

ISOLATED DC/DC CONVERTERS

48 Vdc Input 54 Vdc /1.5 A Output, 1/4 Brick Converter

bel
POWER PRODUCTS

0RXW-80T54L

RoHS Compliant

Rev.D

- Fixed Frequency (230 kHz)
- Isolated
- High Efficiency
- Output Voltage Trim
- Input Under-Voltage Lockout
- Low Cost
- UL60950-1 Recognized(UL/cUL)
- Output Over Voltage Shut Down
- Over Temperature Protection
- SCP/OCP
- Remote On/Off
- Excellent Thermal Performance
- Basic Insulation



Description

The 0RXW-80T54L is an isolated dc/dc converter that operates from a nominal 48 Vdc source. This unit provides up to 85 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 an industry standard quarter brick package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
54 Vdc	36 Vdc - 75 Vdc	1.5 A	85 W	92.5%	0RXW-80T54L

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	
Remote On/Off	-0.3 V	-	15 V	
I/O Isolation Voltage	-	-	2200 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-55 °C	-	125 °C	

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

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36 V	48 V	75 V	
Input Current (no load)	-	40 mA	60 mA	
Input Current (full load)	-	-	2.7 A	
Remote Off Input Current	-	10 mA	20 mA	
Input Reflected Ripple Current (pk-pk)	-	15 mA	30 mA	With simulated source impedance of 12 uH, 5 Hz to 20 MHz; use a 100uF/100 V electrolytic capacitor with ESR = 1 ohm max at 200 kHz
Input Reflected Ripple Current (rms)	-	5 mA	10 mA	
I ² t Inrush Current Transient	-	TBD	-	
Turn-on Voltage Threshold	32 V	33.5 V	35 V	
Under Voltage Threshold	30 V	31.5 V	33 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		53.0 V	53.5 V	54.0 V	V _{in} =48 V, I _o =100%Load	
Line Regulation		-	0.05%Vo	0.1%Vo		
Load Regulation		-	0.05%Vo	0.2%Vo		
Regulation Over Temperature (-40 °C to 85 °C)		-	-	0.02%Vo/C		
Output Current		0 A	-	1.5 A		
Current Limit Threshold (Vo= 90% VO, nom)		1.65 A	1.82 A	2.025 A		
Ripple and Noise (rms)		-	20 mV	40 mV	0-20 MHz BW, with a 1μF ceramic capacitor and a 100 uF Aluminum cap at output.	
Ripple and Noise (pk-pk)		-	60 mV	100 mV		
Turn on Time		-	-	500 mS		
Rise Time		-	200 mS	300 mS		
Overshoot at Turn on		-	0%	3%		
Output Capacitance		100 uF	-	2200 uF		
Transient Response						
50% ~ 75% Max Load	Overshoot	Vo=54 V	-	400 mV	750 mV	di/dt=0.1A/us, Vin=48 V, Ta=25 °C, with a 1 μF ceramic capacitor and a 100 uF Aluminum cap at output.
	Settling Time		-	3 mS	5 mS	
75% ~ 50% Max Load	Overshoot		-	400 mV	750 mV	
	Settling Time		-	3 mS	5 mS	

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

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	90%	92.5%	-	V _{in} =48 V, full load
Switching Frequency	200 kHz	230 kHz	250 kHz	
Isolation Capacitance	-	3300 pF	-	
Output Voltage Trim Range	45 V	-	56.7 V	
Over Temperature Protection	-	120 °C	-	
Over Voltage Protection	57 V	-	65 V	V _{in} =48 V, I _o =full load, Hiccup Mode
MTBF	3,239,795 hours			Calculated Per Bell Core SR-332 (V _{in} =48 V, V _o =54 V, I _o =1.2 A, T _a = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.28 x 1.45 x 0.50 57.88 x 36.83 x 12.70			
Weight	-	53.4 g	-	

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

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Control Specifications

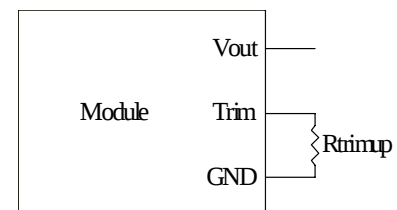
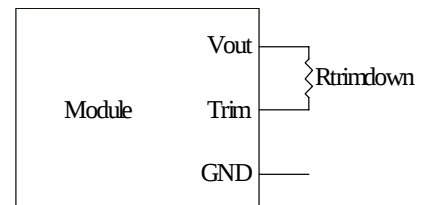
Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal Low (Unit On)	Active Low	-0.3 V	-	The remote on/off pin open, Unit Off.
Signal High (Unit Off)		3 V	-	

