



EA60016

100W SINGLE DC/DC CONVERTER

16–36V_{IN}, 26V_{OUT}@3.84A
US Patents 6,262,901 B1 & 6,473,317 B1

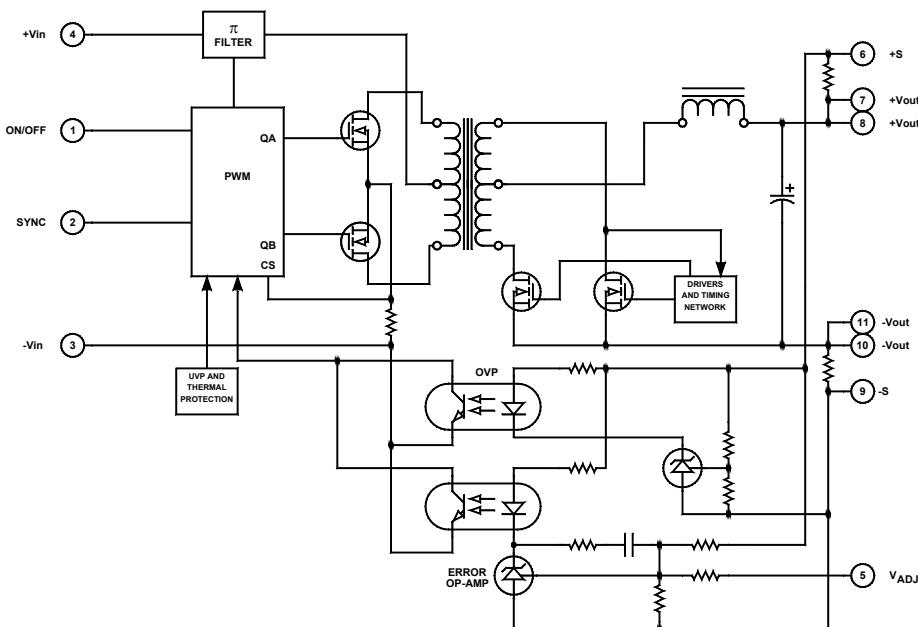
Key Features

- 89% efficiency
- Output overvoltage protection (OVP)
- Wide input voltage range > (2:1)
- Six-sided shielding
- Soft start
- 1500Vdc input-to-output isolation
- Short circuit and thermal protection
- Adjustable output
- 300µA off state current
- Output synchronous rectification
- Input undervoltage protection



Functional Description

The EA60016 is an isolated 100W single output DC/DC converter that accepts 16V_{IN} to 36V_{IN} and provides 26V_{OUT}@3.84A. The converter is designed to synchronize with a 50% duty cycle, 200kHz, AC-coupled, TTL sync input. Push-pull topology and output synchronous rectification allow for continuous operation even at low input voltages with maximum efficiency. Six-sided shielding with external synchronization minimizes EMI and RFI. Protection features allow the converters to operate in harsh environments.



Typical Block Diagram

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		16	24	36	Vdc
Input Filter	LC				
Reverse Polarity Input Current				12	A
Input Surge Current (20µS Spike)				10	A
No Load Input Current			40		mA
Full Load Input Current			4685		mA
Short Circuit Current Limit			180		% I _{IN}
Undervoltage Shutdown		12			Vdc
Off State Current			300		µA
Remote ON/OFF Control, Sync Reference	To -V				
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				
Sync Input	TTL	2.5		5	Vdc
Sync Input Minimum Pulse Width		200			nS

OUTPUT SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Output Voltage			26		Vdc
Output Current			3.84		A
Output Voltage Accuracy			±1	±1.5	%
Output Voltage Adjustment			3	±5	%
Minimum Load		10			% of FL
Ripple & Noise			1	2	% _{PP}
Line Regulation	Minimum V _{IN} to maximum V _{IN}		±1	±2	%
Load Regulation	10% of FL to FL		±1	±2	%
Temperature Coefficient @ FL			0.02		%/ ^o C
Transient Response Time (to within 1% of V _{OUT})	50% FL to FL to 50% FL, See Figure 3		50		µS
Short Circuit Protection	By input current limiting				

GENERAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Efficiency			89		%
Isolation Voltage (1 min.)			1500		Vdc
Isolation Resistance			10 ⁹		Ω
Isolation Capacitance			80		pF
Switching Frequency			80		kHz
External Sync Frequency (F e)	F _e > F _c	180	200	220	kHZ

