



Specification

AC INPUT VOLTAGE
90~264 VAC, 47~440Hz / 127~370VDC.

POWER FACTOR (Typ.)
PF>0.95/230VAC PF>0.98/115VAC at full load

AC INPUT CURRENT (Typ.)
Maximum input current 3.5A at 115VAC, 60Hz or 1.6A at 230VAC, 60Hz with 100% output load.

INRUSH CURRENT (Typ.)
Inrush current is less than 25A at 115VAC or less than 40A at 230VAC under cold start conditions. Limiting provided by internal thermistors.

SETUP, RISE TIME
1000ms, 20ms / 230VAC at full load
3000ms, 20ms / 115VAC at full load

HOLD-UP TIME (Typ.)
16ms / 230VAC at full load
16ms / 115VAC at full load

LEAKAGE CURRENT
Leakage current is less than 180 μ A at 264VAC for earth leakage current
Leakage current is less than 100 μ A at 264VAC for patient leakage current

DC OUTPUT ADJ. RANGE
DC output voltage (or CH1 of multiple output models) can be adjusted between -5%~+10% rated output voltage by potential meter.

OVERLOAD PROTECTION
Fully protected against short circuit and output overload. The hiccup type protection will be activated at 120~160% rated load and recovers automatically after fault condition is removed.

OVER VOLTAGE PROTECTION
Provided on output channel 1 only at 115%~135% rated output voltage. Output will be shut down when this protection is activated.

OVER TEMPERATURE PROTECTION
When the temperature of TSW1 which detect on heat sink of power transistor reaches 95 $^{\circ}$ C, This protection is activated. Then output will be shut down and recovers automatically after temperature goes down.

POWER GOOD / FAIL SIGNAL
TTL logic high for power good and TTL low for power fail. When the output voltage reaches 90% of rated value, a +5V TTL signal will be sent out with a 10~500ms delay; At least 1ms before the output voltage goes below 90% of the rated value, the TTL signal will be turned off.
* MPS-200-3.3 does not have this function.

REMOTE CONTROL
RC+/RC-:0 ~ 0.8V=power on; 4 ~ 10V=power off sink current<4~10mA

Features

- Universal AC input / Full range
- Low leakage current <180 μ A
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Free air convection for 140W and forced air convection for 200W
- UL60601-1 medical safety approved
- With power good and fail signal output
- Built-in remote ON-OFF control
- Built-in remote sense function
- Fixed switching frequency at 100KHz
- 3 years warranty



WORKING TEMP.
Whole series can operate from -20~70 $^{\circ}$ C. Please refer to the derating curves.

WORKING HUMIDITY
20~90% RH non-condensing.

STORAGE TEMP., HUMIDITY
-40~+85 $^{\circ}$ C, 10~90% RH

TEMP. COEFFICIENT
 \pm 0.04%/ $^{\circ}$ C on all outputs at full load between 0~50 $^{\circ}$ C of ambient temperature.

VIBRATION
2G of acceleration, vibrating frequency adjust from 10Hz ~500Hz within a 10-minute cycle. 6 testing cycles (60 minutes) each along X, Y, Z axes.

SAFETY STANDARDS
Medical : UL60601-1, TUV EN60601-1, IEC60601-1 approved
Commercial : Also design refer to UL60950-1, TUV EN60950-1

WITHSTAND VOLTAGE
4000VAC between input and output
1500VAC between input and F.G.
1500VAC between output and F.G.

ISOLATION RESISTANCE
>100M Ohms for I/P-O/P, I/P-FG, O/P-FG by using 500VDC test voltage.

