48 V Input DC-DC Converter Modules

Size:
2.19 x 1.91 x 0.37 in
55,7 x 48,6 x 9,5 mm

Features

- DC input range: 36 – 75 V
- Efficiency: Up to 93%
- DC output: 1 – 48 V
- Maximum operating temp: 100°C, full load
- Isolated output
- Low noise: Sine Amplitude Converter™ (SAC™) technology
- Highly efficient: ZCS/ZVS switching
- Fast dynamic response
- Low profile: 0.37 in. (9.5 mm)
- RoHS Compliant
- Power density up to 145 W/in^3
- Agency approvals

Applications

- Communications
- Distributed power
- ATE
- Defense
- Aerospace
- Medical
- And other applications requiring high efficiency

Product Overview

VI Brick DC-DC converters use advanced Sine Amplitude Converter™ (SAC™) technology, thermally enhanced packaging technologies, and advanced CIM processes to provide high power density and efficiency, superior transient response, and improved thermal management. The high speed 3.5 MHz, zero current switching–zero voltage switching (ZCS–ZVS) design enables efficient and low noise operation throughout the operating range.

Product Selection: 36 – 75 V DC Input Range

Output Voltage	Output Power (W)	Current (A)	Efficiency (%)	Part Numbering
1.0 Vdc	100	100	85	**DC048B 010 010**
1.5 Vdc	120	80	87	**DC048B 015 012**
1.8 Vdc	144	80	89	**DC048B 018 014**
2.5 Vdc	175	70	90	**DC048B 025 017**
3.0 Vdc	180	60	91	**DC048B 030 018**
3.3 Vdc	165	50	91	**DC048B 033 016**
5 Vdc	180	36	91	**DC048B 050 018**
10 Vdc	180	18	92	**DC048B 100 018**
12 Vdc	220	18.33	92	**DC048B 120 022**
15 vdc	200	13.33	92	**DC048B 150 020**
24 Vdc	220	9.17	92	**DC048B 240 022**
28 Vdc	190	6.79	92	**DC048B 280 019**
48 Vdc	220	4.58	93	**DC048B 480 022**

Product Grade Temperatures (°C)

Grade	Operating	Storage
T =	–40 to +100	–40 to +125
M =	–55 to +100	–65 to +125

Baseplate

F = Slotted flange
T = Longitudinal heat sink[a]

[a] Contact factory

Pin Style

P = Through hole

MODULE FAMILY ELECTRICAL CHARACTERISTICS

Electrical characteristics apply over the full operating range of input voltage, output load (resistive) and baseplate temperature, unless otherwise specified. All temperatures refer to the operating temperature at the center of the baseplate.

Absolute Maximum Ratings

Parameter	Rating	Unit	Notes
+In to –In voltage	-1.0 to +85	Vdc	
PC to –In voltage	-0.3 to +6.0	Vdc	
+Out to -Out			
1.0 V	-0.5 to 4.0	Vdc	
1.5 V	-0.5 to 4.0	Vdc	
1.8 V	-0.5 to 4.0	Vdc	
2.5 V	-0.5 to 6.0	Vdc	
3.0 V	-0.5 to 6.0	Vdc	
3.3 V	-0.5 to 12.0	Vdc	
5 V	-0.5 to 12.0	Vdc	
10 V	-0.5 to 30.0	Vdc	
12 V	-0.5 to 30.0	Vdc	
15 V	-0.5 to 25	Vdc	
24 V	-0.5 to 50.0	Vdc	
28 V	-0.5 to 48.0	Vdc	
48 V	-0.5 to 60.0	Vdc	
Isolation voltage			
In to out	2,250	Vdc	Test voltage
In to base	2,250	Vdc	Test voltage
Out to base	707	Vdc	Test voltage
Operating Temperature	-55 to +100	°C	M-Grade
Storage Temperature	-65 to +125	°C	M-Grade
Pin soldering temperature	500 (260)	°F (°C)	<5 sec; wave solder
	750 (390)	°F (°C)	<7 sec; hand solder
Mounting torque	5 (0.57)	in-lbs (N-m)	6 each

Note: Stresses in excess of the maximum ratings can cause permanent damage to the device. Operation of the device is not implied at these or any other conditions in excess of those given in the specification. Exposure to absolute maximum ratings can adversely affect device reliability.

Input Specifications

Parameter	Min	Typ	Max	Unit	Notes
Operating input voltage	36	48	75	Vdc	
Input surge withstand			85	Vdc	
Undervoltage turn-on		33.8	35.3	Vdc	
Undervoltage turn-off	30.4	31.8		Vdc	
Overvoltage turn-on	75.7	77.3		Vdc	
Overvoltage turn-off		78.8	81.0	Vdc	
Recommended external input capacitance		100		µF	See Figure 19

Output Specifications[a]

Parameter	Min	Typ	Max	Unit	Notes
Output voltage setpoint		2%		Vout nom.	Nominal input; full load; 25°C
Line regulation		±0.5	±1	%	Low line to high line; full load, deviation from setpoint
Temperature regulation		±0.03	.05	% / °C	Over operating temperature range

[a] For important information relative to applications where the converter modules are subject to continuous dynamic loading, contact Vicor applications engineering at 800-927-9474.

Control Specifications

Parameter	Min	Typ	Max	Unit	Notes
Primary Control (PC)					
DC voltage	4.8	5.0	5.2	Vdc	Referenced to –In
Module disable voltage	2.3	2.4		Vdc	Referenced to –In
Module enable voltage		2.5	2.6	Vdc	Referenced to –In
Disable hysteresis		100		mV	
Current limit		1.75	1.90	mA	
Disable delay time		1		µs	

Thermal Resistance and Capacity

Parameter	Min	Typ	Max	Unit
Baseplate to sink; flat, greased surface		0.20		°C/Watt
Baseplate to sink; thermal pad		0.18		°C/Watt
Baseplate to ambient		6.5		°C/Watt
Baseplate to ambient; 1000 LFM		2.0		°C/Watt
Thermal capacity		47.7		Watt-sec/°C

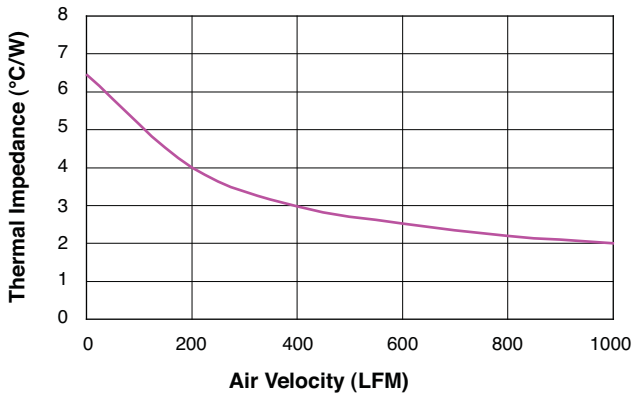

Figure 1 – Thermal impedance vs. airflow

General Specifications

Parameter	Min	Typ	Max	Unit	Notes
Isolation voltage	In to out	2,250		Vdc	Test voltage, complies with basic insulation requirements
	In to base	2,250		Vdc	Test voltage, complies with basic insulation requirements
	Out to base	707		Vdc	Test voltage, complies with operational insulation requirements
Isolation resistance (in to out)		10		megohms	
Weight		2.19		ounces	
			62.14	grams	
Thermal protection	125	130	135	°C	Junction temperature, with automatic recovery
Agency approvals		cTÜVus, CE			UL60950-1, CSA0950-1, EN60950-1, IEC60950-1. With appropriate fuse in series with the +Input

Note: Specifications are subject to change without notice.

1.0 Vout, 100 W OPERATING SPECIFICATIONS - (e.g. DC048B010T010FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	82	85		%	Nominal input; full load; 25°C
Ripple and noise		100	138	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	1.17		1.24	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			108,000	µF	External
Load current	0		100	Amps	
Current limit (peak)	108	115	130	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	50	Amps	Shut down, may require PC enable to initiate restart

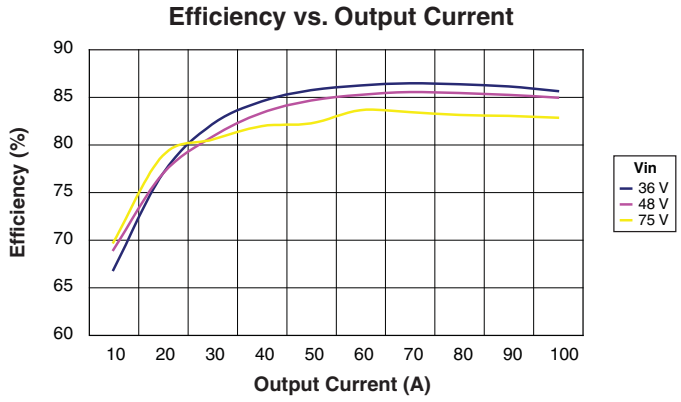

Figure 2-1 – Efficiency vs. load

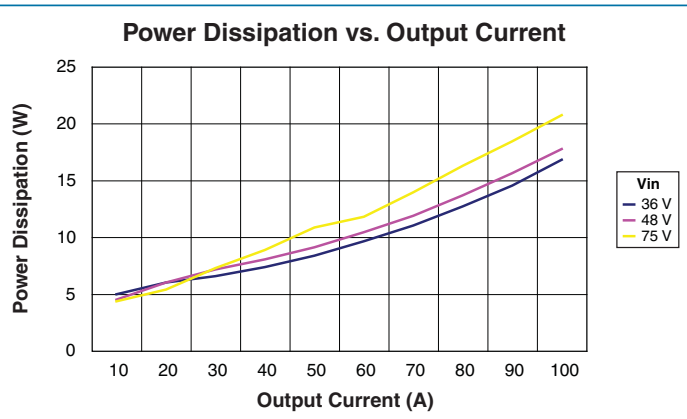

Figure 2-2 – Power dissipation vs. load

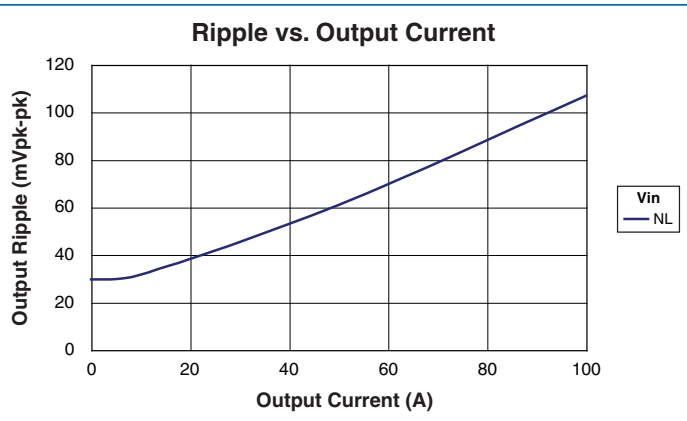

Figure 2-3 – Output ripple vs. load with no external bypass capacitance

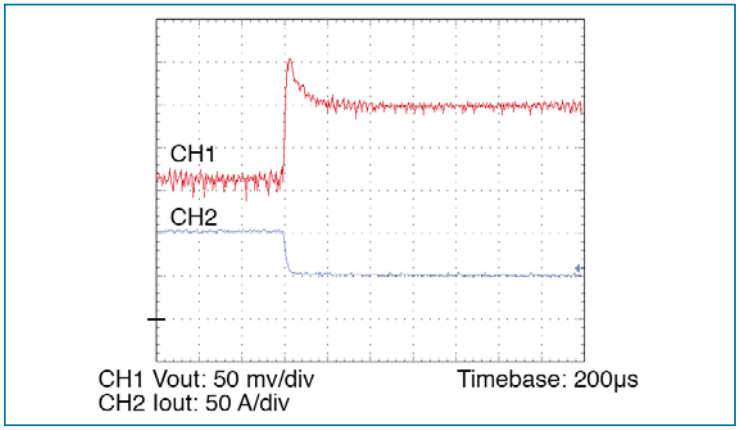

Figure 2-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

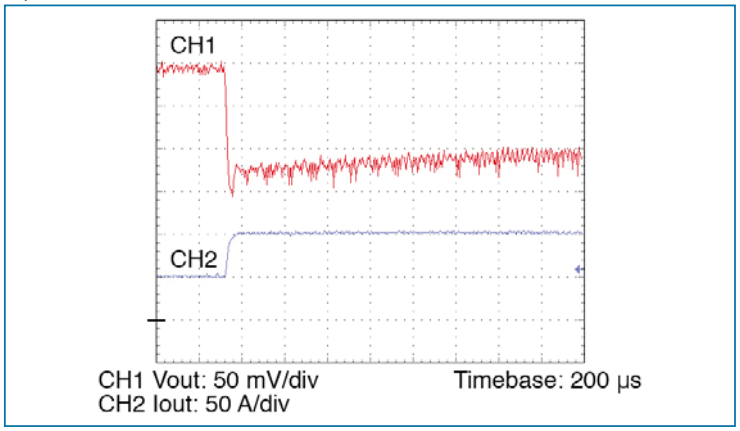

Figure 2-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

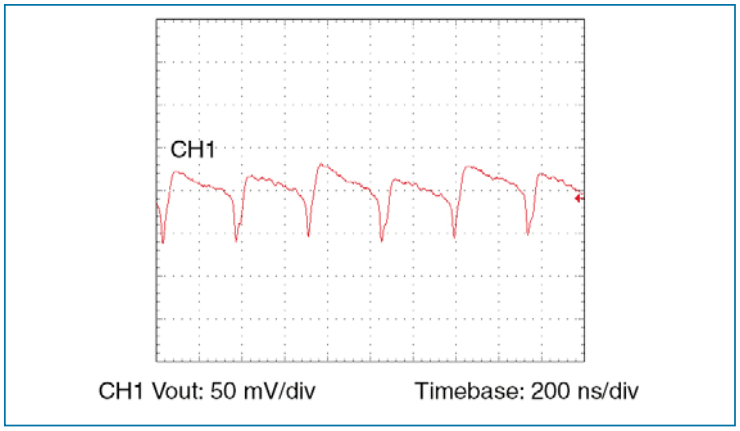

Figure 2-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

1.5 Vout, 120 W OPERATING SPECIFICATIONS - (e.g. DC048B015T012FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	83	87		%	Nominal input; full load; 25°C
Ripple and noise		100	125	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	1.75		1.86	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			48,000	µF	External
Load current	0		80	Amps	
Current limit (peak)	86.4	92	104	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	40	Amps	Shut down, may require PC enable to initiate restart

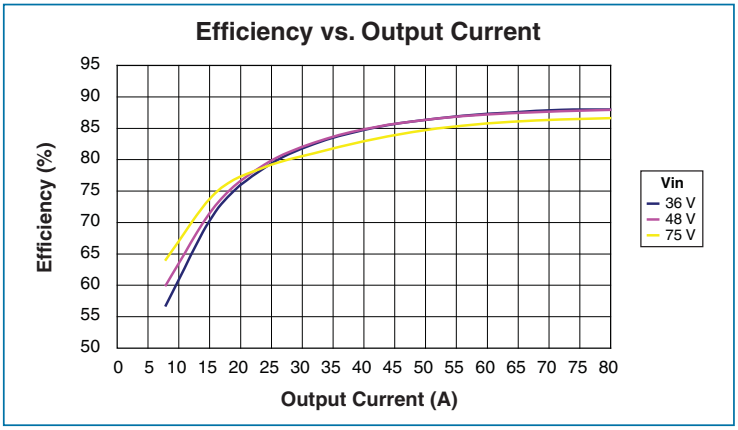

Figure 3-1 – Efficiency vs. load

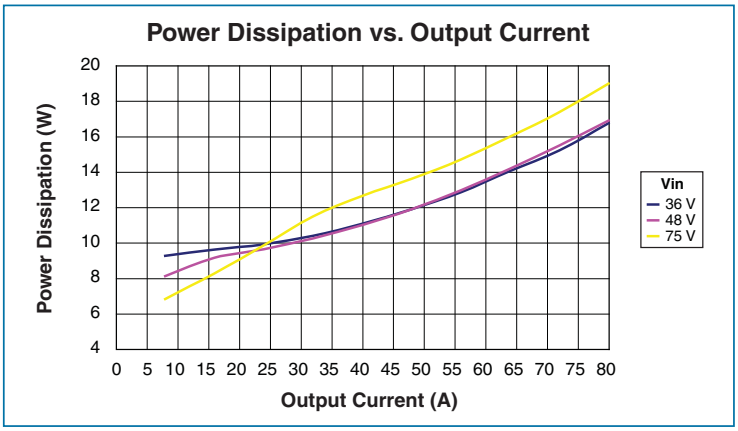

Figure 3-2 – Power dissipation vs. load

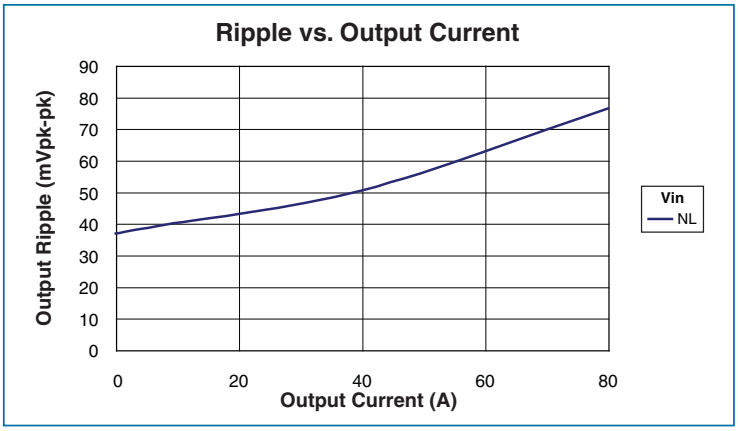

Figure 3-3 – Output ripple vs. load with no external bypass capacitance

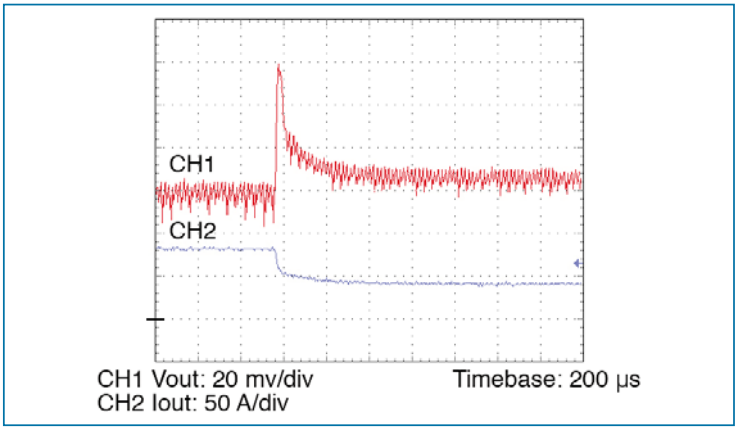

Figure 3-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

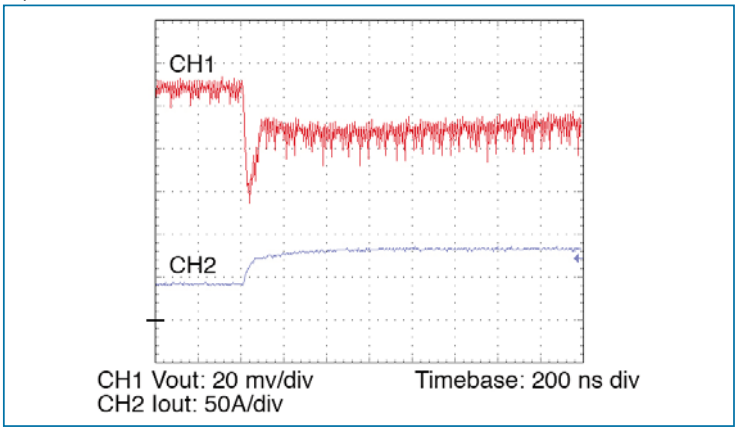

Figure 3-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

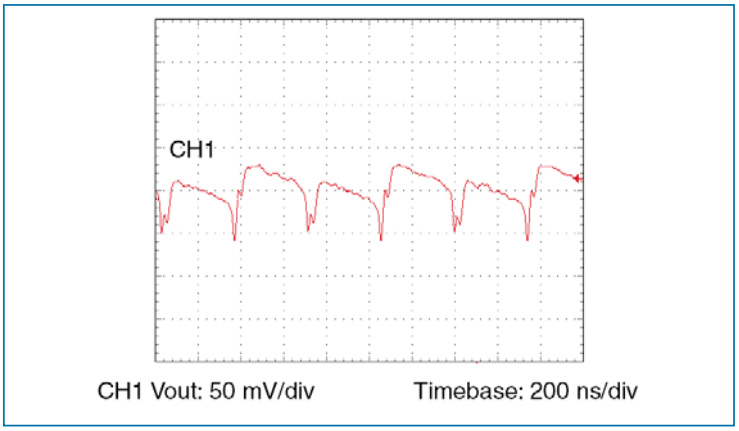

Figure 3-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

1.8 Vout, 144 W OPERATING SPECIFICATIONS - (e.g. DC048B018T014FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	86	89		%	Nominal input; full load; 25°C
Ripple and noise		87	109	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	2.33		2.48	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			27,000	µF	External
Load current	0		80	Amps	
Current limit (peak)	86.4	92	104	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	40	Amps	Shut down, may require PC enable to initiate restart

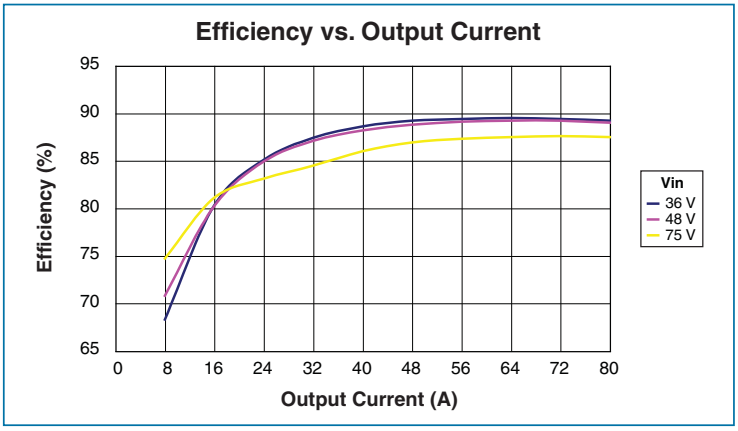

Figure 4-1 – Efficiency vs. load

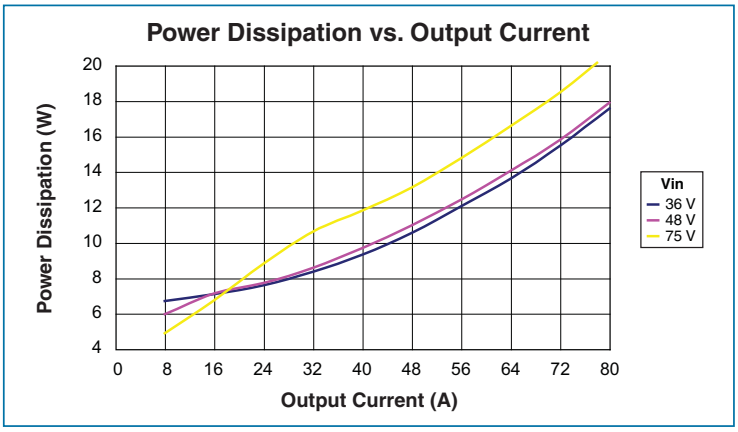

Figure 4-2 – Power dissipation vs. load

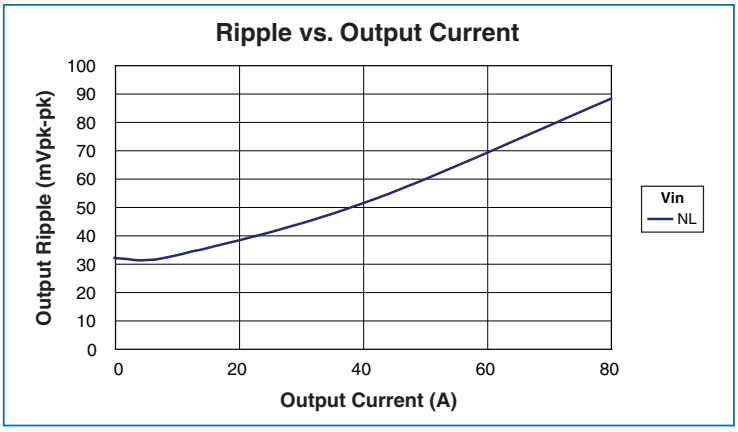

Figure 4-3 – Output ripple vs. load with no external bypass capacitance

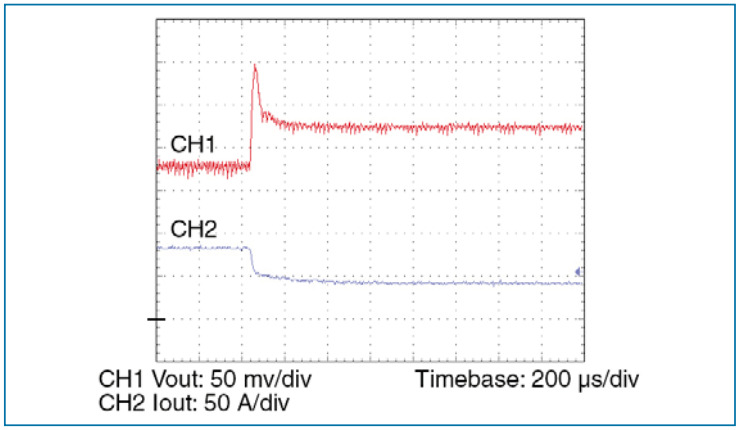

Figure 4-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

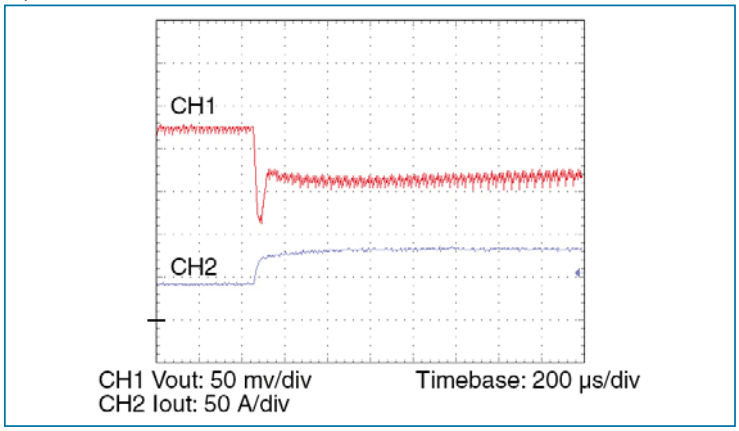

Figure 4-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

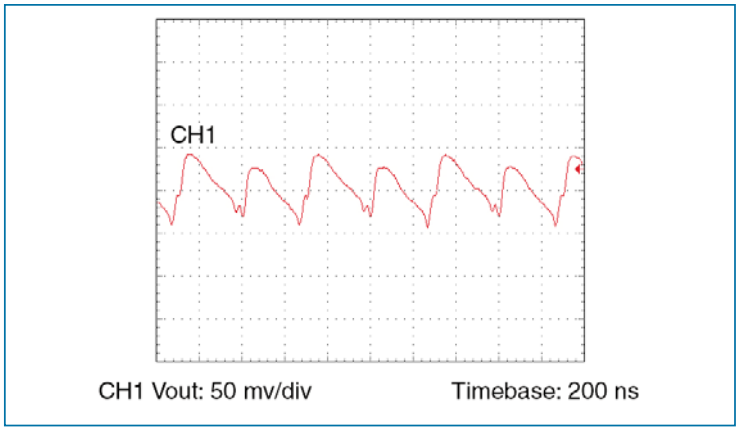

Figure 4-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

2.5 Vout, 175 W OPERATING SPECIFICATIONS - (e.g. DC048B025T017FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	87	90		%	Nominal input; full load; 25°C
Ripple and noise		65	95	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	3.5		3.71	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			12,000	µF	External
Load current	0		70	Amps	
Current limit (peak)	75.6	80.5	91	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	35	Amps	Shut down, may require PC enable to initiate restart

