

# 1W

## DC-DC CONVERTER

The dual output IAB01 series is an ideal solution for isolating voltage rails in a distributed power supply architecture such as analog, digital, data and relay circuits. This product family offers a compact, long-lasting design with high efficiency, 1.5kV functional isolation, short circuit protection and high operating temperature.

### Features

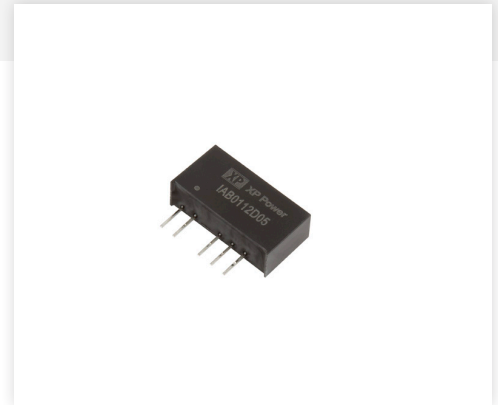
- Unregulated dual outputs
- $\pm 10\%$  input range
- Dual outputs  $\pm 3.3$  to  $\pm 24$ VDC
- SIP7 package
- 1.5kVDC functional isolation
- Short circuit protection
- Class B conducted & radiated emissions
- $-40^{\circ}\text{C}$  to  $+105^{\circ}\text{C}$  operation
- Full load to  $100^{\circ}\text{C}$  ambient
- 3 year warranty

### Models & Ratings

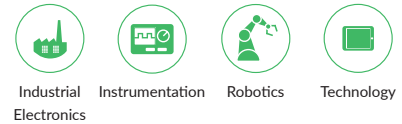
Model Number	Input Voltage	Output Voltage	Output Current	Efficiency at Vin Nominal with Full Load <sup>(1)</sup>	Maximum Capacitive Load
IAB0105D3V3	5V (4.5-5.5V)	$\pm 3.3\text{V}$	$\pm 152\text{mA}$	74%	1200 $\mu\text{F}$
IAB0105D05		$\pm 5\text{V}$	$\pm 100\text{mA}$	82%	1200 $\mu\text{F}$
IAB0105D09		$\pm 9\text{V}$	$\pm 56\text{mA}$	83%	470 $\mu\text{F}$
IAB0105D12		$\pm 12\text{V}$	$\pm 42\text{mA}$	83%	220 $\mu\text{F}$
IAB0105D15		$\pm 15\text{V}$	$\pm 34\text{mA}$	83%	220 $\mu\text{F}$
IAB0105D24		$\pm 24\text{V}$	$\pm 21\text{mA}$	85%	100 $\mu\text{F}$
IAB0112D3V3	12V (10.8-13.2V)	$\pm 3.3\text{V}$	$\pm 152\text{mA}$	75%	1200 $\mu\text{F}$
IAB0112D05		$\pm 5\text{V}$	$\pm 100\text{mA}$	80%	1200 $\mu\text{F}$
IAB0112D12		$\pm 12\text{V}$	$\pm 42\text{mA}$	81%	220 $\mu\text{F}$
IAB0112D15		$\pm 15\text{V}$	$\pm 34\text{mA}$	81%	220 $\mu\text{F}$
IAB0112D24		$\pm 24\text{V}$	$\pm 21\text{mA}$	80%	100 $\mu\text{F}$
IAB0115D05	15V (13.5-16.5V)	$\pm 5\text{V}$	$\pm 100\text{mA}$	80%	1200 $\mu\text{F}$
IAB0115D12		$\pm 12\text{V}$	$\pm 42\text{mA}$	80%	220 $\mu\text{F}$
IAB0115D15		$\pm 15\text{V}$	$\pm 34\text{mA}$	81%	220 $\mu\text{F}$
IAB0124D05	24V (21.6-26.4V)	$\pm 5\text{V}$	$\pm 100\text{mA}$	80%	1200 $\mu\text{F}$
IAB0124D12		$\pm 12\text{V}$	$\pm 42\text{mA}$	81%	220 $\mu\text{F}$
IAB0124D15		$\pm 15\text{V}$	$\pm 34\text{mA}$	79%	220 $\mu\text{F}$
IAB0124D24		$\pm 24\text{V}$	$\pm 21\text{mA}$	80%	100 $\mu\text{F}$

#### Notes:

1. Maximum capacitive load is per output.
2. Measured at nominal input voltage and full load.
3. Pack size 25pcs per tube



### Applications



### Dimensions

0.77" x 0.24" x 0.40" (19.6 x 6.0 x 10.1mm)

### Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	4.5		5.5	VDC	5V nominal
	10.8		13.2		12V nominal
	13.5		16.5		15V nominal
	21.6		26.4		24V nominal
Input Filter	Capacitor				
Input Reflected Ripple		15		mA pk-pk	Measured through 4.7μH inductor and 220μF capacitor
Input Surge	-0.7		9	VDC	5V models, 1s
	-0.7		18		12V models, 1s
	-0.7		21		15V models, 1s
	-0.7		30		24V models, 1s

### Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	3.3		48	VDC	See Models & Ratings table
Initial Set Accuracy				%	See regulation curves
Minimum Load	10			%	Minimum load required to meet specification. Operation at no load will not cause damage
Line Regulation			±1.2	%	Per 1% change of input voltage
			±1.5		3.3V output models, per 1% change of input voltage
Load Regulation				%	From 10% to full load. See regulation curves
Cross Regulation			5	%	When one load is varied between 25% and 100% and other is fixed at 100%
Ripple & Noise			75	mV pk-pk	Measured using parallel cable, 20MHz bandwidth and 10μF ceramic capacitor
			100		24V output models, measured using parallel cable, 20MHz bandwidth and 10μF ceramic capacitor
Short Circuit Protection	Continuous, with autorecovery				
Maximum Capacitive Load	See Models & Ratings table				
Temperature Coefficient			±0.02	%/°C	100% load

### General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		80		%	See models & ratings table
Isolation: Input to Output	1500			VDC	60s test, functional isolation
Isolation Resistance	10 <sup>9</sup>			Ω	
Isolation Capacitance		20		pF	
Switching Frequency		260		kHz	100% load
Power Density			14	W/in <sup>3</sup>	
Mean Time Between Failure	3.5			Mhrs	MIL-HDBK-217F, +25°C GB
Weight		0.004 (2.1)		lb (g)	
Case Material	Black plastic, flame retardant UL94V-0				
Pin Material	Phosphor bronze, solder coated				
Solder Profile			300	°C	1.5mm from case 10s max
Water Wash	Use deionized water. Dry thoroughly				

### Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+105	°C	IAB0105: derate from 100% load at +85°C to 80% load at +105°C Others: derate from 100% load at +100°C to 80% at +105°C
Storage Temperature	-55		+125	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				

### Safety Approvals

Safety Agency	Standard	Notes & Conditions
UL	UL/cUL62368-1	ITE
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

### EMC: Emissions

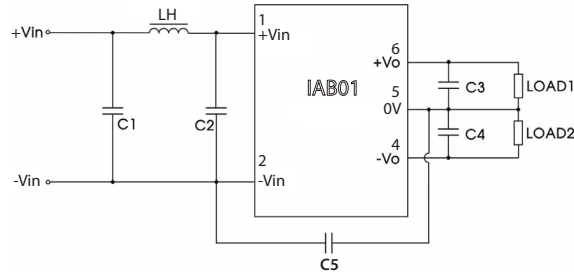
Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55032	Class B	See application notes
Radiated	EN55032	Class B	See application notes

### EMC: Immunity

Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
ESD Immunity	EN61000-4-2	3	B	Air ±8kV, Contact ±6kV
Radiated Immunity	EN61000-4-3	3	A	10V/m

Application Notes

EMC (Class B) Compliance Circuit - Dual



Model Number	Dual Vout (V)	C1	C2	C3	C4	C5	LH		
IAB0105	±3.3	4.7µF/25V	4.7µF/25V	4.7µF/16V	4.7µF/16V	Not fitted	6.8µH		
	±5			1.0µF/25V	1.0µF/25V				
	±9					0.47µF/50V		0.47µF/50V	1nF/2kV
	±12								
	±15								
±24									
IAB0112, 15, 24	±3.3	4.7µF/50V	4.7µF/50V	4.7µF/16V	4.7µF/16V	270pF/2kV	6.8µH		
	±5			1.0µF/25V	1.0µF/25V				
	±12							0.47µF/25V	0.47µF/25V
	±15								
	±24								

