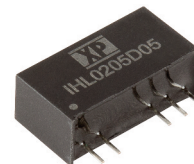


2 Watts

- High Isolation, 5200 V
- 250 VAC Working Voltage
- Single and Dual Outputs
- Bipolar Outputs for MOSFET and IGBT Drives
- SIP7 Package
- -40 °C to +95 °C Operation
- Full Load at 65 °C Ambient
- MTBF 2.5 Mhrs
- 3 Year Warranty



Dimensions:

IHL02:

0.77 x 0.28 x 0.39" (19.5 x 7.2 x 10.0 mm)

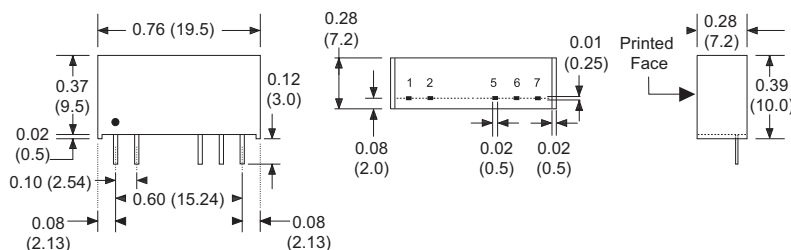
Input

Characteristic	Minimum	Typical	maximum	Units	Notes & Conditions
Input Voltage Range	4.5		5.5	VDC	5 V nominal
	10.8		13.2		12 V nominal
	13.5		16.5		15 V nominal
	21.6		26.4		24 V nominal
Input Reflected Ripple Current		20		mA pk-pk	Through 12 μ H inductor and 47 μ F capacitor
Input Surge			9	VDC for 100 ms	5 V nominal
			18		12 V nominal
			20		15 V nominal
			30		24 V nominal

Output

Characteristic	Minimum	Typical	maximum	Units	Notes & Conditions
Output Voltage	3.3		30	VDC	See Models and Ratings table
Initial Set Accuracy			± 5	%	At full load
Minimum Load	10			%	Minimum load required to meet specified regulation
Line Regulation			± 1.2	%/1%	Output changes by max of 1.2% for each 1% change in input voltage
Load Regulation			12/10	%	For IHL0205S3V3 and IHL0205S05/Other Models. From 10% to full load, see application note
Cross Regulation		± 5		%	On dual output models, when one output is at 25% load and other is varied from 10% load to full load
Ripple & Noise			150	mV pk-pk	20 MHz bandwidth. Measured using 10 μ F electrolytic in parallel with 0.1 μ F ceramic capacitor
Short Circuit Protection					Continuous
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.03	%/°C	

Mechanical Details



Notes

1. All dimensions are in inches (mm)
2. Weight: 0.006 lbs (2.7 g) approx.
3. Pin diameter: 0.02 $\pm$ 0.002 (0.5 $\pm$ 0.05)

