50-200 Watts

ICH/IFH Series

- 2:1 & 4:1 Input Ranges
- Efficiency up to 90%
- Single Output
- -40 °C to +100 °C Operating Temperature
- Continuous Short Circuit Protection
- Five-sided Metal Case
- Remote On/Off

Specification

Input

Input Voltage Range	• See tables
Input Current (no load)	• See tables
Input Reverse Voltage Protection	• None
Input Filter	• Pi network
Undervoltage Lockout	• 12 Vin, power up 8.8 V, down 8.0 V 24 Vin, power up 17.0 V, down 16.0 V 48 Vin, power up 34.0 V, down 32.5 V

Output

Output Voltage Trim	• ±10%
Initial Set Accuracy	• ±1% max
Line Regulation	• ±0.2% max measured from high line to low line
Load Regulation	• ±0.2% max measured from 0-100% load
Transient Response	• 5% max deviation, recovery to within 1% in 500 µs, 25% step load change
Ripple & Noise	• 2.5, 3.3 & 5 V models: 100 mV pk-pk 12 & 15 V models: 150 mV pk-pk 24, 28 & 48 V models: 1% max pk-pk (20 MHz bandwidth). See note 3
Overvoltage Protection	• 115-140%
Short Circuit Protection	• Continuous
Temperature Coefficient	• ±0.03%/°C
Current Limit	• 110-140% nominal output
Remote On/Off	• See note 1 & 2
Thermal Shutdown	• Case temperature +100 °C

General

Efficiency	• See tables
Isolation Voltage	• 1500 VDC Input to Output 1500 VDC Input to Case 1500 VDC Output to Case
Isolation Resistance	• 10^7 Ω min
Switching Frequency	• ICH50/ICH7548W/IFH200: 300 kHz typical ICH7512/ICH7524: 400 kHz typical ICH100/ICH150: 500 kHz typical

Environmental

Operating Case Temperature	• -40 °C to +100 °C, see derating curve
Storage Temperature	• ICH100/150 & IFH200: -40 °C to +105 °C ICH50/75: -55 °C to +105 °C

EMC & Safety

Emissions	• EN55022, level A conducted
ESD Immunity	• EN61000-4-2, level 2 Perf Criteria B
Radiated Immunity	• EN61000-4-3, 3 V/m Perf Criteria B
Conducted Immunity	• EN61000-4-6, 3 V rms Perf Criteria B
Safety Approvals	• UL60950-1

Models and Ratings

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2,5]
			No Load	Full Load[4]		
9-18 VDC	2.5 V	10.00 A	50 mA	2740 mA	76%	ICH5012S2V5
	3.3 V	10.00 A	50 mA	3525 mA	78%	ICH5012S3V3
	5.0 V	10.00 A	50 mA	5145 mA	81%	ICH5012S05
	12.0 V	4.16 A	50 mA	4950 mA	84%	ICH5012S12
	15.0 V	3.33 A	50 mA	4950 mA	84%	ICH5012S15
	24.0 V	2.08 A	50 mA	4950 mA	84%	ICH5012S24
18-36 VDC	2.5 V	10.00 A	50 mA	1353 mA	77%	ICH5024S2V5
	3.3 V	10.00 A	50 mA	1740 mA	79%	ICH5024S3V3
	5.0 V	10.00 A	50 mA	2540 mA	82%	ICH5024S05
	12.0 V	4.16 A	50 mA	2540 mA	85%	ICH5024S12
	15.0 V	3.33 A	50 mA	2540 mA	85%	ICH5024S15
	24.0 V	2.08 A	50 mA	2419 mA	86%	ICH5024S24
36-75 VDC	2.5 V	10.00 A	50 mA	676 mA	77%	ICH5048S2V5
	3.3 V	10.00 A	50 mA	870 mA	79%	ICH5048S3V3
	5.0 V	10.00 A	50 mA	1250 mA	83%	ICH5048S05
	12.0 V	4.16 A	50 mA	1220 mA	85%	ICH5048S12
	15.0 V	3.33 A	50 mA	1220 mA	85%	ICH5048S15
	24.0 V	2.08 A	50 mA	1209 mA	86%	ICH5048S24

