CFM130M SERIES
130 WATT MEDICAL
AC-DC POWER SUPPLY WITH PFC

Features

- Universal Input Range 80~264Vac
- High Efficiency up to 94%
- 2"x 3" Open Frame Compact Size
- Class I & Class II (NOTE8)
- 100W with Natural Convection
- 130W with Fan-Cooled
- No Load Input Power Consumption<150mW
- Approved Safety IEC/EN/UL 60601-1 2 MOPP
- Meets IEC/EN60335-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Active PFC Function



E252331

MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT		RIPPLE& NOISE NOTE2	VOLTAGE ACCURACY NOTE1	LINE REGULATION NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ) NOTE5
		NATURAL CONVECTION	FAN COOLED NOTE7					
CFM130M120	12 V	8.34 A	10.8 A	120 mV	±2%	±0.5%	±1%	93%
CFM130M180	18 V	5.56 A	7.2 A	180 mV	±2%	±0.5%	±1%	93%
CFM130M190	19 V	5.26 A	6.8 A	190 mV	±2%	±0.5%	±1%	93%
CFM130M240	24 V	4.2 A	5.4 A	240 mV	±2%	±0.5%	±1%	93%
CFM130M360	36 V	2.8 A	3.6 A	360 mV	±2%	±0.5%	±1%	94%
CFM130M480	48 V	2.1 A	2.7 A	480 mV	±2%	±0.5%	±1%	94%

Note:

1. Voltage accuracy is set at full load.
2. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
3. Line regulation is measured from 100Vac to 240Vac with full load.
4. Load regulation is measured from 10% to 100% full load.
5. Typical efficiency at 230 VAC and 75% full load at 25℃.
6. Standard input and output connectors (CN1 and CN2) wafer with TAIWAN KING PIN TERMINAL PVHI series and mate with JST housing VHR series or equivalent.
7. Requires 10CFM.
8. Conductive: Class I & Class II meets Class B Radiation: Class I meet Class B, Class II meet Class A.

PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type
CFM130	X	XXX	-X (Option)
CFM130	M：MEDICAL	120：12V 180：18V 190：19V 240：24V 360：36V 480：48V	Blank：Wafer B：Base Cooling C：Cover

Part Number Example:

CFM130M120-B: Open Frame, 130W, Medical 12Vdc Output, Base Cooling

REVISION: V13

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TECHNICAL SPECIFICATIONS

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

ABSOLUTE MAXIMUM RATINGS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input Voltage		All	80		264	V_{ac}
Operating Temperature	See Derating Curve	All	-30		70	℃
Storage Temperature		All	-40		85	℃
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}=100Vac	All			1.8	A
Inrush Current	V_{in}=240V_{ac}, Cold start @25℃	All			100	A
Leakage Current		All			100	uA
Under Voltage Protection		All	55	62	70	V

OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V_{in}=80V_{ac}~264V_{ac}, I_o=Full load, Ambient temperature=25℃	CFM130M120	11.76	12	12.24	V_{dc}
		CFM130M180	17.64	18	18.36	
		CFM130M190	18.62	19	19.38	
		CFM130M240	23.52	24	24.48	
		CFM130M360	35.28	36	36.72	
		CFM130M480	47.04	48	48.96	
Operating Output Current Range	V_{in}=80V_{ac}~264V_{ac}, See Derating Curve	CFM130M120			10.8	A
		CFM130M180			7.2	
		CFM130M190			6.8	
		CFM130M240			5.4	
		CFM130M360			3.6	
		CFM130M480			2.7	
Holdup Time	V_{in}=115V_{ac}	All	20			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	Auto recovery	CFM130M120		13.5		V_{dc}
		CFM130M180		20.5		
		CFM130M190		23		
		CFM130M240		30		
		CFM130M360		42		
		CFM130M480		54		
Over Current Protection	Auto recovery	All	115	130	145	%
Short Circuit Protection	Auto recovery	All				

