

ISOLATED DC/DC CONVERTERS

48 VDC Input 11.8 VDC/25 A Output, 1/8 Brick

bel
POWER PRODUCTS

0RCR-30S12x RoHS Compliant Rev.E

- Isolated
- Fixed Frequency
- High Efficiency
- High Power Density
- Low Cost
- Input Under-Voltage Lockout
- Input Over-Voltage Shutdown
- OCP/SCP
- Over Temperature Protection
- Remote On/Off



Description

The 0RCR-30S12x are isolated DC/DC converters that operate from a nominal 48 VDC source. These converters use a full bridge power train to provide isolation and step down. These units will provide up to 300 W of output power from a nominal 48 VDC input. These units are designed to be highly efficient and low cost. Features include remote on/off, over current protection and under voltage lockout. These converters are provided in an industry standard eighth-brick package.

Part Selection

Output Voltage	Input Voltage	Max. Output Current	Max. Output Power	Typical Efficiency	Model Number Active Low	Model Number Active High
11.8 V	48 V	25 A	300 W	96%	0RCR-3012L	0RCR-30S120

- 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	Non-operating
	-0.3 V	-	57 V	Operating
Remote On/Off (Active Low)	2 V	-	20 V	Module Off
	0 V	-	0.4 V	Module On
Remote On/Off (Active High)	2 V	-	20 V	Module On
	0 V	-	0.4 V	Module Off
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-55 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	38 V	-	55 V	
Input Current (full load)	-	-	8.5 A	Vin=38 V
Input Current (no load)	-	90 mA	150 mA	
Remote Off Input Current	-	8 mA	15 mA	
Input Reflected Ripple Current (pk-pk)	-	25 mA	50 mA	Tested with simulated source impedance of 12 uH, 5 Hz to 20 MHz; use a 100 uF/100 V electrolytic capacitor and 1 uF/100 V ceramic capacitor at the input.
Input Reflected Ripple Current (rms)	-	5 mA	10 mA	
I ² t Inrush Current Transient	-	TBD	-	

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Input Specifications (continued)

Parameter	Min	Typ	Max	Notes
Input Over-Voltage Protection Threshold	58 V	60 V	62 V	Turn-Off Voltage Threshold
	57 V	59 V	61 V	Turn-On Voltage Threshold
Turn On Voltage Threshold	33 V	35 V	36.5 V	
Turn Off Voltage Threshold	32 V	33.5 V	35 V	

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

Output Specifications

Parameter	Min	Typ	Max	Notes	
Output Voltage Set Point				Io=no load	
Vin=38 V	-	9.4 V	-		
Vin=48 V	-	11.8 V	-		
Vin=55 V	-	13.5 V	-		
Load Regulation	-	400 mV	600 mV		
Output Current	0 A	-	25 A	Vin=48 V	
Operating Output Power Range	0 W	-	300 W		
Current Limit Threshold	110%Po	-	165%Po		
Short Circuit Surge Transient	-	TBD	-		
Ripple and Noise (rms)	-	15 mV	50 mV	Test conditions: 0-20 MHz BW, with a 1 uF ceramic cap and a 47 uF tantalum cap at the output.	
Ripple and Noise (pk-pk)	-	50 mV	120 mV		
Turn on Time	-	15 mS	20 mS		
Overshoot at Turn on	-	-	5%		
Output Capacitance	0 uF	-	3300 uF		
Transient Response					
50% ~ 75% Max Load	Overshoot	Vin=48 V	-	200 mV	Test conditions: di/dt = 0.1 A/uS, Vin=48 V, with a 1 uF ceramic cap and a 47 uF tantalum cap at the output.
	Settling Time		-	100 uS	
75% ~ 50% Max Load	Overshoot		-	200 mV	
	Settling Time		-	100 uS	

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

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General Specifications

Parameter	Min	Typ	Max	Notes
Efficiency	95%	96%	-	Vin=48 V, full load, 25°C
Switching Frequency	-	250 kHz	-	
Isolation Capacitance	-	3900 pF	-	
Isolation Voltage	-	1500 V	-	
Over Temperature Protection	-	125 °C	-	
MTBF	TBD			Calculated Per Bell Core SR-332 (Vin=48 V; Io=80% full load; Ta = 25 °C)
Dimensions				
Inches (L × W × H)	2.30 x 0.896 x 0.50			
Millimeters (L × W × H)	58.41 x 22.76 x 12.7			
Weight	-	42 g	-	

