



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/Inches³
- Active PFC Function
- Over Voltage Category OVC II & OVC III



| MODEL NUMBER | OUTPUT VOLTAGE | OUTPUT CURRENT | | | RIPPLE & NOISE NOTE1 | VOLTAGE ACCURACY NOTE2 | VOLTAGE ADJ. RANGE | LINE REGULATION NOTE3 | LOAD REGULATION NOTE4 | % EFF. (Typ.) NOTE5 |
|--------------|----------------|----------------|-------------------------------|---------|----------------------|------------------------|--------------------|-----------------------|-----------------------|---------------------|
| | | With Fan NOTE6 | With Conduction Cooling 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 150 : 15V 240 : 24V 280 : 28V 300 : 30V 360 : 36V 480 : 48V 540 : 54V | B : With Baseplate C : With Cover | Blank : Through Hole 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



LFM200S 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 | Safety approvals only to the AC input | All | 85 | | 264 | V_{ac} |
| | | | 115 | | 370 | V_{dc} |
| Operating Temperature | See derating curve | All | -40 | | 80 | °C |
| Operating Case Temperature | At the center of base plate ($T_c =$ Case temperature) | All | -40 | | 90 | °C |
| Storage Temperature | | All | -40 | | 90 | °C |
| Operating Altitude | IEC/EN/UL 62368-1 OVC II IEC/EN/UL 62368-1 OVC III | All | | | 5000 2000 | 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 | | | 3.15 | A |
| Leakage Current | Contact leakage current Earth leakage current | All | | | 100 300 | μA |
| Inrush Current | $V_{in}=240V_{ac}$, Cold Start @25°C | All | | | 85 | A |
| Power Factor | 230 V_{ac} @ Full load | All | 0.96 | 0.98 | | |

OUTPUT CHARACTERISTICS

| PARAMETER | NOTES and CONDITIONS | Device | Min. | Typ. | Max. | Units |
|--------------------------------|---|------------|-------|------|-----------|----------|
| Output Voltage Set Point | $V_{in}=\text{Nominal } V_{in}$, $I_o=I_o \text{ max.}$, $T_c=25^\circ C$ | LFM200S120 | 11.88 | 12 | 12.12 | V_{dc} |
| | | LFM200S150 | 14.85 | 15 | 15.15 | |
| | | LFM200S240 | 23.76 | 24 | 24.24 | |
| | | LFM200S280 | 27.72 | 28 | 28.28 | |
| | | LFM200S300 | 29.7 | 30 | 30.3 | |
| | | LFM200S360 | 35.64 | 36 | 36.36 | |
| | | LFM200S480 | 47.52 | 48 | 48.48 | |
| | | LFM200S540 | 53.46 | 54 | 54.54 | |
| Operating Output Current Range | $V_{in}=85V_{ac}\sim 264V_{ac}$, see derating curve | LFM200S120 | 0 | | 16.67 | A |
| | | LFM200S150 | 0 | | 13.33 | |
| | | LFM200S240 | 0 | | 8.33 | |
| | | LFM200S280 | 0 | | 7.14 | |
| | | LFM200S300 | 0 | | 6.66 | |
| | | LFM200S360 | 0 | | 5.55 | |
| | | LFM200S480 | 0 | | 4.16 | |
| | | LFM200S540 | 0 | | 3.7 | |
| Holdup Time | $V_{in}=115V_{ac}$ | All | 10 | 12 | | ms |
| Output Voltage Regulation | | | | | | |
| Load Regulation | 10% Load to full load | All | | | ± 0.5 | % |
| Line Regulation | $V_{in}=\text{High line to low line}$ | All | | | ± 0.2 | % |
| Output Voltage Adjustment | $P_o \leq \text{max. rated power}$, $I_o \leq I_o \text{ max.}$ | 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 2. Oscilloscope is 20MHz band width. 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} 2. Output is max. load 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 2. Output is rated load 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 ₀ =100%; T _a =25°C per MIL-HDBK-217F I ₀ =100%; T _a =25°C per Telcordia SR332 | All | 450 2800 | | | k hours |
| Life Time | @75% Load, 40°C | All | 45 | | | 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 Covered versions | LFM200SXXXB LFM200SXXXC | | 130 220 | | grams |
| Dimensions | Baseplate versions Covered versions | LFM200SXXXB LFM200SXXXC | 3.04x2.00x1.00 Inches (77.2x50.8x25.4 mm) 3.09x2.28x1.00 Inches (78.6x57.9x25.4 mm) | | | |
| Safety | Class I, IEC/EN/UL 62368-1 | | | | | Ed. 3.0 |
| EMC Emission | EN 55032, EN 61000-6-4, EN 61204-3, EN 61000-3-2, EN 61000-3-3, 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 | | | | | Class A, C, D |
| Voltage Fluctuations & Flicker | EN 61000-3-3 | | | | | Criterion A |
| EMC Immunity | EN 55035, EN 61000-6-2, EN 61204-3 | | | | | |
| Electrostatic Discharge (ESD) | IEC 61000-4-2, Level 3: Air Discharge: ±8kV, Level 2: Contact Discharge: ±4kV | | | | | Criterion A |
| Radio-Frequency, Continuous Radiated Disturbance | IEC 61000-4-3, Level 3: 80~1000MHz, 10V/m | | | | | Criterion A |
| Electrical Fast Transient (EFT) | IEC 61000-4-4, Level 3: ±2kV | | | | | Criterion A |
| Surge | IEC 61000-4-5, Level 4: L-N: ±2kV, L-E (Ground): ±4kV | | | | | Criterion A |
| Conducted Disturbances, Induced by RF Fields | IEC 61000-4-6, Level 3: 0.15~80MHz, 10V | | | | | Criterion A |
| Power Frequency Magnetic Field | IEC 61000-4-8, Level 4: 30A/m | | | | | Criterion A |
| Voltage Dips | IEC/EN 61000-4-11, Dip: 30% Reduction IEC/EN 61000-4-11, Dip >95% Reduction | | | | | Criterion A |
| Voltage Interruptions | IEC/EN 61000-4-11, >95% Reduction | | | | | Criterion B |
| Application Note Link | | | | | | LFM200S Series App Notes |

