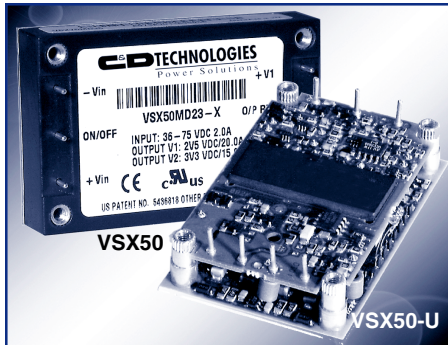


VSX50MD23

50 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%/ -8%
- Fixed Frequency Operation
- -40°C to +100°C 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 VSX50 Series are 50 Watt, compact, high-efficiency, high-density dual output converters with a 36-75V input and 2.5Vdc and 3.3Vdc outputs. The industry quarter-pack size of 2.3" x 1.5" x 0.5" coupled with 89% efficiency is an industry high-density breakthrough.

These converters utilize V Series 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 VSX50 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 VSX50 Series.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Input Voltage: VSX50MD23	V_i		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 $T_{CASE} = +40^{\circ}C$ nominal input voltage unless otherwise specified.

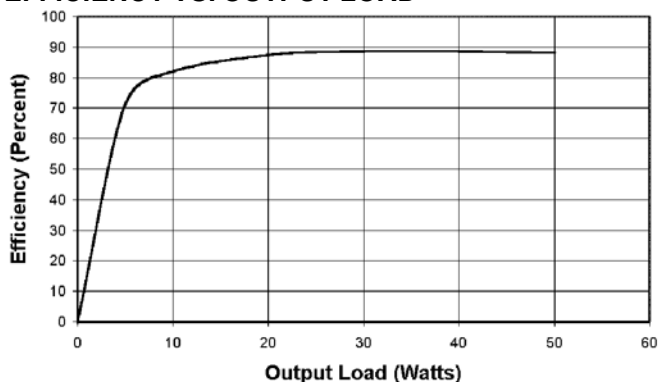
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
INPUT					
Voltage Range		36	48	75	VDC
Input Reflected Ripple Current	Peak - Peak			325	mA
Maximum Input Current	$V_{in} = 30V, P_{out} 50W$			2	A
No Load Input Current				60	mA
On/Off Activated Input Current				25	mA
Input Undervoltage Lockout					
Turn On		30	33	36	VDC
Turn Off		27	30	33	VDC
Input Overvoltage Lockout					
Turn Off		76	80	84	VDC
Turn On		74.5	78.5	82.5	VDC

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Power				50	Watts
Output Efficiency	$I_{o1}=10A, I_{o2}=7.5A$	88			%
Set Point Voltage					
V1 (2.5V)	$I_{o1}=10A$	2.460	2.5	2.530	V _{DC}
V2 (3.3V)	$I_{o2}=7.5A$	3.290	3.3	3.360	V _{DC}
Output Current	Total Module Output				
V1 (2.5V)	Power Should Not	0		20	A
V2 (3.3V)	Exceed 50 Watts	0		15	A
Output Ripple And Noise Voltage	100 MHz BW				
V1 (2.5V)				60	mV _{P-P}
V2 (3.3V)				80	mV _{P-P}
Output Adjust Range	Both Outputs Will Adjust at the Same Time and by the Same %	-8		+10	%
Output Temperature Drift			0.02	0.05	% / °C
Line Regulation	$V_{IN} = 36$ to 75 $I_1=10A, I_2=7.5A$		0.10	0.20	%
Load Regulation					
V1 (2.5V)	$I_1 = 0$ to $20A, I_2=0A$			4	% of Nom
V2 (3.3V)	$I_1=0A, I_2=0$ to $15.15A$			2.5	% of Nom
Load Cross Regulation					
V1 (2.5V)	$I_1 = 0A, I_2=0$ to $15.15A$			1.5	% of Nom
V2 (3.3V)	$I_1=0$ to $20A, I_2=0A$			3.5	% of Nom
Output Current Limit Inception					
V1 (2.5V)		21.0	24.0	28.0	A
V2 (3.3V)		16.0	17.5	22.0	A
Short Circuit Current					
V1 (2.5V)		19.0	23.0	28.0	A
V2 (3.3V)		14.0	18.0	22.0	A
Output Overvoltage Set Point (Non-latching independent control loop)					
V1 (2.5V)		2.70	2.90	3.25	V _{DC}
V2 (3.3V)		3.60	3.90	4.30	V _{DC}
Transient Response Settling Time	($\Delta I_o/\Delta t=0.2A/\mu sec$ either output) Load change of 40% of I_o max at any operating load up to I_o max and P_o max			100	μsec
Peak Deviation				4	%
Switching Frequency			330		KHz

