

MODEL : HRPG-600-5

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|---------------------------------------------------|--------------------------------------------------------------------|----------------------------------------------------|---------|
| 1 | RIPPLE & NOISE | V1 : 150 mVp-p (Max) | I/P : 230VAC O/P : FULL LOAD Ta : 25°C | V1 : 122 mVp-p (Max) | P |
| 2 | OUTPUT VOLTAGE ADJUST RANGE | CH1 : 4.3 V~ 5.8 V | I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C | 4.2 V~ 6.045 V/ 230 VAC 4.2 V~ 6.042 V/ 115 VAC | P |
| 3 | OUTPUT VOLTAGE TOLERANCE | V1 : 2%~ -2% (Max) | I/P : 100 VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C | V1 : 0.74 %~ -0.74 % | P |
| 4 | LINE REGULATION | V1 : 0.5%~ -0.5% (Max) | I/P : 100 VAC ~ 264 VAC O/P : FULL LOAD Ta : 25°C | V1 : 0.23 %~ -0.23 % | P |
| 5 | LOAD REGULATION | V1 : 1%~ -1% (Max) | I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C | V1 : 0.61 %~ -0.61 % | P |
| 6 | SET UP TIME | 230VAC : 1000 ms (Max) 115 VAC : 2500 ms (Max) | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | 230VAC/ 484 ms 115VAC/ 968 ms | P |
| 7 | RISE TIME | 230VAC : 50 ms (Max) 115VAC : 50 ms (Max) | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | 230VAC/ 17.4 ms 115VAC/ 17.46 ms | P |
| 8 | HOLD UP TIME | 230VAC : 16 ms (TYP) 115VAC : 16 ms(TYP) | I/P : 230 VAC I/P : 115VAC O/P : FULL LOAD Ta : 25°C | 230VAC/ 16.5 ms 115VAC/ 16 ms | P |
| 9 | OVER/UNDERSHOOT TEST | < ±5% | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | TEST : < 5 % | P |
| 10 | DYNAMIC LOAD | V1 : 1000 mVp-p | I/P : 230 VAC O/P : FULL /Min LOAD 90%DUTY/1KHZ Ta : 25°C | 738 mVp-p | P |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------|----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------|---------|
| 1 | INPUT VOLTAGE RANGE | 85VAC~264 VAC | I/P : TESTING O/P : FULL LOAD Ta : 25°C | 59.4 V~264V | P |
| | | | I/P : LOW-LINE-3V= 97 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 ~63 HZ NO DAMAGE OSC | I/P : 100 VAC ~ 264 VAC O/P : FULL-MIN LOAD Ta : 25°C | TEST : OK | P |
| 3 | POWER FACTOR | 0.93 / 230 VAC(TYP) 0.99 / 115 VAC(TYP) | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | PF= 0.956 / 230 VAC PF= 0.99 / 115 VAC | P |
| 4 | EFFICIENCY | 82% (TYP) | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | 82.6 % | P |
| 5 | INPUT CURRENT | 230V/ 3.6 A (TYP) 115V/ 7.6 A (TYP) | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | I = 3.486 A/ 230 VAC I = 7.09 A/ 115 VAC | P |
| 6 | INRUSH CURRENT | 230V/ 70 A (TYP) 115V/ 35 A (TYP) COLD START | I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C | I = 70 A/ 230 VAC I = 35 A/ 115 VAC | P |
| 7 | LEAKAGE CURRENT | < 1.2 mA / 240 VAC | I/P : 264 VAC O/P : Min LOAD Ta : 25°C | L-FG : 1.1 mA N-FG : 0.42 mA | P |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------------|-------------------------------------------------------------------------------------|---------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---------|
| 1 | OVER LOAD PROTECTION | 105 %~ 135 % | I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C | 123 %/ 230 VAC 123 %/ 115 VAC Constant current limiting, recovers automatically after fault condition is removed | P |
| 2 | OVER VOLTAGE PROTECTION | CH1 : 6V~ 7 V | I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C | 6.8V/ 230 VAC 6.8V/ 115 VAC Shut down Re- power ON | P |
| 3 | OVER TEMPERATURE PROTECTION | SPEC : Shut down o/p voltage, recovers automatically after temperature goes down | 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 Constant current limiting, recovers automatically after fault condition is removed | P |