EMI COMPLIANCE

| | |
|-----------------------|------------------|
| EMI Specifications | Compliance Level |
| Conducted & Radiation | EN55011, Class B |
| | EN55022, Class B |
| Harmonic distortion | EN61000-3-2 |
| Voltage flicker | EN61000-3-3 |

EMS COMPLIANCE

| | |
|--------------------------------------|-------------------------------------|
| EMS Specification | Compliance Level |
| ESD air | EN61000-4-2, Level 3, 8KV |
| ESD contact | EN61000-4-2, Level 2, 4KV |
| RF field susceptibility | EN61000-4-3, Level 2, 3V/m |
| | Level 3, 10V/m |
| EFT(Electrical Fast Transient)/Burst | EN61000-4-4, Level 2, 1KV/5KHz |
| | Level 3, 2KV/5KHz |
| Lightning/Surge | EN61000-4-5, Level 4, 2KV/Line-Line |
| | 4KV/Line-Earth |
| Conducted RF susceptibility | EN61000-4-6, Level 2, 3Vrms/m |
| | Level 3, 10Vrms/m |
| Magnetic field immunity | EN61000-4-8, Level 2, 3A/m |
| | Level 3, 10A/m |
| Voltage dip, interruption | EN61000-4-11, Compliance |
| Digital phone carrier immunity | ENV50204, Level 2, 3V/m, 900MHZ |
| | Level 3, 10A/m, 900MHZ |

MTBF
262,100 hours min. at full load and 25 $^{\circ}$ C of ambient temperature, calculated per MIL-HDBK-217F.

DIMENSION (L*W*H)
177.8x107.2x35.5mm or 7"x4.22"x1.4"

