

MODEL : PLN-60-20

### OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 1.8 Vp-p (Max)	I/P : 230VAC O/P : 100% LOAD Ta : 25°C	V1 : 1.2 Vp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 19.5 V~ 22 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	17.3 V~ 22.59 V / 230 VAC 17.3 V~ 22.59 V / 115 VAC	P
3	OUTPUT CURRENT ADJUST RANGE	CH1 : 3.09 A~2.25 A	I/P : 230 VAC I/P : 115 VAC Ta : 25°C	1.55 A~ 4.77 A / 230 VAC 1.49 A~ 4.53 A / 115 VAC	P
4	OUTPUT VOLTAGE TOLERANCE	V1 : 10 %~ -10 % (Max)	I/P : 100 VAC / 295 VAC O/P : 100% LOAD / MIN LOAD Ta : 25°C	V1 : 0.5 %~ -0.5 %	P
5	LINE REGULATION	V1 : 3 %~ -3 % (Max)	I/P : 100VAC ~ 295 VAC O/P : 100% LOAD Ta : 25°C	V1 : 0.2 %~ -0.2 %	P
6	LOAD REGULATION	V1 : 5 %~ -5 % (Max)	I/P : 230 VAC O/P : 100% LOAD ~MIN LOAD Ta : 25°C	V1 : 0.3 %~ -0.3 %	P
7	SET UP TIME	230VAC : 500 ms (Max) 115 VAC : 3000 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : 100% LOAD Ta : 25°C	230VAC/ 451.358 ms 115VAC/ 902.716 ms	P
8	OVER/UNDERSHOOT TEST	< ±10%	I/P : 230 VAC O/P : 100% LOAD Ta : 25°C	TEST : <10 %	P

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~295 VAC	I/P : TESTING O/P : 100% LOAD Ta : 25°C	80 V~295V	P
			I/P : LOW-LINE-3V= 87V HIGH-LINE+10V=305 V O/P : 95% LOAD /MIN LOAD ON : 30 Sec. OFF : 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	TEST : OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P : 90 VAC ~ 295 VAC O/P : 100% LOAD ~MIN LOAD Ta : 25°C	TEST : OK	P
3	POWER FACTOR	0.90 / 230 VAC(TYP) 0.92 / 115 VAC(TYP) 0.9 / 277VAC(TYP)	I/P : 230 VAC I/P : 115 VAC I/P : 277 VAC O/P : 95% LOAD Ta : 25°C	PF= 0.921 / 230 VAC PF= 0.996 / 115 VAC PF= 0.902 / 277VAC	P
4	EFFICIENCY	87.5% (TYP)	I/P : 230 VAC O/P : 100% LOAD Ta : 25°C	88 %	P
5	INPUT CURRENT	230V/ 0.4 A (TYP) 115V/ 0.8 A (TYP)	I/P : 230 VAC I/P : 115 VAC O/P : 100% LOAD Ta : 25°C	I = 0.33 A/ 230 VAC I = 0.6 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 35 A (TYP)  COLD START	I/P : 230 VAC O/P : 100% LOAD Ta : 25°C	I = 29 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 0.75 mA / 240 VAC	I/P : 264 VAC O/P : Min LOAD Ta : 25°C	L-FG : 0.34 mA N-FG : 0.34 mA	P

## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	95%~110 %	I/P : 230 VAC I/P : 115 VAC O/P : TESTING Ta : 25°C	103 %/ 230 VAC 102 %/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 22.8 V~ 25V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	23.7 V/ 230 VAC 23.7 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 95 ± 10°C O.T.P. NO DAMAGE	I/P : 230 VAC O/P : 100% LOAD	O.T.P. Active Shut down o/p voltage, recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : 100% LOAD Ta : 25°C	NO DAMAGE Hiccup Mode	P

## ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : PLN-60-24 1. ROOM AMBIENT BURN-IN : 1HRS I/P : 230VAC O/P : 100% LOAD Ta= 30.6 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : 100% LOAD Ta= 39.6 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P : 230 VAC O/P : 103 % LOAD Ta : 25°C	TEST : OK	P
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230 VAC O/P : 100 % LOAD Ta= -30 °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 : 295 VAC O/P : 100% LOAD Ta= 40°C HUMIDITY= 95 %R.H	TEST : OK	P
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P : 230 VAC O/P : 100% LOAD	± 0.01 %(0~50°C)	P
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform : Sine Wave (2) Frequency : 10~500Hz (3) Time : 72min (4) Acceleration : 2G (5) Test Time : 1 hour in each axis (X.Y.Z) (6) Ta : 25°C		TEST : OK	P

### SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P : 3.75 KVAC/min I/P-FG : 2KVAC/min O/P-FG : 0.5KVAC/min	I/P-O/P : 4.2KVAC/min I/P-FG : 2.4KVAC/min O/P-FG : 0.6KVAC/min Ta : 25°C	I/P-O/P : 2.211 mA I/P-FG : 4.76 mA O/P-FG : 5.35 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 Ta : 25°C	I/P-O/P : 30 GΩ I/P-FG : 30 GΩ O/P-FG : 30 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta : 25°C	49 mΩ	P
4	APPROVAL	TUV : Certificate NO : R50102381 UL : File NO : E307078			P

### E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C	I/P : 230 VAC/50HZ O/P : 100% LOAD/75%LOAD Ta : 25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : 100% LOAD /50% LOAD Ta : 25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P : 230 VAC (50HZ) O/P : 100% LOAD Ta : 25°C	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR : 8KV / Contact : 4KV	I/P : 230 VAC/50HZ O/P : 100% LOAD Ta : 25°C	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT : 1KV	I/P : 230 VAC/50HZ O/P : 100% LOAD Ta : 25°C	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N : 1KV L,N-PE : 2KV	I/P : 230 VAC/50HZ O/P : 100% LOAD Ta : 25°C	CRITERIA A	P
7	Test by certified Lab & Test Report Prepare				

### M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	PLN-60-24 : SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P : 230VAC O/P : 100% LOAD Ta= 25 °C LIFE TIME= 116971 HRS I/P : 230VAC O/P : 100% LOAD Ta= 50 °C LIFE TIME= 46886 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 497.8K HRS			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure(Expected Life) : 20,000 hours @ Tcase 65°C ; 50,000 hours @ Tcase 50°C			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 2SK2843 : 600V 10A	I/P : High-Line +3V = 298 V O/P : (1) 100% LOAD Turn on (2) Output Short Ta : 25°C	(1) 520 V (2) 482 V	P
2	Diode Peak Voltage	D100 Rated STPS2017OC : 170V 20A	I/P : High-Line +3V = 298 V O/P : (1) 100% LOAD Turn on (2) Output Short Ta : 25°C	(1) 118 V (2) 108 V	P
3	Clamp Diode Peak Voltage	D2 Rated GP30J : 600V 3A	I/P : High-Line +3V = 298 V O/P : (1) Dynamic Load 90%Duty/1KHz Ta : 25°C	(1) 498 V	P
4	Control IC Voltage Test	U1 Rated TDA4863G : 22V	I/P : High-Line +3V = 298 V O/P : (1) 100% LOAD Turn on /Off (2) Min load Turn on /Off (3) 100% /Min load Change Ta : 25°C	(1) 16.75 V (2) 13.38 V (3) 16.75 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/10/5	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/1/9	PRODUCT SAMPLE W0611B31	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023