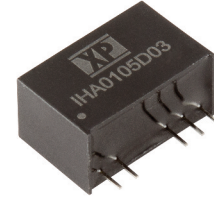


1 Watt

- High isolation, 6kVDC (functional insulation)
- Working voltage rated for 250Vrms & 400VDC
- Single & dual outputs
- Bipolar outputs for MOSFET & IGBT drives
- Common mode transient immunity (CMTI) 20kV/μs
- SIP7 package
- -40°C to +85°C operation
- Full load at 85°C ambient
- MTBF 2.5 Mhrs
- 3 year warranty



Dimensions:

IHA01:

0.77 x 0.39 x 0.49" (19.5 x 9.8 x 12.5 mm)

The IHA01 series is a low cost, high isolation, high working voltage DC-DC converter with excellent common mode transient immunity (CMTI). The low input to output capacitance of just 10pF, high continuous working voltage rating and 2.5mm isolation barrier, make the product ideal for IGBT & MOSFET driver applications.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5		5.5	VDC	5 V nominal
	8.1		9.9		9 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 μH inductor and 47 μF capacitor
Input Surge			7	VDC for 100 ms	5 V nominal
			12		9 V nominal
			15		12 V nominal
			18		15 V nominal
			28		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			±3	%	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			10	%	From 10% to full load, see application note
Cross Regulation		±4		%	On dual output models, when one output is at 25% load and other is varied from 10% load to full load
Ripple & Noise			200	mV pk-pk	20 MHz bandwidth. Measured using 10 μF electrolytic in parallel with 0.1 μF ceramic capacitor
Short Circuit Protection					Continuous, auto recovery
Maximum Capacitive Load					See Models and Ratings table
Temperature Coefficient			0.03	%/°C	

