4–6 Watts

JCD Series

- 2:1 Input Range
- Industry Standard Package
- 1600 VDC Isolation
- Continuous Short Circuit Protection
- –40 °C to +100 °C Operating Temperature
- Single & Dual Outputs
- 3 Year Warranty

Specification

Input

Input Voltage Range	• 5 V (4.5-9 VDC) 12 V (9-18 VDC) 24 V (18-36 VDC) 48 V (36-72 VDC)
Input Current	• See table
Input Reflected Ripple Current	• 35 mA rms through 12 µH inductor
Input Filter	• Pi network
Input Surge	• 5 V models 15 VDC for 100 ms 12 V models 24 VDC for 100 ms 24 V models 40 VDC for 100 ms 48 V models 80 VDC for 100 ms

Output

Output Voltage	• See table
Setpoint Accuracy	• ±1% (±2% for JCD0412/24/48S3V3 & D03 models)
Voltage Balance	• ±1% (±2% D03 models)
Minimum Load	• No minimum load required
Line Regulation	• ±0.5%
Load Regulation	• ±0.5% single outputs, ±1.5% for S3V3 & D03 models
Cross Regulation	• ±5% (see note 1)
Ripple & Noise	• 60 mV pk-pk, 20 MHz bandwidth. See note 2
Start Up Delay	• 20 ms typical for 5 V input models, 500 ms typical for 12/24/48 V input models
Transient Response	• 3% max deviation, recovery to within 1% in 250 µs (5% & 300 µS for JCD0412/24/48S3V3 & D03 models) for a 25% load change
Temperature Coefficient	• 0.02%/°C
Overload Protection	• 150% of full load on 5 V input models only
Short Circuit Protection	• Indefinite with auto recovery
Maximum Capacitive Load	• See table

General

Efficiency	• See table
Isolation Voltage	• 1600 VDC Input to Output For optional high isolation versions 3500 VDC Input to Output add suffix -H to model number 1600 VDC Input to Case 1600 VDC Output to Case
Isolation Capacitance	• 500 pF typical input to output
Isolation Resistance	• $10^9\Omega$
Switching Frequency	• 266 kHz typical
Power Density	• 4 W: 10 W/in^3, 5 W: 12.5 W/in^3, 6 W: 15 W/in^3
MTBF	• >1.1 MHrs to MIL-STD-217F at 25 °C, GB

Environmental

Operating Temperature	• -40 °C to +100 °C (see derating curve)
Case Temperature	• +100 °C max
Storage Temperature	• -40 °C to +125 °C
Cooling	• Convection-cooled
Operating Humidity	• Up to 95% RH, non-condensing

EMC

Emissions	• EN55022 Class A conducted with external components, see application note
ESD Immunity	• EN61000-4-2, level 3, Perf Criteria B
Radiated Immunity	• EN61000-4-3, 10 V/m, Perf Criteria A
EFT/Burst	• EN61000-4-4, level 3 Perf Criteria B*
Surge	• EN61000-4-5, level 2, Perf Criteria A*
Conducted Immunity	• EN61000-4-6, 10 Vrms, Perf Criteria B*
Magnetic Field	• EN61000-4-8, 1 A/m, Perf Criteria B*