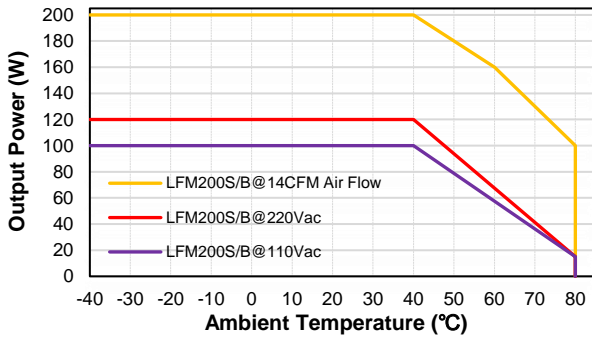


LFM200S Series

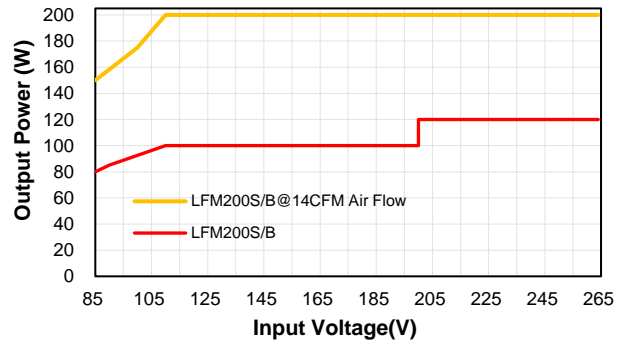
CHARACTERISTIC CURVE

Power Derating Curve

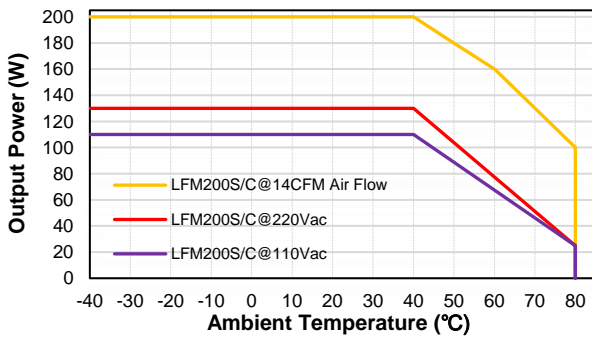
Output Power vs Ambient Temperature



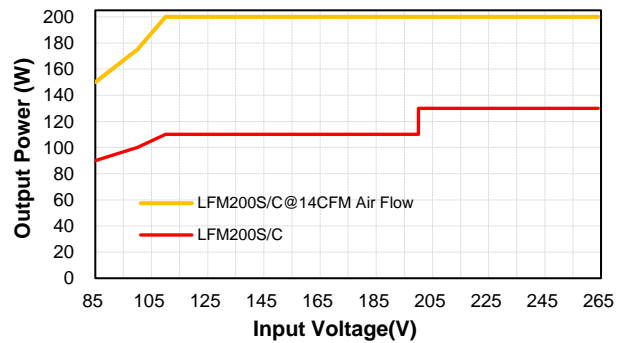
Output Power & Input Voltage



Output Power vs Ambient Temperature

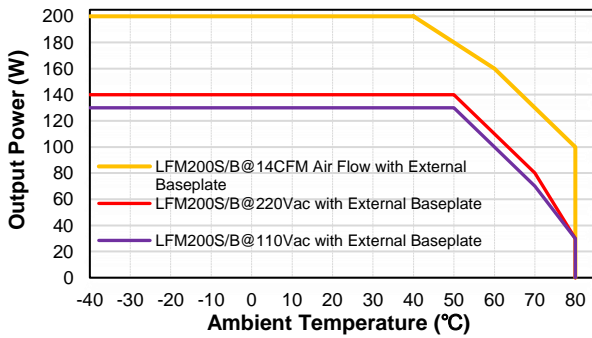


Output Power & Input Voltage

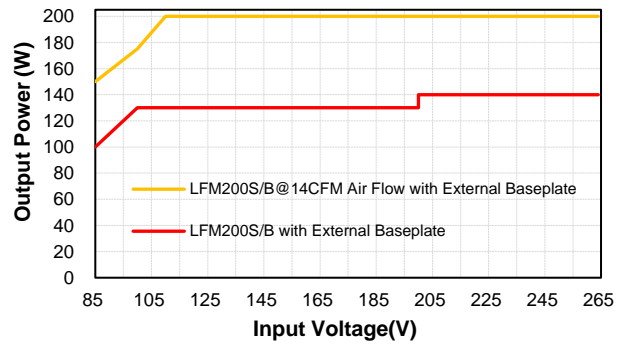


