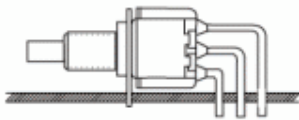


# T701 Snap-Acting Push Switches Lock type



## SPECIFICATION

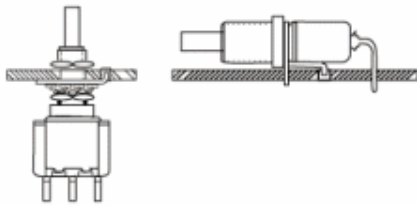
Rating : Silver : 3A @120V AC or 28V DC.  
 1A @250V AC.  
 Gold : 0.4VA Max. @20V Max.(AC or DC)  
 Contact resistance : 20mΩ Max. @2-4V DC.(initial)  
 Withstand voltage : 1,000V RMS @sea level.  
 Operating temperature : -30°C ~ +85°C.  
 Mechanical life : 50,000 Cycles.

## MATERIAL

Case : Diallyl phthalate.(DAP)(UL-94V-0)  
 Plunger : Glass filled Nylon or Glass filled polyester.  
 Bushing : Brass, Nickel plated.  
 Housing : Stainless steel.  
 Contact : Brass, Silver or Gold plated.  
 Terminal : Brass, Silver or Gold plated.



Lock Type



( ) : MOMENTARY

### SPDT

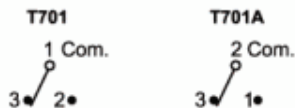


T701

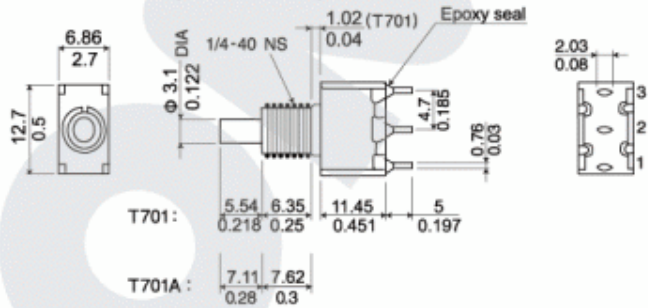
### T701A LOCK type

MODEL NO.	TYPE	
T701	ON	(ON)
T701A	ON	ON

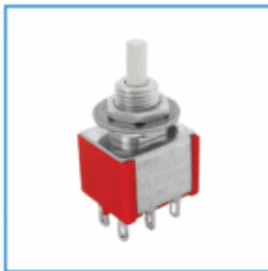
#### Schematic



Travel: 1.0+/-0.2mm (T701, T702)  
 Travel: 0.7+/-0.2mm (T701A, T702A)



### DPDT

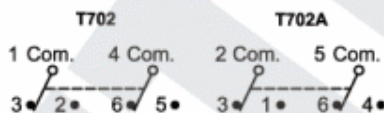


T702

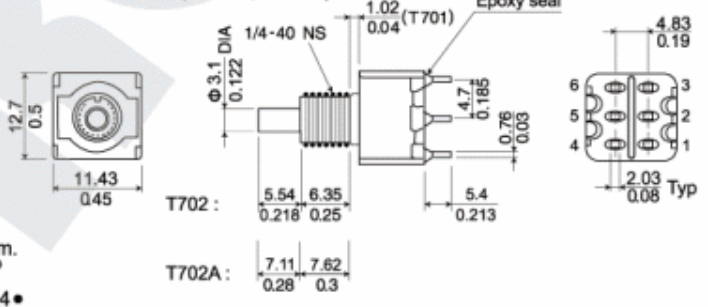
### T702A LOCK type

MODEL NO.	TYPE	
T702	ON	(ON)
T702A	ON	ON

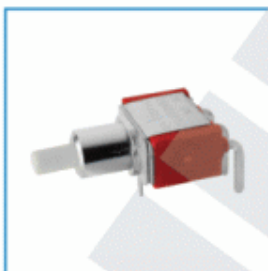
#### Schematic



Travel: 1.0+/-0.2mm (T701, T702)  
 Travel: 0.7+/-0.2mm (T701A, T702A)

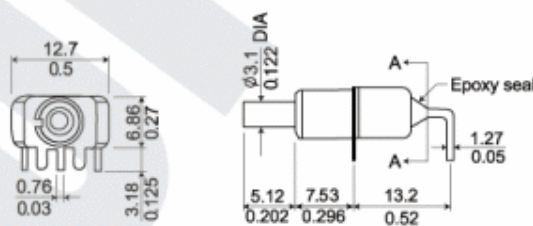


### SPDT

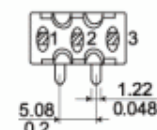


T701P

Travel: 1.0+/-0.2mm (T701, T702)  
 Travel: 0.7+/-0.2mm (T701A, T702A)

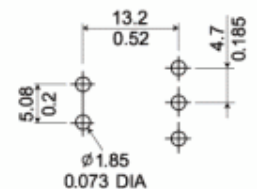


Com. N.O. N.C.

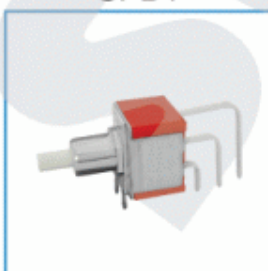


SECTION A-A

P.C.B. LAYOUT

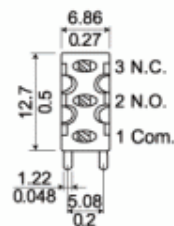
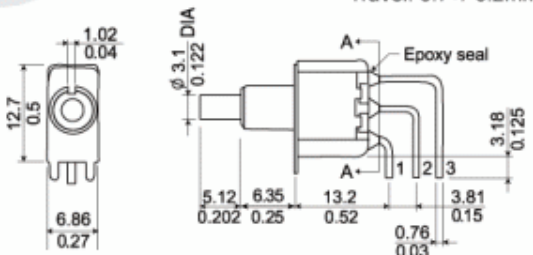


### SPDT



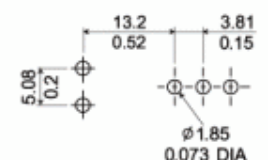
T701L

Travel: 1.0+/-0.2mm (T701, T702)  
 Travel: 0.7+/-0.2mm (T701A, T702A)

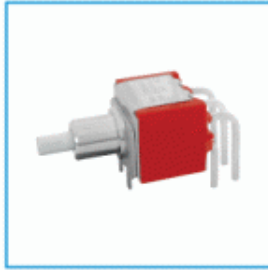


SECTION A-A

P.C.B. LAYOUT

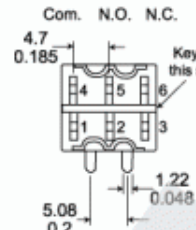
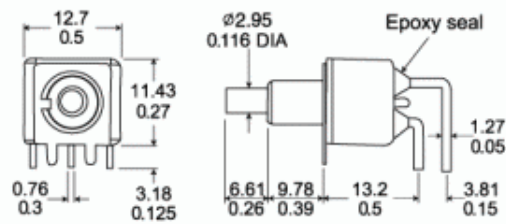


## DPDT

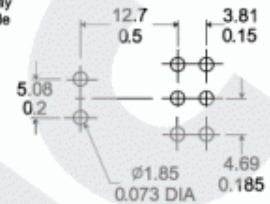


T702P

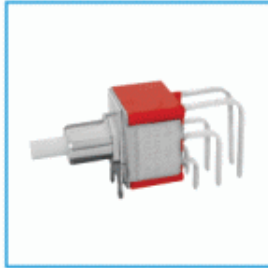
Travel: 1.0+/-0.2mm (T701, T702)  
Travel: 0.7+/-0.2mm (T701A, T702A)



## P.C.B. LAYOUT

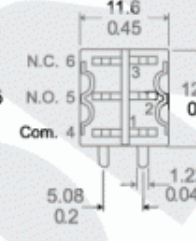
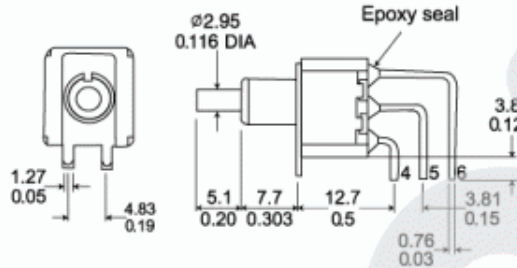


