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JTD20 series

XP Power

20W

DC-DC converters

The JTD20 series is a range of ultra-compact, regulated PCB-mount medical DC-DC converters which offers single and dual output voltages ranging from 5 to 15VDC. Housed in a 40.6 x 25.4mm (1" x 1.6") plastic case, the JTD20 series features a 4:1 input voltage range and offers a ±10% output trim on single output versions. Its low no load power increases efficiency and extends runtime in battery powered applications.

The JTD20 series features worldwide medical approvals, 2 x MOPP 5kVAC reinforced isolation and extremely low leakage currents benefitting system designers with easy integration into a wide range of BF and CF rated medical applications including imaging, patient monitoring, surgical equipment, patient treatment and dentistry.



Features

- Regulated single outputs 3.3 to 15VDC
- Regulated dual outputs ±5, ±12 & ±15VDC
- 4:1 input range
- Output trim ±10% for single output models
- 40.6 x 25.4mm (1.6" x 1") footprint, 10.4mm (0.41") profile
- 3.0kVDC isolation
- Remote On/Off
- -40°C to +100°C operating temperature
- Full power to +65°C
- 3 year warranty

Applications

Healthcare

Home healthcare

Medical Diagnostics

Dimensions

40.6 x 25.4 x 10.4mm (1.6" x 1.0" x 0.41")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current[1]		Maximum capacitive load[2]
					No load	Full load	
JTD2024S3V3	9-36VDC	3.3VDC	5500mA	89.0%	10mA	850 mA	10000µF
JTD2024S05		5VDC	4000mA	89.0%	10mA	935 mA	6800µF
JTD2024S12		12VDC	1670mA	88.5%	10mA	945 mA	1000µF
JTD2024S15		15VDC	1330mA	88.0%	15mA	945 mA	680µF
JTD2024D05		±5VDC	±2000mA	86.0%	10mA	970 mA	±2200µF
JTD2024D12		±12VDC	±835mA	88.5%	15mA	945 mA	±470µF
JTD2024D15		±15VDC	±665mA	88.5%	15mA	940 mA	±330µF

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Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.

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Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current[1]		Maximum capacitive load[2]
					No load	Full load	
JTD2048S3V3	18-75VDC	3.3VDC	5500mA	89.5%	8mA	425mA	10000µF
JTD2048S05		5VDC	4000mA	90.0%	8mA	465mA	6800µF
JTD2048S12		12VDC	1670mA	90.0%	8mA	465mA	1000µF
JTD2048S15		15VDC	1330mA	91.0%	8mA	455mA	680µF
JTD2048D05		±5VDC	±2000mA	87.0%	8mA	480mA	±2200µF
JTD2048D12		±12VDC	±835mA	90.0%	8mA	465mA	±470µF
JTD2048D15		±15VDC	±665mA	90.5%	10mA	460mA	±330µF

Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		36	VDC	24VDC nominal
	18		75		48VDC nominal
Inrush reflected ripple current		20		mA pk-pk	Through 12µH inductor and 47µF capacitor
Input surge			50	VDC for 100ms	24VDC nominal
			100		48VDC nominal

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		30	VDC	See models & ratings table
Output trim	±10			%	Single output only, see application note
Initial set accuracy			±1	%	At full load
Minimum load	0			%	No minimum load required
Line regulation			±0.5	%	From min to max input voltage
Load regulation			0.5/1.0	%	From 0% to full load for single/dual output
Cross regulation			±5	%	On dual output models, when one output is at 100% load and other is varied from 25% load to full load
Start up time		30		ms	
Ripple & noise			75/60	mV pk-pk	Single/dual output, measured using 20MHz bandwidth and 10µF/25VDC MLCC per output
Short circuit protection	Continuous, hiccup mode with auto recovery				
Maximum capacitive load	See models & ratings table				
Temperature coefficient			0.02	%/ °C	
Overvoltage protection			140	%	
Remote On/Off	Output is on if remote on/off (pin 3) is open or high (3-12VDC) Output turns off if remote on/off (pin 3) is low (<1.2VDC max), e.g. short pin 6 to pin 2 -Vin. Idle input current 2mA typical				

