Murata Power Solutions

VSX60XD35C

60 Watt Dual Output Quarter Brick DC/DC Converter

NOT RECOMMENDED FOR NEW DESIGNS

FEATURES

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

VSX60

VSX60-U

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-40 at www.murata-ps.com

PRODUCT OVERVIEW

The VSX60 series are dual output converters having two input ranges, either 18-36V or 36-75V. The units' dual asymmetric output voltages are 5V and 3.3V. The converter features an industry-standard quarter-brick size (2.3" x 1.5" x 0.5") coupled with 90% efficiency.

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 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.

Absolute Maximum Rating

Parameter	Symbol	Min	Max	Unit
Input Voltage:				
VSX60LD35C	Vi		100	Vdc
VSX60MD35C	Vi		75	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

RoHS COMPLIANT 2002/95/EC

For full details go to www.murata-ps.com/rohs

ISO9001 CERTIFIED

	PARAMETER	SYMBOL	MIN	TYP	MAX	UNITS
INPUT	Operating Input Voltage					
	VSX60LDC	Vi	18	24	36	VDC
	VSX60MDC	Vi	36	48	75	VDC
	Maximum Input Current (Vi=0V to Vi max, Io=Io max)					
	VSX60LDC	Ii max			5.0	A
	VSX60MDC	Ii max			2.25	
	I/P Reflected Ripple Current				400	mA p-p
	No Load Input Current	IiNL		50		mA
	On/Off Activated Input Current	IiQ		17		mA

OUTPUT 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)					
	3.3 Vout (V2)	3.3 Vo	2.375	–	2.555	Vdc
	5.0 Vout (V1)	5.0 Vo	3.225	–	3.450	Vdc
	Output Voltage Setpoint (Vi=48, Io_2=9A, Io_3=6A, Tc=25°C)					
	3.3 (V2)	3.3 Vo,set	2.450		2.510	Vdc
	5.0 (V1)	5.0 Vo,set	3.310		3.390	Vdc
	Output Ripple and Noise Voltage (peak-to-peak, 100 MHz BW)					
	3.3 (V2)	–	–	–	60	mv p-p
	5.0 (V1)	–	–	–	80	mv p-p
	Output Current (Total module O/P power should not exceed 60 Watts)					
	3.3 (V2)	Io_2	–	–	15	A
	5.0 (V1)	Io_1	–	–	12	A
	Output Current Limit Inception (Vo=95% of Vo nom)					
	3.3 (V2)	Io_2cli	19.0	21.0	23.0	A
	5.0 (V1)	Io_1cli	12.5	13.5	15.0	A
	Output Short Ckt Current (Max impedance across short circuit = 65mΩ)		16	19	22	A
	3.3 Vo		16	19	22	A
	5.0 Vo		11	14	17	A
	Efficiency (Vi=48V, Io_3=9A,Io_5=6A, Tc=70°C)	η	90	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

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.

GENERAL

Isolation Specifications						
Isolation Capacitance		_	_	1000	_	pF
Isolation Resistance		_	10	_	_	MΩ
Feature Specifications						
Remote On/Off (open collector equivalent, signal referenced to -Vin terminal)						
VSX60MD35C Preferred Logic (negative)						
Logic Low - Module On						
Logic High - Module Off						
VSX60MD35-1C - 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			2.7	2.9	3.2	Vdc
3.3 Vo			3.6	3.9	4.2	Vdc
Overtemperature Shutdown		Tc	105	115	125	°C
Hysteresis				10		°C
Weight						
VSX60MD35C, VSX60MD35-1C				67		Grams
VSX60MD35-UC, VSX60MD35-1UC						
Output Trim						
Tie Trim to +2.5 Vo for trim down	2.5 V2		–	-10	–	%
	3.3 V1		–	-10	–	%
Tie Trim to O/P RTN for trim up	2.5 V2		–	10	–	%
	3.3 V1		–	10	–	%

