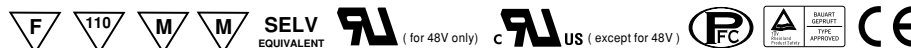




■ Features :

- Universal AC input / Full range
- Fully isolated plastic case with terminal block style of I/O
- Built-in constant current limiting circuit
- Adjustable output voltage and current level
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Built-in active PFC function, comply with EN61000-3-2 class C (Pin $\geq$ 25W)
- 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



MODEL		PLC-30-9	PLC-30-12	PLC-30-15	PLC-30-20	PLC-30-24	PLC-30-27	PLC-30-36	PLC-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	2.4Vp-p	2.3Vp-p	3.6Vp-p	3.7Vp-p
	VOLTAGE ADJ. RANGE Note.5	8.55 ~ 9.9V	11.4 ~ 13.2V	14.5 ~ 16.5V	19 ~ 22V	22.8 ~ 26.4V	25.65 ~ 29.7V	34.2 ~ 39.6V	45.6 ~ 52.8V
	CURRENT ADJ. RANGE Note.5	2.475 ~ 3.399A	1.875 ~ 2.575A	1.5 ~ 2.06A	1.125 ~ 1.545A	0.938 ~ 1.288A	0.84 ~ 1.1536A	0.63 ~ 0.865A	0.473 ~ 0.649A
	VOLTAGE TOLERANCE Note.3	$\pm 10\%$							
	LINE REGULATION	$\pm 3.0\%$							
INPUT	LOAD REGULATION	$\pm 5.0\%$							
	SETUP TIME	1500ms / 230VAC 3000ms / 115VAC at full load							
	VOLTAGE RANGE Note.4	90 ~ 264VAC 127 ~ 370VDC							
	FREQUENCY RANGE	47 ~ 63Hz							
	POWER FACTOR	PF $\geq$ 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							
PROTECTION	INRUSH CURRENT(max.)	40A/230VAC							
	LEAKAGE CURRENT	<0.5mA / 240VAC							
	OVER CURRENT	100 ~ 110%							
	SHORT CIRCUIT	Protection type : Constant current limiting, recovers automatically after fault condition is removed							
	OVER VOLTAGE	Hiccup mode, recovers automatically after fault condition is removed.							
ENVIRONMENT	OVER VOLTAGE	10 ~ 14V	14 ~ 16V	17 ~ 22V	23 ~ 26V	27 ~ 34V	31 ~ 35V	40 ~ 50V	53 ~ 63V
	OVER TEMPERATURE	Protection type : Shut down o/p voltage, re-power on to recover							
	WORKING TEMP.	95 $^{\circ}$ C $\pm 10^{\circ}$ C (TSW1)							
	WORKING HUMIDITY	Protection type : Shut down o/p voltage, re-power on to recover							
SAFETY & EMC	STORAGE TEMP., HUMIDITY	100 ~ 110%							
	TEMP. COEFFICIENT	20 ~ 95% RH non-condensing							
	VIBRATION	-40 ~ +80 $^{\circ}$ C, 10 ~ 95% RH							
	SAFETY STANDARDS	$\pm 0.06\%/^{\circ}$ C (0 ~ 50 $^{\circ}$ C)							
	WITHSTAND VOLTAGE	10 ~ 500Hz, 2G 12min./1cycle, period for 72min. each along X, Y, Z axes							
	ISOLATION RESISTANCE	UL1310 Class 2, TUV EN61347-1, EN61347-2-13, CAN/CSA C22.2 No. 223-M91(except for 48V) approved							
OTHERS	EMI CONDUCTION & RADIATION	I/P-O/P:3.75KVAC							
	HARMONIC CURRENT	I/P-O/P:100M Ohms / 500VDC / 25 $^{\circ}$ C / 70% RH							
	EMS IMMUNITY	Compliance to EN55015							
NOTE	MTBF	Compliance to EN61000-3-2 Class C (Pin $\geq$ 25W), Class D (>70% load) ; EN61000-3-3							
	DIMENSION	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, EN61547, light industry level, criteria A							
	PACKING	625.5Khrs min. MIL-HDBK-217F (25 $^{\circ}$ C)							
NOTE		160*46*30mm (L*W*H)							
		0.2Kg; 70pcs/15Kg/0.96CUFT							
		1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25 $^{\circ}$ 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" $\geq 10\%$ 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.							

