



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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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
- 3 Year Warranty

Specification

Input

- | | |
|----------------------------------|--|
| Input Voltage Range | • See tables |
| Input Current (no load) | • See tables |
| Input Reverse Voltage Protection | • None |
| Input Filter | • Pi network |
| Undervoltage Lockout | • 2:1 Input Models:
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

4:1 Input Models:
24 Vin, power up 8.8 V, down 8.0 V
48 Vin, power up 17.0 V, down 16.0 V |

Output

- | | |
|--------------------------|--|
| Output Voltage Trim | • $\pm 10\%$ |
| Initial Set Accuracy | • $\pm 1\%$ max (ICH100: $\pm 1.5\%$) |
| Line Regulation | • $\pm 0.2\%$ max measured from high line to low line |
| Load Regulation | • $\pm 0.2\%$ max measured from 0-100% load |
| Transient Response | • 5% max deviation, recovery to within 1% in 500 μ s, 25% step load change |
| Ripple & Noise | • 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
ICH50/75 - 3.3 V, 5 V models: 75 mV
12 V, 15 V models: 100 mV
20 MHz bandwidth (see note 3) |
| Overvoltage Protection | • 115-140% |
| Short Circuit Protection | • ICH50/75/100W/IFH200-: Trip & restart (hiccup mode) with auto recovery
ICH50W/75W/100/150 & IFH200: Current limit, auto recovery |
| Temperature Coefficient | • $\pm 0.03\%/^{\circ}\text{C}$ |
| Current Limit | • IFH200: 110-150% nominal output, all other models: 110-160% nominal output |
| Remote On/Off | • See note 1 & 2 |
| Thermal Shutdown | • ICH50/50W/75/75W/100/150:
Thermal shutdown when case temperature reaches 100 °C, auto recovery when case temperature < +60 °C
ICH100W/IFH200:
Thermal shutdown when case temperature reaches 105 °C, auto recovery when case temperature < +90 °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 ohms min |
| Switching Frequency | • ICH50/75 12-24V models: 400 kHz typical
ICH50/75 48V models: 300 kHz typical
ICH50W/75W: 300 kHz typical
ICH100/ICH150: 500 kHz typical
ICH100W: 250 kHz typical
IFH200: 350 kHz typical |
| Power Density | • ICH50: 18.3 W/in ³
ICH75: 27.4 W/in ³
ICH100: 36.6 W/in ³
ICH150: 54.8 W/in ³
IFH200: 34.8 W/in ³ |
| MTBF | • ≥ 790 kHrs to MIL-HDBK-217F at 25 °C, GB |

Environmental

- | | |
|----------------------------|--|
| Operating Case Temperature | • -40 °C to +100 °C, see derating curve |
| Storage Temperature | • ICH50/75: -55 °C to +105 °C
ICH100/150 & IFH200: -40 °C to +105 °C |
| Shock | • 30 g pk, half sine wave for 18 ms, 3 pulses per face, all 6 faces tested on all 3 axes |
| Vibration | • 5-500 Hz at 3 g, 10 mins per axis |

EMC & Safety

- | | |
|--------------------|---|
| Emissions | • EN55022, level A conducted with external components |
| ESD Immunity | • EN61000-4-2, level 2 Perf Criteria A |
| EFT/Burst | • EN61000-4-4, level 1, Perf Criteria A |
| Surge | • EN61000-4-5, installation class 1, Perf Criteria A |
| Conducted Immunity | • EN61000-4-6, 3 V rms Perf Criteria A |
| Magnetic Field | • EN61000-4-8, 1 A/m, Perf Criteria A |
| Safety Approvals | • UL60950-1 (ICH100W not UL approved) |