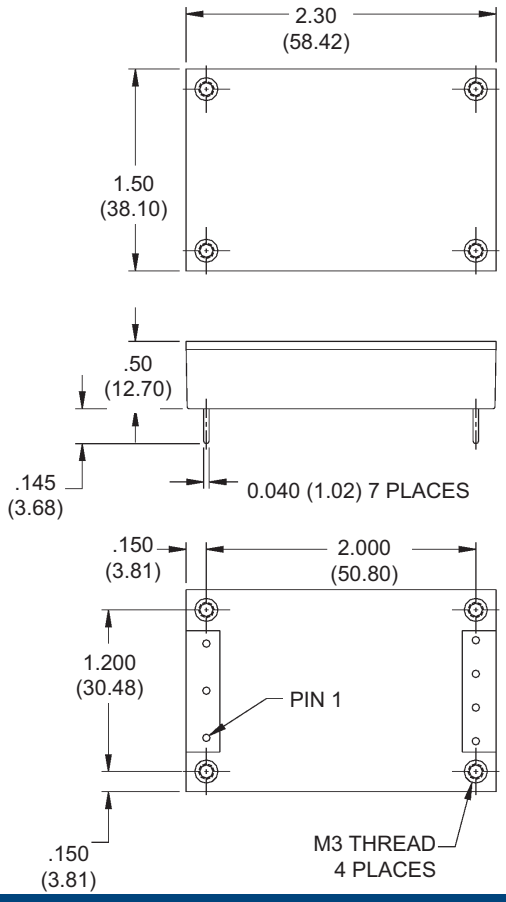
THROUGH-HOLE SOLDERING INFORMATION

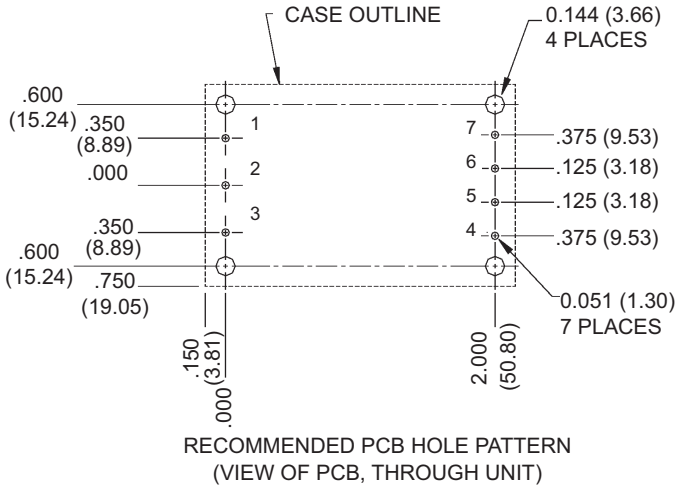
These devices are intended for wave soldering or manual soldering.
They are not intended to be subject to surface mount processes under any circumstances.

The normal wave soldering process can be used with these devices where the device is subjected to a maximum wave temperature of 260°C for a period of no more than 10 seconds. Within this time and temperature range, the integrity of the device's plastic body will not be compromised and internal temperatures within the converter will not exceed 175°C. Care should be taken to control manual soldering limits identical to that of wave soldering.

MECHANICAL

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	+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.murata-ps.com.

ORDERING INFORMATION

To Find Model Number

VSX60 -1 U C

Device Family
VSX60MD35 (Quarter Brick, 60 Watt DC/DC)
Logic: No Number = Preferred Logic (Negative);
1 = Optional Logic (Positive)
Package
No Letter = Encapsulated; U = Unencapsulated
RoHS Compliant

Model Numbers
VSX60MD35C
VSX60MD35-UC
VSX60MD35-1C
VSX60LD35C

Murata Power Solutions

Murata Power Solutions, Inc.
11 Cabot Boulevard, Mansfield, MA 02048-1151 U.S.A.
Tel: (508) 339-3000 (800) 233-2765 Fax: (508) 339-6356
www.murata-ps.com email: sales@murata-ps.com ISO 9001 and 14001 REGISTERED

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USA: Mansfield (MA), Tel: (508) 339-3000, email: sales@murata-ps.com
Canada: Toronto, Tel: (866) 740-1232, email: toronto@murata-ps.com
UK: Milton Keynes, Tel: +44 (0)1908 615232, email: mk@murata-ps.com
France: Montigny Le Bretonneux, Tel: +33 (0)1 34 60 01 01, email: france@murata-ps.com
Germany: München, Tel: +49 (0)89-544334-0, email: munich@murata-ps.com
Japan: Tokyo, Tel: 81-3-3779-1031, email: japan@murata-ps.com
Kyoto, Tel: 81-75-955-7269, email: japan@murata-ps.com
China: Shanghai, Tel: +86 215 027 3678, email: shanghai@murata-ps.com
Guangzhou, Tel: +86 208 221 8066, email: guangzhou@murata-ps.com
Singapore: Parkway Centre, Tel: +65 6348 9096, email: singapore@murata-ps.com