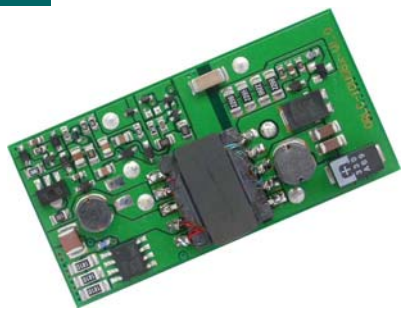
ISOLATED DC/DC CONVERTERS

18 Vdc - 75 Vdc Input 5 Vdc/2 A Output

bel POWER PRODUCTS

0RLC-10U05x RoHS Compliant PRELIMINARY Rev.C

- Isolated
- Fixed Frequency
- High Efficiency
- High Power Density
- Output Voltage Trim
- Low Cost
- Pre-Bias Start Up
- Remote On/Off
- Input Under/Over Voltage Lockout
- Output Over-Voltage Shut Down
- SCP/OCP
- Excellent Thermal Performance
- Over Temperature Protection
- Basic Insulation



Description

The 0RLC-10U05x is an isolated dc/dc converter that operates from a nominal 48 Vdc source. This unit provides up to 10 W of output power from a nominal 48 Vdc input. This unit is designed to be highly efficient and low cost. The converter is provided in a 1"x2" package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active High	Model Number Active Low
5 Vdc	18 Vdc - 75 Vdc	2 A	10 W	83%	0RLC-10U050	0RLC-10U05L

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	-	80 V	
I/O Isolation Voltage	-	-	1500 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-55 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	18 V	-	75 V	
Input Current	-	-	0.8 A	
Input Current (no load)	-	-	50 mA	
Input Reflected Ripple Current (pk-pk)	-	-	30 mA	With simulated source impedance of 10 uH, 5 Hz to 20 MHz, use a 47 uF/ 100 V electrolytic capacitor with ESR=1 ohm max, at 200 kHz.
Turn-on Input Voltage	-	-	18 V	
Turn-off Input Voltage	16 V	-	-	

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

ISOLATED DC/DC CONVERTERS

18 Vdc - 75 Vdc Input 5 Vdc/2 A Output

bel POWER PRODUCTS

Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point	4.925 V	5.0 V	5.075 V	V_{in}=48 V, I_O=50% full load
Line Regulation	-	-	0.5%Vo	
Load Regulation	-	-	1%Vo	
Temperature Regulation (-40 °C to +85 °C)	-	-	0.02%Vo/C	
Ripple and Noise (pk-pk)	-	-	60 mV	0-20 MHz BW, with a 1uF ceramic cap and a 10 uF Tantalum cap at output
Output Current	0 A	-	2 A	
Current Limit Threshold	2.3 A	-	3.5 A	
Turn on Time	-	-	50 mS	
Rise Time	-	-	30 mS	Vinnom, Ionom, resistive load
	-	-	30 mS	Vinnom, Ionom, capacitive load
Output Capacitance	0 uF	-	1000 uF	

Transient Response

50% ~ 100% Max Load	Overshoot	Vo=5 V	-	-	200 mV	di/dt=0.1 A/us, Vin=48 V, with a 10 tantalum cap and a 1uF ceramic cap at the output.
	Settling Time		-	-	100 uS	

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

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	80%	83%	-	Measured at V_{in}=48 V, full load
Switching Frequency	270 kHz	300 kHz	330 kHz	
Isolation Capacitance	-	1500 pF	-	
Output Voltage Trim Range	90%	-	110%	
Over Temperature Protection	-	125 °C	-	
MTBF	TBD			Calculated Per Bell Core SR-332 (I_O = 80% $I_{O\,max}$; Vin=48 V; Vo=5 V; T_a = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.0 x 1.0 x 0.475 50.8 x 25.4 x 12.05			
Weight	-	12 g	-	

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

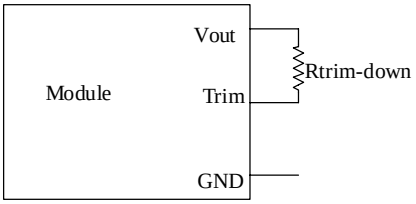
Control Specifications

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	
Signal High (Unit On)		0 mA	-	0.75 mA	

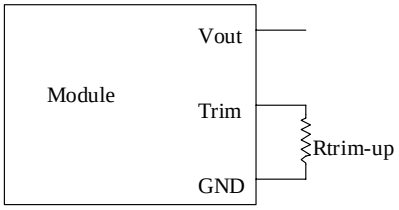
Output Trim Equations

Equations for calculating the trim resistor (in kohm) given the desired adjusted voltage (Vadj) and the nominal output voltage of the converter (Vo) are shown below. The Trim Down resistor should be connected between the Trim pin and Vout. The Trim Up resistor should be connected between the Trim pin and Ground. Only one of the resistors should be used for any given application.