Models and Ratings

ICH/IFH Series

Input Voltage	Output Voltage	Output Current	Input Current ⁽⁴⁾		Efficiency	Model Number ^(2,5)
			No Load	Full Load		
9-18 VDC (12 V nominal)	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 (24 V nominal)	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	2450 mA	85%	ICH5024S12
	15.0 V	3.33 A	50 mA	2450 mA	85%	ICH5024S15
	24.0 V	2.08 A	50 mA	2419 mA	86%	ICH5024S24
36-75 VDC (48 V nominal)	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 ⁽⁴⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
9-36 VDC (24 V nominal)	3.3 V	10.00 A	50 mA	1785 mA	77%	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 (48 V nominal)	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 ⁽⁴⁾		Efficiency	Model Number ^(2,5)
			No Load	Full Load		
9-18 VDC (12 V nominal)	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 (24 V nominal)	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 (48 V nominal)	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 ⁽⁴⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
9-36 VDC (24 V nominal)	3.3 V	15.00 A	50 mA	2611 mA	79%	ICH7524WS3V3
	5.0 V	15.00 A	50 mA	3811 mA	82%	ICH7524WS05
	12.0 V	6.25 A	50 mA	3765 mA	83%	ICH7524WS12
	15.0 V	5.00 A	50 mA	3720 mA	84%	ICH7524WS15
	24.0 V	3.12 A	50 mA	3720 mA	84%	ICH7524WS24
18-75 VDC (24 V nominal)	3.3 V	15.00 A	50 mA	1289 mA	80%	ICH7548WS3V3
	5.0 V	15.00 A	50 mA	1883 mA	83%	ICH7548WS05
	12.0 V	6.25 A	50 mA	1860 mA	84%	ICH7548WS12
	15.0 V	5.00 A	50 mA	1838 mA	85%	ICH7548WS15
	24.0 V	3.12 A	50 mA	1835 mA	85%	ICH7548WS24

Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
18-36 VDC (24 V nominal)	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 (48 V nominal)	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 ⁽¹⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
9-36 VDC (24 V nominal)	3.3 V	20.00 A	35 mA	3374 mA	81%	ICH10024WS3V3
	5.0 V	20.00 A	35 mA	4990 mA	83%	ICH10024WS05
	12.0 V	8.30 A	35 mA	4902 mA	85%	ICH10024WS12
	15.0 V	6.70 A	35 mA	4817 mA	86%	ICH10024WS15
	24.0 V	4.17 A	35 mA	4849 mA	86%	ICH10024WS24
18-75 VDC (48 V nominal)	3.3 V	20.00 A	30 mA	1708 mA	80%	ICH10048WS3V3
	5.0 V	20.00 A	30 mA	2422 mA	86%	ICH10048WS05
	12.0 V	8.30 A	30 mA	2408 mA	86%	ICH10048WS12
	15.0 V	6.70 A	30 mA	2381 mA	87%	ICH10048WS15
	24.0 V	4.17 A	30 mA	2367 mA	88%	ICH10048WS24

Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
36-75 VDC (48 V nominal)	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

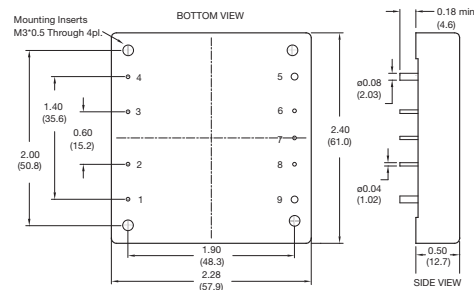
Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Efficiency	Model Number ⁽²⁾
			No Load	Full Load		
36-75 VDC (48 V nominal)	3.3 V	40.00 A	25 mA	3.5 A	79%	IFH20048S3V3
	5.0 V	40.00 A	25 mA	5.0 A	83%	IFH20048S05
	12.0 V	17.00 A	25 mA	5.0 A	85%	IFH20048S12
	15.0 V	13.30 A	25 mA	5.0 A	85%	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

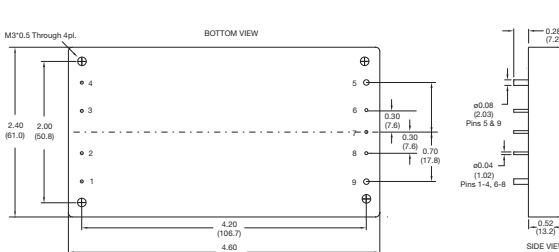
- Logic compatibility: Module On = Open circuit (or >3.5 VDC for ICH100 W models). Module Off = <0.8 VDC (<1.8 VDC for ICH100 W models).
- Add suffix 'N' to the model number to receive the unit with negative logic Remote On/Off.
- Ripple & noise is measured with a 10 µF tantalum capacitor and 0.1 µF ceramic capacitor across output.
- Input current specified at 24 V for 18-36 & 9-36 VDC and 48 V for 36-75 & 18-75 VDC models.
- For dual output models available, contact sales.

