

DIP SWITCHES



ERD6 SERIES

SMALL SIZE 7×7 ROTARY TYPE



ERD SERIES

10×10 SIZE SEALED CONSTRUCTION ROTARY TYPE



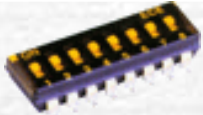
EHS SERIES

HALF PITCH SMT TYPE



EAH SERIES

AUTO INSERTING TYPE



EAD SERIES

AUTO INSERTING SMT TYPE



EAM SERIES

END-STACKABLE TYPE



ESD/ESL SERIES

END-STACKABLE SMT TYPE



ETD/ETA/ETS SERIES

TRI-STATE TYPE



EPM/EPG/EPS SERIES

EDGE ACTUATED TYPE



EPD SERIES

EDGE ACTUATED SMT TYPE

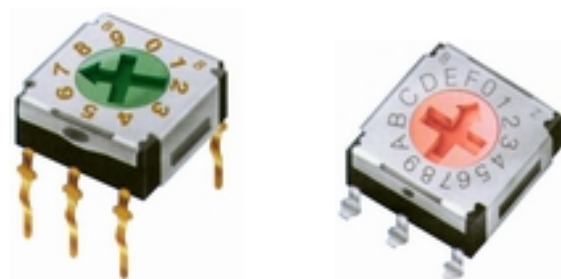


EDG/EDS SERIES

SLIDE TYPE (SLIDE WITH RIGHT ANGLE TYPE INCLUDED)

ERD6 SERIES

SMALL SIZE 7x7 ROTARY TYPE



FEATURES

- Flat type with outer dimensions 7.2mm square; 4.0mm high on board for through hole type and 3.6mm high on board for surface mounting type.
- Top size 7.2x3.5mm², 8mm high on board for side adjust type.
- Positions (10,16) and switch code can be identified by color rotor.
- Gold plated contact area ensures reliable electric continuity for micro current.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
Max. switching load	100 mA, 50 VDC
Min. switching load	10 μ A, 5 VDC
Contact resistance	200 m Ω Max., 1.5mA, 200 μ VDC
Insulation resistance	100 M Ω Min., 100 VDC
Dielectric strength	250 VAC (rms), 60 sec.

2 . MECHANICAL

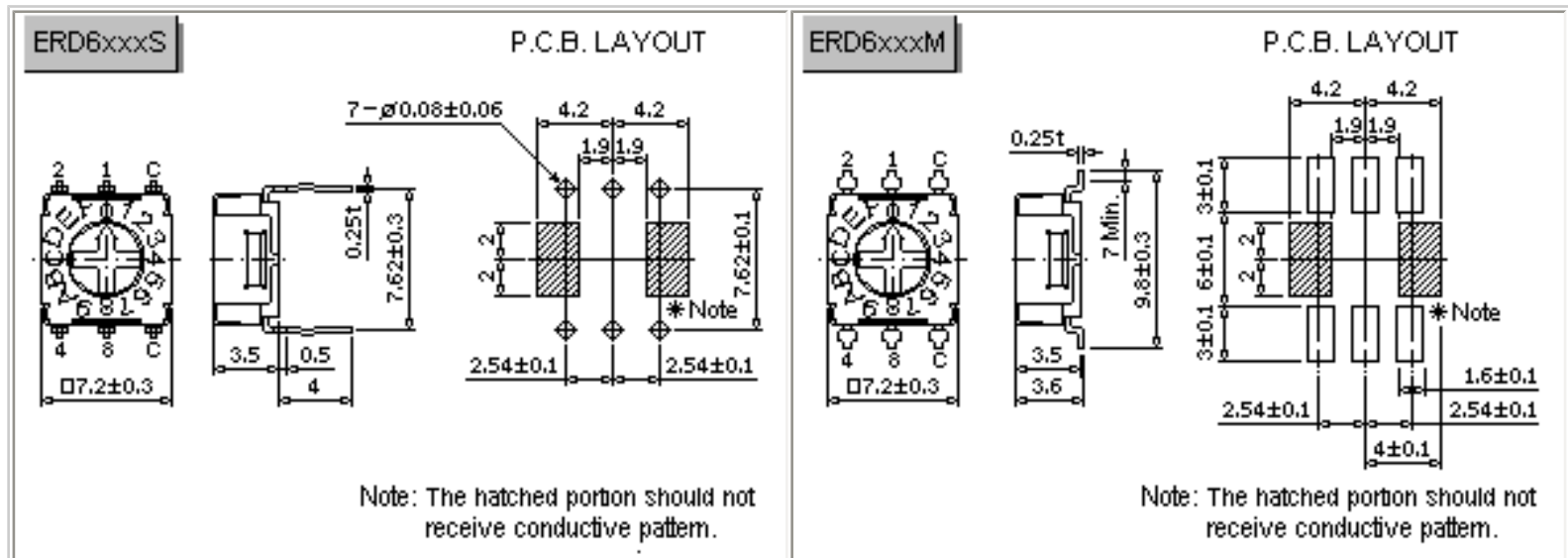
Temperature rating	
operating	-25°C ~+70°C
storage	-25°C ~+85°C
Operation force	510 gf-cm Max. (Rotational torque)
Durability	10000 detents Min.

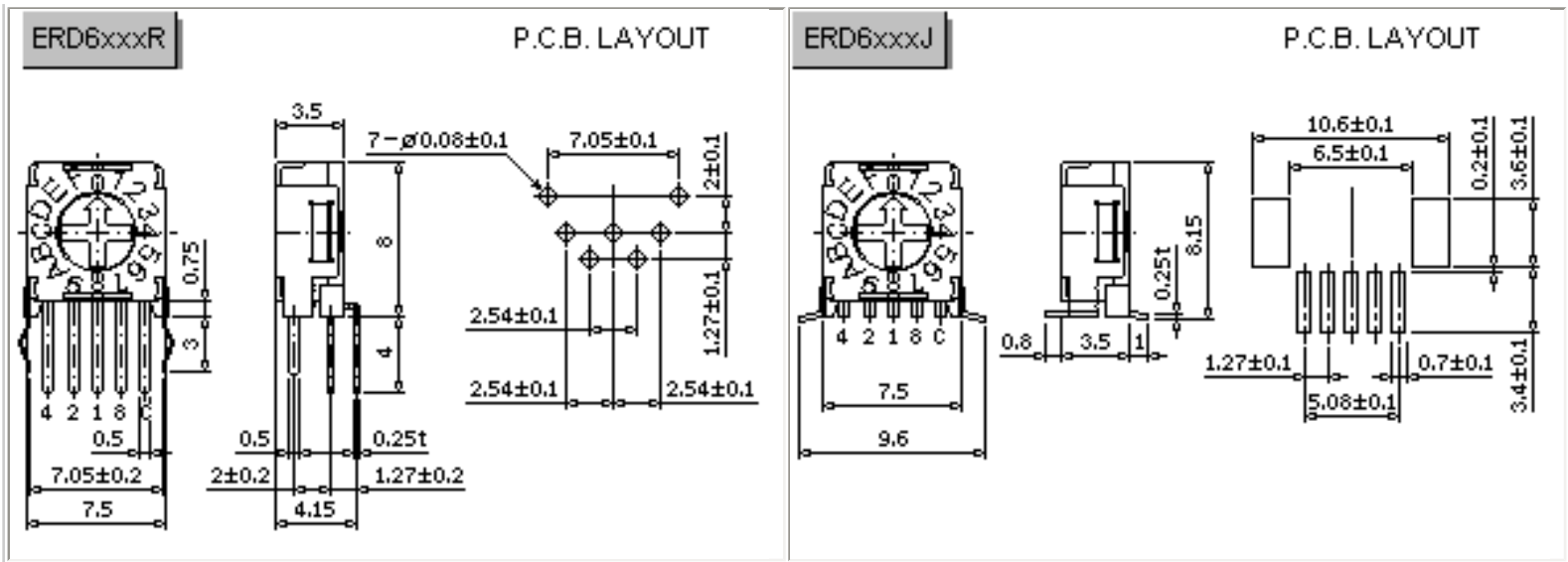
PART NUMBERING SYSTEM

ERD	6	10	C	S	A	C
-----	---	----	---	---	---	---

+--- Rotor:
 C:"minus", No letter:"plus"
 +--- Ground Terminal:
 No letter:without, A:with
 +--- Setting:
 S:Standard Type (Top Adjust Type)
 R:Right Angle Type
 M:Surface Mounting Type
 in Tube Package
 J:Right Angle with Surface Mounting Type
 in Tube Package
 D:Surface Mounting Type
 in Tape & Reel Package
 T:Right Angle with Surface Mounting Type
 in Tape & Reel Package
 +--- Code: R:Real, C:Complement
 +--- Number of positions: 10,16
 +--- 7.2x7.2 mm², Flat Type
 +--- Series Name: ERD:Rotary DIP Switch

DIMENSIONS AND CIRCUITRY (UNIT: mm)



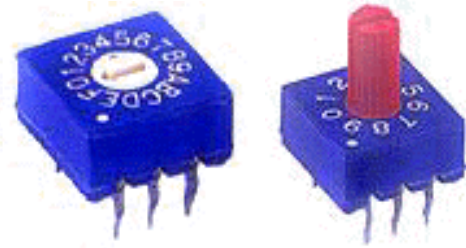


INTRODUCTION to USE ROTARY DIP SWITCH

SIZE	POSITIONS	CODE	PIN OUT	ROTOR	TYPE	PART NUMBER
7x7	10,16	REAL, COMPLEMENT	3:3	FLAT	STANDARD	ERD6xxxSxx
			3:2		RIGHT ANGLE	ERD6xxxRxx
			3:3		SMT	ERD6xxxMxx
			5:0		RIGHT ANGLE WITH SMT	ERD6xxxJxx
			3:3		SMT IN T&R	ERD6xxxDxx
			5:0		RIGHT ANGLE WITH SMT IN T&R	ERD6xxxTxx

ERD SERIES

10x10 SIZE SEALED CONSTRUCTION ROTARY TYPE

PATENT NO.: 610031162165814775(U.S.A.)

FEATURES

- Molded-in terminals and fully sealed construction.
- Standard 2.54mm pin spacing.
- All plastics UL 94V-0 grade fire retardant.
- Reliable contact and long-term stability.
- Binary decimal (8 or 10 positions) and hexadecimal (16 positions), real and complementary codes available.
- Pin-out compatible with most of current equivalents.
- Gold plated contacts to ensure low contact resistance.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	250 VAC Min. for 60 seconds

2 . MECHANICAL

Temperature Rating	
operating	-25°C to +70°C
storage	-40°C to +85°C
Operation force	500 gf-cm Max.
Mechanical life	2000 steps per position

Vibration	10Hz-50Hz-10Hz for 6Hrs.
Solderability	after flux 230±5°C for 5±0.5 seconds, 95% coverage
Resistance to soldering heat	260±5°C for 5±1 seconds.
Reflow soldering heat for SMT type(reference only)	reflow zone 230±5°C for 20 seconds.

PART NUMBERING SYSTEM

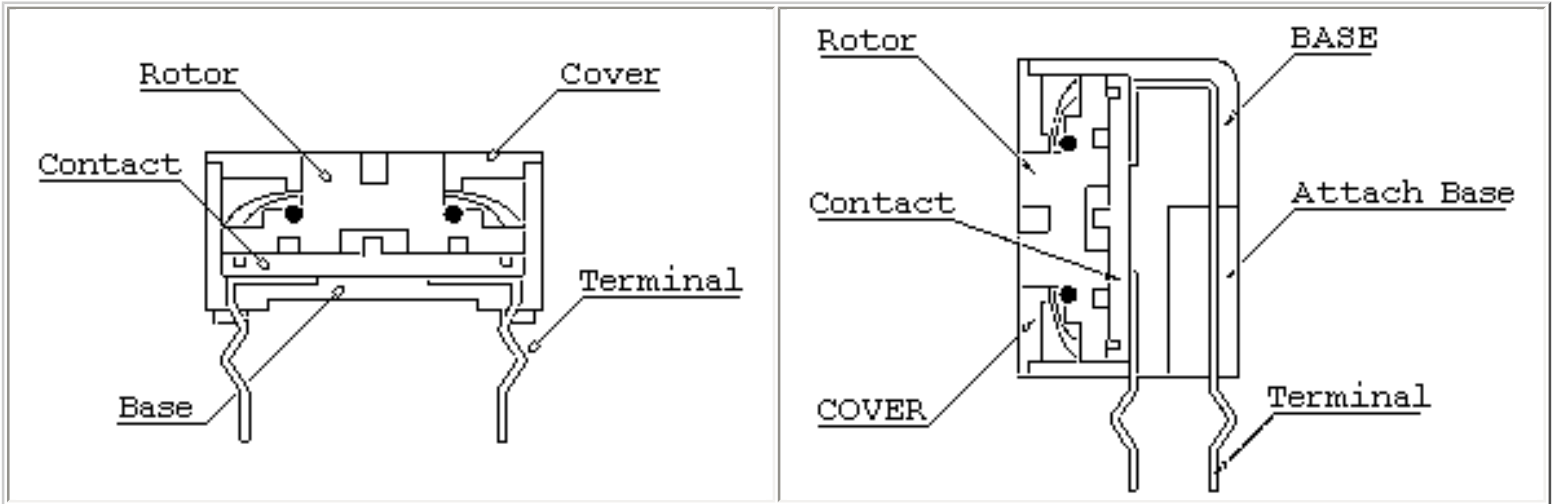
ERD 1 10 R S
 +--- Setting:
 S:Standard Type (Top Adjust Type)
 R:Right Angle Type with Rows Spacing 2.54 mm (Side Adjust Type)
 F:Right Angle Type with Rows Spacing 5.08 mm (Side Adjust Type)
 M:Surface Mounting Type with Top Tape Sealed
 D:Surface Mounting Type with Top Tape Sealed in Tape & Reel Package
 +--- Code: R:Real
 C:Complement
 +--- Number of positions: 08,10,16
 +--- Rotor: 1:Flat Type (pin out 3:3)
 2:Shaft Type(pin out 3:3)
 4:Flat Type (pin out 1:4)
 5:Shaft Type(pin out 1:4)
 +--- Series name: ERD:Rotary Type Sealed Construction

CODE

PIN NO.	POSITION															
	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
1	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
2	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
4	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
8	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●

-Real Code
Rotor color: White (3:3), Yellow (1:4)
-Complement Code
Rotor color: Red (3:3), Orange (1:4)

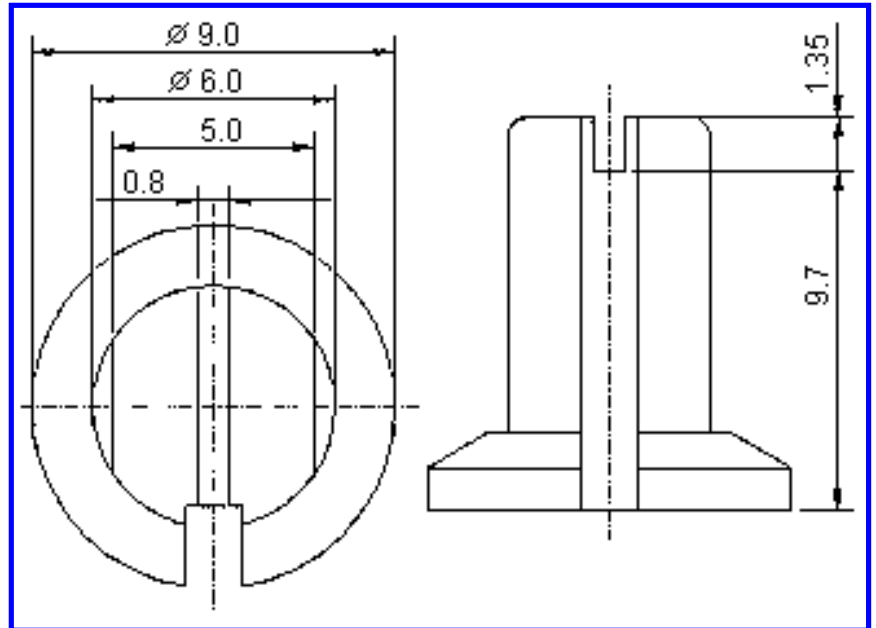
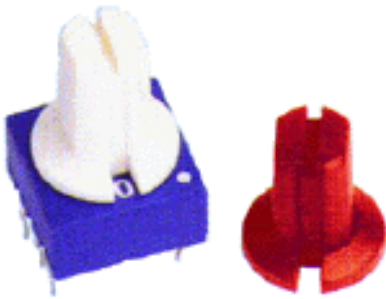
CONSTRUCTION



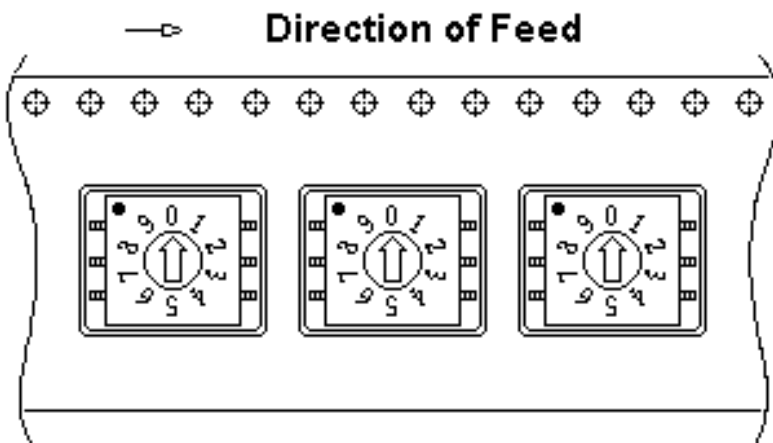
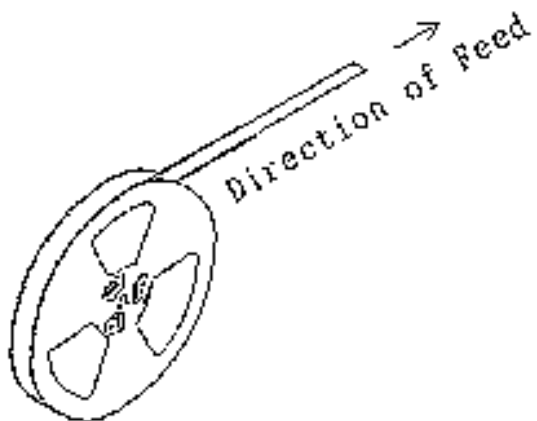
OPTIONS

- 1.Special marking available upon request.
- 2.Shaft Cover.