$$Rtrim\_down := \frac{6.25}{(Vo - Vadj\_down)} - 2.5$$

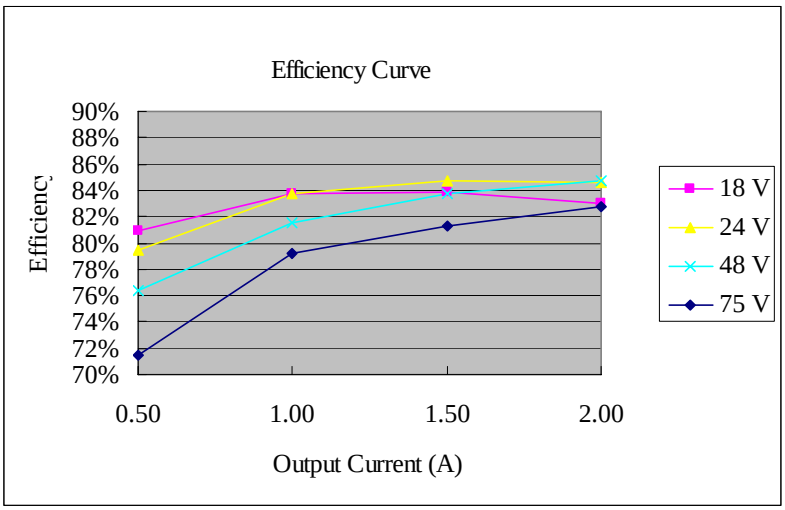


$$Rtrim\_up := \frac{6.25}{Vadj\_up - Vo}$$

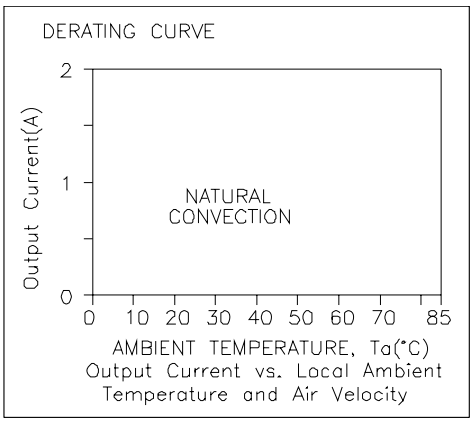


Output voltage Vo=5.01 V

Efficiency Data

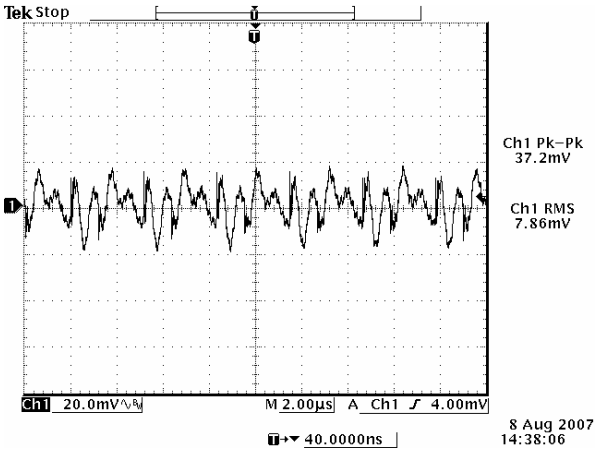


Thermal Derating Curve



Vin=48 V, with maximum junction temperature of semiconductors derated to 120 degree C.

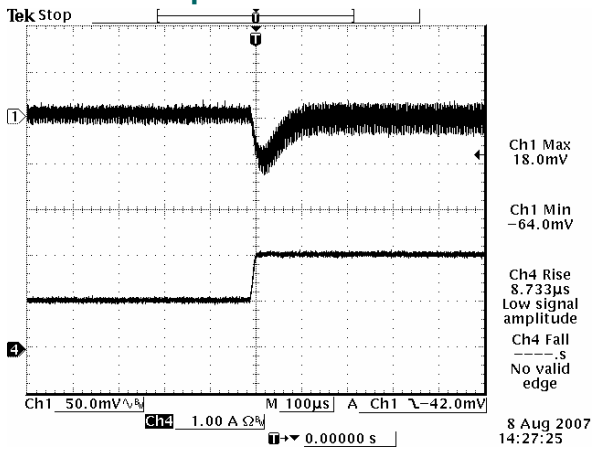
Ripple and Noise Waveform

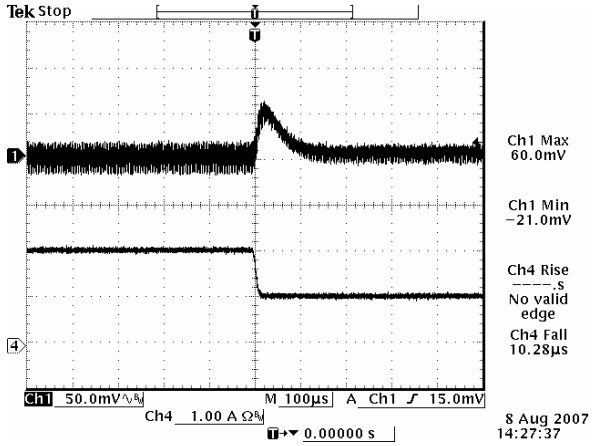


48 Vdc input, 5.0 Vdc/2 A output

Note: Ripple and noise at full load, with a 1uF ceramic cap and a 10 uF Tantalum cap at output, Ta=25 deg C.

