

ISOLATED DC/DC CONVERTERS

48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick

bel
POWER PRODUCTS

0RCR-40S10x

RoHS Compliant

Rev.E

- Isolated
- Fixed Frequency
- High Efficiency
- High Power Density
- Low Cost
- Input Under-Voltage Lockout
- Input Over-Voltage Shutdown
- OCP/SCP
- Remote On/Off
- Over Temperature Protection



Description

The 0RCR-40S10x Series are isolated DC/DC converters that operate from a nominal 48 VDC source. These converters use a full bridge power train to provide isolation and step down. These units will provide up to 300 W of output power from a nominal 48 VDC input. These units are designed to be highly efficient and low cost. Features include remote on/off, over current protection and under voltage lockout. These converters are provided in an industry standard eighth-brick package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active Low	Model Number Active High
9.6 V	48 V	40 A	300 W	96.5%	0RCR-40S10L	0RCR-40S100

- 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 (continuous)	-0.3 V	-	60 V	
Remote On/Off (Active Low)	-0.3 V	-	0.8 V	
Remote On/Off (Active High)	2.4 V	-	18 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-40 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	38 V	-	55 V	
Input Current (full load)	-	-	8.8 A	
Input Current (no load)	-	-	150 mA	
Remote Off Input Current	-	-	30 mA	
Input Reflected Ripple Current (pk-pk)	-	20 mA	50 mA	Tested with simulated source impedance of 10 uH, 5 Hz to 20 MHz; use a 100 uF/100 V electrolytic cap with ESR=1 ohm, at 200kHz at the input.
Input Reflected Ripple Current (rms)	-	5 mA	20 mA	
I ² t Inrush Current Transient	-	0.05 A ² s	0.1 A ² s	
Turn On Voltage Threshold	34 V	35.5 V	37 V	
Turn Off Voltage Threshold	32 V	33.5 V	35 V	
Input Over-Voltage Lockout	56 V	58 V	60 V	

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

ISOLATED DC/DC CONVERTERS

48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick



Output Specifications

Parameter	Min	Typ	Max	Notes		
Output Voltage Set Point Vin=38 V Vin=48 V Vin=55 V	7.15 V 9.10 V 10.45 V	7.30 V 9.24 V 10.62 V	7.6 V 9.6 V 11.0 V	Io=0 A - Iomax		
Load Regulation Vin=38 V Vin=48 V Vin=55 V	- - -	0.16 V 0.13 V 0.10 V	0.25 V 0.20 V 0.15 V	Io=0 A - Iomax		
Line Regulation	-	3.4 V	4.0 V			
Regulation Over Temperature (-40 °C to +85 °C)	-	100 mV	150 mV			
Output Current	0 A	-	40 A	Max output power 300W		
Current Limit Threshold Vin=38 V Vin=48 V Vin=55 V	46 A 38 A 31 A	53 A 44 A 38 A	60 A 50 A 45 A			
Short Circuit Surge Transient	-	1.5 A ² s	2.5 A ² s			
Ripple and Noise (rms)	-	25 mV	50 mV	Vin=48 V, 0-20 MHz BW, with a 1 uF ceramic cap and a 47 uF tantalum cap at the output.		
Ripple and Noise (pk-pk)	-	90 mV	150 mV			
Turn on Time	-	20 mS	30 mS			
Overshoot at Turn on	-	0%	3%			
Output Capacitance	47 uF	-	3300 uF			
Transient Response						
50% ~ 75% Max Load	Overshoot	Vin=48 V	-	100 mV	Test conditions: di/dt = 0.5 A/uS, Vin=48 V, Ta=25°C, with a 47 uF tantalum cap at the output.	
	Settling Time		-	-		
75% ~ 50% Max Load	Overshoot		-	100 mV		150 mV
	Settling Time		-	-		-

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

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	95.5%	97%	-	Vin=48 V, full load
Switching Frequency	120 kHz	150 kHz	180 kHz	
Isolation Capacitance	-	1500 pF	-	
Input to Output Isolation Voltage	-	1500 V	-	
Over Temperature Protection	-	120 °C	-	Average PCB temperature will not exceed 120°C.
MTBF	TBD			Calculated Per Bell Core SR-332 (Vin=48 V; Io=80% full load; Ta = 25 °C)
Dimensions Inches (L x W x H) Millimeters (L x W x H)	2.30 x 0.896 x 0.50 58.41 x 22.76 x 12.7			
Weight	-	45 g	-	

