



electronic powersolutions

CFM500S SERIES 500 WATT AC-DC POWER SUPPLY WITH PFC

Features

- Universal Input Range 80~264V_{ac}
- High Efficiency up to 94.5%
- 3"x 5" Compact Size
- High Power Density up to 20.96W/Inch³
- 390W Natural, 470 ~ 500W Conduction Convection
- No Load Power Consumption<0.5W
- Over Temperature Protection
- PS On/Off Remote Control
- Power Good & Power Fail Signal
- +5V Stand-by, 12V Fan Output
- Low Inrush Current
- Active PFC Meets EN61000-3-2
- Meets EN55032 Class B
- Meets IEC/EN60335-1
- Class I



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT			VOLTAGE ACCURACY	RIPPLE & NOISE	VOLTAGE ADJ. RANGE	LINE REGULATION	LOAD REGULATION	%EFF. (Typ.)				
		NOTE1									NOTE2	NOTE3	NOTE4	NOTE5
		With FAN	Without FAN											
			COVER	OPEN										
CFM500S120	12 V	41.67A	27.5A	25A	±1%	120mV	11.4~12.6 V	±0.5%	±1%	92.5%				
CFM500S180	18 V	27.78A	18.33A	16.67A	±1%	150mV	17.1~18.9 V	±0.5%	±1%	93.5%				
CFM500S240	24 V	20.83A	17.08A	15.83A	±1%	150mV	22.8~25.2 V	±0.5%	±1%	94.5%				
CFM500S360	36 V	13.89A	11.39A	10.56A	±1%	200mV	34.2~37.8 V	±0.5%	±1%	94.5%				
CFM500S480	48 V	10.42A	8.54A	7.92A	±1%	250mV	45.6~50.4 V	±0.5%	±1%	94.5%				
Stand-by Output Voltage														
All	+5V	1A			±3%	1%	---	±1%	±5%	---				
Fan Output Voltage														
All	+12V	0.5A (NOTE 6)			---	---	---	---	---	---				

Note:

1. Forced Air Convection with 21CFM Fan.
2. Voltage Accuracy is Set at Full Load and 25°C Ta.
3. Add a 0.1uF Ceramic Capacitor and a 10uF E.L. Capacitor to Output for Ripple & Noise Measuring @20MHz B.W.
4. Line Regulation is Measured from High Line to Low Line with Rated Load.
5. Load Regulation is Measured from Full Load to 10% Rated Load.
6. Fan Output Can Only Operate Normal When the Stand-by Output is Above 0.5A.

PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM500	X	XXX	X (Option)
CFM500	S: Single	120: 12V 180: 18V 240: 24V 360: 36V 480: 48V	None: With Baseplate C: With Cover

Part Number Example:

- CFM500S120:** With Baseplate, 500W, 12Vdc Output
- CFM500S120C:** With Cover, 500W, 12Vdc Output



TECHNICAL SPECIFICATIONS

(All specifications are typical at nominal input, full load at 25°C unless otherwise noted.)

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage	Safety approvals only to the AC input	All	80		264	V _{ac}
Operating Case Temperature	See derating curve	All	-40		85	°C
Storage Temperature		All	-40		85	°C
Operating Altitude		All			5000	m

INPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Operating Voltage Range		All	100		240	V _{ac}
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V _{in} =100V _{ac}	All			6	A
Power Factor		All		0.97		
Leakage Current		All			0.1	mA
Inrush Current	V _{in} =240V _{ac} , Cold start at 25°C.	All		8.5		A

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V _{in} =Nominal V _{in} , I _o =I _o max., T _c =25°C.	CFM500S120	11.88	12	12.12	V _{dc}
		CFM500S180	17.82	18	18.18	
		CFM500S240	23.76	24	24.24	
		CFM500S360	35.64	36	36.36	
		CFM500S480	47.52	48	48.48	
Operating Output Current Range		CFM500S120			41.67	A
		CFM500S180			27.78	
		CFM500S240			20.83	
		CFM500S360			13.89	
		CFM500S480			10.42	
Holdup Time	V _{in} =115V _{ac}	All		16		ms
Output Voltage Regulation						
Load Regulation	10% Load to full load	All			±1.0	%
Line Regulation	V _{in} =High line to low line	All			±0.5	%
Over Voltage Protection	Latch off (AC recycle to reset)	CFM500S120			16	V _{dc}
		CFM500S180			30	
		CFM500S240			35	
		CFM500S360			50	
		CFM500S480			63	
Over Current Protection	Auto recovery	All	120		190	%
Short Circuit Protection	Auto recovery	All				
Output Ripple and Noise	1. Add a 0.1uF ceramic capacitor and a 10uF aluminum electrolytic capacitor to Output 2. Oscilloscope is 20MHz band width 3. Ambient temperature=25°C	CFM500S120			120	mV
		CFM500S180			150	
		CFM500S240			150	
		CFM500S360			200	
		CFM500S480			250	



