

## 300Watt Half Brick Power Modules

### FEATURES

- Up To 300 Watts
- Input Range 220VDC-400VDC (Off-Line and PFC Compatible)
- High Efficiency-Up to 91%
- Small Size 2.28" x 2.28" x 0.43"
- Output Voltages from 5V 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)
- UL & CSA Approval (pending)  
E186932

### APPLICATIONS

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

### DESCRIPTION

These modules have been developed with the low cost/high reliability concept Core has initiated in it's line of industry standard footprint series power modules.

All of these regulated, isolated, converters 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. All of Core Technology's Power Modules can operate up to a base-plate temperature of 100 °C. Our half brick converters deliver up to 300 Watts of output power in a 2.28" x 2.28" x 0.43" form factor.

### OPTIONS

- Special Output Voltages Available

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CSA is a registered trademark of the Canadian Standards Association.

**CORE** Technology, Inc.

ELECTRICAL SPECIFICATIONS - OUTPUT

Advance Information

Parameter	Symbol	Units	C300HXXXX48-X	C300HXXXX24-X	C300HXXXX15-X	C300HXXXX12-X	C300HXXXX5-X
Nominal Output Voltage	V <sub>o</sub>	Volts	48	24	15	12	5
Output Voltage Range	V <sub>o</sub>	Volts	+10 to -20%	+10 to -20%	+10 to -20%	+10 to -20%	+10 to -20%
Output Ripple and Noise *1	V <sub>p-p</sub>	mV					
Efficiency	%	-	91				
Max Output Current	I <sub>MAX</sub>	Amps	6.25	10.4	11.7	12.5	30
Max Output Power	P	Watts	300	250	175	150	150
Output Current Limit	%	-	105 - 135	105-135	105 - 135	105 - 135	105 - 135
Short Circuit Current (MAX)	Amps	-	8.5	14	16	17	40
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 Hysterisis	°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						
Ripple Rejection @ 120Hz	XX dB Min.						
Sense Line Vdrop Allowed	0.5V Max Total (0.25V/Leg)						

ELECTRICAL SPECIFICATIONS - INPUT

Advance Information

Parameter	Symbol	Units	C300HXXXX48-X	C300HXXXX24-X	C300HXXXX15-X	C300HXXXX12-X	C300HXXXX5-X
Input Voltage Range	V <sub>I</sub>	Volts	220 - 400	220 - 400	220 - 400	220 - 400	220 - 400
Maximum Input Current	I	Amps	1.75A	1.5	1.25	1.1	1.2
Input Reflected Ripple Current*3	I <sub>RR</sub>	Amps					
Inrush Charge	Q <sub>IN</sub>	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 <sub>I</sub>	Volts	180 - 210	180 - 210	180 - 210	180 - 210	180 - 210
Turn-off Voltage	V <sub>I</sub>	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	C300HXXX48-X	C300HXXX24-X	C300HXXX15-X	C300HXXX12-X	C300HXXX5-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	C300HXXX48-X	C300HXXX24-X	C300HXXX15-X	C300HXXX12-X	C300HXXX5-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**

