DEMO CIRCUIT 1285
QUICK START GUIDE

LT3598
6-String 30mA LED Driver with 1.5% Current Matching

DESCRIPTION

WARNING!

Do not look directly at operating LED.

This circuit produces light that can damage eyes.

Demonstration circuit 1285 is a 6-String 30mA LED Driver with 1.5% Current Matching featuring the LT3598. The LT3598 is a step-up DC/DC converter designed to drive up to 6-strings of LEDs at an output voltage up to 44V. The LED strings are connected to internal current sources where the current level is set with an external resist.

The demonstration circuit drives 20mA through each LED string. Each string can have up to 10 white LEDs. The circuit operation frequency is set to 1MHz. Parameters such as the LED current; the switching frequency, etc can be modified easily based on the demo circuit. When a string is not used, tie its LED pin to V_{OUT}. Any unused string is no longer in the regulation loop. Direct paralleling multiple strings together to achieve higher per string current is allowed. To paralleling strings, tie the respective LED*n* pins together. OPENLED indicator flags should any string be left open. To improve efficiency, it is recommended that V_{IN} is between 3.2V and 5.5V. The V_{IN} bias capacitor of the demo circuit is rated at 6.3V. PWM dimming ratio can be as high as 3000:1.

The LT3598 datasheet gives complete descriptions of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for working on or modifying the demo circuit 1285.

Design files for this circuit board are available. Call the LTC factory.

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PERFORMANCE SUMMARY **Specifications are at TA = 25°C**

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}	Input Supply Range		3.2		5.5*	V
PV_{IN}	Power Input Supply Range**		3		40	V
I_Q	Quiescent Current	PWM=0V, Not switching		3.5	5	mA
F_{SW}	Switching Frequency		0.9	1	1.1	MHz
I_{LED}	LED String Current		19.5	20	20.7	mA
I_M	LED String Current Matching***			0.5	1.5	%
Eff	Efficiency	V_{IN} = 3.3V; PV_{IN} = 12V; I_{LED} = 20mA		90		%
D_{PWM}	PWM dimming ratio	PVIN = 12V		3000:1		

*: Limited by the voltage rating of the bias capacitor, C2, on the demo circuit. The IC rating is 30V.
**: MIN PV_{IN} depends on LED string voltages and the Maximum Switch Duty Cycle (specified on page 3 of the datasheet). PV_{IN} greater than MAX LED string voltage is permitted but power dissipation needs to be taken into considerations.
***: Specifications apply over the full operating temperature range.

QUICK START PROCEDURE

Demonstration circuit 1285 is easy to set up to evaluate the performance of the LT3598. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to VIN and GND.

2. Connect the power input power supply to PVIN and GND.

3. Tie PWM to VIN or a PWM signal.

4. Connect LED strings to LED*n*+ and LED*n*-. If any string is not used, tie LED*n*- to LED*n*+, where *n* is the string number (between 1 and 6).

5. Turn on power supplies for VIN and PVIN.

NOTE. Make sure that VIN does not exceed 5.5V and PVIN does not exceed 40V.

