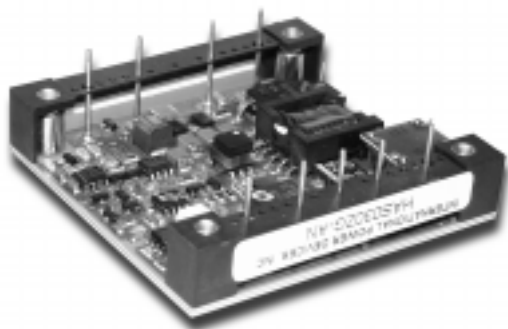


## key features

- industry standard half-brick
- low cost design
- 100C baseplate operation
- open frame packaging
- 24V and 48V Inputs
- optional enable logic
- 1500 VDC isolation
- input pi filter



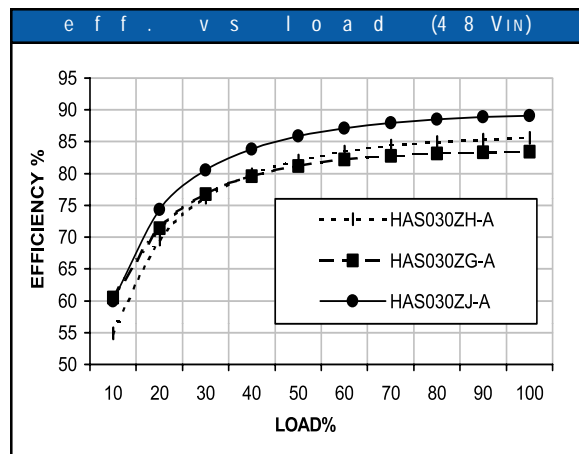
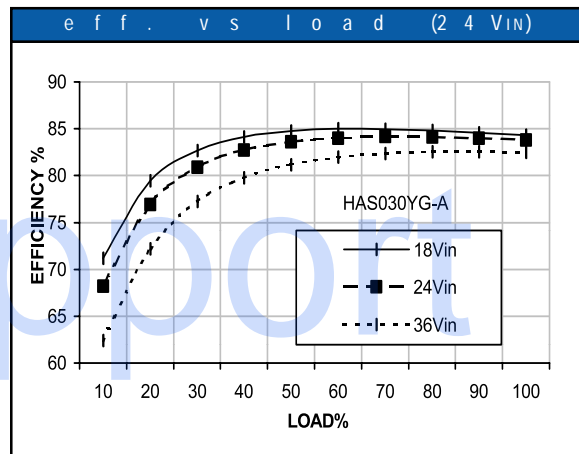
The HAS series is IPD's low cost industry standard half-brick converter. The HAS features a wide 2:1 input voltage, excellent efficiency, and IPD's open frame packaging technology. Operation is guaranteed from -40C to 100C, a built in input Pi filter insures low noise operation. Available in several input and output combinations, the HAS is perfect for industrial, telecom, and networking applications.

## technical specifications

input	
voltage range	18 - 36 VDC
24 VDC nominal	34 - 75 VDC
48 VDC nominal	
reflected ripple	25 mA
input reverse voltage protection	shunt diode

output	
setpoint accuracy	±1%
line regulation $V_{in}$ min. - $V_{in}$ max., $I_{out}$ rated	0.2% $V_o$
load regulation $I_{out}$ min. - $I_{out}$ max., $V_{in}$ nom.	0.2% $V_o$
remote sense headroom	0.5VDC
minimum output current	10 %
dynamic regulation, loadstep	25% $I_o$
Pk deviation	4% $V_o$
settling time	500 $\mu$ S
voltage trim range	±10%
short circuit / overcurrent protection	hiccup
current limit threshold range, % $I_o$ rated	110 - 140%
OVP trip range	115 - 140% $V_{out}$ nom.
remote shutdown reference	$V_{in}$ negative
shutdown pin current, sourced at off	10mA max.

general	
turn-on time	10 ms
remote shutdown	positive or negative logic
switching frequency	250 KHz
isolation	
input - output	1500 VDC
input - case	1050 VDC
output - case	500 VDC
temperature coefficient	0.03%/°C
case temperature	
operating range	-40 to +100°C
storage range	-40 to +125°C
thermal shutdown range	105 to 115°C
humidity max, non-condensing	95%
vibration, 3 axes, 5 min each	5 g, 10-55 Hz
MTBF† (Bellcore TR-NWT-000332)	$2.5 \times 10^6$ hrs
safety	UL/CSA/EN60950
weight (approx.)	1.4 oz.



**notes**

† MTBF predictions may vary slightly from model to model.  
 Specifications typically at 25°C, normal line, and full load - unless otherwise stated.  
 Specifications subject to change without notice.

## m o d e l s

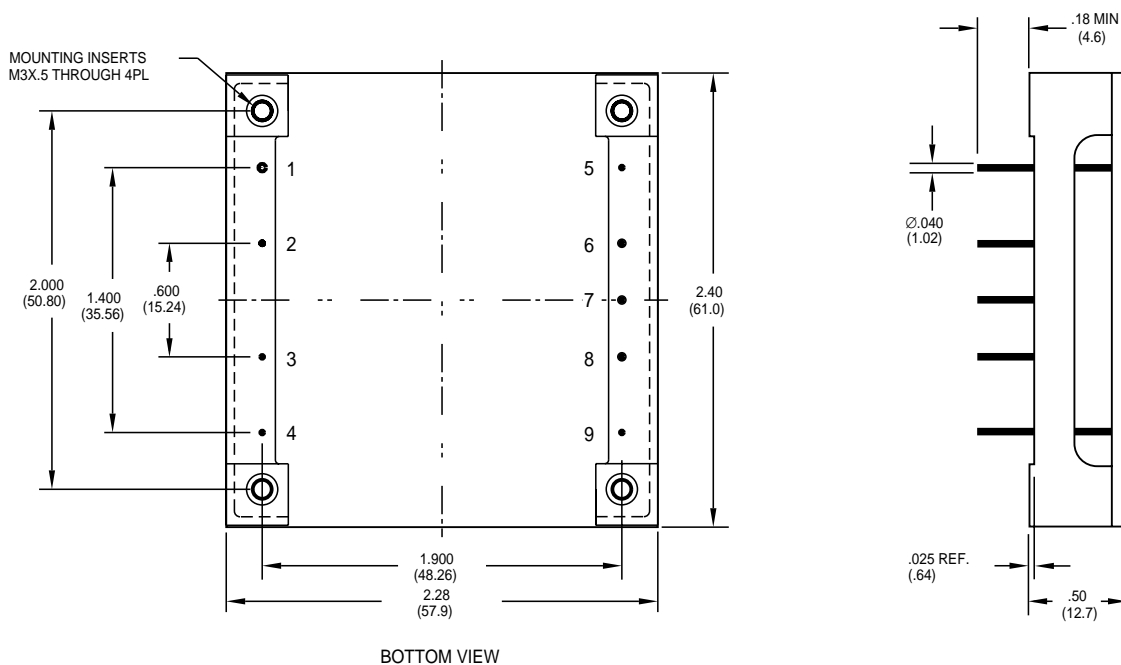
V <sub>IN</sub> (volts)	V <sub>IN</sub> range (volts)	I <sub>IN</sub> max. (amps)	V <sub>OUT</sub> (volts)	I <sub>OUT</sub> rated (amps)	ripple & noise pk-pk (mV)	efficiency typ.**	model
24	18 - 36	1.2	2.50	6.00	100	77%	HAS015YD-A
24	18 - 36	1.5	3.30	6.00	100	78%	HAS020YE-A
24	18 - 36	2.2	5.00	6.00	100	82%	HAS030YG-A
24	18 - 36	2.2	12.00	2.50	150	85%	HAS030YH-A
24	18 - 36	2.2	15.00	2.00	150	87%	HAS030YJ-A
48	34 - 75	0.6	2.50	6.00	100	78%	HAS015ZD-A
48	34 - 75	1.0	3.30	6.00	100	79%	HAS020ZE-A
48	34 - 75	1.3	5.00	6.00	100	84%	HAS030ZG-A
48	34 - 75	1.3	12.00	2.50	150	86%	HAS030ZH-A
48	34 - 75	1.3	15.00	2.00	150	87%	HAS030ZJ-A

\* max input current at minimum input voltage, maximum rated output power

\*\* at nominal V<sub>IN</sub>, rated output

for negative logic, add suffix "N" to model number

## m e c h a n i c a l d r a w i n g



t h e r m a l i m p e d a n c e	
natural convection	7.9 C/W
100 LFM	6.8 C/W
200 LFM	4.9 C/W
300 LFM	3.6 C/W
400 LFM	3.0 C/W

Thermal impedance data is dependant on many environmental factors. The exact thermal performance should be validated for specific application.

p i n	f u n c t i o n
1	-V <sub>IN</sub>
2	Case
3	On/Off
4	+V <sub>IN</sub>
5	-V <sub>OUT</sub>
6	-Sense
7	Trim
8	+Sense
9	+V <sub>OUT</sub>

t o l e r a n c e s (unless otherwise specified)	
<b>Inches</b>	<b>(Millimeters)</b>
.XX ± .020	.X ± 0.5
.XXX ± .010	.XX ± .25
<b>Pin:</b>	
± .002	± .05