



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
 UL/cUL/IEC/EN 60950-1 Safety Approvals & **Applications**
- No Minimum Load Requirement
- Over Load and Short Circuit Protection
- RoHS & REACH Compliant
- Common Mode Transient Immunity: 15KV/µs
 - **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 (No Load	Current Max Load	Ripple & Noise	Maximum Capacitive Load	Efficiency	Output Power
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 &	Maximum	Efficiency	Output
				No Load	Max Load	Noise	Capacitive Load ⁽¹⁾	Linciency	Power
DCMK10-12D12HI	12VDC	±12VDC	±417mA	20 1	1042mA	150mVp-p	220#µF	80%	10W
DCMK10-12D15HI	(9~18VDC)	±15VDC	±333mA	30mA	1028mA	150mVp-p	220#µF	81%	1000
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%	



SPECIFICATION INPUT SPECIFICATIONS Input Voltage Range Input Surge Voltage (1 sec. max) Input Surge Voltage (1 sec. max) Input Models Input Surge Voltage (1 sec. max) Input Models Input Surge Voltage (1 sec. max) Input Models Input Filter Input Filte	9 18 36 7 13 30 -0.7 -0.7 -0.7	12 24 48 8 15 33	18 36 75 9 18 36 25 50 100 8.5 16 24 3000 Pi Type	VDC VDC VDC VDC mW			
INPUT SPECIFICATIONS	9 18 36 7 13 30 -0.7 -0.7	12 24 48 8 15 33	18 36 75 9 18 36 25 50 100 8.5 16 24 3000	VDC VDC VDC			
Input Voltage Range	18 36 7 13 30 -0.7 -0.7	24 48 8 15 33	36 75 9 18 36 25 50 100 8.5 16 24 3000	VDC VDC VDC			
Input Voltage Range Al Vinput Models Al Vinput Models 12V Input Models 24V Input Models 24V Input Models Al Vinput Models 12V Input Models 24V Input Models 12V Input Models 24V Input Models 12V Input Models 24V Input Models 24V Input Models 24V Input Models All models Input Filter OUTPUT SPECIFICATIONS Output Voltage Voltage Stirg Accuracy Line Regulation Load Regulation Load Regulation Vin=Min. to Max. @ Full Load Io=15% to 100% Voltage Balance Output Power Output Current Minimum Load Maximum Capacitive Load Ripple & Noise 12V Input Models 24V Input Models 24V Input Models 24V Input Models 24V Input Models 25% Load Step Change Transient Response Deviation 25% Load Step Change Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Natural Convection Non-Condensing Altitude Cooling® Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS	18 36 7 13 30 -0.7 -0.7	24 48 8 15 33	36 75 9 18 36 25 50 100 8.5 16 24 3000	VDC VDC VDC			
Start-Up Threshold Voltage Start-Up Threshold Voltage Start-Up Threshold Voltage 12V Input Models	36 7 13 30 -0.7 -0.7	48 8 15 33	75 9 18 36 25 50 100 8.5 16 24 3000	VDC VDC VDC			
Start-Up Threshold Voltage 24V Input Models 24	7 13 30 -0.7 -0.7	8 15 33 Internal	9 18 36 25 50 100 8.5 16 24 3000	VDC VDC			
Start-Up Threshold Voltage 24V Input Models 48V Input Models 12V Input Models 12V Input Models 48V Input Models 12V Input Models 48V Input Mo	13 30 -0.7 -0.7	15 33 Internal	18 36 25 50 100 8.5 16 24 3000	VDC VDC			
ABV Input Models 12V Input M	30 -0.7 -0.7	Internal See	36 25 50 100 8.5 16 24 3000	VDC VDC			
Input Surge Voltage (1 sec. max) Input Surge Voltage (1 sec. max) Input Models 48V Input Models 12V Input Models 48V Input Models 48V Input Models 48V Input Models All models All models Output SPECIFICATIONS Output Voltage Voltage Setting Accuracy Line Regulation Load Regulation Voltage Balance Output Power Output Current Minimum Load Maximum Capacitive Load Ripple & Noise Transient Response Deviation Transient Recovery Time ⁽²⁾ Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection Over Load Protection Storage Temperature Environmentature Natural Convection Non-Condensing All thodels 12V Input Models 48V Input Models 12V Input Models 48V Input Models 12V Input Models 24V Input Models 48V Input Models 24V Input Models All models 12V Input Models 24V Input Models 48V Input Models 48V Input Models All models 12V Input Models 24V Input Models All models 48V Input Models 24V Input Models All models All models All models Input Models 24V Input Models 24V Input Models All models All models All models Input Models 24V Input Models 24V Input Models All models	-0.7 -0.7	Internal See	25 50 100 8.5 16 24 3000	VDC			
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48V Input Models 12V Input Models 12V Input Models 24V Input Models 48V In	_	See -	100 8.5 16 24 3000	VDC			
Under Voltage Shutdown 24V Input Models 24V Input Models 48V Input Models 48V Input Models All models Input Filter All models OUTPUT SPECIFICATIONS Output Voltage Voltage Setting Accuracy Line Regulation Voltage Balance Output Power Output Power Output Power Output Current Minimum Load Maximum Capacitive Load Ripple & Noise Reflected Ripple Current 24V Input Models 24V Input Models 24V Input Models 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Transient Recovery Time ⁽²⁾ Reflection Nover Load Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Load Temperature Humidity Altitude Cooling ⁽⁶⁾ Lead Temperature I.5mm from case for 10sec. MIL-HDBK-217F, 25°C, Ground Benign Efficiency Efficiency Efficiency Efficiency Immodels All models Dual Output, Balanced Load Doa's Efficiency	-0.7	See -	8.5 16 24 3000				
