

# Quality Engineering Test Report

**SERIES: SP-150 150 WATTS SIGLE OUTPUT SWITCHING POWER SUPPLY**

**SAMPLE: A.SP-150-3.3 3.3V / 30A D.SP-150-12 12V /12.5A G.SP-150-24 24V /6.3A**  
**B.SP-150-5 5V /30A E.SP-150-13.5 13.5V /11.2A H.SP-150-27 27V /5.6A**  
**C.SP-150-7.5 7.5V /20A F.SP-150-15 15V /10A I.SP-150-48 48V /3.2A**

| NO | TEST ITEM                | TEST CONDITION / SPECIFICATION   | RESULT   | VERDICT |
|----|--------------------------|--|--|---------|
| 1  | AC INPUT VOLTAGE RANGE   | I/P:TESTING SPEC:85~264VAC<br>O/P:FULL LOAD  | A:54V-267VAC   | P       |
| 2  | LINE REGULATION          | I/P:85~264VAC SPEC:<br>O/P:FULL LOAD<br>A: ±0.5%<br>B: ±0.5%<br>C: ±0.5%<br>D: ±0.5%<br>E: ±0.5%<br>G:±0.5%<br>H: ±0.5%<br>I: ±0.5%                | A: 0% - 0%<br>B: 0% - 0%<br>C: 0% - -0.07%<br>D: 0.049% - 0.049%<br>E: -0.04% - -0.04%<br>F: -0.04% - -0.04%<br>G: 0% - -0.02%<br>H: 0% - 0.02%<br>I: -0.01% - -0.01%                    | P       |
| 3  | LOAD REGULATION          | I/P:230VAC SPEC:<br>O/P:0% LOAD TO FULL LOAD<br>A: ±1%<br>B: ±1%<br>C: ±1%<br>D: ±0.5%<br>E: ±0.5%<br>F: ±0.5%<br>G: ±0.5%<br>H: ±0.5%<br>I: ±0.5% | A: -0.75% - 0.75%<br>B: -0.35% - 0.35%<br>C: -0.20% - 0.15%<br>D: -0.049% - 0%<br>E: -0.04% - +0.04%<br>F: 0.04% - 0.04%<br>G: -0.02% - 0.05%<br>H: 0.06% - -0.02%<br>I: -0.15% - 0.14%  | P       |
| 4  | OUTPUT VOLTAGE TOLERANCE | I/P:85~264VAC SPEC:<br>O/P:0% LOAD TO FULL LOAD<br>A: ±2%<br>B: ±2%<br>C: ±2%<br>D: ±2%<br>E: ±2%<br>F: ±2%<br>G: ±1%<br>H: ±1%<br>I: ±1%          | A: 0.75% - -0.75%<br>B: -0.6% - 0%<br>C: -0.45% - 0.08%<br>D: -0.049% - +0.049%<br>E: -0.04% - +0.04%<br>F: 1.3% - 0.7%<br>G: 0.128% - -0.07%<br>H: -0.02% - 0.07%<br>I: -0.02% - 0.18 % | P       |
| 5  | RIPPLE & NOISE           | I/P:230VAC SPEC:<br>O/P: FULL LOAD<br>A:100mV<br>B:100mV<br>C:100mV<br>D:100mV<br>E:100mV<br>F:100mV<br>G :150mV<br>H:150mV<br>I:250mV             | A: 53mV<br>B: 62mV<br>C: 53mV<br>D: 53mV<br>E: 53mV<br>F: 54mV<br>G: 47mV<br>H: 65mV<br>I: 108mV   | P       |
| 6  | AC INPUT CURRENT         | I/P:230VAC SPEC: 1.1A<br>O/P:FULL LOAD   | A:0.649A   | P       |

