

Front-End Modules

250 Watts to 1500 Watts

CA5MGXCX, CA5MKXCX, CA5MMXCX, CA5MNXCX

FEATURES

- 97-98% Efficient
- 250 to 1500 Watts
- 85 to 264 VAC, 47 to 63 Hz, Autoranging
- Small Form Factor 2.4" x 2.3" x 0.50"
- "AC OK" Signal Output
- UL & C-UL(CSA) Safety Approvals (UL E186932 97NK16122)
- 100 °C Base Plate Operation

APPLICATIONS

- AC Front-Ends that Require Tracking of the AC Line to Insure Correct Strapping of the Voltage Doubler.

DESCRIPTION

Core Technology's CA5MXXCX series of Autoranging Front-End Modules are members of our Power Converter Building Blocks. The CA5MXXCX carries the complete front end of a Switching Power Supply housed in a rugged industry standard (2.4" x 2.3" x 0.5") form factor. In addition, this module provides a patent pending AC-OK/Fail Logic Output for AC Line Monitoring. The CA5MXXCX is utilized for offline AC to DC power conversion systems requiring tracking of the AC mains to insure proper strapping of the converter voltage doubler circuit. The user is required to provide AC Line Filtering and hold up capacitance for their particular application. The CA5MXXCX has an efficiency of 97%-98% and can provide 250 to 1500 Watts of Output Power. The CA5MXXCX can be used with or without Core Technology's line of CT4XXXEX, CI3XXXEX and CI4XXXEX Converter Modules.

* UL is a registered trademark of the Underwriters Laboratories, Inc.

† CSA is a registered trademark of the Canadian Standards Association.

‡ This product is intended for integration into end-use equipment. All the required procedures for CE marking of end-use equipment should be followed. (The CE mark is placed on selected products.)

ABSOLUTE MAXIMUM RATINGS

Parameter		Unit	Notes
AC Line Input	270	VAC	
Input Current			
CA5MNXCX	12	Amps	
CA5MMXCX	10	Amps	
CA5MKXCX	8	Amps	
CA5MGXCX	4	Amps	
Vout Switch-over	400	VDC	Max output before switch-over into 240 VAC range
Max Output Current	12.5	Amps	at 90-132 VAC Range
	9.0	Amps	at 180-264 VAC Range
Max Output Voltage	425	VDC	Internal Clamp
Base Plate	100	Celsius	For Military Version

Stressing this product in excess of the Absolute Maximum Ratings can cause permanent damage to the product. Extended exposure to Absolute Maximum Ratings can adversely affect the operation and the reliability of the product. These are absolute maximum ratings and operation of this device is not implied at these conditions or conditions beyond the ratings given in the electrical specification of the data sheet.

ELECTRICAL SPECIFICATIONS

Parameter		Unit	Notes
AC Line Input	85-132 180-264	VAC VAC	Auto Switching
Input Frequency	47-63	Hz	
Output Power			
CA5MNXCX	1000	Watts	at 90-132 VAC Range
CA5MMXCX	1500	Watts	at 180-264 VAC Range
Output Power			
CA5MMXCX	750	Watts	at 90-132 VAC Range
CA5MMXCX	1000	Watts	at 180-264 VAC Range
Output Power			
CA5MKXCX	500	Watts	at 90-132 VAC Range
CA5MKXCX	750	Watts	at 180-264 VAC Range
Output Power			
CA5MGXCX	250	Watts	at 90-132 VAC Range
CA5MGXCX	500	Watts	at 180-264 VAC Range
Efficiency	Better than 97% Better than 98%		at full load & 120 VAC at full load & 240 VAC
No Load Dissipation	<4.0	Watts	Across entire Vin range
MTBF	961631	HRS	Per MIL-HDBK-217E @40°C

ISOLATION SPECIFICATIONS

Parameter		Unit	Notes
Isolation Voltage			
Input to Output	None		
Input to baseplate	2500	Vrms	
Output to baseplate	2500	Vrms	

