ISOLATED DC/DC CONVERTERS

36 Vdc - 75 Vdc Input 72 Vdc/2.8 A Output

0RXW-D0T72L RoHS Compliant Rev.A

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

Description

The 0RXW-D0T72L 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 and input under-voltage lockout. This converter is provided in a compact, though-hole package that is easy to use and provides good thermal performance.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
72 Vdc	36 Vdc - 75 Vdc	2.8 A	200 W	92%	0RXW-D0T72L

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	

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)	-	-	120 mA	Vin=48 V, null load
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^2t Inrush Current Transient	-	-	1 A^2s	
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	74.0 V	74.3 V	74.6 V	V_{in}=48 V, null load
Output Voltage Set Point	72.0 V	72.3 V	72.6 V	V_{in}=48 V, full load
Line Regulation	-	20 mV	100 mV	V_{in}=36-75 V, full load
Temperature Coefficient	-	-	0.02%Vo	
Output Current Range	0 A	-	2.8 A	
Output DC Current Limit	5.0 A	-	6.4 A	Hiccup Mode
Ripple and Noise (rms)	-	75 mV	100 mV	0 - 20 MHz BW,with 1 uF ceramic capacitor and a 47 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	Power up
	-	20 mS	30 mS	Remote on/off
Start-Up Time	-	30 mS	50 mS	Power up
	-	30 mS	50 mS	Remote on/off
Overshoot at Turn on	-	-	3%	
Output Capacitance	47 uF	-	1200 uF	
Transient Response				
25% ~ 50% Max Load	-	500 mV	600 mV	di/dt=0.1 A/us, Vin=48 Vdc, Ta=25°C
50% ~ 25% Max Load	-	500 mV	600 mV	
50% ~ 75% Max Load	-	500 mV	600 mV	
75% ~ 50% Max Load	-	500 mV	600 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	89%	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 ℃	-	120 ℃	PCB temperature, No Latch
	5 ℃	10 ℃	-	Hysteresis
Over Voltage Protection	78 V	-	85 V	Latch
MTBF	TBD			Calculated Per Bell Core SR-332 (Io=Normal, T_a = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.4 x 2.28 x 0.5 60.96 x 57.91 x 12.70			
Weight	-	100 g	-	

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

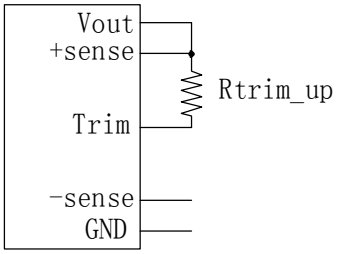
Control Specifications

Parameter		Min	Typ	Max	Notes
Remote On/Off					
Signal Low (Unit On)	Active Low	-0.3 V	-	1.2 V	The remote on/off pin open, Unit Off.
Signal High (Unit Off)		3 V	-	15 V	

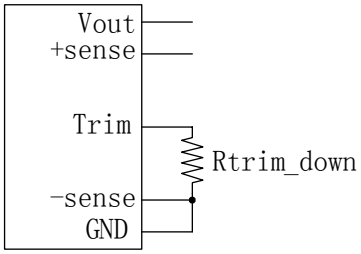
Output Trim Equations

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.

$$Rtrim\_up = \frac{(100 + delta) \times Vo - 124}{1.24 \times |delta|} - 2 \quad K\Omega$$



$$Rtrim\_down = \frac{100}{|delta|} - 2 \quad K\Omega$$

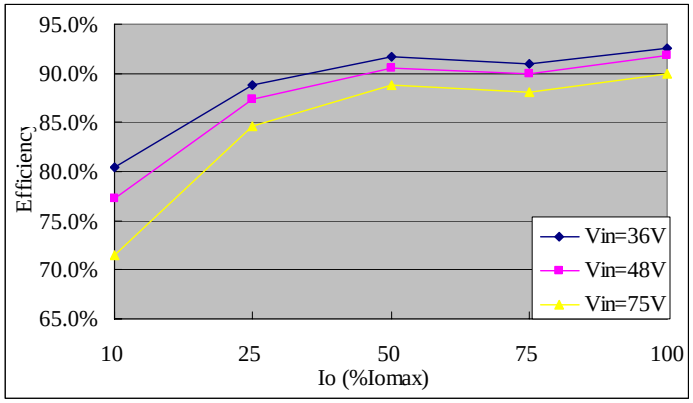


Note:

