

15/20 Watts

JCM Series



- Very High Power Density
- 2:1 Input Range
- Operating Temperature -40°C to $+105^{\circ}\text{C}$
- Single & Dual Outputs
- 1600 VDC Isolation
- High Efficiency – up to 89%
- 3 Year Warranty

Specification

Input

Input Voltage Range	• 12 V (9-18 VDC) • 24 V (18-36 VDC) • 48 V (36-75 VDC)
Input Current	• See table
Input Filter	• Pi network
Input Reflected Ripple Current	• JCM15: 20 mA pk-pk, JCM20: 30 mA pk-pk through 12 μH inductor and 47 μF capacitor, 5 Hz to 20 MHz
Input Surge	• 12 V models: 36 VDC for 100 ms • 24 V models: 50 VDC for 100 ms • 48 V models: 100 VDC for 100 ms

Output

Output Voltage	• See table
Output Trim	• $\pm 10\%$ max on single output
Minimum Load	• No minimum load required
Initial Set Accuracy	• $\pm 1\%$ max
Start Up Delay	• 20 ms typical
Line Regulation	• JCM15: $\pm 0.2\%$ max, JCM20: $\pm 0.5\%$
Load Regulation	• $\pm 0.5\%$ max single, $\pm 1.0\%$ max dual
Cross Regulation	• $\pm 5\%$ on dual output models (see note 2)
Transient Response	• $< 3\%$ max deviation, recovery to within 1% in 250 μs for a 25% load change
Ripple & Noise	• 100 mV pk-pk, 20 MHz bandwidth, (see note 3)
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 • ± 5 V models: ± 6.2 V typical • ± 12 V models: ± 15 V typical • ± 15 V models: ± 18 V typical
Overload Protection	• 150% of full load typical
Short Circuit Protection	• Trip & restart (hiccup) with auto recovery
Maximum Capacitive Load	• See table
Temperature Coefficient	• $\pm 0.02/^{\circ}\text{C}$ max
Remote On/Off	• On > 3.0 VDC or open circuit • Off < 1.2 VDC or short circuit pins 2 & 3

General

Efficiency	• See table
Isolation	• 1600 VDC Input to Output • 1600 VDC Input to Case • 1600 VDC Output to Case
Isolation Capacitance	• JCM15: 1200 pF max, JCM20: 1000 pF max
Switching Frequency	• JCM15: 375 kHz typical, JCM20: 330 kHz typical
Power Density	• JCM15: 38.4 W/in³, JCM20: 51.3 W/in³
MTBF	• > 560 kHrs to MIL-STD-217F at 25°C, GB

Environmental

Operating Temperature	• -40°C to $+105^{\circ}\text{C}$, derate from 100% load at $+65^{\circ}\text{C}$ to no load at $+105^{\circ}\text{C}$
Case Temperature	• $+105^{\circ}\text{C}$ max
Storage Temperature	• -40°C to $+125^{\circ}\text{C}$
Humidity	• Up to 90%, non-condensing
Cooling	• Natural convection

EMC

Emissions	• EN55022 class A conducted & radiated with external components, see application note
ESD Immunity	• EN61000-4-2, 6 kV contact discharge, 8 kV air discharge, Perf Criteria A
Radiated Immunity	• EN61000-4-3, 10 V/m, Perf Criteria A
EFT/Burst	• EN61000-4-4, level 2, Perf Criteria A*
Surge	• EN61000-4-5, level 2, Perf Criteria A
Conducted Immunity	• EN61000-4-6, 10 Vrms, Perf Criteria A
Magnetic Field	• EN61000-4-8, 1 A/m, Perf Criteria A

*External input capacitor required, 220 $\mu\text{F}/100$ V.