Safety

Safety Approvals	• UL60950-1, CAN/CSA C22.2 No.60950-1, UL62368-1

**External input capacitor required, 220 µF/100 V*

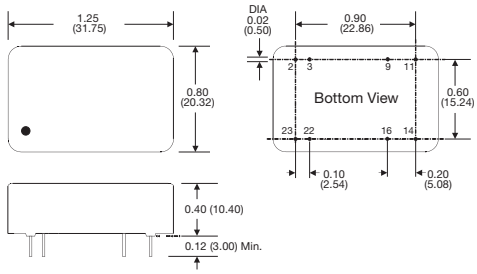
Models and Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load	Efficiency	Model Number
			No Load	Full Load			
4.5-9 VDC	3.3 V	1200 mA	25 mA	1084 mA	3300 µF	73%	JCD0405S3V3
	5.0 V	800 mA	25 mA	1026 mA	1000 µF	78%	JCD0405S05
	12.0 V	333 mA	30 mA	974 mA	220 µF	82%	JCD0405S12
	15.0 V	266 mA	30 mA	973 mA	100 µF	82%	JCD0405S15
	±3.3 V	±600 mA	25 mA	1042 mA	±680 µF	76%	JCD0405D03
	±5.0 V	±400 mA	30 mA	1012 mA	±470 µF	79%	JCD0405D05
	±12.0 V	±166 mA	35 mA	963 mA	±100 µF	83%	JCD0405D12
	±15.0 V	±133 mA	40 mA	985 mA	±47 µF	81%	JCD0405D15
9-18 VDC	3.3 V	1200 mA	30 mA	445 mA	680 µF	74%	JCD0412S3V3
	5.0 V	800 mA	30 mA	427 mA	1000 µF	78%	JCD0412S05
	9.0 V	444 mA	30 mA	416 mA	470 µF	80%	JCD0412S09
	12.0 V	333 mA	30 mA	406 mA	100 µF	82%	JCD0412S12
	15.0 V	266 mA	30 mA	401 mA	100 µF	83%	JCD0412S15
	24.0 V	166 mA	30 mA	406 mA	22 µF	82%	JCD0412S24
	±3.3 V	±600 mA	30 mA	438 mA	±680 µF	76%	JCD0412D03
	±5.0 V	±400 mA	30 mA	427 mA	±470 µF	78%	JCD0412D05
	±9.0 V	±220 mA	30 mA	416 mA	±220 µF	80%	JCD0412D09
	±12.0 V	±166 mA	30 mA	427 mA	±47 µF	78%	JCD0412D12
	±15.0 V	±133 mA	30 mA	416 mA	±150 µF	80%	JCD0412D15
	±24.0 V	±83 mA	30 mA	416 mA	±10 µF	80%	JCD0412D24
18-36 VDC	3.3 V	1200 mA	20 mA	216 mA	1000 µF	77%	JCD0424S3V3
	5.0 V	800 mA	20 mA	208 mA	1000 µF	80%	JCD0424S05
	9.0 V	444 mA	20 mA	203 mA	470 µF	82%	JCD0424S09
	12.0 V	333 mA	20 mA	198 mA	330 µF	84%	JCD0424S12
	15.0 V	266 mA	20 mA	203 mA	330 µF	82%	JCD0424S15
	24.0 V	166 mA	20 mA	200 mA	1000 µF	83%	JCD0424S24
	±3.3 V	±600 mA	20 mA	216 mA	±1000 µF	77%	JCD0424D03
	±5.0 V	±400 mA	20 mA	208 mA	±330 µF	80%	JCD0424D05
	±9.0 V	±220 mA	20 mA	200 mA	±220 µF	83%	JCD0424D09
	±12.0 V	±166 mA	20 mA	200 mA	±68 µF	83%	JCD0424D12
	±15.0 V	±133 mA	20 mA	203 mA	±220 µF	82%	JCD0424D15
	±24.0 V	±83 mA	20 mA	210 mA	±47 µF	79%	JCD0424D24
36-72 VDC	3.3 V	1200 mA	15 mA	108 mA	1000 µF	76%	JCD0448S3V3
	5.0 V	800 mA	15 mA	104 mA	1000 µF	80%	JCD0448S05
	9.0 V	444 mA	15 mA	100 mA	470 µF	83%	JCD0448S09
	12.0 V	333 mA	15 mA	99 mA	330 µF	84%	JCD0448S12
	15.0 V	266 mA	15 mA	102 mA	68 µF	81%	JCD0448S15
	24.0 V	166 mA	15 mA	98 mA	68 µF	85%	JCD0448S24
	±3.3 V	±600 mA	15 mA	109 mA	±1000 µF	76%	JCD0448D03
	±5.0 V	±400 mA	15 mA	104 mA	±470 µF	80%	JCD0448D05
	±9.0 V	±220 mA	15 mA	100 mA	±220 µF	83%	JCD0448D09
	±12.0 V	±166 mA	15 mA	100 mA	±220 µF	83%	JCD0448D12
	±15.0 V	±133 mA	15 mA	100 mA	±47 µF	83%	JCD0448D15
	±24.0 V	±83 mA	15 mA	105 mA	±100 µF	79%	JCD0448D24

Notes

1. When one output is set at 100% load and the other varies between 25% & 100% load.
2. Measured with 20 MHz bandwidth and 1 µF ceramic capacitor across output rails.
3. Input current specified at nominal 5 V, 12 V, 24 V or 48 V input.
4. For optional 3500 VDC isolation add suffix -H to part number e.g. JCD0424S12-H

Mechanical Details



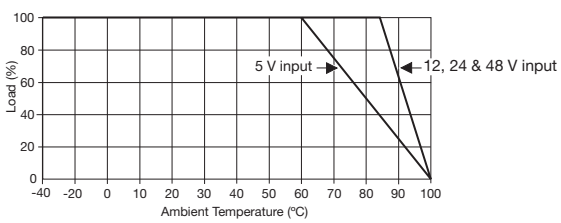
Pin	Single	Dual
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Notes