## DPDT

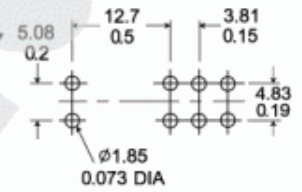


T702L

Travel: 1.0+/-0.2mm (T701, T702)  
Travel: 0.7+/-0.2mm (T701A, T702A)



## P.C.B. LAYOUT

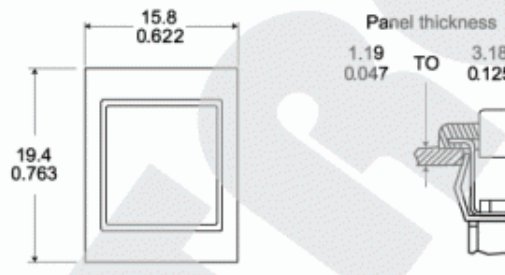


## SPDT

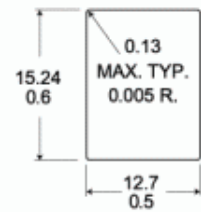


T701BNQYF22A

Travel: 1.0+/-0.2mm (T701, T702)  
Travel: 0.7+/-0.2mm (T701A, T702A)



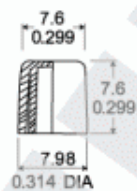
## MOUNTING HOLE



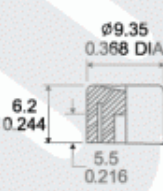
## CAP, TERMINAL OPTIONS



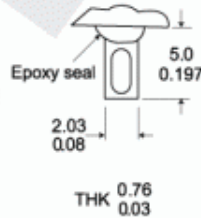
T701 C1



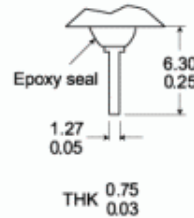
T701 C2



### B



### C



### P



### L



## HOW TO ORDER



T701 Momentary  
T702 Momentary  
T701A Latching  
T702A Latching

B  
C  
P  
L

T: THREAD  
N: NON THREAD

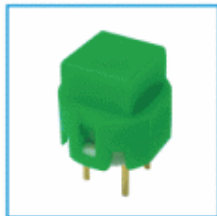
Q: SILVER PLATED  
R: GOLD PLATED

Y: YES

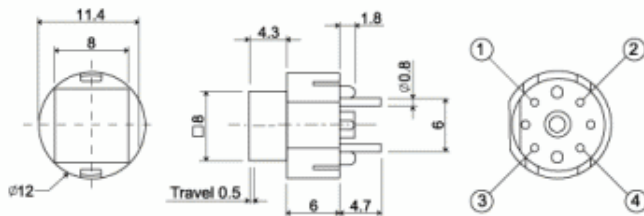
□: SEPARATE PACKING

1: FIXED ON S/W

# KS-505 Series Lightly-Touch Key Switches



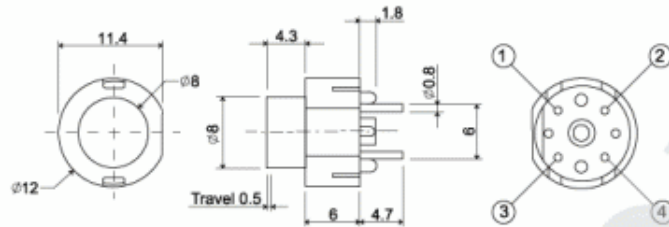
KS-505A



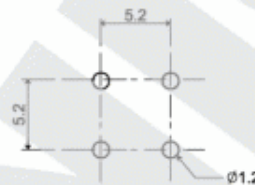
**Rating** : 0.25A 125V AC  
**Circuit** : PUSH (ON)  
**Contact resistance** : 30mΩ (initial)  
**Insulation resistance** : 100MΩ at 500V DC.  
**Withstand voltage** : 500V AC for 1 minute  
**Operating force** : 100, 180±50g  
**Life** : 100,000 Cycles.



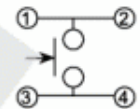
KS-505B



P.C.B. LAYOUT



SCHEMATIC



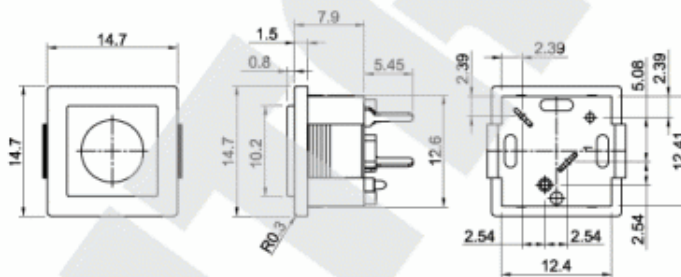
## HOW TO ORDER

<b>MODEL NO.</b> KS-505	+	<b>CAP TYPE</b> A : SQUARE B : ROUND	+	<b>CAP COLOR</b> R : RED B : BLACK Y : YELLOW O : ORANGE G : GRAY GN : GREEN BU : BLUE	+	<b>CONTACT &amp; TERMINAL MATERIAL</b> R : GOLD	-	<b>OPERATING FORCE</b> L : 100±50g * H : 180±50g (std.) (Click Sound)
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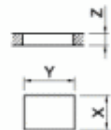
# TS3-B, PB-04 Push Switches



TS3-B



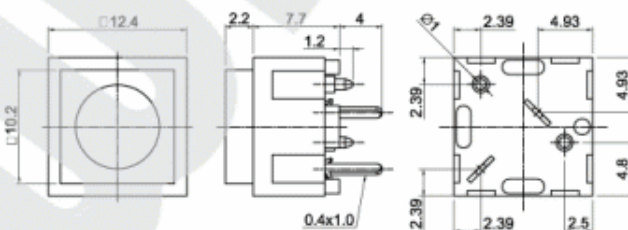
PANEL OUT-CUT		
Z	X	Y
1.0 ~ 1.2	12.5 ~ 12.6	14.0 ~ 14.1



**Rating**: 0.5A 30V DC, 0.25A 50V DC.  
**Circuit**: OFF-(ON).  
**Contact resistance**: 50mΩ Max. (initial)  
**Insulation resistance**: 100MΩ Min.  
**Withstand voltage**: 1,000V AC for 1 minute.  
**Operating temperature**: -25°C ~ +65°C.  
**Life**: 10,000 Cycles.  
**Terminals**: Silver or Gold plated.



PB-04



P.C.B. LAYOUT

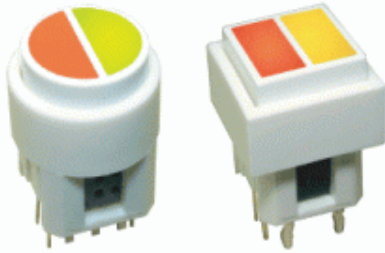


**Rating**: 0.25A 125V AC.  
**Circuit**: OFF-(ON).  
**Operating force**: 250±50g.  
**Contact resistance**: 30mΩ Max. (initial)  
**Withstand voltage**: 500V AC for 1 minute.  
**Insulation resistance**: 100MΩ at 500V DC Min.  
**Life**: 40,000 Cycles.  
**Terminals**: Tin or Gold plated.

## HOW TO ORDER

<b>MODEL NO.</b> TS3-B PB-04	+	<b>BUTTON COLOR</b> R : RED Y : YELLOW B : BLACK G : GRAY O : ORANGE W : WHITE GN : GREEN BU : BLUE	+	<b>MOVABLE CONTACT AND TERMINAL MATERIAL</b> Q : SILVER or TIN PLATED R : GOLD PLATED
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# SPA-2V Series Dual-LED Push Switches (W/LED)



## SPECIFICATION

Item	: SPA-A Type & SPA-M Type.	: SPA-T Type.
Current rating	: 100mA.	: 50mA.
Voltage rating	: 30V DC.	: 12V DC.
LED rating	: See the table below.	: See the table below.
Circuit	: DPDT.	: SPST.
Total travel	: Max. 2.5mm; Lock 1.5mm.	: 0.3±0.2mm.
Contact resistance	: 100mΩ Max.(initial)	: 100mΩ Max.(initial)
Insulation resistance	: 100MΩ Min. at 500V DC.	: 100MΩ Min. at 500V DC.
Operating temperature	: +10°C ~ +65°C.	: +10°C ~ +60°C.
Operating force	: 200±80g.	: 180±50g.
Electrical life	: 10,000 Cycles Min.	: 800,000 Cycles Min.
Soldering temperature	: 250°C Max. for 3 sec.	: 250°C for 3 sec.

