Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

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DESCRIPTION

Demonstration circuit 1542 is a 60V Step-Down 3-Channel LED Driver featuring the LT3596. The demo board is optimized for 8 LEDs, 100mA output per channel from a 48V input. When different number of LEDs is used for evaluation, it is recommended to change the resistor divider (R1 and R4) values according to the datasheet. The connections between the board and LEDs strings should be as short as feasible.

The circuit achieves 10,000:1 PWM dimming at 100Hz PWM frequency. LED dimming can also be done by analog control of the CTRL1-3 pin. If dimming is not required, leave the PWM1-3 and CTRL1-3 terminals unconnected. The demo circuit pulls PWM1-3 and CTRL1-3

pins up to VREF. The switching frequency is set to 1MHz on the demo circuit for best solution size. The LT3596 internal compensation makes it a lot easier for a designer to design different application circuits.

The LT3596 datasheet gives a complete description of the part, operation and application information. The datasheet must be read in conjunction with this quick start guide for demo circuit 1542A.

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

PERFORMANCE SUMMARY Specifications are at TA = 25°C

SYMBOL	PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
V_{IN}*	Input Supply		6		55	V
V_{OUT}	Output Voltage	8 White LEDs		29	32	V
$V_{OUT(MAX)}$	Maximum Output Voltage			38		V
I_{OUT}	Output Current		98	100	102	mA
DIM	PWM Dimming Ratio	PWM Dimming Frquency = 100Hz		10,000:1		V
F_{SW}	Switching Frequency	R3=100k	0.9	1	1.1	MHz
EFE	Efficiency	V_{IN}=48V, V_{OUT}=29V, I_{OUT}=100mA, BIAS=5V, No Dimming		90		%

*: Actual V_{IN} range should be determined by the load. For 8 white LEDs per channel, use a 48V input for evaluation.
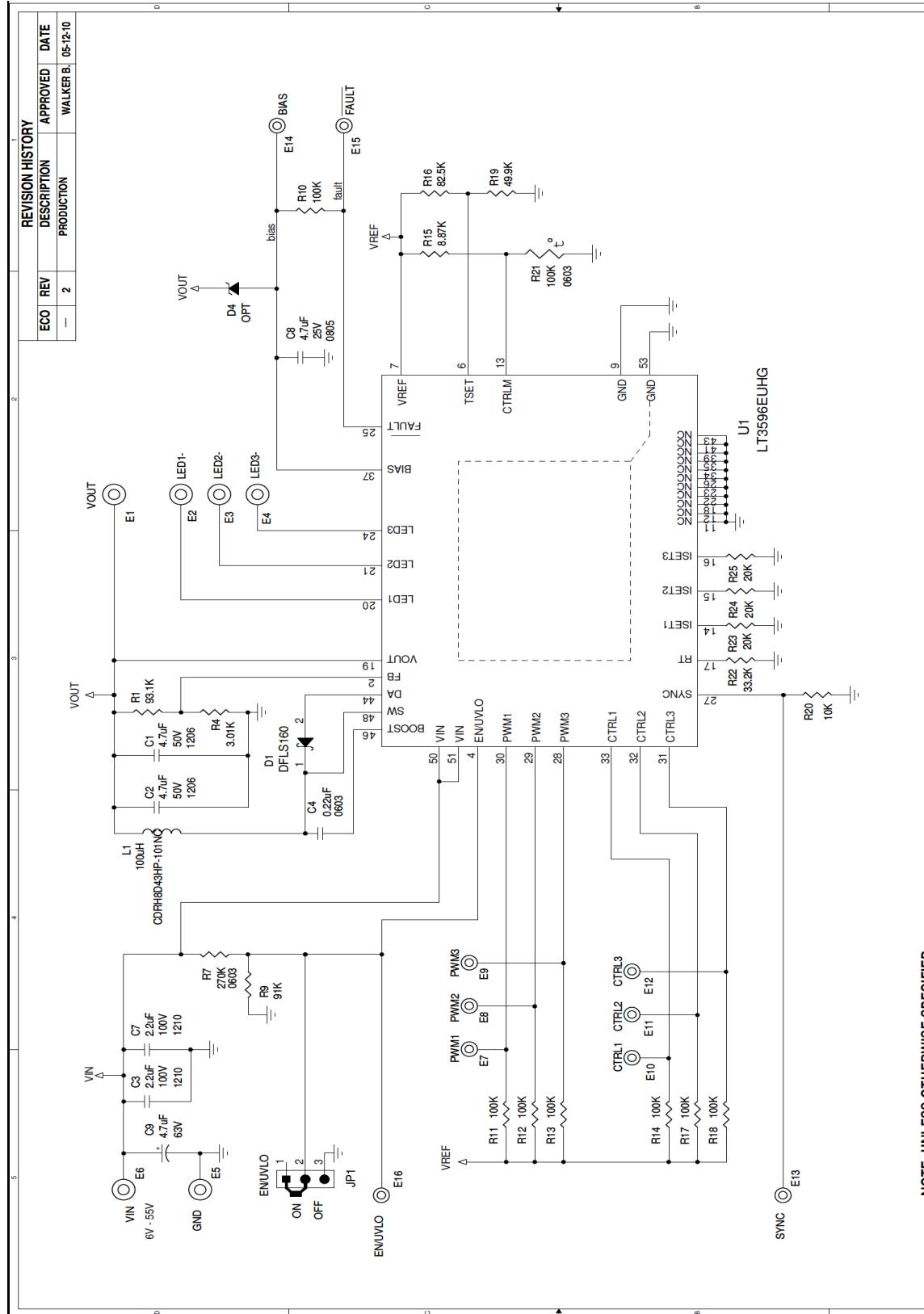
QUICK START PROCEDURE

