SP6801
Universal High Brightness LED Driver

DESCRIPTION

The SP6801 is a PWM high efficiency LED driver. It operates in wide range input voltage from 10V up to 600V. The device drives an external MOSFET at a fixed frequency. The frequency is programmable up to 300KHz with a single resistor. The dimming control for SP6801 can be either PWM input or linear input. The LED string is driven at a constant current without the need for loop compensation. SP6801 requires only few external components to achieve constant LED current making it ideas for low cost LED driver. The SP6801 is available in SOP-8 package.

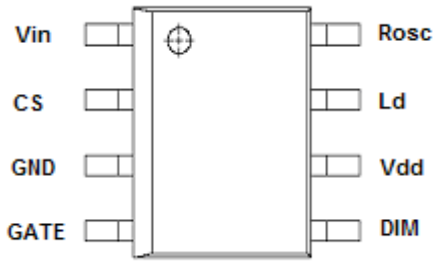
APPLICATIONS

- AC/DC or DC/DC LED driver applications
- Backlighting for flat panel displays
- General purpose constant current source
- Automotive
- Chargers

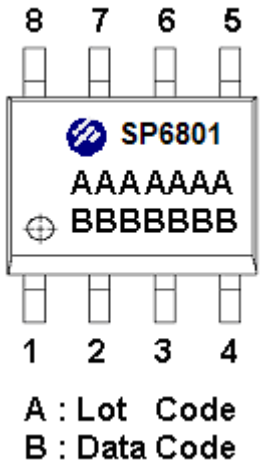
FEATURES

- >90% efficiency
- 10V to 600V DC input range
- Constant current LED driver
- Linear and PWM dimming capability
- Internal thermal overload protection

PIN CONFIGURATION(SOP-8)

