



# LFM300M SERIES 300 WATT MEDICAL AC-DC POWER SUPPLY WITH PFC

## Features

- Universal Input Range 85~264Vac
- High Efficiency up to 94%
- Class I & Class II
- 25.4mm Low Profile Package
- No Load Input Power Consumption<0.3W
- Approval Safety IEC/EN/UL 60601-1 2 MOPP
- Approval Safety IEC/EN/UL 62368-1
- Meets IEC/EN 60335-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Temperature Protection
- High Power Density 32.1W/Inches<sup>3</sup>
- Active PFC Function



MODEL NUMBER	OUTPUT VOLTAGE	OUTPUT CURRENT			RIPPLE & NOISE NOTE1	VOLTAGE ACCURACY NOTE2	VOLTAGE ADJ. RANGE	LINE REGULATION N NOTE3	LOAD REGULATION NOTE4	%EFF. (Typ.) NOTE5
		With Fan NOTE6	Without Conduction Cooling	With Conduction Cooling NOTE7						
LFM300M120C	12 V	25 A	13.34 A	20.83 A	150 mV	±1%	11.4-12.6 V	±0.3%	±0.5%	93%
LFM300M150C	15 V	20 A	10.67 A	16.6 A	150 mV	±1%	14.25-15.75 V	±0.3%	±0.5%	93%
LFM300M240C	24 V	12.5 A	6.67 A	10.4 A	240 mV	±1%	22.8-25.2 V	±0.3%	±0.5%	94%
LFM300M280C	28 V	10.7 A	5.71 A	8.90 A	280 mV	±1%	26.6-29.4 V	±0.3%	±0.5%	94%
LFM300M300C	30 V	10 A	5.33 A	8.33 A	300 mV	±1%	28.5-31.5 V	±0.3%	±0.5%	94%
LFM300M480C	48 V	6.25 A	3.33 A	5.20 A	480 mV	±1%	45.6-50.4 V	±0.3%	±0.5%	94%
LFM300M540C	54 V	5.56 A	2.96 A	4.63 A	540 mV	±1%	51.3-56.7 V	±0.3%	±0.5%	93%

### Note:

1. Add a 0.1uF ceramic capacitor and a 10uF E.L. capacitor to output for ripple & noise measuring @20MHz BW.
2. Voltage accuracy is set at full load.
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 full load at 25°C.
6. Forced air convection with 14CFM above 115Vac.
7. With addition cooling conduction plate, 22.8 by 22.8 cm with min. 0.2 cm thick, as below.

## PART NUMBER

Series	Number of Outputs	Nominal Output Voltage	Type	Mounting Inserts
LFM300	O	XXX	X	-YZ
LFM300	M : Medical	120 : 12V 150 : 15V 240 : 24V 280 : 28V 300 : 30V 480 : 48V 540 : 54V	C : With Cover	Blank: Through Hole C0: Threaded Hole

### Part Number Example:

**LFM300M120C-C0:** With Cover, 300W, Medical 12Vdc Output, Threaded Hole



# LFM300M Series

## 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		All	85		264	V <sub>ac</sub>
Operating Temperature	See Derating Curve	All	-40		80	°C
Operating Case Temperature	At the center of base plate (T <sub>c</sub> = Case temperature)	All	-40		90	°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 <sub>ac</sub>
Input Frequency Range		All	47		63	Hz
Maximum Input Current	100% Load, V <sub>in</sub> =100V <sub>ac</sub>	All			5.0	A
Leakage Current (Earth)		All			300	uA
Leakage Current (Touch)		All			100	uA
Inrush Current	V <sub>in</sub> =240V <sub>ac</sub> , Cold start @25°C	All			105	A
Power Factor	230V <sub>ac</sub> @ Full load	All		0.92		