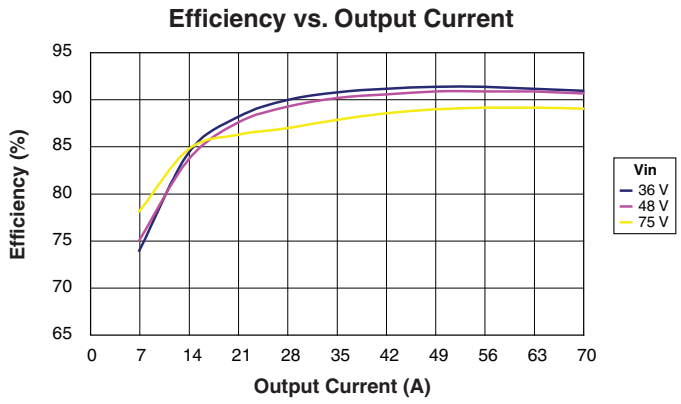

Figure 5-1 – Efficiency vs. load

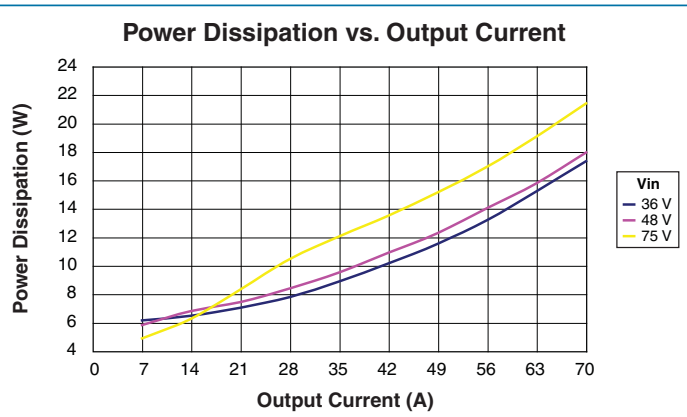

Figure 5-2 – Power dissipation vs. load

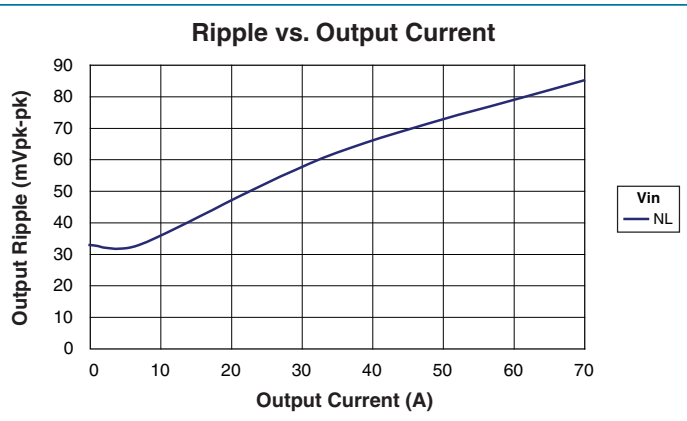

Figure 5-3 – Output ripple vs. load with no external bypass capacitance

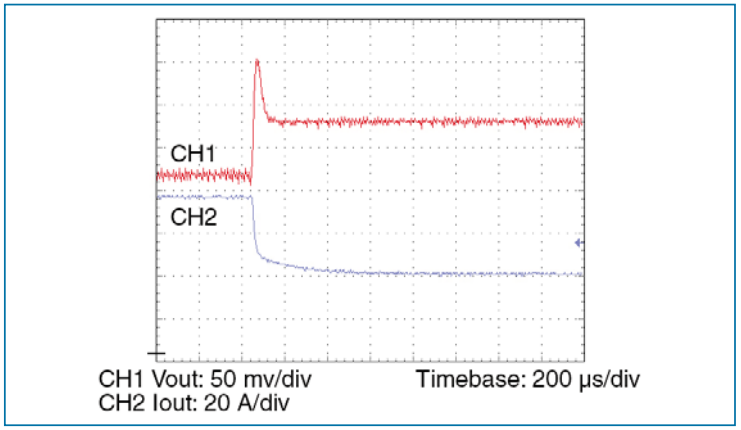

Figure 5-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

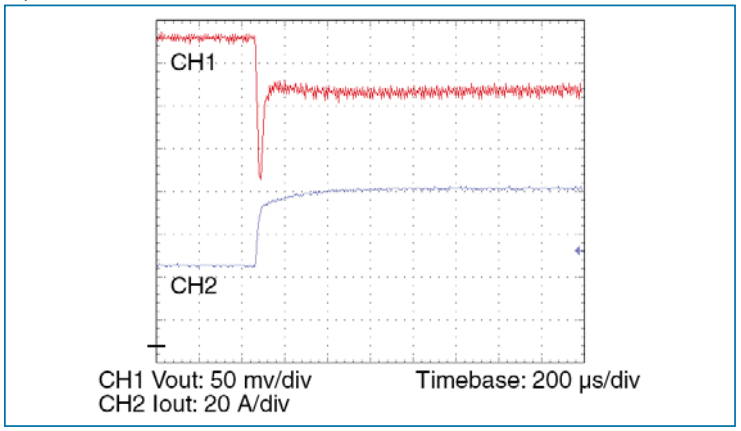

Figure 5-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

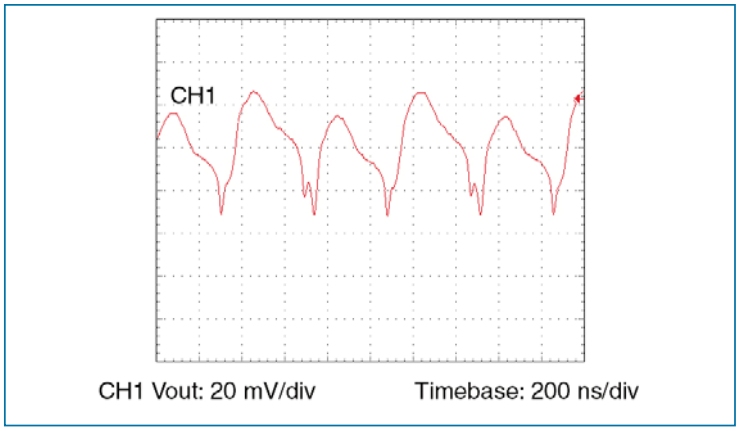

Figure 5-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

3.0 Vout, 180 W OPERATING SPECIFICATIONS - (e.g. DC048B030T018FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	88	91		%	Nominal input; full load; 25°C
Ripple and noise		56	90	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	3.5		3.71	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			12,000	µF	External
Load current	0		60	Amps	
Current limit (peak)	64.8	69.0	78.0	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	30	Amps	Shut down, may require PC enable to initiate restart

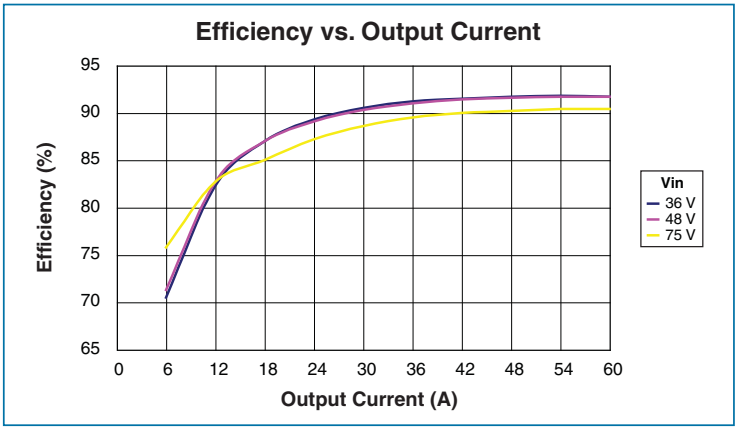

Figure 6-1 – Efficiency vs. load

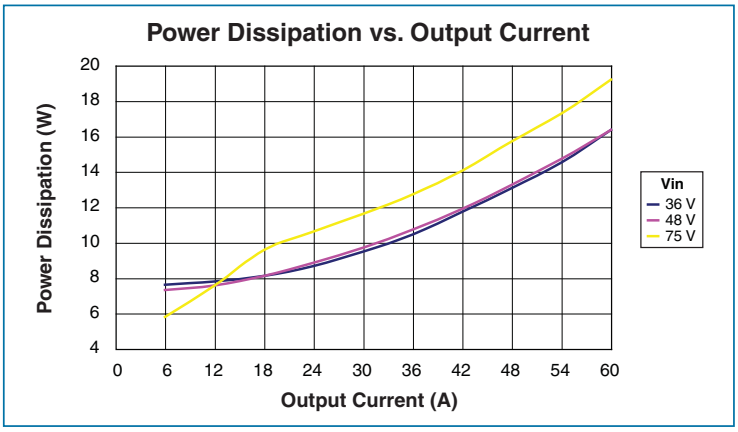

Figure 6-2 – Power dissipation vs. load

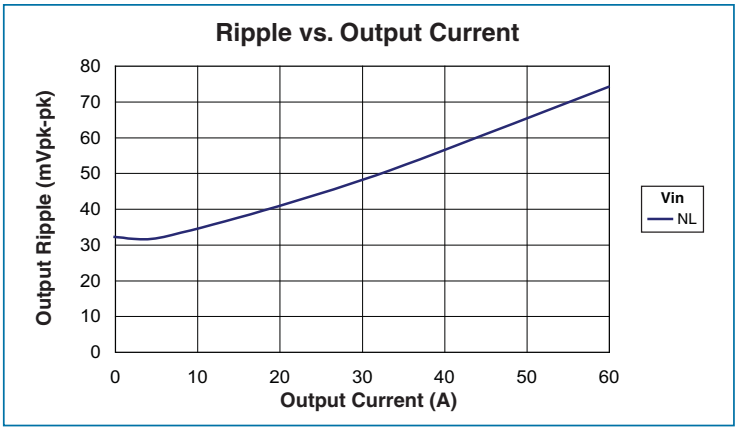

Figure 6-3 – Output ripple vs. load with no external bypass capacitance

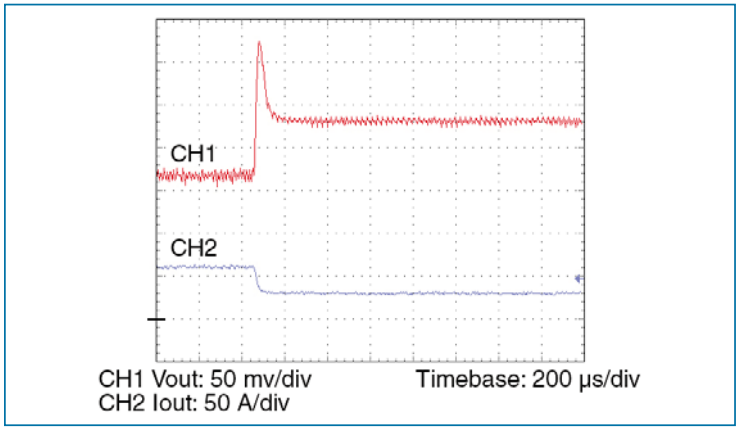

Figure 6-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

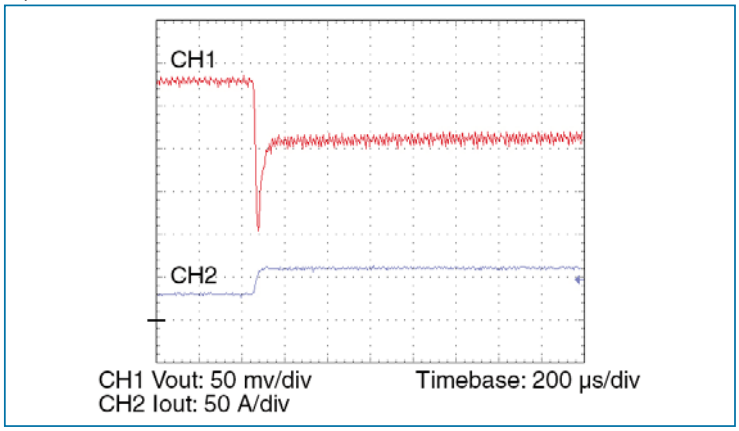

Figure 6-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

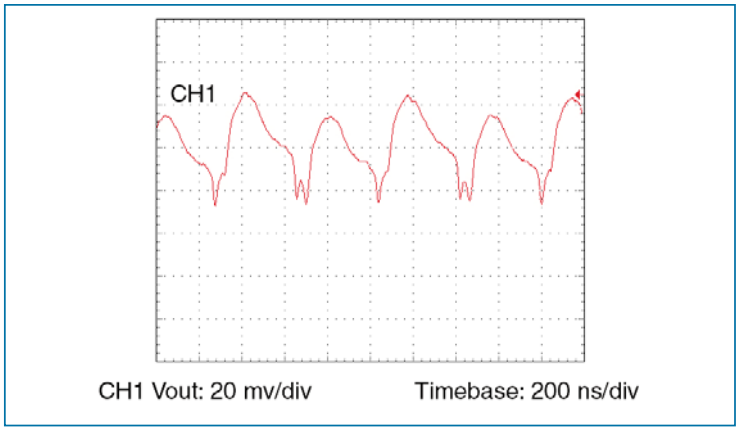

Figure 6-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

3.3 Vout, 165 W OPERATING SPECIFICATIONS - (e.g. DC048B033T016FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	87	91		%	Nominal input; full load; 25°C
Ripple and noise		130	163	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	4.67		4.95	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			6,700	µF	External
Load current	0		50	Amps	
Current limit (peak)	54.0	57.5	65	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	25	Amps	Shut down, may require PC enable to initiate restart

