

DESIGNED EXCLUSIVELY FOR SURFACE MOUNTING

SMT TL Series switches incorporate many desirable features that include:

- **Tape & reel packaging**
This type of packaging is recommended for:
 - economy
 - suitability for automated placement
 - handling of large quantities of components per packaging unit
 - positive component positioning
 - protection of terminals against damage during handling
 - high static resistance
- **Reflow solderable**
 - High temperature plastic materials
 - Tin plated grounding brackets
 - Tin-lead alloy over nickel terminal plating
 - Terminals turned outward to prevent the shadow effect in infrared soldering and to permit visual inspection of the solder joints
 - .021" (0.55mm) air gap between p.c. board and switch case
 - End stackable with .400" (10.16mm) pitch
 - Available with positioning pins to assure correct switch orientation during the reflow process and provide additional mechanical integrity
- **Protected against electrostatic discharges (ESD) up to 10 KV.**
- **Washable**
Switches are designed to withstand cleaning processes, including hot water under pressure.

Surface mount devices (SMD) are subject to more stringent constraints of temperature, solderability, sealing and space savings than through-hole components.

To meet these requirements, APEM has designed a family of tiny surface mount switches that include TP Series pushbutton switches, TG Series slide switches and TL Series toggle switches. See Pushbutton & Slide switch sections of catalog for TP & TG Series respectively.



New! TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

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ELECTRICAL SPECIFICATIONS

| | |
|--|--|
| Contact ratings (resistive lds.): | 0.4 VA at 20 V max. (AC or DC) |
| Minimum load: | 10 mA at 50 mV or 10 μ A at 5 VD |
| Initial contact resistance: | 20 milliohms maximum |
| Insulation resistance: | 1000 M Ω min. at 500 VDC |
| Dielectric strength: | 1000 V rms between terminals & frame. 500 V rms between terminals |
| Electrical life (at full load): | 2 position switches: 60,000 cycles 3 position switches: 30,000 cycles |
| Static resistance: | 10 KV (Schaffner equipment) |

GENERAL SPECIFICATIONS

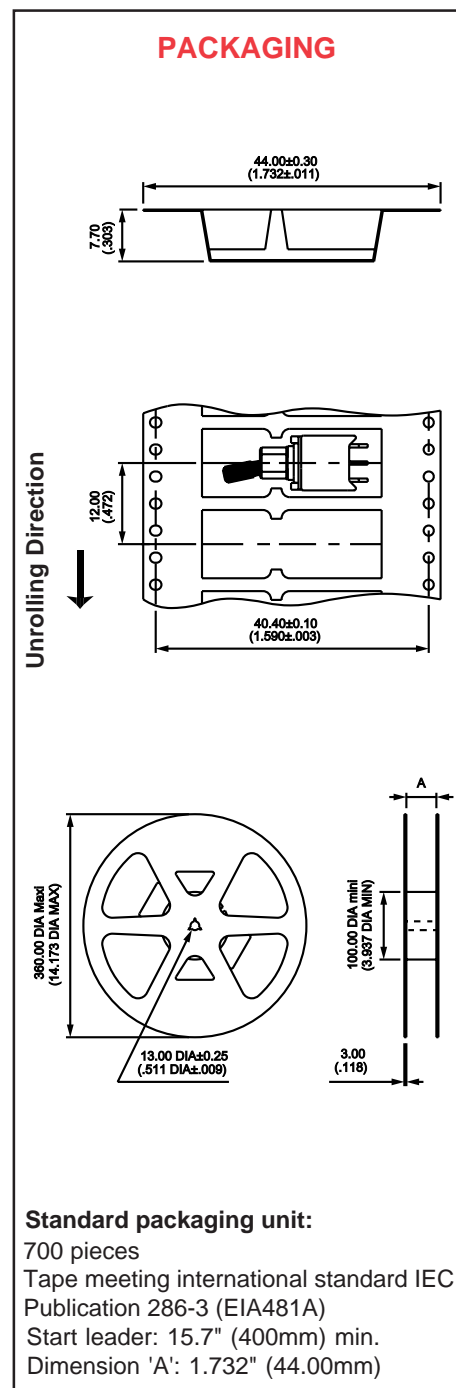
| | |
|-------------------------------------|-------------------------------------|
| Operating temperature range: | -40°C to +85°C |
| Moisture resistance: | 21 days per IEC 512-6 test 11c |
| Vibration resistance: | 10-500 Hz/10g per IEC 512-4 test 6d |
| Shock resistance: | 50 g per IEC 512-4 test 6c |

