

# LFM200S SERIES 200 WATT AC-DC POWER SUPPLY WITH PFC

## Features

- Universal Input Range 85~264Vac
- High Efficiency up to 94%
- Class I
- 25.4mm Low Profile Package
- No Load Input Power Consumption<0.3W
- 48V, 54V No Load Input Power Consumption<0.4W
- Approval IEC/EN/UL 62368-1 Ed 3.0
- Approval EN 55032 and CISPR/FCC Class B
- Meets IEC/EN 60335-1
- Operating Altitude 5000m
- Continuous Short Circuit Protection
- Over Voltage Protection
- Over Temperature Protection
- High Power Density 32.89W/Inches<sup>3</sup>
- Active PFC Function
- Over Voltage Category OVC II & OVC III



| MODEL<br>NUMBER | OUTPUT<br>VOLTAGE | OUTPUT CURRENT    |                                     |         | RIPPLE &<br>NOISE<br>NOTE1 | VOLTAGE<br>ACCURACY<br>NOTE2 | VOLTAGE<br>ADJ. RANGE | LINE<br>REGULATION<br>NOTE3 | LOAD<br>REGULATION<br>NOTE4 | % EFF.<br>(Typ.)<br>NOTE5 |
|-----------------|-------------------|-------------------|-------------------------------------|---------|----------------------------|------------------------------|-----------------------|-----------------------------|-----------------------------|---------------------------|
|                 |                   | With Fan<br>NOTE6 | With<br>Conduction Cooling<br>NOTE7 |         |                            |                              |                       |                             |                             |                           |
|                 |                   |                   | Baseplate                           | Cover   |                            |                              |                       |                             |                             |                           |
| LFM200S120      | 12 V              | 16.67 A           | 10.83 A                             | 14.17 A | 150 mV                     | ±1%                          | 11.4-12.6 V           | ±0.2%                       | ±0.5%                       | 92%                       |
| LFM200S150      | 15 V              | 13.33 A           | 8.66 A                              | 11.33 A | 150 mV                     | ±1%                          | 14.25-15.75 V         | ±0.2%                       | ±0.5%                       | 92%                       |
| LFM200S240      | 24 V              | 8.33 A            | 5.41 A                              | 7.08 A  | 200 mV                     | ±1%                          | 22.8-25.2 V           | ±0.2%                       | ±0.5%                       | 94%                       |
| LFM200S280      | 28 V              | 7.14 A            | 4.64 A                              | 6.07 A  | 200 mV                     | ±1%                          | 26.6-29.4 V           | ±0.2%                       | ±0.5%                       | 93%                       |
| LFM200S300      | 30 V              | 6.66 A            | 4.33 A                              | 5.67 A  | 200 mV                     | ±1%                          | 28.5-31.5 V           | ±0.2%                       | ±0.5%                       | 93%                       |
| LFM200S360      | 36 V              | 5.55 A            | 3.61 A                              | 4.72 A  | 200 mV                     | ±1%                          | 34.2-37.8 V           | ±0.2%                       | ±0.5%                       | 94%                       |
| LFM200S480      | 48 V              | 4.16 A            | 2.71 A                              | 3.54 A  | 200 mV                     | ±1%                          | 45.6-50.4 V           | ±0.2%                       | ±0.5%                       | 94%                       |
| LFM200S540      | 54 V              | 3.7 A             | 2.41 A                              | 3.15 A  | 200 mV                     | ±1%                          | 51.3-56.7 V           | ±0.2%                       | ±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 110Vac.
7. With addition cooling conduction plate, 17.78 by 17.78 cm with min. 0.2 cm thick, as below.



