

ISOLATED DC/DC CONVERTERS

36 Vdc - 75 Vdc Input 68.3 Vdc/3 A Output

bel
POWER PRODUCTS

0RXW-D0T67L

RoHS Compliant

Rev.A

- Fixed Frequency (300 kHz)
- Isolated
- High Efficiency
- High Power Density
- Input Under-Voltage Lockout
- Input Over-Voltage Protection
- Output Over-Voltage Protection
- Over Temperature Protection
- SCP/OCP
- Low Cost
- Remote On/Off
- TUV certified to EN 60950-1 and CE Mark



Description

The 0RXW-D0T67L is an isolated dc/dc converter that operates from a nominal 48 Vdc source. This converter provides up to 200 W of output power. Features include remote on/off, short circuit protection, over current protection, over-temperature protection, output over-voltage protection, input over-voltage protection and input under-voltage lockout. This converter is provided in a compact, through-hole package that is easy to use and provides good thermal performance. Target applications include computer, networking and telecommunication industries.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
68.3 Vdc	36 Vdc - 75 Vdc	3 A	200 W	92%	0RXW-D0T67L

Notes: 1. Add "G" suffix at the end of the model number to indicate Tray Packaging.
2. All part numbers above indicate RoHS 6. Change the second letter "R" to "7" for RoHS 5 part numbers.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage	-0.3 V	-	80 V	100 V for 100 mS Max
Remote On/Off	-0.3 V	-	15 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-55 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36 V	48 V	75 V	
Input Current (no load)	-	-	100 mA	
Input Current (full load)	-	-	7 A	
Remote Off Input Current	-	5 mA	10 mA	
Input Reflected Ripple Current (pk-pk)	-	10 mA	30 mA	With simulated source impedance of 12 uH, 5 Hz to 20 MHz; use a 47uF/100 V electrolytic capacitor with ESR = 1 ohm max. at 200 kHz
Input Reflected Ripple Current (rms)	-	2 mA	5 mA	
I ² t Inrush Current Transient	-	-	1 A ² s	
Turn-on Voltage Threshold	34 V	35 V	36 V	
Turn-off Voltage Threshold	33 V	34.5 V	35.5 V	

Note: All specifications are typical at nominal input, full load at 25 °C unless otherwise stated

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Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point	70 V	70.3 V	70.6 V	V _{in} =48 V, null load
Output Voltage Set Point	68 V	68.3 V	68.6 V	V _{in} =48 V, full load
Line Regulation	-	150 mV	300 mV	V _{in} =36-75 V, full load
Temperature Coefficient	-	-	0.02%Vo	
Output Current Range	0 A	-	3 A	
Output DC Current Limit	5.4 A	-	6.4 A	Hiccup Mode
Ripple and Noise (rms)	-	50 mV	100 mV	0 - 20 MHz BW, with 1 uF ceramic capacitor and a 22 uF electrolytic capacitor at output
Ripple and Noise (pk-pk)	-	150 mV	350 mV	
Short Circuit Protection	-	-	-	Hiccup Mode
Rise Time	-	20 mS	30 mS	
	-	20 mS	30 mS	
Start-Up Time	-	30 mS	50 mS	
	-	30 mS	50 mS	
Overshoot at Turn on	-	-	3%	
Output Capacitance	22 uF	-	1200 uF	
Transient Response				
25% ~ 50% Max Load	-	600 mV	1000 mV	di/dt=0.1 A/us, V _{in} =48 Vdc, T _a =25 °C
50% ~ 25% Max Load	-	600 mV	1000 mV	
50% ~ 75% Max Load	-	600 mV	1000 mV	
75% ~ 50% Max Load	-	600 mV	1000 mV	

Note: All specifications are typical at nominal input, full load at 25 °C unless otherwise stated.

