ISOLATED DC/DC CONVERTERS

36 Vdc - 75 Vdc Input 3.3 Vdc/20 A Output

0RXW-70T03x RoHS Compliant PRELIMINARY Rev.A

- Isolated
- Fixed Frequency (310 kHz)
- High Efficiency
- High Power Density
- Low Cost
- Input Under-Voltage Protection
- Output Over-Voltage Protection
- Over Temperature Protection
- OCP /SCP
- Remote On/Off
- Output Voltage Trim

Description

The 0RXW-70T03x is an isolated dc/dc converter that operates from a nominal 48 Vdc source. This converter provides up to 66 W of output power. Features include remote on/off, short circuit protection, over current protection, over-temperature protection, output over-voltage protection, input under-voltage protection.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active Low	Model Number Active High
3.3 V	36 Vdc - 75Vdc	20 A	66 W	92%	0RXW-70T03L	0RXW-70T033

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
Continuous Input Voltage	-0.3 V	-	80 V	
Remote On/Off	-0.3 V		18 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)	-	50 mA	120 mA	
Input Current (full load)	-	-	2.5 A	
Remote Off Input Current	-	2 mA	5 mA	
Input Reflected Ripple Current (pk-pk)	-	10 mA	30 mA	Input filter for noise, not for EMI. C1-L-C2 filter, C1=100uF/100V, L=10uH, C2=100uF/100V
Input Reflected Ripple Current (rms)	-	2 mA	5 mA	
I^2t Inrush Current Transient	-	-	1 A^2s	
Turn-on Voltage Threshold	32 V	34 V	35 V	
Turn-off Voltage Threshold	30 V	32 V	34 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	3.25 V	3.3 V	3.35 V	V_{in}=48 V, Io=50%Load
Line Regulation	-	0.2%	0.5%	Vin=36~75V, full load
Load Regulation	-	0.2%	0.5%	
Regulation Over Temperature (-40 °C to 85 °C)	-	-	0.02%Vo/℃	
Output Current	0 A	-	20 A	
Current Limit Threshold	22 A	25 A	28 A	
Ripple and Noise (rms)	-	15 mV	30 mV	0-20 MHz BW, with a 1 uF ceramic capacitor and 10uF tantalum capacitor at the output, Vin=48V, Iout=20A, 300LFM
Ripple and Noise (pk-pk)	-	60 mV	100 mV	
Ripple and Noise (pk-pk)	-	-	150 mV	0-20MHz BW, over all load, line and temperature conditions with a 1µF ceramic capacitor and a 10µF tantalum capacitor at output
Short Circuit Surge Transient	-	-	TBD	
Turn on Time	-	-	20 mS	
Overshoot at Turn on	-	-	3%	
External load Capacitance	0 uF	-	10000 uF	

Transient Response

50% ~ 75% Max Load	Overshoot	V_O=3.3 V	-	100 mV	150 mV	di/dt=0.1 A/us, Vin=48 Vdc, External 10 uF Tantalum Cap and 1uF Ceramic Cap, Ta=25℃ .
	Settling Time		-	200 uS	400 uS	
75% ~ 50% Max Load	Overshoot		-	100 mV	150 mV	
	Settling Time		-	200 uS	400 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	90%	92%	-	Vin = 48 V, full load
Switching Frequency	290 kHz	310 kHz	330 kHz	
I/O Isolation Voltage	-	1500 V	-	
Output Voltage Trim Range	80%	-	110%	
Remote Sense Compensation	-	-	10%	
Over Temperature Protection	-	120 °C	-	
Over Voltage Protection (Static)	3.8 V	-	5 V	
Over Voltage Protection (Dynamic)	3.8 V	-	5 V	The transient over voltage must be measured at Rtrim-up≥10K
MTBF	TBD			Calculated Per Bell Core SR-332 (I_O = Normal; T_a = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.3 x 0.9 x 0.335 58.4 x 22.9 x 8.5			
Weight	-	23 g	-	

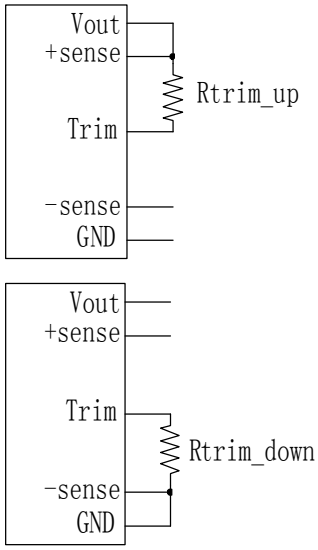
Note: All specifications are typical at 25 °C unless otherwise stated.

