Test Report: PSD-15A-5

15W DC-DC 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	V1：50 mVp-p (Max)	I/P： 12VDC O/P：FULL LOAD Ta：25℃	V1： 20 mVp-p (Max)	P
2	OUTPUT VOLTAGE TOLERANCE	V1： 2 %~ -2 % (Max)	I/P：11 VDC ~ 18 VDC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.15 %~ -0.15 %	P
3	LINE REGULATION	V1： 1 %~ -1 % (Max)	I/P：11 VDC ~ 18 VDC O/P：FULL LOAD Ta：25℃	V1： 0 %~ 0 %	P
4	LOAD REGULATION	V1：1 %~ -1 % (Max)	I/P： 12 VDC O/P：FULL ~ MIN LOAD Ta：25℃	V1： 0.15 %~ -0.15 %	P
5	SET UP TIME	12VDC： 2500 ms (Max)	I/P： 12 VDC O/P：FULL LOAD Ta：25℃	12VDC/ 588 ms	P
6	RISE TIME	12VDC： 25 ms (Max)	I/P： 12 VDC O/P：FULL LOAD Ta：25℃	12VDC/ 4 ms	P
7	OVER/UNDERSHOOT TEST	< ± 10 %	I/P： 12 VDC O/P：FULL LOAD Ta：25℃	TEST： < 10 %	P
8	DYNAMIC LOAD	V1： 1000 mVp-p	I/P： 12 VDC (1).O/P：FULL /Min LOAD 90%DUTY/ 1KHZ (2).O/P：FULL /Min LOAD 50%DUTY/ 120HZ Ta：25℃	(1) 281 mVp-p (2) 646 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	9.2VDC~18VDC	I/P：TESTING O/P：FULL LOAD Ta：25℃	9 V~18V	P
			I/P： LOW-LINE-0.2V=9 V HIGH-LINE+ 5%=18.9 V O/P：FULL/MIN LOAD ON： 30 Sec . OFF： 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST： OK	
2	EFFICIENCY	74 % (TYP)	I/P： 12 VDC O/P：FULL LOAD Ta：25℃	74.12 %	P
3	INPUT CURRENT	12VDC/ 1.9 A (TYP)	I/P： 12 VDC O/P：FULL LOAD Ta：25℃	I = 1.685 A/ 12 VDC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 % ~ 150 %	I/P： 12 VDC O/P：TESTING Ta：25℃	138.02 %/ 12 VDC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1： 5.75 V ~ 6.75 V	I/P： 12 VDC O/P：N0 LOAD Ta：25℃	6.28 V/ 12 VDC Shut off o/p voltage, clamping by zener diode	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 18 VDC O/P：FULL LOAD Ta：25℃	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： IRF540N : 100 V/ 33 A	I/P：High-Line +3V = 21 V O/P： (1)Full Load Turn on (2) Output Short (3)Full load continue Ta：25℃	(1) 41.9 V (2) 54.5 V (3) 38.2 V	P
2	Diode Peak Voltage	D10 Rated： SG10SC6M :60V/ 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℃	(1) 45.2 V (2) 34.8 V (3) 34.7 V	P
3	Input Capacitor Voltage	C3 Rated： 220u/63V 105℃ 10*20 GL	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℃	(1) 21.5 V (2) 21.4 V (3) 21.5 V	P
4	Control IC Voltage Test	U 1 Rated： TL3845P: 30V (MAX)	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℃	(1) 14.2 V (2) 12.1 V (3) 14.1 V	P

■ SAFETY & E.M.C. TEST

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 2.0 KVAC/min EN 60950	I/P-O/P: 2.4 KVAC/min Ta:25℃	I/P-O/P： 0.67 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta：25℃/70%RH	I/P-O/P： >9999 MΩ NO DAMAGE	P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
3	RADIATION	EN55022 CLASSB	I/P: 12 VDC O/P: FULL LOAD Ta:25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 12 VDC O/P:FULL LOAD Ta:25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 12 VDC O/P:FULL LOAD Ta:25℃	CRITERIA A	P
7	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-15A-5 1. ROOM AMBIENT BURN-IN：2.5 HRS I/P： 12VDC O/P： FULL LOAD Ta=25.5 ℃ 2. HIGH AMBIENT BURN-IN：3.5 HRS I/P： 12VDC O/P： FULL LOAD Ta=50.7 ℃			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P： 12 VDC O/P： 138.2 % LOAD Ta：25℃	TEST：OK	P
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P： 18VDC/9.2VDC O/P：FULL LOAD Ta= -5℃	TEST：OK	P
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 ℃ NO DAMAGE	I/P： 18 VDC O/P：FULL LOAD Ta= 50 ℃ HUMIDITY= 95 %R.H	TEST：OK	P

NO	Position	P/N	ROOM AMBIENT Ta= 25.5 ℃	HIGH AMBIENT Ta= 50.7 ℃
1	LF1	TR-6003	61.7℃	88.8℃
2	R2	2W 10Ω 5%	58.1℃	85.6℃
3	D2	HER203 2A/200V	58.9℃	83.8℃
4	C3	220uF/63V 10*20 GL	60.3℃	85.0℃
5	U1	TL3845P	56.6℃	81.8℃
6	C33	330uF/35V 10*16 GL	45.8℃	70.2℃
7	Q1	IRF540N 33A/100V	75.9℃	101.7℃
8	T1	TF-6003	78.5℃	104.4℃
9	T2	TF-6000	55.9℃	83.9℃
10	D10	SG10SC6M 10A/60V	89.5℃	113.2℃
11	C11	2200uF/10V 13*20 GL	60.7℃	86.4℃

5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50℃)	I/P： 12 VDC O/P：FULL LOAD	± 0.015 %(0~50℃)	P
6	STORAGE TEMPERATURE TEST	1. Thermal shock Temperature： -25℃~ +90℃ 2. Temperature change rate ：25℃ / 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： -5℃~ +55℃ 2. Temperature change rate ：25℃ / MIN 3. Dwell time low and high temperature ： 30 MIN/EACH 4. Total test cycle：10 CYCLE 5. Input/Output condition： 12VDC/Full Load AC ON/OFF TEST turn on 58sec；turn off 2sec		OK	P
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：72min in each axis (X.Y.Z) (6) Ta：25℃		TEST：OK	P
9	CAPACITOR LIFE CYCLE	PSD-15A-5 :SUPPOSE C11 IS THE MOST CRITICAL COMPONENT (1) I/P： 12VDC O/P：FULL LOAD Ta=25 ℃ LIFE TIME (2) I/P： 12VDC O/P：FULL LOAD Ta=50 ℃ LIFE TIME (3) I/P： 12VDC O/P：75% LOAD Ta=50 ℃ LIFE TIME		(1) 119590.6 HRS (2) 20414.0 HRS (3) 31397.9 HRS	P
10	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE：740.4KHRS			P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/07/10	PRODUCT SAMPLE	PASS	LIUWY	WANGDZ

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