



Features :

- Constant current mode power supply
- 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
- Small and compact size
- 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
- 2 years warranty

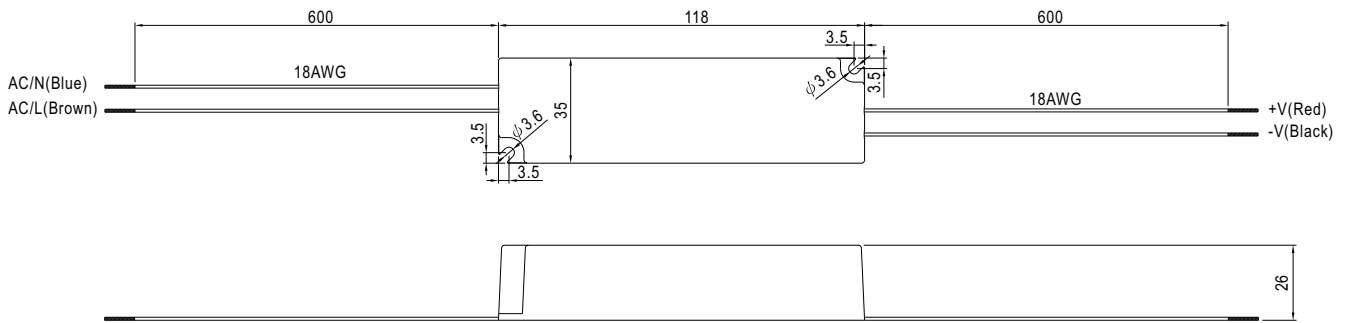
LPS IP67  (for 350mA only)  US (except for 350mA) 

SPECIFICATION

MODEL		LPC-20-350	LPC-20-700
OUTPUT	RATED CURRENT	350mA	700mA
	DC VOLTAGE RANGE	9 ~ 48V	9 ~ 30V
	RATED POWER	16.8W	21W
	RIPPLE & NOISE (max.) Note.2	200mVp-p	200mVp-p
	VOLTAGE TOLERANCE Note.3	±5.0%	
	LINE REGULATION	±1.0%	
	LOAD REGULATION	±2.0%	
	SETUP, RISE TIME Note.6	500ms, 250ms / 230VAC	500ms, 250ms / 115VAC at full load
INPUT	HOLD UP TIME (Typ.)	50ms/230VAC	24ms/115VAC at full load
	VOLTAGE RANGE Note.4	90 ~ 264VAC	127 ~ 370VDC
	FREQUENCY RANGE	47 ~ 63Hz	
	EFFICIENCY (Typ.)	83%	
	AC CURRENT	0.55A/115VAC	0.35A/230VAC
	INRUSH CURRENT(max.)	COLD START 35A/115VAC	70A/230VAC
PROTECTION	LEAKAGE CURRENT	0.25mA / 240VAC	
	CURRENT LIMIT	±5% rated output current	
	OVER VOLTAGE	50.4 ~ 60V	31.5 ~ 40.5V
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	UL879, UL1310 Class 2, CAN/CSA C22.2 No. 223-M91(except for LPC-20-350), 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	786.5Khrs min. MIL-HDBK-217F (25℃)	
	DIMENSION	118*35*26mm (L*W*H)	
	PACKING	0.22Kg; 60pcs/14.2Kg/0.62CUFT	
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.		