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	88%	92%	-	V _{in} =48 V, full load
Switching Frequency	270 kHz	300 kHz	330 kHz	
I/O Isolation Voltage	1500 V	-	-	
Isolation Capacitance	-	2300 pF	-	
Isolation Resistance	10 MΩ	-	-	
Remote Sense Compensation	-	-	500 mV	
Output Voltage Trim Range	-10%Vo	-	1%Vo	
Over Temperature Protection	110 °C	-	120 °C	No Latch
	5 °C	10 °C	-	
Over Voltage Protection	72 V	73 V	75 V	Latch
MTBF	TBD			Calculated Per Bell Core SR-332 (V _{in} =48 V, V _o =68.685 V, I _o =2.4 A, T _a = 25 °C)
Weight	-	100 g	-	

Note: All specifications are typical at 25 °C unless otherwise stated.

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Control Specifications

Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal Low (Unit On)	Active Low	-	1.2 V	The remote on/off pin open, Unit Off.
Signal High (Unit Off)			15 V	

Output Trim Equations

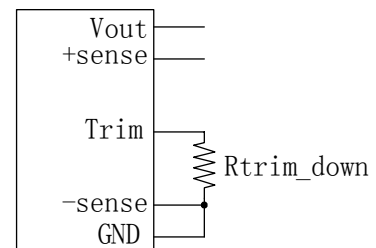
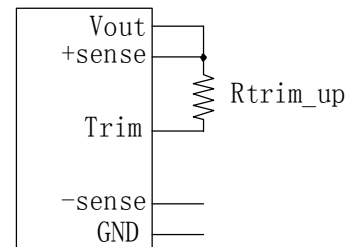
Equations for calculating the trim resistor are shown below. The Trim Down resistor should be connected between the Trim pin and -sense pin. The Trim Up resistor should be connected between the Trim pin and the Vout. Only one of the resistors should be used for any given application.

$$R_{trim_up} = \frac{(100 + \delta) \times V_o - 124}{1.24 \times |\delta|} - 2 \quad \text{K}\Omega$$

