ISOLATED DC/DC CONVERTERS

36 Vdc - 75 Vdc Input +12 Vdc/5 A, -12 Vdc/1.5 A Dual Outputs

bel POWER PRODUCTS

0RXU-75TD10 RoHS Compliant

- Isolated
- Fixed Frequency (300 kHz)
- High Efficiency
- High Power Density
- Input Under- Voltage Lockout (UVLO)
- UL60950 Recognized (UL/cUL) and CE Mark
- Low Cost
- SCP/OCP
- Remote On/Off
- Output Voltage Trim
- Output Over-Voltage Protection (OVP)
- Over Temperature Protection

Description

The 0RXU-75TD10 is an isolated dc/dc converter that operates from a nominal 48 Vdc source. It provides up to 78 W of output power with two output voltages. Features include remote on/off, output adjust, short circuit protection, over current protection, over-temperature shutdown, 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
+12 Vdc/-12 Vdc	36 Vdc - 75 Vdc	5 A/1.5 A	78 W	90%	0RXU-75TD10

Note: Add “G” suffix at the end of the model number listed above to indicate Tray Packaging.

Absolute Maximum Ratings

Parameter	Min	Typ	Max	Notes
Input Voltage	-0.3 V	-	100 V	100 V for 10 mS Max.
Remote On/Off	-0.3 V	-	30 V	
Ambient Temperature	-40 °C	-	85 °C	
Storage Temperature	-40 °C	-	125 °C	

Input Specifications

Parameter	Min	Typ	Max	Notes
Input Voltage	36 V	-	75 V	
Input Current (no load)	-	-	200 mA	
Input Current (full load)	-	-	3 A	
Remote Off Input Current	-	10 mA	20 mA	
Input Reflected Ripple Current (rms)	-	10 mA	30 mA	With simulated source impedance of 10 uH, 5 Hz to 20 MHz; use a 100 uF/100 V electrolytic capacitor with ESR=1 ohm max at 200k Hz
Input Reflected Ripple Current (pk-pk)	-	50 mA	100 mA	
Turn On Voltage Threshold	32 V	34 V	35 V	
Turn Off Voltage Threshold	30 V	31 V	33 V	

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

Output Specifications

Parameter	Min	Typ	Max	Notes
Output Voltage Set Point				
V_{O1}=+12 V	+11.76 V	+12 V	+12.24 V	Vin=48 V, Io=50% load
V_{O2}=-12 V	-11.86 V	-12.1 V	-12.34 V	
Load Regulation				
V_{O1}=+12 V	-	-	2% V_O	ΔIo1=50% Imax1; Io2=50% Imax2
V_{O2}=-12 V	-	-	4% V_O	ΔIo2=50% Imax2; Io1=50% Imax1
Line Regulation				
V_{O1}=+12 V	-	-	1% V_O	Io1=50% Imax1; Io2=50% Imax2
V_{O2}=-12 V	-	-	1% V_O	
Regulation Over Temperature	-	-	0.02% /°C	(-40 °C to +85 °C)
Output Current				
V_{O1}=+12 V	0.06 A	-	5 A	
V_{O2}=-12 V	0.06 A	-	1.5 A	
Output Current Limit				
V_{O1}=+12 V	6 A	-	7.5 A	Hiccup Mode
V_{O2}=-12 V	1.8 A	-	2.25 A	
Short Circuit Protection	-	-	-	Hiccup Mode
Startup Time				
Power Up	-	10 mS	20 mS	
Remote On/Off	-	7 mS	20 mS	
Overshoot at Turn On	-	-	5%	
Ripple and Noise (rms)				Test conditions: 0-20 MHz Bandwidth, with a 1 uF ceramic capacitor at the output.
V_{O1}=+12 V	-	25 mV	50 mV	
V_{O2}=-12 V	-	10 mV	50 mV	
Ripple and Noise (pk-pk)				
V_{O1}=+12 V	-	75 mV	150 mV	
V_{O2}=-12 V	-	40 mV	150 mV	
Output Capacitance	0 uF	-	1,000 uF	For both V_{O1} and V_{O2}

