

400KHz 60V 2A Switching Current Boost LED Constant Current Driver**JTMX6003****Features**

Wide 3.6V to 24V Input Voltage Range
0.22V FB adjustable LED drive current
Directly drive 6 Series 1W LED at $V_{IN} \geq 12V$
Fixed 400KHz Switching Frequency
Max. 2A Switching Current Capability
Up to 92% efficiency
Excellent line and load regulation
EN PIN TTL shutdown capability
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 SOP8L package

General Description

The JTMX6003 regulator is fixed frequency PWM Boost (step-up) LED constant current driver, capable of driving Series 1W 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 JTMX6003 could directly drive 6 Series 1W LED units at $V_{IN} > 12V$.

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 JTMX6003

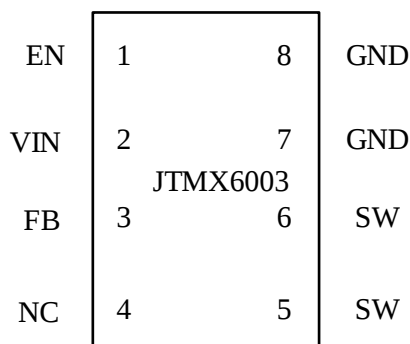
400KHz 60V 2A Switching Current Boost LED Constant Current Driver**JTMX6003****Pin Configurations**

Figure2. Pin Configuration of JTMX6003 (Top View)

Table 1 Pin Description

Pin Number	Pin Name	Description
1	EN	Enable Pin. Drive EN pin low to turn off the device, drive it high to turn it on. Floating is default high.
2	VIN	Supply Voltage Input Pin. JTMX6003 operates from a 3.6V to 24V DC voltage. Bypass Vin to GND with a suitably large capacitor
3	FB	Feedback Pin (FB). The feedback threshold voltage is 0.22V.
4	NC	No Connected.
5,6	SW	Power Switch Output Pin (SW). Output is the switch node that supplies power to the output.
7,8	GND	Ground Pin.