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General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		85		%	See models & ratings table
Isolation: input to output	3000			VDC	60s functional
Isolation: input and output to case	1600			VDC	60s
Switching frequency		270/330		kHz	3V3 & 5VDC models/other models
Isolation resistance	10^9			Ω	
Isolation capacitance		2000		pF	
Power density			1.83 (30)	W/cm³ (W/in³)	
Mean time between failure	400			khrs	MIL-HDBK-217F, +25°C GB
Weight		29.0 (0.064)		g (lb)	
Solder profile			260	°C	1.5mm from case, 10s max
Case material	Black plastic UL94V-0				
Potting material	Epoxy, UL84V-0 rated				
Pin material	Brass, Solder coated				
Solder profile	260°C max, 1.5mm from case, 10s max				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+100	°C	See derating curve
Storage temperature	-55		+125	°C	
Case temperature			+105	°C	
Humidity			95	%RH	Non-condensing
Cooling	Natural convection				
Thermal impedance to air	12			°C/W	

Safety approvals

Safety agency	Standard	Notes & conditions
UL	UL/cUL60950-1, 62368-1	
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

EMC: emissions

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class B	No external components required
Radiated	EN55032	Class B	No external components required

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EMC: immunity

Phenomenon	Standard	Test Level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±6kV	A	Contact
		±8kV		Air
Radiated immunity	EN61000-4-3	20V/m	A	
EFT/Burst	EN61000-4-4	2kV	A	Requires 330µF/100VDC electrolytic and 3kW TVS (SMDJ58A for 24VDC input, SMDJ120A for 48VDC input), see application notes.
Surge	EN61000-4-5	2kV	A	Requires 330µF/100VDC electrolytic and 3kW TVS (SMDJ58A for 24VDC input, SMDJ120A for 48VDC input), see application notes.
Conducted immunity	EN61000-4-6	10Vrms	A	
Magnetic fields	EN61000-4-8	100A/m	A	

Application notes

External output trimming

Output can be externally trimmed by using the method as below, (single output models only)





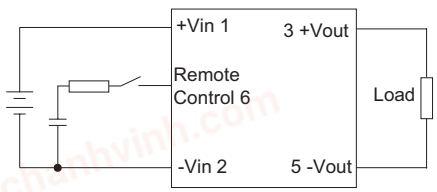
Trim down resistor values (Rd)

Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx0.99	Voutx0.98	Voutx0.97	Voutx0.96	Voutx0.95	Voutx0.94	Voutx0.93	Voutx0.92	Voutx0.91	Voutx0.90
3V3DC	309.0kΩ	165.4kΩ	105.6kΩ	72.9kΩ	52.3kΩ	38.0kΩ	27.6kΩ	19.7kΩ	13.5kΩ	8.40kΩ
5VDC	119.9kΩ	77.70kΩ	50.50kΩ	35.2kΩ	25.3kΩ	18.4kΩ	13.4kΩ	9.50kΩ	6.40kΩ	3.90kΩ
12VDC	345.0kΩ	138.1kΩ	79.90kΩ	51.5kΩ	34.6kΩ	23.4kΩ	15.5kΩ	9.50kΩ	4.90kΩ	1.26kΩ
15VDC	174.4kΩ	91.10kΩ	56.60kΩ	37.7kΩ	25.8kΩ	17.6kΩ	11.6kΩ	7.00kΩ	3.50kΩ	0.55kΩ

Trim up resistor values (Ru)

