Size: 2.00in x 1.00in x 0.47in (50.8mm x 25.4mm x 12mm)

FEATURES

- Wide 2:1 Input Voltage Range
- Full Regulated Output Voltage
- Ultra-High I/O Isolation with Reinforced Insulation
- Qualified for IGBT and High Isolation Applications
- No Minimum Load Requirement
- Over Load and Short Circuit Protection
- RoHS & REACH Compliant
- Common Mode Transient Immunity: 15KV/μs
- UL/cUL/IEC/EN 60950-1 Safety Approvals & CE Marking

DESCRIPTION

The DCMK10-HI series of DC/DC converters offers 10 watts of output power in a compact 2” x 1” x 0.47” 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 no minimum load requirement, is qualified for IGBT and high isolation applications, and has over load and short circuit protection. This series has UL/cUL/IEC/EN 60950-1 safety approvals and CE marking.

MODEL SELECTION TABLE

Single Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Input Current		Ripple & Noise	Maximum Capacitive Load	Efficiency	Output Power
				No Load	Max Load				
DCMK10-12S05HI	12VDC (9~18VDC)	5VDC	1600mA	30mA	889mA	100mVp-p	1000μF	75%	10W
DCMK10-12S051HI		5.1VDC	1600mA		919mA	100mVp-p	1000μF	74%	
DCMK10-12S12HI		12VDC	835mA		1057mA	150mVp-p	470μF	79%	
DCMK10-24S05HI	24VDC (18~36VDC)	5VDC	2000mA	20mA	548mA	100mVp-p	1000μF	76%	10W
DCMK10-24S051HI		5.1VDC	2000mA		567mA	100mVp-p	1000μF	75%	
DCMK10-24S12HI		12VDC	835mA		522mA	150mVp-p	470μF	80%	
DCMK10-48S05HI	48VDC (36~75VDC)	5VDC	2000mA	10mA	274mA	100mVp-p	1000μF	76%	10W
DCMK10-48S051HI		5.1VDC	2000mA		283mA	100mVp-p	1000μF	75%	
DCMK10-48S12HI		12VDC	835mA		261mA	150mVp-p	470μF	80%	

MODEL SELECTION TABLE

Dual Output Models

Model Number	Input Voltage Range	Output Voltage	Output Current	Input Current		Ripple & Noise	Maximum Capacitive Load(1)	Efficiency	Output Power
				No Load	Max Load				
DCMK10-12D12HI	12VDC (9~18VDC)	±12VDC	±417mA	30mA	1042mA	150mVp-p	220#μF	80%	10W
DCMK10-12D15HI		±15VDC	±333mA		1028mA	150mVp-p	220#μF	81%	
DCMK10-24D12HI	24VDC (18~36VDC)	±12VDC	±417mA	20mA	516mA	150mVp-p	220#μF	81%	10W
DCMK10-24D15HI		±15VDC	±333mA		508mA	150mVp-p	220#μF	82%	
DCMK10-48D12HI	48VDC (36~75VDC)	±12VDC	±417mA	10mA	258mA	150mVp-p	220#μF	81%	10W
DCMK10-48D15HI		±15VDC	±333mA		254mA	150mVp-p	220#μF	82%	

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.