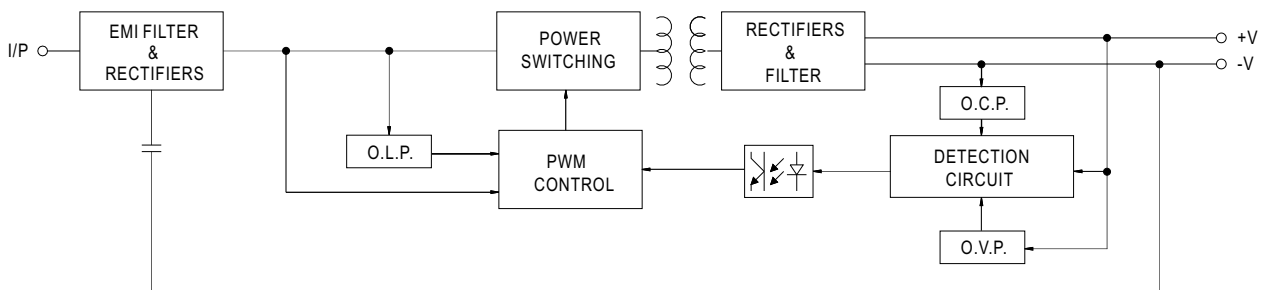
Mechanical Specification

Case No. 972A Unit:mm

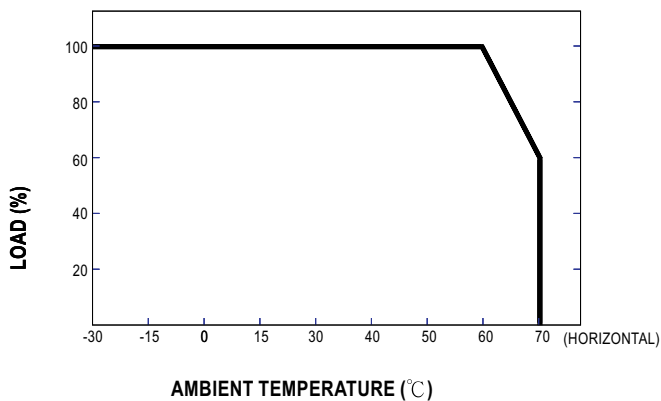


Block Diagram

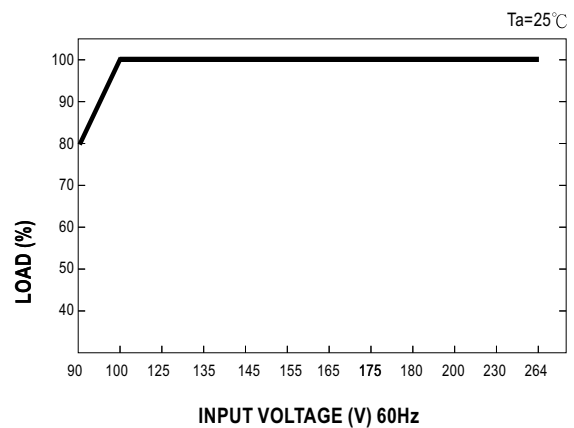
fosc : 60KHz



Derating Curve



Static Characteristics



MODEL : LPC-20-700

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: 24 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 9V~ 30 V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25℃	2.4 V~ 30.39 V/ 230 VAC 1.35 V~ 30.35 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: 0.05 %~ -0.05 %	P
4	LINE REGULATION	V1: 1 %~ -1 % (Max)	I/P: 100VAC ~ 264 VAC O/P:FULL LOAD Ta:25℃	V1: 0.04 %~ -0.04 %	P
5	LOAD REGULATION	V1: 2 %~ 2 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25℃	V1: 0.02 %~ -0.02 %	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/ 140 ms 115VAC/ 280 ms	P
7	RISE TIME	230VAC: 250 ms (Max) 115VAC: 250 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25℃	230VAC/ 50 ms 115VAC/ 63 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/ 100 ms 115VAC/ 22 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25℃	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 3000 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25℃	208 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	43 V~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: 90 VAC ~ 264 VAC O/P: FULL~MIN LOAD Ta: 25°C	TEST: OK	P
3	EFFICIENCY	83 % (TYP)	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	83.6 %	P
4	INPUT CURRENT	230V/ 0.35 A (TYP) 115V/ 0.55 A (TYP)	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 0.23 A/ 230 VAC I = 0.39 A/ 115 VAC	P
5	INRUSH CURRENT	230V/ 70 A (TYP) 115V/ 35 A (TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P: FULL LOAD Ta: 25°C	I = 63 A/ 230 VAC I = 32 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	103 %/ 230 VAC 103 %/ 115 VAC Constant Current Limiting	P
2	OVER VOLTAGE PROTECTION	CH1: 31.5 V~ 40.5 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	36 V/ 230 VAC 36 V/ 115 VAC Shut off o/p voltage clamping by zener diode	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-20-700 1. ROOM AMBIENT BURN-IN : 45 HRS I/P: 230VAC O/P: FULL LOAD Ta=32.4℃ 2. HIGH AMBIENT BURN-IN : 12 HRS I/P: 230VAC O/P: FULL LOAD Ta=65.4 ℃ <table><thead><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta=32.4 ℃</th><th>HIGH AMBIENT Ta=65.4 ℃</th></tr></thead><tbody><tr><td>1</td><td>U1</td><td>NCP1200</td><td>54.1℃</td><td>82.5℃</td></tr><tr><td>2</td><td>C5</td><td>47U/400V 105℃ KM</td><td>54.7℃</td><td>82.8℃</td></tr><tr><td>3</td><td>BD1</td><td>2A/800V</td><td>52.3℃</td><td>80.4℃</td></tr><tr><td>4</td><td>LF1</td><td>LF-802</td><td>51.8℃</td><td>80.1℃</td></tr><tr><td>5</td><td>D1</td><td>EGP20J 2A/600V</td><td>67.3℃</td><td>95.0℃</td></tr><tr><td>6</td><td>Q1</td><td>2SK2865 2A/600V</td><td>71.8℃</td><td>99.2℃</td></tr><tr><td>7</td><td>ZD1</td><td>P6KE180A</td><td>60.1℃</td><td>87.4℃</td></tr><tr><td>8</td><td>D100</td><td>UF3004 3A/400V</td><td>79.0℃</td><td>102.5℃</td></tr><tr><td>9</td><td>C40</td><td>47U/25V 105℃ TXF</td><td>58.3℃</td><td>86.6℃</td></tr><tr><td>10</td><td>C105</td><td>220u/35V LL3K