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

FEATURES

- Wide 2:1 Input Voltage Range
- Industry Standard DIP-24 Package
- Fully Regulated Output Voltage
- Ultra-High I/O Isolation
- RoHS & REACH Compliant
- Qualified for IGBT and High Isolation Applications
- Short Circuit, Over Load, and Over Voltage Protection
- UL/cU/IEC/EN 62368-1 (60905-1) Pending Safety Approvals & CE Marking

DESCRIPTION

The DCMIE03-HI series of DC/DC converters offers 3 watts of output power in a 1.25" x 0.80" x 0.47" industry standard DIP-24 package. This series consists of fully regulated single and dual outputs with a wide 2:1 input voltage range. Each model in this series has ultra-high I/O isolation, qualifies for IGBT and high isolation applications, and has short circuit, over load, and over voltage protection. This series has UL/cUL/IEC/EN 62368-1 (60905-1) pending safety approvals.

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				
DCMIE03-05S05HI	5VDC (4.5~9VDC)	5VDC	700mA	20mA	854mA	750µF	82%	70mVp-p	3W
DCMIE03-05S58HI		5.8VDC	600mA		849mA	560µF	82%		
DCMIE03-05S12HI		12VDC	290mA		839mA	130µF	83%		
DCMIE03-05S15HI		15VDC	235mA		839mA	100µF	84%		
DCMIE03-12S05HI	12VDC (9~18VDC)	5VDC	700mA	8mA	356mA	750µF	82%	70mVp-p	3W
DCMIE03-12S12HI		12VDC	290mA		337mA	130µF	86%		
DCMIE03-12S15HI		15VDC	235mA		338mA	100µF	87%		
DCMIE03-24S05HI	24VDC (18~36VDC)	5VDC	700mA	6mA	178mA	750µF	82%	70mVp-p	3W
DCMIE03-24S12HI		12VDC	290mA		171mA	130µF	85%		
DCMIE03-24S15HI		15VDC	235mA		169mA	100µF	87%		
DCMIE03-48S05HI	48VDC (36~75VDC)	5VDC	700mA	4mA	89mA	750µF	82%	70mVp-p	3W
DCMIE03-48S12HI		12VDC	290mA		85mA	130µF	85%		
DCMIE03-48S15HI		15VDC	235mA		86mA	100µF	85%		

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Input Current		Maximum Capacitive Load(1)	Efficiency	Reflected Ripple Current	Output Power
				No Load	Max. Load				
DCMIE03-05D12HI	5VDC (4.5~9VDC)	±12VDC	±145mA	35mA	829mA	75#µF	84%	70mVp-p	3W
DCMIE03-05D15HI		±15VDC	±115mA		821mA	56#µF	84%		
DCMIE03-12D12HI	12VDC (9~18VDC	±12VDC	±145mA	13mA	333mA	75#µF	87%	70mVp-p	3W
DCMIE03-12D15HI		±15VDC	±115mA		330mA	56#µF	87%		
DCMIE03-24D12HI	24VDC (18~36VDC)	±12VDC	±145mA	6mA	167mA	75#µF	87%	70mVp-p	3W
DCMIE03-24D15HI		±15VDC	±115mA		167mA	56#µF	86%		
DCMIE03-48D12HI	48VDC (36~75VDC)	±12VDC	±145mA	4mA	86mA	75#µF	84%	70mVp-p	3W
DCMIE03-48D15HI		±15VDC	±115mA		86mA	56#µF	84%		

SPECIFICATIONS

All specifications are based on 25°C, Nominal Input Voltage, Resistive Load 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	5V Input Models	4.5	5	9	VDC
	12V Input Models	9	12	18	
	24V Input Models	18	24	36	
	48V Input Models	36	48	75	
Input Surge Voltage (1 sec. max.)	5V Input Models	-0.7		15	VDC
	12V Input Models	-0.7		25	
	24V Input Models	-0.7		50	
	48V Input Models	-0.7		100	
Start-Up Threshold	5V Input Models			4.5	VDC
	12V Input Models			9	
	24V Input Models			18	
	48V Input Models			36	
Under Voltage Shutdown	5V Input Models		4		VDC
	12V Input Models		8		
	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=25% to 100%			±0.5	%
Voltage Balance	Dual Outputs, Balanced Loads		±0.5	±2.0	%
Load Cross Regulation	Dual Outputs, Asymmetrical Load 25%/100% Full Load			±5.0	%
Output Power			See Table		
Output Current			See Table		
Minimum Load			No Minimum Load Requirement		
Maximum Capacitive Load			See Table		
Ripple & Noise	0-20MHz Bandwidth, Measured with a 1µF/25V MLCC			70	mVp-p
Start Up Time (Power On)	Nominal Vin and Constant Resistive Load			30	mS
Transient Recovery Time[2]	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			150		%
Over Voltage			Yes		
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature	Natural Convection	-40		+95	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	5,815,448			Hours
GENERAL SPECIFICATIONS					
Typ. Efficiency	@Max. Load		See Table		
Switching Frequency			330		KHz
Isolation Voltage	60 Seconds, Reinforced Insulation, Rated for 100Vrms 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	Flammability to UL 94V-0 Rated		Non-Conductive Black Plastic		
Pin Material			Tinned Copper		