# LFM200S Series

## PART NUMBER

| Series | Number of Outputs | Nominal Output Voltage                                                                               | Type                                 | Mounting Inserts                           |
|--------|-------------------|------------------------------------------------------------------------------------------------------|--------------------------------------|--------------------------------------------|
| LFM200 | O                 | XXX                                                                                                  | X                                    | -YZ                                        |
| LFM200 | S : Single        | 120 : 12V<br>150 : 15V<br>240 : 24V<br>280 : 28V<br>300 : 30V<br>360 : 36V<br>480 : 48V<br>540 : 54V | B : With Baseplate<br>C : With Cover | Blank : Through Hole<br>C0 : Threaded Hole |

Part Number Example:

**LFM200S120C-C0**: With Cover 200W, Single 12Vdc Output, Threaded Hole

**LFM200S240B**: With Baseplate 200W, Single 24Vdc Output, Through Hole

**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    | 85<br>115 |      | 264<br>370   | V <sub>ac</sub><br>V <sub>dc</sub> |
| Operating Temperature      | See derating curve                                                 | All    | -40       |      | 80           | °C                                 |
| Operating Case Temperature | At the center of base plate<br>(T <sub>c</sub> = Case temperature) | All    | -40       |      | 90           | °C                                 |
| Storage Temperature        |                                                                    | All    | -40       |      | 90           | °C                                 |
| Operating Altitude         | IEC/EN/UL 62368-1 OVC II<br>IEC/EN/UL 62368-1 OVC III              | All    |           |      | 5000<br>2000 | 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    |      |      | 3.15       | A               |
| Leakage Current         | Contact leakage current<br>Earth leakage current       | All    |      |      | 100<br>300 | uA              |
| Inrush Current          | V <sub>in</sub> =240V <sub>ac</sub> , Cold Start @25°C | All    |      |      | 85         | A               |
| Power Factor            | 230V <sub>ac</sub> @ Full load                         | All    | 0.96 | 0.98 |            |                 |

**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 | LFM200S120<br>LFM200S150<br>LFM200S240<br>LFM200S280<br>LFM200S300<br>LFM200S360<br>LFM200S480<br>LFM200S540 | 11.88<br>14.85<br>23.76<br>27.72<br>29.7<br>35.64<br>47.52<br>53.46 | 12<br>15<br>24<br>28<br>30<br>36<br>48<br>54 | 12.12<br>15.15<br>24.24<br>28.28<br>30.3<br>36.36<br>48.48<br>54.54 | V <sub>dc</sub> |
| Operating Output Current Range | V <sub>in</sub> =85V <sub>ac</sub> ~264V <sub>ac</sub> , see derating curve                          | LFM200S120<br>LFM200S150<br>LFM200S240<br>LFM200S280<br>LFM200S300<br>LFM200S360<br>LFM200S480<br>LFM200S540 | 0<br>0<br>0<br>0<br>0<br>0<br>0<br>0                                |                                              | 16.67<br>13.33<br>8.33<br>7.14<br>6.66<br>5.55<br>4.16<br>3.7       | A               |
| Holdup Time                    | V <sub>in</sub> =115V <sub>ac</sub>                                                                  | All                                                                                                          | 10                                                                  | 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                                                                                                          |                                                                     |                                              | ±0.2                                                                | %               |
| Output Voltage Adjustment      | P <sub>o</sub> ≤ max. rated power, I <sub>o</sub> ≤ I <sub>o</sub> max.                              | All                                                                                                          | -5                                                                  |                                              | +5                                                                  | %               |