$$R_{trim_down} = \frac{100}{|\delta|} - 2 \quad \text{K}\Omega$$

Note: $\delta = \frac{(V_{adj} - V_o)}{V_o} \times 100 [\%]$

V_{adj} is the desired output voltage
V_o = 70.285V @I_{out}=0

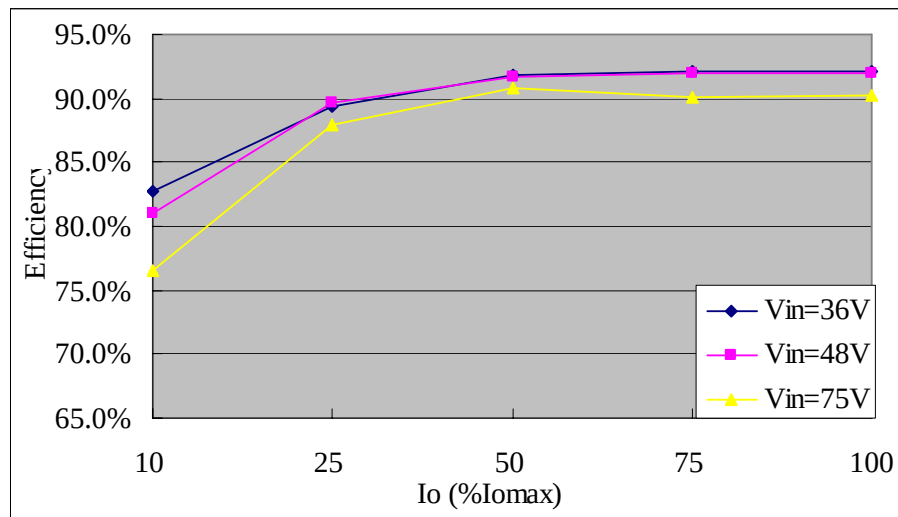


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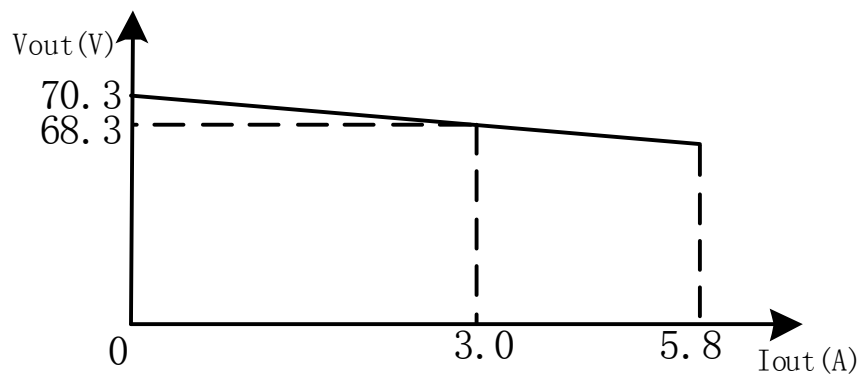
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Efficiency Data



Load Characteristic

$$V_{out} = 56.695 \times (1.24 - I_{out} \times 12 \times 10^{-3})$$

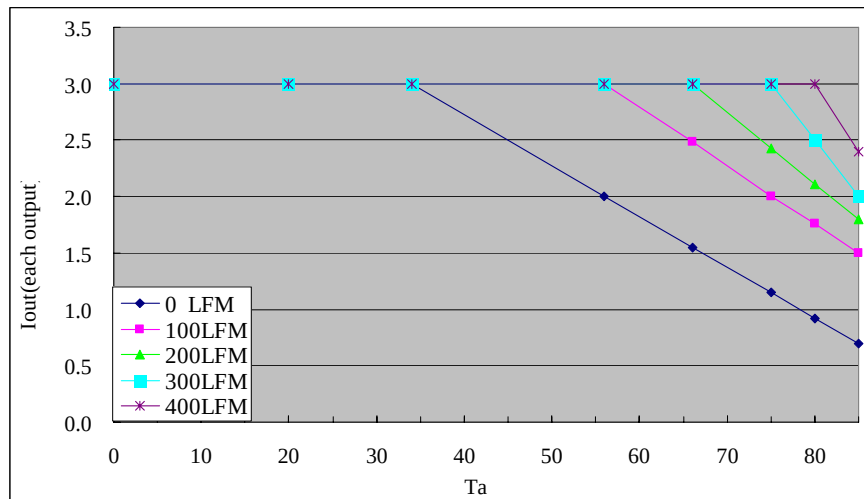


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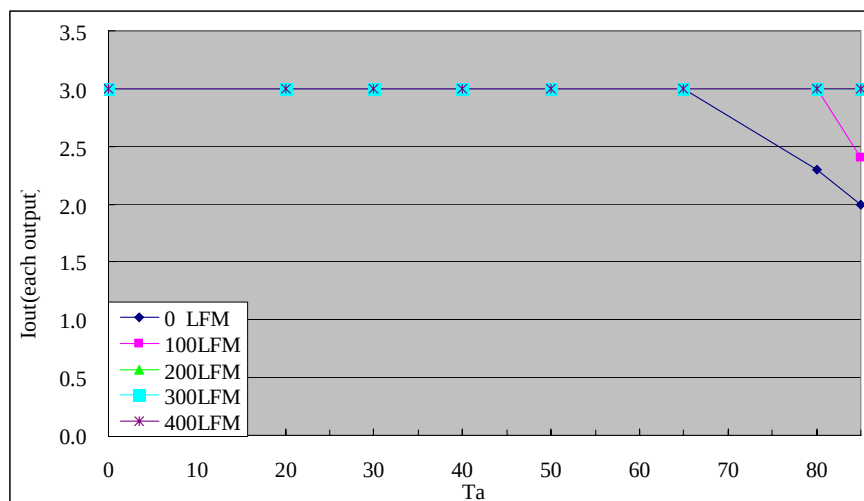
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Thermal Derating Curves



