



# Test Report: PSD-30A-24

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30W SINGLE OUTPUTB DC-DC CONVERTER

## ■ DESIGN VERIFY TEST

Output Function Test  
Input Function Test  
Protection Function Test  
Control 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 : 150 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 : 22V ~ 26 V	I/P : 18VDC I/P : 9 VDC O/P : MIN LOAD Ta : 25°C	21.42 V ~ 27.4 V / 18VDC 21.43 V ~ 27.4 V / 9VDC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -1 %~ +1 % (Max)	I/P:9VDC /18VDC O/P:FULL / MIN LOAD Ta:25°C	V1 : 0 %~ 0.2 %	P
4	LINE REGULATION	V1: -1 %~ +1 % (Max)	I/P: 9VDC ~ 18VDC O/P:FULL LOAD Ta:25°C	V1 : 0.02 %~ 0 %	P
5	LOAD REGULATION	V1: -1 %~ +1 % (Max)	I/P:12VDC O/P:FULL ~MIN LOAD Ta:25°C	V1 : -0.1 %~ 0.1 %	P
6	SET UP TIME	12 VDC : 2000 ms (Max)	I/P: 12VDC O/P:FULL LOAD Ta:25°C	12VDC/ 306.8 ms	P
7	RISE TIME	12VDC : 50 ms (Max)	I/P: 12VDC O/P:FULL LOAD Ta:25°C	12VDC/ 13.5 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 12VDC O/P:FULL LOAD Ta:25°C	TEST : 1.25 %	P
9	DYNAMIC LOAD	V1 : 2400 mVp-p	I/P : 12VDC (1).O/P : FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P : FULL /Min LOAD 50%DUTY/ 120HZ Ta : 25°C	(1) 398 mVp-p (2) 206 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-0.2V=9.8 VDC HIGH-LINE+5%=18.9 VDC O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	7.687VDC-18VDC  TEST : OK	P
2	EFFICIENCY	78% (TYP)	I/P:12VDC O/P:FULL LOAD Ta:25°C	79.465 %	P
3	INPUT CURRENT	12VDC/ 3.5 A (TYP)	I/P:12VDC O/P:FULL LOAD Ta:25°C	I = 3.116 A/ 12 VDC	P

**PROTECTION FUNCTION TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 150 %	I/P:18 VDC I/P: 12VDC I/P:9VDC O/P:TESTING Ta:25°C	132.8 %/ 18 VDC 131.5 %/ 12 VDC 132.8 %/ 9 VDC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1 : 27 V ~32.5 V	I/P:18 VDC I/P: 12VDC I/P: 9VDC O/P:TESTING Ta:25°C	29.0 V/ 18 VDC 29.0 V/ 12 VDC 29.1 V/ 9 VDC 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	Q 1 Rated : 60 V 50 A	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) 37.4 V (2) 33.4 V (3) 31.5 V	P
2	Diode Peak Voltage	D100 Rated : 400 V 10 A	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) 70.1 V (2) 69.2 V (3) 68.5 V	P
3	Clamp Diode Peak Voltage	D 6 Rated : 200 V 1 A	I/P : High-Line +3V = 21 V O/P : (1) Dynamic Load 90%Duty/1KHz (2)Full load continue Ta : 25°C	(1) 26.4 V (2) 25.9 V	P
4	Input Capacitor Voltage	C5 Rated : 330 u /100V/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) 19.1 V (2) 18.7 V (3) 18.9 V	P
5	Control IC Voltage Test	U1 Rated : 30 V	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) 12.6 V (2) 12.5 V (3) 12.4 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 : 1.8 KVAC/min I/P-FG : 1.8 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-O/P : 1.298 mA I/P-FG : 1.318 mA O/P-FG : 3.70 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 : 20.0 GΩ I/P-FG : 25.4 GΩ O/P-FG : 18.3 GΩ NO DAMAGE	P

**E.M.C TEST**

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CONDUCTION	EN55022 CLASS B	I/P: 12VDC O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	P
2	RADIATION	EN55022 CLASS B	I/P: 12VDC O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	P
3	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P: 12VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
4	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P: 12VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
5	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P: 12VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
6	Test by certified Lab & Test Report Prepare				

■ RELIABILITY TEST

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : PSD-30A-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta=24.2 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 12VDC O/P : FULL LOAD Ta= 40.2 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 12 VDC O/P : 125 % LOAD Ta : 25°C	TEST : OK	P
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 18 VDC/9 VDC O/P : 80 % LOAD Ta= -20 °C	TEST : OK	P
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 40 °C NO DAMAGE	I/P : 18.54 VDC O/P : FULL LOAD Ta= 40 °C HUMIDITY= 95 %R.H	TEST : OK	P
5	TEMPERATURE COEFFICIENT	± 0.03 %/°C (0-50°C)	I/P : 12VDC O/P : FULL LOAD	± 0.005 %/°C (0-50°C)	P
6	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
7	THERMAL SHOCK TEST	1. Thermal shock Temperature : -20°C~ +40°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 DC ON/OFF TEST turn on 58sec ; turn off 2sec		OK	P



# 30W SINGLE OUTPUTB DC-DC CONVERTER

# PSD-30 series

8	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
9	CAPACITOR LIFE CYCLE	PSD-30A-24 SUPPOSE C 100 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=40 °C LIFE TIME	(1) 1752835 HRS (2) 891417 HRS	P
10	MTBF	MIL-HDBK-217F NOTICE S2 PARTS COUNT TOTAL FAILURE RATE : 902.4 KHRS		P
11	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure (Expected Life): Above 20,000 hours @ TA 40°C		P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/09/02	RD SAMPLE	PASS	GE SHUANG GEN	Wangdz

2009/08/04 A50-F023