180KHz 60V 4A Switching Current Boost LED Constant Current Driver JTM6285

Features

- Wide 3.6V to 32V Input Voltage Range
- 0.22V FB adjustable LED drive current
- Directly drive 11 Series 1W LED at VIN>=12V
- Fixed 180KHz Switching Frequency
- Max. 4A Switching Current Capability
- Up to 94% efficiency
- Excellent line and load regulation
- EN PIN TTL shutdown capability & With PWM Dimming Function
- Internal Optimize Power MOSFET
- Built in Soft-Start Function
- Built in Frequency Compensation
- Built in Thermal Shutdown Function
- Built in Current Limit Function
- Available in TO252-5L package

General Description

The JTM6285 regulator is fixed frequency PWM Boost (step-up) LED constant current driver, capable of driving Series 1W/3W/5W LED units with excellent line and load regulation. The regulator is simple to use because it includes internal frequency compensation and a fixed-frequency oscillator so that it requires a minimum number of external components to work.

The JTM6285 could directly drive 11 Series 1W LED units at VIN>12V .

The PWM control circuit is able to adjust the duty ratio linearly from 0 to 95%. An enable function, an over current protection function is built inside. An internal compensation block is built in to minimize external component count.

Applications

- LED Lighting
- Boost constant current driver
- Monitor LED Backlighting
- 7’ to 15’ LCD Panels

Figure1. Package Type of JTM6285

Pin Configurations

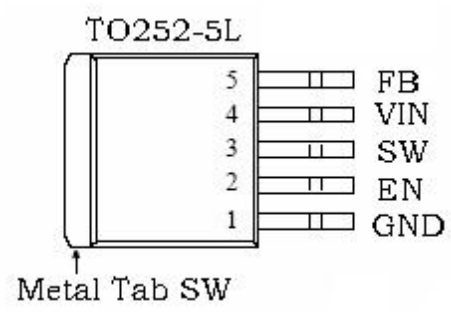


Figure2. Pin Configuration of JTM6285 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	GND	Ground Pin.
2	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on. Floating is default high.
3	SW	Power Switch Output Pin (SW).
4	VIN	Supply Voltage Input Pin. HM6285 operates from a 3.6V to 32V DC voltage. Bypass Vin to GND with a suitably large capacitor to eliminate noise on the input.
5	FB	Feedback Pin (FB). The feedback threshold voltage is 0.22V.

