JCB03 series

XP Power

3W

DC-DC converters

The JCB03 series is housed in a DIP24 PCB mount plastic case. Featuring a 2:1 input voltage range of 4.5 to 9VDC, 9 to 18VDC, 18 to 36VDC or 36 to 75VDC with regulated single outputs of 5, 9, 12, 15 & 24VDC and dual outputs ±5, ±9, ±12, ±15 or ±24VDC.

The 3W JCB03 has 1.5kVDC (3kV option) isolation between input and output, over voltage, overload & short circuit protection is standard. The operating temperature range is from -40°C to +100°C, with derating above +85°C.

Features

- Regulated single & dual outputs
- 2:1 input range
- Single outputs 5.0 to 24VDC
- Dual outputs ±5.0 to ±24VDC
- DIP24 package
- 1.5kVDC isolation, 3.0kVDC option
- -40°C to +100°C operating temperature
- Full power to +85°C
- 3 year warranty

Applications

Autonomous equipment

Industrial

Technology

Instrumentation

Robotics

Dimensions

31.75 x 20.32 x 10.15mm (1.25” x 0.80” x 0.40”)

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Models & ratings

Model number	Input voltage	Output voltage	Output current	Input current[4]		Maximum capacitive load	Efficiency
				No load	Full load		
JCB0305S05	4.5-9.0VDC	5.0VDC	600mA	40mA	857mA	2200µF	70%
JCB0305S09		9.0VDC	333mA	40mA	833mA	470µF	72%
JCB0305S12		12.0VDC	250mA	40mA	810mA	470µF	74%
JCB0305S15		15.0VDC	200mA	40mA	810mA	470µF	74%
JCB0305S24		24.0VDC	125mA	40mA	857mA	220µF	70%
JCB0305D05[2]		±5.0VDC	±300mA	40mA	869mA	±1000µF	69%
JCB0305D09[2]		±9.0VDC	±167mA	40mA	857mA	±220µF	70%
JCB0305D12[2]		±12.0VDC	±125mA	40mA	833mA	±220µF	72%
JCB0305D15[2]		±15.0VDC	±100mA	40mA	810mA	±220µF	74%
JCB0305D24[2]		±24.0VDC	±63mA	40mA	857mA	±100µF	70%

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Notes:

1. Minimum load required to meet noise and ripple and initial set accuracy specifications. Below 25% load, noise and ripple increases to 200mV pk-pk typical and load regulation to ±1% max.
2. Cross regulation is ±5% when one output is at 100% the other is varied between 25% and 100%.
3. For optional 3000VDC isolation, add suffix ‘-H’ to end of part number.
4. Input current measured at nominal input voltage
5. A 220µF/100V capacitor across the input is required in order to meet EN61000-4-4 & EN61000-4-5.