CFM500S Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Load Capacitance	1. Ambient temperature=25°C 2. Input Voltage is 115V _{ac} and 230V _{ac} 3. Output is max. load	CFM500S120			42900	uF
		CFM500S180			28600	
		CFM500S240			20800	
		CFM500S360			14000	
		CFM500S480			10800	
Efficiency	Output is rated load Ambient temperature=25°C @ Input voltage is 230V _{ac}	CFM500S120		92.5		%
		CFM500S180		93.5		
		CFM500S240		94.5		
		CFM500S360		94.5		
		CFM500S480		94.5		
PS-On Signal	Power on	All	0		2	Vdc
	Power off (PS-ON and GND open)			4		
	Power on (PS-ON and GND short)			10		mA
	Power-off (PS-ON and GND open)			0		
Power Good (PG)	1. Input voltage is 90V _{ac} ~264V _{ac} 2. Output is max. load 3. The TTL goes high after power set up	All	100		500	ms
Power Fail (PF)	1. Input voltage is 90V _{ac} ~264V _{ac} 2. Output is max. load 3. The TTL goes low before Vo below 90% rated value	All	1	10		ms

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute	All			4000	V _{ac}
Isolation Resistance	Input to output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	Pout=max. rated power	All		65		kHz
Output Voltage adjustment		All	-5		+5	%

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I _o =100%; T _a =25°C per MIL-HDBK-217F	All		200		k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-1 10ms, each axis 3 times(±X · ±Y · ±Z axis)	All		75		g
Vibration	Meet MIL-STD-810F Table 514.5C-VIII, 15~2000Hz, X · Y · Z axis, 1 hour (each axis), Total 3 hrs.	All		4		g
Weight	Baseplate versions	All		515		g
	Covered versions			635		
Dimensions	With baseplate	All	5.000x3.000x1.540 Inches (127.00x76.20x39.10mm)			
	C (with cover)	All	5.354x3.425x1.673 Inches (136.00x87.00x42.50mm)			
Safety	Class I, IEC/EN/UL62368-1					
EMC Emission	EN55032:2015+AC:2016, EN61204-3:2000, EN61000-6-3:2007+A1:2011+AC:2012, EN61000-6-4:2007+A1:2011, 47 CFR FCC Part 15 Subpart B (Class B)				Class B	
Conducted Disturbance	EN55032, 47 CFR FCC Part 15 Subpart B (Class B)				Class B	
Radiated Disturbance	EN55032, 47 CFR FCC Part 15 Subpart B (Class B)				Class B	
Harmonic Current Emissions	EN61000-3-2:2014				Class A, C, D	
Voltage Fluctuations & Flicker	EN61000-3-3:2013					
EMC Immunity	EN55035:2017, EN61204-3:2000, EN61000-6-1:2019+CRGD:2019, EN61000-6-2:2019					



GENERAL SPECIFICATIONS

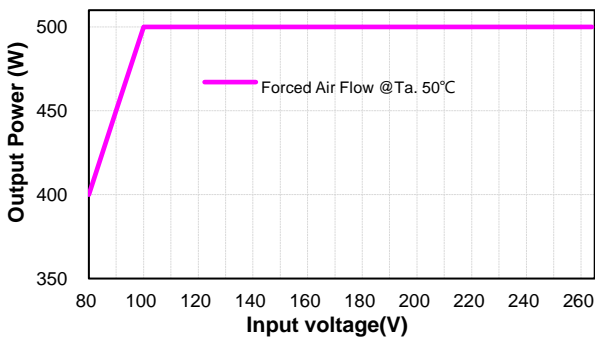
Electrostatic Discharge (ESD)	IEC61000-4-2:2008, Air Discharge: $\pm 8\text{kV}$, Contact Discharge: $\pm 4\text{kV}$	Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC61000-4-3:2006+A1:2007+A2:2010	Criterion A
Electrical Fast Transient (EFT)	IEC61000-4-4:2012, $\pm 1\text{kV}$, $\pm 2\text{kV}$	Criterion A
Surge	IEC61000-4-5:2014+A1:2017, L-N: $\pm 0.5\text{kV}$, $\pm 1\text{kV}$, L-E(Ground): $\pm 0.5\text{kV}$, $\pm 1\text{kV}$, $\pm 2\text{kV}$	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC61000-4-6:2013+COR1:2015	Criterion A
Power Frequency Magnetic Field	IEC61000-4-8:2009	Criterion A
Voltage Dips	IEC61000-4-11:2004+A1:2017, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC61000-4-11:2017+A1:2017, >95% Reduction	Criterion B
Application Note Link	CFM500S Series App Notes	

