

**40W** Conduction cooled

DC-DC converters

The JTL40 series is housed in a 50.8 x 50.8 x 10.2mm (2" x 2" x 0.4") metal case with a power density of 1.52W/cm<sup>3</sup>. Featuring a 4:1 input voltage range of 9 to 36VDC or 18 to 75VDC with both single and dual outputs, singles have 3.3, 5, 12 or 15VDC with duals having either  $\pm 12$  or  $\pm 15$ VDC. Single output models are adjustable  $\pm 10\%$  with a trim resistor.

The JTL40 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 (-HK) extends the full power operating temperature when fitted. Remote on/off is standard.



## Features

- ▶ Regulated single outputs 5 to 15VDC
- ▶ Regulated dual outputs  $\pm 12$  &  $\pm 15$ VDC
- ▶ 4:1 input range
- ▶ 50.8 x 50.8mm (2" x 2") Footprint, 10.2mm profile
- ▶ Output trim  $\pm 10\%$  (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 50.8 x 10.2mm (1.00" x 2.00" x 0.40")

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## Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		Maximum capacitive load
					No load	Full load	
JTL4024S3V3	9-36VDC	3.3VDC	10.00A	90%	80mA	1600mA	25000 $\mu$ F
JTL4024S05		5.0VDC	8.00A	91%	100mA	1900mA	13000 $\mu$ F
JTL4024S12		12.0VDC	3.35A	91%	50mA	1930mA	2300 $\mu$ F
JTL4024S15		15.0VDC	2.65A	91%	50mA	1910mA	1500 $\mu$ F
JTL4024D12		$\pm 12.0$ VDC	$\pm 1.65$ A	91%	60mA	1920mA	$\pm 1200$ $\mu$ F
JTL4024D15		$\pm 15.0$ VDC	$\pm 1.35$ A	92%	60mA	1960mA	$\pm 750$ $\mu$ F

Continued on page 2

### Notes:

1. Input current specified at nominal 24V or 48V input.
2. Cross regulation for duals is  $\pm 5\%$  when one output is at 100% and the other is varied between 25% and 100%.
3. Measured with 1 $\mu$ F ceramic capacitor across output rails.
4. A 220 $\mu$ F/250V capacitor across the input is required in order to meet EN61000-4-4 and EN61000-4-5.
5. Efficiency is measured at full load and nominal input at 25°C.
6. For heatsink option, add '-HK' to the end of the part number.

## Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency	Input current <sup>(1)</sup>		Maximum capacitive load
					No load	Full load	
JTL4048S3V3	18-75VDC	3.3VDC	10.00A	89%	60mA	800mA	25000μF
JTL4048S05		5.0VDC	8.00A	92%	60mA	940mA	13000μF
JTL4048S12		12.0VDC	3.35A	90%	30mA	970mA	2300μF
JTL4048S15		15.0VDC	2.65A	91%	30mA	940mA	1500μF
JTL4048D12		±12.0VDC	±1.65A	90%	30mA	950mA	±1200μF
JTL4048D15		±15.0VDC	±1.35A	90%	30mA	970mA	±750μF

### Notes:

1. Input current specified at nominal 24V or 48V input.
2. Cross regulation for duals is ±5% when one output is at 100% and the other is varied between 25% and 100%.
3. Measured with 1μF ceramic capacitor across output rails.
4. A 220μF/250V capacitor across the input is required in order to meet EN61000-4-4 and EN61000-4-5.
5. Efficiency is measured at full load and nominal input at 25°C.
6. For heatsink option, add '-HK' to the end of the part number.

## General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See models & ratings table				
Isolation: input to output	1600			VDC	
Isolation: input to case	1600			VDC	
Isolation: output to case	1600			VDC	
Isolation capacitance			2500	pF	
Switching frequency		270		kHz	
Power density		409.67 (25.0)		W/cm³ (W/in³)	
Mean time between failure		150		khls	MIL-HDBK-217F, +25°C GB

## Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9		36	VDC	24VDC nominal
	18		75		48VDC nominal
Input current	See models & ratings table				
Input reflected ripple current		20		mA/pk-pk	12μH inductor, 5Hz to 20MHz
Input reverse voltage protection	None				
Input surge		50		VDC	24VDC models (for 1000ms)
		100			48VDC models (for 1000ms)
Input filter	Pi network				
Undervoltage lockout	On at 8.6VDC Off at 7.9VDC				24VDC models
	On at 17.8VDC Off at 16VDC				48VDC models

## Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	See models & ratings table				
Output voltage trim		±10		%	Single outputs models only
Minimum load	0			%	No minimum load required
Line regulation			±0.5	%	
Load regulation			±0.5	%	Single output
			±1		Dual outputs
Setpoint accuracy		±1		%	
Cross regulation		±5		%	Dual outputs
Transient response			3	%	Deviation, recovery to within 1% in <250µs for a 25% load change
Start up time		25		ms	
Ripple & noise			50	mV pk-pk	For 3V3 & 5VDC models
			75		Other models
			150		Dual outputs
Short circuit protection	Trip & restart (hiccup mode), auto recovery				
Temperature coefficient		0.02		%/ °C	
Overload protection	115		130	%	
Remote on/off	On = Logic High (>3.0VDC) or Open				
	Off = Logic Low (<1.2VDC) or short pin 2 to 3				
Overload protection		>130		%	Full load
Overvoltage protection		3.9		VDC	3.3VDC models
		6.2			5VDC models
		15			12VDC models
		18			15VDC models
		±15			±12VDC models
		±18			±15VDC models
Max capacitive load	See models & ratings table				

## Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+85	°C	
Case temperature			+105	°C	
Cooling	Convection cooled				
Operating altitude	5		95	%	RH, non condensing

## Safety approvals

Safety agency	Standard	Notes & conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

## Emissions - EMC

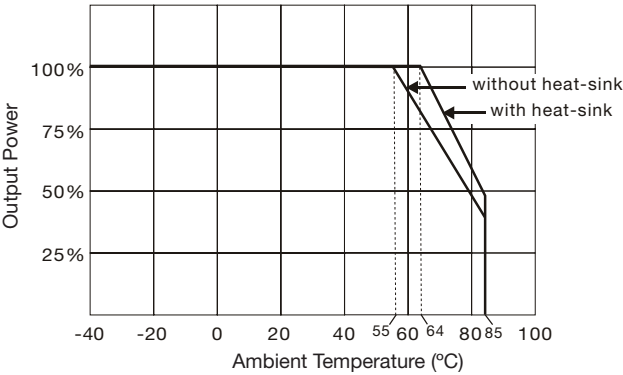
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55022	Class A	With no external components
Radiated	EN55022	Class A	

Immunity - EMC

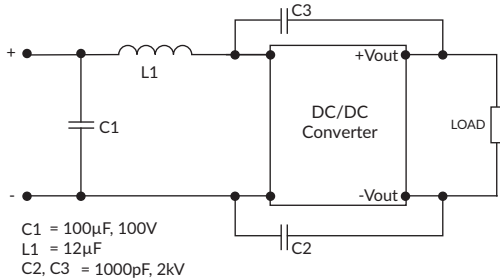
Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	3	A	
EFT/Burst	EN61000-4-4	3	A	A 220μF/250V capacitor across the input is required in order to meet EN61000-4-4 and EN61000-4-5.
Surge	EN61000-4-5	2	A	
Conducted immunity	EN61000-4-6	3Vrms	A	
Magnetic fields	EN61000-4-8	1A/m	A	

Application notes

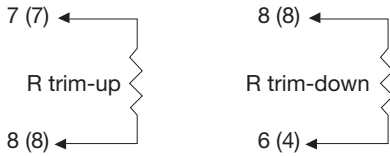
Derating curve



Input filter

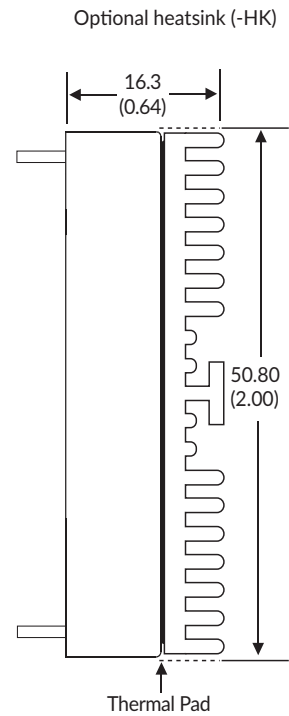


External Output Trim



Output can be externally trimmed using this method. ( ) for dual output trim.

## Mechanical details



Pin connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote On/Off	Remote On/Off
4	-Sense	+Vout
5	+Sense	Com
6	+Vout	Com
7	-Vout	-Vout
8	Trim	Trim

1. All dimensions are in mm (inches).
2. Weight: 30g (0.07lbs) approx
3. Pin diameter:  $1.0 \pm 0.05$  ( $0.04 \pm 0.002$ )

- XP** Power