

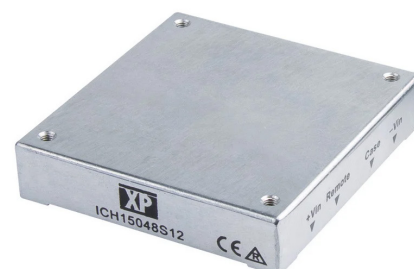
**150W** Baseplate cooled

DC-DC converters 

The ICH150 series offers a compact 150W DC-DC converter solution in an industry standard ½ brick package, with integral baseplate for conduction cooling.

Available in 2:1 input range, covering 36 to 75VDC for 48VDC nominal input.

Standard features are:  $\pm 10\%$  output voltage trim, remote sense, remote On/Off, a wide operating temperature range and includes protection for over current, over temperature and over voltage.



## Features

- ▶ Regulated single outputs 3.3 to 24VDC
- ▶ 2:1 input ranges
- ▶ Baseplate cooled ½ brick package
- ▶ 1.5kVDC isolation
- ▶ Output trim  $\pm 10\%$
- ▶ Remote sense
- ▶ Remote On/Off
- ▶ Continuous short circuit protection
- ▶  $-40^{\circ}\text{C}$  to  $+100^{\circ}\text{C}$  operating temperature
- ▶ 3 year warranty

## Applications



## Dimensions

61.0 x 57.9 x 12.7mm (2.40" x 2.28" x 0.5")  
½ brick package

## Documentation

For further information click the link or scan the code

→ [xppower.com](http://xppower.com)



## Models & ratings

| Model number <sup>(2,5)</sup> | Input voltage             | Output voltage | Output current | Input current <sup>(4)</sup> |           | Efficiency |
|-------------------------------|---------------------------|----------------|----------------|------------------------------|-----------|------------|
|                               |                           |                |                | No load                      | Full load |            |
| ICH15048S3V3                  | 18-36VDC<br>(24V nominal) | 3.3VDC         | 30.00A         | 25mA                         | 2.60A     | 79%        |
| ICH15048S05                   |                           | 5.0VDC         | 30.00A         |                              | 3.70A     | 83%        |
| ICH15048S12                   |                           | 12.0VDC        | 12.50A         |                              | 3.60A     | 85%        |
| ICH15048S15                   |                           | 15.0VDC        | 10.00A         |                              | 3.60A     | 85%        |
| ICH15048S24                   |                           | 24.0VDC        | 6.25A          |                              | 3.60A     | 85%        |

### Notes:

1. Logic compatibility: Module On = Open circuit, Module Off =  $< 0.8\text{VDC}$
2. Add suffix 'N' to the model number to receive the unit with negative logic Remote On/Off.
3. Ripple & noise is measured with a 10 $\mu\text{F}$  tantalum capacitor and 0.1 $\mu\text{F}$  ceramic capacitor across output.

4. Input current specified at 24V for 18-36 & 9-36VDC and 48V for 36-75 & 18-75VDC models.
5. For dual output models available, contact sales.

## Input

| Characteristic                   | Minimum                      | Typical | Maximum | Units | Notes & conditions |
|----------------------------------|------------------------------|---------|---------|-------|--------------------|
| Input voltage range              | See models and ratings table |         |         |       |                    |
| Input current (no load)          | See models and ratings table |         |         |       |                    |
| Input reverse voltage protection | None                         |         |         |       |                    |
| Input filter                     | Pi network                   |         |         |       |                    |
| Undervoltage lockout             | Power up: 8.8V, down: 8.0V   |         |         |       | 2:1 input, 12Vin   |
|                                  | Power up: 17.0V, down: 16.0V |         |         |       | 2:1 input, 24Vin   |
|                                  | Power up: 34.0V, down: 32.5V |         |         |       | 2:1 input, 48Vin   |
|                                  | Power up: 8.8V, down: 8.0V   |         |         |       | 4:1 input, 24Vin   |
|                                  | Power up: 17.0V, down: 16.0V |         |         |       | 4:1 input, 48Vin   |

