



**DESCRIPTION:** 0.25W 3KVDC Isolated Single and Dual Output DC/DC Converters

The PPA-W25 series are miniature, isolated 0.25W DC/DC converters in a SIP and DIP package. They offer the ideal solution in many space critical applications for board level power distribution. The internal SMD construction makes it possible to offer a product with high performance at low cost. The series offers smaller size, improved efficiency, lower output ripple noise and 3KVDC isolation.

## FEATURES

|                                       |   |   |
|---------------------------------------|---|---|
| RoHS compliant                        | Efficiency up to 80%  | Power density up to 0.85W/cm <sup>3</sup> |
| Operating temperature :-40°C to 105°C | Single and dual output from a single input rail                 | UL 94V-0 package material                 |
| Power sharing on output               | 3KVDC isolation   | Industry standard pinout                  |
| Input voltage: 3.3V, 5V, 12V, 15V     | Output voltage :3.3V,5V,9V,12V,15V,24V / ±5V,±9V,±12V,±15V,±24V | CE certification                          |

## SELECTION GUIDE

| Part Number   | Nominal Input Voltage | Output Voltage | Output Current (Max./Min) | Efficiency | Package Style |
|---------------|-----------------------|----------------|---------------------------|------------|---------------|
|               | V                     | V              | mA                        | %          |               |
| PPA303DA-W25  | 3.3                   | 3.3            | 75.8/7.58                 | 72         | DIP           |
| PPA305DA-W25  | 3.3                   | 5              | 50/5                      | 74         | DIP           |
| PPA0505DA-W25 | 5                     | 5              | 50/5                      | 68         | DIP           |
| PPA0509DA-W25 | 5                     | 9              | 28/2.8                    | 76         | DIP           |
| PPA0512DA-W25 | 5                     | 12             | 21/2.1                    | 79         | DIP           |
| PPA0515DA-W25 | 5                     | 15             | 17/1.7                    | 78         | DIP           |
| PPA0524DA-W25 | 5                     | 24             | 10.5/1.05                 | 81         | DIP           |
| PPA1203DA-W25 | 12                    | 3.3            | 75.8/7.58                 | 73         | DIP           |
| PPA1205DA-W25 | 12                    | 5              | 50/5                      | 68         | DIP           |
| PPA1209DA-W25 | 12                    | 9              | 28/2.8                    | 74         | DIP           |
| PPA1212DA-W25 | 12                    | 12             | 21/2.1                    | 77         | DIP           |
| PPA1215DA-W25 | 12                    | 15             | 17/1.7                    | 75         | DIP           |
| PPA1505DA-W25 | 15                    | 5              | 50/5                      | 71         | DIP           |
| PPA1512DA-W25 | 15                    | 12             | 21/2.1                    | 77         | DIP           |
| PPA1515DA-W25 | 15                    | 15             | 17/1.7                    | 80         | DIP           |
| PPA0505D-W25  | 5                     | ±5             | ±25/±2.5                  | 67         | DIP           |
| PPA0509D-W25  | 5                     | ±9             | ±14/±1.4                  | 76         | DIP           |
| PPA0512D-W25  | 5                     | ±12            | ±10.5/±1.05               | 79         | DIP           |
| PPA0515D-W25  | 5                     | ±15            | ±8.5/±0.85                | 78         | DIP           |
| PPA0524D-W25  | 5                     | ±24            | ±5.25/±0.525              | 81         | DIP           |
| PPA0505S-W25  | 5                     | ±5             | ±25/±2.5                  | 67         | SIP           |
| PPA0509S-W25  | 5                     | ±9             | ±14/±1.4                  | 76         | SIP           |
| PPA0512S-W25  | 5                     | ±12            | ±10.5/±1.05               | 79         | SIP           |
| PPA0515S-W25  | 5                     | ±15            | ±8.5/±0.85                | 78         | SIP           |
| PPA0524S-W25  | 5                     | ±24            | ±5.25/±0.525              | 81         | SIP           |
| PPA1205D-W25  | 12                    | ±5             | ±25/±2.5                  | 68         | DIP           |
| PPA1209D-W25  | 12                    | ±9             | ±14/±1.4                  | 74         | DIP           |
| PPA1212D-W25  | 12                    | ±12            | ±10.5/±1.05               | 77         | DIP           |
| PPA1215D-W25  | 12                    | ±15            | ±8.5/±0.85                | 75         | DIP           |
| PPA1224D-W25  | 12                    | ±24            | ±5.25/±0.525              | 81         | DIP           |
| PPA1205S-W25  | 12                    | ±5             | ±25/±2.5                  | 68         | SIP           |
| PPA1209S-W25  | 12                    | ±9             | ±14/±1.4                  | 74         | SIP           |
| PPA1212S-W25  | 12                    | ±12            | ±10.5/±1.05               | 77         | SIP           |
| PPA1215S-W25  | 12                    | ±15            | ±8.5/±0.85                | 75         | SIP           |
| PPA1505D-W25  | 15                    | ±5             | ±25/±2.5                  | 71         | DIP           |
| PPA1509D-W25  | 15                    | ±9             | ±14/±1.4                  | 74         | DIP           |
| PPA1512D-W25  | 15                    | ±12            | ±10.5/±1.05               | 77         | DIP           |
| PPA1515D-W25  | 15                    | ±15            | ±8.5/±0.85                | 80         | DIP           |
| PPA1524D-W25  | 15                    | ±24            | ±5.25/±0.525              | 81         | DIP           |
| PPA1505S-W25  | 15                    | ±5             | ±25/±2.5                  | 71         | SIP           |
| PPA1512S-W25  | 15                    | ±12            | ±14/±1.4                  | 77         | SIP           |
| PPA1515S-W25  | 15                    | ±15            | ±10.5/±1.05               | 80         | SIP           |

