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JHM20 Series

DC-DC Converter

XP Power

20 Watts

- International Medical Approvals
- 4000 VAC Reinforced Insulation
- 2 x MOPP at 250 VAC Working Voltage
- Medical Approval, IEC60601-1, 3rd Edition
- 2.5 µA Patient Leakage Current
- Compact 1 x 2" Footprint
- EN55011 Level A With No External Components
- 3 Year Warranty

Dimensions:

JHM20:
2.00 x 1.00 x 0.40" (50.8 x 25.4 x 10.2 mm)

Models & Ratings

Input Voltage	Output Voltage	Output Current	Input Current		Maximum Capacitive Load[2]	Efficiency[3]	Model Number
			No Load[1]	Full Load			
9-18 V	5.0 V	4000 mA	11 mA	2552 mA	4000 µF	88%	JHM2012S05
	12.0 V	1670 mA	7 mA	2550 mA	1660 µF	88%	JHM2012S12
	15.0 V	1330 mA	7 mA	2511 mA	1330 µF	89%	JHM2012S15
	±5.0 V	±2000 mA	7 mA	2630 mA	±2000 µF	86%	JHM2012D05
	±12.0 V	±835 mA	10 mA	2537 mA	±800 µF	88%	JHM2012D12
	±15.0 V	±665 mA	11 mA	2512 mA	±660 µF	89%	JHM2012D15
18-36 V	5.0 V	4000 mA	7 mA	1251 mA	4000 µF	89%	JHM2024S05
	12.0 V	1670 mA	5 mA	1262 mA	1660 µF	88%	JHM2024S12
	15.0 V	1330 mA	6 mA	1252 mA	1330 µF	89%	JHM2024S15
	±5.0 V	±2000 mA	5 mA	1305 mA	±2000 µF	86%	JHM2024D05
	±12.0 V	±835 mA	7 mA	1256 mA	±800 µF	88%	JHM2024D12
	±15.0 V	±665 mA	8 mA	1244 mA	±660 µF	89%	JHM2024D15
36-75 V	5.0 V	4000 mA	4 mA	635 mA	4000 µF	88%	JHM2048S05
	12.0 V	1670 mA	3 mA	627 mA	1660 µF	88%	JHM2048S12
	15.0 V	1330 mA	4 mA	627 mA	1330 µF	88%	JHM2048S15
	±5.0 V	±2000 mA	4 mA	653 mA	±2000 µF	85%	JHM2048D05
	±12.0 V	±835 mA	4 mA	625 mA	±800 µF	89%	JHM2048D12
	±15.0 V	±665 mA	5 mA	626 mA	±660 µF	88%	JHM2048D15

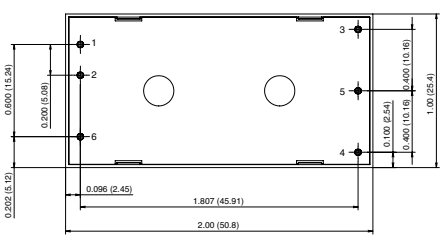
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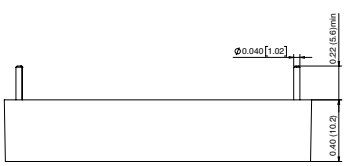
Notes

1. Input current measured at lowest input voltage.
2. Maximum capacitive load is per output.
3. Typical values.

Mechanical Details

BOTTOM VIEW





Pin Connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	Trim	-Vout
5	-Vout	Common
6	No Pin	No Pin

Notes

1. All dimensions are in inches (mm)
2. Weight: 0.066 lbs (30 g) approx.
3. Pin diameter: 0.04 ±0.002 (1.02 ±0.05)
4. Pin pitch tolerance: ±0.01 (±0.25)
5. Case tolerance: ±0.02 (±0.5)

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Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Input Voltage Range	9		18	VDC	12 V nominal
	18		36	VDC	24 V nominal
	36		75	VDC	48 V nominal
Input Current					See Models and Ratings table
Inrush Current			25	A	at Maximum Input Voltage
Input Filter	Pi type				
Undervoltage Lockout	On at >8.8 V. Off <8.4 V				12 V models
	On at >17.5 V. Off <17.0 V				24 V models
	On at >35.2 V. Off <33.2 V				48 V models
Input Surge			25	VDC	12 V models for 3 s
			50	VDC	24 V models for 3 s
			100	VDC	48 V models for 3 s

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Output Voltage	5		30	V	See Models and Ratings table
Output Voltage Trim			±10	%	Via external resistors, see Application Notes
Initial Set Accuracy			±1	%	on V1
			±2	%	on V2 of dual output models
Minimum Load	0			A	No minimum load required
Start Up Delay		5		ms	
Start Up Rise Time		2		ms	
Line Regulation			±0.3	%	
Load Regulation			±2	%	0 - 10% load
			±1	%	10 - 100% load
Cross Regulation			±4	%	On dual output models with one output set to 50% load and the other varied from 10% to 100% load (D05 20% to 100%)
Transient Response			4	% deviation	Recovery to within 1% in <500 µs for a 50% load change at 0.25 A/µs rate
Ripple & Noise			1	% pk-pk	20 MHz bandwidth
Short Circuit Protection					Trip & Restart (hiccup mode), auto recovery
Overload Protection	120		200	%	Trip & Restart (hiccup mode)
Overvoltage Protection	115		140	%	Non latching, auto recovery
Temperature Coefficient			0.03	%/°C	

