



■ Features :

- Universal AC input / Full range (up to 295VAC)
- Fully isolated plastic case with IP64 level
- Built-in constant current limiting circuit with adjustable OCP level
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Built-in active PFC function
- Pass LPS
- IP64 design for indoor or outdoor installations
- Cooling by free air convection
- 100% full load burn-in test
- High reliability
- Suitable for LED lighting and moving sign applications (Note.2)
- Compliance to worldwide safety regulations for lighting
- 2 years warranty

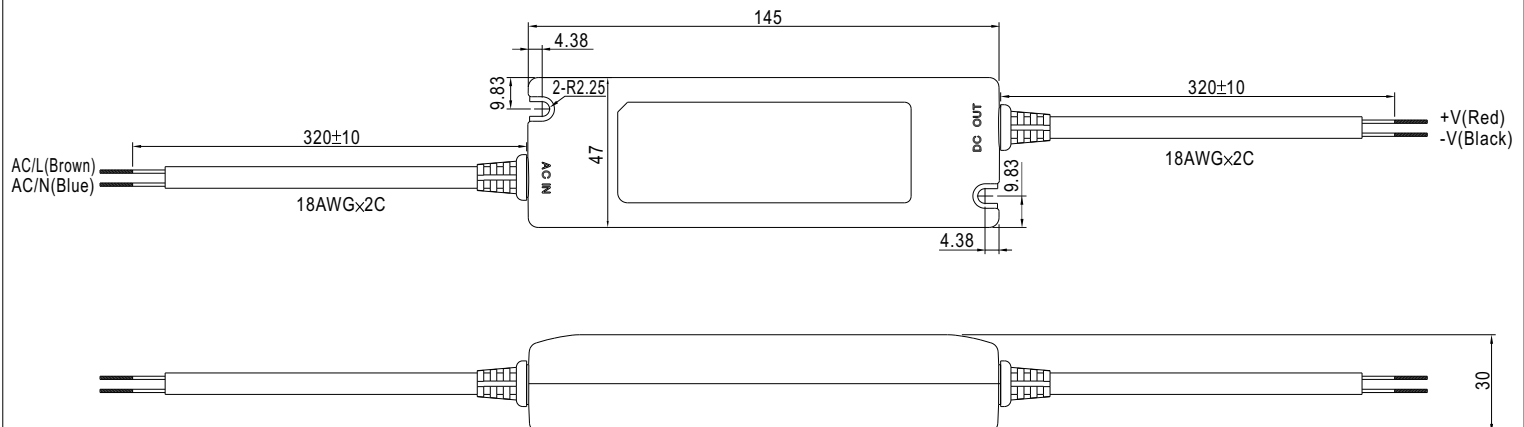
SPECIFICATION      SELV LPS  (except for 48V)  (for 48V only)  (except for 48V) IP64   

