General Description

RLD1301 is a AC direct driver (ACDD) for LED lights. Inductor and electrolyte capacitors are not necessary implementing a driving circuit. Thus the lifetime of LED lights can be extended up to LED chips itself. The output current level is adjustable via an external resistor. Dimming control can be accomplished with current control circuit or TRIAC phase control switch. The NTC (Negative Temperature Coefficient) characteristics of the control block ensure stable operation of LED lights under over voltage and over temperature. THD (Total Harmonic Distortion) can be reduced to below 20%, and PF (Power Factor) is close to 1. RLD1301 offers the competitive solution for AC direct drive LED lights with a robust long lifetime and cost effectiveness.

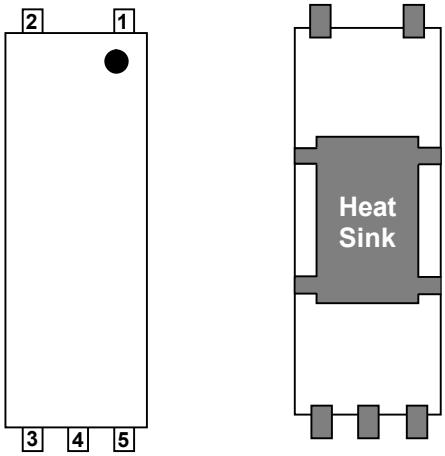
Features

- AC direct drive IC (ADDI) for LED lights
- No electrolyte capacitor, No inductor
- Low THD
- High PF
- Long lifetime
- No EMI issue
- Dimming controllable
- Negative temperature coefficient

Applications

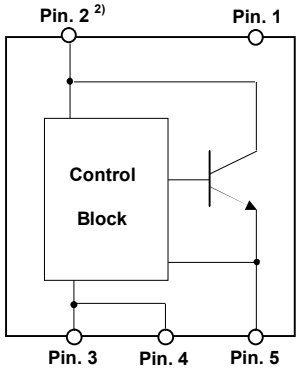
- Bulb type LED light
- PAR type LED light
- Panel type LED light
- Street type LED light
- Down light

Package Type : P-6020G



[Top view] [Bottom view]

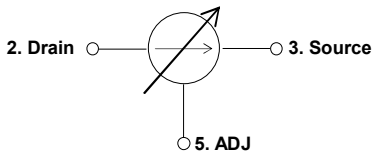
Schematic & PIN Configuration



1 : NC 2 : Drain 3,4 : Source 5 : ADJ

2) Heat sink connected to pin. 2

Device Symbol



Absolute Maximum Ratings at T_A = 25 °C

Parameter	Symbol	Ratings	Unit
Drain Voltage	V_{DD}	80	V
Drain Current	I_D	100	mA
Power Dissipation*[1)]	P_D	2.0	W
Operating Temperature	T_{OP}	-40 ~ 85	°C
Junction Temperature	T_J	150	°C
Storage Temperature	T_{STG}	-65 ~ 150	°C

*[1)] Drain voltage and drain current should be determined by considering the power dissipation rating