MODEL : PLC-30-12

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 2 Vp-p (Max)	I/P : 230VAC O/P : 100% LOAD Ta : 25°C	V1 : 1.46 Vp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 11.4 V~ 13.2 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	10.52V~ 13.88 V/ 230 VAC 10.52V~ 13.88 V/ 115 VAC	P
3	OUTPUT CURRENT ADJUST RANGE	CH1 : 1.875 A~2.575A	I/P : 230 VAC I/P : 115 VAC Ta : 25°C	1.65 A~ 3.01 A/ 230 VAC 1.65 A~ 3.01 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 : 0.6 %~ -0.6 %	P
5	LINE REGULATION	V1 : 3 %~ -3 % (Max)	I/P : 100VAC ~ 264 VAC O/P : 100% LOAD Ta : 25°C	V1 : 0.1 %~ -0.1 %	P
6	LOAD REGULATION	V1 : 5 %~ -5 % (Max)	I/P : 230 VAC O/P : 100% LOAD ~MIN LOAD Ta : 25°C	V1 : 0.4 %~ -0.4 %	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/ 841 ms 115VAC/ 1682 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/ 32 ms 115VAC/ 22 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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P : TESTING O/P : 100% LOAD Ta : 25°C	69 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= 0.91 / 230 VAC PF= 0.96 / 115 VAC ≥ 0.9 at 75 ~ 100% load	P
4	EFFICIENCY	82.5% (TYP)	I/P : 230 VAC O/P : 100% LOAD Ta : 25°C	84.6 %	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 = 0.17 A/ 230 VAC I = 0.33 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 = 28 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 : 0.001 mA N-FG : 0.001 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	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 : 14 V~ 16 V	I/P : 230 VAC I/P : 115 VAC O/P : MIN LOAD Ta : 25°C	14.7 V/ 230 VAC 14.7 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	SPECICATION	TEST CONDITION	RESULT	VERDICT																																																																											
1	TEMPERATURE RISE TEST	MODEL : PLC-30-9 1. ROOM AMBIENT BURN-IN : 17 HRS I/P : 230VAC O/P : 100% LOAD Ta= 24.7℃ 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℃</th><th>HIGH AMBIENT Ta= 40.8℃</th></tr><tr><td>1</td><td>Q1</td><td>P9NK70ZFP 7.5A/700A</td><td>72.3℃</td><td>83.9℃</td></tr><tr><td>2</td><td>D2</td><td>1N4007 1A/1KV</td><td>85.6℃</td><td>96.6℃</td></tr><tr><td>3</td><td>LF1</td><td>TR-572</td><td>52.8℃</td><td>64.5℃</td></tr><tr><td>4</td><td>U1</td><td>TDA4863</td><td>60.9℃</td><td>71.5℃</td></tr><tr><td>5</td><td>BD1</td><td>UD2KB80</td><td>63.6℃</td><td>74.9℃</td></tr><tr><td>6</td><td>C48</td><td>47U/35V 105℃ ZLH</td><td>66.8℃</td><td>77.8℃</td></tr><tr><td>7</td><td>C7</td><td>474/450V 105℃</td><td>63.3℃</td><td>74.5℃</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF-1594</td><td>89.1℃</td><td>99.3℃</td></tr><tr><td>9</td><td>TSW1</td><td>NTC200K 5%</td><td>69.8℃</td><td>81.6℃</td></tr><tr><td>10</td><td>L1</td><td>TR-751</td><td>60.3℃</td><td>71.9℃</td></tr><tr><td>11</td><td>C106</td><td>1500U/16V 105℃ ZLH</td><td>83.1℃</td><td>93.5℃</td></tr><tr><td>12</td><td>D100</td><td>FME-220A 20A/100V</td><td>90.7℃</td><td>100.5℃</td></tr><tr><td>13</td><td>LF100</td><td>TR-574</td><td>59.6℃</td><td>70.7℃</td></tr><tr><td>14</td><td>CASE</td><td>UP CASE</td><td>51.9℃</td><td>65.3℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 24.7℃	HIGH AMBIENT Ta= 40.8℃	1	Q1	P9NK70ZFP 7.5A/700A	72.3℃	83.9℃	2	D2	1N4007 1A/1KV	85.6℃	96.6℃	3	LF1	TR-572	52.8℃	64.5℃	4	U1	TDA4863	60.9℃	71.5℃	5	BD1	UD2KB80	63.6℃	74.9℃	6	C48	47U/35V 105℃ ZLH	66.8℃	77.8℃	7	C7	474/450V 105℃	63.3℃	74.5℃	8	T1 COIL	TF-1594	89.1℃	99.3℃	9	TSW1	NTC200K 5%	69.8℃	81.6℃	10	L1	TR-751	60.3℃	71.9℃	11	C106	1500U/16V 105℃ ZLH	83.1℃	93.5℃	12	D100	FME-220A 20A/100V	90.7℃	100.5℃	13	LF100	TR-574	59.6℃	70.7℃	14	CASE	UP CASE	51.9℃	65.3℃	P
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14	CASE	UP CASE	51.9℃	65.3℃																																																																												
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 115 % LOAD Ta : 25℃	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℃ NO DAMAGE	I/P : 272 VAC O/P : 100% LOAD Ta= 40℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																											
5	TEMPERATURE COEFFICIENT	± 0.06 %(0~50℃)	I/P : 230 VAC O/P : 100% LOAD	± 0.03 %(0~50℃)	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℃		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 : 2.19 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 : R50103804 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 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	PLC-30-9 : SUPPOSE C 106 IS THE MOST CRITICAL COMPONENT I/P : 230VAC O/P : 100% LOAD Ta= 25 °C LIFE TIME= 53282 HRS I/P : 230VAC O/P : 100% LOAD Ta= 50 °C LIFE TIME= 28012 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 621.4K HRS			P

