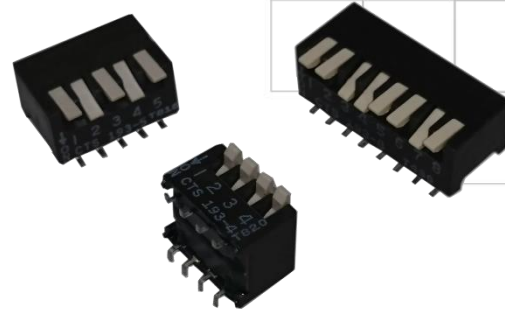




Series 193

Side Actuated DIP Switch

- Coplanarity: 0.1mm/.004" maximum
- Enclosed actuators shield contacts from foreign particles throughout life of switch
- Integral terminal and contact locked into high temperature plastic base
- Gold plated contacts for long-term contact corrosion resistance



Description

The gold plated contact lock-over-center design provides positive detent action for CTS 193 Series. Optimized active contact design incorporates a high contact force, dimple wiping action interface, making it the ideal choice for any network or security system.

Ordering Information

| Series | Number of Actuator | Actuator Length | Bottom Seal | Package | Shipping Position | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------|-------------|----------------------------|-------------|-------------------------------------------------------------------|-------------|---|-------------|---|-------------|---|-------------|---|-------------|----|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|---|--------------------------------|--|--|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-------|-------|----------------------|---|---------------------|
| 193- | XX | M | S | R | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th>Code</th> <th>No. of switch positions</th> </tr> </thead> <tbody> <tr><td>2</td><td>2 positions</td></tr> <tr><td>3</td><td>3 positions</td></tr> <tr><td>4</td><td>4 positions</td></tr> <tr><td>5</td><td>5 positions</td></tr> <tr><td>6</td><td>6 positions</td></tr> <tr><td>7</td><td>7 positions</td></tr> <tr><td>8</td><td>8 positions</td></tr> <tr><td>9</td><td>9 positions</td></tr> <tr><td>10</td><td>10 positions</td></tr> </tbody> </table> | Code | No. of switch positions | 2 | 2 positions | 3 | 3 positions | 4 | 4 positions | 5 | 5 positions | 6 | 6 positions | 7 | 7 positions | 8 | 8 positions | 9 | 9 positions | 10 | 10 positions | <table border="1"> <thead> <tr> <th>Code</th> <th>Spec.</th> </tr> </thead> <tbody> <tr> <td>M</td> <td>Medium actuator (1.14mm/.045")</td> </tr> </tbody> </table> | Code | Spec. | M | Medium actuator (1.14mm/.045") | | | <table border="1"> <thead> <tr> <th>Code</th> <th>Spec.</th> </tr> </thead> <tbody> <tr> <td>BLANK</td> <td>Ship at OFF position</td> </tr> <tr> <td>N</td> <td>Ship at ON position</td> </tr> </tbody> </table> | Code | Spec. | BLANK | Ship at OFF position | N | Ship at ON position |
| Code | No. of switch positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 2 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | 3 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | 4 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | 5 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | 6 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | 7 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | 8 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | 9 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | 10 positions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Code | Spec. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| M | Medium actuator (1.14mm/.045") | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Code | Spec. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BLANK | Ship at OFF position | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N | Ship at ON position | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| Code | Spec. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Blank | Anti-static tube packaging | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| R | Tape and reel packaging (Not available for 7 position switch) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Notes: Contact CTS for other common features not listed.