- 418-80100(White 3:3)
- 418-80200(Red 3:3)
- 418-80300(Yellow 1:4)
- 418-80400(Orange 1:4)



3.Tape & Reel Packaging (Per EIA STANDARD):



Each Reel contains 7000pcs switches with a 390mm minimum leader and a 160mm minimum trailer

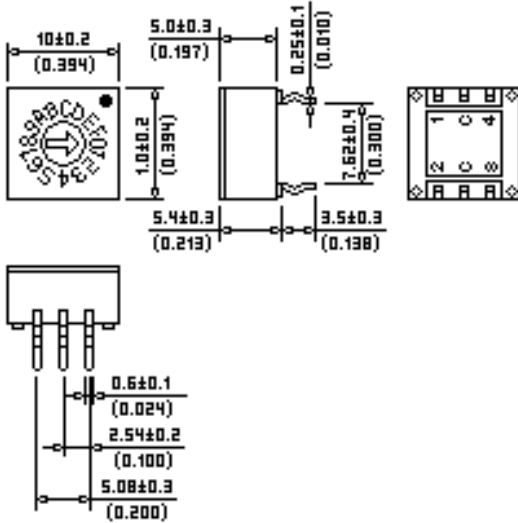
INTRODUCTION to USE ROTARY DIP SWITCH

SIZE	POSITIONS	CODE	PIN OUT	ROTOR	TYPE	PART NUMBER
10x10	8,10,16	REAL, COMPLEMENT	3:3	FLAT, SHAFT	STANDARD	ERD1xxxS, ERD2xxxS
					RIGHT ANGLE	ERD1xxxR/F, ERD2xxxR/F
				FLAT	SMT	ERD1xxxM
					SMT IN T&R	ERD1xxxD
			1:4	FLAT, SHAFT	STANDARD	ERD4xxxS, ERD5xxxS
					RIGHT ANGLE	ERD4xxxR/F, ERD5xxxR/F
				FLAT	SMT	ERD4xxxM
					SMT IN T&R	ERD4xxxD

DIMENSIONS AND CIRCUITRY (UNIT: mm) PIN OUT 3:3

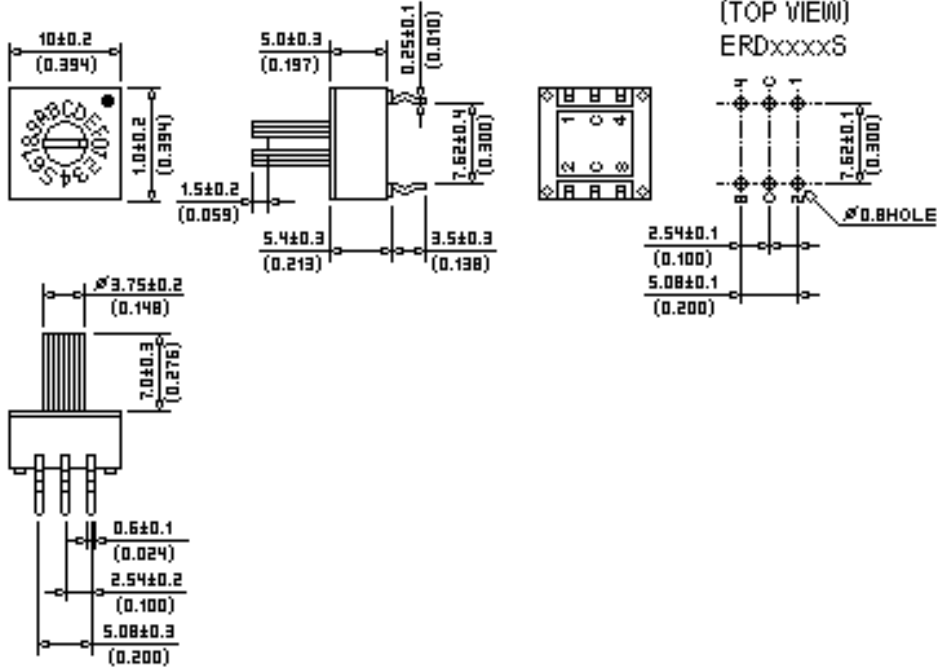
ERD1xxxS Flat Type STANDARD TYPE

16 POSITIONS



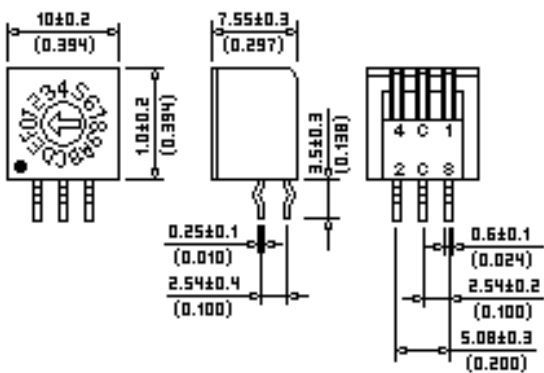
ERD2xxxS Shaft Type

16 POSITIONS



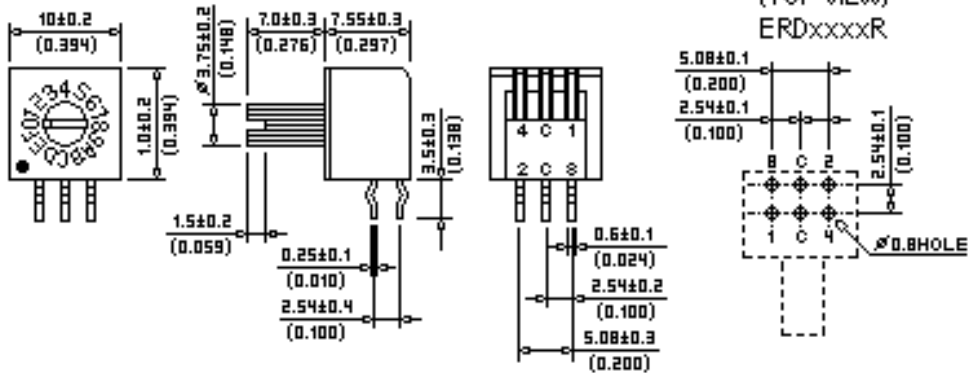
ERD1xxxR Flat Type RIGHT ANGLE TYPE PITCH: 2.54mm

16 POSITIONS



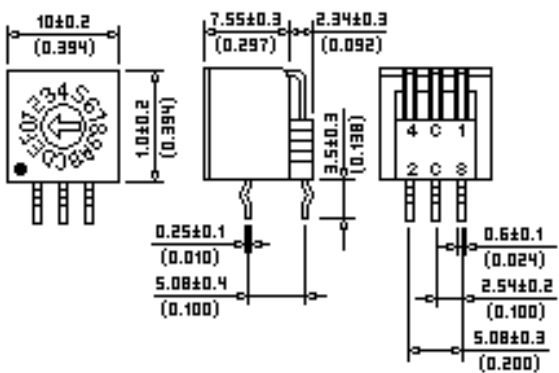
ERD2xxxR Flat Type

16 POSITIONS



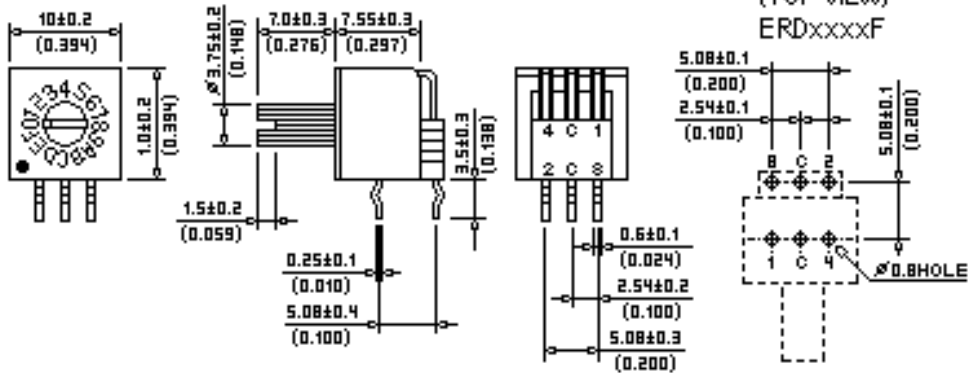
ERD1xxxF Flat Type RIGHT ANGLE TYPE PITCH: 5.08mm

16 POSITIONS



ERD2xxxF Flat Type

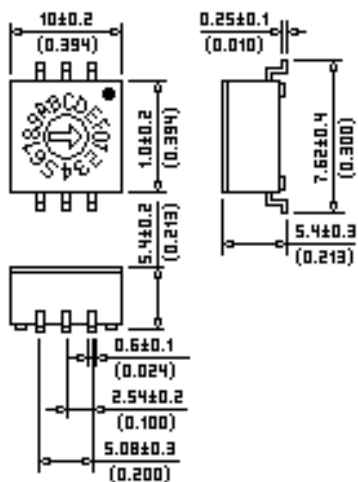
16 POSITIONS



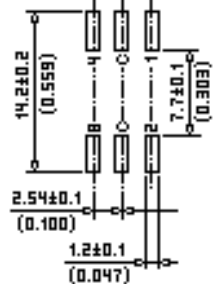
ERD1xxxM Flat Type

SMT TYPE
(ONLY FLAT TYPE AVAILABLE)

16 POSITIONS



P.C.B. LAYOUT
(TOP VIEW)
ERDxxxxM

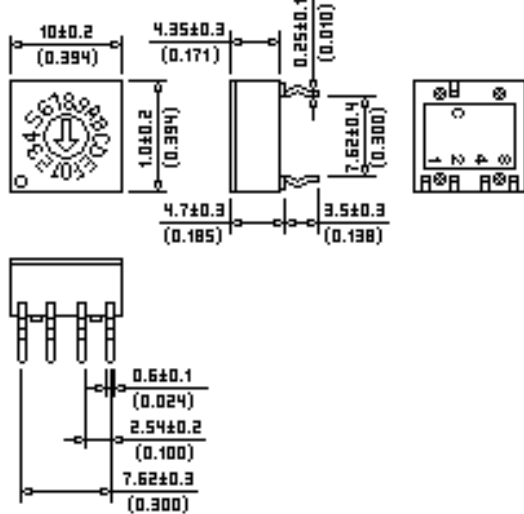


DIMENSIONS AND CIRCUITRY (UNIT: mm) PIN OUT 1:4

ERD4xxxS Flat Type

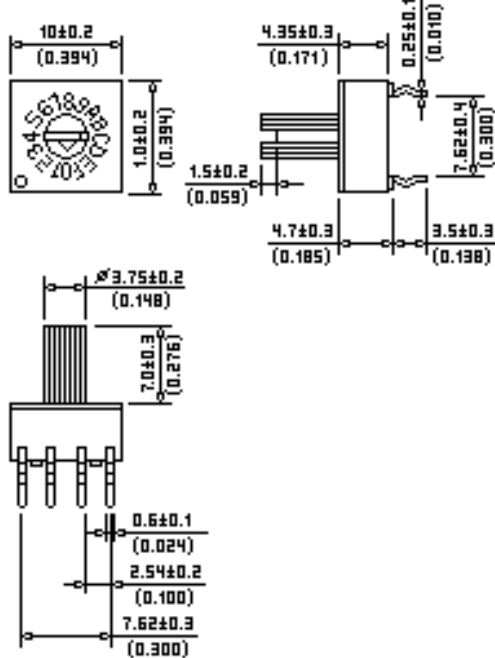
STANDARD TYPE

16 POSITIONS

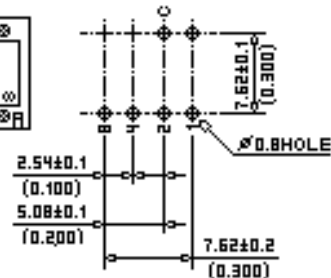


ERD5xxxS Shaft Type

16 POSITIONS



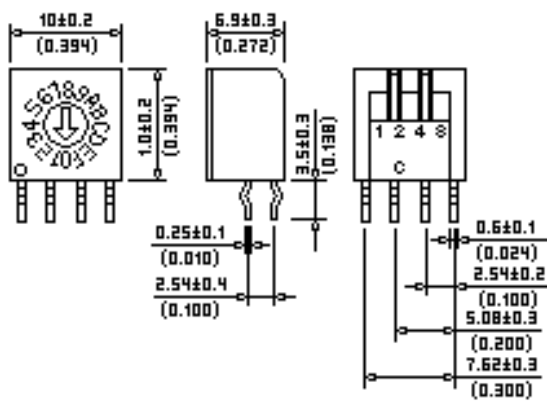
P.C.B. LAYOUT
(TOP VIEW)
ERDxxxxS



ERD4xxxR Shaft Type RIGHT ANGLE TYPE

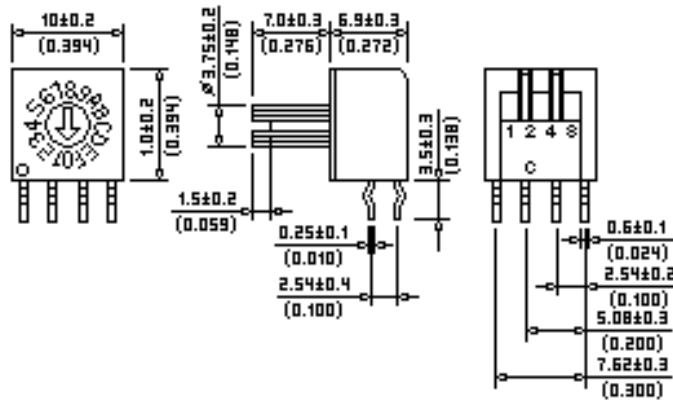
PITCH: 2.54mm

16 POSITIONS

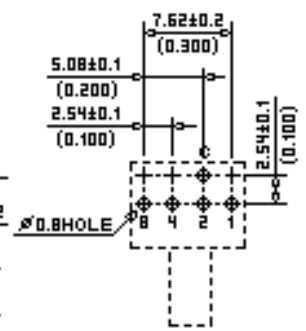


ERD5xxxR Shaft Type

16 POSITIONS



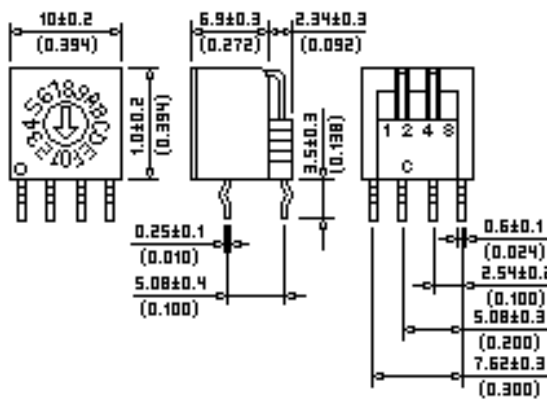
P.C.B. LAYOUT (TOP VIEW) ERDxxxxR



ERD4xxxF Flat Type RIGHT ANGLE TYPE

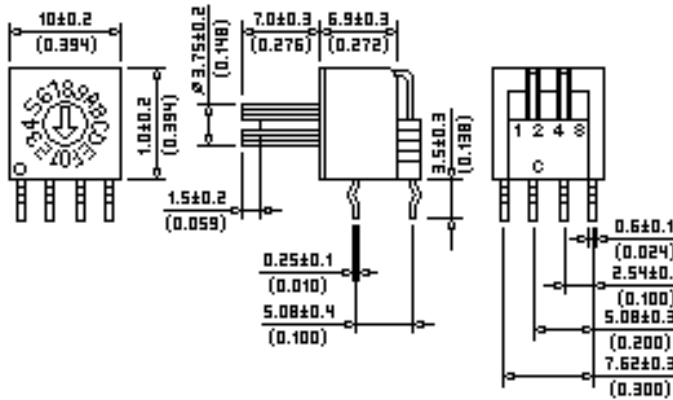
PITCH: 5.08mm

16 POSITIONS

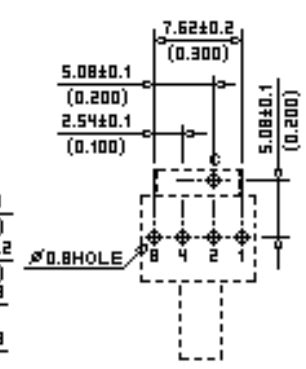


ERD5xxxF Flat Type

16 POSITIONS



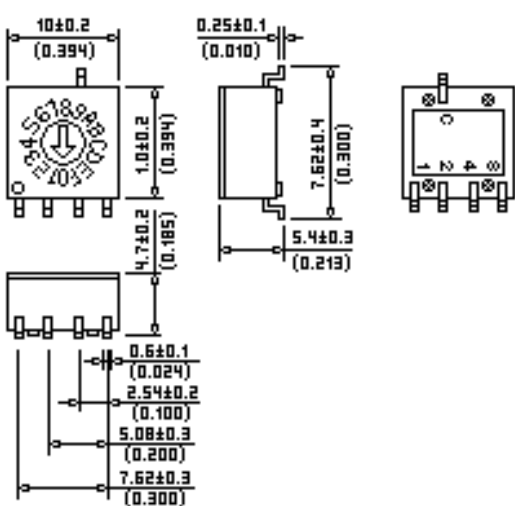
P.C.B. LAYOUT (TOP VIEW) ERDxxxxF



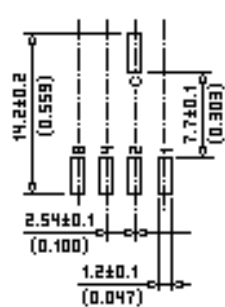
ERD4xxxM Flat Type SMT TYPE

(ONLY FLAT TYPE AVAILABLE)