### OUTPUT CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Output Voltage Set Point	V <sub>in</sub> =Nominal V <sub>in</sub> , I <sub>o</sub> =I <sub>o</sub> max., T <sub>c</sub> =25°C	LFM300M120	11.88	12	12.12	V <sub>dc</sub>
		LFM300M150	14.85	15	15.15	
		LFM300M240	23.76	24	24.24	
		LFM300M280	27.72	28	28.28	
		LFM300M300	29.7	30	30.3	
		LFM300M480	47.52	48	48.48	
Operating Output Current Range	V <sub>in</sub> =85V <sub>ac</sub> ~264V <sub>ac</sub> , <b>See Derating Curve</b>	LFM300M120	0		25.0	A
		LFM300M150	0		20.0	
		LFM300M240	0		12.5	
		LFM300M280	0		10.7	
		LFM300M300	0		10.0	
		LFM300M480	0		6.25	
LFM300M540	0		5.56			
Holdup Time	V <sub>in</sub> =115V <sub>ac</sub>	All		12		ms
Output Voltage Regulation						
Load Regulation	10% Load to full load	All			±0.5	%
Line Regulation	V <sub>in</sub> =High line to low line	All			±0.3	%
Output Voltage Adjustment	P <sub>o</sub> ≤ max. rated power, I <sub>o</sub> ≤ I <sub>o</sub> max.	All	-5		+5	%
Over Voltage Protection	Latch off (AC recycle to reset)	LFM300M120			16	V <sub>dc</sub>
		LFM300M150			20	
		LFM300M240			32	
		LFM300M280			35	
		LFM300M300			36	
		LFM300M480			59	
LFM300M540			63			
Over Current Protection	Auto recovery (output is rated load)	All	110	120	140	%



## LFM300M Series

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Short Circuit Protection	Auto recovery	All				
Over Temperature 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	LFM300M120			150	mV
		LFM300M150			150	
		LFM300M240			240	
		LFM300M280			280	
		LFM300M300			300	
		LFM300M480			480	
Load Capacitance	1. $V_{in}=115V_{ac}$ and $230V_{ac}$ 2. Output is max. load 3. Ambient temperature=25°C	LFM300M120			15400	uF
		LFM300M150			12200	
		LFM300M240			7800	
		LFM300M280			6600	
		LFM300M300			6200	
		LFM300M480			3870	
Efficiency	1. Input Voltage is $230V_{ac}$ 2. Output is rated load 3. Ambient temperature=25°C	LFM300M120		93		%
		LFM300M150		93		
		LFM300M240		94		
		LFM300M280		94		
		LFM300M300		94		
		LFM300M480		94		
LFM300M540		93				

### ISOLATION CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Input to Output	1 Minute (without dielectric breakdown)	All			4250	$V_{ac}$
Input to Earth (Ground)	1 Minute (without dielectric breakdown)	All			2000	$V_{ac}$
Output to Earth (Ground)	1 Minute (without dielectric breakdown)	All			2000	$V_{ac}$
Isolation Resistance	Input to output	All	100			MΩ

### FEATURE CHARACTERISTICS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
Switching Frequency	$P_{out}$ =max. rated power	All		100		kHz

### GENERAL SPECIFICATIONS

PARAMETER	NOTES and CONDITIONS	Device	Min.	Typ.	Max.	Units
MTBF	$I_o=100\%$ ; $T_a=25^\circ C$ per MIL-HDBK-217F	All	500			k hours
Life Time	@75% Load, 40°C	All	77			k hours
Humidity	Non-condensing	All			93	% RH
Shock	Meet MIL-STD-810F Table 516.5, Table 516.5-I 10ms, each axis 3 times( $\pm X$ · $\pm Y$ · $\pm Z$ 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		All		280		grams
Dimensions		All	4.09x2.28x1.00 Inches (104x57.9x25.4 mm)			