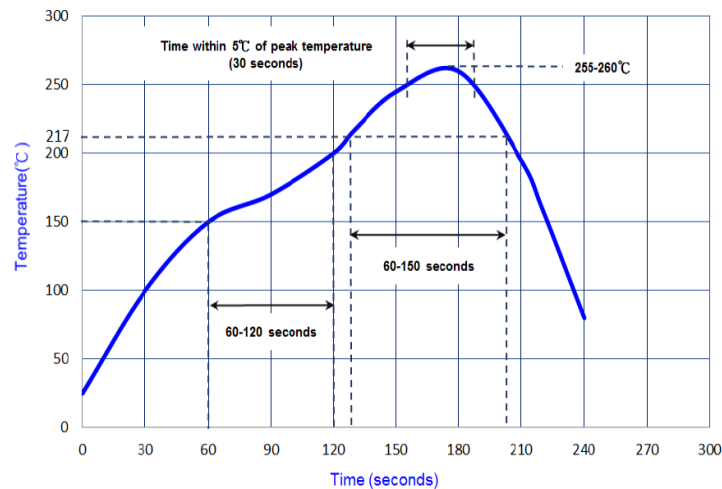
Electrical Specifications

| Parameter | Conditions & Remarks | Min | Max | Unit |
|-----------------------|-----------------------------------|------|-----------------|-----------------|
| Circuit | SPST | 2 | 10 | positions |
| Contact Resistance | Initial At end of life | | 50 100 | milliohms |
| Insulation Resistance | Between insulated terminals | 1000 | | megohms |
| Dielectric Strength | 500 VAC between adjacent switches | | 1 | minute |
| Actuation Life | 50mA @ 24 VDC | | 7,000 | cycles |
| Switch Capacitance | Between adjacent closed switches | | 5.0 | pF |
| Nonswitching Rating | | | 100 or 50 | mA or VDC |

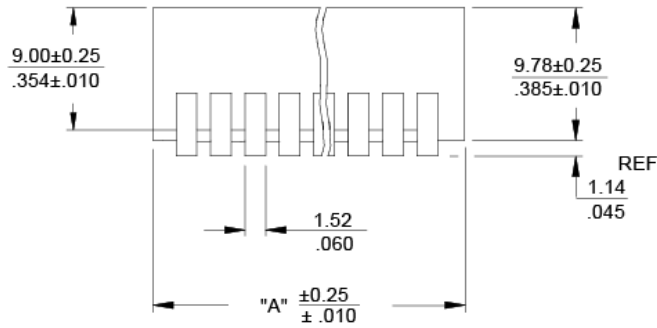
Mechanical and Environmental

| | |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| Soldering | Maximum reflow temperature, 250°C for 30 seconds |
| MSL | Level 1 |
| RoHS | Lead-Free. Fully compliant to RoHS Directive 2011/65/EU |
| Shock | Per MIL-STD-202F, method 213B, condition A (50G's) with no contact inconsistencies greater than 1 microsecond |
| Vibration | Per MIL-STD-202F, method 204D, condition B (.06" or 15G's between 10 HZ to 2K HZ) with no contact inconsistencies greater than 1 microsecond |
| Seal | Bottom seal standard |
| Marking | Special side or top marking available-consult CTS |
| Packaging: | Standard anti-static tube packaging, optional tape & reel packaging |
| Operating Temperature Range | -40°C to +85°C |
| Storage Temperature Range | -40°C to +85°C |

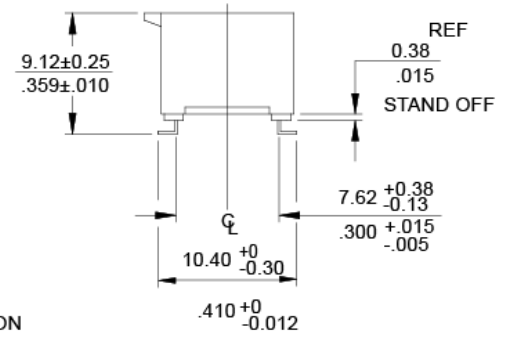
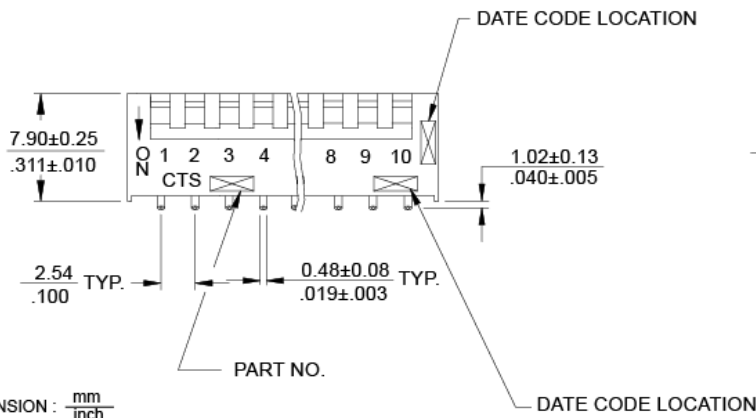
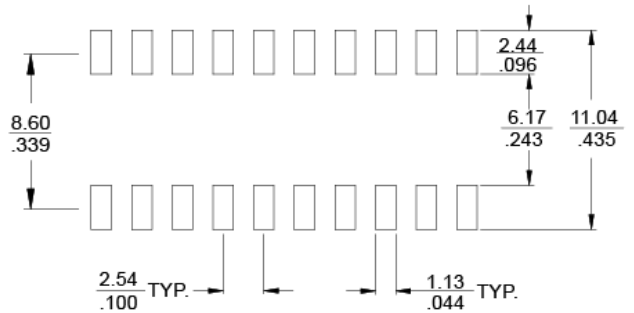
Soldering Profile