COMPONENT STRESS TEST

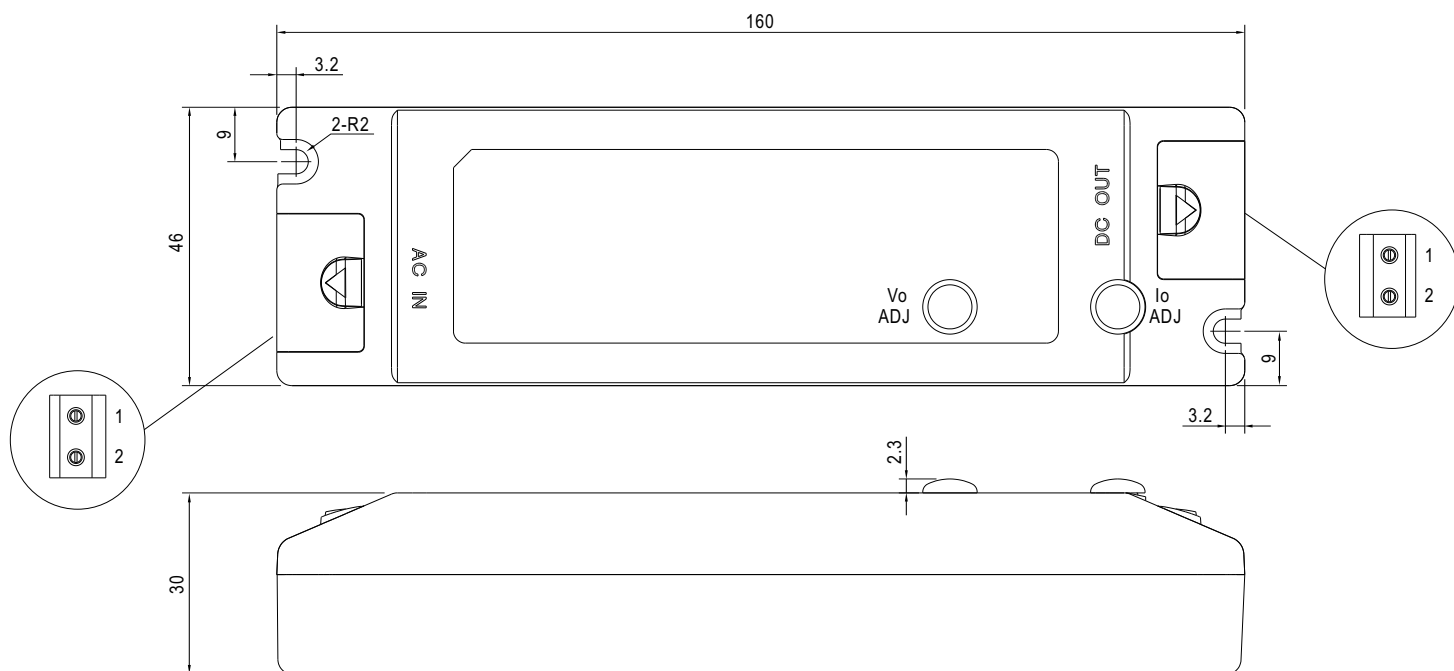
NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated STP9NK70ZFP : 700V 7.5A	I/P : High-Line +3V = 267 V O/P : (1) 100% LOAD Turn on (2) Output Short Ta : 25℃	(1) 604 V (2) 458 V	P
2	Diode Peak Voltage	D100 Rated FME220A : 100V 20A	I/P : High-Line +3V = 267 V O/P : (1) 100% LOAD Turn on (2)Output Short Ta : 25℃	(1) 76 V (2) 64 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) 396 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) 14.6 V (3) 14.6 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/6/16	W0905C35	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023