GENERAL SPECIFICATIONS

Parameter		Unit	Notes
Operating Temperature			
Industrial	-25 to +85	Celsius	Base Plate Temperature
Military	-40 to +100	Celsius	Base Plate Temperature
Thermal Resistance	0.08°C/W ±0.02°C/W	C/Watt	Base Plate to sink (Grafoil) @ Interface
Storage Temperature	-50 to +120	Celsius	

"Grafoil" is a registered Trade Mark of Union Carbide Corporation

FEATURE SPECIFICATIONS

Parameter		Unit	Notes
AC-Fail logic Assertion point	83	VAC	±2.5% @120VAC Range
AC-Fail logic Assertion point	170	VAC	±2.5% @240VAC Range
AC-Fail logic Delay Time	12	m Sec	Time from AC Fail to logic output assertion.

FUSING CONSIDERATIONS

In order to maintain maximum flexibility and to allow this product to be utilized in a wide variety of applications, internal fusing is not provided. For protection of this product and the system in which it will exist, fusing must always be provided. Fusing must be determined in accordance with the proper safety requirements for a particular application. Refer to a fuse manufacturer for further information.

SAFETY CONSIDERATIONS

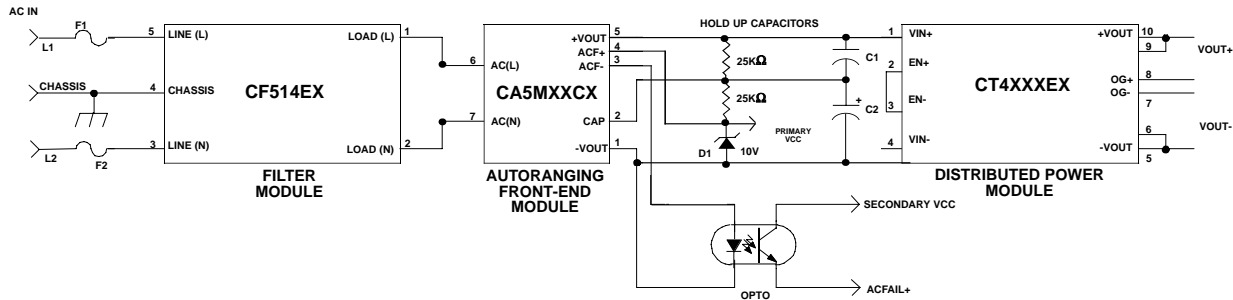
In order to insure agency approval of the application in which this power module is utilized, the unit must be used in compliance with the creepage (spacing and separation) requirements of UL-1950, CSA22.2-950 and EN60950.

