

Regulated, Isolated Power Modules

220 Vdc to 400 Vdc Input
Up to 600 Watts

FEATURES

- Up To 600 Watts
- Input Range 220VDC-400VDC (Off-Line and PFC Compatible)
- High Efficiency-Up to 91%
- Low Cost
- Small Size 2.35" x 4.6" x 0.5"
- Output Voltages from 24V to 48V
- 100 °C Base-Plate Operation
- Low-Noise, Constant-Frequency
- Easily Paralleled with Accurate Load Sharing (N+M Fault Tolerance)
- Over-Temp Shutdown (with Auto-Recovery)
- Very High Power Density Up to 135W/cu. in.
- UL and C-UL Safety Approvals UL E186932 Pending
- Availability (Stock to 8 Weeks)

OPTIONS

- Special Output Voltages Available

APPLICATIONS

- Distributed power architecture
- Telecommunication
- Motor control
- Applications requiring high power in a compact space

DESCRIPTION

These DC to DC converters are part of Core Technology's family of high density power modules designed to reduce product development time while achieving maximum power performance. These modules are regulated, isolated, and have been targeted for distributed power and system level designs utilizing modular power converters. Utilizing Active Load Sharing, allows them to accurately share the total output current. In addition, they feature input enable, high efficiency, and 135 Watts per cubic inch power density. Core Technology's Regulated Power Modules can operate up to a base-plate temperature of 100 °C and deliver up to 600 Watts of output power in a 2.35" x 4.6" x 0.5" form factor.

* UL is a registered trademark of the Underwriters Laboratories, Inc.
CSA is a registered trademark of the Canadian Standards Association.

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ELECTRICAL SPECIFICATIONS - OUTPUT

Advance Information

Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Nominal Output Voltage	V _o	Volts	48	24	15	12	5
Output Voltage Range	V _o	Volts	+10 to -20%	+10 to -20%	+10 to -20%	+10 to -20%	+10 to -20%
Output Ripple and Noise *1	V _{p-p}	mV	600	500	150	120	50
Efficiency	%	-	91	89	86.5	85	83
Max Output Current	I _{MAX}	Amps	12.5	20.8	23.33	25	60
Max Output Power	P	Watts	600	500	350	300	300
Output Current Limit	%	-	105 - 135	105-135	105 - 135	105 - 135	105 - 135
Short Circuit Current (MAX)	Amps	-	16.9	28.1	31.5	33.75	
Over-temp Shutdown (NOM)	°C	-	105	105	105	105	105
Over-temp Tolerance	°C	-	±5°C	±5°C	±5°C	±5°C	±5°C
Over-temp Shutdown Hysteresis	°C	Celsius	10°C to 20°C	10°C to 20°C	10°C to 20°C	10°C to 20°C	10°C to 20°C
Power Sharing Accuracy *2	%	-	2.5	2.5	2.5	2.5	2.5
Output V Set Point Accuracy	± 1% Max						
Load Regulation	± 1% Max						
Line Regulation	± 1% Max						
Sense Line Vdrop Allowed	0.5V Max Total (0.25V/Leg)						
Output Over-voltage trip point	125% Nom.						

ELECTRICAL SPECIFICATIONS - INPUT

Advance Information

Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Input Voltage Range	V _I	Volts	220 - 400	220 - 400	220 - 400	220 - 400	220 - 400
Maximum Input Current	I	Amps	3.5A	3.0A	2.5A	2.2A	2.4A
Input Reflected Ripple Current*3	I _{RR}	Amps	0.250	0.250	0.250	0.250	
Inrush Charge	Q _{IN}	Coulombs	186.0 E-6	186.0 E-6	186.0 E-6	186.0 E-6	186.0 E-6
Start-up Voltage	V _I	Volts	180 - 210	180 - 210	180 - 210	180 - 210	180 - 210
Turn-off Voltage	V _I	Volts	160 - 180	160 - 180	160 - 180	160 - 180	160 - 180
Module Enable	SB	Volts	>2.0	>2.0	>2.0	>2.0	>2.0
Module Disable	SB	Volts	<1.5	<1.5	<1.5	<1.5	<1.5

*1 @ Full Load

*2 tested @ 50% Load

*3 @ 0.75% Load

ISOLATION SPECIFICATIONS

Advance Information

Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Input to Output Isolation	-	Volts(RMS)	3000	3000	3000	3000	3000
Input to Base Plate Isolation	-	Volts(RMS)	1500	1500	1500	1500	1500
Output to Chassis Isolation	-	Volts(RMS)	500	500	500	500	500
Input to Output Isolation Resis.	Ω	Meg. Ohm	>10	>10	>10	>10	>10

