

■ Features :

- Constant current design
- Universal AC input / Full range
- Fully encapsulated with IP67 level
- Withstand 300VAC surge input for 5 seconds
- Protections: Short circuit / Over current / Over voltage
- Fully isolated plastic case
- Cooling by free air convection
- UL1310 Class 2 power unit, pass LPS
- 100% full load burn-in test
- Low cost, high reliability
- Suitable for LED lighting and moving sign applications (Note.7)
- 2 years warranty

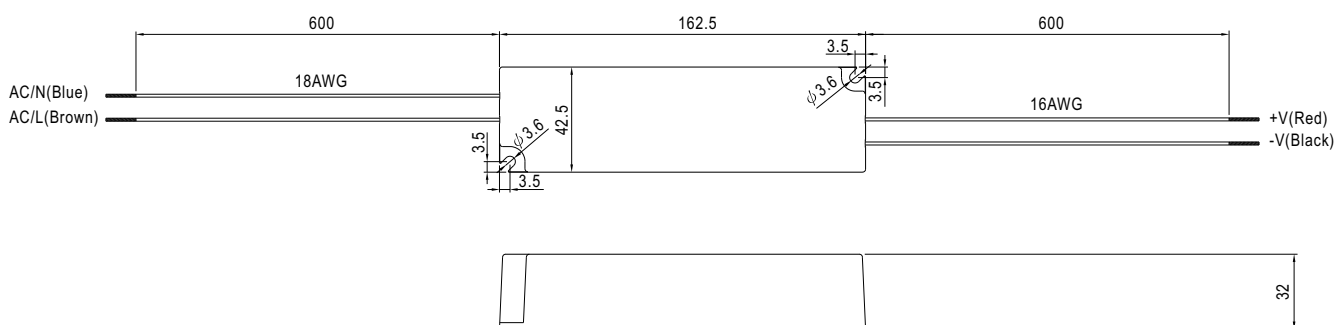
LPS IP67  (for 1750mA only)  US (except for 1750mA) 

SPECIFICATION

MODEL		LPC-60-1050	LPC-60-1400	LPC-60-1750
OUTPUT	RATED CURRENT	1050mA	1400mA	1750mA
	DC VOLTAGE RANGE	9 ~ 48V	9 ~ 42V	9 ~ 34V
	RATED POWER	50.4W	58.8W	59.5W
	RIPPLE & NOISE (max.) Note.2	200mVp-p	200mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.3	±5.0%		
	LINE REGULATION	±1.0%		
	LOAD REGULATION	±2.0%		
	SETUP, RISE TIME Note.6	500ms, 120ms / 230VAC 500ms, 120ms / 115VAC at full load		
HOLD UP TIME (Typ.)	50ms/230VAC	16ms/115VAC at full load		
INPUT	VOLTAGE RANGE Note.4	90 ~ 264VAC	127 ~ 370VDC	
	FREQUENCY RANGE	47 ~ 63Hz		
	EFFICIENCY (Typ.)	87%	85%	87%
	AC CURRENT	1.2A/115VAC 0.7A/230VAC		
	INRUSH CURRENT(max.)	COLD START 30A/115VAC	60A/230VAC	
	LEAKAGE CURRENT	0.25mA / 240VAC		
PROTECTION	CURRENT LIMIT	±5% rated output current Protection type : Constant current limiting type		
	OVER VOLTAGE	50.4 ~ 60V	44.1 ~ 56.7V	39.1 ~ 45.9V
		Protection type : Shut off o/p voltage, clamping by TVS diode		
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	SAFETY STANDARDS	UL1310 Class 2, CAN/CSA C22.2 No. 223-M91(for LPC-60-1750 only), IP67 approved ; design refer to TUV EN60950-1, EN61347-2-13		
	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	732Khrs min. MIL-HDBK-217F (25℃)		
	DIMENSION	162.5*42.5*32mm (L*W*H)		
	PACKING	0.4Kg; 32pcs/13.8Kg/0.56CUFT		
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. Derating may be needed under low input voltage. Please check the static characteristics for more details. 5. 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. 6. Length of set up time is measured at first cold start. Turning ON/OFF the power supply may lead to increase of the set up time. 7. In the European market this product is only suitable for LED lighting applications that don't have to comply with the harmonic current requirements of EN61000-3-2 Class C.			