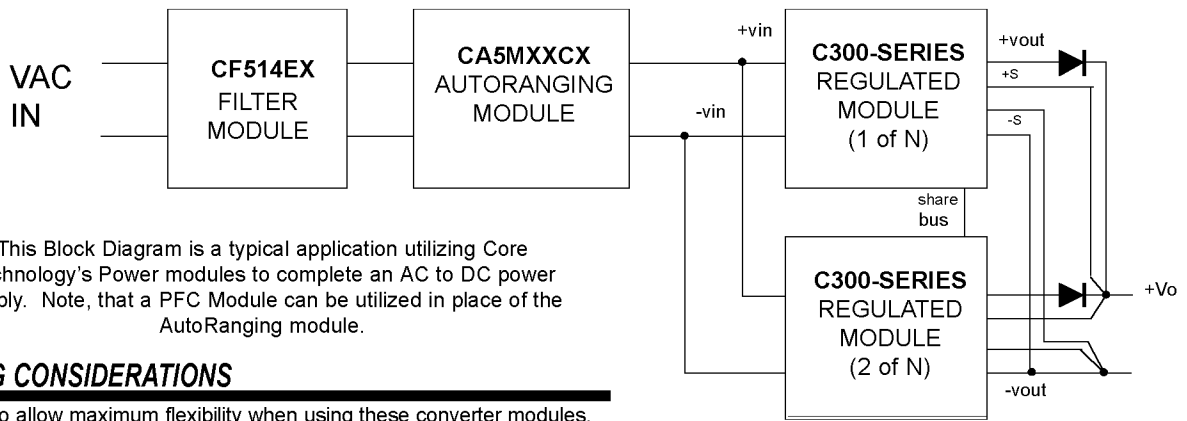
**Advance Information**

Parameter	Symbol	Units	C300HXXX48-X	C300HXXX24-X	C300HXXX15-X	C300HXXX12-X	C300HXXX5-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 <sub>th</sub>	-	0.08°C ± 0.02°C					
Flammability	-	-	Materials Meet UL94V-0					

**MECHANICAL SPECIFICATIONS**

**Advance Information**

Parameter	Symbol	Units	C300HXXX48-X	C300HXXX24-X	C300HXXX15-X	C300HXXX12-X	C300HXXX5-X	
Weight	-	gr/oz/lb	206gr / 7.3oz / 0.460lb					
Dimension (L x W x D)	-	Inches	2.28" x 2.28" x 0.43"					
Volume	Vol	Cubic Inch	2.7					



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.