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Models & ratings

Model number	Input voltage	Output voltage	Output current	Input current[4]		Maximum capacitive load	Efficiency
				No load	Full load		
JCB0312S05	9-18VDC	5.0VDC	600mA	20mA	328mA	2200µF	76%
JCB0312S09		9.0VDC	333mA	20mA	324mA	470µF	77%
JCB0312S12		12.0VDC	250mA	20mA	316mA	470µF	79%
JCB0312S15		15.0VDC	200mA	20mA	316mA	470µF	79%
JCB0312S24		24.0VDC	125mA	20mA	316mA	220µF	79%
JCB0312D05[2]		±5.0VDC	±300mA	20mA	324mA	±1000µF	77%
JCB0312D09[2]		±9.0VDC	±167mA	20mA	320 mA	±220µF	78%
JCB0312D12[2]		±12.0VDC	±125mA	20mA	320 mA	±220µF	78%
JCB0312D15[2]		±15.0VDC	±100mA	20mA	320 mA	±220µF	78%
JCB0312D24[2]		±24.0VDC	±63mA	20mA	320mA	±100µF	78%
JCB0324S05	18-36VDC	5.0VDC	600mA	12mA	156mA	2200µF	80%
JCB0324S09		9.0VDC	333mA	12mA	156mA	470µF	80%
JCB0324S12		12.0VDC	250mA	12mA	152mA	470µF	82%
JCB0324S15		15.0VDC	200mA	12mA	152mA	470µF	82%
JCB0324S24		24.0VDC	125mA	12mA	156mA	220µF	80%
JCB0324D05[2]		±5.0VDC	±300mA	12mA	160mA	±1000µF	78%
JCB0324D09[2]		±9.0VDC	±167mA	12mA	158mA	±220µF	79%
JCB0324D12[2]		±12.0VDC	±125mA	12mA	156mA	±220µF	80%
JCB0324D15[2]		±15.0VDC	±100mA	12mA	156mA	±220µF	80%
JCB0324D24[2]		±24.0VDC	±63mA	8mA	156mA	±100µF	80%
JCB0348S05	36-72VDC	5.0VDC	600mA	8mA	81mA	2200µF	77%
JCB0348S09		9.0VDC	333mA	8mA	80mA	470µF	78%
JCB0348S12		12.0VDC	250mA	8mA	78mA	470µF	80%
JCB0348S15		15.0VDC	200mA	8mA	78mA	470µF	80%
JCB0348S24		24.0VDC	125mA	8mA	78mA	220µF	80%
JCB0348D05[2]		±5.0VDC	±300mA	8mA	80mA	±1000µF	78%
JCB0348D09[2]		±9.0VDC	±167mA	8mA	79mA	±220µF	79%
JCB0348D12[2]		±12.0VDC	±125mA	8mA	78mA	±220µF	80%
JCB0348D15[2]		±15.0VDC	±100mA	8mA	78mA	±220µF	80%
JCB0348D24[2]		±24.0VDC	±63mA	8mA	78mA	±100µF	80%

Notes:

1. Minimum load required to meet noise and ripple and initial set accuracy specifications. Below 25% load, noise and ripple increases to 200mV pk-pk typical and load regulation to ±1% max.
2. Cross regulation is ±5% when one output is at 100% the other is varied between 25% and 100%.
3. For optional 3000VDC isolation, add suffix '-H' to end of part number.
4. Input current measured at nominal input voltage
5. A 220µF/100V capacitor across the input is required in order to meet EN61000-4-4 & EN61000-4-5.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	4.5		9	VDC	5VDC nominal
	9		18		12VDC nominal
	18		36		24VDC nominal
	36		75		48VDC nominal
Input current	See models & ratings table				
Input filter	Pi network				
Input Reflected Ripple		35		mA	Through 12µH inductor
Input surge		15		VDC	5VDC models (for 100ms max)
		24			12VDC models (for 100ms max)
		40			24VDC models (for 100ms max)
		80			48VDC models (for 100ms max)

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Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	See models & ratings table				
Initial set accuracy			±1	%	
Minimum load	0			%	Minimum load required to meet noise and ripple and initial set accuracy specifications. Below 25% load, noise and ripple increases to 200mV pk-pk typical and load regulation to ±1% max
Line regulation			±0.5	%	
Load regulation			±0.5	%	
Cross regulation		±5.0		%	Dual output models, cross regulation is ±5% when one output is at 100% the other is varied between 25% and 100%
Transient response		<3		%	Deviation, recovery to within 1% in 2ms for a 50% load change
Ripple & noise		60		mV	20MHz bandwidth
Short circuit protection	Continuous with auto recovery				
Overvoltage protection	None				
Overcurrent protection	None				
Maximum capacitive load	See models and ratings table				
Temperature coefficient			±0.02	%/°C	

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See models & ratings table				
Isolation: input to output		1500		VDC	For optional high isolation version 3000VDC, add suffix '-H' to end of part number
Isolation: input to case		1500			
Isolation: output to case		1500			
Isolation capacitance		1200		pF	
Switching frequency	100		400	kHz	Variable
Power density		0.45 (7.4)		W/cm^3 (W/in^3)	
Mean time between failure		2		mhrs	MIL-HDBK-217F, +25°C GB

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+100	°C	Derates from 100% load at +85°C to no load at +100°C
Storage temperature	-40		+125	°C	
Case temperature			+100	°C	
Cooling	Convection cooled				
Operating humidity			95	%	RH, non condensing

