



# Test Report: APC-25-500

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25W Single Output Switching Power Supply

## ■ DESIGN VERIFY TEST

Output Function Test

Input Function Test

Protection Function Test

Component Stress Test

## ■ SAFETY & E.M.C. TEST

Safety Test

E.M.C. Test

## ■ RELIABILITY TEST

ENVIRONMENT TEST

## DESIGN VERIFY TEST

### OUTPUT FUNCTION TEST

| NO | TEST ITEM                | SPECIFICATION                                   | TEST CONDITION                                                                                                        | RESULT                                   | VERDICT |
|----|--------------------------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------|
| 1  | RIPPLE & NOISE           | V1 : 300 mVp-p (Max )                           | I/P : 230VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                          | V1 : 70 mVp-p (Max )                     | P       |
| 2  | CONSTANT CURRENT REGION  | V1= 15 V ~ 50 V                                 | I/P : 230VAC<br>O/P : CV MODE<br>Ta : 25°C                                                                            | O/P= 15V : 0.513 A<br>O/P= 49V : 0.512 A | P       |
| 3  | OUTPUT VOLTAGE TOLERANCE | V1 : 5 %~ -5 % (Max)                            | I/P : 100 VAC / 264 VAC<br>O/P : FULL/ MIN LOAD<br>Ta : 25°C                                                          | V1 : 0.528 %~ -0.012 %                   | P       |
| 4  | LINE REGULATION          | V1 : 1 %~ -1 % (Max)                            | I/P : 100 VAC ~ 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                               | V1 : 0.012 %~ -0.012 %                   | P       |
| 5  | LOAD REGULATION          | V1 : 3 %~ -3 % (Max)                            | I/P : 230 VAC<br>O/P : FULL ~MIN LOAD<br>Ta : 25°C                                                                    | V1 : 0.012 %~ -0.012 %                   | P       |
| 6  | SET UP TIME              | 230VAC : 1500 ms (Max)<br>115VAC : 1500 ms(Max) | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 278.13 ms<br>115VAC/ 285.13 ms   | P       |
| 7  | RISE TIME                | 230VAC : 40 ms (Max)<br>115VAC : 40 ms (Max)    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 16.21 ms<br>115VAC/ 15.86 ms     | P       |
| 8  | HOLD UP TIME             | 230VAC : 20 ms (TYP)<br>115VAC : 12 ms (TYP)    | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                        | 230VAC/ 76.97 ms<br>115VAC/ 17.82 ms     | P       |
| 9  | OVER/UNDERSHOOT TEST     | < $\pm 5\%$                                     | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                         | TEST : <5 %                              | P       |
| 10 | DYNAMIC LOAD             | V1 : 5000 mVp-p                                 | I/P : 230 VAC<br>(1).O/P : FULL /Min LOAD 90%DUTY/<br>1KHZ<br>(2).O/P : FULL /Min LOAD 50%DUTY/<br>120HZ<br>Ta : 25°C | (1) 316 mVp-p<br>(2) 2610 mVp-p          | P       |

