

VSX60MD35, VSX60LD35 60 W 3.3 Volt & 5 Volt Dual Output dc/dc Converters



The VSX60MD35 and the VSX60LD35 dc/dc Power Converters are compact, high efficiency, high-density breakthrough models 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

Description

The VSX60 Series are dual output converters with 18-36V and 36-75V input models with 3.3VDC and 5VDC outputs. The industry quarter-pak size of 1.5" X 2.3" X 0.5" coupled with 90% efficiency is an industry high-density breakthrough.

These converters utilize Vx high density technology. This technology has been featured in our highly efficient VKP60 and VLP100 series now successfully in use worldwide. The very high 90% 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 VSX60 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 VSX60 series.

Features

- Small size: 2.3 in. x 1.5 in. x 0.5 in.
- 90% 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 approved
- 18 to 36 Vdc and 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: VSX60MD35	V_i		100	Vdc
VSX60LD35	V_i		55	Vdc
I/O Isolation Voltage			1500	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 VSX60MD35	V_i	36	48	75	Vdc
VSX60LD35	V_i	18	24	36	Vdc
Maximum Input Current ($V_i=0\text{V}$ to V_i max, $I_o=I_o$ max)					
VSX60MD35	$I_{i\text{ max}}$	—	—	2.25	A
VSX60LD35	$I_{i\text{ max}}$	—	—	5.0	A
I/P Reflected Ripple Current	—	—		400	mA p-p
No Load Input Current	I_{iNL}		50		mA
On/Off Activated Input Current	I_{iQ}		17		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 (Over all conditions of I/P voltage, load and temperature)					
3.3 Vout (V2)	3.3 V_o	3.2	—	3.4	Vdc
5.0 Vout (V1)	5.0 V_o	4.8	—	5.2	Vdc
Output Voltage Setpoint ($V_i=48$, $I_{o_3}=9\text{A}$, $I_{o_5}=6\text{A}$, $T_c=25^\circ\text{C}$)					
3.3 Vout (V2)	3.3 $V_{o,set}$	3.26	3.30	3.34	Vdc
5.0 Vout (V1)	5.0 $V_{o,set}$	4.96	5.02	5.08	Vdc
Output Ripple and Noise Voltage (peak-to-peak, 100 MHz BW)					
3.3 Vout (V2)	—	—	—	60	mv p-p
5.0 Vout (V1)	—	—	—	80	mv p-p
Output Current (Total module O/P power should not exceed 60 Watts)					
3.3 Vout (V2)	I_{o_3}	—	—	15	A
5.0 Vout (V1)	I_{o_5}	—	—	12	A
Output Current Limit Inception ($V_o=95\%$ of V_o nom)					
3.3 Vout (V2)	I_{o_3cli}	19.0	21.0	23.0	A
5.0 Vout (V1)	I_{o_5cli}	12.5	13.5	15.0	A

Output Specifications (continued)

Parameter	Symbol	Min	Typ	Max	Unit
Output Short Ckt Current	3.3 Vo	16	19	22	A
(Max impedance across short circuit = 65mΩ)	5.0 Vo	11	14	17	A
Efficiency (Vi=48V, Io ₃ =9A, Io ₅ =6A, Tc=70°C)	η	89	90	—	%
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

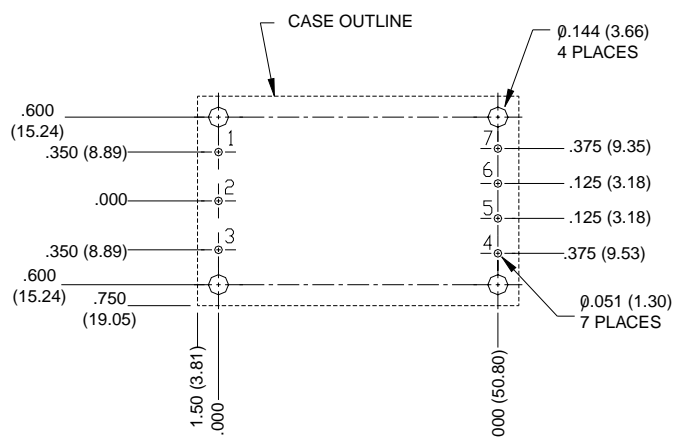
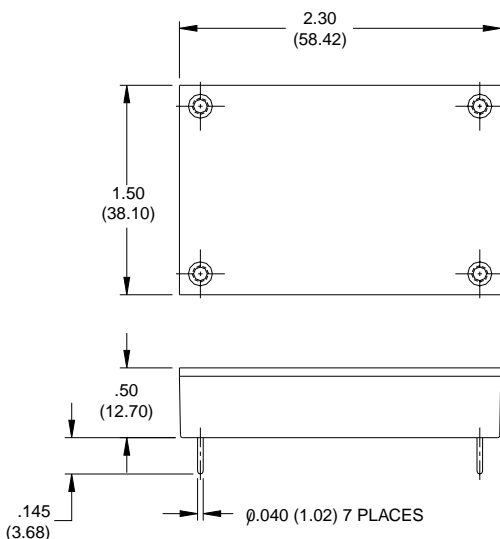
Feature Specifications

Parameter	Symbol	Min	Typ	Max	Unit
Remote On/Off (open collector equivalent, signal referenced to -Vin terminal) VSx60xD35 Preferred Logic (negative) Logic Low - Module On Logic High - Module Off VSX60xD35-1 - Optional Logic (positive) Logic Low - Module Off Logic High - Module On Logic Low: At Von/off = 0V	Von/off Ion/off	0	—	70	Vdc
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) 3.3 Vo	VO3OV clamp	3.8	4.0	4.3	Vdc
5.0 Vo	VO3OV clamp	5.85	6.1	6.35	Vdc
Overtemperature Limiting	Tc	105	115	125	°C
Output Trim					
Tie Trim to +3.3 Vo for trim down	3.3 Vo	—	-10	—	%
	5.0 Vo	—	-10	—	%
Tie Trim to O/P RTN for trim up	3.3 Vo	—	10	—	%
	5.0 Vo	—	10	—	%

Outline Diagram

Dimensions are in inches (millimeters).

Tolerances: x.xx in. ± 0.02 in.
x.xxx in. ±0.01 in.



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

PINOUT KEY

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

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