SPECIFICATION									
MODEL		PLN-30-9	PLN-30-12	PLN-30-15	PLN-30-20	PLN-30-24	PLN-30-27	PLN-30-36	PLN-30-48
OUTPUT	DC VOLTAGE	9V	12V	15V	20V	24V	27V	36V	48V
	CONSTANT CURRENT REGION Note.6	6.3 ~ 9V	8.4 ~ 12V	10.5 ~ 15V	14 ~ 20V	16.8 ~ 24V	18.9 ~ 27V	25.2 ~ 36V	33.6 ~ 48V
	RATED CURRENT	3.3A	2.5A	2A	1.5A	1.25A	1.12A	0.84A	0.63A
	CURRENT RANGE	0 ~ 3.3A	0 ~ 2.5A	0 ~ 2A	0 ~ 1.5A	0 ~ 1.25A	0 ~ 1.12A	0 ~ 0.84A	0 ~ 0.63A
	RATED POWER	29.7W	30W	30W	30W	30W	30.24W	30.24W	30.24W
	RIPPLE & NOISE (max.) Note.2	2.6Vp-p	2Vp-p	2.6Vp-p	2.6Vp-p	2.6Vp-p	2.3Vp-p	4.5Vp-p	3.7Vp-p
	VOLTAGE ADJ. RANGE Note.5	-5% ~ 10%. Can be adjusted by internal potential meter SVR1							
	CURRENT ADJ. RANGE Note.5	3% ~ -25%. Can be adjusted by internal potential meter SVR2							
	VOLTAGE TOLERANCE Note.3	±10%							
	LINE REGULATION	±3.0%							
	LOAD REGULATION	±5.0%							
SETUP TIME	1500ms / 230VAC 3000ms / 115VAC at full load								
INPUT	VOLTAGE RANGE Note.4	90 ~ 295VAC 127 ~ 417VDC							
	FREQUENCY RANGE	47 ~ 63Hz							
	POWER FACTOR	PF ≥ 0.9 at 75 ~ 100% load, 115VAC / 230VAC							
	EFFICIENCY(Typ.)	80%	82.5%	83.5%	84%	84%	84.5%	85%	85.5%
	AC CURRENT	0.4A/115VAC 0.2A/230VAC							
	INRUSH CURRENT(max.)	40A/230VAC							
	LEAKAGE CURRENT	<0.5mA / 240VAC							
PROTECTION	OVER CURRENT	100 ~ 110% Protection type : Constant current limiting, recovers automatically after fault condition is removed							
	SHORT CIRCUIT	Hiccup mode, recovers automatically after fault condition is removed.							
	OVER VOLTAGE	10 ~ 14V	14 ~ 16V	17 ~ 22V	23 ~ 26V	27 ~ 34V	31 ~ 35V	40 ~ 50V	53 ~ 63V
		Protection type : Shut down o/p voltage, re-power on to recover							
	OVER TEMPERATURE	95℃ ±10℃ (TSW1) Protection type : Shut down o/p voltage, re-power on to recover							
ENVIRONMENT	WORKING TEMP.	-30 ~ +50℃ (Refer to output load derating curve)							
	WORKING HUMIDITY	20 ~ 95% RH non-condensing							
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH							
	TEMP. COEFFICIENT	±0.06%/℃ (0 ~ 50℃)							
	VIBRATION	10 ~ 500Hz, 2G 12min./1cycle, period for 72min. each along X, Y, Z axes							
SAFETY & EMC	SAFETY STANDARDS	UL879, TUV EN61347-1, EN61347-2-13, CAN/CSA C22.2 No. 223-M91(except for 48V), IP64 approved							
	WITHSTAND VOLTAGE	I/P-O/P:3.75KVAC							
	ISOLATION RESISTANCE	I/P-O/P:100M Ohms / 500VDC / 25℃ / 70% RH							
	EMI CONDUCTION & RADIATION	Compliance to EN55015							
	HARMONIC CURRENT	Compliance to EN61000-3-2 Class C (pin ≥ 25W), Class D (>70% load) ; EN61000-3-3							
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN61547, light industry level, criteria A							
OTHERS	MTBF	621.4Khrs min. MIL-HDBK-217F (25℃)							
	DIMENSION	145*47*30mm (L*W*H)							
	PACKING	0.22Kg; 60pcs/14.2Kg/1.25CUFT							

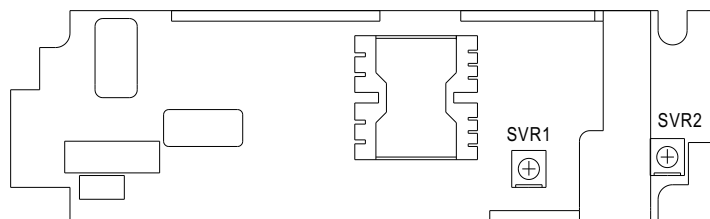
1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C of ambient temperature.
2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor.
Direct connecting to LEDs is not suggested for models with "RIPPLE & NOISE" >±10% and using additional drivers is highly recommended.
3. Tolerance : includes set up tolerance, line regulation and load regulation.
4. Derating may be needed under low input voltage. Please check the static characteristics for more details.
5. Output voltage can be adjusted through the SVR1 on the PCB; limit of output constant current level can be adjusted through the SVR2 on the PCB.
6. Constant current operation region is within 70% ~100% rated output voltage. This is the suitable operation region for LED related applications, but please reconfirm special electrical requirements for some specific system design.
7. The power supply is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC Directive on the complete installation again.