ENVIRONMENTAL SPECIFICATIONS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Operating Temperature, Industrial (Ambient)	See Figure 2	-40		+71	°C
Storage Temperature Range		-55		+125	°C
Thermal Resistance			3		°C/W _{DISS}
Maximum Operating Case Temperature			85		°C
Thermal Turn Off, Case Temperature		80	90	100	°C
Thermal Hysteresis			10		°C
Derating	See Figure 2				
Humidity	Up to 95% non-condensing				
Cooling	Free-air convection				
EMI/RFI	Six-sided continuous shielded metal case				

PHYSICAL CHARACTERISTICS

PARAMETER	CONDITION / NOTE	MIN	TYP	MAX	UNIT
Dimensions (L×W×H)	2.00×2.00×0.50 in. (50.80×50.80×12.70mm)				
Weight	2.78 oz. (79g)				
Case Material	Coated metal				
Shielding Connection	-V _{IN} (Pin 3)				

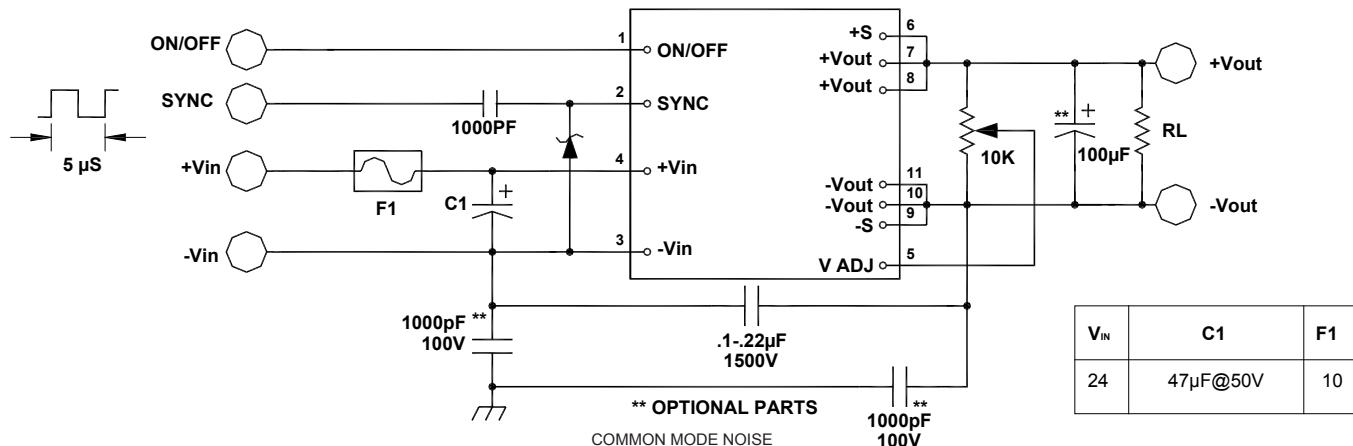


FIGURE 1. Typical connection diagram

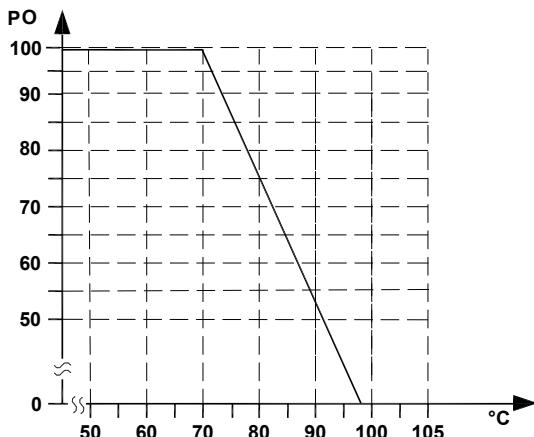
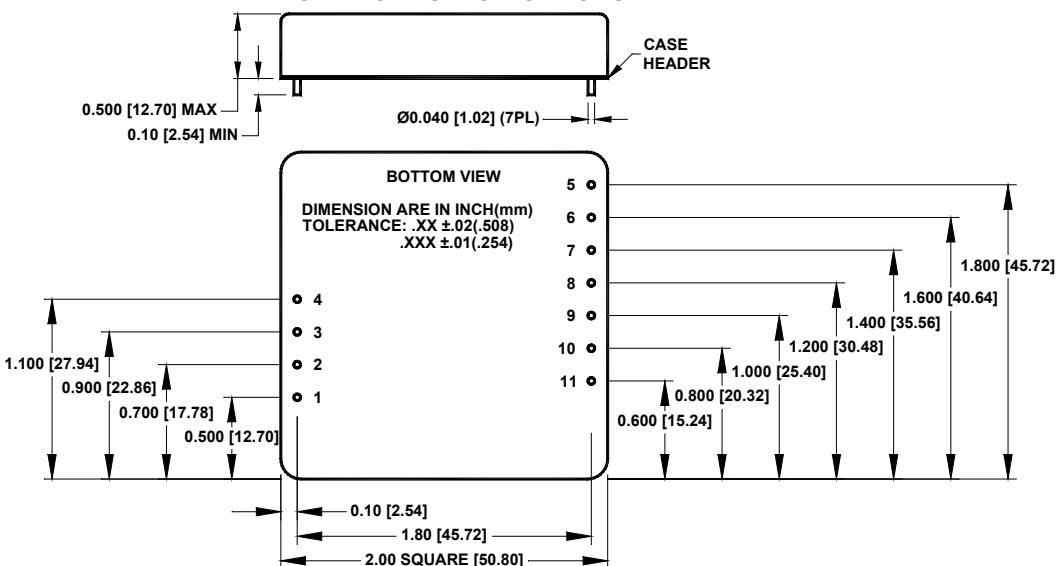