CHARACTERISTIC CURVE

Power Derating Curve

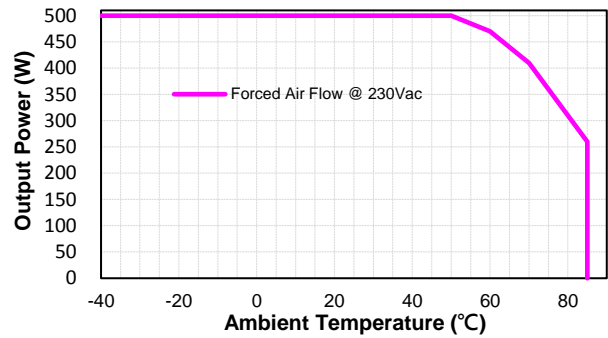
Forced Air Flow

Output power & Input voltage



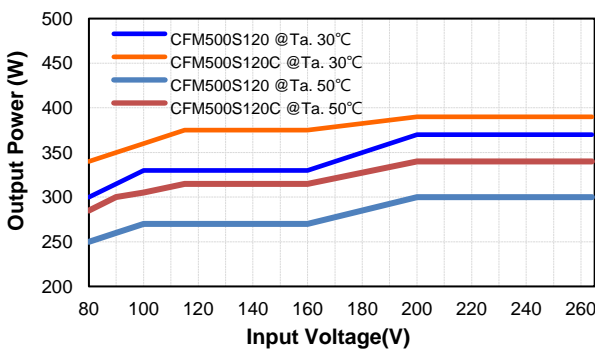
Forced Air Flow

Output power vs Ambient Temperature



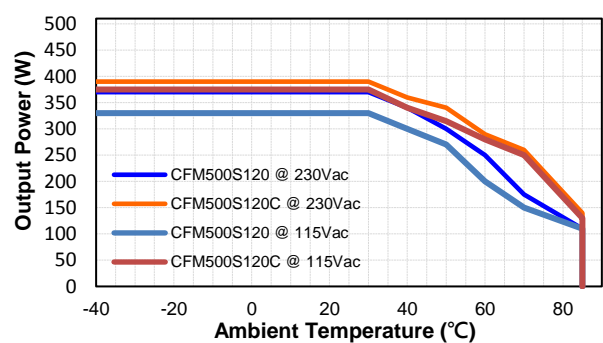
Natural Convection

Output power & Input Voltage



Natural Convection

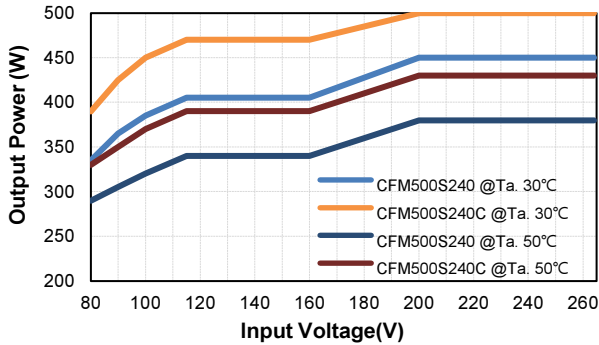
Output power vs Ambient Temperature





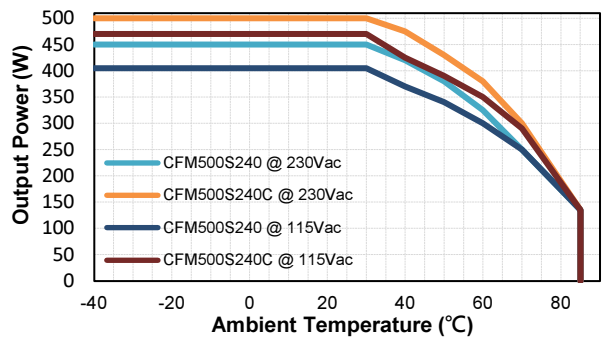
CFM500S Series

Output power & Input Voltage



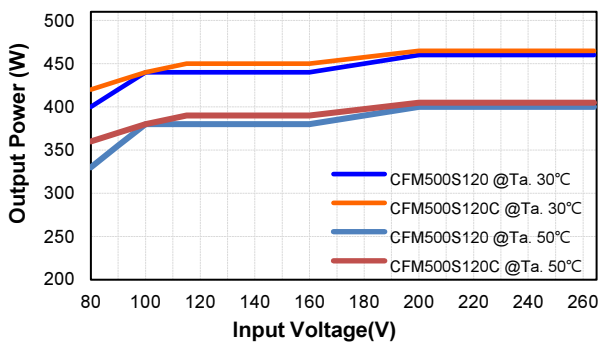
