Series 76



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	76SC02	76RSC02	76STC02
	3	0.580"	14,7mm	18	76SC03	76RSC03	76STC03
	4	0.780"	19,8mm	13	76SC04	76RSC04	76STC04
SPDT 2 Circuits	1	0.280"	7,1mm	35	78J01	—	—
	2	0.480"	12,2mm	21	78J02	—	—
	3	0.680"	17,3mm	15	78J03	—	—
	4	0.880"	22,4mm	12	78J04	—	—
	5	1.080"	27,4mm	9	78J05	—	—
	6	1.280"	32,5mm	8	78J06	—	—

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

ADDITIONAL INFORMATION

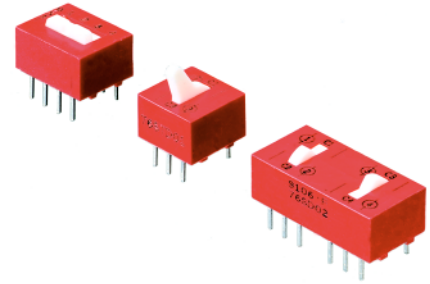
For Specifications, see page B-16. For Options and Accessories, see pages B-20 and B-21.

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

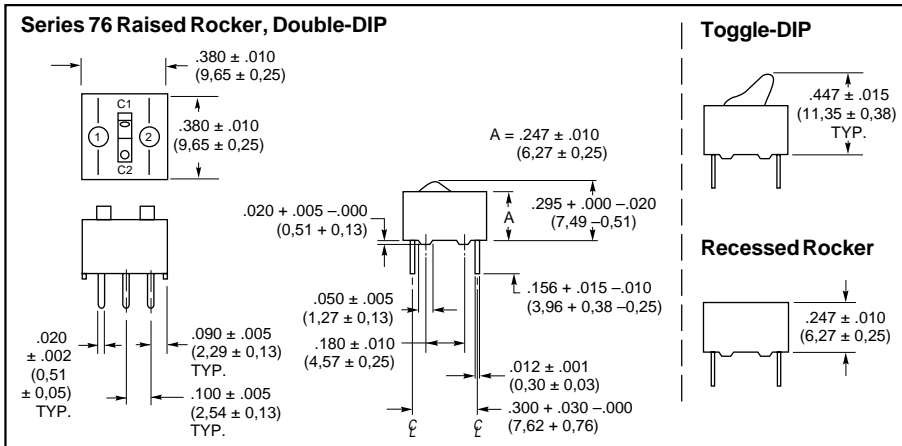
SERIES 76 and 78 DPDT

FEATURES

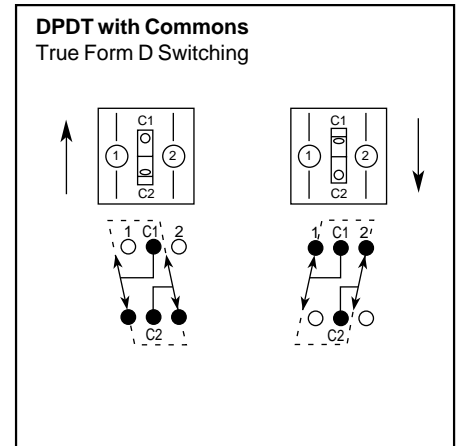
- Raised and Recessed Rocker, and Toggle Actuated Styles
- DPDT with Common Poles, or DPDT with 4 Isolated Circuits
- Spring and Ball Contact
- Top Tape Seal Option for Most Styles



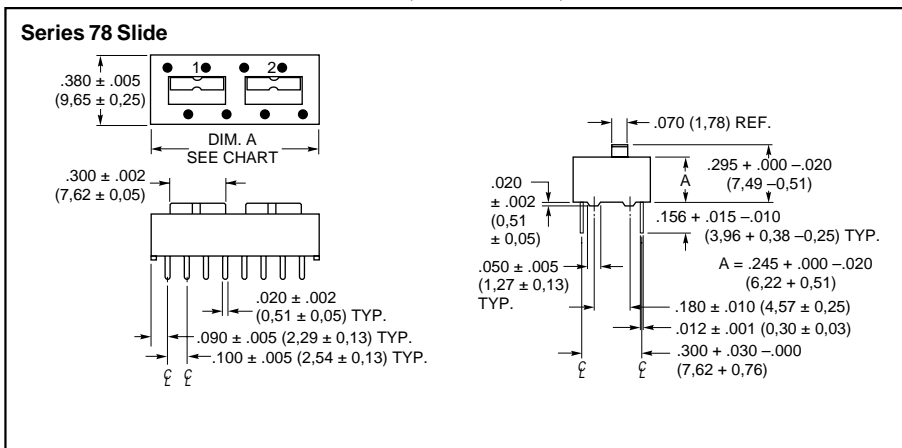
DIMENSIONS: Series 76 In inches (and millimeters)



