



# Test Report: APC-8-250

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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

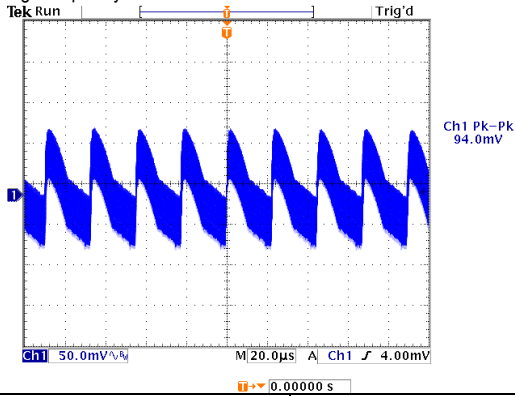
Environment Test

## DESIGN VERIFY TEST

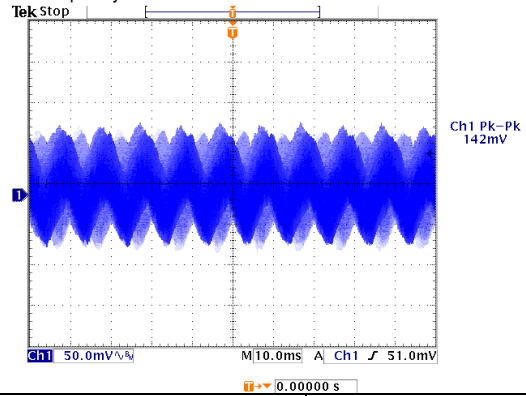
### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	CURRENT ACCURACY	$< \pm 8\%$	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	5.88%
2	OPERATING VOLTAGE RANGE	16V~ 32 V	I/P: 230VAC O/P: LED MODE Ta:25°C	9.6V~33.0V
3	NO LOAD OUTPUT VOLTAGE (Max)	38V	I/P: 230VAC O/P: NO LOAD Ta: 25°C	36.66V
4	OVER/UNDERSHOOT TEST	$< \pm 5\%$	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	$< 5\%$
5	RIPPLE & NOISE(Max)	350mVp-p	I/P: 230VAC O/P: FULL LOAD Ta: 25°C	142mVp-p

high frequency :



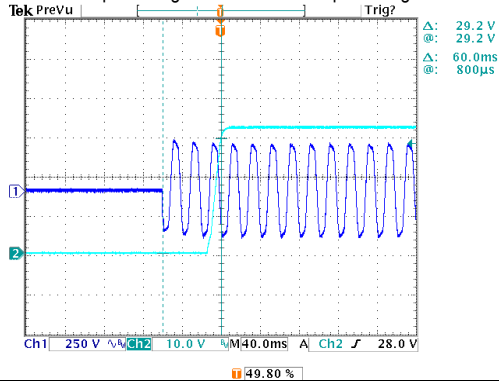
low frequency :



6	SET UP TIME(Max)	230VAC/ 500ms 115VAC/ 3000ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 60.0 ms 115VAC/ 121 ms
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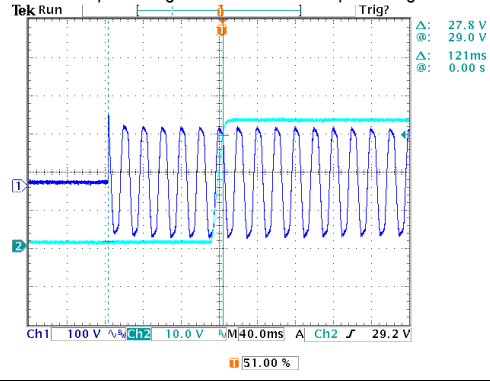
INPUT=230VAC/50HZ @ FULL LOAD

