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JTL60 series

XP Power

60W Convection cooled

DC-DC converters

The JTL60 series is housed in a 50.8 x 25.4 x 11.5mm (2" x 1" x 0.45") metal case with a power density of 66W/in³. Featuring a 4:1 input voltage range of 9 to 36VDC or 18 to 75VDC with both single and dual outputs, singles have 5, 12 or 15VDC with duals having either ±12 or ±15VDC. Single output models are adjustable +/-10% with a trim resistor.

The JTL60 is tightly regulated and provides 1.6kVDC isolation between input and output. Operating temperature range is from -40°C to +85°C, with derating above +45°C. An optional heatsink (suffix -HK) extends the full power operating temperature when fitted. Remote on/off is standard.



Features

- Regulated single outputs 5 to 15VDC
- Regulated dual outputs ±12 & ±15VDC
- 4:1 input range
- 50.8 x 25.4mm (2" x 1") footprint, 11.5mm (0.45") profile
- Output trim ±10% (single O/P)
- 1.6kVDC isolation
- Remote On/Off
- -40°C to +85°C operating temperature
- Full power to +45°C
- 3 year warranty

Applications

Autonomous equipment

Industrial electronics & robotics

Technology

Dimensions

50.8 x 25.4 x 11.5mm (2.0" x 1.0" x 0.45")

Documentation

For further information click the link or scan the code

→ xppower.com

Models & ratings

Model number[3]	Input voltage	Output voltage	Output current	Efficiency	OVP setting	Input current[1]		Maximum capacitive load[2]
						No load	Full load	
JTL6024S05	9-36VDC	5.0VDC	12.0A	92%	6.2V	25mA	2705mA	30,000µF
JTL6024S12		12.0VDC	5.0A	92%	15.0V	25mA	2705mA	5850µF
JTL6024S15		15.0VDC	4.0A	93%	20.0V	25mA	2690mA	3900µF
JTL6024D12		±12.0VDC	±2.5A	91%	±15.0V	40mA	2750mA	±3900µF
JTL6024D15		±15.0VDC	±2.0A	91%	±20.0V	50mA	2730mA	±2400µF

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Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. Add suffix '-HK' for optional heatsink

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Models & ratings

Model number[3]	Input voltage	Output voltage	Output current	Efficiency	OVP setting	Input current[1]		Maximum capacitive load[2]
						No load	Full load	
JTL6048S05	18-75VDC	5.0VDC	12.0A	93%	6.2V	25mA	1345mA	30,000µF
JTL6048S12		12.0VDC	5.0A	92%	15.0V	25mA	1350mA	5850µF
JTL6048S15		15.0VDC	4.0A	93%	20.0V	25mA	1345mA	3900µF
JTL6048D12		±12.0VDC	±2.5A	91%	±15.0V	40mA	1375mA	±3900µF
JTL6048D15		±15.0VDC	±2.0A	91%	±20.0V	50mA	1375mA	±2400µF

Notes:

1. Input currents measured at nominal input voltage.
2. Maximum capacitive load is per output.
3. Add suffix '-HK' for optional heatsink

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		36	VDC	24VDC nominal
	18		75		48VDC nominal
Input reflected ripple current		20		mA/pk-pk	Through 11µH inductor and 22µF capacitor
Input surge			50	VDC	24VDC models (for 100ms)
			100		48VDC models (for 100ms)

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	5.0		30	VDC	See models and ratings table
Output voltage trim	±10			%	See application note
Initial set accuracy			±1	%	At full load
Minimum load	0			%	No minimum load required
Line regulation			±0.5	%	From minimum to maximum input at full load
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		60		ms	
Ripple & noise			100	mV pk-pk	Measured using 20MHz bandwidth and 1.0µF ceramic capacitor
Short circuit protection	Continuous hiccup mode, with auto recovery				
Temperature coefficient			0.02	%/ ˚C	
Overload protection	120		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)				
Overvoltage protection	See models & ratings table				
Maximum capacitive load	See models & ratings table				

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General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency		93		%	See models & ratings table
Isolation: input to output	1600			VDC	Functional
Isolation: input to case	1600			VDC	
Isolation: output to case	1600			VDC	
Isolation capacitance		2200		pF	
Isolation resistance	10^9				
Switching frequency		225		kHz	
Power density			4.0 (66.0)	W/cm³ (W/in³)	
Mean time between failure	210			khrs	MIL-HDBK-217F, +25°C GB
Weight		45.0 (0.1)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+85	°C	See derating curve
Storage temperature	-55		+125	°C	
Case temperature			+115	°C	
Cooling	Natural convection				
Humidity			95	%	RH, non condensing