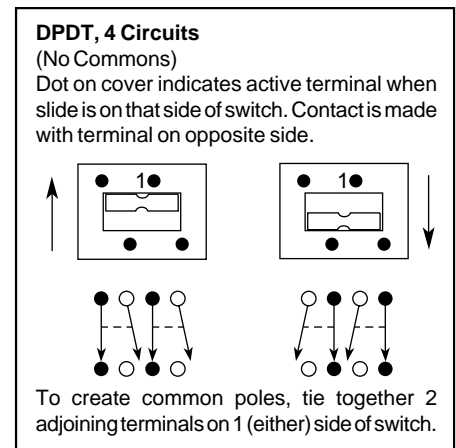
CIRCUITRY: Series 76



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	76SD01	76RSD01	76STD01
	2	0.780"	19,8mm	13	76SD02	76RSD02	76STD02
DPDT 4 Circ.	1	0.480"	12,2mm	21	78K01	—	—
	2	0.880"	22,4mm	12	78K02	—	—

ADDITIONAL INFORMATION

For Specifications, see page B-16. For other Options and Accessories, see pages B-20 and B-21.

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" to the Grayhill part number. Not available on Toggle-DIP.

SPECIFICATIONS: Standard and Military Qualified Styles

Ratings	76	78	90B
Mechanical Life: Operations per switch position	20,000	20,000	5,000
Make-and-break Current Rating: Operations per switch position at these resistive loads			
1 mA, 5 Vdc; 50 mA, 30 Vdc; or 150 mA, 30 Vdc:	10,000	10,000	—
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
Contact Resistance: Initially:	≤ 30 mΩ	≤ 30 mΩ	≤ 20 mΩ
After life, at 10 mA, 50 mVdc, open circuit:	≤ 100 mΩ	≤ 100 mΩ	≤ 100 mΩ
Insulation Resistance:			
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
Dielectric Strength: 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
Current Carry Rating: Maximum rise of 20°C	5 A	4 A	3 A
Switch Capacitance: At 1 megahertz	2 pF	2 pF	2 pF
Operating Temperature Range:	-40°C to + 85°C	-40°C to + 85°C	-40°C to + 85°C
Storage Temperature Range:	-55°C to + 85°C	-55°C to + 85°C	-55°C to + 85°C

DIP Switches

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 specification, 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: 76RSB, 90: 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 10 microinches minimum over nickel barrier.
Base Contacts: Copper alloy, gold-plated 10 microinches minimum over nickel barrier.
Terminals: Copper alloy, solder-plated over nickel barrier.
Non-Conductive Parts: Thermoplastic (UL94V-O)
Potting Material: Epoxy, 76,78 only.
Protective Cover: 76,78, only-Polycarbonate.

Tape and Reel Packaging

Tape Seal:
 76, 78: Polyester film
 90: Polyimide film or foil
Tape Seal Integrity: Passes gross leak test using 125°C flourinert for 20 seconds minimum. Reference MIL-STD-202, Method 112.

SERIES 76, 78 and 90

Military Qualified

TOP SEAL

All Grayhill DIP Switch part numbers ending in "S" have a tape seal. This is now the standard for

FEATURES

- All switches listed on these pages are qualified to MS83504

military qualified DIP switches. If you order by the military "M" number, you will also get the tape seal

version. The exception is the toggle actuated styles which are not top tape sealed.

