

MODEL : APV-12-15

OUTPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|--------------------------|--|---|--|---------|
| 1 | RIPPLE & NOISE | V1: 120 mVp-p (Max) | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | V1: 20 mVp-p (Max) | PASS |
| 2 | OUTPUT VOLTAGE TOLERANCE | V1: -5 %~ +5 % (Max) | I/P: 100VAC / 264 VAC O/P:FULL/ 0% LOAD Ta:25°C | V1: -0.487%~ 0.653 % | PASS |
| 3 | LINE REGULATION | V1: -1 %~ +1 % (Max) | I/P: 100 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C | V1: -0.04 %~ 0 % | PASS |
| 4 | LOAD REGULATION | V1: -2 %~ +2 % (Max) | I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C | V1: -0.066 %~ 0.099 % | PASS |
| 5 | SET UP TIME | 230VAC/ 1500 ms (Max) 115VAC/ 1500 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230 VAC/ 422.88 ms 115 VAC/ 842.63 ms | PASS |
| 6 | RISE TIME | 230VAC/ 30 ms (Max) 115VAC/ 30 ms (Max) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230 VAC/ 20.31 ms 115 VAC/ 22.20 ms | PASS |
| 7 | HOLD TIME | 230VAC/ 20 ms (Typ) 115VAC/ 15 ms (Typ) | I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C | 230 VAC/ 82.53 ms 115 VAC/ 17.44 ms | PASS |
| 8 | OVER/UNDERSHOOT TEST | < ±5 % | I/P: 230 VAC O/P:FULL LOAD Ta:25°C | TEST: ±1.974% | PASS |
| 9 | DYNAMIC LOAD | V1: 1500 mVp-p | I/P: 230 VAC O/P: (1)FULL /Min LOAD 90%DUTY/1KHZ (2)FULL /Min LOAD 50%DUTY/120HZ Ta:25°C | (1) 170 mVp-p (2) 600 mVp-p | PASS |

INPUT FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------------------|---|--|--|---------|
| 1 | INPUT VOLTAGE RANGE | 90 VAC~ 264 VAC | I/P: TESTING O/P: FULL LOAD Ta: 25°C | 90 V~ 264 V | PASS |
| | | | (1) I/P: LOW-LINE-3V= 87 V HIGH-LINE+15%= 300 V O/P: FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (2) I/P: 230VAC ON: 0.5 Sec . OFF: 0.5 Sec 20MIN (AC POWER ON/OFF NO DAMAGE) | TEST: (1) OK (2) OK | |
| 2 | INPUT FREQUENCY RANGE | 47HZ ~63 HZ NO DAMAGE OSC | I/P: 90 VAC ~264 VAC O/P: FULL-MIN LOAD Ta: 25°C | TEST: OK | PASS |
| 3 | EFFICIENCY | 82 % (Typ) | I/P: 230 VAC O/P: FULL LOAD Ta: 25°C | 84.42 % | PASS |
| 4 | INPUT CURRENT | 230 V/ 0.2 A (Typ) 115 V/ 0.35 A (Typ) | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C | I = 0.160A / 230VAC I = 0.234A / 115VAC | PASS |
| 5 | INRUSH CURRENT | 230 V/ 70 A 115 V/ 35 A COLD START | I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C | I = 62.41 A / 230VAC I = 25.72 A / 115VAC | PASS |

PROTECTION FUNCTION TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-------------------------|--|--|--|---------|
| 1 | OVER LOAD PROTECTION | Above 105% RATED OUTPUT POWER | I/P: 264 VAC I/P: 230 VAC I/P: 100 VAC O/P: TESTING Ta: 25°C | 146 %/264VAC 143 %/ 230VAC 124 %/ 100 VAC Hiccup Mode | PASS |
| 2 | OVER VOLTAGE PROTECTION | CH1: 17.5 V~ 21 V | I/P: 264 VAC I/P: 230 VAC I/P: 90 VAC O/P: MIN LOAD Ta: 25°C | 18.37 V/264VAC 18.37 V/ 230VAC 18.37 V/ 90VAC Shut off O/P voltage, clamping by zener diode | PASS |
| 3 | SHORT PROTECTION | SHORT EVERY OUTPUT 1 HOUR NO DAMAGE | I/P: 264 VAC O/P: FULL LOAD Ta: 25°C | NO DAMAGE Hiccup Mode | PASS |