ABSOLUTE MAXIMUM RATINGS

Advance Information

Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Input Voltage	Vo	Volts	425	425	425	425	425
Input Surge Withstand (100 ms)	Vdc	Volts	500	500	500	500	500
Storage Temperature	TST	Celsius	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C	-40°C to 110°C

ENVIRONMENTAL SPECIFICATIONS

Advance Information

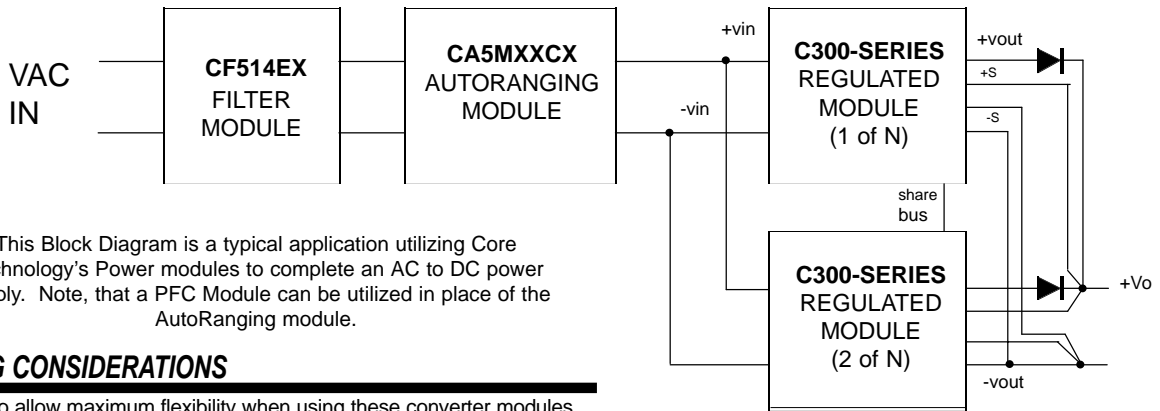
Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Max Operating Altitude	ft	-	10,000				
Max Storage Altitude	ft	-	40,000				
Operating Humidity	RH%	-	5% to 95% RH(non-condensing)				
Vibration	-	-	Three Axis Orthogonal, Random Vibration 10min (2.4Grms 5hz-500hz)				
Reliability (Mil-HDBK-217E) @40C	-	Hours	_____				
Temperature Coefficient	Tco	°C	0.02°C				
Cooling	-	-	Choose Heat Sink Based On Airflow				
Base Plate Thermal Resistance	R _{th}	-	0.08°C ± 0.02°C				
Flammability	-	-	Materials Meet UL94V-0				

MECHANICAL SPECIFICATIONS

Advance Information

Parameter	Symbol	Units	C300FXXXX48-X	C300FXXXX24-X	C300FXXXX15-X	C300FXXXX12-X	C300FXXXX5-X
Weight	-	gr/oz/lb	206gr / 7.3oz / 0.460lb				
Dimension (L x W x D)	-	Inches	4.6" x 2.35" x 0.5"				
Volume	Vol	Cubic Inch	5.4				

TYPICAL APPLICATION



This Block Diagram is a typical application utilizing Core Technology's Power modules to complete an AC to DC power supply. Note, that a PFC Module can be utilized in place of the AutoRanging module.

FIGURE 1

FUSING CONSIDERATIONS

In order to allow maximum flexibility when using these converter modules, an internal fuse is not provided. For module and system protection always provide input fusing based on the particular application requirements.

SAFETY CONSIDERATIONS

In order to insure agency approval in which this power module is utilized, the unit must be used in compliance with the creepage, (spacing and separation) requirements with UL-1950, CSA22.2 - 950 and EN60950.

MODULE ENABLE/DISABLE

This converter module is disabled unless the enable pin (SD) is pulled above 2.5 Vdc with respect to input common. If this pin is left floating, the module will be enabled.

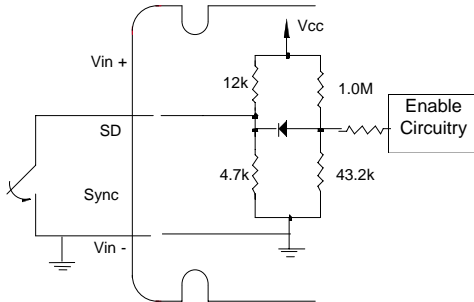


FIGURE 2

LOAD SHARING

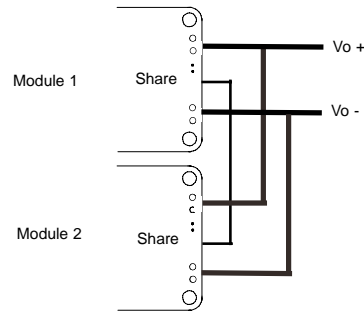


FIGURE 3

OVER-TEMPERATURE SHUTDOWN

Core regulated power modules are equipped with over-temperature protection circuitry so that the unit will not be damaged in an over-temperature condition. The converter will shut itself down above 100°C and will auto-restart once it is at a safe operating temperature.