Conduction Convection with External Baseplate (17.78cmx17.78cmx0.2cm)

Output Power vs Ambient Temperature



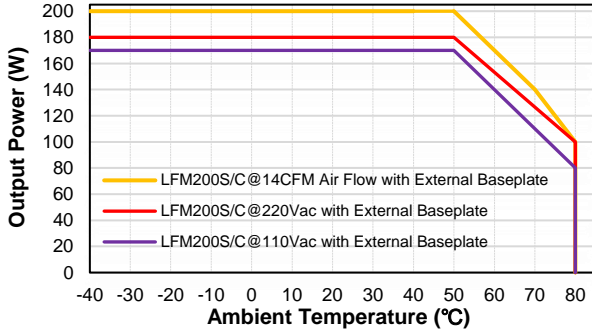
Output Power & Input Voltage



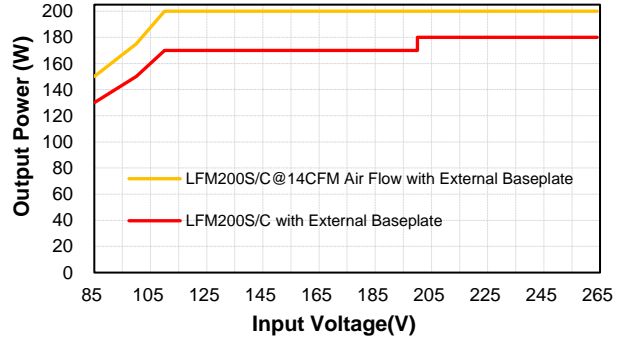


LFM200S Series

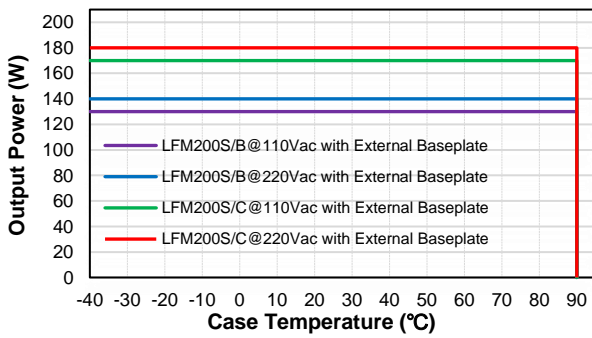
Output Power vs Ambient Temperature



Output Power & Input Voltage

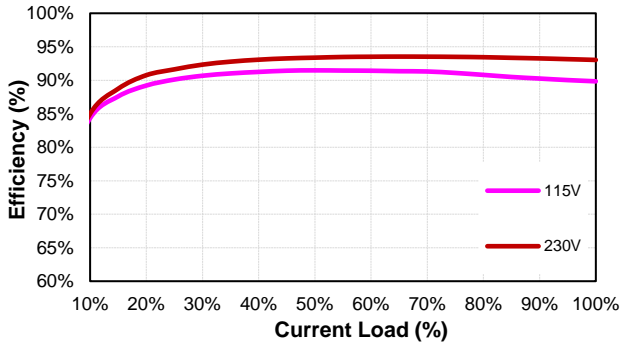


Output Power vs Case Temperature (T_c)