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input current		Max. capacitive load	Efficiency	Model Number
			No Load	Full Load			
5V (4.5-5.5 V)	3V3	303 mA	30 mA	280 mA	220 µF	71%	IHA0105S3V3
	5V	200 mA	30 mA	265 mA	220 µF	75%	IHA0105S05
	9V	111 mA	30 mA	260 mA	220 µF	77%	IHA0105S09
	12V	83 mA	45 mA	265 mA	220 µF	76%	IHA0105S12
	15V	67 mA	40 mA	260 mA	220 µF	77%	IHA0105S15
	±3V3	±151 mA	30 mA	275 mA	±100 µF	73%	IHA0105D03
	±5V	±100 mA	30 mA	265 mA	±100 µF	75%	IHA0105D05
	±9V	±56 mA	30 mA	260 mA	±100 µF	77%	IHA0105D09
	±12V	±42 mA	45 mA	265 mA	±100 µF	76%	IHA0105D12
	±15V	±33 mA	40 mA	260 mA	±100 µF	77%	IHA0105D15
+15V / -9V	+33 mA / -55 mA	40 mA	265 mA	±100 µF	76%	IHA0105D1509	
9V (8.1-9.9 V)	3V3	303 mA	20 mA	155 mA	220 µF	72%	IHA0109S3V3
	5V	200 mA	25 mA	145 mA	220 µF	77%	IHA0109S05
	9V	111 mA	25 mA	140 mA	220 µF	79%	IHA0109S09
	12V	83 mA	25 mA	145 mA	220 µF	77%	IHA0109S12
	15V	67 mA	25 mA	140 mA	220 µF	79%	IHA0109S15
	±3V3	±151 mA	25 mA	155 mA	±100 µF	73%	IHA0109D03
	±5V	±100 mA	25 mA	150 mA	±100 µF	75%	IHA0109D05
	±9V	±56 mA	25 mA	140 mA	±100 µF	79%	IHA0109D09
	±12V	±42 mA	25 mA	145 mA	±100 µF	77%	IHA0109D12
	±15V	±33 mA	25 mA	140 mA	±100 µF	79%	IHA0109D15
+15V / -9V	+33 mA / -55 mA	25 mA	140 mA	±100 µF	78%	IHA0109D1509	
12V (10.8-13.2 V)	3V3	303 mA	20 mA	120 mA	220 µF	70%	IHA0112S3V3
	5V	200 mA	20 mA	115 mA	220 µF	73%	IHA0112S05
	9V	111 mA	20 mA	110 mA	220 µF	77%	IHA0112S09
	12V	83 mA	20 mA	115 mA	220 µF	73%	IHA0112S12
	15V	67 mA	20 mA	110 mA	220 µF	76%	IHA0112S15
	±3V3	±151 mA	20 mA	115 mA	±100 µF	72%	IHA0112D03
	±5V	±100 mA	20 mA	115 mA	±100 µF	73%	IHA0112D05
	±9V	±56 mA	20 mA	110 mA	±100 µF	77%	IHA0112D09
	±12V	±42 mA	20 mA	115 mA	±100 µF	74%	IHA0112D12
	±15V	±33 mA	20 mA	110 mA	±100 µF	76%	IHA0112D15
+15V / -9V	+33 mA / -55 mA	20 mA	110 mA	±100 µF	76%	IHA0112D1509	
15V (13.5-16.5 V)	3V3	303 mA	15 mA	91 mA	220 µF	73%	IHA0115S3V3
	5V	200 mA	15 mA	87 mA	220 µF	77%	IHA0115S05
	9V	111 mA	15 mA	83 mA	220 µF	80%	IHA0115S09
	12V	83 mA	15 mA	83 mA	220 µF	80%	IHA0115S12
	15V	67 mA	15 mA	84 mA	220 µF	79%	IHA0115S15
	±3V3	±151 mA	15 mA	89 mA	±100 µF	75%	IHA0115D03
	±5V	±100 mA	15 mA	84 mA	±100 µF	79%	IHA0115D05
	±9V	±56 mA	15 mA	82 mA	±100 µF	81%	IHA0115D09
	±12V	±42 mA	15 mA	83 mA	±100 µF	80%	IHA0115D12
	±15V	±33 mA	15 mA	83 mA	±100 µF	80%	IHA0115D15
+15V / -9V	+33 mA / -55 mA	12 mA	79 mA	±100 µF	84%	IHA0115D1509	
24V (21.6-26.4 V)	3V3	303 mA	15 mA	60 mA	220 µF	70%	IHA0124S3V3
	5V	200 mA	15 mA	59 mA	220 µF	71%	IHA0124S05
	9V	111 mA	15 mA	60 mA	220 µF	70%	IHA0124S09
	12V	83 mA	15 mA	58 mA	220 µF	72%	IHA0124S12
	15V	67 mA	15 mA	57 mA	220 µF	73%	IHA0124S15
	±3V3	±151 mA	10 mA	61 mA	±100 µF	68%	IHA0124D03
	±5V	±100 mA	15 mA	60 mA	±100 µF	69%	IHA0124D05
	±9V	±56 mA	15 mA	57 mA	±100 µF	73%	IHA0124D09
	±12V	±42 mA	15 mA	58 mA	±100 µF	72%	IHA0124D12
	±15V	±33 mA	15 mA	56 mA	±100 µF	75%	IHA0124D15
+15V / -9V	+33 mA / -55 mA	15 mA	56 mA	±100 µF	74%	IHA0124D1509	

Notes

Input currents measured at nominal input voltage.

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		77		%	See Models and Ratings table
Isolation: Input to Output	6000			VDC	Functional (100% production test for 60s)
Isolation Working Voltage			250	VAC rms	400 VDC
Isolation Resistance	10 ⁹			Ω	
Isolation Capacitance			10	pF	
Switching Frequency	20		50	kHz	
Power Density			6.8	W/in ³	
Mean Time Between Failure	2.39			MHrs	MIL-HDBK-217F, +25 °C GB
Case Material	Non-conductive black plastic with epoxy potting (UL94V-0 rated)				
Pin Material	Alloy 42, solder coated nickel iron				
Solder Process	Maximum 260°C peak 10s duration, 1.5mm from case				
Weight		0.009 (4.2)		lb (g)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+85	°C	No thermal derating
Storage Temperature	-40		+125	°C	
Case Temperature			+100	°C	
Humidity	2.5		95	%RH	Non-condensing
Cooling					Natural convection