16 POSITIONS



P.C.B. LAYOUT (TOP VIEW) ERDxxxxM



EHS SERIES

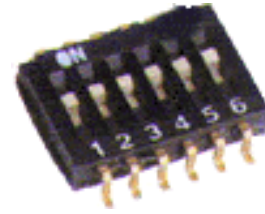
HALF PITCH SMT TYPE, THE LOWEST PROFILE DIP SWITCH

U.S.Electronics Inc.

Ph: (314) 423 7550

Fax: (314) 423 0585

PATENT NO.:91452

5844184(U.S.A.)3093703(JAPAN)ZL97221448.8(CHINA)

FEATURES

- Standard 0.05" integrated circuit pitch.
- Smaller size makes better heat convection during PC board wave soldering.
- Top tape sealed to withstand wave soldering, board washing.
- All plastics are UL 94V-0 grade fire retardant.
- Gold plated contact to ensure low contact resistance and long operation life.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	100 m Ω Max.
Insulation resistance	500 M Ω Min. at 100 VDC
Dielectric strength	300 VAC Min. for 60 seconds
Capacitance between adjacent switches 5pF Max.	

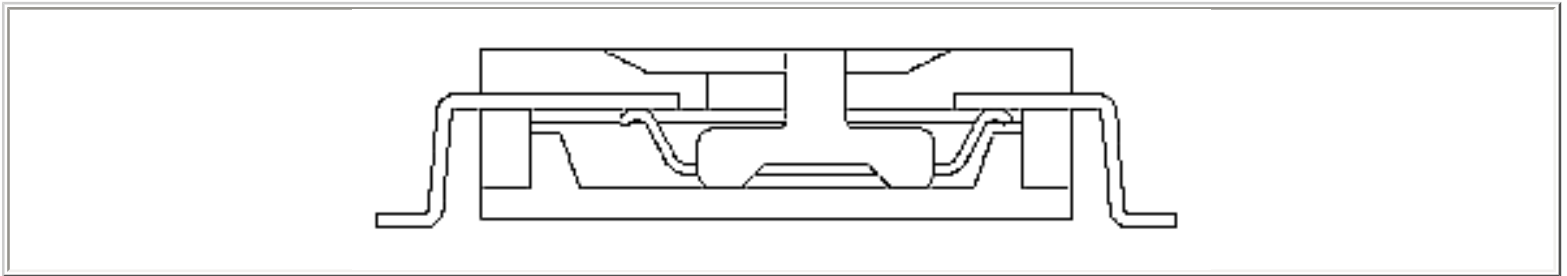
2 . MECHANICAL

Temperature rating	
operating	-25°C to +70°C
storage	-40°C to +85°C
Operation force	500g Max.
Mechanical life	1000 operations
Reflow soldering heat	reflow zone 230 \pm 5°C for 20 seconds Max.

PART NUMBERING SYSTEM

<u>EHS</u>	<u>1</u>	<u>06</u>	<u>XX</u>	<u>XX</u>	
					+--- XX: Special Number
					+--- Sealing:
					LC:Tape & Reel Package, Product without
					Top Tape Sealed
					LD:Tape & Reel Package, Product with
					Top Tape Sealed
					+--- Number of Positions: 2,4,6,8,10,12
					+--- Contact Form: SPST
					+--- Series Name: EHS:Half Pitch SMT Type

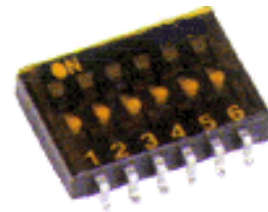
CONSTRUCTION



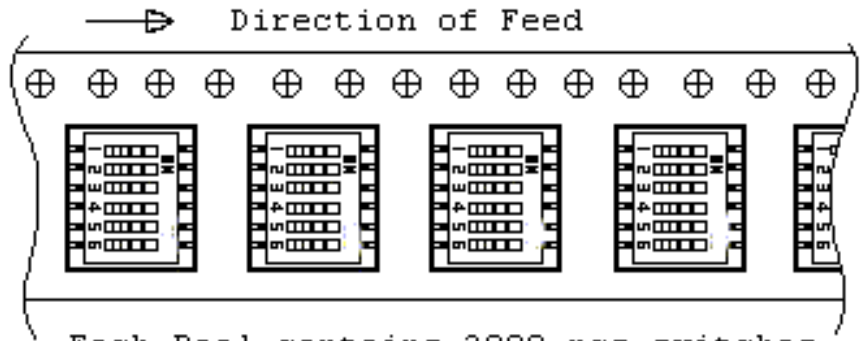
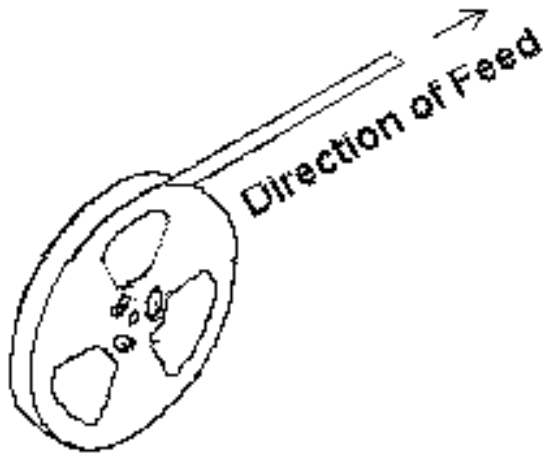
OPTIONS

1.Special marking and case color available

2.Top Tape Sealed



3. Tape & Reel Packaging (Per EIA STANDARD):



Each Reel contains 2000 pcs switches with a 390mm minimum leader and a 160mm minimum trailer

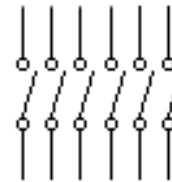
DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A

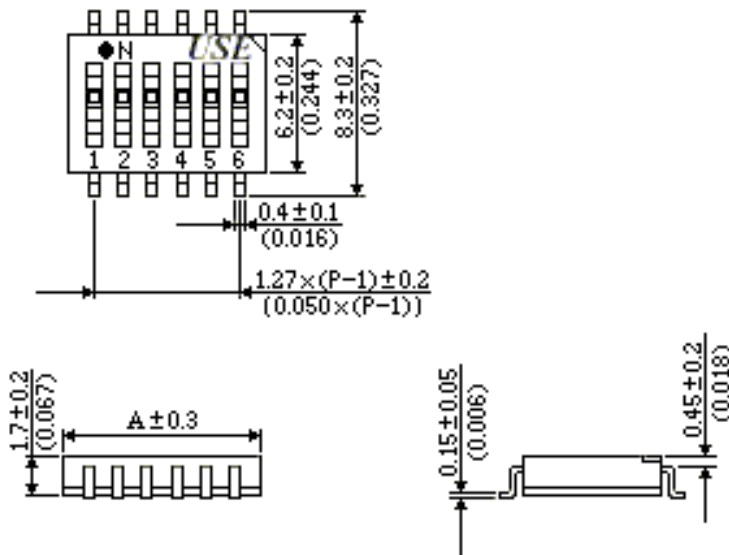
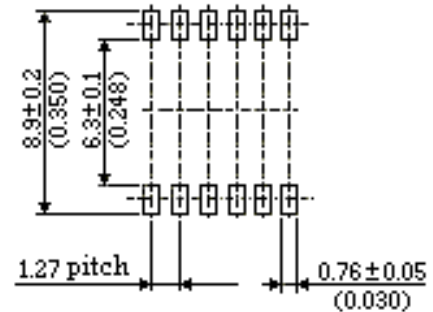
Positions	2	4	6	8	10	12
A	3.70 (0.146)	6.20 (0.244)	8.75 (0.234)	11.30 (0.445)	13.80 (0.543)	16.35 (0.644)

Unit:mm(inch)

CIRCUIT DIAGRAM



P.C.B. LAYOUT (TOP VIEW)



EAH SERIES

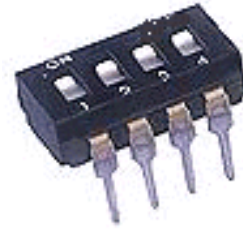
AUTO INSERTING TYPE

U.S.Electronics Inc.

Ph: (314)423 7550

Fax: (314)423 0585

PATENT NO.:59876
47618
4856189(U.S.A.)
66207



FEATURES

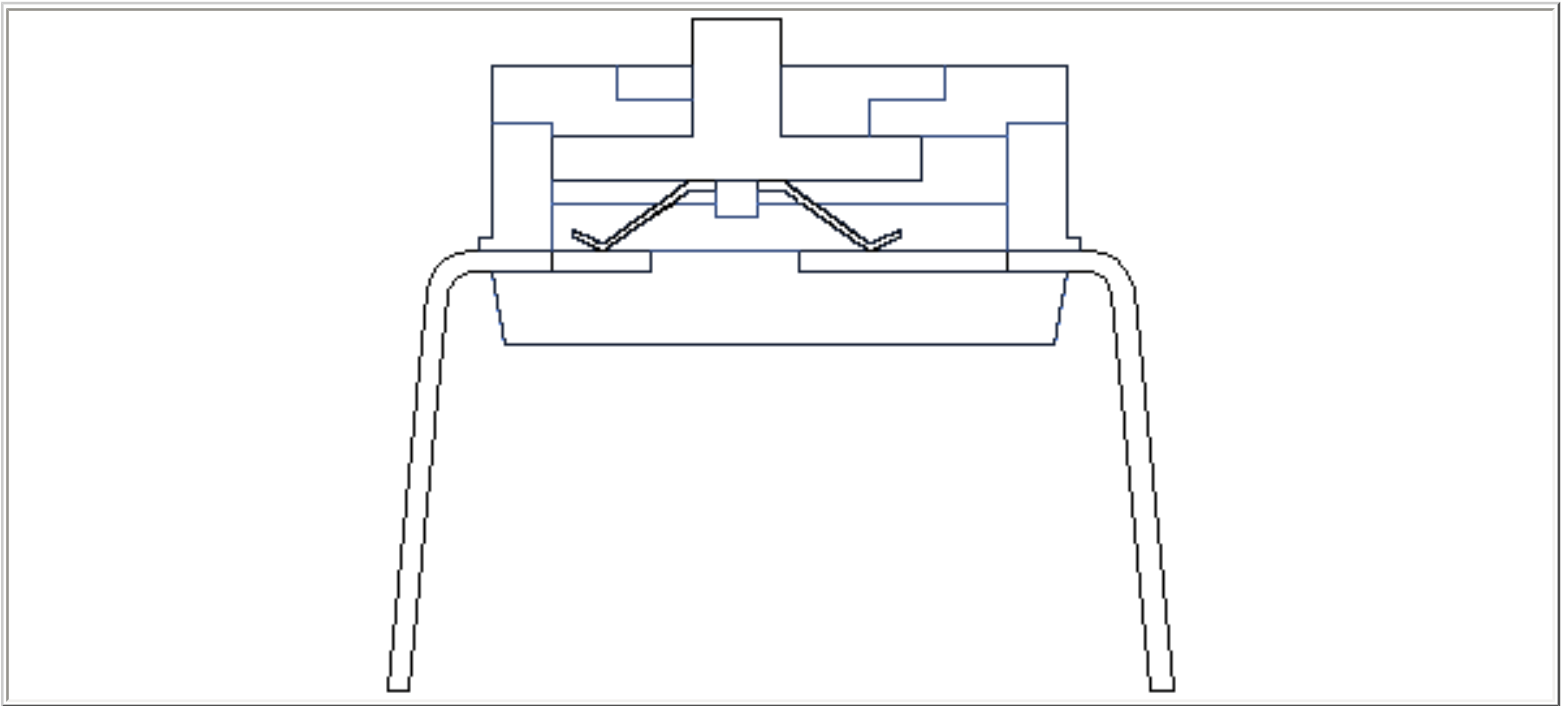
- Same size with IC, can be assembled by any automatic IC inserter.
- Molded 0.3" integrated circuit packing outline allowing automatic insertion.
- Smaller size makes better heat convection during PC board wave soldering.
- Top tape sealed to withstand wave soldering, board washing.
- All plastics are UL 94V-0 grade fire retardant.
- Twin contacts designed to ensure stable contact.
- Gold plated contact to ensure low contact resistance and Tin plated terminals to prevent contamination during soldering.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

CONSTRUCTION



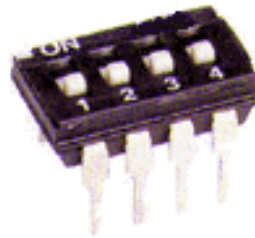
OPTIONS

1.Special marking and case color available upon request.

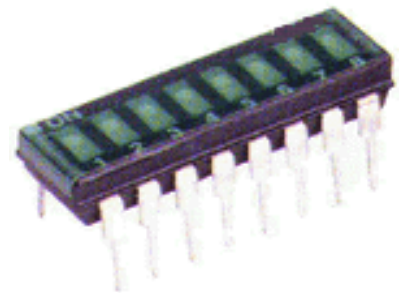
2.Two kinds of pitch available.