Function Block

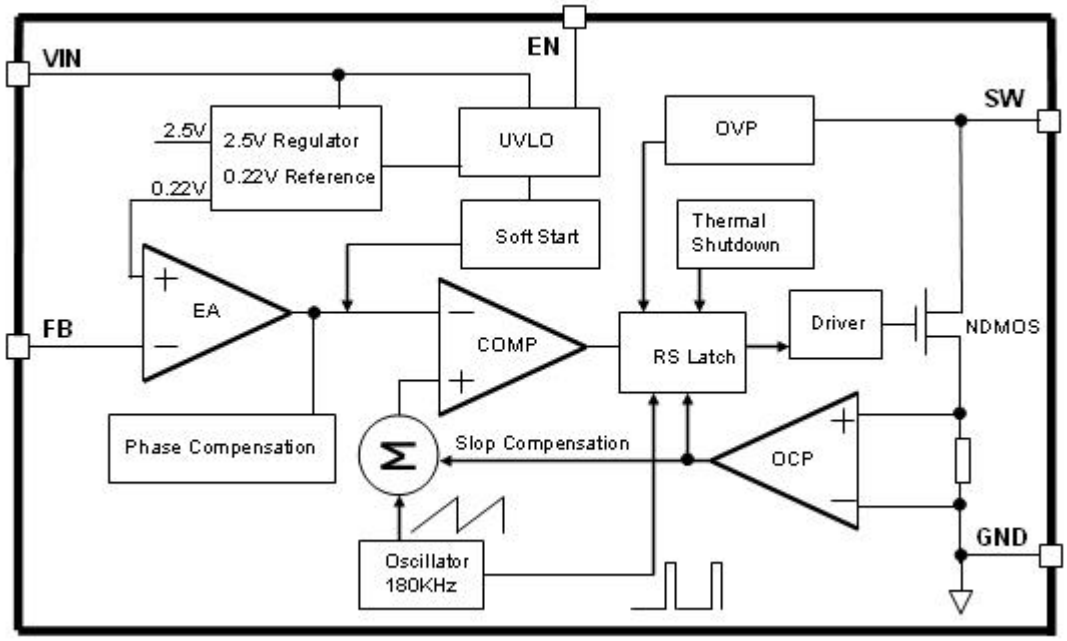


Figure3. Function Block Diagram of JTM6285

Typical Application Circuit

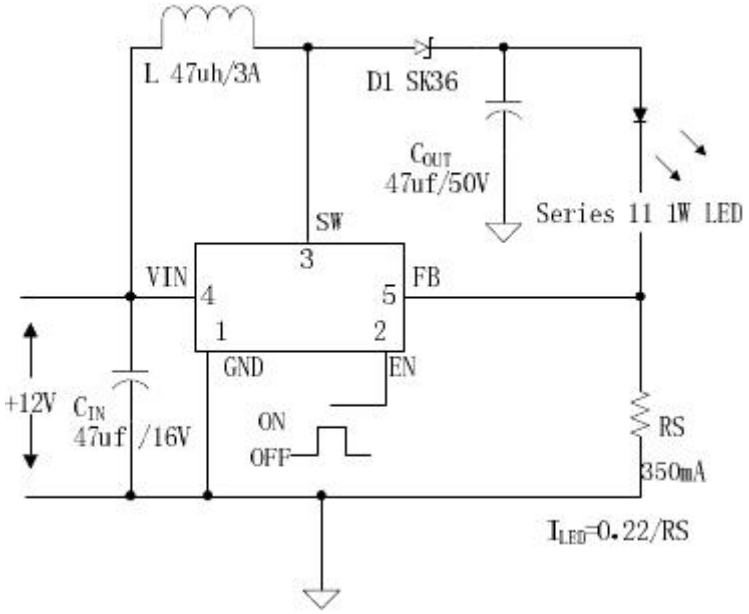


Figure4. JTM6285 Typical Application Circuit

Ordering Information

Package	Temperature Range	Part Number	Marking ID	Packing Type
		Lead Free	Lead Free	
		JTM6285	JTM6285	Tube
		JTM6285TR	JTM6285	Tape & Reel

Absolute Maximum Ratings（Note1）

Parameter	Symbol	Value	Unit
Input Voltage	Vin	-0.3 to 36	V
Feedback Pin Voltage	V_{FB}	-0.3 to Vin	V
EN Pin Voltage	V_{EN}	-0.3 to Vin	V
Output Switch Pin Voltage	V_{Output}	-0.3 to 60	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (TO252-5L) (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	50	℃/W
Operating Junction Temperature	T_J	-40 to 125	℃
Storage Temperature	T_{STG}	-65 to 150	℃
Lead Temperature (Soldering, 10 sec)	T_{LEAD}	260	℃
ESD (HBM)		>2000	V

Note1: Stresses greater than those listed under Maximum Ratings may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operation is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

JTM6285 Electrical Characteristics

T_a = 25℃;unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
System parameters test circuit figure4						
VFB	Feedback Voltage	Vin = 5V to 12V, Vout=24V Iload=100mA	209	220	231	mV
Efficiency	ŋ	Vin=12V ,Vout=24V Iout=1A	-	92	-	%

Electrical Characteristics (DC Parameters)