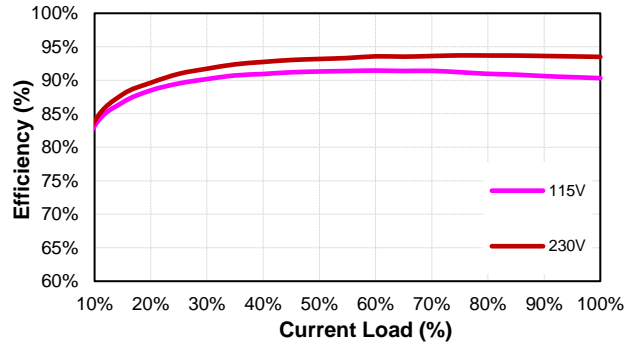


Performance Data

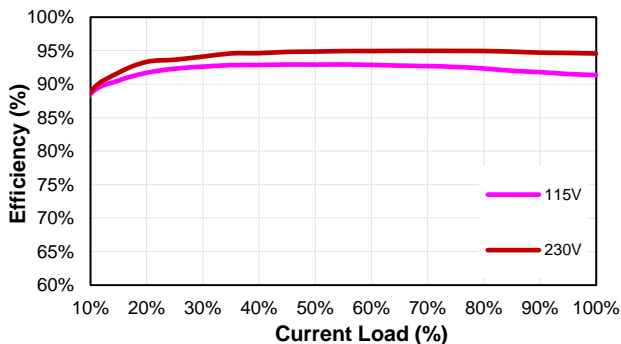
LFM200S120 (Eff Vs Io)



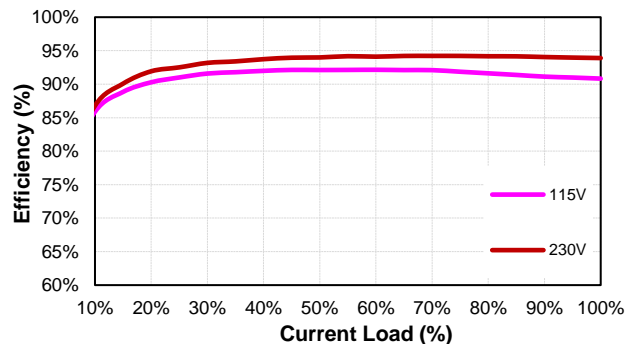
LFM200S150 (Eff Vs Io)



LFM200S240 (Eff Vs Io)



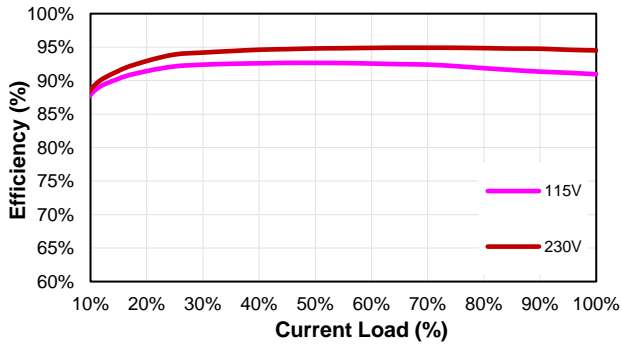
LFM200S280 (Eff Vs Io)



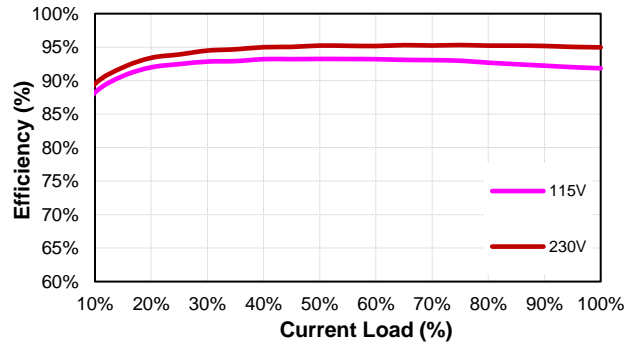


LFM200S Series

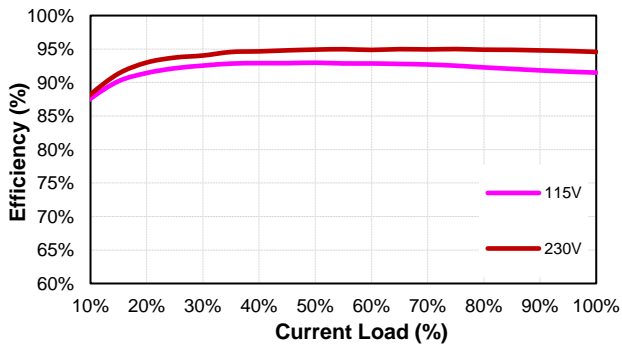
LFM200S300 (Eff Vs Io)