FEATURE DESCRIPTIONS

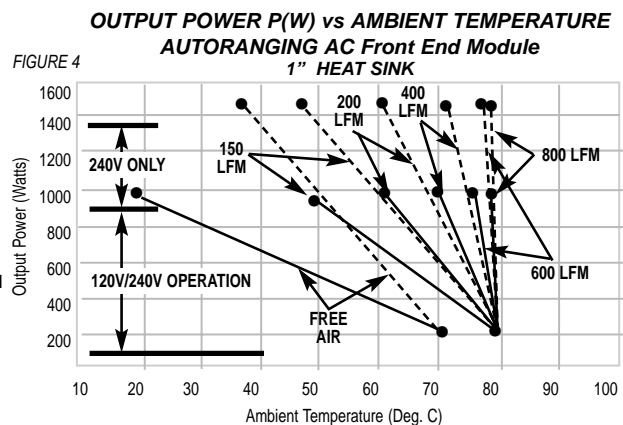
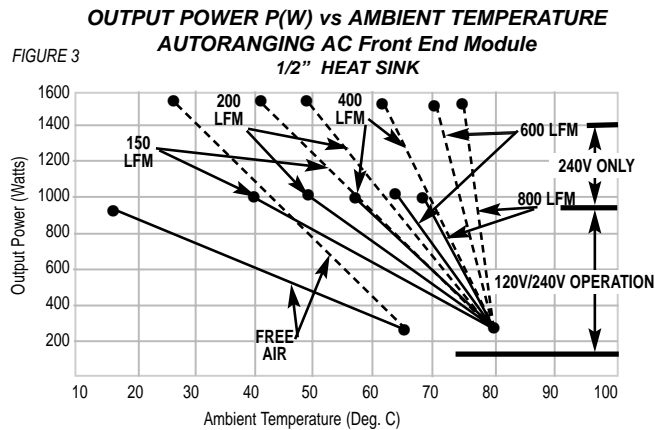
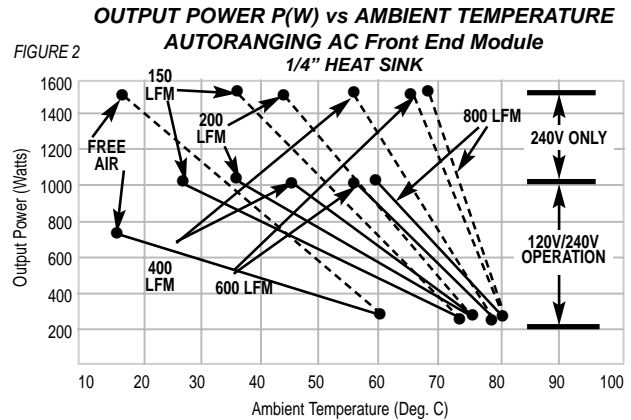
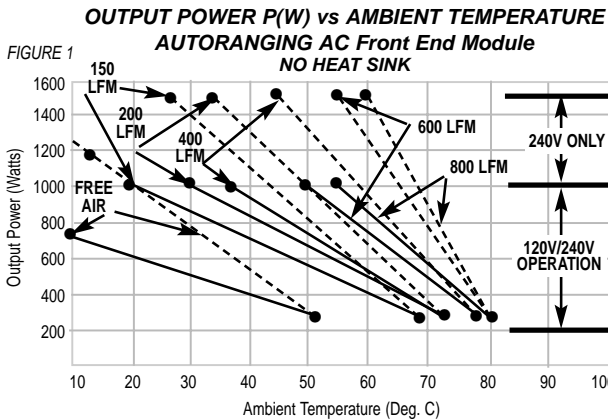
Autoranging - The CA5MXXCX's primary function is tracking the AC line to automatically provide correct strapping of the Voltage doubling circuit providing a power supply with an input voltage range of 90VAC to 132VAC and 180VAC to 264VAC. This product is properly utilized in power supplies which require both 90-132VAC and 180-264VAC Line Voltage Input.

AC - Fail Logic Output - The CA5MXXCX Series of Modules come with a FET Drain Output providing a logic low signal when AC is normal and an open drain signal when the output line falls below 83VAC.