Transient Response						
50% ~ 75% Max Load	Overshoot	V_{O1}=+12 V	-	300 mV	600 mV	Test conditions: di/dt=0.5 A/us, Vin=48 V
	Settling Time		-	150 uS	300 uS	
75% ~ 50% Max Load	Overshoot		-	300 mV	600 mV	
	Settling Time		-	150 uS	300 uS	
50% ~ 75% Max Load	Overshoot	V_{O2}=-12 V	-	300 mV	600 mV	
	Settling Time		-	150 uS	300 uS	
75% ~ 50% Max Load	Overshoot		-	300 mV	600 mV	
	Settling Time		-	150 uS	300 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	84%	90%	-	Vin = 48 V; Full Load
Switching Frequency	270k Hz	300k Hz	330k Hz	
I/O Isolation Voltage	-	1500 V	-	
Isolation Capacitance	-	1500 pF	-	
Output Trim Range	90%	-	110%	
Output Over Voltage Protection V_{O1}=+12 V V_{O2}=-12 V	 +13.5 V -13.5 V	 +15 V -15 V	 +17 V -17 V	 Hiccup Mode Hiccup Mode
Over-temperature	-	130 °C	-	
MTBF	2,366,749 hours			Calculated Per Bell Core SR-332 (I_O = 80% Imax; T_A = 25 °C)
Dimensions Inches (L × W × H) Millimeters (L × W × H)	 2.28 x 2.4 x 0.48 57.9 x 61.0 x 12.09			
Weight	-	45 g	-	

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

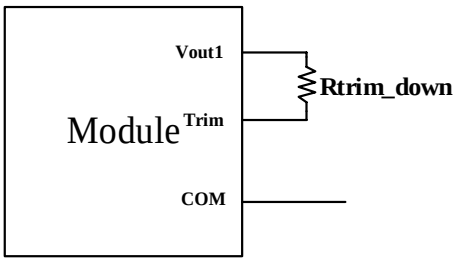
Control Specifications

Parameter	Min	Typ	Max	Notes
Remote On/Off				
Signal Low (Unit On)	-0.3 V	-	1.8 V	Active Low; Remote On/Off pin open, Unit off.
Signal High (Unit Off)	3.5 V	-	12 V	

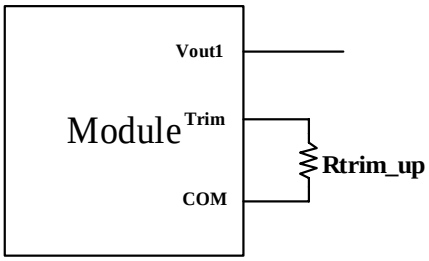
Output Trim Equations

Equations for calculating the trim resistor (in kΩ) given the desired adjusted voltage (Vadj) and the nominal output voltage of the converter (Vnom) are shown below. The Trim Down resistor should be connected between the Trim pin and V_{o1}. The Trim Up resistor should be connected between the Trim pin and COM. Only one of the resistors should be used for any given application.