Mechanical Specification

Case No.964A Unit:mm

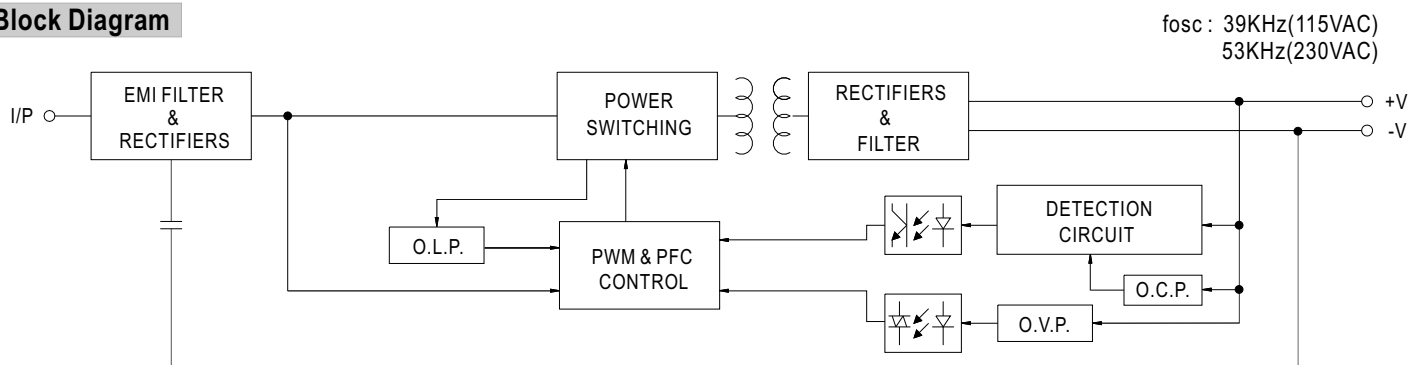


Output voltage and current adjustment : remove the upper case and adjust through SVR1 & SVR2 shown in the diagram.