CONTROL FUNCTION TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---------------------------|--------------------------------------------------------------------------|------------------------------------------------------------------|--------------------------------------------------|---------|
| 1 | DC OK SIGNAL | PSU turn on : 3.3 ~ 5.6V ; PSU turn off : 0 ~ 1V | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | PSU turn on : 5.187 V PSU turn off : -0.066 V | P |
| 2 | REMOTE CONTROL | Rc+ / Rc- 4 ~ 10V or open = power on 0 ~ 0.8V or short = power off | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | 3.55 V ~ 104 V POWER ON 0 V ~ 3 V POWER OFF | P |
| 3 | REMOTE SENSE | >0.5V | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | > 0.5 V | P |
| 4 | AUX POWER | 4.75V~5.25V / 0.3A Ripple : 50mV | I/P : 230 VAC O/P : FULL LOAD Ta : 25°C | 4.995V/0.3A Ripple : 16 mv | P |
| 5 | No load power consumption | <0.75W | I/P : 230 VAC O/P : O/P:NO LOAD RC+&RC- SHORT Ta : 25°C | 0.64W | P |
| 6 | FAN ON/OFF control test | ---- | I/P : 230 VAC O/P : TESTING Ta : 25°C | > 35 %LOAD FAN ON < 28 %LOAD FAN OFF | P |

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|---|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---|
| 6 | VIBRATION TEST | 1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 10min/sweep cycle (4) Acceleration : 5G (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 : 3 KVAC/min I/P-FG : 2 KVAC/min O/P-FG : 0.5 KVAC/min | I/P-O/P : 3.6 KVAC/min I/P-FG : 2.4 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C | I/P-O/P : 6.3 mA I/P-FG : 5.92 mA O/P-FG : 3.85 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 / 70%RH | I/P-O/P : 304 GΩ I/P-FG : 15.8 GΩ O/P-FG : 304 GΩ NO DAMAGE | P |
| 3 | GROUNDING CONTINUITY | FG(PE) TO CHASSIS OR TRACE < 100 mΩ | 40 A / 2min Ta : 25°C / 70%RH | 11 mΩ | P |
| 4 | APPROVAL | TUV : Certificate NO : R 50153202 UL : File NO : E183223 | | | P |

E.M.C TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|---------------------------------------------|-------------------------------------------------------|----------------------------------------------------------|-------------------------------|---------|
| 1 | HARMONIC | EN61000-3-2,-3 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 | HRPG-600-5 : SUPPOSE C106 IS THE MOST CRITICAL COMPONENT I/P : 230VAC O/P : FULL LOAD Ta= 25 °C LIFE TIME= 2114922.6 HRS I/P : 230VAC O/P : FULL LOAD Ta= 50 °C LIFE TIME= 310081.8 HRS | | | P |
| 2 | MTBF | Conducted by Parts Stress Analysis Prediction 1142.5K hrs min. Telcordia SR-332 (Bellcore) ; 138.5K hrs min. MIL-HDBK-217F (25°C) | | | P |
| 3 | Ongoing Reliability Test | I/P : 230VAC O/P : FULL LOAD TA=50°C Demonstration Mean Time Between Failure : 50,000 hours | | | P |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECIFICATION | TEST CONDITION | RESULT | VERDICT |
|----|--------------------------------------------------------|----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|---------|
| 1 | Power Transistor (D to S) or (C to E) Peak Voltage | Q3 Rated 20.7A/600V | I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C | (1) 480 V (2) 464 V | P |
| 2 | Diode Peak Voltage | Q100 Rated 80A/30V Q103 Rated 80A/30V | I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25°C | (1) 21.8 V (2) 21 V (1) 28 V (2) 27 V | P |
| 3 | Input Capacitor Voltage | C5 Rated 470u/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 Ta : 25°C | (1) 376.7 V (2) 380.6 V (3) 380.8 V | P |
| 4 | Control IC Voltage Test | U1 Rated 10V~20V | 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) 14.231 V (2) 14.023 V (3) 14.051 V | P |
| 5 | P.F.C Transistor (D to S) or (C to E) Peak Voltage | Q1 Rated 20A/500V | I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25°C | (1) 492 V (2) 426 V | P |

| TEST RESULT | TESTER | APPROVAL |
|-------------|------------|---------------|
| PASS | SANFORD SU | VINCENT TSENG |

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