Mechanical Details

ICH50 to ICH150



IFH200



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

* IFH200: N.C.

Notes

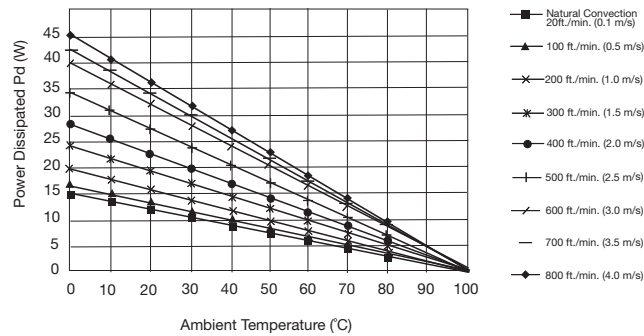
- All dimensions are in inches (mm)
- Weight: ICH50: 0.194 lbs (88 g)
ICH50W: 0.207 lbs (94 g)
ICH75: 0.202 lbs (92 g)
ICH75W: 0.207 lbs (94 g)
ICH100: 0.209 lbs (95 g)
ICH150: 0.220 lbs (100 g)
IFH200: 0.425 lbs (193 g)
- Case tolerance: ±0.02 (±0.50)
- Pin diameter tolerance: ICH series ±0.002 (±0.05), ±0.004 (±0.1),
IFH series ±0.006 (±0.15)
- Case Material: ICH50/75/100/150 - Aluminium
IFH200 - Aluminium baseplate with plastic case
- Pin pitch tolerance: ±0.01 (±0.25)

THERMAL RESISTANCE vs AIR FLOW		
Air Flow Rate	ICH Typical Rca	IFH Typical Rca
Natural Convection 20 ft./min (0.1 m/s)	7.12 °C/W	3.82 °C/W
100 ft./min (0.5 m/s)	6.21 °C/W	3.23 °C/W
200 ft./min (1.0 m/s)	5.17 °C/W	2.71 °C/W
300 ft./min (1.5 m/s)	4.29 °C/W	2.28 °C/W
400 ft./min (2.0 m/s)	3.64 °C/W	1.92 °C/W
500 ft./min (2.5 m/s)	2.96 °C/W	1.68 °C/W
600 ft./min (3.0 m/s)	2.53 °C/W	1.50 °C/W
700 ft./min (3.5 m/s)	2.37 °C/W	1.35 °C/W
800 ft./min (4.0 m/s)	2.19 °C/W	1.23 °C/W

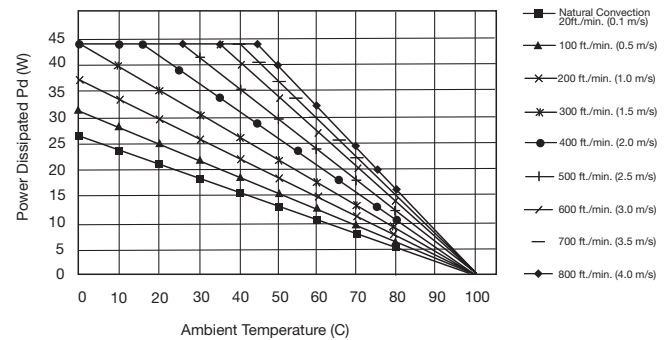
Temperature Rise = Pd x Rca, Where Pd = Pin - Pout or Pout (1-η) / η, Where η= efficiency

Maximum Power Dissipation vs Ambient Temperature and Air Flow (without Heatsink)

ICH50-150S

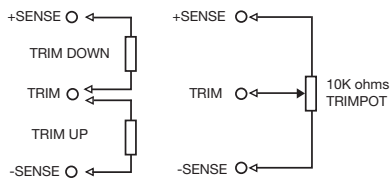


IFH200S



Application Notes

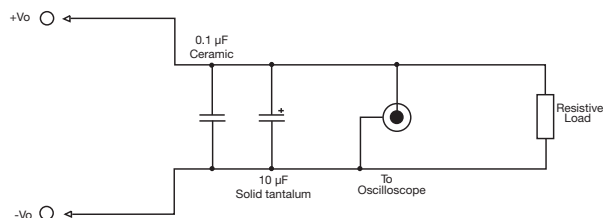
External Output Trimming



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

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.

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