### INPUT FUNCTION TEST

| NO | TEST ITEM             | SPECIFICATION                                          | TEST CONDITION                                                                                                                                                                                | RESULT                                       | VERDICT |
|----|-----------------------|--------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|---------|
| 1  | INPUT VOLTAGE RANGE   | 100VAC~264 VAC                                         | I/P : TESTING<br>O/P : FULL LOAD<br>Ta : 25°C<br><br>I/P :<br>LOW-LINE=3V=97 V<br>HIGH-LINE=264 V<br>O/P : FULL/MIN LOAD<br>ON : 30 Sec . OFF : 30 Sec 10MIN<br>( AC POWER ON/OFF NO DAMAGE ) | 85 V~264V<br><br>TEST : OK                   | P       |
| 2  | INPUT FREQUENCY RANGE | 47HZ ~63 HZ<br>NO DAMAGE OSC                           | I/P : 100 VAC ~ 264 VAC<br>O/P : FULL~MIN LOAD<br>Ta : 25°C                                                                                                                                   | TEST : OK                                    | P       |
| 3  | EFFICIENCY            | 83% (TYP)                                              | I/P : 230 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                                 | 84.40 %                                      | P       |
| 4  | INPUT CURRENT         | 230V/ 0.4 A (TYP)<br>115V/ 0.8 A (TYP)                 | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                | I = 0.289 A/ 230 VAC<br>I = 0.441 A/ 115 VAC | P       |
| 5  | INRUSH CURRENT        | 230V/ 70 A (TYP)<br>115V/ 35 A (TYP)<br><br>COLD START | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                                                                                                                                | I = 35.5 A/ 230 VAC<br>I = 17.3 A/ 115 VAC   | P       |
| 6  | LEAKAGE CURRENT       | < 0.25 mA / 240 VAC                                    | I/P : 240 VAC<br>O/P : Min LOAD<br>Ta : 25°C                                                                                                                                                  | L-CASE : 0.003 mA<br>N-CASE : 0.003 mA       | P       |

### PROTECTION FUNCTION TEST

| NO | TEST ITEM               | SPECIFICATION                          | TEST CONDITION                                                | RESULT                                                                              | VERDICT |
|----|-------------------------|----------------------------------------|---------------------------------------------------------------|-------------------------------------------------------------------------------------|---------|
| 1  | OVER VOLTAGE PROTECTION | CH1 : 55 V ~ 68 V                      | I/P : 230 VAC<br>I/P : 115 VAC<br>O/P : MIN LOAD<br>Ta : 25°C | 60.5 V/ 230 VAC<br>60.5 V/ 115 VAC<br>Shut down o/p voltage, re-power on to recover | P       |
| 2  | SHORT PROTECTION        | SHORT EVERY OUTPUT<br>1 HOUR NO DAMAGE | I/P : 264 VAC<br>O/P : FULL LOAD<br>Ta : 25°C                 | NO DAMAGE<br>Hiccup mode                                                            | P       |

### COMPONENT STRESS TEST

| NO | TEST ITEM                                             | SPECIFICATION                            | TEST CONDITION                                                                                                                               | RESULT                                 | VERDICT |
|----|-------------------------------------------------------|------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|---------|
| 1  | Power Transistor<br>(D to S) or (C to E) Peak Voltage | Q1 Rated :<br>NDF06N60ZG : 600 V/ 6.0 A  | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2) Output Short<br>(3)Full load continue<br>Ta : 25°C                          | (1) 498 V<br>(2) 432 V<br>(3) 494 V    | P       |
| 2  | Diode Peak Voltage                                    | D103 Rated :<br>HER305: 400 V/ 3.0 A     | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on<br>(2)Output Short<br>(3)Full load continue<br>Ta : 25°C                           | (1) 307 V<br>(2) 294 V<br>(3) 254 V    | P       |
| 3  | Input Capacitor Voltage                               | C5 Rated :<br>47u/420V 105°C 18*20 KM    | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load<br>Change<br>Ta : 25°C | (1) 390 V<br>(2) 370 V<br>(3) 374 V    | P       |
| 4  | Control IC Voltage Test                               | U 1 Rated :<br>NCP1200D100R2G: 16V (MAX) | I/P : High-Line +3V = 267 V<br>O/P : (1)Full Load Turn on /Off<br>(2) Min load Turn on /Off<br>(3)Full Load /Min load<br>Change<br>Ta : 25°C | (1) 11.7 V<br>(2) 11.8 V<br>(3) 11.6 V | P       |