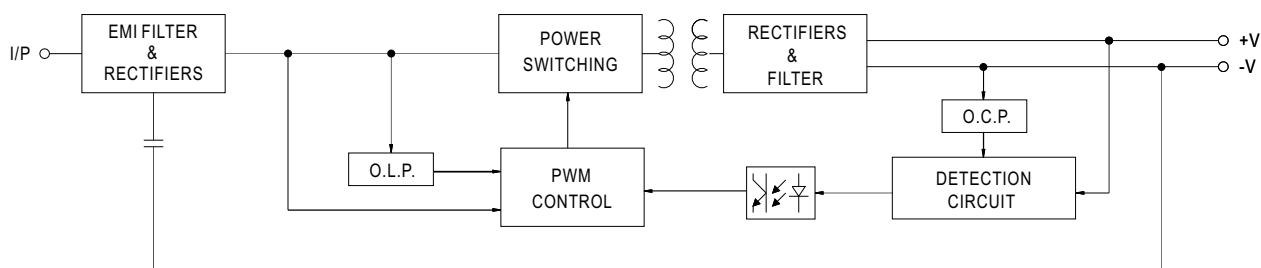
■ Mechanical Specification

Case No. 976A Unit:mm

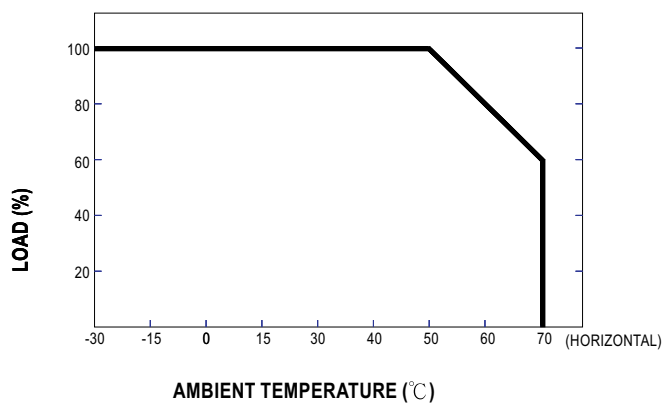


■ Block Diagram

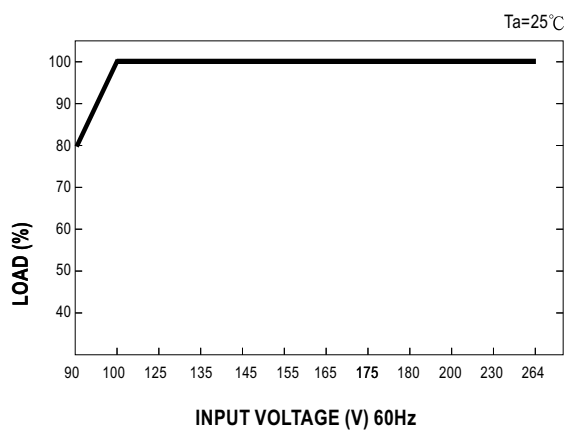
fosc : 60KHz



Derating Curve



■ Static Characteristics



MODEL : LPC-60-1400

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 200 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25℃	V1: 96 mVp-p (Max)	P
2	OUTPUT VOLTAGE RANGE	CH1: 9 V~ 42 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	0 V~ 41.90 V/ 230 VAC 0 V~ 41.90 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 5 %~ -5 % (Max)	I/P: 100 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25℃	V1: 0.06 %~ -0.06 %	P
4	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P: 100VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0.02 %~ -0.02 %	P
5	LOAD REGULATION	V1: 2 %~ 2 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.06 %~ -0.06 %	P
6	SET UP TIME	230VAC: 500 ms (Max) 115 VAC: 500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 170 ms 115VAC/ 103 ms	P
7	RISE TIME	230VAC: 120 ms (Max) 115VAC: 120 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 46 ms 115VAC/ 23 ms	P
8	HOLD UP TIME	230VAC: 50 ms (TYP) 115VAC: 16 ms (TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 103 ms 115VAC/ 23 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 4200 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	373 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P: TESTING O/P: FULL LOAD Ta: 25°C	49V~264V	P
			I/P: LOW-LINE-3V= 87 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: 100 VAC ~ 264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK	P
3	EFFICIENCY	85% (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	88.7%	P
4	INPUT CURRENT	230V/ 0.7 A (TYP) 115V/ 1.2 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 0.5 A/ 230 VAC I = 0.9 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 51 A/ 230 VAC I = 26 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 0.25 mA / 240 VAC	I/P: 240 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	95 %~ 105 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	102.7%/ 230 VAC 102.8%/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 44.1 V~ 56.7 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	51.4V/ 230 VAC 51.4V/ 115 VAC Shut down Re- power ON	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Constant Current Limiting	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																											
1	TEMPERATURE RISE TEST	MODEL : LPC-60-1750 1. ROOM AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 30.9 °C 2. HIGH AMBIENT BURN-IN : 8 HRS I/P: 230VAC O/P: FULL LOAD Ta= 63.2 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30.9 °C</th><th>HIGH AMBIENT Ta= 63.2 °C</th></tr><tr><td>1</td><td>U1</td><td>NCP1230D65R2G</td><td>74.2°C</td><td>96.3°C</td></tr><tr><td>2</td><td>BD1</td><td>D3SB60 4A/600V</td><td>72.7°C</td><td>94.4°C</td></tr><tr><td>3</td><td>LF1</td><td>LF158</td><td>66.0°C</td><td>87.6°C</td></tr><tr><td>4</td><td>C5</td><td>120u/400V 105°C KMG</td><td>78.8°C</td><td>100.0°C</td></tr><tr><td>5</td><td>Q1</td><td>STF6NM60N :600 V/ 4.6A</td><td>86.3°C</td><td>107.8°C</td></tr><tr><td>6</td><td>D1</td><td>EGP20J 2A/600V</td><td>84.8°C</td><td>105.1°C</td></tr><tr><td>7</td><td>ZD1</td><td>P6KE180A</td><td>80.4°C</td><td>98.7°C</td></tr><tr><td>8</td><td>D40</td><td>1A/100V 1N4002</td><td>80.7°C</td><td>102.6°C</td></tr><tr><td>9</td><td>C40</td><td>47u/50V UL10Kh