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	
Current Source	-	0 mA	-	1 mA	

Output Trim Equations

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



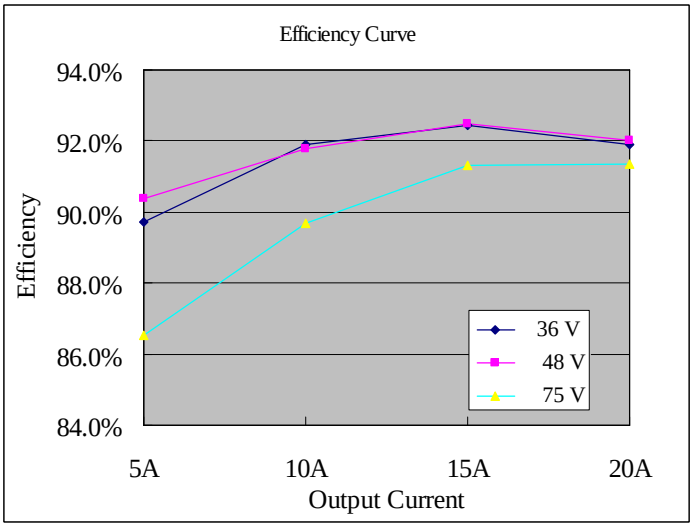
$$\text{Rtrimdown} = \frac{511}{|\text{delta}|} - 10.22[\text{k}\Omega]$$

$$Rtrimup = \frac{(100 + delta) \cdot Vo \cdot 5.11 - 626}{1.225 \cdot delta} - 10.22[k\Omega]$$

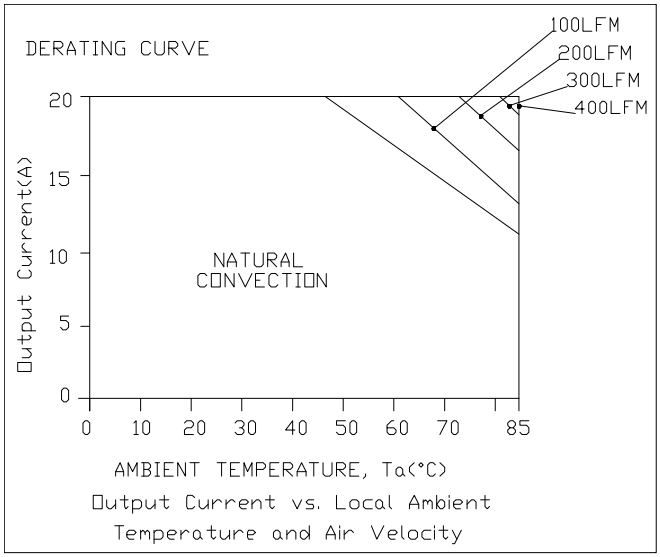
Note: $$\text{delta} = \frac{(\text{Vo\_req} - \text{Vo})}{\text{Vo}} \times 100[\%]$$

