

VSX40MD23 40 W 2.5 Volt & 3.3 Volt Dual Output dc/dc Converters



The VSX40MD23 dc/dc Power Converter is a compact, high efficiency, high-density breakthrough model in today's technology.

Applications

- Distributed power architectures
- Workstations
- EDP equipment
- Telecommunications

Options

- Choice of remote on/off logic configuration
- Heat sink available for extended operation

Additional Information

- See Application Note DCAN-41 on C&D's website at www.cdpowerelectronics.com

Description

The VSX40 Series are dual output converters with a 36-75V input. The industry quarter-pak size of 1.5" X 2.3" X 0.5" coupled with 89% efficiency is an industry high-density breakthrough.

These converters utilize Vx high density technology. This technology has been featured in our highly efficient VKP and VKA series now successfully in use worldwide. The very high 89% efficiency minimizes the requirement for heat-sinking and the low output ripple minimizes the need for additional filtering. For maximum flexibility, power can be traded between outputs as required. The VSX40 series feature virtually all of the options required by design engineers but not at the competition's typical additional price for each option. This multitude of features are standard on the VSX40 series.

Features

- Small size: 2.3 in. x 1.5 in. x 0.5 in.
- 89% efficiency
- Low output noise
- Input filtering
- Remote on/off, input side
- Output voltage trim, +/-10%
- Fixed frequency operation
- -40C° to +100C° baseplate temp.
- Output current limit, self-start
- 1,500 Vdc isolation, input to output
- UL/CUL 1950, EN60 950
- 36 to 75 Vdc input models
- Continuous short circuit protection
- Non-latching protection:
 - Input undervoltage
 - Input overvoltage
 - Output overvoltage
 - Overtemperature
- Output voltage tracking at turn-on and turn-off
- No minimum load current

AGENCY APPROVALS



Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit
Input Voltage: VSX40MD23	V_i		100	Vdc
I/O Isolation Voltage I/P to case O/P to case			1500 1500 200	Vdc Vdc Vdc
Operating Case Temperature	T_c	-40	100	°C

Electrical Characteristics - Unless otherwise indicated, specifications apply over all conditions of line, load and at $T_c = +40^\circ\text{C}$.

Input Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Operating Input Voltage VSX40MD23	V_i	36	48	75	Vdc
Maximum Input Current ($V_i=0\text{V}$ to V_i max, $I_o=I_o$ max) VSX40MD23	$I_{i\text{ max}}$	—	—	1.5	A
I/P Reflected Ripple Current	—	—	—	260	mA p-p
No Load Input Current	I_{iNL}		35		mA
On/Off Activated Input Current	I_{iQ}		20		mA

Output Specifications

Under any conditions, the voltage of V1 will always be greater or equal to that of V2.

Parameter	Symbol	Min	Typ	Max	Unit
Output voltage (Note 1) (Over all conditions of I/P voltage, load and temperature) 2.5 Vout (V2) 3.3 Vout (V1)	2.5 V_o 3.3 V_o	2.375 3.225	— —	2.555 3.450	Vdc Vdc
Output Voltage Setpoint ($V_i=48$, $I_{o_2}=9\text{A}$, $I_{o_3}=6\text{A}$, $T_c=25^\circ\text{C}$) 2.5 (V2) 3.3 (V1)	2.5 $V_{o,set}$ 3.3 $V_{o,set}$	2.465 3.335		2.490 3.368	Vdc Vdc
Output Ripple and Noise Voltage (peak-to-peak, 100 MHz BW) 2.5 (V2) 3.3 (V1)	— —	— —	— —	60 80	mv p-p mv p-p
Output Current (Total module O/P power should not exceed 40 Watts) 2.5 (V2) 3.3 (V1)	I_{o_2} I_{o_3}	— —	— —	16 12.12	A A
Output Current Limit Inception ($V_o=95\%$ of V_o nom) 2.5 (V2) 3.3 (V1)	$I_{o_{cli}}$ $I_{o_{cli}}$	16.8 12.7	18.5 14.0	21.0 15.9	A A

NOTE: 1. Worst case voltage conditions occur with full load drawn from one output only, zero being drawn from the other. For worst case voltages at less extreme loading conditions, consult the factory.

Output Specifications (continued)

Parameter	Symbol	Min	Typ	Max	Unit
Output Short Ckt Current (Max impedance across short circuit = 65mΩ)	2.5 Vo 3.3 Vo	15 11	19 13.2	22 17	A A
Efficiency (Vi=48V, Io ₂ =8A, Io ₃ =6A, Tc=40°C)	η	88	89	–	%
Dynamic Response (ΔIo/Δt=0.2A/μsec. Vi=48V, Tc=25°C, either O/P) Load change of 50% Io max; at any operating load up to Iomax or Pomax Peak Deviation outside settling point	–	–	2	–	%Vo nom

Isolation Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Isolation Capacitance	–	–	1000	–	pF
Isolation Resistance	–	10	–	–	MΩ