Add suffix "P" for continuous short circuit protection, for example PPA0505SP-W25.

## INPUT CHARACTERISTICS

| Parameter                | Conditions          | Min. | Typ. | Max. | Units  |
|--------------------------|---------------------|------|------|------|--------|
| Voltage range            | 3.3V input variants | 2.9  | 3.3  | 3.6  | V      |
| Voltage range            | 5V input variants   | 4.5  | 5    | 5.5  | V      |
| Voltage range            | 12V input variants  | 10.7 | 12   | 13.1 | V      |
| Voltage range            | 15V input variants  | 13.5 | 15   | 16.5 | V      |
| Reflected ripple current |                     |      | 22   | 45   | mA p-p |

## ABSOLUTE MAXIMUM RATINGS

|   |       |
|---|-------|
| Lead temperature 1.5mm from case for 10 seconds | 300°C |
| Internal power dissipation                      | 450mW |
| Input voltage $V_{in}$ , PPA03 variants         | 5.5V  |
| Input voltage $V_{in}$ , PPA05 variants         | 7V    |
| Input voltage $V_{in}$ , PPA12 variants         | 15V   |
| Input voltage $V_{in}$ , PPA15 variants         | 18V   |

All specifications typical at  $T_A=25^\circ\text{C}$ , nominal input voltage and rated output current unless otherwise specified.

## OUTPUT CHARACTERISTICS

| Parameter                              | Conditions                                    | Min.       | Typ. | Max. | Units |
|--|---|------------|------|------|-------|
| Rated Power                            | $T_A=-40^\circ\text{C}$ to $85^\circ\text{C}$ |            |      | 0.25 | W     |
| Voltage Set Point Accuracy             | See tolerance envelope                        |            |      |      |       |
| Line regulation                        | High $V_{in}$ to low $V_{in}$                 |            | 1.0  | 1.2  | %/%   |
| Load Regulation 10% load to rated load | 5V & 12V input                                | 5V output  | 10   | 13   | %     |
| Load Regulation 10% load to rated load | 5V & 12V input                                | 9V output  | 9    | 10   | %     |
| Load Regulation 10% load to rated load | 5V & 12V input                                | 12V output | 7    | 8    | %     |
| Load Regulation 10% load to rated load | 5V & 12V input                                | 15V output | 6    | 7.0  | %     |
| Load Regulation 10% load to rated load | 15V input                                     | 5V output  | 6    | 10   | %     |
| Load Regulation 10% load to rated load | 15V input                                     | 12V output | 3    | 4    | %     |
| Load Regulation 10% load to rated load | 15V input                                     | 15V output | 3    | 4    | %     |

## ISOLATION CHARACTERISTICS

| Parameter              | Conditions               | Min. | Typ. | Max. | Units |
|------------------------|--------------------------|------|------|------|-------|
| Isolation test voltage | Tested for 1 second      | 3000 |      |      | VDC   |
| Resistance             | $V_{iso}=1000\text{VDC}$ | 1    |      |      | GΩ    |

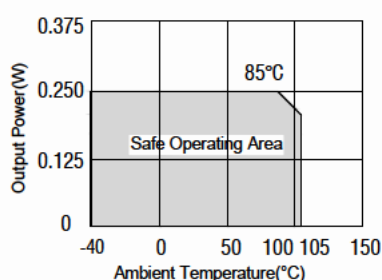
## GENERAL CHARACTERISTICS

| Parameter           | Conditions | Min. | Typ. | Max. | Units |
|---------------------|------------|------|------|------|-------|
| Switching frequency | 3.3V input |      | 95   |      | kHz   |
| Switching frequency | 5V input   |      | 110  |      | kHz   |
| Switching frequency | 12V input  |      | 130  |      | kHz   |
| Switching frequency | 15V input  |      | 90   |      | kHz   |

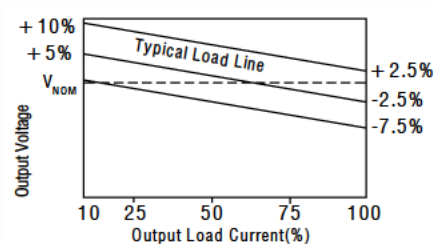
## TEMPERATURE CHARACTERISTICS

| Parameter     | Conditions  | Min. | Typ. | Max. | Units            |
|---------------|---|------|------|------|------------------|
| Specification | Derating if the temperature $\geq 85^\circ\text{C}$ | -40  |      | 105  | $^\circ\text{C}$ |
| Storage       |   | -50  |      | 130  | $^\circ\text{C}$ |
| Cooling       | Free air convection                                 |      |      |      |                  |