Mechanical Specifications



Surface Mount Pad Layouts



DIMENSION : $\frac{\text{mm}}{\text{inch}}$
 STANDARD TOLERANCE :
 .X (1 PLACE) : $\frac{\pm 0.3}{\pm 0.012}$.XX(2 PLACE) : $\frac{\pm 0.13}{\pm 0.005}$

| "A" Overall Dimensions | No. of Switch Positions | Part Number |
|------------------------------|-------------------------------|-------------|
| 7.26 / .286 | 2 | 193-2MS |
| 9.80 / .386 | 3 | 193-3MS |
| 12.34 / .486 | 4 | 193-4MS |
| 14.88 / .586 | 5 | 193-5MS |
| 17.42 / .686 | 6 | 193-6MS |
| 19.96 / .786 | 7 | 193-7MS |
| 22.50 / .886 | 8 | 193-8MS |
| 25.04 / .986 | 9 | 193-9MS |
| 27.58 / 1.086 | 10 | 193-10MS |

Packing: Tape and Reel

Unit: mm

| SW Section | Fig | Bo | W | F | S |
|------------|-----|-------|------|-------|------|
| 2 | I | 7.15 | 24.0 | 11.50 | - |
| 3 | I | 9.69 | 24.0 | 11.50 | - |
| 4 | I | 12.23 | 24.0 | 11.50 | - |
| 5 | II | 14.81 | 32.0 | 14.20 | 28.4 |
| 6 | II | 17.35 | 32.0 | 14.20 | 28.4 |
| 8 | II | 22.40 | 44.0 | 20.20 | 40.4 |