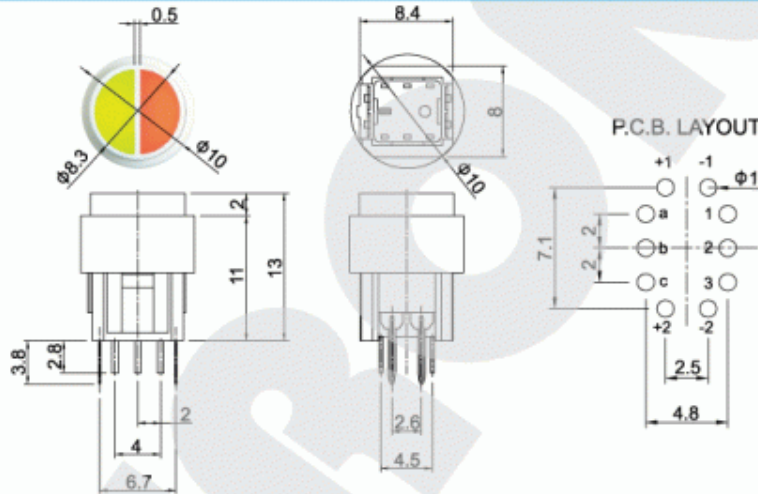
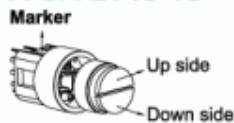
## MATERIAL

S/W Button	: Polyacetal.(POM)	Housing	: Polyamide.(PA)
S/W Base	: Polyacetal.(PA)	Lens	: Polycarbonate.(PC)
S/W Terminal	: Brass, Silver plated.	Contact	: Acrylonitrile Butadine Styrene.(ABS)
Spring	: Piano wire.	LED terminal	: Phosphor bronze(PBS), Gold plated.
Cap	: Polycarbonate.(PC)		
Act. Dome	: Stainless steel, Silver plated.		

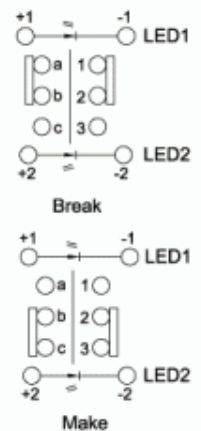
### DPDT (Lock)



SPA-A-SA-2V13-13



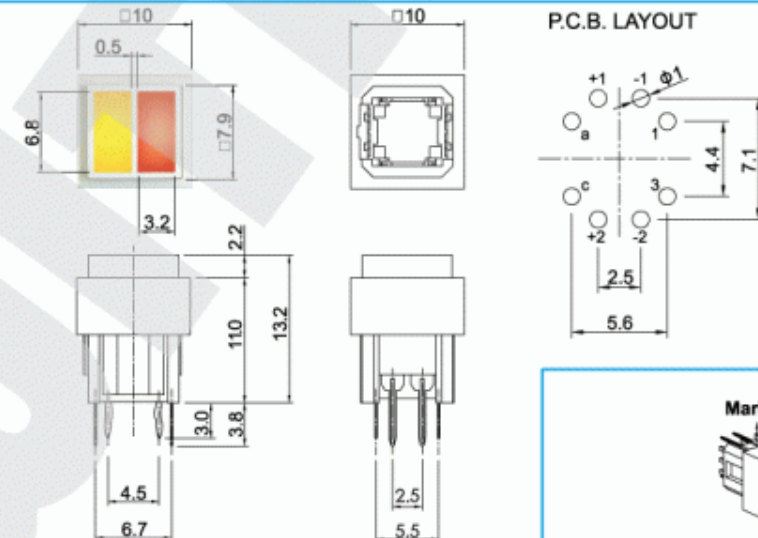
### CIRCUIT DIAGRAM



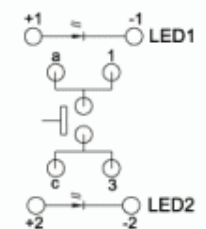
### SPST (Tact)



SPA-T-CA-2V12-12



### CIRCUIT DIAGRAM



## HOW TO ORDER

SPA - FUNCTION - HOUSING TYPE - 2V +

T: TACTILE  
M: MOMENTARY  
A: ALTERNATE

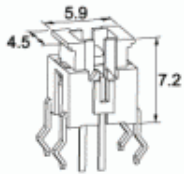
SA: SPHERICAL  
CA: CUBOIDAL

LENS COLOR		
CODE	UP	DOWN
12	RED	YELLOW
13	RED	GREEN
14	RED	WHITE
17	RED	BLUE
23	YELLOW	GREEN
24	YELLOW	WHITE
27	YELLOW	BLUE
34	GREEN	WHITE
37	GREEN	BLUE
44	WHITE	WHITE
47	WHITE	BLUE

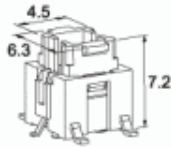
LED COLOR		
CODE	UP	DOWN
12	RED	YELLOW
13	RED	GREEN
1P3	RED	PURE GREEN
14	RED	WHITE
17	RED	BLUE
23	YELLOW	GREEN
2P3	YELLOW	PURE GREEN
24	YELLOW	WHITE
27	YELLOW	BLUE
3P3	GREEN	PURE GREEN
34	GREEN	WHITE
37	GREEN	BLUE
P34	PURE GREEN	WHITE
P37	PURE GREEN	BLUE
47	WHITE	BLUE

# TS Tiny Illuminated Push Switches (W/ SINGLE LED)

TS-N-BU(Blue LED) TS-NS-R(Red LED)



(Dip, W/LED)  
(W/O Cap & Housing)



(SMD, W/LED)  
(W/O Cap & Housing)

## SPECIFICATION

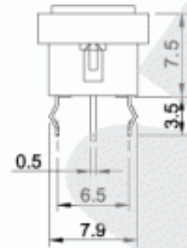
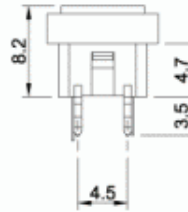
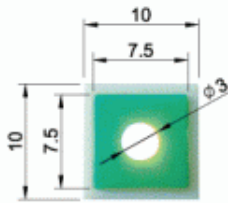
Rating	: 50mA 12V DC.
Circuit	: SPST.
Total travel	: 0.25±0.2mm.
Contact resistance	: 100mΩ Max.(initial)
Insulation resistance	: 100MΩ Min.
Withstand voltage	: 250V AC for 1 minute.
Electrical life	: 100,000 Cycles Min.
Soldering temperature	: 250°C Max. for 3 sec.

## MATERIAL

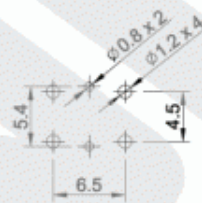
Cap	: ABS.
Base	: Nylon 66+30% glass fiber.
Stem	: Nylon 66+30% glass fiber.
Action dome	: SUS301+Au.
LED	: Surface mount chip LED.
Terminal	: Brass, Silver plated.