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OUTPUT SPECIFICATIONS Output Voltage Voltage Setting Accuracy Line Regulation Vin=Min. to Max. @Full Load Load Regulation Voltage Balance Output Power Output Current Minimum Load Maximum Capacitive Load Ripple & Noise Reflected Ripple Current 25% Load Step Change Transient Response Deviation Transient Recovery Time ⁽²⁾ Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Case Temperature Case Temperature Humidity Altitude Cooling ⁽⁵⁾ Lead Temperature MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency Fficiency Fficiency		See -	гттуре				
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Output Power Output Current Minimum Load Maximum Capacitive Load Ripple & Noise Reflected Ripple Current All V Input Models 24V Input Models 24V Input Models 48V Input Models Transient Response Deviation 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		±0.6	±1.2				
Output Current Minimum Load Maximum Capacitive Load Ripple & Noise Reflected Ripple Current Reflected Ripple Current Response Deviation Transient Response Deviation Transient Recovery Time ⁽²⁾ Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Case Temperature Humidity Altitude Cooling ⁽⁵⁾ Lead Temperature I.5mm from case for 10sec. MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		±0.5	±2.0	%			
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Reflected Ripple Current 24V Input Models 24V Input Models 48V Input Models 48V Input Models 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Case Temperature Humidity Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		See -					
Reflected Ripple Current 24V Input Models 48V Input Models Transient Response Deviation 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		100	I able				
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Transient Response Deviation 25% Load Step Change Transient Recovery Time ⁽²⁾ 25% Load Step Change Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		50		mA			
Transient Recovery Time ⁽²⁾ Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		25					
Temperature Coefficient PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		300	600	µsec			
PROTECTION Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		±3	±5	%			
Short Circuit Protection Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature ### 1.5mm from case for 10sec. ### MTBF (Calculated) ### MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		±0.02	±0.05	%/°C			
Over Load Protection ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency							
ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency	Cor	tinuous, Auto	omatic Reco	very			
ENVIRONMENTAL SPECIFICATIONS Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency	120	150		%			
Operating Ambient Temperature Storage Temperature Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency	.=-						
Storage Temperature Case Temperature Humidity Altitude Cooling ⁽⁵⁾ Lead Temperature MTBF (Calculated) GENERAL SPECIFICATIONS Efficiency Storage Temperature Non-Condensing Non-Con	-40		+75	°C			
Case Temperature Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency	-50		+125	°C			
Humidity Non-Condensing Altitude Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency	-50			°C			
Altitude Cooling ⁽⁵⁾ Lead Temperature MTBF (Calculated) GENERAL SPECIFICATIONS Efficiency Altitude 1.5mm from case for 10sec. MIL-HDBK-217F, 25°C, Ground Benign			+95	_			
Cooling ⁽⁵⁾ Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency			95	%RH			
Lead Temperature 1.5mm from case for 10sec. MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency			4000	m			
MTBF (Calculated) MIL-HDBK-217F, 25°C, Ground Benign GENERAL SPECIFICATIONS Efficiency		Natural C	onvection				
GENERAL SPECIFICATIONS Efficiency			260	°C			
Efficiency		100,000		Hours			
Switching Frequency		See ⁻	Table				
	120	150	180	kHz			
Rated for 60 seconds	4000			VACrms			
I/O Isolation Voltage Tested for 1 second	8000			VDC			
I/O Isolation Resistance 500VDC	10			GΩ			
I/O Isolation Capacitance 100KHz, 1V	10	60	80				
Common Mode Transient Immunity	15	00	60	pF KV//up			
PHYSICAL SPECIFICATIONS	15	0.00-	(0.4.5)	KV/µs			
Weight		0.86oz					
Dimensions (L x W x H)			(50.8mm x 25.4mm x 12mm)				
Case Material Flammability to UL 94V-0 rated		Non-Conductive Black Plastic					
Pin Material		with Gold P	late over Nic	kel Subplat			
SAFETY CHARACTERISTICS							
Safety Approvals UL/cUL 60950-1 recognition (UL Certificate) IEC/EN 60950-1 (CB-Report)	No						
Conducted EMI Compliance to EN55022, FCC Part 15	No						

