

PRELIMINARY

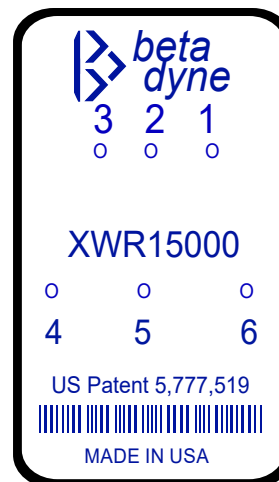


XWR15000 DC/DC CONVERTER

10.5W High Efficiency, $\pm 15V_{out}$ (30V_{out}), 9-22V_{in} Input Range
US Patent 5,777,519

Key Features

- Wide input voltage range (9-22V)
- Less than 20mV output noise
- Efficiency up to 88%
- Six-sided shielding
- Soft start
- Dual output
- Short circuit protection
- 1mA off state current
- Industry pinouts



Beta Dyne is protected under various patents, including but not limited to U.S. Patent numbers: 5,777,519; 6,188,276; 6,262,901; 6,452,818; 6,473,3171.

Applications

High-Resolution Data Converters

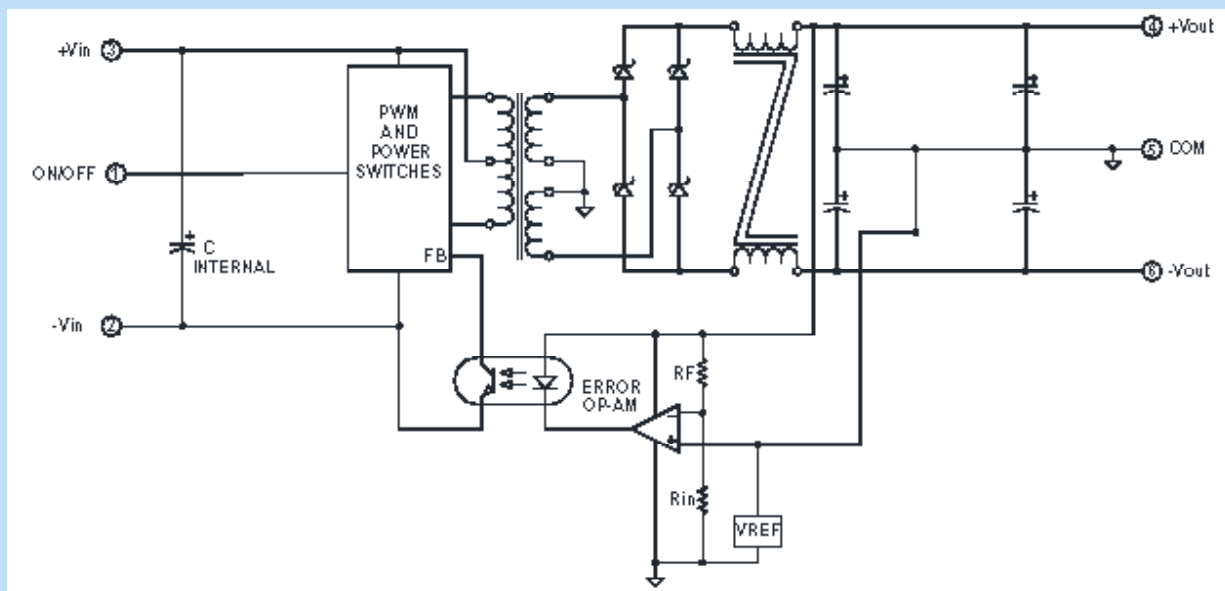
Instrumentation

Test & Measurement

Telecom

Functional Description

The XWR15000 series is a high-performance, low-noise, low-cost isolated DC/DC converters consisting of $\pm 15V_{out}$ to provide 30V_{out}. The input range of converter is 9-22V_{in}. The converter incorporates low switching noise techniques at its input and output sections to achieve low output ripple.



Typical Block Diagram of XWR15000 Converter

Electrical Specifications

INPUT SPECIFICATIONS

Unless otherwise specified, all parameters are given under typical +25°C with nominal input voltage and under full output load conditions.

