

ISOLATED DC/DC CONVERTERS

48 Vdc Input

5 Vdc/1.7 A Output

bel
POWER PRODUCTS

0RXL-02T050

RoHS Compliant

Rev.A

- Isolated
- High Efficiency
- Fixed Frequency (220 kHz)
- High Power Density
- Low Cost
- SCP/OCP
- Output Over-Voltage Clamp
- Synchronization



Description

The 0RXL-02T050 is an isolated dc/dc converter that operates from a nominal 48 Vdc source. This unit will provide up to 10 W of output power from a nominal 48 Vdc input. This unit is designed to be highly efficient and very low cost. Features include Synchronization, over current protection, short circuit protection and output over voltage clamp. This converter is provided in an industry standard package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
5 Vdc	38 Vdc - 60 Vdc	1.7 A	10 W	81%	0RXL-02T050

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

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Continuous Input Voltage	-0.3 V	-	80 V	
I/O Isolation Voltage	-	-	500 V	
Synchronization Voltage	-	-	5.5 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-40 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	38 V	48 V	60 V	
Input Current (full load)	-	0.3 A	-	
Input Current (no load)	-	8 mA	15 mA	
Input Reflected Ripple Current (rms)	-	20 mA	40 mA	With simulated impedance of 10 uH, two 0.47 uF ceramic capacitor at 5 Hz to 20 MHz BW, and a 10 uF/100 V electrolytic capacitor with ESR=1ohm max at 200 kHz.
Input Reflected Ripple Current (pk-pk)	-	60 mA	100 mA	
I ² t Inrush Current Transient	-	-	0.2 A ² s	

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		4.8 V	5.0 V	5.2 V	Vin=48 V, Io=100% load.
Load Regulation		-	-	0.2%Vo	Io = 0.35 A - 1.7 A
Line Regulation		-	-	0.1%Vo	Vin = 38 V - 60 V
Regulation Over Temperature (-40 °C to +85 °C)		-	-	0.03%/°C	
Ripple and Noise (pk-pk)		-	-	70 mV	Test conditions: 0-20 MHz BW; with a 4.7 uF and a 0.1 uF ceramic capacitor at the output.
Ripple and Noise (rms)		-	10 mV	20 mV	
Output Current		0.35 A	-	1.7 A	
Output Current Limit		2.0 A	-	3.5 A	Hiccup
Turn on Time		-	-	90 mS	
Overshoot at Turn On		0%	-	5%	
Output Capacitance		0 uF	-	680 uF	
Transient Response					
50% ~ 100% Max Load	Vo=5.0 V	-	100 mV	150 mV	Test conditions: di/dt=0.1 A/uS; Vin=48 V; with a 100 uF/10 V Tantalum capacitor at the output.
Settling Time		-	500 uS	-	
50% ~ 100% Max Load		-	100 mV	150 mV	
Settling Time		-	500 uS	-	

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

General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	77%	81%	-	Vin = 48 V; Full Load
Switching Frequency	200 kHz	220 kHz	240 kHz	
Isolation Capacitance	-	1000 pF	-	
Output Over Voltage Clamp	-	-	7 V	
MTBF	8,159,815 hours			Calculated Per Bell Core SR-332 (Vin=48 V; Vo=5 V, Io = 80% Load; TA = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	1.9 x 0.98 x 0.44 48.26 x 24.89 x 11.25			
Weight	-	10.5 g	-	