ORDERING INFORMATION

Circuitry	Description	Number of Positions	Military Part Number	Grayhill Part Number
Single Pole/Single Throw	Raised Rocker	02	M83504/01-022	76MSB02S
Single Pole/Single Throw	Raised Rocker	03	M83504/01-023	76MSB03S
Single Pole/Single Throw	Raised Rocker	04	M83504/01-024	76MSB04S
Single Pole/Single Throw	Raised Rocker	05	M83504/01-025	76MSB05S
Single Pole/Single Throw	Raised Rocker	06	M83504/01-026	76MSB06S
Single Pole/Single Throw	Raised Rocker	07	M83504/01-027	76MSB07S
Single Pole/Single Throw	Raised Rocker	08	M83504/01-028	76MSB08S
Single Pole/Single Throw	Raised Rocker	09	M83504/01-029	76MSB09S
Single Pole/Single Throw	Raised Rocker	10	M83504/01-030	76MSB10S
Single Pole/Single Throw	Raised Rocker	12	M83504/01-032	76MSB12S
Single Pole/Single Throw	Recessed Rocker	02	M83504/02-022	76MRSB02S
Single Pole/Single Throw	Recessed Rocker	03	M83504/02-023	76MRSB03S
Single Pole/Single Throw	Recessed Rocker	04	M83504/02-024	76MRSB04S
Single Pole/Single Throw	Recessed Rocker	05	M83504/02-025	76MRSB05S
Single Pole/Single Throw	Recessed Rocker	06	M83504/02-026	76MRSB06S
Single Pole/Single Throw	Recessed Rocker	07	M83504/02-027	76MRSB07S
Single Pole/Single Throw	Recessed Rocker	08	M83504/02-028	76MRSB08S
Single Pole/Single Throw	Recessed Rocker	09	M83504/02-029	76MRSB09S
Single Pole/Single Throw	Recessed Rocker	10	M83504/02-030	76MRSB10S
Single Pole/Single Throw	Recessed Rocker	12	M83504/02-032	76MRSB12S
Single Pole/Single Throw	Slide	02	M83504/04-022	78M02S
Single Pole/Single Throw	Slide	03	M83504/04-023	78M03S
Single Pole/Single Throw	Slide	04	M83504/04-024	78M04S
Single Pole/Single Throw	Slide	05	M83504/04-025	78M05S
Single Pole/Single Throw	Slide	06	M83504/04-026	78M06S
Single Pole/Single Throw	Slide	07	M83504/04-027	78M07S
Single Pole/Single Throw	Slide	08	M83504/04-028	78M08S
Single Pole/Single Throw	Slide	09	M83504/04-029	78M09S
Single Pole/Single Throw	Slide	10	M83504/04-030	78M10S
Single Pole/Single Throw	Slide	12	M83504/04-032	78M12S
Single Pole/Single Throw	Machine Insertable	02	M83504/12-002	90MB02S
Single Pole/Single Throw	Machine Insertable	03	M83504/12-003	90MB03S
Single Pole/Single Throw	Machine Insertable	04	M83504/12-004	90MB04S
Single Pole/Single Throw	Machine Insertable	05	M83504/12-005	90MB05S
Single Pole/Single Throw	Machine Insertable	06	M83504/12-006	90MB06S
Single Pole/Single Throw	Machine Insertable	07	M83504/12-007	90MB07S
Single Pole/Single Throw	Machine Insertable	08	M83504/12-008	90MB08S
Single Pole/Single Throw	Machine Insertable	09	M83504/12-009	90MB09S
Single Pole/Single Throw	Machine Insertable	10	M83504/12-010	90MB10S
Single Pole/Single Throw	Side Actuated	02	M83504/11-022	76MP SB02S
Single Pole/Single Throw	Side Actuated	03	M83504/11-023	76MP SB03S
Single Pole/Single Throw	Side Actuated	04	M83504/11-024	76MP SB04S
Single Pole/Single Throw	Side Actuated	05	M83504/11-025	76MP SB05S
Single Pole/Single Throw	Side Actuated	06	M83504/11-026	76MP SB06S
Single Pole/Single Throw	Side Actuated	07	M83504/11-027	76MP SB07S
Single Pole/Single Throw	Side Actuated	08	M83504/11-028	76MP SB08S
Single Pole/Single Throw	Side Actuated	09	M83504/11-029	76MP SB09S
Single Pole/Single Throw	Side Actuated	10	M83504/11-030	76MP SB10S
Single Pole/Single Throw	Side Actuated	12	M83504/11-032	76MP SB12S
Single Pole/Double Throw	Raised Rocker	02	M83504/05-022	76MSC02S
Single Pole/Double Throw	Raised Rocker	03	M83504/05-023	76MSC03S
Single Pole/Double Throw	Raised Rocker	04	M83504/05-024	76MSC04S
Single Pole/Double Throw	Recessed Rocker	02	M83504/06-022	76MRSC02S
Single Pole/Double Throw	Recessed Rocker	03	M83504/06-023	76MRSC03S
Single Pole/Double Throw	Recessed Rocker	04	M83504/06-024	76MRSC04S

ADDITIONAL INFORMATION

For dimensions and number per packaging tube, see equivalent non-qualified styles, pages B-11 through B-15. For Specifications, see page B-16.

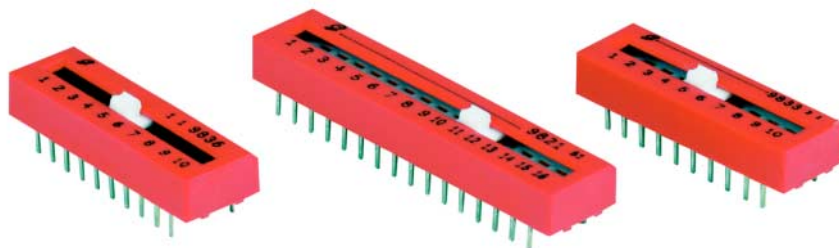
Available from your local Grayhill Distributor.

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

SERIES 79A
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

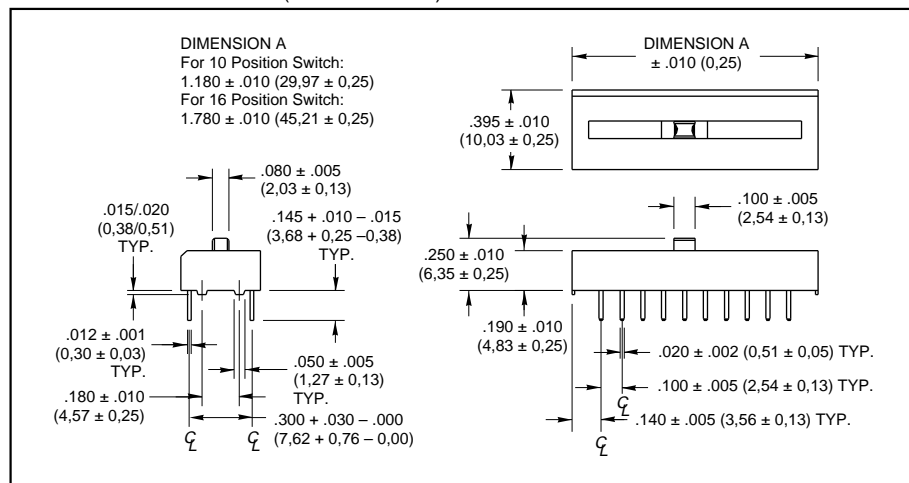
Each position is a single isolated circuit, which connects the two terminals across the switch package. The movable contact is non-shorting.