Output Trim Equations

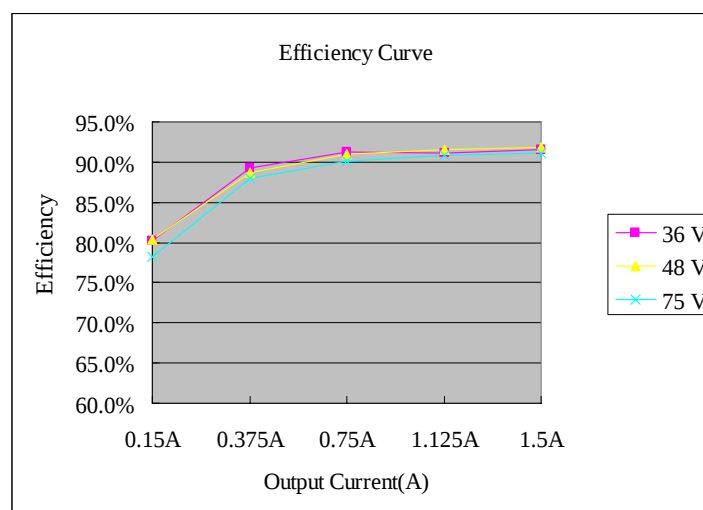
Equations for calculating the trim resistor are shown below. The Trim Down resistor should be connected between the Trim pin and Vout pin. The Trim Up resistor should be connected between the Trim pin and the GND pin. Only one of the resistors should be used for any given application.

$$R_{trimdown} = \frac{51 * 51}{\Delta U} - 55.7 (K \Omega)$$

$$R_{trimup} = \frac{127.5}{\Delta U} - 4.7 (K \Omega)$$



Efficiency Data

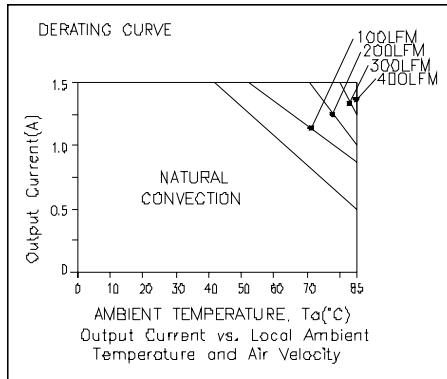


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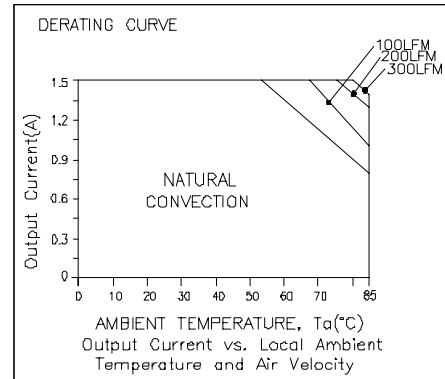
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POWER PRODUCTS

Thermal Derating Curves

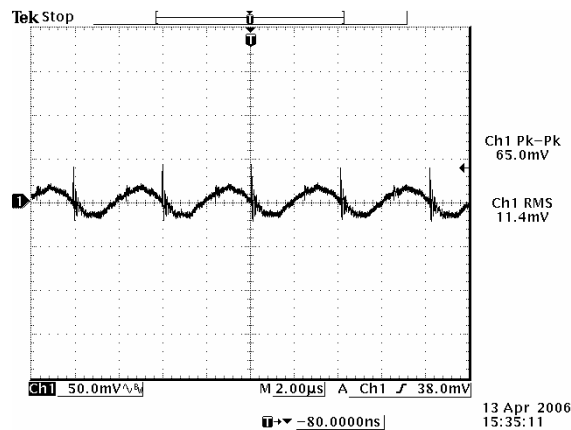


Open-frame module



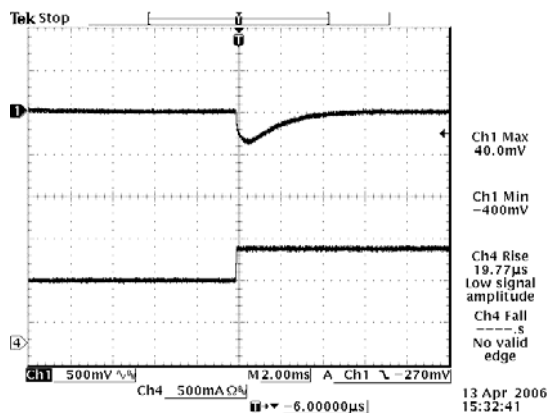
The module is covered with a heat sink

Ripple and Noise Waveform

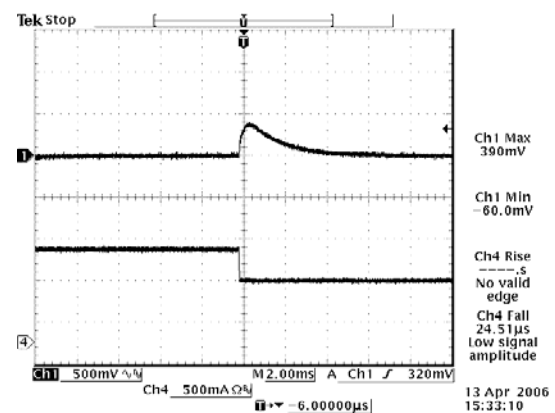


Note: Ripple and noise at full load, 48 V input, 54 V/1.5 A output, with a 1 μF ceramic cap and a 100 μF Aluminum cap at output, and $T_a=25^{\circ}\text{C}$..

