



# Test Report: APC-8E-500

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8W 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

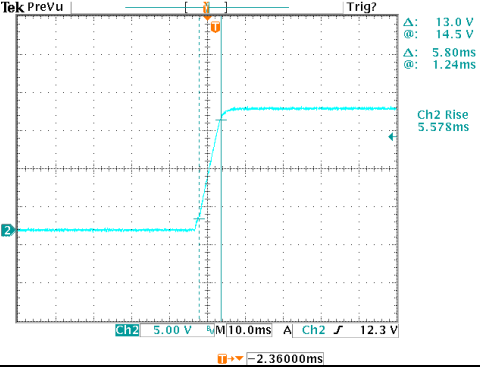
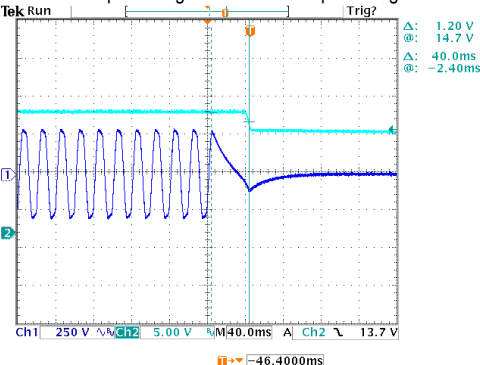
### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT ACCURACY	$< \pm 8\%$	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	3.06%
2	OPERATING VOLTAGE RANGE	8V~ 16V	I/P: 230VAC O/P: LED MODE Ta:25°C	5.1V~19.3V
3	NO LOAD OUTPUT VOLTAGE (Max)	24V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	21.92V
4	OVER/UNDERSHOOT TEST	$< \pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	$< 5\%$
5	RIPPLE & NOISE(Max)	300mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	66.0mVp-p
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>high frequency :</p> <p>Ch2 Pk-Pk 64.0mV</p> </div> <div style="text-align: center;"> <p>low frequency :</p> <p>Ch2 Pk-Pk 66.0mV</p> </div> </div>				
6	SET UP TIME(Max)	230VAC/ 500ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 52.8 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2 : Output Voltage CH1 : AC Input Voltage</p> <p>Ch1 250 V V/CH2 5.00 V V/CH2 40.0ms A Ch2 12.3 V</p> <p>Δ: 15.2 V @: 52.8ms @: 1.64ms</p>				



# 8W Single Output Switching Power Supply

# APC-8E series

7	RISE TIME (Max)	230VAC/ 180ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 5.578 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2 : Output Voltage</p> 				
8	HOLD UP TIME(Typ)	230VAC/ 20ms	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 40.0 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2 : Output Voltage CH1 : AC Input Voltage</p> 				



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	180VAC~264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	177V~267V
			I/P: (1)LOW-LINE-3V=177 V HIGH-LINE+15%=300 V O/P: FULL/MIN LOAD ON: 30 Sec OFF: 30 Sec 10MIN (2)230Vac ON: 0.5 Sec OFF: 0.5 Sec 20MIN (3)230Vac ON: 3Sec OFF: 3Sec 12HOURS ( POWER ON/OFF NO DAMAGE )	TEST: OK
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE	I/P: 180 VAC ~264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	INPUT CURRENT (Typ)	230V/ 0.15A	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I =0.099A/ 230VAC
4	LEAKAGE CURRENT	< 0.25mA / 240 VAC	I/P: 240 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.0028 mA N-FG: 0.0027 mA
5	INRUSH CURRENT(Typ)	230V/ 70A Twidth =120 us measured at 50% Ipeak COLD START	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	I = 32.1A Twidth =91.2us
INPUT=230VAC/50HZ @ FULL LOAD CH2 : Input current CH1 : AC Input Voltage 				
6	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.075W
7	EFFICIENCY(Typ)	79%	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	82.09%
8	POWER FACTOR	>0.5/ 230VAC	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	PF= 0.5394 / 230VAC



## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Hiccup mode, recovers automatically after fault condition is removed

