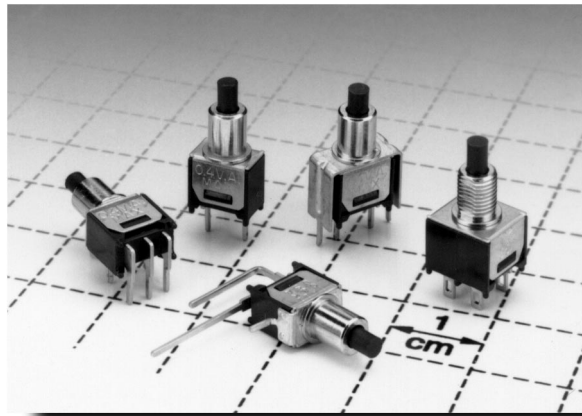


TP Series Tiny Pushbutton Switches



Features/Benefits

- **Subminiature size**—capable of switching 1 AMP
- **Vertical & right angle terminations**
- **PC & panel mount models**
- **Snap-in front panel mounting available**

Typical Applications

- **Telecommunications and networking equipment**
- **Computers and peripherals**
- **Instrumentation and controls**

Build-A-Switch

Our easy Build-A-Switch concept allows you to mix and match options to create the switch you need. Below is a complete listing of options shown in catalog. To order, simply select desired option from each category and place in the appropriate box. Switches with standard options are shown on pages B-11 and B-12. Available options are shown and described on pages B-12 thru B-16. For additional options not shown in catalog, consult Customer Service Center. All models have epoxy terminal seal and are compatible with all "bottom-wash" PCB cleaning methods.

Typical Example: **T P 1 1** — **S H 8** — **A** — **B** — **E** — **2** — **2**

Switch Function

- TP11** (STD.) SPST Off-Mom.
- TP12** (STD.) SPDT On-Mom.
- TP21** DPST Off-Mom.

Actuator or Bushing

- SH** (STD.) .155" high plunger, unthreaded, .220" high bushing, round
- SH8** (STD.) .155" high plunger, unthreaded, .220" high bushing, flat
- SH9** (STD.) .155" high plunger, .220" high bushing
- J80** Snap-in
- J81** Snap-in with frame
- LT** .215" high plunger, .310" high bushing, flat
- LT9** .215" high plunger, unthreaded, .310" high bushing, flat
- MS9** .130" high plunger, .020" high bushing, round

Terminations

- A** (STD.) Right angle, PC thru-hole
- C** (STD.) PC Thru-hole
- Z** (STD.) Solder lug
- AV** Vertical right angle, PC thru-hole
- V3** Vertical mount, v-bracket
- W** Wire wrap

Contact Material

- B** (STD.) Gold
- Q** (STD.) silver
- K** Gold
- M** silver
- G** Gold over silver
- L** Gold over silver

Seal

- E** (STD.) Epoxy

Cap Color

- 2** (STD.) Black
- NONE** Models with no cap
- 1** White
- 3** Red

Frame Color

- 2** (STD.) Black
- NONE** Models with no frame



Pushbutton

Specifications

CONTACT RATING: B contact material: 0.4 VA max. @ 20 V AC or DC max. Q contact material: 1 AMP @ 120 V AC or 28 V DC. See page B-16 for additional ratings.

ELECTRICAL LIFE: TP11, TP21 MODELS: 60,000 make-and-break cycles at full load.
TP12 MODELS: 30,000 cycles.

CONTACT RESISTANCE: Below 20 milliohms typ. initial @ 2-4 V DC, 100 mA, for both silver and gold plated contacts.

INSULATION RESISTANCE: 10^9 ohms min.

DIELECTRIC STRENGTH: 1000 V RMS min. @ sea level.

OPERATING TEMPERATURE: -30°C to 85°C .

SOLDERABILITY: Per MIL-STD-202F method 208D, or EIA RS-186E method 9 (1 hour steam aging).

NOTE: Specifications and materials listed above are for switches with standard options. For information on specific and custom switches, consult Customer Service Center.

Materials

CASE: Glass filled nylon 6/6, flame retardant, heat stabilized or diallyl phthalate (DAP), (UL 94V-0).

PLUNGER: Thermoplastic polyester (UL 94V-0).

CAP & FRAME: Nylon, black standard.