| NO | TEST ITEM                  | TEST CONDITION / SPECIFICATION   | RESULT  | VERDICT |
|----|----------------------------|--|---|---------|
| 7  | MAX. INRUSH CURRENT        | I/P:230VAC<br>O/P:FULL LOAD<br>SPEC: 40A   | A:36.843A   | P       |
| 8  | O/P VOLTAGE<br>ADJ.RANGE   | I/P:230VAC<br>O/P:MIN. LOAD<br>SPEC: +10%~-5%<br>A:3.1V~3.6V<br>B:4.7V~5.5V<br>C:7.12V~8.25V<br>D:11.4V~13.2V<br>E:12.8V~14.8V<br>F:14.2V~16.5V<br>G:22.8V~26.4V<br>H:25.6V~29.7V<br>I:45.6V~52.8V | A:3.10V~3.81V<br>B:4.44V~5.82V<br>C:6.36V~8.94V<br>D:10.34V~13.79V<br>E:10.887V~15.014V<br>F:12.37V~17.55V<br>G:19.8V~27.8V<br>H:19.81V~30.15V<br>I:40.5V~53.7V | P       |
| 9  | SET UP TIME                | I/P:230VAC<br>O/P:FULL LOAD<br>SPEC:600ms  | A:152mS   | P       |
| 10 | HOLD UP TIME               | I/P:230VAC<br>O/P:FULL LOAD<br>SPEC:20mS   | A:33.28mS   | P       |
| 11 | EFFICIENCY                 | I/P:230VAC<br>O/P: FULL LOAD<br>SPEC:<br>A:67%<br>B:75%<br>C:79%<br>D:80%<br>E:80%<br>F:81%<br>G:83%<br>H:84%<br>I:84%   | A: 68.02%<br>B: 76.23%<br>C: 80.5%<br>D: 81.25%<br>E: 81.61%<br>F: 84%<br>G: 83.6%<br>H: 86.4%<br>I: 84.5%  | P       |
| 12 | OVER LOAD<br>PROTECTION    | I/P:230VAC<br>O/P:TESTING<br>SPEC:105%~150%  | A: 138%<br>B: 123%<br>C: 135%<br>D: 129%<br>E: 118%<br>F: 125%<br>G: 133%<br>H: 124%<br>I: 136%   | P       |
| 13 | OVER VOLTAGE<br>PROTECTION | I/P:230VAC<br>O/P: TESTING<br>SPEC:110%~135%<br>A:3.63~4.45 V<br>B:5.5~6.75V<br>C:8.25~10.12V<br>D:13.2~16.2V<br>E:14.8~18.2V<br>F:16.5~20.2V<br>G:26.4~32.4V<br>H:29.7~36.4V<br>I:52.8~64.8V      | A: 4.10V<br>B: 5.9V<br>C: 9.08V<br>D: 14.5V<br>E: 16.98V<br>F: 17.6V<br>G: 29.0V<br>H: 35.6V<br>I: 57.8V  | P       |
| 14 | GROUND LEAKAGE<br>CURRENT  | I/P:240VAC<br>SPEC:<br>L-FG--<2.00mA<br>N-FG--<2.00mA  | A: L-FG:0.5mA<br>N-FG:0.5mA   | P       |
| 15 | GROUNDING<br>CONTINUITY    | SPEC: FG--CHASSIS<0.10hms/2min   | A 42mOhms   | P       |
| 16 | INSULATION<br>RESISTANCE   | SPEC: O/P-FG 500VDC / 100MOhms MIN.<br>I/P-O/P 500VDC / 100MOhms MIN.<br>I/P-FG 500VDC / 100MOhms MIN.   | A: O/P-FG >100MOhms<br>I/P-O/P >100MOhms<br>I/P-FG >100MOhms  | P       |