Safety approvals

Certification	Standard	Notes & conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55022	Level A	With external components, see application note
Radiated	EN55022	Level A	

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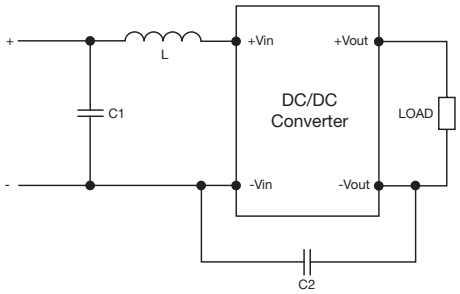
Immunity - EMC

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	Level 3	A	
EFT/burst	EN61000-4-4	Level 3	A	A 220µF/100V capacitor across the input is required in order to meet EN61000-4-4 & EN61000-4-5
Surges	EN61000-4-5	Inst. class 3	A	A 220µF/100V capacitor across the input is required in order to meet EN61000-4-4 & EN61000-4-5
Conducted immunity	EN61000-4-6	10Vrms	A	
Magnetic fields	EN61000-4-8	1A/m	A	

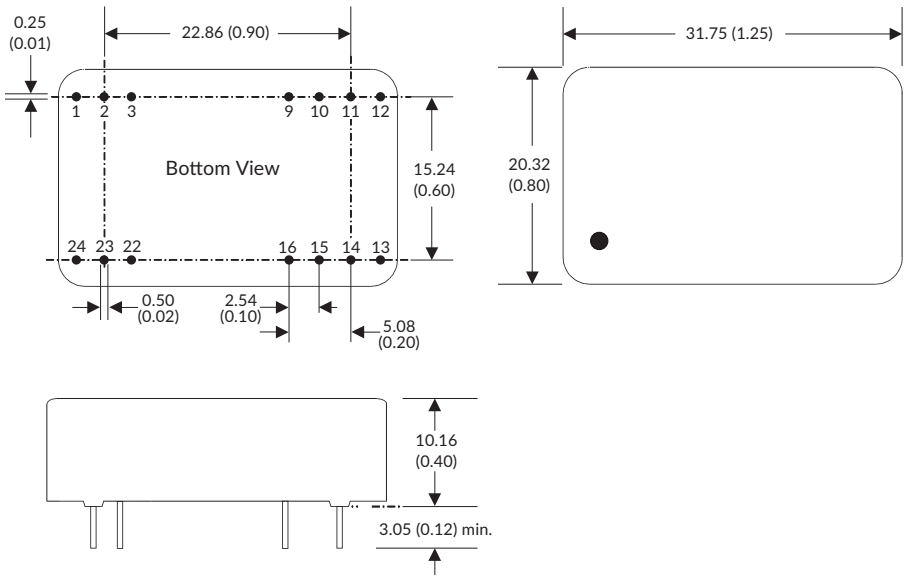
Application notes

Input filter



Model	C1	L	C2
JCB0305	220µF/100V	12µH	
JCB0312	220µF/100V	12µH	
JCB0324	220µF/100V	12µH	470pF/2KV/ MLCC or higher for -H
JCB0348	220µF/100V	12µH	

Mechanical details



Pin	Single	Dual	Single-H	Dual-H
1	+Vin	+Vin	No pin	No pin
2	No connection	-Vout	-Vin	-Vin
3	No connection	Common	-Vin	-Vin
9	No pin	No pin	No pin	Common
10	-Vout	Common	No pin	No pin
11	+Vout	+Vout	No connection	-Vout
12	-Vin	-Vin	No pin	No pin
13	-Vin	-Vin	No pin	No pin
14	+Vout	+Vout	+Vout	+Vout
15	-Vout	Common	No pin	No pin
16	No pin	No pin	-Vout	Common
22	No connection	Common	+Vin	+Vin
23	No connection	-Vout	+Vin	+Vin
24	+Vin	+Vin	No pin	No pin

Notes:

1. All dimensions in mm (inches)
2. Weight: 20g (0.04lbs)
3. Pin diameter: 0.5 ±0.05 (0.02 ± 0.002)
4. Pin pitch tolerance: ±0.35 (±0.014)
5. Case tolerance: ±0.5 (±0.02)