Function Block

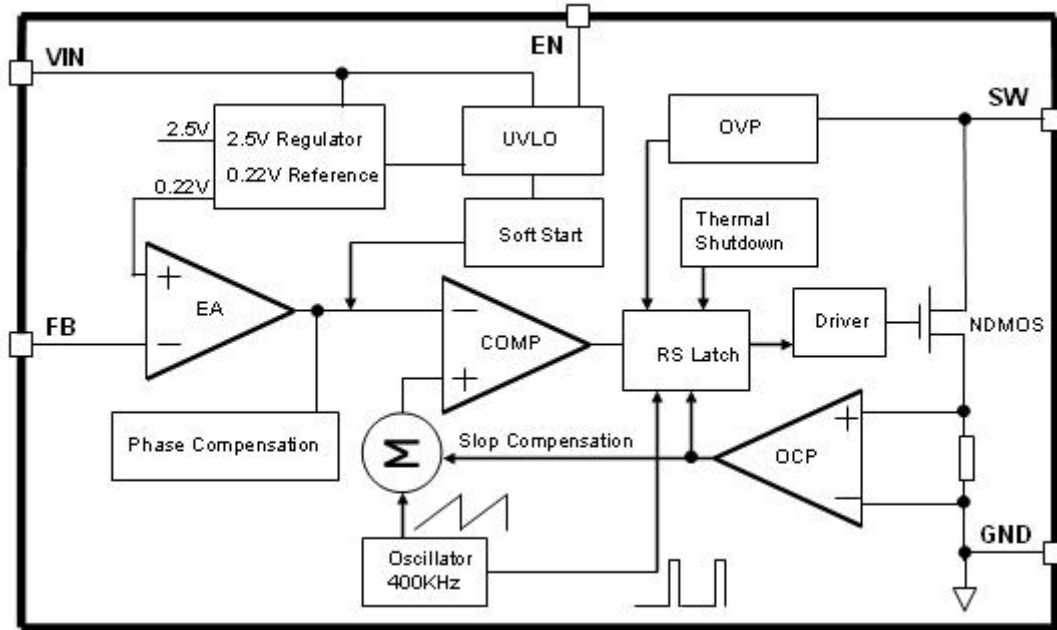


Figure3. Function Block Diagram of JTMX6003

Typical Application Circuit

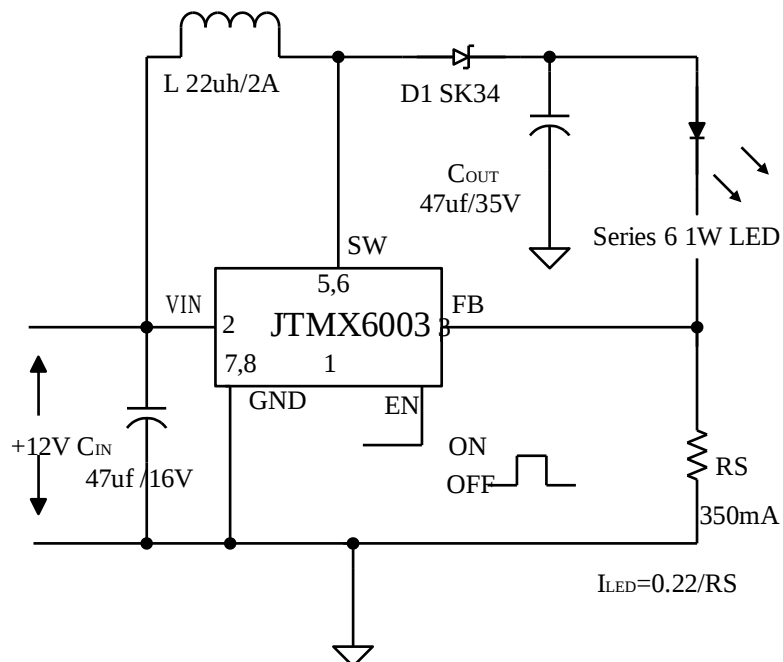


Figure4. JTMX6003 Typical Application Circuit

400KHz 60V 2A Switching Current Boost LED Constant Current Driver**JTMX6003****Ordering Information**

Order Information	Marking ID	Package Type	Packing Type Supplied As
JTMX6003E1	JTMX6003E1	SOP8L	2500 Units on Tape & Reel

JTMXSEMI Pb-free products, as designated with “E1” suffix in the par number, are RoHS compliant.

Absolute Maximum Ratings (Note1)

Parameter	Symbol	Value	Unit
Input Voltage	V_{in}	-0.3 to 26	V
Feedback Pin Voltage	V_{FB}	-0.3 to V_{in}	V
EN Pin Voltage	V_{EN}	-0.3 to V_{in}	V
Output Switch Pin Voltage	V_{Output}	-0.3 to 60	V
Power Dissipation	P_D	Internally limited	mW
Thermal Resistance (SOP8) (Junction to Ambient, No Heatsink, Free Air)	R_{JA}	100	℃/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.

400KHz 60V 2A Switching Current Boost LED Constant Current Driver**JTMX6003****JTMX6003 Electrical Characteristics**T_a = 25°C; unless otherwise specified.

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
<i>System parameters test circuit figure4</i>						
VFB	Feedback Voltage	V _{in} = 5V to 12V, V _{out} =24V I _{load} =100mA	209	220	231	mV
Efficiency	η	V _{in} =12V, V _{out} =24V I _{out} =0.3A	-	92	-	%

Electrical Characteristics (DC Parameters)V_{in} = 12V, GND=0V, V_{in} & GND parallel connect a 100uf/50V capacitor; I_{out}=100mA, T_a = 25°C; the others floating unless otherwise specified.

Parameters	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input operation voltage	V _{in}		3.6		24	V
Shutdown Supply Current	I _{STBY}	V _{EN} =0V		70	100	uA
Quiescent Supply Current	I _q	V _{EN} =2V, V _{FB} =V _{in}		2.5	5	mA
Oscillator Frequency	F _{osc}		320	400	480	Khz
Switch Current Limit	I _L	V _{FB} =0		2		A
Output Power NMOS	R _{dson}	V _{in} =12V, I _{sw} =2A		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		%

400KHz 60V 2A Switching Current Boost LED Constant Current Driver**JTMX6003****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

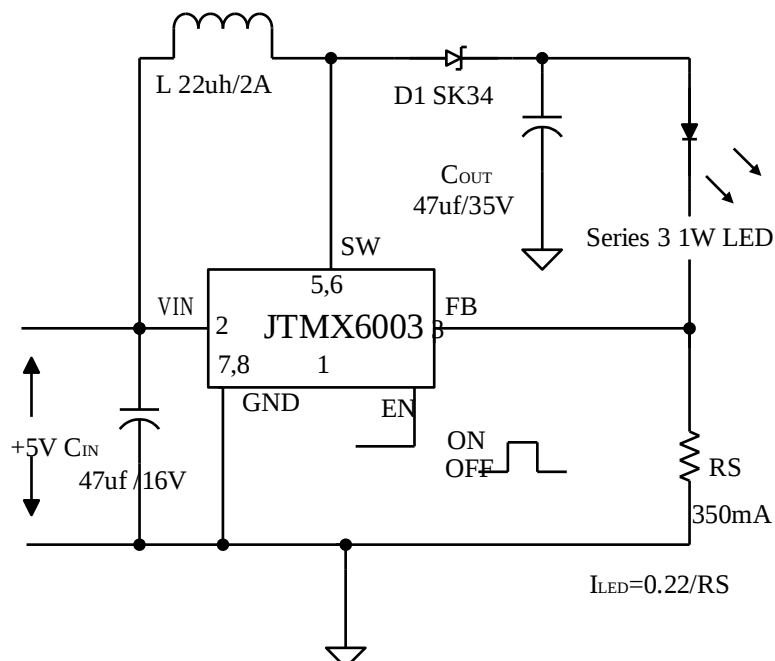
Typical System Application for VIN=5V to driver 3 x 1W series LED units