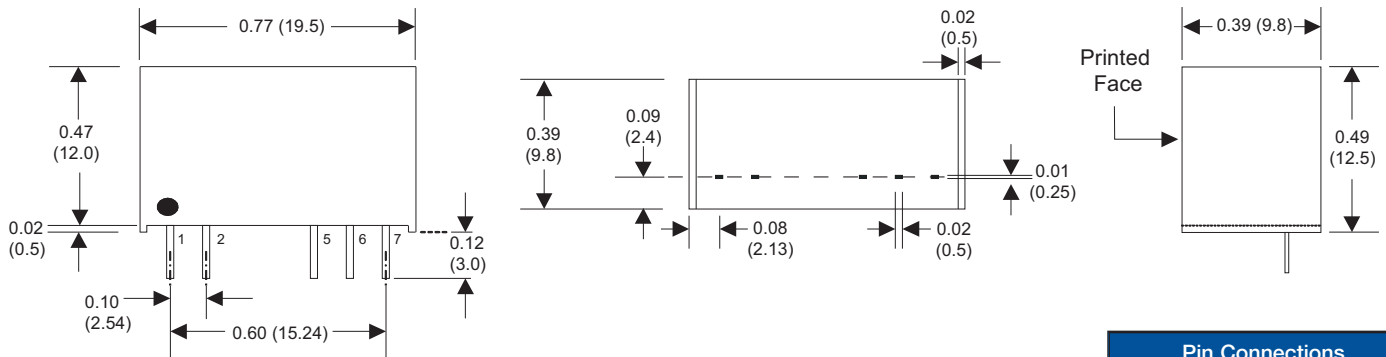
EMC: Emissions

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	
CMTI		20 kV/μs		1500 VDC

Mechanical Details



Notes

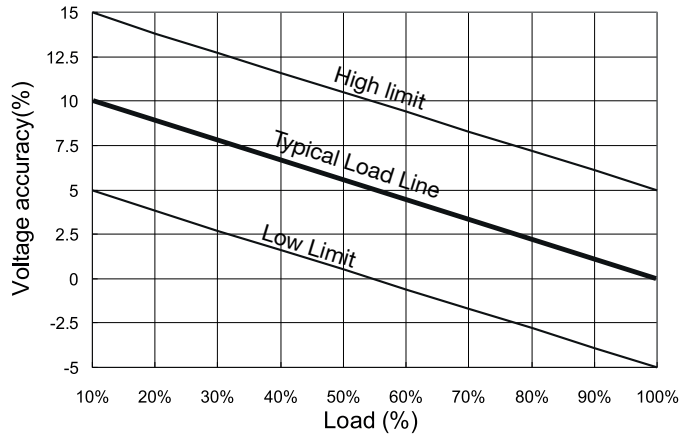
- All dimensions are in inches (mm)
- Weight: 0.009 lbs (4.3 g) approx.
- Pin diameter: 0.02±0.002 (0.5±0.05)

- Pin pitch and length tolerance: ±0.014 (±0.35)
- 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

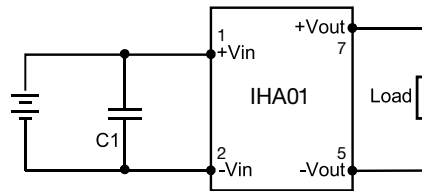
Application Note

Regulation



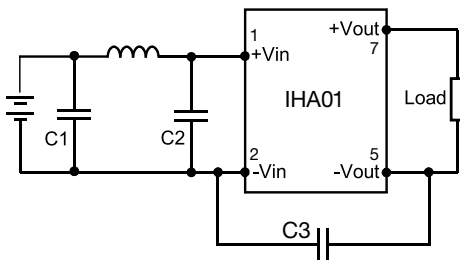
EFT Filter

Input component C1 470 μ F 100V (e.g. Nippon Chemi-Con KY Series) is used to help meet EFT EN6100-4-4 test requirements for the module.



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
IHA0105XXXX	1210, 2.2 μ F/ 100V	18 μ H		
IHA0109XXXX	1210, 2.2 μ F/ 100V	18 μ H		
IHA0112XXXX	1210, 2.2 μ F/ 100V	18 μ H		
IHA0115XXXX	1210, 2.2 μ F/ 100V	18 μ H		
IHA0124XXXX	1210, 2.2 μ F/ 100V	18 μ H	1210, 2.2 μ F/ 100 V	1206, 470 pF/ 2 kV