Size: 1.25in x 0.80in x 0.47in (31.8mm x 20.3mm x 12mm)

FEATURES

- Wide 2:1 Input Voltage Range
- Industrial Standard DIP-24 Package
- Ultra-High Isolation
- Fully Regulated Output Voltage
- RoHS & REACH Compliant
- No Minimum Load Requirement
- Qualified for IGBT and High Isolation Applications
- Over Load, Over Voltage, and Short Circuit Protection
- UL/cUL/IEC/EN 60950-1 & UL/cUL/IEC/EN 62368-1 Pending Safety Approvals & CE Marking

DESCRIPTION

The DCMIE03-HI series of DC/DC converters offers up to 6 watts of output power in a compact 1.25” x 0.80” x 0.47” industrial standard DIP-24 package. This series consists of single and dual fully regulated output models with a wide 2:1 input voltage range and ultra-high isolation. Each model in this series has over load, over voltage, and short circuit protection, is qualified for IGBT and high isolation application, and is RoHS & REACH compliant. This series has UL/cUL/IEC/EN 60950-1 pending safety approvals and CE marking.

MODEL SELECTION TABLE

Single Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Input Current		Maximum Capacitive Load	Efficiency	Ripple & Noise	Output Power
				No Load	Max Load				
DCMIE06-12S05HI	12VDC (9~18VDC)	5VDC	1200mA	10mA	602mA	1500µF	83%	70mVp-p	6W
DCMIE06-12S12HI		12VDC	500mA		581mA	260µF	86%		
DCMIE06-12S15HI		15VDC	400mA		581mA	210µF	86%		
DCMIE06-24S05HI	24VDC (18~36VDC)	5VDC	1200mA	8mA	301mA	1500µF	83%	70mVp-p	6W
DCMIE06-24S12HI		12VDC	500mA		291mA	260µF	86%		
DCMIE06-24S15HI		15VDC	400mA		287mA	210µF	87%		
DCMIE06-48S05HI	48VDC (36~75VDC)	5VDC	1200mA	5mA	151mA	1500µF	83%	70mVp-p	6W
DCMIE06-48S12HI		12VDC	500mA		145mA	260µF	86%		
DCMIE06-48S15HI		15VDC	400mA		140mA	210µF	89%		

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Input Current		Maximum Capacitive Load	Efficiency	Ripple & Noise	Output Power
				No Load	Max Load				
DCMIE06-12D12HI	12VDC (9~18VDC)	±12VDC	±250mA	10mA	575mA	150#µF	87%	70mVp-p	6W
DCMIE06-12D15HI		±15VDC	±200mA		575mA	110#µF	87%		
DCMIE06-24D12HI	24VDC (18~36VDC)	±12VDC	±250mA	8mA	291mA	150#µF	86%	70mVp-p	6W
DCMIE06-24D15HI		±15VDC	±200mA		287mA	110#µF	87%		
DCMIE06-48D12HI	48VDC (36~75VDC)	±12VDC	±250mA	5mA	144mA	150#µF	87%	70mVp-p	6W
DCMIE06-48D15HI		±15VDC	±200mA		142mA	110#µF	88%		

SPECIFICATIONS

All specifications are based on 25°C, Resistive Load, Nominal Input Voltage, and Rated Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
INPUT SPECIFICATIONS						
Input Voltage Range	12V Input Models		9	12	18	VDC
	24V Input Models		18	24	36	
	48V Input Models		36	48	75	
Input Surge Voltage (1 Sec. Max)	12V Input Models		-0.7		25	VDC
	24V Input Models		-0.7		50	
	48V Input Models		-0.7		100	
Start-Up Threshold Voltage	12V Input Models				9	VDC
	24V Input Models				18	
	48V Input Models				36	
Under Voltage Shutdown	12V Input Models			8		VDC
	24V Input Models			16		
	48V Input Models			34		
Input Filter	All Models		Internal Pi Type			
OUTPUT SPECIFICATIONS						
Output Voltage			See Table			
Voltage Accuracy					±1.0	%Vnom.
Line Regulation	Vin= Min. to Max. @Full Load				±0.5	%
Load Regulation	Io=0% to 100%	Single Output			±0.5	%
		Dual Output			±1.0	
Voltage Balance	Dual Output, Balanced Loads			±0.5	±2.0	%
Output Power			See Table			
Output Current			See Table			
Maximum Capacitive Load			See Table			
Ripple & Noise	0-20MHz Bandwidth, Measured with 1µF/25V MLCC				70	mVp-p
Minimum Load			No Minimum Load Requirement			
Load Cross Regulation	Dual Outputs, Asymmetrical Load 25%/100% Full Load				±5.0	%
Start Up Time (Power On)	Nominal Vin and Constant Resistive Load				30	mS
Transient Recovery Time	25% Load Step Change			300		µsec
Transient Response Deviation	25% Load Step Change			±3	±6	%
Temperature Coefficient				±0.01		%/ºC
PROTECTION						
Short Circuit Protection	Hiccup Mode 0.5Hz typ.		Automatic Recovery			
Over Load Protection	Foldback			150		%
Over Voltage Protection			Yes			
ENVIRONMENTAL SPECIFICATIONS						
Operating Ambient Temperature	Natural Convection		-40		+92.5	ºC
Storage Temperature			-50		+125	ºC
Case Temperature					+105	ºC
Humidity	Non-Condensing				95	%RH
Lead Temperature	1.5mm from case for 10Sec				260	ºC
Cooling[5]			Natural Convection			
MTBF (Calculated)	MIL-HDBK-217F@25ºC, Ground Benign		4,667,952			Hours
GENERAL SPECIFICATIONS						
Efficiency			See Table			
Switching Frequency				330		KHz
Isolation Voltage	60 Seconds Reinforced Insulation, Rated for 1000Vrms Working Voltage		5000			VACrms
	Tested for 1 Second		9000			VDC
Isolation Resistance	500VDC		10			GΩ
Isolation Capacitance	100KHz, 1V				40	pF
Common Mode Transient Immunity			15			KV/µs
PHYSICAL SPECIFICATIONS						
Weight			0.55oz (15.5g)			
Dimensions (L x W x H)			1.25in x 0.80in x 0.47in (31.8mm x 20.3mm x 12mm)			
Case Material			Non-Conductive Black Plastic (Flammability to UL94V-0 Rated)			
Pin Material			Tinned Copper			