CH2 : Output Voltage CH1 : AC Input Voltage



INPUT=115VAC/60HZ @ FULL LOAD

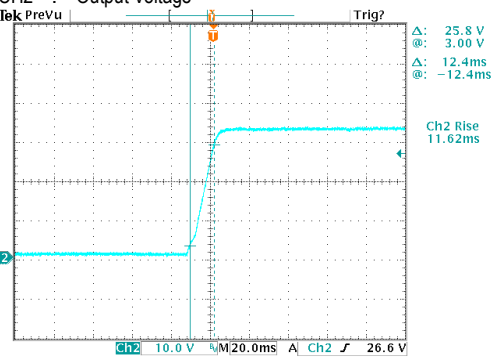
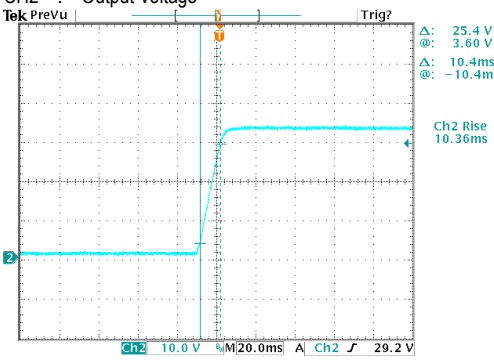
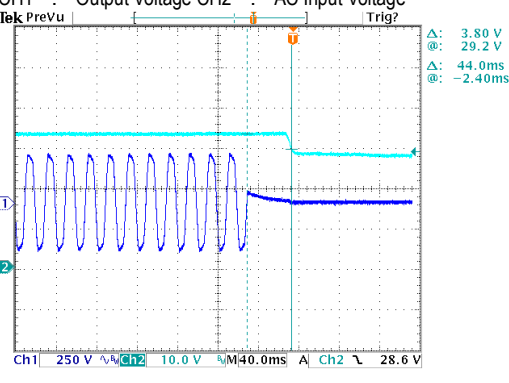
CH2 : Output Voltage CH1 : AC Input Voltage





# 8W Single Output Switching Power Supply

# APC-8 series

7	RISE TIME (Max)	230VAC/ 180ms 115VAC/ 150ms	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	230VAC/ 11.62 ms 115VAC/ 10.36 ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2 : Output Voltage</p> 		<p>INPUT=115VAC/60HZ @ 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/ 44.0ms
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH1 : Output Voltage CH2 : AC Input Voltage</p> 				



INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT
1	INPUT VOLTAGE RANGE	90VAC~264VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	87V~267V
			I/P: (1)LOW-LINE-3V=87 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: 90 VAC ~264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK
3	INPUT CURRENT (Typ)	230V/ 0.15A 115V/ 0.3A	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I =0.105A/ 230VAC I =0.160A/ 115VAC
4	LEAKAGE CURRENT	< 0.25mA / 240 VAC	I/P: 240 VAC O/P: NO LOAD Ta: 25°C	L-FG: 0.0027 mA N-FG: 0.0028 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 = 31.9A Twidth =91.2us
<p>INPUT=230VAC/50HZ @ FULL LOAD</p> <p>CH2 : Input current CH1 : AC Input Voltage</p> <p>Ch2 Max 31.9 A</p> <p>40.40%</p>				
6	NO LOAD POWER CONSUMPTION	< 0.5W	I/P: 230VAC O/P: NO LOAD Ta: 25°C	0.084W
7	EFFICIENCY(Typ)	82.5%	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	82.76%