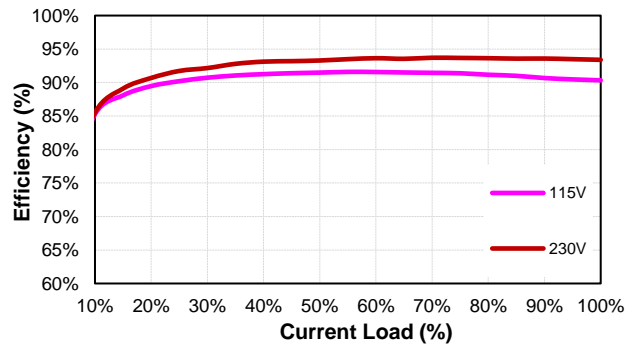
LFM200S360 (Eff Vs Io)



LFM200S480 (Eff Vs Io)



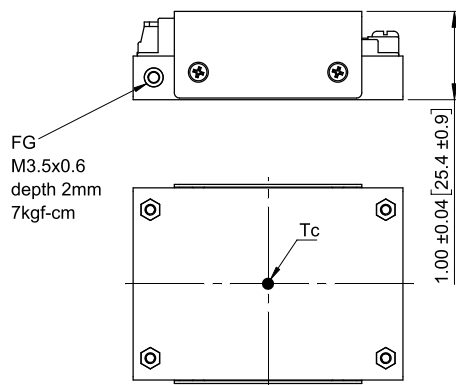
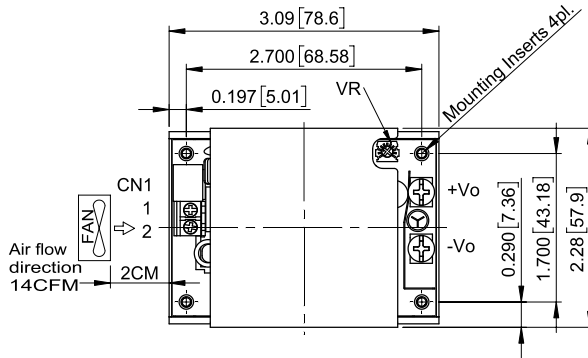
LFM200S540 (Eff Vs Io)





LFM200S Series

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

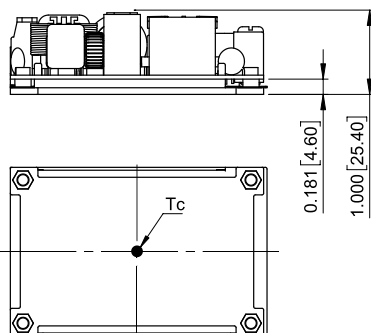
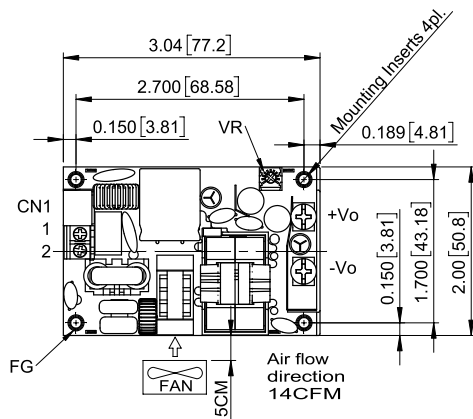
| Pin | Function | Mating Wire Range |
|-----|----------|-------------------|
| 1 | ACL | 14~18 AWG |
| 2 | ACN | |

DC Output Connector:KANG YANG PCB-58M4

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

Mounting Inserts

| Series | Option |
|--------|------------------------------|
| Blank | ∅3.2 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 | ∅3.2 Through depth 8.1mm |
| -C0 | M3x0.5 Threaded depth 8.1mm |

CINCON Electronics Co. Ltd.
Add: 14F, No. 306, Sec.4, Hsin Yi Rd., Taipei, Taiwan
Tel: 886-2-27086210
Fax: 886-2-27029852
E-mail: sales@cincon.com.tw
Web: www.cincon.com