
■ Features :

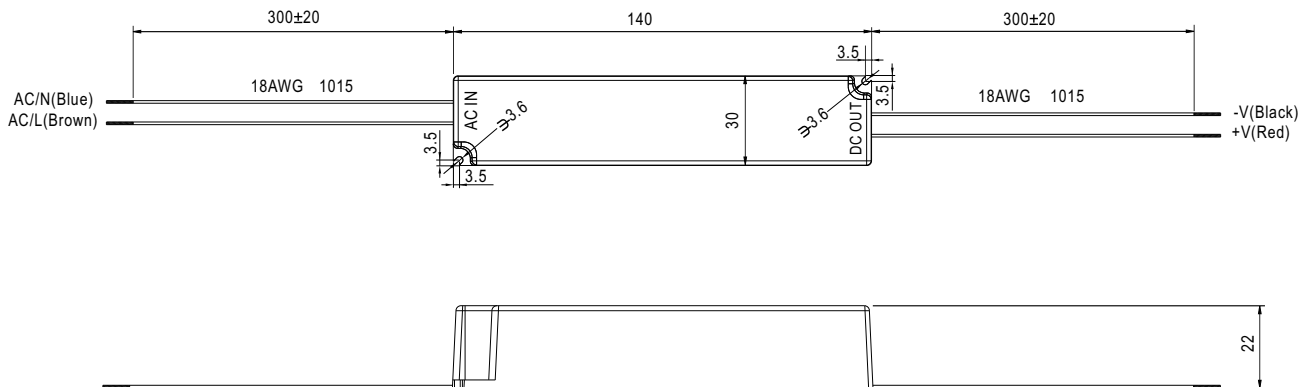
- 180-264VAC input only
- Fully encapsulated with IP67 level
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Cooling by free air convection
- Pass LPS
- 100% full load burn-in test
- Suitable for LED lighting and moving sign applications
- High reliability / Low cost
- 2 years warranty