TS-ALGGN-G



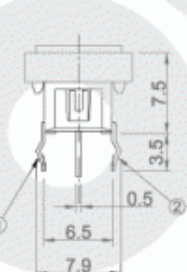
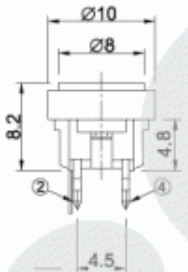
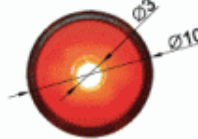
P.C.B. LAYOUT



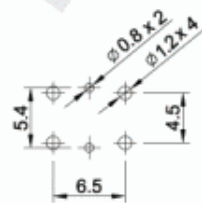
CIRCUIT DIAGRAM



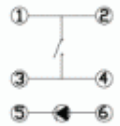
TS-BLBR-R



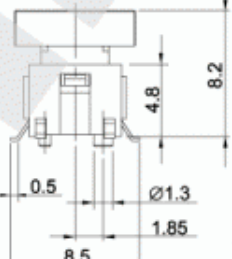
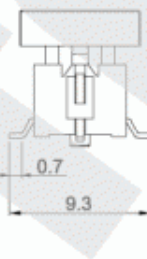
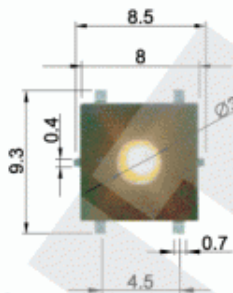
P.C.B. LAYOUT



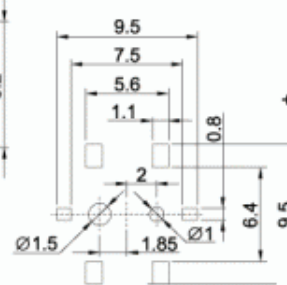
CIRCUIT DIAGRAM



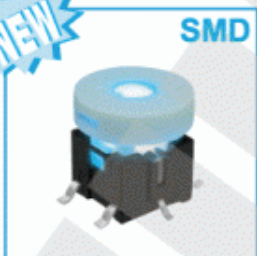
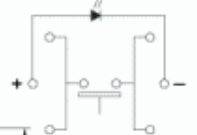
TS-ALSB-Y



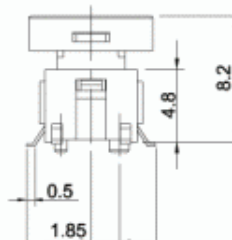
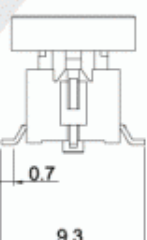
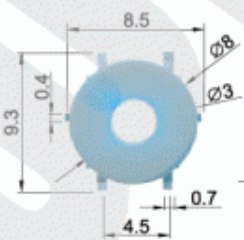
P.C.B. LAYOUT



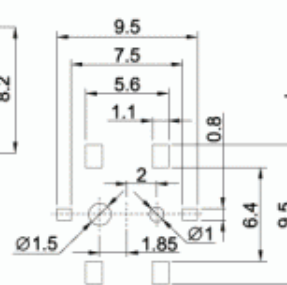
CIRCUIT DIAGRAM



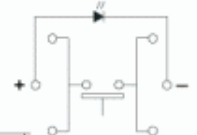
TS-BLSG-BU



P.C.B. LAYOUT



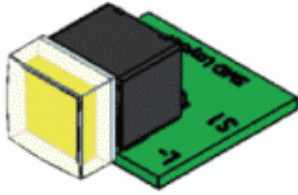
CIRCUIT DIAGRAM



## HOW TO ORDER

TS	-	<b>CAP TYPE</b>	+	<b>TERMINAL</b>	+	<b>HOUSING COLOR</b>	+	<b>CAP COLOR</b>	-	<b>LED COLOR</b>
		N : WITHOUT CAP		□ : DIP TYPE		□ : WITHOUT HOUSING (SMD TYPE ONLY)		□ : WITHOUT CAP		□ : WITHOUT LED
		A : □		S : SMD TYPE		G : LIGHT GRAY		R : RED		R : RED
		B : ○				B : BLACK		GN : GREEN		Y : YELLOW
		AL : □ W/LED						O : ORANGE		O : ORANGE
		BL : ○ W/LED						G : GRAY		BU : BLUE
								W : WHITE		

# SPJ Series Push Switches (W/LED)



## SPECIFICATION

Rating	: 50mA 12V DC.
Circuit	: SPST.
Total travel	: 0.3±0.1mm.
Contact resistance	: 100mΩ Max.(initial)
Insulation resistance	: 100MΩ Min. at 100V DC.
Withstand voltage	: 250V AC for 1 minute.
Operating force	: 200±50g.
Life	: 100,000 Cycles Min.
Soldering temperature	: 250°C Max. for 3 sec.

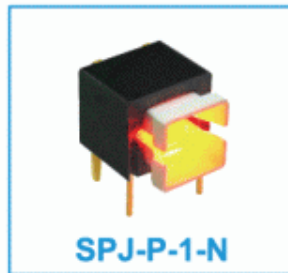
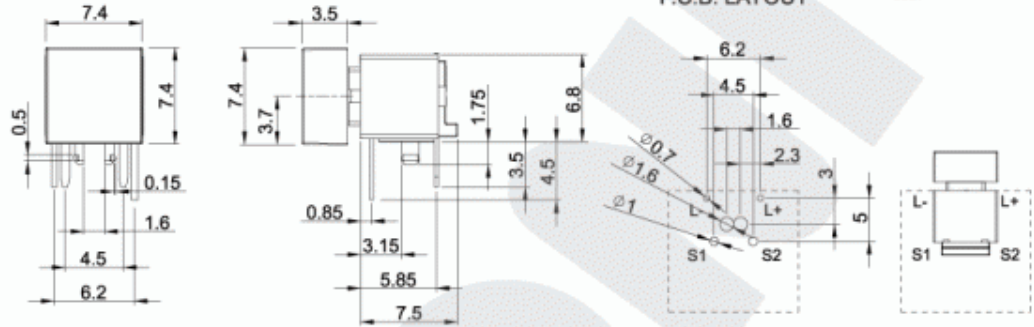
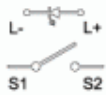
## MATERIAL

Cap	: Polycarbonate.(PC)
Base	: Polyamide.(PA)
Reflector	: Polyamide.(PA)
Terminal	: Brass, Gold plated.
Action dome	: Stainless steel, Silver plated.
Sealing rubber	: Silicone.
LED	: LED.



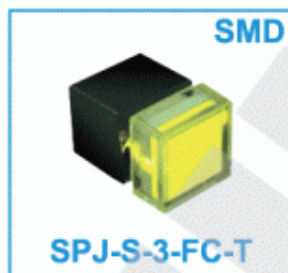
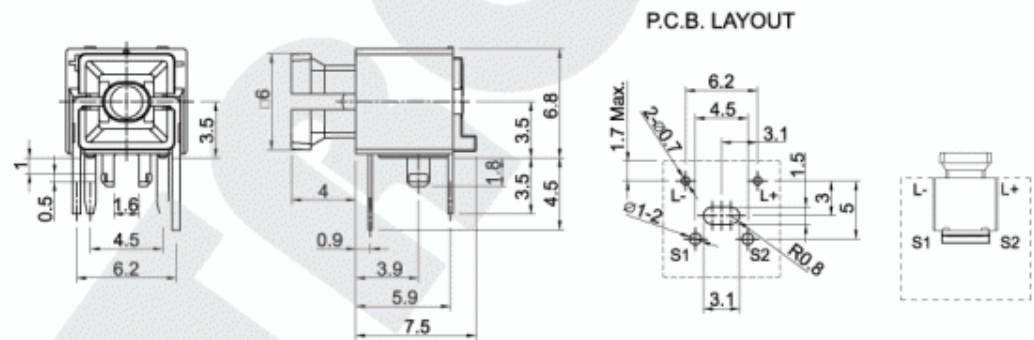
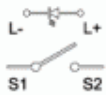
**SPJ-P-1-FC-7**

CIRCUIT DIAGRAM



**SPJ-P-1-N**

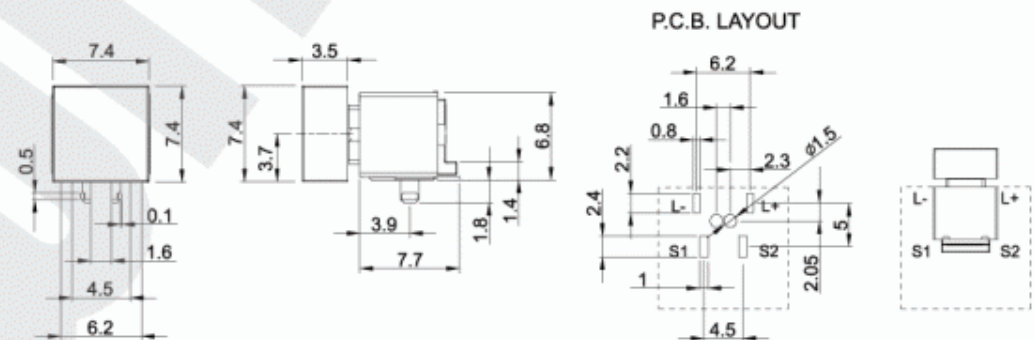
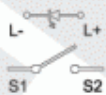
CIRCUIT DIAGRAM