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

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48 Vdc Input

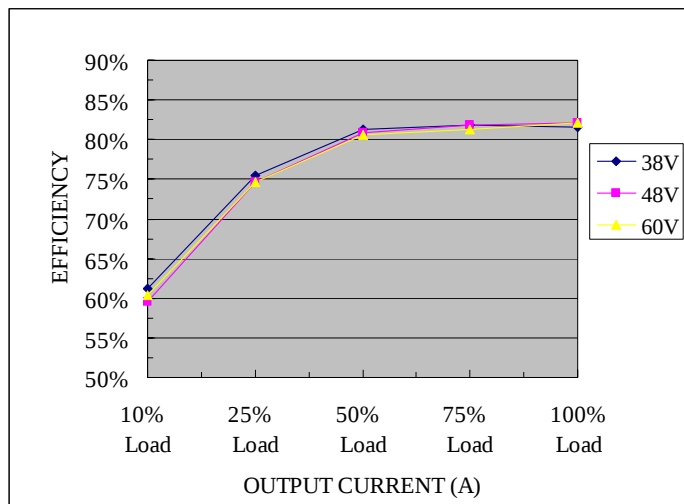
5 Vdc/1.7 A Output

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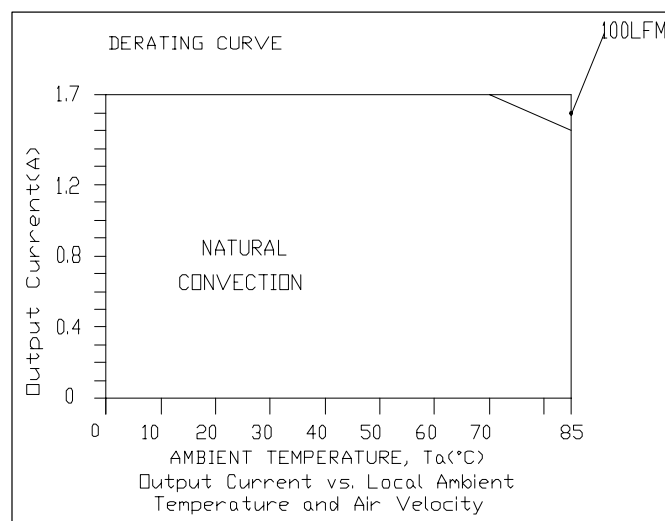
Control Specifications

Parameter	Min	Typ	Max	Notes
Synchronization Signal Specifications				
Signal Low	-	-	0.4 V	
Signal High	2.4 V	-	-	
Frequency	255 kHz	-	300 kHz	
Duty Cycle	45%	-	55%	

Efficiency Data



Thermal Derating Curve



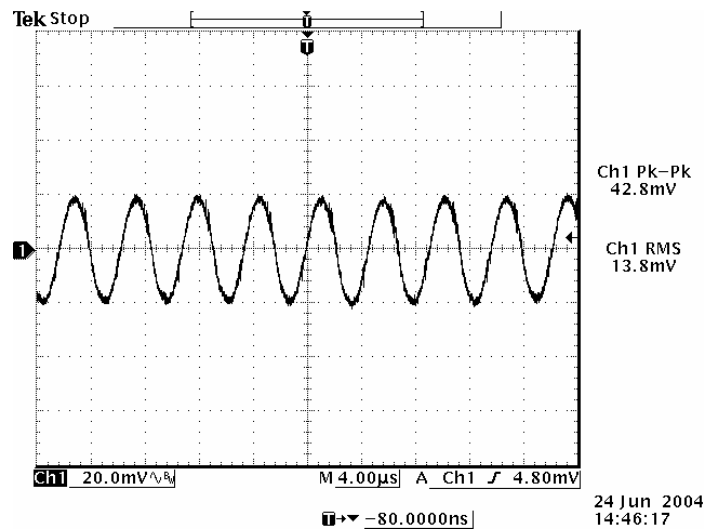
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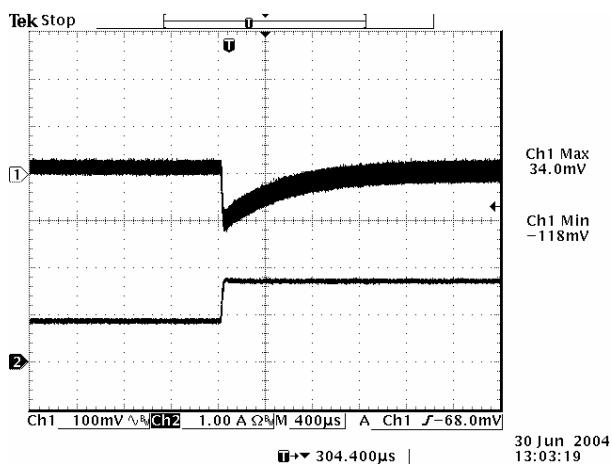
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Ripple and Noise Waveform

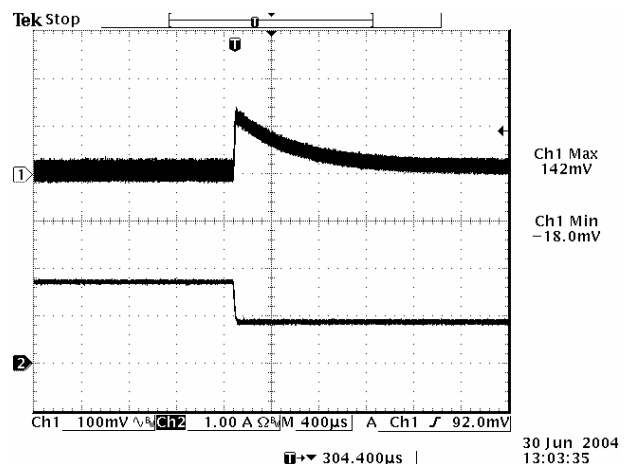


Note: Ripple and noise at full load, 48 V input, 5 V/1.7 A output, and $T_a=25$ deg C, with a 4.7 μ F and a 0.1 μ F ceramic capacitor at output.