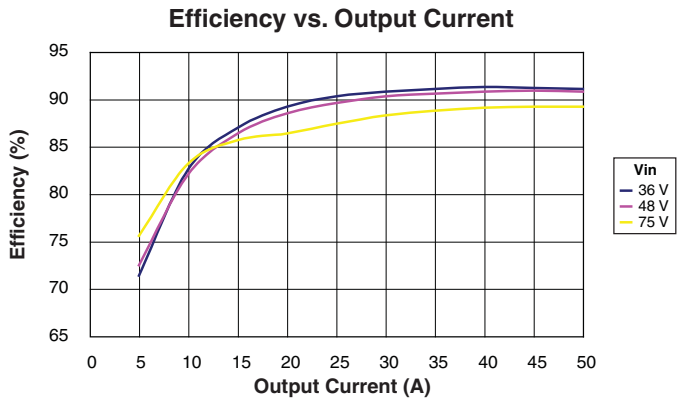

Figure 7-1 – Efficiency vs. load

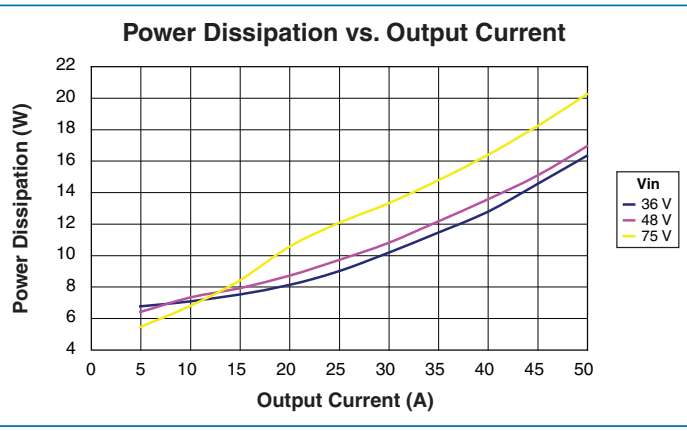

Figure 7-2 – Power dissipation vs. load

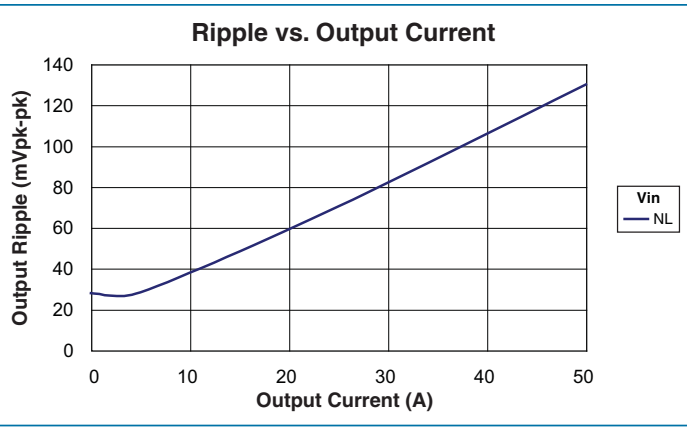

Figure 7-3 – Output ripple vs. load with no external bypass capacitance

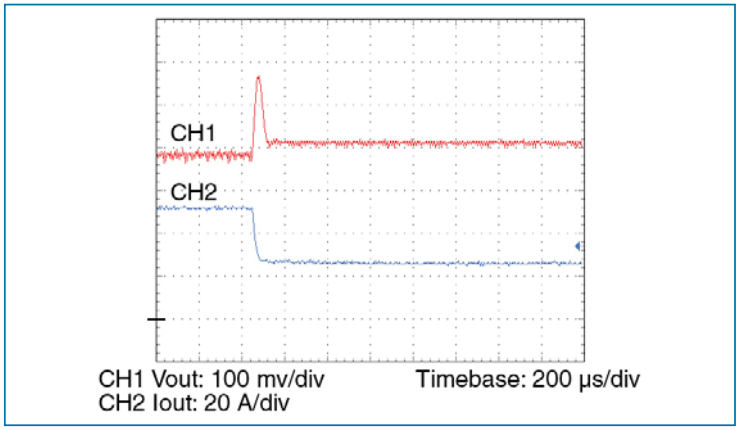

Figure 7-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

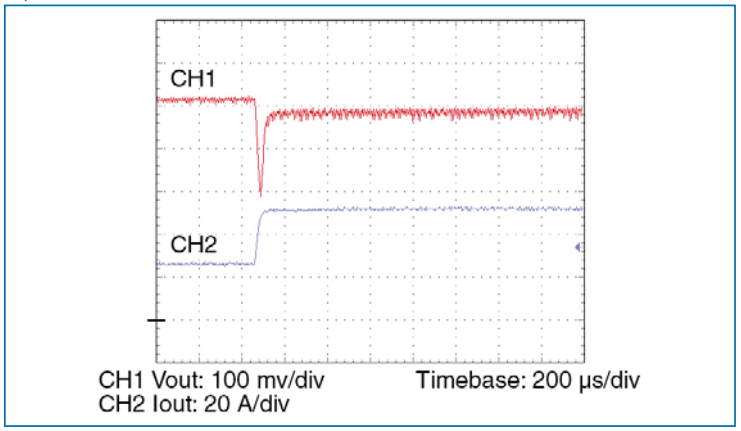

Figure 7-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

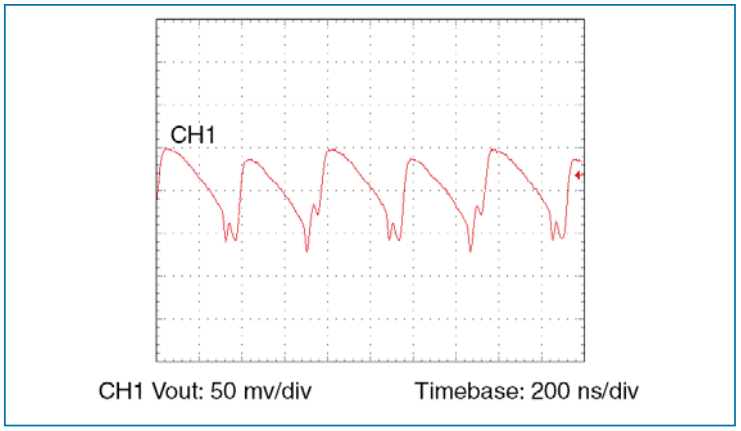

Figure 7-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

5.0 Vout, 180 W OPERATING SPECIFICATIONS - (e.g. DC048B050T018FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	88	91		%	Nominal input; full load; 25°C
Ripple and noise		130	165	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	7.0		7.43	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			3,000	µF	External
Load current	0		36	Amps	
Current limit (peak)	38.88	41.4	46.8	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	18.0	Amps	Shut down, may require PC enable to initiate restart

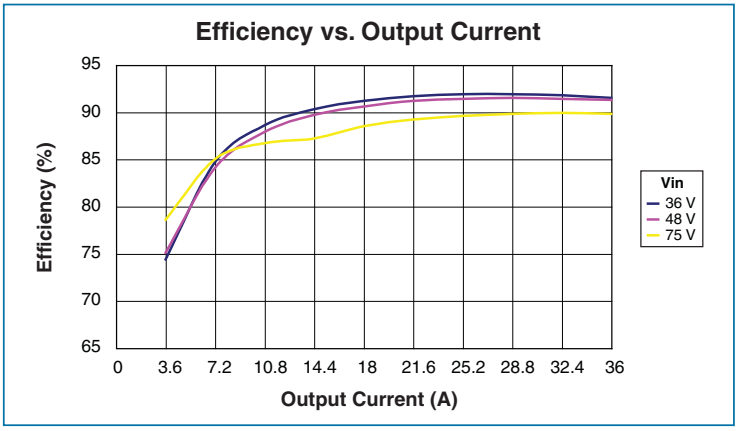

Figure 8-1 – Efficiency vs. load

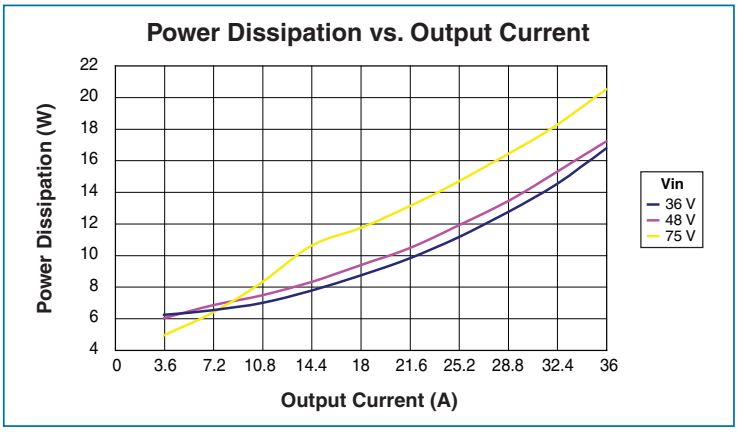

Figure 8-2 – Power dissipation vs. load

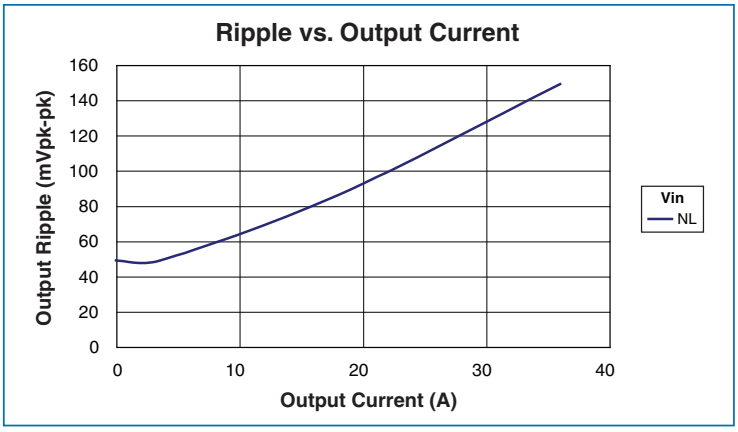

Figure 8-3 – Output ripple vs. load with no external bypass capacitance

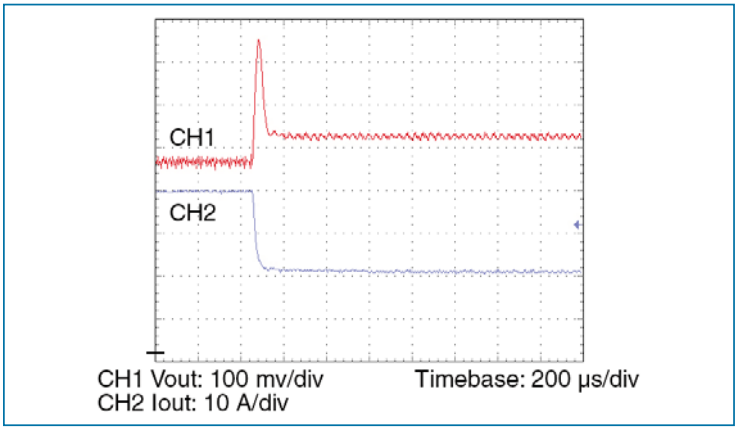

Figure 8-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

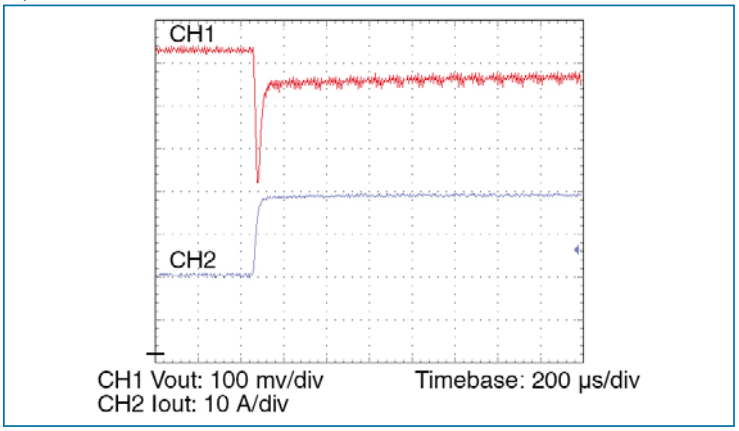

Figure 8-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

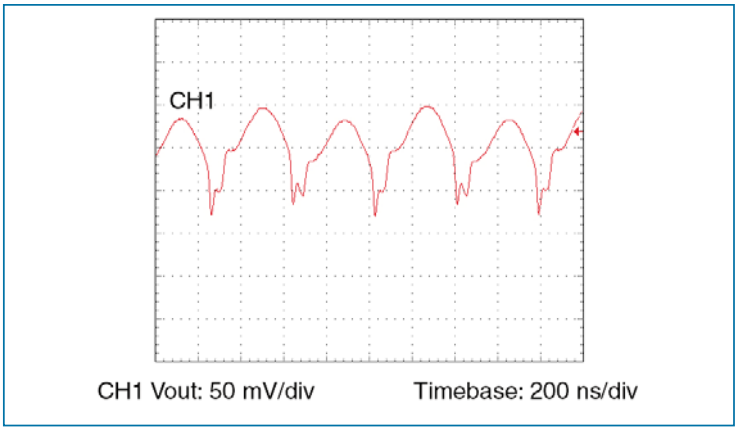

Figure 8-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

10 Vout, 180 W OPERATING SPECIFICATIONS - (e.g. DC048B100T018FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	89	92		%	Nominal input; full load; 25°C
Ripple and noise		80	125	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	14.0		14.85	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			750	µF	External
Load current	0		18	Amps	
Current limit (peak)	19.44	20.7	23.4	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	9.0	Amps	Shut down, may require PC enable to initiate restart