Tap Switch

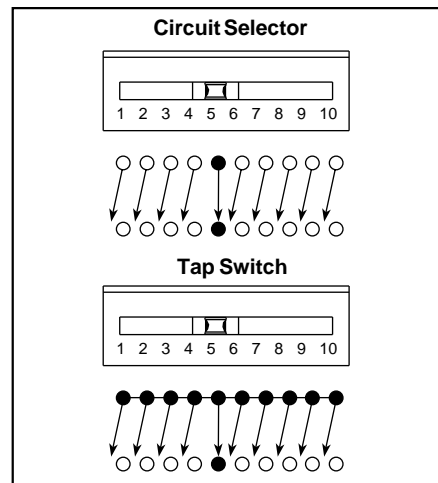
SP/10 Positions, and SP/16 Postions

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 minimum. 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, plated. 10 microinches minimum gold over 20 microinches minimum nickel

Base Contacts: Copper alloy, plated. 10 microinches minimum gold over 20 microinches minimum nickel

Terminals: Copper alloy, plated. 60 microinches minimum (90/10) tin lead solder over 20 microinches minimum nickel

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

ORDERING INFORMATION

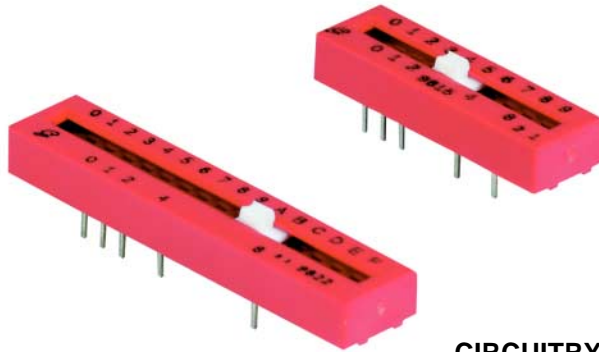
Number of Positions	Type of Circuit Code	Number per Tube	Part Number*
10	Circuit Selector	9	79A10
10	Single Pole	9	79C10
16	Circuit Selector	6	79A16
16	Single Pole	6	79C16

*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.

SERIES 79B Linear Action Tap

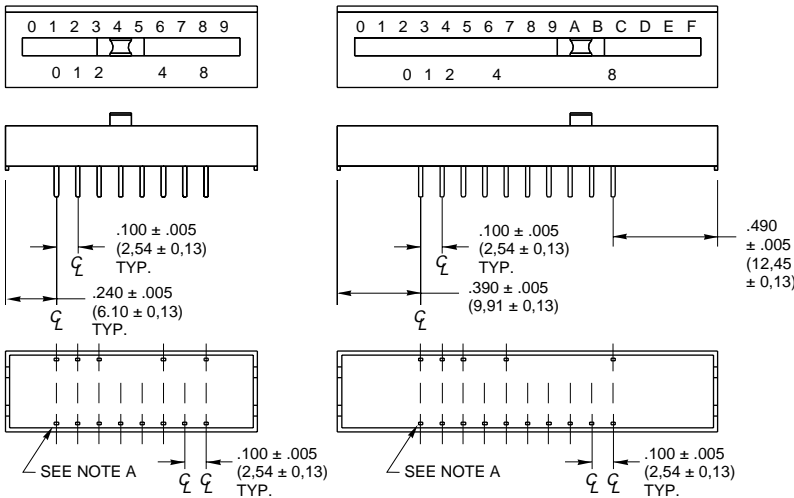
FEATURES

- 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



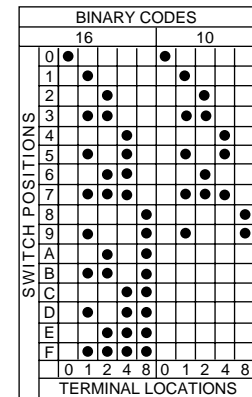
DIMENSIONS In inches (and millimeters)

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 minimum. 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, plated 10 microinches minimum gold over 20 microinches minimum nickel.

Base Contacts: Copper alloy, plated 10 microinches minimum gold over 20 microinches minimum nickel.

Terminals: Copper alloy, plated. 60 microinches minimum solder (90/10) over 20 microinches minimum nickel.

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	79B10
16	Hexadecimal	6	79B16

*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.

ADDITIONAL INFORMATION

For other Options and Accessories, see pages B-20 and B-21.

Available from your local Grayhill Distributor.

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

SERIES 78
Right Angle Option

FEATURES

- Easy Access
- SPST Circuitry



DIMENSIONS In inches (and millimeters)

Series 78

LENGTH $\pm .010$ (0,25) SEE CHART

$.380 \pm .010$ (9,65 \pm 0,25)

$.115 \pm .015$ (2,92 \pm 0,38) TYP.