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

Control Specifications

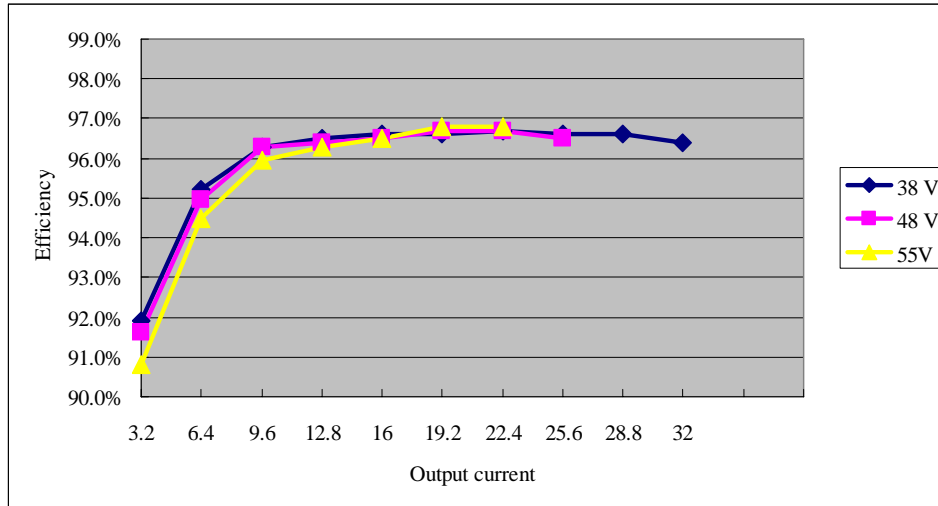
Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal High (Unit Off)	Active Low	2 V	-	The remote on/off pin is open: If active low, the Unit Off; If active high, the Unit On.
Signal Low (Unit On)		0 V	-	
Signal High (Unit On)	Active High	2 V	-	
Signal Low (Unit Off)		0 V	-	

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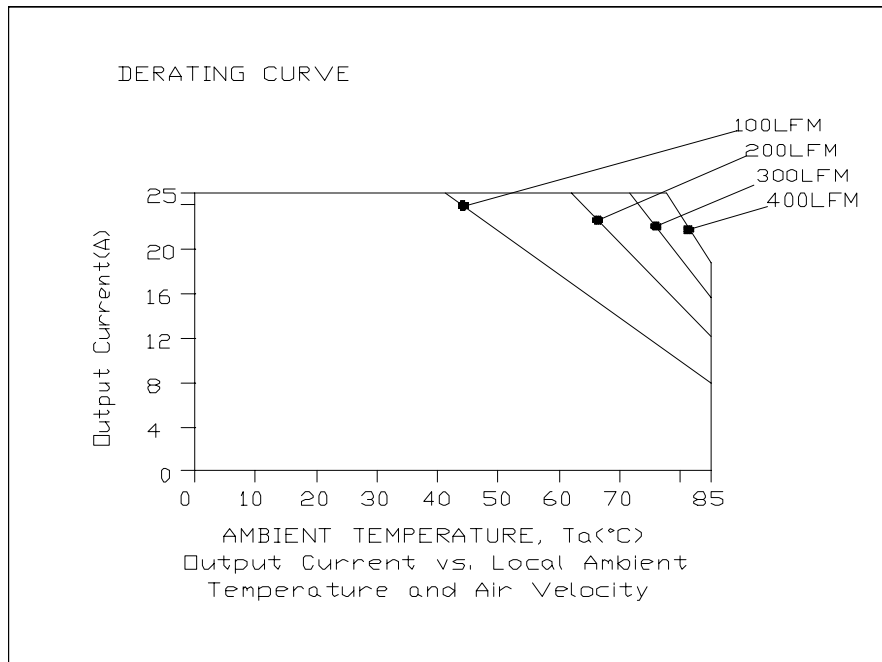
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Efficiency Data