Safety approvals

Safety agency	Standard	Notes & conditions
UL	UL62368-1 & CAN/CSA C22.2 No. 62368-1-14	Information technology
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

Emissions - EMC

Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class A	See application note
Radiated	EN55032	Class A	

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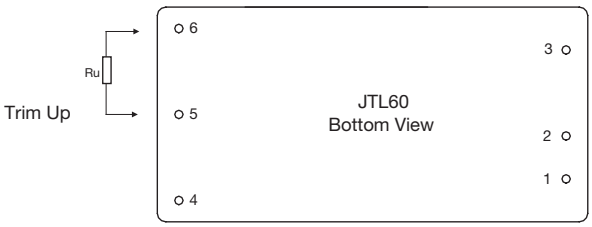
Immunity - EMC

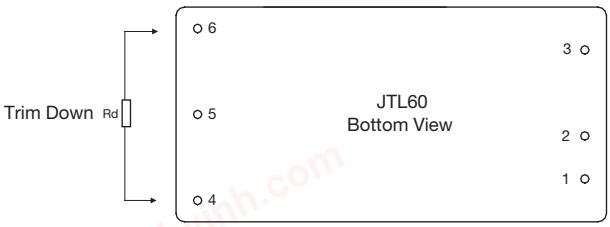
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	±6kV/±8kV	A	Contact discharge/air discharge
Radiated immunity	EN61000-4-3	20Vrms	A	
EFT/burst	EN61000-4-4	2kV	A	External input filter required, see applications note
Surge	EN61000-4-5	2kV	A	External input filter required, see applications note
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)

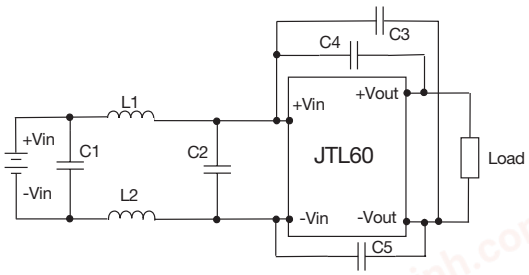
Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx0.99	Voutx0.98	Voutx0.97	Voutx0.96	Voutx0.95	Voutx0.94	Voutx0.93	Voutx0.92	Voutx0.91	Voutx0.90
5V	151.459kΩ	133.906kΩ	83.261kΩ	59.010kΩ	44.786kΩ	35.435kΩ	28.819kΩ	23.892kΩ	20.079kΩ	17.042kΩ
12V	638.700kΩ	309.724kΩ	198.291kΩ	142.236kΩ	108.494kΩ	85.954kΩ	69.831kΩ	57.727kΩ	48.305kΩ	40.763kΩ
15V	842.916kΩ	431.715kΩ	283.823kΩ	207.666kΩ	161.238kΩ	129.974kΩ	107.488kΩ	90.539kΩ	77.305kΩ	66.685kΩ

Trim up resistor values (Ru)

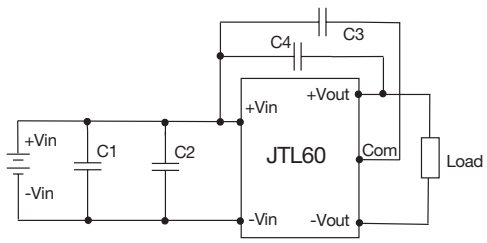
Model	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
	Voutx1.01	Voutx1.02	Voutx1.03	Voutx1.04	Voutx1.05	Voutx1.06	Voutx1.07	Voutx1.08	Voutx1.09	Voutx1.10
5V	256.848kΩ	37.895kΩ	23.952kΩ	16.708kΩ	12.271kΩ	9.273kΩ	7.113kΩ	5.482kΩ	4.107kΩ	3.183kΩ
12V	215.446kΩ	97.176kΩ	58.401kΩ	39.133kΩ	27.610kΩ	19.944kΩ	14.476kΩ	10.379kΩ	7.195kΩ	4.649kΩ
15V	233.526kΩ	99.391kΩ	58.514kΩ	38.725kΩ	27.052kΩ	19.352kΩ	13.891kΩ	9.817kΩ	6.661kΩ	4.144kΩ