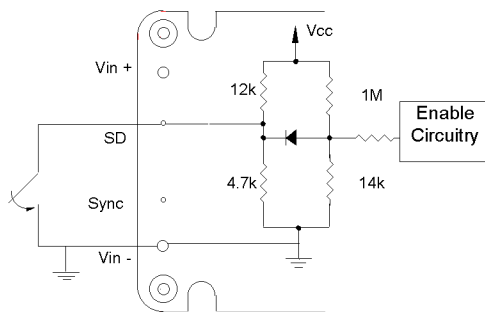


FIGURE 2

**LOAD SHARING**

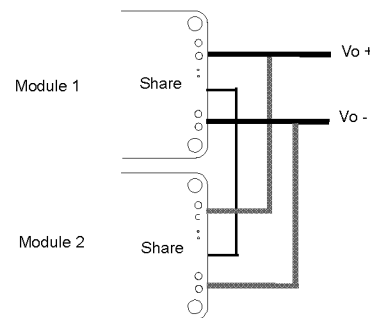


FIGURE 3

**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**

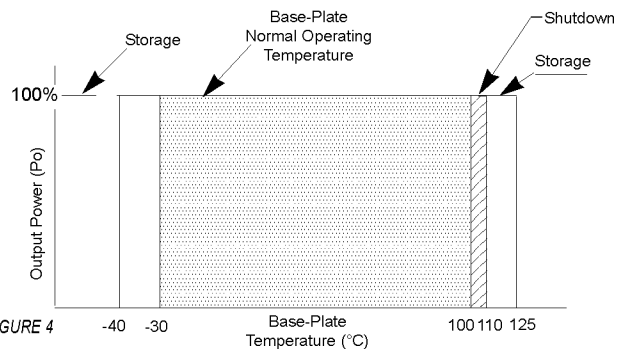


FIGURE 4

**CHARACTERISTIC CURVES**

**PRELIMINARY**

**EFFICIENCY vs INPUT VOLTAGE  
REGULATED POWER MODULE**

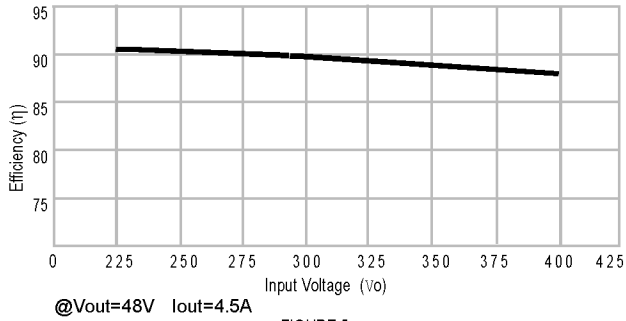


FIGURE 5

**EFFICIENCY vs OUTPUT CURRENT  
REGULATED POWER MODULE**

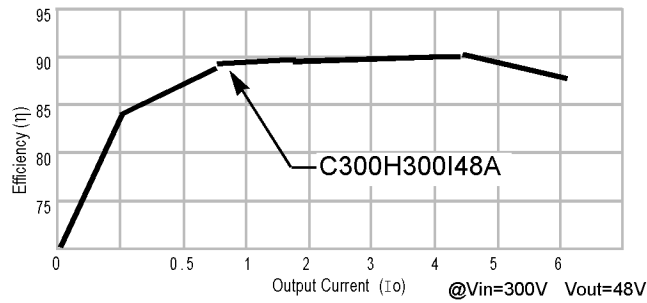


FIGURE 6

Output Enable timing Regulated Power Module

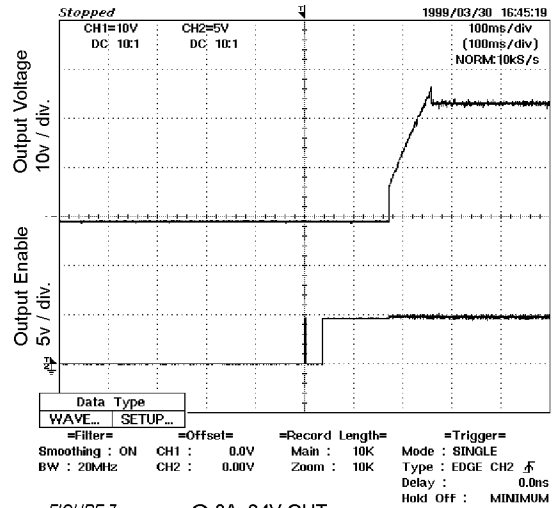


FIGURE 7

@ 8A, 24V OUT

**TEST CONFIGURATIONS**

**EFFICIENCY MEASUREMENT**

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

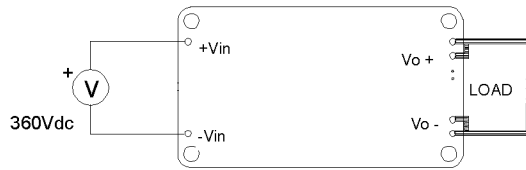


FIGURE 8

**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.)

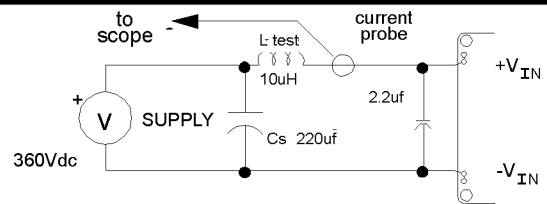


FIGURE 9

**PRELIMINARY**

**Outline Drawing**

PCB PIN LAYOUT  
AS Viewed from pin side of  
module