Demonstration circuit 1542A is easy to set up to evaluate the performance of the LT3596. Refer to Figure 1 for proper measurement equipment setup and follow the procedure below:

1. With power off, connect the input power supply to V_{IN} and GND.

2. With power off, connect a 5V bias supply to BIAS and GND. Bias voltage should be less then 25V.

3. With power off, connect 3 LED strings between VOUT and LED1-, LED2-, LED3- respectively.

4. Turn on the power at the input. Be careful not to look at the LEDs directly.

5. Carefully evaluate all design parameters as needed.

6. To evaluate PWM dimming, apply a PWM signal to PWM1, PWM2 and/or PWM3. To evaluate 10,000:1 PWM dimming, the PWM signal should have a frequency of 100Hz and the minimum pulse width can be as low as 1us.

7. To modify the demo board for other applications, please contact Linear Applications Group for help.

Figure 1. Proper Measurement Equipment Setup

REVISION HISTORY

ECO	REV	DESCRIPTION	APPROVED	DATE
—	2	PRODUCTION	WALKER B.	05-12-10

NOTE: UNLESS OTHERWISE SPECIFIED
1. ALL RESISTORS ARE 0402

BIAS E14
FAULT E15

R10 100K fault
bias

VOUT
D4 OPT
C8 4.7µF 25V 0805

VREF
R15 8.87K
R16 82.5K
R19 49.9K
R21 100K 0603

VREF 7
TSET 6
CTRLM 13
GND 9
GND 53

U1
LT3596EUHG

FAULT 25
BIAS 37
LED3 24
LED2 21
LED1 20
VOUT 19
DA 2
SW 44
FB 48
BOOST 46
VIN 50
VIN 51
ENUVLO 4
PWM1 30
PWM2 29
PWM3 28
CTRL1 33
CTRL2 32
CTRL3 31
SYNC 27
ISET3 16
ISET2 15
ISET1 14
RT 17

R25 20K
R24 20K
R23 20K
R22 33.2K
R20 10K

VOUT E1
LED1- E2
LED2- E3
LED3- E4

R1 93.1K
C1 4.7µF 50V 1206
R4 3.01K
C2 4.7µF 50V 1206
D1 DFLS160
C4 0.22µF 0603

L1 100µH
CDRH8D43HP-101NC

R7 270K 0603
R9 91K

C7 2.2µF 100V 1210
C3 2.2µF 100V 1210
C9 4.7µF 63V

VIN E6
GND E5
VIN 6V - 55V

ENUVLO
JP1
ON OFF
1 2 3

ENUVLO E16

PWM3 E9
PWM2 E8
PWM1 E7
CTRL3 E12
CTRL2 E11
CTRL1 E10

R11 100K
R12 100K
R13 100K
R14 100K
R17 100K
R18 100K

VREF
SYNC E13

APPROVALS
PCB DES. AK
APP ENG. WALKER B

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LTC Confidential-For Customer Use Only

TITLE: SCHEMATIC
60V STEP-DOWN 3-CHANNEL LED DRIVER
LT3596EUHG
DEMO CIRCUIT 1542A
REV. 2

IC NO.
SIZE N/A
DATE: Friday, June 25, 2010
SCALE = NONE
SHEET 1 OF 1