Actuator	Pitch (mm)	
	Standard	Option
L	8.50	7.62
E	7.62	8.50

3.Extended Actuator



4.Tape Sealed



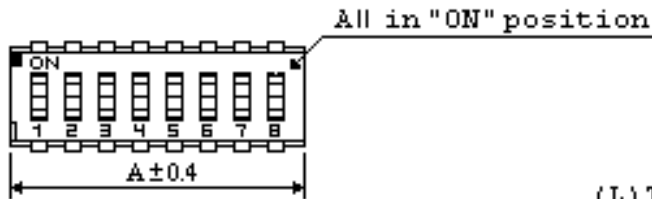
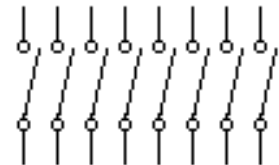
DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A

Positions	2	3	4	5	6	7	8	10	12
A	6.88 (0.271)	9.42 (0.371)	11.96 (0.471)	14.50 (0.571)	17.04 (0.671)	19.58 (0.771)	22.12 (0.871)	27.20 (1.071)	32.28 (1.271)

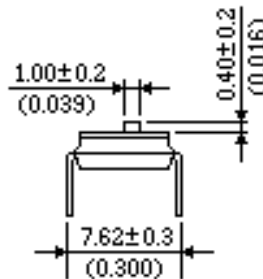
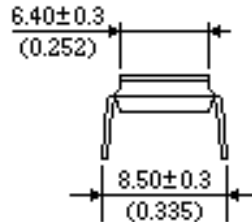
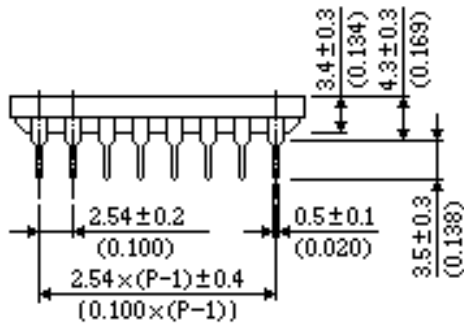
Unit:mm(inch)

CIRCUIT DIAGRAM

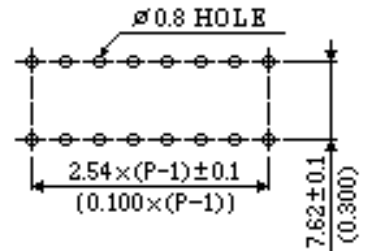


(L) TYPE

(E) TYPE

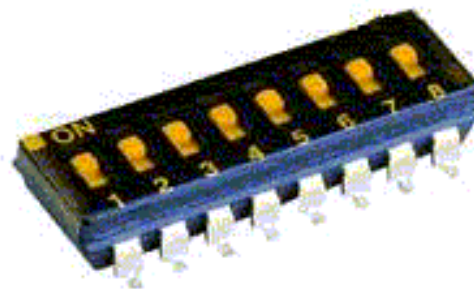


P.C.B. LAYOUT (TOP VIEW)



EAD SERIES

AUTO INSERTING SMT TYPE

PATENT NO.:59876476184856189(U.S.A.)66207

FEATURES

- Same size with IC, can be assembled by any automatic IC inserter.
- Molded 0.3" integrated circuit packing outline allowing automatic insertion.
- Smaller size makes better heat convection during PC board wave soldering.
- Top tape sealed to withstand wave soldering, board washing.
- All plastics are UL 94V-0 grade fire retardant.
- Gold plated contact to ensure low contact resistance and Tin plated terminals to prevent contamination during soldering.

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1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

2 .MECHANICAL

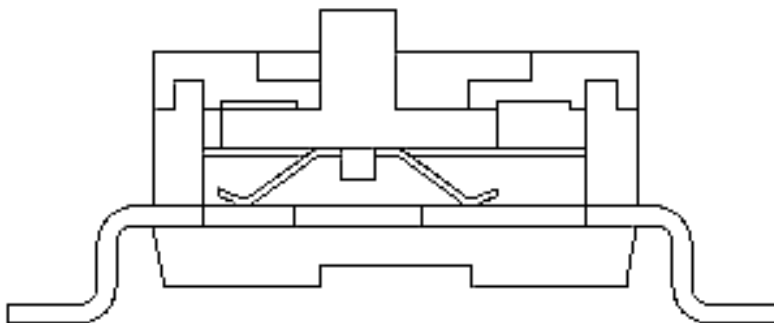
Temperature rating	
operating	-25°C to +70°C
storage	-40°C to +85°C
Operation force	800g Max.
Mechanical life	2000 operations
Humidity	95%RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, method 204D
Solderability	after flux 230±5°C for 5±0.5 seconds, 95% coverage
Resistance to soldering Heat	260±5°C for 5±1 seconds
Reflow soldering heat for SMT type (reference only)	refolw zone 230±5°C for 30 seconds

PART NUMBERING SYSTEM

EAD 1 08 L

----- Actuator, Sealing and Rows Spacing Options:
L:Low Profile Actuator
E:Extended Actuator
LT:Top Tape Sealed & Low Profile Actuator
LC:Tape & Reel Package, product without
Top Tape sealed
LD:Tape & Reel Package, product with
Top Tape sealed
----- Number of Positions: 2,3,4,5,6,7,8,10,12
----- Contact form: SPST
----- Series name: EAD:Surface mounting Type

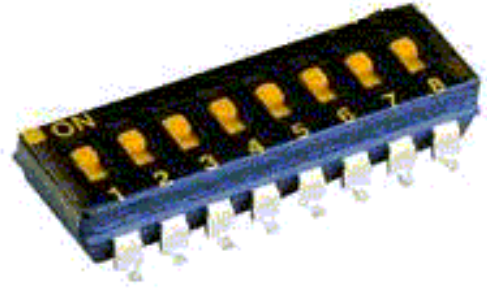
CONSTRUCTION



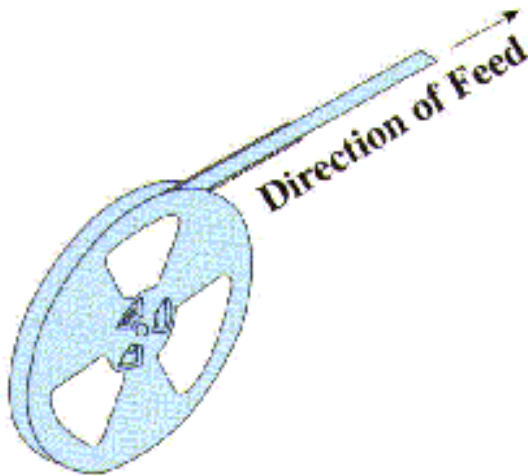
OPTIONS

- 1.Special marking and case color available
- 2.Extended Actuator

3.Top Tape Sealed

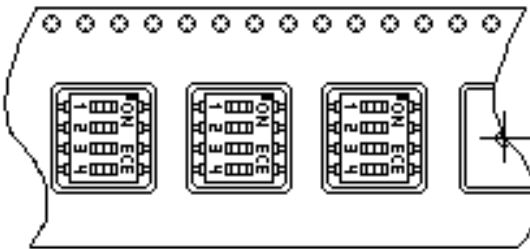


4.Tape & Reel Packaging (per EIA STANDARD)



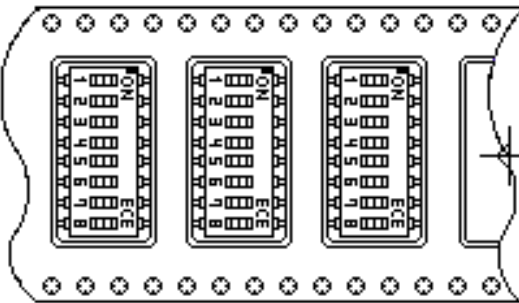
For 3P-6P

→ Direction of feed



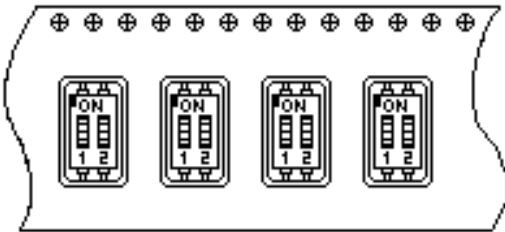
For 7P-12P

→ Direction of feed



For 2P

→ Direction of feed



Pole	No. of pcs per reel
2P	1300
3P	1000
4P	1000
5P	1000
6P	1000
7P	1000
8P	1000
10P	1000
12P	1000

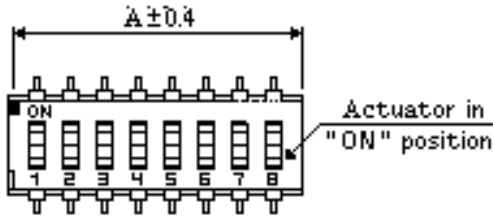
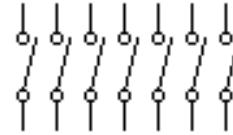
DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A

Positions	2	3	4	5	6	7	8	10	12
A	6.88 (0.271)	9.42 (0.371)	11.96 (0.471)	14.50 (0.571)	17.04 (0.671)	19.58 (0.771)	22.12 (0.871)	27.20 (1.071)	32.28 (1.271)

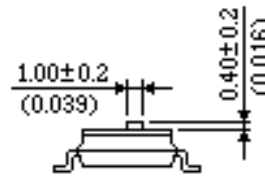
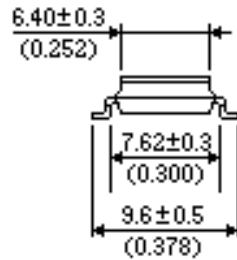
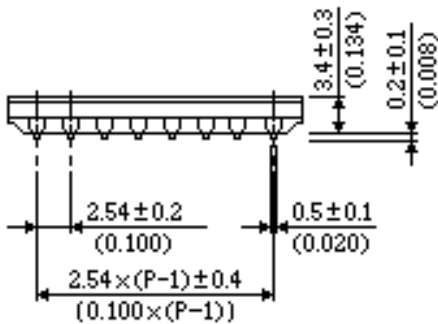
Unit:mm(inch)

CIRCUIT DIAGRAM

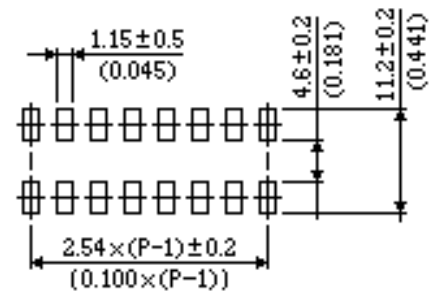


(L) TYPE

(E) TYPE



P.C.B. LAYOUT (TOP VIEW)



EAM SERIES

END-STACKABLE TYPE

PATENT NO.:47618

415364856189(U.S.A.)

FEATURES

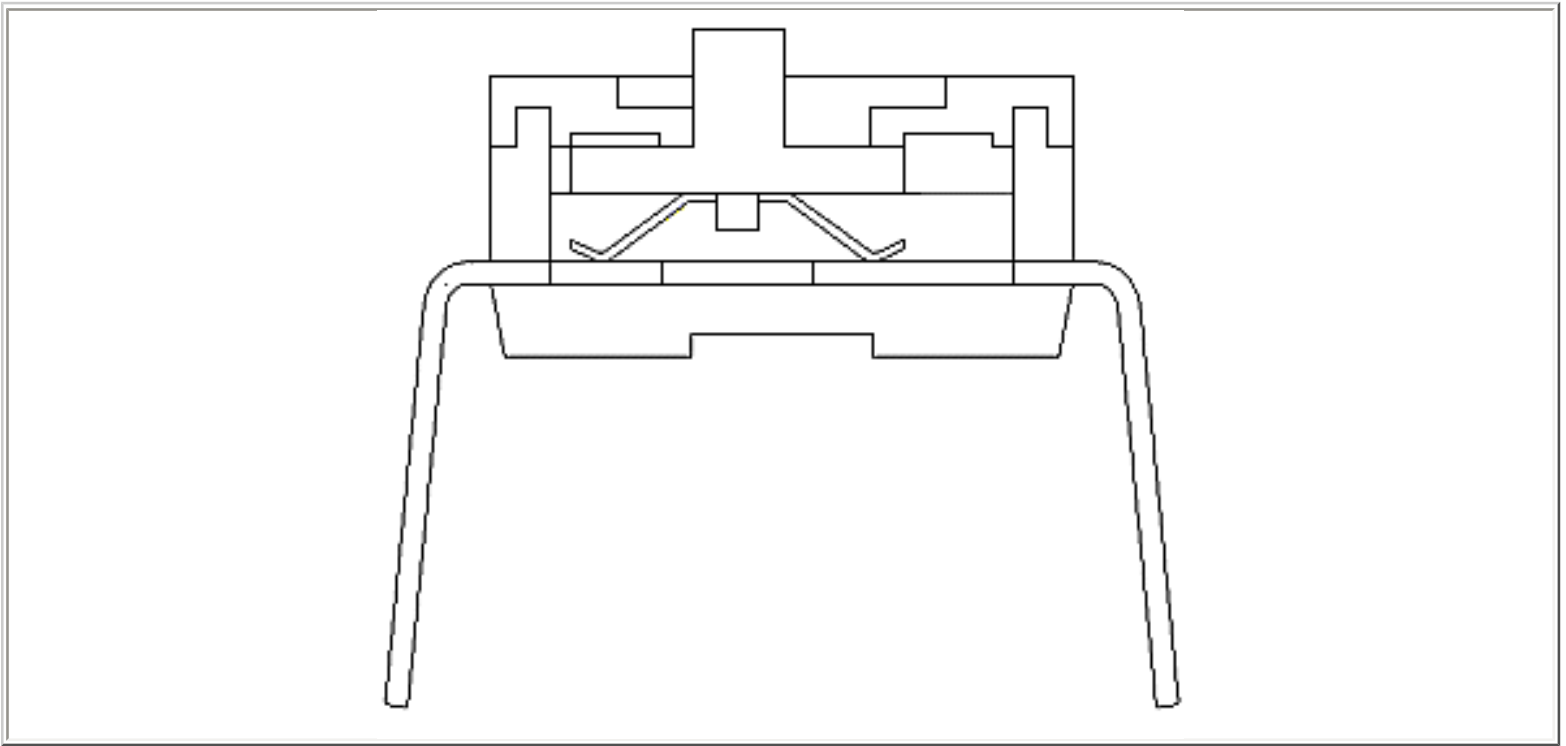
- End stackable for standard 0.1" integrated circuit pitch.
- Molded 0.3" integrated circuit packing outline allowing automatic insertion.
- Smaller size makes better heat convection during PC board reflow wave soldering.
- Top tape sealed to withstand wave soldering, board washing.
- All plastics are UL 94V-0 grade fire retardant.
- Twin contacts designed to ensure stable contact.
- Gold plated contact to ensure low contact resistance and tin plated terminal to prevent contamination during soldering.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1,000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

CONSTRUCTION



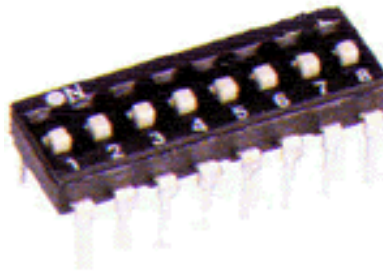
OPTIONS

1.Special marking and case color available upon request.

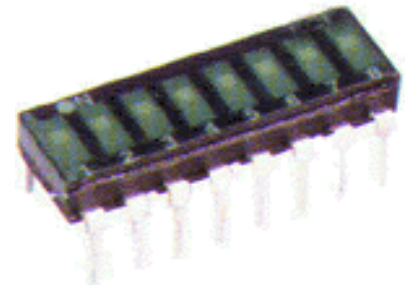
2.Two kinds of pitch available.

Actuator	Pitch (mm)	
	Standard	Option
L	8.50	7.62
E	7.62	8.50

3.Extended Actuator



4.Tape Sealed

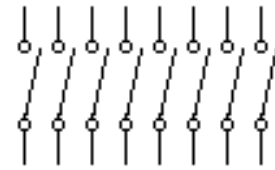


DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A

Positions	1	2	3	4	5	6	7	8	9	10	12
A	2.5 (0.098)	5.04 (0.198)	7.58 (0.298)	10.12 (0.398)	12.66 (0.498)	15.20 (0.598)	17.74 (0.698)	20.28 (0.798)	22.82 (0.898)	25.36 (1.998)	30.43 (1.198)

CIRCUIT DIAGRAM

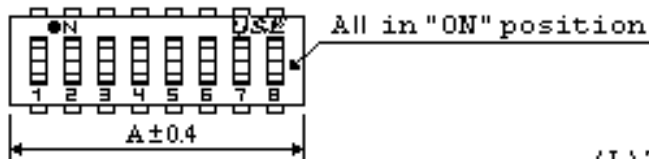


Unit:mm(inch)

NOTE: 1 pole switches have the "ON" printing.

NOTE: 2-12 pole switches have the "●N" printing.

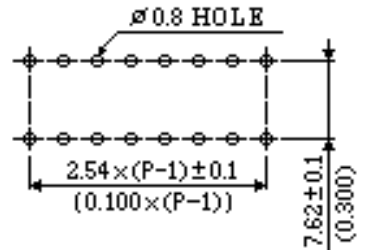
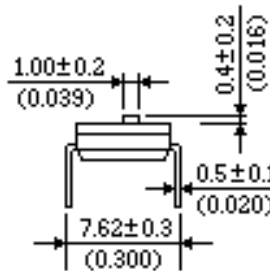
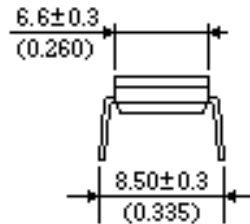
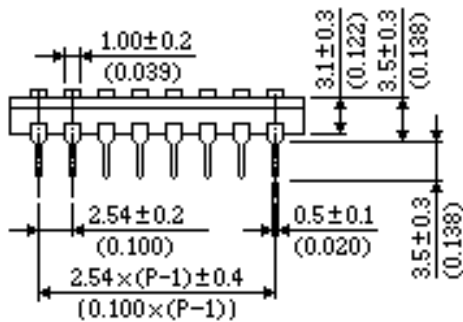
NOTE: 1 & 2 & 3 pole switches do not have the mark.