BUSHING: Brass, nickel plated.

HOUSING: Stainless steel.

SWITCH SUPPORT: Brass, tin plated.

END CONTACTS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Coin silver, silver plated. See page B-16 for additional contact materials.

CENTER CONTACT & ALL TERMINALS: B contact material: Copper alloy, with gold plate over nickel plate. Q contact material: Copper alloy, silver plated. See page B-16 for additional contact materials.

TERMINAL SEAL: Epoxy.

HARDWARE: Nut & Locking Ring: Brass nickel plated.
Lockwasher: Steel, nickel plated.



B

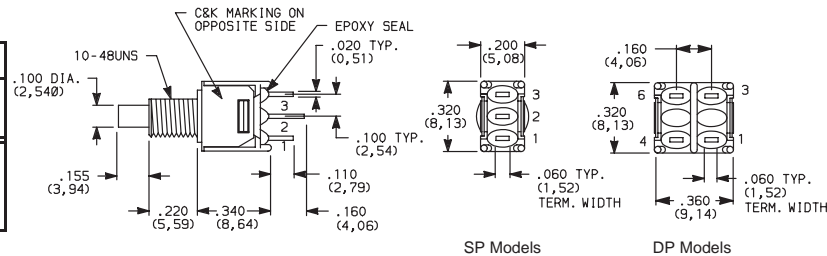
Pushbutton

SWITCHES WITH STANDARD OPTIONS

PART NUMBER	FUNCTION	POS. 1	POS. 2
TP11SHZQE	SPST	OFF	MOM.
TP12SHZQE	SPDT	ON	MOM.
TP21SHZQE	DPST	OFF	MOM.

MOM. = Momentary

NOTE: For PC termination, replace 'Z' with 'C'.
For panel & PC mounting information, see page B-13.



SP Models

DP Models



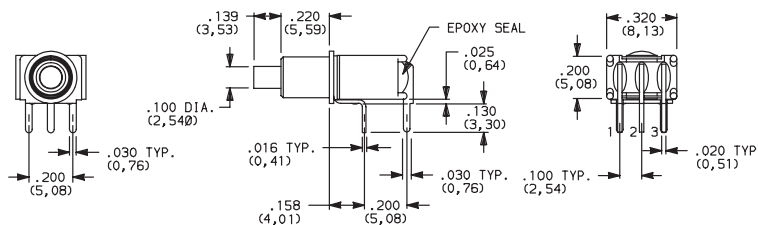
TP12SHZQE
SPDT

Omit center terminals for SPST & DPST models.

PART NUMBER	FUNCTION	POS. 1	POS. 2
TP11SH8ABE	SPST	OFF	MOM.
TP12SH8ABE	SPDT	ON	MOM.

MOM. = Momentary

NOTE: For PC mounting information, see page B-14.



Omit center terminal for SPST models.

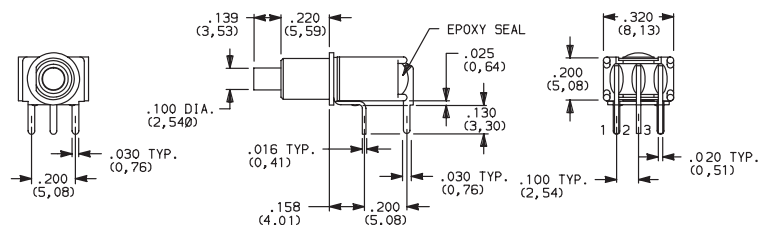


TP12SH8ABE
SPDT

PART NUMBER	FUNCTION	POS. 1	POS. 2
TP11SH9ABE	SPST	OFF	MOM.
TP12SH9ABE	SPDT	ON	MOM.

MOM. = Momentary

NOTE: For PC mounting information, see page B-14.



Omit center terminal for SPST models.