Feature Specifications

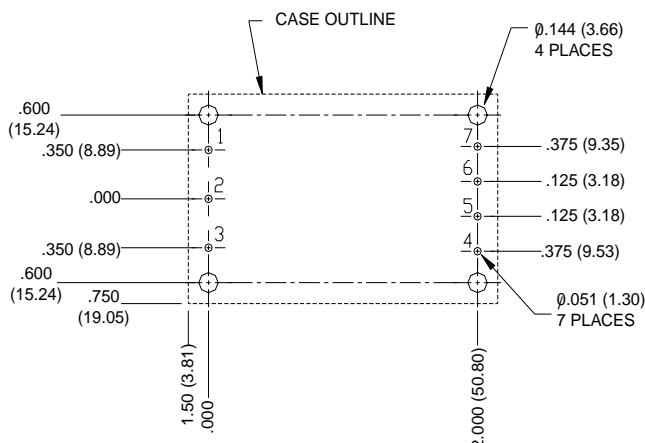
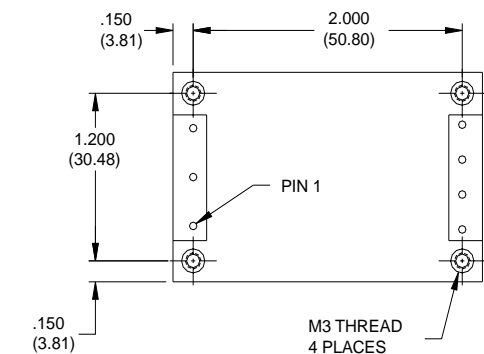
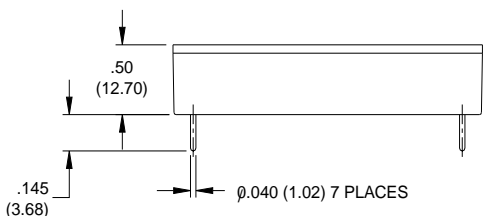
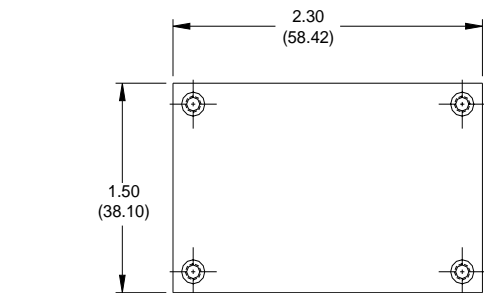
Parameter	Symbol	Min	Typ	Max	Unit
Remote On/Off (open collector equivalent, signal referenced to -Vin terminal) VSx40MD23 Preferred Logic (negative) Logic Low - Module On Logic High - Module Off VSX40MD23-1 - Optional Logic (positive) Logic Low - Module Off Logic High - Module On Logic Low: At Von/off = 0V	Von/off Ion/off	0 –	– –	50 200	Vdc μA
Turn On Time (Vo within 1% of steady state) From Application of Vin From Remote On/Off Activation)	– –	– –	7 3	10 4	mSecs mSecs
Input Undervoltage Lockout (Turn Off & Turn On Voltages Track) Turn On Turn Off	– –	30 27	33 30	36 33	Vdc Vdc
Input Overvoltage Lockout (Turn Off & Turn On Voltages Track) Turn Off Turn On	– –	76 74.5	80 78.5	84 82.5	Vdc Vdc
Output Overvoltage Set Point (Non-latching independent control loop) 2.5 Vo 3.3 Vo	VO2OV clamp VO3OV clamp	2.7 3.6	2.9 3.9	3.2 4.2	Vdc Vdc
Overtemperature Shutdown Hysteresis	Tc	105	115 10	125	°C °C
Output Trim Tie Trim to +2.5 Vo for trim down 3.3 Vo Tie Trim to O/P RTN for trim up 2.5 Vo 3.3 Vo	VO ₂ td VO ₃ td VO ₂ td VO ₃ td	– – – –	-10 -10 10 10	– – – –	% % % %

Outline Diagram

Dimensions are in inches (millimeters).

Tolerances: x.xx in. \pm 0.02 in.

x.xxx in. \pm 0.01 in.



**RECOMMENDED PCB HOLE PATTERN
(VIEW OF PCB, THROUGH UNIT)**

PINOUT KEY

- 1 +Vin
- 2 On/Off
- 3 -Vin
- 4 +2.5 Vout
- 5 O/P RTN
- 6 Trim
- 7 +3.3 Vout

C&D Technologies (Power Electronics) Ltd.
Shannon, Co. Clare, Ireland
Tel: +353.61.474.133 Fax: +353.61.474.141

Power Electronics Division, United States
3400 E Britannia Drive, Tucson, Arizona 85706
Tel: 800.547.2537 Fax: 520.770.9369

C&D Technologies, (NCL)
Milton Keynes MK14 5BU UK
Tel: +44 (0)1908 615232 Fax: +44 (0)1908 617545

Any data, prices, descriptions or specifications presented herein are subject to revision by C&D Technologies, Inc. without notice. While such information is believed to be accurate as indicated herein, C&D Technologies, Inc. makes no warranty and hereby disclaims all warranties, express or implied, with regard to the accuracy or completeness of such information. Further, because the product(s) featured herein may be used under conditions beyond its control, C&D Technologies, Inc. hereby disclaims all warranties, either express or implied, concerning the fitness or suitability of such product(s) for any particular use or in any specific application or arising from any course of dealing or usage of trade. The user is solely responsible for determining the suitability of the product(s) featured herein for user's intended purpose and in user's specific application. C&D Technologies, Inc. does not warrant or recommend that any of its products be used in any life support or aviation or aerospace applications.