Vin = 12V, GND=0V, Vin & GND parallel connect a 100uf/50V capacitor; Iout=100mA, T_a = 25℃; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	Vin		3.6		32	V
Shutdown Supply Current	I_{STBY}	V_{EN}=0V		70	100	uA
Quiescent Supply Current	I_q	V_{EN} =2V, V_{FB} =Vin		2.5	5	mA
Oscillator Frequency	Fosc		144	180	216	Khz
Switch Current Limit	I_L	V_{FB} =0		4		A
Output Power NMOS	Rdson	Vin=12V, I_{SW}=4A		110	120	mohm
EN Pin Threshold	V_{EN}	High (Regulator ON) Low (Regulator OFF)		1.4 0.8		V
EN Pin Input Leakage Current	I_H	V_{EN} =2V (ON)		3	10	uA
	I_L	V_{EN} =0V (OFF)		3	10	uA
Max. Duty Cycle	D_{MAX}	V_{FB}=0V		90		%

Schottky Diode Selection Table

Current	Surface Mount	Through Hole	VR (The same as system maximum input voltage)				
			20V	30V	40V	50V	60V
1A		√	1N5817	1N5818	1N5819		
3A		√	1N5820	1N5821	1N5822		
		√	MBR320	MBR330	MBR340	MBR350	MBR360
	√		SK32	SK33	SK34	SK35	SK36
	√			30WQ03	30WQ04	30WQ05	
		√		31DQ03	31DQ04	31DQ05	
		√	SR302	SR303	SR304	SR305	SR306
5A		√	1N5823	1N5824	1N5825		
		√	SR502	SR503	SR504	SR505	SR506
		√	SB520	SB530	SB540	SB550	SB560
	√			50WQ03	50WQ04	50WQ05	

Typical System Application for VIN=12V to driver 11 x 1W series LED units

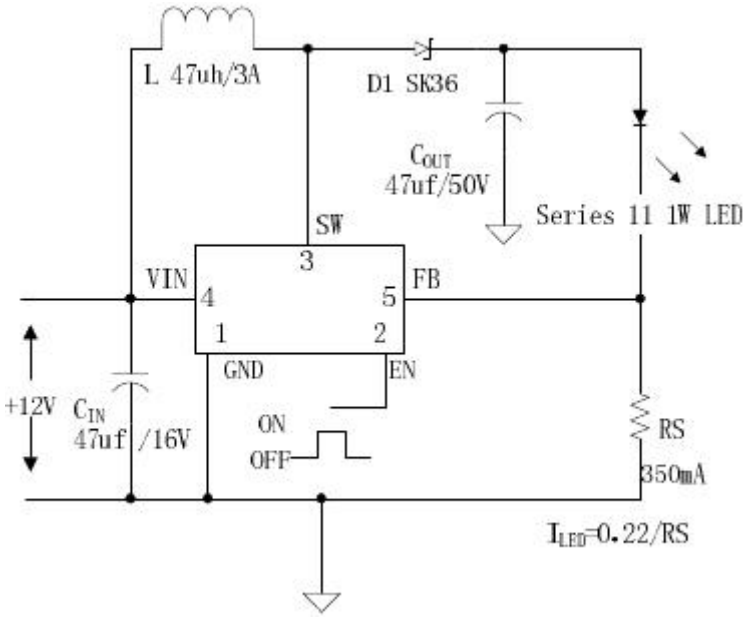


Figure5. JTM6285 System Parameters Test Circuit (12V ~11 x 1W LED)

