



THE DATASHEET OF JCK6024S05



60 Watts

JCK Series



- 2:1 Input Range
- Very High Power Density
- High Efficiency – Up to 92%
- Remote On/Off
- 1600 VDC Isolation
- OCP, OVP & OTP Functions
- 3 Year Warranty

Specification

Input

Input Voltage Range	• 24 V (18-36 VDC), 48 V (36-75 VDC)
Input Current	• See table
Input Reflected Ripple Current	• 20 mA pk-pk through 12 μH inductor, 5 Hz to 20 MHz
Undervoltage Lockout	• 24 V models: ON 17.8 V, OFF 16 V typical • 48 V models: ON 33.5 V, OFF 30.5 V typical
Input Surge	• 24 V models 50 VDC for 100 ms • 48 V models 100 VDC for 100 ms

Output

Output Voltage	• See table
Output Voltage Trim	• $\pm 10\%$
Minimum Load	• No minimum load required
Line Regulation	• $\pm 0.5\%$ max
Load Regulation	• $\pm 0.5\%$ max
Setpoint Accuracy	• $\pm 1\%$
Start Up Time	• 30 ms typical
Ripple & Noise	• 75 mV for 3V3 +5 V models, 100 mV for other models (see note 2)
Transient Response	• 3% max deviation, recovery to within 1% in <250 μs for a 25% load change
Temperature Coefficient	• 0.02%/°C
Overvoltage Protection	• 3.3 V models: 3.9 V typical • 5 V models: 6.2 V typical • 12 V models: 15 V typical • 15 V models: 18 V typical
Overload Protection	• 115-130% of output current
Short Circuit Protection	• Trip & restart (Hiccup mode), auto recovery
Remote On/Off	• On = Logic High (>3.0) or Open • Off = Logic Low (<1.2 V) or short pin 2 to 3

General

Efficiency	• See table
Isolation	• 1600 VDC Input to Output • 1600 VDC Input to Case • 1600 VDC Output to Case
Isolation Capacitance	• 2000 pF typical
Switching Frequency	• 270 kHz typical
Power Density	• 37.5 W/in³
MTBF	• >110 kHrs min to MIL-HDBK-217F at 25 °C, GB

Environmental

Operating Temperature	• -40 °C to +85 °C, see derating curve
Case Temperature	• +105 °C max
Cooling	• Natural convection
Operating Humidity	• 5-95% RH, non-condensing
Storage Temperature	• -40 °C to +125 °C

EMC

Emissions	• EN55022 class A conducted & radiated with no external components
ESD Immunity	• EN61000-4-2, 4 kV contact discharge, Perf Criteria B
Radiated Immunity	• EN61000-4-3, 3 V/m, Perf Criteria A
EFT/Burst	• EN61000-4-4, level 1, Perf Criteria A*
Surge	• EN61000-4-5, level 1, Perf Criteria A
Conducted Immunity	• EN61000-4-6, 3 Vrms, Perf Criteria A
Magnetic Field	• EN61000-4-8, 1 A/m, Perf Criteria A

Safety

Safety Approvals	• CE (Meets all applicable directives), UKCA (Meets all applicable legislation)
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*External input capacitor required, 220 μ F/100 V.