FIGURE 2. Typical derating curve

MECHANICAL SPECIFICATIONS



EXTERNAL SYNCHRONIZATION

The converter can be synchronized to an external clock by driving the SYNC pin (pin 2) directly. The driving signal frequency must be >200kHz. When the external clock with 50% duty cycle is AC-coupled to the SYNC pin of the converter through a 1000pF ceramic capacitor, connect a signal Schotky diode with the cathode

connected to the SYNC pin and the anode to $-V_{IN}$ (See Figure 1). AC coupling reduces the power required for driving multiple converters and allows for continuous operation of the other synchronized converters in case the driving signal is missing or a short circuit develops at one of the sync inputs.

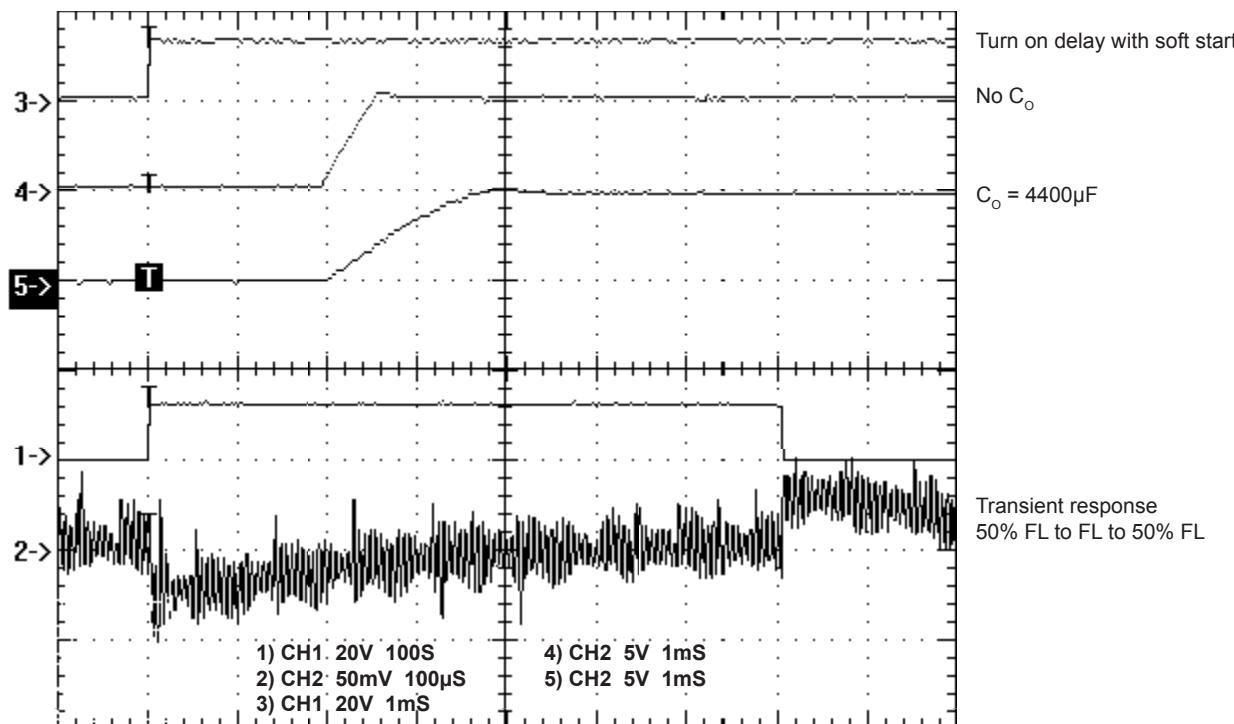


FIGURE 3. Turn on delay with soft start and transient response