PRELIMINARY

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Efficiency		88		%	See Models and Ratings table
Isolation	4000			VAC	For 1 min. Double/reinforced with a working voltage of 250 VAC. Meets 2 x MOPP per 3rd edition of IEC60601-1 5000 VAC for 10 ms in accordance with IEC60664-1
Leakage Current			2.5	µA	
Input to Output Capacitance			30	pF	
Switching Frequency		250		kHz	
Power Density			25	W/in³	
Mean Time Between Failure		>1		MHrs	MIL-HDBK-217F, +25 °C GB
Weight		0.066 (30.0)		lb (g)	

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Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & Conditions
Operating Temperature	-40		+80	°C	See derating curve
Storage Temperature	-55		+100	°C	
Case Temperature			+100	°C	
Humidity	5		90	%RH	Non-condensing
Cooling					Natural convection
Shock	±3 shocks in each plane, total 18 shocks of 30 g : 11 ms halfsine. Conforms to EN60068-2-27 & EN60068-2-47				
Vibration	10-500 Hz at 2 g sweep and endurance at resonance in all 3 planes. Conforms to EN60068-2-6				

EMC: Emissions

Phenomenon	Standard	Test Level	Notes & Conditions
Conducted	EN55011	Level A	
Radiated	EN55011	Level A	

EMC: Immunity

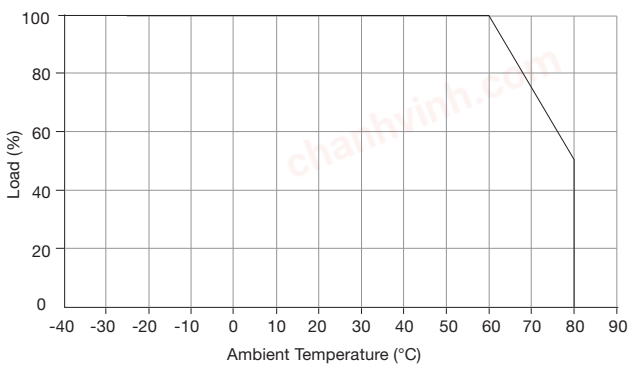
Phenomenon	Standard	Test Level	Criteria	Notes & Conditions
Immunity	IEC60601-1-2			
ESD Immunity	EN61000-4-2	2	A	
Radiated Immunity	EN61000-4-3	10 V/m	A	
EFT/Burst	EN61000-4-4	2	A	
Surges	EN61000-4-5	1	A	
Conducted Immunity	EN61000-4-6	10 Vm	A	
Magnetic Fields	EN61000-4-8	3 A/m	A	

Safety Approvals

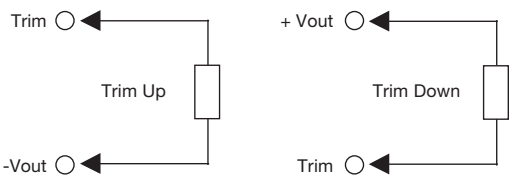
Safety Agency	Safety Standard	Notes & Conditions
CB Report	IEC60601-1 Including Risk Management	Medical
UL	ANSI/AAMI ES60601-1 & CSA C22.2, No.60601-1	Medical

Application Notes

Derating Curve



External Output Trim



For 5 V output:
Trim +10%, R = 3.4 k typical
Trim -10%, R = 1.1 k typical

For 12 V output:
Trim +10%, R = 5.9 k typical
Trim -10%, R = 11.3 k typical

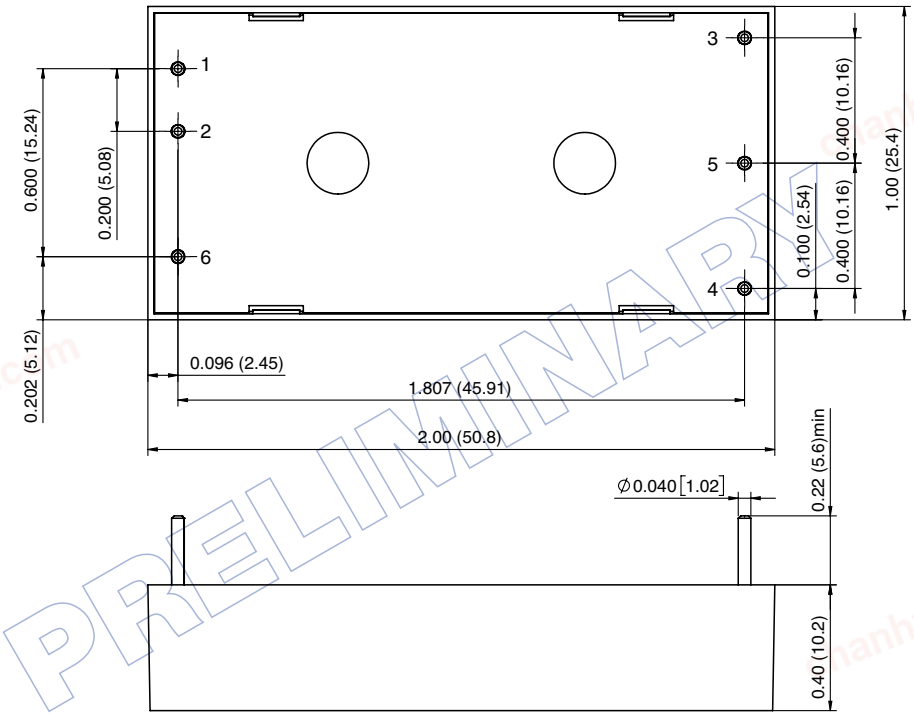
For 15 V output:
Trim +10%, R = 8.4 k typical
Trim -10%, R = 10.4 k typical

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Mechanical Details

BOTTOM VIEW



PRELIMINARY

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