TYPICAL APPLICATION



THERMAL CURVES

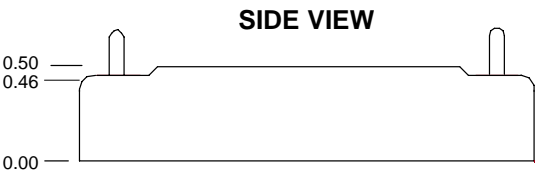
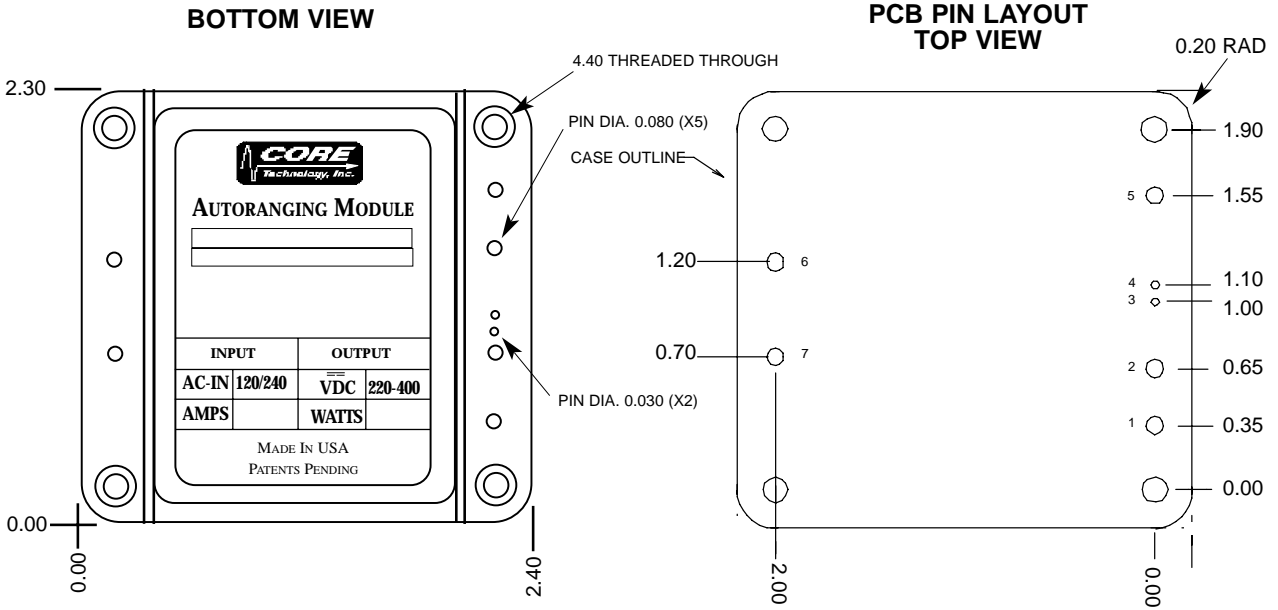


FORCED AIR CONVECTION COOLING

These figures can be utilized to determine if a heat sink and forced air convection cooling will be required in your particular application. Figures 1 through 4 show typical output power vs ambient temperature with various heat sink and air flow conditions. By utilizing these curves, the required cooling can be determined.

EXAMPLE: For your particular application you have determined that you will require an input power of 750 watts with a 120VAC input. Selecting the CA5MM1CLXX, will provide you with the 750 watts. This unit is 97% efficient at 120VAC, therefore, the power dissipation from the module will be approximately 22.5 watts. By viewing Figure 3, it can be determined that in a 60 °C environment, forced air cooling of 200LFM with a 1/2" heat sink will be required.

CORE Technology, Inc.



TOLERANCES: -0.000"
+0.030"

Connector Pin Assignment

1	-Vout
2	CAP
3	ACF-
4	ACF+
5	+ Vout
6	AC(L)
7	AC(N)

Ordering Information

Part Numbering Scheme for CA5MXXCX Autoranging Front End Modules

C	TYPE	IN VOLTS	OUT-VOLTS	POWER LEVEL @90-132VAC	TEMPERATURE RANGE	PACKAGE SIZE	HEAT SINK TYPE
C	A = Autoranging Module	5 = 90-264VDC	M = 200-400V	G = 250 Watts K = 500 Watts M = 750 Watts N = 1000 Watts **	2 = -25C to +85C 3 = -40C to +100C	C = 1/2 Full Size	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	A	5	M	N	2	C	L05

** See electrical specifications on page 2 for 180VAC - 264VAC power level

EXAMPLE - To order an Autoranging Front End Module with an output of 1000 watts, -25C to +85C operating temperature range, and 1/2" longitudinal heat sink would require the part number above.