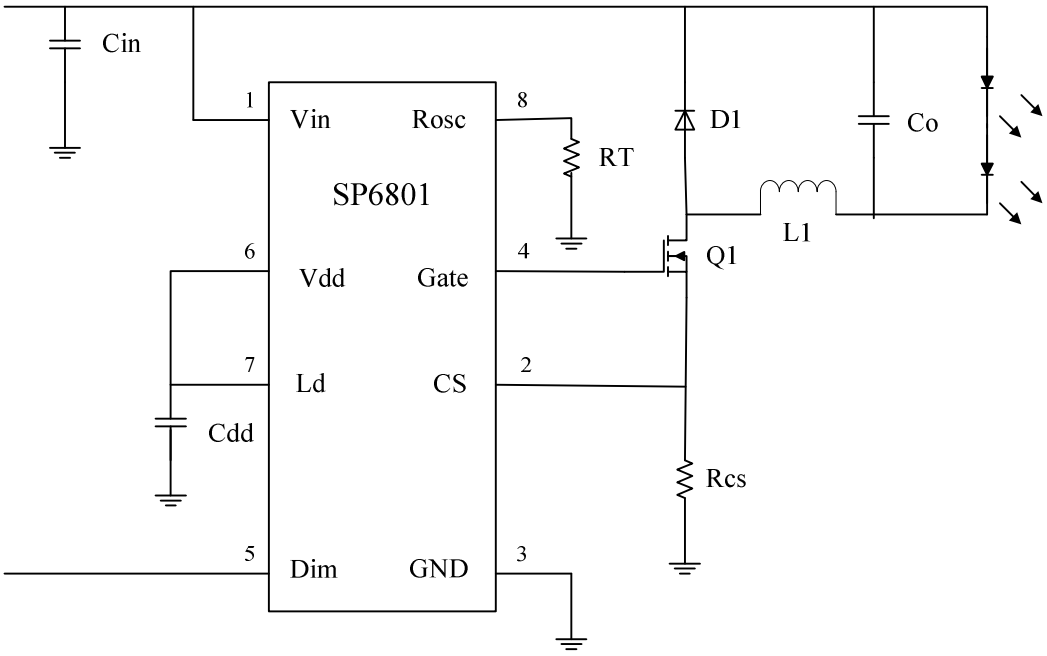


PART MARKING



A : Lot Code
B : Data Code

TYPICAL APPLCATION CIRCUIT



PIN DESCRIPTION

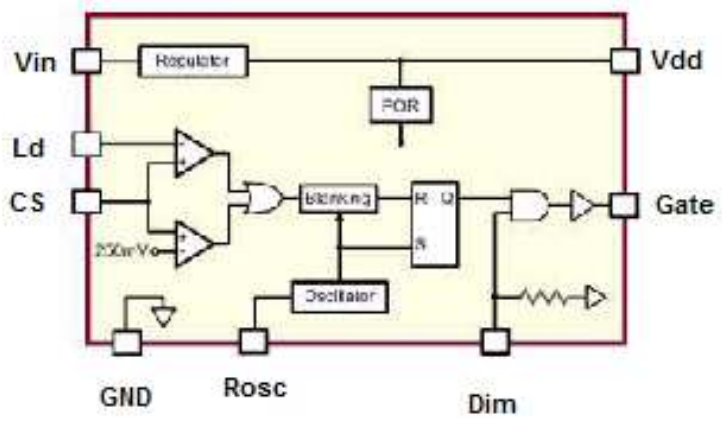
Pin	Symbol	Description
1	VIN	Supply Voltage Input
2	CS	Current sense. This pin senses the voltage across a resistor, to control PWM output. This pin also provides current amplitude information for current-mode control
3	GND	Ground
4	Gate	Gate driver output to drive the external MOSFET
5	Dim	Dimming Control
6	Vdd	Power supply pin for internal circuits
7	Ld	Linear dimming by changing the current limit threshold at current sense comparator
8	Rosc	This is used to charge an internal capacitor, to determine the switching frequency

ORDERING INFORMATION

Part Number	Package	Part Marking
SP6801S8RGB	SOP-8	SP6801

※ SP6801S8RGB : Tape Reel ; Pb – Free ; Halogen -Free

BLOCK DIAGRAM



ABSOULTE MAXIMUM RATINGS

(T_A=25℃ Unless otherwise specified)

Parameter	Symbol	Value	Unit
DC Supply Voltage	V_{IN}	600	V
Vdd to Ground	Vdd	12	V
CS, Gate, Dim, Ld		Vdd+0.3V	V
Operating Temperature	T_{OPR}	-40～85	℃
Maximum Junction Temperature	$T_{J(Max)}$	-40~125	℃
Storage Temperature	T_S	-65～150	℃
Thermal Resistance Junction – Case (*)	$R_{\Theta JC}$	150	℃/W
Power Dissipation	P_D	630	mW

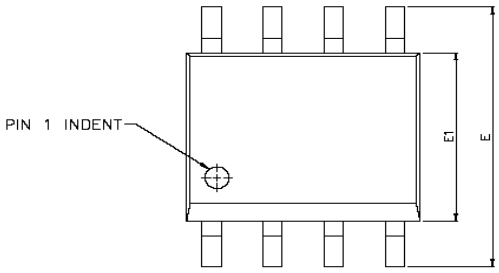
The IC has a protection circuit against static electricity. Do not apply high static electricity or high voltage that exceeds the performance of the protection circuit to the IC.

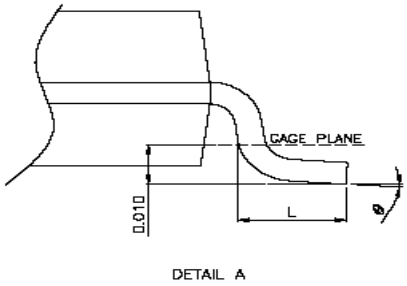
ELECTRICAL CHARACTERISTICS

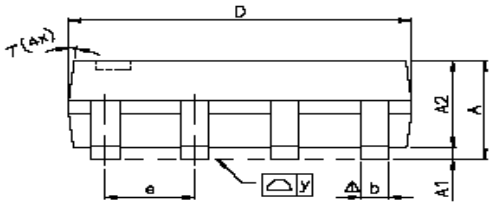
(T_A=25℃, V_{IN}=12V, Unless otherwise specified)