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2]
			No Load	Full Load[4]		
9-36 VDC	3.3 V	10.00 A	50 mA	1785 mA	78%	ICH5024WS3V3
	5.0 V	10.00 A	50 mA	2570 mA	81%	ICH5024WS05
	12.0 V	4.16 A	50 mA	2510 mA	83%	ICH5024WS12
	15.0 V	3.33 A	50 mA	2510 mA	83%	ICH5024WS15
	24.0 V	2.08 A	50 mA	2510 mA	83%	ICH5024WS24
18-75 VDC	3.3 V	10.00 A	50 mA	880 mA	78%	ICH5048WS3V3
	5.0 V	10.00 A	50 mA	1270 mA	82%	ICH5048WS05
	12.0 V	4.16 A	50 mA	1240 mA	84%	ICH5048WS12
	15.0 V	3.33 A	50 mA	1240 mA	84%	ICH5048WS15
	24.0 V	2.08 A	50 mA	1240 mA	84%	ICH5048WS24

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2,5]
			No Load	Full Load[4]		
9-18 VDC	2.5 V	15.00 A	50 mA	4110 mA	76%	ICH7512S2V5
	3.3 V	15.00 A	50 mA	5290 mA	78%	ICH7512S3V3
	5.0 V	15.00 A	50 mA	7715 mA	81%	ICH7512S05
	12.0 V	6.25 A	50 mA	7440 mA	84%	ICH7512S12
	15.0 V	5.00 A	50 mA	7440 mA	84%	ICH7512S15
	24.0 V	3.13 A	50 mA	7440 mA	84%	ICH7512S24
18-36 VDC	2.5 V	15.00 A	50 mA	2029 mA	77%	ICH7524S2V5
	3.3 V	15.00 A	50 mA	2610 mA	79%	ICH7524S3V3
	5.0 V	15.00 A	50 mA	3810 mA	82%	ICH7524S05
	12.0 V	6.25 A	50 mA	3675 mA	85%	ICH7524S12
	15.0 V	5.00 A	50 mA	3675 mA	85%	ICH7524S15
	24.0 V	3.13 A	50 mA	3640 mA	86%	ICH7524S24
36-75 VDC	2.5 V	15.00 A	50 mA	1015 mA	77%	ICH7548S2V5
	3.3 V	15.00 A	50 mA	1305 mA	79%	ICH7548S3V3
	5.0 V	15.00 A	50 mA	1883 mA	83%	ICH7548S05
	12.0 V	6.25 A	50 mA	1838 mA	85%	ICH7548S12
	15.0 V	5.00 A	50 mA	1838 mA	85%	ICH7548S15
	24.0 V	3.13 A	50 mA	1820 mA	86%	ICH7548S24

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2]
			No Load	Full Load[4]		
18-75 VDC	3.3 V	15.00 A	50 mA	1320 mA	78%	ICH7548WS3V3
	5.0 V	15.00 A	50 mA	1905 mA	82%	ICH7548WS05
	12.0 V	6.25 A	50 mA	1860 mA	84%	ICH7548WS12
	15.0 V	5.00 A	50 mA	1860 mA	84%	ICH7548WS15
	24.0 V	3.12 A	50 mA	1860 mA	84%	ICH7548WS24

Notes

1. Logic compatibility: open collector ref to -ve input. Module On = open circuit. Module Off = <0.8 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 µF tantalum capacitor and 0.1 µF ceramic capacitor across output.
4. Input current specified at 12 V for 9-18 VDC models, 24 V for 18-36 & 9-36 VDC models and 48 V for the 36-75 & 18-75 VDC models.
5. For dual output models contact sales.

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2]
			No Load	Full Load[4]		
18-36 VDC	2.5 V	20.00 A	50 mA	2705 mA	77%	ICH10024S2V5
	3.3 V	20.00 A	50 mA	3480 mA	79%	ICH10024S3V3
	5.0 V	20.00 A	50 mA	5020 mA	83%	ICH10024S05
	12.0 V	8.30 A	50 mA	4880 mA	85%	ICH10024S12
	15.0 V	6.70 A	50 mA	4925 mA	85%	ICH10024S15
	24.0 V	4.17 A	50 mA	4905 mA	85%	ICH10024S24
36-75 VDC	2.5 V	20.00 A	50 mA	1335 mA	78%	ICH10048S2V5
	3.3 V	20.00 A	50 mA	1720 mA	80%	ICH10048S3V3
	5.0 V	20.00 A	50 mA	2480 mA	84%	ICH10048S05
	12.0 V	8.30 A	50 mA	2442 mA	85%	ICH10048S12
	15.0 V	6.70 A	50 mA	2463 mA	85%	ICH10048S15
	24.0 V	4.17 A	50 mA	2463 mA	85%	ICH10048S24

