

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		
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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																																																																						

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	Conducted by Parts Stress Analysis Prediction 7488.9K hrs min. Telcordia SR-332 (Bellcore); 1132.5K hrs min. MIL-HDBK-217F (25°C)	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				

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) <b>Peak Voltage</b>	U1 Rated SD4843 : 650 V 11 A	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (4)Dynamic Load 50% Load/ Min. Load 50%Duty/120Hz  I/P:Low-Line -3V = 87 V O/P: (1)Full Load input on/off (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (4)Dynamic Load 50% Load/ Min. Load 50%Duty/120Hz  Ta:25°C	(1) 506 V (2) 478 V (3) 506 V (4) 484 V  (1) 251 V (2) 189 V (3) 254 V (4) 235 V	PASS
2	Diode <b>Peak Voltage</b>	D10 Rated SR3100 : 100 V 3 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load input on/off (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (4)Dynamic Load 50% Load/ Min. Load 50%Duty/120Hz  I/P:Low-Line -3V = 87 V O/P: (1)Full Load input on/off (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (4)Dynamic Load 50% Load/ Min. Load 50%Duty/120Hz  Ta:25°C	(1) 88.4 V (2) 80.8 V (3) 88.0 V (4) 88.4 V  (1) 43.8 V (2) 27.0 V (3) 40.6 V (4) 40.0 V	PASS
3	Clamp Diode <b>Peak Voltage</b>	D 1 Rated 1N4007 : 1000 V 1 A	I/P:High-Line +3V = 267 V O/P: (1)Dynamic Load Full Load/ Min. Load 90%Duty/3KHz (2)Dynamic Load 50% Load/ Min. Load 50%Duty/120Hz  Ta:25°C	(1) 510 V (2) 494 V	PASS
4	Input Capacitor <b>Voltage</b>	C 6 Rated CAPXON : 12 u/ 400 V 105°C/ KM Series	I/P:High-Line +3V =267 V O/P: (1)Full Load input on/off (2)Min load input on /Off (3)Bum-IN 1Hour  Ta:25°C	(1) 386 V (2) 366 V (3) 362 V	PASS
5	Control IC <b>Voltage Test</b>	U 1 Rated SD4843 : 21 V	I/P:High-Line +3V = 267 V O/P:(1).FULL LOAD	(1) 14.0 V	PASS



# 12W Single Output Switching Power Supply

# APV-12 series

			(2).Output Short (3).O.L.P (4).O.V.P. (5).NO LOAD LOW LINE  Ta:25°C	(2) 12.4 V (3) 12.4 V (4) 12.4 V (5) 12.1 V	
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2007/11/26 A50-G058

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