PACKING
0.66Kg; 24pcs/16.8Kg/0.99CUFT



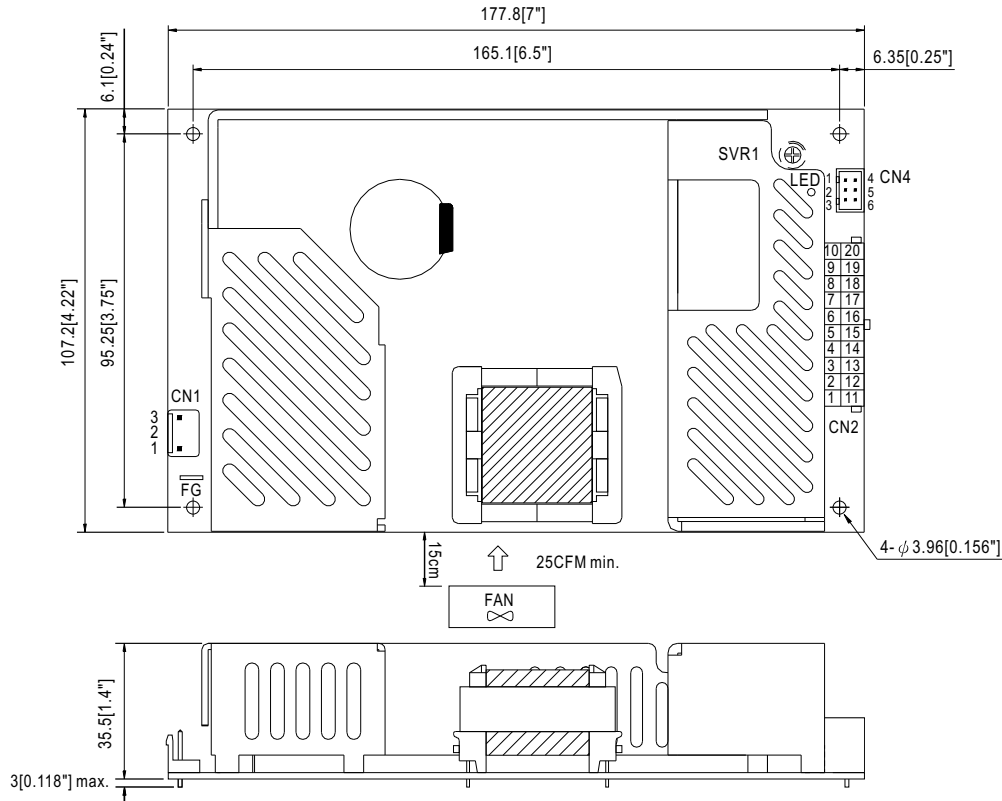
■ Output Chart

| MODEL | OUTPUT VOLTAGE | RATED CURRENT | OUTPUT CURRENT | | | | RIPPLE & NOISE (Max.) (Note 2) | VOLTAGE TOLERANCE (Note 3) | LINE REGULATION | LOAD REGULATION | EFFICIENCY (typ.) |
|-------------|----------------|---------------|----------------|-------------------|------------------|-----------------------------------|--------------------------------|----------------------------|-----------------|-----------------|-------------------|
| | | | MINIMUM LOAD | CONVECTION (max.) | WITH FAN (25CFM) | PEAK LOAD WITH 25CFM FAN (Note 4) | | | | | |
| MPS-200-3.3 | 3.3V | 40A | 0A | 28A | 40A | 48A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 77% |
| MPS-200-5 | 5V | 40A | 0A | 28A | 40A | 48A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 81% |
| MPS-200-12 | 12V | 16.7A | 0A | 11.7A | 16.7A | 20A | 100mVp-p | ±2.0% | ±0.5% | ±1.0% | 84% |
| MPS-200-15 | 15V | 13.4A | 0A | 9.4A | 13.4A | 16A | 100mVp-p | ±2.0% | ±0.5% | ±1.0% | 85% |
| MPS-200-24 | 24V | 8.4A | 0A | 5.9A | 8.4A | 10A | 150mVp-p | ±1.0% | ±0.5% | ±1.0% | 86% |
| MPS-200-48 | 48V | 4.2A | 0A | 3A | 4.2A | 5A | 200mVp-p | ±1.0% | ±0.5% | ±1.0% | 87% |
| MPD-200A | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 82% |
| | 12V | 8A | 0.8A | 5.4A | 8A | 9.6A | 120mVp-p | +8,-5% | ±1.0% | ±4.0% | |
| MPD-200B | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 83% |
| | 24V | 4A | 0.4A | 2.7A | 4A | 4.8A | 180mVp-p | ±6.5% | ±1.0% | +4,-6% | |
| MPT-200A | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 80% |
| | 12V | 7.5A | 0.8A | 5A | 7.5A | 9A | 120mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | -5V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPT-200B | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 80% |
| | 12V | 6A | 0.6A | 4.4A | 6A | 7.2A | 120mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | -12V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPT-200C | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 80% |
| | 15V | 4.7A | 0.5A | 3.3A | 4.7A | 5.6A | 150mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | -15V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPT-200D | 5V | 20A | 4A | 15A | 20A | 24A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 81% |
| | 24V | 3A | 0.3A | 2.2A | 3A | 3.6A | 180mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | 12V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPQ-200B | 5V | 15A | 3A | 12A | 15A | 18A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 78% |
| | 12V | 7A | 0.7A | 5.3A | 7A | 8.4A | 120mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | -5V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| | -12V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPQ-200C | 5V | 15A | 3A | 12A | 15A | 18A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 78% |
| | 15V | 5A | 0.5A | 4A | 5A | 6A | 150mVp-p | ±6.0% | ±1.0% | ±5.0% | |
| | -5V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| | -15V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPQ-200D | 5V | 15A | 3A | 12A | 15A | 18A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 79% |
| | 24V | 3A | 0.3A | 2.3A | 3A | 3.6A | 180mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | 12V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| | -12V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| MPQ-200F | 5V | 15A | 3A | 12A | 15A | 18A | 80mVp-p | ±2.0% | ±0.5% | ±1.0% | 81% |
| | 24V | 2.7A | 0.3A | 2.1A | 2.7A | 3.3A | 180mVp-p | ±8.0% | ±1.0% | ±5.0% | |
| | 15V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |
| | -15V | 2A | 0A | 1A | 2A | 2.4A | 80mVp-p | ±5.0% | ±0.5% | ±1.0% | |

- Notes :
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1μf & 47μf parallel capacitor.
 3. Tolerance : includes set up tolerance, line regulation and load regulation.
 4. 33% Duty cycle maximum within every 30 seconds. Average output power should not exceed the rated power.
 5. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
 6. Derating may be needed under low input voltages. Please check the derating curve for more details.