$$R_{trim\_down} = \frac{99.86}{V_{nom} - V_{adj}} - 20.5$$

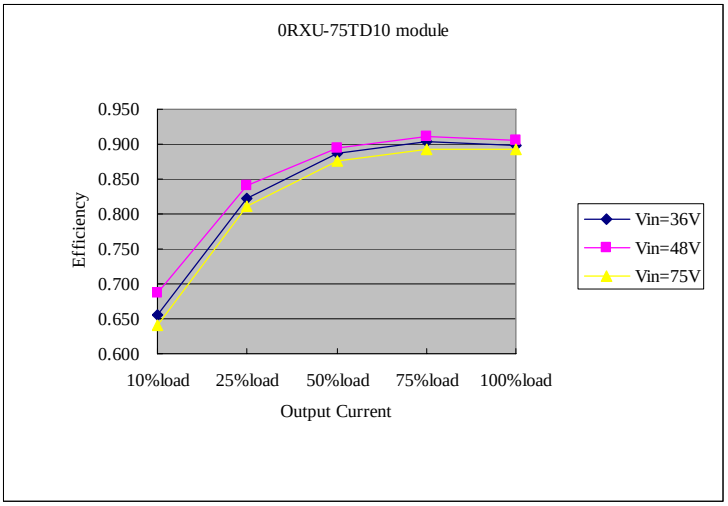


$$R_{trim\_up} = \frac{26.25}{V_{adj} - V_{nom}} - 10$$

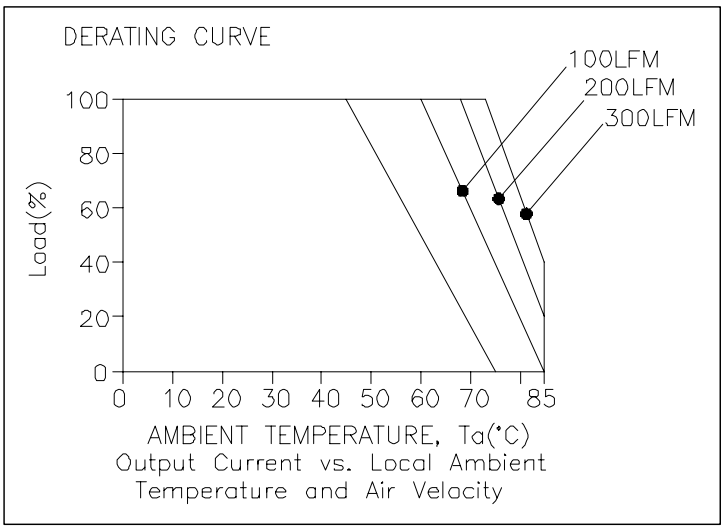


Note: Output voltage Vo=12.012 V

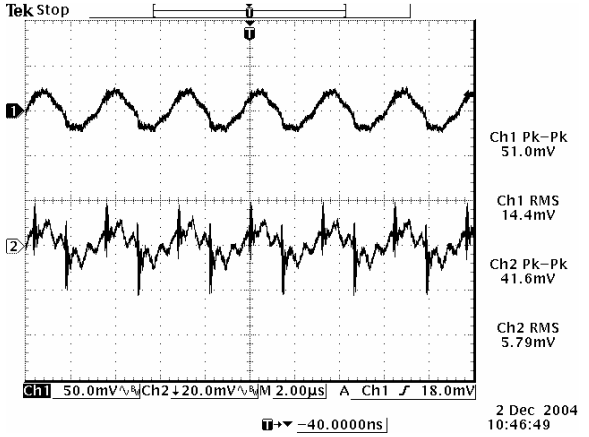
Efficiency Data



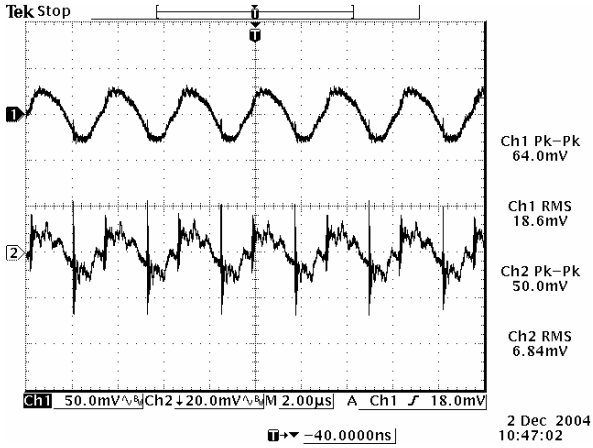
Thermal Derating Curve (Vin=48 V)