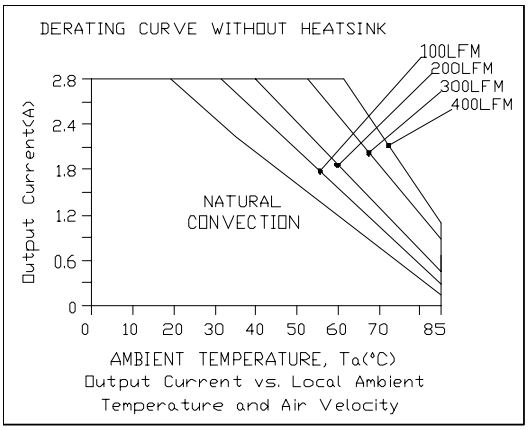
$$delta = \frac{(Vadj - Vo)}{Vo} \times 100 [\%]$$

Vadj is the desired output voltage
Vo = 74.298 V @Iout=0

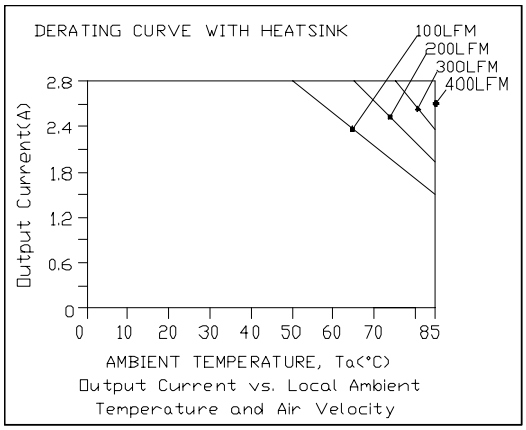
Efficiency Data



Thermal Derating Curves



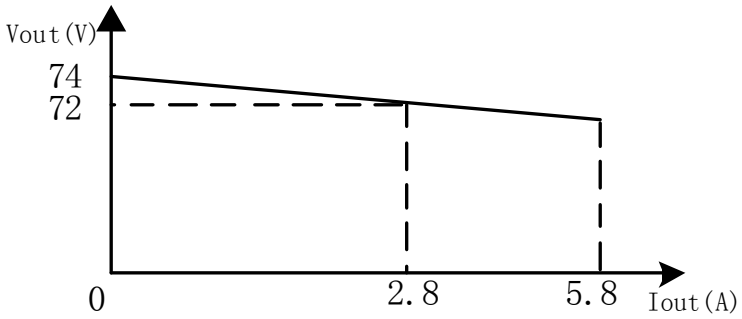
Vin=48 V without heatsink



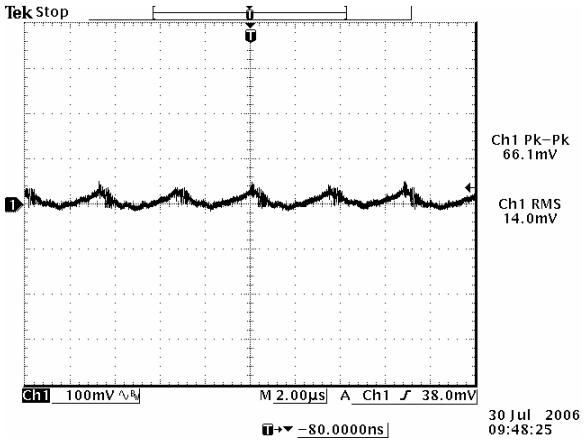
Vin=48 V with heatsink

Load Characteristic

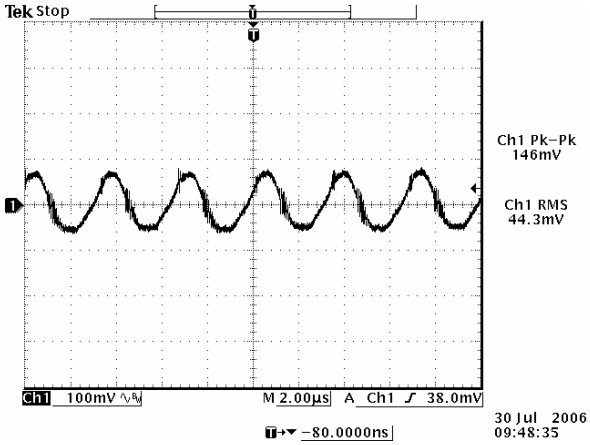
$$Vout=59.918 \times (1.24 - Iout \times 12 \times 10^{-3})$$