Models and Ratings

JCM15/20 XP

Input Voltage	Output Voltage	Output Current	Input Current ⁽¹⁾		Maximum Capacitive Load	Efficiency	Model Number
			No Load	Full Load			
9-18 V	3.3 V	4.000 A	20 mA	1310 mA	1000 μ F	85%	JCM1512S3V3 [†] ^
	5.0 V	3.000 A	20 mA	1471 mA	1000 μ F	86%	JCM1512S05 [†] ^
	12.0 V	1.300 A	20 mA	1494 mA	330 μ F	88%	JCM1512S12 [†] ^
	15.0 V	1.000 A	20 mA	1420 mA	220 μ F	89%	JCM1512S15 [†] ^
	± 5.0 V	± 1.500 A	20 mA	1488 mA	± 470 μ F	85%	JCM1512D05 [†] ^
	± 12.0 V	± 0.625 A	20 mA	1420 mA	± 220 μ F	89%	JCM1512D12 [†] ^
18-36 V	± 15.0 V	± 0.500 A	20 mA	1437 mA	± 100 μ F	89%	JCM1512D15 [†] ^
	3.3 V	4.000 A	15 mA	647 mA	1000 μ F	86%	JCM1524S3V3 [†] ^
	5.0 V	3.000 A	15 mA	727 mA	1000 μ F	87%	JCM1524S05 [†] ^
	12.0 V	1.300 A	15 mA	747 mA	330 μ F	88%	JCM1524S12 [†] ^
	15.0 V	1.000 A	15 mA	710 mA	220 μ F	89%	JCM1524S15 [†] ^
	± 5.0 V	± 1.500 A	15 mA	744 mA	± 470 μ F	85%	JCM1524D05 [†] ^
36-75 V	± 12.0 V	± 0.625 A	15 mA	718 mA	± 220 μ F	88%	JCM1524D12 [†] ^
	± 15.0 V	± 0.500 A	15 mA	710 mA	± 100 μ F	89%	JCM1524D15 [†] ^
	3.3 V	4.000 A	10 mA	327 mA	1000 μ F	85%	JCM1548S3V3 [†] ^
	5.0 V	3.000 A	10 mA	368 mA	1000 μ F	86%	JCM1548S05 [†] ^
	12.0 V	1.300 A	10 mA	374 mA	330 μ F	88%	JCM1548S12 [†] ^
	15.0 V	1.000 A	10 mA	359 mA	220 μ F	88%	JCM1548S15 [†] ^
9-18 V	± 5.0 V	± 1.500 A	10 mA	377 mA	± 470 μ F	84%	JCM1548D05 [†] ^
	± 12.0 V	± 0.625 A	10 mA	363 mA	± 220 μ F	87%	JCM1548D12 [†] ^
	± 15.0 V	± 0.500 A	10 mA	359 mA	± 100 μ F	88%	JCM1548D15 [†] ^
	3.3 V	4.500 A	60 mA	1439 mA	7000 μ F	86%	JCM2012S3V3 [†] ^
	5.0 V	4.000 A	60 mA	1852 mA	5000 μ F	90%	JCM2012S05 [†] ^
	12.0 V	1.670 A	30 mA	1873 mA	850 μ F	89%	JCM2012S12 [†] ^
18-36 V	15.0 V	1.330 A	30 mA	1873 mA	700 μ F	89%	JCM2012S15 [†] ^
	± 12.0 V	± 0.833 A	30 mA	1873 mA	± 470 μ F	89%	JCM2012D12 [†] ^
	± 15.0 V	± 0.667 A	30 mA	1873 mA	± 330 μ F	89%	JCM2012D15 [†] ^
	3.3 V	4.500 A	35 mA	720 mA	7000 μ F	86%	JCM2024S3V3 [†] ^
	5.0 V	4.000 A	35 mA	936 mA	5000 μ F	89%	JCM2024S05 [†] ^
	12.0 V	1.670 A	25 mA	936 mA	850 μ F	89%	JCM2024S12 [†] ^
36-75 V	15.0 V	1.330 A	25 mA	936 mA	700 μ F	89%	JCM2024S15 [†] ^
	± 12.0 V	± 0.833 A	30 mA	936 mA	± 470 μ F	89%	JCM2024D12 [†] ^
	± 15.0 V	± 0.667 A	30 mA	936 mA	± 330 μ F	89%	JCM2024D15 [†] ^
	3.3 V	4.500 A	25 mA	360 mA	7000 μ F	86%	JCM2048S3V3 [†] ^
	5.0 V	4.000 A	25 mA	468 mA	5000 μ F	89%	JCM2048S05 [†] ^
	12.0 V	1.670 A	15 mA	468 mA	850 μ F	89%	JCM2048S12 [†] ^
36-75 V	15.0 V	1.330 A	15 mA	468 mA	700 μ F	90%	JCM2048S15 [†] ^
	± 12.0 V	± 0.833 A	20 mA	468 mA	± 470 μ F	89%	JCM2048D12 [†] ^
	± 15.0 V	± 0.667 A	20 mA	468 mA	± 330 μ F	89%	JCM2048D15 [†] ^