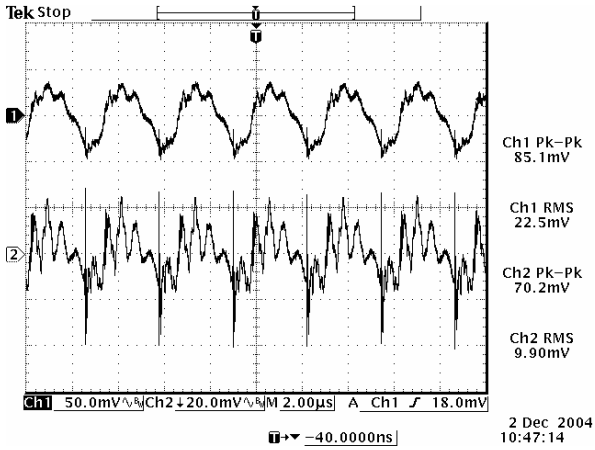
Ripple and Noise Waveforms



Ripple and noise at full load, 36 V input, ch1 (+)12 V/5 A output, (-)12 V/1.5 A



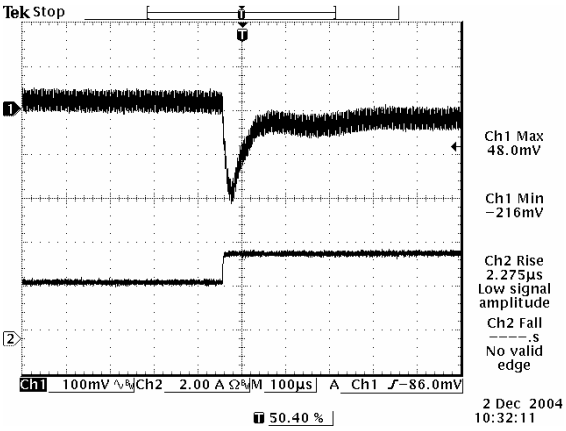
Ripple and noise at full load, 48 V input, ch1 (+)12 V/5 A output, (-)12 V/1.5 A



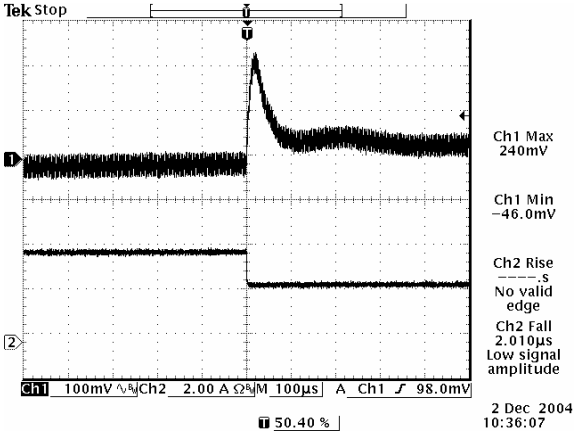
Ripple and noise at full load, 75 V input, ch1 (+)12 V/5 A output, (-)12 V/1.5 A

Note: With a 1uF ceramic capacitor at the output, Ta=25 deg C.