## LFM200S Series

| PARAMETER                   | NOTES and CONDITIONS                                                                                                                                         | Device     | Min. | Typ. | Max. | Units    |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|------|------|------|----------|
| Over Voltage Protection     | Latch off (AC recycle to reset)                                                                                                                              | LFM200S120 |      |      | 16   | $V_{dc}$ |
|                             |                                                                                                                                                              | LFM200S150 |      |      | 20   |          |
|                             |                                                                                                                                                              | LFM200S240 |      |      | 32   |          |
|                             |                                                                                                                                                              | LFM200S280 |      |      | 35   |          |
|                             |                                                                                                                                                              | LFM200S300 |      |      | 35   |          |
|                             |                                                                                                                                                              | LFM200S360 |      |      | 45   |          |
|                             |                                                                                                                                                              | LFM200S480 |      |      | 55   |          |
|                             |                                                                                                                                                              | LFM200S540 |      |      | 63   |          |
| Over Current Protection     | Auto recovery (output is rated load)                                                                                                                         | All        | 125  | 145  | 165  | %        |
| 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<br>2. Oscilloscope is 20MHz band width.<br>3. Ambient Temperature=25°C | LFM200S120 |      |      | 150  | mV       |
|                             |                                                                                                                                                              | LFM200S150 |      |      | 150  |          |
|                             |                                                                                                                                                              | LFM200S240 |      |      | 200  |          |
|                             |                                                                                                                                                              | LFM200S280 |      |      | 200  |          |
|                             |                                                                                                                                                              | LFM200S300 |      |      | 200  |          |
|                             |                                                                                                                                                              | LFM200S360 |      |      | 200  |          |
|                             |                                                                                                                                                              | LFM200S480 |      |      | 200  |          |
|                             |                                                                                                                                                              | LFM200S540 |      |      | 200  |          |
| Load Capacitance            | 1. $V_{in}=115V_{ac}$ and $230V_{ac}$<br>2. Output is max. load<br>3. Ambient temperature=25°C                                                               | LFM200S120 |      |      | 6800 | uF       |
|                             |                                                                                                                                                              | LFM200S150 |      |      | 5360 |          |
|                             |                                                                                                                                                              | LFM200S240 |      |      | 3440 |          |
|                             |                                                                                                                                                              | LFM200S280 |      |      | 3440 |          |
|                             |                                                                                                                                                              | LFM200S300 |      |      | 3220 |          |
|                             |                                                                                                                                                              | LFM200S360 |      |      | 2680 |          |
|                             |                                                                                                                                                              | LFM200S480 |      |      | 2000 |          |
|                             |                                                                                                                                                              | LFM200S540 |      |      | 1560 |          |
| Efficiency                  | 1. Input Voltage is 230Vac<br>2. Output is rated load<br>3. Ambient temperature=25°C                                                                         | LFM200S120 |      | 92   |      | %        |
|                             |                                                                                                                                                              | LFM200S150 |      | 92   |      |          |
|                             |                                                                                                                                                              | LFM200S240 |      | 94   |      |          |
|                             |                                                                                                                                                              | LFM200S280 |      | 93   |      |          |
|                             |                                                                                                                                                              | LFM200S300 |      | 93   |      |          |
|                             |                                                                                                                                                              | LFM200S360 |      | 94   |      |          |
|                             |                                                                                                                                                              | LFM200S480 |      | 94   |      |          |
|                             |                                                                                                                                                              | LFM200S540 |      | 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 |                      | 15V    |      | 130  |      | kHz   |
|                     |                      | Others |      | 110  |      |       |