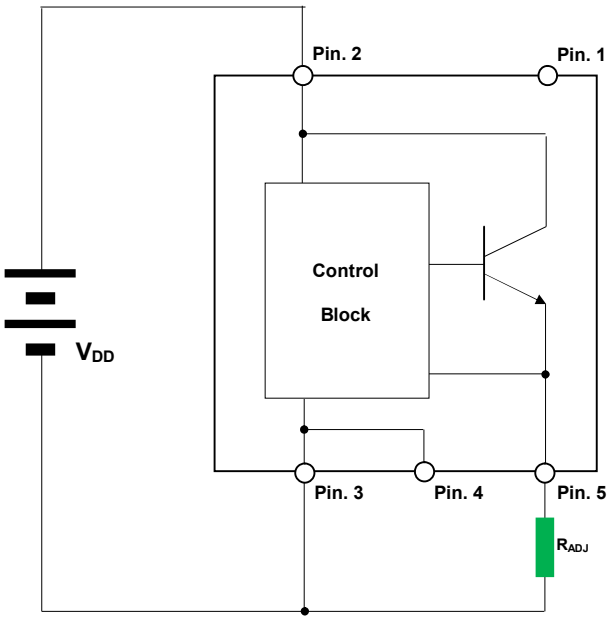
Electrical Characteristics

500mm^2 Heat sink*[2)], T_A= 25 °C

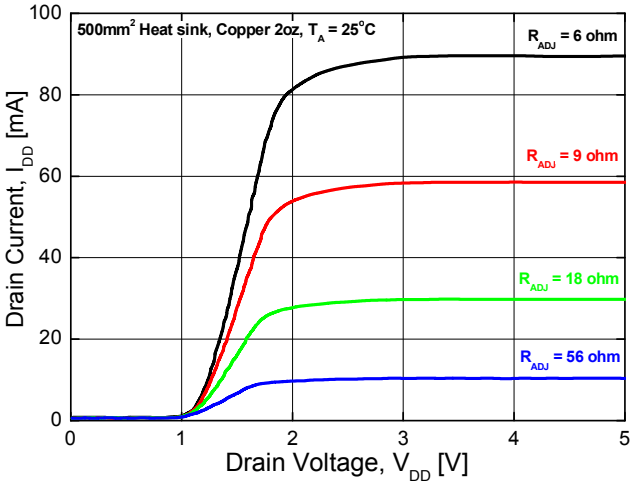
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Drain Voltage	V_{DD}		4		80	V
Drain Current	I_D	R_{ADJ} = 6Ω, V_{DD}=5V	79	83	88	mA
		R_{ADJ} = 9Ω, V_{DD}=5V	54	57	60	mA
		R_{ADJ} = 18Ω, V_{DD}=5V	26	27	29	mA
		R_{ADJ} = 55Ω, V_{DD}=5V	8	9	10	mA