$.090 + .020 - .005$ (2,29 + 0,51 - 0,13) TYP.

$.020 \pm .002$ (0,51 \pm 0,05) TYP.

$.100 \pm .005$ (2,54 \pm 0,13) TYP.

$.090 \pm .005$ (2,29 \pm 0,13) TYP.

SPST Switch Length

NO. OF STATIONS	LENGTH INCHES	LENGTH MILLIMETERS
2	0.280	7,1 MM
3	0.380	9,7 MM
4	0.480	12,2 MM
5	0.580	14,7 MM
6	0.680	17,3 MM
7	0.780	19,8 MM
8	0.880	22,4 MM
9	0.980	24,9 MM
10	1.080	27,4 MM
12	1.280	32,5 MM

The 12 station length is for Series 76 switches. For switches of circuitry other than SPST, see standard switch pages.

Note: Switches are same length as standard switches. See chart or standard switch pages.

Note: Terminal row spacing is designed to be used in PC board holes with .100 X .100 (2,54 x 2,54) centers.

SPECIFICATIONS

Electrical Ratings

Make-and-break Current:

At 1 mA, 5 Vdc: 10,000 operations
At 50 or 125 mA, 30 Vdc: 10,000 operations

Materials and Finishes

Terminal Ends: Copper alloy, solder (90/10) plated 150 microinches minimum over copper/nickel barrier solderability per MIL-STD-202, Method 208

For other specifications, see Additional Information.

ADDITIONAL INFORMATION

For SPST switches, see page B-12.
For Multipole/ST switches see page B-13.
For SPDT switches, see page B-14; and for DPDT switches, see page B-15.

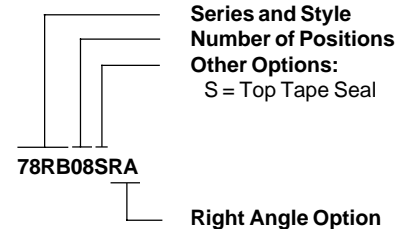
For additional specifications, see page B-16.

CHOICES

Circuitry	Type of Actuation	Series & Style	Number Of Positions	Other Options
SPST	Raised Slide	78B	02 thru 10	S
SPST	Recessed Slide	78RB	02 thru 10	S
2PST	Raised Slide	78F	01 thru 05	S
3PST	Raised Slide	78G	01 thru 03	S
4PST	Raised Slide	78H	01 & 02	S
SPDT-2	Raised Slide	78J	01 thru 05	S
DPDT-4	Raised Slide	78K	01 & 02	S

ORDERING INFORMATION

Sample number orders a right angle mount, top tape sealed, 8-position, SPST switch with recessed slides. Part number for the same switch without tape seal and lines would be 78RB08RA.



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

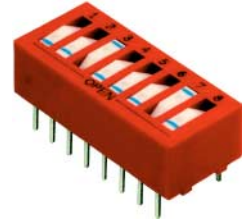
OPTIONS

Position Identification Line Option

For Series 76RSB, 76RSC, 76RSD, & 90B
 A line can be added to the recessed rocker or Series 90 slide actuator to provide positive identification of the actuator position. To order, add L as a final suffix to the part number. For example, 76RSB08 becomes 76RSB08L; and, 90B08S becomes 90B08SL.
Available from a local Grayhill Distributor.

Other Switch Markings

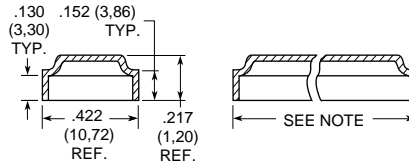
For Series 76, 78, & 90
 We can mark your part number or other wording on the switch, often at no charge. For some markings there will be a nominal charge for tooling plus a set-up charge. In addition, there is a marking charge per side per switch. Add it to the unit price and discount it accordingly.
To order, contact Grayhill.



ACCESSORIES

Protective Cover Accessory

For Series 76, & 78
 Rigid, clear plastic cover fits all but toggle actuated switches. It provides a top cover for less strenuous cleaning, serves as a dust cover in dirty environments, and provides protection against accidental actuation.
Material: 76,78, only-Polycarbonate.
 Purchase as a separate item. Check length of the desired DIP Switch, and then select from the ordering information on this page.
Available from a local Grayhill Distributor.



Note: For length, add .042" (1.07 MM) to length of DIP switch.