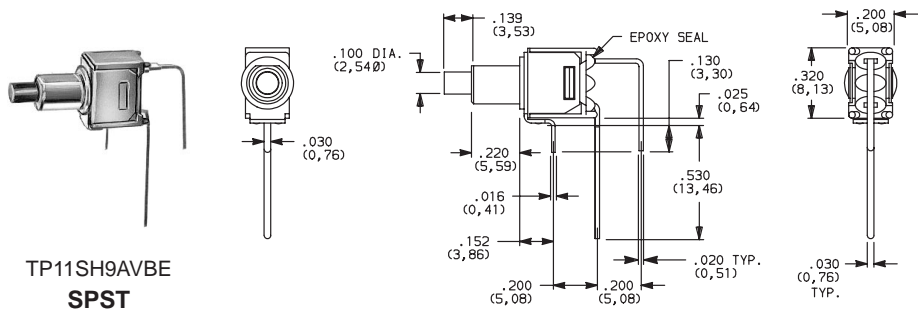


TP12SH9ABE
SPDT

TP Series Tiny Pushbutton Switches



SWITCHES WITH STANDARD OPTIONS



PART NUMBER	FUNCTION	POS. 1	POS. 2
		TP11SH9AVBE	SPST

MOM. = Momentary

NOTE: For PC mounting information, see page B-14.

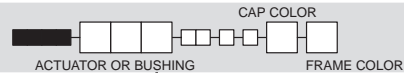
SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS. 1	POS. 2	POS. 1	POS. 2	
SP	TP11 (STD.)	OFF	MOM.	OPEN	1-3	SPST
	TP12 (STD.)	ON	MOM.	2-1	2-3	SPDT
DP	TP21	OFF	MOM.	OPEN	1-3,4-6	DPST

MOM. = Momentary

All models with all options when ordered with G, L, M or Q contact material.

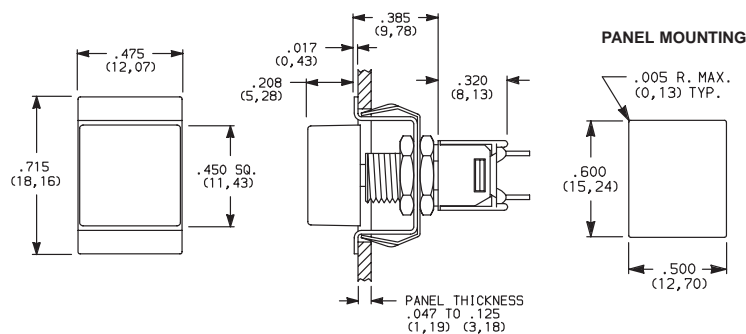
ACTUATOR—SNAP-IN FRONT MOUNT



J80 SNAP-IN



TP11J80ZQE
SPST



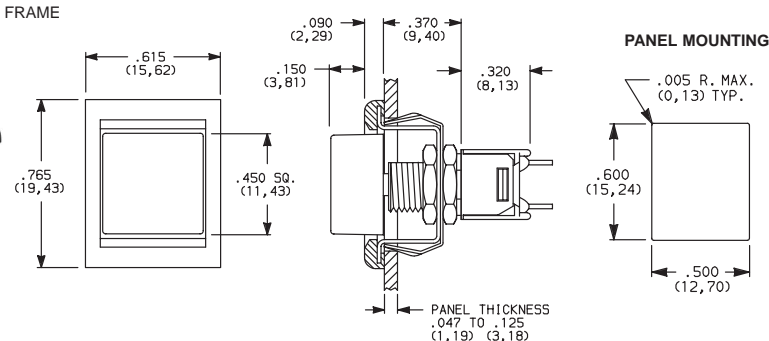
OPTION CODE	CAP COLOR
2	(STD.) BLACK
1	WHITE
3	RED

NOTE: No frame color choice required.

J81 SNAP-IN WITH FRAME



TP11J81ZQE
SPST



OPTION CODE	FRAME COLOR
2	(STD.) BLACK
NONE	No Frame Color (J80 option)