## LFM200S Series

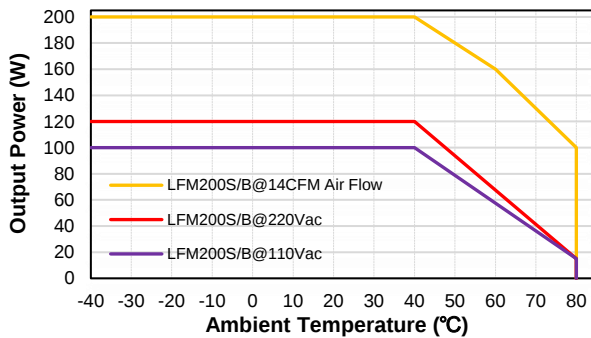
## GENERAL SPECIFICATIONS

| PARAMETER                                        | NOTES and CONDITIONS                                                                                                                 | Device                     | Min.                                                                                   | Typ.       | Max. | Units         |
|--------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|----------------------------|----------------------------------------------------------------------------------------|------------|------|---------------|
| MTBF                                             | I <sub>0</sub> =100%; T <sub>a</sub> =25°C per MIL-HDBK-217F<br>I <sub>0</sub> =100%; T <sub>a</sub> =25°C per Telcordia SR332       | All                        | 450<br>2800                                                                            |            |      | k<br>hours    |
| Life Time                                        | @ 75% Load, 40°C                                                                                                                     | All                        | 45                                                                                     |            |      | k<br>hours    |
| Humidity                                         | Non-condensing                                                                                                                       | All                        |                                                                                        |            | 93   | % RH          |
| Shock                                            | Meet MIL-STD-810F Table 516.5, Table 516.5-I 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<br>Covered versions                                                                                               | LFM200SXXXB<br>LFM200SXXXC |                                                                                        | 130<br>220 |      | grams         |
| Dimensions                                       | Baseplate versions<br>Covered versions                                                                                               | LFM200SXXXB<br>LFM200SXXXC | 3.04x2.00x1.00 Inches (77.2x50.8x25.4 mm)<br>3.09x2.28x1.00 Inches (78.6x57.9x25.4 mm) |            |      |               |
| <b>Safety</b>                                    | Class I, IEC/EN/UL 62368-1                                                                                                           |                            |                                                                                        |            |      | Ed. 3.0       |
| <b>EMC Emission</b>                              | EN 55032:2015+A11:2020, 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 |                            |                                                                                        |            |      |               |
| Conducted Disturbance                            | EN 55032, 47 CFR FCC Part 15                                                                                                         |                            |                                                                                        |            |      | Class B       |
| Radiated Disturbance                             | EN 55032, 47 CFR FCC Part 15                                                                                                         |                            |                                                                                        |            |      | Class B       |
| Harmonic Current Emissions                       | EN 61000-3-2:2019+A1:2021                                                                                                            |                            |                                                                                        |            |      | Class A, C, D |
| Voltage Fluctuations & Flicker                   | EN 61000-3-3:2013+A2:2021                                                                                                            |                            |                                                                                        |            |      | Criterion A   |
| <b>EMC Immunity</b>                              | EN 55035:2017+A11:2020, EN 61000-6-2:2019, EN 61204-3:2018                                                                           |                            |                                                                                        |            |      |               |
| Electrostatic Discharge (ESD)                    | IEC 61000-4-2:2008 Air Discharge: ±8kV, Contact Discharge: ±4kV                                                                      |                            |                                                                                        |            |      | Criterion A   |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3:2020                                                                                                                   |                            |                                                                                        |            |      | Criterion A   |
| Electrical Fast Transient (EFT)                  | IEC 61000-4-4:2012, ±2kV                                                                                                             |                            |                                                                                        |            |      | Criterion A   |
| Surge                                            | IEC 61000-4-5:2014+A1:2017, L-N: ±2kV, L-E (Ground): ±4kV                                                                            |                            |                                                                                        |            |      | Criterion A   |
| Conducted Disturbances, Induced by RF Fields     | IEC 61000-4-6:2013+C0R1:2015                                                                                                         |                            |                                                                                        |            |      | Criterion A   |
| Power Frequency Magnetic Field                   | IEC 61000-4-8:2009                                                                                                                   |                            |                                                                                        |            |      | 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="#">LFM200S Series App Notes</a>                                                                                             |                            |                                                                                        |            |      |               |

