



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



1~4 Output Medical Type

200W Medical series

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.

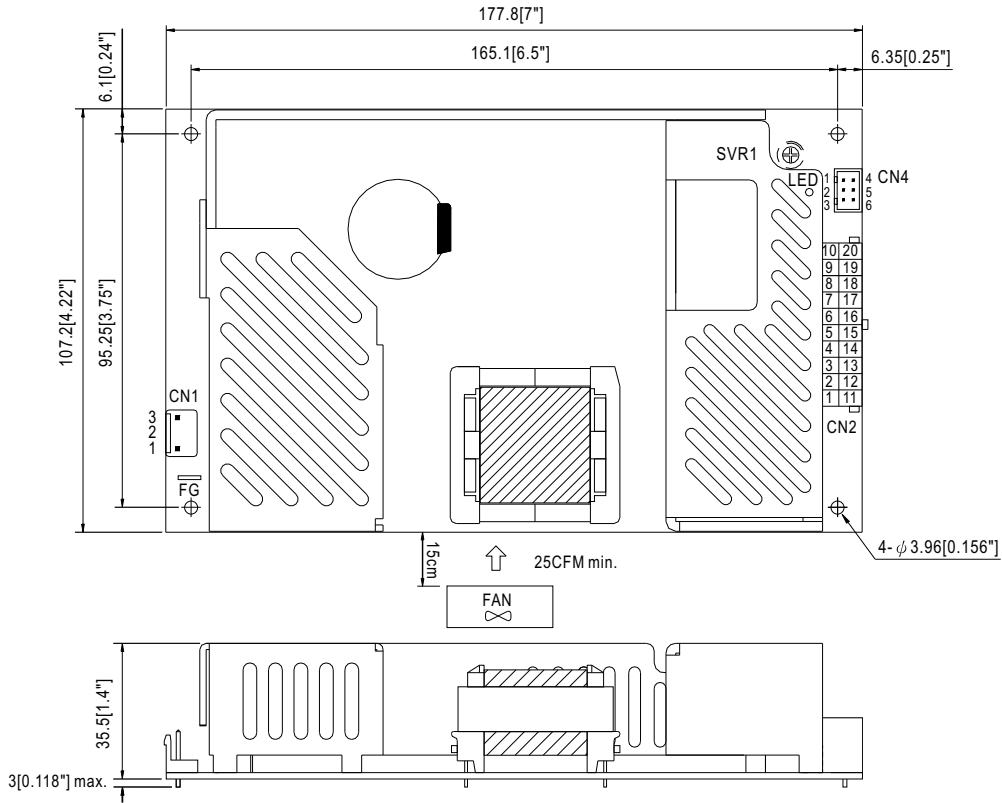


1~4 Output Medical Type

200W Medical series

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 | | |

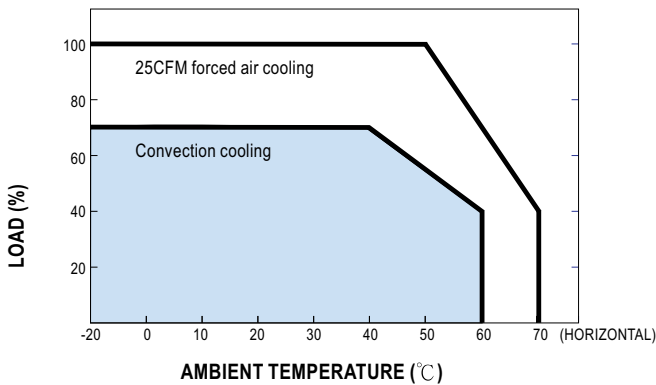
DC Output Connector (CN4) : JS-2008-03*2 or equivalent

