# 15mm potentiometer SMD

# PS-15 & PSX-15

## FEATURES

- Specifically designed for leadfree reflow soldering processes (excellent performance).
- IP54 protection according to IEC 60529.
- Carbon resistive element.
- Full traceability.
- Self extinguishable plastic UL 94V-0 and moisture sensitivity level 1 (PS-15).
- Embossed tape according to IEC 60286-3:2007
- Wiper positioned at initial, 50% or fully clockwise.
- Also upon request:
  - Mechanical detents.
  - Locating pins for accurate PCB positioning.
  - Low torque versions.
  - Log/alog and custom tapers.
  - Shafts and knobs.

## MECHANICAL SPECIFICATIONS

| | |
|---|---|
| – Mechanical rotation angle: | 265° ± 5° |
| – Electrical rotation angle: | 240° ± 20° |
| – Torque: | 0.5 to 2.5 Ncm.<br>(0.7 to 3.4 in-oz) |
| – Stop torque: | > 10 Ncm. ( >14 in-oz) |
| – Mechanical life*: | up to 10K cycles |

* Others upon request

## ELECTRICAL SPECIFICATIONS

– Value*: 1kΩ to 1MΩ

– Tolerance*: ± 30%

– Taper*: Linear

– Nominal Power: 0.25W @ 50°C (122°F)

– Operating temperature: PSX-15: –25°C + 70°C<br>PS-15: –40°C + 85°C

– Residual resistance: ≤ $5.10^{-3}$ Rn

– Equivalent Noise Resistance: ≤ 3% Rn

## HOW TO ORDER

STANDARD

OPTIONAL EXTRAS

| PSX15 | T | V50 | 103 | A | 3030 | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Series | Rotors | Mounting | Value | Taper | Tolerance | Life | Detents | Wiper position | Torque | Packaging |
| PSX15<br>PS15 | C<br>F<br>G<br>N<br>R<br>T<br>(See note 1) | V50<br>V60<br>(See note 2) | 102 = 1kΩ<br>⋮ ⋮<br>105 = 1MΩ | A = Linear | 3030 = ± 30% | E = Long life<br>(See note 3) | PAI<br>PAM<br>PAF<br>P1I<br>P1F<br>P02<br>⋮<br>P38 | PM = 50%<br>PF = Final | – = Standard<br>L = Low torque<br>(See note 4) | B = Bulk |

NOTES:

(1) Rotors C and F not available for PSX-15.

(2) V50: without locating pins.
V60: with locating pins.

(3) "E" option for PSX-15 only. Higher life available upon request for both models to be studied case by case.

(4) Low Torque: ≤1.5Ncm. *No detent option available for low torque models*

## HOW TO ORDER CUSTOM DRAWING

PS(X)-15 TV50 + DRAWING NUMBER (Max. 16 digits)

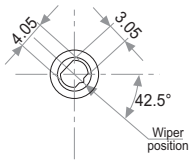
This way of ordering should be used for options which are not included in the "How to order" standard and optional extras.

## STANDARD OPTIONS

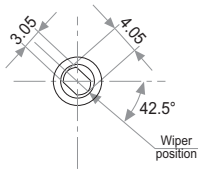
| | PSX-15 | PS-15 |
|---|---|---|
| Detents | None | None |
| Rotor colour | Black | Grey |
| Housing colour | Black | Grey |
| Wiper position | Initial | Initial |
| Torque | Standard | Standard |
| Packaging | Reel | Reel |
| Mechanical Life | 1K cycles | 10K cycles |

## ROTORS (collector side view)

### Wipers positioned at initial

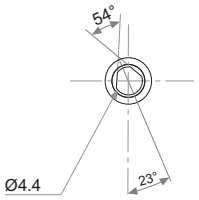



**N =**
Removable shaft or thumbwheel

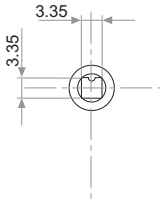



**G =**
Removable shaft or thumbwheel

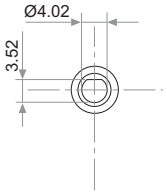
### Wipers positioned at 50%



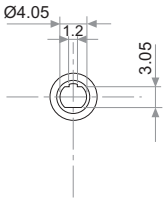

**Rotor C**




**Rotor F**

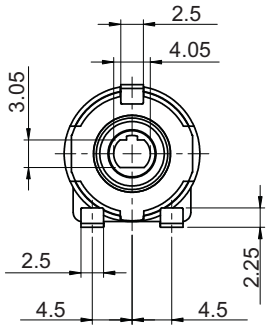


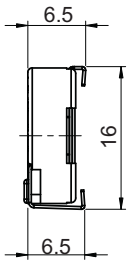

**Rotor R**

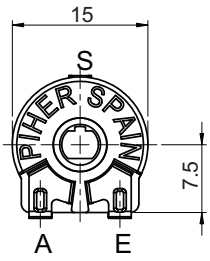


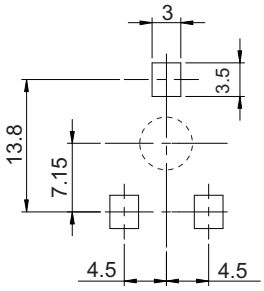

**Rotor T**

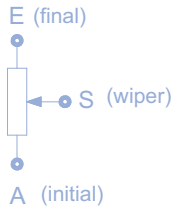
## DIMENSIONS (V50 version)