DIPSTICK Accessory

For all series
 Pen-sized plastic DIPSTICK has a tapered end for actuating DIP Switches.
 Part Number **90-DIPSTICK**

Available from a local Grayhill Distributor

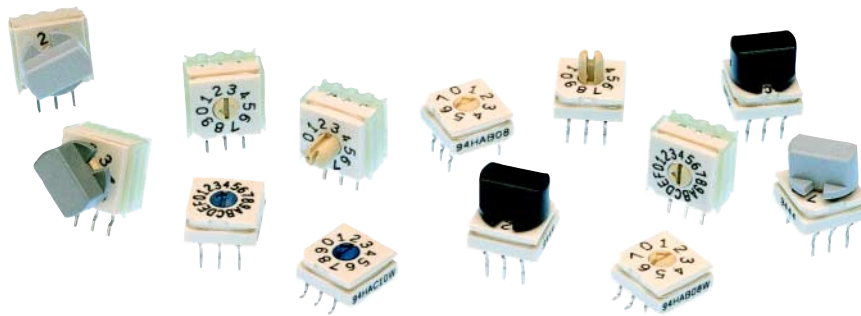


ORDERING INFORMATION

Length Inches	Protective Cover Part Number
0.280	76P02
0.380	76P03
0.480	76P04
0.580	76P05
0.680	76P06
0.780	76P07
0.880	76P08
0.980	76P09
1.080	76P10
1.180	79P10
1.780	79P16

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

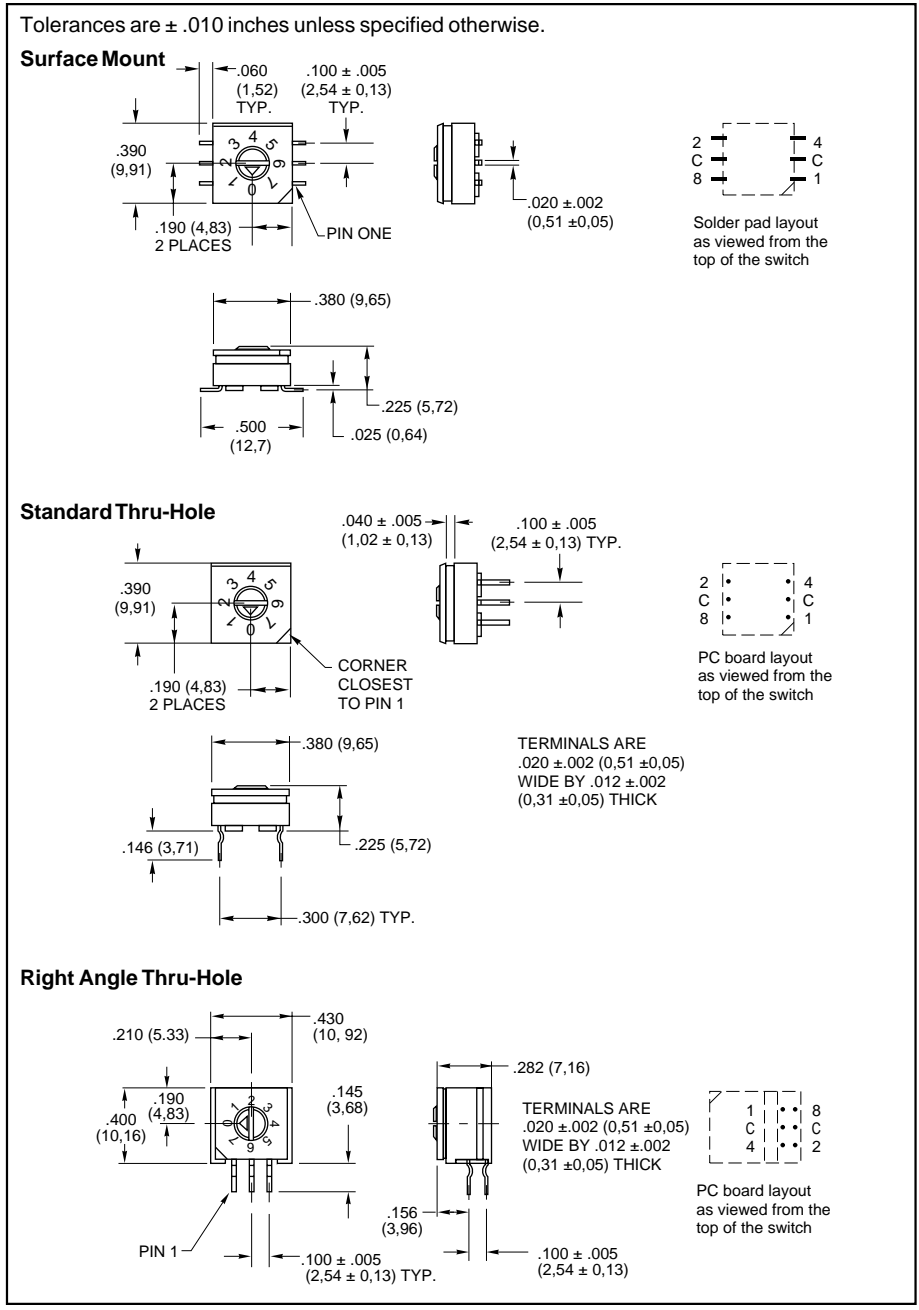
SERIES 94H
Binary Coded



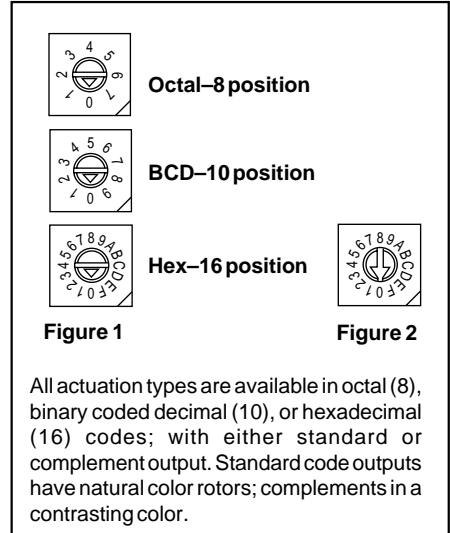
FEATURES

- Sealed Construction; No Tape Seal Required
- Surface Mount or Thru-Hole Style
- Tube or Tape and Reel Packaging
- Octal, BCD, and Hexadecimal Code
- In Standard or Complement
- Standard and Right Angle Mount
- Flush or Extended Actuators
- Gold-Plated Contacts

