Preliminary – **LD7006**

Power Factor Correction Controller

Features

- Primary-side feedback constant current control
- Universal rectified 85VAC to 275VAC Input Voltage Range
- Transition-mode PFC operating
- Constant current control LED driver
- Built-in output short and open circuit protections
- Line compensation
- Over voltage protection
- Series/Parallel Combinations
- SOT23-6 Package Available
- Patent pending

General Description

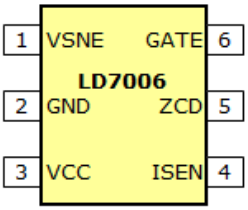
The LD7006 is a high performance LED driver which uses primary side feedback technology to reduce cost. The LD7006 removes the need for secondary feedback circuitry while achieving excellent line regulation. The transition mode PFC function with low switch loss maximizes the system efficiency.

Compared with a traditional LED driver, the LD7006 can reduce total costs, size, and components while simultaneously increasing efficiency and system reliability.

Applications

- Isolation AC/DC LED driver application
- Isolation DC/DC LED driver application
- Industrial and commercial lighting
- Retro-fit lamps, e.g. E27, GU10.

Package Pin Out



Ordering Information

		Packing Options	
Part No.	Package	Tube(BG)	Tape & Reel(TR)
LD7006	SOT23-6	LD7006L3-BG	LD7006L3-TR

- Package material default is “Green” package.

Product Marking

LD8888
SSSSS…

- Line 1 – “LD” is a fixed character
  8888: product name
- Line 2 – SSSSS…: lot number

Absolute Maximum Ratings[*1]

Parameter	Maximum	Unit
V_{CC} Operating voltage on Internal regulator	22	V
V_{ZCD}, V_{ISEN} ZCD, ISEN voltage to GND	-0.3~ +5	V
V_{SNE} VSNE voltage to GND	-0.3~ +12	V
V_{GATE} GATE voltage to GND	-0.3~ +18	V
P_D Power dissipation @T_A=25 °C	0.3	W
θ_{JA} Thermal resistance junction to ambient[*2]	220	°C/W
T_J Operating junction temperature rang	-40 to + 125	°C
T_{OPA} Operating ambient temperature rang	-40 to +85	°C
T_{STG} Storage temperature rang	-65 to +150	°C

The values beyond the boundaries of absolute maximum rating may cause the damage to the device. Functional operation in this context is not implied. Continuous use of the device at the absolute rating level might influence device reliability. All voltages have their reference to device ground.

Recommended Operating Condition[*3]

Parameter	Symbol	Condition	Unit
Supply voltage	V_{CC}	20	V
VSNE voltage to GND	V_{SNE}	-0.3~ +6.5	V
Junction temperature range	T_J	-40 to +125	°C
Ambient temperature range	T_A	-40 to -85	°C

Electrical Characteristics

V_{DD}=12V, T_A=25°C unless specified, otherwise minimum and maximum values are guaranteed by production testing requirements.

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Power Supply						
Operating voltage range	V_{CC}	After turn on	10	–	16	V
Turn on threshold voltage	V_{CCON}	–	11	12	13	V
Turn off threshold voltage	V_{CCOFF}	–	8.5	9.5	10.5	V
UVLO Hysteresis	V_{UVLOHY}	–	–	2.5	–	V
Over voltage protection	V_{OVP}	–	–	18	–	V
Operating supply current	I_{OP}	V_{CC} =12V, C_{OUT}=1nF	–	2	–	mA
Quiescent current	I_Q	During protection	–	100	–	μA
Zero Current Detection						
Input bias current	I_{ZCD}	–	–	2	–	μA
Source current	I_{ZCDSRC}	–	-2.5	–	5.5	mA
Current Sense						
Current sense reference voltage	V_{SNE}	–	240	250	260	mV
Leading edge blanking time	T_{LEB}	–	400	500	600	nS
Gate Output						
Fall time	T_F	V_{CC} =12V, C_{OUT}=1nF	–	30	70	nS
Rise time	T_R	V_{CC} =12V, C_{OUT}=1nF	–	40	80	nS

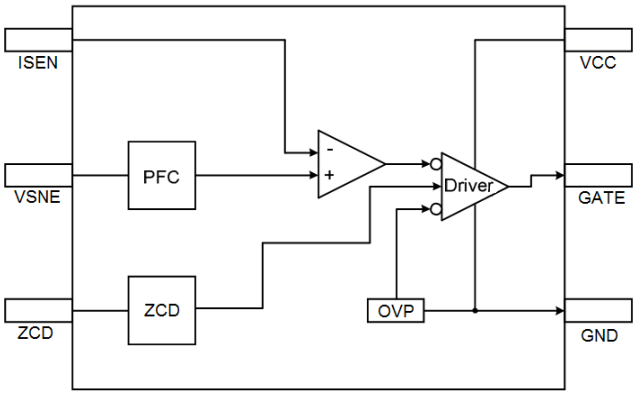
Notes:

1. *Stresses listed as the above "Absolute Maximum Ratings" may cause permanent damage to the device. These are for stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may remain possibility to affect device reliability.*
2. *Thermal Resistance is specified with the component mounted on a low effective thermal conductivity test board in free air atTA=25°C.*
3. *The device is not guaranteed to function outside its operating conditions.*

Pin Description

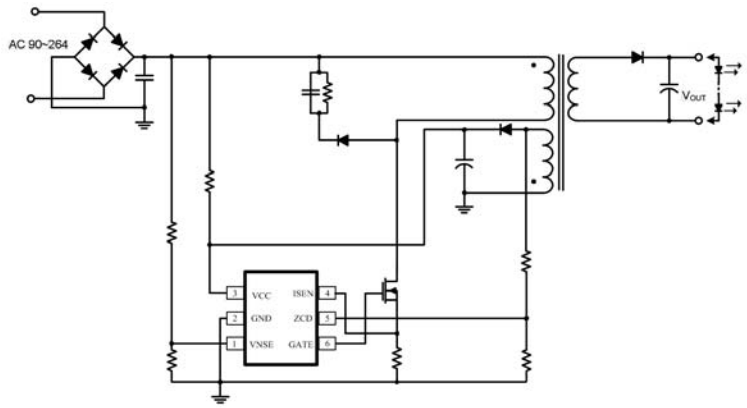
Pin #	Name	Description
1	VSNE	This pin is connected to the rectified voltage to provides the sinusoidal reference
2	GND	Ground return for all internal circuitry
3	VCC	Power supply pin for all internal circuit
4	ISEN	Current sense
5	ZCD	This pin is zero current demagnetization sensing for transition-mode operation
6	GATE	GATE driver output

Functional Block Diagram

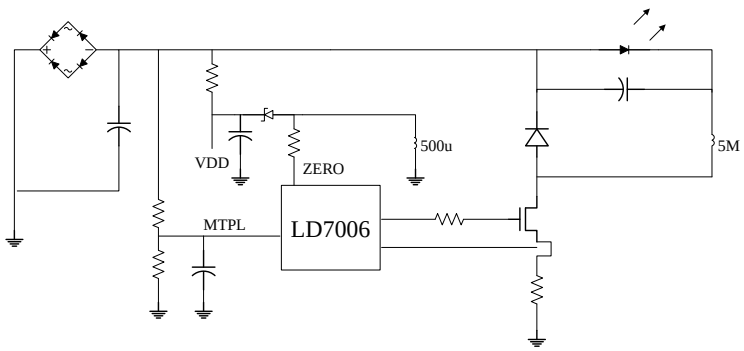


Typical Application Circuit

Isolation

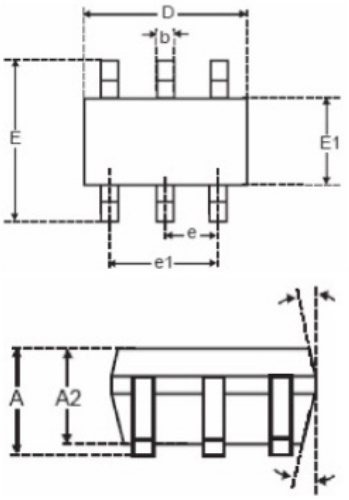


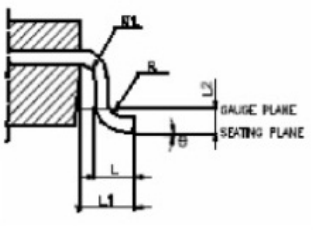
Non-isolation

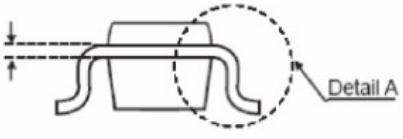


Package Outline

SOT23-6:







SYMBOLS	MILLMETERS		
	MIN.	NOM.	MAX.
A			1.45
A1			0.15
A2	0.90	1.15	1.30
b	0.30		0.50
c	0.08		0.22
D		2.90 BSC.	
E		2.80 BSC.	
E1		1.60 BSC.	
e		0.95 BSC.	
e1		1.90 BSC.	
L	0.30	0.45	0.60
L1		0.60 REF	
L2		0.25 BSC.	
R	0.10		
R1	0.10		0.25
θ	0°	4°	8°
θ1	5°	10°	15°

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