## SAFETY & E.M.C. TEST

### SAFETY TEST

| NO | TEST ITEM            | SPECIFICATION           | TEST CONDITION                        | RESULT                              | VERDICT |
|----|----------------------|-------------------------|---------------------------------------|-------------------------------------|---------|
| 1  | WITHSTAND VOLTAGE    | I/P-O/P : 3.75 KVAC/min | I/P-O/P : 4 KVAC/min<br>Ta : 25°C     | I/P-O/P : 2.070 mA<br><br>NO DAMAGE | P       |
| 2  | ISOLATION RESISTANCE | I/P-O/P : 500VDC>100MΩ  | I/P-O/P : 500 VDC<br>Ta : 25°C /70%RH | I/P-O/P : >9999 MΩ<br><br>NO DAMAGE | P       |

### E.M.C TEST

| NO | TEST ITEM                                   | SPECIFICATION                                          | TEST CONDITION                                                    | RESULT                        | VERDICT |
|----|---------------------------------------------|--------------------------------------------------------|-------------------------------------------------------------------|-------------------------------|---------|
| 1  | HARMONIC                                    | EN61000-3-2<br>CLASS A                                 | I/P:230VAC/240VAC/220VAC50HZ<br>O/P:100%LOAD<br>CLASS A<br>Ta:25℃ | PASS                          | P       |
| 2  | CONDUCTION                                  | EN55022<br>CLASSB                                      | I/P: 230 VAC (50HZ)/115V[60HZ]<br>O/P:FULL LOAD<br>Ta:25℃         | PASS<br>Test by certified Lab | P       |
| 3  | RADIATION                                   | EN55022<br>CLASSB                                      | I/P: 230 VAC (50HZ)/115V[60HZ]<br>O/P: FULL LOAD<br>Ta:25℃        | PASS<br>Test by certified Lab | P       |
| 4  | E.S.D                                       | EN61000-4-2<br>LIGHT INDUSTRY<br>AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃                      | CRITERIA A                    | P       |
| 5  | E.F.T                                       | EN61000-4-4<br>LIGHT INDUSTRY<br>INPUT: 1KV            | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃                      | CRITERIA A                    | P       |
| 6  | SURGE                                       | IEC61000-4-5<br>INDUSTRY<br>L-N :2KV                   | I/P: 230 VAC/50HZ<br>O/P:FULL LOAD<br>Ta:25℃                      | CRITERIA A                    | P       |
| 7  | Test by certified Lab & Test Report Prepare |                                                        |                                                                   |                               |         |

