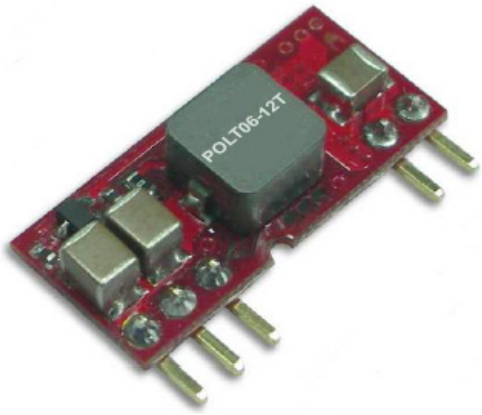
SMD Package


Size: 0.80in x 0.45in x 0.25in

SIP Vertical Package




Size: 0.90in x 0.40in x 0.23in

SIP Horizontal Package


Size: 0.90in x 0.40in x 0.40in

## OPTIONS

- SMD or SIP Package Type Available
- Vertical or Horizontal Mounting for SIP Package
- Remote Control Positive or Negative Logic

## FEATURES

- SMD and SIP packages available
- High Efficiency of 89%
- Small Size and Low Profile
- SMD Package qualifies for Leadfree Reflow Solder Process According to IPC J-STD-020D
- Delivers up to 6A of Output Current
- Fixed Switching Frequency
- Output Voltage Programmable from 0.75VDC to 5VDC via External Resistor
- No Minimum Load Required
- CE Marked
- RoHS II & REACH
- Over Load, Over Temperature, and Short Circuit Protection
- Remote ON/OFF
- UL60950-1, EN60950-1, & IEC60950-1 Safety Approvals

## APPLICATIONS

- Wireless Network
- Telecom/Datacom
- Industry Control System
- Distributed Power Architectures
- Semiconductor Equipment
- Microprocessor Power Applications

## DESCRIPTION

The POL06-12T series of DC DC open frame converters offers up to 6A of output current. This series has an input voltage range of 8.3~13.2 (14)VDC and programmable output voltage via external resistor ranging from 0.75~5VDC. No minimum load is required and there is a fixed switching frequency for this series. POL06-12T has many options available including an SMD or SIP package type, vertical or horizontal mounting for SIP package, or positive or negative logic. This series has over load, over temperature, and short circuit protection, is RoHS II & REACH, and has UL60950-1, EN60950-1, & IEC60950-1 safety approvals. Please call factory for order details.

## MODEL SELECTION TABLE

| Model Number | Input Voltage Range | Output Voltage | Output Current @Full Load | Efficiency | Package Type | Remote ON/OFF |
|---|---|---|---|---|---|---|
| POLS06-12T | 12VDC (8.3~14VDC) | 0.75~5VDC | 6A | 89% | SMD | Negative |
| POLS06-12T-P | | | | | | Positive |
| POLT06-12T | 12VDC (8.3~13.2VDC) | 0.75~5VDC | 6A | 89% | SIP Vertical | Negative |
| POLT06-12T-P | | | | | | Positive |
| POLT06-12TA | | | | | SIP Horizontal | Negative |
| POLT06-12TA-P | | | | | | Positive |

## SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

| SPECIFICATION | TEST CONDITIONS | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| **INPUT SPECIFICATIONS** | | | | | | |
| Input Voltage Range | Vout(set) ≤3.63VDC | | 8.3 | 12 | 14 | VDC |
| | Vout(set) >3.63VDC | | 8.3 | 12 | 13.2 | |
| Start-Up Voltage | | | | 30 | | mAp-p |
| Shutdown Voltage | | | | 7.8 | | VDC |
| Input Reflected Ripple Current | 5~20MHz, 1µH source impedance | | | 30 | | mAp-p |
| Maximum Input Current | Vin=Vin(min), Io=Io(max.) | | | 4.5 | | A |
| Input Filter[1] | | | Capacitor Type | | | |
| **OUTPUT SPECIFICATIONS** | | | | | | |
| Output Voltage | | | 0.75 | | 5 | VDC |
| Voltage Accuracy | % of Vout(set) | | -2.0 | | +2.0 | % |
| Line Regulation | Vin=Vin(min.) to Vin(max.) at Full Load; % of Vout(set) | | -0.3 | | +0.3 | % |
| Load Regulation | No Load to Full Load; % of Vout(set) | | -0.4 | | +0.4 | % |
| Voltage Adjustability[2] | | | 0.7525 | | 5 | VDC |
| Output Current | | | | | 6 | A |
| Minimum Load | | | 0 | | | % |
| Maximum Capacitive Load[3] | ESR≥1mΩ | | | 1000 | | µF |
| | ESR≥10mΩ | | | 3000 | | |
| Ripple & Noise (20MHz bandwidth) | Measured by 20MHz bandwidth with a 1µF MLCC & a 10µF T/C | | | | 20 | mVrms |
| | | | | | 50 | mVp-p |
| No Load Input Current | 0.75VDC | | | 17 | | mA |
| | 5.0VDC | | | 100 | | |
| Dynamic Load Response[4] | ΔIo/Δt=2.5A/µs, Vin(nom) | Peak Deviation | | 200 | | mV |
| | 50% Load Step Change | Setting Time (Vout<10%peak deviation) | | 25 | | µs |
| Dynamic Load Response[5] | ΔIo/Δt=2.5A/µs, Vin(nom) | Peak Deviation | | 50 | | mV |
| | 50% Load Step Change | Setting Time (Vout<10%peak deviation) | | 50 | | µs |
| Rise Time | Time for Vout to rise from 10% to 90% of Vout(set) | | | | 6 | mS |
| Output Voltage Overshoot-Startup | Vin=Vin(min.) to Vin(max.) at Full Load; % of Vout(set) | | | 1.0 | | % |
| Temperature Coefficient | | | -0.4 | | +0.4 | %/ºC |
| **REMOTE ON/OFF CONTROL[6]** | | | | | | |
| Negative Logic (Standard) | DC/DC ON | | Open or 0~0.3VDC | | | |
| | DC/DC OFF | | 2.5VDC~Vin(max.) | | | |
| Positive Logic (Option) | DC/DC ON | | Open or (Vin-4)~Vin(max.) | | | |
| | DC/DC OFF | | 0~0.3VDC | | | |
| Input Current of CTRL Pin | | | 0.1 | | 1.0 | mA |
| Remote OFF Input Current | | | | 1.2 | | mA |
| Turn-On Delay Time | Case 1[7]<br>Case 2 [8] | | | 3 | | ms |
| **PROTECTION** | | | | | | |
| Short Circuit Protection | | | Continuous, Automatic Recovery | | | |
| Over Load Protection | % of Iout | | | 200 | | % |
| Over Temperature Protection | | | | 140 | | ºC |
| **ENVIRONMENTAL SPECIFICATIONS** | | | | | | |
| Operating Ambient Temperature | With Derating | | -40 | | +85 | ºC |
| Storage Temperature | | | -55 | | +125 | ºC |
| Thermal Shock | | | MIL-STD-801F | | | |
| Relative Humidity | Non-Condensing | | 5 | | 95 | %RH |
| Vibration | | | MIL-STD-810F | | | |
| Lead-Free Reflow Solder Process | | | IPC J-STD-020D | | | |
| Moisture Sensitivity Level (MSL) | | | IPC J-STD-033B Level 2a | | | |
| MTBF | MIL-HDBK-217F, Full Load | | 9,277,000 | | | Hours |

## SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, and Maximum Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

| SPECIFICATION | TEST CONDITIONS | Min | Typ | Max | Unit |
|---|---|---|---|---|---|
| GENERAL SPECIFICATIONS | | | | | |
| Efficiency | 3.3VDC@Full Load | | 89 | | % |
| Switching Frequency | | 270 | 300 | 330 | kHz |
| PHYSICAL SPECIFICATIONS | | | | | |
| Weight | | 0.1oz (2.8g) | | | |
| Dimensions (L x W x H) | SMD Package | 0.80in x 0.45in x 0.25in (20.3mm x 11.4mm x 6.4mm) | | | |
| | Vertical SIP Package | 0.90in x 0.40in x 0.23in (22.9mm x 10.2mm x 5.9mm) | | | |
| | Horizontal SIP Package | 0.90in x 0.40in x 0.40in (22.9mm x 10.2mm x 10.1mm) | | | |
| SAFETY & EMC CHARACTERISTICS | | | | | |
| Safety Approvals | UL60950-1<br>EN60950-1<br>IEC60950-1 | | | | |