Vin=48 V without heatsink



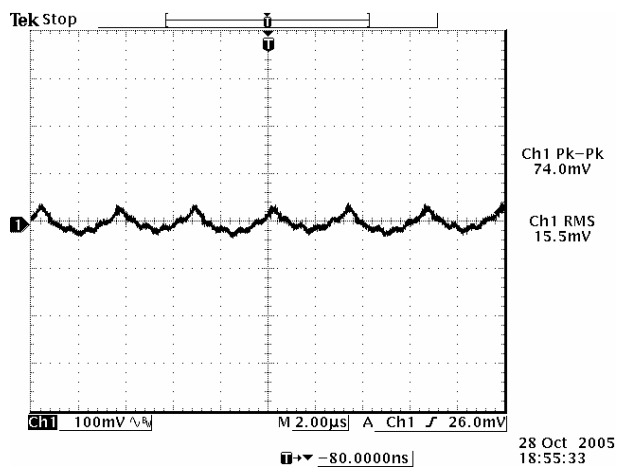
Vin=48 V with heatsink

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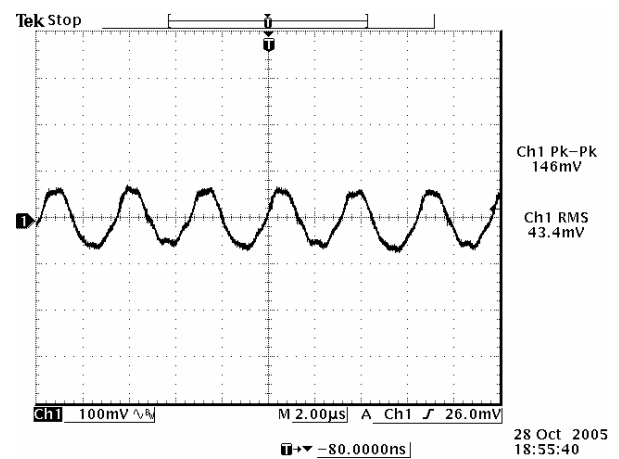
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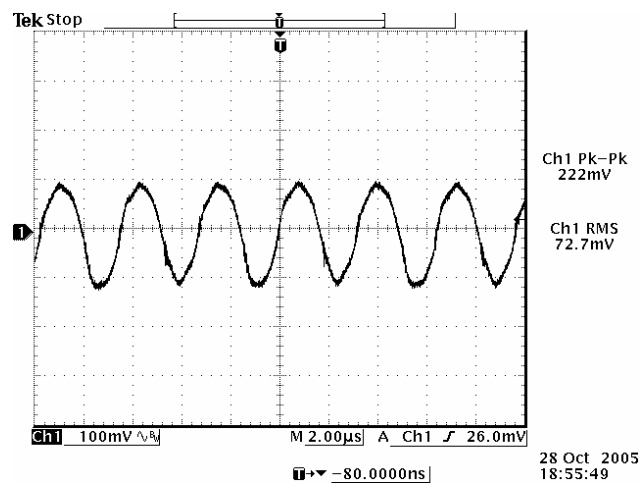
Ripple and Noise Waveforms



