ISOLATED DC/DC CONVERTERS

48 Vdc Input 3.3 Vdc /6 A Output

0RXW-25T033 RoHS Compliant PRELIMINARY Rev.B

- Fixed Frequency (330 kHz)
- Isolated
- High Efficiency
- High Power Density
- Input Under-Voltage Lockout
- TUV Certified to EN 60950-1 (pending)
- Output Over Voltage Latch Off
- Output Voltage Trim
- Low Cost
- SCP/OCP
- Over Temperature Protection
- Remote On/Off

Description

The 0RXW-25T033 series are isolated dc/dc converters that operate from a nominal 48 Vdc source. These units will provide up to 19.8 W of output power from a nominal 48 Vdc input. These units are designed to be highly efficient and very low cost. Features include remote on/off, over current protection and under-voltage lockout, etc. These converters are provided in an industry standard package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number
3.3 Vdc	36 Vdc - 75 Vdc	6 A	19.8 W	85%	0RXW-25T033

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	100 V for 100 mS Max
Remote On/Off (Active High)	-0.7 V	-	12 V	
Remote On/Off (Optional Active)	-0.7 V	-	12 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)	-	30 mA	50 mA	
Input Current (full load)	-	-	1 A	
Remote Off Input Current	-	3 mA	10 mA	
Input Reflected Ripple Current (pk-pk)	-	45 mA	70 mA	With simulated source impedance of 10 uH, 5 Hz to 20 MHz; use a 0.47uF ceramic cap and a 100 uF/100 V electrolytic cap with ESR = 1 ohm max at 200 kHz
Input Reflected Ripple Current (rms)	-	10 mA	20 mA	
I^2t Inrush Current Transient	-	0.02 A^2s	0.04 A^2s	
Turn-on Voltage Threshold	32 V	34 V	36 V	
Under Voltage Threshold	30 V	31 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		3.236 V	3.302 V	3.368 V	V_{in}=48 V, Io=50%Load
Line Regulation		-0.2%Vo	-	0.2%Vo	
Load Regulation		-0.5%Vo	-	0.5%Vo	
Regulation Over Temperature (-40 °C to 85 °C)		-1%Vo	-	1%Vo	
Output Current		0 A	-	6 A	
Current Limit Threshold		6.6 A	-	9.6 A	
Ripple and Noise (rms)		-	5 mV	10 mV	0-20 MHz BW, with a 1µF ceramic capacitor and a 10 uF tantalum cap at output.
Ripple and Noise (pk-pk)		-	30 mV	60 mV	
Short Circuit Surge Transient		-	1.5 A^2s	3 A^2s	
Turn on Time		-	30 mS	60 mS	
Overshoot at Turn on		-	0%	3%	
Output Capacitance		0 uF	-	5000 uF	
Transient Response					
50% ~ 75% Max Load	Overshoot	Vo=3.3 V	-	60 mV	100 mV	di/dt=0.1A/us, Vin=48 V, Ta=25 ℃.
	Settling Time		-	80 uS	150 uS	
75% ~ 50% Max Load	Overshoot		-	60 mV	100 mV	
	Settling Time		-	80 uS	150 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	82%	85%	-	V_{in}=48 V, full load
Switching Frequency	300 kHz	330 kHz	360 kHz	
I/O Isolation Voltage	1500 V	-	-	
Isolation Capacitance	1500 pF	-	-	
Output Voltage Trim Range	90%	-	110%	
Over Temperature Protection	-	110 ℃	-	Vin=48 V, Io=100% load
Over Voltage Protection	3.9 V	-	5.0 V	Latch
MTBF	-	TBD	-	Calculated Per Bell Core SR-332 (Vin=48 V, Vo=3.3 V, Io=4.8 A, T_a = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	2.0 x 1.60 x 0.35 50.80 x 40.64 x 8.90			
Weight	-	20 g	-	

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

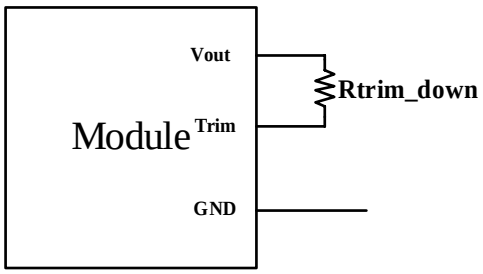
Control Specifications

Parameter		Min	Typ	Max	Notes
Remote On/Off					
Signal Low (Unit Off)	Active High	-0.7 V	-	0.8 V	The remote on/off pin open, Unit On.
Signal High (Unit On)		3.5 V	-	12 V	