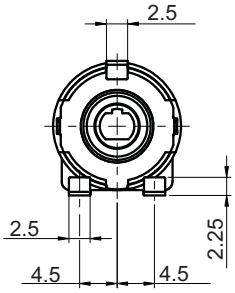



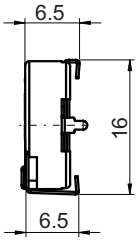



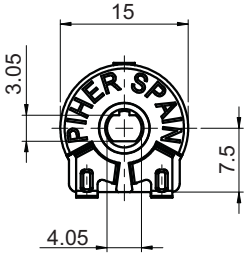



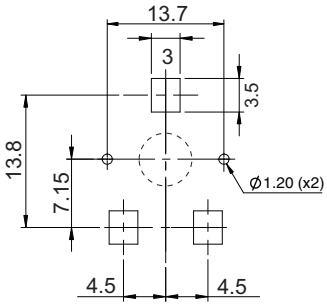




## DIMENSIONS (V60 version - with centering pins)



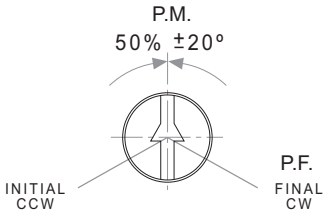



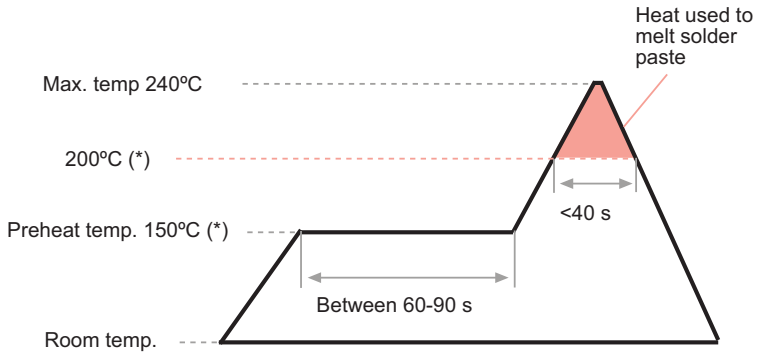



## POSITIONING

Positioning (Std. Position = CCW)




## PSX-15 RECOMMENDED REFLOW PROFILE



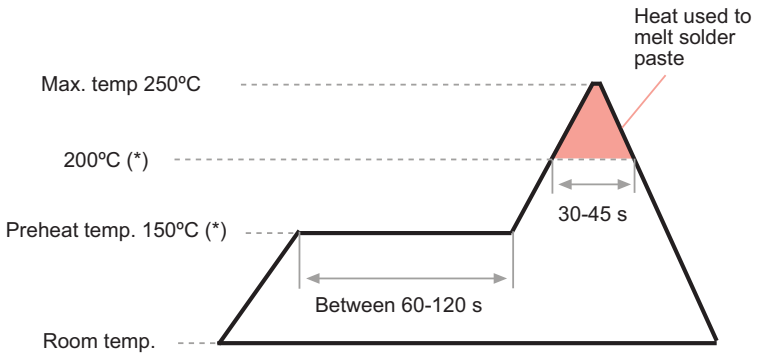

(*) Melting point temp. depends on solder properties

The recommended reflow profile is provided as a guideline. Optimal profile may differ due to oven type, assembly layout or other design or process variables. Customers should verify actual device performance in their specific application and reflow process. Please contact Piher if you require additional support.

| PSX-15 TESTS | | VARIATIONS |
|---|---|---|
| ELECTRICAL LIFE | 1000 h. @ 50°C; 0.25 W | ±10 % |
| MECHANICAL LIFE* | 1k @ 10 CPM ...15 CPM | ±10 % |
| TEMPERATURE COEFFICIENT | –25°C; +70°C | ±1000 ppm |
| THERMAL CYCLING | 16 h. @ 85°C; 2h. @ -25°C | ±5 % |
| DAMP HEAT | 500 h. @ 40°C @ 95% HR | ±15 % |
| VIBRATION (for each plane X,Y,Z) | 2 h. @ 10 Hz. ... 55 Hz. | ±3 % |

* Tests at room temperature. Other life cycles upon request.
NOTE: Out of range values may not comply these results. Please confirm with the factory all the information before designing in.