SPECIFICATIONS

All specifications are based on 25°C, Resistive Load, Nominal Input Voltage, and Rated Output Current unless otherwise noted.
We reserve the right to change specifications based on technological advances.

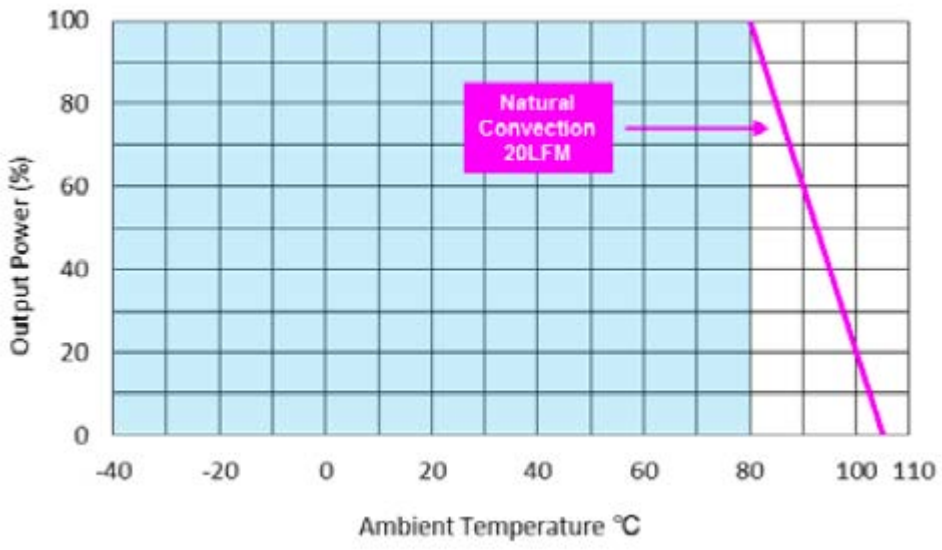
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
SAFETY CHARACTERISTICS						
Safety Approvals (Pending)	UL/cUL 60950-1 recognition (UL Certificate), IEC/EN 60950-1 (CB-report) UL/cUL 62368-1 recognition (UL certificate), IEC/EN 62368-1 (CB-report)					
EMI	Conduction	EN55032/22, FCC Part 15				Class A
EMS	EN55024					
	ESD	EN61000-4-2 Air ±8KV, Contact ±6kV				A
	Radiated Immunity	EN61000-4-3 10V/m				A
	Fast Transient	EN61000-4-4 ±2kV(6)				A
	Surge	EN61000-4-5 ±2kV(6)				A
	Conducted Immunity	EN61000-4-6 10Vrms				A
	PFMF	EN61000-4-8 3A/m				A

NOTES

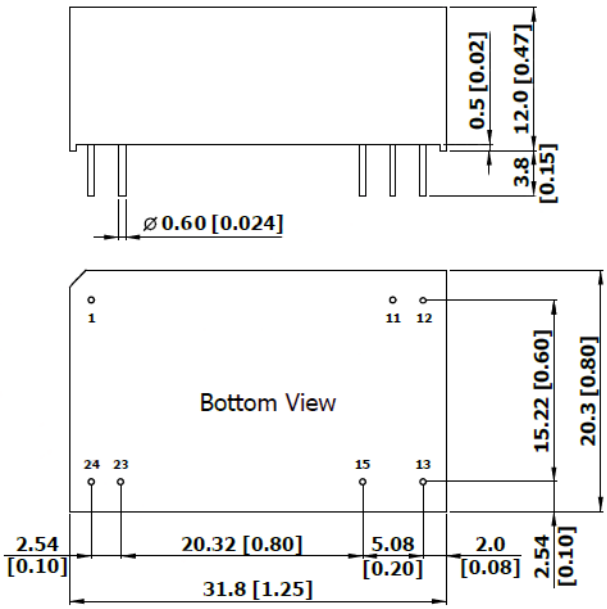
1. # for each output.
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. It is recommended to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltages may be available, please contact factory.
5. “Natural Convection” is about 20LFM but is not equal to still air (0 LFM)
6. To meet EN61000-4-4 & EN61000-4-5 an external capacitor across the input pins is required.
   -Suggested Capacitors:
   -12V Input Models: CHEMI-CON KY Series 470µF/100V
   -24V Input Models: CHEMI-CON KY Series 330µF/100V
   -48V Input Models: CHEMI-CON KY Series 220µF/100V

