

MODEL : APV-12E-12

## 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 : 16 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE TOLERANCE	V1 : -5%~+5% (Max)	I/P : 180VAC / 264 VAC O/P : FULL/ NO LOAD Ta : 25°C	V1: -0.933%~ 1.133 %	PASS
3	LINE REGULATION	V1 : -1%~+1% (Max)	I/P : 190 VAC ~ 264VAC O/P : FULL LOAD Ta : 25°C	V1: -0.008%~ 0.025 %	PASS
4	LOAD REGULATION	V1 : -2%~+2% (Max)	I/P : 230 VAC O/P : FULL ~NO LOAD Ta : 25°C	V1: -0.09%~ 0.09 %	PASS
5	SET UP TIME	230VAC/ 500 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230 VAC/ 346 ms	PASS
6	RISE TIME	230VAC/ 30 ms (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230 VAC/ 19.24 ms	PASS
7	HOLD TIME	230VAC/ 20 ms(Typ)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	230 VAC/ 82.47 ms	PASS
8	OVER/UNDERSHOOT TEST	< ±5 %	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : ±1.317%	PASS
9	DYNAMIC LOAD	V1 : 1200 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) 530 mVp-p	PASS

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180 VAC~ 264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	180 V~ 264 V	PASS
			(1)I/P : LOW-LINE-3V= 177 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 : 180 VAC ~264 VAC O/P : FULL~NO LOAD Ta : 25°C	TEST : OK	PASS
3	EFFICIENCY	81 % (Typ)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	81.16%	PASS
4	INPUT CURRENT	230 V/ 0.2 A	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=0.162A/ 230VAC	PASS
5	LEAKAGE CURRENT	< 0.25mA / 240 VAC	I/P : 240 VAC O/P : NO LOAD Ta : 25°C	L-FG : 0.0021 mA N-FG : 0.0021 mA	PASS
6	INRUSH CURRENT	230V/ 70A Twidth =120 us measured at 50% Ipeak COLD START(Typ)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	I=57.69 A/ 230VAC Twidth =87 us	PASS
7	NO LOAD POWER CONSUMPTION	< 0.5W	I/P : 230VAC O/P : NO LOAD Ta : 25°C	0.32W	PASS
8	POWER FACTOR	> 0.5/ 230VAC(Typ)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	PF= 0.5448	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 : 190 VAC O/P : TESTING Ta : 25°C	143 %/264VAC 140 %/ 230VAC 121 %/ 190 VAC Hiccup Mode , recovers automatically after fault condition is removed	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 13.8 V~ 16 V	I/P : 264 VAC I/P : 230 VAC I/P : 180 VAC O/P : NO LOAD Ta : 25°C	14.72 V/264VAC 14.78 V/ 230VAC 14.64 V/ 180VAC 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 , recovers automatically after fault condition is removed	PASS

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	U1 Rated 650 V/11 A	I/P : High-Line +3V =267 V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1)504V (2)464V (3)476V	PASS
2	Diode Peak Voltage	D10 Rated 100 V/3 A	I/P : High-Line +3V = 267 V O/P : (1) Full Load Turn on (2) Output Short (3) Full load continue Ta : 25°C	(1)69.2V (2)64.4V (3)70.0V	PASS
3	Input Capacitor Voltage	C 6 Rated 12 u /400 V	I/P : High-Line +3V =267 V O/P : (1) Full Load input on/off (2) NO load input on /Off (3) Full Load /NO load Change Ta : 25°C	(1) 390V (2) 370V (3) 368V	PASS
4	Control IC Voltage Test	U 1 Rated 21 V	I/P : High-Line +3V = 267 V O/P : (1) Full Load input on/off (2) NO load input on /Off (3) Full Load /NO load Change Ta : 25°C	(1)14.0V (2)12.6V (3)13.5V	PASS

## SAFETY TEST

1	WITHSTAND VOLTAGE	I/P-O/P : 3.75 KVAC/min	I/P-O/P : 4.2 KVAC/min Ta : 25°C	I/P-O/P : 1.507 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

## E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P : 230VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS	PASS
2	CONDUCTION	EN55015	I/P : 230 VAC/50HZ O/P : FULL LOAD Ta : 25°C	PASS Test by certified Lab	PASS
3	RADIATION	EN55015	I/P : 230 VAC/50HZ 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 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				

## ENVIRONMENT TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT																																																								
1	TEMPERATURE RISE TEST	MODEL : APV-12E-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	<table border="1"> <thead> <tr> <th>NO</th> <th>Position</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>43.0°C</td><td>65.2°C</td></tr> <tr><td>2</td><td>L1</td><td>44.2°C</td><td>66.8°C</td></tr> <tr><td>3</td><td>D1</td><td>58.5°C</td><td>81.6°C</td></tr> <tr><td>4</td><td>R5</td><td>62.2°C</td><td>84.1°C</td></tr> <tr><td>5</td><td>U1</td><td>57.8°C</td><td>83.3°C</td></tr> <tr><td>6</td><td>T1</td><td>65.4°C</td><td>86.6°C</td></tr> <tr><td>7</td><td>D10</td><td>64.8°C</td><td>85.0°C</td></tr> <tr><td>8</td><td>D2</td><td>52.9°C</td><td>75.9°C</td></tr> <tr><td>9</td><td>C5</td><td>40.3°C</td><td>62.4°C</td></tr> <tr><td>10</td><td>C6</td><td>52.2°C</td><td>74.8°C</td></tr> <tr><td>11</td><td>C9</td><td>48.6°C</td><td>72.0°C</td></tr> <tr><td>12</td><td>C15</td><td>53.4°C</td><td>73.9°C</td></tr> <tr><td>13</td><td>C17</td><td>51.3°C</td><td>71.7°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 21.7 °C	HIGH AMBIENT Ta= 43.4 °C	1	BD1	43.0°C	65.2°C	2	L1	44.2°C	66.8°C	3	D1	58.5°C	81.6°C	4	R5	62.2°C	84.1°C	5	U1	57.8°C	83.3°C	6	T1	65.4°C	86.6°C	7	D10	64.8°C	85.0°C	8	D2	52.9°C	75.9°C	9	C5	40.3°C	62.4°C	10	C6	52.2°C	74.8°C	11	C9	48.6°C	72.0°C	12	C15	53.4°C	73.9°C	13	C17	51.3°C	71.7°C		PASS
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 142% LOAD Ta : 25°C	TEST : OK	PASS																																																								
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 264 VAC/190 VAC O/P : FULL LOAD Ta= -35 °C	TEST : OK	PASS																																																								
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H	TEST : OK	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~+ 45 °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 : 60 min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	PASS																																																								



# 12W Single Output Switching Power Supply

# APV-12E series

9	CAPACITOR LIFE CYCLE	APV-12E-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 NOTICE 2 STRESS ANALYSIS TOTAL FAILURE RATE : 1145.7K HRS (25°C)	PASS
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) 20,000 hours @ Tcase 70°C	PASS

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY