

## 5W

Convection cooled

DC-DC converters

The JCD05 series is housed in a DIP24 PCB mount metal 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 3.3, 5, 9, 12, 15 & 24VDC and dual outputs  $\pm 3.3 \pm 5$ ,  $\pm 9$ ,  $\pm 12$ ,  $\pm 15$  or  $\pm 24$ VDC.

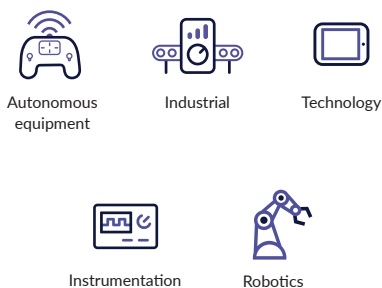
The 5W JCD05 has 1.6kVDC isolation (3.5kV optional) between input and output, overload & short circuit protection are standard. The operating temperature range is from -40°C to +100°C, with derating above +60°C.



### Features

- ▶ Regulated single & dual outputs
- ▶ 2:1 input range
- ▶ Single outputs 3.3 to 24VDC
- ▶ Dual outputs  $\pm 3.3$  to  $\pm 24$ VDC
- ▶ DIP24 metal case
- ▶ 1.6kVDC isolation, 3.5kVDC option
- ▶ Continuous short circuit protection
- ▶ -40°C to +100°C operating temperature
- ▶ Full power to +60°C
- ▶ 3 year warranty

### Applications



### Dimensions

31.7 x 20.3 x 10.4mm (1.25" x 0.8" x 0.4")

### Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		Maximum capacitive load
					No load	Full load	
JCD0505S3V3	4.5-9.0VDC	3.3VDC	1300mA	74%	25mA	1159mA	1000 $\mu$ F
JCD0505S05		5.0VDC	1000mA	77%	25mA	1298mA	1000 $\mu$ F
JCD0505S12		12.0VDC	417mA	82%	30mA	1220mA	330 $\mu$ F
JCD0505S15		15.0VDC	333mA	82%	30mA	1218mA	220 $\mu$ F
JCD0505D03		$\pm 3.3$ VDC	$\pm 750$ mA	76%	25mA	1302mA	$\pm 680$ $\mu$ F
JCD0505D05		$\pm 5.0$ VDC	$\pm 500$ mA	79%	30mA	1265mA	$\pm 330$ $\mu$ F
JCD0505D12		$\pm 12.0$ VDC	$\pm 208$ mA	82%	35mA	1217mA	$\pm 100$ $\mu$ F
JCD0505D15		$\pm 15.0$ VDC	$\pm 167$ mA	82%	40mA	1221mA	$\pm 47$ $\mu$ F

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#### Notes:

1. When one output is set at 100% load, the other varies between 25% & 100% load.
2. Measured with 20MHz bandwidth and 1 $\mu$ F ceramic capacitor across output rails.
3. Input current specified at nominal 5VDC, 12VDC, 24VDC or 48VDC input.
4. For optional 3500VDC isolation add suffix -H to part number e.g. JCD0524S12-H

## Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		Maximum capacitive load
					No load	Full load	
JCD0512S3V3	9-18VDC	3.3VDC	1300mA	74%	30mA	483mA	1000µF
JCD0512S05		5.0VDC	1000mA	77%	30mA	541mA	1000µF
JCD0512S09		9.0VDC	555mA	80%	30mA	520mA	470µF
JCD0512S12		12.VDC	417mA	82%	30mA	508mA	330µF
JCD0512S15		15.0VDC	333mA	82%	30mA	508mA	100µF
JCD0512S24		24.0VDC	208mA	82%	30mA	508mA	68µF
JCD0512D03		±3.3VDC	±750mA	70%	30mA	595mA	±1000µF
JCD0512D05		±5.0VDC	±500mA	77%	30mA	541mA	±1000µF
JCD0512D09		±9.0VDC	±278mA	79%	30mA	527mA	±330µF
JCD0512D12		±12.0VDC	±208mA	80%	30mA	520mA	±47µF
JCD0512D15		±15.0VDC	±167mA	79%	30mA	527mA	±47µF
JCD0512D24		±24.0VDC	±104mA	81%	30mA	514mA	±10µF
JCD0524S3V3	18-36VDC	3.3VDC	1300mA	75%	20mA	239mA	1000µF
JCD0524S05		5.0VDC	1000mA	80%	20mA	261mA	1000µF
JCD0524S09		9.0VDC	555mA	82%	20mA	254mA	470µF
JCD0524S12		12.VDC	417mA	83%	20mA	251mA	1000µF
JCD0524S15		15.0VDC	333mA	84%	20mA	248mA	220µF
JCD0524S24		24.0VDC	208mA	84%	20mA	248mA	1000µF
JCD0524D03		±3.3VDC	±750mA	76%	20mA	274mA	±470µF
JCD0524D05		±5.0VDC	±500mA	79%	20mA	263mA	±680µF
JCD0524D09		±9.0VDC	±278mA	83%	20mA	251mA	±220µF
JCD0524D12		±12.0VDC	±208mA	83%	20mA	251mA	±220µF
JCD0524D15		±15.0VDC	±167mA	83%	20mA	251mA	±22µF
JCD0524D24		±24.0VDC	±104mA	82%	20mA	254mA	±22µF
JCD0548S3V3	36-72VDC	3.3VDC	1300mA	76%	12mA	117mA	1000µF
JCD0548S05		5.0VDC	1000mA	80%	12mA	130mA	1000µF
JCD0548S09		9.0VDC	555mA	84%	12mA	124mA	100µF
JCD0548S12		12.VDC	417mA	80%	12mA	132mA	470µF
JCD0548S15		15.0VDC	333mA	82%	12mA	127mA	330µF
JCD0548S24		24.0VDC	208mA	85%	12mA	122mA	220µF
JCD0548D03		±3.3VDC	±750mA	74%	12mA	140mA	±1000µF
JCD0548D05		±5.0VDC	±500mA	80%	12mA	130mA	±470µF
JCD0548D09		±9.0VDC	±278mA	82%	12mA	127mA	±220µF
JCD0548D12		±12.0VDC	±208mA	84%	12mA	124mA	±100µF
JCD0548D15		±15.0VDC	±167mA	81%	12mA	128mA	±220µF
JCD0548D24		±24.0VDC	±104mA	81%	12mA	128mA	±22µF

### Notes:

- When one output is set at 100% load, the other varies between 25% & 100% load.
- Measured with 20MHz bandwidth and 1µF ceramic capacitor across output rails.
- Input current specified at nominal 5VDC, 12VDC, 24VDC or 48VDC input.
- For optional 3500VDC isolation add suffix -H to part number e.g. JCD0524S12-H

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See models & ratings table				
Isolation: input to output		1600		VDC	For optional high isolation versions 3500 VDC Input to Output add suffix -H to model number
Isolation: input to case		1600		VDC	
Isolation: output to case		1600		VDC	
Isolation capacitance		500		pF	
Isolation resistance		10 <sup>9</sup>		Ω	
Switching frequency		266		kHz	
Power density		204.8 (2.5)		W/cm <sup>3</sup> (W/in <sup>3</sup> )	
Mean time between failure		>1.1		Mhrs	MIL-HDBK-217F, +25°C GB

## 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		72		48VDC nominal
Input current	See models & ratings table				
Input reflected ripple current		35		mA/rms	12μH inductor
Input filter	Pi network				
Input surge		15		VDC	5VDC models (for 100ms)
		24			12VDC models (for 100ms)
		40			24VDC models (for 100ms)
		80			48VDC models (for 100ms)

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	See models & ratings table				
Setpoint accuracy		±1		%	D03 models
Voltage balance		±1		%	±2% D03 models
Minimum load	0			%	No minimum load required
Line regulation		±0.5		%	
Load regulation		±0.5		%	Single outputs
		±1.5			S3V3 & D03 models
Cross regulation		±5.0		%	See models and ratings note 1
Start up delay		20		ms	5VDC input models, 500ms typical for 12/24/48VDC input models
Transient Response			3	%	Recovery to within 1% in 250μs for a 25% load change
Start up rise time		3.5		ms	
Ripple & noise		60		mV pk-pk	Measured with 20MHz bandwidth
Overload protection		150		%	Of full load on 5VDC input models only
Short circuit protection	Continuous with auto recovery				
Temperature coefficient		±0.02		%/°C	

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+100	°C	See derating curve
Storage temperature	-55		+125	°C	
Case temperature			+100	°C	
Cooling	Convection cooled				
Operating humidity			95	%	RH, non condensing