Transient Response Waveforms



50%-100% Load Transients



100%-50% Load Transients

Note: Transient Response at $V_{in}=48$ V, $V_o=5$ V, $di/dt=0.1A/\mu s$, with a 100 μ F/10 V tantalum capacitor, $T_a=25$ deg C.

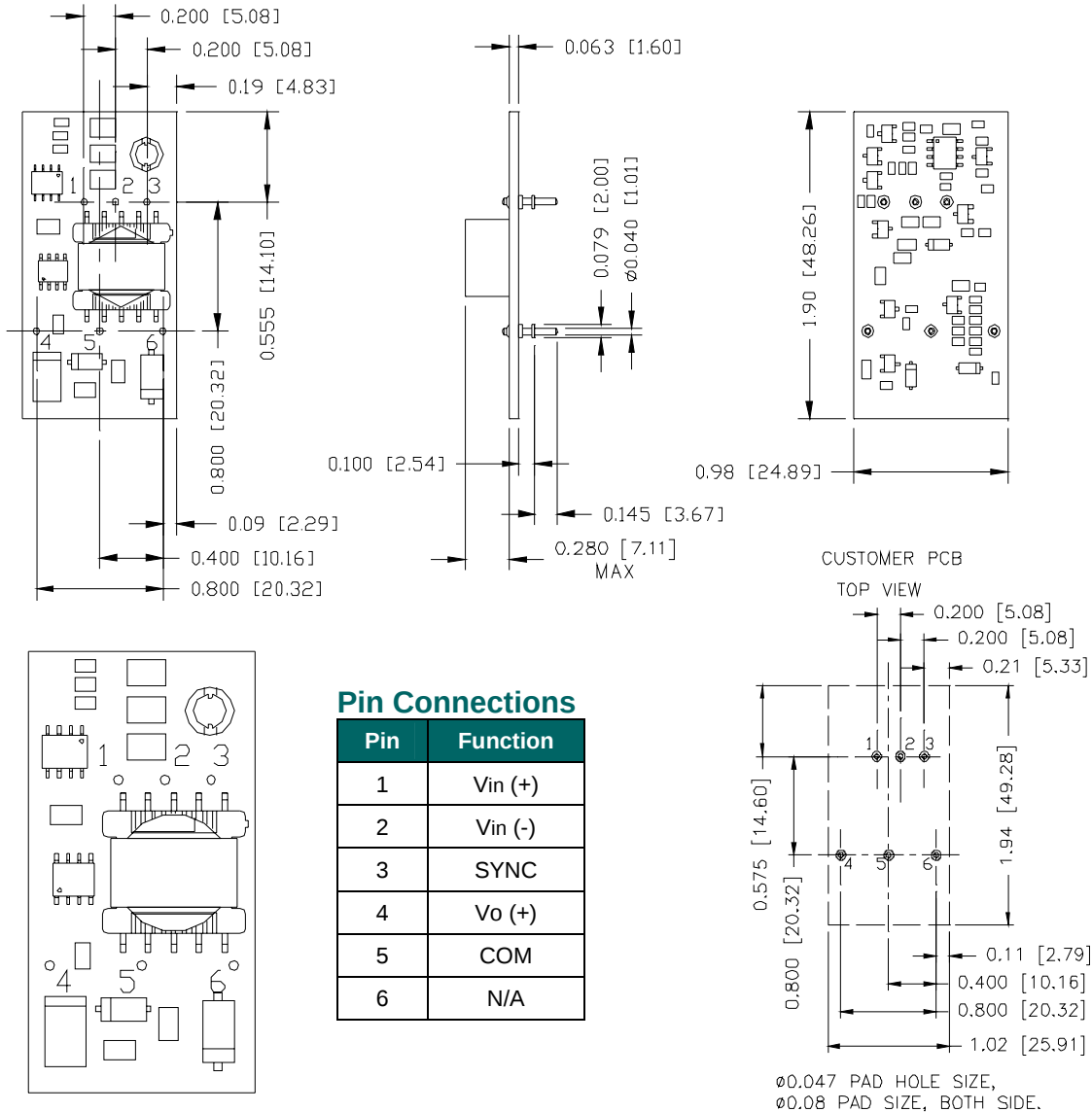
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Mechanical Outline



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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