| NO | TEST ITEM  | TEST CONDITION / SPECIFICATION  | RESULT   | VERDICT  |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|----|--|---|--|----------|-----|------|-------|--|-----|--------------|--------|--------|--|----|-----------------|--------|--------|--|----|----------------|------|--------|--|----|-----------------------|------|--------|--|----|-----------------------|--------|--------|--|-----|-----------|--------|--------|--|-----|----------------------|--------|--------|--|----|-----------|--------|--------|--|----|----------------------|--------|-------|--|-----|------------------|--------|-------|--|----|-----------|--------|--------|--|--|
| 17 | DIELECTRIC / WITHSTAND VOLTAGE                                 | SPEC: I/P- O/P: 3000VAC/ 60 sec (10mA CUT-OFF)<br>I/P - FG: 1500VAC/60 sec (10mA CUT-OFF)<br>O/P - FG : 500VAC/60sec (10mA CUT-OFF)   | A: I/P-O/P :3.6mA<br>I/P-FG :2.57mA<br>O/P- FG :2.18mA | P        |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
| 18 | BURN-IN TEST   | I/P: 230VAC O/P:FULL LOAD<br>TA:24.7°C BURN-IN DURATION : 14 hrs  | E: NON BREAK   | P        |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
| 19 | ENVIRONMENT TEST   | 1.LOW TEMPERATURE TEST<br>I/P : 230 VAC O/P : 100% LOAD<br>AMBIENT TEMPERATURE : -9.9°C   | I :<br>AFTER 24 hrs POWER ON OK                        | P        |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    |  | 2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST<br>I/P : 230VAC O/P : FULL LOAD<br>AMBIENT TEMPERATURE : 53.4°C with cooling FAN  | I :<br>AFTER 14 hrs NON BREAK                          |          |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    |  | 3.HIGH HUMIDITY HIGH VOLTAGE ON/OFF TEST<br>I/P : 272VAC O/P : FULL LOAD<br>AMBIENT TEMPERATURE : 25°C<br>AMBIENT HUMIDITY : 95%  | I :<br>AFTER 14.5hrs POWER ON/OFFNON BREAK             |          |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
| 20 | TEMPERATURE RISE TEST Trise OF PARTS                           | B: I/P : 230VAC O/P : FULL LOAD<br>AFTER 2 hrs BURN-IN<br>TA : 24.7°C<br>with cooling FAN   |  | P        |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    |  | <table border="1"> <thead> <tr> <th></th> <th>POSITION</th> <th>P/N</th> <th>TEMP</th> <th>Trise</th> </tr> </thead> <tbody> <tr> <td></td> <td>BD1</td> <td>BRIDGE DIODE</td> <td>46.5°C</td> <td>21.8°C</td> </tr> <tr> <td></td> <td>Q2</td> <td>MAIN TRANSISTOR</td> <td>42.8°C</td> <td>18.1°C</td> </tr> <tr> <td></td> <td>Q1</td> <td>PFC TRANSISTOR</td> <td>47°C</td> <td>22.3°C</td> </tr> <tr> <td></td> <td>T1</td> <td>MAIN TRANSFORMER COIL</td> <td>56°C</td> <td>31.3°C</td> </tr> <tr> <td></td> <td>T1</td> <td>MAIN TRANSFORMER CORE</td> <td>58.1°C</td> <td>33.4°C</td> </tr> <tr> <td></td> <td>D20</td> <td>O/P DIODE</td> <td>43.2°C</td> <td>18.5°C</td> </tr> <tr> <td></td> <td>C42</td> <td>O/P FILTER CAPACITOR</td> <td>45.4°C</td> <td>20.7°C</td> </tr> <tr> <td></td> <td>L2</td> <td>O/P CHOCK</td> <td>40.9°C</td> <td>16.2°C</td> </tr> <tr> <td></td> <td>C5</td> <td>I/P FILTER CAPACITOR</td> <td>31.5°C</td> <td>6.8°C</td> </tr> <tr> <td></td> <td>LF1</td> <td>LINE FILTER COIL</td> <td>29.1°C</td> <td>4.4°C</td> </tr> <tr> <td></td> <td>D2</td> <td>PFC DIODE</td> <td>39.2°C</td> <td>14.5°C</td> </tr> </tbody> </table> |  | POSITION | P/N | TEMP | Trise |  | BD1 | BRIDGE DIODE | 46.5°C | 21.8°C |  | Q2 | MAIN TRANSISTOR | 42.8°C | 18.1°C |  | Q1 | PFC TRANSISTOR | 47°C | 22.3°C |  | T1 | MAIN TRANSFORMER COIL | 56°C | 31.3°C |  | T1 | MAIN TRANSFORMER CORE | 58.1°C | 33.4°C |  | D20 | O/P DIODE | 43.2°C | 18.5°C |  | C42 | O/P FILTER CAPACITOR | 45.4°C | 20.7°C |  | L2 | O/P CHOCK | 40.9°C | 16.2°C |  | C5 | I/P FILTER CAPACITOR | 31.5°C | 6.8°C |  | LF1 | LINE FILTER COIL | 29.1°C | 4.4°C |  | D2 | PFC DIODE | 39.2°C | 14.5°C |  |  |
|    | POSITION   | P/N   | TEMP   | Trise    |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | BD1  | BRIDGE DIODE  | 46.5°C   | 21.8°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | Q2   | MAIN TRANSISTOR   | 42.8°C   | 18.1°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | Q1   | PFC TRANSISTOR  | 47°C   | 22.3°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | T1   | MAIN TRANSFORMER COIL   | 56°C   | 31.3°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | T1   | MAIN TRANSFORMER CORE   | 58.1°C   | 33.4°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | D20  | O/P DIODE   | 43.2°C   | 18.5°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | C42  | O/P FILTER CAPACITOR  | 45.4°C   | 20.7°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | L2   | O/P CHOCK   | 40.9°C   | 16.2°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | C5   | I/P FILTER CAPACITOR  | 31.5°C   | 6.8°C    |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | LF1  | LINE FILTER COIL  | 29.1°C   | 4.4°C    |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
|    | D2   | PFC DIODE   | 39.2°C   | 14.5°C   |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
| 21 | LIFE CYCLE   | SUPPOSE C42 IS THE MOST CRITICAL COMPONENT WITH COOLING FAN<br>I/P : 230VAC O/P : FULL LOAD Ta : 25°C Tc42 : 45.4°C Life:380546hrs<br>I/P : 230VAC O/P : FULL LOAD Ta : 50°C Tc42 : 75.2°C Life:48232hrs  |  | P        |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |
| 22 | CRITICAL COMPONENT RECORD ( FOR QC INSPECTION REFERENCE ONLY ) | I:<br>FUSE :4A/250V GFE/GNA<br>BRIDGE DIODE : RS606 4A/800V GL<br>LINE FILTER :LF601<br>TRANSFOMER :TF-616 EI-33<br>OUTPUT DIODE :IR40L45CW 30A/40V ESAD83-004<br>OUTPUT CAPACITOR :ELNA 220uF/63V 105°C RJH<br>INPUT CAPACITOR :HITACHI 1000uF/400V,85°C HP3/USC<br>P.C.B :SP-150 CEM-3 20Z SS   |  |          |     |      |       |  |     |              |        |        |  |    |                 |        |        |  |    |                |      |        |  |    |                       |      |        |  |    |                       |        |        |  |     |           |        |        |  |     |                      |        |        |  |    |           |        |        |  |    |                      |        |       |  |     |                  |        |       |  |    |           |        |        |  |  |