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Input Voltage Range		9	15	22	Vdc
Input Current			797		mA
Input Filter	LC				
Reverse Polarity Input Current	External series-blocking diode			12	A
Input Surge Current (20µS Spike)				10	A
Short Circuit Current Limit	by Hiccup Technique		150		% I _{IN}
Undervoltage Shutdown		7			Vdc
Start Up Voltage		8.7			Vdc
Off State Current			750		µA
Remote ON/OFF Control					
Converter ON	Open (Open circuit voltage at Pin 1: 10V Max.)				
Converter OFF		-0.6	0	0.2	Vdc
Logic Input Reference	-Input				
Logic Compatibility	TTL Open Collector or CMOS Open Drain				
Reflected Input Ripple(Typical)	15V _{IN} =600mA				mA _{pk-pk}

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			30		Vdc
Output Current			350		mA
Output Voltage Accuracy			±1	±1.5	%
Ripple & Noise	See Figure 2,3 & 4 (20MHz bandwidth)		20		mV _{pp}
Line Regulation	Minimum V _{IN} to maximum V _{IN}		±1		%
Load Regulation	NL to FL		±1		%
Temperature Coefficient @ FL			0.02		%/°C of V _{OUT}
Transient Response Time (to within 0.5% of V _{OUT})	50% FL to FL to 50% FL, See Figure 1				
Short Circuit Protection	All outputs, by Hiccup Technique				

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			86		%
Isolation Voltage (1 min.)			1500		Vdc
Isolation Resistance			10 ⁹		Ω
Isolation Capacitance			80		pF
Switching Frequency			160		kHz

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature, Industrial (Ambient)*		-40		+75	°C
Operating Temperature, Extended (X) ³	See Ordering Guide (Please contact factory)	-55		+85	°C
Storage Temperature Range		-55		+125	°C
Maximum Operating Case Temperature				105	°C
Thermal Resistance			9.3		°C/W
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
EMI/RFI	Six-sided continuous shielded metal case				
MTBF	per MIL-HNBK-217F (Ground benign, +25°C)		1×10 ⁶		hours

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×1.00×0.445 in. (50.80×25.40×11.43mm)				
Weight	1.04 oz. (30g)				
Case Material	Coated metal				
Shielding Connection, 12	-Input (Pin 3)				

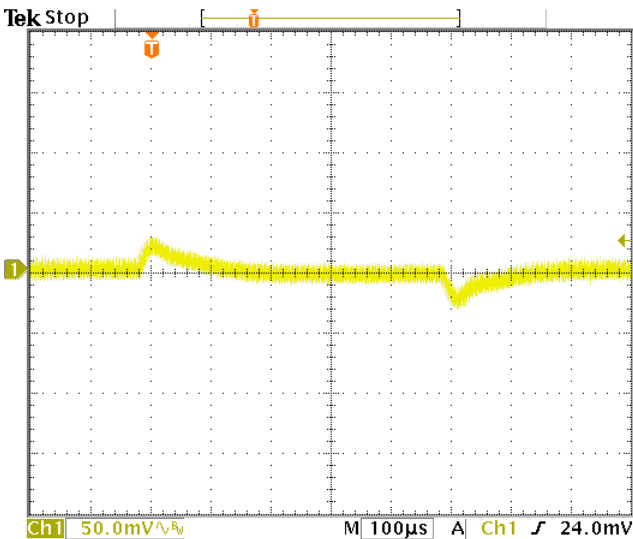


FIGURE 1. Transient response of XWR15000 from Full load to Half Load, at V_{in} =12V.

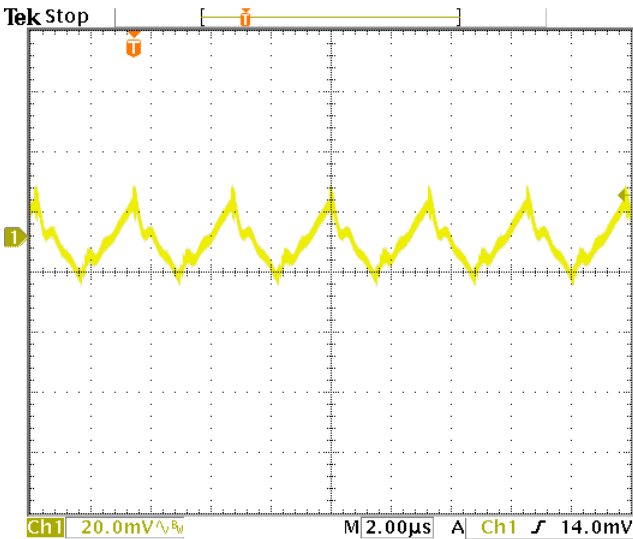


FIGURE 2. Output ripple of XWR15000 at V_{in} =15V, I_o =0.35A with a .1uF@50V across the output as shown in figure 4.