YXM</td><td>81.8°C</td><td>103.3°C</td></tr><tr><td>10</td><td>T1</td><td>TF1780</td><td>81.5°C</td><td>105.7°C</td></tr><tr><td>11</td><td>D100</td><td>SF10LC40 10A/400V</td><td>83.2°C</td><td>104.1°C</td></tr><tr><td>12</td><td>C105</td><td>220u/50V L7Kh YXG</td><td>76.6°C</td><td>97.6°C</td></tr><tr><td>13</td><td>L100</td><td>RB010E</td><td>70.5°C</td><td>92.0°C</td></tr><tr><td>14</td><td>CASE</td><td>UPCASE</td><td>59°C</td><td>87.9°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 30.9 °C	HIGH AMBIENT Ta= 63.2 °C	1	U1	NCP1230D65R2G	74.2°C	96.3°C	2	BD1	D3SB60 4A/600V	72.7°C	94.4°C	3	LF1	LF158	66.0°C	87.6°C	4	C5	120u/400V 105°C KMG	78.8°C	100.0°C	5	Q1	STF6NM60N :600 V/ 4.6A	86.3°C	107.8°C	6	D1	EGP20J 2A/600V	84.8°C	105.1°C	7	ZD1	P6KE180A	80.4°C	98.7°C	8	D40	1A/100V 1N4002	80.7°C	102.6°C	9	C40	47u/50V UL10Kh YXM	81.8°C	103.3°C	10	T1	TF1780	81.5°C	105.7°C	11	D100	SF10LC40 10A/400V	83.2°C	104.1°C	12	C105	220u/50V L7Kh YXG	76.6°C	97.6°C	13	L100	RB010E	70.5°C	92.0°C	14	CASE	UPCASE	59°C	87.9°C	P
NO	Position	P/N	ROOM AMBIENT Ta= 30.9 °C	HIGH AMBIENT Ta= 63.2 °C																																																																												
1	U1	NCP1230D65R2G	74.2°C	96.3°C																																																																												
2	BD1	D3SB60 4A/600V	72.7°C	94.4°C																																																																												
3	LF1	LF158	66.0°C	87.6°C																																																																												
4	C5	120u/400V 105°C KMG	78.8°C	100.0°C																																																																												
5	Q1	STF6NM60N :600 V/ 4.6A	86.3°C	107.8°C																																																																												
6	D1	EGP20J 2A/600V	84.8°C	105.1°C																																																																												
7	ZD1	P6KE180A	80.4°C	98.7°C																																																																												
8	D40	1A/100V 1N4002	80.7°C	102.6°C																																																																												
9	C40	47u/50V UL10Kh YXM	81.8°C	103.3°C																																																																												
10	T1	TF1780	81.5°C	105.7°C																																																																												
11	D100	SF10LC40 10A/400V	83.2°C	104.1°C																																																																												
12	C105	220u/50V L7Kh YXG	76.6°C	97.6°C																																																																												
13	L100	RB010E	70.5°C	92.0°C																																																																												
14	CASE	UPCASE	59°C	87.9°C																																																																												
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P:101 % LOAD Ta:32.7°C	TEST : OK	P																																																																											
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 264 VAC O/P:100 % LOAD Ta= -35 °C	TEST : OK	P																																																																											
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	P																																																																											
5	TEMPERATURE COEFFICIENT	± 0.03 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.004 %(0~50°C)	P																																																																											
6	VIBRATION TEST	1 Carton & 1 Set (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	P																																																																											