| 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- | | |

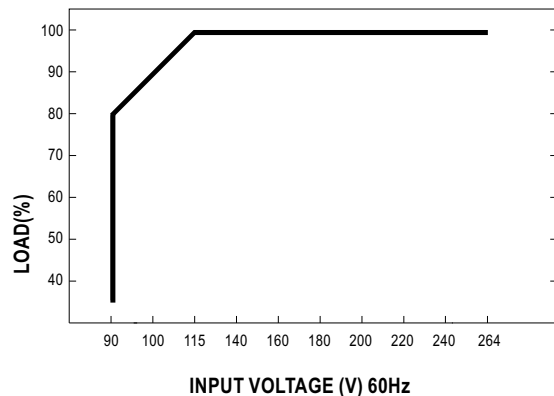
DC Output Connector (CN2) : MOLEX 5566-20 or equivalent

| 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)



MODEL: MPQ-200F

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|--|--|--|---------|
| 1 | RIPPLE & NOISE | V1: 80 mVp-p (Max) V2: 180 mVp-p (Max) V3: 80 mVp-p (Max) V3: 80 mVp-p (Max) | I/P: 230VAC O/P:FULL LOAD Ta:25°C | V1: 34 mVp-p (Max) V2: 88 mVp-p (Max) V3: 34 mVp-p (Max) V4: 29 mVp-p (Max) | P |
| 2 | OUTPUT VOLTAGE ADJUST RANGE | CH1: 4.75 V- 5.5 V | I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C | 4057 V- 5.63 V/ 230 VAC 4057 V- 5.63 V/ 115 VAC | P |
| 3 | OUTPUT VOLTAGE TOLERANCE | V1: 2 %- -2 % (Max) V2: 8 %- -8 % (Max) V3: 5 %- -5 % (Max) V4: 5 %- -5 % (Max) | I/P: 115 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C | V1: 0.12 %- -0.12 % V2: 3.2 %- -3.2 % V3: 0.1 %- -0.1 % V4: 0.1 %- -0.1 % | P |
| 4 | LINE REGULATION | V1: 0.5 %- -0.5 % (Max) V2: 1 %- -1 % (Max) V3: 0.5 %- -0.5 % (Max) V4: 0.5 %- -0.5 % (Max) | I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C | V1: 0 %- 0 % V2: 0.03 %- -0.03 % V3: 0.05 %- -0.05 % V4: 0 %- 0 % | P |
| 5 | LOAD REGULATION | V1: 1 %- -1 % (Max) V2: 5 %- -5 % (Max) V3: 1 %- -1 % (Max) V4: 1 %- -1 % (Max) | I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C | V1: 0.12 %- -0.12 % V2: 2.5 %- -2.5 % V3: 0.05 %- -0.05 % V4: 0.05 %- -0.05 % | P |
| 6 | CROSS REGULATION | V1: 1 %- -1 % (Max) V2: 5 %- -5 % (Max) V3: 1 %- -1 % (Max) V4: 1 %- -1 % (Max) | I/P: 230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25°C | V1: 0.12 %- -0.12 % V2: 3.2 %- -3.2 % V3: 0.05 %- -0.05 % V4: 0.05 %- -0.05 % | P |
| 7 | SET UP TIME | 230VAC: 1000 ms (Max) 115 VAC: 3000 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230VAC/ 681 ms 115VAC/ 1881 ms | P |
| 8 | RISE TIME | 230VAC: 20 ms (Max) 115VAC: 20 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230VAC/ 14 ms 115VAC/ 13 ms | P |
| 9 | HOLD UP TIME | 230VAC: 16 ms (TYP) 115VAC: 16 ms (TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230VAC/ 17.6 ms 115VAC/ 17.8 ms | P |
| 10 | OVER/UNDERSHOOT TEST | < ±5% | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | TEST: <5 % | P |
| 11 | DYNAMIC LOAD | V1: 1000 mVp-p | I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C | 100 mVp-p | P |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|--|---|---------|
| 1 | INPUT VOLTAGE RANGE | 90VAC-264 VAC) | I/P:TESTING O/P:FULL LOAD Ta:25°C | 73 V-264V | P |
| | | | I/P: LOW-LINE-3V= 87 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE) | TEST: OK | |
| 2 | INPUT FREQUENCY RANGE | 47HZ ~440HZ NO DAMAGE OSC | I/P: 90 VAC ~ 264 VAC O/P:FULL -MIN LOAD Ta:25°C | TEST: OK | P |
| 3 | POWER FACTOR | 0.95/ 230 VAC(TYP) 0.98/1150 VAC(TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | PF= 0.97 /230 VAC. PF= 0.99 /115 VAC | P |
| 4 | EFFICIENCY | 81 % (TYP) | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | 82.2 % | P |
| 5 | INPUT CURRENT | 230V/ 1.6 A (TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 1.13 A/ 230 VAC | P |
| | | 115V/ 3.5 A (TYP) | | I = 2.31 A/ 115 VAC | |
| 6 | INRUSH CURRENT | 230V/ 40 A(TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 37 A/ 230 VAC | P |
| | | 115V/ 25 A(TYP) COLD START | | I = 20 A/ 115 VAC | |
| 7 | LEAKAGE CURRENT a. For earth leakage current b. For patient leakage current | a. <180 uA / 264 VAC | I/P: 264 VAC O/P:Min LOAD Ta:25°C | a. 66.7 uA | P |
| | | b. <100 uA / 264 VAC | | b. 57 uA | |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|----------------------------|---|--|---|---------|
| 1 | OVER LOAD PROTECTION | 120 %- 160 % | I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta:25°C | 137 %/ 230 VAC 137 %/ 115 VAC Hiccup Mode | P |
| 2 | OVER VOLTAGE PROTECTION | CH1: 5.75 V- 6.75 V | I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta:25°C | 6 V/ 230 VAC 6 V/ 115 VAC Shunt down Re- power ON | P |
| 3 | OVER TEMPERATURE ROTECTION | SPEC: TSW1: 95 ± 5°C O.T.P. NO DAMAGE | I/P: 230 VAC O/P: FULL LOAD | O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down | P |
| 4 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P: 264 VAC O/P: FULL LOAD Ta:25°C | NO DAMAGE Hiccup Mode | P |