SPECIFICATION
LPS IP67

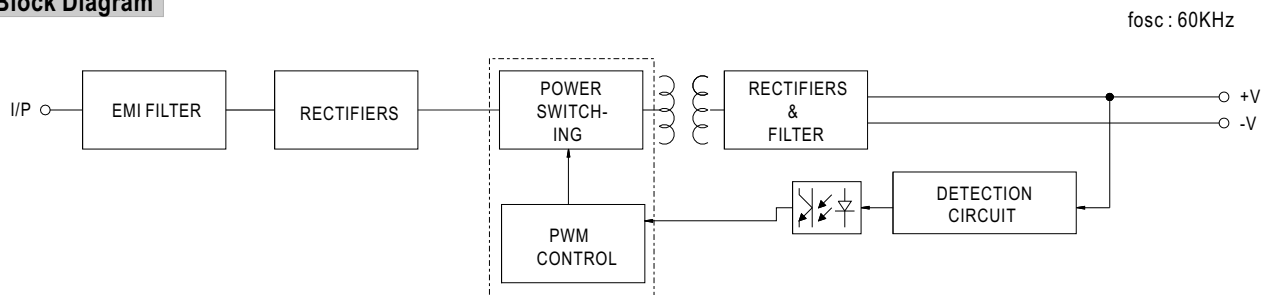

MODEL		LPH-18-12		LPH-18-24		LPH-18-36	
OUTPUT	DC VOLTAGE	12V		24V		36V	
	RATED CURRENT	1.5A		0.75A		0.5A	
	CURRENT RANGE	0 ~ 1.5A		0 ~ 0.75A		0 ~ 0.5A	
	RATED POWER	18W		18W		18W	
	RIPPLE & NOISE (max.) Note.2	120mVp-p		150mVp-p		200mVp-p	
	VOLTAGE TOLERANCE Note.3	±3.0%					
	LINE REGULATION	±1.0%					
	LOAD REGULATION	±2.0%					
	SETUP, RISE TIME	1500ms, 30ms / 230VAC					
	HOLD UP TIME (Typ.)	50ms/230VAC at full load					
INPUT	VOLTAGE RANGE	180 ~ 264VAC 254 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY(Typ.)	78%		82%		83%	
	AC CURRENT	0.3A/230VAC					
	INRUSH CURRENT(max.)	Cold start 50A/230VAC					
	LEAKAGE CURRENT	0.25mA / 240VAC					
PROTECTION	OVER CURRENT	Above 105% rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed					
	OVER VOLTAGE	13.8~ 16.2V		27.6~ 32.4V		41.4 ~ 48.6V	
		Protection type : Shut off o/p voltage, clamping by zener diode					
	OVER TEMPERATURE	Tj 170 t typically (U1) Detect on main control IC Protection type : Hiccup mode, recovers automatically after temperature goes down					
ENVIRONMENT	WORKING TEMP.	-30 ~ 70℃ (Refer to output load derating curve)					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +80℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 4)	SAFETY STANDARDS	TUV EN60950-1, IP67 approved; design refer to UL1310 Class 2, EN61347-2-13, CAN/CSA C22.2 No. 223-M91					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC					
	ISOLATION RESISTANCE	I/P-O/P:>100M Ohms / 500VDC / 25℃ / 70% RH					
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B					
	HARMONIC CURRENT	Compliance to EN61000-3-2 Class A,EN61000-3-3					
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, Light industry level, criteria A					
OTHERS	MTBF	1200.6K hrs min. MIL-HDBK-217F (25)					
	DIMENSION	140*30*22(L*W*H)					
	PACKING	0.175Kg; 70pcs/13.3Kgs/0.71CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ 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. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. 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