SPECIFICATIONS

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

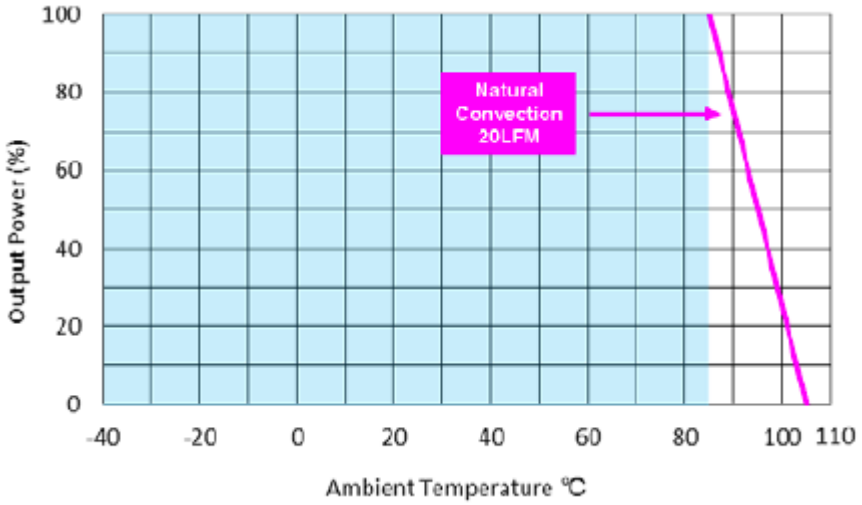
SPECIFICATION	TEST CONDITIONS		Min	Typ	Max	Unit
SAFETY CHARACTERISTICS						
Safety Approvals (Pending)	UL/cUL 60950-1 Recognition (UL Certificate) IEC/EN 60950-1 (CB-Report) UL/cUL 62368-1 Recognition (UL Certificate) IEC/EN 62368-1 (CB Report)					
EMI	Conduction	EN55022, FCC Part 15				Class A
EMS	EN55024					
	ESD	EN61000-4-2 Air±8kV, Contact±6kV				A
	Radiated Immunity	EN61000-4-3 10V/m				A
	Fast Transient(6)	EN61000-4-4 ±2kV				A
	Surge(6)	EN61000-4-5 ±2kV				A
	Conducted Immunity	EN61000-4-6 10Vrms				A
	PFMF	EN61000-4-8 3A/m				A

NOTES

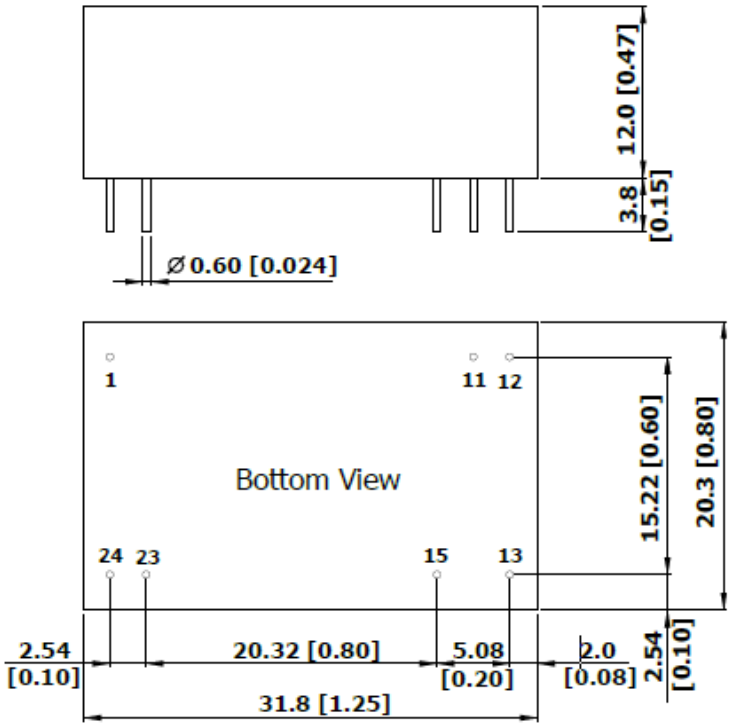
1. #For each output.
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. It is recommended to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltages may be available, please contact factory.
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:
   5V Input Models: CHEMI-CON KY Series 1000µF/100V//Diode (V10P45)
   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