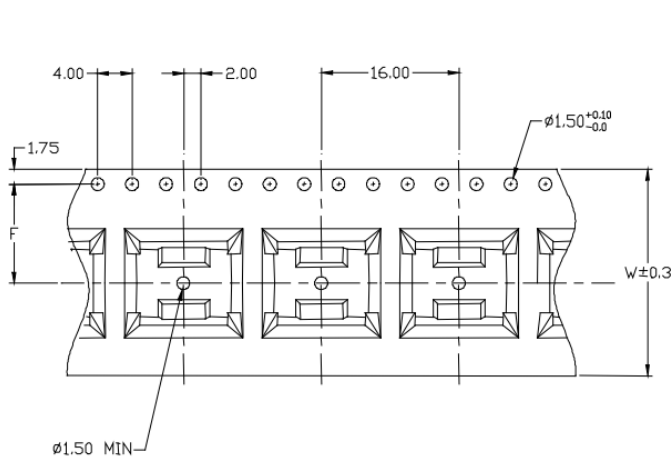


FIG I

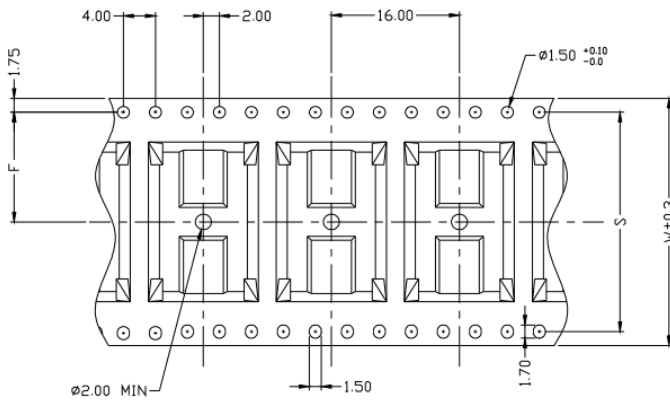
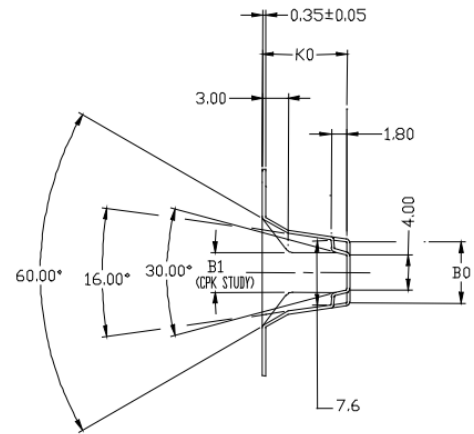
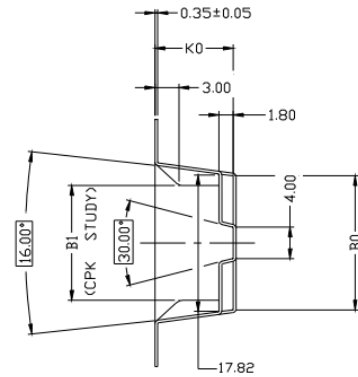


FIG II

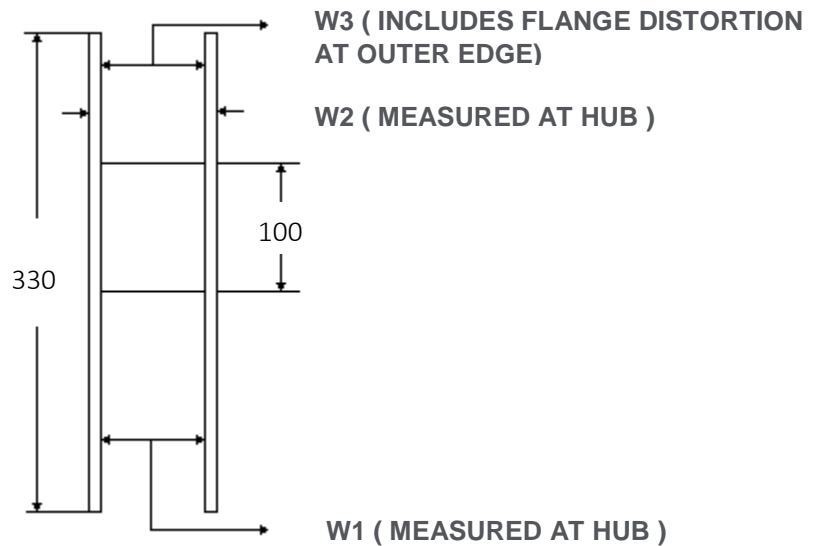


SPECIFIED REEL PARTS DIMENSIONS:

Unit: mm

| SW Section | W1 | W2 | W3 |
|------------|------|-----------|---------------------|
| 2~4 | 24.4 | 30.4 MAX. | 23.9 MIN./27.4 MAX. |
| 5~6 | 32.4 | 38.4 MAX. | 31.9 MIN./35.4 MAX. |
| 8 | 44.4 | 50.4 MAX. | 43.9 MIN./47.4 MAX. |

(SEE PICTURE FIG)



1. TAPE SPROCKET HOLE PITCH : 4.0 ± 0.1 MM
2. ALL SMT ASSEMBLING MACHINES WILL PICK-UP THE COMPONENT FROM THE POINT, WHICH IS LOCATED IN THE CENTRE OF TWO ADJACENT SPROCKET HOLES IN FEEDING DIRECTION. THIS MUST BE TAKE INTO ACCOUNT WHEN DESIGNING THE LOCATION OF THE COMPONENT IN T&R POCKET.
3. RECOMMENDED PART ORIENTATION IN TAPE & REEL POCKET. ORIENT SWITCH TERMINAL #1 TO THE SIDE OF ROUND SPROCKET HOLES, SEE PICTURE BELOW.



LENGTH OF TAPE

5. THERE SHALL BE A LEADER OF 390mm MINIMUM WHICH IS SEALED ONTO EMPTY CARRIER TAPE, SEE PICTURE BELOW.

