

# 4/6 Watts

## JTC Series



- 4:1 Input Range
- DIP-24 Metal Package
- Operating Temperature  $-40\text{ }^{\circ}\text{C}$  to  $+100\text{ }^{\circ}\text{C}$
- Single & Dual Outputs
- Continuous Short Circuit Protection
- 1500 VDC Isolation, 3500 VDC Option
- 3 Year Warranty

### Specification

#### Input

Input Voltage Range	<ul style="list-style-type: none"> <li>• 24 V (9-36 VDC)</li> <li>• 48 V (18-72 VDC)</li> </ul>
Input Current	<ul style="list-style-type: none"> <li>• See table</li> </ul>
Input Filter	<ul style="list-style-type: none"> <li>• Pi network</li> </ul>
Input Reflected Ripple	<ul style="list-style-type: none"> <li>• 35 mA pk-pk through 12 <math>\mu\text{H}</math> inductor</li> </ul>
Input Surge	<ul style="list-style-type: none"> <li>• 24 V models 40 VDC for 100 ms</li> <li>• 48 V models 80 VDC for 100 ms</li> </ul>
Undervoltage Lockout	<ul style="list-style-type: none"> <li>• None</li> </ul>
Input Reverse Voltage Protection	<ul style="list-style-type: none"> <li>• None</li> </ul>

#### Output

Output Voltage	<ul style="list-style-type: none"> <li>• See table</li> </ul>
Output Voltage Balance	<ul style="list-style-type: none"> <li>• <math>\pm 1\%</math> max, dual output models</li> </ul>
Minimum Load	<ul style="list-style-type: none"> <li>• No minimum load required</li> </ul>
Initial Set Accuracy	<ul style="list-style-type: none"> <li>• <math>\pm 1\%</math> max</li> </ul>
Start Up Delay	<ul style="list-style-type: none"> <li>• <math>&lt; 800</math> ms</li> </ul>
Start Up Rise Time	<ul style="list-style-type: none"> <li>• <math>&lt; 10</math> ms</li> </ul>
Line Regulation	<ul style="list-style-type: none"> <li>• <math>\pm 0.5\%</math> max</li> </ul>
Load Regulation	<ul style="list-style-type: none"> <li>• <math>\pm 0.5\%</math> max, <math>\pm 1.5\%</math> max for 3.3 V and <math>\pm 3.3</math> V models</li> </ul>
Cross Regulation	<ul style="list-style-type: none"> <li>• <math>\pm 5\%</math> on dual output models (see note 4)</li> </ul>
Transient Response	<ul style="list-style-type: none"> <li>• <math>&lt; 1.5\%</math> max deviation, recovery to within 1% in 200 <math>\mu\text{s}</math> for a 50% load change</li> </ul>
Ripple & Noise	<ul style="list-style-type: none"> <li>• 60 mV pk-pk for 3.3 V to 15 V models, 100 mV pk-pk for 18 V models, 150 mV pk-pk for 24 V models, 20 MHz bandwidth</li> </ul>
Short Circuit Protection	<ul style="list-style-type: none"> <li>• Trip &amp; restart (Hiccup mode), auto recovery</li> </ul>
Maximum Capacitive Load	<ul style="list-style-type: none"> <li>• See tables</li> </ul>
Temperature Coefficient	<ul style="list-style-type: none"> <li>• <math>\pm 0.02/^{\circ}\text{C}</math> max</li> </ul>

#### General

Efficiency	<ul style="list-style-type: none"> <li>• See tables</li> </ul>
Isolation Voltage	<ul style="list-style-type: none"> <li>• 1500 VDC Input to Output, for optional high isolation version 3500 VDC input to output add suffix '-H' to model number</li> <li>• 1000 VDC Input to Case</li> <li>• 1000 VDC Output to Case</li> </ul>
Isolation Resistance	<ul style="list-style-type: none"> <li>• <math>10^9\Omega</math></li> </ul>
Switching Frequency	<ul style="list-style-type: none"> <li>• 266 kHz typical</li> </ul>
Power Density	<ul style="list-style-type: none"> <li>• JTC04: 10 W/in<sup>3</sup>, JTC06: 15 W/in<sup>3</sup></li> </ul>
MTBF	<ul style="list-style-type: none"> <li>• <math>&gt; 1.0</math> Mhrs to MIL-HDBK-217F at 25 <math>^{\circ}\text{C}</math>, GB</li> </ul>