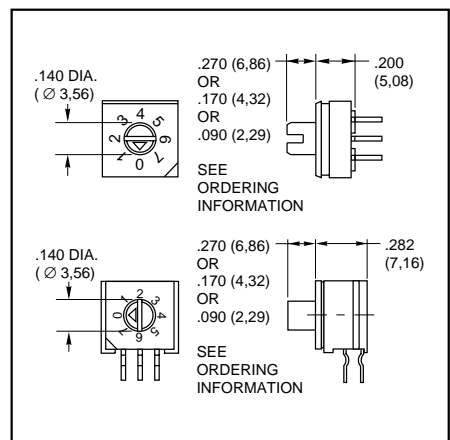
DIMENSIONS In inches (and millimeters)



ACTUATOR STYLES/FACTUATOR STYLES



EXTENDED ACTUATOR TYPES



DIP Switches

SERIES 94R

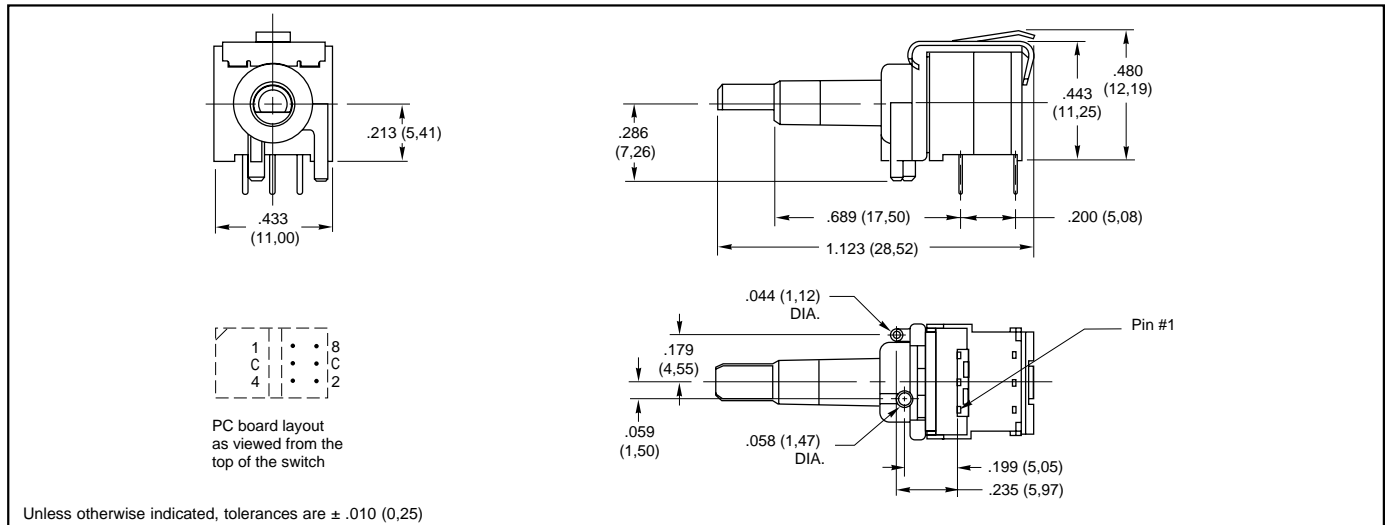
Economical, Binary Coded

FEATURES

- 10,000 Cycles of Operation
- Gold-Plated Contacts
- Sealed Contact System
- Right Angle Mount
- Octal, BCD & Hexadecimal Codes
- Standard or Complement



DIMENSIONS In inches (and millimeters)



SPECIFICATIONS: Series 94H and 94R

Electrical Ratings

Make-and-break Current Rating: 30 mA at 30 Vdc for 10,000 cycles of operation.

Carrying Current Rating: 100 mA at 50 Vdc

Contact Resistance: 50 mohms maximum initially (measured at 10 mA, 50 mVdc). 150 mohms maximum after life.

Insulation Resistance: (measured at 100 Vdc across open switch contacts) Initial: 5000 Mohms minimum. After Life: 1000 Mohms minimum.

Dielectric Strength: (measured across open switch contacts) Initial: 500 Vac RMS minimum. After Life: 250 Vac RMS

Mechanical Ratings

Mechanical Life: 10,000 cycles of operation. One cycle is a rotation through all positions and a complete return through all positions.

Mechanical Shock: 1000g's, 0.5 mS, half sine per MIL-STD-202F, Method 213, Test Condition E.