Models and Ratings

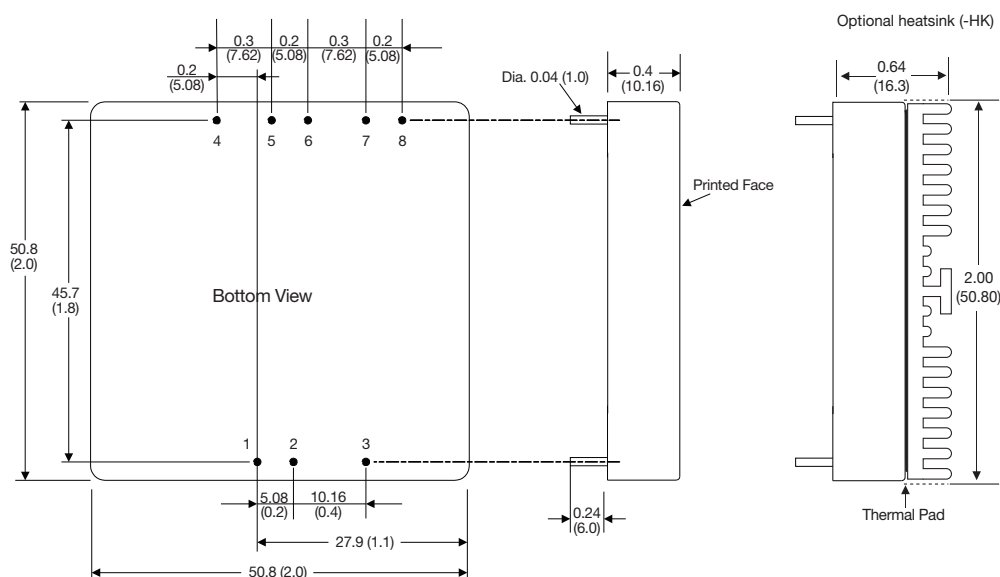
JCK60 **XP**

Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Maximum Capacitive Load	Efficiency	Model Number
			No Load	Full Load			
18-36 VDC	3.3 V	14.0 A	80 mA	2151 mA	36000 μ F	91%	JCK6024S3V3
	5.0 V	12.0 A	100 mA	2762 mA	20400 μ F	92%	JCK6024S05
	12.0 V	5.0 A	40 mA	2793 mA	3550 μ F	91%	JCK6024S12
	15.0 V	4.0 A	40 mA	2793 mA	2300 μ F	91%	JCK6024S15
36-75 VDC	3.3 V	14.0 A	50 mA	1075 mA	36000 μ F	91%	JCK6048S3V3
	5.0 V	12.0 A	60 mA	1389 mA	20400 μ F	92%	JCK6048S05
	12.0 V	5.0 A	40 mA	1397 mA	3550 μ F	91%	JCK6048S12
	15.0 V	4.0 A	40 mA	1397 mA	2300 μ F	91%	JCK6048S15

Notes

1. Input current specified at nominal input.
2. Measured with 1 μ F ceramic capacitor in parallel with a 10 μ F electrolytic across output rails and 20 MHz bandwidth.
3. For heatsink option, add '-HK' to the end of the part number

Mechanical Details



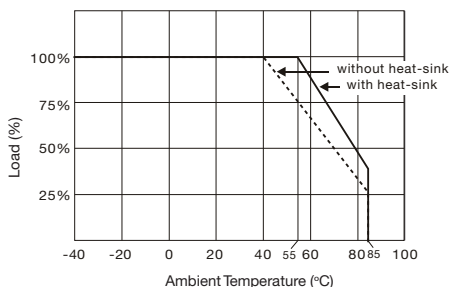
PIN CONNECTIONS	
Pin	Single
1	+Vin
2	-Vin
3	Remote On/Off
4	-Sense
5	+Sense
6	+Vout
7	-Vout
8	Trim

Notes

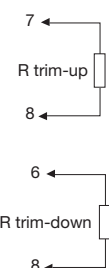
1. All dimensions are in inches (mm).
2. Weight: 0.154 lbs (70 g) approx
3. Pin diameter: 0.04 $\pm$ 0.002 (1.0 $\pm$ 0.05)
4. Pin pitch tolerance: $\pm$ 0.014 ($\pm$ 0.35)
5. Case tolerance: $\pm$ 0.02 ($\pm$ 0.5)

Application Notes

Derating Curve



External Output Trim



$$R_{\text{trim-up}} = \frac{(R2 + R3) \times R_{\text{TU}}}{(R2 + R3) - R_{\text{TU}}} - R4 \quad \text{Where:} \quad R_{\text{TU}} = \frac{R1 \times (R2 + R3) \times K}{V_{\text{REQ}} \times R3 - (R2 + R3) \times K}$$

$$R_{\text{trim-down}} = \frac{R1 \times R_{\text{TD}}}{R1 - R_{\text{TD}}} - R4 \quad \text{Where:} \quad R_{\text{TD}} = \frac{R3 \times (V_{\text{REQ}} - K)}{K} - R2$$

Model	R1	R2	R3	R4	K
JCK60XXS3V3	8200	330	5100	24000	1.24
JCK60XXS05	5100	22	5100	15000	2.495
JCK60XXS12	7500	6200	3600	20000	2.495
JCK60XXS15	8200	6800	3000	24000	2.495

Remote Sense

If Remote Sense is not required, the +Sense and -Sense pins should be locally connected to +Vout and -Vout respectively. Remote sense can compensate for a total volt drop of 10%. When remote sense is used, output power must not exceed rated power.

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