## 1. Features :

- ■ Wide 4：1 Input Range
- ■ 24 Pin SMD Package
- ■ Input / Output Isolation 1.5K Vdc or 3.5K Vdc
- ■ 100 % Burn-In
- ■ Input $\pi$ - Filter
- ■ Custom Design Available


## 2. Absolute maximum ratings :

( Exceeding these values may damage the module. These are not continuous operating ratings )

| Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input **Absolute** Voltage Range | 24V Input Model | -0.7 | 24 | 45 | Vdc |
| | 48V Input Model | -0.7 | 48 | 90 | |
| Output Short circuit duration | Nominal Input Range | Indefinite & Auto-Restart | | | |
| Reverse Polarity Input current Limit | --- | --- | --- | 1 | A |
| Operating temperature | Output Full Load | -25 | --- | +71 | ℃ |
| Storage temperature | | -55 | --- | +125 | |

## 3. Nominal Input / Output Electrical Specifications :

( Specifications typical at Ta = +25℃, nominal input voltage, rated output current unless otherwise noted )

| Parameter | Condition | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Input Voltage Range | 24V Input Model | 9 | 24 | 36 | Vdc |
| | 48V Input Model | 18 | 48 | 75 | |
| Line Regulation | Output full Load | --- | --- | ± 0.5 | % |
| Load Regulation | Single Output Model | --- | --- | ± 0.5 | |
| | Dual Output Model | | | ± 2 | |
| Output Voltage Accuracy | Nominal Input | --- | ± 1.0 | ± 2.0 | |
| Output Voltage Balance | Dual Output at same Load | --- | --- | ± 1.0 | |
| Switching Frequency | Nominal Input | --- | 250 | --- | KHz |
| Temperature Coefficient | | --- | ± 0.01 | ± 0.02 | % / ℃ |
| Isolation Voltage | Standard Series | 1500 | --- | --- | Vdc |
| | High Isolation Series | 3500 | --- | --- | |
| Isolation Resistance | 500 Vdc | 1000 | --- | --- | MΩ |
| Isolation Capacitance | 1 KHz / 250 mV rms | --- | 350 | --- | pF |

## 4. Single Output Selection Guide :

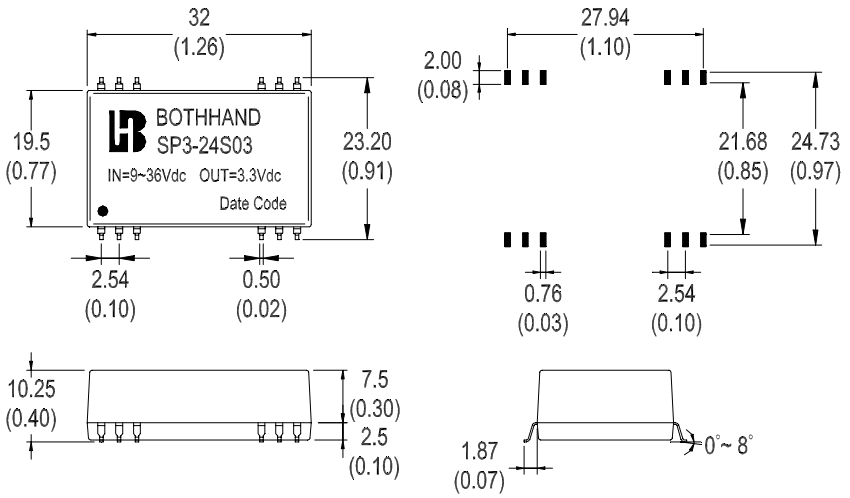
( Specifications typical at Ta = +25 ℃, Nominal input voltage, Rated output current unless otherwise noted )

| Bothhand Model No. | Input Voltage (Vdc) | Output Voltage (Vdc) | Output Current (mA) Max | Input Current @ No Load (mA) Typ. | Input Current @ Max. Load (mA) Typ. | Output Ripple (mV) Max. | Load Regulation (%) Max. | Efficiency (%) Typ. |
|---|---|---|---|---|---|---|---|---|
| **3 W Single output Series** | | | | | | | | |
| SP3-24S03 | 9 ~ 36 | 3.3 | 1000 | 17 | 181 | 50 | ± 0.5 | 76 |
| SP3-24S05 | | 5.0 | 600 | 20 | 160 | 50 | ± 0.5 | 78 |
| SP3-48S03 | 18 ~ 75 | 3.3 | 1000 | 10 | 89 | 50 | ± 0.5 | 77 |
| SP3-48S05 | | 5.0 | 600 | 17 | 78 | 50 | ± 0.5 | 80 |
| **6 W Single output Series** | | | | | | | | |
| SP6-24S05 | 9 ~ 36 | 5.0 | 1200 | 25 | 316 | 50 | ± 0.5 | 79 |
| SP6-24S12 | | 12.0 | 500 | 27 | 309 | 100 | ± 0.5 | 81 |
| SP6-48S05 | 18 ~ 75 | 5.0 | 1200 | 15 | 158 | 50 | ± 0.5 | 79 |
| SP6-48S12 | | 12.0 | 500 | 17 | 154 | 100 | ± 0.5 | 81 |
| SPx-xxSxx | | | | | | | | |