Vibration Resistance: 10-2000 Hz at 15G or 0.060" double amplitude per MIL-STD-202F, Method 204, Test Condition B.

Operational Torque: 2 to 6 inch-ounces initially and 1.2 inch-ounces minimum after life.

Environmental Ratings

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

Storage Temperature Range: -40° to +85° C.

Moisture Resistance: 240 hours with temperature cycling and polarization. Passes insulation resistance and dielectric strength per MIL-STD-202F, Method 106 following exposure.

Materials and Finishes

Rotor and Switch Body: Plastic (UL94V-O)

Contact Material: Copper alloy, plated. 30 microinches minimum gold over 50 microinches minimum nickel.

Shorting Member: Copper alloy, plated. 30 microinches minimum gold over 50 microinches minimum nickel.

Terminals: Copper alloy, plated. 100 microinches minimum 90/10 tin lead solder over 50 microinches minimum nickel.

Internal O-ring: Rubber BUNA-N

Soldering Information

Soldering Temperature: 250° C for 10 seconds maximum.

Cleaning: Acceptable solutions include 1-1-1 Trichlorethane, Freon (TF, TE, or TMS), Isopropyl Alcohol and detergent (140°F maximum). Solutions which are not recommended include Acetone, Methylene Chloride, and Freon TMC.

CODE & TRUTH TABLES: Series 94H and 94R

Standard Output	CODE OUTPUT				CODE OUTPUT				Complement Output
	1	2	4	8	1	2	4	8	
0									
1	●				●	●	●	●	
2		●				●	●	●	●
3	●	●			●	●	●	●	
4			●		●	●	●	●	●
5	●			●		●	●	●	●
6		●		●		●	●	●	●
7	●	●		●		●	●	●	●
8				●	●	●	●	●	
9	●			●	●	●	●	●	
A		●		●		●	●	●	●
B	●	●		●		●	●	●	●
C			●		●	●	●	●	●
D	●			●		●	●	●	●
E		●		●		●	●	●	●
F	●	●		●		●	●	●	●

Dot indicates terminal to common connection. All switches are continuous rotation.

Octal and Octal Complement outputs are 0 thru 7 positions.

BCD and BCD Complement outputs are 0 thru 9 positions.

Hexadecimal and Hexadecimal Complement outputs are 0 thru F positions.

Standard codes have natural color rotors; complements have rotors in a contrasting color.

ORDERING INFORMATION: Series 94H

Series
Actuator Style: A = Flush, Figure 1
 B = .27, Figure 1 (see page B-20)
 C = .17, Figure 1 (see page B-20)
 E = .09, Figure 1 (see page B-20)
 F = Flush, Figure 2

Code: B = Standard, C = Complementary

Packaging: R = Tape and Reel
 Blank = Tube*

Terminal Style: RA = Right Angle, Thru-Hole
 W = Surface Mount
 Blank = Thru-Hole

Number of Positions: 08 = Octal, 8 Position
 10 = BCD, 10 Position
 16 = Hex, 16 Position

* 27 Pieces per tube for surface mount and perpendicular, 24 pieces per tube for right angle switches.

ORDERING INFORMATION: Series 94R

Continuous Rotation Versions			
Code	No. of Positions	Standard Code Part Number	Complement Part Number
Octal	8	94RB08C	94RC08C
BCD	10	94RB10C	94RC10C
Hexadecimal	16	94RB16C	94RC16C
Rotational Stop Versions*			
Code	No. of Positions	Standard Code Part Number	Complement Part Number
Hexadecimal	16	94RB16F	94RC16F

* Consult Grayhill for 8 or 10 position

SERIES 94 High Temperature Knobs: For Shaft Extensions

Slotted knobs show switch markings. Contact Grayhill for other knob material/ marking color combinations and geometrics.

* Use only with Actuator Type B or C

ORDERING INFORMATION: Series 94 High Temperature Knobs*

Knob Style and Height	Knob Color	Arrow Color	Part Number
1A	Gray	N/A	947706-001
5A	Gray	Black	947706-005
1B	Black	N/A	947705-001
1B	Gray	N/A	947705-012
2B	Gray	White	947705-004
3B	Gray	Black	947705-017
4B	Gray	Black	947705-018
1B	Natural	N/A	947705-009
4B	Black	White	947705-010
5B	Gray	Black	947705-019

*Ordered as a separate item.

TAPE AND REEL PACKAGING: Series 94H

Meets requirements of EIA 481-2.

13 INCH DIAMETER REEL

CONDUCTIVE PLASTIC EMBOSSED TAPE

16mm

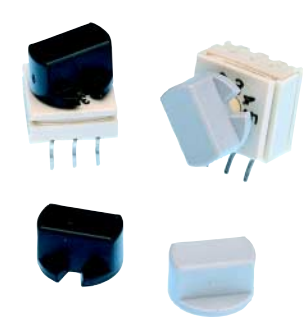
PIN 1 CHAMFER

24mm

DIRECTION OF FEED →

Each reel contains 750 switches with a 15.35 inch (390 mm) minimum leader and a 6.30 inch (160 mm) minimum trailer.

DIP Switches



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