Typical System Application for VIN>=12V to driver 6 x 3W series LED units

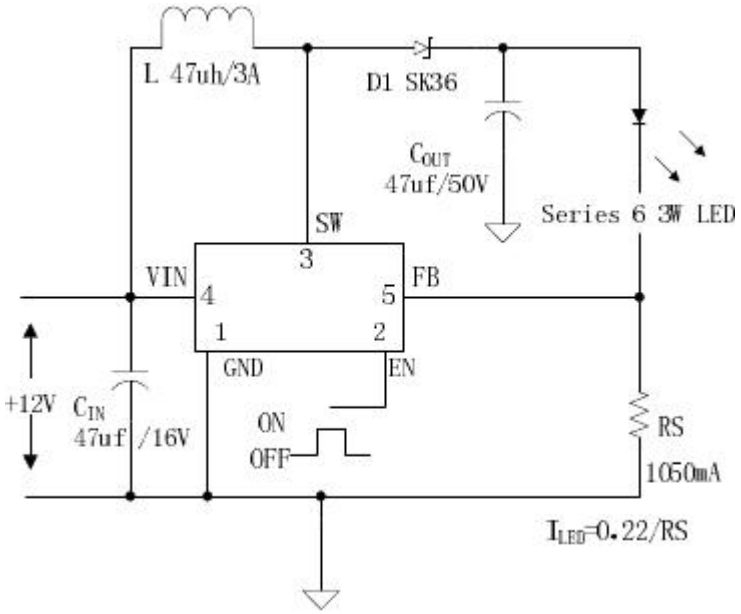


Figure6. JTM6285 System Parameters Test Circuit (12V ~ 6 x 3W LED)

Typical System Application for VIN>=24V to driver 11 x 3W series LED units

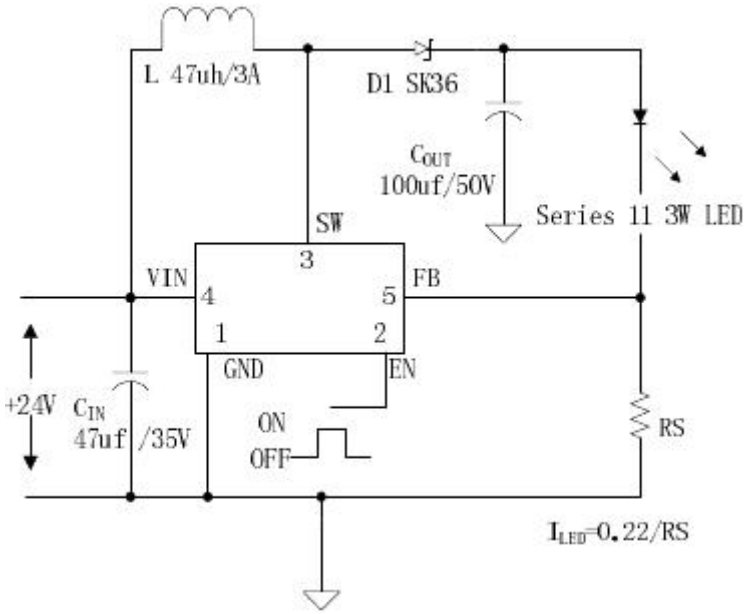


Figure7. JTM6285 System Parameters Test Circuit (24V ~ 11 x 3W LED)

Typical System Application for VIN>=12V to driver 11 series x 40 parallel White LED Array