Notes：

1. Standard output Voltage is 3.3V, 5V, 9V, 12V, 15V, SPx-xxSxx is for Customer Design.
2. Suffix “H” for 3.5K Vdc Isolation …… ( SPx-xxSxxH )

### Mechanical：( Single O/P )




Units : mm ( inch )

Tolerance : .xx ± 0.25

( ± 0.01 )

| Pin | Single Output | | Pin |
|---|---|---|---|
| 1 | -Vin | +Vin | 24 |
| 2 | | | 23 |
| 3 | | | 22 |
| 4 | --- | --- | 21 |
| 5 | | | 20 |
| 6 | | | 19 |
| 7 | | | 18 |
| 8 | | | 17 |
| 9 | | | 16 |
| 10 | NC | Vo (-) | 15 |
| 11 | | Vo (+) | 14 |
| 12 | | | 13 |

Note：” --- “ means Omitted

## 5. Dual Output Selection Guide :

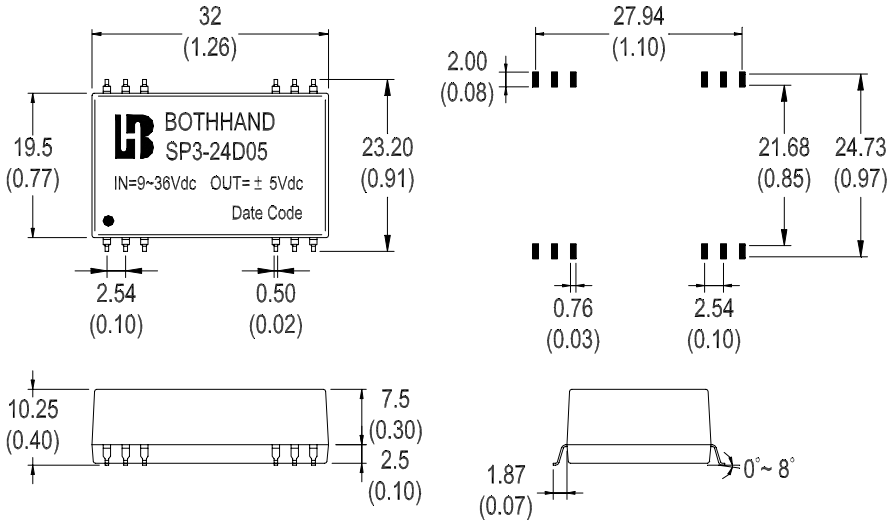
( Specifications typical at Ta = +25 ℃, Nominal input voltage, Rated output current unless otherwise noted )

| Bothhand Model No. | Input Voltage (Vdc) | Output Voltage (Vdc) | Output Current (mA) Max | Input Current @ No Load (mA) Typ. | Input Current @ Max. Load (mA) Typ. | Output Ripple (mV) Max. | Load Regulation (%) Max. | Efficiency (%) Typ. |
|---|---|---|---|---|---|---|---|---|
| **3 W Dual output Series** | | | | | | | | |
| SP3-24D05 | 9 ~ 36 | ± 5.0 | ± 300 | 25 | 162 | 50 | ± 2 | 77 |
| SP3-24D12 | | ± 12.0 | ± 125 | 27 | 156 | 100 | ± 2 | 80 |
| SP3-48D05 | 18 ~ 75 | ± 5.0 | ± 300 | 18 | 80 | 50 | ± 2 | 78 |
| SP3-48D12 | | ± 12.0 | ± 125 | 20 | 78 | 100 | ± 2 | 80 |
| **6 W Dual output Series** | | | | | | | | |
| SP6-24D05 | 9 ~ 36 | ± 5.0 | ± 600 | 25 | 325 | 50 | ± 2 | 77 |
| SP6-24D12 | | ± 12.0 | ± 250 | 27 | 312 | 100 | ± 2 | 80 |
| SP6-48D05 | 18 ~ 75 | ± 5.0 | ± 600 | 18 | 160 | 50 | ± 2 | 78 |
| SP6-48D12 | | ± 12.0 | ± 250 | 20 | 156 | 100 | ± 2 | 80 |

Notes：

1. SP3-xxxxDx is for Customer Design.
2. Suffix “H” for 3.5K Vdc Isolation. ( BP-xxxxDxH )
3. Load regulation is for Each output current change from 20 % to 100 % Max. Load.

### Mechanical：( Dual O/P )




Units : mm ( inch )

Tolerance : .xx ± 0.25

( ± 0.01 )

| Pin | Dual Output | | Pin |
|---|---|---|---|
| 1 | -Vin | +Vin | 24 |
| 2 | | | 23 |
| 3 | | | 22 |
| 4 | --- | --- | 21 |
| 5 | | | 20 |
| 6 | | | 19 |
| 7 | | | 18 |
| 8 | | | 17 |
| 9 | | | 16 |
| 10 | Common | Common | 15 |
| 11 | Vo (-) | Vo (+) | 14 |
| 12 | | | 13 |

Note：” --- “ means Omitted