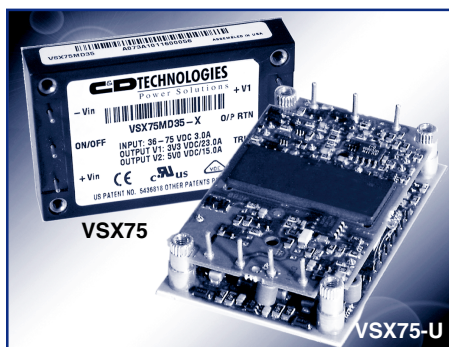# C&D TECHNOLOGIES
Power Solutions

VSX75MD35

75 Watt Dual Output Quarter Brick DC/DC Converter

- 3.3V & 5.0V 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
- 36-75 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-40 at www.cdpowerelectronics.com

The VSX75 Series are 75 Watt, compact, high-efficiency, high-density dual output converters with a 36-75V input and with 3.3Vdc and 5.0Vdc outputs. The industry quarter-pack size of 2.3" x 1.5" x 0.5" coupled with 90% 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 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 VSX75 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 VSX75 Series.

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	MIN	MAX	UNIT
Input Voltage: VSX75MD35	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	℃

SPECIFICATIONS, ALL MODELS

Specifications are at T_{CASE} = +40°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			500	mA
Maximum Input Current	Vin = 30V, Pout 75W			3	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

INPUT (side label)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Output Power				75	Watts
Output Efficiency	Io1=11.5A, Io2=7.5A	89			%
Set Point Voltage					
V1 (3.3V)	Io1=11.5A	3.26	3.30	3.34	VDC
V2 (5.0V)	Io2=7.5A	4.96	5.02	5.08	VDC
Output Current	Total Module Output				
V1 (3.3V)	Power Should Not	0		23	A
V2 (5.0V)	Exceed 75 Watts	0		15	A
Output Ripple And Noise Voltage	100 MHz BW				
V1 (3.3V)				60	mV$_{P-P}$
V2 (5.30V)				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=11.5A, I_2=7.5A		0.10	0.20	%
Load Regulation					
V1 (3.3V)	I_1 = 0 to 23A, I_2=0A			3.0	% of Nom
V2 (5.0V)	I_1=0A, I_2=0 to 15A			2.5	% of Nom
Load Cross Regulation					
V1 (3.3V)	I_1 = 0A, I_2=0 to 15A			1.0	% of Nom
V2 (5.0V)	I_1=0 to 23A, I_2=0A			5.0	% of Nom
Output Current Limit Inception					
V1 (3.3V)		24	27	30	A
V2 (5.0V)		16	18	20	A
Short Circuit Current					
V1 (3.0V)		22	25	30	A
V2 (5.0V)		15	18	20	A
Output Overvoltage Set Point (Non-latching independent control loop)					
V1 (3.3V)		3.8	4.0	4.3	VDC
V2 (5.0V)		5.85	6.1	6.35	VDC
Transient Response	($\Delta Io/\Delta t$=0.2A/μsec either output) Load change of 40% of Io max at any operating load up to Io max and Po max				
Settling Time				100	μsec
Peak Deviation				4	%
Switching Frequency			330		KHz

OUTPUT Under any conditions, the voltage of V1 will always be greater or equal to that of V2. (side label)