## TEMPERATURE DERATING GRAPHS

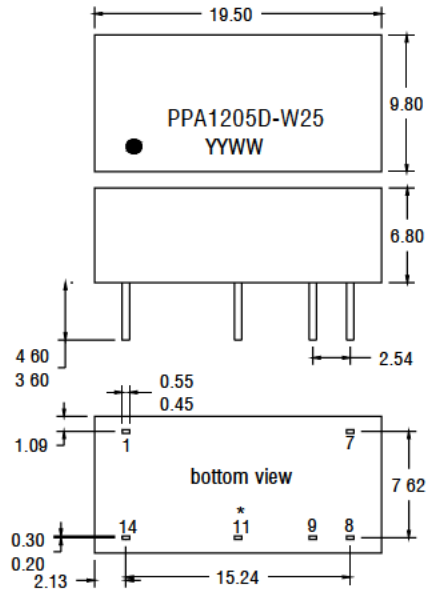


## TOLERANCE ENVELOPES

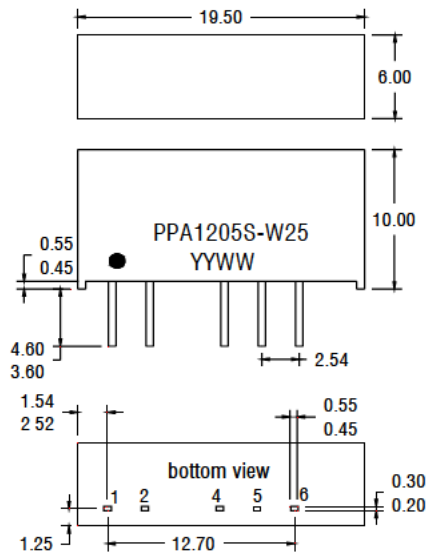


## MECHANICAL DIMENSIONS

### DIP Package



### SIP Package



## PIN CONNECTIONS

| 14 PIN DIP |          |
|------------|----------|
| Pin        | Function |
| 1          | -Vin     |
| 7          | NC       |
| 8          | OV       |
| 9          | +Vout    |
| 11*        | -Vout    |
| 14         | +Vin     |

| 7 PIN SIP |          |
|-----------|----------|
| Pin       | Function |
| 1         | +Vin     |
| 2         | -Vin     |
| 4         | -Vout    |
| 5         | OV       |
| 6         | +Vout    |

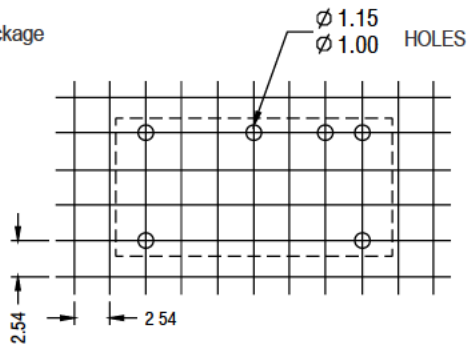
All dimensions in mm±0.25mm. All pins on a 2.54mm pitch and within ±0.25mm of true position.

Weight: 2.4g (DIP) 2.1g (SIP)

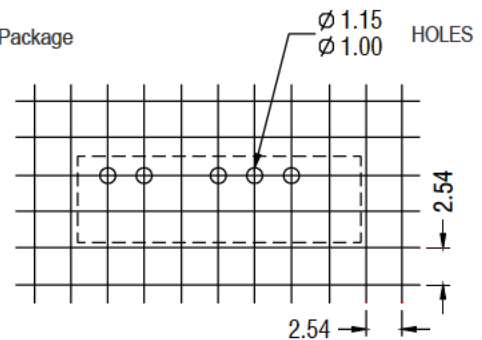
\*Pin not fitted on single output variants

## RECOMMENDED FOOTPRINT DETAILS

### 14 Pin DIP Package

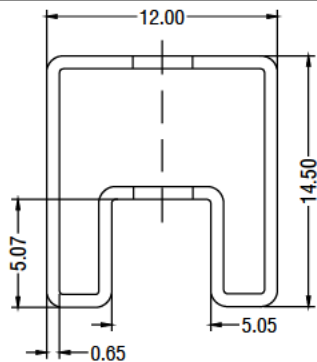


### 7 Pin SIP Package

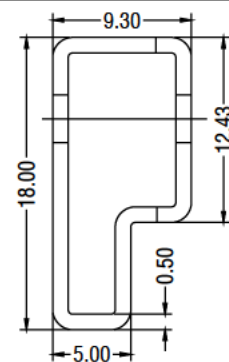


## TUBE OUTLINE DIMENSIONS

### 14Pin DIP Tube



### 7Pin SIP Tube



Tube length (14 Pin DIP) : 520mm±2mm.

Tube Quantity : 25PCS

## SOLDERING INFORMATION

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300°C for 10 seconds. Both SIP and DIP types in this series are backward compatible with Sn/Pb soldering systems.