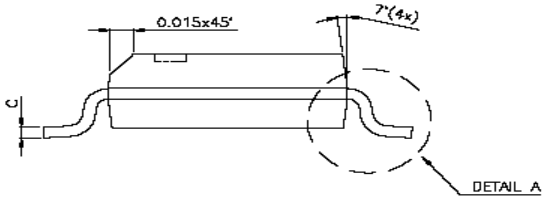
Symbol	Parameter	Conditions	Min.	Typ.	Max.	Unit
Supply Voltage (V_{IN} Pin)						
I_{SD}	Shut Down Mode Supply Current	DIM to Ground,		0.5	1	mA
Vin	DC Input Supply Voltage		10		600	V
UVLO (on)	Start Threshold Voltage	V_{DD} Rising	6.45	6.7	6.95	V
△UVLO	Under Voltage Lockout Hysteresis	V_{DD} Falling		500		mV
Internal Regulator (V_{DD} Pin)						
V_{DD}	Internal Regulated Voltage	Vin=10V~600V, I_{DD}=0, Gate Open	7.0	7.5	8.0	V
△V_{DD}	Load Regulation	I_{DD}=0~1mA, V_{DIM}=V_{DD}, Rosc=226KΩ, Gate=500pF			100	mV
V_{DD}	Maximum V_{DD} Voltage	Apply External Voltage			10	V
$I_{DD(ext)}$	Current Available for External Circuit	Vin=15~100V			0.7	mA
Oscillator (Rosc Pin)						
F_{OSC}	Frequency	Rosc=1 MΩ	20	25	30	KHz
		Rosc=226 KΩ	80	100	120	KHz
Current Sensing (CS Pin)						
$V_{cs(TH)}$	Current Sense Pull-in Threshold Voltage	T_A=-40℃~85℃	225	250	275	mV
T_{BLANK}	Current Sense Blanking Interval	V_{CS}=0.55V_{LD}, V_{LD},=V_{DD}	150	215	280	nS
T_{DELAY}	Delay to Output	V_{LD}=0.15V, Vcs=0~0.22V after T_{BLANK}, Vin=12V			300	nS
Gate Driver Output (GATE Pin)						
V_{OL}	Output Low Level	Io=-10mA	0		0.3	V
V_{OH}	Output High Level	Io=10mA	V_{DD}-0.3		V_{DD}	V
Tr	Rising Time	Load Cap=500pF, V_{DD}=7.5V	30		50	nS
Tf	Falling Time	Load Cap=500pF, V_{DD}=7.5V	30		50	nS
PWM Dimming (DIM Pin)						
$V_{EN(LO)}$	PWM Dimming Input Low Voltage	Vin=10V~600V			0.8	V
$V_{EN(HI)}$	PWM Dimming Input High Voltage	Vin=10V~600V	2			V
R_{EN}	PWM Dimming Pull Down Resistance	V_{EN}=5V	50	100	150	KΩ
Linear Dimming (Ld Pin)						
V_{LD}	Linear Dimming Voltage	Vin=12V, T_A<85℃			250	mV

SOP-8 PACKAGE OUTLINE









SYMBOLS	DIMENSIONS IN MILLIMETERS			DIMENSIONS IN INCHES		
	MIN	NOM	MAX	MIN	NOM	MAX
A	1.47	1.60	1.73	0.058	0.063	0.068
A1	0.10	——	0.25	0.004	——	0.010
A2	——	1.45	——	——	0.057	——
b	0.33	0.41	0.51	0.013	0.016	0.020
C	0.19	0.20	0.25	0.0075	0.008	0.0098
D	4.80	4.85	4.95	0.189	0.191	0.195
E	5.80	6.00	6.20	0.228	0.236	0.244
E1	3.80	3.90	4.00	0.150	0.154	0.157
e	——	1.27	——	——	0.050	——
L	0.38	0.71	1.27	0.015	0.028	0.050
2 y	——	——	0.076	——	——	0.003
θ	0°	——	8°	0°	——	8°

SYNC Power Corporation
7F-2, No.3-1, Park Street
NanKang District (NKSP), Taipei, Taiwan 115
Phone: 886-2-2655-8178
Fax: 886-2-2655-8468
http://www.syncpower.com