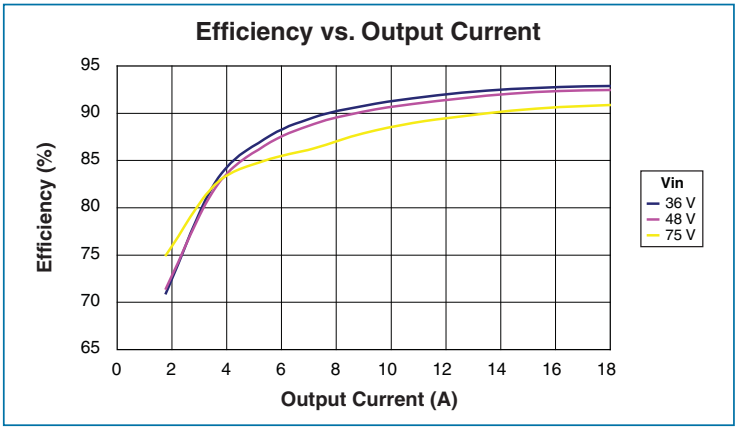

Figure 9-1 – Efficiency vs. load

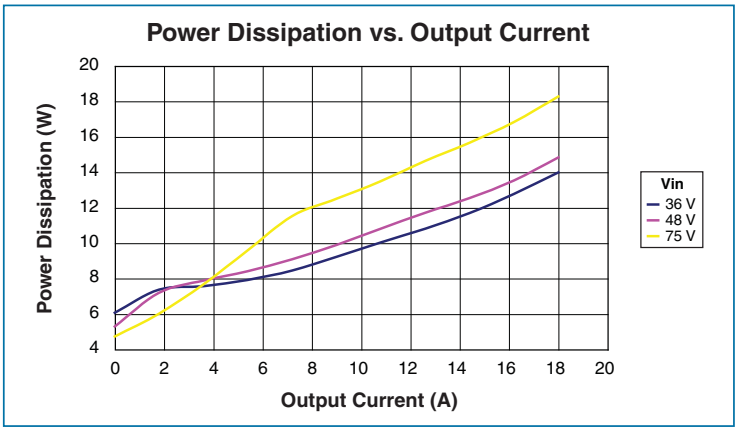

Figure 9-2 – Power dissipation vs. load

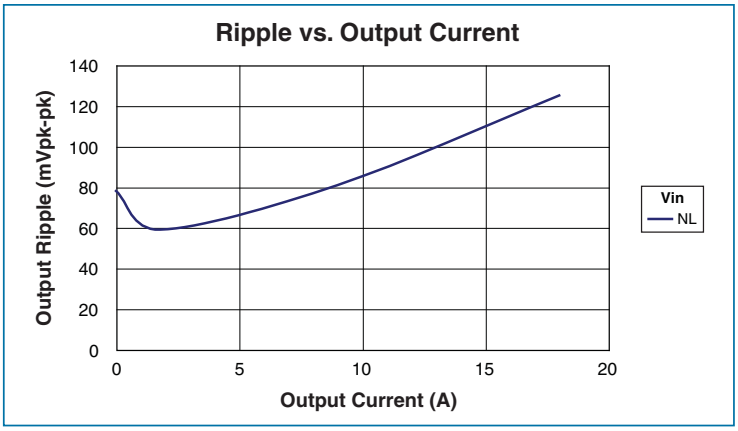

Figure 9-3 – Output ripple vs. load with no external bypass capacitance

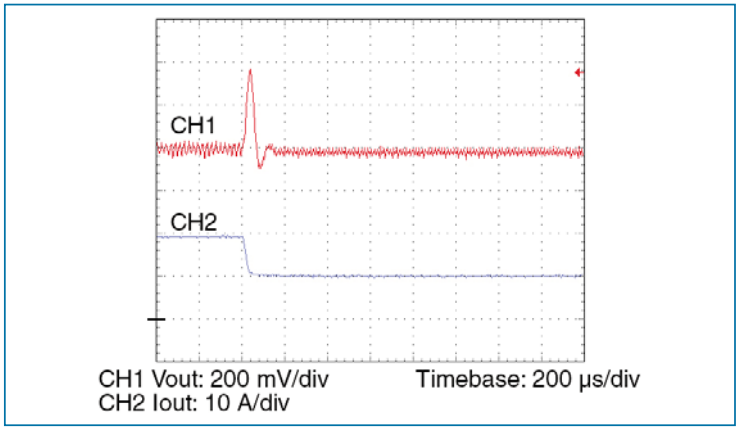

Figure 9-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

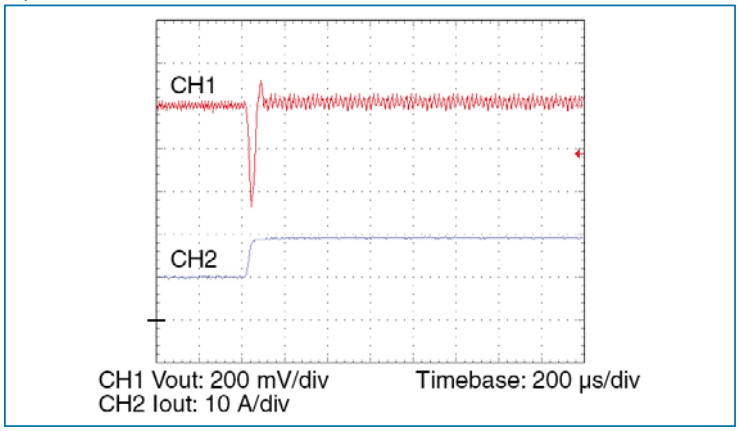

Figure 9-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

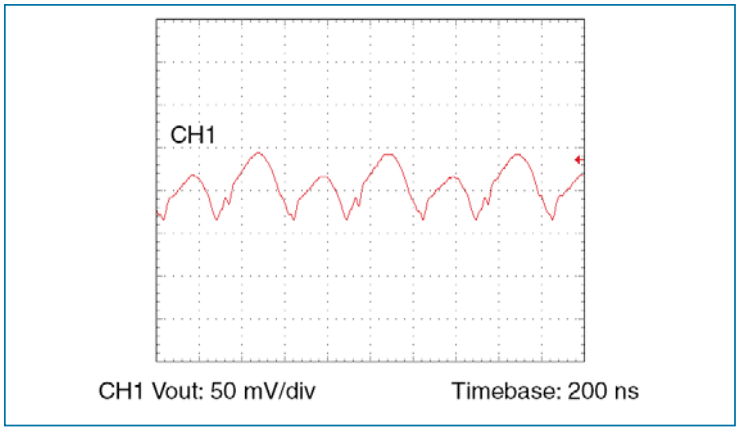

Figure 9-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

12 Vout, 220 W OPERATING SPECIFICATIONS - (e.g. DC048B120T022FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	87	92		%	Nominal input; full load; 25°C
Ripple and noise		160	200	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	14.0		14.85	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			750	µF	External
Load current	0		18.33	Amps	
Current limit (peak)	19.80	21.08	23.83	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	9.17	Amps	Shut down, may require PC enable to initiate restart

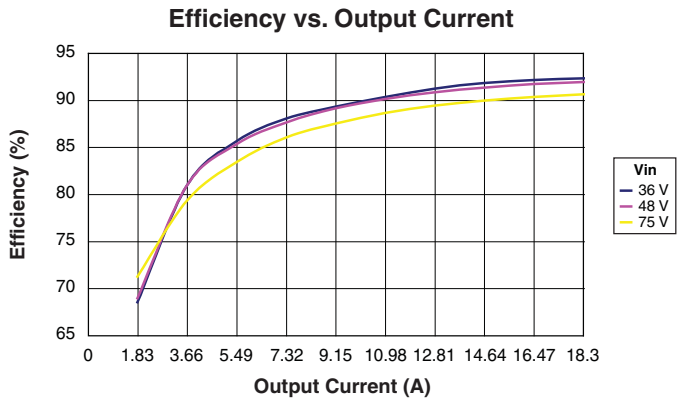

Figure 10-1 – Efficiency vs. load

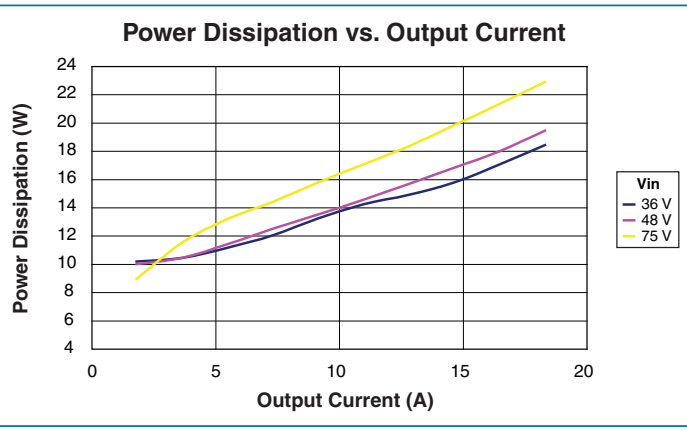

Figure 10-2 – Power dissipation vs. load

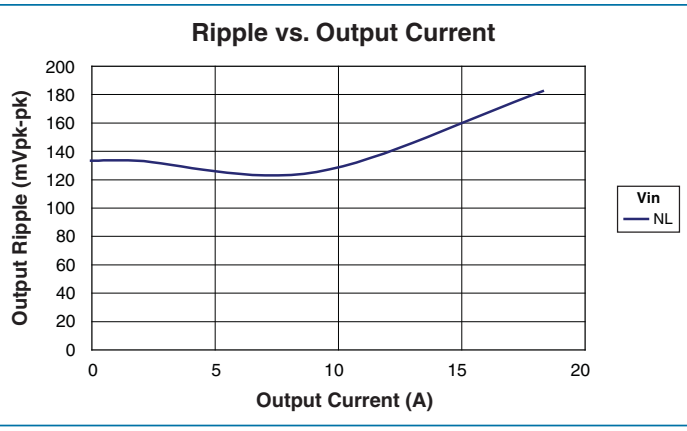

Figure 10-3 – Output ripple vs. load with no external bypass capacitance

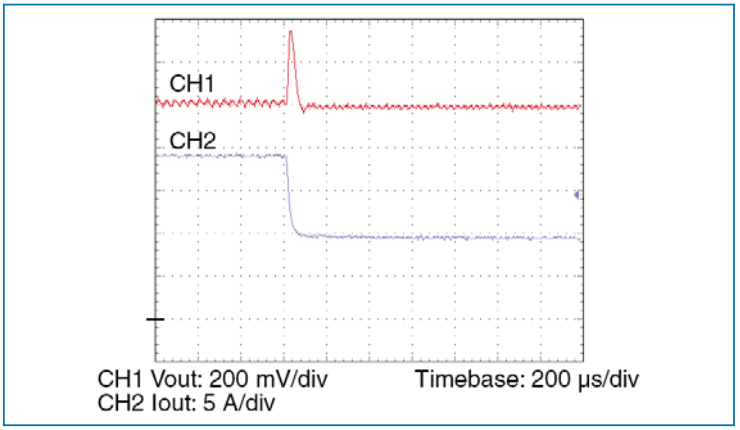

Figure 10-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

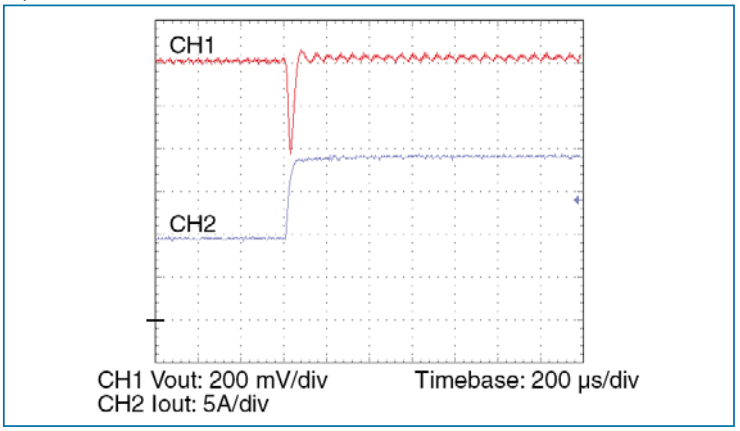

Figure 10-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

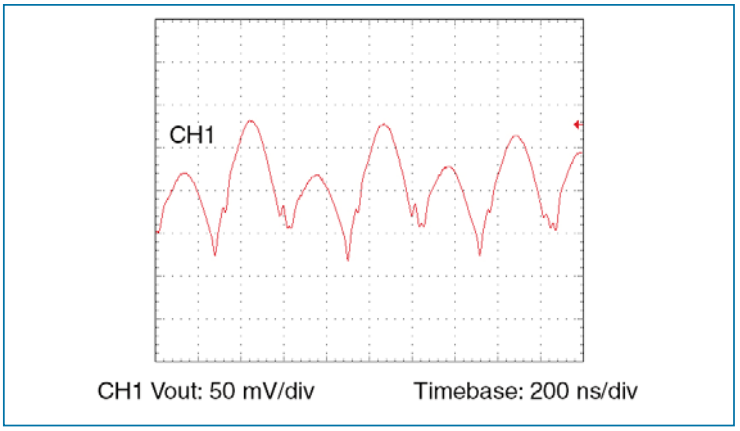

Figure 10-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

15 Vout, 200 W OPERATING SPECIFICATIONS - (e.g. DC048B150T020FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	89	92		%	Nominal input; full load; 25°C
Ripple and noise		115	144	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	18.67		19.8	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			423	µF	External
Load current	0		13.33	Amps	
Current limit (peak)	14.40	15.33	17.33	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	6.67	Amps	Shut down, may require PC enable to initiate restart