ENVIRONMENT TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|----|---|--|---|-----------------------------|---------|-----|-----------------------------|-----------------------------|---|-----|---------|--------|--------|---|----|----------|--------|--------|---|----|--------|--------|--------|---|----|------------|--------|--------|---|----|--------|--------|--------|---|----|--------|--------|--------|---|-----|--------|--------|--------|---|----|-------|--------|--------|---|----|--------------------|--------|--------|----|----|--------------------|--------|--------|----|----|------------------|--------|--------|----|-----|--------------------|--------|--------|----|-----|-------------------|--------|--------|--|--|
| 1 | TEMPERATURE RISE TEST | MODEL : APV-12-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 21.7 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 43.4 °C | | | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 21.7 °C</th> <th>HIGH AMBIENT Ta= 43.4 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>KBP208G</td><td>43.0°C</td><td>65.2°C</td></tr> <tr><td>2</td><td>L1</td><td>DRGZ001D</td><td>44.2°C</td><td>66.8°C</td></tr> <tr><td>3</td><td>D1</td><td>1N4007</td><td>58.5°C</td><td>81.6°C</td></tr> <tr><td>4</td><td>R5</td><td>1/2W 150KΩ</td><td>62.2°C</td><td>84.1°C</td></tr> <tr><td>5</td><td>U1</td><td>SD4843</td><td>57.8°C</td><td>83.3°C</td></tr> <tr><td>6</td><td>T1</td><td>TF6328</td><td>65.4°C</td><td>86.6°C</td></tr> <tr><td>7</td><td>D10</td><td>SR3100</td><td>64.8°C</td><td>85.0°C</td></tr> <tr><td>8</td><td>D2</td><td>FR104</td><td>52.9°C</td><td>75.9°C</td></tr> <tr><td>9</td><td>C5</td><td>12uF/400V 105°C KM</td><td>40.3°C</td><td>62.4°C</td></tr> <tr><td>10</td><td>C6</td><td>12uF/400V 105°C KM</td><td>52.2°C</td><td>74.8°C</td></tr> <tr><td>11</td><td>C9</td><td>22uF/50V L5Kh KY</td><td>48.6°C</td><td>72.0°C</td></tr> <tr><td>12</td><td>C15</td><td>220uF/25V UL7Kh KY</td><td>53.4°C</td><td>73.9°C</td></tr> <tr><td>13</td><td>C17</td><td>220uF/25V LL3K GL</td><td>51.3°C</td><td>71.7°C</td></tr> </tbody> </table> | NO | Position | | P/N | ROOM AMBIENT Ta= 21.7 °C | HIGH AMBIENT Ta= 43.4 °C | 1 | BD1 | KBP208G | 43.0°C | 65.2°C | 2 | L1 | DRGZ001D | 44.2°C | 66.8°C | 3 | D1 | 1N4007 | 58.5°C | 81.6°C | 4 | R5 | 1/2W 150KΩ | 62.2°C | 84.1°C | 5 | U1 | SD4843 | 57.8°C | 83.3°C | 6 | T1 | TF6328 | 65.4°C | 86.6°C | 7 | D10 | SR3100 | 64.8°C | 85.0°C | 8 | D2 | FR104 | 52.9°C | 75.9°C | 9 | C5 | 12uF/400V 105°C KM | 40.3°C | 62.4°C | 10 | C6 | 12uF/400V 105°C KM | 52.2°C | 74.8°C | 11 | C9 | 22uF/50V L5Kh KY | 48.6°C | 72.0°C | 12 | C15 | 220uF/25V UL7Kh KY | 53.4°C | 73.9°C | 13 | C17 | 220uF/25V LL3K GL | 51.3°C | 71.7°C | | |
| NO | Position | P/N | ROOM AMBIENT Ta= 21.7 °C | HIGH AMBIENT Ta= 43.4 °C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | BD1 | KBP208G | 43.0°C | 65.2°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | L1 | DRGZ001D | 44.2°C | 66.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | D1 | 1N4007 | 58.5°C | 81.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | R5 | 1/2W 150KΩ | 62.2°C | 84.1°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | U1 | SD4843 | 57.8°C | 83.3°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | T1 | TF6328 | 65.4°C | 86.6°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7 | D10 | SR3100 | 64.8°C | 85.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | D2 | FR104 | 52.9°C | 75.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9 | C5 | 12uF/400V 105°C KM | 40.3°C | 62.4°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10 | C6 | 12uF/400V 105°C KM | 52.2°C | 74.8°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11 | C9 | 22uF/50V L5Kh KY | 48.6°C | 72.0°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12 | C15 | 220uF/25V UL7Kh KY | 53.4°C | 73.9°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13 | C17 | 220uF/25V LL3K GL | 51.3°C | 71.7°C | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | OVER LOAD BURN-IN TEST | NO DAMAGE 1 HOUR (MIN) | I/P: 230 VAC O/P: 139% LOAD Ta:25°C | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 | LOW TEMPERATURE TURN ON TEST | TURN ON AFTER 2 HOUR | I/P: 264 VAC/100 VAC O/P: 100% LOAD Ta= -30 °C | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4 | HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST | AFTER 12 HOURS IN CHAMBER ON CONTROL 45 °C NO DAMAGE | I/P: 272 VAC O/P:FULL LOAD Ta= 45 °C HUMIDITY= 95 %R.H | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5 | TEMPERATURE COEFFICIENT | ± 0.03 %(0~50°C) | I/P: 230 VAC O/P:FULL LOAD | ± 0.003 %(0~50°C) | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6 | STORAGE TEMPERATURE TEST | 1. Thermal shock Temperature : -45°C~ +85°C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 5 CYCLE 5. Input/Output condition : STATIC | | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7. | THERMAL SHOCK TEST | 1. Thermal shock Temperature : - 35 °C~ + 50 °C 2. Temperature change rate : 25°C / MIN 3. Dwell time low and high temperature : 30 MIN/EACH 4. Total test cycle : 10 CYCLE 5. Input/Output condition : 230VAC/Full Load 58SEC ON/2SEC OFF | | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8 | VIBRATION TEST | 1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C | | TEST : OK | PASS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| 9 | CAPACITOR LIFE CYCLE | APV-12-24: SUPPOSE C15 IS THE MOST CRITICAL COMPONENT (1) I/P: 230 VAC O/P:FULL LOAD Ta= 25 °C LIFE TIME= 241285 HRS (2) I/P: 230 VAC O/P:FULL LOAD Ta= 45 °C LIFE TIME= 65581 HRS (3) I/P: 230 VAC O/P:75% LOAD Ta= 45 °C LIFE TIME= 96633 HRS (4) I/P: 230 VAC O/P:50% LOAD Ta= 45 °C LIFE TIME= 125818 HRS | PASS |
| 10 | MTBF | MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 1145.7K HRS | PASS |
| 11 | DMTBF/Accelerated Life Test | Demonstration Mean Time Between Failure(Expected Life) : 20,000 hours @ Tcase 65°C , 50,000 hours @ Tcase 50°C for 5v 20,000 hours @ Tcase 70°C , 50,000 hours @ Tcase 55°C or 12v-24v | PASS |