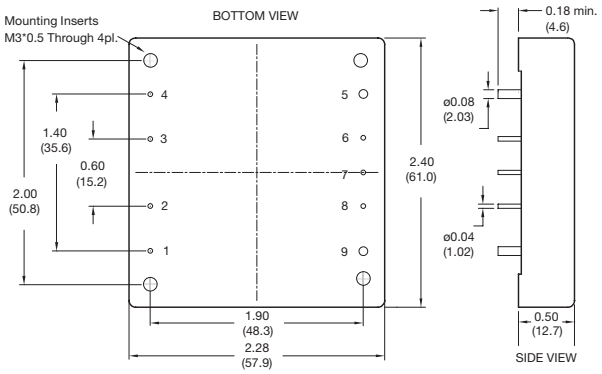
Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2]
			No Load	Full Load[4]		
36-75 VDC	2.5 V	30.00 A	25 mA	2.10 A	74%	ICH15048S2V5
	3.3 V	30.00 A	25 mA	2.60 A	79%	ICH15048S3V3
	5.0 V	30.00 A	25 mA	3.70 A	83%	ICH15048S05
	12.0 V	12.50 A	25 mA	3.60 A	85%	ICH15048S12
	15.0 V	10.00 A	25 mA	3.60 A	85%	ICH15048S15
	24.0 V	6.25 A	25 mA	3.60 A	85%	ICH15048S24

Input Voltage	Output Voltage	Output Current	Input Current		Efficiency	Model Number[2]
			No Load	Full Load[4]		
36-75 VDC	2.5 V	40.00 A	25 mA	2.1 A	74%	IFH20048S2V5
	3.3 V	40.00 A	25 mA	3.5 A	79%	IFH20048S3V3
	5.0 V	40.00 A	25 mA	5.0 A	83%	IFH20048S05
	12.0 V	17.00 A	25 mA	5.0 A	85%	IFH20048S12
	15.0 V	13.30 A	25 mA	5.0 A	85%	IFH20048S15
	24.0 V	8.33 A	25 mA	5.0 A	85%	IFH20048S24
	28.0 V	7.14 A	25 mA	4.7 A	89%	IFH20048S28
	48.0 V	4.20 A	25 mA	4.7 A	90%	IFH20048S48

Notes

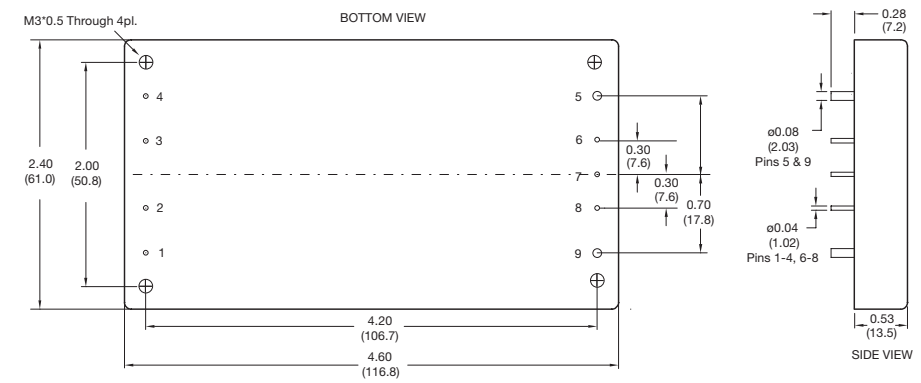
1. Logic compatibility: open collector ref to -ve input. Module On = open circuit. Module Off = <0.8 VDC.
2. Add suffix 'N' to the model number to receive the unit with negative logic Remote On/Off.
3. Ripple & noise is measured with a 10 µF tantalum capacitor and 0.1 µF ceramic capacitor across output.
4. Input current specified at 24 V for 18-36 VDC models and 48 V for 36-75 VDC models.