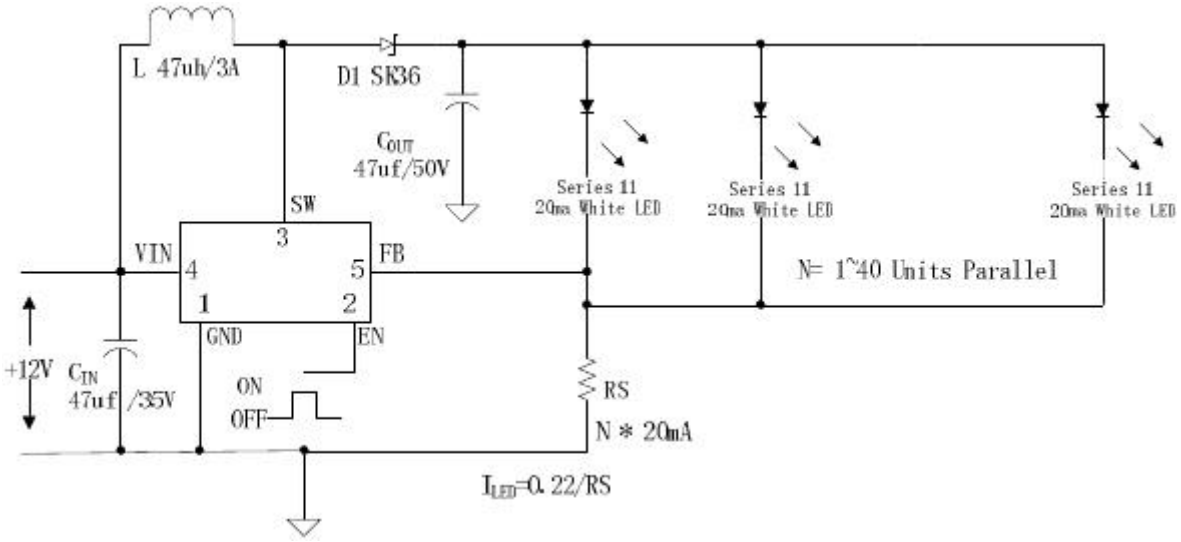


Figure8. JTM6285 System Parameters Test Circuit (12V ~ 11 x 40 White LED)

Typical System Application for SEPIC Buck-Boost LED Driver

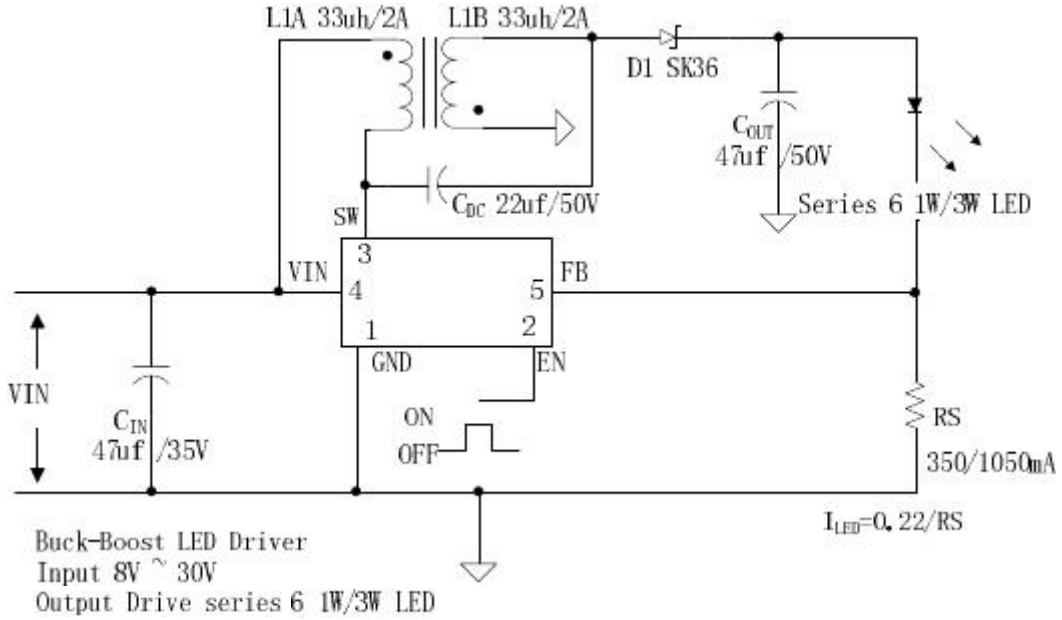


Figure9. JTM6285 System Parameters Test Circuit (Buck-Boost LED Driver)

Typical System Application for VIN>=12V to driver 6 x 3W series LED units With Dimming Function