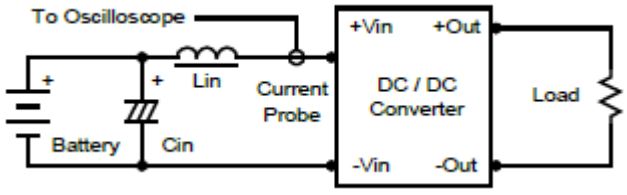
Pin	Single	Dual
1	+Vin	+Vin
11	No Pin	Common
12	-Vout	No Pin
13	+Vout	-Vout
15	No Pin	+Vout
23	-Vin	-Vin
24	-Vin	-Vin

All dimensions in mm (inches)
Tolerance: X.X±0.5 (X.X±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin diameter Ø0.5 ±0.05(0.02±0.002)

TEST SETUP

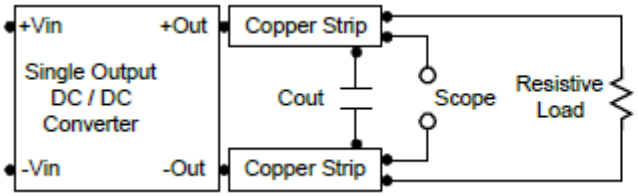
Input Reflected-Ripple Current Test Setup

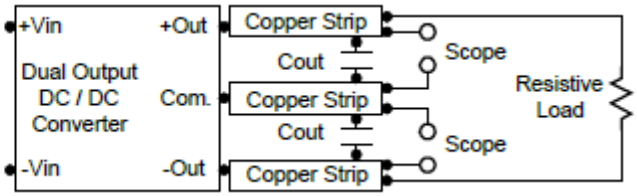
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR <1.0Ω at 100KHz) to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500KHz.



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

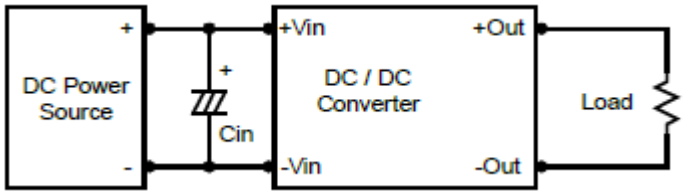
To provide protection in a fault (output overload) condition, the unit is equipped with internal current limiting circuitry and can endure current limiting for an unlimited duration.

Overvoltage Protection

The output overvoltage clamp consists 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.

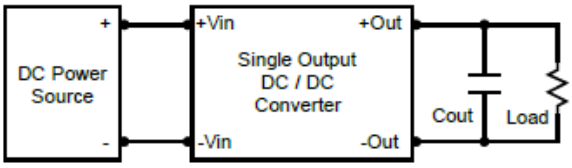
Input Source Impedance

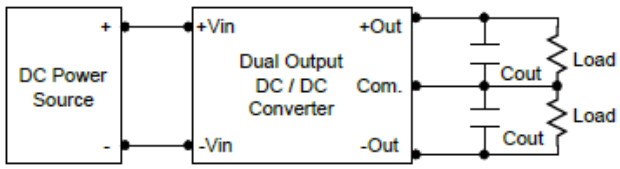
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long lines and output loading is high, it may be necessary to use a capacitor on the input to insure startup. Capacitor mounted close to the power module helps ensure stability of the unit, it is recommended to use a good quality low Equivalent Series Resistance (ESR<1.0Ω at 100kHz) capacitor of a 22µF for the 5V input devices, a 10µF for the 12V input devices, a 4.7µF for the 24V input devices, and 2.2µF for the 48V devices; capacitor should be mounted close to the power module to 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.



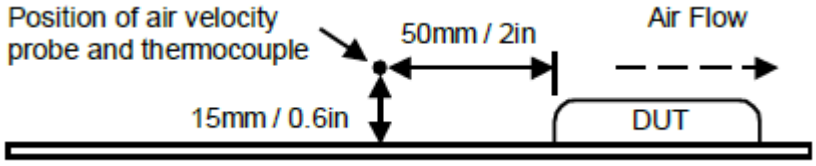


Maximum Capacitive Load

The DCMIE03-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 best performance. The maximum capacitance can be found in the data sheet.

Thermal Considerations

Many conditions affect the thermal performance 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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