#### Environmental

Operating Temperature	<ul style="list-style-type: none"> <li>• <math>-40\text{ }^{\circ}\text{C}</math> to <math>+100\text{ }^{\circ}\text{C}</math>, derate from 100% load at <math>+85\text{ }^{\circ}\text{C}</math> to no load at <math>+100\text{ }^{\circ}\text{C}</math></li> </ul>
Case Temperature	<ul style="list-style-type: none"> <li>• <math>+100\text{ }^{\circ}\text{C}</math> max</li> </ul>
Storage Temperature	<ul style="list-style-type: none"> <li>• <math>-40\text{ }^{\circ}\text{C}</math> to <math>+125\text{ }^{\circ}\text{C}</math></li> </ul>
Humidity	<ul style="list-style-type: none"> <li>• Up to 95%, non-condensing</li> </ul>
Cooling	<ul style="list-style-type: none"> <li>• Natural convection</li> </ul>

#### EMC

Emissions	<ul style="list-style-type: none"> <li>• EN55022 class A conducted with external components - see application note</li> </ul>
ESD Immunity	<ul style="list-style-type: none"> <li>• EN61000-4-2, 8 kV air discharge Perf Criteria A, 4 kV contact discharge Perf Criteria A</li> </ul>
EFT/Burst	<ul style="list-style-type: none"> <li>• EN61000-4-4, level 1, Perf Criteria A</li> </ul>
Conducted Immunity	<ul style="list-style-type: none"> <li>• EN61000-4-6, 3 Vrms, Perf Criteria A</li> </ul>
Magnetic Fields	<ul style="list-style-type: none"> <li>• EN61000-4-8, 1 A/m, Perf Criteria A</li> </ul>

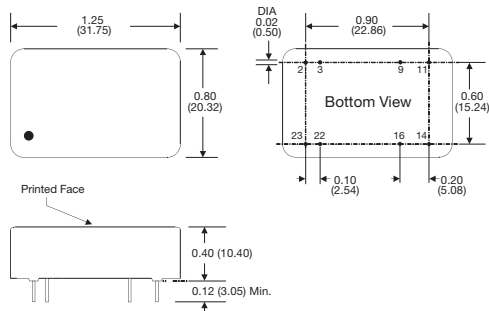
Input Voltage	Output Voltage	Output Current	Input Current <sup>(2)</sup>		Maximum Capacitive Load <sup>(3)</sup>	Efficiency	Model Number <sup>(1)</sup>
			No Load	Full Load			
9-36 V	3.3 V	1200 mA	12 mA	220 mA	1000 µF	75%	JTC0424S3V3
	5.0 V	800 mA	15 mA	211 mA	1000 µF	79%	JTC0424S05
	9.0 V	445 mA	12 mA	201 mA	220 µF	83%	JTC0424S09
	12.0 V	333 mA	15 mA	203 mA	100 µF	82%	JTC0424S12
	15.0 V	267 mA	15 mA	203 mA	220 µF	82%	JTC0424S15
	18.0 V	223 mA	15 mA	203 mA	10 µF	82%	JTC0424S18
	24.0 V	167 mA	18 mA	203 mA	220 µF	82%	JTC0424S24
	±3.3 V	±606 mA	12 mA	222 mA	±470 µF	75%	JTC0424D03
	±5.0 V	±400 mA	15 mA	211 mA	±100 µF	79%	JTC0424D05
	±9.0 V	±222 mA	18 mA	208 mA	±47 µF	80%	JTC0424D09
	±12.0 V	±167 mA	15 mA	203 mA	±47 µF	82%	JTC0424D12
	±15.0 V	±134 mA	20 mA	208 mA	±10 µF	80%	JTC0424D15
±24.0 V	±84 mA	18 mA	208 mA	±22 µF	80%	JTC0424D24	
18-72 V	3.3 V	1200 mA	10 mA	110 mA	1000 µF	76%	JTC0448S3V3
	5.0 V	800 mA	8 mA	106 mA	470 µF	79%	JTC0448S05
	9.0 V	445 mA	10 mA	100 mA	330 µF	83%	JTC0448S09
	12.0 V	333 mA	12 mA	104 mA	1000 µF	80%	JTC0448S12
	15.0 V	267 mA	10 mA	99 mA	47 µF	84%	JTC0448S15
	18.0 V	223 mA	10 mA	99 mA	10 µF	84%	JTC0448S18
	24.0 V	167 mA	15 mA	102 mA	22 µF	82%	JTC0448S24
	±3.3 V	±606 mA	10 mA	107 mA	±680 µF	78%	JTC0448D03
	±5.0 V	±400 mA	15 mA	106 mA	±330 µF	79%	JTC0448D05
	±9.0 V	±222 mA	15 mA	104 mA	±47 µF	80%	JTC0448D09
	±12.0 V	±167 mA	12 mA	102 mA	±100 µF	82%	JTC0448D12
	±15.0 V	±134 mA	15 mA	104 mA	±100 µF	80%	JTC0448D15
±24.0 V	±84 mA	15 mA	104 mA	±10 µF	80%	JTC0448D24	