GL</td><td>66.7℃</td><td>91.7℃</td></tr><tr><td>11</td><td>C200</td><td>22u/50V 105℃ KY</td><td>68.5℃</td><td>94.5℃</td></tr><tr><td>12</td><td>T1</td><td>TF1769</td><td>68.7℃</td><td>95.4℃</td></tr><tr><td>13</td><td>CASE</td><td>CASE 上方</td><td>56.8℃</td><td>83.2℃</td></tr></tbody></table>			NO	Position	P/N	ROOM AMBIENT Ta=32.4 ℃	HIGH AMBIENT Ta=65.4 ℃	1	U1	NCP1200	54.1℃	82.5℃	2	C5	47U/400V 105℃ KM	54.7℃	82.8℃	3	BD1	2A/800V	52.3℃	80.4℃	4	LF1	LF-802	51.8℃	80.1℃	5	D1	EGP20J 2A/600V	67.3℃	95.0℃	6	Q1	2SK2865 2A/600V	71.8℃	99.2℃	7	ZD1	P6KE180A	60.1℃	87.4℃	8	D100	UF3004 3A/400V	79.0℃	102.5℃	9	C40	47U/25V 105℃ TXF	58.3℃	86.6℃	10	C105	220u/35V LL3K GL	66.7℃	91.7℃	11	C200	22u/50V 105℃ KY	68.5℃	94.5℃	12	T1	TF1769	68.7℃	95.4℃	13	CASE	CASE 上方	56.8℃	83.2℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P:96.3% LOAD Ta:30.5℃	TEST : OK	P																																																																						
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC O/P:95 % LOAD Ta=-30℃	TEST : OK	P																																																																						
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 60℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta=60 ℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																						
5	TEMPERATURE COEFFICIENT	± 0.03 %(0-50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.004 %(0-50℃)	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℃		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 Ta:25°C	I/P-O/P: 1.346 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: 20.3 GΩ NO DAMAGE	P
3	APPROVAL	TUV: Certificate NO : UL: File NO :			N

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230/240/220VAC/ 50HZ O/P:100/75/50/25%LOAD Ta:25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230VAC(50HZ)//115V(60HZ) O/P:FULL/ 50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230VAC(50HZ)//115V(60HZ) O/P:FULL/ 50% 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-20-700:SUPPOSE C105 I/P: 230VAC O/P:FULL LOAD Ta=25 °C I/P: 230VAC O/P:FULL LOAD Ta= 60 °C	IS THE MOST CRITICAL COMPONENT LIFE TIME=80797 HRS LIFE TIME=12451 HRS		P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 786.5KHRS			P
3	ORT (Ongoing Reliability test)	LPC-20-700:I/P : 230VAC O/P : 95% LOAD TA=50°C Sample=10pcs	TEST TIME=1464HRS		P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 1 Rated STD4NK60Z-1 4A/600V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 488 V (2) 514 V	P
2	Diode Peak Voltage	D100 Rated UF3004 3A/400V	I/P: High-Line +3V = 267 V O/P: (1) Full Load Turn on (2) Output Short Ta: 25°C	(1) 228 V (2) 200 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°C	(1) 480 V	P
4	Input Capacitor Voltage	C5 Rated 47u/400V 105°C KM	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°C	(1) 374 V (2) 376 V (3) 376 V	P
5	Control IC Voltage Test	U1 Rated NCP1200D60R2G 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°C	(1) 13.3 V (2) 11.41 V (3) 13.3 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/4/1	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2008/6/20	PRODUCT SAMPLE W0804D14	PASS	SANFORD SU	VINCENT TSENG
2008/8/1	PRODUCT SAMPLE W0806D09	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023