CONTROL FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------|---|---|---|---------|
| 1 | REMOTE CONTROL | Rc+ / Rc- 0V- 0.8V POWER ON 4V- 10V POWER OFF | I/P: 230 VAC O/P: FULL LOAD Ta:25°C | 0V ~ 2.5 V POWER ON 2.6 V ~ 10 V POWER OFF | P |
| 2 | POWER GOOD SIGNAL | DELAY 10ms ~ 500ms | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta:25°C | 301 ms/ 230 VAC 301 ms/ 115 VAC | P |
| 3 | POWER FAIL SIGNAL | > 1ms | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta:25°C | 5 ms/ 230 VAC 5 ms/ 115 VAC | P |
| 4 | REMOTE SENSE | >0.25V | I/P: 230 VAC O/P: FULL LOAD Ta:25°C | >0.25V | P |

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|---|---|-------------------|---------|
| 1 | TEMPERATURE RISE TEST | MODEL : MPQ-200B WITH FAN 1. ROOM AMBIENT BURN-IN : 2HRS I/P: 230VAC O/P: FULL LOAD Ta= 28.8 °C 2. HIGH AMBIENT BURN-IN : 2HRS I/P: 230VAC O/P: FULL LOAD Ta= 50.7 °C | | | P |
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| 2 | OVER LOAD BURN-IN TEST | NO DAMAGE 1 HOUR (MIN) | I/P: 230 VAC O/P: V1@20A V2@9A V3@2.4A V4@2.4A Ta:25°C | TEST : OK | P |
| 3 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P: 230 VAC O/P: 80 % LOAD Ta= -20 °C | TEST : OK | P |
| 4 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE | I/P: 272 VAC O/P: FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H | TEST : OK | P |
| 5 | TEMPERATURE COEFFICIENT | ± 0.04 % (0~50°C) | I/P: 230 VAC O/P: FULL LOAD | ± 0.02 % (0~50°C) | P |
| 6 | VIBRATION TEST | 1 Carton & 1 Set Operating (1) Waveform: Sine Wave (2) Frequency: 10~500Hz (3) Sweep Time: 10min/sweep cycle (4) Acceleration: 2G (5) Test Time: 1 hour in each axis (X.Y.Z) (6) Ta: 25°C | | TEST : OK | P |