| DATE     | SAMPLE                                    | TEST RESULT | TEST      | APPROVAL |
|----------|---|-------------|-----------|----------|
| 19990519 | RD<br>SAMPLE<br>5V                        | PASS        | H.C. LIOU | Max Lin  |
| 19990719 | RD<br>SAMPLE<br>5V,12V,24V,48V            | PASS        | H.C. LIOU | Max Lin  |
| 19991119 | PRDUCTION<br>SAMPLE<br>9911A32            | PASS        | C.C.CHEN  | Max Lin  |
| 20000120 | PRDUCTION<br>SAMPLE<br>A001B13<br>48V,24V | PASS        | C.C.CHEN  | Max Lin  |
| 20000308 | PRDUCTION<br>SAMPLE<br>A003A05A<br>24V    | PASS        | VINCENT   | Max Lin  |
| 20000408 | PRDUCTION<br>SAMPLE<br>A004A09<br>12V,15V | PASS        | VINCENT   | Max Lin  |
| 20000627 | PRDUCTION<br>SAMPLE<br>A006C03<br>3.3V    | PASS        | VINCENT   | Max Lin  |
| 20000726 | PRDUCTION<br>SAMPLE<br>A007C10E<br>13.5V  | PASS        | VINCENT   | Max Lin  |
| 20000828 | PRDUCTION<br>SAMPLE<br>A008C08<br>12V     | PASS        | VINCENT   | Max Lin  |
| 20010327 | PRDUCTION<br>SAMPLE<br>A103C03<br>12V     | PASS        | VINCENT   | Max Lin  |
| 20020103 | PRDUCTION<br>SAMPLE<br>A112D23<br>3.3V    | PASS        | VINCENT   | Max Lin  |