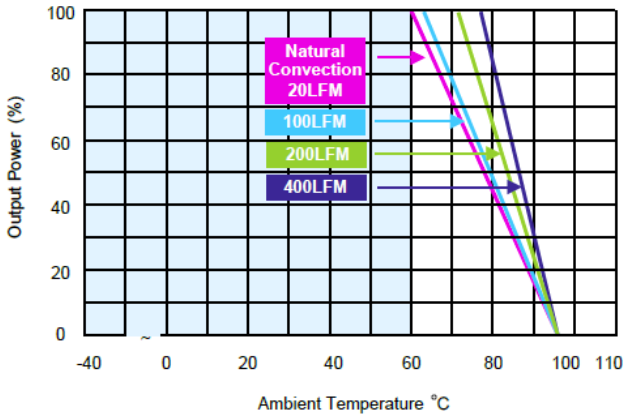
SPECIFICATION	TEST CONDITIONS	Min	Typ	Max	Unit
INPUT SPECIFICATIONS					
Input Voltage Range	12V Input Models	9	12	18	VDC
	24V Input Models	18	24	36	
	48V Input Models	36	48	75	
Start-Up Threshold Voltage	12V Input Models	7	8	9	VDC
	24V Input Models	13	15	18	
	48V Input Models	30	33	36	
Input Surge Voltage (1 sec. max)	12V Input Models	-0.7		25	VDC
	24V Input Models	-0.7		50	
	48V Input Models	-0.7		100	
Under Voltage Shutdown	12V Input Models			8.5	VDC
	24V Input Models			16	
	48V Input Models			24	
Short Circuit Input Power	All models			3000	mW
Input Filter	All models	Internal Pi Type			
OUTPUT SPECIFICATIONS					
Output Voltage		See Table			
Voltage Setting Accuracy				±1.0	%Vnom
Line Regulation	Vin=Min. to Max. @Full Load		±0.3	±0.5	%
Load Regulation	Io=15% to 100%		±0.5	±1.0	%
	Io=5% to 100%		±0.6	±1.2	
Voltage Balance	Dual Output, Balanced Load		±0.5	±2.0	%
Output Power		See Table			
Output Current		See Table			
Minimum Load		No Minimum Load Requirement			
Maximum Capacitive Load		See Table			
Ripple & Noise		See Table			
Reflected Ripple Current	12V Input Models		100		mA
	24V Input Models		50		
	48V Input Models		25		
Transient Response Deviation	25% Load Step Change		300	600	µsec
Transient Recovery Time[2]	25% Load Step Change		±3	±5	%
Temperature Coefficient			±0.02	±0.05	%/ºC
PROTECTION					
Short Circuit Protection		Continuous, Automatic Recovery			
Over Load Protection		120	150		%
ENVIRONMENTAL SPECIFICATIONS					
Operating Ambient Temperature	Natural Convection	-40		+75	ºC
Storage Temperature		-50		+125	ºC
Case Temperature				+95	ºC
Humidity	Non-Condensing			95	%RH
Altitude				4000	m
Cooling[5]		Natural Convection			
Lead Temperature	1.5mm from case for 10sec.			260	ºC
MTBF (Calculated)	MIL-HDBK-217F, 25ºC, Ground Benign		100,000		Hours
GENERAL SPECIFICATIONS					
Efficiency		See Table			
Switching Frequency		120	150	180	kHz
I/O Isolation Voltage	Rated for 60 seconds	4000			VACrms
	Tested for 1 second	8000			VDC
I/O Isolation Resistance	500VDC	10			GΩ
I/O Isolation Capacitance	100KHz, 1V		60	80	pF
Common Mode Transient Immunity		15			KV/µs
PHYSICAL SPECIFICATIONS					
Weight		0.86oz (24.5g)			
Dimensions (L x W x H)		2in x 1in x 0.47in (50.8mm x 25.4mm x 12mm)			
Case Material	Flammability to UL 94V-0 rated	Non-Conductive Black Plastic			
Pin Material		Copper Alloy with Gold Plate over Nickel Subplate			
SAFETY CHARACTERISTICS					
Safety Approvals	UL/cUL 60950-1 recognition (UL Certificate)[6] IEC/EN 60950-1 (CB-Report)				
Conducted EMI	Compliance to EN55022, FCC Part 15				Class A

NOTES

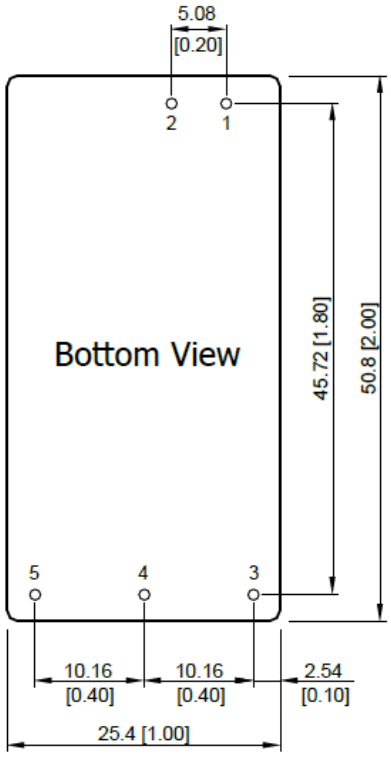
1. # for each output
2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
3. We recommend to protect the converter by a slow blow fuse in the input supply line.
4. Other input and output voltages may be available, please contact factory.
5. "Natural Convection" is about 20LFM but is not equal to still air (0 LFM).
6. This product is Listed to applicable standards and requirements by UL.