## 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

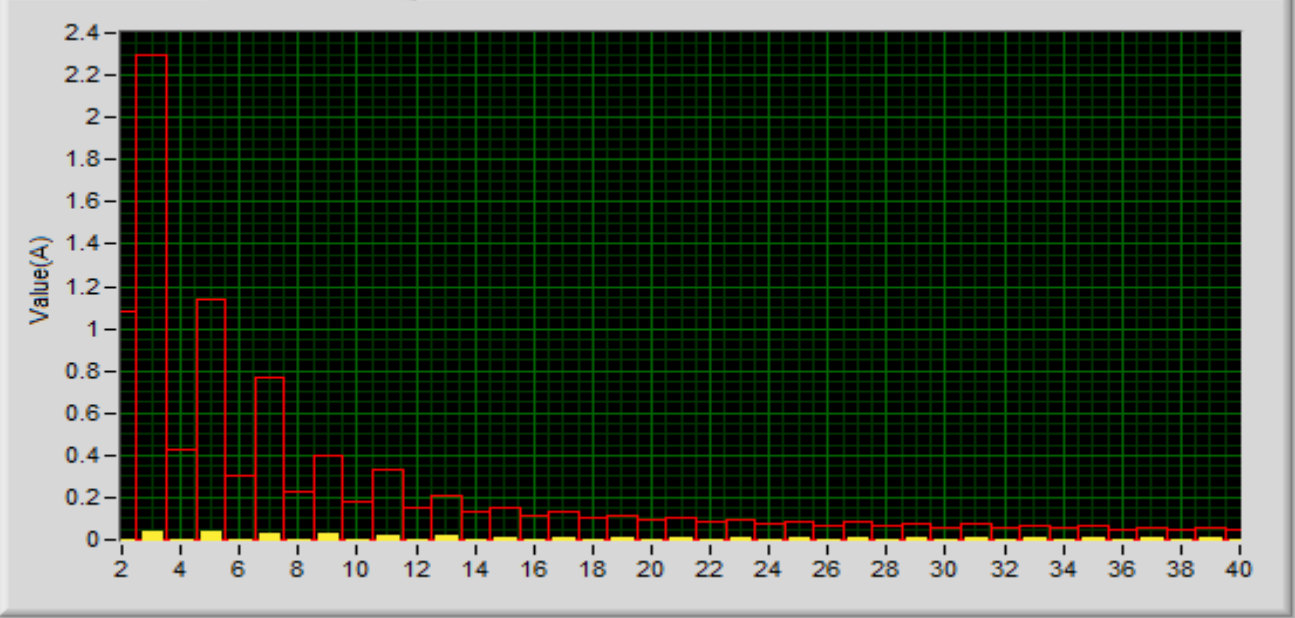
## COMPONENT STRESS TEST

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) 546V (2) 438V (3) 452V
2	Diode Peak Voltage	D100 Rated 400V/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) 359V (2) 277V (3) 268V
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) 392V (2) 350V
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) 16.9V (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: 1.337mA 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-8-350 1. ROOM AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 22.6 °C 2. HIGH AMBIENT BURN-IN: 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 43.8°C																																										
		<table border="1"> <thead> <tr> <th>NO</th> <th>Position</th> <th>ROOM AMBIENT Ta= 22.6 °C</th> <th>HIGH AMBIENT Ta= 43.8 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>L1</td><td>41.1°C</td><td>60.8°C</td></tr> <tr><td>2</td><td>C5</td><td>50.7°C</td><td>69.7°C</td></tr> <tr><td>3</td><td>C6</td><td>55.1°C</td><td>73.9°C</td></tr> <tr><td>4</td><td>U1</td><td>78.4°C</td><td>98.3°C</td></tr> <tr><td>5</td><td>D1</td><td>75.9°C</td><td>95.1°C</td></tr> <tr><td>6</td><td>T1</td><td>71.0°C</td><td>89.2°C</td></tr> <tr><td>7</td><td>C101</td><td>52.8°C</td><td>71.1°C</td></tr> <tr><td>8</td><td>D100</td><td>63.1°C</td><td>80.5°C</td></tr> <tr><td>9</td><td>TC</td><td>58.5°C</td><td>75.7°C</td></tr> </tbody> </table>			NO	Position	ROOM AMBIENT Ta= 22.6 °C	HIGH AMBIENT Ta= 43.8 °C	1	L1	41.1°C	60.8°C	2	C5	50.7°C	69.7°C	3	C6	55.1°C	73.9°C	4	U1	78.4°C	98.3°C	5	D1	75.9°C	95.1°C	6	T1	71.0°C	89.2°C	7	C101	52.8°C	71.1°C	8	D100	63.1°C	80.5°C	9	TC	58.5°C	75.7°C
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2	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264VAC/100VAC 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	±0.008 %/°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																																								



8W Single Output Switching Power Supply

# APC-8 series

8	CAPACITOR LIFE CYCLE	APC-8-350 : 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) 261127 HRS (2) 79844 HRS (3) 103838 HRS (4) 122703 HRS
9	MTBF	Conducted by Parts Stress Analysis Prediction 14511.7K hrs min. Telcordia SR-332 (Bellcore) ; 2275.9K 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