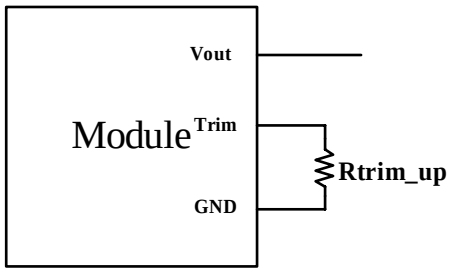
Output Trim Equations

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.

$$Rtrim\_down = \frac{(Vo,adj - 1.24)\times 2.07}{Vo - Vo,adj} \text{ Kohm}$$

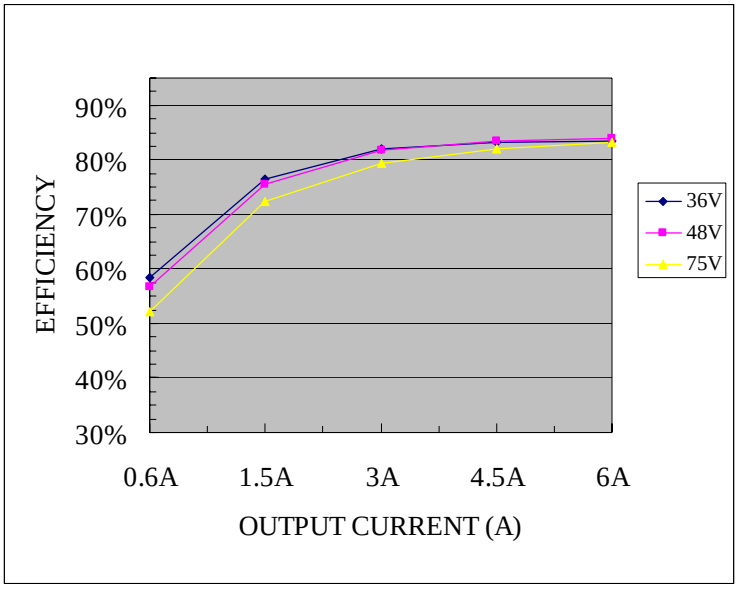


$$Rtrim\_up = \frac{2.567}{Vo,adj - Vo} \text{ Kohm}$$

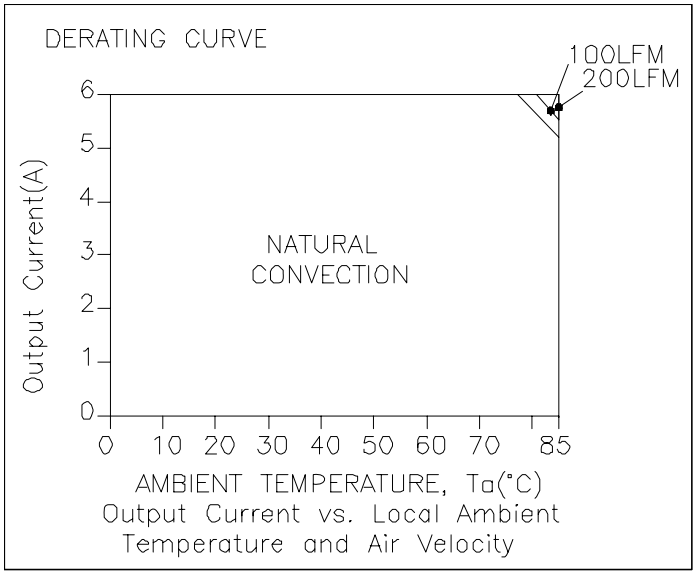


Output voltage Vo=3.302 V.