## RELIABILITY TEST

### ENVIRONMENT TEST

| NO | TEST ITEM             | SPECIFICATION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | TEST CONDITION              | RESULT                      | VERDICT |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|----|-----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-----------------------------|---------|----------|-----|-----------------------------|-----------------------------|---|-----|--------|--------|--------|---|-----|---------|--------|--------|---|----|--------------|--------|--------|---|----|--------------|--------|--------|---|-----|----------|--------|--------|---|----|------------|--------|--------|---|----|------------|--------|--------|---|----|---------|--------|--------|---|------|--------|--------|--------|----|------|--------------|--------|--------|----|------|-------------|--------|--------|----|------|--------------|--------|--------|----|------|-------------|--------|--------|--|---|
| 1  | TEMPERATURE RISE TEST | <div>MODEL : APC-25-500</div> <div>1. ROOM AMBIENT BURN-IN : 2.5 HRS</div> <div>I/P : 230VAC O/P : 95% LOAD Ta=33.2 °C</div> <div>2. HIGH AMBIENT BURN-IN : 3.5 HRS</div> <div>I/P : 230VAC O/P : 95% LOAD Ta=44.1 °C</div> <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT<br/>Ta= 33.2 °C</th><th>HIGH AMBIENT<br/>Ta= 44.1 °C</th></tr><tr><td>1</td><td>LF1</td><td>LF-804</td><td>68.4°C</td><td>86.6°C</td></tr><tr><td>2</td><td>BD1</td><td>KBP208G</td><td>69.5°C</td><td>87.7°C</td></tr><tr><td>3</td><td>C5</td><td>47uF/420V KM</td><td>62.2°C</td><td>79.6°C</td></tr><tr><td>4</td><td>C9</td><td>100uF/25V KY</td><td>73.1°C</td><td>92.6°C</td></tr><tr><td>5</td><td>ZD1</td><td>P6KE180A</td><td>72.5°C</td><td>89.5°C</td></tr><tr><td>6</td><td>D1</td><td>S1M 1A/1KV</td><td>77.1°C</td><td>93.4°C</td></tr><tr><td>7</td><td>Q1</td><td>NDF06N60ZG</td><td>83.7°C</td><td>98.6°C</td></tr><tr><td>8</td><td>T1</td><td>TF-6404</td><td>81.5°C</td><td>91.6°C</td></tr><tr><td>9</td><td>D103</td><td>HER304</td><td>81.5°C</td><td>92.1°C</td></tr><tr><td>10</td><td>C106</td><td>120uF/63V GL</td><td>68.1°C</td><td>81.7°C</td></tr><tr><td>11</td><td>C105</td><td>47uF/63V GL</td><td>61.6°C</td><td>76.1°C</td></tr><tr><td>12</td><td>C200</td><td>47uF/50V YXF</td><td>69.0°C</td><td>82.7°C</td></tr><tr><td>13</td><td>C108</td><td>47uF/63V GL</td><td>54.0°C</td><td>69.3°C</td></tr></table> |                             |                             | NO      | Position | P/N | ROOM AMBIENT<br>Ta= 33.2 °C | HIGH AMBIENT<br>Ta= 44.1 °C | 1 | LF1 | LF-804 | 68.4°C | 86.6°C | 2 | BD1 | KBP208G | 69.5°C | 87.7°C | 3 | C5 | 47uF/420V KM | 62.2°C | 79.6°C | 4 | C9 | 100uF/25V KY | 73.1°C | 92.6°C | 5 | ZD1 | P6KE180A | 72.5°C | 89.5°C | 6 | D1 | S1M 1A/1KV | 77.1°C | 93.4°C | 7 | Q1 | NDF06N60ZG | 83.7°C | 98.6°C | 8 | T1 | TF-6404 | 81.5°C | 91.6°C | 9 | D103 | HER304 | 81.5°C | 92.1°C | 10 | C106 | 120uF/63V GL | 68.1°C | 81.7°C | 11 | C105 | 47uF/63V GL | 61.6°C | 76.1°C | 12 | C200 | 47uF/50V YXF | 69.0°C | 82.7°C | 13 | C108 | 47uF/63V GL | 54.0°C | 69.3°C |  | P |
| NO | Position              | P/N                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ROOM AMBIENT<br>Ta= 33.2 °C | HIGH AMBIENT<br>Ta= 44.1 °C |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 1  | LF1                   | LF-804                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 68.4°C                      | 86.6°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 2  | BD1                   | KBP208G                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 69.5°C                      | 87.7°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 3  | C5                    | 47uF/420V KM                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 62.2°C                      | 79.6°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 4  | C9                    | 100uF/25V KY                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 73.1°C                      | 92.6°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 5  | ZD1                   | P6KE180A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 72.5°C                      | 89.5°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 6  | D1                    | S1M 1A/1KV                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 77.1°C                      | 93.4°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 7  | Q1                    | NDF06N60ZG                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 83.7°C                      | 98.6°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 8  | T1                    | TF-6404                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 81.5°C                      | 91.6°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 9  | D103                  | HER304                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 81.5°C                      | 92.1°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 10 | C106                  | 120uF/63V GL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 68.1°C                      | 81.7°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 11 | C105                  | 47uF/63V GL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 61.6°C                      | 76.1°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 12 | C200                  | 47uF/50V YXF                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 69.0°C                      | 82.7°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
| 13 | C108                  | 47uF/63V GL                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 54.0°C                      | 69.3°C                      |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
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|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |
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|    |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                             |                             |         |          |     |                             |                             |   |     |        |        |        |   |     |         |        |        |   |    |              |        |        |   |    |              |        |        |   |     |          |        |        |   |    |            |        |        |   |    |            |        |        |   |    |         |        |        |   |      |        |        |        |    |      |              |        |        |    |      |             |        |        |    |      |              |        |        |    |      |             |        |        |  |   |