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

ISOLATED DC/DC CONVERTERS

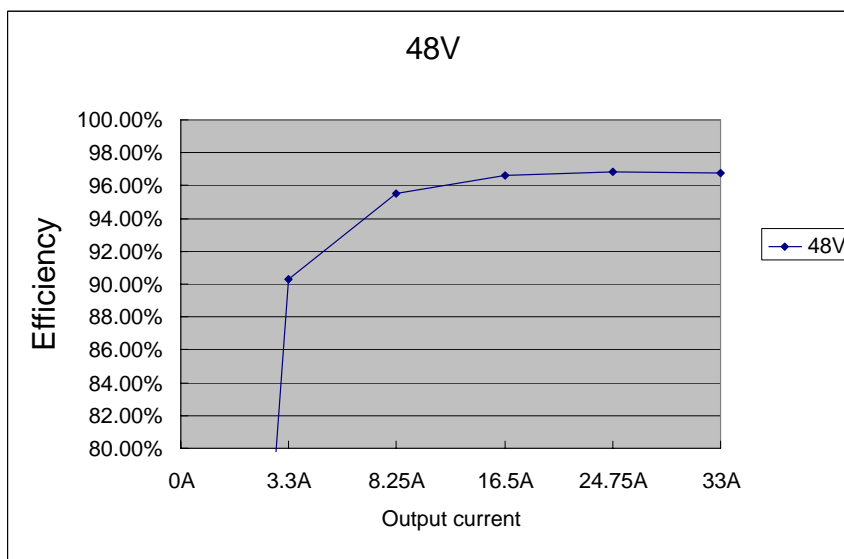
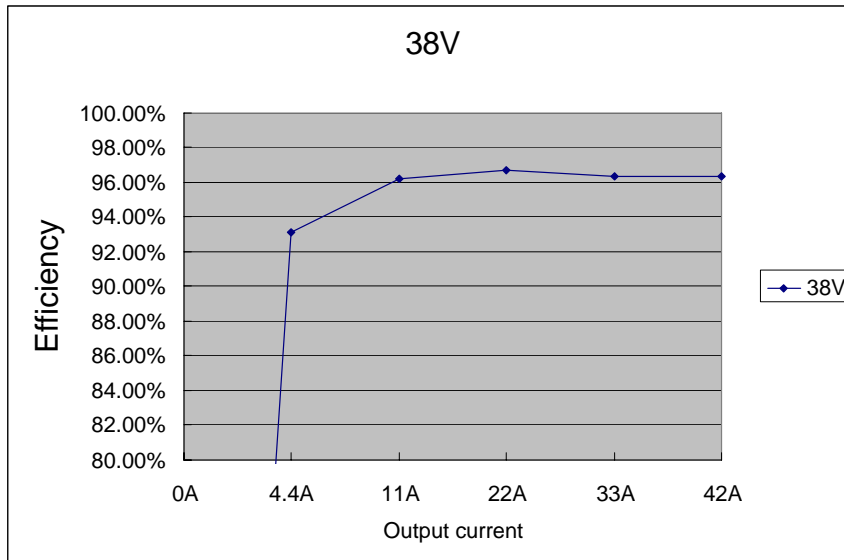
48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick



Control Specifications

Parameter		Min	Typ	Max	Notes
Remote On/Off					
Signal Low (Unit On)	Active Low	-0.3 V	-	0.8 V	The remote on/off pin open, Unit Off;
Signal High (Unit Off)		2.4 V	-	18 V	
Signal Low (Unit Off)	Active High	-0.3 V	-	0.8 V	The remote on/off pin open, Unit On.
Signal High (Unit On)		2.4 V	-	18 V	