## Output

| Characteristic           | Minimum                                                                                                                                                                                                        | Typical | Maximum | Units    | Notes & conditions                                                                                             |
|--------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|----------|----------------------------------------------------------------------------------------------------------------|
| Output voltage trim      |                                                                                                                                                                                                                | ±10     |         | %        | See application notes                                                                                          |
| Initial set accuracy     |                                                                                                                                                                                                                |         | ±1.5    | %        |                                                                                                                |
| Line regulation          |                                                                                                                                                                                                                |         | ±0.2    | %        | Measured from high line to low line                                                                            |
| Load regulation          |                                                                                                                                                                                                                |         | ±0.2    | %        | Measured from 0-100% load                                                                                      |
| Transient response       |                                                                                                                                                                                                                |         | 5       | %        | Maximum deviation, recovery to within 1% in 500µs, 25% step load change                                        |
| Ripple and noise         |                                                                                                                                                                                                                |         | 100     | mV pk-pk | 3.3 & 5VDC, 20MHz bandwidth, measured with a 10µF tantalum capacitor and 0.1µF ceramic capacitor across output |
|                          |                                                                                                                                                                                                                |         | 150     |          | 12 & 15VDC, 20MHz bandwidth, measured with a 10µF tantalum capacitor and 0.1µF ceramic capacitor across output |
|                          |                                                                                                                                                                                                                |         | 1       | % pk-pk  | 24, 28 & 48VDC, 20MHz bandwidth                                                                                |
| Overvoltage protection   | 115                                                                                                                                                                                                            |         | 140     | %        |                                                                                                                |
| Short circuit protection | Trip & restart (hiccup mode) with auto recovery, ICH150W: current limit, auto recovery.                                                                                                                        |         |         |          |                                                                                                                |
| Temperature coefficient  |                                                                                                                                                                                                                | ±0.03   |         | %/°C     |                                                                                                                |
| Current Limit            | 110                                                                                                                                                                                                            |         | 160     | %        | Of nominal output                                                                                              |
| Remote On/Off            | Logic compatibility: Module On = Open circuit, Module Off = <0.8VDC, add suffix 'N' to the model number to receive the unit with negative logic Remote On/Off.                                                 |         |         |          |                                                                                                                |
| Thermal shutdown         | Thermal shutdown when case temperature reaches +100°C, auto recovery when case temperature <+60°C<br>ICH150W: Thermal shutdown when case temperature reaches 105°C, auto recovery when case temperature <+90°C |         |         |          |                                                                                                                |

## General

| Characteristic             | Minimum                    | Typical     | Maximum | Units                                  | Notes & conditions      |
|----------------------------|----------------------------|-------------|---------|----------------------------------------|-------------------------|
| Efficiency                 | See models & ratings table |             |         |                                        |                         |
| Isolation: input to output | 1500                       |             |         | VDC                                    |                         |
| Isolation: input to case   | 1500                       |             |         | VDC                                    |                         |
| Isolation: output to case  | 1500                       |             |         | VDC                                    |                         |
| Isolation resistance       | 10 <sup>7</sup>            |             |         | Ω                                      |                         |
| Isolation capacitance      |                            | 100         |         | pF                                     |                         |
| Switching frequency        |                            | 500         |         | kHz                                    |                         |
| Power density              |                            | 3.34 (54.8) |         | W/cm <sup>3</sup> (W/in <sup>3</sup> ) |                         |
| Mean time between failure  |                            | ≥790        |         | khrs                                   | MIL-HDBK-217F, +25°C GB |
| Weight                     |                            | 100 (0.220) |         | g (lb)                                 |                         |

## Environmental

| Characteristic       | Minimum                                                                              | Typical | Maximum | Units | Notes & conditions |
|----------------------|--------------------------------------------------------------------------------------|---------|---------|-------|--------------------|
| Operating base plate | -40                                                                                  |         | +100    | °C    | See derating curve |
| Storage temperature  | -40                                                                                  |         | +105    | °C    |                    |
| Shock                | 30g pk, half sine wave for 18ms, 3 pulses per face, all 6 faces tested on all 3 axes |         |         |       |                    |
| Vibration            | 5-500 Hz at 3g, 10 mins per axis                                                     |         |         |       |                    |

## EMC: emissions

| Phenomenon | Standard | Test level | Notes & conditions       |
|------------|----------|------------|--------------------------|
| Conducted  | EN55032  | A          | With external components |
| Radiated   | EN55032  | A          | With external components |