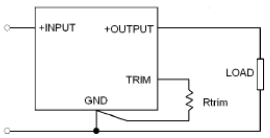
## NOTES

(1) It's necessary to equip the external input capacitors at the input of the module. The capacitors should connect as close as possible to the input terminals that ensuring module stability. The external $C_{in}$ is 2pcs of 47µF ceramic capacitors at least.

(2) Output voltage programmable from 0.7525V to 5V by connecting a single resistor (shown as Trim Table) between the Trim and GND pins of the module. To calculate the value of the resistor Rtrim for a particular output voltage Vout use the following equation:

$$Rtrim = \left[\frac{10500}{Vout - 0.7525} - 1000\right]\Omega$$

Trim Figure




Trim Table

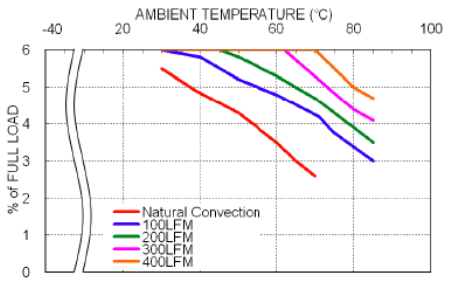
| Vout(set) (VDC) | Rtrim (kΩ) |
|---|---|
| 0.7525 | Open |
| 1.2 | 22.46 |
| 1.5 | 13.05 |
| 1.8 | 9.024 |
| 2.5 | 5.009 |
| 3.3 | 3.122 |
| 5 | 1.472 |

(3) Test by minimum input and constant resistive load.
(4) With a 1µF MLCC & a 10µF T/C
(5) With 2pcs of 150µF polymer capacitors
(6) Remote ON/OFF Referred to –Vin pin
Positive Logic: ON/OFF is open collector/drain logic input
Negative Logic: ON/OFF pin is open collector/drain logic input with external pull-up resistor
(7) Case 1: ON/OFF input is set to logic low (module on) and then input power is applied (delay from instant at which Vin=Vin(min.) until Vout=10% of Vout(set))
(8) Case 2: Input power is applied for at least one second and then the ON/OFF input is set to logic low (delay from instant at which Von/off=0.3VDC until Vout=10% of Vout(set))

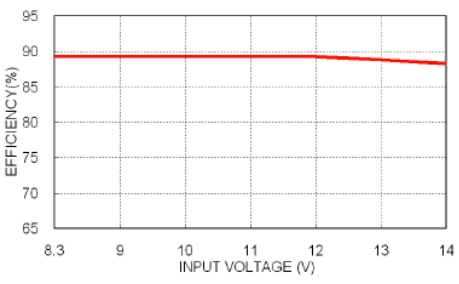
**CAUTION:** This power module is not internally fused. An input line fuse must always be used.