Input Voltage	Output Voltage	Output Current	Input Current <sup>(2)</sup>		Maximum Capacitive Load <sup>(3)</sup>	Efficiency	Model Number <sup>(1)</sup>
			No Load	Full Load			
9-36 V	3.3 V	1400 mA	12 mA	253 mA	1000 µF	76%	JTC0624S3V3
	5.0 V	1200 mA	10 mA	312 mA	1000 µF	80%	JTC0624S05
	9.0 V	667 mA	12 mA	301 mA	220 µF	83%	JTC0624S09
	12.0 V	500 mA	15 mA	301 mA	1000 µF	83%	JTC0624S12
	15.0 V	400 mA	18 mA	301 mA	470 µF	83%	JTC0624S15
	18.0 V	334 mA	15 mA	301 mA	47 µF	83%	JTC0624S18
	24.0 V	250 mA	18 mA	305 mA	47 µF	82%	JTC0624S24
	±3.3 V	±909 mA	12 mA	338 mA	±470 µF	74%	JTC0624D03
	±5.0 V	±600 mA	10 mA	312 mA	±680 µF	80%	JTC0624D05
	±9.0 V	±333 mA	18 mA	309 mA	±100 µF	81%	JTC0624D09
	±12.0 V	±250 mA	20 mA	301 mA	±330 µF	83%	JTC0624D12
	±15.0 V	±200 mA	22 mA	305 mA	±100 µF	82%	JTC0624D15
±24.0 V	±125 mA	18 mA	312 mA	±22 µF	80%	JTC0624D24	
18-72 V	3.3 V	1400 mA	15 mA	126 mA	1000 µF	76%	JTC0648S3V3
	5.0 V	1200 mA	8 mA	156 mA	1000 µF	80%	JTC0648S05
	9.0 V	667 mA	10 mA	153 mA	220 µF	82%	JTC0648S09
	12.0 V	500 mA	10 mA	151 mA	1000 µF	83%	JTC0648S12
	15.0 V	400 mA	10 mA	149 mA	100 µF	84%	JTC0648S15
	18.0 V	334 mA	10 mA	151 mA	10 µF	83%	JTC0648S18
	24.0 V	250 mA	12 mA	151 mA	22 µF	83%	JTC0648S24
	±3.3 V	±909 mA	10 mA	162 mA	±330 µF	77%	JTC0648D03
	±5.0 V	±600 mA	10 mA	158 mA	±470 µF	79%	JTC0648D05
	±9.0 V	±333 mA	15 mA	154 mA	±100 µF	81%	JTC0648D09
	±12.0 V	±250 mA	10 mA	152 mA	±100 µF	82%	JTC0648D12
	±15.0 V	±200 mA	15 mA	149 mA	±47 µF	84%	JTC0648D15
±24.0 V	±125 mA	15 mA	154 mA	±22 µF	81%	JTC0648D24	

**Notes**

- For optional 3500 VDC isolation add suffix '-H' to model number. For optional plastic case, add suffix '-P' to model number. For both options add suffix '-HP' to model number.
- Input current measured at nominal input voltage.
- Maximum capacitive load is per output.
- Cross regulation for duals is ±5% when one output is at 100% and the other is varied between 25% and 100%.

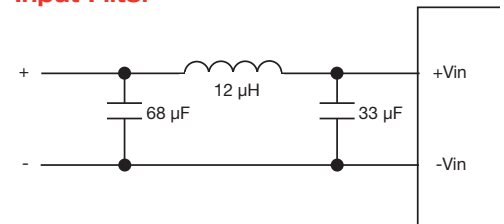
**Mechanical Details and Application Note**



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

- All dimensions are in inches (mm)
- Weight: 0.04 lbs (17 g) approx.
- Pin diameter: 0.02 ±0.002 (0.5 ±0.005)
- Pin pitch tolerance: ±0.014 (±0.35)
- Case tolerance: ±0.02 (±0.5)

**Input Filter**



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