*[2)] Device mounted on 2oz copper heat sink on FR4

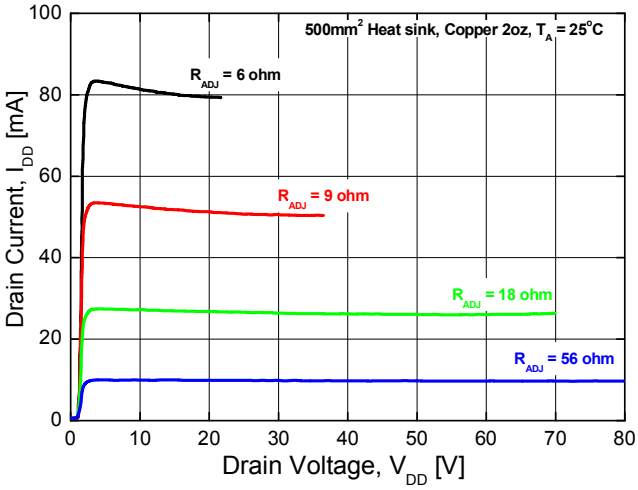
Test circuit



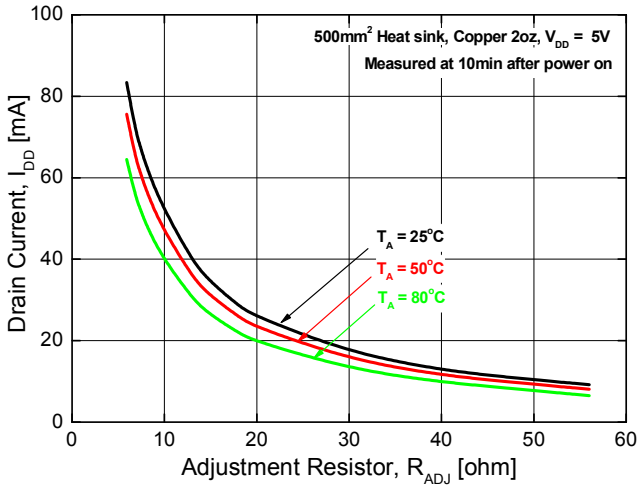
Drain Current vs. Drain Voltage



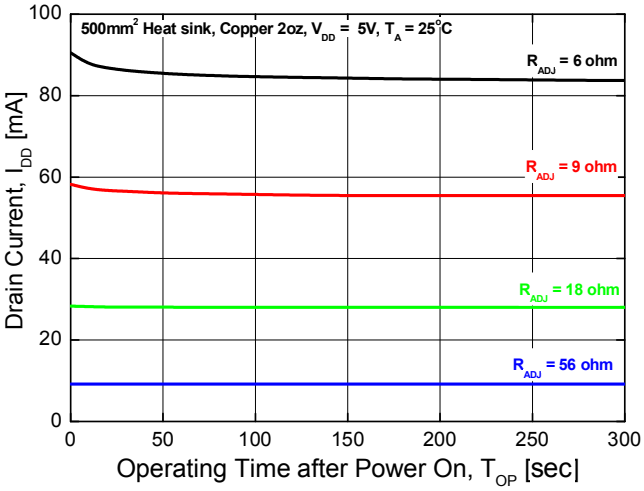
Drain Current vs. Drain Voltage



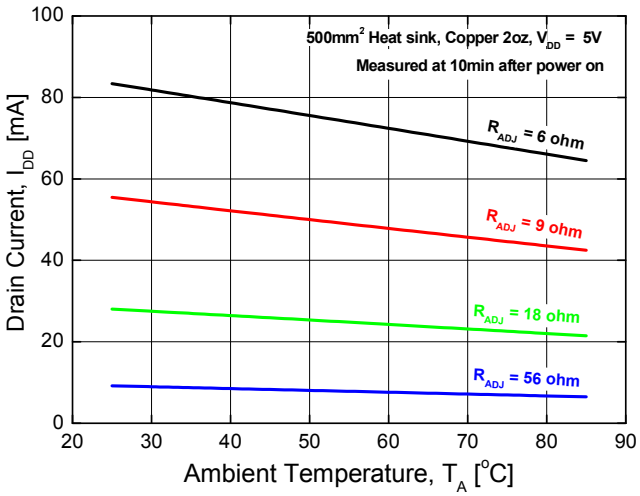
Drain Current vs. Adjustment Resistor



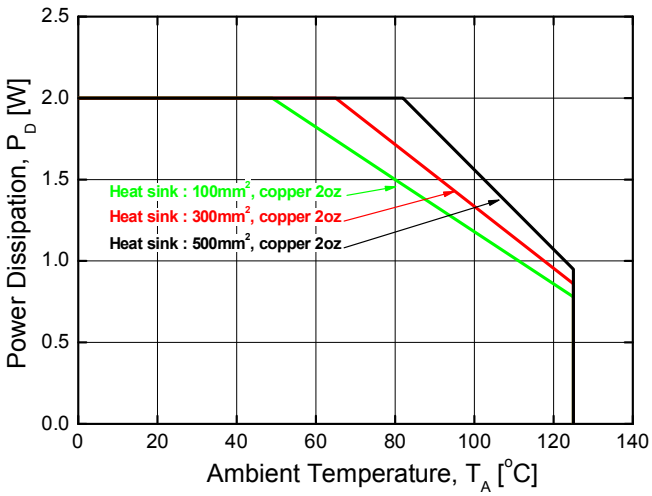
Drain Current vs. Operating Time



Drain Current vs. Ambient Temperature

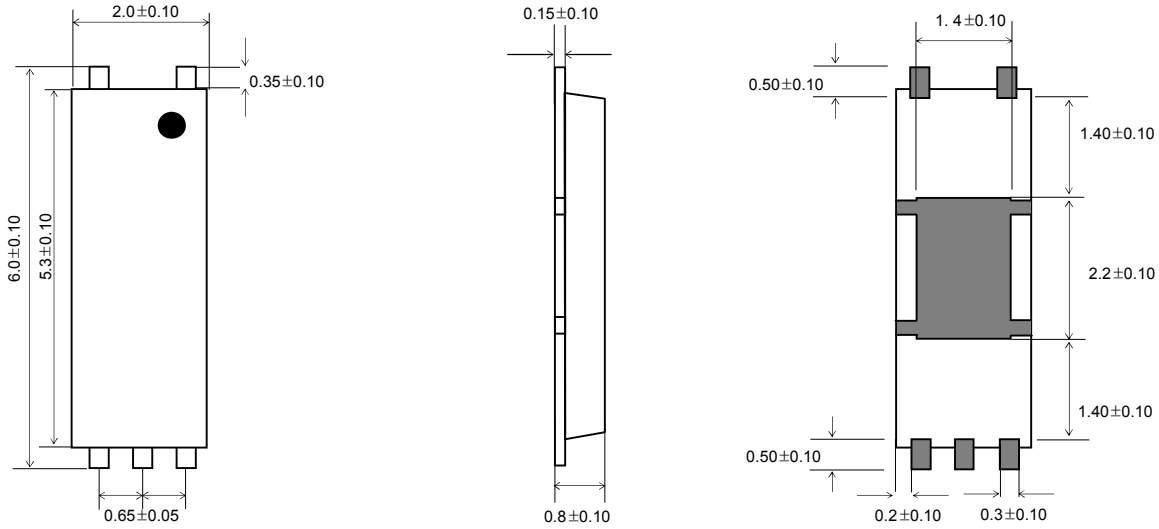