GENERAL

| 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			$M\Omega$
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)					
VSX75MD35 Preferred Logic (negative)					
Logic Low – Module On					
Logic High – Module Off					
VSX75MD35-1 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					
VSX75MD35, VSX75MD35-1			67		Grams
VSX75MD35-U, VSX75MD35-1U			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
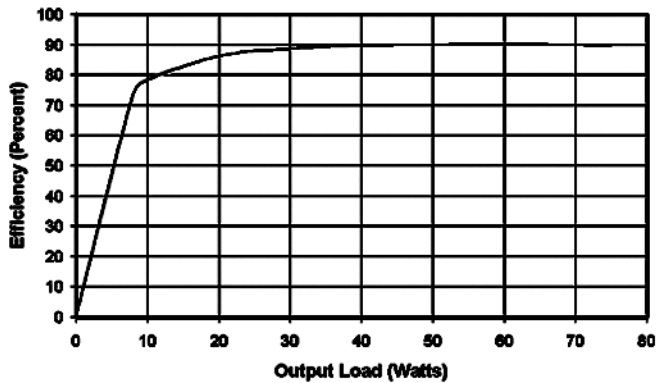
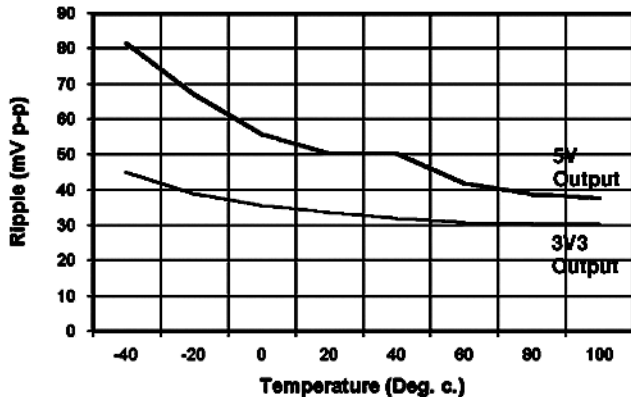## LOAD REGULATION VS. LOAD DISTRIBUTION
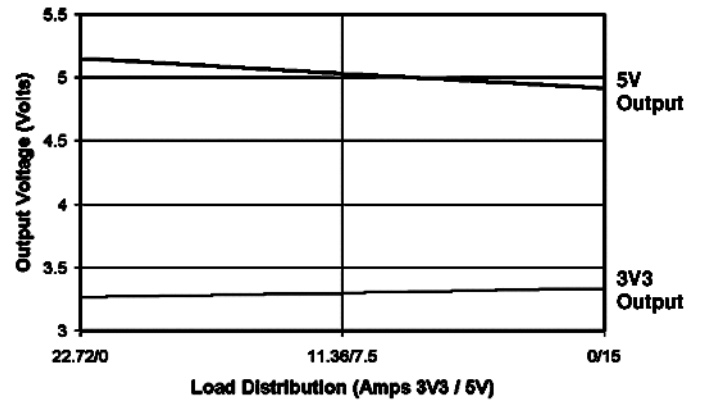
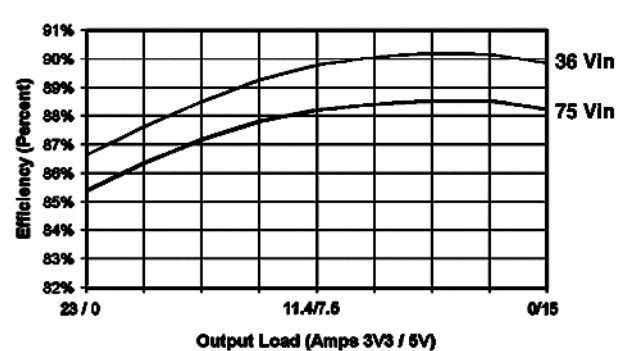## EFFICIENCY VS. INPUT VOLTAGE
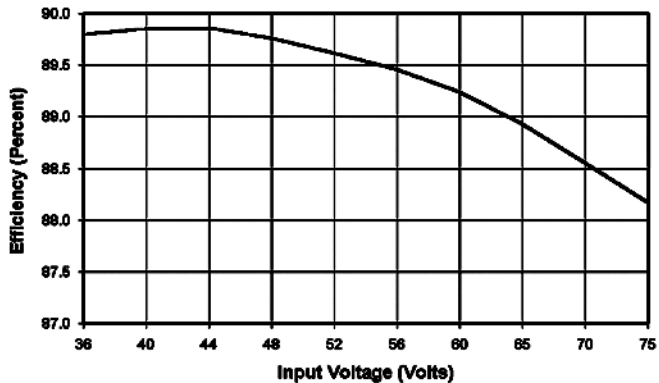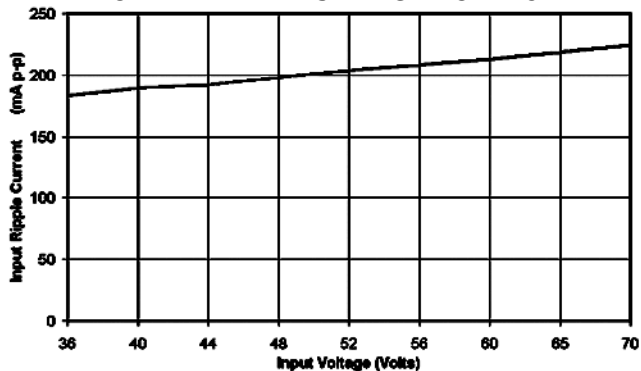

EFFICIENCY VS. BASEPLATE TEMPERATURE
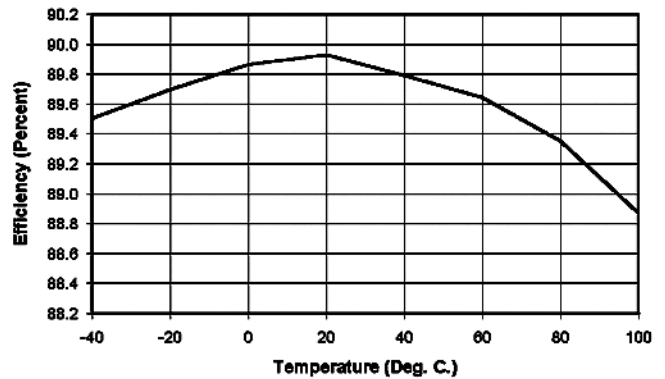
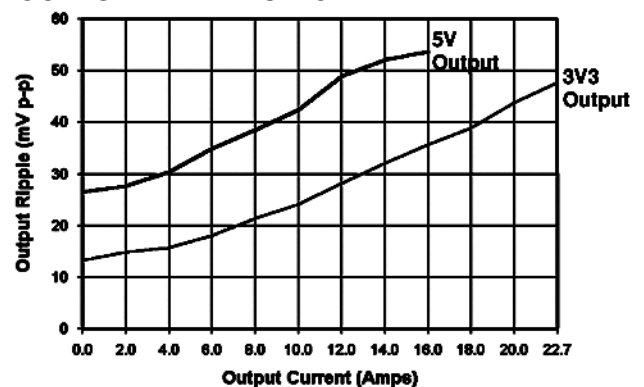## OUTPUT VOLTAGE RIPPLE VS. TEMPERATURE AT FULL LOAD