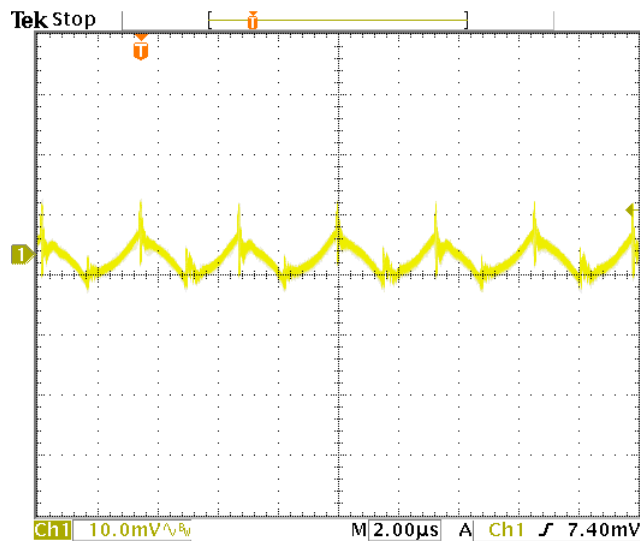


FIGURE 3. Output ripple of XWR15000 as shown in figure 4 with an additional 47uF@20V(C4,C6) low esr capacitors.

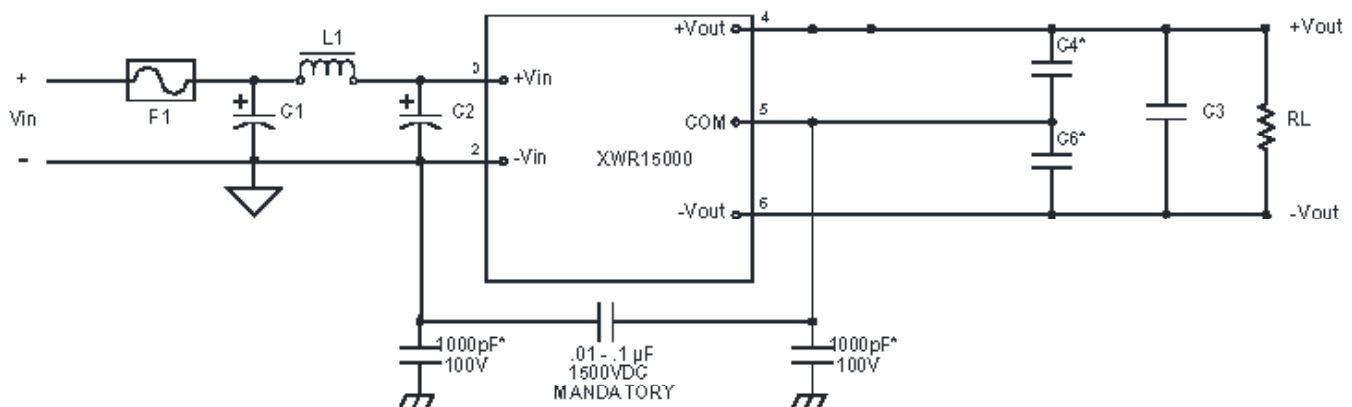


FIGURE 4. Typical connection diagram of XWR15000 DC/DC Converter

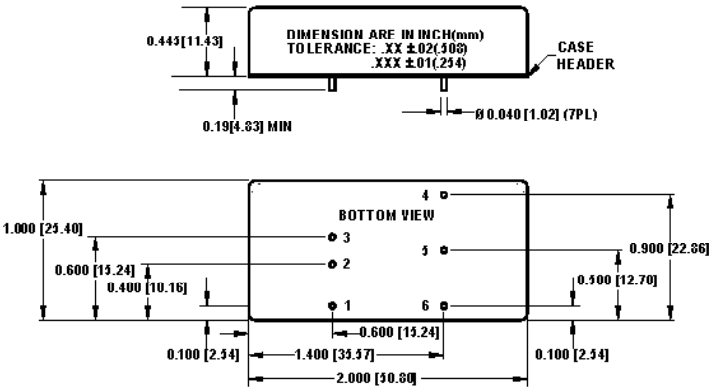
Typical Values

V_{IN}	F1 (A)	C1(Low ESR) (μ F)	L1 (μ H)	C2 (μ F)	C3 (μ F)	C4,C6*(Low ESR) (μ F)
24	1	22@50V	1	22@50V	.1@50V	47@20V

* Output filter components shown may be needed if output ripple/noise less than 3mV is required.

* Optional Parts

MECHANICAL SPECIFICATIONS



Pin	Function
1	ON/OFF
2	-V _{IN}
3	+V _{IN}
4	+V _{OUT}
5	GND (COM)
6	-V _{OUT}