**SMD**

**SPJ-S-3-FC-T**

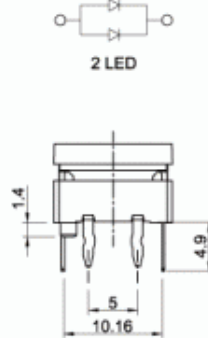
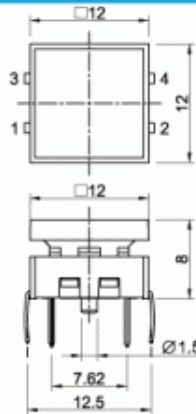
CIRCUIT DIAGRAM



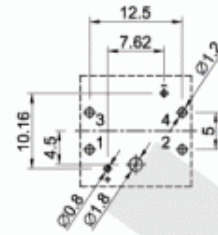
## HOW TO ORDER

SPJ	-	<b>TERMINAL</b>	-	<b>LED COLOR</b>	-	<b>CAP TYPE</b>	-	<b>CAP COLOR</b>
		S : SMD TYPE P : DIP TYPE		N : Without LED 1 : Red 2 : Yellow 3 : Green 4 : White 7 : Blue		N : Without CAP FC : FC TYPE		T : Transparent 7 : White

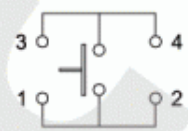
# ST-12 Illuminated Push Key Switches (w/LED)



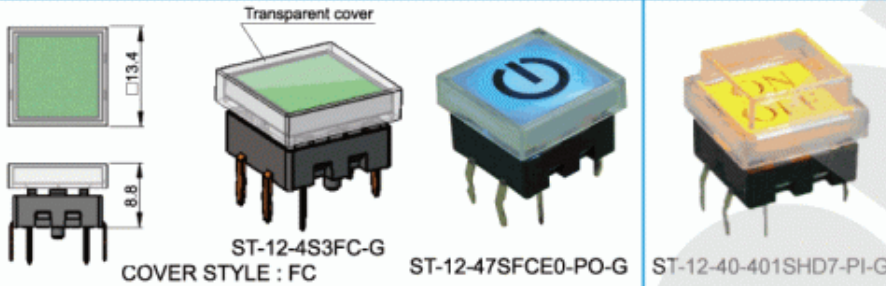
P.C.B. LAYOUT



CIRCUIT

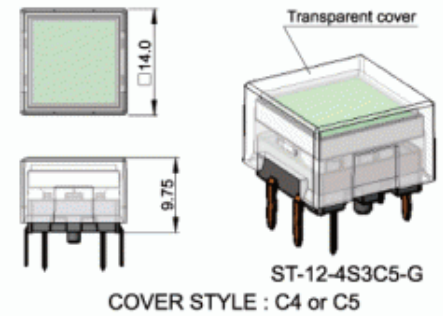
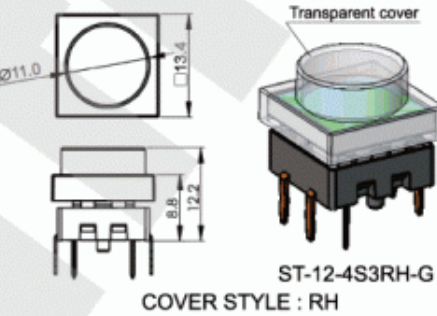
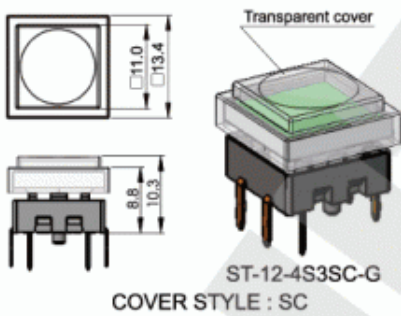
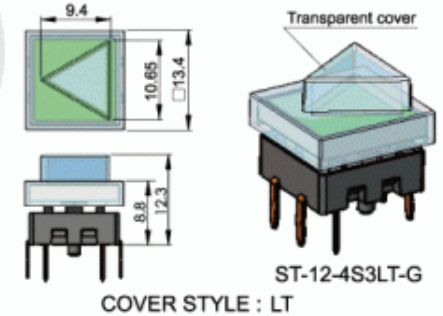
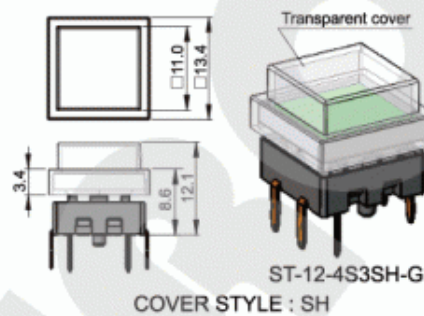
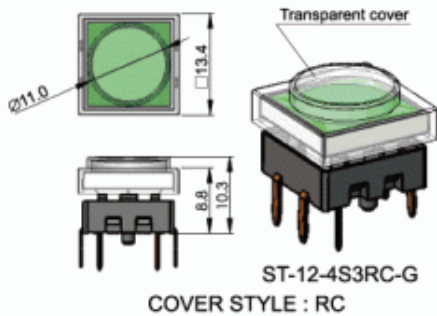


ST-12-30300-G



## SPECIFICATION

Rating : 50mA 12V DC.  
 Circuit : SPST.  
 Travel : 0.3±0.1mm.  
 Contact resistance : 100mΩ Max.(initial)  
 Insulation resistance : 100MΩ Min.  
 Operating temperature : -25°C ~ +60°C.  
 Operating force : 300±50g.  
 Life : 5,000,000 Cycles Min.



## HOW TO ORDER

MODEL NO.	LENS COLOR	LED COLOR	TRANSPARENT COVER STYLE	MARKING TYPE	MARKING POSITION
ST-12	1 : Red 2 : Yellow 3 : Green 4 : White 5 : Transparent 6 : Orange 7 : Blue	00 : Without LED 01 : Red S2S : Super Yellow 03 : Green S3 : Super Green P3S : Green(Single) 7S : Blue(Single) 4S : White(Single)	00 : Without Cover FC : Flat/clear RC : Round h=4.9mm/clear RH : Round h=6.9mm/clear SC : Square h=4.9mm/clear SH : Square h=6.9mm/clear UT : UP Triangle/clear DT : Down Triangle/clear RT : Right Triangle/clear LT : Left Triangle/clear C5 : Flat cover/clear C4 : Flat cover/white (Solid)	□ : Non D6 : Power E0 :  D7 : ON/OFF H9 :  D8 : ON Others : For inquiry	□ : Non PO : Laser-Engraving on Transparent Cover



# MP86 Dip Push Switches (W/LED Transparent) Lock Type



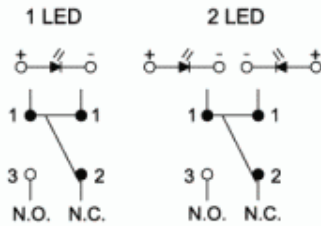
## SPECIFICATION

Rating	: 12mA 24V DC.
Circuit	: SPDT.
Contact resistance	: 50mΩ Max.(initial)
Insulation resistance	: 100MΩ Min.
Operating force	: 170±50g.
Total travel	: 2.5±0.5mm.
Life	: 1,000,000 Cycles Min.
Soldering temperature	: 250°C Max. for 3 sec.
Operating temperature	: +10°C ~ +60°C.