Thermal Derating Curve



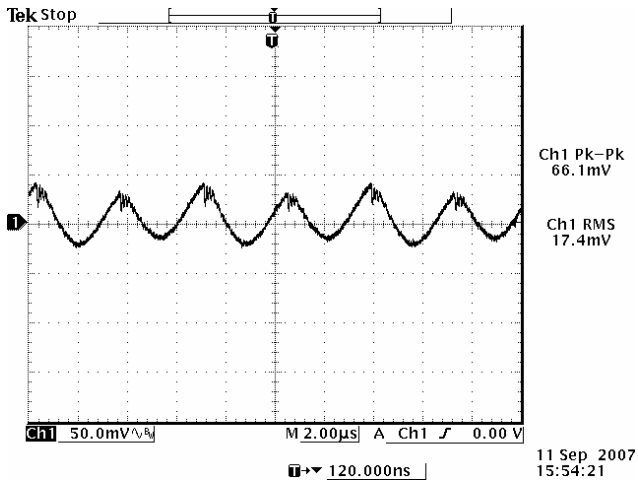
This derating curve is tested when Vin=48 Vdc

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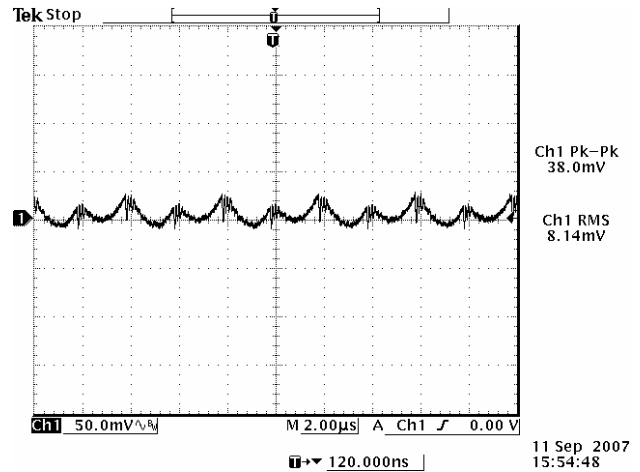
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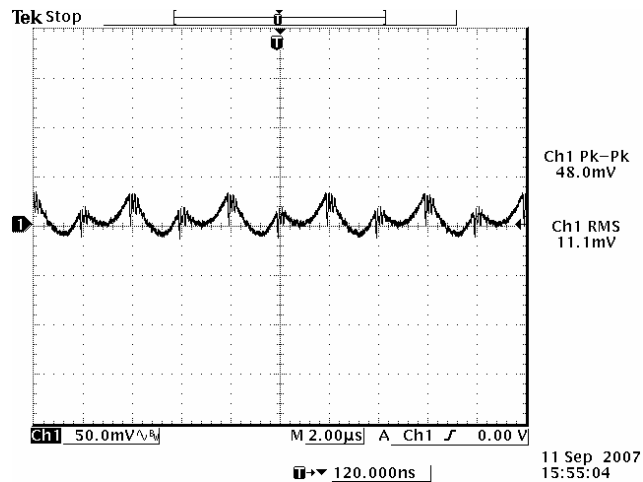
Ripple and Noise Waveforms



38 Vdc input



48Vdc input



55 Vdc input

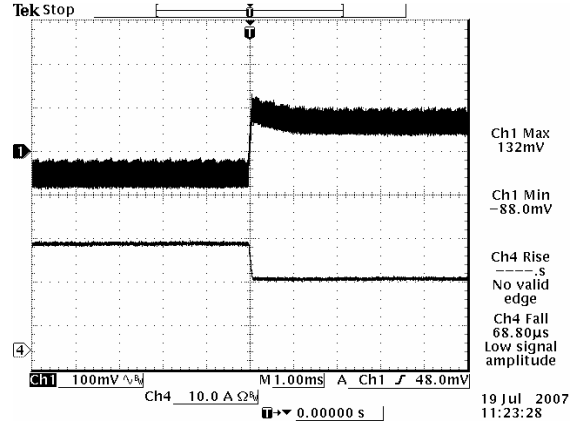
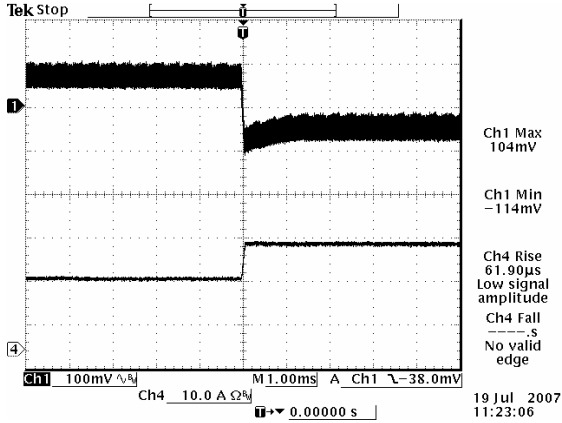
Note: Ripple and noise at full load, with 1 μ F ceramic cap and 47 μ F Tan cap at the output, and $T_a=25$ deg C.