6. Check for the proper LED voltage and current.

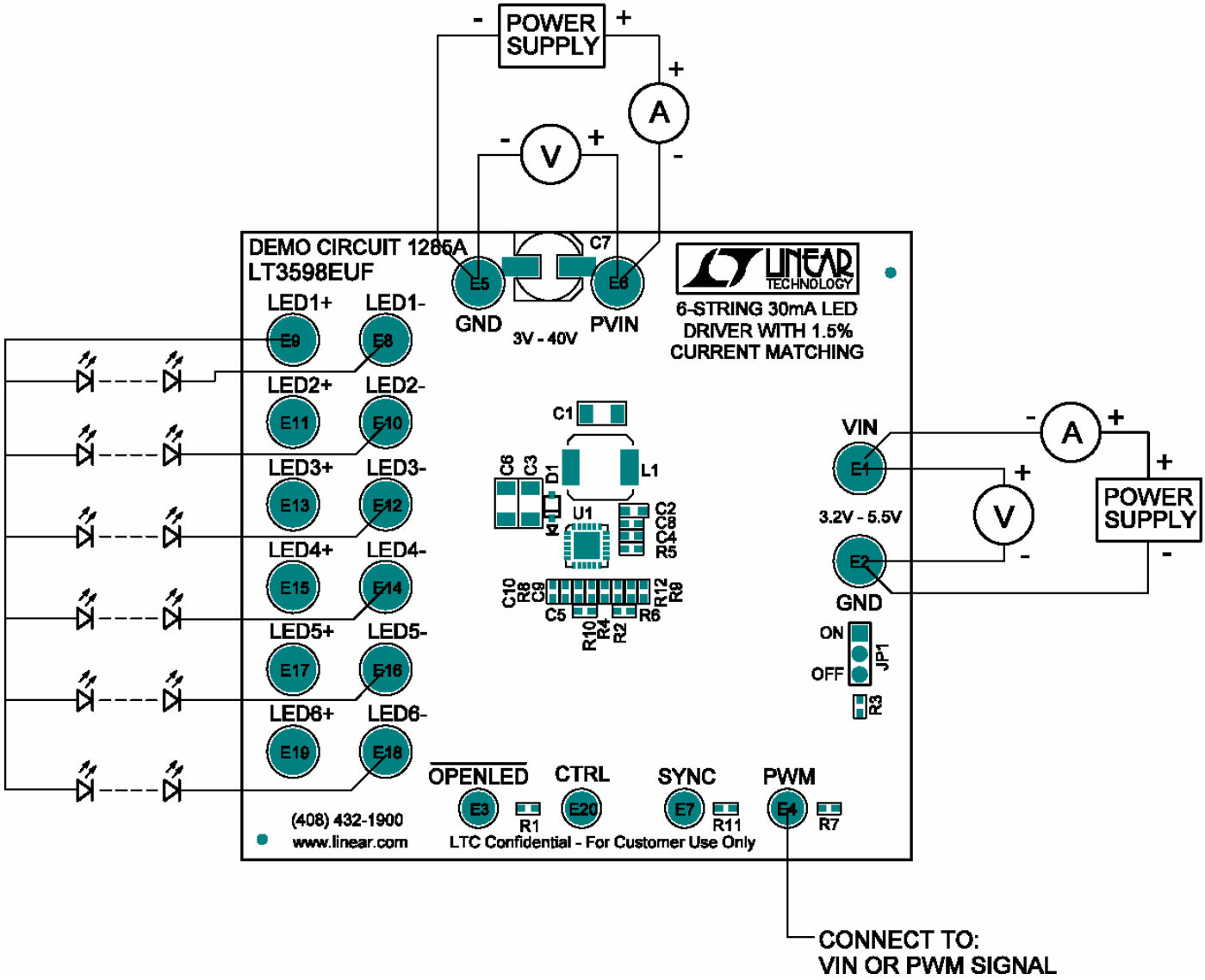
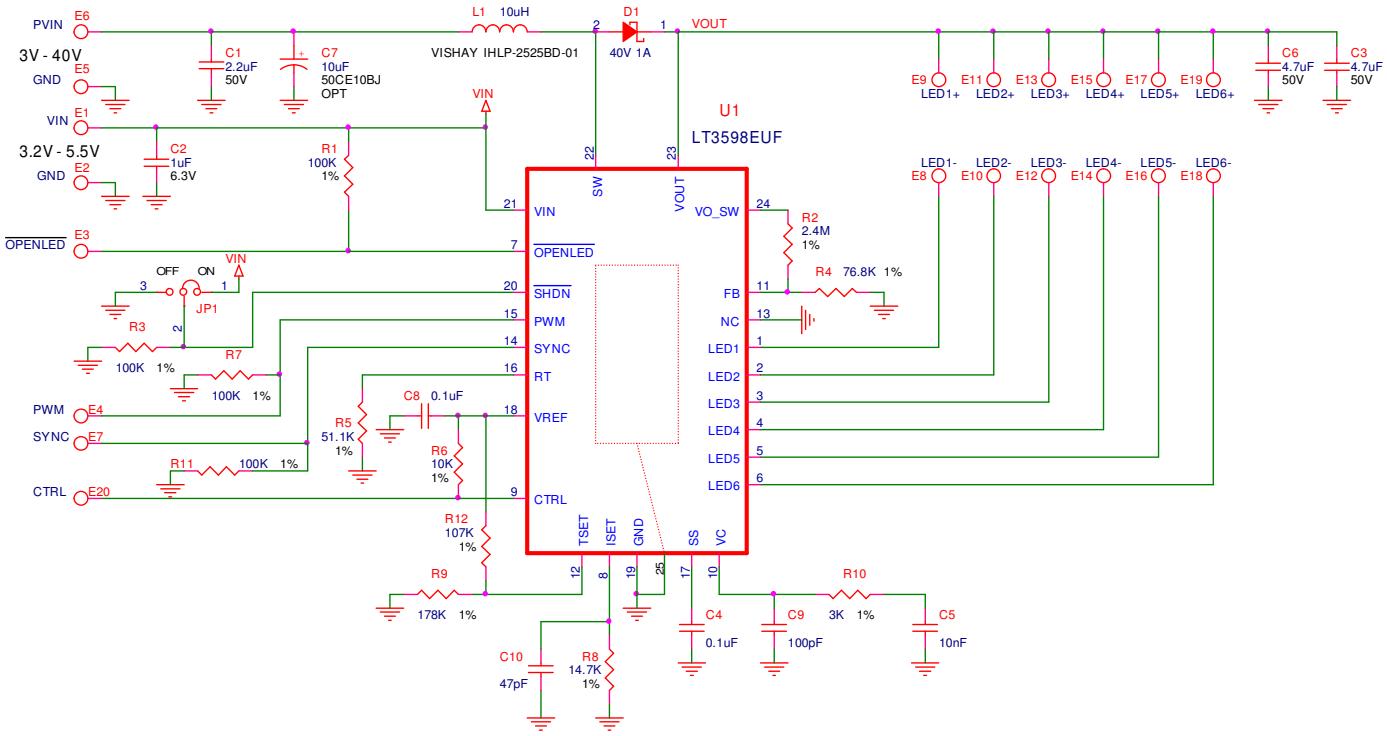