MATERIALS

| | |
|----------------------------|---|
| Case: | High temperature plastic UL94V-0 |
| Actuator: | Nickel plated brass with high temperature plastic UL94V-0 cap |
| Grounding brackets: | Tin plated steel (includes positioning pins) |
| Contacts: | Gold plated brass |
| Terminals: | Brass with tin-lead alloy over nickel plate |

SOLDERING AND CLEANING

| | |
|--------------------------|---|
| Reflow soldering: | Infrared, vapor phase and infrared convection |
| Washable: | Per IEA-RS448-2: water and detergent preferred. Solvents. |



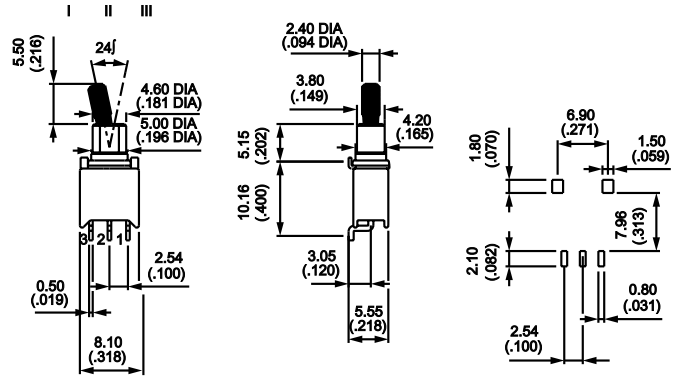
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

Single pole toggle switches



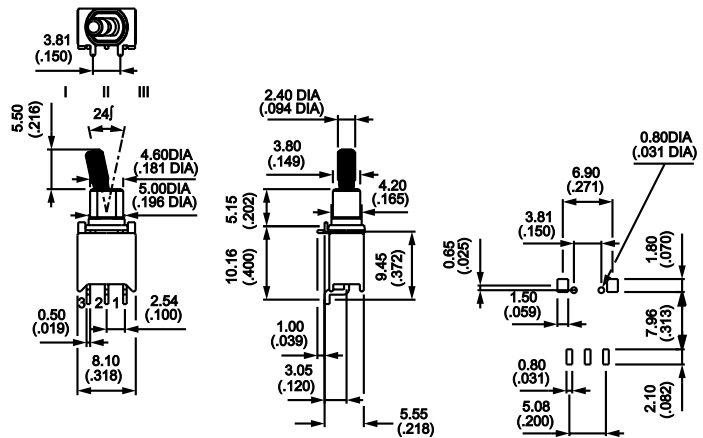
| MODEL NO. | CIRCUIT | | |
|------------------|---------|-----|-----|
| TL36WS84000 | ON | - | ON |
| TL39WS84000 | ON | OFF | ON |
| TL37WS84000 | MOM | OFF | MOM |
| TL38WS84000 | ON | OFF | MOM |
| TL32WS84000 | ON | - | MOM |
| Handle position: | III | II | I |



Single pole toggle switches with positioning pins

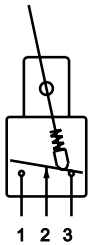


| MODEL NO. | CIRCUIT | | |
|------------------|---------|-----|-----|
| TL36WS84065 | ON | - | ON |
| TL39WS84065 | ON | OFF | ON |
| TL37WS84065 | MOM | OFF | MOM |
| TL38WS84065 | ON | OFF | MOM |
| TL32WS84065 | ON | - | MOM |
| Handle position: | III | II | I |