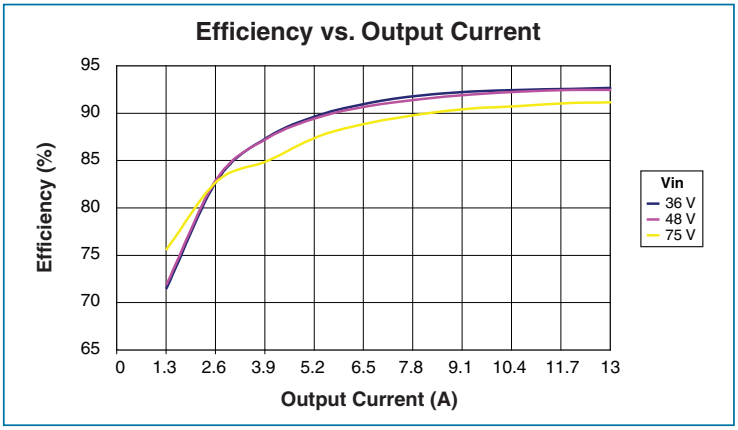

Figure 11-1 – Efficiency vs. load

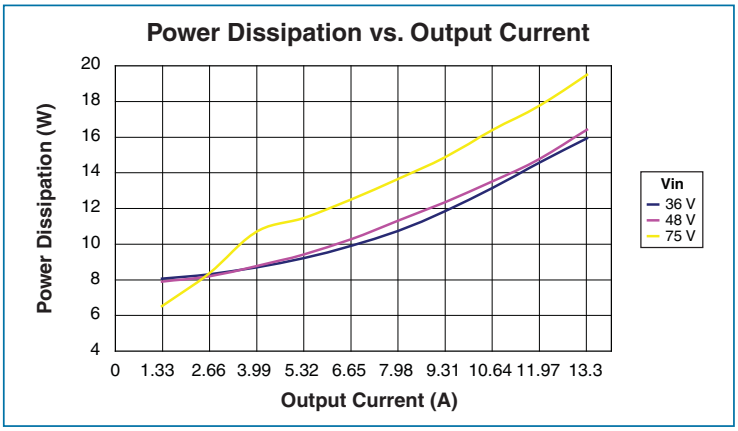

Figure 11-2 – Power dissipation vs. load

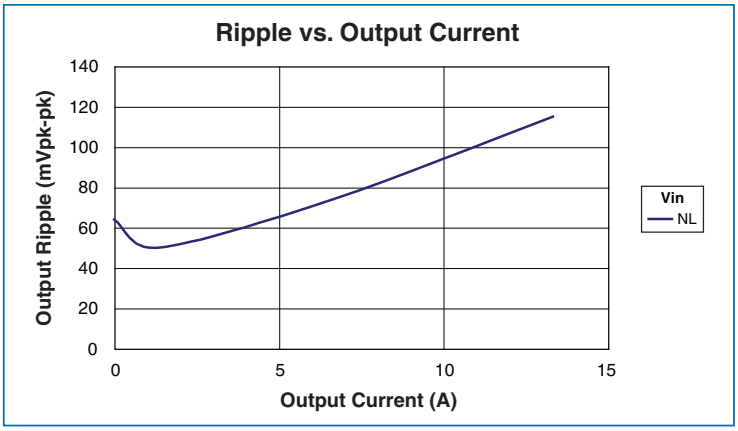

Figure 11-3 – Output ripple vs. load with no external bypass capacitance

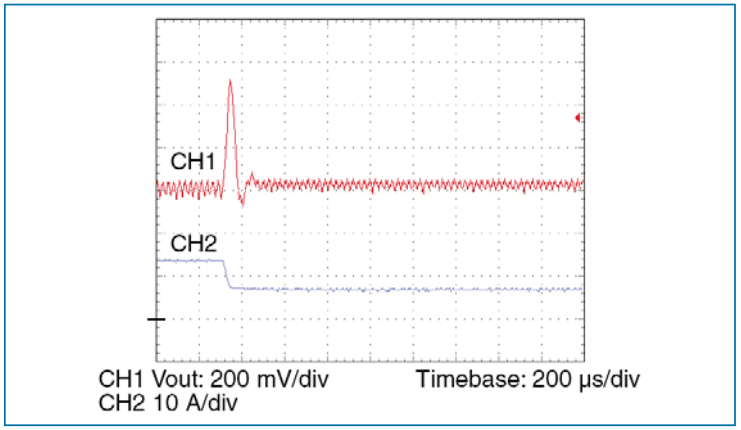

Figure 11-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

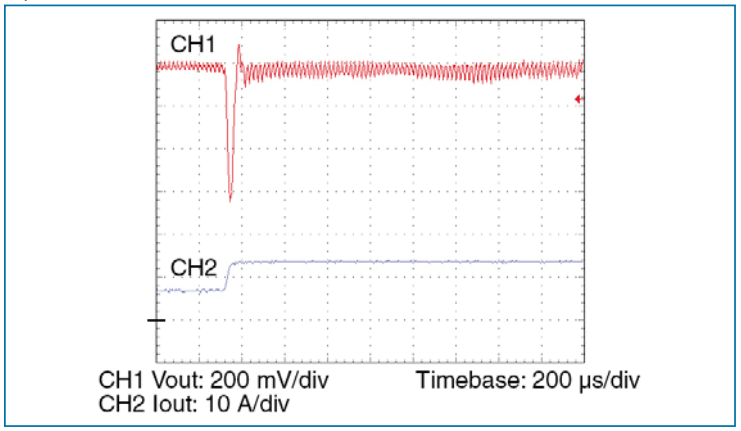

Figure 11-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

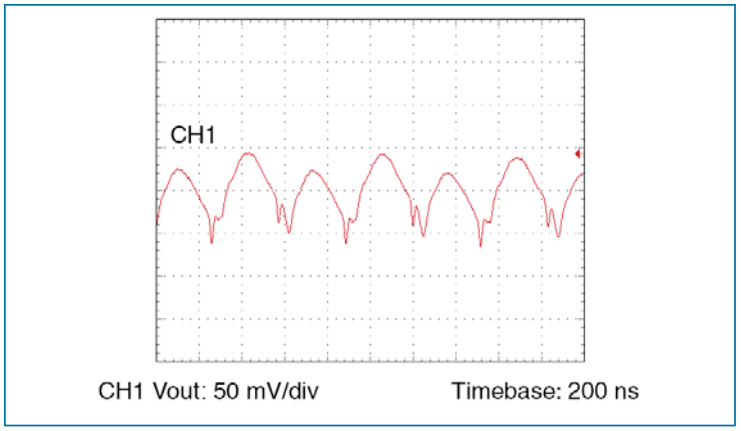

Figure 11-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

24 Vout, 220 W OPERATING SPECIFICATIONS - (e.g. DC048B240T022FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	87	92		%	Nominal input; full load; 25°C
Ripple and noise		108	135	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	28.0		29.7	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			188	µF	External
Load current	0		9.17	Amps	
Current limit (peak)	9.90	10.55	11.92	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	4.59	Amps	Shut down, may require PC enable to initiate restart

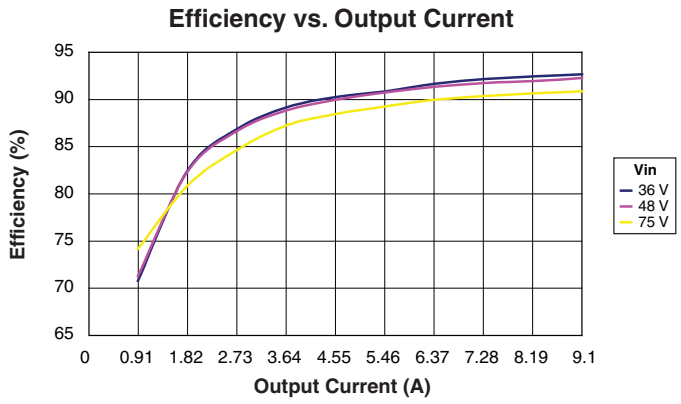

Figure 12-1 – Efficiency vs. load

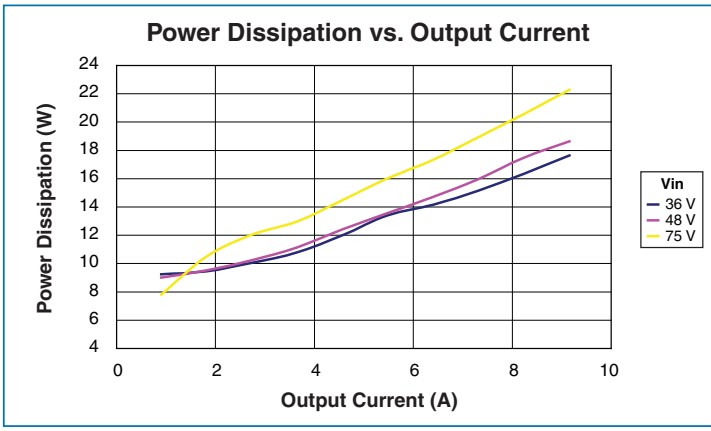

Figure 12-2 – Power dissipation vs. load

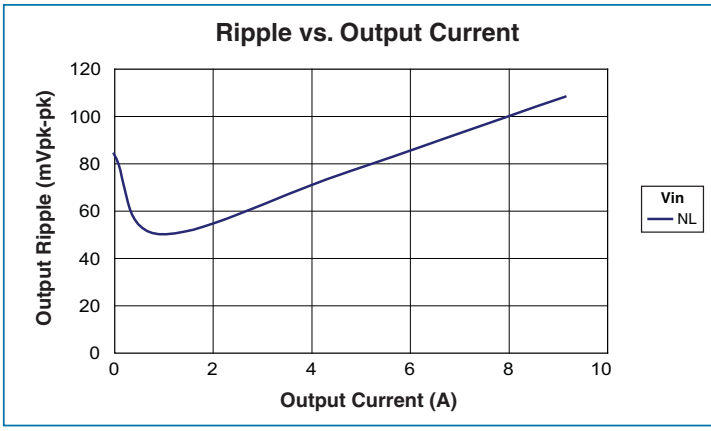

Figure 12-3 – Output ripple vs. load with no external bypass capacitance

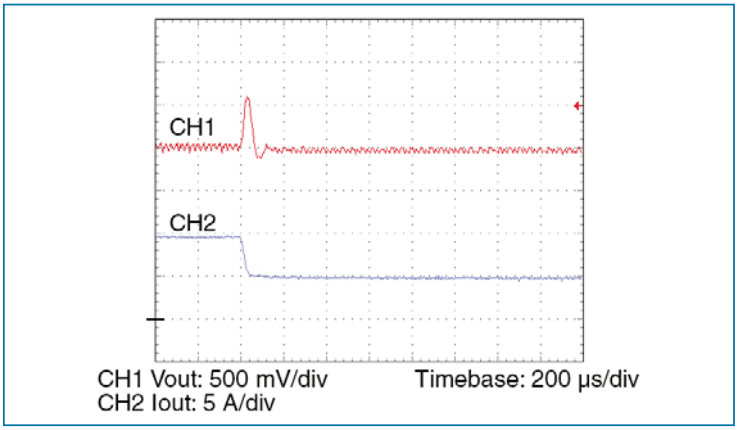

Figure 12-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

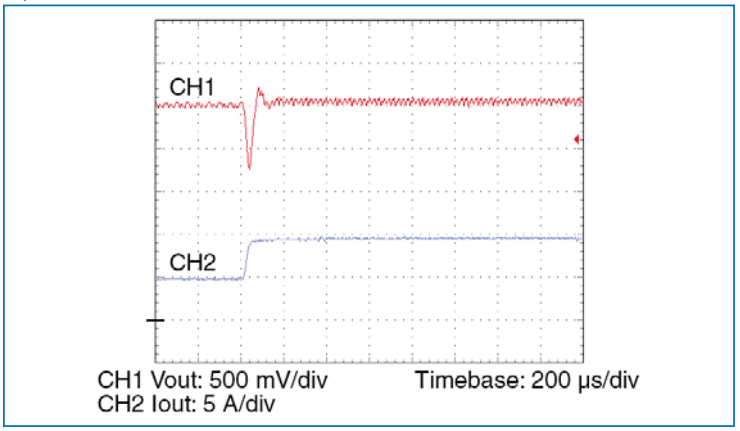

Figure 12-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

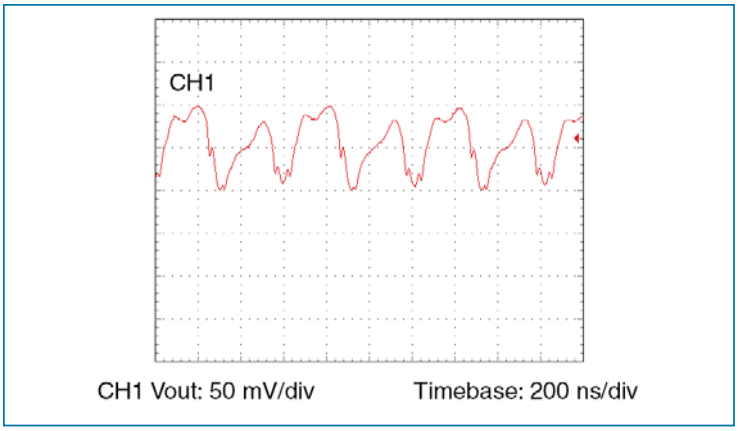

Figure 12-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

28 Vout, 190 W OPERATING SPECIFICATIONS - (e.g. DC048B280T019FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	89	92		%	Nominal input; full load; 25°C
Ripple and noise		130	163	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	37.33		39.6	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			106	µF	External
Load current	0		6.79	Amps	
Current limit (peak)	7.33	7.81	8.83	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	10	3.40	Amps	Shut down, may require PC enable to initiate restart