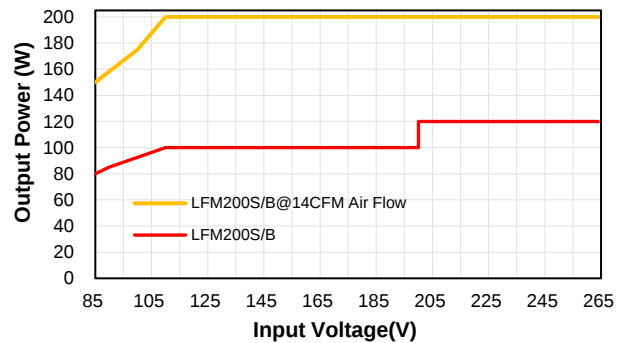
## CHARACTERISTIC CURVE

### Power Derating Curve

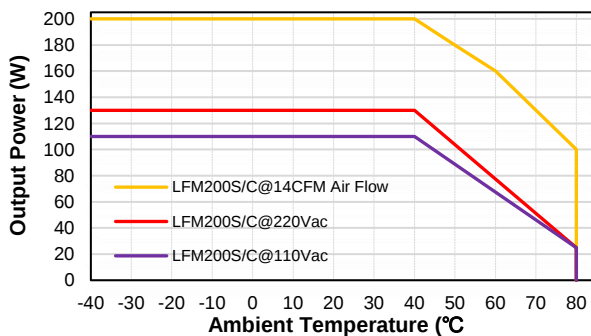
Output Power vs Ambient Temperature



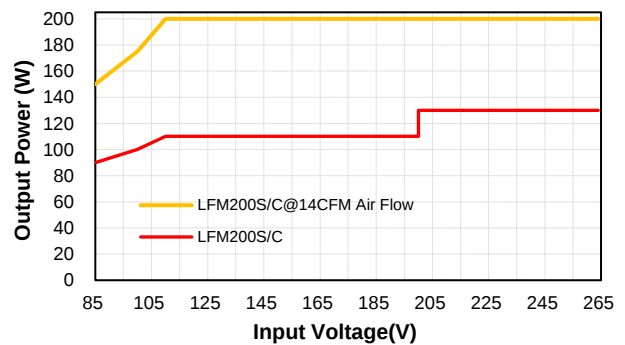
Output Power & Input Voltage



Output Power vs Ambient Temperature

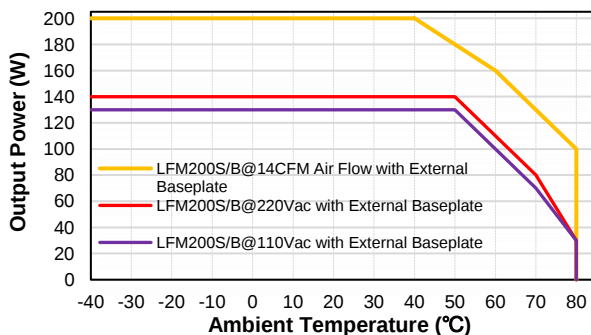


Output Power & Input Voltage

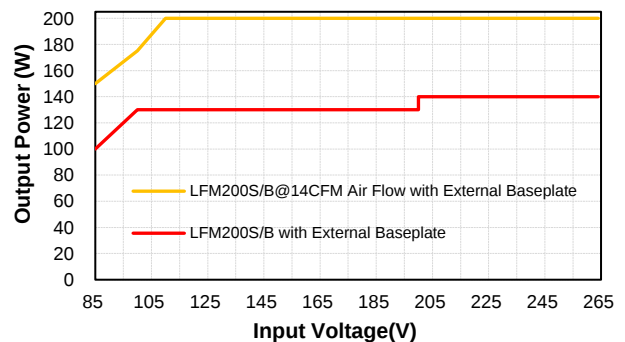


### Conduction Convection with External Baseplate (17.78cmx17.78cmx0.2cm)

Output Power vs Ambient Temperature