SAFETY TEST

| | | | | | |
|---|----------------------|------------------------------------|--|--------------------------------|------|
| 1 | WITHSTAND VOLTAGE | I/P-O/P: 3.75 KVAC/min EN 60950 | I/P-O/P: 4.2 KVAC/min Ta:25°C | I/P-O/P: 1.488 mA NO DAMAGE | PASS |
| 2 | ISOLATION RESISTANCE | I/P-O/P:500VDC>100MΩ | I/P-O/P: 500 VDC Ta:25°C | I/P-O/P: >9999 MΩ NO DAMAGE | PASS |
| 3 | LEAKAGE CURRENT | < 0.25 mA / 240VAC EN 60950 | I/P: 264 VAC O/P:NO LOAD Ta:25°C | L-FG: 2.1 uA N-FG: 2.1 uA | PASS |

E.M.C TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|---|--|---|-------------------------------|---------|
| 1 | HARMONIC | EN61000-3-2 CLASS A | I/P: 220V/230V/240V AC 50HZ O/P:100%/75%/50%/25% LOAD Ta:25°C | PASS | PASS |
| 2 | CONDUCTION | EN55015 | I/P:230 VAC (50HZ) /115V(60HZ) O/P:FULL/50% LOAD Ta:25°C | PASS Test by certified Lab | PASS |
| 3 | RADIATION | EN55015 | I/P: 230 VAC (50HZ)/115V(60HZ) O/P:FULL LOAD Ta:25°C | PASS Test by certified Lab | PASS |
| 4 | E.S.D | EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | PASS |
| 5 | E.F.T | EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | PASS |
| 6 | SURGE | EN61000-4-5 LIGHT INDUSTRY L-N :2KV | I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C | CRITERIA A | PASS |
| 7 | Test by certified Lab & Test Report Prepare | | | | |

COMPONENT STRESS TEST

| NO | TEST ITEM | SPECICATION | TEST CONDITION | RESULT | VERDICT |
|----|-----------|-------------|----------------|--------|---------|
|----|-----------|-------------|----------------|--------|---------|



| DATE | SAMPLE | TEST RESULT | TESTER | APPROVAL |
|-----------|-------------------------------|-------------|--------|----------|
| 2011/1/4 | RD SAMPLE | PASS | SKY | HOWAY |
| 2011/6/10 | PRODUCT SAMPLE (W1106A193) | PASS | SKY | HOWAY |
| 2011/8/22 | PRODUCT SAMPLE (W1108E123) | PASS | SKY | HOWAY |