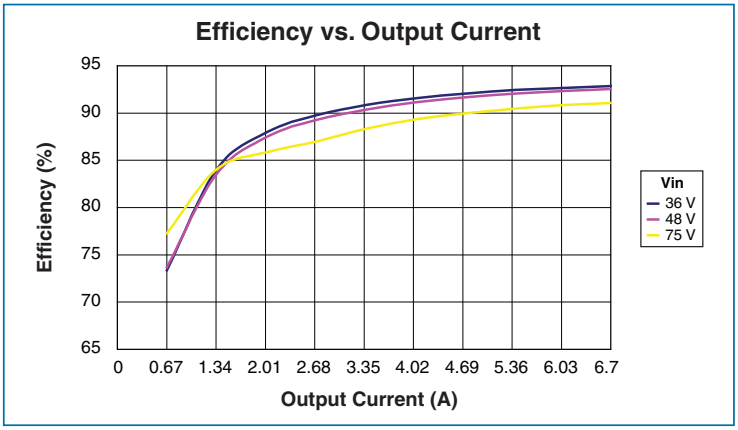

Figure 13-1 – Efficiency vs. load

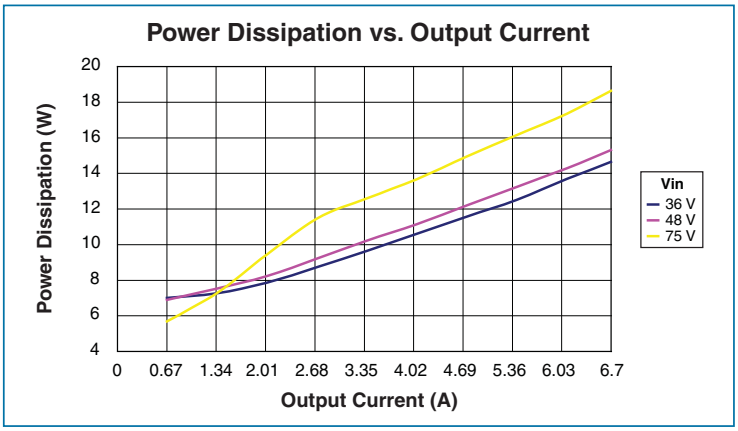

Figure 13-2 – Power dissipation vs. load

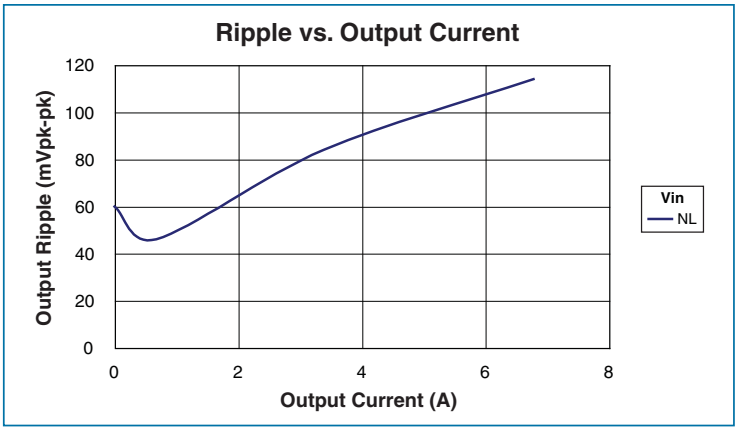

Figure 13-3 – Output ripple vs. load with no external bypass capacitance

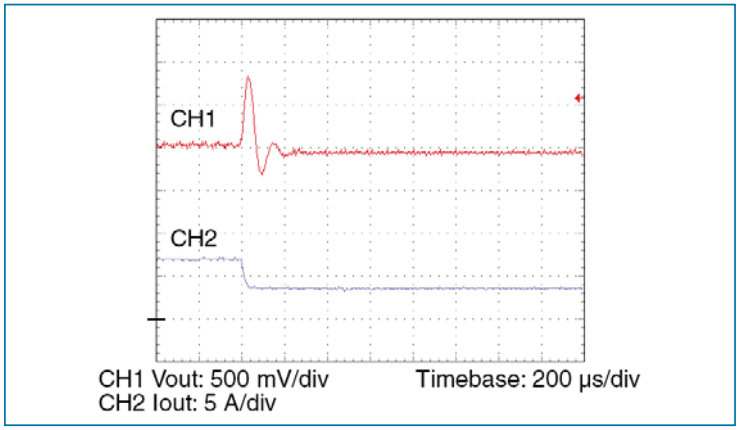

Figure 13-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

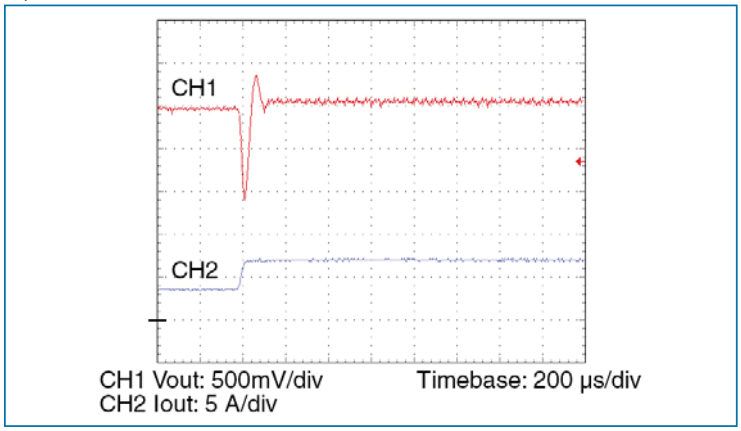

Figure 13-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

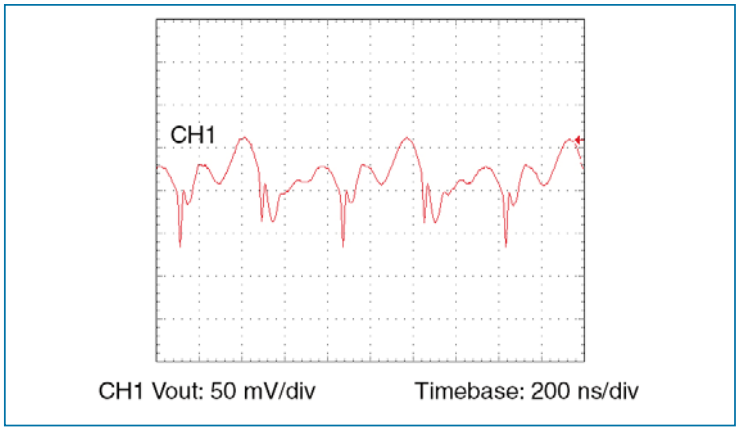

Figure 13-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

48 Vout, 220 W OPERATING SPECIFICATIONS - (e.g. DC048B480T022FP)

Parameter	Min	Typ	Max	Unit	Notes
Efficiency	90	93		%	Nominal input; full load; 25°C
Ripple and noise		160	200	mV	p-p; Nominal input; full load; 20 MHz bandwith
Output OVP setpoint	56.0		59.4	Volts	25°C; recycle input voltage to restart (1 minute off)
Dissipation, standby		5.5	7.6	Watts	No load
Load regulation		±0.6	±1.5	%	No load to full load; nominal input, deviation from setpoint
Output capacitance			47	µF	External
Load current	0		4.58	Amps	
Current limit (peak)	4.95	5.27	5.95	Amps	Shut down, may require PC enable to initiate restart
Short circuit current (avg)	0	1.0	2.29	Amps	Shut down, may require PC enable to initiate restart

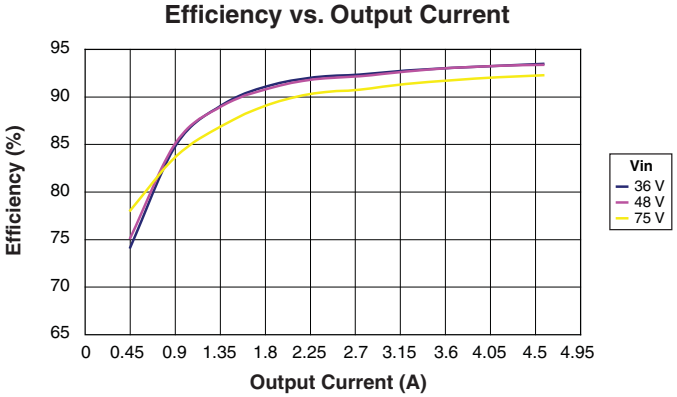

Figure 14-1 – Efficiency vs. load

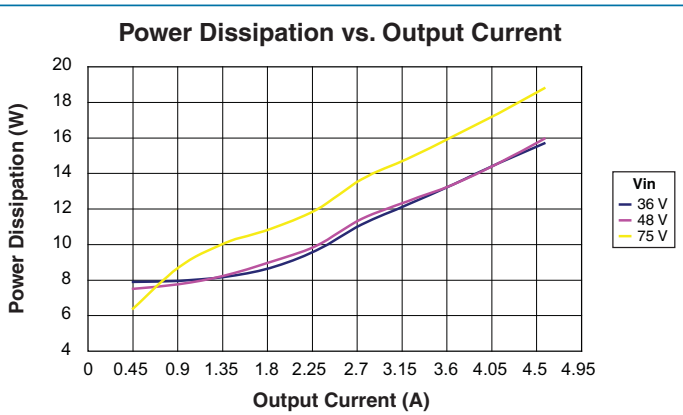

Figure 14-2 – Power dissipation vs. load

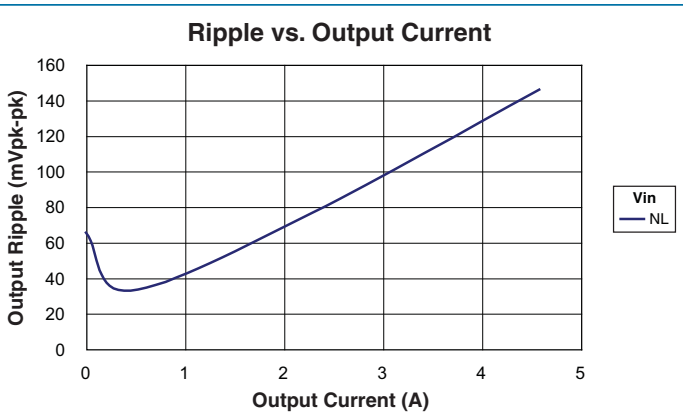

Figure 14-3 – Output ripple vs. load with no external bypass capacitance

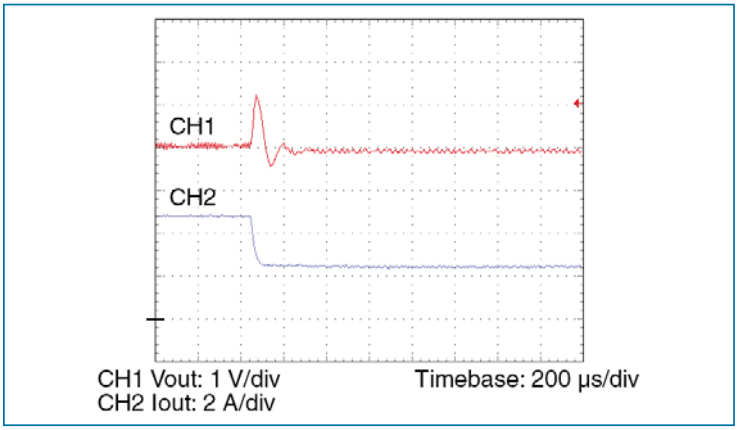

Figure 14-4 – Transient response 100 – 50%, 3 x 4.7 µF ceramic bypass capacitance