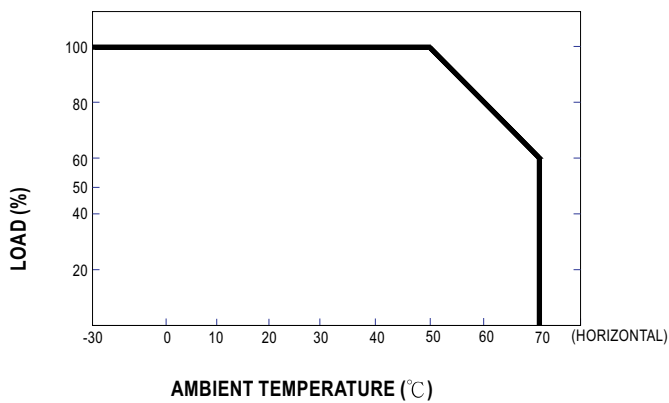
Unit:mm



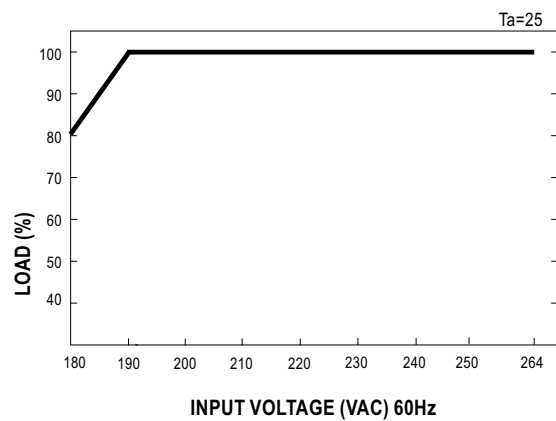
Block Diagram



Derating Curve



Static Characteristics



MODEL : LPH-18-24

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 40 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE TOLERANCE	V1: -3 %~ +3 % (Max)	I/P: 190VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: -0.025 %~ +0.025 %	PASS
3	LINE REGULATION	V1: -1 %~ +1 % (Max)	I/P: 190 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: 0 %~ 0 %	PASS
4	LOAD REGULATION	V1: -2 %~ +2 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: -0.025 %~ +0.025 %	PASS
5	SET UP TIME	230VAC/ 1500 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 876.2 ms	PASS
6	RISE TIME	230VAC/ 30 ms (Max)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230 VAC/ 11.5 ms	PASS
7	HOLD UP TIME	230VAC/ 50 ms (Typ)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 62.4 ms	PASS
8	OVER/UNDERSHOOT TEST	<±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	PASS
9	DYNAMIC LOAD	V1: 2400 mVp-p	I/P: 230 VAC O/P: (1)FULL /Min LOAD 90%DUTY/1KHZ (2)FULL /Min LOAD 50%DUTY/120HZ Ta:25°C	(1) 228 mVp-p (2) 684 mVp-p	PASS

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180 VAC~ 264 VAC	I/P:TESTING O/P:FULL LOAD Ta:25°C	120 V~ 264 V	PASS
			I/P: LOW-LINE-3V= 177 V HIGH-LINE+15%= 300 V O/P:FULL/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: 180 VAC ~264 VAC O/P:FULL-MIN LOAD Ta:25°C	TEST: OK	PASS
3	EFFICIENCY	82 % (Typ)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	84.48 %	PASS
4	INPUT CURRENT	230 V/ 0.3 A (Typ)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 0.14 A/ 230VAC	PASS
5	INRUSH CURRENT	230 V/ 50 A (max) COLD START	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	I = 45.2 A/ 230VAC	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	>105% RATED OUTPUT POWER	I/P: 264 VAC I/P: 230 VAC I/P: 190 VAC O/P:TESTING Ta:25°C	163 %/264VAC 151 %/ 230VAC 144 %/190 VAC Hiccup Mode	PASS
2	OVER VOLTAGE PROTECTION	CH1: 27.6 V~ 32.4 V	I/P: 230 VAC O/P:MIN LOAD Ta:25°C	30.86 V/ 230VAC Shut off o/p voltage, clamping by zener diode	PASS
3	OVER TEMPERATURE PROTECTION	SPEC: Tj 170°C O.T.P. NO DAMAGE	I/P: 230 VAC O/P:FULL LOAD	O.T.P. Active Hiccup Mode , recovers automatically after temperature goes down	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta:25°C	NO DAMAGE Hiccup Mode	PASS

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																	
1	TEMPERATURE RISE TEST	MODEL : LPH-18-24 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 25.2 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230 VAC O/P: 100% LOAD Ta= 45.3 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 25.2 °C</th><th>HIGH AMBIENT Ta= 45.3 °C</th></tr><tr><td>1</td><td>LF1</td><td>LF6006</td><td>36.6°C</td><td>60.3°C</td></tr><tr><td>2</td><td>BD1</td><td>2A/800V</td><td>34.5°C</td><td>58.2°C</td></tr><tr><td>3</td><td>C5</td><td>27u/400V KM</td><td>41.2°C</td><td>65.3°C</td></tr><tr><td>4</td><td>ZD1</td><td>P6KE200A</td><td>45.3°C</td><td>69.1°C</td></tr><tr><td>5</td><td>D1</td><td>GP20K</td><td>45.0°C</td><td>68.7°C</td></tr><tr><td>6</td><td>T1</td><td>TF6137</td><td>46.1°C</td><td>68.8°C</td></tr><tr><td>7</td><td>C36</td><td>47u/50V YXF</td><td>36.0°C</td><td>59.8°C</td></tr><tr><td>8</td><td>U1</td><td>VIPER22A</td><td>43.5°C</td><td>67.8°C</td></tr><tr><td>9</td><td>D100</td><td>HER303</td><td>46.3°C</td><td>69.6°C</td></tr><tr><td>10</td><td>C105</td><td>220u/35V GL</td><td>36.9°C</td><td>60.6°C</td></tr><tr><td>11</td><td>C106</td><td>220u/35V GL</td><td>33.1°C</td><td>57.0°C</td></tr><tr><td>12</td><td>L100</td><td>DR006C</td><td>33.2°C</td><td>57.4°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 25.2 °C	HIGH AMBIENT Ta= 45.3 °C	1	LF1	LF6006	36.6°C	60.3°C	2	BD1	2A/800V	34.5°C	58.2°C	3	C5	27u/400V KM	41.2°C	65.3°C	4	ZD1	P6KE200A	45.3°C	69.1°C	5	D1	GP20K	45.0°C	68.7°C	6	T1	TF6137	46.1°C	68.8°C	7	C36	47u/50V YXF	36.0°C	59.8°C	8	U1	VIPER22A	43.5°C	67.8°C	9	D100	HER303	46.3°C	69.6°C	10	C105	220u/35V GL	36.9°C	60.6°C	11	C106	220u/35V GL	33.1°C	57.0°C	12	L100	DR006C	33.2°C	57.4°C	PASS
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 130 % LOAD Ta:25°C	TEST : OK	PASS																																																																	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P: 100 % LOAD Ta= -30 °C	TEST : OK	PASS																																																																	
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	PASS																																																																	
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.008 %(0~50°C)	PASS																																																																	
6	VIBRATION TEST	1 Carton & 1 Set Operating at I/P: VAC NO LOAD (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25°C		TEST : OK	PASS																																																																	