4. Pin pitch and length tolerance: ± 0.014 (± 0.35)
5. Case tolerance: ± 0.02 (± 0.5)

Pin Connections

Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input current		Maximum Capacitive Load	Efficiency	Model Number
			No Load	Full Load			
4.5-5.5V	3V3	500 mA	40 mA	435 mA	1000 μ F	76%	IHL0205S3V3
	5 V	400 mA	40 mA	505 mA	470 μ F	79%	IHL0205S05
	9 V	222 mA	40 mA	480 mA	470 μ F	83%	IHL0205S09
	12 V	167 mA	40 mA	475 mA	220 μ F	84%	IHL0205S12
	15 V	133 mA	40 mA	470 mA	220 μ F	85%	IHL0205S15
	± 5 V	± 200 mA	40 mA	505 mA	± 220 μ F	79%	IHL0205D05
	± 9 V	± 111 mA	40 mA	490 mA	± 220 μ F	82%	IHL0205D09
	± 12 V	± 83.3 mA	40 mA	480 mA	± 100 μ F	83%	IHL0205D12
	± 15 V	± 66.7 mA	40 mA	475 mA	± 100 μ F	84%	IHL0205D15
10.8-13.2V	+15/-9 V	+66.7/-111 mA	40 mA	480 mA	+100/-220 μ F	83%	IHL0205D1509
	3V3	500 mA	30 mA	185 mA	1000 μ F	74%	IHL0212S3V3
	5 V	400 mA	30 mA	210 mA	470 μ F	79%	IHL0212S05
	9 V	222 mA	30 mA	205 mA	470 μ F	82%	IHL0212S09
	12 V	167 mA	30 mA	205 mA	220 μ F	82%	IHL0212S12
	15 V	133 mA	30 mA	200 mA	220 μ F	83%	IHL0212S15
	± 5 V	± 200 mA	30 mA	210 mA	± 220 μ F	79%	IHL0212D05
	± 9 V	± 111 mA	30 mA	205 mA	± 220 μ F	81%	IHL0212D09
	± 12 V	± 83.3 mA	30 mA	200 mA	± 100 μ F	83%	IHL0212D12
13.5-16.5V	± 15 V	± 66.7 mA	30 mA	200 mA	± 100 μ F	83%	IHL0212D15
	+15/-9V	+66.7/-111 mA	30 mA	210 mA	+100/-220 μ F	80%	IHL0212D1509
	3V3	500 mA	25 mA	150 mA	1000 μ F	74%	IHL0215S3V3
	5 V	400 mA	25 mA	170 mA	470 μ F	78%	IHL0215S05
	9 V	222 mA	25 mA	165 mA	470 μ F	81%	IHL0215S09
	12 V	167 mA	25 mA	165 mA	220 μ F	82%	IHL0215S12
	15 V	133 mA	25 mA	160 mA	220 μ F	83%	IHL0215S15
	± 5 V	± 200 mA	25 mA	170 mA	± 220 μ F	79%	IHL0215D05
	± 9 V	± 111 mA	25 mA	165 mA	± 220 μ F	81%	IHL0215D09
21.6-26.4V	± 12 V	± 83.3 mA	25 mA	160 mA	± 100 μ F	83%	IHL0215D12
	± 15 V	± 66.7 mA	25 mA	165 mA	± 100 μ F	82%	IHL0215D15
	+15/-9V	+66.7/-111 mA	25 mA	165 mA	+100/-220 μ F	81%	IHL0215D1509
	3V3	500 mA	20 mA	95 mA	1000 μ F	73%	IHL0224S3V3
	5 V	400 mA	20 mA	105 mA	470 μ F	78%	IHL0224S05
	9 V	222 mA	20 mA	105 mA	470 μ F	81%	IHL0224S09
	12 V	167 mA	20 mA	105 mA	220 μ F	81%	IHL0224S12
	15 V	133 mA	20 mA	105 mA	220 μ F	81%	IHL0224S15
	± 5 V	± 200 mA	20 mA	105 mA	± 220 μ F	79%	IHL0224D05
	± 9 V	± 111 mA	20 mA	105 mA	± 220 μ F	80%	IHL0224D09
	± 12 V	± 83.3 mA	20 mA	105 mA	± 100 μ F	81%	IHL0224D12
	± 15 V	± 66.7 mA	20 mA	100 mA	± 100 μ F	82%	IHL0224D15
	+15/-9V	+66.7/-111 mA	20 mA	105 mA	+100/-220 μ F	80%	IHL0224D1509

Notes

Input currents measured at nominal input voltage.

General

Characteristic	Minimum	Typical	maximum	Units	Notes & Conditions
Efficiency		80		%	See Models and Ratings table
Isolation: Input to Output	5200			VDC	
Isolation Working Voltage			250	VAC	
Isolation Resistance	10 ⁹			Ω	
Isolation Capacitance		7		pF	
Switching Frequency	50		100	kHz	
Power Density			23.7	W/in ³	
Mean Time Between Failure	3.3			MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.006 (2.7)		lb (g)	

Environmental

Characteristic	Minimum	Typical	maximum	Units	Notes & Conditions
Operating Temperature	-40		+95	°C	Derate Linearly from 100% at 65 °C to no load at 95 °C
Storage Temperature	-40		+125	°C	
Case Temperature			+100	°C	
Humidity	2.5		95	%RH	Non-condensing
Cooling					Natural convection