## EMC: immunity

| Phenomenon     | Standard    | Test level    | Criteria | Notes & conditions |
|----------------|-------------|---------------|----------|--------------------|
| ESD immunity   | EN61000-4-2 | 2             | A        |                    |
| EFT/burst      | EN61000-4-4 | Level 1       | A        |                    |
| Surges         | EN61000-4-5 | Inst. Class 1 | A        |                    |
| Conducted      | EN61000-4-6 | 3Vrms         | A        |                    |
| Magnetic field | EN61000-4-8 | 1A/m          | A        |                    |

## Safety approvals

| Safety agency | Standard                         | Test level | Notes & conditions |
|---------------|----------------------------------|------------|--------------------|
| UL            | UL60950-1                        |            |                    |
| CE            | Meets all applicable directives  |            |                    |
| UKCA          | Meets all applicable legislation |            |                    |

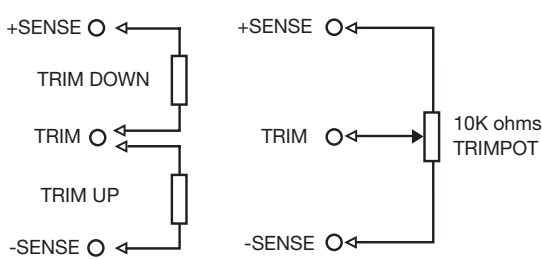
Application notes

Thermal resistances vs air flow

| Air flow rate                                   | Typical Rca |
|-------------------------------------------------|-------------|
| Natural Convection 6.0m/min (20ft/min) (0.1m/s) | 7.12°C/W    |
| 30.48 metres/min (100ft./min) (0.5m/s)          | 6.21°C/W    |
| 60.96 metres/min (200ft./min) (1.0m/s)          | 5.17°C/W    |
| 91.44 metres/min (300 ft./min) (1.5m/s)         | 4.29°C/W    |
| 121.92 metres/min (400 ft./min) (2.0m/s)        | 3.64°C/W    |
| 152.4 metres/min (500 ft./min) (2.5m/s)         | 2.96°C/W    |
| 182.88 metres/min (600 ft./min) (3.0m/s)        | 2.53°C/W    |
| 213.36 metres/min (700 ft./min) (3.5m/s)        | 2.37°C/W    |
| 243.84 metres/min (800 ft./min) (4.0m/s)        | 2.19°C/W    |

Temperature Rise:  
Pd x Rca, Where Pd = Pin - Pout or Pout (1-η) / η, Where η= efficiency