Power Derating vs. Ambient Temperature



PKG Dimensions

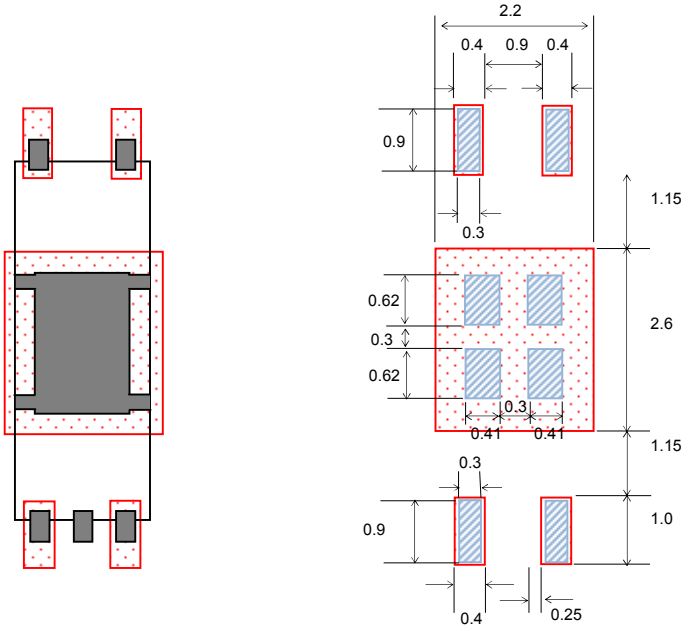
Unit : mm



Marking Information

Land Pattern

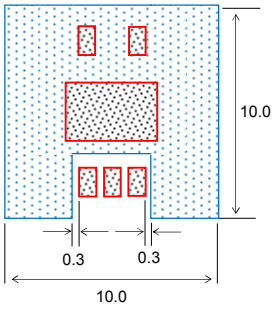
Unit : mm



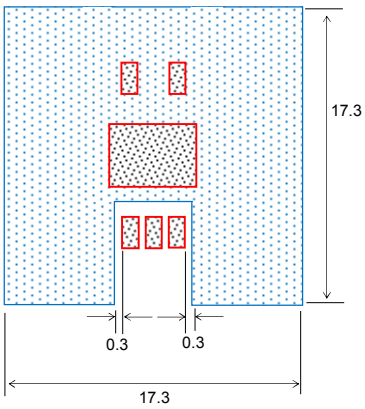
Heat Sink Pattern

Unit : mm

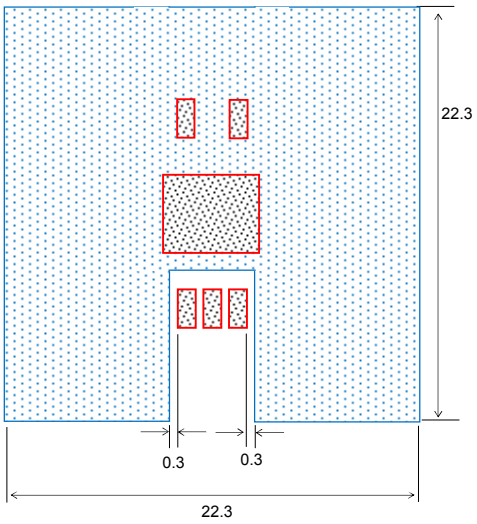
100mm^2 / Copper 2oz



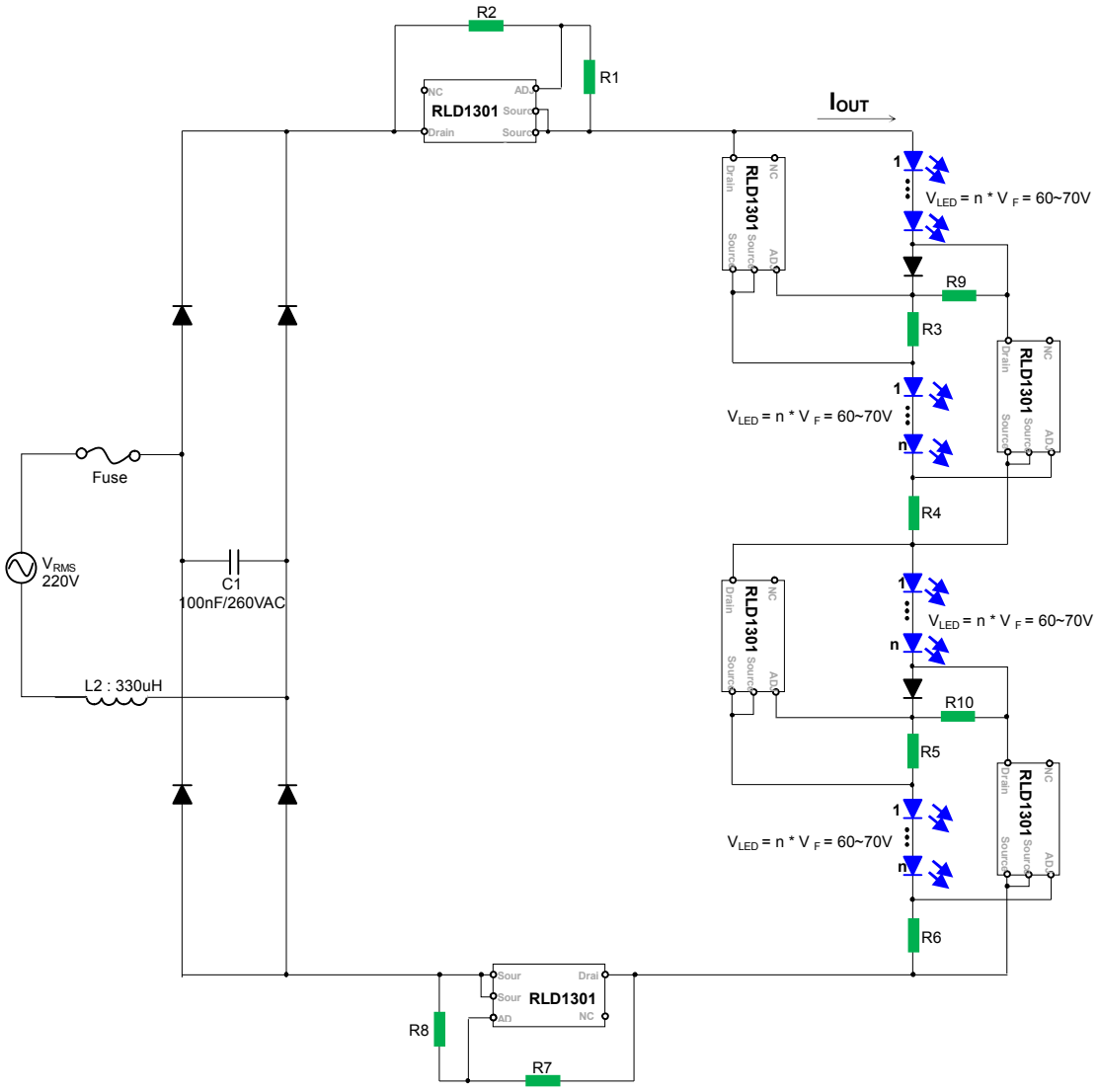
300mm^2 / Copper 2oz



500mm^2 / Copper 2oz



ACDD-1 Type Application Circuit for the 5~12W LED Lights