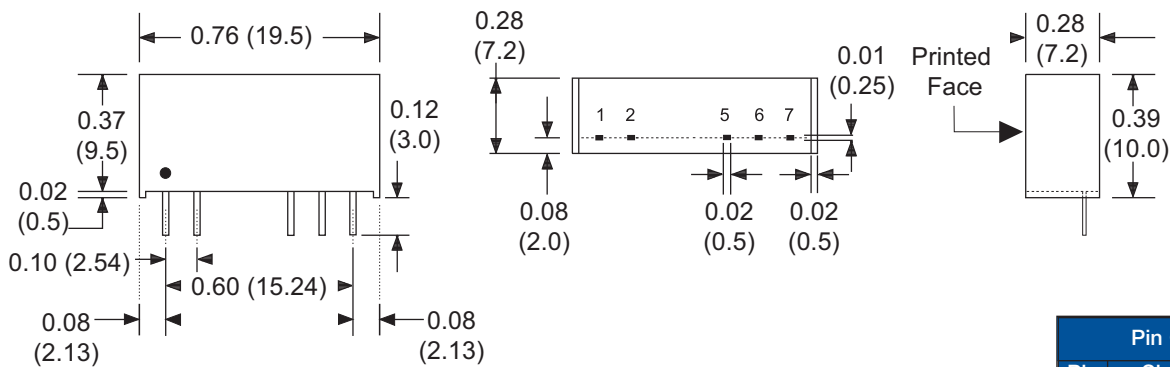
EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See Application Note
Radiated	EN55032	Class B	

EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	±6/±8 kV	A	Contact/Air Discharge
Radiated Immunity	EN61000-4-3	10 Vrms	A	
EFT/Burst	EN61000-4-4	2 kV	A	External components required, see application notes
Conducted Immunity	EN61000-4-6	10 V rms	A	
magnetic Fields	EN61000-4-8	1 A/m	A	

Mechanical Details



Notes

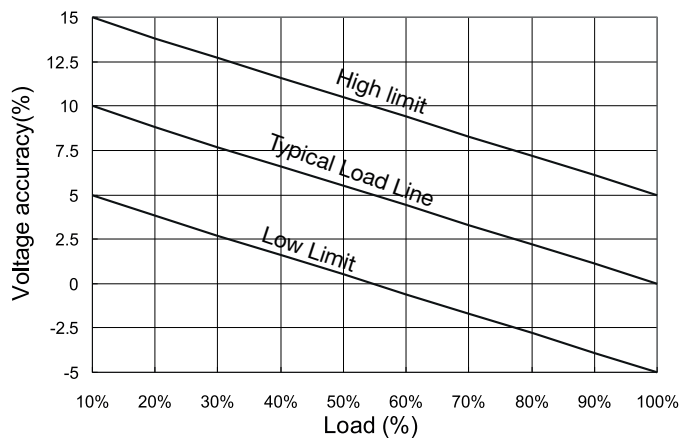
1. All dimensions are in inches (mm)
2. Weight: 0.006 lbs (2.7 g) approx.
3. Pin diameter: 0.02±0.002 (0.5±0.05)

4. Pin pitch and length tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)

Pin Connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
5	-Vout	-Vout
6	No Pin	Common
7	+Vout	+Vout

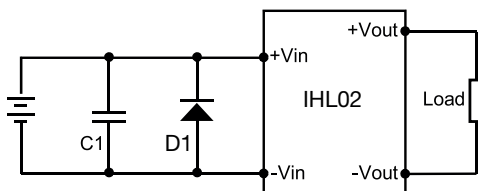
Application Note

Regulation



EFT Filter

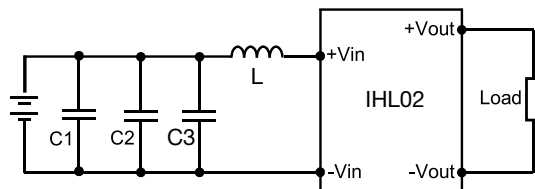
Input components C1 and D1 are used to help meet EFT and surge test requirements for the module.



	C1	D1
IHL0205XXXX	330 μ F/50 V	SMDJ9.0 A
IHL0212XXXX	330 μ F/50 V	SMDJ13 A
IHL0215XXXX	330 μ F/50 V	SMDJ18 A
IHL0224XXXX	1000 μ F/35 V	SMDJ24 A

EMI Filter

Input filter components (C1, C2, C3 and L) are used to help meet conducted emissions requirements for the module. These components should be mounted as close as possible to the module, and all leads should be minimised to decrease radiated noise.



	C1	L	C2	C3
IHL0205XXXX	1206, 4.7 μ F/ 16 V	6.8 μ H		
IHL0212XXXX	1206, 22 μ F/ 25 V	6.8 μ H		
IHL0215XXXX	1206, 22 μ F/ 25 V	6.8 μ H		
IHL0224XXXX	1210, 10 μ F/ 35 V	10 μ H	1210, 10 μ F/ 35 V	1210, 10 μ F/ 35 V