

# LM3485 Design Document

National Semiconductor  
LM3485  
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## 1.0 Design Specifications

Inputs	Outputs #1
VinMin=10	Vout1=8
VinMax=30	Iout1=1.0

## 2.0 Design Description

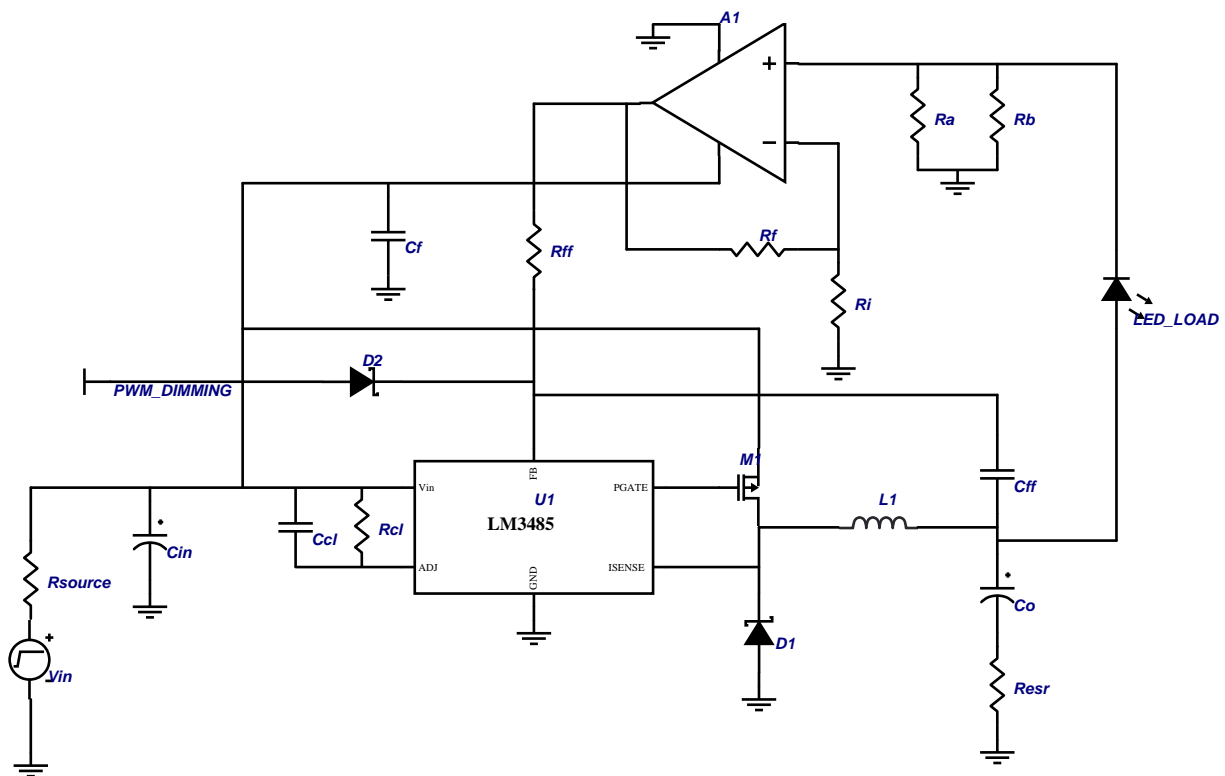
The LM3485 design is a buck regulator derived controlled current source designed to drive high power, high brightness LEDs (HBLEDs) at a constant current of 1.0A. The design can accept an input voltage ranging from 10V to 30V and can control the output current delivered to series and/or parallel arrays of HBLEDs as long as the forward voltage of all the LEDs in series is less than  $0.9 \times V_{in}$ . The accuracy of the output current is  $\pm 10\%$ .

Diode D2 provides an input for a pulse width modulation signal for dimming of the LED array. In order to fully enable and disable the LM3485 the PWM signal should have a maximum

logic low level of 1.0V, a minimum logic high level of 2.0V, and minimum low and high periods of 40 $\mu$ s. For example, at 100Hz, the minimum and maximum PWM duty cycles to which LM3485 can respond are 0.4% and 99.6%, respectively.

In the case that the input is powered but no LED array is connected to the output (output open circuit) the output voltage will rise to equal the input voltage. The output of the circuit is rated to 30V and will not suffer damage, however care should be taken not to connect an LED array if the output voltage is higher than the target forward voltage of the LED array in steady state.

## 3.0 Schematic



689758\_1455\_0

FIGURE 1. Example Schematic Showing Connection for all Components.

## 4.0 Bill Of Materials

Part	Manufacturer	Part#	Attributes
A1	National Semiconductor	LM321	
Ccl	VISHAY	VJ0805A101KXXAT	100p F
Cf	TDK	C2012X7R1H104M	100n F
Cff	VISHAY	VJ0805Y102KXXAT	1n F
Cin	TDK	C3216X7R1H105M	NumCaps=1, 1u F
Co	TDK	C3216X7R1H105M	1u F
D1	VISHAY	SS24	0.5 V
D2	VISHAY	MBR0520	0.5 V
L1	TDK	SLF7045T-6R8M1R7	6.8u H
M1	VISHAY	Si3483DV	
Ra	VISHAY	CRCW08051R00F	1 Ohms
Rb	VISHAY	CRCW08051R00F	1 Ohms
Rcl	VISHAY	CRCW08052552F	25.5k Ohms
Resr	VISHAY	CRCW08051R00F	1 Ohms
Rf	VISHAY	CRCW08051492F	14.9k Ohms
Rff	VISHAY	CRCW08051002F	10.0k Ohms
Ri	VISHAY	CRCW08051002F	10k Ohms
U1	National Semiconductor	LM3485	

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