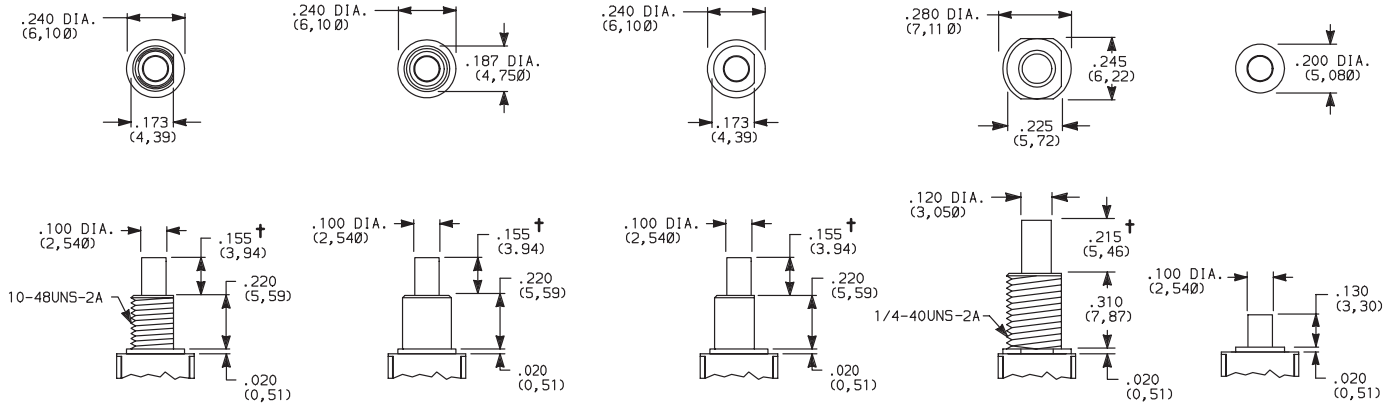
Cap and Frame Finish: matte. Other colors available, consult Customer Service Center.

NOTE: Available with Z, C, or W terminations.

BUSHING



- SH** (STD.) .155" HIGH PLUNGER, .220" HIGH BUSHING, THREADED, FLAT
- SH8** (STD.) .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED
- SH9** (STD.) .155" HIGH PLUNGER, .220" HIGH BUSHING, UNTHREADED, FLAT
- LT** .215" HIGH PLUNGER, .310" HIGH BUSHING, THREADED
- MS9** .130" HIGH PLUNGER
- LT9** .215" HIGH PLUNGER, .310" HIGH BUSHING, UNTHREADED



Standard with Z, C, W terminations.

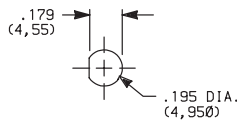
Standard with A, AV, V3 terminations.

Not available with Z terminations.

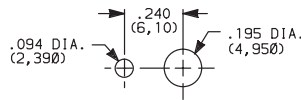
† Subtract .016 (0,41) for models with A, AV or V3 terminations.

PANEL MOUNTING

10-48 BUSHING

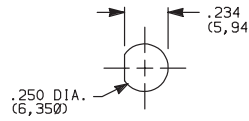


Without locking ring

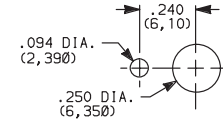


With standard locking ring

1/4 IN. BUSHING



Without locking ring



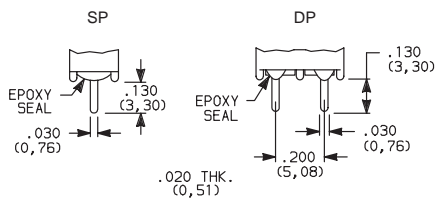
With standard locking ring

NOTE: One mounting nut, locking ring and lockwasher supplied standard with 10-48 threaded bushings (two nuts with 1/4-40 bushings). Optional mounting nut and locking ring styles and finishes available separately, see section L.

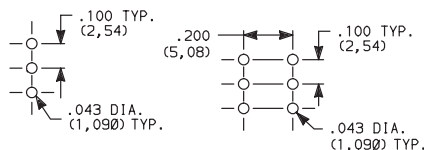
TERMINATIONS



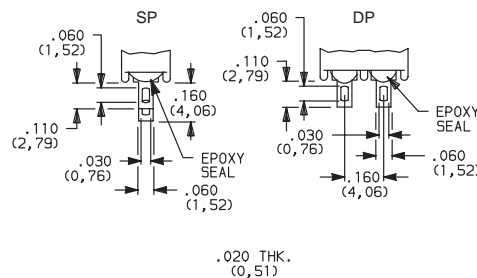
C (STD.) PC THRU-HOLE



PC MOUNTING

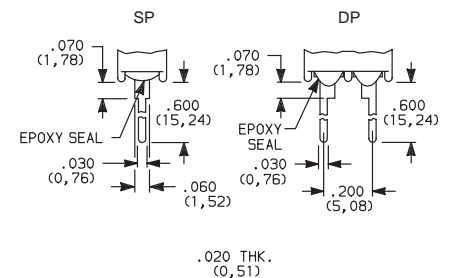


Z (STD.) SOLDER LUG



Not available with MS9 bushing or K, L or M contact material.