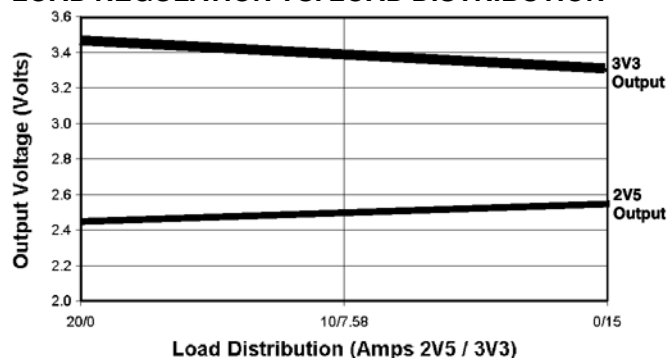
PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
ISOLATION SPECIFICATIONS					
Input to Output		1500			V _{DC}
Input to Case		1500			V _{DC}
Output to Case		200			V _{DC}
Resistance Input to Output		10			MΩ
Capacitance Input to Output			1000		pF
Leakage Current	V _{ISO} = 240V _{AC} , 60Hz		90		μA, rms
FEATURE SPECIFICATIONS					
Remote On/Off (open collector equivalent, signal referenced to -V _{IN} terminal)					
VSX50MD23 Preferred Logic (negative) Logic Low – Module On Logic High – Module Off					
VSX50MD23-1 Optional Logic (Positive) Logic Low – Module Off Logic High – Module On					
	Von/off Low	0		0.4	V _{DC}
	Von/off High	2		Open Collector	V _{DC}
	Ion/off			200	μA
Turn On Time					
From Application of V _{IN}	(V _O within 1% of		7	10	mSecs
From Remote On/Off Activation	steady state)		3	4	mSecs
Weight					
VSX50MD23, VSX50MD23-1			67		Grams
VSX50MD23-U, VSX50MD23-1U			44		Grams
TEMPERATURE					
Operation /Specification	Case	-40		+100	°C
Storage	Case	-55		+125	°C
Shutdown	Case	+105	+115	+125	°C
Shutdown (Hysteresis)			10		°C
Thermal Impedance (Case to Ambient)	Free Air		12.2		°C/Watt