# LFM300M Series

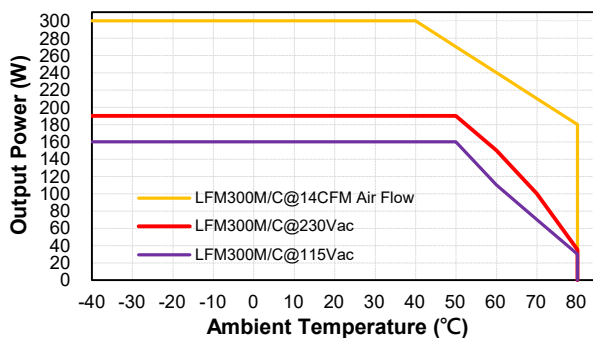
## GENERAL SPECIFICATIONS

Safety	Class I, Class II ANSI/AAMI ES 60601-1:2005 & A1:2012 & A2:2021 IEC 60601-1:2005/AMD1:2012 + AMD2:2020 EN 60601-1:2006/A1:2013 + A12:2014 + A2:2021	Ed. 3.2
	Class I, IEC/EN/UL 62368-1	Ed. 3.0
EMC Emission	EN 55011: 2016+A2: 2021, Class B, IEC/EN 61000-3-2: 2019+A1:2021, EN 61000-3-3: 2013+A2: 2021, 47 CFR FCC Part 18	
	EN 55032:2015+A11:2020 (Class B), EN 61000-6-4:2019, EN 61204-3:2018, EN 61000-3-2:2019+A1:2021, EN 61000-3-3:2013+A2:2021, 47 CFR FCC Part 15 Subpart B	
Conducted Disturbance	EN 55011: 2016+A2: 2021, EN 55032:2015+A11:2020 47, CFR FCC Part 18 & Part 15	Class B
Radiated Disturbance	EN 55011:2016+A2: 2021, CFR FCC Part 18 (Class II Only Meets Class A), EN 55032:2015+A11:2020 47,CFR FCC Part 15	Class B
Harmonic Current Emissions	IEC/EN 61000-3-2: 2019+A1:2021	Class A, D
Voltage Fluctuations & Flicker	EN 61000-3-3:2013+A2: 2021	Criterion A
EMC Immunity	EN 60601-1-2: 2015+A1:2021, IEC/EN 61000-4-2, 3, 4, 5, 6, 8, 11	Ed 4.1
	EN 55035:2017+A11:2020, EN 61000-6-2:2019, EN 61204-3:2018	
Electrostatic Discharge (ESD)	IEC 61000-4-2:2009 Air Discharge: ±15kV, Contact Discharge: ±8kV	Criterion A
Radio-Frequency, Continuous Radiated Disturbance	IEC/EN 61000-4-3: 2020	Criterion A
Electrical Fast Transient (EFT)	EN 61000-4-4:2012, ±2kV	Criterion A
Surge	EN 61000-4-5:2014+A1:2017, L-N: ±2kV, L-E (Ground): ±4kV	Criterion A
Conducted Disturbances, Induced by RF Fields	EN 61000-4-6: 2014+AC: 2015	Criterion A
Power Frequency Magnetic Field	EN 61000-4-8: 2010	Criterion A
Voltage Dips	IEC/EN 61000-4-11: 2020, Dip: 30% Reduction, Dip >95% Reduction	Criterion A
Voltage Interruptions	IEC/EN 61000-4-11: 2020, >95% reduction	Criterion B
Application Note Link	<a href="#">LFM300M Series App Notes</a>	