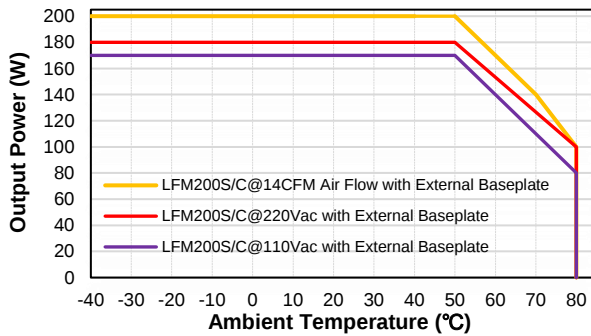


Output Power & Input Voltage

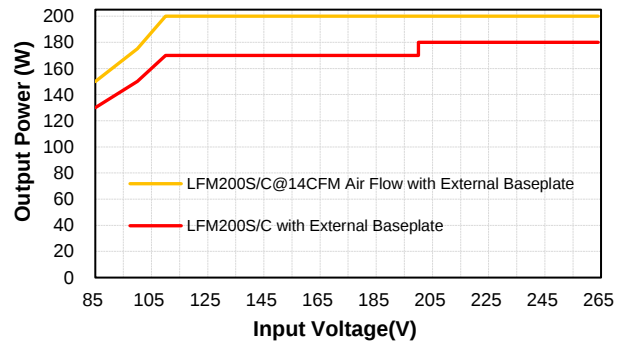


# LFM200S Series

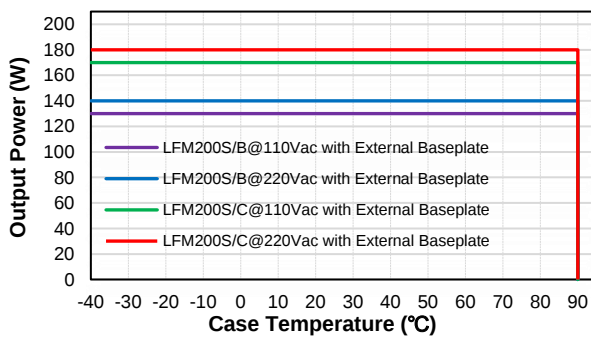
Output Power vs Ambient Temperature



Output Power & Input Voltage

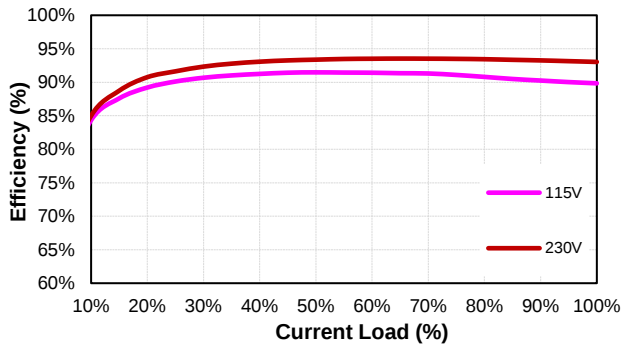


Output Power vs Case Temperature ( $T_c$ )

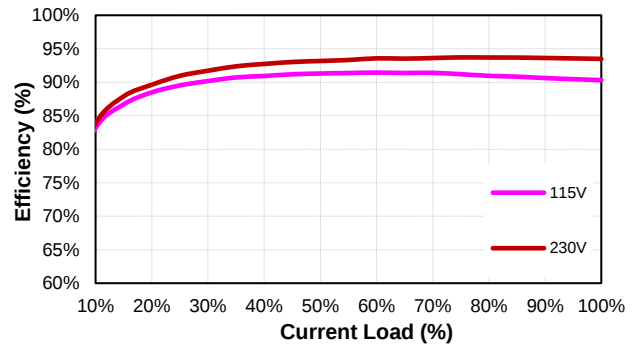


## Performance Data

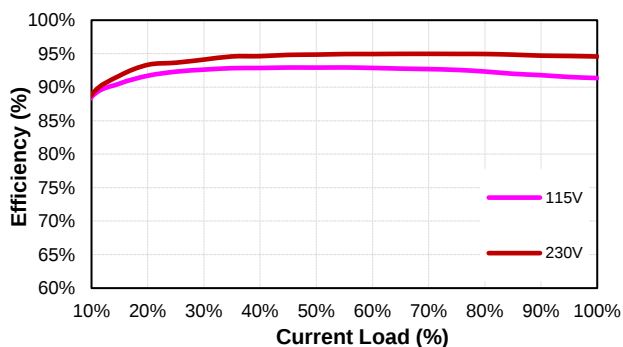
LFM200S120 (Eff Vs Io)