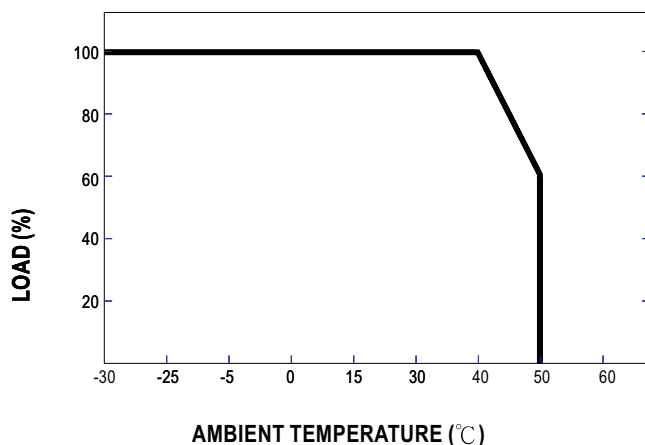


SVR1	Output voltage adjustment
SVR2	Output current adjustment

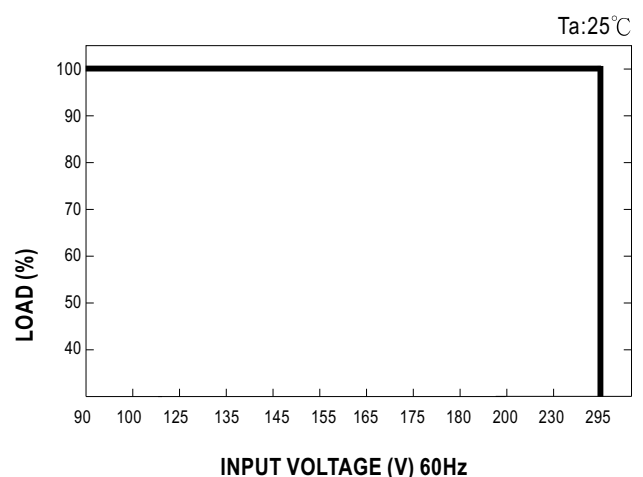
Block Diagram



Derating Curve



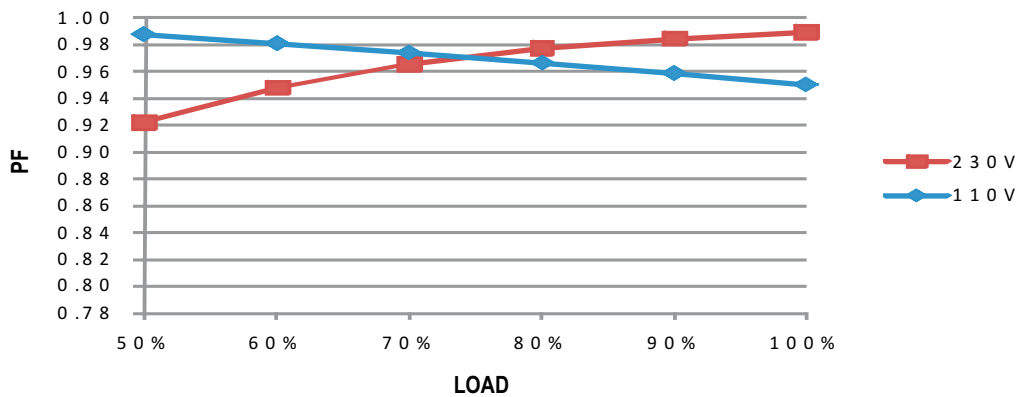
Static Characteristics



Power Factor Characteristic

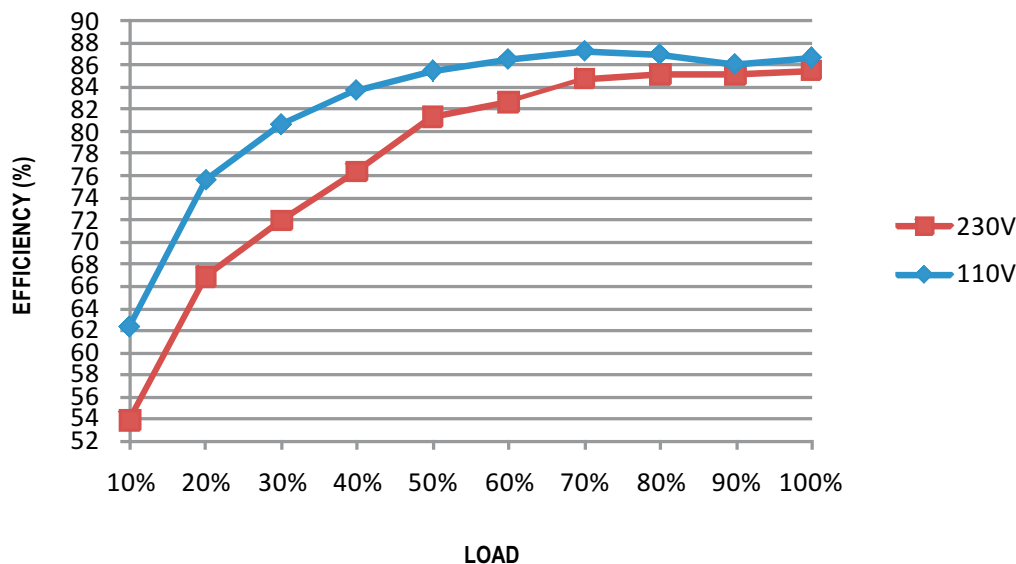
Power factor will be higher than 0.9 when output loading is 75% or higher.

Constant Current Mode



EFFICIENCY vs LOAD (48V Model)

PLN-30 series possess superior working efficiency that up to 85.5% can be reached in field applications.

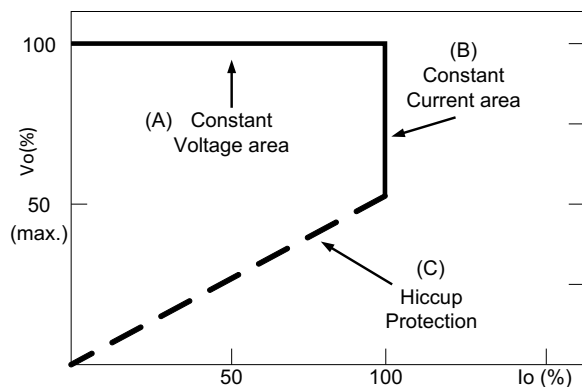


DRIVING METHODS OF LED MODULE

There are two major kinds of LED drive method "direct drive" and "with LED driver".

A typical LED power supply may either work in "constant voltage mode (CV) or constant current mode (CC)" to drive the LEDs.

Mean Well's LED power supply with CV+ CC characteristic can be operated at both CV mode [with LED driver, at area (A)] and CC mode [direct drive, at area (B)].