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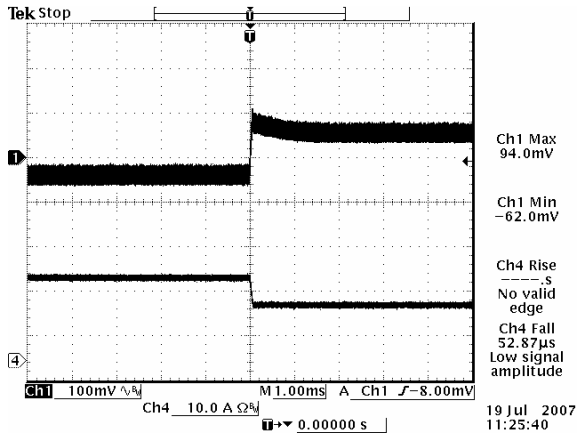
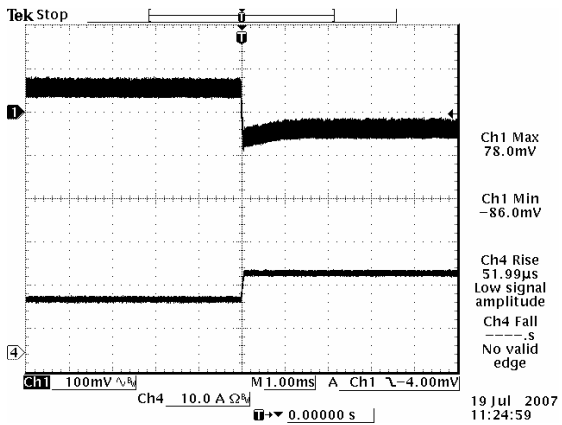


Transient Response Waveforms



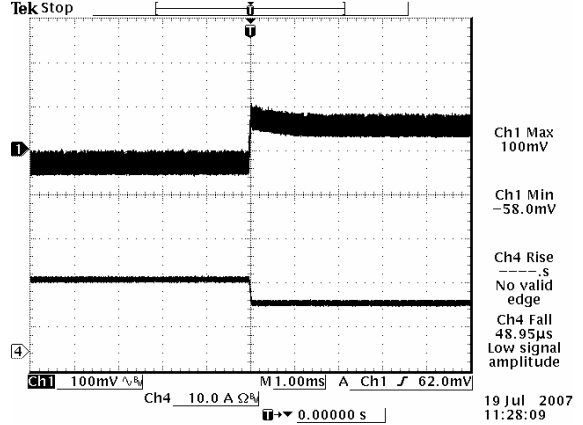
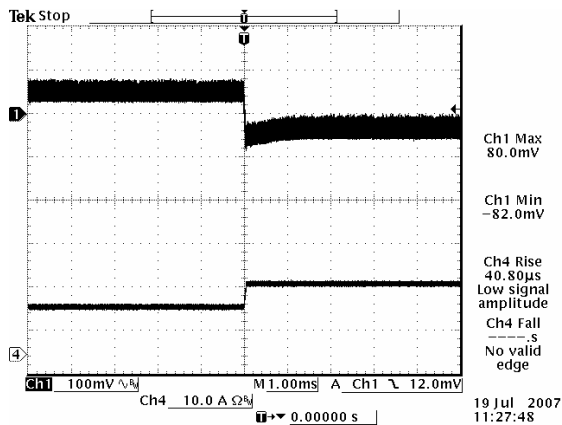
50% to 75% load Transient at 38 Vdc input