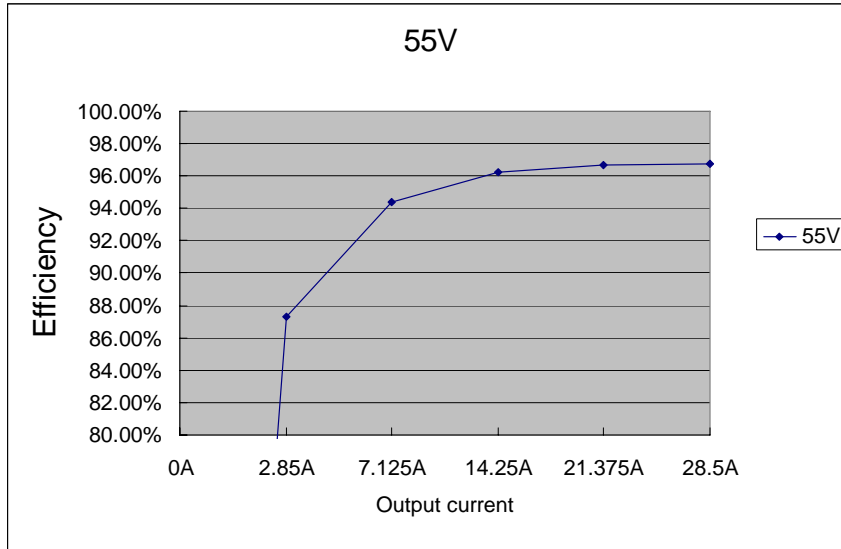
Efficiency Data



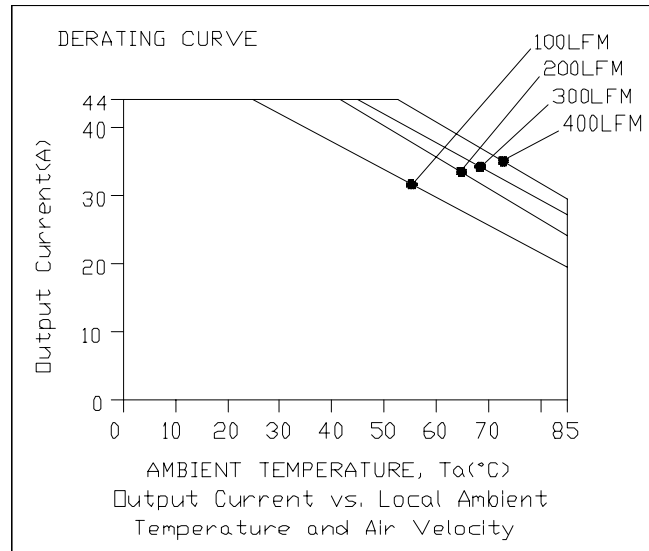
ISOLATED DC/DC CONVERTERS
 48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick



Efficiency Data (continued)



Thermal Derating Curves

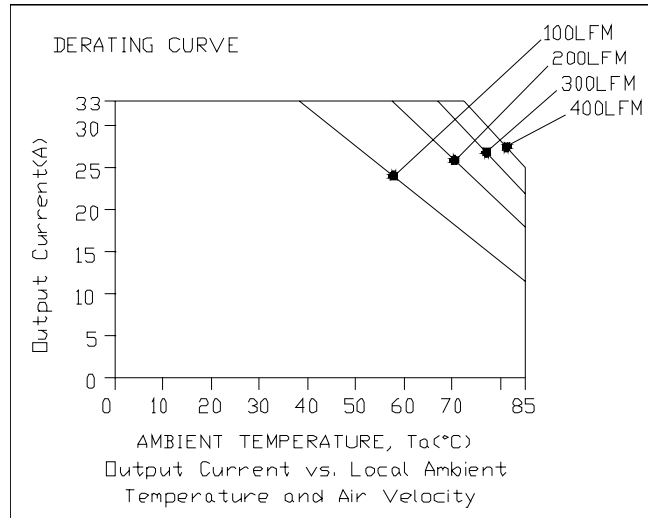


Vin=38 V

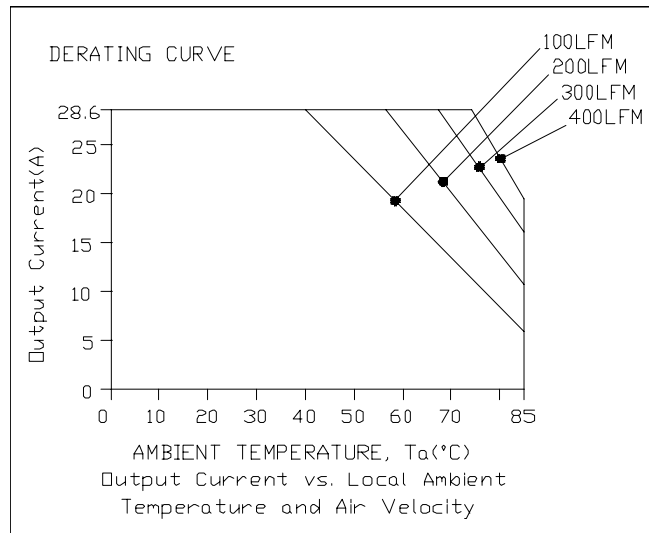
ISOLATED DC/DC CONVERTERS
 48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick



Thermal Derating Curves (continued)



$V_{in}=48\text{ V}$



$V_{in}=55\text{ V}$

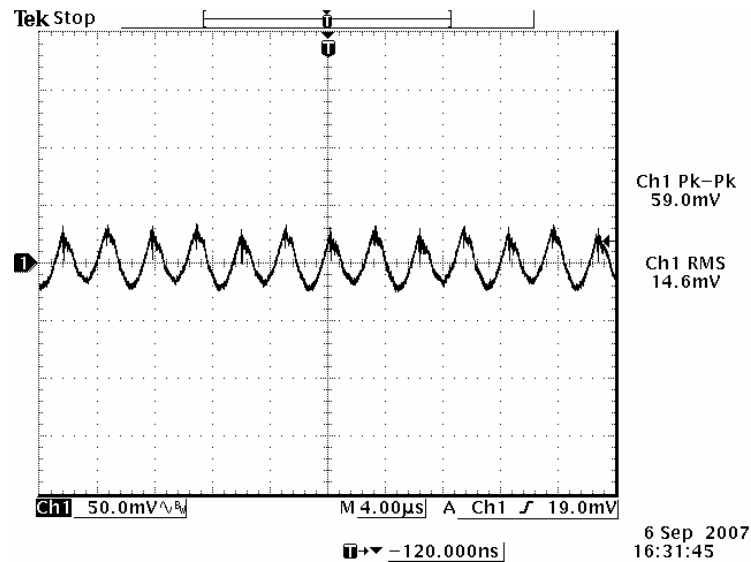
Note: Maximum output power derating curves vs. ambient air temperature for airflow rates of 0 LFM through 400 LFM with air flowing from input to output.

ISOLATED DC/DC CONVERTERS

48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick

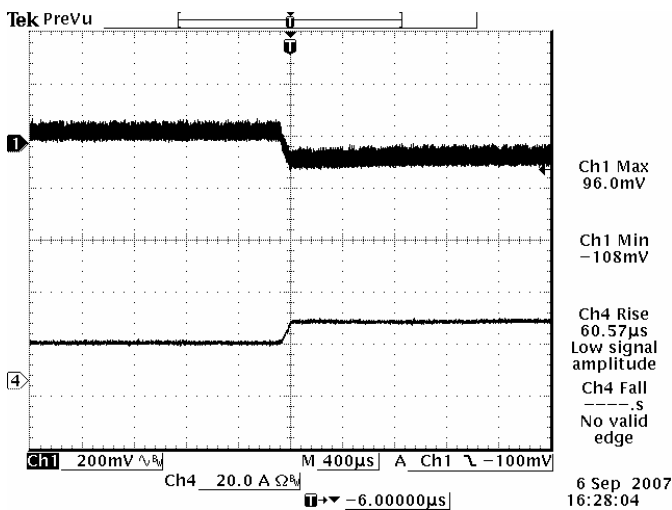


Ripple and Noise Waveform

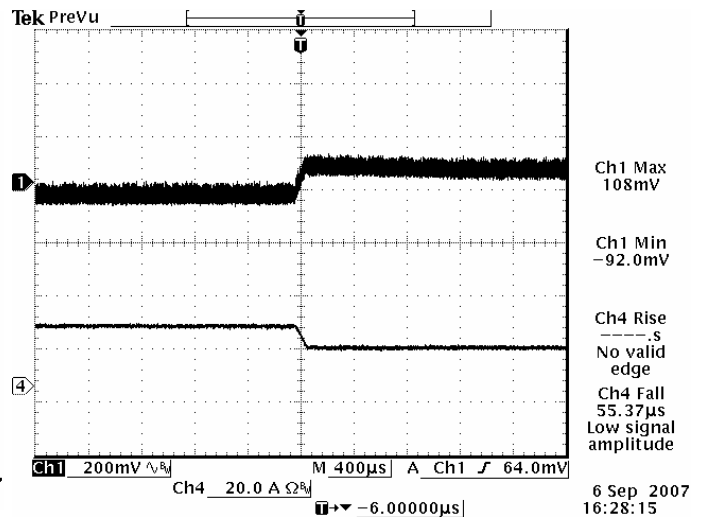


Note: Ripple and noise at full load, 48 Vdc input, with a 1µF ceramic capacitor and 47µF tantalum capacitor at the output, and Ta=25 deg C.