■ Mechanical Specification(MPS-200)

Unit:mm



AC Input Connector (CN1) : JST B3P-VH or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|-----------------------|--------------------------------|
| 1 | AC/N | JST VHR or equivalent | JST SVH-21T-P1.1 or equivalent |
| 2 | No Pin | | |
| 3 | AC/L | | |

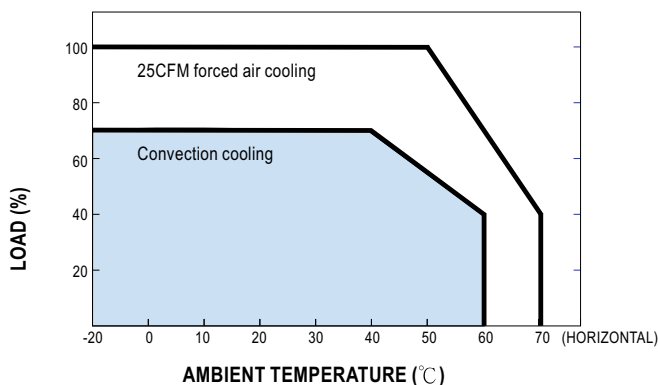
DC Output Connector (CN4) : JS-2008-03*2 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|----------------------------|-------------------------|
| 1 | PG | JS-2007-03*2 or equivalent | JS-2007-T or equivalent |
| 2 | RS- | | |
| 3 | GND | | |
| 4 | RC+ | | |
| 5 | RS+ | | |
| 6 | RC- | | |

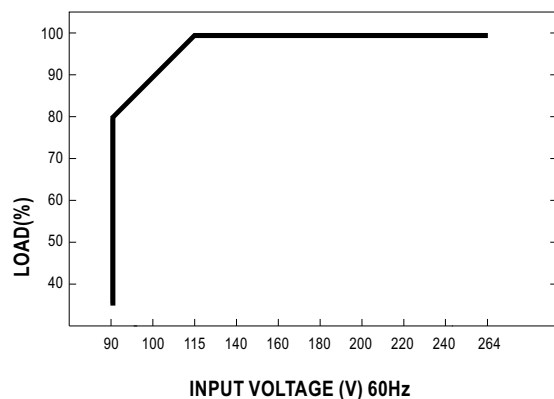
DC Output Connector (CN2) : MOLEX 5566-20 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|-------------|--------------|--------------------------|--------------------------|
| 1~5, 11~15 | DC OUTPUT -V | MOLEX 5557 or equivalent | MOLEX 5556 or equivalent |
| 6~10, 16~20 | DC OUTPUT +V | | |