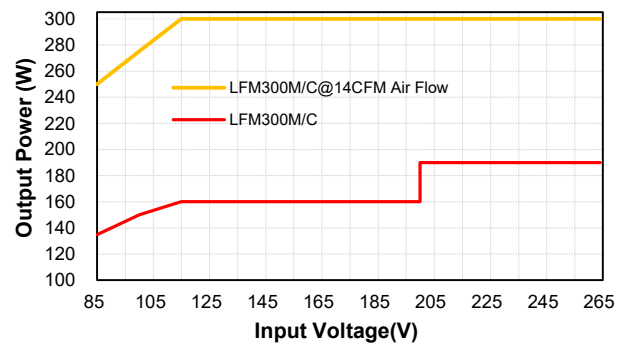
## CHARACTERISTIC CURVE

### Power Derating Curve

Output Power vs Ambient Temperature



Output power & Input Voltage

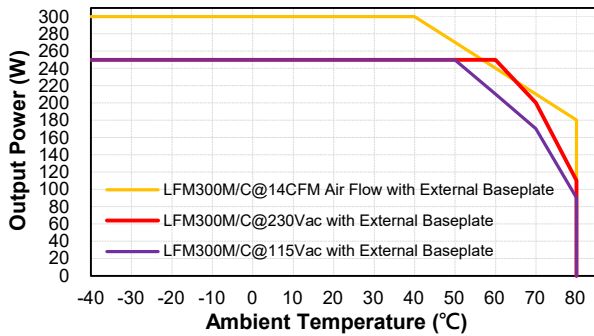




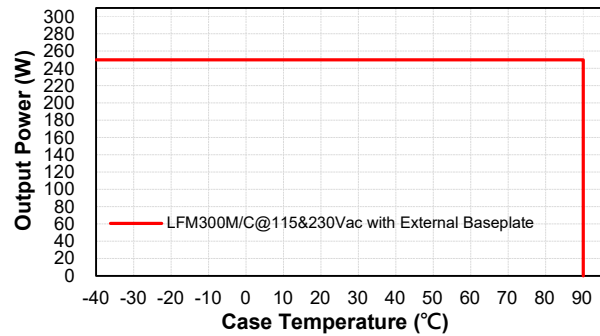
# LFM300M Series

Conduction Convection with External Baseplate (22.8cmx22.8cmx0.2cm)

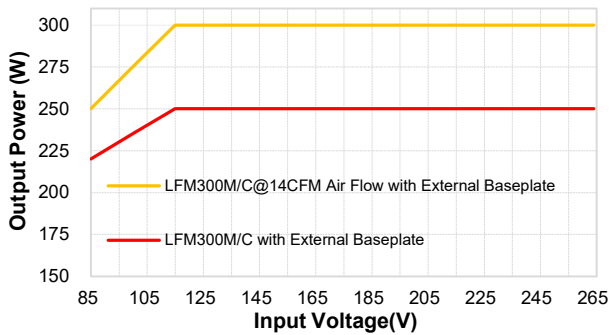
Output Power vs Ambient Temperature



Output Power vs Case Temperature (Tc)