Conduction Convection with External Baseplate (48x24.8x0.12cm)

Output power vs Ambient Temperature

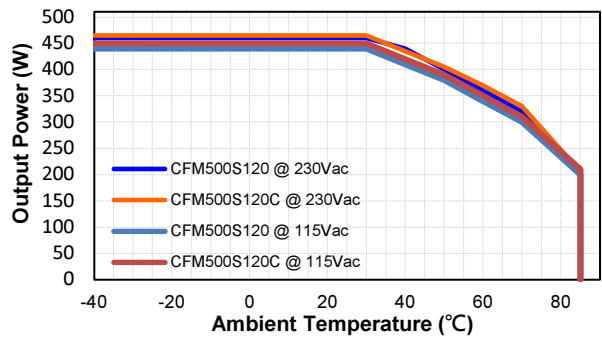


Conduction Convection with External Baseplate (48x24.8x0.12cm)

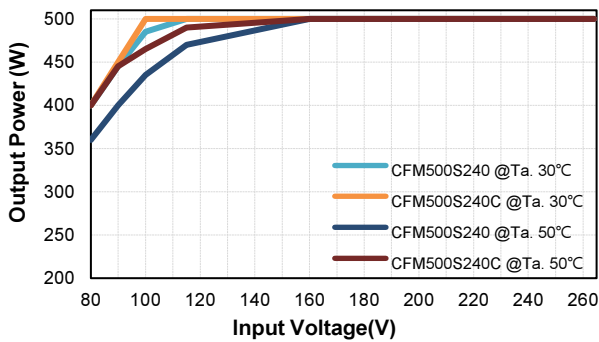
Output power & Input Voltage



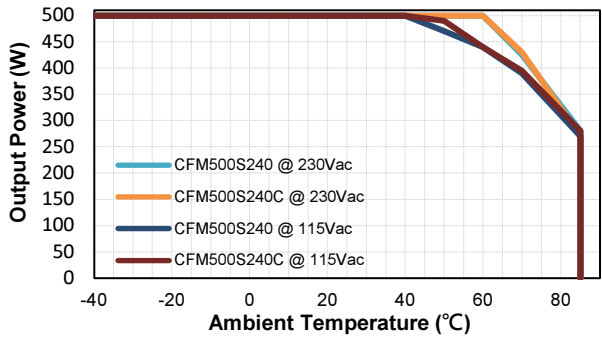
Output power vs Ambient Temperature



Output power & Input Voltage

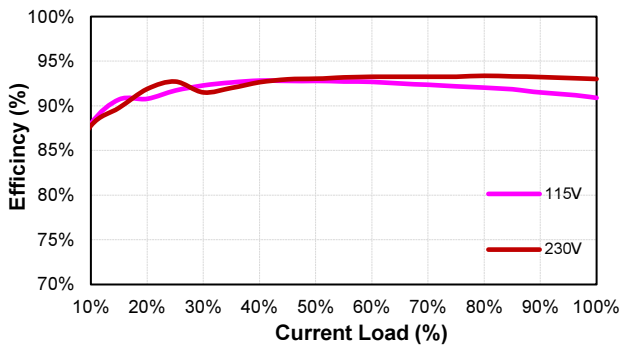


Output power vs Ambient Temperature

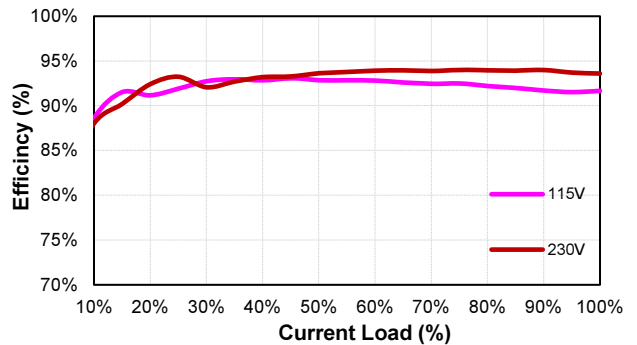


Performance Data

CFM500S120 (Eff Vs Io)