Efficiency Data

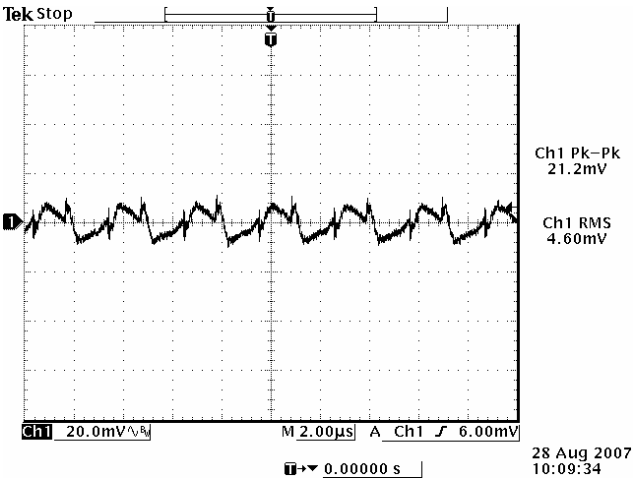


Thermal Derating Curve

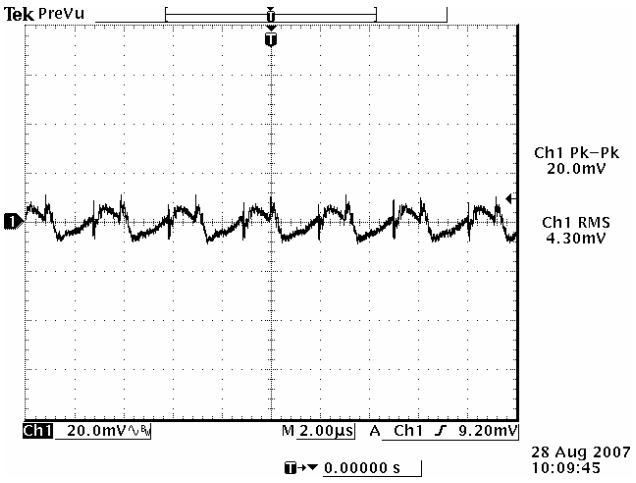


48 Vdc input, 3.3 Vdc output

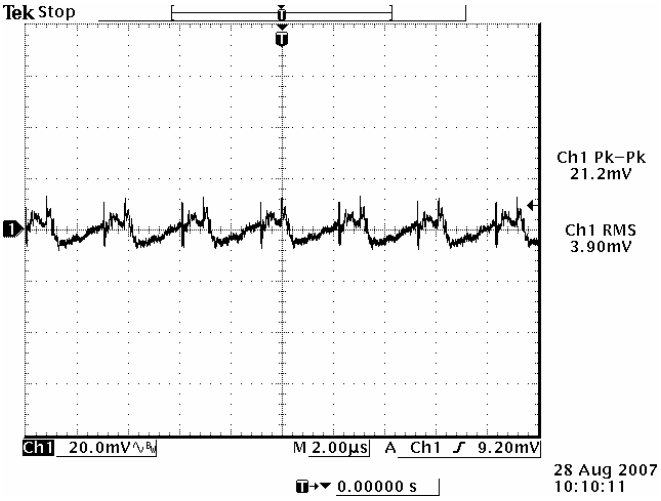
Ripple and Noise Waveforms



36 Vdc input, 3.3 Vdc/6 A output



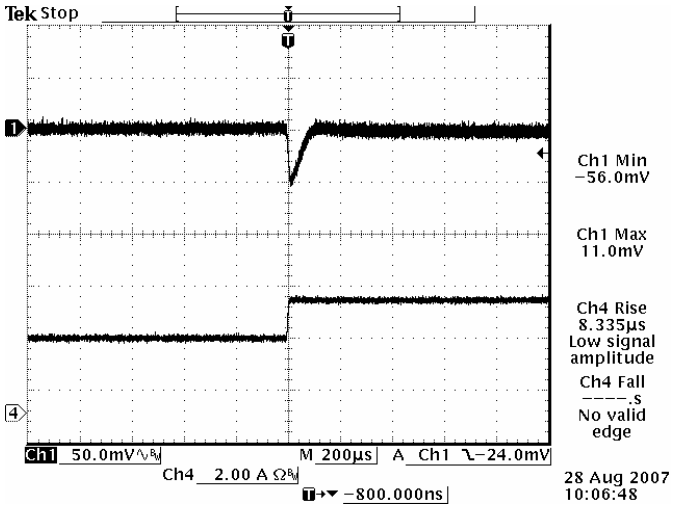
48 Vdc input, 3.3 Vdc/6 A output



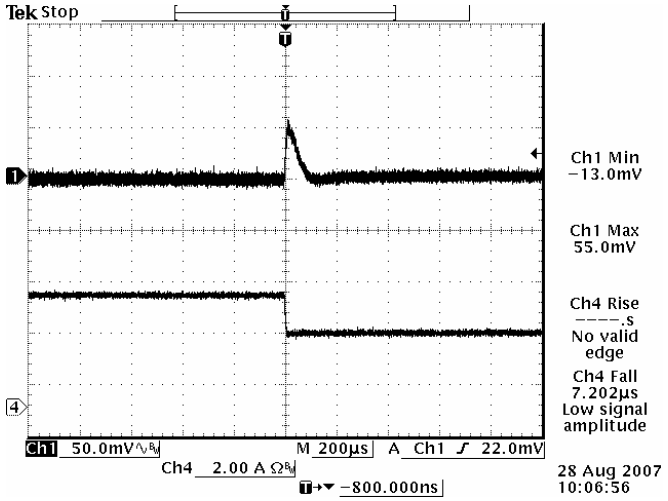
75 Vdc input, 3.3 Vdc/6 A output

Note: Ripple and noise at full load, 0-20MHz BW, with 10 uF tantalum cap and 1uF ceramic cap, Ta=25 deg C.