Mechanical Details



ICH50 to ICH150

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



IFH200

Dimensions are in inches (mm)
Weight: 0.22 lbs (100 g) approx
Case Material:
ICH50/75/100/150 - Aluminium
IFH200 - Aluminium baseplate with plastic case

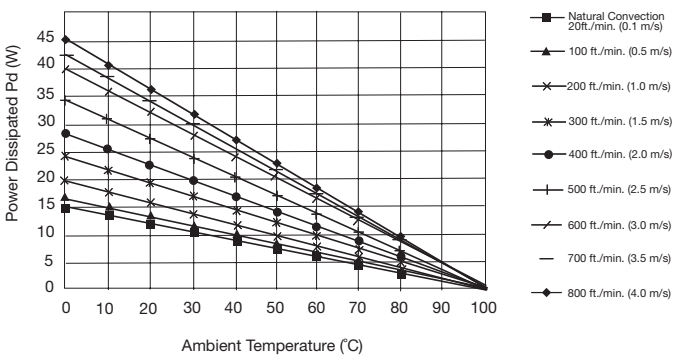
Derating Curves

THERMAL RESISTANCE vs AIR FLOW	
Air Flow Rate	Typical Rca
Natural Convection 20 ft./min (0.1 m/s)	7.12 °C/W
100 ft./min (0.5 m/s)	6.21 °C/W
200 ft./min (1.0 m/s)	5.17 °C/W
300 ft./min (1.5 m/s)	4.29 °C/W
400 ft./min (2.0 m/s)	3.64 °C/W
500 ft./min (2.5 m/s)	2.96 °C/W
600 ft./min (3.0 m/s)	2.53 °C/W
700 ft./min (3.5 m/s)	2.37 °C/W
800 ft./min (4.0 m/s)	2.19 °C/W

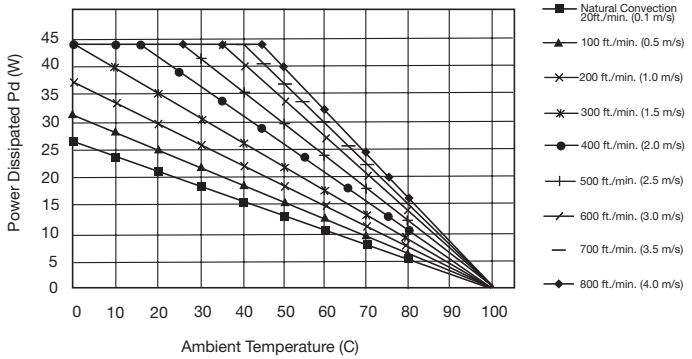
Temperature Rise = Pd x Rca

Where Pd = P_{in} - P_{out} or P_{out} (1-η) / η

Power Dissipated vs Ambient Temperature And Air Flow - ICH50-150S

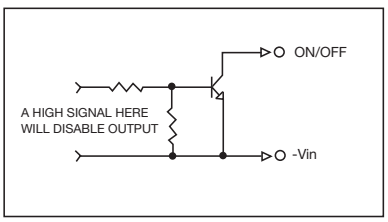


Power Dissipated vs Ambient Temperature And Air Flow - IFH200S



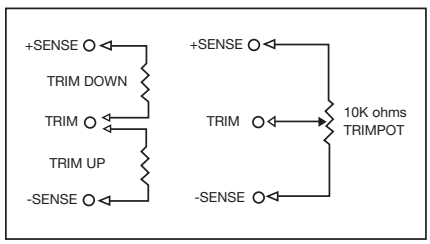
Application Notes

Remote On/Off Control



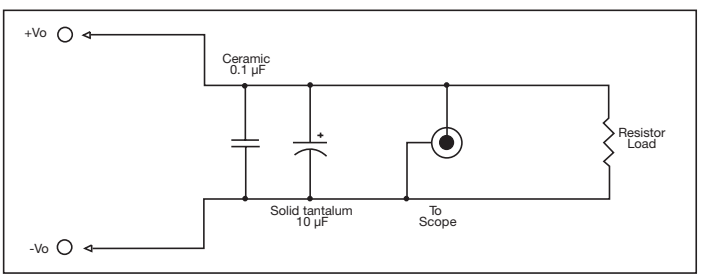
LOGIC TABLE		
Logic State (Pin 2)	Negative Logic	Positive Logic
Logic Low Switch Closed	Module On	Module Off
Logic High Switch Open	Module Off	Module On

External Output Trimming



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

Output Noise



Output noise is measured with a 10 µF tantalum capacitor and 0.1 µF ceramic capacitor across output.