Notes

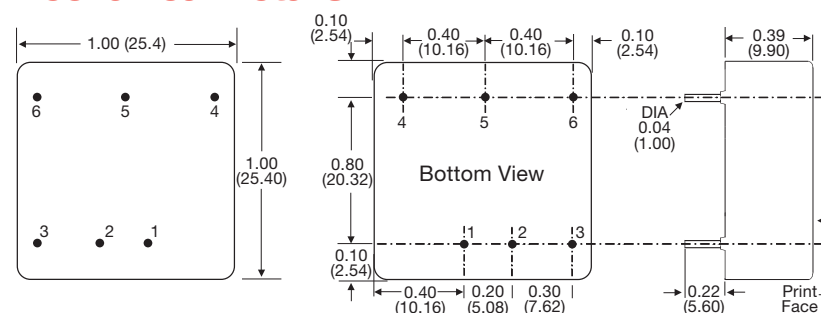
1. Input current specified at nominal input.
2. Cross regulation for duals is $\pm 5\%$ when one output is at 100% and the other is varied between 25% and 100%.

3. Measured with 1 μ F ceramic capacitor in parallel with a 10 μ F electrolytic across output rails.

[†] Available from Farnell & element14. See pages 284-290.

[^] Available from Newark. See pages 291-296

Mechanical Details



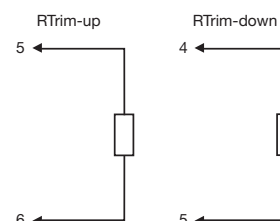
Pin Connections					
Pin	Single	Dual	Pin	Single	Dual
1	+Vin	+Vin	4	+Vout	+Vout
2	-Vin	-Vin	5	Trim	Com
3	Remote On/Off	Remote On/Off	6	-Vout	-Vout

Notes

1. All dimensions are in inches (mm).
2. Weight: 0.04 lbs (20 g) approx.
3. Pin diameter: 0.004 $\pm$ 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

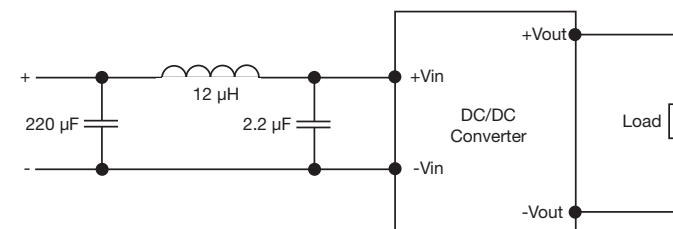
Output Trim



Trim Resistor Values		
Model Number	Trim up 10%	Trim down 10%
JCM-S3V3	8 k Ω	12 k Ω
JCM-S05	10 k Ω	5 k Ω
JCM-S12	20 k Ω	7 k Ω
JCM-S15	20 k Ω	6 k Ω

Approximate values.

Input Filter



Output can be externally trimmed by using the method above.
(Single output models only). For variable trimming, use 100 k Ω potentiometer