Figure5. JTMX6003 System Parameters Test Circuit (5V ~ 3 x 1W LED)

Typical System Application for $V_{IN} \geq 12V$ to driver 6 x 1W series LED units

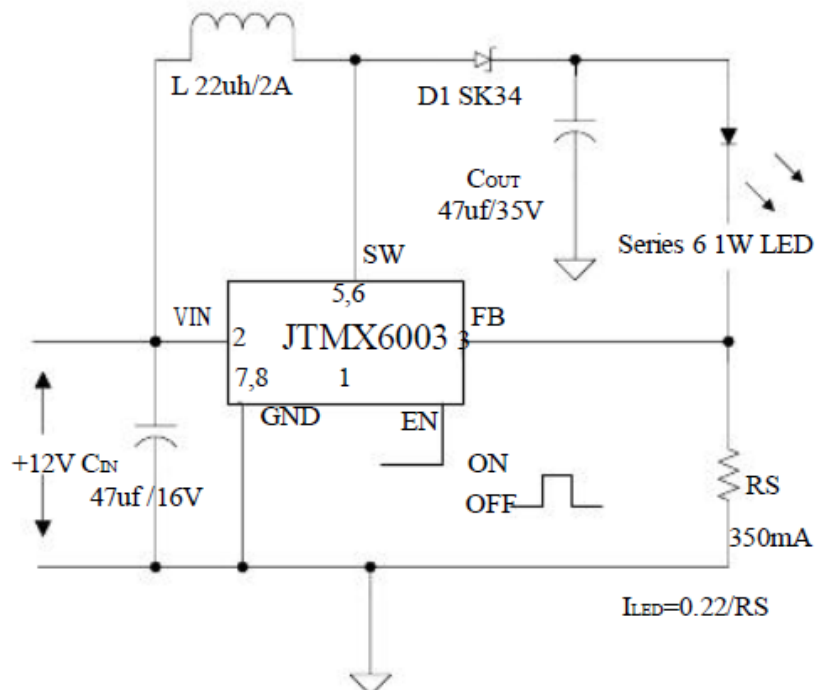


Figure6. JTMX6003 System Parameters Test Circuit (12V ~ 6 x 1W LED)

Typical System Application for $V_{IN} \geq 12V$ to driver 6 series x 28 parallel White LED Array

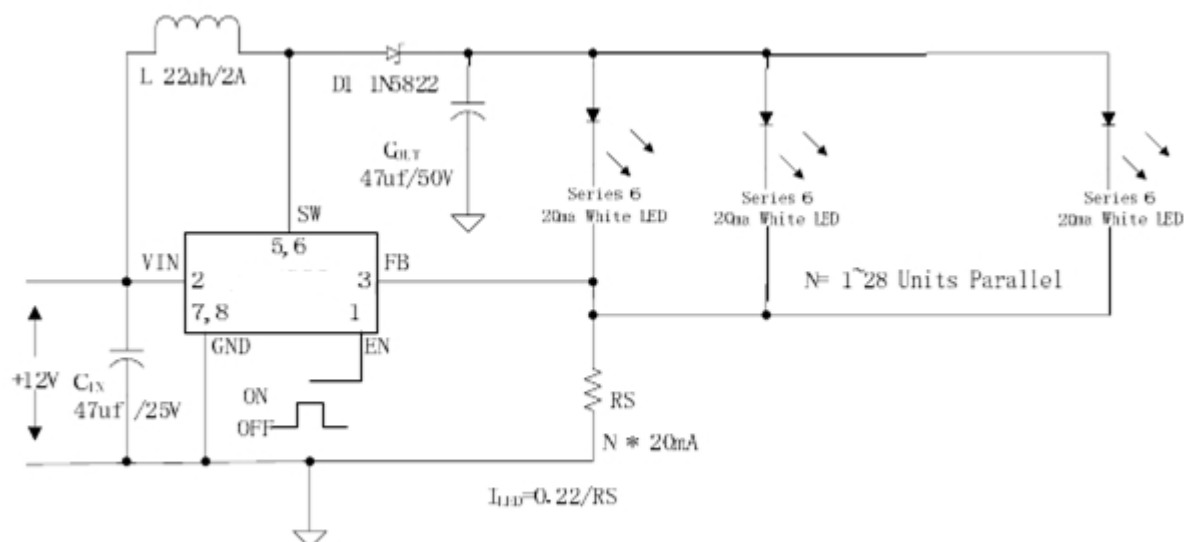


Figure7. JTMX6003 System Parameters Test Circuit (12V ~ 6 x 28 White LED)