36 Vdc input, 68.3 V output



48 Vdc input, 68.3 V output



75 Vdc input, 68.3 V output

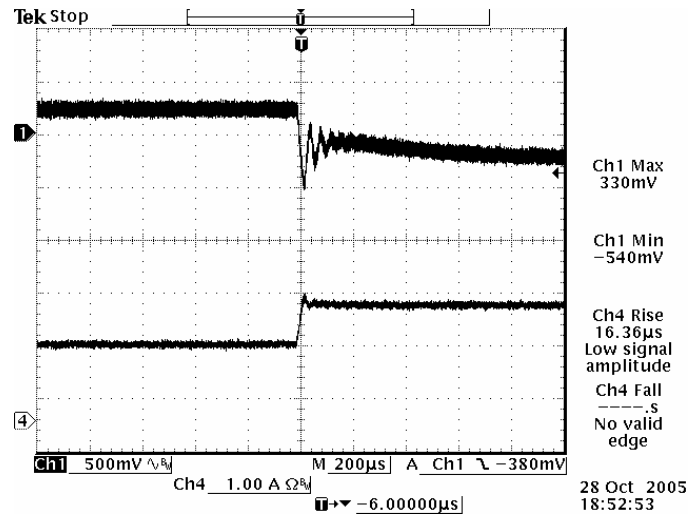
Note: Ripple and noise at full load, with a 1µF ceramic capacitor and 22µF electrolytic capacitor at the output, Ta=25 deg C.

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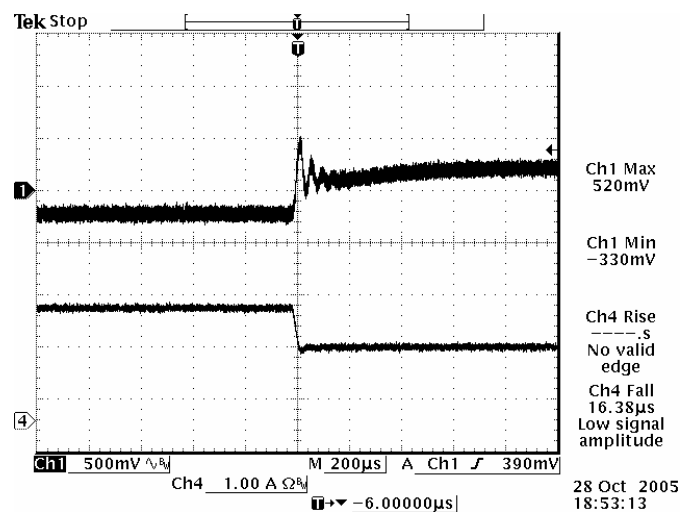
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Transient Response Waveforms