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min	I/P-O/P: 3.6 KVAC/min	I/P-O/P: 2.632 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 : UL: File NO :			N/A

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	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	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL 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:FULL 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:FULL 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:FULL 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	LPC-60-1750:SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta=25 °C LIFE TIME=86553 HRS I/P: 230VAC O/P:FULL LOAD Ta=50 °C LIFE TIME=33481 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 732K HRS			P
3	ORT (Ongoing Reliability test)	LPC-60-1400:I/P : 230VAC O/P : 95% LOAD TA=50°C Sample=10pcs TEST TIME=2856HRS			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 STF6NM60N :600 V/4.6A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Output Short Ta:25℃	(1) 580 V (2) 538 V	P
2	Diode Peak Voltage	D100Rated SF10LC40 10A/400V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25℃	(1) 362 V (2) 364 V	P
3	Clamp Diode Peak Voltage	D1 Rated EGP20J : 2A/600V	I/P:High-Line +3V = 267 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25℃	(1) 516 V	P
4	Input Capacitor Voltage	C5 Rated 120u/400V 105℃ VZ	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 376 V (2) 380 V (3) 380 V	P
5	Control IC Voltage Test	U1 NCP1200/ 18V	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25℃	(1) 12.11 V (2) 10.14 V (3) 12.11 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/4/9	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2008/9/4	PRODUCT SAMPLE W0806B59	PASS	SANFORD SU	VINCENT TSENG
2008/11/10	PRODUCT SAMPLE W0809E06	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023