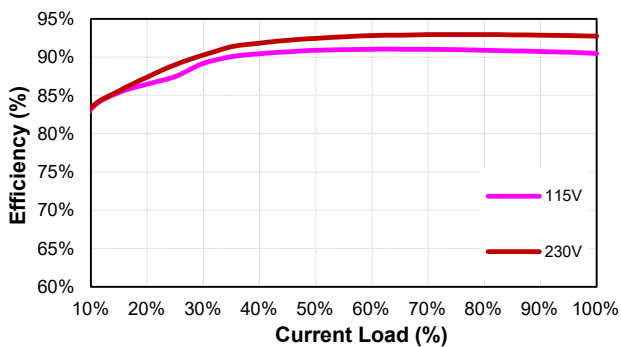


Output Power & Input Voltage

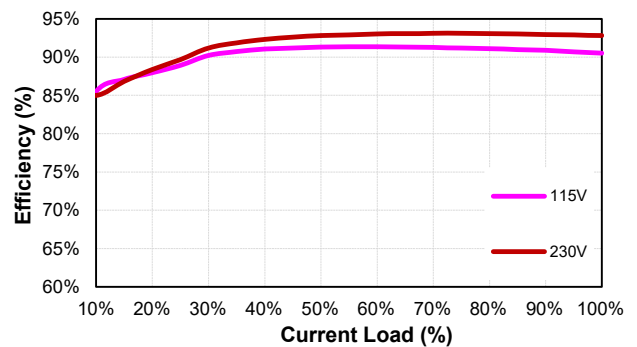


## Performance Data

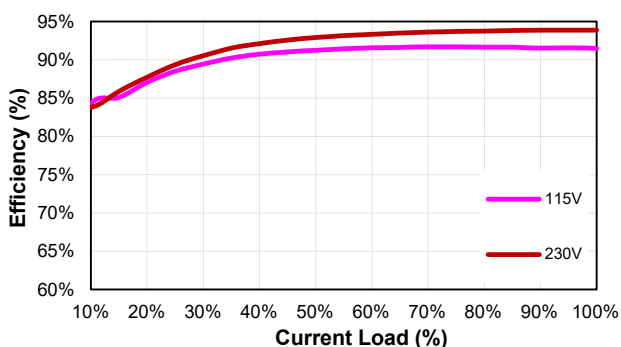
LFM300M120 (Eff Vs Io)



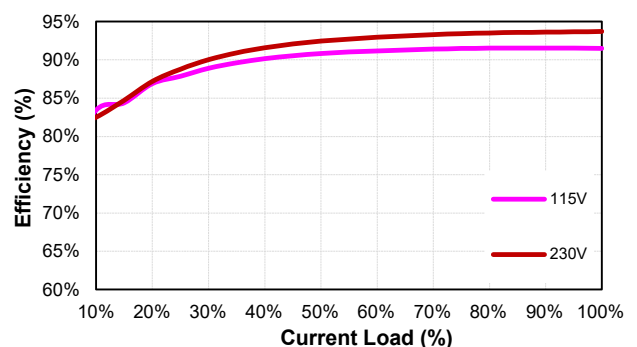
LFM300M150 (Eff Vs Io)



LFM300M240 (Eff Vs Io)



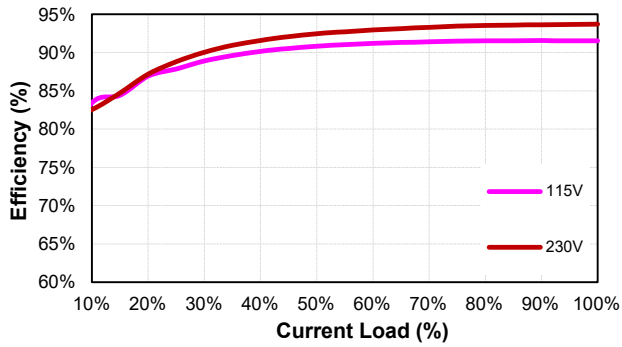
LFM300M280 (Eff Vs Io)



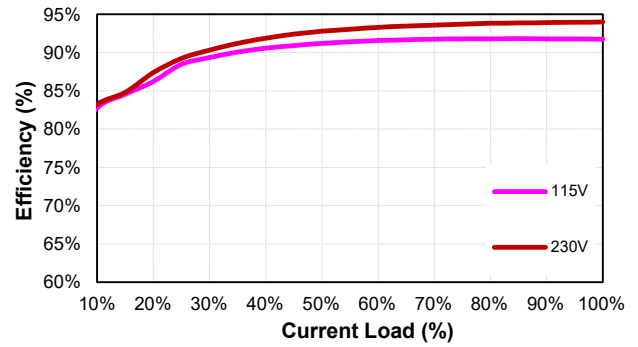


# LFM300M Series

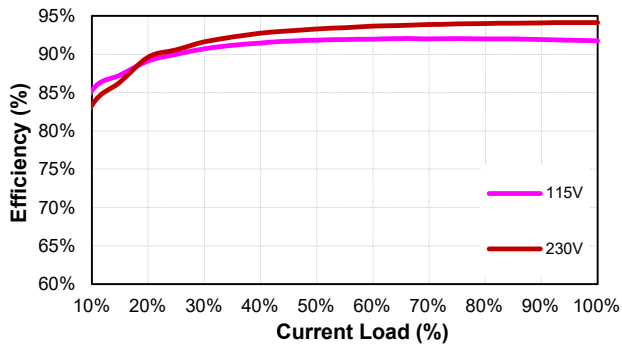
LFM300M300 (Eff Vs Io)