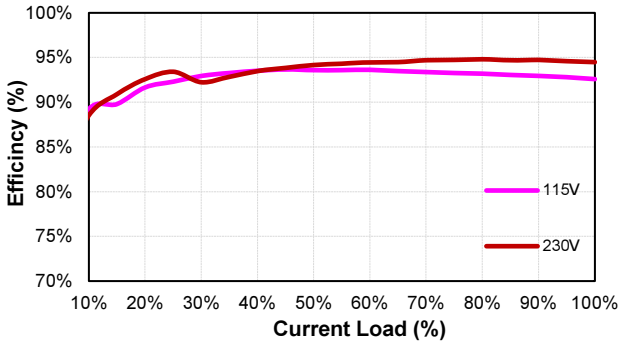
CFM500S180 (Eff Vs Io)



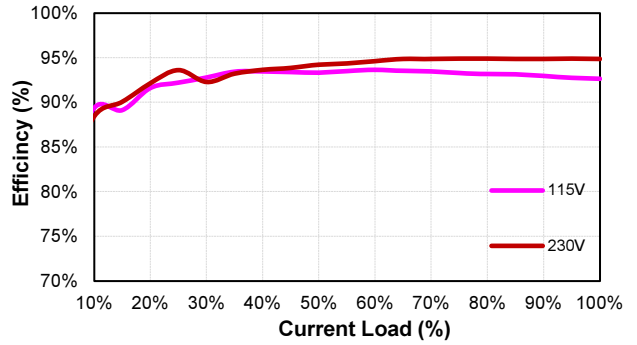


CFM500S Series

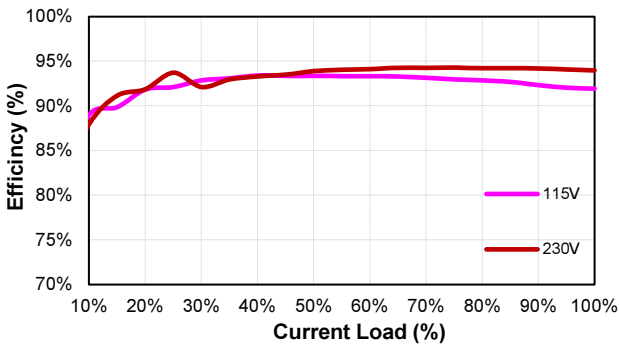
CFM500S240 (Eff Vs Io)



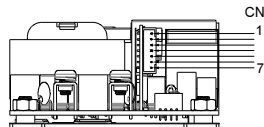
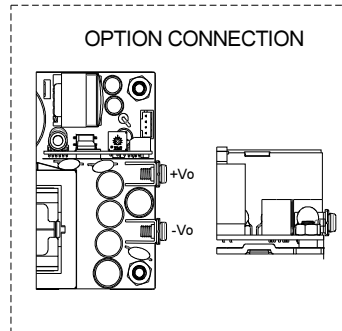
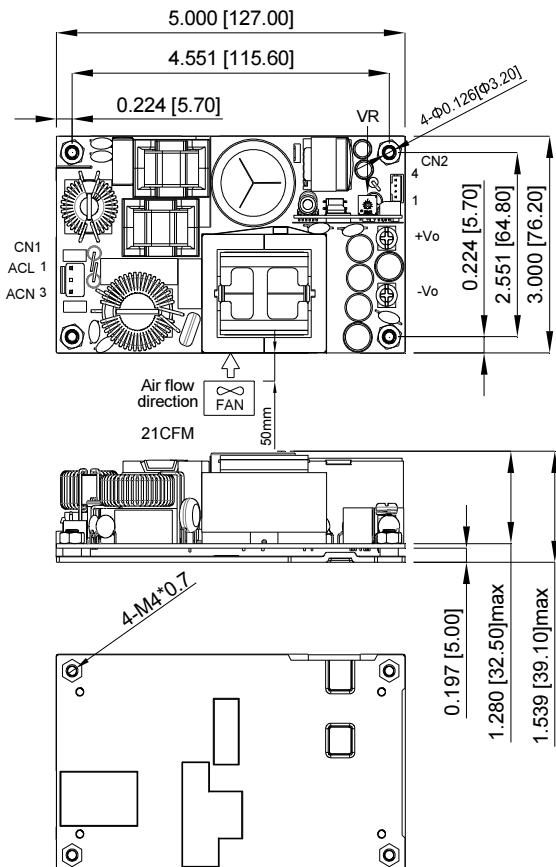
CFM500S360 (Eff Vs Io)