Output voltage Vo=3.3 V

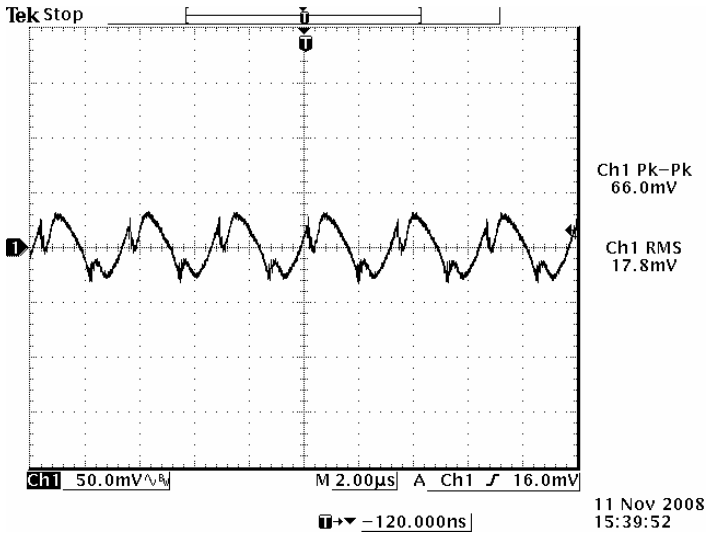
Efficiency Data



Thermal Derating Curve



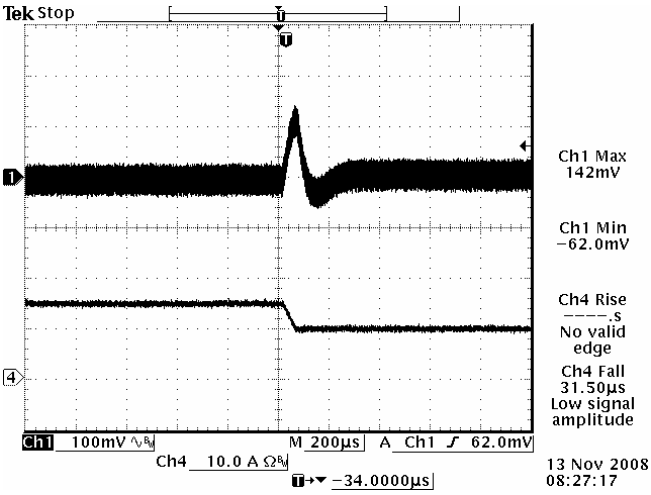
Ripple and Noise Waveform



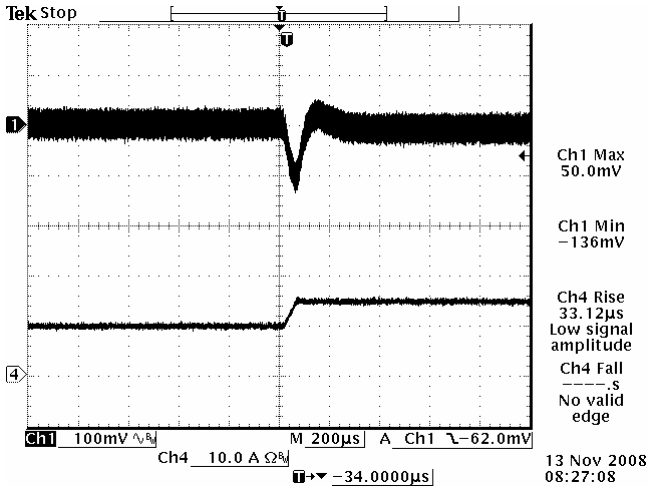
48V input, 3.3V output

Note: Ripple and noise at full load, 0-20MHz, with a 1uF/50V ceramic capacitor and 10uF/10V tantalum capacitor at the output and Ta=25 deg C.

Transient Responses Waveforms



Vout=3.3 V 50%-75% Load Transients



Vout=3.3 V 75%-50% Load Transients

Note: Transient Response at di/dt=0.1A/uS, with a 1uF/50V ceramic capacitor and 10uF/10V tantalum capacitor at the output and Ta=25 deg C.

