

MODEL : PLN-60-27

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 2.7 Vp-p (Max)	I/P : 230VAC O/P : 100% LOAD Ta : 25°C	V1 : 1.29 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 25 V~ 30V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	24.5 V~ 30.78 V / 230 VAC 24.5 V~ 30.78 V / 115 VAC	P
3	OUTPUT CURRENT ADJUST RANGE	CH1 : 2.369 A~1.725 A	I/P : 230 VAC I/P : 115 VAC Ta : 25°C	1.35 A~ 3.4 A / 230 VAC 1.3 A~ 3.17 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 : 2.4 %~ -2.4 %	P
5	LINE REGULATION	V1 : 3 %~ -3 % (Max)	I/P : 100VAC ~ 295 VAC O/P : 100% LOAD Ta : 25°C	V1 : 0.05 %~ -0.05 %	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/ 459.915 ms 115VAC/ 919.830 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	76 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	88% (TYP)	I/P : 230 VAC O/P : 100% LOAD Ta : 25°C	89 %	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 = 0.62 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 = 30 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 : 0.4 mA N-FG : 0.4 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	105 %/ 230 VAC 105 %/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1 : 31V~ 35V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	33.4 V/ 230 VAC 33.4 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  <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>NO</th> <th>Position</th> <th>P/N</th> <th>ROOM AMBIENT Ta= 30.6 °C</th> <th>HIGH AMBIENT Ta= 39.6 °C</th> </tr> </thead> <tbody> <tr><td>1</td><td>BD1</td><td>US4KB80 4A/800V SHI</td><td>75.1°C</td><td>81.9°C</td></tr> <tr><td>2</td><td>Q1</td><td>K2843 10A/600V TOS</td><td>85.4°C</td><td>91.4°C</td></tr> <tr><td>3</td><td>LF2</td><td>TR-689</td><td>64.9°C</td><td>71.5°C</td></tr> <tr><td>4</td><td>L1</td><td>TR-623</td><td>73.2°C</td><td>79.6°C</td></tr> <tr><td>5</td><td>R5</td><td>100K/2W R/MO</td><td>90.6°C</td><td>96.6°C</td></tr> <tr><td>6</td><td>D2</td><td>GP30J 3A/600V ZOW</td><td>96.5°C</td><td>103.1°C</td></tr> <tr><td>7</td><td>C46</td><td>100U/25V RUB 105°C YXG</td><td>78.8°C</td><td>85.5°C</td></tr> <tr><td>8</td><td>T1 COIL</td><td>TF-1547 LS</td><td>83.0°C</td><td>89.9°C</td></tr> <tr><td>9</td><td>D100</td><td>BYV32E 20A/200V PH</td><td>79.7°C</td><td>87.0°C</td></tr> <tr><td>10</td><td>C106</td><td>1000U/35V NCC 105°C KY</td><td>78.0°C</td><td>85.2°C</td></tr> <tr><td>11</td><td>TSW1</td><td>ST-95</td><td>75.5°C</td><td>82.6°C</td></tr> <tr><td>12</td><td>U1</td><td>TDA4863G INFINEON</td><td>81.4°C</td><td>88.0°C</td></tr> <tr><td>13</td><td>LF100</td><td>TR-706</td><td>68.7°C</td><td>76.6°C</td></tr> <tr><td>14</td><td>C7</td><td>474/450V/105°C NISSEI</td><td>80.0°C</td><td>86.3°C</td></tr> </tbody> </table>	NO	Position	P/N	ROOM AMBIENT Ta= 30.6 °C	HIGH AMBIENT Ta= 39.6 °C	1	BD1	US4KB80 4A/800V SHI	75.1°C	81.9°C	2	Q1	K2843 10A/600V TOS	85.4°C	91.4°C	3	LF2	TR-689	64.9°C	71.5°C	4	L1	TR-623	73.2°C	79.6°C	5	R5	100K/2W R/MO	90.6°C	96.6°C	6	D2	GP30J 3A/600V ZOW	96.5°C	103.1°C	7	C46	100U/25V RUB 105°C YXG	78.8°C	85.5°C	8	T1 COIL	TF-1547 LS	83.0°C	89.9°C	9	D100	BYV32E 20A/200V PH	79.7°C	87.0°C	10	C106	1000U/35V NCC 105°C KY	78.0°C	85.2°C	11	TSW1	ST-95	75.5°C	82.6°C	12	U1	TDA4863G INFINEON	81.4°C	88.0°C	13	LF100	TR-706	68.7°C	76.6°C	14	C7	474/450V/105°C NISSEI	80.0°C	86.3°C			P
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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) 512 V (2) 442 V	P
2	Diode Peak Voltage	D100 Rated BYV32E-200 : 200V 20A	I/P : High-Line +3V = 298 V O/P : (1) 100% LOAD Turn on (2) Output Short Ta : 25°C	(1) 165 V (2) 137 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) 492 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) 14.99 V (2) 12.2 V (3) 14.99 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