CFM500S480 (Eff Vs Io)



MECHANICAL SPECIFICATION



CN1:
PIN CONNECTION

Pin	Function
1	ACL
2	-
3	ACN

CN2:
PIN CONNECTION

Pin	Function
1	GND
2	+5VSB
3	GND
4	+12V-FAN

CN3:
PIN CONNECTION

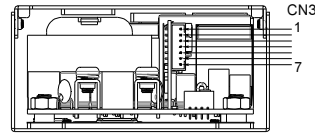
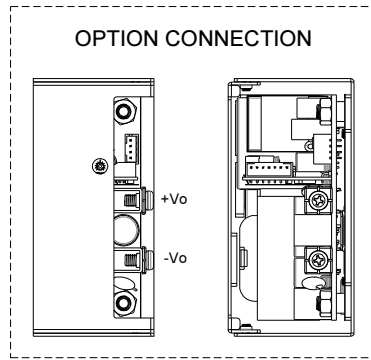
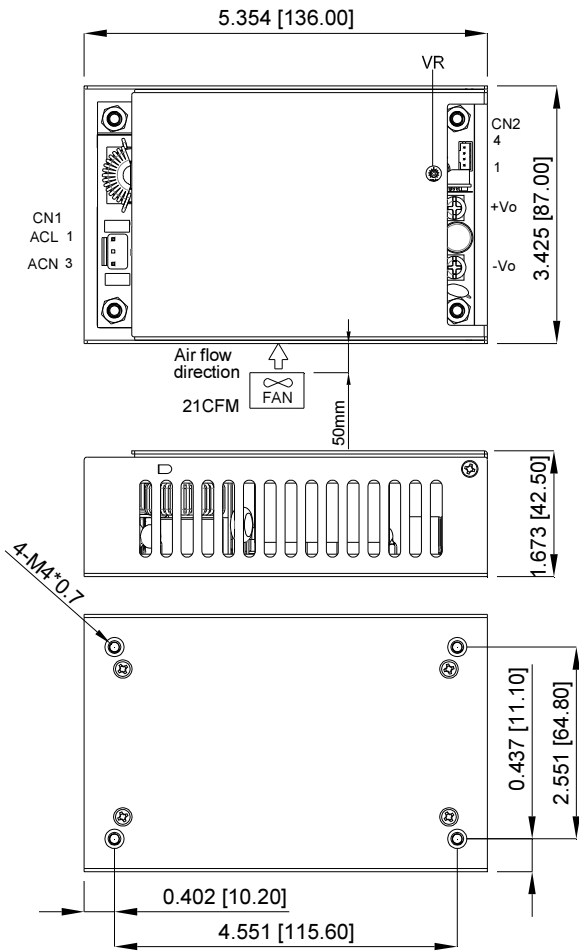
Pin	Function
1	GND
2	PF
3	FAN-EN
4	PS-ON
5	-Sense
6	+Sense
7	OPTION

All Dimensions In Inches[mm]
Tolerance Inches:x.xxx = ± 0.02
Millimeters: x.xx = ± 0.5

CFM500SXXX



CFM500S Series



**CN1:
PIN CONNECTION**

Pin	Function
1	ACL
2	-
3	ACN

**CN2:
PIN CONNECTION**

Pin	Function
1	GND
2	+5VSB
3	GND
4	+12V-FAN

**CN3:
PIN CONNECTION**

Pin	Function
1	GND
2	PF
3	FAN-EN
4	PS-ON
5	-Sense
6	+Sense
7	OPTION

All Dimensions In Inches[mm]
Tolerance Inches:x.xxx= ± 0.02
Millimeters: x.xx = ± 0.5

CFM500SXXC