Typical Performance Curves

Fig 1. 3.3VDC Output

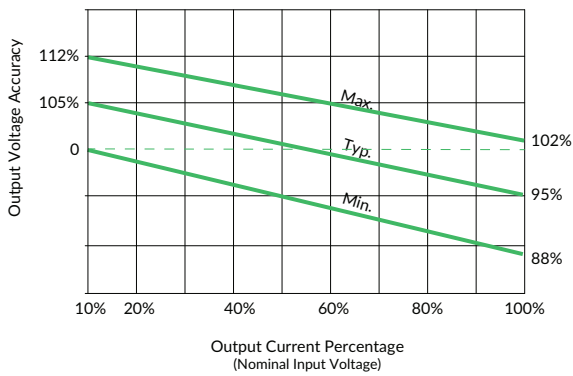


Fig 2. 5/9/12/15/24VDC Output applies to IAB0105

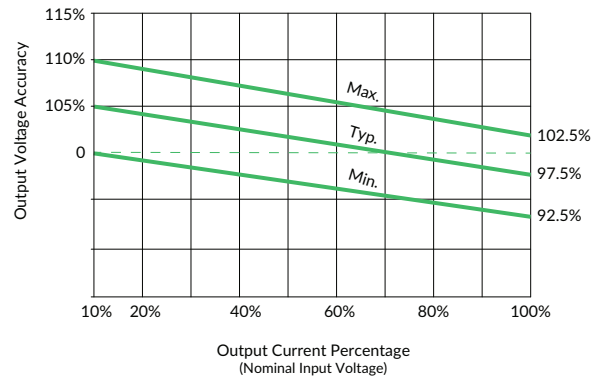


Fig 3. 5/12/15/24VDC Output

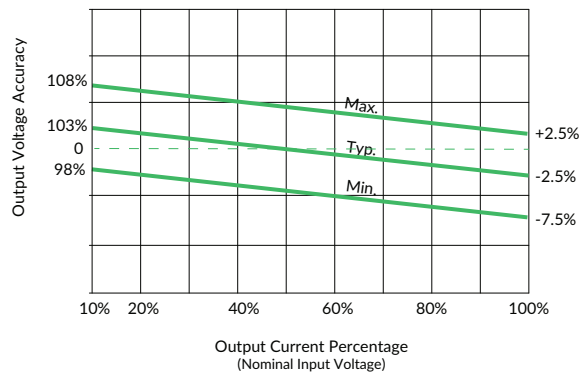
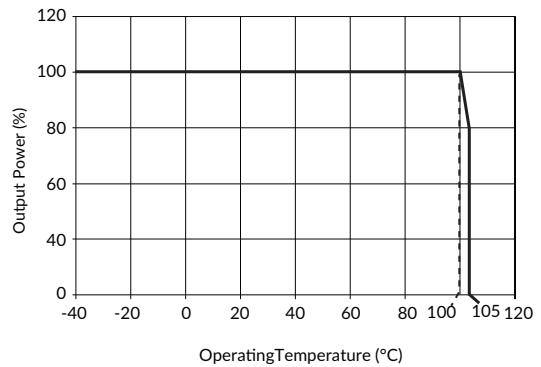
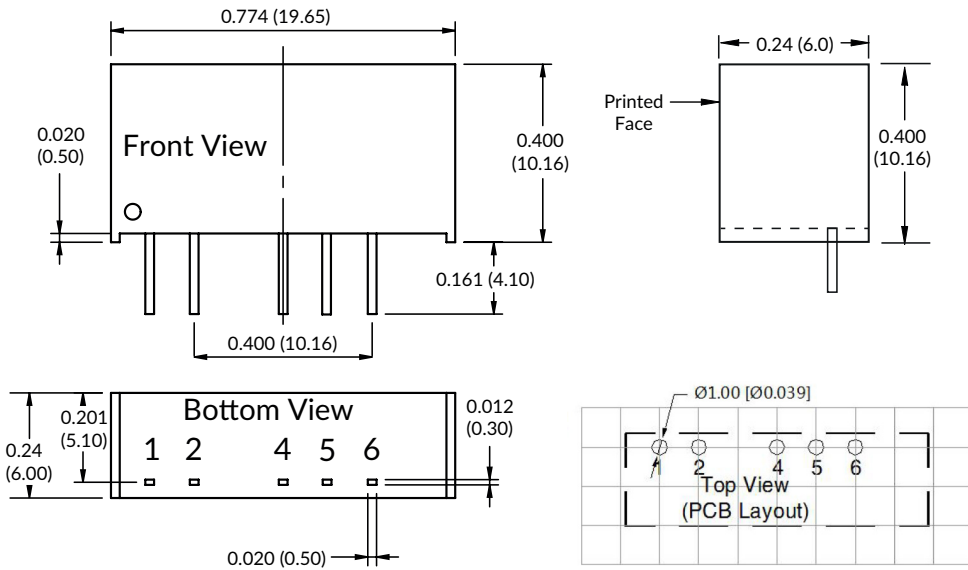


Fig 4. Temperature Derating Curve



**Mechanical Details**



Pin Connections	
Pin	Function
1	+Vin
2	-Vin
3	No pin
4	-Vout
5	Common
6	+Vout
7	No pin

**Notes:**

- 1. All dimensions are in inches (mm)
- 2. Weight: 0.004lbs (2.1g) approx.
- 3. Pin diameter: 0.02±0.002 (0.5±0.05)
- 4. Pin pitch tolerance: ±0.014 (±0.35)
- 5. Case tolerance: ±0.02 (±0.5)

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