Mechanical Specification

Case No. 990A Unit:mm



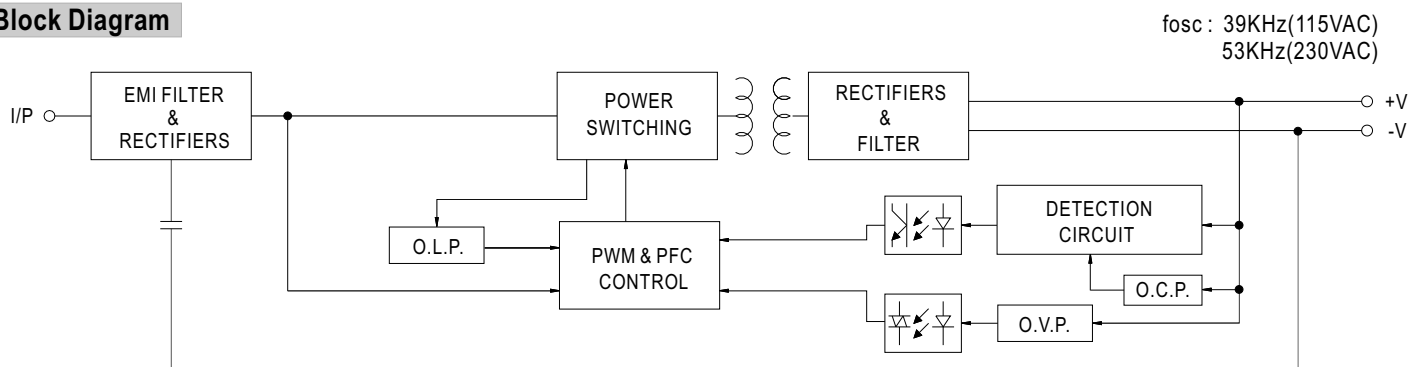
Terminal Pin No. Assignment (TB1):
SWITCLAB MB310-75002