50%-75% Load Transients at $V_{in}=48\text{ V}$



75%-50% Load Transients at $V_{in}=48\text{ V}$

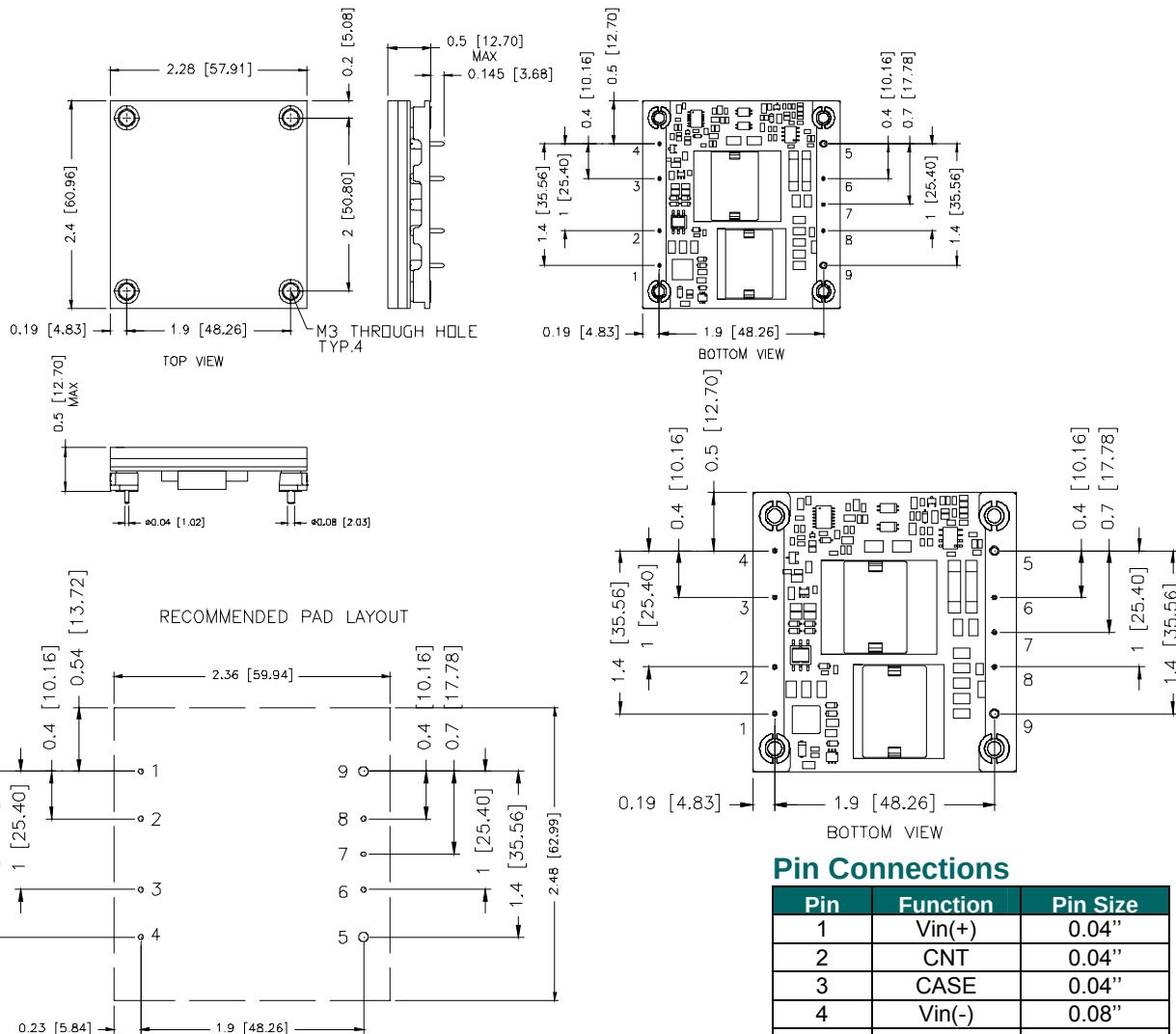
Note: Transients at $di/dt=0.1\text{ A}/\mu\text{s}$, $V_{in}=48\text{ Vdc}$, $T_a=25\text{ deg C}$.

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Mechanical Outline



Pin Connections

Pin	Function	Pin Size
1	Vin(+)	0.04"
2	CNT	0.04"
3	CASE	0.04"
4	Vin(-)	0.08"
5	Vo(-)	0.04"
6	Sense(-)	0.04"
7	Trim	0.04"
8	Sense(+)	0.04"
9	Vo(+)	0.08"

1, 2, 3, 4, 6, 7, 8 Ø 0.047 HOLE SIZE, Ø 0.08 min PAD SIZE, BOTH SIDE
5, 9 Ø 0.093 HOLE SIZE, Ø 0.12 min PAD SIZE, BOTH SIDE

RoHS Compliance

Complies with the European Directive 2002/95/EC, calling for the elimination of lead and other hazardous substances from electronic products.



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CORPORATE

Bel Fuse Inc.
206 Van Vorst Street
Jersey City, NJ 07302
Tel 201-432-0463
Fax 201-432-9542
www.belfuse.com

FAR EAST

Bel Fuse Ltd.
8F/ 8 Luk Hop Street
San Po Kong
Kowloon, Hong Kong
Tel 852-2328-5515
Fax 852-2352-3706
www.belfuse.com

EUROPE

Bel Fuse Europe Ltd.
Preston Technology Management Centre
Marsh Lane, Suite G7, Preston
Lancashire, PR1 8UD, U.K.
Tel 44-1772-556601
Fax 44-1772-888366
www.belfuse.com