T_A : 25°C, Unit : Ω

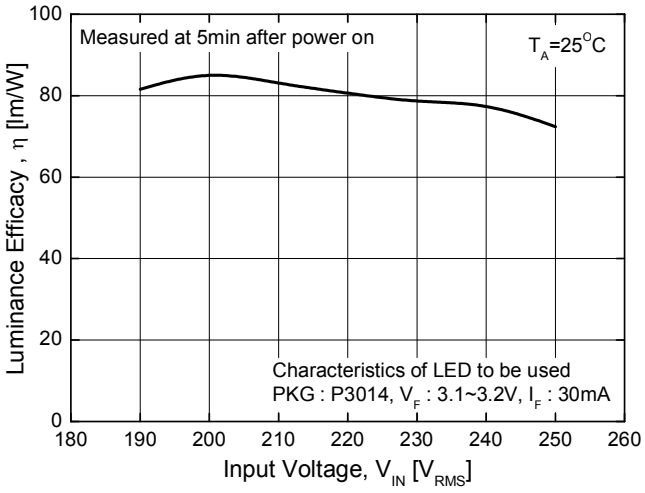
Input Voltage	Power	I_{OUT}	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10
220VAC 60Hz	5W	23mA	15	1900	44	22	44	22	1900	15	33K	33K
	6W	27mA	12	1600	37	18	37	18	1600	12	33K	33K
	7W	32mA	10	1400	31	16	31	16	1400	10	33K	33K
	8W	36mA	9	1200	28	14	28	14	1200	9	33K	33K
	9W	41mA	8	1000	24	12	24	12	1000	8	33K	33K
	10W	45mA	7	960	22	11	22	11	960	7	33K	33K
	11W	50mA	7	870	20	10	20	10	870	7	33K	33K
	12W	55mA	6	800	18	9	18	9	800	6	33K	33K