Terminal Pin No. Assignment (TB2):
SWITCLAB MB310-75002

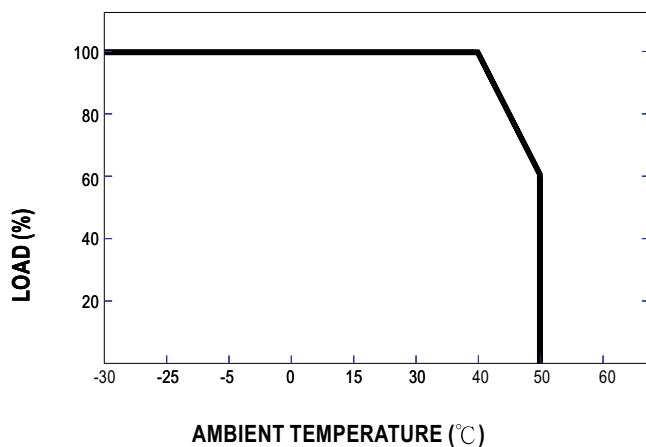
Pin No.	Assignment
1	AC/N
2	AC/L

Pin No.	Assignment
1	+V
2	-V

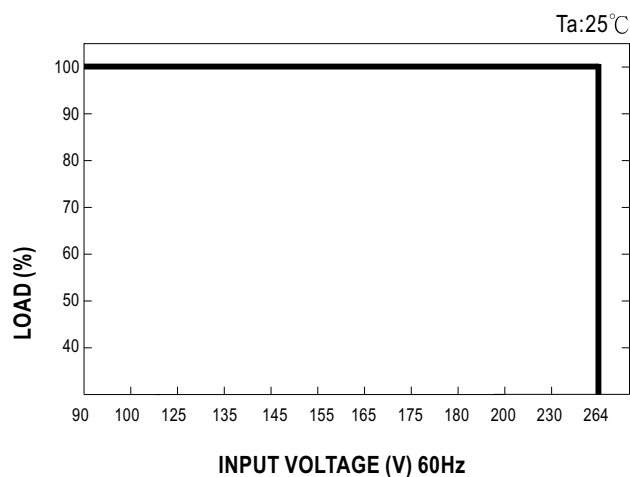
Block Diagram



Derating Curve



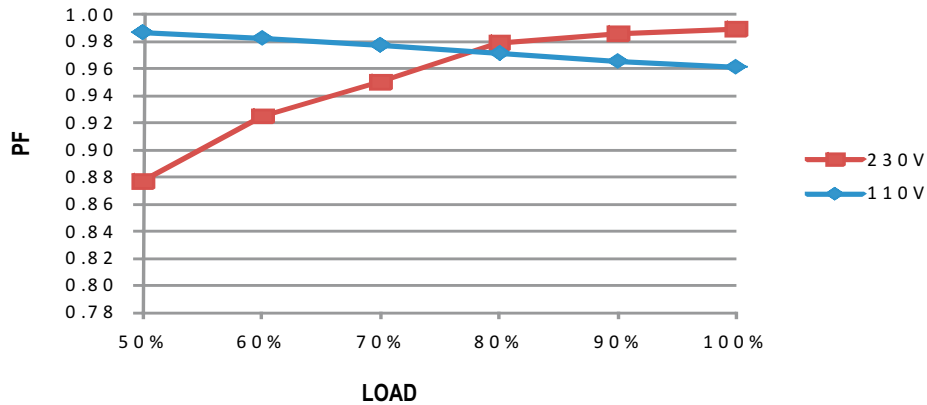
Static Characteristics



Power Factor Characteristic

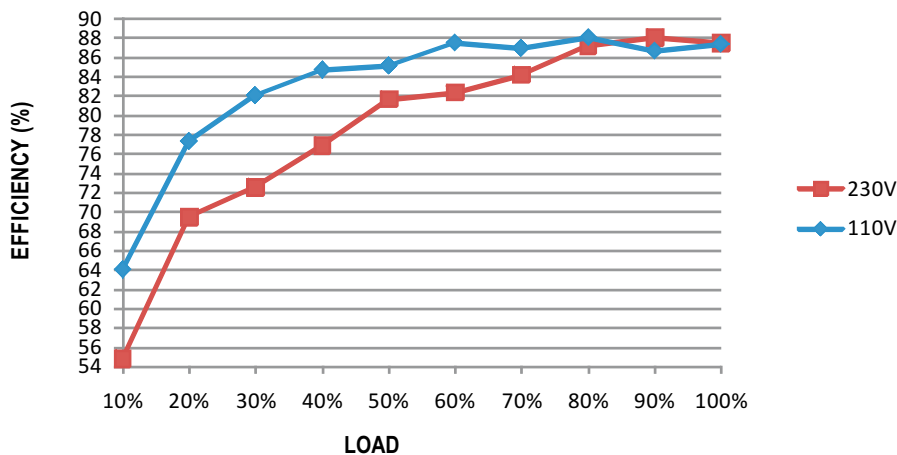
Power factor will be higher than 0.9 when output loading is 75% or higher.

Constant Current Mode



EFFICIENCY vs LOAD (48V Model)

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

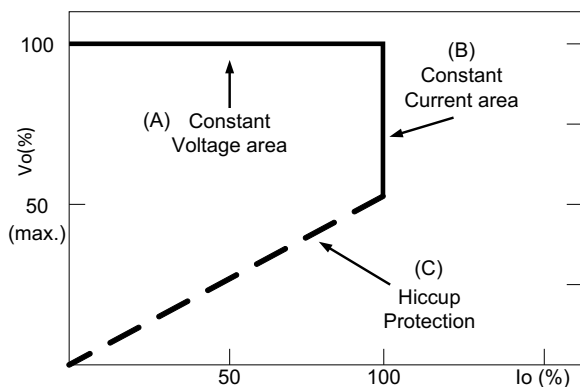


DRIVING METHODS OF LED MODULE

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