Typical LED power supply I-V curve

MODEL : PLN-30-20

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 2.6 Vp-p (Max)	I/P: 230VAC O/P: 100% LOAD Ta:25°C	V1: 1.35 Vp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 19 V~ 22 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta:25°C	17.76 V~ 22.45 V/ 230 VAC 17.76 V~ 22.45 V/ 115 VAC	P
3	OUTPUT CURRENT ADJUST RANGE	CH1: 1.125A-1.545A	I/P: 230 VAC I/P: 115 VAC Ta:25°C	0.92 A~ 1.77 A/ 230 VAC 0.92 A~ 1.77 A/ 115 VAC	P
4	OUTPUT VOLTAGE TOLERANCE	V1: 10 %~ -5 % (Max)	I/P: 100 VAC / 264 VAC O/P: 100% LOAD / MIN LOAD Ta:25°C	V1: 0.2 %~ -0.2 %	P
5	LINE REGULATION	V1: 3 %~ -3 % (Max)	I/P: 100VAC ~ 264 VAC O/P: 100% LOAD Ta:25°C	V1: 0.03 %~ -0.03 %	P
6	LOAD REGULATION	V1: 5 %~ -5 % (Max)	I/P: 230 VAC O/P: 100% LOAD ~ MIN LOAD Ta:25°C	V1: 0.2 %~ -0.2 %	P
7	SET UP TIME	230VAC: 1500 ms (Max) 115 VAC: 3000 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: 100% LOAD Ta:25°C	230VAC/ 684 ms 115VAC/ 1368 ms	P
8	RISE TIME	230VAC: 150 ms (Max) 115VAC: 150 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P: 100% LOAD Ta:25°C	230VAC/ 12 ms 115VAC/ 24 ms	P
9	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~264 VAC	I/P: TESTING O/P: 100% LOAD Ta: 25°C	68 V~264V	P
			I/P: LOW-LINE-3V= 87V HIGH-LINE+15%=272 V O/P: 100% 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 ~ 264 VAC O/P: 100% LOAD ~MIN LOAD Ta: 25°C	TEST: OK	P
3	POWER FACTOR	0.90 / 230 VAC(TYP) 0.90 / 115 VAC(TYP) ≥ 0.9 at 75 ~ 100% load	I/P: 230 VAC I/P: 115 VAC O/P: 100% LOAD Ta: 25°C	PF= 0.924 / 230 VAC PF= 0.983 / 115 VAC ≥ 0.9 at 75 ~ 100% load	P
4	EFFICIENCY	84% (TYP)	I/P: 230 VAC O/P: 100% LOAD Ta: 25°C	86 %	P
5	INPUT CURRENT	230V/ 0.2 A (TYP) 115V/ 0.4 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: 100% LOAD Ta: 25°C	I = 0.16 A/ 230 VAC I = 0.31 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 40 A (TYP) COLD START	I/P: 230 VAC O/P: 100% LOAD Ta: 25°C	I = 33 A/ 230 VAC	P
7	LEAKAGE CURRENT	< 0.5 mA / 240 VAC	I/P: 264 VAC O/P: Min LOAD Ta: 25°C	L-FG: 0.01 mA N-FG: 0.01 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	100 %~ 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: 23 V~ 26 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	25.1 V/ 230 VAC 25.1 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 Shunt down Re-power ON	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-30-24 1. ROOM AMBIENT BURN-IN : 17 HRS I/P: 230VAC O/P: 100% LOAD Ta= 24.7 °C 2. HIGH AMBIENT BURN-IN : 1 HRS I/P: 230VAC O/P: 100% LOAD Ta= 40.8 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 24.7°C</th><th>HIGH AMBIENT Ta= 40.8°C</th></tr><tr><td>1</td><td>Q1</td><td>P9NK70ZFP 7.5A/700A</td><td>71.1°C</td><td>84.0°C</td></tr><tr><td>2</td><td>D2</td><td>1N4007 1A/1KV</td><td>81.7°C</td><td>94.3°C</td></tr><tr><td>3</td><td>LF1</td><td>TR-572</td><td>54.0°C</td><td>66.3°C</td></tr><tr><td>4</td><td>U1</td><td>TDA4863</td><td>63.8°C</td><td>76.3°C</td></tr><tr><td>5</td><td>BD1</td><td>UD2KB80</td><td>59.8°C</td><td>72.2°C</td></tr><tr><td>6</td><td>C48</td><td>47U/35V 105°C ZLH</td><td>65.9°C</td><td>78.0°C</td></tr><tr><td>7</td><td>C7</td><td>474/450V 105°C</td><td>64.5°C</td><td>77.0°C</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF-1596</td><td>85.9°C</td><td>96.8°C</td></tr><tr><td>9</td><td>TSW1</td><td>NTC200K 5%</td><td>68.2°C</td><td>81.3°C</td></tr><tr><td>10</td><td>L1</td><td>TR-751</td><td>60.6°C</td><td>72.9°C</td></tr><tr><td>11</td><td>C106</td><td>560U/35V 105°C ZLH</td><td>69.1°C</td><td>80.7°C</td></tr><tr><td>12</td><td>D100</td><td>FMX-12SL 10A/200V</td><td>68.1°C</td><td>79.4°C</td></tr><tr><td>13</td><td>LF100</td><td>TR-574</td><td>51.5°C</td><td>63.2°C</td></tr><tr><td>14</td><td>CASE</td><td>UP CASE</td><td>51.9°C</td><td>65.3°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 24.7°C	HIGH AMBIENT Ta= 40.8°C	1	Q1	P9NK70ZFP 7.5A/700A	71.1°C	84.0°C	2	D2	1N4007 1A/1KV	81.7°C	94.3°C	3	LF1	TR-572	54.0°C	66.3°C	4	U1	TDA4863	63.8°C	76.3°C	5	BD1	UD2KB80	59.8°C	72.2°C	6	C48	47U/35V 105°C ZLH	65.9°C	78.0°C	7	C7	474/450V 105°C	64.5°C	77.0°C	8	T1 COIL	TF-1596	85.9°C	96.8°C	9	TSW1	NTC200K 5%	68.2°C	81.3°C	10	L1	TR-751	60.6°C	72.9°C	11	C106	560U/35V 105°C ZLH	69.1°C	80.7°C	12	D100	FMX-12SL 10A/200V	68.1°C	79.4°C	13	LF100	TR-574	51.5°C	63.2°C	14	CASE	UP CASE	51.9°C	65.3°C	P