(L) TYPE

(E) TYPE

P.C.B. LAYOUT
(TOP VIEW)



ESD/ESL SERIES

END-STACKABLE SMT TYPE

PATENT NO.:47618415364856189(U.S.A.)

FEATURES

- End stackable for standard 0.1" integrated circuit pitch.
- Molded 0.3" integrated circuit packing outline allowing automatic insertion.
- Smaller size makes better heat convection during PC board reflow wave soldering.
- Top tape sealed to withstand wave soldering, board washing.
- All plastics are UL 94V-0 grade fire retardant.
- Twin contacts designed to ensure stable contact.
- Gold plated contact to ensure low contact resistance and Tin plated terminals to prevent contamination during soldering.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches	5 pF Max.

2.MECHANICAL

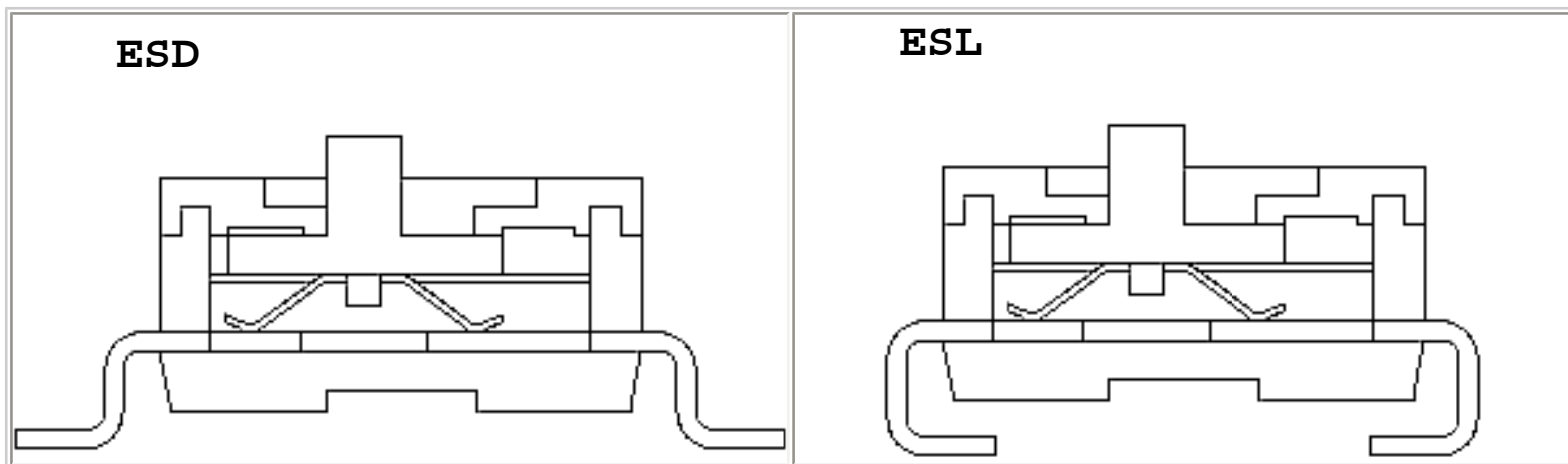
Temperature rating	
operating	-25°C to +70°C
storage	-40°C to +85°C
Operation force	800g Max.
Mechanical life	2000 operations
Humidity	95%RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, method 204D
Solderability	after flux 230±5°C for 5±0.5 seconds, 95% coverage
Resistance to soldering Heat	260±5°C for 5°C seconds.
Reflow soldering heat for SMT type (reference only)	reflow zone 230±5°C for 30 seconds

PART NUMBERING SYSTEM

ESD 1 08 L

+--- Actuator, Sealing and Rows Spacing Options:
 L:Low Profile Actuator
 E:Extended Actuator
 LT:Top Tape Sealed & Low Profile Actuator
 LC:Tape & Reel Package, product without
 Top Tape sealed
 LD:Tape & Reel Package, product with
 Top Tape sealed
 +--- Number of Positions: 1,2,3,4,5,6,7,8,9,10,12
 +--- Contact form: SPST
 +--- Series name: ESD:Surface mounting "S" type(Gull Wing)
 ESL:Surface mounting "L" type(T-Bend)

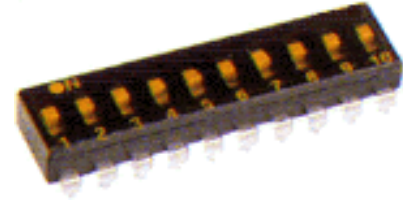
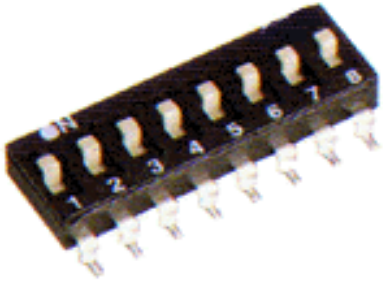
CONSTRUCTION



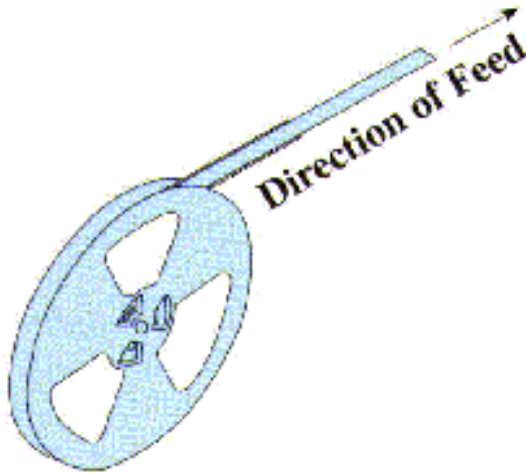
OPTIONS

- 1.Special marking and case color available
- 2.Extended Actuator

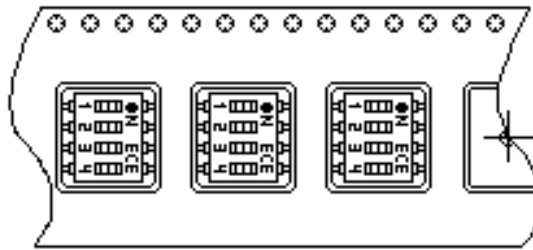
3.Top Tape Sealed



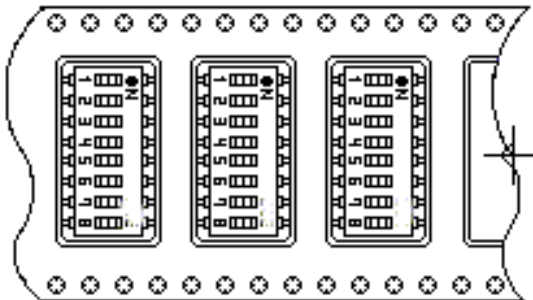
4.Tape & Reel Packaging (per EIA STANDARD)



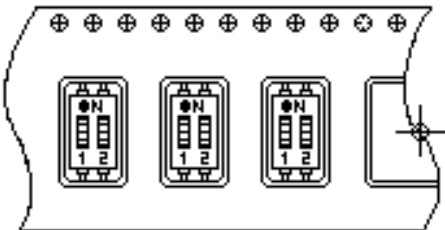
For 3P-6P
 → **Direction of feed**



For 7P-12P
 → **Direction of feed**



For 1P-2P
 → **Direction of feed**



Pole	No. of pcs per reel
1P	2000
2P	1300
3P	1000
4P	1000
5P	1000
6P	1000
7P	1000
8P	1000
10P	1000
12P	1000

DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A ESD/ESL

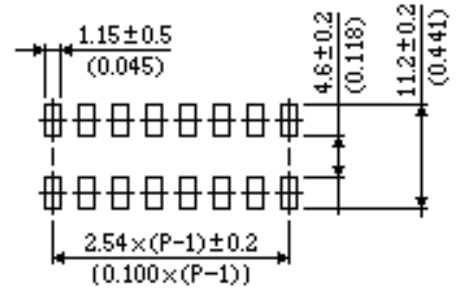
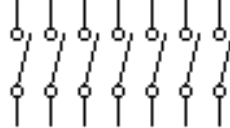
Positions	1	2	3	4	5	6
A	2.50 (0.098)	5.04 (0.198)	7.58 (0.298)	10.12 (0.398)	12.66 (0.498)	15.20 (0.598)

Positions	7	8	9	10	12
A	17.74 (0.698)	20.28 (0.798)	22.82 (0.898)	25.36 (0.998)	30.43 (1.198)

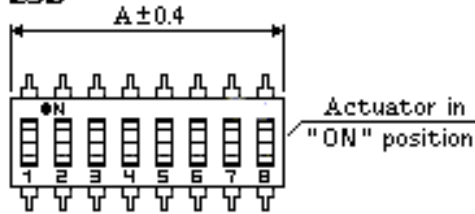
Unit:mm(inch)

P.C.B LAYOUT (TOP VIEW)

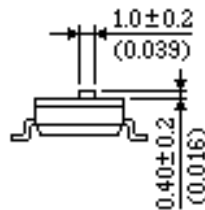
CIRCUIT DIAGRAM



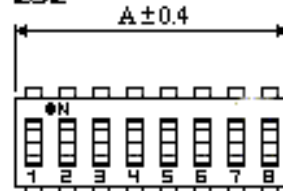
ESD



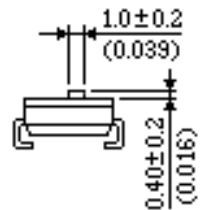
(E) TYPE



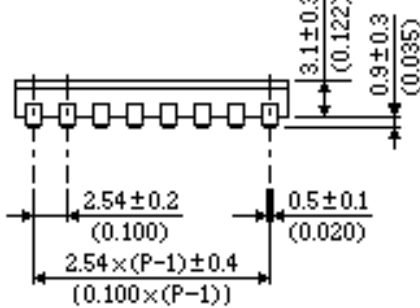
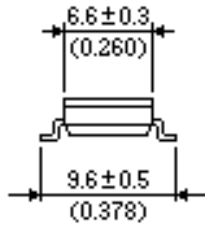
ESL



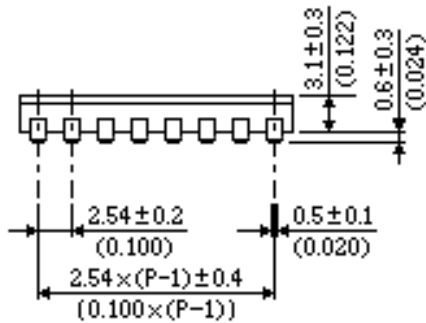
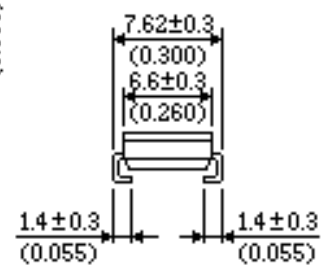
(E) TYPE



(L) TYPE



(L) TYPE



ETD/ETA/ETS SERIES

TRI-STATE TYPE

PATENT NO.:5065276(U.S.A.)476184856189(U.S.A.)

FEATURES

- With three state (1, open, 0) setting function, especially suitable for encoding/decoding of tri-state encoder/decoder integrated circuit to obtain more security codes than traditional two-state (1,0) operation. For instance, 9 bits with tri-state gets 19,683 (3^9) codes, while two-state has 512 (2^9) codes, gains 38 times more codes with a *USE* tri-state DIP Switch.
- Bottom sealed to ensure free of flux immersion during wave soldering.
- All plastics are UL 94V-0 grade fire retardant.
- Gold plated contact to ensure low contact resistance and tin plated terminals to prevent contamination during soldering.
- Twin contacts designed to ensure stable contact.
- Ideal for coding tele-communication, transceiving, remote control and burglar alarm systems which use integrated circuits with tri-state coding systems.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

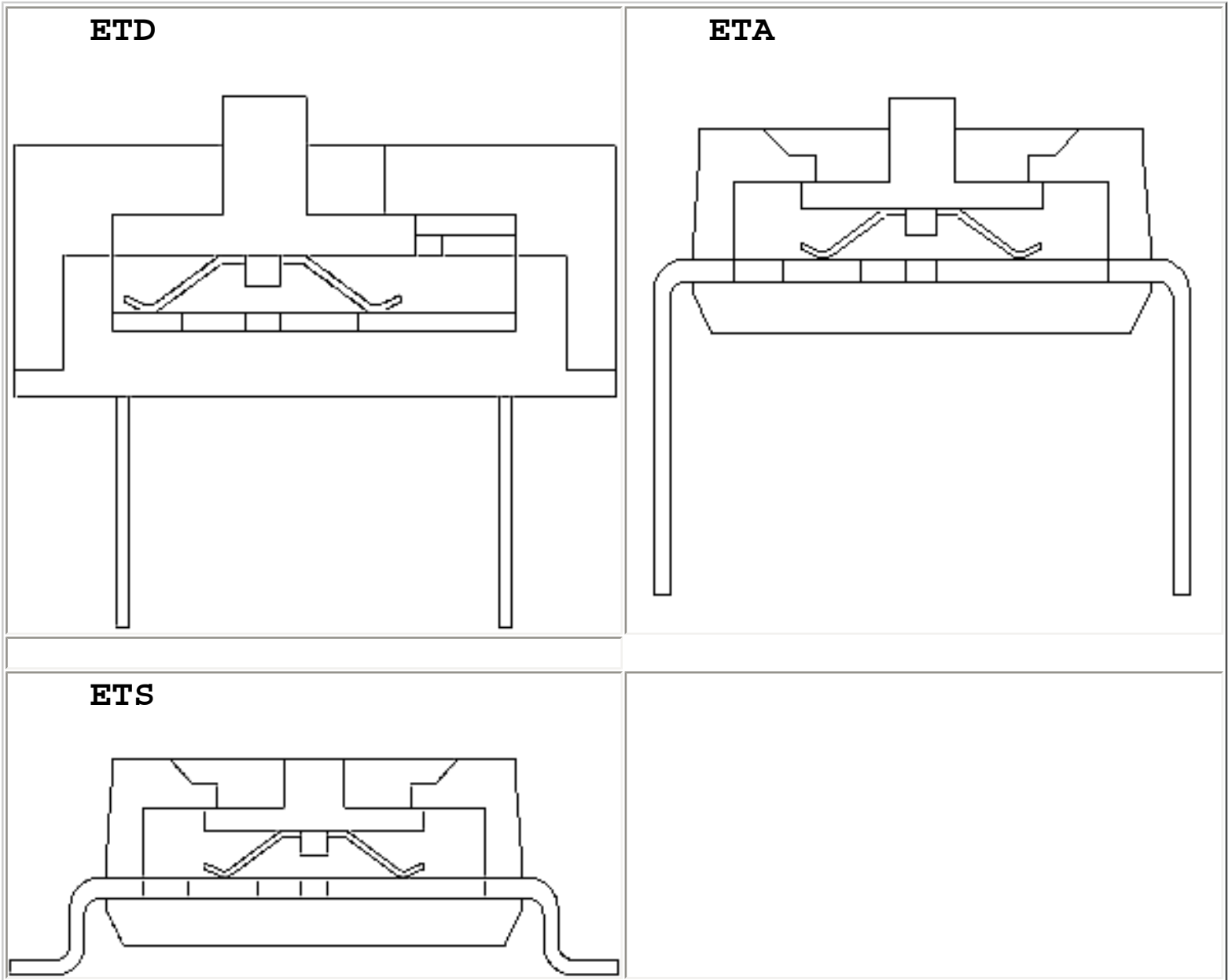
2 . MECHANICAL

Temperature rating	
operating	-25°C to + 70°C
storage	-40°C to + 85°C
Operation force	800g Max.
Mechanical life	2000 operations
Humidity	95%RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, method 204D
Solderability	after flux 230±5°C for 5±0.5 seconds, 95% coverage
Resistance to soldering heat	260±5°C for 5±1 seconds
Reflow soldering heat for SMT type (reference only)	reflow zone 230±5°C for 30 seconds

PART NUMBERING SYSTEM

ETS 1 08 L T
 | | | | |
 | | | | +---- Option: Blank:Non-Top Tape Sealed
 | | | | T:Top Tape Sealed
 | | | +--- Actuator: L:Low Profile Actuator
 | | | E:Extended Actuator
 | | +--- Number of Positions: As Dimensions and Circuitry
 | +--- Contact Form: SPST
 +--- Series Name: ETD:Bottom Sealed Type
 ETA:Automatic Inserting Type
 ETS:Surface Mounting Type

CONSTRUCTION



OPTIONS

1. Tape sealed.
 ETDxxxET ETSxxxLT

2. Reverse P.C.B. LAYOUT available

P.C.B. LAYOUT
 (TOP VIEW)

$\phi 0.8$ HOLE (+) (-)
 1 2 3 4 5 6 7 8
 $2.54 \times (P-1) \pm 0.1$
 $(0.100 \times (P-1))$
 7.62 ± 0.1
 (0.300)