W WIRE WRAP



B

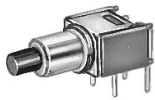
Pushbutton

TP Series Tiny Pushbutton Switches

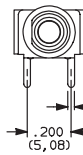


TERMINATIONS

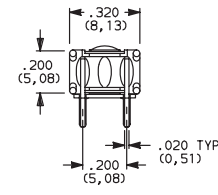
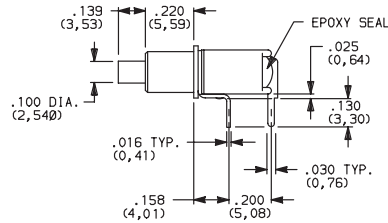
A (STD.) RIGHT ANGLE, PC THRU-HOLE



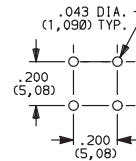
TP11SH9ABE
SPST



.200 (5,08)
.030 TYP. (0,76)



PC MOUNTING

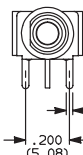


TP11 Only

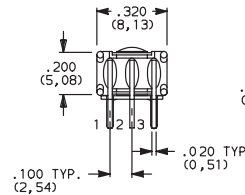
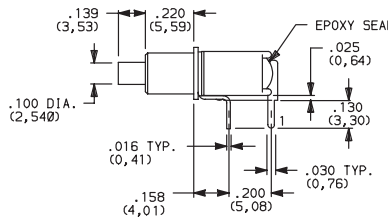
A (STD.) RIGHT ANGLE, PC THRU-HOLE



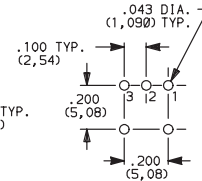
TP12SH9ABE
SPDT



.200 (5,08)
.030 TYP. (0,76)

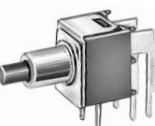


PC MOUNTING

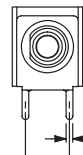


TP12 Only

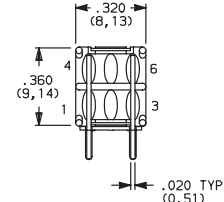
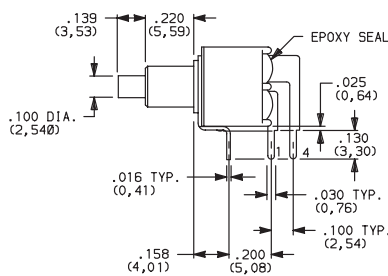
A (STD.) RIGHT ANGLE, PC THRU-HOLE



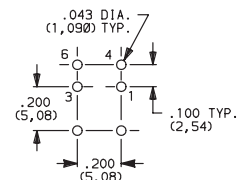
TP21SH9ABE
DPST



.200 (5,08)
.030 TYP. (0,76)



PC MOUNTING

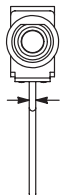


TP21 Only

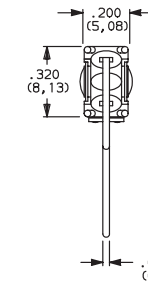
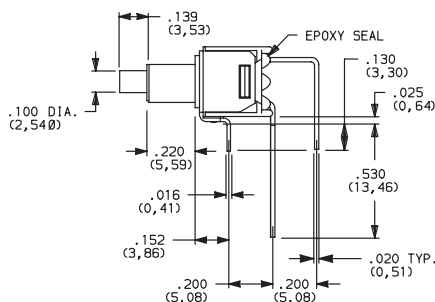
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



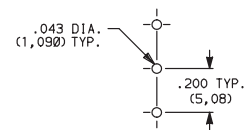
TP11SH9AVBE
SPST



.030 (0,76)