**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVES



MECHANICAL DRAWINGS



Pin Connections

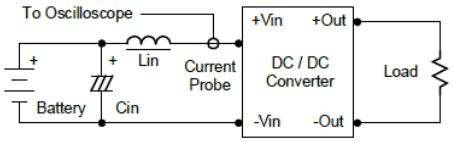
Pin	Single Output	Dual Output
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin

All dimensions in mm (Inches)
Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin Diameter Ø 0.5±0.05 (0.02±0.002)

TEST SETUP

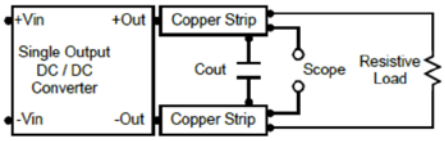
Input Reflected-Ripple Current Test Setup

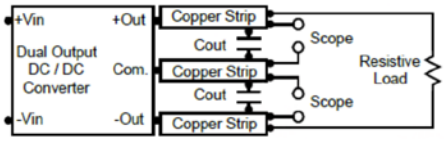
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR <1.0Ω at 100KHz) to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500KHz.



Peak-to-Peak Output Noise Measurement Test

Use a Cout 0.47µF ceramic capacitor. Scope measurement should be made by using a BNC socket, measurement bandwidth is 0-20MHz. Position the load between 50mm and 75mm from the DC/DC converter.





TECHNICAL NOTES

Overload Protection

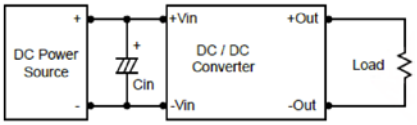
To provide hiccup mode protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure overload for an unlimited duration

Overvoltage Protection

The output overvoltage clamp consist of control circuitry, which is independent of the primary regulation loop that monitors the voltage on the output terminals. The control loop of the clamp has a higher voltage set point than the primary loop. This provides a redundant voltage control that reduces the risk of output overvoltage.

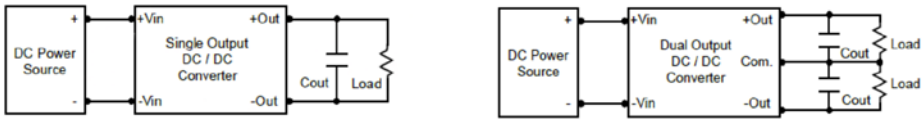
Input Source Impedance

The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor on the input to ensure startup. By using a good quality low Equivalent Series Resistance (ESR<1.0Ω at 100KHz) capacitor of a 10µF for the 12 input devices and a 4.7µF for the 24V input devices and a 2.2µF for the 48V devices, capacitor mounted close to the power module helps ensure stability of the unit.



Output Ripple Reduction

A good quality low ESR capacitor placed as close as practicable across the load will give the best ripple and noise performance. To reduce output ripple, it is recommended to use 4.7µF capacitors at the output.

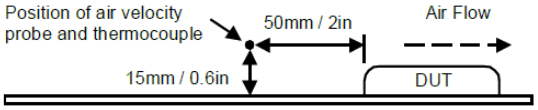


Maximum Capacitive Load

The DCMIE06-HI series has limitation of maximum connected capacitance on the output. The power module may operate in current limiting mode during start-up, affecting the ramp-up and the startup time. Connect capacitors at the point of load for the best of performance. The maximum capacitance can be found in the data sheet.

Thermal Considerations

Many conditions affect the thermal performances of the power module, such as orientation, airflow over the module and board spacing. To avoid exceeding the maximum temperature rating of the components inside the power module, the case temperature must be kept below 105ºC. The derating curves are determined from measurements obtained in a test setup.



COMPANY INFORMATION

Wall Industries, Inc. has created custom and modified units for over 50 years. Our in-house research and development engineers will provide a solution that exceeds your performance requirements on-time and on budget. Our ISO9001-2008 certification is just one example of our commitment to producing a high quality, well-documented product for our customers.

Our past projects demonstrate our commitment to you, our customer. Wall Industries, Inc. has a reputation for working closely with its customers to ensure each solution meets or exceeds form, fit and function requirements. We will continue to provide ongoing support for your project above and beyond the design and production phases. Give us a call today to discuss your future projects.

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