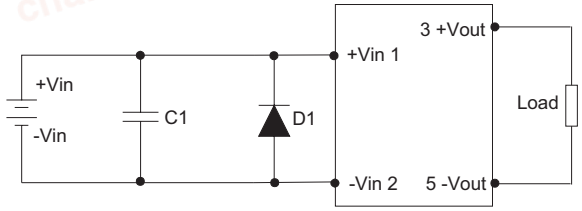
Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx0.99	Voutx0.98	Voutx0.97	Voutx0.96	Voutx0.95	Voutx0.94	Voutx0.93	Voutx0.92	Voutx0.91	Voutx0.90
3V3DC	537.7kΩ	177.1kΩ	96.40kΩ	60.8kΩ	40.8kΩ	27.9kΩ	19.0kΩ	12.4kΩ	7.30kΩ	3.40kΩ
5VDC	635.2kΩ	170.0kΩ	92.80kΩ	61.1kΩ	43.8kΩ	32.9kΩ	25.4kΩ	20.0kΩ	15.8kΩ	12.5kΩ
12VDC	367.4kΩ	179.6kΩ	113.6kΩ	79.9kΩ	59.5kΩ	45.8kΩ	35.9kΩ	28.5kΩ	22.7kΩ	18.1kΩ
15VDC	661.5kΩ	231.3kΩ	134.0kΩ	91.0kΩ	66.8kΩ	51.3kΩ	40.4kΩ	32.5kΩ	26.4kΩ	21.5kΩ

Remote on/off



The module is enabled by positive logic. Adding a switch function between the remote control pin 6 and -Vin pin 2 will facilitate this (open drain or open collector type)

EFT surge filter



Model	C1	D1
JTD2024	330µF, 100V	TVS, 58V, 3kW
JTD2048	330µF, 100V	TVS, 120V, 3kW

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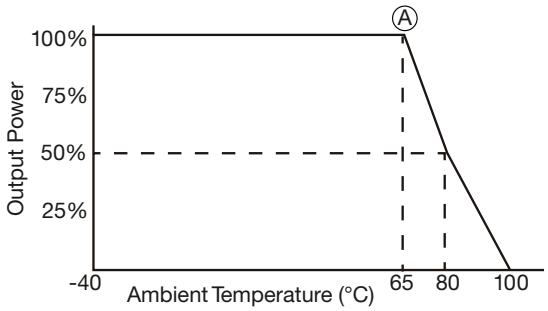
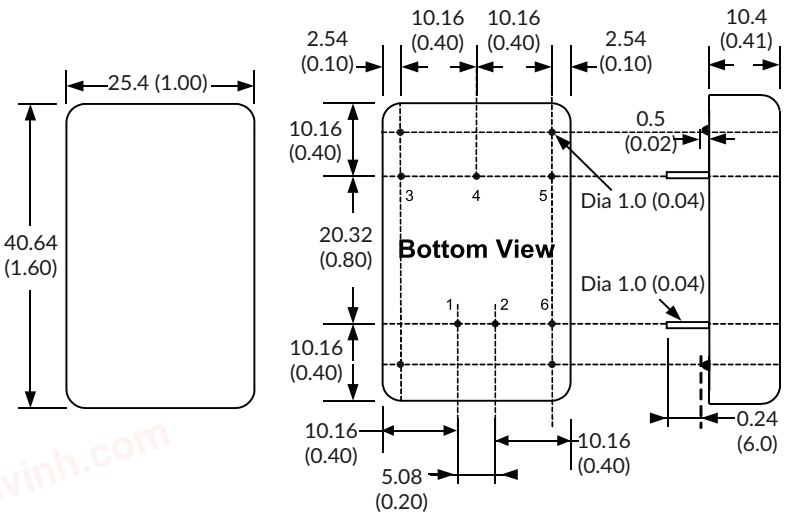
Derating curve



Note: Point Ⓐ is 60°C for dual 5VDC output models

Mechanical details



Pin connections		
Pin	**Single**	**Dual**
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	Common
5	-Vout	-Vout
6	Remote On/Off	Remote On/Off

Notes:

1. All dimensions are in mm (inches)
2. Weight: 19.0 (0.042) g(lb) approx.
3. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
4. Pin pitch tolerance: ±0.35 (±0.014)
5. Case tolerance: ±0.5 (±0.02)