1) R2 R7 must be used resistor above 1/2 W

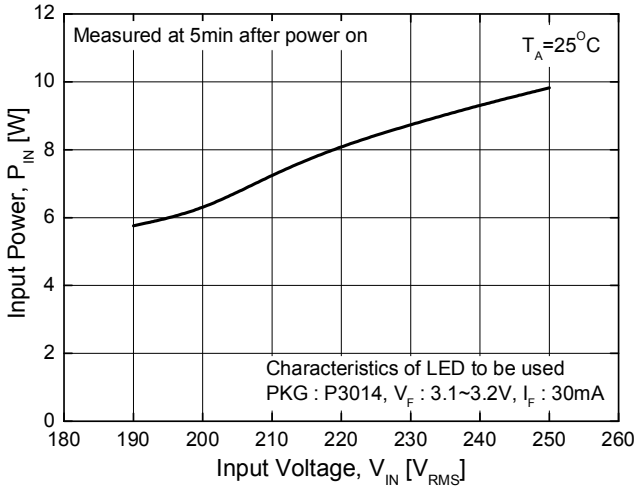
2) R1, R3, R4, R5, R6, R8, R9, R10 must be used resistor above 1/4 W

Example : 8W bulb type LED lights

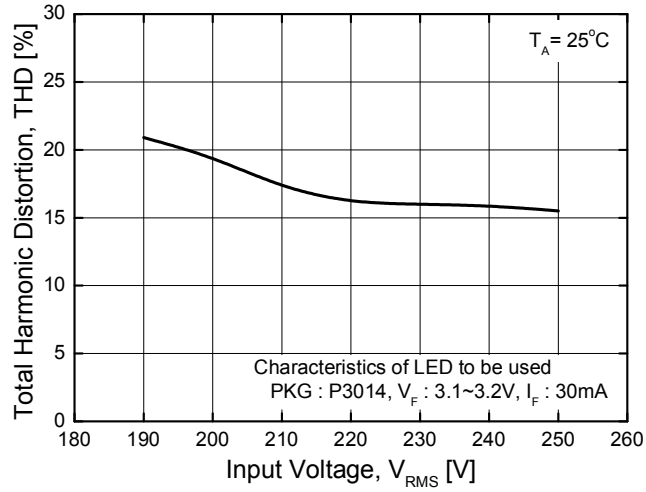
Luminance Efficacy vs. Input Voltage



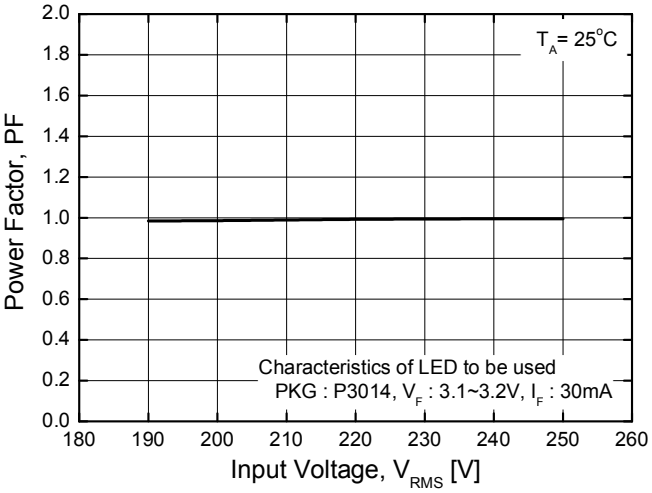
Input Power vs. Input Voltage



Total Harmonic Distortion vs. Input Voltage



Power Factor vs. Input Voltage



Bulb case was covered when testing