Transient Response Waveforms



50%-75% Load Transients at $V_{in}=48\text{ V}$, $V_o=54\text{ V}$



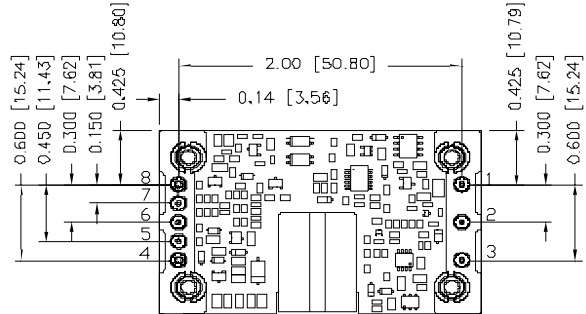
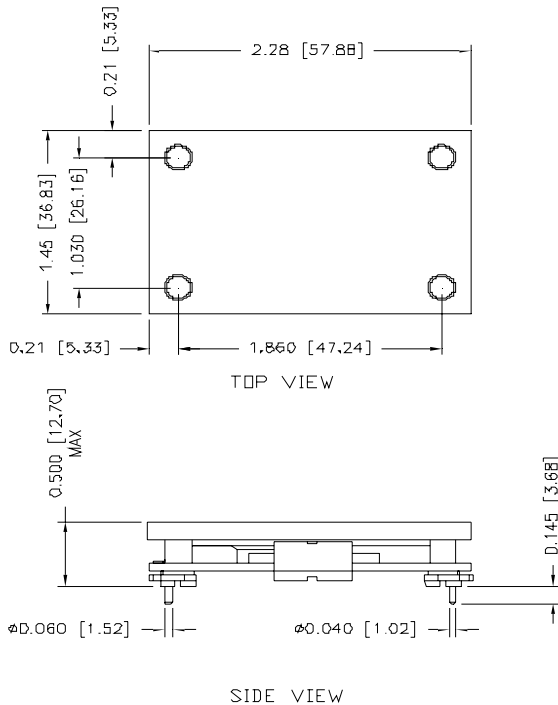
75%-50% Load Transients at $V_{in}=48\text{ V}$, $V_o=54\text{ V}$

Note: Transients response with a 1 μF ceramic cap and a 100 μF /100 V Aluminum cap at output, $T_a=25^{\circ}\text{C}$..

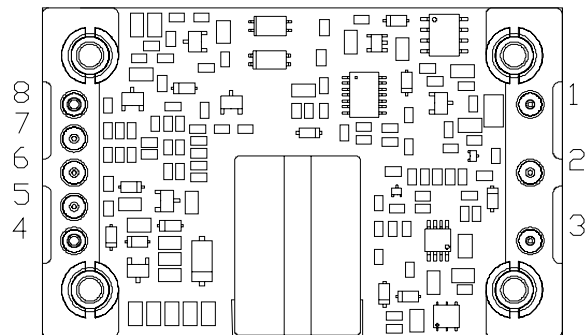
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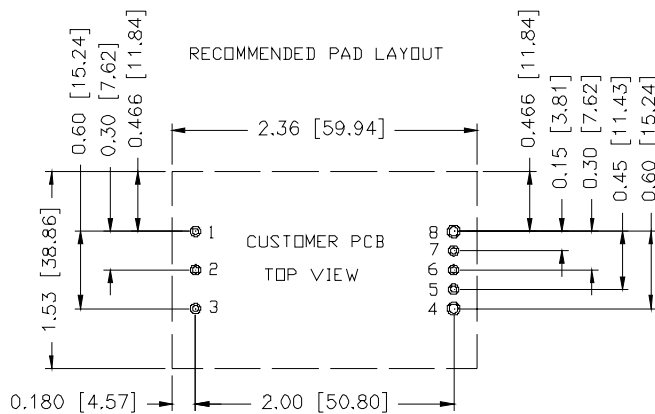
Mechanical Outline



BOTTOM VIEW



BOTTOM VIEW



Pin Connections

Pin	Function
1	Vin(+)
2	On/OFF
3	Vin(-)
4	Vo(-)
5	Sense(-)
6	Trim
7	Sense(+)
8	Vo(+)

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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