NO	Position	P/N	ROOM AMBIENT Ta= 24.7°C	HIGH AMBIENT Ta= 40.8°C																																																																												
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6	C48	47U/35V 105°C ZLH	65.9°C	78.0°C																																																																												
7	C7	474/450V 105°C	64.5°C	77.0°C																																																																												
8	T1 COIL	TF-1596	85.9°C	96.8°C																																																																												
9	TSW1	NTC200K 5%	68.2°C	81.3°C																																																																												
10	L1	TR-751	60.6°C	72.9°C																																																																												
11	C106	560U/35V 105°C ZLH	69.1°C	80.7°C																																																																												
12	D100	FMX-12SL 10A/200V	68.1°C	79.4°C																																																																												
13	LF100	TR-574	51.5°C	63.2°C																																																																												
14	CASE	UP CASE	51.9°C	65.3°C																																																																												
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 115 % 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: 272 VAC O/P: 100% LOAD Ta= 40°C HUMIDITY= 95 %R.H	TEST : OK	P																																																																											
5	TEMPERATURE COEFFICIENT	± 0.06 %(0~50°C)	I/P: 230 VAC O/P:100% LOAD	± 0.027 %(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: 3.75KVAC/min	I/P-O/P: 4.2KVAC/min Ta:25°C	I/P-O/P: 2.1 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C / 70% RH	I/P-O/P: 30 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : R50164054 UL: File NO : E186843			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS C CLASS D	I/P: 230 VAC/50HZ O/P: 100% LOAD/70%LOAD Ta:25°C	PASS	P
2	CONDUCTION	EN55015 CLASS B	I/P: 230 VAC (50HZ) O/P: 100% LOAD /50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55015 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	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-30-24 : SUPPOSE C106 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P: 100% LOAD Ta= 25 °C LIFE TIME= 144427 HRS I/P: 230VAC O/P: 100% LOAD Ta= 50 °C LIFE TIME= 69825 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 621.4K HRS			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 STP9NK70ZFP : 700V 7.5A	I/P:High-Line +3V = 267 V O/P: (1) 100% LOAD Turn on (2) Output Short Ta:25℃	(1) 652 V (2) 460 V	P
2	Diode Peak Voltage	D100 Rated FMX-12SL : 10A/200V	I/P:High-Line +3V = 267 V O/P: (1) 100% LOAD Turn on (2)Output Short Ta:25℃	(1) 107 V (2) 88 V	P
3	Clamp Diode Peak Voltage	D2 Rated IN4007 : 1000V 1A	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 360 V	P
4	Control IC Voltage Test	U1 Rated TDA4863G : 22V	I/P:High-Line +3V = 267 V O/P: (1) 100% LOAD Turn on /Off (2) Min load Turn on /Off (3) 100% /Min load Change Ta:25℃	(1) 14.6 V (2) 14.5 V (3) 14.6 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/2/1	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/6/4	PRODUCT SAMPLE W0703A44	PASS	VINCENT TSENG	MAX LIN
2007/11/15	PRODUCT SAMPLE W0710D31	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023