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	LPH-18-24 SUPPOSE C 105 I/P: 230 VAC O/P:FULL LOAD I/P: 230 VAC O/P:FULL LOAD	IS THE MOST CRITICAL COMPONENT Ta= 25 °C LIFE TIME= 681482.3 HRS Ta 50 °C LIFE TIME= 93863.3 HRS		PASS
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 1200.6K HRS			PASS

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3.0 KVAC/min	I/P-O/P: 3.6 KVAC/min Ta:25°C	I/P-O/P: 0.791 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ	I/P-O/P: 500 VDC Ta:25°C	I/P-O/P: >9999 MΩ NO DAMAGE	PASS
4	LEAKAGE CURRENT	< 0.25 mA / 240VAC	I/P: 264 VAC O/P:NO LOAD Ta:25°C	L-FG: 0.081 mA N-FG: 0.081 mA	PASS

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230/240/220 VAC/50HZ O/P:100%/75%/50%/25% LOAD Ta:25°C	PASS	PASS
2	CONDUCTION	EN55022 CLASS B	I/P:230 VAC (50HZ) /115V(60HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	PASS
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ)/115V(60HZ) O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	PASS
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :1KV L,N-PE:2KV	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	CRITERIA A	PASS
7	Test by certified Lab & Test Report Prepare				

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	U1 Rated VIPER22A : 730 V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta:25°C	(1) 510 V (2) 550 V (3) 524 V (4) 514 V	PASS
2	Diode Peak Voltage	D 100 Rated HER303 : 200 V 3 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta:25°C	(1) 106 V (2) 103 V (3) 106 V (4) 108 V	PASS
3	Clamp Diode Peak Voltage	D1 Rated GP20A : 800 V 2 A	I/P:High-Line +3V = 267 V O/P: (1)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (2)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta:25°C	(1) 532 V (2) 556 V	PASS
4	Input Capacitor Voltage	C 5 Rated CAPXON : 27 u / 400 V 105 °C / KM Series	I/P:High-Line +3V =267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Burn-IN 0.5 Hour Ta:25°C	(1) 312 V (2) 312 V (3) 312 V	PASS
5	Control IC Voltage Test	U 1 Rated VIPER22A : 50 V	I/P:High-Line +3V =267 V O/P:(1) Output Short (2)O.L.P Ta:25°C	(1) 14.6 V (2) 14.7 V	PASS

2007/11/26 A50-G058

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/2/29	RD SAMPLE	PASS	SKY	LIUWY
2008/4/29	PRODUCT SAMPLE (W0804C312)	PASS	SKY	LIUWY
2008/7/11	PRODUCT SAMPLE (W0805D012)	PASS	SKY	LIUWY