EMI filter

Single output versions



Dual output versions



Single	C1	L1/L2	C2	C3	C4	C5
24V	1812, 4.7µF, 50V	12µH	1812, 4.7µF, 50V	1206, 470pF, 2kV	1206, 1000pF, 2kV	1206, 1000 pF, 2kV
48V	1812, 5µF, 100V	12µH	1812, 5µF, 50V	1206, 470pF, 2kV	1206, 1000pF, 2kV	1206, 1000 pF, 2kV

Dual	C1	C2	C3	C4
24V	1812, 4.7µF, 50V	1812, 7µF, 50V	1206, 2200pF, 2kV	1206, 1500pF, 2kV
48V	1812, 5µF, 100V	1812, 5µF, 50V	1206, 2200pF, 2kV	1206, 1500pF, 2kV

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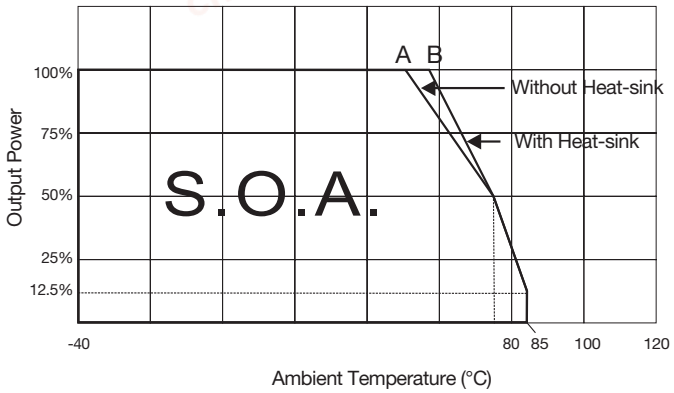
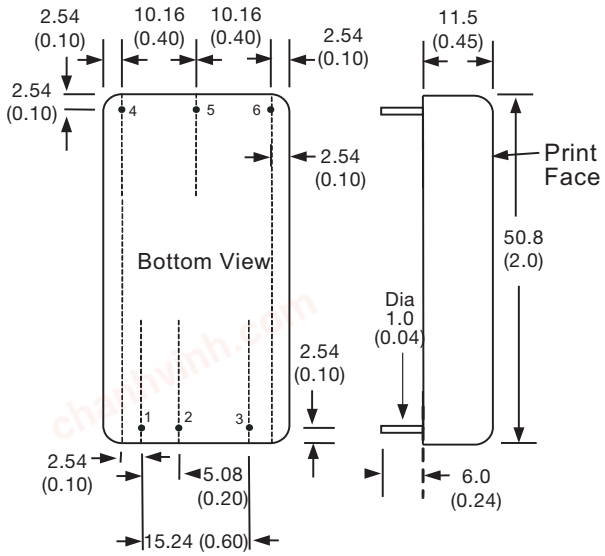
Application notes

Derating curve

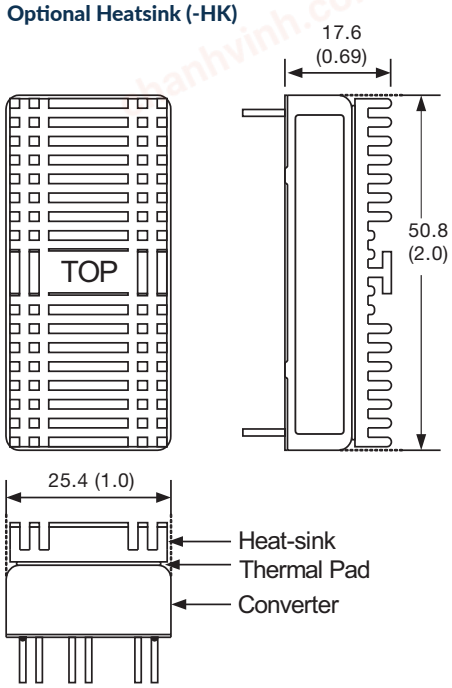


A = 45°C for JTL6024S05 and +50°C for other models
B = 52°C for JTL6024S05-HK and +57°C for other models

Mechanical details



Optional Heatsink (-HK)



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

Notes:

1. All dimensions are in mm (inches).
2. Pin diameter: 1.0 ±0.05 (0.04 ±0.002)
3. Pin pitch tolerance: ±0.35 (±0.014)
4. Case tolerance: ±0.5 (±0.02)
5. Stand-off tolerance ±0.1 (±0.004)