ETAxxxLT



DIMENSIONS AND CIRCUITRY (UNIT: mm)

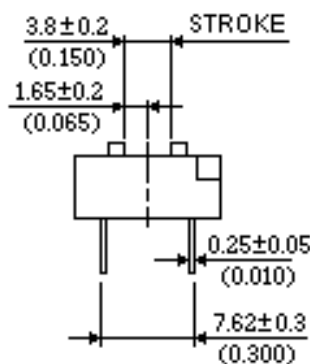
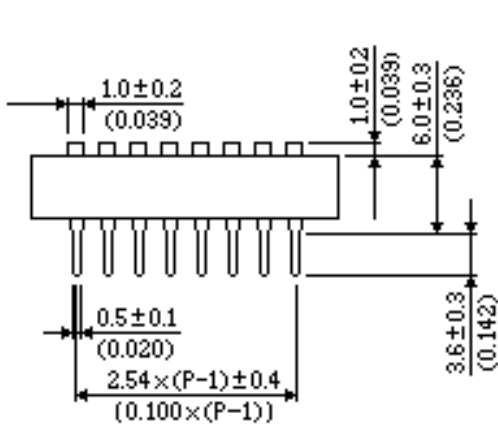
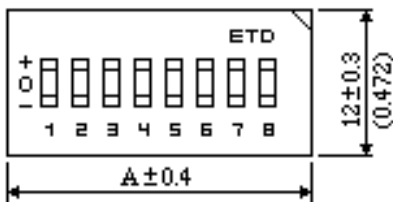
ETD

DIMENSION A

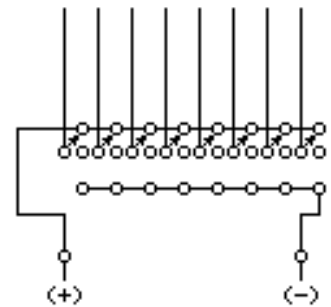
ETD

Positions	4	5	6	7	8	9	10
A	15.30 (0.602)	17.84 (0.702)	20.38 (0.802)	22.92 (0.902)	25.46 (1.002)	28.00 (1.102)	30.54 (1.202)

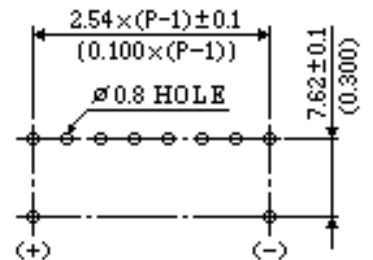
Unit: mm(inch)



CIRCUIT DIAGRAM



P.C.B. LAYOUT
(TOP VIEW)



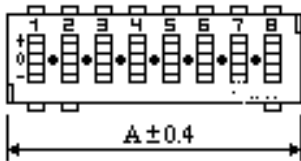
ETA

DIMENSION A

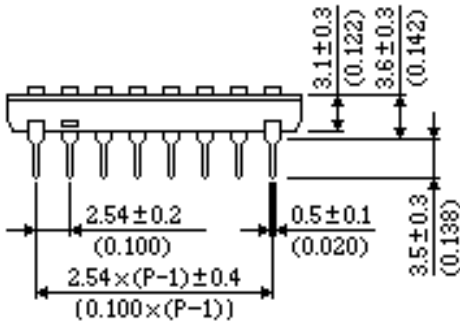
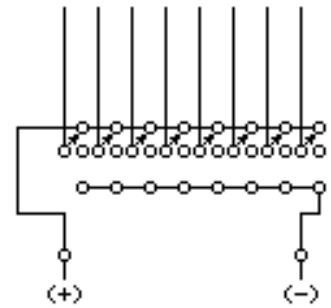
ETA/ETS

Positions	2	3	4	5	6	7	8	9	10	12
A	6.88 (0.263)	9.22 (0.363)	11.76 (0.463)	14.30 (0.563)	16.84 (0.663)	19.38 (0.763)	21.92 (0.863)	24.46 (0.963)	27.00 (1.063)	32.08 (1.263)

Unit:mm(inch)



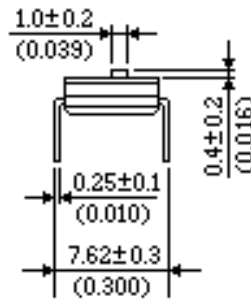
CIRCUIT DIAGRAM



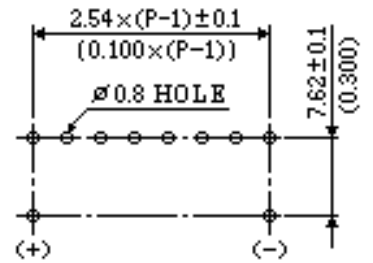
(L) TYPE



(E) TYPE



P.C.B. LAYOUT (TOP VIEW)

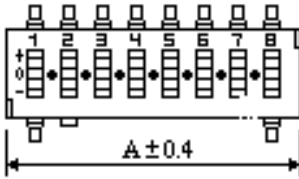


DIMENSION A

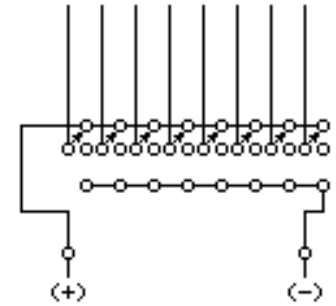
ETA/ETS

Positions	2	3	4	5	6	7	8	9	10	12
A	6.88 (0.263)	9.22 (0.363)	11.76 (0.463)	14.30 (0.563)	16.84 (0.663)	19.38 (0.763)	21.92 (0.863)	24.46 (0.963)	27.00 (1.063)	32.08 (1.263)

Unit:mm(inch)



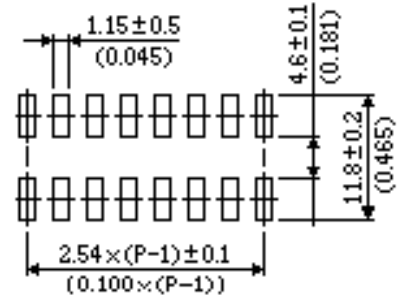
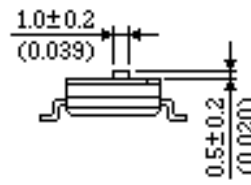
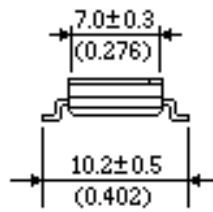
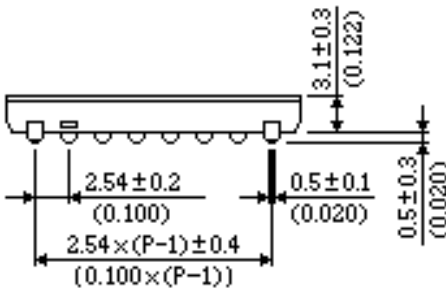
CIRCUIT DIAGRAM



(L) TYPE

(E) TYPE

**P.C.B. LAYOUT
(TOP VIEW)**



EPM/EPG/EPS SERIES

EDGE ACTUATED TYPE

PATENT NO.:29197
24553
153160



FEATURES

- Edge actuated type (Piano Type) easy setting on closely racked PCB.
- Tactile response is performed directly by larger contact pressure to ensure stable contact.
- All plastics are UL 94V-0 grade fire retardant.
- Bottom epoxy sealed standard to ensure free of flux immersion during wave soldering.
- Contact wiping on make and break.
- Gold plated or silver plated contacts to ensure low contact resistance and long operation life.
- Ideal for data processing, communications, remote controls and burglar alarm system use, where manual programming required.

SPECIFICATIONS

1 . ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

2 .MECHANICAL

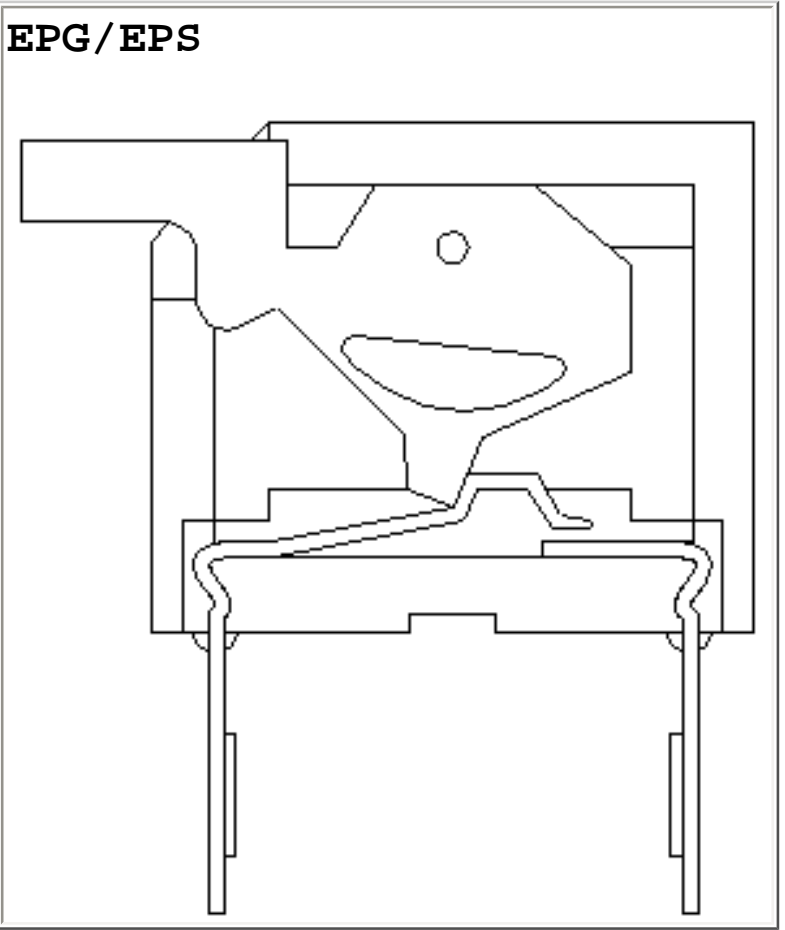
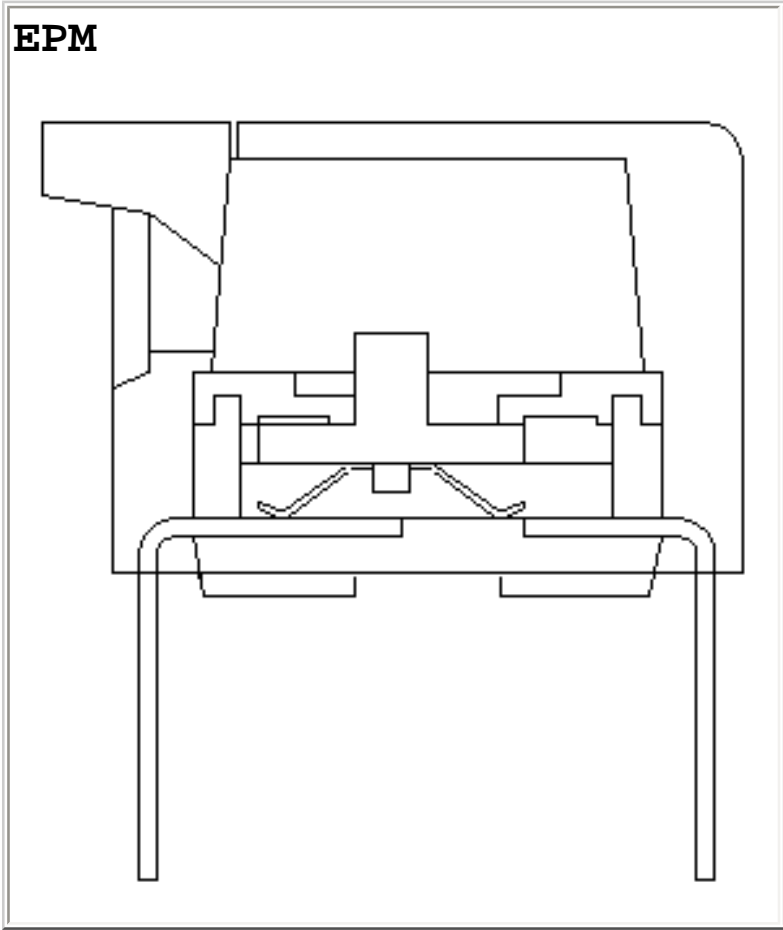
Temperature rating	
operating	-25°C to + 70°C
storage	-40°C to + 85°C
Operation force	800g Max.
Mechanical life	2000 operations
Humidity	95%RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, method 204D
Solderability	after flux 230±5°C for 5±0.5 seconds, 95% coverage
Resistance to soldering heat	260±5°C for 5±1 seconds

PART NUMBERING SYSTEM

EPM 1 08 1 1 00
 | | | | |
 | | | | +--- 00: Row Special 7.62mm
 | | | | +--- Sealing: 1:Non Top Tape Sealed
 | | | | | 2:Top Tape Sealed
 | | | | +--- Actuator and ON position (For Position 1):
 | | | | | 1:Extended Actuator and Top Side "OFF"
 | | | | | 2:Extended Actuator and Top Side "ON"
 | | | | | 3:Low Profile Actuator and Top Side "OFF"
 | | | | | 4:Low Profile Actuator and Top Side "ON"
 | | | | +--- Number of Positions: 2,3,4,5,6,7,8,9,10,12
 | | | | +--- Contact Forms: SPST
 | | | | +--- Series Name: EPM:Piano type

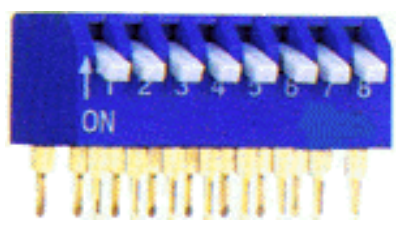
EPG 1 08 A
 | | | |
 | | | | +--- Actuator Sealing (For Position 1):
 | | | | | A:Top Side"OFF"
 | | | | | B:Top Side"ON"
 | | | | | AT:Top Side "OFF" and Tape Sealed
 | | | | | BT:Top Side "ON" and Tape Sealed
 | | | | +--- Number of Positions: As Dimensions and Circuitry
 | | | | +--- Contact Forms: 1.SPST 2.DPST 3.SPDT
 | | | | | 4.3PST 5.4PST 6.DPDT
 | | | | +--- Series Name: EPG:Edge Actuated Type
 | | | | | (Gold Plated Contacts)
 | | | | | EPS:Edge Actuated Type
 | | | | | (Silver Plated Contacts)

CONSTRUCTION



OPTIONS

- 1. Special top or side marking available
- 2. Blue or black body color
- 3. Normal "ON" (top side "ON") available

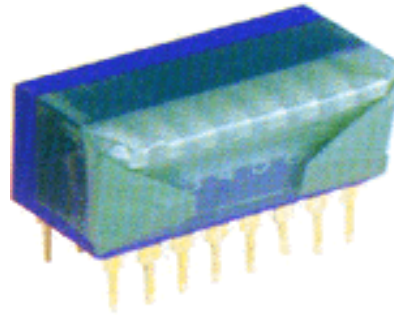
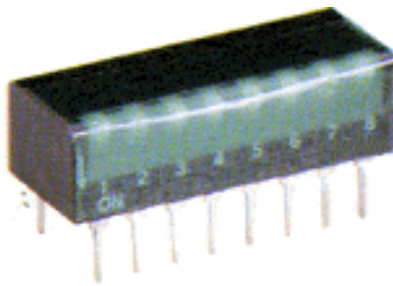


4. Tape sealed

EPMxxx3200 (Low Profile only)

EPMxxx4200 (Low Profile only)

EPGxxxxT



DIMENSIONS AND CIRCUITRY (UNIT: mm)

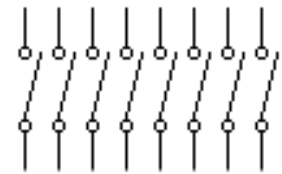
EPM

DIMENSION A

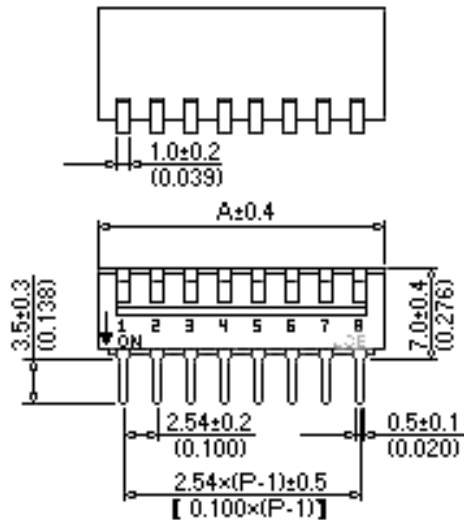
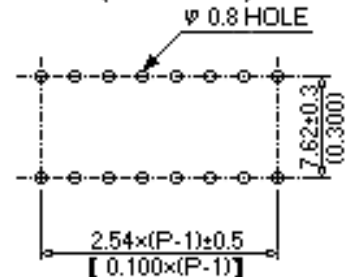
Positions	2	3	4	5	6	7	8	9	10	12
A	6.5 (0.256)	9.0 (0.354)	11.6 (0.457)	14.1 (0.555)	16.7 (0.657)	19.2 (0.756)	21.7 (0.854)	24.2 (0.953)	26.7 (1.050)	31.9 (1.256)