FULL LOAD EFFICIENCY VS. LOAD DISTRIBUTION

REFLECTED RIPPLE VS. INPUT VOLTAGE
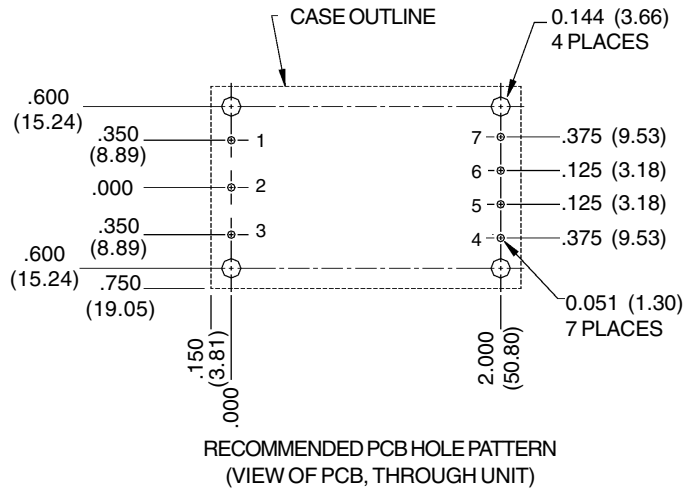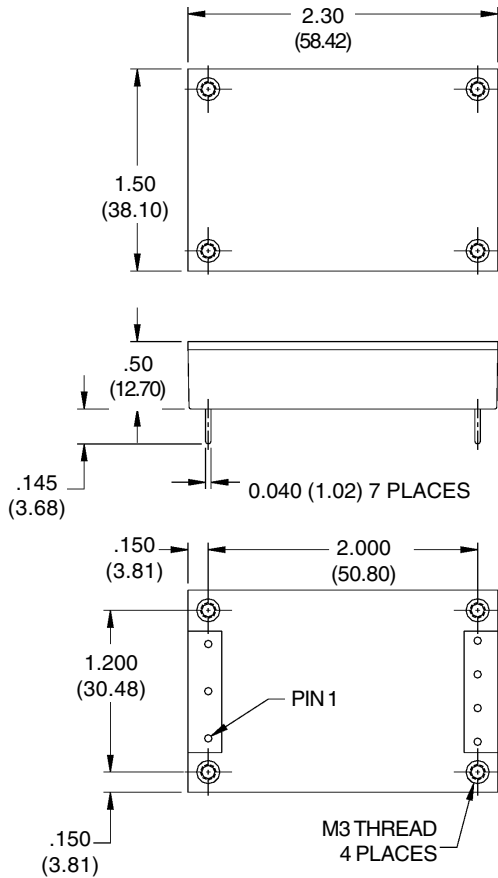

OUTPUT RIPPLE VS. LOAD

MECHANICAL

Dimensions are in inches (millimeters).
Tolerances: x.xx in. ± 0.02 in.
                   x.xxx in. ±0.01 in.

2.30 (58.42)

1.50 (38.10)

.50 (12.70)

.145 (3.68)

0.040 (1.02) 7 PLACES

.150 (3.81)

2.000 (50.80)

1.200 (30.48)

PIN 1

.150 (3.81)

M3 THREAD 4 PLACES

CASE OUTLINE

0.144 (3.66) 4 PLACES

.600 (15.24)

.350 (8.89)

.000

.350 (8.89)

.600 (15.24)

.750 (19.05)

.150 (3.81)

.000

2.000 (50.80)

1
2
3

7   .375 (9.53)
6   .125 (3.18)
5   .125 (3.18)
4   .375 (9.53)

0.051 (1.30) 7 PLACES

**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	+5.0 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-40 available on the web at www.cdpowerelectronics.com.

ORDERING INFORMATION

To Find Model Number

VSX75MD35 - 1 U

Device Family
   VSX75MD35 (Quarter Brick, 75 Watt DC/DC)
Logic: No Number = Preferred Logic (Negative);
                1 = Optional Logic (Positive)
Package
No Letter = Encapsulated; U = Unencapsulated

Model Numbers

VSX75MD35
VSX75MD35-U
VSX75MD35-1
VSX75MD35-1U