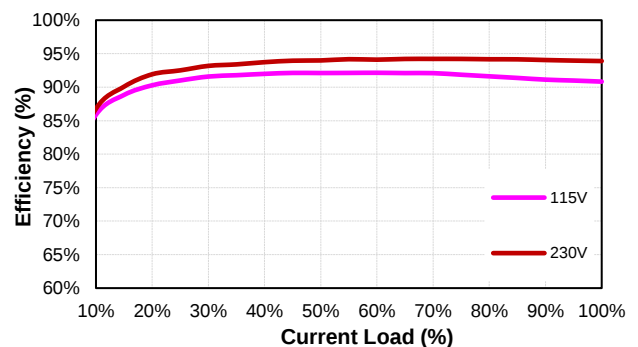
LFM200S150 (Eff Vs Io)



LFM200S240 (Eff Vs Io)

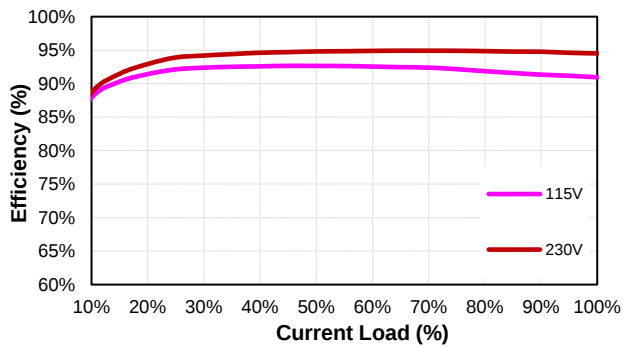


LFM200S280 (Eff Vs Io)

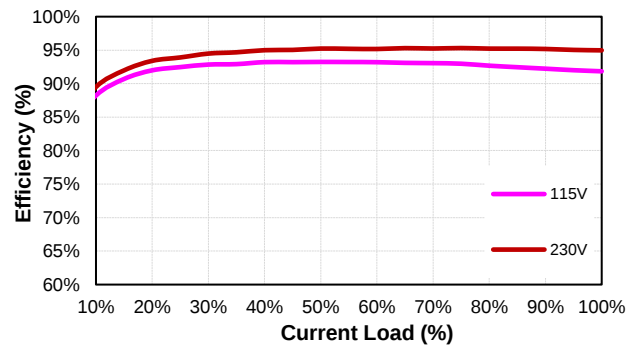


# LFM200S Series

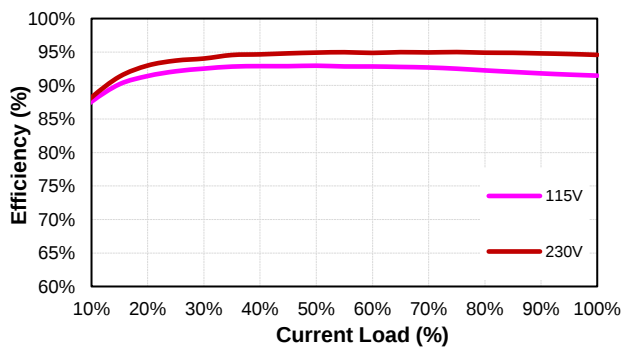
LFM200S300 (Eff Vs Io)