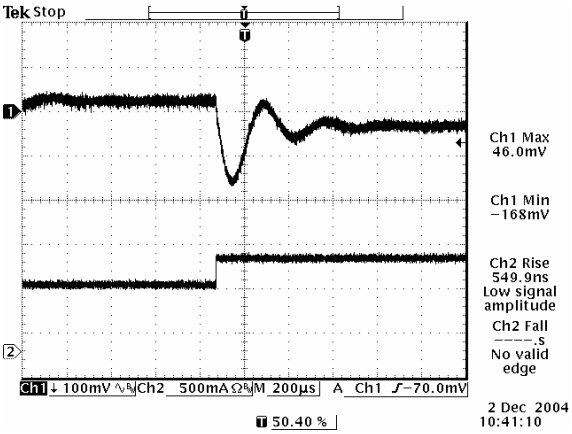
Transient Response Waveforms



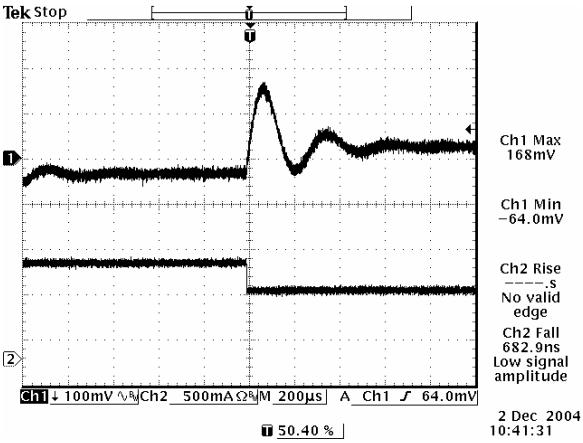
Vout=(+)12 V 50%-75% Load Transients at Vin=36 V



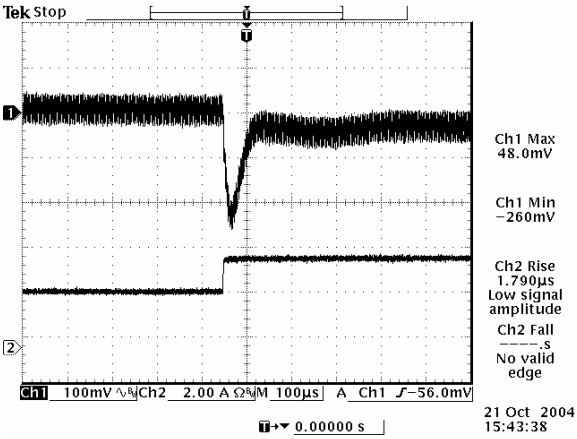
Vout=(+12) V 75%-50% Load Transients at Vin=36 V



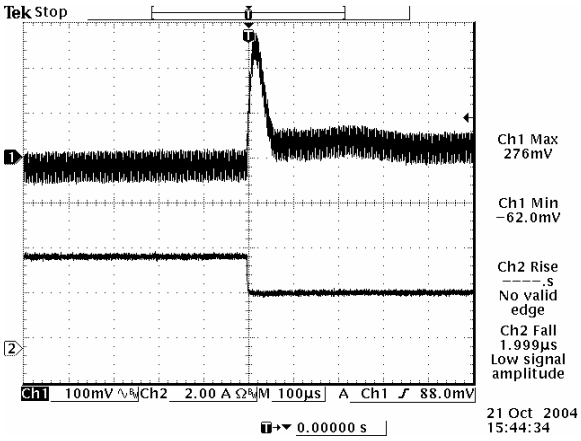
Vout=(-)12 V 50% - 75% Load Transients at Vin=36 V