Unit: mm(inch)

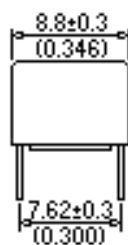
CIRCUIT DIAGRAM



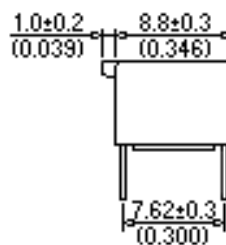
P.C.B. LAYOUT (TOP VIEW)



(L) TYPE



(E) TYPE



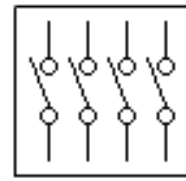
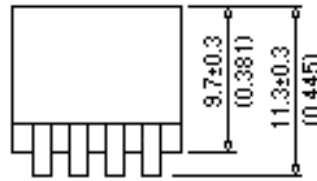
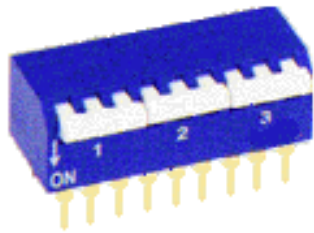
EPG/EPS SPST

DIMENSION A

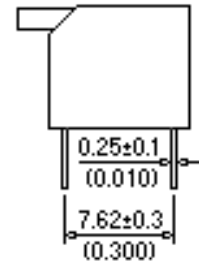
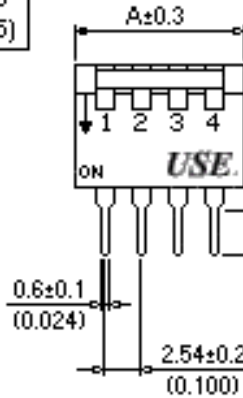
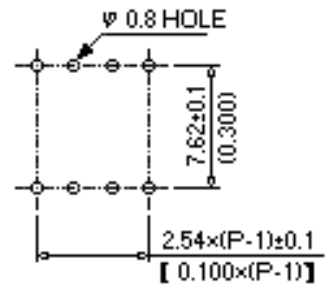
Positions	2	3	4	5	6
A	6.7 (0.264)	9.2 (0.362)	11.7 (0.461)	14.2 (0.559)	16.7 (0.657)
Positions	7	8	9	10	12
A	19.2 (0.756)	21.7 (0.854)	24.4 (0.953)	26.7 (1.05)	31.8 (1.25)

Unit: mm(inch)

EPG/EPS SPST



P.C.B. LAYOUT
(TOP VIEW)

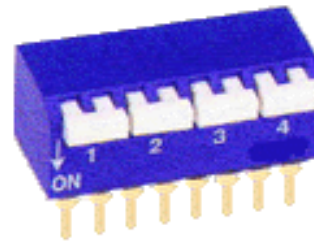


EPG/EPS DPST.SPDT

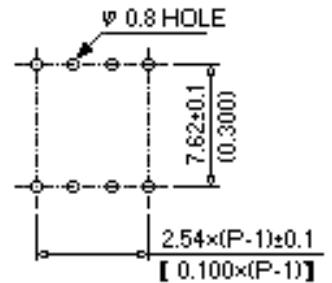
DIMENSION A

Positions	1	2	3	4	5	6
A	6.7 (0.264)	11.7 (0.461)	16.7 (0.657)	21.7 (0.854)	26.7 (1.05)	31.8 (1.25)

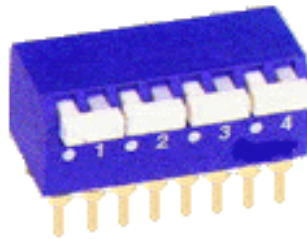
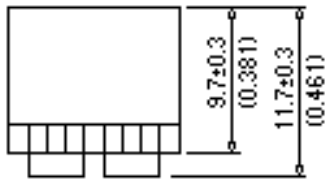
Unit: mm(inch)



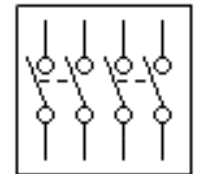
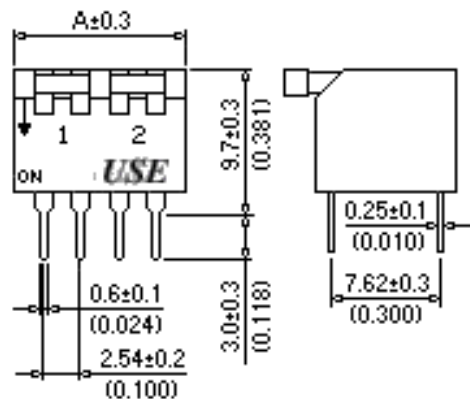
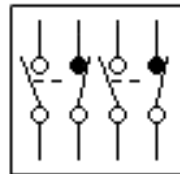
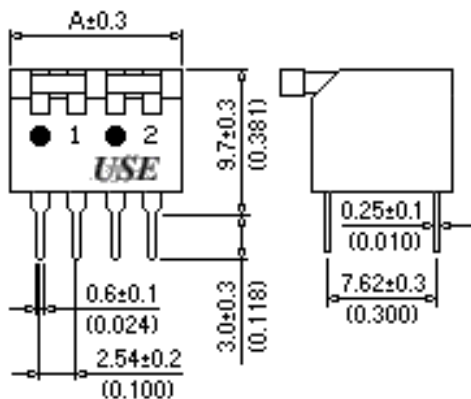
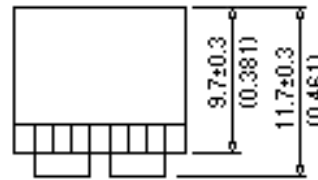
P.C.B. LAYOUT
(TOP VIEW)



EPG/EPS SPDT



EPG/EPS DPST

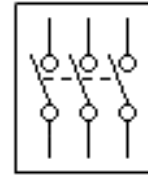
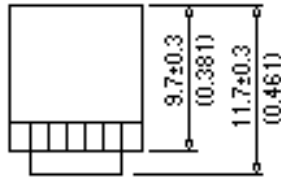


EPG/EPS 3PST

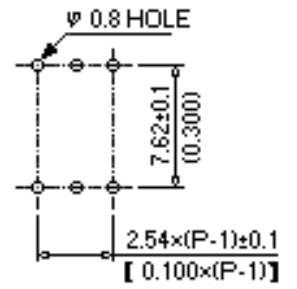
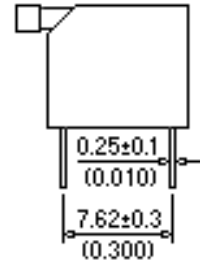
DIMENSION A **3PST**

Positions	1	2	3	4
A	9.2 (0.362)	16.7 (0.657)	24.2 (0.953)	31.8 (1.25)

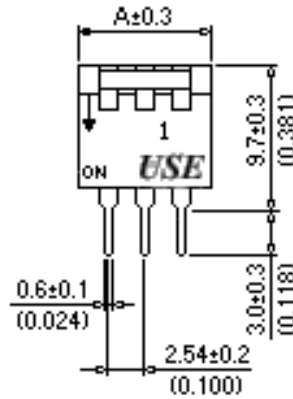
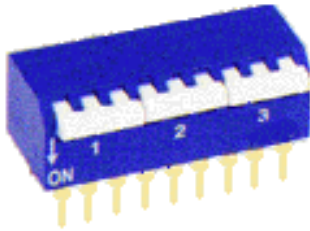
Unit:mm(inch)



P.C.B. LAYOUT
(TOP VIEW)



EPG/EPS 3PST

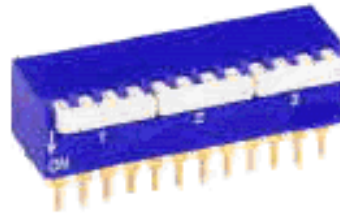


EPG/EPS 4PST.DPDT

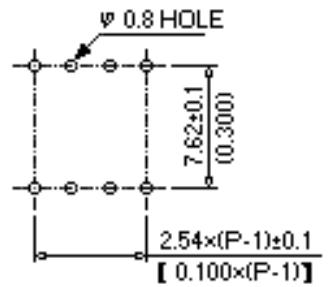
DIMENSION A 4PST.DPDT

Positions	1	2	3
A	11.7 (0.461)	21.7 (0.854)	31.8 (1.25)

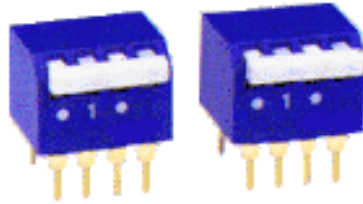
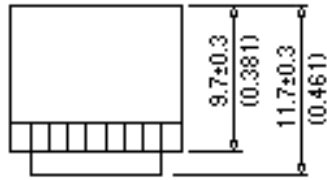
Unit:mm(inch)



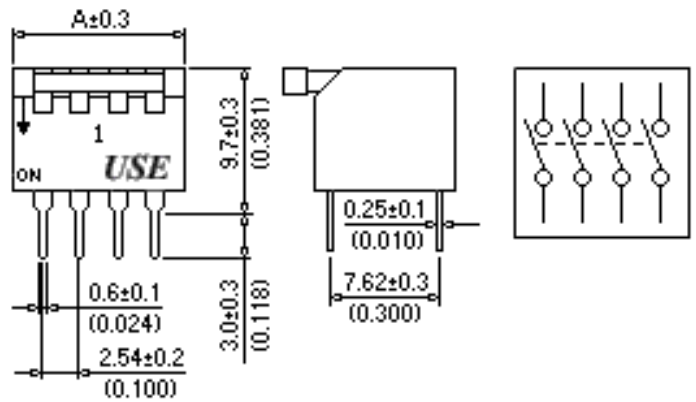
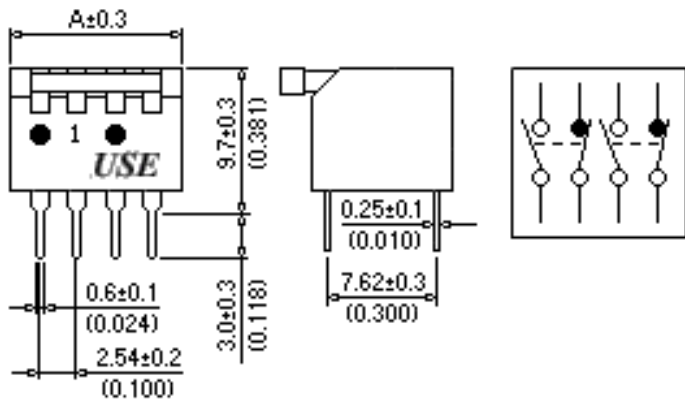
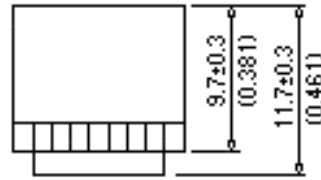
**P.C.B. LAYOUT
(TOP VIEW)**



EPG/EPS DPDT



EPG/EPS 4PST



EPD SERIES

EDGE ACTUATED SMT TYPE

U.S.Electronics Inc.

Ph: (314) 423 7550

Fax: (314) 423 0585

PATENT NO.: 153160

FEATURES

- SMT of edge actuated type (SMT piano type) easy setting on closely racked PCB.
- Gold plated contact to ensure low contact resistance and long operation life and tin plated terminal to prevent contamination during soldering.
- All plastics are UL 94V-0 grade fire retardant.
- Twin contacts designed to ensure stable contact.
- Smaller size makes better heat convection during PC board reflow soldering.
- Bottom epoxy sealed standard to ensure free of flux immersion during wave soldering.
- Low profile with top tape sealed to withstand board washing.

SPECIFICATIONS

1 . ELECTRICAL

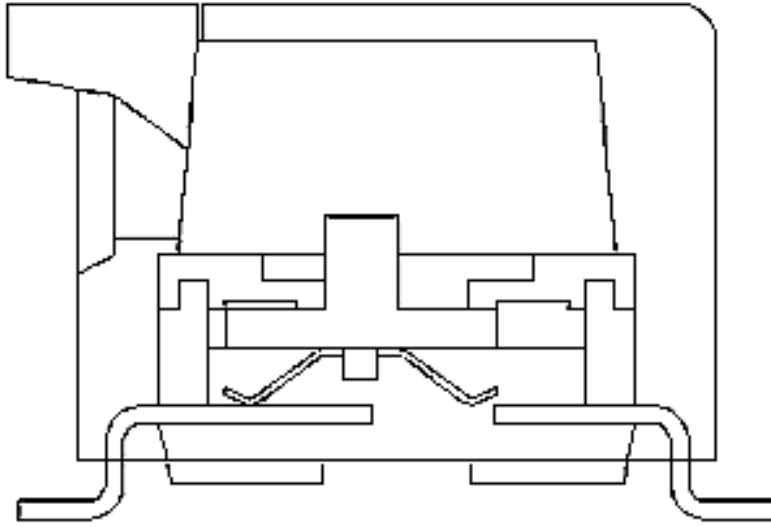
Contact rating	
switching	25mA, 24VDC
non-switching	100mA, 50VDC
Contact resistance	
initial	50m Ω Max.
after life test	100m Ω Max.
Insulation resistance	1000M Ω Min. at 100VDC
Dielectric strength	500VDC for 60 seconds
Capacitance between adjacent switches 5pF Max.	

2.MECHANICAL

Temperature rating	
operating	-25°C to +70°C
storage	-40°C to +85°C
Operating force	800g Max.
Mechanical life	2000 operations.
Humidity	95% RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, Method 204D
Solderability	After flux 230 ± 5°C for 5 ± 0.5 seconds, 95% coverage.
Resistance to soldering heat	260 ± 5°C for 5 ± 1 seconds.
Reflow soldering heat for SMT type (reference only)	reflow zone 230 ± 5°C for 30 seconds

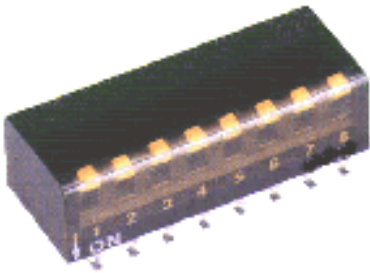
PART NUMBERING SYSTEM

```
EPD 1 08 1 1 00
|   |   |   |   |
|   |   |   |   | +--- Standard
|   |   |   |   | +--- Sealing:
|   |   |   |   | 1:Non Top Tape Sealed
|   |   |   |   | 2:Top Tape Sealed
|   |   |   |   | 3:Tape & Reel Package,product without
|   |   |   |   |   Top Tape Sealed
|   |   |   |   | 4:Tape & Reel Package.product with
|   |   |   |   |   Top Tape Sealed
|   |   |   |   | +--- Actuator and ON position (For Position 1):
|   |   |   |   | 1:Extended Actuator and Top Side "OFF"
|   |   |   |   | 2:Extended Actuator and Top Side "ON"
|   |   |   |   | 3:Low Profile Actuator and Top Side "OFF"
|   |   |   |   | 4:Low Profile Actuator and Top Side "ON"
|   |   |   |   | +--- Number of Positions: 2,3,4,5,6,7,8,9,10,12
|   |   |   |   | +--- Contact Forms: SPST
+--- Series Name: EPD:SMT Piano Type
```

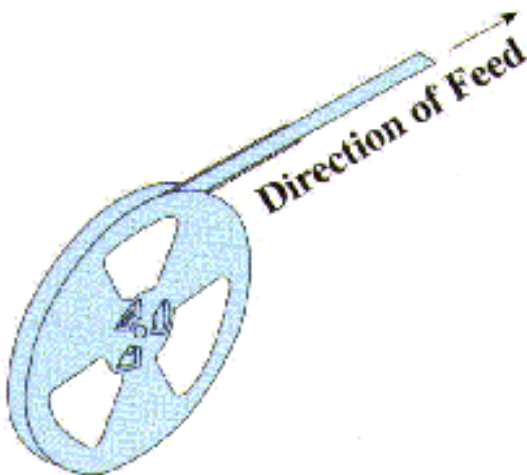


OPTIONS

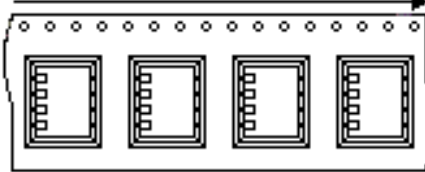
1. Top Tape sealed



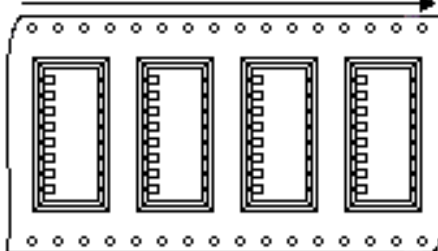
2. Tape & Reel Packaging (per EIA STAMDARD)