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PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
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℃	CFM130M120			120	mV
		CFM130M180			180	
		CFM130M190			190	
		CFM130M240			240	
		CFM130M360			360	
		CFM130M480			480	
Load Capacitance	1. Input Voltage is 115V_{ac} and 230$V_{ac.}$ 2. Output is max. Full Load 3. Ambient Temperature=25℃	CFM130M120			8400	uF
		CFM130M180			5600	
		CFM130M190			5200	
		CFM130M240			4200	
		CFM130M360			2720	
		CFM130M480			2040	
Efficiency	1. Input Voltage is 230V_{ac} 2. Output is 75% Full Load 3. Ambient Temperature=25℃	CFM130M120		93		%
		CFM130M180		93		
		CFM130M190		93		
		CFM130M240		93		
		CFM130M360		94		
		CFM130M480		94		

ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 minute (without dielectric breakdown)	All			4400	V_{ac}
Input to Earth (Ground)	1 minute (without dielectric breakdown)	All			1800	V_{ac}
Output to Earth (Ground)	1 minute (without dielectric breakdown)	All			1800	V_{ac}
Isolation Resistance	Input to Output	All	100			MΩ

FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency		All		105		kHz

GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	I_o=100%; T_a=25℃ per MIL-HDBK-217F	All	400			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meets MIL-STD-810F Table 516.5,TABLE 516.5-I 10ms, each axis 3 times(±-X、±Y、±Z axis)	All		75		g
Vibration	Meets MIL-STD-810F Table 514.5C-VIII,15~2000Hz, X、Y、Z axis, 1 hr (each axis),. total 3 hrs.	All		4		g
Weight		CFM130M		135		grams
		CFM130M-B		170		
		CFM130M-C		218		
Dimensions	Open Frame (Wafer)	All	3.000x2.000x1.201 Inches (76.20x50.80x30.50 mm)			
	B (Base Cooling)		3.598x2.000x1.299 Inches (91.40x50.80x33.00mm)			
	C (Cover)		3.598x2.520x1.358 Inches (91.40x64.00x34.50mm)			
Safety	Class I & Class II, IEC 60601-1:2005 (Third Edition) + CORR. 1(2006) + CORR. 2(2007) + AM1(2012) EN 60601-1:2006;A11+A1+A12 ANSI/AAMI ES60601-1 (2005/(R)2012 + A1:2012, C1:2009/(R)2012 + A2:2010/(R)2012) CAN/CSA-C22.2 No. 60601-1:14					Ed 3.1
EMC Emission	EN55011, Class B, IEC61000-3-2:2014, IEC61000-3-3:2013, FCC CFR 47 Part 18					

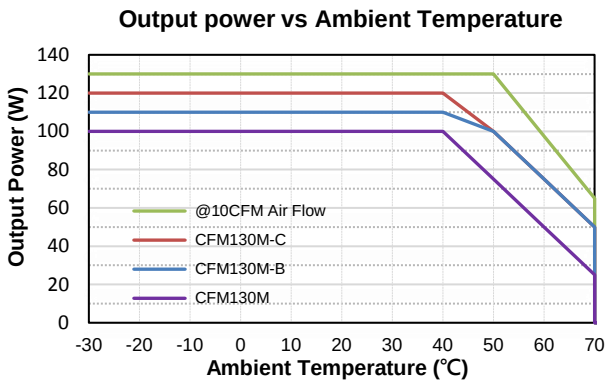
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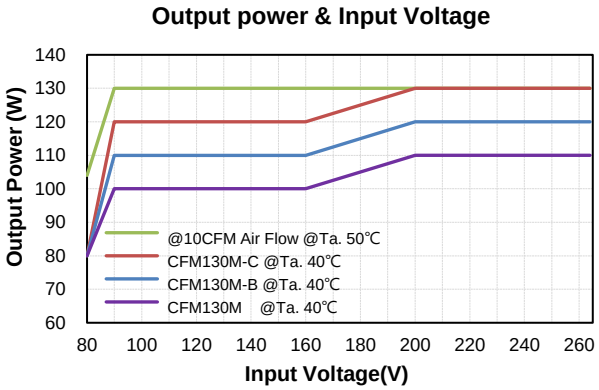
GENERAL SPECIFICATIONS