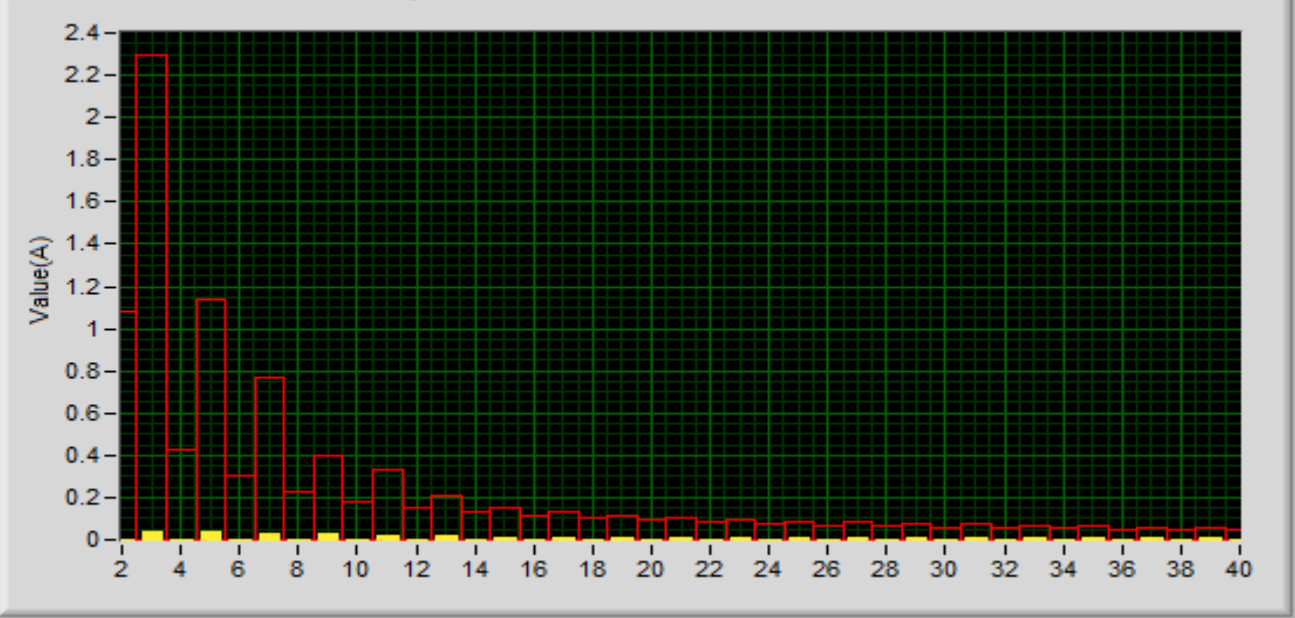
## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	PWM Transistor (D to S) or (C to E) Peak Voltage	U1 Rated 650V	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 602V (2) 500V (3) 498V
2	Diode Peak Voltage	D100 Rated 200V/2A	I/P: High-Line +3V =267V O/P: (1) Full Load Turn on (2) Output Short (3) Full load continue Ta: 25°C	(1) 169V (2) 139V (3) 138V
3	Input Capacitor Voltage	C6 Rated 10uF/400V	I/P: High-Line +3V =267 V O/P: (1) Full Load input on/off (2) Min load input on /Off Ta: 25°C	(1) 398V (2) 354V
4	Control IC Voltage Test	U1 Rated 17V	I/P: High-Line +3V =267 V O/P: (1) Full Load input on/off (2) Min load input on /Off Ta: 25°C	(1) 16.8V (2) 16.7V

## SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.75KVAC/min	I/P-O/P: 4.2KVAC/min Ta: 25°C	I/P-O/P: 1.283mA NO DAMAGE
2	ISOLATION RESISTANCE	I/P-O/P: 500VDC>100MΩ	I/P-O/P: 500VDC Ta: 25°C	I/P-O/P: >9999MΩ NO DAMAGE

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P: FULL LOAD Ta: 25°C	PASS
				
2	CONDUCTION	EN55015	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
3	RADIATION	EN55015	I/P: 230 VAC (50HZ) O/P: FULL LOAD Ta: 25°C	PASS Test by certified Lab
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
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
6	SURGE	EN61000-4-5 INDUSTRY L-N : 2KV	I/P: 230VAC/50HZ O/P: FULL LOAD Ta: 25°C	CRITERIA A
7	Test by certified Lab & Test Report Prepare			

## RELIABILITY TEST

### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT																																				
1	TEMPERATURE RISE TEST	MODEL: APC-8E-500 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 26.1°C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 46.7°C																																						
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 26.1 °C</th> <th>HIGH AMBIENT Ta= 46.7 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L1</td><td>44.2°C</td><td>63.0°C</td></tr> <tr><td>2</td><td>C6</td><td>67.6°C</td><td>85.0°C</td></tr> <tr><td>3</td><td>U1</td><td>71.6°C</td><td>89.8°C</td></tr> <tr><td>4</td><td>D1</td><td>82.6°C</td><td>100.0°C</td></tr> <tr><td>5</td><td>T1</td><td>83.0°C</td><td>99.6°C</td></tr> <tr><td>6</td><td>C101</td><td>59.3°C</td><td>76.8°C</td></tr> <tr><td>7</td><td>D100</td><td>69.6°C</td><td>92.9°C</td></tr> <tr><td>8</td><td>TC</td><td>64.4°C</td><td>81.4°C</td></tr> </tbody> </table>	NO	Position	ROOM AMBIENT Ta= 26.1 °C	HIGH AMBIENT Ta= 46.7 °C	1	L1	44.2°C	63.0°C	2	C6	67.6°C	85.0°C	3	U1	71.6°C	89.8°C	4	D1	82.6°C	100.0°C	5	T1	83.0°C	99.6°C	6	C101	59.3°C	76.8°C	7	D100	69.6°C	92.9°C	8	TC	64.4°C	81.4°C		
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/190VAC O/P: FULL LOAD Ta= -35°C	TEST: OK																																				
3	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																																				
4	TEMPERATURE COEFFICIENT	±0.2 %/°C (0~45°C)	I/P: 230 VAC O/P: FULL LOAD	±0.019 %/°C (0~45°C)																																				
5	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature: -45°C~ +90°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																																				
6	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 AC ON/OFF TEST turn on 58 sec; turn off 2 sec		TEST: OK																																				
7	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: 60min in each axis (X.Y.Z) (6) Ta: 25°C		TEST: OK																																				



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# APC-8E series

8	CAPACITOR LIFE CYCLE	APC-8E-500 : SUPPOSE C101 IS THE MOST CRITICAL COMPONENT (1) I/P: 230VAC O/P: FULL LOAD Ta= 25 °C LIFE TIME (2) I/P: 230VAC O/P: FULL LOAD Ta= 45 °C LIFE TIME (3) I/P: 230VAC O/P: 75% LOAD Ta= 45 °C LIFE TIME (4) I/P: 230VAC O/P: 50% LOAD Ta= 45 °C LIFE TIME	(1) 245432 HRS (2) 76033 HRS (3) 90493 HRS (4) 121902 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 13484.2K hrs min. Telcordia SR-332 (Bellcore); 2207.6K hrs min. MIL-HDBK-217F (25°C)	
10	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 20,000 hours @ Tcase 75°C	

TEST RESULT	TESTER	REVIEW	APPROVAL
PASS	ZHANGZJ/ZHUOKB	SKY	LIUWY