**Pin Assignment**

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

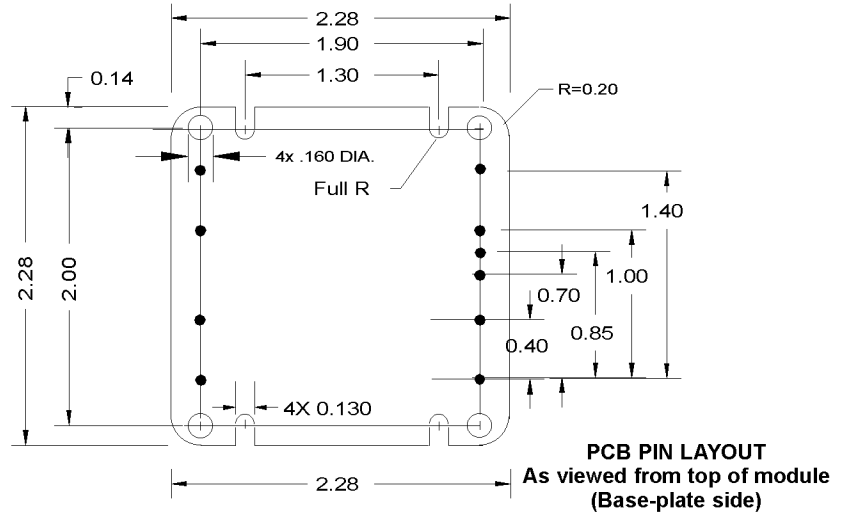
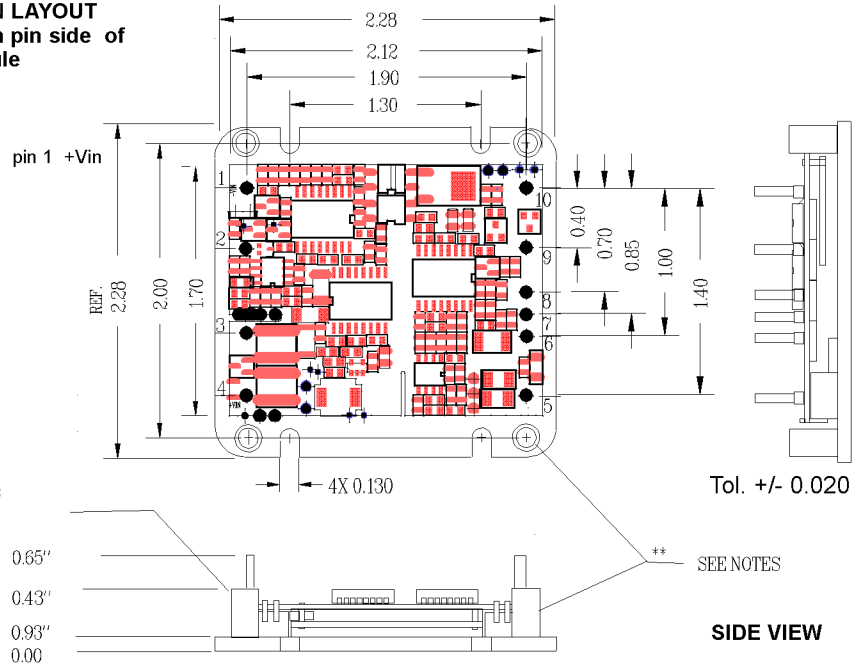
**PIN DIAMETER  
OPTION-A**

Pin #	Dia
1-4, 7-9	.040
5,10	.080

**PIN DIAMETER  
OPTION-B**

Pin #	Dia
1-4, 7-9	.080
5,10	.120

SPECIFY OPTION-B  
FOR 0.50" INSERTS



**Ordering Information**

Part Numbering Scheme for  
Regulated Power Module

C	INPUT VOLTAGE	SIZE	OUTPUT POWER	PRODUCT GRADE	OUTPUT VOLTAGE	PIN CONFIGURATION	** MOUNTING CONFIG.
C	220-400Vdc	H= HALF	SEE SPEC PAGE	C = -10°C to +85°C I = -25°C to +100°C M = -45°C to +100°C	2.5 3.3 5.0 12.0 15.0 24.0 48.0	SEE OUTLINE DRAWINGS A =Small Dia. B =Large Dia.	CONSULT FACTORY A = 0.43"H B = 0.50"H
C	300	H	300	I	48	B	A

**EXAMPLE** - To order a Regulated Power module with an input voltage of 300VDC, half size, output power of 300 watts, -25 C to 100 C Temp Range, 48 VDC output voltage, type B pins(Large Dia. pins.) & 0.43" total height

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