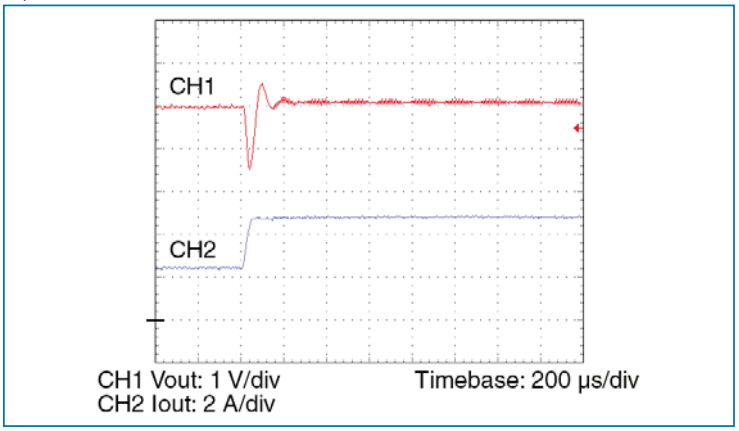

Figure 14-5 – Transient response 50 – 100%, 3 x 4.7 µF ceramic bypass capacitance

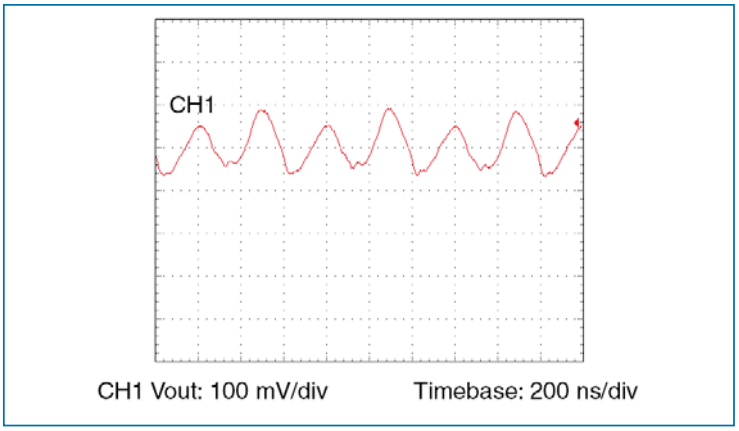

Figure 14-6 – Output voltage ripple at nominal line and full load with no external bypass capacitance.

+In / -In DC Voltage Ports

The maximum input voltage should not be exceeded. The modules have internal over / undervoltage lockout functions that prevent operation outside of the specified input range. They will turn on when the input voltage rises above its undervoltage lockout. If the input voltage exceeds the overvoltage lockout, the module will shut down until the overvoltage fault clears. PC will toggle indicating an out of bounds condition.

PC – Primary Control

The output voltage is enabled when the PC pin is open circuit (floating). To disable the module's output voltage, the PC pin is pulled low (referenced to –IN). Open collector optocouplers, transistors, or relays can be used to control the PC pin. During an abnormal condition the PC pin will pulse (Figure 17) as the module initiates a restart cycle. This will continue until the abnormal condition is rectified. The PC pin should not be used as an auxiliary voltage supply, nor should it be switched at a rate greater than 1 Hz.

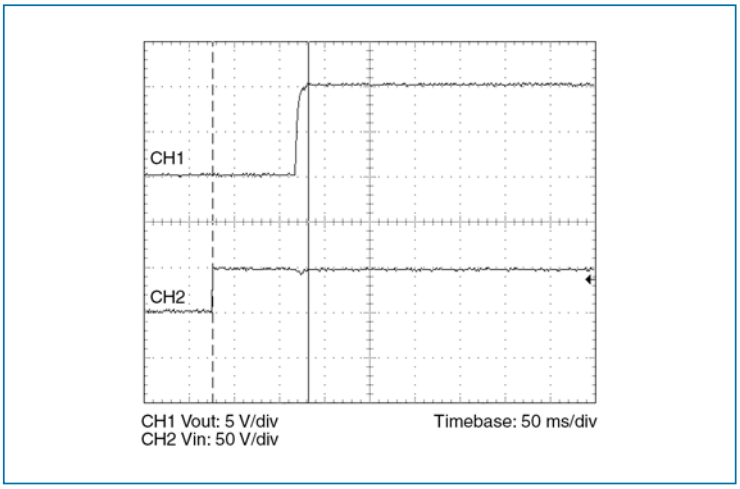

Figure 15 — Nominal line full load, turn on delay, Vin vs. Vout

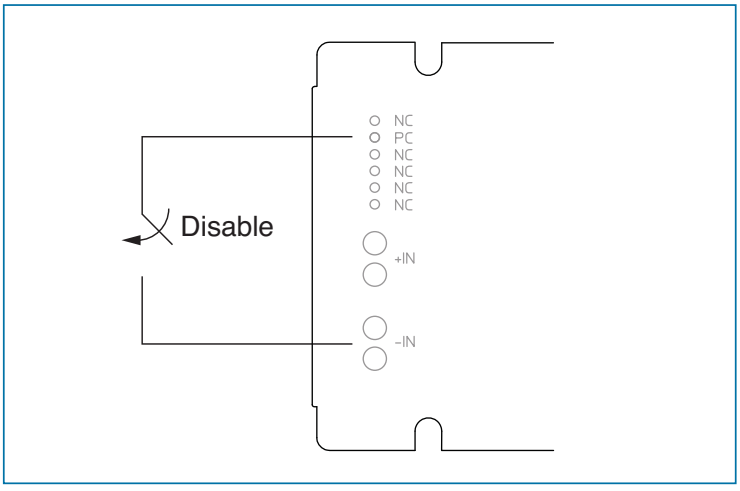

Figure 16 — Module enable/disable.

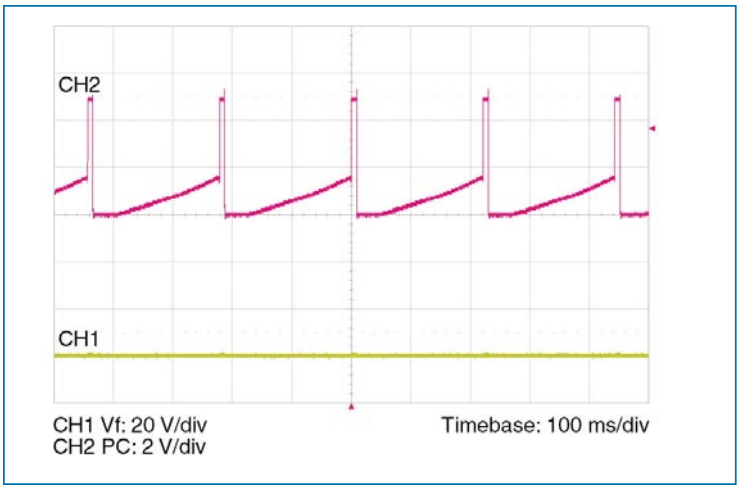

Figure 17 — PC module alarm logic

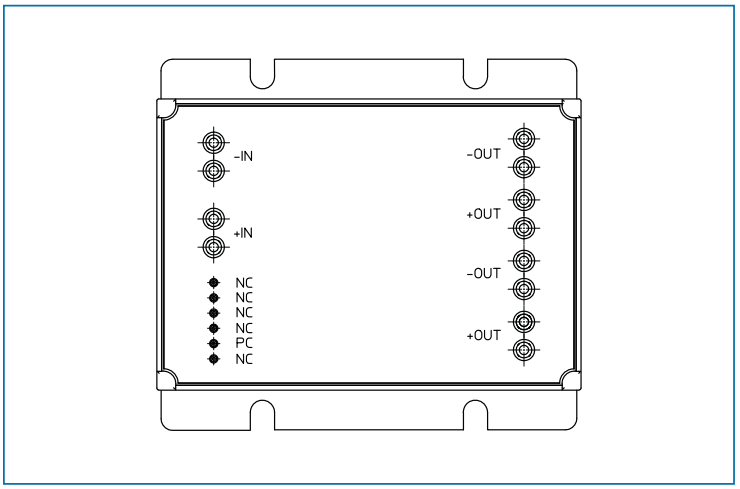

Figure 18 — Pin configuration (as viewed from pin side)

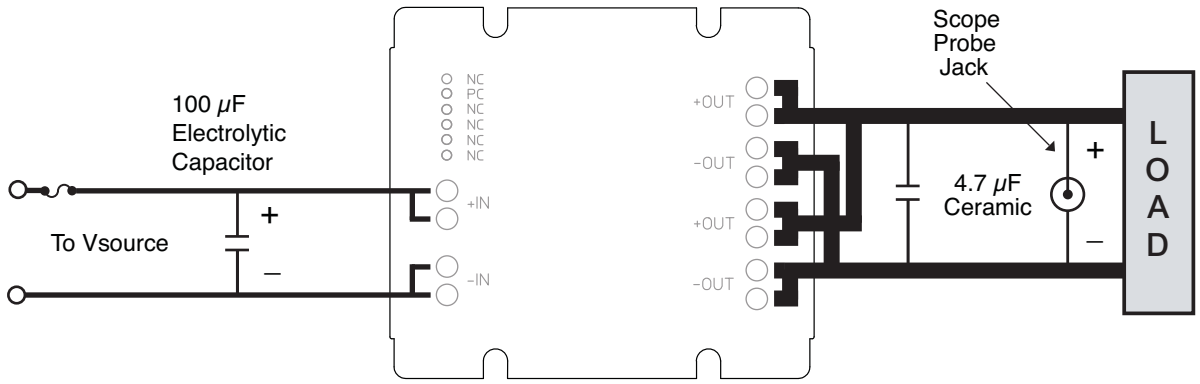

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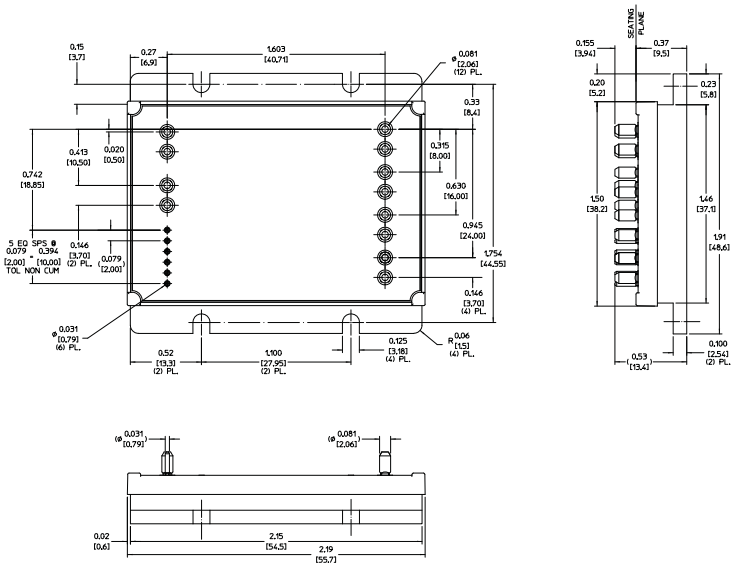
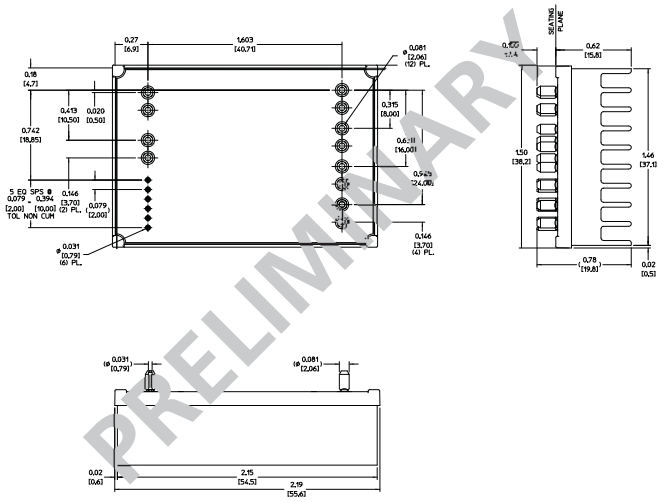
Figure 19 — Test set-up diagram for input and output ripple.

Baseplate – Slotted Flange



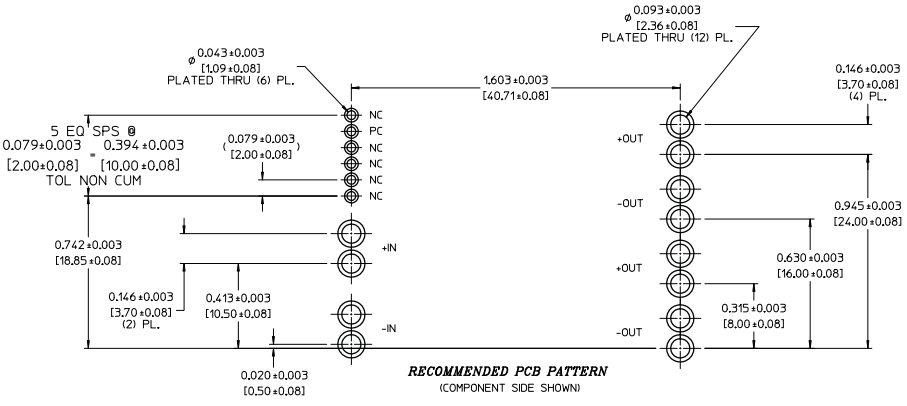
Heat Sink (Longitudinal)



Note:
RoHS COMPLIANT PER CST-001 LATEST REVISION

Figure 20 — Module outline

Recommended PCB Pattern
(Component side shown)



Note:
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Figure 21 — PCB mounting specifications

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