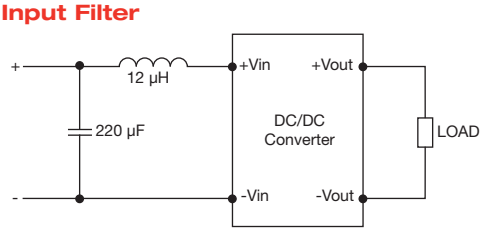
1. All dimensions are in inches (mm)
2. Weight: 0.04 lbs (18 g) approx.
3. Pin diameter: 0.02 ±0.002 (0.5 ±0.005)
4. Pin pitch and length tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)
6. Package: 24 pin DIL nickel-coated copper

Application Notes

Derating Curve



Input Filter



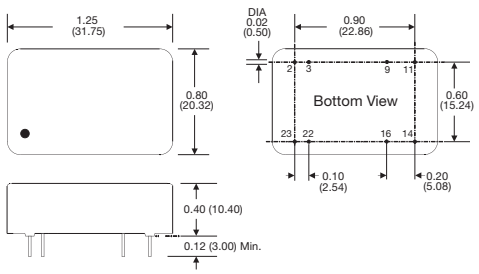
Models and Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load	Efficiency	Model Number[4]
			No Load	Full Load			
4.5-9 VDC	3.3 V	1300 mA	25 mA	1159 mA	1000 µF	74%	JCD0505S3V3
	5.0 V	1000 mA	25 mA	1298 mA	1000 µF	77%	JCD0505S05
	12.0 V	417 mA	30 mA	1220 mA	330 µF	82%	JCD0505S12
	15.0 V	333 mA	30 mA	1218 mA	220 µF	82%	JCD0505S15
	±3.3 V	±750 mA	25 mA	1302 mA	±680 µF	76%	JCD0505D03
	±5.0 V	±500 mA	30 mA	1265 mA	±330 µF	79%	JCD0505D05
	±12.0 V	±208 mA	35 mA	1217 mA	±100 µF	82%	JCD0505D12
	±15.0 V	±167 mA	40 mA	1221 mA	±47 µF	82%	JCD0505D15
9-18 VDC	3.3 V	1300 mA	30 mA	483 mA	1000 µF	74%	JCD0512S3V3
	5.0 V	1000 mA	30 mA	541 mA	1000 µF	77%	JCD0512S05
	9.0 V	555 mA	30 mA	520 mA	470 µF	80%	JCD0512S09
	12.0 V	417 mA	30 mA	508 mA	330 µF	82%	JCD0512S12
	15.0 V	333 mA	30 mA	508 mA	100 µF	82%	JCD0512S15
	24.0 V	208 mA	30 mA	508 mA	68 µF	82%	JCD0512S24
	±3.3 V	±750 mA	30 mA	595 mA	±1000 µF	70%	JCD0512D03
	±5.0 V	±500 mA	30 mA	541 mA	±1000 µF	77%	JCD0512D05
	±9.0 V	±278 mA	30 mA	527 mA	±330 µF	79%	JCD0512D09
	±12.0 V	±208 mA	30 mA	520 mA	±47 µF	80%	JCD0512D12
	±15.0 V	±167 mA	30 mA	527 mA	±47 µF	79%	JCD0512D15
	±24.0 V	±104 mA	30 mA	514 mA	±10 µF	81%	JCD0512D24
18-36 VDC	3.3 V	1300 mA	20 mA	239 mA	1000 µF	75%	JCD0524S3V3
	5.0 V	1000 mA	20 mA	261 mA	1000 µF	80%	JCD0524S05
	9.0 V	555 mA	20 mA	254 mA	470 µF	82%	JCD0524S09
	12.0 V	417 mA	20 mA	251 mA	1000 µF	83%	JCD0524S12
	15.0 V	333 mA	20 mA	248 mA	220 µF	84%	JCD0524S15
	24.0 V	208 mA	20 mA	248 mA	1000 µF	84%	JCD0524S24
	±3.3 V	±750 mA	20 mA	274 mA	±470 µF	76%	JCD0524D03
	±5.0 V	±500 mA	20 mA	263 mA	±680 µF	79%	JCD0524D05
	±9.0 V	±278 mA	20 mA	251 mA	±220 µF	83%	JCD0524D09
	±12.0 V	±208 mA	20 mA	251 mA	±220 µF	83%	JCD0524D12
	±15.0 V	±167 mA	20 mA	251 mA	±22 µF	83%	JCD0524D15
	±24.0 V	±104 mA	20 mA	254 mA	±22 µF	82%	JCD0524D24
36-72 VDC	3.3 V	1300 mA	12 mA	117 mA	1000 µF	76%	JCD0548S3V3
	5.0 V	1000 mA	12 mA	130 mA	1000 µF	80%	JCD0548S05
	9.0 V	555 mA	12 mA	124 mA	100 µF	84%	JCD0548S09
	12.0 V	417 mA	12 mA	132 mA	470 µF	80%	JCD0548S12
	15.0 V	333 mA	12 mA	127 mA	330 µF	82%	JCD0548S15
	24.0 V	208 mA	12 mA	122 mA	220 µF	85%	JCD0548S24
	±3.3 V	±750 mA	12 mA	140 mA	±1000 µF	74%	JCD0548D03
	±5.0 V	±500 mA	12 mA	130 mA	±470 µF	80%	JCD0548D05
	±9.0 V	±278 mA	12 mA	127 mA	±220 µF	82%	JCD0548D09
	±12.0 V	±208 mA	12 mA	124 mA	±100 µF	84%	JCD0548D12
	±15.0 V	±167 mA	12 mA	128 mA	±220 µF	81%	JCD0548D15
	±24.0 V	±104 mA	12 mA	128 mA	±22 µF	81%	JCD0548D24

