



# Test Report: PSD-30A-12

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30W 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	VERDICT
1	RIPPLE & NOISE	V1 : 120 mVp-p (Max)	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	V1 : 40 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 11 ~13.5V	I/P : 12VDC I/P : 9VDC O/P : MIN LOAD Ta : 25°C	10 V~ 14.5 V/ 12VDC 10 V~ 14.5 V/9VDC	P
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1.0% ~ +1.0% (Max)	I/P : 9VDC /18VDC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.15 %~ +0.15 %	P
4	LINE REGULATION	V1 : -1% ~ +1% (Max)	I/P : 9VDC ~18VDC O/P : FULL LOAD Ta : 25°C	V1 : -0.02 %~ +0.02 %	P
5	LOAD REGULATION	V1 : -1% ~ +1% (Max)	I/P : 12VDC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.15 %~ +0.15 %	P
6	SET UP TIME	12VDC : 2000 ms (Max)	I/P : 12VDC I/P : 9VDC O/P : FULL LOAD Ta : 25°C	12VDC/ 304 ms	P
7	RISE TIME	12VDC : 50 ms (Max)	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	12VDC/ 16 ms	P
8	DYNAMIC LOAD	V1 : 1200 mVp-p	I/P : 12VDC O/P : FULL /Min LOAD 90%DUTY/ 1KHZ Ta : 25°C	650 mVp-p	P

### INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	9VDC ~ 18VDC	I/P : TESTING O/P : FULL LOAD Ta : 25°C  I/P : LOW-LINE= 9 V HIGH-LINE= 18 V O/P : FULL/MIN LOAD ON : 30 Sec . OFF : 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	9V ~ 18VDC  TEST : OK	P
2	EFFICIENCY	77%(TYP)	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	78 %	P
3	INPUT CURRENT	12V/ 4.5 A (TYP)	I/P : 12VDC I/P : 9VDC O/P : FULL LOAD Ta : 25°C	I = 3.2 A/ 12VDC	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~150%	I/P : 12VDC I/P : 9VDC O/P : TESTING Ta : 25°C	128%/ 12VDC 132%/ 9VDC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 14V~16.5V	I/P : 12VDC I/P : 9VDC O/P : MIN LOAD Ta : 25°C	14.9V/ 12VDC 15V/ 9VDC Hiccup Mode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 18VDC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P

### COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : 60V 50A	I/P : High-Line +3V =21 V O/P : (1)Full Load Turn on (2) Output Short (3)Full load continue Ta : 25°C	(1) 38.4 V (2) 39.6 V (3) 38.4 V	P
2	Diode Peak Voltage	D100 Rated : 200V 10A	I/P : High-Line +3V =21 V O/P : (1)Full Load Turn on (2)Output Short (3)Full load continue Ta : 25°C	(1) 80 V (2) 59.2 V (3) 80 V	P
3	Clamp Diode Peak Voltage	D6 Rated : 200V 1A	I/P : High-Line +3V =21 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1) 21.6 V (2) 21.8 V	P
4	Input Capacitor Voltage	C5 Rated : 1000u / 35V / 105°C	I/P : High-Line +3V =21 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 20.6 V (2) 21.1 V (3) 20.6 V	P
5	Control IC Voltage Test	U1 Rated : 30V	I/P : High-Line +3V =21 V O/P : (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta : 25°C	(1) 15.8 V (2) 11.7 V (3) 15.7 V	P

## ■ SAFETY & E.M.C. TEST

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 1.5 KVAC/min I/P-FG : 1.5 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-O/P : 1.8KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 0.15 mA I/P-FG : 0.58 mA O/P-FG : 3.17 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P : 500VDC>100MΩ I/P-FG : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-O/P : 500 VDC I/P-FG : 500 VDC O/P-FG : 500 VDC Ta : 25°C/70%RH	I/P-O/P : >9.99 GΩ I/P-FG : >9.99 GΩ O/P-FG : 3.63 GΩ NO DAMAGE	P

### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55022 CLASS B	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	OK	P
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	OK	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	OK	P
4	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P : 12VDC O/P : FULL LOAD Ta : 25°C	OK	P

### ■ RELIABILITY TEST

#### ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : PSD-30A-12 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 12VDC O/P : FULL LOAD Ta=25.4°C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P : 12VDC O/P : FULL LOAD Ta=43°C			p
3	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 12VDC O/P : 128% LOAD Ta : 25°C	TEST : ok	p
4	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 18VDCAC/100VAC O/P : 100 % LOAD Ta= -20°C	TEST : ok	p
5	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	p

6	TEMPERATURE COEFFICIENT	$\pm 0.03\%$ (0~50°C)	I/P : 12VDC O/P : FULL LOAD	$\pm 0.02\%$ (0~50°C)	p
7	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature : -20°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		ok	p
8.	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20°C ~ +60°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 : 12VDC/Full Load		ok	p
9	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Sweep Time : 12min/sweep cycle (4) Acceleration : 2G (5) Test Time : 60min in each axis (X.Y.Z) (6) Ta : 25°C		TEST : ok	p
10	CAPACITOR LIFE CYCLE	SUPPOSE C100 IS THE MOST CRITICAL COMPONENT (1) I/P : 12VDC O/P : FULL LOAD Ta=25°C LIFE TIME (2) I/P : 12VDC O/P : FULL LOAD Ta=40°C LIFE TIME		(2) 308686HRS (3) 124523HRS	p
11	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 902.4 HRS			p

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/9/8	RD SAMPLE	PASS	何马超、葛双根	王德昭

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