Ripple and Noise Waveforms



Ripple and noise at full load, 36 Vdc input, Ta=25 deg C



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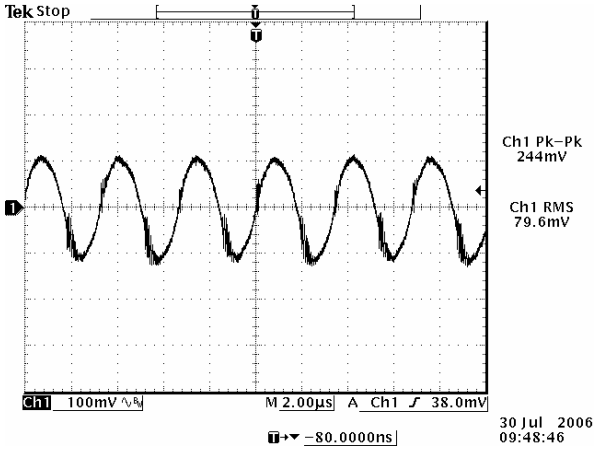
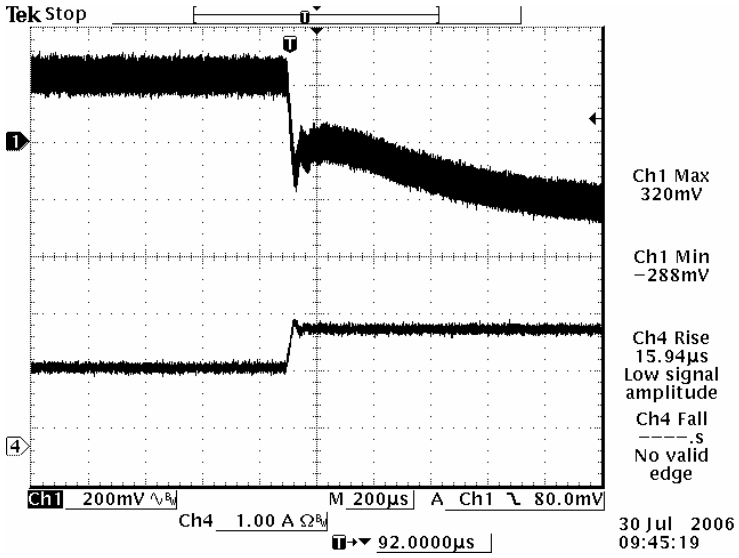


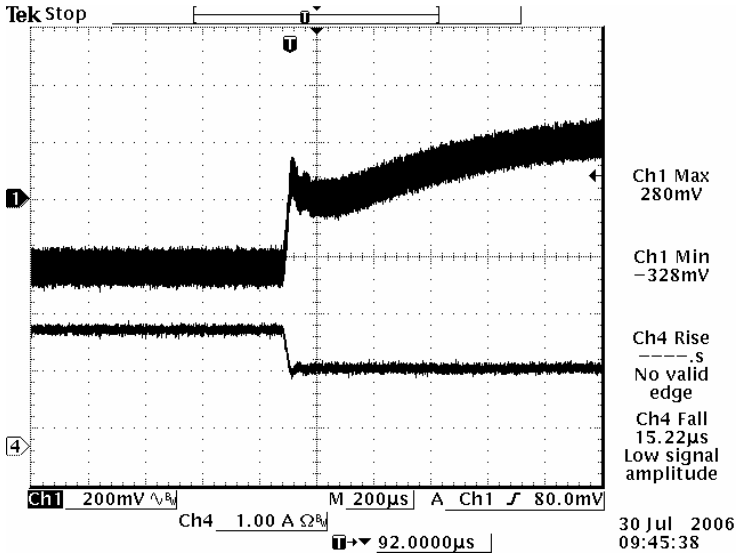
Ripple and noise at full load, 75 Vdc input, Ta=25 deg C

Note: Ripple and noise with a 1 µF ceramic capacitor and 47 µF electrolytic capacitor.