## CHARACTERISTIC CURVES

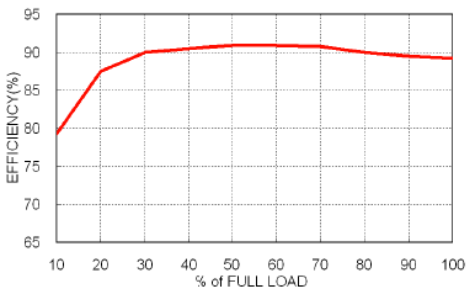
POLS06-12T, Vout=3.3V
Derating Curve




POLS06-12T, Vout=3.3V
Efficiency vs. Input Voltage

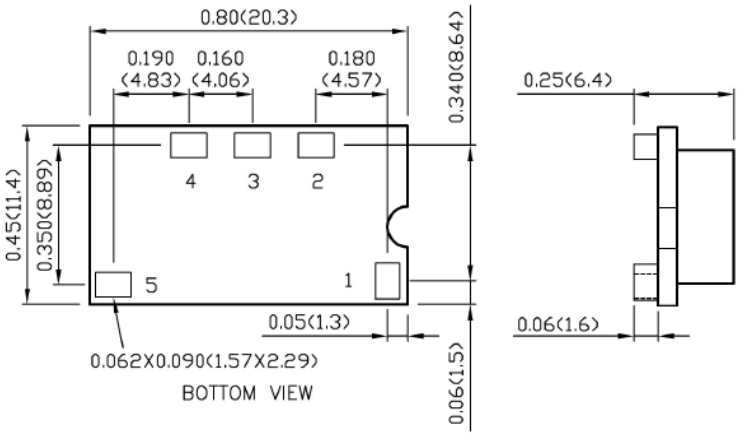



POLS06-12T, Vout=3.3V
Efficiency vs. Output Load



## MECHANICAL DRAWINGS

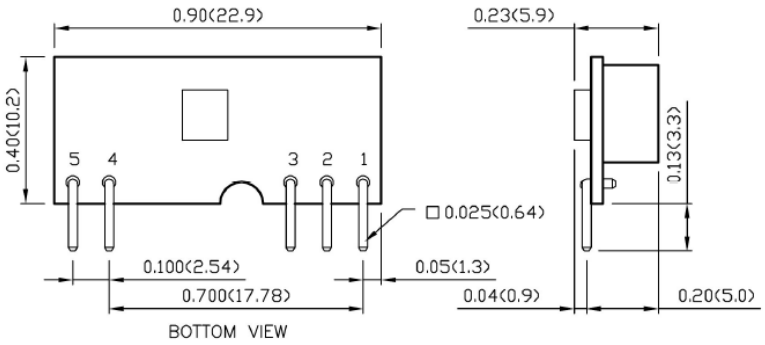
### SMD Package




PIN Connection

| PIN | DEFINE |
|---|---|
| 1 | Ctrl |
| 2 | +Vout |
| 3 | Trim |
| 4 | GND |
| 5 | +Vin |

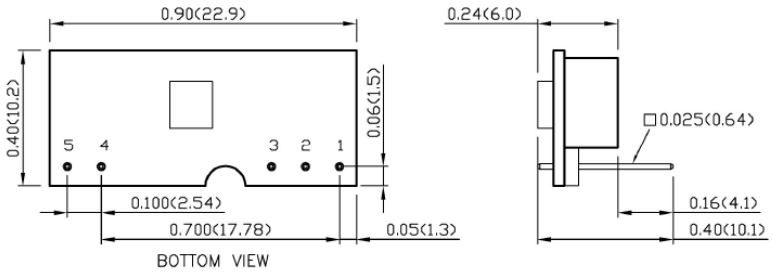
### SIP Vertical Package




PIN Connection

| PIN | DEFINE |
|---|---|
| 1 | +Vout |
| 2 | Trim |
| 3 | GND |
| 4 | +Vin |
| 5 | Ctrl |

### SIP Horizontal Package




PIN Connection

| PIN | DEFINE |
|---|---|
| 1 | +Vout |
| 2 | Trim |
| 3 | GND |
| 4 | +Vin |
| 5 | Ctrl |

1. All dimensions in inch (mm)
2. Tolerance: x.xx0.02 (x.x±0.5)
   x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)

## MODEL NUMBER SETUP

| POLT | 06 | - | 12 | TA | P |
|---|---|---|---|---|---|
| Series Name | Output Current | | Input Voltage | Package | Remote On/Off & Pin Length |
| **POLS:** SMD Type<br>**POLT:** SIP Type | **06:** 6A | | **12:** 8.3~14VDC | **T:** No Assembly<br>**T:** Vertical Mouting SIP<br>**TA:** Horizontal Mounting SIP | **None:** Negative Logic<br>**P:** Positive Logic |

## COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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