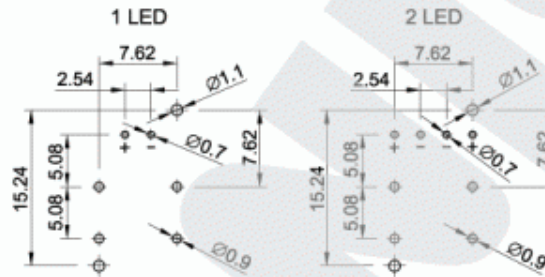
## MATERIAL

Cap	: ABS.
Base	: PA.
Spring	: Piano wire.
Contact	: PBS, Gold plated.
Terminal	: PBS, Gold plated.
Fixed support	: Stainless steel wire.
LED type	: 3mm diameter LED lamp.

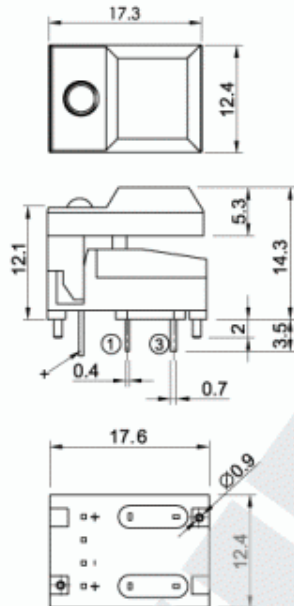
## SWITCH CIRCUIT



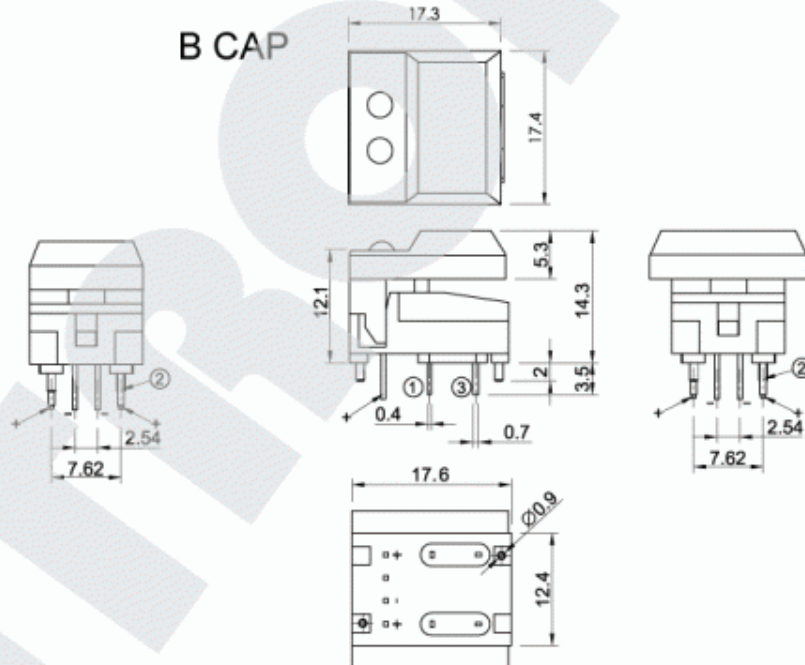
## P.C.B. LAYOUT



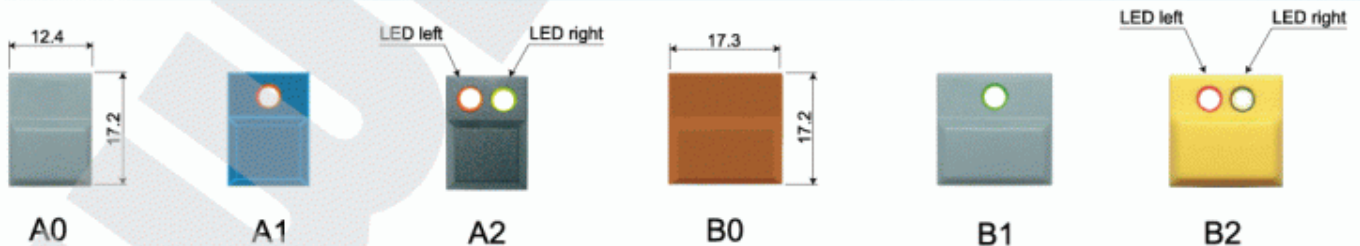
## A CAP



## B CAP



## COLOR CAP STYLES

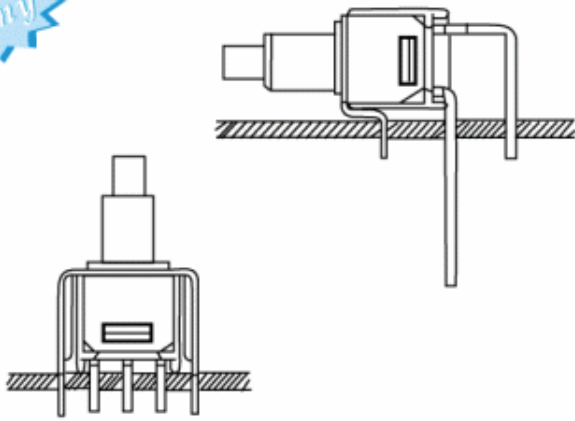


## HOW TO ORDER

MODEL NO.	+	CAP STYLE	+	CAP COLOR (A&B CAP STYLE ONLY)	+	LED COLOR LEFT	+	LED COLOR RIGHT
MP86 : Momentary Type MP86L : Lock Type		A0 A1 A2 B0 B1 B2		R: RED    BU: BLUE G: GRAY    GN: GREEN B: BLACK    BR: BROWN W: WHITE Y: YELLOW O: ORANGE		□: WITHOUT LED 1: RED 2: YELLOW 3: GREEN		□: WITHOUT LED 1: RED 2: YELLOW 3: GREEN



# TPS-21,22 Tiny Push Switches **NEW** Lock type



## SPECIFICATION

**Rating** : Silver : 3A @120V AC, 28V DC  
 1A @250V AC.  
 Gold : 0.4VA Max. @20V Max.(AC or DC)  
**Contact resistance** : 20mΩ Max. initial @2-4V DC  
 100mA for both Silver and Gold plated contacts.  
**Insulation resistance** : 1,000MΩ Min.  
**Withstand voltage** : 1,000V RMS @sea level.  
**Operating temperature** : -30°C ~ 85°C.  
**Mechanical life** : 50,000 Cycles.

## MATERIAL

**Case** : Diallyl phthalate.(DAP)  
**Plunger** : Thermoplastic polyester-black.  
**Bushing** : Brass, Nickel plated.  
**Housing** : Stainless steel.  
**Contact** : Brass, Silver or Gold plated.  
**Terminal** : Brass, Silver or Gold plated.