OUTPUT POWER VS BASEPLATE TEMPERATURE

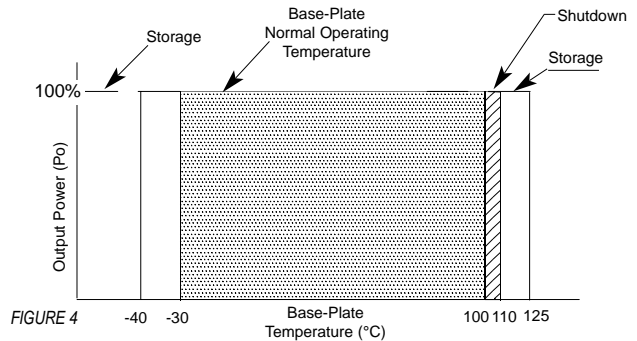


FIGURE 4

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CHARACTERISTIC CURVES

**EFFICIENCY vs INPUT VOLTAGE
REGULATED POWER MODULE**

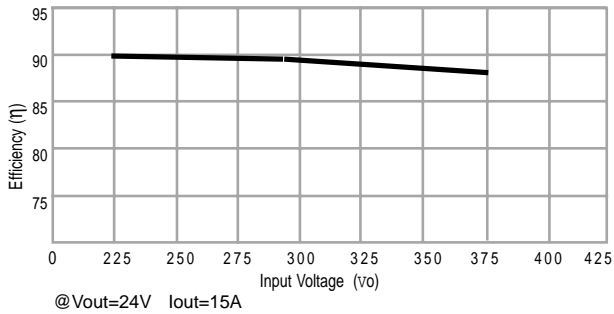


FIGURE 5

**EFFICIENCY vs OUTPUT CURRENT
REGULATED POWER MODULE**

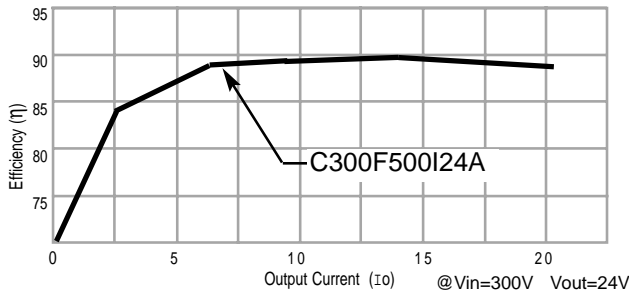


FIGURE 6

TEST CONFIGURATIONS

EFFICIENCY MEASUREMENT

NOTE: Measurement taken at terminals of module. All connection points must be tight to avoid erroneous readings.

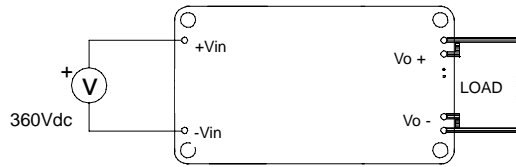


FIGURE 8

REFLECTED RIPPLE CURRENT MEASUREMENT

NOTE: Measurements of Reflected Ripple Currents are taken at input terminals with a simulated supply impedance of 10uH. A low ESR 220uF capacitor connected across the supply is used to suppress any supply impedance deficiencies. Measurements taken are within 12" of module terminals. (All connection points must be tight to avoid erroneous readings.)

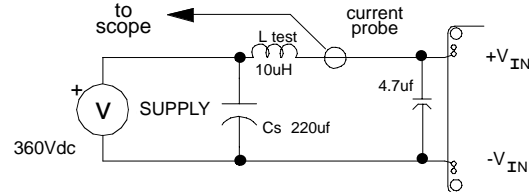


FIGURE 9

Output Enable timing Regulated Power Module

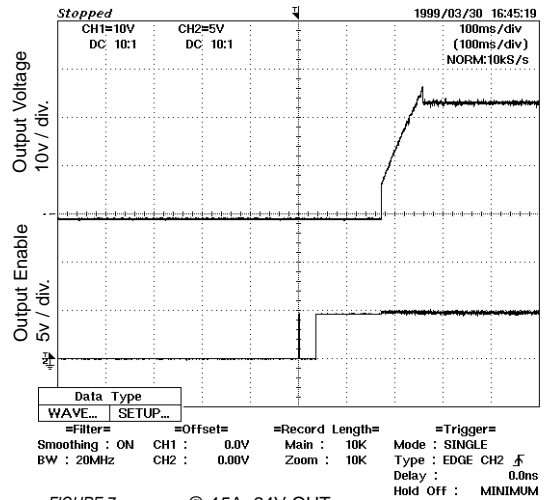
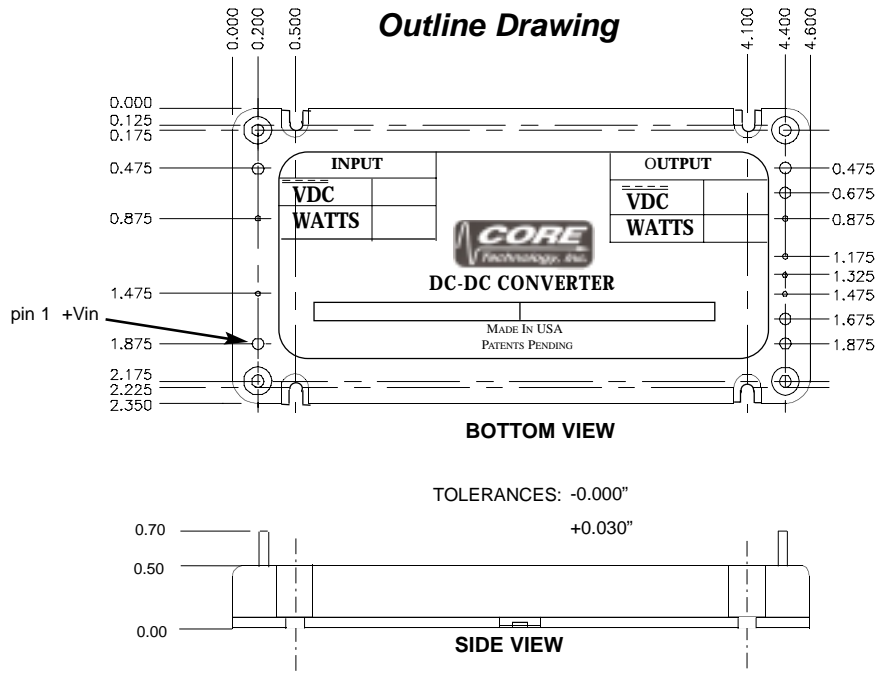


FIGURE 7 @ 15A, 24V OUT

Connector Pin Assignment

1	+Vin
2	SD
3	SYNC
4	-Vin
5,6	-Vout
7	-SENSE
8	TRIM
9	SHARE
10	+SENSE
11, 12	+Vout

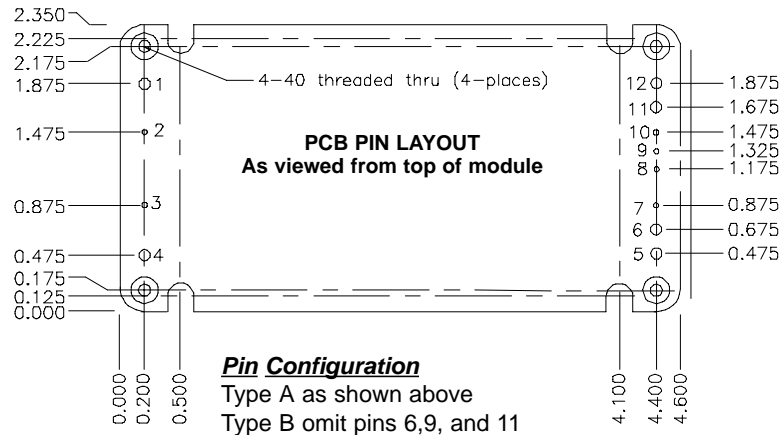


PIN CONFIGURATION OPTION-A

Pin #	Dia
1-4, 6-10	.040
5,6,11,12	.080

PIN CONFIGURATION OPTION-B

Pin #	Dia
1-4, 7-10	.080
5,12	.120



Ordering Information

Part Numbering Scheme for Regulated Power Module

C	INPUT VOLTAGE	SIZE	OUTPUT POWER	PRODUCT GRADE	OUTPUT VOLTAGE	PIN CONFIGURATION	HEAT SINK TYPE
C	300 = 220-400Vdc	F = FULL	SEE SPEC PAGE	C = -10°C to +85°C I = -25°C to +100°C M = -45°C to +100°C	5 12 15 24 48 Others available	SEE OUTLINE DRAWINGS OPT-A OPT-B	Blank = No Sink L02 = 0.25" Longitudinal L05 = 0.50" Longitudinal L10 = 1.0" Longitudinal T02 = 0.25" Transverse T05 = 0.50" Transverse T10 = 1.0" Transverse
C	300	F	600	I	48	A	L10

EXAMPLE - To order a Regulated Power module with an input voltage of 300VDC, full size, output power of 600 watts, -25 C to 100 C Temp Range, 48 VDC output voltage, type A pin configuration, with 1.0" longitudinal heatsink fins, would require the following part number C300F600I48AL10.

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