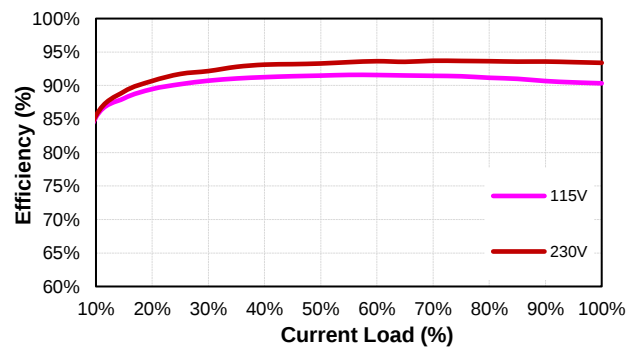
LFM200S360 (Eff Vs Io)



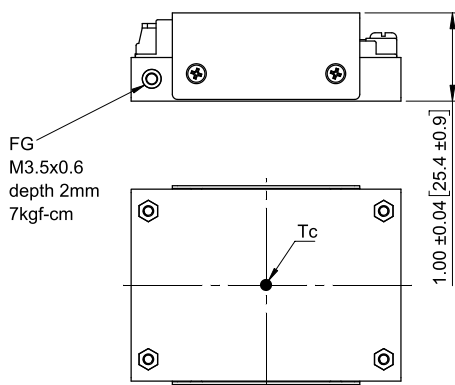
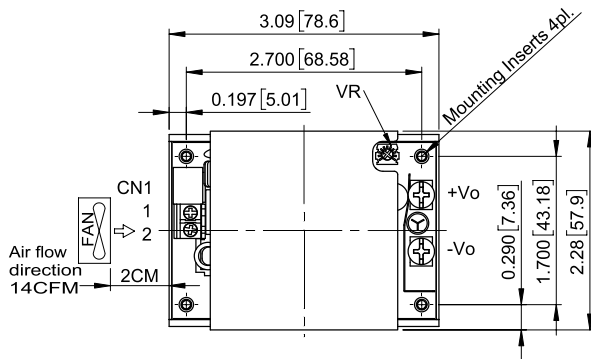
LFM200S480 (Eff Vs Io)



LFM200S540 (Eff Vs Io)



## MECHANICAL SPECIFICATION



### LFM200SXXXC LFM200SXXXC-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

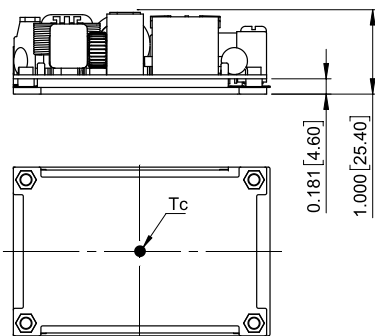
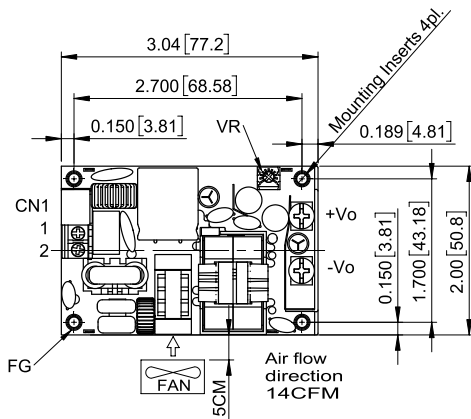
| Pin | Function | Mating Wire Range |
|-----|----------|-------------------|
| 1   | ACL      | 14~18 AWG         |
| 2   | ACN      |                   |

DC Output Connector:KANG YANG PCB-58M4

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

Mounting Inserts

| Series | Option                       |
|--------|------------------------------|
| Blank  | Ø3.2 Through depth 10.5mm    |
| -C0    | M3x0.5 Threaded depth 10.5mm |



### LFM200SXXXB LFM200SXXXB-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  | Ø3.2 Through depth 8.1mm    |
| -C0    | M3x0.5 Threaded depth 8.1mm |

Specifications are subject to change without notice, E&OE. ALL PSU Terms & Conditions apply.

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