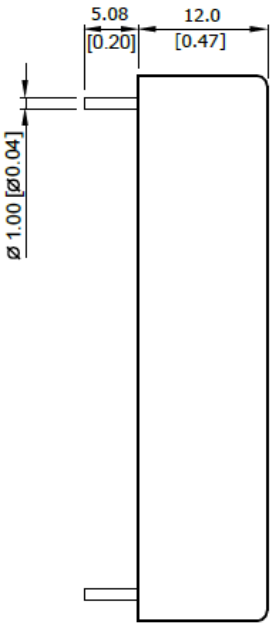
**Due to advances in technology, specifications subject to change without notice.*

DERATING CURVE



MECHANICAL DRAWINGS





Pin Connections

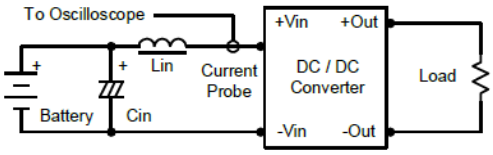
Pin	Single Output	Dual Output
1	+Vin	+Vin
2	-Vin	-Vin
3	+Vout	+Vout
4	No Pin	Common
5	-Vout	-Vout

Notes:
All dimensions in mm (inches)
Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin Diameter: 1.0±0.05 (0.04±0.002)

TEST SETUP

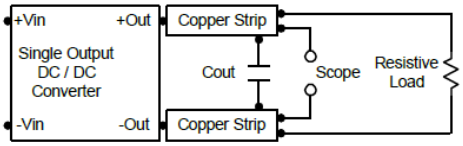
Input Reflected-Ripple Current Test Setup

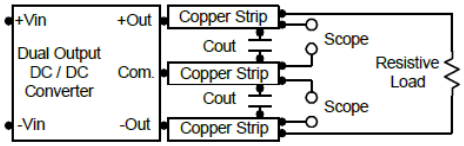
Input reflected-ripple current is measured with an inductor Lin (4.7µH) and Cin (220µF, ESR < 1.0Ω at 100KHz) to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, measurement bandwidth is 0-500KHz.



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.

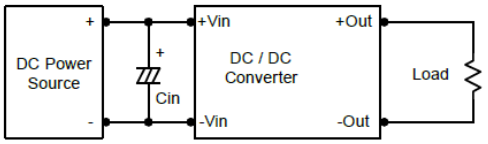




TECHNICAL NOTES

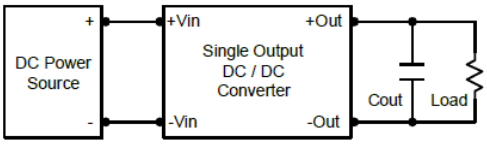
Input Source Impedance

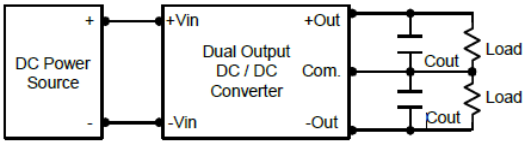
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long line and output loading is high, it may be necessary to use a capacitor on the input to ensure startup. By using a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100kHz) capacitor of a 10µF for the 12V input devices and a 4.7µF for the 24V input devise 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 3.3µF capacitors at the output.



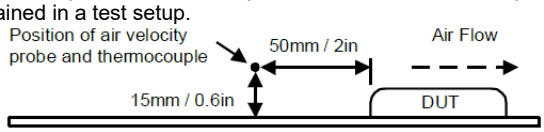


Maximum Capacitive Load

The DCMKE10-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. Maximum capacitance can be found in 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 95ºC. 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 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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