75% to 50% load Transient at 38 Vdc input



50% to 75% load Transient at 48 Vdc input

75% to 50% load Transient at 48 Vdc input



50% to 75% load Transient at 55 Vdc input

75% to 50% load Transient at 55 Vdc input

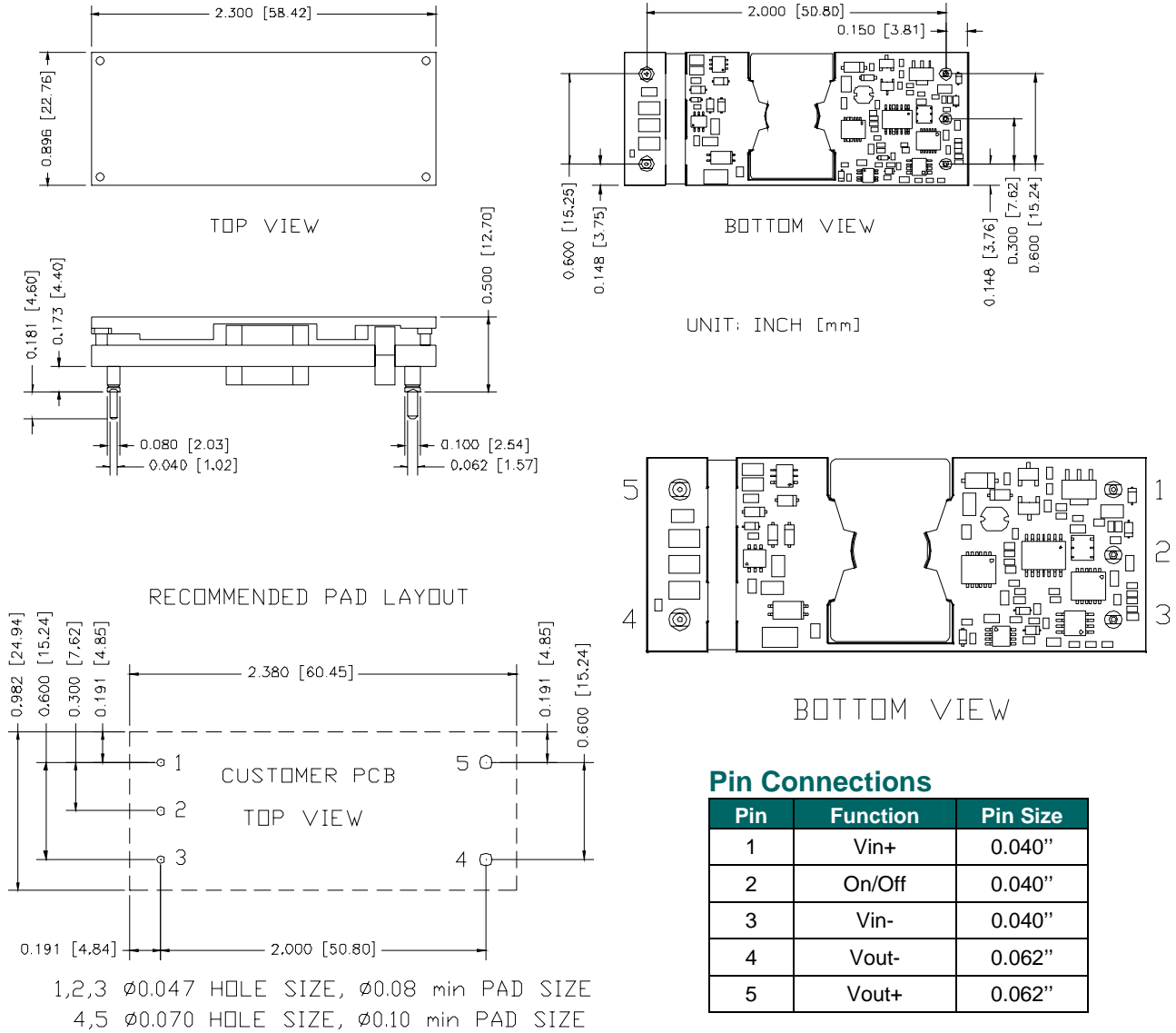
Note: Transient response at $di/dt=0.1 \text{ A}/\mu\text{S}$, with 1 μF ceramic cap and 47 μF Tan cap at the output, and $T_a=25 \text{ deg C}$.

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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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