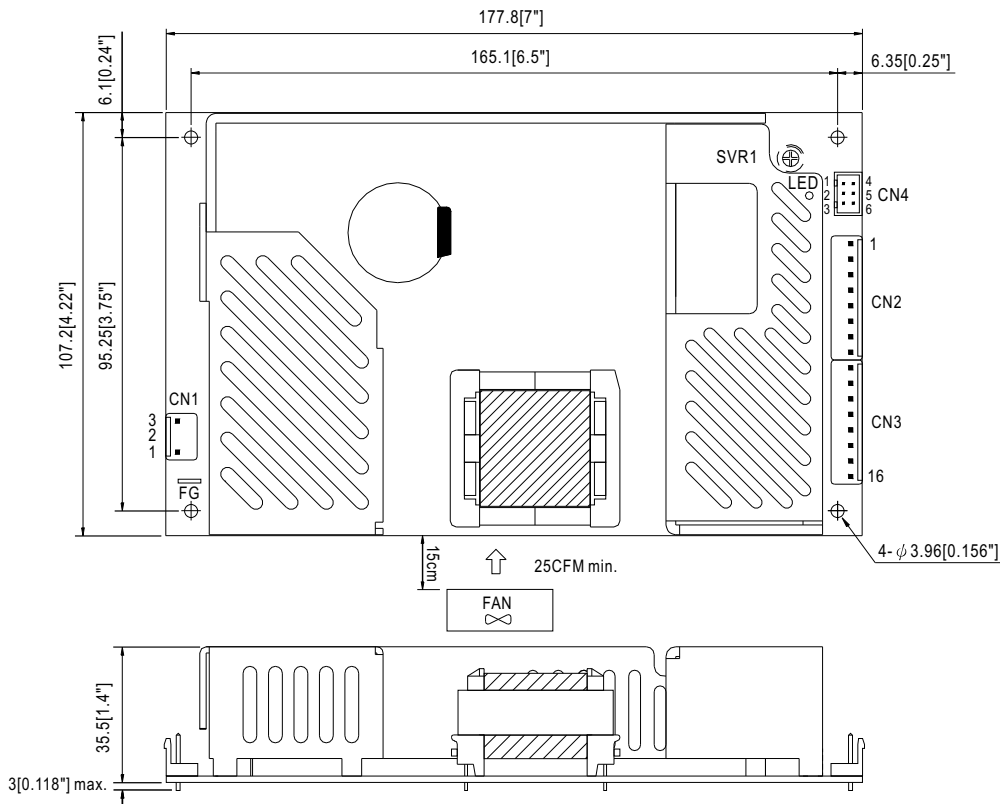
■ Derating Curve (MPS-200)



■ Static Characteristics (MPS-200)



■ Mechanical Specification (MPD/T/Q-200)



AC Input Connector (CN1) : JST B3P-VH or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|-----------------------|--------------------------------|
| 1 | AC/N | JST VHR or equivalent | JST SVH-21T-P1.1 or equivalent |
| 2 | No Pin | | |
| 3 | AC/L | | |

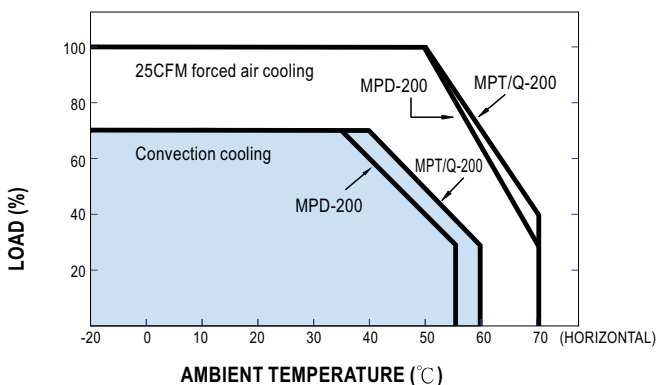
DC Output Connector (CN4) : JS-2008-03*2 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|----------------------------|-------------------------|
| 1 | PG | JS-2007-03*2 or equivalent | JS-2007-T or equivalent |
| 2 | RS- | | |
| 3 | GND | | |
| 4 | RC+ | | |
| 5 | RS+ | | |
| 6 | RC- | | |

DC Output Connector (CN2,3) : JST B8P-VH*2 or equivalent

| Pin No. | Assignment | Mating Housing | Terminal |
|---------|------------|-----------------------|--------------------------------|
| 1,2,3,4 | V1 | JST VHR or equivalent | JST SVH-21T-P1.1 or equivalent |
| 5~11 | COM | | |
| 12,13 | V2 | | |
| 14 | V3 | | |
| 15 | No pin | | |
| 16 | V4 | | |

■ Derating Curve (MPD/T/Q-200)



■ Static Characteristics (MPD, T, Q-200)