For 2P-5P Direction of feed →



For 6P-12P Direction of feed →



Pole	No. of pcs per reel
2P	550
3P	550
4P	550
5P	550
6P	550
7P	550
8P	550
10P	550
12P	550

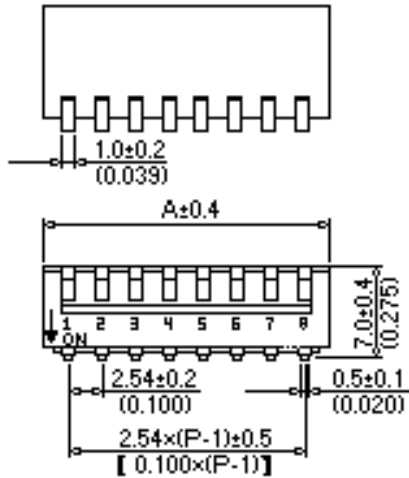
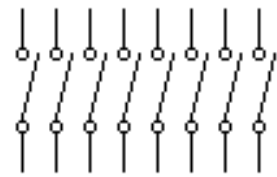
DIMENSIONS AND CIRCUITRY (UNIT: mm)

DIMENSION A

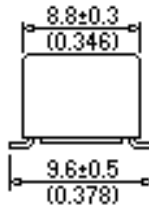
Positions	2	3	4	5	6	7	8	9	10	12
A	6.5 (0.256)	9.0 (0.354)	11.6 (0.457)	14.1 (0.555)	16.7 (0.657)	19.2 (0.756)	21.7 (0.854)	24.2 (0.953)	26.7 (1.050)	31.9 (1.256)

Unit:mm(inch)

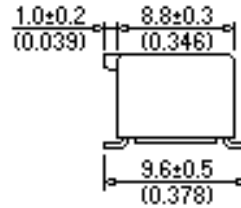
CIRCUIT DIAGRAM



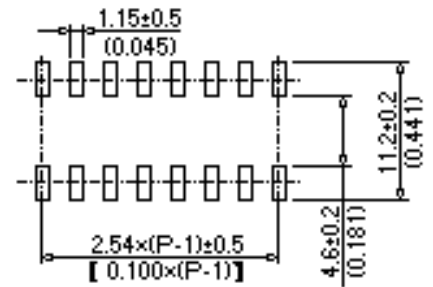
(L) TYPE



(E) TYPE

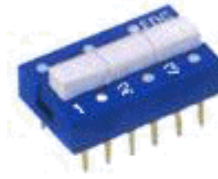


P.C.B. LAYOUT (TOP VIEW)



EDG/EDS SERIES

SLIDE TYPE (SLIDE WITH RIGHT ANGLE TYPE)

PATENT NO.:29197
24553

FEATURES

- Tactile response is performed directly by larger contact pressure to ensure very stable contact.
- All plastics are UL 94V-0 grade fire retardant.
- Bottom epoxy sealed standard to ensure free of flux immersion during wave soldering.
- Contact wiping on make and break.
- Gold or silver plated contacts to ensure low contact resistance and long mechanical life.
- Ideal for data processing, communications, remote controls and burglar alarm system use, where manual programming is required.

SPECIFICATIONS

1. ELECTRICAL

Contact rating	
switching	25 mA, 24 VDC
non-switching	100 mA, 50 VDC
Contact resistance	
initial	50 m Ω Max.
after life test	100 m Ω Max.
Insulation resistance	1000 M Ω Min. at 100 VDC
Dielectric strength	500 VDC Min. for 60 seconds
Capacitance between adjacent switches 5 pF Max.	

2. MECHANICAL

Temperature rating	
operating	-25°C to + 70°C
storage	-40°C to + 85°C
Operation force	800g Max.
Mechanical life	2000 operations
Humidity	95%RH, 40°C for 96 Hrs.
Vibration	Per MIL-STD-202F, method 204D
Solderability	after flux 230 \pm 5°C for 5 \pm 0.5 seconds, 95% coverage
Resistance to soldering heat	260 \pm 5°C for 5 \pm 1 seconds

PART NUMBERING SYSTEM

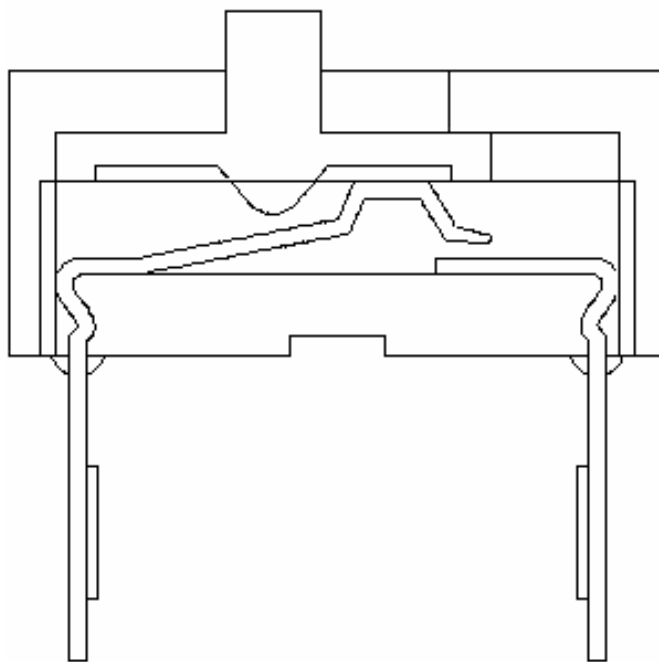
EDG 1 08 S

+--- Actuator and Sealing:
 S:Standard
 L:Low Profile Actuator
 LT:Low Profile and Tape Sealed
 ST:Standard and Tape Sealed
 +--- Number of positions: As Dimensions and Circuitry
 +--- Contact Forms: 1.SPST 2.DPST 3.SPDT
 4.3PST 5.4PST 6.DPDT
 +--- Series Name: EDG:Gold Plated Contacts
 EDS:Silver Plated Contacts

EDG 1 08 S RA

+--- Right Angle
 +--- Actuator and Sealing:
 S:Standard
 L:Low Profile Actuator
 LT:Low Profile and Tape Sealed
 ST:Standard and Tape Sealed
 +--- Number of positions: As Dimensions and Circuitry
 +--- Contact Forms: 1.SPST 2.DPST 4.3PST 5.4PST
 +--- Series Name: EDG:Gold Plated Contacts/EDS:Silver Plated Contacts

CONSTRUCTION



DIMENSIONS AND CIRCUITRY (UNIT: mm)

SPST

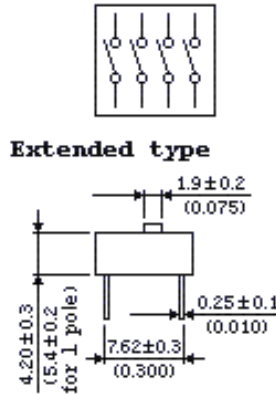
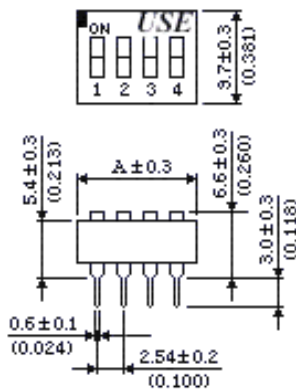
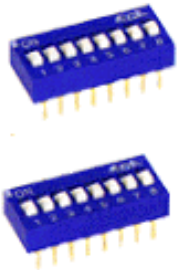
DIMENSION A

SPST

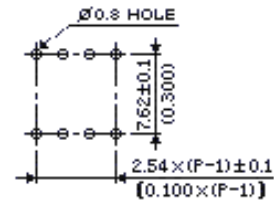
Positions	1	2	3	4	5	6	7	8	9	10	12	15
A	3.9 * (0.154)	6.7 (0.264)	9.2 (0.362)	11.7 (0.461)	14.2 (0.559)	16.7 (0.657)	19.2 (0.756)	21.7 (0.854)	24.2 (0.953)	26.7 (1.051)	31.8 (1.252)	39.5 (1.555)

Unit:mm(inch)

* The dimensions of the 1 pole switch may vary slightly.



P.C.B LAYOUT (TOP VIEW)



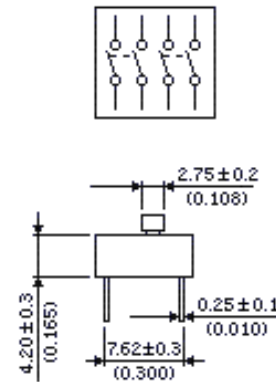
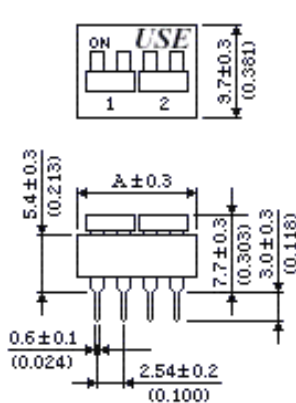
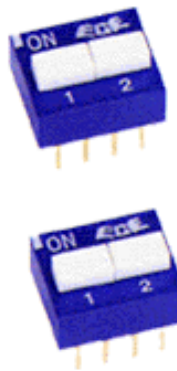
DPST

DIMENSION A

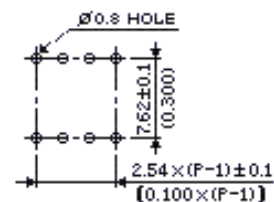
DPST

Positions	1	2	3	4	5	6
A	6.7 (0.264)	11.7 (0.461)	16.7 (0.657)	21.7 (0.854)	26.7 (1.05)	31.8 (1.25)

Unit:mm(inch)



P.C.B LAYOUT (TOP VIEW)



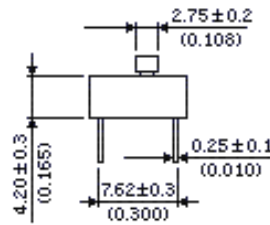
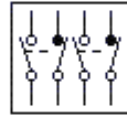
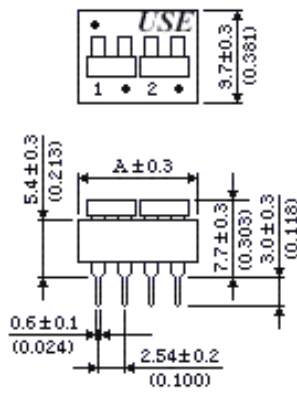
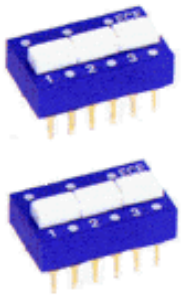
SPDT

DIMENSION A

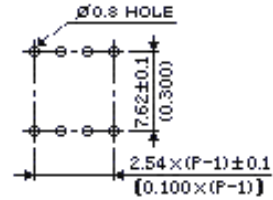
SPDT

Positions	1	2	3	4	5	6
A	6.7 (0.264)	11.7 (0.461)	16.7 (0.657)	21.7 (0.854)	26.7 (1.05)	31.8 (1.25)

Unit:mm(inch)



P.C.B LAYOUT (TOP VIEW)



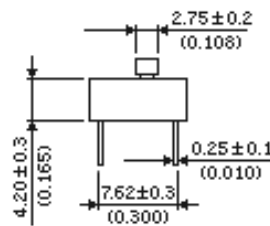
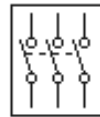
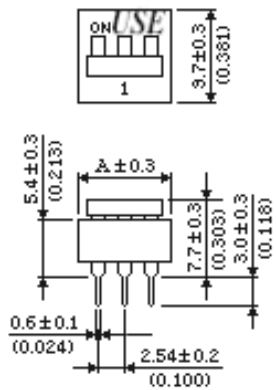
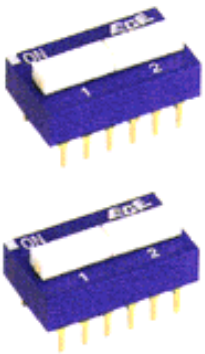
3PST

DIMENSION A

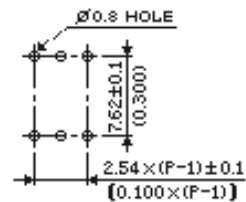
3PST

Positions	1	2	3	4	5
A	9.2 (0.362)	16.7 (0.657)	24.2 (0.953)	31.8 (1.25)	39.5 (1.555)

Unit:mm(inch)



P.C.B LAYOUT (TOP VIEW)



4PST.DPDT

DIMENSION A 4PST.DPDT

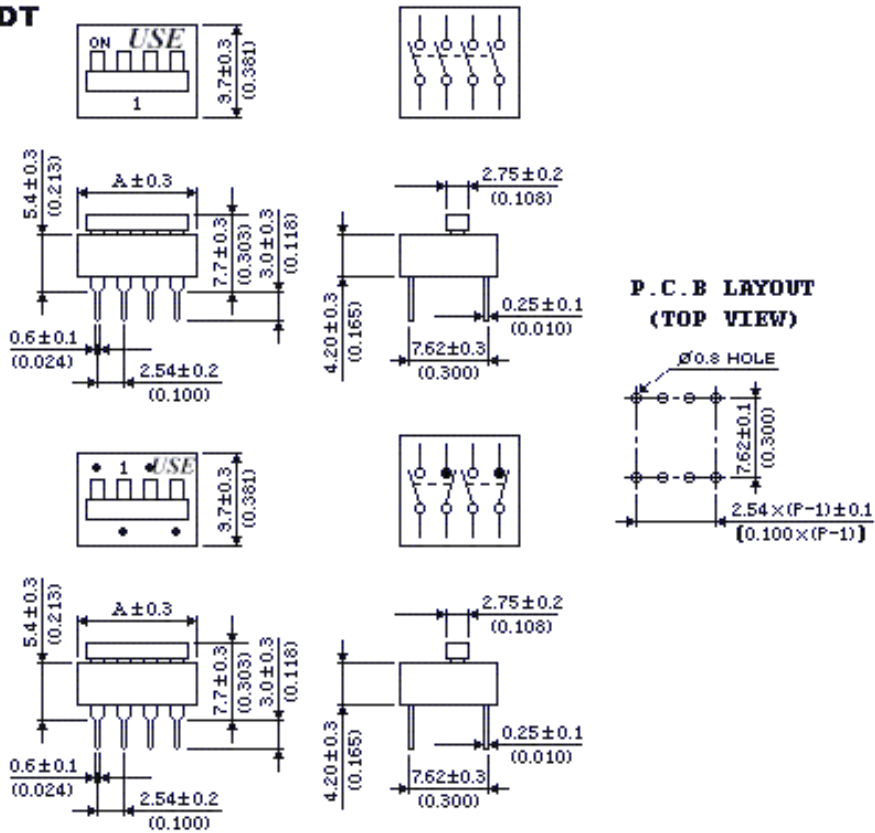
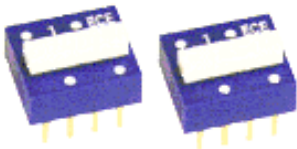
Positions	1	2	3
A	11.7 (0.461)	21.7 (0.854)	31.8 (1.25)

Unit:mm(inch)

4PST

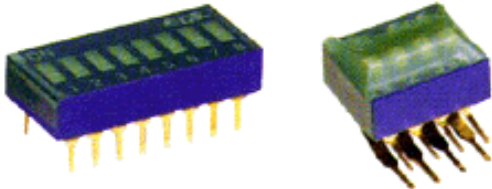


DPDT

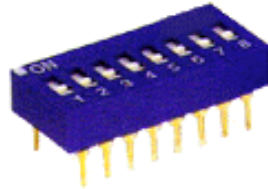


OPTIONS

4.Low profile actuators plus top tape sealed

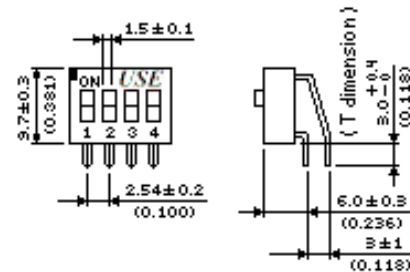


3.Low profile actuators



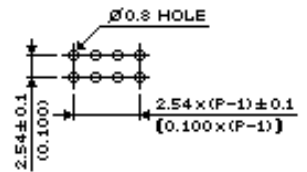
2.Slide with Right Angle Type: EDG(S)xxxSRA Series

Right angle type

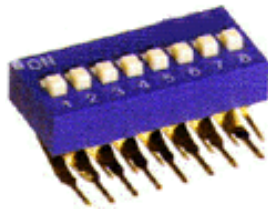


Unit:mm(inch)

P.C.B LAYOUT



1.Special top or side marking available



** The "T" dimension of the 1 position switch is 3.0 ± 0.2