GRAPHS

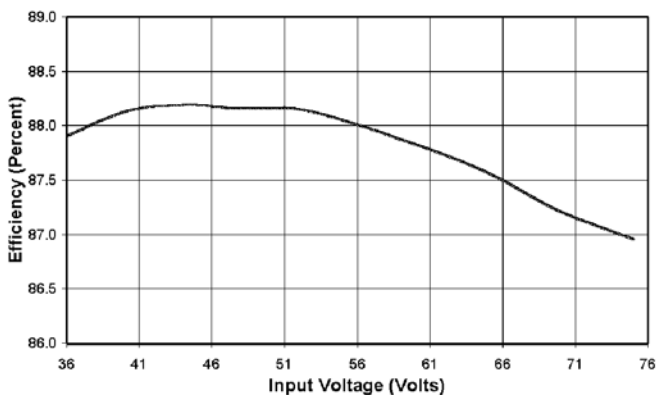
EFFICIENCY VS. OUTPUT LOAD



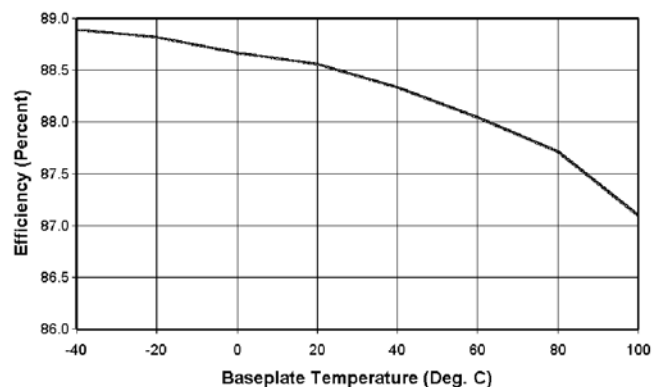
LOAD REGULATION VS. LOAD DISTRIBUTION



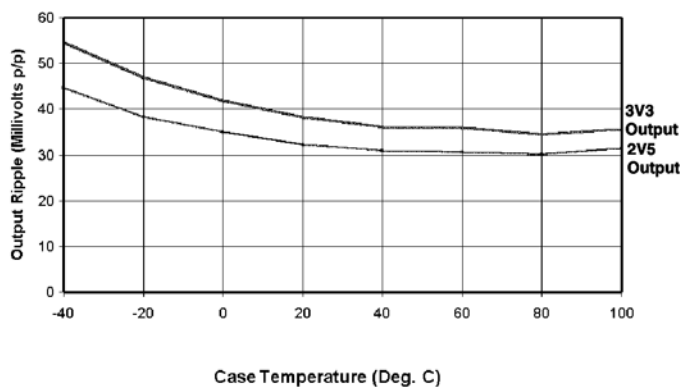
EFFICIENCY VS. INPUT VOLTAGE



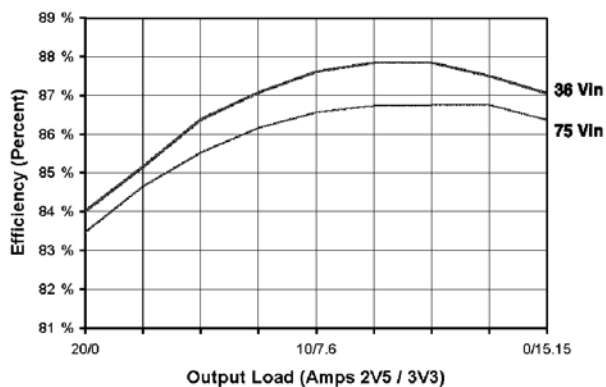
EFFICIENCY VS. BASEPLATE TEMPERATURE



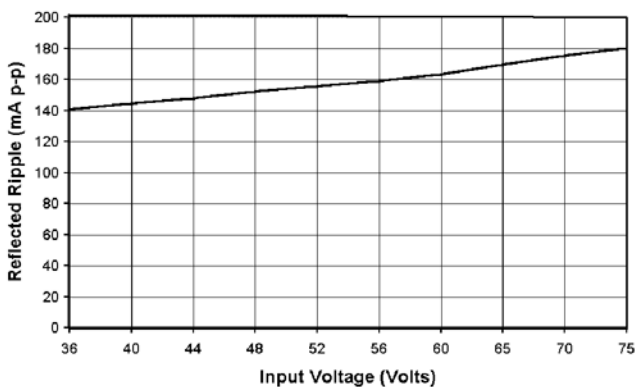
OUTPUT VOLTAGE RIPPLE VS. TEMPERATURE AT FULL LOAD



