

VSX40MD23

40 Watt Dual Output Quarter Brick DC/DC Converter



- 2.5V & 3.3V Dual Output
- 2.3" x 1.5" x 0.5"
- 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

APPLICATIONS

- Distributed Power Architectures
- Workstations
- EDP Equipment
- Telecommunications

OPTIONS

- Choice of Remote On/Off logic Configuration
- Heatsink Available for Extended Operation

ADDITIONAL INFORMATION

- See Application Note DCAN-41 at www.cdpowerelectronics.com

The VSX40 Series are dual output converters with a 36-75V input. The industry quarter-pak size of 2.3" x 1.5" 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.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Input Voltage: VSX40MD23	Vi		100	Vdc
I/O Isolation Voltage			1500	Vdc
I/P to case			1500	Vdc
O/P to case			200	Vdc
Operating Case Temperature	T	-40	100	°C

SPECIFICATIONS, ALL MODELS

Specifications are at $T_{CASE} = +40^{\circ}\text{C}$ nominal input voltage unless otherwise specified.

INPUT	PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
	Operating Input Voltage VSX40MD23	Vi	36	48	75	VDC
	Maximum Input Current (Vi=0V to Vi max, Io=Io max) VSX40MD23	Io max			1.5	A
	I/P Reflected Ripple Current				260	mA p-p
	No Load Input Current	IoNL		35		mA
	On/Off Activated Input Current	IoQ		20		mA

OUTPUT	PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Under any conditions, the voltage of V1 will always be greater or equal to that of V2.	Output voltage (Note 1) (Over all conditions of I/P voltage, load and temperature)					
	2.5 Vout (V2) 3.3 Vout (V1)	2.5 Vo 3.3 Vo	2.375 3.225	— —	2.555 3.450	Vdc Vdc
	Output Voltage Setpoint (Vi=48, Io ₂ =9A, Io ₃ =6A, Tc=25°C)					
	2.5 (V2) 3.3 (V1)	2.5 Vo, set 3.3 Vo, set	2.450 3.310		2.510 3.390	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)	Io ₂ Io ₃	— —	— —	16 12.12	A A
	Output Current Limit Inception (Vo=95% of Vo nom)					
	2.5 (V2) 3.3 (V1)	Io ₂ cli Io ₃ cli	16.8 12.7	18.5 14.0	21.0 15.9	A A
	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 Io max or Pmax Peak Deviation outside settling point		—	—	2	%Vo nom

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.

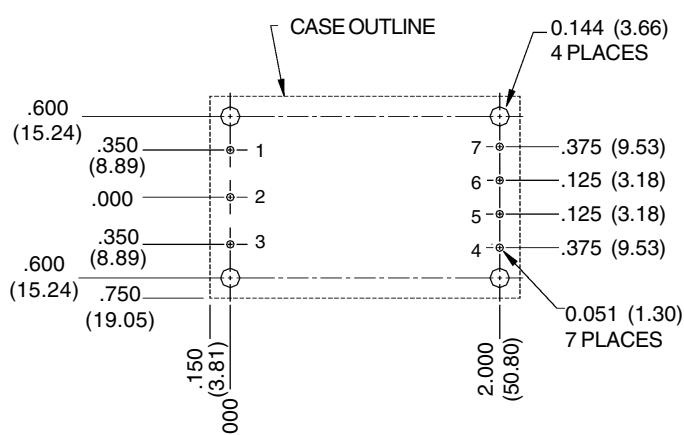
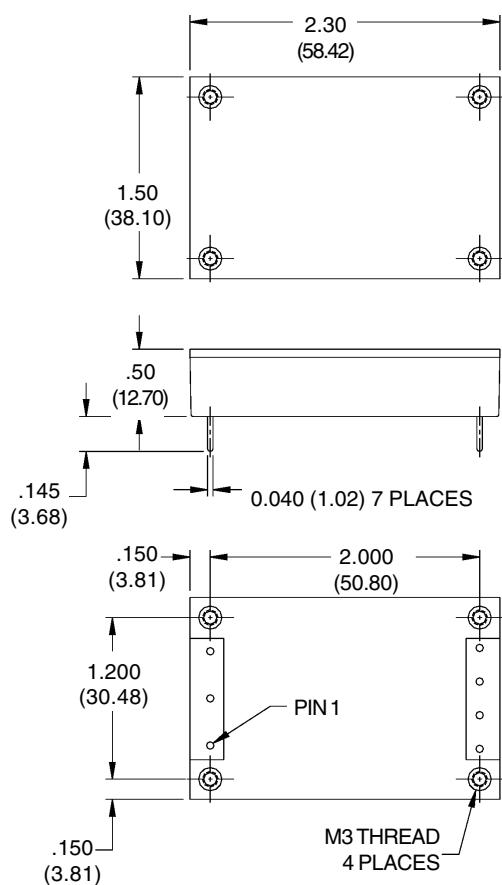
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
Isolation Specifications					
Isolation Capacitance	—	—	1000	—	pF
Isolation Resistance	—	10	—	—	MΩ
Feature Specifications					
Remote On/Off (open collector equivalent, signal referenced to -Vin terminal)					
VSx40MD23 Preferred Logic (negative)					
Logic Low - Module 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	0	—	50	Vdc
	Ion/off		—	200	µA
Turn On Time (Vo within 1% of steady state)					
From Application of Vin	—	—	7	10	mSecs
From Remote On/Off Activation)	—	—	3	4	mSecs
Input Undervoltage Lockout (Turn Off & Turn On Voltages Track)					
Turn On	—	30	33	36	Vdc
Turn Off	—	27	30	33	Vdc
Input Overvoltage Lockout (Turn Off & Turn On Voltages Track)					
Turn Off	—	76	80	84	Vdc
Turn On	—	74.5	78.5	82.5	Vdc
Output Overvoltage Set Point (Non-latching independent control loop)					
2.5 Vo	VO2OV clamp	2.7	2.9	3.2	Vdc
3.3 Vo	VO3OV clamp	3.6	3.9	4.2	Vdc
Overtemperature Shutdown	Tc	105	115	125	°C
Hysteresis			10		°C
Weight					
VSX40MD23, VSX40MD23-1			67		Grams
VSX40MD23-U, VSX40MD23-1U					
Output Trim					
Tie Trim to +2.5 Vo for trim down	2.5 Vo	VO ₂ td	—	-10	%
	3.3 Vo	VO ₃ td	—	-10	%
Tie Trim to O/P RTN for trim up	2.5 Vo	VO ₂ td	—	10	%
	3.3 Vo	VO ₃ td	—	10	%

MECHANICAL

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

NOTES:

1. Marked with: specific model ordered, date code, job code.
2. MATERIAL: Units are encapsulated in a low thermal resistance molding compound which has excellent chemical resistance and electrical properties in high humidity environments and over a wide operating temperature range. The encapsulant and outer shell of the unit have UL94V-0 ratings. Lead material is solder plated to allow ease of solderability.
3. IMPORTANT: When utilizing the PEM nuts for board mounting, it is required to follow guidelines in application note DCAN-41 available on the web at www.cdpowerelectronics.com.

ORDERING INFORMATION

To Find Model Number

Device Family VSX40MD23 - 1 U
 VSX40MD23 (Quarter Brick, 40 Watt DC/DC)
 Logic: No Number = Preferred Logic (Negative); 1 = Optional Logic (Positive)
 Package No Letter = Encapsulated; U = Unencapsulated

Model Numbers

- VSX40MD23
- VSX40MD23-U
- VSX40MD23-1
- VSX40MD23-1U

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