PC MOUNTING

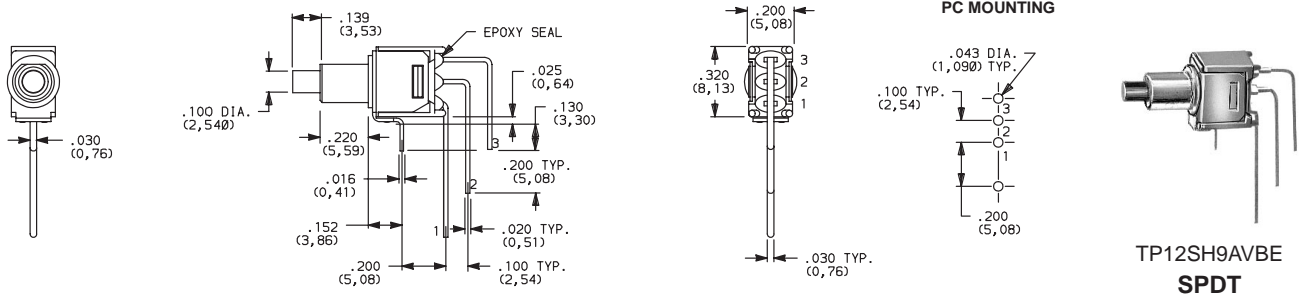


TP11 Only

NOTE: Terminal bend radii and lead-in manufacturing option.

TERMINATIONS

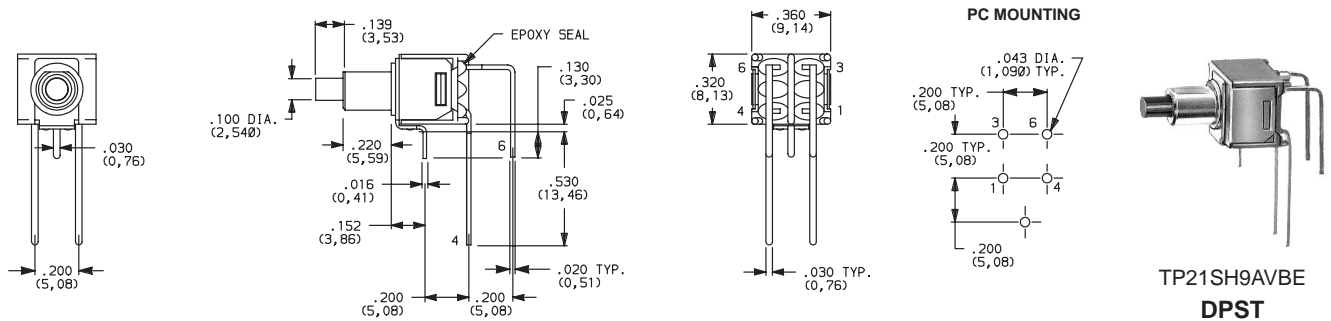
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



TP12 Only

NOTE: Terminal bend radii and lead-in manufacturing option.