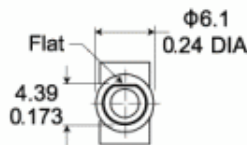
## TPS-21A LOCK type

SPST

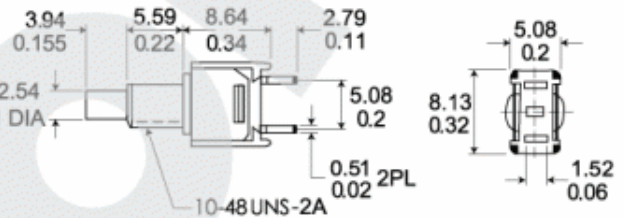


TPS-21

MODEL NO.	TYPE	
TPS-21	OFF	(ON)
TPS-21A	OFF	ON



Terminal : B



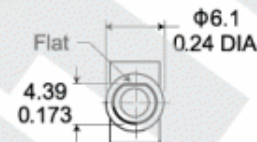
## TPS-22A LOCK type

SPDT

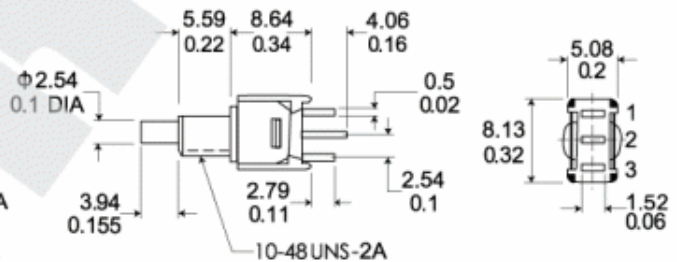


TPS-22

MODEL NO.	TYPE	
TPS-22	ON	(ON)
TPS-22A	ON	ON
Term. Com.	2 - 1	2 - 3



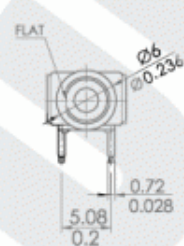
Terminal : B



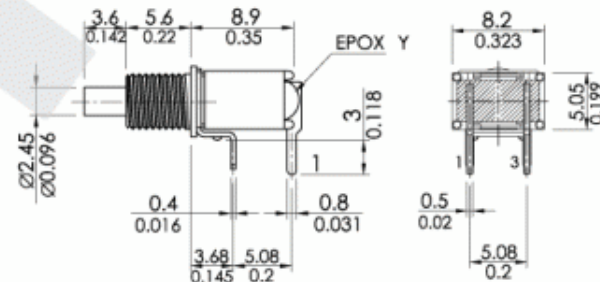
SPST



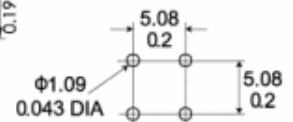
TPS-21P



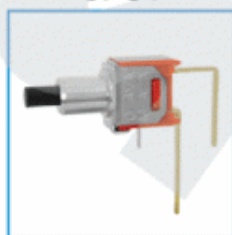
Terminal : P



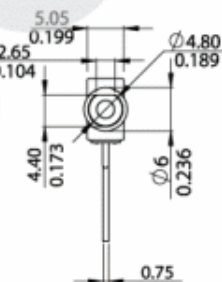
## P.C.B. LAYOUT



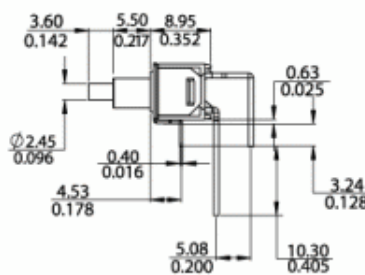
SPST



TPS-21L



Terminal : L



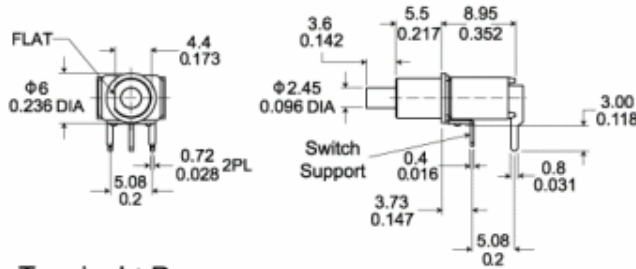
## P.C.B. LAYOUT



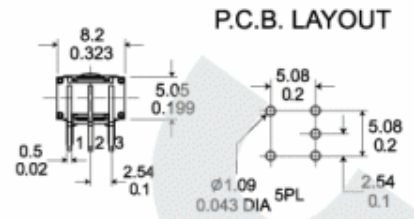
## SPDT



TPS-22P

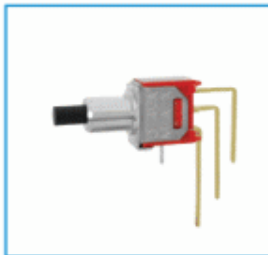


Terminal : P

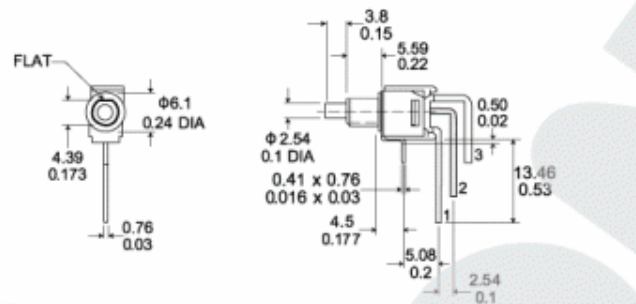


P.C.B. LAYOUT

## SPDT



TPS-22L

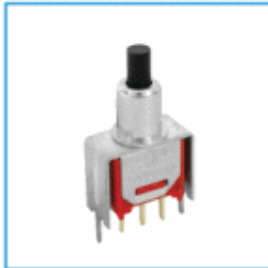


Terminal : L



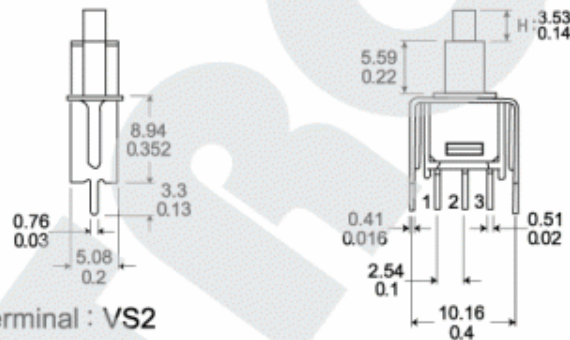
P.C.B. LAYOUT

## SPDT

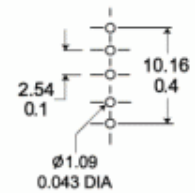


TPS-21VS2  
TPS-22VS2  
TPS-22C

H: 3.53mm } Terminal : VS2  
H: 3.53mm }  
H: 4mm (W/O BRACKET) Terminal : C



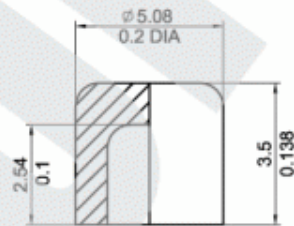
P.C.B. LAYOUT



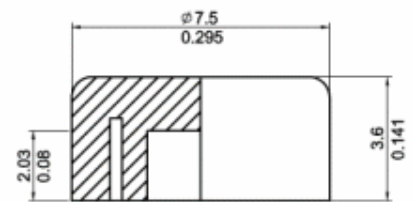
## CAPS OPTIONS



C1

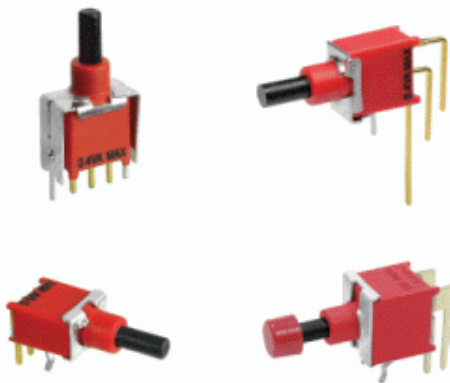


C2



## HOW TO ORDER

MODEL NO.	+	TERMINAL	+	BUSHING	+	CONTACT AND TERMINAL MATERIAL	+	EPOXY SEAL	+	NUTS & WASHER
TPS-21 TPS-22		B C P L VS2		T : THREAD N : NON THREAD		Q : SILVER PLATED R : GOLD PLATED		Y : YES N : NO		<input type="checkbox"/> : SEPARATE PACKING 1 : FIXED ON S/W



## SPECIFICATION

Rating : Silver : 3A @120V AC or 28V DC.  
 1A @250V AC.  
 Gold : 0.4VA Max. @20V Max.(AC or DC)  
 Contact resistance : 20mΩ Max. initial @2-4V DC.  
 100mA for both Silver and Gold plated contacts.  
 Insulation voltage : 1,000MΩ Min.  
 Withstand voltage : 1,000V RMS @sea level.  
 Operating temperature : -30°C ~ +85°C.  
 Mechanical life : 50,000 Cycles.

## MATERIAL

Case / Bushing : Glass filled Nylon 66, flame retardant, heat stabilized.(UL-94V-0)  
 Plunger : Thermoplastic polyester(UL-94V-0), with internal O-ring seal.  
 Switch support : Brass or steel, Tin plated.  
 Contact : Copper alloy, Silver or Gold plated.

