

MODEL : IPC-200

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|--|--|--|---------|
| 1 | RIPPLE & NOISE | V1:50 mVp-p (Max) V2:50 mVp-p (Max) V3:120 mVp-p (Max) V4:100 mVp-p (Max) V5:120 mVp-p (Max) V6:50 mVp-p (Max) | I/P: 230VAC O/P:FULL LOAD Ta:25°C | V1: 13 mVp-p (Max) V2: 6 mVp-p (Max) V3: 30 mVp-p (Max) V4: 3 mVp-p (Max) V5: 10 mVp-p (Max) V6: 10 mVp-p (Max) | P |
| 2 | OUTPUT VOLTAGE ADJUST RANGE | CH1: 3.14V~ 3.5V | I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C | 3.07 V~ 3.76 V/ 230 VAC 3.07 V~ 3.76 V/ 115 VAC | P |
| 3 | OUTPUT VOLTAGE TOLERANCE | V1: 5 %- -5 % (Max) V2: 5 %- -5 % (Max) V3: 7 %- -7 % (Max) V4: 8 %- -8 % (Max) V5: 10 %- -10 % (Max) V6: 5 %- -5 % (Max) | I/P: 115 VAC / 264 VAC O/P:FULL/ 40% LOAD Ta:25°C | V1: 1 %- -1 % V2: 2.9 %- -2.9 % V3: 2.5 %- -2.5 % V4: 0.5 %- -0.5 % V5: 4.5 %- -4.5 % V6: 1.5 %- -1.5 % | P |
| 4 | LINE REGULATION | V1: 1 %- -1 % (Max) V2: 1 %- -1 % (Max) V3: 1 %- -1 % (Max) V4: 2 %- -2 % (Max) V5: 2 %- -2 % (Max) V6: 1 %- -1 % (Max) | I/P: 115 VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C | V1: 0 %- 0 % V2: 0.13 %- -0.13 % V3: 0.05 %- -0.05 % V4: 0 %- 0 % V5: 0.06 %- -0.06 % V6: 0.15 %- -0.15 % | P |
| 5 | LOAD REGULATION | V1: 5 %- -5 % (Max) V2: 5 %- -5 % (Max) V3: 7 %- -7 % (Max) V4: 8 %- -8 % (Max) V5: 10 %- -10 % (Max) V6: 5 %- -5 % (Max) | I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C | V1: 1 %- -1 % V2: 2.9 %- -2.9 % V3: 0.8 %- -2.3 % V4: 0.4 %- -0.4 % V5: 0.7 %- -4.5 % V6: 1.3 %- -1.3 % | P |
| 6 | CROSS REGULATION | V1: 5 %- -5 % (Max) V2: 5 %- -5 % (Max) V3: 7 %- -7 % (Max) V4: 8 %- -8 % (Max) V5: 10 %- -10 % (Max) V6: 5 %- -5 % (Max) | I/P: 230 VAC O/P: Testing O/P 60%LOAD Other O/P 40%LOAD Change Ta:25°C | V1: 0.4 %- -0.4 % V2: 0.25 %- -0.25 % V3: 1.7 %- -1.7 % V4: 0.5 %- -0.5 % V5: 0.9 %- -0.9 % V6: 0.5 %- -0.5 % | P |
| 7 | SET UP TIME | 230VAC: 800 ms (Max) 115 VAC: 2500 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230VAC/ 182 ms 115VAC/ 546 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/ 14 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/ 17.3 ms 115VAC/ 18.4 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: 660 mVp-p | I/P: 230 VAC O/P:FULL /50% LOAD 90%DUTY/1KHZ Ta:25°C | 155 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 | 58V~264V | P |
| | | | I/P: LOW-LINE-3V= 87V 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 ~63 HZ NO DAMAGE OSC | I/P: 90VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C | TEST: OK | P |
| 3 | POWER FACTOR | 0.95 / 230 VAC (TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | PF= 0.95 / 230 VAC | P |
| | | 0.95 / 115 VAC (TYP) | | PF= 0.99 / 115 VAC | |
| 4 | EFFICIENCY | 75% (TYP) | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | 75.6 % | P |
| 5 | INPUT CURRENT | 230V/ 1.7 A (TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 1.23 A/ 230 VAC | P |
| | | 115V/ 3.5 A (TYP) | | I = 2.44 A/ 115 VAC | |
| 6 | INRUSH CURRENT | 230V/ 80 A (TYP) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | I = 38 A/ 230 VAC | P |
| | | 115V/ 40 A (TYP) COLD START | | I = 17 A/ 115 VAC | |
| 7 | LEAKAGE CURRENT | < 3 mA / 240 VAC | I/P: 254 VAC O/P:Min LOAD Ta:25°C | L-FG: 1.2 mA N-FG: 1.2 mA | P |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|---|--|--|---------|
| 1 | OVER LOAD PROTECTION | 105 %~ 150 % | I/P: 230 VAC I/P: 115 VAC O/P:TESTING Ta:25°C | 130 %/ 230 VAC 130 %/ 115 VAC Shunt down Re-power ON | P |
| 2 | OVER VOLTAGE PROTECTION | +3V,+5V: 110%~140% of rated voltage +12V: 13.2V~16V | I/P: 230 VAC O/P:MIN LOAD Ta:25°C | 120 %/ +3V 122 %/ +5V 15.4V/ +12V Shunt down Re- power ON | P |
| 3 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P: 264 VAC O/P:FULL LOAD Ta:25°C | NO DAMAGE Shunt down Re-power ON | P |