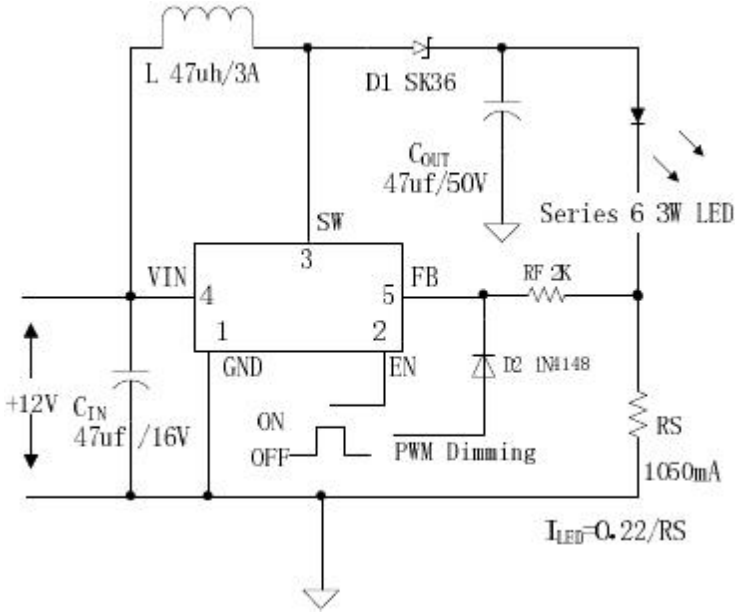
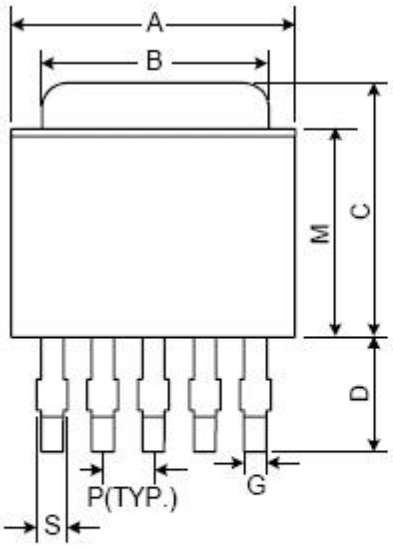
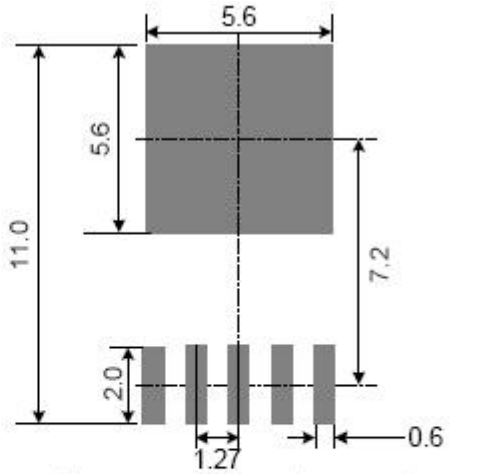


Figure10. JTM6285 System Parameters Test Circuit (12V ~ 6 x 3W LED with Dimming Function)

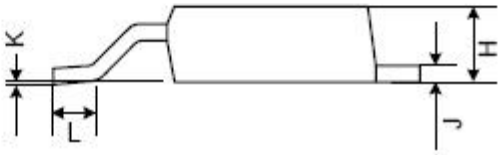
Package Information

TO252-5L





Land Pattern Recommendation (Unit: mm)



Symbol	Dimensions In Millimeters			Dimensions In Inches		
	Min.	Nom.	Max.	Min.	Nom.	Max.
A	6.35	6.60	6.85	0.250	0.260	0.270
B	5.20	5.35	5.50	0.205	0.211	0.217
C	6.80	7.00	7.30	0.268	0.276	0.287
D	2.20	2.50	2.80	0.087	0.098	0.110
P		1.27 REF.			0.050 REF.	
S	0.50	0.65	0.80	0.020	0.026	0.031
G	0.40	0.50	0.63	0.016	0.020	0.025
H	2.20	2.30	2.40	0.087	0.091	0.094
J	0.45	0.52	0.58	0.018	0.020	0.023
K	0.00	0.08	0.15	0.000	0.003	0.006
L	0.90	1.20	1.63	0.035	0.047	0.064
M	5.40	5.80	6.20	0.213	0.228	0.244