( ) : MOMENTARY

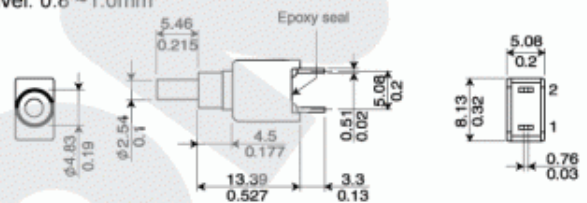
SPST



8AS9M2RE

MODEL NO.	TYPE	
8AS9	OFF	(ON)
Term. Com.	—	1 - 2

Travel: 0.8 ~1.0mm



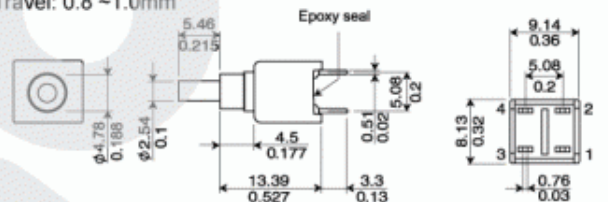
DPST



8AD9M2RE

MODEL NO.	TYPE	
8AD9	OFF	(ON)
Term. Com.	—	1 - 2 3 - 4

Travel: 0.8 ~1.0mm

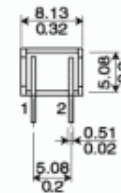
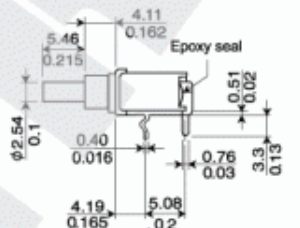
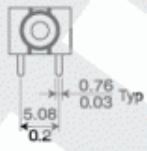


SPST

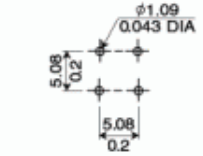


8AS9M6NRE

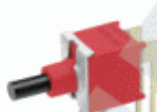
M6 M6N (kink pin)



Travel: 0.8 ~1.0mm

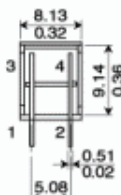
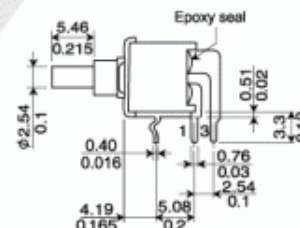
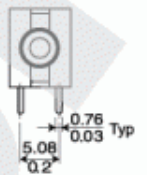


DPST



8AD9M6NRE

M6 M6N (kink pin)



Travel: 0.8 ~1.0mm

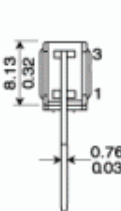
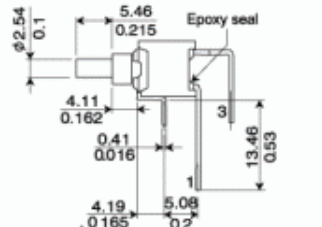


SPST

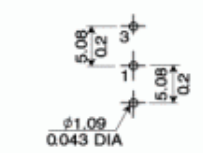


8AS9M7RE

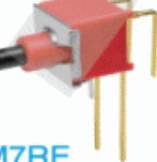
M7



Travel: 0.8 ~1.0mm

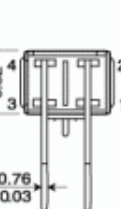
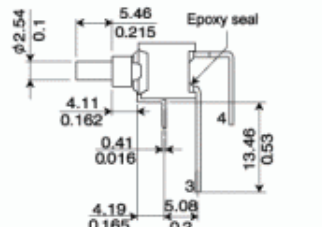
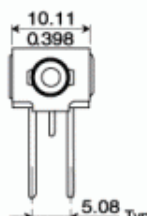


DPST

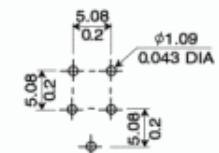


8AD9M7RE

M7

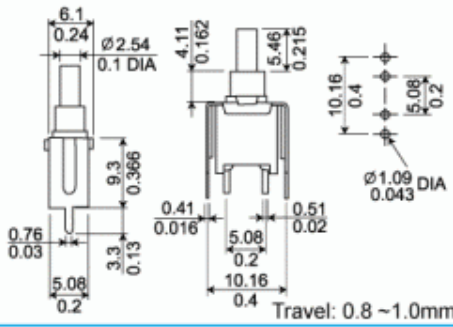


Travel: 0.8 ~1.0mm

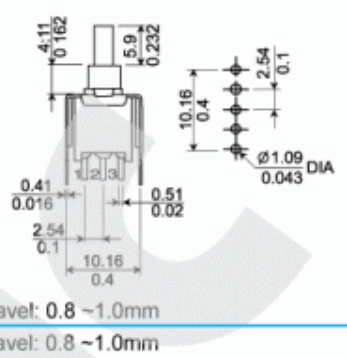




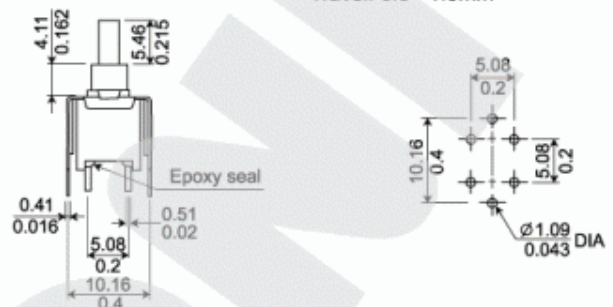
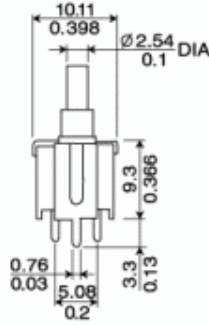
8AS9VS2RE



8AS8VS2RE



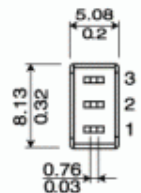
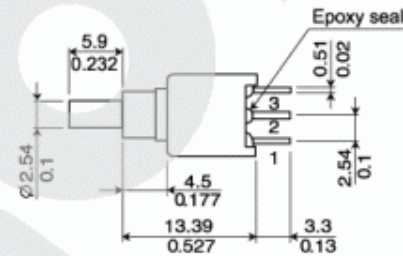
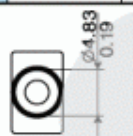
8AD9VS2RE



8AS8M2RE

MODEL NO.	TYPE	
8AS8	ON	(ON)
Term. Com.	1 - 2	2 - 3

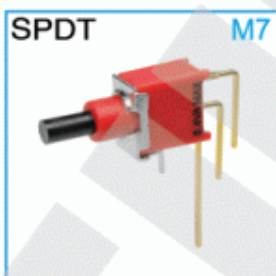
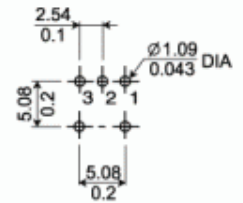
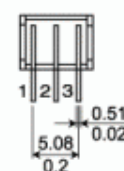
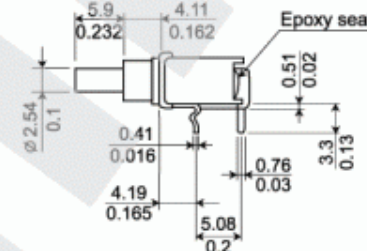
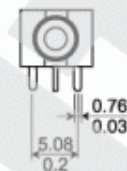
Travel: 0.8 ~ 1.0mm



8AS8M6NRE

M6N (kink pin)

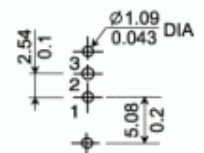
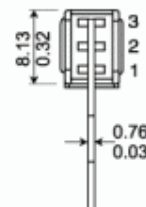
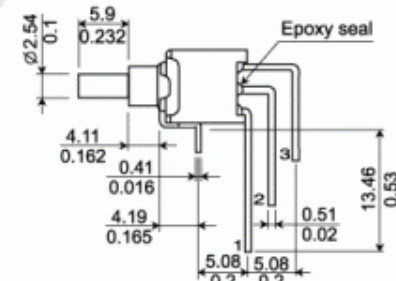
Travel: 0.8 ~ 1.0mm



8AS8M7RE

M7N (kink pin)

Travel: 0.8 ~ 1.0mm



## HOW TO ORDER

MODEL NO.	+	TERMINAL	+	CONTACT AND TERMINAL MATERIAL	+	SEAL
8AS8 (SPDT)		M2 M6N VS2		Q : SILVER PLATED		E : EPOXY
8AS9 (SPST)		M6 M7N VS3		R : GOLD PLATED		
8AD9 (DPST)		M7				

※CAPS OPTIONS  
Please See Page  
H08