## PS-15 RECOMMENDED REFLOW PROFILE




(*) Melting point temp. depends on solder properties

The recommended reflow profile is provided as a guideline. Optimal profile may differ due to oven type, assembly layout or other design or process variables. Customers should verify actual device performance in their specific application and reflow process. Please contact Piher if you require additional support.

## PS-15 TESTS — VARIATIONS

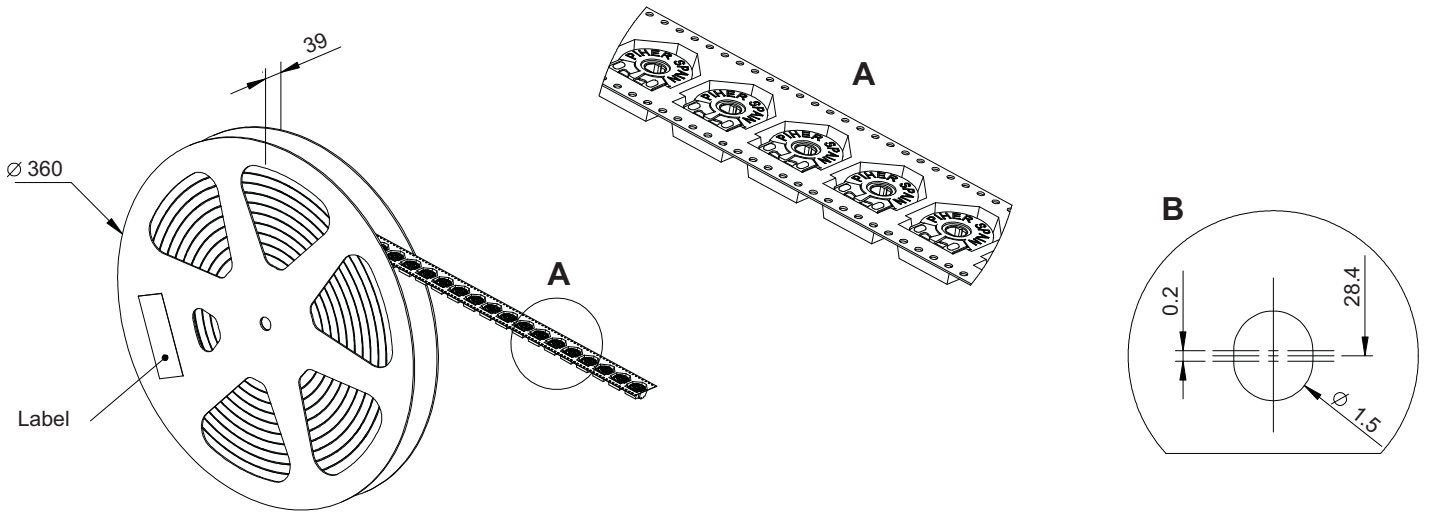
| | | |
|---|---|---|
| ELECTRICAL LIFE | 1000 h. @ 50°C; 0.25 W | ±10 % |
| MECHANICAL LIFE | 10k @ 10 CPM ...15 CPM | ±10 % |
| TEMPERATURE COEFFICIENT | –40°C; +85°C | ±1500 ppm |
| | –25°C; +70°C | ±1000 ppm |
| THERMAL CYCLING | 16 h. @ 90°C; 2h. @ -40°C | ±5 % |
| DAMP HEAT | 500 h. @ 40°C @ 95% HR | ±15 % |
| VIBRATION (for each plane X,Y,Z) | 2 h. @ 10 Hz. ... 55 Hz. | ±3 % |