CONTROL FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|--------------------|--|--|---|---------|
| 1 | POWER GOOD SIGNAL | DELAY 100ms ~ 500ms | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 240 ms/ 230VAC 240 ms/ 115 VAC | P |
| 2 | POWER FAIL SIGNAL | >1ms | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 7ms/ 230 VAC 7 ms/115 VAC | P |
| 3 | PS-ON INPUT SIGNAL | Power off :PS-ON="Hi" or ">2v" Power on :PS-ON="Low" or "<0.5v" | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | Power off : PS-ON="Hi" or 0.7V~ 5V Power on : PS-ON="Low" or 0V-0.7V | P |

ENVIRONMENT TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|---|------------------|---------|
| 1 | TEMPERATURE RISE TEST | MODEL : IPC-200 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P: 230VAC O/P: FULL LOAD Ta= 23.8 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P: 230VAC O/P: FULL LOAD Ta= 41.4 °C | | | P |
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| 2 | OVER LOAD BURN-IN TEST | NO DAMAGE 1 HOUR (MIN) | I/P: 230 VAC O/P: 115 % LOAD Ta:25°C | TEST : OK | P |
| 3 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P: 230 VAC O/P: 100 % LOAD Ta= -20 °C | TEST : OK | P |
| 4 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 40°C NO DAMAGE | I/P: 272 VAC O/P:FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H | TEST : OK | P |
| 5 | TEMPERATURE COEFFICIENT | ± 0.05 %(0-50°C) | I/P: 230 VAC O/P:FULL LOAD | ± 0.02 %(0-50°C) | P |
| 6 | VIBRATION TEST | 1 Carton & 1 Set (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 | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|----------------------|---|---|--|---------|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 1.5 KVAC/min I/P-FG: 1.5 KVAC/min | I/P-O/P: 1.8 KVAC/min I/P-FG: 1.8 KVAC/min Ta:25°C | I/P-O/P: 6.71 mA I/P-FG: 6.9 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: 5 GΩ I/P-FG: 960 MΩ O/P-FG: 990 MΩ NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS OR TRACE < 100 mΩ | 40 A / 2min Ta:25°C | 12 mΩ | P |
| 4 | APPROVAL | TUV: Certificate NO : R50062279 UL: File NO : E183223 | | | P |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | 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 | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|---|----------------|--------|---------|
| 1 | CAPACITOR LIFE CYCLE | SUPPOSE C113 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 749794 HRS I/P: 230VAC O/P:FULL LOAD Ta= 40 °C LIFE TIME= 576162 HRS | | | P |
| 2 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 94.1K 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 | Q 21 Rated 2SK2082 : 900V 9A Q 22 Rated 2SK2082 : 900V 9A | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 748 V (2) 776 V (3) 388 V (1) 756 V (2) 768 V (3) 388 V | P |
| 2 | Diode Peak Voltage | D101 Rated MBR3060PT : 60V 30A D110 Rated S60SC4M : 40V 60A D112 Rated 31DQ10 : 100V 3A D140 Rated S30C4M : 40V 30A D160 Rated YG802C04 : 40V 10A | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 36 V (2) 32.7 V (3) 0 V (1) 27.6 V (2) 27 V (3) 0 V (1) 60.4 V (2) 55 V (3) 0 V (1) 26.6 V (2) 27.2 V (3) 0 V (1) 33.2 V (2) 35.8 V (3) 34.8 V | P |
| 3 | Input Capacitor Voltage | C 5 Rated : 150u / 400V/ 85°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 Ta:25°C | (1) 420 V (2) 420 V (3) 406 V | P |
| 4 | Control IC Voltage Test | U1 Rated ML4800CP : 18V | 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) 15 V (2) 14 V (3) 11.3 V | P |
| 5 | PFC Power Transistor (D to S) or (C to E) Peak Voltage | Q 1 Rated 16N50C3 : 560V 30A | I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C | (1) 440 V (2) 436 V (3) 386 V | P |

| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|-----------|----------------------------|-------------|---------------|----------|
| 2005/1/19 | RD SAMPLE | PASS | VINCENT TSENG | MAX LIN |
| 2005/7/15 | PRODUCT SAMPLE W0504B42 | PASS | VINCENT TSENG | MAX LIN |
| 2005/12/2 | PRODUCT SAMPLE W0511A27 | PASS | VINCENT TSENG | MAX LIN |