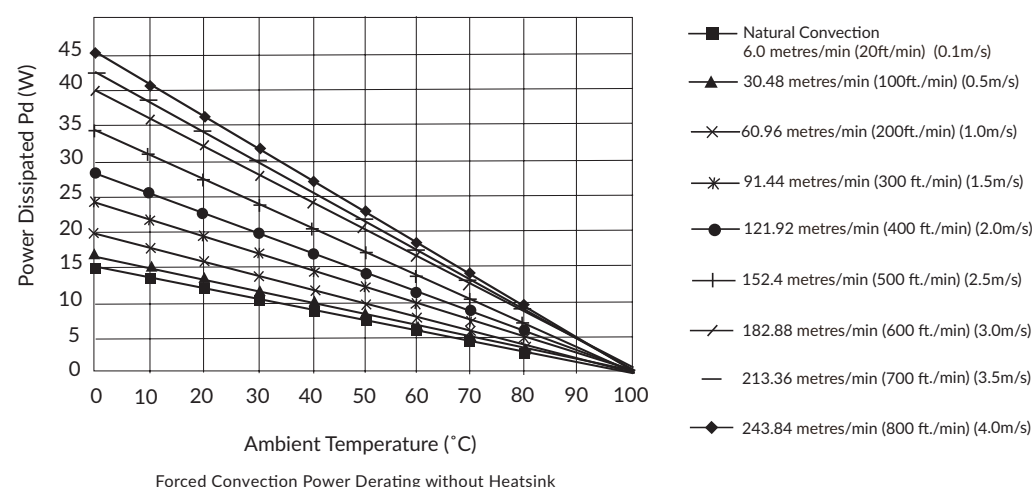
External output trimming



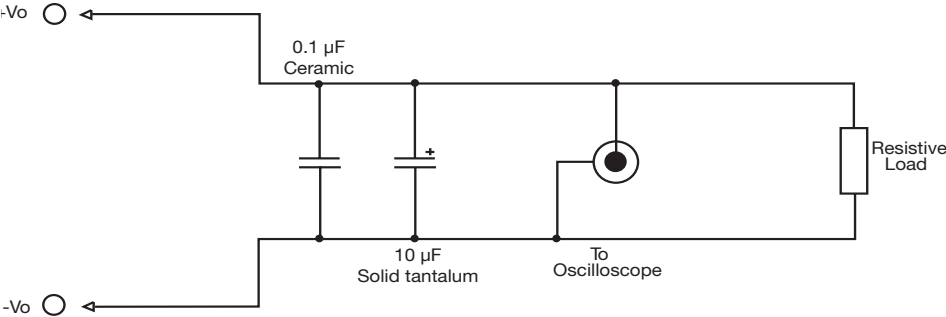
Output may be trimmed by ±10% (±5% for dual output models) with a fixed resistor or an external trimpot as shown. Contact sales for details.

| Logic table             |                |                     |
|-------------------------|----------------|---------------------|
| Logic State (Pin 2)     | Positive Logic | Negative Logic (-N) |
| Logic Low Switch Closed | Module Off     | Module On           |
| Logic High Switch Open  | Module On      | Module Off          |

Maximum power dissipation vs ambient temperature and air flow (without heatsink)

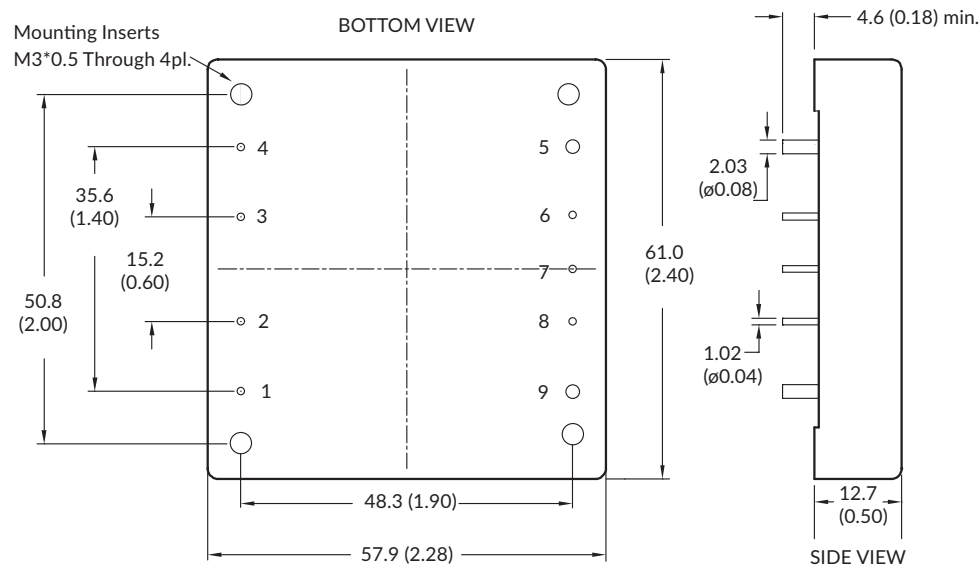


Output noise



Output noise is measured with a 10 µF tantalum capacitor and 0.1 µF ceramic capacitor across output. Oscilloscope limited to 20 MHz bandwidth.

Mechanical details



| Pin connections |          |
|-----------------|----------|
| Pin             | Function |
| 1               | +Vin     |
| 2               | On/Off   |
| 3               | Case     |
| 4               | -Vin     |
| 5               | -Vout    |
| 6               | -Sense   |
| 7               | Trim     |
| 8               | +Sense   |
| 9               | +Vout    |

- Notes:**
1. Dimensions are in mm (inches)

2. Tolerances: x.xx (x.x) =  $\pm 0.5$  ( $\pm 0.02$ ). x.xxx (x.xx) =  $\pm 0.25$  ( $\pm 0.01$ )

3. Case tolerance:  $\pm 0.50$  ( $\pm 0.02$ )
4. Pin diameter tolerance:  $\pm 0.05$  ( $\pm 0.002$ ),  $\pm 0.1$  ( $\pm 0.004$ )

5. Case Material: Aluminium

6. Pin pitch tolerance:  $\pm 0.25$  ( $\pm 0.01$ )