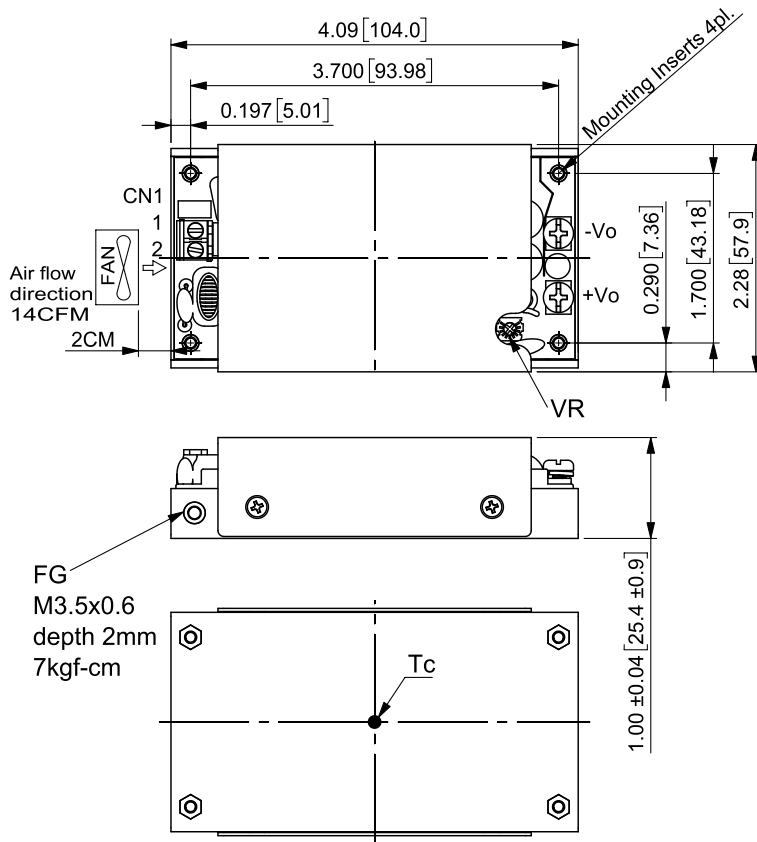
LFM300M480 (Eff Vs Io)



LFM300M540 (Eff Vs Io)



## MECHANICAL SPECIFICATION



### LFM300MXXXC LFM300MXXXC-C0

All Dimensions in Inches[mm]

Tolerance Inches: x.xx=±0.03, x.xxx=±0.020

Millimeters: x.x=±0.7, x.xx=±0.50

AC Input Connector(CN1):ECE ETB22

Pin	Function	Mating Wire Range
1	ACL	14~18 AWG
2	ACN	

DC Output Connector:KANG YANG PCB-58M4

Function	The screw locked torque
+Vo	M4 7kgf-cm
-Vo	

Mounting Inserts

Series	Option
Blank	∅ 3.2 Through depth 10.5mm
-C0	M3x0.5 Threaded depth 10.5mm



## Revision History

Revision Version	Date	Change Description	Signature
V01	2021/12/20	New Release	Wendong
V02	2022/1/05	Delete LFM300MXXXB series	Wendong
V03	2023/2/8	Update Surge Test Spec	Wendong
V04	2023/3/10	Update Inrush Current Spec 130A	Wendong
V05	2023/3/21	Add LFM300MXXXB series; Update Inrush105A	Wendong
V06	2023/3/22	Delete LFM300MXXXB series	Wendong
V07	2023/4/21	Add Tc Case temperature	Wendong
V08	2023/07/18	Update Safety standard	Calvin
V10	2023/07/26	New Release	Wendong
V11	2024/01/26	Modify Features High Power Density 37.5W/Inches <sup>3</sup> Change to High Power Density 32.1W/Inches <sup>3</sup>	Joyce
V12	2024/03/06	Adjust Feature sequence	Calvin
V13	2024/04/01	Update Medical Safety Class I & Class II	Calvin