Conducted Disturbance	EN55011, FCC CFR 47 Part 18 (Class I & Class II meets Class B)	Class B
Radiated Disturbance	EN55011, FCC CFR 47 Part 18 Class I (Class I Meet Class B; Class II Meet Class A)	Class B
Harmonic Current Emissions	IEC 61000-3-2:2014	Class A
Voltage Fluctuations & Flicker	EN 61000-3-3:2013	Criteria A
EMC Immunity	EN60601-1-2:2015, IEC61000-4-2, 3, 4, 5, 6, 8, 11	Ed 4.0
Electrostatic Discharge (ESD)	IEC 61000-4-2:2008 Air Discharge: ±15kV, Contact Discharge: ±8kV	Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC 61000-4-3:2006+A1:2007+A2:2010	Criterion A
Electrical Fast Transient (EFT)	IEC61000-4-4:2012, ±2kV	Criterion A
Surge	IEC 61000-4-5:2014+A1:2017, L-N: ±1kV, L-E (Ground): ±1kV, ±2kV	Criterion A
Conducted Disturbances, Induced by RF Fields	IEC 61000-4-6:2013+COR1:2015	Criterion A
Power Frequency Magnetic Field	IEC 61000-4-8:2009	Criterion A
Voltage Dips	IEC 61000-4-11:2004, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC 61000-4-11:2004+A1:2017, >95% reduction	Criterion B
Application Note Link	CFM130M Series App Notes	

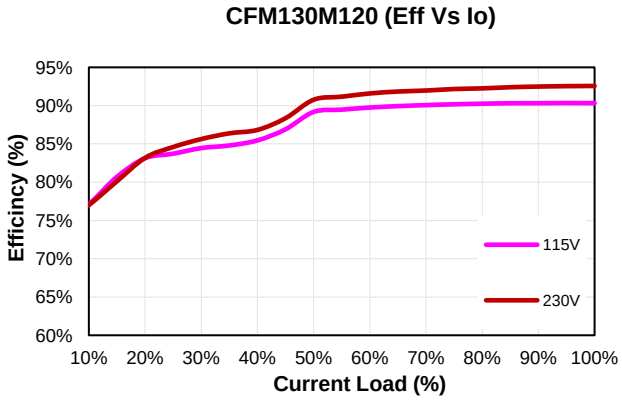
CHARACTERISTIC CURVE

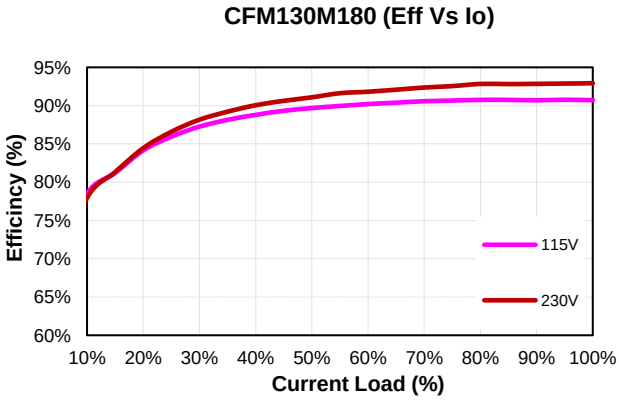
Power Derating Curve





Performance Data

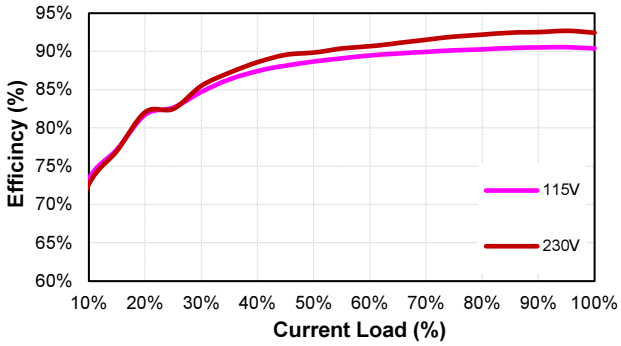




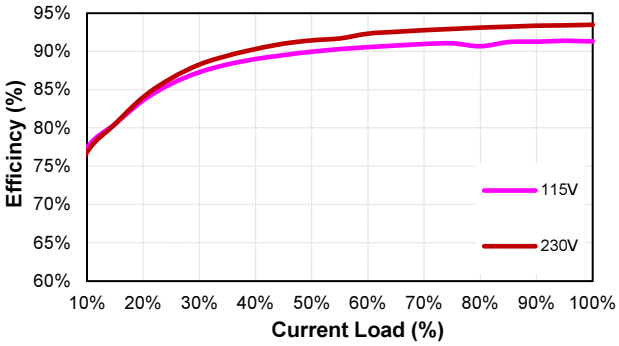
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CFM130M Series