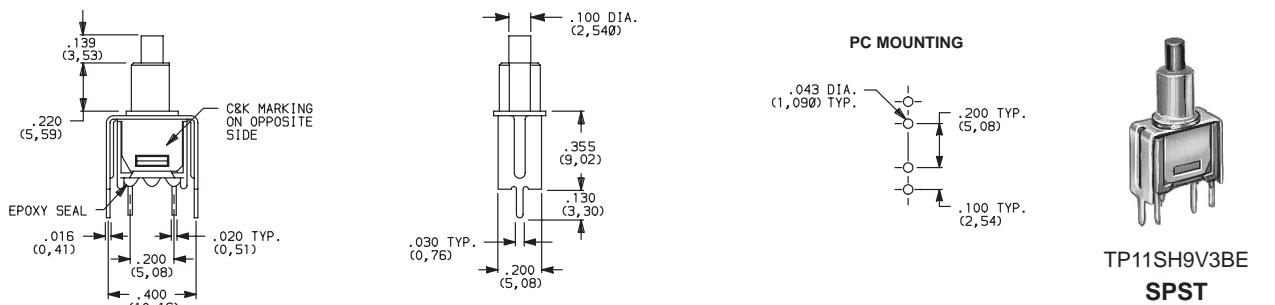
AV VERTICAL RIGHT ANGLE, PC THRU-HOLE



TP21 Only

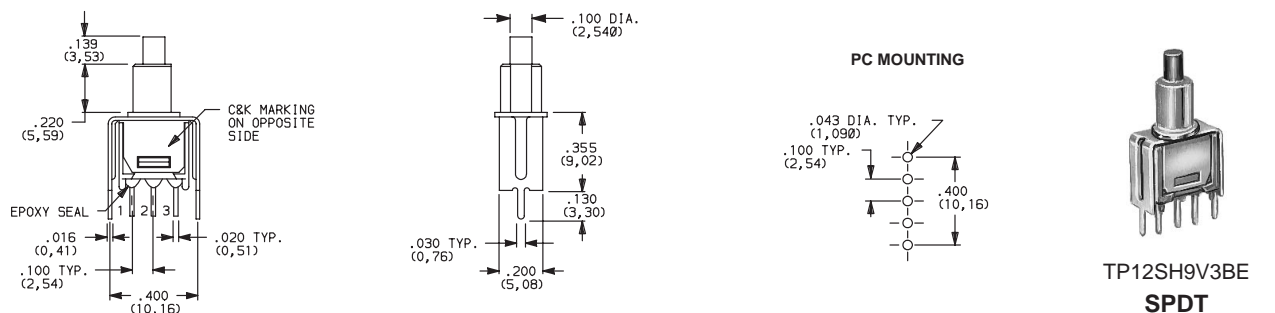
NOTE: Terminal bend radii and lead-in manufacturing option.

V3 VERTICAL MOUNT, V-BRACKET



TP11 Only

V3 VERTICAL MOUNT, V-BRACKET



TP12 Only

TP Series Tiny Pushbutton Switches

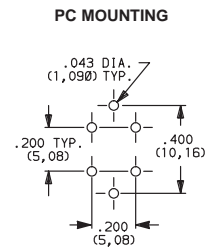
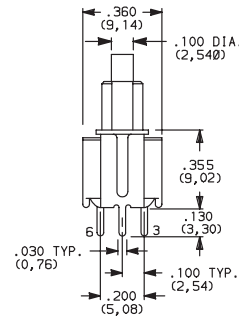
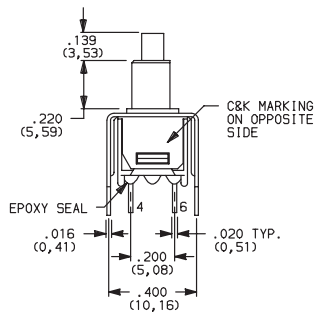


TERMINATIONS

V3 VERTICAL MOUNT, V-BRACKET



TP21SH9V3BE
DPST



TP21 Only

CONTACT MATERIAL

OPTION CODE	CONTACT MATERIAL	TERMINAL PLATING	RATINGS	
B (STD.)	GOLD ¹	GOLD ¹	LOW LEVEL / DRY CIRCUIT	0.4 VA MAX. @ 20 V AC OR DC MAX.
K		TIN-LEAD ⁶		
Q (STD.)	SILVER ^{4,5}	SILVER ⁵	POWER	1 AMP @ 120 V AC OR 28 V DC.
M		TIN-LEAD ⁶		
G	GOLD OVER SILVER ^{2,3}	GOLD ³	LOW LEVEL / DRY CIRCUIT OR POWER	0.4 VA MAX @ 20 V AC OR DC MAX. OR 1 AMP @ 120 V AC OR 28 V DC.
L		TIN-LEAD ⁶		

CONTACT MATERIAL / APPLICATION RECOMMENDATIONS—SEE CHART, PAGE L-31.

- ¹ CONTACTS & TERMINALS: Copper alloy, with gold plate over nickel plate.
- ² END CONTACTS: Coin silver, with gold plate over nickel plate.
- ³ CENTER CONTACTS & ALL TERMINALS: Copper alloy, with gold plate over nickel plate.
- ⁴ END CONTACTS: Coin silver, silver plated.
- ⁵ CENTER CONTACTS & ALL TERMINALS: Copper alloy, silver plated.
- ⁶ TERMINALS: Copper alloy, with tin-lead alloy over nickel plate.

All models with all options when ordered with G, L, M or Q contact material.
 B contact material standard with A, AV, V3 & W terminations.
 Q contact material standard with C & Z terminations.
K, L & M contact materials not available with Z terminations.

SEAL

E (STD.) EPOXY SEAL