Transient Response Waveforms



50%-75% Load Transients at Vin=48 V, Ta=25 deg C



75%-50% Load Transients at Vin=48 V, Ta=25 deg C

Note: Transients at di/dt=0.1 A/us.

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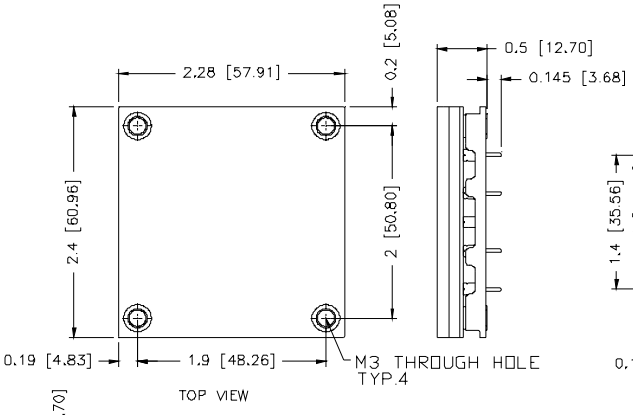
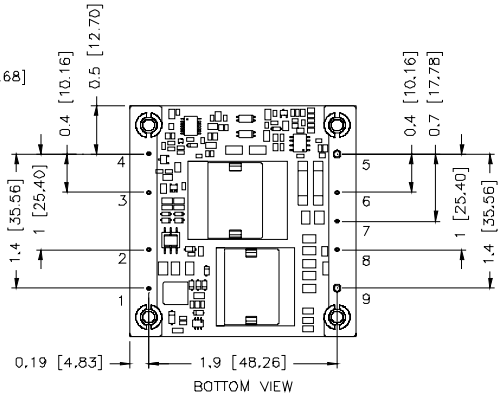
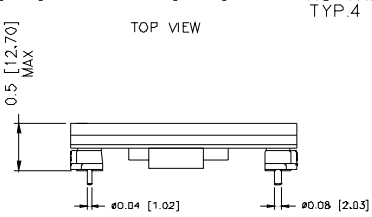
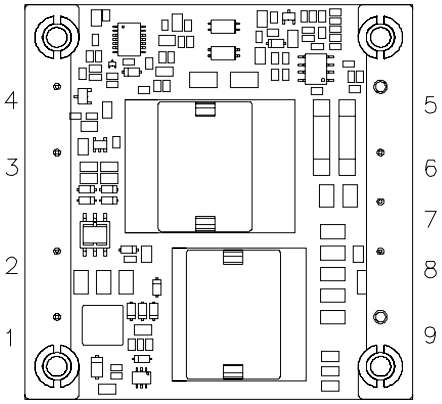
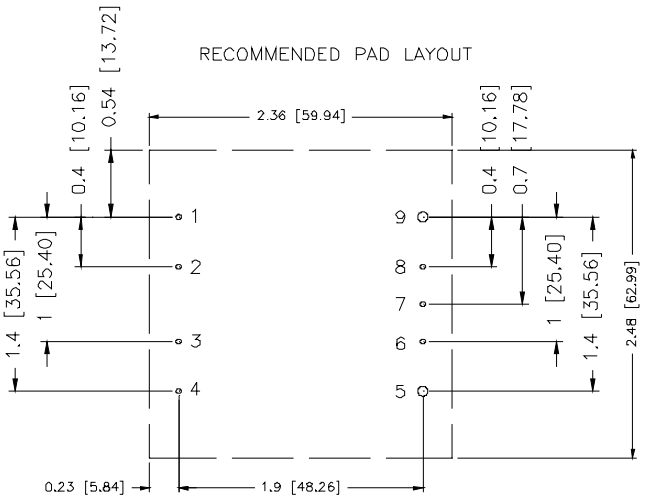
Mechanical Outline











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

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"

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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