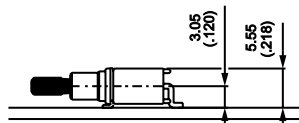


SWITCH ACTION

ON - ON Model shown



P.C. BOARD DIMENSIONS



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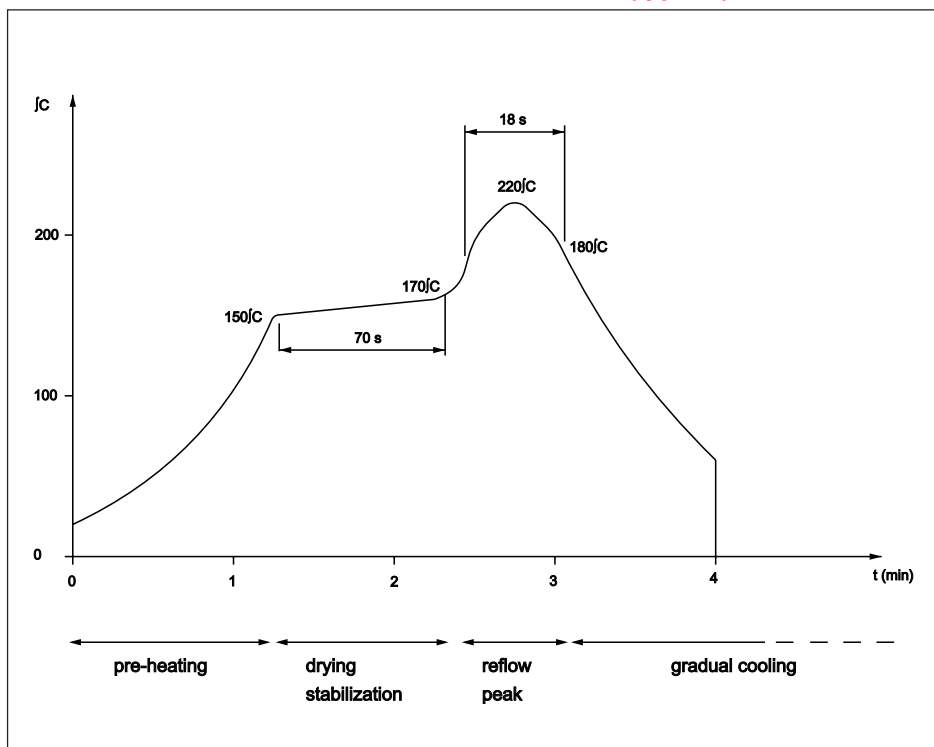
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REFLOW SOLDERING - STANDARD PROFILE

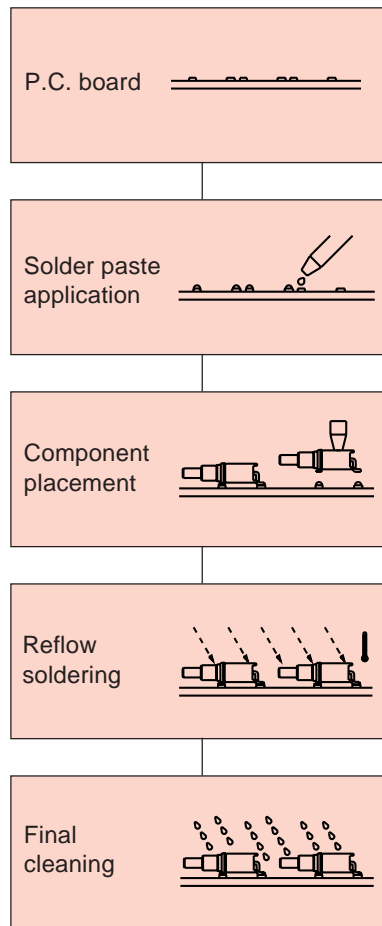
The printed circuit board, carried by a conveyor belt, travels through the reflow soldering oven and experiences the following programmed cycles:

- pre-heat to a maximum of 200°C for 30 seconds
- reflow at a maximum of 245°C for 10 seconds
- final cleaning

TEMPERATURE/TIME PROFILE (typical)

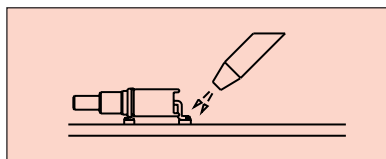


PROCESSING STEPS



P.C. BOARD REWORK RECOMMENDATIONS

Hot air reflow technique is preferred. Avoid the use of a soldering iron.



Caution: Excessive and/or repeated high temperature exposure may affect switch performance & reliability.

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