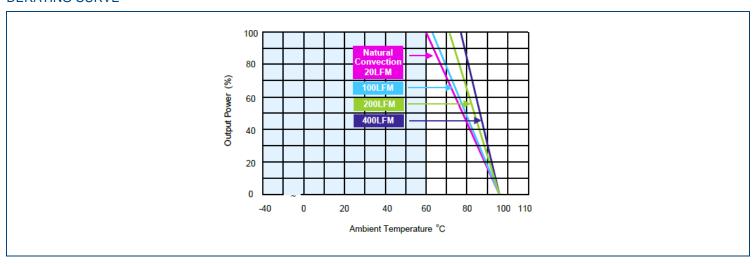


NOTES

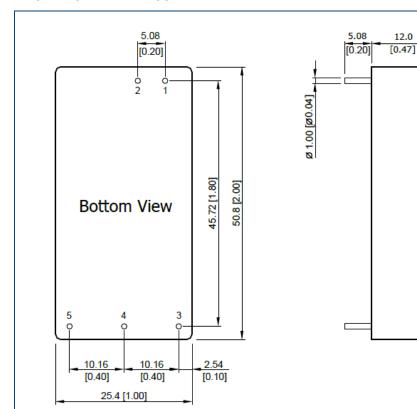
- 1. # for each output
- 2. Transient recovery time is measured to within 1% error band for a step change in output load of 75% to 100%.
- 3. We recommend to protect the converter by a slow blow fuse in the input supply line.
- 4. Other input and output voltages may be available, please contact factory.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

*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:

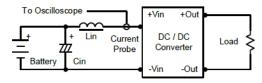
All dimensions in mm (inches)
Tolerance: X.X±0.5 (X.XX±0.02)
X.XX±0.25 (X.XXX±0.01)
Pin Diameter: 1.0±0.05 (0.04±0.002)



TEST SETUP -

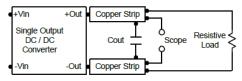
Input Reflected-Ripple Current Test Setup

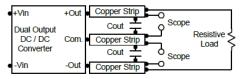
Input reflected-ripple current is measured with an inductor Lin $(4.7\mu\text{H})$ and Cin $(220\mu\text{F}, \text{ESR} < 1.0\Omega \text{ at } 100\text{KHz})$ to simulate source impedance. Capacitor Cin, offsets possible battery impedance. Current ripple is measured at the input terminals of the module, 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.

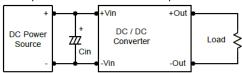




TECHNICAL NOTES

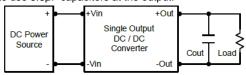
Input Source Impedance

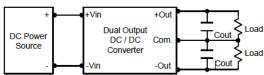
The power module should be connected to a low ac-impedance input source. Highly inductive source impedances can affect the stability of the power module. In applications where power is supplied over long line and output loading is high, it may be necessary to use a capacitor on the input to ensure startup. By using a good quality low Equivalent Series Resistance (ESR < 1.0Ω at 100kHz) capacitor of a $10\mu\text{F}$ for the 12V input devices and a $4.7\mu\text{F}$ for the 24V input devices and a $2.2\mu\text{F}$ 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.



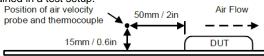


Maximum Capacitive Load

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 95°C. 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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