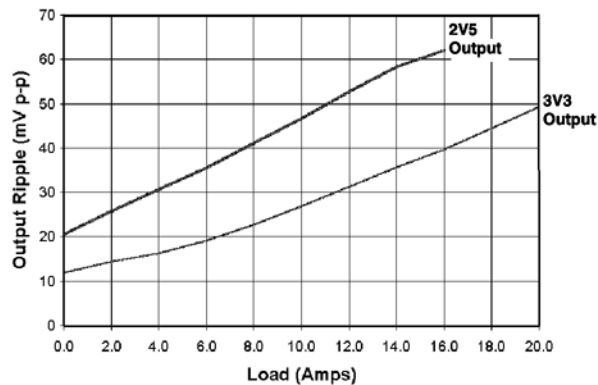
FULL LOAD EFFICIENCY VS. LOAD DISTRIBUTION



REFLECTED RIPPLE VS. INPUT VOLTAGE



OUTPUT RIPPLE VS. LOAD

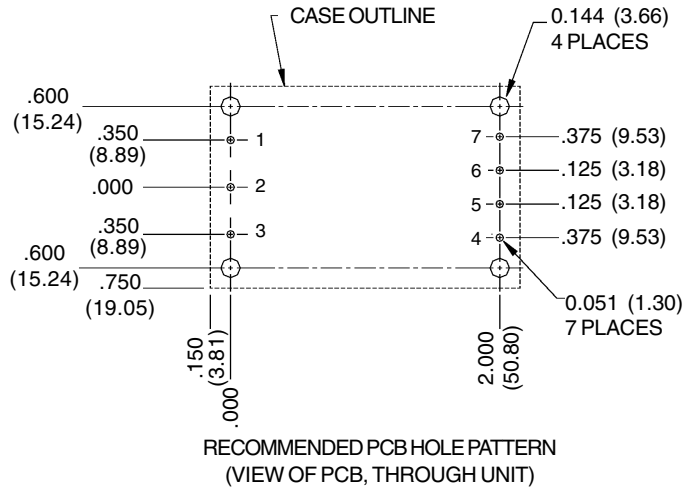
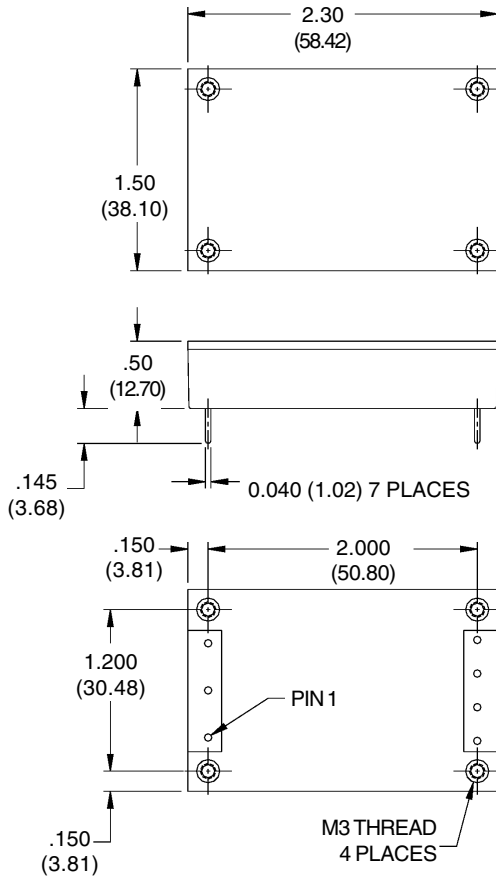


MECHANICAL

Dimensions are in inches (millimeters).

Tolerances: x.xx in. ± 0.02 in.

x.xxx in. ±0.01 in.



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 _____ VSX50MD23 - 1 U
 VSX50MD23 (Quarter Brick, 50 Watt DC/DC)
 Logic: No Number = Preferred Logic (Negative); _____
 1 = Optional Logic (Positive)
 Package _____
 No Letter = Encapsulated; U = Unencapsulated

Model Numbers

VSX50MD23
VSX50MD23-U
VSX50MD23-1
VSX50MD23-1U

Power Electronics Division, United States
 3400 E Britannia Drive, Tucson, Arizona 85706
 Tel: 800.547.2537 Fax: 520.295.4160

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

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