Notes

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

Mechanical Details



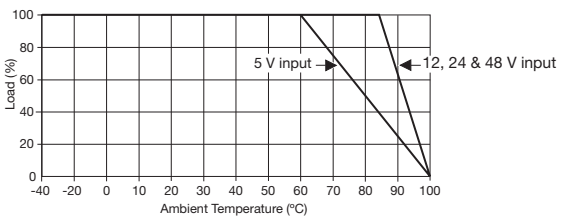
Pin	Single	Dual
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Notes

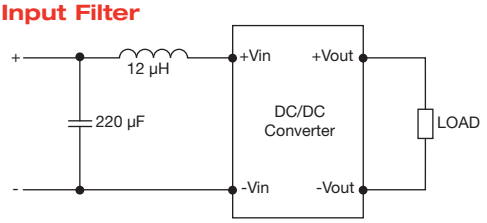
1. All dimensions are in inches (mm)
2. Weight: 0.04 lbs (18 g) approx.
3. Pin diameter: 0.02 ±0.002 (0.5 ±0.005)
4. Pin pitch and length tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)
6. Package: 24 pin DIL nickel-coated copper

Application Notes

Derating Curve



Input Filter



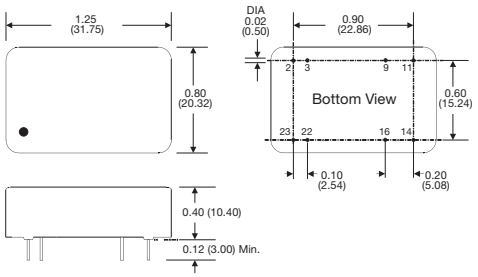
Models and Ratings

Input Voltage	Output Voltage	Output Current	Input Current[1]		Maximum Capacitive Load	Efficiency	Model Number[4]
			No Load	Full Load			
4.5-9 VDC	3.3 V	1400 mA	25 mA	1232 mA	1000 µF	75%	JCD0605S3V3
	5.0 V	1200 mA	25 mA	1558 mA	1000 µF	77%	JCD0605S05
	12.0 V	500 mA	25 mA	1445 mA	330 µF	83%	JCD0605S12
	15.0 V	400 mA	30 mA	1445 mA	220 µF	83%	JCD0605S15
	±3.3 V	±909 mA	25 mA	1578 mA	±680 µF	76%	JCD0605D03
	±5.0 V	±600 mA	25 mA	1500 mA	±330 µF	80%	JCD0605D05
	±12.0 V	±250 mA	35 mA	1428 mA	±100 µF	84%	JCD0605D12
	±15.0 V	±200 mA	40 mA	1428 mA	±47 µF	84%	JCD0605D15
9-18 VDC	3.3 V	1400 mA	30 mA	520 mA	220 µF	74%	JCD0612S3V3
	5.0 V	1200 mA	30 mA	649 mA	1000 µF	77%	JCD0612S05
	9.0 V	666 mA	30 mA	632 mA	680 µF	79%	JCD0612S09
	12.0 V	500 mA	30 mA	617 mA	1000 µF	81%	JCD0612S12
	15.0 V	400 mA	30 mA	604 mA	100 µF	82%	JCD0612S15
	24.0 V	250 mA	30 mA	617 mA	100 µF	81%	JCD0612S24
	±3.3 V	±909 mA	30 mA	675 mA	±1000 µF	74%	JCD0612D03
	±5.0 V	±600 mA	30 mA	657 mA	±680 µF	76%	JCD0612D05
	±9.0 V	±333 mA	30 mA	617 mA	±22 µF	81%	JCD0612D09
	±12.0 V	±250 mA	30 mA	632 mA	±330 µF	79%	JCD0612D12
	±15.0 V	±200 mA	30 mA	625 mA	±100 µF	80%	JCD0612D15
	±24.0 V	±125 mA	30 mA	625 mA	±10 µF	80%	JCD0612D24
18-36 VDC	3.3 V	1400 mA	20 mA	256 mA	1000 µF	75%	JCD0624S3V3
	5.0 V	1200 mA	20 mA	313 mA	1000 µF	80%	JCD0624S05
	9.0 V	666 mA	20 mA	301 mA	680 µF	83%	JCD0624S09