SAFETY TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|----------------------|---|--|---|---------|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 4 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 1.5 KVAC/min | I/P-O/P: 4.2 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 1.8 KVAC/min Ta:25°C | I/P-O/P: 2.08 mA I/P-FG: 0.83 mA O/P-FG: 0.13 mA NO DAMAGE | P |
| 2 | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ | I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C | I/P-O/P: 18 GΩ I/P-FG: 16 GΩ O/P-FG: 30 GΩ NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS OR TRACE < 100 mΩ | 40 A / 2min Ta:25°C | 18 mΩ | P |
| 4 | APPROVAL | TUV: Certificate NO : TA50069957 UL: File NO : E227340 | | | P |

E.M.C TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|---|-------------------------------|---------|
| 1 | HARMONIC | EN61000-3-2 CLASS A | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | PASS | P |
| 2 | CONDUCTION | EN55022 CLASS B | I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C | PASS Test by certified Lab | P |
| 3 | RADIATION | EN55022 CLASS B | I/P: 230 VAC (50HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | P |
| 4 | E.S.D | EN61000-4-2 INDUSTRY AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 5 | E.F.T | EN61000-4-4 INDUSTRY INPUT: 2KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 6 | SURGE | IEC61000-4-5 INDUSTRY L-N :2KV L,N-PE:4KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | P |
| 7 | Test by certified Lab & Test Report Prepare | | | | |

M.T.B.F & LIFE CYCLE CALCULATION

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|--|----------------|--------|---------|
| 1 | CAPACITOR LIFE CYCLE | SUPPOSE C110 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 437900 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 72238 HRS | | | P |
| 2 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 262.1K HRS | | | P |



COMPONENT STRESS TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|--|--|---|--|---------|
| 1 | Power Transistor (D to S) or (C to E) Peak Voltage | Q20 Rated IRFP450 : 500 V 14A | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 380 V (2) 386 V (3) 382 V | P |
| 2 | Diode Peak Voltage | D100 Rated SBL3040PT : 40 V 30 A D200 Rated S20LC20U : 200 V 20 A D300 Rated FMX-12SL : 200 V 10 A D300 Rated FMX-12SL : 200 V 10 A | I/P:High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 23.4 V (2) 20.3 V (3) 24.1 V (1) 101 V (2) 83.2 V (3) 104 V (1) 77.2 V (2) 56.6 V (3) 77.2 V (1) 80.4 V (2) 57.4 V (3) 82.4 V | P |
| 3 | Input Capacitor Voltage | C 5 Rated : 150u / 400V/ 105°C | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (4) Burn in 1hour Ta:25°C | (1) 380 V (2) 380 V (3) 392 V (4) 382 V | P |
| 4 | Control IC Voltage Test | U1 Rated ML4800 : 18 V | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C | (1) 14.9 V (2) 14.9 V (3) 15.4 V | P |
| 5 | Power Transistor (D to S) or (C to E) Peak Voltage | Q1 Rated IRFP460A : 500 V 20A | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 386 V (2) 404 V (3) 384 V | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|-----------|----------------------------|-------------|---------------|----------|
| 2005/5/17 | RD SAMPLE | PASS | VINCENT TSENG | MAX LIN |
| 2005/9/3 | PRODUCT SAMPLE W0507B20 | PASS | VINCENT TSENG | MAX LIN |

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