Vout=(-)12 V 75% -50% Load Transients at Vin=36 V

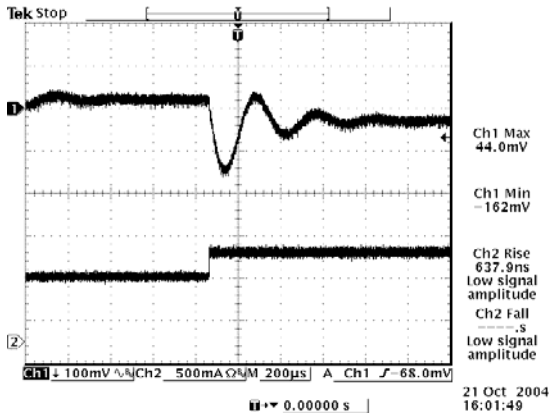


Vout=(+)12 V 50%-75% Load Transients at Vin=48 V

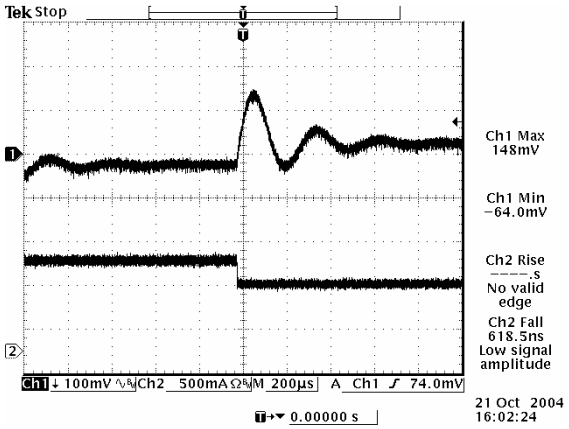


Vout=(+12) V 75%-50% Load Transients at Vin=48 V

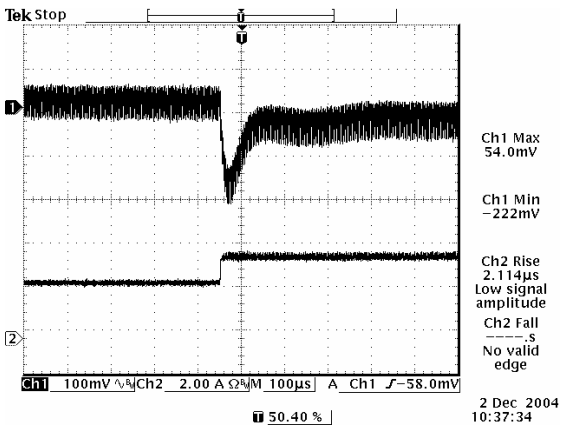
Transient Response Waveforms (continued)



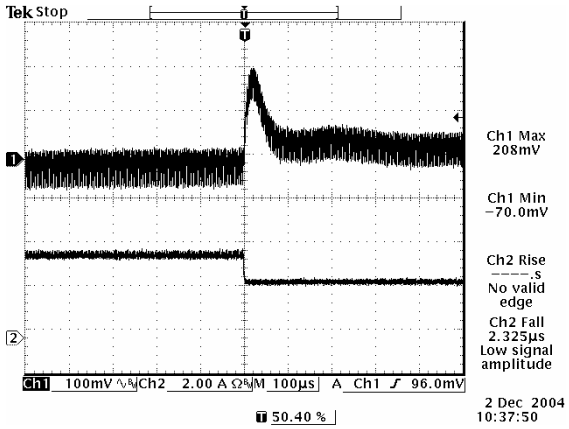
Vout=(-)12 V 50% - 75% Load Transients at Vin=48 V



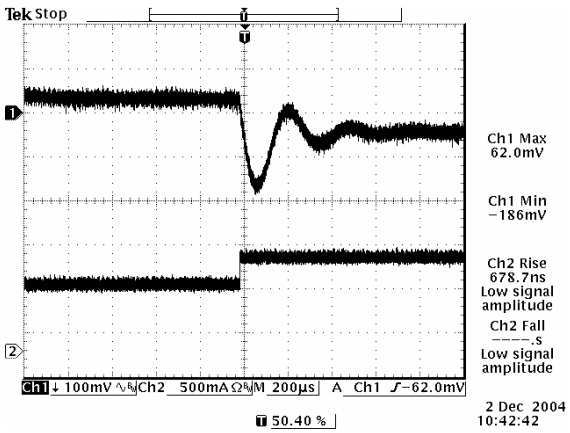
Vout=(-)12 V 75% -50% Load Transients at Vin=48 V



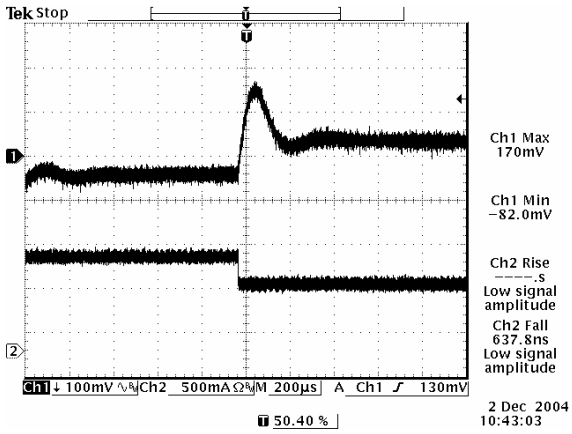
Vout=(+)12 V 50%-75% Load Transients at Vin=75 V