Typical System Application for SEPIC Buck-Boost LED Driver

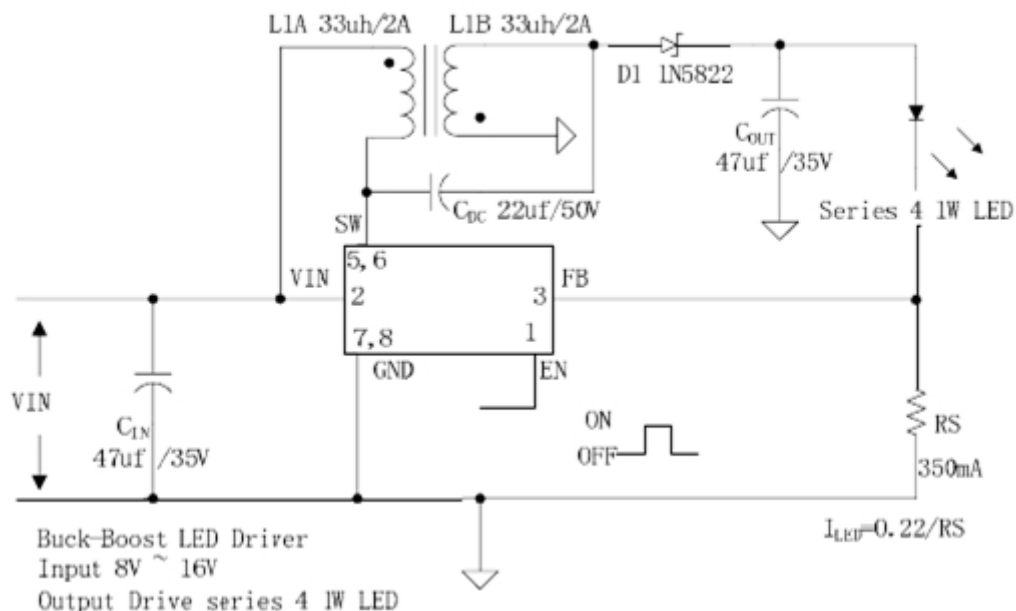


Figure8. JTMX6003 System Parameters Test Circuit (Buck-Boost LED Driver)

Typical System Application for $V_{IN} \geq 12V$ to driver 6 x 1W series LED units With Dimming Function

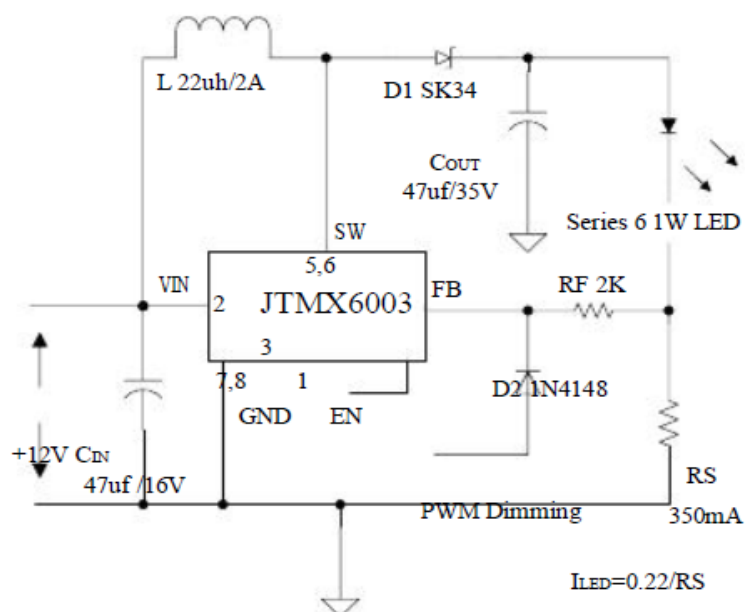


Figure9. JTMX6003 System Parameters Test Circuit (12V ~ 6 x 1W LED with Dimming Function)

SOP8 Package Mechanical Dimensions