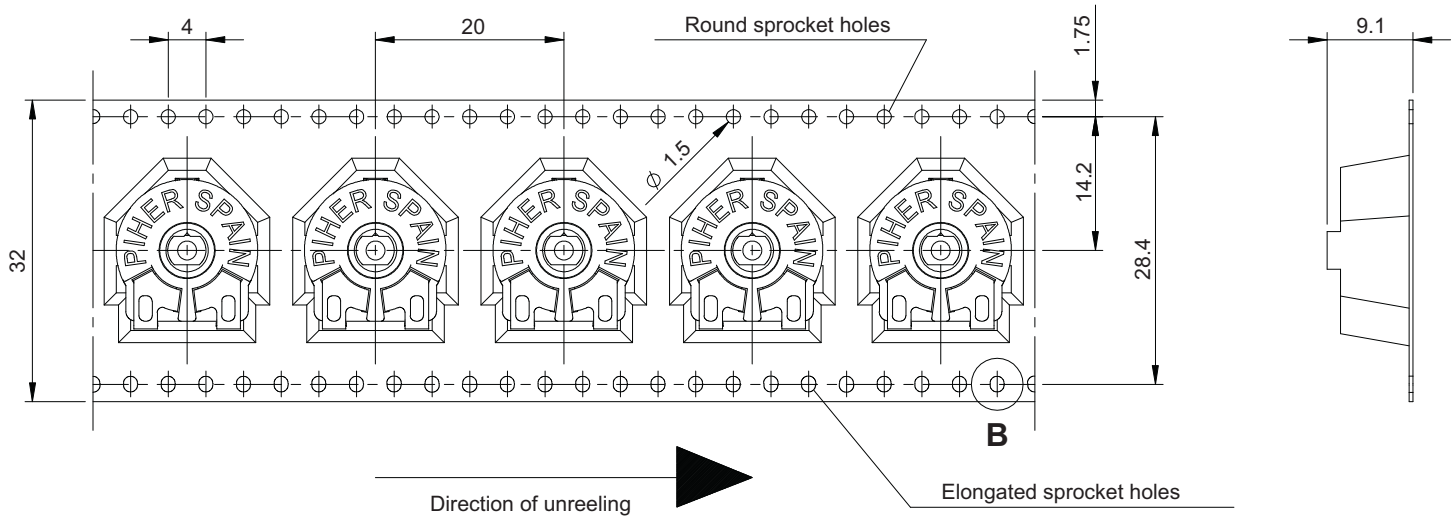
* Tests at room temperature. Other life cycles upon request.
NOTE: Out of range values may not comply these results. Please confirm with the factory all the information before designing in.

## PACKAGING

BULK: 500pcs per box (80 x 85 x 185 mm.).

EMBOSSED TAPE: 400pcs per reel.



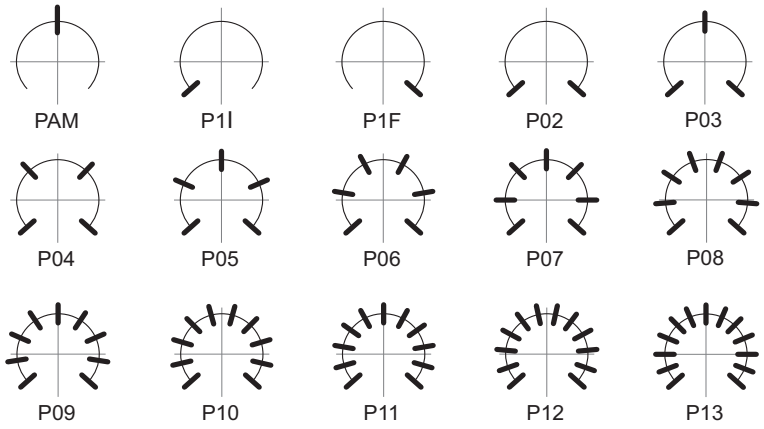



## DETENT CONFIGURATIONS EXAMPLES

This innovative PT´s with detents family has been specifically developed to allow the integration of otherwise large and expensive external mechanisms into the body of the potentiometer thus allowing a high range of configurations: special tapers, torque, tolerances, linearity, cut track, etc.

This detent design not only adds a "click" sensation of position, but also offers enormous savings in both cost and space for any given application.

Detent number and positions can be made or fitted to the customer needs or preferences.




NOTES FOR DETENTED VERSIONS:

(1) Some configurations may have a longer leadtime.

(2) Standard mechanical life is 500 cycles.

(3) Long life versions are available under request and have the following characteristics at T[a]:
- Potentiometers with 1 to 3 detents: up to 10K cycles
- Potentiometers with 4 and more detents: up to 5K cycles

(4) Detent torque can vary from 1.2 to 2.5 times the standard potentiometer torque.

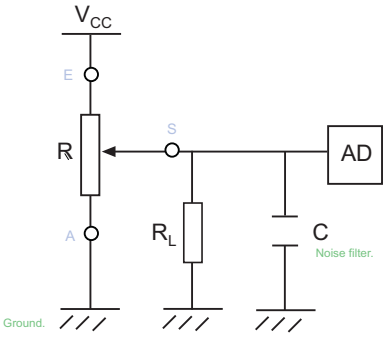
(5) Please consult your nearest Piher supplier if unique non-overlapping values at each detent position or LOG/ALOG tapers are required.

(6) Different output voltage values can be matched at each detent position (under request).

— Relative detent positions along the total mechanical travel.
Unless otherwise specified the detents are evenly spaced (using the end points as reference)

## RECOMMENDED CONNECTIONS

Piher potentiometer's recommended connection circuit for a position sensor or control application.
(voltage divider circuit electronic design).




$R_L \simeq 100 \times R$

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