Vout=(+12) V 75%-50% Load Transients at Vin=75 V



Vout=(-)12 V 50% - 75% Load Transients at Vin=75 V

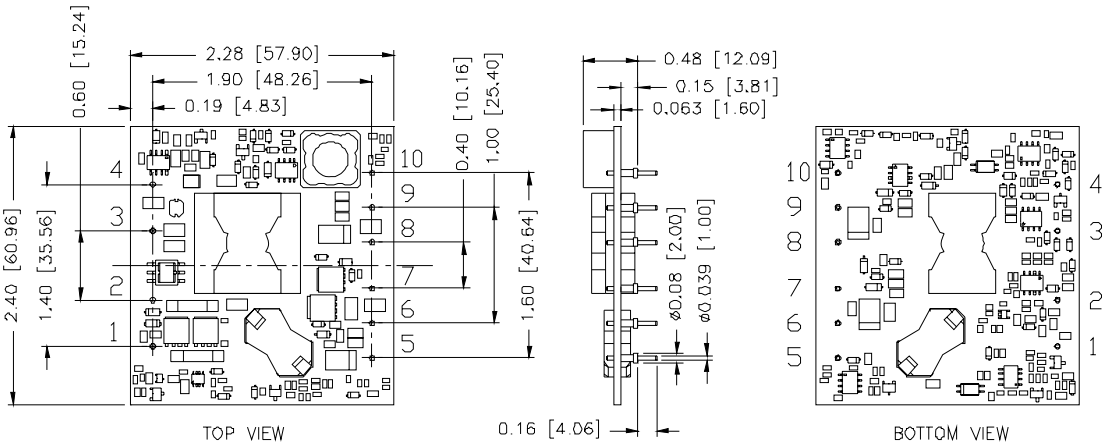


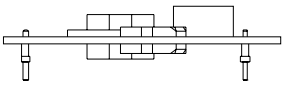
Vout=(-)12 V 75% -50% Load Transients at Vin=75 V

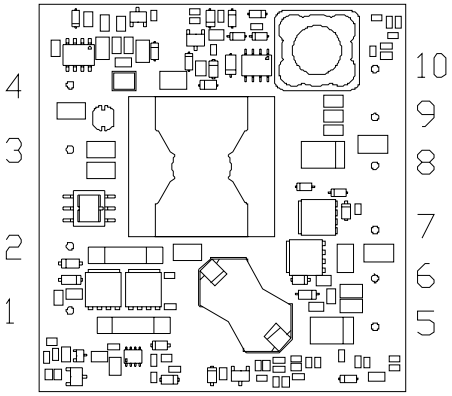
ISOLATED DC/DC CONVERTERS

36 Vdc - 75 Vdc Input +12 Vdc/5 A, -12 Vdc/1.5 A Dual Outputs

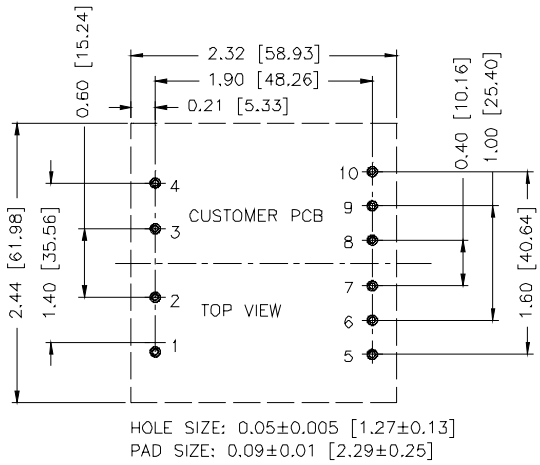
Mechanical Outline







RECOMMENDED PAD LAYOUT



Pin Connections

Pin	Function	Pin	Function
1	-Vin	6	COM
2	FG	7	Trim
3	REM	8	COM
4	+Vin	9	-Vo1 (-12 V)
5	+Vo1 (+12 V)	10	No Connection

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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