	12.0 V	500 mA	20 mA	301 mA	1000 µF	83%	JCD0624S12
	15.0 V	400 mA	20 mA	301 mA	100 µF	83%	JCD0624S15
	24.0 V	250 mA	20 mA	294 mA	470 µF	85%	JCD0624S24
	±3.3 V	±909 mA	20 mA	328 mA	±1000 µF	76%	JCD0624D03
	±5.0 V	±600 mA	20 mA	308 mA	±680 µF	81%	JCD0624D05
	±9.0 V	±333 mA	20 mA	301 mA	±220 µF	83%	JCD0624D09
	±12.0 V	±250 mA	20 mA	301 mA	±470 µF	83%	JCD0624D12
	±15.0 V	±200 mA	20 mA	301 mA	±100 µF	83%	JCD0624D15
	±24.0 V	±125 mA	20 mA	304 mA	±100 µF	82%	JCD0624D24
36-72 VDC	3.3 V	1400 mA	12 mA	128 mA	2200 µF	75%	JCD0648S3V3
	5.0 V	1200 mA	12 mA	156 mA	1000 µF	80%	JCD0648S05
	9.0 V	666 mA	12 mA	148 mA	1000 µF	84%	JCD0648S09
	12.0 V	500 mA	12 mA	148 mA	470 µF	84%	JCD0648S12
	15.0 V	400 mA	12 mA	154 mA	1000 µF	81%	JCD0648S15
	24.0 V	250 mA	12 mA	147 mA	220 µF	85%	JCD0648S24
	±3.3 V	±909 mA	12 mA	164 mA	±1000 µF	76%	JCD0648D03
	±5.0 V	±600 mA	12 mA	156 mA	±680 µF	80%	JCD0648D05
	±9.0 V	±333 mA	12 mA	150 mA	±680 µF	83%	JCD0648D09
	±12.0 V	±250 mA	12 mA	148 mA	±330 µF	84%	JCD0648D12
	±15.0 V	±200 mA	12 mA	152 mA	±330 µF	82%	JCD0648D15
	±24.0 V	±125 mA	12 mA	150 mA	±150 µF	83%	JCD0648D24

Notes

1. When one output is set at 100% load and the other varies between 25% & 100% load.
2. Measured with 20 MHz bandwidth and 1 µF ceramic capacitor across output rails.
3. Input current specified at nominal 5 V, 12 V, 24 V or 48 V input.
4. For optional 3500 VDC isolation add suffix -H to part number e.g. JCD0624S12-H

Mechanical Details



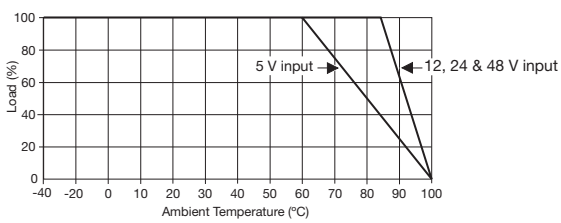
Pin	Single	Dual
2	-Vin	-Vin
3	-Vin	-Vin
9	No Pin	Common
11	N.C.	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin	+Vin
23	+Vin	+Vin

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.04 lbs (18 g) approx.
3. Pin diameter: 0.02 ±0.002 (0.5 ±0.005)
4. Pin pitch and length tolerance: ±0.014 (±0.35)
5. Case tolerance: ±0.02 (±0.5)
6. Package: 24 pin DIL nickel-coated copper

Application Notes

Derating Curve



Input Filter