Transient Response Waveforms



50% to 75% load Transient



75% to 50% load Transient

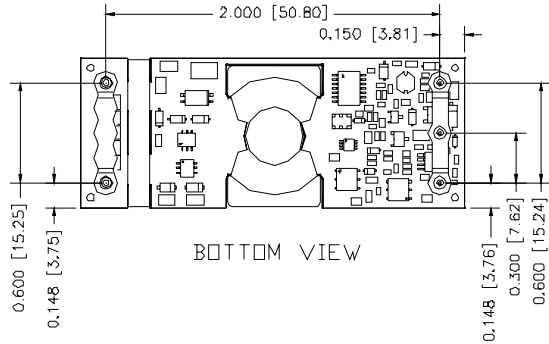
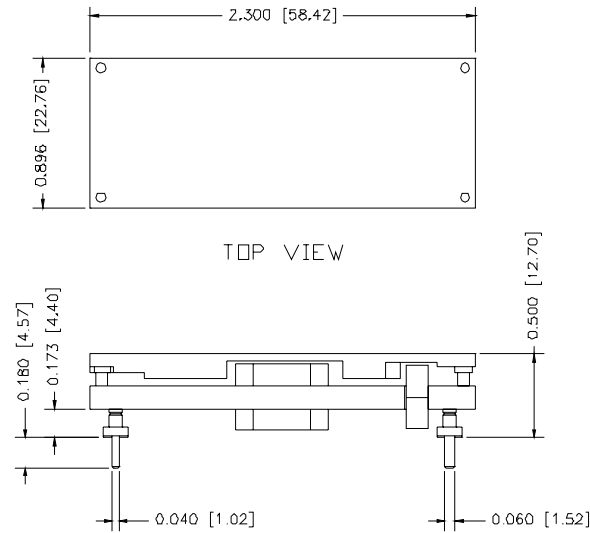
Note: Transient at 48 Vdc input and Ta=25 deg C, External Load Capacitance Co=47uF (Tantalum).

ISOLATED DC/DC CONVERTERS

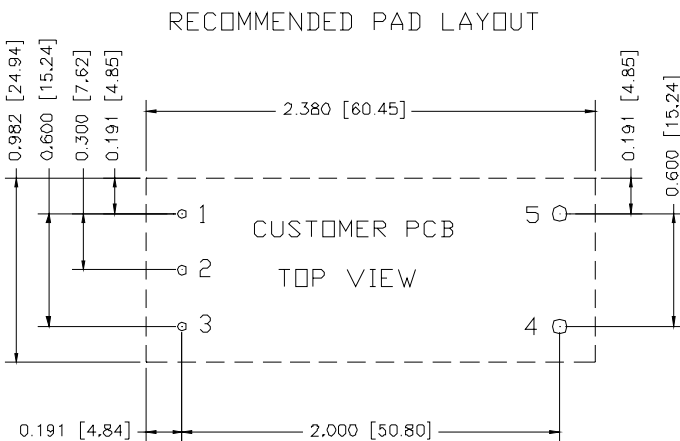
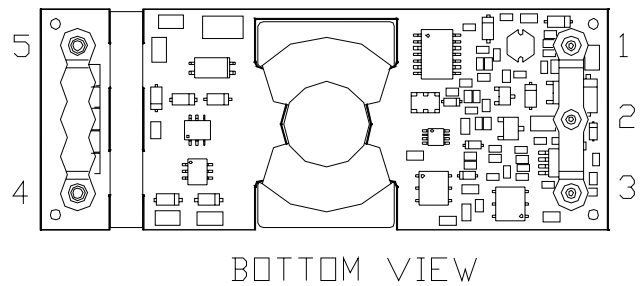
48 VDC Input 9.6 VDC/40 A Output, 1/8 Brick



Mechanical Outline



UNIT: INCH [mm]



1,2,3 ϕ 0.047 HOLE SIZE, ϕ 0.08 min PAD SIZE
4,5 ϕ 0.070 HOLE SIZE, ϕ 0.10 min PAD SIZE

Pin Connections

Pin	Function	Pin Size
1	Vin+	0.040"
2	Enable	0.040"
3	Vin-	0.040"
4	Vout-	0.060"
5	Vout+	0.060"

RoHS Compliance

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



©2008 Bel Fuse Inc. Specifications subject to change without notice. 121808

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