Transient Response Waveforms



Vout=3.3 V 50%-75% Load Transients at Vin=48 V



Vout=3.3 V 75%-50% Load Transients at Vin=48 V

Note: Transient response at di/dt=0.1A/uS, with 10uF tantalum cap and 1uF ceramic cap, Ta=25 deg C.

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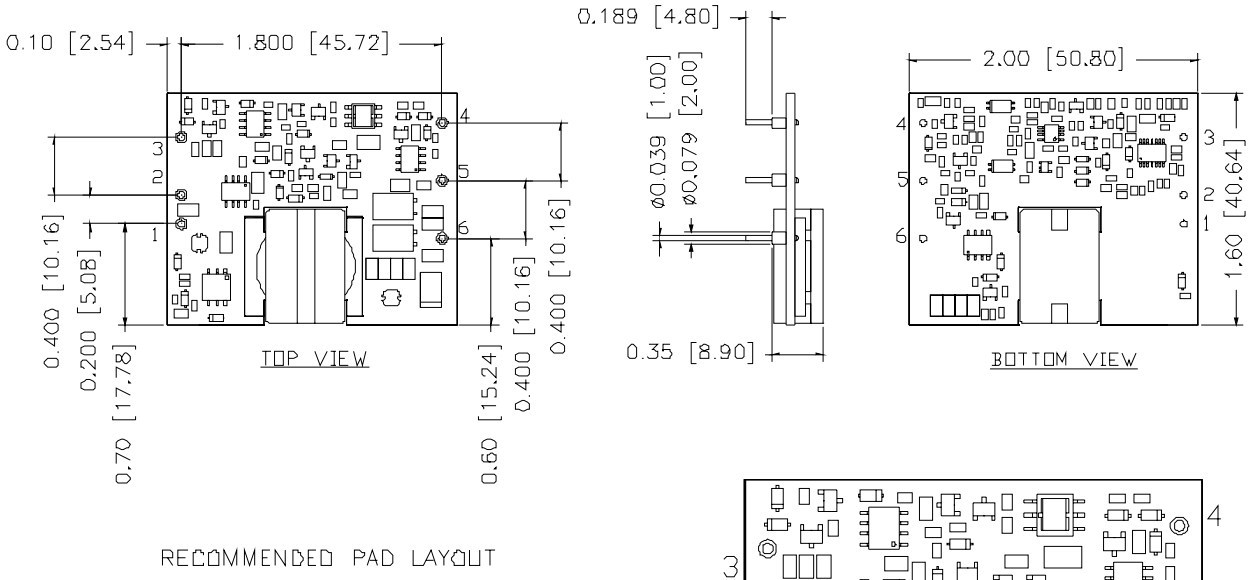
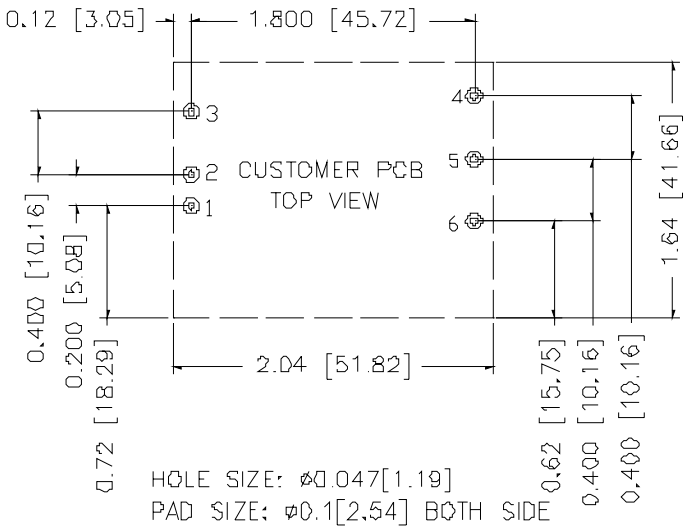
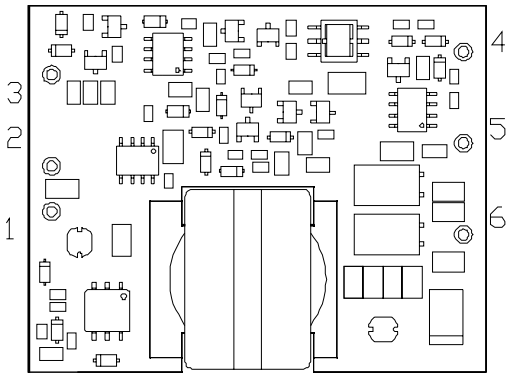
Mechanical Outline







Pin Connections

Pin	Function
1	Vin(+)
2	Vin(-)
3	CNT
4	Trim
5	Vo(-)
6	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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