Transient Response Waveform



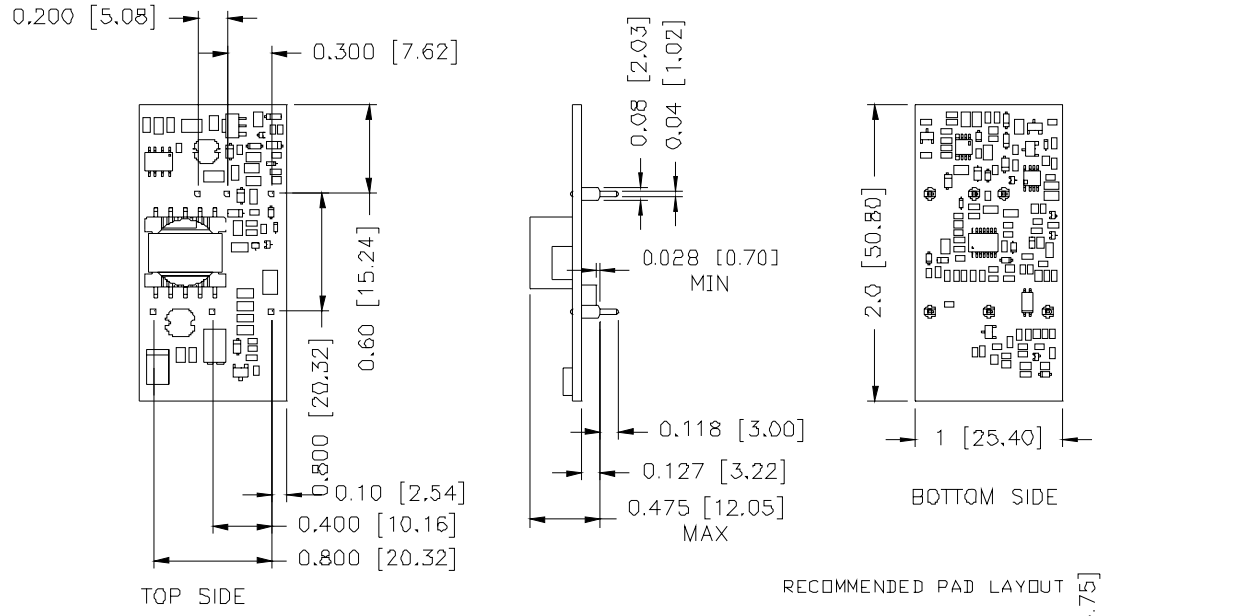


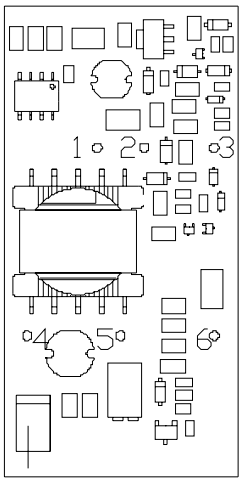
Vo= 5V 50%-100%-50% Load Transients at Vin=48 V@Ta=25℃ Vo= 5V 100%-50% Load Transients at Vin=48 V@Ta=25℃

ISOLATED DC/DC CONVERTERS

18 Vdc - 75 Vdc Input 5 Vdc/2 A Output

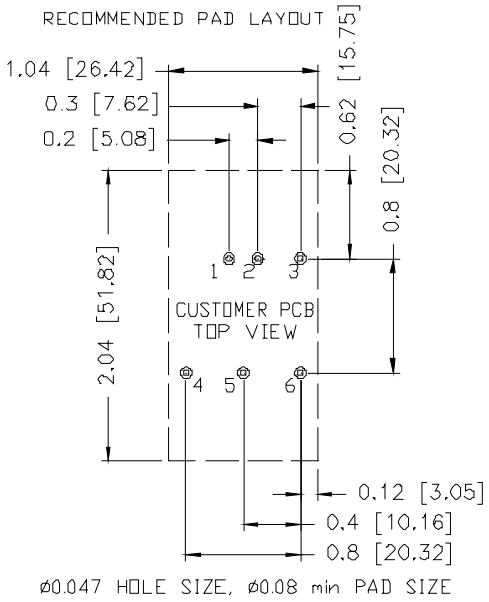
Mechanical Outline





Pin Connections

Pin	Function	Pin Size
1	Vin+	0.040"
2	Vin-	0.040"
3	On/Off	0.040"
4	Vo+	0.040"
5	Trim	0.040"
6	Vo-	0.040"



RoHS Compliance

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

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