|    |                                                                   |                                                                                                                                                                                                                                                                               |                                                                  |                                                       |   |
|----|-------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-------------------------------------------------------|---|
| 2  | LOW TEMPERATURE<br>TURN ON TEST                                   | TURN ON AFTER 2 HOUR                                                                                                                                                                                                                                                          | I/P : 264VAC/100VAC<br>O/P : 95 % LOAD<br>Ta= -30℃               | TEST : OK                                             | P |
| 3  | HIGH HUMIDITY<br>HIGH TEMPERATURE<br>HIGH VOLTAGE<br>TURN ON TEST | AFTER 12 HOURS<br>IN CHAMBER ON<br>CONTROL 40 ℃<br>NO DAMAGE                                                                                                                                                                                                                  | I/P : 264 VAC<br>O/P : 95% LOAD<br>Ta= 40 ℃<br>HUMIDITY= 95 %R.H | TEST : OK                                             | P |
| 4  | TEMPERATURE<br>COEFFICIENT                                        | ± 0.2 %(0~50℃)                                                                                                                                                                                                                                                                | I/P : 230 VAC<br>O/P : 95% LOAD                                  | ± 0.004 %(0~50℃)                                      | P |
| 5  | STORAGE TEMPERATURE TEST                                          | 1. Thermal shock Temperature : -45℃~ +85℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 5 CYCLE<br>5. Input/Output condition : STATIC                                                            |                                                                  | OK                                                    | P |
| 6  | THERMAL SHOCK TEST                                                | 1. Thermal shock Temperature : -35℃~ +45℃<br>2. Temperature change rate : 25℃ / MIN<br>3. Dwell time low and high temperature : 30 MIN/EACH<br>4. Total test cycle : 10 CYCLE<br>5. Input/Output condition : 230VAC/Full Load AC ON/OFF TEST<br>turn on 58sec ; turn off 2sec |                                                                  | OK                                                    | P |
| 7  | VIBRATION TEST                                                    | 1 Carton & 1 Set<br>(1) Waveform : Sine Wave<br>(2) Frequency : 10~500Hz<br>(3) Sweep Time : 12min/sweep cycle<br>(4) Acceleration : 2G<br>(5) Test Time : 72min in each axis (X.Y.Z)<br>(6) Ta : 25℃                                                                         |                                                                  | TEST : OK                                             | P |
| 8  | CAPACITOR<br>LIFE CYCLE                                           | APC-25-500 :SUPPOSE C106 IS THE MOST CRITICAL COMPONENT<br>(1) I/P : 230VAC O/P : FULL LOAD Ta=25 ℃ LIFE TIME<br>(2) I/P : 230VAC O/P : FULL LOAD Ta=40 ℃ LIFE TIME<br>(3) I/P : 230VAC O/P : 75% LOAD Ta=40 ℃ LIFE TIME                                                      |                                                                  | (1) 168792.8 HRS<br>(2) 48617 HRS<br>(3) 109388.3 HRS | P |
| 9  | MTBF                                                              | MIL-HDBK-217F NOTICES2 PARTS COUNT<br>TOTAL FAILURE RATE : 518.9KHRS                                                                                                                                                                                                          |                                                                  |                                                       | P |
| 10 | DMTBF/Accelerated Life Test                                       | Demonstration Mean Time Between Failure(Expected Life) :<br>20,000 hours @ Tcase 75℃; 50,000 hours @ Tcase 60℃                                                                                                                                                                |                                                                  |                                                       | P |

| DATE       | SAMPLE         | TEST RESULT | TESTER | APPROVAL |
|------------|----------------|-------------|--------|----------|
| 2012/05/30 | PRODUCT SAMPLE | PASS        | ZOULF  | HOWAY    |

2009/08/04 A50-F023