Figure 1. Proper Measurement Equipment Setup


PVIN
E6
3V - 40V
GND
E5
VIN
E1
3.2V - 5.5V
GND
E2
OPENLED
E3
PWM
E4
SYNC
E7
CTRL
E20
C1
2.2uF
50V
C7
10uF
50CE10BJ
OPT
L1 10uH
VISHAY IHLP-2525BD-01
D1
40V 1A
VOUT
C2
1uF
6.3V
R1
100K
1%
VIN
U1
LT3598EUF
SW
VOUT
VIN
OPENLED
SHDN
PWM
SYNC
RT
VREF
CTRL
VO_SW
FB
NC
LED1
LED2
LED3
LED4
LED5
LED6
TSET
ISET
GND
SS
VC
R2
2.4M
1%
R4 76.8K 1%
OFF ON
JP1
R3
100K 1%
R7
100K 1%
C8 0.1uF
R5
51.1K
1%
R6
10K
1%
R11 100K 1%
R12
107K
1%
R9
178K 1%
C10
47pF
R8
14.7K
1%
C4
0.1uF
C9
100pF
R10
3K 1%
C5
10nF
E9 LED1+
E11 LED2+
E13 LED3+
E15 LED4+
E17 LED5+
E19 LED6+
C6
4.7uF
50V
C3
4.7uF
50V
LED1- E8
LED2- E10
LED3- E12
LED4- E14
LED5- E16
LED6- E18