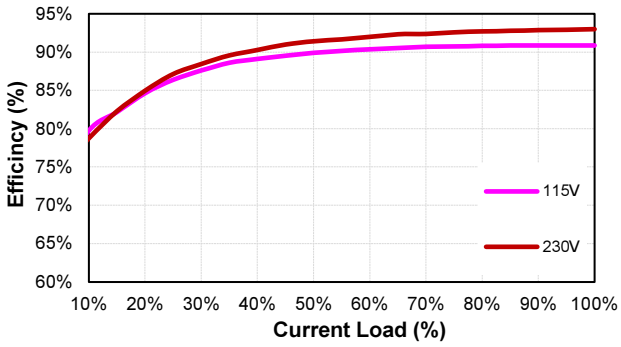
CFM130M190 (Eff Vs Io)



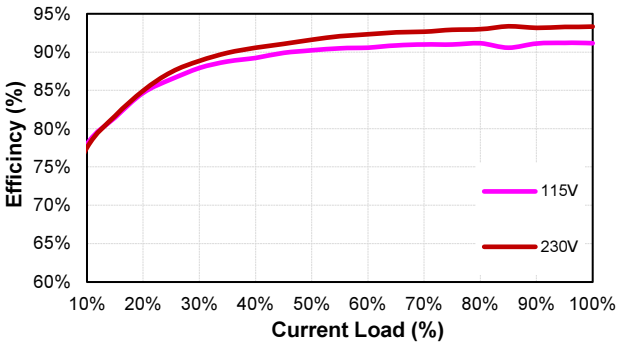
CFM130M240 (Eff Vs Io)



CFM130M360 (Eff Vs Io)

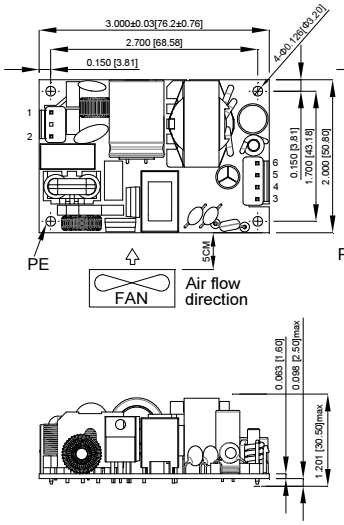


CFM130M480 (Eff Vs Io)

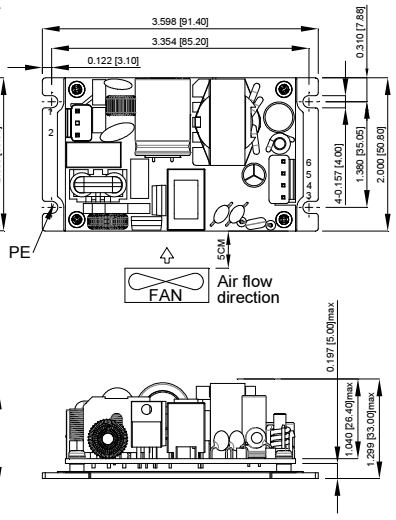


MECHANICAL SPECIFICATION

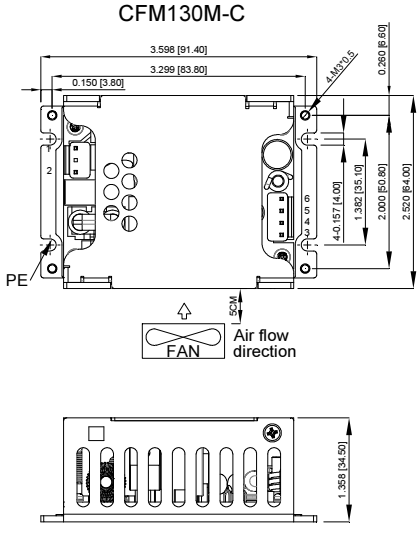
CFM130M



CFM130M-B



CFM130M-C



PIN CONNECTION	
Pin	Function
1	ACL
2	ACN
3	-Vout
4	-Vout
5	+Vout
6	+Vout

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

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