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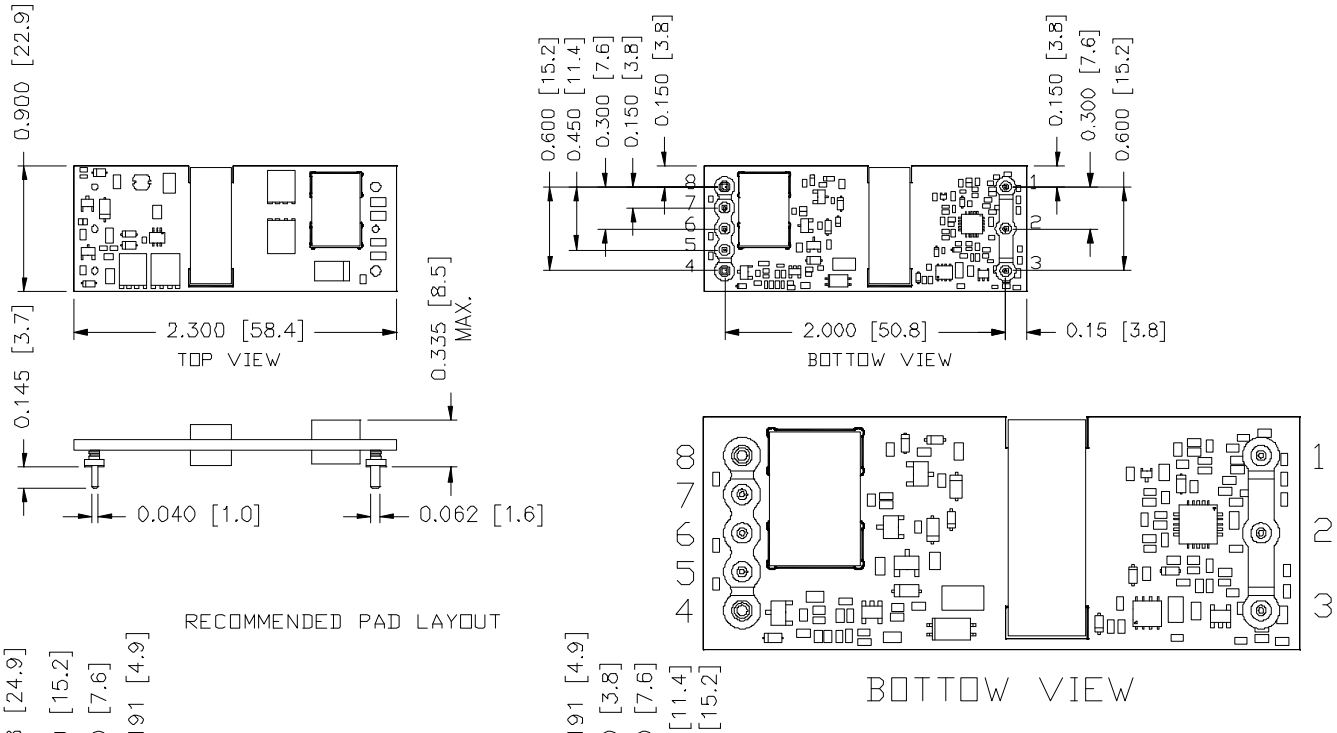
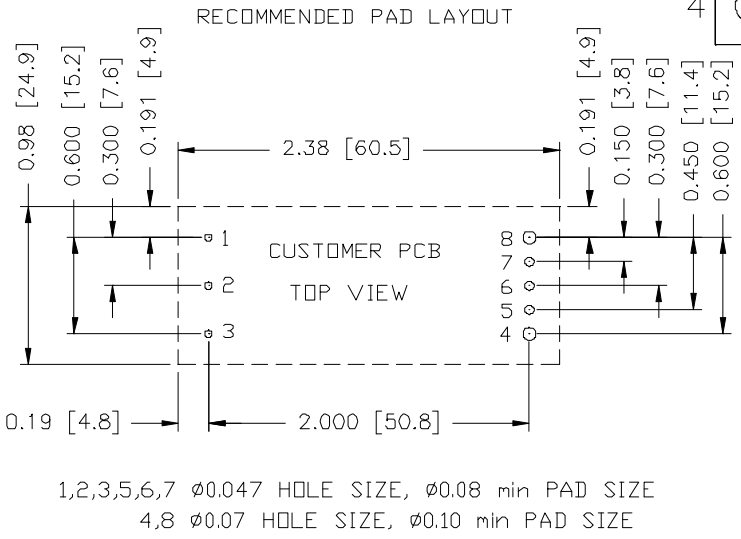
Mechanical Outline





Pin Connections

Pin	Function	Pin Dim.
1	Vin(+)	0.040”
2	On/Off	0.040”
3	Vin(-)	0.040”
4	Vout(-)	0.060”
5	Sense(-)	0.040”
6	Trim	0.040”
7	Sense(+)	0.040”
8	Vout(+)	0.060”

Notes:1. Pin 5 must be connected to Vout(-).
2. Pin 7 must be connected to Vout(+).

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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