## Safety approvals

Certification	Standard	Notes & conditions
UL	UL60950-1, CAN/CSA C22.2 No.60950-1, UL62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

## Emissions - EMC

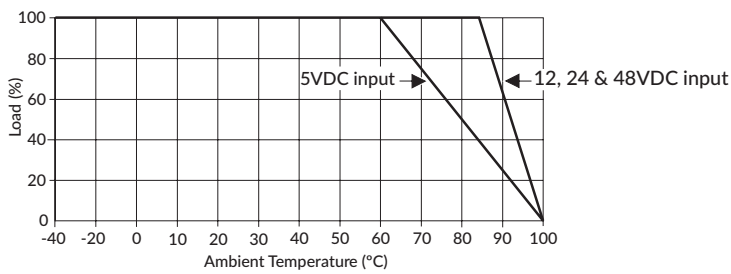
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55022	Class A	With external components, see application note
Radiated	EN55022		

## Immunity - EMC

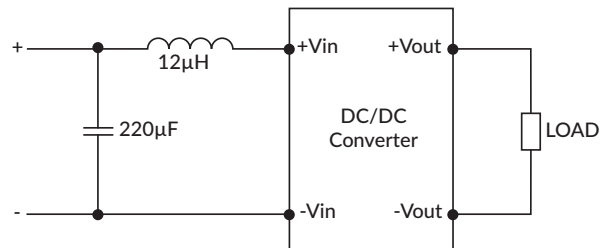
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	Level 3	B	External input capacitor required, 220 $\mu$ F/100V
Radiated immunity	EN61000-4-3	10V/m	A	
EFT/Burst	EN61000-4-4	Level 3	B	
Surge	EN61000-4-5	Level 2	A	
Conducted immunity	EN61000-4-6	10Vrms	B	
Magnetic fields	EN61000-4-8	1A/m	B	

## Application notes

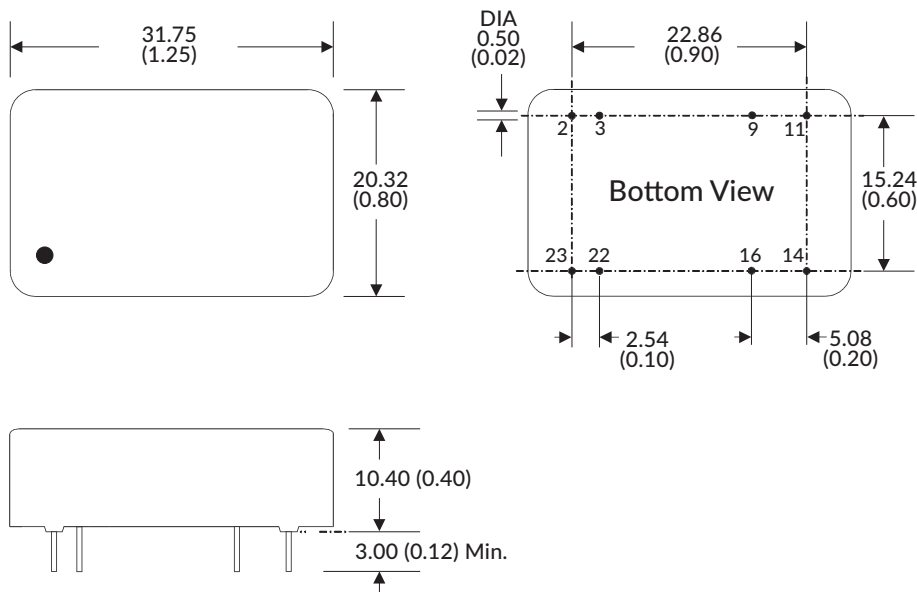
### Derating Curve



### Input filter



## Mechanical details



Pin connections		
Pin	Single	Dual
2	-Vin	-Vin
3	-Vin	-Vin
9	No pin	Common
11	N/C	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

### Notes:

- All dimensions in inches (mm)
- Weight: 18g (0.04lbs)
- Pin diameter tolerance:  $0.5 \pm 0.005$  ( $0.02 \pm 0.002$ )
- Pin pitch tolerance:  $\pm 0.35$  ( $\pm 0.014$ )
- Case tolerance:  $\pm 0.5$  ( $\pm 0.02$ )
- Package: 24 pin DIL nickel-coated copper

Specifications subject to change without notice.